



## 8W+8W+15W TRIPLE AMPLIFIER

PRODUCT PREVIEW

### 1 FEATURES

- 8+8W (RL = 8Ω) + 15W (RL = 4Ω)  
OUTPUT POWER @THD = 10%, Vcc = 25V
- INDEPENDENT MUTE FOR CENTER CHANNEL AND MAIN CHANNELS
- NO TURN-ON TURN-OFF POP NOISE
- NO BOUCHEROT CELL
- SINGLE SUPPLY RANGING UP TO 35V
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION
- INTERNALLY FIXED GAIN
- SOFT CLIPPING
- CLIPWATT 15 PACKAGE

### 2 DESCRIPTION

The TDA7497SA is a triple 8+8+15W class AB power

Figure 1. Package

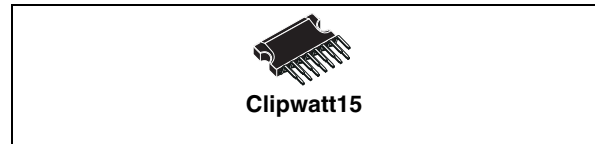


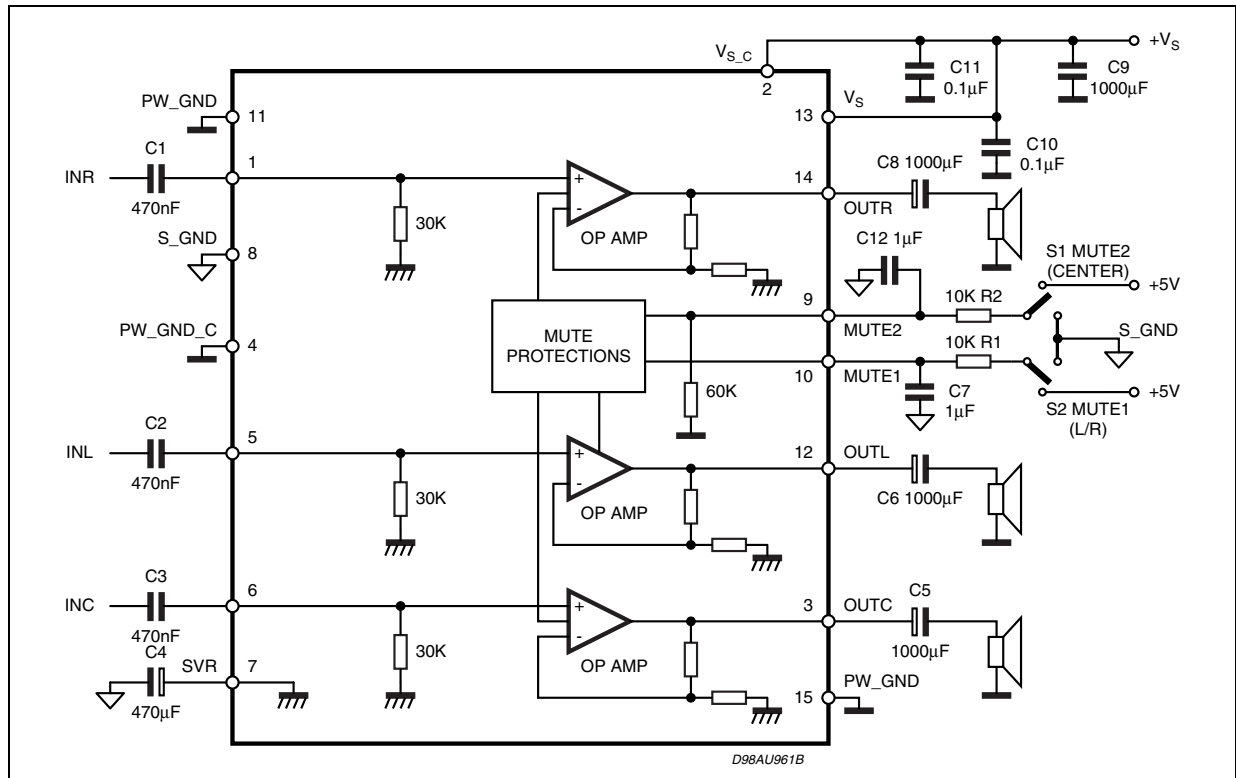
Table 1. Order Codes

Part Number	Package
TDA7497SA	Clipwatt15

amplifier assembled in the @ Clipwatt 15 package, specially designed for high quality sound, TV applications.

