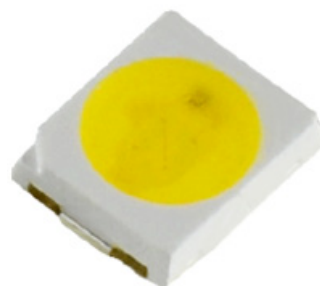


2T03X2CW70031SA1

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 temperature: 5000K~7000K
- 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

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General Information

Ordering Code Format

<u>2</u>	<u>T</u>	<u>03</u>	<u>X2</u>	<u>CW</u>	<u>70</u>	<u>03</u>	<u>1</u>	<u>S</u>	<u>A</u>	<u>1</u>
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	X2	0.2W	CW	Cool White

X9-X10		X11-X12		X13		X14		X15	
CRI(Ra)		Voltage		Leadframe Mode		Leadframe Plating		Model	
70	70	03	3V	1	PCT 0.80H 2PIN	S	Silver	A	Automotive

X16	
Serial Number	
-	-

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 $T_j = 25\text{ °C}$	min. max.	I_F	5 mA 70 mA
Surge Current $t \leq 10\text{ }\mu\text{s}; D = 0.005; T_j = 25\text{ °C}$	max.	I_{FS}	100 mA
Reverse voltage $T_j = 25\text{ °C}$	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

$I_F = 50\text{ mA}; T_j = 25\text{ °C}$

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 $V_R = 5\text{ V}$	typ. max.	I_R	0.01 μA 10 μA
Real thermal resistance junction/solder point	typ. max.	$R_{thJS\text{ real}}$	122 K / W 148 K / W
Electrical thermal resistance junction/ solder point with efficiency $\eta_e = 37\%$	typ. max.	$R_{thJS\text{ elec.}}$	77 K / W 93 K / W

Luminous Intensity Characteristic

Luminous Intensity Characteristics, $I_f=50\text{mA}$, $T_j=25^\circ\text{C}$

Symbol	Group	Min. Luminous Intensity(mcd)	Max. Luminous Intensity(mcd)	Typ. Luminous Flux(mlm)
I _v	DA	4500	5600	15781
	DB	5600	7100	19844

Note:

The luminous intensity performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of $\pm 10\%$ on intensity measurements.

Voltage Bin Structure

Voltage Bin Structure, $I_f=50\text{mA}$, $T_j=25^\circ\text{C}$

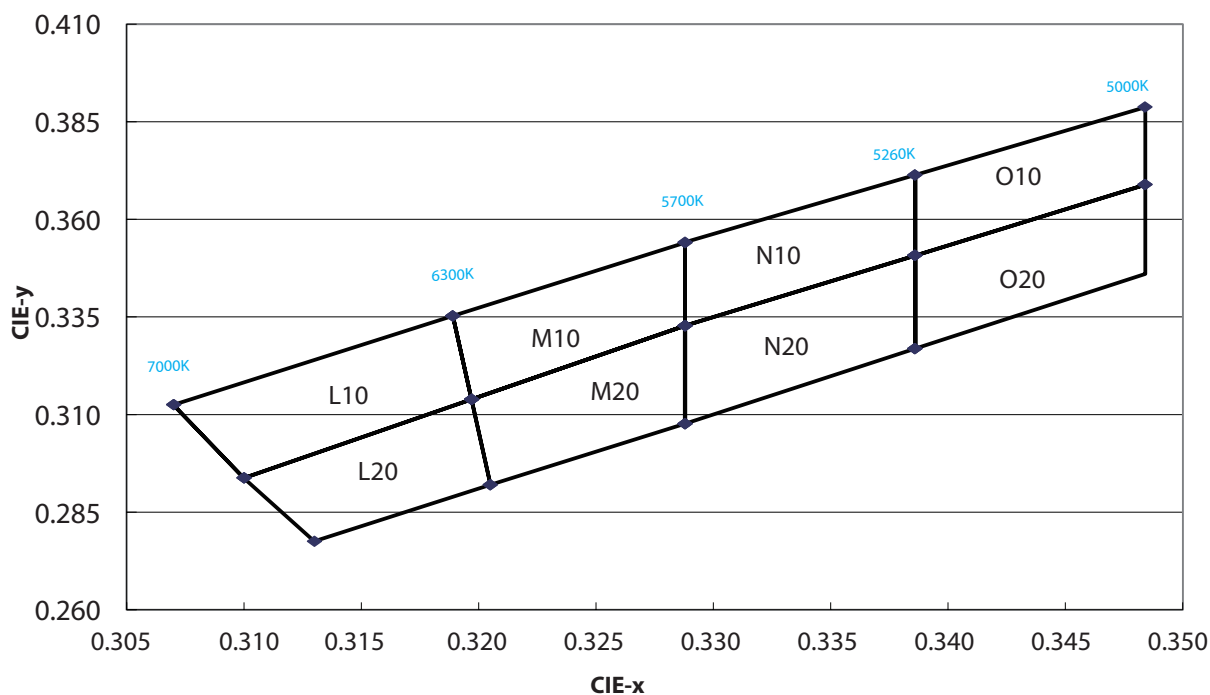
Symbol	Group	Min. Voltage (V)	Max. Voltage (V)
V _F	B70	2.70	2.90
	B90	2.90	3.10
	C10	3.10	3.30

