Harman Kardon Service Manual

AVR 161/230

5.1 CHANNEL 85 Watt per channel A/V RECEIVER



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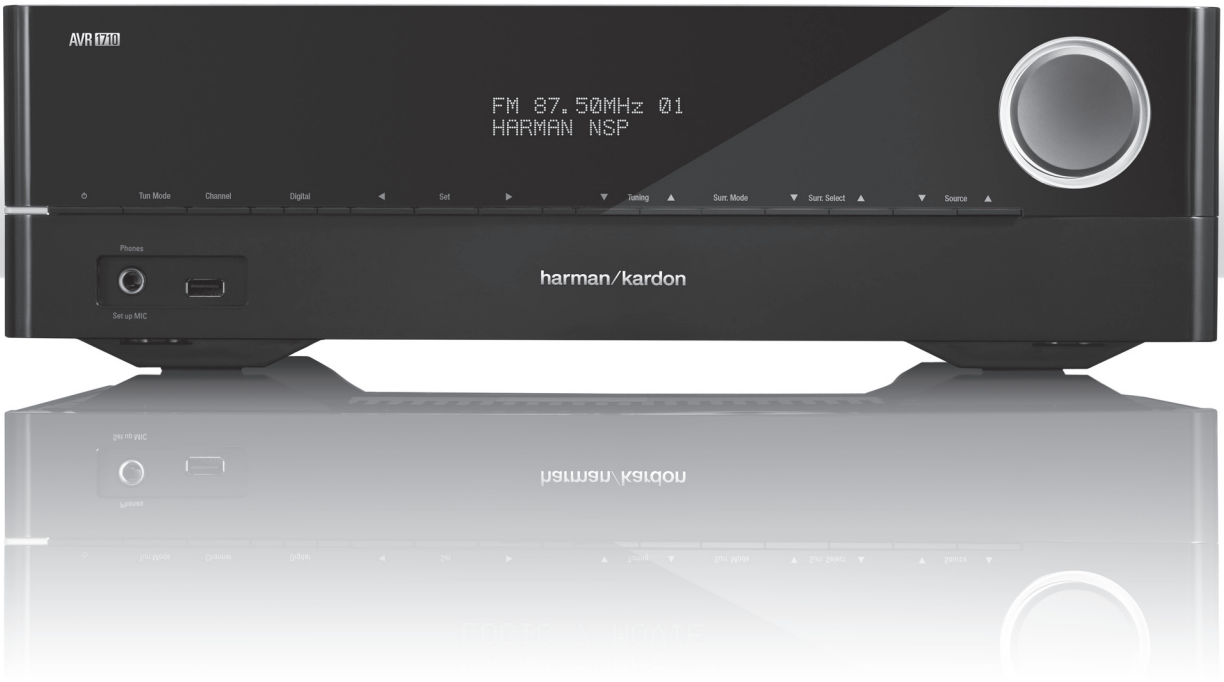
Rev 1.1, 03/2016

AVR 1710, AVR 171, AVR 171/230C
AVR 1610, AVR 161, AVR 161/230C

Audio/video receiver

HIGH-DEFINITION MULTIMEDIA INTERFACE

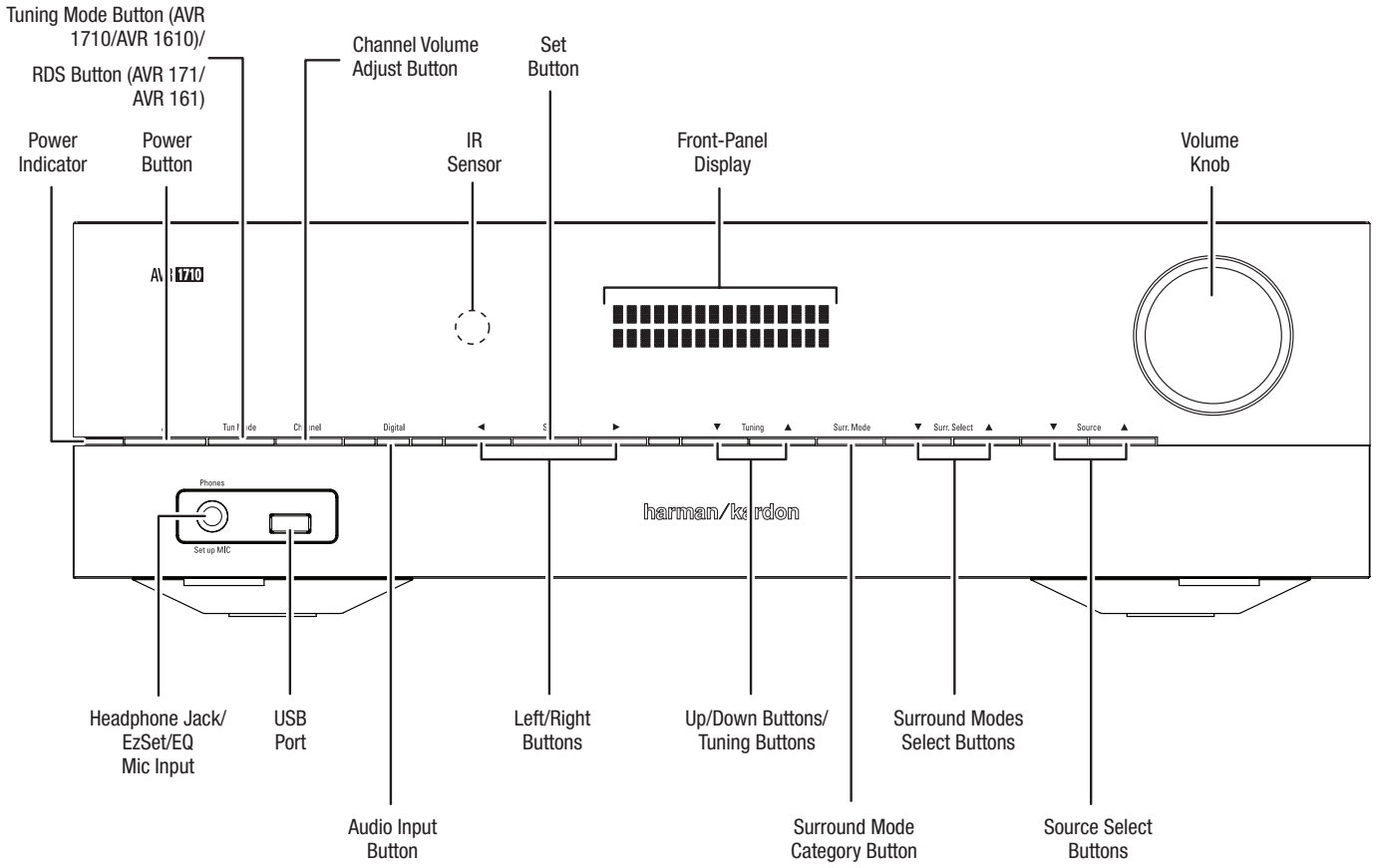
Owner's Manual



harman/kardon®
by HARMAN

AVR

Front-Panel Controls



AVR

Front-Panel Controls, continued

Power indicator/Power button: The AVR has three different power modes:

- Off (Power indicator glows solid amber): The Off mode minimizes energy consumption when you're not using the AVR. When the AVR is off, it will not automatically turn on or play audio in response to an AirPlay stream from a networked device (AVR 1710/ AVR 171 only). When the AVR is off, pressing the Power button turns it on. To turn the AVR off when it is on, press the Power button for more than three seconds. The Front-Panel Display will indicate "Your device is switched off" for two seconds, then will switch off.

  NOTE: You can use the System Setup menu to set the AVR to automatically enter the off mode after it has been in the Sleep mode for a certain period of time. See *System Settings,* on page 34.

- **Sleep** (Power indicator glows solid amber and front-panel display indicates "Device sleep"): The Sleep mode powers-down some of the AVR's circuitry, but allows the AVR to automatically turn on and play audio in response to an AirPlay or DLNA DMR stream from a networked device (AVR 1710/AVR 171 only). When the AVR is in Sleep, pressing the Power button turns it on. To put the AVR into Sleep when it is on, press the Power button for less than three seconds. The front-panel display will indicate "Device sleep" while the AVR is in the Sleep mode.

  NOTE: The AVR will automatically enter the Sleep mode after 30 minutes of no audio signal or user control input , unless USB, iPod, Home Network, vTuner, AirPlay, or DLNA DMR is active. In these cases, the AVR will automatically enter the Sleep mode after the number of hours set in the Auto Power Off system setting. See System Settings, on page 34.

- **On** (Power indicator glows solid white): When the AVR is on it is fully operational.

Headphone jack/EzSet/EQ Mic input: Connect a 1/4" stereo headphone plug to this jack for private listening. This jack is also used to connect the supplied microphone for the EzSet/EQ setup procedure described in *Configure the AVR For Your Speakers,* on page 22.

Tuning Mode button (AVR 1710/AVR 1610 only): Press this button to toggle the radio between the manual (one frequency step at a time) and automatic (seeks frequencies with acceptable signal strength) FM tuning mode. The button also toggles the radio between stereo and mono modes when an FM station is tuned in.

RDS button (AVR 171/AVR 161 only): When listening to an FM radio station that broadcasts RDS information, this button activates the various RDS functions.

USB port: The USB port can be used to play audio files from an Apple iOS® device connected to the port, and can also be used to play MP3 and WMA audio files from a USB device inserted into the port. Insert the connector or device into the USB port oriented so it fits all the way into the port. You may insert or remove the connector or device at any time – there is no installation or ejection procedure.

You can also use the USB port to perform firmware upgrades. If an upgrade for the AVR's operating system is released in the future, you will be able to download it to the AVR using this port. Complete instructions will be provided at that time.

IMPORTANT: Do not connect a PC or other USB host/controller to this port, or you may damage both the AVR and the other device.

Channel Volume Adjust button: Press this button to activate the individual channel level adjustment. After pressing this button, use the Up/Down buttons/Tuning buttons to select the channel for adjustment and use theLeft/Right buttons to adjust the channel's level.

Audio Input button: Press this button to change the audio input connection for the current source. Use the Left/Right buttons to cycle through the available input connections, and press the Set button to assign the currently-displayed connection to the source.

IR sensor: This sensor receives infrared (IR) commands from the remote control. Make sure that the sensor is not blocked.

Set button: Press this button to select the currently highlighted menu item.

Left/Right buttons: Use these buttons to navigate the AVR's menus.

Front-panel display: Various messages appear on this two-line display in response to commands and changes in the incoming signal. In normal operation, the current source name appears on the upper line, while the active surround mode is displayed on the lower line. When the on-screen display menu system (OSD) is in use, the current menu settings appear.

Up/Down buttons/Tuning buttons: Use these buttons to navigate the AVR's menus. When the radio is the active source, use these buttons to tune stations according to the setting of the Tuning Mode button (see above).

Surround Mode Category button: Press this button to select a surround-sound category. Each press changes the surround-mode category: Auto Select, Virtual, Stereo, HARMAN NSP, Movie, Music and Video Game. To change the specific surround-sound mode within the category, use the Surround Mode Select buttons. See *Audio Processing and Surround Sound,* on page 29, for more information about surround modes.

Surround Mode Select buttons: After you have selected the desired surround-mode category, press these buttons to select a specific mode within the category, such as to change from Dolby® Pro Logic® II Movie mode to DTS® NEO:6 Cinema mode. Surround mode availability depends on the nature of the source input signal, i.e., digital versus analog, and the number of channels encoded within the signal.

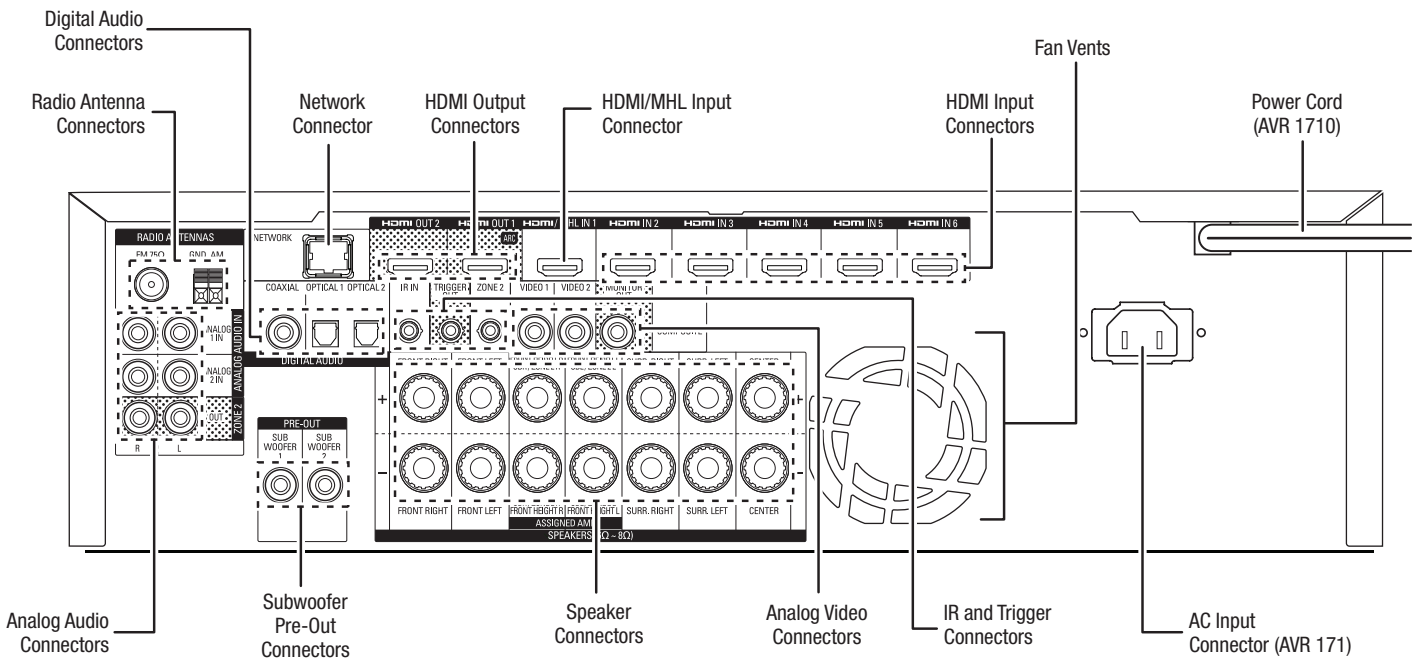
Source Select buttons: Press these buttons to select the active source.

Volume knob: Turn this knob to raise or lower the volume.

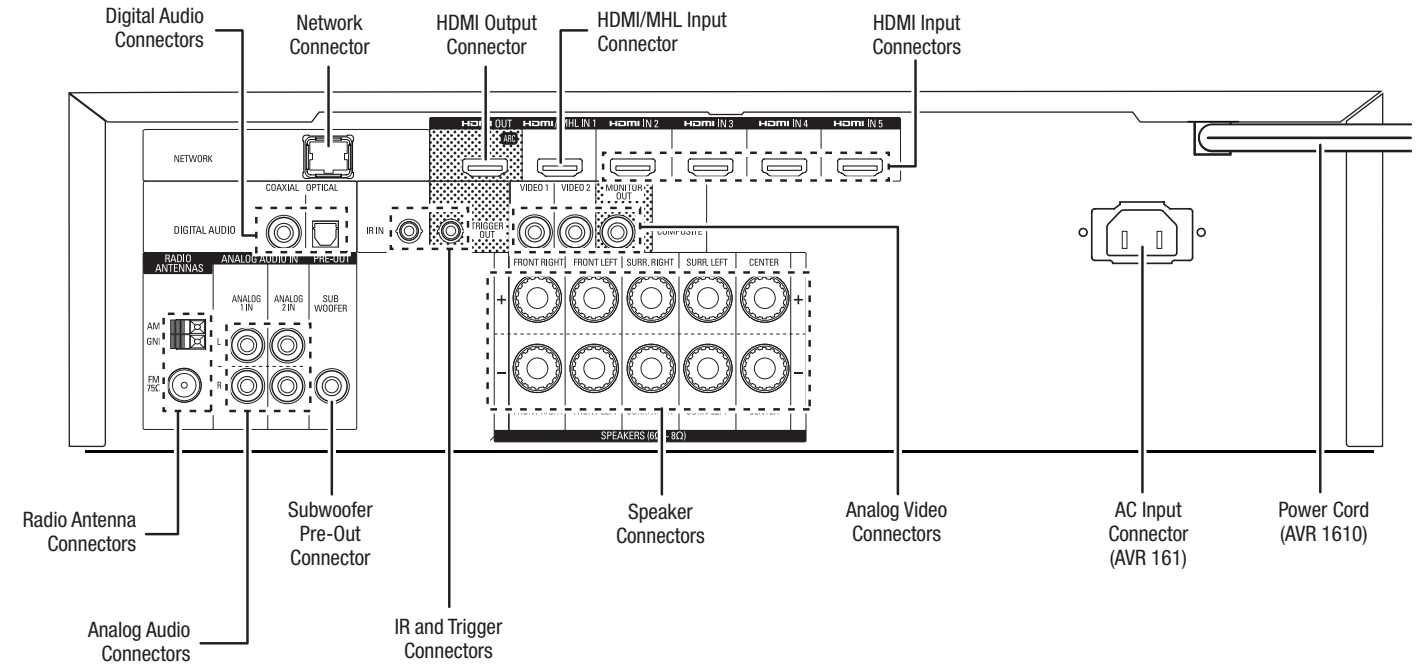
AVR

Rear-Panel Connectors

AVR 1710/AVR 171



AVR 1610/AVR 161



AVR

Rear-Panel Connectors, continued

Digital Audio connectors: If your non-HDMI source devices have digital outputs, connect them to the AVR's digital audio connectors. NOTE: Make only one type of digital connection (HDMI, optical or coaxial) from each device. See *Connect Your Audio and Video Source Devices,* on page 16, for more information.

Radio Antenna connectors: Connect the supplied AM and FM antennas to their respective terminals for radio reception.

Analog Audio connectors: The following analog audio connectors are provided:

- **Analog Audio Input connectors:** Use the AVR's Analog Audio Input connectors for source devices that don't have HDMI or digital audio connectors. See *Connect Your Audio and Video Source Devices,* on page 16, for more information.
- **Zone 2 Out connectors (AVR 1710/AVR 171 only):** Connect these jacks to an external amplifier to power the speakers in the remote zone of a multizone system.

Network connector: If your home network is wired, use a Cat. 5 or Cat. 5E Ethernet cable (not supplied) to connect the AVR's Network connector to your home network to enjoy Internet radio and content from DLNA-compatible devices that are connected to the network. See *Connect to Your Home Network,* on page 18, for more information.

Subwoofer Pre-Out connector: Connect this jack to a powered subwoofer with a line-level input. See *Connect Your Subwoofer,* on page 15, for more information. NOTE: The AVR 1710 and AVR 171 have two subwoofer connectors.

HDMI Output connectors: If your TV has an HDMI connector and you are connecting HDMI source devices to the AVR, use an HDMI cable (not included) to connect it to the AVR's HDMI Out connector. **NOTE:** The AVR 1710 and AVR 171 have two HDMI Out connectors.

Notes on using the HDMI Output connector:

- When connecting a DVI-equipped display to the HDMI Out connector, use an HDMI-to-DVI adapter and make a separate audio connection.
- Make sure the HDMI-equipped display is HDCP (High-bandwidth Digital Content Protection)-compliant. If it isn't, do not connect it via an HDMI connection; use an analog video connection instead and make a separate audio connection.
- AVR 1710/AVR 171 only: If you have connected a 3D-capable TV to HDMI Out 1 and a 2D-capable TV to HDMI Out 2, the AVR will not allow 3D playback when both TVs are powered on. To watch 3D content, turn off the AVR and both TVs, then first turn on the 3D TV, then turn on the AVR, and finally turn on the 3D source device. Do NOT turn the 2D TV back on.

HDMI/MHL Input connector: If you have a Roku Streaming Stick or other MHL-capable device, connect it only to this HDMI/MHL In connector. If you do not have an MHL device you can use this connector for an HDMI-capable device.

Speaker connectors: Use two-conductor speaker wire to connect each set of terminals to the correct speaker. See *Connect Your Speakers,* on page 14, for more information.

NOTE: The Assigned Amp speaker connectors (AVR 1710/AVR 171 only) are used for the surround back or Front Height channels in a 7.1- channel home theater, or you can reassign them to a remote room for multizone operation or to front height channels for Dolby® Pro Logic IIz operation. See *Place Your Speakers*, on page 11, for more information.

Analog Video connectors: The following Analog Video connectors are provided:

- **Composite Video Input connectors:** Use composite video connectors for video source devices that don't have HDMI connectors. You will also need to make an audio connection from the source device to the AVR. See *Connect Your Audio and Video Source Devices,* on page 16, for more information.
- **Composite Video Monitor Out connector:** If your TV or video display does not have an HDMI connector, or if your TV does have an HDMI connector *but you are connecting some source devices with only composite video connectors,* use a composite video cable (not included) to connect the AVR's Composite Video Monitor Out connector to your TV 's composite video input.

HDMI® Input connectors: An HDMI connection transmits digital audio and video signals between devices. If your source devices have HDMI connectors, using them will provide the best possible video and audio performance quality. Since the HDMI cable carries both digital video and digital audio signals, you do not have to make any additional audio connections for devices you connect via the HDMI connection. See *Connect Your Audio and Video Source Devices,* on page 16, for more information.

IR and Trigger connector: The following IR and trigger connectors are provided:

- **IR In connectors:** When the IR sensor on the front panel is blocked (such as when the AVR is installed inside a cabinet), connect an optional IR receiver to the IR In jack.
- **12V Trigger connector:** This connector provides 12V DC whenever the AVR is on. It can be used to turn on and off other devices such as a powered subwoofer.
- **Zone 2 IR Input connector (AVR 1710/AVR 171 only):** Connect a remote IR receiver located in Zone 2 of a multizone system to this jack to control the AVR from the remote zone.

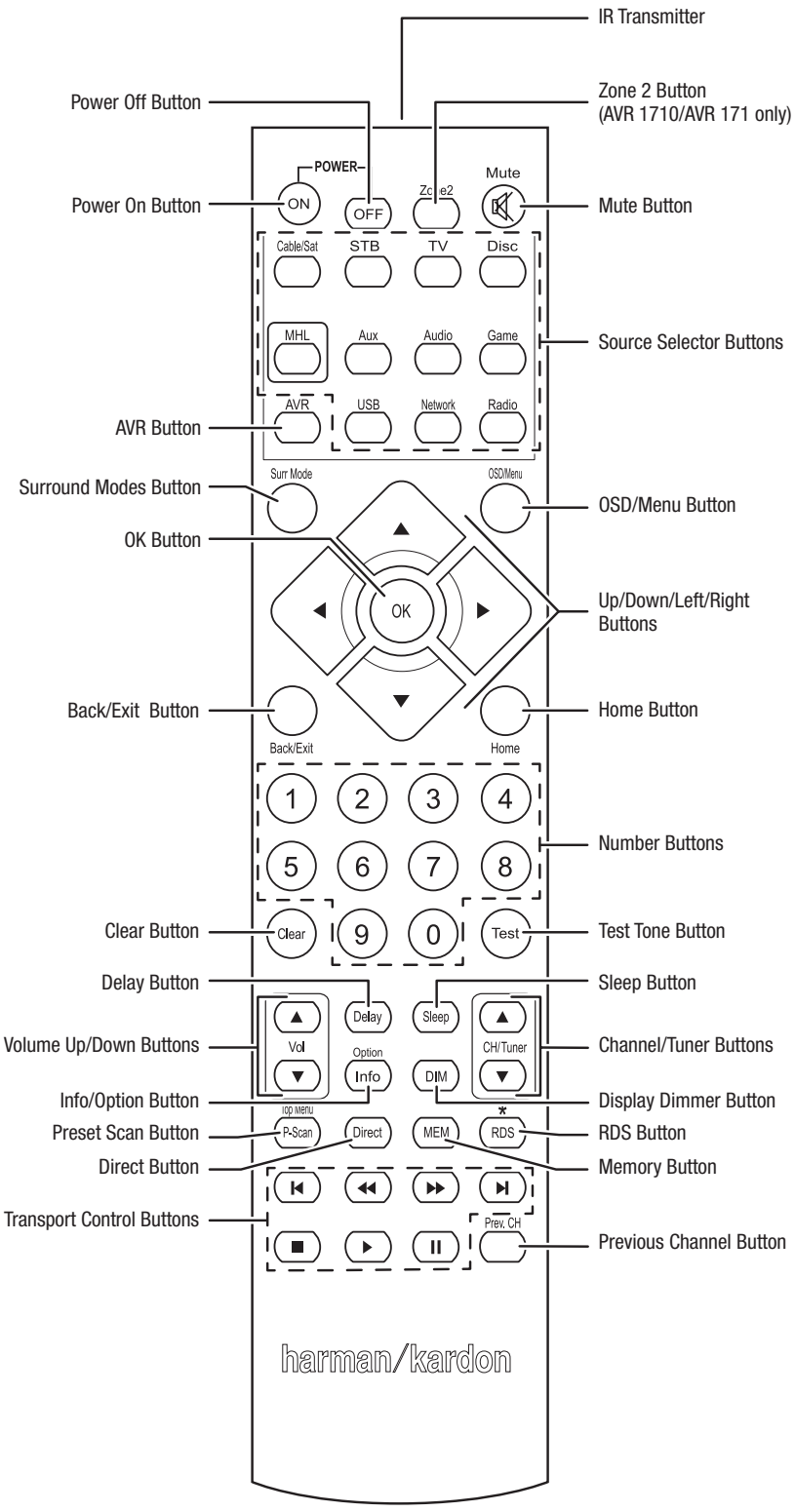
Fan Vents (AVR 1710/AVR 171 only): These vents are used by the AVR's fan to cool the system. Maintain a clearance of at least three inches (75mm) from the nearest surface to avoid overheating the unit. It is normal for the fan to remain off at most normal volume levels. An automatic temperature sensor turns the fan on only when it is needed.

IMPORTANT NOTE: Never block the fan vents. Doing so could allow the AVR to overheat to dangerous levels.

AC Input connector (AVR 171/AVR 161 only): After you have made and verified all other connections, plug the supplied AC power cord into this receptacle and into an *unswitched* wall outlet.

Power cord (AVR 1710/AVR 1610 only): After you have made and verified all other connections, plug the power cord into an *unswitched* wall outlet.

System Remote Control Functions



AVR

System Remote Control Functions, continued

In addition to controlling the AVR, the AVR remote is capable of controlling eight other devices, including an iPod/iPhone device connected to the AVR's front-panel USB port. During the installation process, you may program the codes for each of your source components into the remote. (See *Program the Remote to Control Your Source Devices and TV*, on page 21, for programming information.) To operate a component, press its Source Selector button to change the remote's control mode.

A button's function depends on which component is being controlled. See Table A13 in the Appendix for listings of the functions for each type of component. Most of the buttons on the remote have dedicated functions, although the precise codes transmitted vary depending on the specific device being controlled. Due to the wide variety of functions for various source devices, we have included only a few of the most-often used functions on the remote: number buttons, transport controls, television-channel control, menu access and power on and off. Buttons dedicated to the AVR – AVR Power On/Off, Surround Modes, Volume, Mute, Delay and Sleep Settings – are available at any time, even when the remote is controlling another device.

Power On/Power Off buttons: Press these buttons to turn the AVR on and put it into Sleep or turn it off. See *Power Indicator/Power Button,* on page 4, for more information.

IR Transmitter: As buttons are pressed on the remote, infrared codes are emitted through this lens.

Zone 2 button (AVR 1710/AVR 171 only): Use this button to select whether the AVR commands will affect the main listening area (Zone 1) or the remote zone of a multizone system (Zone 2). When the remote is in the Zone 2 control mode, the Zone 2 button will illuminate whenever you press a button.

Mute button: Press this button to mute the AVR's speaker-output connectors and headphone jack. To restore the sound, press this button or adjust the volume.

Source Selector buttons: Press one of these buttons to select a source device, e.g., Disc, Cable/Sat, Radio, etc. This action will also turn on the AVR and switch the remote's control mode to operate the selected source device.

- The first press of the Radio button switches the AVR to the last-used tuner band (AM or FM). Each successive press changes the band.
- The first press of the USB button switches the AVR to the last-used source (USB or iPod). Each successive press cycles between the two sources.
- The first press of the Network button switches the AVR to the last-used source (Network or vTuner). Each successive press cycles between the two sources.

AVR button: Press to put the remote into the AVR control mode.

Surround Modes button: Press this button to access the Surround Modes submenu. Select a surround-mode category: Auto Select, Virtual Surround, Stereo, HARMAN NSP, Movie, Music or Game. When you select the category, it is highlighted and the surround mode changes.

To change the surround mode for the selected category navigate to the Surround Mode menu in the AVR's on-screen display menu, select the desired category, and use the Left/Right buttons to select one of the available surround modes. See the *Advanced Functions* section, on page 29, for more information.

OSD/Menu button: When the remote is controlling the AVR, press this button to display the AVR's on-screen display (OSD) menu. This button is also used within the tuner menus and an iPod connected to the AVR's front-panel USB port, and is also used to display the main menu on some source devices.

Up/Down/Left/Right buttons: These buttons are used to navigate the menu system and to operate the tuner.

OK button: This button is used to select items from the menu system.

Back/Exit button: Press this button to return to the previous menu or to exit the menu system.

Home button: Press this button to display the Home menu for a Roku Streaming Stick™ that is connected to the AVR's MHL/HDMI connector.

Number buttons: Use these buttons to enter numbers for radio-station frequencies or to select station presets.

Clear button: Press this button to clear a radio station frequency you have started to enter.

Test Tone button: Press this button to activate test noise that will circulate through each speaker, allowing you to adjust the individual speaker levels. Use the Up/Down buttons to switch the noise to a different speaker and use the Left/Right buttons to change the volume of the speaker the noise is playing through.

Delay Adjust button: Pressing this button lets you adjust two different types of delay settings (use the Up/Down buttons to cycle through the settings):

- Lip Sync: This setting lets you resynchronize the audio and video signals from a source to eliminate a "lip sync" problem. Lip-sync issues can occur when the video portion of a signal undergoes additional processing in either the source device or the video display. Use the Left/Right buttons to delay the audio by up to 180ms.
- Distance: These settings let you set the delay for each speaker to compensate for the different distances they may be from the listening position. Use the Up/Down buttons to cycle through each of the system's speakers, and use the Left/Right buttons to set the distance each speaker is from the listening position. See *Manual Speaker Setup,* on page 30, for more information.

Sleep button: Press this button to activate the sleep timer, which turns off the receiver after a programmed period of time. Each press increases the time by 10 minutes, up to 90 minutes – ending with the "Sleep Off" message.

Volume Up/Down buttons: Press these buttons to raise or lower the volume.

Channel/Tuner buttons: When radio has been selected, press these buttons to select a preset radio station. While operating a cable, satellite or HDTV set-top box or a television, press these buttons to change channels.

Info/Option button: Press to display the available option settings for the current source.

Display Dimmer button: Press this button to dim the AVR's front-panel Message Display partially or fully.

Preset Scan button: When Radio is the selected source, press this button to play each of your preset radio stations in order for five seconds. Pressing the button again to remain tuned to the current station.

RDS button (AVR 171/AVR 161 only): When listening to an FM radio station that broadcasts RDS information, this button activates the various RDS functions.

Direct button: Press this button to directly tune to a radio station by using the Number buttons to enter its frequency.

Memory button: Press this button to save the current radio or vTuner station as a preset.

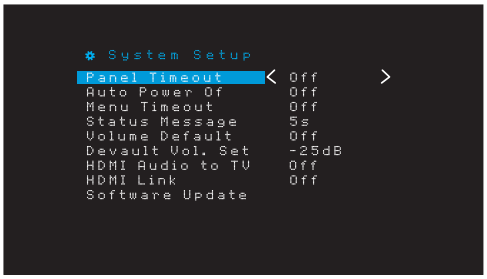
Transport Control buttons: These buttons are used to control source devices.

Previous Channel button: When TV is the selected source, press this button to switch to the previously-tuned channel.

AVR

System Settings

The AVR's System Settings menu lets you customize in what way many of the AVR's features operate. Press the OSD/Menu button and navigate to the System line. Press the OK button to display the System Settings menu.



Panel Timeout: This setting allows you to set the AVR's front-panel display to automatically turn off after remaining on for a predetermined time (3 – 10 seconds) each time you use a control. Set this to "Off" to have the display remain on continually.

Auto Power Off: This setting allows you to set the AVR to automatically switch to the Off mode after being in the Sleep mode for a predetermined time (1 – 8 hours). See *Power Indicator/Power Button,* on page 4, for more information. It also allows the AVR to automatically switch to the Sleep mode after being on for the predetermined amount of time. Note that it will not transition to Sleep mode this way if the active source has one of the Digital Audio Connectors selected as the Audio Input. See Source Setup, on page 23, for more information.

Menu Timeout: This setting allows you to set the amount of time (20 – 50 seconds) a menu screen will remain on after the last adjustment. Set this to "Off" to have the menus remain on continually until you press the OSD/Menu button.

Status Message: When the AVR is turned on, the volume is adjusted, the source is changed or a change in the input signal is detected, a status message will be displayed on the TV screen. Select how long the message remains visible, from 2 to 10 seconds, with a default of 3 seconds. Select "Off" if you do not wish to see the status messages on the TV screen (they will still appear on the AVR's front-panel display).

Volume Default and Default Volume Setting: These two settings are used together to program the volume level when you turn on the AVR. Set Volume Default to On, and then set the Default Volume Setting to the desired turn-on volume. When Volume Default is set to Off, the AVR will turn on at the last-used volume setting from the previous listening session.

HDMI Audio to TV: This setting determines whether HDMI audio signals are passed through the HDMI Monitor Out connector to the video display. In normal operation, leave this setting at Off, as audio will be played through the AVR. To use the TV by itself, without the home theater system, turn this setting to On.

HDMI Link: This setting allows the communication of control information among the HDMI devices in your system. Turn this setting to On to allow control communication between the HDMI devices; turn the setting to Off to forbid control communication.

Software Update: If a software upgrade is released for your AVR, installation instructions will be available in the Product Support section of the Web site or from Harman Kardon customer service. At that time, you may use this submenu to install the upgrade software.

IMPORTANT: During a software upgrade, do not power off the AVR or use any of its controls. Doing so could permanently damage the AVR.

Sleep Timer

The sleep timer sets the AVR to play for up to 90 minutes and then turn off automatically.

Press the Sleep button on the remote, and the time until turn-off will be displayed. Each additional press of the Sleep button increases the play time by 10 minutes, with a maximum of 90 minutes. The SLEEP OFF setting disables the sleep timer.

When the sleep timer has been set, the front-panel display will automatically dim to half brightness.

If you press the Sleep button after the timer has been set, the remaining play time will be displayed. Press the Sleep button again to change the play time.

The front-panel display will count down during the final 10 seconds before going to Sleep mode. Pressing any button during this countdown will cancel the process and disable the Sleep timer.

Processor Reset

If the AVR behaves erratically after a power surge, unplug the AC power cord for at least 3 minutes. Plug the cord back in and turn the AVR on. If this procedure doesn't help, reset the AVR's processor as described below.

NOTE: A processor reset erases all user configurations, including speaker and level settings and tuner presets. After a reset, reenter all of these settings from your entries in the Appendix worksheets.

To reset the AVR's processor:

1. Press the front-panel Power Button for more than three seconds to turn the AVR off (the Power Indicator will turn amber).
2. Press and hold the front-panel Surround Mode Category button for at least 5 seconds until the RESET message appears on the front-panel display.

NOTE: After performing a processor reset, wait at least 1 minute before pressing any Source Selector buttons.

If the AVR does not function correctly after a processor reset, contact an authorized Harman Kardon service center for assistance. Authorized service centers may be located by visiting our Web site at www.harmankardon.com.

AVR

Troubleshooting

Symptom	Cause	Solution
Unit does not function	• No AC power	• Ensure that the power cord is plugged into a live AC power outlet • Check if the AC outlet is switch-controlled
Front-panel display lights, but there's no sound or picture	• Intermittent input connection • Mute is on • Volume control is turned down	• Secure all input and speaker connections • Press Mute button • Turn up Volume control
No sound from any speaker	• Amplifier is in protection mode due to possible short circuit • Amplifier is in protection mode due to internal problems	• Check all speaker wires at speaker and AVR connections for crossed wires • Contact your local Harman Kardon service center
No sound from center or surround speakers	• Incorrect surround mode • Program material is monophonic • Incorrect speaker configuration • Program material is stereo	• Select a surround mode other than stereo • Mono programs contain no surround information • Check the speaker configuration in the setup menu • The surround decoder may not create center- or surround-channel information from nonencoded programs
Unit does not respond to remote control commands	• Weak batteries in remote • Remote sensor is obscured	• Change batteries in remote • Ensure that the AVR's front-panel remote sensor is in the line of sight of the remote
Intermittent buzzing in tuner	• Local interference	• Move the AVR or antenna away from computers, fluorescent lights, motors or other electrical appliances
(AVR 1710/AVR 171 only): Surround-back speaker settings cannot be accessed, and the test tone does not play through the surround back speakers	• Multi-zone operation has been selected/Assigned AMP channels have been assigned to Zone 2	• Use the Speaker Setup menu to reassign the Assigned AMP to the surround back left and right channels
Unable to activate remote control Programming mode	• Source Selector button is not held for at least 3 seconds	• Be sure to hold the Source Selector button for at least 3 seconds
Remote buttons light, but AVR does not respond	• Remote is in Zone 2 mode	• Press Zone 2 button (button will not illuminate when remote is in Zone 1 control mode).
Unable to establish network connection	• AVR network programming requires rebooting	• Cycle the AVR into the Off mode, and then turn it on again

Additional information on troubleshooting possible problems with your AVR and installation-related issues may be found in the list of "Frequently Asked Questions," which is located in the Product Support section of our Web site: www.harmankardon.com

AVR

Specifications

Audio Section

Stereo power:	AVR 1710/AVR 171: 100W per channel, two channels driven @ 6/8 ohms, 1kHz, <0.9% THD AVR 1610/AVR 161: 85W per channel, two channels driven @ 6/8 ohms, 1kHz, <0.9% THD
Multichannel power:	AVR 1710/AVR 171: 100W per channel, two channels driven @ 6/8 ohms, 1kHz, <0.9% THD AVR 1610/AVR 161: 85W per channel, two channels driven @ 6/8 ohms, 1kHz, <0.9% THD
Input sensitivity/impedance:	250mV/27k ohms
Signal-to-noise ratio (IHF-A):	100dB
Surround system adjacent channel separation:	Dolby Pro Logic/DPLII: 40dB Dolby Digital: 55dB DTS: 55dB
Frequency response (@ 1W):	10Hz – 130kHz (+0dB/–3dB)
High instantaneous current capability (HCC):	±40 amps (AVR 1710/AVR 171); ±29 amps (AVR 1610/AVR 161)
Transient intermodulation distortion (TIM):	Unmeasurable
Slew rate:	40V/µsec

FM Tuner Section

Frequency range:	87.5 – 108.0MHz
Usable sensitivity IHF:	1.3µV/13.2dBf
Signal-to-noise ratio (mono/stereo):	70dB/68dB
Distortion (mono/stereo):	0.2%/0.3%
Stereo separation:	40dB @ 1kHz
Selectivity (±400kHz):	70dB
Image rejection:	80dB
IF rejection:	80dB

AM Tuner Section

Frequency range:	520 – 1710kHz (AVR 1710/AVR 1610) 522 – 1620kHz (AVR 170/AVR 160)
Signal-to-noise ratio:	38dB
Usable sensitivity (loop):	500µV
Distortion (1kHz, 50% mod):	1.0%
Selectivity (±10kHz):	30dB

Bluetooth Section

Frequency range:	2402MHz - 2480MHz
Transmitter power:	0-4dBm
Modulation:	GFSK, π/4-DQPSK, 8-DPSK
Functions:	Streaming audio play, supports Bluetooth 3.0, A2DP v1.2, AVRCP v1.4

Video Section

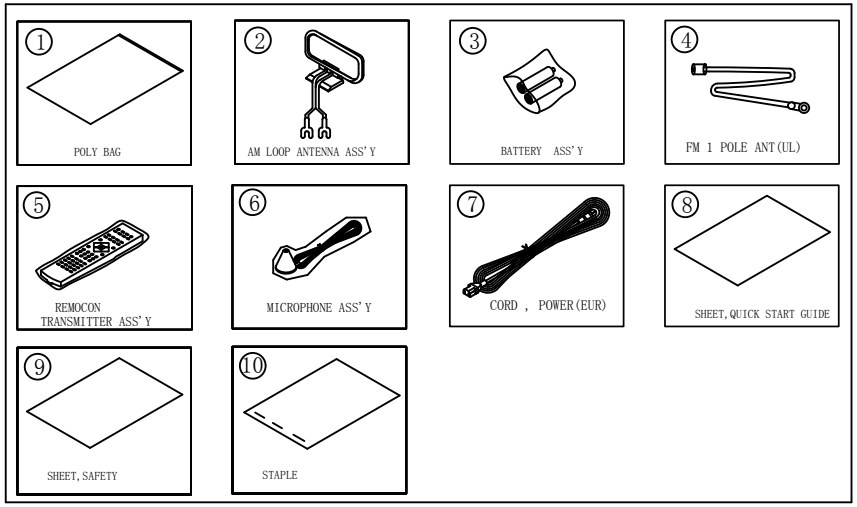
Television format:	NTSC (AVR 1710/AVR 1610); PAL (AVR 171/AVR 161)
Input level/impedance:	1Vp-p/75 ohms
Output level/impedance:	1Vp-p/75 ohms
Video frequency response (composite video):	10Hz – 8MHz (–3dB)
HDMI:	HDMI 1.4 with 4k x 2k bypass

General Specifications

Power requirement:	120V AC/60Hz (AVR 1710/AVR 1610); 220V – 240V AC/50Hz – 60Hz (AVR 171/AVR 161)
Power consumption:	<0.5W (standby); 510W maximum (AVR 1710/AVR 171); 450W maximum (AVR 1610/AVR 161)
Dimensions (W x H x D):	17-5/16" x 4-3/4" x 11-3/16" (440mm x 121mm x 300mm)
Weight	(AVR 1710/AVR 171): 11 lb (5.1kg) (AVR 1610/AVR 161): 10 lb (4.6kg)

Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.

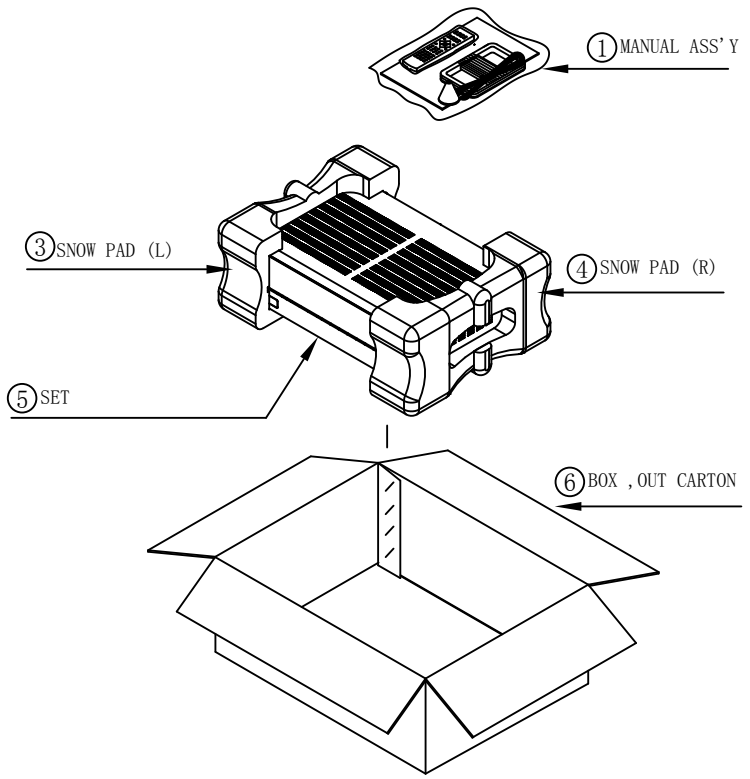
1. Instruction manual ass'y - Accessories(CQXAVR161/230)



NO	DESCRIPTION	PARTS NO.	Q,ty
1	POLY BAG	CPB1A190Z	1
2	ANT, AM LOOP(9.5uH/5T)	CSA1A039Z	1
3	BATTERY	CABR03PPB	2
4	FM 1 POL ANT	CSA1A018Z	1
5	REMOCON ASS'Y	CARTAVR161-HK	1
6	MICROPHONE ASS'Y	CJXAVR365MICRO	1
7	CORD,POWER(PLUG+SOCKET)	CJA2B120Z	1
8	SHEET,QUICK START GUIDE	CQE1A570Z	1
9	SHEET,SAFETY	CQE1A601Z	1
10	STAPLE	CPL0905	3

AVR161/230

2. Package Drawing

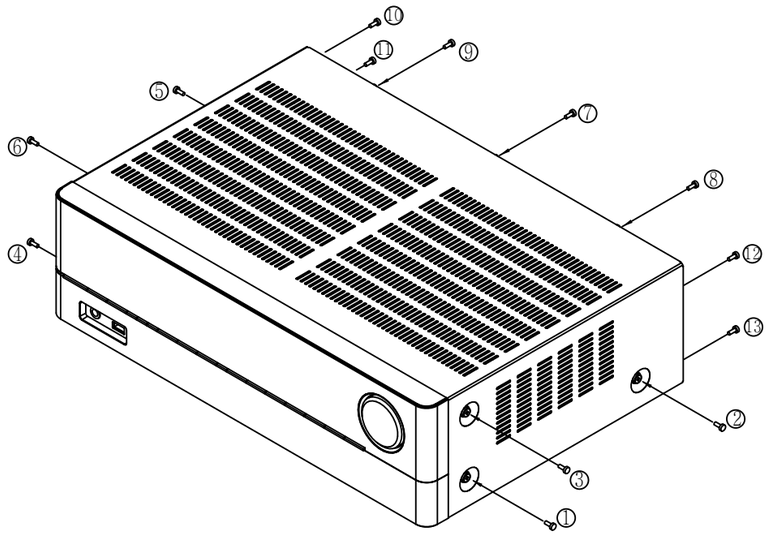


NO	DESCRIPTION	PARTS NO.	Q,ty
1	MANUAL ASS'Y	CQXAVR161/230	1
2	PAD,LEFT	CPS1A930	1
3	PAD,RIGHT	CPS1A931	1
4	SET	AVR161/230SET	1
5	BOX,OUT CARTON	CPG1A972V	1

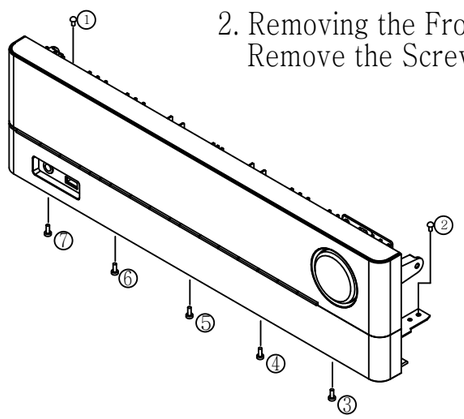
DISASSEMBLY

AVR161/230

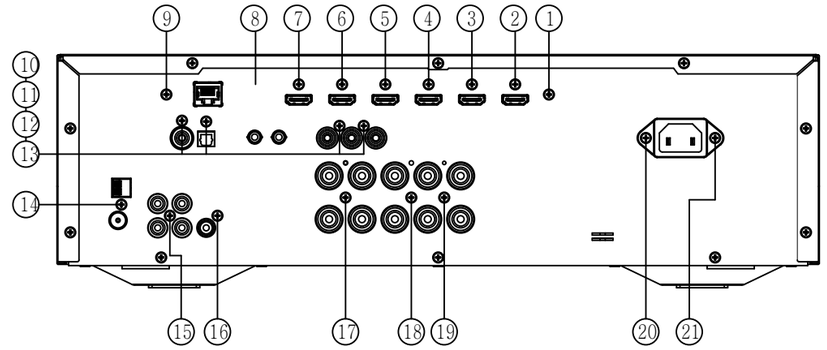
1. Removing the Top Cabinet
Remove the Screws ①~⑬



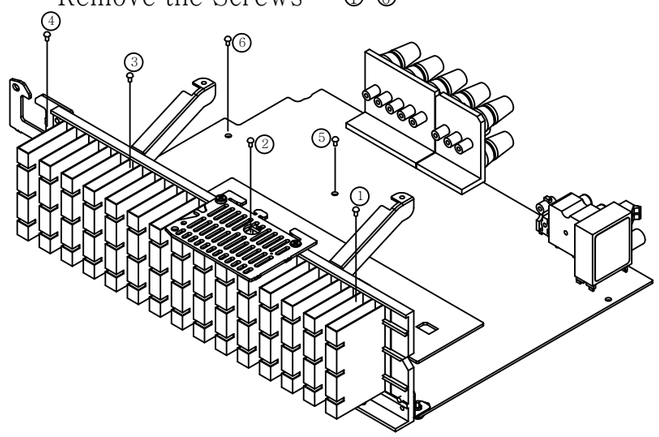
2. Removing the Front Panel
Remove the Screws ①~⑦



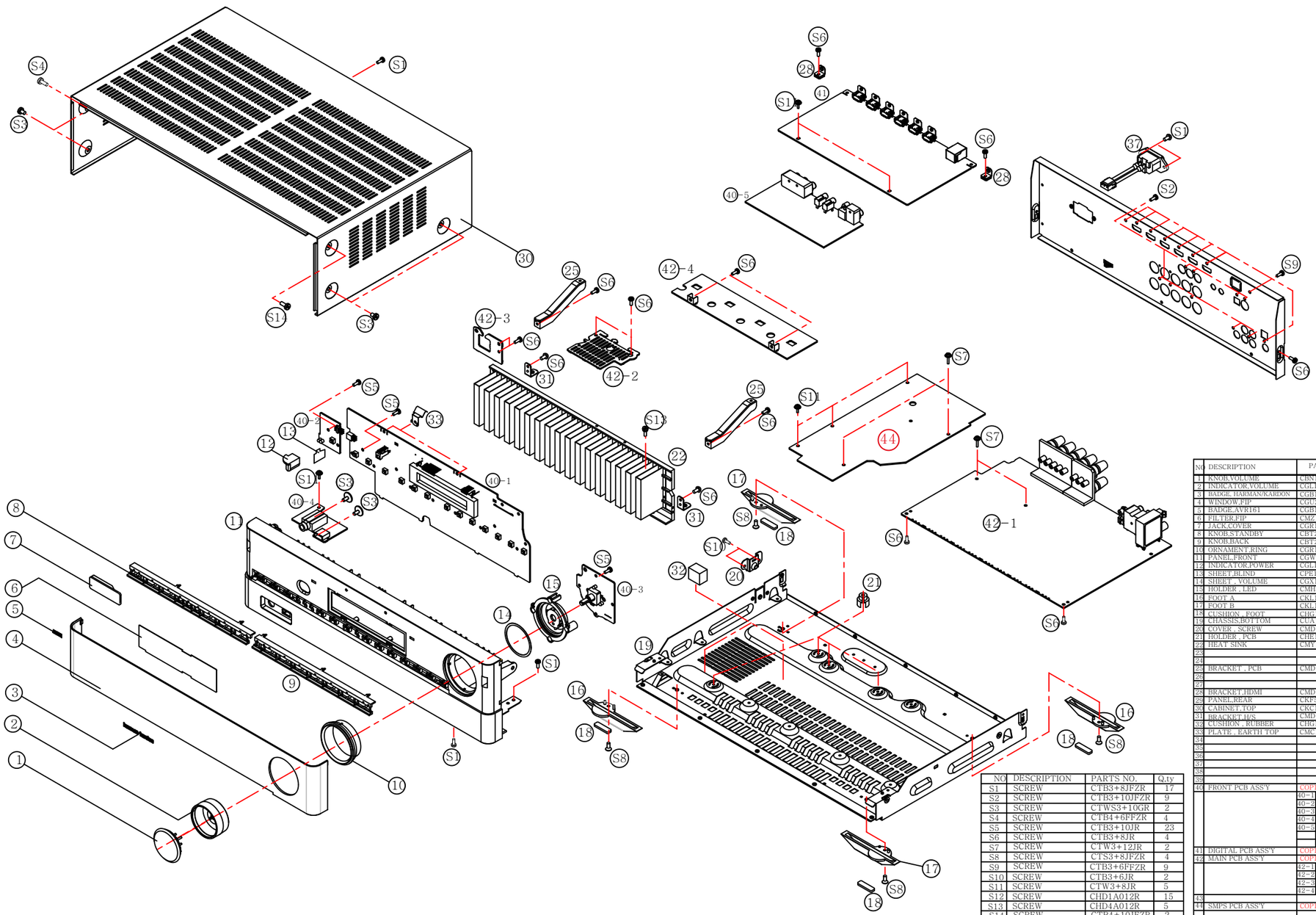
3. Removing the Rear Panel
Remove the Screws ①~㉑



4. Removing the Main PCB
Remove the Screws ①~⑥



AVR161/230 EXPLODED VIEW



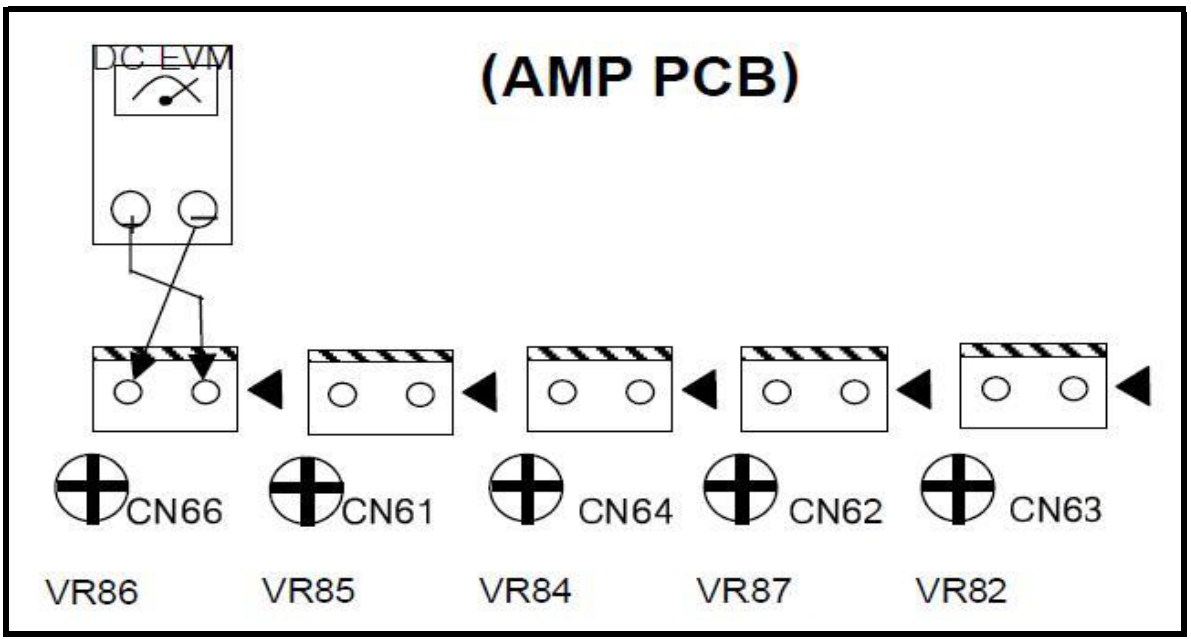
NO	DESCRIPTION	PARTS NO.	Q.ty
S1	SCREW	CTB3+8JFZR	17
S2	SCREW	CTB3+10JFZR	9
S3	SCREW	CTWS3+10GR	2
S4	SCREW	CTB4+6FFZR	4
S5	SCREW	CTB3+10JR	23
S6	SCREW	CTB3+8JR	4
S7	SCREW	CTW3+12JR	2
S8	SCREW	CTS3+8JFZR	4
S9	SCREW	CTB3+6FFZR	9
S10	SCREW	CTB3+6JR	2
S11	SCREW	CTW3+8JR	5
S12	SCREW	CHD1A012R	15
S13	SCREW	CHD4A012R	5
S14	SCREW	CTB4+10JFZR	2

NO	DESCRIPTION	PARTS NO.	Q.ty	REMARK
1	KNOB,VOLUME	CBN1A269B65	1	
2	INDICATOR,VOLUME	CGL1A300	1	
3	BADGE, HARMAN/KARDON	CGB1A255Z	1	
4	WINDOW,FIP	CGU2A410A25J	1	
5	BADGE,AVR161	CGB1A260Z	1	
6	FILTER,FIP	CMZ1A145	1	
7	JACK,COVER	CGR1A555B63	1	
8	KNOB,STANDBY	CBT2A1064	1	
9	KNOB,BACK	CBT2A1065	1	
10	ORNAMENT,RING	CGR1A538G5	1	
11	PANEL,FRONT	CGW1A533RHZB63	1	
12	INDICATOR,POWER	CGL1A285Y	1	
13	SHEET,BLIND	CPB1A009	1	
14	SHEET , VOLUME	CGN1A178Z	1	
15	HOLDER , LED	CMH3A215	1	
16	FOOT A	CKL1A094	2	
17	FOOT B	CKL1A095	2	
18	CUSHION , FOOT	CHG1A373	4	
19	CHASSIS,BOTTOM	CUA1A343	1	
20	COVER , SCREW	CMD1A815	1	
21	HOLDER , PCB	CHE170	4	
22	HEAT SINK	CMY1A388	1	
23				
24				
25	BRACKET , PCB	CMD1A810	2	
26				
27				
28	BRACKET,HDMI	CMD1A809	2	
29	PANEL,REAR	CKF5A463Z	1	
30	CABINET,TOP	CKC1A219B64	1	
31	BRACKET,HS	CMD1A802	2	
32	CUSHION , RUBBER	CHG1A166Z	2	
33	PLATE , EARTH TOP	CMC1A416	2	
34				
35				
36				
37				
38				
39				
40	FRONT PCB ASS'Y	COP12502F	1	
		40-1 FIP & KEY PCB	1	
		40-2 POWER LED PCB	1	
		40-3 VOLUME PCB	1	
		40-4 PHONE PCB	1	
		40-5 JACK PCB ASS'Y	1	
41	DIGITAL PCB ASS'Y	COP12504F		
42	MAIN PCB ASS'Y	COP12506F	1	
		42-1 MAIN PCB	1	
		42-2 GUIDE PCB(CARD)	1	
		42-3 GUIDE PCB(CARD)	1	
		42-4 SHIELD PCB	1	
43			1	
44	SMPS PCB ASS'Y	COP12509F	1	

AMPLIFIER SECTION BIAS ADJUSTMENT

Measurement condition
.No input signal or volume position is minium.
.Do not adjust at FM/AM

Standard value
.Ideal current = 48mA (±7%)
.Ideal DC Voltage = 22.5mA (±7%)



DC VOLTMETER ; Connect to
CN66(SL),CN61(CNT),CN64(SR),CN62(FR),CN63(FL)

No.	Channel	Adjust for	Adjust
1	Front Left	22.5mV (±7%)	CN63
2	Front Right	22.5mV (±7%)	CN62
3	Center	22.5mV (±7%)	CN61
4	Surround Left	22.5mV (±7%)	CN66
5	Surround Right	22.5mV (±7%)	CN64

			AVR 161 PARTS LIST	
Level	**Ref#**	**Component**	**Description**	**Drawing No**
..2		CBN1A269B65	KNOB , VOLUME	
..2		CGL1A300	INDICATOR , VOLUME	
..2		CGR1A555B63	COVER , JACK AVR1510	
..2		CGWAVR161/230	FRONT PANEL ASS'Y	
...3		CBT2A1064	KNOB , STANDBY	
...3		CBT2A1065	KNOB , BACK	
...3		CGB1A255Z	BADGE , HARMAN/KARDON	
...3		CGB1A260Z	BADGE , AVR161	
...3		CGL1A265Y	INDICATOR , POWER AVR155	
...3		CGR1A538G5	ORNAMENT , RING	
...3		CGU2A410A25J	WINDOW , FIP AVR170/230	
...3		CGW1A533RHZB63	PANEL , FRONT AVR1610	
...3		CGX1A476Z	SHEET , VOLUME	
...3		CMC1A416	PLATE , EARTH TOP	
...3		CMH3A215	HOLDER , LED	
...3		CMZ1A145	FILTER AVR1510	
Level	**Ref#**	**Component**	**Description**	**Drawing No**
...3		**COP12502E**	**AVR1610 FRONT PCB ASS'Y**	
.....6	C109	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C121	CCUS1H151JA	CAP, CHIP(1608, 50V/150pF)	
.....6	C151	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C213	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....6	C214	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....6	C311	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....6	C322	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....6	C351	CCUS1H181JA	CAP, CHIP(1608, 50V/180pF)	1608 SIZE
.....6	C352	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C361	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....6	C362	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....6	C363	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C364	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C365	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C366	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C421	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C422	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C423	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
.....6	C431	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C441	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....6	C442	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....6	C451	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C456	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C557	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C558	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C601	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C602	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C603	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C604	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C605	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C644	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C645	CCUS1H471JA	CAP, CHIP(1608, 50V/470pF)	
.....6	C646	CCUS1H471JA	CAP, CHIP(1608, 50V/470pF)	
.....6	C647	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C714	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C715	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....6	C732	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C751	CCUS1H222KC	CAP, CHIP(1608, 50V/2200pF)	
.....6	C752	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....6	C753	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....6	C754	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C801	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C802	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C813	CCUS1H470JA	CAP, CHIP(1608, 50V/47pF)	
.....6	C821	CCUS1H471JA	CAP, CHIP(1608, 50V/470pF)	
.....6	C822	CCUS1H151JA	CAP, CHIP(1608, 50V/150pF)	
.....6	C830	CCUS1H473KC	CAP, CHIP(1608, 50V/0.047uF)	

Level	Ref#	Component	Description	Drawing No
...3		**COP12502E**	**AVR1610 FRONT PCB ASS'Y**	
.....6	C911	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C912	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C923	CCUS1H681JA	CAP, CHIP(1608, 50V/680pF)	
.....6	C924	CCUS1H681JA	CAP, CHIP(1608, 50V/680pF)	
.....6	C951	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C952	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	D1	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D2	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D361	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D362	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D363	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D643	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D644	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D955	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	IC13	CVISN74ACT04DR	I.C , HEX INVERTERS(SOIC/D-14P)	SN74ACT04DR
.....6	IC14	CVINJM4580CG	I.C , DUAL OPAMP(SOP-8P)	
.....6	IC421	HVINJM2244MTE1	I.C , VIDEO SWITCH	QRW-6500
.....6	IC91	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	IC92	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	L451	HLZ9Z014Z	CHIP , BEAD	HU-1M4516-600JT
.....6	Q111	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....6	Q112	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	Q113	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	Q114	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	Q252	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	Q362	CVTRT1N141C	T.R,RT1N141C(10K-10K)	RT1N141C
.....6	Q363	CVTRT1P141C	T.R,RT1P141C(10K-10K)	RT1P141C-T112-1
.....6	Q373	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....6	Q721	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	Q906	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....6	Q907	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....6	Q955	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	R101	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)	00200-0101
.....6	R102	CRJ10DJ681T	RES, CHIP(1608/5%/680ohm)	00200-0120
.....6	R104	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R108	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R109	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R110	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R111	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R112	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R113	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R122	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....6	R151	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R201	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R202	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R203	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R211	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R213	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....6	R214	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....6	R251	CRJ10DJ222T	RES, CHIP(1608/5%/2.2Kohm)	00200-0142
.....6	R252	CRJ10DJ393T	RES, CHIP(1608/5%/39Kohm)	
.....6	R312	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)	RM06FB1K
.....6	R313	CRJ10DF1501T	RES, CHIP(1608/1%/1.5Kohm)	1.5K /1/10W/F
.....6	R314	CRJ10DF1801T	RES, CHIP(1608/1%/1.8Kohm)	1.8K /1/10W/F
.....6	R315	CRJ10DF2701T	RES, CHIP(1608/1%/2.7Kohm)	RM06FB2K7
.....6	R316	CRJ10DF3301T	RES, CHIP(1608/1%/3.3Kohm)	
.....6	R322	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)	RM06FB1K
.....6	R323	CRJ10DF1501T	RES, CHIP(1608/1%/1.5Kohm)	1.5K /1/10W/F
.....6	R324	CRJ10DF1801T	RES, CHIP(1608/1%/1.8Kohm)	1.8K /1/10W/F
.....6	R325	CRJ10DF2701T	RES, CHIP(1608/1%/2.7Kohm)	RM06FB2K7
.....6	R326	CRJ10DF3301T	RES, CHIP(1608/1%/3.3Kohm)	
.....6	R327	CRJ10DF5601T	RES, CHIP(1608/1%/5.6Kohm)	00200-0234
.....6	R328	CRJ10DF5601T	RES, CHIP(1608/1%/5.6Kohm)	00200-0234
.....6	R351	CRJ10DJ750T	RES, CHIP(1608/5%/75ohm)	1608 SIZE
.....6	R352	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096

Level	Ref#	Component	Description	Drawing No
...3		**COP12502E**	**AVR1610 FRONT PCB ASS'Y**	
.....6	R361	CRJ10DJ1R0T	RES, CHIP(1608/5%/1ohm)	1608 SIZE
.....6	R362	CRJ10DJ1R0T	RES, CHIP(1608/5%/1ohm)	1608 SIZE
.....6	R363	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R364	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)	00200-0099
.....6	R365	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)	00200-0099
.....6	R366	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R367	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R368	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R375	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R376	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)	00200-0101
.....6	R377	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R402	CRJ14CJ4R7T	RES, CHIP(3216/5%/4.7ohm)	3216
.....6	R404	CRJ14CJ4R7T	RES, CHIP(3216/5%/4.7ohm)	3216
.....6	R413	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R421	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....6	R422	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....6	R423	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....6	R424	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R425	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R426	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R431	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....6	R432	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....6	R451	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R452	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R453	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R454	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R455	CRJ14CJ101T	RES, CHIP(3216/5%/100ohm)	3216
.....6	R456	CRJ14CJ101T	RES, CHIP(3216/5%/100ohm)	3216
.....6	R457	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R601	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R602	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R603	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R604	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R605	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R641	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R643	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R644	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R701	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R702	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R703	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R711	CRJ10DJ470T	RES, CHIP(1608/5%/47ohm)	00200-0098
.....6	R712	CRJ10DJ470T	RES, CHIP(1608/5%/47ohm)	00200-0098
.....6	R713	CRJ10DJ470T	RES, CHIP(1608/5%/47ohm)	00200-0098
.....6	R721	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R722	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R731	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....6	R735	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....6	R741	CRJ10DJ123T	RES, CHIP(1608/5%/12Kohm)	1608 SIZE
.....6	R742	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R811	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R812	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R813	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R821	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R822	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R823	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R834	CRJ10DJ222T	RES, CHIP(1608/5%/2.2Kohm)	00200-0142
.....6	R835	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R836	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....6	R901	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R902	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R921	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R922	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R923	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....6	R924	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....6	R925	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097

Level	Ref#	Component	Description	Drawing No
...3		**COP12502E**	**AVR1610 FRONT PCB ASS'Y**	
.....6	R926	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R931	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R932	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R933	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)	00200-0101
.....6	R934	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)	00200-0101
.....6	R935	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)	00200-0101
.....6	R936	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)	00200-0101
.....6	R941	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R942	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R943	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R944	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R955	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	ZD451	HVDUDZS5.6BSR	DIODE , ZENER(CHIP,5.6V)	UDZSTE-175.6B
.....6	ZD452	HVDUDZS5.6BSR	DIODE , ZENER(CHIP,5.6V)	UDZSTE-175.6B
.....6	ZD453	HVDUDZS5.6BSR	DIODE , ZENER(CHIP,5.6V)	UDZSTE-175.6B
.....5	C108	CCEA1AH471TC	CAP, ELECT(10V/470uF)	
.....5	C122	CCEA1AKS331TC	CAP, ELECT(10V/330uF)-S	
.....5	C152	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C251	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C252	CCEA1HKS2R2TC	CAP, ELECT(50V/2.2uF)-S	
.....5	C401	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C424	CCEA1AH471TC	CAP, ELECT(10V/470uF)	
.....5	C425	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C426	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C452	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C453	CCEA1JH470TCS	CAP , ELECT(63V/47uF),105'C	
.....5	C454	CCME2E273JX14T	CAP , POLYESTER FILM(250V/0.027UF, 5%)	
.....5	C455	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C556	CCEA1AKS331TC	CAP, ELECT(10V/330uF)-S	
.....5	C559	CCEA1AKS331TC	CAP, ELECT(10V/330uF)-S	
.....5	C721	CCEA1HKS2R2TC	CAP, ELECT(50V/2.2uF)-S	
.....5	C731	CCEA1AH471TC	CAP, ELECT(10V/470uF)	
.....5	C811	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C823	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C901	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C902	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C931	CCEA1CH331TC	CAP, ELECT(16V/330uF)	
.....5	C932	CCEA1CH331TC	CAP, ELECT(16V/330uF)	
.....5	C933	CCEA1VKS470TCS	CAP, ELECT(35V/47uF, 105'C)-S	
.....5	C944	CCEA1VKS470TCS	CAP, ELECT(35V/47uF, 105'C)-S	
.....5	ET90	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	
.....5	L452	CLZ9Z112Z	COIL , CHOKE (220uH)	
.....5	Q251	HVTKTA1271YT	T.R	KTA1271-Y-AT/P
.....5	Q361	HVTKTA1266YT	T.R	KTA1266-Y-AT/PJ
.....5	Q451	CVTKTC1027YT	T.R	KTC1027Y
.....5	Q452	CVTKTC1027YT	T.R	KTC1027Y
.....5	S311	CST1A024ZT	SW , TACT	
.....5	S312	CST1A024ZT	SW , TACT	
.....5	S313	CST1A024ZT	SW , TACT	
.....5	S314	CST1A024ZT	SW , TACT	
.....5	S315	CST1A024ZT	SW , TACT	
.....5	S316	CST1A024ZT	SW , TACT	
.....5	S317	CST1A024ZT	SW , TACT	
.....5	S318	CST1A024ZT	SW , TACT	
.....5	S319	CST1A024ZT	SW , TACT	
.....5	S320	CST1A024ZT	SW , TACT	
.....5	S321	CST1A024ZT	SW , TACT	
.....5	S322	CST1A024ZT	SW , TACT	
.....5	S323	CST1A024ZT	SW , TACT	
.....5	S330	CST1A024ZT	SW , TACT	
....4	BK30	CMD1A775	BRACKET, SHIELD	
....4	BK71	CMD1A572-V1	BRACKET , FIP	
....4	BK72	CMD1A572-V1	BRACKET , FIP	
....4	BN71	CWB1B007150HC	WIRE ASS'Y Locking (YH) (7P,2MM,150MM,#26)	
....4	BN72	CWB1B005100HC	WIRE ASS'Y Locking (YH) (5P,2MM,100MM,26#)	