Features of the TDA7497SA include mute functions independently controlled for main and center channels.

Figure 2. Block Diagram



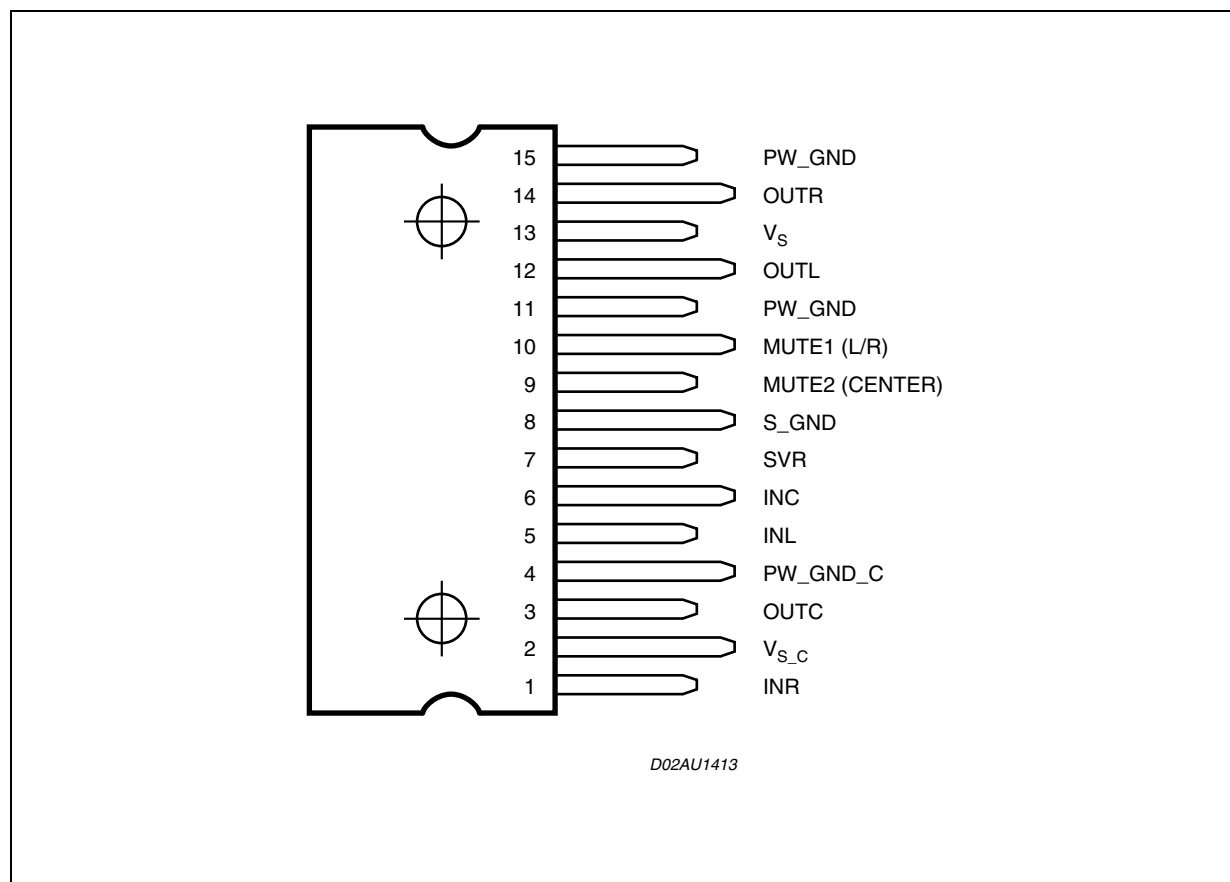
## TDA7497SA

**Table 2. Absolute Maximum Ratings**

Symbol	Parameter	Value	Unit
$V_S$	DC Supply Voltage	35	V
$P_{tot}$	Total Power Dissipation ( $T_{amb} = 70^\circ\text{C}$ )	30	W
$T_{amb}$	Ambient Operating Temperature (1)	0 to 70	$^\circ\text{C}$
$T_{stg}, T_j$	Storage and Junction Temperature	-40 to 150	$^\circ\text{C}$

(1) Operation between -20 to 85 $^\circ\text{C}$  guaranteed by correlation with 0 to 70 $^\circ\text{C}$ .

