

PLW2835ACB Series

Product Datasheet



Bulb



Wall
Light



Floor
Light



Tube
Light



General
Lighting

Introduction

The PLW2835ACB series offer ultra-high luminous efficacy combined with the flexibility in design due to its slim and miniature size. This PLCC LED Series is optimized to be used as lighting for building and other general lighting applications. These high performance LEDs are available in a wide range of colour temperatures.

Description

- Best luminous and colour uniformity
- Enables halogen and CDM replacement
- The article itself present the actual colour

Features and Benefits

- High luminous Intensity and high efficiency.
- Based on InGaN / GaN 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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Order Codes

CCT /K	CRI 80	
	3 Step	5 Step
6500	PLW2835ACB65B3	PLW2835ACB65B5
5700	PLW2835ACB57B3	PLW2835ACB57B5
5000	-	PLW2835ACB50B5
4000	PLW2835ACB40B3	PLW2835ACB40B5
3500	-	PLW2835ACB35B5
3000	PLW2835ACB30B3	PLW2835ACB30B5
2700	-	PLW2835ACB27B5

Absolute Maximum Ratings

$T_{amb} = +25^{\circ}\text{C}$ unless otherwise stated.

Parameter		Value	Units
DC Forward Current	I_F	90	mA
Pulse Forward Current ($t_p \leq 100\mu\text{s}$, Duty cycle=0.25)	I_{pulse}	120	mA
Reverse Current [1]	I_R	10	μA
Reverse Voltage [1]	V_R	5	V
LED Junction Temperature [2]	T_J	125	$^{\circ}\text{C}$
Operating Temperature	T_{opr}	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +125	$^{\circ}\text{C}$
Power Dissipation	P_D	200	mW
ESD Sensitivity (HBM)	V_B	2,000	V
Soldering Temperature	Reflow Soldering	T_S	255~260 $^{\circ}\text{C}$ /10~30sec
	Manual Soldering		350 $^{\circ}\text{C}$ /3sec

Notes [1] : LEDs are not designed to operate in reverse bias mode.

[2] : Current derating must be applied to ensure that the maximum junction temperature is not exceeded.

General Characteristics

$T_{amb} = +25^{\circ}\text{C}$ unless otherwise stated.

Parameter		Value	Units
Viewing angle ^[1]	$2\theta_{1/2}$	120	mA
Thermal resistance	R_{thj-sp}	30	$^{\circ}\text{C/W}$
Correlated Colour Temperature ^[2]	Cool White	6500	K
		5700	
		5000	
	Neutral White	4000	
	Warm White	3500	
		3000	
		2700	
Colour Rendering Index ^[3]	CRI	80/90	V
JEDEC Moisture Sensitivity ^[4]	-	2a (4 weeks)	-

Notes [1] : Viewing angle, $2\theta_{1/2}$, is the off-axis angle where the luminous intensity is 50% of the axial luminous intensity.

[2] : The CIE x/y tolerance is ± 0.005

[3] : The CRI tolerance is ± 2

[4] : MSL 2a Floor life conditions: $\leq 30^{\circ}\text{C}/60\%RH$.

Soak Requirement (Standard): $120 +1/-0$ hr, $60^{\circ}\text{C}/5\%RH$.

Luminous Flux Characteristics

Luminous flux at $I_f=60\text{mA}$, $T_j=25^\circ\text{C}$.

CCT /K	CRI	Group	Luminous Flux /lm [1]	
			min	max
Cool White: 6500 5700 5000	80	7E	20	22
		8E	22	24
		9E	24	26
		1F	26	28
		2F	28	30
Neutral White: 4000		7E	20	22
		8E	22	24
		9E	24	26
		1F	26	28
		2F	28	30
Warm White: 3500 3000 2700		7E	20	22
		8E	22	24
		9E	24	26
		1F	26	28

Notes [1] : The luminous flux tolerance is $\pm 10\%$

Forward Voltage Bins

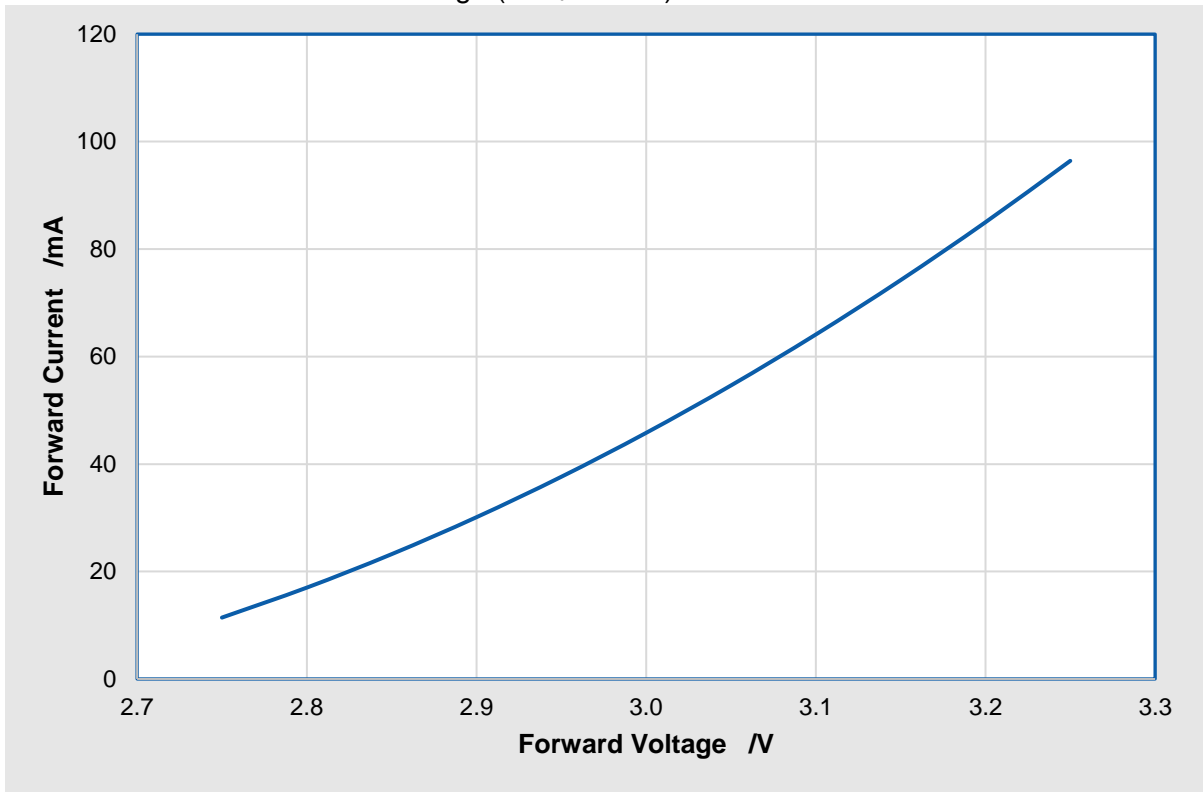
Forward Voltage at $I_f=60\text{mA}$, $T_j=25^\circ\text{C}$.

