

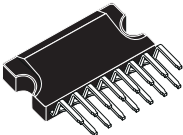


# TDA7266SA

## 7W+7W DUAL BRIDGE AMPLIFIER

- WIDE SUPPLY VOLTAGE RANGE (3.5-18V)
- MINIMUM EXTERNAL COMPONENTS
  - NO SWR CAPACITOR
  - NO BOOTSTRAP
  - NO BOUCHEROT CELLS
  - INTERNALLY FIXED GAIN
- STAND-BY & MUTE FUNCTIONS
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION

**TECHNOLOGY B120II**



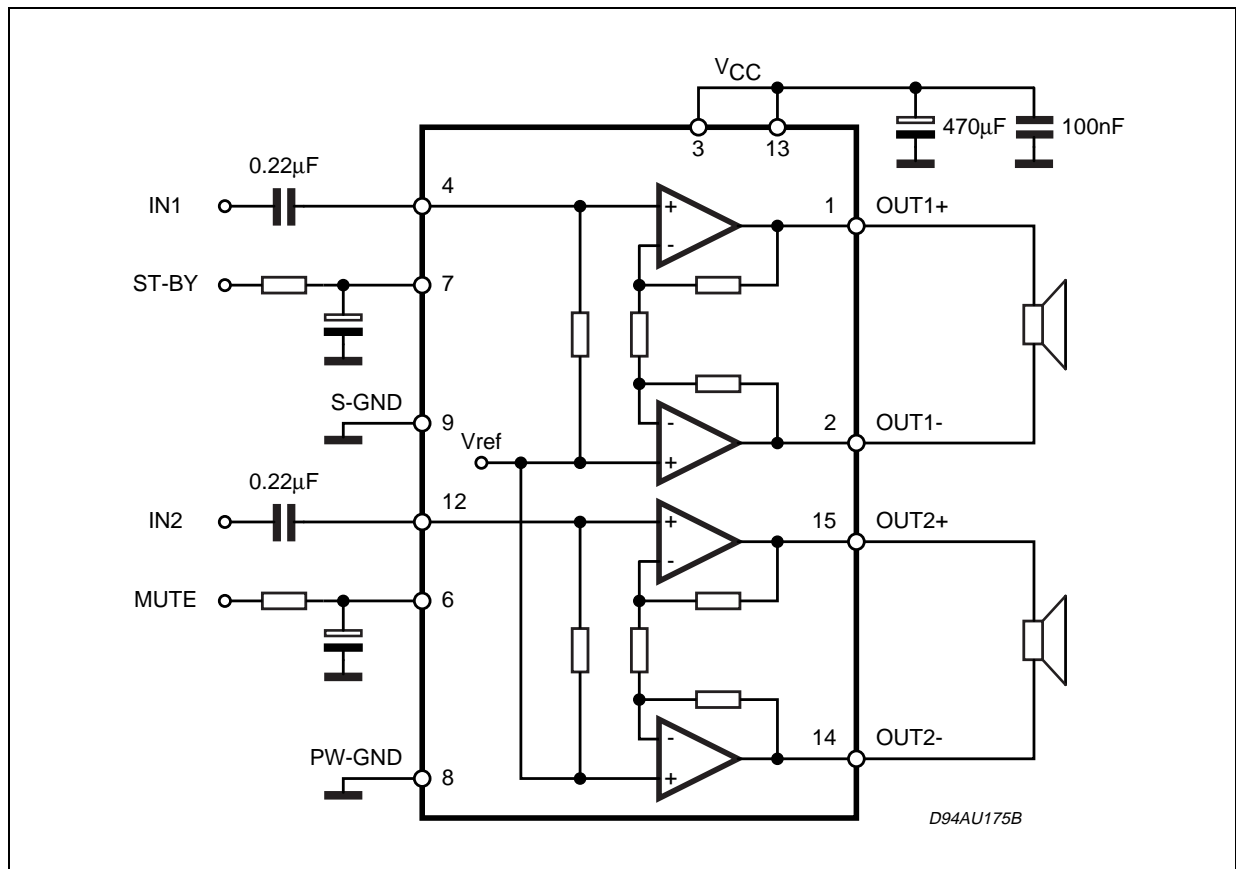
**CLIPWATT15**  
**ORDERING NUMBER: TDA7266SA**

### DESCRIPTION

The TDA7266SA is a dual bridge amplifier specially designed for LCD Monitor, PC Motherboard, TV and Portable Radio applications.

Pin to pin compatible with: TDA7266S, TDA7266, TDA7266M, TDA7266MA, TDA7266B, TDA7297SA & TDA7297.