Level	Ref#	Component	Description	Drawing No
...3		**COP12502E**	**AVR1610 FRONT PCB ASS'Y**	
....4	BN73	CJP06GB142ZB	PIN HEADER(6P, 2.54mm)	
....4	BN76	CWB1C207380H6001	WIRE ASS'Y (7P,2.0mm,380mm,Shield_ANGLE)_usb	
....4	BN78	CWB1B005100HC	WIRE ASS'Y Locking (YH) (5P,2MM,100MM,26#)	
....4	CN72	CJP05GJ288ZY	LOCK-WAFER/ANGLE/2MM PITCH/5PIN	
....4	CN73	CJP06GB143ZB	FEMALE HEADER(6P, 2.54mm)	
....4	CN78	CJP05GI236ZW	LOCKING TYPE , STRAIGHT WAFER , 2mm	A2008WV0-5P
....4	D101	CVD1L0345W31BOCT201	L.E.D , WHITE	
....4	D102	CVD30ASOGCAA-S7	L.E.D , ORANGE	
....4	D201	CVD1L0345W31BOCT201	L.E.D , WHITE	
....4	D202	CVD1L0345W31BOCT201	L.E.D , WHITE	
....4	D203	CVD1L0345W31BOCT201	L.E.D , WHITE	
....4	FIP1	CFL162SD19GINK	V.F.D , (FUTABA, 162-SD-19GINK)	162SD19GINK
....4	IC12	CRVKSM603TE5B	SENSOR , REMOCON	
....4	IC15	HVINJM4556AL	I.C , HEADPHONE (JRC)	NJM4556AL
....4	IC371	BVIKP1010B	IC, PHOTO COUPLER (COSMO)	
....4	JK351	CJJ4M044X	JACK , RCA (1P,RCA-115A-04)	RCA-115A-04
....4	JK352	CJSJSR1124	MODULE , OPTICAL(RX 16MHz)	
....4	JK401	CJJ4S010Z	JACK , BOARD	RCA-325A-02
....4	JK402	CJJ2D008Z	JACK, STEREO (BLK MOLD)	PJ-308-02
....4	JK403	CJJ2D008Z	JACK, STEREO (BLK MOLD)	PJ-308-02
....4	JK53	CJJ9X012Z	JACK , USB (ANGLE TYPE)	
....4	JK64	CJJ2E026Z	JACK, PHONES(6.35mm,SILVER)	PJ-612A-51
....4	JW19	CWE8202150RV	WIRE ASS'Y	HTS-5000
....4	JW20	CWE8202120RV	WIRE ASS'Y	PM-4200
....4	JW21	CWE5202080A	WIRE ASS'Y (1P, 80MM,BLK,#22)	
....4	RL91	CSL4A016ZU	RELAY,BC3-12H,DC12V,2C2P	BC3-12H
....4	TF94	CLT9Z092ZE	TRANS , DC-AC (AVR1X1)	
....4	VR74	CSR2A037Z	ENCODER	
....4	WF31	CJP11GA285ZN	WAFER, FFC(11P-1.25mm, STRAIGHT)	
....4	WF70	CJP23GA285ZN	WAFER,FPC 1.25mm,stright	
Level	**Ref#**	**Component**	**Description**	**Drawing No**
		COP12510E	**AVR1610 BT PCB ASS'Y**	
.....7	AN1101	CLA9V003Z	BLUETOOTH ANT , CHIP(3.0*1.5) 2.425MHz	
.....7	C1101	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1109	CCUI1H101JA	CAP, CHIP(1005, 50V/100pF)	0402N101J500HI
.....7	C1111	CCUI1H101JA	CAP, CHIP(1005, 50V/100pF)	0402N101J500HI
.....7	C1112	CCUI1H1R2CA	CAP, CHIP(1005, 50V/1.2pF)	
.....7	C1134	CCUS0J225KC	CAP, CHIP(1608, 6.3V/2.2uF)	
.....7	C1135	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1136	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	D1100	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1101	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	IC1101	CVIMX25L8006EM2I-12G	I.C , SERIAL FLASH(8M)	
.....7	R1113	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....7	R1119	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1120	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1121	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1122	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7		CUP12510Z	PCB,AVR1710 BT(FR-4/2L/293X181)	
.....7	CN1101	CJP17GB210ZY	WAFER, (CARD CABLE,ANGLE, SMT, 1MM,10008HR-17L(P)	
.....7	CN1102	CJP07GA193ZY	WAFER, FFC, SMD(07P-1mm, STRAIGHT)	
.....7	C1100	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1102	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1103	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1104	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1130	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1131	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1132	CCUS0J225KC	CAP, CHIP(1608, 6.3V/2.2uF)	
.....7	C1133	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1137	CCUS1H222KC	CAP, CHIP(1608, 50V/2200pF)	
.....7	C1138	CCUS1H222KC	CAP, CHIP(1608, 50V/2200pF)	
.....7	C1139	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1140	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1141	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	

Level	Ref#	Component	Description	Drawing No
		COP12510E	**AVR1610 BT PCB ASS'Y**	
.....7	C1142	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	IC1100	CNVBM840-AVR161	MODULE, BLUETOOTH SPEC 4.0	
.....7	IC1102	CVIPCM5100PWR	I.C , 2CH DAC(32BIT,384KHZ,TSSOP-20P)	
.....7	L1130	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	RN1100	CRJ104DJ330T	RES, CHIP(1608/5%/33ohm*4)	
.....7	R1100	CRJ06IJ332T	RES, CHIP(1005/5%/3.3Kohm)	RM04JC3K3
.....7	R1101	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1102	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1103	CRJ06IJ332T	RES, CHIP(1005/5%/3.3Kohm)	RM04JC3K3
.....7	R1104	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1105	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1106	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1107	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1108	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1114	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1115	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1116	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1117	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1118	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1129	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1130	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1132	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1133	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1134	CRJ10DJ471T	RES, CHIP(1608/5%/470ohm)	00200-0088
.....7	R1135	CRJ10DJ471T	RES, CHIP(1608/5%/470ohm)	00200-0088
.....7	R1136	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1137	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
....4	BK21	CMD1A629	BRACKET , PCB	
....4	BK22	CMD1A629	BRACKET , PCB	
...3		CPE1A009	SHEET , BLIND	
...3		CTB3+10JR	SCREW	
...3		CTWS3+10GR	SCREW	
...3		CWC4F2A17A180B10	CARD , CABLE (17P,1.0mm,180mm,B,10mm)	
...3		CWC6C4A23B220B10	CARD , CABLE (23P,1.25mm,220mm,B,10mm)	
..2		CKC1A219B64	CABINET, TOP AVR1510	
..2		CQB1A549Y	LABEL , ATTENTION DVD48	
..2		CQB1A622	LABEL , SERIAL NO	DVD-310
..2		CTB3+8JFZR	SCREW	
..2		CTB4+10JFZR	SCREW	
..2		CTB4+6FFZR	SCREW	
..2		CUAAVR161/230	BOTTOM CHASSIS ASS'Y	
...3		CHD4A012R	SCREW , SPECIAL	
...3		CHE170	HOLDER , PCB	ALL MODEL
...3		CHG1A373	CUSHION , FOOT AVR350	
...3		CKF5A463Z	PANEL , REAR AVR161	
...3		CKL1A094	FOOT , A AVR350	
...3		CKL1A095	FOOT , B AVR350	
...3		CMD1A809	BRACKET , HDMI	
...3		CMD1A815	COVER , SCREW	
Level	**Ref#**	**Component**	**Description**	**Drawing No**
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1001	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1002	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1004	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1005	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1006	CCUS1H473KC	CAP, CHIP(1608, 50V/0.047uF)	
.....7	C1007	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1008	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1009	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1012	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1013	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1014	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1017	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1020	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1021	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1022	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1023	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1024	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1025	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1026	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1027	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1028	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1029	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1030	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1031	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1032	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1033	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1034	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1035	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1036	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1037	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1038	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1039	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1040	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1041	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1042	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1043	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1044	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1047	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1049	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1051	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1053	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1054	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1056	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1058	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1059	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1062	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1100	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1101	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1103	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1104	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1107	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1110	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1111	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1121	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1122	CCUS1H222KC	CAP, CHIP(1608, 50V/2200pF)	
.....7	C1123	CCUS1H222KC	CAP, CHIP(1608, 50V/2200pF)	
.....7	C1126	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1130	CCUP0J226KC	CAP, CHIP(3216, 6.3V/22uF)	
.....7	C1133	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1134	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1136	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1137	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1140	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1142	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1143	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1144	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1145	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1147	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1149	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1150	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1151	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1152	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
.....7	C1153	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1154	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1155	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
.....7	C1156	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1157	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1158	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1159	CCUS0J225KC	CAP, CHIP(1608, 6.3V/2.2uF)	
.....7	C1162	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
.....7	C1163	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1164	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1165	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1166	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1190	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1191	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1201	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1203	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1205	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1214	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1221	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1237	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1240	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1241	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1249	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1251	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1252	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1259	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1260	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1263	CCUS1H153KC	CAP, CHIP(1608, 50V/0.015uF)	
.....7	C1300	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)	
.....7	C1301	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1302	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1303	CCUS1H151JA	CAP, CHIP(1608, 50V/150pF)	
.....7	C1307	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1308	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)	
.....7	C1309	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1310	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1311	CCUS1H151JA	CAP, CHIP(1608, 50V/150pF)	
.....7	C1312	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1315	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1316	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1317	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1318	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1319	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....7	C1320	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1321	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1322	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1324	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1325	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1326	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1334	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1335	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1338	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1339	CCUS1H331JA	CAP, CHIP(1608, 50V/330pF)	1608 SIZE
.....7	C1342	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1343	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1346	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1348	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1349	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1350	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1353	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1355	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1360	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1361	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1362	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1364	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1366	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1367	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1368	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1369	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1370	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1373	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1374	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1375	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1377	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1378	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1379	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1380	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1381	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1382	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1383	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1384	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1385	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1388	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1389	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1403	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)	
.....7	C1404	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1406	CCUC1A225KC	CAP, CHIP(2012, 10V/2.2uF)	
.....7	C1407	CCUC1A225KC	CAP, CHIP(2012, 10V/2.2uF)	
.....7	C1414	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1415	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1417	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1418	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1427	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1428	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1429	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1430	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1431	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1433	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1434	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1435	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1436	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1500	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1503	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1506	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1508	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1511	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1512	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1516	CCUS1H683KC	CAP, CHIP(1608, 50V/0.068uF)	
.....7	C1519	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1521	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1522	CCUS1H822KC	CAP, CHIP(1608, 50V/8200pF)	
.....7	C1525	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1526	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1530	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1533	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1535	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1536	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1538	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1539	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1548	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1549	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1550	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	D1400	CVDBAR43C	DIODE, SCHOTTKY	BAR43CFILM
.....7	D1403	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1404	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1500	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1501	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1506	HVDUDZS3.3BSR	DIODE , ZENER(CHIP,3.3V)	UDZSTE-173.3B
.....7	F1301	CRTMINISMDC200F	SW , POLY (RESETTABLE 2A 0.02 OHM 1W 4532)	MINISMDC200F
.....7	IC1002	CVISTMPS2161STR	I.C , Current Limiter 1A (SOT-5L)	
.....7	IC1101	CVIMFI337S3959-HK	IC, Apple iPod Authentication coprocessor 2.0c	MFI337S3959
.....7	IC1103	CVIPCM5100PWR	I.C , 2CH DAC(32BIT,384KHZ,TSSOP-20P)	
.....7	IC1105	CVIAT45DB321D-SU	I.C , SERIAL DATA FLASH(32M)	
.....7	IC1300	HVINJM2115MDTE1	IC, OP AMP	NJM2115M
.....7	IC1301	HVINJM2115MDTE1	IC, OP AMP	NJM2115M
.....7	IC1405	CVICAT809RTBI-GT3	I.C , RESET IC (2.63V, SOT-23-3)	CAT809RTBI-GT3

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	L1001	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1002	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1006	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1007	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1008	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1009	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1010	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1105	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1106	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1107	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1108	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1109	CLZ9R018V	FERRITE CHIP BEAD(2012/220R, CB05YTYH221)	
.....7	L1111	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1201	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1202	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1205	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1215	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1218	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1300	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1500	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	Q1100	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1404	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1405	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1406	CVTRT1N141C	T.R,RT1N141C(10K-10K)	RT1N141C
.....7	Q1407	HVTKTA1504SYRTK	T.R , CHIP , SOT-23	KTA1504S-Y-RTK/P
.....7	Q1408	HVTKTC3875SYRTK	T.R , CHIP , SOT-23	KTC3875S-Y-RTK/P
.....7	Q1500	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1501	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....7	Q1502	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....7	Q1503	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1504	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....7	Q1505	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....7	Q1506	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1507	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....7	Q1508	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....7	Q1509	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1510	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1514	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1515	CVTMMBT5401	High Voltage PNP Transistors(SOT-23)	
.....7	Q1516	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....7	Q1517	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....7	RN1003	CRJ064IJ103T	RES, CHIP(1005/5%/10Kohm*4)	
.....7	RN1302	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1303	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1308	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1309	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1310	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	R1003	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1009	CRJ06IJ472T	RES, CHIP(1005/5%/4.7Kohm)	RM04JC4K7
.....7	R1011	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1012	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1014	CRJ06IJ472T	RES, CHIP(1005/5%/4.7Kohm)	RM04JC4K7
.....7	R1015	CRJ06IJ512T	RES, CHIP(1005/5%/5.1Kohm)	
.....7	R1016	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1018	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1019	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1030	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1031	CRJ06IJ512T	RES, CHIP(1005/5%/5.1Kohm)	
.....7	R1039	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1040	CRJ06IJ512T	RES, CHIP(1005/5%/5.1Kohm)	
.....7	R1048	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1049	CRJ06IJ512T	RES, CHIP(1005/5%/5.1Kohm)	
.....7	R1056	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1058	CRJ06IJ512T	RES, CHIP(1005/5%/5.1Kohm)	
.....7	R1060	CRJ06IJ102T	RES, CHIP(1005/5%/1Kohm)	RM04JC1K

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1061	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1062	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1063	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1064	CRJ10DJ220T	RES, CHIP(1608/5%/22ohm)	
.....7	R1065	CRJ10DJ220T	RES, CHIP(1608/5%/22ohm)	
.....7	R1069	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1070	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1072	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1084	CRJ10DJ301T	RES, CHIP(1608/5%/300ohm)	00200-0170
.....7	R1085	CRJ10DJ620T	RES, CHIP(1608/5%/62ohm)	
.....7	R1086	CRJ10DJ301T	RES, CHIP(1608/5%/300ohm)	00200-0170
.....7	R1087	CRJ10DJ620T	RES, CHIP(1608/5%/62ohm)	
.....7	R1088	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1093	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1094	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1105	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1108	CRJ06IJ100T	RES, CHIP(1005/5%/10ohm)	RM04JC10R
.....7	R1123	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1125	CRJ10DJ301T	RES, CHIP(1608/5%/300ohm)	00200-0170
.....7	R1128	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1129	CRJ10DJ471T	RES, CHIP(1608/5%/470ohm)	00200-0088
.....7	R1130	CRJ10DJ471T	RES, CHIP(1608/5%/470ohm)	00200-0088
.....7	R1133	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1135	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1136	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1137	CRJ06IJ0R0T	RES, CHIP(1005/5%/0ohm)	RM04JC0R
.....7	R1143	CRJ10DF6041T	RES, CHIP(1608/1%/6.04Kohm)	
.....7	R1147	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1151	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1152	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1153	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1155	CRJ10DJ224T	RES, CHIP(1608/5%/220Kohm)	
.....7	R1170	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)	RM04JC100R
.....7	R1202	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1203	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1206	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1207	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1208	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1209	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1210	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1211	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1213	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1214	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1215	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1217	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1218	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1220	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1235	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	R1238	CRJ10DF2491T	RES, CHIP	
.....7	R1250	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm)	10K /1/10W/F
.....7	R1256	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1257	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1258	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1259	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1260	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1261	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1262	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1263	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1264	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1265	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1268	CRJ10DF1202T	RES, CHIP(1608/1%/12Kohm)	12K, 1/10W/F
.....7	R1300	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1301	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1303	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1304	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1305	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1307	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1309	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....7	R1310	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1311	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1312	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1314	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1315	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1316	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1317	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1318	CRJ10DF1371T	RES, CHIP(1608/1%/1.37Kohm)	
.....7	R1323	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1324	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1325	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1326	CRJ10DJ560T	RES, CHIP(1608/5%/56ohm)	00200-0226
.....7	R1328	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1332	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1333	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1338	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1343	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1344	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1345	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1346	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1347	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1348	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1349	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1350	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1363	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1375	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1406	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1407	CRJ10DJ224T	RES, CHIP(1608/5%/220Kohm)	
.....7	R1410	CRJ10DJ203T	RES, CHIP(1608/5%/20Kohm)	1608
.....7	R1412	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1414	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1420	CRJ06IJ0R0T	RES, CHIP(1005/5%/0ohm)	RM04JC0R
.....7	R1421	CRJ06IJ0R0T	RES, CHIP(1005/5%/0ohm)	RM04JC0R
.....7	R1424	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1425	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1427	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1428	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1429	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1441	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1442	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1454	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1455	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1459	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1462	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1467	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1469	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1471	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1472	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1473	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1488	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1489	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1490	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1491	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1500	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1503	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1504	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1505	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1506	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1509	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1510	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1511	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1514	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1515	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1516	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1517	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1518	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1524	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1526	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1527	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1528	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1529	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1530	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1531	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1532	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1533	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1534	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1535	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1536	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1543	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1544	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1545	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1546	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1547	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1548	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1549	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1550	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1551	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1552	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1553	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1554	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1555	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1556	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1557	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1558	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1559	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1560	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1561	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1563	CRJ10DJ302T	RES, CHIP(1608/5%/3Kohm)	1608
.....7	R1564	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1567	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1568	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm)	10K /1/10W/F
.....7	R1569	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm)	10K /1/10W/F
.....7	R1570	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7		CUP12504Z	PCB,AVR1610 DIGITAL (FR-4/4L/231X135)	
.....7	BN1400	CJP03GA208ZY	WAFER , SMD (2MM PITCH)-3P	
.....7	CN1001	CJP07GA193ZY	WAFER, FFC, SMD(07P-1mm, STRAIGHT)	
.....7	CN1100	CJP07GA208ZY	WAFER, 2mm, SMD, Vertical, 07p	
.....7	CN1200	CJP15GB276ZY	WAFER, 20037WR-NN Series, 2mm, SMD, ANGLE, 15P	
.....7	CN1400	CJP03GA208ZY	WAFER , SMD (2MM PITCH)-3P	
.....7	CN1401	CJP07GA193ZY	WAFER, FFC, SMD(07P-1mm, STRAIGHT)	
.....7	CN1402	CJP09GA193ZY	WAFER, FFC, SMD(09-1mm, STRAIGHT)	
.....7	C1010	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1011	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1015	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1016	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1018	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1019	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1045	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1055	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1057	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1060	CCUS1H100JA	CAP, CHIP(1608, 50V/10pF)	
.....7	C1061	CCUS1H100JA	CAP, CHIP(1608, 50V/10pF)	
.....7	C1102	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1105	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1106	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1108	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1109	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1112	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1113	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1114	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1115	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1116	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1117	CCUS0J225KC	CAP, CHIP(1608, 6.3V/2.2uF)	
.....7	C1118	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1119	CCUS0J225KC	CAP, CHIP(1608, 6.3V/2.2uF)	
.....7	C1120	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)	
.....7	C1124	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1125	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1127	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1128	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1129	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1131	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1132	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1135	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1138	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1139	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1141	CCUS1H070DA	CAP, CHIP(1608, 50V/7pF)	
.....7	C1146	CCUS1H100JA	CAP, CHIP(1608, 50V/10pF)	
.....7	C1148	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)	
.....7	C1160	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
.....7	C1161	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1167	CCUS1H100JA	CAP, CHIP(1608, 50V/10pF)	
.....7	C1168	CCUS1H100JA	CAP, CHIP(1608, 50V/10pF)	
.....7	C1169	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1170	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....7	C1171	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1200	CCEC1CMVG101T	CAP,ALUMINUM ELECTROLYTIC CAPACITORS(16V/100uF)	
.....7	C1202	CCEC1CMVG101T	CAP,ALUMINUM ELECTROLYTIC CAPACITORS(16V/100uF)	
.....7	C1204	CCEC0JMVG221T	CAP,ALUMINUM ELECTROLYTIC (6.3V/220uF)	
.....7	C1206	CCEC1CMVG471T	CAP,ALUMINUM ELECTROLYTIC (16V/470uF)	
.....7	C1207	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1212	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1213	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1215	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1216	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1217	CCUC1A225KC	CAP, CHIP(2012, 10V/2.2uF)	
.....7	C1218	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1219	CCUS1H153KC	CAP, CHIP(1608, 50V/0.015uF)	
.....7	C1220	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1222	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1223	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1224	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1225	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1226	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1227	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1228	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1229	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1230	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1231	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1233	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1234	CCUC1A225KC	CAP, CHIP(2012, 10V/2.2uF)	
.....7	C1235	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1236	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1239	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1242	CCUC1A225KC	CAP, CHIP(2012, 10V/2.2uF)	
.....7	C1243	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1245	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1246	CCUYAP0J226KC	CAP , CHIP (3216, 6.3V/22uF)	
.....7	C1247	CCUSSP1E106KC	CAP, CHIP(3216, 25V/10uF)	
.....7	C1248	CCUYAP0J226KC	CAP , CHIP (3216, 6.3V/22uF)	
.....7	C1250	CCEC0JMVG470T	CAP,ALUMINUM ELECTROLYTIC (6.3V/47uF)	
.....7	C1257	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1258	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1261	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1262	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1264	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1265	CCUC1A225KC	CAP, CHIP(2012, 10V/2.2uF)	
.....7	C1266	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1267	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1268	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1304	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1305	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1306	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1313	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1314	CCEC1CMVG101T	CAP,ALUMINUM ELECTROLYTIC CAPACITORS(16V/100uF)	
.....7	C1323	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1327	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1328	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1329	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	1608 SIZE
.....7	C1330	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1331	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1332	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1333	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF, X7R)	LAO-63V103MS56PW#
.....7	C1336	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1337	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1340	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1341	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1344	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1345	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1351	CCUS1H120JA	CAP, CHIP(1608, 50V/12pF)	
.....7	C1352	CCUS1H120JA	CAP, CHIP(1608, 50V/12pF)	
.....7	C1354	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1356	CCUS1H153KC	CAP, CHIP(1608, 50V/0.015uF)	
.....7	C1357	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1358	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1359	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1363	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1365	CCEC0JMVG101T	CAP,ALUMINUM ELECTROLYTIC (6.3V/100uF)	
.....7	C1371	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1372	CCEC0JMVG101T	CAP,ALUMINUM ELECTROLYTIC (6.3V/100uF)	
.....7	C1376	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1386	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1387	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1401	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1402	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1405	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1408	CCUC1A226KC	CAP, CHIP(2012, 10V/22uF)	
.....7	C1409	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1410	CCUS0J475KC	CAP, CHIP(1608, 6.3V/4.7uF, MURATA GRM18)	GRM188R60J475KE19D
.....7	C1411	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1412	CCUS1H120JA	CAP, CHIP(1608, 50V/12pF)	
.....7	C1413	CCUS1H120JA	CAP, CHIP(1608, 50V/12pF)	
.....7	C1419	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1426	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1432	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1437	CCUS1H151JA	CAP, CHIP(1608, 50V/150pF)	
.....7	C1501	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1502	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1504	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1505	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1507	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1509	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1510	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1513	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1514	CCUS1H683KC	CAP, CHIP(1608, 50V/0.068uF)	
.....7	C1515	CCUS1H822KC	CAP, CHIP(1608, 50V/8200pF)	
.....7	C1517	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	C1518	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1520	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1523	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1524	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1527	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1528	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1529	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1531	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)	
.....7	C1532	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)	
.....7	C1534	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1537	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1540	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1541	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1542	CCEC1CMVG471T	CAP,ALUMINUM ELECTROLYTIC (16V/470uF)	
.....7	C1543	CCEC1CMVG471T	CAP,ALUMINUM ELECTROLYTIC (16V/470uF)	
.....7	C1544	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1545	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1546	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1547	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	C1551	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1552	CCEC1CMVG100T	CAP,ALUMINUM ELECTROLYTIC (16V/10uF)	
.....7	C1553	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)	
.....7	C1554	CCEC0JMVG220T	CAP,ALUMINUM ELECTROLYTIC (6.3V/22uF)	
.....7	C1555	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....7	D1104	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1105	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1401	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1502	CVD1SR159-200H	DIODE, SCHOTTKY	
.....7	D1503	CVD1SR159-200H	DIODE, SCHOTTKY	
.....7	D1504	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	D1505	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....7	IC1003	CVITC74VCX541FT	I,C , OCTAL BUS BUFFER (TOSHIBA)	TC74VCX541FT(EL,M)
.....7	IC1004	CVIMX25L8006EM2I-12G	I.C , SERIAL FLASH(8M)	
.....7	IC1005	CVISII9573CTUC	I.C , HDMI PORT PROCESSOR	SII9573CTUC
.....7	IC1100	CVIISL54220IUZ-T	I.C , USB2.0 Multiplexer(TQFN-10P)	ISL54220IUZ-T
.....7	IC1102	CVIKSZ8851SNLTR	I.C , ETHERNET PHY (10/100M,QFN-32P))	KSZ8851SNL TR
.....7	IC1104	CVIA3V28S40FTP-G6	I.C , SDRAM(128MBIT,TSOP-54P)	
.....7	IC1106	CVIFS1230A	I.C , CHORUS3(NETWORK PROCESSOR)	FS1230A
.....7	IC1201	CVIDB1230HETR	I.C , DC DC CONVERTER(3A,700KHZ,SOP-8P)	DB1230HETR
.....7	IC1202	CVIDB1514AHETR	I.C,REGULATOR(1.5A,ADJ,CONT,8-SOP-EP)	
.....7	IC1203	CVIDB1230HETR	I.C , DC DC CONVERTER(3A,700KHZ,SOP-8P)	DB1230HETR
.....7	IC1204	CVIDB1230HETR	I.C , DC DC CONVERTER(3A,700KHZ,SOP-8P)	DB1230HETR
.....7	IC1205	CVIEML3418-00SE08GRR	I.C , DCDC CONVERTER(SOP-8FD)	
.....7	IC1206	CVIAZ1117CH-1.2TRG1	LDO , low dropout three-terminal regulator	AZ1117CH-1.2TRG1
.....7	IC1208	CVIDB1230HETR	I.C , DC DC CONVERTER(3A,700KHZ,SOP-8P)	DB1230HETR
.....7	IC1303	HVICS42528-CQ	I.C , CODEC + DIR (CIRRUS LOGIC)	CS42528-CQZ
.....7	IC1304	CVIM12L16161A5TG2Q	I.C, 16MB SDRAM(TSOP-50P)	M12L16161A5TG2Q
.....7	IC1305	HVITC74VHC157FT	I.C, QUAD 2-CHANNEL MUX(TSSOP-16)	TC74VHC157FT(EL,M)
.....7	IC1306	CVICS49834A-CQZ	I.C , AUDIO DSP(TRI-CORE,LQFP-144P)	
.....7	IC1307	CVIMX25L3206EM2I-12G	I.C , SERIAL FLASH(32M)	
.....7	IC1308	CVITC74VCX541FT	I,C , OCTAL BUS BUFFER (TOSHIBA)	TC74VCX541FT(EL,M)
.....7	IC1400	CRTLM94022BIMG	SENSOR , TEMPERATURE	LM94022BIMG
.....7	IC1401	CVISTM32F205ZGT6	I.C , FLASH MCU (32 BIT, 1MB, LQFP 144)	
.....7	IC1402	CVTUPA672T	F.E.T (NEC)	UPA672T-T1-A
.....7	IC1403	CVICAT24C32WI-GT3	I.C, EEPROM, 32K	CAT24C32WI-GT3
.....7	IC1404	CVIDB1510BT3TR33	I.C, REGULATOR(1.0A,3.3V,TO252-(1))	DB1510BT3TR33
.....7	IC1500	CVINJM4580CG	I.C , DUAL OPAMP(SOP-8P)	
.....7	IC1501	CVINJM4580CG	I.C , DUAL OPAMP(SOP-8P)	
.....7	IC1502	CVILM7808RTRL	IC, REGULATOR(1A, 8V)	LM7808RTRL
.....7	IC1503	CVILM7908RTRL	IC, REGULATOR(1A, -8V)	LM7908RTRL
.....7	IC1504	CVINJM4580CG	I.C , DUAL OPAMP(SOP-8P)	
.....7	JK1001	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)	
.....7	JK1002	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)	
.....7	JK1003	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)	
.....7	JK1004	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)	

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	JK1005	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)	
.....7	JK1006	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)	
.....7	JK1100	CJJ9L026Z	JACK , RJ-45 With TR (SMT)	
.....7	L1003	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1004	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1005	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1011	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1100	CLZ9R018V	FERRITE CHIP BEAD(2012/220R, CB05YTYH221)	
.....7	L1101	CLZ9R018V	FERRITE CHIP BEAD(2012/220R, CB05YTYH221)	
.....7	L1102	CLZ9Z127Z	COIL, CHOKE CHIP(2012/180R)	DLW21SN181SQ2L
.....7	L1103	CLZ9Z128Z	COIL, CHOKE CHIP(2012/90R)	DLW21SN900SQ2L
.....7	L1104	CLZ9Z128Z	COIL, CHOKE CHIP(2012/90R)	DLW21SN900SQ2L
.....7	L1110	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1112	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1113	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1114	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1115	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1116	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1117	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1120	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1121	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1203	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1204	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1206	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1207	CLQ20E3R3NRZ	COIL,SMD POWER(3.3uH/3.2A)	
.....7	L1208	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	L1209	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1210	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1211	CLQ20E3R3NRZ	COIL,SMD POWER(3.3uH/3.2A)	
.....7	L1212	CLQ20E3R3NRZ	COIL,SMD POWER(3.3uH/3.2A)	
.....7	L1213	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1214	CLQ18E1R5NRZ	COIL,SMD POWER(1.5uH/2A)	SWPA3015S1R5MT
.....7	L1217	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1219	CLQ20E3R3NRZ	COIL,SMD POWER(3.3uH/3.2A)	
.....7	L1301	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....7	L1401	CLZ9R005V	FERRITE CHIP BEAD(1608/60R, CB03YTYH600)	
.....7	Q1001	CVTRT1N241C	T.R,RT1N241C(22K-22K)	RT1N241C-T112-1
.....7	Q1300	CVTRT1N241C	T.R,RT1N241C(22K-22K)	RT1N241C-T112-1
.....7	Q1400	CVTINC2001AC1	T.R , MUTE	INC2001AC1
.....7	Q1401	CVT2SC3052	T.R,2SC3052	2SC3052
.....7	Q1402	CVT2SC3052	T.R,2SC3052	2SC3052
.....7	Q1403	CVTRT1P144C	T.R,RT1P144C(10K-47K)	RT1P144C-T112-1
.....7	Q1511	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....7	Q1512	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....7	Q1513	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....7	RN1001	CRJ104DJ220T	RES, CHIP(1608/5%/22ohm*4)	22X4/2012
.....7	RN1002	CRJ104DJ220T	RES, CHIP(1608/5%/22ohm*4)	22X4/2012
.....7	RN1004	CRJ064IJ103T	RES, CHIP(1005/5%/10Kohm*4)	
.....7	RN1005	CRJ064IJ103T	RES, CHIP(1005/5%/10Kohm*4)	
.....7	RN1006	CRJ064IJ103T	RES, CHIP(1005/5%/10Kohm*4)	
.....7	RN1007	CRJ064IJ103T	RES, CHIP(1005/5%/10Kohm*4)	
.....7	RN1008	CRJ064IJ103T	RES, CHIP(1005/5%/10Kohm*4)	
.....7	RN1009	CRJ104DJ330T	RES, CHIP(1608/5%/33ohm*4)	
.....7	RN1010	CRJ104DJ330T	RES, CHIP(1608/5%/33ohm*4)	
.....7	RN1011	CRJ104DJ330T	RES, CHIP(1608/5%/33ohm*4)	
.....7	RN1300	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1301	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1304	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1305	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1306	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1307	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)	0402*4 5% 33 OHM
.....7	RN1400	CRJ104DJ101T	RES, CHIP(1608/5%/100ohm*4)	
.....7	RN1401	CRJ104DJ101T	RES, CHIP(1608/5%/100ohm*4)	
.....7	RN1402	CRJ104DJ101T	RES, CHIP(1608/5%/100ohm*4)	
.....7	R1002	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1004	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1005	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1021	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1022	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1024	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1027	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1028	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1033	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1036	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1037	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1042	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1045	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1046	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1051	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1054	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1055	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1068	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1073	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1074	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1075	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1076	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1077	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1078	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1079	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1080	CRJ06IJ5R1T	RES, CHIP(1005/5%/5.1ohm)	
.....7	R1081	CRJ10DJ182T	RES, CHIP(1608/5%/1.8Kohm)	00200-0200
.....7	R1082	CRJ10DJ182T	RES, CHIP(1608/5%/1.8Kohm)	00200-0200
.....7	R1083	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....7	R1089	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1090	CRJ10DJ151T	RES, CHIP(1608/5%/150ohm)	
.....7	R1091	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1092	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1095	CRJ10DJ124T	RES, CHIP(1608/5%/120Kohm)	1608
.....7	R1096	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1097	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1098	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1099	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1100	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1101	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1104	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1106	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1107	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1109	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)	1608 SIZE
.....7	R1110	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)	1608 SIZE
.....7	R1111	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)	1608 SIZE
.....7	R1112	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)	1608 SIZE
.....7	R1114	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1115	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1116	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1117	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1118	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1119	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1120	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1121	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1122	CRJ06IJ105T	RES, CHIP(1005/5%/1Mohm)	RM04JC1M
.....7	R1124	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1126	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1127	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)	RM04JC10K
.....7	R1131	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1132	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1134	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)	RM04JC33R
.....7	R1138	CRJ064IJ750T	RES, CHIP(1005/5%/75ohm*4)	
.....7	R1139	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)	RM04JC100R
.....7	R1140	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1142	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1144	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1146	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1148	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1149	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1150	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....7	R1200	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1201	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1204	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1205	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1212	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1216	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1219	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1221	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1222	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1223	CRJ10DF1502T	RES, CHIP(1608/1%/15Kohm)	
.....7	R1224	CRJ10DF4702T	RES, CHIP(1608/1%/47Kohm)	
.....7	R1225	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1226	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1227	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1228	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm)	10K /1/10W/F
.....7	R1229	CRJ10DF6201T	RES, CHIP(1608/1%/6.2Kohm)	
.....7	R1230	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1231	CRJ10DF3301T	RES, CHIP(1608/1%/3.3Kohm)	
.....7	R1232	CRJ10DF1802T	RES, CHIP(1608/1%/18Kohm)	1/10W 1608 F 18K OHM
.....7	R1233	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1236	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1237	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm)	10K /1/10W/F
.....7	R1239	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1240	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1241	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm)	10K /1/10W/F
.....7	R1242	CRJ10DF4702T	RES, CHIP(1608/1%/47Kohm)	
.....7	R1255	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1266	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1267	CRJ10DF2401T	RES, CHIP(1608/1%/2.4Kohm)	00200-0365
.....7	R1269	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1270	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1271	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1272	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1273	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1274	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1302	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1306	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1308	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1313	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1319	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1320	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1321	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1322	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1327	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1329	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1330	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1331	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1334	CRJ10DJ560T	RES, CHIP(1608/5%/56ohm)	00200-0226
.....7	R1335	CRJ10DJ820T	RES, CHIP(1608/5%/82ohm)	1608 SIZE
.....7	R1336	CRJ10DJ820T	RES, CHIP(1608/5%/82ohm)	1608 SIZE
.....7	R1337	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1339	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1340	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1341	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1342	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....7	R1351	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1352	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1353	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1354	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1355	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1356	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1357	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1358	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1359	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1360	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1361	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1362	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1364	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1365	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1366	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1367	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1368	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1369	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1370	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1371	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1372	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1373	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1374	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1376	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1400	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1401	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1402	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1403	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1404	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....7	R1405	CRJ10DJ225T	RES, CHIP(1608/5%/2.2Mohm)	
.....7	R1411	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1413	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1416	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1417	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1418	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1419	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1422	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1423	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1430	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1431	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1432	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1433	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1434	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1435	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1436	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1437	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1438	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1439	CRJ06IJ473T	RES, CHIP(1005/5%/47Kohm)	RM04JC47K
.....7	R1440	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1443	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1444	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1445	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1446	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....7	R1447	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1448	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1449	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1450	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1451	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1452	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	00200-0118
.....7	R1453	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1456	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1457	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)	
.....7	R1458	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....7	R1461	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1464	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1465	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	00200-0095
.....7	R1466	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1470	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1474	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1476	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090

Level	Ref#	Component	Description	Drawing No
		COP12504F	**AVR161/230 DIGITAL PCB ASS'Y (EUR)**	
.....7	R1477	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1478	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1480	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1481	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1483	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....7	R1484	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)	1608 SIZE
.....7	R1485	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1486	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1487	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....7	R1501	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1502	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1507	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1508	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1512	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1513	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1519	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1520	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1521	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1522	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1523	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1525	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1537	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1538	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1539	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1540	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)	1608 SIZE
.....7	R1541	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)	00200-0105
.....7	R1542	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1562	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)	00200-0119
.....7	R1565	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1566	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....7	R1571	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....7	R1700	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....7	R1701	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1702	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1703	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	R1704	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....7	WF1100	CJP15GA193ZY	WAFER, FFC, SMD(15P-1mm, STRAIGHT)	
.....7	WF1400	CJP23GA299ZN	WAFER, FFC, SMD(23P-1.25mm, STRAIGHT)	
.....7	WF1401	CJP11GA299ZN	WAFER, FFC, SMD(11P-1.25mm, STRAIGHT)	
.....7	WF1500	CJP17GA193ZY	WAFER, FFC, SMD(17P-1mm, STRAIGHT)	
.....7	WF1501	CJP27GA299ZN	WAFER, FFC, SMD(27P-1.25mm, STRAIGHT)	
.....7	WF1502	CJP17GA299ZN	WAFER, FFC, SMD(17P-1.25mm, STRAIGHT)	
.....7	X1001	COX27000I100ST	X-TAL, SMD 3.2X2.5, 27.000MHz, 10PF	7V27000050
.....7	X1100	COX25000I120ST	X-TAL, SMD 3.2X2.5, 25.000MHz, 12PF	7V25000009
.....7	X1101	COX12000I100ST	X-TAL, SMD 3.2X2.5, 12.000MHz, 10PF	7V12000005
.....7	X1102	COX24576I120ST	X-TAL, SMD 3.2X2.5, 24.576MHz, 12PF	7V24500006
.....7	X1300	COX24576I120ST	X-TAL, SMD 3.2X2.5, 24.576MHz, 12PF	7V24500006
.....7	X1400	COX25000I120ST	X-TAL, SMD 3.2X2.5, 25.000MHz, 12PF	7V25000009
Level	**Ref#**	**Component**	**Description**	**Drawing No**
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....6	C1700	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1701	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1702	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1703	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1704	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1705	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1706	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1707	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1708	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1709	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1710	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1711	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
.....6	C1742	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C1743	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....6	C1750	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)	
.....6	C1751	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)	
.....6	C1771	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....6	C1773	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
.....6	C303	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)	
.....6	C304	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)	
.....6	C305	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)	
.....6	C306	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)	
.....6	C312	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C313	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C322	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	C726	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)	
.....6	C924	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
.....6	D303	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D304	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D501	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D502	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D503	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D504	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D803	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D973	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	D974	CVD1SS355T	DIODE , CHIP , SWITCHING	1SS355(T/B)
.....6	IC1700	CVINJU72340AFH3	I.C , INPUT WITH 8CH VOLUME(52P LQFP)	
.....6	IC1704	CVINJM8080G	I.C , DUAL OPAMP(SOP-8P)	
.....6	IC1706	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	IC1707	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	IC1709	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	IC1710	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	IC1712	HVTKTC812TB	T.R , CHIP(TS6)	KTC812T-B-RTK/P
.....6	Q541	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q542	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q543	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q544	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q610	CVTINC2001AC1	T.R , MUTE	INC2001AC1
.....6	Q612	CVTINC2001AC1	T.R , MUTE	INC2001AC1
.....6	Q613	CVTINC2001AC1	T.R , MUTE	INC2001AC1
.....6	Q681	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q682	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q683	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q684	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q801	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q824	CVTMMBT5551	High Voltage NPN Transistors(SOT-23)	
.....6	Q937	CVTMMBT5401	High Voltage PNP Transistors(SOT-23)	
.....6	Q940	CVTMMBT5401	High Voltage PNP Transistors(SOT-23)	
.....6	Q960	CVTRT1N144C	T.R,RT1N144C(10K-47K)	RT1N144C
.....6	R1702	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R1703	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	00200-0094
.....6	R1704	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R1705	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R1708	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R1709	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R1710	CRJ10DJ183T	RES, CHIP(1608/5%/18Kohm)	1608 SIZE
.....6	R1711	CRJ10DJ183T	RES, CHIP(1608/5%/18Kohm)	1608 SIZE
.....6	R1712	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1713	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1786	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1787	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1788	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1789	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1790	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....6	R1791	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....6	R1792	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1793	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....6	R1794	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....6	R1795	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....6	R1796	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1797	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1798	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1799	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1800	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)	00200-0225
.....6	R1801	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)	00200-0225
.....6	R1802	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1803	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)	00200-0225
.....6	R1805	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1806	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1809	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)	00200-0225
.....6	R1811	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1812	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)	00200-0225
.....6	R1813	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)	
.....6	R1815	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1816	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	00200-0185
.....6	R1822	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R1823	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R1824	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1825	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1826	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1827	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1828	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1829	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R1836	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R1837	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R1839	CRJ10DJ393T	RES, CHIP(1608/5%/39Kohm)	
.....6	R1840	CRJ10DJ393T	RES, CHIP(1608/5%/39Kohm)	
.....6	R1845	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....6	R1848	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)	1608 SIZE
.....6	R305	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R306	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R307	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R308	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R311	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R312	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R313	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R314	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R319	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R321	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R322	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R323	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	00200-0087
.....6	R324	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R325	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R326	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R327	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	00200-0100
.....6	R328	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R329	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	00200-0097
.....6	R686	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R687	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R688	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R689	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R706	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	00200-0090
.....6	R731	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R732	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R733	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R734	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R735	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R736	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R737	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R738	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R801	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R901	CRJ10DJ753T	RES, CHIP(1608/5%/75Kohm)	1608 SYZE
.....6	R902	CRJ10DJ333T	RES, CHIP(1608/5%/33Kohm)	1608 SIZE
.....6	R917	CRJ14CJ473T	RES, CHIP(3216/5%/47Kohm)	

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....6	R918	CRJ14CJ473T	RES, CHIP(3216/5%/47Kohm)	
.....6	R919	CRJ14CJ473T	RES, CHIP(3216/5%/47Kohm)	
.....6	R920	CRJ14CJ473T	RES, CHIP(3216/5%/47Kohm)	
.....6	R925	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	00200-0096
.....6	R928	CRJ10DJ333T	RES, CHIP(1608/5%/33Kohm)	1608 SIZE
.....5	C1740	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C1741	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C1744	CCEA1HH101TC	CAP, ELECT(50V/100uF)	
.....5	C1745	CCEA1HH101TC	CAP, ELECT(50V/100uF)	
.....5	C1747	CCEA1HH101TC	CAP, ELECT(50V/100uF)	
.....5	C1749	CCEA1HH101TC	CAP, ELECT(50V/100uF)	
.....5	C1752	CCEA1HH101TC	CAP, ELECT(50V/100uF)	
.....5	C1753	CCEA1HH101TC	CAP, ELECT(50V/100uF)	
.....5	C1767	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C1768	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C1776	CCEA1HH220TC	CAP, ELECT(50V/22uF)	
.....5	C321	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C501	CCEA2AH100T	CAP, ELECT(100V/10uF)	
.....5	C502	CCEA2AH100T	CAP, ELECT(100V/10uF)	
.....5	C503	CCEA2AH100T	CAP, ELECT(100V/10uF)	
.....5	C504	CCEA2AH100T	CAP, ELECT(100V/10uF)	
.....5	C506	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)	CKB 1H 331K 04 FK5
.....5	C507	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)	CKB 1H 331K 04 FK5
.....5	C508	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)	CKB 1H 331K 04 FK5
.....5	C509	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)	CKB 1H 331K 04 FK5
.....5	C561	CCEA1HH221T	CAP, ELECT(50V/220uF)	
.....5	C562	CCEA1HH221T	CAP, ELECT(50V/220uF)	
.....5	C563	CCEA1HH221T	CAP, ELECT(50V/220uF)	
.....5	C564	CCEA1HH221T	CAP, ELECT(50V/220uF)	
.....5	C566	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C567	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C568	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C569	CCEA1CH101TC	CAP, ELECT(16V/100uF)	
.....5	C571	CCBS1H271KBT	CAP , CERAMIC(270PF/50V)	CH UP025 B271K-A-B Z
.....5	C572	CCBS1H271KBT	CAP , CERAMIC(270PF/50V)	CH UP025 B271K-A-B Z
.....5	C573	CCBS1H271KBT	CAP , CERAMIC(270PF/50V)	CH UP025 B271K-A-B Z
.....5	C574	CCBS1H271KBT	CAP , CERAMIC(270PF/50V)	CH UP025 B271K-A-B Z
.....5	C601	CCCT1H120JC	CAP, CERAMIC(50V/12pF/J)	CCC 1H 120J 04 FK5
.....5	C602	CCCT1H120JC	CAP, CERAMIC(50V/12pF/J)	CCC 1H 120J 04 FK5
.....5	C603	CCCT1H120JC	CAP, CERAMIC(50V/12pF/J)	CCC 1H 120J 04 FK5
.....5	C604	CCCT1H120JC	CAP, CERAMIC(50V/12pF/J)	CCC 1H 120J 04 FK5
.....5	C606	CCCT1H330JC	CAP, CERAMIC(50V/33pF/J)	CCC 1H 330J 05 FK5
.....5	C607	CCCT1H330JC	CAP, CERAMIC(50V/33pF/J)	CCC 1H 330J 05 FK5
.....5	C608	CCCT1H330JC	CAP, CERAMIC(50V/33pF/J)	CCC 1H 330J 05 FK5
.....5	C609	CCCT1H330JC	CAP, CERAMIC(50V/33pF/J)	CCC 1H 330J 05 FK5
.....5	C631	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C632	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C633	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C634	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C636	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C637	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C638	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C639	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C681	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C682	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C683	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C684	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C716	CCEA1CH220TC	CAP, ELECT(16V/22uF)	
.....5	C801	CCEA1HH100TC	CAP, ELECT(50V/10uF)	
.....5	C803	CCCT1H330JC	CAP, CERAMIC(50V/33pF/J)	CCC 1H 330J 05 FK5
.....5	C805	CCCT1H120JC	CAP, CERAMIC(50V/12pF/J)	CCC 1H 120J 04 FK5
.....5	C807	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C808	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C811	CCEA1HH221T	CAP, ELECT(50V/220uF)	
.....5	C813	CCEA1CH101TC	CAP, ELECT(16V/100uF)	

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....5	C815	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)	CKB 1H 331K 04 FK5
.....5	C817	CCEA2AH100T	CAP, ELECT(100V/10uF)	
.....5	C819	CCBS1H271KBT	CAP , CERAMIC(270PF/50V)	CH UP025 B271K-A-B Z
.....5	C852	CCEA1HH220T	CAP, ELECT(50V/22uF)	00107-1033
.....5	C854	CCEA1HH220T	CAP, ELECT(50V/22uF)	00107-1033
.....5	C855	CCEA1HH220T	CAP, ELECT(50V/22uF)	00107-1033
.....5	C856	CCEA1HH220T	CAP, ELECT(50V/22uF)	00107-1033
.....5	C857	CCEA1HH220T	CAP, ELECT(50V/22uF)	00107-1033
.....5	C900	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C901	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C910	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C917	CCEA1HH470TC	CAP , ELECT (50V/47uF)	
.....5	C918	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C919	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C931	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C932	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C940	CCEA1AH471TC	CAP, ELECT(10V/470uF)	
.....5	C971	HCQI1H562JZT	CAP, MYLAR(50V/5600pF/J)	HPE562J2AP050T
.....5	C972	HCQI1H562JZT	CAP, MYLAR(50V/5600pF/J)	HPE562J2AP050T
.....5	C973	HCQI1H562JZT	CAP, MYLAR(50V/5600pF/J)	HPE562J2AP050T
.....5	C980	HCQI1H562JZT	CAP, MYLAR(50V/5600pF/J)	HPE562J2AP050T
.....5	C981	HCQI1H562JZT	CAP, MYLAR(50V/5600pF/J)	HPE562J2AP050T
.....5	C990	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C992	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C993	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C995	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	C997	HCQI1H473JZT	CAP, MYLAR(50V/0.047uF/J)	HPE473J2AP050T
.....5	D581	CVD1SS133MT	DIODE , SWITCHING	ISS133(T/B)
.....5	D582	CVD1SS133MT	DIODE , SWITCHING	ISS133(T/B)
.....5	D583	CVD1SS133MT	DIODE , SWITCHING	ISS133(T/B)
.....5	D584	CVD1SS133MT	DIODE , SWITCHING	ISS133(T/B)
.....5	D801	CVD1SS133MT	DIODE , SWITCHING	ISS133(T/B)
.....5	D954	CVD1N4003SRT	DIODE , RECT	1N4003 SRT
.....5	D955	CVD1N4003SRT	DIODE , RECT	1N4003 SRT
.....5	G901	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	
.....5	G902	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	
.....5	Q501	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q502	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q503	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q504	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q511	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q512	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q513	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q514	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q516	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q517	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q518	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q519	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q556	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q557	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q558	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q559	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q561	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q562	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q563	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q564	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q601	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q602	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q603	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q604	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q812	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q813	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q816	CVTKSA992FTA	PNP, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	
.....5	Q818	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q819	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....5	Q820	CVTKSC1845FTA	NPN, TO-92, LOW NOISE, HFE:300-600, FAILCHILD	KSC1845FTA
.....5	Q961	HVTKTA1024YT	T.R	KTA1024-Y-AT/P
.....5	R501	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)	43K OHM 1/5W J
.....5	R502	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)	43K OHM 1/5W J
.....5	R504	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)	43K OHM 1/5W J
.....5	R505	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)	43K OHM 1/5W J
.....5	R506	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R507	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R508	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R509	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R511	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R512	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R513	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R514	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R516	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R517	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R518	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R519	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R521	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)	
.....5	R522	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)	
.....5	R523	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)	
.....5	R524	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)	
.....5	R531	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R532	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R533	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R534	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R536	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R537	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R538	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R539	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R541	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)	
.....5	R542	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)	
.....5	R543	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)	
.....5	R544	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)	
.....5	R556	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R557	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R558	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R559	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R561	CRD20TJ242T	RES, CARBON(1/5W,2.4Kohm,J)	
.....5	R562	CRD20TJ242T	RES, CARBON(1/5W,2.4Kohm,J)	
.....5	R563	CRD20TJ242T	RES, CARBON(1/5W,2.4Kohm,J)	
.....5	R564	CRD20TJ242T	RES, CARBON(1/5W,2.4Kohm,J)	
.....5	R566	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R567	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R568	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R569	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R571	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R572	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R573	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R574	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R576	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)	
.....5	R577	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)	
.....5	R578	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)	
.....5	R579	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)	
.....5	R581	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R582	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R583	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R584	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R586	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R587	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R588	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R589	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R591	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R592	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R593	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....5	R594	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R596	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R597	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R598	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R599	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R601	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R602	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R603	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R604	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R606	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R607	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R608	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R609	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R611	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)	
.....5	R631	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R632	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R633	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R634	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R636	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R637	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R638	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R639	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R646	CRD25FJ3R3T	RES , CARBON	
.....5	R647	CRD25FJ3R3T	RES , CARBON	
.....5	R648	CRD25FJ3R3T	RES , CARBON	
.....5	R649	CRD25FJ3R3T	RES , CARBON	
.....5	R651	CRD25FJ3R3T	RES , CARBON	
.....5	R652	CRD25FJ3R3T	RES , CARBON	
.....5	R653	CRD25FJ3R3T	RES , CARBON	
.....5	R654	CRD25FJ3R3T	RES , CARBON	
.....5	R666	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R667	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R668	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R669	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R671	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)	
.....5	R672	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)	
.....5	R673	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)	
.....5	R674	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)	
.....5	R676	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)	
.....5	R677	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)	
.....5	R678	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)	
.....5	R679	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)	
.....5	R681	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)	
.....5	R682	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)	
.....5	R683	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)	
.....5	R684	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)	
.....5	R696	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R697	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R698	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R699	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R711	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R712	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R713	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R714	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R715	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R716	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R717	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R718	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R719	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R720	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R721	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R722	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R723	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R724	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R725	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....5	R726	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R727	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R728	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R729	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R730	CRG2SANJR47RT	RES, M-OXIDE FILM(2W/0.47ohm)	
.....5	R771	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R772	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R773	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R774	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R776	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R781	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R782	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R783	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R784	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R786	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)	
.....5	R803	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)	
.....5	R805	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)	
.....5	R808	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)	
.....5	R812	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R813	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)	
.....5	R817	CRD25FJ3R3T	RES , CARBON	
.....5	R818	CRD25FJ3R3T	RES , CARBON	
.....5	R821	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R822	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	
.....5	R830	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R831	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)	
.....5	R834	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R835	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R836	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R837	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R842	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R843	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)	
.....5	R848	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R850	CRD20TJ242T	RES, CARBON(1/5W,2.4Kohm,J)	
.....5	R852	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R853	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)	
.....5	R856	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R857	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
.....5	R860	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)	
.....5	R862	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R870	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)	43K OHM 1/5W J
.....5	R872	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)	
.....5	R875	CRD20TJ361T	RES, CARBON(1/5W,360ohm,J)	360 OHM 1/5W J
.....5	R877	CRD20TJ361T	RES, CARBON(1/5W,360ohm,J)	360 OHM 1/5W J
.....5	R878	CRD20TJ361T	RES, CARBON(1/5W,360ohm,J)	360 OHM 1/5W J
.....5	R879	CRD20TJ361T	RES, CARBON(1/5W,360ohm,J)	360 OHM 1/5W J
.....5	R880	CRD20TJ361T	RES, CARBON(1/5W,360ohm,J)	360 OHM 1/5W J
.....5	R883	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)	
.....5	R885	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)	
.....5	R886	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)	
.....5	R887	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)	
.....5	R888	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)	
.....5	R891	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)	
.....5	R893	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)	
.....5	R894	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)	
.....5	R896	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)	
.....5	R897	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)	
.....5	R908	CRD20TJ333T	RES, CARBON(1/5W,33Kohm,J)	
.....5	R909	CRD20TJ333T	RES, CARBON(1/5W,33Kohm,J)	
.....5	R941	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)	
.....5	R942	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)	
.....5	R944	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)	
.....5	R946	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)	
.....5	R947	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)	
.....5	R951	CRD20TJ1R0T	RES, CARBON(1/5W,1ohm,J)	

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
.....5	R954	CRD20TJ102T	RES, CARBON(1/5W,1Kohm,J)	
.....5	R955	CRD20TJ564T	RES, CARBON(1/5W,560Kohm,J)	
.....5	R961	CRD20TJ331T	RES, CARBON(1/5W,330ohm,J)	
.....5	R962	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)	
.....5	R990	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)	
.....5	R993	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)	
.....5	R995	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)	
.....5	R997	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)	
.....5	R999	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)	
.....5	VR82	CVN12A221B03T	RES , SEMI FIXED (220 OHM)	NVZ6TLTAB221
.....5	VR84	CVN12A221B03T	RES , SEMI FIXED (220 OHM)	NVZ6TLTAB221
.....5	VR85	CVN12A221B03T	RES , SEMI FIXED (220 OHM)	NVZ6TLTAB221
.....5	VR86	CVN12A221B03T	RES , SEMI FIXED (220 OHM)	NVZ6TLTAB221
.....5	VR87	CVN12A221B03T	RES , SEMI FIXED (220 OHM)	NVZ6TLTAB221
....4		CMYAVR1510	HEAT SINK ASS'Y	
.....5		CHD1A012R	SCREW , SPECIAL	
.....5		CHD4A012R	SCREW , SPECIAL	
.....5		CMD1A802	BRACKET,H/S PCB	
.....5		CMD1A810	BRACKET , PCB	
.....5		CMY1A388	HEAT SINK AVR1510	
.....5		CTB3+8JR	SCREW	00M51260308M0
.....5	Q652	CVT2SB1559P	T.R , POWER	2SB1559P
.....5	Q653	CVT2SB1559P	T.R , POWER	2SB1559P
.....5	Q654	CVT2SB1559P	T.R , POWER	2SB1559P
.....5	Q657	CVT2SD2389P	T.R , POWER	2SD2389P
.....5	Q658	CVT2SD2389P	T.R , POWER	2SD2389P
.....5	Q659	CVT2SD2389P	T.R , POWER	2SD2389P
.....5	Q660	CVT2SD2389P	T.R , POWER	2SD2389P
.....5	Q661	CVT2SB1559P	T.R , POWER	2SB1559P
.....5	Q803	CVT2SD2389P	T.R , POWER	2SD2389P
.....5	Q804	CVT2SB1559P	T.R , POWER	2SB1559P
.....5	Q852	HVTKTD600KGR	T.R , BIAS	KTD600K-Y-U/PH
.....5	Q854	HVTKTD600KGR	T.R , BIAS	KTD600K-Y-U/PH
.....5	Q855	HVTKTD600KGR	T.R , BIAS	KTD600K-Y-U/PH
.....5	Q856	HVTKTD600KGR	T.R , BIAS	KTD600K-Y-U/PH
.....5	Q857	HVTKTD600KGR	T.R , BIAS	KTD600K-Y-U/PH
....4	BK90	CMD1A629	BRACKET , PCB	
....4	BK91	CMD1A629	BRACKET , PCB	
....4	BN60	CWB3FE03320UZ	WIRE ASS'Y (3P, 320mm)	
....4	BN61	CWB1B0031507H	WIRE ASS'Y (3P, 2.0mm, 150mm)	
....4	CN54	CJP17GA115ZY	WAFER, FFC(17P-1.25mm, STRAIGHT)	12511HS-17
....4	CN55	CJP27GA115ZY	WAFER, FFC(27P-1.25mm, STRAIGHT)	12511HS-27
....4	CN61	CJP02GA01ZY	WAFER/STRAIGHT/2.5mm/2P	YMW025-02R
....4	CN62	CJP02GA01ZY	WAFER/STRAIGHT/2.5mm/2P	YMW025-02R
....4	CN63	CJP02GA01ZY	WAFER/STRAIGHT/2.5mm/2P	YMW025-02R
....4	CN64	CJP02GA01ZY	WAFER/STRAIGHT/2.5mm/2P	YMW025-02R
....4	CN66	CJP02GA01ZY	WAFER/STRAIGHT/2.5mm/2P	YMW025-02R
....4	C915	CCET50VLP222NC	CAP , ELECT (2200uF/50V, 85'C), 22X26	
....4	C916	CCET50VLP222NC	CAP , ELECT (2200uF/50V, 85'C), 22X26	
....4	ET01	CWE5202080A	WIRE ASS'Y (1P, 80MM,BLK,#22)	
....4	JK312	CJJ4P014W	JACK , IN/OUT	RCA-401DA(II)-05
....4	JK90	CJJ4M040Z	JACK , BOARD (SW)	RCA-107B-01
....4	JK91	CJJ5R006Z	TERMINAL , SPEAKER	JB-602A-08
....4	JK92	CJJ5P020Z	TERMINAL , SPEAKER	JB-405E-09
....4	L501	CLEY0R5KAK	COIL , SPEAKER(0.5uH)	0.5UH K
....4	L502	CLEY0R5KAK	COIL , SPEAKER(0.5uH)	0.5UH K
....4	L503	CLEY0R5KAK	COIL , SPEAKER(0.5uH)	0.5UH K
....4	L504	CLEY0R5KAK	COIL , SPEAKER(0.5uH)	0.5UH K
....4	L506	CLEY0R5KAK	COIL , SPEAKER(0.5uH)	0.5UH K
....4	Q858	HVTKTA1360Y	T.R , PRE DRIVE	KTA1360-Y-U/PH
....4	Q871	HVTKTA1360Y	T.R , PRE DRIVE	KTA1360-Y-U/PH
....4	Q872	HVTKTA1360Y	T.R , PRE DRIVE	KTA1360-Y-U/PH
....4	Q874	HVTKTA1360Y	T.R , PRE DRIVE	KTA1360-Y-U/PH
....4	Q876	HVTKTA1360Y	T.R , PRE DRIVE	KTA1360-Y-U/PH
....4	Q881	HVTKTC3423Y	T.R , PRE DRIVE	KTC3423-Y-U/PH

Level	Ref#	Component	Description	Drawing No
		COP12506F	**AVR161/230 MAIN PCB ASS'Y**	
....4	Q882	HVTKTC3423Y	T.R , PRE DRIVE	KTC3423-Y-U/PH
....4	Q883	HVTKTC3423Y	T.R , PRE DRIVE	KTC3423-Y-U/PH
....4	Q884	HVTKTC3423Y	T.R , PRE DRIVE	KTC3423-Y-U/PH
....4	Q886	HVTKTC3423Y	T.R , PRE DRIVE	KTC3423-Y-U/PH
....4	R937	CRF5EKR10HS	RES , CEMENT (SMALL SIZE)	
....4	R938	CRF5EKR10HS	RES , CEMENT (SMALL SIZE)	
....4	TUN1	CNVMW104MV1R78	MODULE , TUNER (AM/FM WITH RDS)	
Level	**Ref#**	**Component**	**Description**	**Drawing No**
...3		**COP12509F**	**AVR161/230 SMPS PCB ASS'Y**	
.....6	C903	CCUC1H474KC	CAP, CHIP(2012, 50V/0.47uF)	
.....6	C904	CCUC1H105KC	CAP, CHIP(2012, 50V/1uF)	
.....6	C905	CCUP3A102KC	CAP, CHIP(3216, 1KV/1000pF, X7R)	
.....6	C906	CCUC1H222KC	CAP, CHIP(2012, 50V/2200pF)	
.....6	C907	CCUC1H470JA	CAP, CHIP(2012, 50V/47pF)	
.....6	C908	CCUP3A221JA	CAP, CHIP(3216, 1KV/220pF, X7R)	
.....6	C909	CCUC1H821JA	CAP, CHIP(2012, 50V/820pF, NPO)	
.....6	C910	CCUP3A222KC	CAP, CHIP(3216, 1KV/2200pF, X7R)	
.....6	C912	CCUP3A470JA	CAP, CHIP(3216, 1KV/47pF, X7R)	
.....6	C913	CCUC1E225KC	CAP, CHIP(2012, 25V/2.2uF, X7R)	
.....6	C914	CCUC1H472KC	CAP, CHIP(2012, 50V/4700pF)	
.....6	C915	CCUC1H105KC	CAP, CHIP(2012, 50V/1uF)	
.....6	C917	CCUC1H472KC	CAP, CHIP(2012, 50V/4700pF)	
.....6	C919	CCUP3A470JA	CAP, CHIP(3216, 1KV/47pF, X7R)	
.....6	C923	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C924	CCUC1H222KC	CAP, CHIP(2012, 50V/2200pF)	
.....6	C925	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C926	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C927	CCUC1H105KC	CAP, CHIP(2012, 50V/1uF)	
.....6	C934	CCUC1H105KC	CAP, CHIP(2012, 50V/1uF)	
.....6	C945	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C956	CCUP3A102KC	CAP, CHIP(3216, 1KV/1000pF, X7R)	
.....6	C957	CCUP3A102KC	CAP, CHIP(3216, 1KV/1000pF, X7R)	
.....6	C958	CCUC1H103KC	CAP, CHIP(2012, 50V/0.01uF)	
.....6	C959	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C960	CCUC1H103KC	CAP, CHIP(2012, 50V/0.01uF)	
.....6	C961	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C962	CCUC1H103KC	CAP, CHIP(2012, 50V/0.01uF)	
.....6	C963	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C964	CCUC1H103KC	CAP, CHIP(2012, 50V/0.01uF)	
.....6	C967	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C968	CCUC1H103KC	CAP, CHIP(2012, 50V/0.01uF)	
.....6	C969	CCUC1H224KC	CAP, CHIP(2012, 50V/0.22uF)	
.....6	C970	CCUC1H223KC	CAP, CHIP(2012, 50V/0.022uF, X7R)	
.....6	C971	CCUC1H224KC	CAP, CHIP(2012, 50V/0.22uF)	
.....6	C972	CCUC1H223KC	CAP, CHIP(2012, 50V/0.022uF, X7R)	
.....6	C973	CCUC1H224KC	CAP, CHIP(2012, 50V/0.22uF)	
.....6	C974	CCUC1H223KC	CAP, CHIP(2012, 50V/0.022uF, X7R)	
.....6	C975	CCUC1H224KC	CAP, CHIP(2012, 50V/0.22uF)	
.....6	C976	CCUC1H223KC	CAP, CHIP(2012, 50V/0.022uF, X7R)	
.....6	C977	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C978	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	C979	CCUC1H104KC	CAP, CHIP(2012, 50V/0.1uF)	
.....6	D901	CVDS1M	DIODE, SURFACE MOUNT RECTIFIER(1000V/1A)	
.....6	D902	CVDS1M	DIODE, SURFACE MOUNT RECTIFIER(1000V/1A)	
.....6	D903	CVDUS1M	DIODE , ULTRA FAST RECTIFIER	
.....6	D904	CVDUS1M	DIODE , ULTRA FAST RECTIFIER	
.....6	D906	CVDUS1M	DIODE , ULTRA FAST RECTIFIER	
.....6	D907	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D908	CVDMM1Z24H	DIODE , ZENER(24V/0.5W, SOD-123)	
.....6	D909	CVDMM1Z20H	DIODE , ZENER(20V/0.5W, SOD-123)	
.....6	D911	CVDUS1M	DIODE , ULTRA FAST RECTIFIER	
.....6	D912	CVDMM1Z27H	DIODE , ZENER(27V/0.5W, SOD-123)	
.....6	D913	CVDS1M	DIODE, SURFACE MOUNT RECTIFIER(1000V/1A)	
.....6	D914	CVDMM1Z18H	DIODE , ZENER(18V/0.5W, SOD-123)	

Level	Ref#	Component	Description	Drawing No
...3		**COP12509F**	**AVR161/230 SMPS PCB ASS'Y**	
.....6	D917	CVDMM1Z16H	DIODE , ZENER(16V/0.5W, SOD-123)	
.....6	D918	CVDMM1Z16H	DIODE , ZENER(16V/0.5W, SOD-123)	
.....6	D922	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D924	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D925	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D926	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D927	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D929	CVDMM1Z12H	DIODE , ZENER(12V/0.5W, SOD-123)	
.....6	D932	CVDS1M	DIODE, SURFACE MOUNT RECTIFIER(1000V/1A)	
.....6	D935	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D936	CVD1N4448W	DIODE , FAST SWITCHING(0.5W, SOD-123)	
.....6	D944	CVDUS1M	DIODE , ULTRA FAST RECTIFIER	
.....6	D950	CVDMM1Z15H	DIODE , ZENER(15V/0.5W, SOD-123)	
.....6	IC93	CVIICE2QS02G	I.C , PWM CONTROLLER(PG-DSO-8)	
.....6	IC94	CVIKA431SAMF2	I.C , SHUNT REGULATOR(SOT-23F)	
.....6	IC95	CVIKA431SAMF2	I.C , SHUNT REGULATOR(SOT-23F)	
.....6	IC96	CVIKA431SAMF2	I.C , SHUNT REGULATOR(SOT-23F)	
.....6	L922	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....6	L923	CLZ9Z014Z	FERRITE CHIP BEAD(4516/60R)	HCB4516KF-600T60
.....6	Q909	CVTRT1N141C	T.R,RT1N141C(10K-10K)	RT1N141C
.....6	Q915	CVTRT1N141C	T.R,RT1N141C(10K-10K)	RT1N141C
.....6	Q916	CVTRT1N141C	T.R,RT1N141C(10K-10K)	RT1N141C
.....6	R901	CRJ18AJ392T	RES, CHIP(2012/5%/3.9Kohm)	0805 5%
.....6	R902	CRJ18AJ153T	RES, CHIP(2012/5%/15Kohm)	0805 5%
.....6	R904	CRJ14CJ0R0T	RES, CHIP(3216/5%/0ohm)	
.....6	R906	CRJ18AJ390T	RES, CHIP(2012/5%/39ohm)	
.....6	R907	CRJ01HJ683T	RES, CHIP(6432/5%/68Kohm)	
.....6	R910	CRJ18AJ330T	RES, CHIP(2012/5%/33ohm)	
.....6	R911	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R912	CRJ18AJ112T	RES, CHIP(2012/5%/1.1Kohm)	
.....6	R915	CRJ18AJ683T	RES, CHIP(2012/5%/68Kohm)	0805 5%
.....6	R916	CRJ18AJ153T	RES, CHIP(2012/5%/15Kohm)	0805 5%
.....6	R918	CRJ18AJ203T	RES, CHIP(2012/5%/20Kohm)	
.....6	R919	CRJ18AJ103T	RES, CHIP(2012/5%/10Kohm)	0805 5%
.....6	R921	CRJ14CF5602T	RES, CHIP(3216/1%/56Kohm)	
.....6	R922	CRJ18AJ100T	RES, CHIP(2012/5%/10ohm)	00200-0001
.....6	R923	CRJ18AJ102T	RES, CHIP(2012/5%/1Kohm)	0805 5%
.....6	R924	CRJ14CJ125T	RES, CHIP(3216/5%/1.2Mohm)	
.....6	R925	CRJ14CJ125T	RES, CHIP(3216/5%/1.2Mohm)	
.....6	R926	CRJ14CJ125T	RES, CHIP(3216/5%/1.2Mohm)	
.....6	R927	CRJ14CJ125T	RES, CHIP(3216/5%/1.2Mohm)	
.....6	R928	CRJ18AJ100T	RES, CHIP(2012/5%/10ohm)	00200-0001
.....6	R929	CRJ14CJ125T	RES, CHIP(3216/5%/1.2Mohm)	
.....6	R930	CRJ18AF6202T	RES, CHIP(2012/1%/62Kohm)	
.....6	R931	CRJ18AJ824T	RES, CHIP(2012/5%/820Kohm)	
.....6	R932	CRJ14CJ4R7T	RES, CHIP(3216/5%/4.7ohm)	3216
.....6	R933	CRJ18AJ181T	RES, CHIP(2012/5%/180ohm)	0805 5%
.....6	R934	CRJ18AJ561T	RES, CHIP(2012/5%/560ohm)	0805 5%
.....6	R935	CRJ18AJ220T	RES, CHIP(2012/5%/22ohm)	0805 5%
.....6	R936	CRJ18AJ102T	RES, CHIP(2012/5%/1Kohm)	0805 5%
.....6	R937	CRJ18AJ102T	RES, CHIP(2012/5%/1Kohm)	0805 5%
.....6	R938	CRJ18AJ561T	RES, CHIP(2012/5%/560ohm)	0805 5%
.....6	R939	CRJ18AJ470T	RES, CHIP(2012/5%/47ohm)	0805 5%
.....6	R940	CRJ18AJ153T	RES, CHIP(2012/5%/15Kohm)	0805 5%
.....6	R941	CRJ18AJ622T	RES, CHIP(2012/5%/6.2Kohm)	
.....6	R942	CRJ18AJ222T	RES, CHIP(2012/5%/2.2Kohm)	0805 5%
.....6	R943	CRJ18AJ622T	RES, CHIP(2012/5%/6.2Kohm)	
.....6	R944	CRJ18AJ472T	RES, CHIP(2012/5%/4.7Kohm)	0805 5%
.....6	R945	CRJ18AJ561T	RES, CHIP(2012/5%/560ohm)	0805 5%
.....6	R946	CRJ18AF1002T	RES, CHIP(2012/1%/10Kohm)	
.....6	R947	CRJ18AF1002T	RES, CHIP(2012/1%/10Kohm)	
.....6	R948	CRJ14CJ0R0T	RES, CHIP(3216/5%/0ohm)	
.....6	R950	CRJ18AJ224T	RES, CHIP(2012/5%/220Kohm)	
.....6	R952	CRJ01HJ101T	RES, CHIP(6432/5%/100ohm)	
.....6	R953	CRJ18AF1502T	RES, CHIP(2012/1%/15Kohm)	

