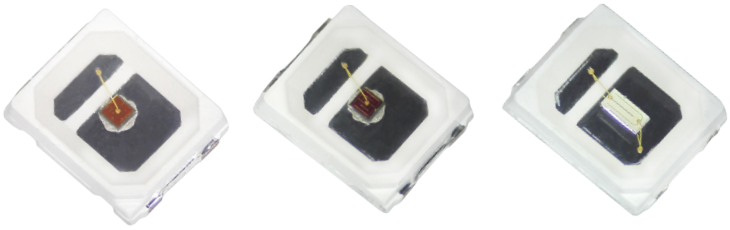
PLCC Series

2835 0.5W Plant Lighting

Datasheet



Introduction :

Ultra high luminous efficacy, combined with the flexibility in design due to its slim and miniature size, PLCC LED Series are optimized to be used as lighting for building.

Description :

- Best luminous and color uniformity
- Enables halogen and CDM replacement
- The article itself presents the actual color.

Feature and Benefits :

- Based on Blue: InGaN, Red: AlGaInP technology
- Wide viewing angle : 120°
- Excellent performance and visibility
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance

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Table of Contents

Lighting Design Manufacturing Service

General Information

Ordering Code Format

2	T	0 3	X 5	x X	X	0 0	0 3	x x x
X1	X2	X3-X4	X5-X6	X7-X8	X9	X10-X11	X12-X13	X14-X16

X1		X2		X3-X4		X5-X6		X7-X8	
Type		Component		Series		Wattage		Color/CCT	
2	Emitter	T	PLCC	03	3528	X5	0.5W	BX	Blue
								EX	Deep Red
								FX	Cherry Red

X9		X10-X11		X12-X13		X14-X16	
BIN		CRI		Voltage		Serial Number	
X	-	00	-	03	3V	-	-

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Absolute Maximum Ratings

Absolute maximum ratings (T_a=25°C)

Parameter	Symbol	Value	Units
DC Forward Current	I_F	200	mA
Pulse Forward Current (tp<=100μs, Duty cycle=0.25)	I_{pulse}	400	mA
Reverse Current	I_R	10	uA
Reverse Voltage	V_R	5	V
LED Junction Temperature	T_J	125	°C
Operating Temperature	-	-40 ~ +85	°C
Storage Temperature	-	-40 ~ +125	°C
ESD Sensitivity (HBM)	-	2,000	V
Soldering Temperature	T_s	Reflow Soldering : 255~260°C/10~30sec Manual Soldering : 350°C/3sec	

Notes:
1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.
3. tp: Pulse width time

Characteristics

Parameter		Symbol	Value	Units
Viewing Angle	(Typ.)	$2\Theta_{1/2}$	130	Degree
Thermal resistance		-	10	°C/W
Wavelength	(Blue) (Deep Red) (Cherry Red)	-	450-460 650-670 720-740	nm
JEDEC Moisture Sensitivity		-	Level 2a **Floor Life** Conditions: ≤30°C / 60% RH **Soak Requirements(Standard)** Time (hours): 120+1/-0 Conditions: 60°C / 60% RH	-

Note:
$2\theta_{1/2}$ is the off-axis angle where the luminous intensity is half of the axial luminous intensity.

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Luminous Flux Characteristic

Luminous Flux Characteristics, I_F=150mA, V_F = 5V and T_J=25˚C

Color	Group	Min. Radiometric Power(mW) @150mA	Max. Radiometric Power(mW) @150mA	Order Code
Blue	B1	130.0	169.0	2T03X5BXX0003001
	B2	169.0	219.7	
	B3	219.7	285.6	
Deep Red	R2	84.5	109.8	2T03X5EXX0003001
	R3	109.8	142.8	
	R4	142.8	185.6	
Cherry Red	R0	50.0	65.0	2T03X5FXX0003001
	R1	65.0	84.5	
	R2	84.5	109.8	

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

Wavelength Bin Structure

Color	Group	Min. Wd (nm)	Max. Wd (nm)
Blue	BU0	450	455
	BV0	455	460
Deep Red	EX0	650	670
Cherry Red	FX1	720	740

