



0.2W Medium Power Series Datasheet

Features:

- PLCC-2 package.
- Silicone resin.
- GaN technology Chip Material.
- High luminous Intensity and high efficiency.
- High Color rendering index.
- Low Color Tolerance Adjustment.
- 120°Wide viewing angle.
- Compatible with automatic placement equipment.
- Compatible with reflow solder process.
- Suitable for all SMT assembly methods.
- Doesn't contain restriction Substance, comply ROHS standard.

Typical Application:

- Indoor Displays.
- Backlighting (illuminated advertising, general lighting).
- Substitution of fluorescent lamps.
- Interior Automotive Lighting.
- Signal and Symbol Luminaire.

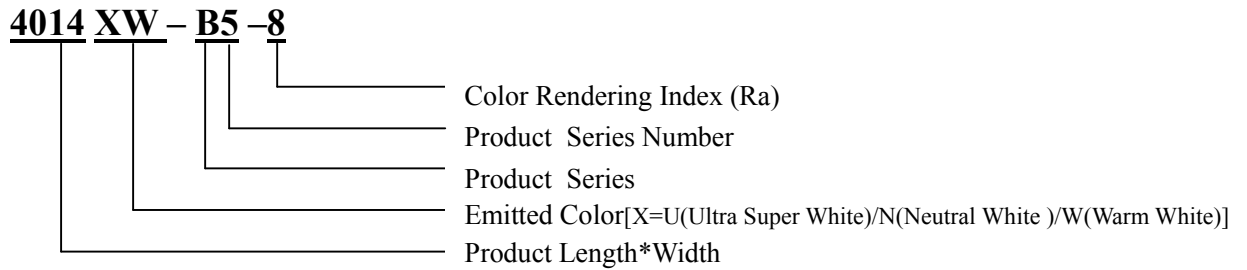
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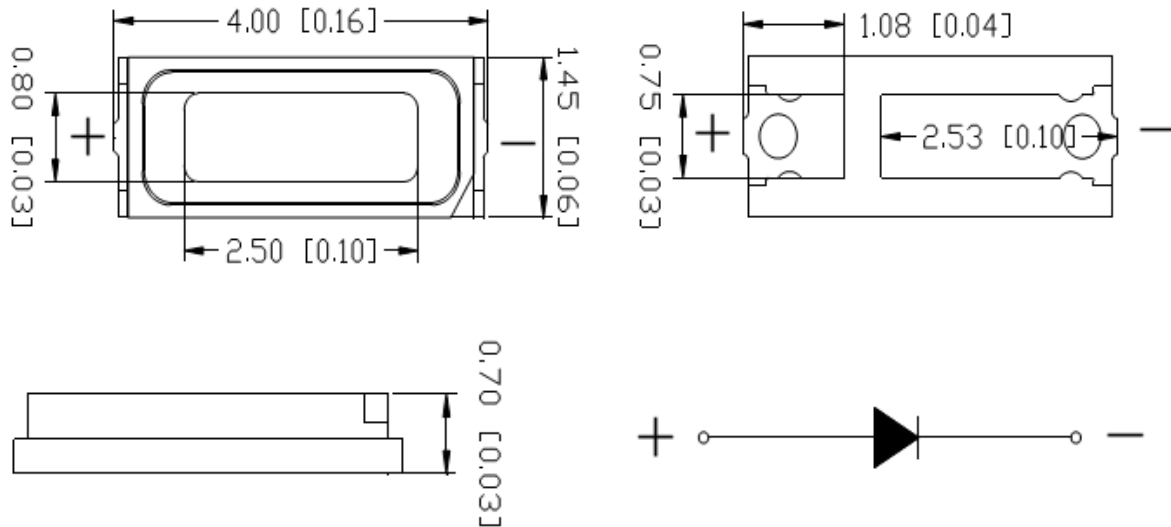
◆ General Information

Product Nomenclature

The following table describes the available color, color rendering index (Ra) and product series. For more flux and forward voltage information, please consult the Bin range of Chromaticity Coordinates and Chromaticity Coordinates & Bin grading diagram.



