

SPECIFICATION

产品规格书

REFOND P/N 产品型号

RF-A13D-W***0*12-P7

☐ R&D 研发

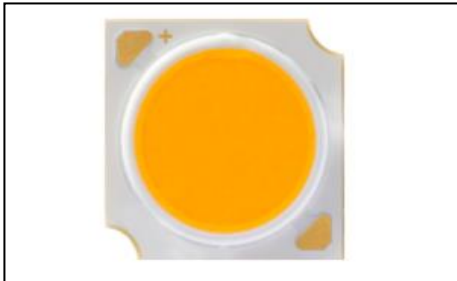
☒ Mass Product 量产供货

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1. Description 产品介绍

1.1 General Description 产品描述



The white light of this COBs is formed by mixing light from a blue light chip., Size : 13.5mmX13.5mmX1.55mm。

这种 COB 单白光 是由蓝光芯片激发荧光粉后，混光形成，产品尺寸：13.5mmX13.5mmX1.55mm。

1.2 Features 产品特征

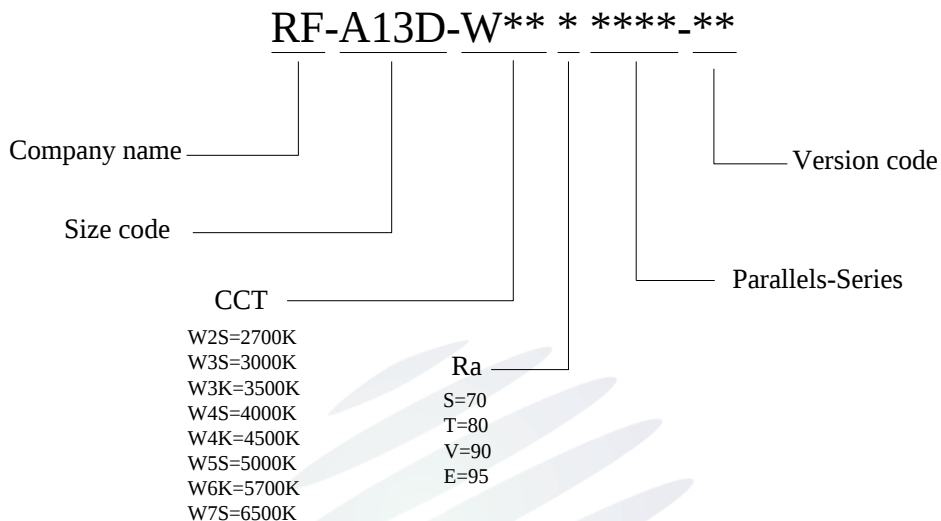
- ▶ COB Package. COB封装
- ▶ High power density. 高功率密度
- ▶ Integrated packaging module, no SMT. 集成封装模块，免SMT
- ▶ Aluminum substrate package , low thermal resistance 铝基板封装，热阻低
- ▶ RoHS compliant. RoHS 认证

1.3 Application 产品应用

- ▶ Commercial lighting, Movie and TV lighting. 商业照明，影视照明
- ▶ Industrial and Mining Lighting, Downlights and spotlights. 工矿照明，筒灯和射灯
- ▶ Indoor lighting, Supermarket lighting. 室内照明，超市照明
- ▶ Marina and ship lighting, Other Outdoor Lighting. 码头和船舶照明，其它户外照明
- ▶ General use. 一般应用

1.4 Product Nomenclature 产品命名规则

The part number designation for COB is explained as follows:



1.5 Package Dimension 封装尺寸

Fig.1-1 Top view 正面视图

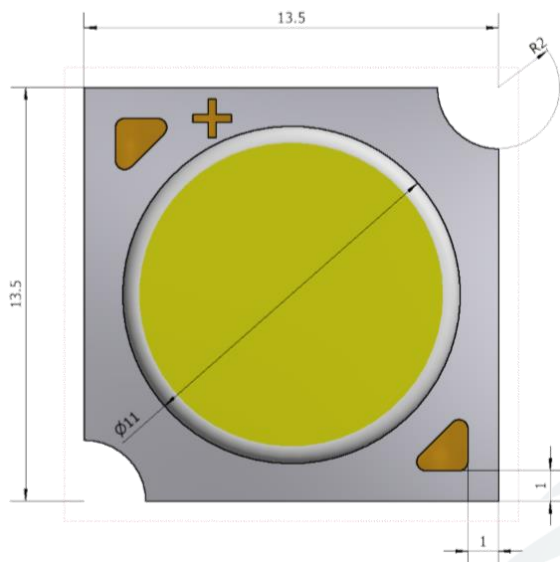
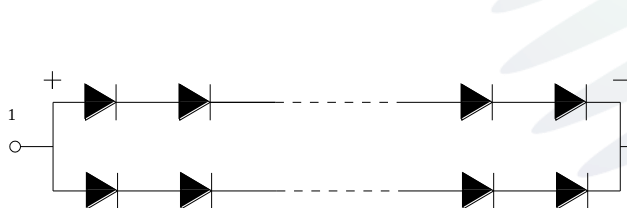
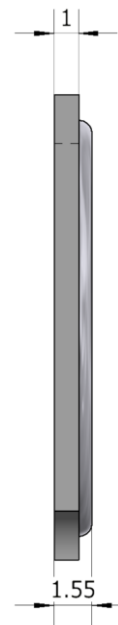


Fig.1-2 Side view 侧面视图



RF-A13D-W***0212-P7:12S2P

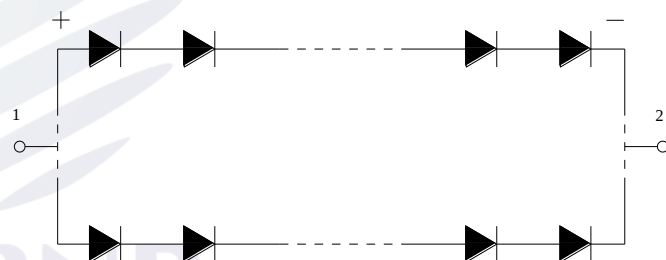

RF-A13D-W***0312-P7:12S3P
RF-A13D-W***0512-P7:12S5P

Fig.1-3 Polarity 极性

Notes 备注:

1. All dimensions units are millimeters. 所有尺寸标注单位为毫米
2. All dimensions tolerances are $\pm 0.5\text{mm}$ unless otherwise noted. 除特别标注外, 所有尺寸公差为 ± 0.5 毫米

1.6 Product Parameters 产品参数

Table 1-1 Electrical / Optical Characteristics at Ts=25°C 电性与光学特性

Item 项目	Symbol 符号	Test Condition 测试条件	Value			Unit 单位
			Min. (最小值)	Typ (典型值)	Max. (最大值)	
RF-A13D-W***0212-P7 Forward Voltage (正向电压)	V_F	$I_F=200\text{mA}$	32	36	40	V
RF-A13D-W***0312-P7 Forward Voltage (正向电压)	V_F	$I_F=350\text{mA}$	32	36	40	V
RF-A13D-W***0512-P7 Forward Voltage (正向电压)	V_F	$I_F=550\text{mA}$	32	36	40	V
Reverse Current (漏电流)	I_R	$V_R=60\text{V}$	---	---	60	μA
RF-A13D-W2SS0212-P7 (2700K) Luminous Flux (光通量)	Φ	$I_F=200\text{mA}$	900	1050	1200	lm
RF-A13D-W3SS0212-P7 (3000K) Luminous Flux (光通量)	Φ	$I_F=200\text{mA}$	900	1050	1200	lm
RF-A13D-W3KS0212-P7 (3500K) Luminous Flux (光通量)	Φ	$I_F=200\text{mA}$	1000	1150	1300	lm
RF-A13D-W4SS0212-P7 (4000K) Luminous Flux (光通量)	Φ	$I_F=200\text{mA}$	1000	1150	1300	lm
RF-A13D-W5SS0212-P7 (5000K) Luminous Flux (光通量)	Φ	$I_F=200\text{mA}$	1000	1150	1300	lm
RF-A13D-W7SS0212-P7 (6500K) Luminous Flux (光通量)	Φ	$I_F=200\text{mA}$	1000	1150	1300	lm