Group	Forward Voltage /V [1]	
	min	max
V03	2.9	3.0
V04	3.0	3.1
V05	3.1	3.2
V06	3.2	3.3
V07	3.3	3.4
V08	3.4	3.5
V09	3.5	3.6

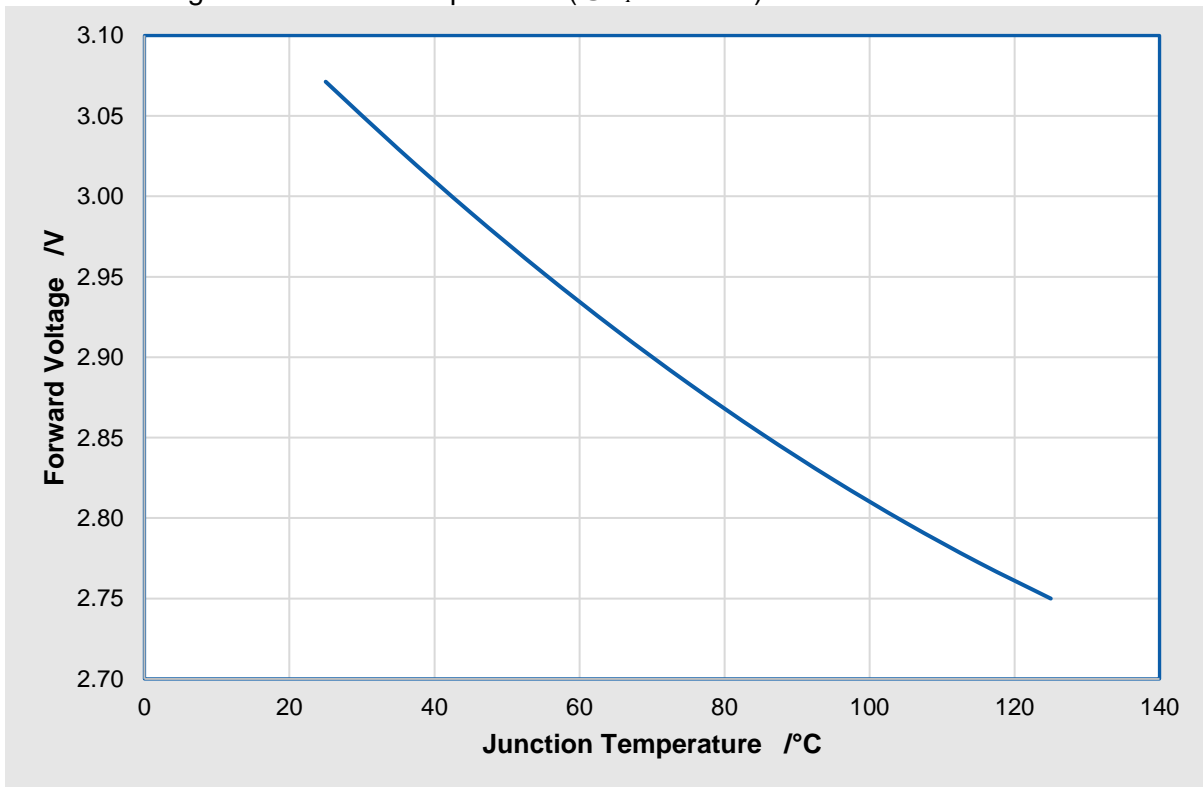
Notes [1] : The forward voltage tolerance is $\pm 0.06\text{V}$

Characteristic Curves

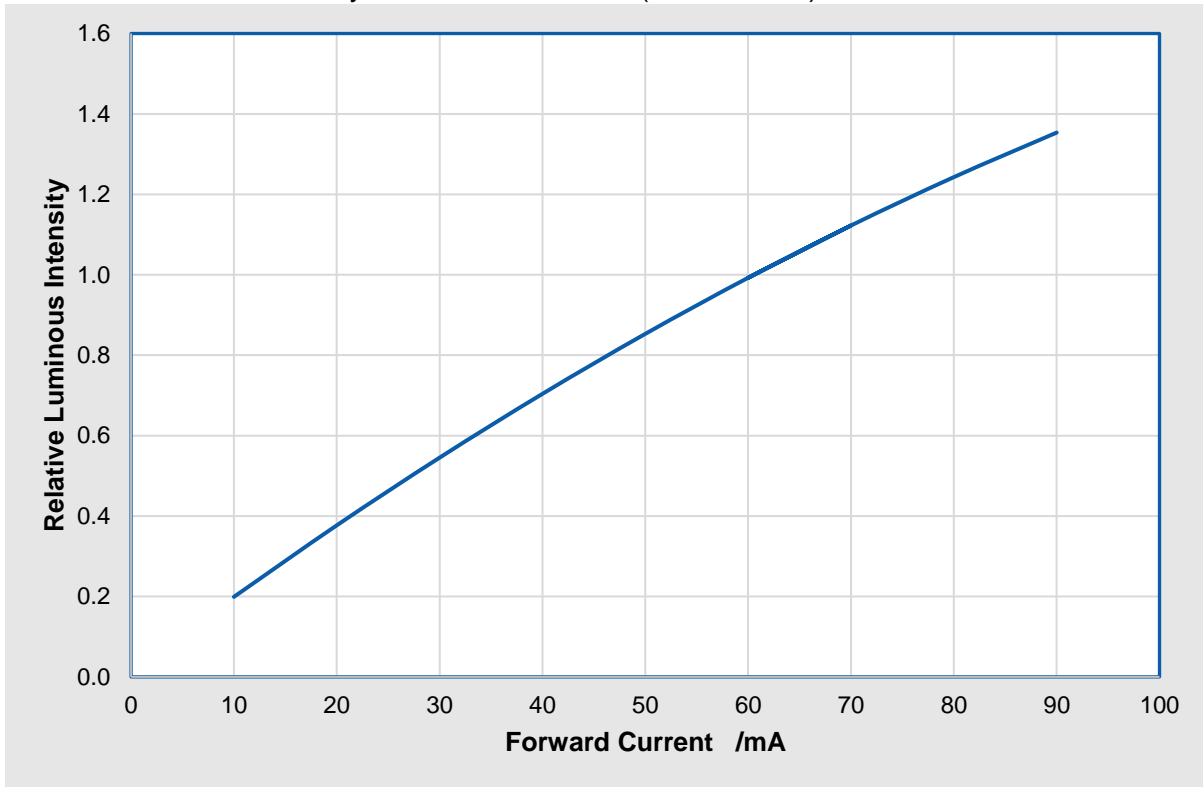
Forward Current vs. Forward Voltage (@ $T_J = 25^\circ\text{C}$)