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



**Table 3. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case	Typ.=1.5 max = 2.5	$^\circ\text{C}/\text{W}$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	max = 48	$^\circ\text{C}/\text{W}$

**Table 4. Electrical Characteristics** (Refer to the test circuit  $V_S = 25V$ ;  $R_g = 50\Omega$ ;  $f = 1KHz$ ;  $T_{amb} = 25^\circ C$ )

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage Range		11		30	V
$I_q$	Total Quiescent Current			60	100	mA
$V_O$	Quiescent Output Voltage		11.5	12.5	13.5	V
$P_{O\_L/R}$	Output Power Left / Right Channels	THD = 10%; RL = 8 $\Omega$ ; THD = 1%; RL = 8 $\Omega$ ;	6 5	8 6		W W
$P_{O\_C}$	Output Power Center Channel	THD = 10%; RL = 4 $\Omega$ THD = 1%; RL = 4 $\Omega$	12 10	15 12		W W
THD	Total Harmonic Distortion	$P_O = 1W$ ; $f = 1KHz$ ;			0.4	%
$I_{peak\ L/R}$	Output Peak Current	(internally limited)		2.0		A
$I_{peak\ C}$	Output Peak Current Central Channel	(internally limited)		2.5		A
GV	Closed Loop Gain		28.5	29.5	30.5	dB
$\Delta GV$	L/R Voltage Gain Matching		-1		1	dB
BW				0.6		MHz
$e_N$	Total Output Noise	$f = 20Hz$ to $22KHz$		60	150	$\mu V$
SR	Slew Rate		5	8		V/ $\mu s$
$R_i$	Input Resistance		22.5	30		K $\Omega$
SVR	Supply Voltage Rejection	$f = 1kHz$ CSVR = 470mF; VRIP = 1Vrms	50	60		dB
$T_M$	Thermal Muting			150		$^\circ C$
$T_S$	Thermal Shut-down			160		$^\circ C$
<b>MUTE &amp; INPUT SELECTION FUNCTIONS</b>						
$V_{MUTE1}$	Mute 1 ON threshold (L/R)		3.5			V
	Mute 1 OFF threshold (L/R)				1.5	V
$V_{MUTE2}$	Mute 2 ON threshold (center)		3.5			V
	Mute 2 OFF threshold (center)				1.5	V
$A_{MUTE}$	Mute Attenuation		50	65		dB
$I_{muteBIAS}$	Mute bias current Mute1/Mute2	Mute		1	5	$\mu A$
		St-By		0.2	2	$\mu A$