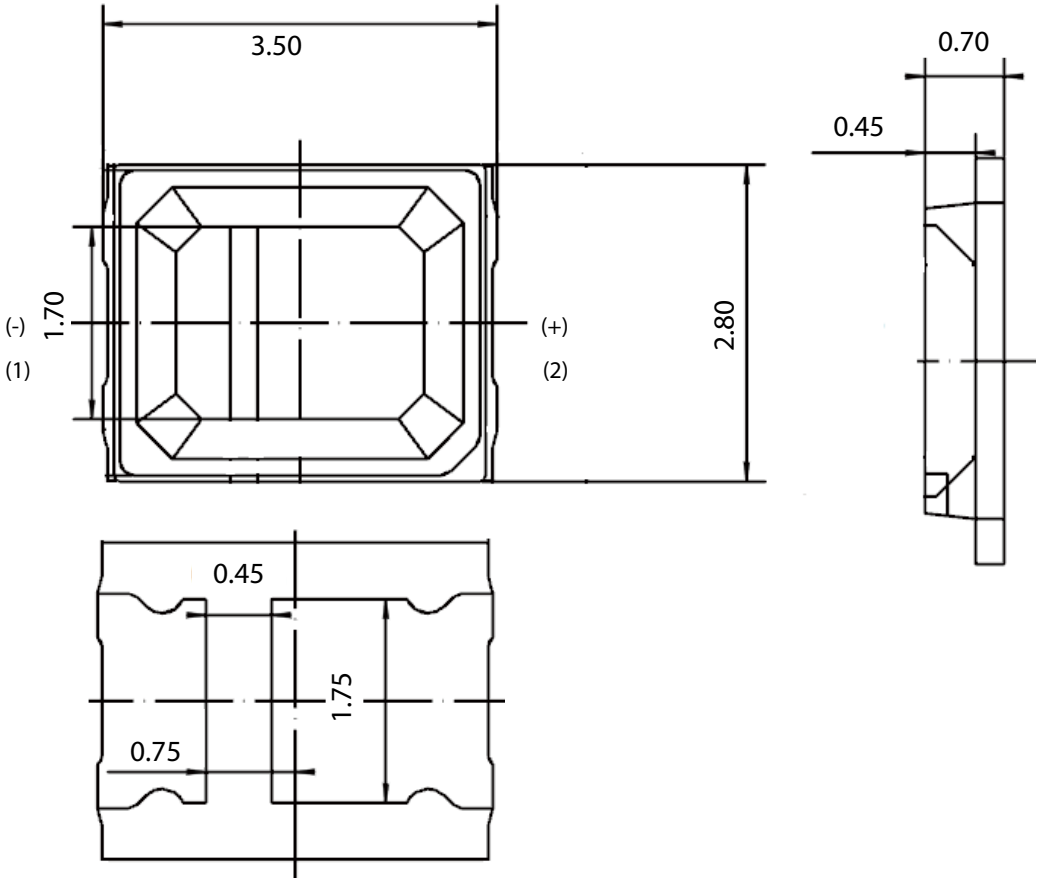
Note:
Dominant wavelength Measurement Allowance is ± 1nm.

Voltage Bin Structure

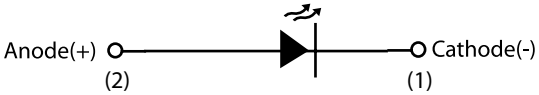
Color	Group	Min. Voltage (V)	Max. Voltage (V)
Blue	VB1	2.9	3.0
	VC1	3.0	3.1
	VA2	3.1	3.2
	VB2	3.2	3.3
	VC2	3.3	3.4
Deep Red	UC3	1.8	1.9
	UA4	1.9	2.0
	UB4	2.0	2.1
	UC4	2.1	2.2
	UA5	2.2	2.3
	UB5	2.3	2.4
	UC5	2.4	2.5
Cherry Red	UC3	1.8	1.9
	UA4	1.9	2.0
	UB4	2.0	2.1
	UC4	2.1	2.2
	UA5	2.2	2.3
	UB5	2.3	2.4
	UC5	2.4	2.5

Note:
Forward voltage measurement allowance is ± 0.06V.