RF-A13D-W2ST0212-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =200mA	800	950	1100	lm
RF-A13D-W3ST0212-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =200mA	800	950	1100	lm
RF-A13D-W3KT0212-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =200mA	900	1050	1200	lm
RF-A13D-W4ST0212-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =200mA	900	1050	1200	lm
RF-A13D-W5ST0212-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =200mA	900	1050	1200	lm
RF-A13D-W7ST0212-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =200mA	900	1050	1200	lm
RF-A13D-W2SV0212-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =200mA	700	850	1000	lm
RF-A13D-W3SV0212-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =200mA	700	850	1000	lm
RF-A13D-W3KV0212-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =200mA	800	950	1100	lm
RF-A13D-W4SV0212-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =200mA	800	950	1100	lm
RF-A13D-W5SV0212-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =200mA	800	950	1100	lm

RF-A13D-W7SV0212-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =200mA	800	950	1100	lm
RF-A13D-W2SS0312-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =350mA	1700	1900	2100	lm
RF-A13D-W3SS0312-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =350mA	1700	1900	2100	lm
RF-A13D-W3KS0312-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =350mA	1800	2000	2200	lm
RF-A13D-W4SS0312-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =350mA	1800	2000	2200	lm
RF-A13D-W5SS0312-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =350mA	1800	2000	2200	lm
RF-A13D-W7SS0312-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =350mA	1800	2000	2200	lm
RF-A13D-W2ST0312-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =350mA	1500	1700	1900	lm
RF-A13D-W3ST0312-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =350mA	1500	1700	1900	lm
RF-A13D-W3KT0312-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =350mA	1600	1800	2000	lm
RF-A13D-W4ST0312-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =350mA	1600	1800	2000	lm

RF-A13D-W5ST0312-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =350mA	1600	1800	2000	lm
RF-A13D-W7ST0312-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =350mA	1600	1800	2000	lm
RF-A13D-W2SV0312-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =350mA	1300	1500	1700	lm
RF-A13D-W3SV0312-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =350mA	1300	1500	1700	lm
RF-A13D-W3KV0312-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =350mA	1400	1600	1800	lm
RF-A13D-W4SV0312-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =350mA	1400	1600	1800	lm
RF-A13D-W5SV0312-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =350mA	1400	1600	1800	lm
RF-A13D-W7SV0312-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =350mA	1400	1600	1800	lm
RF-A13D-W2SS0512-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =550mA	2500	2800	3100	lm
RF-A13D-W3SS0512-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =550mA	2500	2800	3100	lm
RF-A13D-W3KS0512-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =550mA	2650	2950	3250	lm

RF-A13D-W4SS0512-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =550mA	2650	2950	3250	lm
RF-A13D-W5SS0512-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =550mA	2650	2950	3250	lm
RF-A13D-W7SS0512-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =550mA	2650	2950	3250	lm
RF-A13D-W2ST0512-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =550mA	2200	2500	2800	lm
RF-A13D-W3ST0512-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =550mA	2200	2500	2800	lm
RF-A13D-W3KT0512-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =550mA	2350	2650	2950	lm
RF-A13D-W4ST0512-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =550mA	2350	2650	2950	lm
RF-A13D-W5ST0512-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =550mA	2350	2650	2950	lm
RF-A13D-W7ST0512-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =550mA	2350	2650	2950	lm
RF-A13D-W2SV0512-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =550mA	1950	2250	2550	lm
RF-A13D-W3SV0512-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =550mA	1950	2250	2550	lm

RF-A13D-W3KV0512-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =550mA	2100	2400	2700	lm
RF-A13D-W4SV0512-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =550mA	2100	2400	2700	lm
RF-A13D-W5SV0512-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =550mA	2100	2400	2700	lm
RF-A13D-W7SV0512-P7 (6500K) Luminous Flux (光通量)	Φ	I _F =550mA	2100	2400	2700	lm
RF-A13D-W2SE0512-P7 (2700K) Luminous Flux (光通量)	Φ	I _F =550mA	1750	2050	2350	lm
RF-A13D-W3SE0512-P7 (3000K) Luminous Flux (光通量)	Φ	I _F =550mA	1750	2050	2350	lm
RF-A13D-W3KE0512-P7 (3500K) Luminous Flux (光通量)	Φ	I _F =550mA	1900	2200	2500	lm
RF-A13D-W4SE0512-P7 (4000K) Luminous Flux (光通量)	Φ	I _F =550mA	1900	2200	2500	lm
RF-A13D-W5SE0512-P7 (5000K) Luminous Flux (光通量)	Φ	I _F =550mA	1900	2200	2500	lm
RF-A13D-W***0212-P7 RF-A13D-W***0312-P7 RF-A13D-W***0512-P7 Viewing Angle (发光角度)	2θ1/2	I _F =200mA / I _F =350mA / I _F =550mA	---	---	120	deg
RF-A13D-W**S0212-P7 RF-A13D-W**S0312-P7 RF-A13D-W**S0512-P7 Color Rendering Index (显色指数)	C _{RI}	I _F =200mA / I _F =350mA / I _F =550mA	70	72	---	/

RF-A13D-W**T0212-P7 RF-A13D-W**T0312-P7 RF-A13D-W**T0512-P7 Color Rendering Index (显色指数)	C _{RI}	I _F =200mA / I _F =350mA / I _F =550mA	80	82	---	/
RF-A13D-W**V0212-P7 RF-A13D-W**V0312-P7 RF-A13D-W**V0512-P7 Color Rendering Index (显色指数)	C _{RI}	I _F =200mA / I _F =350mA / I _F =550mA	90	92	---	/
RF-A13D-W**E0512-P7 Color Rendering Index (显色指数)	C _{RI}	I _F =550mA	95	96.5	---	/

Table 1-2 Absolute Maximum Ratings at Ts=25°C 绝对最大值

Parameter (参数)	Symbol (符号)	Rating (值)	Units (单位)
RF-A13D-W***0212-P7 Power Dissipation (功耗)	P _D	16.0	W
RF-A13D-W***0312-P7 Power Dissipation (功耗)	P _D	24.0	W
RF-A13D-W***0512-P7 Power Dissipation (功耗)	P _D	40.0	W
RF-A13D-W***0212-P7 Forward Current (正向电流)	I _F	400	mA
RF-A13D-W***0312-P7 Forward Current (正向电流)	I _F	600	mA
RF-A13D-W***0512-P7 Forward Current (正向电流)	I _F	1000	mA
RF-A13D-W***0212-P7 Peak Forward Current (峰值电流)	I _F	440	mA
RF-A13D-W***0312-P7 Peak Forward Current (峰值电流)	I _F	660	mA
RF-A13D-W***0512-P7 Peak Forward Current (峰值电流)	I _F	1100	mA

