PARA LIGHT ELECTRONICS CO., LTD.
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DATA SHEET

PART NO.: LT2812WDT-HQ

REV: A/2

CUSTOMER'S APPROVAL : _____ DCC : _____

SURFACE MOUNT DEVICE LED

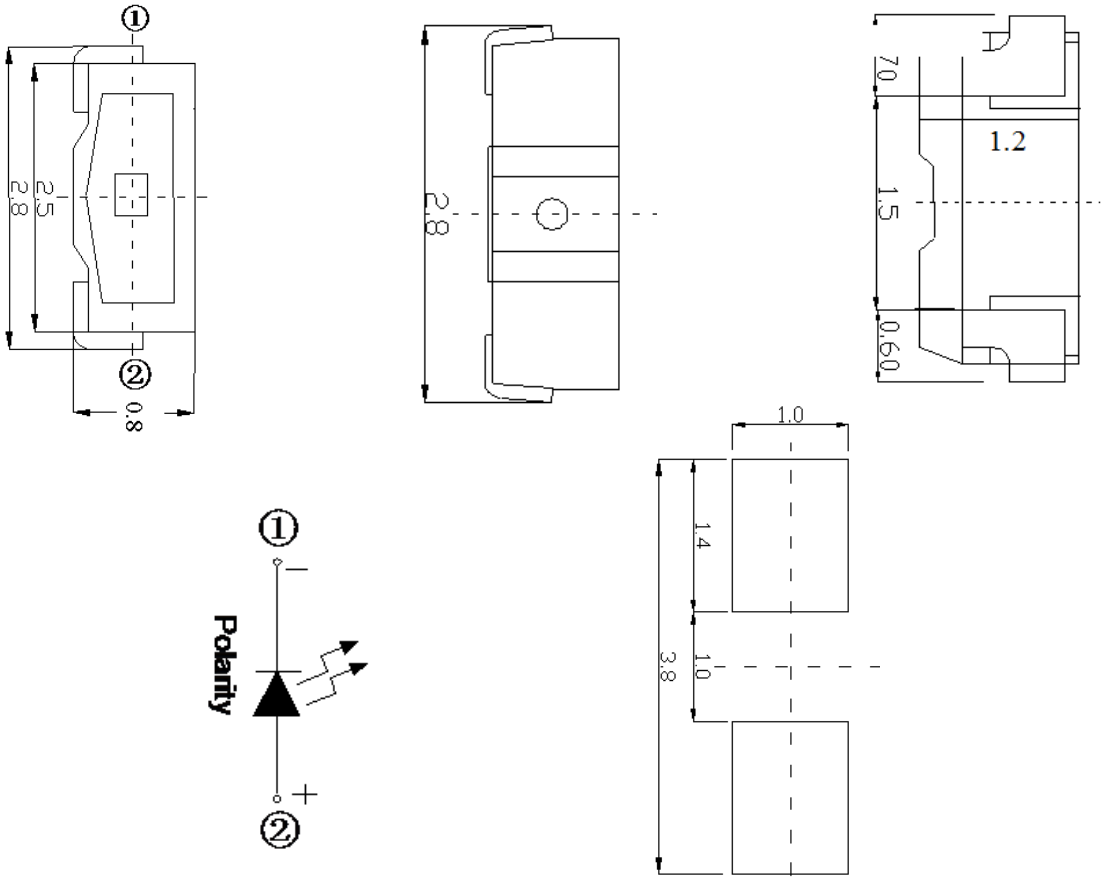
Part No. : LT2812WDT-HQ

REV: A/2

Features

- 2.8 × 0.8 × 1.2 mm
- Ultra Bright Standard White
- Yellow Diffuse Flat Mold
- EIA STD Package
- Meet ROHS, Green Product
- Compatible With SMT Automatic Equipment
- Compatible With Infrared Reflow Solder Process

Package Profile & Soldering PAD Suggested



Notes:

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

Absolute Maximum Ratings （Ta=25℃）

PARAMETER	SYMBOL	RATING	UNIT
Power Dissipation	Pd	90	mW
Peak Forward Current	IFP	100	mA
DC Forward Current	IF	25	mA
Reverse Voltage	VR	5	V
Operating Temperature Range	Topr	-30°C ~ +85°C	
Storage Temperature Range	Tstg	-40°C ~ +90°C	
Soldering Condition	Tsol	Reflow soldering : 245°C ， 30s	
Solder-ability	Weldability	Solder-ability：240°C，30s，90%	
Electrostatic Discharge	ESD	2000	V

