BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED!

PRODUCT DATASHEET

- ► Ceramic High Power
- ► 3535 2.22t Series
- ► Ultraviolet (390-400nm)

Release Date: 15 April 2019 Version: A2.1

N0Q10S91Z (3mm Lens)

3535 2.22t Series

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RoHS Compliant

FEATURES:

- **Package:** Ceramic SMT Package with Silicon Lens
- **Forward Current:** 500-700mA
- **Forward Voltage (typ.):** 3.4V
- **Radiant Power (typ.):** 780mW@500mA; 1037mW@700mA
- **Colour:** Ultraviolet (UV)
- **Peak Wavelength:** 390-400nm
- **Viewing angle:** 125°
- **Materials:**
  - Die: InGaN
  - Resin: Silicon (Water Clear)
  - L/T Finish: Gold (Au)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+100°C
- **Grouping parameters:**
  - Forward Voltage
  - Radiant Power
  - Peak Wavelength
- **Soldering methods:** Reflow
- **Moisture Sensitive Level:** MSL2 according to J-STD020
- **Packing:** 12mm tape with Max.1000pcs/reel, ø180mm (7'')

APPLICATIONS:

- Industrial Curing
- Air Purifier
- Poster Printing Curing
- Counterfeit Money Detector
- Blood Detector
- Nail Curing
- Teeth Curing

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I_F	700	mA
Reverse Current @5V	I_R	10	μA
Junction Temperature	T_j	90	°C
Electrostatic Discharge (HBM: MIL-STD-883 C:3B)	ESD	8000	V
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+100	°C
Soldering Temperature	T_{SOL}	250	°C
Thermal Resistance - Junction to Solder Point	R_{th}	8	°C/W

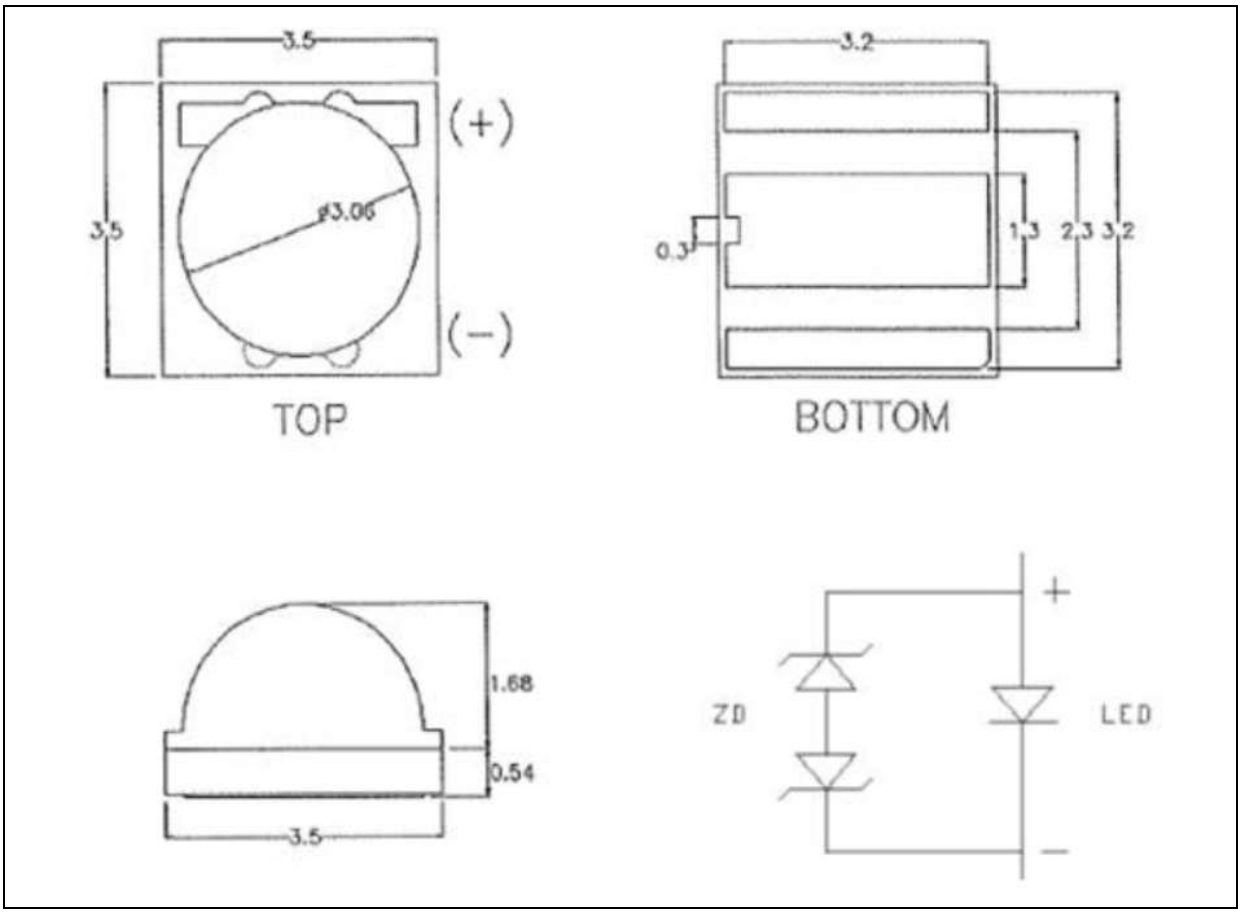
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	2.8	3.4	4.0	V	I_F=500mA
Radiant Power	P_O	445	560	675	mW	I_F=350mA
		620	780	940		I_F=500mA
		824	1037	1250		I_F=700mA
Radiant Intensity	Ie	---	210	---	mW/sr	I_F=350mA
		---	295	---		I_F=500mA
		---	390	---		I_F=700mA
Peak Wavelength	λ_D	390	---	400	nm	I_F=500mA
Viewing Angle	$2\theta_{1/2}$	---	125	---	deg	I_F=500mA