Reverse Voltage (反向电压)	V_R	60	V
Electrostatic Discharge (HBM) (静电)	E_{SD}	1000	V
Case Temperature (外壳温度)	T_C	-40 ~ +85	°C
Storage Temperature (储存温度)	T_{OPR}	-40 ~ +85	°C
Junction Temperature (结温)	T_J	125	°C

Notes 备注:

- 1/10 Duty cycle, 0.1ms pulse width. 脉宽0.1ms,占空比1/10.
- The above forward voltage measurement allowance tolerance is $\pm 0.3V$. 以上所示电压测量误差 $\pm 0.3V$.
- The above color coordinates measurement allowance tolerance is 0.005. 以上所示坐标测量误差 0.005.
- The above luminous intensity measurement allowance tolerance $\pm 10\%$. 上述发光强度的测试允许公差为 $\pm 10\%$.
- Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. 使用功率不能超过规定的最大值。
- All measurements were made under the standardized environment of Refond. 所有测试都是基于瑞丰现有的标准测试平台。
- When the COBs are in operation the maximum current should be decided after measuring the package temperature, junction temperature should not exceed the maximum rate. COB 使用的最大电流需要根据散热条件确定, 结温不能超过最大值。
- ESD yield is over 90% at 1000V ESD (HBM). ESD protection during products handing is needed. 90%的COB 通过人体模式ESD 1000V 测试, 在操作时请注意静电防护。

1.6.1 Bin Range Of Luminous Flux and The Chromaticity Diagram (IF=200/350/550mA) 流明与色区分 BIN 范围 (IF=200/350/550mA)

Table 1-3

	VF (V)	Φ (lm)	SDCM
RF-A13D-W2SS0212-P7(2700K)	32-40	900-1050-1200	2S-3
RF-A13D-W2ST0212-P7(2700K)		800-950-1100	
RF-A13D-W2SV0212-P7(2700K)		700-850-1000	
RF-A13D-W3SS0212-P7(3000K)		900-1050-1200	3S-3
RF-A13D-W3ST0212-P7(3000K)		800-950-1100	
RF-A13D-W3SV0212-P7(3000K)		700-850-1000	
RF-A13D-W3KS0212-P7(3500K)		1000-1150-1300	3K-3
RF-A13D-W3KT0212-P7(3500K)		900-1050-1200	
RF-A13D-W3KV0212-P7(3500K)		800-950-1100	
RF-A13D-W4SS0212-P7(4000K)		1000-1150-1300	4S-3
RF-A13D-W4ST0212-P7(4000K)		900-1050-1200	
RF-A13D-W4SV0212-P7(4000K)		800-950-1100	
RF-A13D-W5SS0212-P7(5000K)		1000-1150-1300	5S-3
RF-A13D-W5ST0212-P7(5000K)		900-1050-1200	
RF-A13D-W5SV0212-P7(5000K)		800-950-1100	
RF-A13D-W7SS0212-P7(6500K)		1000-1150-1300	7S-3
RF-A13D-W7ST0212-P7(6500K)		900-1050-1200	
RF-A13D-W7SV0212-P7(6500K)		800-950-1100	
RF-A13D-W2SS0312-P7(2700K)		1700-1900-2100	2S-3
RF-A13D-W2ST0312-P7(2700K)		1500-1700-1900	
RF-A13D-W2SV0312-P7(2700K)		1300-1500-1700	
RF-A13D-W3SS0312-P7(3000K)		1700-1900-2100	3S-3
RF-A13D-W3ST0312-P7(3000K)		1500-1700-1900	
RF-A13D-W3SV0312-P7(3000K)		1300-1500-1700	
RF-A13D-W3KS0312-P7(3500K)		1800-2000-2200	3K-3
RF-A13D-W3KT0312-P7(3500K)		1600-1800-2000	
RF-A13D-W3KV0312-P7(3500K)		1400-1600-1800	
RF-A13D-W4SS0312-P7(4000K)		1800-2000-2200	4S-3
RF-A13D-W4ST0312-P7(4000K)		1600-1800-2000	
RF-A13D-W4SV0312-P7(4000K)		1400-1600-1800	
RF-A13D-W5SS0312-P7(5000K)		1800-2000-2200	5S-3
RF-A13D-W5ST0312-P7(5000K)		1600-1800-2000	
RF-A13D-W5SV0312-P7(5000K)		1400-1600-1800	
RF-A13D-W7SS0312-P7(6500K)		1800-2000-2200	7S-3
RF-A13D-W7ST0312-P7(6500K)		1600-1800-2000	
RF-A13D-W7SV0312-P7(6500K)		1400-1600-1800	
RF-A13D-W2SS0512-P7(2700K)		2500-2800-3100	2S-3
RF-A13D-W2ST0512-P7(2700K)		2200-2500-2800	
RF-A13D-W2SV0512-P7(2700K)		1950-2250-2550	
RF-A13D-W2SE0512-P7(2700K)		1750-2050-2350	

RF-A13D-W3SS0512-P7(3000K)	2500-2800-3100	3S-3
RF-A13D-W3ST0512-P7(3000K)	2200-2500-2800	
RF-A13D-W3SV0512-P7(3000K)	1950-2250-2550	
RF-A13D-W3SE0512-P7(3000K)	1750-2050-2350	
RF-A13D-W3KS0512-P7(3500K)	2650-2950-3250	3K-3
RF-A13D-W3KT0512-P7(3500K)	2350-2650-2950	
RF-A13D-W3KV0512-P7(3500K)	2100-2400-2700	
RF-A13D-W3KE0512-P7(3500K)	1900-2200-2500	
RF-A13D-W4SS0512-P7(4000K)	2650-2950-3250	4S-3
RF-A13D-W4ST0512-P7(4000K)	2350-2650-2950	
RF-A13D-W4SV0512-P7(4000K)	2100-2400-2700	
RF-A13D-W4SE0512-P7(4000K)	1900-2200-2500	
RF-A13D-W5SS0512-P7(5000K)	2650-2950-3250	5S-3
RF-A13D-W5ST0512-P7(5000K)	2350-2650-2950	
RF-A13D-W5SV0512-P7(5000K)	2100-2400-2700	
RF-A13D-W5SE0512-P7(5000K)	1900-2200-2500	
RF-A13D-W7SS0512-P7(6500K)	2650-2950-3250	7S-3
RF-A13D-W7ST0512-P7(6500K)	2350-2650-2950	
RF-A13D-W7SV0512-P7(6500K)	2100-2400-2700	