Electrical Optical Characteristics （Ta=25℃）

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Luminous Intensity	IV	1400	1600	2200	mcd	IF = 20mA
Viewing Angle	2θ1/2	--	120	--	deg	IF = 20mA
CIE 1931 Coordinate	X	--	0.29	---	---	IF = 20mA
	Y	---	0.29	---	---	
Color Temperature	VF	2.8	---	3.2	V	IF = 20mA
Forward Voltage	IR	---	---	5	μA	VR = 5V
Reverse Current	CCT	1600	---	2000	K	IF = 20mA

Bin Range of Luminous Intensity

BIN	MIN	MAX	UNIT	CONDITION
M22	1400	1600	MCD	IF=20mA
N21	1600	1800		
N22	1800	2000		
O21	2000	2200		

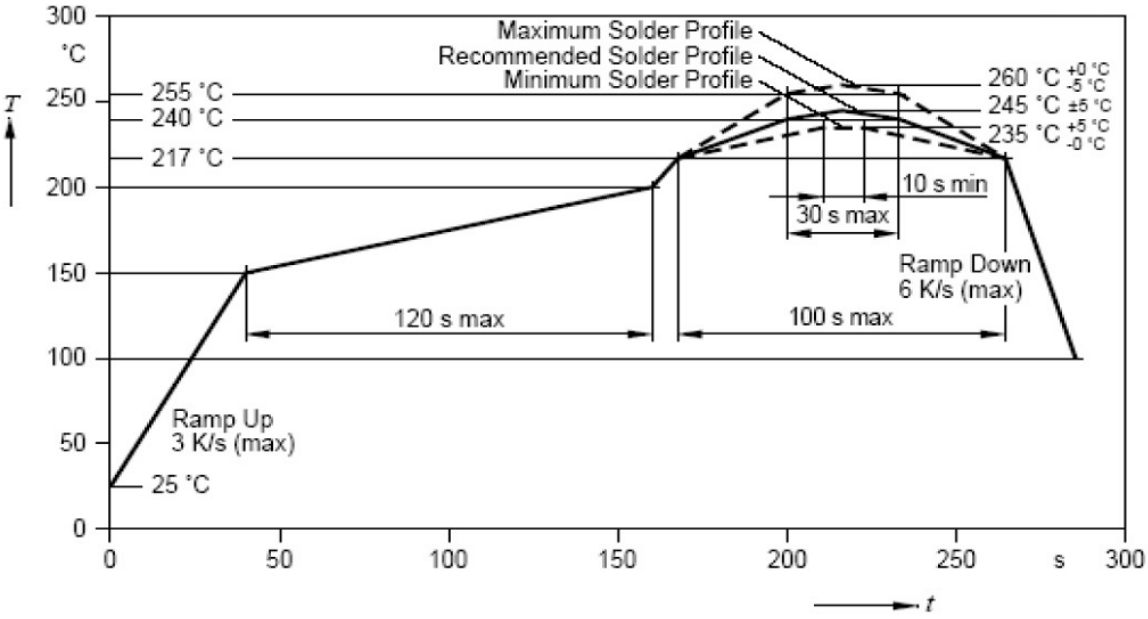
Notes: Tolerance of Luminous Intensity: ± 10%

Bin Range of Forward Voltgae

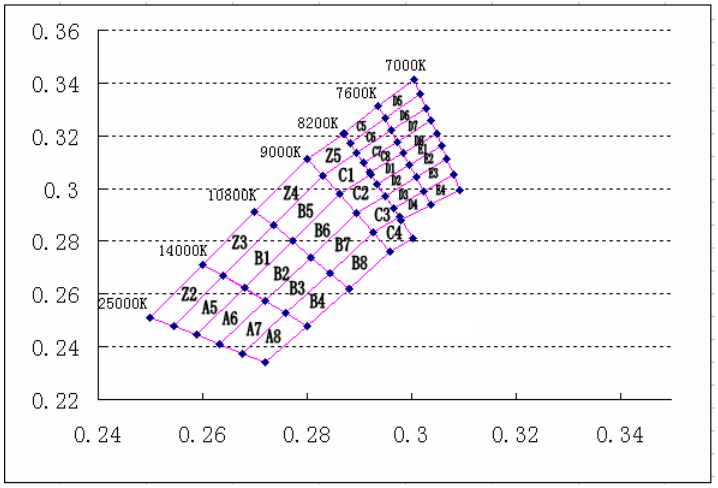
BIN	MIN	MAX	UNIT	CONDITION
6B	2.8	2.9	V	IF=20mA
7A	2.9	3.0		
7 B	3.0	3.1		
8A	3.1	3.2		

