

MULTI-COLOR SPECIFICATION FOR SMD 0909BBC

MC-S0909BBC

FEATURES: • Size (mm):0.92×0.92×0.60

• Pb-free Reflow soldering Application

• Anti-Glare

Excellent contrast

• RoHS Compliant



Hangzhou Multi-Color Optoelectronics Co., Ltd Address: No. 300, The 10th Avenue, East HETZ, Hangzhou, China Tel: 0571-86708389 Fax: 0571-86708340 Web: www.m

Web: www.mc-oe.com

1. SPECIFICATIONS

1.1 Absolute Maximum Ratings (Ta=25°C)

Item	Cymbol	Abs	solute Maximum Rati	ng	Unit
	Symbol	Red	Green	Blue	mA mA V mW
Forward Current	I_{F}	10	10	10	mA
Pulse Forward Current	I_{FP}	20	20	20	mA
Reverse Voltage	V_R	5	5	5	V
Power dissipation	P_D	24	35	35	mW
Operating Temperature	T _{opr}	-30 to +85	-30 to +85	-30 to +85	°C
Storage Temperature	T_{stg}	-40 to +100	-40 to +100	-40 to +100	°C

^{*} $I_{\mbox{\tiny FP}}$ conditions with pulse width ${\le}10\mbox{ms}$ and duty cycle ${\le}10\%.$

1.2 Optical and Electrical Characteristics (Ta=25°C)

Thous	Comple ed	ad Condition	Red		Green		Blue		l lait		
Item	Symbol	Sylfibol	Symbol	Condition	Min	Max	Min	Max	Min	Max	Unit
		R I _F =5mA									
Forward Voltage	V_{F}	G I _F =5mA	1.6	2.3	2.65	3.45	2.65	3.45	V		
		B I _F =3mA									
Reverse Current	I_{R}	V _R =5V		1		1		1	μΑ		
Dominant Wavelength		R I _F =5mA	615	630	515	530	460	475			
	λ_{D}	G I _F =5mA							nm		
		B I _F =3mA	4nm p	er Bin	3nm p	per Bin	3nm p	er Bin			
		R I _F =5mA	20	30	55	85	7	11			
Luminous Intensity	I_{V}	G I _F =5mA				mcd					
	B I _F =3mA	B I _F =3mA	Typ.24		Typ.70		Typ.9				
		R I _F =5mA									
Viewing Angle	2 θ _{1/2}	G I _F =5mA			Тур	.120			deg		
		B I _F =3mA									

^{*} A: Not Reflective Surface.

^{*} Each Bin: $I_V(Max):I_V(Min) \le 1.3$.

^{*} Tolerance of measurements of the Forward Voltage is ± 0.05 V.

^{*} Tolerance of measurements of the Luminous Intensity is $\pm 5\%$.

^{*} Tolerance of measurements of the Wavelength is ± 0.5 nm.

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2. RELIABILITY

2.1 Test Items and Results

Test Item	Standard Test Method	Test Conditions	Test Duration	Units Failed/Tested
Resistance to Soldering Heat (Reflow Soldering)	JEITA ED-4701 300 301	Tsld=260°C,10sec. Precondition:30°C 70%RH,168hrs	2times	0/100
Temperature Cycle		-65°C~150°C 15min. 15min. (30min./cycle)	200cycles	0/100
Temperature Cycle	JEITA ED-4701 100 105	-40°C~25°C~100°C~25°C 30min. 5min. 30min. 5min	100cycles	0/100
Moisture Resistance (Cyclic)	JEITA ED-4701 200 203	25°C~65°C~-10°C 90%RH, 24hr per cycle	10cycles	0/100
High Temperature Storage	JEITA ED-4701 200 201	Ta=100°C	500hrs	0/100
Temperature Humidity Storage		Ta=85°C,RH=85%	500hrs	0/100
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40°C	500hrs	0/100
Room Temperature Operating Life		Ta=25°C, I _F =6mA	1000hrs	0/10
Temperature Humidity Operating Life		Ta=85°C,RH=85% I _F =6mA	500hrs	0/10
Low Temperature Operating Life		Ta=-30°C, I _F =6mA	1000hrs	0/10

NOTES:

Measurements are performed after allowing the LEDs to return to room temperature.

2.2 Criteria for Judging Damage

Thom	Cumbal	Took Conditions	Criteria for Judgement		
Item	Symbol	Test Conditions	Min.	Max.	
		R I _F =5mA			
Forward Voltage	V_{F}	G I _F =5mA	-	U.S.L.×1.1	
		B I _F =3mA			
Reverse Current	I_{R}	V _R =5V	-	U.S.L.×2.0	
		R I _F =5mA			
Luminous Intensity	I_{V}	G I _F =5mA	L.S.L. ×0.8	-	
		B I _F =3mA			

