

DATA SHEET

TDA1519

**2 x 6 W stereo car radio power
amplifier**

Product specification
File under Integrated Circuits, IC01

May 1992

2 x 6 W stereo car radio power amplifier**TDA1519****GENERAL DESCRIPTION**

The TDA1519 is an integrated class-B dual output amplifier in a 9-lead single in-line (SIL) plastic medium power package. The device is primarily developed for car radio applications.

Features

- Requires very few external components
- High output power
- Fixed gain
- Good ripple rejection
- Mute/stand-by switch
- Load dump protection
- 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
- Protected against electrostatic discharge
- Compatible with TDA1517 (except gain).

QUICK REFERENCE DATA

| PARAMETER | CONDITIONS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---------------------------------|------------------------|---------------|------|------|------|--------------|
| Supply voltage range | | | | | | |
| operating | | V_P | 6,0 | 14,4 | 18,0 | V |
| non-operating | | V_P | – | – | 30 | V |
| load dump protected | | V_P | – | – | 45 | V |
| Repetitive peak output current | | I_{ORM} | – | – | 2,5 | A |
| Total quiescent current | | I_{tot} | – | 40 | 80 | mA |
| Stand-by current | | I_{sb} | – | 0,1 | 100 | μ A |
| Switch-on current | | I_{sw} | – | – | 40 | μ A |
| Input impedance | | $ Z_i $ | 50 | – | – | k Ω |
| Output power | THD = 0,5%; 4 Ω | P_o | – | 5 | – | W |
| | THD = 10%; 4 Ω | P_o | – | 6 | – | W |
| Channel separation | | α | 40 | – | – | dB |
| Noise output voltage | | $V_{no(rms)}$ | – | 150 | – | μ V |
| Supply voltage ripple rejection | f = 100 Hz | SVRR | 40 | – | – | dB |
| | f = 1 kHz to 10 kHz | SVRR | 48 | – | – | dB |
| Crystal temperature | | T_c | – | – | 150 | $^{\circ}$ C |

PACKAGE OUTLINE

9-lead SIL-bent-to-DIL; plastic (SOT110B); SOT110-1; 1996 July 19.

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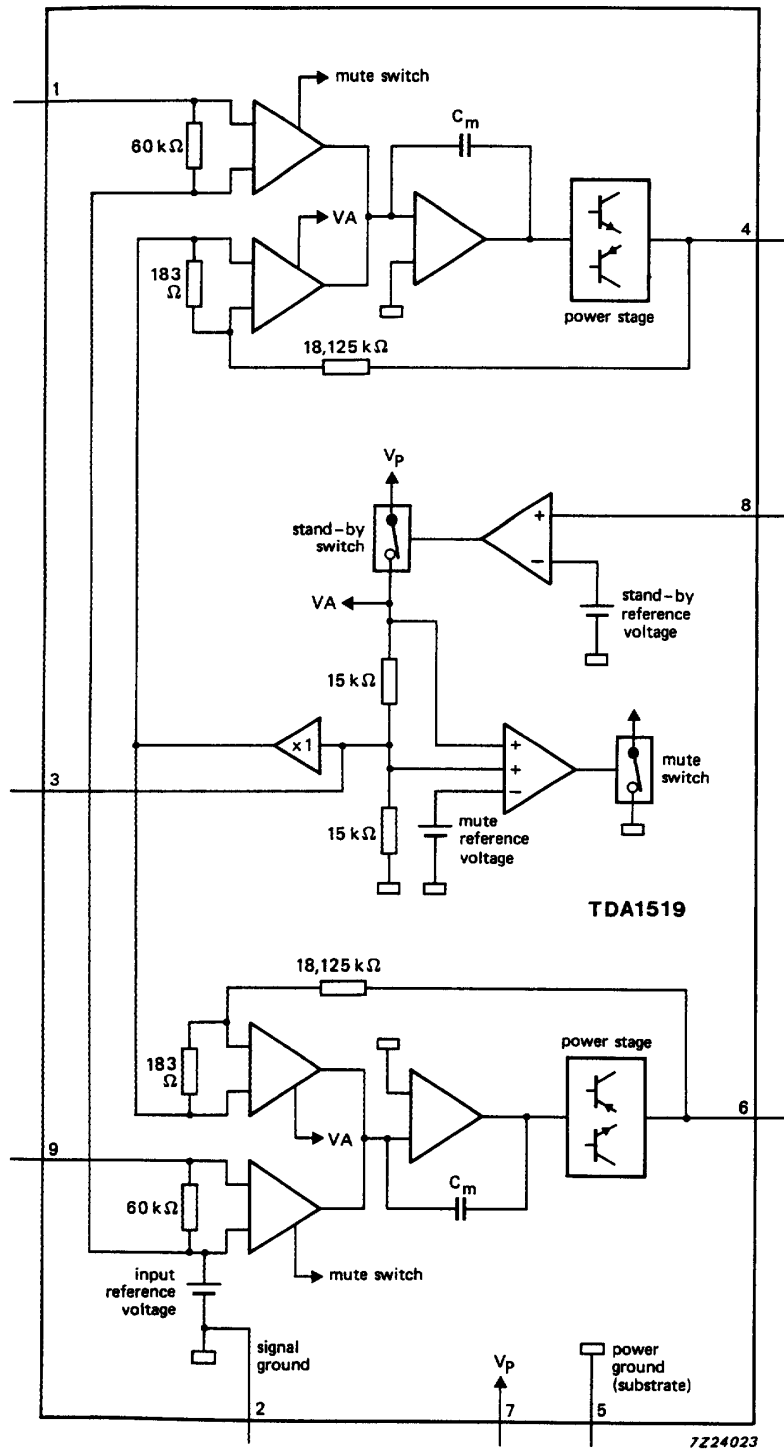


