BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

- ► EMC Top View SMD
- ► 2720 0.6t
- ► Red (618nm)

Release Date: 07 March 2021 Version: A1.1

N0R51S90

2720 0.6t Series

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RoHS Compliant

AUTOMOTIVE

FEATURES:

- **Package:** EMC Mono Colour Top View SMD
- **Forward Current:** 200mA
- **Forward Voltage (typ.):** 2.3V
- **Luminous Flux (typ.):** 38lm@200mA
- **Colour:** Red
- **Wavelength:** 618nm
- **Viewing angle:** 120°
- **Materials:**
  - Resin: Silicone (Water Clear)
  - Finishing: Ag plated
- **Operating Temperature:** -40~+125°C
- **Storage Temperature:** -40~+125°C
- **ESD (HBM):** 2KV
- **Grouping parameters:**
  - Forward voltage
  - Luminous flux
  - Dominant wavelength
- **Soldering methods:** Reflow
- **MSL:** acc. to JEDEC Level 2a
- **Packing:** 8mm tape with max.2000/reel, ø180mm (7'')

APPLICATIONS:

- Backlighting
- Indication Light
- Switch light
- Dashboard
- Automotive
- Decoration Lighting

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	200	mA
Peak Forward Current Duty 1/10; width 0.1ms	I_{FP}	700	mA
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Junction Temperature	T_j	150	°C
Thermal Resistance Junction to Solder Point	R_{th}	19	°C/W
Operating Temperature	T_{OPR}	-40~+125	°C
Storage Temperature	T_{STG}	-40~+125	°C

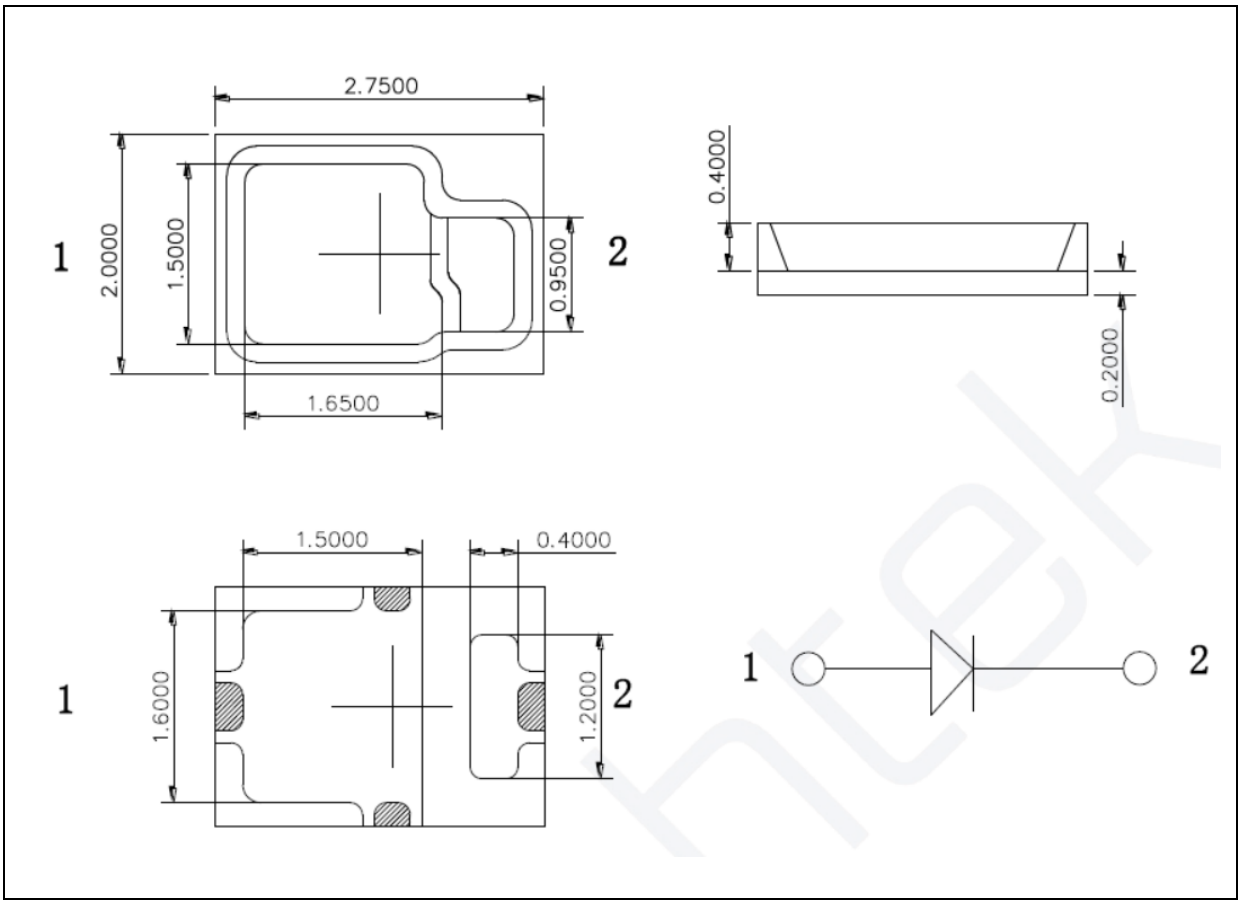
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.8	2.3	2.8	V	I_F=200mA
Luminous Flux	Φ_V	28	38	50	lm	I_F=200mA
Dominant Wavelength	λ_D	613	618	623	nm	I_F=200mA
Peak Wavelength	λ_P	---	622	---	nm	I_F=200mA
Spectral Line Half Bandwidth	$\Delta\lambda$	---	17	---	nm	I_F=200mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=200mA

