



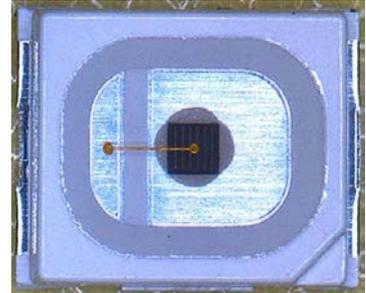
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Top Crystal Technology Inc.,

Power Light Source

Introduction :

TMSB-BFI is one the highest flux LEDs in the world. Due to the special design of chip and package, the TMSB-BFI is designed by particular package for high power LED.



Feature :

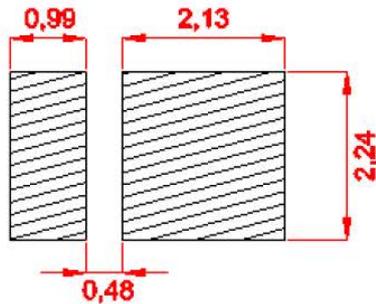
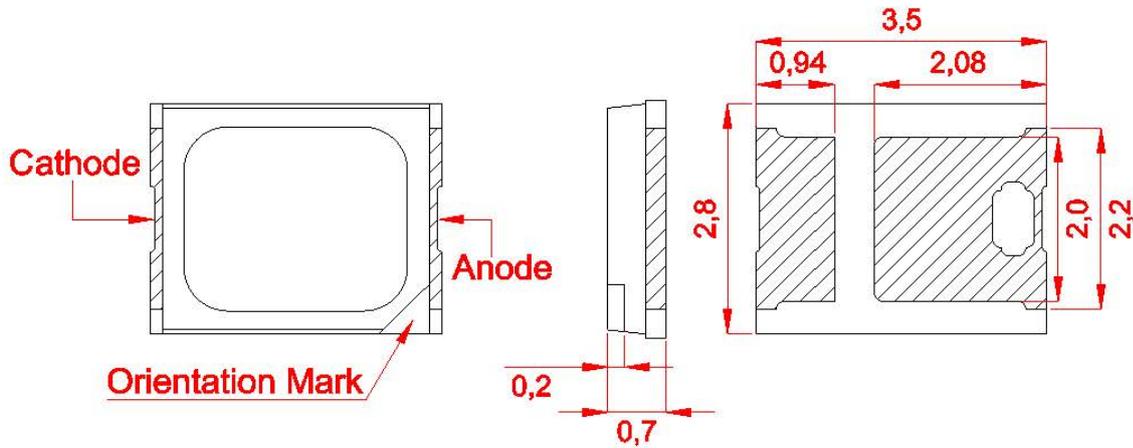
- Long operating life
- Energy efficiency
- Low thermal resistance
- Compact design
- Instant light
- Fully dimmable
- No UV
- Superior ESD protection
- ROHS compatibility

Typical Applications:

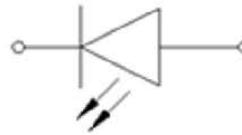
- Reading lights
- Portable light
- Orientation
- Entertainment
- Garden
- Security light
- Ceiling light
- Architectural lighting
- General lighting
- Jewel display illumination



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Recommended Solder Pad



Circuit Diagram

Notes :

1. Drawings are not to scale.
2. All dimensions are in millimeter.
3. General tolerance is ± 0.2 mm.
4. The polarity of slug at bottom is anode.
5. It is important that the slug can't contact aluminum surface, it is strongly recommended that there should coat a uniform electrically isolated heat dissipation film on the surface.
6. It is strongly recommended that the temperature of lead be not higher than 70°C.



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Absolute Maximum Ratings

Parameter		Conditions
DC Forward Current	Crimson	150mA
	IR	150mA
Peak Pulse Current (mA)	Crimson	250mA
	IR	250mA
LED Junction Temperature (°C)		120°C
Operating Temperature (°C)		-30~100
Storage Temperature (°C)		-40~120
Soldering Temperature		Manual 240°C(max) 5 seconds
Reverse Voltage		Not design to be driven in reverse bias

Notes :

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. Allowable reflow cycles are 3 times for each LED

Optical Characteristics (T_j=25°C)

Color	Peak Wavelength λ _p		Viewing Angle Degree
	Min.	Max.	2θ _{1/2}
Crimson	650nm	670nm	120
	720nm	740nm	120
IR	835nm	870nm	120
	935nm	955nm	120

Notes :

1. CCT (Wavelength) ±5% tester tolerance.
2. Wavelength is measured with an accuracy of ±0.5nm.



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Flux Characteristics (T_j=25°C)

