



Technical Data Sheet

Product Name: 2121 RGB SMD Chip LED

Part Number: RD2121-103RGBBD13-S65

Customer: _____

Customer PN: _____

Version No.: A.4

Date: July 12th, 2015

Customer Approval		

Instituted By: _____ Checked By: _____ Approved By: _____

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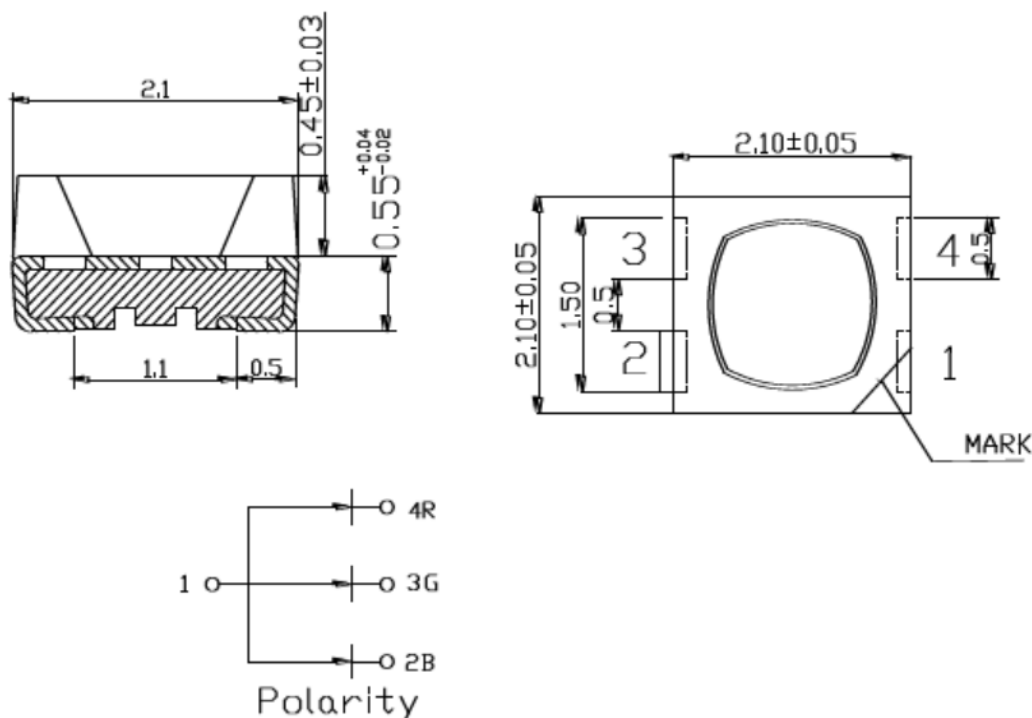
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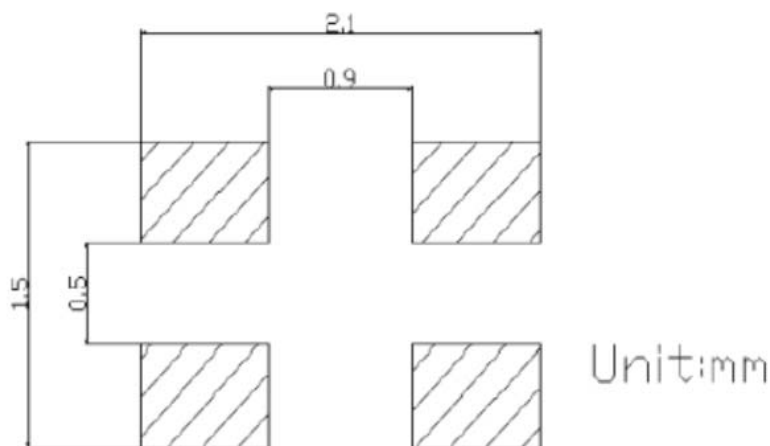
1. Features

- Package (L/W/H) : $2.1 \times 2.1 \times 1.0$ mm
- Color : Ultra Bright BGR Full Color
- Lens: Black Diffused Flat Mold
- EIA STD Package
- Meet ROHS, Green Product
- Compatible With SMT Automatic Equipment
- Compatible With Infrared Reflow Solder Process

