

LED level meter driver, 5-point, VU scale

BA6154

The BA6154 is a driver IC for LED VU level meters in stereo equipment and other display applications.

The IC displays the input level (range: -10dB to $+6\text{dB}$) on a 5-point, bar-type LED display.

The BA6154 includes a rectifier amplifier allowing direct AC input, and has constant-current outputs, so it can directly drive the LEDs without variations in LED current due to supply voltage fluctuations.

● Applications

VU meters, signal meters, and other display devices.

● Features

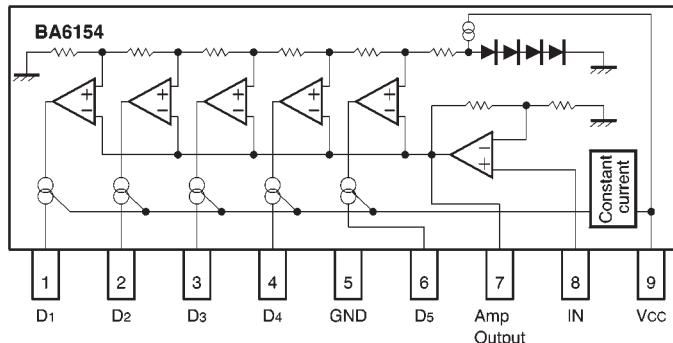
- 1) Rectifier amplifier allows either AC or DC input.
- 2) Rectifier amplifier has high gain (26dB), so operation at low input level is possible.
- 3) Constant-current outputs for constant LED current when the power supply voltage fluctuates.
- 4) Built-in reference voltage means that power supply voltage fluctuations do not effect the display.
- 5) Wide operating power supply voltage range (3.5V to 16V) for a wide range of applications.
- 6) Low PCB space requirements. Comes in a compact 9-pin SIP package and requires few external components.

● Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{cc}	18	V
Power dissipation	P_d	800*	mW
Operating temperature	T_{opr}	$-25\sim+60$	°C
Storage temperature	T_{stg}	$-55\sim+125$	°C
Junction temperature	T_j	150	°C

* Reduced by 6.4mW for each increase in T_a of 1°C over 25°C .

● Block diagram

● Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{\text{cc}} = 6.0\text{V}$, and $V_f = 1\text{kHz}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply voltage	V_{cc}	3.5	6	16	V	—
Quiescent current	I_Q	—	5	8	mA	$V_{\text{IN}}=0\text{V}$
Comparator level 1	V_{C1}	-13	-10	-7	dB	—
Comparator level 2	V_{C2}	-6.5	-5	-3.5	dB	—
Comparator level 3	V_{C3}	—	0	—	dB	Adjustment point
Comparator level 4	V_{C4}	2.5	3	3.5	dB	—
Comparator level 5	V_{C5}	5	6	7	dB	—
Sensitivity	V_{IN}	36	45	54	mV_{rms}	V_{C3} on level
LED current	I_{LED}	11	15	18.5	mA	—
Input bias current	I_{INO}	—	0.3	1.0	μA	—

● Measurement circuit

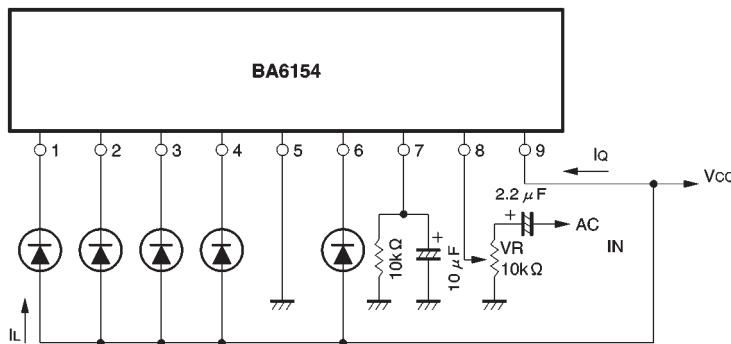


Fig. 1

● Application example

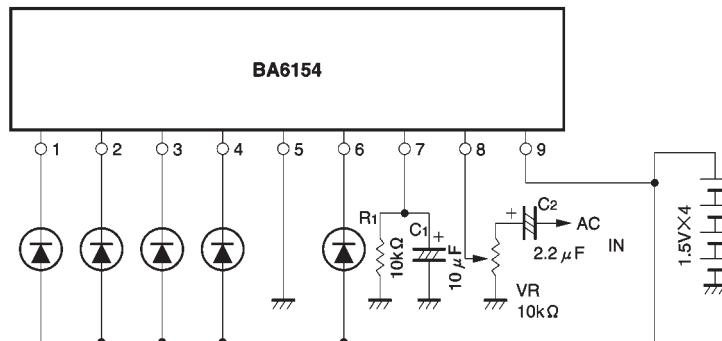


Fig. 2

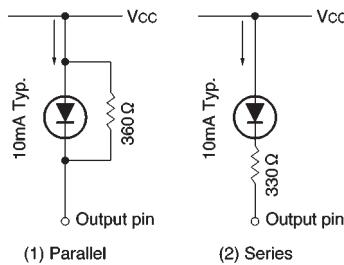


Fig. 3

The response time (attack and release time) can be changed by varying the values of C_1 and R_1 . C_2 is a coupling capacitor, and the potentiometer VR varies the input level. Input a fixed voltage level and adjust the potentiometer so that the LED lights at 0dB. To reduce the LED current, connect a resistor either in parallel

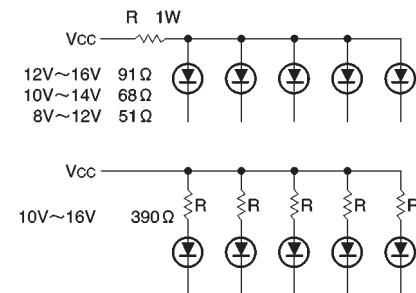
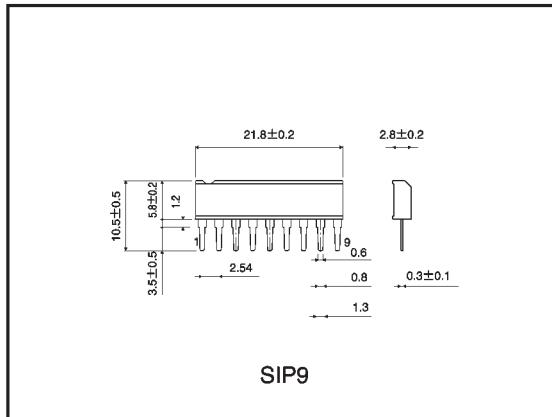


Fig. 4

(Fig. 3 (1)) or in series (Fig. 3 (2)) with the LED. If a resistor is connected in series with the LED, the LED current will change if the supply voltage fluctuates.

Note: If the power supply voltage exceeds 9V, insert a resistor in series with the LED current supply line, or connect a heat sink so that the maximum power dissipation P_d Max. is not exceeded (see Fig. 4).

● External dimensions (Units: mm)



SIP9