Low Power, 5 Electrode Electrocardiogram (ECG) Analog Front

ADAS1000/ADAS1000-1/ADAS1000-2

FEATURES

Biopotential signals in; digitized signals out
5 acquisition (ECG) channels + 1 driven lead
Parallel ICs for up to 10+ Electrode measurements
AC and DC Leads Off Detection
Internal Pace Detection Algorithm on 3 leads
    Support for users own pace
Thoracic Impedance Measurement (internal/external path)
Selectable Reference Lead
Scalable Noise vs. Power Control, Power Down Modes
Low Power Operation from:
    11mW (one lead), 14mW (3 leads), 21mW (all electrodes)
Lead or Electrode Data available
Supports AAMI EC11:1991/(R)2001/(R)2007,
    EC13:2002/(R)2007, IEC60601-1 ed. 3.0b, 2005, IEC60601-2-25 ed. 1.0b, IEC60601-2-27 ed. 2.0, 2005 IEC60601-2-51 ed. 1.0, 2005
Fast Overload Recovery
Low or High speed Data Output Rates
Serial interface SPI®-/QSPI™-/DSP-compatible
56 lead LFCSP package (9mm x9mm)
64 lead LQFP package (10mm x10mm Body size)

APPLICATIONS

ECG: Monitor & Diagnostic
    Bedside Patient Monitoring, Portable Telemetry, Holter, AED, Cardiac Defibrillators, Ambulatory Monitors, Pace Maker Programmer, Patient Transport, Stress testing,

GENERAL DESCRIPTION

The ADAS1000 measures electro cardiac (ECG) signals, thoracic impedance, pacing artifacts, lead on/off status and outputs this information in the form of a data frame supplying either Lead/Vector or Electrode data at programmable data rates. Its low power from 11mW and small size make it suitable for portable, battery powered applications. The high performance also makes it suitable for higher end diagnostic machines.

The ADAS1000 is designed to simplify the task of acquiring and ensuring quality ECG signals. Value-added cardiac post-processing is executed externally on a DSP, microprocessor or FPGA. Several digital output options ensure flexibility when monitoring and analyzing signals. The ADAS1000 provides a low power, small data acquisition system for biopotential applications.
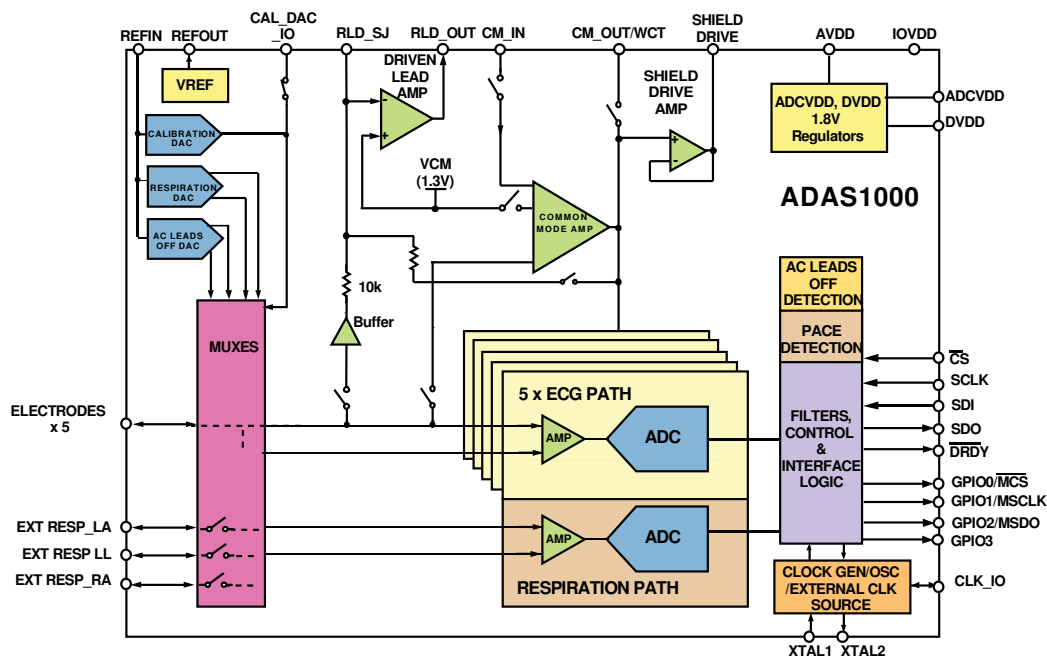
FUNCTIONAL BLOCK DIAGRAM

Figure 1 Functional Block Diagram – ADAS1000 Full featured Model

GENERAL DESCRIPTION - CONTINUED

Auxiliary features that aid in better quality ECG signal acquisition include: multi-channel averaged driven lead, selectable reference drive, fast over load recovery, flexible respiration circuitry returning magnitude and phase information, internal pace detection algorithm operating on 3 leads and option of AC or DC leads off detection.

