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NTE889M
Integrated Circuit
Dual, Low Power, JFET OP Amplifier

Description:
The NTE889M is a JFET–input operational amplifier in an 8–Lead DIP type package designed for low power applications and features high input impedance, low input bias current, and low input offset current. Advanced design techniques allow for higher slew rates, gain bandwidth products, and output swing.

Features:
- Low Supply Current: 200µA/Amplifier
- Low Input Bias Current: 5pA
- High Gain Bandwidth: 2MHz
- High Slew rate: 6V/µs
- High Input Impedance: $10^{12}\Omega$
- Large Output Voltage Swing: ±14V
- Output Short Circuit Protection

Absolute Maximum Ratings:
Supply Voltage (From V_{CC} to V_{EE}), V_S . . . . +36V
Input Differential Input Voltage (Note 1), V_{IDR} . . . . ±30V
Input Voltage Range (Note 1, Note 2), V_{IR} . . . . ±15V
Output Short–Circuit Duration (Note 3), t_s . . . . Indefinite Seconds
Operating Junction Temperature (Note 3), T_J . . . . 0° to +70°C
Storage Temperature range, T_{stg} . . . . +150°C
Storage temperature Range, T_{stg} . . . . –60° to +150°C

Note 1. Differential voltages are at the non–inverting input terminal with respect to the inverting input terminal.
Note 2. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15V, whchever is less.
Note 3. Power dissipation must be considered to ensure maximun junction temperature (T_J) is not exceeded.

DC Electrical Characteristics: (V_{CC} = +15V, V_{EE} = –15V unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Input Offset Voltage	V_{IO}	V_O = 0, R_S = 50Ω	T_A = +25°C	–	3	15	mV
			T_A = 0° to +70°C	–	–	20	mV
Temperature Coefficient of Input Offset Voltage	α_{VIO}	V_O = 0, R_S = 50Ω, T_A = 0° to +70°C		–	10	–	µV/°C
Input Offset Current	I_{IO}	V_{CM} = 0, V_O = 0	T_A = +25°C	–	5	200	pA
			T_A = 0° to +70°C	–	–	5	nA
Input Bias Current	I_{IB}	V_{CM} = 0, V_O = 0	T_A = +25°C	–	30	200	pA
			T_A = 0° to +70°C	–	–	10	nA
Common–Mode Input Voltage Range	V_{ICR}	T_A = +25°C		–	+14.5	+11	V
		T_A = 0° to +70°C		–11	–12	–	V
Maximim Peak Output Voltage Swing	V_{OM}	R_L = 10kΩ, T_A = +25°C		±10.0	±14	–	V
		R_L = 10kΩ, T_A = 0° to +70°C		±10.0	–	–	V
Large–Signal Differential Voltage Amplification	A_{VD}	V_O = ±10V, R_L ≥ 10kΩ	T_A = +25°C	3	58	–	V/mV
			T_A = 0° to +70°C	3	–	–	V/mV
Gain Bandwidth Product	GBW	f = 200kHz		–	2	–	MHz
Input Resistance	r_i	T_A = +25°C		–	10^{12}	–	Ω
Common–Mode Rejection Ratio	CMRR	V_{CM} = V_{ICR}min, V_O = 0, R_S = 50Ω, T_A = +25°C		70	84	–	dB
Supply Volatge Rejection Ratio	PSRR	V_{CM} = 0, V_O = 0, R_S = 50Ω, T_A = +25°C		70	86	–	dB
Total Power Dissipation (Each Amp)	P_D	No Load, V_O = 0, T_A = +25°C		–	6.0	7.5	mW
Power Supply Current (Each Amp)	I_D	No Load, V_O = 0, T_A = +25°C		–	200	250	µA
Channel Separation	CS	f = 10kHz		–	120	–	dB
Slew Rate	SR	V_{in} = –10V to +10V, R_L = 10kΩ, C_L = 100pF, A_V = +1.0		2	6	–	V/µs
Rise Time	t_r	V_{in} = 20mV, R_L = 10kΩ, C_L = 100pF, A_V = +1.0		–	0.1	–	µs
Overshoot	OS			–	10	–	%
Setting Time	t_S	V_{CC} = +15V, V_{EE} = –15V, A_V = –1.0, R_L = 10kΩ, V_O = 0 to 10V step	to within 10mV	–	1.6	–	µs
			to within 1.0mV	–	2.2	–	µs
Equivalent Input Noise	e_n	R_S = 100Ω, f = 1kHz		–	47	–	nV/√Hz

Pin Connection Diagram