### BLOCK AND APPLICATION DIAGRAM



# TDA7266SA

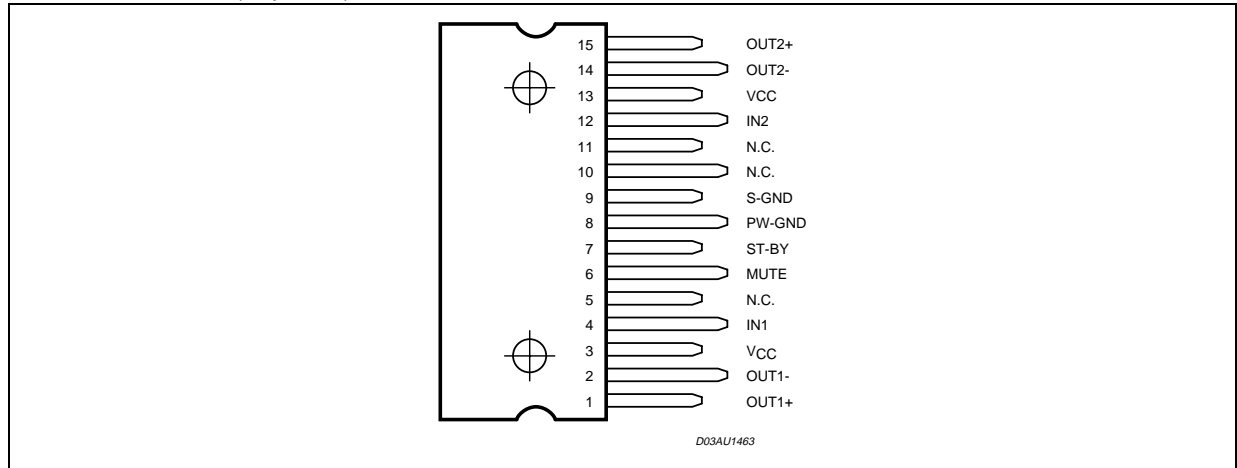
## ABSOLUTE MAXIMUM RATINGS

| Symbol                            | Parameter   | Value      | Unit |
|-----------------------------------|---|------------|------|
| V <sub>s</sub>                    | Supply Voltage                                    | 20         | V    |
| I <sub>O</sub>                    | Output Peak Current (internally limited)          | 2          | A    |
| P <sub>tot</sub>                  | Total Power Dissipation (T <sub>amb</sub> = 70°C) | 20         | W    |
| T <sub>op</sub>                   | Operating Temperature                             | 0 to 70    | °C   |
| T <sub>stg</sub> , T <sub>j</sub> | Storage and Junction Temperature                  | -40 to 150 | °C   |

## THERMAL DATA

| Symbol                 | Parameter                           | Value                 | Unit |
|------------------------|-------------------------------------|-----------------------|------|
| R <sub>th j-case</sub> | Thermal Resistance Junction-case    | Typ = 1.8; Max. = 2.5 | °C/W |
| R <sub>th j-amb</sub>  | Thermal Resistance Junction-ambient | 48                    | °C/W |

## PIN CONNECTION (Top view)



## ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub> = 11V, R<sub>L</sub> = 8Ω, f = 1KHz, T<sub>amb</sub> = 25°C unless otherwise specified)

| Symbol            | Parameter                 | Test Condition                                    | Min. | Typ. | Max. | Unit |
|-------------------|---------------------------|---|------|------|------|------|
| V <sub>CC</sub>   | Supply Range              |   | 3    | 11   | 18   | V    |
| I <sub>q</sub>    | Total Quiescent Current   |   |      | 50   | 65   | mA   |
| V <sub>OS</sub>   | Output Offset Voltage     |   |      |      | 120  | mV   |
| P <sub>O</sub>    | Output Power              | THD 10%   | 6.3  | 7    |      | W    |
| THD               | Total Harmonic Distortion | P <sub>O</sub> = 1W                               |      | 0.05 | 0.2  | %    |
|                   |                           | P <sub>O</sub> = 0.1W to 2W<br>f = 100Hz to 15KHz |      |      | 1    | %    |
| SVR               | Supply Voltage Rejection  | f = 100Hz, VR = 0.5V                              | 40   | 56   |      | dB   |
| CT                | Crosstalk                 |   | 46   | 60   |      | dB   |
| A <sub>MUTE</sub> | Mute Attenuation          |   | 60   | 80   |      | dB   |
| T <sub>w</sub>    | Thermal Threshold         |   |      | 150  |      | °C   |
| G <sub>V</sub>    | Closed Loop Voltage Gain  |   | 25   | 26   | 27   | dB   |
| ΔG <sub>V</sub>   | Voltage Gain Matching     |   |      |      | 0.5  | dB   |

**ELECTRICAL CHARACTERISTICS** (continued)(V<sub>CC</sub> = 11V, R<sub>L</sub> = 8Ω, f = 1KHz, T<sub>amb</sub> = 25°C unless otherwise specified)

| Symbol               | Parameter                          | Test Condition                                     | Min.                     | Typ.                       | Max.                       | Unit |
|----------------------|------------------------------------|--|--------------------------|----------------------------|----------------------------|------|
| R <sub>i</sub>       | Input Resistance                   |  | 25                       | 30                         |                            | KΩ   |
| V <sub>T</sub> MUTE  | Mute Threshold                     | for V <sub>CC</sub> > 6.4V; V <sub>o</sub> = -30dB | 2.3                      | 2.9                        | 4.1                        | V    |
|                      |                                    | for V <sub>CC</sub> < 6.4V; V <sub>o</sub> = -30dB | V <sub>CC</sub> /2<br>-1 | V <sub>CC</sub> /2<br>-075 | V <sub>CC</sub> /2<br>-0.5 | V    |
| V <sub>T</sub> ST-BY | St-by Threshold                    |  | 0.8                      | 1.3                        | 1.8                        | V    |
| I <sub>ST-BY</sub>   | St-by Current V <sub>6</sub> = GND |  |                          |                            | 100                        | μA   |
| e <sub>N</sub>       | Total Output Voltage               | A Curve; f = 20Hzto 20KHz                          |                          | 150                        |                            | μV   |

**APPLICATION SUGGESTION****STAND-BY AND MUTE FUNCTIONS****(A) Microprocessor Application**

In order to avoid annoying "Pop-Noise" during Turn-On/Off transients, it is necessary to guarantee the right St-by and mute signals sequence. It is quite simple to obtain this function using a microprocessor (Fig. 1 and 2). At first St-by signal (from μP) goes high and the voltage across the St-by terminal (Pin 7) starts to increase exponentially. The external RC network is intended to turn-on slowly the biasing circuits of the amplifier, this to avoid "POP" and "CLICK" on the outputs.

When this voltage reaches the St-by threshold level, the amplifier is switched-on and the external capacitors in series to the input terminals (C3, C53) start to charge.

