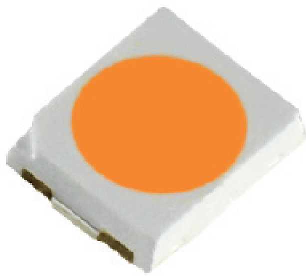
2T03X5PA00031SA1

Ultra high reliability and luminous efficacy ,PLCC LED Series are optimized to be used as lighting for automotive signal lighting designs or signboard.



Automotive Lighting

Applications :

- Automotive Interior/Exterior Lighting

Features :

- Package: Ag Plated 2 pad design package with silicone resin
- Dimension: 3.5 mmx2.8 mm
- Chip technology: InGaN
- View Angle: 120°
- Color : PC Amber
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- MSL: Level 2
- Qualifications: The product qualification test based on the guidelines of AEC-Q102

Lighting Design Manufacturing Service

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General Information

Ordering Code Format

2	T	03	X5	PA	00	03	1	S	A	1
X1	X2	X3-X4	X5-X6	X7-X8	X9-X10	X11-X12	X13	X14	X15	X16

X1		X2		X3-X4		X5-X6		X7-X8	
Type		Component		Series		Wattage		Color/CCT	
2	Emitter	T	PLCC	03	3528	X5	0.5W	PA	PC Amber

X9-X10		X11-X12		X13		X14		X15	
CRI(Ra)		Voltage		Leadframe Mode		Leadframe Plating		Model	
00	-	03	3V	1	PCT 0.80H 2PIN	S	Silver	A	Automotive

X16	
Serial Number	
-	-

Lighting Design Manufacturing Service

Absolute Maximum Ratings

Absolute maximum ratings

Parameter		Symbol	Values
Operating Temperature	min. max.	T_{op}	-40 °C 110 °C
Storage Temperature	min. max.	T_{stg}	-40 °C 110 °C
Junction Temperature	max.	T_j	125 °C
Forward current T_J = 25 °C	min. max.	I_F	5 mA 200 mA
Surge Current t ≤ 10 µs; D = 0.005 ; T_J = 25 °C	max.	I_{FS}	300 mA
Reverse voltage T_J = 25 °C	max.	V_R	Not designed for reverse operation
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)		V_{ESD}	2 kV

Notes: Proper current derating must be observed to maintain junction temperature below the maximum at all time.

Characteristics

I_F = 140 mA; T_J = 25 °C

Parameter		Symbol	Values
Viewing angle	typ.	φ	120 °
Forward Voltage	min. typ. max.	V_F	2.70 V 3.05 V 3.30 V
Reverse current V_R= 5V	typ. max.	I_R	0.01 µA 10 µA
Real thermal resistance junction/solder point	typ. max.	$R_{thJS\ real}$	36 K / W 42 K / W
Electrical thermal resistance junction/ solder point with efficiency ηe = 27%	typ. max.	$R_{thJS\ elec.}$	26 K / W 31 K / W

Luminous Flux Characteristic

Luminous Flux Characteristics, I_F=140mA , T_J=25˚C

Symbol	Group	Min. Luminous Flux(lm)	Max. Luminous Flux(lm)	Typ. Luminous Intensity(cd)
Iv	30	30	35	10.2
	35	35	40	11.7
	40	40	45	13.3
	45	45	50	14.8

Note:
The luminous flux performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of ±10% on flux measurements.

Voltage Bin Structure

Voltage Bin Structure, I_F=140mA , T_J=25˚C

Symbol	Group	Min. Voltage (V)	Max. Voltage (V)
V_F	B70	2.70	2.90
	B90	2.90	3.10
	C10	3.10	3.30

Note:
Forward voltage measurement allowance is ± 0.1V.

