

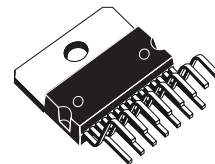


TDA7496S

5W+5W AMPLIFIER

- 5+5W OUTPUT POWER
 $R_L = 8\Omega @ THD = 10\% V_{CC} = 22V$
- ST-BY AND MUTE FUNCTIONS
- LOW TURN-ON TURN-OFF POP NOISE
- NO BOUCHEROT CELL
- NO ST-BY RC INPUT NETWORK
- SINGLE SUPPLY RANGING UP TO 35V
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION
- INTERNALLY FIXED GAIN
- SOFT CLIPPING
- MULTIWATT 15 PACKAGE

MULTIPOWER BI50II TECHNOLOGY



Multiwatt15

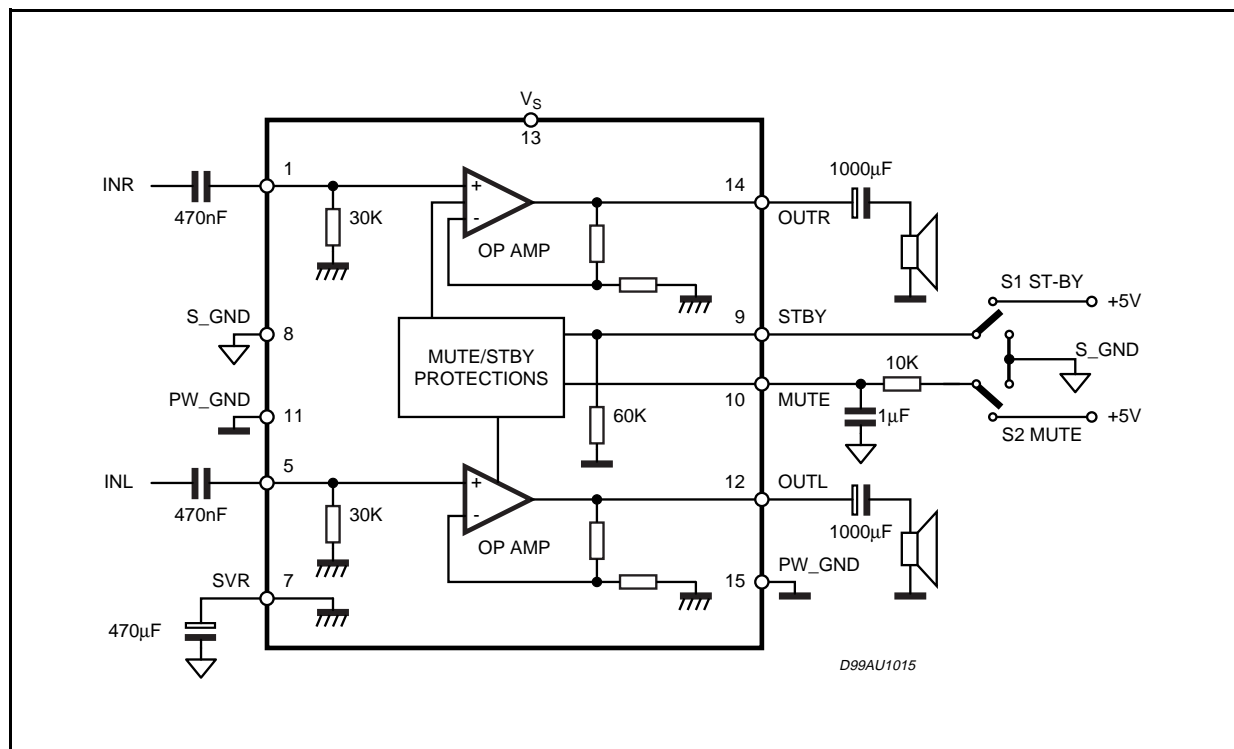
ORDERING NUMBER: TDA7496

DESCRIPTION

The TDA7496 is a stereo 5+5W class AB power amplifier assembled in the @ Multiwatt 15 package, specially designed for high quality sound, TV applications.

Features of the TDA7496 include Stand-by and mute functions.

