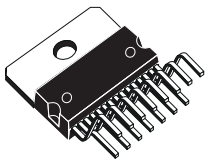
# TDA7365

## 2 x 6W CAR RADIO AMPLIFIER PLUS SOLID STATE SWITCH

- OUTPUT POWER 2x6W/4Ω @14.4V, 1KHz, 10%
- SOLID STATE POWER SWITCH INCLUDED (1A @ $V_{DROP}$ = 0.8V Typ.)
- MINIMUM EXTERNAL COMPONENT COUNT
  - INTERNALLY FIXED GAIN (40dB)
  - NO BOOTSTRAP CAPACITORS
  - NO EXTERNAL COMPENSATION
- ST-BY FUNCTION (CMOS COMPATIBLE)
- MUTE FUNCTION (CMOS COMPATIBLE)
- NO AUDIBLE POP DURING MUTE/ST-BY OPERATIONS
- LOW SUPPLY SELF MUTING

**PROTECTIONS**

- AC AUDIO OUTPUTS SHORT CIRCUIT TO GND
- DC AUDIO OUTPUTS SHORT CIRCUIT TO GND AND TO $V_S$ AT POWER ON
- SWITCH OUTPUT INTERNAL CURRENT LIMITATION
- OVERRATING CHIP TEMPERATURE WITH SOFT THERMAL LIMITER
- LOAD DUMP
- FORTUITOUS OPEN GND



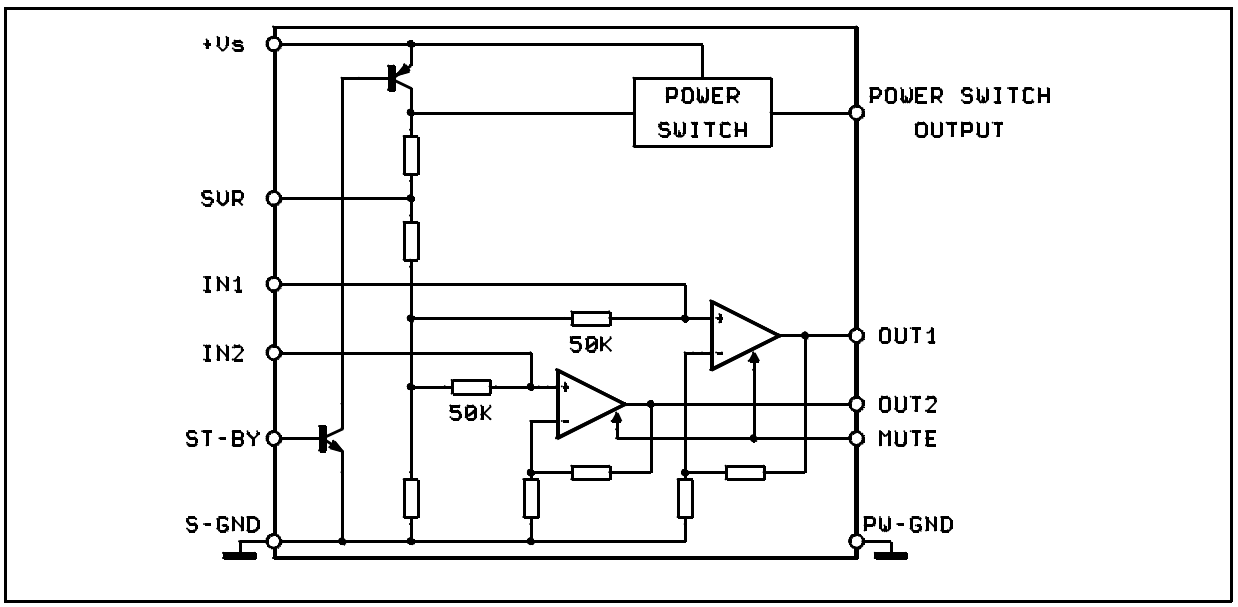
**MULTIWATT15**
**ORDERING NUMBER:** TDA7365