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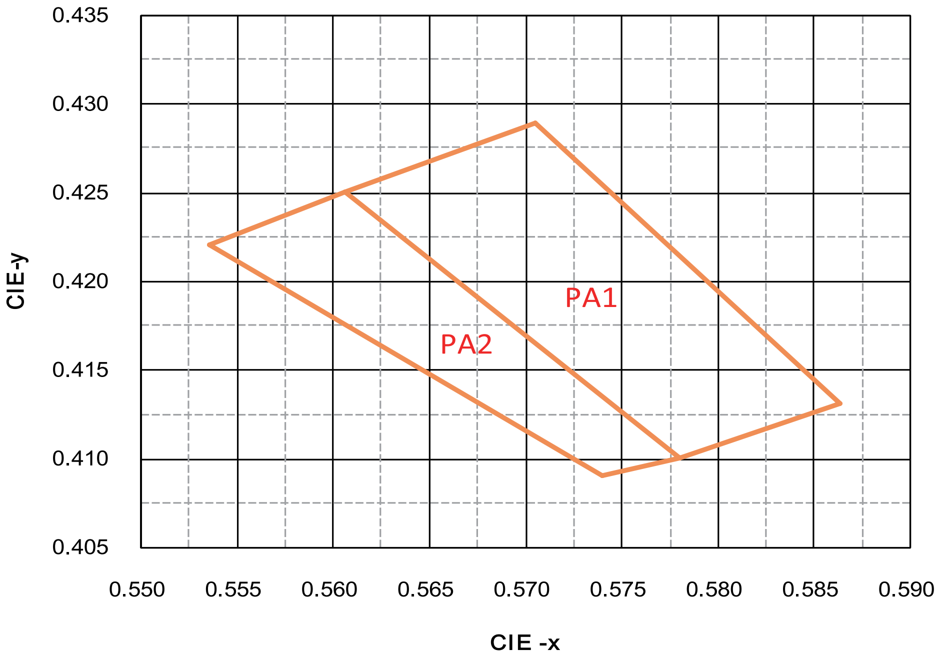
Color BIN code

PC Amber CIE



Color Bin	X	Y	Color Bin	X	Y
PA1	0.5606	0.4250	PA2	0.5536	0.4221
	0.5705	0.4289		0.5606	0.4250
	0.5863	0.4131		0.5780	0.4100
	0.5780	0.4100		0.5740	0.4090

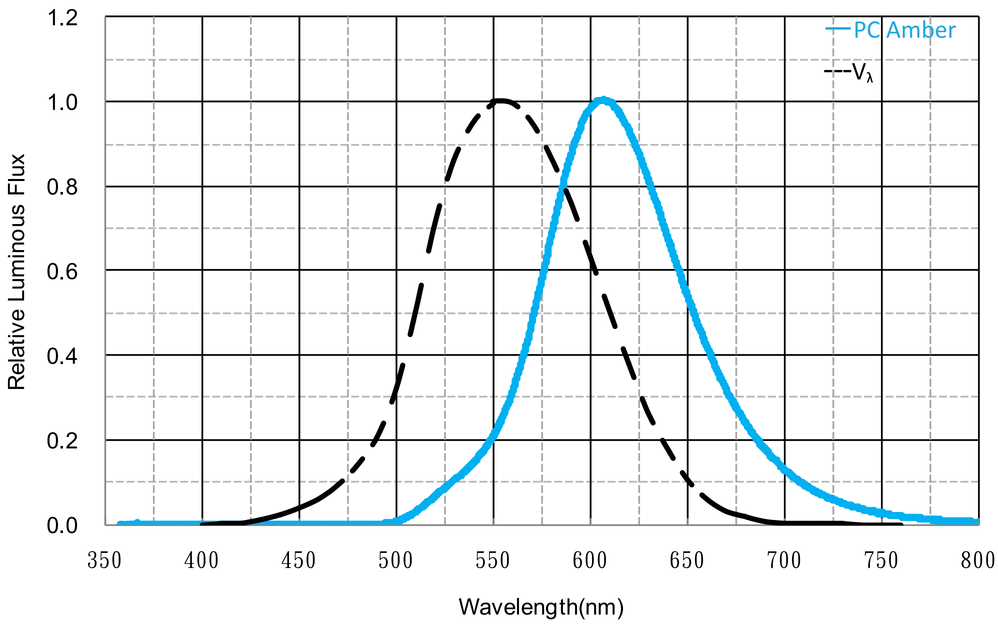
Notes:
1. PLCC 3528 PC Amber Emitters are tested and binned by x,y coordinates.
2. Edison maintains a tester tolerence of ± 0.005 on x, y color coordinates.

