



LM833

CMOS IC

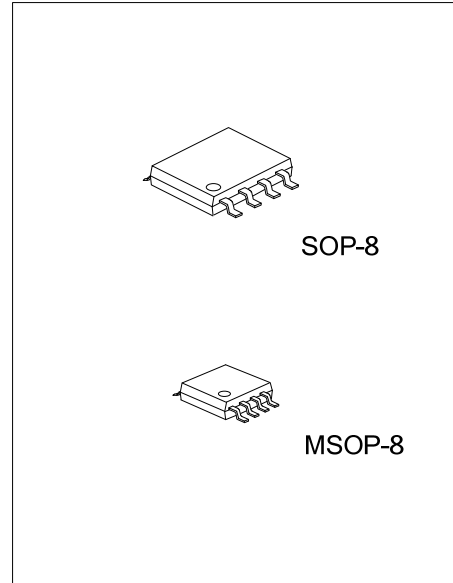
DUAL OPERATIONAL AND LOW VOLTAGE NOISE AMPLIFIER

DESCRIPTION

The UTC **LM833** is integrated circuit amplifiers which combine dual operational and low voltage noise ($4.5nV/\sqrt{Hz}$). It is particularly suited to audio applications.

It offers excellent phase/gain margins and a very low distortion (0.002%).

In addition, the UTC **LM833** has high frequency performances (15 MHz gain bandwidth product, $7V/\mu s$ slew rate).



FEATURES

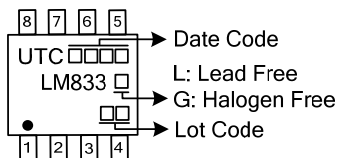
- * High slew rate: $7V/\mu s$
- * High gain bandwidth product: 15MHz
- * Excellent frequency stability
- * Low distortion: 0.002%
- * Low voltage noise: $4.5nV/\sqrt{Hz}$

ORDERING INFORMATION

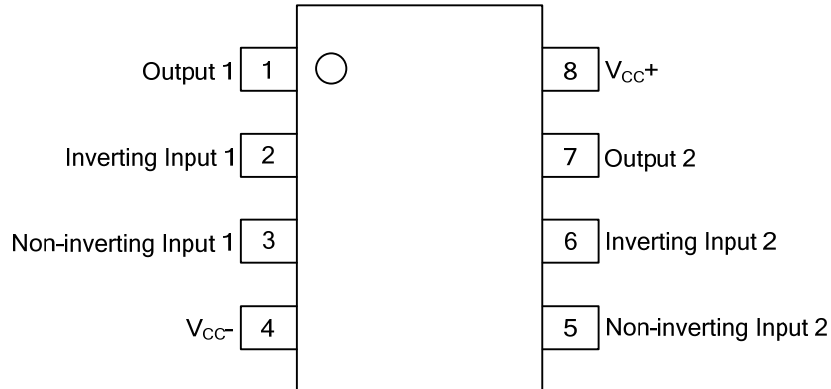
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LM833L-S08-R	LM833G-S08-R	SOP-8	Tape Reel
LM833L-SM1-R	LM833G-SM1-R	MSOP-8	Tape Reel

<p>LM833G-S08-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S08: SOP-8, SM1: MSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



