LM833

LOW NOISE DUAL OPERATIONAL AMPLIFIER

- LOW VOLTAGE NOISE: **4.5nV/√Hz**
- HIGH GAIN BANDWIDTH PRODUCT: **15MHz**
- HIGH SLEW RATE: **7V/µs**
- LOW DISTORTION: 0.002%
- EXCELLENT FREQUENCY STABILITY
- ESD PROTECTION 2kV

N
DIP8
(Plastic Package)

D
SO8
(Plastic Micropackage)

DESCRIPTION

The LM833 is a monolithic dual operational amplifier particularly well suited for audio applications. It offers low voltage noise (4.5nV/√Hz) and high frequency performances (15MHz Gain Bandwidth product, 7V/µs slew rate).

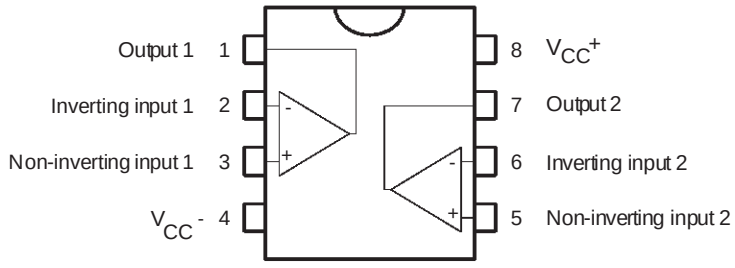
In addition the LM833 has also a very low distortion (0.002%) and excellent phase/gain margins.

ORDER CODE

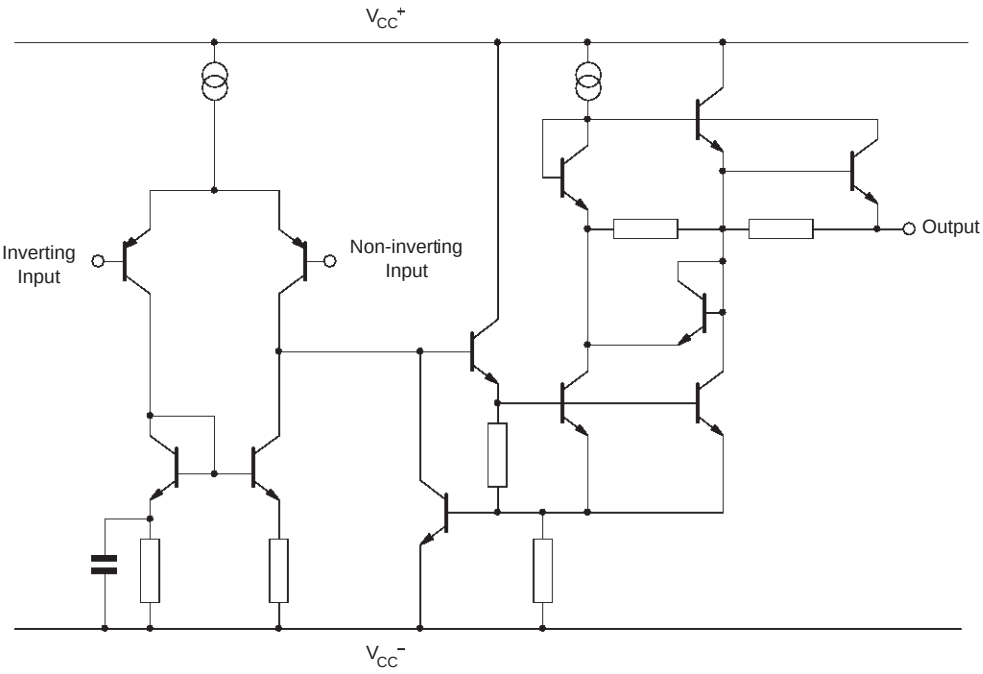
Part Number	Temperature Range	Package	
		N	D
LM833	-40°C, +105°C	•	•

N = Dual in Line Package (DIP)
D = Small Outline Package (SO) - also available in Tape & Reel (DT)

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 - see note 1	±15	V
	Output Short Circuit Duration	Infinite	s
T_{oper}	Operating Free-Air Temperature Range	-40 to 105	°C
T_j	Junction Temperature	+150	°C
T_{stg}	Storage Temperature	-65 to +150	°C
Ptot	Maximum Power Dissipation - note 2)	500	mW

1. Either or both input voltages must not exceed the magnitude of Vcc^+ or Vcc^-.
2. Power dissipation must be considered to ensure maximum junction temperature (Tj) is not exceeded.

