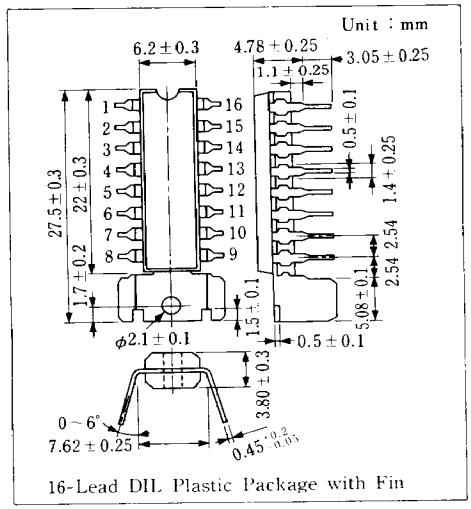
AN6877, AN6878

7-Dot LED Driver Circuits

■ Outline

The AN6877 and the AN6878 are integrated circuits designed for driving 7-dot LED. The AN6877 responses linearly to the input signal, while the AN6878 responses logarithmically to the input signal. Because the adjust pin for output current is provided, the brightness of LED can be controlled.

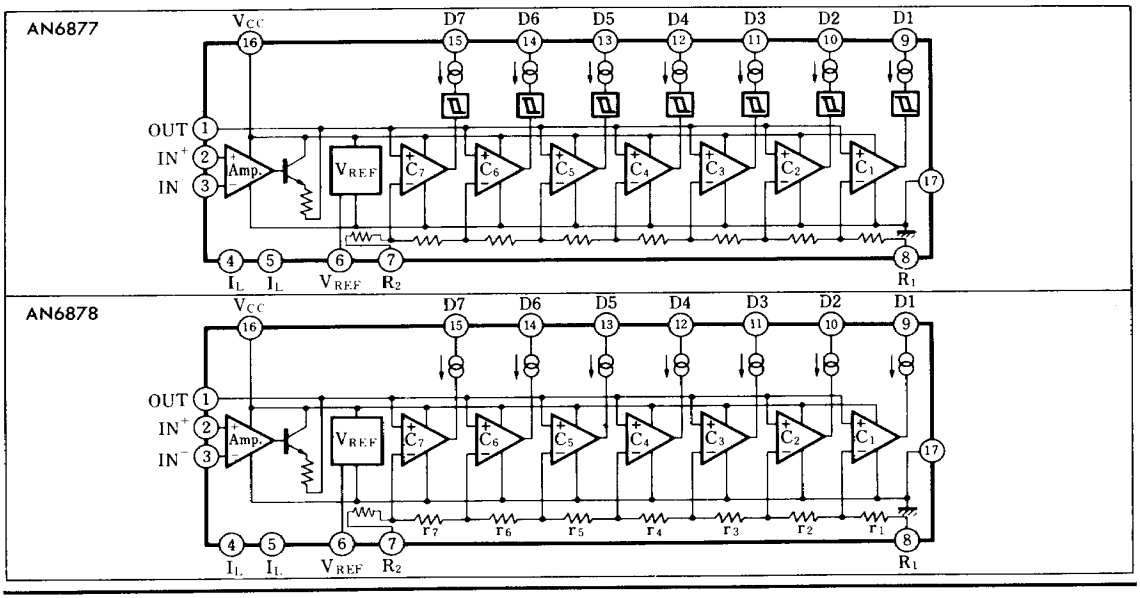


16-Lead DIL Plastic Package with Fin

■ Features

- 7-LED bar graph display drive
- Linear (AN6877) and Logarithm (AN6978) response
- Brightness externally adjustable
- High output current : 25 mA (max.)
- Series connection available for driving more than 7-dot display.
- Incorporating reference supply voltage circuit
- No fluctuation of LED current even if supply voltage changes
- Snap turning on available

■ Block Diagrams



■ Absolute Maximum Ratings (Ta=25℃)

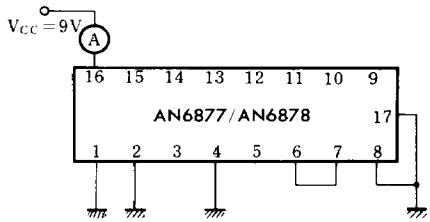
Item		Symbol	Rating	Unit
Voltage	Supply Voltage	V_{CC}	18	V
	Circuit Voltage	V_I	7.5	V
	Input Voltage	V_I	16	V
	Output Voltage	V_O	16	V
Current	Supply Current	I_{CC}	25	mA
	Output Current	I_O	25	mA
Power Dissipation (T_a=25℃)		P_D	1,800	mW
Temperature	Operating Ambient Temperature	T_{opr}	−30～+75	℃
	Storage Temperature	T_{stg}	−55～+150	℃