2. Package Profile & Soldering PAD Suggested

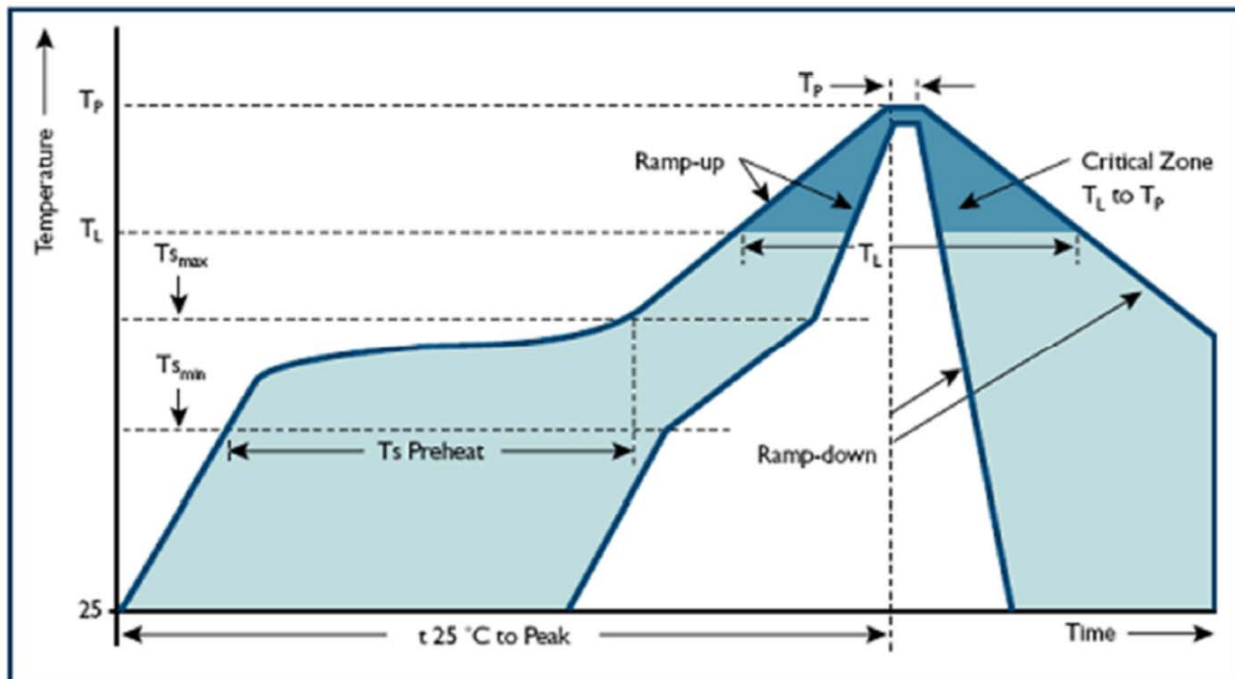


Recommended-Solder-pad Design



- Notes:
1. All dimensions are in millimeters ;
 2. Tolerance is ± 0.10 mm unless otherwise noted.

3. Soldering Profile Suggested



3.1 For Lead Solder

Temperature rising slope $T_{S_{max}}$ to $T_P=4^{\circ}\text{C Max}$

Preheating temperature $T_{S_{min}}=100^{\circ}\text{C} \sim 150^{\circ}\text{C}$

Warm-up time $T_{S_{min}}$ to $T_{S_{max}}=100\text{s Max}$

Temperature falling slope 6°C/s Max

Peak temperature $T_P=230^{\circ}\text{C Max}$

At Peak temperature $\pm 5^{\circ}\text{C}$, time not exceed 10s

Temperature higher than 183°C , time not exceed 80s

3.2 For Lead Free Solder

Temperature rising slope $T_{S_{max}}$ to $T_P=4^{\circ}\text{C Max}$

Preheating temperature $T_{S_{min}}=150^{\circ}\text{C} \sim 200^{\circ}\text{C}$

Warm-up time $T_{S_{min}}$ to $T_{S_{max}}=100\text{s Max}$

Temperature falling slope 6°C/s Max

Peak temperature $T_P=245^{\circ}\text{C Max}$

At Peak temperature $\pm 5^{\circ}\text{C}$, time not exceed 10s

Temperature higher than 217°C , time not exceed 80s

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4. Absolute Maximum Ratings At Ta=25°C

