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## NTE1503 Integrated Circuit 5-Step LED Driver Circuit for Logarithmic Response

**Description:**

The NTE1503 is an integrated circuit in a 9-Lead SIP type package designed for driving 5-LED bar graphs or dot displays so that the LEDs may light logarithmically (dB) for input signal. Brightness of the LEDs can be controlled by using the output current adjustment pin provided.

**Features:**

- 5-LED Bar Graph or Dot Display Drive
- Logarithmic Response with Respect to Input
- Brightness Externally Adjustable
- High Output Current, Suitable for Green LED Drive
- Lamp ON/OFF Hysteresis, No Flickering by Noise

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

Supply Voltage, $V_{CC}$ .....	-0.5V to +18V
Circuit Voltage, $V_{8-5}$ .....	-0.5V to +16V
Load Current Set Input Voltage, $V_{7-5}$ .....	+16V
Output Voltage (Note 1), $V_O$ .....	-0.5V to +16V
Supply Current, $I_{CC}$ .....	18mA
Load Current Set Input Current, $I_7$ .....	4.25mA
Output Current, $I_O$ .....	20mA
Power Dissipation, $P_D$ .....	550mW
Operating Ambient Temperature Range, $T_{opr}$ .....	-20° to +75°C
Storage Temperature Range, $T_{stg}$ .....	-55° to +150°C

Note 1. Output Pin1, Pin2, Pin3, Pin4, and Pin6.

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 16\text{V}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage (LED ON) LED 1	$V_{I(ON)1}$		-	-	1.12	V
LED 2	$V_{I(ON)2}$		-	-	1.86	V
LED 3	$V_{I(ON)3}$		-	-	3.10	V
LED 4	$V_{I(ON)4}$		-	-	5.18	V
LED 5	$V_{I(ON)5}$		-	-	8.66	V



**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 16\text{V}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage (LED OFF) LED 1	$V_{I(OFF)1}$		0.80	–	–	V
LED 2	$V_{I(OFF)2}$		1.49	–	–	V
LED 3	$V_{I(OFF)3}$		2.54	–	–	V
LED 4	$V_{I(OFF)4}$		4.28	–	–	V
LED 5	$V_{I(OFF)5}$		7.23	–	–	V
Load Current Pin6	$I_6$	$V_O = 1.2\text{V}$ , $I_7 = 4.25\text{mA}$	13	16	–	mA
Pin1 to Pin4	$I_1$ to $I_4$	$V_O = 2.5\text{V}$ , $I_7 = 4.25\text{mA}$	13	16	–	mA
Pin1 to Pin4, Pin6	$I_1$ to $I_4$ , $I_6$	$V_O = 16\text{V}$ , $I_7 = 4.25\text{mA}$	–	16	19	mA
Input Current	$I_8$	$V_{8-5} = 8.7\text{V}$	–	–	50	$\mu\text{A}$
		$V_{8-5} = 16\text{V}$	–	–	5	mA
Supply Current	$I_9$	$V_{8-5} = 16\text{V}$	–	–	18	mA
Output Pin Leakage Current	$I_1$ to $I_4$ , $I_6$	$V_O = 16\text{V}$	–	–	15	$\mu\text{A}$

**Pin Connection Diagram**  
(Front View)