BLOCK AND APPLICATION DIAGRAM

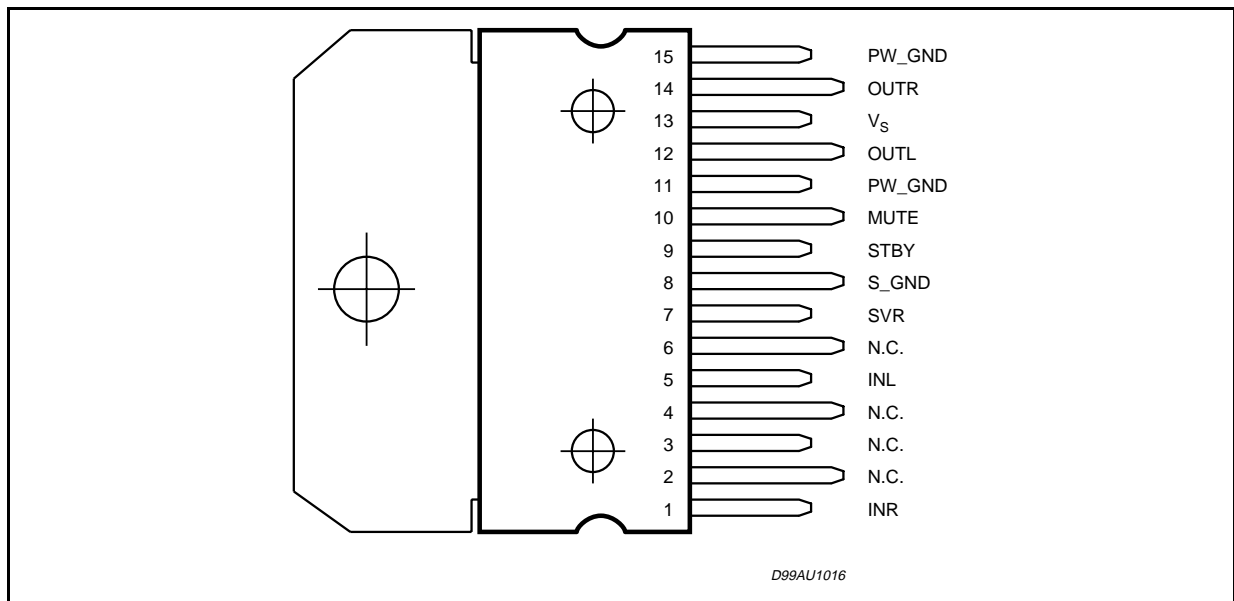


TDA7496S

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|----------------|------------------------------------------------------------|------------|--------------------|
| V_S | DC Supply Voltage | 35 | V |
| V_{IN} | Maximum Input Voltage | 8 | V _{pp} |
| P_{tot} | Total Power Dissipation ($T_{amb} = 80^{\circ}\text{C}$) | 15 | W |
| T_{amb} | Ambient Operating Temperature | 0 to 70 | $^{\circ}\text{C}$ |
| T_{stg}, T_j | Storage and Junction Temperature | -40 to 150 | $^{\circ}\text{C}$ |

PIN CONNECTION (Top view)



THERMAL DATA

| Symbol | Parameter | Value | Unit |
|------------------|-------------------------------------|--------------------------|-----------------------------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Typ. = 4 Max. = 4.6 | $^{\circ}\text{C}/\text{W}$ |
| $R_{th\ j-amb}$ | Thermal Resistance Junction-ambient | max 35 | $^{\circ}\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS (Refer to the test circuit $V_S = 22\text{V}$; $R_L = 8\Omega$, $R_g = 50\Omega$, $T_{amb} = 25^{\circ}\text{C}$).

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|------------|--------------------------------------------|---------------------------------------------------------------|------|------|------|------------------|
| V_S | Supply Voltage Range | | 10 | | 32 | V |
| I_q | Total Quiescent Current | | | 25 | 50 | mA |
| DCVos | Output DC Offset Referred to SVR Potential | No Input Signal | | 200 | | mV |
| V_o | Quiescent Output Voltage | $V_S = 22\text{V}$ | | 11 | | V |
| P_o | Output Power | THD = 10%; $R_L = 8\Omega$; $V_S = 22\text{V}$ | 5 | 5.5 | | W |
| | | THD = 1%; $R_L = 8\Omega$; $V_S = 22\text{V}$ | | 4 | | W |
| | | THD = 10%; $R_L = 4\Omega$; $V_{CC} = 12\text{V}$ | | 2.1 | | W |
| | | THD = 1%; $R_L = 4\Omega$; $V_{CC} = 12\text{V}$ | | 1.0 | | W |
| THD | Total Harmonic Distortion | $G_v = 30\text{dB}$; $P_o = 1\text{W}$; $f = 1\text{KHz}$; | | | 0.4 | % |
| I_{peak} | Output Peak Current | (internally limited) | 1 | 1.3 | | A |
| V_{in} | Input Signal | | | | 2.8 | V _{rms} |
| G_v | Closed Loop Gain | | 28.5 | 30 | 31.5 | dB |

ELECTRICAL CHARACTERISTICS (continued)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------|------|------|------|------|
| BW | | | | 0.6 | | MHz |
| e _N | Total Output Noise | f = 20Hz to 22KHz Play | | 60 | 150 | μV |
| | | f = 20Hz to 22KHz Mute | | 60 | 150 | μV |
| SR | Slew Rate | | 5 | 8 | | V/μs |
| R _i | Input Resistance | | 22.5 | 30 | | KΩ |
| SVR | Supply Voltage Rejection | f = 1kHz; C _{SVR} = 470μF; V _{RIP} = 1V _{rms} | 35 | 39 | | dB |
| T _M | Thermal Muting | | | 150 | | °C |
| T _s | Thermal Shut-down | | | 160 | | °C |
| MUTE STAND-BY & INPUT SELECTION FUNCTIONS | | | | | | |
| V _{ST-ON} | Stand-by ON threshold | | 3.5 | | | V |
| V _{ST-OFF} | Stand-by OFF threshold | | | | 1.5 | V |
| V _{M ON} | Mute ON Threshold | | 3.5 | | | V |
| V _{M OFF} | Mute OFF Threshold | | | | 1.5 | V |
| I _{qST-BY} | Quiescent Current @ Stand-by | | | 0.6 | 1 | mA |
| A _{MUTE} | Mute Attenuation | | 50 | 65 | | dB |
| I _{stbyBIAS} | Stand-by bias current | Stand by on V _{ST-BY} = 5V V _{MUTE} = 5V | | 80 | | μA |
| | | Play or Mute | -20 | -5 | | μA |
| I _{muteBIAS} | Mute bias current | Mute | | 1 | 5 | μA |
| | | Play | | 0.2 | 2 | μA |