Level	Ref#	Component	Description	Drawing No
...3		**COP12509F**	**AVR161/230 SMPS PCB ASS'Y**	
.....6	R954	CRJ18AJ472T	RES, CHIP(2012/5%/4.7Kohm)	0805 5%
.....6	R955	CRJ14CF5602T	RES, CHIP(3216/1%/56Kohm)	
.....6	R956	CRJ18AJ473T	RES, CHIP(2012/5%/47Kohm)	0805 5%
.....6	R957	CRJ18AJ181T	RES, CHIP(2012/5%/180ohm)	0805 5%
.....6	R958	CRJ18AF1002T	RES, CHIP(2012/1%/10Kohm)	
.....6	R959	CRJ18AF5601T	RES, CHIP(2012/1%/5.6Kohm)	
.....6	R960	CRJ01HJ752T	RES, CHIP(6432/5%/7.5Kohm)	
.....6	R961	CRJ18AJ103T	RES, CHIP(2012/5%/10Kohm)	0805 5%
.....6	R962	CRJ18AF1692T	RES, CHIP(2012/1%/16.9Kohm)	
.....6	R963	CRJ14CJ0R0T	RES, CHIP(3216/5%/0ohm)	
.....6	R966	CRJ18AJ220T	RES, CHIP(2012/5%/22ohm)	0805 5%
.....6	R967	CRJ18AJ100T	RES, CHIP(2012/5%/10ohm)	00200-0001
.....6	R968	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R969	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R970	CRJ18AJ100T	RES, CHIP(2012/5%/10ohm)	00200-0001
.....6	R971	CRJ18AJ100T	RES, CHIP(2012/5%/10ohm)	00200-0001
.....6	R972	CRJ18AJ100T	RES, CHIP(2012/5%/10ohm)	00200-0001
.....6	R973	CRJ01HJ221T	RES, CHIP(6432/5%/220ohm)	
.....6	R974	CRJ14CJ154T	RES, CHIP(3216/5%/150Kohm)	
.....6	R975	CRJ14CJ154T	RES, CHIP(3216/5%/150Kohm)	
.....6	R976	CRJ14CJ154T	RES, CHIP(3216/5%/150Kohm)	
.....6	R977	CRJ18AF1503T	RES, CHIP(2012/1%/150Kohm)	
.....6	R978	CRJ01HJ221T	RES, CHIP(6432/5%/220ohm)	
.....6	R979	CRJ14CJ474T	RES, CHIP(3216/5%/470Kohm)	
.....6	R980	CRJ14CJ474T	RES, CHIP(3216/5%/470Kohm)	
.....6	R981	CRJ14CJ474T	RES, CHIP(3216/5%/470Kohm)	
.....6	R982	CRJ14CJ474T	RES, CHIP(3216/5%/470Kohm)	
.....6	R984	CRJ18AJ470T	RES, CHIP(2012/5%/47ohm)	0805 5%
.....6	R985	CRJ18AJ182T	RES, CHIP(2012/5%/1.8Kohm)	
.....6	R986	CRJ18AJ561T	RES, CHIP(2012/5%/560ohm)	0805 5%
.....6	R988	CRJ18AJ0R0T	RES, CHIP(2012/5%/0ohm)	00200-0000
.....6	R989	CRJ18AJ182T	RES, CHIP(2012/5%/1.8Kohm)	
.....6	R990	CRJ01HJ100T	RES , CHIP	2515 5% 100HM
.....6	R991	CRJ18AJ102T	RES, CHIP(2012/5%/1Kohm)	0805 5%
.....6	R992	CRJ14CJ0R0T	RES, CHIP(3216/5%/0ohm)	
.....6	R993	CRJ01HJ752T	RES, CHIP(6432/5%/7.5Kohm)	
.....6	R994	CRJ01HJ361T	RES, CHIP(6432/5%/360ohm)	
.....6	R995	CRJ01HJ361T	RES, CHIP(6432/5%/360ohm)	
.....6	R996	CRJ18AJ470T	RES, CHIP(2012/5%/47ohm)	0805 5%
.....6	R997	CRJ14CF5602T	RES, CHIP(3216/1%/56Kohm)	
.....6	R999	CRJ14CF5602T	RES, CHIP(3216/1%/56Kohm)	
.....5	C901	C3A206	WIRE, COPPER(D0.6)	SN95/PB5 , 0.6
.....5	C911	CCKT3A102KBL	CAP, CERAMIC(1kV/1000pF/K)	EKR3A102K05FK5
.....5	C918	CCEA1HH100TCS	CAP, ELECT(50V/10uF),105'C	
.....5	C920	CCEA1HH470TCS	CAP, ELECT(50V/47uF),105'C	
.....5	C921	CCEA1HH220TCS	CAP, ELECT(50V/22uF),105'C	
.....5	C929	CCEA0JH471TCS	CAP, ELECT(6.3V/470uF),105'C	
.....5	C932	CCEA1HH470TCS	CAP, ELECT(50V/47uF),105'C	
.....5	C944	CCEA0JH102TCS	CAP, ELECT(6.3V/1000uF),105'C	
.....5	C949	CCEA2AH100TCS	CAP, ELECT(100V/10uF),105'C	
.....5	C953	CCEA1EH101TCS	CAP, ELECT(25V/100uF),105'C	
.....5	C955	CCEA1HH220TCS	CAP, ELECT(50V/22uF),105'C	
.....5	C984	CCEA0JH471TCS	CAP, ELECT(6.3V/470uF),105'C	
.....5	D910	HVDUF4007T	DIODE , SCHOTTKY	UF4007
.....5	D916	CVDZJ20BT	DIODE , ZENER ,1/2W, 20V	ZJ20BT(26MM T/B)
.....5	D919	HVD1N4007T	DIODE	1N4007T
.....5	D920	HVDUF4004T	DIODE , SCHOTTKY	UF4004
.....5	D921	HVD11EQ06T	DIODE , SCHOTTKY (60V/1A)	11EQ06
.....5	D928	CVDZJ20BT	DIODE , ZENER ,1/2W, 20V	ZJ20BT(26MM T/B)
.....5	D933	CVDSF26	DIODE , SUPER FAST RECTIFIER	
.....5	D937	CVDSF26	DIODE , SUPER FAST RECTIFIER	
.....5	D943	HVDUF4004T	DIODE , SCHOTTKY	UF4004
.....5	ET91	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	
.....5	ET92	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	
.....5	ET93	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	

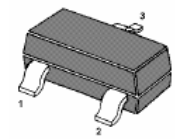
Level	Ref#	Component	Description	Drawing No
...3		**COP12509F**	**AVR161/230 SMPS PCB ASS'Y**	
.....5	ET95	CJT1A026	PLATE , EARTH(TRONIC ELECTRONICS)	
.....5	FH91	KJCFC5S	HOLDER , FUSE	
.....5	FH92	KJCFC5S	HOLDER , FUSE	
.....5	IC99	CVIL78L24AB	IC, REGULATOR (24V, TO-92L)	L78L24ABZ-TR
.....5	Q902	HVTKSA708YT	T.R	KSA708-YTA
.....5	Q903	HVTKSA708YT	T.R	KSA708-YTA
.....5	Q914	HVTKSA708YT	T.R	KSA708-YTA
.....5	RX93	CRO50TJ155T	RES , SURGE ,(1.5M OHM, 5%, 1/2W, PRC TYPE)	
....4		C4B120122	TUBE , UL	
....4	BD91	CLZ9H002Z	BEAD , CORE(100MHz MIN 120ohm)	
....4	BN65	CWB1C01525047	WIRE ASSY (LOCK, 15P, 250mm, 2.0mm)	
....4	CN20	CJP03GA90ZY	WAFER,YW396-03B(3.96mm)	
....4	CN66	CJP07GI236ZW	LOCKING TYPE , STRAIGHT WAFER , 2MM	A2008WV0-7P
....4	CN90	CJP02KA060ZY	WAFER, 2P, 3.96mm	
....4	CX91	CCQF2E224KZFS	CAP , X2(275VAC, 0.22uF, 12mm, SEORYONG)	
....4	CX92	CCQF2E334KZES	CAP , X2(275VAC, 0.33uF, 15mm, SEORYONG)	
....4	CY91	CCKDHS152ME	CAP , CERAMIC (400V Y-CAP)	SDE1152M10FF7
....4	CY92	CCKDHS152ME	CAP , CERAMIC (400V Y-CAP)	SDE1152M10FF7
....4	CY93	CCKDHS102ME	CAP , CERAMIC (400V Y-CAP)	SDE102M10FF7
....4	CY94	CCKDHS102ME	CAP , CERAMIC (400V Y-CAP)	SDE102M10FF7
....4	CY95	CCKDHS102ME	CAP , CERAMIC (400V Y-CAP)	SDE102M10FF7
....4	CY96	CCKDHS152ME	CAP , CERAMIC (400V Y-CAP)	SDE1152M10FF7
....4	C902	CCET450VKM220NCS	CAP, ELECT(450V/22uF),105'C,13X20	
....4	C928	CCEA1JGF222ECS	CAP, ELECT(63V/2200uF/105'C), 18X40	
....4	C930	CCET450VK3J121NKS	CAP , ELECT (120uF/450V, 105'C, 25X40, K3J)	
....4	C933	CCEA1EH471ECS	CAP, ELECT(25V/470uF),105'C	
....4	C936	CCEA1JGF222ECS	CAP, ELECT(63V/2200uF/105'C), 18X40	
....4	C937	CCEA1JH471ECS	CAP , ELECT(63V/470uF),105'C	
....4	C939	CCEA1JH471ECS	CAP , ELECT(63V/470uF),105'C	
....4	C941	CCEA1AGF562ECS	CAP, ELECT(10V/5600uF/105'C), 13X30	
....4	C943	CCEA1AH102ECS	CAP, ELECT(10V/1000uF),105'C	
....4	DB91	CVDRS1005M	DIODE , BRIDGE (600V/10A,RS-10M)	
....4	D934	CVD31DQ06FC6	DIODE , SB (60V, 3A, DO-201)	
....4	D938	HVD31DQ06H	DIODE	31DQ06H
....4	D939	HVD31DQ06H	DIODE	31DQ06H
....4	HS91	CVTIPW65R280E6ZA	FET HEAT SINK ASS'Y (IPW65R280E6+CMY2A327ZA-V1)	
.....5		CMD1A720	BRACKET , THERMAL SENSOR	
.....5		CMX1A164	INSULATOR , SILICON	QRW-7500
.....5		CMY2A327ZA-V2	HEAT SINK	
.....5		CRTST22110070WZA	PROTECTOR , THERMAL ASS'Y	
......6		CRTST22110070W	PROTECTOR , THERMAL (110'C, 70mm)	
......6		CRTST22110070WA	PROTECTOR , THERMAL ASS'Y (110'C, 70mm)	
.....5		CTB3+10JR	SCREW	
.....5		CVTIPW65R280E6	FET, IPW65R280E6, N-CH, PG-TO247, INFINEON	
....4	HS92	CVDFCU20A40YA	DIODE HEAT SINK ASS'Y (CMY9A222)	
.....5		CMY9A222-V2	HEAT SINK	
.....5		CTB3+10JR	SCREW	
.....5		CVDFCU20A40	DIODE , FAST RECOVERY (400V/20A,TO-220)	
.....5		K8AYG6260	COMPOUND , SILICONE	
....4	HS93	CVDFCU20A40YA	DIODE HEAT SINK ASS'Y (CMY9A222)	
.....5		CMY9A222-V2	HEAT SINK	
.....5		CTB3+10JR	SCREW	
.....5		CVDFCU20A40	DIODE , FAST RECOVERY (400V/20A,TO-220)	
.....5		K8AYG6260	COMPOUND , SILICONE	
....4	HS94	CVINJM7812FAXA	HEAT SINK ASS'Y(HVINJM7812FA+CMY2A223)	
.....5		CMY2A223-V2	HEAT SINK	
.....5		CTB3+8JR	SCREW	00M51260308M0
.....5		HVINJM7812FA	I.C , REGULATOR	NJM7812FA
.....5		K8AYG6260	COMPOUND , SILICONE	
....4	IC91	CVIOB2358LAP	I.C , PWM	
....4	IC92	CVIICE2B265	IC , COOLSET	ICE2B265
....4	IC98	HVINJM7912FA	I.C , REGULATOR	NJM7912FA
....4	LF91	CLZ9Z135Z	FILTER , LINE (SQE2930, 8mH)	
....4	LF92	CLZ9Z135Z	FILTER , LINE (SQE2930, 8mH)	
....4	LF93	CLZ9Z121Z	LINE, FILTER (150uH, RING-616)	

Level	Ref#	Component	Description	Drawing No
...3		**COP12509F**	**AVR161/230 SMPS PCB ASS'Y**	
....4	L924	CLZ9Z090Z	COIL , CHOKE(7UH)	
....4	L925	CLZ9Z090Z	COIL , CHOKE(7UH)	
....4	L928	CLZ9Z090Z	COIL , CHOKE(7UH)	
....4	PC91	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC92	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC93	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC94	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC95	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC96	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC97	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	PC98	CVIEL817B	I.C , PHOTO COUPLER	EL817B
....4	R903	CRG2ANJ470H	RES , METAL OXIDE FILM	47 OHM 2W J
....4	R908	CRW1PJ0R6V	RES , WIRE WOUND (1W/0.6OHM)	
....4	R913	CRW1PJ0R1V	RES , WIRE WOUND (1W/0.1OHM)	
....4	R914	CRW1PJ0R1V	RES , WIRE WOUND (1W/0.1OHM)	
....4	R920	CRG2ANJ683H	RES , METAL OXIDE FILM	68K OHM 2W J
....4	TF91	CLT9Z087ZE	TRANS , STBY (AVR1X1)	
....4	TF92	CLT9Z088ZE	TRANS , SUB (AVR1X1)	
....4	TF93	CLT9Z089ZE	TRANS , MAIN (AVR1X1)	
....4	TH91	CRT2R5D20MSFC	NTC , THERMISTOR (10MM PITCH, 2.5D-20)	
....4	TS92	CJP02GA01ZY	WAFER/STRAIGHT/2.5mm/2P	YMW025-02R
....4	VT91	CRVSVC561D14A	VARISTOR(560V, 14mm)	
....4	VT92	CRVSVC561D14A	VARISTOR(560V, 14mm)	
...3		CTB3+10JFZR	SCREW	
...3		CTB3+6FFZR	SCREW	
...3		CTB3+6JR	SCREW	
...3		CTB3+8JFZR	SCREW	
...3		CTB3+8JR	SCREW	00M51260308M0
...3		CTS3+8JFZR	SCREW	
...3		CTW3+12JR	SCREW	
...3		CTW3+8JR	SCREW	
...3		CUA1A343	CHASSIS , BOTTOM AVR1510	
...3		CWB1B003200HH	WIRE ASS'Y (3P, 2.0mm, 200mm)	
...3		CWC4C4A11B150B10	CARD , CABLE (11P,1.25mm,150mm,B,10mm)	
...3		CWZAVR2700CN90A	INLET WIRE ASS'Y	
....4		CJJ8A006ZW	RECEPTACLE , AC(15A/250V,R-301,B21)	R-301-(B21)
....4		CLZ9W003Z	FERRITE , RING	29X7.7X19
....4		CWZAVR1700CN90	WIRE ASS'Y	
...3	F901	KBA2C6300TLHEY	FUSE(215Series, 250V/6.3)	
...3	WF1501	CWC4C4A27B150B10	CARD , CABLE (27p,1.25mm Pitch, 150mm)	
...3	WF1502	CWC4C4A17B120B10	CABLE , CARD(17P, 120MM, 1.25MM)	
.1		CHE154	CLAMPER , ARM	
.1		CPG1A972V	BOX , OUT CARTON AVR161	
.1		CPL18A5M	STAPLE	
.1		CPS1A930	PAD , LEFT	
.1		CPS1A931	PAD , RIGHT	
.1		CQXAVR161/230	INSTRUCTION MANUAL ASS'Y	
..2		CARTAVR161-HK	REMOTE CONTROLLER (AVR161)	
..2		CJA2B120Z	CORD , POWER (PLUG+SOCKET) EUR	
..2		CJXAVR365MICRO	MICRO PHONE ASS'Y	
..2		CQE1A570Z	SHEET , QUICK START GUIDE AVR1510	
..2		CSA1A018Z	FM 1 POLE ANT	T15011F-1
..2		CSA1A039Z	ANT, AM LOOP(9.5uH/5T)	

SPECIFICATION OF MMBT5401

PNP Silicon Epitaxial Planar Transistor

for high voltage amplifier applications



1. Base 2. Emitter 3. Collector
SOT-23 Plastic Package

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Base Voltage	$-V_{CBO}$	160	V
Collector Emitter Voltage	$-V_{CEO}$	150	V
Emitter Base Voltage	$-V_{EBO}$	5	V
Collector Current Continuous	$-I_C$	600	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	- 55 to + 150	°C

Characteristics at T_a = 25 °C

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at $-V_{CE}$ = 5 V, $-I_C$ = 1 mA at $-V_{CE}$ = 5 V, $-I_C$ = 10 mA at $-V_{CE}$ = 5 V, $-I_C$ = 50 mA	 h_{FE} h_{FE} h_{FE}	 50 60 50	 - 240 -	 - - -
Collector Cutoff Current at $-V_{CB}$ = 120 V	$-I_{CBO}$	-	50	nA
Emitter Cutoff Current at $-V_{EB}$ = 3 V	$-I_{EBO}$	-	50	nA
Collector Base Breakdown Voltage at $-I_C$ = 100 µA	$-V_{(BR)CBO}$	160	-	V
Collector Emitter Breakdown Voltage at $-I_C$ = 1 mA	$-V_{(BR)CEO}$	150	-	V
Emitter Base Breakdown Voltage at $-I_E$ = 10 µA	$-V_{(BR)EBO}$	5	-	V
Collector Emitter Saturation Voltage at $-I_C$ = 10 mA, $-I_B$ = 1 mA at $-I_C$ = 50 mA, $-I_B$ = 5 mA	 $-V_{CE(sat)}$ $-V_{CE(sat)}$	 - -	 0.2 0.5	 V V
Base Emitter Saturation Voltage at $-I_C$ = 10 mA, $-I_B$ = 1 mA at $-I_C$ = 50 mA, $-I_B$ = 5 mA	 $-V_{BE(sat)}$ $-V_{BE(sat)}$	 - -	 1 1	 V V
Gain Bandwidth Product at $-V_{CE}$ = 10 V, $-I_C$ = 10 mA, f = 100 MHz	f_T	100	300	MHz
Output Capacitance at $-V_{CB}$=10 V, f = 1 MHz	C_{obo}	-	6	pF

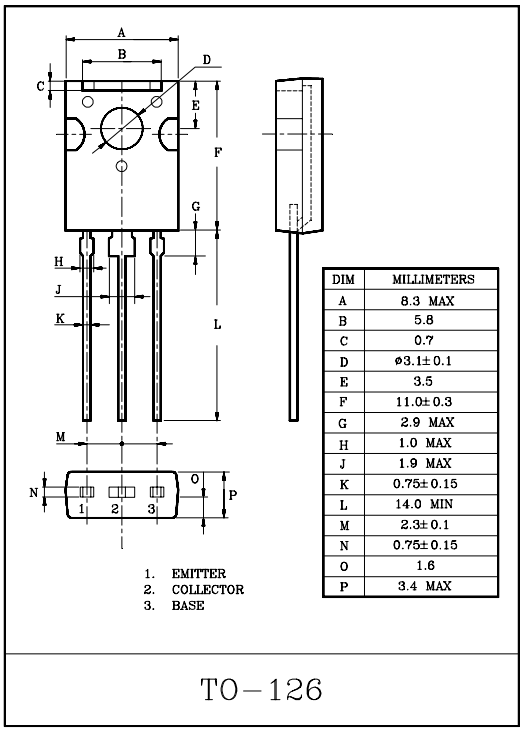
KOREA ELECTRONICS CO.,LTD.

SEMICONDUCTOR
TECHNICAL DATA

KTD600K
EPITAXIAL PLANAR NPN TRANSISTOR

LOW FREQUENCY POWER AMP,
MEDIUM SPEED SWITCHING APPLICATIONS

FEATURES
- High breakdown voltage V_{CEO} 120V, high current 1A.
- Low saturation voltage and good linearity of h_{FE}.



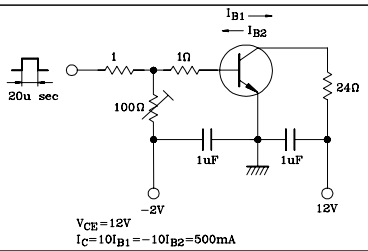
DIM	MILLIMETERS
A	8.3 MAX
B	5.8
C	0.7
D	ø3.1±0.1
E	3.5
F	11.0±0.3
G	2.9 MAX
H	1.0 MAX
J	1.9 MAX
K	0.75±0.15
L	14.0 MIN
M	2.3±0.1
N	0.75±0.15
O	1.6
P	3.4 MAX

TO-126

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	120	V
Collector-Emitter Voltage		V_{CEO}	120	V
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current		I_C	1	A
		I_{CP}	2	
Collector Power Dissipation	Ta=25℃	P_C	1.5	W
	Tc=25℃		8	
Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55~150	℃

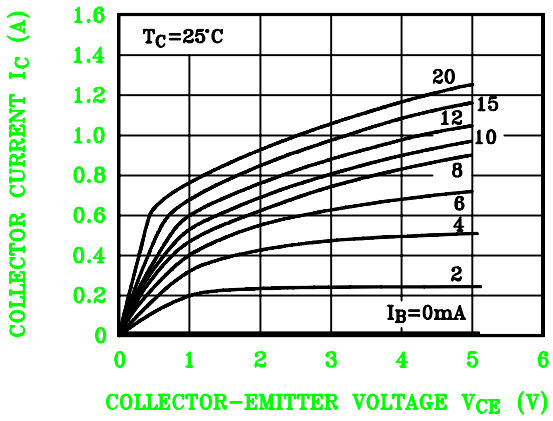
ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut of Current		I_{CBO}	V_{CB}=50V, I_E=0	-	-	1	μA
Emitter Cut of Current		I_{EBO}	V_{EB}=4V, I_C=0	-	-	1	μA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	I_C=10μA	120	-	-	V
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	I_C=1mA	120	-	-	V
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	I_E=10μA	5	-	-	V
DC Current Gain		h_{FE}(1)Note	V_{CE}=5V, I_C=50mA	100	-	320	
		h_{FE}(2)	V_{CE}=5V, I_C=500mA	20	-	-	
Gain Bandwidth Product		f_T	V_{CE}=10V, I_C=50mA	-	130	-	MHz
Output Capacitance		C_{ob}	V_{CB}=10V, f=1MHz	-	20	-	pF
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=500mA, I_B=50mA	-	0.15	0.4	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	I_C=500mA, I_B=50mA	-	0.85	1.2	V
Switching Time	Turn-on Time	t_{on}		-	100	-	nS
	Turn-off Time	t_{off}		-	500	-	
	Storage Time	t_{stg}		-	700	-	

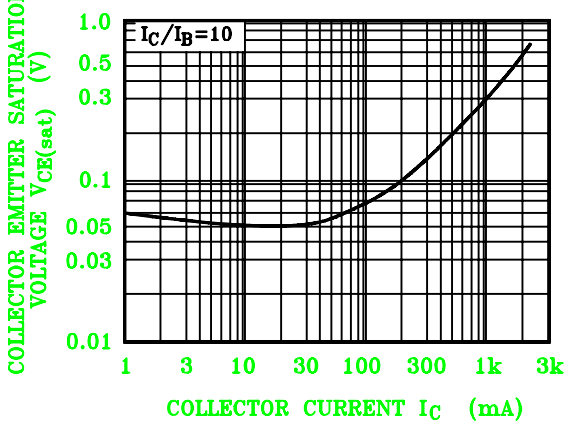
(Note) : h_{FE}(1) Classification Y:100~200, GR:160~320

KTD600K

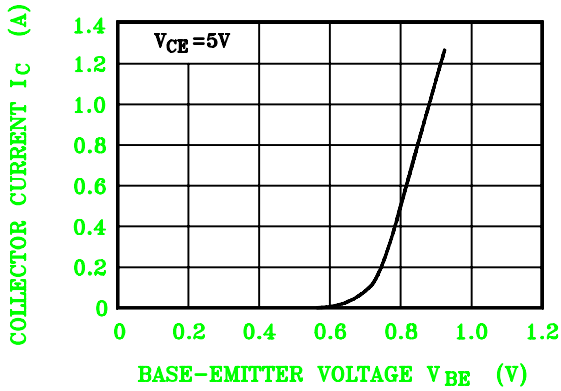
I_C – V_{CE}



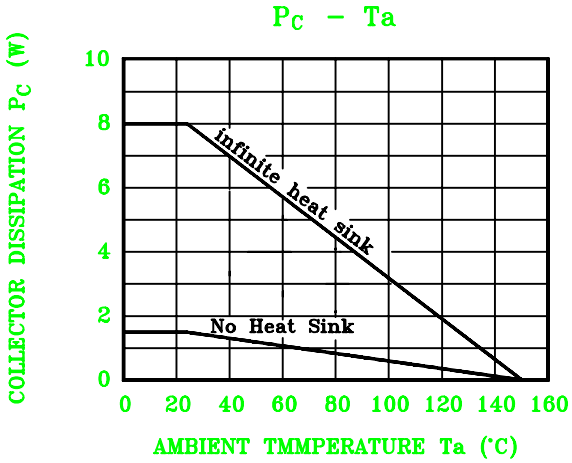
$V_{CE(sat)}$ – I_C



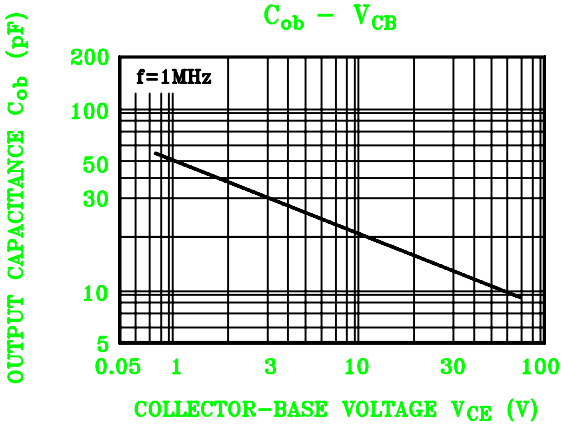
I_C – V_{BE}



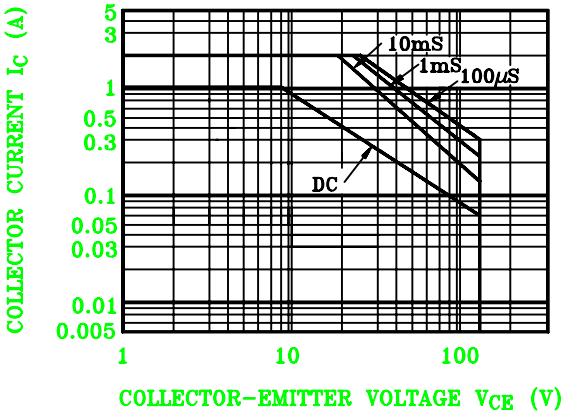
P_C – Ta



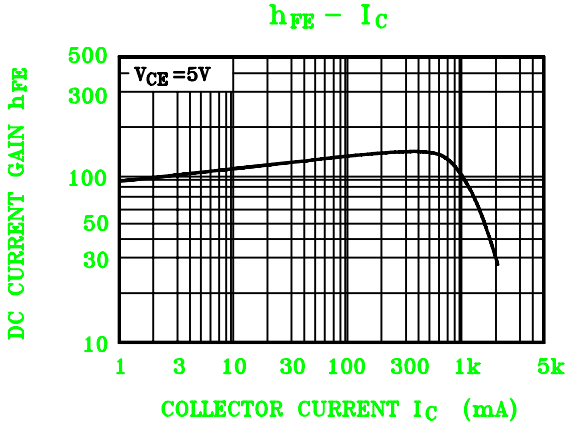
C_{ob} – V_{CB}



A S O



h_{FE} – I_C



KEC

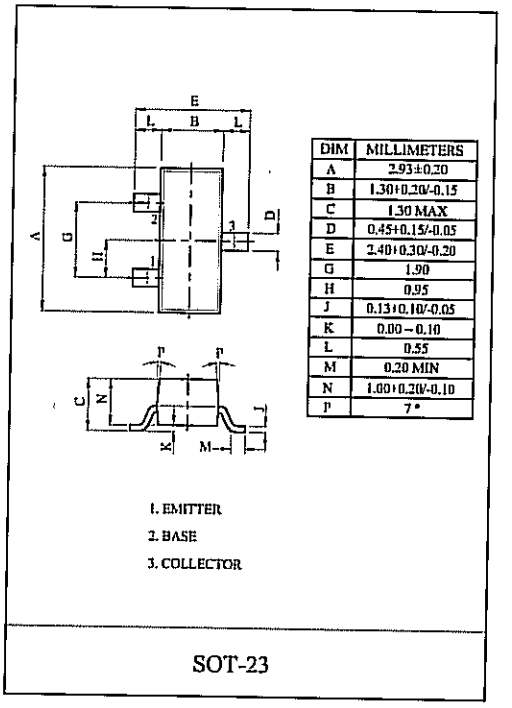
SEMICONDUCTOR
TECHNICAL DATA

KTC3875S
EPITAXIAL PLANAR NPN TRANSISTOR

GENERAL PURPOSE APPLICATION.
SWITCHING APPLICATION.

FEATURES

- Excellent h_{FE} Linearity
  : h_{FE}(0.1mA)/h_{FE}(2mA)=0.95(Typ.).
- High h_{FE} : h_{FE}=70~700.
- Low Noise : NF=1dB(Typ.), 10dB(Max.).
- Complementary to KTA1504S.



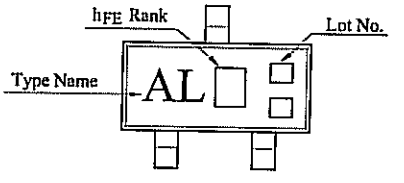
DIM	MILLIMETERS
A	2.93±0.20
B	1.30+0.20/-0.15
C	1.30 MAX
D	0.45+0.15/-0.05
E	2.40+0.30/-0.20
G	1.90
H	0.95
J	0.13+0.10/-0.05
K	0.00~0.10
L	0.55
M	0.20 MIN
N	1.00+0.20/-0.10
P	7°

SOT-23

MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	150	mA
Base Current	I_B	30	mA
Collector Power Dissipation	P_C	150	mW
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55~150	℃

Marking



ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB}=60V, I_E=0	-	-	0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB}=5V, I_C=0	-	-	0.1	μA
DC Current Gain	h_{FE}(Note)	V_{CE}=6V, I_C=2mA	70	-	700	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=100mA, I_B=10mA	-	0.1	0.25	V
Transition Frequency	f_T	V_{CE}=10V, I_C=1mA	80	-	-	MHz
Collector Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz	-	2.0	3.5	pF
Noise Figure	NF	V_{CE}=6V, I_C=0.1mA f=1kHz, Rg=10kΩ	-	1.0	10	dB

Note : h_{FE} Classification O:70~140, Y:120~240, GR(G):200~400, BL(L):350~700

KEC

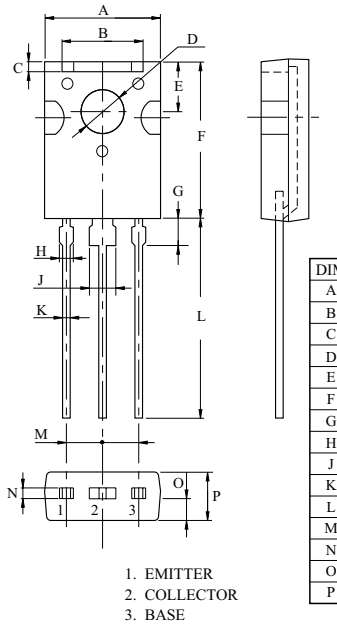
SEMICONDUCTOR
TECHNICAL DATA

KTC3423
TRIPLE DIFFUSED NPN TRANSISTOR

AUDIO FREQUENCY AMPLIFIER APPLICATION.

FEATURES

· High Breakdown Voltage : V_{CEO}=150V(Min.).
· Low Output Capacitance : C_{ob}=5.0pF(Max.).
· High Transition Frequency : f_T=120MHz(Typ.).
· Complementary to KTA1360.



DIM	MILLIMETERS
A	8.3 MAX
B	5.8
C	0.7
D	Φ3.2±0.1
E	3.5
F	11.0±0.3
G	2.9 MAX
H	1.0 MAX
J	1.9 MAX
K	0.75±0.15
L	15.50±0.5
M	2.3±0.1
N	0.65±0.15
O	1.6
P	3.4 MAX

TO-126

MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	150	V
Collector-Emitter Voltage		V_{CEO}	150	V
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current		I_C	50	mA
Emitter Current		I_B	5	mA
Collector Power Dissipation	Ta=25℃	P_C	1.5	W
	Tc=25℃		5	
Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 ~ 150	℃

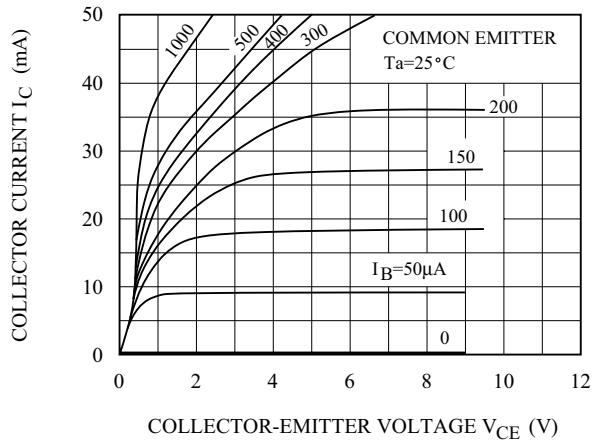
ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB}=150V, I_E=0	-	-	0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB}=5V, I_C=0	-	-	0.1	μA
DC Current Gain	h_{FE}(Note)	V_{CE}=5V, I_C=10mA	70	-	240	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=10mA, I_B=1mA	-	-	0.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=10mA, I_B=1mA	-	-	1.0	V
Transition Frequency	f_T	V_{CE}=30V, I_C=10mA	-	120	-	MHz
Collector Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz	-	3.5	5.0	pF

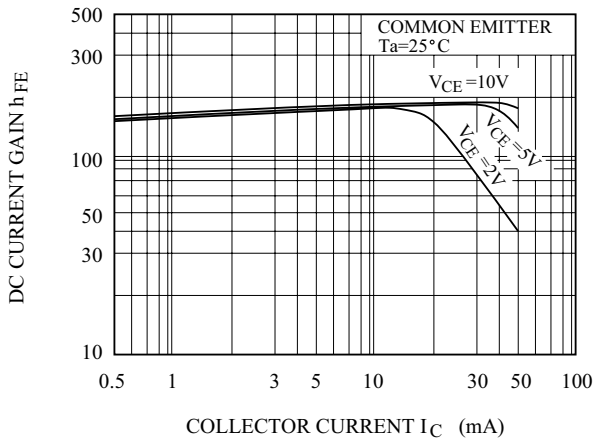
Note : h_{FE} Classification O:70 ~ 140, Y:120 ~ 240

KTC3423

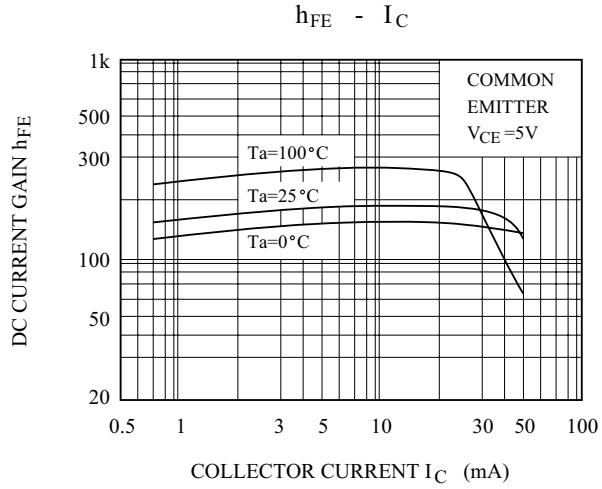
I_C - V_{CE}



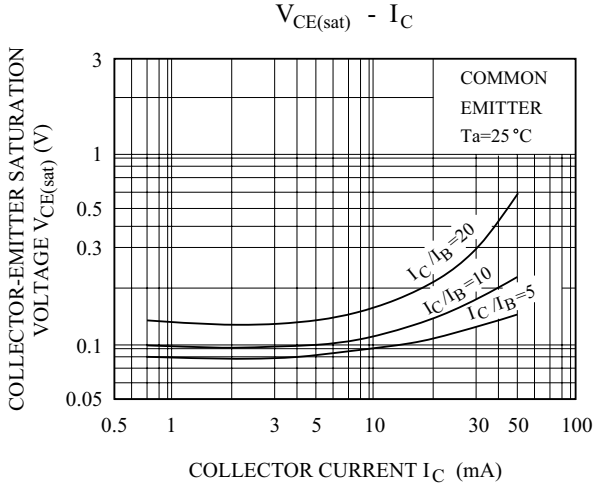
h_{FE} - I_C



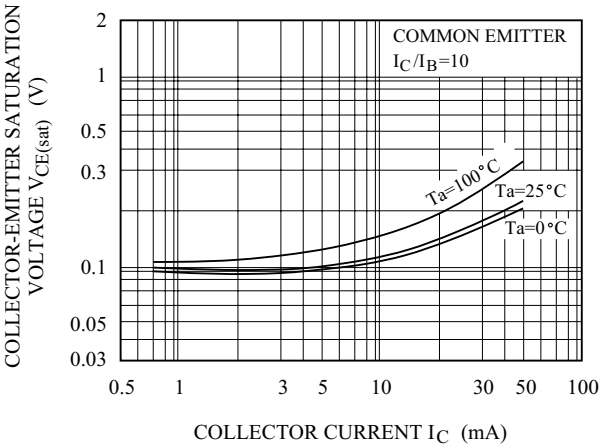
h_{FE} - I_C



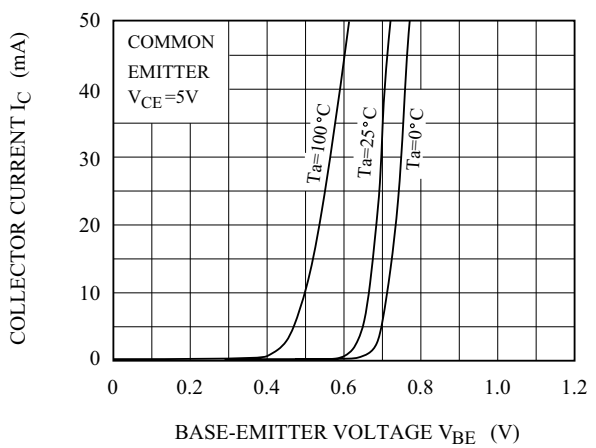
$V_{CE(sat)}$ - I_C



$V_{CE(sat)}$ - I_C

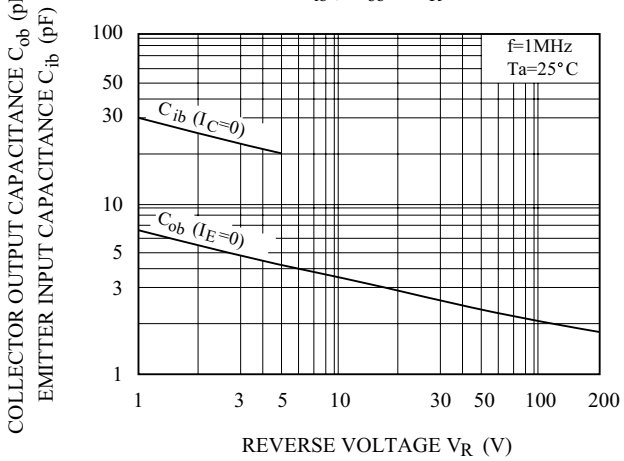


I_C - V_{BE}

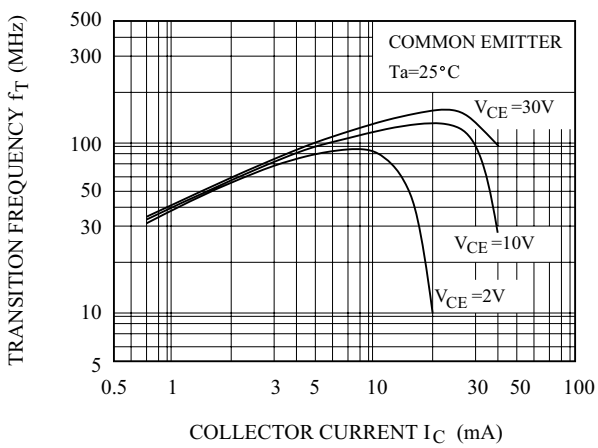


KTC3423

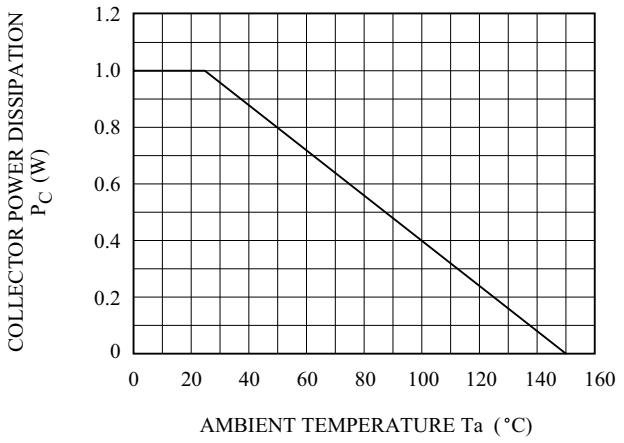
C_{ib} , C_{ob} - V_R



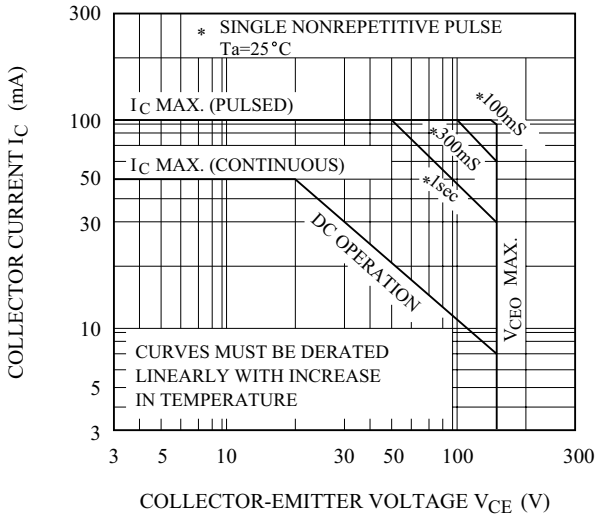
f_T - I_C



Pc - Ta



SAFE OPERATING AREA



KEC

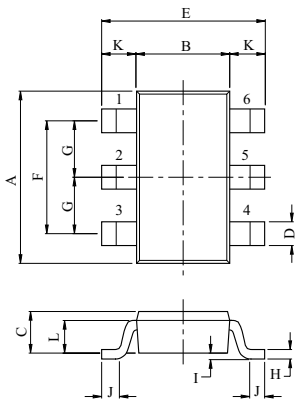
SEMICONDUCTOR
TECHNICAL DATA

KTC812T
EPITAXIAL PLANAR NPN TRANSISTOR

FOR MUTING AND SWITCHING APPLICATION.

FEATURES

- High Emitter-Base Voltage : V_{EBO}=25V(Min.)
- High Reverse h_{FE}
  : Reverse h_{FE}=150(Typ.) (V_{CE}=-2V, I_C=-4mA)
- Low on Resistance : R_{ON}=1Ω(Typ.), (I_B=5mA)



DIM	MILLIMETERS
A	2.9±0.2
B	1.6+0.2/-0.1
C	0.70±0.05
D	0.4±0.1
E	2.8+0.2/-0.3
F	1.9±0.2
G	0.95
H	0.16±0.05
I	0.00-0.10
J	0.25+0.25/-0.15
K	0.60
L	0.55

1. Q_1 EMITTER
2. Q_1 BASE
3. Q_2 COLLECTOR
4. Q_2 EMITTER
5. Q_2 BASE
6. Q_1 COLLECTOR

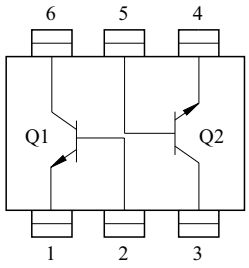
TS6

MAXIMUM RATING (Ta=25℃)

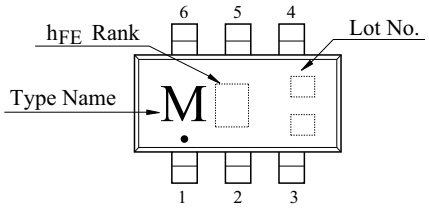
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	25	V
Collector Current	I_C	300	mA
Base Current	I_B	60	mA
Collector Power Dissipation	P_C *	0.9	mW
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55 ~ 150	℃

* Package mounted on a ceramic board (600㎟ × 0.8㎜)

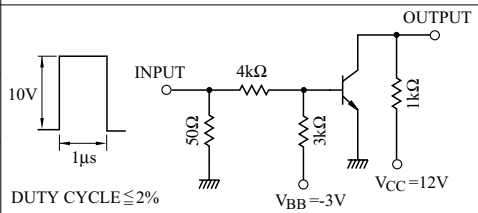
EQUIVALENT CIRCUIT (TOP VIEW)



Marking



ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB}=50V, I_E=0	-	-	0.1	μA
Emitter Cut-off Current		I_{EBO}	V_{EB}=25V, I_C=0	-	-	0.1	μA
DC Current Gain		h_{FE}	V_{CE}=2V, I_C=4mA	350	-	1200	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=30mA, I_B=3mA	-	0.042	0.3	V
Base-Emitter Voltage		V_{BE}	V_{CE}=2V, I_C=4mA	-	0.61	-	V
Transition Frequency		f_T	V_{CE}=6V, I_C=4mA	-	30	-	MHz
Collector Output Capacitance		C_{ob}	V_{CB}=10V, I_E=0, f=1MHz	-	4.8	7	pF
Switching Time	Turn-on Time	t_{on}		-	160	-	nS
	Storage Time	t_{stg}		-	500	-	
	Fall Time	t_f		-	130	-	

Note : h_{FE} Classification B: 350 ~ 1200

KEC

SEMICONDUCTOR
TECHNICAL DATA

KTA1360
TRIPLE DIFFUSED PNP TRANSISTOR

AUDIO FREQUENCY AMPLIFIER APPLICATION.

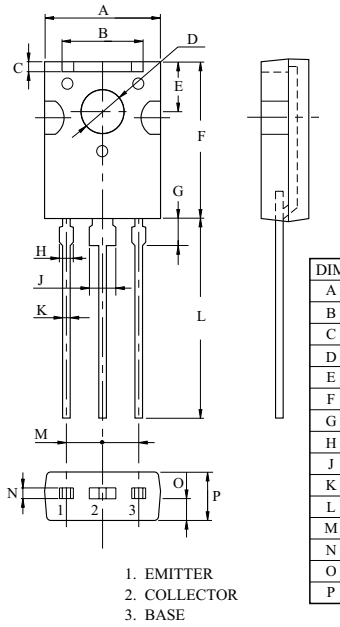
FEATURES

· High Voltage : V_{CEO}=-150V.

· Low Output Capacitance : C_{ob}=5.0pF(Max.).

· High Transition Frequency : f_T=120MHz(Typ.)

· Complementary to KTC3423.



DIM	MILLIMETERS
A	8.3 MAX
B	5.8
C	0.7
D	Φ3.2±0.1
E	3.5
F	11.0±0.3
G	2.9 MAX
H	1.0 MAX
J	1.9 MAX
K	0.75±0.15
L	15.50±0.5
M	2.3±0.1
N	0.65±0.15
O	1.6
P	3.4 MAX

TO-126

MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	-150	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-50	mA
Emitter Current	I_E	50	mA
Collector Power Dissipation	P_C	1.5	W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55 ~ 150	℃

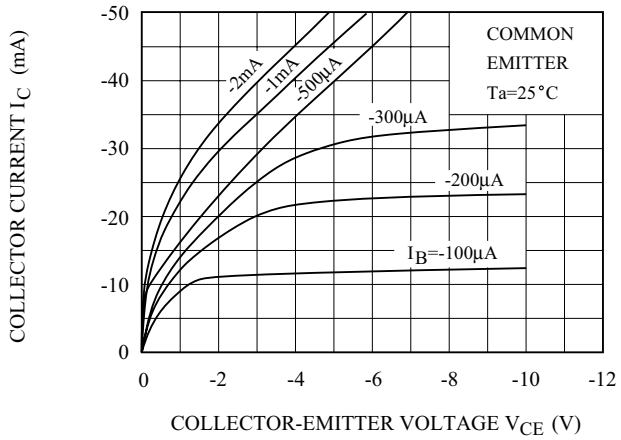
ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB}=-150V, I_E=0	-	-	-0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB}=-5V, I_C=0	-	-	-0.1	μA
DC Current Gain	h_{FE}(Note)	V_{CE}=-5V, I_C=-10mA	70	-	240	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=-10mA, I_B=-1mA	-	-	-0.8	V
Base-Emitter Voltage	V_{BE}	V_{CE}=-5V, I_C=-30mA	-	-	-0.9	V
Transition Frequency	f_T	V_{CE}=-30V, I_C=-10mA	-	120	-	MHz
Collector Output Capacitance	C_{ob}	V_{CB}=-10V, I_E=0, f=1MHz	-	4.0	5.0	pF

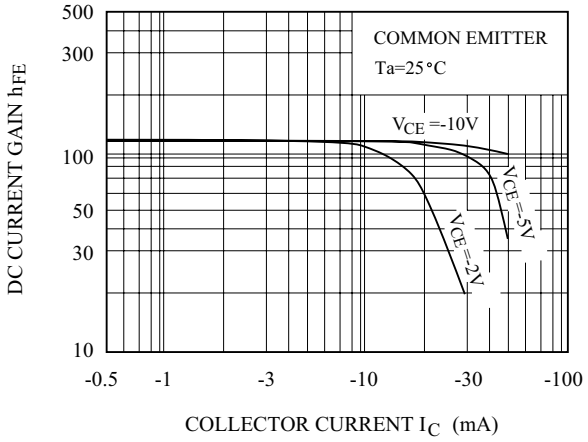
Note : h_{FE} Classification O:70 ~ 140, Y:120 ~ 240

KTA1360

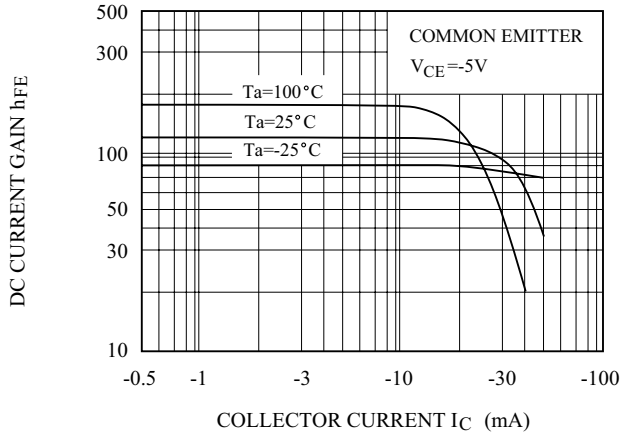
I_C - V_{CE}



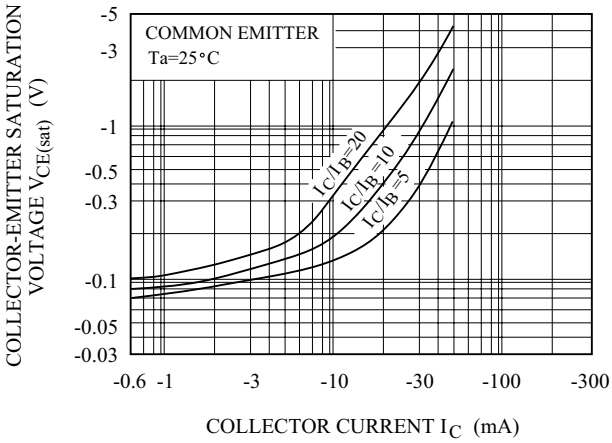
h_{FE} - I_C



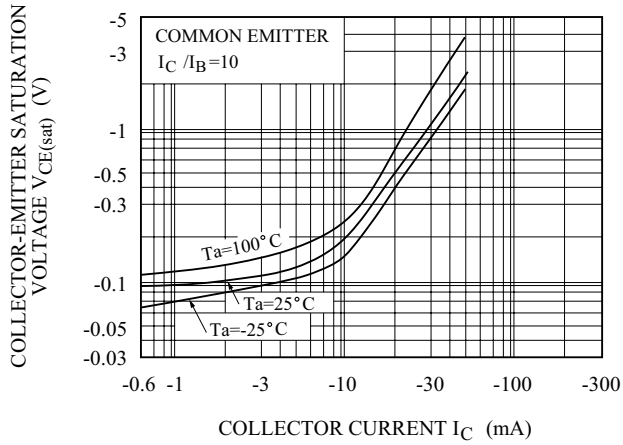
h_{FE} - I_C



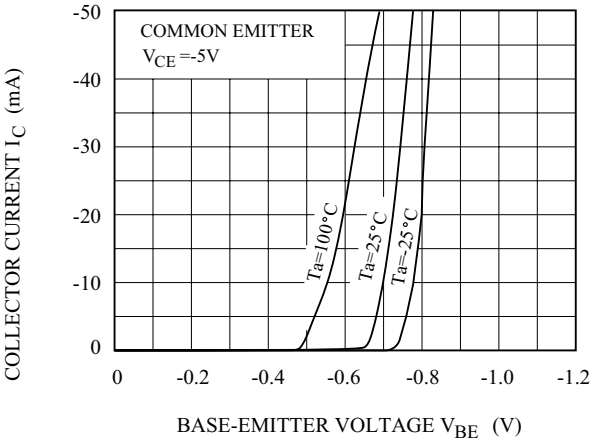
$V_{CE(sat)}$ - I_C



$V_{CE(sat)}$ - I_C

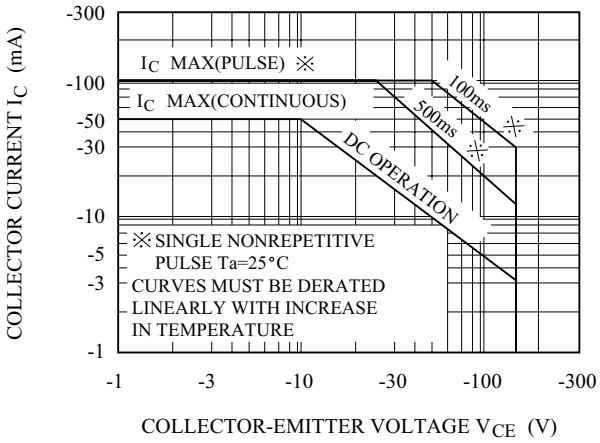


I_C - V_{BE}

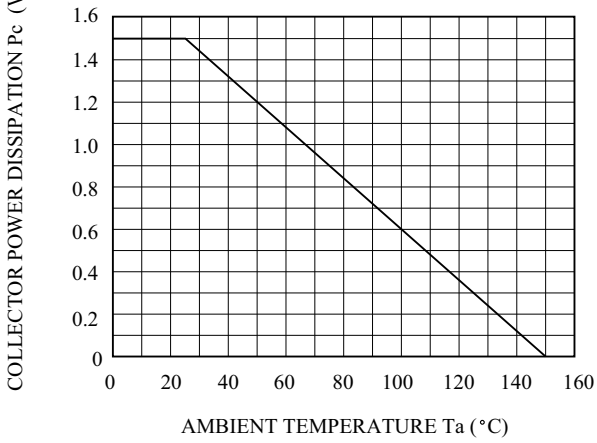


KTA1360

SAFE OPERATING AREA



Pc - Ta



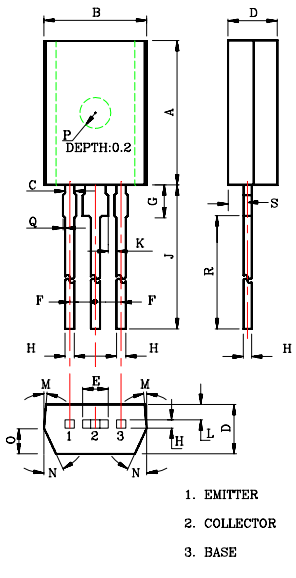
KOREA ELECTRONICS CO.,LTD.

SEMICONDUCTOR
TECHNICAL DATA

KTA1024
TRIPLE DIFFUSED PNP TRANSISTOR

HIGH VOLTAGE APPLICATION.

FEATURES
- High Voltage : V_{CEO}=-150V.
- Low Output Capacitance : C_{ob}=5.0pF(Max.).
- High Transition Frequency : f_T=120MHz (Typ.).
- Complementary to KTC3206.



DIM	MILLIMETERS
A	7.20 MAX
B	5.20 MAX
C	0.60 MAX
D	2.50 MAX
E	1.15 MAX
F	1.27
G	1.70 MAX
H	0.55 MAX
J	14.00±0.50
K	0.35 MIN
L	0.75±0.10
M	4°
N	25°
O	1.25
P	ø1.50
Q	0.10 MAX
R	12.50±0.50
S	1.00

TO-92L

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	-150	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-50	mA
Emitter Current	I_E	50	mA
Collector Power Dissipation	P_C	1	W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55~150	℃

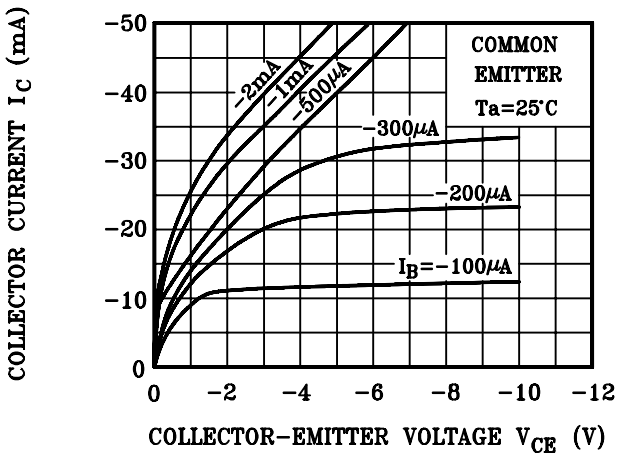
ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB}=-150V, I_E=0	-	-	-0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB}=-5V, I_C=0	-	-	-0.1	μA
DC Current Gain	h_{FE}(Note)	V_{CE}=-5V, I_C=-10mA	70	-	240	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=-10mA, I_B=-1mA	-	-	-0.8	V
Base-Emitter Voltage	V_{BE}	V_{CE}=-5V, I_C=-30mA	-	-	-0.9	V
Transition Frequency	f_T	V_{CE}=-30V, I_C=-10mA	-	120	-	MHz
Collector Output Capacitance	C_{ob}	V_{CB}=-10V, I_E=0, f=1MHz	-	4.0	5.0	pF

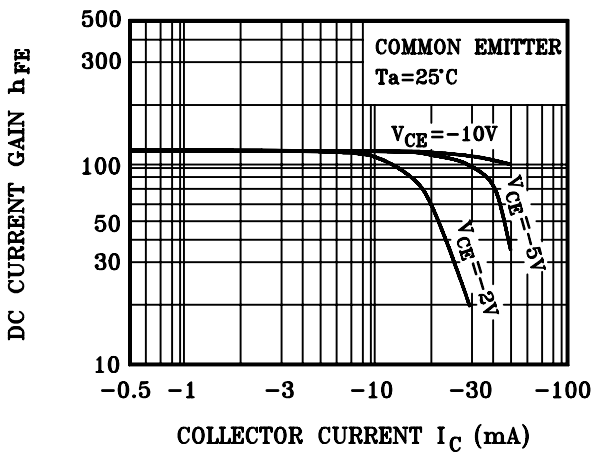
Note : h_{FE} Classification O:70~140, Y:120~240

KTA1024

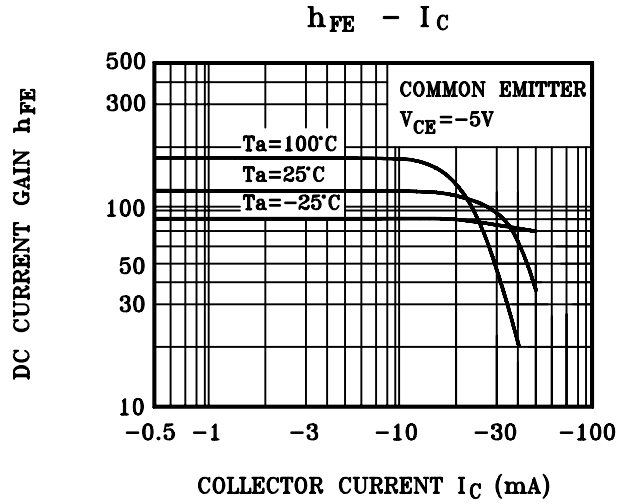
$I_C - V_{CE}$



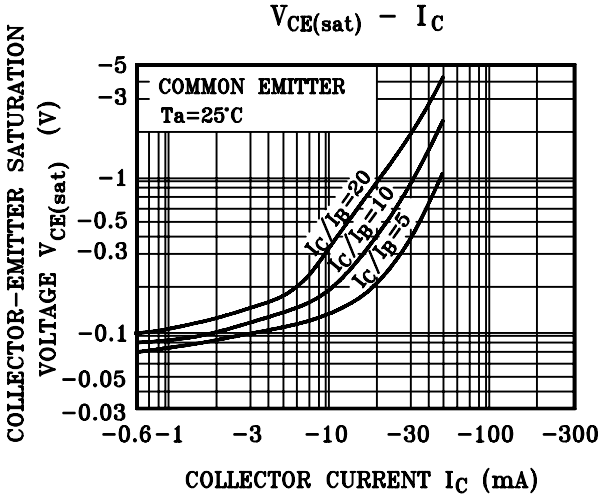
$h_{FE} - I_C$



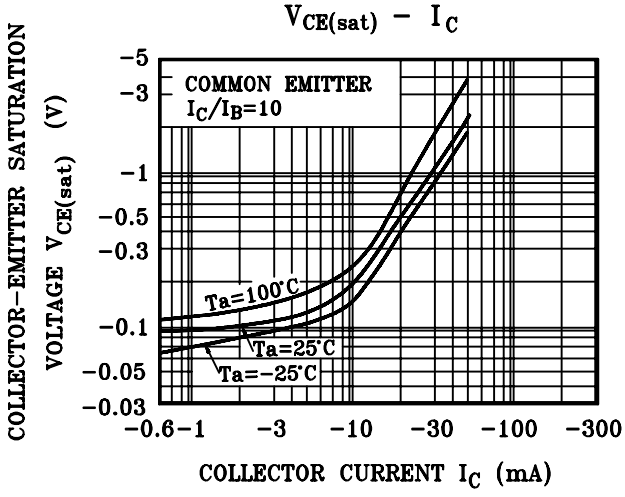
$h_{FE} - I_C$



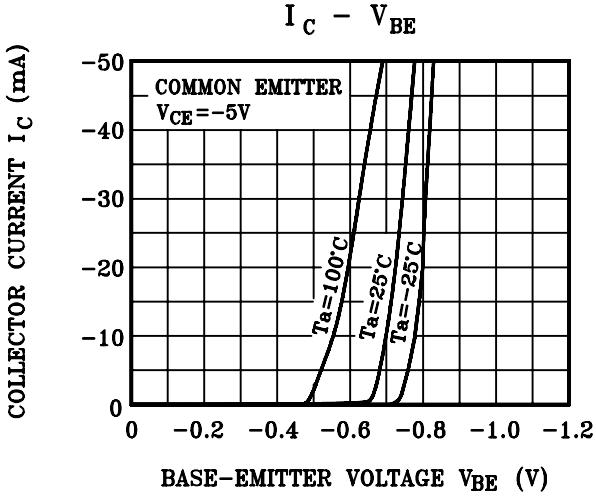
$V_{CE(sat)} - I_C$



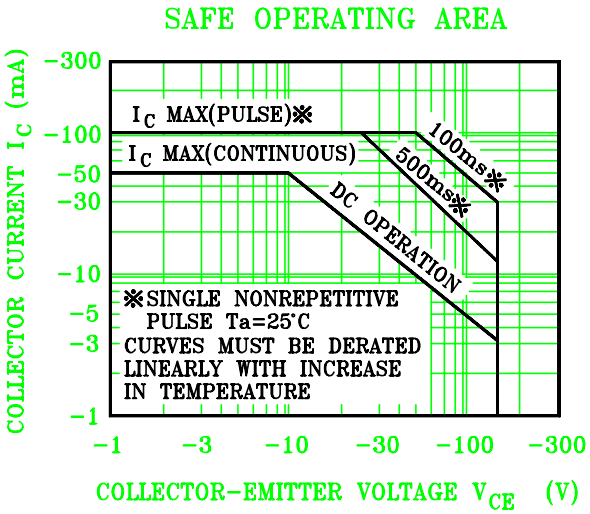
$V_{CE(sat)} - I_C$

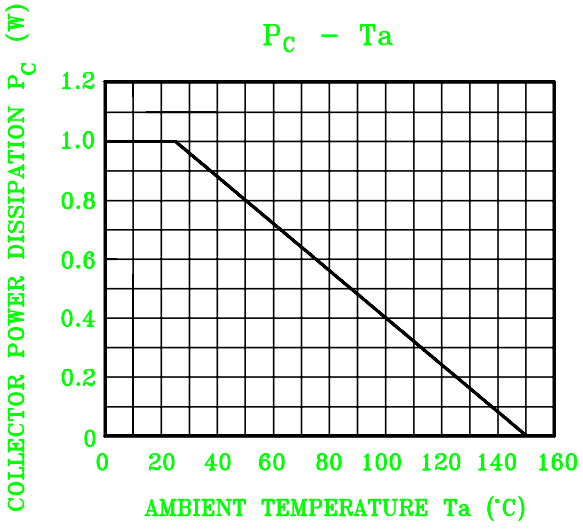


$I_C - V_{BE}$



KTA1024


SAFE OPERATING AREA
COLLECTOR CURRENT I_C (mA)
-300
-100
-50
-30
-10
-5
-3
-1
I_C MAX(PULSE)※
I_C MAX(CONTINUOUS)
100ms※
500ms※
DC OPERATION
※SINGLE NONREPETITIVE
PULSE Ta=25°C
CURVES MUST BE DERATED
LINEARLY WITH INCREASE
IN TEMPERATURE
-1 -3 -10 -30 -100 -300
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

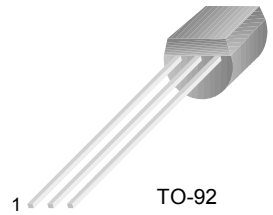

P_C - Ta
COLLECTOR POWER DISSIPATION P_C (W)
1.2
1.0
0.8
0.6
0.4
0.2
0
0 20 40 60 80 100 120 140 160
AMBIENT TEMPERATURE Ta (°C)

FAIRCHILD SEMICONDUCTOR®

KSC1845

Audio Frequency Low Noise Amplifier

- Complement to KSA992



TO-92

1. Emitter 2. Collector 3. Base

NPN Epitaxial Silicon Transistor

Absolute Maximum Ratings T_a=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	120	V
V_{CEO}	Collector-Emitter Voltage	120	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current	50	mA
I_B	Base Current	10	mA
P_C	Collector Power Dissipation	500	mW
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	-55 ~ 150	°C

Electrical Characteristics T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
I_{CBO}	Collector Cut-off Current	V_{CB}=120V, I_E=0			50	nA
I_{EBO}	Emitter Cut-off Current	V_{EB}=5V, I_C=0			50	nA
h_{FE1} h_{FE2}	DC Current Gain	V_{CE}=6V, I_C=0.1mA V_{CE}=6V, I_C=1mA	150 200	580 600	 1200	
V_{BE} (on)	Base-Emitter On Voltage	V_{CE}=6V, I_C=1mA	0.55	0.59	0.65	V
V_{BE} (sat)	Collector-Emitter Saturation Voltage	I_C=10mA, I_B=1mA		0.07	0.3	V
f_T	Current Gain Bandwidth Product	V_{CE}=6V, I_C=1mA	50	110		MHz
C_{ob}	Output Capacitance	V_{CB}=30V, I_E=0, f=1MHz		1.6	2.5	pF
NL	Noise Level			25	40	mV

h_{FE} Classification

Classification	P	F	E	U
h_{FE2}	200 ~ 400	300 ~ 600	400 ~ 800	600 ~ 1200

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Rev. B2, November 2002

Typical Characteristics

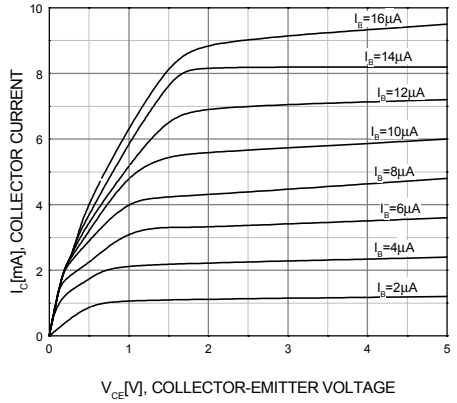


Figure 1. Static Characteristic

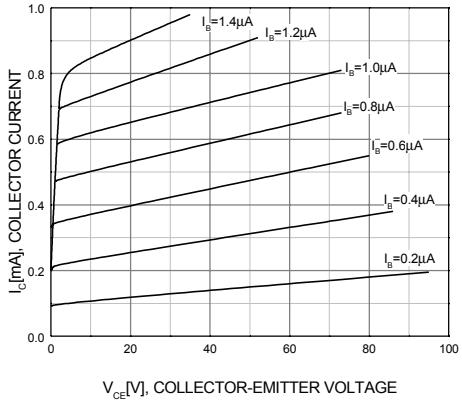


Figure 2. Static Characteristic

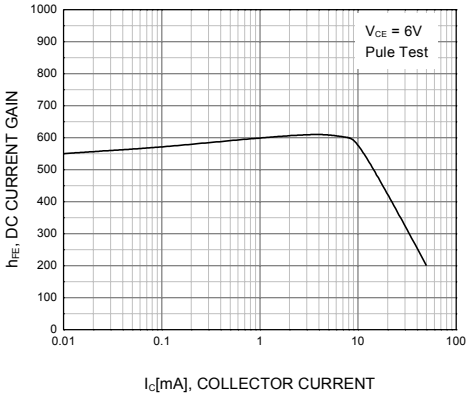


Figure 3. DC current Gain

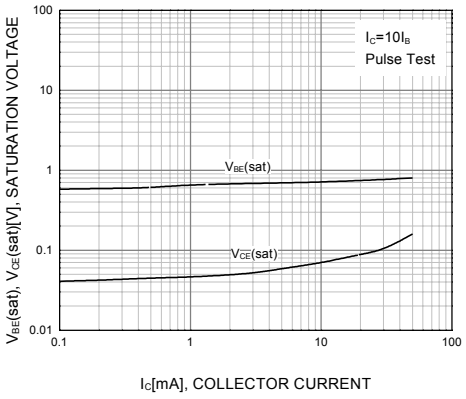


Figure 4. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

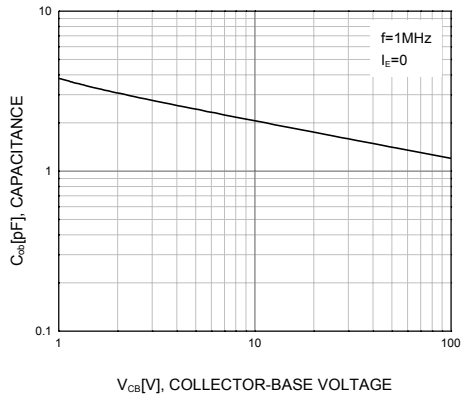


Figure 5. Collector Output Capacitance

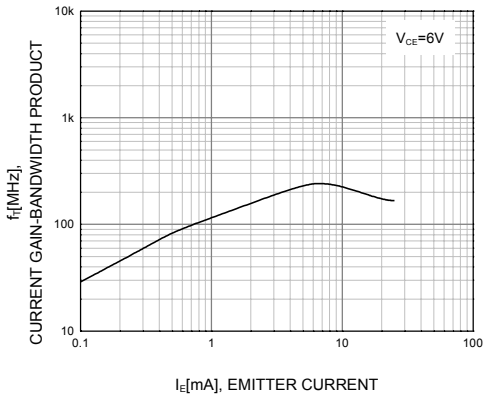


Figure 6. Current Gain Bandwidth Product

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Typical Characteristics (Continued)

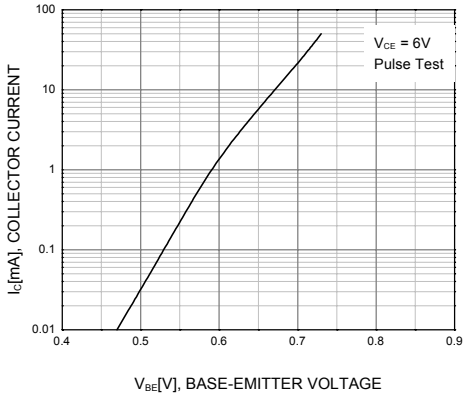


Figure 7. Collector Current vs. Base-Emitter Voltage

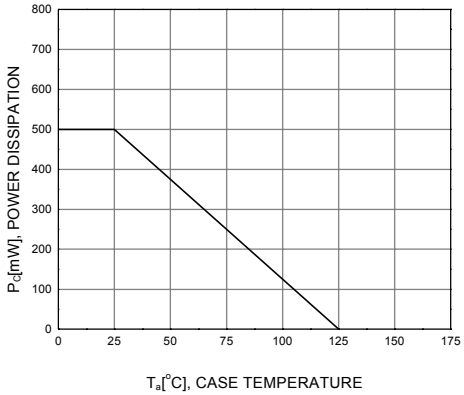


Figure 8. Power Derating

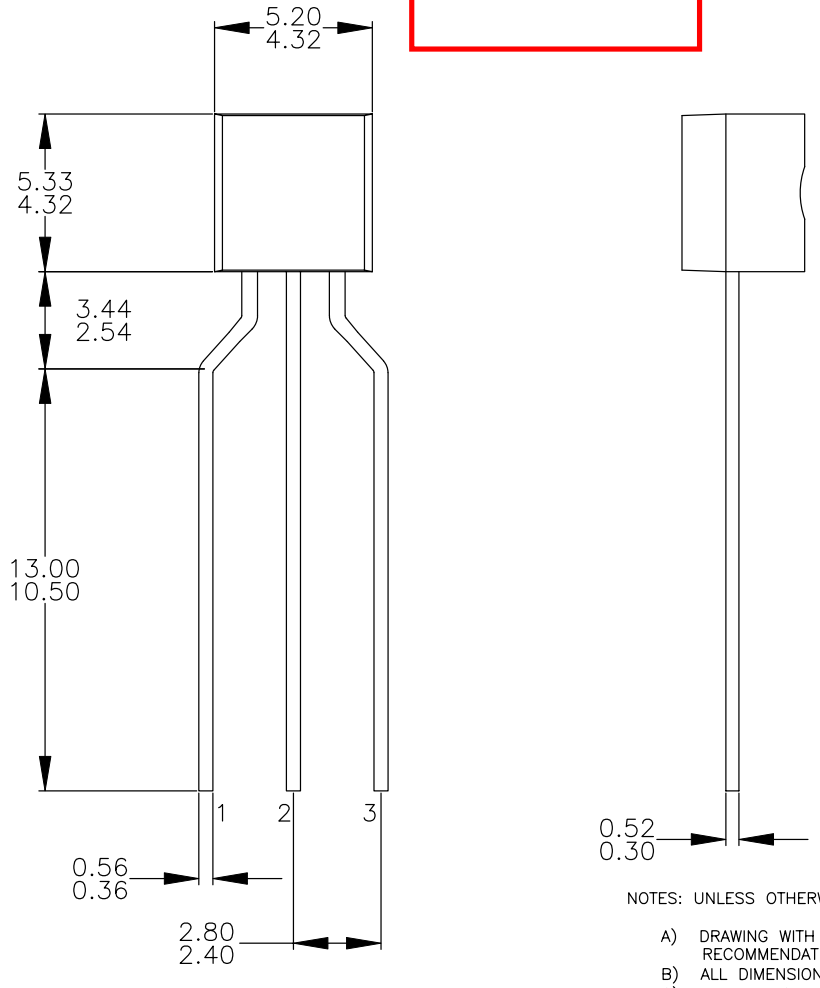
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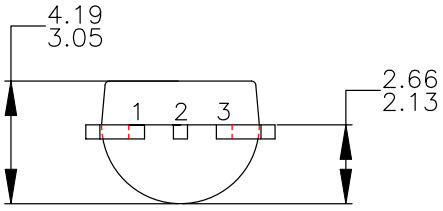
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REVISIONS

NO.	DESCRIPTION	DATE	NAME/SITE
A	RELEASE TO DOCUMENT CONTROL	JUL.5'96	JT/CB
2	RDRW FR NATIONAL TEMPLATE TO STD FSC MKT DWG TEMPLATE; CHG DIM REF FR DUAL DIM INCH[MM] TO SINGLE DIM MM. CHG LD PITCH DIM FR 2.667 TO 2.40; CHG STRAIGHT LD LEN FR 13.00 TO 12.50; CHG MOLD BODY HT FR 4.826 TO 4.32; CHG MOLD BODY WD FR 4.318 TO 4.32; ADD PKG THICKNESS DIM; CHG PKG BOT TO LD SURF DIM FR 2.413 TO 2.54; REMOVE LD SURFACE TO MOLDED SURFACE DIM; REMOVE LAMBAR & EJECTOR PIN LOCATOR FEATURES & DIMS; REMOVE MOLDED SURFACE & DRAFT ANGLE DIMS; ADD BENDED LD OVERALL LEN DIM 44; CHG LD WD FR 0.508 TO 0.52; CHG LD THICKNESS FR 0.483 TO 0.52; ADD NOTES SECTION.	26MAR2008	JC/FSCP

APPROVED
July-14-2008





NOTES: UNLESS OTHERWISE SPECIFIED

A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-1994.
D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	B	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:
P – BIPOLAR E – EMITTER D – DRAIN
F – JFET B – BASE S – SOURCE
M – DMOS C – COLLECTOR G – GATE

E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEAGLE AT JFET "F" OPTION.
F) DRAWING FILENAME: MKT-ZA03FREV2.

