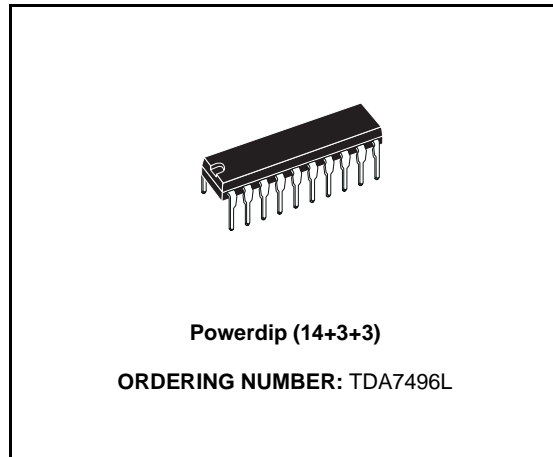




2W+2W AMPLIFIER WITH DC VOLUME CONTROL

- 2W+2W OUTPUT POWER
 $R_L = 8\Omega$ @THD = 10% $V_{CC} = 14V$
- ST-BY AND MUTE FUNCTIONS
- LOW TURN-ON TURN-OFF POP NOISE
- LINEAR VOLUME CONTROL DC COUPLED WITH POWER OP. AMP.
- NO BOUCHEROT CELL
- NO ST-BY RC INPUT NETWORK
- SINGLE SUPPLY RANGING UP TO 15V
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION
- INTERNALLY FIXED GAIN
- SOFT CLIPPING
- VARIABLE OUTPUT AFTER VOLUME CONTROL CIRCUIT
- POWERDIP (14+3+3) PACKAGE



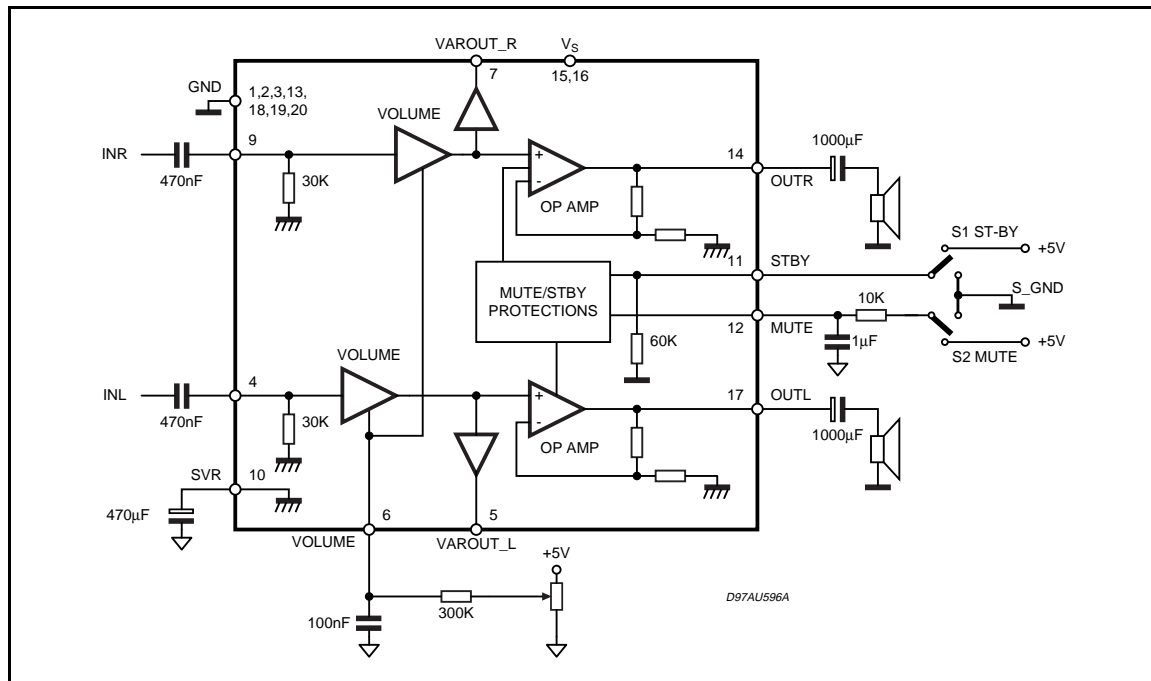
DESCRIPTION

The TDA7496L is a stereo 2W+2W class AB power amplifier assembled in the @ Powerdip

14+3+3 package, specially designed for high quality sound, TV and Monitor applications.

Features of the TDA7496L include linear volume control, Stand-by and mute functions.