Notes: Tolerance of Forward Voltage: ± 0.02V

Soldering Profile Suggested(For Lead Free Solder)



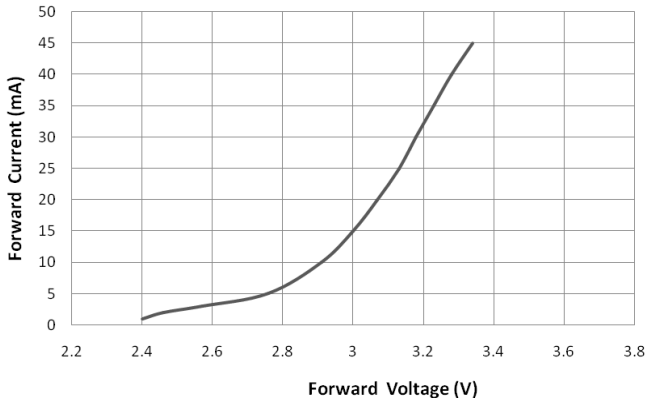
Bin	CIE-X	CIE-Y	Bin	CIE-X	CIE-Y	Bin	CIE-X	CIE-Y
B1	0.2640	0.2670	C1	0.2830	0.3050	D1	0.2920	0.3060
	0.2680	0.2623		0.2863	0.2978		0.2935	0.3015
	0.2772	0.2800		0.2923	0.3052		0.2997	0.3088
	0.2735	0.2860		0.2895	0.3134		0.2984	0.3133
				0.2830	0.3050			
B2	0.2720	0.2575	C2	0.2863	0.2978	D2	0.2935	0.3015
	0.2680	0.2623		0.2895	0.2905		0.2950	0.2970
	0.2772	0.2800		0.2950	0.2970		0.3009	0.3042
	0.2808	0.2740		0.2923	0.3052		0.2997	0.3088
B3	0.2720	0.2575	C3	0.2895	0.2905	D3	0.2950	0.2970
	0.2760	0.2528		0.2928	0.2833		0.2965	0.2925
	0.2844	0.2680		0.2977	0.2891		0.3023	0.2990
	0.2808	0.2740		0.2950	0.2970		0.3009	0.3042
B4	0.2760	0.2528	C4	0.2928	0.2833	D4	0.2965	0.2925
	0.2844	0.2680		0.2977	0.2891		0.2980	0.2880
	0.2880	0.2620		0.3003	0.2812		0.3037	0.2937
	0.2800	0.2480		0.2960	0.2760		0.3023	0.2990
B5	0.2735	0.2860	C5	0.2883	0.3172	D5	0.2937	0.3312
	0.2772	0.2800		0.2870	0.3210		0.2950	0.3266
	0.2863	0.2978		0.2937	0.3312		0.3017	0.3360
	0.2830	0.3050		0.2950	0.3266		0.3005	0.3415
	0.2735	0.2860					0.2937	0.3312
B6	0.2772	0.2800	C6	0.2883	0.3172	D6	0.2950	0.3266
	0.2808	0.2740		0.2950	0.3266		0.2962	0.3220
	0.2895	0.2905		0.2962	0.3220		0.3028	0.3304
	0.2863	0.2978		0.2895	0.3134		0.3017	0.3360
				0.2883	0.3172			
B7	0.2808	0.2740	C7	0.2895	0.3134	D7	0.2962	0.3220
	0.2844	0.2680		0.2908	0.3097		0.2973	0.3177
	0.2928	0.2833		0.2973	0.3177		0.3038	0.3256
	0.2895	0.2905		0.2962	0.3220		0.3028	0.3304
B8	0.2844	0.2680	C8	0.2908	0.3097	D8	0.2973	0.3177
	0.2928	0.2833		0.2920	0.3060		0.2984	0.3133
	0.2960	0.2760		0.2984	0.3133		0.3048	0.3207
	0.2880	0.2620		0.2973	0.3177		0.3038	0.3256
Z4	0.27	0.291	Z5	0.28	0.311			
	0.28	0.311		0.2871	0.321			
	0.283	0.305		0.2895	0.3134			
	0.2735	0.286		0.283	0.305			



