

NTE1500 & NTE1501 Integrated Circuit 7-Step LED Driver Circuit

Description:

The NTE1500 and NTE1501 are integrated circuits designed for driving 7-dot LED displays. The NTE1500 responds logarithmically to the input signal while the NTE1501 responds linearly. Because an adjustment pin for output current is provided, the brightness of the LED can be controlled.

Features:

- Linear (NTE1501) and Logarithmic (NTE1500) Response
- 7-LED Bar Graph Display Driver
- Brightness is Externally Adjustable
- High Output Current: 25mA Max
- Series Connection Capable for Driving more than 7-Dot Displays

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

Supply Voltage, V_{CC}	18V
Circuit Voltage, V_I	7.5V
Input Voltage, V_I	16V
Output Voltage, V_O	16V
Supply Current, I_{CC}	25mA
Output Current, I_O	25mA
Power Dissipation, P_D	1800mW
Operating Ambient Temperature Range, T_{opr}	-30° to $+75^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, $V_{CC} = 9\text{V}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current	I_{tot}	$V_2 = 0$	4	—	18	mA
Output Inflow Current	$I_{(SINK)9-15}$	$V_I = 3.55\text{V}$, $V_7 = 3.5\text{V}$	13	—	25	mA
Reference Voltage	V_{REF}		3.55	3.75	3.95	V
Output Offset Voltage (Amp)	$V_{O(offset)}$	$V_{CC} = 16\text{V}$, $G_V = 20\text{dB}$, $V_2 = 0$	-150	—	+150	mV
Voltage Gain (Amp)	G_V	$V_2 = 50\text{mV}$	18	20	22	dB
Output Pin Leakage Current	$I_{O(Leak)}$	$V_{CC} = 18\text{V}$	0	—	20	μA

Electrical Characteristics (Cont'd): ($T_A = +25^{\circ}\text{C}$, $V_{CC} = 9\text{V}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Bias Current (Amp)	I_{Bias2}	$V_{CC} = 18\text{V}$, $V_2 = 0$	-2	-	0	μA
	I_{Bias3}	$V_{CC} = 18\text{V}$, $V_3 = 0$	-2	-	0	μA
Input Bias Current (Comparator)	I_{Bias7}	$V_{CC} = 18\text{V}$, $V_2 = 10\text{V}$, $V_3 = 0$, $V_7 = 0$	-10	-	0	μA
	I_{Bias1}	$V_{CC} = 18\text{V}$, $V_3 = 10\text{V}$, $V_1 = 0$, $V_2 = 0$, $V_6 = V_7$	-10	-	0	μA
Comparator Level (NTE1500)	GD_1^*	$V_7 = 3.5$, $V_8 = 0$	-17	-15	-13	dB
	GD_2		-9	-7	-5	dB
	GD_3		-4	-3	-2	dB
	GD_4		-1	0	1	dB
	GD_5		1.5	2.0	2.5	dB
	GD_6		3.5	4.0	4.5	dB
	GD_7		4.5	5.0	5.5	dB
Comparator Level (NTE1501)	GD_1	$V_7 = 3.65$, $V_8 = 0$	0.4	0.5	0.6	dB
	GD_2		0.85	1.0	1.15	dB
	GD_3		1.35	1.5	1.65	dB
	GD_4		1.85	2.0	2.15	dB
	GD_5		2.35	2.5	2.65	dB
	GD_6		2.85	3.0	3.15	dB
	GD_7		3.35	3.5	3.65	dB

* The comparator reference voltage is 3.5V and 2.0V is 0dB ($V_{CC\text{opr}} = 5\text{V}$ to 16V).

Pin Connection Diagram



