

# DATA SHEET

## **TDA1517; TDA1517P** **2 × 6 W stereo power amplifier**

Product specification  
Supersedes data of 1998 Apr 28  
File under Integrated Circuits, IC01

2002 Jan 17

**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****FEATURES**

- Requires very few external components
- High output power
- Fixed gain
- Good ripple rejection
- Mute/standby switch
- AC and DC short-circuit safe to ground and  $V_P$
- Thermally protected
- Reverse polarity safe
- Capability to handle high energy on outputs ( $V_P = 0$  V)
- No switch-on/switch-off plop
- Electrostatic discharge protection.

**GENERAL DESCRIPTION**

The TDA1517 is an integrated class-B dual output amplifier in a plastic single in-line medium power package with fin (SIL9MPF) and a plastic heat-dissipating dual in-line package (HDIP18). The device is primarily developed for multi-media applications.

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_P$	supply voltage		6.0	14.4	18.0	V
$I_{ORM}$	repetitive peak output current		–	–	2.5	A
$I_{q(tot)}$	total quiescent current		–	40	80	mA
$I_{sb}$	standby current		–	0.1	100	$\mu$ A
$I_{sw}$	switch-on current		–	–	40	$\mu$ A
$ Z_i $	input impedance		50	–	–	k $\Omega$
$P_o$	output power	$R_L = 4 \Omega$ ; THD = 0.5%	–	5	–	W
		$R_L = 4 \Omega$ ; THD = 10%	–	6	–	W
SVRR	supply voltage ripple rejection	$f_i = 100$ Hz to 10 kHz	48	–	–	dB
$\alpha_{cs}$	channel separation		40	–	–	dB
$G_v$	closed loop voltage gain		19	20	21	dB
$V_{no(rms)}$	noise output voltage (RMS value)		–	50	–	$\mu$ V
$T_c$	crystal temperature		–	–	150	$^{\circ}$ C

**ORDERING INFORMATION**

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA1517	SIL9MPF	plastic single in-line medium power package with fin; 9 leads	SOT110-1
TDA1517P	HDIP18	plastic heat-dissipating dual in-line package; 18 leads	SOT398-1

