

# LED level meter driver, 5-point, VU scale

## BA6137

The BA6137 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 power supply voltage fluctuations.

### ● Applications

VU meters, signal meters, and other display devices.

### ● Features

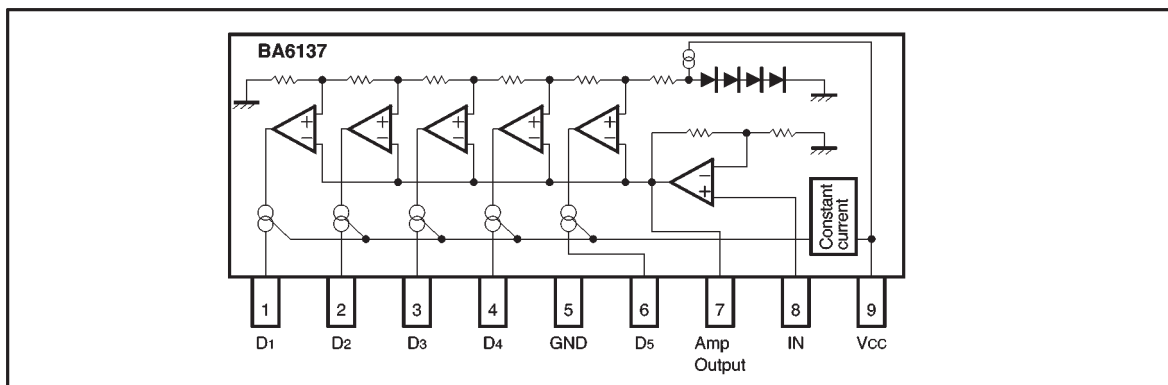
- 1) Rectifier amplifier allows either AC or DC input.
- 2) Constant-current outputs for constant LED current when the power supply voltage fluctuates.
- 3) Current output is optimized for red LEDs, for low power dissipation.
- 4) Built-in reference voltage means that power supply voltage fluctuations 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 attached 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	$T_{opr}$	$-25 \sim +60$	$^\circ\text{C}$
Storage temperature	$T_{stg}$	$-55 \sim +125$	$^\circ\text{C}$
Junction temperature	$T_j$	150	$^\circ\text{C}$

\* Reduced by 6.4mW for each increase in  $T_a$  of  $1^\circ\text{C}$  over  $25^\circ\text{C}$ .

### ● Block diagram



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply voltage	$V_{CC}$	3.5	6	16	V	—
Quiescent current	$I_Q$	—	5	8	mA	$V_{IN}=0\text{V}$
Comparator level 1	$V_{C1}$	-11.5	-10	-8.5	dB	—
Comparator level 2	$V_{C2}$	-6	-5	-4	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	$V_{IN}$	74	85	96	$\text{mV}_{\text{rms}}$	$V_{C3}$ on level
LED current	$I_{LED}$	5	7	9.5	mA	—
Input bias current	$I_{INO}$	—	0.3	1.0	$\mu\text{A}$	—

●Measurement circuit

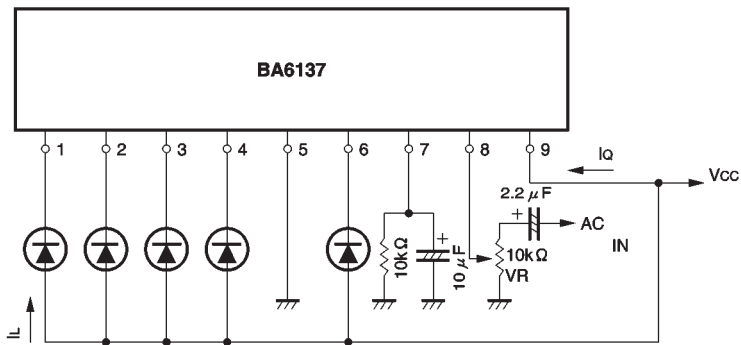


Fig. 1

●Application example

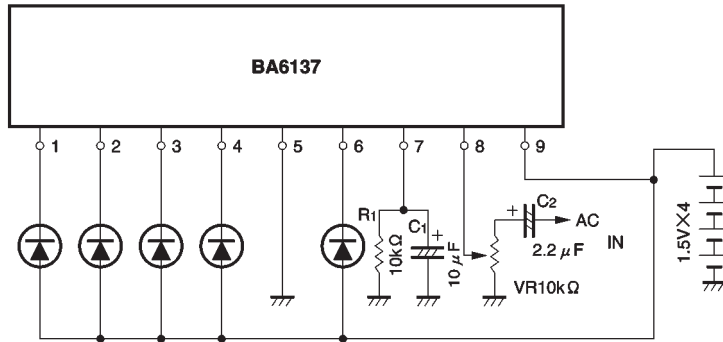


Fig. 2

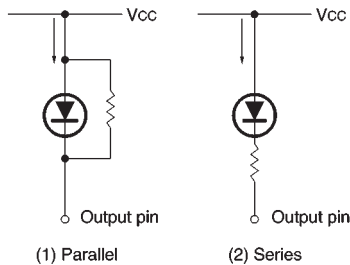


Fig. 3

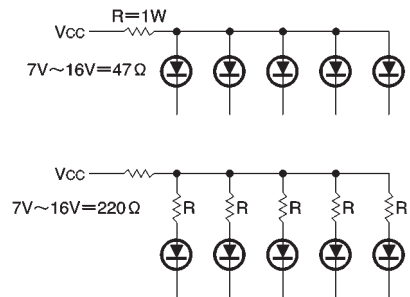


Fig. 4

The response time (attack and release time) can be changed by varying the values of  $C_1$  and  $R_1$  to change the time constant.

$C_2$  is a coupling capacitor, and  $VR$  varies the input level. Input the desired fixed voltage and adjust  $VR$  so that the LED lights at 0dB.

To reduce the LED current, connect a resistor either in

parallel (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)