APPLICATION SUGGESTIONS

The recommended values of the external components are those shown on the application circuit of figure 1a. Different values can be used, the following table can help the designer.

| COMPONENT | SUGGESTION VALUE | PURPOSE | LARGER THAN SUGGESTION | SMALLER THAN SUGGESTION |
|-----------|------------------|-----------------------|----------------------------|-----------------------------|
| R2 | 10K | Mute time constant | Larger mute on/off time | Smaller mute on/off time |
| C1 | 1000μF | Supply voltage bypass | | Danger of oscillation |
| C2 | 470nF | Input DC decoupling | Lower low frequency cutoff | Higher low frequency cutoff |
| C3 | 470nF | Input DC decoupling | Lower low frequency cutoff | Higher low frequency cutoff |
| C4 | 470μF | Ripple rejection | Better SVR | Worse SVR |
| C6 | 1000μF | Output DC decoupling | Lower low frequency cutoff | Higher low frequency cutoff |
| C7 | 1μF | Mute time constant | Larger mute on/off time | Smaller mute on/off time |
| C8 | 1000μF | Output DC decoupling | Lower low frequency cutoff | Higher low frequency cutoff |
| C9 | 100nF | Supply voltage bypass | | Danger of oscillation |

TDA7496S

Figure 1a: Application Circuit.

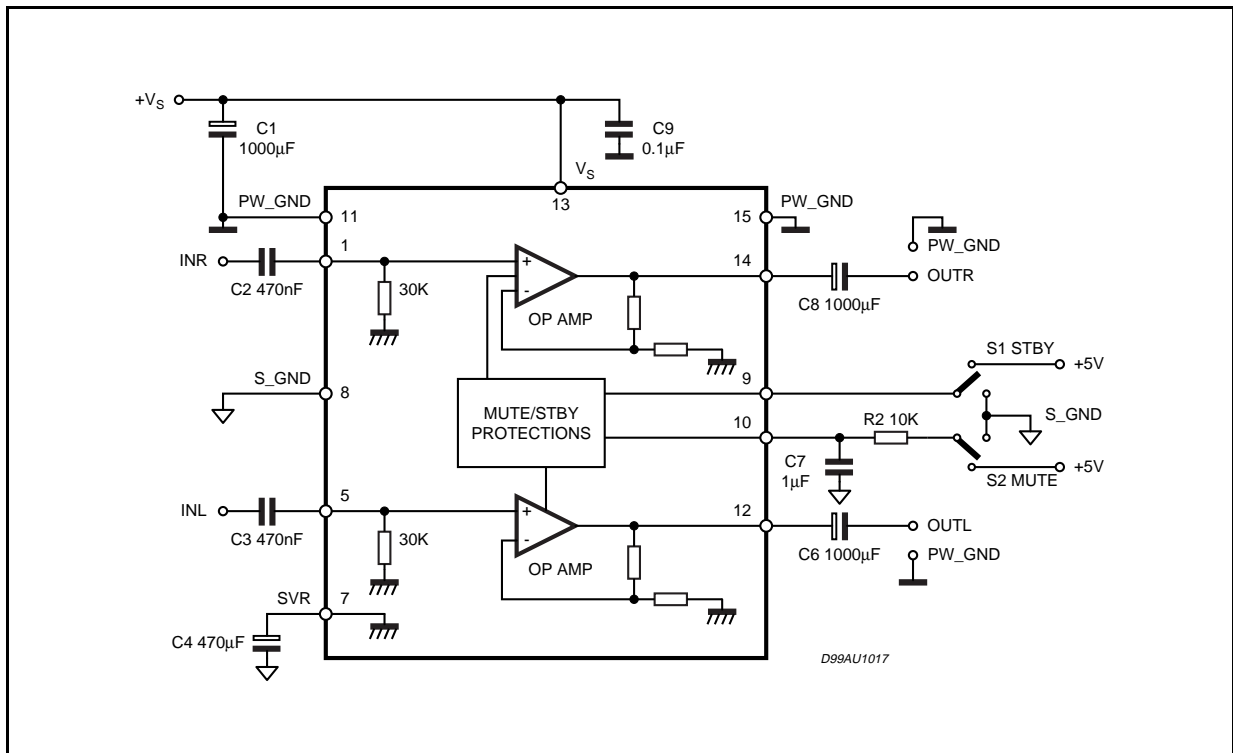
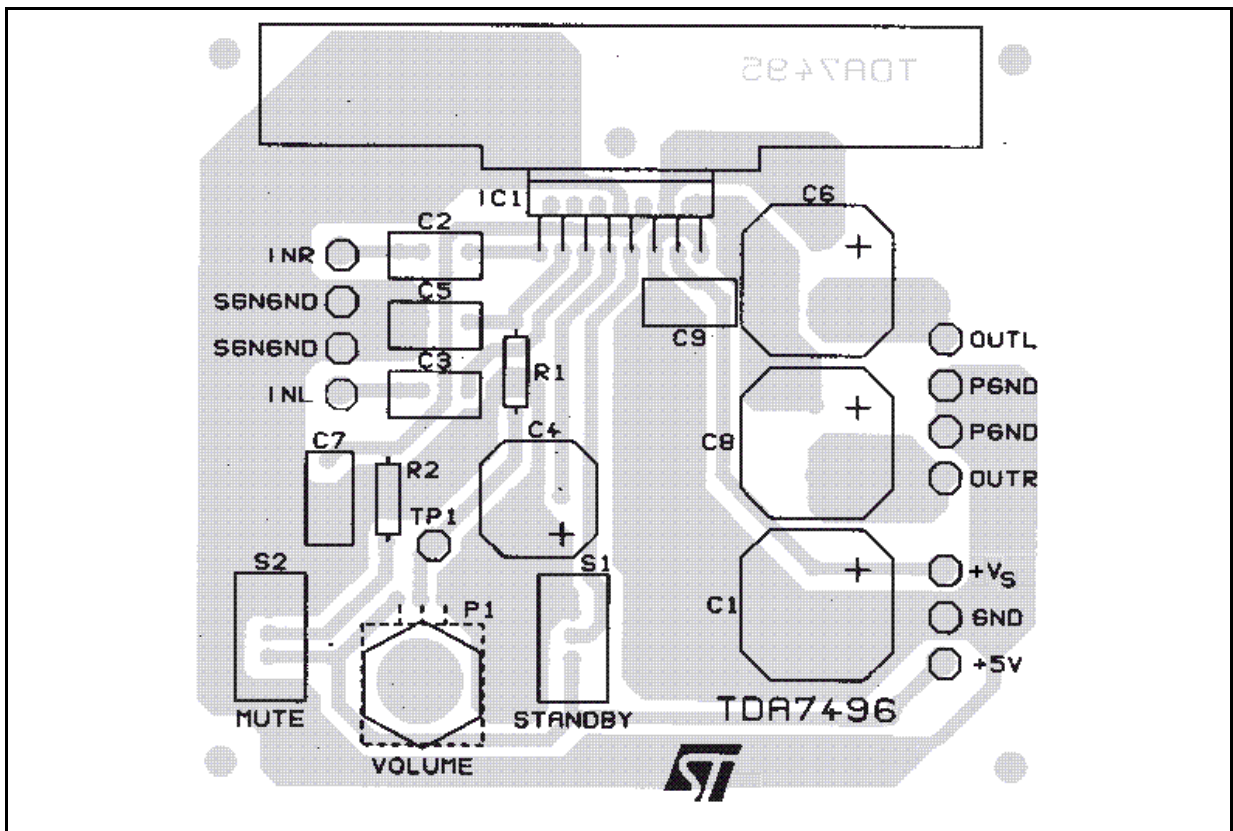


