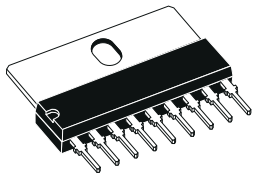
TDA7253L

6W AMPLIFIER WITH MUTING

PRODUCT PREVIEW

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

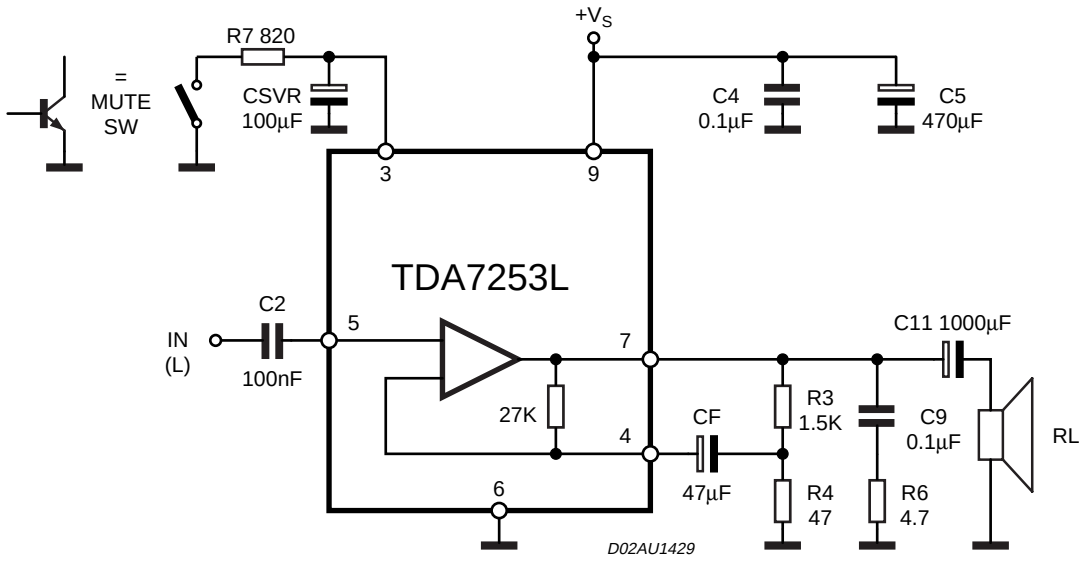


SIP10
ORDERING NUMBER: TDA7253L

DESCRIPTION

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

TEST AND APPLICATION CIRCUIT



ABSOLUTE MAXIMUM RATINGS

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

THERMAL DATA

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

PIN CONNECTION (Top view)