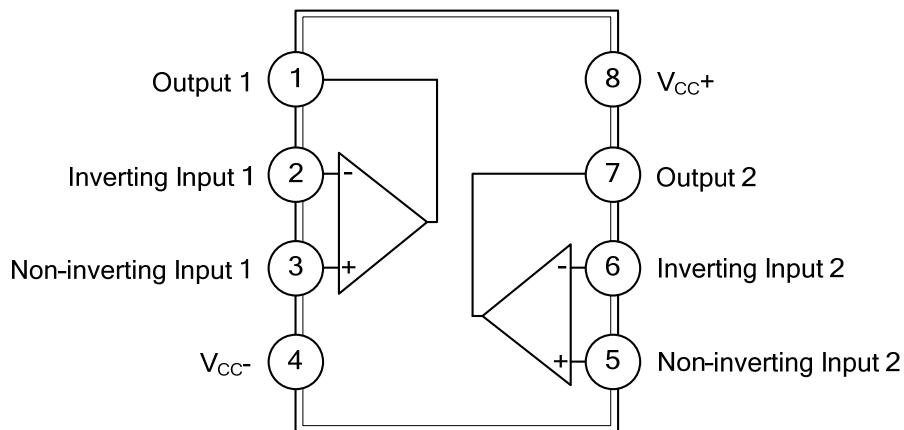
■ PIN CONFIGURATION



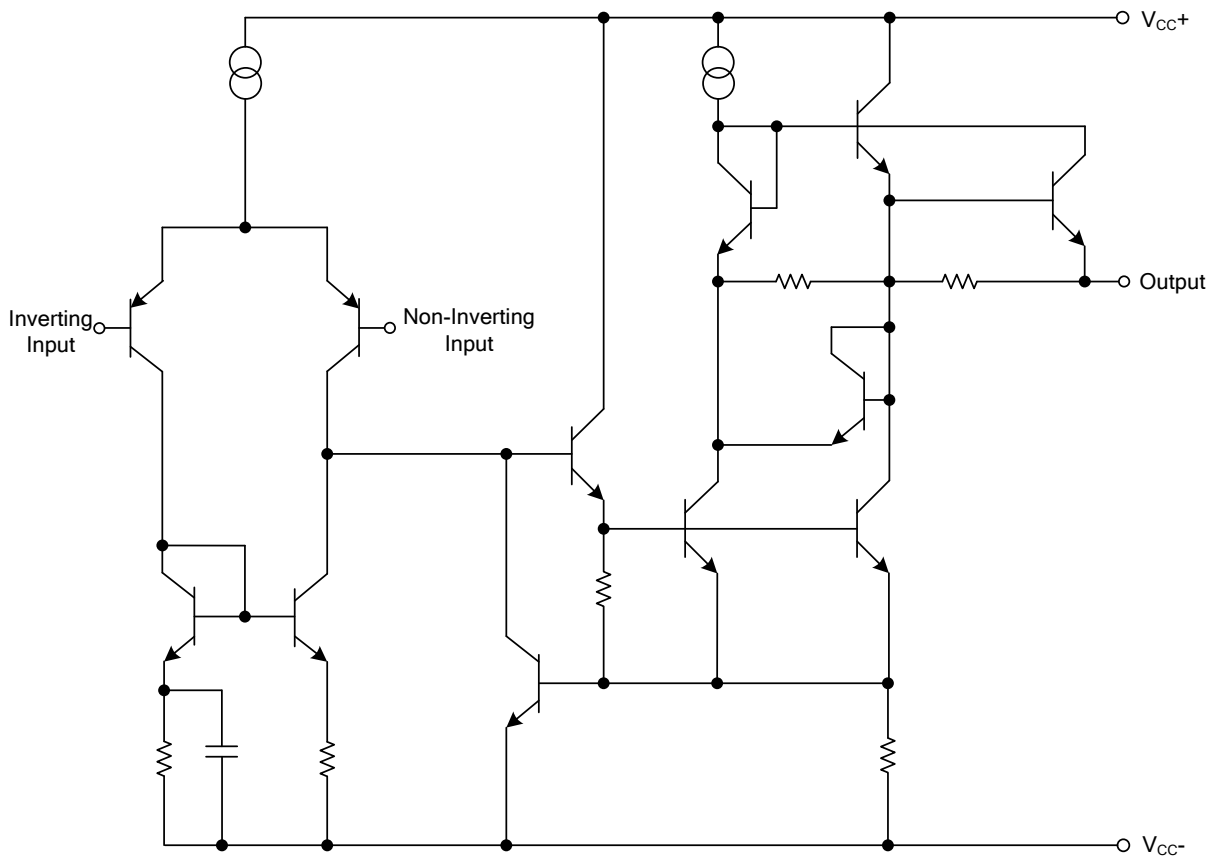
■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	Output 1	The output of channel 1
2	Inverting Input 1	The inverting input of channel 1
3	Non-inverting Input 1	The non-inverting input of channel 1
4	V _{CC-}	Power supply
5	Non-inverting Input 2	The non-inverting input of channel 2
6	Inverting Input 2	The inverting input of channel 2
7	Output 2	The output of channel 2
8	V _{CC+}	Power supply