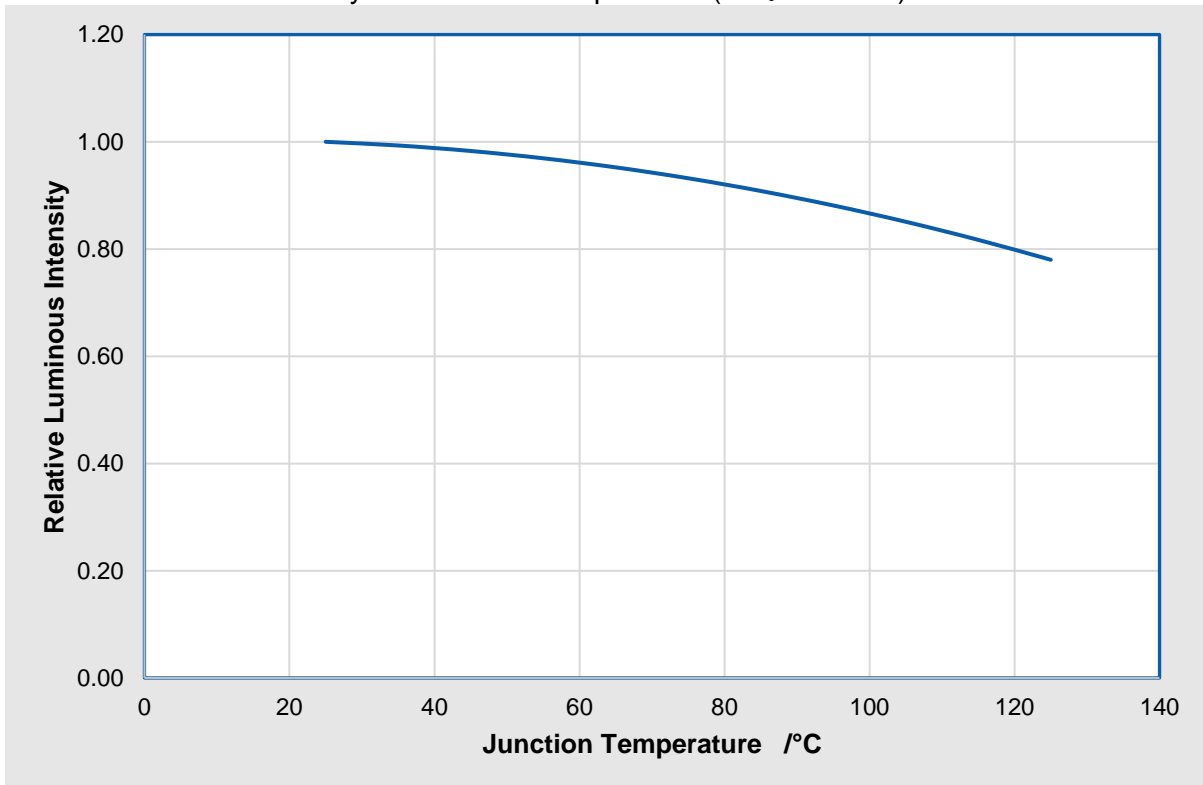
Forward Voltage vs. Junction Temperature (@ $I_F = 60\text{ mA}$)



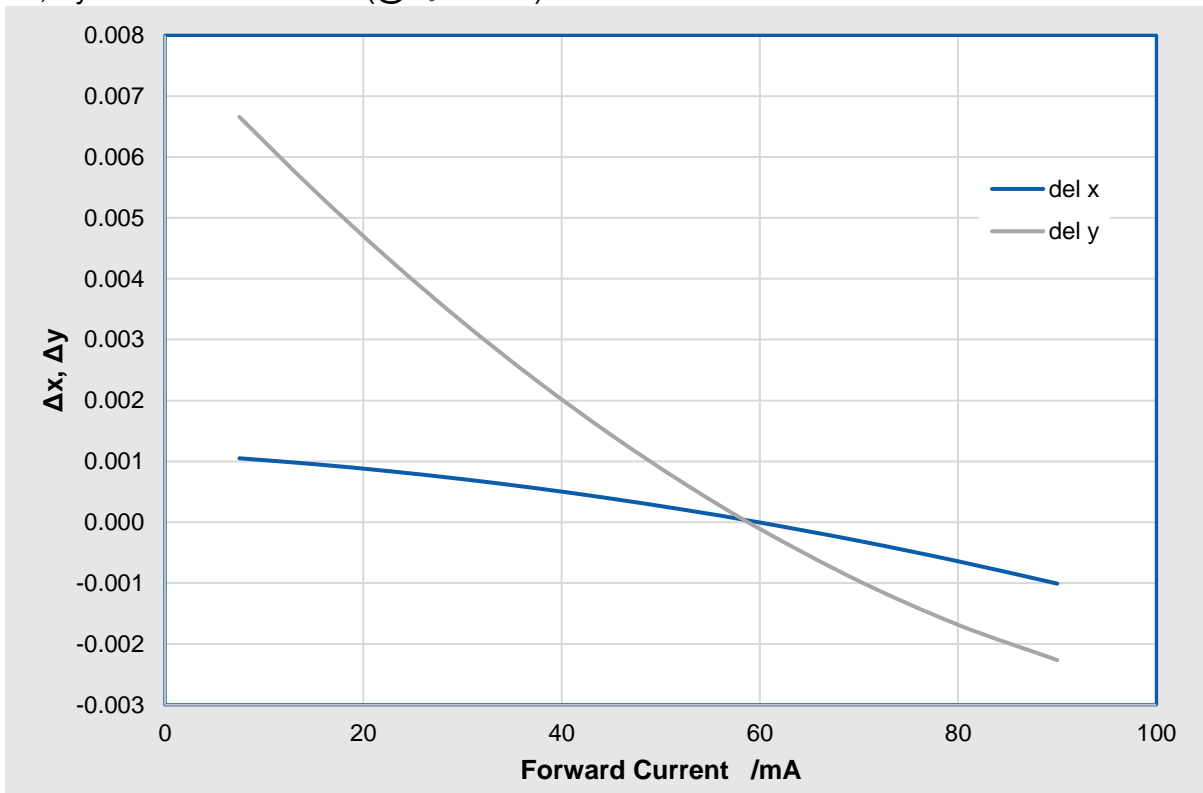
Relative Luminous Intensity vs. Forward Current (@ $T_J = 25^\circ\text{C}$)