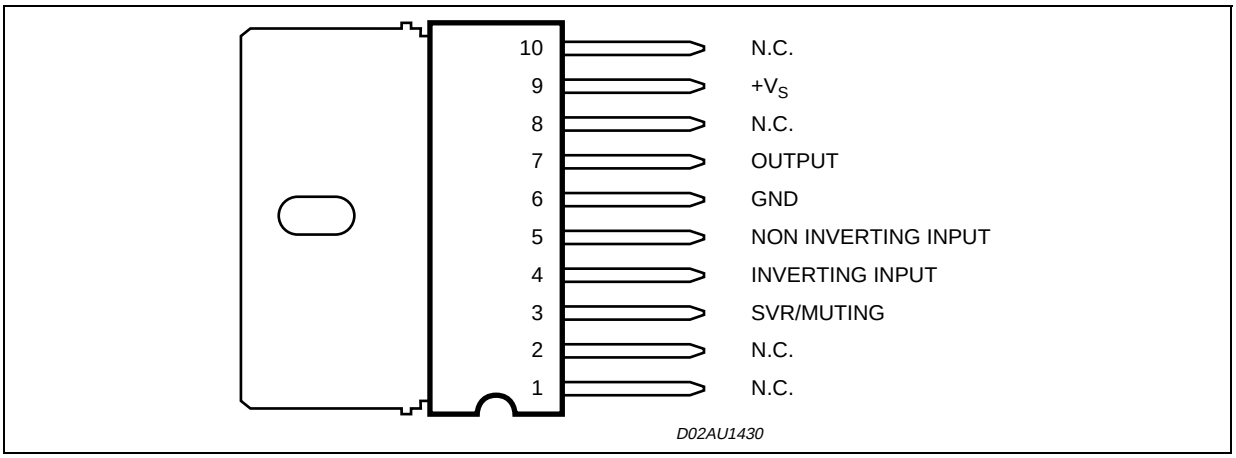
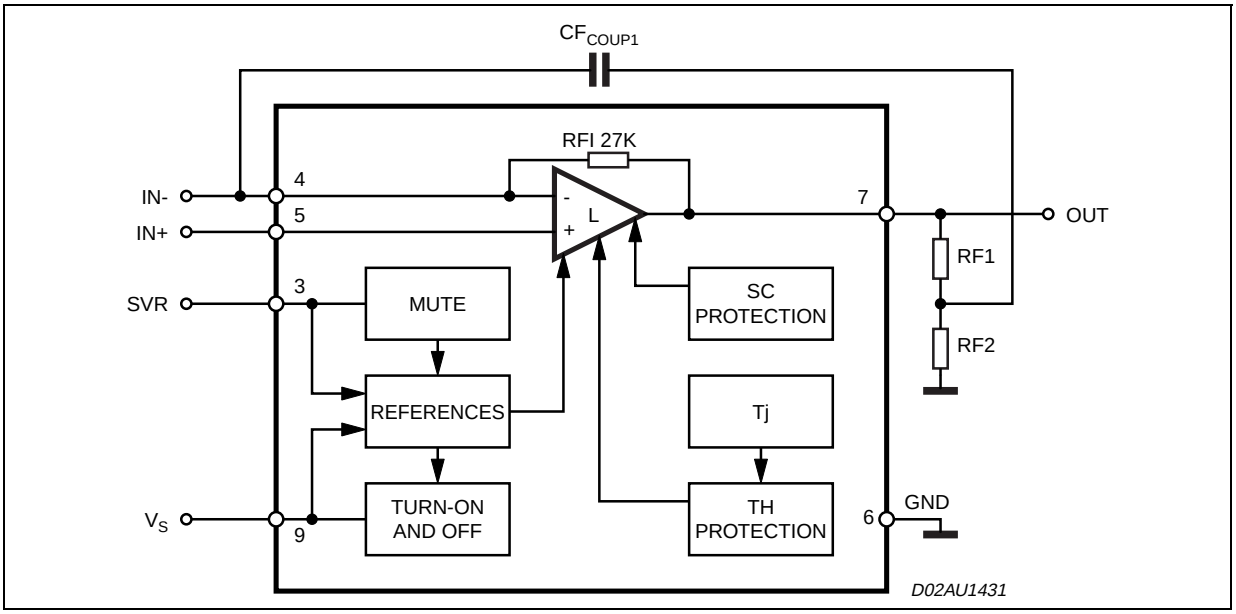


Figure 1. Block Diagram



ELECTRICAL CHARACTERISTCS (Refer to the test and application circuit, V_S = 20V; R_L = 8Ω; G_v = 30dB; f = 1KHz; T_{amb} = 25°C unless otherwise specified).

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_S	Supply Voltage		10		24	V
V_O	Quiescent Output Voltage			11.5		V
I_q	Total Quiescent Current			40		mA
P_O	Output Power	d = 10%		6		W
		d = 1%		5		W
d	Total Harmonic Distortion	PO = 1W		0.03		%
R_I	Input Resistance		100	200		KΩ
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 = 10KΩ		2		mV
		f = 22Hz to 22KHz; R_S = 10KΩ		2.5	10	μV
SVR	Supply Voltage Rejection	R_S = 10KΩ; f = 100Hz; Vr = 0.5V		60		dB
VT_{MUTE}	Mute Threshold			0.8		V
VT_{PLAY}	Play Threshold		5			V
A_M	Mute Attenuation		80	100		dB
I_{qMUTE}	Quiescent Current Mute			7	10	mA