Color	Part Number	Peak Wavelength	Forward current	Minimum Radiant Flux (mW)	Typical Radiant Flux (mW)	Maximum Radiant Flux (mW)
Crimson	TMSB-BFP	650~670nm	150mA	70mW	100mW	--
	TMSB-BFI	720~740nm	150mA	55mW	80mW	--
IR	TMSB-BFI	835~870nm	150mA	40mW	60mW	--
	TMSB-BFI	935~955nm	150mA	40mW	50mW	--

Electrical Characteristics (T_j=25°C)

Color	Part Number	Peak Wavelength	Forward current	Forward Voltage V _F (V)		
				Min.	Typ.	Max.
Crimson	TMSB-BFP	650~670nm	150mA	1.8	2.2	
	TMSB-BFI	720~740nm	150mA	1.8	2.2	
IR	TMSB-BFI	835~870nm	150mA	1.5	1.8	
	TMSB-BFI	935~955nm	150mA	1.5	1.8	

Notes:

1. V_F ±0.1V tester tolerance.



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RELIABILITY ITEMS and SPECTIONS

No	Test Item	Test Conditions	Remark
1	Room Temperature Operating Life	25°C	1000 hrs
2	High Temperature Storage	Temperature : 110°C	1000 hrs
3	Thermal shock	-40°C to 120°C, 20 min. dwell, <20 sec. transfer	200 cycles
4	High Temperature , High Humidity Storage	85°C/85%RH	1000 hrs
5	Low Temperature Storage	- 40°C	1000 hrs
6	Solderability	Tp = 260°C for 5 sec	3 times
7	Drop test	120 cm height , fall freely onto stainless board	3 times
8	Temperature Cycle (TMCL)	-40°C to 120°C, 30 min. dwell, <5 min. transfer	200 cycles

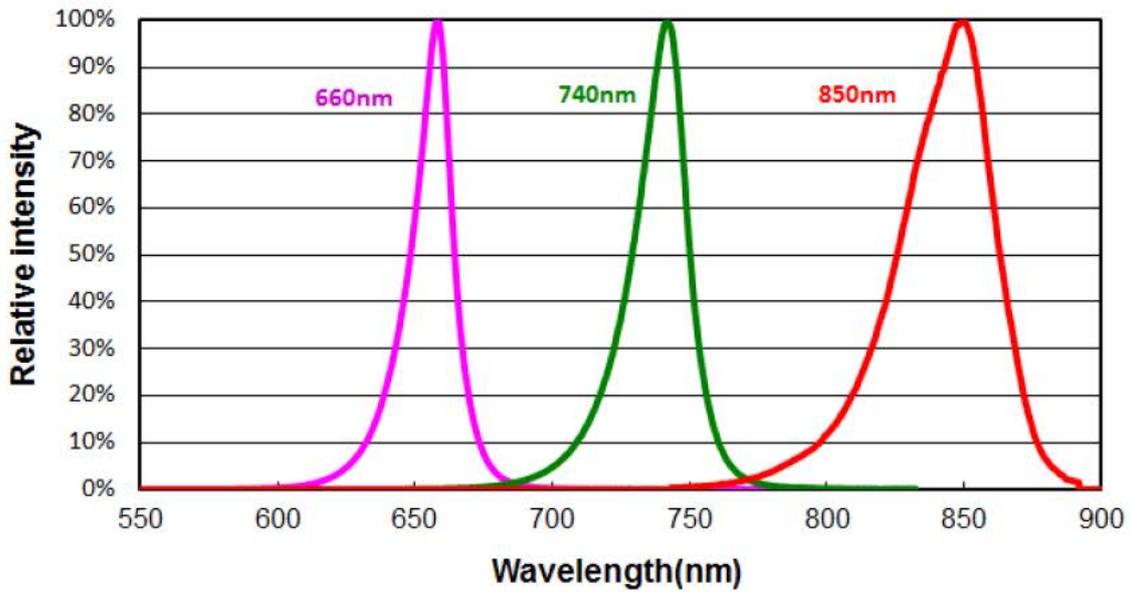
Failure Criteria :

1. Forward Voltage (VF) \geq Initial Level x 1.1
2. Luminous Flux or Radiometric Power (ΦV) \leq Initial Level x 0.7
3. Reverse Current (IR) \geq 10 μ A
4. Resistance to Soldering Heat : No dead lamps or visual damage.



