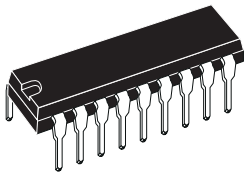
SGS-THOMSON MICROELECTRONICS

# TDA7245A

## 6W AUDIO AMPLIFIER WITH STAND-BY

- STAND-BY FUNCTION
- SUPPLY VOLTAGE RANGE UP TO 30V
- MUSIC POWER = 16W ($R_L$ = 4Ω, d = 10%)
- THERMAL PROTECTION



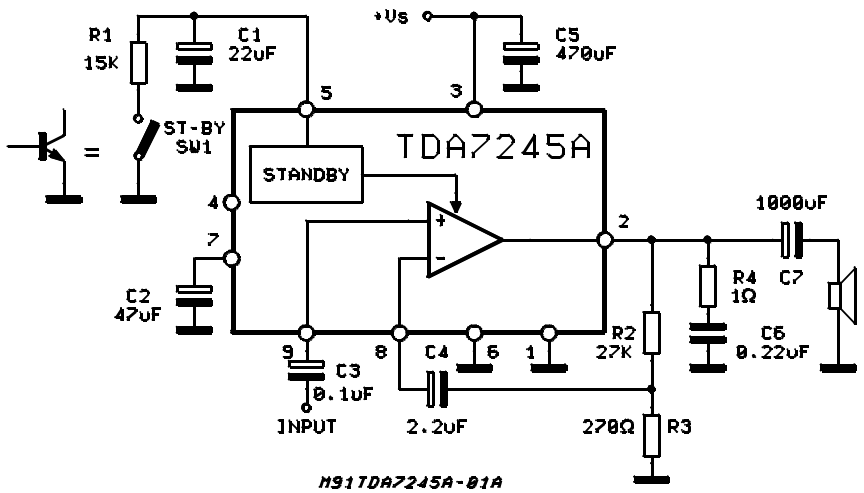
**Powerdip 9+9**

**ORDERING NUMBER:** TDA7245A

### DESCRIPTION

The TDA7245A is a monolithic integrated circuit in 9+9 POWERDIP package, intended for use as low frequency power amplifier in a wide range of applications in radio and TV sets.

**Figure 1:** Test and Application Circuit



## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | Supply Voltage | 30 | V |
| $I_O$ | Output Peak Current (non repetitive t = 100µs) | 3 | A |
| $I_O$ | Output Peak Current (repetitive, f > 20Hz) | 2.5 | A |
| $P_{tot}$ | Power Dissipation at $T_{amb}$ = 80°C<br>at $T_{case}$ = 70°C | 1<br>6 | W<br>W |
| $T_{stg}$, $T_j$ | Storage and junction Temperature | -40 to 150 | °C |

**PIN CONNECTION** (Top view)

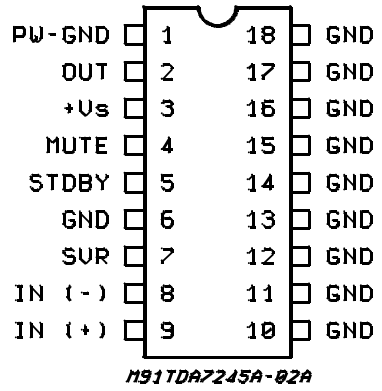
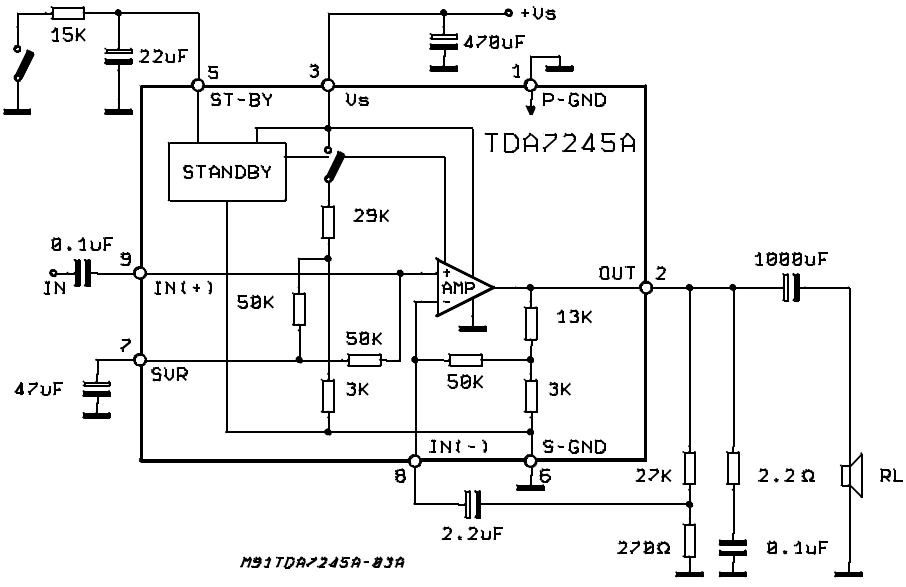