1. Radiant power (Φ_V) ±7%, Forward Voltage (V_F) ±0.05V, Viewing angle($2\theta_{1/2}$) ±10°, Peak wavelength (λ_D) ±1nm.
2. IS standard testing

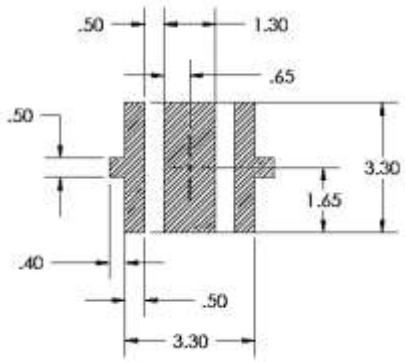
OUTLINE DIMENSION:

Package Dimension:

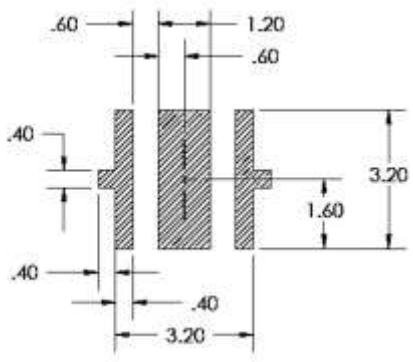


1. All dimensions are in millimetre (mm).
2. Tolerance ±0.13mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



Recommended PCB Solder Pad



Recommended Stencil Pattern

1. Dimensions are in millimetre (mm).
2. Tolerance ±0.12mm with angle tolerance ±0.5°.

BINNING GROUPS:

Forward Voltage Classifications (I_F = 500mA):

Code	Min.	Max.	Unit
V2830	2.8	3.0	V
V3032	3.0	3.2	
V3234	3.2	3.4	
V3436	3.4	3.6	
V3638	3.6	3.8	
V3840	3.8	4.0	

Radiant Power Classifications (I_F = 500mA):

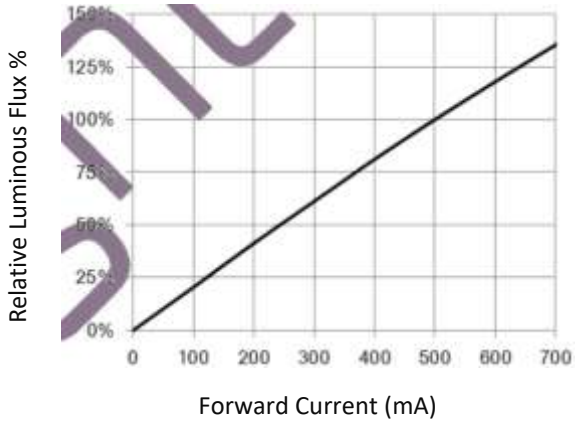
Code	Min.	Max.	Unit
U062	620	660	mW
U066	660	700	
U070	700	740	
U074	740	780	
U078	780	820	
U082	820	860	
U086	860	900	
U090	900	940	