OPERATING CONDITIONS

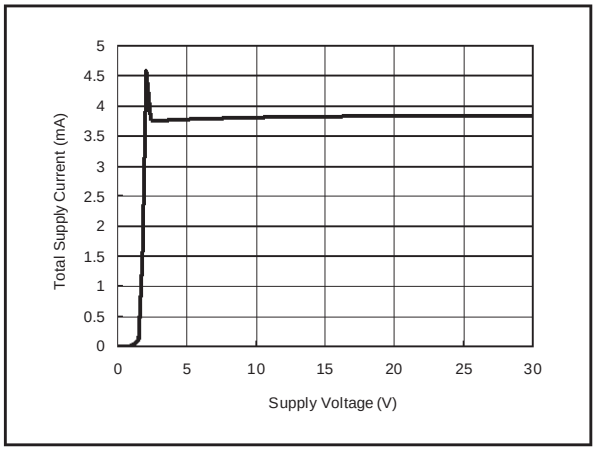
Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	±2.5 to ±15	V

ELECTRICAL CHARACTERISTICS

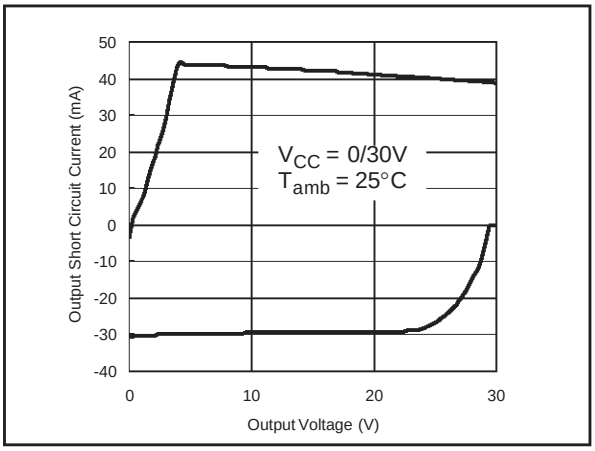
V_{CC}^+ = +15V, V_{CC}^- = -15V, T_{amb} = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{io}	Input Offset Voltage (R_s = 10Ω, V_o = 0V, V_{ic} = 0V)		0.3	5	mV
DV_{io}	Input Offset Voltage Drift R_s = 10Ω, V_o = 0V, $T_{min.} \le T_{amb} \le T_{max.}$		2		µV/°C
I_{io}	Input Offset Current (V_o = 0V, V_{ic} = 0V)		25	200	nA
I_{ib}	Input Bias Current (V_o = 0V, V_{ic} = 0V)		300	1000	nA
V_{icm}	Input Common Mode Voltage Range	±12	±14		V
A_{vd}	Large Signal Voltage Gain (R_L = 2kΩ, V_o = ±10V)	90	100		dB
$\pm V_{opp}$	Output Voltage Swing (V_{id} = ±1V) R_L = 2.0kΩ R_L = 2.0kΩ R_L = 10kΩ R_L = 10kΩ	 10 12	 13.7 -14 13.9 -14.4	 -10 -12	V
CMR	Common-mode Rejection Ratio (V_{ic} = ±13V)	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 = 2kΩ, A_V = +1)	5	7		V/µs
GBP	Gain Bandwidth Product (R_L = 2kΩ, C_L = 100pF, f = 100kHz)	10	15		MHz
B	Unity Gain Bandwidth (Open loop)		9		MHz
ϕm	Phase Margin (R_L = 2kΩ)		60		Degrees
e_n	Equivalent Input Noise Voltage (R_S = 100Ω, 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 = 2kΩ, 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 = 2kΩ, THD ≤ 1%)		120		kHz

