PLW5630AGE Series

Product Datasheet

Bulb | Down Light | Decorative Light | Tube Light | Track Light | Panel Light

Introduction

Plessey's ultra-high luminous PLW5630AGE SMT LEDs are designed for optical indicators, indoor displays, automotive lighting, backlights for switches/symbols/LCD, tubular lighting and other general lighting applications and the light is emitted close to a Lambertian distribution. The LEDs are packed in reels containing 3,000 pieces; each individual reel will be shipped in single intensity and colour bin, to provide close uniformity

Description	Features and Benefits
• Standard package size 5.7mmx3.0mm. • Good uniform light colour. • Multi-colour system more options. • High reliability product (pass LM-80 verification)	• High luminous intensity and high efficiency. • Based on Blue: InGaN technology. • Wide viewing angle: 120°. • Excellent performance and visibility. • Suitable for all SMT assembly methods. • IR reflow process compatible. • Environmental friendly; RoHS compliance. • ANSI compliant colour binning.

Contents

Order Codes

CCT /K	
6500	PLW5630AGE65B5
5700	PLW5630AGE57B5
5000	PLW5630AGE50B5
4000	PLW5630AGE40B5
3500	PLW5630AGE35B5
3000	PLW5630AGE30B5
2700	PLW5630AGE27B5

Absolute Maximum Ratings

T_{amb} = +25°C unless otherwise stated.

Parameter			Value	Units
DC Forward Current		I_F	200	mA
Pulse Forward Current (tp≤100µs, Duty cycle=0.25)		I_{pulse}	350	mA
Reverse Current [1]		I_R	10	µA
Reverse Voltage [1]		V_R	[2]	V
LED Junction Temperature [2]		T_J	125	°C
Operating Temperature		T_{opr}	-40 ~ +85	°C
Storage Temperature		T_{stg}	-40 ~ +125	°C
Power Dissipation		P_D	500	mW
ESD Sensitivity (HBM)		V_B	2,000	V
Soldering Temperature	Reflow Soldering	T_S	255~260°C/10~30sec	-
	Manual Soldering		350°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°C unless otherwise stated.

Parameter			Value	Units
Viewing angle [1]		$2Ø_{1/2}$	120	mA
Thermal resistance		$R_{thj\text{-}sp}$	16	°C/W
Correlated Colour Temperature [2]	Cool White	CCT	6500	K
			5700	
			5000	
	Neutral White		4000	
	Warm White		3500	
			3000	
			2700	
Colour Rendering Index [3]		CRI	80	V
JEDEC Moisture Sensitivity [4]		-	2a (4 weeks)	-

Notes [1] : Viewing angle, 2Ø1/2, 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: ≤30°C/60%RH.
Soak Requirement (Standard): 120 +1/-0 hr, 60°C/5%RH.

Luminous Flux Characteristics

Luminous flux at I_F=65mA, T_J=25°C.

CCT /K	CRI	Group	Luminous Flux /lm [1]	
			min	max
Cool White: 6500 5700 5000	80	3F	30	32
		4F	32	34
		5F	34	36
		6F	36	38
Neutral White: 4000		3F	30	32
		4F	32	34
		5F	34	36
		6F	36	38
Warm White: 3500 3000 2700		2F	28	30
		3F	30	32
		4F	32	34
		5F	34	36

Notes [1] : The luminous flux tolerance is ±10%

Forward Voltage Bins

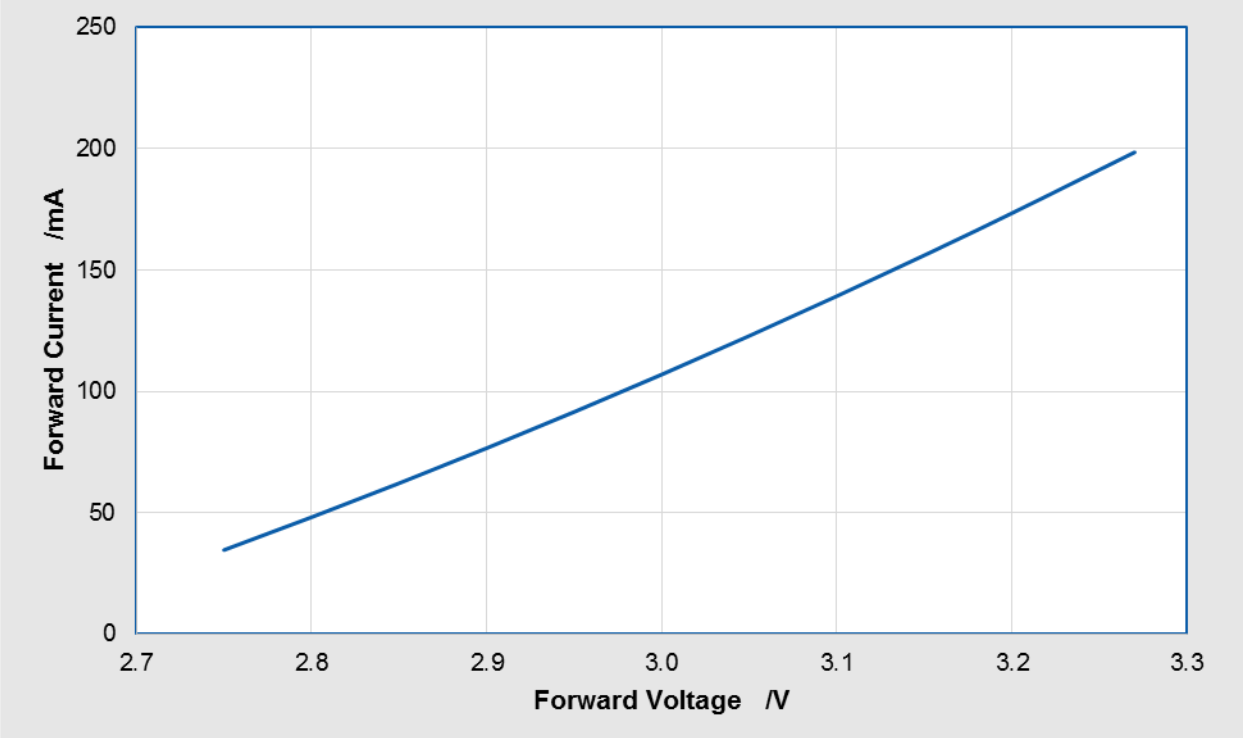
Forward Voltage at I_F=65mA, T_J=25°C.

