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## 6W+6W STEREO AMPLIFIER WITH MUTE & ST-B

### 1 FEATURES

- WIDE SUPPLY VOLTAGE RANGE UP TO +18V
- 6+6W @THD = 10%,  $R_L = 8\Omega$ ,  $V_S = \pm 14V$
- NO POP AT TURN-ON/OFF
- MUTE (POP FREE)
- STAND-BY FEATURE (LOW  $I_q$ )
- SHORT CIRCUIT PROTECTION TO GND
- THERMAL OVERLOAD PROTECTION

Figure 1. Package

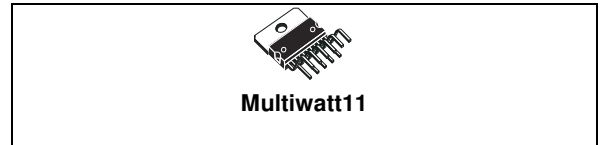


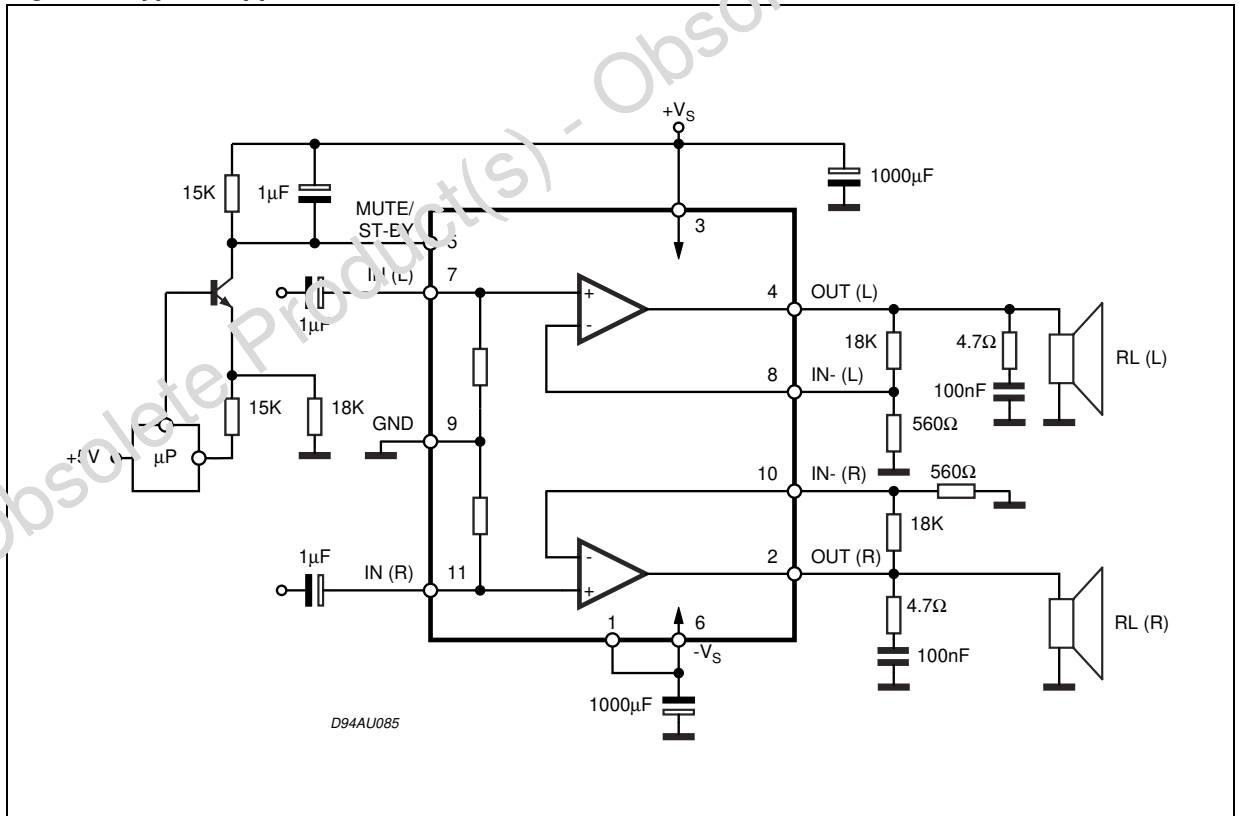
Table 1. Order Codes

Part Number	Package
TDA7499	Multiwatt11V

### 2 DESCRIPTION

The TDA7499 is class AB dual Audio power amplifier assembled in the Multiwatt package, specially designed for high quality sound application as Hi-Fi music centers and stereo TV sets.

