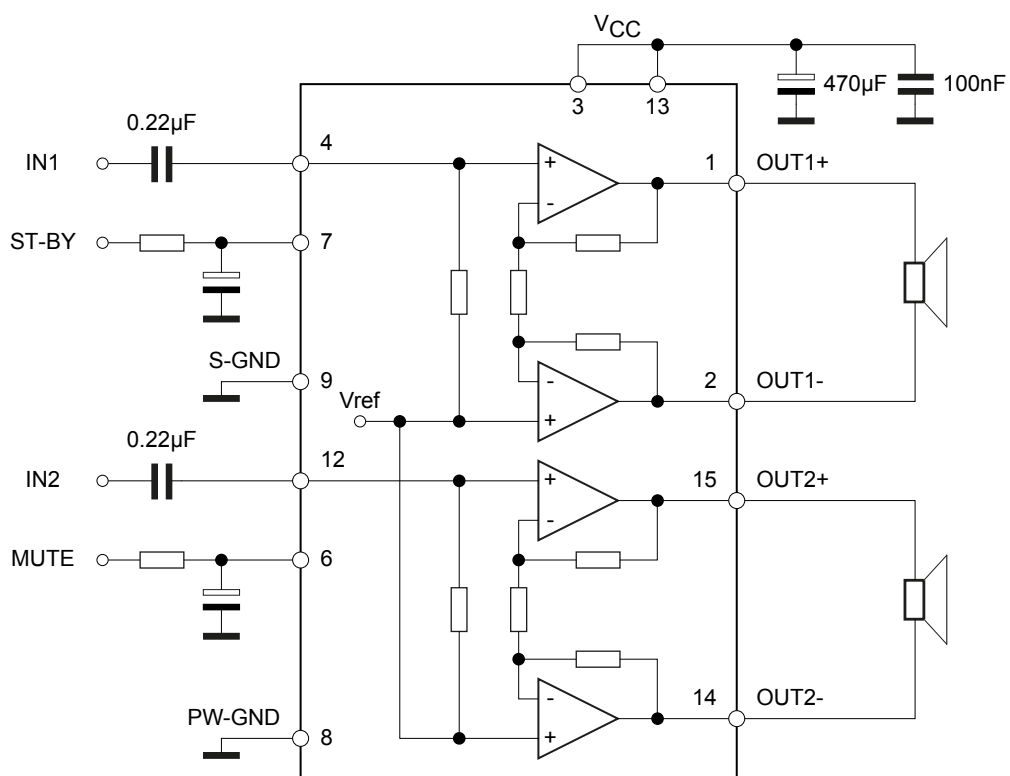


# 1 Block diagram

Figure 1. Block and application diagram



## 2 Maximum ratings

**Table 1. Absolute maximum ratings**

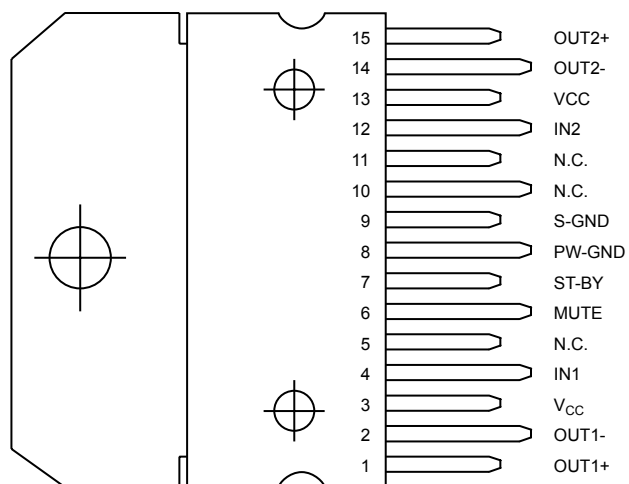
| Symbol    | Parameter   | Value       | Unit |
|-----------|---|-------------|------|
| $V_S$     | Supply voltage  | 20          | V    |
| $I_O$     | Output peak current (internally limited)              | 2           | A    |
| $P_{tot}$ | Total power dissipation ( $T_{case} = 70\text{ °C}$ ) | 33          | W    |
| $T_{op}$  | Operating temperature                                 | -10 to +85  | °C   |
| $T_{stg}$ | Storage temperature                                   | -40 to +150 | °C   |
| $T_j$     | Junction temperature                                  |             |      |