APPROVALS	DATE
DRAWN: J.U. COMPARATIVO JR.	01APR2008
CHECKED: L. GALERA	
APPROVED: M.R. GESTOLE	
G.S. BAJE	

PROJECTION INCH [MM]

FAIRCHILD SEMICONDUCTOR™

3LD,TO-92,MOLDED
0.200 IN LINE SPACING
LD FORM(J61Z OPTION)

SCALE	SIZE	DRAWING NUMBER	REV
1:1	N/A	MKT-ZA03F	2

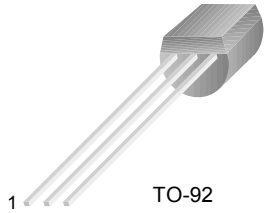
FORMERLY: N/A SHEET : 1 OF 1

FAIRCHILD SEMICONDUCTOR®

KSA992

Audio Frequency Low Noise Amplifier

- Complement to KSC1845



TO-92

1. Emitter 2. Collector 3. Base

PNP Epitaxial Silicon Transistor

Absolute Maximum Ratings T_a=25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{CBO}	Collector-Base Voltage	-120	V
V_{CEO}	Collector-Emitter Voltage	-120	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current	-50	mA
I_B	Base Current	-10	mA
P_C	Collector Power Dissipation	500	mW
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	-55 ~ 150	°C

Electrical Characteristics T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
I_{CBO}	Collector Cut-off Current	V_{CB}= -120V, I_E=0			-50	nA
I_{CEO}	Collector Cur-off Current	V_{CE}= -100V, I_B=0			-1	μA
I_{EBO}	Emitter Cut-off Current	V_{EB}= -5mA, I_C=0			-50	nA
h_{FE1} h_{FE2}	DC Current Gain	V_{CE}= -6V, I_C= -0.1mA V_{CE}= -6V, I_C= -1mA	150 200	500 500	 800	
V_{BE} (on)	Base-Emitter On Voltage	V_{CE}= -6V, I_C= -1mA	-0.55	-0.61	-0.65	V
V_{CE} (sat)	Collector-Emitter Saturation Voltage	I_C= -10mA, I_B= -1mA		-0.09	-0.3	V
f_T	Current Gain Bandwidth Product	V_{CE}= -6V, I_C= -1mA	50	100		MHz
C_{ob}	Output Capacitance	V_{CB}= -30V, I_E=0, f=1MHz		2	3	pF
NV	Noise Voltage	V_{CE} = -5.0V, I_C = -1.0mA, R_G =100KW, G_V = 80dB, f = 10Hz to 1.0KHz		25	40	mV

h_{FE2} Classification

Classification	P	F	E
h_{FE2}	200 ~ 400	300 ~ 600	400 ~ 800

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Rev. B2, August 2004

Typical Characteristics

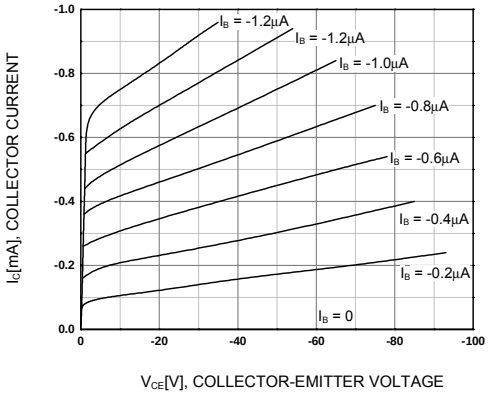


Figure 1. Static Characteristic

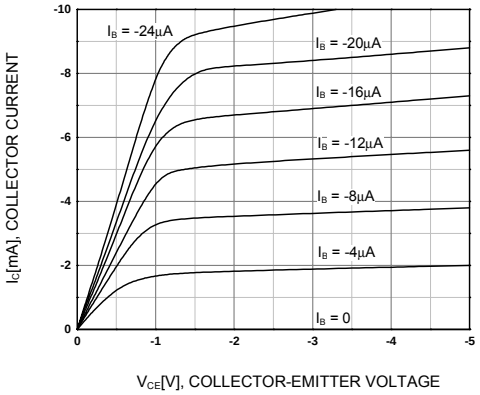


Figure 2. Static Characteristic

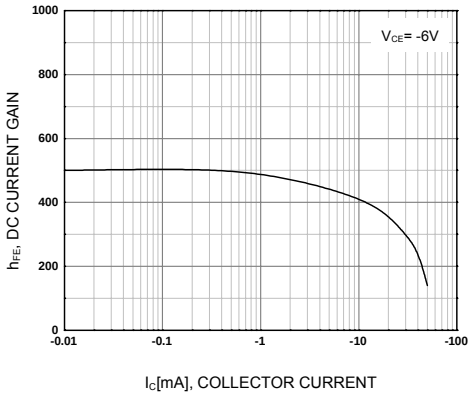


Figure 3. DC current Gain

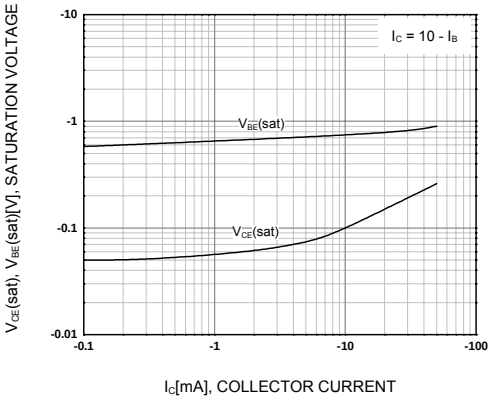


Figure 4. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

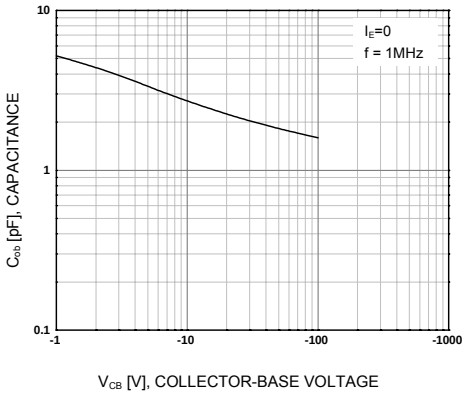


Figure 5. Collector Output Capacitance

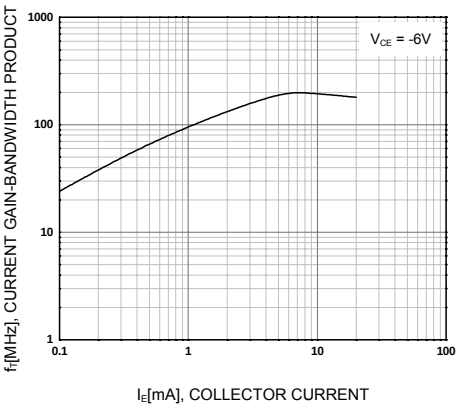


Figure 6. Current Gain Bandwidth Product

©2004 Fairchild Semiconductor Corporation

Typical Characteristics (Continued)

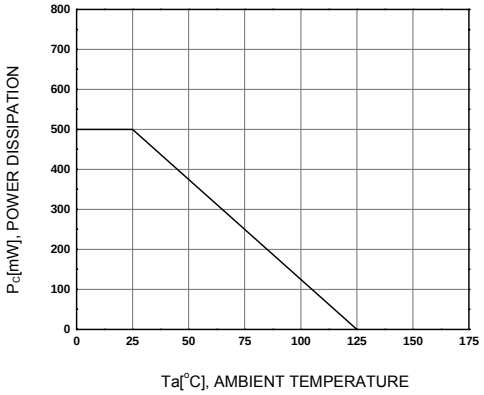


Figure 7. Power Derating

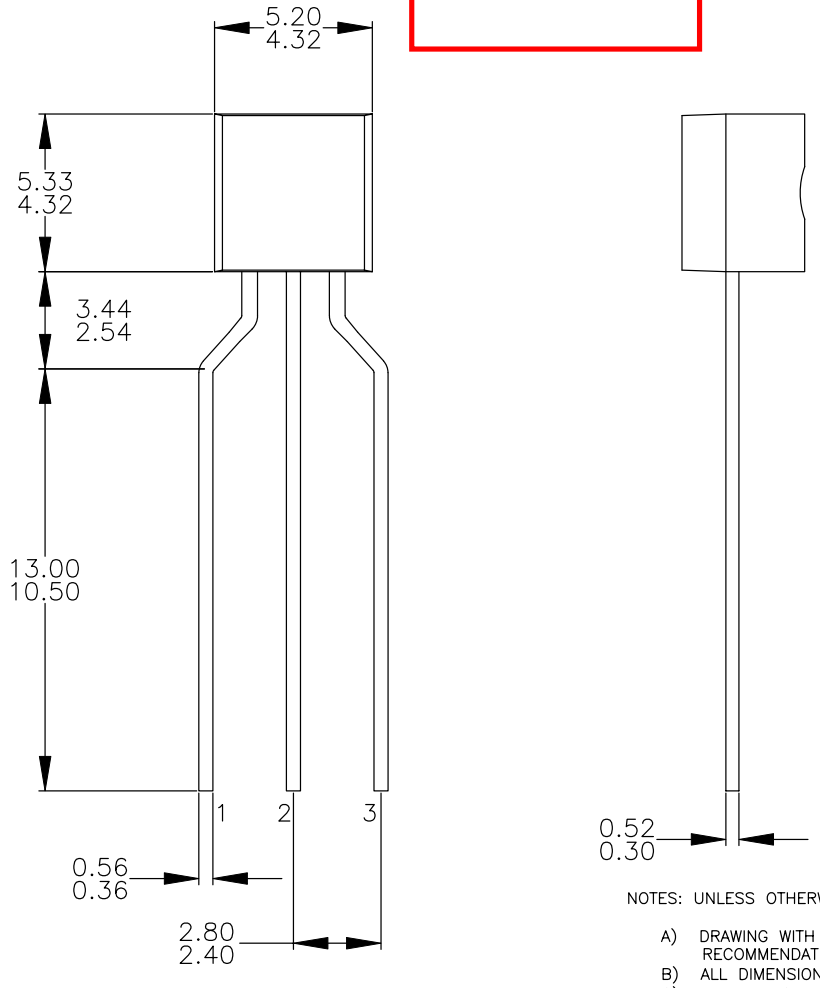
©2004 Fairchild Semiconductor Corporation

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REVISIONS

NO.	DESCRIPTION	DATE	NAME/SITE
A	RELEASE TO DOCUMENT CONTROL	JUL.5'96	JT/CB
2	RDRW FR NATIONAL TEMPLATE TO STD FSC MKT DWG TEMPLATE; CHG DIM REF FR DUAL DIM INCH[MM] TO SINGLE DIM MM. CHG LD PITCH DIM FR 2.667 TO 2.41; TO 2.40; CHG STRAIGHT LD LEN FR 13.97 TO 12.70; TO 12.50; CHG MOLD BODY HT FR 4.826 TO 4.318 TO 4.32; CHG MOLD BODY WD FR 4.826 TO 4.318 TO 4.32; ADD PKG THICKNESS DIM; CHG PKG BOT TO LD SURF DIM FR 2.413 TO 2.15 TO 2.16; REMOVE LD SURFACE TO MOLDED SURFACE DIM; REMOVE LAMBAR & EJECTOR PIN LOCATOR FEATURES & DIMS; REMOVE MOLDED SURFACE & DRAFT ANGLE DIMS; ADD BENDED LD OVERALL LEN DIM 44; CHG LD WD FR 0.508 TO 0.56; TO 0.52; CHG LD THICKNESS FR 0.483 TO 0.56; TO 0.53; ADD NOTES SECTION.	26MAR2008	JC/FSCP

APPROVED
July-14-2008

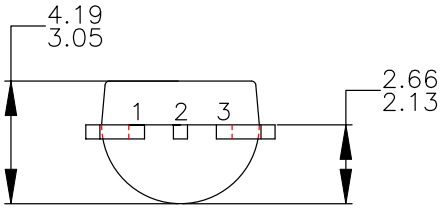


NOTES: UNLESS OTHERWISE SPECIFIED

A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-1994.
D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	B	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:
P – BIPOLAR
F – JFET
M – DMOS
E – EMITTER
B – BASE
C – COLLECTOR
D – DRAIN
S – SOURCE
G – GATE



E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEAGLE AT JFET "F" OPTION.
F) DRAWING FILENAME: MKT-ZA03FREV2.

APPROVALS	DATE
DRAWN: J.U. COMPARATIVO JR.	01APR2008
CHECKED: L. GALERA	
APPROVED: M.R. GESTOLE	
G.S. BAJE	

PROJECTION INCH [MM]

FAIRCHILD SEMICONDUCTOR™

3LD,TO-92,MOLDED
0.200 IN LINE SPACING
LD FORM(J61Z OPTION)

SCALE	SIZE	DRAWING NUMBER	REV
1:1	N/A	MKT-ZA03F	2

FORMERLY: N/A SHEET : 1 OF 1

INC2001AX SERIES

FOR MUTING APPLICATION
SILICON NPN EPITAXIAL TYPE

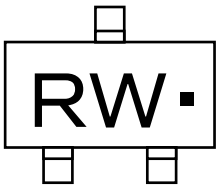
FEATURE

- Small package for easy mounting.
- High reverse h_{FE}
- Small collector to emitter saturation voltage.
  $V_{CE(sat)}$=40mV$_{(TYP.)}$ (@I_C=50mA/I_B=2.5mA)
- Low On-Resistance
  R_{ON}=0.65Ω$_{(TYP.)}$ (@I_B=5mA)

APPLICATION

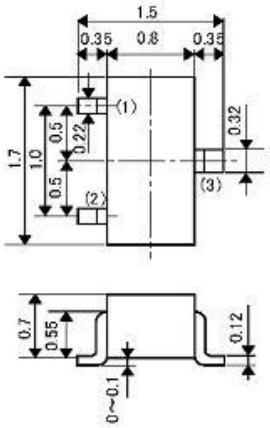
muting circuit , switching circuit

MARKING



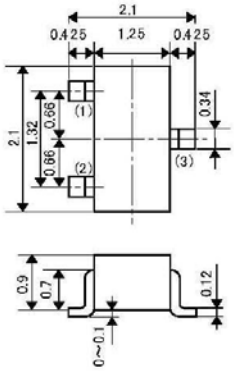
OUTLINE DRAWING (Unit : mm)

INC2001AU1



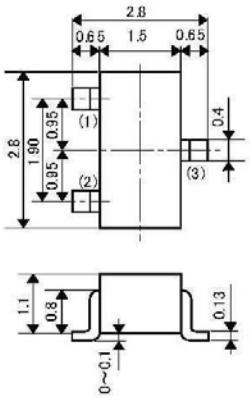
JEITA : SC-75A
JEDEC : —
TERMINAL CONNECTOR
①:BASE
②:EMITTER
③:COLLECTOR

INC2001AM1



JEITA : SC-70
JEDEC : —
TERMINAL CONNECTOR
①:BASE
②:EMITTER
③:COLLECTOR

INC2001AC1



JEITA : SC-59
JEDEC : Similar to TO-236
TERMINAL CONNECTOR
①:BASE
②:EMITTER
③:COLLECTOR

INC2001AX SERIES

FOR MUTING APPLICATION
SILICON NPN EPITAXIAL TYPE

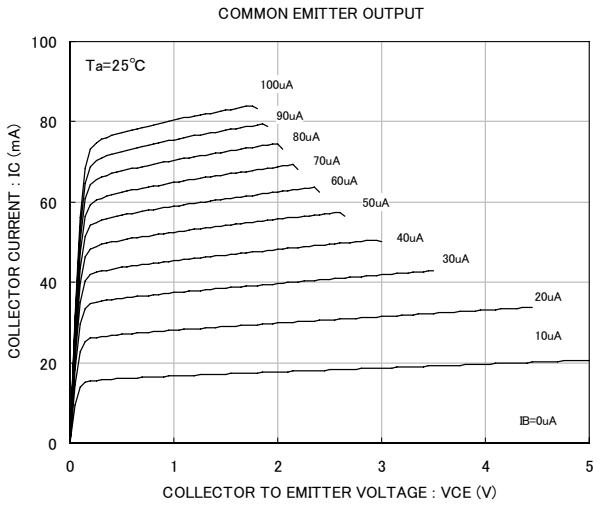
MAXIMUM RATING (Ta=25℃)

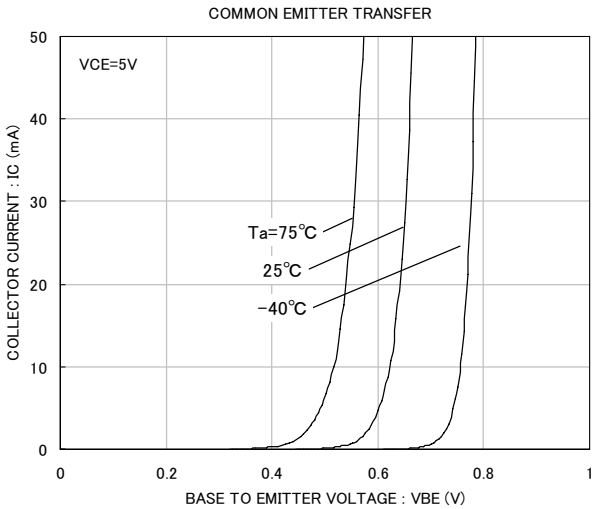
SYMBOL	PARAMETER	RATING			UNIT
		INC2001AU1	INC2001AM1	INC2001AC1	
V_{CBO}	Collector to Base voltage	40			V
V_{EBO}	Emitter to Base voltage	40			V
V_{CEO}	Collector to Emitter voltage	20			V
I_C	Collector current	600			mA
P_C	Collector dissipation	150	200		mW
T_j	Junction temperature	+150			℃
T_{stg}	Storage temperature	−55～+150			℃

ELECTRICAL CHARACTERISTICS (Ta=25℃)

SYMBOL	PARAMETER	TEST CONDITION	LIMIT			UNIT
			MIN	TYP	MAX	
$V_{(BR)CBO}$	C to B break down voltage	I_C=50μA, I_E=0mA	40	−	−	V
$V_{(BR)EBO}$	E to B break down voltage	I_E=50μA, I_C=0mA	40	−	−	V
$V_{(BR)CEO}$	C to E break down voltage	I_C=1mA, R_{BE}=∞	20	−	−	V
I_{CBO}	Collector cut off current	V_{CB}=40V, I_E=0mA	−	−	0.5	μA
I_{EBO}	Emitter cut off current	V_{EB}=40V, I_C=0mA	−	−	0.5	μA
h_{FE}	DC forward current gain	V_{CE}=5V, I_C=10mA	820	−	2500	—
$V_{CE(sat)}$	C to E saturation voltage	I_C=50mA, I_B=2.5mA	−	40	150	mV
f_T	Gain band width product	V_{CE}=10V, I_E=−10mA, f=100MHz	−	50	−	MHz
C_{ob}	Collector output capacitance	V_{CB}=10V, I_E=0A, f=1MHz	−	5.0	−	pF
R_{ON}	Output “ON” resistance	I_B=5mA, R_L=1kΩ	−	0.65	−	Ω

TYPICAL CHARACTERISTICS

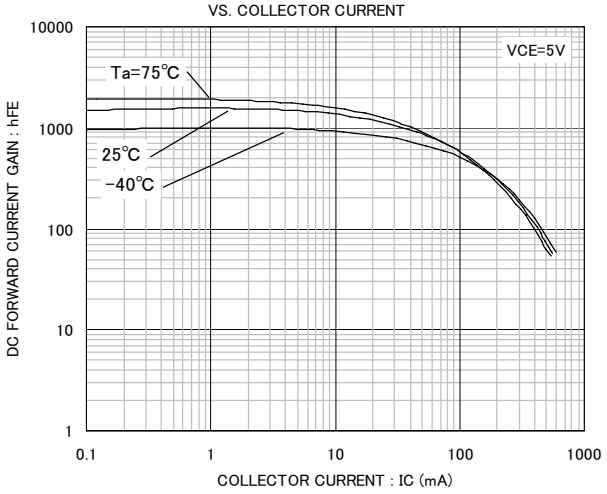




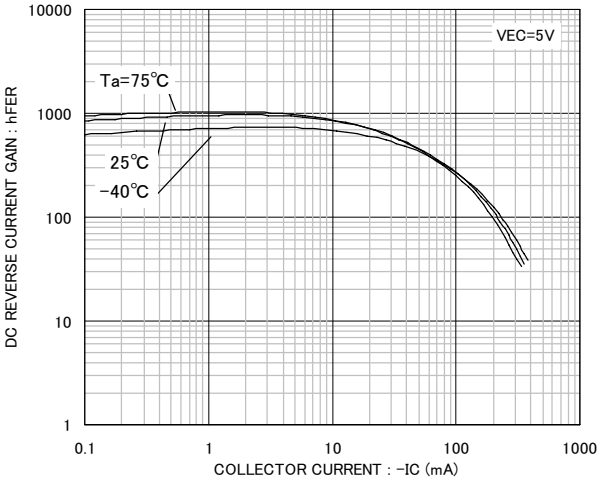
INC2001AX SERIES

FOR MUTING APPLICATION
SILICON NPN EPITAXIAL TYPE

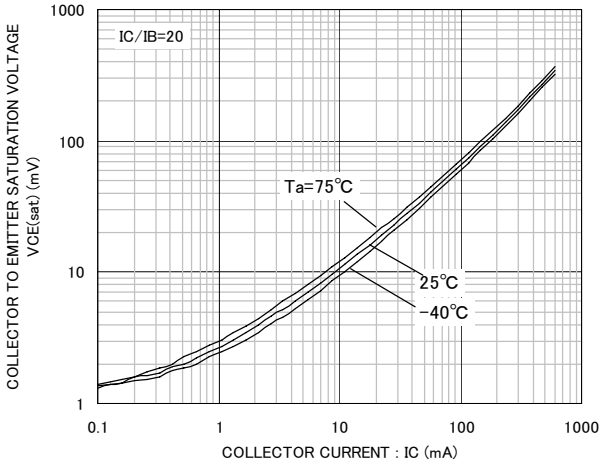
DC FORWARD CURRENT GAIN
VS. COLLECTOR CURRENT



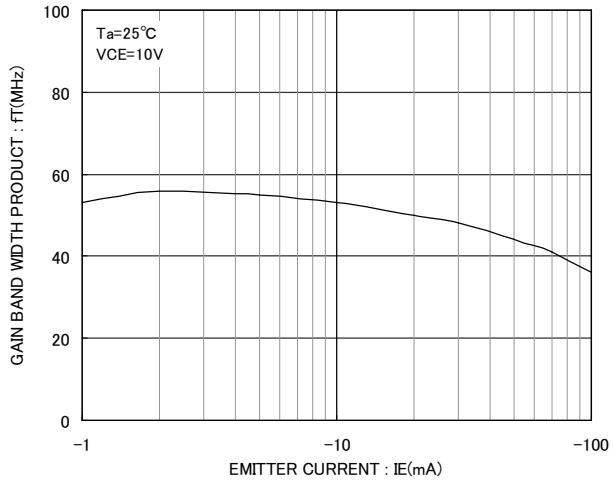
DC REVERSE CURRENT GAIN VS. COLLERCTOR CURRENT



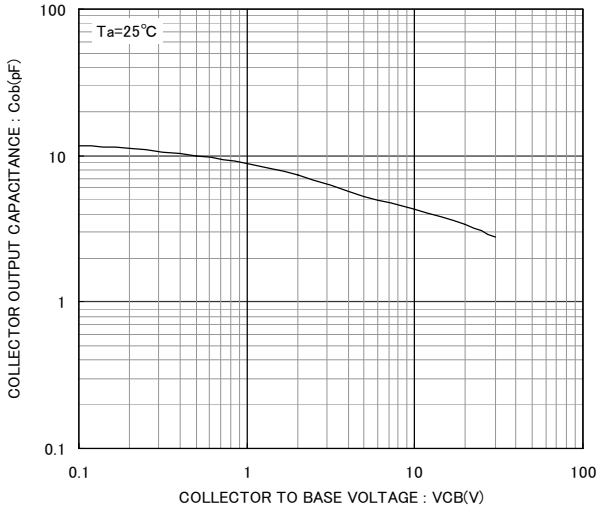
COLLECTOR TO EMITTER SATURATION VOLTAGE
VS. COLLECTOR CURRENT



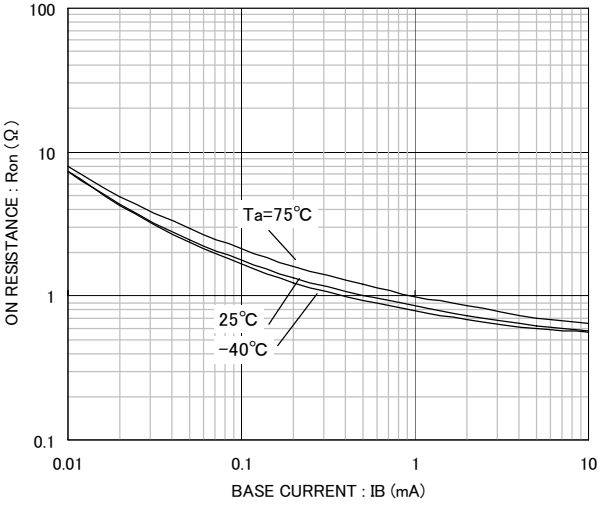
GAIN BAND WIDTH PRODUCT
VS. EMITTER CURRENT



COLLECTOR OUTPUT CAPACITANCE
VS. COLLECTOR TO BASE VOLTAGE

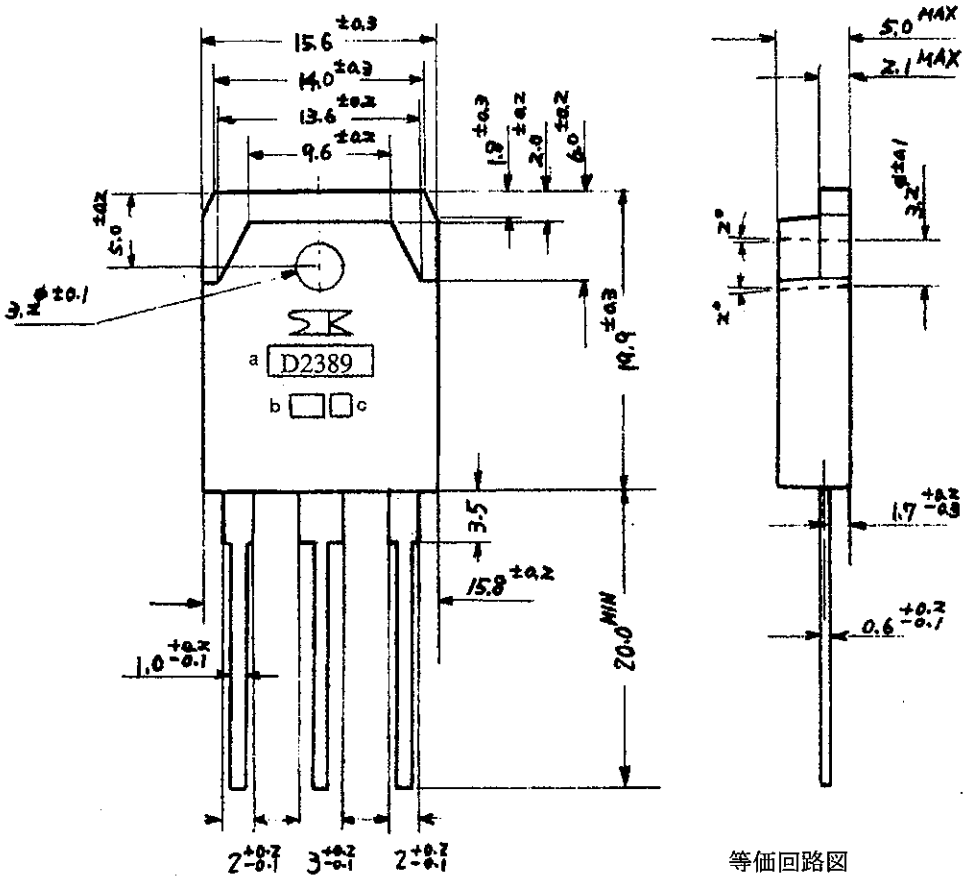


ON RESISTANCE VS. BASE CURRENT

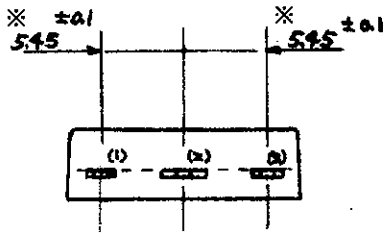


4 外形（リードフォーミング No.100）
Package information(Lead forming No.100)

4-1 外形、寸法および材質
Package type, physical dimensions and material



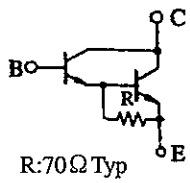
(1) ベース
Base
(2) コレクタ
Collector
(3) エミッタ
Emitter



<注> ※印寸法は、リード根元部の寸法を示す。
<Note> ※shows the dimensions measured at the bottom of lead.

リード端子 Lead terminal	Cu	Ni メッキ・半田ディップ処理 Ni plating, solder dip treatment
ヒートシンク Heat sink	Cu	Ni メッキ Ni plating
名　称 Description	材　質 Material	仕　様 Specification

等価回路図
Equivalent circuit



R:70Ω Typ

a. 品名標示
Type Number
b. ロット番号
Lot Number
第１文字 西暦年号下一桁
1st letter The last digit of year
第二文字 月
2nd letter Month
1～9 月 ： アラビア数字
10 月 ：O
11 月 ：N
12 月 ：D
(1 to 9 for Jan. to Sept.,
O for Oct. N for Nov. D for Dec.)
c. h_{FE} ランク
h_{FE} rank

単位：mm
Dimensions in mm
図番 DWG No.:TG3A-0101

4-2 外観
Appearance

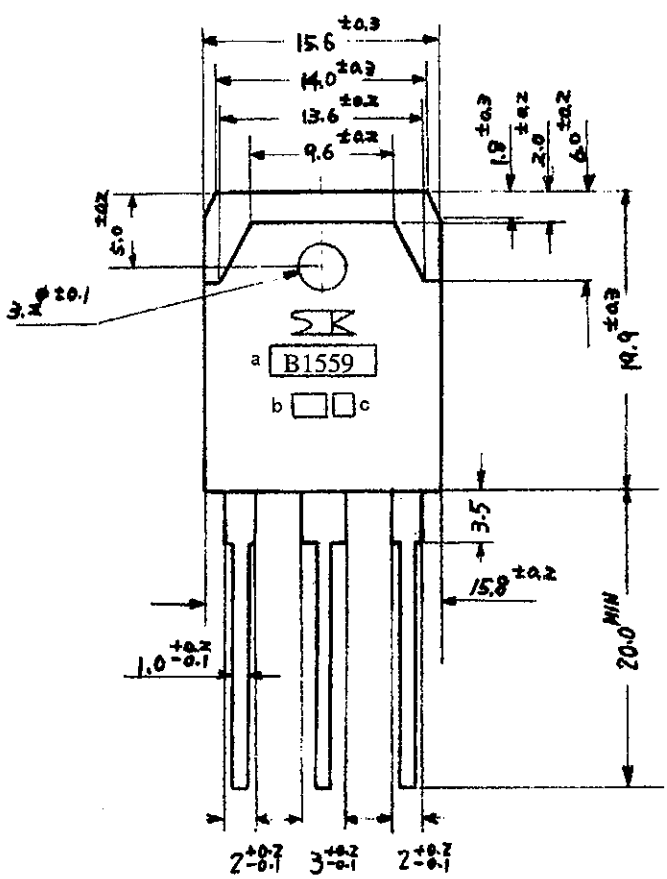
本体は、汚れ、傷、亀裂等なく綺麗であること。
The body shall be clean and shall not bear any stain, rust or flaw.

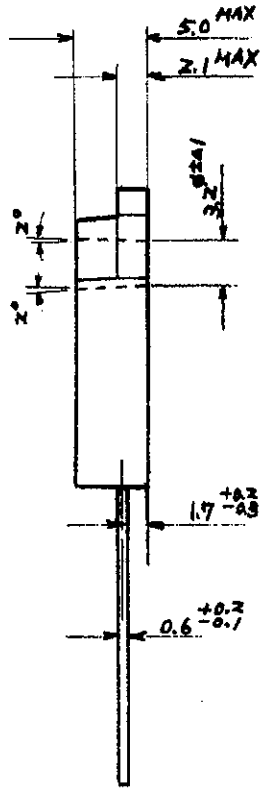
4-3 標示
Marking

本体に明瞭に品名、ロット番号を容易に消えぬよう白色で捺印すること。
The type number and lot number shall be clearly marked in white.

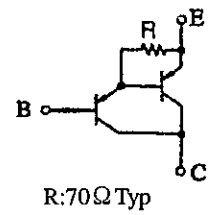
5 外形（リードフォーミング No.100）
Package information(Lead forming No.100)

5-1 外形、寸法および材質
Package type, physical dimensions and material



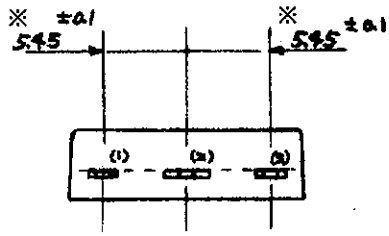


等価回路図
Equivalent circuit



R:70Ω Typ

(1) ベース
Base
(2) コレクタ
Collector
(3) エミッタ
Emitter



<注> ※印寸法は、リード根元部の寸法を示す。
<Note> ※shows the dimensions measured at the bottom of lead.

名　称 Description	材　質 Material	仕　様 Specification
リード端子 Lead terminal	Cu	Ni メッキ・半田ディップ処理 Ni plating, solder dip treatment
ヒートシンク Heat sink	Cu	Ni メッキ Ni plating

a. 品名標示
Type Number
b. ロット番号
Lot Number
第１文字 西暦年号下一桁
1st letter The last digit of year
第二文字 月
2nd letter Month
1～9 月 ：アラビア数字
10 月 ：O
11 月 ：N
12 月 ：D
(1 to 9 for Jan. to Sept.,
O for Oct. N for Nov. D for Dec.)
c. h_{FE} ランク
h_{FE} rank

5-2 外観
Appearance
本体は、汚れ、傷、亀裂等なく綺麗であること。
The body shall be clean and shall not bear any stain, rust or flaw.

単位：mm
Dimensions in mm
図番 DWG No.:TG3A-0101

5-3 標示
Marking
本体に明瞭に品名、ロット番号を容易に消えぬよう白色で捺印すること。
The type number and lot number shall be clearly marked in white.

RT1P141X SERIES

〈Transistor〉

Transistor With Resistor
For Switching Application
Silicon PNP Epitaxial Type

DESCRIPTION

RT1P141X is a one chip transistor with built-in bias resistor,NPN type is RT1N141X.

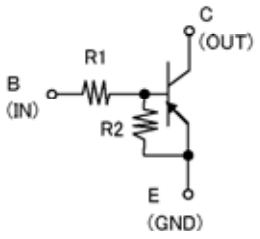
FEATURE

・Built-in bias resistor (R1=10kΩ,R2=10kΩ).

APPLICATION

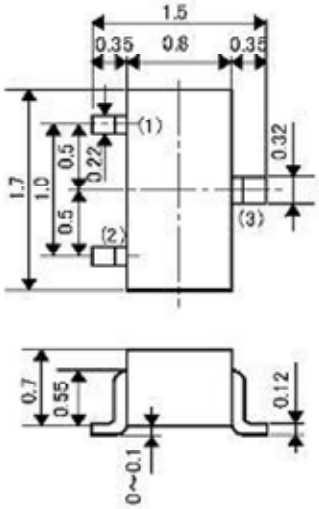
Inverted circuit,switching circuit,interface circuit, driver circuit.

Equivalent circuit



OUTLINE DRAWING UNIT:mm

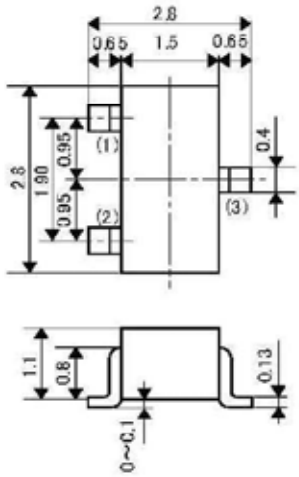
RT1P141U



JEITA:—
JEDEC:—

Terminal Connector
①:Base
②:Emitter
③:Collector

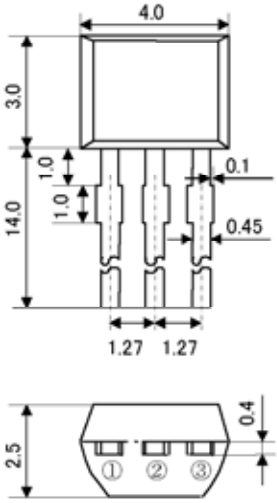
RT1P141C



JEITA:SC-59
JEDEC:Similar to TO-236

Terminal Connector
①:Base
②:Emitter
③:Collector

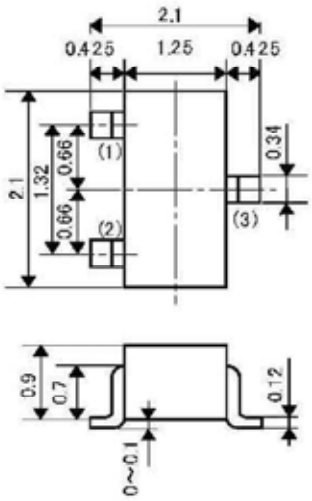
RT1P141S



JEITA:—
JEDEC:—

①:Emitter
②:Collector
③:Base

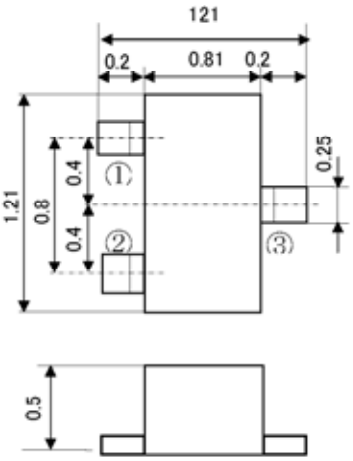
RT1P141M



JEITA:SC-70
JEDEC:—

Terminal Connector
①:Base
②:Emitter
③:Collector

RT1P141T2



JEITA,JEDEC:—
ISAHAYA:T-USM

Terminal Connector
①:Base
②:Emitter
③:Collector

RT1N441X SERIES

〈Transistor〉

Transistor With Resistor
For Switching Application
Silicon NPN Epitaxial Type

DESCRIPTION

RT1N441X is a one chip transistor with built-in bias resistor,PNP type is RT1P441X.

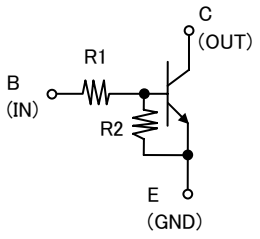
FEATURE

・Built-in bias resistor (R1=47kΩ,R2=47kΩ).

APPLICATION

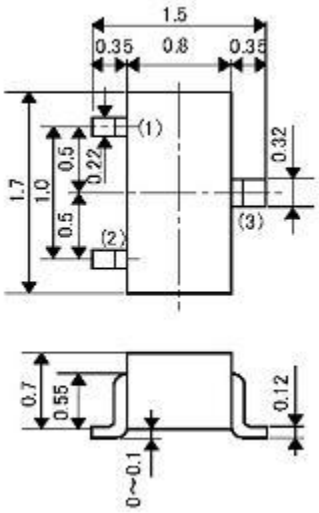
Inverted circuit,switching circuit,interface circuit, driver circuit.

Equivalent circuit



OUTLINE DRAWING UNIT : mm

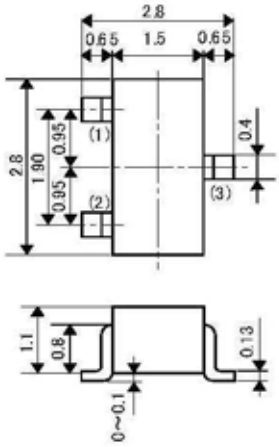
RT1N441U



JEITA : —
JEDEC : —

Terminal Connector
①:Base
②:Emitter
③:Collector

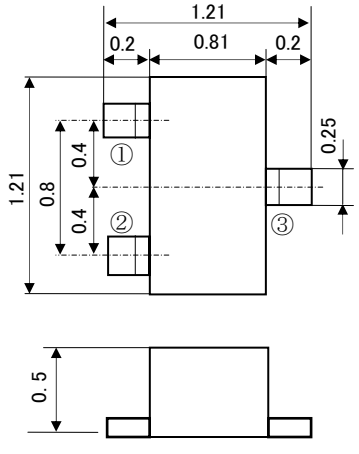
RT1N441C



JEITA : SC-59
JEDEC : Similar to TO-236

Terminal Connector
①:Base
②:Emitter
③:Collector

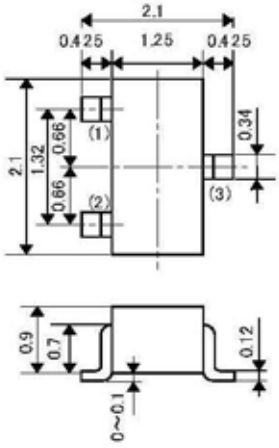
RT1N441T2



JEITA、JEDEC : –
ISAHAYA : T-USM

Terminal Connector
①:Base
②:Emitter
③:Collector

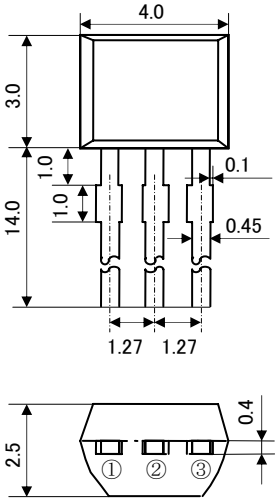
RT1N441M



JEITA : SC-70
JEDEC : —

Terminal Connector
①:Base
②:Emitter
③:Collector

RT1N441S



JEITA : —
JEDEC : —

Terminal Connector
①:Emitter
②:Collector
③:Base

RT1N241X SERIES

〈Transistor〉

Transistor With Resistor

For Switching Application

Silicon NPN Epitaxial Type

DESCRIPTION

RT1N241X is a one chip transistor with built-in bias resistor,PNP type is RT1P241X.

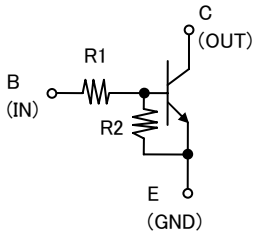
FEATURE

・Built-in bias resistor (R1=22kΩ,R2=22kΩ).

APPLICATION

Inverted circuit,switching circuit,interface circuit, driver circuit.

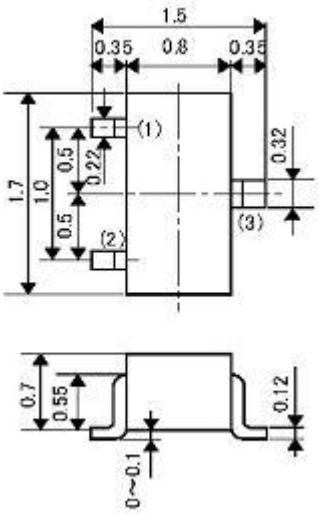
Equivalent circuit



OUTLINE DRAWING

UNIT : mm

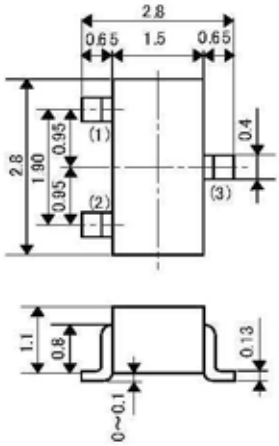
RT1N241U



JEITA : —
JEDEC : —

Terminal Connector
①:Base
②:Emitter
③:Collector

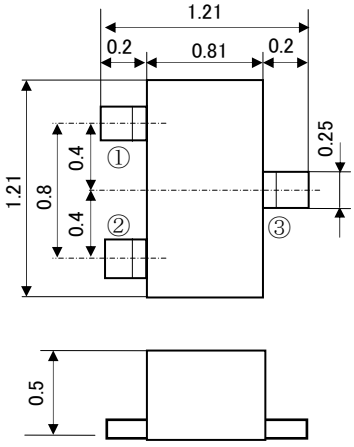
RT1N241C



JEITA : SC-59
JEDEC : Similar to TO-236

Terminal Connector
①:Base
②:Emitter
③:Collector

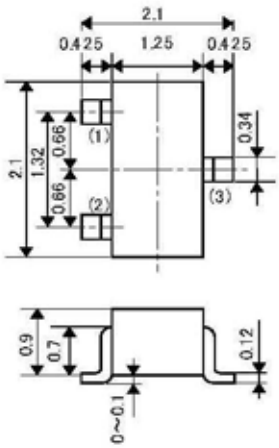
RT1N241T2



JEITA, JEDEC : —
ISAHAYA : T-USM

Terminal Connector
①:Base
②:Emitter
③:Collector

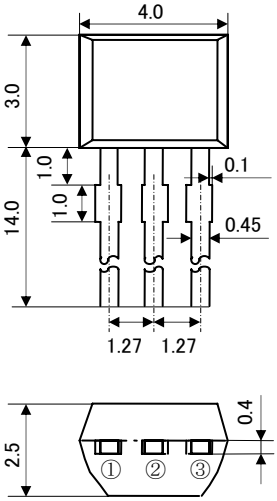
RT1N241M



JEITA : SC-70
JEDEC : —

Terminal Connector
①:Base
②:Emitter
③:Collector

RT1N241S



JEITA : —
JEDEC : —

Terminal Connector
①:Emitter
②:Collector
③:Base

RT1N144X SERIES

〈Transistor〉

Transistor With Resistor
For Switching Application
Silicon NPN Epitaxial Type

DESCRIPTION

RT1N144X is a one chip transistor with built-in bias resistor,PNP type is RT1P144X.

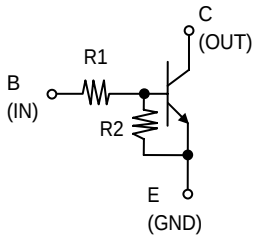
FEATURE

•Built-in bias resistor (R1=10kΩ,R2=47kΩ).

APPLICATION

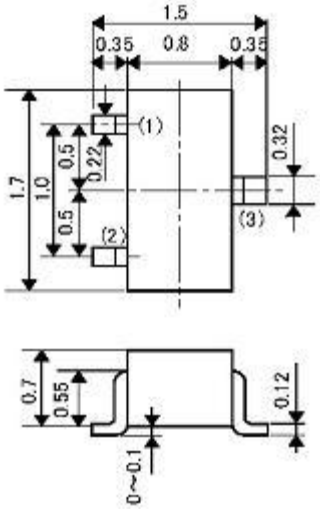
Inverted circuit,switching circuit,interface circuit, driver circuit.

Equivalent circuit



OUTLINE DRAWING UNIT :mm

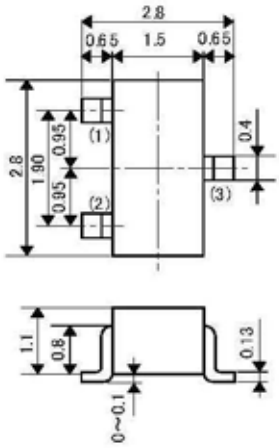
RT1N144U



JEITA :—
JEDEC :—

Terminal Connector
① :Base
② :Emitter
③ :Collector

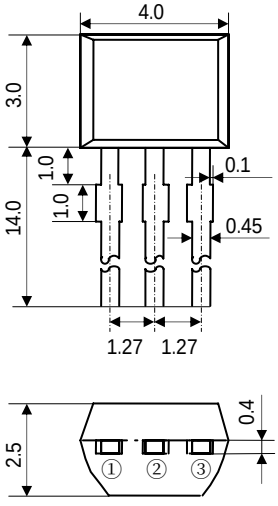
RT1N144C



JEITA :SC-59
JEDEC :Similar to TO-236

Terminal Connector
① :Base
② :Emitter
③ :Collector

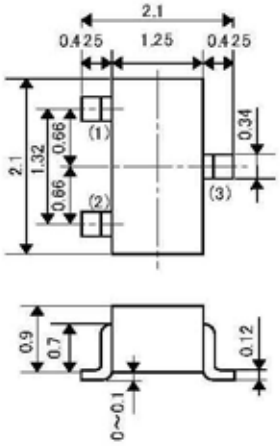
RT1N144S



JEITA :—
JEDEC :—

Terminal Connector
① :Emitter
② :Collector
③ :Base

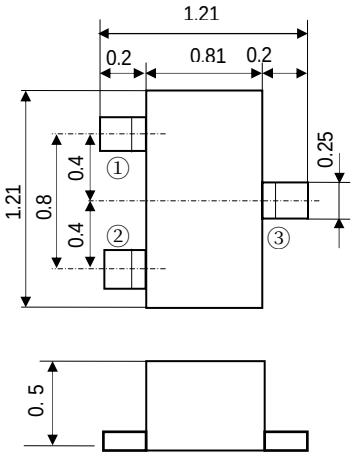
RT1N144M



JEITA :SC-70
JEDEC :—

Terminal Connector
① :Base
② :Emitter
③ :Collector

RT1N144T2



JEITA :—, JEDEC :—
ISAHAYA :T-USM

Terminal Connector
① :Base
② :Emitter
③ :Collector

RT1N144X SERIES

〈Transistor〉

Transistor With Resistor

For Switching Application

Silicon NPN Epitaxial Type

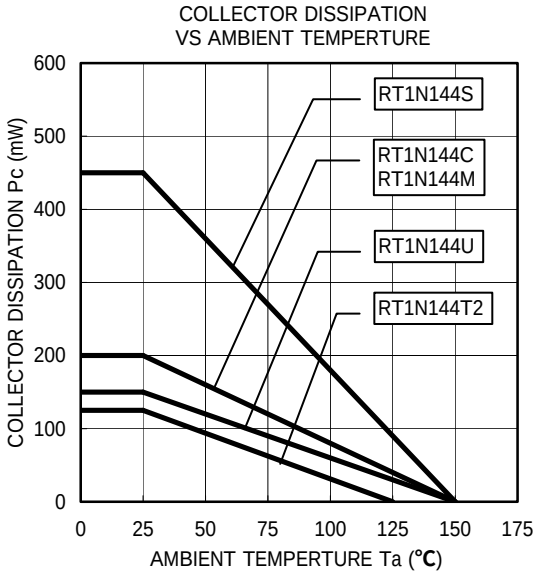
MAXIMUM RATING (Ta=25℃)

SYMBOL	PARAMETER	RATING					UNIT
		RT1N144T2	RT1N144U	RT1N144M	RT1N144C	RT1N144S	
V_{CBO}	Collector to Base voltage	50					V
V_{EBO}	Emitter to Base voltage	6					V
V_{CEO}	Collector to Emitter voltage	50					V
I_C	Collector current	100					mA
I_{CM}	Peak Collector current	200					mA
P_C	Collector dissipation(Ta=25℃)	125 (※)	150	200		450	mW
Tj	Junction temperature	+125	+150				℃
Tstg	Storage temperature	-55～+125	-55～+150				℃

(※) package mounted on 9mm×19mm×1mm glass-epoxy substrate.

ELECTRICAL CHARACTERISTICS (Ta=25℃)

SYMBOL	PARAMETER	TEST CONDITION	LIMIT			UNIT
			MIN	TYP	MAX	
$V_{(BR)CEO}$	C to E break down voltage	I_C=100μA, R_{BE}=∞	50			V
I_{CBO}	Collector cut off current	V_{CB}=50V, I_E=0			0.1	μA
h_{FE}	DC forward current gain	V_{CE}=5V, I_C=5mA	50			—
$V_{CE(sat)}$	C to E saturation voltage	I_C=10mA, I_B=0.5mA		0.1	0.3	V
$V_{I(ON)}$	Input on voltage	V_{CE}=0.2V, I_C=5mA		1.0	1.8	V
$V_{I(OFF)}$	Input off voltage	V_{CE}=5V, I_C=100μA	0.4	0.7		V
R_1	Input resistance		7.0	10	13	kΩ
R_2/R_1	Resistance ratio		4.2	4.7	5.1	
f_t	Gain band width product	V_{CE}=6V, I_E=-10mA		200		MHz



RT1N144X SERIES

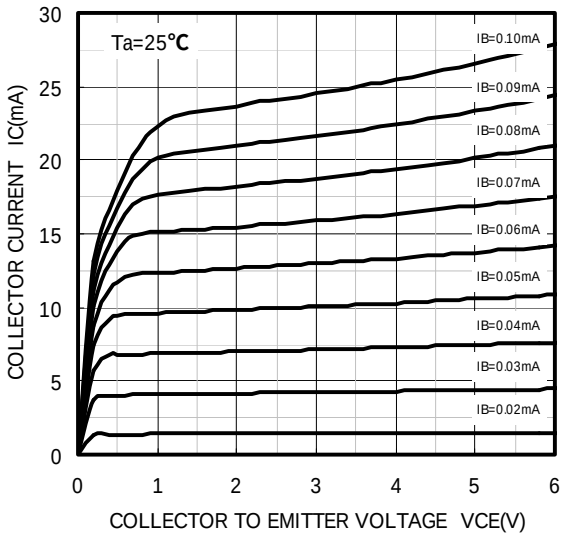
〈Transistor〉

Transistor With Resistor

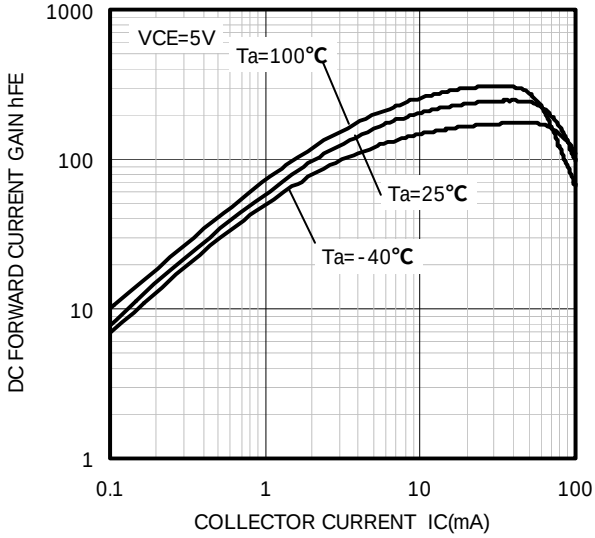
For Switching Application

Silicon NPN Epitaxial Type

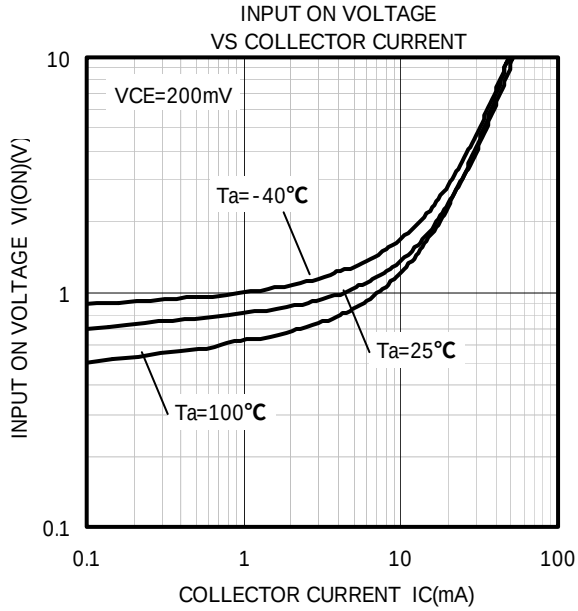
COMMON EMITTER OUTPUT



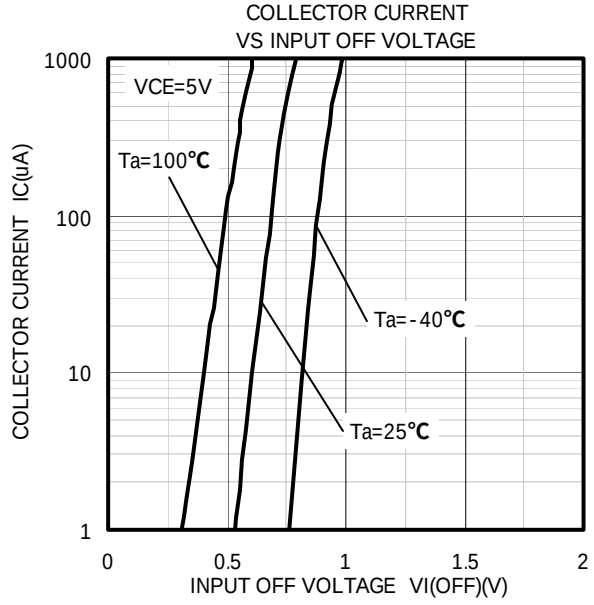
DC FORWARD CURRENT GAIN VS COLLECTOR CURRENT



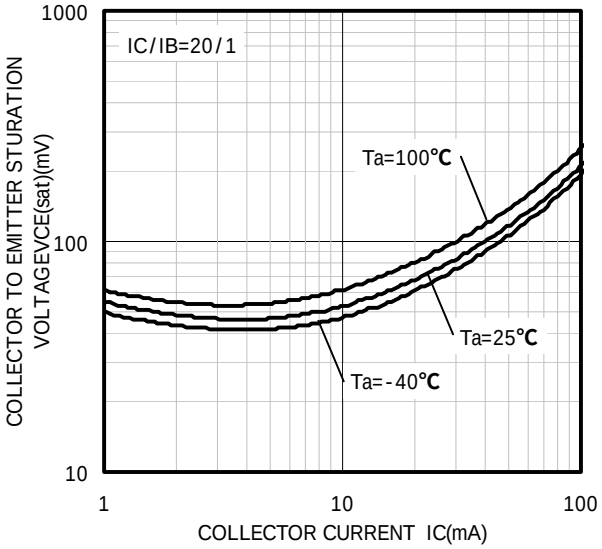
INPUT ON VOLTAGE VS COLLECTOR CURRENT



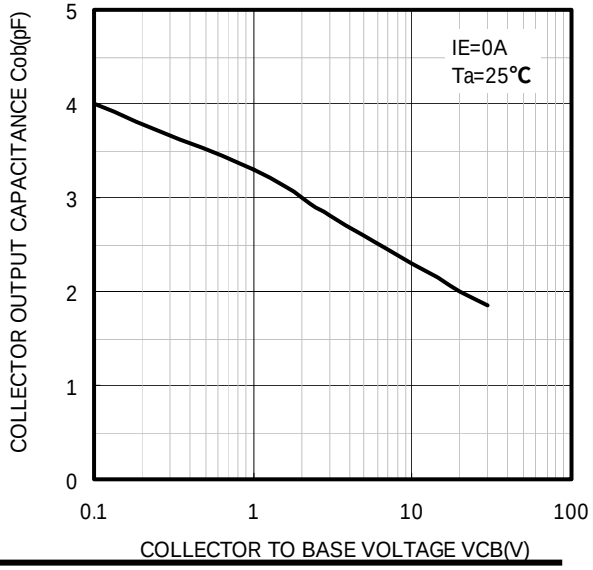
COLLECTOR CURRENT VS INPUT OFF VOLTAGE



COLLECTOR TO EMITTER SATURATION VOLTAGE VS. COLLECTOR CURRENT

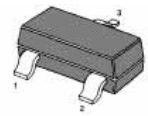


COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



SPECIFICATION OF MMBT5551

NPN Silicon Epitaxial Planar Transistors
for high voltage amplifier applications.



1. Base 2. Emitter 3. Collector

SOT-23 Plastic Package

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Emitter Voltage	V_{CEO}	160	V
Collector Base Voltage	V_{CBO}	180	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	600	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	-55 to +150	°C

Characteristics at T_{amb}=25 °C

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at V_{CE}=5V, I_C=1mA at V_{CE}=5V, I_C=10mA at V_{CE}=5V, I_C=50mA	 h_{FE} h_{FE} h_{FE}	 80 80 30	 - 250 -	 - - -
Collector Emitter Breakdown Voltage at I_C=1mA	$V_{(BR)CEO}$	160	-	V
Collector Base Breakdown Voltage at I_C=100µA	$V_{(BR)CBO}$	180	-	V
Emitter Base Breakdown Voltage at I_E=10µA	$V_{(BR)EBO}$	6	-	V
Collector Cutoff Current at V_{CB}=120V	I_{CBO}	-	50	nA
Emitter Cutoff Current at V_{EB}=4V	I_{EBO}	-	50	nA
Collector Saturation Voltage at I_C=10mA, I_B=1mA at I_C=50mA, I_B=5mA	 $V_{CE\ sat}$ $V_{CE\ sat}$	 - -	 0.15 0.2	 V V
Base Saturation Voltage at I_C=10mA, I_B=1mA at I_C=50mA, I_B=5mA	 $V_{BE\ sat}$ $V_{BE\ sat}$	 - -	 1 1	 V V
Gain Bandwidth Product at V_{CE}=10V, I_C=10mA, f=100MHz	f_T	100	300	MHz
Collector Base Capacitance at V_{CB}=10V, f=1MHz	C_{CBO}	-	6	pF
Noise Figure at V_{CE}=5V, I_C=200µA, R_G=2KΩ, f=30Hz…15KHz	NF	-	8	dB
Thermal Resistance Junction to Ambient	R_{thA}	-	200	K/W

1. Overview

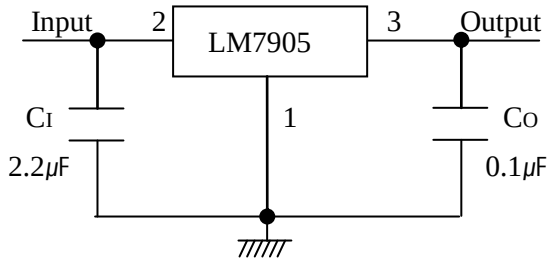
1.1 Description

LM7900 series of fixed output negative voltage regulators are intended as complement to LM7800 series devices. These negative regulators are available in the same even-voltage options as the LM7800 devices

1.2 Features

- No external components required
- Output voltages (5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 24V)
- Internal Thermal shutdown and SOA protection
- Output voltage offered in 4% Tolerance
- Pb-Free Packages are available
- High ESD Level (HBM>8,000V, MM>800V)

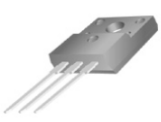
1.3 Standard Application



The input voltage must remain typically 2.0V below the output voltage even during the high point on the ripple voltage.

- CI is required if regulator is located an appreciable distance from power filter.
- Co improves transient response. Values of ≤1.0 μF could cause instability.