Figure 4. PC Board and Component Layout

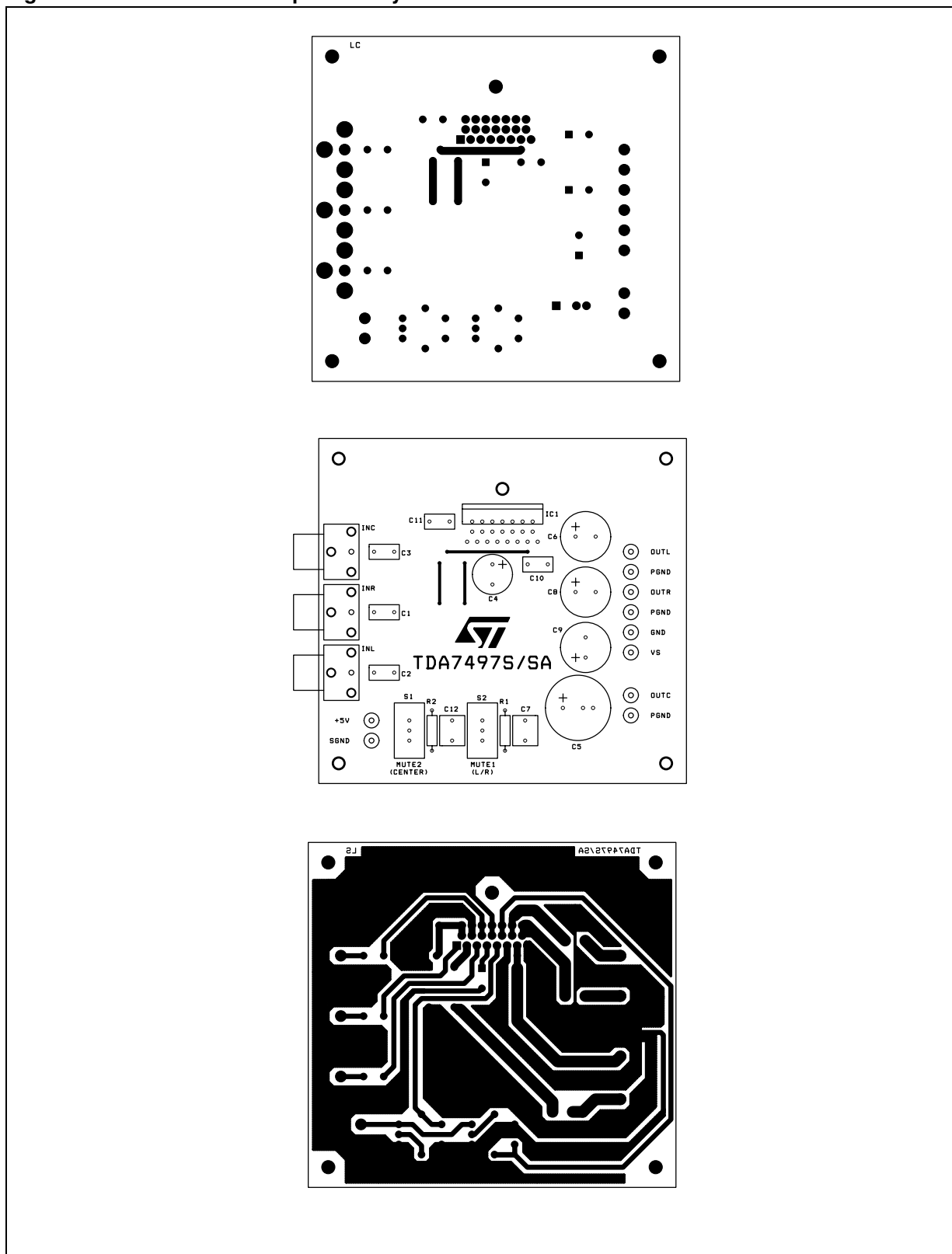


Figure 5. Output Power vs Supply Voltage

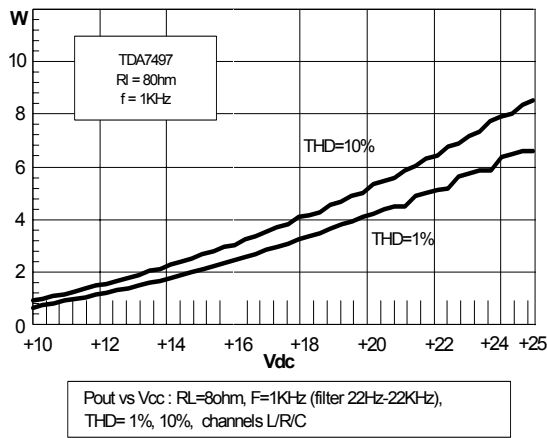


Figure 8. P<sub>diss</sub> vs Output Power

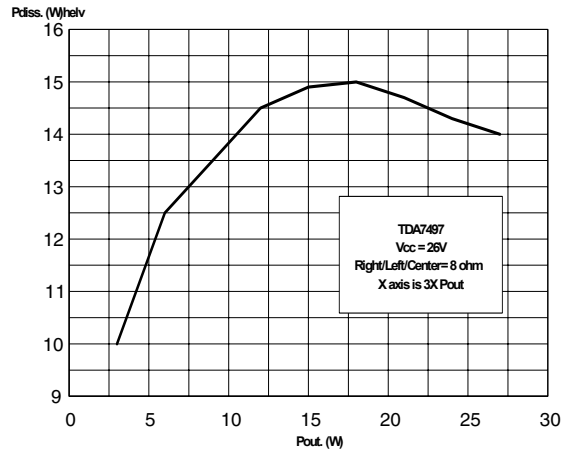


Figure 6. Frequency Response

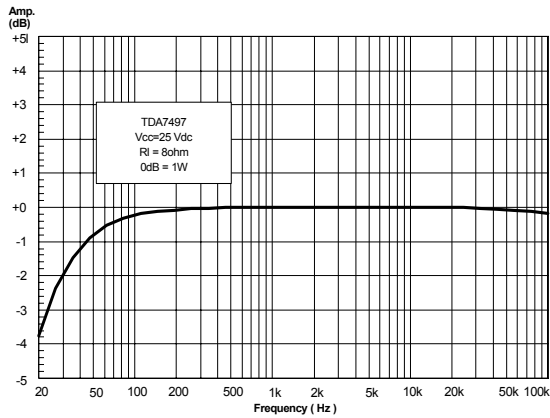


Figure 9. Output power vs Supply Voltage

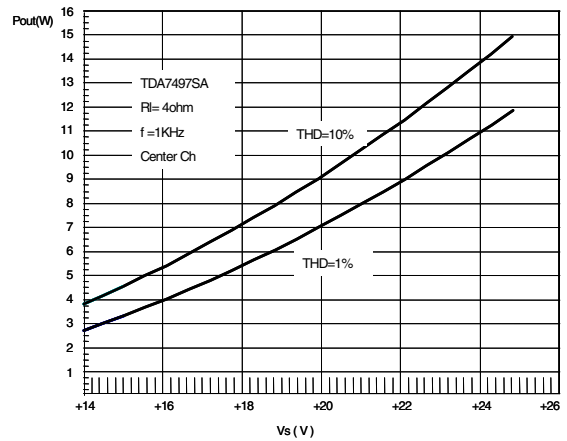


Figure 7. THD+N vs Output Power

