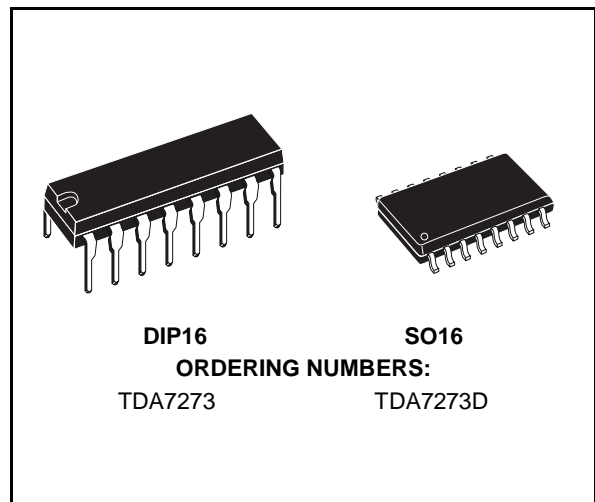


SINGLE CHIP STEREO CASSETTE PLAYBACK SYSTEM

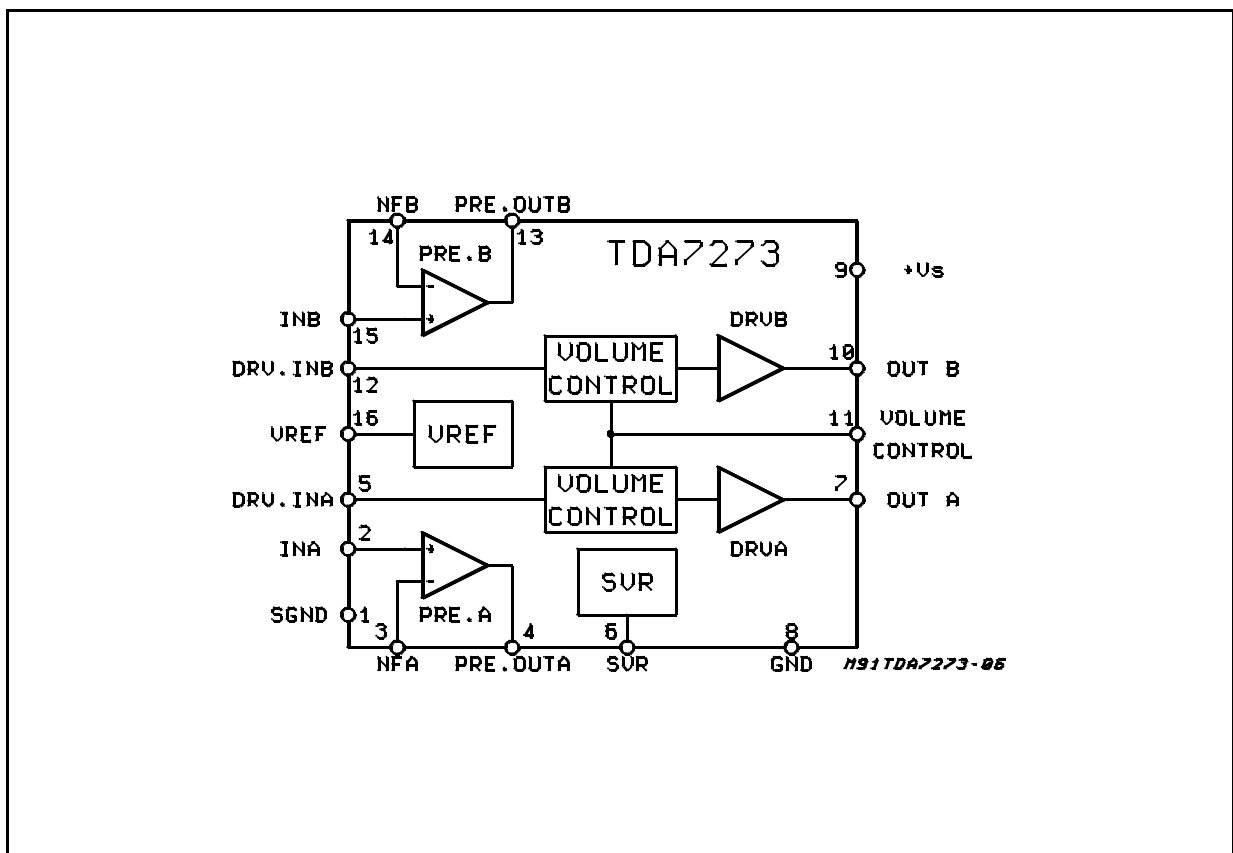
- WIDE OPERATING SUPPLY VOLTAGE (1.8V to 7V)
- INPUT COUPLING WITHOUT CAPACITORS
- BUILT-IN DC STEREO VOLUME CONTROL
- BUILT-IN RIPPLE FILTERS
- LOW QUIESCENT CURRENT
- NO EXTERNAL BOUCHEROT CELL
- MAX OUTPUT CURRENT 70mA PEAK

DESCRIPTION

The TDA7273 is a monolithic integrated circuit designed for portable cassette players market. It comprises preamplifiers, DC volume control, and headphone drivers.