Note:

Forward voltage measurement allowance is $\pm 0.06\text{V}$.

Color BIN code

Cool White



O10		O20		N10		N20	
X	Y	X	Y	X	Y	X	Y
0.3386	0.3426	0.3386	0.3235	0.3288	0.3282	0.3288	0.3081
0.3484	0.3571	0.3484	0.3388	0.3386	0.3426	0.3386	0.3235
0.3484	0.3730	0.3484	0.3571	0.3386	0.3591	0.3386	0.3426
0.3386	0.3591	0.3386	0.3426	0.3288	0.3453	0.3288	0.3282

M10		M20		L10		L20	
X	Y	X	Y	X	Y	X	Y
0.3189	0.3302	0.3197	0.3131	0.3070	0.3120	0.3100	0.2970
0.3197	0.3131	0.3205	0.2956	0.3189	0.3302	0.3197	0.3131
0.3288	0.3282	0.3288	0.3081	0.3197	0.3131	0.3205	0.2956
0.3288	0.3452	0.3288	0.3282	0.3100	0.2970	0.3130	0.2840

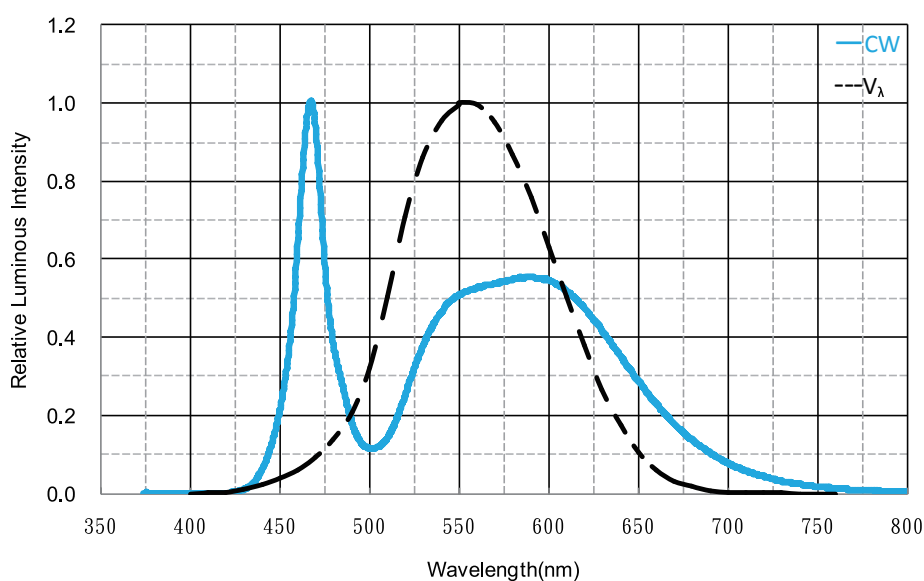
Notes:

1. PLCC 3528 Cool White Emitters are tested and binned by x,y coordinates.
2. Edison maintains a tester tolerance of ± 0.005 on x, y color coordinates.

Characteristic Curves

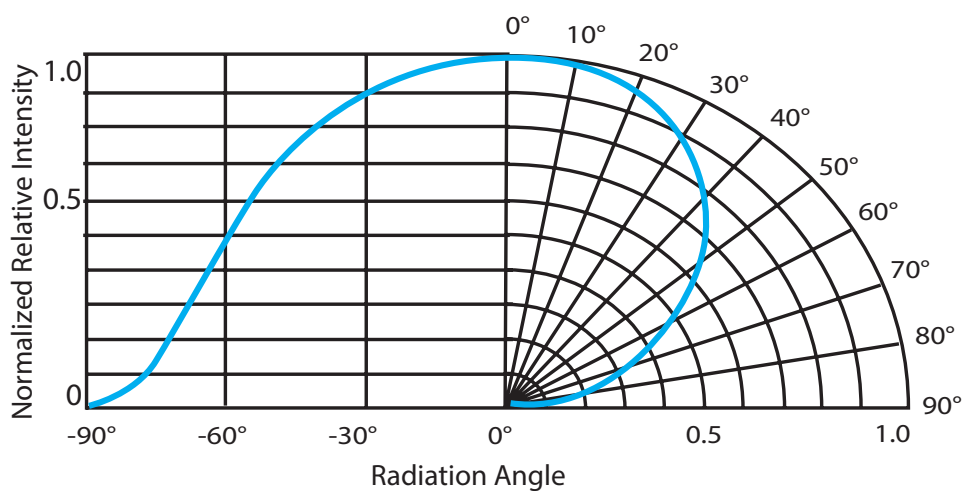
Color Spectrum

$I_f = 50 \text{ mA}$; $T_j = 25^\circ \text{C}$



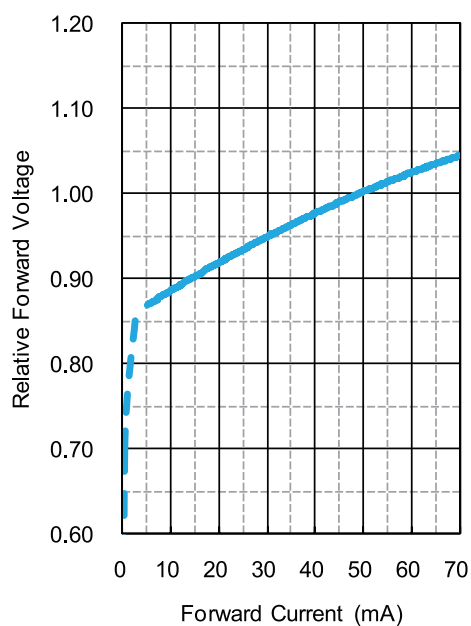