1. Luminous intensity (I_V) ±10%, Forward Voltage (V_F) ±0.1V.

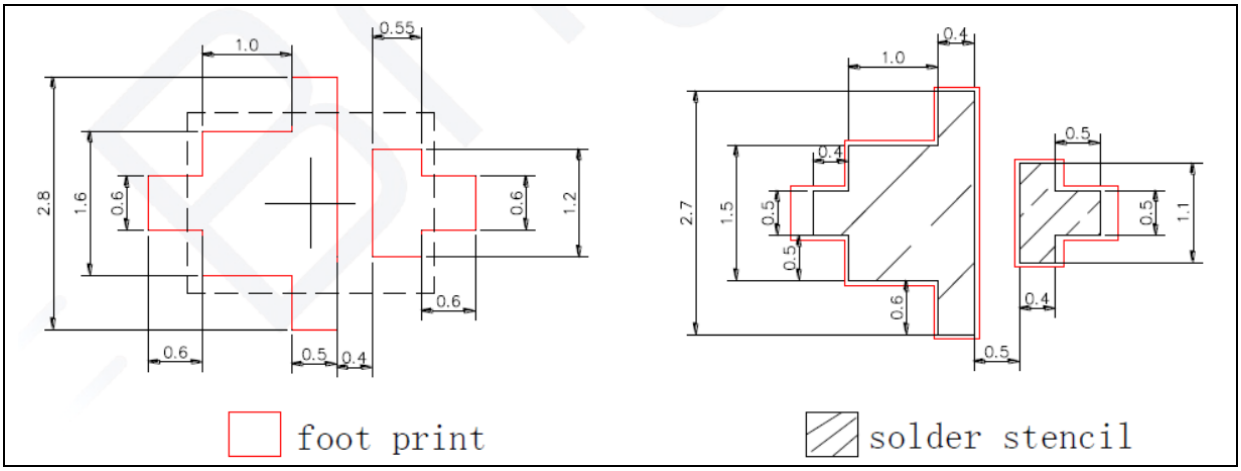
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.2mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance ±0.1mm with angle tolerance ±0.5°.