It's necessary to maintain the mute signal low until the capacitors are fully charged, this to avoid that the device goes in play mode causing a loud "Pop Noise" on the speakers.

A delay of 100-200ms between St-by and mute signals is suitable for a proper operation.

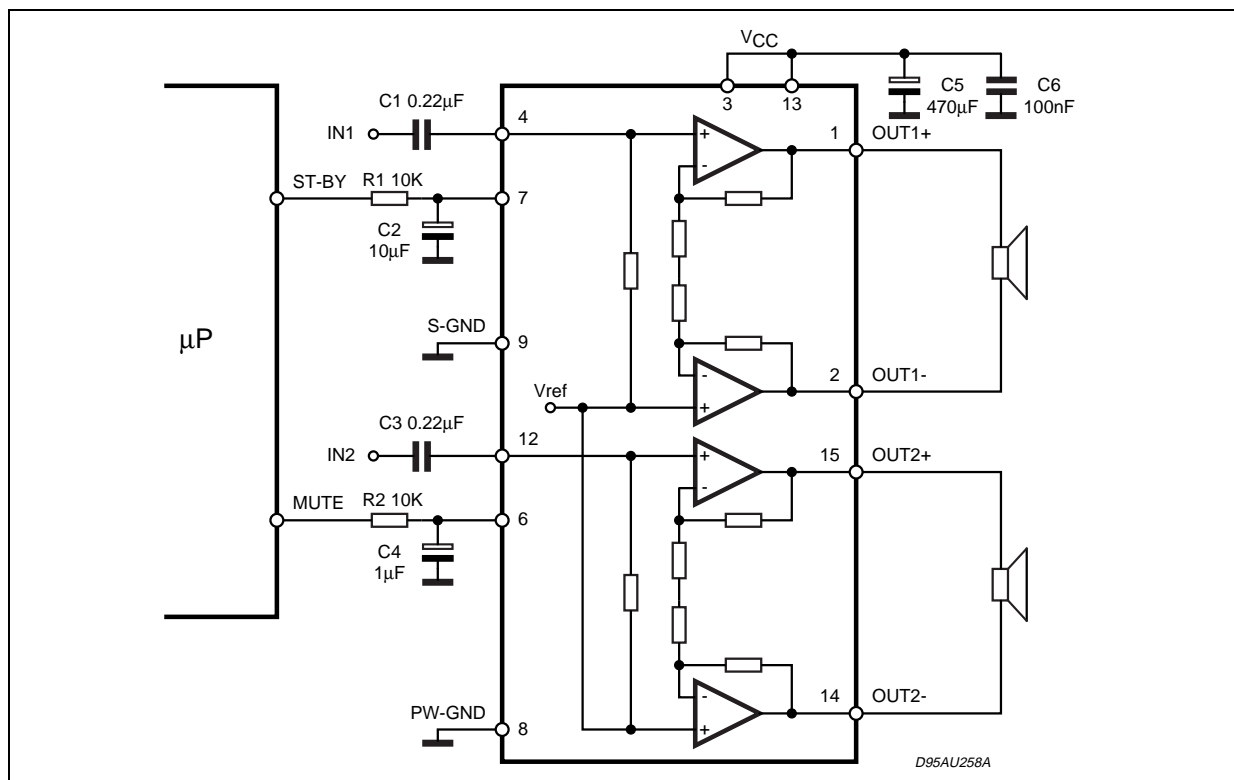
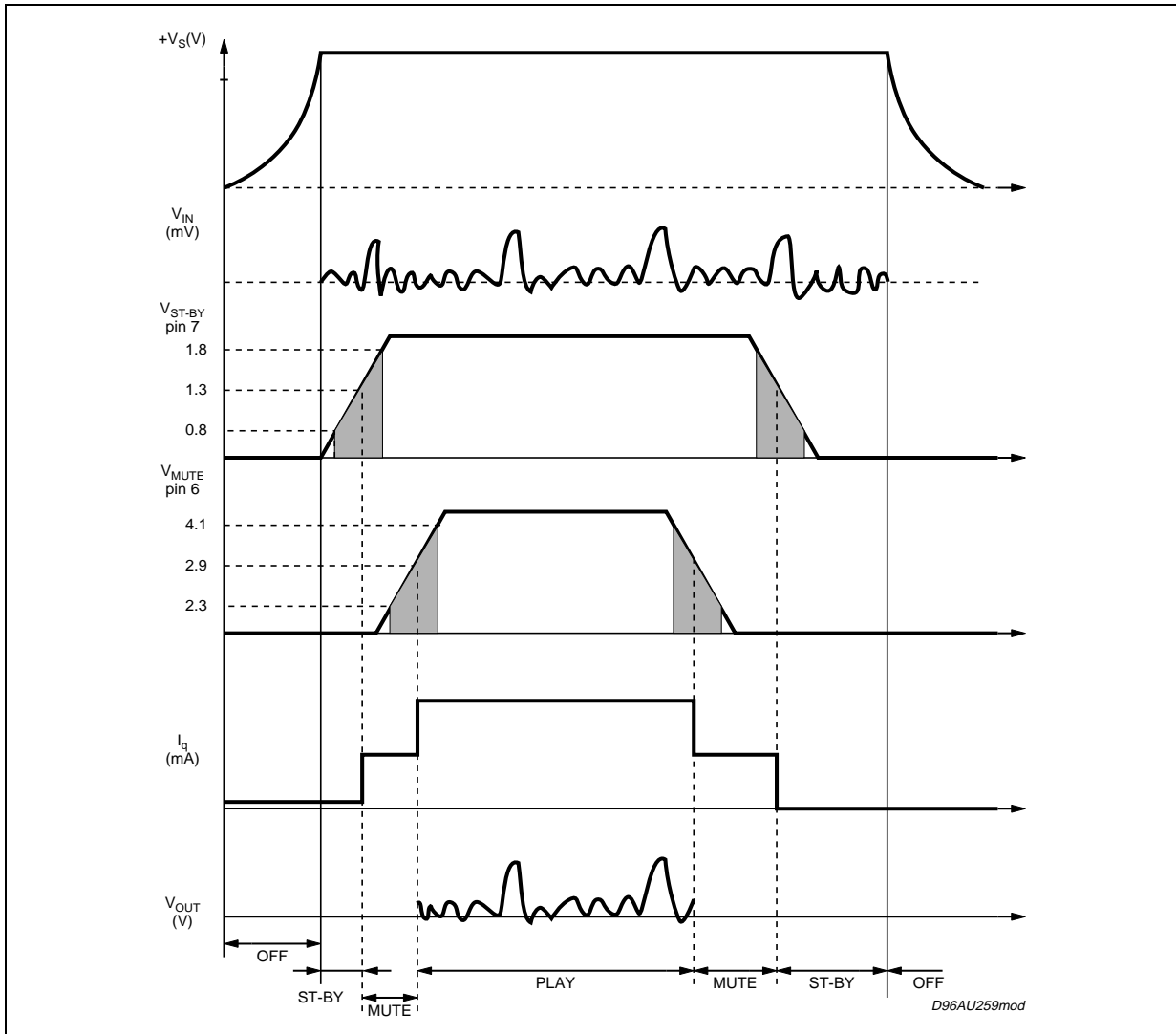
**Figure 1. Microprocessor Application**