1.4 Package Type



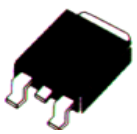
123

TO-220F



123

TO-220



1 2 3

D-PAK(TO-252)

1. GND
2. INPUT
3. OUTPUT

1. Overview

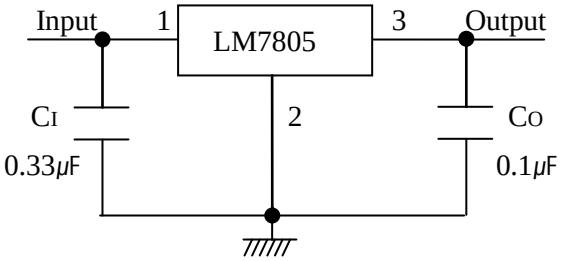
1.1 Description

The voltage regulators are designed as fixed-voltage regulator for a wide variety of applications Including local,on-card regulation. Although designed primarily as a fixed voltage regulator, these devices can be used with external components to obtain adjustable voltages and currents

1.2 Features

- Output current in excess of 1.0A
- No external components required
- Output voltages (5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 24V)
- Internal Thermal shutdown and SOA protection
- Output voltage offered in 4% Tolerance
- Pb-Free Packages are available
- High ESD Level (HBM>8,000V, MM>800V)

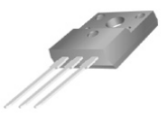
1.3 Standard Application



The input voltage must remain typically 2.0V above the output voltage even during the low point on the ripple voltage.

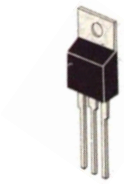
- CI is required if regulator is located an appreciable distance from power filter.
- Co improves transient response. Value of ≤0.1μF could cause instability.

1.4 Package Type



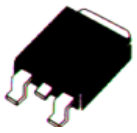
1 2 3

TO-220F



123

TO-220



1 2 3

D-PAK(TO-252)

1. INPUT
2. GND
3. OUTPUT

Pin Configuration

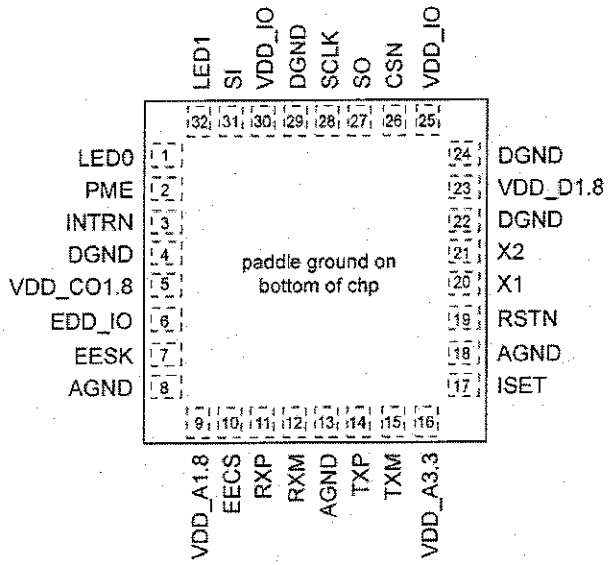


Figure 2. 32-Pin (5mm x 5mm) MLF®

Pin Description

Pin Number	Pin Name	Type	Pin Function
1	LED0	Opu	Programmable LED output to indicate PHY activity/status. LED is ON when output is LOW; LED is OFF when output is HIGH. LED indicators[1] defined as follows: Chip Global Control Register: CGCR bit [9]: 0 (Default) / 1 LED1 (pin 32): 100BT / ACT LED0 (pin 1): LINK/ACT / LINK Link (up) = LED On; Activity = LED Blink; Link/Act = LED On/Blink; Speed = LED On (100BASE-T); LED Off (10BASE-T)
2	PME	Opu	Power Management Event (default active low) It is asserted (low or high depends on polarity set in PMECR register) when one of the wake-on-LAN events is detected by KSZ8851SNL. The KSZ8851SNL is requesting the system to wake up from low power mode.
3	INTRN	Opu	Interrupt Not An active low signal to host CPU to indicate an interrupt status bit is set. This pin needs an external 4.7K pull-up resistor.
4	DGND	Gnd	Digital IO ground.
5	VDD_CO1.8	P	1.8V regulator output . This 1.8V output pin provides power to pins 9 (VDD_A1.8) and 23 (VDD_D1.8) for core VDD supply. If VDD_IO is set for 1.8V then this pin should be left floating, pins 9 (VDDA_1.8) and 23 (VDD_D1.8) will be sourced by the external 1.8V supply that is tied to pins 25 and 30 (VDD_IO) with appropriate filtering.
6	EED_IO	Ipd/O	In/Out Data from/to external EEPROM Config Mode: The pull-up/pull-down value is latched as with/without EEPROM during power-up / reset. See "Strapping Options" section for details.
7	EESK	Opd	EEPROM Serial Clock A 4µs (OBCR[1:0]=11 on-chip bus speed @ 25MHz) or 800ns (OBCR[1:0]=00 on-chip bus speed @ 125 MHz) serial output clock to load configuration data from the serial EEPROM.
8	AGND	Gnd	Analog ground.
9	VDD_A1.8	P	1.8V analog power supply from VDD_CO1.8 (pin 5) with appropriate filtering. If VDD_IO is 1.8V, this pin must be supplied power from the same source as pins 25 and 30 (VDD_IO) with appropriate filtering.
10	EECS	Opd	EEPROM Chip Select This signal is used to select an external EEPROM device.
11	RXP	I/O	Physical receive (MDI) or transmit (MDIX) signal (+ differential).
12	RXM	I/O	Physical receive (MDI) or transmit (MDIX) signal (– differential).
13	AGND	Gnd	Analog ground.
14	TXP	I/O	Physical transmit (MDI) or receive (MDIX) signal (+ differential).
15	TXM	I/O	Physical transmit (MDI) or receive (MDIX) signal (– differential).
16	VDD_A3.3	P	3.3V analog V_{DD} input power supply with well decoupling capacitors.
17	ISET	O	Set physical transmits output current. Pull-down this pin with a 3.01K 1% resistor to ground.
18	AGND	Gnd	Analog ground.
19	RSTN	Ipu	Reset Not.

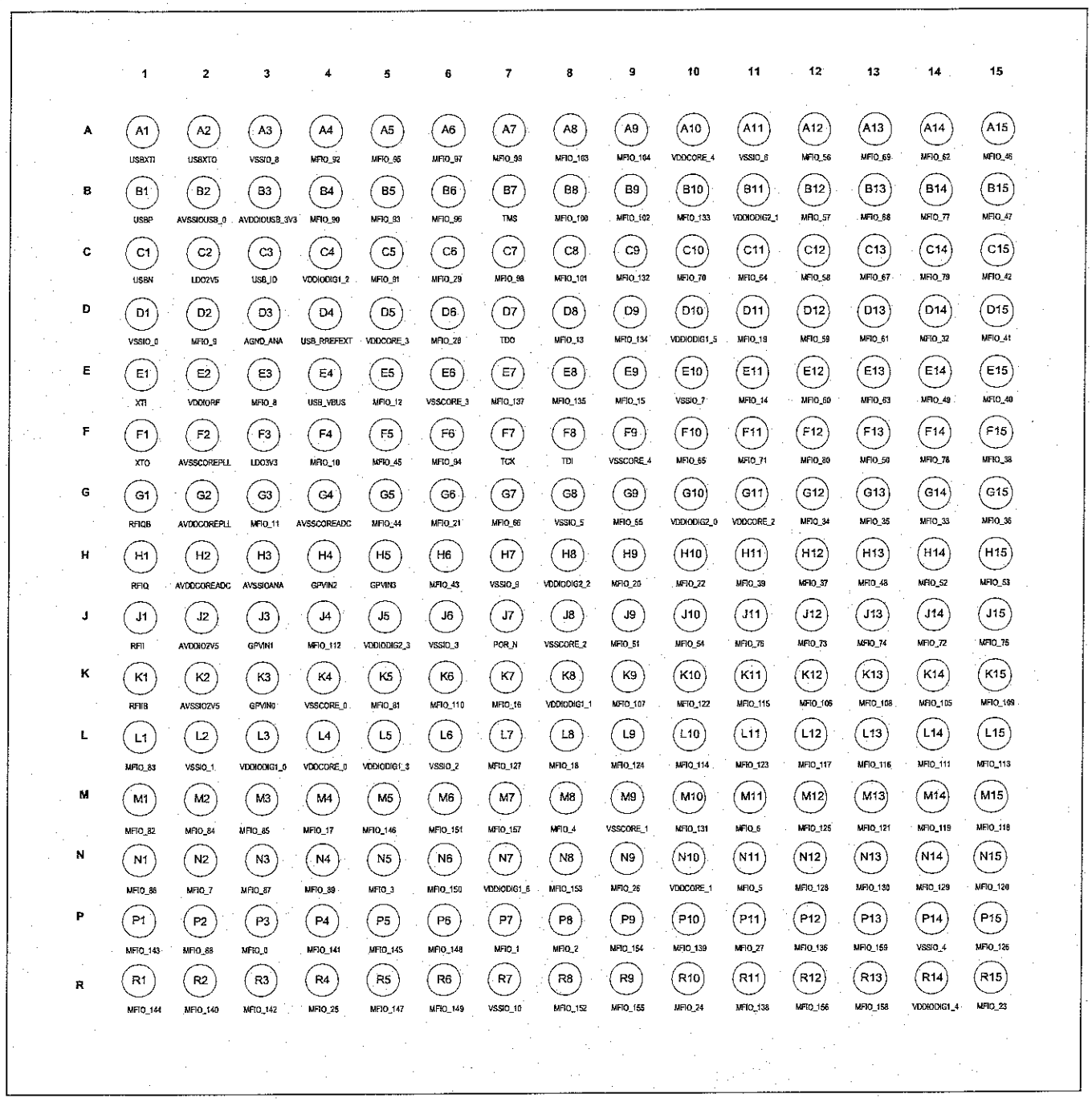
Pin Number	Pin Name	Type	Pin Function
			Hardware reset pin (active Low). This reset input must be held low for a minimum of 10ms after stable supply voltage 3.3V.
20	X1	I	25MHz crystal or oscillator clock connection. Pins (X1, X2) connect to a crystal. If an oscillator is used, X1 connects to a 3.3V tolerant oscillator and X2 is a no connect. Note: Clock requirement is +/- 50ppm for either crystal or oscillator.
21	X2	O	
22	DGND	Gnd	Digital IO ground
23	VDD_D1.8	P	1.8V digital power supply from VDD_CO1.8 (pin 5) with appropriate filtering. If VDD_IO is 1.8V, this pin must be supplied power from the same source as pins 25 and 30 (VDD_IO) with appropriate filtering.
24	DGND	Gnd	Digital IO ground
25	VDD_IO	P	3.3V, 2.5V or 1.8V digital V_{DD} input power supply for IO with well decoupling capacitors.
26	CSN	Ipu	SPI slave mode: Chip Select Not Active low input pin for SPI interface.
27	SO	O	SPI slave mode: Serial data out for SPI interface. This SO is tri-stated output when CSN is negated and this pin must have external 4.7K pull-up to keep the SO line high while the driver is tri-stated.
28	SCLK	I	SPI slave mode: Serial clock input for SPI interface. This clock speed can run up to 40MHz.
29	DGND	Gnd	Digital IO ground
30	VDD_IO	P	3.3V, 2.5V or 1.8V digital V_{DD} input power supply for IO with well decoupling capacitors.
31	SI	Ipd	SPI slave mode: Serial data in for SPI interface.
32	LED1	Opu	Programmable LED1 output to indicate PHY activity/status (see LED0 description at pin1)

Legend:
P = Power supply Gnd = Ground
I/O = Bi-directional I = Input O = Output.
Ipd = Input with internal pull-down (58K +/-30%).
Ipu = Input with internal pull-up (58K +/-30%).
Opd = Output with internal pull-down (58K +/-30%).
Opu = Output with internal pull-up (58K +/-30%).
Ipu/O = Input with internal pull-up (58K +/-30%) during power-up/reset; output pin otherwise.
Ipd/O = Input with internal pull-down (58K +/-30%) during power-up/reset; output pin otherwise.

Strapping Options

Pin Number	Pin Name	Type	Pin Function
6	EED_IO	Ipd/O	EEPROM select: Pull-up = EEPROM present Floating (NC) or Pull-down = EEPROM not present (default) During power-up / reset, this pin value is latched into register CCR, bit 9

Note: Ipd/O = Input with internal pull-down (58K +/-30%) during power-up/reset; output pin otherwise.
Pin strap-ins are latched during power-up or reset.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	A1 USBXTI	A2 USBXTO	A3 VSSIO_8	A4 MFIO_92	A5 MFIO_95	A6 MFIO_97	A7 MFIO_99	A8 MFIO_103	A9 MFIO_104	A10 VDDCORE_4	A11 VSSIO_6	A12 MFIO_56	A13 MFIO_69	A14 MFIO_62	A15 MFIO_46
B	B1 USBP	B2 AVSSIOUSB_0	B3 AVDDIOUSB_3V3	B4 MFIO_90	B5 MFIO_93	B6 MFIO_96	B7 TMS	B8 MFIO_100	B9 MFIO_102	B10 MFIO_133	B11 VDDIODIG2_1	B12 MFIO_57	B13 MFIO_68	B14 MFIO_77	B15 MFIO_47
C	C1 USBN	C2 LDO2V5	C3 USB_ID	C4 VDDIODIG1_2	C5 MFIO_91	C6 MFIO_29	C7 MFIO_98	C8 MFIO_101	C9 MFIO_132	C10 MFIO_70	C11 MFIO_64	C12 MFIO_58	C13 MFIO_67	C14 MFIO_79	C15 MFIO_42
D	D1 VSSIO_0	D2 MFIO_9	D3 AGND_ANA	D4 USB_RREFEXT	D5 VDDCORE_3	D6 MFIO_28	D7 TDO	D8 MFIO_13	D9 MFIO_134	D10 VDDIODIG1_5	D11 MFIO_19	D12 MFIO_59	D13 MFIO_61	D14 MFIO_32	D15 MFIO_41
E	E1 XTI	E2 VDDIORF	E3 MFIO_8	E4 USB_VBUS	E5 MFIO_12	E6 VSSCORE_3	E7 MFIO_137	E8 MFIO_135	E9 MFIO_15	E10 VSSIO_7	E11 MFIO_14	E12 MFIO_60	E13 MFIO_63	E14 MFIO_49	E15 MFIO_40
F	F1 XTO	F2 AVSSCOREPLL	F3 LDO3V3	F4 MFIO_10	F5 MFIO_45	F6 MFIO_94	F7 TCK	F8 TDI	F9 VSSCORE_4	F10 MFIO_65	F11 MFIO_71	F12 MFIO_80	F13 MFIO_50	F14 MFIO_78	F15 MFIO_38
G	G1 RFIQB	G2 AVDDCOREPLL	G3 MFIO_11	G4 AVSSCOREADC	G5 MFIO_44	G6 MFIO_21	G7 MFIO_66	G8 VSSIO_5	G9 MFIO_55	G10 VDDIODIG2_0	G11 VDDCORE_2	G12 MFIO_34	G13 MFIO_35	G14 MFIO_33	G15 MFIO_36
H	H1 RFIQ	H2 AVDDCOREADC	H3 AVSSIOANA	H4 GPVIN2	H5 GPVIN3	H6 MFIO_43	H7 VSSIO_9	H8 VDDIODIG2_2	H9 MFIO_20	H10 MFIO_22	H11 MFIO_39	H12 MFIO_37	H13 MFIO_48	H14 MFIO_52	H15 MFIO_53
J	J1 RFII	J2 AVDDIO2V5	J3 GPVIN1	J4 MFIO_112	J5 VDDIODIG2_3	J6 VSSIO_3	J7 POR_N	J8 VSSCORE_2	J9 MFIO_51	J10 MFIO_54	J11 MFIO_76	J12 MFIO_73	J13 MFIO_74	J14 MFIO_72	J15 MFIO_75
K	K1 RFIIB	K2 AVSSIO2V5	K3 GPVIN0	K4 VSSCORE_0	K5 MFIO_81	K6 MFIO_110	K7 MFIO_16	K8 VDDIODIG1_1	K9 MFIO_107	K10 MFIO_122	K11 MFIO_115	K12 MFIO_106	K13 MFIO_108	K14 MFIO_105	K15 MFIO_109
L	L1 MFIO_83	L2 VSSIO_1	L3 VDDIODIG1_0	L4 VDDCORE_0	L5 VDDIODIG1_3	L6 VSSIO_2	L7 MFIO_127	L8 MFIO_18	L9 MFIO_124	L10 MFIO_114	L11 MFIO_123	L12 MFIO_117	L13 MFIO_116	L14 MFIO_111	L15 MFIO_113
M	M1 MFIO_82	M2 MFIO_84	M3 MFIO_85	M4 MFIO_17	M5 MFIO_146	M6 MFIO_151	M7 MFIO_157	M8 MFIO_4	M9 VSSCORE_1	M10 MFIO_131	M11 MFIO_6	M12 MFIO_125	M13 MFIO_121	M14 MFIO_119	M15 MFIO_118
N	N1 MFIO_86	N2 MFIO_7	N3 MFIO_87	N4 MFIO_89	N5 MFIO_3	N6 MFIO_150	N7 VDDIODIG1_6	N8 MFIO_153	N9 MFIO_26	N10 VDDCORE_1	N11 MFIO_5	N12 MFIO_128	N13 MFIO_130	N14 MFIO_129	N15 MFIO_120
P	P1 MFIO_143	P2 MFIO_88	P3 MFIO_0	P4 MFIO_141	P5 MFIO_145	P6 MFIO_148	P7 MFIO_1	P8 MFIO_2	P9 MFIO_154	P10 MFIO_139	P11 MFIO_27	P12 MFIO_136	P13 MFIO_159	P14 VSSIO_4	P15 MFIO_126
R	R1 MFIO_144	R2 MFIO_140	R3 MFIO_142	R4 MFIO_25	R5 MFIO_147	R6 MFIO_149	R7 VSSIO_10	R8 MFIO_152	R9 MFIO_155	R10 MFIO_24	R11 MFIO_138	R12 MFIO_156	R13 MFIO_158	R14 VDDIODIG1_4	R15 MFIO_23

Figure 2: Chorus 3 package pin-out (top view)

2 Pin-out

2.1 Full pin list (primary functions)

Pin	Signal/function	Pin	Signal/function	Pin	Signal/function	Pin	Signal/function
A1	USBXTI	C1	USBN	E1	XTI	G1	RFIQB
A2	USBXTO	C2	LDO2V5	E2	VDDIORF	G2	AVDDCOREPLL
A3	VSSIO_8	C3	USB_ID	E3	MFIO_8	G3	MFIO_11
A4	MFIO_92	C4	VDDIODIG1_2	E4	USB_VBUS	G4	AVSSCOREADC
A5	MFIO_95	C5	MFIO_91	E5	MFIO_12	G5	MFIO_44
A6	MFIO_97	C6	MFIO_29	E6	VSSCORE_3	G6	MFIO_21
A7	MFIO_99	C7	MFIO_98	E7	MFIO_137	G7	MFIO_66
A8	MFIO_103	C8	MFIO_101	E8	MFIO_135	G8	VSSIO_5
A9	MFIO_104	C9	MFIO_132	E9	MFIO_15	G9	MFIO_55
A10	VDDCORE_4	C10	MFIO_70	E10	VSSIO_7	G10	VDDIODIG2_0
A11	VSSIO_6	C11	MFIO_64	E11	MFIO_14	G11	VDDCORE_2
A12	MFIO_56	C12	MFIO_58	E12	MFIO_60	G12	MFIO_34
A13	MFIO_69	C13	MFIO_67	E13	MFIO_63	G13	MFIO_35
A14	MFIO_62	C14	MFIO_79	E14	MFIO_49	G14	MFIO_33
A15	MFIO_46	C15	MFIO_42	E15	MFIO_40	G15	MFIO_36
B1	USBP	D1	VSSIO_0	F1	XTO	H1	RFIQ
B2	AVSSIOUSB_0	D2	MFIO_9	F2	AVSSCOREPLL	H2	AVDDCOREADC
B3	AVDDIOUSB_3V3	D3	AGND_ANA	F3	LDO3V3	H3	AVSSIOANA
B4	MFIO_90	D4	USB_RREFEXT	F4	MFIO_10	H4	GPVIN2
B5	MFIO_93	D5	VDDCORE_3	F5	MFIO_45	H5	GPVIN3
B6	MFIO_96	D6	MFIO_28	F6	MFIO_94	H6	MFIO_43
B7	TMS	D7	TDO	F7	TCK	H7	VSSIO_9
B8	MFIO_100	D8	MFIO_13	F8	TDI	H8	VDDIODIG2_2
B9	MFIO_102	D9	MFIO_134	F9	VSSCORE_4	H9	MFIO_20
B10	MFIO_133	D10	VDDIODIG1_5	F10	MFIO_65	H10	MFIO_22
B11	VDDIODIG2_1	D11	MFIO_19	F11	MFIO_71	H11	MFIO_39
B12	MFIO_57	D12	MFIO_59	F12	MFIO_80	H12	MFIO_37
B13	MFIO_68	D13	MFIO_61	F13	MFIO_50	H13	MFIO_48
B14	MFIO_77	D14	MFIO_32	F14	MFIO_78	H14	MFIO_52
B15	MFIO_47	D15	MFIO_41	F15	MFIO_38	H15	MFIO_53

Table 2: Chorus 3 full pin list (primary functions) by pin number

Confidential for VAM licensees

Pin	Signal/function
J1	RFII
J2	AVDDIO2V5
J3	GPVIN1
J4	MFIO_112
J5	VDDIODIG2_3
J6	VSSIO_3
J7	POR_N
J8	VSSCORE_2
J9	MFIO_51
J10	MFIO_54
J11	MFIO_76
J12	MFIO_73
J13	MFIO_74
J14	MFIO_72
J15	MFIO_75
K1	RFIIB
K2	AVSSIO2V5
K3	GPVIN0
K4	VSSCORE_0
K5	MFIO_81
K6	MFIO_110
K7	MFIO_16
K8	VDDIODIG1_1
K9	MFIO_107
K10	MFIO_122
K11	MFIO_115
K12	MFIO_106

Pin	Signal/function
K13	MFIO_108
K14	MFIO_105
K15	MFIO_109
L1	MFIO_83
L2	VSSIO_1
L3	VDDIODIG1_0
L4	VDDCORE_0
L5	VDDIODIG1_3
L6	VSSIO_2
L7	MFIO_127
L8	MFIO_18
L9	MFIO_124
L10	MFIO_114
L11	MFIO_123
L12	MFIO_117
L13	MFIO_116
L14	MFIO_111
L15	MFIO_113
M1	MFIO_82
M2	MFIO_84
M3	MFIO_85
M4	MFIO_17
M5	MFIO_146
M6	MFIO_151
M7	MFIO_157
M8	MFIO_4
M9	VSSCORE_1

Pin	Signal/function
M10	MFIO_131
M11	MFIO_6
M12	MFIO_125
M13	MFIO_121
M14	MFIO_119
M15	MFIO_118
N1	MFIO_86
N2	MFIO_7
N3	MFIO_87
N4	MFIO_89
N5	MFIO_3
N6	MFIO_150
N7	VDDIODIG1_6
N8	MFIO_153
N9	MFIO_26
N10	VDDCORE_1
N11	MFIO_5
N12	MFIO_128
N13	MFIO_130
N14	MFIO_129
N15	MFIO_120
P1	MFIO_143
P2	MFIO_88
P3	MFIO_0
P4	MFIO_141
P5	MFIO_145
P6	MFIO_148

Pin	Signal/function
P7	MFIO_1
P8	MFIO_2
P9	MFIO_154
P10	MFIO_139
P11	MFIO_27
P12	MFIO_136
P13	MFIO_159
P14	VSSIO_4
P15	MFIO_126
R1	MFIO_144
R2	MFIO_140
R3	MFIO_142
R4	MFIO_25
R5	MFIO_147
R6	MFIO_149
R7	VSSIO_10
R8	MFIO_152
R9	MFIO_155
R10	MFIO_24
R11	MFIO_138
R12	MFIO_156
R13	MFIO_158
R14	VDDIODIG1_4
R15	MFIO_23

Confidential Information

Table 2: Chorus 3 full pin list (primary functions) by pin number

ESMT/EMP EML3418

1.3MHz 2A, Synchronous Step-Down Regulator

General Description

EML3418 is designed with high efficiency step down DC/DC converter for portable devices applications. It features with extreme low quiescent current with no load which is the best fit for extending battery life during the standby mode. The device operates from 2.5V to 5.5V input voltage and up to 2.0A output current capability. High 1.3MHz internal frequency makes small surface mount inductors and capacitors possible and reduces overall PCB board space. Further, build-in synchronous switch makes external Schottky diode is no longer needed and efficiency is improved. EML3418 is designed base on pulse width modulation (PWM) for low output voltage ripple and fixed frequency noise, low dropout mode provides 100% duty cycle operation. Low reference voltage is designed for achieving regulated output down to 0.6V.
The device is available in an adjustable version for TDFN-8 and SOP-8FD package.

Features

- Achieve 95% efficiency
- Input Voltage : 2.5V to 5.5V
- Output Current up to 2A
- Reference voltage 0.6V
- Quiescent Current 240 μ A with No Switching
- Internal switching frequency 1.3MHz
- No Schottky Diode needed
- Low Dropout Operation: 100% Duty Cycle
- Shutdown current < 1 μ A
- Excellent Line and Load Transient Response
- Over-current and Over-temperature Protection

Applications

- Blue-Tooth devices
- Cellular and Smart Phones
- Personal multi-media Player (PMP)
- Wireless networking
- Digital Still Cameras
- Portable applications

Typical Application (adjustable)

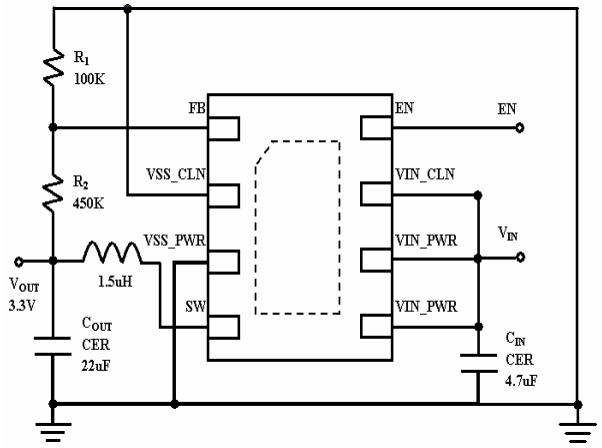


Fig. 1

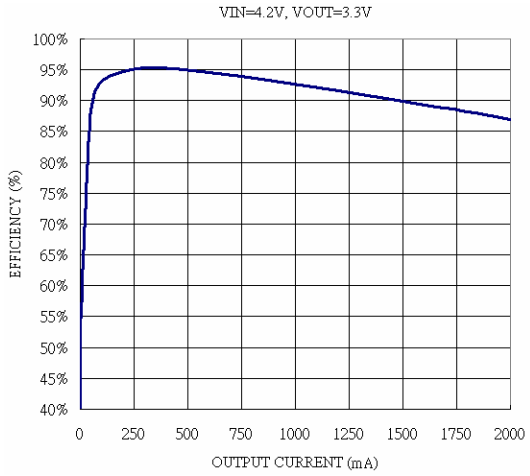
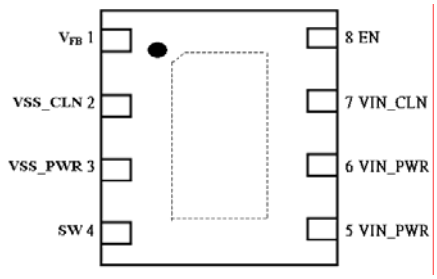


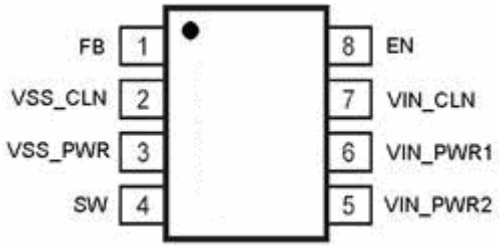
Fig. 2

Connection Diagram

TDFN-8 Package



SOP-8FD Package

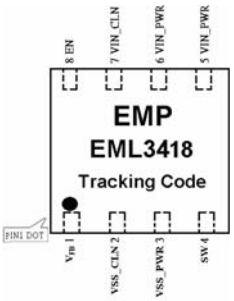
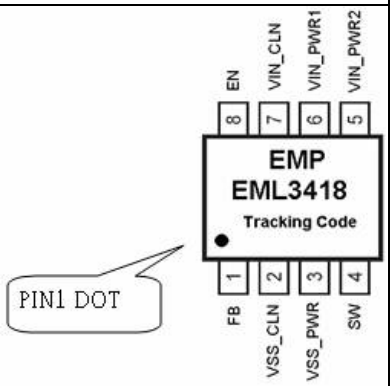


Order information

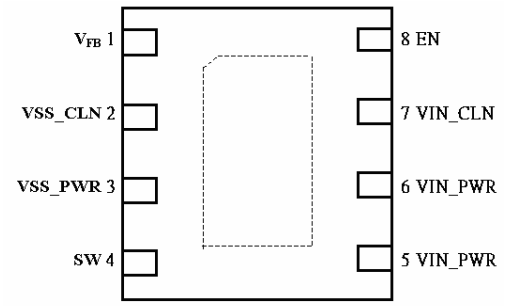
EML3418-00FF08NRR
00 Adj Operation
FF08 TDFN-8 Package
NRR RoHS & Halogen Free
Rating: -40 to 85°C
Package in Tape & Reel

EML3418-00SE08GRR/NRR
00 Adj Operation
SE08 SOP-8FD package
GRR RoHS (Pb Free)
Rating: -40 to 85°C
Package in Tape & Reel
NRR RoHS & Halogen free (By Request)
Rating: -40 to 85°C
Package in Tape & Reel

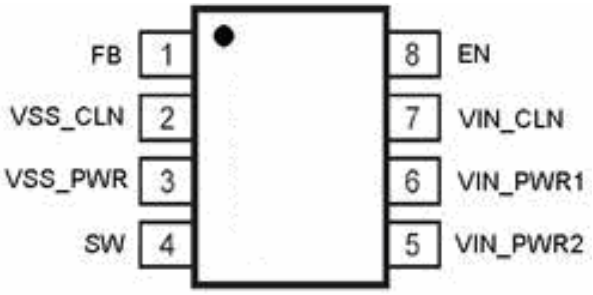
Order, Mark & Packing Information

Package	Vout	Product ID	Marking	Packing
TDFN-8	Adj	EML3418-00FF08NRR		5Kpcs Tape & Reel
SOP-8FD	Adj	EML3418-00SE08GRR		3Kpcs Tape & Reel

Package Configuration



FBP-8, Adjustable



Pin Fun

Pin #	Pin Name	Function
1	V_{FB} (Adjustable)	Feedback Pin. Receives the feedback voltage from an external resistive divider across the output.
	V_{OUT} (Fixed voltage)	Output Voltage Pin. An internal resistive divider divides the output voltage down for comparison to the internal reference voltage.
2	VSS_CLN	Analog Ground Pin.
3	VSS_PWR	Power Ground Pin.
4	SW	Switch Pin. Must be connected to Inductor. This pin connects to the drains of the internal main and synchronous power MOSFET switches.
5, 6	V_{IN_PWR}	Power Input Pin. Must be closely decoupled to GND pin with a 4.7µF or greater ceramic capacitor.
7	V_{IN_CLN}	Analog Input Pin. Must be closely decoupled to GND pin with a 4.7µF or greater ceramic capacitor.
8	EN	Enable Pin. Minimum 1.2V to enable the device. Maximum 0.4V to shut down the device. Do not leave this pin floating and enable the chip after Vin is in the input voltage range.
Exposed pad		Connect to Ground.

Dongbu HiTek Semiconductor Business

DB1514A

1.5A, Low Dropout Regulator with Power Good

DESCRIPTION

The DB1514A is a very low dropout voltage linear regulator which can operate from the input voltages as low as 2.5V and is capable of delivering the continuous output load current up to 1.5A.

It has a low dropout voltage (maximum 300mV at 1A), a very low quiescent current (typically 300uA at 0.1A) and very high PSRR up to 86dB at 1A load current.

The output voltage can be set from 0.5V to (VIN - V_{DRP}) with an external resistor divider and it has ±2% accuracy through all temperature ranges include the line as well as load variations.

It is allowed to use a small 4.7μF MLCC input and output capacitor to deliver the current with the stable operation.

An internal Soft-Start function reduces the inrush current and the other features are include over current protection (OCP), short-circuit protection (SCP), and thermal shut down protection (TSD).

The DB1514A is available in 8-SOP-EP package with exposed pad for optimal power dissipation and 8-TDFN(3mmx3mm).

FEATURES

- ***Input Voltage Range: 2.5V to 6.0V***
- ***Low Quiescent Current: Typ. 300uA @***
- ***Current limit : Min. 1.8A***
- ***Adjustable Output from 0.5V***
- ***DB1514A: Typ 0.4V Dropout @ I_{OUT}=1.5A***
  Max 0.28V Dropout @ I_{OUT}=1A
  Max 0.2V Dropout @ I_{OUT}=0.5A
- ***Compatible with MLCC Capacitors***
- ***Soft-Start Limits Inrush Current***
- ***Thermal Shutdown Protection***
- ***Over Current & Short Circuit Protection***

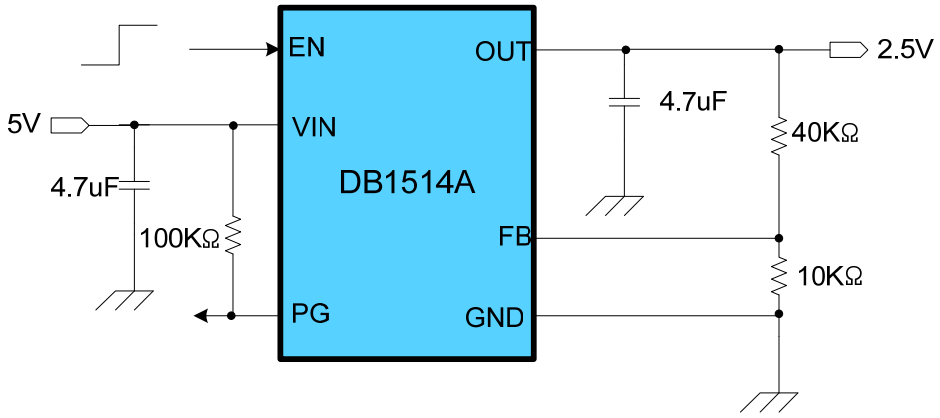
APPLICATIONS

- TV & STB application
- Servers
- Networking
- Notebook
- Optical Modules
- Post Regulators

ORDERING INFORMATION

PART NUMBER	PACKAGE
DB1514AHETR	8-SOP-EP
DB1514ADLTR	8-TDFN(3x3)

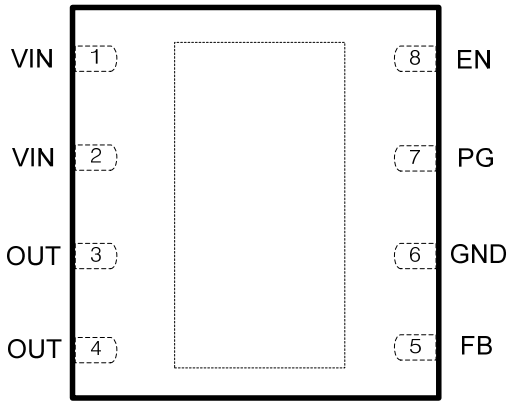
TYPICAL APPLICATION



PIN DESCRIPTION

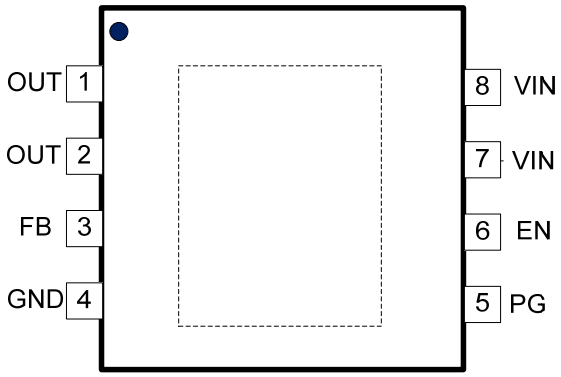
PIN NO		SYMBOL	DESCRIPTION
8-TDFN	8-SOP-EP		
7	5	PG	Open Drain Power-Good (PG) Output.
8	6	EN	Enable Input.
1,2	7,8	VIN	Input Supply Voltage Pin.
3,4	1,2	OUT	Output pin
5	3	FB	Feedback Pin. Connect to output through a voltage-divider to set the output. Recommended that the tolerance of feedback resistors is below 1%.
6	4	GND	Ground Pin
EP	EP	Exposed pad	Should be connected to GND for Heatsink.

PIN CONFIGURATION



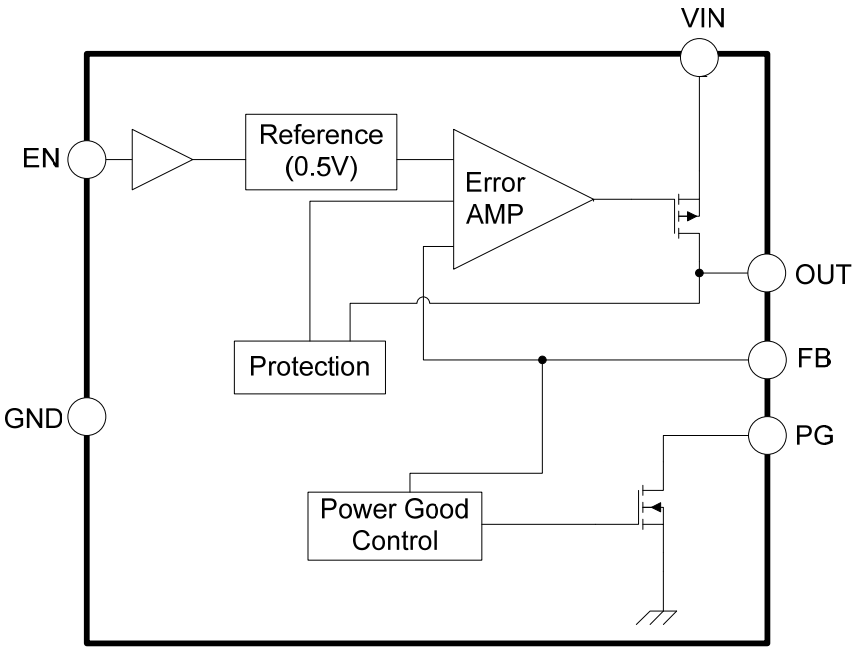
8-TDFN(3x3)

TOP VIEW



8-SOP-EP

BLOCK DIAGRAM



Dongbu HiTek
Semiconductor Business

DB1230

3A, 700KHz, Synchronous Step-down Converter

DESCRIPTION

The DB1230 is a high frequency synchronous rectified step-down regulator which integrates an 110mΩ high-side power MOSFET and an 85mΩ low-side power MOSFET.

It provides easy & compact solution to implement 3A continuous output current over a wide range input from 4.5V to 16V with a good load and line regulation.

The current-mode control operation provides a good loop-stability under any system condition and fast transient response.

According to an internal compensation and a high frequency operation, the DB1230 requires a few number of external components mentioned in the basic dc-dc power system.

The built-in protections are allowed to have a simple design and a robust operation.

For a good thermal performance, the DB1230 uses an internal temperature independent voltage reference and the package that has low Θ_{JA} (<50°C/W)

It is available in 8-pin SOP-EP or 14-pin TSSOP package with an exposed pad.

FEATURES

- 4.5V to 16V operating input range.
- High-side 110 mΩ, low-side 85 mΩ Built-in power MOSFETs.
- Fixed PWM 700kHz switching frequency.
- Output voltage accuracy : ± 2%
- 3A continuous output current.
- Low reference voltage : 0.8V
- Programmable soft-start.
- Internal Compensation.
- Built-in SCP, OCP, TSD Protection.
- Thermally Enhanced 8-SOP-EP Package

APPLICATIONS

- Digital Set Top Boxes.
- Personal Video Recorder.
- Flat Panel TV & Monitor.
- Distributed Power Systems.

ORDERING INFORMATION

PART NUMBER	PACKAGE
DB1230HETR	8-SOP-EP
DB1230HPTR	14-TSSOP-EP

TYPICAL APPLICATION

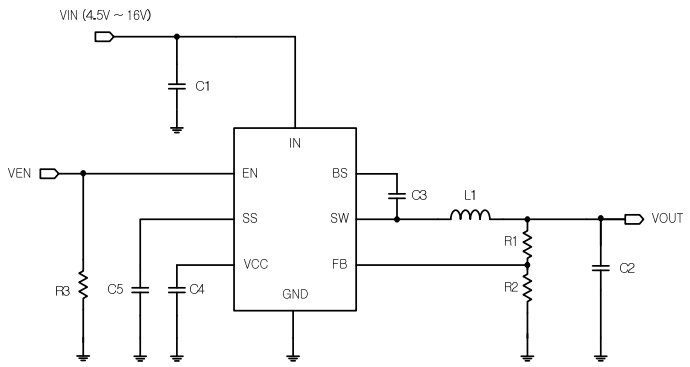


Fig.1 Normal application circuit

EFFICIENCY

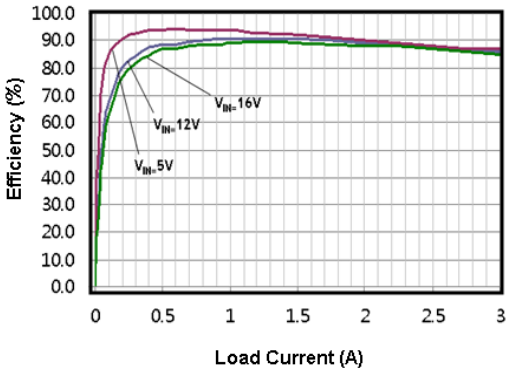


Fig.2 Efficiency (Vout=3.3V)

PIN DESCRIPTION

PIN NO.	SYMBOL	DESCRIPTION
1	EN	Enable pin. For automatic start-up, please leave it open and in case of on/off control, there should be pull-down resistor.(10K~100Kohm)
2	FB	Feedback pin. External resistors are connected between OUT and GND to set the regulated output voltage based on 0.8V reference.
3	VCC	Internal regulated output. A decoupling capacitor should be close to this pin as possible
4	SS	External soft-start program pin. An external capacitor should be connected to GND.
5	GND	Ground.
6	SW	Switching Node. An inductor, internal high-side and low-side power switches are connected
7	BS	Bootstrap pin. The bootstrap charge capacitor should be connected between BS and SW to provide a supply to gate driver of high-side power switch.
8	IN	Input power supply pin.
EP	Exposed Pad	Exposed pad. Connect the exposed pad to GND for heat sink. This pin combines thermal sink and power ground.

PIN CONFIGURATION

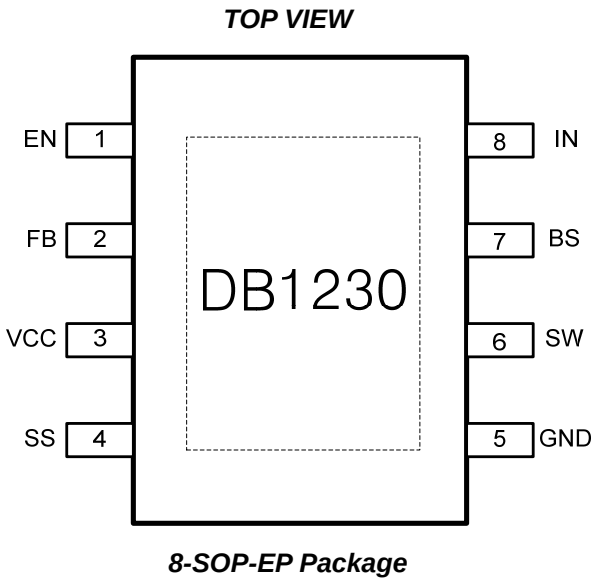


Fig.3 DB1230 PIN configuration

Dongbu HiTek
Semiconductor Business

DB1510B

1A, 0.8V Dropout LDO Regulator

DESCRIPTION

The DB1510B low-dropout linear regulator operates from input voltages as low as 2.2V and are able to deliver up to 1A of continuous output current the DB1510B offers low dropout (typically 800mV at 1A) and low quiescent current (typically 400uA at 0.1A).

Fixed output voltages of the DB1510B are 1.0V, 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.3V & 3.5V and the output voltage is 2% accurate over load and line variations. These regulators use small 2.2µF MLCC input capacitor and 4.7µF MLCC output capacitors to deliver 1A output current.

Soft-start reduces inrush current. The other features include over current protection (OCP), short-circuit protection (SCP), and thermal shut down protection (TSD).

The DB1510B is packaged SOT-223, TO-252 & 8-pin thin dual flat no lead (TDFN) package that a heat sink or an exposed pad for optimal power dissipation.

FEATURES

- ***Input Voltage Range: 2.2V to 6.0V***
- ***Quiescent Current: Typ. 400uA***
- ***Current limit : Min. 1.2A***
- ***Dropout Voltage: Typ. 800mV @ 1A***
- ***Compatible with MLCC Capacitors***
- ***Soft-Start Limits Inrush Current***
- Thermal Shutdown Protection
- Over Current & Short Circuit Protection

APPLICATIONS

- Servers
- Storage
- Networking
- Optical Modules
- Post Regulators
- Notebooks
- PDA

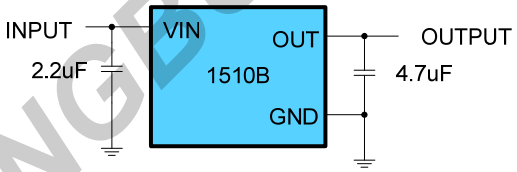
ORDERING INFORMATION

PART NUMBER	PACKAGE
DB1510BT3TRxx[NOTE1)]	TO-252 (I)
DB1510BT32TRxx[NOTE1)]	TO-252 (II)
DB1510BNNTRxx[NOTE1)]	SOT-223 (I)
DB1510BNN2TRxx[NOTE1)]	SOT-223 (II)
DB1510BDLTRxx[NOTE1)]	8-TDFN (3x3)

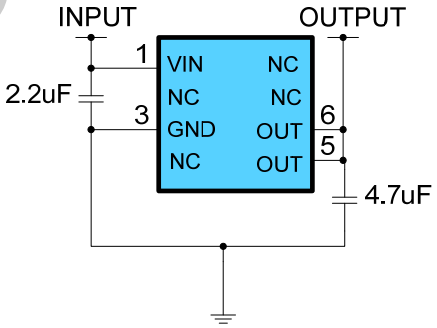
NOTE1) xx: Voltage Code, 1.0V (10), 1.2V (12), 1.5V (15), 1.8V (18), 2.5V (25), 2.8V (28), 3.3V (33) & 3.5V (35)

TYPICAL APPLICATION

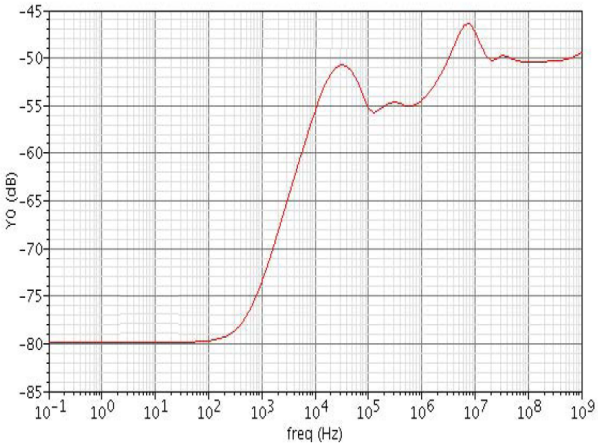
3-Lead Application Circuit



8-TDFN (3x3) Application Circuit



Power Supply Ripple Rejection



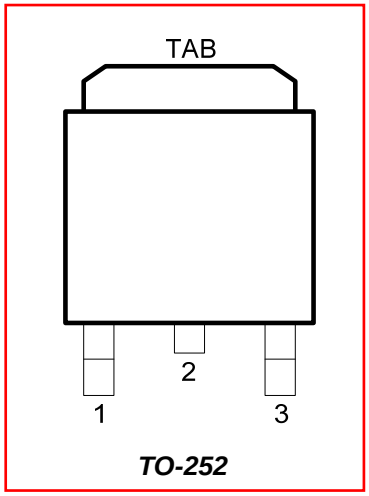
DONGBU HITEK CONFIDENTIAL

PIN DESCRIPTION

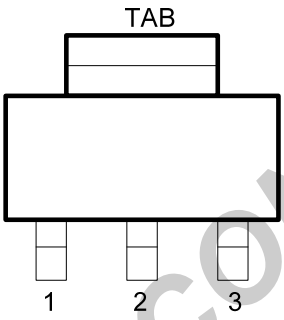
PIN NO			SYMBOL	DESCRIPTION
TO-252 (I) SOT-223 (I)	TO-252 (II) SOT-223 (II)	8-TDFN		
1	3	1	VIN	Input Voltage
2, TAB	1	3	GND	Ground
3	2, TAB	5, 6	OUT	Output Voltage
-	-	2, 4, 7, 8	NC	No Connection

PIN CONFIGURATION

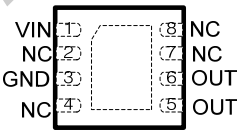
TOP VIEW



TO-252

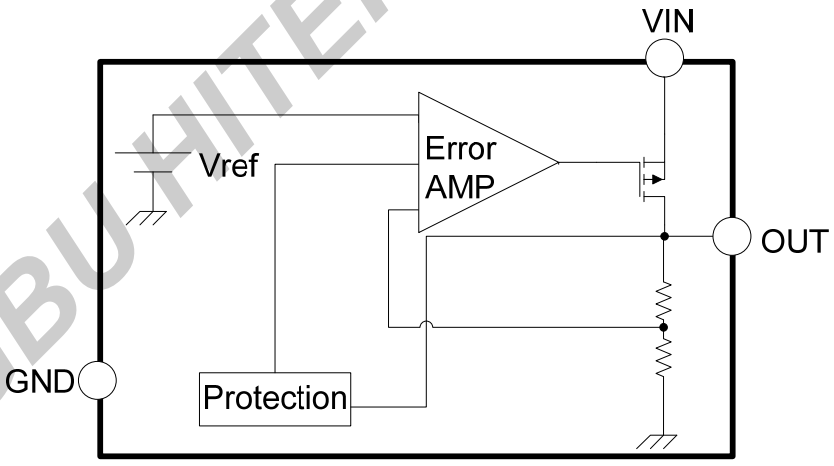


SOT-223



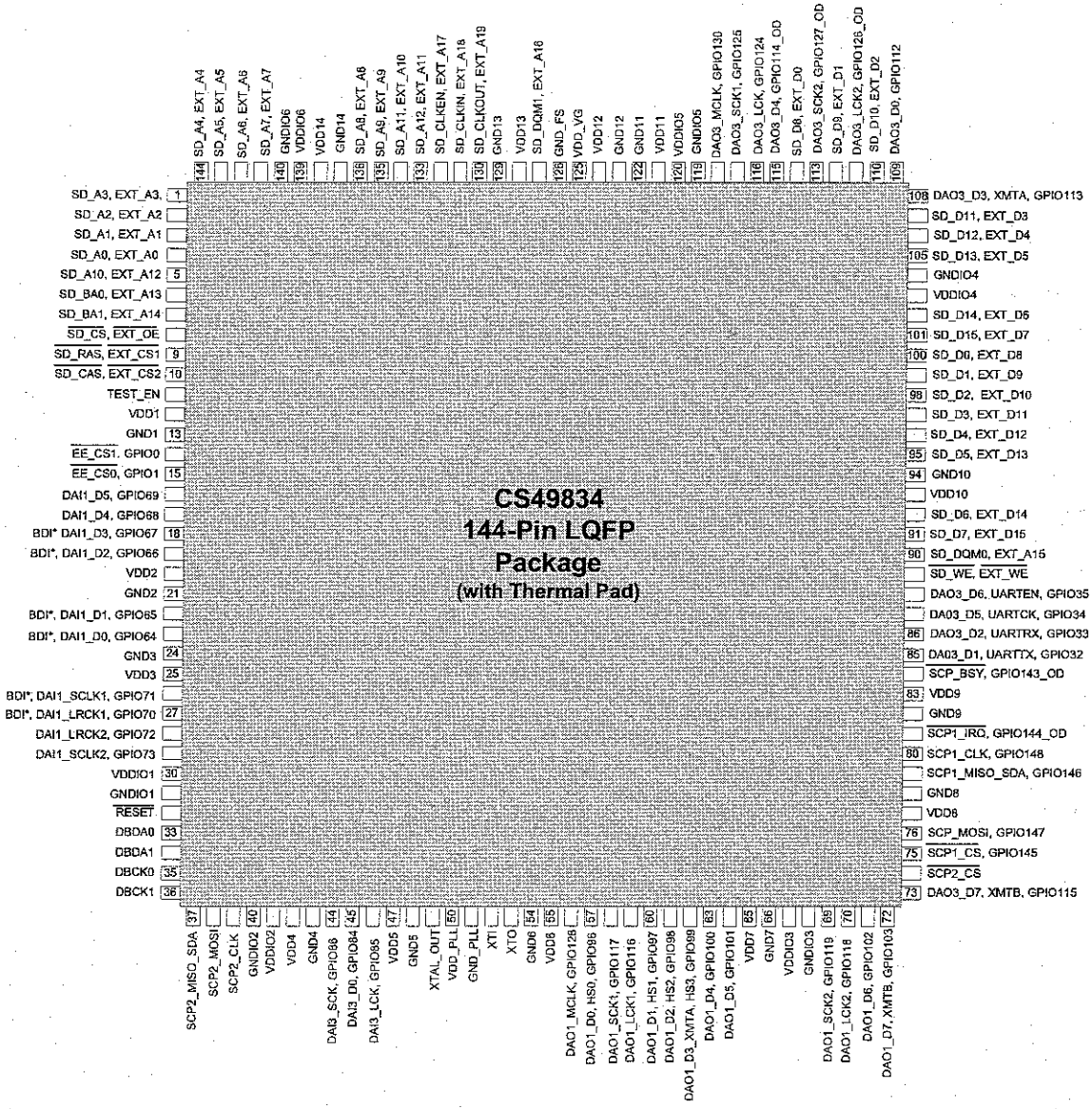
8-TDFN (3x3)

BLOCK DIAGRAM



DONGBU HITEK CONFIDENTIAL

8.2 144-Pin LQFP Pinout Diagram



Note: BDI* pin—Check with Factory if this pin is used.

Figure 23. 144-Pin LQFP Pin-Out Drawing for the CS49834 DSP

9. Package Mechanical Drawings

9.1 128-Pin LQFP Package Drawing

Figure 24 contains the 128-pin LQFP package drawing.

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CIRRUS LOGIC®

CS42528

114 dB, 192 kHz 8-Ch Codec with S/PDIF Receiver

Features

- Eight 24-bit D/A, two 24-bit A/D Converters
- 114 dB DAC / 114 dB ADC Dynamic Range
- -100 dB THD+N
- System Sampling Rates up to 192 kHz
- S/PDIF Receiver compatible with EIAJ CP1201 and IEC-60958
- Recovered S/PDIF CLK or System Clock Selection
- 8:2 S/PDIF Input MUX
- ADC High Pass Filter for DC Offset Calibration
- Expandable ADC Channels and One-line-Mode Support
- Digital Output Volume control with soft ramp
- Digital +/-15dB Input Gain Adjust for ADC
- Differential Analog Architecture
- Supports logic levels between 5 V and 1.8 V

General Description

The CS42528 codec provides two analog-to-digital and eight digital-to-analog delta-sigma converters, as well as an integrated S/PDIF receiver, in a 64-pin LQFP package.

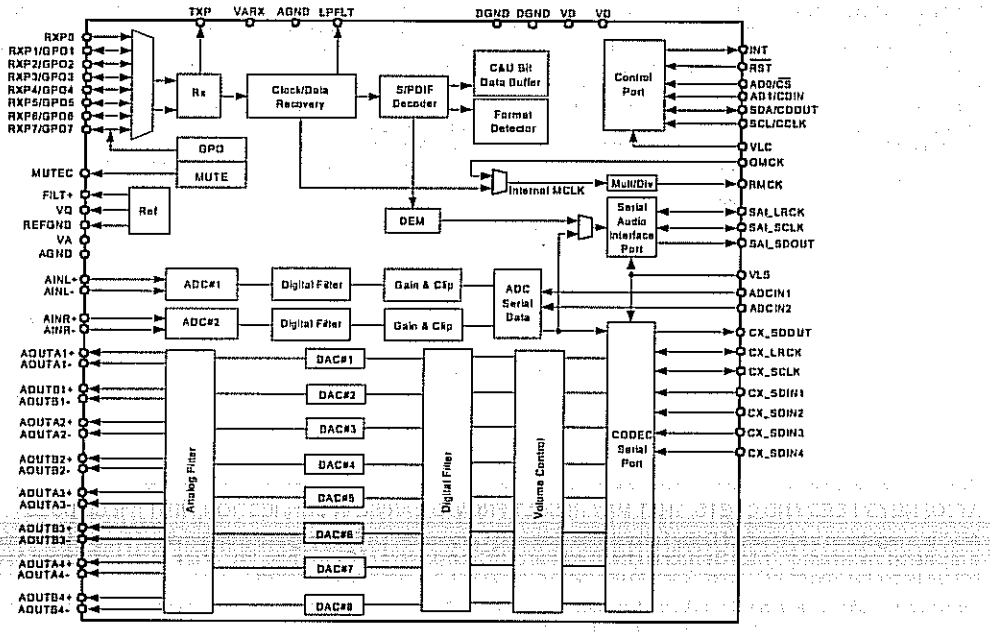
The CS42528 integrated S/PDIF receiver supports up to eight inputs, clock recovery circuitry and format auto-detection. The internal stereo ADC is capable of independent channel gain control for single-ended or differential analog inputs. All eight channels of DAC provide digital volume control and differential analog outputs. The general purpose outputs may be driven high or low, or mapped to a variety of DAC mute controls or ADC overflow indicators.

The CS42528 is ideal for audio systems requiring wide dynamic range, negligible distortion and low noise, such as A/V receivers, DVD receivers, digital speaker and automotive audio systems.

ORDERING INFORMATION

CS42528-CQ*	-10° to 70° C	64-pin LQFP
CS42528-DQ*	-40° to 85° C	64-pin LQFP
CDB42528	Evaluation Board	

*Also available in Lead-Free package



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JUL '03
DS586PP1
1

FILT+ Nominal Voltage		-	5.0	-	-	5.0	-	V
Output Impedance		-	35	-	-	35	-	kΩ
Maximum allowable DC current		-	0.01	-	-	0.01	-	mA

Notes: 3. Referred to the typical full-scale voltage.
4. Measured between AIN+ and AIN-

A/D DIGITAL FILTER CHARACTERISTICS

Parameter			Symbol	Min	Typ	Max	Unit
Single Speed Mode (2 to 50 kHz sample rates)							
Passband	(-0.1 dB)	(Note 5)		0	-	0.47	Fs
Passband Ripple				-	-	±0.035	dB
Stopband		(Note 5)		0.58	-	-	Fs
Stopband Attenuation				-95	-	-	dB
Total Group Delay (Fs = Output Sample Rate)			t_{gd}	-	12/Fs	-	s
Group Delay Variation vs. Frequency			Δt_{gd}	-	-	0.0	µs
Double Speed Mode (50 to 100 kHz sample rates)							
Passband	(-0.1 dB)	(Note 5)		0	-	0.45	Fs
Passband Ripple				-	-	±0.035	dB
Stopband		(Note 5)		0.68	-	-	Fs
Stopband Attenuation				-92	-	-	dB
Total Group Delay (Fs = Output Sample Rate)			t_{gd}	-	9/Fs	-	s
Group Delay Variation vs. Frequency			Δt_{gd}	-	-	0.0	µs
Quad Speed Mode (100 to 192 kHz sample rates)							
Passband	(-0.1 dB)	(Note 5)		0	-	0.24	Fs
Passband Ripple				-	-	±0.035	dB
Stopband		(Note 5)		0.78	-	-	Fs
Stopband Attenuation				-97	-	-	dB
Total Group Delay (Fs = Output Sample Rate)			t_{gd}	-	5/Fs	-	s
Group Delay Variation vs. Frequency			Δt_{gd}	-	-	0.0	µs
High Pass Filter Characteristics							
Frequency Response	-3.0 dB			-	1	-	Hz
	-0.13 dB	(Note 6)			20	-	Hz
Phase Deviation	@ 20 Hz	(Note 6)		-	10	-	Deg
Passband Ripple				-	-	0	dB
Filter Setting Time				-	10^5/Fs	-	s

Notes: 5. The filter frequency response scales precisely with Fs.
6. Response shown is for Fs equal to 48 kHz. Filter characteristics scale with Fs.

D/A DIGITAL FILTER CHARACTERISTICS

Parameter		Fast Roll-Off Min	Fast Roll-Off Typ	Fast Roll-Off Max	Slow Roll-Off Min	Slow Roll-Off Typ	Slow Roll-Off Max	Unit
Combined Digital and On-chip Analog Filter Response - Single Speed Mode - 48 kHz								
Passband (Note 9)	to -0.01 dB corner	0	-	0.4535	0	-	0.4166	Fs
	to -3 dB corner	0	-	0.4998	0	-	0.4998	Fs
Frequency Response 10 Hz to 20 kHz		-0.01	-	+0.01	-0.01	-	+0.01	dB
StopBand		0.5465	-	-	0.5834	-	-	Fs
StopBand Attenuation	(Note 10)	90	-	-	64	-	-	dB
Group Delay		-	12/Fs	-	-	6.5/Fs	-	s
Passband Group Delay Deviation	0 - 20 kHz	-	-	±0.41/Fs		-	±0.14/Fs	s
De-emphasis Error (Note 11)	Fs = 32 kHz	-	-	±0.23	-	-	±0.23	dB
(Relative to 1 kHz)	Fs = 44.1 kHz	-	-	±0.14	-	-	±0.14	dB
	Fs = 48 kHz	-	-	±0.09	-	-	±0.09	dB
Combined Digital and On-chip Analog Filter Response - Double Speed Mode - 96 kHz								
Passband (Note 9)	to -0.01 dB corner	0	-	0.4166	0	-	0.2083	Fs
	to -3 dB corner	0	-	0.4998	0	-	0.4998	Fs
Frequency Response 10 Hz to 20 kHz		-0.01	-	0.01	-0.01	-	0.01	dB
StopBand		0.5834	-	-	0.7917	-	-	Fs
StopBand Attenuation	(Note 10)	80	-	-	70	-	-	dB
Group Delay		-	4.6/Fs	-	-	3.9/Fs	-	s
Passband Group Delay Deviation	0 - 20 kHz	-	-	±0.03/Fs		-	±0.01/Fs	s
Combined Digital and On-chip Analog Filter Response - Quad Speed Mode - 192 kHz								
Passband (Note 9)	to -0.01 dB corner	0	-	0.1046	0	-	0.1042	Fs
	to -3 dB corner	0	-	0.4897	0	-	0.4813	Fs
Frequency Response 10 Hz to 20 kHz		-0.01	-	0.01	-0.01	-	0.01	dB
StopBand		0.6355	-	-	0.8683	-	-	Fs
StopBand Attenuation	(Note 10)	90	-	-	75	-	-	dB
Group Delay		-	4.7/Fs	-	-	4.2/Fs	-	s
Passband Group Delay Deviation	0 - 20 kHz	-	-	±0.01/Fs		-	±0.01/Fs	s

Notes: 9. Response is clock dependent and will scale with Fs. Note that the response plots (Figures 46 to 69) have been normalized to Fs and can be de-normalized by multiplying the X-axis scale by Fs.

10. Single and Double Speed Mode Measurement Bandwidth is from stopband to 3 Fs. Quad Speed Mode Measurement Bandwidth is from stopband to 1.34 Fs.

11. De-emphasis is available only in Single Speed Mode.

SWITCHING CHARACTERISTICS - CONTROL PORT - I²C FORMAT (For CQ, T_A = -10 to +70° C; For DQ, T_A = -40 to +85° C; VA=VARX = 5 V, VD =VLS= 3.3 V; VLC = 1.8 V to 5.25 V; Inputs: Logic 0 = DGND, Logic 1 = VLC, C_L = 30 pF)

Parameter		Symbol	Min	Max	Unit
SCL Clock Frequency		f_{scl}	-	100	kHz
$\overline{RST}$ Rising Edge to Start		t_{irs}	500	-	ns
Bus Free Time Between Transmissions		t_{buf}	4.7	-	µs
Start Condition Hold Time (prior to first clock pulse)		t_{hdst}	4.0	-	µs
Clock Low time		t_{low}	4.7	-	µs
Clock High Time		t_{high}	4.0	-	µs
Setup Time for Repeated Start Condition		t_{sust}	4.7	-	µs
SDA Hold Time from SCL Falling	(Note 16)	t_{hdd}	0	-	µs
SDA Setup time to SCL Rising		t_{sud}	250	-	ns
Rise Time of SCL and SDA		t_{rc}	-	1	µs
Fall Time SCL and SDA		t_{fc}	-	300	ns
Setup Time for Stop Condition		t_{susp}	4.7	-	µs
Acknowledge Delay from SCL Falling	(Note 17)	t_{ack}	-	(Note 18)	ns

Notes: 16. Data must be held for sufficient time to bridge the transition time, t_{fc}, of SCL.

17. The acknowledge delay is based on MCLK and can limit the maximum transaction speed.

18. $\frac{15}{256 \times Fs}$ for Single-Speed Mode, $\frac{15}{128 \times Fs}$ for Double-Speed Mode, $\frac{15}{64 \times Fs}$ for Quad-Speed Mode

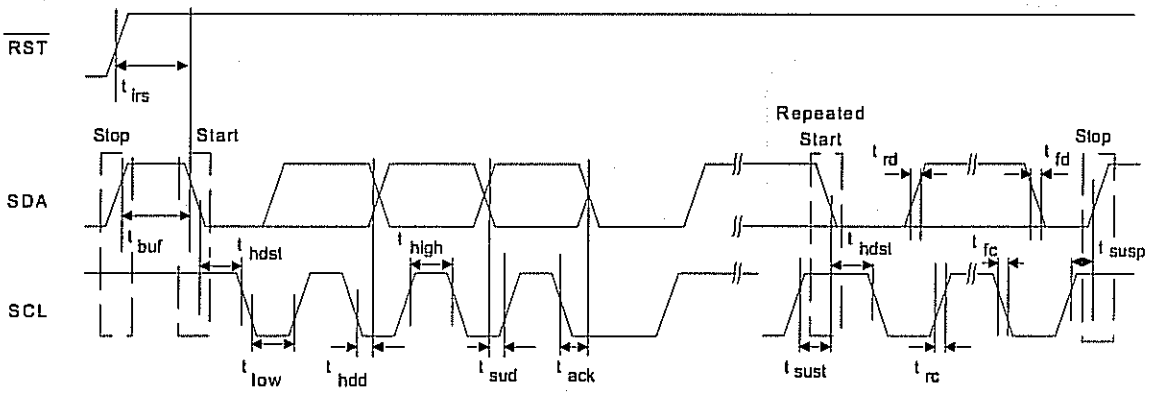


Figure 3. Control Port Timing - I²C Format

DC ELECTRICAL CHARACTERISTICS (T_A = 25° C; AGND=DGND=0, all voltages with respect to ground; OMCK=12.288 MHz; Master Mode)

Parameter		Symbol	Min	Typ	Max	Units
Power Supply Current (Note 22)	normal operation, VA = VARX = 5 V	I_A	-	90	-	mA
	VD = 5 V	I_D	-	150	-	mA
	VD = 3.3 V	I_D	-	100	-	mA
	Interface current, VLC=5 V (Note 23)	I_{LC}	-	250	-	µA
	VLS=5 V	I_{LS}	-	250	-	µA
	power-down state (all supplies) (Note 24)	I_{pd}	-	250	-	µA
Power Consumption	(Note 22)					
VA=VARX=5 V, VD=VLS=VLC=3.3 V	normal operation		-	780	850	mW
	power-down (Note 24)		-	1.25	-	mW
VA=VARX=5 V, VD=VLS=VLC=5 V	normal operation		-	950	1050	mW
	power-down (Note 24)		-	1.25	-	mW
Power Supply Rejection Ratio (Note 25)	(1 kHz)	PSRR	-	60	-	dB
	(60 Hz)		-	40	-	dB

Notes: 22. Current consumption increases with increasing FS and increasing OMCK. Max values are based on highest FS and highest OMCK. Variance between speed modes is negligible.