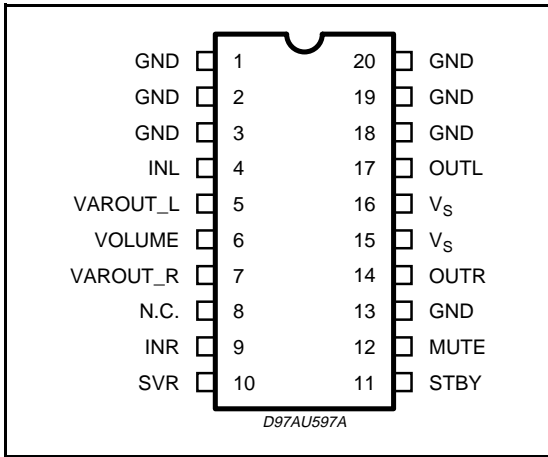
BLOCK DIAGRAM



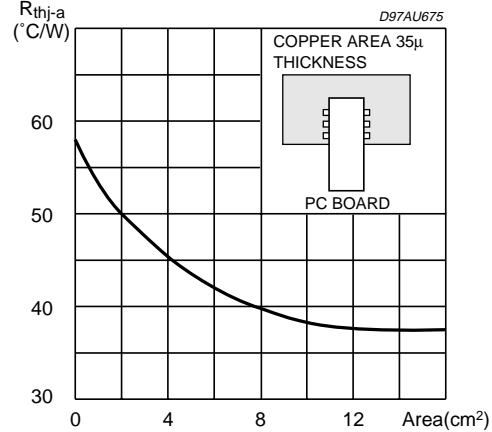
ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-----------------------------------|--|------------|-----------------|
| V _S | DC Supply Voltage | 26 | V |
| V _{IN} | Maximum Input Voltage | 8 | V _{pp} |
| P _{tot} | Total Power Dissipation (T _{case} = 60°C) | 6 | W |
| T _{amb} | Ambient Operating Temperature | 0 to 70 | °C |
| T _{stg} , T _j | Storage and Junction Temperature | -40 to 150 | °C |
| V ₆ | Volume CTRL DC voltage | 7 | V |

PIN CONNECTION



R_{th} with "on board" Square Heatsink vs. copper area.



THERMAL DATA

| Symbol | Parameter | Value | Unit |
|---------------------------|-------------------------------------|---------|------|
| R _{th j-pins} | Thermal Resistance Junction-pins | max. 15 | °C/W |
| R _{th j-amb} (*) | Thermal Resistance Junction-ambient | max. 50 | °C/W |

(*) Mounted on PCB with no heatsink

ELECTRICAL CHARACTERISTICS (Refer to the test circuit V_S = 14V; R_L = 8Ω, R_G = 50Ω, T_{amb} = 25°C).

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|----------------------------------|--|---|------|------|------|------------------|
| V _S | Supply Voltage Range | | 10 | | 18 | 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 | | | 7 | | V |
| P _O | Output Power | THD = 10%; R _L = 8Ω; | 1.6 | 2 | | W |
| | | THD = 1%; R _L = 8Ω; | | 1.3 | | W |
| THD | Total Harmonic Distortion | G _v = 30dB; P _O = 1W; f = 1KHz; | | | 0.4 | % |
| I _{peak} | Output Peak Current | (internally limited) | 0.7 | 0.9 | | A |
| V _{in} | Input Signal | | | | 2.8 | V _{rms} |
| G _v | Closed Loop Gain | Vol Ctrl > 4.5V | 28.5 | 30 | 31.5 | dB |
| G _{vLine} | Monitor Out Gain | Vol Ctrl > 4.5V; Zload > 30KΩ | -1.5 | 0 | 1.5 | dB |
| A _{Min} V _{OL} | Attenuation at Minimum Volume | Vol Ctrl < 0.5V | 80 | | | dB |
| BW | | | | 0.6 | | MHz |

ELECTRICAL CHARACTERISTICS (continued)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|--|------------------------------|---|------|------|------|------|
| en | Total Output Noise | f = 20Hz to 22KHz Play, max volume | | 500 | 800 | μV |
| | | f = 20Hz to 22KHz Play, max attenuation | | 100 | 250 | μV |
| | | f = 20Hz to 22KHz Mute | | 60 | 150 | μV |
| SR | Slew Rate | | 5 | 8 | | V/μs |
| R _i | Input Resistance | | 22.5 | 30 | | KΩ |
| R _{Var Out} | Variable Output Resistance | | | 30 | 100 | Ω |
| R _{load Var Out} | Variable Output Load | | 2 | | | KΩ |
| SVR | Supply Voltage Rejection | f = 1kHz; max volume C _{SVR} = 470μF; V _{RIP} = 1V _{rms} | 35 | 39 | | dB |
| | | f = 1kHz; max attenuation C _{SVR} = 470μF; V _{RIP} = 1V _{rms} | 55 | 65 | | 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 |
| AMUTE | 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 |
|-----------|------------------|------------------------------|-------------------------------|--------------------------------|
| R1 | 300K | Volume control circuit | Larger volume regulation time | Smaller volume regulation time |
| R2 | 10K | Mute time constant | Larger mute on/off time | Smaller mute on/off time |
| P1 | 50K | Volume control circuit | | |
| 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 |
| C5 | 100nF | Volume control time constant | Larger volume regulation time | Smaller volume regulation time |
| 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 |

Figure 1A. Application Circuit.