■ BLOCK DIAGRAM



■ SCHEMATIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	± 18 or $+36$	V
Differential Input Voltage (Note 1)	V_{ID}	± 30	V
Input Voltage (Note 1)	V_{IN}	± 15	V
Maximum Power Dissipation (Note 2)	P_D	500	mW
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

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

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	$\pm 2.5 \sim \pm 15$	V
Operating Free-Air Temperature Range	T_{OPER}	-40 ~ +105	$^{\circ}\text{C}$

■ ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Input Offset Voltage	V_{IO}	$R_S=10\Omega$, $V_O=0\text{V}$, $V_{IC}=0\text{V}$		0.3	5	mV	
Input Offset Voltage Drift	DV_{IO}	$R_S=10\Omega$, $V_O=0\text{V}$, $T_{MIN.} \leq T_{AMB} \leq T_{MAX.}$		2		$\mu\text{V}/^{\circ}\text{C}$	
Input Offset Current	I_{IO}	$V_O=0\text{V}$, $V_{IC}=0\text{V}$		25	200	nA	
Input Bias Current	I_{IB}	$V_O=0\text{V}$, $V_{IC}=0\text{V}$		500	1000	nA	
Input Common Mode Voltage Range	V_{ICM}		± 12	± 14		V	
Large Signal Voltage Gain	A_{VD}	$R_L=2\Omega$, $V_O=\pm 10\text{V}$	90	100		dB	
Output Voltage Swing	$\pm V_{OPP}$	$V_{ID}=\pm 1\text{V}$	$R_L=2.0\text{k}\Omega$	10	13.7		V
			$R_L=2.0\text{k}\Omega$		-14	-10	V
			$R_L=10\text{k}\Omega$	12	13.9		V
			$R_L=10\text{k}\Omega$		-14.4	-12	V
Common-Mode Rejection Ratio	CMR	$V_{IC}=\pm 13\text{V}$	80	100		dB	
Supply Voltage Rejection Ratio	SVR	$V_{CC+}/V_{CC-}=\pm 15\text{V}/-15\text{V} \sim +5\text{V}/-5\text{V}$	80	105		dB	
Supply Current	I_{CC}	$V_O=0\text{V}$, all amplifiers		4	8	mA	
Slew Rate	SR	$V_I=-10\text{V} \sim +10\text{V}$, $R_L=2\text{k}\Omega$, $A_V=+1$	5	7		$\text{V}/\mu\text{s}$	
Gain Bandwidth Product	GBW	$R_L=2\text{k}\Omega$, $C_L=100\text{pF}$, $f=100\text{kHz}$	10	15		MHz	
Unity Gain Bandwidth	B	open loop		9		MHz	
Phase Margin	ϕ_m	$R_L=2\text{k}\Omega$		60		Degrees	
Equivalent Input Noise Voltage	e_N	$R_S=100\Omega$, $f=1\text{kHz}$		4.5		$\text{nV}/\sqrt{\text{Hz}}$	
Equivalent Input Noise Current	i_N	$f=1\text{kHz}$		0.5		$\text{pA}/\sqrt{\text{Hz}}$	
Total Harmonic Distortion	THD	$R_L=2\text{k}\Omega$, $f=20\text{Hz} \sim f=20\text{kHz}$, $V_O=3V_{RMS}$, $A_V=+1$		0.002		%	
Channel Separation	V_{O1}/V_{O2}	$f=20\text{Hz} \sim f=20\text{kHz}$		120		dB	
Full Power Bandwidth	PBW	$V_O=27V_{PP}$, $R_L=2\text{k}\Omega$, $\text{THD} \leq 1\%$		120		kHz	

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