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BLOCK DIAGRAM

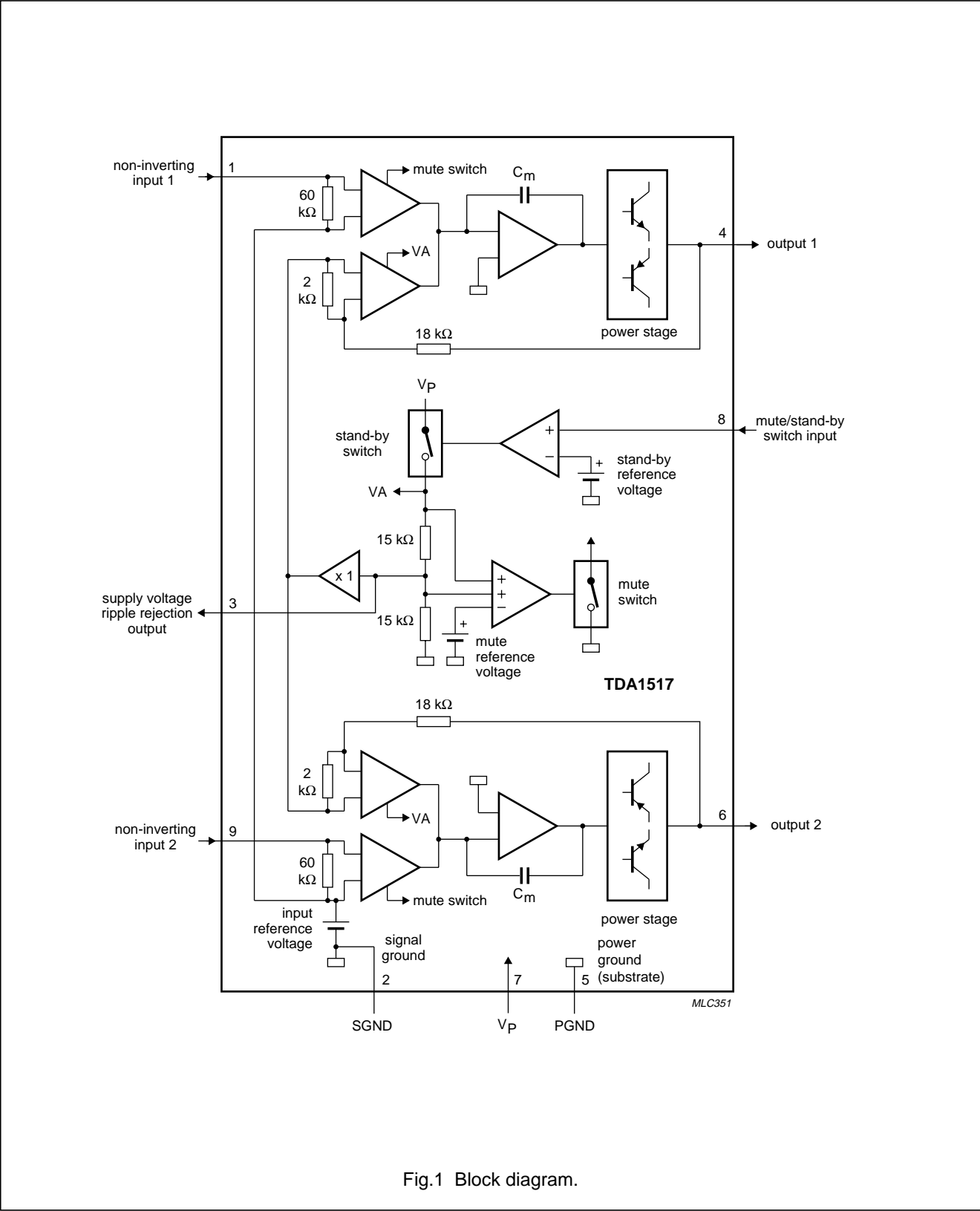


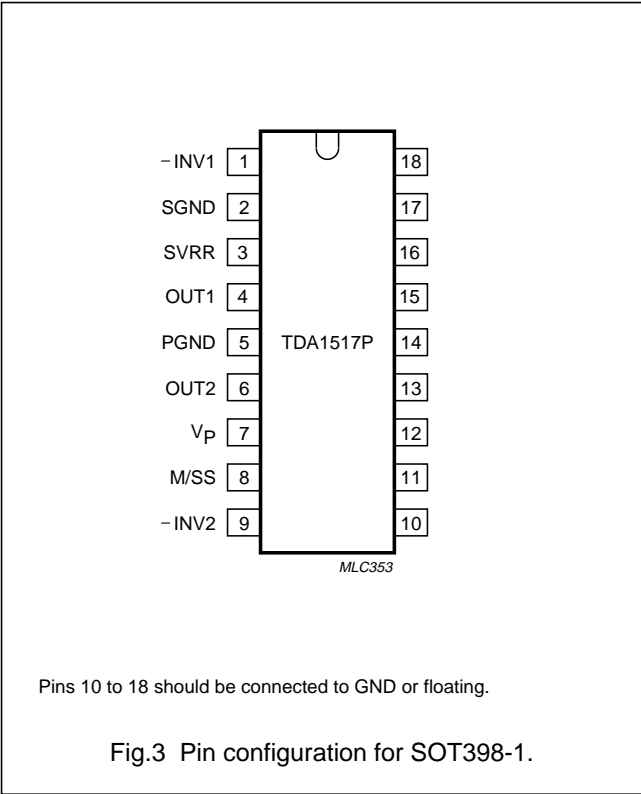
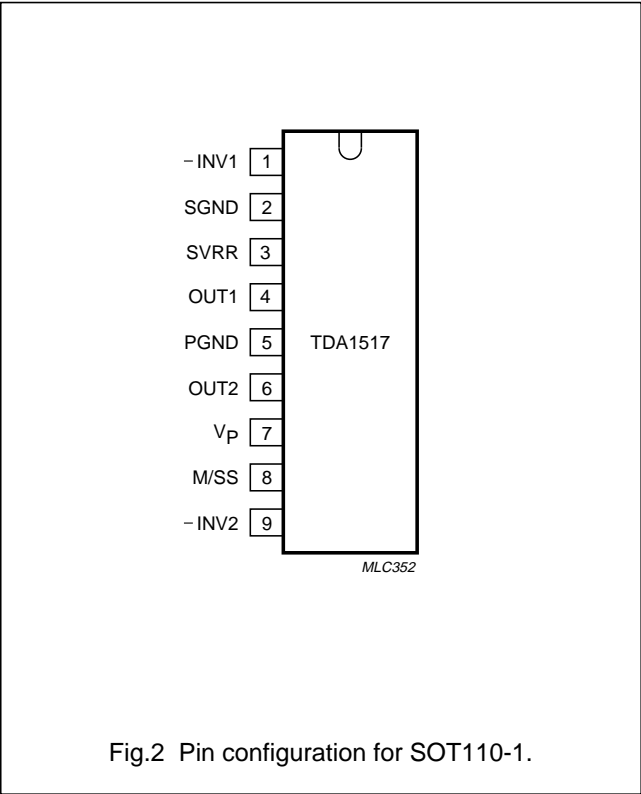
Fig.1 Block diagram.

