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NTE1513 Integrated Circuit 9-Step LED Driver Circuit for Logarithmic Scale

Functions:

- Indication Way: Indicates input level in a series bar by 9 red or green LED's
- Input Amp: DC amp installed the aim of which can be varied by a peripheral resistor.
- Comparator Level: Designed with 3dB rate;
 -18dB, -15dB, -12dB, -9dB, -6dB, -3dB, 0dB, +3dB, +6dB
- Supply Voltage: Wide recommended supply voltage: 5.5 to 16V At V_{ref2} : 7 to 16V
- Reference Voltage: V_{ref} (5V) pin can prepare another voltage regulator with added transistor

Applications:

- For AC Level Meter as VU Meter
- For DC Level Metetr as Signal Meter

Comparator Level: ($T_A = +25^\circ\text{C}$, $V_{CC} = 12\text{V}$, $V_{ref1} = 3\text{V}$)

Comparator Level	Pin	Min	Typ	Max	Unit
D1	7	0.11	0.18 (Note 1)	0.25	V
D2	8	0.20	0.27 (Note 1)	0.34	V
D3	9	0.30	0.38 (Note 1)	0.46	V
D4	10	0.45	0.53 (Note 1)	0.61	V
D5	11	0.66	0.75	0.84	V
D6	12	0.97	1.06	1.15	V
D7	13	1.40	1.50	1.60	V
D8	14	2.02	2.12	2.22	V
D9	15	2.90	3.00	3.10	V

Note 1. No

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

- Maximum Supply Voltage (Pin1), V_{CCmax} -0.3V to +18V
- Input Voltage (Pin3, Pin4), V_{IN} -0.3V to V_{CC}
- D1 to D9 Output Voltage (D1 to D9: Off), $V_{OUT D}$ -0.3V to +18V
- D1 to D9 Output Current (Pin7 to Pin15, D1 to D9: On), $I_{OL D}$ +30mA
- Reference Voltage Flow-Out Current,
 Pin2, I_{ref1} -1mA to 0mA
 Pin16, I_{ref2} -6mA to 0mA
- V_{OUT} Supply Voltage (Pin5), V_{OUT} -0.3V to +6.0V
- Allowable Power Dissipation ($T_A = +55^\circ\text{C}$), P_dmax 500mW
- Operating Temperature Range, T_{opr} -10° to $+60^\circ\text{C}$
- Storage Temperature Range, T_{stg} -40° to $+125^\circ\text{C}$

Allowable Operation Condition: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Recommended Supply Voltage (Pin1), V_{CC}	+55V to +16V
Using V_{ref2}	+7V to +16V
Input Voltage (Pin3, Pin4), V_{IN+} , V_{IN-}	-0.3V to V_{CC}
Load Resistance (Pin5 to Pin6), R_L	15k Ω to 20k Ω

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, $V_{CC} = 12\text{V}$ unless otherwise specified)

Parameter	Symbol	Pin	Test Conditions	Min	Typ	Max	Unit
Input Bias Current (Amp Section)	$I_{IN+(A)}$	3	$V_{IN+} = 0\text{V}$, $V_{IN-} = 3\text{V}$, $\text{GND} = 0\text{V}$	-2	-	0	μA
	$I_{IN-(A)}$	4	$V_{IN+} = 3\text{V}$, $V_{IN-} = 0\text{V}$, $\text{GND} = 0\text{V}$	-2	-	0	μA
Input Bias Current (Comparator Section) + Output Leakage Current	$I_{IN+(C)}$ + $I_{OL(A)}$	5	$V_{IN+} = 0\text{V}$, $V_{IN-} = 3\text{V}$, $\text{OUT} = 0\text{V}$, $\text{GND} = 0\text{V}$	-10	-	0	μA
Offset Voltage	$V_{offset1}$	5	$V_{CC} = 6\text{V}$, $V_{IN+} = V_{IN-} = 0\text{V}$, $\text{GND} = -6\text{V}$, Gain 20dB	-180	-	+180	mV
	$V_{offset2}$	5	$V_{IN+} = V_{IN-} = 0\text{V}$, $\text{GND} = 0\text{V}$, Gain 20dB	0	-	+180	mV
Reference Voltage	V_{ref1}	2	$I_{ref} = 0$ to 1mA	2.6	-	3.0	V
	V_{ref2}	16	$I_{ref} = 0$ to 6mA	4.2	4.7	5.2	V
Current Dissipation	I_{CC}	1	$V_{IN+} = 3\text{V}$, $V_{IN-} = 0\text{V}$	-	10	20	mA
Amp Gain	VG		Open Looped	30	-	-	dB
Output Flow-out Current	I_{OH}	5	$V_{OUT} = 0\text{V}$, $V_{IN+} = 3\text{V}$, $V_{IN-} = 0\text{V}$	-	-	-10	μA
Pin D Output On Voltage	$V_{OL D}$	7 to 15	D1 to D9: $I_{OL} = 20\text{mA}$, $V_{IN+} = 3\text{V}$, $V_{IN-} = 0\text{V}$	-	-	1.2	V
Pin D Output Leakage Current	$I_{OH D}$	7 to 15	D1 to D9: $V_{IN+} = 0\text{V}$, $V_{IN-} = 3\text{V}$, V_{D1} to $D9 = 12\text{V}$	-	-	10	μA
Output Voltage (Amp Section)	V_{OH}	5	$V_{CC} = 5.5\text{V}$, $V_{IN+} = 3\text{V}$, $V_{IN-} = 0\text{V}$, $R_L = 15\text{k}\Omega$	4	-	-	V
			$V_{IN+} = 3\text{V}$, $V_{IN-} = 0\text{V}$, $R_L = 15\text{k}\Omega$	9.5	-	-	V

Pin Connection Diagram