**Table 2. Thermal data**

| Symbol         | Parameter                        | Typ. | Max. | Unit |
|----------------|----------------------------------|------|------|------|
| $R_{th-jcase}$ | Thermal resistance junction-case | 1.4  | 2    | °C/W |

### 3 Pin connection

**Figure 2. Pin connection (top view)**



## 4 Electrical characteristics

$V_{CC} = 11\text{ V}$ ,  $R_L = 8\ \Omega$ ,  $f = 1\text{ kHz}$ ,  $T_{amb} = 25\text{ °C}$  unless otherwise specified.

**Table 3. Electrical characteristics**

| Symbol       | Parameter                        | Test conditions                                     | Min.         | Typ.            | Max.           | Unit          |
|--------------|----------------------------------|---|--------------|-----------------|----------------|---------------|
| $V_{CC}$     | Supply range                     |   | 3            | 11              | 18             | V             |
| $I_q$        | Total quiescent current          |   |              | 50              | 65             | mA            |
| $V_{OS}$     | Output offset voltage            |   |              |                 | 120            | mV            |
| $P_O$        | Output power                     | THD = 10%   | 6.3          | 7               |                | W             |
| THD          | Total harmonic distortion        | $P_O = 1\text{ W}$                                  |              | 0.05            | 0.2            | %             |
|              |                                  | $P_O = 1\text{ W to }2\text{ W}$                    |              |                 | 1              |               |
|              |                                  | $f = 100\text{ Hz to }15\text{ kHz}$                |              |                 |                |               |
| SVR          | Supply voltage rejection         | $f = 100\text{ Hz}$ , $V_R = 0.5\text{ V}$          | 40           | 56              |                | dB            |
| CT           | Crosstalk                        |   | 46           | 60              |                | dB            |
| $A_{MUTE}$   | Mute attenuation                 |   |              |                 |                |               |
| $T_W$        | Thermal threshold                |   |              |                 |                |               |
| $G_V$        | Closed loop voltage gain         |   | 25           | 26              | 27             | dB            |
| $\Delta G_V$ | Voltage gain matching            |   |              |                 | 0.5            |               |
| $R_I$        | Input resistance                 |   | 25           | 30              |                | k $\Omega$    |
| $V_{TMUTE}$  | Mute threshold                   | for $V_{CC} > 6.4\text{ V}$ ; $V_O = -30\text{ dB}$ | 2.3          | 2.9             | 4.1            | V             |
|              |                                  | for $V_{CC} < 6.4\text{ V}$ ; $V_O = -30\text{ dB}$ | $V_{CC}/2-1$ | $V_{CC}/2-0.75$ | $V_{CC}/2-0.5$ |               |
| $V_{TST-BY}$ | ST-BY threshold                  |   | 0.8          | 1.3             | 1.8            | V             |
| $I_{ST-BY}$  | ST-BY current $V_6 = \text{GND}$ |   |              |                 | 100            | $\mu\text{A}$ |
| $e_N$        | Total output noise voltage       | A curve<br>$f = 20\text{ Hz to }20\text{ kHz}$      |              | 150             |                | $\mu\text{V}$ |

## 5 Application suggestion

Standby and mute functions

### (A) Microprocessor application

Turn-on/off transients, guarantee the right ST-BY and mute signal sequence.

This function can be got thanks to a microprocessor (Figure 3. Microprocessor application and Figure 4. Microprocessor driving signals).

