



BRIGHTTEK
BRIGHTTEK (EUROPE) LIMITED

Brighten Up The World With LED!



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 080000 IECQ HSPM

PRODUCT DATASHEET

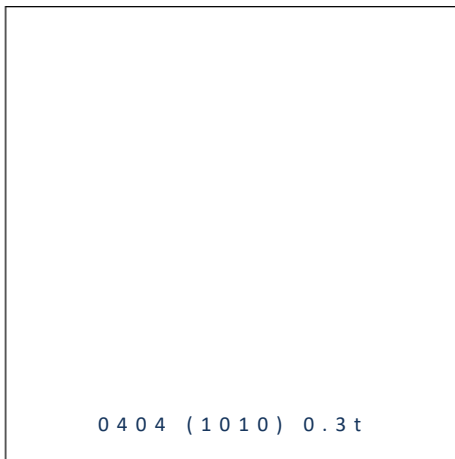


- ▶ PCB / CHIP LED
- ▶ 0404 (1010) 0.3t
- ▶ Red (625nm) / Green (530nm) / Blue (465nm)

NOM51S12-10MA



Release Date: 25 February 2021 Version: A1.0



0404 (1010) 0.3t

0404 (1010) 0.3t

RoHS Compliant



FEATURES (Red/Green/Blue):

- **Package:** PCB / CHIP LED Top View SMT Package
- **Forward Current:** 10/10/10mA*
- **Forward Voltage (typ.):** 2.0/2.9/2.9V
- **Luminous Intensity (typ.):** 280/280/85mcd@10mA
- **Colour:** Red/Green/Blue
- **Wavelength:** 625/530/470nm
- **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	69/102/102	mW
Electrostatic Discharge (HBM)	ESD	4/2/2	KV
Operating Temperature	T _{OPR}	-40~+85	°C
Storage Temperature	T _{STG}	-40~+85	°C

- * 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	1.7/2.5/2.5*	---	2.3/3.4/3.4	V	I _F =10mA
Luminous Intensity	I _v	160/160/50	---	400/400/125	mcd	I _F =10mA
Dominant Wavelength	λ _D	620/525/460	---	630/535/470	nm	I _F =10mA
Spectral Line Half Bandwidth	Δλ	---	20/35/25	---	nm	I _F =10mA
Viewing Angle	2θ _{1/2}	---	120	---	deg	I _F =10mA

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

CHARACTERISTICS (WHITE BALANCE):