Fig.1 Block diagram.

2 x 6 W stereo car radio power amplifier

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PINNING

| | | |
|---|----------------|---------------------------------|
| 1 | INV1 | non-inverting input 1 |
| 2 | GND1 | ground (signal) |
| 3 | SVRR | supply voltage ripple rejection |
| 4 | OUT1 | output 1 |
| 5 | GND2 | ground (substrate) |
| 6 | OUT2 | output 2 |
| 7 | V _P | supply voltage |
| 8 | M/SS | mute/stand-by switch |
| 9 | -INV2 | non-inverting input 2 |

FUNCTIONAL DESCRIPTION

The TDA1519 contains two identical amplifiers with differential input stages. The gain of each amplifier is fixed at 40 dB. A special feature of this device is the mute/stand-by switch which has the following features:

- low stand-by current (< 100 μ A)
- low mute/stand-by switching current (low cost supply switch)
- mute condition.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| PARAMETER | CONDITIONS | SYMBOL | MIN. | MAX. | UNIT |
|---------------------------------------|--|------------------|------|-------|------|
| Supply voltage | | | | | |
| operating | | V _P | – | 18 | V |
| non-operating | | V _P | – | 30 | V |
| load dump protected | during 50 ms; t _r ≥ 2,5 ms | V _P | – | 45 | V |
| AC and DC short-circuit-safe voltage | | V _{PSC} | – | 18 | V |
| Reverse polarity | | V _{PR} | – | 6 | V |
| Energy handling capability at outputs | V _P = 0 V | | – | 200 | mJ |
| Non-repetitive peak output current | | I _{OSM} | – | 4 | A |
| Repetitive peak output current | | I _{ORM} | – | 2,5 | A |
| Total power dissipation | see Fig.2 | P _{tot} | – | 15 | W |
| Crystal temperature | | T _c | – | 150 | °C |
| Storage temperature range | | T _{stg} | –55 | + 150 | °C |

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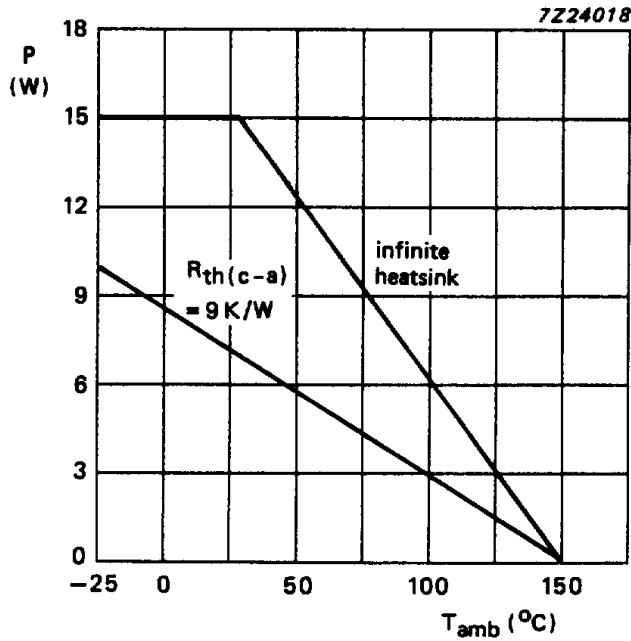