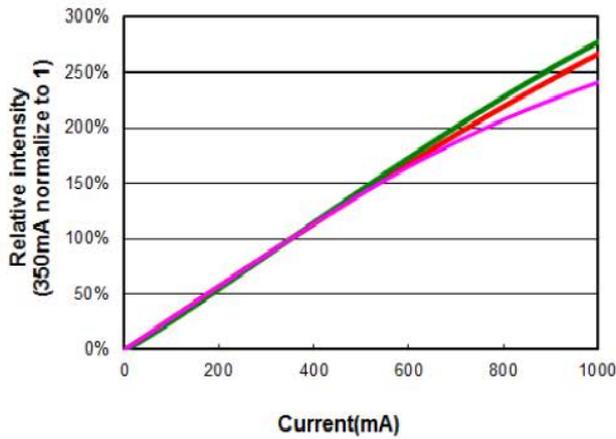
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Wavelength Spectrum, Ta=25 °C

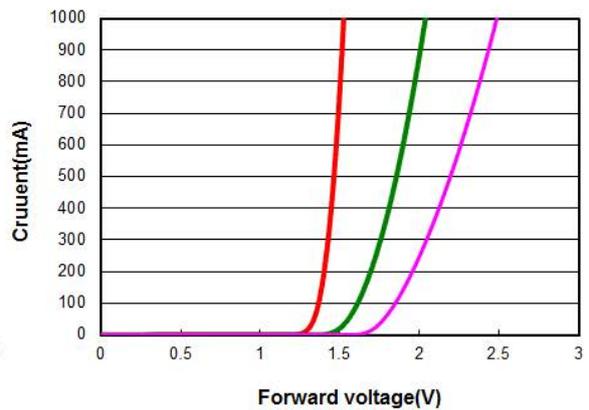


Characteristic curves

Radiant flux (Φ_e) vs Current(I_F)



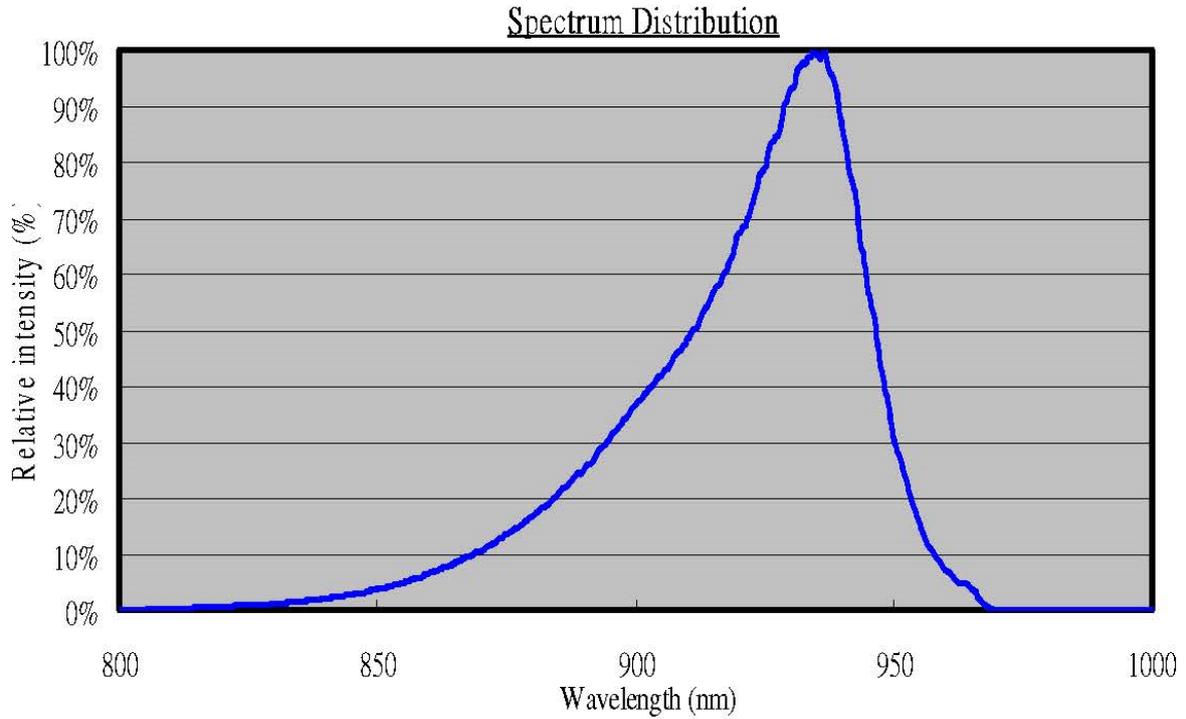
Current(I_F) vs Voltage(V_F)