Lighting Design Manufacturing Service

Characteristic Curves

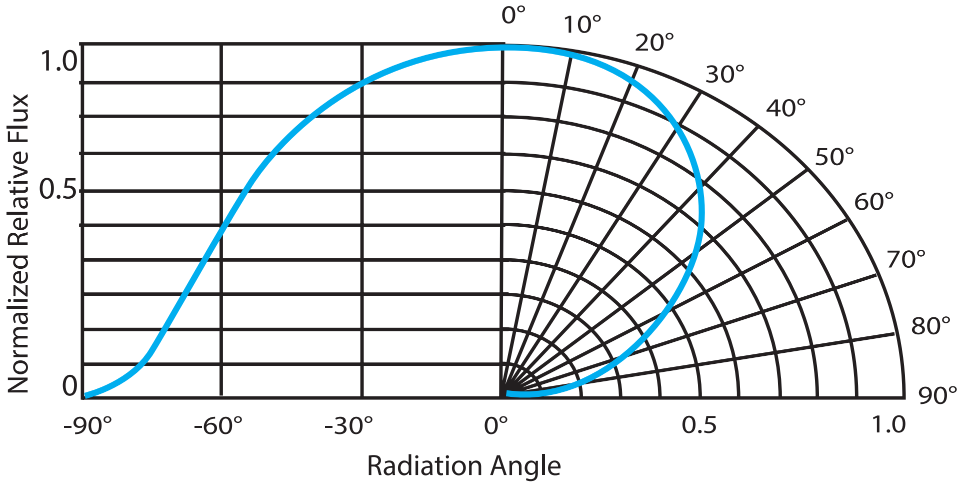
Color Spectrum

I_F =140 mA ; T_J = 25 °C



Beam Pattern

I_F =140 mA ; T_J = 25 °C



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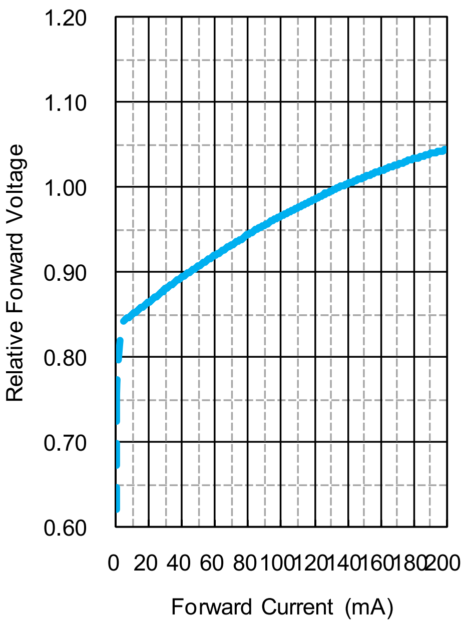
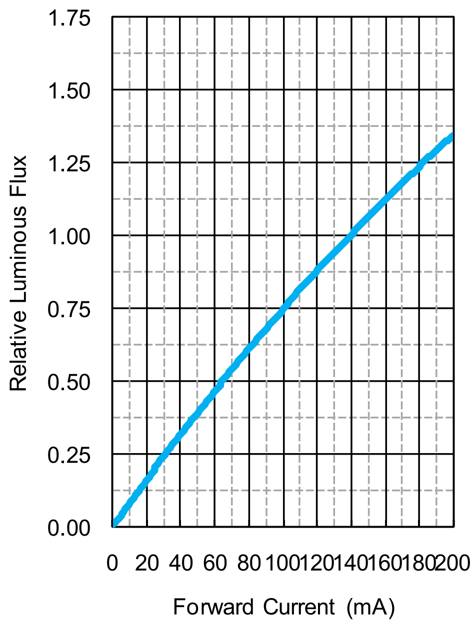
Relative Foward Voltage