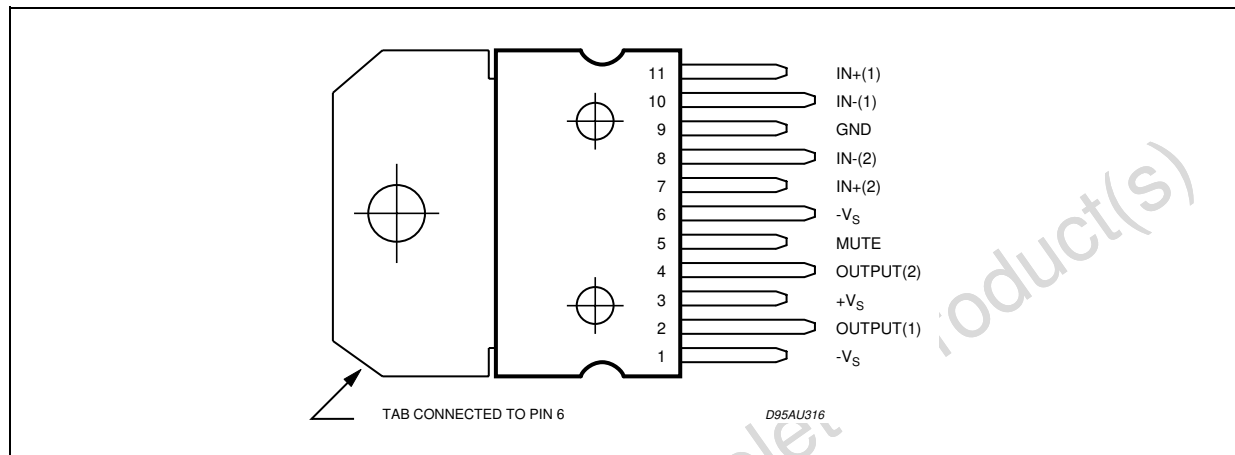
Figure 2. Typical Application Circuit



**Table 2. Absolute Maximum Ratings**

Symbol	Parameter	Value	Unit
V <sub>S</sub>	DC Supply Voltage	±20	V
I <sub>O</sub>	Output Power Current (internally limited)	2.5	A
P <sub>tot</sub>	Total Power Dissipation (T <sub>amb</sub> = 70°C)	23	W
T <sub>amb</sub>	Ambient Operating Temperature (1)	0 to 70	°C
T <sub>stg</sub> , T <sub>j</sub>	Storage and Junction Temperature	-40 to 150	°C