Since ECG systems span different applications, the ADAS1000 features a novel power/noise scaling architecture where the noise can be reduced at the expense of increasing power consumption. Signal acquisition channels may be shutdown to save power. Data rates can be reduced to save power.

To ease manufacturing tests, development, as well as offer holistic power-up testing, the ADAS1000 offers a suite of dc and ac test excitation via the CAL DAC, CRC redundancy testing in addition to read-back of all relevant register address space.

The ADAS1000 is a full featured 5 channel ECG including respiration and pace detection, while the ADAS1000-1 offers only ECG channels with no respiration or pace features. Similarly the ADAS1000-2 is a subset of the main device and is configured for gang purposes with only ECG channels enabled (no respiration, pace, RLD, etc). The input structure is a differential amplifier input thereby allowing the user a variety of configuration options to best suit their application.

The ADAS1000 variants are available in two package options, either a 56 lead LFCSP or a 64 lead LQFP package and are specified over -40°C to +85°C temperature range.
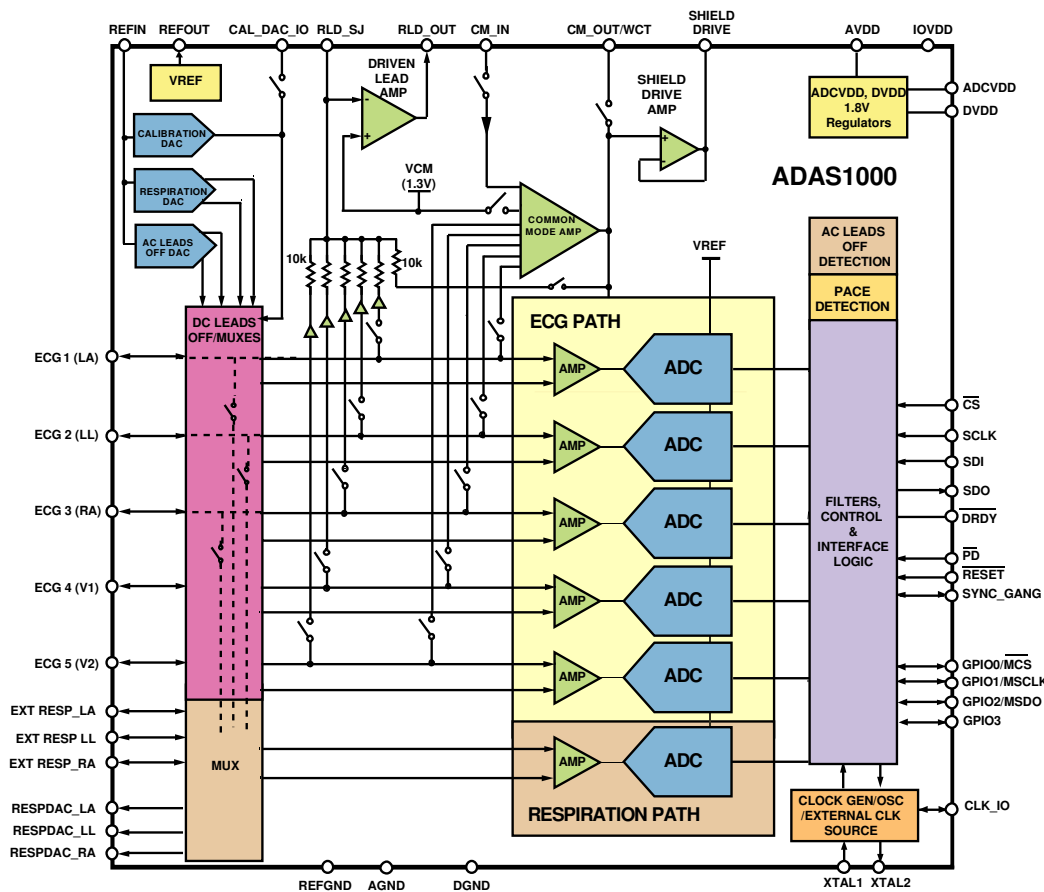