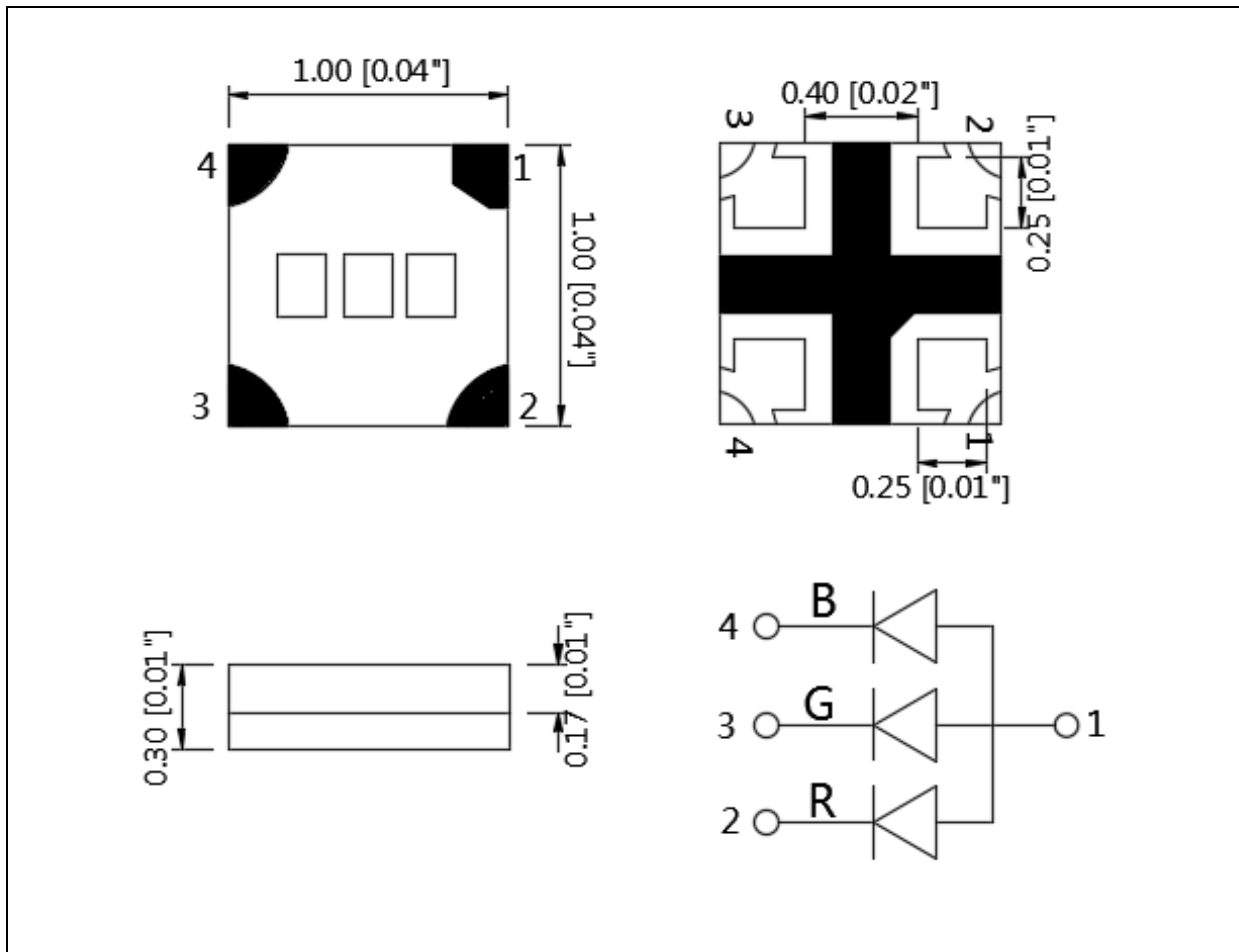
Electrical & Optical Characteristics (Ta=25°C)

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: $I_F=0.9\text{mA}$ G: $I_F=10\text{mA}$ B: $I_F=0.65\text{mA}$
Luminous Intensity	I_V	45**	---	95	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	$V_R=5\text{V}$

- * In the order of Red/Green/Blue.
- ** when three dies operated simultaneously.
- Luminous intensity (I_V) $\pm 15\%$, Forward Voltage (V_F) $\pm 0.1\text{V}$, Wavelength (λ_D) $\pm 1\text{nm}$.