◆ Package Dimensions



Unit: All dimensions are in millimeters (inches);

Figure: 0.2W medium power series circuit diagram

Tolerance: $\pm 0.2\text{mm}$ unless otherwise noted

Electrodes: Ag Plating Copper Alloy

Encapsulating Resin: Silicon Resin

Package: Heat-Resistant Polymer

◆ Absolute Maximum Rating (Ta=25°C)

The following table describe absolute maximum ratings of 0.2 W medium power series.

Parameter	Symbol	Value	Unite
Forward current	If	60	mA
Reverse Voltage	Vr	5	V
Operating temperature range	Top	-40~+85	°C
Storage temperature range	Tstg	-40~+100	°C
Pulse Forward Current	Ifp	120	mA
Electrostatic Discharge	ESD	2000(HBM)	V
Junction temperature	Tj	115	°C

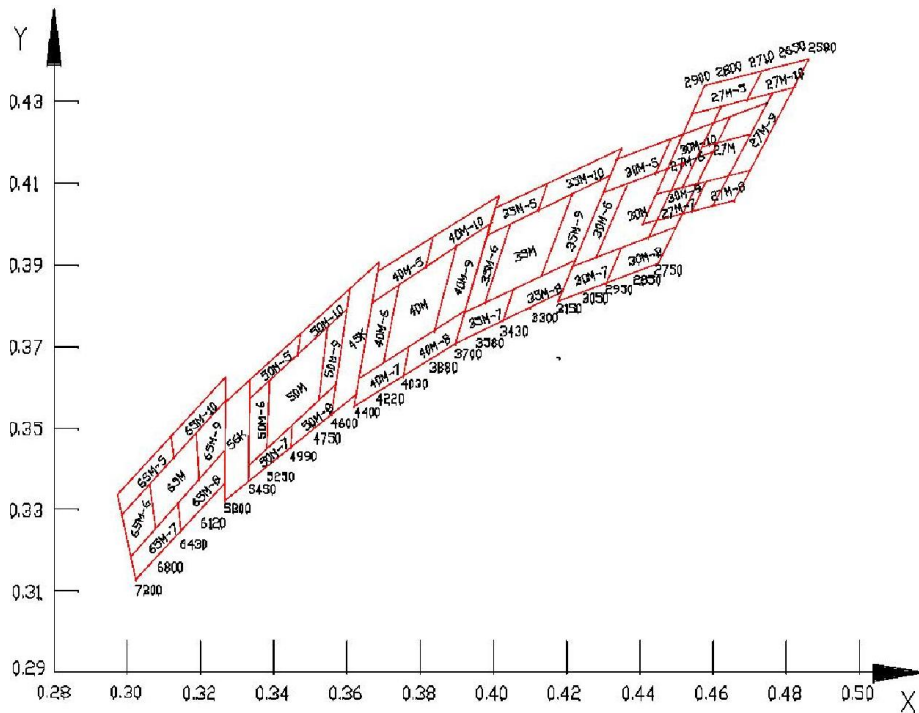
◆ Optical and Electrical Characteristics (Ta=25°C)

Luminous intensity characteristics at Ta=25°C for 0.2W medium power series.

Parameter		Test Condition	Symbol	Value		Typ.	Unit
				Min.	Max.		
Forward Voltage	Rank G2	If=60mA	Vf	2.9	3.0	--	V
	Rank H1			3.0	3.1	--	V
	Rank H2			3.1	3.2	--	V
	Rank I1			3.2	3.3	--	V
	Rank I2			3.3	3.4	--	V
	Rank J1			3.4	3.5	--	V
4014WW-B5-8 (2580-2900k)	Rank PED	If=60mA	Φ	18.0	20.0	19.0	lm
	Rank QED			20.0	22.0		lm
	Rank QGD			22.0	24.0		lm
	Rank QHA			24.0	26.0		lm
4014WW-B5-8 (2750-3150k)	Rank PED	If=60mA	Φ	18.0	20.0	20.0	lm
	Rank QED			20.0	22.0		lm
	Rank QGD			22.0	24.0		lm
	Rank QHA			24.0	26.0		lm
4014WW-B5-8 (3700-4400k)	Rank PED	If=60mA	Φ	18.0	20.0	22.0	lm
	Rank QED			20.0	22.0		lm
	Rank QGD			22.0	24.0		lm
	Rank QHA			24.0	26.0		lm

