

## 6W AMPLIFIER WITH MUTING

### 1 FEATURES

- WIDE SUPPLY VOLTAGE RANGE
- 6W @  $V_S = 20V$ ,  $R_L = 8\Omega$ , THD=10%
- MUTE FACILITY (POP FREE) WITH LOW CONSUMPTION
- AC SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION (150°C)

### 2 DESCRIPTION

The TDA7253L is class AB audio power amplifier assembled in the Single in Line 10 pins Package.

Figure 1. Package

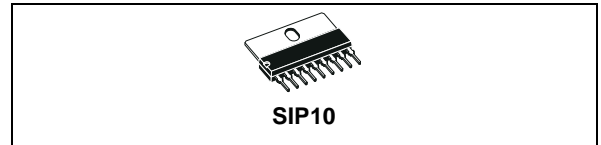
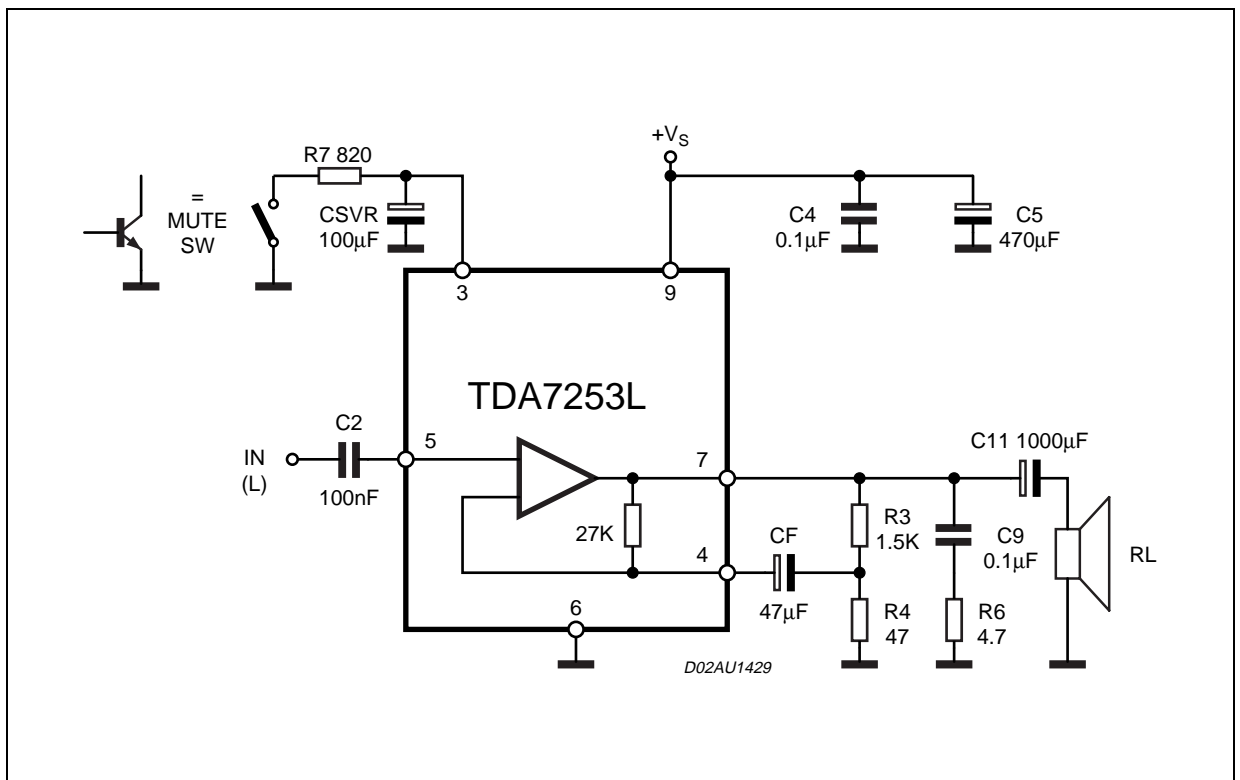