Beam Pattern

$I_f = 50 \text{ mA}$; $T_j = 25^\circ \text{C}$



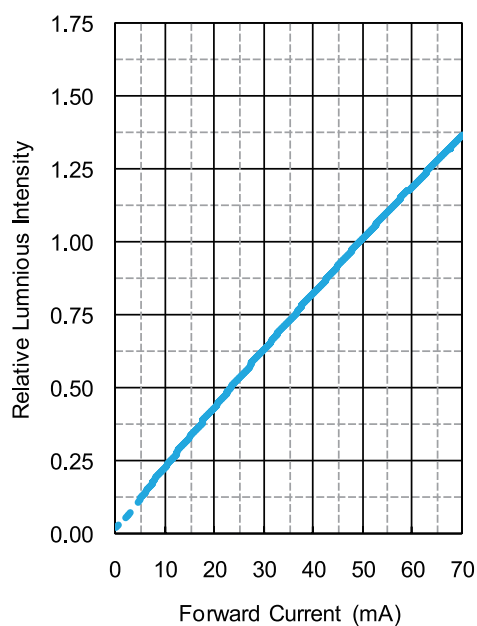
Relative Forward Voltage

$$V_F/V_F(50 \text{ mA}) = f(I_F); T_J = 25^\circ\text{C}$$



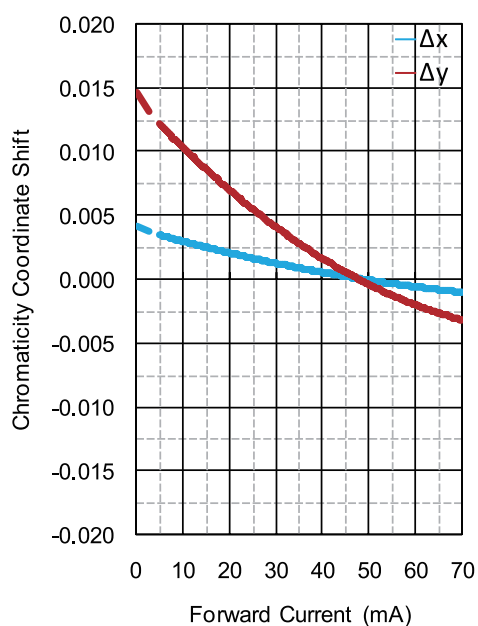
Relative Luminous Intensity

$$I_V/I_V(50 \text{ mA}) = f(I_F); T_J = 25^\circ\text{C}$$