Peak Wavelength Classifications (I_F = 500mA):

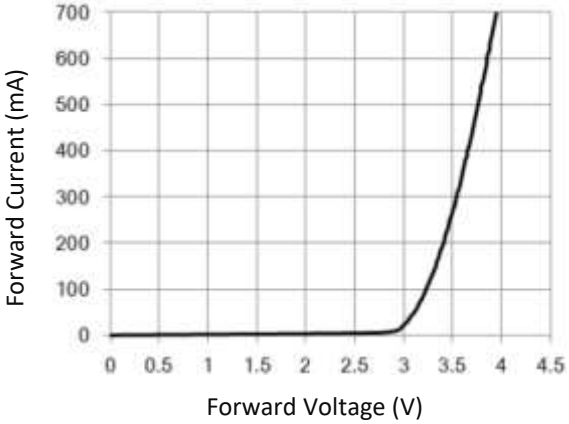
Code	Min.	Max.	Unit
Q390	390	395	nm
Q395	395	400	

ELECTRO-OPTICAL CHARACTERISTICS:

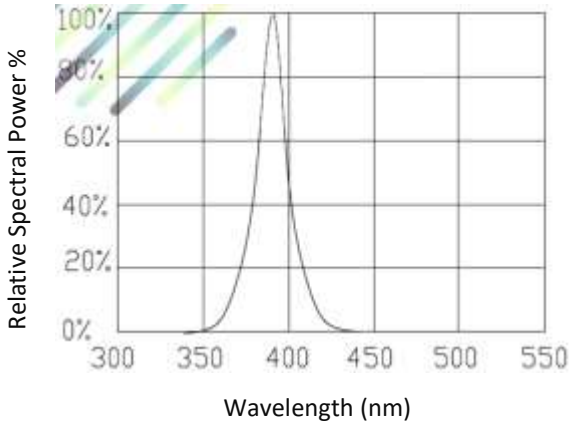
Relative Luminous Flux v.s. Forward Current



