

# **DATA SHEET**

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

Product specification

2002 Jan 17

Supersedes data of 1998 Apr 28

File under Integrated Circuits, IC01

**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

## 2 × 6 W stereo power amplifier

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## BLOCK DIAGRAM

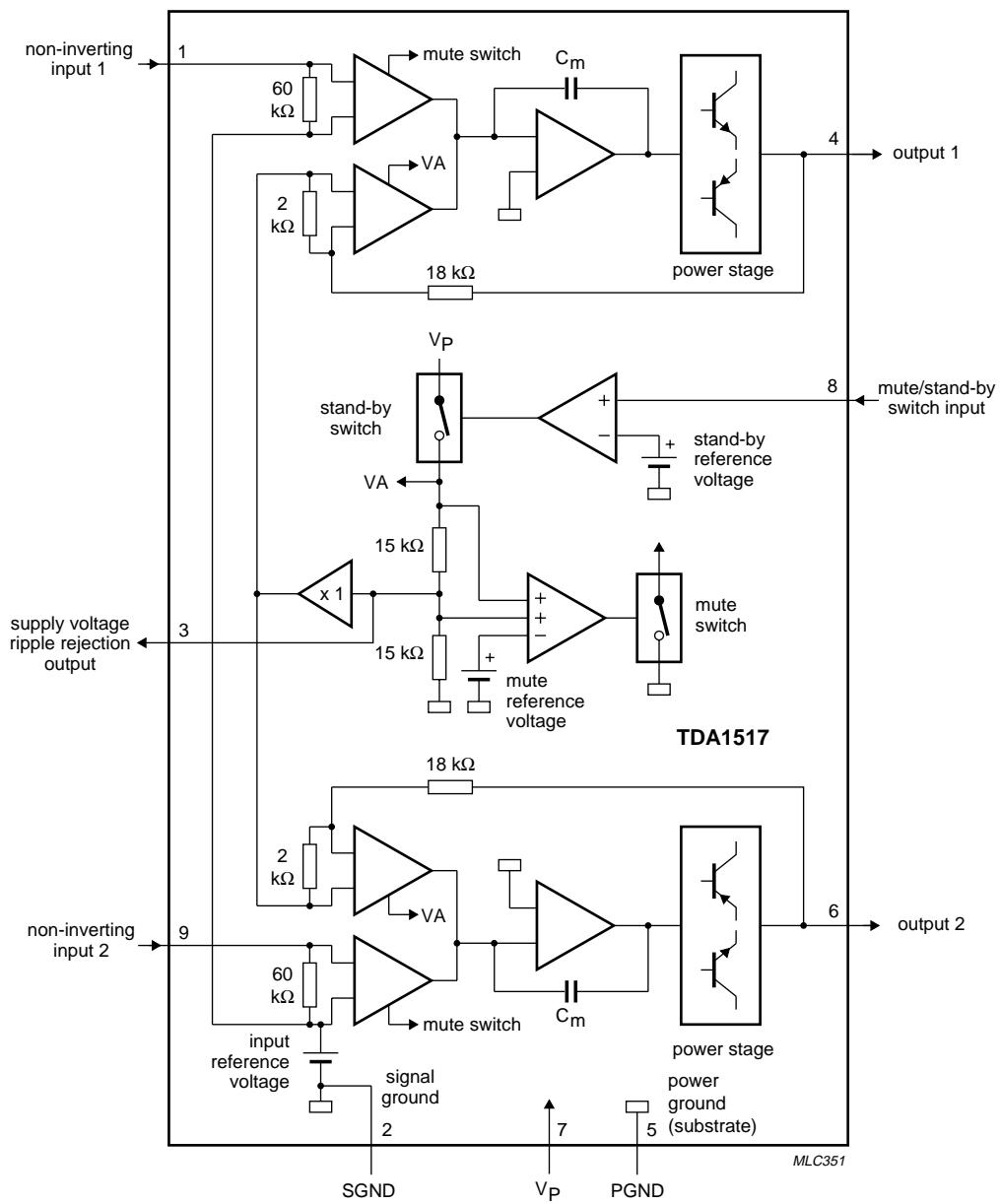


Fig.1 Block diagram.

