AN6875

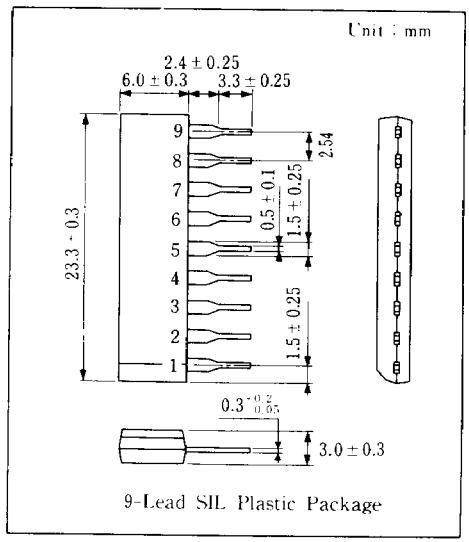
5-Dot LED Driver Circuit

■ Outline

The AN6875 is an integrated circuit designed for driving 5-dot LED so that LED may light logarithmically (dB) for input signal. Because the adjust pin for output current is provided, the brightness of LED can be controlled.

■ Features

- 5-LED bar graph or dot display drive
- Logarithmic response with respect to input signal
- Brightness externally adjustable
- High output current, suitable for green LED drive
- Lamp ON/OFF hysteresis, no flickering by noise

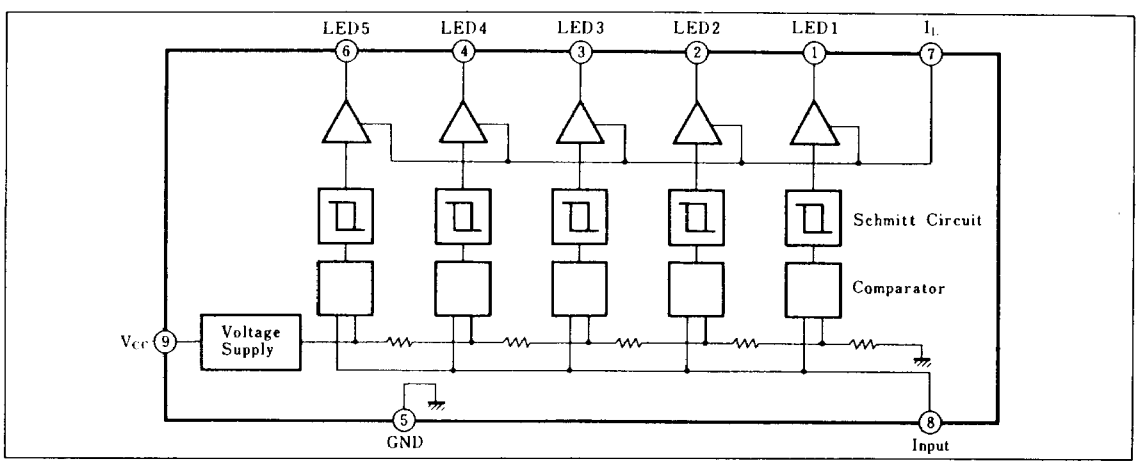


9-Lead SIL Plastic Package

■ Pin

Pin No.	Pin Name
1	LED1 Output
2	LED2 Output
3	LED3 Output
4	LED4 Output
5	GND
6	LED5 Output
7	LED Current Set Input
8	Non Inverting Input
9	V_{CC}

■ Block Diagram



■ Absolute Maximum Ratings (Ta=25℃)

Item		Symbol	Rating		Unit
Voltage	Supply Voltage	V_{CC}	−0.5	+18	V
	Circuit Voltage	V_{8-5}	−0.5	+16	V
	Load Current Set Input Voltage	V_{7-5}		+16	V
	Output Voltage*1	V_O	−0.5	+16	V
Current	Supply Current	I_{CC}	18		mA
	Load Current Set Input Current	I_7	4.25		mA
	Output Current	I_O	20		mA
Power Dissipation		P_D	550		mW
Temperature	Operating Ambient Temperature	T_{opr}	−20~+75		℃
	Storage Temperature	T_{stg}	−55~+150		℃

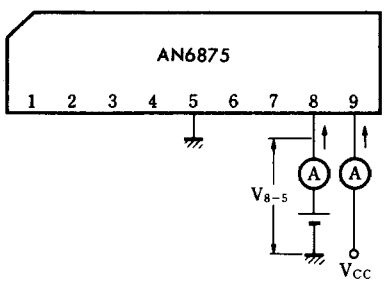
*1 Output pins ①, ②, ③, ④ and ⑥

■ Electrical Characteristics (Ta=25℃)