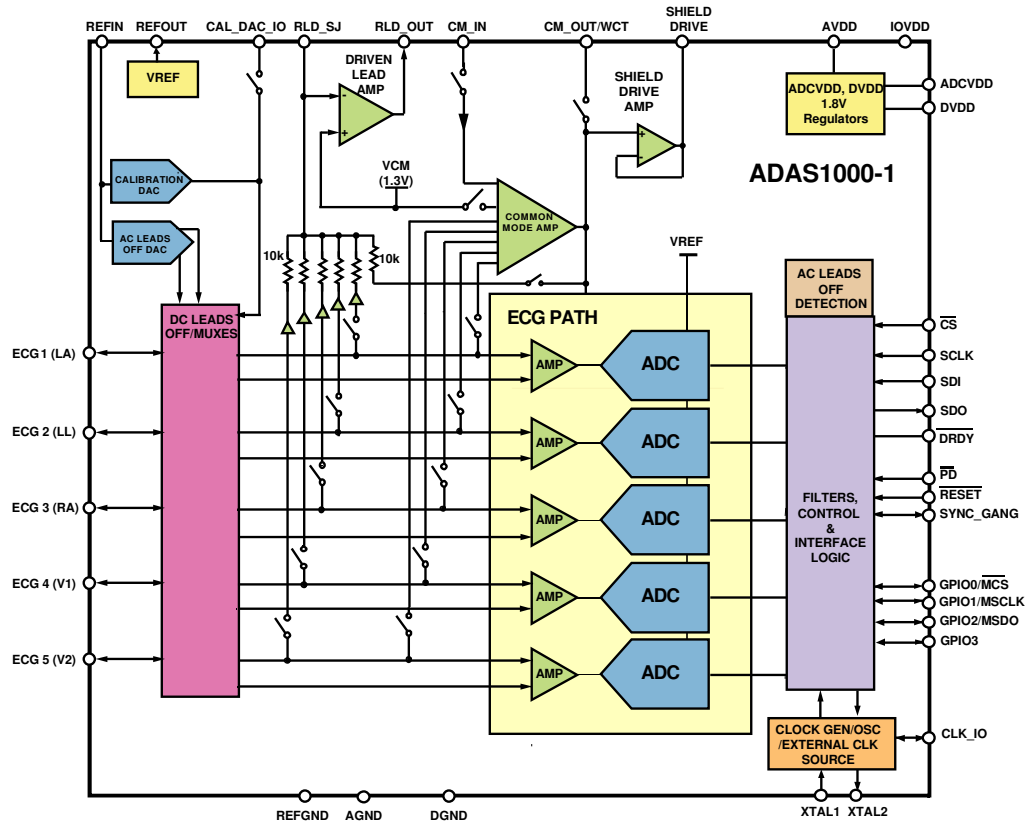Figure 2. ADAS1000 Model Simplified Block Diagram