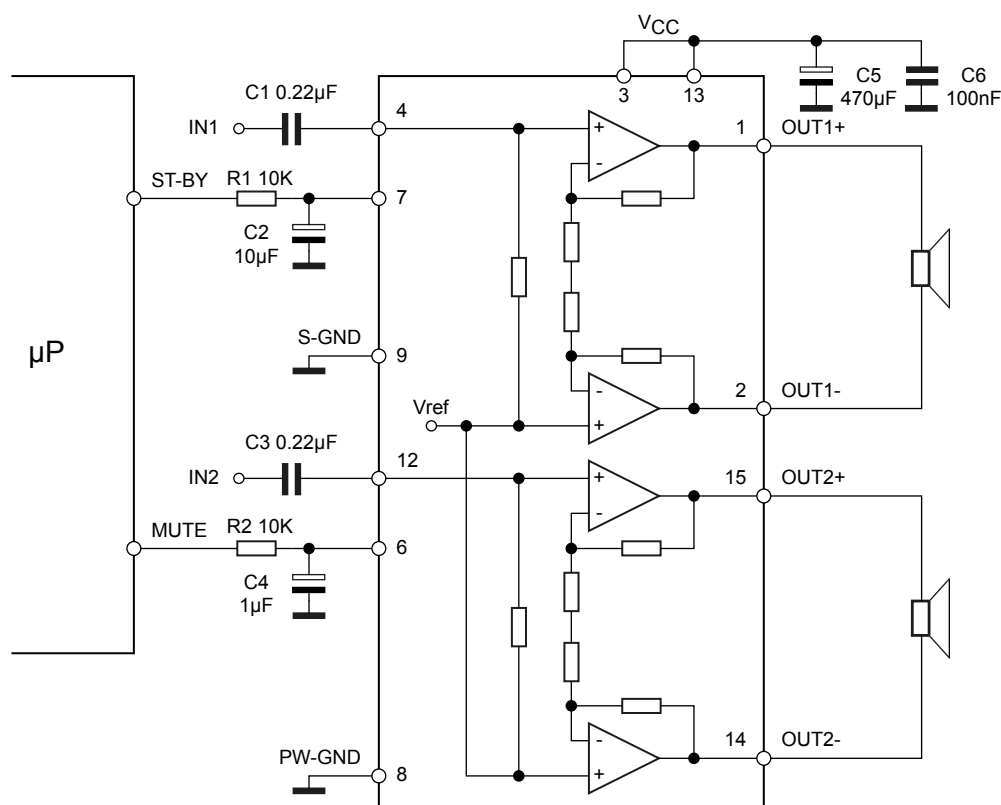
At first ST-BY signal (from microprocessor) goes high and the voltage across the ST-BY terminal (Pin 7) starts to increase exponentially. The external RC network turns on slowly the biasing circuits of the amplifier, to avoid "POP" and "CLICK" on the outputs.

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, C5) start to charge.