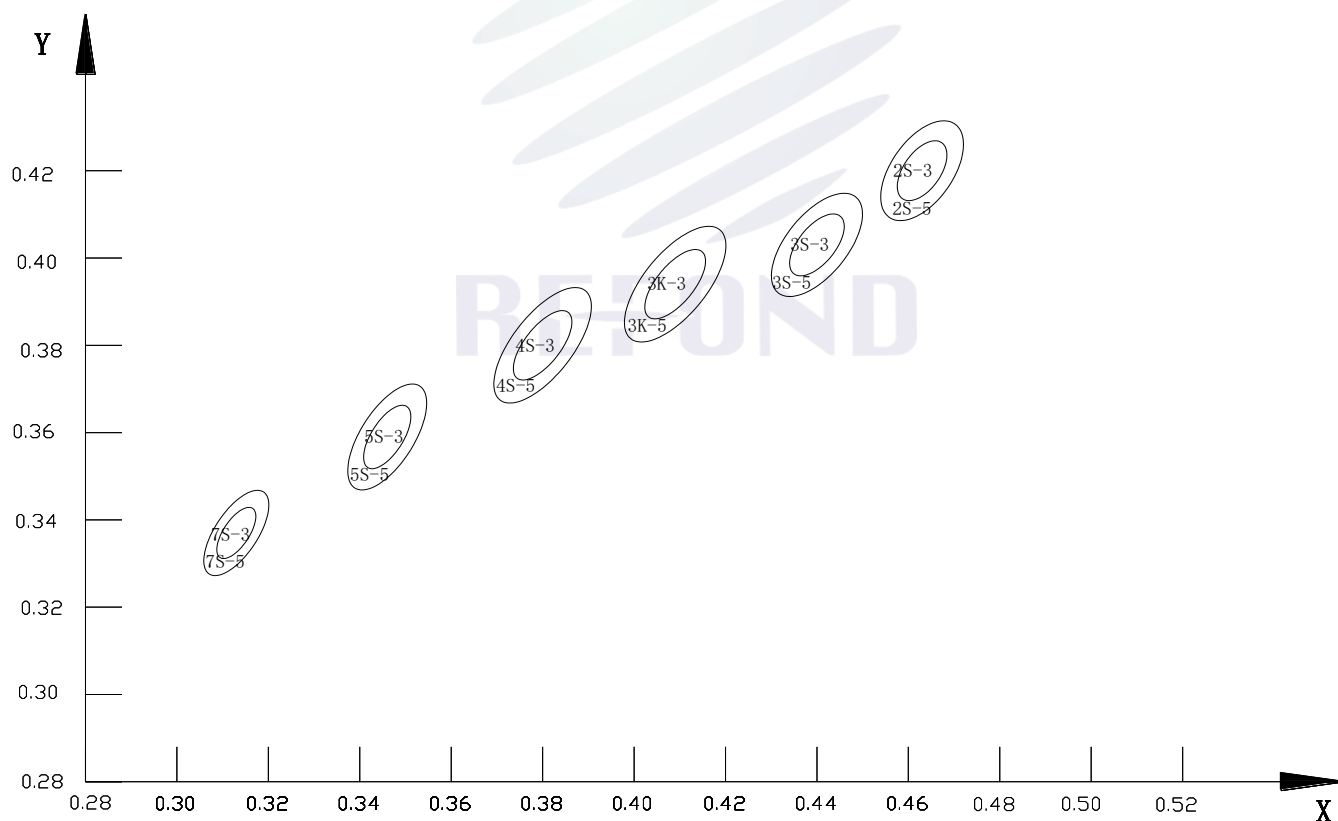


Fig 1-4 The C.I.E Chromaticity Diagram CIE 色度图

Table 1-4

色温	中心点		θ
2700K	0.4630	0.4200	57.17
	色区代码	3-step	
		a	b
	2S-3	0.00774	0.00411
	色区代码	5-step	
		a	b
	2S-5	0.01290	0.00685

色温	中心点		θ
3000K	0.4400	0.4030	53.10
	色区代码	3-step	
		a	b
	3S-3	0.00834	0.00408
	色区代码	5-step	
		a	b
	3S-5	0.01390	0.00680

色温	中心点		θ
3500K	0.4090	0.3940	52.58
	色区代码	3-step	
		a	b
	3K-3	0.00951	0.00417
	色区代码	5-step	
		a	b
	3K-5	0.01585	0.00695

色温	中心点		θ
4000K	0.3800	0.3800	54.00
	色区代码	3-step	
		a	b
	4S-3	0.00939	0.00402
	色区代码	5-step	
		a	b
	4S-5	0.01565	0.00670

色温	中心点		θ
5000K	0.3460	0.3590	59.37
	色区代码	3-step	
		a	b
	5S-3	0.00822	0.00354
	色区代码	5-step	
		a	b
	5S-5	0.01370	0.00590

色温	中心点		θ
6500K	0.3130	0.3370	58.23
	色区代码	3-step	
		a	b
	7S-3	0.00669	0.00285
	色区代码	5-step	
		a	b
	7S-5	0.01115	0.00475