Figure 2. Microprocessor Driving Signals



**B) Low Cost Application**

In low cost applications where the  $\mu P$  is not present, the suggested circuit is shown in fig.3.

The St-by and mute terminals are tied together and they are connected to the supply line via an external voltage divider.

The device is switched-on/off from the supply line and the external capacitor C4 is intended to delay the St-by and mute threshold exceeding, avoiding "Popping" problems.

Figure 3. Stand-alone low-cost Application

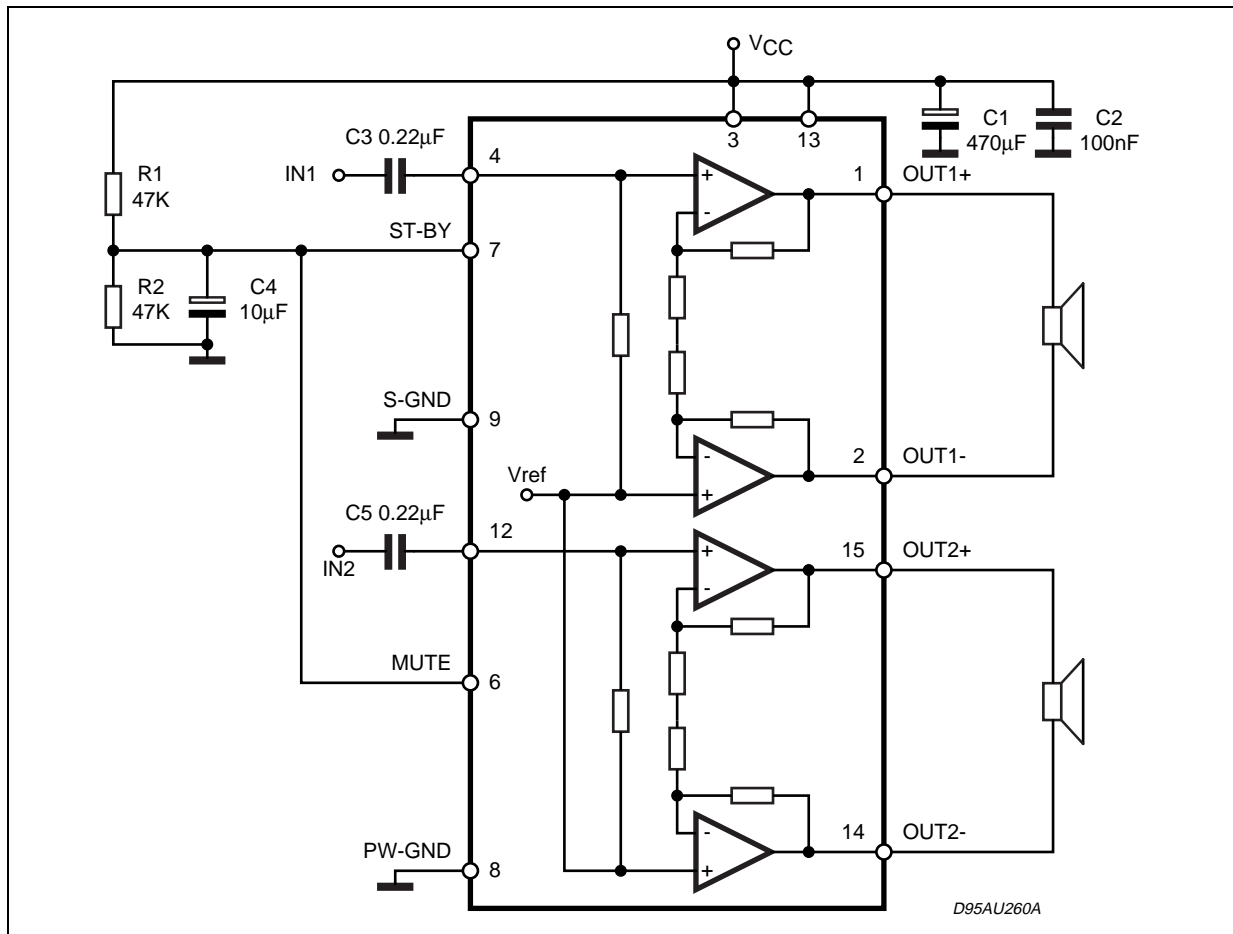


Figure 4. Distortion vs Frequency

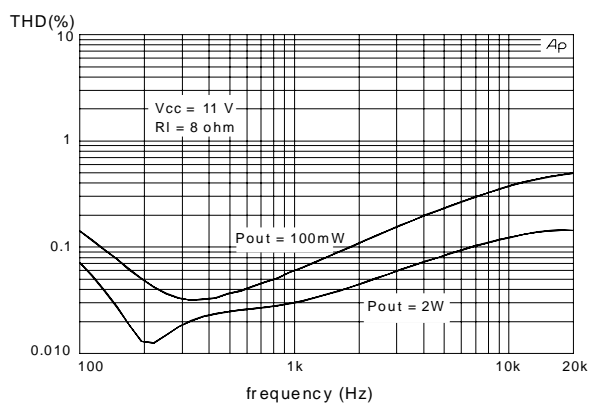


Figure 5. Gain vs Frequency

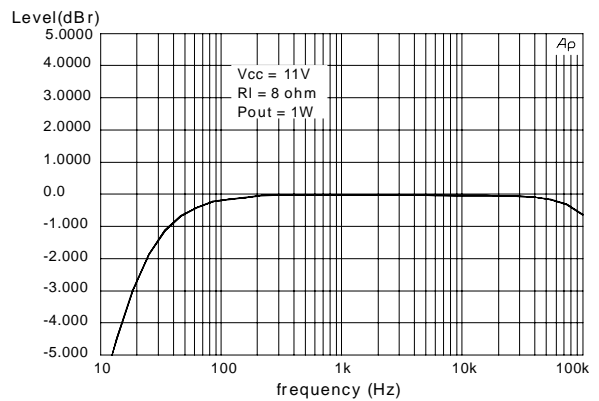


Figure 6. Mute Attenuation vs Vpin.8

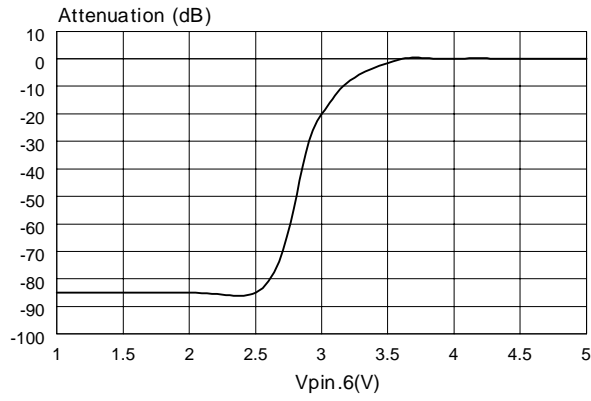


Figure 8. Quiescent Current vs Supply Voltage

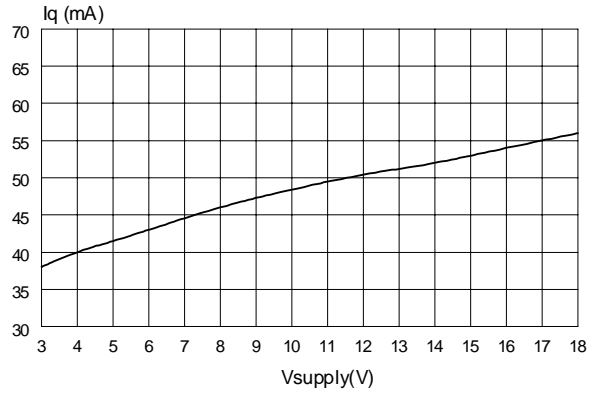


Figure 7. Stand-By attenuation vs Vpin 9

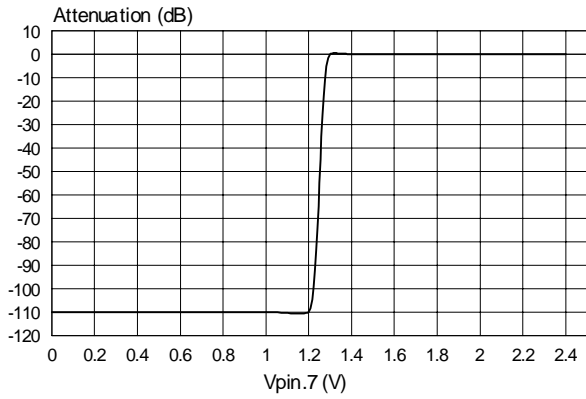