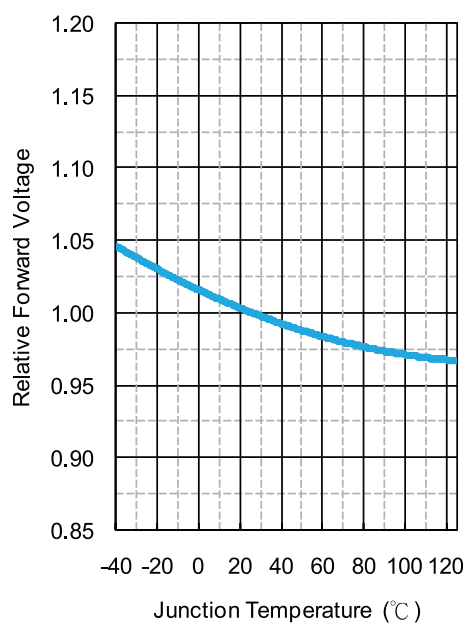
Chromaticity Coordinate Shift

$$\Delta C_x, \Delta C_y = f(I_F); T_J = 25^\circ\text{C}$$



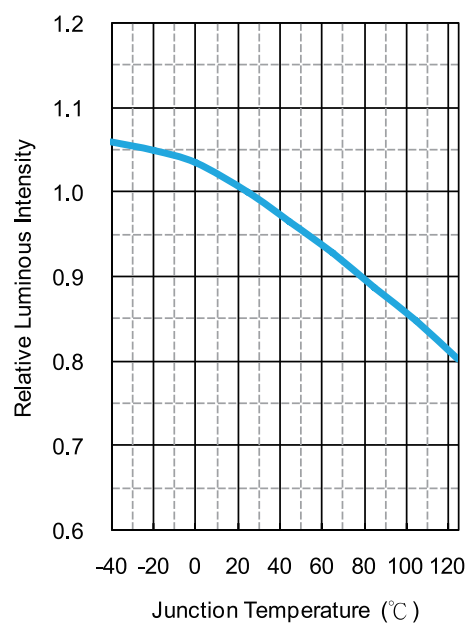
Relative Forward Voltage

$$V_F/V_F(25^\circ\text{C}) = f(V_F); I_F = 50 \text{ mA}$$



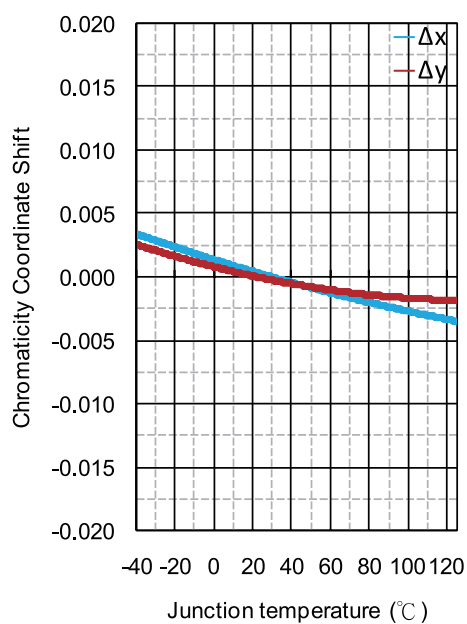
Relative Luminous Intensity

