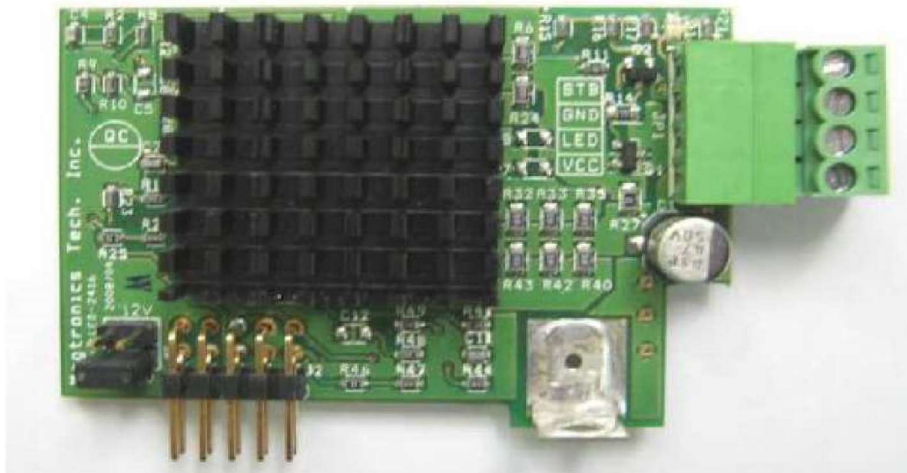




Smart LED controller 2.0 For AOI

Model: SmartLED-2416

User's Manual
Version: 2.2 2022-12-01



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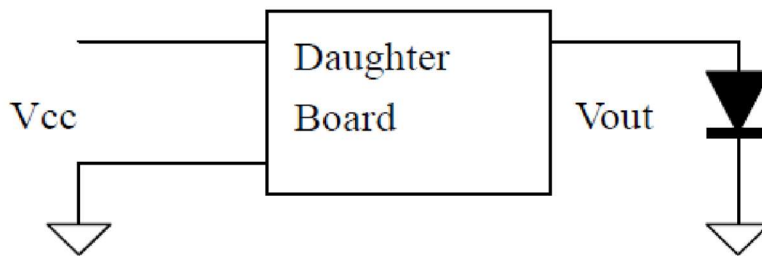
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1. Features

- A daughter driver board for modularized SmartLED controller.
- Jumper 2 can select the voltage source to be 12V or 24V.
- The output current is up to 1600mA.
- When the LED current is larger than 100mA, the voltage difference at LED output terminal (Vout) and the power supply (Vcc) should not exceed 2 Volt. The method of using external resistor to comply this rule is described in Chapter 4. If the voltage difference is greater than 2 volt and the current larger than 100mA, this board may shut down due to over temperature.





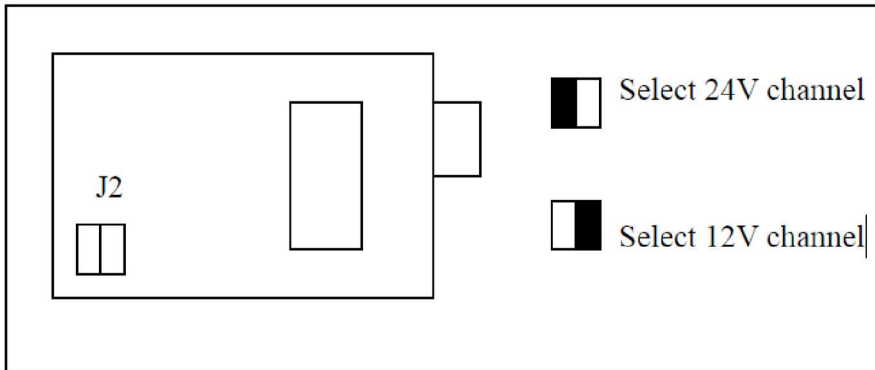
• **2. Electrical Specification**

Item	Value	Unit
Supply voltage Vcc	8~30 *	V
Maximal output current	1600	mA
Maximal output voltage @ 1600mA	Vcc-2	V
LED connection	Common cathode	
Operation condition	0~70 °C	20~90% Humidity



3. Pin definition

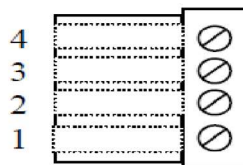
J2: jumper for voltage selection



Note : J2 is used to select the voltage source from mother board. Actually, 12V or 24V is the name for distinguishing these two channels. You can input voltage of 8~24V to V12 or V24 terminals of mother board.

J1: LED connector

Pin No.	Name	Function
1	VCC	Voltage source input (may not be connected if the power from V12 or V24 terminal of mother board)
2	LED	Output terminal to LED (LED+)
3	GND	Return terminal from LED (LED -) / Power ground (GND)
4	STB	Strobe control input pull high to VCC through a 10K resistor.





4. Calculation of external resistor to reduce voltage difference

When the voltage difference between forward voltage of LED and the power supply voltage is too large, there is considerable power need to be dissipated by the daughter board itself. This may lead to power stage shut down due to over temperature. The method to reduce this voltage difference is to add external resistor so that part of the power may dissipate by the resistor, not only by the power stage.

An example is given as follows to show the detailed calculation.

LED: six 1Watt White ($V_f=3V$) LED in series and 4 series parallel.

LED forward voltage $V_{ft}=6 \times 3V=18 V$

Power supply voltage is $V_{cc}=24 V$

LED current is $I_c: 1Watt/3V*4 = 1.32 A$

Resistance of the external resistor for voltage difference $2 V$ can be deduced as

$$R=(V_{cc}-V_{ft}-2)/I_c=(24-18-2)/1.32=3 \text{ ohm}$$

Power rating of the external resistor is thus given as

$$W=I_c \times I_c \times R=1.32 \times 1.32 \times 3=5.2 \text{ Watt (You can select 5W package)}$$

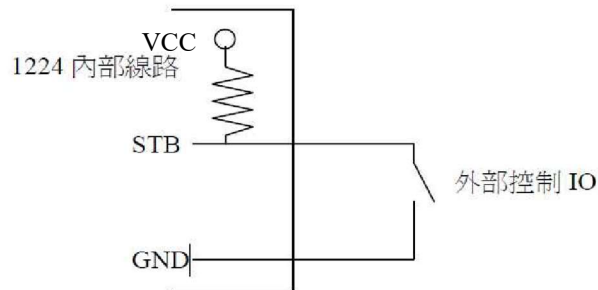


5.High-speed flash LED using STB terminal

The STB terminal on J1 is used to strobe the LED for high speed flashing. Use external open-collector digital output to turn ON/OFF the current output to LED.

- **Open: output current to LED**
- **Short: stop outputting current to LED**

* : The response time is smaller than 1us of this strobe. However, some LED module has multiple series of LED which needs more time to turn ON/OFF due to high-current payload. Some experiment is necessary to determine the actual turn ON/OFF time.





6. Connection of common cathode LED module

When the LED module is composed of multiple series of LED branches with common cathode connection, you may use multiple daughter boards to drive the branches separately. The detailed connection is shown as follows.

