Low-Noise Dual Operational Amplifier LM833N/D/S

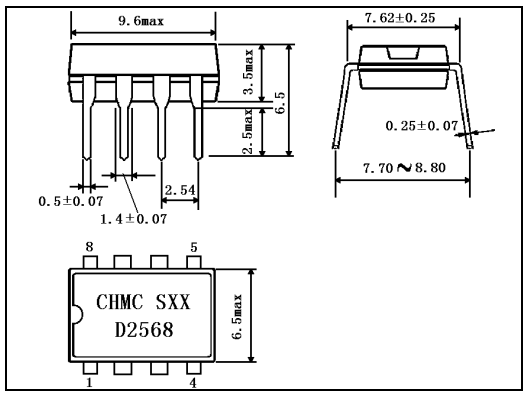
DESCRIPTION

The LM833 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate, which far exceeds that of the 4558 type amplifier. The specially designed low noise input transistors allow the LM833 to be used in very low noise signal processing applications such as audio preamplifiers and servo error amplifier.

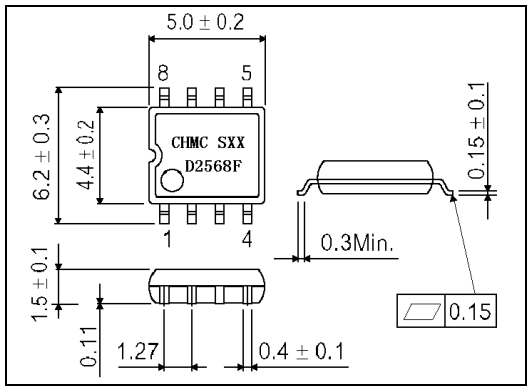
FEATURES

- Operating Voltage: ±4V~±18V
- Low Total Harmonic Distortion (0.001%typ.)
- Low Noise Voltage
- High Slew Rate (6V/μs typ.)
- Unity Gain Bandwidth (27MHz@f=10kHz)
- Bipolar Technology