Figure 1b: P.C.B. and Component Layout.

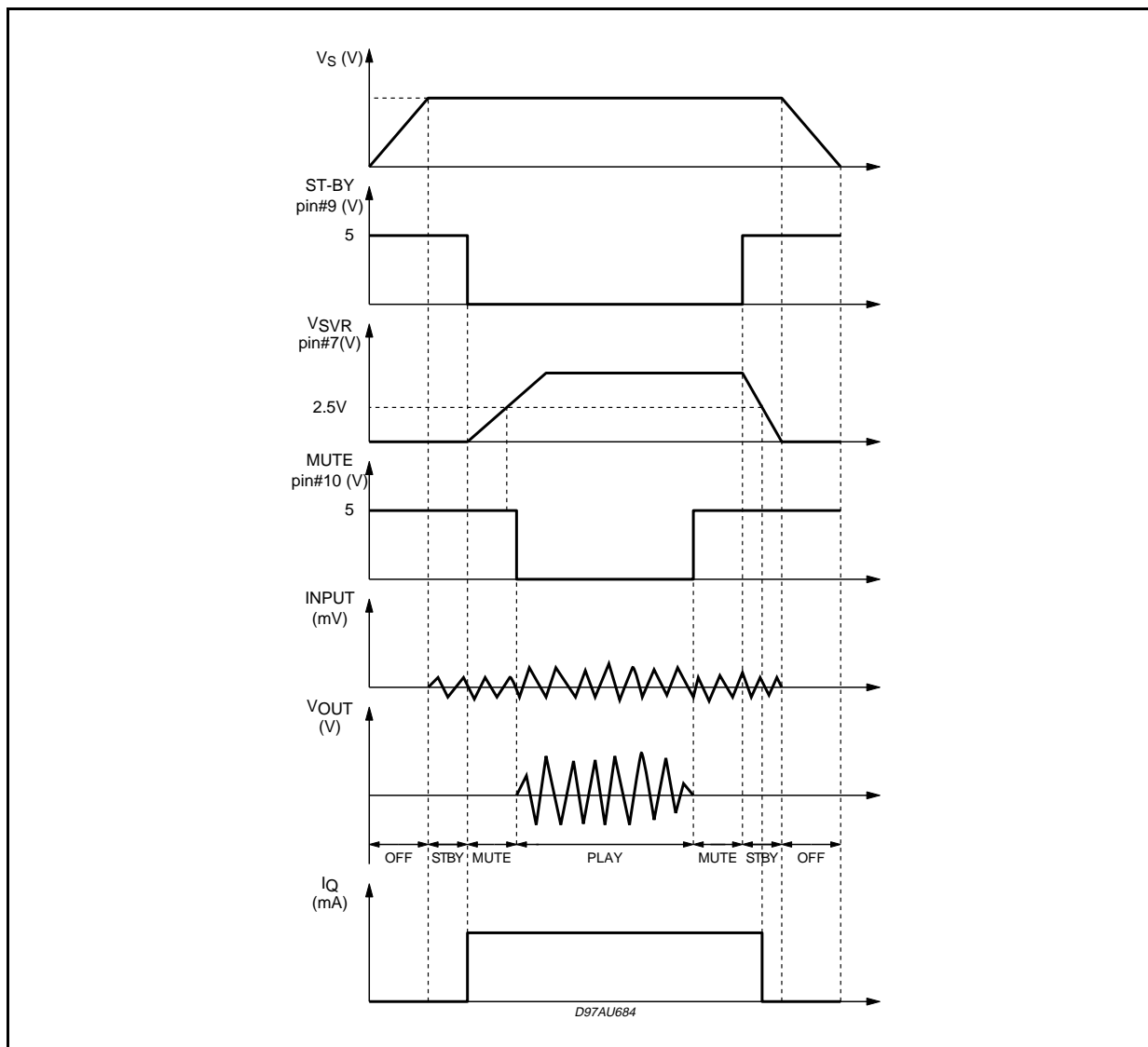


MUTE STAND-BY TRUTH TABLE

| MUTE | ST-BY | OPERATING CONDITION |
|------|-------|---------------------|
| H | H | STANDBY |
| L | H | STANDBY |
| H | L | MUTE |
| L | L | PLAY |

Turn ON/OFF Sequences (for optimizing the POP performances)

A) USING MUTE AND STAND-BY FUNCTIONS



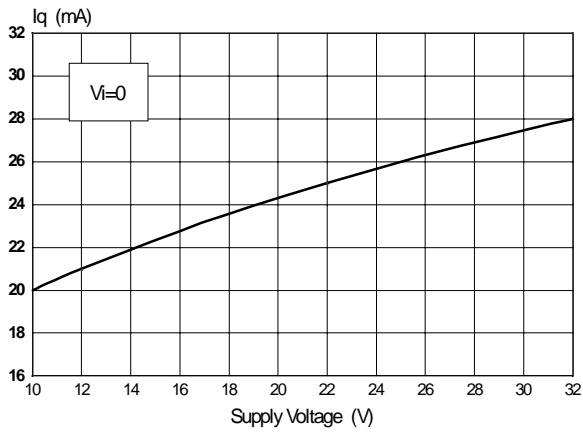
B) USING ONLY THE MUTE FUNCTION

To simplify the application, the stand-by pin can be connected directly to Ground.

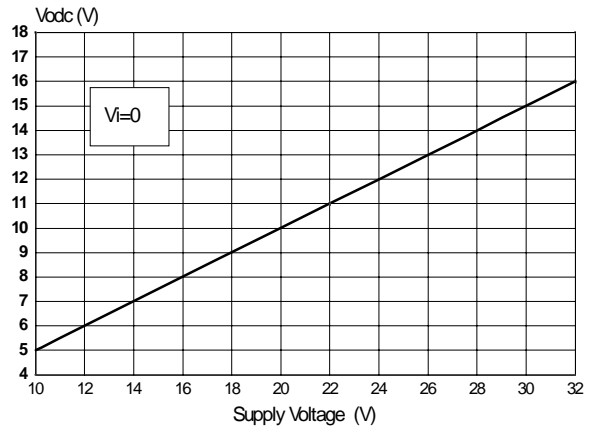
During the ON/OFF transitions it is recommended to respect the following conditions.

- At the turn-on, the transition mute - play must be made when the SVR pin is higher than 2.5V
- At the turn-off, the TDA7496 must be brought to mute from the play condition when the SVR pin is higher than 2.5V.

