

# 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:  $-10\text{dB}$  to  $+6\text{dB}$ ) on a 5-point, bar-type LED display.

The BA6137 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

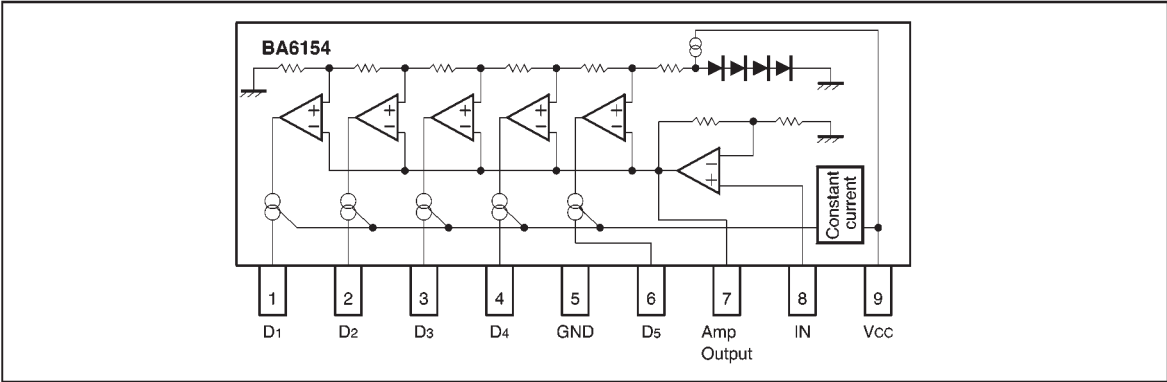
- 1) Rectifier amplifier allows either AC or DC input.
- 2) Rectifier amplifier has high gain (26dB), so operation at low input level is possible.
- 3) Constant-current outputs for constant LED current when the power supply voltage fluctuates.
- 4) Built-in reference voltage means that power supply voltage 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 (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>cc</sub>	18	V
Power dissipation	P <sub>d</sub>	800*	mW
Operating temperature	T <sub>opr</sub>	$-25\sim+60$	°C
Storage temperature	T <sub>stg</sub>	$-55\sim+125$	°C
Junction temperature	T <sub>j</sub>	150	°C

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

●Block diagram



●Electrical characteristics (unless otherwise noted, Ta = 25°C, Vcc = 6.0V, and Vf = 1kHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply voltage	V <sub>CC</sub>	3.5	6	16	V	—
Quiescent current	I <sub>Q</sub>	—	5	8	mA	V <sub>IN</sub> =0V
Comparator level 1	V <sub>C1</sub>	−13	−10	−7	dB	—
Comparator level 2	V <sub>C2</sub>	−6.5	−5	−3.5	dB	—
Comparator level 3	V <sub>C3</sub>	—	0	—	dB	Adjustment point
Comparator level 4	V <sub>C4</sub>	2.5	3	3.5	dB	—
Comparator level 5	V <sub>C5</sub>	5	6	7	dB	—
Sensitivity	V <sub>IN</sub>	36	45	54	mV <sub>rms</sub>	V <sub>C3</sub> on level
LED current	I <sub>LED</sub>	11	15	18.5	mA	—
Input bias current	I <sub>INO</sub>	—	0.3	1.0	μA	—

●Measurement circuit

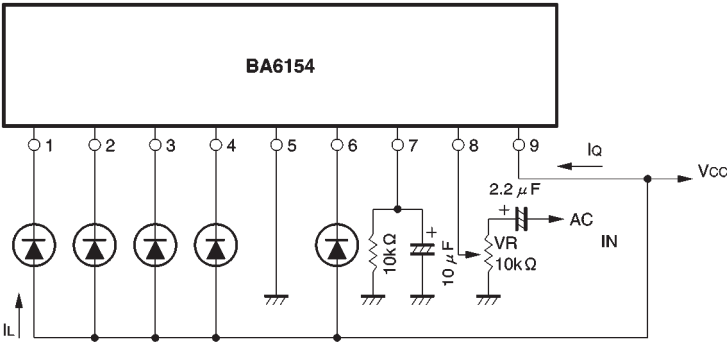


Fig. 1

●Application example

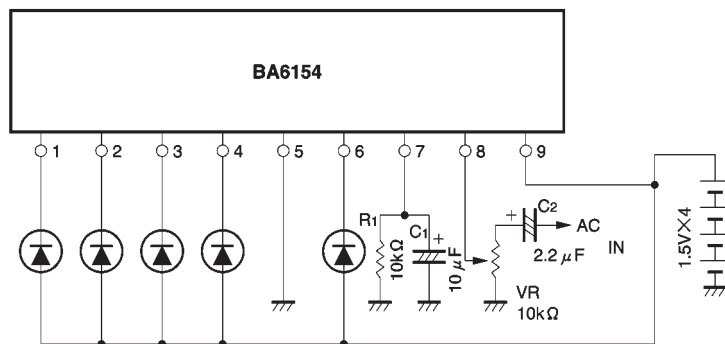


Fig. 2

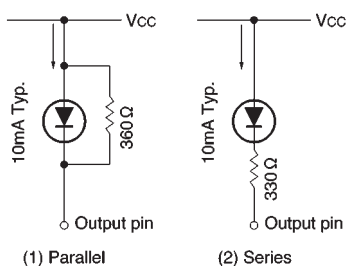


Fig. 3

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

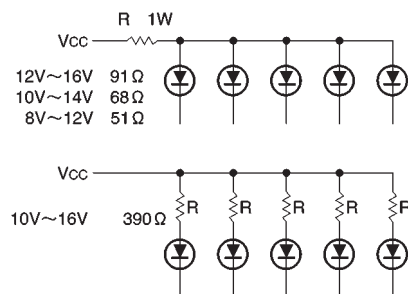


Fig. 4

(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  $P_{d\text{ Max.}}$  is not exceeded (see Fig. 4).

●External dimensions (Units: mm)