23. I_{LC} measured with no external loading on the SDA pin.

24. Power down mode is defined as $\overline{RST}$ pin = Low with all clock and data lines held static.

25. Valid with the recommended capacitor values on FILT+ and VQ as shown in Figure 5.

DIGITAL INTERFACE CHARACTERISTICS (For CQ, T_A = +25° C; For DQ, T_A = -40 to +85° C)

Parameters (Note 26)		Symbol	Min	Typ	Max	Units
High-Level Input Voltage	Serial Port		0.7xVLS	-	-	V
	Control Port	V_{IH}	0.7xVLC	-	-	V
Low-Level Input Voltage	Serial Port		-	-	0.2xVLS	V
	Control Port	V_{IL}	-	-	0.2xVLC	V
High-Level Output Voltage at I_o=2 mA	(Note 27)Serial Port		VLS-1.0	-	-	V
	Control Port		VLC-1.0	-	-	V
	MUTEC, GPOx	V_{OH}	VA-1.0	-	-	V
	TXP		VD-1.0	-	-	V
Low-Level Output Voltage at I_o=2 mA (Note 27) Serial Port, Control Port, MUTEC, GPOx,TXP		V_{OL}	-	-	0.4	V
Input Sensitivity, RXP[7:0]		V_{TH}	-	150	200	mVpp
Input Leakage Current		I_{in}	-	-	±10	µA
Input Capacitance			-	8	-	pF
MUTEC Drive Current			-	3	-	mA

Notes: 26. Serial Port signals include: RMCK, OMCK, SAI_SCLK, SAI_LRCK, SAI_SDOUT, CX_SCLK, CX_LRCK, CX_SDOUT, CX_SDIN1-4 ADCIN1/2
Control Port signals include: SCL/CCLK, SDA/CDOUT, AD0/$\overline{CS}$, AD1/CDIN, INT, $\overline{RST}$
S/PDIF-GPO Interface signals include: RXP0, RXP/GPO[1:7]

27. When operating RMCK above 24.576 MHz, limit the loading on the signal to 1 CMOS load.

AD0/$\overline{CS}$	10	**Address Bit 0 (I^2C)/Control Port Chip Select (SPI)** *(Input)* - AD0 is a chip address pin in I^2C mode; $\overline{CS}$ is the chip select signal in SPI mode.
INT	11	**Interrupt** *(Output)* - The CS42528 will generate an interrupt condition as per the Interrupt Mask register. See "Interrupts" on page 40 for more details.
$\overline{RST}$	12	**Reset** *(Input)* - The device enters a low power mode and all internal registers are reset to their default settings when low.
AINR- AINR+	13 14	**Differential Right Channel Analog Input** *(Input)* - Signals are presented differentially to the delta-sigma modulators via the AINR+/- pins.
AINL+ AINL-	15 16	**Differential Left Channel Analog Input** *(Input)* - Signals are presented differentially to the delta-sigma modulators via the AINL+/- pins.
VQ	17	**Quiescent Voltage** *(Output)* - Filter connection for internal quiescent reference voltage.
FILT+	18	**Positive Voltage Reference** *(Output)* - Positive reference voltage for the internal sampling circuits.
REFGND	19	**Reference Ground** *(Input)* - Ground reference for the internal sampling circuits.
AOUTA1 +,- AOUTB1 +,- AOUTA2 +,- AOUTB2 +,- AOUTA3 +,- AOUTB3 +,- AOUTA4 +,- AOUTB4 +,-	36,37 35,34 32,33 31,30 28,29 27,26 22,23 21,20	**Differential Analog Output** *(Output)* - The full-scale differential analog output level is specified in the Analog Characteristics specification table.
VA VARX	24 41	**Analog Power** *(Input)* - Positive power supply for the analog section.
AGND	25 40	**Analog Ground** *(Input)* - Ground reference. Should be connected to analog ground.
MUTEC	38	**Mute Control** *(Output)* - The Mute Control pin outputs high impedance following an initial power-on condition or whenever the PDN bit is set to a '1', forcing the codec into power-down mode. The signal will remain in a high impedance state as long as the part is in power-down mode. The Mute Control pin goes to the selected "active" state during reset, muting, or if the master clock to left/right clock frequency ratio is incorrect. This pin is intended to be used as a control for external mute circuits to prevent the clicks and pops that can occur in any single supply system. The use of external mute circuits are not mandatory but may be desired for designs requiring the absolute minimum in extraneous clicks and pops.
LPFLT	39	**PLL Loop Filter** *(Output)* - An RC network should be connected between this pin and ground.
RXP7/GPO7 RXP6/GPO6 RXP5/GPO5 RXP4/GPO4 RXP3/GPO3 RXP2/GPO2 RXP1/GPO1	42 43 44 45 46 47 48	**S/PDIF Receiver Input/ General Purpose Output** *(Input/Output)* - Receiver inputs for S/PDIF encoded data. The CS42528 has an internal 8:2 multiplexer to select the active receiver port, according to the Receiver Mode Control 2 register. These pins can also be configured as general purpose output pins, ADC Overflow indicators or Mute Control outputs according to the RXP/General Purpose Pin Control registers.
RXP0	49	**S/PDIF Receiver Input** *(Input)* - Dedicated receiver input for S/PDIF encoded data.
TXP	50	**S/PDIF Transmitter Output** *(Output)* - S/PDIF encoded data output, mapped directly from one of the receiver inputs as indicated by the Receiver Mode Control 2 register.
VLS	53	**Serial Port Interface Power** *(Input)* - Determines the required signal level for the serial port interfaces.
SAI_SDOUT	54	**Serial Audio Interface Serial Data Output** *(Output)* - Output for two's complement serial audio PCM data from the S/PDIF incoming stream. This pin can also be configured to transmit the output of the internal and external ADCs.
RMCK	55	**Recovered Master Clock** *(Output)* - Recovered master clock output from the External Clock Reference (OMCK, pin 59) or the PLL which is locked to the incoming S/PDIF stream or CX_LRCK.

Product Specification

BM840 Stereo Solution Module

Bluetooth Qualified

CSR**8640A04**

April 2012

Features:

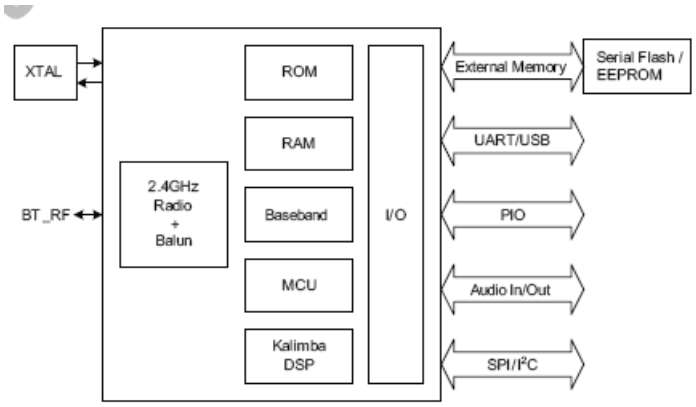
- Bluetooth Spec 4.0 Compliant
- Class 2 type Output Power
- Support A2DP 1.2,AVRCP V1.4,HSP 1.2 and HFP 1.6 Profiles
- Secure simple pairing, CSR's proximity pairing and CSR's proximity connection
- HFP v1.6 includes wideband speech and mSBC Codec.
- CSR's latest CVC technology audio enhancement
- Multipoint connection to 2 phones for voice and Music
- Support for multi-language programmable audio prompts
- OS battery status monitoring and smart apps
- Voice recognition support for answering a call, enables true hands-free use
- Wired audio support (USB and analogue)
- SBC, MP3, and AAC decoder support
- 5-band fully configurable EQ
- Integrated dual switch-mode regulators, linear regulators and battery charger
- Support for 802.11 Co-existence
- Size: 15mm x 11mm x 2.35mm
- Weight: 0.8g



Product Description:

The BM840 is a Class 2 Bluetooth sub-system using CSR8640 chipset from leading Bluetooth chipset supplier Cambridge Silicon Radio.

It is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems.The integrated peripherals reduce the number of external components required, including no requirement for external codec, battery charger, SMPS, LDOs, balun or external program memory, ensuring minimum production costs.



System Architecture

Applications:

- Stereo headsets and Headphones
- Wireless speaker

Specifications:

Operating Frequency Band	2.4GHz ~ 2.48GHz unlicensed ISM band
Bluetooth Specification	V4.0
Output Power Class	Class 2
Operating Voltage	3.3V
Host Interface	USB 1.1
Audio Interface	PCM, I2S, Analogue and USB audio
Dimension	15mm (L) x 11(W) mm x 2.35mm (H)

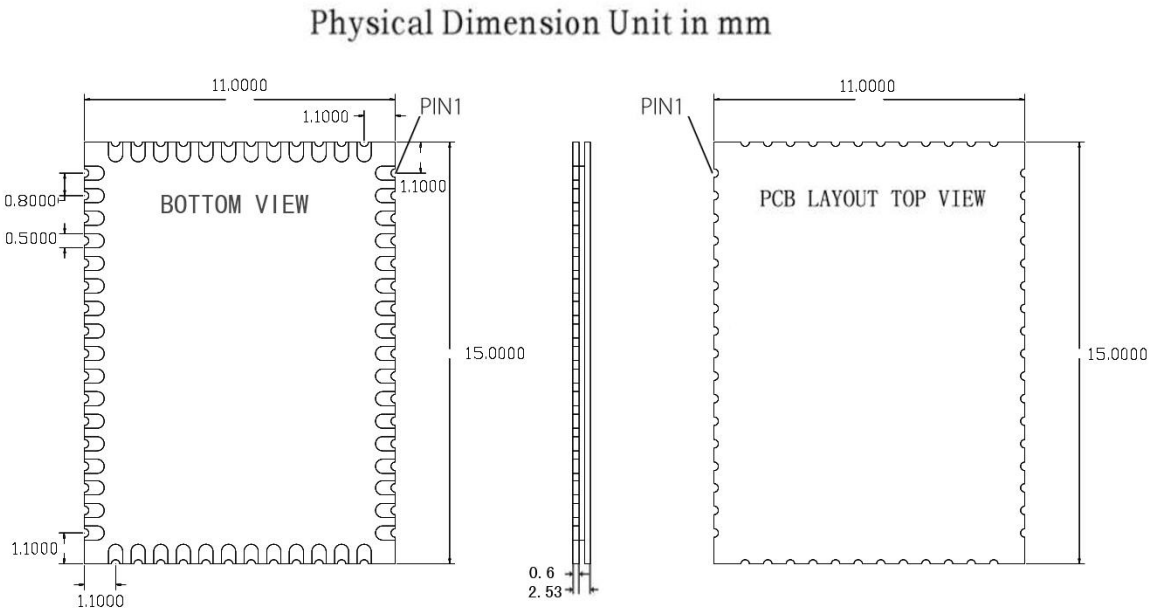
Specifications are subject to change without prior notice

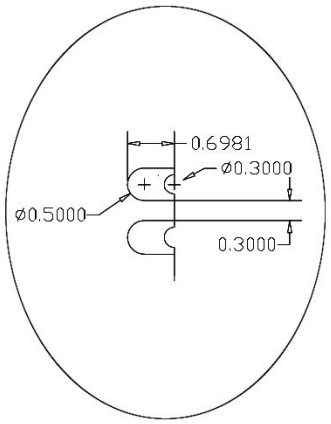
Pin Configurations

PIN NO.	NAME	TYPE	FUNCTION	RE-MARK
1	GND	GND	Ground	
2	GND	GND	Ground	
3	AIO0	Bi-directional	Analogue programmable input / output line	
4	PIO12	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_FLASH_CS#: serial quad I/O flash chip select ■ I2C_WP: I²C bus memory write protect line	
5	PIO14	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RX: UART data input	
6	PIO11	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_IO[0]: serial quad I/O flash data bit 0 ■ I2C_SDA: I²C serial data line	
7	PIO17	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_CTS: UART clear to send, active low	
8	PIO10	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_FLASH_CLK: serial quad I/O flash clock ■ I2C_SCL: I²C serial clock line	
9	PIO15	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_TX: UART data output	
10	PIO16	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RTS: UART request to send, active low	
11	PIO13	Bi-directional	Programmable Input/Output Line Alternative function: ■ QSPI_IO[1]: serial quad I/O flash data bit 1	
12	GND	GND	Ground	
13	PIO2	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_MOSI: SPI data input ■ PCM1_IN: PCM1 synchronous data input	
14	PIO5	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_CLK: SPI clock ■ PCM1_CLK: PCM1 synchronous data clock	
15	PIO4	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_CS#: chip select for SPI, active low ■ PCM1_SYNC: PCM1 synchronous data sync	
16	PIO3	Bi-directional	Programmable Input/Output Line Alternative functions: ■ SPI_MISO: SPI data output ■ PCM1_OUT: PCM1 synchronous data output	
17	GND	GND	Ground	
18	LED1	Bi-directional	LED driver. Alternative function: programmable output PIO[30].	
19	LED0	Bi-directional	LED driver. Alternative function: programmable output PIO[29].	
20	RST#	Input with strong pull-up	Reset if low. Pull low for minimum 5ms to cause a reset.	
21	SPI_PCM#	Bidirectional with weak pull-down	SPI/PCM select input: ■ 0 = PCM/PIO interface ■ 1 = SPI	
22	VREGENABLE	CMOS Input	Regulator enable input Can also be sensed as an input. Regulator enable and multifunction button. A high input (tolerant to VBAT) enables the on-chip regulators, which can then be latched on internally and the button used as a multifunction input	
23	GND	GND	Ground	
24	VBUS	Power Input	Charger input.	

			Typically connected to VBUS (USB supply) as Section 12 shows.	
25	CHG_EXT		External battery charger control. External battery charger transistor base control when using external charger boost. Otherwise leave unconnected.	
26	VBAT_SENSE		Battery charger sense input. Connect directly to the battery positive pin.	
27	VBAT	Power IN	Battery positive terminal.	
28	GND	GND	Ground	
29	1V8_SMPS	Power out	Serial Peripheral Interface Clock	
30	VDD_PADS	Power IN	Positive supply input for input/output ports	
31	PIO9	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_CTS: UART clear to send, active low	
32	PIO0	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RX: UART data input	
33	PIO6	Bi-directional	Programmable Input/Output Line	
34	PIO18	Bi-directional	Programmable Input/Output Line	
35	PIO19	Bi-directional	Programmable Input/Output Line	
36	GND	GND	Ground	
37	USB_N	Bi-directional	USB data minus	
38	USB_P	Bi-directional	USB data plus with selectable internal 1.5kΩ pull-up resistor	
39	PIO7	Bi-directional	Programmable Input/Output Line	
40	PIO1	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_TX: UART data output	
41	PIO8	Bi-directional	Programmable Input/Output Line Alternative functions: ■ UART_RTS: UART request to send, active low	
42	PIO21	Bi-directional	Programmable Input/Output Line	
43	PIO20	Bi-directional	Programmable Input/Output Line	
44	LED2	Bi-directional	LED driver. Alternative function: programmable output PIO[31]	
45	GND	GND	Ground	
46	MIC_BIAS	Analogue out	Microphone bias	
47	MIC_RN	Analogue in	Microphone input negative, channel A	
48	MIC_RP	Analogue in	Microphone input positive, channel A	
49	MIC_LN	Analogue in	Microphone input negative, channel B	
50	MIC_LP	Analogue in	Microphone input positive, channel B	
51	AGND	Analogue	Ground connection for audio and audio driver.	
52	SPK_RN	Analogue out	Speaker A output negative, right	
53	SPK_RP	Analogue out	Speaker A output positive, right	
54	SPK_LN	Analogue out	Speaker A output negative, left	
55	SPK_LP	Analogue out	Speaker A output positive, left	
56	GND	GND	Ground	
57	RF_IN	GND	Bluetooth 50Ω transmitter output /receiver input	
58	GND	GND	Ground	

Recommended Layout patterns:





NO	PINNAME	NO	PINNAME
1	GND	31	PIO[9]
2	GND	32	PIO[0]
3	AIO[0]	33	PIO[6]
4	PIO[12]	34	PIO[18]
5	PIO[14]	35	PIO[19]
6	PIO[11]	36	GND
7	PIO[17]	37	USB_N
8	PIO[10]	38	USB_P
9	PIO[15]	39	PIO[7]
10	PIO[16]	40	PIO[1]
11	PIO[13	41	PIO[8]
12	GND	42	PIO[21]
13	PIO[2]	43	PIO[20]
14	PIO[5]	44	LED[2]
15	PIO[4]	45	GND
16	PIO[3]	46	MIC_BIAS
17	GND	47	MIC_RN
18	LED[1]	48	MIC_RP
19	LED[0]	49	MIC_LN
20	RST#	50	MIC_LP
21	SPI_PCM#	51	AGND
22	VREGENABLE	52	SPKR_RN
23	GND	53	SPKR_RP
24	VBUS	54	SPKR_LN
25	CHG_EXT	55	SPKR_LP
26	VBAT_SENSE	56	GND
27	VBAT	57	RF
28	GND	58	GND
29	1V8_SMPS		
30	VDD_PADS		

Configuration

Data Sheet

LOW DROPOUT LINEAR REGULATOR AZ1117C

General Description

The AZ1117C is a low dropout three-terminal regulator.

The AZ1117C has been optimized for low voltage where transient response and minimum input voltage are critical. It provides current limit and thermal shutdown. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within ±1%. On-chip thermal shutdown provides protection against a combination of high current and ambient temperature that would create excessive junction temperature.

The AZ1117C is available in 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5.0V fixed output voltage vesions and ADJ output voltage version. The fixed versions integrate the adjust resistors. It is also available in an adjustable version which can set the output voltage with two external resistors.

The AZ1117C is available in the industry-standard TO-252-2 (1), TO-252-2 (2), TO-252-2 (3), TO-252-2 (4), SOT-89 and SOT-223 power packages.

Features

- Current Limit: 1.0A (Typ.)
- Output Noise from 10Hz to 10KHz: 0.003% of V_{OUT}
- PSRR at I_{OUT}=300mA and f=120Hz: 70dB
- Output Voltage Accuracy: ±1% (Except 1.2V version)
- On-chip Thermal Shutdown
- Maximum Quiescent Current: I_{QMAX}=6mA
- Compatible with Low ESR Ceramic Capacitor
- Operation Junction Temperature: -20 to 125°C

Applications

- USB Device
- Add-on Card
- DVD Player
- PC Motherboard

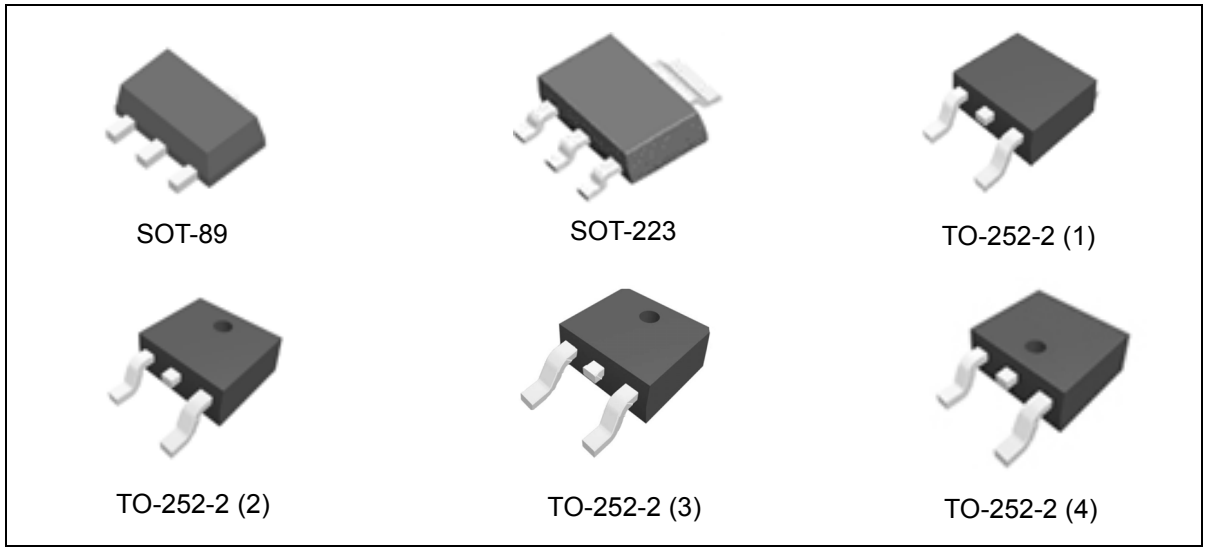


Figure 1. Package Types of AZ1117C

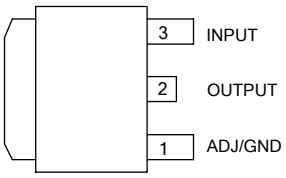
Data Sheet

LOW DROPOUT LINEAR REGULATOR **AZ1117C**

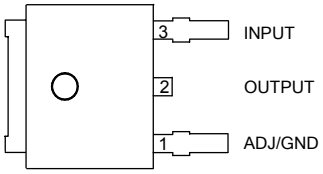
Pin Configuration

D Package

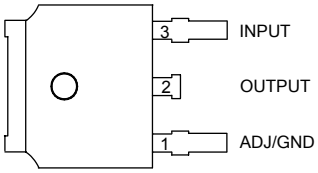
(TO-252-2 (1))



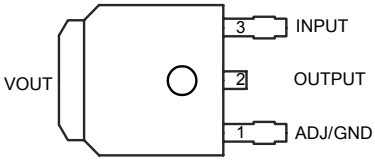
(TO-252-2 (2))



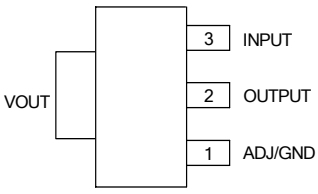
(TO-252-2 (3))



(TO-252-2 (4))



H Package
(SOT-223)



R Package
(SOT-89)

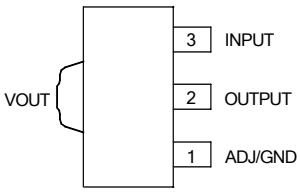


Figure 2. Pin Configuration of AZ1117C (Top View)

1. Description

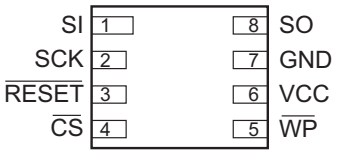
The Atmel AT45DB321D is a 2.5V or 2.7V, serial interface, sequential access flash memory ideally suited for a wide variety of digital voice-, image-, program code-, and data-storage applications. The AT45DB321D supports the Atmel RapidS serial interface for applications requiring very high speed operations. The RapidS serial interface is SPI compatible for frequencies up to 66MHz. The 34,603,008-bits of memory are organized as 8,192 pages of 512 bytes or 528 bytes each. In addition to the main memory, the AT45DB321D also contains two SRAM buffers of 512/528 bytes each. These buffers allow the receiving of data while a page in the main memory is being reprogrammed, as well as the writing of a continuous data stream. EEPROM (electrically erasable and programmable read-only memory) emulation (bit or byte alterability) is easily handled with a self-contained, three-step read-modify-write operation. Unlike conventional flash memories, which are accessed randomly with multiple address lines and a parallel interface, Atmel DataFlash® devices use a RapidS serial interface to sequentially access its data. The simple sequential access dramatically reduces active pin count, facilitates hardware layout, increases system reliability, minimizes switching noise, and reduces package size. The device is optimized for use in many commercial and industrial applications where high density, low pin count, low voltage and low power are essential.

To allow for simple, in-system reprogrammability, the AT45DB321D does not require high input voltages for programming. The device operates from a single power supply, 2.7V to 3.6V, for both the program and read operations. The AT45DB321D is enabled through the chip select pin ($\overline{CS}$) and accessed via a three-wire interface consisting of the serial input (SI), serial output (SO), and serial clock (SCK) lines.

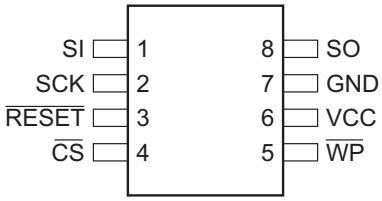
All programming and erase cycles are self timed.

Figure 1-1. Pin configurations and pinouts.

MLF[1] (VDFN)
Top View

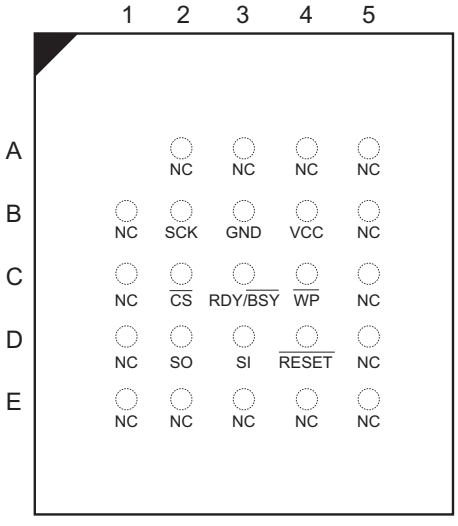


SOIC
Top View

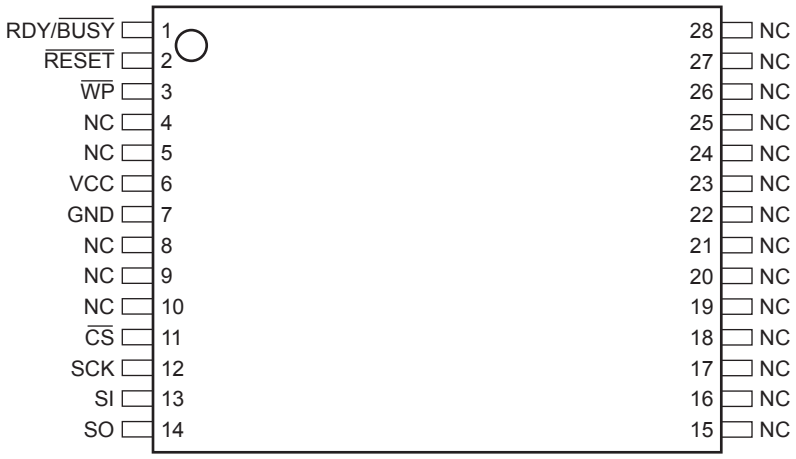


Note: 1. The metal pad on the bottom of the MLF package is floating. This pad can be a “No Connect” or connected to GND.

BGA Package Ball-out
Top View



TSOP: Type 1
Top View

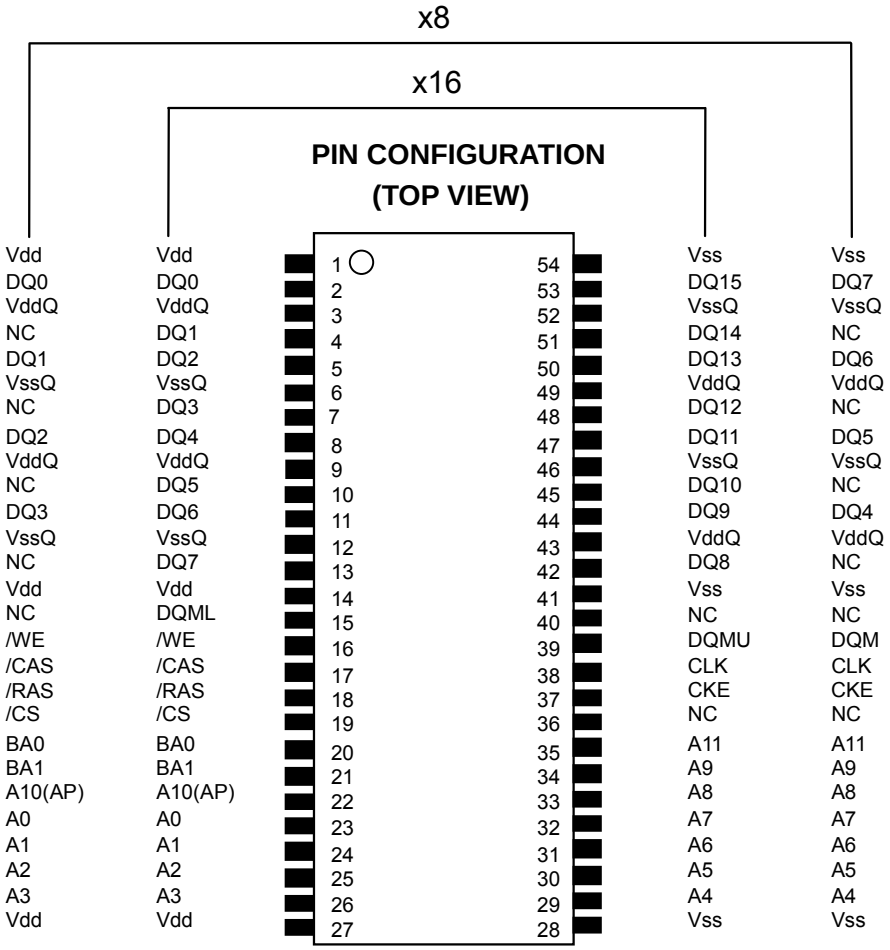


Note: TSOP package is not recommended for new designs. Future die shrinks will support 8-pin packages only.

Table 1-1. Pin Configurations

Symbol	Name and Function	Asserted State	Type
$\overline{CS}$	**Chip Select:** Asserting the $\overline{CS}$ pin selects the device. When the $\overline{CS}$ pin is deasserted, the device will be deselected and normally be placed in the standby mode (not deep power-down mode), and the output pin (SO) will be in a high-impedance state. When the device is deselected, data will not be accepted on the input pin (SI). A high-to-low transition on the $\overline{CS}$ pin is required to start an operation, and a low-to-high transition is required to end an operation. When ending an internally self-timed operation such as a program or erase cycle, the device will not enter the standby mode until the completion of the operation.	Low	Input
SCK	**Serial Clock:** This pin is used to provide a clock to the device, and is used to control the flow of data to and from the device. Command, address, and input data present on the SI pin are always latched on the rising edge of SCK, while output data on the SO pin are always clocked out on the falling edge of SCK.	–	Input
SI	**Serial Input:** The SI pin is used to shift data into the device. The SI pin is used for all data input, including command and address sequences. Data on the SI pin are always latched on the rising edge of SCK.	–	Input
SO	**Serial Output:** The SO pin is used to shift data out from the device. Data on the SO pin are always clocked out on the falling edge of SCK.	–	Output
$\overline{WP}$	**Write Protect:** When the $\overline{WP}$ pin is asserted, all sectors specified for protection by the sector protection register will be protected against program and erase operations, regardless of whether the enable sector protection command has been issued or not. The $\overline{WP}$ pin functions independently of the software controlled protection method. After the $\overline{WP}$ pin goes low, the content of the sector protection register cannot be modified. If a program or erase command is issued to the device while the $\overline{WP}$ pin is asserted, the device will simply ignore the command and perform no operation. The device will return to the idle state once the $\overline{CS}$ pin has been deasserted. The enable sector protection command and sector lockdown command, however, will be recognized by the device when the $\overline{WP}$ pin is asserted. The $\overline{WP}$ pin is internally pulled high, and may be left floating if hardware controlled protection will not be used. However, it is recommended that the $\overline{WP}$ pin also be externally connected to V_{CC} whenever possible.	Low	Input
RESET	**Reset:** A low state on the reset pin ($\overline{RESET}$) will terminate the operation in progress and reset the internal state machine to an idle state. The device will remain in the reset condition as long as a low level is present on the $\overline{RESET}$ pin. Normal operation can resume once the $\overline{RESET}$ pin is brought back to a high level. The device incorporates an internal power-on reset circuit, and so there are no restrictions on the $\overline{RESET}$ pin during power-on sequences. If this pin and feature are not utilized, it is recommended that the $\overline{RESET}$ pin be driven high externally.	Low	Input
RDY/$\overline{BUSY}$	**Ready/Busy:** This open drain output pin will be driven low when the device is busy in an internally self-timed operation. This pin, which is normally in a high state (through an external pull-up resistor), will be pulled low during programming/erase operations, compare operations, and page-to-buffer transfers. The busy status indicates that the flash memory array and one of the buffers cannot be accessed; read and write operations to the other buffer can still be performed.	–	Output
V_{CC}	**Device Power Supply:** The V_{CC} pin is used to supply the source voltage to the device. Operations at invalid V_{CC} voltages may produce spurious results and should not be attempted.	–	Power
GND	**Ground:** The ground reference for the power supply. GND should be connected to the system ground.	–	Ground

PIN CONFIGURATION (TOP VIEW)



CLK	: Master Clock	DQM	: Output Disable / Write Mask (A3V28S30FTP)
CKE	: Clock Enable	DQMU,L	: Output Disable / Write Mask (A3V28S40FTP)
/CS	: Chip Select	A0-11	: Address Input
/RAS	: Row Address Strobe	BA0,1	: Bank Address
/CAS	: Column Address Strobe	Vdd	: Power Supply
/WE	: Write Enable	VddQ	: Power Supply for Output
DQ0-7	: Data I/O (A3V28S30FTP)	Vss	: Ground
DQ0-15	: Data I/O (A3V28S40FTP)	VssQ	: Ground for Output

Pin Descriptions

SYMBOL	TYPE	DESCRIPTION
CLK	Input	Clock: CLK is driven by the system clock. All SDRAM input signals are sampled on the positive edge of CLK. CLK also increments the internal burst counter and controls the output registers.
CKE	Input	Clock Enable: CKE activates (HIGH) and deactivates (LOW) the CLK signal. Deactivating the clock provides PRECHARGE POWER-DOWN and SELF REFRESH operation (all banks idle), ACTIVE POWER-DOWN (row active in any bank), or CLOCK SUSPEND operation (burst / access in progress). CKE is synchronous except after the device enters self refresh mode, where CKE becomes asynchronous until after exiting the same mode. The input buffers, including CLK, are disabled during self refresh mode, providing low standby power. CKE may be tied HIGH.
/CS	Input	Chip Select: /CS enables (registered LOW) and disables (registered HIGH) the command decoder. All commands are masked when /CS is registered HIGH. /CS provides for external bank selection on systems with multiple banks. /CS is considered part of the command code.
/CAS, /RAS, /WE	Input	Command Inputs: /CAS, /RAS, and /WE (along with /CS) define the command being entered.
DQM, DQML, DQMU,	Input	Input / Output Mask: DQM is sampled HIGH and is an input mask signal for write accesses and an output disable signal for read accesses. Input data is masked during a WRITE cycle. The output buffers are placed in a High-Z state (two-clock latency) when during a READ cycle. DQM corresponds to DQ0–DQ7 (A3V28S30FTP). DQML corresponds to DQ0–DQ7, DQMU corresponds to DQ8–DQ15 (A3V28S40FTP).
BA0, BA1	Input	Bank Address Input(s): BA0 and BA1 define to which bank the ACTIVE, READ, WRITE or PRECHARGE command is being applied.
A0–A11	Input	A0-11 specify the Row / Column Address in conjunction with BA0,1. The Row Address is specified by A0-11. The Column Address is specified by A0-9(x8) and A0-8(x16). A10 is also used to indicate precharge option. When A10 is high at a read / write command, an auto precharge is performed. When A10 is high at a precharge command, all banks are precharged.
DQ0–DQ15	I/O	Data Input / Output: Data bus.
NC	–	Internally Not Connected: These could be left unconnected, but it is recommended they be connected or Vss.
VddQ	Supply	Data Output Power: Provide isolated power to output buffers for improved noise immunity.
VssQ	Supply	Data Output Ground: Provide isolated ground to output buffers for improved noise immunity.
Vdd	Supply	Power for the input buffers and core logic.
Vss	Supply	Ground for the input buffers and core logic.

KEC

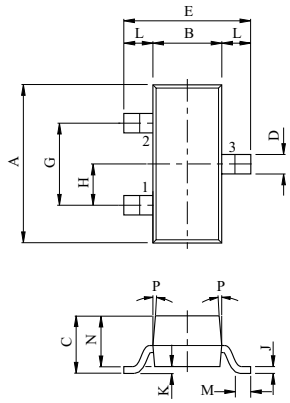
SEMICONDUCTOR
TECHNICAL DATA

2N7002K
N Channel MOSFET
ESD Protected 2000V

INTERFACE AND SWITCHING APPLICATION.

FEATURES

- ESD Protected 2000V.
- High density cell design for low $R_{DS(ON)}$.
- Voltage controlled small signal switch.
- Rugged and reliable.
- High saturation current capablity.



DIM	MILLIMETERS
A	2.93± 0.20
B	1.30+0.20/-0.15
C	1.30 MAX
D	0.45+0.15/-0.05
E	2.40+0.30/-0.20
G	1.90
H	0.95
J	0.13+0.10/-0.05
K	0.00 ~ 0.10
L	0.55
M	0.20 MIN
N	1.00+0.20/-0.10
P	7°

1. SOURCE
2. GATE
3. DRAIN

SOT-23

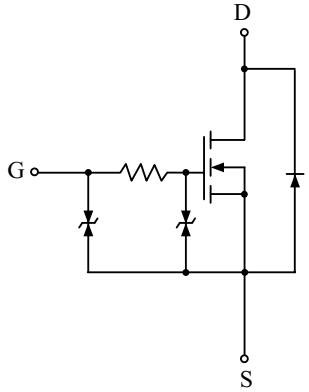
MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	300	mA
	Pulsed (Note 1)	I_{DP}	1200	
Drain Power Dissipation (Note 2)		P_D	300	mW
Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55～150	℃

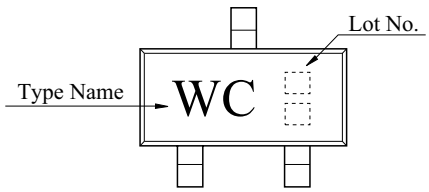
Note 1) Pulse Width ≦10㎲, Duty Cycle ≦1%

Note 2) Package mounted on a glass epoxy PCB(100mm² ×1mm)

EQUIVALENT CIRCUIT



Marking



ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=10㎂	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	㎂
Gate-Body Leakage, Forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V	-	-	10	㎂
Gate-Body Leakage, Reverse	I_{GSSR}	V_{GS}=-20V, V_{DS}=0V	-	-	-10	㎂

DATA SHEET

NEC

MOS FIELD EFFECT TRANSISTOR

μPA672T

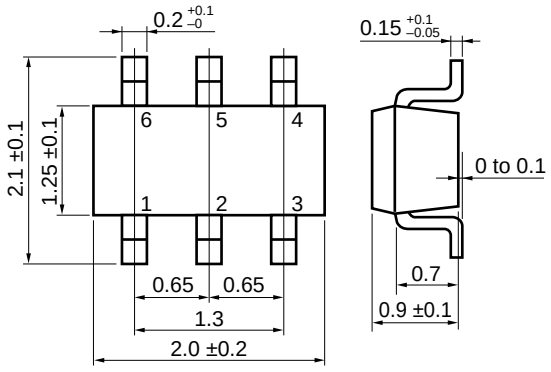
N-CHANNEL MOS FET ARRAY FOR SWITCHING

The μPA672T is a super-mini-mold device provided with two MOS FET elements. It achieves high-density mounting and saves mounting costs.

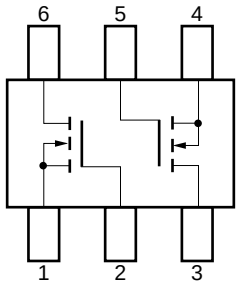
FEATURES

- Two MOS FET circuits in package the same size as SC-70
- Automatic mounting supported

PACKAGE DIMENSIONS (in millimeters)



PIN CONNECTION



1. Source 1 (S1)
2. Gate 1 (G1)
3. Drain 2 (D2)
4. Source 2 (S2)
5. Gate 2 (G2)
6. Drain 1 (D1)

Marking: MA

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Drain to Source Voltage	V_{DSS}		50	V
Gate to Source Voltage	V_{GSS}		±7.0	V
Drain Current (DC)	$I_{D(DC)}$		100	mA
Drain Current (pulse)	$I_{D(pulse)}$	PW ≤ 10 ms, Duty Cycle ≤ 50 %	200	mA
Total Power Dissipation	P_T		200 (Total)	mW
Channel Temperature	T_{ch}		150	°C
Storage Temperature	T_{stg}		–55 to +150	°C

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Date Published June 1996 P
Printed in Japan

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TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74VHC157F, TC74VHC157FN, TC74VHC157FT

QUAD 2-CHANNEL MULTIPLEXER

The TC74VHC157 is an advanced high speed CMOS QUAD 2 - CHANNEL MULTIPLEXER fabricated with silicon gate C^2MOS technology.
It achieves the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation.
It consists of four 2 - input digital multiplexers with common select and strobe inputs.
When the $\overline{STROBE}$ input is held "H" level, selection of data is inhibited and all the outputs become "L" level.
The SELECT decoding determines whether the A or B inputs get routed to their corresponding Y outputs.
An Input protection circuit ensures that 0 to 5.5V can be applied to the input pins without regard to the supply voltage. This device can be used to interface 5V to 3V systems and on two supply systems such as battery back up. This circuit prevents device destruction due to mismatched supply and input voltages.

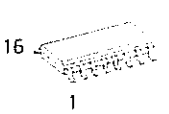
FEATURES:

- High Speed ..... t_{pd} = 4.1ns(typ.) at V_{CC} = 5V
- Low Power Dissipation ..... I_{CC} = 4μA(Max.) at Ta = 25°C
- High Noise Immunity ..... $V_{NIH} = V_{NIL}$ = 28% V_{CC} (Min.)
- Power Down Protection is provided on all inputs.
- Balanced Propagation Delays ..... $t_{pLH} \simeq t_{pHL}$
- Wide Operating Voltage Range ..... V_{CC} (opr) = 2V ~ 5.5V
- Low Noise ..... V_{OLP} = 0.8V (Max.)
- Pin and Function Compatible with 74ALS157

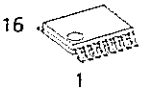
(Note) The JEDEC SOP (FN) is not available in Japan.



F (SOP16-P-300-1.27)
Weight : 0.18g (Typ.)

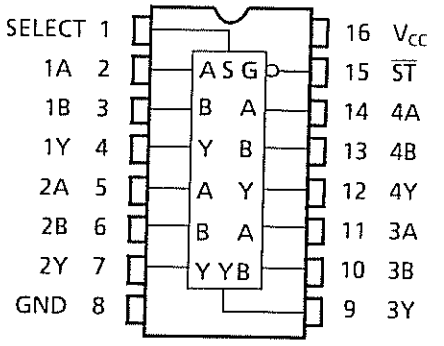


FN (SOL16-P-150-1.27)
Weight : 0.13g (Typ.)



FT (TSSOP16-P-0044-0.65)
Weight : 0.06g (Typ.)

PIN ASSIGNMENT



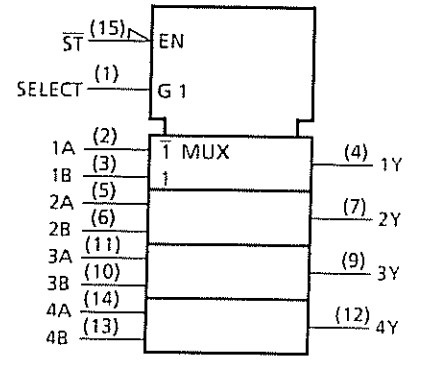
(TOP VIEW)

TRUTH TABLE

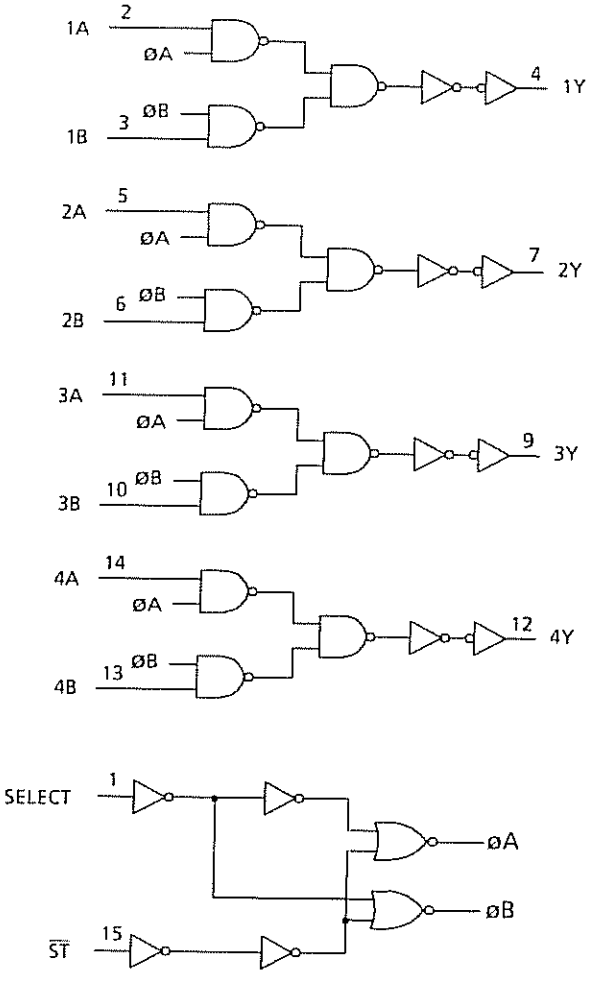
INPUTS				OUTPUT
$\overline{ST}$	SELECT	A	B	
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

X : Don't Care

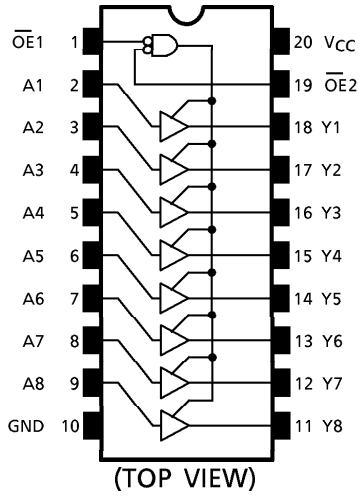
IEC LOGIC SYMBOL



SYSTEM DIAGRAM

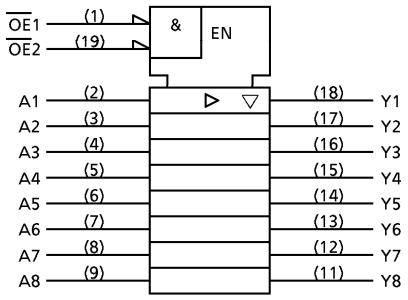


PIN ASSIGNMENT



(TOP VIEW)

IEC LOGIC SYMBOL



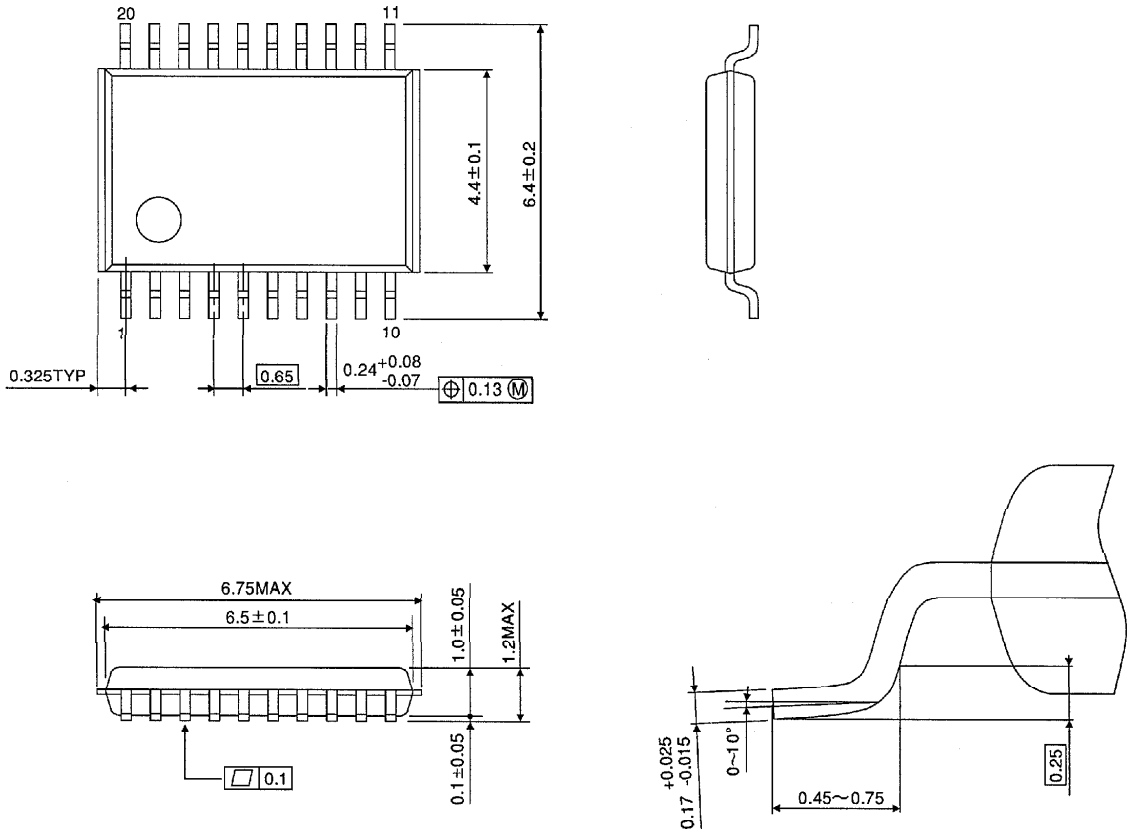
TRUTH TABLE

INPUTS			OUTPUTS
$\overline{OE1}$	$\overline{OE2}$	An	
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L

X : Don't Care
Z : High Impedance

OUTLINE DRAWING

TSSOP20-P-0044-0.65



Weight : 0.08g (Typ.)

SY6288

Low Loss Power Distribution Switch

Preliminary Specification

General Description

SY6288 is an ultra-low $R_{DS(ON)}$ switch with current limiting function to protect the power source from over current and short circuit conditions.

Ordering Information

SY6288□(□□)□

- Temperature Code
- Package Code
- Optional Spec Code

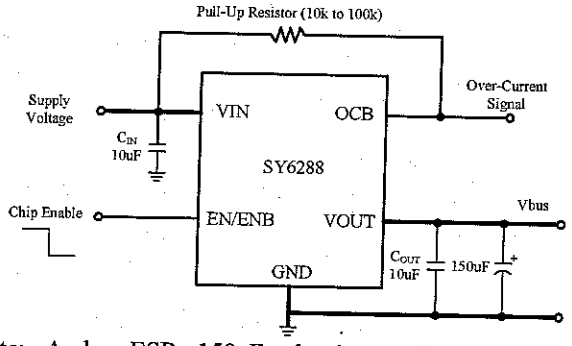
Temperature Range: -40°C to 85°C

Ordering Number	Package type	Note
SY6288AAAC	SOT23-5	0.6A/Active High
SY6288ACAC	MSOP8	0.6A/Active High
SY6288AFAC	SO8	0.6A/Active High
SY6288BAAC	SOT23-5	0.6A/Active Low
SY6288BCAC	MSOP8	0.6A/Active Low
SY6288BFAC	SO8	0.6A/Active Low
SY6288CAAC	SOT23-5	2A/Active High
SY6288CCAC	MSOP8	2A/Active High
SY6288CFAC	SO8	2A/Active High
SY6288DAAC	SOT23-5	2A/Active Low
SY6288DCAC	MSOP8	2A/Active Low
SY6288DFAC	SO8	2A/Active Low
SY6288D1AAC	SOT23-5	1.5A/Active Low
SY6288D1CAC	MSOP8	1.5A/Active Low
SY6288D1FAC	SO8	1.5A/Active Low
SY6288EAAC	SOT23-5	2A/Active Low
SY6288ECAC	MSOP8	2A/Active Low
SY6288EFAC	SO8	2A/Active Low

Features

- Distribution voltages: 2.5V to 5.5V
- Over temperature shutdown and automatic retry
- Reverse blocking (no body diode)
- At shutdown, OUT can be forced higher than IN
- Fault flag (OCB) output for over current and fault conditions
- Automatic output discharge at shutdown
- Built-in softstart
- 0.4ms rise time
- RoHS Compliant and Halogen Free
- Two Enable polarities and three current levels
  - SY6288A: Active High/0.6A
  - SY6288B: Active Low/0.6A
  - SY6288C: Active High/2A
  - SY6288D: Active Low/2A
  - SY6288D1: Active Low/1.5A
  - SY6288E: Active Low/2A
- Compact packages minimize board space: SOT23-5, SO8, MSOP8
- UL certification NO. 20100428-E333762
  TUV certification NO. R501887690001

Typical Application Circuit



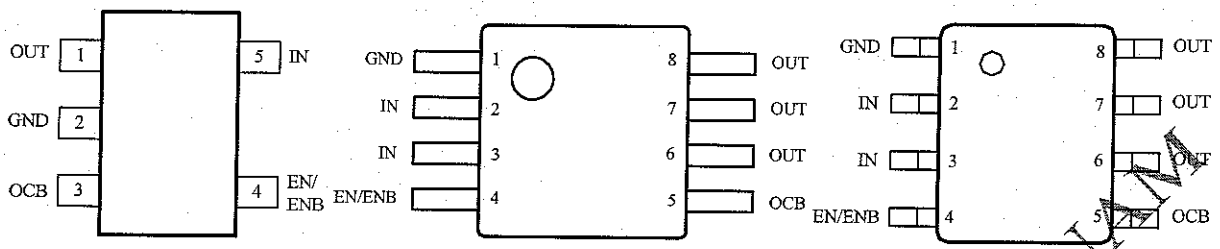
Note: A low-ESR 150uF aluminum electrolytic or tantalum between VOUT and GND is strongly recommended.

Silergy Corp. Confidential-Prepared for ANAM

SILERGY

SY6288

Pin Configurations (Top View)



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3 Pinouts and pin description

Figure 9. STM32F20x LQFP64 pinout

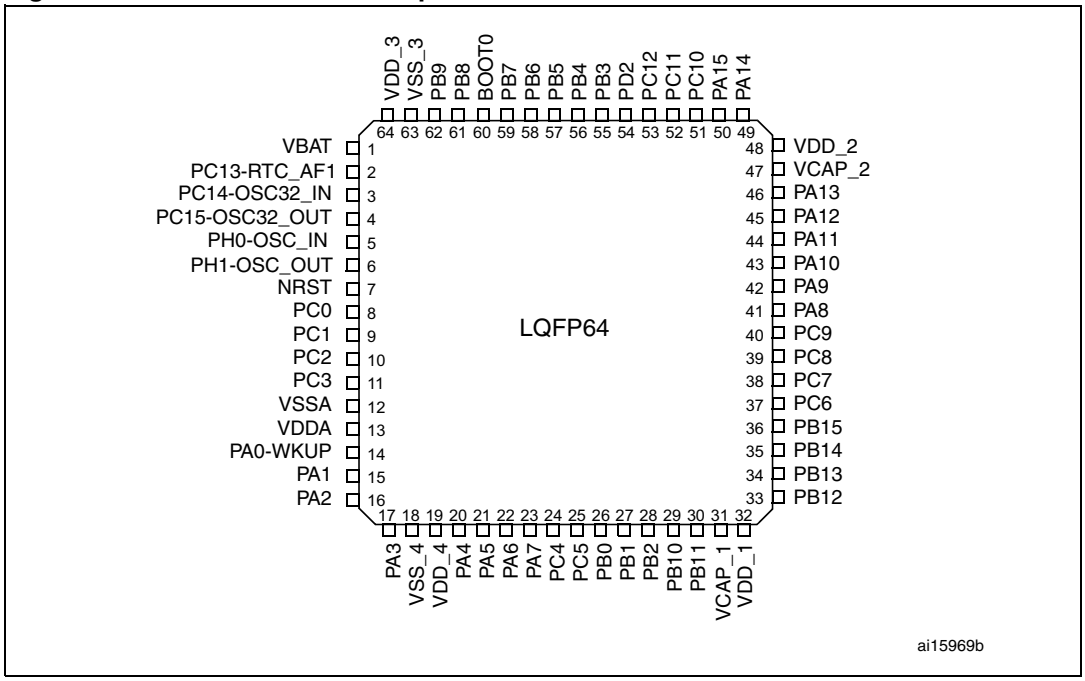


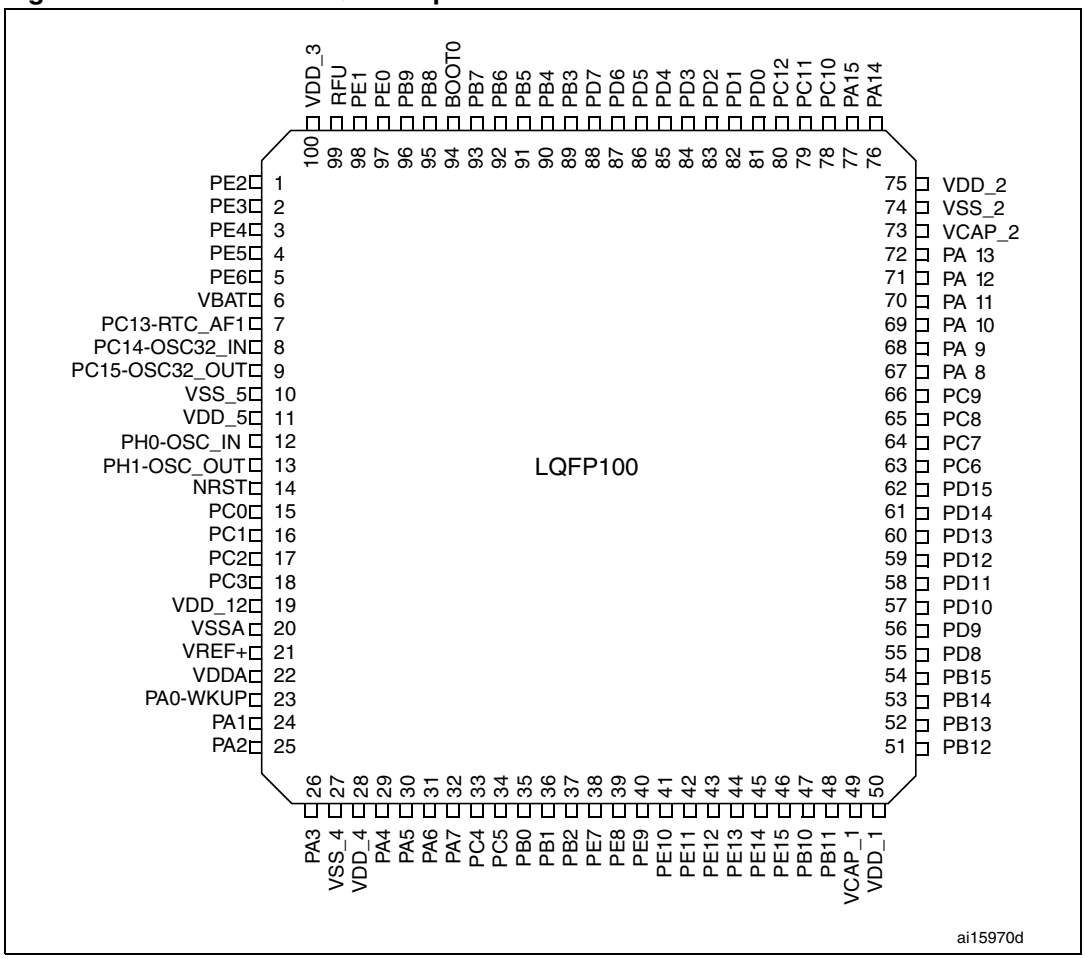
Figure 10. STM32F20x WLCSP64+2 ballout

	1	2	3	4	5	6	7	8	9
A	PA14	PA15	PC12	PB3	PB5	PB7	PB9	VDD_2	V_{BAT}
B	VSS_2	PA13	PC10	PB4	PB6	BOOT0	PB8	PC13	PC14
C	PA12	VCAP_2	PC11				PD2	PDROFF	PC15
D	PC9	PA11	PA10				PC2	VSS_3	VDD_3
E	VDD_4	PA8	PA9				PA0	NRST	PH0-OSC_IN
F	VSS_4	PC7	PC8				VREF+	PC1	PH1-OSC_OUT
G	PB15	PC6	PC5				PA3	PC3	PC0
H	PB14	PB13	PB10	PC4	PA6	PA5	REGOFF	PA1	VSS_5
J	PB12	PB11	VCAP_1	PB2	PB1	PB0	PA7	PA4	PA2

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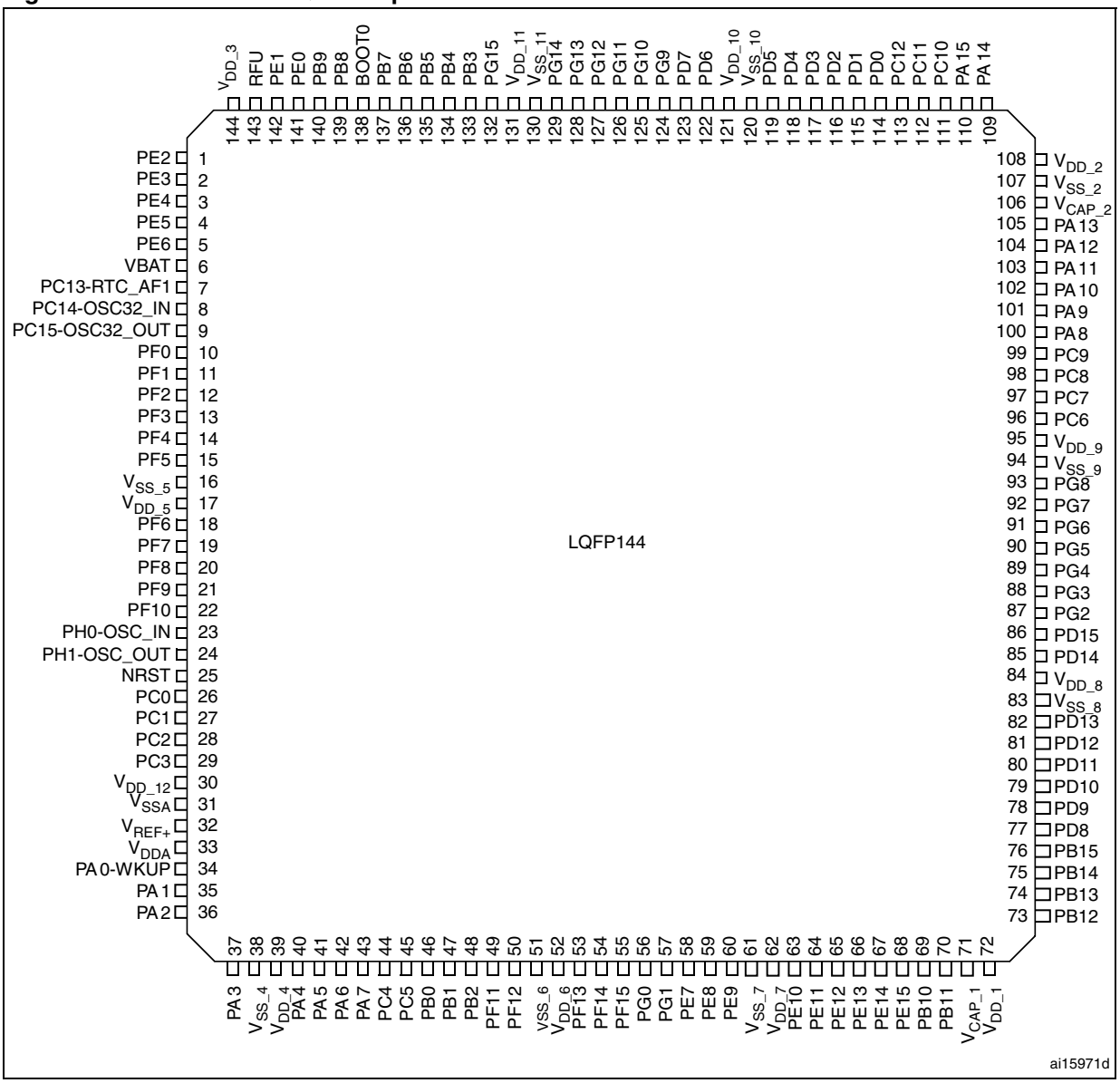
1. Top view.

Figure 11. STM32F20x LQFP100 pinout



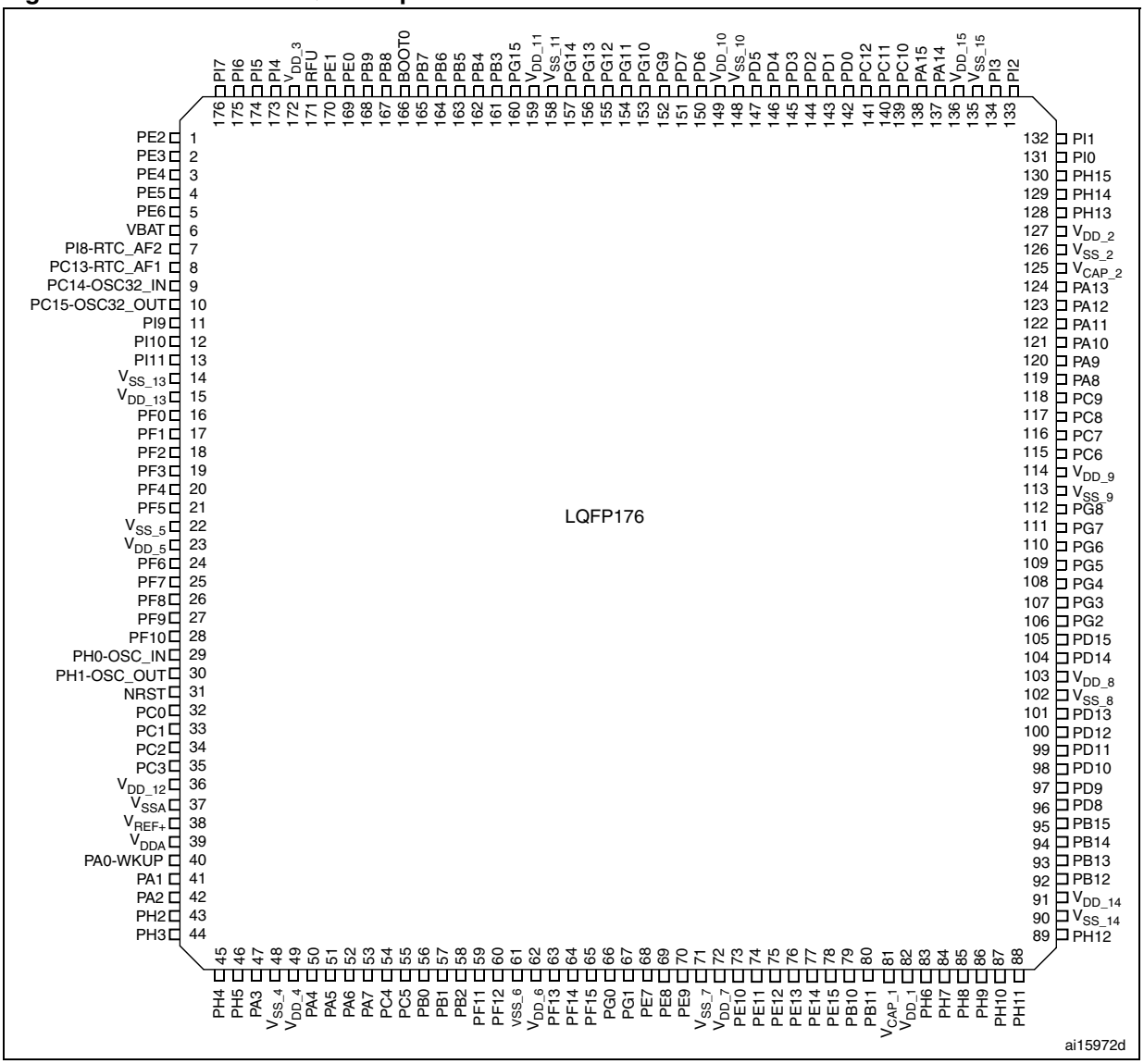
1. RFU means “reserved for future use”.

