

AN6875

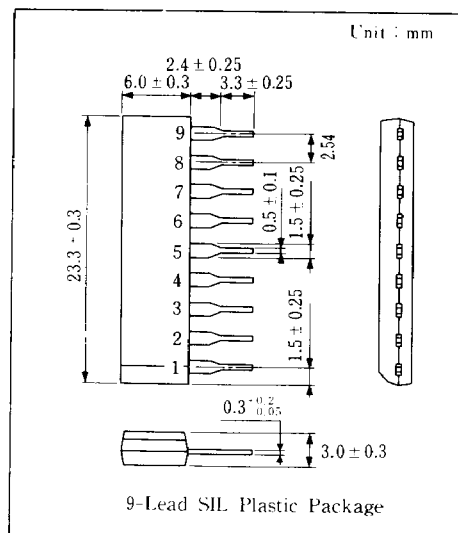
5-Dot LED Driver Circuit

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

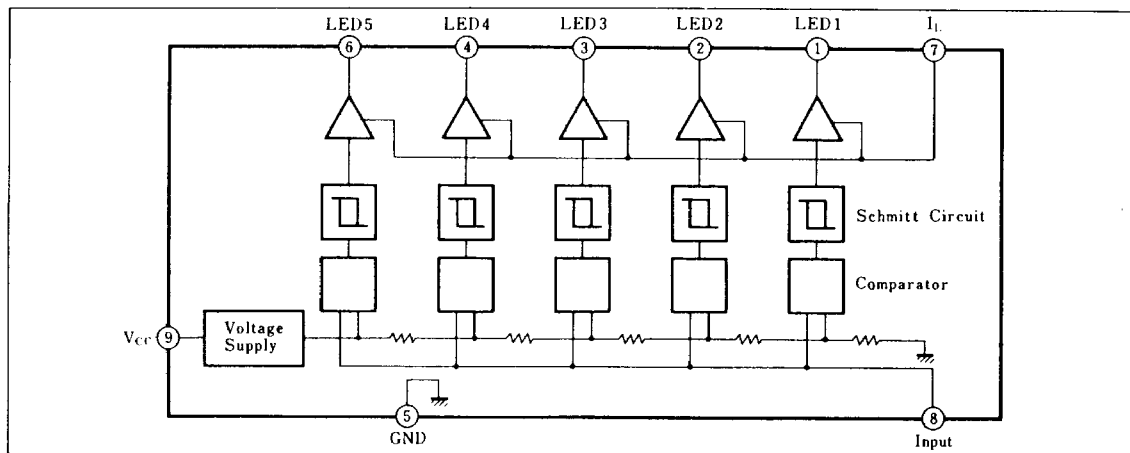
- 5-LED bar graph or dot display drive
- Logarithmic response with respect to input signal
- Brightness externally adjustable
- High output current, suitable for green LED drive
- Lamp ON/OFF hysteresis, no flickering by noise



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 ($T_a = 25^\circ\text{C}$)

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}	$-20 \sim +75$		$^\circ\text{C}$
	Storage Temperature	T_{stg}	$-55 \sim +150$		$^\circ\text{C}$

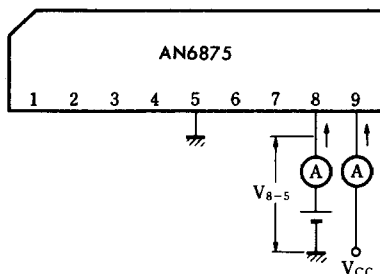
*1 Output pins ①, ②, ③, ④ and ⑥

■ Electrical Characteristics ($T_a = 25^\circ\text{C}$)

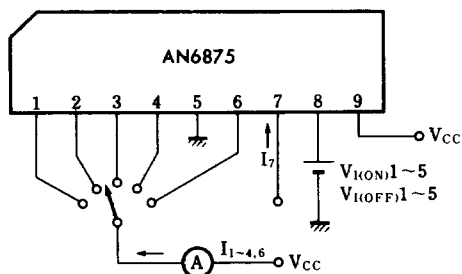
Item		Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Input Voltage (LED ON)	LED1	$V_{I(ON)1}$	2	$V_{CC} = 16\text{V}$			1.12	V
	LED2	$V_{I(ON)2}$					1.86	V
	LED3	$V_{I(ON)3}$					3.10	V
	LED4	$V_{I(ON)4}$					5.18	V
	LED5	$V_{I(ON)5}$					8.66	V
Input Voltage (LED OFF)	LED1	$V_{I(OFF)1}$	2	$V_{CC}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

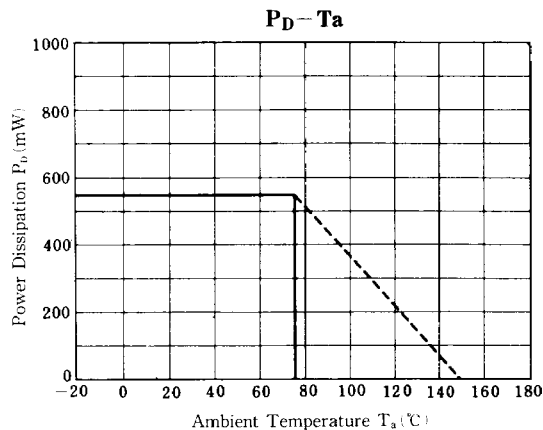
Note) Operating Supply Voltage Range : $V_{CC(oper)} = 12 \sim 16\text{V}$

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



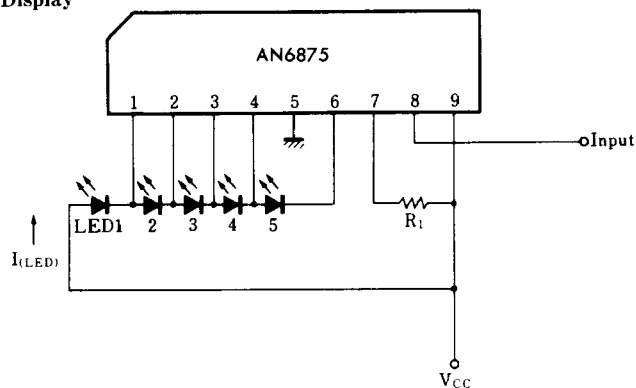
Test Circuit 2 ($V_{I(ON)1 \sim 5}, V_{I(OFF)1 \sim 5}, I_1 \sim I_4, I_6$)





■ Application Circuit

1) Bar Display



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

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

Note) When the voltage of Pin ⑥ is high for 5-dot LED ON, insert the resistor into the anode side of LED₁, to reduce P_D.

2) Dot Display

