IR2406/IR2406G 12-Dot LED Display Driver

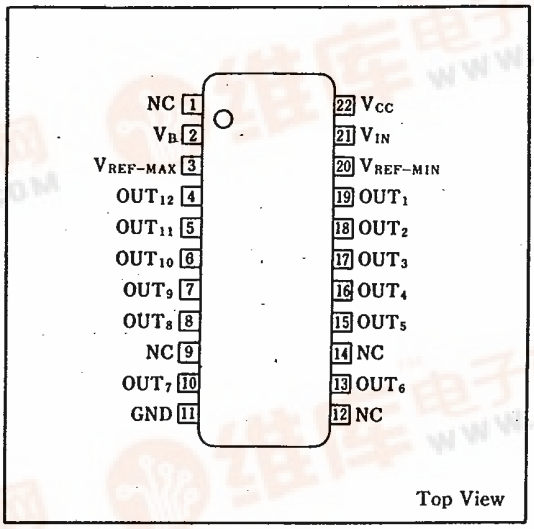
■ Description

The IR2406/IR2406G is suitable for driving 12-dot LED level meters, the IR2406 is for red LEDs and the IR2406G is for green LEDs.

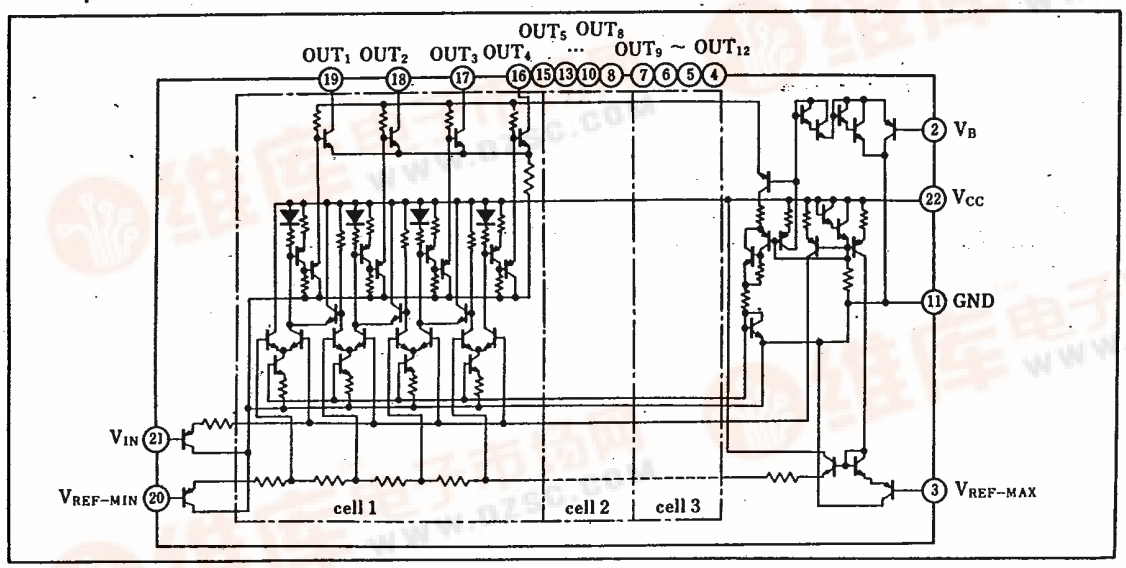
■ Features

1. Linear-scale display
2. Series connection is possible
3. LED current is adjustable
4. 22-pin dual-in-line package

■ Pin Connections



■ Equivalent Circuit



■ Absolute Maximum Ratings

(Ta=25℃)

Parameter	Symbol	Condition		Rating	Unit
Supply voltage	V_{CC}			18	V
Input voltage	V_3 V_{20} V_{21}	voltage not to damage the IC		V_{CC}	V
Power dissipation	P_D	Ta≦25℃		800	mW
P_D derating ratio	ΔP_D/℃	Ta>25℃		8	mW/℃
Operating temperature	T_{opr}		IR2406	−20～+80	℃
			IR2406G	−20～+75	
Storage temperature	T_{stg}			−25～+125	℃

■ Electrical Characteristics

(V_{CC}=12V, Ta=25℃)

Parameter	Symbol	Condition		MIN.	TYP.	MAX.	Unit
Supply voltage	V_{CC}			6		18	V
Supply current	I_{CC}				5.5	8.2	mA
Input voltage	V_{IN1}	Applies to 3, 20 and 21 pins				6	V
	V_{IN2}	V_3-V_{20}*		0.9		6	
Input current	I_3	V_3-V_{20}*=20V			0.3	1	μA
	I_{20}				0.3	1	
	I_{21}				0.3	1	
	I_2				4	20	
Output current	I_{OUT}	Test time 10ms	IR2406	7.5	10	12.5	mA
			IR2406G	17	23	28	
Min. output current	$I_{O\ MIN}$	Test time 10ns			0.3	0.5	mA
Output leakage current	I_{OL}	V_{CC}=18V				10	μA

* V_n shows the voltage of the n-th pin.