4014WW-B5-8 (4600-5450k)	Rank PED	If=60mA	Φ	18.0	20.0	22.0	lm
	Rank QED			20.0	22.0		lm
	Rank QGD			22.0	24.0		lm
	Rank QHA			24.0	26.0		lm
4014WW-B5-8 (5800-7300k)	Rank PED	If=60mA	Φ	18.0	20.0	22.0	lm
	Rank QED			20.0	22.0		lm
	Rank QGD			22.0	24.0		lm
	Rank QHA			24.0	26.0		lm
Viewing angle at 50% Iv		If=60mA	2 θ 1/2	-	-	120	Deg
Color Rendering Index		If=60mA	CRI	80	-	-	-
Reverse Current		Vr=5V	Ir	-	10	-	uA
Thermal Resistance		If=60mA	Rth(j-s)		-	50	°C/W

● Please refer to CIE 1931 Chromaticity diagram



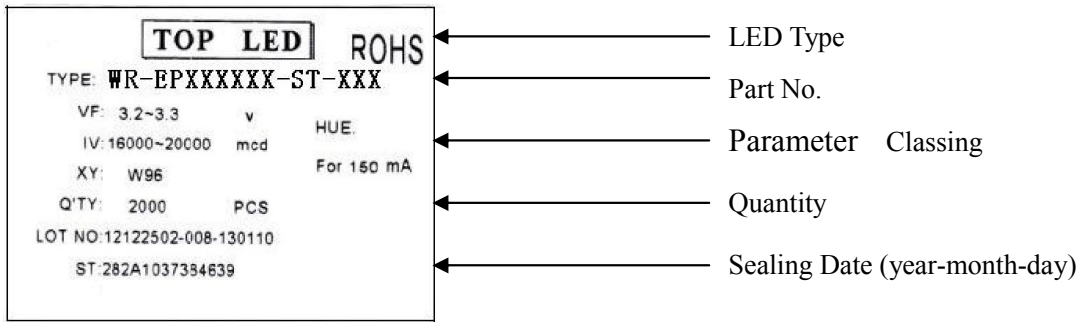
◆ Chromaticity Coordinates & Bin grading diagram

Bin range of Chromaticity Coordinates (tolerance is ± 0.01 @ $I_f = 60$ mA):

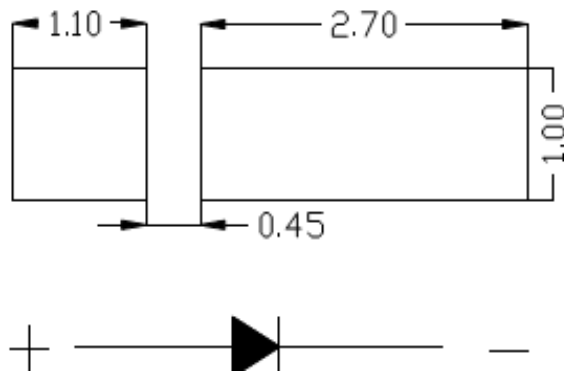
MacAdam-5step								
BIN	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
65M	0.3061	0.3361	0.3188	0.3488	0.3196	0.3372	0.3079	0.3255
50M	0.3389	0.3615	0.3547	0.3746	0.3523	0.3566	0.3382	0.3450
40M	0.3745	0.3852	0.3902	0.3947	0.3840	0.3739	0.3700	0.3660
35M	0.4048	0.3999	0.4215	0.4072	0.4132	0.3871	0.3979	0.3806
30M	0.4365	0.4096	0.4525	0.4151	0.4423	0.3965	0.4280	0.3917
27M	0.4624	0.4285	0.4761	0.4318	0.4644	0.4117	0.4518	0.4088

