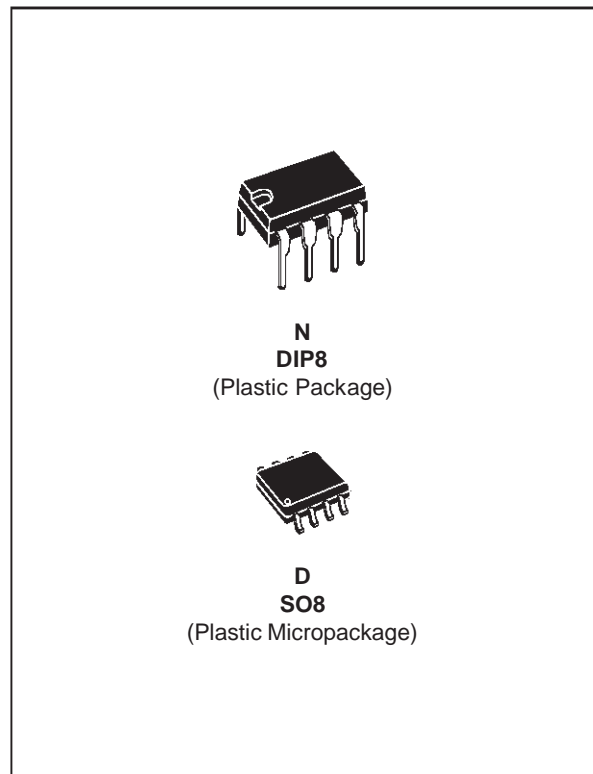


LOW NOISE DUAL OPERATIONAL AMPLIFIERS

- LOW VOLTAGE NOISE : $4.5nV/\sqrt{Hz}$
- HIGH GAIN BANDWIDTH PRODUCT : 15MHz
- HIGH SLEW RATE : $7V/\mu s$
- LOW DISTORTION : 0.002%
- EXCELLENT FREQUENCY STABILITY
- ESD PROTECTION 2kV



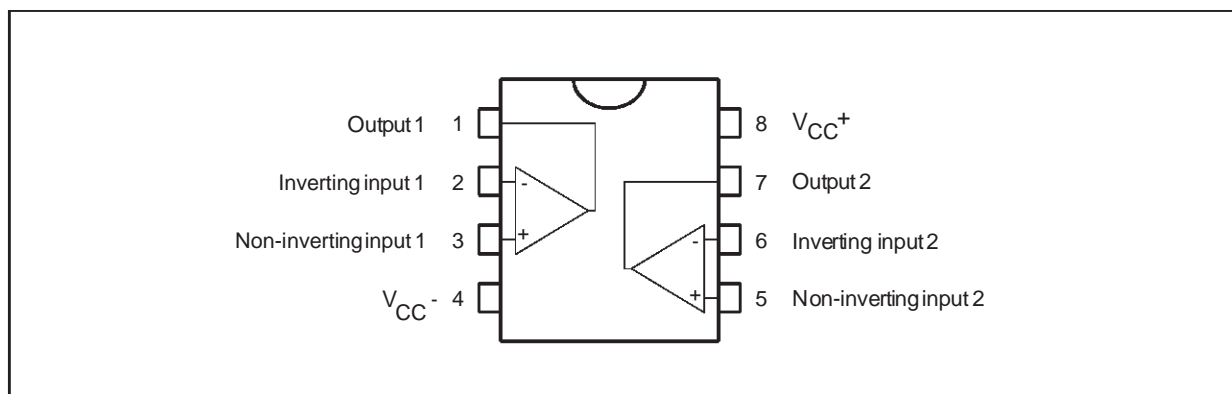
DESCRIPTION

The LM833 is a monolithic dual operational amplifier dedicated to audio applications. The LM833 offers low voltage noise ($4.5nV/\sqrt{Hz}$) and high frequency performances (15MHz gain bandwidth product, $7V/\mu s$ slew rate). In addition the LM833 has also a very low distortion (0.002%) and excellent phase/gain margins.