BLOCK DIAGRAM



TDA7273

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Test Conditions | Unit |
|----------------|--------------------------------------|-----------------|------|
| V_S | Supply Voltage | 9 | V |
| I_o | Output Current (max) | 70 | mA |
| T_{op} | Operating Temperature Range | -20 to 70 | °C |
| T_{stg}, T_j | Storage & Junction Temperature Range | -40 to +150 | °C |

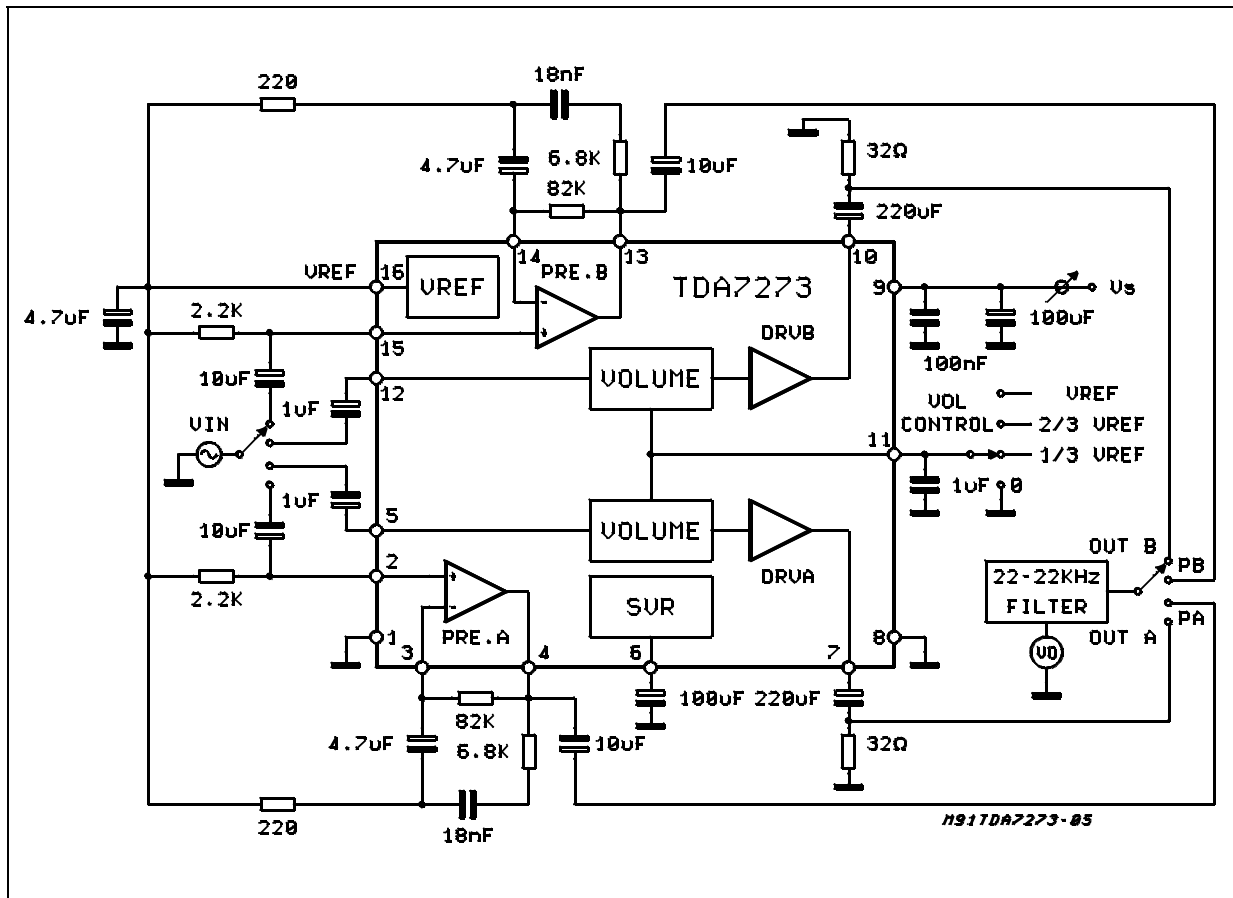
THERMAL DATA

| Symbol | Description | DIP-16 | SO-16 | Unit |
|---------------|-------------------------------------|--------|-------|------|
| $R_{thj-amb}$ | Thermal Resistance Junction-ambient | 100 | 200 | °C/W |