1.7 Typical optical characteristics curves 典型光学特性曲线

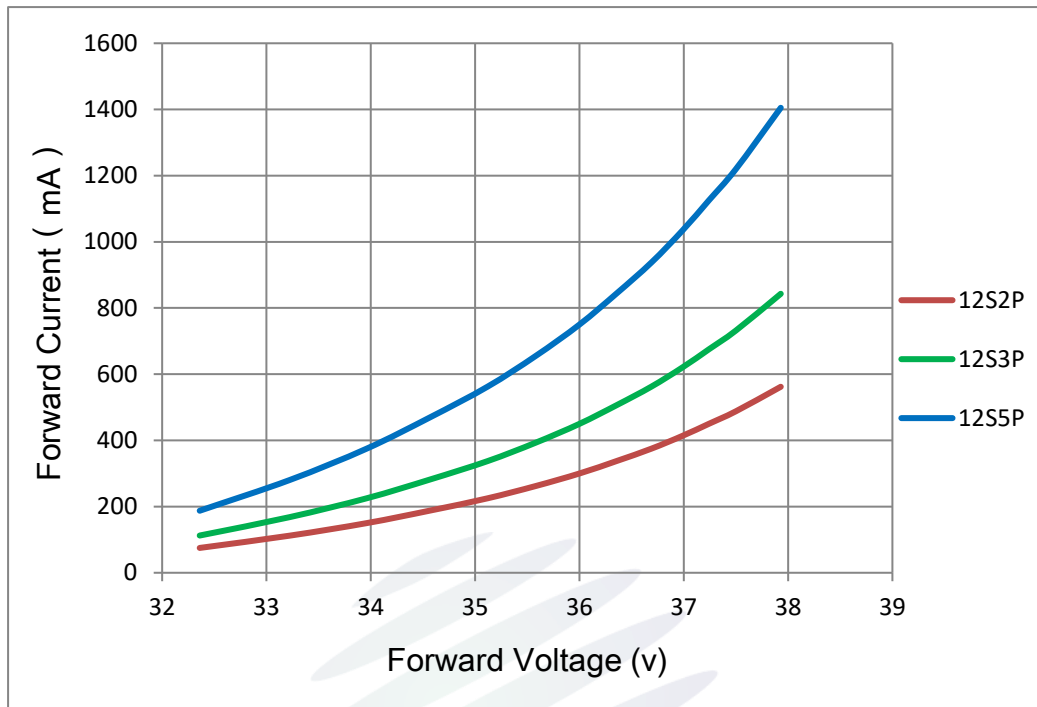


Fig 1-5 Forward Voltage Vs Forward Current. 伏安特性曲线

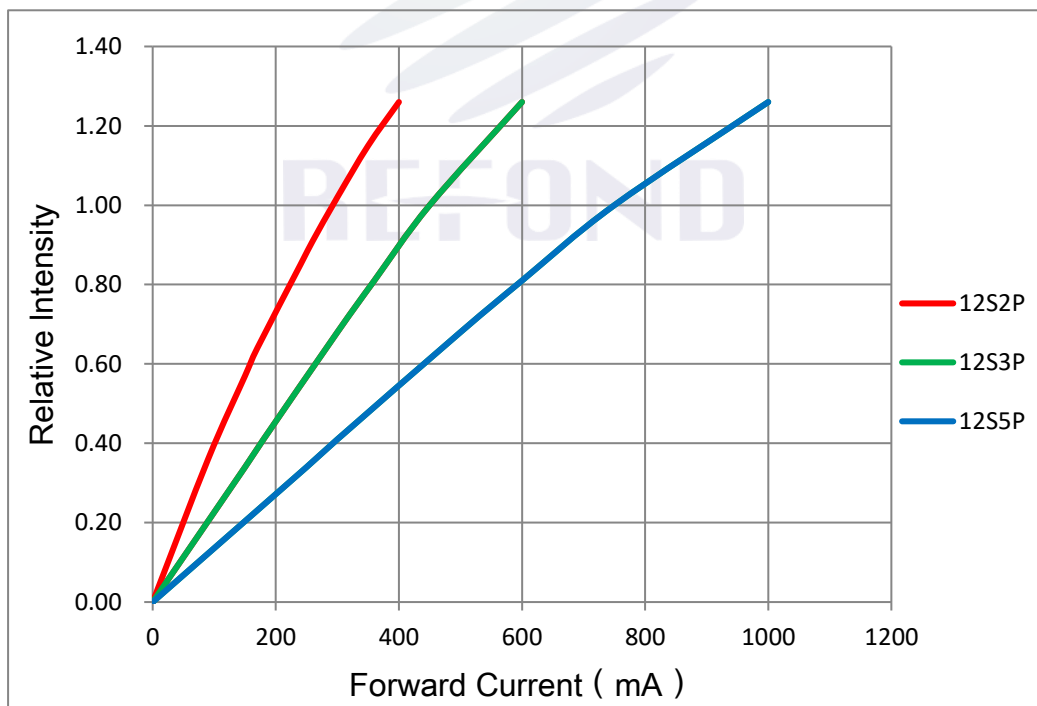


Fig 1-6 Forward Current Vs Relative Intensity. 正向电流与相对光强特性曲线

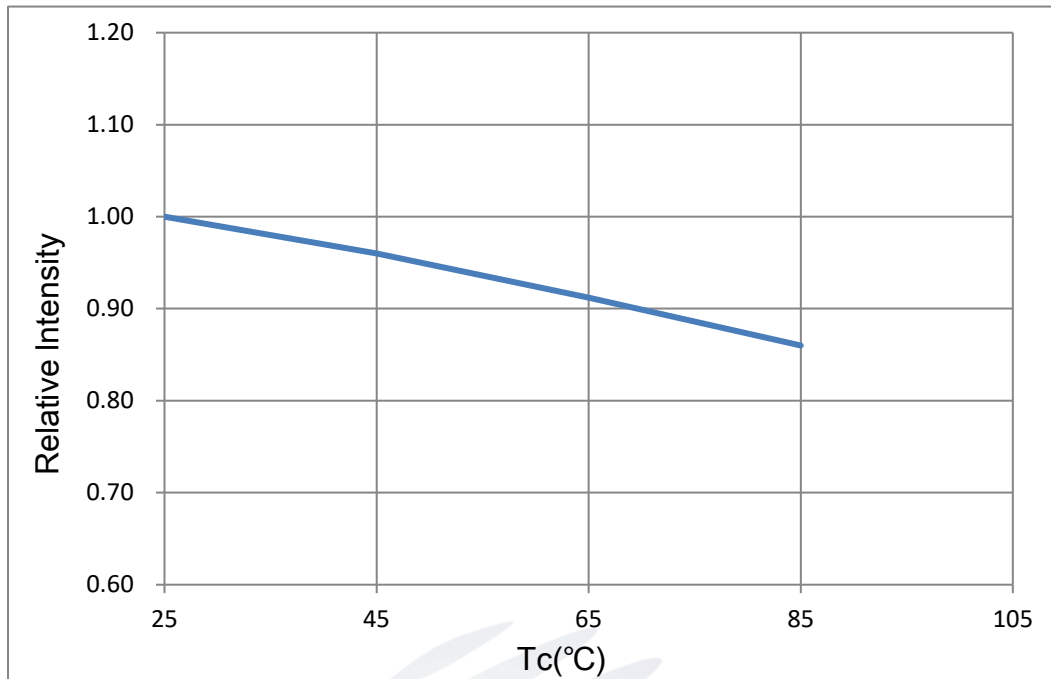


Fig 1-7 Case Temperature Vs Relative Intensity. Tc测试点温度与相对光强特性曲线

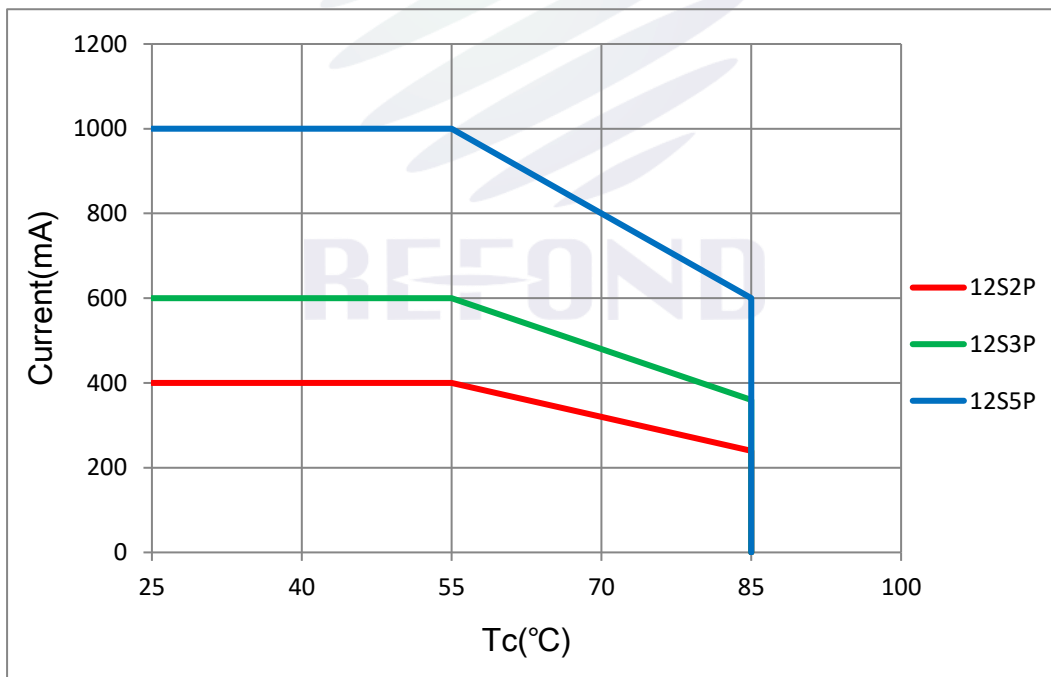


Fig 1-8 Case Temperature Vs Forward Current. Tc 测试点温度与正向电流特性曲线

$T_j \leq 125^\circ\text{C}$

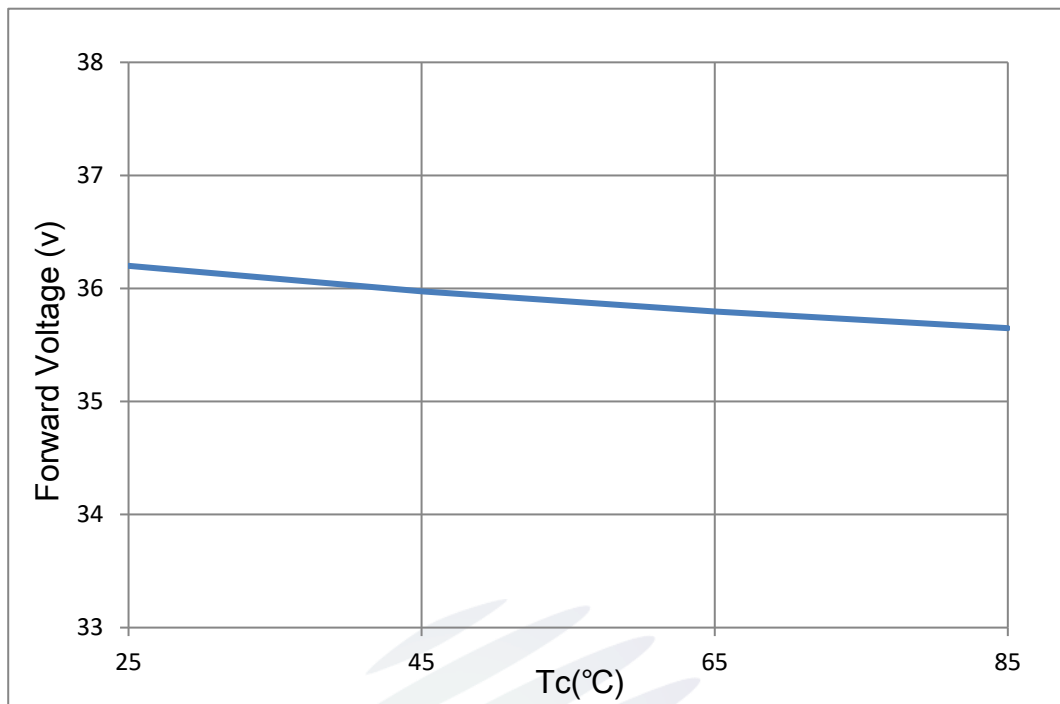


Fig 1-9 Forward Voltage Vs Case Temperature. 电压与Tc测试点温度特性曲线

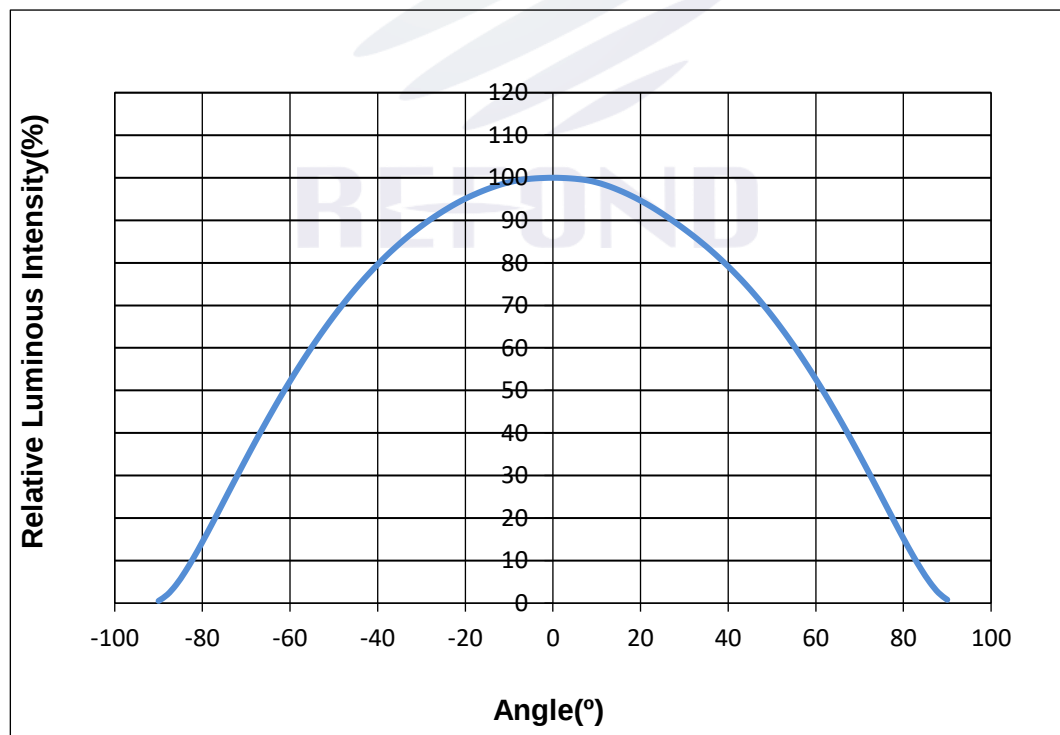