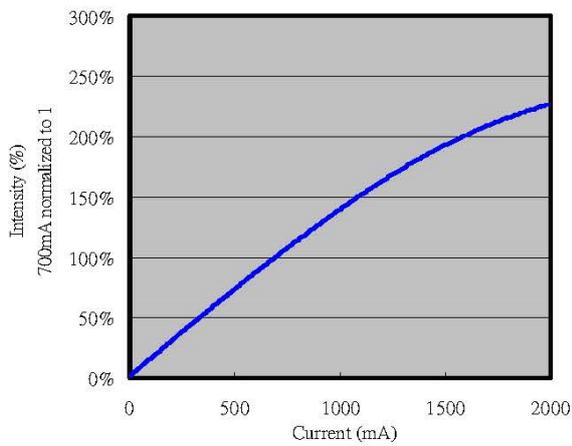
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Wavelength Spectrum, Ta=25 °C

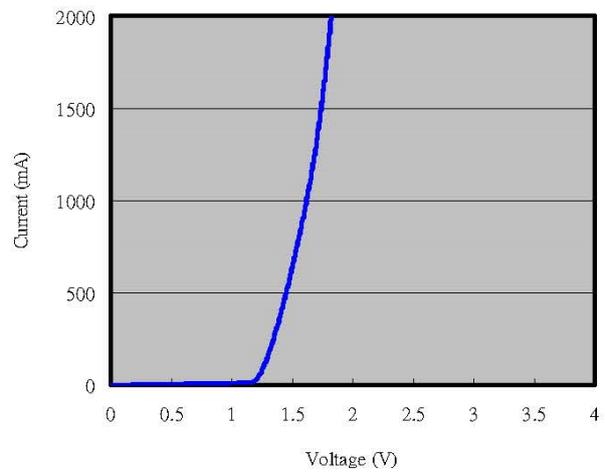


Characteristic curves

Radiant flux (Φ_e) vs Current(IF)



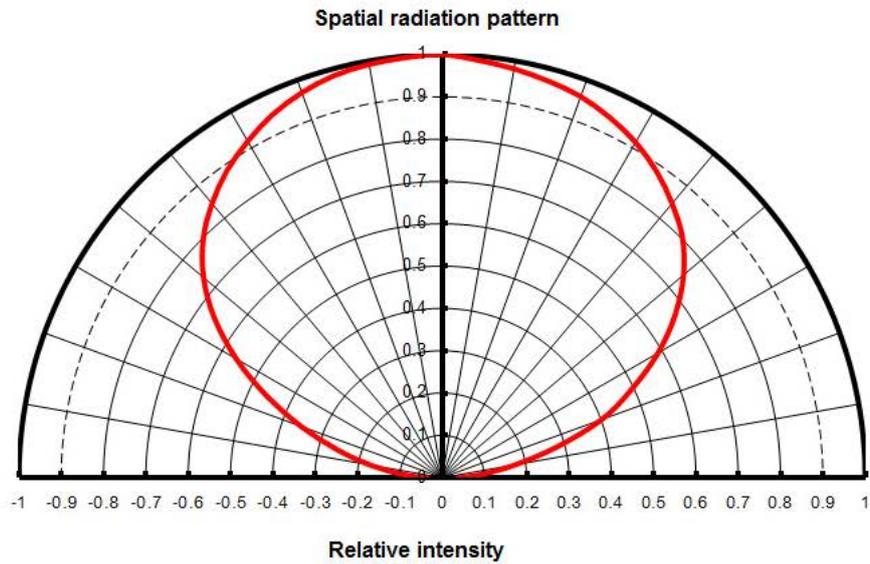
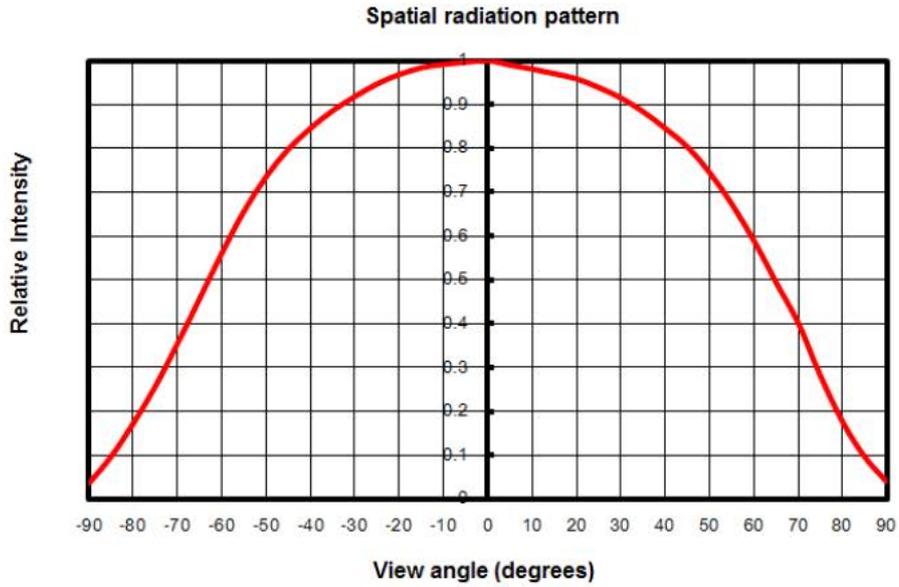
Current(IF) vs Voltage(VF)