- REVERSE BATTERY
- ESD

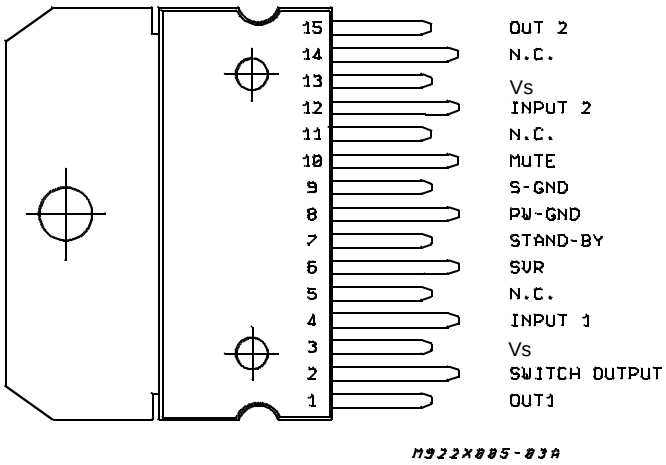
**DESCRIPTION**

The TDA7365 is a new technology Dual Audio Amplifier in Multiwatt15 package especially designed for stereo car radio applications.
Thanks to the fully complementary output configuration the TDA7365 delivers a rail to rail voltage swing with no need of boostrap capacitors
It includes a solid state switch, enabled by a ST-BY function common to the audio section, suitable for supplying both the signal processing part of the car radio set and the lamps. As a results the power-on operation is simplified, thereby saving cost and space in the whole power section.

**BLOCK DIAGRAM**



**PIN CONNECTION** (Top view)




## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | DC Supply Voltage | 28 | V |
| $V_{OP}$ | Operating Supply Voltage | 18 | V |
| $V_{PEAK}$ | Peak Supply Voltage (t = 50ms) | 40 | V |
| $I_O$ | Audio Channels Output Peak Current (not rep. t = 100µs) | 4 | A |
| $I_O$ | Audio Channels Output Peak Current (rep. f > 10Hz) | 3 | A |
| $I_O$ | Switch Output Peak Current | (internally limited) 1.5 | A |
| $P_{tot}$ | Power Dissipation ($T_{case}$ = 85°C) | 32 | W |
| $T_{stg}$, $T_j$ | Storage and Junction Temperature | -40 to 150 | °C |

## THERMAL DATA

| Symbol | Description | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | Max | 2 | °C/W |

**ELECTRICAL CHARACTERISTICS** (Refer to the test circuit; $V_S$ = 14.4V; $R_L$ = 4Ω, $T_{amb}$ = 25°C, f = 1kHz, unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Range | | 8 | | 18 | V |
| $I_d$ | Total Quiescent Drain Current | Power Switch Unloaded | | 80 | | mA |
| $P_O$ | Output Power | $R_L$ = 4Ω; THD = 10% each channel | 5.5 | 6 | | W |
| | | $R_L$ = 2Ω; THD = 10% each channel | | 9 | | W |
| d | Distortion | $P_O$ = 0.1 to 3W | | 0.08 | 0.3 | % |
| CT | Cross Talk | f = 1kHz; $R_g$ = 0<br>f = 10kHz; $R_g$ = 0 | 50 | 55<br>50 | | dB<br>dB |
| $R_{IN}$ | Input Impedance | | 40 | 50 | | KΩ |
| $G_V$ | Voltage Gain | | 39 | 40 | 41 | dB |
| $G_V$ | Voltage Gain Match. | | | | 1 | dB |
| $E_{IN}$ | Input Noise Voltage (*) | Rg = 0 | | 1.2 | 5 | µV |
| SVR | Supply Voltage Rejection | $R_g$ = 0 ; f = 100Hz;<br>$V_r$ = 0.5$V_{rms}$ | 45 | 50 | | dB |
| ASB | Stand-by Attenuation | | 60 | 90 | | dB |
| $I_{SB}$ | ST-BY Current Consumption | | | | 100 | µA |
| $V_{SB\ IN}$ | ST-BY IN Threshold Voltage | | | | 1.5 | V |
| $V_{SB\ OUT}$ | ST-BY OUT Threshold Voltage | | 3.5 | | | V |
| $V_{M\ IN}$ | MUTE IN Threshold Voltage | | | | 1.5 | V |
| $V_{M\ OUT}$ | MUTE OUT Threshold Voltage | | 3.5 | | | V |