Fig 1-10 Radiation diagram 辐射特性曲线

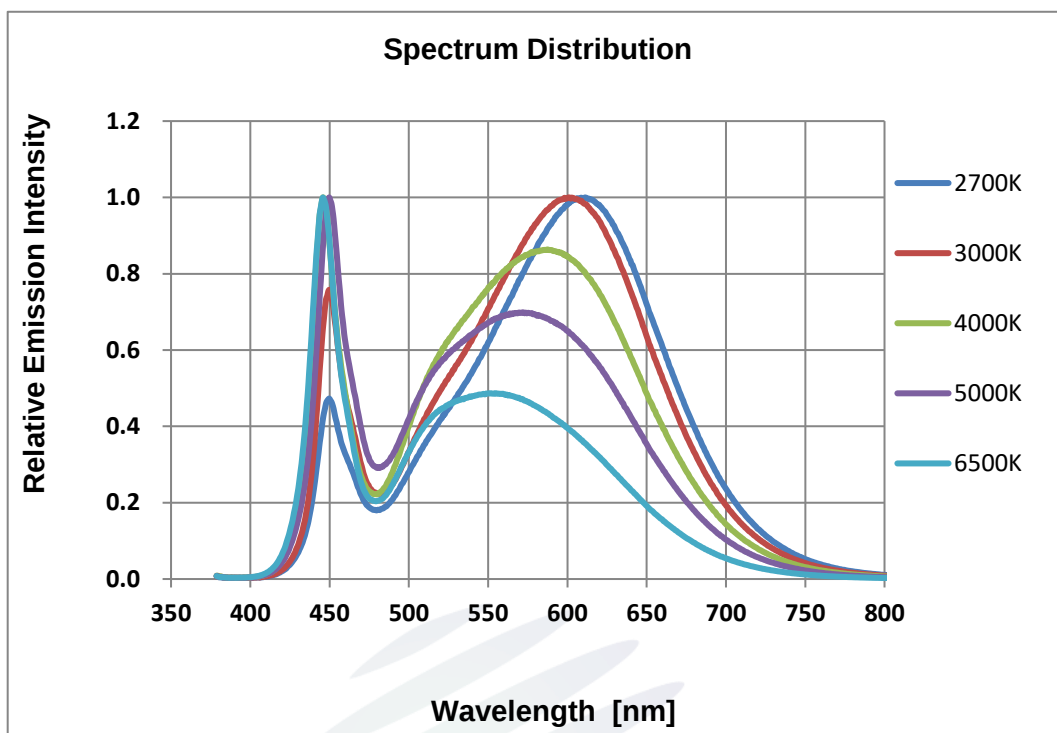


Fig 1-11 Spectrum Distribution 光谱分布特性曲线

REFOND

2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package: Max 25pcs/box, 300pcs/ package. 最多包装每盒 25pcs, 每包 300pcs。

2.1.1 Label Form Specification 标签规格

Table 2-1 Label Parameter 标签参数

PART NO.		
SPEC NO.		
LOT NO.		
BIN CODE :		
Φ :	XY:	
V _F :	Ra :	
	QTY:	
	DATE:	

PART NO.	Part Number 品名
SPEC NO.	Spec Number 规格
LOT NO.	Lot Number 批次号
BIN CODE	Bin Code 参数代码
Φ	Luminous flux 光通量
XY	Chromaticity Bin 色区
V _F	Forward Voltage 正向电压
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

