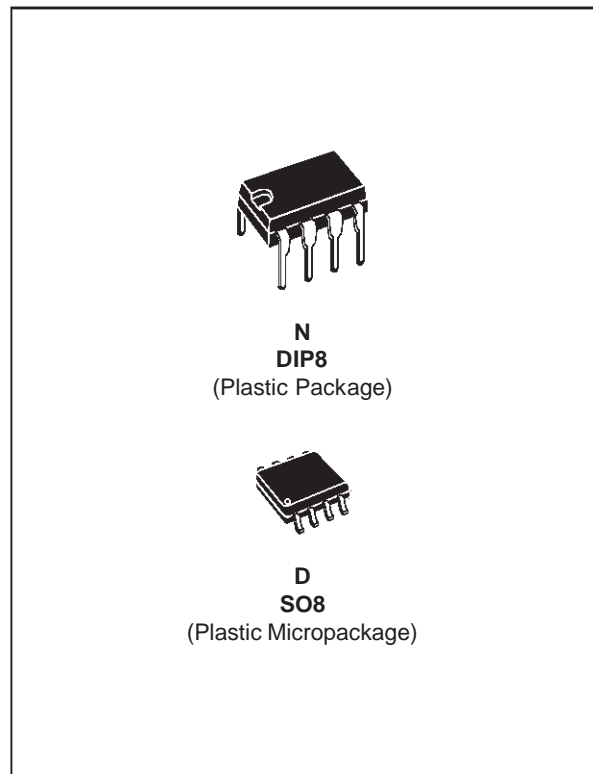


**LOW NOISE DUAL OPERATIONAL AMPLIFIERS**

- 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**

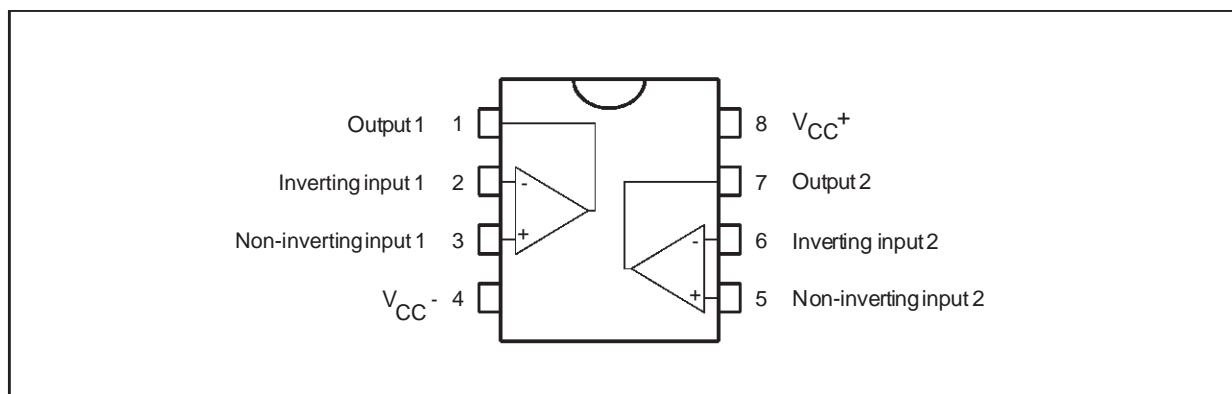
The LM833 is a monolithic dual operational amplifier dedicated to audio applications. The LM833 offers low voltage noise ( $4.5nV/\sqrt{Hz}$ ) and high frequency performances (15MHz gain bandwidth product,  $7V/\mu s$  slew rate).

In addition the LM833 has also a very low distortion (0.002%) and excellent phase/gain margins.