BINNING GROUPS:

Forward Voltage Classifications (I_F = 200mA):

Code	Min.	Max.	Unit
E	1.8	2.0	V
F	2.0	2.2	
G	2.2	2.4	
H	2.4	2.6	
J	2.6	2.8	

Luminous Flux Classifications (I_F = 200mA):

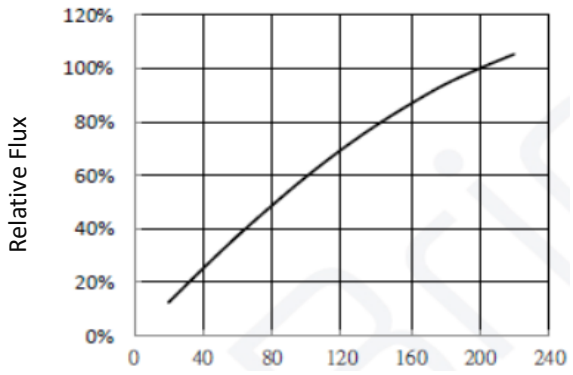
Code	Min.	Max.	Unit
17	28	32	lm
18	32	38	
19	38	44	
20	44	50	

Dominant Wavelength Classifications (I_F = 200mA):

Code	Min.	Max.	Unit
V0	613	618	nm
V1	618	623	

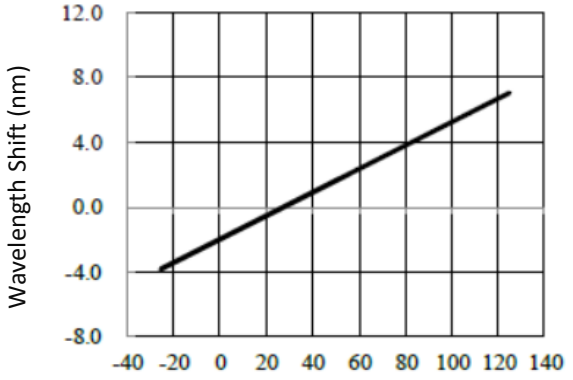
ELECTRO-OPTICAL CHARACTERISTICS:

Relative Flux v.s. Forward Current

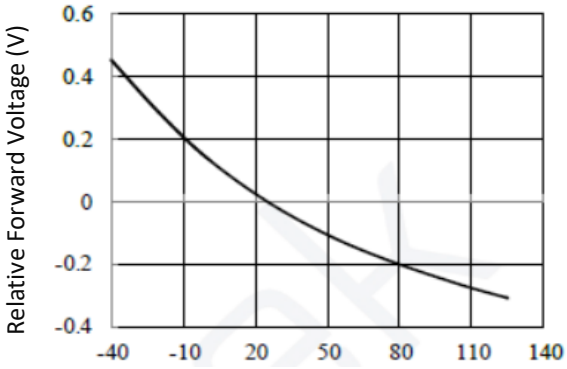


Forward Current v.s. Forward Voltage

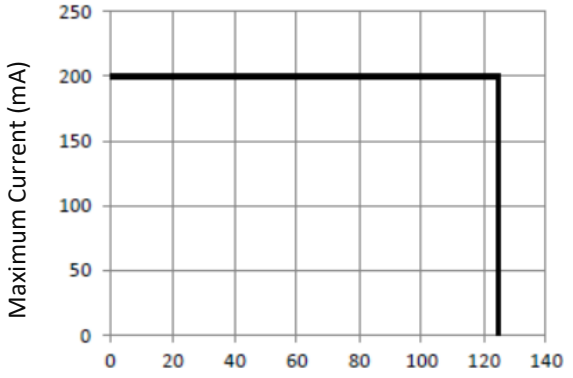
Ambient Temperature v.s. Wavelength Shift