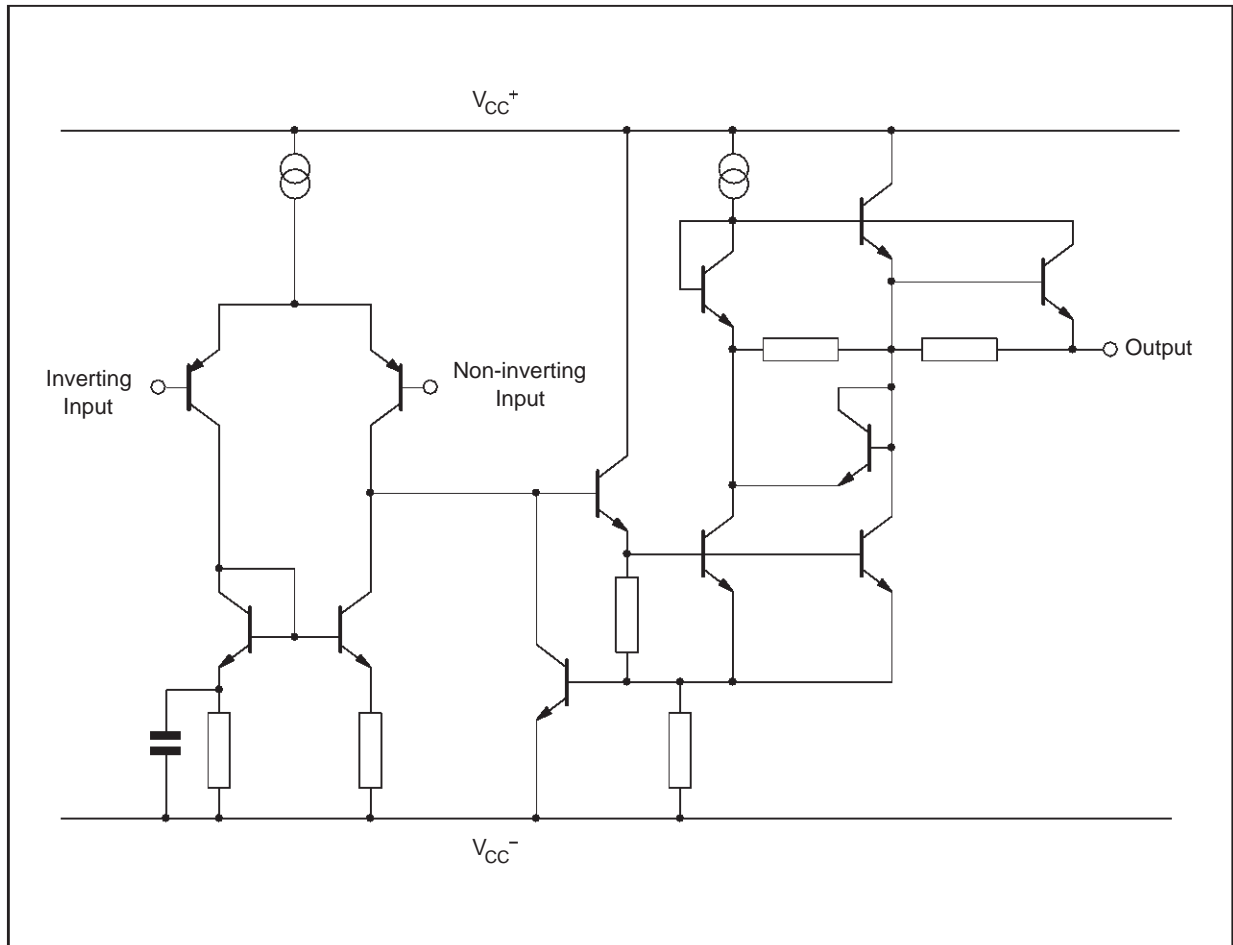
ORDER CODES

| Part Number | Temperature Range | Package | |
|-------------|-------------------|---------|---|
| | | N | D |
| LM833 | -40, +105°C | • | • |

PIN CONNECTIONS (top view)



SCHEMATIC DIAGRAM (1/2 LM833)



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|------------|--|-------------------|-------------|
| V_{CC} | Supply Voltage | ± 18 or $+36$ | V |
| V_{id} | Differential Input Voltage - (note 1) | ± 30 | V |
| V_i | Input Voltage - (note 1) | ± 15 | V |
| | Output Short-Circuit Duration - (note 2) | Infinite | |
| T_{oper} | Operating Free-air Temperature Range | -40 to $+105$ | $^{\circ}C$ |
| T_j | Maximum Junction Temperature | $+150$ | $^{\circ}C$ |
| T_{stg} | Storage Temperature | -65 to $+150$ | $^{\circ}C$ |
| P_{tot} | Maximum Power Dissipation - (note 2) | 500 | mW |

- Notes :**
1. Either or both input voltages must not exceed the magnitude of V_{CC}^{+} or V_{CC}^{-}
 2. Power dissipation must be considered to ensure maximum junction temperature (T_j) is not exceeded