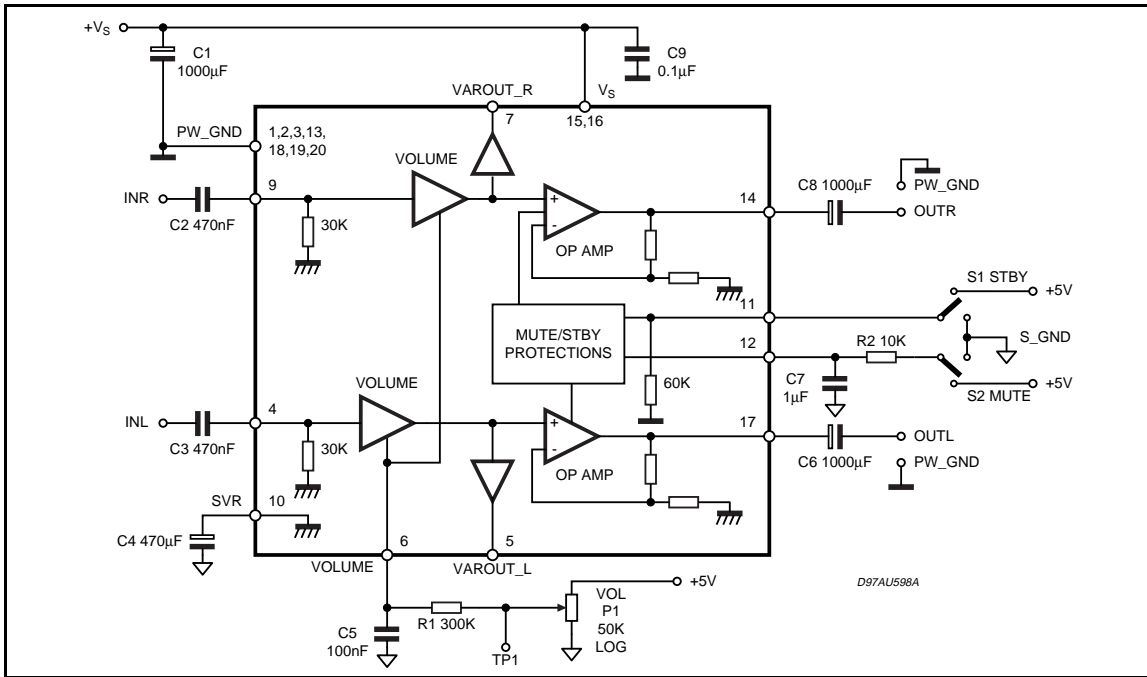
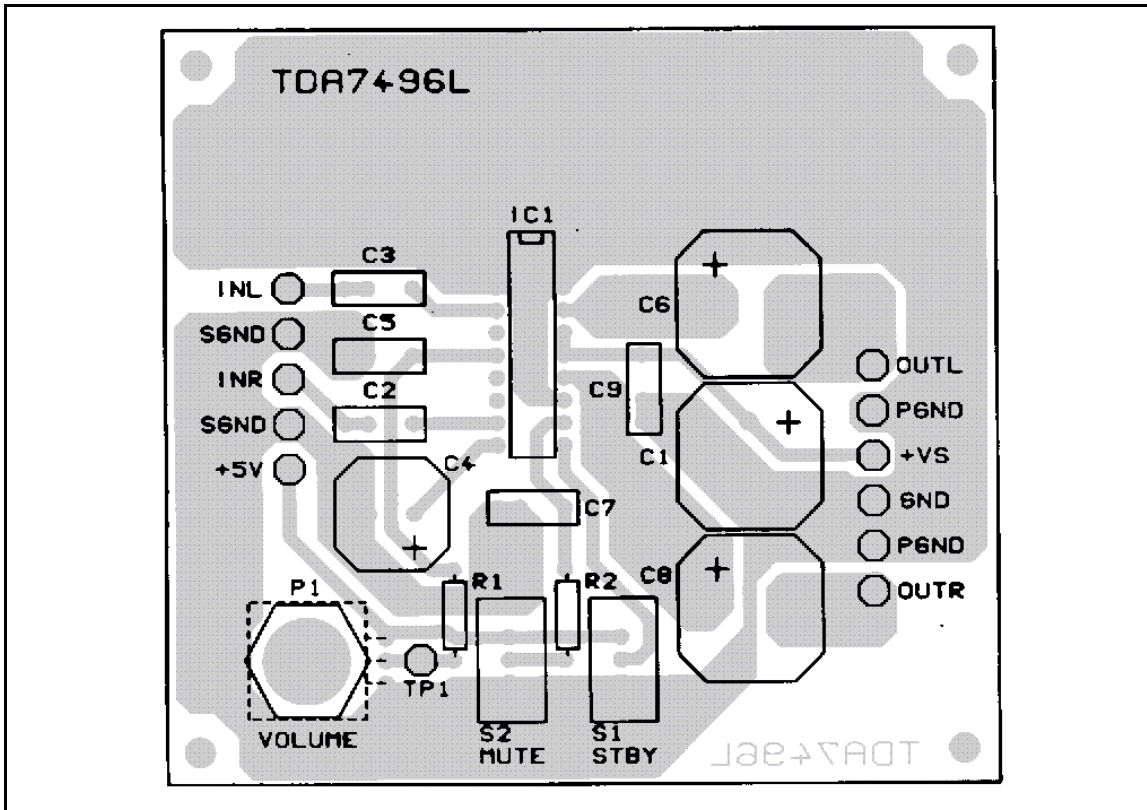