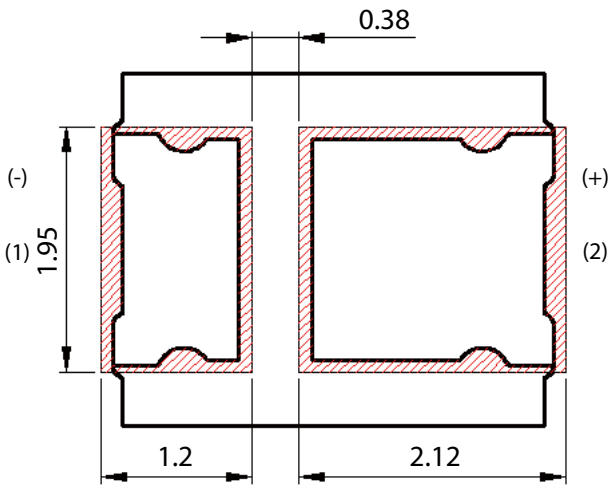
Mechanical Dimensions



Circuit



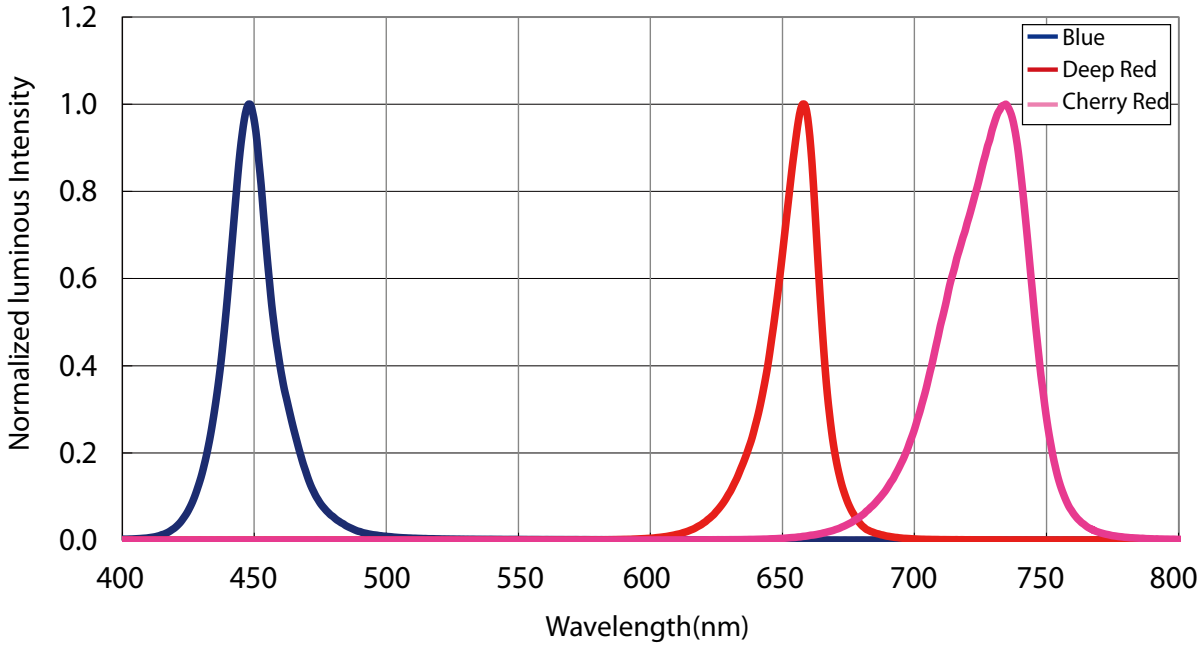
Solder Pad



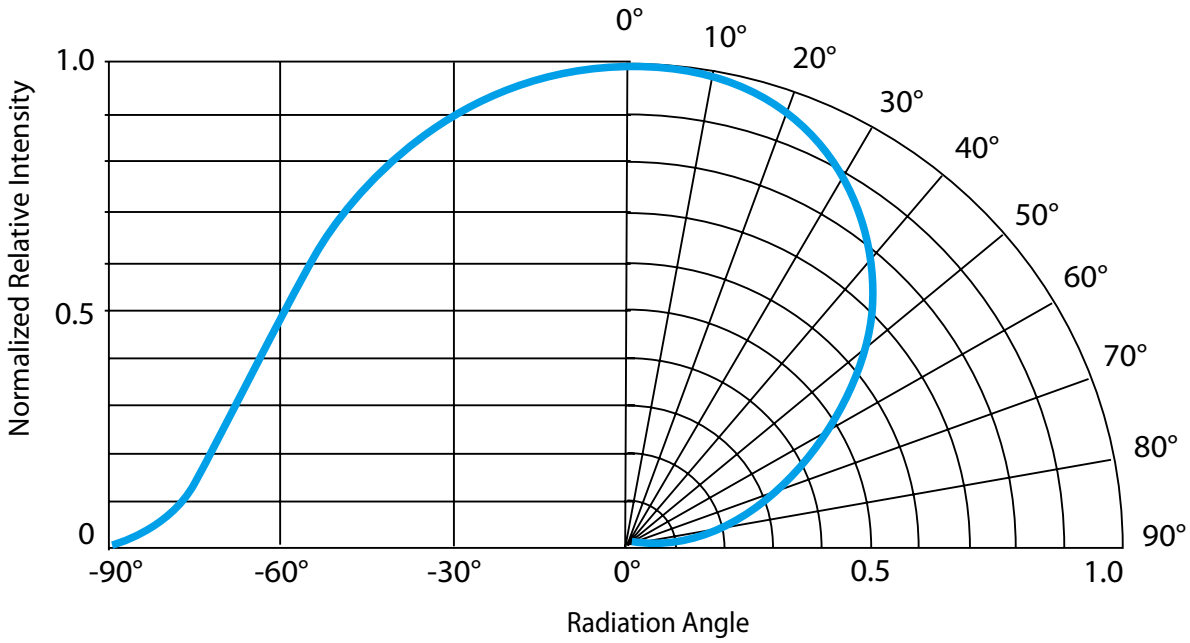
Notes:
1. All dimensions are measured in mm.
2. Tolerance : ± 0.20 mm