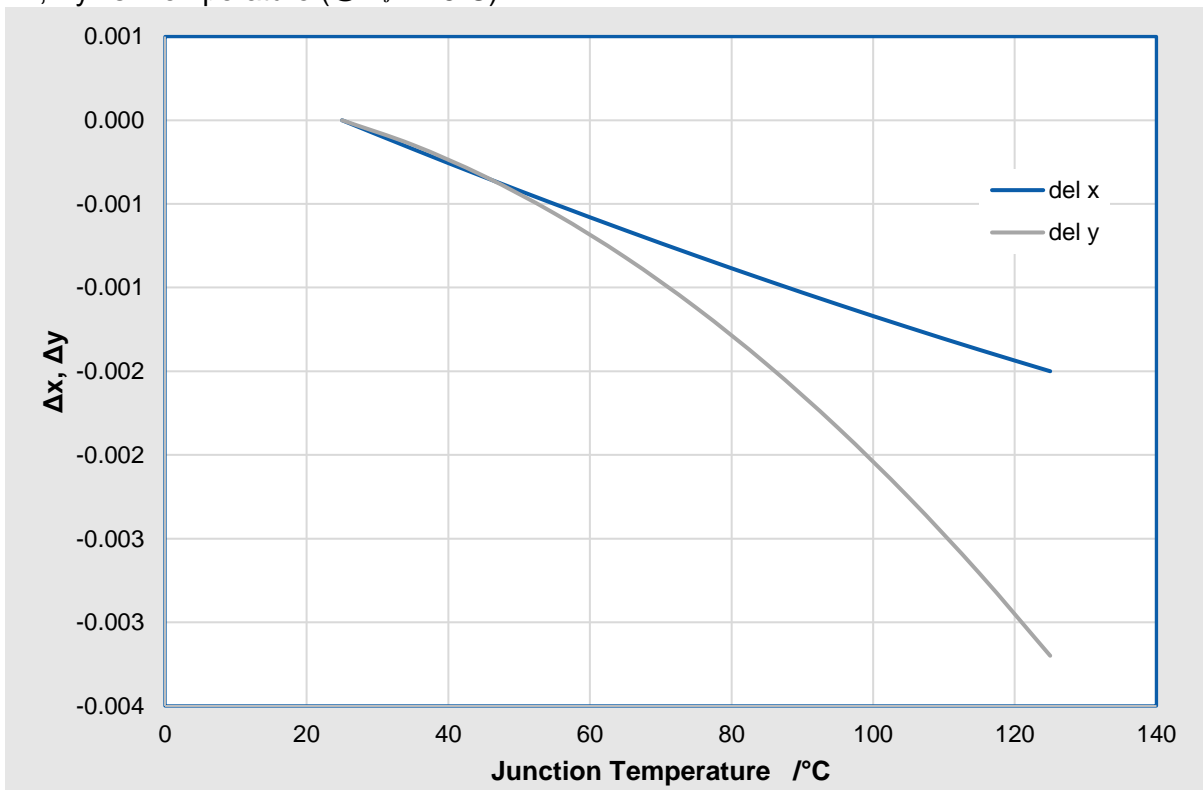
Relative Luminous Intensity vs. Junction Temperature (@ $I_F = 60\text{ mA}$)



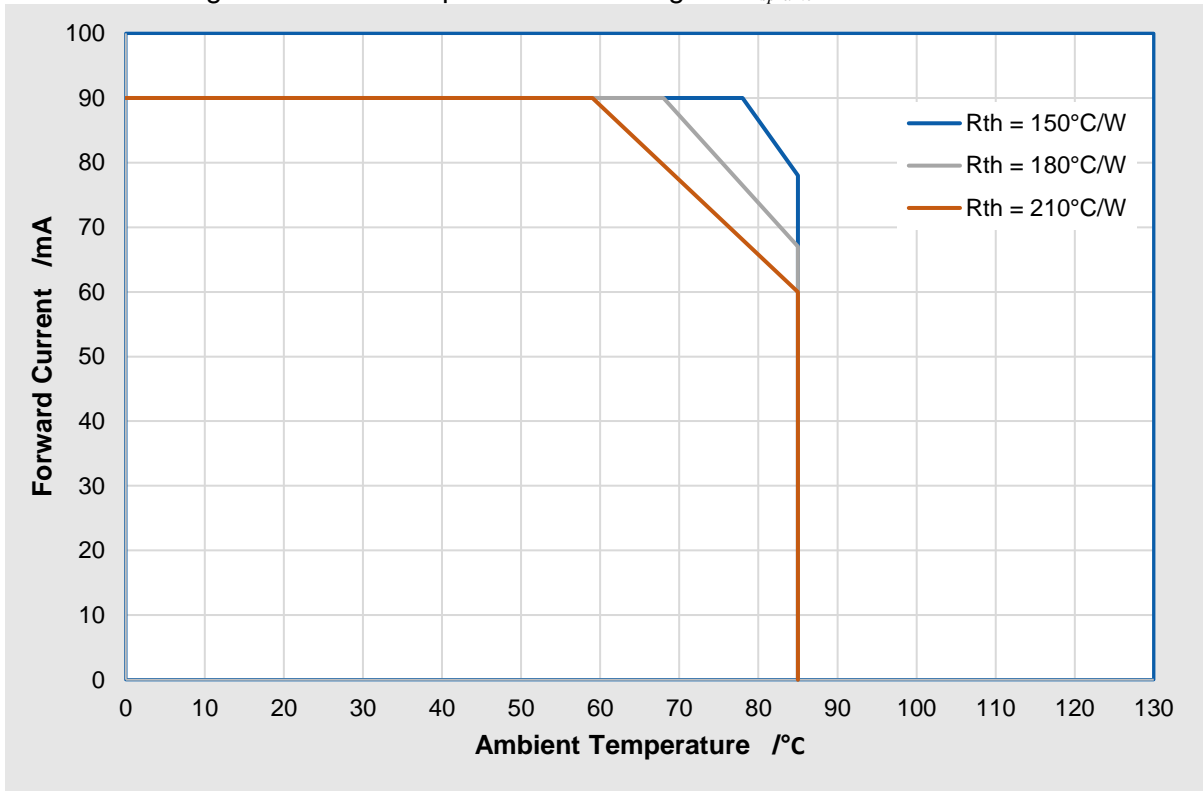
$\Delta x, \Delta y$ vs. Forward Current (@ $T_J = 25^\circ\text{C}$)



