

## Data Sheet

Tunable White Square LED Module

BLX-SQ-250-250-T1-1400



### Product Description

- Square LED module with 250mm x 250mm
- Tunable white capability with independent 2 channels
- Nominal 1400lm @ 350mA, Tc=40°C
- Module efficacy up to 174lm/W
- High CRI of 80+
- High quality of Lambertian white light
- Re-workable push-in connector for easy wiring
- Suitable for robot wiring
- Simple installation with M4 screws (Built-in LED module)
- Long lifetime of 50,000hr



### Order Information

Type	Part number
BLX-SQ-250-250-T1-1400-827-865	7416A020
BLX-SQ-250-250-T1-1400-830	7416A123
BLX-SQ-250-250-T1-1400-840	7416A124

### Key Performance Data

Type	Channel	Typ lm flux	Nominal CCT	Typ Vf	Typ power consumption	Efficacy of module	CRI
BLX-SQ-250-250-T1-1400-827-865	Channel 1	1280lm	2700K	22.5V	7.9W	163lm/W	80+
	Channel 2	1400lm	6500K	22.5V	7.9W	174m/W	80+
BLX-SQ-250-250-T1-1400-830	Channel 1	1300lm	3000K	22.5V	7.9W	167lm/W	80+
BLX-SQ-250-250-T1-1400-840	Channel 1	1400lm	4000K	22.5V	7.9W	174lm/W	80+

Note) Performance per channel @ If=350mA/Channel, Tc=40°C

## Photometric Characteristics

Parameter	Type	Channel	Min	Typ	Max	Unit	Remark
Luminous flux	827-865	Channel 1	1200	1280	1410	lm	827
		Channel 2	1270	1370	1500	lm	865
	830	Channel 1	1210	1300	1430	lm	
	840	Channel 1	1270	1370	1500	lm	
Module efficacy	827- 865	Channel 1		163		lm/W	827
		Channel 2		174		lm/W	865
	830	Channel 1		167		lm/W	
	840	Channel 1		174		lm/W	
CCT	827-865	Channel 1		2700		K	827
		Channel 2		6500		K	865
	830	Channel 1		3000		K	
	840	Channel 1		4000		K	
CIE	827-865	Channel 1		(0.459, 0.412)		-	827
		Channel 2		(0.312, 0.324)		-	865
	830	Channel 1		(0.433, 0.400)			
	840	Channel 1		(0.381, 0.377)			
Color consistency	-	-			3.5	SDCM	
CRI	-	-	80			-	
Radiation angle	-	-		115		deg	Lambertian

Note) Performance per channel @  $I_f=350\text{mA}/\text{Channel}$ ,  $T_c=40^\circ\text{C}$

Measurement tolerance: Luminous flux  $\pm 7\%$ , CIE  $\pm 0.007$

Color measurement indicates integrated color over the module. Color consistency of 3.5 SDCM is therefore module-to-module consistency. LED-to-LED color consistency in a module could be up to 7 SDCM. We recommend that users design systems to provide enough mixing of the lights from individual LEDs (for example with diffuser placed with large enough distance from the module).

## Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Remark
Forward voltage	21.4	22.5	23.6	V	
Power consumption	7.5	7.9	8.3	W	

Note) Performance per channel @ If=350mA/Channel, Tc=40°C

Measurement tolerance: Forward voltage ±4%

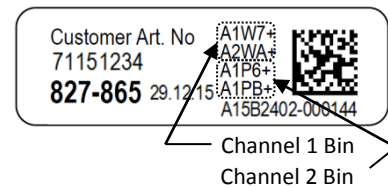
Max range of Vf considering entire operating temperature range (-25 to 85°C) is **21.0V** to **24.3V**. Please choose a driver with proper Vf range for your operating condition. If you plan to dim the module, check the Vf range of the module at minimum dimming level using Performance Graphs in this data sheet and choose a driver with proper Vf range.

## Vf Bins

When connecting multiple modules in parallel, please be aware that it can cause difference in brightness among modules. To minimize such brightness difference in parallel modulation, please use modules with the same Vf bin in one chain.

LED Vf bins are marked on the bar code label as shown below. There are 3 Vf bins ( AZ < A1 < A2 in increasing order ). In the following example, A1 + A2 combination is used in channel 1 (A1W7+, A2WA+) and A1 + A1 combination is used in channel 2 (A1P6+, A1PB+).