Table 1. Order Codes

Part Number	Package
TDA7253L	SIP10

Figure 2. Test and Application Circuit



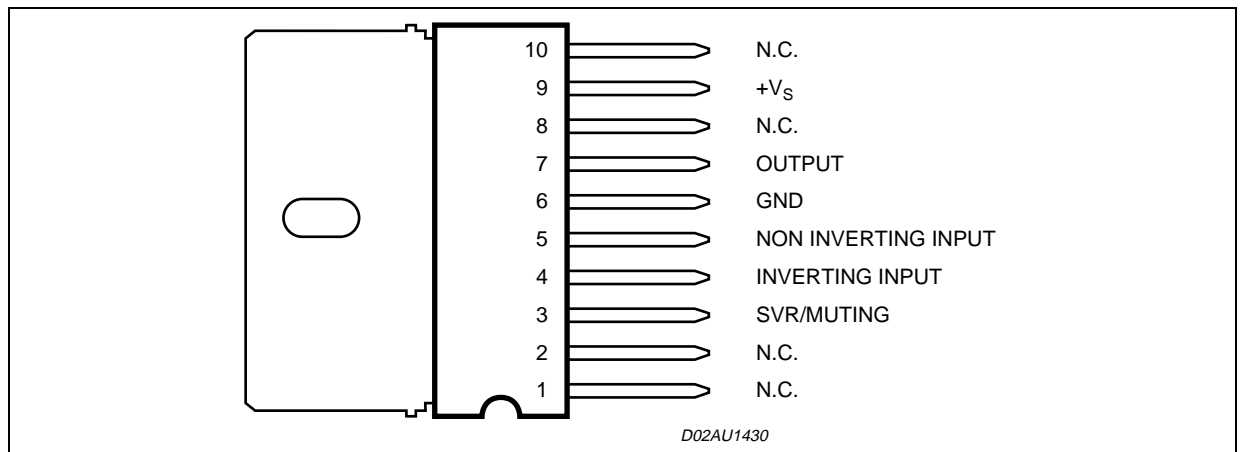
**Table 2. Absolute Maximum Ratings**

Symbol	Parameter	Value	Unit
$V_S$	Supply Voltage	30	V
$I_O$	Output Peak Current (repetitive $f > 20\text{Hz}$ )	1.7	A
$I_O$	Output Peak Current (non repetitive, $t = 100\mu\text{s}$ )	2	A
$P_{\text{tot}}$	Total Power Dissipation ( $T_{\text{case}} = 70^\circ\text{C}$ )	8	W
$T_{\text{op}}$	Operating Temperature Range	0 to 70	$^\circ\text{C}$
$T_{\text{stg}}, T_j$	Storage & Junction Temperature	-40 to 150	$^\circ\text{C}$