Group	Forward Voltage /V [1]	
	min	max
V01	2.7	2.8
V02	2.8	2.9
V03	2.9	3.0
V04	3.0	3.1

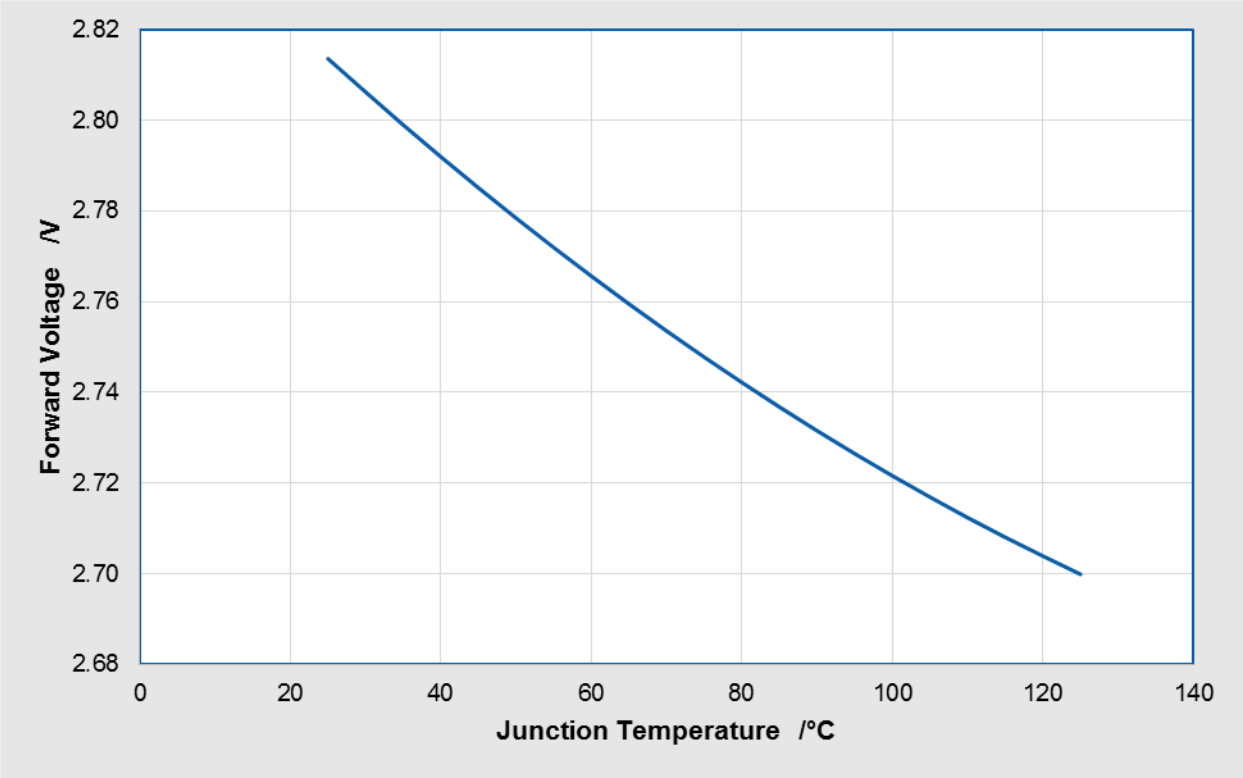
Notes [1] : The forward voltage tolerance is ±0.06V

Characteristic Curves

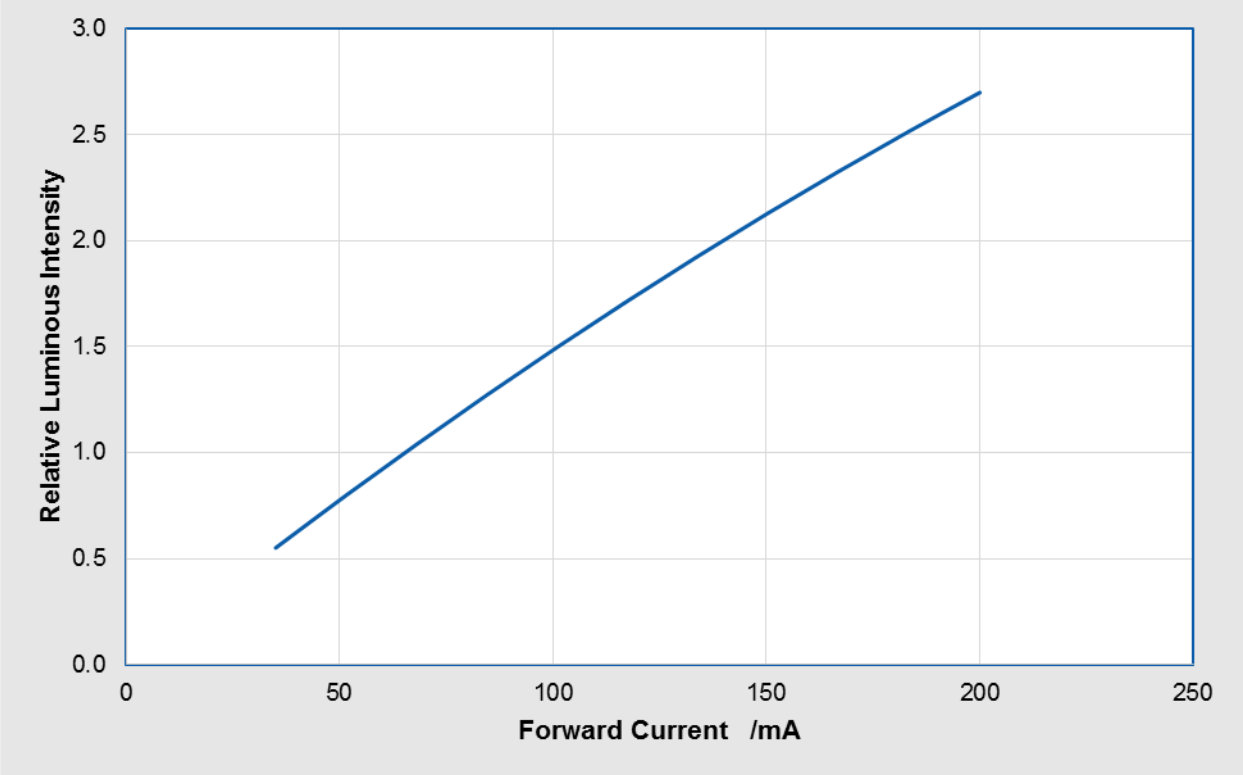
Forward Current vs. Forward Voltage (@ T_J = 25°C)