V_F/V_F(140 mA) = f(V_F); T_J = 25 °C



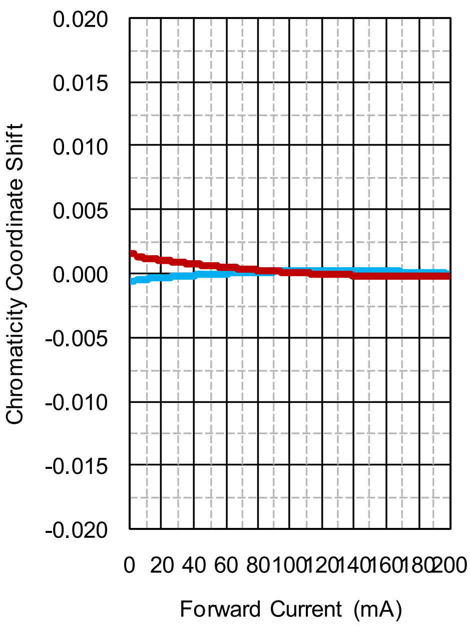
Relative Luminous Flux

I_V/I_V(140 mA) = f(I_V); T_J = 25 °C



Chromaticity Coordinate Shift

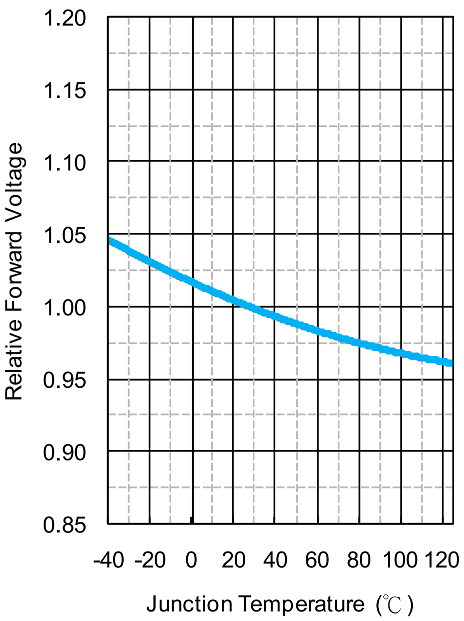
ΔCx, ΔCy = f(I_F); T_J = 25 °C



Lighting Design Manufacturing Service

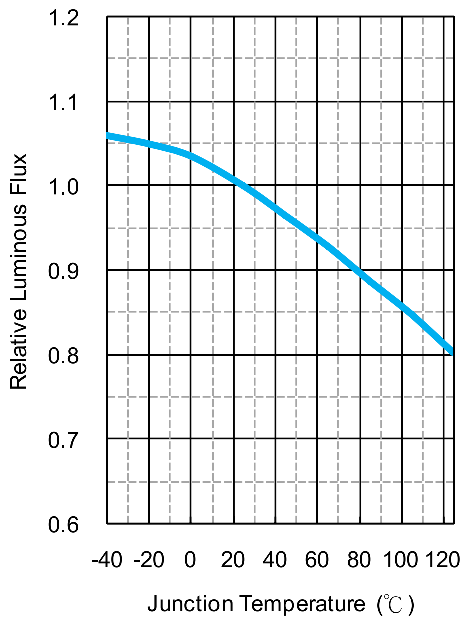
Relative Forward Voltage

$V_F/V_F(25\ °C) = f(V_F)$; $I_F = 140$ mA



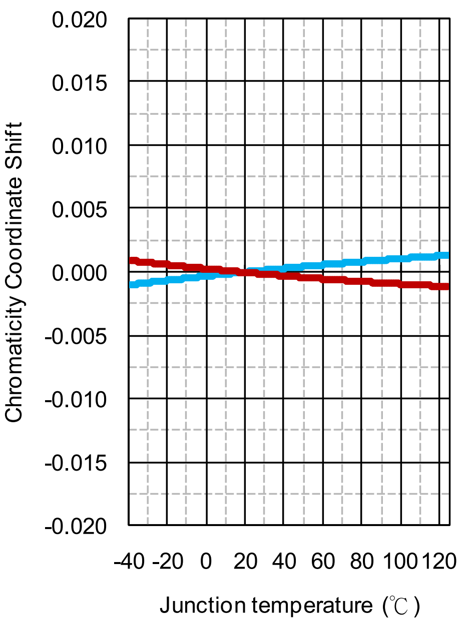
Relative Luminous Flux

$I_v/I_v(25\ °C) = f(I_v)$; $I_F = 140$ mA



Chromaticity Coordinate Shift

$\Delta Cx, \Delta Cy = f(T_j)$; $I_F = 140$ mA



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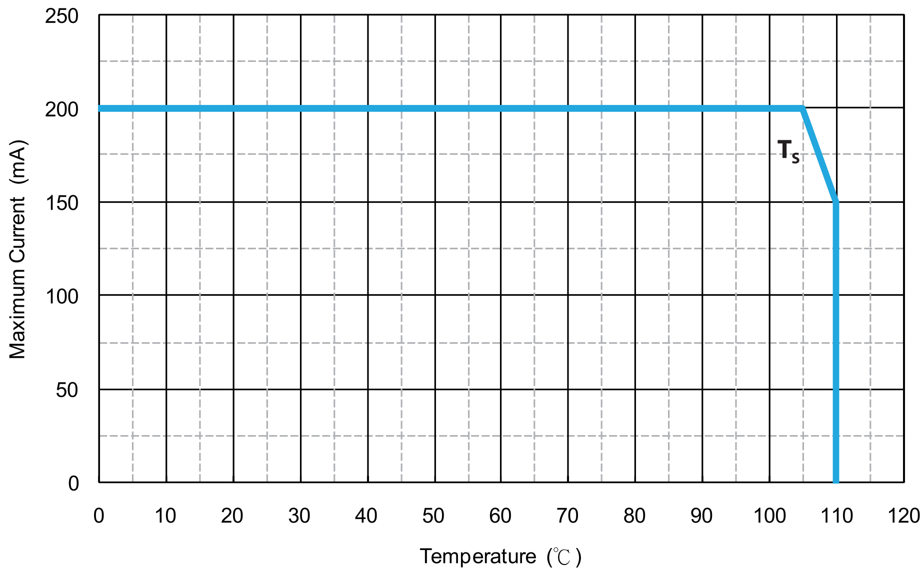
Max. Permissible Forward Current