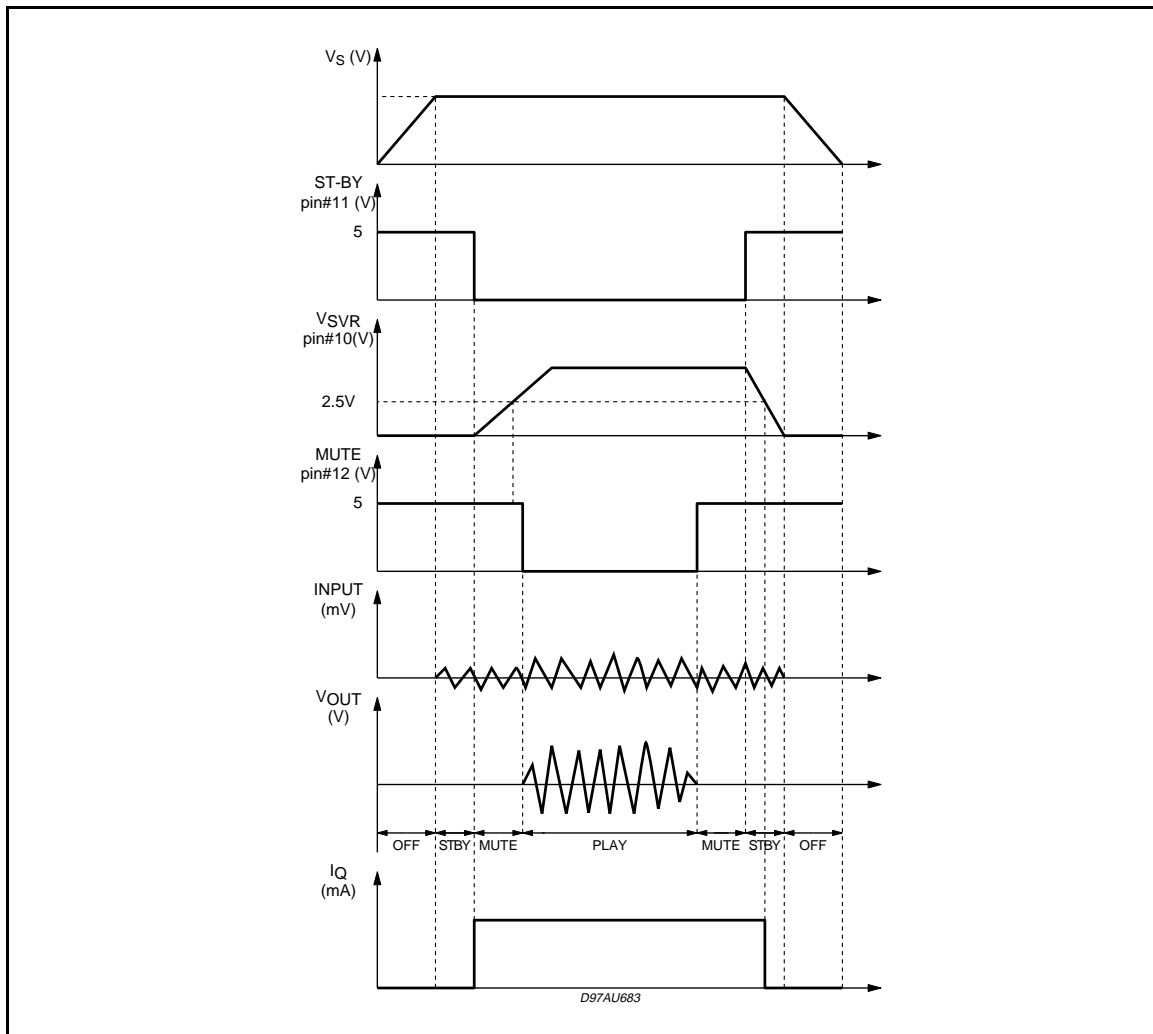
Figure 1B. PCB and Component Layout of the Fig. 1A (1.25:1 scale)