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PINNING

SYMBOL	PIN	DESCRIPTION
–INV1	1	non-inverting input 1
SGND	2	signal ground
SVRR	3	supply voltage ripple rejection output
OUT1	4	output 1
PGND	5	power ground
OUT2	6	output 2
V <sub>P</sub>	7	supply voltage
M/SS	8	mute/standby switch input
–INV2	9	non-inverting input 2



FUNCTIONAL DESCRIPTION

The TDA1517 contains two identical amplifiers with differential input stages. The gain of each amplifier is fixed at 20 dB. A special feature of the device is the mute/standby switch which has the following features:

- Low standby current (<100 µA)
- Low mute/standby switching current (low cost supply switch)
- Mute condition.

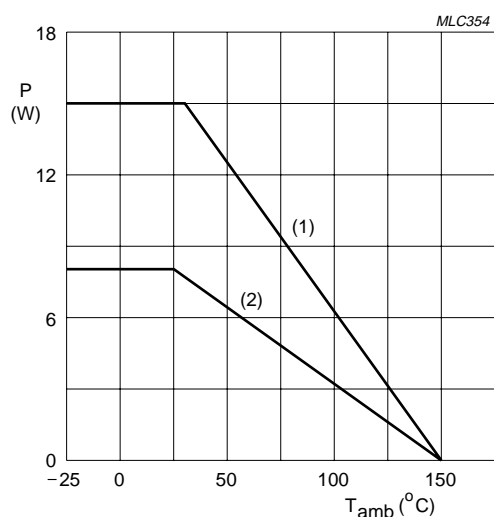
**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_P$	supply voltage	operating	–	18	V
		no signal	–	20	V
$V_{P(sc)}$	AC and DC short-circuit safe voltage		–	18	V
$V_{P(r)}$	reverse polarity		–	6	V
$ERG_O$	energy handling capability at outputs	$V_P = 0$ V	–	200	mJ
$I_{OSM}$	non-repetitive peak output current		–	4	A
$I_{ORM}$	repetitive peak output current		–	2.5	A
$P_{tot}$	total power dissipation	see Fig.4	–	15	W
$T_{stg}$	storage temperature		–55	+150	°C
$T_{amb}$	operating ambient temperature		–40	+85	°C
$T_c$	crystal temperature		–	150	°C

**THERMAL RESISTANCE**

SYMBOL	TYPE NUMBER	PARAMETER	VALUE	UNIT
$R_{th\ j-c}$	TDA1517	thermal resistance from junction to case	8	K/W
$R_{th\ j-p}$	TDA1517P	thermal resistance from junction to pins	15	K/W
$R_{th\ j-a}$	TDA1517; TDA1517P	thermal resistance from junction to ambient	50	K/W



- (1)  $R_{th\ j-c} = 8$  K/W.  
 (2)  $R_{th\ j-p} = 15$  K/W.