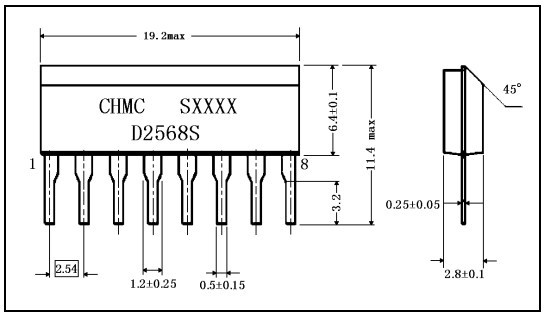
Outline Drawing



DIP8

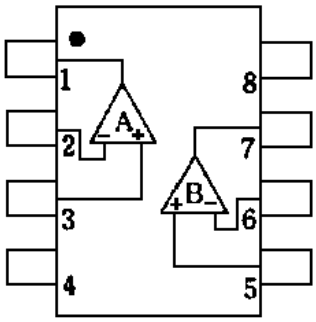


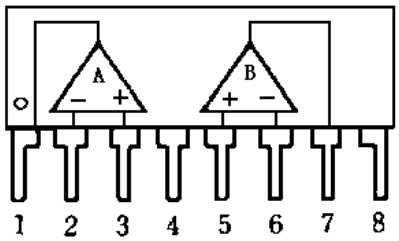
SOP8



SIP8

PIN CONNECTION

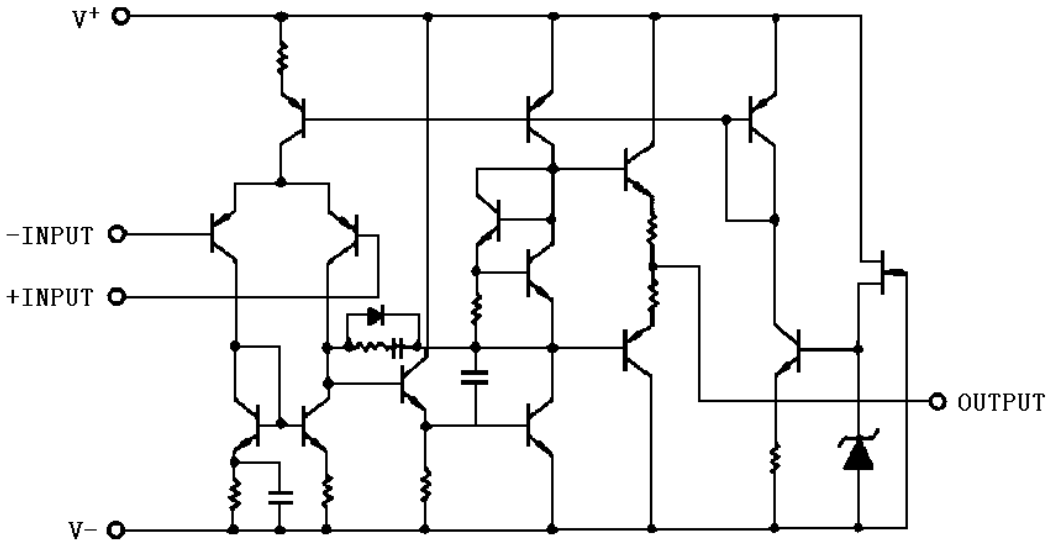




PIN FUNCTION

1 A OUTPUT
2 A-INPUT
3 A+INPUT
4 V⁻
5 B+INPUT
6 B-INPUT
7 B OUTPUT
8 V⁺

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Characteristic		Symbol	Value	Unit
Power Supply voltage		V^+/V^-	±18	V
Input Voltage		V_{IC}	±15*	V
Differential Input Voltage		V_{ID}	±30	V
Power Dissipation	DIP8	Pd	500	mW
	SOP8		300	
	SIP8		800	
Operating temperature		Topr	-20~+75	°C
Storage temperature		Tstg	-40~+125	°C

* For supply voltage less than ±15V. the absolute maximum input voltage is equal to the supply voltage.

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: $V^+/V^-=\pm15V$, Ta=25°C)

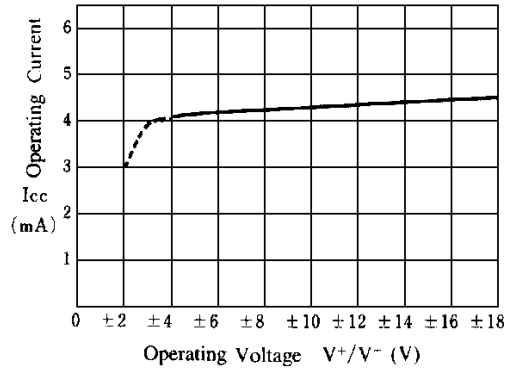
Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Input Offset Voltage	V_{IO}	Rs≤10kΩ		0.3	3	mV
Input Offset Current	I_{IO}			5	200	nA
Input Bias Current	I_B			150	1000	nA
Input Resistance*	R_{IN}		50	300		kΩ
Large Signal Voltage Gain	A_V	R_L≥2 kΩ,Vo=±10V	90	120		dB
Maximum Output Voltage Swing	V_{OM}	R_L≥2 kΩ	±12	±13.5		V
Input Common Mode Voltage Range	V_{ICM}		±12	±13.5		V
Common Mode Rejection Ratio	CMR	Rs≤10kΩ	80	110		dB
Supply Voltage Rejection Ratio	SVR	Rs≤10kΩ	80	120		dB
Slew Rate	SR	R_L≤2 kΩ		6		V/μs
Gain Bandwidth Product 1	GB1	f=10kHz		27		MHz
Gain Bandwidth Product 2	GB2	f=100kHz		19		MHz
Unity Gain Bandwidth	f_T	A_V=1		5.5		MHz
Total Harmonic Distortion	THD	A_V=20dB,Vo=5V, R_L=2kΩ,f=1kHz		0.001		%
Equivalent Input Noise Voltage 1	V_{NI1}	Rs=300Ω		0.44	0.56	μV
Operating Current	Icc			5.0	8.0	mA

* Oscillation might be caused when capacitor type load were connected. It is recommendable to insert series resistor (about 50Ω) at the output for preventing oscillation.

