

# 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

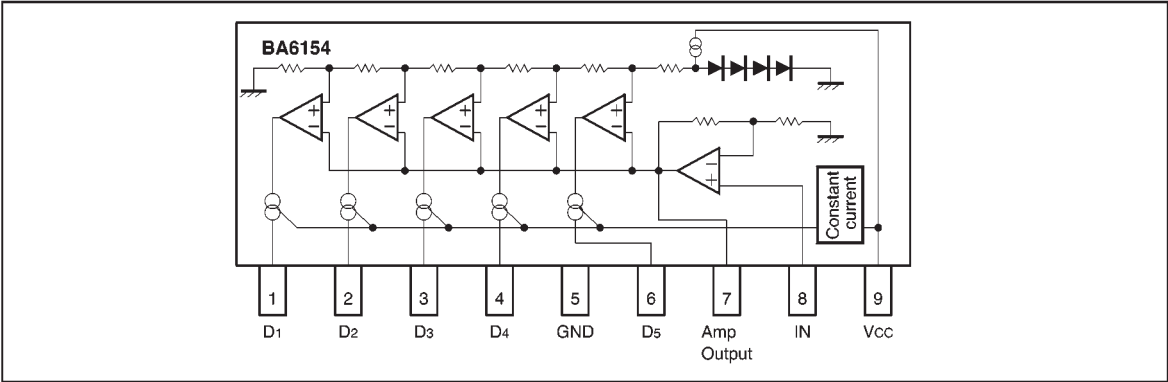
- 1) Rectifier amplifier allows either AC or DC input.
- 2) Rectifier amplifier has high gain (26dB), so operation at low input level is possible.
- 3) Constant-current outputs for constant LED current when the power supply voltage fluctuates.
- 4) Built-in reference voltage means that power supply voltage 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 | Vcc    | 3.5  | 6    | 16   | V     | —                |
| Quiescent current    | Iq     | —    | 5    | 8    | mA    | VIN=0V           |
| Comparator level 1   | Vc1    | −13  | −10  | −7   | dB    | —                |
| Comparator level 2   | Vc2    | −6.5 | −5   | −3.5 | dB    | —                |
| Comparator level 3   | Vc3    | —    | 0    | —    | dB    | Adjustment point |
| Comparator level 4   | Vc4    | 2.5  | 3    | 3.5  | dB    | —                |
| Comparator level 5   | Vc5    | 5    | 6    | 7    | dB    | —                |
| Sensitivity          | VIN    | 36   | 45   | 54   | mVrms | Vc3 on level     |
| LED current          | ILED   | 11   | 15   | 18.5 | mA    | —                |
| Input bias current   | IINO   | —    | 0.3  | 1.0  | μA    | —                |

●Measurement circuit

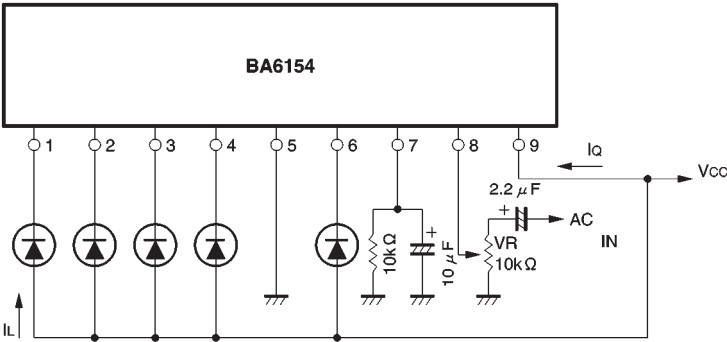


Fig. 1

●Application example

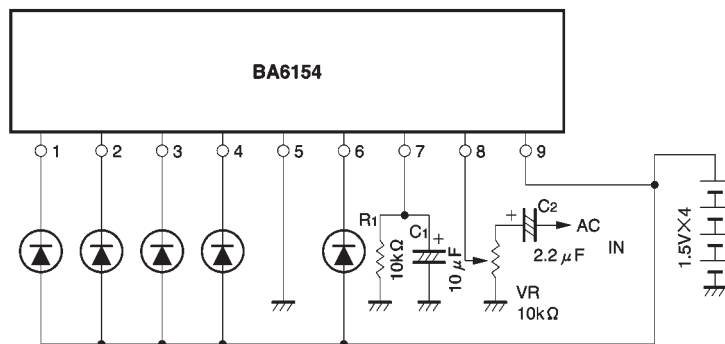


Fig. 2

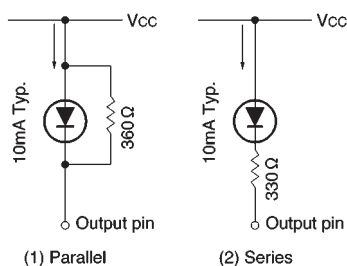


Fig. 3

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

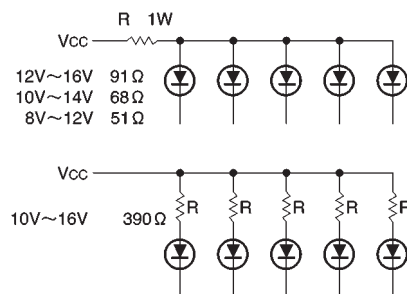


Fig. 4

(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)