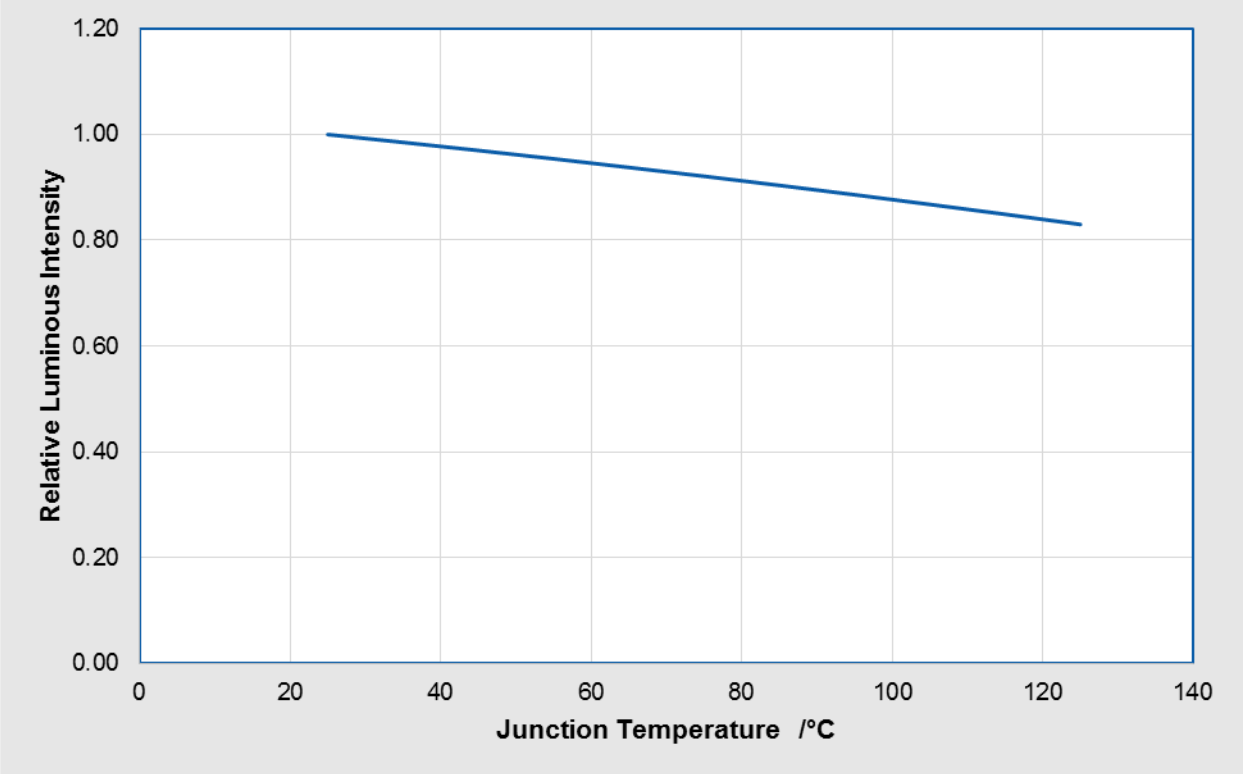
Forward Voltage vs. Junction Temperature (@ I_F = 65 mA)



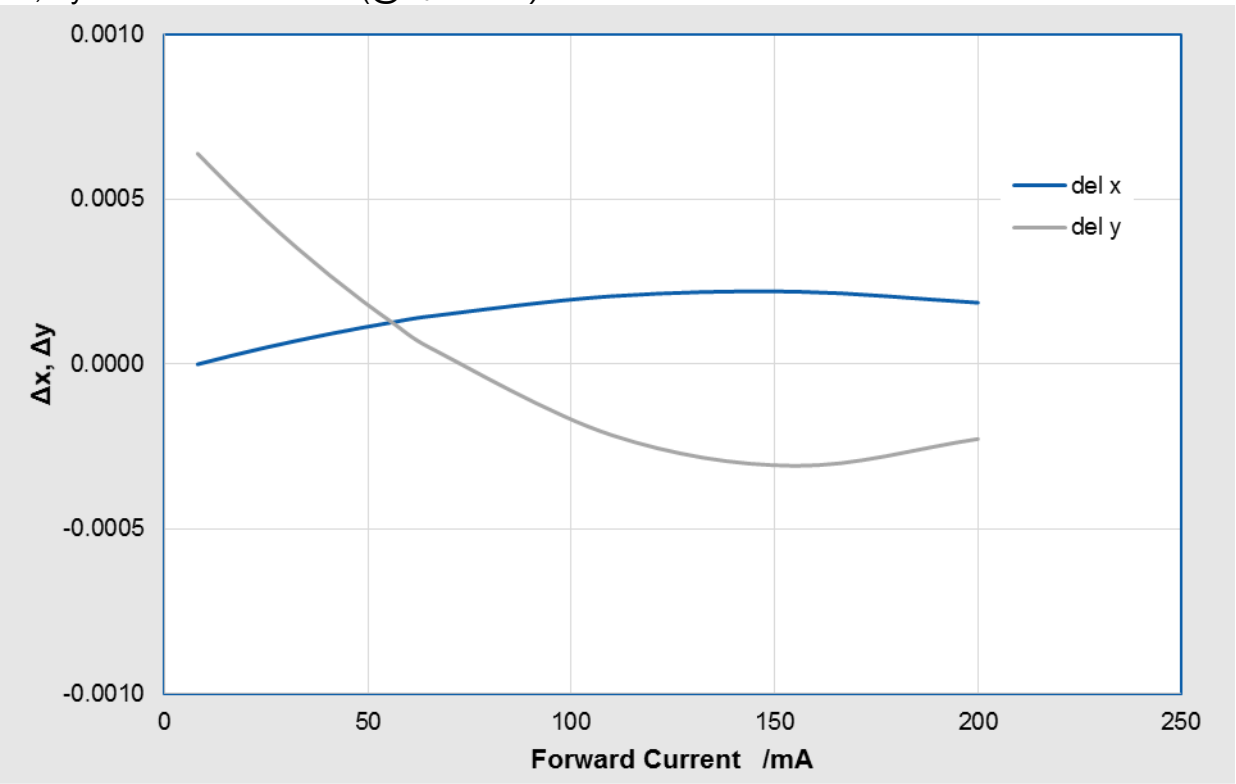
Relative Luminous Intensity vs. Forward Current (@ T_J = 25°C)