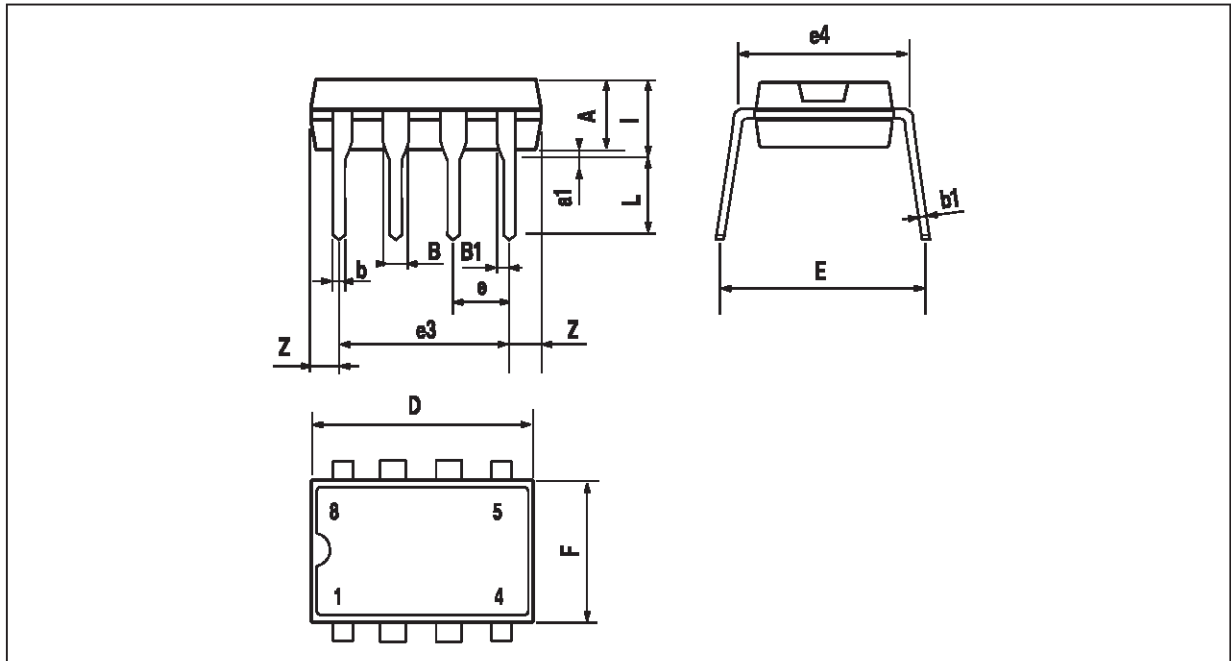
OPERATING CONDITIONS

| Symbol | Parameter | Value | Unit |
|----------|----------------|-----------------------|------|
| V_{CC} | Supply Voltage | ± 2.5 to ± 15 | V |

ELECTRICAL CHARACTERISTICS
 $V_{CC}^+ = +15V, V_{CC}^- = -15V, T_{amb} = 25^{\circ}C$ (unless otherwise specified)

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|-----------------|--|----------|------------------------------|------------|------------------------|
| V_{io} | Input Offset Voltage ($R_s = 10\Omega, V_o = 0V, V_{ic} = 0V$) | | 0.3 | 5 | mV |
| DV_{io} | Input Offset Voltage Drift $R_s = 10\Omega, V_o = 0V, T_{min.} \leq T_{amb} \leq T_{max.}$ | | 2 | | $\mu V/^{\circ}C$ |
| I_{io} | Input Offset Current ($V_{ic} = 0V, V_o = 0V$) | | 25 | 200 | nA |
| I_{ib} | Input Bias Current ($V_{ic} = 0V, V_o = 0V$) | | 300 | 1000 | nA |
| V_{icm} | Common Mode Input Voltage Range | ± 12 | ± 14 | | V |
| A_{vd} | Large Signal Voltage Gain ($R_L = 2k\Omega, V_o = \pm 10V$) | 90 | 100 | | dB |
| $\pm V_{opp}$ | Output Voltage Swing ($V_{id} = \pm 1V$) $R_L = 2.0k\Omega$ $R_L = 2.0k\Omega$ $R_L = 10k\Omega$ $R_L = 10k\Omega$ | 10 12 | 13.7 -14 13.9 -14.4 | -10 -12 | V |
| CMR | Common Mode Rejection Ratio ($V_{ic} = \pm 12V$) | 80 | 100 | | dB |
| SVR | Supply Voltage Rejection Ratio $V_{CC}^+ / V_{CC}^- = +15V / -15V$ to $+5V / -5V$ | 80 | 105 | | dB |
| I_{CC} | Supply current ($V_o = 0V$, All Amplifiers) | | 4 | 8 | mA |
| SR | Slew Rate $V_i = -10V$ to $+10V, R_L = 2k\Omega, A_v = +1V$ | 5 | 7 | | V/ μs |
| GBP | Gain Bandwidth Product ($f = 100kHz, R_L = 2k\Omega, C_L = 100pF$) | 10 | 15 | | MHz |
| B | Unity Gain Bandwidth (Open loop) | | 9 | | MHz |
| ϕ_m | Phase Margin | | 60 | | Degrees |
| e_n | Equivalent Input Noise Voltage ($R_s = 100\Omega, f = 1kHz$) | | 4.5 | | $\frac{nV}{\sqrt{Hz}}$ |
| i_n | Equivalent Input Noise current ($f = 1kHz$) | | 0.5 | | $\frac{pA}{\sqrt{Hz}}$ |
| THD | Total Harmonic Distortion $R_L = 2k\Omega, f = 20Hz$ to $20kHz, V_o = 3V_{rms}, A_v = +1$ | | 0.002 | | % |
| V_{O1}/V_{O2} | Channel Separation ($f = 20Hz$ to $20kHz$) | | 120 | | dB |
| FPB | Full Power Bandwidth ($V_o = 27V_{pp}, R_L = 2k\Omega, THD \leq 1\%$) | | 120 | | kHz |