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

Figure 2. Output Power vs. Supply Voltage

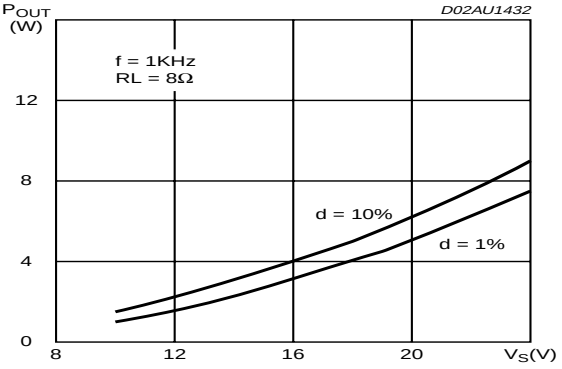


Figure 3. Quiescent Current vs. Supply Voltage

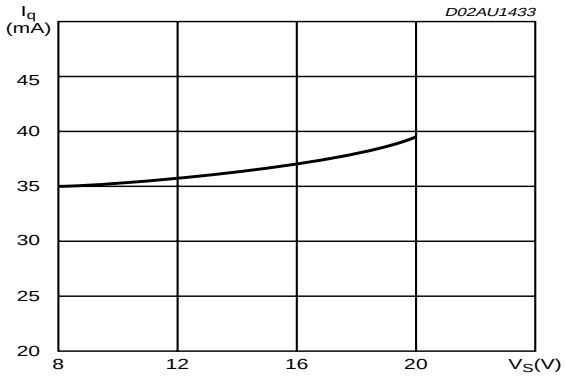


Figure 4. Distortion vs Output Power

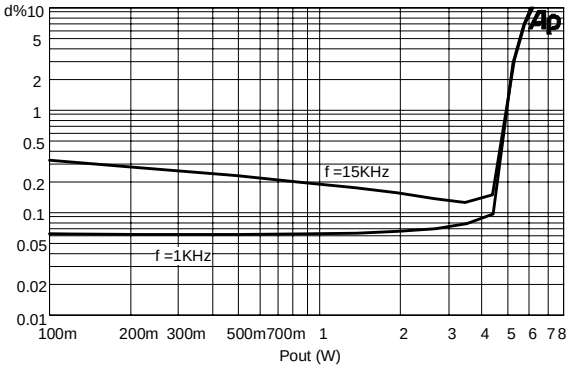


Figure 5. PC Board Component Layout

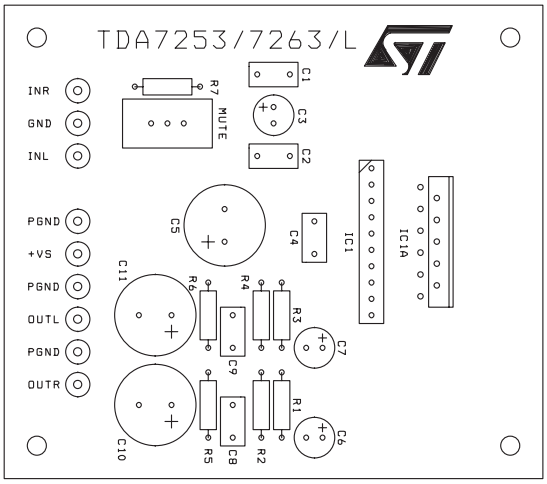


Figure 6. Evaluation Board Top Layer Layout

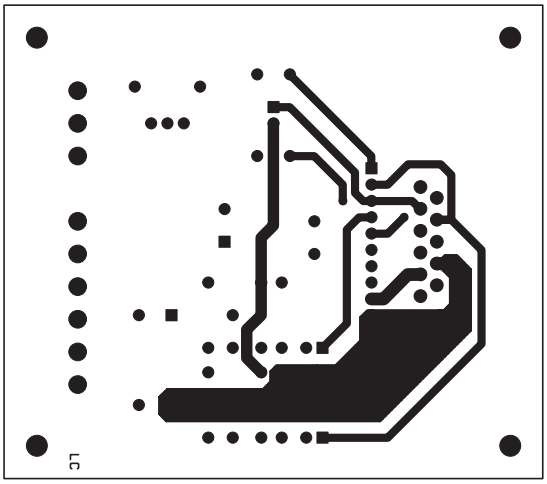
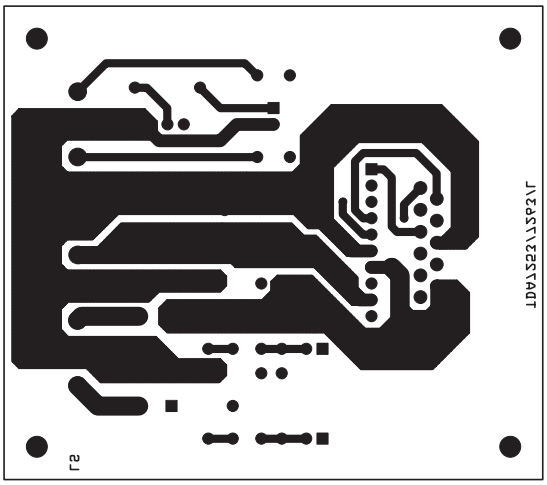


Figure 7. Evaluation Board Bottom Layer Layout



HEAT SINK DIMENSIONING:

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

The parameters that influence the dimensioning are:

– Maximum dissipated power for the device (P_{dmax})

– Max thermal resistance Junction to case ($R_{Th\ j\text{-}c}$)

– Max. ambient temperature $T_{amb\ max}$

– Quiescent current I_q (mA)

Example:

V_{CC} = 20V, R_{load} = 8ohm, $R_{Th\ j\text{-}c}$ = 9 °C/W , $T_{amb\ max}$ = 50°C

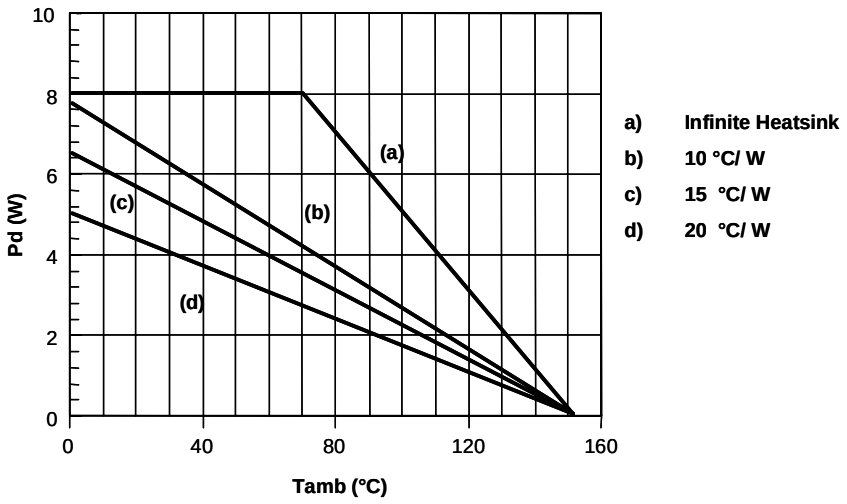
$$P_{dmax} = (N° \text{ channels}) \cdot \frac{2V_{cc}^2}{\Pi^2 \cdot R_{load}} + I_q \cdot V_{cc}$$

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

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

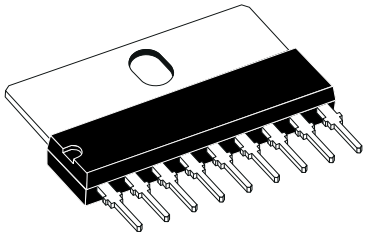
In figure 8 is shown the Power derating curve for the device.

Figure 8. Power derating curve



DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			7.1			0.280
a1	2.7		3	0.106		0.118
B			24.8			0.976
b1		0.5			0.020	
b3	0.85		1.6	0.033		0.063
C		3.3			0.130	
c1		0.43			0.017	
c2		1.32			0.052	
D			23.7			0.933
d1		14.5			0.571	
e		2.54			0.100	
e3		22.86			0.900	
L	3.1			0.122		
L1		3			0.118	
L2		17.6			0.693	
L3			0.25			0.010
L4			0.254			0.010
M		3.2			0.126	
N		1			0.039	
P			0.15			0.006

OUTLINE AND MECHANICAL DATA



SIP10