$$I_V/I_V(25^\circ\text{C}) = f(I_V); I_F = 50 \text{ mA}$$



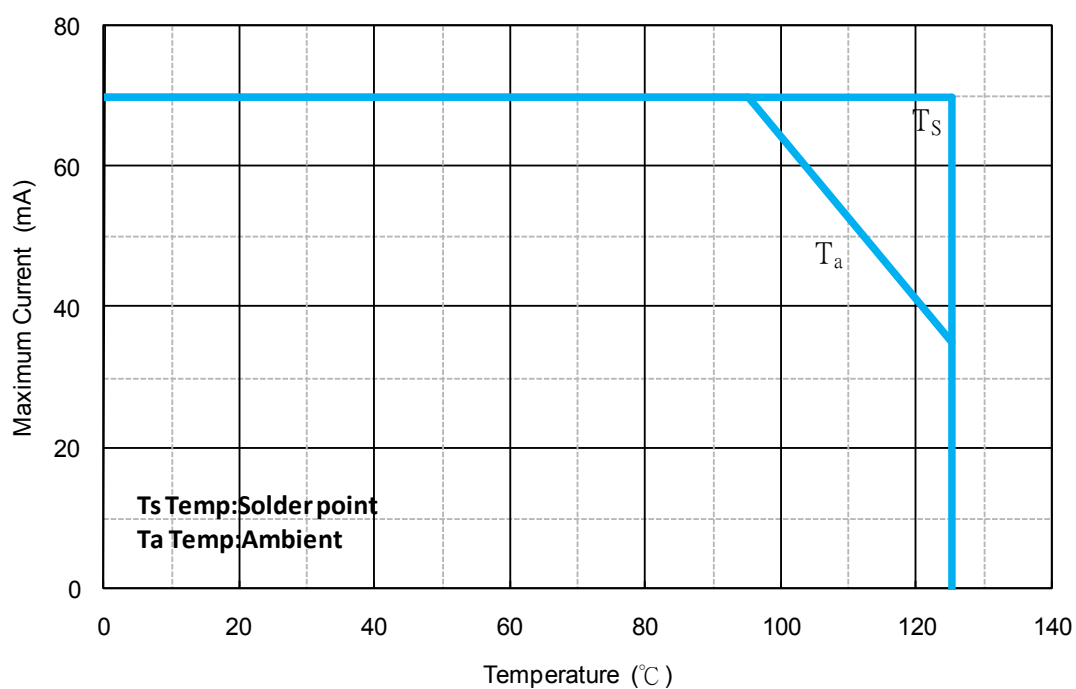
Chromaticity Coordinate Shift

$$\Delta C_x, \Delta C_y = f(T_J); I_F = 50 \text{ mA}$$



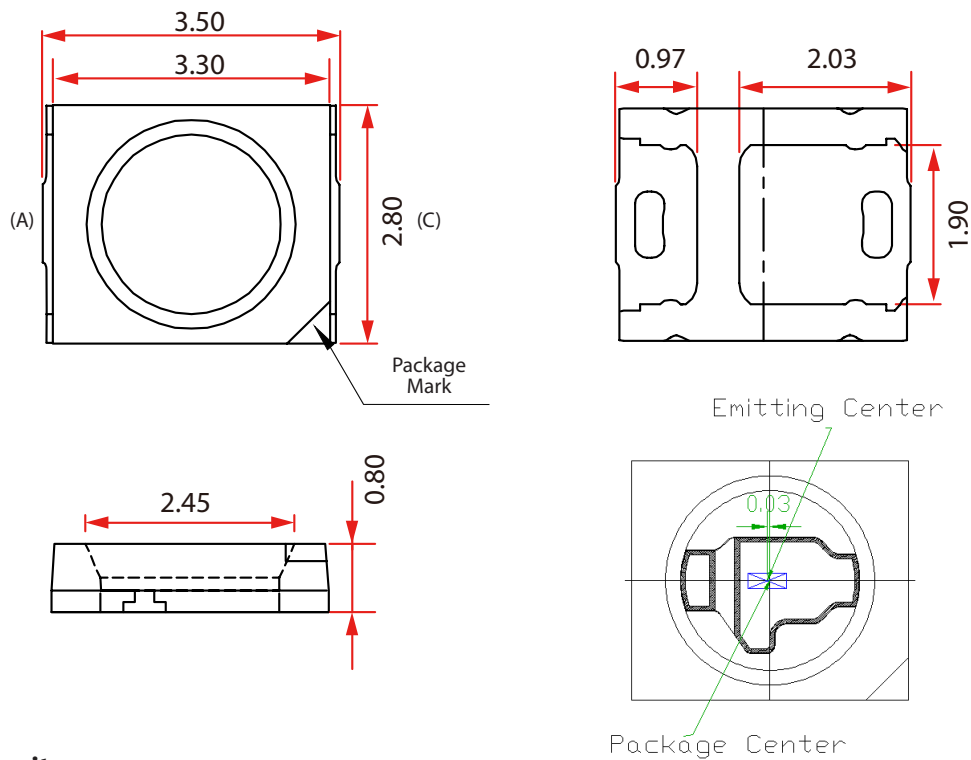
Max. Permissible Forward Current

$$I_F = f(T)$$

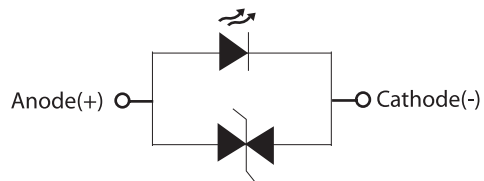