## POWER SWITCH CHARACTERISTICS

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{Op}$ | Continuous Output Current | | | 1.2 | | A |
| $V_{DROP}$ | Dropout Voltage | Io = 1A | | | 1.4 | V |

(*) 22Hz to 22KHz
(**) A weighted

## TEST AND APPLICATION CIRCUIT

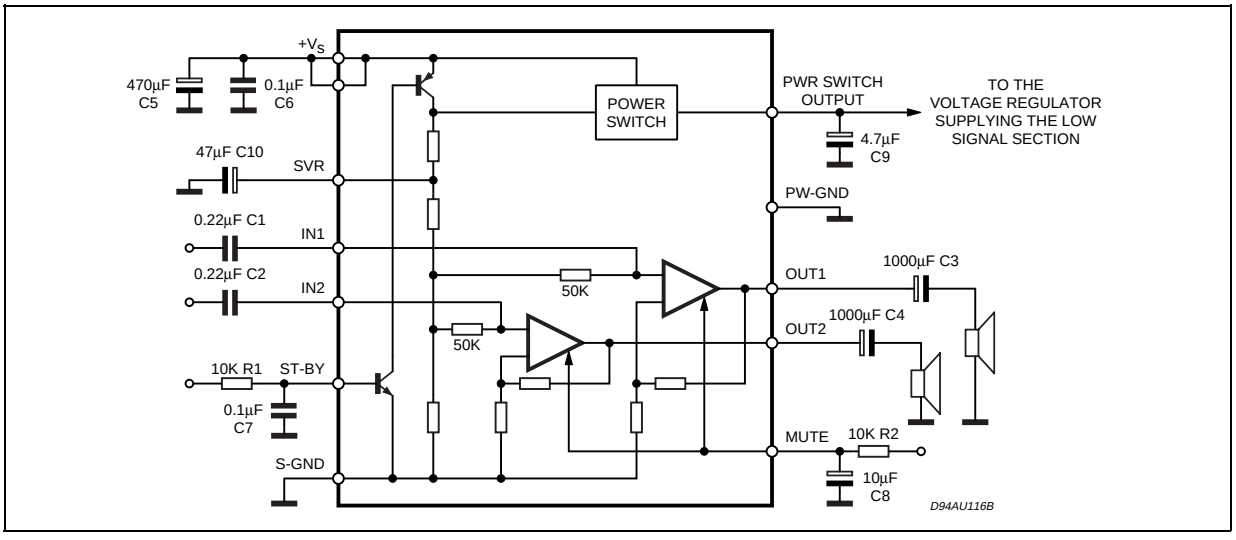