Fig.4 Power derating curve.

**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****DC CHARACTERISTICS**

$V_P = 14.4\text{ V}$ ;  $T_{\text{amb}} = 25\text{ °C}$ ; measured in Fig.6; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Supply</b>						
$V_P$	supply voltage	note 1	6.0	14.4	18.0	V
$I_{q(\text{tot})}$	total quiescent current		–	40	80	mA
$V_O$	DC output voltage		–	6.95	–	V
<b>Mute/standby switch</b>						
$V_8$	switch-on voltage level	see Fig.5	8.5	–	–	V
<b>Mute condition</b>						
$V_O$	output signal in mute position	$V_{l(\text{max})} = 1\text{ V}$ ; $f_i = 20\text{ Hz to }15\text{ kHz}$	–	–	2	mV
<b>Standby condition</b>						
$I_{\text{sb}}$	DC current in standby condition		–	–	100	μA
$V_{\text{sw}}$	switch-on current		–	12	40	μA

**Note**

1. The circuit is DC adjusted at  $V_P = 6\text{ to }18\text{ V}$  and AC operating at  $V_P = 8.5\text{ to }18\text{ V}$ .

**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****AC CHARACTERISTICS**

$V_P = 14.4\text{ V}$ ;  $R_L = 4\ \Omega$ ;  $f = 1\text{ kHz}$ ;  $T_{\text{amb}} = 25\text{ }^\circ\text{C}$ ; measured in Fig.6; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$P_o$	output power	THD = 0.5%; note 1	4	5	–	W
		THD = 10%; note 1	5.5	6.0	–	W
THD	total harmonic distortion	$P_o = 1\text{ W}$	–	0.1	–	%
$f_{lr}$	low frequency roll-off	at –3 dB; note 2	–	45	–	Hz
$f_{hr}$	high frequency roll-off	at –1 dB	20	–	–	kHz
$G_v$	closed loop voltage gain		19	20	21	dB
SVRR	supply voltage ripple rejection	note 3				
	on		48	–	–	dB
	mute		48	–	–	dB
	standby		80	–	–	dB
$ Z_i $	input impedance		50	60	75	k $\Omega$
$V_{no}$	noise output voltage					
	on	$R_s = 0\ \Omega$ ; note 4	–	50	–	$\mu\text{V}$
	on	$R_s = 10\ \Omega$ ; note 4	–	70	100	$\mu\text{V}$
	mute	note 5	–	50	–	$\mu\text{V}$
$\alpha_{cs}$	channel separation	$R_s = 10\ \Omega$	40	–	–	dB
$ \Delta G_v $	channel unbalance		–	0.1	1	dB

**Notes**

1. Output power is measured directly at the output pins of the IC.
2. Frequency response externally fixed.
3. Ripple rejection measured at the output with a source impedance of  $0\ \Omega$ , maximum ripple amplitude of 2 V (p-p) and a frequency between 100 Hz and 10 kHz.
4. Noise voltage measured in a bandwidth of 20 Hz to 20 kHz.
5. Noise output voltage independent of  $R_s$  ( $V_i = 0\text{ V}$ ).

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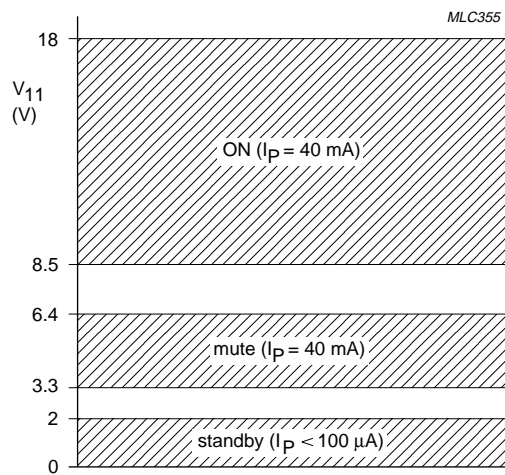


Fig.5 Standby, mute and on conditions.

