



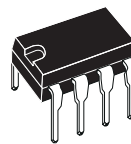
# TDA7233 TDA7233D

## 1W AUDIO AMPLIFIER WITH MUTE

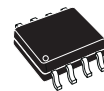
- OPERATING VOLTAGE 1.8 TO 15V
- EXTERNAL MUTE OR POWER DOWN FUNCTION
- IMPROVED SUPPLY VOLTAGE REJECTION
- LOW QUIESCENT CURRENT
- HIGH POWER CAPABILITY
- LOW CROSSOVER DISTORTION

### DESCRIPTION

The TDA7233/D is a monolithic integrated circuit in 8 pin Minidip or SO8 package, intended for use as class AB power amplifier with a wide range of supply voltage from 1.8V to 15V in portable players, cordless telephones and Cellular Radios.



Minidip



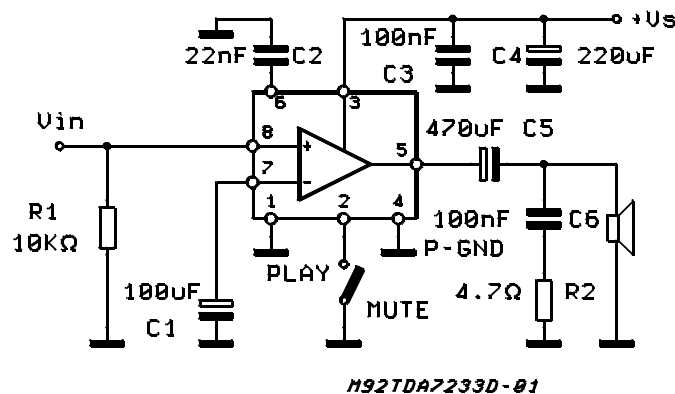
SO8

### ORDERING NUMBERS:

TDA7233

TDA7233D

### TEST AND APPLICATION CIRCUIT



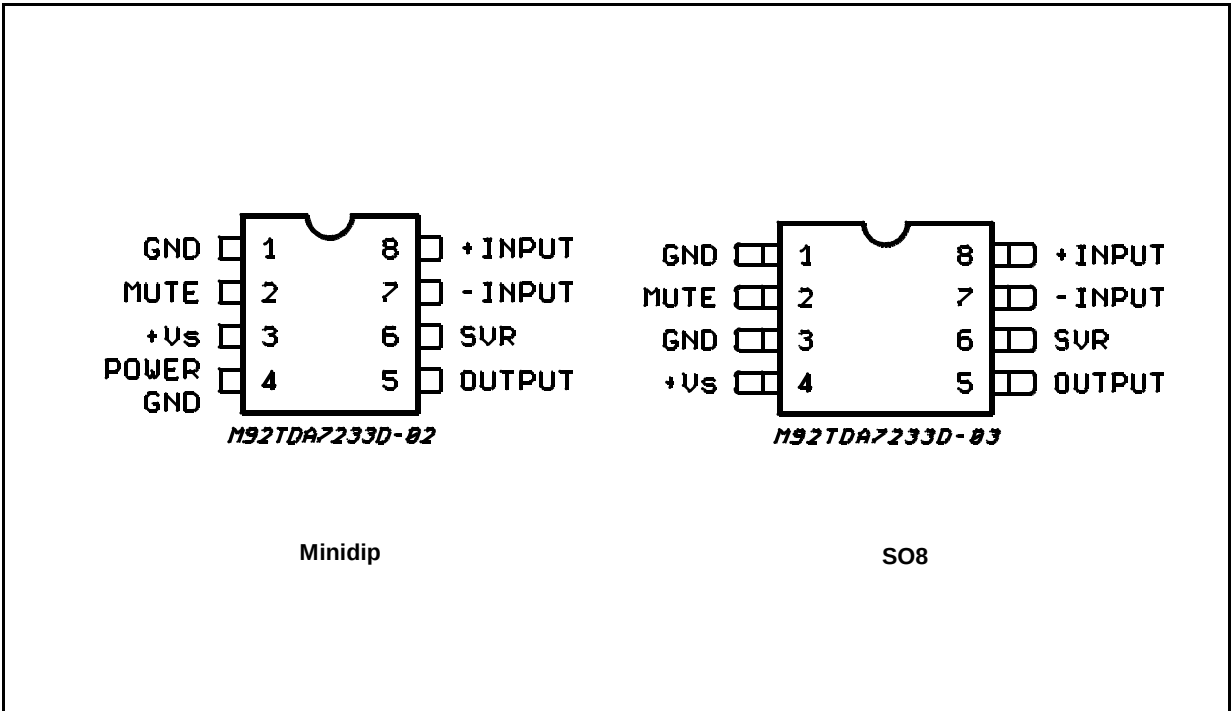
Note: Switch Open = Mute  
Switch Closed = Play