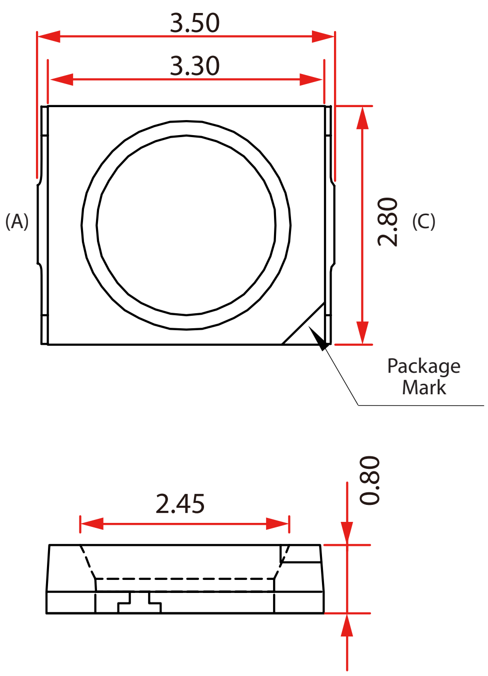
$I_F = f(T)$

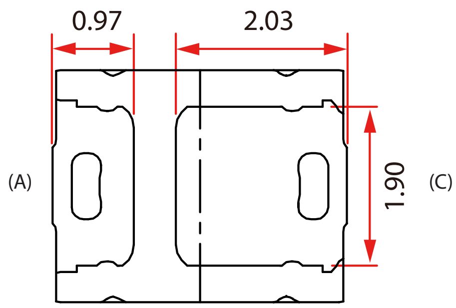


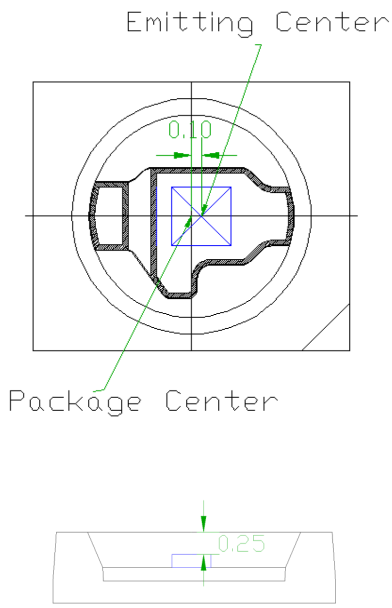
Lighting Design Manufacturing Service

Mechanical Dimensions

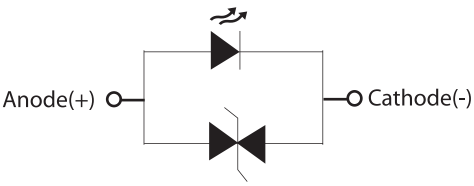
Dimensional Drawing





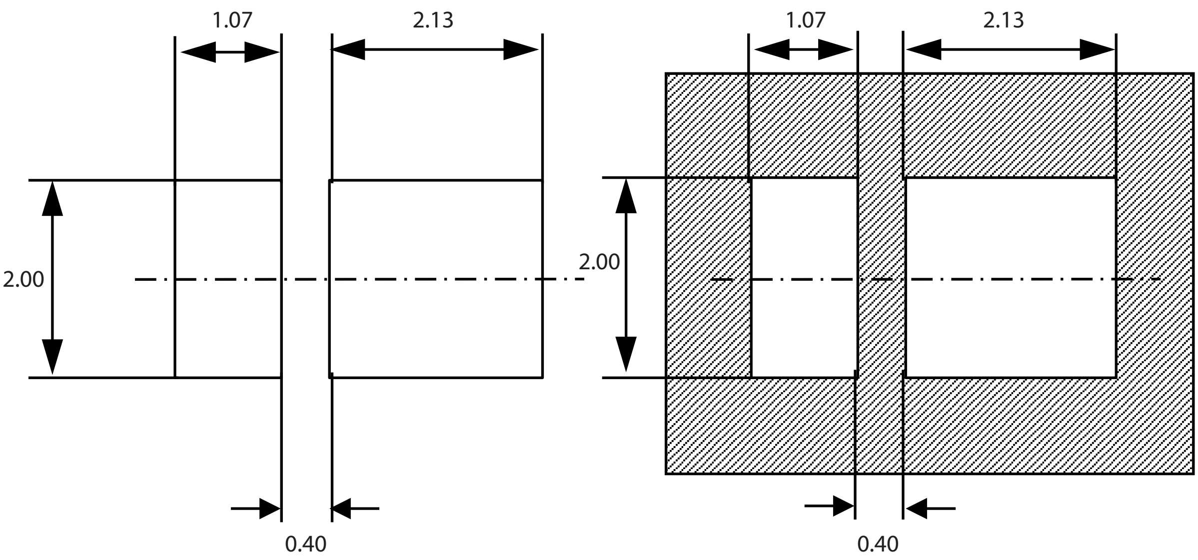


Circuit

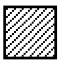


Notes:
1. All dimensions are measured in mm.
2. Tolerance : ± 0.1 mm
3. Approximate Weight : 25.0 mg

Recommended Solder Pad



Paddesign for improved heat dissipation



Solder resist

Cu-area>16mm^2 per pad

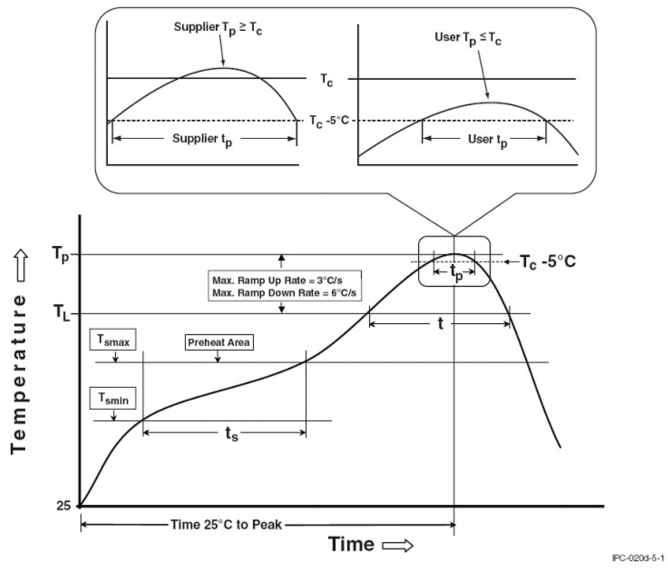
Notes:

1. All dimensions are measured in mm.
2. Tolerance : ± 0.1 mm

Lighting Design Manufacturing Service

Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Reflow Profiles

Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak Temperature min (Tsmin) Temperature max (Tsmax) Time (Tsmin to Tsmax) (ts)	150 °C 200 °C 60-120 seconds
Average ramp-up rate (Tsmax to Tp)	3 °C/second max.
Liquidous temperature (TL) Time at liquidous (tL)	217 °C 60-150 seconds
Peak package body temperature (Tp)	255 °C ~260 °C
Classification temperature (Tc)	260 °C
Time (tp) within 5 °C of the specified classification temperature (Tc)	30 seconds
Average ramp-down rate (Tp to Tsmax)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