U.S.L.: Upper Standard Level

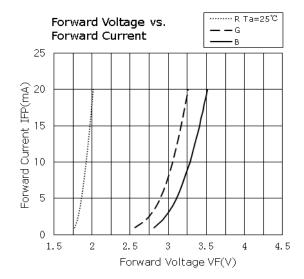
L.S.L.: Lower Standard Level

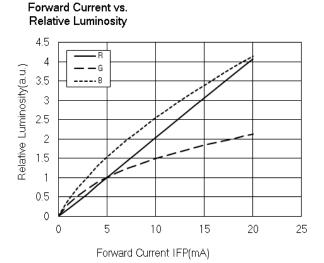
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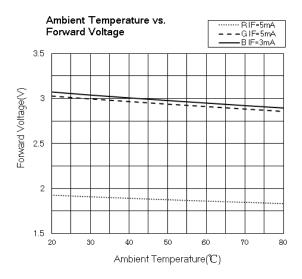
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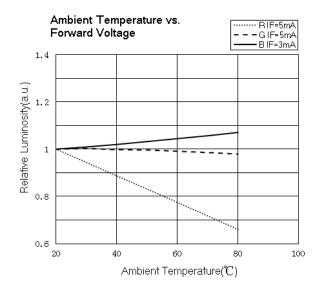
3. TYPICAL ELECTRICAL CHARACTERISTICS CURVES

All characteristics shown are for reference only and are not guaranteed.











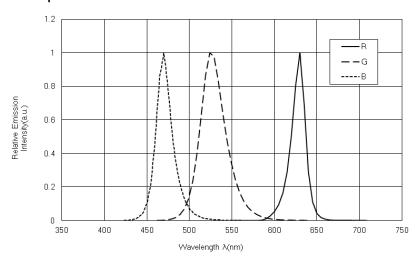
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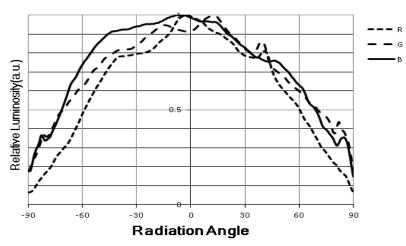
4. TYPICAL OPTICAL CHARACTERISTICS CURVES

All characteristics shown are for reference only and are not guaranteed.

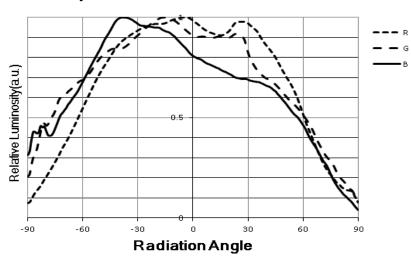
Spectrum

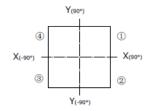


Directivity X--X



Directivity Y--Y





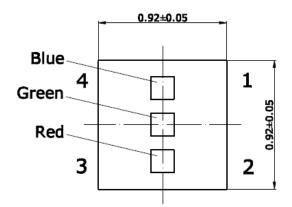


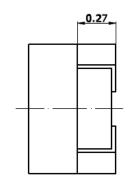
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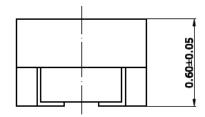
5. OUTLINE DIMENSIONS AND MATERIALS

This product complies with RoHS Directive.

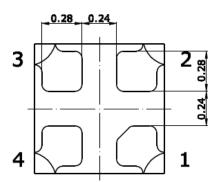
(Unit: mm, Tolerance: ±0.2)

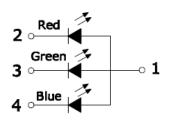






Item	Description		
Package Materials	PCB		
Encapsulating Resin Materials	Epoxy Resin(With diffuser)		
Electrodes Materials	Au-plated Copper Alloy		



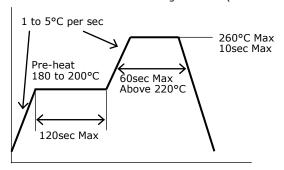


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6. SOLDERING

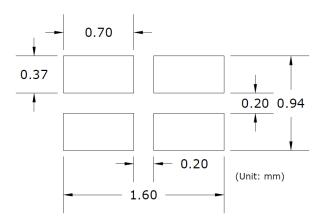
• Recommended Reflow Soldering Condition(Lead-free Solder)



• Recommended Hand Soldering Condition

Temperature	350°C Max		
Soldering Time	3sec Max		

• Recommended Soldering Pad Pattern



- * This LED is designed to be reflow soldered on to a PCB. If dip soldered, Multi Color cannot guarantee its reliability.
- * Reflow soldering must not be performed more than twice. Hand soldering must not be performed more than once.
- * Avoid rapid cooling. Ramp down the temperature gradually from the peak temperature.
- * Nitrogen reflow soldering is recommended. Air flow soldering conditions can cause optical degradation, caused by heat and/or atmosphere.
- * Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-heat soldering

It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

- * When soldering, do not apply stress to the LED while the LED is hot.
- * This product can differ in optical characteristics depending on the number of reflow cycles.