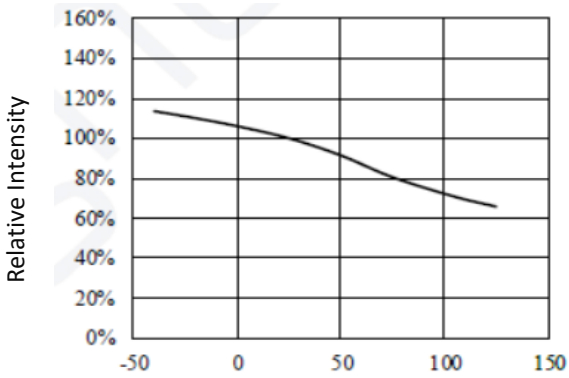
Relative Forward Voltage v.s. Temperature



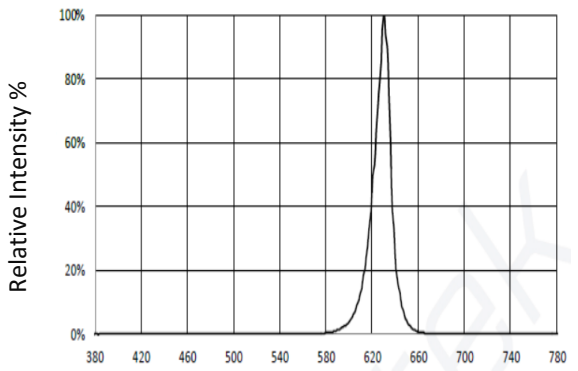
Temperature Derating Chart

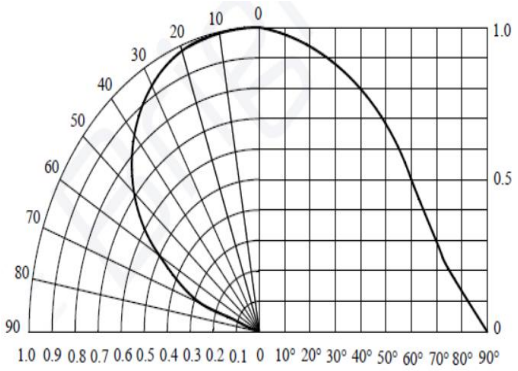


Relative Intensity Flux v.s. Ambient Temperature

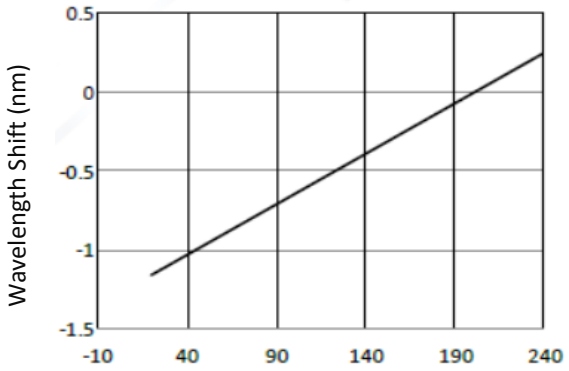


Relative Intensity v.s. Wavelength	Relative Intensity v.s. Angular Displacement



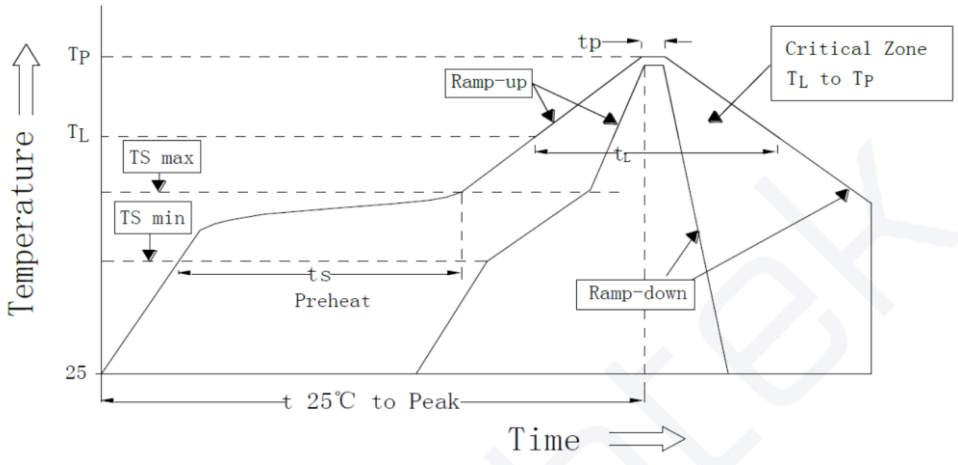


Forward Current v.s. Wavelength Shift



RECOMMENDED SOLDERING PROFILE:

Reflow solder:



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Min.	Recommendation	Max.	