MacAdam-8step								
65M-5	0.2975	0.3337	0.3121	0.3481	0.3127	0.3427	0.2987	0.3287
65M-6	0.2987	0.3287	0.3061	0.3361	0.3079	0.3255	0.3011	0.3187
65M-7	0.3011	0.3187	0.3139	0.3315	0.3146	0.3247	0.3025	0.3128
65M-8	0.3139	0.3315	0.3268	0.3444	0.3267	0.3365	0.3146	0.3247
65M-9	0.3196	0.3372	0.3188	0.3488	0.3268	0.3568	0.3268	0.3444
65M-10	0.3121	0.3481	0.3268	0.3624	0.3268	0.3568	0.3127	0.3427
50M-5	0.3337	0.3619	0.3472	0.3728	0.3468	0.3680	0.3336	0.3571
50M-6	0.3336	0.3571	0.3389	0.3615	0.3382	0.3450	0.3334	0.3410
50M-7	0.3334	0.3410	0.3452	0.3507	0.3447	0.3451	0.3333	0.3369
50M-8	0.3452	0.3507	0.3571	0.3606	0.3560	0.3534	0.3447	0.3451
50M-9	0.3547	0.3746	0.3600	0.3790	0.3571	0.3606	0.3523	0.3566
50M-10	0.3472	0.3728	0.3607	0.3837	0.3600	0.3790	0.3468	0.3680
40M-5	0.3686	0.3882	0.3834	0.3965	0.3818	0.3896	0.3672	0.3808
40M-6	0.3672	0.3808	0.3745	0.3852	0.3700	0.3660	0.3635	0.3623
40M-7	0.3635	0.3623	0.3771	0.3700	0.3754	0.3626	0.3621	0.3551
40M-8	0.3771	0.3700	0.3923	0.3786	0.3897	0.3707	0.3754	0.3626
40M-9	0.3902	0.3947	0.3995	0.4004	0.3923	0.3786	0.3840	0.3739
40M-10	0.3834	0.3965	0.4017	0.4069	0.3995	0.4004	0.3818	0.3896
35M-5	0.4007	0.4038	0.4145	0.4096	0.4122	0.4031	0.3984	0.3971
35M-6	0.3984	0.3971	0.4048	0.3999	0.3979	0.3806	0.3922	0.3782
35M-7	0.3922	0.3782	0.4053	0.3837	0.4026	0.3763	0.3897	0.3707
35M-8	0.4053	0.3837	0.4224	0.3910	0.4188	0.3831	0.4026	0.3763
35M-9	0.4215	0.4072	0.4320	0.4118	0.4224	0.3910	0.4132	0.3871
35M-10	0.4145	0.4096	0.4350	0.4185	0.4320	0.4118	0.4122	0.4031
30M-5	0.4337	0.4157	0.4486	0.4207	0.4444	0.4123	0.4300	0.4074
30M-6	0.4300	0.4074	0.4365	0.4096	0.4280	0.3917	0.4217	0.3895
30M-7	0.4217	0.3895	0.4352	0.3941	0.4308	0.3853	0.4177	0.3809
30M-8	0.4352	0.3941	0.4498	0.3991	0.4450	0.3901	0.4308	0.3853
30M-9	0.4525	0.4151	0.4600	0.4176	0.4498	0.3991	0.4423	0.3965
30M-10	0.4486	0.4207	0.4646	0.4261	0.4600	0.4176	0.4444	0.4123
27M-5	0.4579	0.4335	0.4730	0.4369	0.4693	0.4302	0.4544	0.4267
27M-6	0.4544	0.4267	0.4624	0.4285	0.4518	0.4088	0.4445	0.4071
27M-7	0.4445	0.4071	0.4583	0.4103	0.4542	0.4029	0.4408	0.3999
27M-8	0.4583	0.4103	0.4702	0.4130	0.4658	0.4057	0.4542	0.4029
27M-9	0.4761	0.4318	0.4823	0.4333	0.4702	0.4130	0.4644	0.4117
27M-10	0.4730	0.4369	0.4864	0.4401	0.4823	0.4333	0.4693	0.4302