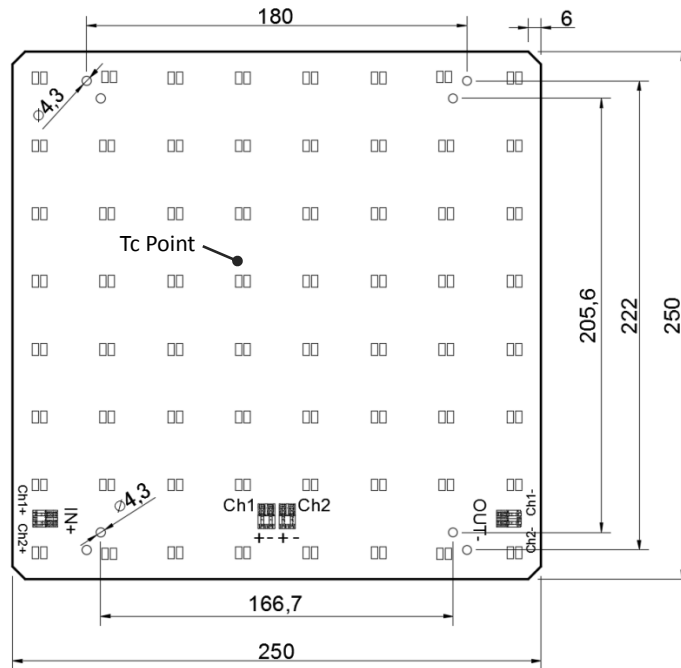
### Bar code label example showing Vf bin



Serial modulation does not cause such brightness difference among modules with different Vf bins.

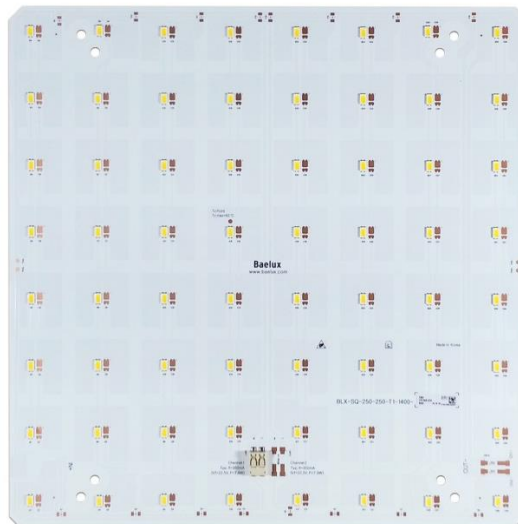
## Mechanical Characteristics

### Dimension



- Length: 250mm, Width: 250mm
- Height: 5.8mm (including connector),  
1.6mm (PCB only, in area without copper underneath)

### Module Image



### Fixing Screws

- Use M4 screws (Max head diameter: 8mm to ensure electrical isolation when using metal screws)
- Max torque: 1.0N·m
- Do not use metal washers whose diameter exceeds the above screw head guideline as it becomes difficult to maintain proper creepage distance.



This module is designed for RMS working voltage not exceeding 250V.

## Wiring

Item	Min	Typ	Max	Unit	Remark
Wire cross section	18		24	AWG	Use solid wire
	0.2		0.8	mm <sup>2</sup>	
Insulation diameter			2.1	mm	
Strip length	7.5	8.0	8.5	mm	