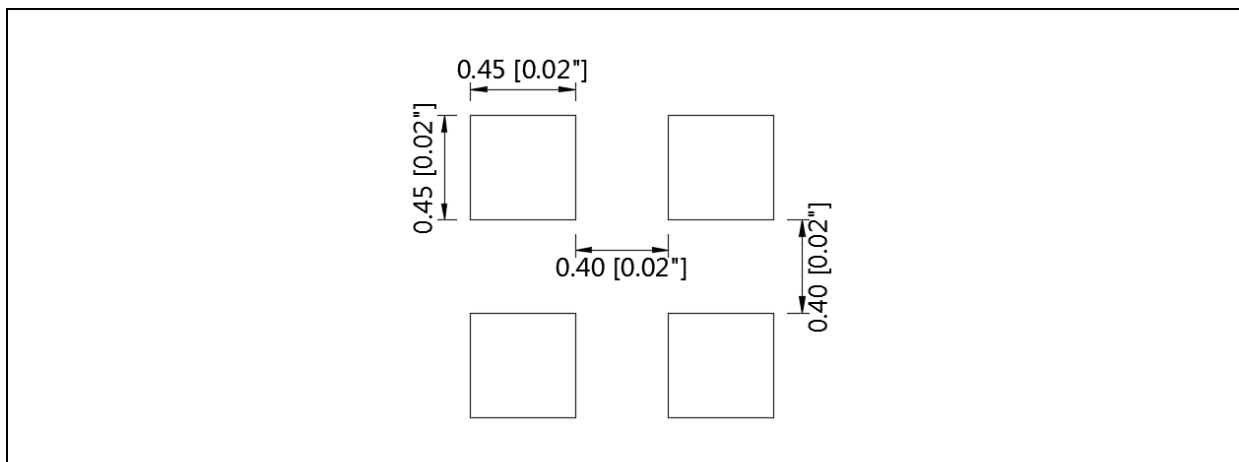
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance $\pm 0.1\text{mm}$, unless otherwise noted.

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance $\pm 0.1\text{mm}$ with angle tolerance $\pm 0.5^\circ$.

BINNING GROUPS:

 Forward Voltage Classifications ($I_F = 10/10/10\text{mA}$):

	Code	Min.	Max.	Unit
Red	□	1.7	2.3	V
Green	e	2.5	2.8	V
	f	2.8	3.1	
	g	3.1	3.4	
Blue	e	2.5	2.8	V
	f	2.8	3.1	
	g	3.1	3.4	

 Luminous Intensity Classifications ($I_F = 10/10/10\text{mA}$):

	Code	Min.	Max.	Unit
Red	L	160	200	V
	M	200	250	
	N	250	320	
	O	320	400	
Green	L	160	200	V
	M	200	250	
	N	250	320	
	O	320	400	
Blue	G	50	63	V
	H	63	80	
	I	80	100	
	J	100	125	

BINNING GROUPS:

 Dominant Wavelength Classifications ($I_F = 10/10/10\text{mA}$):

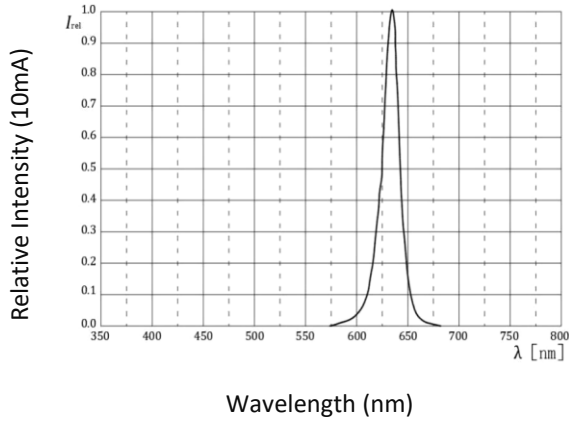
	Code	Min.	Max.	Unit
Red	t	620	625	V
	u	625	630	
Green	W	525	527.5	V
	X	527.5	530	
	Y	530	532.5	
	Z	532.5	535	
Blue	E	460	462.5	V
	F	462.5	465	
	G	465	467.5	
	H	467.5	470	

Example Group Name on Label:

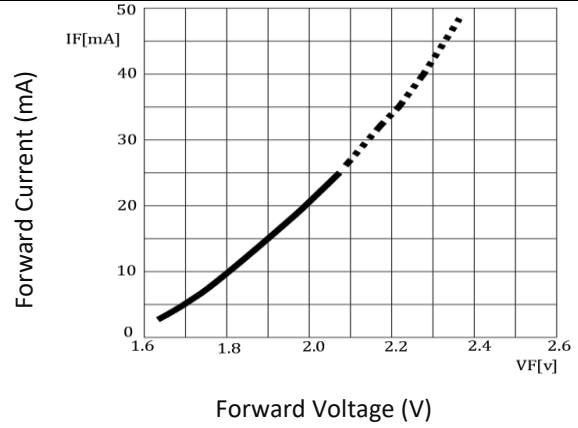
- Mt fNW fHE 10 =**
 Red: (1.7~2.3V) ▶ **M** (200~250mcd) ▶ **t** (620~625nm) ▶ **10** ($I_F=10\text{mA}$)
 Green: (2.8~3.1V) ▶ **N** (250~320mcd) ▶ **W** (525~527.5nm) ▶ **10** ($I_F=10\text{mA}$)
 Blue: (2.8~3.1V) ▶ **H** (63~80mcd) ▶ **E** (460~462.5nm) ▶ **10** ($I_F=10\text{mA}$)

ELECTRO-OPTICAL CHARACTERISTICS (RED):

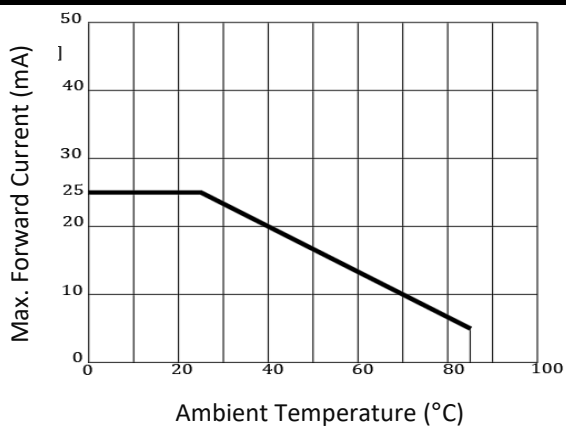
Relative Spectral Distribution



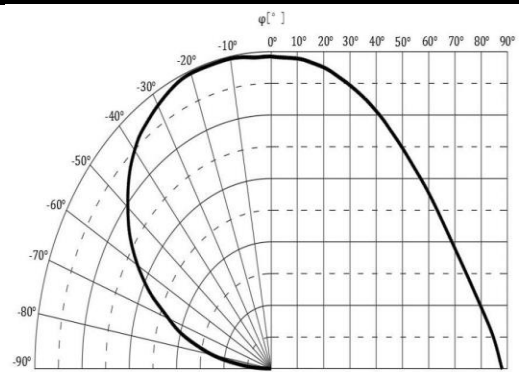
Forward Voltage v.s. Forward Current



Relative Spectral Distribution

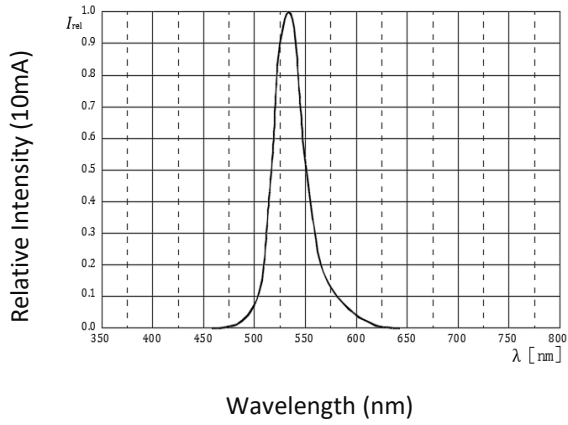


Directive Radiation

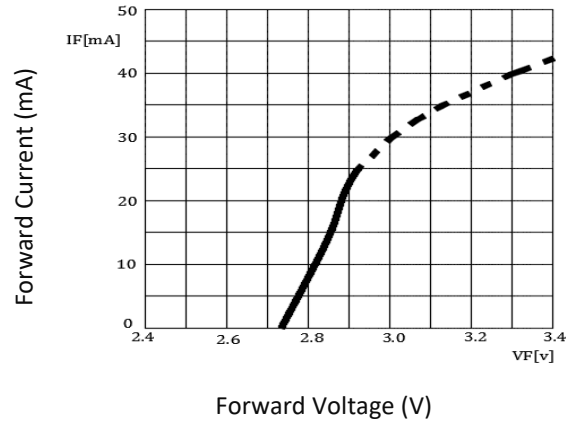


ELECTRO-OPTICAL CHARACTERISTICS (GREEN):