◆ Package Label: (For example)

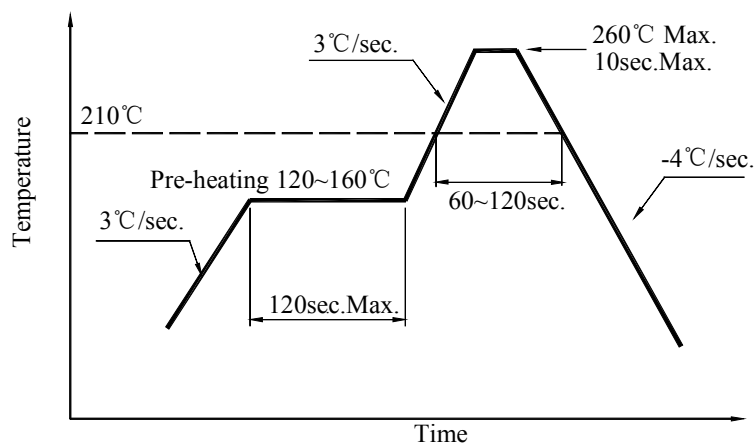


◆ Soldering Pad Dimensions



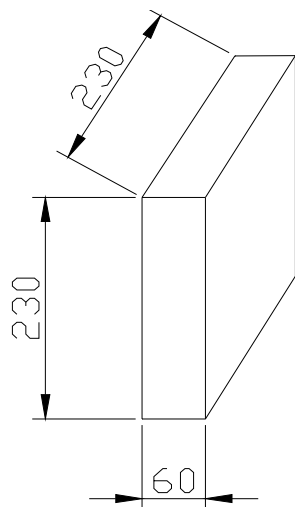
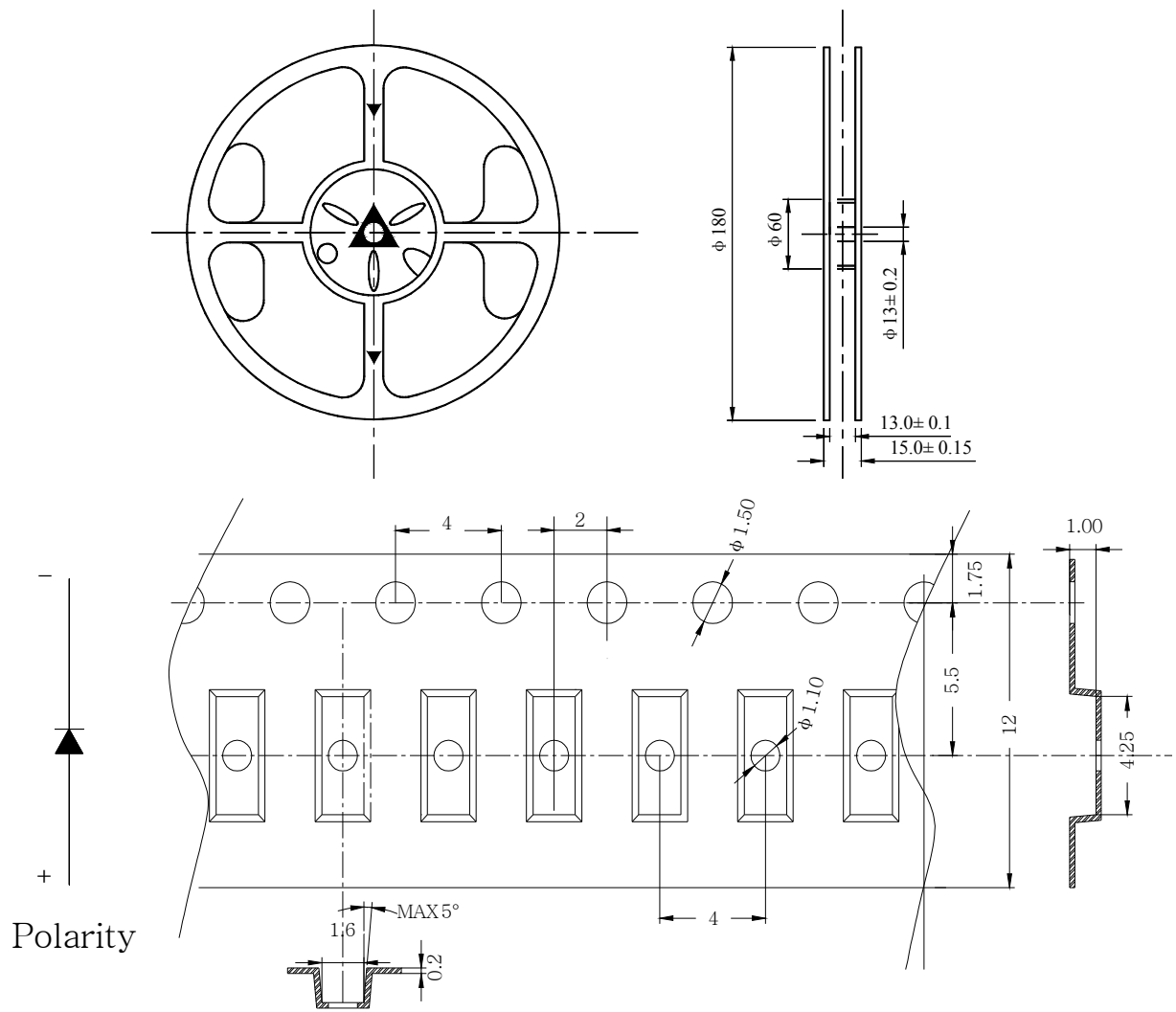
◆ Soldering Conditions (Maximum allowable soldering conditions)