## 2 × 6 W stereo power amplifier

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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

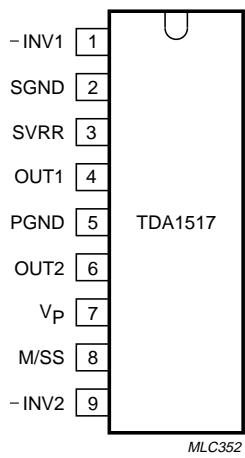
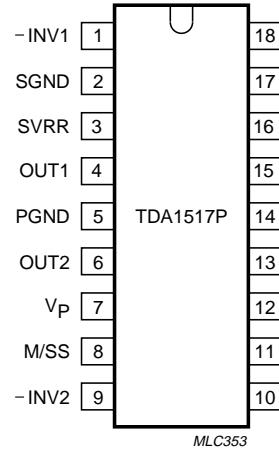


Fig.2 Pin configuration for SOT110-1.



Pins 10 to 18 should be connected to GND or floating.

Fig.3 Pin configuration for SOT398-1.

## 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  $\mu$ A)
- Low mute/standby switching current (low cost supply switch)
- Mute condition.

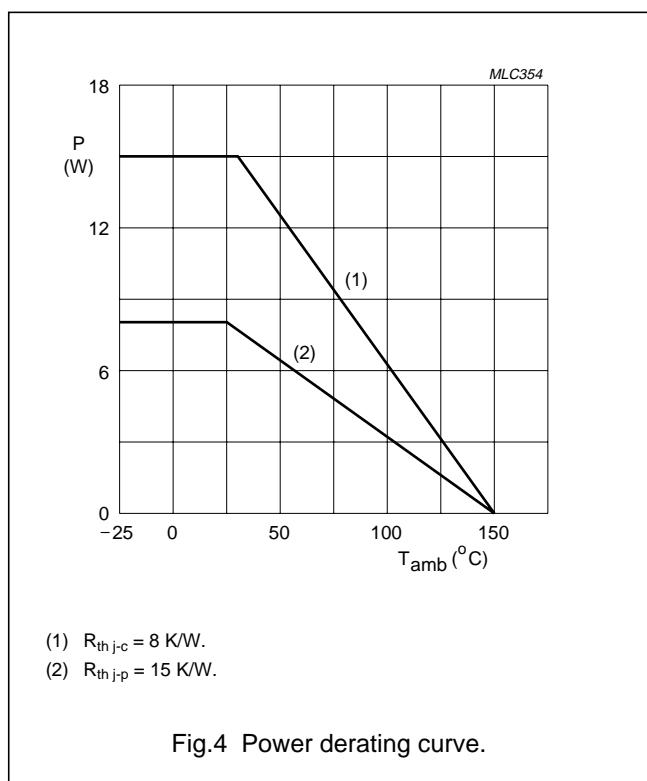
**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****LIMITING VALUES**

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



**2 × 6 W stereo power amplifier****TDA1517; TDA1517P****DC CHARACTERISTICS** $V_P = 14.4$  V;  $T_{amb} = 25$  °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
$I_{q(tot)}$	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	$V_{I(max)} = 1$ V; $f_i = 20$ Hz to 15 kHz	–	–	2	mV
<b>Standby condition</b>						
$I_{sb}$	DC current in standby condition		–	–	100	µA
$V_{sw}$	switch-on current		–	12	40	µA

**Note**

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

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

$V_P = 14.4$  V;  $R_L = 4 \Omega$ ;  $f = 1$  kHz;  $T_{amb} = 25$  °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	$P_o = 1$ 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 on mute standby	note 3	48	—	—	dB
			48	—	—	dB
			80	—	—	dB
$ Z_i $	input impedance		50	60	75	kΩ
$V_{no}$	noise output voltage on on mute	$R_s = 0 \Omega$ ; note 4 $R_s = 10 \Omega$ ; note 4 note 5	—	50	—	μV
			—	70	100	μV
			—	50	—	μV
$\alpha_{cs}$	channel separation	$R_s = 10 \Omega$	40	—	—	dB
$ \Delta G_{vl} $	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 Ω, 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  $R_s$  ( $V_I = 0$  V).