Characteristic curve

Color Spectrum

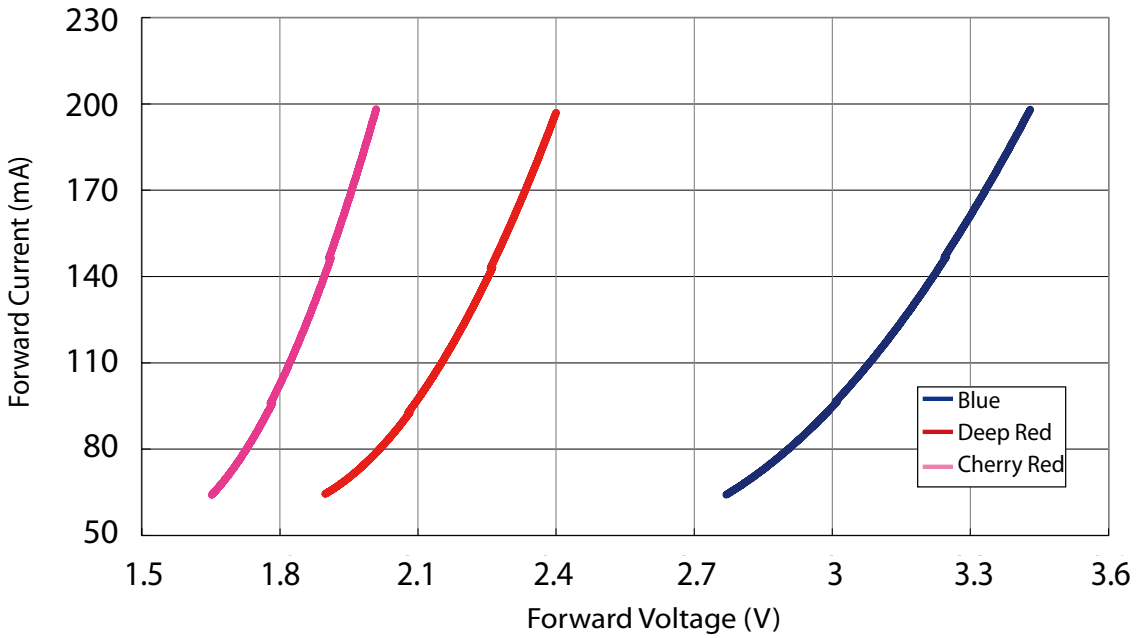


Beam Pattern

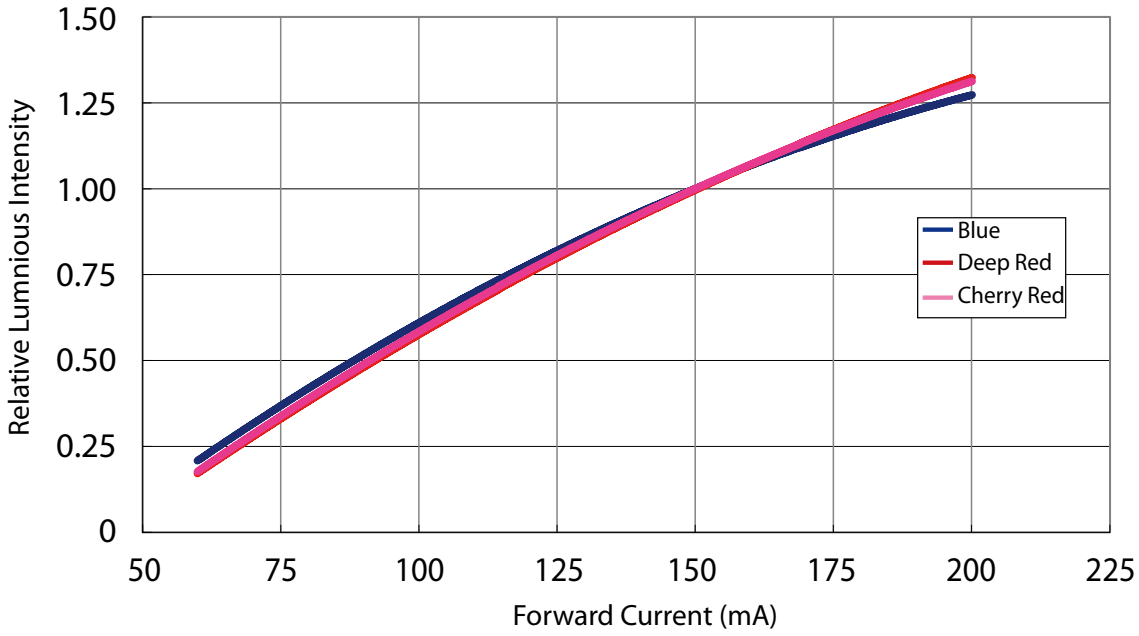


Beam pattern diagram for PLCC series