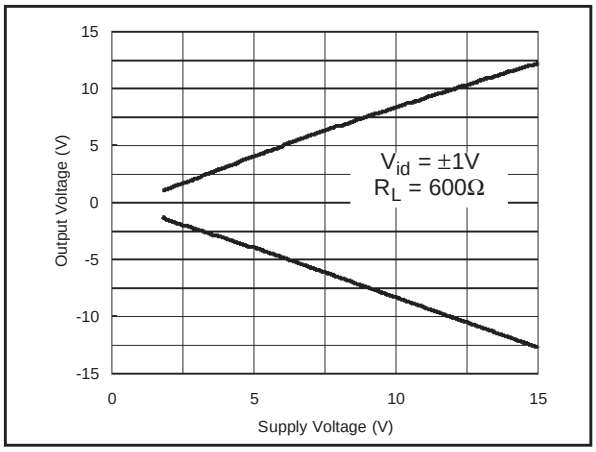
TOTAL SUPPLY CURRENT vs SUPPLY VOLTAGE



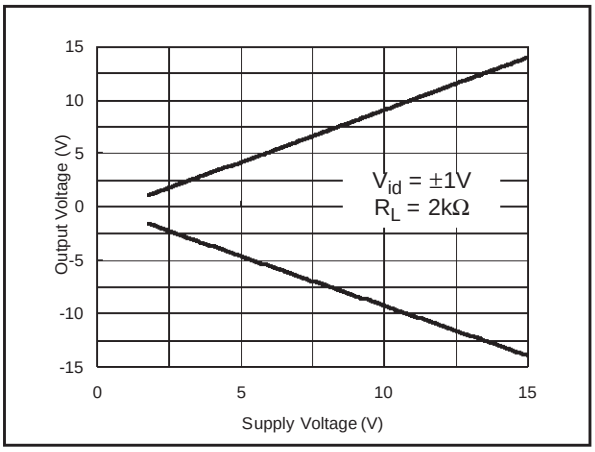
OUTPUT SHORT CIRCUIT CURRENT vs OUTPUT VOLTAGE