# TDA7233 - TDA7233D

## ABSOLUTE MAXIMUM RATINGS

| Symbol         | Parameter                                                 | Value      | Unit               |
|----------------|-----------------------------------------------------------|------------|--------------------|
| $V_S$          | Supply Voltage                                            | 16         | V                  |
| $I_O$          | Output Peak Current                                       | 1          | A                  |
| $P_{tot}$      | Total Power Dissipation at $T_{amb} = 50^{\circ}\text{C}$ | 1          | W                  |
| $T_{stg}, T_j$ | Storage and Junction Temperature                          | -40 to 150 | $^{\circ}\text{C}$ |

## PIN CONNECTIONS (Top views)



## THERMAL DATA

| Symbol        | Parameter                           |      | SO8 | Minidip | Unit                 |
|---------------|-------------------------------------|------|-----|---------|----------------------|
| $R_{thj-amb}$ | Thermal Resistance Junction-ambient | Max. | 200 | 100     | $^{\circ}\text{C/W}$ |

**ELECTRICAL CHARACTERISTICS** ( $V_S = 6\text{ V}$ ,  $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Symbol   | Parameter                                          | Test Condition                                                                                                                                                                                                                                                                                                         | Min. | Typ.                                       | Max. | Unit                              |
|----------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------|------|-----------------------------------|
| $V_S$    | Supply Voltage                                     |                                                                                                                                                                                                                                                                                                                        | 1.8  |                                            | 15   | V                                 |
| $V_O$    | Quiescent Out Voltage                              |                                                                                                                                                                                                                                                                                                                        |      | 2.7                                        |      | V                                 |
|          |                                                    | $V_S = 3\text{ V}$                                                                                                                                                                                                                                                                                                     |      | 1.2                                        |      | V                                 |
|          |                                                    | $V_S = 9\text{ V}$                                                                                                                                                                                                                                                                                                     |      | 4.2                                        |      | V                                 |
| $I_d$    | Quiescent Drain Current                            | MUTE HIGH                                                                                                                                                                                                                                                                                                              |      | 3.6                                        | 9    | mA                                |
|          |                                                    | MUTE LOW                                                                                                                                                                                                                                                                                                               |      | 0.4                                        |      |                                   |
| $I_b$    | Input Bias Current                                 |                                                                                                                                                                                                                                                                                                                        |      | 100                                        |      | nA                                |
| $P_o$    | Output Power                                       | $d = 10\%$ $f = 1\text{ KHz}$<br>$V_S = 12\text{ V}$ $R_L = 8\ \Omega$<br>$V_S = 9\text{ V}$ $R_L = 4\ \Omega$<br>$V_S = 9\text{ V}$ $R_L = 8\ \Omega$<br>$V_S = 6\text{ V}$ $R_L = 8\ \Omega$<br>$V_S = 6\text{ V}$ $R_L = 4\ \Omega$<br>$V_S = 3\text{ V}$ $R_L = 4\ \Omega$<br>$V_S = 3\text{ V}$ $R_L = 8\ \Omega$ |      | 1.9<br>1.6<br>1<br>0.4<br>0.7<br>110<br>70 |      | W<br>W<br>W<br>W<br>W<br>mW<br>mW |
| $d$      | Distortion                                         | $P_o = 0.5\text{ W}$<br>$f = 1\text{ kHz}$<br>$R_L = 8\ \Omega$<br>$V_S = 9\text{ V}$                                                                                                                                                                                                                                  |      | 0.3                                        |      | %                                 |
| $G_v$    | Closed Loop Voltage Gain                           | $f = 1\text{ kHz}$                                                                                                                                                                                                                                                                                                     |      | 39                                         |      | dB                                |
| $R_{IN}$ | Input Resistance                                   | $f = 1\text{ kHz}$                                                                                                                                                                                                                                                                                                     | 100  |                                            |      | $\text{K}\Omega$                  |
| $e_N$    | Total Input Noise<br>( $R_S = 10\text{ k}\Omega$ ) | $B = \text{Curve A}$                                                                                                                                                                                                                                                                                                   |      | 2                                          |      | $\mu\text{V}$                     |
|          |                                                    | $B = 22\text{ Hz to } 22\text{ kHz}$                                                                                                                                                                                                                                                                                   |      | 3                                          |      |                                   |
| SVR      | Supply Voltage Rejection                           | $f = 100\text{ Hz}$ , $R_g = 10\text{ K}\Omega$                                                                                                                                                                                                                                                                        |      | 45                                         |      | dB                                |
|          | MUTE Attenuation                                   | $V_O = 1\text{ V}$ $f = 100\text{ Hz to } 10\text{ kHz}$                                                                                                                                                                                                                                                               |      | 70                                         |      | dB                                |
|          | MUTE Threshold                                     |                                                                                                                                                                                                                                                                                                                        |      | 0.6                                        |      | V                                 |
| $I_M$    | MUTE Current                                       | $V_S = 15\text{ V}$                                                                                                                                                                                                                                                                                                    |      | 0.4                                        |      | mA                                |