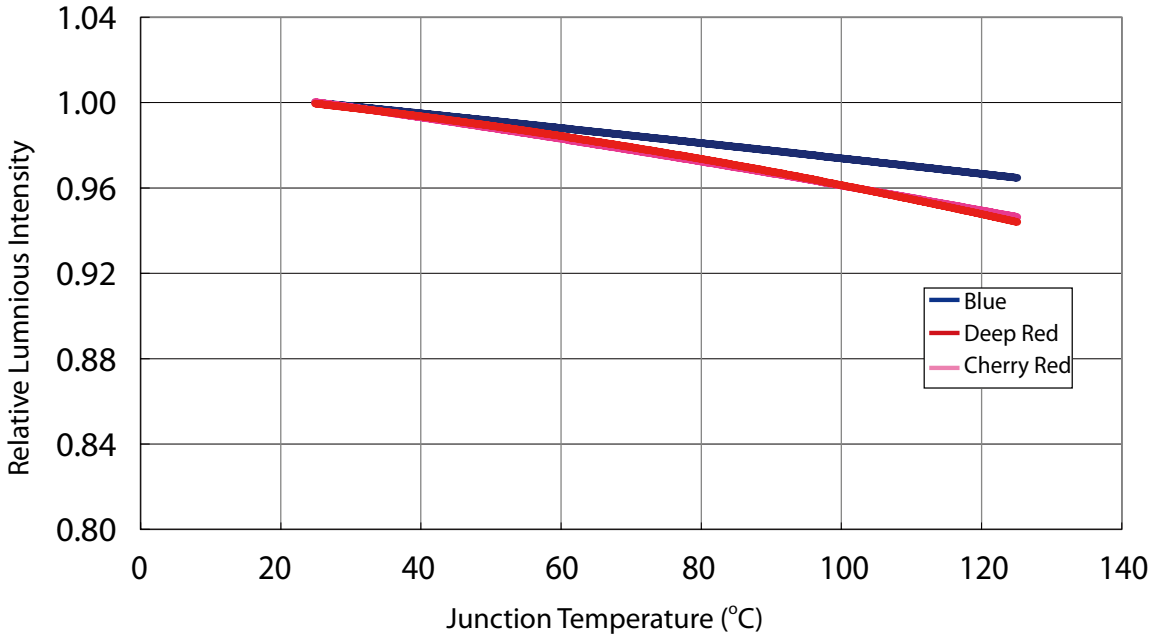
Forward Current vs. Forward Voltage



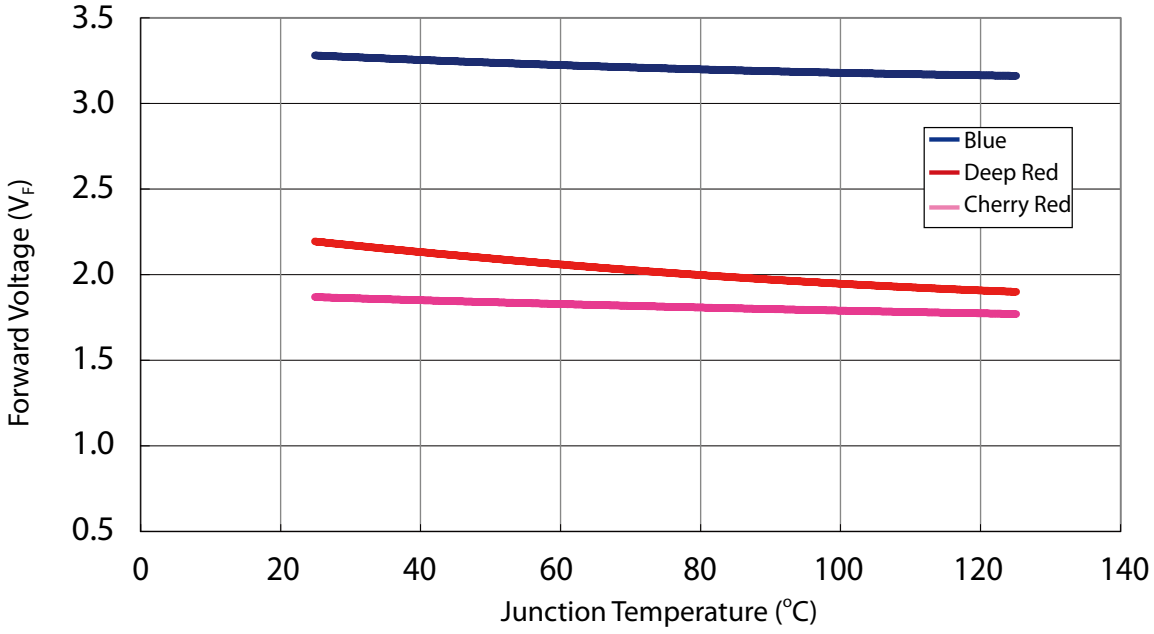
Relative Intensity vs. Forward Current