**Figure 2:** Schematic Diagram




## THERMAL DATA

| Symbol | Description | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance junction-case | Max | 15 | °C/W |
| $R_{th\ j\text{-}amb}$ | Thermal Resistance junction-ambient | Max | 70 | °C/W |

**ELECTRICAL CHARACTERISTICS** (Refer to the test circuit, $T_{amb}$ = 25°C, $V_S$ = 16.5V, $R_L$ = 4Ω, f = 1kHz; unless otherwise specified).

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Voltage | | 12 | | 30 | V |
| $V_O$ | Quiescent Output Voltage | $V_S$ = 24V | | 11.6 | | V |
| $I_d$ | Quiescent Drain Current | $V_S$ = 28V | | 24 | 35 | mA |
| $P_O$ | Output Power | d = 1%<br>$V_S$ = 16.5V, $R_L$ = 4Ω<br>$V_S$ = 20V, $R_L$ = 8Ω<br>d = 10%<br>$V_S$ = 16.5V, $R_L$ = 4Ω<br>$V_S$ = 20V, $R_L$ = 8Ω<br>Music Power (*)<br>$V_S$ = 24V, d = 10%, $R_L$ = 4Ω | <br><br><br>6.5<br><br><br> | <br>6<br>5<br><br>7.5<br>6.5<br><br>16 | <br><br><br><br><br><br> | <br>W<br>W<br><br>W<br>W<br><br>W |
| d | Harmonic Distortion | $P_O$ = 50mW to 4W<br>f = 1KHz<br>f = 10KHz<br><br>$V_S$ = 20V, $R_L$ = 8Ω,<br>$P_O$ = 50mW to 3.5W<br>f = 1KHz<br>f = 10KHz | | <br>0.15<br>0.8<br><br><br><br>0.12<br>0.5 | <br>0.5<br><br><br><br><br><br> | <br>%<br>%<br><br><br><br>%<br>% |
| $R_I$ | Input Impedance | f = 1kHz | 30 | | | KΩ |
| BW | Small signal bandwidth (-3dB) | $P_O$ = 1W | | 20 to 40,000 | | Hz |
| $G_V$ | Voltage Gain (open loop) | f = 1KHz | | 75 | | dB |
| $G_V$ | Voltage Gain (closed loop) | f = 1KHz | 39 | 40 | 41 | dB |
| $e_N$ | Total Input Noise | B = 22 - 22,000Hz<br>$R_s$ = 50Ω<br>$R_s$ = 1kΩ<br>$R_s$ = 10kΩ | | <br>1.7<br>2<br>3 | <br><br><br>6 | <br>mV<br>µV<br>µV |
| S/N | Signal to Noise Ratio | $P_O$ = 5W; $R_S$ = 10KΩ | | 86 | | dB |
| SVR | Supply Voltage Rejection | $V_S$ = 16.5V; $R_L$ = 8Ω; f = 100Hz<br>$R_s$ = 10kΩ; $V_r$ = 0.5Vrms | 38 | 45 | | dB |
| $T_{sd}$ | Thermal shut-down Junction Temperature | | | 150 | | °C |