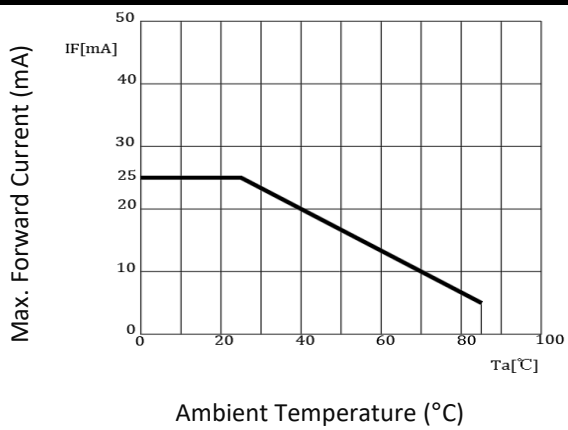
Relative Spectral Distribution



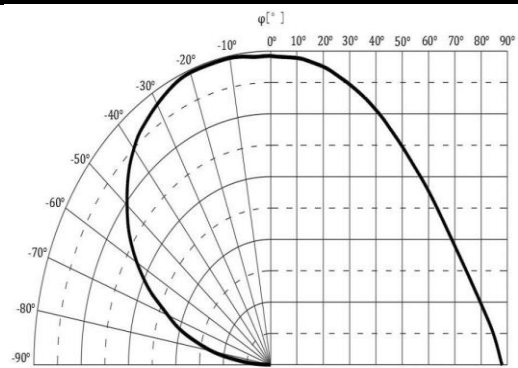
Forward Voltage v.s. Forward Current



Relative Spectral Distribution

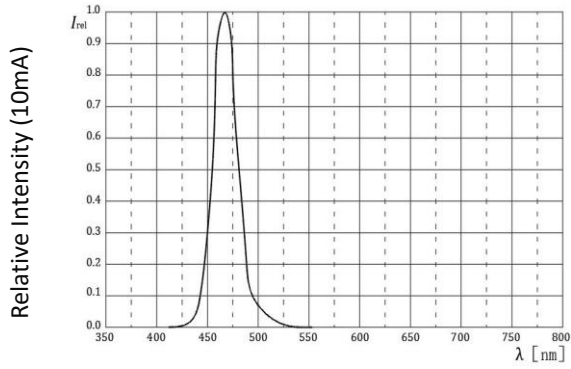


Directive Radiation



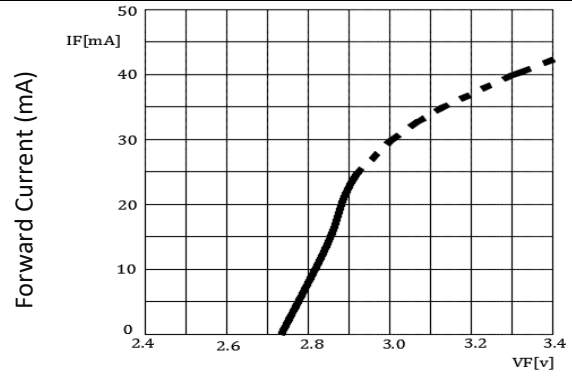
ELECTRO-OPTICAL CHARACTERISTICS (BLUE):

