

NTE7013 Integrated Circuit Remote Control Preamp with Active “Low”

Description:

The NTE7013 is a bipolar integrated circuit in an 8-Lead DIP type package intended for infrared remote control applications. This device has an active “Low” output polarity and contains a high-gain amplifier, a limiter amplifier, a band-pass filter, a detector, and a pulse shaper.

Features:

- On-Chip Band-Pass Filter: Frequency Range 30 to 60kHz
- High Gain Pre-Amplifier: 86dB Typ
- Detector for PCM Demodulation
- Low Current Consumption
- Minimum External Components

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Supply Voltage ($R_g = 0\Omega$), V_{CC}	5.6V
Output Voltage, V_{OUT}	15V
Input Voltage, V_{IN}	5V _{P-P}
Supply Current, I_{CC}	6mA
Power Dissipation, P_D	270mW
Operating Temperature Range, T_{opr}	-20° to $+75^\circ\text{C}$
Storage Temperature Range, T_{stg}	-40° to $+125^\circ\text{C}$

Recommended Operating Conditions:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Power Supply Voltage	V_{CC}	$R_g = 0\Omega$	4.5	5.0	5.5	V
Power Supply Voltage	$V_{CC'}$	$R_g = 1.5k\Omega$	11	12	13	V
Operating Frequency	f_O		30	—	60	kHz

Electrical Characteristics: ($T_A = +25^{\circ}\text{C}$, $V_{CC} = 5\text{V}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Power Supply Current	I_{CC}		–	1.6	2.5	mA
Input Pin Voltage 1	V_{IN1}		2.0	2.5	3.1	V
Input Pin Voltage 2	V_{IN2}	$I_1 = -100\mu\text{A}$	0.5	0.9	1.7	V
Voltage Gain	A_v	38kHz CW, $v_i = 30\mu\text{V}_{P-P}$	74	86	89	dB
Frequency Response	A_{vQ}	28, 35, 41, 48kHz CW, $v_i = 30\mu\text{V}_{P-P}$ Note 1	4	10	–	dB
Input Impedance	r_{in}	38kHz CW, $v_i = 0.2\text{V}_{P-P}$, Note 2	27	40	55	$k\Omega$
Output Pulse Width 1	t_{PW1}	38kHz Burst, $v_i = 60\mu\text{V}_{P-P}$	440	–	770	μs
Output Pulse Width 2	t_{PW2}	$V_{CC} = 4\text{V}$, 38kHz Burst, $v_i = 50\mu\text{V}_{P-P}$	440	–	770	μs
Output Voltage	V_{OL}	$E_1 = 1.0\text{V}$	–	0.2	0.4	V
Output Leak Current	I_{OH}	$E_1 = 2.5\text{V}$, $E_2 = 15\text{V}$	–	–	2.0	μA

Note 1. Voltage gain difference $A_{vQ} = A_v (35\text{kHz}) - A_v (28\text{kHz})$
 $A_{vQ} = A_v (41\text{kHz}) - A_v (48\text{kHz})$

Note 2. $r_{in} = \frac{47}{v_i/V_x - 1}$ ($k\Omega$), v_x : Input voltage, v_i : SG output voltage