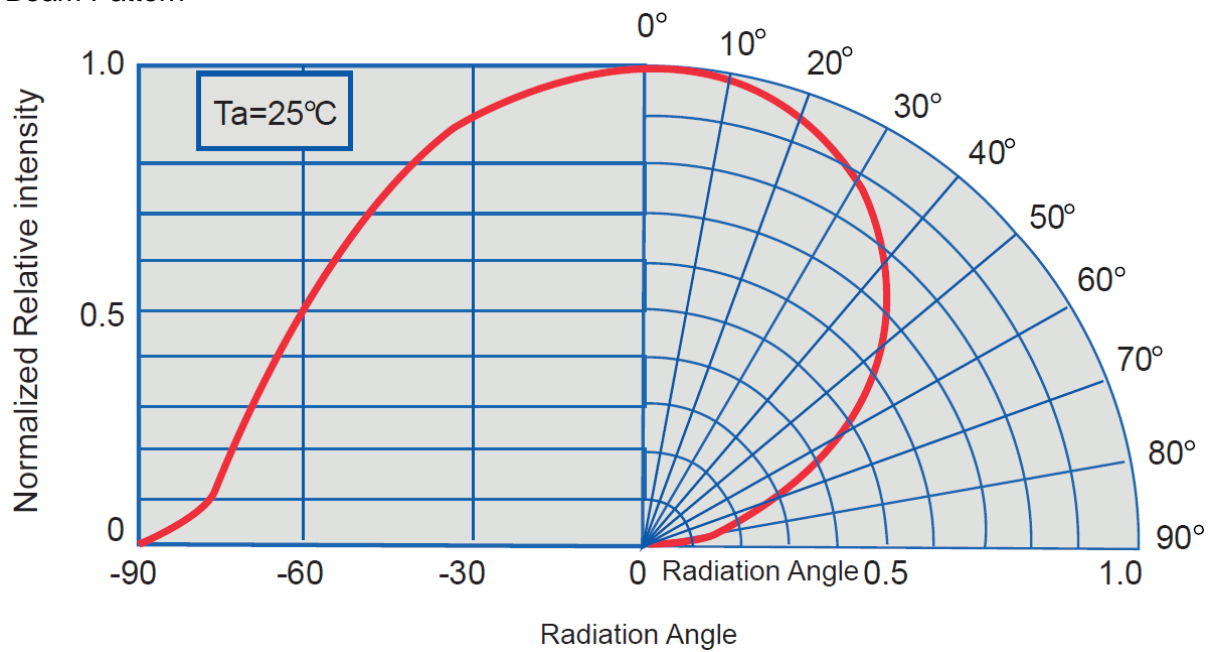
$\Delta x, \Delta y$ vs. Temperature (@ $T_J = 25^\circ\text{C}$)



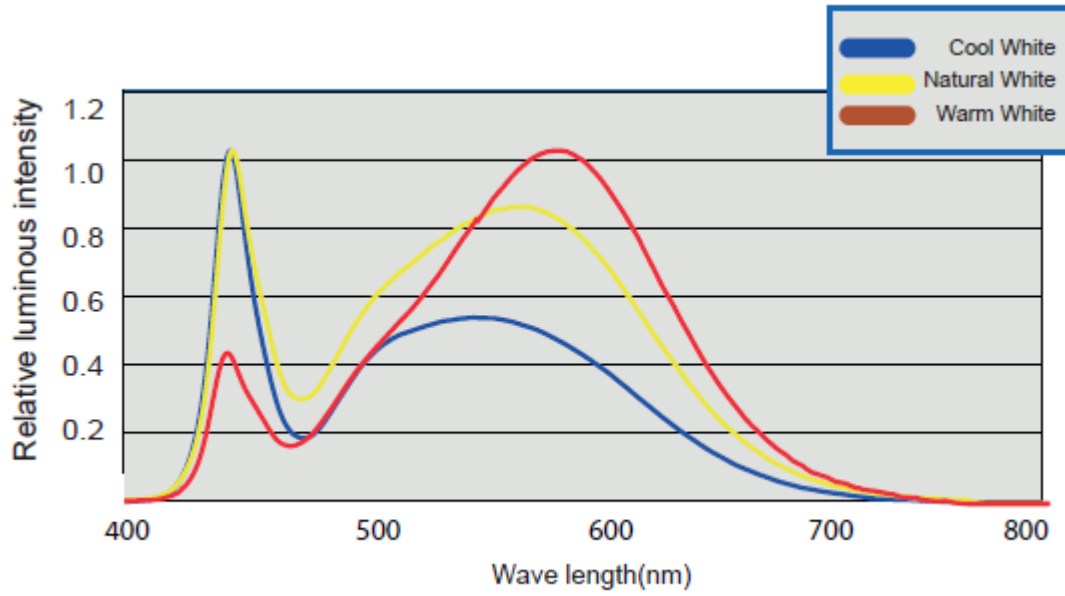
Current Derating vs Ambient Temperature for a range of R_{sp-amb}