APPLICATION INFORMATION

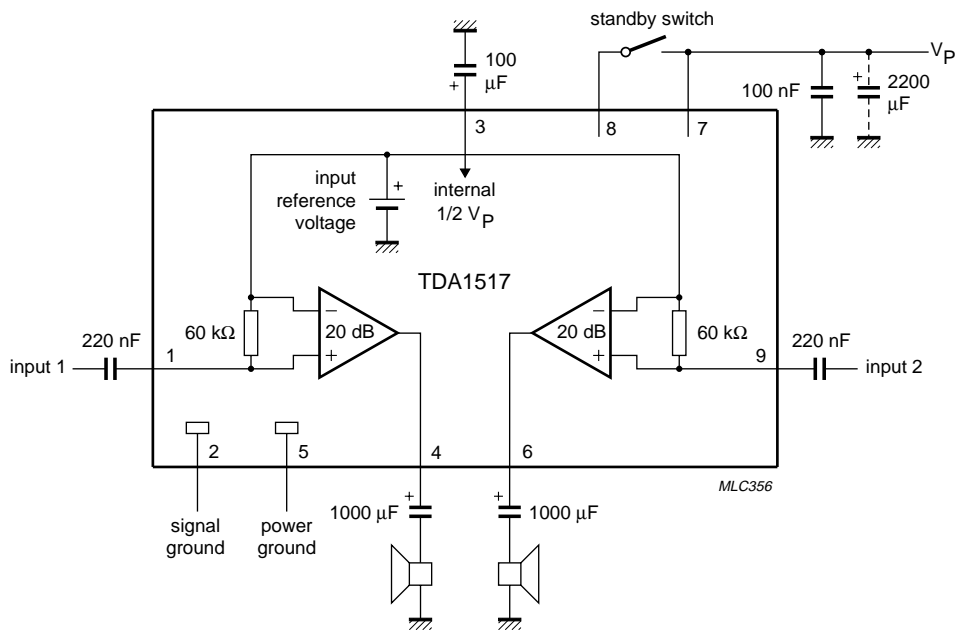


Fig.6 Application circuit diagram.