Fig 2-1 Label Form 标签模板

2.2 Moisture Resistant Packing 防潮包装

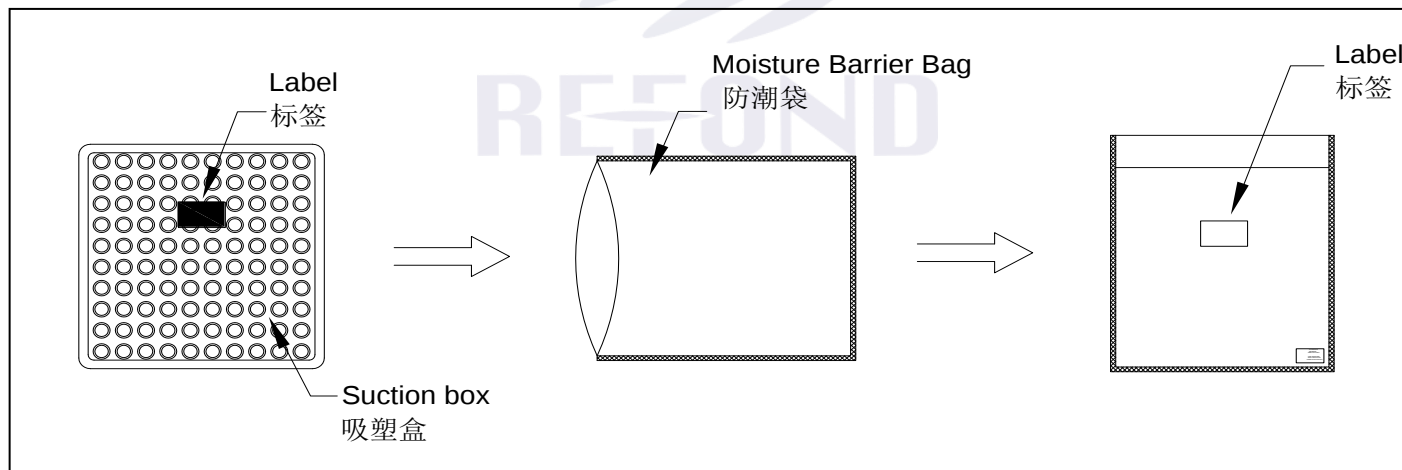


Fig.2-2 Moisture Resistant Packing 防潮包装

2.3 Cardboard Box 包装纸箱

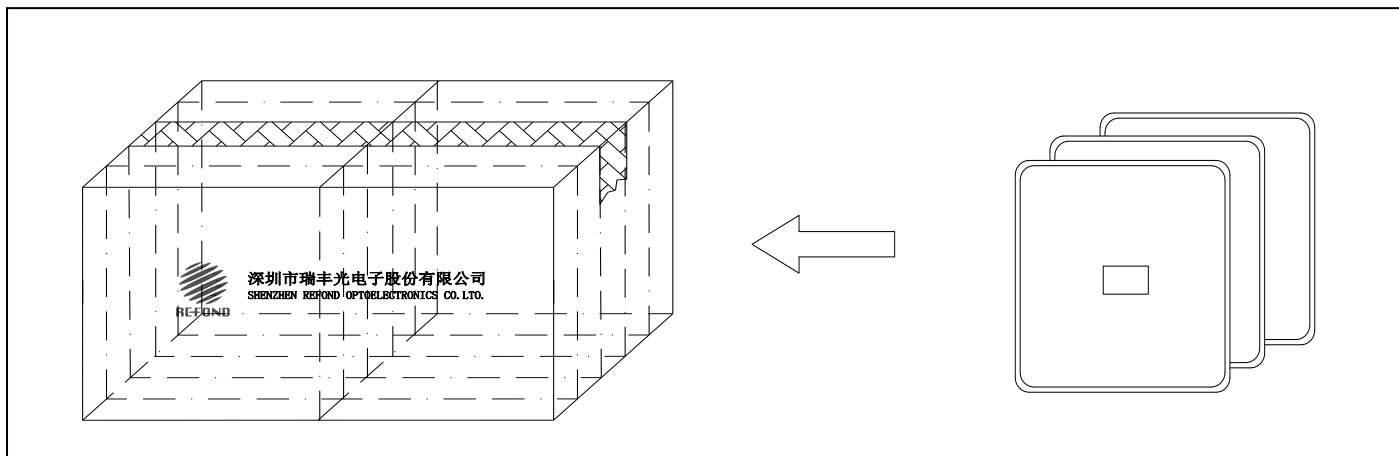


Fig.2-3 Cardboard Box 包装纸箱

2.4 Reliability Test Items And Conditions 信赖性测试项目及条件

Table 2-2 Reliability Test Items And Conditions 信赖性测试项目及条件

Test Items 项目	Ref. Standard 参考标准	Test Condition 测试条件	Time 时间	Quantity 数量	Ac/Re 接收/拒收
Thermal Shock 冷热冲击	JESD22-A106	-40°C 15min ↑↓10sec 100°C 15min	100 cycles	10pcs	0/1
Life Test 常温老化	JESD22-A108	T _c =65°C T _a =25°C RF-A13D-W***0212-P7 (I _F =400mA) RF-A13D-W***0312-P7 (I _F =600mA) RF-A13D-W***0512-P7 (I _F =1000mA)	1000hrs	10pcs	0/1

High Temperature High Humidity Life Test 高温高湿老化	JESD22-A101	60°C/ 90%RH T _c =85°C RF-A13D-W***0212-P7 (I _F =300mA) RF-A13D-W***0312-P7 (I _F =450mA) RF-A13D-W***0512-P7 (I _F =750mA)	1000hrs	10pcs	0/1
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2.5 Criteria For Judging Damage 失效判定标准

Table 2-3 Criteria For Judging Damage 失效判定标准

Test Items 项目	Symbol 符号	Test Condition 测试条件	Criteria For Judgement 判定标准	
			Min. 最小	Max. 最大
Forward Voltage 正向电压	V _F	RF-A13D-W***0212-P7 (I _F =300mA) RF-A13D-W***0312-P7 (I _F =450mA) RF-A13D-W***0512-P7 (I _F =750mA)	-	U.S.L*)x1.1
High Temperature High Humidity Life Test 高温高湿老化	/	RF-A13D-W***0212-P7 (I _F =300mA) RF-A13D-W***0312-P7 (I _F =450mA) RF-A13D-W***0512-P7 (I _F =750mA)	No open circuit, shortcircuit or Flicke 无开路,短路, 闪变	
Luminous Flux 光通量	Φ	RF-A13D-W***0212-P7 (I _F =300mA) RF-A13D-W***0312-P7 (I _F =450mA) RF-A13D-W***0512-P7 (I _F =750mA)	L.S.L*)x0.7	-

Notes 备注:

1. U.S.L: Upper standard level 规格上限 L.S.L: Lower standard level 规格下限。
2. The above reliability tests is based on the verification of a single/strip COB of Refond's existing experimental platform, the reliability experiment was taken under good heat dissipation conditions. when customers applies

the COB to the series and parallel circuit, should take consideration of all the factors such as the current. Voltage distribution, heat dissipation and others. 以上可靠性测试是基于瑞丰现有实验平台单颗/条 COB 在良好散热条件验证下的结果。客户端将 COB 应用于串、并联线路时, 需自行评估电流、电压分配、散热等问题。

3.The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license. 以上技术数据仅为产品的典型值, 只作为参考, 不作为任何应用条件及应用方式的保证。



3. Soldering Instructions 焊接说明

焊接温度	300 °C	最高温度	350 °C
焊接时间	3 秒	最长时间	最多5 秒

- (1) The hand solder should be done only one time.手工焊接只可焊接一次。
- (2) When soldering , do not put stress on the COBs' silicone.当焊接时，不要压 COB 硅胶体表面。
- (3) When soldering , put COB on the Surface of a poor conductor of heat.当焊接时，将 COB 放在热的不良导体表面。
- (4) Don't remove the protective film on the silicone until soldering end.焊接结束前不得撕掉硅胶的保护层。

3.1.1 Soldering Iron 烙铁焊接

- (1) When hand soldering, keep the temperature of iron below less 350°C less than 5 seconds.当手工焊接时，烙铁的温度必须小于350°C，时间不可超过5秒。
- (2) The tip of the iron tip is the blade.建议使用刀型烙铁焊接。

3.1.2 Repairing 修补

Repair should not be done after the COBs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of COBs will or will not be damaged by repairing. When COBs are repairing, don't use soldering iron scrape pad of COBs.