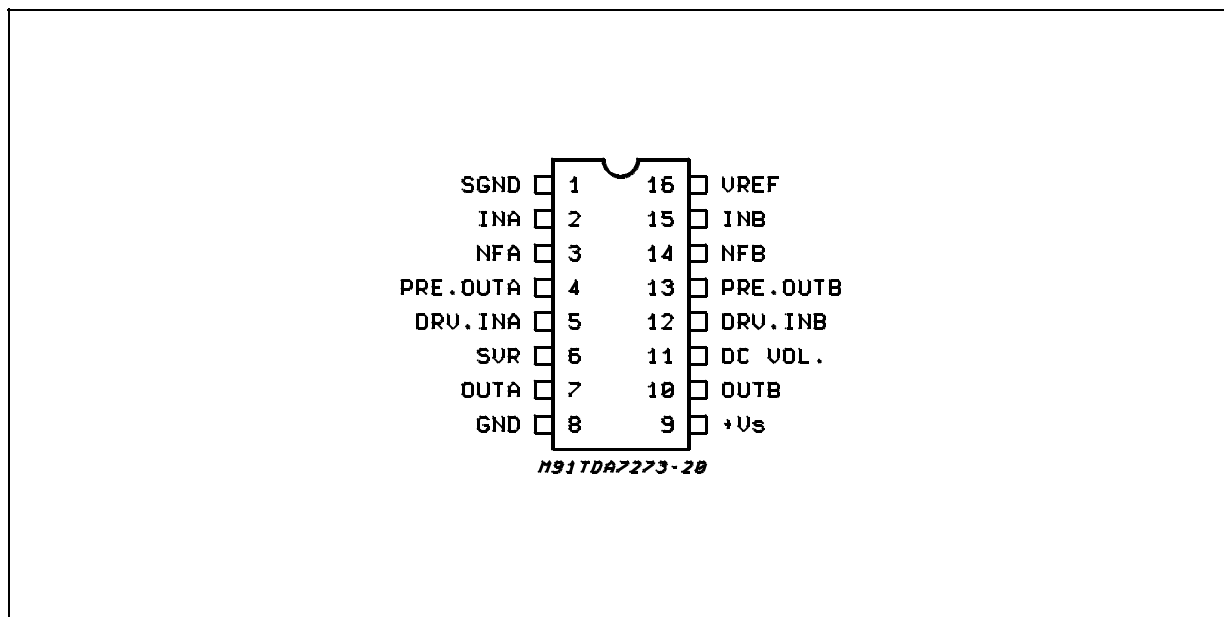
DC CHARACTERISTICS: $T_{amb} = 25^{\circ}C$; $V_S = 3V$; $R_L = 10K\Omega$ (Preamplifier), $R_L = 32\Omega$ (Headphone); $V_{IN} = 0$; $V_{OL} control = V_{ref}$

| Terminal No | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|----------------------|---|-----|-----|-----|-----|-----|-----|---|---|-----|-----|-----|-----|-----|-----|-----|
| Terminal Voltage (V) | 0 | 1.5 | 1.5 | 1.5 | 1.5 | 2.7 | 1.5 | 0 | 3 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |

TEST CIRCUIT



PIN CONNECTION (Top view)



ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, $V_S = 3\text{V}$, $f = 1\text{KHz}$, $R_L = 32\Omega$ Vol. control = $2/3V_{ref}$ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|-----------|-------------------|----------------|------|------|------|------|
| V_S | Supply Voltage | | 1.8 | | 7 | V |
| I_d | Quiescent Current | | | 14 | 20 | mA |
| V_{ref} | Reference Voltage | | 1.3 | 1.49 | 1.7 | V |

PREAMPLIFIER SECTION

| | | | | | | |
|----------|---------------------------|--|-----|------|------|---------------|
| G_{VO} | Open Loop Gain | | | 70 | | dB |
| G_V | Close Loop Gain | | 30 | 33 | 35 | dB |
| V_o | Output Voltage | THD = 1% | 600 | 850 | | mV |
| I_b | Bias Current | | | 3 | | μA |
| THD | Total Harmonic Distortion | $V_o = 330\text{mVrms}$ | | 0.05 | 0.25 | % |
| C_t | Cross Talk | $R_g = 2.2\text{K}\Omega$; $V_o = 330\text{mVrms}$ | | 74 | | dB |
| E_N | Output Noise | $R_g = 2.2\text{K}\Omega$; BW = 22Hz to 22KHz | | 100 | | μV |
| SVR | Ripple Rejection | $R_g = 2.2\text{K}\Omega$ $V_R = 100\text{mVrms}$ $f = 100\text{Hz}$; $C_{SVR} = 100\mu\text{F}$ | 40 | 50 | | dB |

HEADPHONE DRIVER

| | | | | | | |
|-------------|---------------------------|---|----|------|----|----|
| $V_{o(DC)}$ | DC Output Voltage | | | 1.50 | | V |
| P_o | Output Power | THD = 10%; | 15 | 30 | | mW |
| P_o | Transient Output Power | THD = 10% $R_L = 16\Omega$ | | 50 | | mW |
| G_V | Close Loop Gain | $P_o = 5\text{mW}$ | 28 | 31 | 34 | dB |
| THD | Total Harmonic Distortion | $P_o = 5\text{mW}$ | | 0.2 | 1 | % |
| C_t | Cross Talk | $R_g = 10\text{K}\Omega$; $P_o = 5\text{mW}$ | 40 | 50 | | dB |
| SVR | Ripple Rejection | $V_r = 100\text{mVrms}$, $f = 100\text{Hz}$ Vol. control = $1/3V_{ref}$ $C_{SVR} = 100\mu\text{F}$; $R_g = 600\Omega$ | | 47 | | dB |
| | Volume Control Range | | 66 | 75 | | dB |

