

PLW2835AID Series

Product Datasheet



Bulb



Commercial
Lighting



General
Lighting

Introduction

The PLW2835AID 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.

Features and Benefits

- Superior luminous efficiency 181 lm/W @4000K.
- Deliver 33.5 lm @ 65mA, 4000k.
- Pass LM-80 verification.
- Suitable for all SMT assembly methods.
- IR reflow process compatible.
- Environmentally friendly; RoHS compliant.

Contents

Order Codes	3
Absolute Maximum Ratings.....	3
General Characteristics.....	4
Electro-Optical Characteristics (Neutral White)	5
Luminous Flux Characteristic	5
Forward Voltage Bins.....	6
Characteristic Curves.....	7
Forward Current vs. Forward Voltage	7
Forward Current vs. Junction Temperature	7
Relative Luminous Intensity vs. Forward Current.....	8
Relative Luminous Intensity vs. Junction Temperature	8
Δx , Δy vs. Forward Current.....	9
Δx , Δy vs. Junction Temperature	9
Current Derating vs. Ambient Temperature	10
Beam Pattern	10
Spectrum, CRI 80.....	11
Chromaticity Groups	12
Cool White; 5000, 5700 and 6500K	12
Neutral White; 4000K	13
Warm White; 2700, 3000 and 3500K.....	14
Mechanical Dimensions	15
Soldering Temperature Profile	16
Reliability	17
Reliability – Environmental/Mechanical Evaluation	17
Reliability - Lumen Maintenance.....	17
Product Packaging Information	18
Cautions.....	19
Legal Notice.....	20
Contact	20

Order Codes

CCT (K)	
6500	PLW2835AID65B5
5700	PLW2835AID57B5
5000	PLW2835AID50B5
4000	PLW2835AID40B5
3500	PLW2835AID35B5
3000	PLW2835AID30B5
2700	PLW2835AID27B5

Absolute Maximum Ratings

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

Parameter		Value	Units
DC Forward Current	I_F	300	mA
Pulse Forward Current ($t_p \leq 100\mu\text{s}$, Duty cycle=0.25)	I_{pulse}	350	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	800	mW
ESD Sensitivity (HBM)	V_B	2,000	V
Soldering Temperature	Reflow Soldering	255~260 $^{\circ}\text{C}$ /10~30sec	-
	Manual Soldering		-

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	°
Thermal resistance	R_{thj-sp}	20	°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	
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: $\leq 30^{\circ}\text{C}/60\%\text{RH}$.

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

Electro-Optical Characteristics (Neutral White)

$I_F=65\text{mA}$, $T_J=25^\circ\text{C}$

<u>If(mA)</u>	<u>Vf(V)</u>	<u>Power (W)</u>	<u>Lm</u>	<u>Lm/W</u>
20	2.70	0.054	11.0	204
40	2.78	0.111	22.0	198
60	2.80	0.168	32.0	190
65 (Typ)	2.84	0.185	34.5	186
80	2.93	0.234	42.0	179
100	3.00	0.300	51.0	170
150	3.08	0.462	73.0	158

Luminous Flux Characteristics

Luminous flux at $I_F=65\text{mA}$, $T_J=25^\circ\text{C}$.

Luminous flux at 1 F = 6500 K, 1 f = 25 °C.				
CCT (K)	CRI	Group	Luminous Flux (lm) ^[1]	
			min	max
Cool White: 6500 5700 5000	80	4F	32	34
		5F	34	36
		6F	36	38
Neutral White: 4000		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 $\pm 10\%$