Fig.2 Power derating curve.

DC CHARACTERISTICS (note 1)

V_P = 14,4 V; T_{amb} = 25 °C; unless otherwise specified

| PARAMETER | CONDITIONS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|--|-----------------|------|------|------|------|
| Supply | | | | | | |
| Supply voltage range | note 2 | V _P | 6,0 | 14,4 | 18,0 | V |
| Quiescent current | | I _P | – | 40 | 80 | mA |
| DC output voltage | note 3 | V _O | – | 6,95 | – | V |
| Mute/stand-by switch | | | | | | |
| Switch-on voltage level | see Fig.3 | V _{ON} | 8,5 | – | – | V |
| Mute condition | | | | | | |
| Output signal in mute position | V _I = 1 V (max.); f = 20 Hz to 15 kHz | V _O | – | – | 20 | mV |
| Stand-by condition | | | | | | |
| DC current in stand-by condition | | I _{sb} | – | – | 100 | μA |
| Switch-on current | | I _{sw} | – | 12 | 40 | μA |

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AC CHARACTERISTICS (note 1) $V_P = 14,4 \text{ V}$; $R_L = 4 \Omega$; $f = 1 \text{ kHz}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$; unless otherwise specified

| PARAMETER | CONDITIONS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---------------------------------|--|----------------------|------|------|------|---------------|
| Output power | note 4; | | | | | |
| | THD = 0,5% | P_o | 4 | 5 | – | W |
| | THD = 10% | P_o | 5,5 | 6,0 | – | W |
| Total harmonic distortion | $P_o = 1 \text{ W}$ | THD | – | 0,1 | – | % |
| Low frequency roll-off | note 5; | | | | | |
| | –3 dB | f_L | – | 45 | – | Hz |
| High frequency roll-off | –1 dB | f_H | 20 | – | – | kHz |
| Closed loop voltage gain | | G_v | 39 | 40 | 41 | dB |
| Supply voltage ripple rejection | note 6 | | | | | |
| ON | $f = 100 \text{ Hz}$ | SVRR | 40 | – | – | dB |
| ON | $f = 10 \text{ Hz to } 10 \text{ kHz}$ | SVRR | 48 | – | – | dB |
| mute | | SVRR | 48 | – | – | dB |
| stand-by | | SVRR | 80 | – | – | dB |
| Input impedance | | $ Z_i $ | 50 | 60 | 75 | k Ω |
| Noise output voltage | note 7; | | | | | |
| ON | $R_S = 0 \Omega$ | $V_{\text{no(rms)}}$ | – | 150 | – | μV |
| ON | $R_S = 10 \text{ k}\Omega$ | $V_{\text{no(rms)}}$ | – | 250 | 500 | μV |
| mute | note 8 | $V_{\text{no(rms)}}$ | – | 120 | – | μV |
| Channel separation | $R_S = 10 \text{ k}\Omega$ | α | 40 | – | – | dB |
| Channel balance | | $ \Delta G_v $ | – | 0,1 | 1 | dB |

Notes to the characteristics

- All characteristics are measured using the circuit shown in Fig.4.
- The circuit is DC adjusted at $V_P = 6 \text{ V}$ to 18 V and AC operating at $V_P = 8,5 \text{ V}$ to 18 V .
- At $18 \text{ V} < V_P < 30 \text{ V}$ the DC output voltage $\leq V_P/2$.
- Output power is measured directly at the output pins of the IC.
- Frequency response externally fixed.
- Ripple rejection measured at the output with a source impedance of 0Ω (maximum ripple amplitude of 2 V) and a frequency between 100 Hz and 10 kHz .
- Noise voltage measured in a bandwidth of 20 Hz to 20 kHz .
- Noise output voltage independent of R_S ($V_I = 0 \text{ V}$).