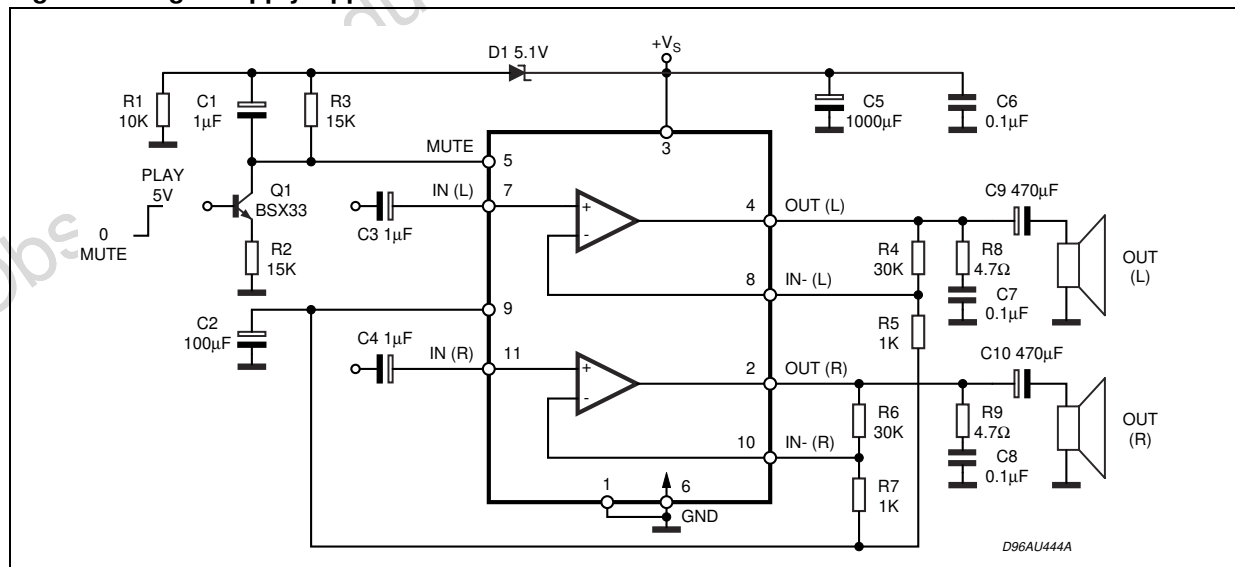
**Figure 3. Pin Connection (Top view)**



**Table 3. Thermal Data**

Symbol	Parameter	Value	Unit
R <sub>th j-case</sub>	Thermal Resistance Junction-case	max 2.8	°C/W
R <sub>th j-amb</sub>	Thermal Resistance Junction-ambient	max 35	°C/W

**Figure 4. Single Supply Application**



**Table 4. Electrical Characteristics** (Refer to the test circuit  $V_S = \pm 10V$ ;  $R_S = 50\Omega$ ;  $G_V = 30dB$ ,  $f = 1KHz$ ;  $T_{amb} = 25^\circ C$ , unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage Range	$R_L = 8\Omega$	$\pm 5$		$\pm 18$	V
		$R_L = 4\Omega$ ;	$\pm 5$		$\pm 13.5$	V
$I_q$	Total Quiescent Current			50	90	mA
$V_{OS}$	Input Offset Voltage		-25		+25	mV
$I_b$	Output Bias Current			500		nA
$P_O$	Output Power	THD = 10%; $R_L = 8\Omega$ ; $V_S = \pm 8.5V$ ; $R_L = 4\Omega$ ;		6 6		W W
		THD = 1%; $R_L = 8\Omega$ ; $V_S = \pm 8.5V$ ; $R_L = 4\Omega$ ;		5 5		W W
THD	Total Harmonic Distortion	$R_L = 8\Omega$ ; $P_O = 1W$ ; $f = 1KHz$ ;		0.03		%
		$R_L = 8\Omega$ ; $V_S = \pm 10V$ ; $P_O = 0.1$ to $3W$ ; $f = 100Hz$ to $15KHz$ ;		0.2	0.5	%
		$R_L = 4\Omega$ ; $P_O = 1W$ ; $f = 1KHz$ ;		0.02		%
		$R_L = 4\Omega$ ; $V_S = \pm 8.5V$ ; $P_O = 0.1$ to $2W$ ; $f = 100Hz$ to $15KHz$ ;		0.2	1	%
$C_T$	Cross Talk	$f = 1KHz$ ;		70		dB
		$f = 10KHz$ ;	50	60		dB
SR	Slew Rate		6.5	10		V/ $\mu s$
$G_{OL}$	Open Loop Voltage Gain			80		dB
$e_N$	Total Output Noise	A Curve $f = 20Hz$ to $22KHz$		3 4	8	$\mu V$ $\mu V$
				15	20	
SVR	Supply Voltage Rejection (each channel)	$f = 100Hz$ ; $V_R = 0.5V$		60		dB
$T_j$	Thermal Shut-down Junction Temperature			145		$^\circ C$
<b>MUTE &amp; INPUT SELECTION FUNCTIONS</b>						
$V_{MUTE}$	Mute /Play threshold		-7	-6	-5	V
$A_{MUTE}$	Mute Attenuation		60	70		dB
<b>STAND-BY FUNCTIONS [ref: +V<sub>S</sub>] (only for Split Supply)</b>						
$V_{ST-BY}$	Stand-by Mute threshold		-3.5	-2.5	-0.5	V
$A_{ST-BY}$	Stand-by Attenuation			110		dB
$I_{qST-BY}$	Quiescent Current @ Stand-by			3	6	mA