## 2 × 6 W stereo power amplifier

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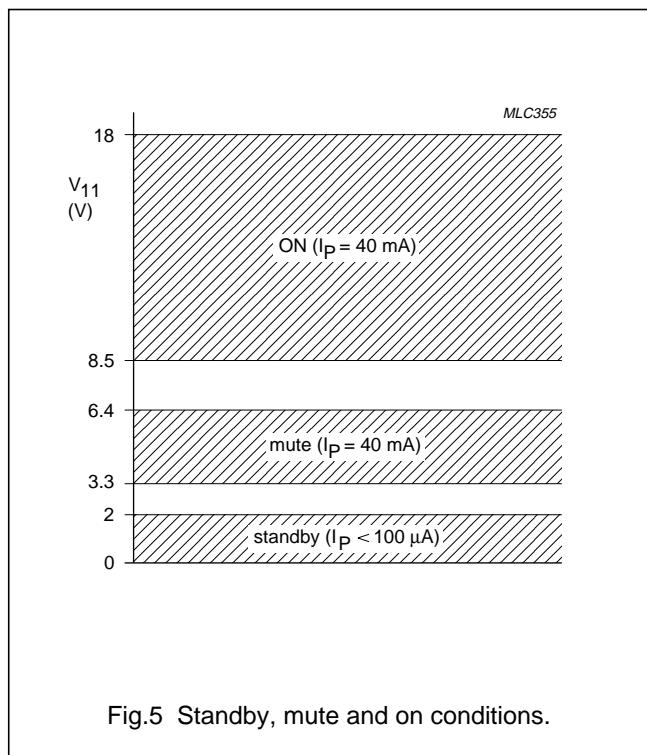


Fig.5 Standby, mute and on conditions.

## APPLICATION INFORMATION

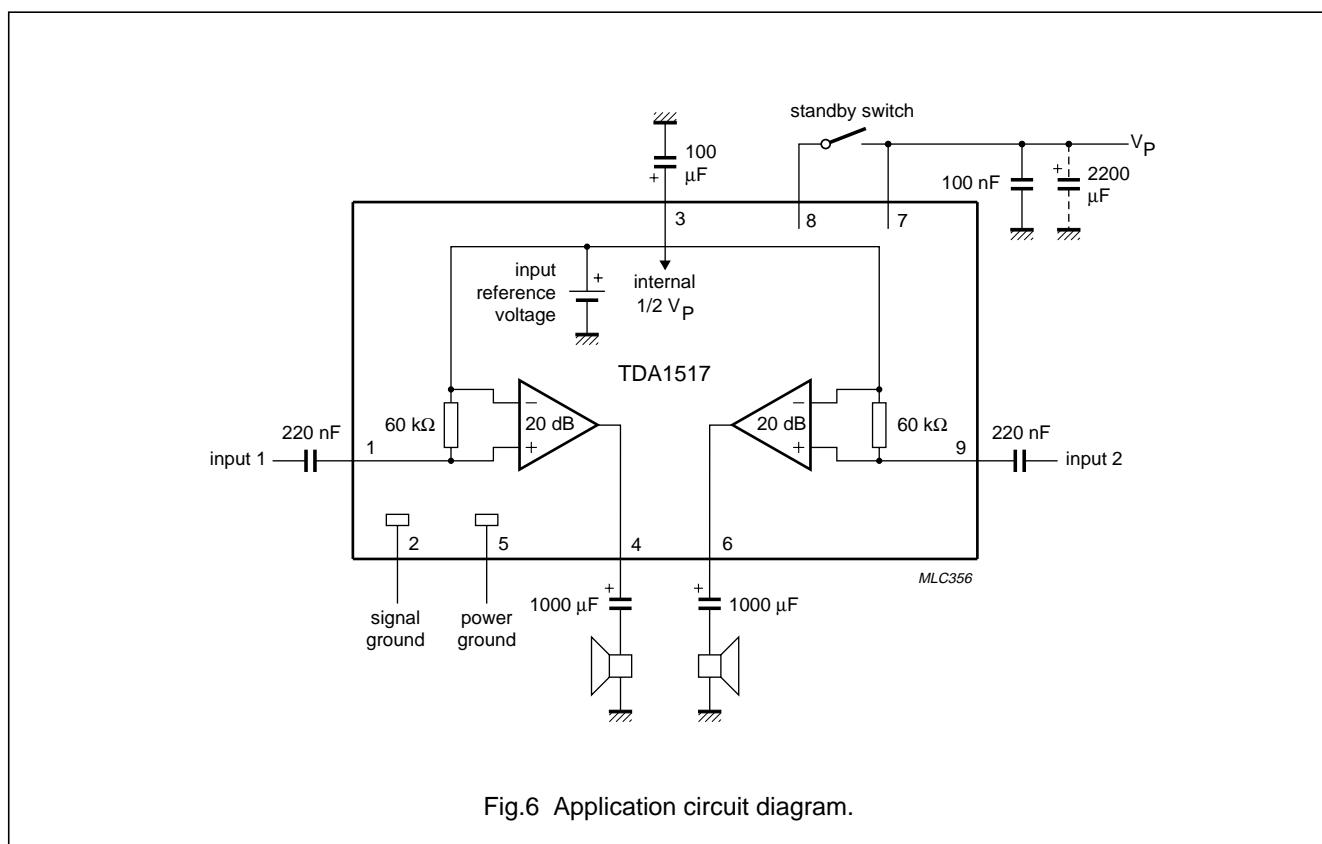


Fig.6 Application circuit diagram.