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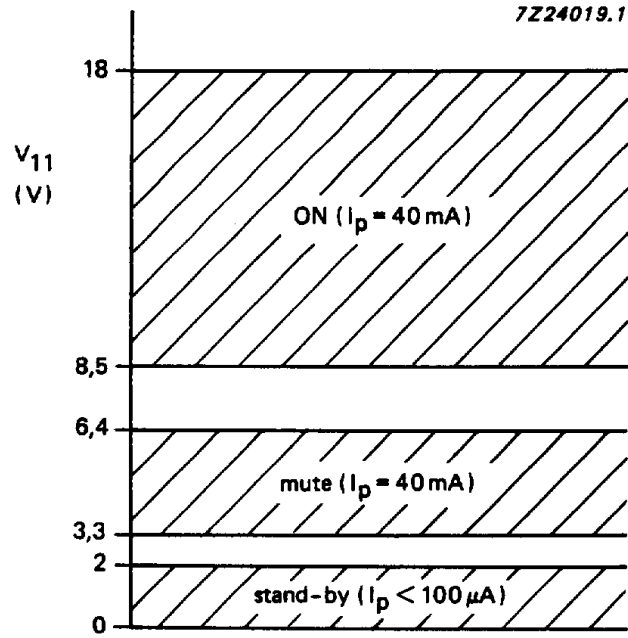


Fig.3 Stand-by, mute and ON conditions.

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APPLICATION INFORMATION

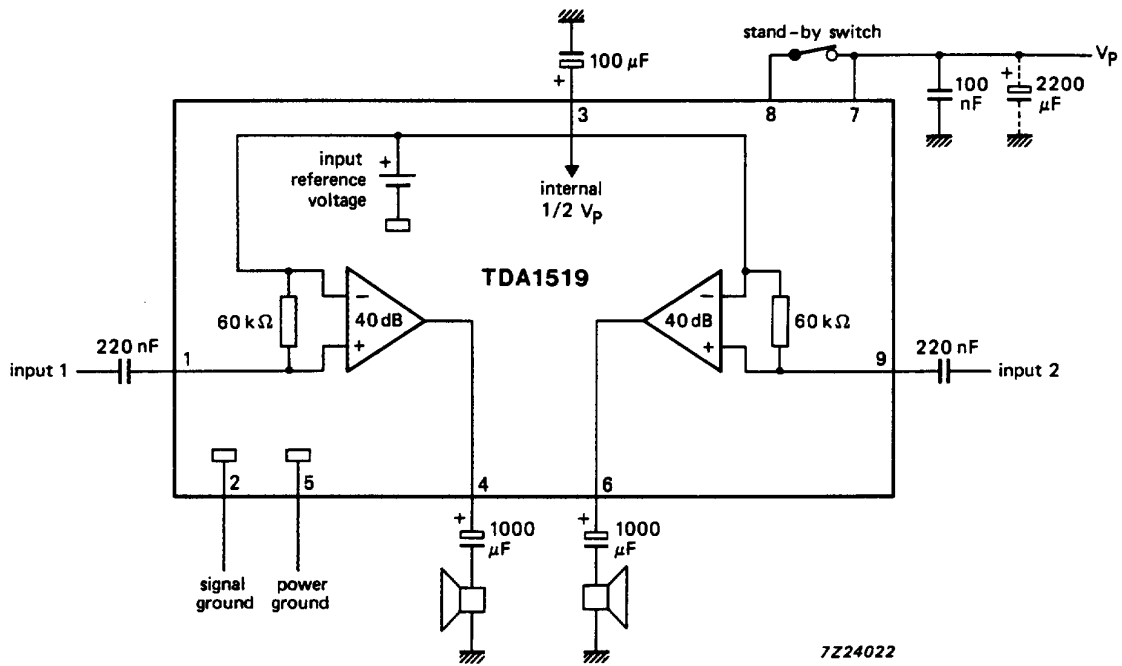


Fig.4 Application circuit diagram.

