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NTE857M
NTE857SM
Integrated Circuit
Low–Noise JFET–Input Operational Amplifier

Description:

The NTE857M and NTE857SM are low–noise JFET input operational amplifiers combining two state–of–the–art linear technologies on a single monolithic integrated circuit. Each internally compensated operational amplifier has well matched high voltage JFET input devices for low input offset voltage. The BIFET technology provides wide bandwidths and fast slew rates with low input bias currents, input offset currents, and supply currents. Moreover, these devices exhibit low–noise and low harmonic distortion making them ideal for use in high–fidelity audio amplifier applications.

Features:

- Available in Two Different Package Types:
  8–Lead Mini DIP (NTE857M)
  SOIC–8 Surface Mount (NTE857SM)
- Low Input Noise Voltage: $18nV\sqrt{Hz}$ Typ
- Low Harmonic Distortion: 0.01% Typ
- Low Input Bias and Offset Currents
- High Input Impedance: $10^{12}\Omega$ Typ
- High Slew Rate: 13V/μs Typ
- Wide Gain Bandwidth: 4MHz Typ
- Low Supply Current: 1.4mA per Amp

Absolute Maximum Ratings:

Supply Voltage
- V_{CC} . . . . . +18V
- V_{EE} . . . . . –18V

Differential Input Voltage, V_{ID} . . . . . ±30V
Input Voltage Range (Note 1), V_{IDR} . . . . . ±15V
Output Short–Circuit Duration (Note 2), t_S . . . . . Continuous
Power Dissipation, P_D 680mW
- Derate Above T_A = +47°C . . . . . 10mW/°C

Operating Ambient Temperature Range, T_A . . . . . 0 to +70°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C

Note 1. The magnitude of the input voltage must not exceed the magnitude of the supply voltage or 15V, whichever is less.

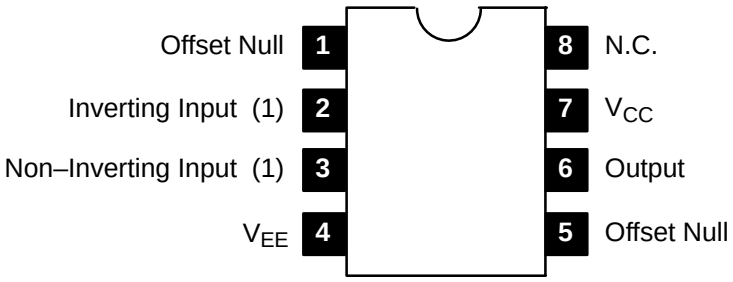
Note 2. The output may be shorted to GND or either supply. Temperature and/or supply voltages must be limited to ensure that power dissipation ratungs are not exceeded.

Electrical Characteristics: (V_{CC} = +15V, V_{EE} = –15V, T_A = +25°C unless otherwise specified)