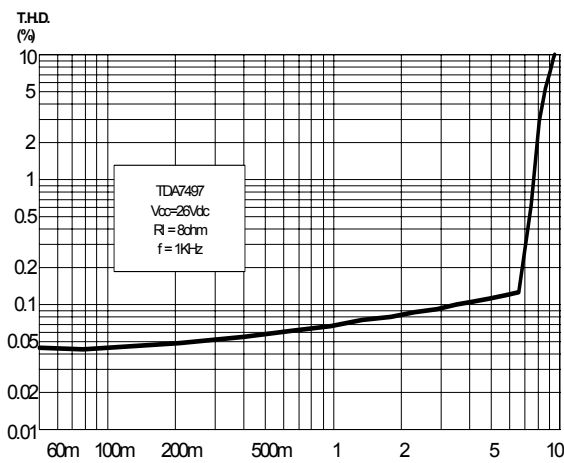
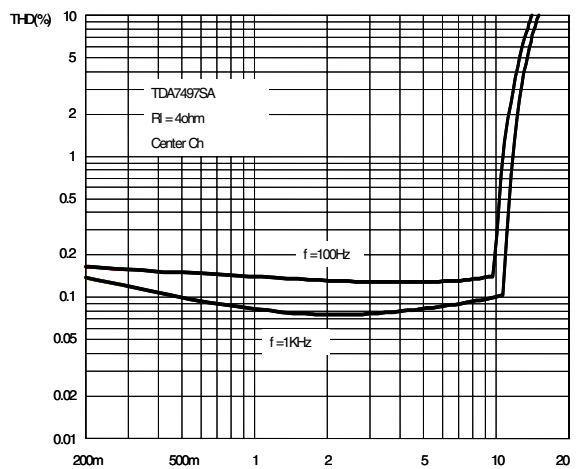


Figure 10. THD+N vs Output Power



### 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 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)

#### 3.1 Example:

$V_{CC} = 28\text{V}$ ,  $R_{load} = 80\text{ohm}$  (left/right),  $R_{load} = 40\text{ohm}$  (centre),  $R_{Th\ j-c} = 2.5^\circ\text{C}/\text{W}$ ,  $T_{amb\ max} = 50^\circ\text{C}$