■ Description of Operation

Given the maximum reference voltage and the minimum reference voltage, the reference voltage is 12-divided. The comparison of this and the input voltage V_{IN} is made by the comparator circuits. And the "High" or "Low" output of the AND gate turns on the corresponding transistor and causes the LED to glow.

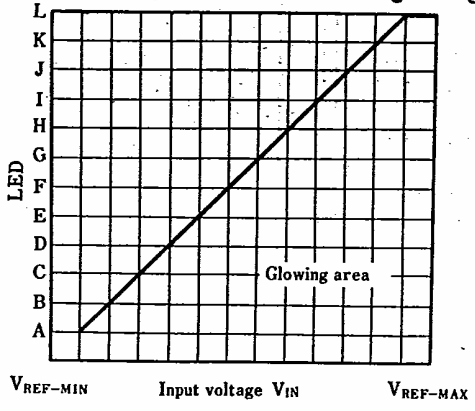
ΔV_{IN}(the voltage required to advance the LED by one position) is given by the formula:

$\Delta V_{IN}=(V_{REF-MAX}-V_{REF-MIN})/13$

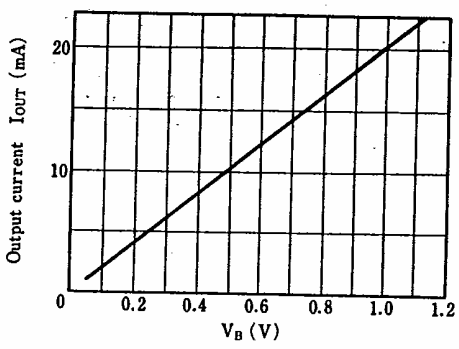
● **Sample use of V_B terminal**

The terminal V_B supplied with a voltage less than about 1.2V can control the current I_{OUT}.

Input voltage when LED starts glowing



Output current—V_B terminal voltage Characteristics



- **Operating voltage range**

The operating voltage range given in the electrical characteristics is the one only for operating IR2406/IR2406G. If it is used in connecting the anode of LED to the power supply pin (see Basic Connection Diagram), be sure to operate it on the voltage higher than($4V_F$ + 3)V.

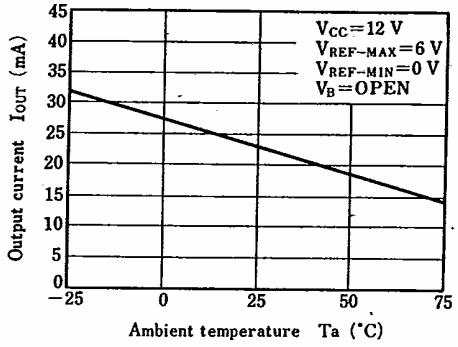
Where V_F=LED forward voltage.

- **Connecting the output pin not to be used**

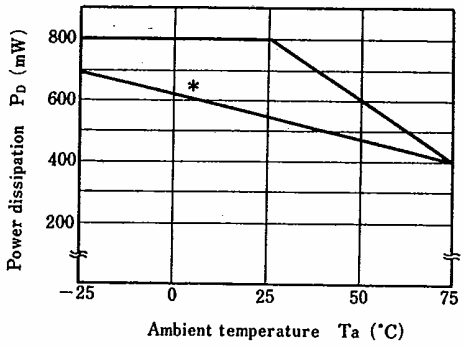
Connect the output pin to the cathode of the last LED connected inside.

■ Electrical Characteristic Curves

Output current—Ambient temperature Characteristics



Power dissipation—Ambient temperature Characteristics



* Power dissipation when 9 LEDs are ON under conditions that V_{CC}=12V, I_{CC}=6mA, V_F=2V and I_{OUT}=26.5mA (Ta=25°C).

■ Basic Connection Diagram