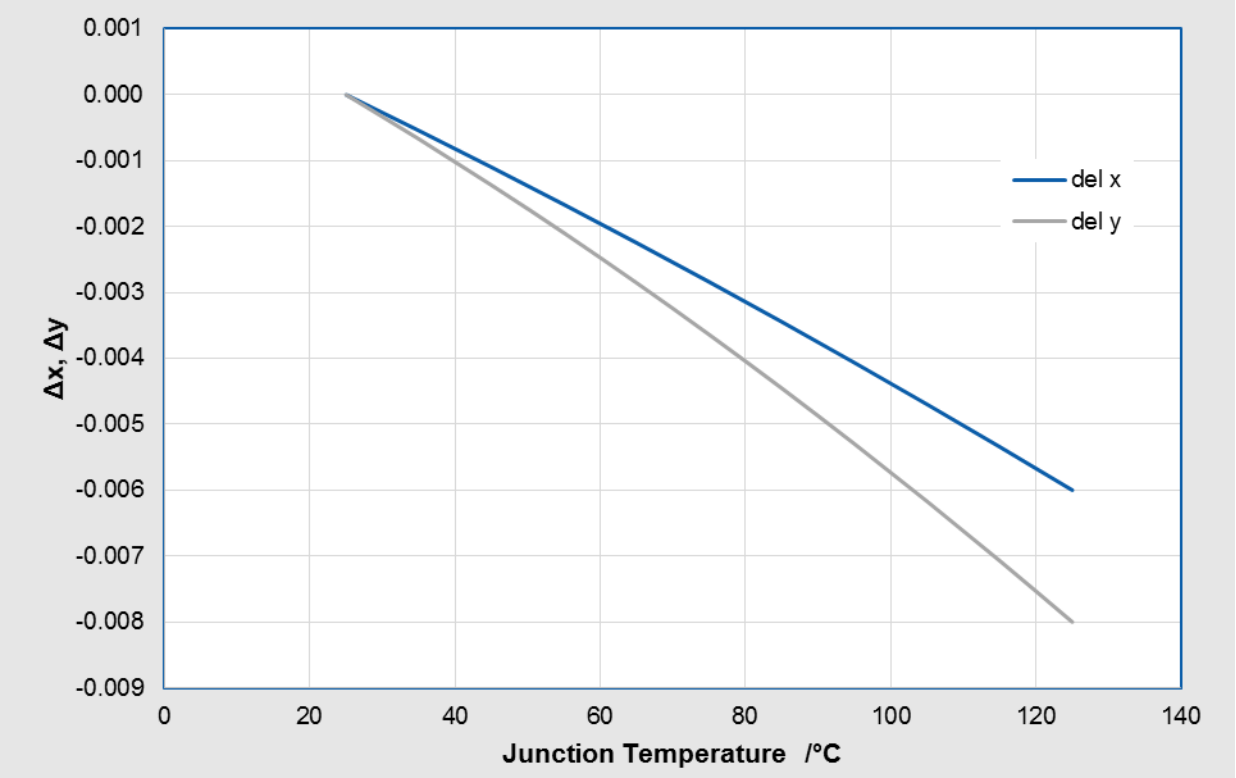
Relative Luminous Intensity vs. Junction Temperature (@ I_F = 65 mA)



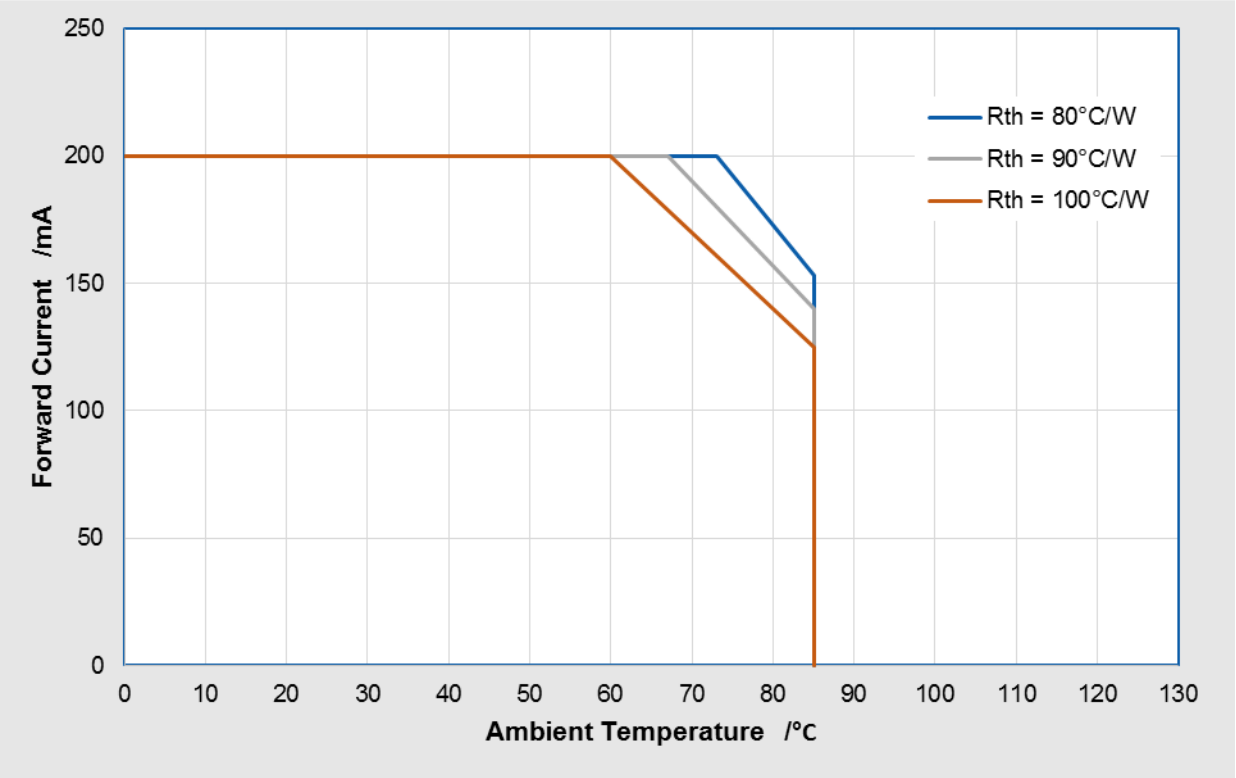
Δx, Δy vs. Forward Current (@ T_J = 25°C)