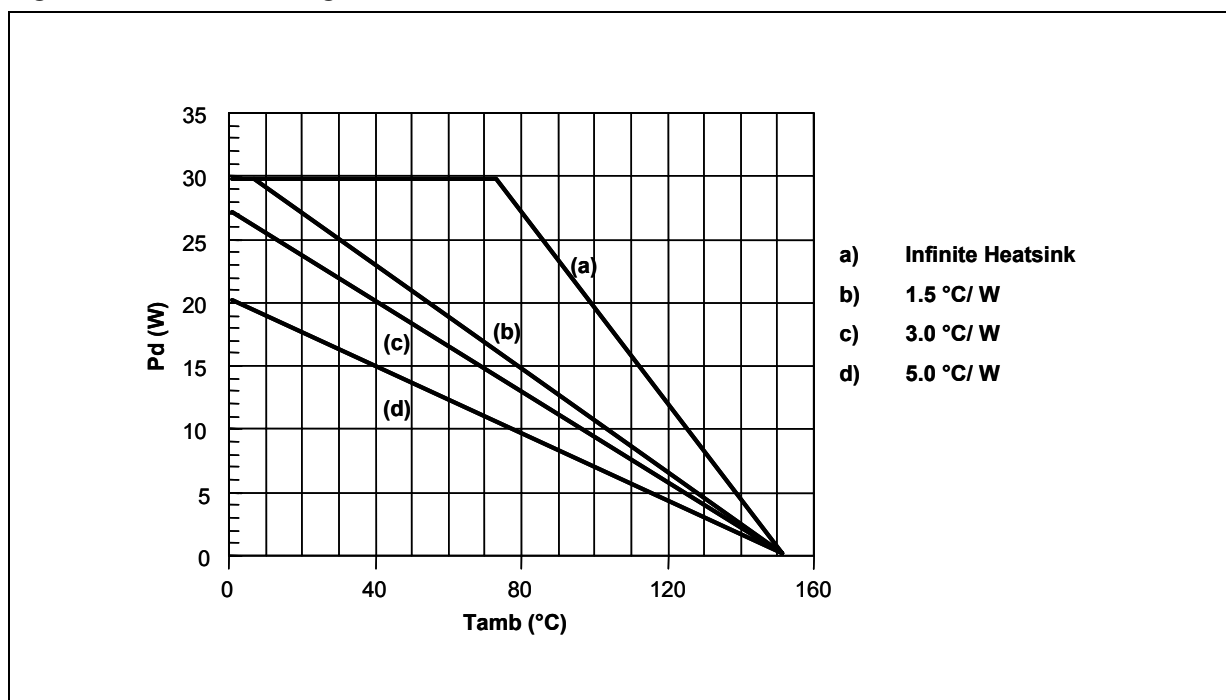
$$P_{dmax} = (N^\circ \text{ channels}) \cdot \frac{V_{cc}^2}{2\pi^2 \cdot R_{load}} + I_q \cdot V_{cc}$$

$$P_{dmax} = 2 \cdot (3.95) + 1 \cdot (7.9) + 1.2 = 17\text{W}$$

$$(\text{Heat Sink}) R_{Th\ c-a} = \frac{150 - T_{amb\ max}}{P_{d\ max}} - R_{Th\ j-c} = \frac{150 - 50}{17} - 2.5 = 3.3^\circ\text{C}/\text{W}$$

In figure 6 is shown the Power derating curve for the device.

Figure 11. Power Derating Curve



### 3.2 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 7.

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 12. Example of Right Placement of the Clip**

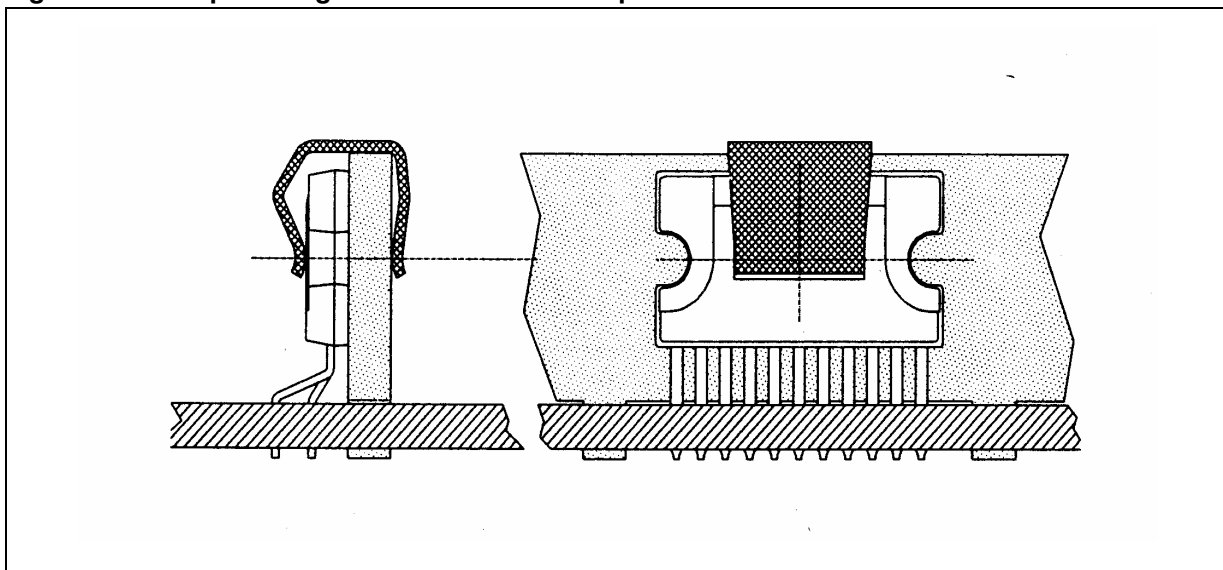
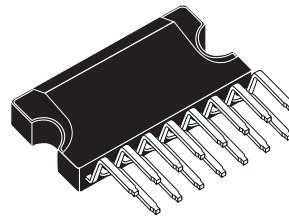