Parameter	Symbol	Rating		Unit
Power Dissipation	Pd	B	24	mW
		R	44	
		G	45	
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	IFP	B	60	mA
		R	70	
		G	60	
DC Forward Current	IF	B	8	mA
		R	20	
		G	15	
Reverse Voltage	VR	B	10	V
		R	10	
		G	10	
Operating Temperature Range	Topr	-40°C ~ + 80°C		
Storage Temperature Range	Tstg	-40°C ~ + 80°C		
Soldering Condition	Tsol	Reflow soldering : 240°C For 5 Seconds		
Junction Temperature	Tj	B	+110	°C
		R	+110	
		G	+110	



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5. Electrical Optical Characteristics At Ta=25℃

Parameter	Symbol	Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	IV	B		42		mcd	IF = 5mA
		R		57			IF = 10mA
		G		160			IF = 5mA
Dominant Wavelength	λ_d	B	465	470	475	nm	IF = 5mA
		R	618	622	625		IF = 10mA
		G	515	520	530		IF = 5mA
Peak Wavelength	λ_p	B	---	470	---	nm	IF = 5mA
		R	---	625	---		IF = 10mA
		G	---	523	---		IF = 5mA
Spectral Line Half-Width	$\Delta\lambda$	B	---	30	---	nm	IF = 5mA
		R	---	18	---		IF = 10mA
		G	---	35	---		IF = 5mA
Forward Voltage	VF	B	2.5	---	3.0	V	IF = 5mA
		R	1.8	---	2.2		IF = 10mA
		G	2.4	---	3.0		IF = 5mA
Reverse Current	IR	B	---	---	1	uA	VR=8V
		R	---	---	1		
		G	---	---	1		
Viewing Angle	2θ1/2	---	---	110	---	deg	

Notes: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

2. θ1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

3. The dominant wavelength, λ_d is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.



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6. Typical Electrical-Optical Characteristics Curves

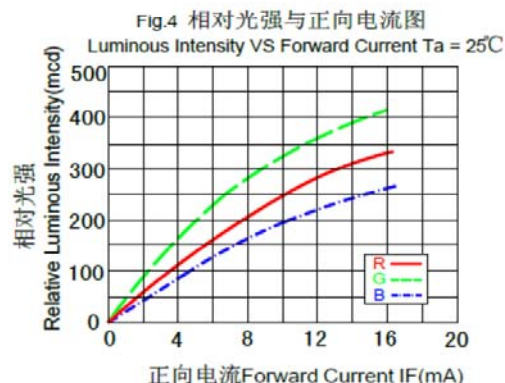
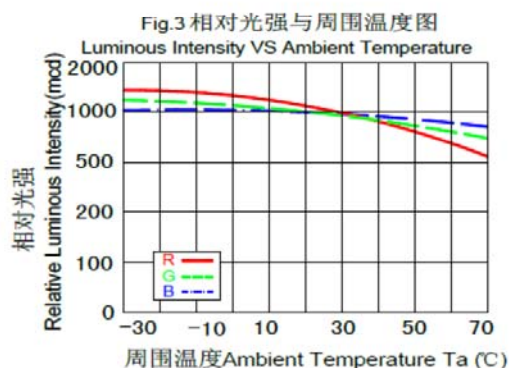
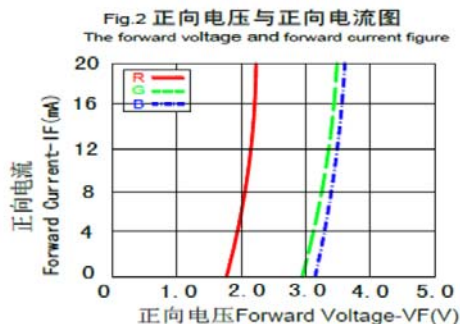
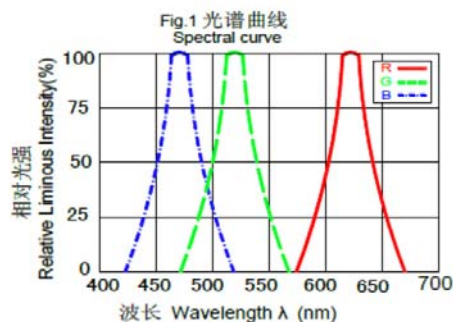