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)

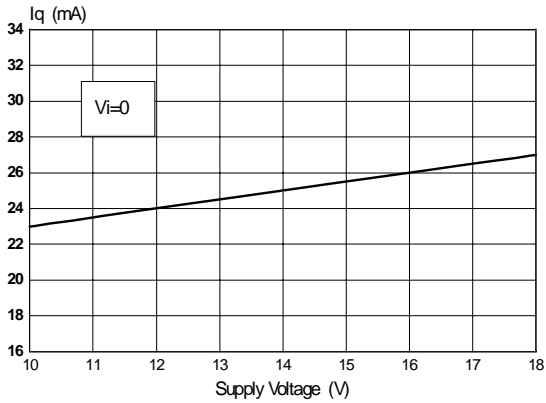
A) USING MUTE AND STAND-BY FUNCTIONS**B) USING ONLY THE MUTE FUNCTION**

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

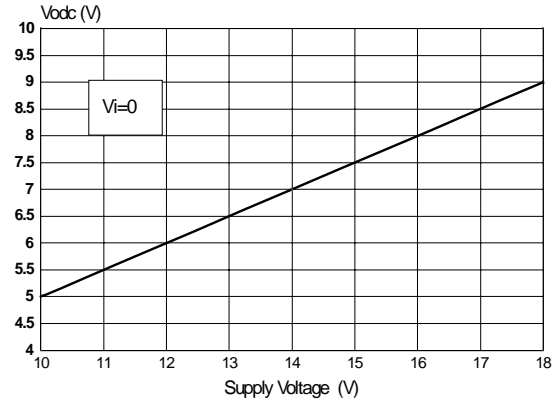
During the ON/OFF transitions it is recommended to respect the following conditions.

- 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 TDA7496L must be brought to mute from the play condition when the SVR pin is higher than 2.5V.