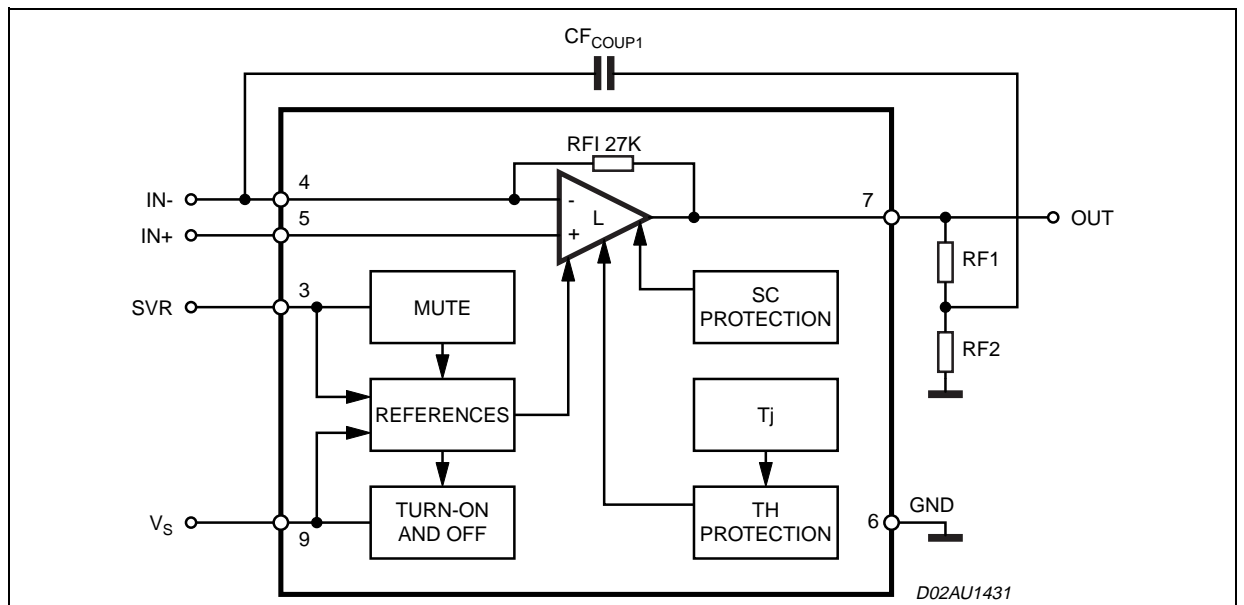
**Table 3. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{\text{th j-case}}$	Thermal resistance junction to case	Max 9	$^\circ\text{C/W}$

**Figure 3. Pin Connection (Top view)**



**Figure 4. Block Diagram**



**Table 4. ELECTRICAL CHARACTERISTICS**

(Refer to the test and application circuit,  $V_S = 20V$ ;  $R_L = 8\Omega$ ;  $G_v = 30dB$ ;  $f = 1KHz$ ;  $T_{amb} = 25^\circ C$  unless otherwise specified).

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage		10		24	V
$V_O$	Quiescent Output Voltage			9.5		V
$I_q$	Total Quiescent Current			30	60	mA
$P_O$	Output Power	$d = 10\%$	5	6		W
		$d = 1\%$	4	5		W
$d$	Total Harmonic Distortion	$P_O = 1W$		0.03	0.3	%
$R_I$	Input Resistance		100	200		$K\Omega$
$f_L$	Low Frequency Roll-off (-3dB)			40		Hz
$f_H$	High Frequency Roll-off (-3dB)			80		KHz
$e_N$	Total Input Noise Voltage	A Curve; $R_S = 10K\Omega$		2		mV
		$f = 22Hz$ to $22KHz$ ; $R_S = 10K\Omega$		2.5	10	$\mu V$
SVR	Supply Voltage Rejection	$R_S = 10K\Omega$ ; $f = 100Hz$ ; $V_r = 0.5V$	46	60		dB
$V_{T\_MUTE}$	Mute Threshold		1	1.6		V
$V_{T\_PLAY}$	Play Threshold			4.5		V
$A_M$	Mute Attenuation		80	100		dB
$I_{q\_MUTE}$	Quiescent Current Mute			6	10	mA

