BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

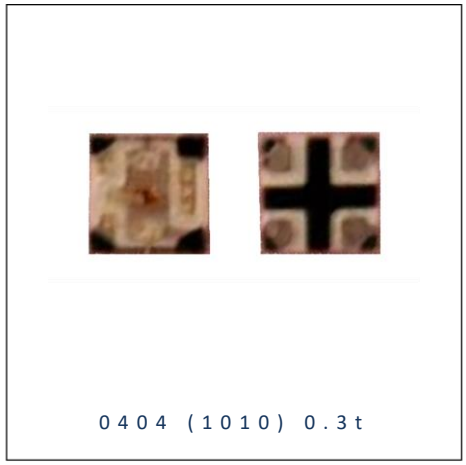
ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

- ▶ PCB / CHIP LED
- ▶ 0404 (1010) 0.3t
- ▶ Red (627nm) / Green (530nm) / Blue (470nm)

Release Date: 27 November 2022 Version: A1.4

N0M51S11-2MA



0 4 0 4 (1 0 1 0) 0 . 3 t

0404 (1010) 0.3t

RoHS Compliant

FEATURES (Red/Green/Blue):

- **Package:** PCB / CHIP LED Top View SMT Package
- **Forward Current:** 2/2/2mA*
- **Forward Voltage (typ.):** 1.9/2.5/2.5V
- **Luminous Intensity (typ.):** 35/50/20mcd@2mA
- **Colour:** Red/Green/Blue
- **Wavelength:** 627/530/470nm
- **Viewing angle:** 120°
- **Materials:**
  - Die: AlGaInP/InGaN-GaN/InGaN-GaN
  - Resin: Epoxy (Water Clear)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+85°C
- **Grouping parameters:**
  - Forward voltage
  - Luminous intensity
  - Dominant Wavelength
- **Soldering methods:** Reflow soldering
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 8mm tape with max.4000/reel, ø180mm (7'')

* In the order of Red/Green/Blue.

APPLICATIONS:

- Indicator
- Dashboard
- 3C Application
- Backlighting
- Decoration Lighting

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	30/30/30	mA
Peak Forward Current Duty 1/8@1KHz	I_{FP}	125	mA
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Power Dissipation	P_D	46/56/56*	mW
Electrostatic Discharge (HBM)	ESD	4/2/2	KV
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+85	°C

1. * In the order of Red/Green/Blue.

Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.7/2.3/2.4*	---	2.1/2.7/2.7	V	I_F=2mA
Luminous Intensity	I_V	25/35/16	---	45/65/24	mcd	I_F=2mA
Dominant Wavelength	λ_D	622/524/465	---	632/538/475	nm	I_F=2mA
Spectral Line Half Bandwidth	$\Delta\lambda$	---	20/35/25	---	nm	I_F=2mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=2mA

1. * In the order of Red/Green/Blue.
2. Luminous intensity (I_V) ±15%, Forward Voltage (V_F) ±0.1V, Wavelength (λ_D) ±1nm.

CHARACTERISTICS (WHITE BALANCE):