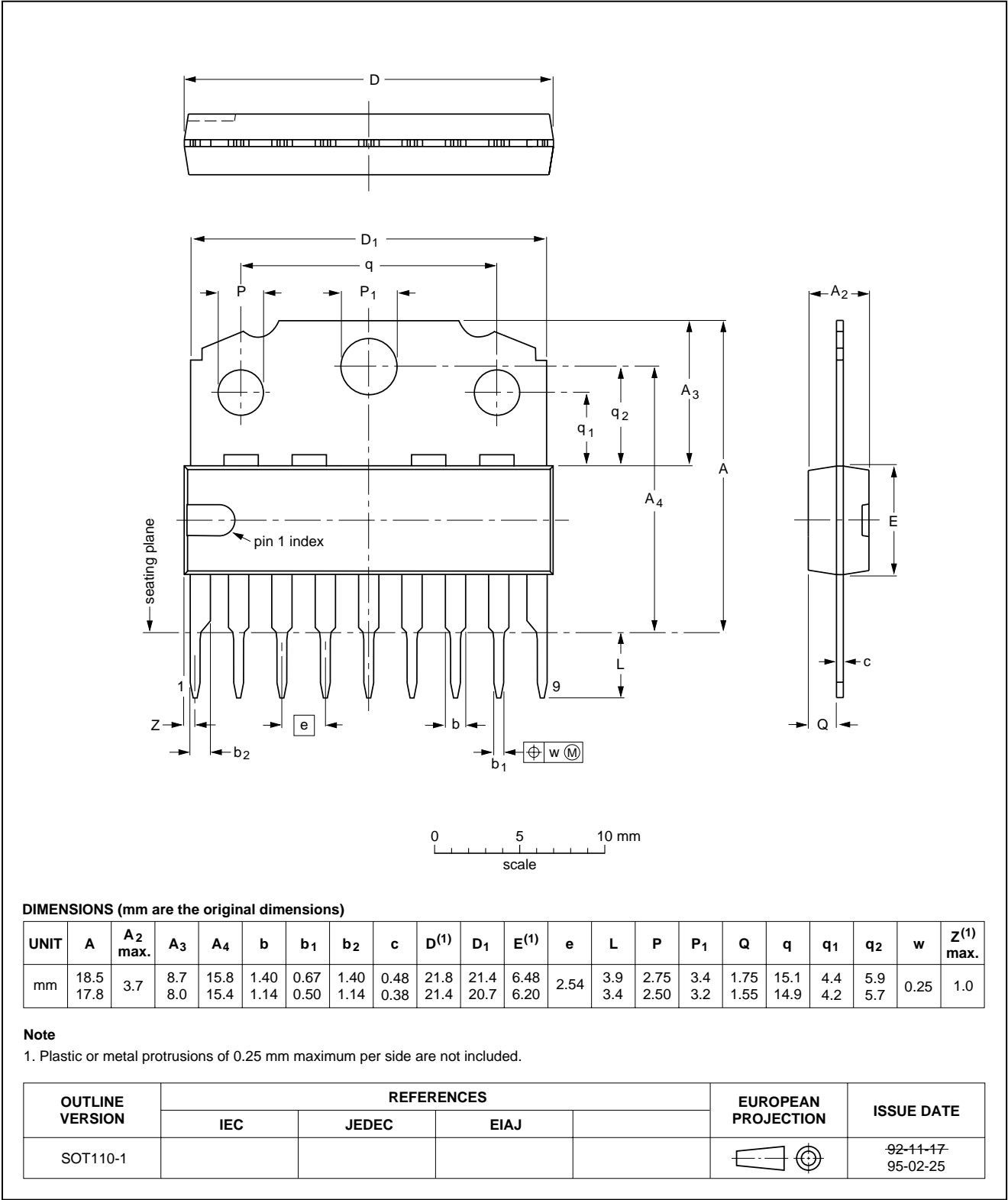
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PACKAGE OUTLINES