STAND-BY FUNCTION

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{st\text{-}by}$ | Pin 5 DC Voltage | SW1 Open (play) | | 6.4 | | V |
| $I_{st\text{-}by}$ | Pin 5 Current | SW1 Closed (st-by) | | 160 | 280 | µA |
| $ATT_{st\text{-}by}$ | Stand-by Attenuation | f = 1kHz | 70 | 90 | | dB |
| $V_t$ | Stand-by Threshold (pin 5) | | | 3.8 | | V |
| $I_{d\ st\text{-}by}$ | Quiescent Current @ Stand-by | | | 2 | 4 | mA |

**Note (*):**

MUSIC POWER CONCEPT

MUSIC POWER is ( according to the IEC clauses n.268-3 of Jan 83) the maximal power which the amplifier is capable of producing across the rated load resistance (regardless of non linearity) 1 sec after the application of a sinusoidal input signal of frequency 1KHz.

According to this definition our method of measurement comprises the following steps:
1) Set the voltage supply at the maximum operating value -20%
2) Apply a input signal in the form of a 1KHz tone burst of 1 sec duration; the repetition period of the signal pulses is > 60 sec
3) The output voltage is measured 1 sec from the start of the pulse
4) Increase the input voltage until the output signal show a THD = 10%
5) The music power is then $V^2_{out}/R1$, where $V_{out}$ is the output voltage measured in the condition of point 4) and R1 is the rated load impedance

The target of this method is to avoid excessive dissipation in the amplifier.

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

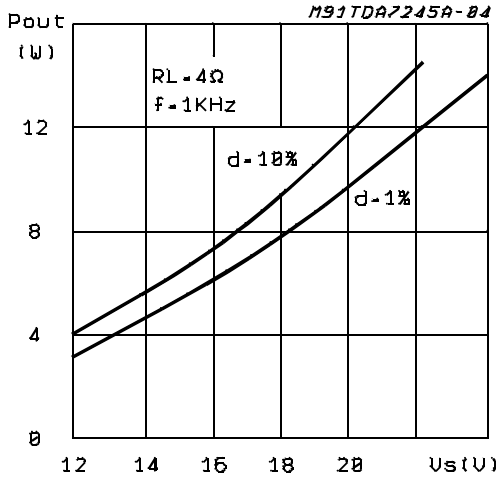
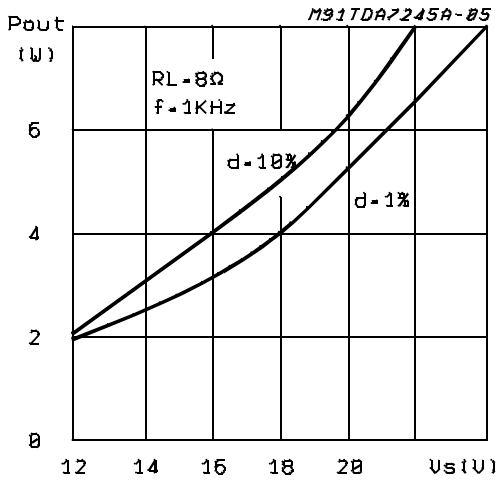



**Figure 4:** Output Power vs. Supply Voltage



## POWERDIP 18 PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| a1 | 0.51 | | | 0.020 | | |
| B | 0.85 | | 1.40 | 0.033 | | 0.055 |
| b | | 0.50 | | | 0.020 | |
| b1 | 0.38 | | 0.50 | 0.015 | | 0.020 |
| D | | | 24.80 | | | 0.976 |
| E | | 8.80 | | | 0.346 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 20.32 | | | 0.800 | |
| F | | | 7.10 | | | 0.280 |
| I | | | 5.10 | | | 0.201 |
| L | | 3.30 | | | 0.130 | |
| Z | | | 2.54 | | | 0.100 |