● Typical Electrical-Optical Characteristics Curves

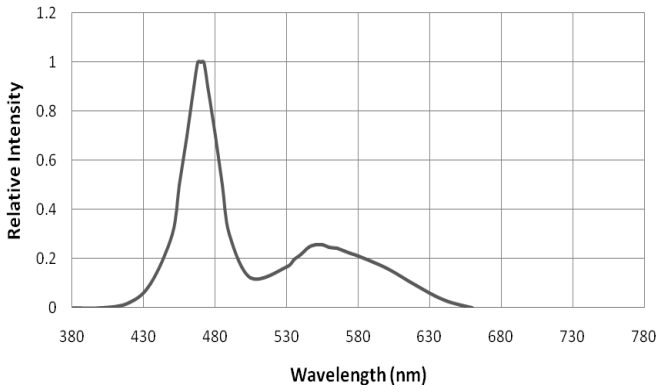
伏安特性曲线

Forward Current VS. Forward Voltag (Ta=25℃)



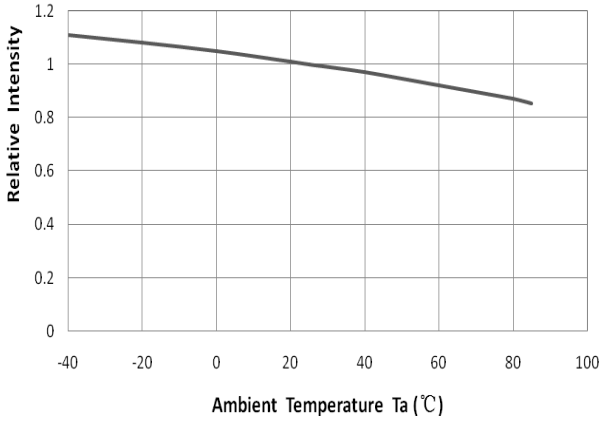
光谱分布特性曲线

Spectrum Distribution (Ta=25℃)



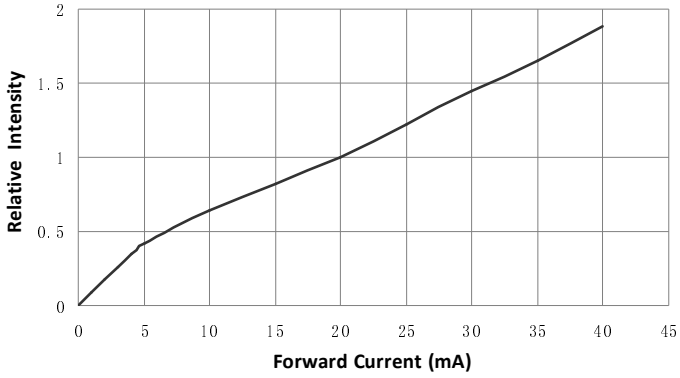
相对光强与环境温度特性曲线

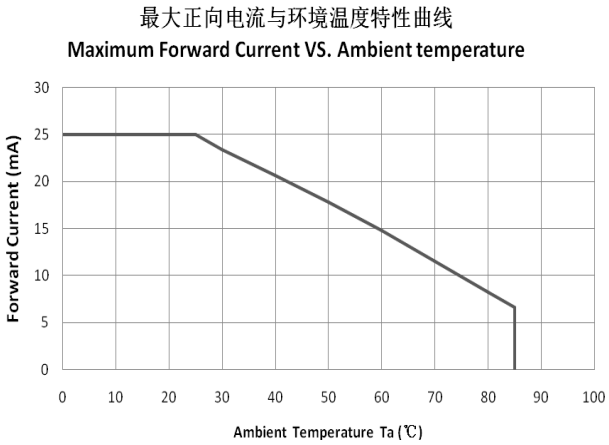
Relative Intensity VS. Ambient Temperature (Ta=25℃)