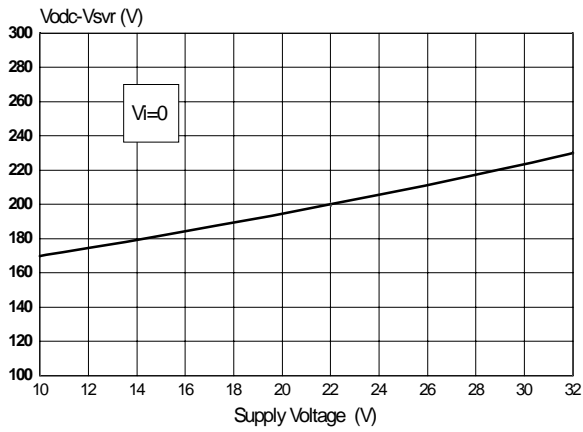
Quiescent Current vs. Supply Voltage



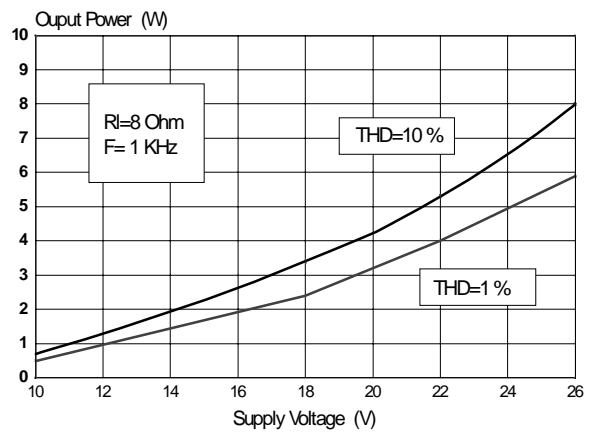
Output DC Voltage vs. Supply Voltage



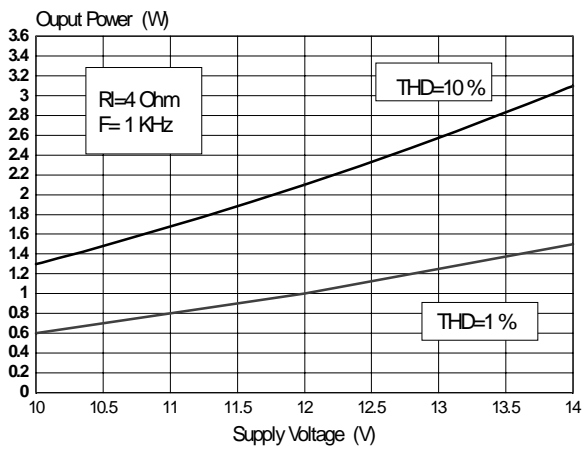
Output DC Offset vs. Supply Voltage



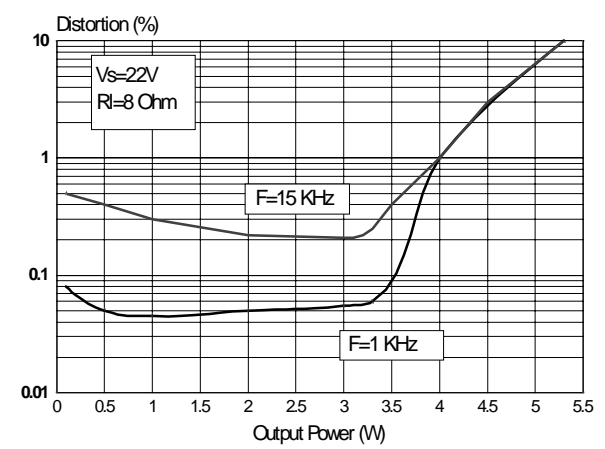
Output Power vs. Supply Voltage



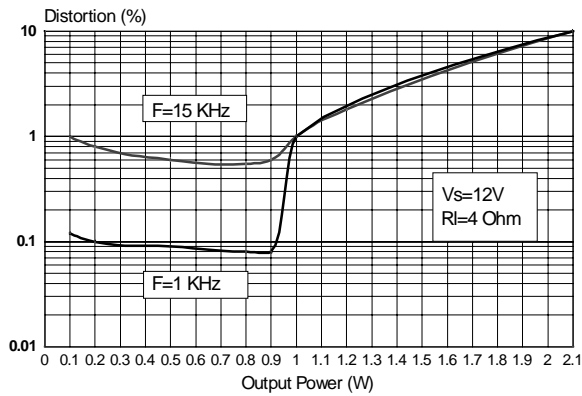
Output Power vs. Supply Voltage



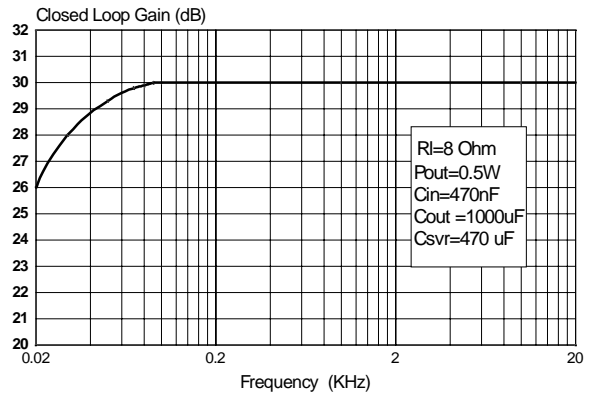
Distortion vs. Output Power



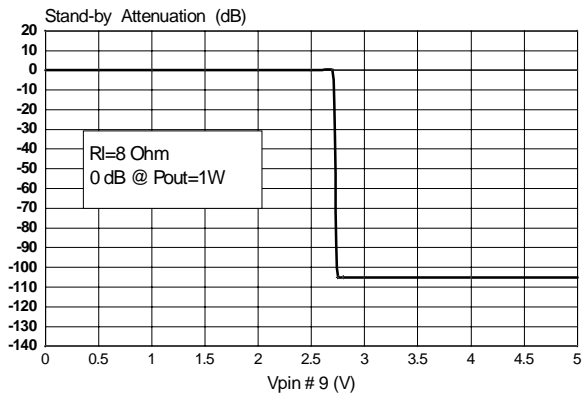
Distortion vs. Output Power