■ Electrical Characteristics (V_{CC}=9V, Ta=25℃)

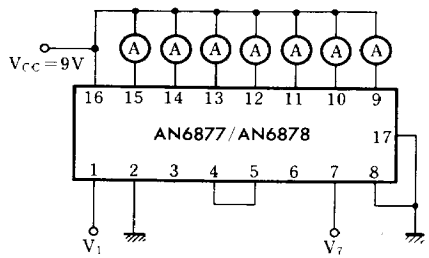
Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Supply Current	I_{tot}	1	V_2=0V	4		18	mA
Output Inflow Current	$I_{(SINK)9\sim15}$	2	V_1=3.55V, V_7=3.5V	13		25	mA
Reference Voltage	V_{REF}	3		3.55	3.75	3.95	V
Output Offset Voltage (Amp.)	$V_{O(offset)}$	4	V_{CC}=16V, G_V=20dB, V_2=0V	−150		150	mV
Voltage Gain (Amp.)	G_V	4	V_2=50mV	18	20	22	dB
Output Pin Leakage Current	$I_{O(Leak)}$	5	V_{CC}=18V	0		20	μA
Input Bias Current (Amp.)	I_{Bias2}	6	V_{CC}=18V, V_2=0V	−2		0	μA
	I_{Bias3}	6	V_{CC}=18V, V_3=0V	−2		0	μA
Input Bias Current (Comparator)	I_{Bias7}	7	V_{CC}=18V, V_2=10V, V_3=0V V_7=0V	−10		0	μA
	I_{Bias1}	7	V_{CC}=18V, V_3=10V, V_1=0V, V_2=0V, V_6=V_7	−10		0	μA
Comparator Level (AN6877)	GD_1	8	V_7=3.65V V_8=0V	0.4	0.5	0.6	V
	GD_2			0.85	1	1.15	V
	GD_3			1.35	1.5	1.65	V
	GD_4			1.85	2	2.15	V
	GD_5			2.35	2.5	2.65	V
	GD_6			2.85	3	3.15	V
	GD_7			3.35	3.5	3.65	V
Comparator Level (AN6878)	GD_1*	8	V_7=3.5V V_8=0V	−17	−15	−13	dB
	GD_2			−9	−7	−5	dB
	GD_3			−4	−3	−2	dB
	GD_4			−1	0	1	dB
	GD_5			1.5	2	2.5	dB
	GD_6			3.5	4	4.5	dB
	GD_7			4.5	5	5.5	dB

*1 The comparator reference voltage is 3.5V and 2.0V is 0dB.
Note) Operating Supply Voltage Range : $V_{CC(opr)}$=5～16V

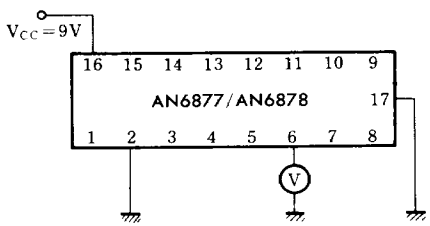
Test Circuit 1 (I_{tot})



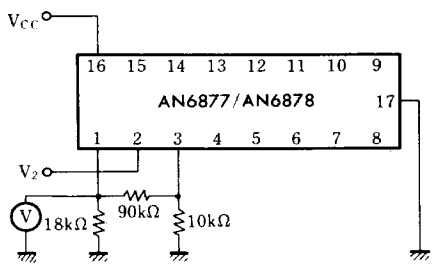
Test Circuit 2 ($I_{(SINK)9\sim15}$)



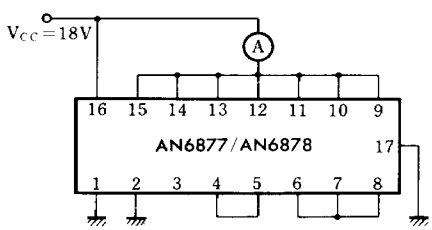
Test Circuit 3 (V_{REF})



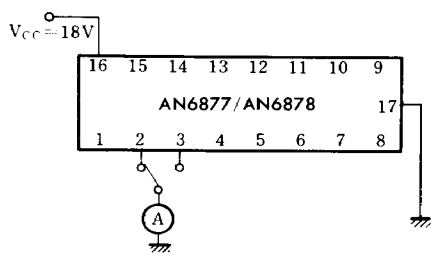
Test Circuit 4 ($V_{O(offset)}$, G_V)



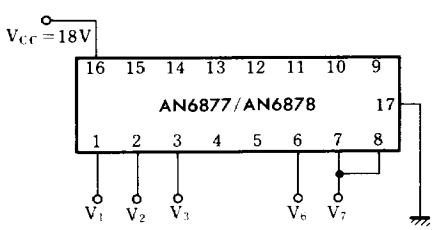
Test Circuit 5 ($I_{O(Leak)}$)