Note: to avoid pop-on noise  $\frac{C_F}{C_{SVR}} \leq 1$

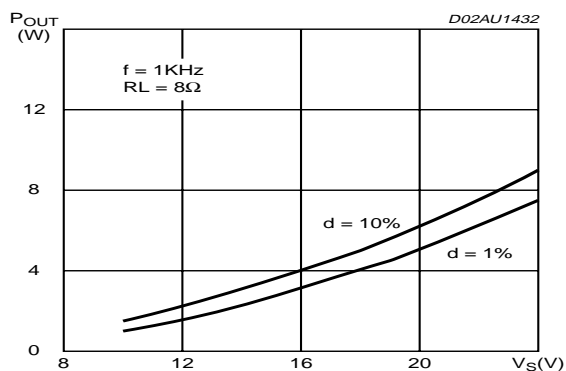
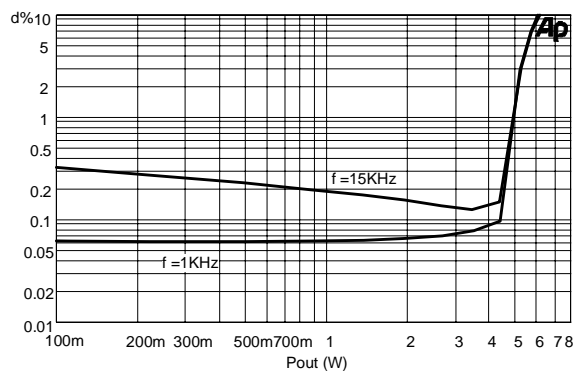
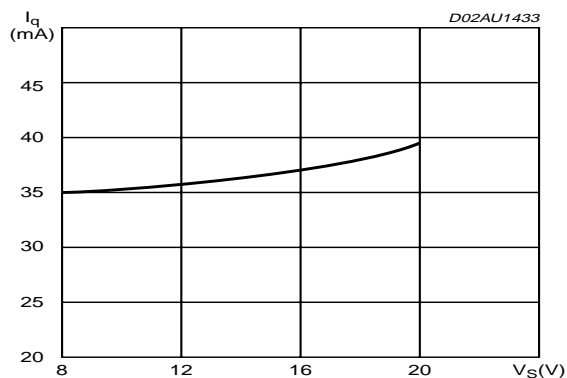
**Figure 5. Output Power vs. Supply Voltage****Figure 7. Distortion vs. Output Power****Figure 6. Quiescent Current vs. Supply Voltage**