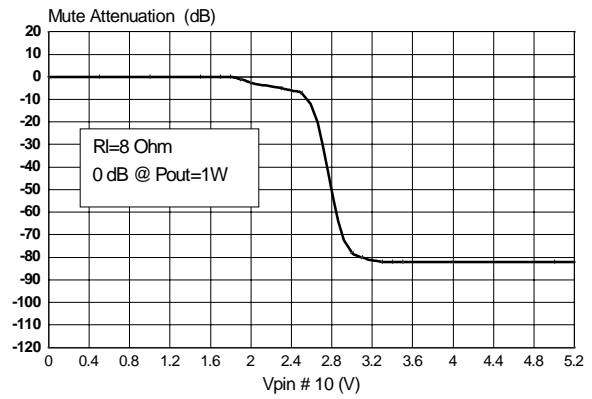
Closed Loop Gain vs. Frequency



St-By Attenuation vs. Vpin 9

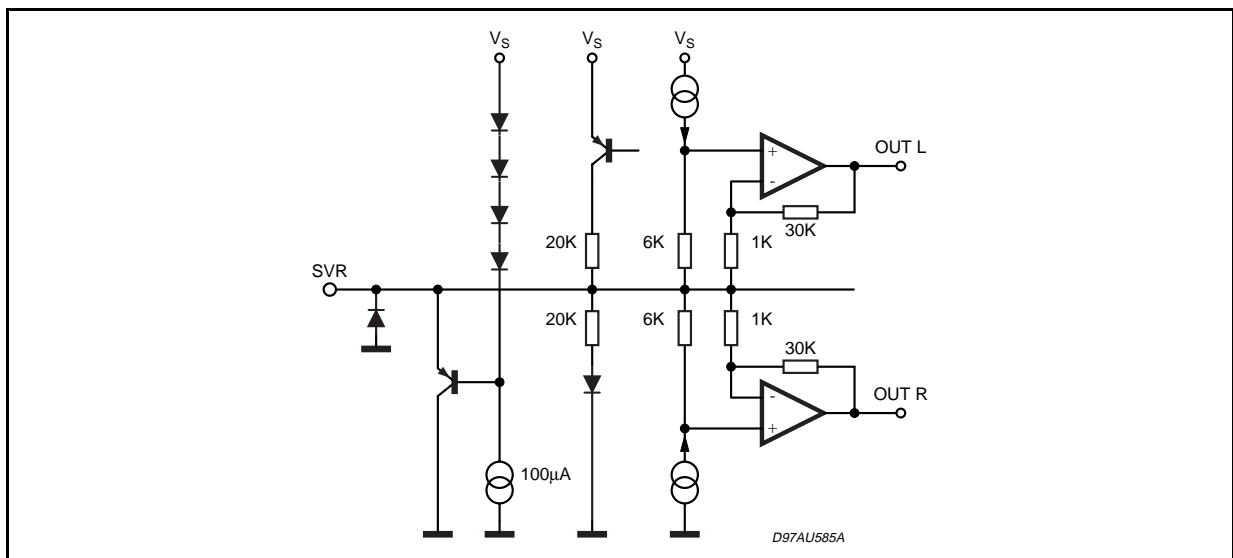


Mute Attenuation vs. Vpin 10



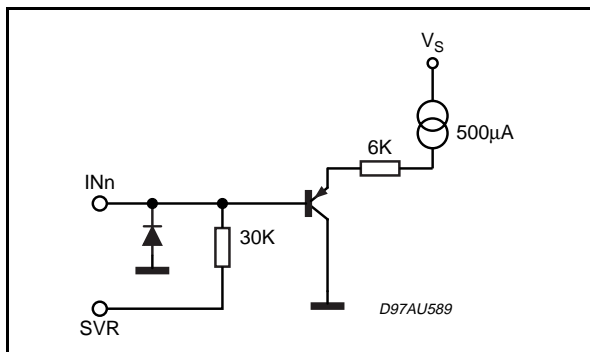
PINS DESCRIPTION

PIN: SVR

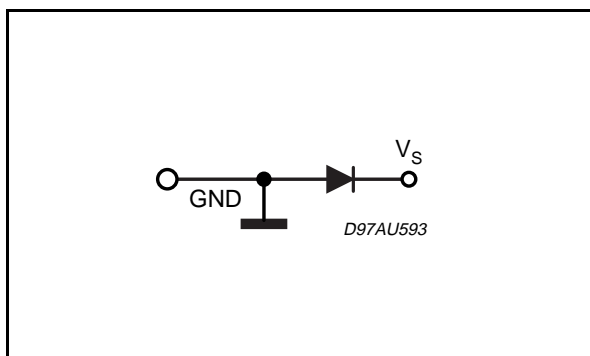


TDA7496S

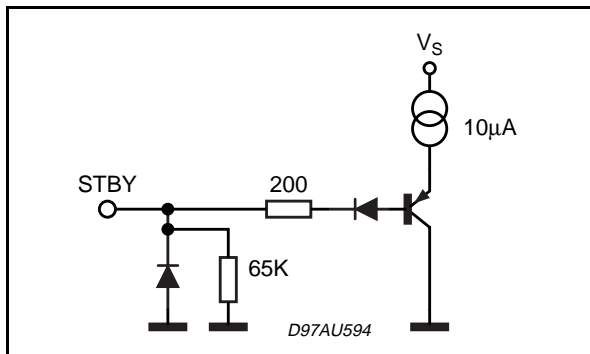
PINS: INL, INR



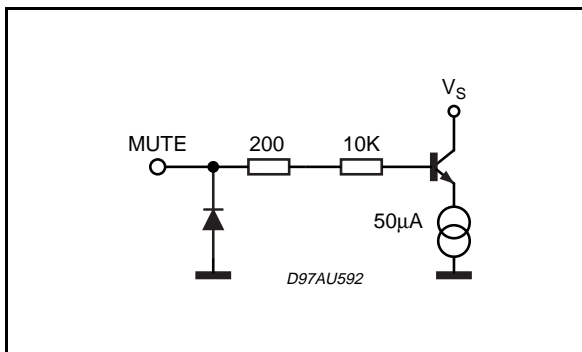
PINS: PW-GND, S-GND



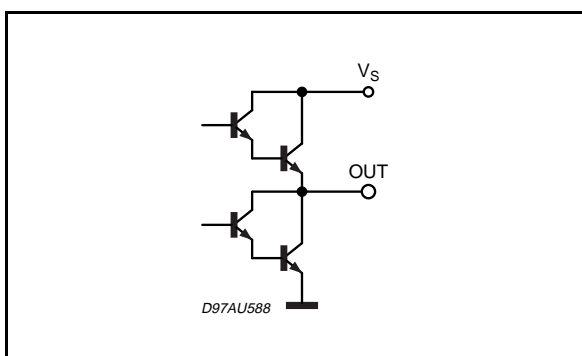
PIN: STBY



PIN: MUTE

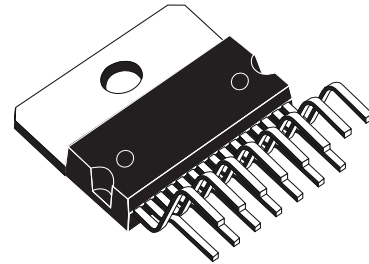


PINS: OUT R, OUT L