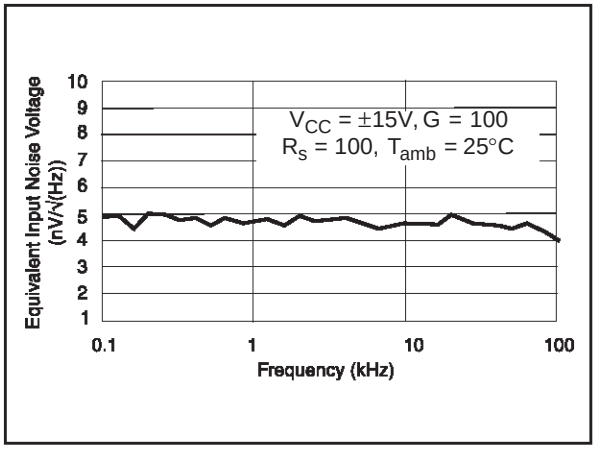
OUTPUT VOLTAGE vs SUPPLY VOLTAGE



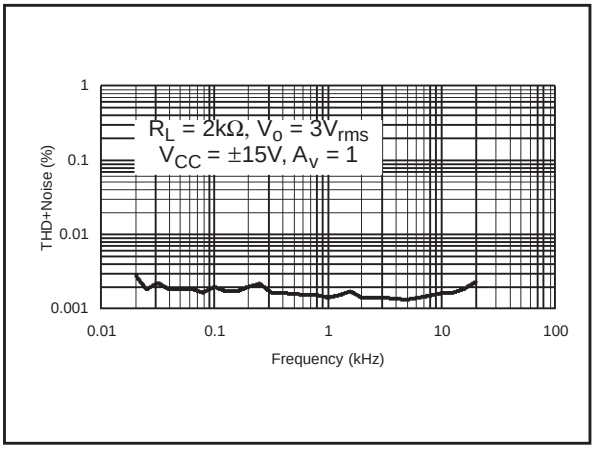
OUTPUT VOLTAGE vs SUPPLY VOLTAGE



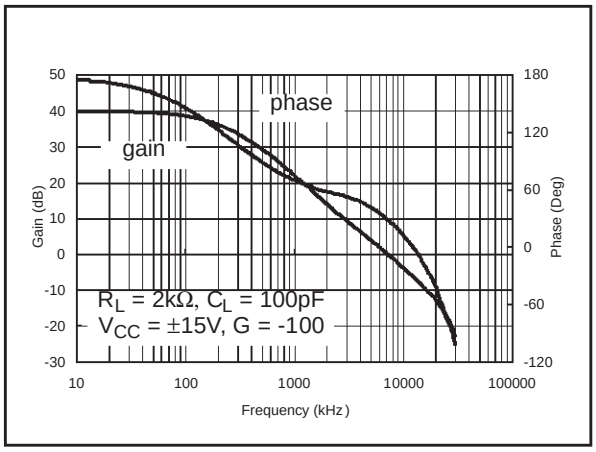
EQUIVALENT INPUT NOISE VOLTAGE vs FREQUENCY