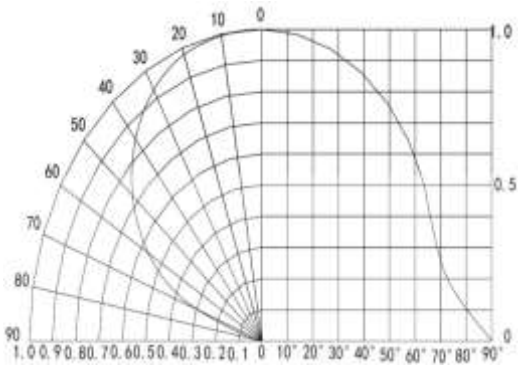
Forward Current v.s. Forward Voltage



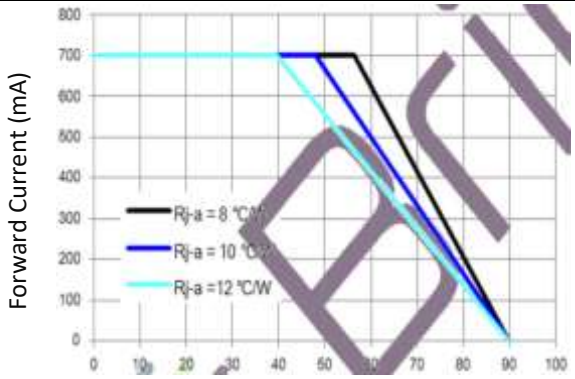
Relative Spectral Power v.s. Wavelength

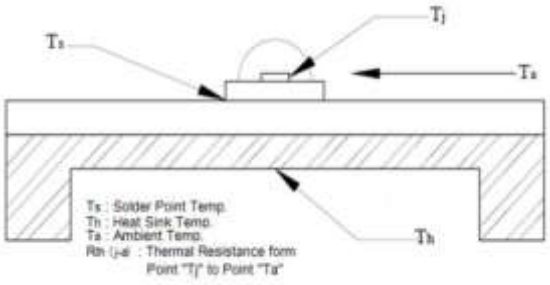


Directive Radiation



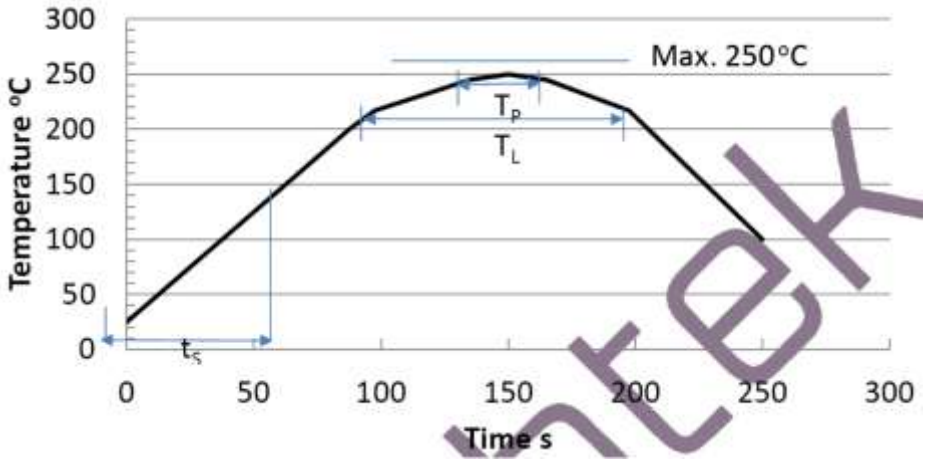
Forward Current Derating Curve





RECOMMENDED SOLDERING PROFILE:

Reflow Lead-free Solder:



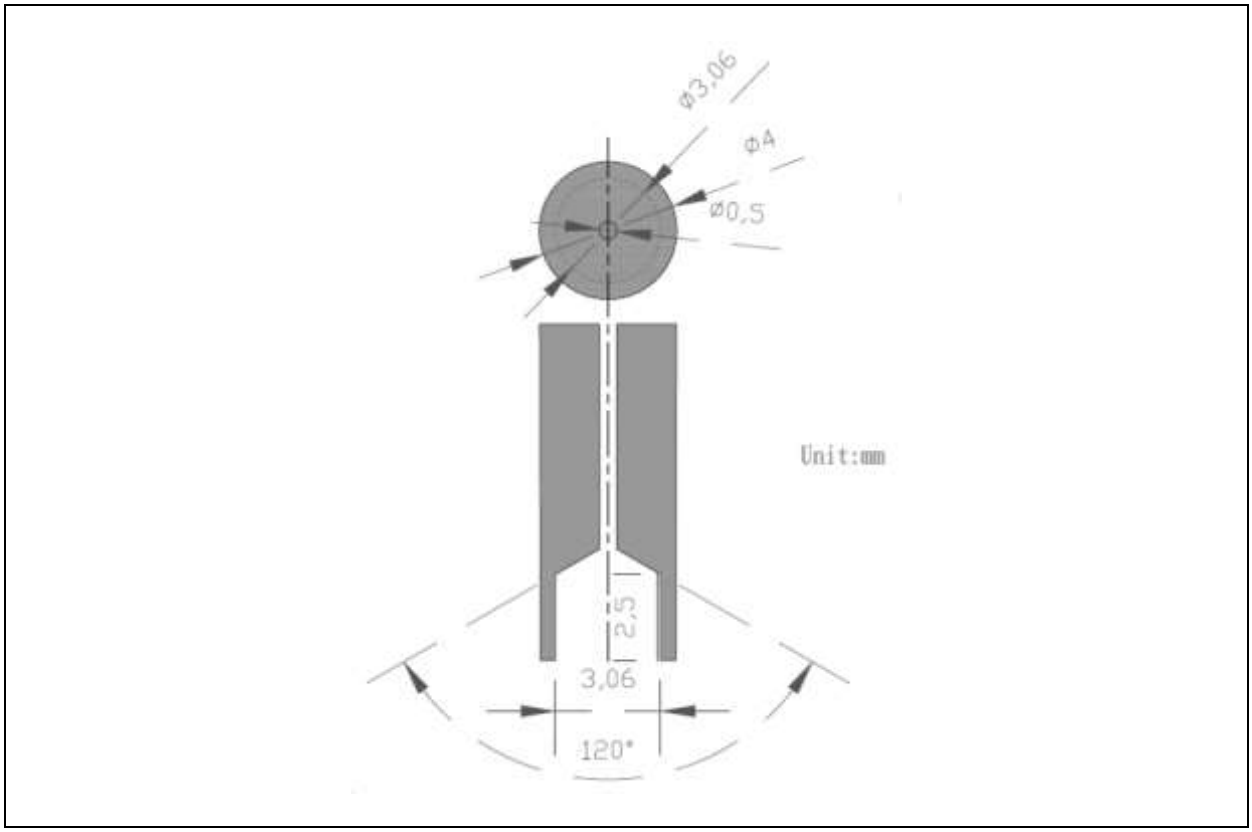
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up Rate to Preheat (25°C to 150°C)			2	3	K/s
Time t_S (T_{Smin} to T_{smax})	t_S	60	100	120	s
Ramp-up Rate to Peak (T_{Smax} to T_P)			2	3	K/s
Liquidus Temperature	T_L		217		°C
Time above Liquidus temperature	t_L		80	100	s
Peak Temperature	T_P		245	250	°C
Time within 5 °C of the specified peaktemperature T_P - 5 K	t_P	10	20	30	s
Ramp-down Rate (T_P to 100 °C)			3	4	K/s
Time 25 °C to T_P				480	s