TDA7273

Figure 1: Application Circuit

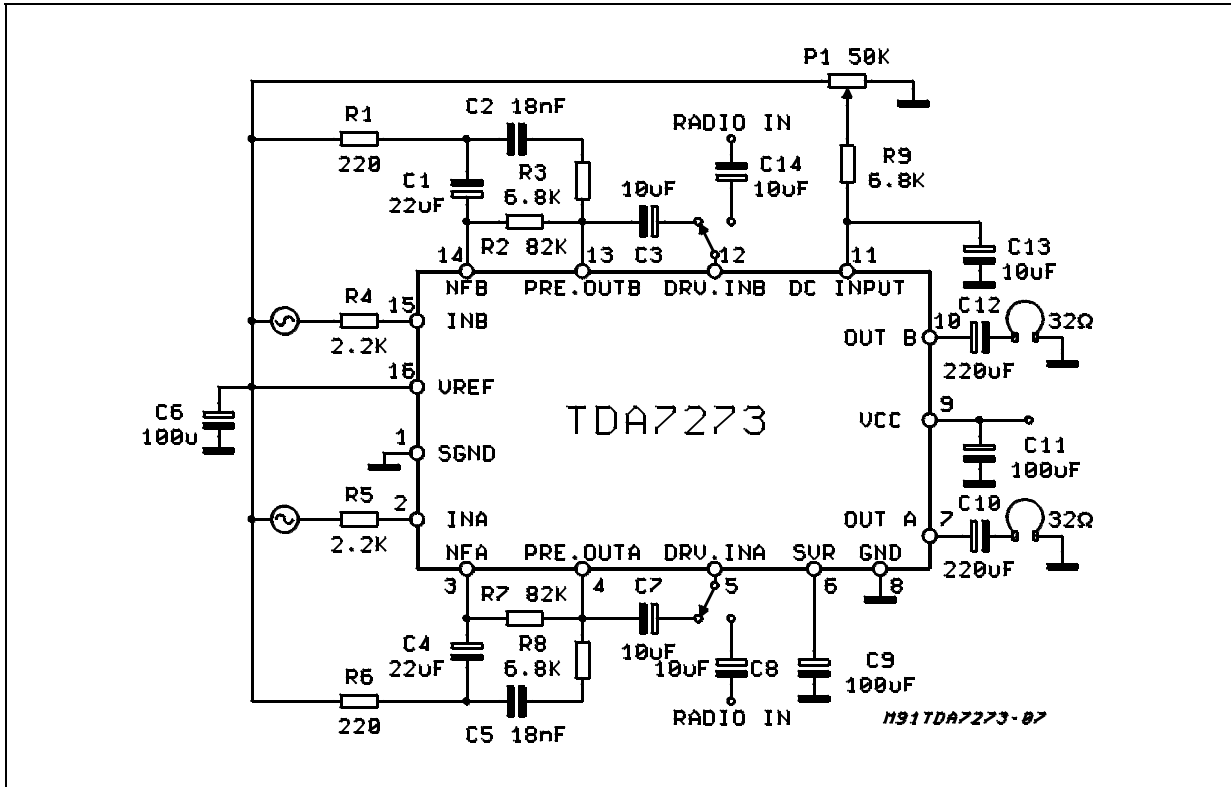


Figure 2: P.C. Board and Component Layout of the Circuit of Figure 1 (1:1 scale)