PACKAGE MECHANICAL DATA
8 PINS - PLASTIC DIP



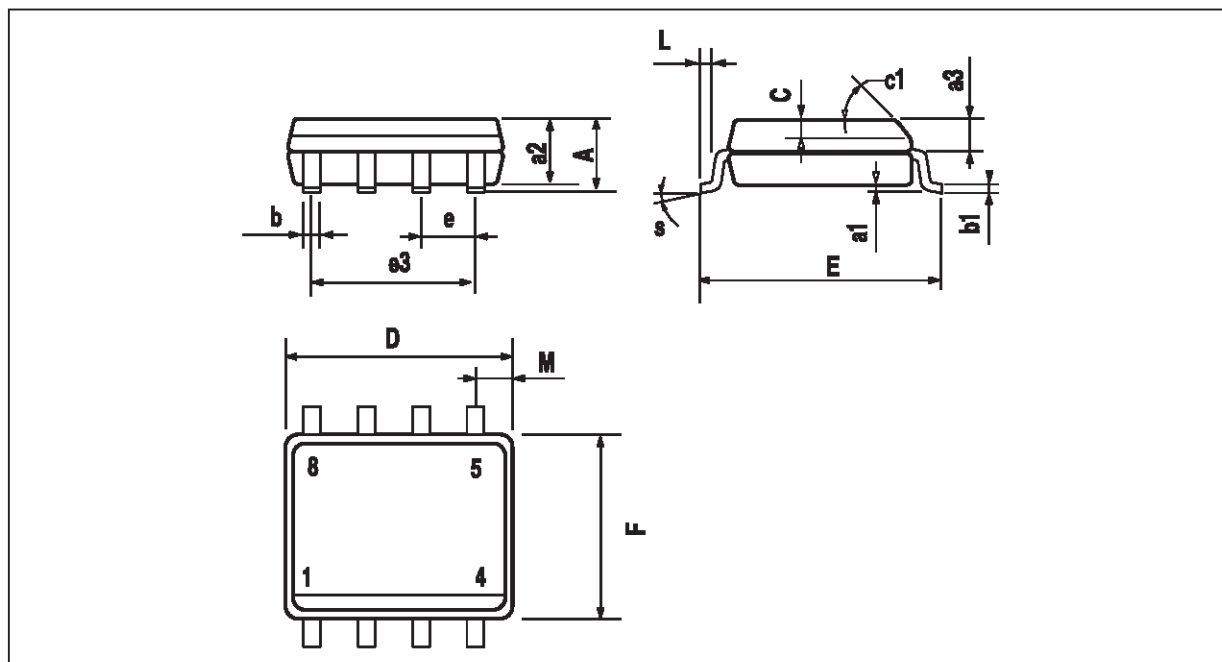
PM-DIP8.EPS

| Dim. | Millimeters | | | Inches | | |
|------|-------------|------|-------|--------|-------|-------|
| | 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 |

DIP8.TBL

PACKAGE MECHANICAL DATA

8 PINS - PLASTIC MICROPACKAGE (SO)



PW-S08.EPS

| Dim. | Millimeters | | | Inches | | |
|------|-------------|------|------|--------|-------|-------|
| | 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 | 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 | 3.8 | | 4.0 | 0.150 | | 0.157 |
| L | 0.4 | | 1.27 | 0.016 | | 0.050 |
| M | | | 0.6 | | | 0.024 |
| S | 8° (max.) | | | | | |

S08.TBL

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