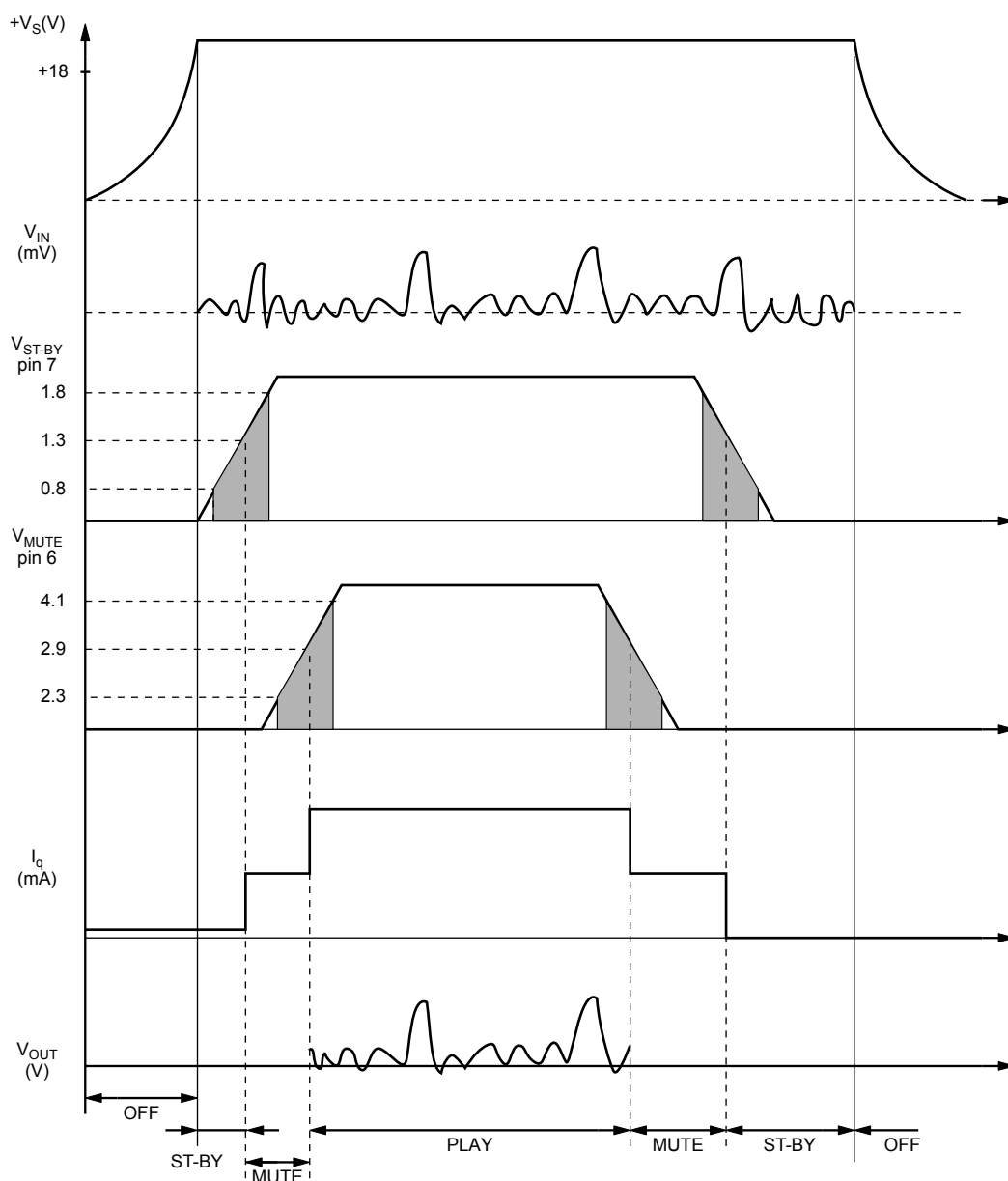
The mute signal must be kept low until the capacitors are fully charged, so to avoid that the device goes to play mode causing a loud "Pop Noise" on the speakers.