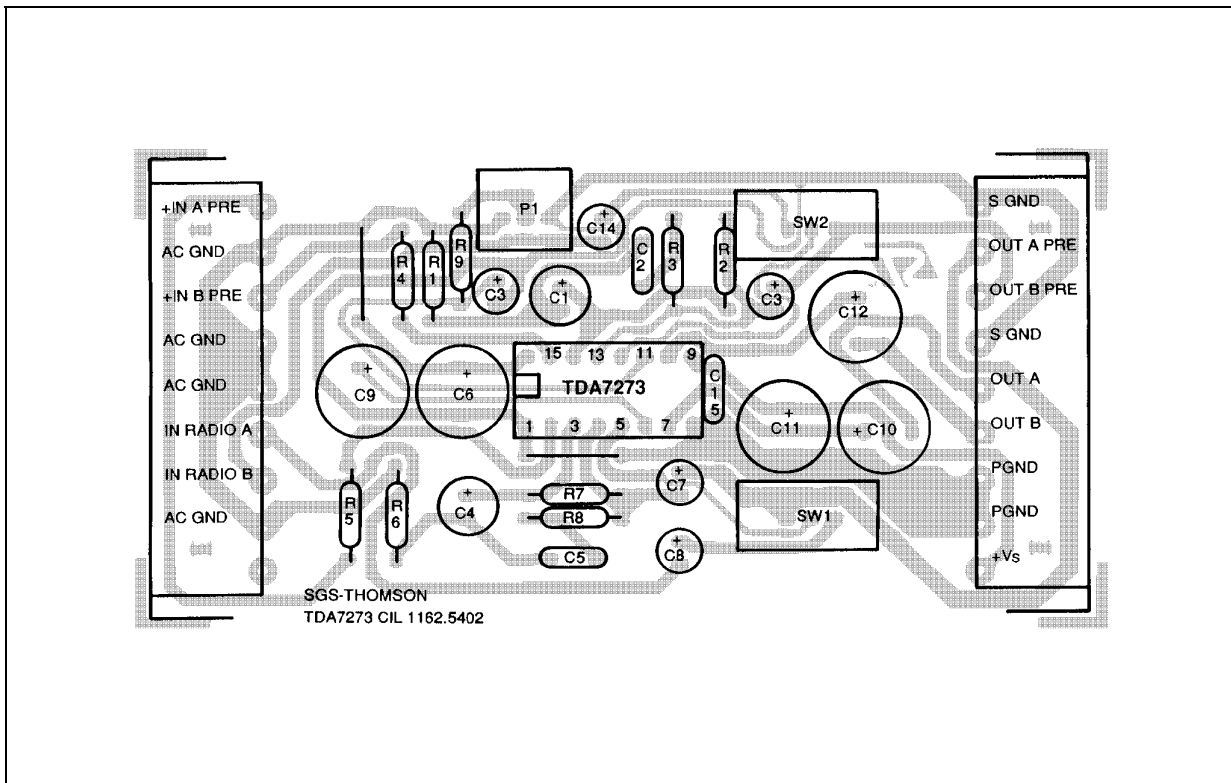


Figure 3: Supply Current vs. Supply Voltage (Preamplifier + Driver)

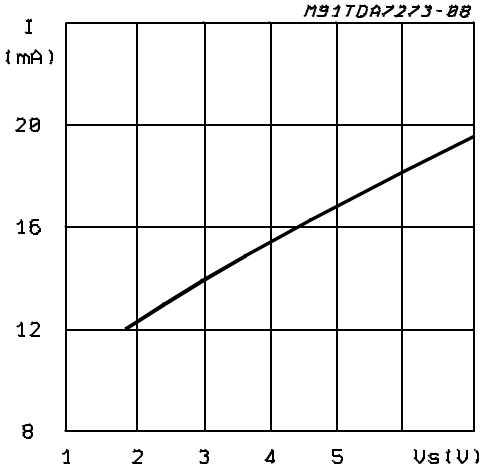


Figure 4: V_{ref} vs. Supply Voltage (pin 16)

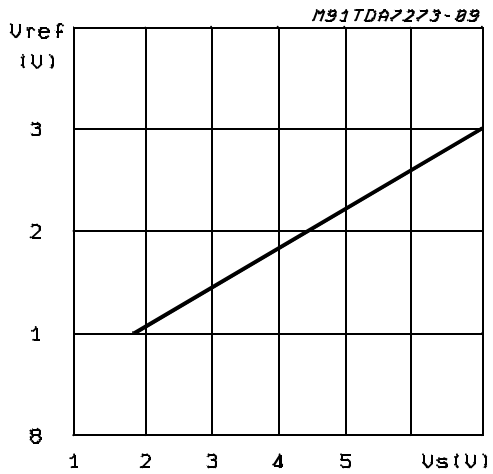


Figure 5: Closed Loop Gain vs. Frequency ($V_S = 3V$) (PREAMPLIFIER)

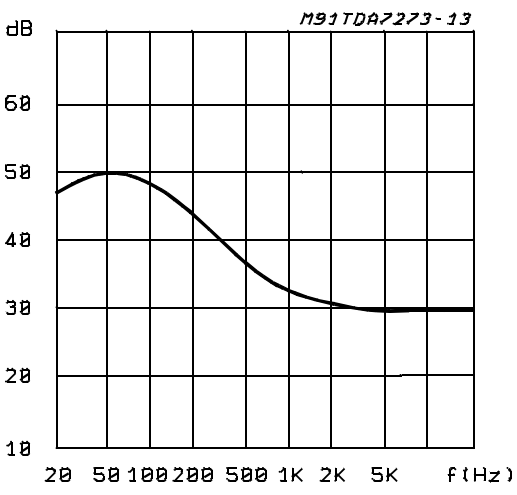


Figure 6: THD vs. Frequency ($V_S = 3V$, $V_O = 330mV_{rms}$, $R_L = 10K\Omega$) (PREAMPLIFIER)

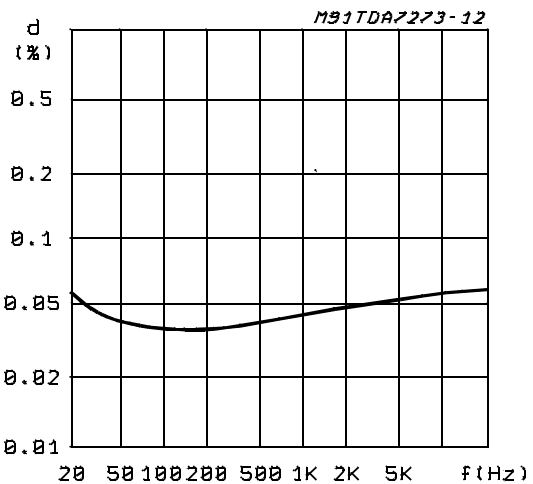


Figure 7: SVR vs. Frequency (PREAMPLIFIER)