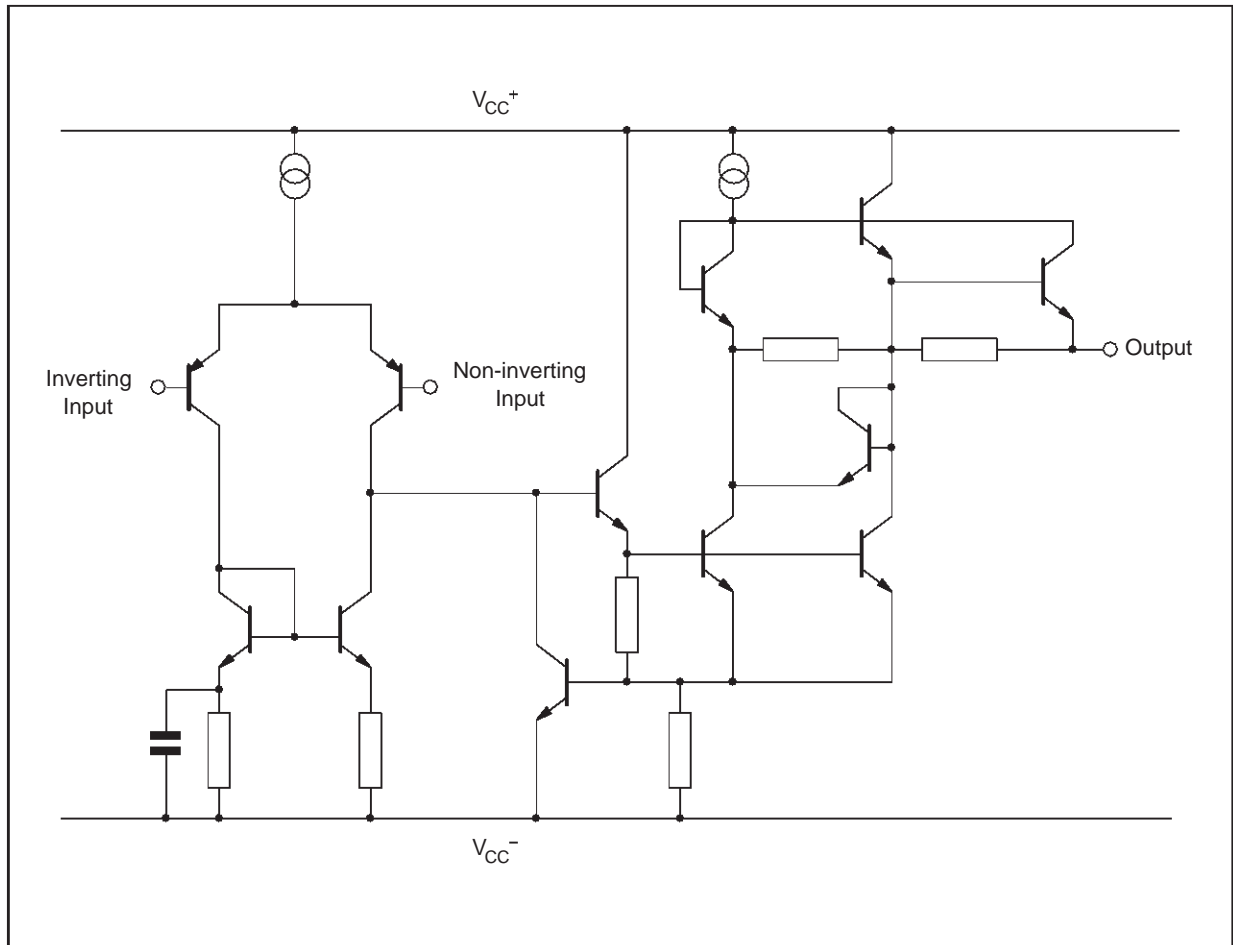
**ORDER CODES**

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 <sub>CC</sub>	Supply Voltage	±18 or +36	V
V <sub>id</sub>	Differential Input Voltage - (note 1)	±30	V
V <sub>i</sub>	Input Voltage - (note 1)	±15	V
	Output Short-Circuit Duration - (note 2)	Infinite	
T <sub>oper</sub>	Operating Free-air Temperature Range	-40 to +105	°C
T <sub>j</sub>	Maximum Junction Temperature	+150	°C
T <sub>stg</sub>	Storage Temperature	-65 to +150	°C
P <sub>tot</sub>	Maximum Power Dissipation - (note 2)	500	mW

- Notes :**
1. Either or both input voltages must not exceed the magnitude of V<sub>CC</sub><sup>+</sup> or V<sub>CC</sub><sup>-</sup>
  2. Power dissipation must be considered to ensure maximum junction temperature (T<sub>j</sub>) is not exceeded