Figure 12. STM32F20x LQFP144 pinout



1. RFU means “reserved for future use”.

Figure 13. STM32F20x LQFP176 pinout



1. Package not in production and available for development only.
2. RFU means “reserved for future use”.

Figure 14. STM32F21xxx UFBGA176 ballout

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	PE3	PE2	PE1	PE0	PB8	PB5	PG14	PG13	PB4	PB3	PD7	PC12	PA15	PA14	PA13
B	PE4	PE5	PE6	PB9	PB7	PB6	PG15	PG12	PG11	PG10	PD6	PD0	PC11	PC10	PA12
C	VBAT	PI7	PI6	PI5	VDD_3	RFU	VDD_11	VDD_10	VDD_15	PG9	PD5	PD1	PI3	PI2	PA11
D	PC13-TAMP1	PI8-TAMP2	PI9	PI4	VSS	BOOT0	VSS_11	VSS_10	VSS_15	PD4	PD3	PD2	PH15	PI1	PA10
E	PC14-OSC32_IN	PF0	PI10	PI11								PH13	PH14	PI0	PA9
F	PC15-OSC32_OUT	VSS_13	VDD_13	PH2		VSS	VSS	VSS	VSS	VSS		VSS_2	VCAP2	PC9	PA8
G	PH0-OSC_IN	VSS_5	VDD_5	PH3		VSS	VSS	VSS	VSS	VSS		VSS_9	VDD_2	PC8	PC7
H	PH1-OSC_OUT	PF2	PF1	PH4		VSS	VSS	VSS	VSS	VSS		VSS_14	VDD_9	PG8	PC6
J	NRST	PF3	PF4	PH5		VSS	VSS	VSS	VSS	VSS		VDD_14	VDD_8	PG7	PG6
K	PF7	PF6	PF5	VDD_4		VSS	VSS	VSS	VSS	VSS		PH12	PG5	PG4	PG3
L	PF10	PF9	PF8	REGOFF								PH11	PH10	PD15	PG2
M	VSSA	PC0	PC1	PC2	PC3	PB2	PG1	VSS_6	VSS_7	VCAP1	PH6	PH8	PH9	PD14	PD13
N	VREF-	PA1	PA0-WKUP	PA4	PC4	PF13	PG0	VDD_6	VDD_7	VDD_1	PE13	PH7	PD12	PD11	PD10
P	VREF+	PA2	PA6	PA5	PC5	PF12	PF15	PE8	PE9	PE11	PE14	PB12	PB13	PD9	PD8
R	VDDA	PA3	PA7	PB1	PB0	PF11	PF14	PE7	PE10	PE12	PE15	PB10	PB11	PB14	PB15

ai17293b

1. RFU means “reserved for future use”.
2. Top view.

Table 5. STM32F20x pin and ball definitions

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
-	-	1	1	1	A2	PE2	I/O	FT	PE2	TRACECLK/ FSMC_A23 / ETH_MII_TXD3	
-	-	2	2	2	A1	PE3	I/O	FT	PE3	TRACED0/FSMC_A19	
-	-	3	3	3	B1	PE4	I/O	FT	PE4	TRACED1/FSMC_A20 / DCMI_D4	
-	-	4	4	4	B2	PE5	I/O	FT	PE5	TRACED2 / FSMC_A21 / TIM9_CH1 / DCMI_D6	
-	-	5	5	5	B3	PE6	I/O	FT	PE6	TRACED3 / FSMC_A22 / TIM9_CH2 / DCMI_D7	
1	A9	6	6	6	C1	V_{BAT}	S		V_{BAT}		
-	-	-	-	7	D2	PI8(4)	I/O	FT	PI8(5)		RTC_AF2
2	B8	7	7	8	D1	PC13(4)	I/O	FT	PC13(5)		RTC_AF1
3	B9	8	8	9	E1	PC14(4)-OSC32_IN(6)	I/O	FT	PC14(5)		OSC32_IN
4	C9	9	9	10	F1	PC15(4)-OSC32_OUT(6)	I/O	FT	PC15(5)		OSC32_OUT
-	-	-	-	11	D3	PI9	I/O	FT	PI9	CAN1_RX	
-	-	-	-	12	E3	PI10	I/O	FT	PI10	ETH_MII_RX_ER	
-	-	-	-	13	E4	PI11	I/O	FT	PI11	OTG_HS_ULPI_DIR	
-	-	-	-	14	F2	V_{SS_13}	S		V_{SS_13}		
-	-	-	-	15	F3	V_{DD_13}	S		V_{DD_13}		
-	-	-	10	16	E2	PF0	I/O	FT	PF0	FSMC_A0 / I2C2_SDA	
-	-	-	11	17	H3	PF1	I/O	FT	PF1	FSMC_A1 / I2C2_SCL	
-	-	-	12	18	H2	PF2	I/O	FT	PF2	FSMC_A2 / I2C2_SMBA	
-	-	-	13	19	J2	PF3(6)	I/O	FT	PF3	FSMC_A3	ADC3_IN9
-	-	-	14	20	J3	PF4(6)	I/O	FT	PF4	FSMC_A4	ADC3_IN14
-	-	-	15	21	K3	PF5(6)	I/O	FT	PF5	FSMC_A5	ADC3_IN15
-	H9	10	16	22	G2	V_{SS_5}	S		V_{SS_5}		
-	-	11	17	23	G3	V_{DD_5}	S		V_{DD_5}		
-	-	-	18	24	K2	PF6(6)	I/O	FT	PF6	TIM10_CH1 / FSMC_NIORD	ADC3_IN4
-	-	-	19	25	K1	PF7(6)	I/O	FT	PF7	TIM11_CH1/FSMC_NREG	ADC3_IN5
-	-	-	20	26	L3	PF8(6)	I/O	FT	PF8	TIM13_CH1 / FSMC_NIOWR	ADC3_IN6
-	-	-	21	27	L2	PF9(6)	I/O	FT	PF9	TIM14_CH1 / FSMC_CD	ADC3_IN7

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
-	-	-	22	28	L1	PF10(6)	I/O	FT	PF10	FSMC_INTR	ADC3_IN8
5	E9	12	23	29	G1	PH0(6)-OSC_IN	I/O	FT	PH0		OSC_IN
6	F9	13	24	30	H1	PH1(6)-OSC_OUT	I/O	FT	PH1		OSC_OUT
7	E8	14	25	31	J1	NRST	I/O		NRST		
8	G9	15	26	32	M2	PC0(6)	I/O	FT	PC0	OTG_HS_ULPI_STP	ADC123_ IN10
9	F8	16	27	33	M3	PC1(6)	I/O	FT	PC1	ETH_MDC	ADC123_ IN11
10	D7	17	28	34	M4	PC2(6)	I/O	FT	PC2	SPI2_MISO / OTG_HS_ULPI_DIR / ETH_MII_TXD2	ADC123_ IN12
11	G8	18	29	35	M5	PC3(6)	I/O	FT	PC3	SPI2_MOSI / I2S2_SD / OTG_HS_ULPI_NXT / ETH_MII_TX_CLK	ADC123_ IN13
-	-	19	30	36	-	V_{DD_12}	S		V_{DD_12}		
12	-	20	31	37	M1	V_{SSA}	S		V_{SSA}		
-	-	-	-	-	N1	V_{REF-}	S		V_{REF-}		
-	F7	21	32	38	P1	V_{REF+}	S		V_{REF+}		
13	-	22	33	39	R1	V_{DDA}	S		V_{DDA}		
14	E7	23	34	40	N3	PA0(7)-WKUP(6)	I/O	FT	PA0-WKUP	USART2_CTS/ UART4_TX/ ETH_MII_CRS / TIM2_CH1_ETR/ TIM5_CH1 / TIM8_ETR	ADC123_CH0 /WKUP
15	H8	24	35	41	N2	PA1(6)	I/O	FT	PA1	USART2_RTS / UART4_RX/ ETH_RMII_REF_CLK / ETH_MII_RX_CLK / TIM5_CH2 / TIM2_CH2	ADC123_IN1
16	J9	25	36	42	P2	PA2(6)	I/O	FT	PA2	USART2_TX/TIM5_CH3 / TIM9_CH1 / TIM2_CH3 / ETH_MDIO	ADC123_IN2
-	-	-	-	43	F4	PH2	I/O	FT	PH2	ETH_MII_CRS	
-	-	-	-	44	G4	PH3	I/O	FT	PH3	ETH_MII_COL	
-	-	-	-	45	H4	PH4	I/O	FT	PH4	I2C2_SCL / OTG_HS_ULPI_NXT	
-	-	-	-	46	J4	PH5	I/O	FT	PH5	I2C2_SDA	

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
17	G7	26	37	47	R2	PA3(6)	I/O	FT	PA3	USART2_RX/TIM5_CH4 / TIM9_CH2 / TIM2_CH4 / OTG_HS_ULPI_D0 / ETH_MII_COL	ADC123_IN3
18	F1	27	38	48	-	V_{SS_4}	S		V_{SS_4}		
	H7				L4	REGOFF	I/O		REGOFF		
19	E1	28	39	49	K4	V_{DD_4}	S		V_{DD_4}		
20	J8	29	40	50	N4	PA4(6)	I/O		PA4	SPI1_NSS / SPI3_NSS / USART2_CK / DCMI_HSYNC / OTG_HS_SOF/ I2S3_WS	ADC12_IN4 /DAC1_OUT
21	H6	30	41	51	P4	PA5(6)	I/O		PA5	SPI1_SCK/ OTG_HS_ULPI_CK / / TIM2_CH1_ETR/ TIM8_CHIN	ADC12_IN5 /DAC2_OUT
22	H5	31	42	52	P3	PA6(6)	I/O	FT	PA6	SPI1_MISO / TIM8_BKIN/TIM13_CH1 / DCMI_PIXCLK / TIM3_CH1 / TIM1_BKIN	ADC12_IN6
23	J7	32	43	53	R3	PA7(6)	I/O	FT	PA7	SPI1_MOSI/ TIM8_CH1N / TIM14_CH1 TIM3_CH2/ ETH_MII_RX_DV / TIM1_CH1N / RMII_CRS_DV	ADC12_IN7
24	H4	33	44	54	N5	PC4(6)	I/O	FT	PC4	ETH_RMII_RX_D0 / ETH_MII_RX_D0	ADC12_IN14
25	G3	34	45	55	P5	PC5(6)	I/O	FT	PC5	ETH_RMII_RX_D1 / ETH_MII_RX_D1	ADC12_IN15
26	J6	35	46	56	R5	PB0(6)	I/O	FT	PB0	TIM3_CH3 / TIM8_CH2N/ OTG_HS_ULPI_D1/ ETH_MII_RXD2 / TIM1_CH2N	ADC12_IN8
27	J5	36	47	57	R4	PB1(6)	I/O	FT	PB1	TIM3_CH4 / TIM8_CH3N/ OTG_HS_ULPI_D2/ ETH_MII_RXD3 / OTG_HS_INTN / TIM1_CH3N	ADC12_IN9
28	J4	37	48	58	M6	PB2	I/O	FT	PB2-BOOT1		
-	-	-	49	59	R6	PF11	I/O	FT	PF11	DCMI_12	
-	-	-	50	60	P6	PF12	I/O	FT	PF12	FSMC_A6	

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
-	-	-	51	61	M8	V_{SS_6}	S		V_{SS_6}		
-	-	-	52	62	N8	V_{DD_6}	S		V_{DD_6}		
-	-	-	53	63	N6	PF13	I/O	FT	PF13	FSMC_A7	
-	-	-	54	64	R7	PF14	I/O	FT	PF14	FSMC_A8	
-	-	-	55	65	P7	PF15	I/O	FT	PF15	FSMC_A9	
-	-	-	56	66	N7	PG0	I/O	FT	PG0	FSMC_A10	
-	-	-	57	67	M7	PG1	I/O	FT	PG1	FSMC_A11	
-	-	38	58	68	R8	PE7	I/O	FT	PE7	FSMC_D4/TIM1_ETR	
-	-	39	59	69	P8	PE8	I/O	FT	PE8	FSMC_D5/TIM1_CH1N	
-	-	40	60	70	P9	PE9	I/O	FT	PE9	FSMC_D6/TIM1_CH1	
-	-	-	61	71	M9	V_{SS_7}	S		V_{SS_7}		
-	-	-	62	72	N9	V_{DD_7}	S		V_{DD_7}		
-	-	41	63	73	R9	PE10	I/O	FT	PE10	FSMC_D7/TIM1_CH2N	
-	-	42	64	74	P10	PE11	I/O	FT	PE11	FSMC_D8/TIM1_CH2	
-	-	43	65	75	R10	PE12	I/O	FT	PE12	FSMC_D9/TIM1_CH3N	
-	-	44	66	76	N11	PE13	I/O	FT	PE13	FSMC_D10/TIM1_CH3	
-	-	45	67	77	P11	PE14	I/O	FT	PE14	FSMC_D11/TIM1_CH4	
-	-	46	68	78	R11	PE15	I/O	FT	PE15	FSMC_D12/TIM1_BKIN	
29	H3	47	69	79	R12	PB10	I/O	FT	PB10	SPI2_SCK/ I2S2_CK/ I2C2_SCL / USART3_TX / OTG_HS_ULPI_D3 / ETH_MII_RX_ER / OTG_HS_SCL / TIM2_CH3	
30	J2	48	70	80	R13	PB11	I/O	FT	PB11	I2C2_SDA/USART3_RX/ OTG_HS_ULPI_D4 / ETH_RMII_TX_EN/ ETH_MII_TX_EN / OTG_HS_SDA / TIM2_CH4	
31	J3	49	71	81	M10	V_{CAP_1}	S		V_{CAP_1}		
32	-	50	72	82	N10	V_{DD_1}	S		V_{DD_1}		
-	-	-	-	83	M11	PH6	I/O	FT	PH6	I2C2_SMBA / TIM12_CH1 / ETH_MII_RXD2	
-	-	-	-	84	N12	PH7	I/O	FT	PH7	I2C3_SCL / ETH_MII_RXD3	
-	-	-	-	85	M12	PH8	I/O	FT	PH8	I2C3_SDA / DCMI_HSYNC	

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
-	-	-	-	86	M13	PH9	I/O	FT	PH9	I2C3_SMBA / TIM12_CH2/ DCMI_D0	
-	-	-	-	87	L13	PH10	I/O	FT	PH10	TIM5_CH1_ETR / DCMI_D1	
-	-	-	-	88	L12	PH11	I/O	FT	PH11	TIM5_CH2 / DCMI_D2	
-	-	-	-	89	K12	PH12	I/O	FT	PH12	TIM5_CH3 / DCMI_D3	
-	-	-	-	90	H12	V_{SS_14}	S		V_{SS_14}		
-	-	-	-	91	J12	V_{DD_14}	S		V_{DD_14}		
33	J1	51	73	92	P12	PB12	I/O	FT	PB12	SPI2_NSS/I2S2_WS/ I2C2_SMBA/ USART3_CK/ TIM1_BKIN / CAN2_RX / OTG_HS_ULPI_D5/ ETH_RMII_TXD0 / ETH_MII_TXD0/ OTG_HS_ID	
34	H2	52	74	93	P13	PB13	I/O	FT	PB13	SPI2_SCK / I2S2_CK / USART3_CTS/ TIM1_CH1N /CAN2_TX / OTG_HS_ULPI_D6 / ETH_RMII_TXD1 / ETH_MII_TXD1	OTG_HS_ VBUS
35	H1	53	75	94	R14	PB14	I/O	FT	PB14	SPI2_MISO/ TIM1_CH2N / TIM12_CH1 / OTG_HS_DM USART3_RTS/ TIM8_CH2N	
36	G1	54	76	95	R15	PB15	I/O	FT	PB15	SPI2_MOSI / I2S2_SD / TIM1_CH3N / TIM8_CH3N / TIM12_CH2 / OTG_HS_DP	
-	-	55	77	96	P15	PD8	I/O	FT	PD8	FSMC_D13 / USART3_TX	
-	-	56	78	97	P14	PD9	I/O	FT	PD9	FSMC_D14 / USART3_RX	
-	-	57	79	98	N15	PD10	I/O	FT	PD10	FSMC_D15 / USART3_CK	
-	-	58	80	99	N14	PD11	I/O	FT	PD11	FSMC_A16/USART3_CTS	
-	-	59	81	100	N13	PD12	I/O	FT	PD12	FSMC_A17/TIM4_CH1 / USART3_RTS	
-	-	60	82	101	M15	PD13	I/O	FT	PD13	FSMC_A18/TIM4_CH2	
-	-	-	83	102	-	V_{SS_8}	S		V_{SS_8}		
-	-	-	84	103	J13	V_{DD_8}	S		V_{DD_8}		

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
-	-	61	85	104	M14	PD14	I/O	FT	PD14	FSMC_D0/TIM4_CH3	
-	-	62	86	105	L14	PD15	I/O	FT	PD15	FSMC_D1/TIM4_CH4	
-	-	-	87	106	L15	PG2	I/O	FT	PG2	FSMC_A12	
-	-	-	88	107	K15	PG3	I/O	FT	PG3	FSMC_A13	
-	-	-	89	108	K14	PG4	I/O	FT	PG4	FSMC_A14	
-	-	-	90	109	K13	PG5	I/O	FT	PG5	FSMC_A15	
-	-	-	91	110	J15	PG6	I/O	FT	PG6	FSMC_INT2	
-	-	-	92	111	J14	PG7	I/O	FT	PG7	FSMC_INT3 /USART6_CK	
-	-	-	93	112	H14	PG8	I/O	FT	PG8	USART6_RTS / ETH_PPS_OUT	
-	-	-	94	113	G12	V_{SS_9}	S		V_{SS_9}		
-	-	-	95	114	H13	V_{DD_9}	S		V_{DD_9}		
37	G2	63	96	115	H15	PC6	I/O	FT	PC6	SPI2_MCK / TIM8_CH1/SDIO_D6 / USART6_TX / DCMI_D0/TIM3_CH1	
38	F2	64	97	116	G15	PC7	I/O	FT	PC7	SPI3_MCK / TIM8_CH2/SDIO_D7 / USART6_RX / DCMI_D1/TIM3_CH2	
39	F3	65	98	117	G14	PC8	I/O	FT	PC8	TIM8_CH3/SDIO_D0 /TIM3_CH3/ USART6_CK / DCMI_D2	
40	D1	66	99	118	F14	PC9	I/O	FT	PC9	I2S2_CKIN/ I2S3_CKIN/ MCO2 / TIM8_CH4/SDIO_D1 / /I2C3_SDA / DCMI_D3 / TIM3_CH4	
41	E2	67	100	119	F15	PA8	I/O	FT	PA8	MCO1 / USART1_CK/ TIM1_CH1/ I2C3_SCL/ OTG_FS_SOF	
42	E3	68	101	120	E15	PA9	I/O	FT	PA9	USART1_TX/ TIM1_CH2 / I2C3_SMBA / DCMI_D0	OTG_FS_ VBUS
43	D3	69	102	121	D15	PA10	I/O	FT	PA10	USART1_RX/ TIM1_CH3/ OTG_FS_ID/DCMI_D1	
44	D2	70	103	122	C15	PA11	I/O	FT	PA11	USART1_CTS / CAN1_RX / TIM1_CH4 / OTG_FS_DM	

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
45	C1	71	104	123	B15	PA12	I/O	FT	PA12	USART1_RTS / CAN1_TX/ TIM1_ETR/ OTG_FS_DP	
46	B2	72	105	124	A15	PA13	I/O	FT	JTMS-SWDIO	JTMS-SWDIO	
47	C2	73	106	125	F13	V_{CAP_2}	S		V_{CAP_2}		
-	B1	74	107	126	F12	V_{SS_2}	S		V_{SS_2}		
48	A8	75	108	127	G13	V_{DD_2}	S		V_{DD_2}		
-	-	-	-	128	E12	PH13	I/O	FT	PH13	TIM8_CH1N / CAN1_TX	
-	-	-	-	129	E13	PH14	I/O	FT	PH14	TIM8_CH2N / DCMI_D4	
-	-	-	-	130	D13	PH15	I/O	FT	PH15	TIM8_CH3N / DCMI_D11	
-	-	-	-	131	E14	PI0	I/O	FT	PI0	TIM5_CH4 / SPI2_NSS / I2S2_WS / DCMI_D13	
-	-	-	-	132	D14	PI1	I/O	FT	PI1	SPI2_SCK / I2S2_CK / DCMI_D8	
-	-	-	-	133	C14	PI2	I/O	FT	PI2	TIM8_CH4 /SPI2_MISO / DCMI_D9	
-	-	-	-	134	C13	PI3	I/O	FT	PI3	TIM8_ETR / SPI2_MOSI / I2S2_SD / DCMI_D10	
-	-	-	-	135	D9	V_{SS_15}	S		V_{SS_15}		
-	-	-	-	136	C9	V_{DD_15}	S		V_{DD_15}		
49	A1	76	109	137	A14	PA14	I/O	FT	JTCK-SWCLK	JTCK-SWCLK	
50	A2	77	110	138	A13		I/O	FT	JTDI	JTDI/ SPI3_NSS/ I2S3_WS/TIM2_CH1_ETR / SPI1_NSS	
51	B3	78	111	139	B14	PC10	I/O	FT	PC10	SPI3_SCK / I2S3_CK / UART4_TX / SDIO_D2 / DCMI_D8 / USART3_TX	
52	C3	79	112	140	B13	PC11	I/O	FT	PC11	UART4_RX/ SPI3_MISO / SDIO_D3 / DCMI_D4/USART3_RX	
53	A3	80	113	141	A12	PC12	I/O	FT	PC12	UART5_TX/SDIO_CK / DCMI_D9 / SPI3_MOSI / I2S3_SD / USART3_CK	
-	-	81	114	142	B12	PD0	I/O	FT	PD0	FSMC_D2/CAN1_RX	
-	-	82	115	143	C12	PD1	I/O	FT	PD1	FSMC_D3 / CAN1_TX	

Table 5. STM32F20x pin and ball definitions (continued)

Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
54	C7	83	116	144	D12	PD2	I/O	FT	PD2	TIM3_ETR/UART5_RX SDIO_CMD / DCMI_D11	
-	-	84	117	145	D11	PD3	I/O	FT	PD3	FSMC_CLK/USART2_CTS	
-	-	85	118	146	D10	PD4	I/O	FT	PD4	FSMC_NOE/USART2_RTS	
-	-	86	119	147	C11	PD5	I/O	FT	PD5	FSMC_NWE/USART2_TX	
-	-	-	120	148	D8	V_{SS_10}	S		V_{SS_10}		
-	-	-	121	149	C8	V_{DD_10}	S		V_{DD_10}		
-	-	87	122	150	B11	PD6	I/O	FT	PD6	FSMC_NWAIT/USART2_RX	
-	-	88	123	151	A11	PD7	I/O	FT	PD7	USART2_CK/FSMC_NE1/FSMC_NCE2	
-	-	-	124	152	C10	PG9	I/O	FT	PG9	USART6_RX / FSMC_NE2/FSMC_NCE3	
-	-	-	125	153	B10	PG10	I/O	FT	PG10	FSMC_NCE4_1/ FSMC_NE3	
-	-	-	126	154	B9	PG11	I/O	FT	PG11	FSMC_NCE4_2 / ETH_MII_TX_EN	
-	-	-	127	155	B8	PG12	I/O	FT	PG12	FSMC_NE4 / USART6_RTS	
-	-	-	128	156	A8	PG13	I/O	FT	PG13	FSMC_A24 / USART6_CTS /ETH_MII_TXD0/ETH_RMII_TXD0	
-	-	-	129	157	A7	PG14	I/O	FT	PG14	FSMC_A25 / USART6_TX /ETH_MII_TXD1/ETH_RMII_TXD1	
-	-	-	130	158	D7	V_{SS_11}	S		V_{SS_11}		
-	-	-	131	159	C7	V_{DD_11}	S		V_{DD_11}		
-	-	-	132	160	B7	PG15	I/O	FT	PG15	USART6_CTS / DCMI_D13	
55	A4	89	133	161	A10	PB3	I/O	FT	JTDO/ TRACESWO	JTDO/ TRACESWO/ SPI3_SCK / I2S3_CK / TIM2_CH2 / SPI1_SCK	
56	B4	90	134	162	A9	PB4	I/O	FT	NJTRST	NJTRST/ SPI3_MISO / TIM3_CH1 / SPI1_MISO	

Table 5. STM32F20x pin and ball definitions (continued)

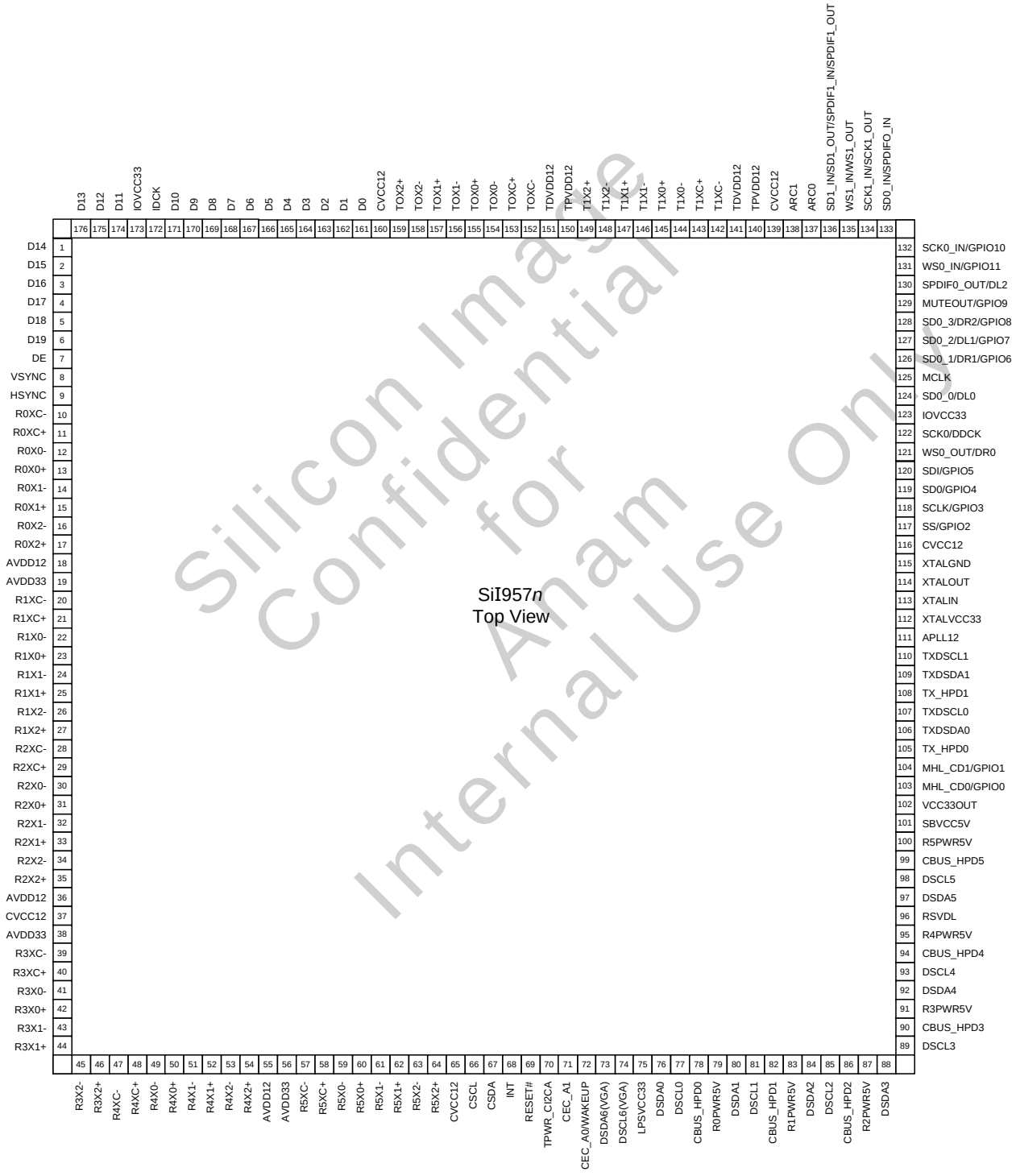
Pins						Pin name	Type(1)	I / O Level(2)	Main function(3) (after reset)	Alternate functions	Other functions
LQFP64	WLCSP64+2	LQFP100	LQFP144	LQFP176	UFBGA176						
57	A5	91	135	163	A6	PB5	I/O	FT	PB5	I2C1_SMBA/ CAN2_RX / OTG_HS_ULPI_D7 / ETH_PPS_OUT/TIM3_CH2 / SPI1_MOSI/ SPI3_MOSI / DCMI_D10 / I2S3_SD	
58	B5	92	136	164	B6	PB6	I/O	FT	PB6	I2C1_SCL/ TIM4_CH1 / CAN2_TX /OTG_FS_INTN / DCMI_D5/USART1_TX	
59	A6	93	137	165	B5	PB7	I/O	FT	PB7	I2C1_SDA / FSMC_NL(8) / DCMI_VSYNC / USART1_RX/ TIM4_CH2	
60	B6	94	138	166	D6	BOOT0	I		BOOT0		V_{PP}
61	B7	95	139	167	A5	PB8	I/O	FT	PB8	TIM4_CH3/SDIO_D4/ TIM10_CH1 / DCMI_D6 / OTG_FS_SCL/ ETH_MII_TXD3 / I2C1_SCL/ CAN1_RX	
62	A7	96	140	168	B4	PB9	I/O	FT	PB9	SPI2_NSS/ I2S2_WS/ TIM4_CH4/ TIM11_CH1/ OTG_FS_SDA/ SDIO_D5 / DCMI_D7 / I2C1_SDA / CAN1_TX	
-	-	97	141	169	A4	PE0	I/O	FT	PE0	TIM4_ETR / FSMC_NBL0 / DCMI_D2	
-	-	98	142	170	A3	PE1	I/O	FT	PE1	FSMC_NBL1 / DCMI_D3	
	-				D5	V_{SS}	S		V_{SS}		
63	D8	-	-	-	-	V_{SS_3}	S		V_{SS_3}		
-	-	99	143	171	C6	RFU(9)					
64	D9	100	144	172	C5	V_{DD_3}	S		V_{DD_3}		
-	-	-	-	173	D4	PI4	I/O	FT	PI4	TIM8_BKIN / DCMI_D5	
-	-	-	-	174	C4	PI5	I/O	FT	PI5	TIM8_CH1 / DCMI_VSYNC	
-	-	-	-	175	C3	PI6	I/O	FT	PI6	TIM8_CH2 / DCMI_D6	
-	-	-	-	176	C2	PI7	I/O	FT	PI7	TIM8_CH3 / DCMI_D7	
-	C8	-	-	-	-	IRROFF	I/O		IRROFF		

1. I = input, O = output, S = supply, HiZ = high impedance.
2. FT = 5 V tolerant.
3. Function availability depends on the chosen device.

Pin Diagram

Pin diagram is subject to change.

Figure 2 shows the pin assignments of the SiI957n port processor. The Target Pin Descriptions section describing the pin functions begins on page 16. The package is a 20 mm x 20 mm x 0.4 mm 176-pin TQFP with an ePad, which ***must*** be connected to ground.



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Figure 2. Pin Diagram (Top View)

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DEVICE INFORMATION

TERMINAL FUNCTIONS, PCM510x

PCM510X (top view)

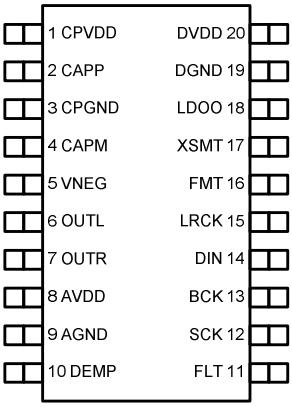


Table 2. TERMINAL FUNCTIONS, PCM510x

TERMINAL		I/O	DESCRIPTION
NAME	NO.		
CPVDD	1	-	Charge pump power supply, 3.3V
CAPP	2	O	Charge pump flying capacitor terminal for positive rail
CPGND	3	-	Charge pump ground
CAPM	4	O	Charge pump flying capacitor terminal for negative rail
VNEG	5	O	Negative charge pump rail terminal for decoupling, -3.3V
OUTL	6	O	Analog output from DAC left channel
OUTR	7	O	Analog output from DAC right channel
AVDD	8	-	Analog power supply, 3.3V
AGND	9	-	Analog ground
DEMP	10	I	De-emphasis control for 44.1kHz sampling rate(1): Off (Low) / On (High)
FLT	11	I	Filter select : Normal latency (Low) / Low latency (High)
SCK	12	I	System clock input
BCK	13	I	Audio data bit clock input
DIN	14	I	Audio data input
LRCK	15	I	Audio data word clock input
FMT	16	I	Audio format selection : I^2S (Low) / Left justified (High)
XSMT	17	I	Soft mute control : Soft mute (Low) / soft un-mute (High)
LDOO	18	-	Internal logic supply rail terminal for decoupling
DGND	19	-	Digital ground
DVDD	20	-	Digital power supply, 3.3V

(1) Failsafe LVCMOS Schmitt trigger input

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tenatative

NJM8080

DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

NJM8080 is the dual operational amplifier, specially designed for improving the tone control, which is most suitable for the audio application.

Featuring noiseless, higher gain bandwidth, high output current and low distortion ratio, and it is most suitable not only for acoustic electronic parts of audio pre-amp and active filter, but also for the industrial measurement tools. It is also suitable for the head phone amp at higher output current, and further more, it can be applied for the handy type set operational amplifier of general purpose in application of low voltage single supply type which is properly biased of the low voltage source.

■ PACKAGE OUTLINE



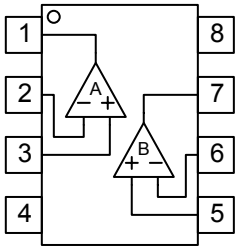
NJM8080G
(SOP8)

■ FEATURES

● Operating Voltage	±2V~±18V
● Low Input Noise Voltage	0.8μVrms typ. (RIAA)
● Wide GBW	15MHz typ.
● Low Distortion	0.0005% typ.
● Slew Rate	5V/μs typ.
● Bipolar Technology	
● Package Outline	SOP8

■ PIN CONFIGURATION

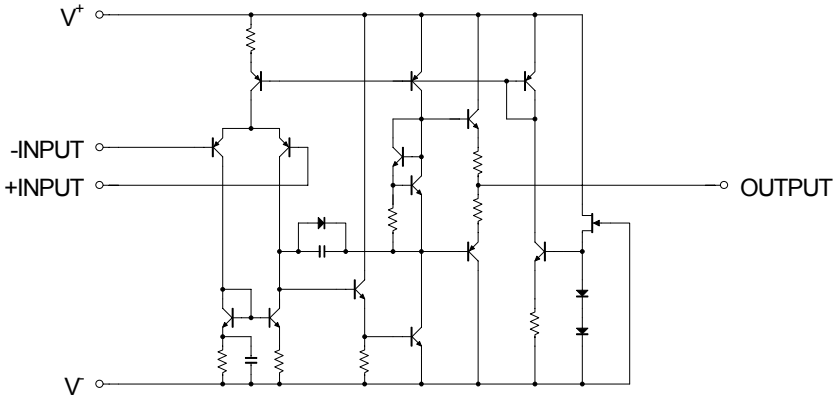
Top View



SOP8 Package

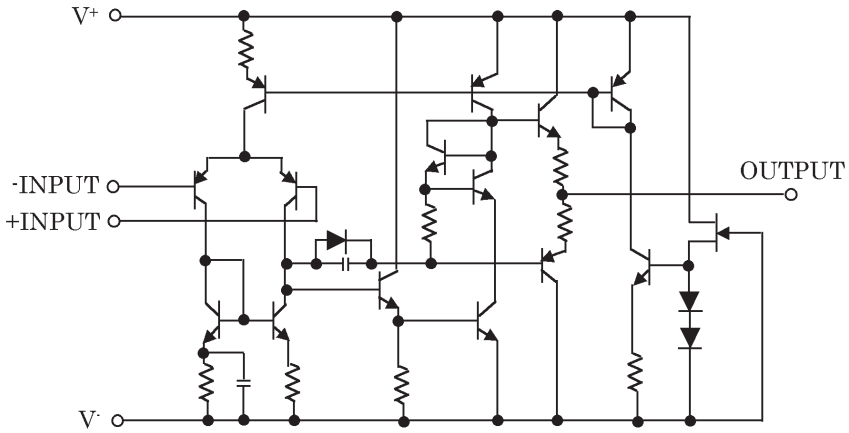
PIN FUNCTION
1.A OUTPUT
2.A -INPUT
3.A +INPUT
4.V^-
5.B +INPUT
6.B -INPUT
7.B OUTPUT
8.V^+

■ EQUIVALENT CIRCUIT (1/2 Shown)



■EQUIVALENT CIRCUIT(1/2 Shown)

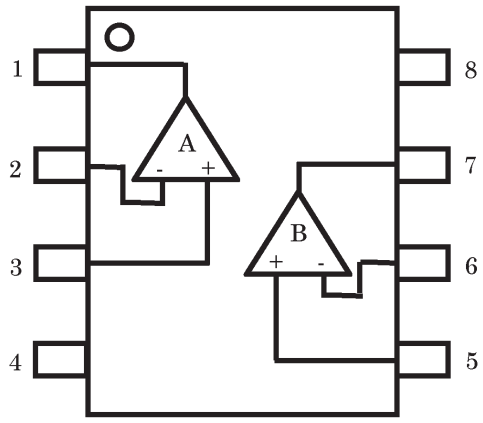
BDE-07950-000-02



■PIN CONFIGURATION

BEE-P0001-000-01

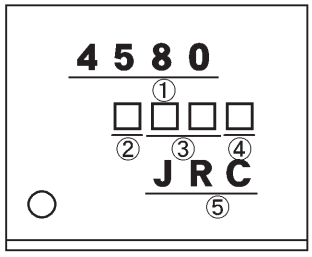
(Top View)



PIN FUNCTION
1. A OUTPUT
2. A-INPUT
3. A+INPUT
4. V-
5. B+INPUT
6. B-INPUT
7. B OUTPUT
8. V+

■MARK SPECIFICATION

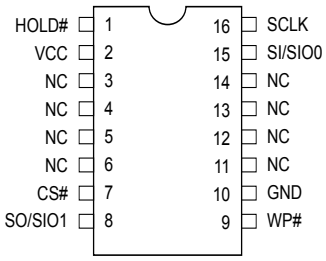
BKE-62233-B00-00



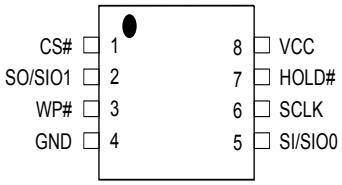
① Device No. (4580)
② Last Digit Year
③ Lot No.
④ Production Code
⑤ Manufacturer's Symbol (JRC)

PIN CONFIGURATIONS

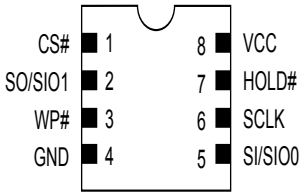
16-PIN SOP (300mil) for MX25L1606E only



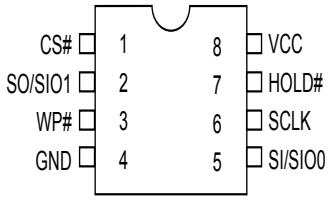
8-PIN SOP (200mil, 150mil)



8-LAND WSON (6x5mm), USON (4x4mm)



8-PIN PDIP (300mil)

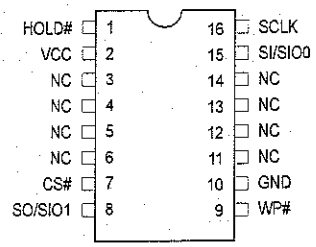


PIN DESCRIPTION

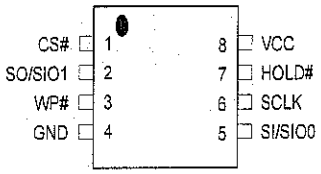
SYMBOL	DESCRIPTION
CS#	Chip Select
SI/SIO0	Serial Data Input (for 1 x I/O)/ Serial Data Input & Output (for Dual Output mode)
SO/SIO1	Serial Data Output (for 1 x I/O)/ Serial Data Output (for Dual Output mode)
SCLK	Clock Input
WP#	Write protection
HOLD#	Hold, to pause the device without deselecting the device
VCC	+ 3.3V Power Supply
GND	Ground

PIN CONFIGURATIONS

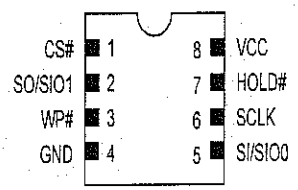
16-PIN SOP (300mil)



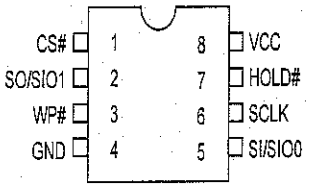
8-PIN SOP (200mil)



8-LAND WSON (6x5mm), USON (4x4mm)



8-PIN PDIP (300mil)



PIN DESCRIPTION

SYMBOL	DESCRIPTION
CS#	Chip Select
SI/SIO0	Serial Data Input (for 1 x I/O)/ Serial Data Input & Output (for Dual Output mode)
SO/SIO1	Serial Data Output (for 1 x I/O)/ Serial Data Output (for Dual Output mode)
SCLK	Clock Input
WP#	Write protection
HOLD#	Hold, to pause the device without deselecting the device
VCC	+ 3.3V Power Supply
GND	Ground

CHAPTER 2

Signal Descriptions and Reference Circuit

This chapter defines the pinouts, signals, and reference circuitry of the iPod Authentication Coprocessor 2.0C.

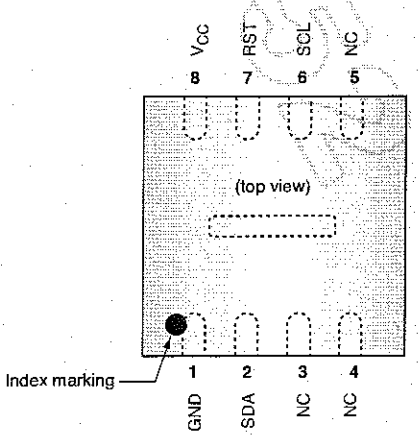
CP Signals and Pinouts

The 2.0C CP chip signal descriptions are given in Table 2-1 and its pinouts are shown in Figure 2-1.

Table 2-1 CP signals

Signal name	Pin	I/O	Description
GND	1		Supply voltage, negative terminal
SDA	2	I/O	I²C data
NC	3-5		Must not be connected
SCL	6	I	I²C clock
RST	7	I	At reset: selects I²C slave address. During operation: CP warm reset.
V_{CC}	8		Supply voltage, positive terminal

Figure 2-1 CP chip pinouts, top view



PG-USON-8-1 package

The thermal pad on the bottom of the CP may be left unconnected or optionally connected to GND.

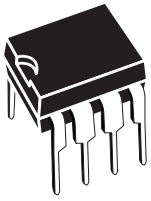
2011-06-22 | © 2011 Apple Inc. All Rights Reserved.

M24C64-W M24C64-R M24C64-F
M24C32-W M24C32-R M24C32-F

64 Kbit and 32 Kbit Serial I²C bus EEPROM

Feature summary

- Two-Wire I²C serial interface
  Supports 400kHz Protocol
- Single supply voltage:
  - 2.5 to 5.5V for M24Cxx-W
  - 1.8 to 5.5V for M24Cxx-R
  - 1.7 to 5.5V for M25Cxx-F
- Write Control Input
- Byte and Page Write (up to 32 Bytes)
- Random And Sequential Read modes
- Self-Timed programming cycle
- Automatic address incrementing
- Enhanced ESD/Latch-Up Protection
- More than 1 Million Write cycles
- More than 40-year data retention



PDIP8 (BN)



SO8 (MN)
150 mil width



TSSOP8 (DW)
169 mil width



UFDFPN8 (MB)
2x3mm² (MLP)

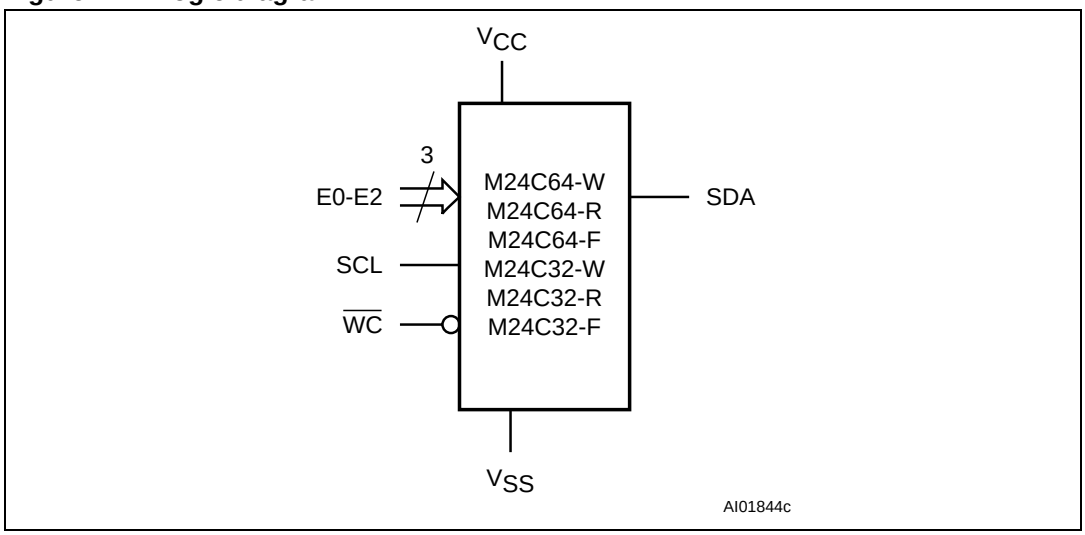
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1 Summary description

These I^2C-compatible electrically erasable programmable memory (EEPROM) devices are organized as 8192 × 8 bits (M24C64-x) and 4096 × 8 bits (M24C32-x).

Figure 1. Logic diagram



I^2C uses a two-wire serial interface, comprising a bi-directional data line and a clock line. The devices carry a built-in 4-bit Device Type Identifier code (1010) in accordance with the I^2C bus definition.

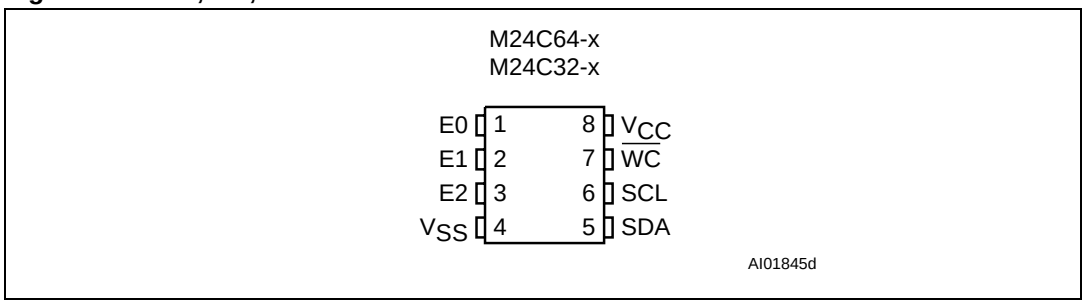
The device behaves as a slave in the I^2C protocol, with all memory operations synchronized by the serial clock. Read and Write operations are initiated by a Start condition, generated by the bus master. The Start condition is followed by a Device Select Code and Read/$\overline{\text{Write}}$ bit ($\overline{\text{RW}}$) (as described in *Table 2*), terminated by an acknowledge bit.

When writing data to the memory, the device inserts an acknowledge bit during the 9th bit time, following the bus master's 8-bit transmission. When data is read by the bus master, the bus master acknowledges the receipt of the data byte in the same way. Data transfers are terminated by a Stop condition after an Ack for Write, and after a NoAck for Read.

Table 1. Signal names

E0, E1, E2	Chip Enable
SDA	Serial Data
SCL	Serial Clock
WC	Write Control
V_{CC}	Supply Voltage
V_{SS}	Ground

Figure 2. DIP, SO, TSSOP and UFDFPN connections



1. See *Package mechanical* section for package dimensions, and how to identify pin-1.

2 Signal description

2.0.1 Serial Clock (SCL)

This input signal is used to strobe all data in and out of the device. In applications where this signal is used by slave devices to synchronize the bus to a slower clock, the bus master must have an open drain output, and a pull-up resistor must be connected from Serial Clock (SCL) to V_{CC}. (*Figure 4* indicates how the value of the pull-up resistor can be calculated). In most applications, though, this method of synchronization is not employed, and so the pull-up resistor is not necessary, provided that the bus master has a push-pull (rather than open drain) output.

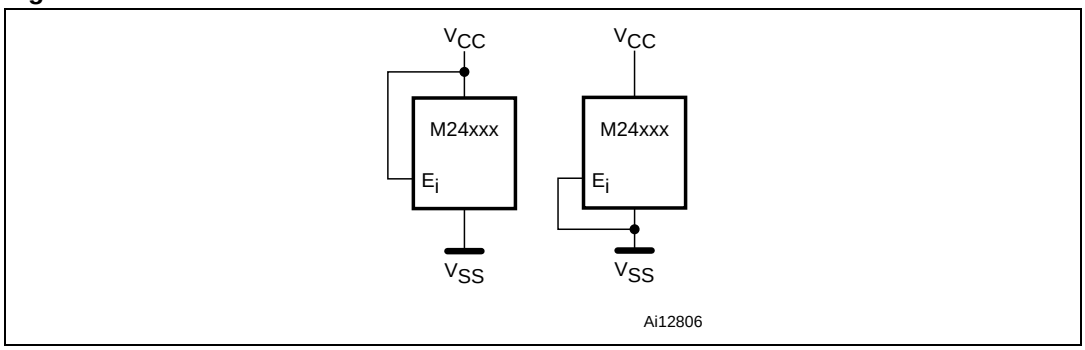
2.0.2 Serial Data (SDA)

This bi-directional signal is used to transfer data in or out of the device. It is an open drain output that may be wire-OR'ed with other open drain or open collector signals on the bus. A pull up resistor must be connected from Serial Data (SDA) to V_{CC}. (*Figure 4* indicates how the value of the pull-up resistor can be calculated).

2.1 Chip Enable (E0, E1, E2)

These input signals are used to set the value that is to be looked for on the three least significant bits (b3, b2, b1) of the 7-bit Device Select Code. These inputs must be tied to V_{CC} or V_{SS}, to establish the Device Select Code as shown in *Figure 3*. When not connected (left floating), these inputs are read as Low (0,0,0).

Figure 3. Device select code



2.2 Write Control ($\overline{WC}$)

This input signal is useful for protecting the entire contents of the memory from inadvertent write operations. Write operations are disabled to the entire memory array when Write Control ($\overline{WC}$) is driven High. When unconnected, the signal is internally read as V_{IL}, and Write operations are allowed.

When Write Control ($\overline{WC}$) is driven High, Device Select and Address bytes are acknowledged, Data bytes are not acknowledged.

2.3 Supply voltage (V_{CC})

2.3.1 Operating supply voltage V_{CC}

Prior to selecting the memory and issuing instructions to it, a valid and stable V_{CC} voltage within the specified [V_{CC}(min), V_{CC}(max)] range must be applied (see *Table 8* and *Table 9*). In order to secure a stable DC supply voltage, it is recommended to decouple the V_{CC} line with a suitable capacitor (usually of the order of 10nF to 100nF) close to the V_{CC}/V_{SS} package pins.

This voltage must remain stable and valid until the end of the transmission of the instruction and, for a Write instruction, until the completion of the internal write cycle (t_W).

2.3.2 Internal device reset

In order to prevent inadvertent Write operations during Power-up, a Power On Reset (POR) circuit is included. At Power-up (continuous rise of V_{CC}), the device does not respond to any instruction until V_{CC} has reached the Power On Reset threshold voltage (this threshold is lower than the minimum V_{CC} operating voltage defined in *Table 8* and *Table 9*).

When V_{CC} has passed the POR threshold, the device is reset and is in Standby Power mode.

2.3.3 Power-down

At Power-down (continuous decrease of V_{CC}), as soon as V_{CC} drops from the normal operating voltage to below the Power On Reset threshold voltage, the device stops responding to any instruction sent to it.

During Power-down, the device must be deselected and in the Standby Power mode (that is there should be no internal Write cycle in progress).

Figure 4. Maximum R_P value versus bus parasitic capacitance (C) for an I^2C bus

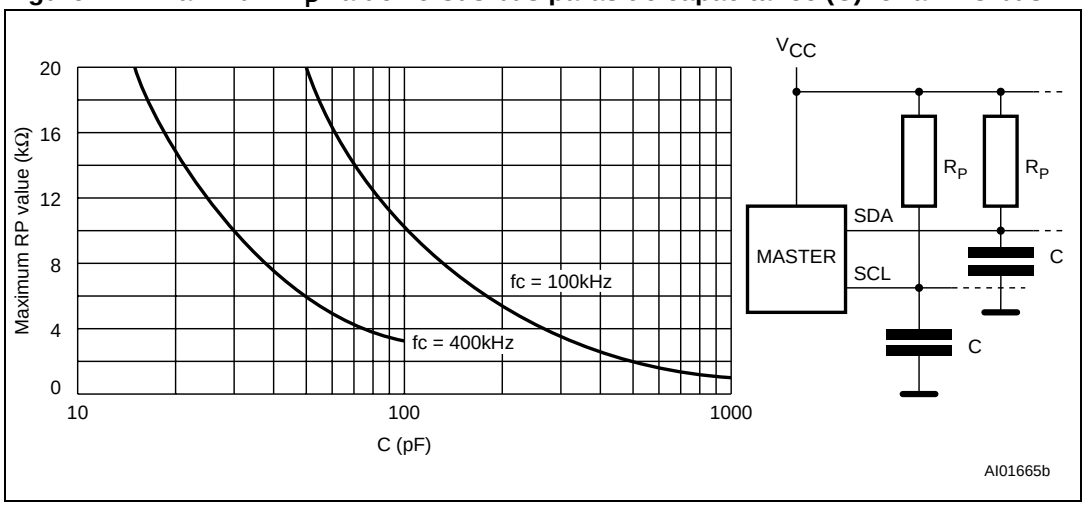


Figure 5. I^2C bus protocol

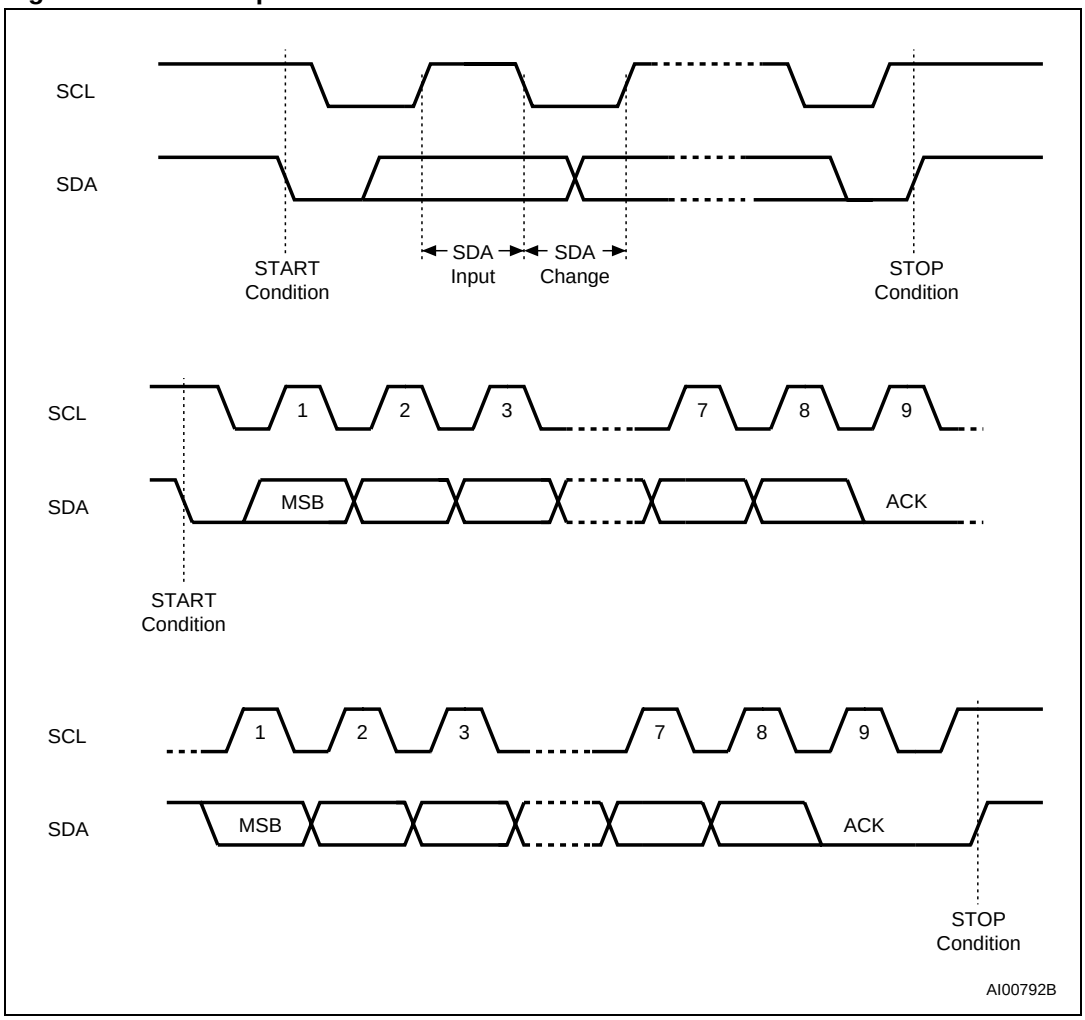


Table 2. Device select code

	Device Type Identifier(1)				Chip Enable Address(2)			RW
	b7	b6	b5	b4	b3	b2	b1	b0
Device Select Code	1	0	1	0	E2	E1	E0	RW

1. The most significant bit, b7, is sent first.
2. E0, E1 and E2 are compared against the respective external pins on the memory device.

Table 3. Address Most Significant Byte

b15	b14	b13	b12	b11	b10	b9	b8

Table 4. Address Least Significant Byte

b7	b6	b5	b4	b3	b2	b1	b0

ESMT (Preliminary) M12L16161A (2Q)

SDRAM 512K x 16Bit x 2Banks Synchronous DRAM

FEATURES

- JEDEC standard 3.3V power supply
- LVTTL compatible with multiplexed address
- Dual banks operation
- MRS cycle with address key programs
  - CAS Latency (2 & 3)
  - Burst Length (1, 2, 4, 8 & full page)
  - Burst Type (Sequential & Interleave)
- All inputs are sampled at the positive going edge of the system clock
- Burst Read Single-bit Write operation
- DQM for masking
- Auto & self refresh
- 32ms refresh period (2K cycle)

GENERAL DESCRIPTION

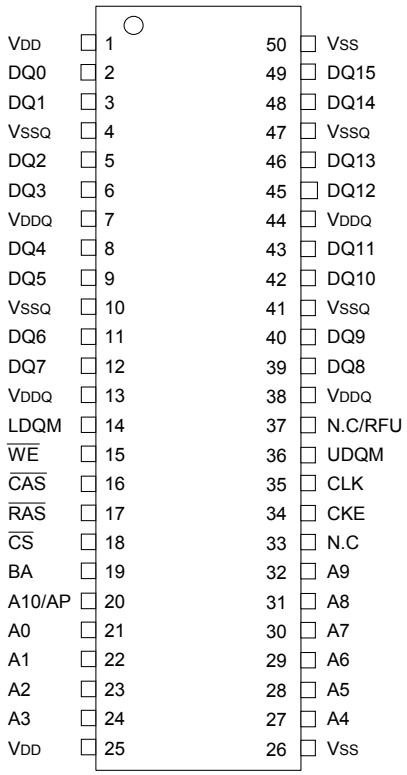
The M12L16161A is 16,777,216 bits synchronous high data rate Dynamic RAM organized as 2 x 524,288 words by 16 bits, fabricated with high performance CMOS technology. Synchronous design allows precise cycle control with the use of system clock I/O transactions are possible on every clock cycle. Range of operating frequencies, programmable burst length and programmable latencies allow the same device to be useful for a variety of high bandwidth, high performance memory system applications.

ORDERING INFORMATION

Product ID	Max Freq.	Package	Comments
M12L16161A-5TG2Q	200MHz	TSOP(II)	Pb-free
M12L16161A-7TG2Q	143MHz	TSOP(II)	Pb-free

PIN CONFIGURATION (TOP VIEW)

(TSOPII 50L, 400milX825mil Body, 0.8mm Pin Pitch)



National Semiconductor

December 6, 2007

LM94022/LM94022Q
1.5V, SC70, Multi-Gain Analog Temperature Sensor with Class-AB Output

General Description

The LM94022 is a precision analog output CMOS integrated-circuit temperature sensor that operates at a supply voltage as low as 1.5 Volts. A class-AB output structure gives the LM94022 strong output source and sink current capability for driving heavy loads. For example, it is well suited to source the input of a sample-and-hold analog-to-digital converter with its transient load requirements. While operating over the wide temperature range of −50°C to +150°C, the LM94022 delivers an output voltage that is inversely porportional to measured temperature. The LM94022's low supply current makes it ideal for battery-powered systems as well as general temperature sensing applications.

Two logic inputs, Gain Select 1 (GS1) and Gain Select 0 (GS0), select the gain of the temperature-to-voltage output transfer function. Four slopes are selectable: −5.5 mV/°C, −8.2 mV/°C, −10.9 mV/°C, and −13.6 mV/°C. In the lowest gain configuration (GS1 and GS0 both tied low), the LM94022 can operate with a 1.5V supply while measuring temperature over the full −50°C to +150°C operating range. Tying both inputs high causes the transfer function to have the largest gain of −13.6 mV/°C for maximum temperature sensitivity. The gain-select inputs can be tied directly to V_{DD} or Ground without any pull-up or pull-down resistors, reducing component count and board area. These inputs can also be driven by logic signals allowing the system to optimize the gain during operation or system diagnostics.

Applications

- Cell phones
- Wireless Transceivers
- Battery Management
- Automotive
- Disk Drives
- Games
- Appliances

Features

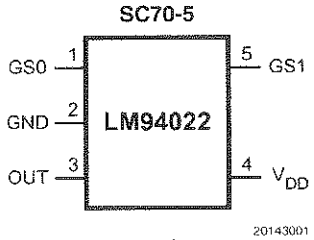
- LM94022Q is AEC-Q100 Grade 0 qualified and is manufactured on an Automotive Grade Flow.
- Low 1.5V operation
- Push-pull output with 50µA source current capability
- Four selectable gains
- Very accurate over wide temperature range of −50°C to +150°C
- Low quiescent current
- Output is short-circuit protected
- Extremely small SC70 package
- Footprint compatible with the industry-standard LM20 temperature sensor

Key Specifications

Supply Voltage		1.5V to 5.5V
Supply Current		5.4 µA (typ)
Output Drive		±50 µA
Temperature Accuracy	20°C to 40°C	±1.5°C
	-50°C to 70°C	±1.8°C
	-50°C to 90°C	±2.1°C
	-50°C to 150°C	±2.7°C
Operating Temperature		−50°C to 150°C

Connection Diagram

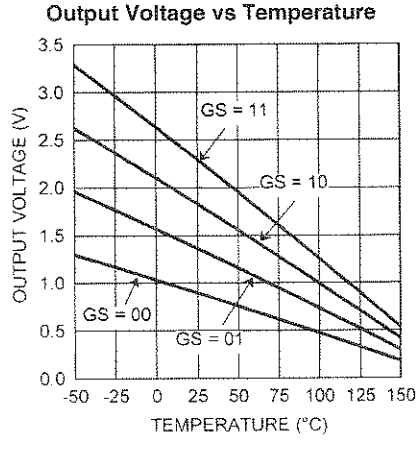
SC70-5



Top View
See NS Package Number MAA05A

Typical Transfer Characteristic

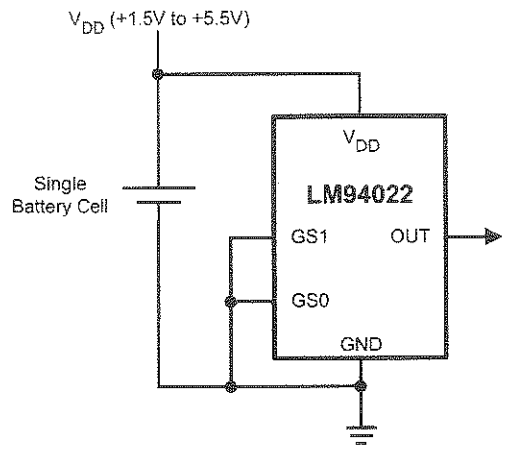
Output Voltage vs Temperature



© 2007 National Semiconductor Corporation 201430

Typical Application

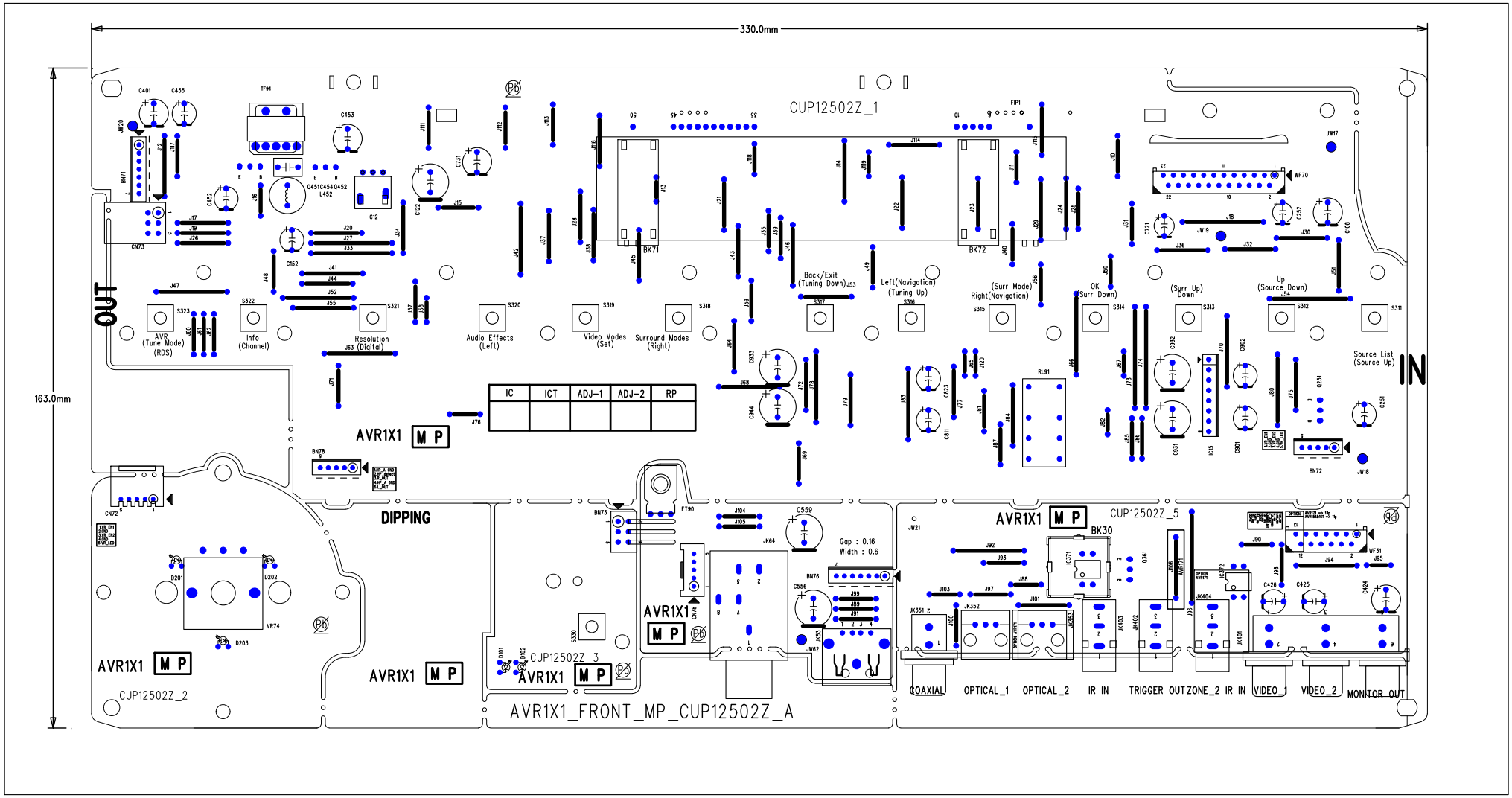
Full-Range Celsius Temperature Sensor (−50°C to +150°C) Operating from a Single Battery Cell

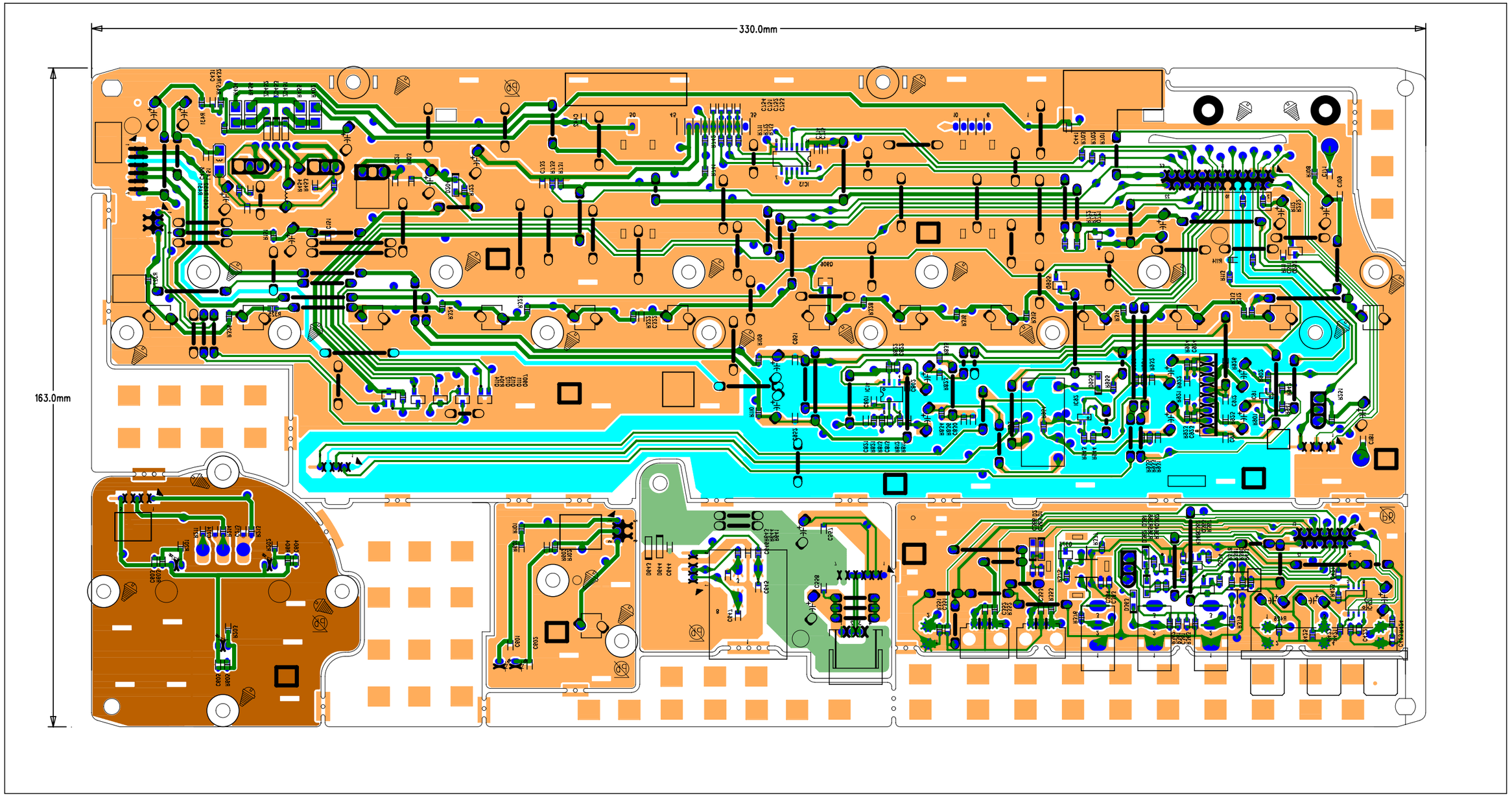


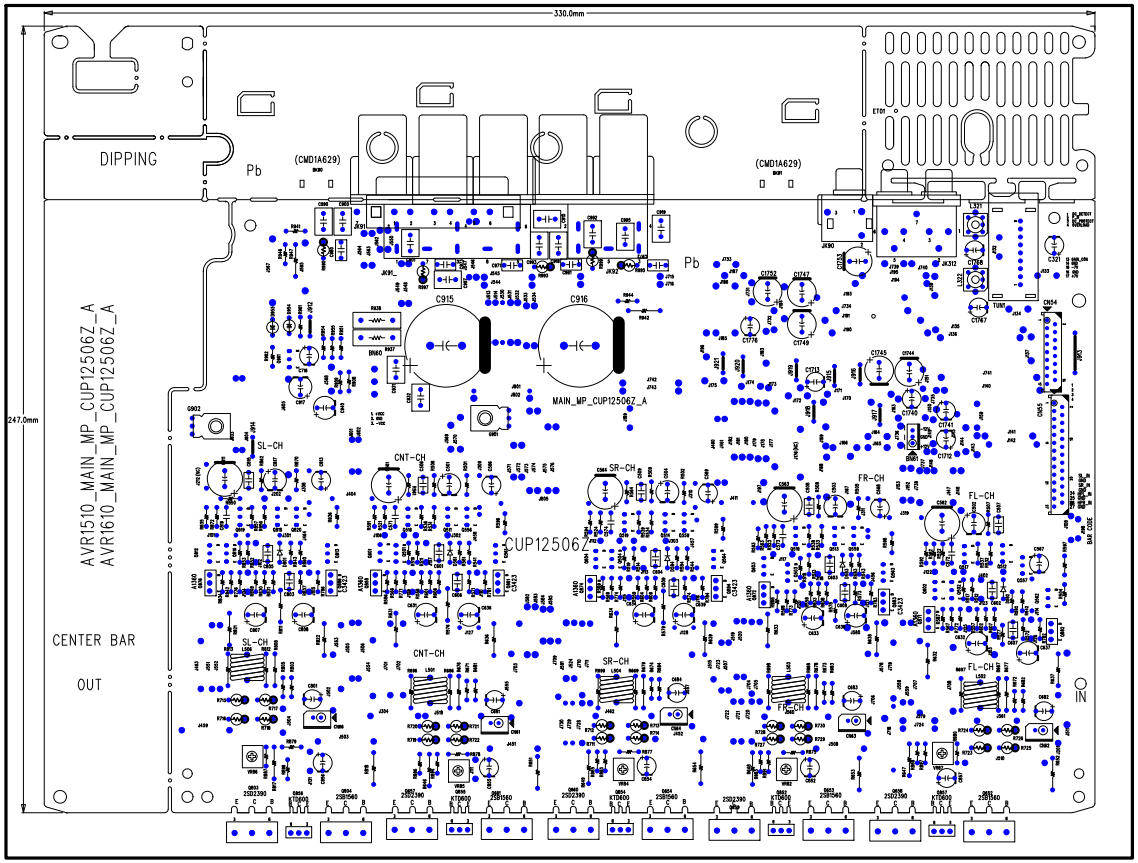
20143002

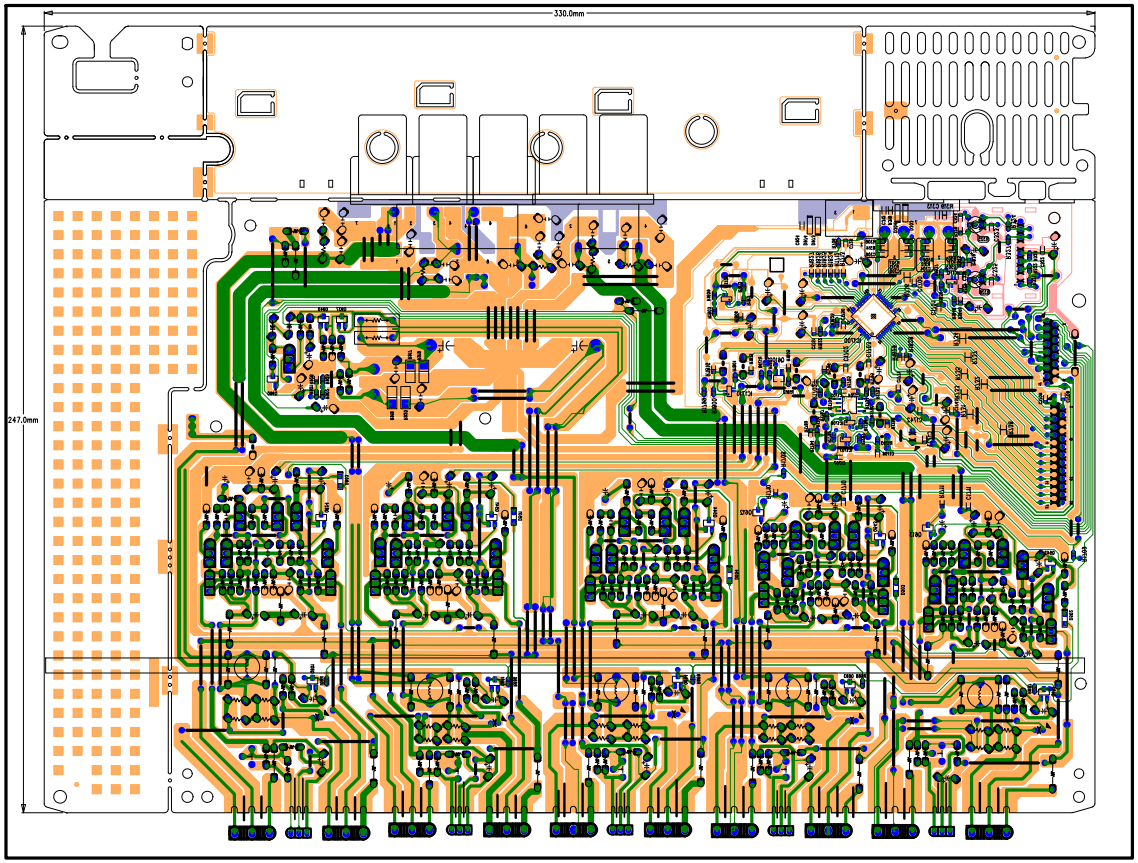
Ordering Information

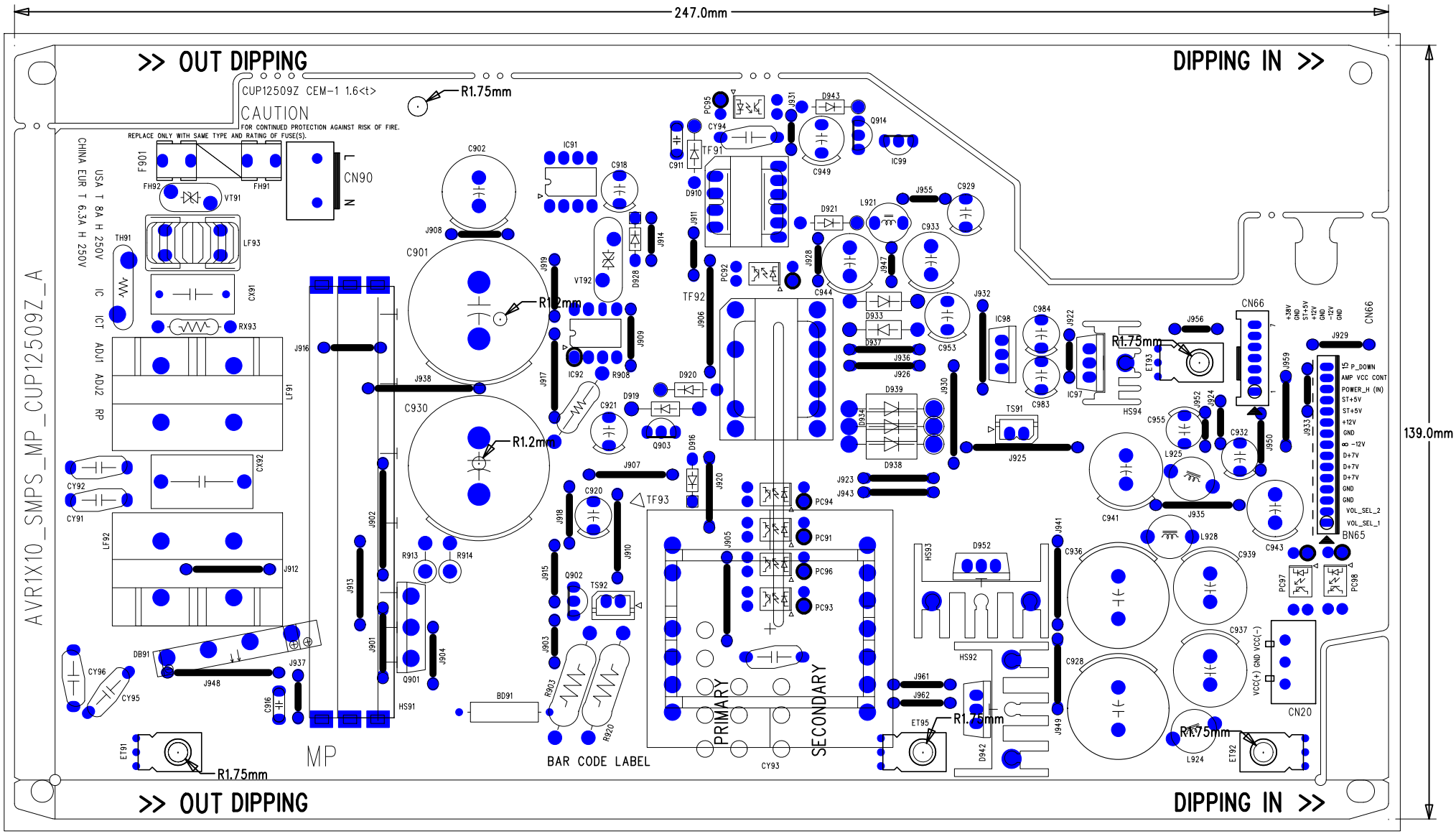
Order Number	Temperature Accuracy	NS Package Number	Device Marking	Transport Media	Features
LM94022BIMG	±1.5°C to ±2.7°C	MAA05A	22B	3000 Units on Tape and Reel	
LM94022BIMGX	±1.5°C to ±2.7°C	MAA05A	22B	9000 Units on Tape and Reel	
LM94022QBIMG	±1.5°C to ±2.7°C	MAA05A	22Q	3000 Units on Tape and Reel	AEC-Q100 Grade 0 Qualified. Automotive-Grade Production Flow.
LM94022QBIMGX	±1.5°C to ±2.7°C	MAA05A	22Q	9000 Units on Tape and Reel	AEC-Q100 Grade 0 Qualified. Automotive-Grade Production Flow.