Figure 9. PC Board Component Layout

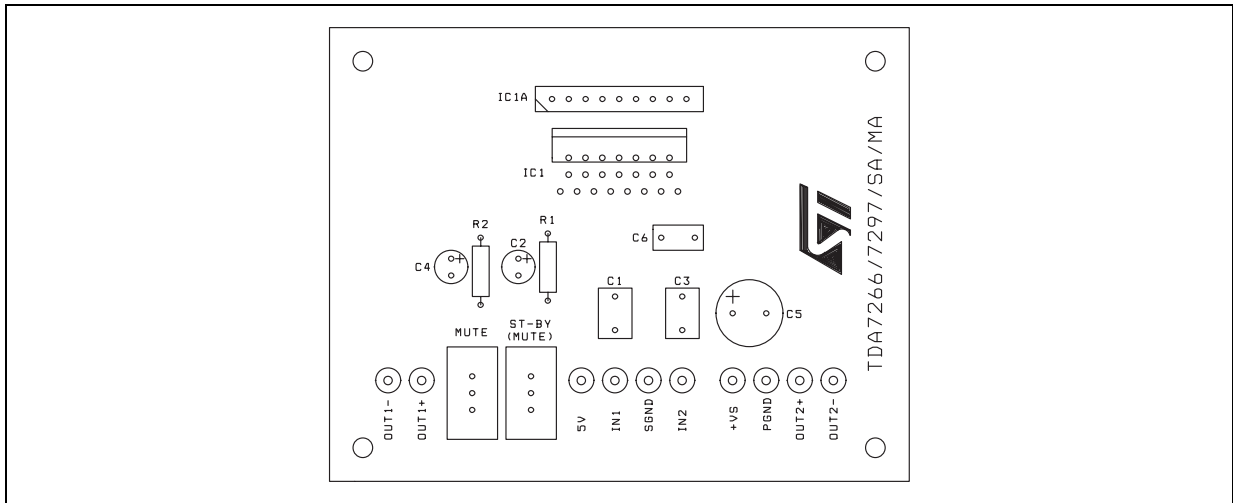


Figure 10. Evaluation Board Top Layer Layout

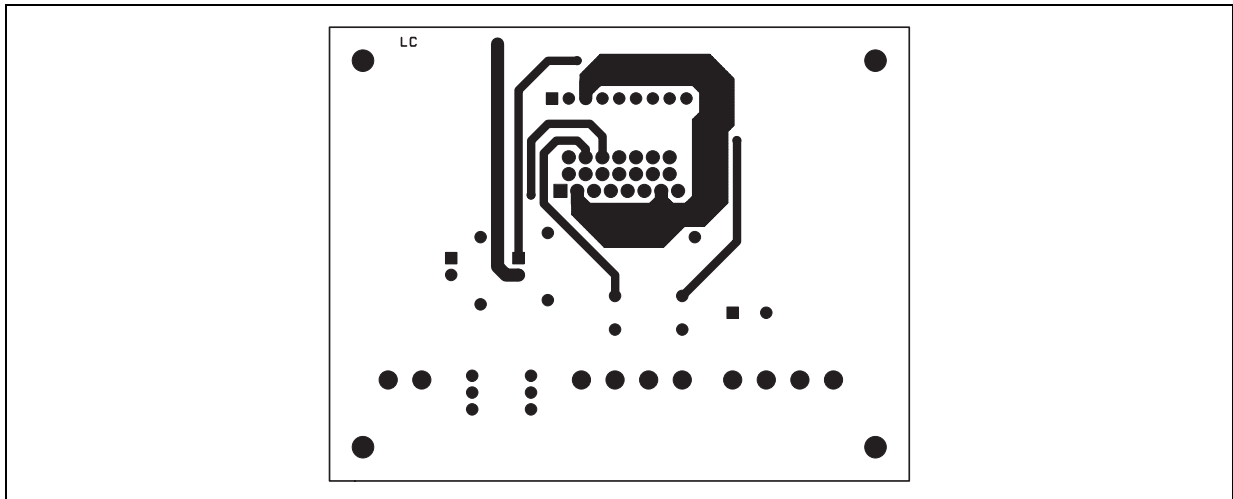
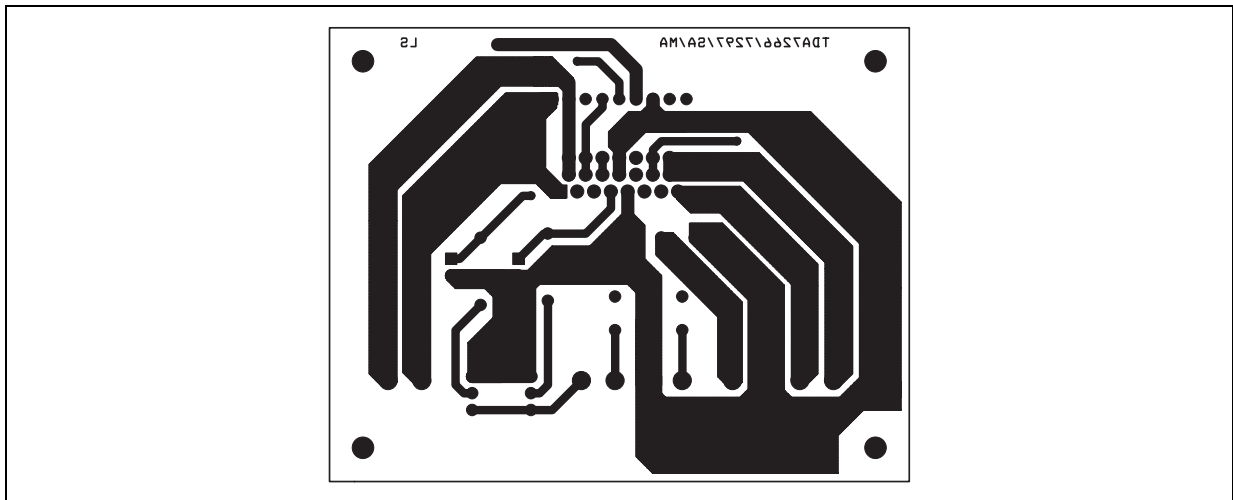


Figure 11. Evaluation Board Bottom Layer Layout



**HEAT SINK DIMENSIONING:**

In order to avoid the thermal protection intervention, that is placed approximatively at  $T_j = 150^\circ\text{C}$ , it is important the dimensioning of the Heat Sink  $R_{Th}$  ( $^\circ\text{C}/\text{W}$ ).