Relative Spectral Distribution



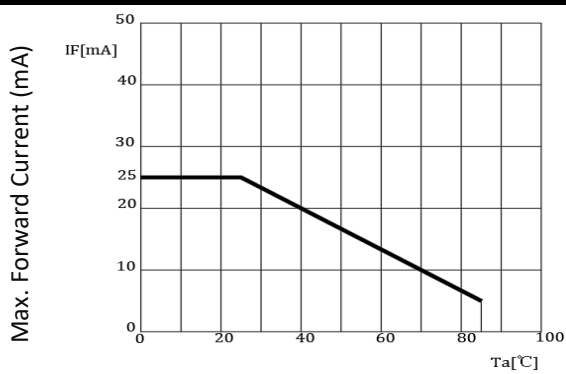
Wavelength (nm)

Forward Voltage v.s. Forward Current



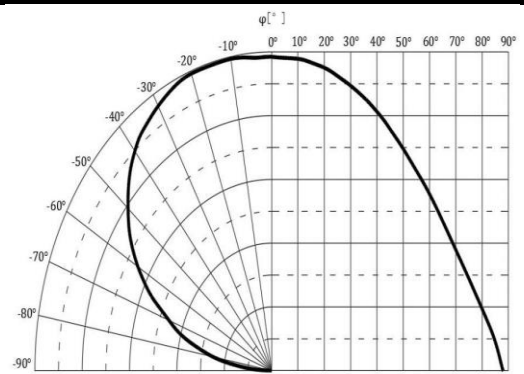
Forward Voltage (V)

Relative Spectral Distribution



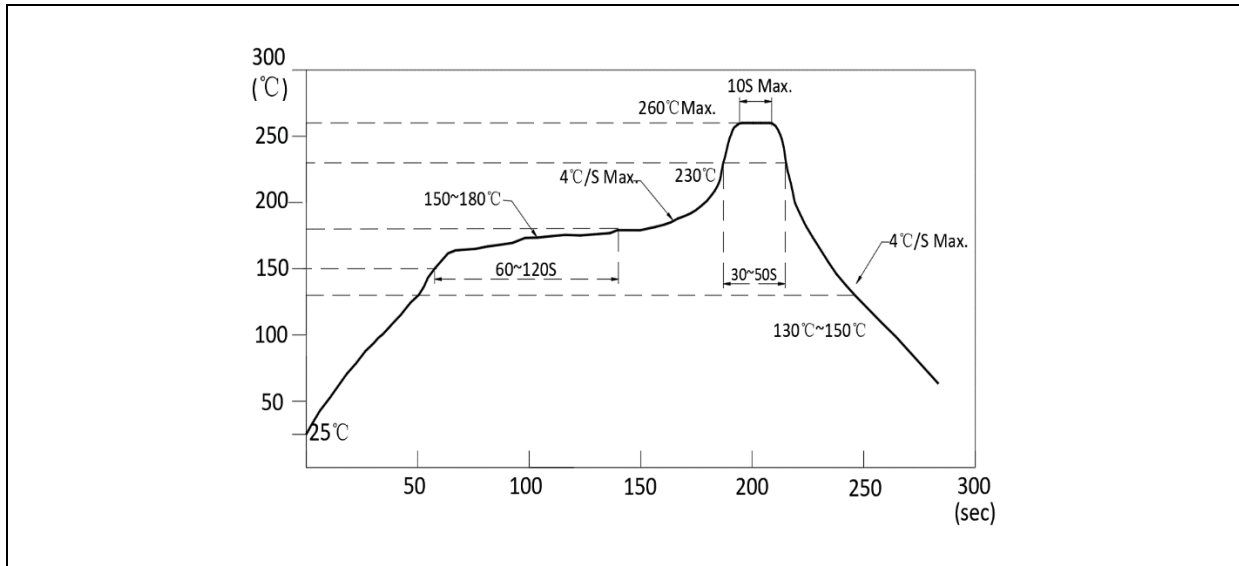
Ambient Temperature (°C)

Directive Radiation



RECOMMENDED SOLDERING PROFILE:

Reflow Solder:

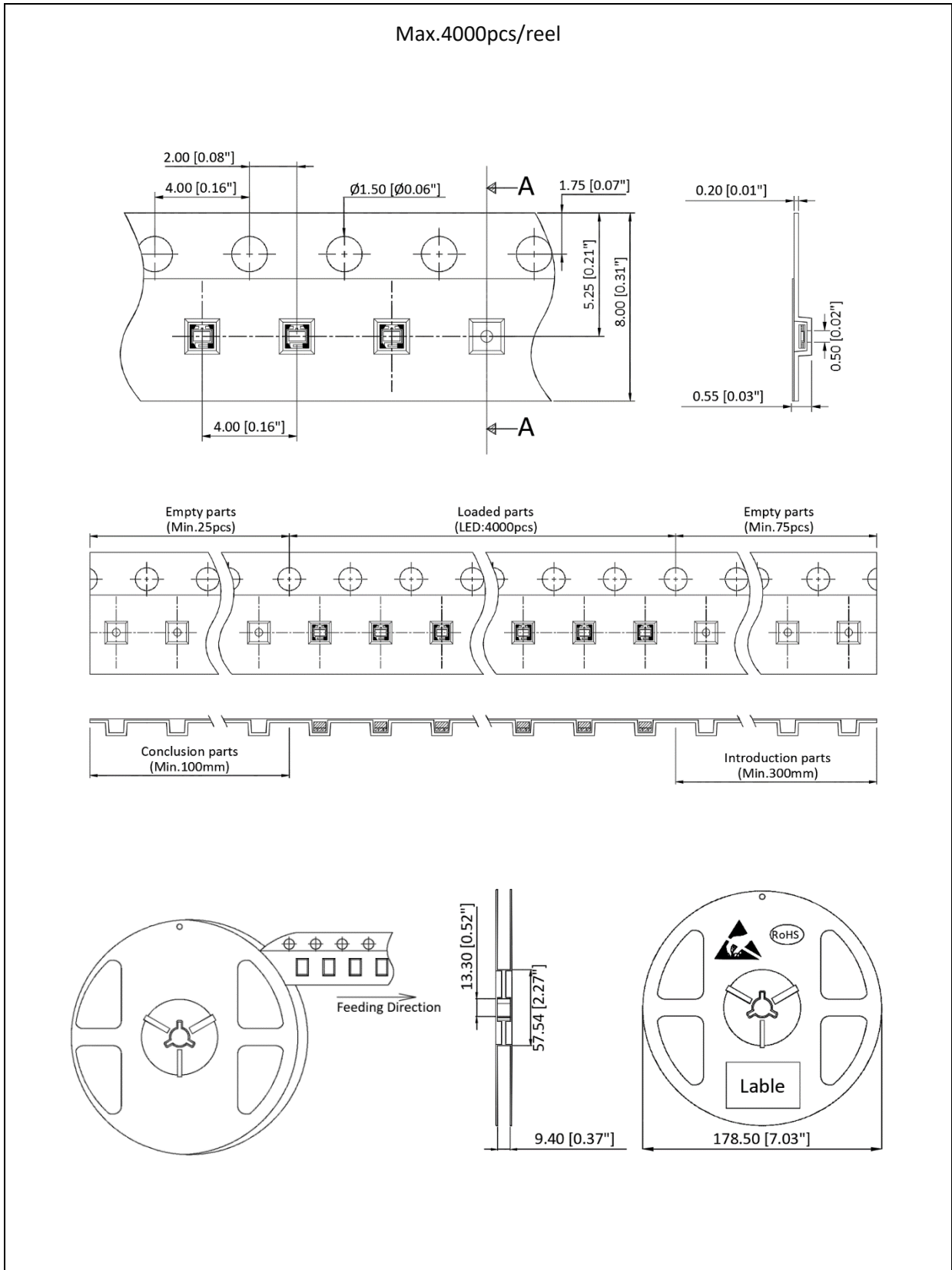


Note:

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:



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 desiccating agent and to be stored at <20% 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 handling 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	25/02/2021	Datasheet set-up.