**EN:** This Datasheet/Document is presented by the manufacturer.

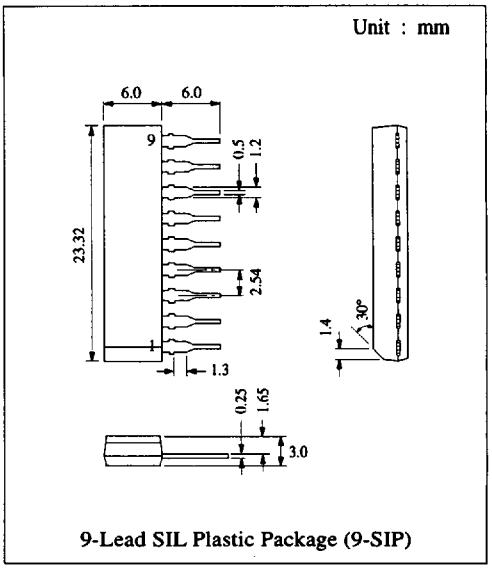
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# AN6884

## 5-Dot LED Driver Circuit

### ■ Description

The AN6884 is a monolithic integrated circuit driving 5-LED and is capable of logarithmic (dB) bar graph display for input signal. Incorporating high gain rectification amp. enable to apply AC (UV meter, etc.) / DC (signal meter, etc.) level meter widely.

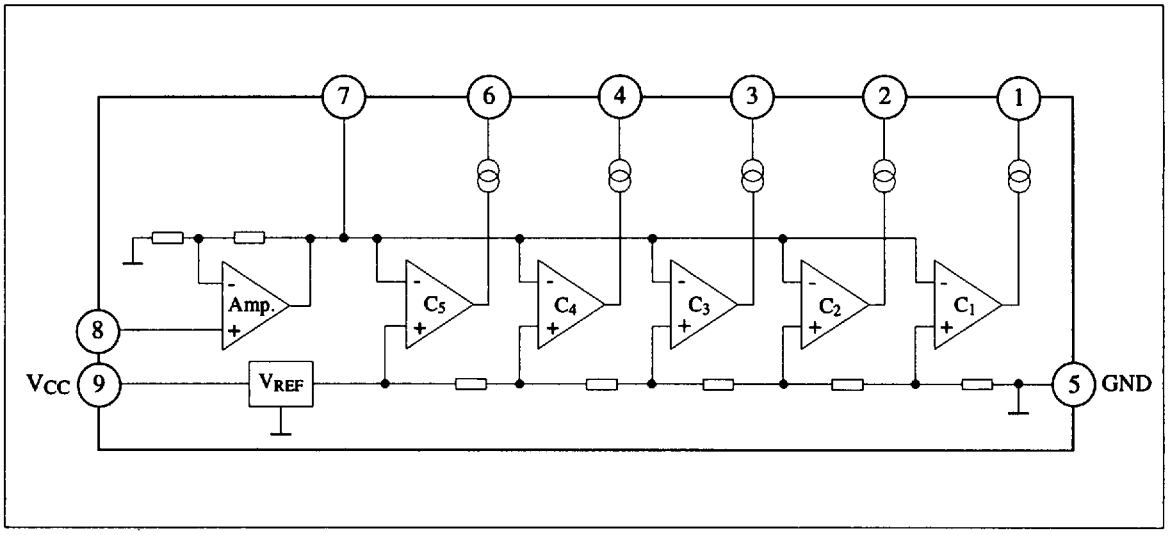



9-Lead SIL Plastic Package (9-SIP)

### ■ Features

- Wide range of operating voltage: $V_{CC(opr.)}$ = 3.5V ~ 16V
- Constant current output: $I_{LED}$ =15mA
- Built-in high gain amp.: $G_V$ = 26dB typ.
- Low noise when LED ON
- 5-dot LED bar logarithmic response: -10, -5, 0, 3, 6dB
- Fewer external components