Reflow soldering profile
<Pb-free solder>

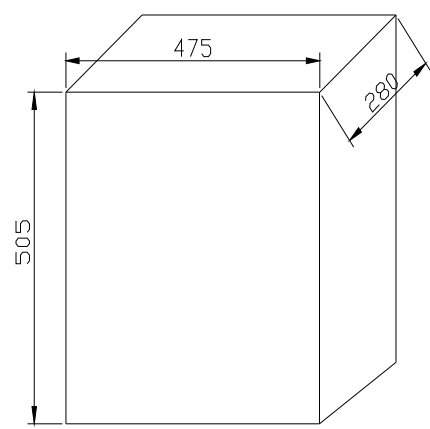


- Reflow soldering should not be done more than two times.
- Do not stress its resin while soldering.
- After soldering, do not warp the circuit board.
- Pay attention to electrostatic (ESD).

◆ Package Tape Specifications (3000 pcs/Reel) :



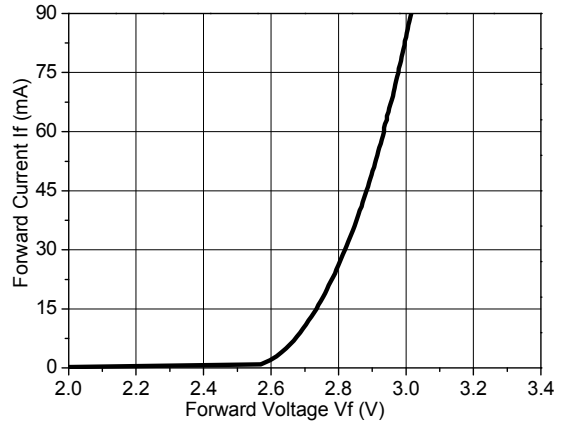
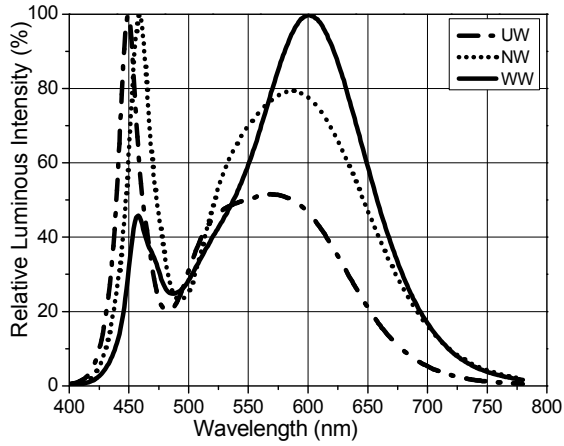
5 Reels in one Box