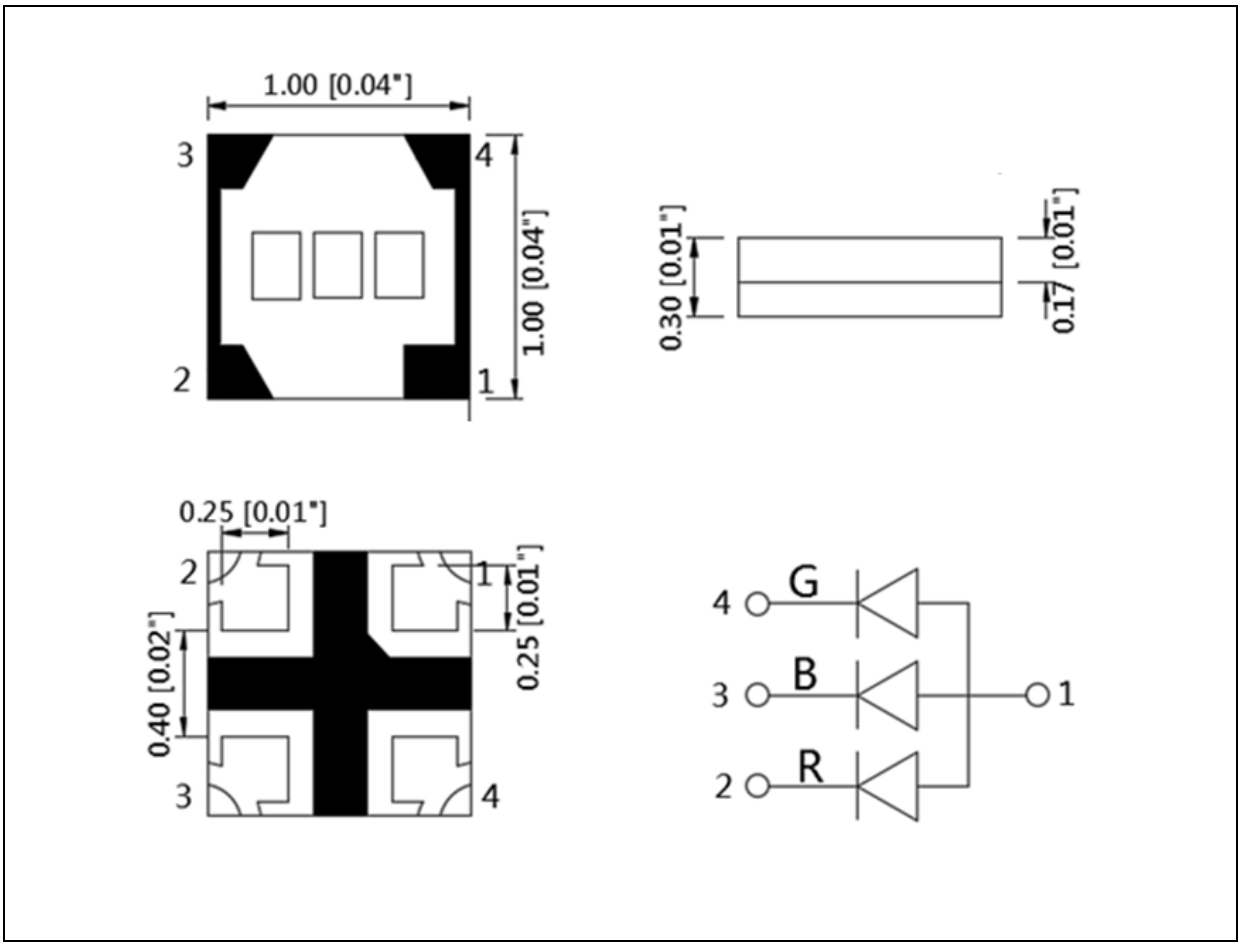
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.7/2.3/2.3*	---	2.1/2.7/2.7	V	R: I_F=0.9mA G: I_F=2mA B: I_F=0.65mA
Luminous Intensity	I_V	45**	---	98	mcd	
Peak Wavelength	λ_P	---	632/518/465	---	nm	
Dominant Wavelength	λ_D	---	624/525/470	---	nm	
Spectral Line Half Bandwidth	$\Delta\lambda$	---	20/35/25	---	nm	
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	
Reverse Current	I_R	---	---	10/50/50	μA	V_R=5V

1. * In the order of Red/Green/Blue.
2. ** when three dies operated simultaneously.
3. Luminous intensity (I_V) ±15%, Forward Voltage (V_F) ±0.1V, Wavelength (λ_D) ±1nm.

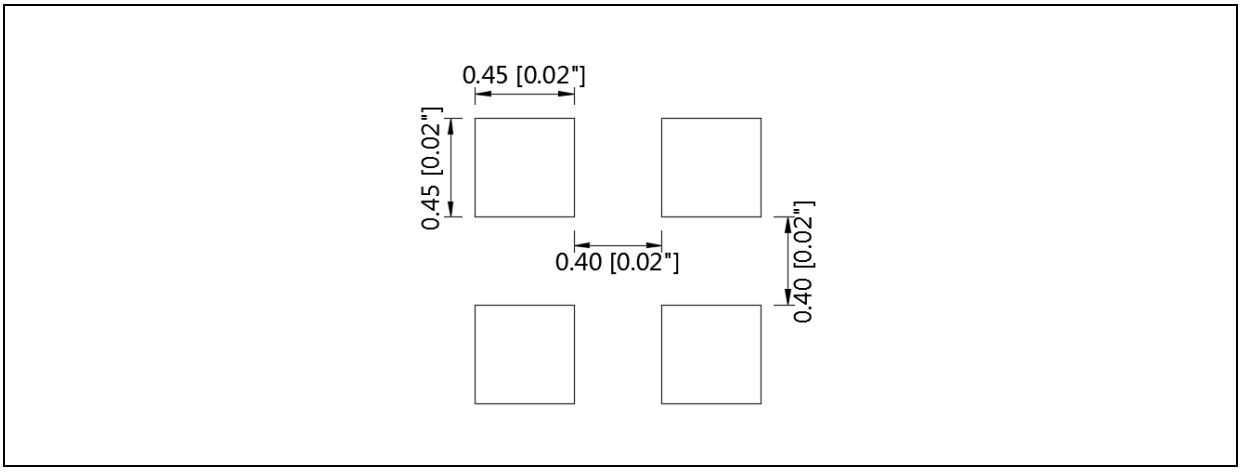
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.1mm, 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 = R:0.9mA / G:2mA / B:0.65mA):