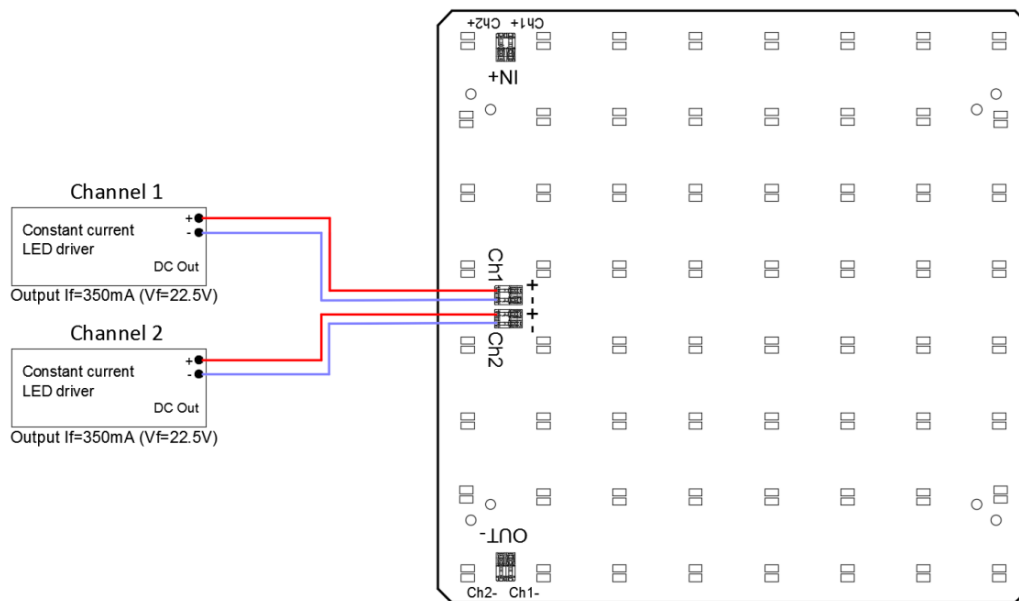
To release wire, gently press down the button on top of connector with fingers or tools, and pull the wire.

For stranded wires, use AWG 20 - 22 and apply pre-soldering to bond the strands together before inserting the wire into the connector.

Conductor diameter must be less than 1.1mm after pre-soldering.

**!** There is no reverse polarity protection. Please use caution and do not drive the module in reverse polarity. It can damage the module.

## Wiring Example



**!** This module is designed for RMS working voltage not exceeding 250V.

## Lifetime

### Lumen Maintenance

Drive current	Tc	L70B50	L80B50	L90B50
800mA	55°C	> 60,000hr	> 60,000hr	47,000hr
	65°C	> 60,000hr	56,000hr	32,000hr
	75°C	48,000hr	36,000hr	21,000hr

Note) The above values are derived from LM80 test and represent statistical values. Individual modules may exhibit variations.

### Color Maintenance

- $\Delta u'v' < 0.004$  @ 6,000hr (For  $I_f < 800\text{mA}$ ,  $T_c < 65^\circ\text{C}$ )

### Temperature at Tc Point

- Note that the lifetime of module is strongly dependent upon the temperature at Tc point.
- Please check the temperature at Tc point in your luminaire and make sure that it is below the values in the following table.

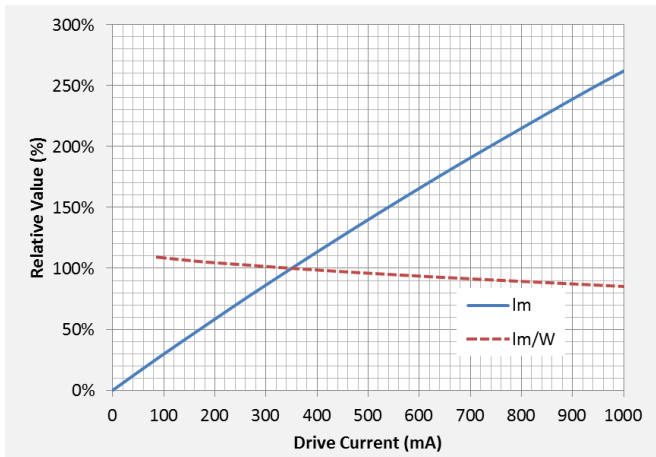
Category	Temperature at Tc point	Drive current per channel	Remark
Nominal	40°C	350mA	Nominal value at which performance is specified
Life	65°C	800mA	Value at which 50,000hr L70B50 lifetime is specified
Max	85°C	1000mA	Max value for safety

## Absolute Max Ratings

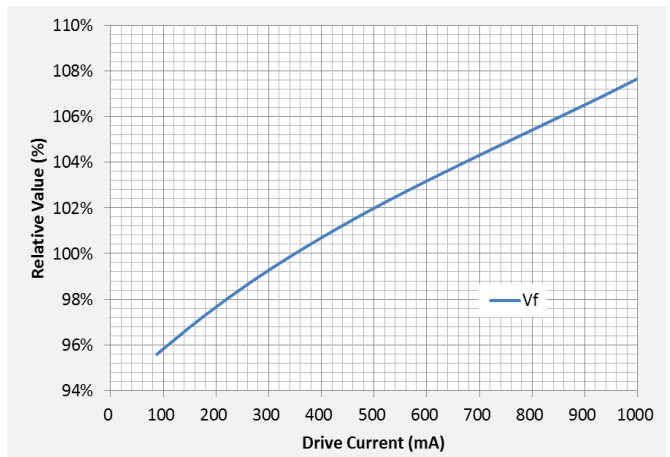
Parameter	Min	Typ	Max	Unit	Remark
Drive current			1000	mA	
Tc	-25		85	°C	@ Tc Point
ESD			5	kV	Human body model
Ambient Temperature	-25		85	°C	