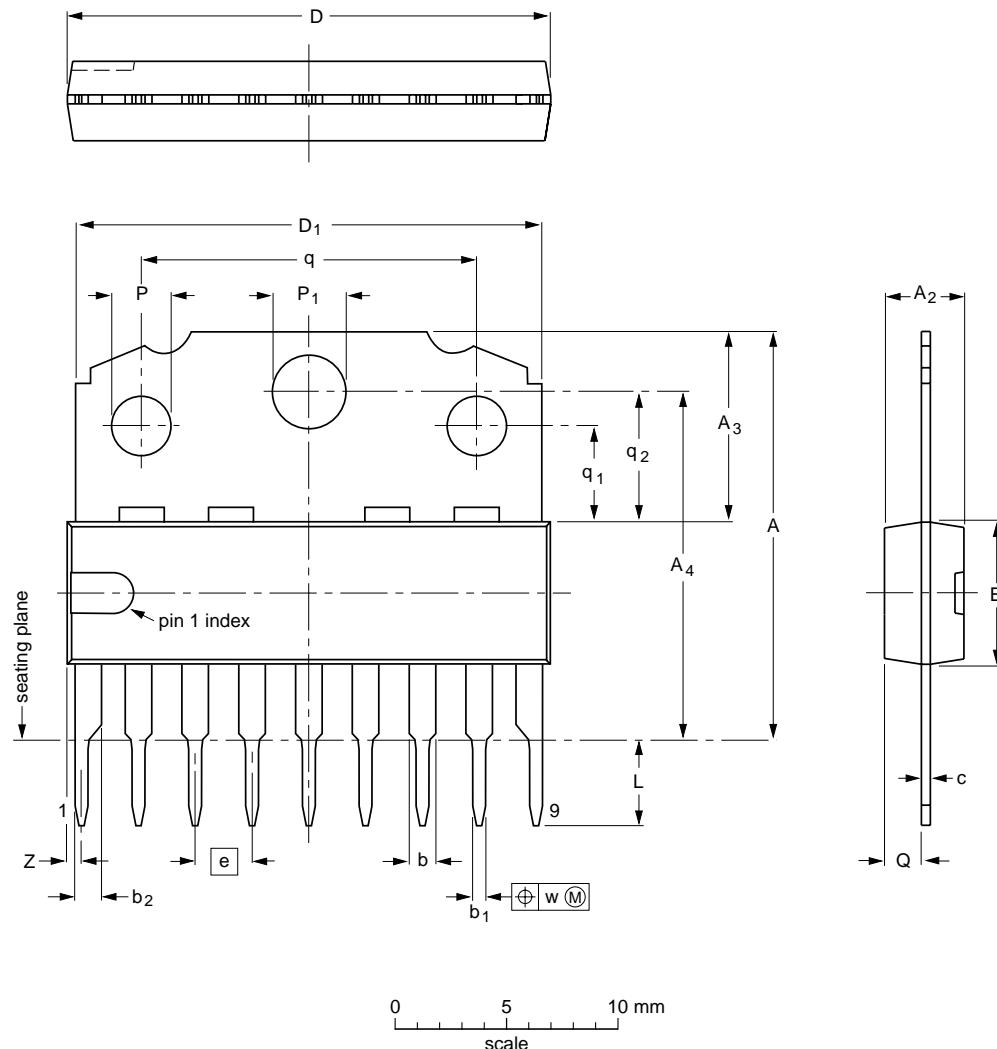
## 2 × 6 W stereo power amplifier

TDA1517; TDA1517P

## PACKAGE OUTLINES

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

SOT110-1



## DIMENSIONS (mm are the original dimensions)

UNIT	A	$A_2$ max.	$A_3$	$A_4$	b	$b_1$	$b_2$	c	$D^{(1)}$	$D_1$	$E^{(1)}$	e	L	P	$P_1$	Q	q	$q_1$	$q_2$	w	$Z^{(1)}$ max.
mm	18.5 17.8	3.7	8.7 8.0	15.8 15.4	1.40 1.14	0.67 0.50	1.40 1.14	0.48 0.38	21.8 21.4	21.4 20.7	6.48 6.20	2.54 3.4	3.9 2.50	2.75 3.2	3.4 1.55	1.75 1.55	15.1 14.9	4.4 4.2	5.9 5.7	0.25	1.0

## Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

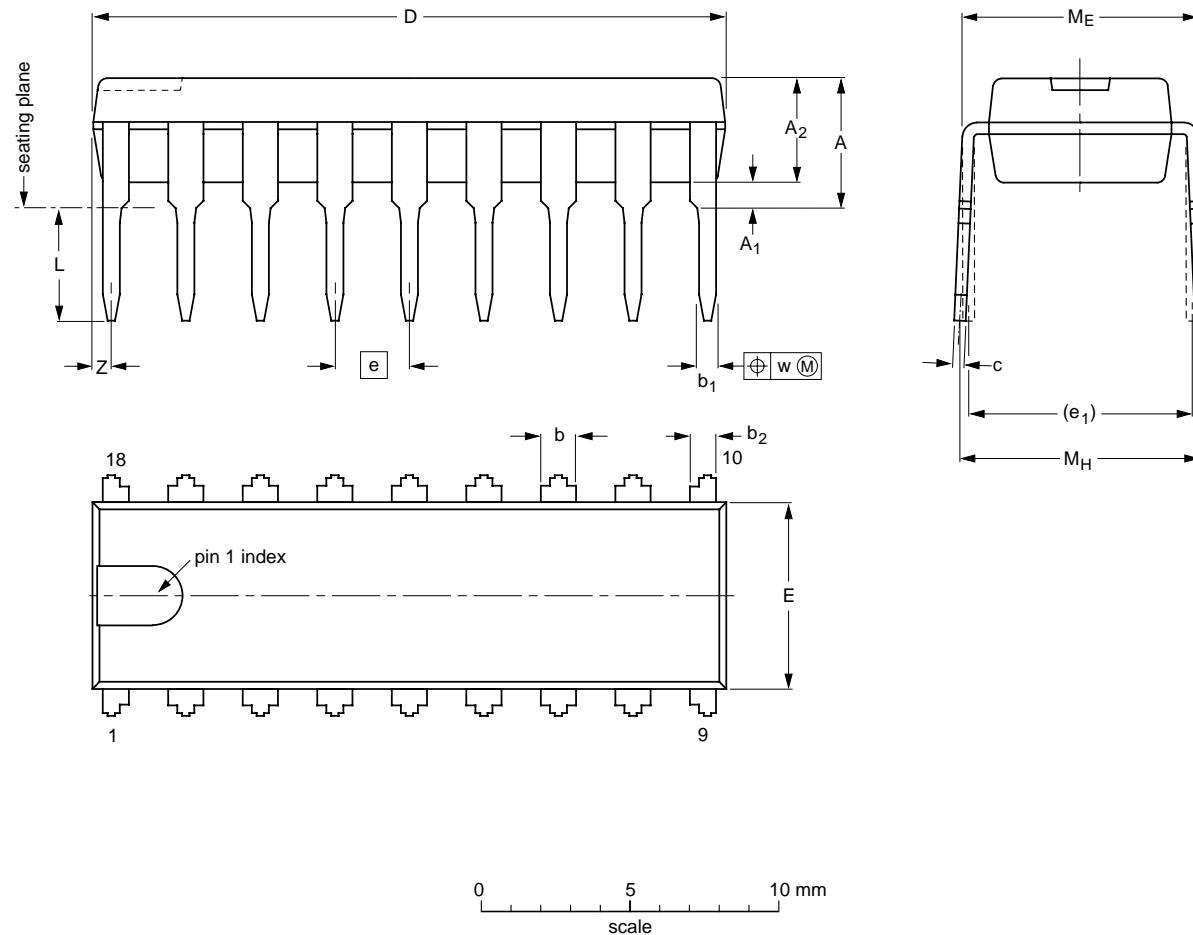
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT110-1						92-11-17 95-02-25

## 2 × 6 W stereo power amplifier

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

SOT398-1



## DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A <sub>1</sub> min.	A <sub>2</sub> max.	b	b <sub>1</sub>	b <sub>2</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	e <sub>1</sub>	L	M <sub>E</sub>	M <sub>H</sub>	w	Z <sup>(1)</sup> max.
mm	4.7	0.51	3.7	1.40 1.14	0.67 0.50	1.05 0.75	0.47 0.38	21.85 21.35	6.5 6.2	2.54	7.62	3.9 3.1	8.32 8.02	8.7 7.7	0.25	1.0
inches	0.19	0.02	0.15	0.06 0.04	0.03 0.02	0.04 0.03	0.02 0.01	0.87 0.84	0.26 0.24	0.10	0.30	0.15 0.12	0.33 0.32	0.34 0.30	0.01	0.04

## Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT398-1						94-04-13 95-01-25

**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 ( $T_{stg(max)}$ ). 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**

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

## 2 × 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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**NOTES**

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