### ■ Block Diagram



## ■ Absolute Maximum Ratings (Ta=25°C)

| Item | | Symbol | Rating | | Unit |
|---|---|---|---|---|---|
| Voltage | Supply Voltage | $V_{CC}$ | 18 | | V |
| | Circuit Voltage | $V_{7-5}$ | 6 | | V |
| | Op. Amp. Input Voltage | $V_{8-5}$ | -0.5 | $V_{CC}$ | V |
| | LED Output Pin Voltage | $V_{1, 2, 3, 4, 6-5}$ | $V_{CC}$ | | V |
| Current | Supply Current | $I_{CC}$ | 12 | | mA |
| | LED Output Pin Current | $I_{1, 2, 3, 4, 6}$ | 20 | | mA |
| Power Dissipation * | | $P_D$ | 1100 | | mW |
| Operating Ambient Temperature | | Topr | -25 ~ +75 | | °C |
| Storage Temperature | | Tstg | -55 ~ +125 | | °C |

Operating Supply Voltage Range: $V_{CC}$ = 3.5V ~ 16.0V
*Under Ta > 25°C, reduce at -11mW/°C

## ■ Electrical Characteristics ($V_{CC}$=3V, Ta=25°C)

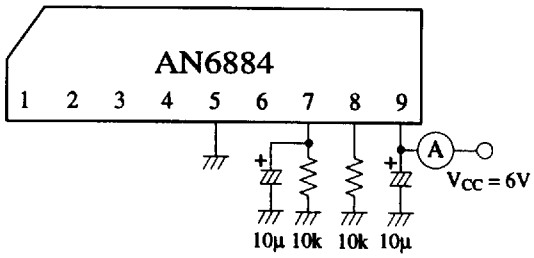
| Item | Symbol | Test Circuit | Condition | | min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|---|
| Supply Current | $I_{CC}$ | 1 | $V_{8-5}$ = 0V | | | 6 | 8.5 | mA |
| Input Bias Current | $I_{Bias8}$ | 2 | | | -1 | | 0 | μA |
| Output Sink Current | $I_{(SINK)1, 2, 3, 4, 6}$ | 3 | $V_{8-5}$ = 0.15V | | 11 | 15 | 18.5 | mA |
| Voltage Gain | $G_V$ | 4 | $V_{8-5}$ = 0.1V, $R_7$ = 10kΩ | | 24 | 26 | 28 | dB |
| Comparator Level | $GD_1$ | 5 | Pin 1 | $V_{8-5}$ = 0V | -12 | -10 | -8 | dB |
| | $GD_2$ | 5 | Pin 2 | | -6 | -5 | -4 | dB |
| | $GD_3$ | 5 | Pin 3 | | | 0 | | dB |
| | $GD_4$ | 5 | Pin 4 | | 2.5 | 3 | 3.5 | dB |
| | $GD_5$ | 5 | Pin 6 | | 5 | 6 | 7 | dB |

*$G_{D3}$ LED ON level adjusting point = 0dB, equivalent to $V_{7-5}$ = 1.1V typ. ($V_{8-5}$ = 57mV)

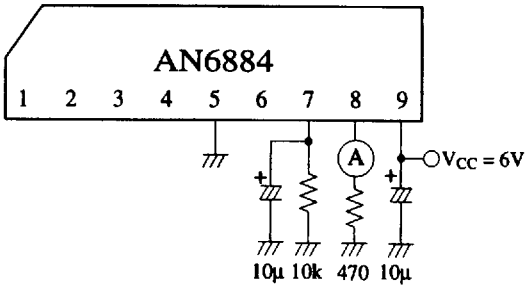
## ■ Pin

| Pin No. | Pin Name |
|---|---|
| 1 | LED 1 Output |
| 2 | LED 2 output |
| 3 | LED 3 Output |
| 4 | LED 4 Output |
| 5 | GND |
| 6 | LED 5 Output |
| 7 | AMP. Output |
| 8 | AMP. Input |
| 9 | $V_{CC}$ |