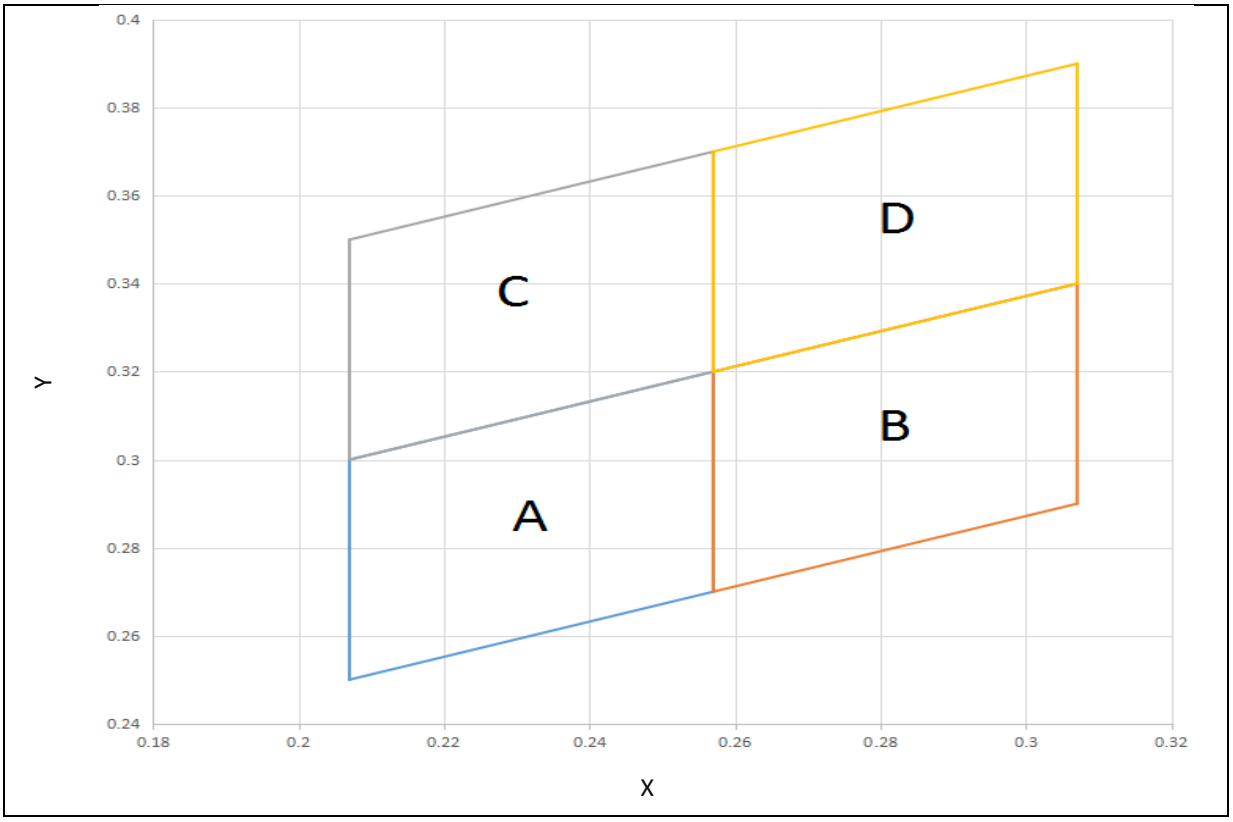
Code		Min.	Max.	Unit
Red R:0.9mA	1	1.7	1.9	V
	2	1.9	2.1	
Green G:2mA	1	2.35	2.4	V
	2	2.4	2.45	
	3	2.45	2.5	
	4	2.5	2.55	
	5	2.55	2.6	
	6	2.6	2.65	
	7	2.65	2.7	
Blue B:0.65mA	1	2.4	2.5	V
	2	2.5	2.6	
	3	2.6	2.7	