Ramp-up rate to preheat (25°C to 150°C)	-	-	2	3	K/s
Time t_S ($T_{S\ min}$ to $T_{S\ max}$)	t_S	60	100	120	s
Ramp-up rate to peak ($T_{S\ max}$ 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	260	°C
Time within 5 °C of the specified peak temperature T_P - 5 K	t_P	-	-	10	s
Ramp-down Rate (T_P to 100 °C)	-	-	3	4	K/s
Time 25 °C to T_P	-	-	-	480	s

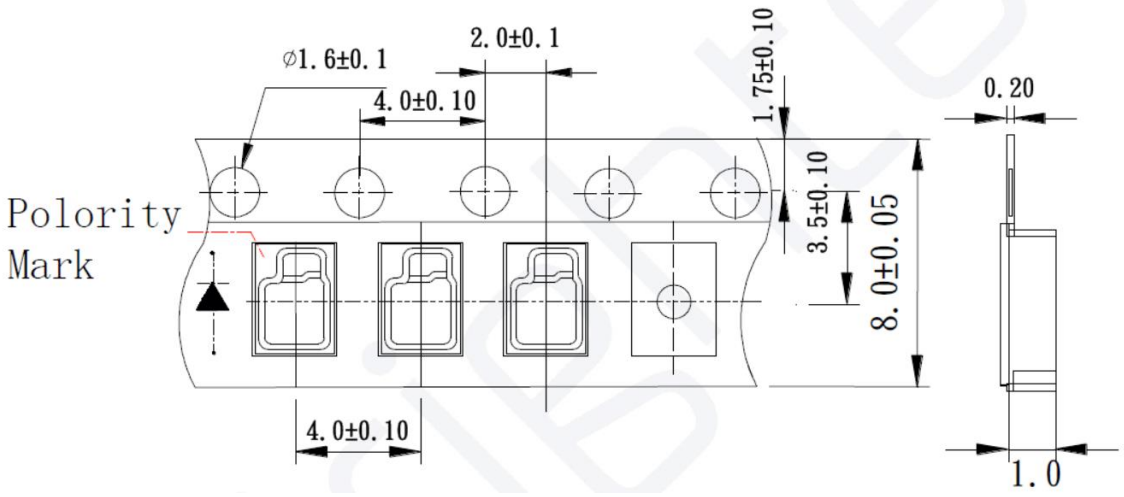
Note:

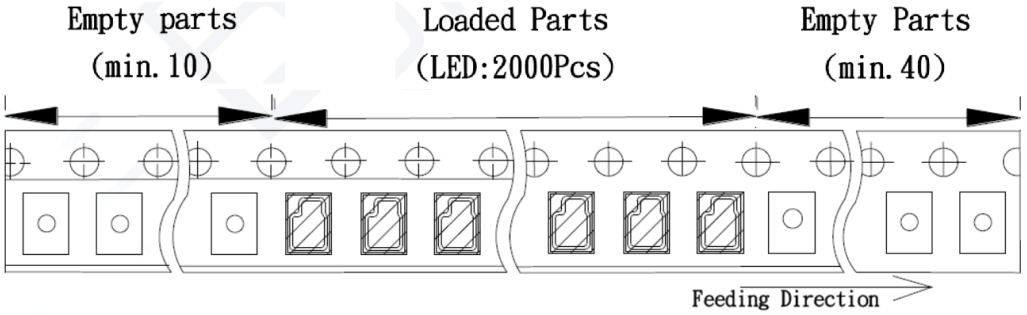
1. Recommend reflow temperature 245°C. The maximum soldering temperature should be limited to 260°C.
2. Maxima reflow soldering: 3 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