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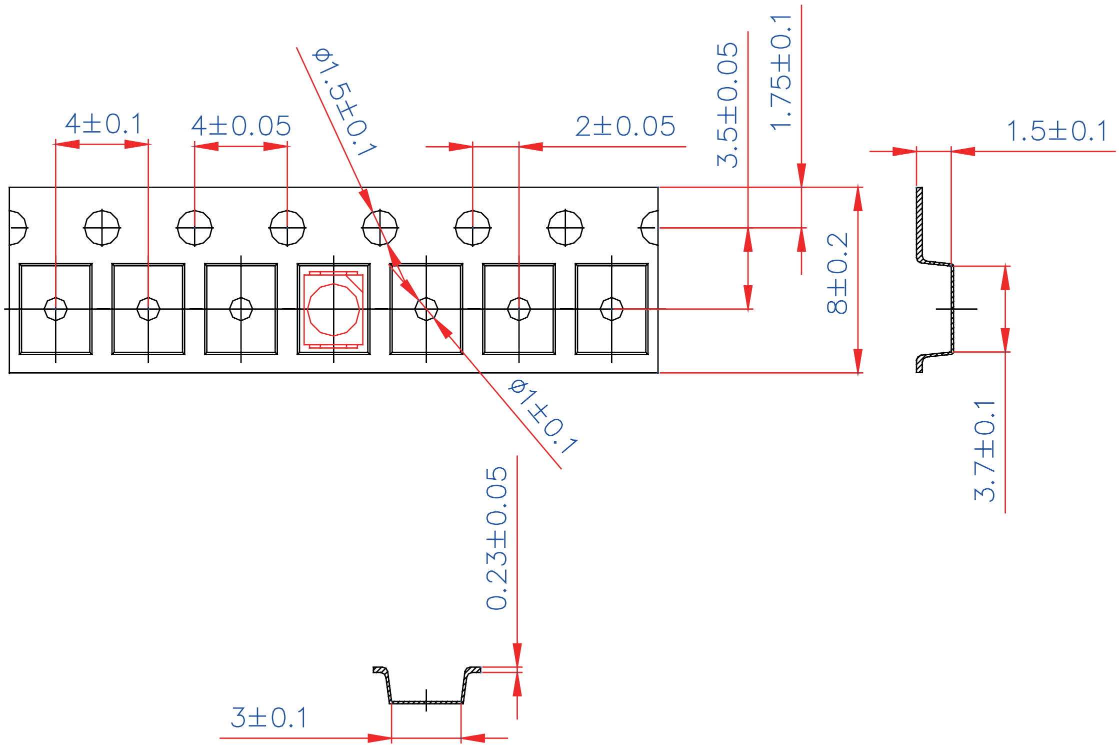
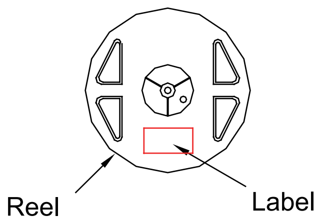
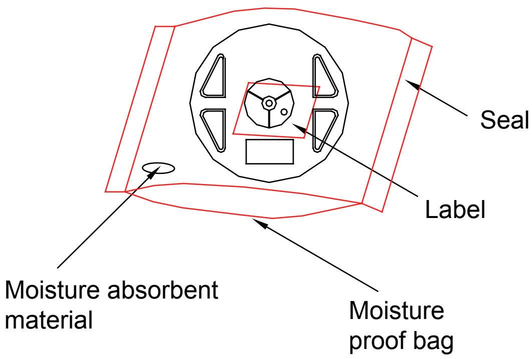
Product Packaging Information





Taping reel dimensions



Package & label

Item	Quantity	Total	Dimensions(mm)
Reel	4,000pcs	4,000pcs	R=178
Starting with 250pcs empty,and 150pcs empty at the last			

Lighting Design Manufacturing Service

Cautions

(1) Moisture monitoring is vital during the storage of LEDs for if too much moisture is absorbed, interface delamination and optical performance degradation will occur. Therefore, products should be packed in moisture-proof aluminum bags so as to reduce moisture absorption to the lowest degree during transportation and storage. Included moisture-proof aluminum bag are the key indicators that they will change from brown to azure if bags are invaded by moisture.

(2) Soldering process in compliance with the range of the conditions stated above should be conducted after opening the moisture-proof aluminum bag. The rest LEDs should be stored in a hermetically sealed container, silica gel desiccants included. And the original moisture-proof aluminum bags are recommended.

(3) If the "Period After Opening" storage time is too long or silica gel desiccants don't maintain blue any more, baking process should be done once.

Lighting Design Manufacturing Service

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2020/05/06
2	Add Flux Bin Group	2021/03/18
3	Add Chip Center Position	2023/08/01
4	Add Chip z-axis Distance	2023/11/14

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

www.edison-opto.com

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LED.Detective@edison-opto.com.tw