**Figure 1:** P.C.Board and component layout of the Test and Application Circuit 1:1 scale.

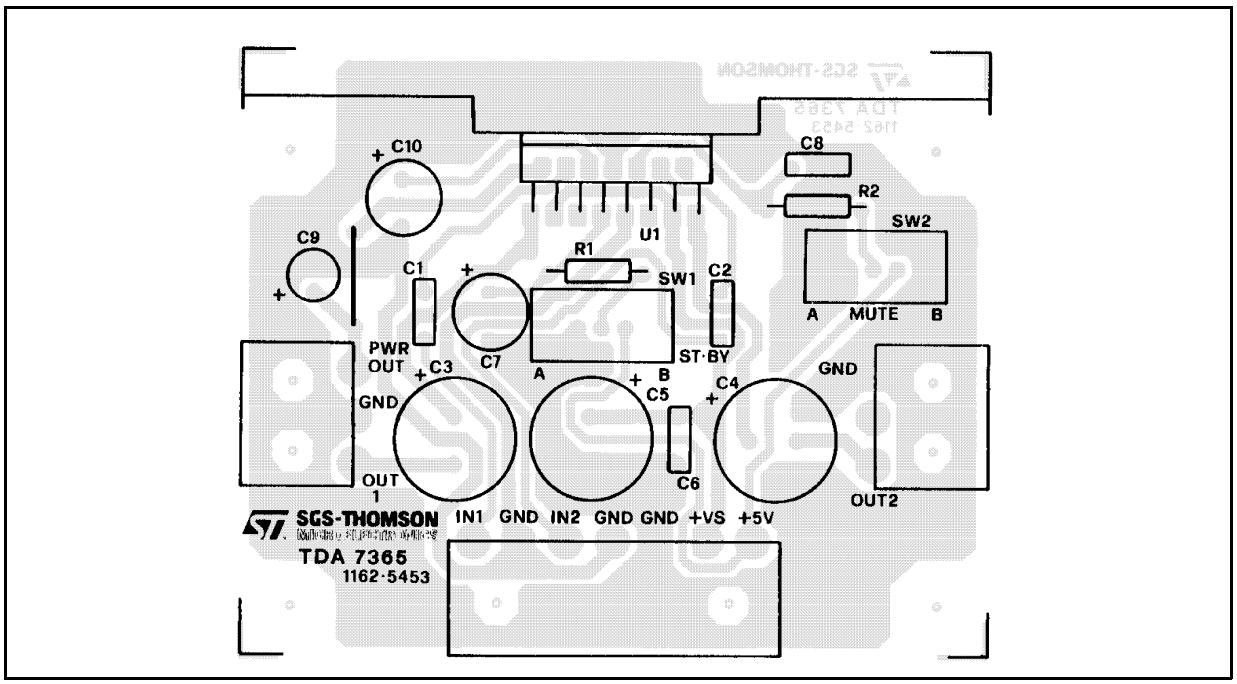



**Figure 2:** Quiescent Drain Current vs. Supply Voltage

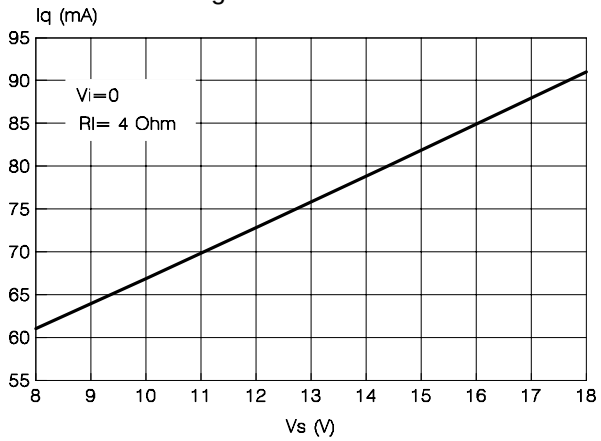



**Figure 3:** Output Power vs. Supply Voltage

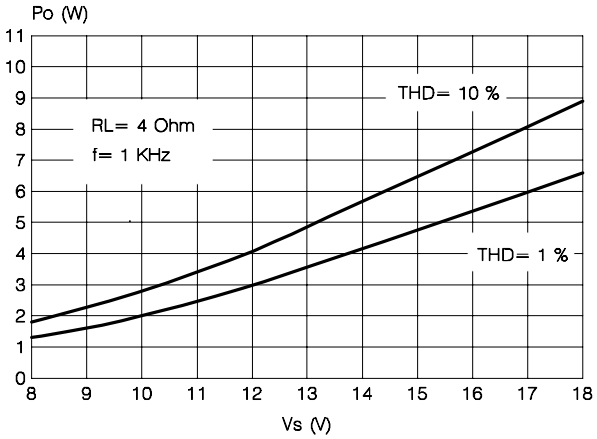