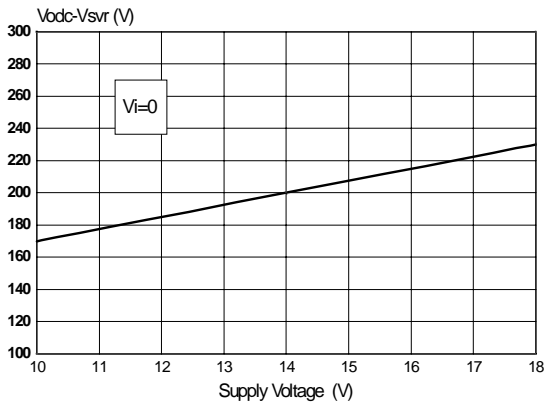
Quiescent current vs. Supply Voltage



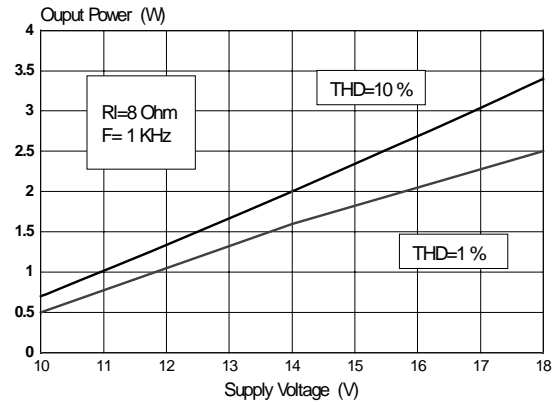
Output DC Voltage vs. Supply Voltage



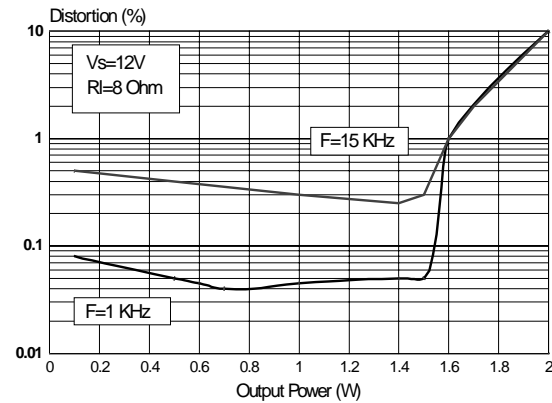
Output DC Offset vs. Supply Voltage



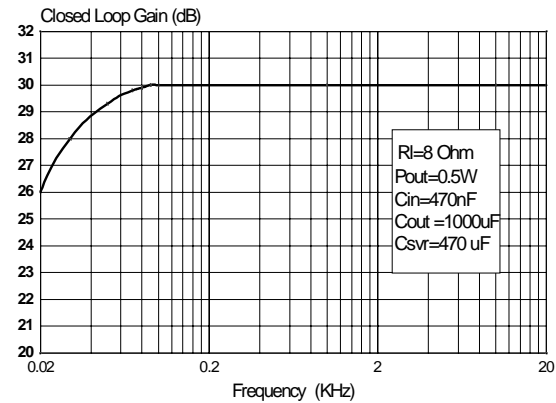
Output Power vs. Supply Voltage



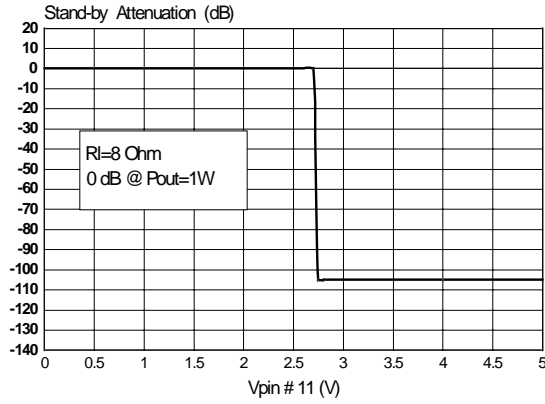
Distortion vs. Output Power



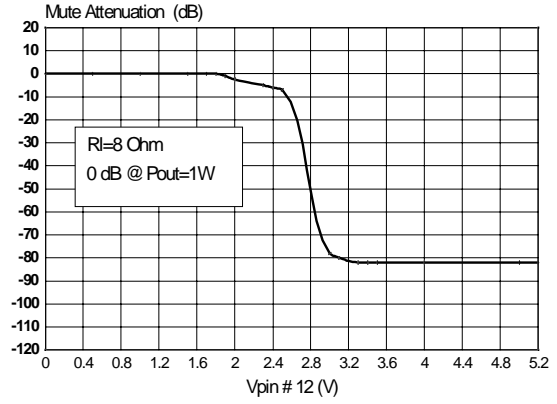
Closed Loop gain vs. Frequency



St-By Attenuation vs. Vpin 11

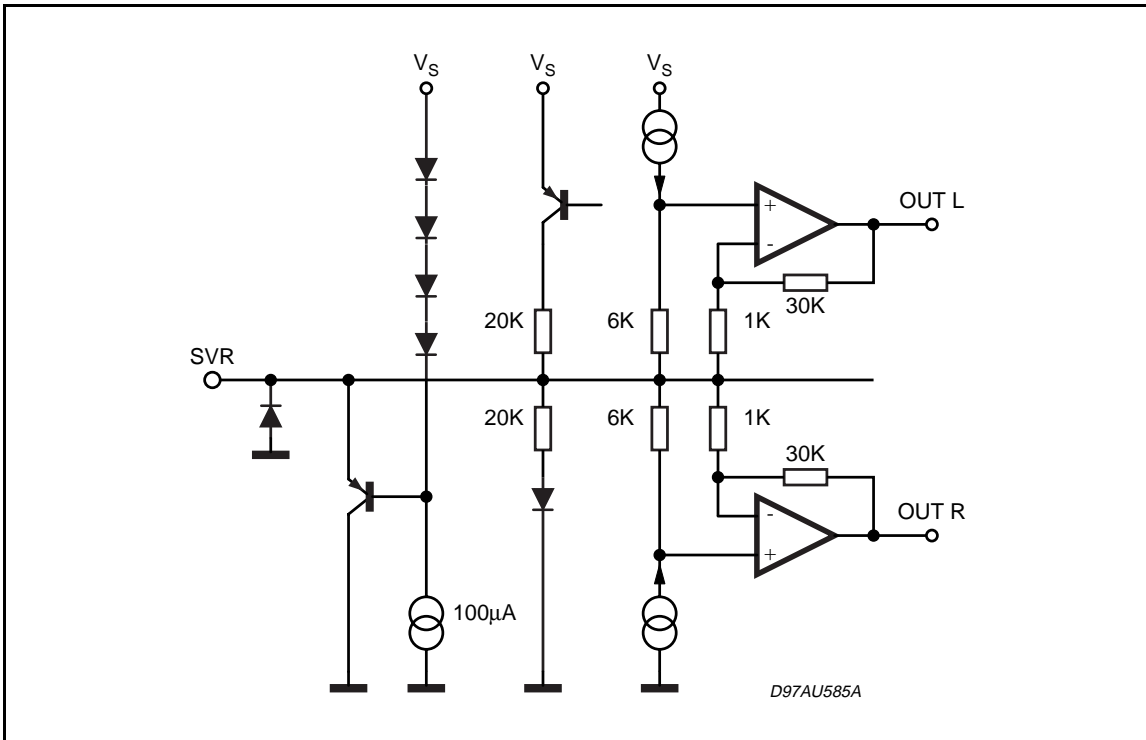


Mute Attenuation vs. Vpin 12