Figure 8. PC Board Component Layout

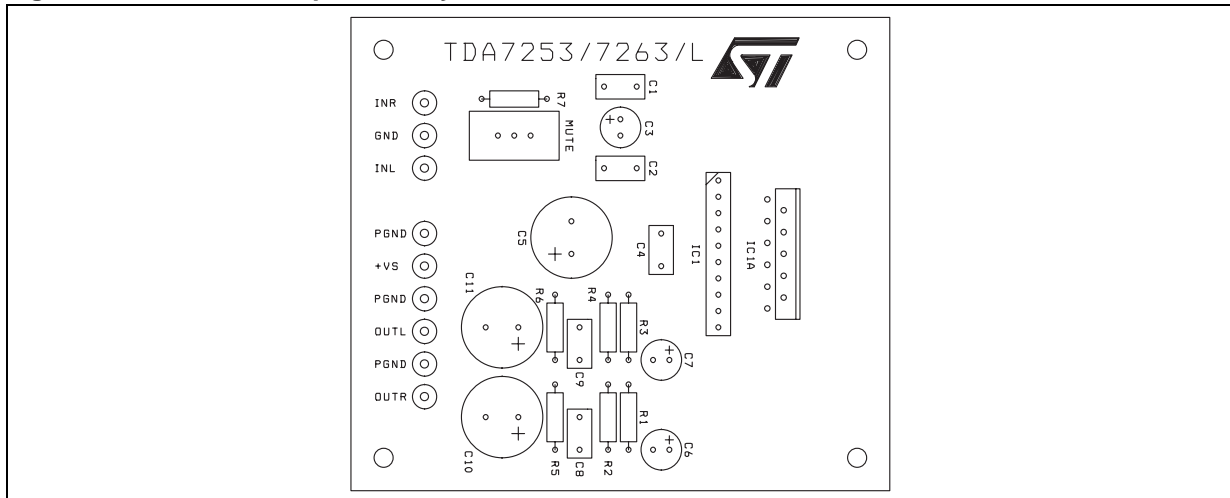


Figure 9. Evaluation Board Top Layer Layout

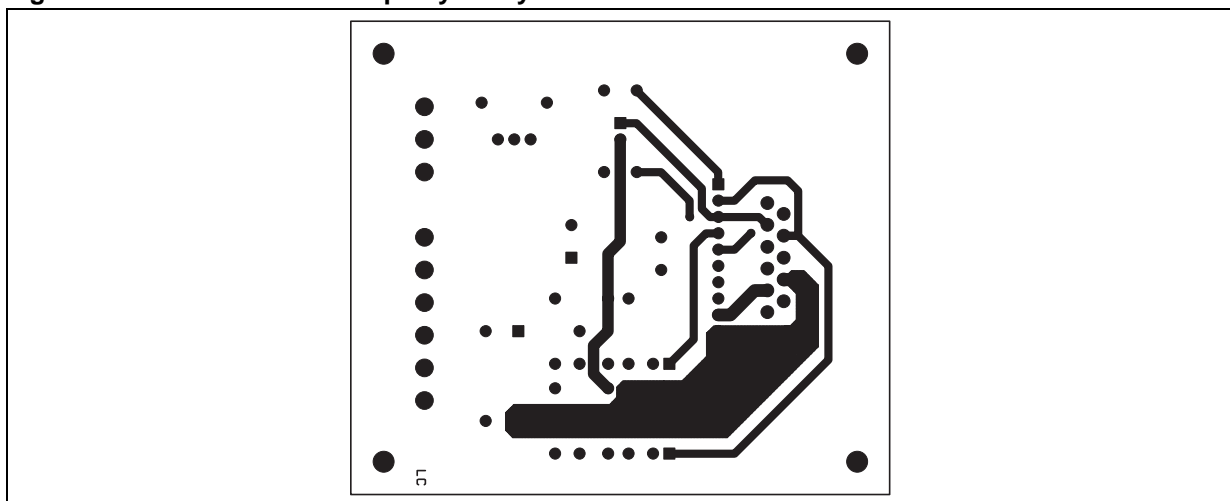
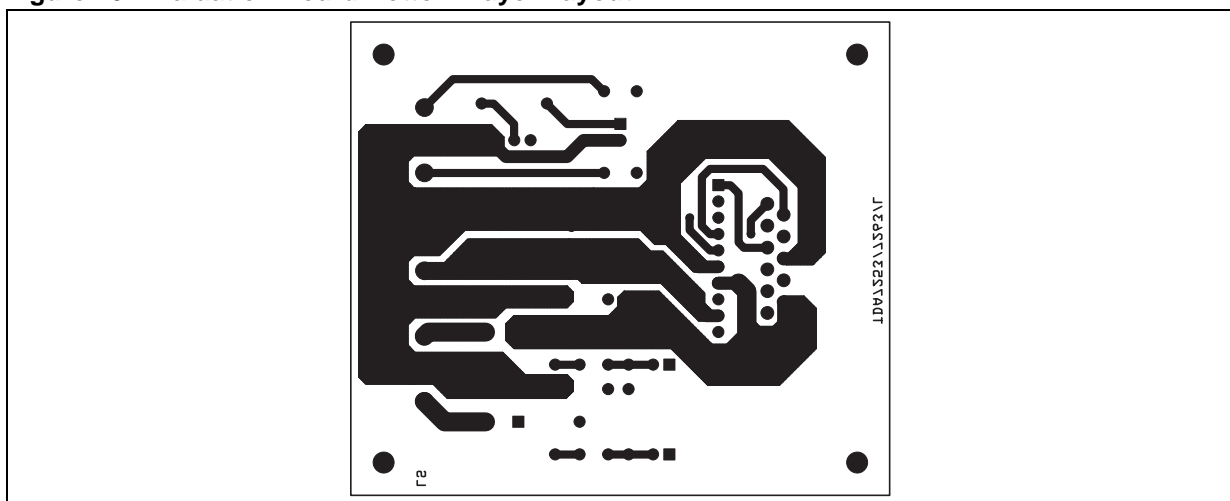