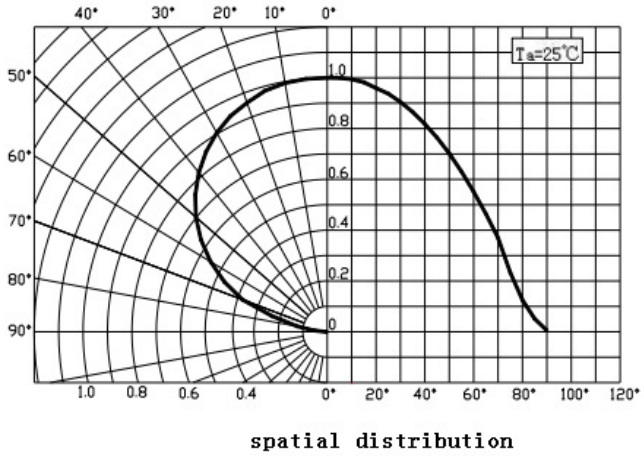


相对光强与电流特性曲线

Relative Intensity VS. Forward Current (Ta=25℃)



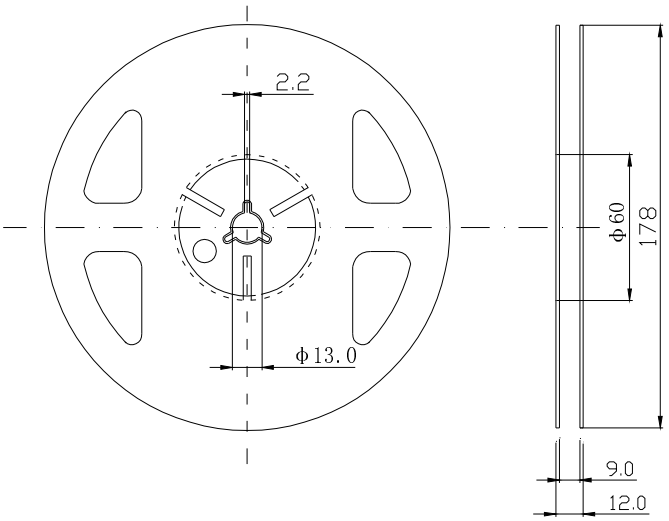


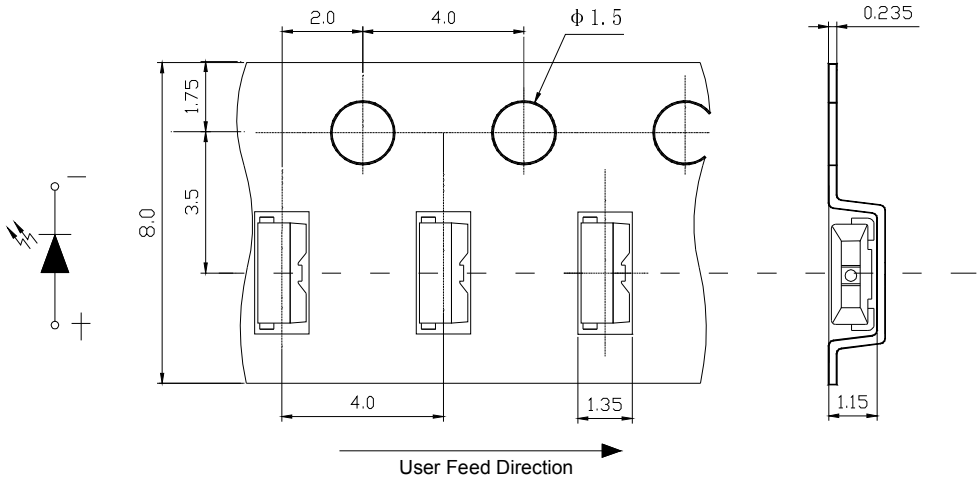


spatial distribution

● Label Explanation

● Reel And Tape Dimensions

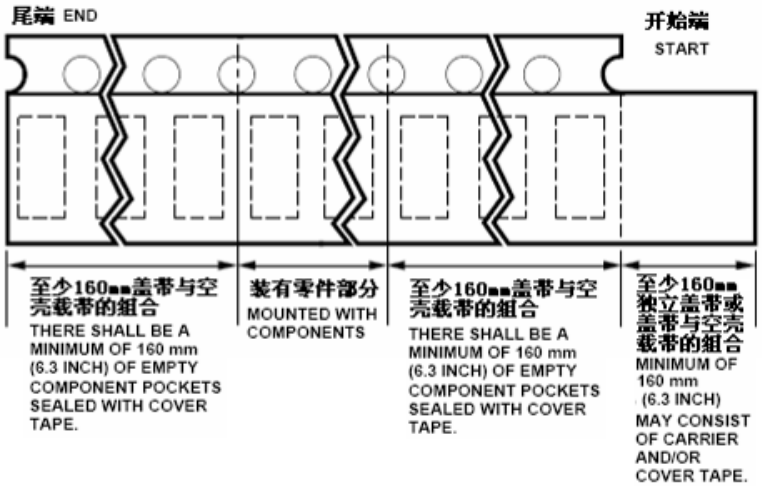


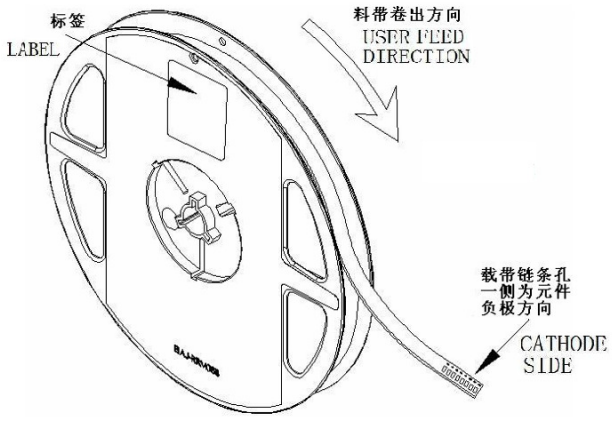


Notes:

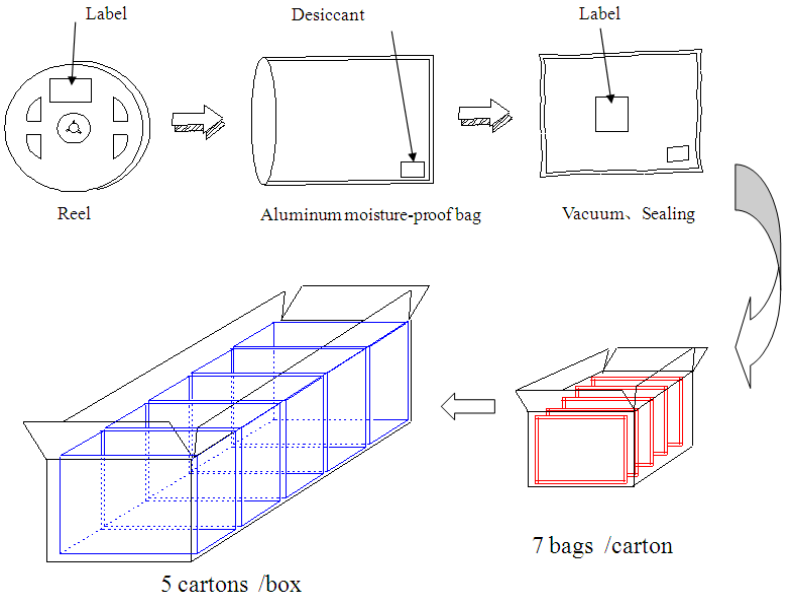
1. All dimensions are in millimeters。
2. Tolerance is ± 0.1 mm unless otherwise noted。

● Tape Leader & Trailer Dimensions And Reel：





Packaging：



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	1000 HRS (-24 HRS，+72 HRS)	MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1
	High Temperature, High Humidity Storage	IR-Reflow In-Board, 2 Times IR-Reflow In-Board, 2 Times Ta= 85±5℃,RH= 85%	1000 HRS (± 2 HRS)	JESD22-A101
	High Temperature Storage	Ta= 105±5℃	1000 HRS (-24HRS，+72 HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= -40±5℃	1000 HRS (-24HRS，+72 HRS)	JIS C 7021:B-12
Environmental testing	Temperature Cycling	100℃ ～ 25℃ ～ -40℃ ～ 25℃ 30mins 5mins 30mins 5mins	100 / 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 100 ± 5℃ ～ -40℃ ± 5℃ 10mins 10mins	100 / Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Reflow Pb Free Process	Peak temperature range 245℃ 30s max	--------	MIL-STD-750D:2031.2 J-STD-020C