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

**Figure 3. Microprocessor application**



**Figure 4. Microprocessor driving signals**



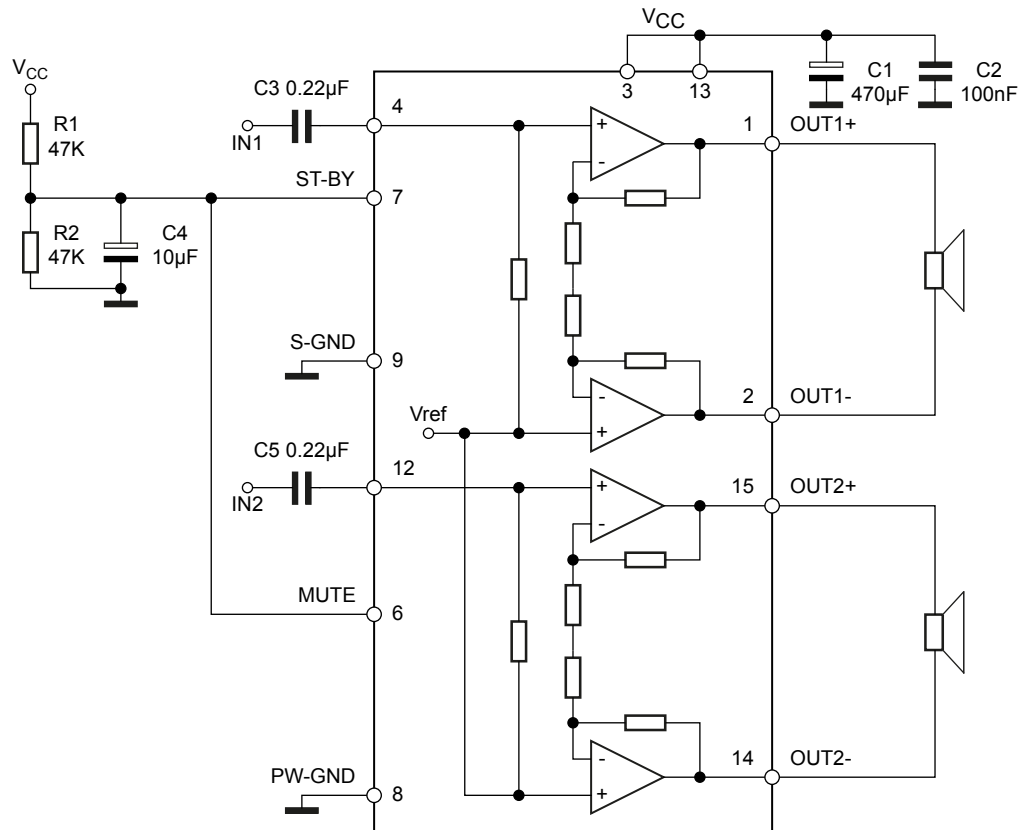
### (B) Low cost application

In low cost applications where the microprocessor is not present, the suggested circuit is shown in [Figure 5. Stand-alone low-cost application.](#)

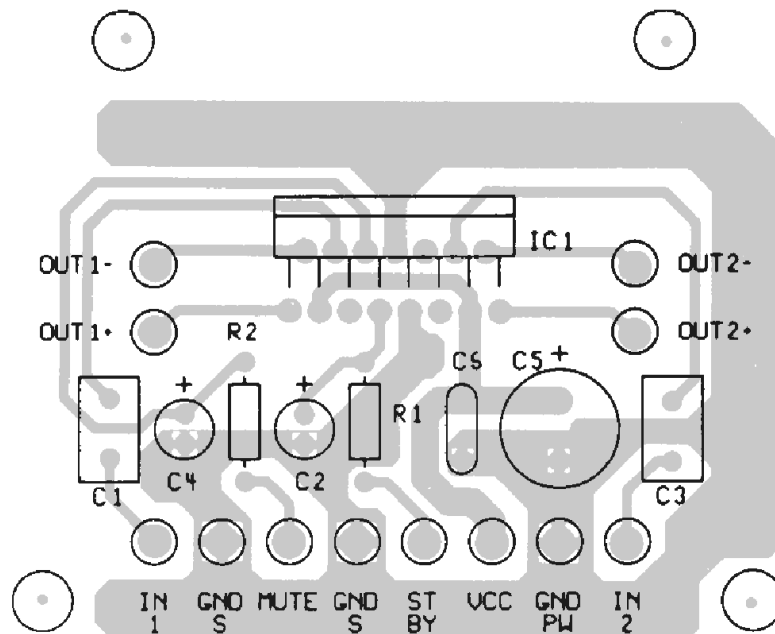
The ST-BY and mute terminals are tied together and they are connected to the supply line via an external voltage divider.

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 5. Stand-alone low-cost application**