Figure 10. Evaluation Board Bottom Layer Layout



### 3 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 Sinker  $R_{Th}$  ( $^\circ\text{C}/\text{W}$ ).

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)

#### 3.1 Example:

$V_{CC} = 20\text{V}$ ,  $R_{load} = 80\text{ohm}$ ,  $R_{Th\ j-c} = 9\ ^\circ\text{C}/\text{W}$ ,  $T_{amb\ max} = 50^\circ\text{C}$

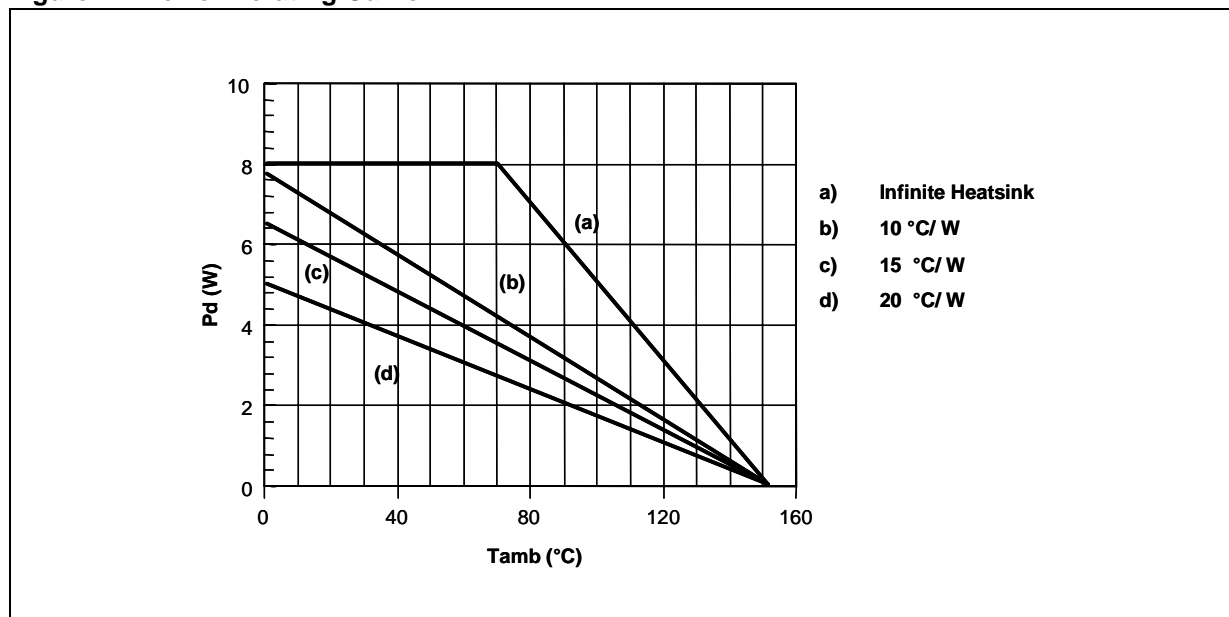
$$P_{dmax} = (N^\circ \text{ channels}) \cdot \frac{2V_{cc}^2}{\Pi^2 \cdot R_{load}} + I_q \cdot V_{cc}$$

$$P_{dmax} = 1 \cdot (2.5) + 0.5 = 3\text{W}$$

$$(\text{Heat Sinker}) R_{Th\ c-a} = \frac{150 - T_{amb\ max}}{P_{d\ max}} - R_{Th\ j-c} = \frac{150 - 50}{6} - 9 = 24.3^\circ\text{C}/\text{W}$$

In figure 8 is shown the Power derating curve for the device.

**Figure 11. Power Derating Curve**





**Table 5. Revision History**

Date	Revision	Description of Changes
June 2003	1	First Issue
September 2004	2	Changed Status and the graphic aspect in compliant to the new rules "Corporate Technical Publications Design Guide"

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