COB回流焊后不应该修复，当必须修复时，必须使用双头烙铁，而且事先应确认此种方式会不会损坏COB本身的特性。修复时不得使用烙铁刮COB焊盘。

3.1.3 Cautions 注意事项

- (1) The encapsulated material of the COBs is silicone. Therefore the COBs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the COBs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper. COB封装胶为硅胶，表面较软，用力按压胶体表面会影响COB可靠性，因此应有预防措施避免在按压器件，当使用吸嘴时，胶体表面的压力应是恰当的。

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board. COB 灯珠不要焊接在弯曲的 PCB 板上, 焊接之后, 也不要弯折线路板。

(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering. 回流焊之后冷却过程中, 不要对材料施加外力, 也不要震动, 回流焊后, 不要采用急剧冷却的方式。

(4) In order to reduce the thermal resistance of the finished lamps, it is recommended to heat the interface materials, such as thermally conductive silicone grease, heat sink, etc., at the connection between the COB and the heat sink, but you need to ensure that the COB screws are mounted without being subjected to the effects of stress. 为了降低成品热阻, 建议在 COB 和散热器连接处加热界面材料, 如导热硅脂、散热片等, 但需要保证 COB 拧螺丝安装时, 没有受到应力的影响。



4. Handling Precautions 产品使用注意事项

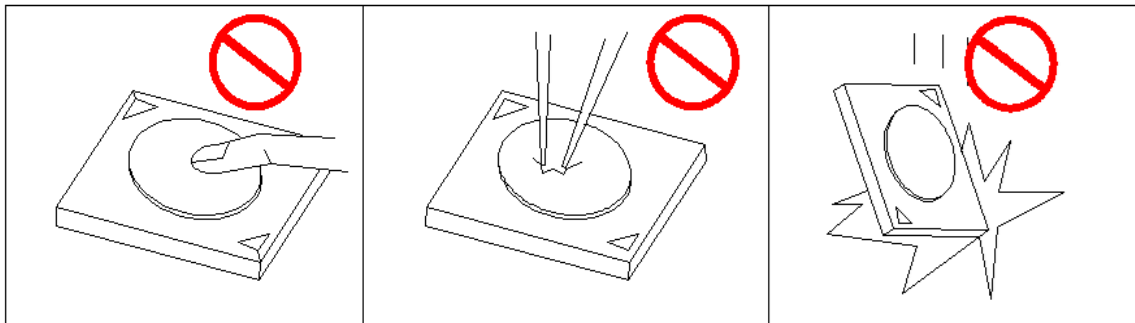
4.1 Handling Precautions 产品使用注意事项

(1) COB operating environment and sulfur element composition cannot be over 100PPM in the COB mating usage material. This is provided for informational purposes only and is not a warranty or endorsement. COB 工作环境及与 COB 适配的材料中硫元素及化合物成份不可超过 100PPM. 这只是一个建议, 不作任何品质担保。

(2) In order to prevent ex-ternal material from getting into the inside of COB, which may cause the malfunction of COB, the single content of Bromine element is required to be less than 900PPM, the single content of Chlorine element is required to be less than 900PPM, the total content of Bromine element and Chlorine element in the external materials of the application products is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement. 为了防止外界物质进入 COB 内部以造成 COB 的损伤, 所处环境及所用套件等等, 单一的溴元素含量要求小于 900PPM, 单一氯元素含量要求小于 900PPM, 溴元素与氯元素总含量必须小于 1500PPM. 这只是一个建议, 不作任何品质担保。

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of COBs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against the use of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verify compatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching COBs, do not use adhesives that outgas organic vapor. 应用套件中的挥发性物质会渗透到 COB 内部, 在通电产生光子及热的条件下, 会导致 COB 变色, 进而造成严重光衰, 提前了解套件材料能够避免产生这些问题。瑞丰反对使用任何对 COB 器件的性能或者可靠性有害的物质或材料, 不管这些材料是已经证实了的还是仅仅怀疑有害。针对特定的用途和使用环境, 瑞丰建议对所有的物质和材料进行相容性的测试。在贴装 COB 时候, 不要使用能产生有机挥发性气体的粘结剂。

(4) Handle the component along the side surface by using forceps or appropriate tools; do not directly touch or Handle the silicone lens surface, it may damage the internal circuitry. 通过使用适当的工具从材料侧面夹取，不可直接用手或尖锐金属压胶体表面，它可能会损坏内部电路。



(5) In designing a circuit, the current through each COB must be exceed the absolute maximum rating specified for each COB. In the meanwhile, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen. The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the reverse voltage is applied to COB, migration can be generated resulting in COB damage. 设计电路时，通过 COB 的电流不能超过规定的最大值，同时，还需使用保护电阻，否则，微小的电压变化将会引起较大电流变化，可能导致产品损毁。电路设计必须保证只有在开启或者关闭的时候出现正向电压的变化，不要施加反压，否则会损坏 COB。

(6) Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color change and so on. Please consider the heat generation of the COBs when making the system design. COB 容易因为自身的发热和环境的温度改变而改变，温度升高会降低 COB 发光效率，影响发光颜色，所以在设计时应充分考虑散热问题。

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust , requiring special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components. Refond suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the COB. 与其他封装胶相比，硅胶通常较软，表面易吸附脏物，应用时应特别注意，当对产品洁净度要求较高时，回流焊以后需要采用恰当的清洗方式，我们推荐用异丙醇作清洗剂，

如需要用到其他清洗剂，必须保证不会破坏封装体，超声清洗可能会对 COB 带来损害，不推荐这种清洗方式。

(8) To avoid the moisture penetration, we recommend store in a dry box with a desiccant. The recommended storage temperature range is 5°C to 30°C and a maximum humidity of RH50%. 为了避免湿气进入，产品应该保存在干燥的地方，同时需要使用干燥剂，推荐的储存温度是 5°C 到 30°C，最大湿度不能超过 50%。

(9) Similar to most Solid state devices; COBs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). 像其他的半导体电子器件一样，COB 对静电过流击穿非常敏感，需要做好防护。

(10) Recommended constant current drive, need to control the drive current is less than the maximum rated current, and control the chip junction temperature is less than the maximum junction temperature. 建议恒流驱动，需要控制驱动电流小于最大额定电流，并控制芯片结温少于最大结温。

(11) Other points for attention, please refer to our relevant information. 其它注意事项请参照瑞丰相关资料。



[illegible]



Declare 申明

This specification is written both in English and in Chinese and the latter is formal.
产品规格书以中英文方式书写，若有冲突以中文版本为准。