Luminous Intensity Classifications (I_F = R:0.9mA / G:2mA / B:0.65mA)*:

Code		Min.	Max.	Unit
R:0.9mA G:2mA B:0.65mA	P1	45	57	mcd
	P2	57	72	
	Q1	72	95	

1. * when three dies operated simultaneously.

CIE CHROMATICITY DIAGRAM:

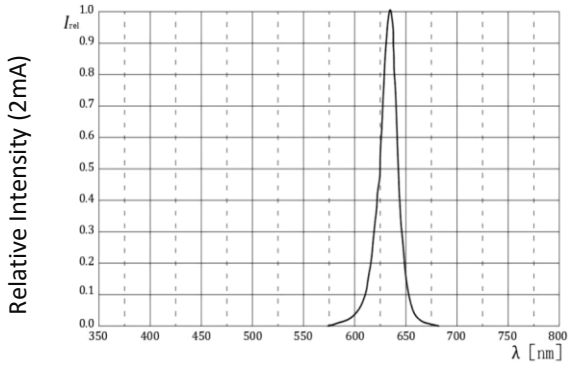
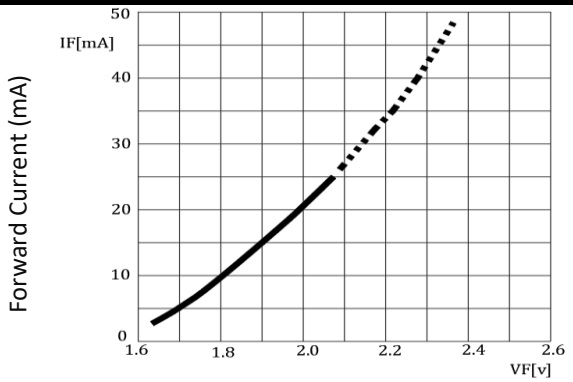


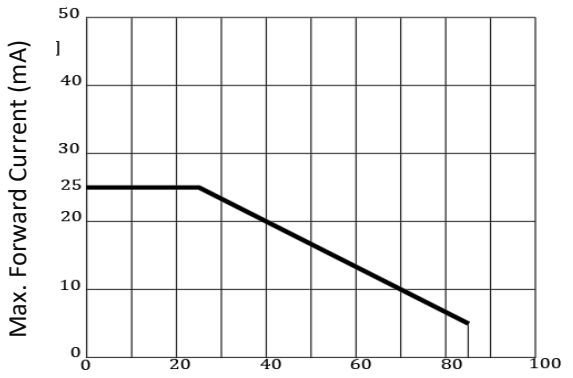
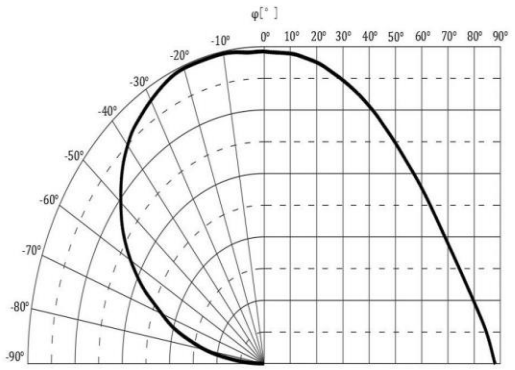
Chromaticity Coordinates Classifications (I_F = R:0.9mA / G:2mA / B:0.65mA):

	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
A	0.2070	0.2500	0.2070	0.3000	0.2570	0.3200	0.2570	0.2700
B	0.2570	0.2700	0.2570	0.3200	0.3070	0.3400	0.3070	0.2900
C	0.2070	0.3000	0.2070	0.3500	0.2570	0.3700	0.2570	0.3200
D	0.2570	0.3200	0.2570	0.3700	0.3070	0.3900	0.3070	0.3400