**Table 5. Electrical Characteristics in Single Supply**

(by correlation with test conditions in split supply)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V <sub>S</sub>	Supply Range	R <sub>L</sub> = 8Ω	10		36	V
		R <sub>L</sub> = 4Ω	10		27	V
I <sub>q</sub>	Total Quiescent Current			50	90	mA
I <sub>b</sub>	Non Inverting Input Bias Current			500		nA
P <sub>O</sub>	Output Power	THD = 10% R <sub>L</sub> = 8Ω V <sub>S</sub> = 22V; R <sub>L</sub> = 4Ω	8	10 7.5		W W
		THD = 1% R <sub>L</sub> = 8Ω V <sub>S</sub> = 22V; R <sub>L</sub> = 4Ω	6	7.5 6		W W
THD	Total Harmonic Distortion	R <sub>L</sub> = 8Ω ; P <sub>O</sub> = 1W; f = 1KHz		0.03		%
		R <sub>L</sub> = 8Ω ; P <sub>O</sub> = 0.1 to 5W; V <sub>S</sub> = 26V; f = 100Hz to 15KHz		0.2	0.5	%
		R <sub>L</sub> = 4Ω ; P <sub>O</sub> = 1W; f = 1KHz		0.02		%
		R <sub>L</sub> = 4Ω ; V <sub>S</sub> = 20V; P <sub>O</sub> = 0.1 to 4W; f = 100Hz to 15KHz		0.2	1	%
C <sub>T</sub>	Cross Talk	f = 1KHz		70		dB
		f = 10KHz	50	60		dB
SR	Slew Rate		6.5	10		V/μs
G <sub>OL</sub>	Open Loop Voltage Gain			80		dB
e <sub>N</sub>	Total Input Noise	A Curve f = 20Hz to 22KHz		3 4	8	μV μV
				15	20	
SVR	Supply Voltage Rejection (each channel)	f <sub>r</sub> = 100Hz; V <sub>r</sub> = 0.5V		60		dB
T <sub>j</sub>	Thermal Shut-down Junction Temperature			145		°C
<b>MUTE FUNCTION</b> [ref: +V <sub>S</sub> ]						
V <sub>T</sub> MUTE	Mute / Play Threshold		-7	-6	-5	V
A <sub>M</sub>	Mute Attenuation		60	70		dB

### 3 MUTE STAND-BY FUNCTION

The pin 5 (MUTE/STAND-BY) controls the amplifier status by two different thresholds, referred to  $+V_S$ .

- When  $V_{pin5}$  higher than  $+V_S - 2.5V$  the amplifier is in Stand-by mode and the final stage generators are off.
- When  $V_{pin5}$  between  $+V_S - 2.5V$  and  $V_S - 6V$  the final stage generators are switched on and the amplifier is in mute mode.
- When  $V_{pin5}$  lower than  $+V_S - 6V$  the amplifier is play mode.

Figure 5.