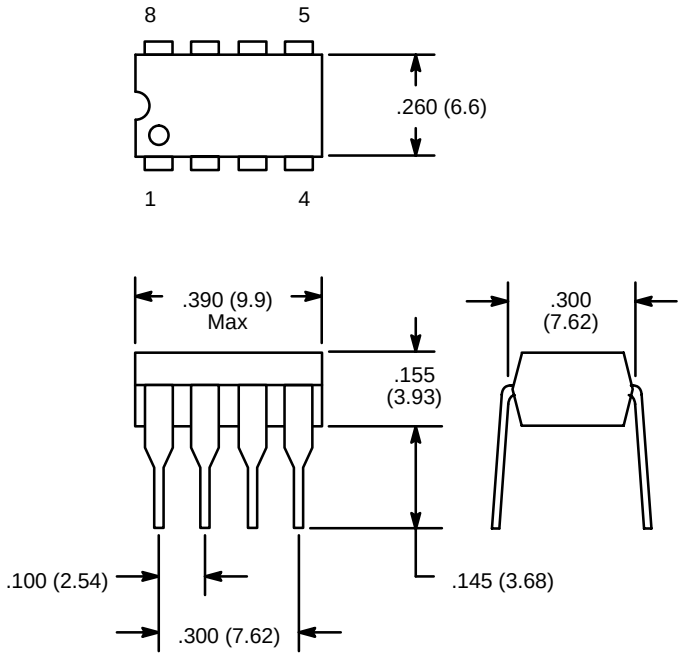
Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Input Offset Voltage	V_{IO}	$R_S \le 10k$, $V_{CM} = 0$		–	3	10	mV
			T_A = 0 to +70°C	–	–	13	mV
Average Temperature Coefficient of Input Offset Voltage	$\Delta V_{IO}/\Delta T$	T_A = 0 to +70°C		–	10	–	µV/°C
Input Offset Current	I_{IO}	V_{CM} = 0, Note 3		–	5	50	pA
			T_A = 0 to +70°C	–	–	2	nA
Input Bias Current	I_{IB}	V_{CM} = 0, Note 3		–	30	200	pA
			T_A = 0 to +70°C	–	–	7	nA
Input Resistance	r_i			–	10^{12}	–	Ω
Common Mode Input Voltage Range	V_{ICR}			±10	+15, –12	–	V
Large–Signal Voltage Gain	A_{VOL}	V_O = ±10V, $R_L \le 2k$		25	150	–	V/mV
			T_A = 0 to +70°C	15	–	–	V/mV
Output Voltage Swing (Peak–to–Peak)	V_O	R_L = 10k		24	28	–	V
		$R_L \ge 10k$	T_A = 0 to +70°C	24	–	–	V
		$R_L \ge 2k$		20	–	–	V
Common Mode Rejection Ratio	CMRR	$R_S \le 10k$		70	100	–	dB
Supply Voltage Rejection Ratio	PSRR	$R_S \le 10k$		70	100	–	dB
Supply Current (Each Amplifier)	I_D			–	1.4	2.5	mA
Unity Gain Bandwidth	BW			–	4	–	MHz
Slew Rate	SR	V_{IN} = 10V, R_L = 2k, C_L = 100pF		–	13	–	V/µs
Rise Time	t_r			–	0.1	–	µs
Overshoot Factor		V_{IN} = 20mV, R_L = 2k, C_L = 100pF		–	10	–	%
Equivalent Input Noise Voltage	e_n	R_S = 100Ω, f = 1000Hz		–	18	–	$nV/\sqrt{Hz}$
Equivalent Input Noise Current	i_n	R_S = 100Ω, f = 1000Hz		–	0.01	–	$pA/\sqrt{Hz}$
Total Harmonic Distortion	THD	$V_{O(RMS)}$ = 10V, $R_S \le 1k$, $R_L \ge 2k$, f = 1000Hz		–	0.01	–	%
Channel Separation		A_V = 100		–	120	–	dB

Note 3. Input Bias currents of JFET input operational amplifiers approximately double for every 10°C rise in Junction Temperature. To maintain Junction Temperature as close to Ambient Temperature as possible, pulse techniques must be used during test.

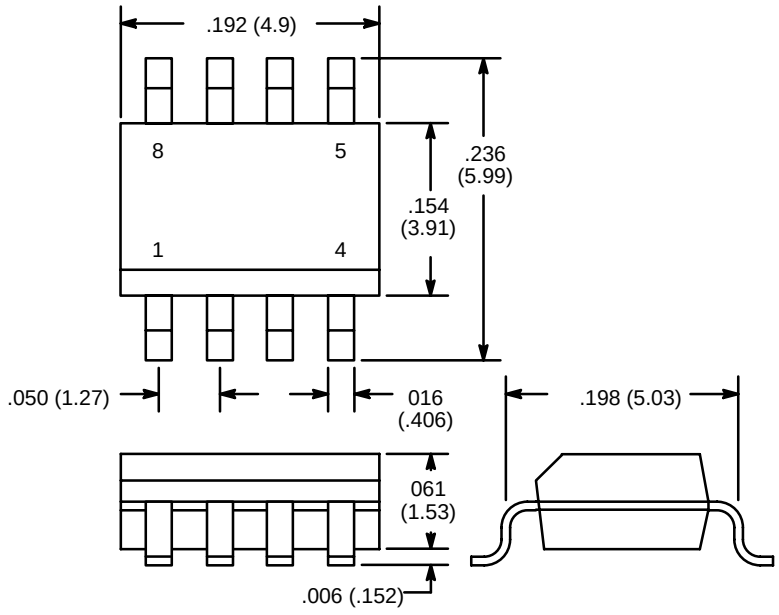
Pin Connection Diagram



NTE857M



NTE857SM



NOTE: Pin1 on Beveled Edge