CHARACTERISTICS CURVES

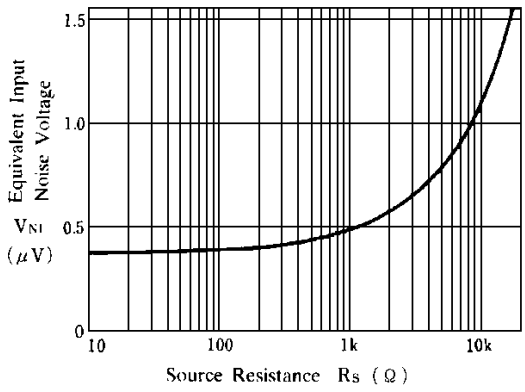
Operating Current vs. Operating Voltage

(No Input Signal, $R_L=\infty$, Ta=25℃)



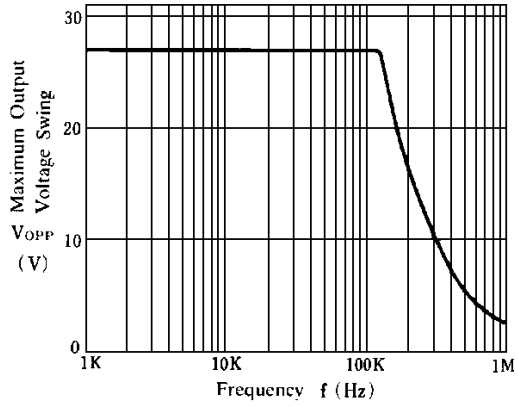
Equivalent Input Noise Voltage vs. Source Resistance

($V^+/V^-=\pm15V$, Ta=25℃)



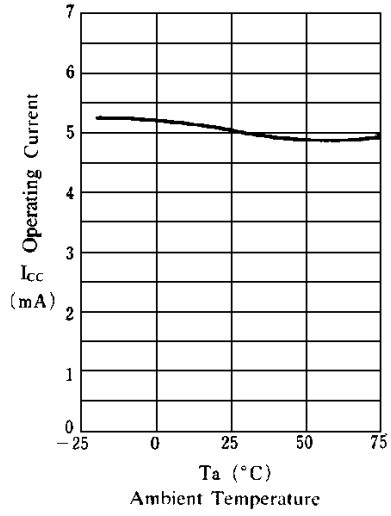
Maximum Output Voltage Swing vs. Frequency

($V^+/V^-=\pm15V$, $R_L=2k\Omega$, Ta=25℃)



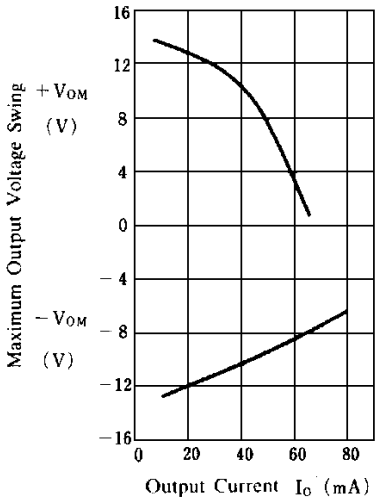
Operating Current vs. Temperature

($V^+/V^-=\pm15V$)



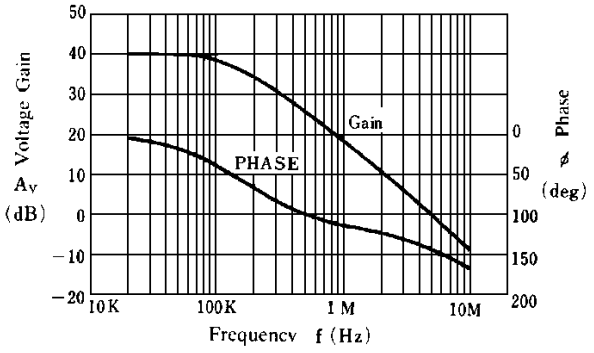
Maximum Output Voltage Swing

($V^+/V^-=\pm15V$, Ta=25℃)



