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

**BA6144** 

The BA6144 is a driver IC for LED VU level meters in stereo equipment and other display applications.

The IC displays the input level (range: -13dB to +17dB) on a 5-point, bar-type LED display. The BA6144 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) Wide display level range (-13 to +17), so signals with large dynamic range can be displayed.
- 3) Constant-current outputs for constant LED current when the power supply voltage fluctuates.
- Built-in reference voltage means that power supply voltage fluctuations do not effect the display.
- 5) Wide operating power supply voltage range (5.5V to 16V) for a wide range of applications.
- Low PCB space requirements. Comes in a compact 9-pin SIP package and requires few external components.

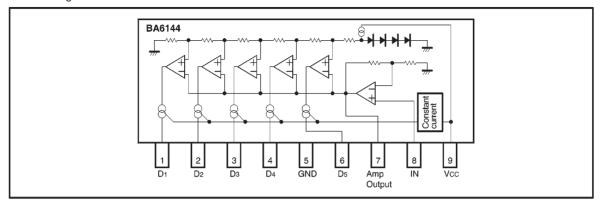
### ■Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	18	V
Power dissipation	Pd	800*	mW
Operating temperature	Topr	<b>−25~+70</b>	င
Storage temperature	Tstg	<b>−55∼</b> +125	°
Junction temperature	Tj	150	°C

 $<sup>\ \ \, \</sup>mbox{\for each increase in Ta of 1°C over 25°C.}$ 

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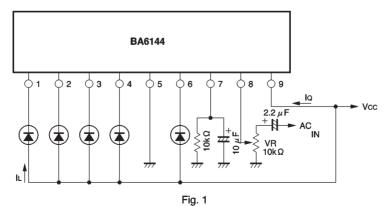
# Block diagram



# ●Electrical characteristics (unless otherwise noted, Ta = 25°C, Vcc = 12V, and f = 1kHz)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions	Measurement circuit
Power supply voltage	Vcc	5.5	12	16	V	_	Fig.1
Quiescent current	lα	_	7	12	mA	V <sub>IN</sub> =0V	Fig.1
Comparator level 1	Vc1	-16	-13	-9	dB	_	Fig.1
Comparator level 2	V <sub>C2</sub>	-9	<b>—7</b>	-4	dB	_	Fig.1
Comparator level 3	Vcз	_	0	_	dB	Adjustment point	Fig.1
Comparator level 4	V <sub>C4</sub>	7	10	12	dB	_	Fig.1
Comparator level 5	V <sub>C5</sub>	13	17	19	dB	_	Fig.1
Sensitivity	Vin	21	47	62	mV <sub>rms</sub>	Vc3 on level	Fig.1
LED current	ILED	11	15	18.5	mA	_	Fig.1
Input bias current	lino	_	0.3	1.0	μΑ	_	Fig.1

# Measurement circuit



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# Application example

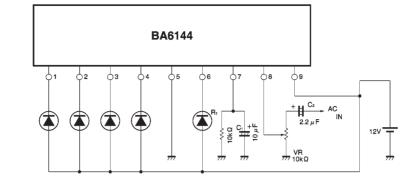


Fig. 2

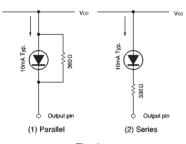
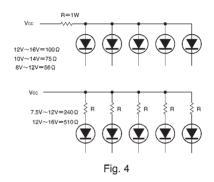


Fig. 3

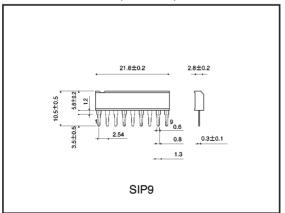


The response time (attack and release time) can be changed by varying the values of  $C_1$  and  $R_1$  to change the time constant.

 $C_2$  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

# External dimensions (Units: mm)



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 Pd Max. is not exceeded (see Fig. 4).