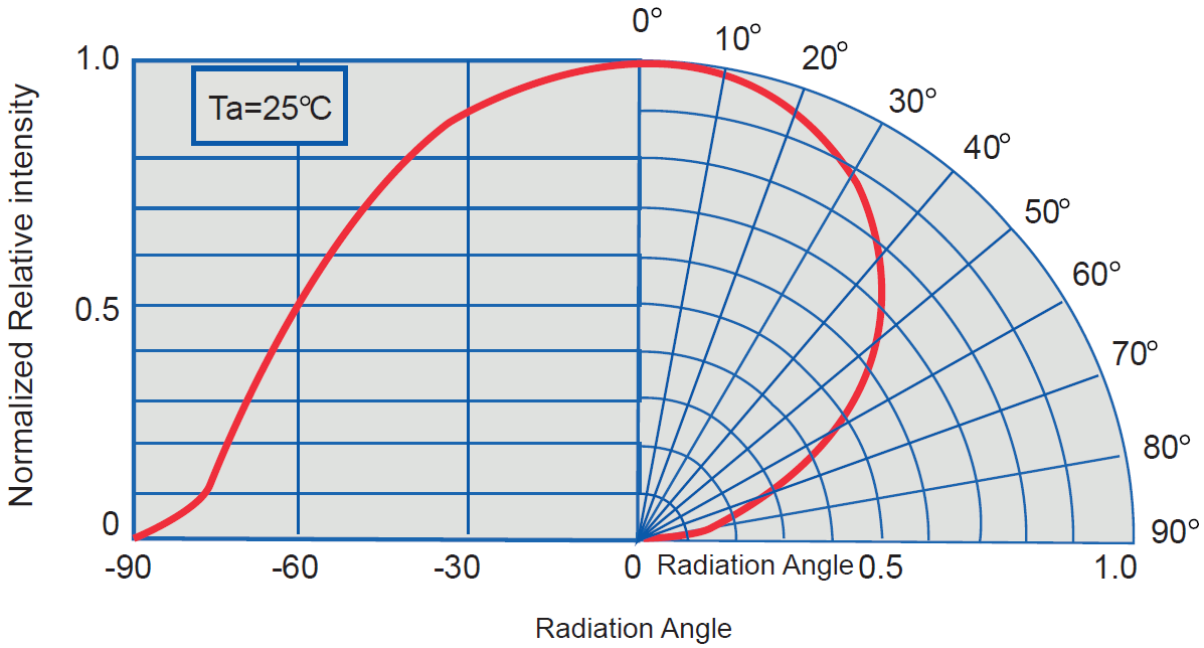
Δx, Δy vs. Temperature (@ T_J = 25°C)



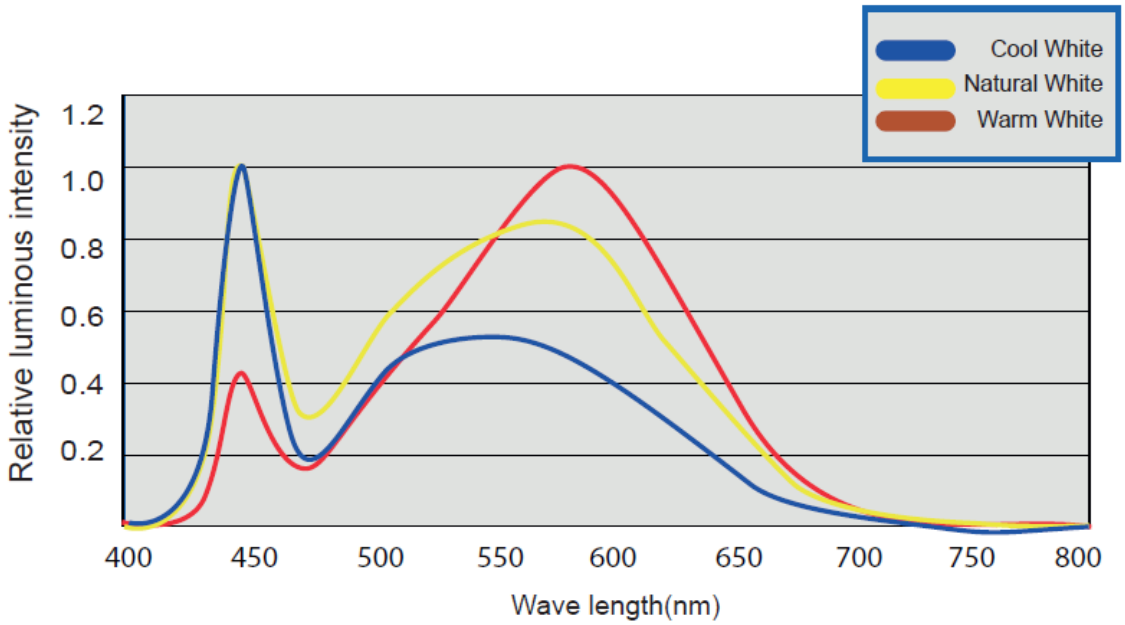
Current Derating vs Ambient Temperature for a range of $R_{jn\text{-}amb}$