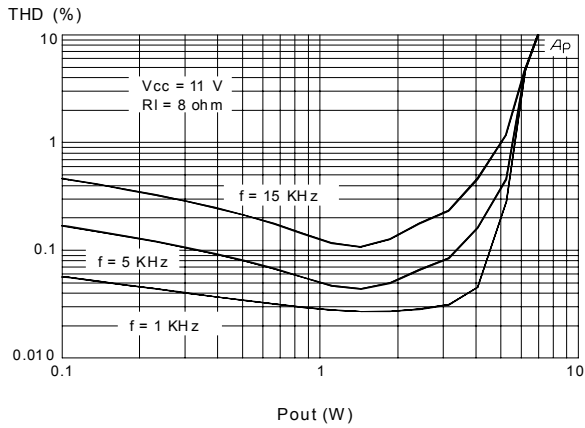


**Figure 6. PCB and component layout of the application circuit (Fig. 1)**

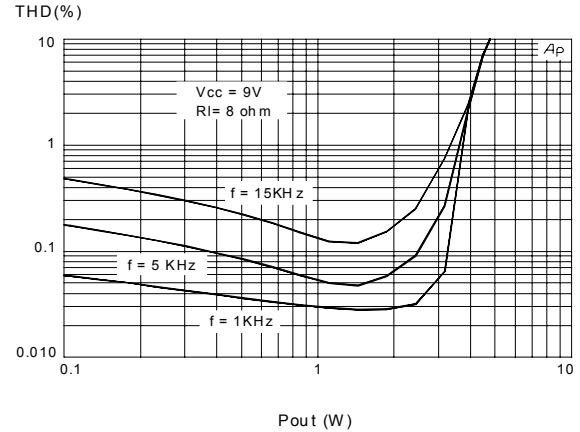


## 6 Typical characteristics

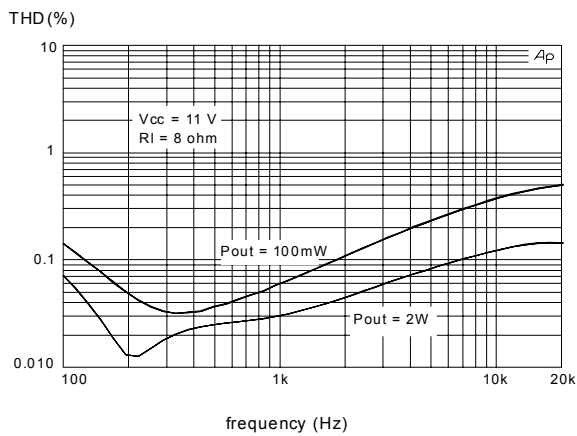
**Figure 7. Distortion vs. output power ( $V_{CC} = 11\text{ V}$ )**



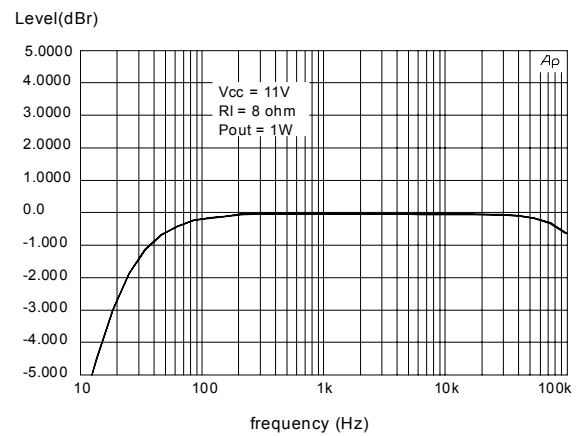
**Figure 8. Distortion vs. output power ( $V_{CC} = 9\text{ V}$ )**