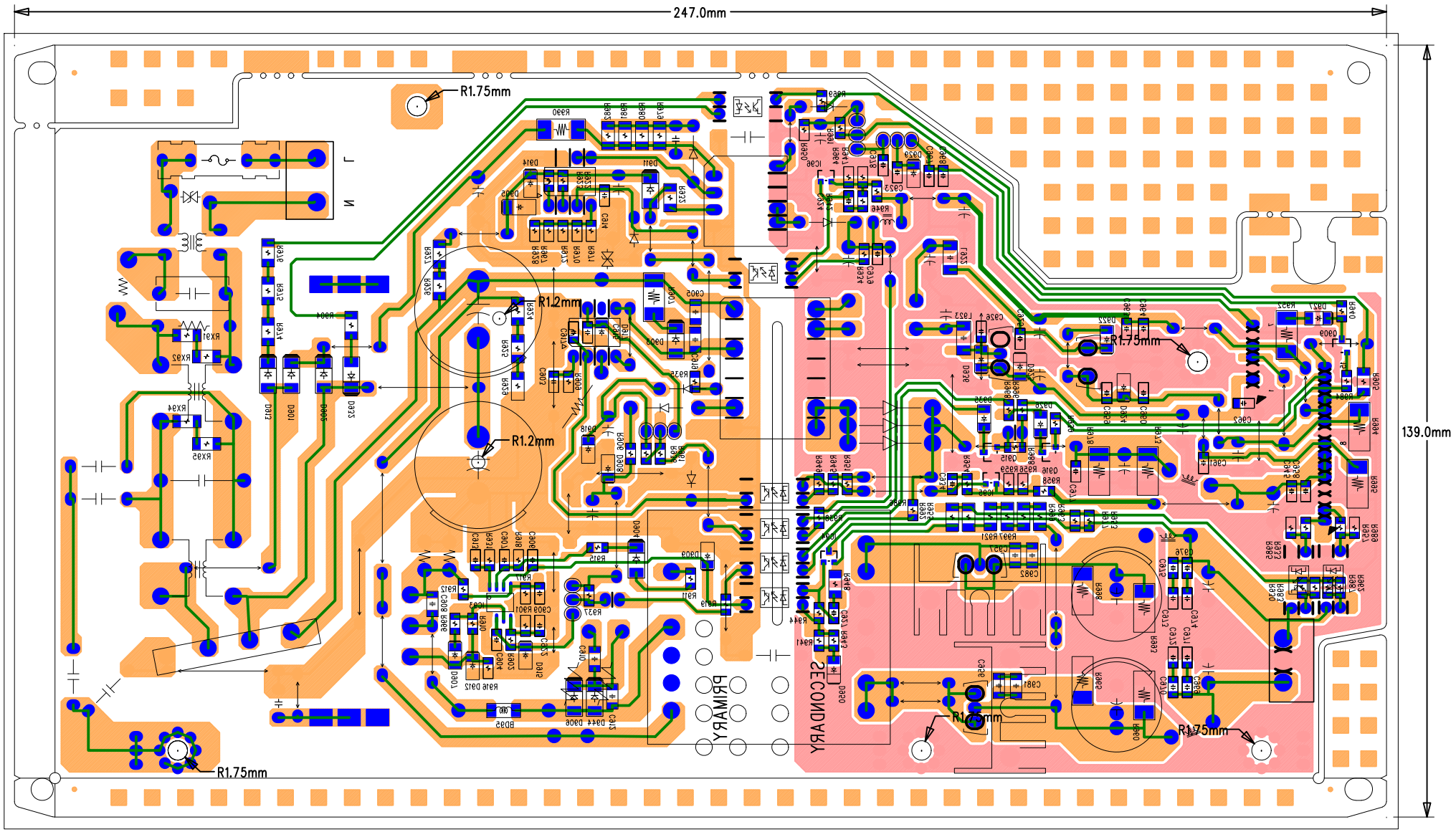

330.0mm
163.0mm
OUT
IN
CUP12502Z_1
CUP12502Z_2
CUP12502Z_3
CUP12502Z_5
AVR1X1_FRONT_MP_CUP12502Z_A
AVR1X1 M P
DIPPING
IC ICT ADJ-1 ADJ-2 RP
Gap : 0.16
Width : 0.6
AVR (Tune Mode) (RDS)
Info (Channel)
Resolution (Digital)
Audio Effects (Left)
Video Modes (Set)
Surround Modes (Right)
Back/Exit (Tuning Down)
Left(Navigation) (Tuning Up)
(Surr Mode) Right(Navigation)
OK Surr Down)
(Surr Up) Down
Up (Source Down)
Source List (Source Up)
COAXIAL
OPTICAL_1
OPTICAL_2
IR IN
TRIGGER OUT
ZONE_2 IR IN
VIDEO_1
VIDEO_2
MONITOR OUT

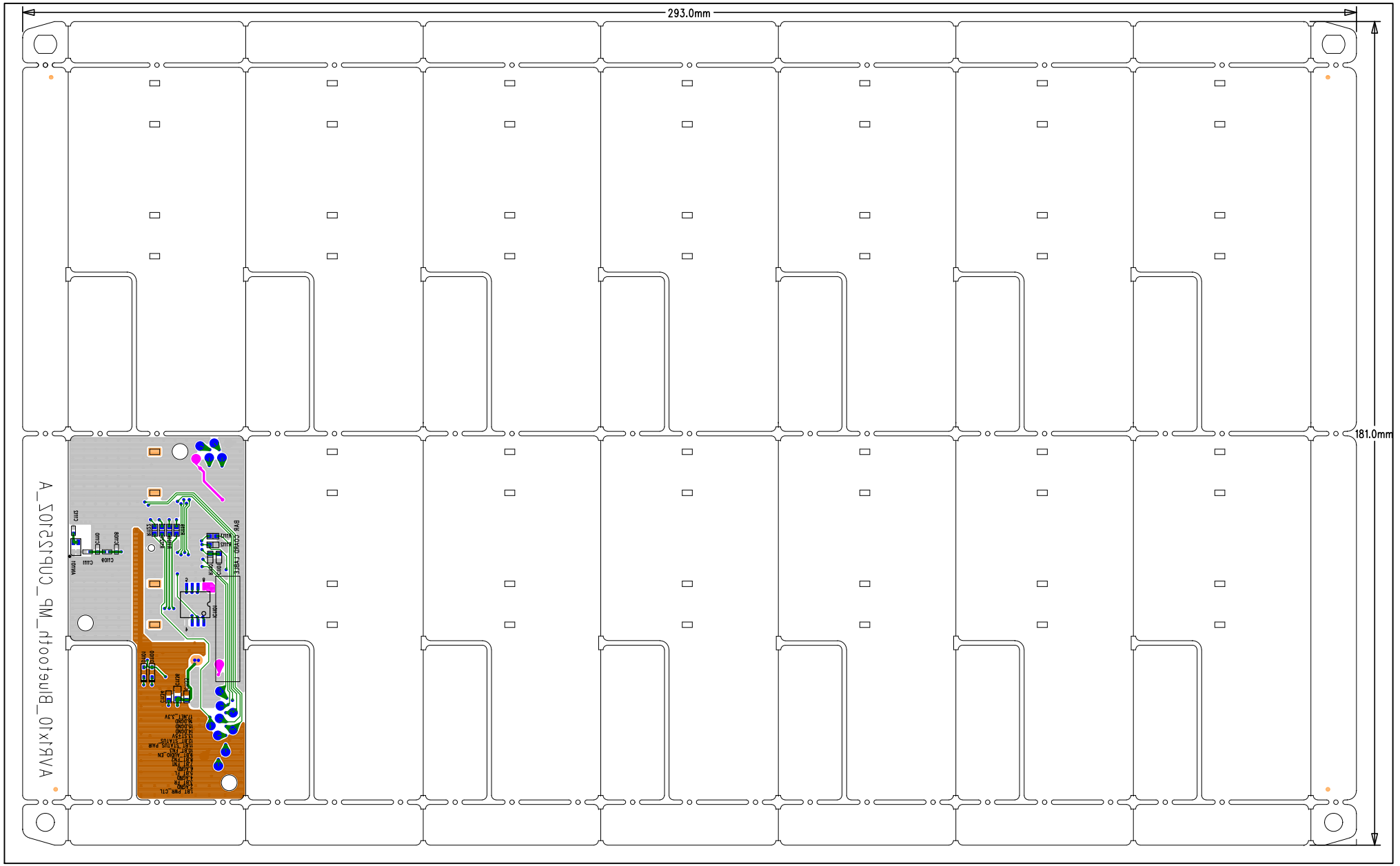

330.0mm
163.0mm

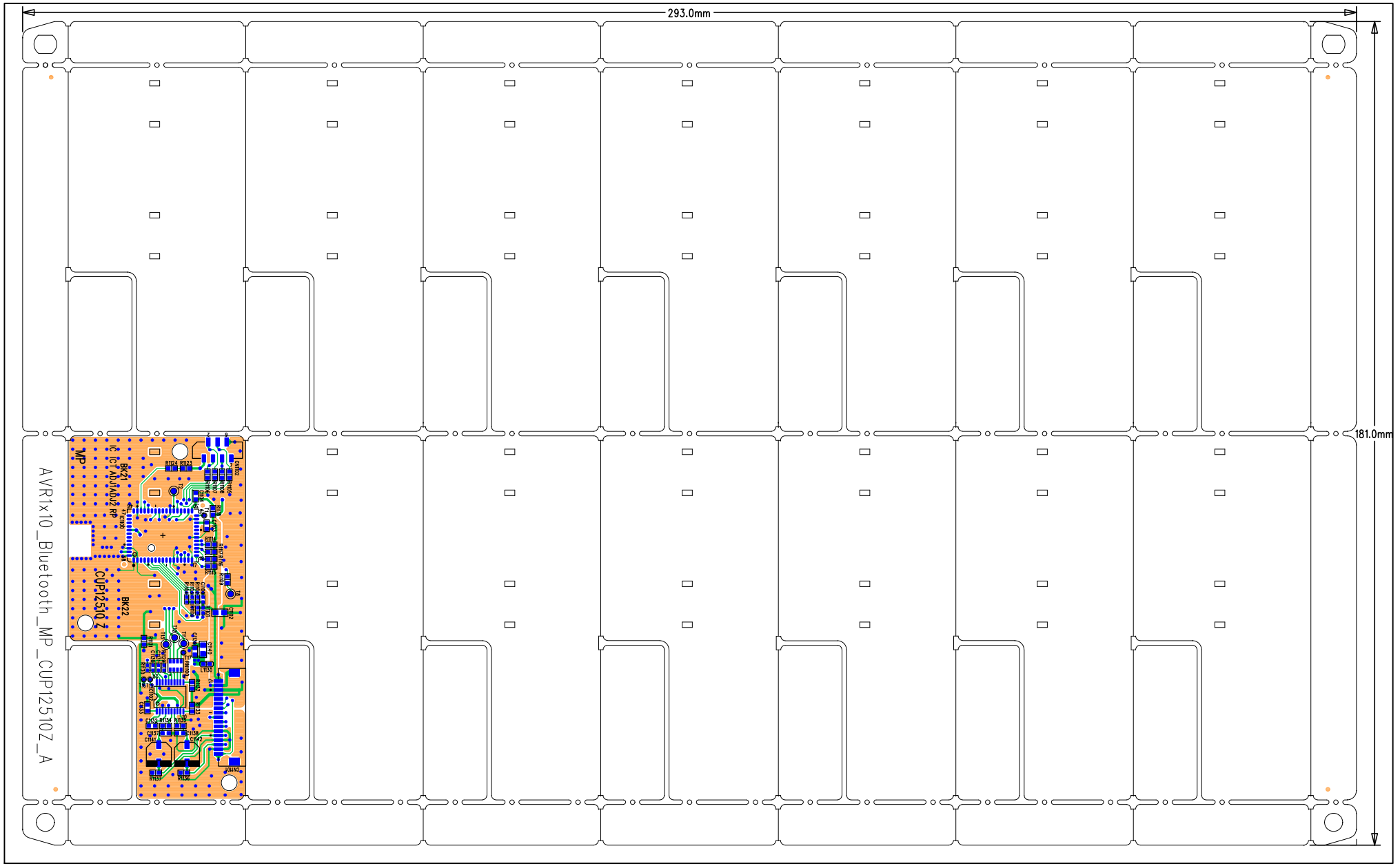

330.0mm
247.0mm
DIPPING
Pb
(CMD1A629)
AVR1510_MAIN_MP_CUP12506Z_A
AVR1610_MAIN_MP_CUP12506Z_A
CENTER BAR
OUT
IN
C915
C916
MAIN_MP_CUP12506Z_A
SL-CH
CNT-CH
SR-CH
FR-CH
FL-CH
CUP12506Z


330.0mm
247.0mm

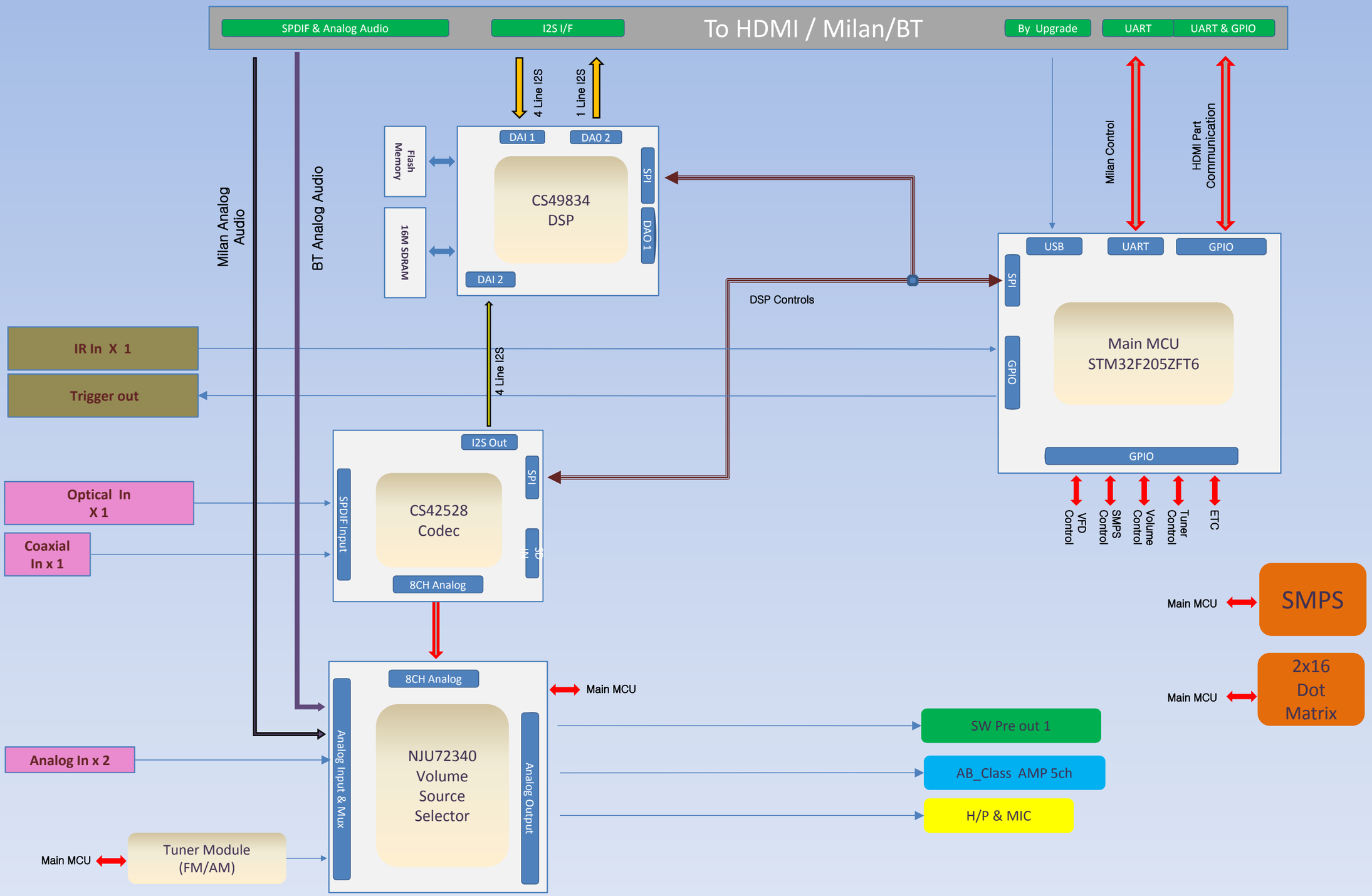

247.0mm
139.0mm
>> OUT DIPPING
DIPPING IN >>
AVR1X10_SMPS_MP_CUP12509Z_A
CUP12509Z CEM-1 1.6<t>
CAUTION
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE(S).
CHINA EUR T 6.3A H 250V
USA T 8A H 250V
IC
ICT
ADJ1
ADJ2
RP
R1.75mm
R1.2mm
PRIMARY
SECONDARY
MP
BAR CODE LABEL
CN90
CN66
CN20
BN65
P_DOWN
AMP VCC CONT
POWER_H (IN)
ST+5V
ST+5V
+12V
GND
-12V
D+7V
D+7V
D+7V
GND
GND
VOL_SEL_2
VOL_SEL_1
>> OUT DIPPING
DIPPING IN >>


247.0mm
139.0mm
R1.75mm
R1.2mm
R1.2mm
R1.75mm
R1.75mm
R1.75mm
R1.75mm
PRIMARY
SECONDARY

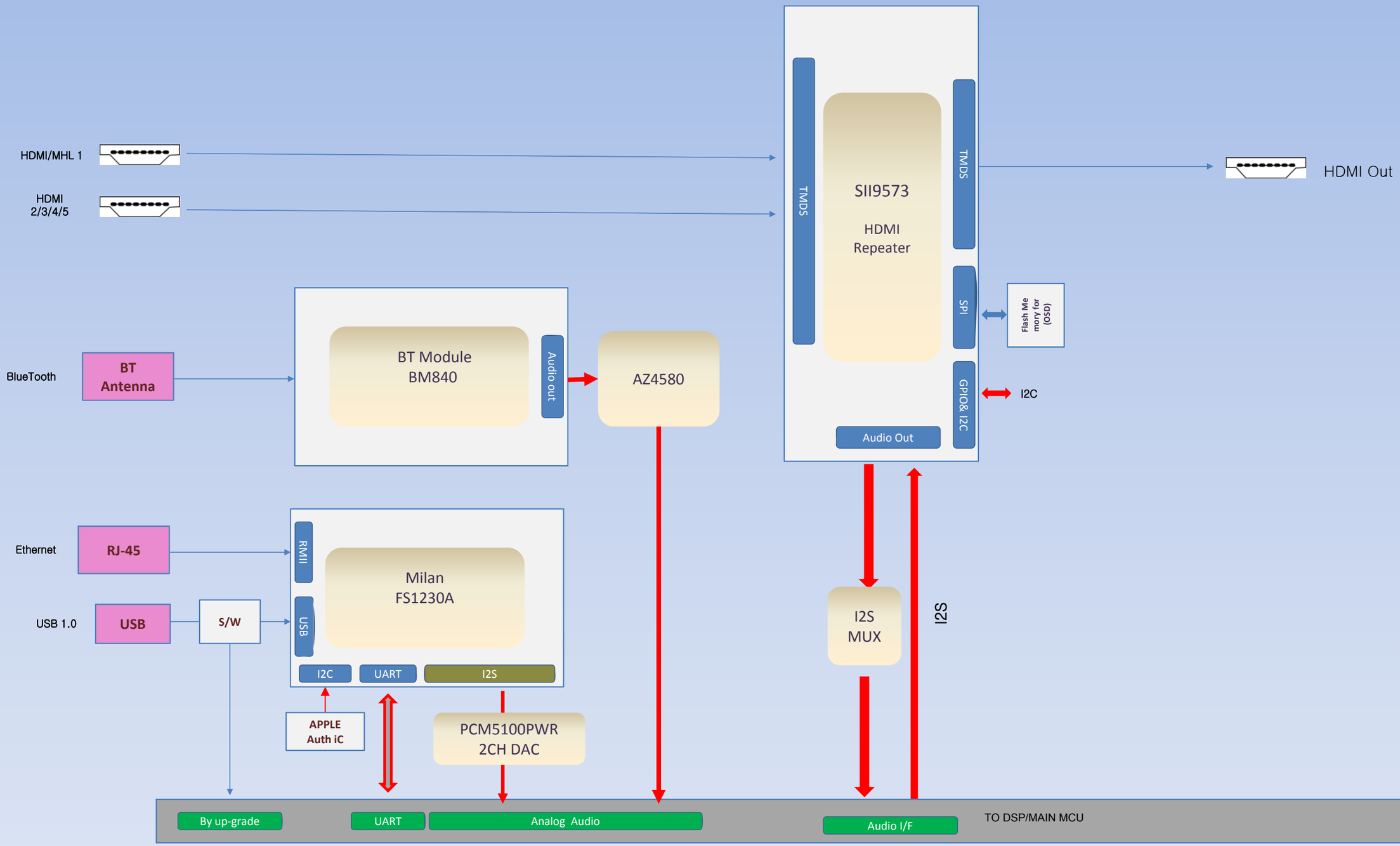

293.0mm
181.0mm
AVR1x0_Bluetooth_MP_CUP12510_A


293.0mm
181.0mm
AVR1x10_Bluetooth_MP_CUP12510Z_A

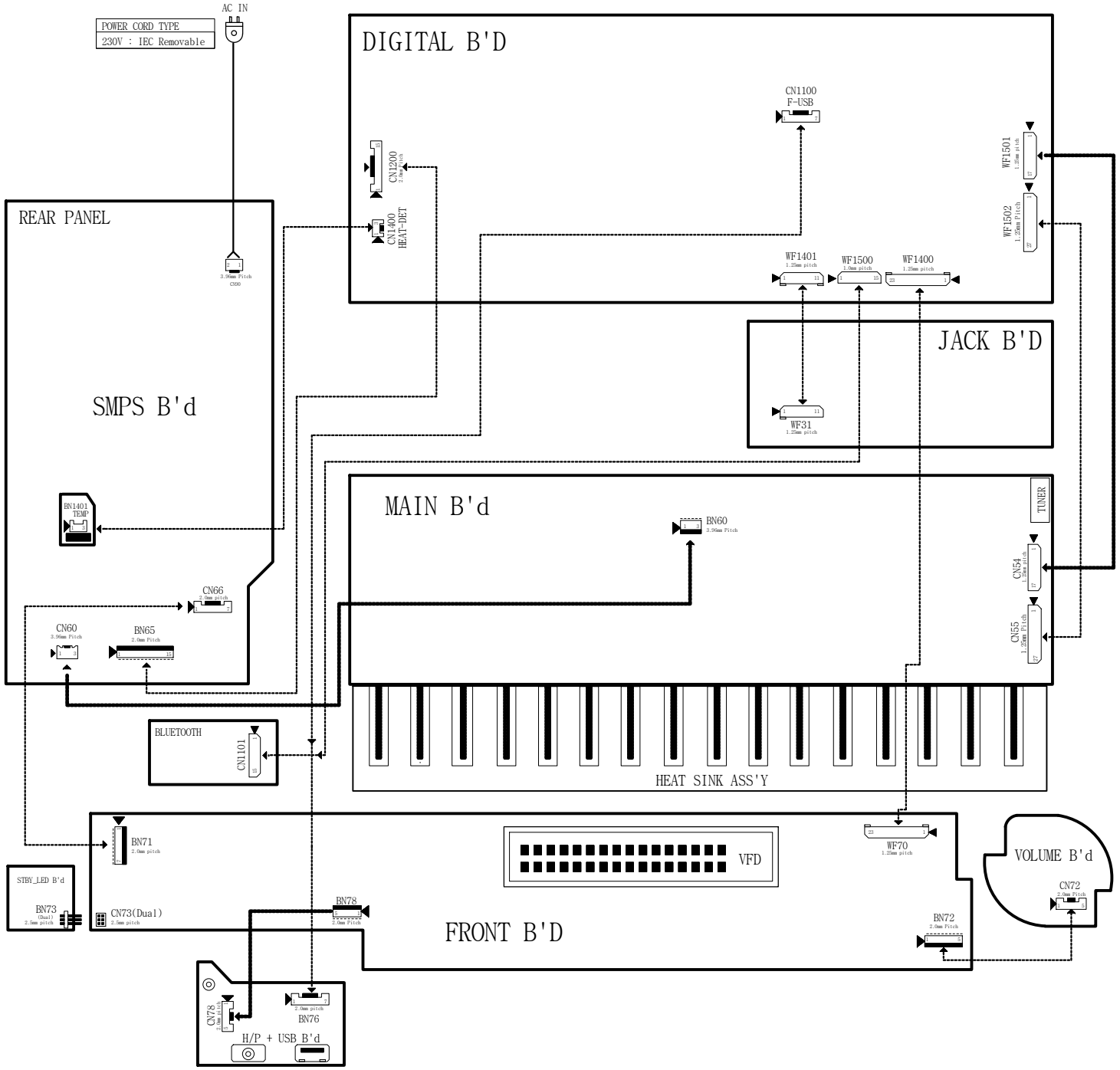
AVR161 Block Diagram



AVR161 Block Diagram

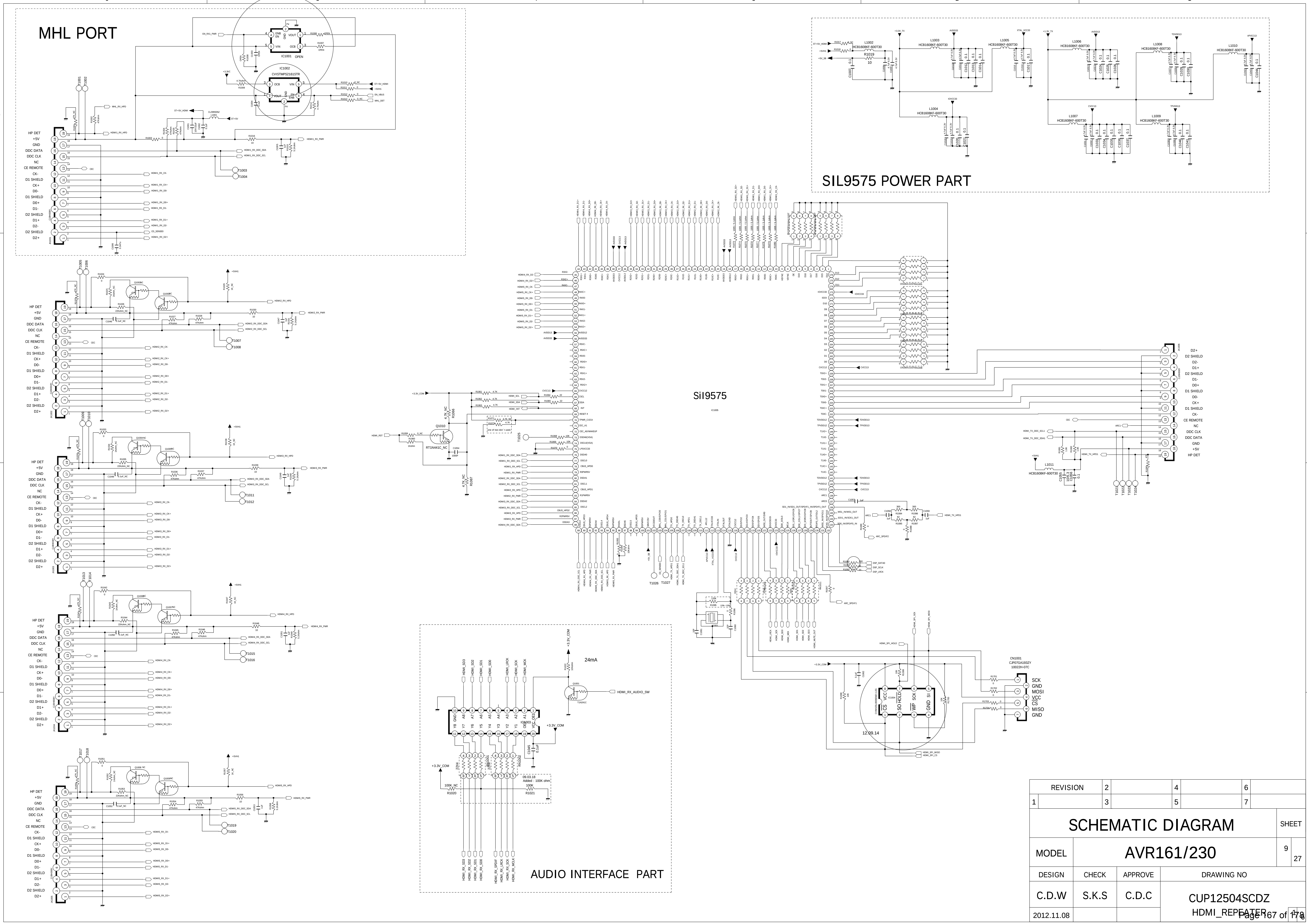


WIRING DIAGRAM



REVISION	2	4	6	
1	3	5	7	

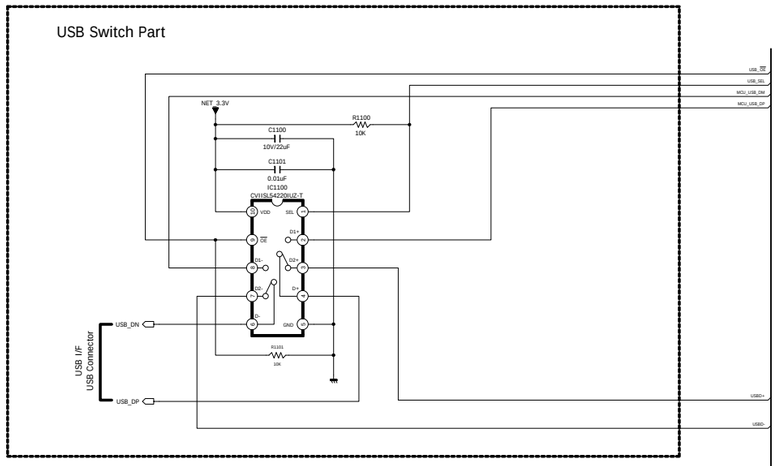
SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		1 1
DESIGN	CHECK	APPROVE	DRAWING NO
K.B.C	L.J.H	Y.W.Y	



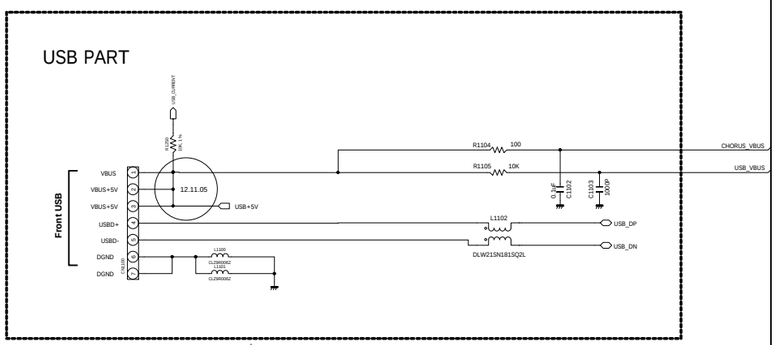
MHL PORT
SIL9575 POWER PART
SiI9575
AUDIO INTERFACE PART
IC1001
IC1002
CN1001
12.09.14
24mA
REVISION
SCHEMATIC DIAGRAM
SHEET
MODEL
AVR161/230
9
27
DESIGN
CHECK
APPROVE
DRAWING NO
C.D.W
S.K.S
C.D.C
CUP12504SCDZ
HDMI_REPEATER
2012.11.08

AVR161/230

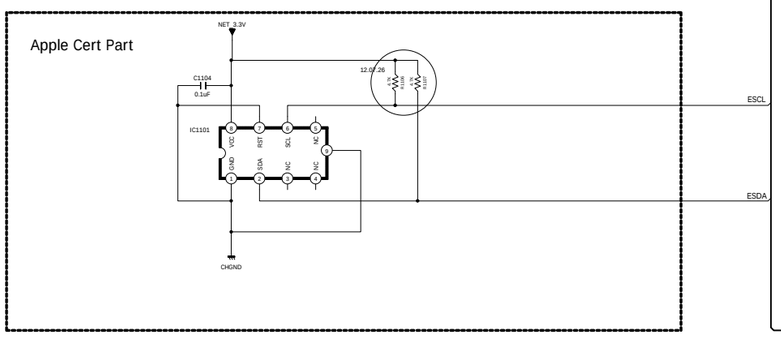
USB Switch Part



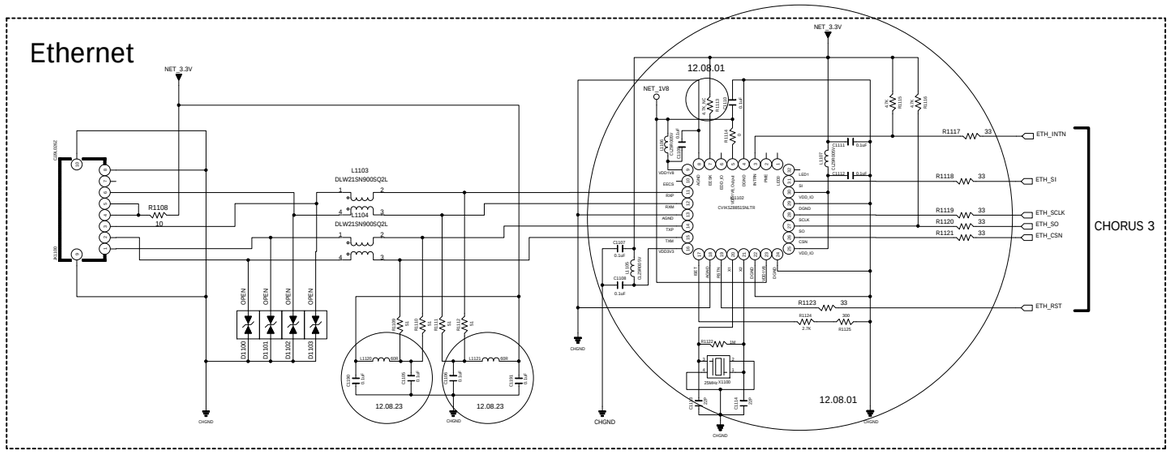
USB PART



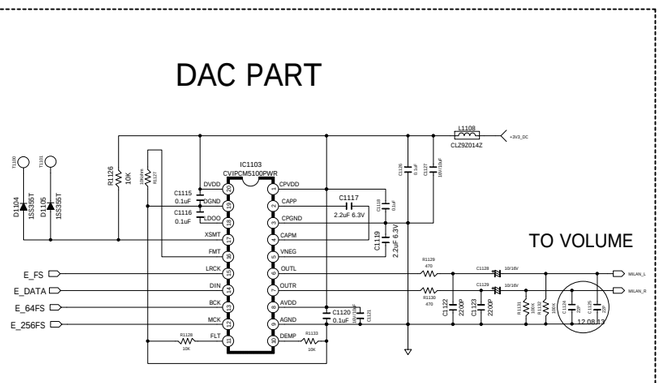
Apple Cert Part



Ethernet



DAC PART



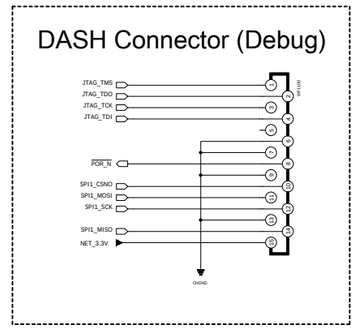
TO CHORUS 3

ESCL, ESDA, USBD-, USBD+, CHORUS_VBUS, CHORUS_VBUSDRIVE

TO MAIN_CPU

USB_SEL, USB_VBUSDRV, MCU_IIC_SCL, USB_VBUS, MCU_USB_DM, MCU_USB_DP

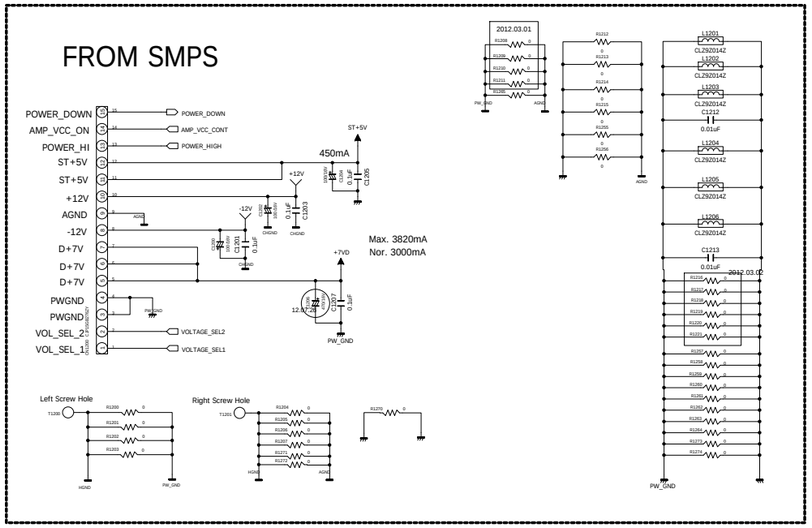
DASH Connector (Debug)



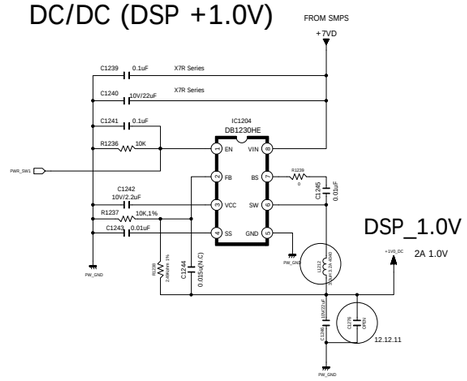
REVISION	2	4	6	
1	3	5	7	

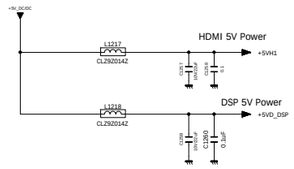
SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		10 / 27
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.W	S.K.S	C.D.C	CUP12504SCDZ (NETWORK_MU,AN)
2012.11.08			27

FROM SMPS

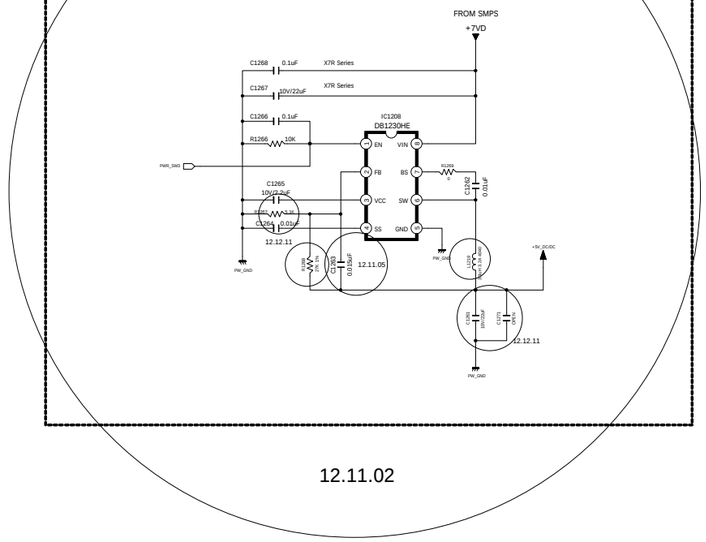


DC/DC (DSP +1.0V)

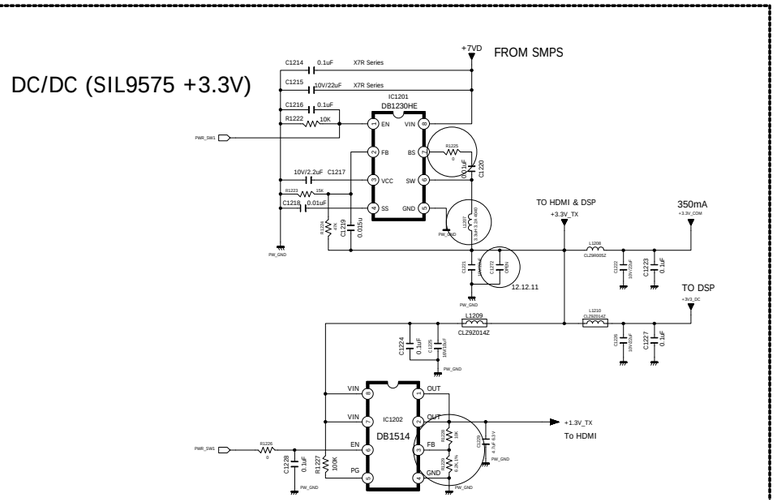




DC/DC (HDMI&DSP +5.0V)

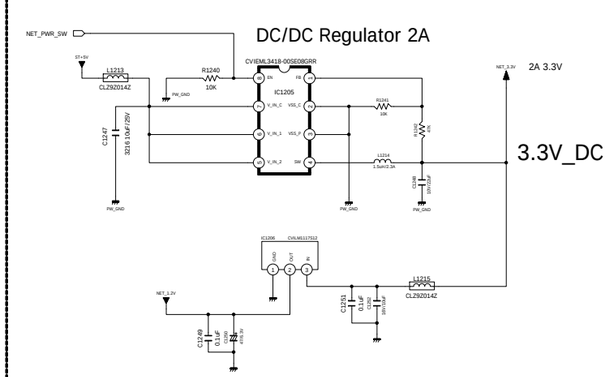


DC/DC (SIL9575 +3.3V)

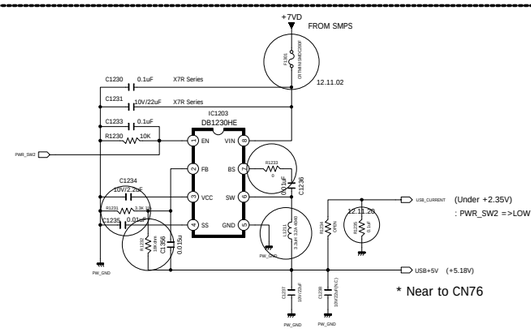


NETWORK_Power Control

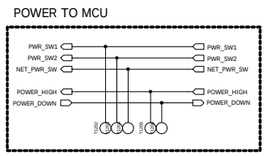
DC/DC (Milan +3.3V)



USB/IPOD POWER PART



POWER TO MCU



REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		11 / 27
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.W	S.K.S	C.D.C	CUP12504SCDZ (DC_DC_POWER)
12.11.08			3 / 3

ADC INPUT

To Volume

From Volume

AD_LIN

AD_RIN

FROM JACK PCB

OPT1

COAX1

Not use

ARC_SPDIF1

ARC_SPDIF2

HDMI_RX_SPDIF

IC1306

CVICS49834A-CQZ

FROM HDMI RX AUDIO

TO HDMI TX AUDIO

ON : HIGH

< = > MCU PART

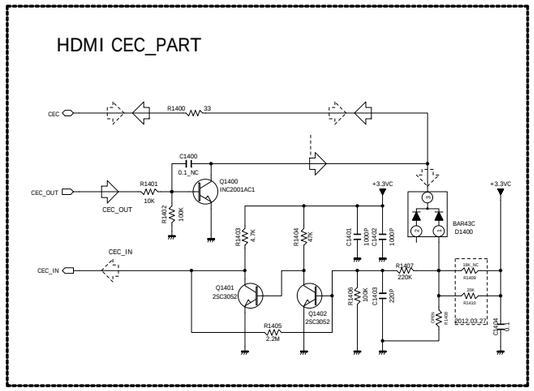
REVISION	2	4	6
1	3	5	7

SCHEMATIC DIAGRAM — SHEET 12 27

MODEL	AVR161/230	
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.W	S.K.S	C.D.C	CUP12504SCDZ (DSP_CODEC)
2012.11.08			4 / 6

CUP12456Z

HDMI CEC_PART



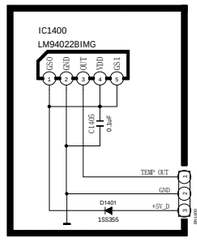
HDMI CEC_PART

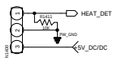
<=> DSP/CODEC

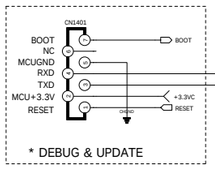
<=> FRONT PCB

<=> BT PCB

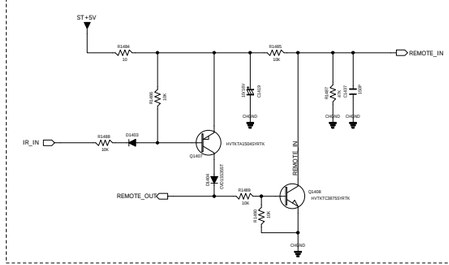
TEMP. SENSING



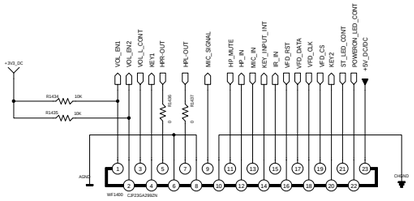




REMOTE IN

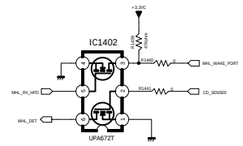


<=> FRONT PCB



12.09.25

MCU PORT WITH MHL



MILAN VBUS DETECT

To SMPS

<=> TUNER CONTROL (JACK B'D)

<=> JTAG

MCU_JTEG

<=> JACK PCB

REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		13 / 27
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.W	S.K.S	C.D.C	CUP12504SCDZ (ST_MCU)
12.11.08			

FROM CODEC

TO AMP B'D

DAC-R
DAC-L
DAC-SW
DAC-C
DAC-SR
DAC-SL

DC PROTECTOR
RS4Ω=1.5K
Operating: +5.0V~ , -5.0V~

OVERLOAD DETECTION

PROTECT TEST
(SHORT)

* 3 Step Detect *
3.8A : VCC 45V->41V
4.3A : VCC 41V->25V
5.96A: Protect

12.12.17

OC_DETECT
P_M
DC_PROTECT
OVERLOAD
P_FAIL
VOL_CLK
VOL_DATA
TUNER_SCL
TUNER_SDA
FUNC_MUTE
TUNER_MUTE
+3.3VC
IPHONE_MUTE
DGND
-7VA
AGND
+7VA

MILAN_L
MILAN_R
AGND
BT_FL
BT_FR
AGND
AGND
AGND
AD-L
AD-R
AGND
SUB_IN
AGND
FL_IN
AGND
FR_IN
AGND
CEN_IN
AGND
SL_IN
AGND
SR_IN
AGND
HP_L
AGND
HP_R
AGND

12.12.17

MUTE CONTROL

2012.03.01

FUNC_MUTE
HP_MUTE
AMP_GAIN_CONT
TUNER_MUTE1
TUNER_MUTE

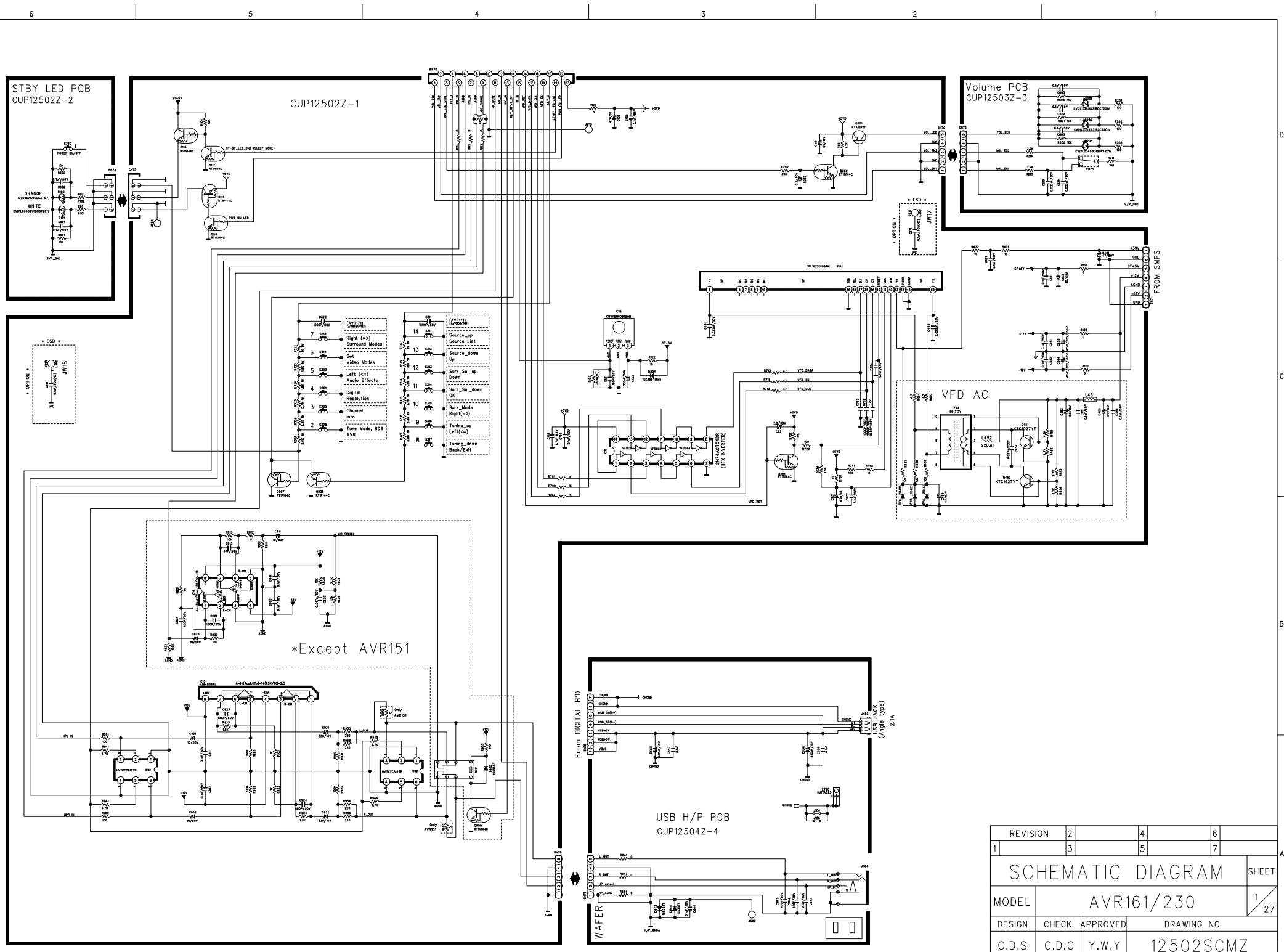
Bluetooth

+3.3V_BT
GND
GND
GND
+5V_BT
BT_STATUS
BT_STATUS_PAIR
FIN3
BT_AUDIO_EN
FIN2
FIN1
GND
BT_FL
GND
BT_FR
GND
BT_PWR_CTL

MET_3.3V
BT_STATUS
BT_STATUS_PAIR
BT_FIN3
BT_AUDIO_EN
BT_FIN2
BT_FIN1
BT_FL
BT_FR
BT_PWR_CTL

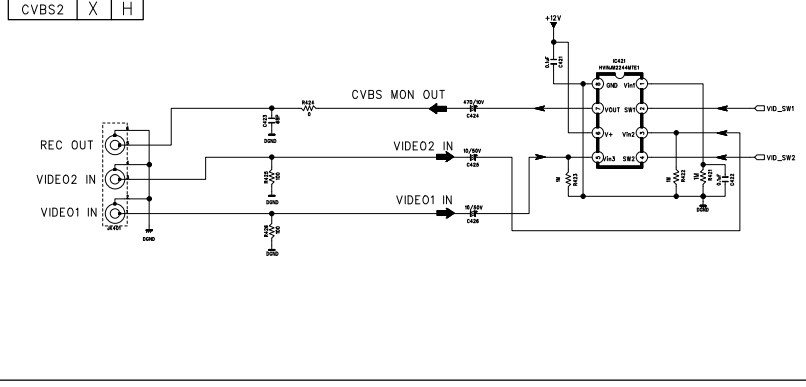
REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		14 / 27
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.W	S.K.S	C.D.C	CUP12504SCDZ (VOLUME_FILTER) 6
2012.11.08			


STBY LED PCB
CUP12502Z-2
CUP12502Z-1
Volume PCB
CUP12503Z-3
VFD AC
*Except AVR151
USB H/P PCB
CUP12504Z-4
FROM SMPS
WAFER
SHIFTACTADOR (HEX INVERTER)
REVISION
SCHEMATIC DIAGRAM
SHEET
MODEL
AVR161/230
DESIGN
CHECK
APPROVED
DRAWING NO
C.D.S
C.D.C
Y.W.Y
12502SCMZ
(FRONT)
12.12.24
00.00.00
00.00.00

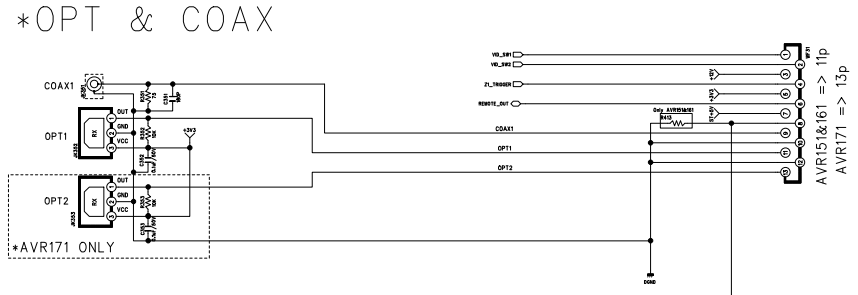
	SW1	SW2
MUTE	L	L
CVBS1	H	L
CVBS2	X	H

*ANALOG VIDEO SW

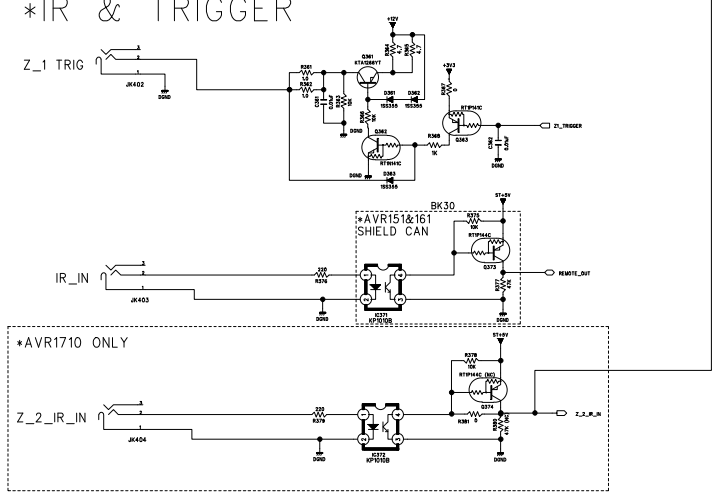


JACK PCB
CUP12502Z-5

*OPT & COAX



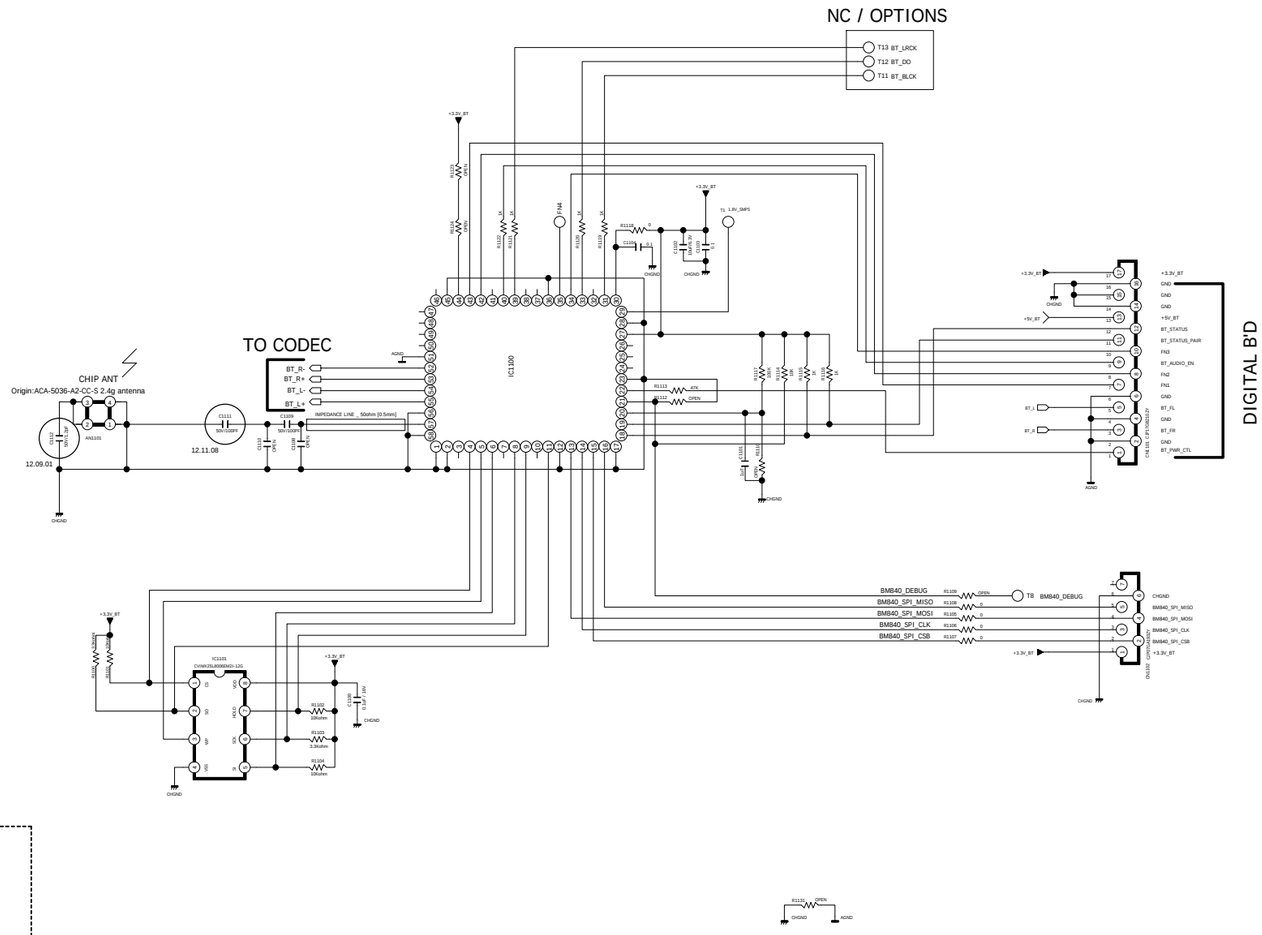
*IR & TRIGGER



REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		2 / 27
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.S	C.D.C	Y.K.Y	12502SCMZ (JACK)
12.12.24	05.00.00	05.00.00	2 / 2

Bluetooth_BM840



REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR161/230		27 / 27
DESIGN	CHECK	APPROVE	DRAWING NO
C.D.W	S.K.S	C.D.C	CUP12510Z Bluetooth
12.11.09	12.11.09	12.11.09	

AVR1X10/AVR1X1 SMPS SCHEMATIC DIAGRAM

**IMPORTANT SAFETY NOTICE.
COMPONENTS IDENTIFIED BY ⚠ MARK HAVE SPECIAL CHARACTERISTICS.
IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS.
USE ONLY MANUFACTUREY'S SPECIFIED PARTS.
**THE UNIT OF RESISTANCE IS OHM. K=1000 OHM, M=1000 KOHM
**THE UNIT OF CAPACITANCE IS MICROFARAD (uF) pF=10^6uF
**THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WITH THE
IMPROVEMENT OF PERFORMANCE

REVISION	2		4		6		
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET 26/27
MODEL	AVR161/230		
DESIGN	CHECK	APPROVE	DRAWING NO
C.S.K	C.D.C	Y.W.Y	12509SCMZ (SMPS) 1/1
12.12.24	12.12.24	12.12.24	

SR-CH

SL-CH

C-CH

FL-CH

FR-CH

FROM INPUT B'D

FROM INPUT B'D

IPHONE_GAIN Control

TO SMPS B'D

	JK91
AVR1510	CJJ5R020Z
AVR1610	CJJ5R006Z

**IMPORTANT SAFETY NOTICE.
COMPONENTS IDENTIFIED BY ⚠ MARK HAVE SPECIAL CHARACTERISTICS
IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY MANUFACTURER'S SPECIFIED PARTS.
**THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM, M=1000 KOHM
**THE UNIT OF CAPACITANCE IS MICROFARAD (uF).
1pF = 10^{-6}uF
**THIS SCHEMATIC DIAGRAM MAY BE MODIFIED AT ANYTIME WITH THE IMPROVEMENT OF PERFORMANCE.

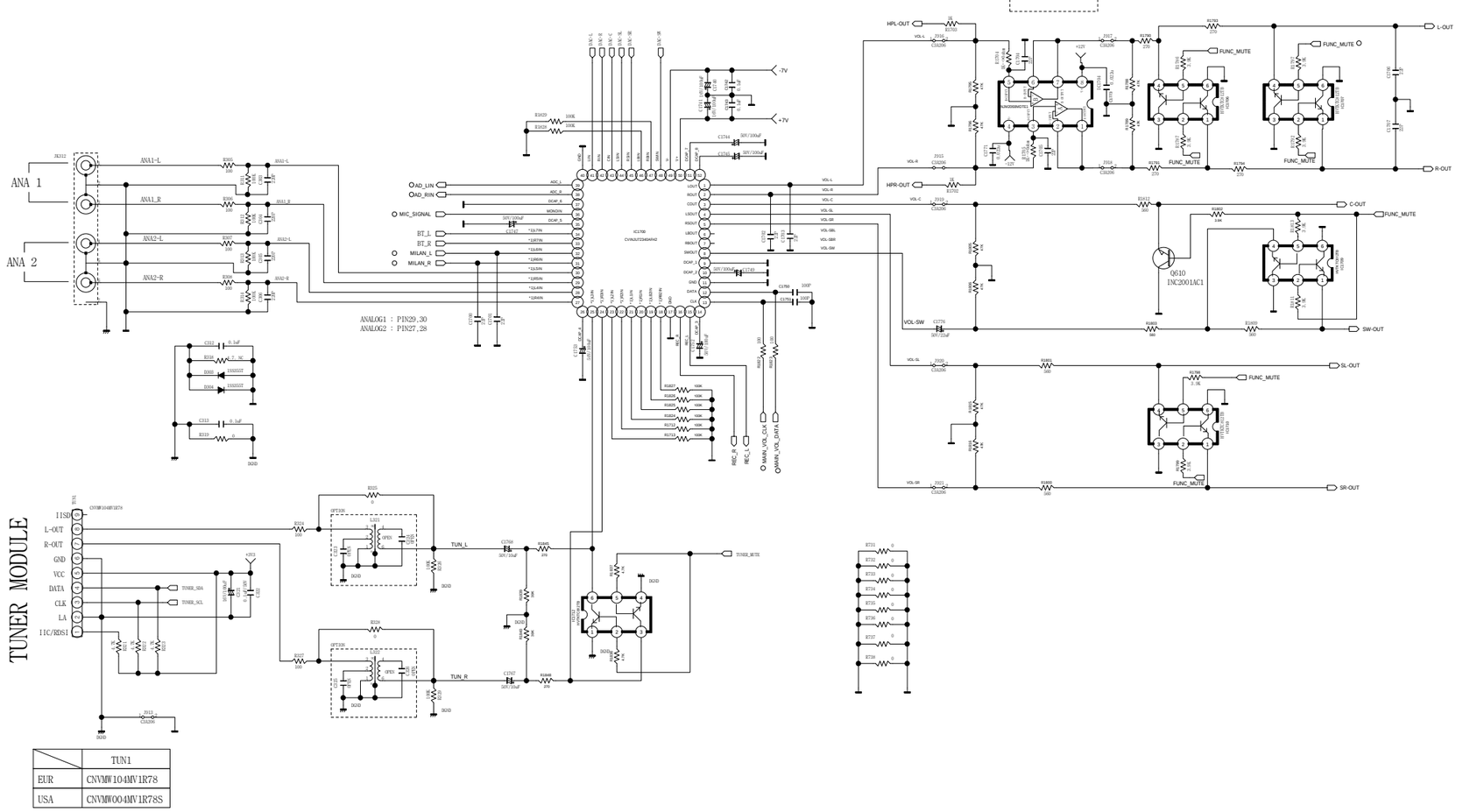
REVISION	2	4	6	
1	3	5	7	

SCHEMATIC DIAGRAM

SHEET A

MODEL	AVR161/230	22	27

DESIGN	CHECK	APPROVE	DRAWING NO
C.D.C	L.J.H	Y.W.Y	12506SCDZ (AMP)
12.06.05	00.00.00	00.00.00	1.2



	TUN1
EUR	CNVMW104MV1R78
USA	CNVMW004MV1R78S

REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET	
MODEL	AVR161/230		23	27
DESIGN	CHECK	APPROVE	DRAWING NO	
C.D.C	L.J.H	Y.W.Y	12506SCDZ	
12.06.05	00.00.00	00.00.00	(VOLUME PART)	2/2