Figure 1: Output Power vs. Supply Voltage

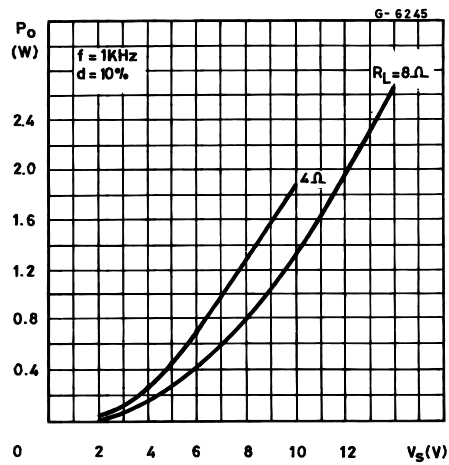


Figure 3: DC Output Voltage vs. Supply Voltage

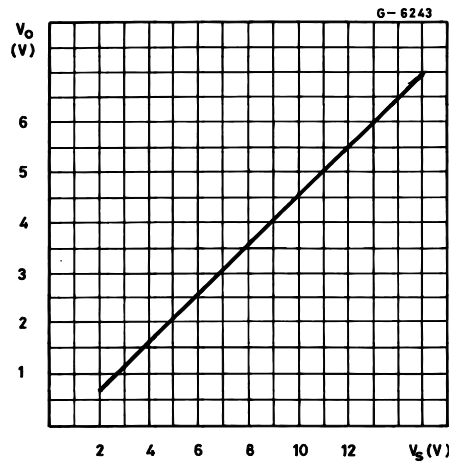


Figure 5: Total Dissipated Power vs. Supply Voltage

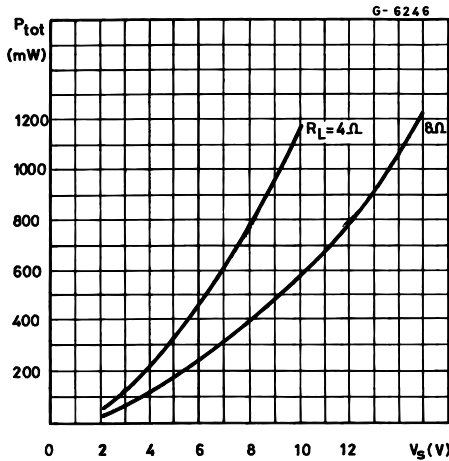


Figure 2: Supply Voltage Rejection vs. Frequency

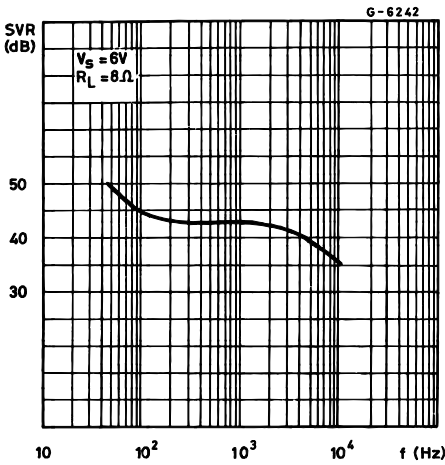
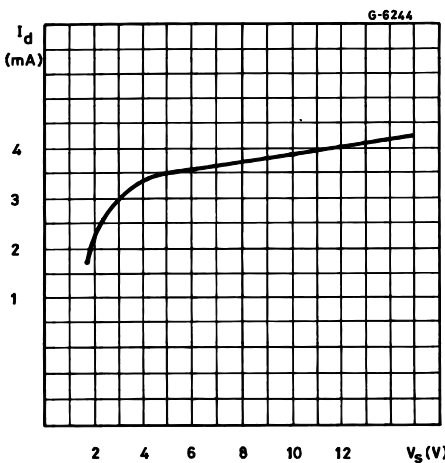


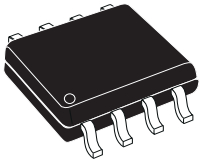
Figure 4: Quiescent Current vs. Supply Voltage



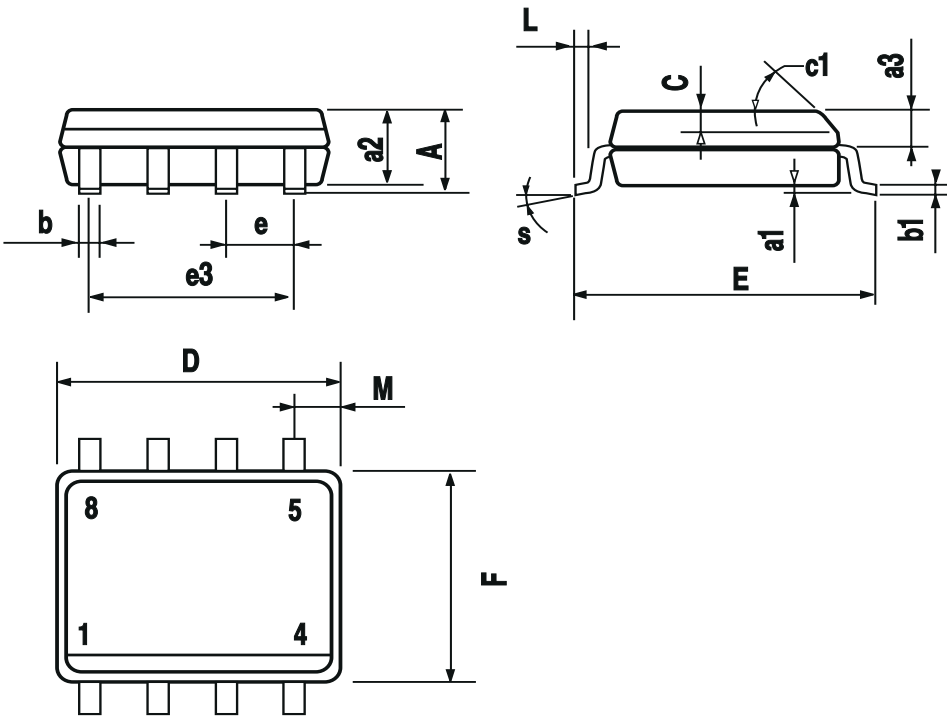
| DIM.  | mm         |      |      | inch  |       |       |
|-------|------------|------|------|-------|-------|-------|
|       | MIN.       | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A     |            |      | 1.75 |       |       | 0.069 |
| a1    | 0.1        |      | 0.25 | 0.004 |       | 0.010 |
| a2    |            |      | 1.65 |       |       | 0.065 |
| a3    | 0.65       |      | 0.85 | 0.026 |       | 0.033 |
| b     | 0.35       |      | 0.48 | 0.014 |       | 0.019 |
| b1    | 0.19       |      | 0.25 | 0.007 |       | 0.010 |
| C     | 0.25       |      | 0.5  | 0.010 |       | 0.020 |
| c1    | 45° (typ.) |      |      |       |       |       |
| D (1) | 4.8        |      | 5.0  | 0.189 |       | 0.197 |
| E     | 5.8        |      | 6.2  | 0.228 |       | 0.244 |
| e     |            | 1.27 |      |       | 0.050 |       |
| e3    |            | 3.81 |      |       | 0.150 |       |
| F (1) | 3.8        |      | 4.0  | 0.15  |       | 0.157 |
| L     | 0.4        |      | 1.27 | 0.016 |       | 0.050 |
| M     |            |      | 0.6  |       |       | 0.024 |
| S     | 8° (max.)  |      |      |       |       |       |