Figure 1. Clipwatt15 Mechanical Data & Package Dimensions

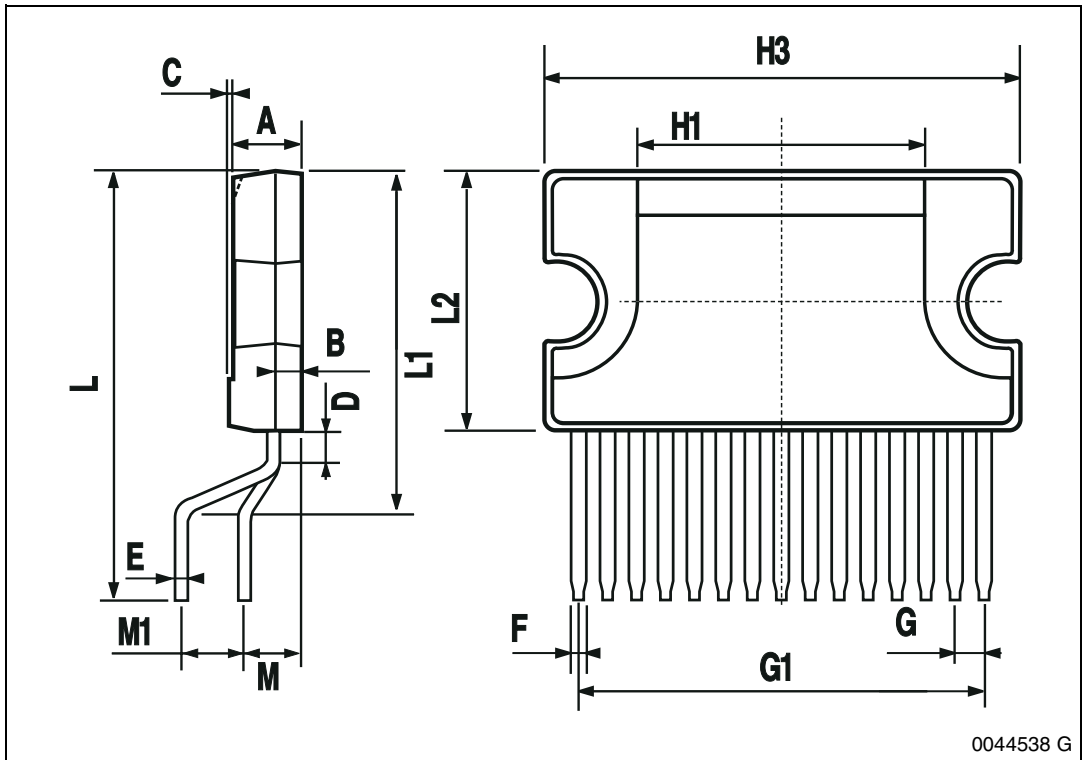
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.2			0.126
B			1.05			0.041
C		0.15			0.006	
D		1.50			0.061	
E	0.49		0.55	0.019		0.022
F	0.67		0.73	0.026		0.029
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1		12			0.480	
H2		18.6			0.732	
H3	19.85			0.781		
L		17.9			0.704	
L1		14.55			0.572	
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**





**Table 1. Revision History**

<b>Date</b>	<b>Revision</b>	<b>Description of Changes</b>
September 2003	1	First Issue in EDOCS
November 2004	2	Changed Style Sheet and add. figs. 9 and 10
February 13, 2005	3	Modified fig 2 in pag 1. and $V_{MUTE}$ in table 4

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