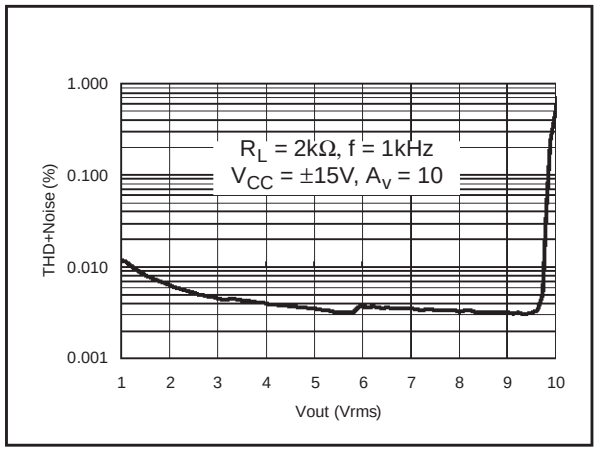
THD + NOISE vs FREQUENCY



VOLTAGE GAIN AND PHASE vs FREQUENCY

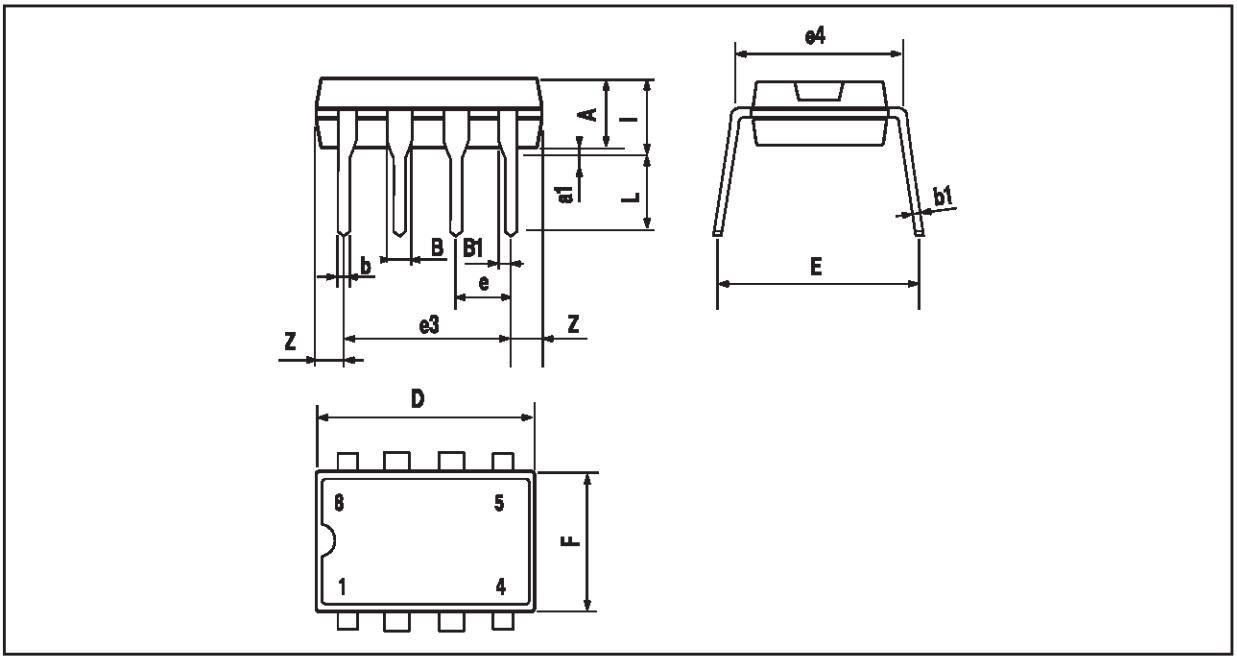


THD + NOISE vs Vout



PACKAGE MECHANICAL DATA

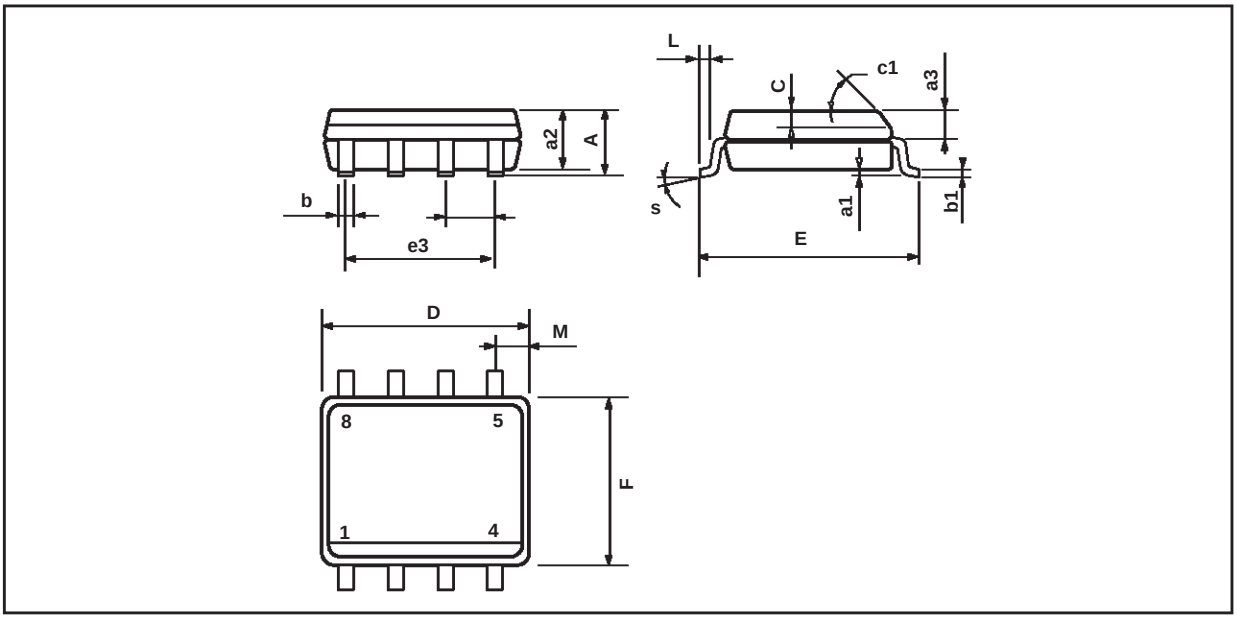
8 PINS - PLASTIC DIP



Dimensions	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			0260
i			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060

PACKAGE MECHANICAL DATA

8 PINS - PLASTIC MICROPACKAGE (SO)



Dimensions	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.)					