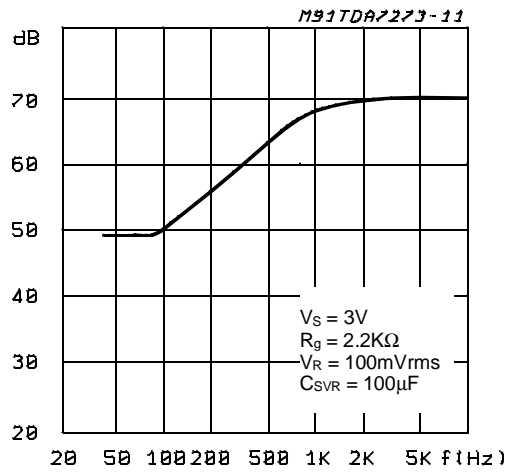


Figure 8: Quiescent Output Voltage vs. Supply Voltage (DRIVER)

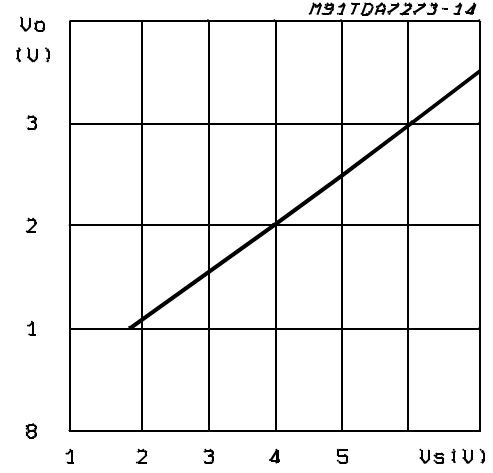


Figure 9: Closed Loop Gain vs Frequency ($V_S = 3V, R_L = 32\Omega$) (DRIVER)

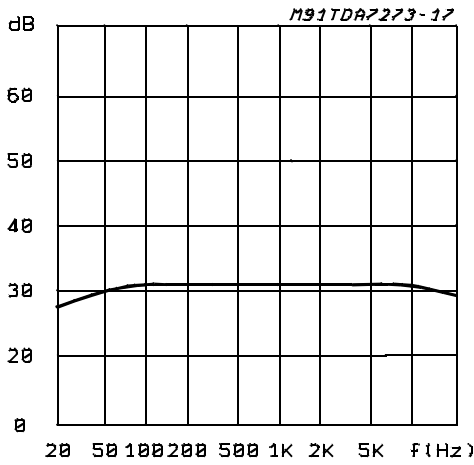


Figure 10: Output Power vs. Supply Voltage ($V_{ol} = 2/3V_{ref}, R_L = 32\Omega, THD = 10\%, f = 1KHz$) (DRIVER)

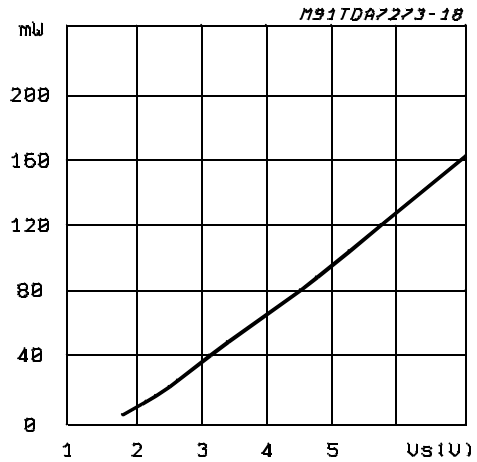


Figure 11: THD vs. Output Power ($V_o = 2/3V_{ref}, V_S = 3V, R_L = 32\Omega, f = 1KHz$) (DRIVER)

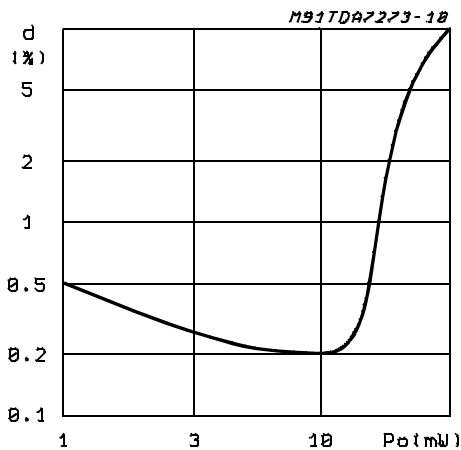


Figure 12: THD vs. Frequency ($P_o = 5mW, V_S = 3V, R_L = 32\Omega$) (DRIVER)