Fig.5 正向电流与温度图
Forward current and temperature

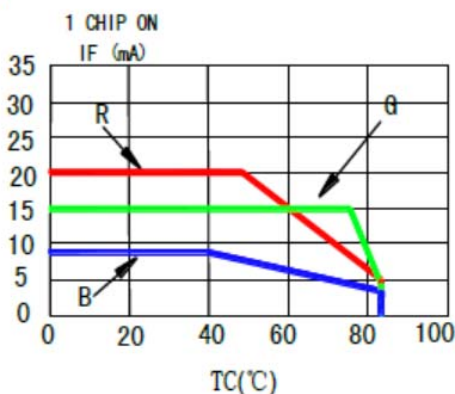
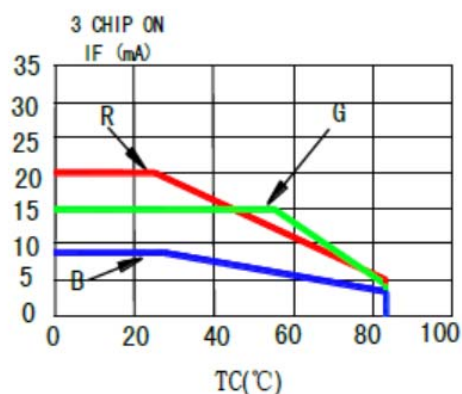
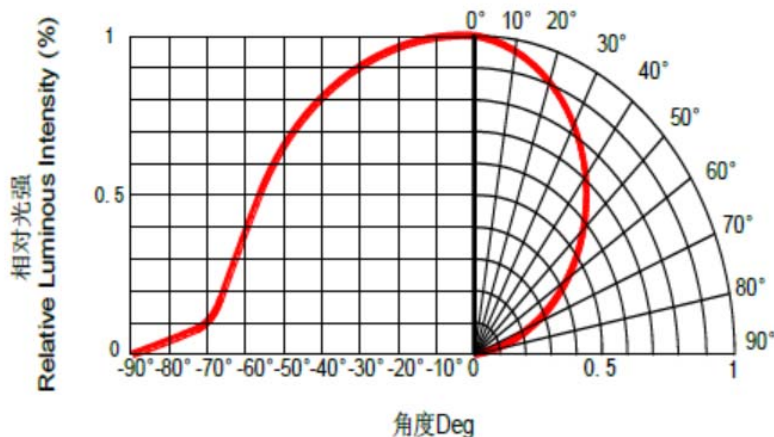


Fig.6 光强分布特性曲线
The intensity distribution curve





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7. Label explanation

CAT: Luminous Intensity Rank (unit : mcd)

HUE: Dominant Wavelength Rank (unit : nm)

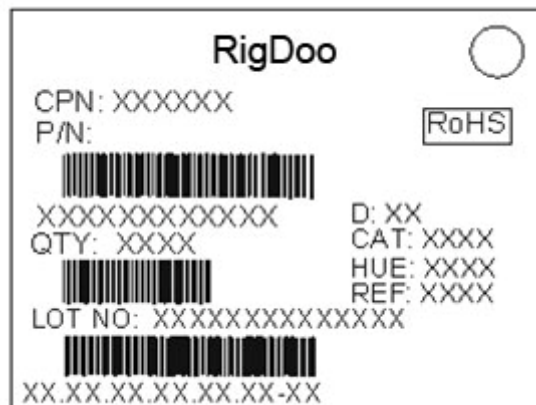
REF: Forward Voltage Rank (unit : V)

Rank Tolerance:

a. Luminous Intensity: $\pm 11\%$

b. HUE: $\pm 1\text{nm}$

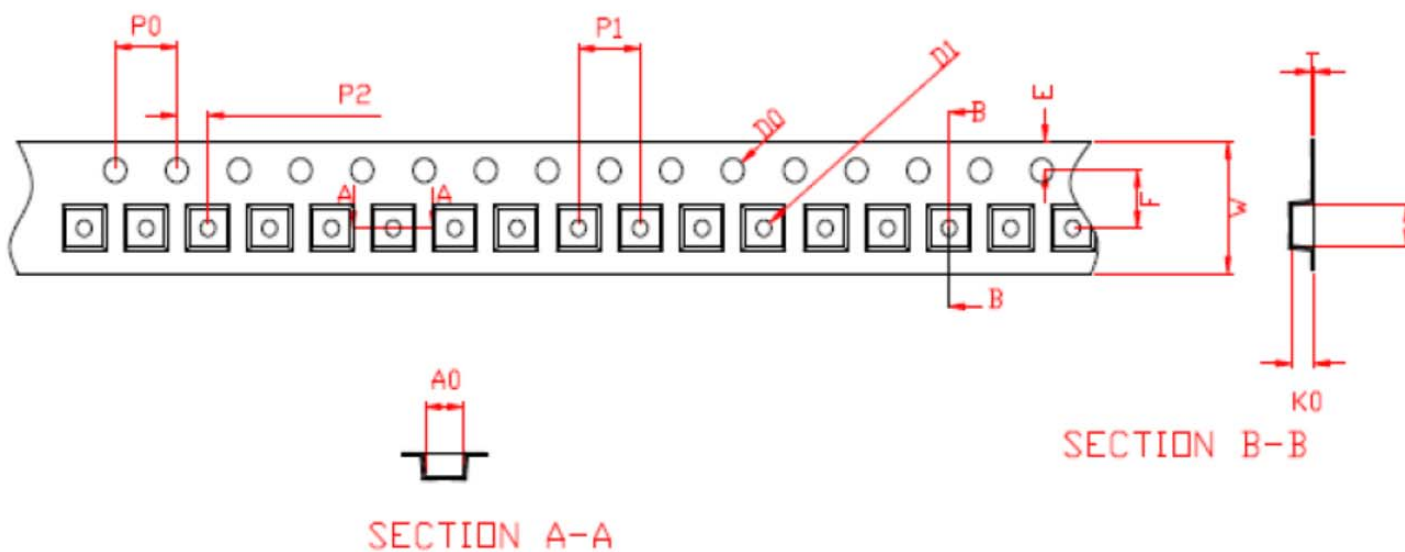
c. Forward Voltage: $\pm 0.02\text{V}$



8. Reel Specification

载带规格 Carrier Tape Specifications

项 目 Item	W	P1	E	F	D	P0	P1	P2	A0	B0	K0	T
尺寸 Size	8.00	4.00	1.75	3.50	1.50	4.00	4.00	2.00	2.25	2.25	1.20	0.20
公差 The tolerance	± 0.10	± 0.10	± 0.10	± 0.05	± 0.10	± 0.10	± 0.10	± 0.05	± 0.10	± 0.10	± 0.10	± 0.02



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9. Reliability Test

Classification	Test Item	Test Condition	Reference Standard	Reference Standard
Endurance Test	Operation Life	Ta= Under Room Temperature As Per Data Sheet Maximum Rating	1000HRS (-24HRS,+72HRS)*@20mA	MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1
	High Temperature, High Humidity Storage	IR-Reflow In-Board, 2 Times Ta= 85±5℃,RH= 85%	1000HRS±2HRS	JESD22-A101
	High Temperature Storage	Ta= 105±5℃	1000HRS (-24HRS,+72HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= -55±5℃	1000HRS (-24HRS,+72H RS)	JIS C 7021:B-12
Environmental Test	Temperature Cycling	105℃ ~ 25℃ ~ -55℃ ~ 25℃ 30mins 5mins 30mins 5mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4
	Thermal Shock	IR-Reflow In-Board, 2 Times 85 ± 5℃ ~ -40℃ ± 5℃ 10mins 10mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Solder Resistance	T.sol= 260 ± 5℃	10 ± 1secs	MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1
	IR-Reflow Normal Process	Ramp-up rate(183℃ to Peak) +3℃/ second max Temp. maintain at 125(±25)℃ 120 seconds max Temp. maintain above 183℃ 60-150 seconds Peak temperature range 235℃+5/-0℃ Time within 5℃ of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate +6℃/second max	-----	MIL-STD-750D:2031.2 J-STD-020C
	IR-Reflow Pb Free Process	Ramp-up rate(217℃ to Peak) +3℃/ second max Temp. maintain at 175(±25)℃ 180 seconds max Temp. maintain above 217℃ 60-150 seconds Peak temperature range 260℃+0/-5℃ Time within 5℃ of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate +6℃/second max	-----	MIL-STD-750D:2031.2 J-STD-020C
	Solderability	T.sol= 235 ± 5℃ Immersion rate 25±2.5 mm/sec Coverage ≥ 95% of the dipped surface	Immersion time 2±0.5 sec	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 IEC 68 Part 2-20 JIS C 7021:A-2