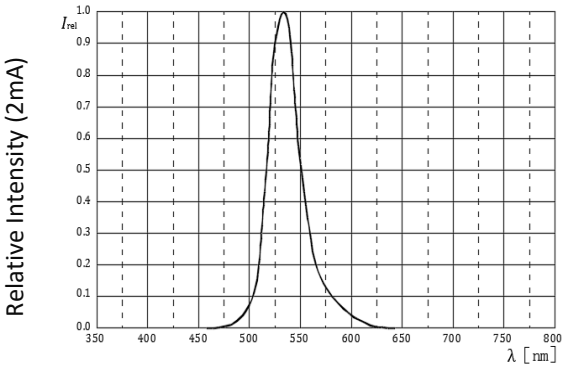
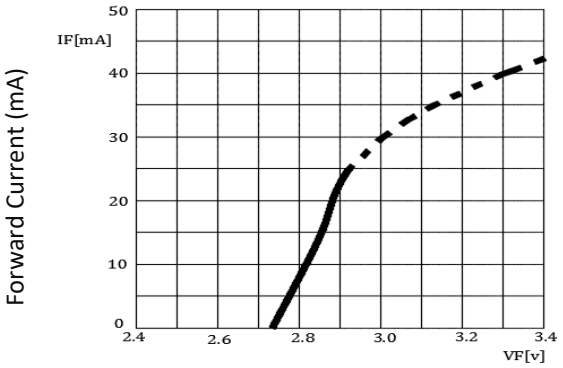
1. The tolerance of luminous intensity (Iv) is ±15%.
2. The tolerance of CIE Coordinates (X, Y) is ±0.01.
3. This specification is a standard specification of our factory, can make in accordance with customer's special requirement.

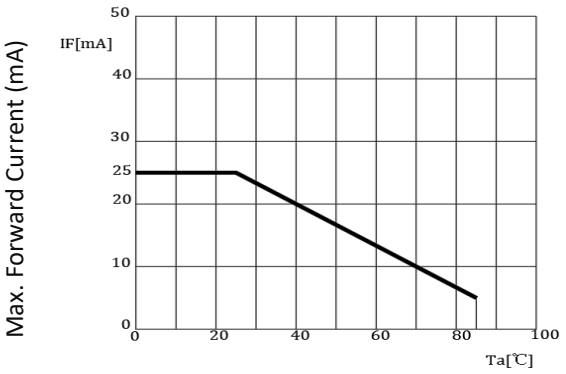
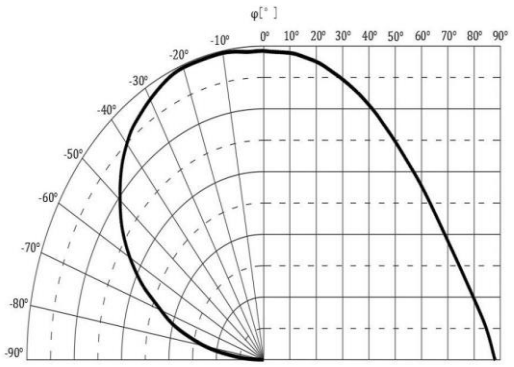
ELECTRO-OPTICAL CHARACTERISTICS (RED):

Relative Spectral Distribution	Forward Voltage v.s. Forward Current
 Wavelength (nm)	 Forward Voltage (V)

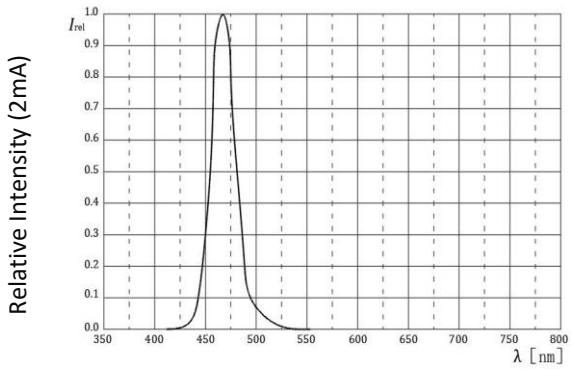
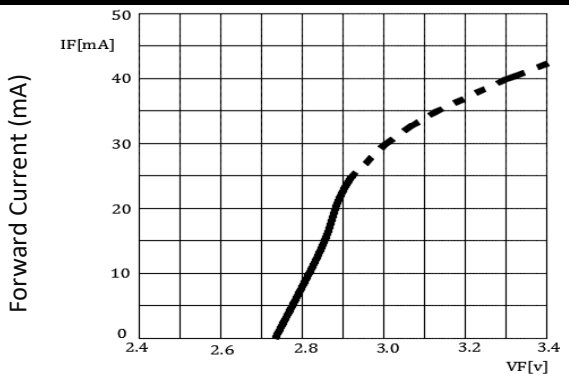
Relative Spectral Distribution	Directive Radiation
 Ambient Temperature (°C)	