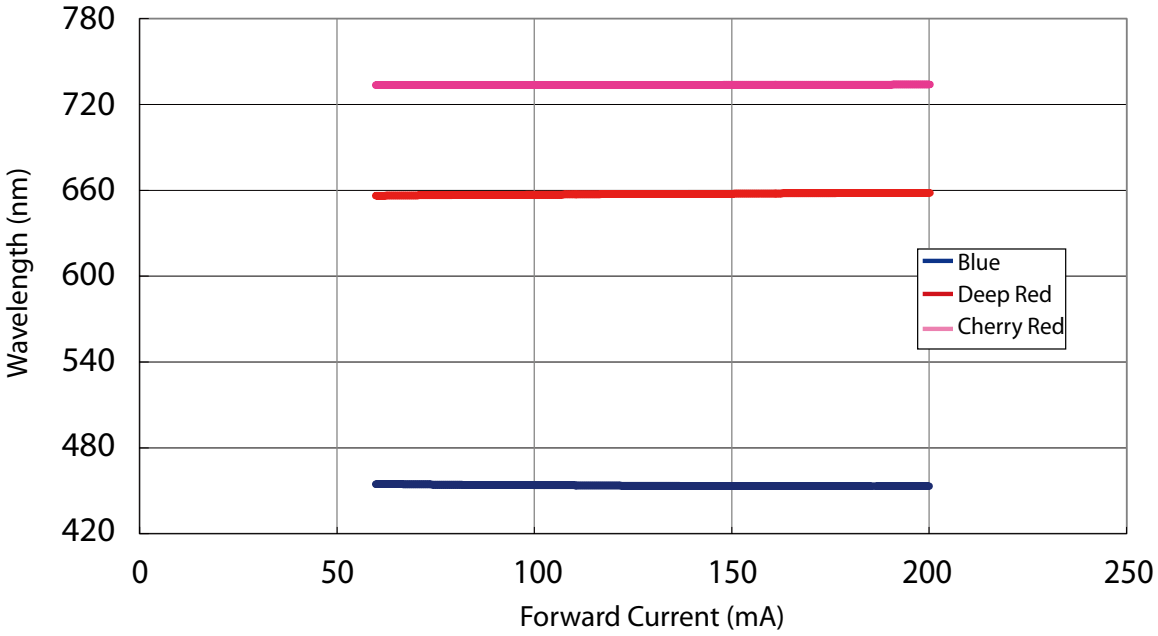
Luminous Flux vs. Junction Temperature



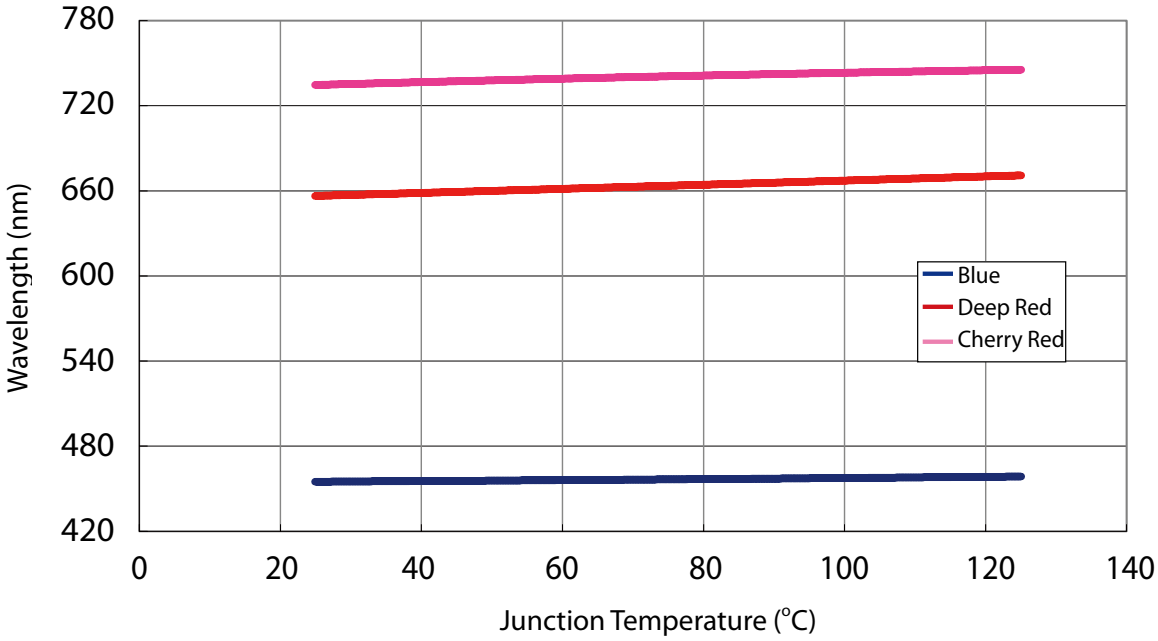
Forward Voltage vs. Junction Temperature