**Figure 4:** Output Power vs. Supply Voltage

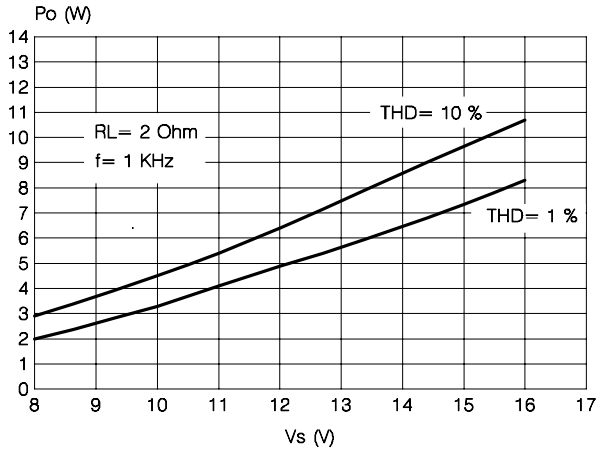
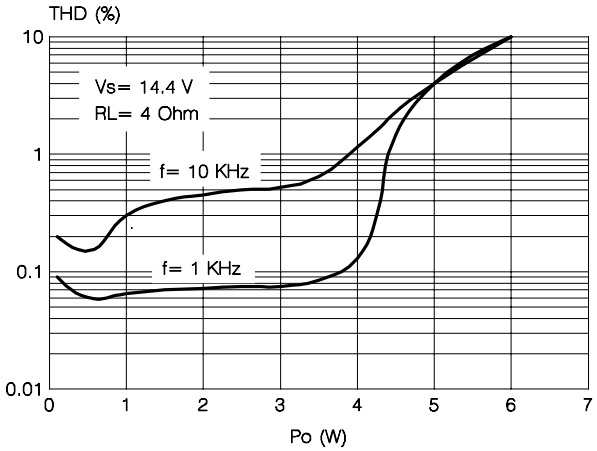



**Figure 5:** Distortion vs. Output Power



**Fiigure 6:** Distortion vs. Frequency

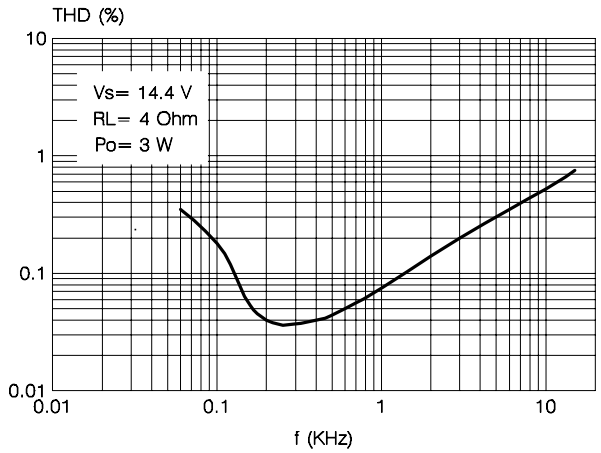
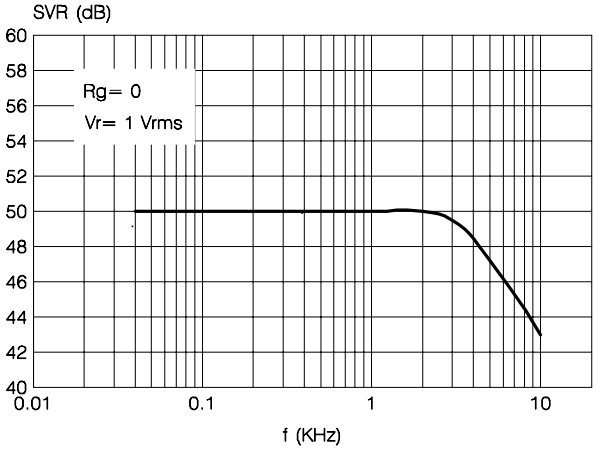