The parameters that influence the dimensioning are:

- Maximum dissipated power for the device ( $P_{dmax}$ )
- Max thermal resistance Junction to case ( $R_{Th\ j-c}$ )
- Max. ambient temperature  $T_{amb\ max}$
- Quiescent current  $I_q$  (mA)

Example:

$V_{CC} = 11\text{V}$ ,  $R_{load} = 80\text{ohm}$ ,  $R_{Th\ j-c} = 2.5\ ^\circ\text{C}/\text{W}$ ,  $T_{amb\ max} = 50^\circ\text{C}$

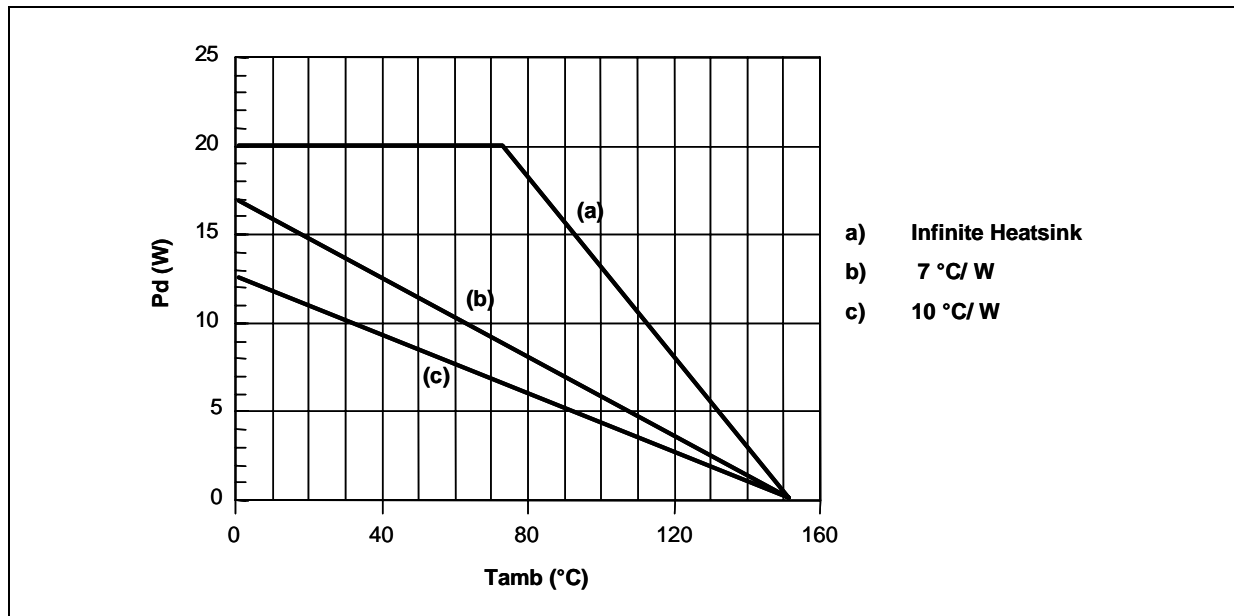
$$P_{dmax} = (N^\circ \text{ channels}) \cdot \frac{V_{cc}^2}{\Pi^2 \cdot \frac{R_{load}}{2}} + I_q \cdot V_{cc}$$

$$P_{dmax} = 2 \cdot (3.0) + 0.5 = 6.5\ \text{W}$$

$$(\text{Heat Sink}) R_{Th\ c-a} = \frac{150 - T_{amb\ max}}{P_{d\ max}} - R_{Th\ j-c} = \frac{150 - 50}{6.5} - 2.5 = 12.8\ ^\circ\text{C}/\text{W}$$

In figure 12 is shown the Power derating curve for the device.

**Figure 12. Power derating curve**





### Clipwatt Assembling Suggestions

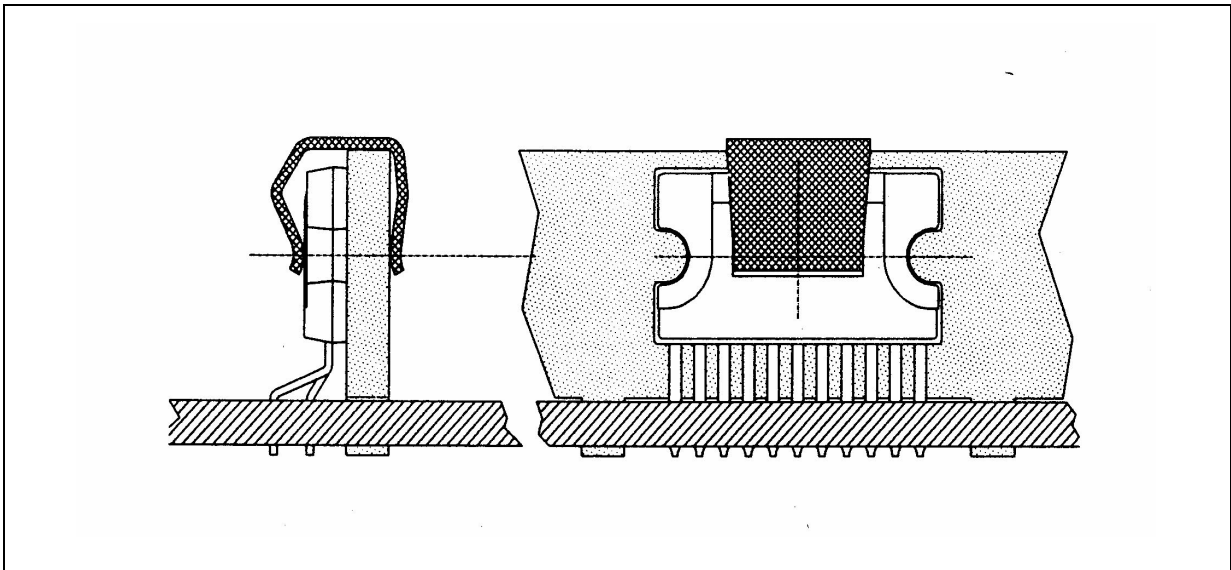
The suggested mounting method of Clipwatt on external heat sink, requires the use of a clip placed as much as possible in the plastic body center, as indicated in the example of figure 13.