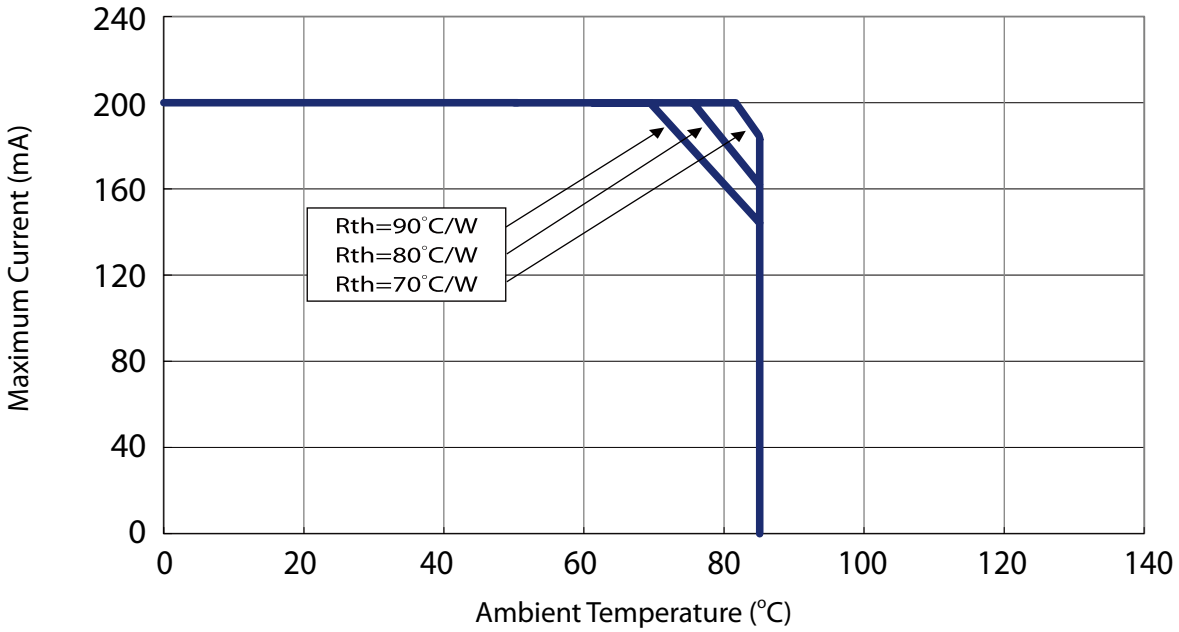
Wavelength vs. Forward Current



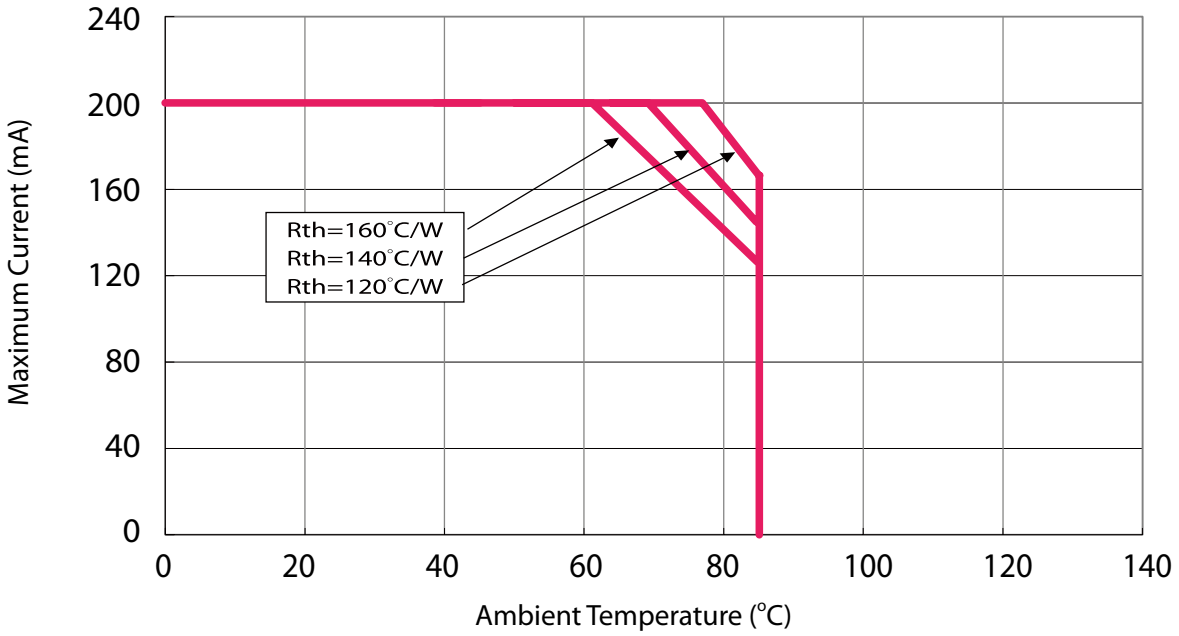
Wavelength vs. Junction Temperature



Maximum Current vs. Ambient Temperature (Blue)



Maximum Current vs. Ambient Temperature (Deep Red & Cherry Red)



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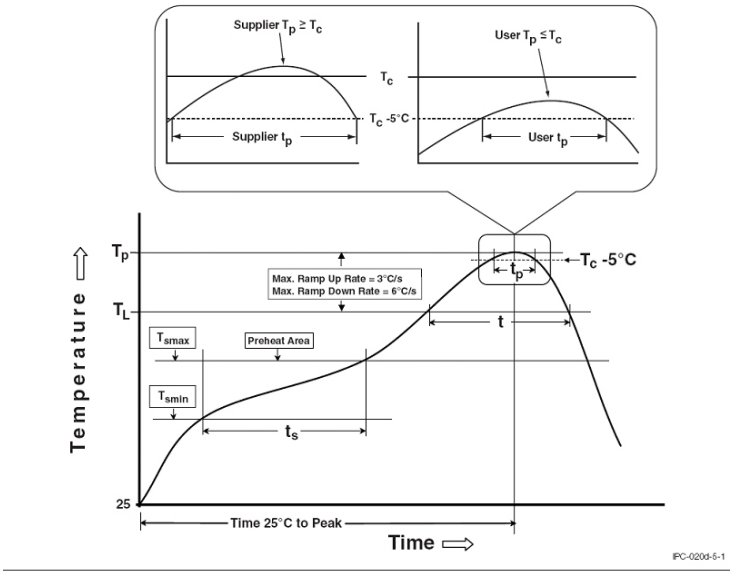
Reflow Profile

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.