Mechanical Dimensions

Dimensional Drawing



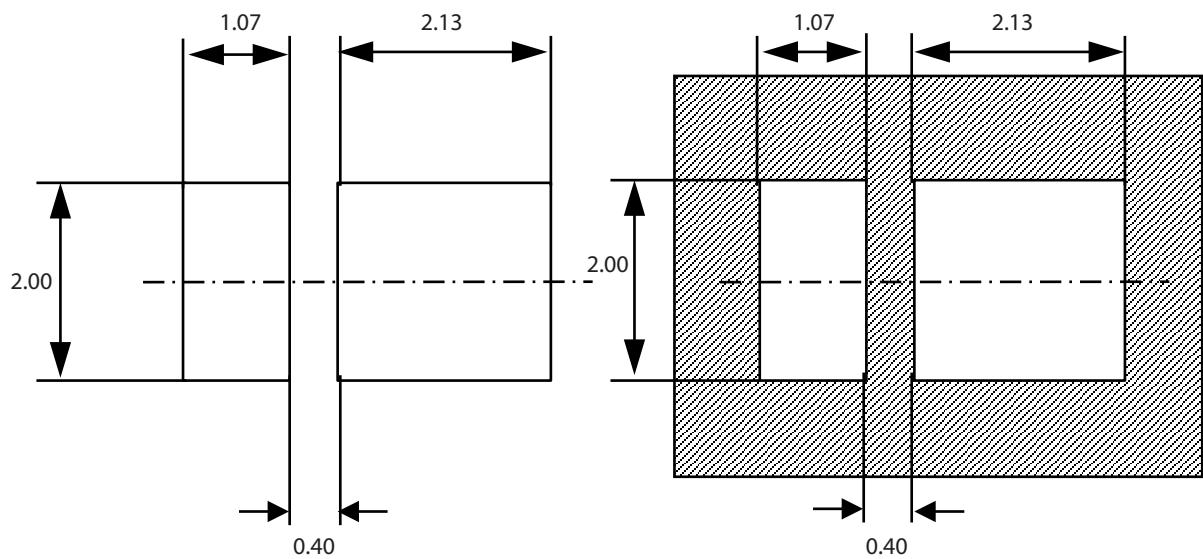
Circuit



Notes:

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

Recommended Solder Pad



Pad design for improved heat dissipation



Solder resist

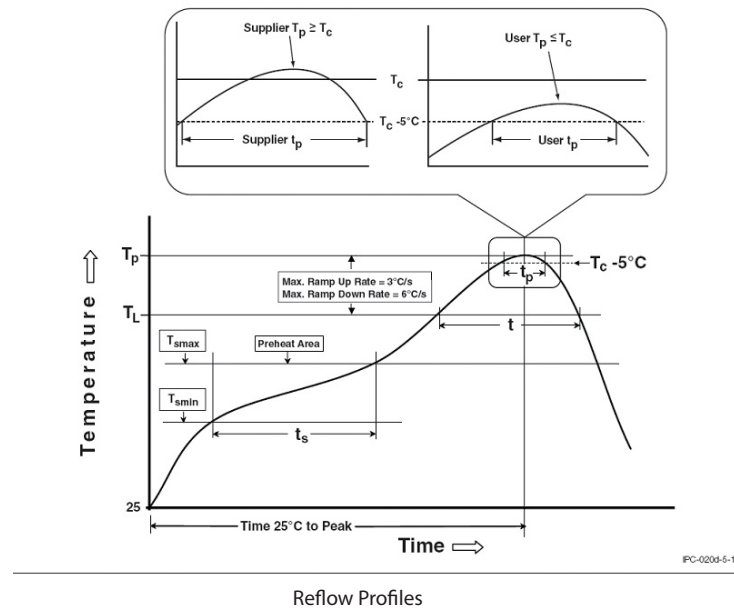
Cu-area > 16mm² per pad

Notes:

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

Reflow Profile

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

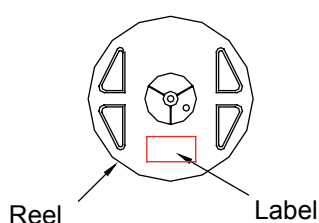
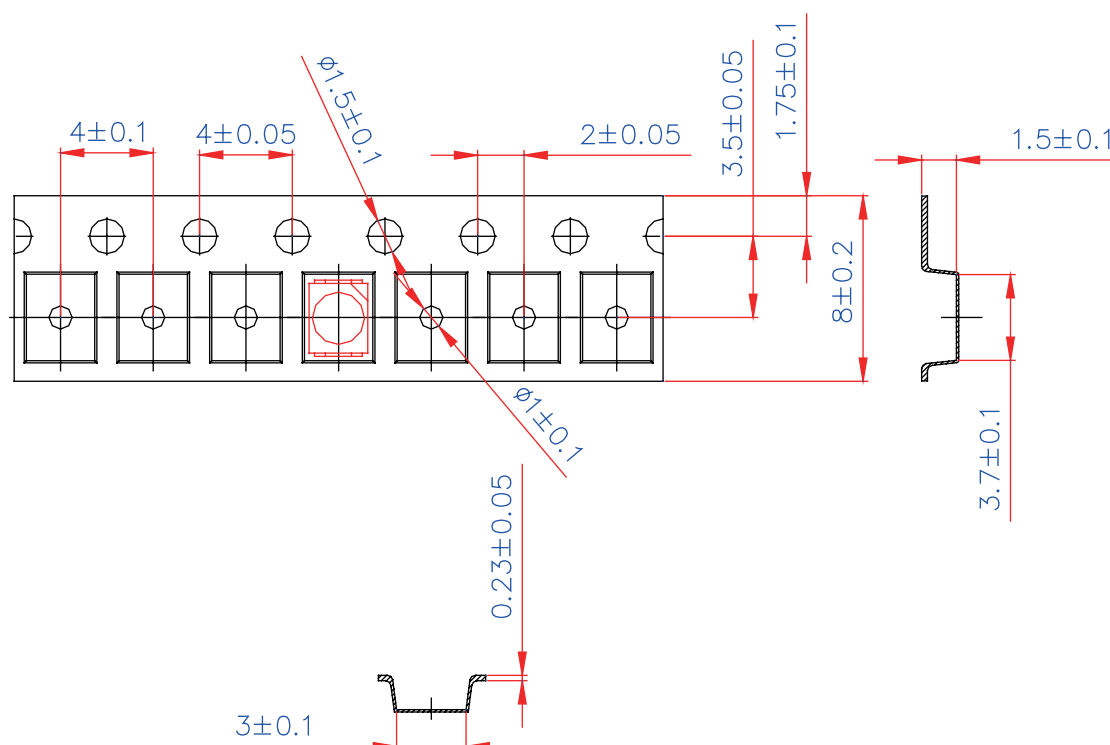


Reflow Profiles

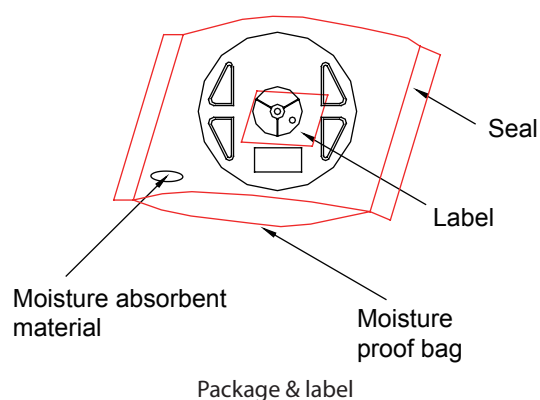
Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak	
Temperature min (T_{min})	150°C
Temperature max (T_{max})	200°C
Time (T_{min} to T_{max}) (t_s)	60-120 seconds
Average ramp-up rate (T_{max} to T_p)	$3^\circ\text{C/second max.}$
Liquidous temperature (T_L)	217°C
Time at liquidous (t_L)	60-150 seconds
Peak package body temperature (T_p)	$255^\circ\text{C} \sim 260^\circ\text{C}$
Classification temperature (T_c)	260°C
Time (t_p) within 5°C of the specified classification temperature (T_c)	30 seconds
Average ramp-down rate (T_p to T_{max})	$6^\circ\text{C/second max.}$
Time 25°C to peak temperature	8 minutes max.

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			

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.

Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2020/04/25
2	Add Chip Center Position	2023/07/11

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

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