Beam Pattern

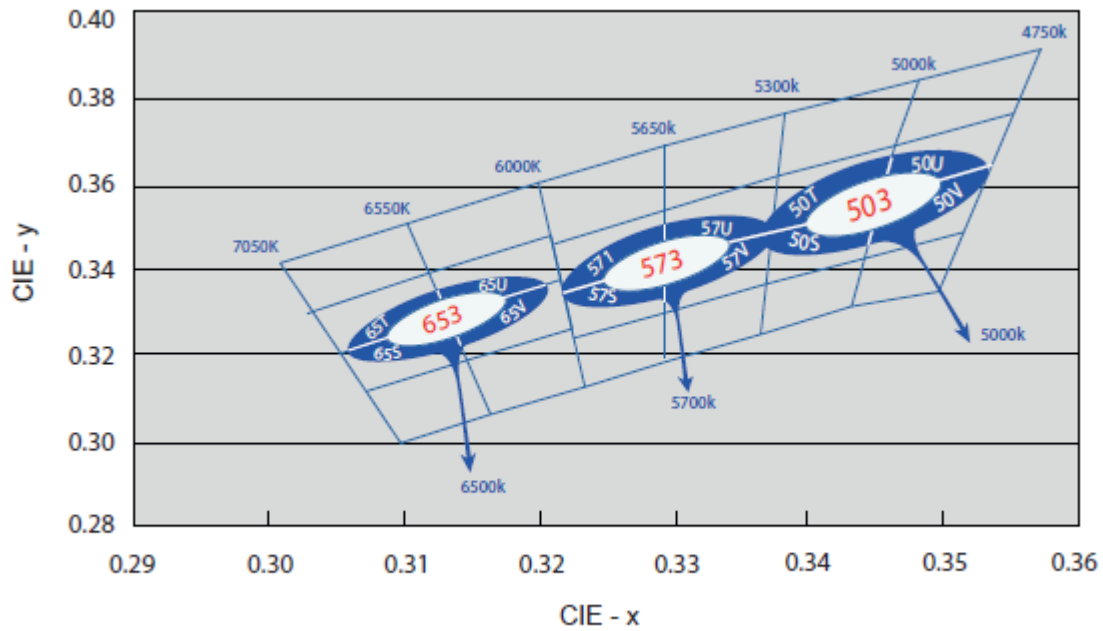


Colour Spectrum



Chromaticity Groups

Cool White; 5000, 5700 and 6500K

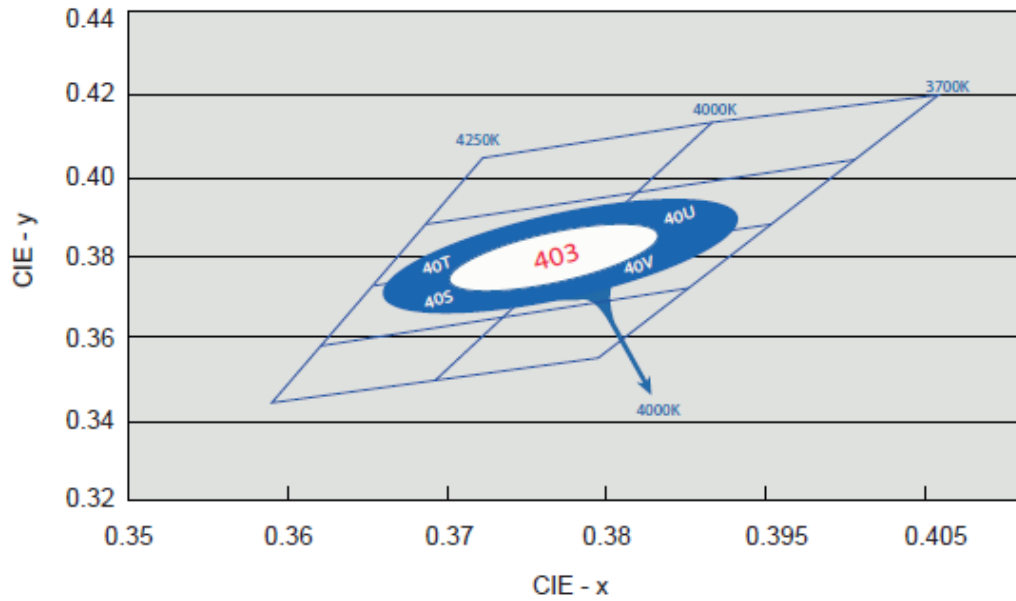


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
5000	5	0.3447	0.3553	0.01370	0.00590	59.62
5700	5	0.3287	0.3417	0.01243	0.00533	59.09
	3			0.00746	0.00320	
6500	5	0.3123	0.3282	0.01115	0.00475	58.57
	3			0.00669	0.00285	

Chromaticity Bins

CCT	MacAdam Steps	
	5	3
5000	503, 50S, 50T, 50U, 50V	-
5700	573, 57S, 57T, 57U, 57V	573
6500	653, 65S, 65T, 65U, 65V	653

Neutral White; 4000K

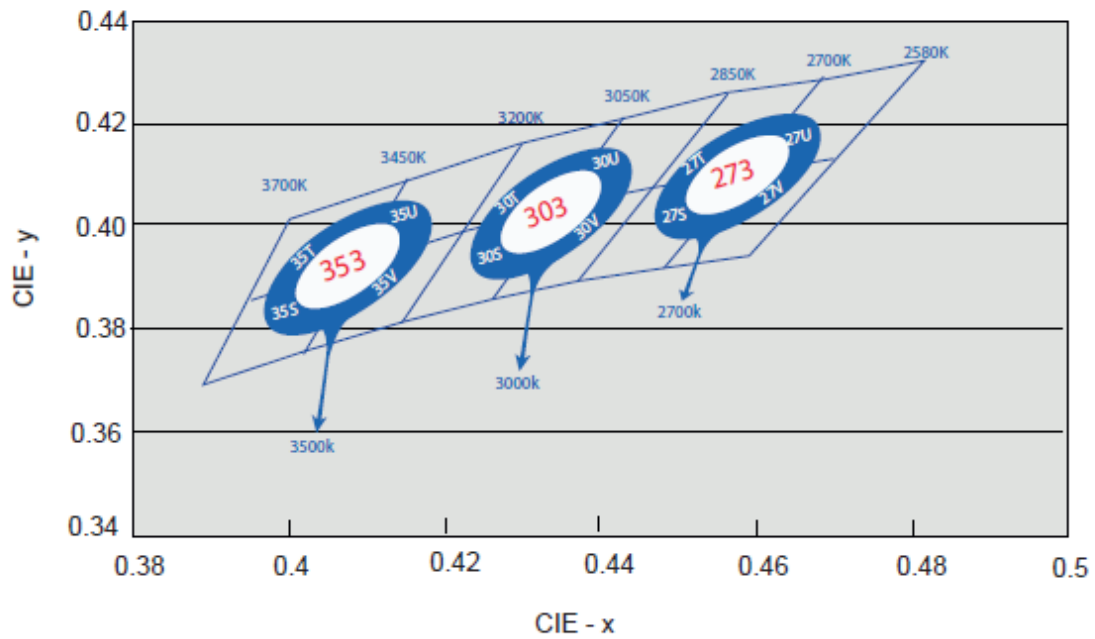


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
4000	5	0.3818	0.3797	0.01565	0.00670	53.72
	3			0.00939	0.00402	