(1) D and F do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm (.006inch).

OUTLINE AND  
MECHANICAL DATA



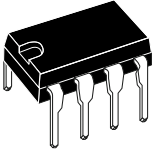
SO8



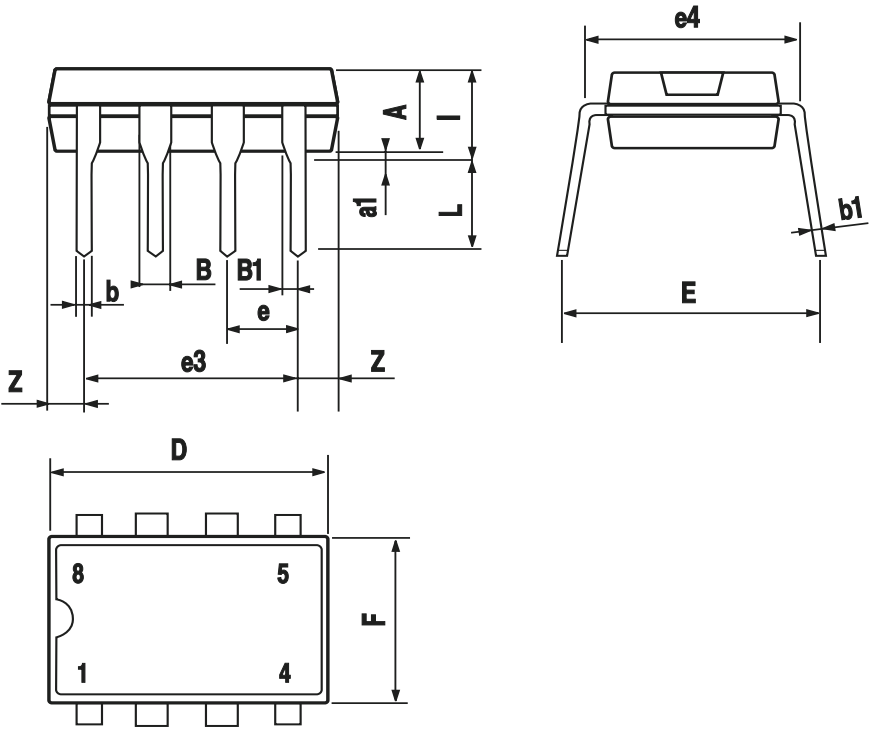
# TDA7233 - TDA7233D

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    |       | 3.32 |       |       | 0.131 |       |
| a1   | 0.51  |      |       | 0.020 |       |       |
| B    | 1.15  |      | 1.65  | 0.045 |       | 0.065 |
| b    | 0.356 |      | 0.55  | 0.014 |       | 0.022 |
| b1   | 0.204 |      | 0.304 | 0.008 |       | 0.012 |
| D    |       |      | 10.92 |       |       | 0.430 |
| E    | 7.95  |      | 9.75  | 0.313 |       | 0.384 |
| e    |       | 2.54 |       |       | 0.100 |       |
| e3   |       | 7.62 |       |       | 0.300 |       |
| e4   |       | 7.62 |       |       | 0.300 |       |
| F    |       |      | 6.6   |       |       | 0.260 |
| I    |       |      | 5.08  |       |       | 0.200 |
| L    | 3.18  |      | 3.81  | 0.125 |       | 0.150 |
| Z    |       |      | 1.52  |       |       | 0.060 |

## OUTLINE AND MECHANICAL DATA



**Minidip**



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