**Figure 7:** Supply Voltage Rejection




**Fiigure 8:** Cross-Talk vs. Frequency

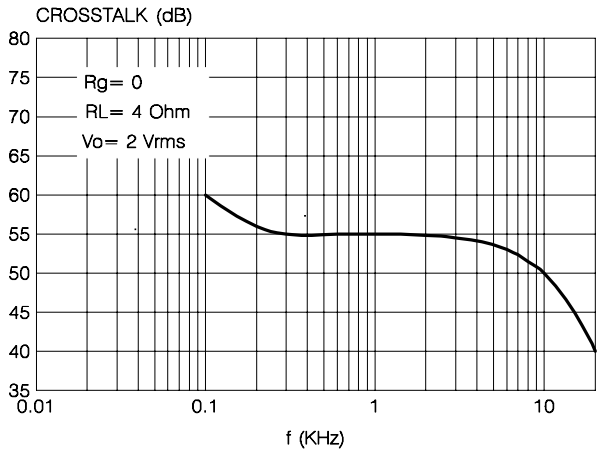



**Figure 9:** Switch Drop-out vs. Switch Current

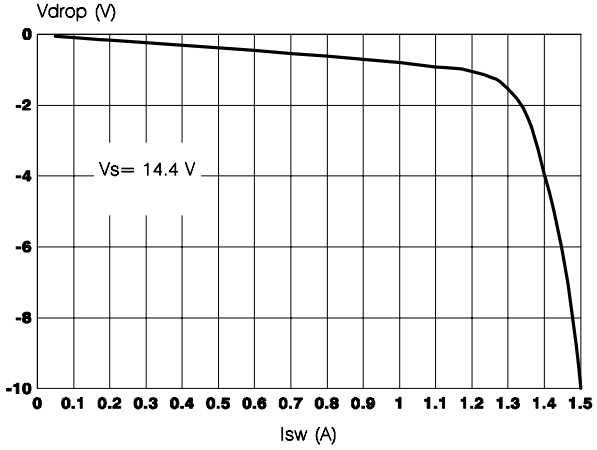



**Figure 10:** Total Power Dissipation and Efficiency vs. Output Power

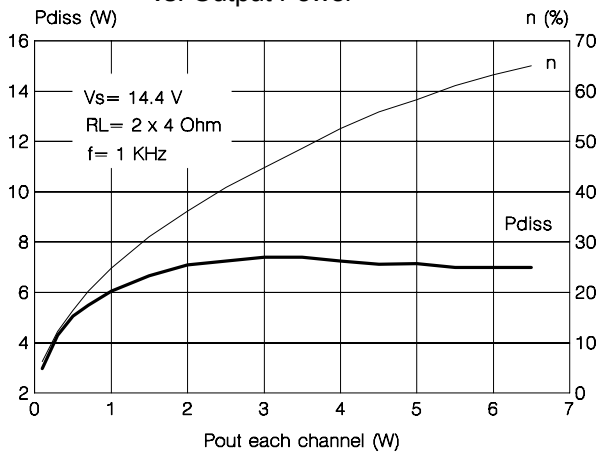
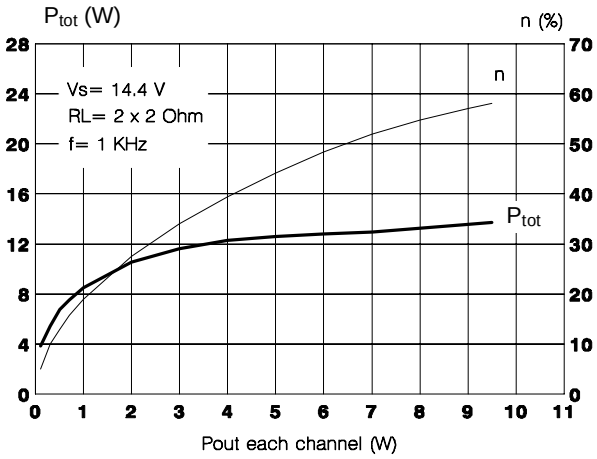
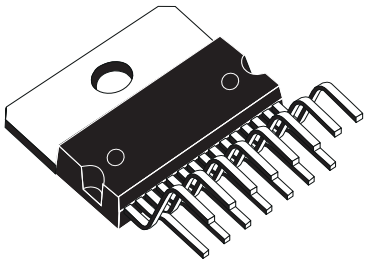



**Figure 11:** Total Power Dissipation and Efficiency



| 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 | 0.66 | | 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 |
| S1 | 1.9 | | 2.6 | 0.075 | | 0.102 |
| Dia1 | 3.65 | | 3.85 | 0.144 | | 0.152 |

## OUTLINE AND MECHANICAL DATA



**Multiwatt15 V**