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Typical Spatial Radiation Pattern

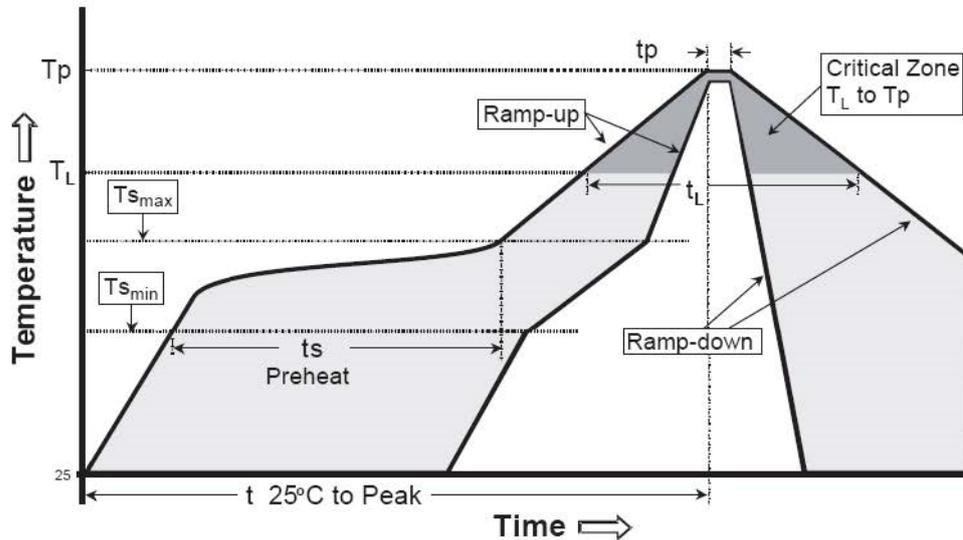




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Recommended Soldering Profile



Profile Feature	Typical parameters
Average Ramp-Up Rate ($T_{s_{max}}$ to T_p)	3 °C/second max.
Preheat Temperature Min ($T_{s_{min}}$)	150 °C
Preheat Temperature Max ($T_{s_{max}}$)	200 °C
Time ($T_{s_{min}}$ to $T_{s_{max}}$)	60-180 seconds
Time maintained above Temperature (T_L)	217 °C
Time maintained above Time (T_L)	60-150 seconds
Peak/Classification Temperature (T_p)	240 °C
Time within 5 °C of Actual Peak Temperature (T_p)	5 seconds
Ramp-Down Rate	6 °C/second max.
Time 25 °C to Peak Temperature	8 minutes max.

- All temperatures refer to topside of the package, measured on the package body surface.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than three times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.



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Notice

1. In order to avoid absorption of moisture, it is recommended that the products are stored in the dry box (or desiccators) with a desiccants. Alternatively the following environment is recommended: Storage temperature : 5°C~30°C Humidity:60% HR max.
2. If the storage conditions are of high humidity the product should be dried before use. Recommended drying conditions: 12 hours at 60°C±5°C.
3. Any mechanical force or any excess vibration should be avoid during the cooling process after soldering.
4. Reflow rapidly cooling should be avoided.
5. Components should not be mounted on distorted Printed Circuit Boards.
6. Devices should not contact with any types of fluid, such as water , oil , organic solvents.... etc.
7. The maximum ambient temperature should be taken into consideration when determining the operating current.
8. Devices should be soldered within 7 days after opening the moisture-proof packing.
9. Repack unused product in anti-moisture packing, fold to close any opening and store in a dry place.
10. The appearance and specifications of devices may be modified for improvement without notice.
11. ESD Precautions Static Electricity and surge damages LEDs. It is recommended that wrist bands or anti-electrostatic gloves be used when handing the LEDs . All devices, equipment and machinery should be properly grounded.
12. This product must be driven by constant power supplier.