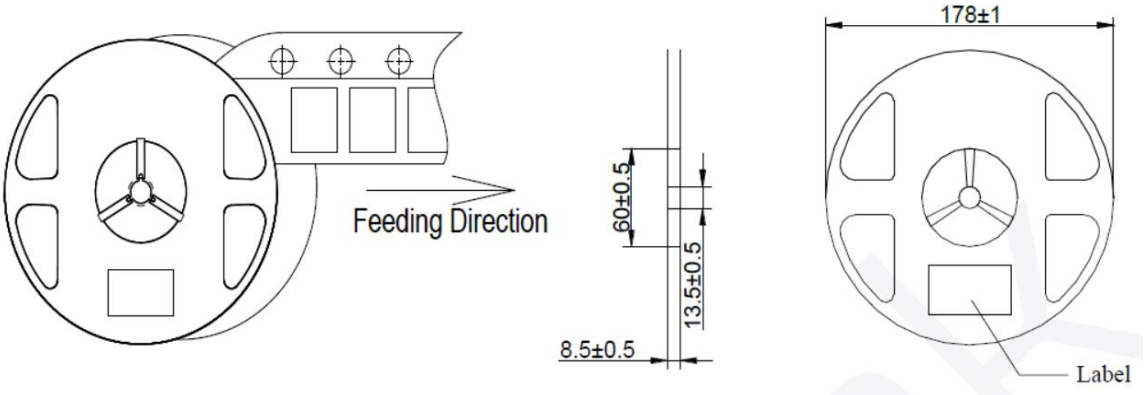
PACKING SPECIFICATION:

Reel Dimension:

Max.2000pcs/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 4 weeks. Otherwise, they should be kept in a damp-proof box with descanting agent <10% R.H. and apply baking before use.

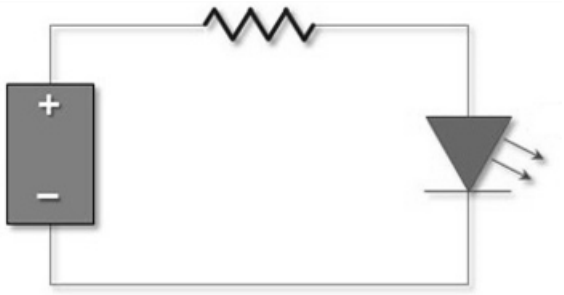
Baking:

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 6hrs 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 105°C 30mins	1000 cycles	0/26	JESD22 A-106
High Temperature Storage	Ta=105°C	1000hrs	0/26	JESD22 A-103B
Low Temperature Storage	Ta=-40°C	1000hrs	0/26	JESD22 A-119
Life Test	Ta=25°C I_F=200mA	1000hrs	0/26	JESD22 A-108
High Humidity Heat Operation	Ta=85°C RH=85% I_F=200mA	1000hrs	0/26	JESD22 A-101
High Temperature Operation	Ta=105°C I_F=200mA	1000hrs	0/26	JESD22 A-108C
ESD (HBM)	2KV at 1.5KΩ 100pf	3 times	0/30	ANSI / JEDEC JS-001

Failure Criteria				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	V_F	I_F=200mA	-	USL[1] x 1.1
Reverse Current	I_R	V_R=5V	-	10μA
Luminous Intensity	I_V	I_F=200mA	LSL[2] x 0.7	-

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

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	07/03/2021	Datasheet set-up.
A1.1	07/03/2021	Revise flux unit.