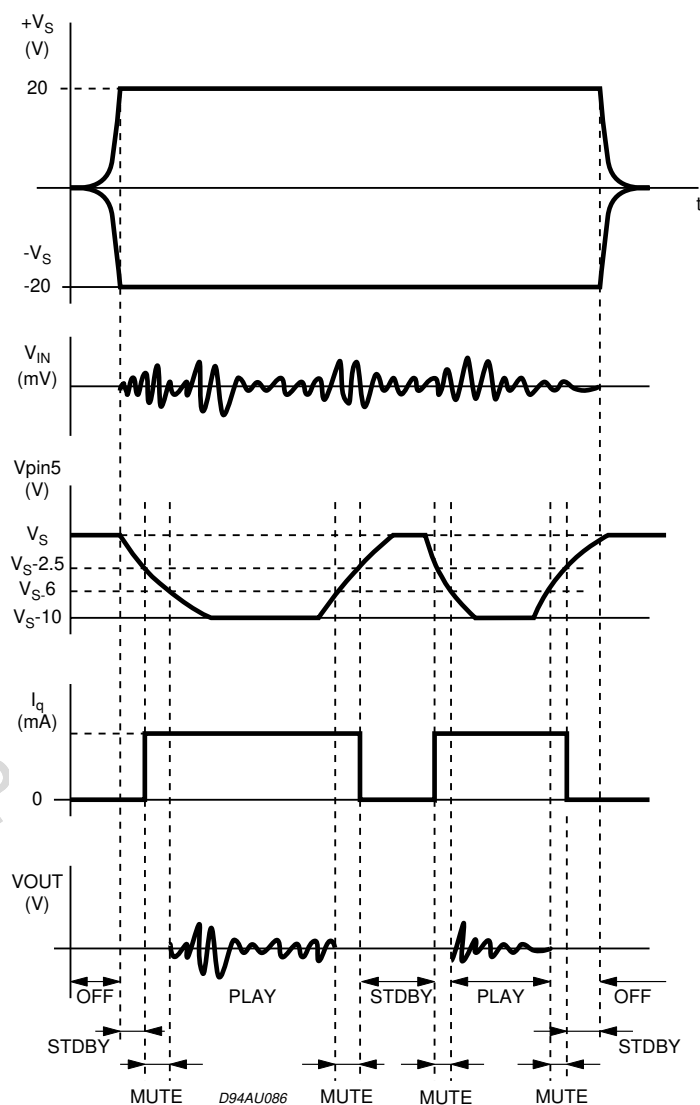
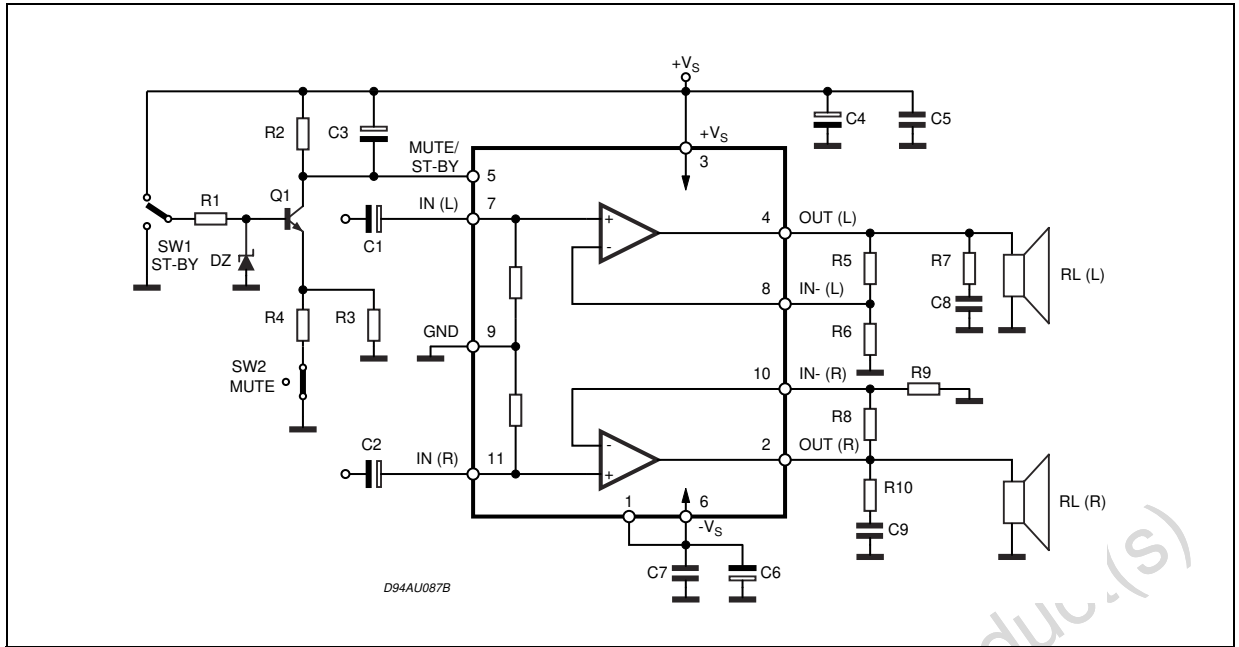




Figure 6. Test and Application Circuit (Stereo Configuration)



### 4 APPLICATION SUGGESTIONS

(Demo Board Schematic)

The recommended values of the external components are those shown the demoboard schematic different values can be used, the following table can help the designer.

Table 6.