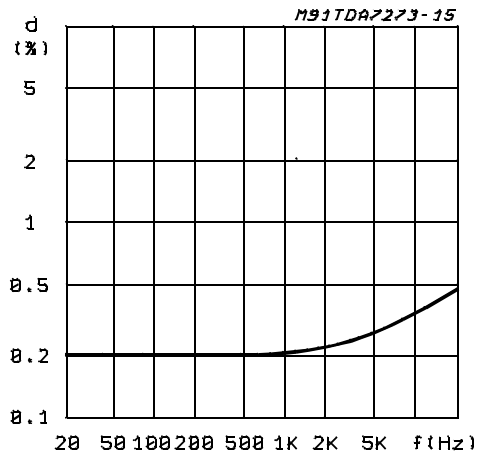


Figure 13: SVR vs. Frequency ($V_S = 3V, R_L = 32\Omega, V_r = 100V_{rms}, R_g = 600\Omega, C_{SVR} = 100mV$) (DRIVER)

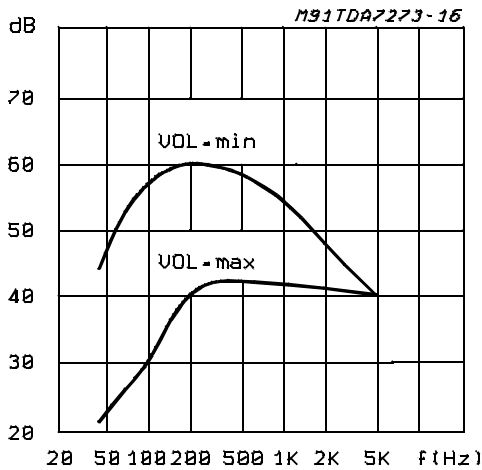
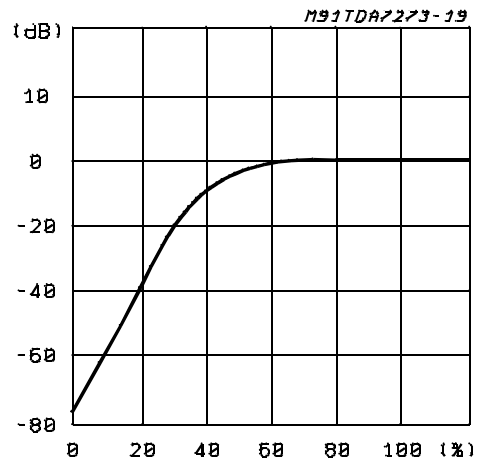
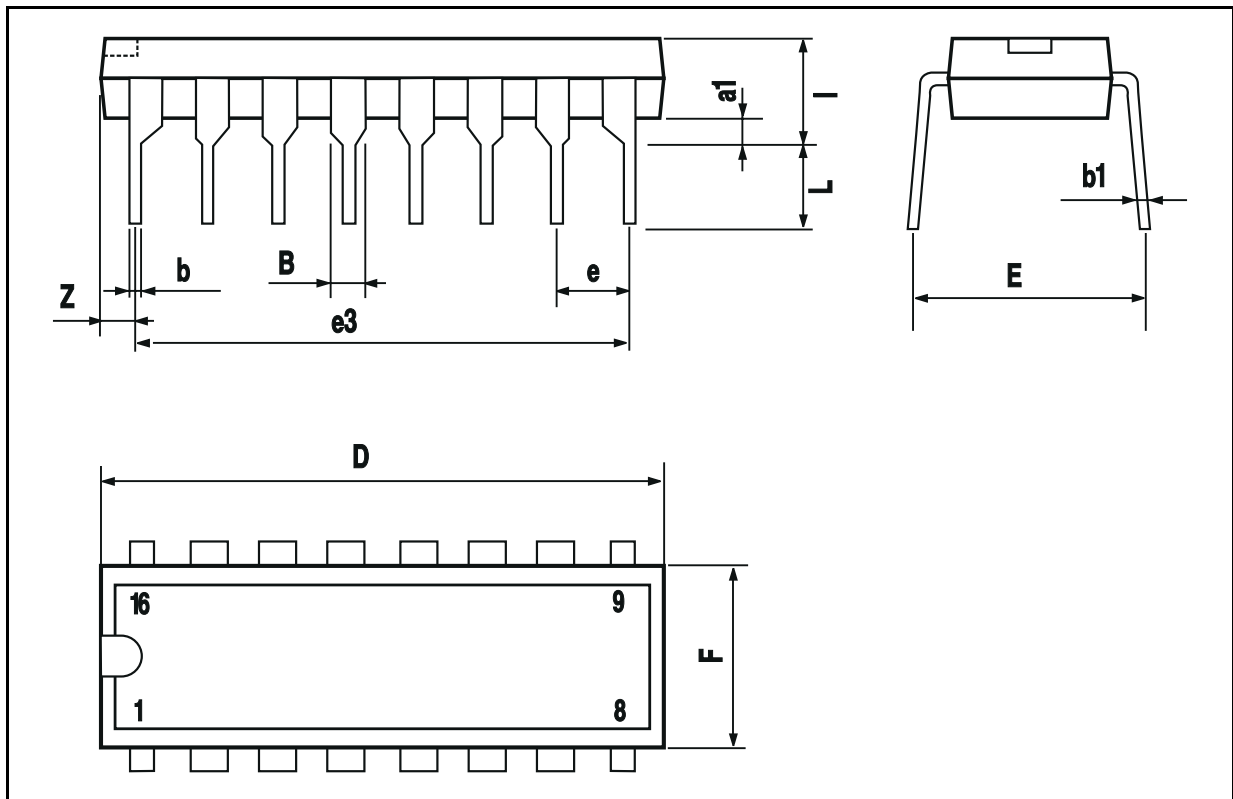