**Figure 9. Distortion vs. frequency**

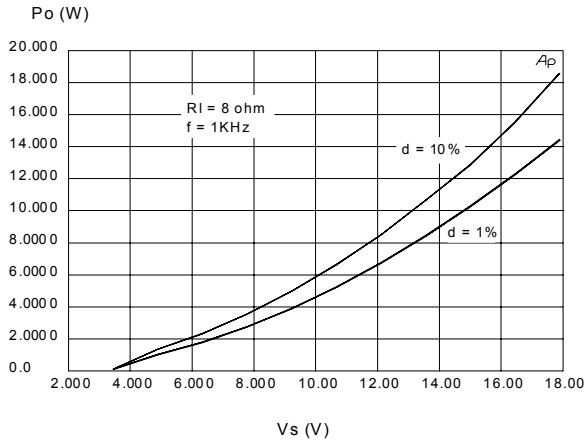


**Figure 10. Gain vs. frequency**

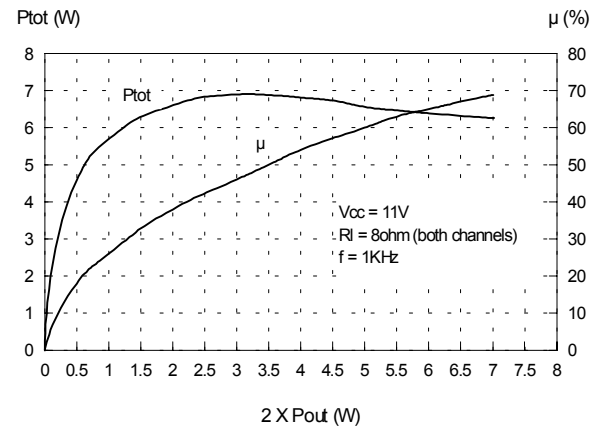




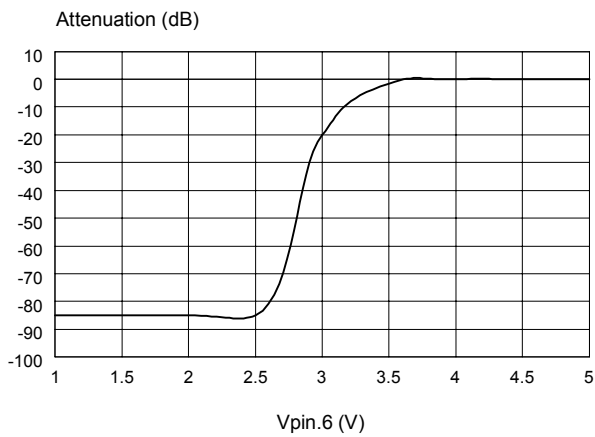
**Figure 11. Output power vs. supply voltage**



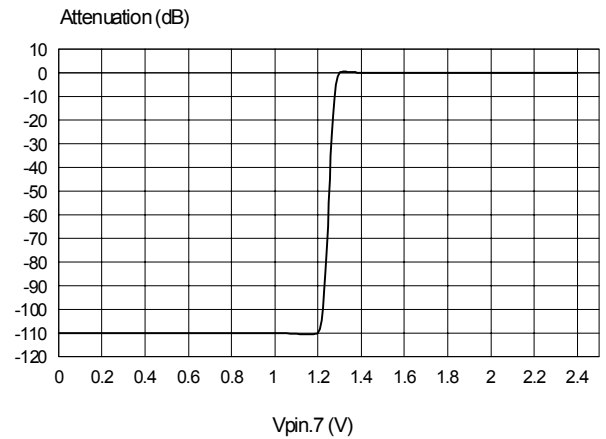
**Figure 12. Total power dissipation & efficiency vs. output power**



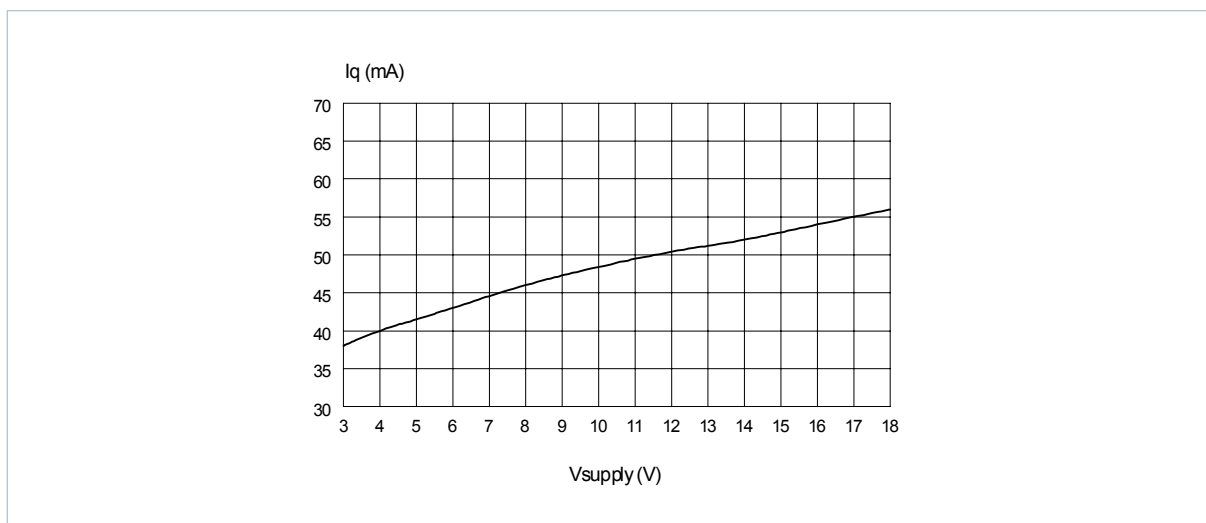
**Figure 13. Mute attenuation vs. Vpin. 6**