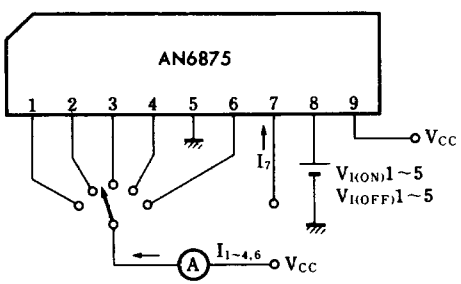
Item		Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Input Voltage (LED ON)	LED1	$V_{I(ON)1}$	2	V_{CC}=16V			1.12	V
	LED2	$V_{I(ON)2}$					1.86	V
	LED3	$V_{I(ON)3}$					3.10	V
	LED4	$V_{I(ON)4}$					5.18	V
	LED5	$V_{I(ON)5}$					8.66	V
Input Voltage (LED OFF)	LED1	$V_{I(OFF)1}$	2	V_{CC}=16V	0.80			V
	LED2	$V_{I(OFF)2}$			1.49			V
	LED3	$V_{I(OFF)3}$			2.54			V
	LED4	$V_{I(OFF)4}$			4.28			V
	LED5	$V_{I(OFF)5}$			7.23			V
Load Current	Pin6	I_6	2	V_{CC}=16V, V_O=1.2V, I_7=4.25mA	13	16		mA
	Pin1~4	I_1~I_4	2	V_{CC}=16V, V_O=2.5V, I_7=4.25mA	13	16		mA
	Pin1~4,6	I_1~I_4, I_6	2	V_{CC}=16V, V_O=16V, I_7=4.25mA		16	19	mA
Input Current		I_{I1}	1	V_{CC}=16V, V_{8-5}=8.7V			50	μA
		I_{I2}	1	V_{CC}=16V, V_{8-5}=16V			5	mA
Total Circuit Current		I_{tot}	1	V_{CC}=16V, V_{8-5}=16V			18	mA
Output Pin Leak Current		I_1~I_4, I_6	2	V_{CC}=16V, V_O=16V			15	μA

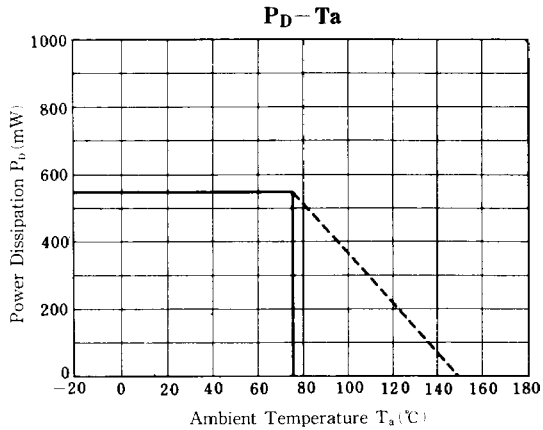
Note) Operating Supply Voltage Range : $V_{CC(opr)}$=12~16V

Test Circuit 1 (I_{I1}, I_{I2}, I_{tot})



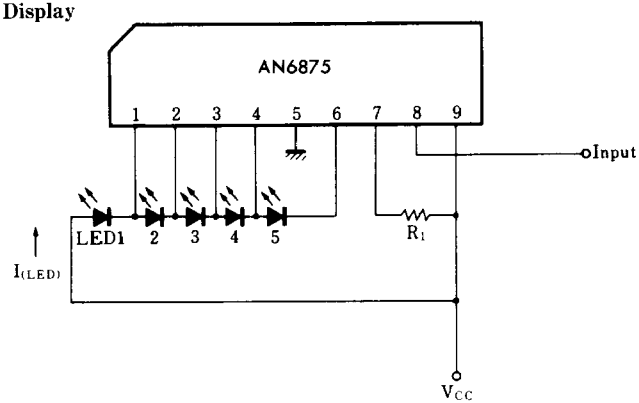
Test Circuit 2 ($V_{I(ON)1\sim5}$, $V_{I(OFF)1\sim5}$, I_1~I_4, I_6)





■Application Circuit

1) **Bar Display**



$$R_1 \fallingdotseq \frac{V_{CC} - 0.7}{I_{(LED)}} \times 4 - 270$$

$$V_{CC} \geqq V_F \times 5 + 1.2$$

Note) When the voltage of Pin ⑥ is high for 5-dot LED ON, insert the resistor into the anode side of LED_1, to reduce P_D.

2) **Dot Display**