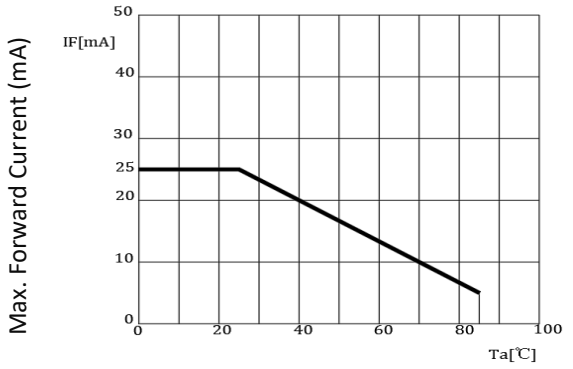
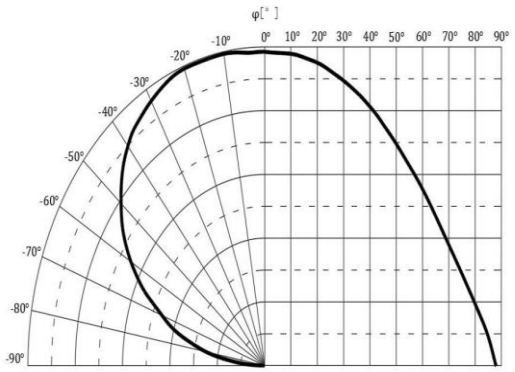
ELECTRO-OPTICAL CHARACTERISTICS (GREEN):

Relative Spectral Distribution	Forward Voltage v.s. Forward Current
	
Wavelength (nm)	Forward Voltage (V)

Relative Spectral Distribution	Directive Radiation
	
Ambient Temperature (°C)	

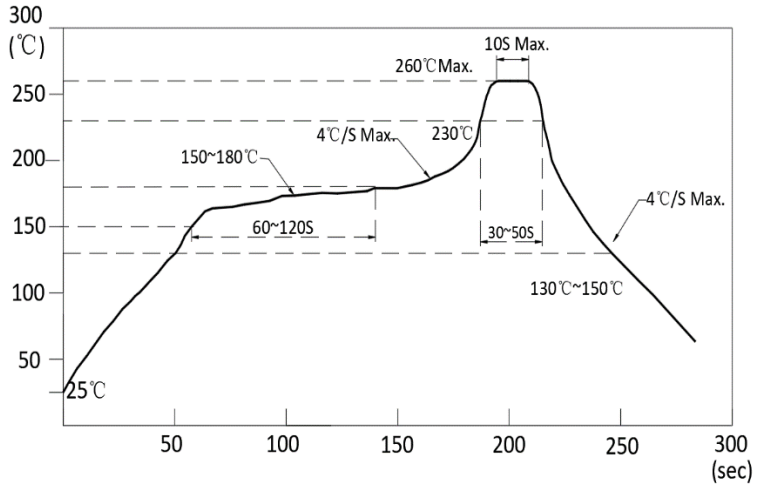
ELECTRO-OPTICAL CHARACTERISTICS (BLUE):

Relative Spectral Distribution	Forward Voltage v.s. Forward Current
	
Wavelength (nm)	Forward Voltage (V)

Relative Spectral Distribution	Directive Radiation
	
Ambient Temperature (°C)	

RECOMMENDED SOLDERING PROFILE:

Reflow Solder:



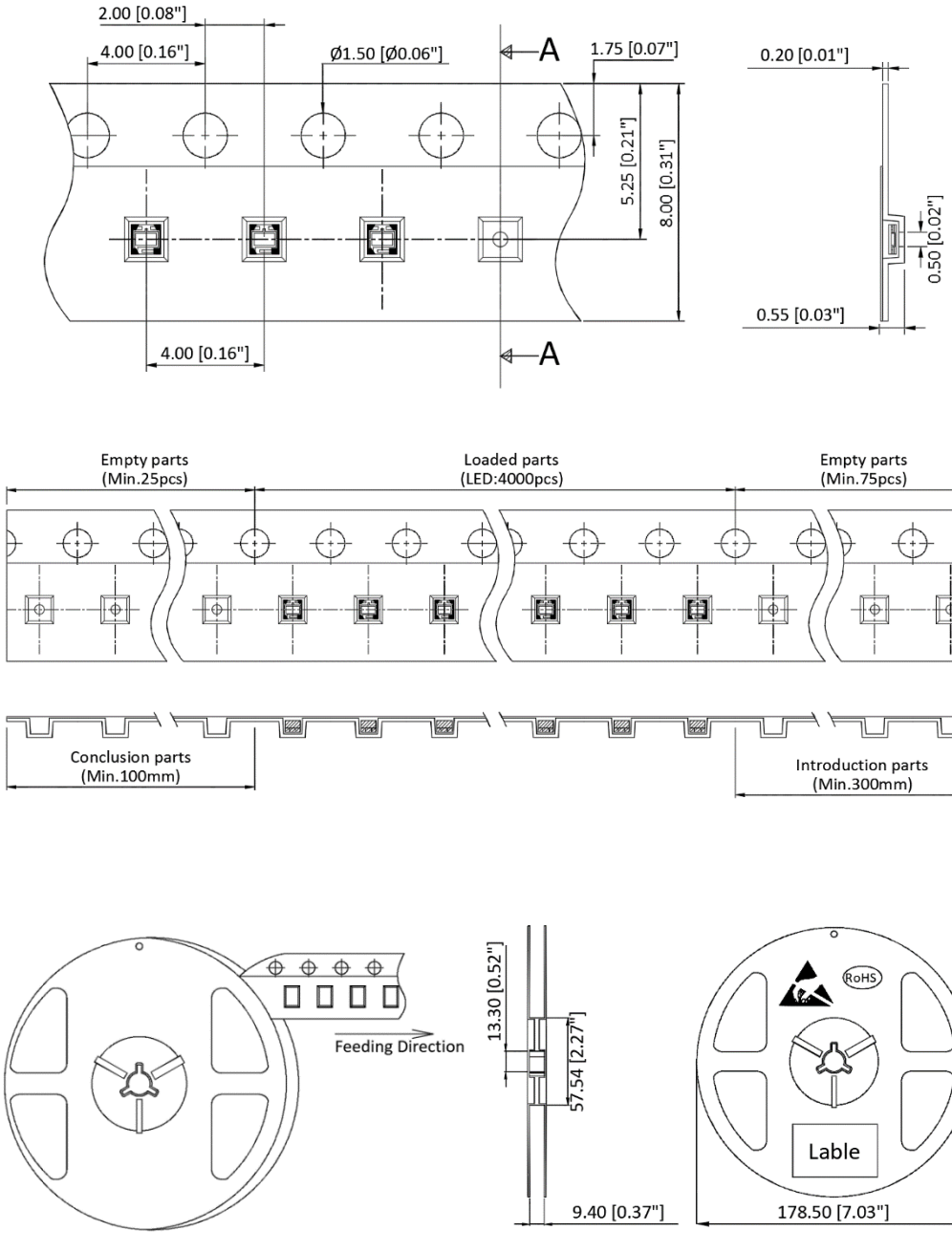
Note:

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

PACKING SPECIFICATION:

Reel Dimension:

Max.4000pcs/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 to be stored at <10% R.H. and apply baking.

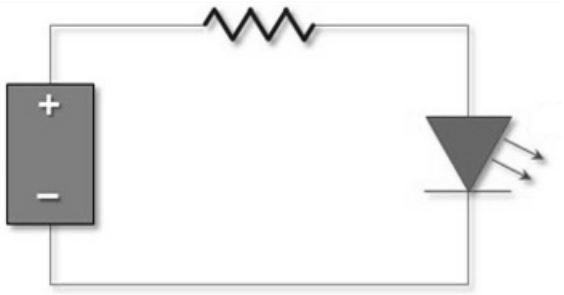
Baking:

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

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

It's normal to see slight color fading of carrier (light Blue) 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.

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	24/03/2020	Datasheet set-up.
A1.1	26/11/2020	Update binning with white balance with CIE.
A1.2	27/11/2020	Correct intensity values at 2Ma.
A1.3	25/02/2021	Add -2MA ending at part number.
A1.4	27/11/2022	Add product photo and revise bin range.