Note:

1. Recommend reflow temperature 240°C. The maximum soldering temperature should be limited to 250°C.
2. Maximum reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

RECOMMENDED NOZZLE FOR SMT:

Recommended Pick & Place Nozzle:

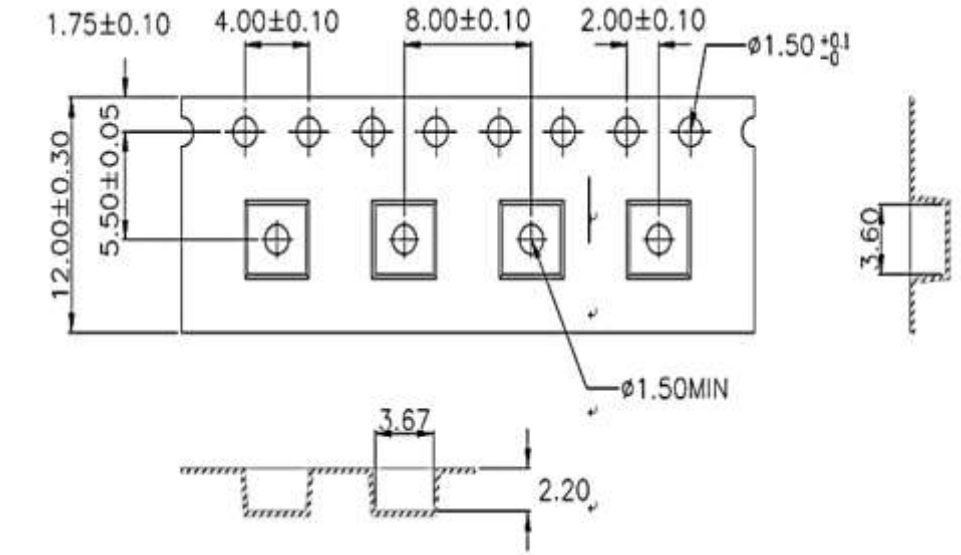


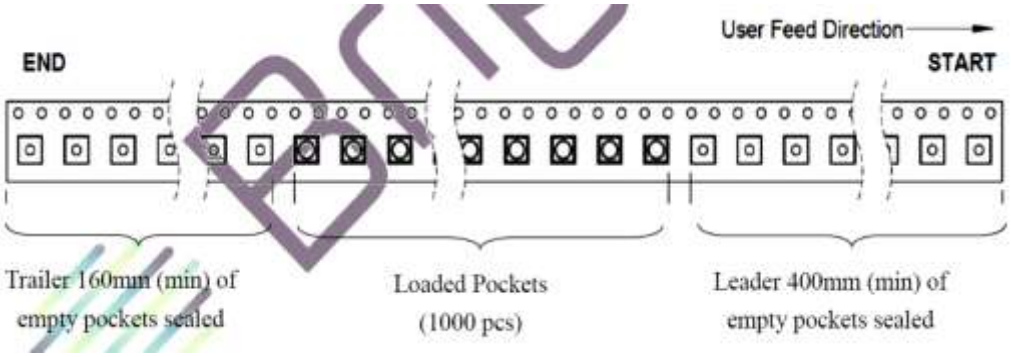
1. All dimensions are in millimetre (mm).
2. Tolerance ±0.1mm, unless otherwise noted.