Beam Pattern

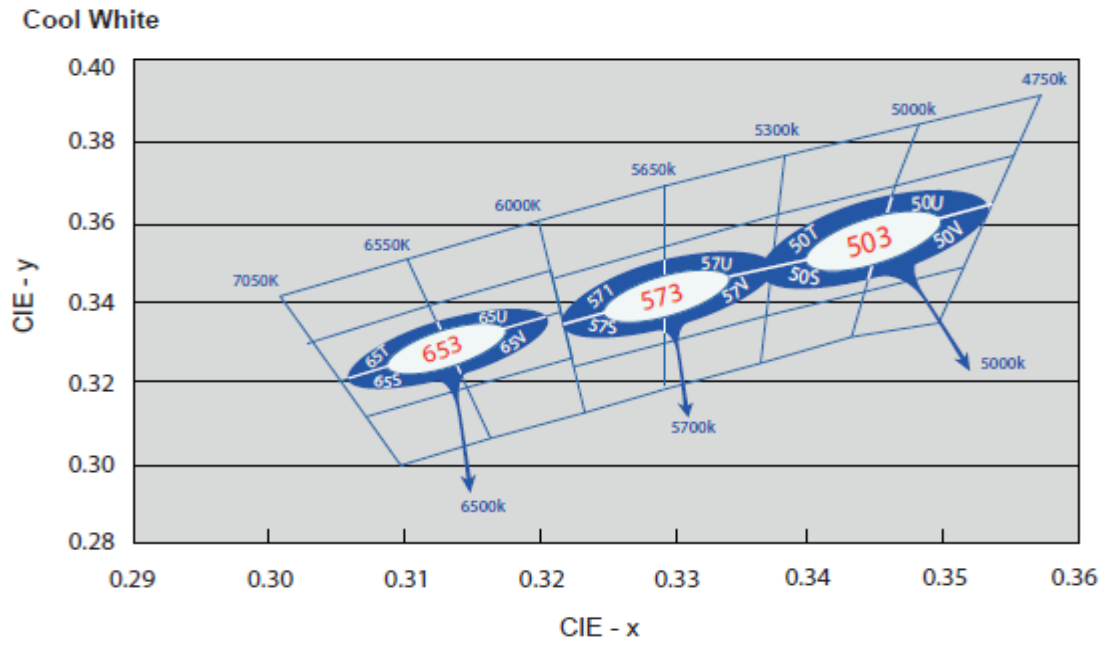


Colour Spectrum (CRI 80)



Chromaticity Groups

Cool White; 5000, 5700 and 6500K

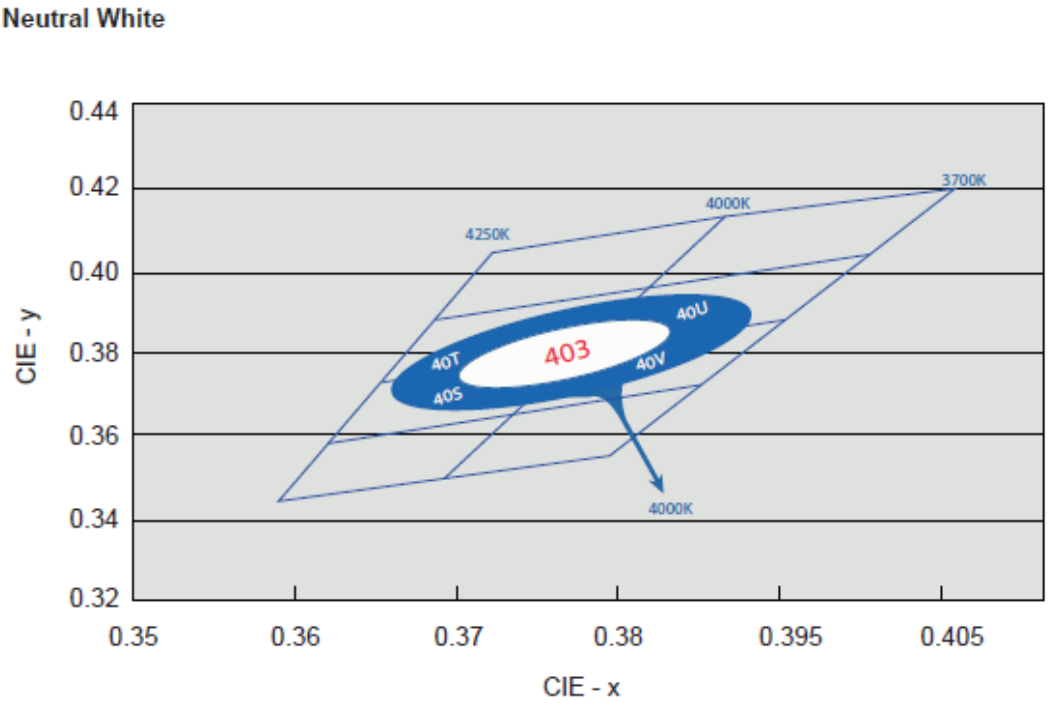


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
5000	5	0.3447	0.3553	0.01370	0.00590	59.62
5700	5	0.3287	0.3417	0.01243	0.00533	59.09
6500	5	0.3123	0.3282	0.01115	0.00475	58.57