Chromaticity Bins

CCT	MacAdam Steps	
	5	3
4000	403, 40S, 40T, 40U, 40V	403

Warm White; 2700, 3000 and 3500K

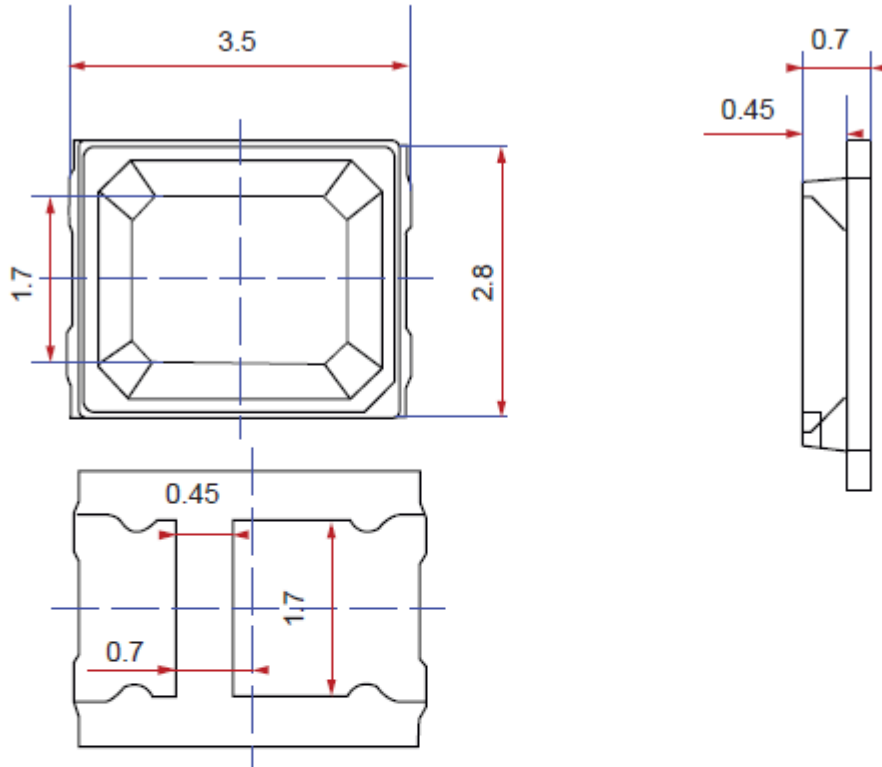


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
2700	5	0.4578	0.4101	0.01350	0.00700	53.70
3000	5	0.4338	0.4030	0.01390	0.00680	53.22
	3			0.00834	0.00408	
3500	5	0.4073	0.3917	0.01545	0.00690	54.00

Chromaticity Bins

CCT	MacAdam Steps	
	5	3
2700	273, 27S, 27T, 27U, 27V	-
3000	303, 30S, 30T, 30U, 30V	303
3500	353, 35S, 35T, 35U, 35V	-

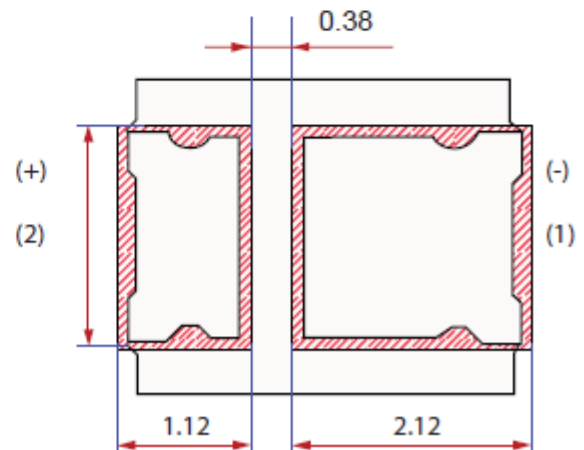
Mechanical Dimensions



Circuit

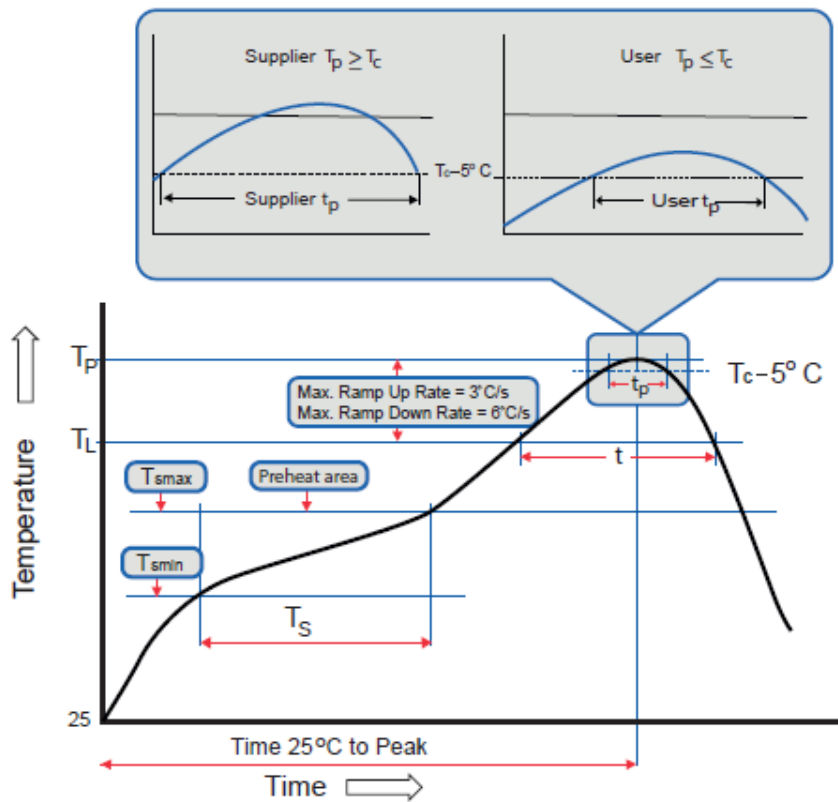


Solder Pad



- Notes:
1. All dimensions measured in mm.
2. Tolerance : +/- 0.20mm

Soldering Temperature Profile



Profile Feature	Pb-Free Assembly
Preheat & Soak	150 °C
Temperature min (T _{smin}) Temperature max (T _{smax}) Time (T _{smin} to T _{smax}) (t _s)	200 °C 60 – 120 seconds
Average ramp-up rate (T _{smax} to T _p)	3 °C/second max.
Liquid temperature (T _L)	217 °C
Time at liquid (t _L)	60 – 150 seconds
Peak package body temperature (T _p) ^[1]	255 °C ~260 °C ^[1]
Classification temperature (T _c)	260 °C
Time (t _p) ^[2] within 5 °C of the specified classification temperature (T _c)	30 seconds ^[2]
Average ramp-down rate (T _p to T _{smax})	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