Forward Voltage Bins

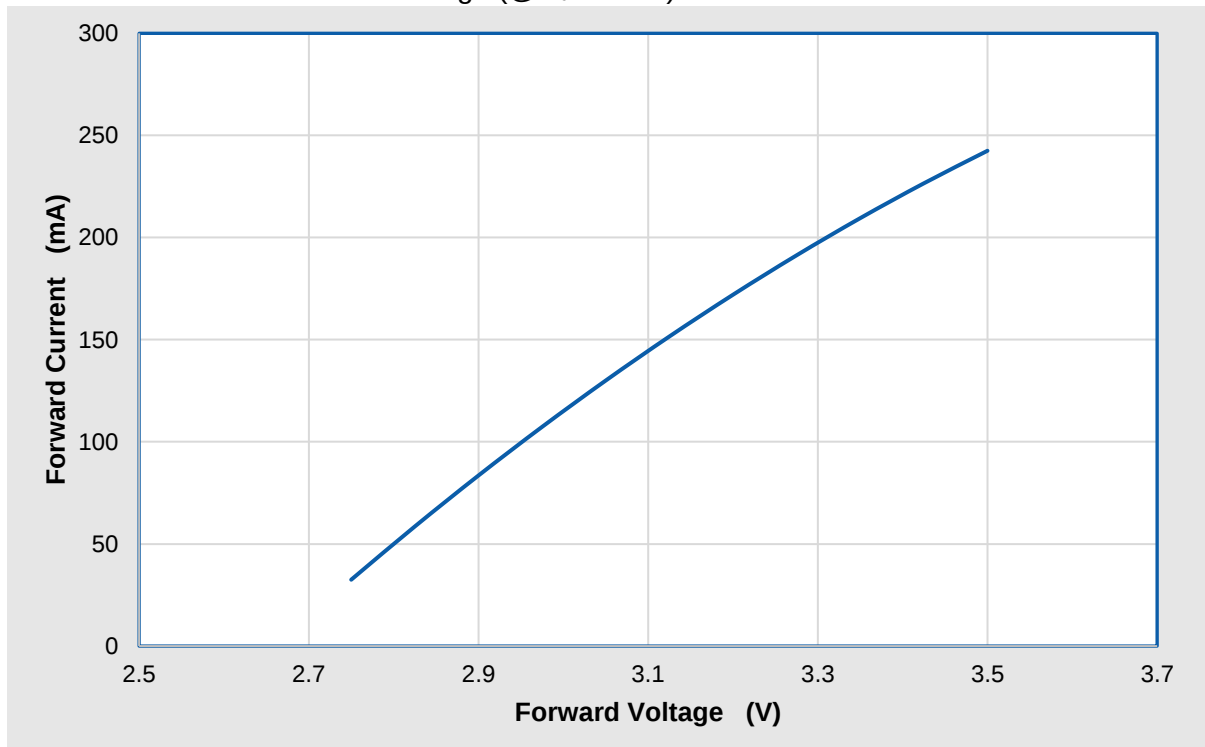
Forward Voltage at $I_F=65\text{mA}$, $T_J=25^\circ\text{C}$.

Group	Forward Voltage (V) ^[1]	
	min	max
V00	2.6	2.7
V01	2.7	2.8
V02	2.8	2.9
V03	2.9	3.0
V04	3.0	3.1