Chromaticity Bins

CCT	
5000	503, 50S, 50T, 50U, 50V
5700	573, 57S, 57T, 57U, 57V
6500	653, 65S, 65T, 65U, 65V

Neutral White; 4000K

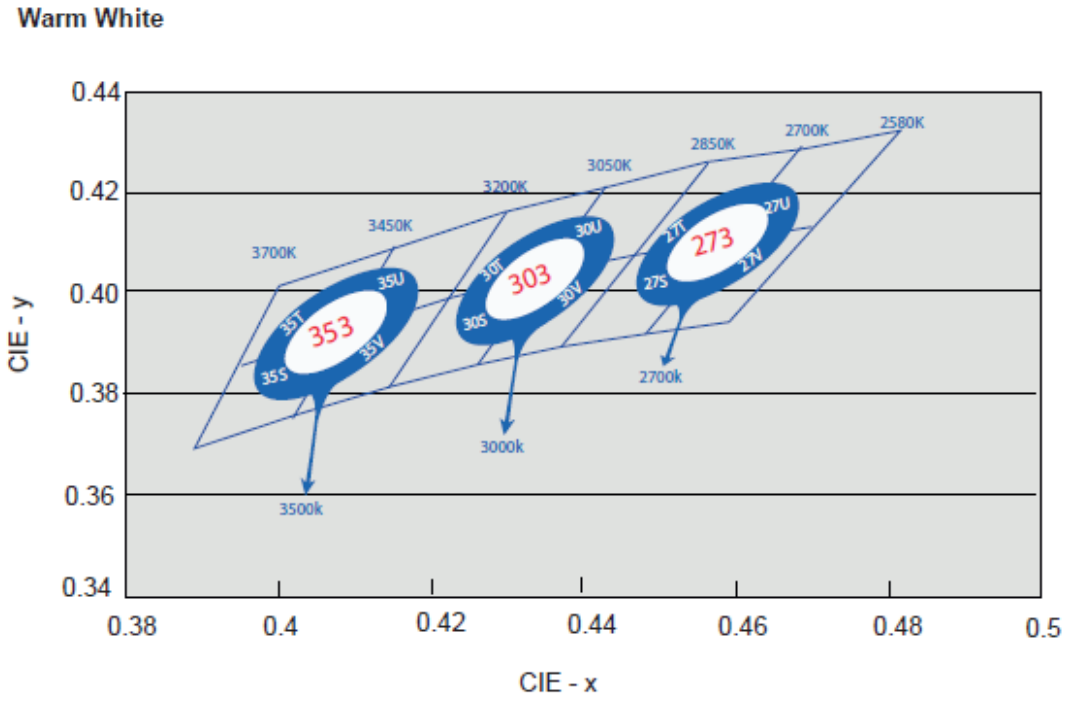


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
4000	5	0.3818	0.3797	0.01565	0.00670	53.72

Chromaticity Bins

CCT	
4000	403, 40S, 40T, 40U, 40V

Warm White; 2700, 3000 and 3500K

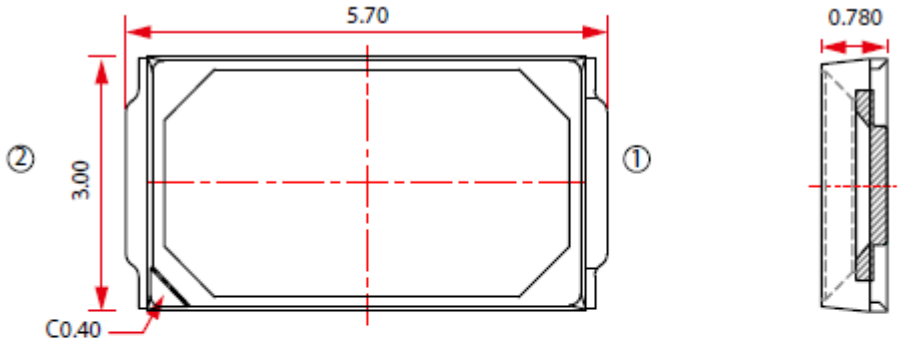


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
2700	5	0.4578	0.4101	0.01350	0.00700	53.70
3000	5	0.4338	0.4030	0.01390	0.00680	53.22
3500	5	0.4073	0.3917	0.01545	0.00690	54.00

Chromaticity Bins

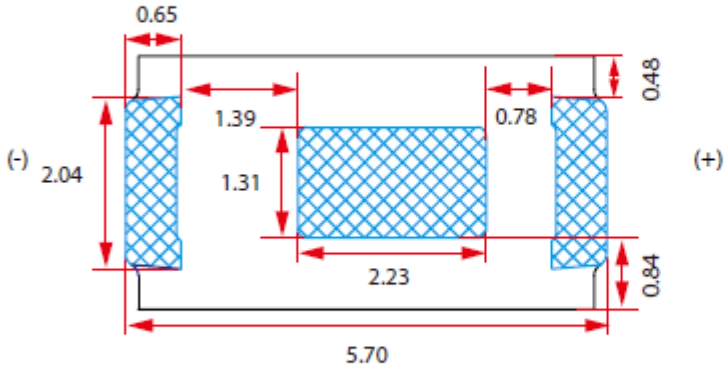
CCT	
2700	273, 27S, 27T, 27U, 27V
3000	303, 30S, 30T, 30U, 30V
3500	353, 35S, 35T, 35U, 35V

Mechanical Dimensions



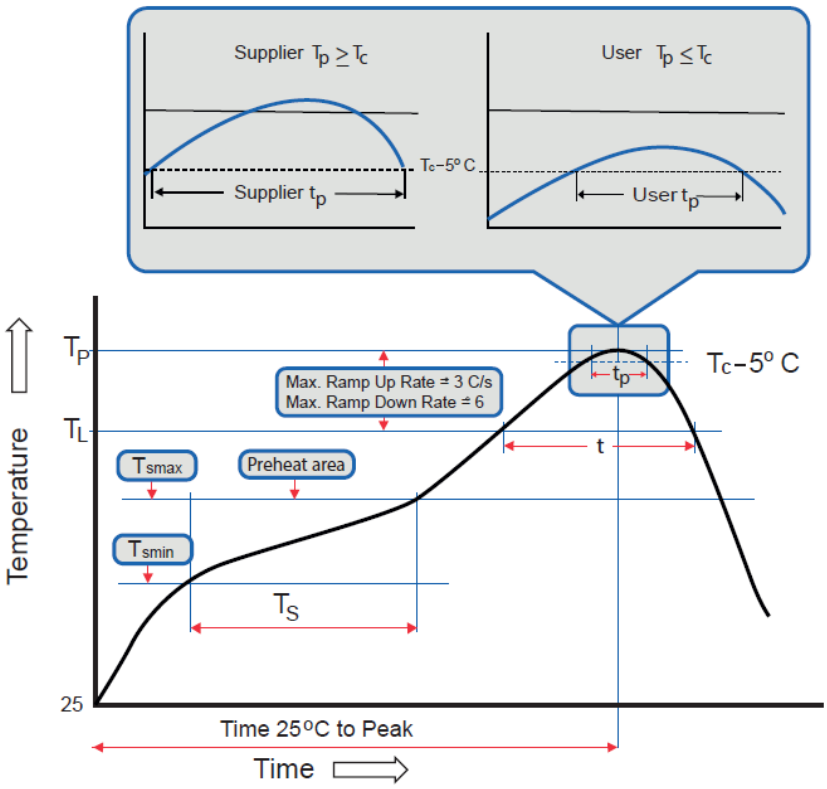
Circuit

Solder Pad



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

Soldering Temperature Profile



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.
Liquid temperature (TL) Time at liquid (tL)	217 °C 60 – 150 seconds
Peak package body temperature (Tp) [1]	255 °C ~260 °C [1]
Classification temperature (Tc)	260 °C
Time (tp) [2] within 5 °C of the specified classification temperature (Tc)	30 seconds [2]
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 - 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 ≦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°C	1000 hrs
6	Humidity Heat Storage.	T_A =85°C RH=85%	1000 hrs
7	Low-Temperature Storage.	T_A=-40°C	1000 hrs
8	Operating Life.	T_A=25°C	1000 hrs
9	High Temperature Operation Life.	T_A=85°C	1000 hrs
10	High Humidity Heat Life Test.	T_A =85°C RH=85%	1000 hrs
11	Power Cycling.	30 sec ON, 30 sec OFF	1.5W times