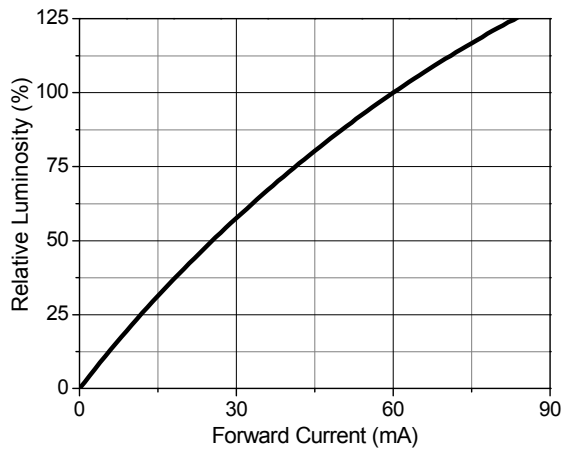
16 Boxes in one Carton

◆ Typical Electro-Optical Characteristics Curves:

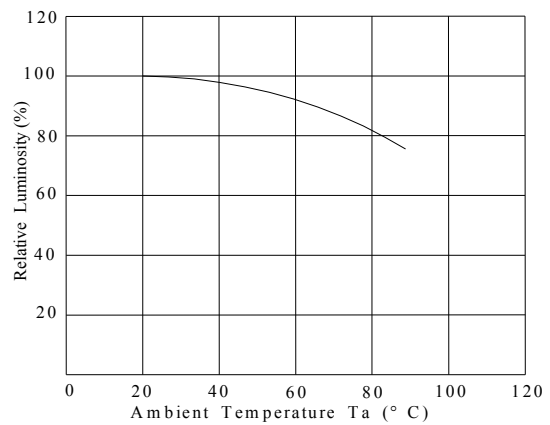
Relative Luminous Intensity Vs. Wavelength $T_a=25^\circ\text{C}$ Forward Current vs Forward Voltage at $T_a=25^\circ\text{C}$



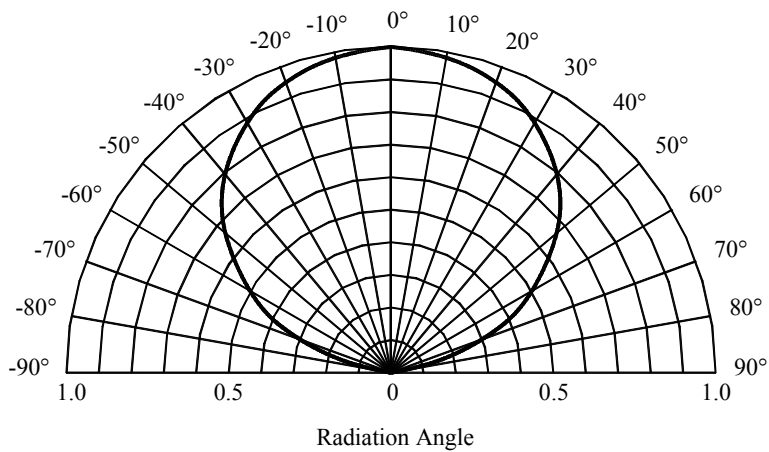
Forward Current Vs. Relative Luminosity $T_a=25^\circ\text{C}$