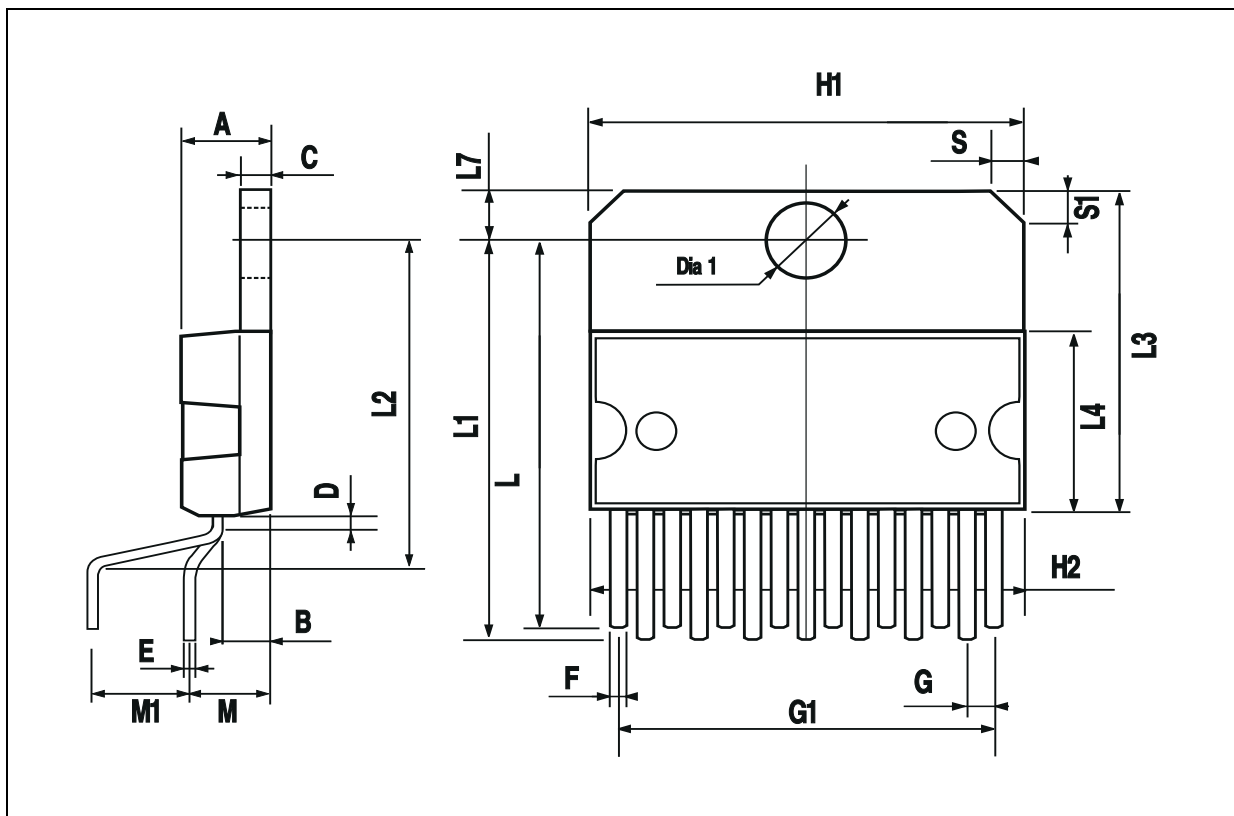


| DIM. | mm | | | inch | | |
|------|-------|-------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 5 | | | 0.197 |
| B | | | 2.65 | | | 0.104 |
| C | | | 1.6 | | | 0.063 |
| D | | 1 | | | 0.039 | |
| E | 0.49 | | 0.55 | 0.019 | | 0.022 |
| F | 0.66 | | 0.75 | 0.026 | | 0.030 |
| G | 1.02 | 1.27 | 1.52 | 0.040 | 0.050 | 0.060 |
| G1 | 17.53 | 17.78 | 18.03 | 0.690 | 0.700 | 0.710 |
| H1 | 19.6 | | | 0.772 | | |
| H2 | | | 20.2 | | | 0.795 |
| L | 21.9 | 22.2 | 22.5 | 0.862 | 0.874 | 0.886 |
| L1 | 21.7 | 22.1 | 22.5 | 0.854 | 0.870 | 0.886 |
| L2 | 17.65 | | 18.1 | 0.695 | | 0.713 |
| L3 | 17.25 | 17.5 | 17.75 | 0.679 | 0.689 | 0.699 |
| L4 | 10.3 | 10.7 | 10.9 | 0.406 | 0.421 | 0.429 |
| L7 | 2.65 | | 2.9 | 0.104 | | 0.114 |
| M | 4.25 | 4.55 | 4.85 | 0.167 | 0.179 | 0.191 |
| M1 | 4.63 | 5.08 | 5.53 | 0.182 | 0.200 | 0.218 |
| S | 1.9 | | 2.6 | 0.075 | | 0.102 |
| S1 | 1.9 | | 2.6 | 0.075 | | 0.102 |
| Dia1 | 3.65 | | 3.85 | 0.144 | | 0.152 |

OUTLINE AND MECHANICAL DATA



Multiwatt15 V



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