SIL9MPF: plastic single in-line medium power package with fin; 9 leads

SOT110-1

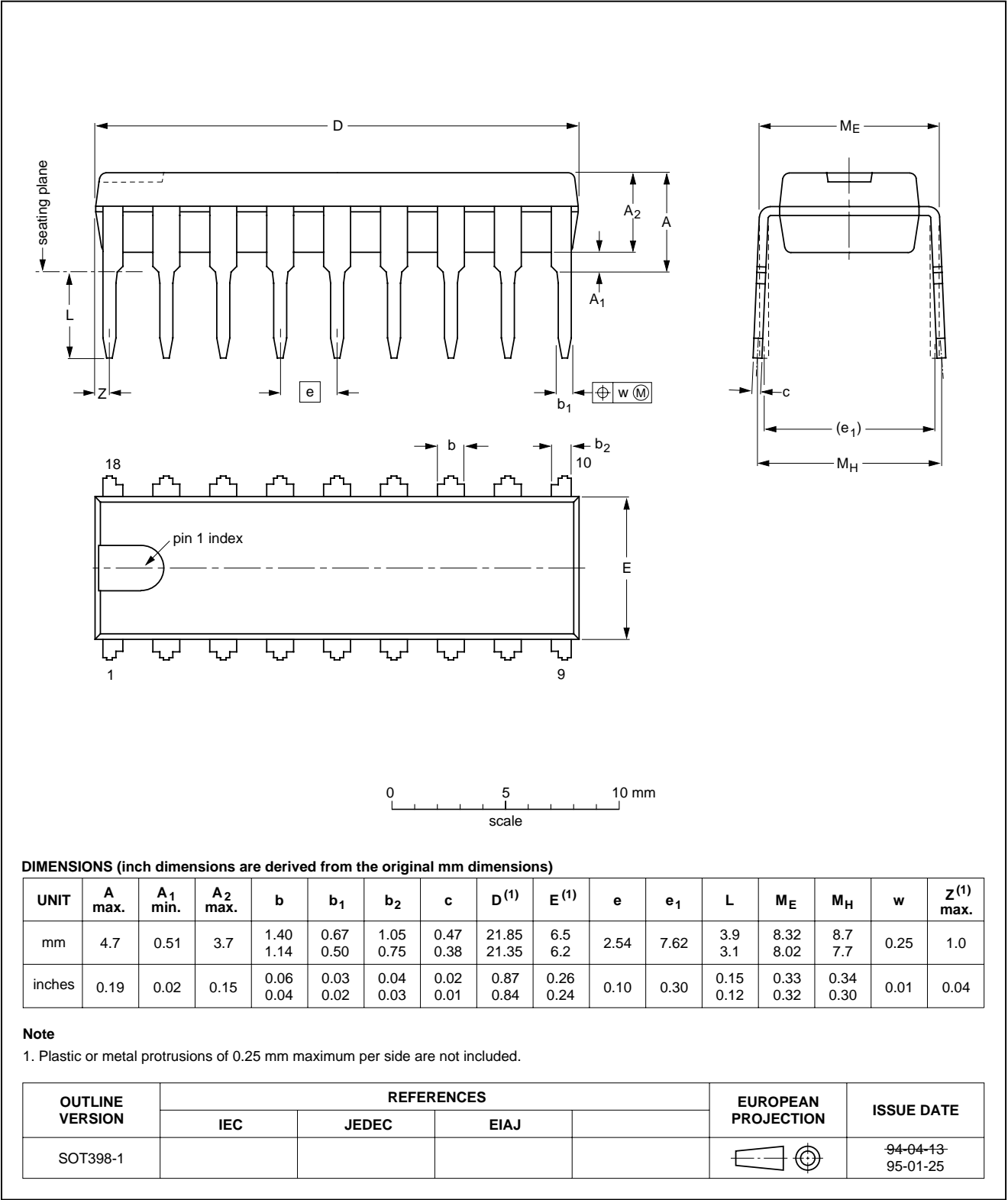


2 × 6 W stereo power amplifier

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HDIP18: plastic heat-dissipating dual in-line package; 18 leads

SOT398-1



**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****SOLDERING****Introduction to soldering through-hole mount packages**

This text gives a brief insight to wave, dip and manual soldering. A more in-depth account of soldering ICs can be found in our *"Data Handbook IC26; Integrated Circuit Packages"* (document order number 9398 652 90011).

Wave soldering is the preferred method for mounting of through-hole mount IC packages on a printed-circuit board.

**Soldering by dipping or by solder wave**

The maximum permissible temperature of the solder is 260 °C; solder at this temperature must not be in contact with the joints for more than 5 seconds.

The total contact time of successive solder waves must not exceed 5 seconds.

The device may be mounted up to the seating plane, but the temperature of the plastic body must not exceed the specified maximum storage temperature ( $T_{\text{stg(max)}}$ ). If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature within the permissible limit.

**Manual soldering**

Apply the soldering iron (24 V or less) to the lead(s) of the package, either below the seating plane or not more than 2 mm above it. If the temperature of the soldering iron bit is less than 300 °C it may remain in contact for up to 10 seconds. If the bit temperature is between 300 and 400 °C, contact may be up to 5 seconds.

**Suitability of through-hole mount IC packages for dipping and wave soldering methods**

PACKAGE	SOLDERING METHOD	
	DIPPING	WAVE
DBS, DIP, HDIP, SDIP, SIL	suitable	suitable <sup>(1)</sup>

**Note**

- For SDIP packages, the longitudinal axis must be parallel to the transport direction of the printed-circuit board.

$2 \times 6$  W stereo power amplifier

## TDA1517; TDA1517P

## DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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**NOTES**

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Printed in The Netherlands

753503/04/pp16

Date of release: 2002 Jan 17

Document order number: 9397 750 08925

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