Failure Criteria

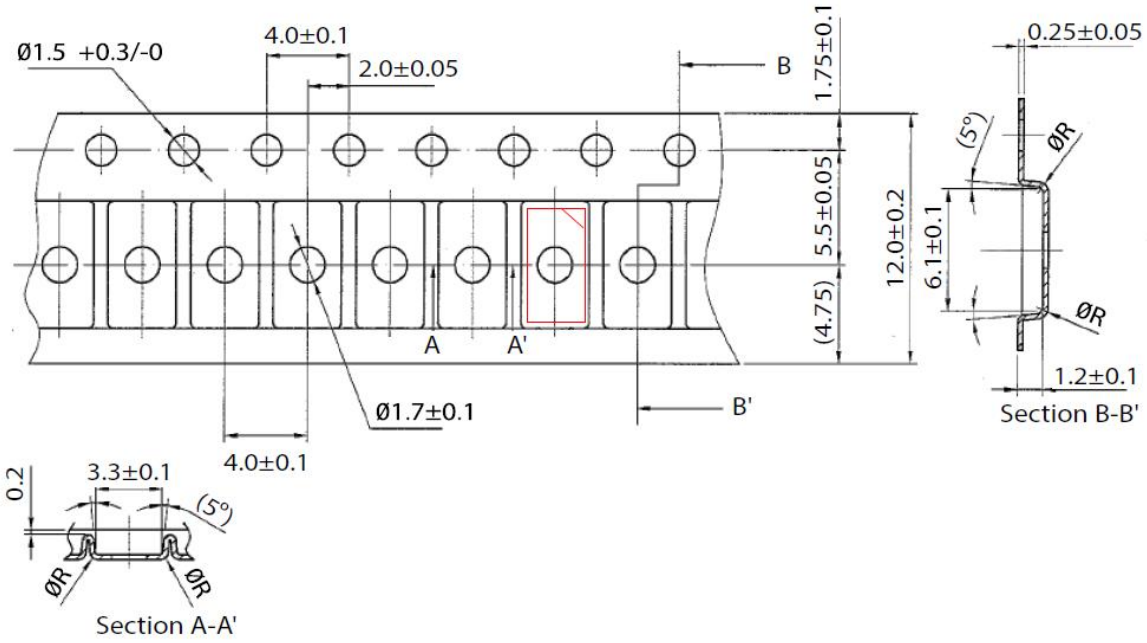
Mode	Failure Criteria	
	Min.	Max
Lumen Maintenance.	85%	-
Δu'v'	-	0.006
Forward Voltage.	-	Initial data x 1.1
Reverse Current.	-	10μA
Resistance to soldering heat.	No dead lamps or visual damage	

Reliability - Lumen Maintenance

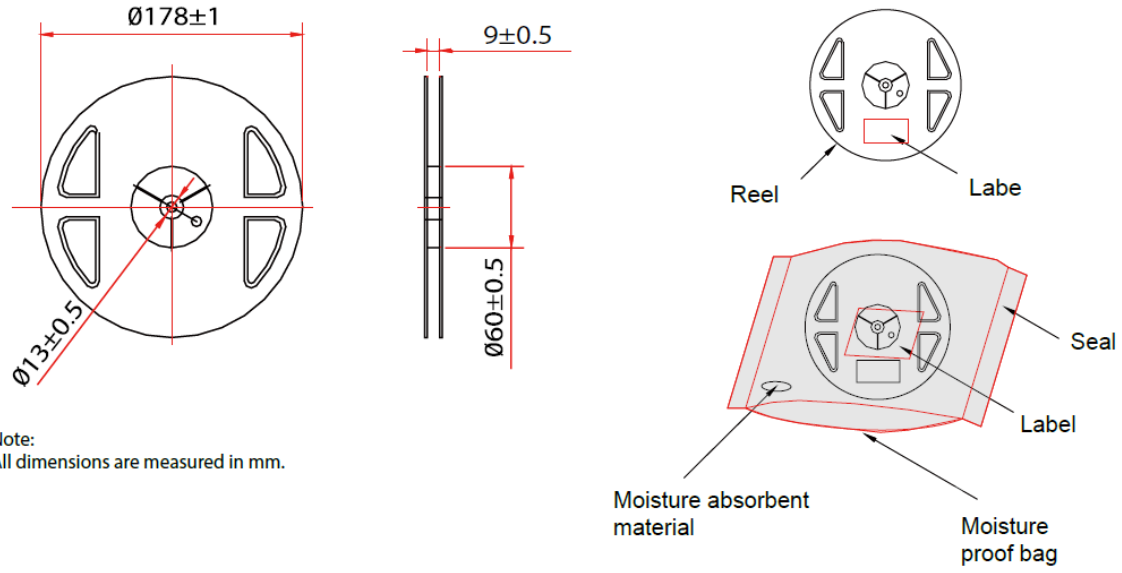
LM-80 verification is conducted according to standardized IES LM-80-08 and TM-21-11 methods. Based on the different testing intervals data, we can extrapolate LED lumen maintenance. For more details on lumen maintenance testing, chromaticity and LED case temperatures please refer to our LM-80 reports.

Product Packing Information

Tape specification

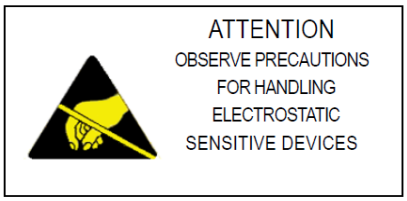


Reel and Reel Packing Specification



Note:
All dimensions are measured in mm.

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	 These LEDs are ESD sensitive. Safe ESD handling precautions are required.

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