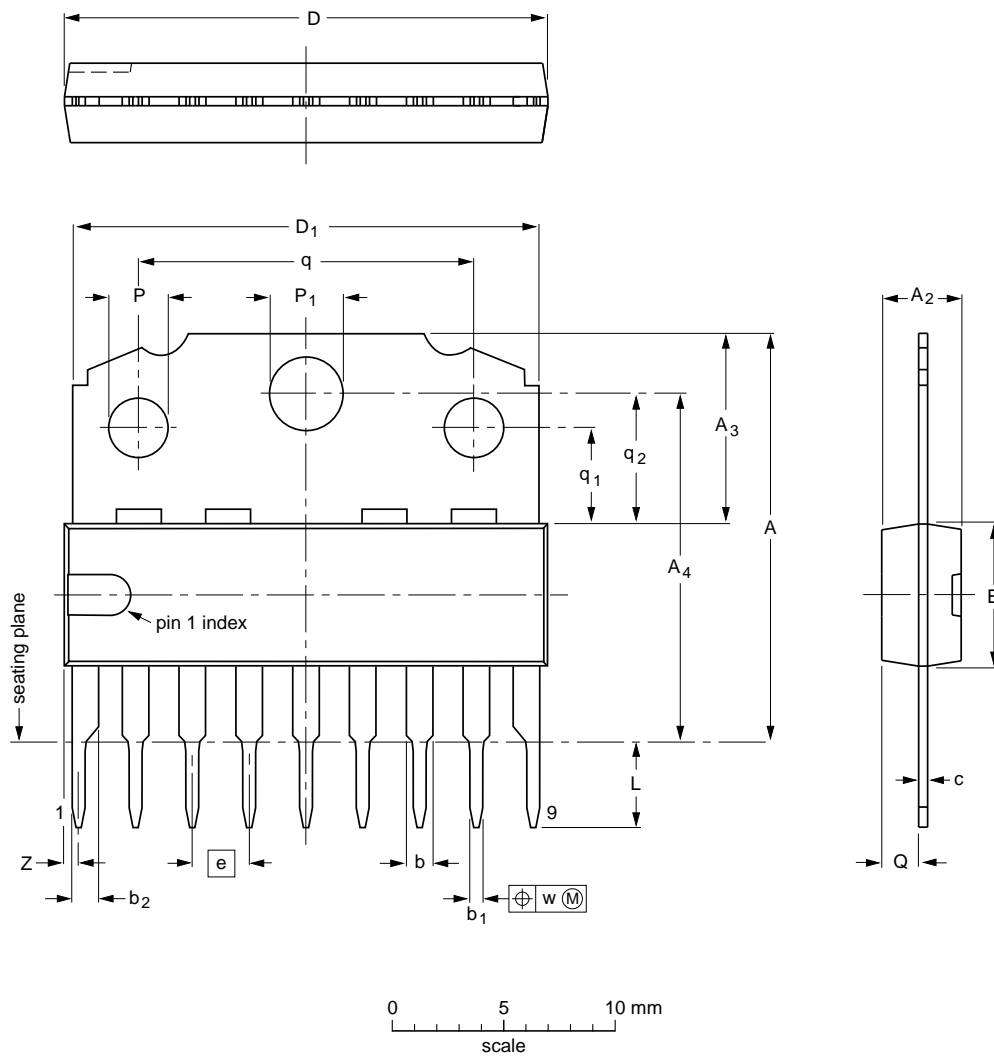
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PACKAGE OUTLINE

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 | 3.9 3.4 | 2.75 2.50 | 3.4 3.2 | 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 |

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SOLDERING**Introduction**

There is no soldering method that is ideal for all IC packages. Wave soldering is often preferred when through-hole and surface mounted components are mixed on one printed-circuit board. However, wave soldering is not always suitable for surface mounted ICs, or for printed-circuits with high population densities. In these situations reflow soldering is often used.

This text gives a very brief insight to a complex technology. A more in-depth account of soldering ICs can be found in our "IC Package Databook" (order code 9398 652 90011).

Soldering by dipping or by wave

The maximum permissible temperature of the solder is 260 °C; solder at this temperature must not be in contact with the joint 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.

Repairing soldered joints

Apply a low voltage soldering iron (less than 24 V) to the lead(s) of the package, 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.

DEFINITIONS

| Data sheet status | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

LIFE SUPPORT APPLICATIONS

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