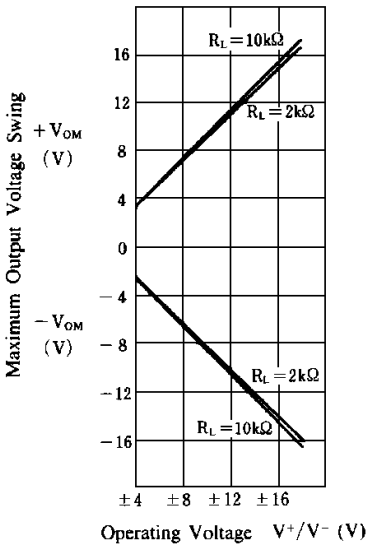
Voltage Gain, Phase vs. Frequency

($V^+/V^-=\pm15V$, $R_L=2k\Omega$, $C_L=100pF$, 40dB Amp, Ta=25℃)



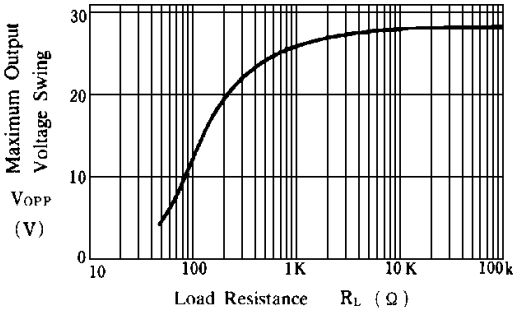
Maximum Output Voltage Swing vs. Operating Voltage

(Ta=25°C)



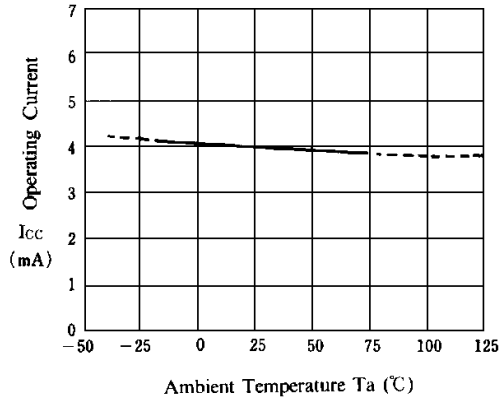
Maximum Output Voltage Swing vs. Load Resistance

(V+/V−=±15V, Ta=25℃)



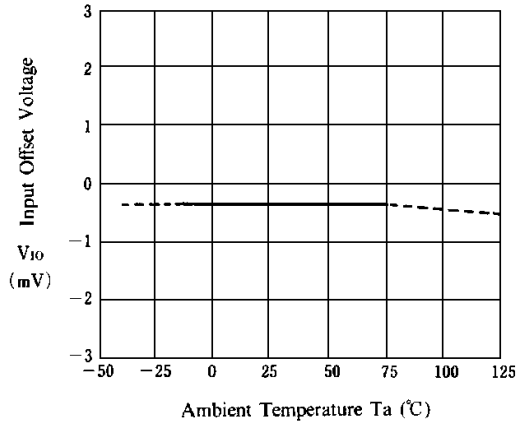
Operating Current vs. Temperature

(V+/V−=±15V)



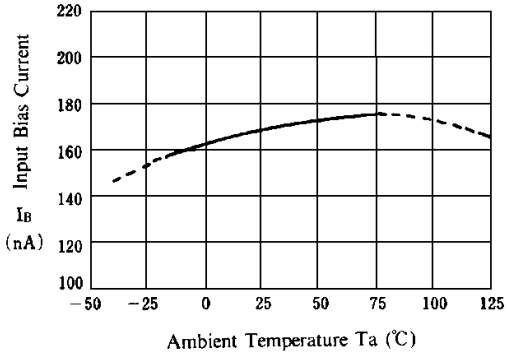
Input Offset Voltage vs. Temperature

(V+/V−=±15V)



Input Bias Current vs. Temperature

(V+/V−=±15V)



Maximum Output Voltage vs. Temperature

(V+/V−=±15V, RL=2kΩ)