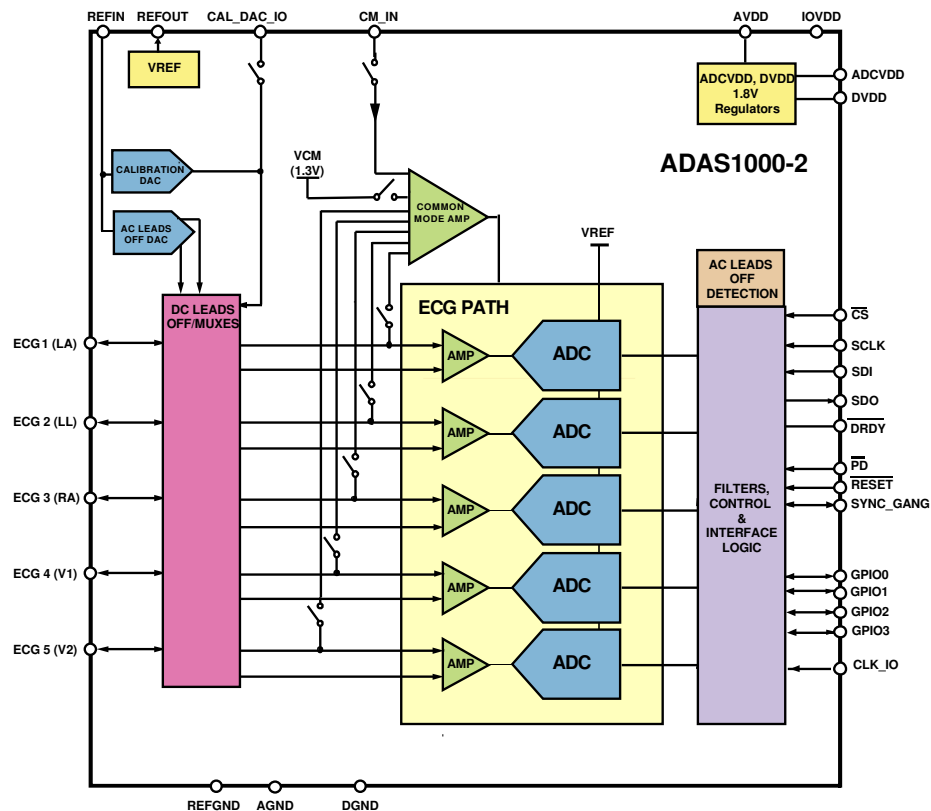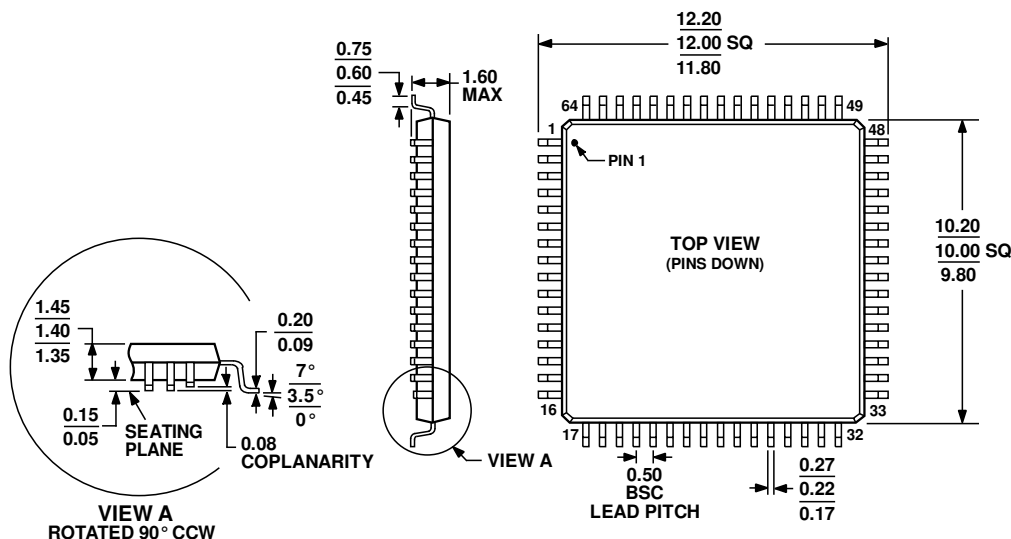Figure 3. ADAS1000-1 Simplified Block Diagram

Figure 4. ADAS1000-2 Companion Simplified Block Diagram

OUTLINE DIMENSIONS

TBD

Exposed paddle will be on the top of package

Figure 5. 56 lead, 9mm x 9mm LFCSP

COMPLIANT TO JEDEC STANDARDS MS-026-BCD

Figure 6. 64 lead, 10mm x 10mm body size LQFP

ORDERING GUIDE

Model[1]	Description	Temperature Range	Package Description	Lead Finish	Package Option
ADAS1000XSTZ[2] SAMPLE MODEL	5 ECG Channels, Pace Algorithm, Respiration Circuit	-40°C to +85°C	64 lead LQFP	TBD	ST-64
ADAS1000BCPZ[3]	5 ECG Channels, Pace Algorithm, Respiration Circuit	-40°C to +85°C	64 lead LFCSP	TBD	CP-64
ADAS1000BSTZ	5 ECG Channels, Pace Algorithm, Respiration Circuit	-40°C to +85°C	64 lead LQFP	TBD	ST-64
ADAS1000-1BCPZ	5 ECG Channels	-40°C to +85°C	64 lead LFCSP	TBD	CP-64
ADAS1000-2BCPZ	Companion for Gang Mode	-40°C to +85°C	64 lead LFCSP	TBD	CP-64
ADAS1000-2BSTZ	Companion for Gang Mode	-40°C to +85°C	64 lead LQFP	TBD	ST-64
EVAL-ADAS1000EBZU2	Evaluation Kit – Sample model. This evaluation kit consists of ADAS1000 x 2 for up to 12 lead configuration. This evaluation board can be used to evaluate all varients.				

[1] Z = Pb-free part.
[2] Initial samples available in this package only, "X" distinguishes unreleased
[3] Final Release model

ANALOG DEVICES

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