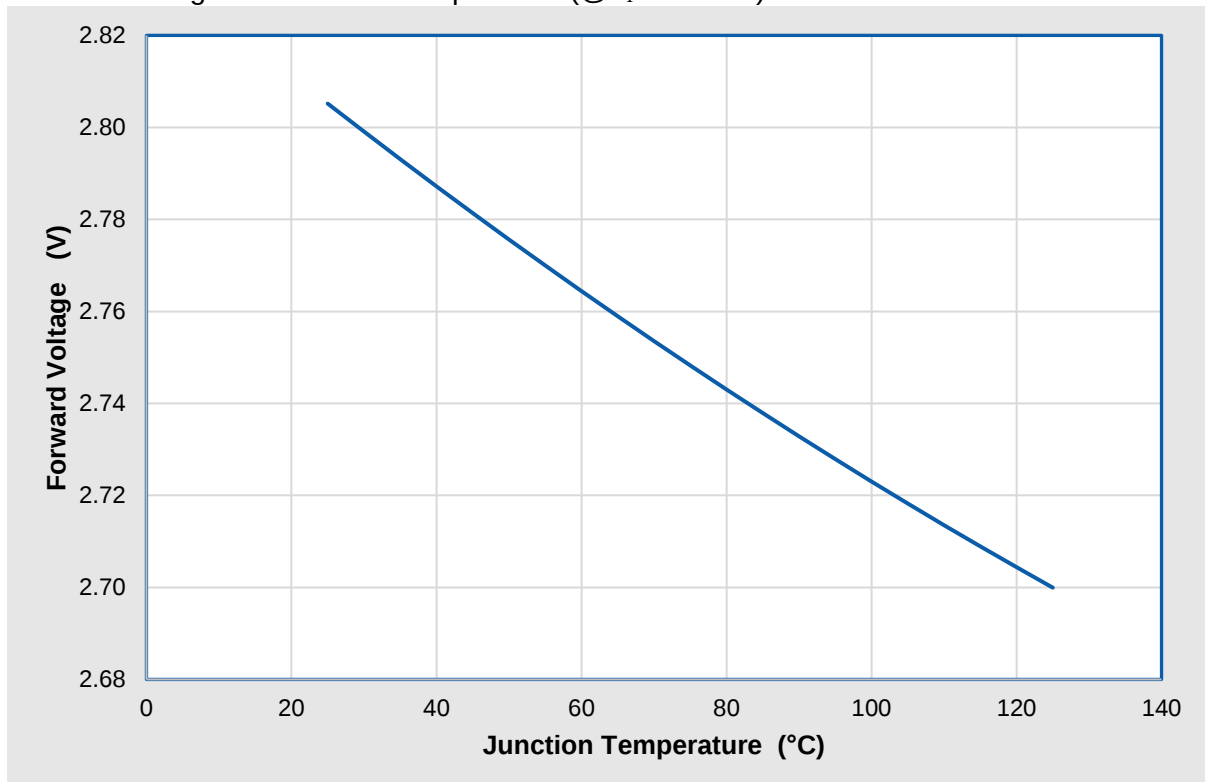
Notes [1] : The forward voltage tolerance is $\pm 0.06\text{V}$

Characteristic Curves

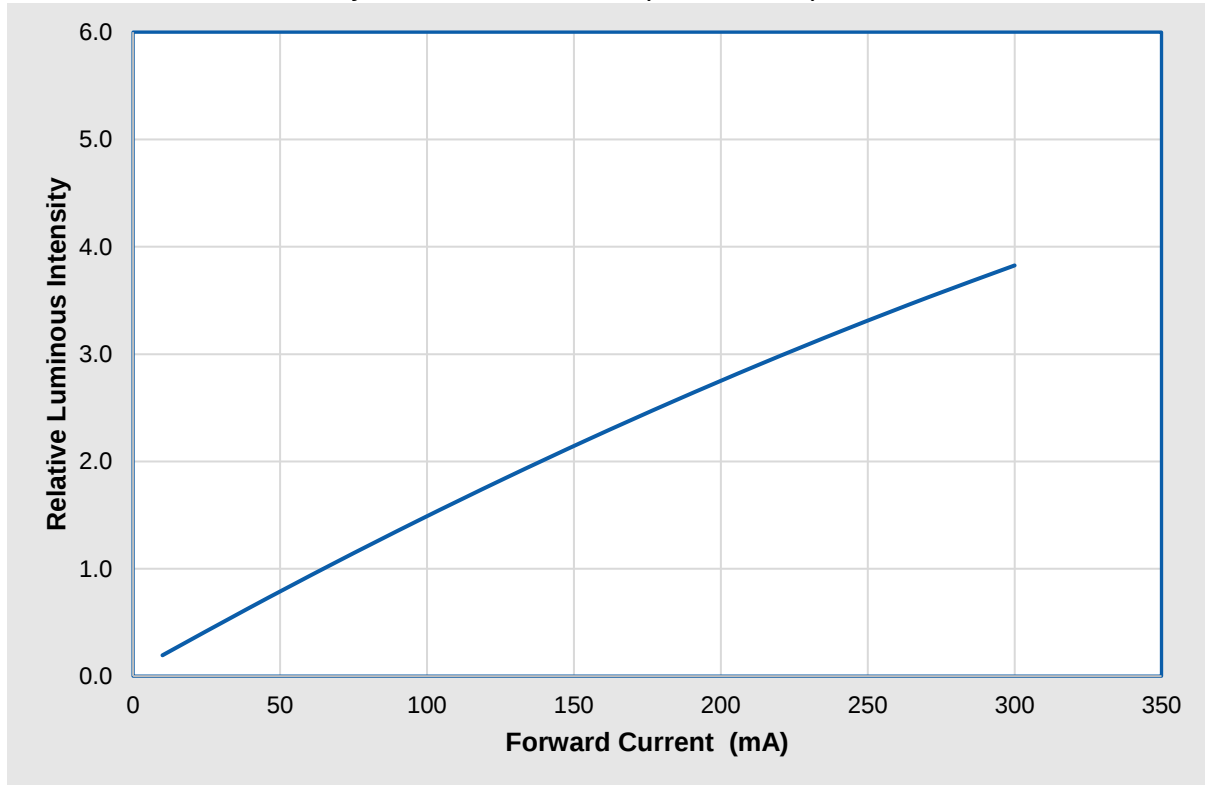
Forward Current vs. Forward Voltage (@ $T_J = 25^\circ\text{C}$)