Notes [1] : Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

[2] : Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Reliability - Environmental Evaluation

#	Test		
1	Temperature Cycling.	-40°C~100°C, 30, 30, mins	100 Cycles
2	Thermal Shock.	-40°C~100°C, 15, 15 mins \leq 10 sec	100 Cycles
3	Resistance to Soldering Heat.	TSOL=260°C, 30 sec	3 times
4	Moisture Resistance.	25°C~65°C 90% RH, 24 hrs / 1 cycle	10 Cycles
5	High-Temperature Storage.	$T_A=100^\circ\text{C}$	1000 hrs
6	Humidity Heat Storage.	$T_A =85^\circ\text{C}$ RH=85%	1000 hrs
7	Low-Temperature Storage.	$T_A=-40^\circ\text{C}$	1000 hrs
8	Operating Life.	$T_A=25^\circ\text{C}$	1000 hrs
9	High Temperature Operation Life.	$T_A=85^\circ\text{C}$	1000 hrs
10	High Humidity Heat Life Test.	$T_A =85^\circ\text{C}$ RH=85%	1000 hrs
11	Power Cycling.	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

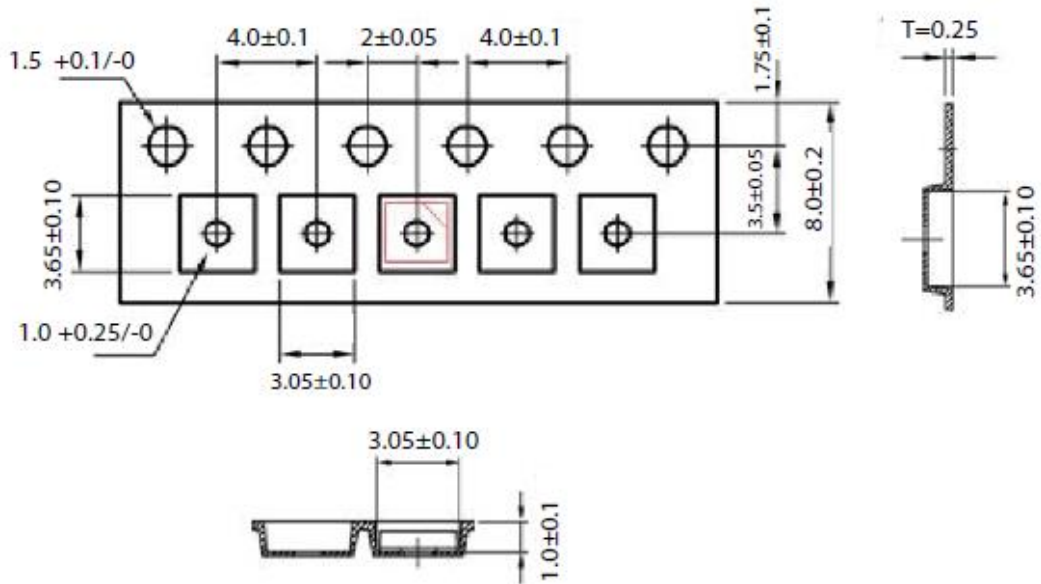
Mode	Failure Criteria	
	Min.	Max
Lumen Maintenance.	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage.	-	Initial data x 1.1
Reverse Current.	-	10 μA
Resistance to soldering heat.	No dead lamps or visual damage	

Reliability - Lumen Maintenance

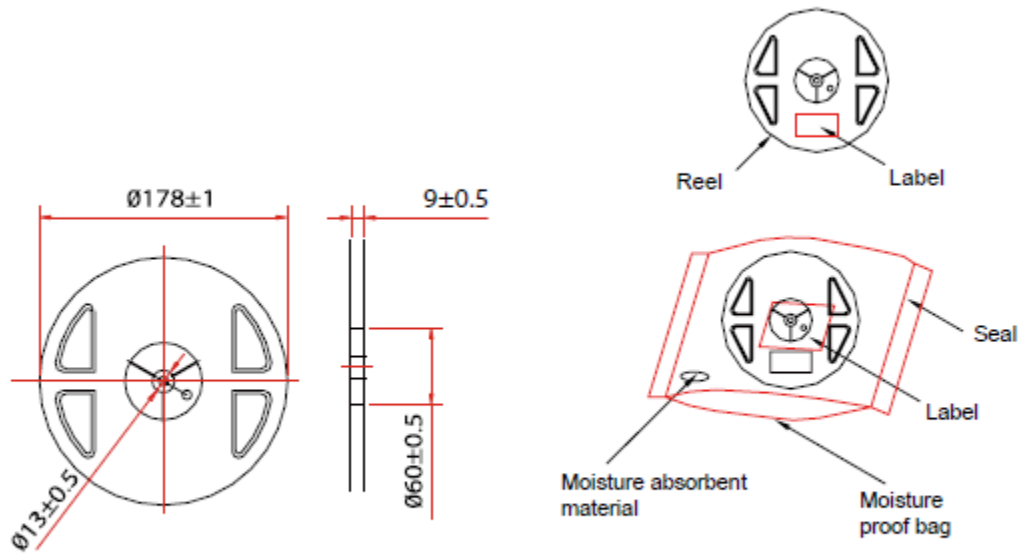
LM-80 verification is conducted according to standardized IES LM-80-08 and TM-21-11 methods. Based on the different testing intervals data, we can extrapolate LED lumen maintenance. For more details on lumen maintenance testing, chromaticity and LED case temperatures please refer to our LM-80 reports.

Product Packing Information


Tape specification



Reel and Reel Packing Specification



Cautions

Sulphur	Avoid storing or operation the LEDs in a sulphur containing environment. Some materials, such as seals, printing ink, enclosure and adhesives, may contain sulphur. Avoiding the exposure in acid or halogen environment.
Reverse Bias	These LEDs are not designed to operate in reverse bias. Precautions are required to prevent reverse bias in applications and during handling.
ESD	<div data-bbox="496 506 898 696" style="border: 1px solid black; padding: 5px; text-align: center;"><p>ATTENTION OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES</p></div> <p>These LEDs are ESD sensitive. Safe ESD handling precautions are required.</p>

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