Notes:
1. * Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.
2. ** Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum.

Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins ≦10 sec	100 Cycle
3	Resistance to Soldering Heat	T_{SOL}=260°C, 30 sec	3 times
4	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
5	High-Temperature Storage	T_A=100°C	1,000 hrs
6	Humidity Heat Storage	T_A=85°C RH=85%	1,000 hrs
7	Low-Temperature Storage	T_A=-40°C	1,000 hrs
8	Operation Life test	25°C	1,000 hrs
9	High Temperature Operation Life test	85°C	1,000 hrs
10	High Humidity Heat Life Test	85°C, 85%RH	1,000 hrs
11	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
Δu'v'	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μA
Resistance to Soldering Heat	No dead lamps or visual damage	

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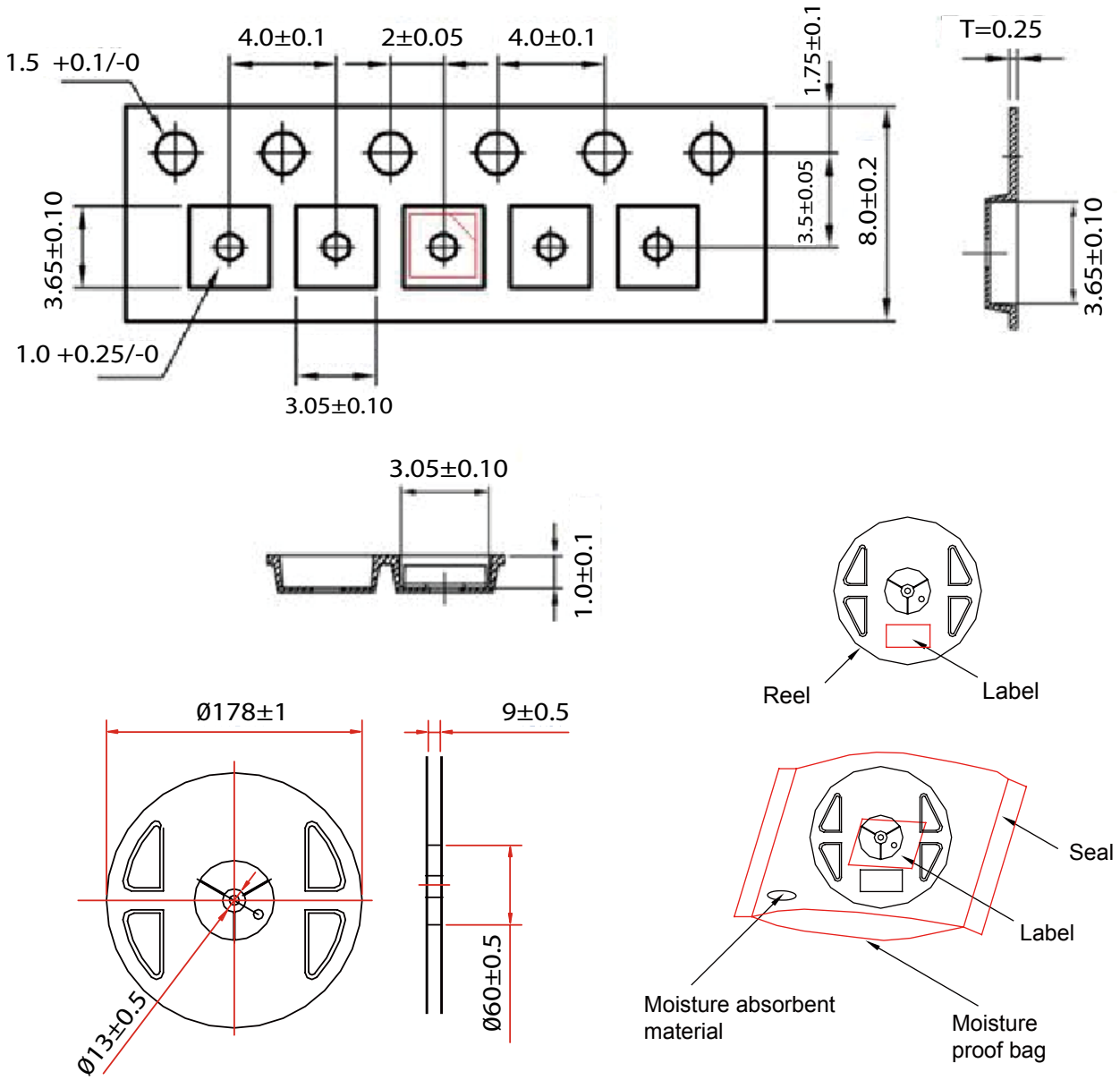
Product Packaging Information



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

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Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2016/08/08

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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