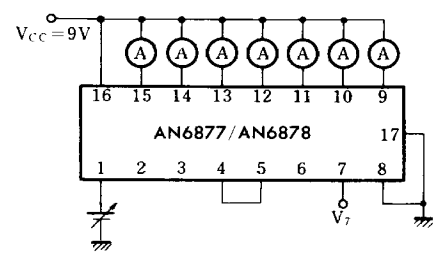
Test Circuit 6 (I_{Bias2}, I_{Bias3})



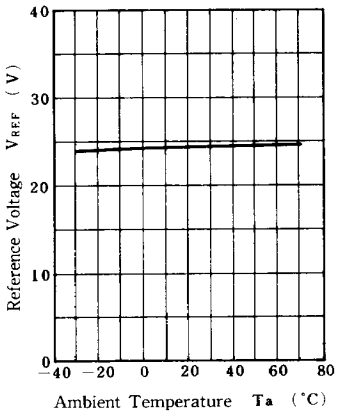
Test Circuit 7 (I_{Bias7}, I_{Bias1})



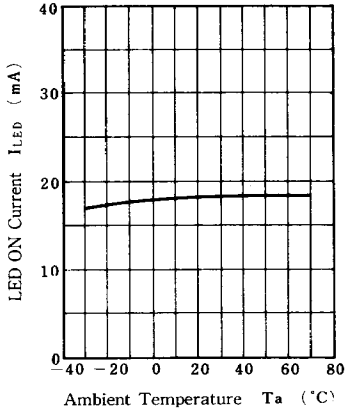
Test Circuit 8 ($GD_{1\sim7}$)



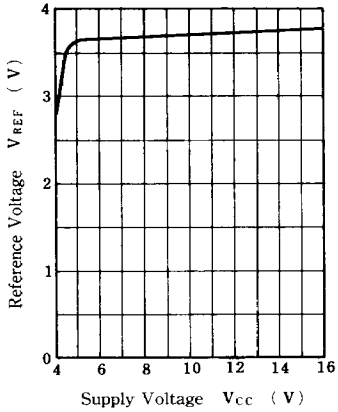
V_{REF} – Ta



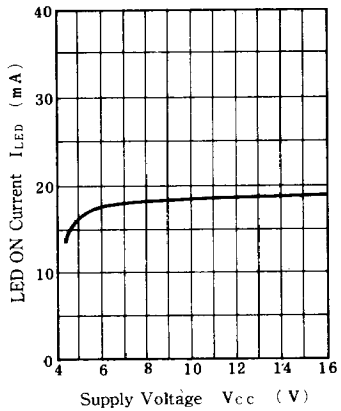
I_{LED} – Ta



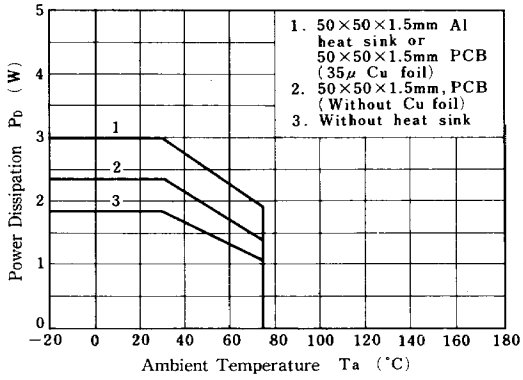
V_{REF} – V_{CC}



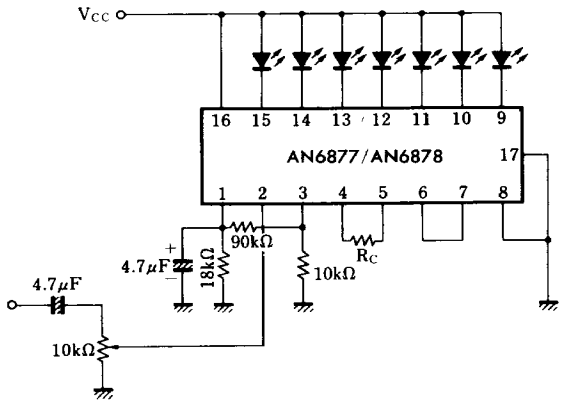
I_{LED} – V_{CC}



P_D – Ta



■ Application Circuit



Amp. Gain 20dB

R_C = 10kΩ, I_{LED} = 5.5mA

R_C = 560Ω, I_{LED} = 17.5mA

■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	Amp. Output	9	LED1 Output
2	Non Inverting Input	10	LED2 Output
3	Inverting Input	11	LED3 Output
4	LED Current Set Input	12	LED4 Output
5		13	LED5 Output
6	Ref. Voltage	14	LED6 Output
7	LED ON Level Set Input	15	LED7 Output
8		16	V_{CC}