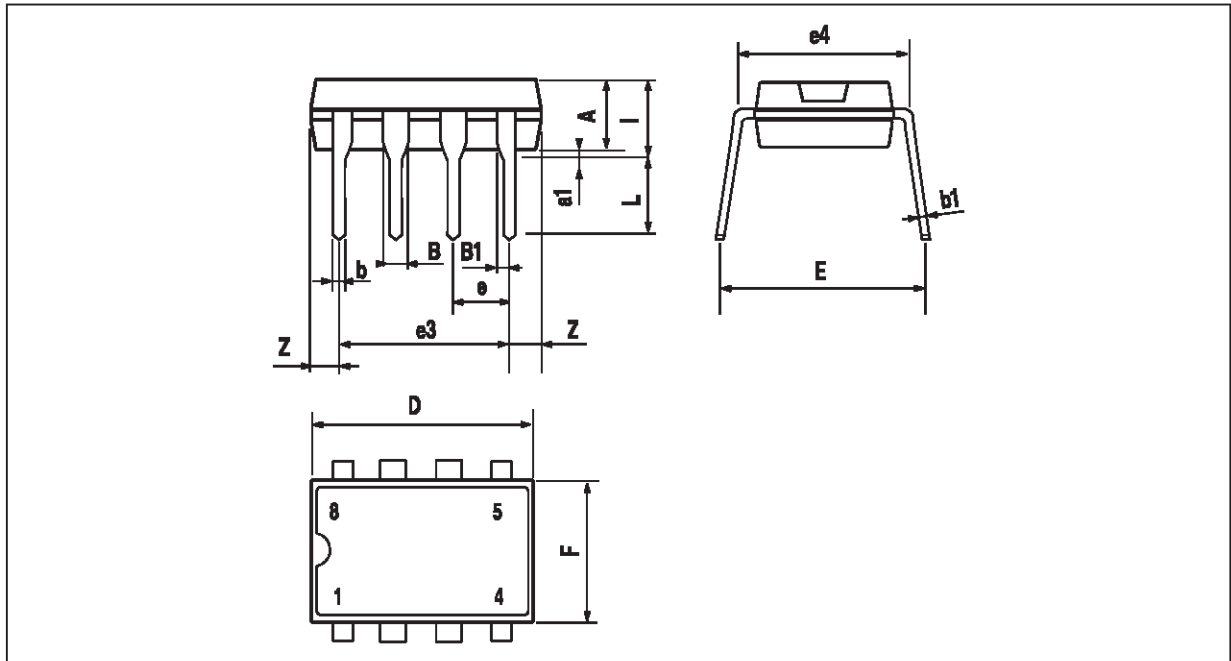
**OPERATING CONDITIONS**

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	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	$\pm 12$	$\pm 14$		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/ $\mu s$
GBP	Gain Bandwidth Product ( $f = 100kHz, R_L = 2k\Omega, C_L = 100pF$ )	10	15		MHz
B	Unity Gain Bandwidth (Open loop)		9		MHz
$\phi_m$	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



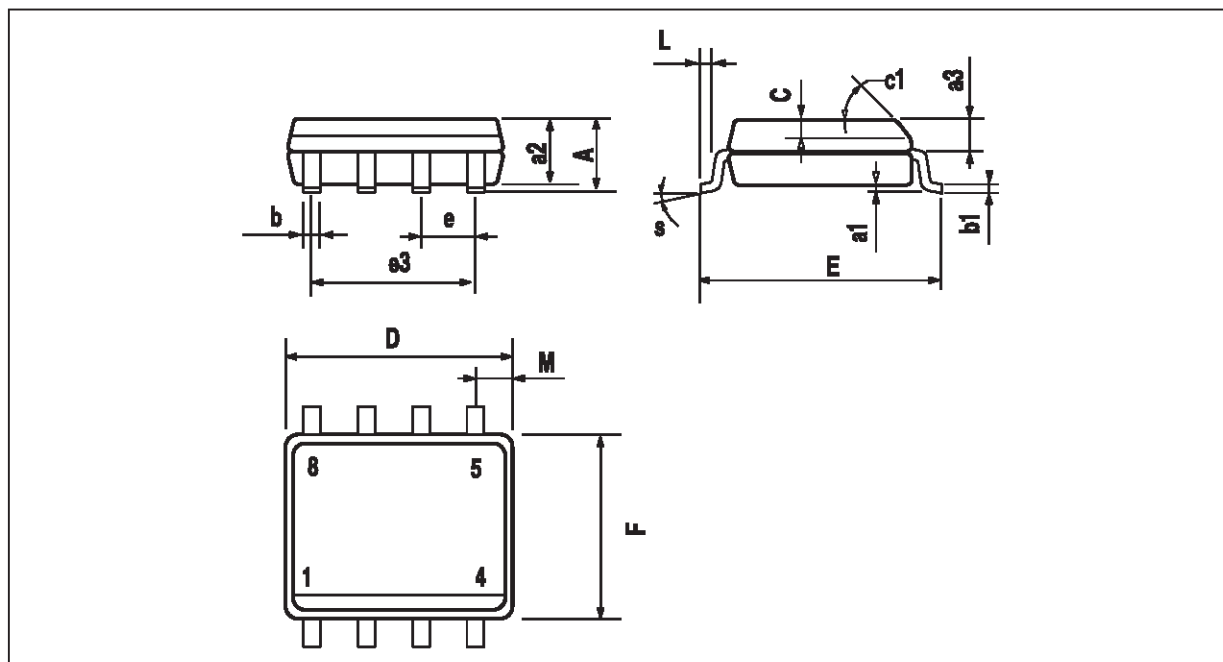
PM-DIP8.EPS

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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