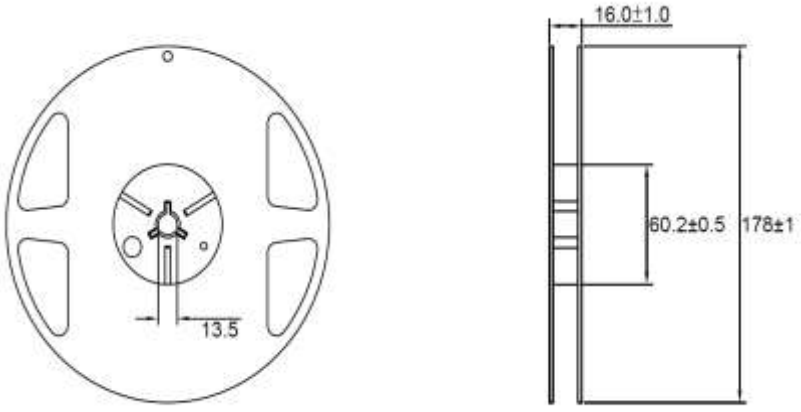
PACKING SPECIFICATION:

Reel Dimension:

Maximum 1000pcs/reel







PRECAUTIONS OF USE:

Storage:

It is recommended to store the products in the following conditions:

- Humidity: 60% R.H. Max.
- Temperature: 5°C~30°C (41°F ~86°F).

Shelf life in sealed bag: 12 months at 5°C~30°C and <60% R.H.

Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp-proof box with descanting agent and apply baking.

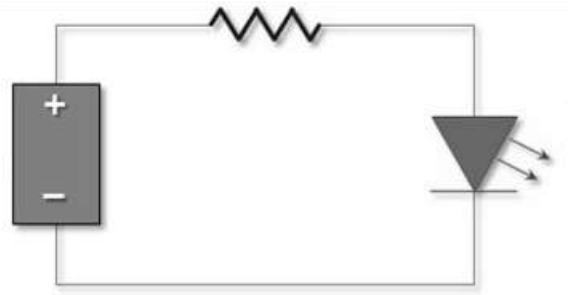
Baking:

It is recommended to bake the LED before soldering if the pack has been unsealed for longer than 24hrs. The suggested baking conditions are as followings:

- 60±3°C x 24hrs and <5%RH, taped / reel package.

It's normal to see slight color fading of carrier (light yellow) after baking in process.

Testing Circuit:



Must apply resistor(s) for protection (over current proof).

Cleaning:

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED carrier / package. Avoid putting any stress force directly on to the LED lens.

ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrosatic glove is recommended when handing the LED all time. All devices, equipment, machinery, work tables, and storage racks must be properly grounded.

In the events of manual working in process, make sure the devices are well protected from ESD at any time.

Test Items and Reliability:

Test Item	Test Condition	Duration / Cycle	Failure Rate	Reference
Thermal Shock	-40°C 30mins ↓↑ 5mins 125°C 30mins	100 cycles	0/22	AEC-Q101
High Temperature Storage	Ta=100°C	1000hrs	0/22	EIAJ ED-4701 200 201
Humidity Heat Storage	Ta=85°C RH=85%	1000hrs	0/22	EIAJ ED-4701 100 103
Low Temperature Storage	Ta=-40°C	1000hrs	0/22	EIAJ ED-4701 200 202
Life Test	Ta=25°C I_F=500Ma	1000hrs	0/22	
High Humidity Heat Operation	85°C RH=85% I_F=500Ma	1000hrs	0/22	
High Temperature Operation	Ta=85°C I_F=500Ma	1000hrs	0/22	
ESD (HBM)	8KV at 1.5Kω 100pf	3 times	0/22	MIL-STD-883

Failure Criteria				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	V_F	I_F=500Ma	-	USL[1] x 1.1
Reverse Current	I_R	V_R=5V	-	100μA
Luminous Intensity	I_V	I_F=500Ma	LSL[2] x 0.7	-

1. USL: Upper Specification Level.
2. LSL: Lower Specification Level.

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	28/07/2014	Datasheet set-up.
A1.1	29/08/2014	Add picture and starboard information.
A1.2	17/09/2014	Add radiant intensity.
A1.3	04/03/2015	Revised reel quantity.
A1.4	12/03/2015	Update photo and drawing.
A1.5	13/03/2015	Add radiant power and intensity information.
A1.6	16/03/2015	P/N adds suffix Z indicating with Zeners.
A1.7	26/03/2015	Mark with old P/N.
A1.8	19/05/2015	Dimension and characteristics update.
A1.9	20/05/2015	Add carton packing dimension.
A2.0	21/12/2016	Separate 390-400nm and 400-410nm into two part numbers.
A2.1	15/04/2019	Dom lens size changes to 3mm diameter and spec update.