## Performance Graphs

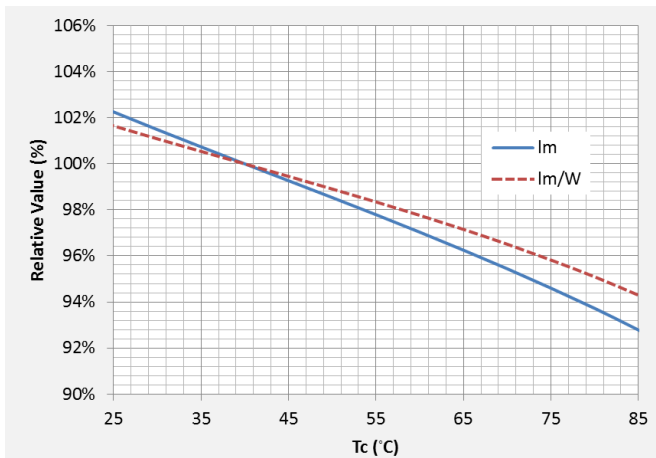
Luminous flux and module efficacy vs. Drive current \*



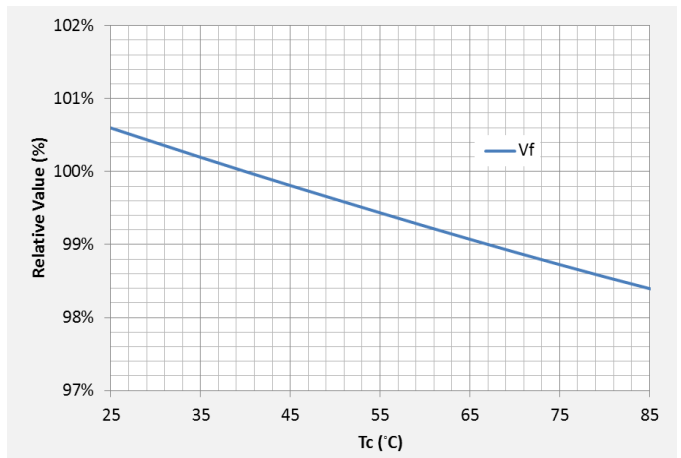
Forward voltage vs. Drive current \*



Luminous flux and module efficacy vs. Temperature at Tc point



Forward voltage vs. Temperature at Tc point



Note) The above graphs show representative values. Each module can have different values.

\*) These two graphs are at fixed Tc of 40°C.

## Precautions for Use

### Chemical Substances

Certain chemical substances listed below may harm LED modules by causing corrosions which result in reduced luminous flux, color shift, and no light output in the worst case. Please use caution when storing LED modules and designing the luminaire system so that LED modules are not exposed to such chemical substances.

- Examples of harmful chemical substances: Sulfur, chlorine, phthalate, halogen, VOCs (volatile organic compound)
- Example sources of harmful chemical substances: Organic rubber, corrugated paper, lead solder paste, epoxy

When designing a sealed luminaire, one must use silicone based sealing instead of rubber based ones and make sure that there is no source of harmful chemical in the luminaire.

Do not store LED modules with corrugated paper or rubber. It is recommended that LED modules be stored in aluminum moisture barrier bag or PE (Polyethylene) bag together with silica gel.

### ESD

This LED module is sensitive to electrostatic discharge. Please handle the module in an environment with appropriate ESD protection measures.

### DC Polarity

There is no reverse polarity protection. Please use caution and do not drive the module in reverse polarity. It can damage the module.

### Constant Current

This LED module must be driven by constant current LED drivers. Constant voltage driver may damage the module.

### LED Handling

LED is a delicate component. Do not touch or apply pressure on the yellow light emitting window of LEDs. This may damage the LED causing no light output.

This product is manufactured in ISO certified facility with strict quality control.

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