A thermal grease can be used in order to reduce the additional thermal resistance of the contact between package and heatsink.

A pressing force of 7 - 10 Kg gives a good contact and the clip must be designed in order to avoid a maximum contact pressure of 15 Kg/mm<sup>2</sup> between it and the plastic body case.

As example, if a 15Kg force is applied by the clip on the package, the clip must have a contact area of 1mm<sup>2</sup> at least.

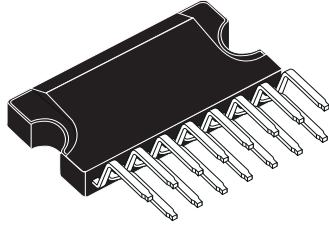
**Figure 13. Example of right placement of the clip**



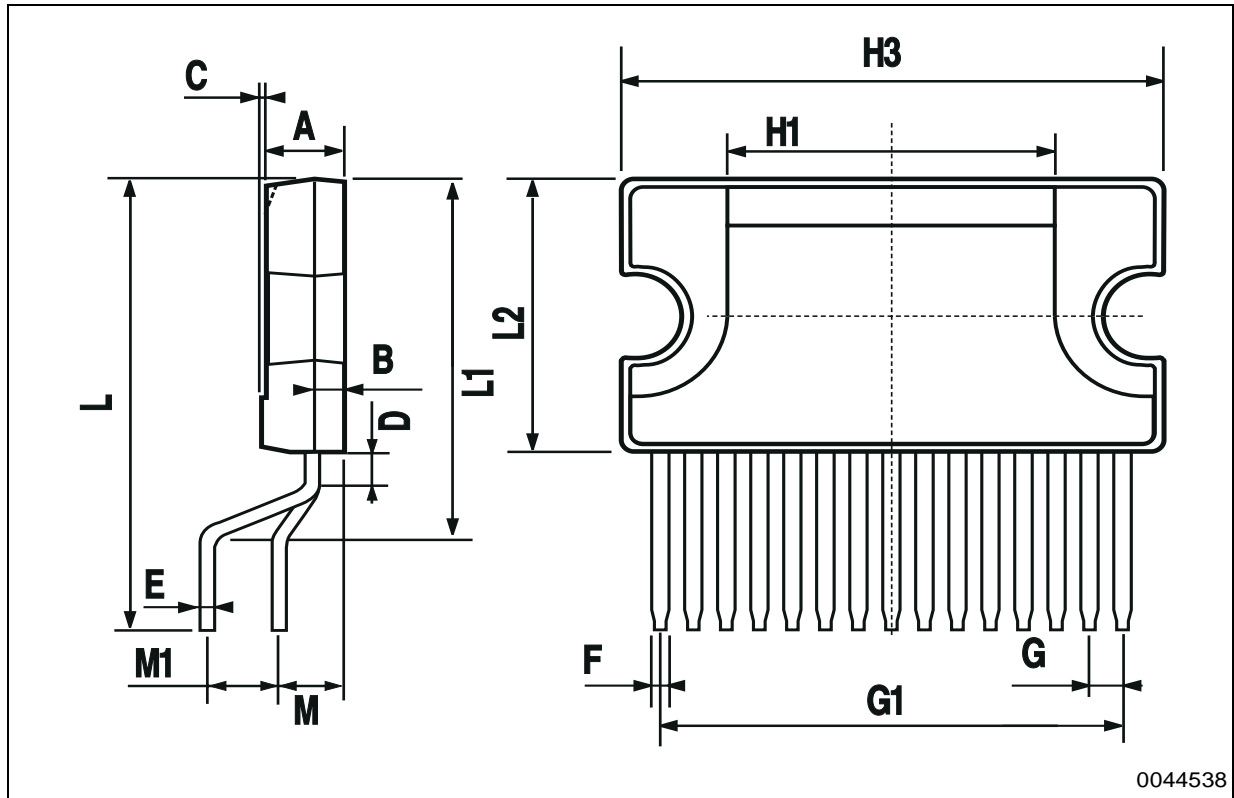
| DIM. | mm    |       |       | inch  |       |       |
|------|-------|-------|-------|-------|-------|-------|
|      | MIN.  | TYP.  | MAX.  | MIN.  | TYP.  | MAX.  |
| A    |       |       | 3.2   |       |       | 0.126 |
| B    |       |       | 1.05  |       |       | 0.041 |
| C    |       | 0.15  |       |       | 0.006 |       |
| D    |       | 1.55  |       |       | 0.061 |       |
| E    | 0.49  |       | 0.55  | 0.019 |       | 0.022 |
| F    | 0.67  |       | 0.73  | 0.026 |       | 0.029 |
| G    | 1.14  | 1.27  | 1.4   | 0.045 | 0.050 | 0.055 |
| G1   | 17.57 | 17.78 | 17.91 | 0.692 | 0.700 | 0.705 |
| H1   |       | 12    |       |       | 0.480 |       |
| H2   |       | 18.6  |       |       | 0.732 |       |
| H3   | 19.85 |       |       | 0.781 |       |       |
| L    |       | 17.95 |       |       | 0.707 |       |
| L1   |       | 14.45 |       |       | 0.569 |       |
| L2   | 10.7  | 11    | 11.2  | 0.421 | 0.433 | 0.441 |
| L3   |       | 5.5   |       |       | 0.217 |       |
| M    |       | 2.54  |       |       | 0.100 |       |
| M1   |       | 2.54  |       |       | 0.100 |       |

**OUTLINE AND MECHANICAL DATA**

Weight: 1.92gr



**Clipwatt15**



0044538



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