**Figure 14. Standby attenuation vs. Vpin. 7**



**Figure 15. Quiescent current vs. supply voltage**



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## 7 Package information

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In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

## 7.1 Multiwatt15 V package information

Figure 16. Multiwatt15 V package outline

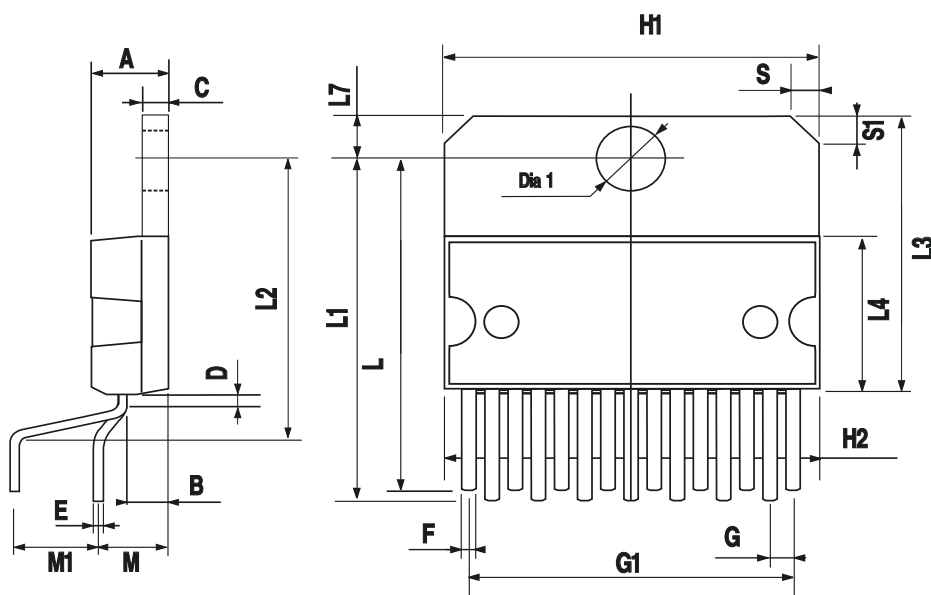


Table 4. Multiwatt15 V package mechanical data

| Symbol | Millimeters |       |       | Inches |       |       |
|--------|-------------|-------|-------|--------|-------|-------|
|        | 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 |

| Symbol | Milimeters |      |      | Inches |      |       |
|--------|------------|------|------|--------|------|-------|
|        | Min.       | Typ. | Max. | Min.   | Typ. | Max.  |
| S1     | 1.9        |      | 2.6  | 0.075  |      | 0.102 |
| Dia1   | 3.65       |      | 3.85 | 0.144  |      | 0.152 |

## Revision history

**Table 5. Document revision history**

| Date        | Version | Changes   |
|-------------|---------|---|
| 24-Mar-2002 | 10      | No history because of migration.  |
| 18-Jun-2019 | 11      | Updated operating temperature value in <a href="#">Table 1. Absolute maximum ratings.</a> |

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