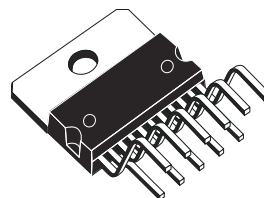
COMPONENT	SUGGESTION VALUE	PURPOSE	LARGER THAN RECOMMENDED VALUE	SMALLER THAN RECOMMENDED VALUE
R1	10KΩ	Mute Circuit	Increase of Dz Biasing Current	
R2	15KΩ	Mute Circuit	V <sub>pin #5</sub> Shifted Downward	V <sub>pin #5</sub> Shifted Upward
R3	18KΩ	Mute Circuit	V <sub>pin #5</sub> Shifted Upward	V <sub>pin #5</sub> Shifted Downward
R4	15KΩ	Mute Circuit	V <sub>pin #5</sub> Shifted Upward	V <sub>pin #5</sub> Shifted Downward
R5, R8	18KΩ	Closed Loop Gain Setting (*)	Increase of Gain	
R6, R9	560KΩ		Decrease of Gain	
R7, R10	4.7Ω	Frequency Stability	Danger of Oscillations	Danger of Oscillations
C1, C2	1μF	Input DC Decoupling		Higher low frequency cutoff
C3	1μF	St-By/Mute Time Constant	Larger On/Off Time	Smaller On/Off Time
C4, C6	1000μF	Supply Voltage Bypass		Danger of Oscillations
C5, C7	0.1μF	Supply Voltage Bypass		Danger of Oscillations
C8, C9	0.1μF	Frequency Stability		
Dz	5.1V	Mute Circuit		

(\*) Closed loop gain has to be ≥25dB

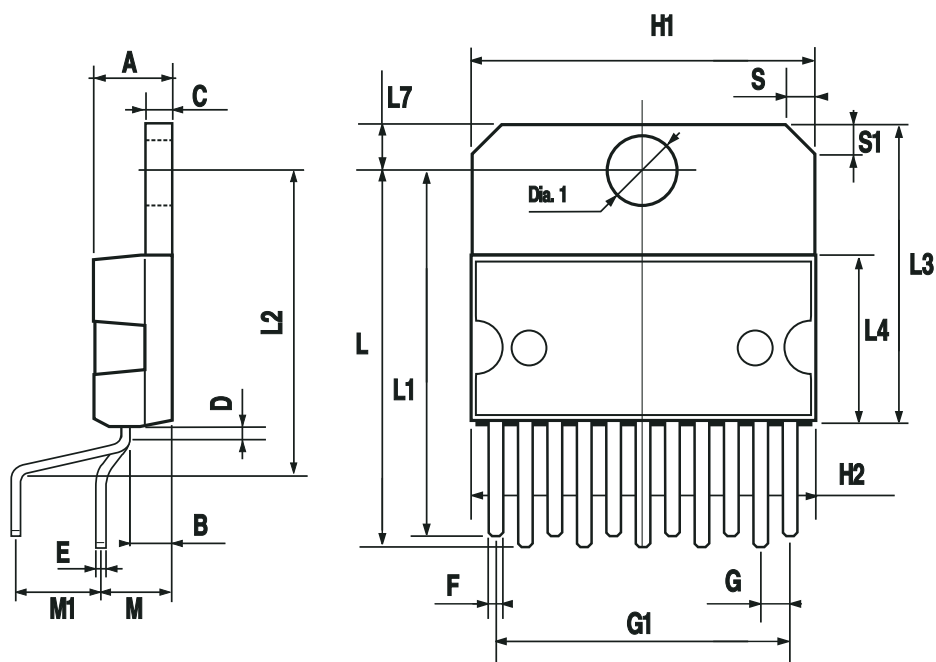
Figure 7. Multiwatt11V Mechanical Data &amp; Package Dimensions

DIM.	mm			inch		
	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	0.88		0.95	0.035		0.037
G	1.45	1.7	1.95	0.057	0.067	0.077
G1	16.75	17	17.25	0.659	0.669	0.679
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	0.87	0.886
L2	17.4		18.1	0.685		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	4.73	5.08	5.43	0.186	0.200	0.214
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

### OUTLINE AND MECHANICAL DATA



### Multiwatt11 (Vertical)



0016035 H



**Table 7. Revision History**

Date	Revision	Description of Changes
September 2003	4	First Issue in EDOCS DMS
August 2004	5	Stylesheet update. Change fig. 4

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