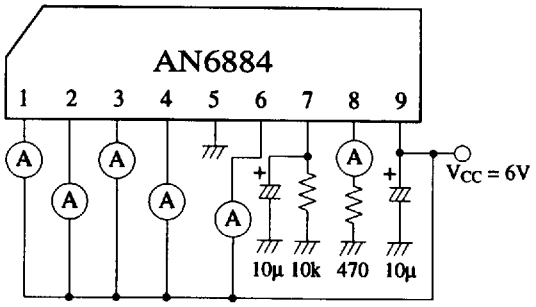
Test Circuit 1 ($I_{CC}$)



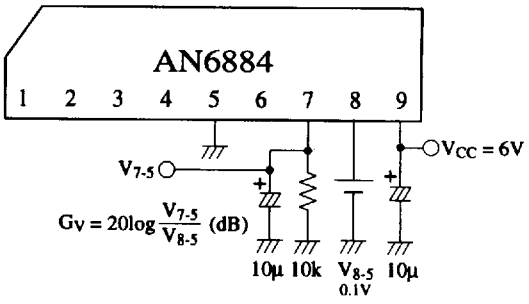

Test Circuit 2 ($I_{Bias8}$)



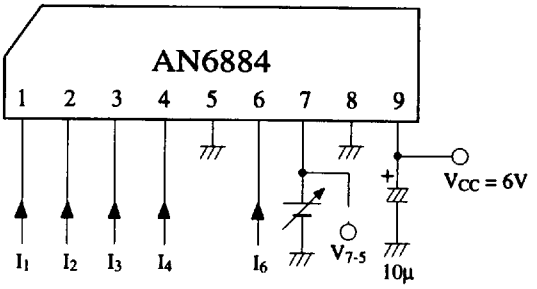

Test Circuit 3 ($I_{(SINK)1, 2, 3, 4, 6}$)




Test Circuit 4 ($G_V$)

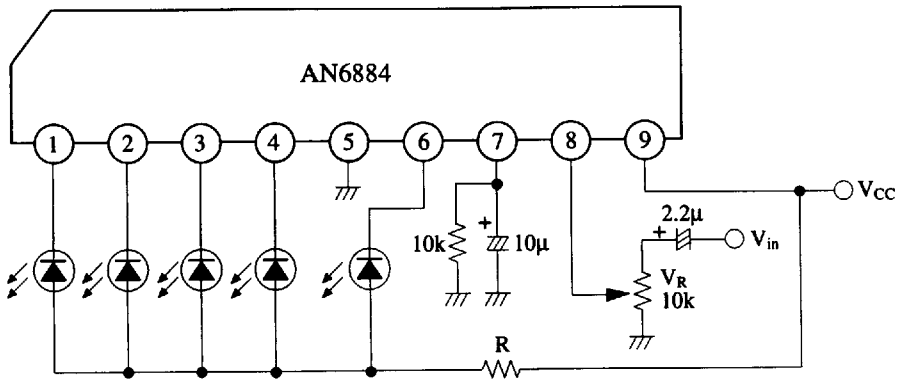



Test Circuit 5 ($GD_{1-5}$)




Note) Measure input voltage $V_{7-5}$ of comparator that $I_1$-$I_5$ flow more than 11mA.

## ■ Application Circuit




In case of Ta(max) = 60°C

| $V_{CC}$(V) | R(Ω) |
|---|---|
| 8 ~ 12 | 47 |
| 10 ~ 14 | 68 |
| 12 ~ 16 | 91 |

In case of Ta(max.) = 75°C

| $V_{CC}$(V) | R(Ω) |
|---|---|
| 7 ~ 9 | 27 |
| 8 ~ 10 | 39 |
| 9 ~ 11 | 51 |
| 10 ~ 12 | 62 |
| 11 ~ 13 | 75 |
| 12 ~ 14 | 82 |
| 13 ~ 15 | 100 |
| 14 ~ 16 | 110 |

### $P_D$ and $V_{CC}$

When maximun ambient temperature Ta(max.) = 60°C, $V_{CC}$ > 9V / Ta(max.) = 75°C, $V_{CC}$ > 7V, $P_D$ is over at the application circuit above. Select R value from the right list. And determine R watt by resistance value and total LED current.

## ■ Characteristics Curve