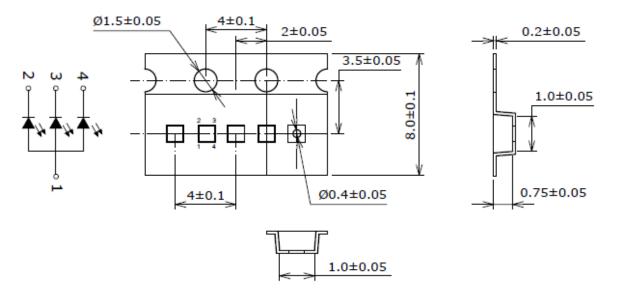
In a single display, only LEDs with same number of reflow cycles should be used regardless of the application type, such as rental and/or permanent installations.

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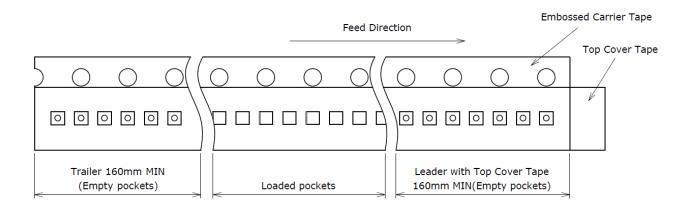
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7. TAPE AND REEL DIMENSIONS

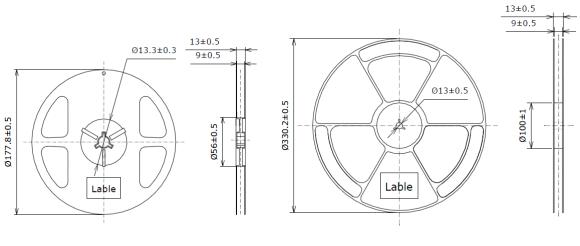
Tape: (Unit: mm)



Trailer and Leader:



Reel:



Quantity per reel=9000pcs

Quantity per reel=30000pcs

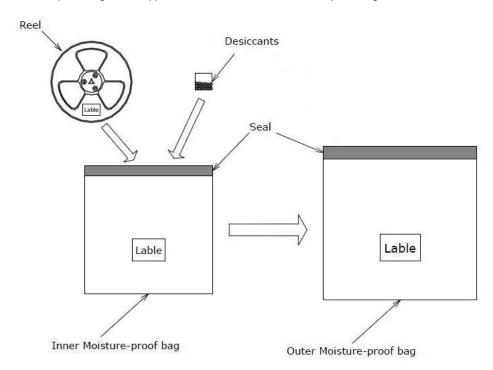


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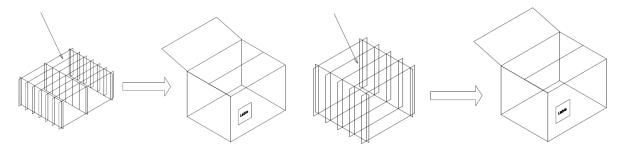
8. PACKAGING - TAPE & REEL

Reels are shipped with desiccants in heat-sealed inner moisture-proof bags.

Inner moisture-proof bags are shipped in heat-sealed outer moisture-proof bags.



Outer moisture-proof bags are packed in cardboard boxes with corrugated partitions.



Reel (\$177.8)

Reel (\$\phi 330)

- * The Label shows: P/O NO., TYPE, QTY, IV, VF, WLD.
- * Products shipped on tape and reel are packed in moisture-proof bag.

 They are shipped in cardboard boxes to protect them from external forces during transportation.
- * Do not drop or shock the box. It may damage the products.
- * Do not expose to water, the box is not water-resistant.
- * Using an original packaging material or equivalent in transit is recommended.

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9. STORAGE CONDITIONS

•Before opening the package, must check if the package bag is well packaged or damaged.

If the package is damaged, please return back to Multi-Color.

•After opening the package:

After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing Must be:

- a) Mounted within 168 hours at factory condition of ≤30°C /60%RH.
- b) If unused LEDs remain, please return these LEDs back to Multi-Color.
- •The LEDs must be used within 6 months.

The LEDs should be kept at less than 30°C and less than 60%RH.

10. STATIC ELECTRICITY

• Static electricity or surge voltage damages the LEDs.

It is recommended that a wrist band or an anti-electrostatic glove be used when handing the LEDs.

• All devices equipment and machinery must be properly grounded. It is recommended that precautions be taken against surge voltage to the equipment that mounts the LEDs.

11. Thermal Management

• Thermal design of the end product is paramount importance.

Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

• The drive current should be decided after considering the ambient maximum temperature (Ta) of LEDs.

12. Safety Guideline for Human Eyes

- The international Commission (IEC) published in 2006 IEC 62471:2006 Photobiological safety of lamps and lamp systems which includes LEDs within its scope.
- Following IEC 62471:2006,most of Multi-Color LEDs can be classified as belonging to either Exempt Group or RiskGroup

 1.Optical characteristics of a LED such as output power, spectrum and light distribution are factors that affect the risk group
 determination of the LED. Especially a high-power LED, that emits light containing blue wavelengths, may be in Risk Group

 2.Great care should be taken when viewing directly the LED driven at high current or the LED with optical instruments which
 may greatly increase the hazard to your eyes.