Figure 14: Volume Control (0dB = 10mW, $V_S = 3V, R_{vol} = 50K\Omega, R_L = 32\Omega, f = 1KHz$) vs. Volume Setting (DRIVER)



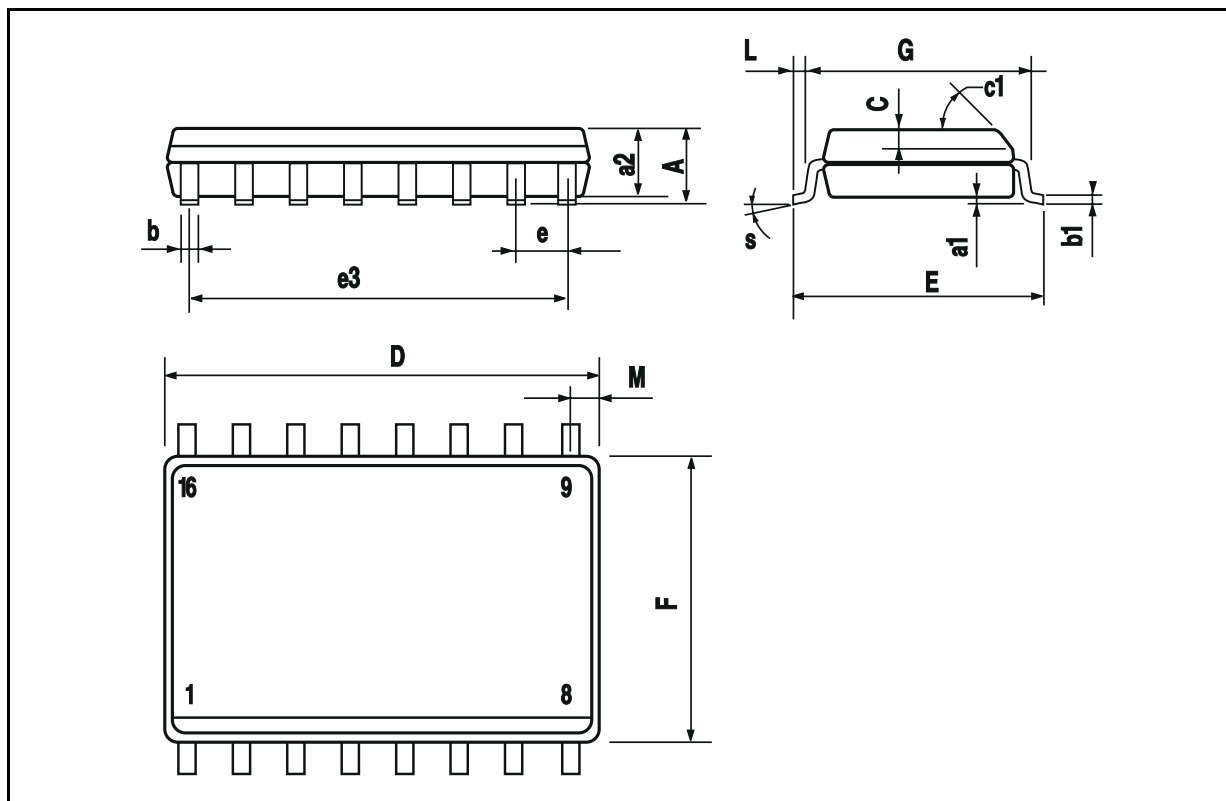
DIP16 PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|-------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| a1 | 0.51 | | | 0.020 | | |
| B | 0.77 | | 1.65 | 0.030 | | 0.065 |
| b | | 0.5 | | | 0.020 | |
| b1 | | 0.25 | | | 0.010 | |
| D | | | 20 | | | 0.787 |
| E | | 8.5 | | | 0.335 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 17.78 | | | 0.700 | |
| F | | | 7.1 | | | 0.280 |
| l | | | 5.1 | | | 0.201 |
| L | | 3.3 | | | 0.130 | |
| Z | | | 1.27 | | | 0.050 |



SO16 PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 2.65 | | | 0.104 |
| a1 | 0.1 | | 0.2 | 0.004 | | 0.012 |
| a2 | | | 2.45 | | | 0.096 |
| b | 0.35 | | 0.49 | 0.014 | | 0.019 |
| b1 | 0.23 | | 0.32 | 0.009 | | 0.013 |
| C | | 0.5 | | | 0.020 | |
| c1 | 45° (typ.) | | | | | |
| D | 10.1 | | 10.5 | 0.398 | | 0.413 |
| E | 10.0 | | 10.65 | 0.394 | | 0.419 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 8.89 | | | 0.350 | |
| F | 7.4 | | 7.6 | 0.291 | | 0.299 |
| L | 0.5 | | 1.27 | 0.020 | | 0.050 |
| M | | | 0.75 | | | 0.030 |
| S | 8° (max.) | | | | | |



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