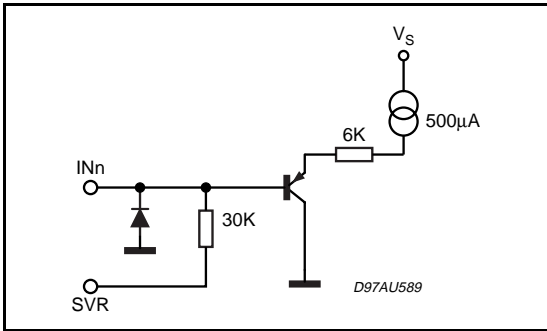


PIN DESCRIPTION

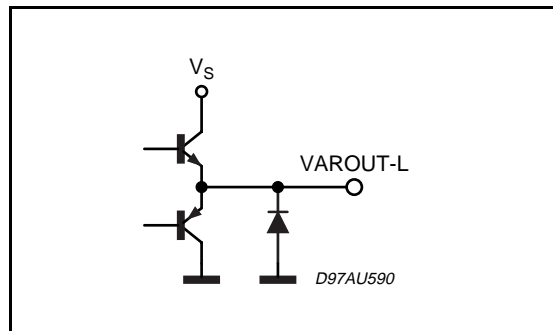
PIN: SVR



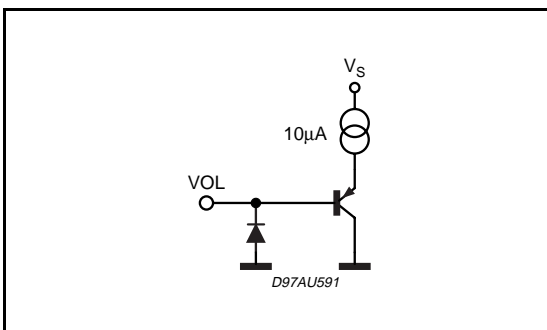
PINS: INL, INR



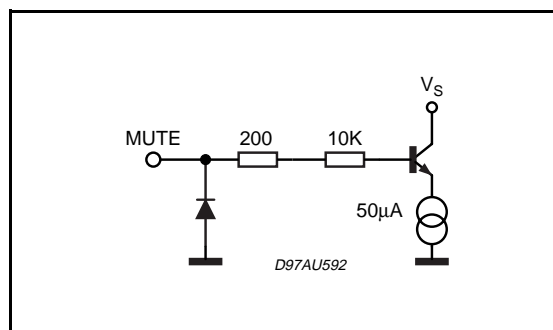
PINS: VAROUT-L, VAROUT-R



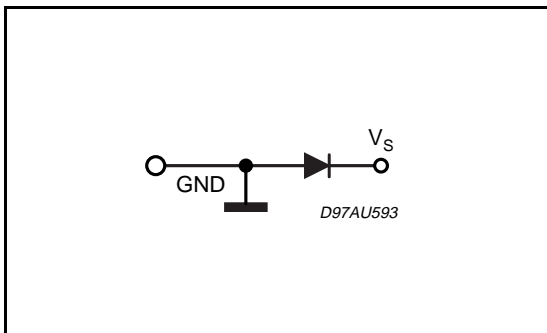
PIN: VOLUME



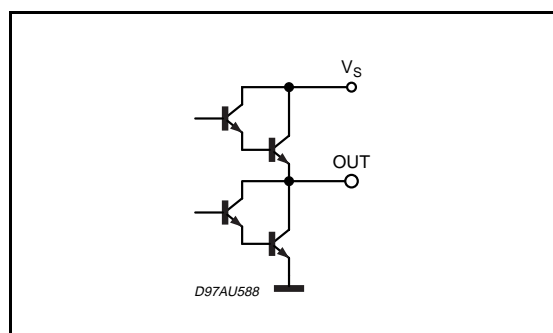
PIN: MUTE



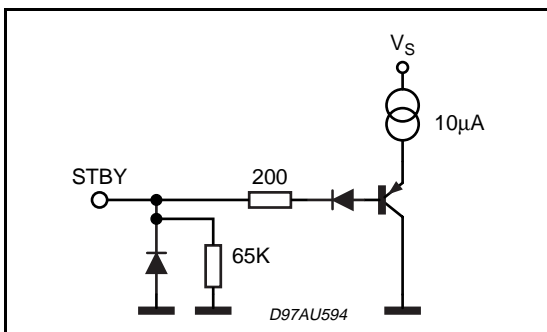
PINS: PW-GND, S-GND



PINS: OUT R, OUT L

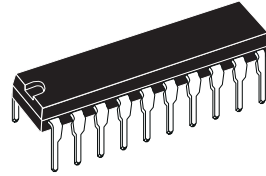


PIN: STBY

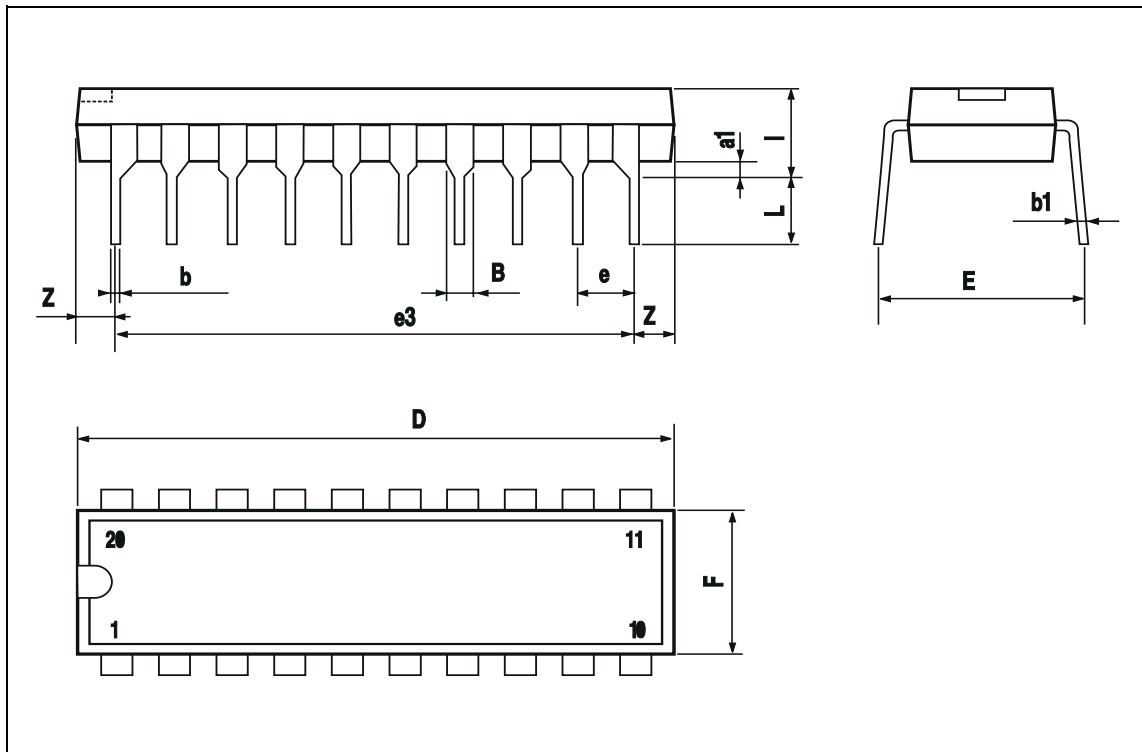


| DIM. | mm | | | inch | | |
|------|------|-------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| a1 | 0.51 | | | 0.020 | | |
| B | 0.85 | | 1.40 | 0.033 | | 0.055 |
| b | | 0.50 | | | 0.020 | |
| b1 | 0.38 | | 0.50 | 0.015 | | 0.020 |
| D | | | 24.80 | | | 0.976 |
| E | | 8.80 | | | 0.346 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 22.86 | | | 0.900 | |
| F | | | 7.10 | | | 0.280 |
| I | | | 5.10 | | | 0.201 |
| L | | 3.30 | | | 0.130 | |
| Z | | | 1.27 | | | 0.050 |

OUTLINE AND MECHANICAL DATA



Powerdip 20



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