Relative Luminosity Vs. Ambient Temperature



Radiation diagram



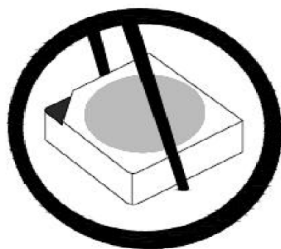
◆ Storage and application notices

1. Storage

1. Calculated shelf life in sealed bag: 12 months at $<30^{\circ}\text{C}$ and $<90\%$ relative humidity (RH)
- 2.1 TOP LED: After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be:
 - a) Mounted within: 168 hours of factory conditions $\leq 30^{\circ}\text{C}/60\%$ RH, or
 - b) Stored at ambient of $<20\%$ RH
- 2.2 CHIP LED: After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be:
 - a) Mounted within: one year of factory conditions $\leq 30^{\circ}\text{C}/60\%$ RH, or
 - b) Stored at ambient of $<20\%$ RH.
3. Device require bake, before mounting, if:
 - a) Humidity indicator Card reads $>10\%$ when read at $25\pm 5^{\circ}\text{C}$
 - b) Above conditions are not metBaking condition: 24 hours at $60\pm 3^{\circ}\text{C}$ and $<5\%$ RH
4. The internal and esterand boxes can not be contacted with ground to prevent absorption of moisture;
5. No acid, alkali, salt, corrosive and explosive gas; away from sunlight and keep the environment clean;

2. Application

1. Do not use any unknown chemical liquid to clean LED, it will damage the LED resin surface; use the alcohol under the room temperature if necessary but less than 1 min, or use the ultrasonic cleaning with proper characters, such as correct power, frequency ,etc.
2. Do not touch the epoxy resin area when carrying LEDs by tweezers (as the following pictures), especially after the soldering process, the epoxy resin will turn to soft, the internal instruction will be damaged by the tweezers which cause the electric character's failure; nozzle is recommended by using SMT mounting.



Correct



Incorrect

3. Soldering iron: double-side soldering iron with power of less than 25W; soldering temperature: less than 300°C; soldering time: less than 3sec.; 1 time completed is recommended, if the 2nd soldering process is requested, 3mins must be left to ensure the high temperature status can return to room temperature.
 - a. REFLOW soldering: set and test the temperature of the different area of REFLOW equipment in advance.
 - b. To set the peak temperature according to different SMDs, but the actual peak temperature should be less than 260 °C ,processing time should be less than 10sec, only 1 time is allowed.
4. SMDs should be soldered at the coordinated position on the PCB.
5. Note of Electrical matter:
 - ① One-way conduction, LED does not allow the reverse driving.
 - ② LED is a kind of constant current component which can not be lighted by the constant voltage mode; a smaller voltage fluctuation can cause the large current fluctuation which causes the failure of LED.

Each LED should be drove under constant current mode if in a parallel circuit design, otherwise, the colour and brightness will be nonuniform; When the environmental temperature rising, the LED junction temperature will rise, internal resistance will decrease, so the current will be increased by the constant voltage power which short the life span.
 - ③ If the brightness of lighting source can meet the requirement, we recommend using the driving current less than the rated current, in order to improve the product's reliability.
6. LED is a kind of electrostatic sensitive devises, anti-static measures have to be processed during storage and operation:
 - ① LED production workshop should lay anti-static floor and ground connection, the work table have to use the anti-static materials and cover a table mater with the surface resistance of 10^6 - $10^9\Omega$.
 - ② Production machine: REFLOW, SMT equipment, electric iron, test equipment; all the equipments must be well grounded, and the grounding alternating current impedance should be less than 1.0 Ω . A fan need to be installed on the equipments and production processes that easy to generate static electricity; the operators must wear anti-static clothing, shoes, wristband, and gloves, etc. in the process.
 - ③ LEDs must be contained in the anti-static box, and all the package material should be the

anti-static materials.

7. The details electronic characters can refer to our product specification.

◆ Notes:

1、Above specification may be changed without notice. We will reserve authority on material change for above specification.

2、When using this product, please observe the absolute maximum ratings and the instructions for the specification sheets. We assume no responsibility for any damage resulting from use of the product which does not comply with the instructions included in the specification sheets.