● Criteria For Judging Damage

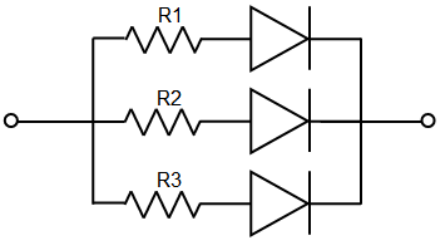
Test items	Symbol	Test Condition	Criteria For Judgement	
			Min	Max
Forward Voltage	VF	IF=20mA		U.S.L)x1.1
Reverse Current	IR	VR=5V		U.S.L)x2.0
Luminous Flux	mcd	IF=20mA	L.S.L)x0.7	

U.S.L: Upper standard level
L.S.L: Lower standard level

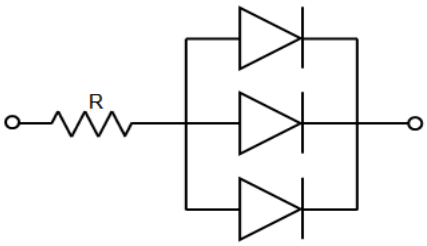
● Cautions：

Application：

1. A LED is a current-operated device. The slight shift of voltage will cause big change of current, which will damage LEDs. Customer should use resistors in series for the Over-Current-Proof.
2. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended to use individual resistor separately, as shown in Circuit A below. The brightness of each LED shown in Circuit B might appear difference due to the differences in the I-V characteristics of those LEDs.



Circuit model A



Circuit model B

3. High temperature may reduce LEDs' intensity and other performances, so keeping it away from heat source to get good performance is necessary.
4. Rank Tolerance： REF / VF： ± 0.02V
CAT / IV ： ± 10%
X / Y ： ± 0.005

Storage

1. Before opening original package, it is recommended to store them in the following environment: Temperature: 5℃~30℃, Humidity: 85%RH max. When the inventory over 3 months, Should be done before treatment using dehumidification, Temperature: 60℃/8 hours.
2. After opening original package, the storage ambient for the LEDs should be in 5~30°C temperature and 60% or less relative humidity.

3. In order to avoid moisture absorption, it is recommended that the LEDs that out of the original package should be stored in a sealed container with appropriate desiccant, or in desiccators with nitrogen ambient.
4. The LEDs should be used within 24hrs (1days) after opening the package. Once been mounted, soldering should be quick.
5. If the moisture absorbent material (silica gel) has faded away or the LEDs stored out of original package for more than 24hrs (1days), baking treatment should be performed using the conditions: 60℃ at least 24 hours.

ESD (Electrostatic Discharge)-Protection

A LED (especially the Blue、White and Green product) is an ESD sensitive component, and static electricity or power surge will damage the LED. ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or “no light-up” at low currents, etc.Some advice as below should be noticed:

1. A conductive wrist strap or anti-electrostatic glove should be worn when handling these LEDs
2. All devices, equipment, machinery, work tables and storage racks, etc. must be properly grounded （Grounding impedance value within 10Ω）
3. Use anti-static package or boxes to carry and storage LEDs. And ordinary plastic package or boxes is forbidden to use.
4. Use ionizer to neutralize the static charge during handling or operating.
5. All surfaces and objects within 1 ft close to LEDs measure less than 100V.

Cleaning

Use alcohol-based cleaning solvents such as IPA (isopropyl alcohol) to clean LEDs if necessary

Soldering

1. Soldering condition refer to the draft “Soldering Profile Suggested” on page 3
2. Reflow soldering should not be done more than 2 times.
3. Manual soldering is only suggested on repair and rework. The maximum soldering temperature should not exceed 300°C within 3 sec. And the maximum capacity of soldering iron is 30W in power.
4. During the soldering process, do not touch the lens at high temperature.
5. After soldering, any mechanical force on the lens or any excessive vibration shall not be accepted to apply, also the circuit board shall not be bent as well.

Others

1. The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications).Consult Harvatek’s Sales in advance for the applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health. (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

2. The light output from the high luminous intensity LEDs may cause injury to human eyes when viewed directly.
3. The appearance and specifications of the product may be modified for improvement without prior notice.