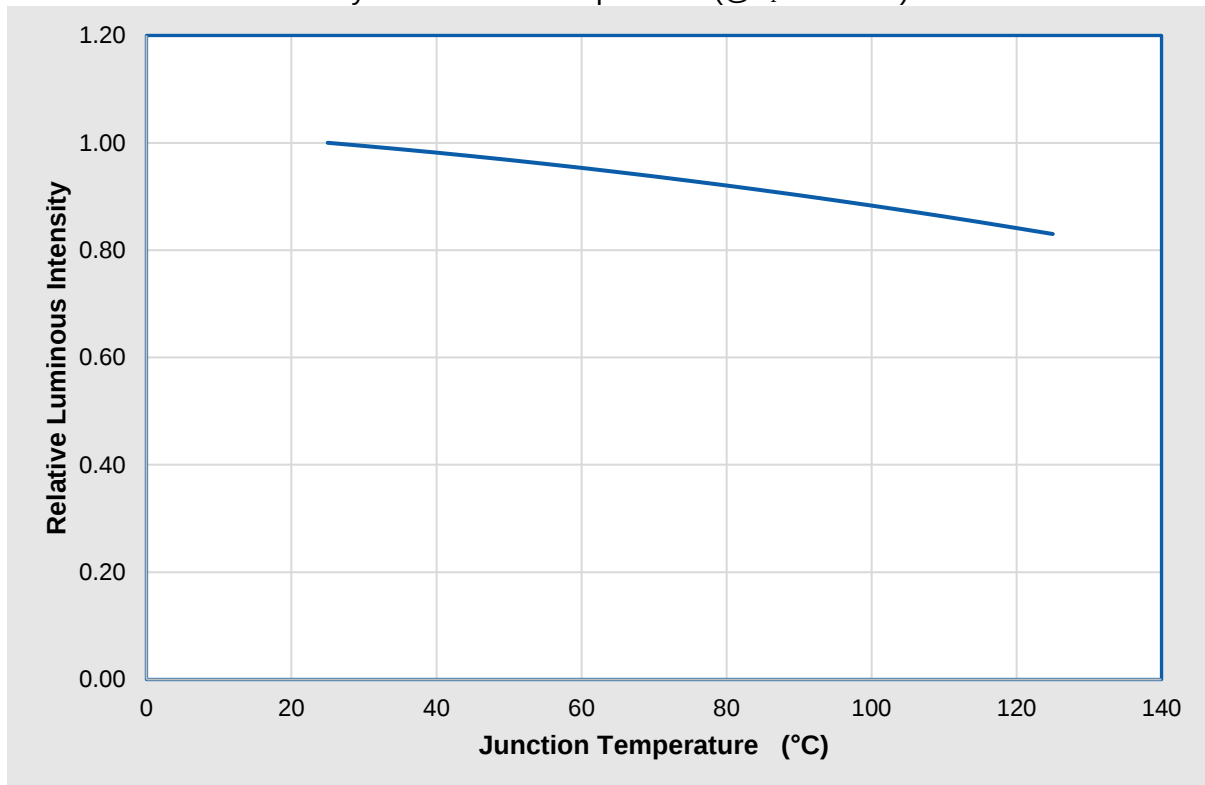
Forward Voltage vs. Junction Temperature (@ $I_F = 65\text{ mA}$)



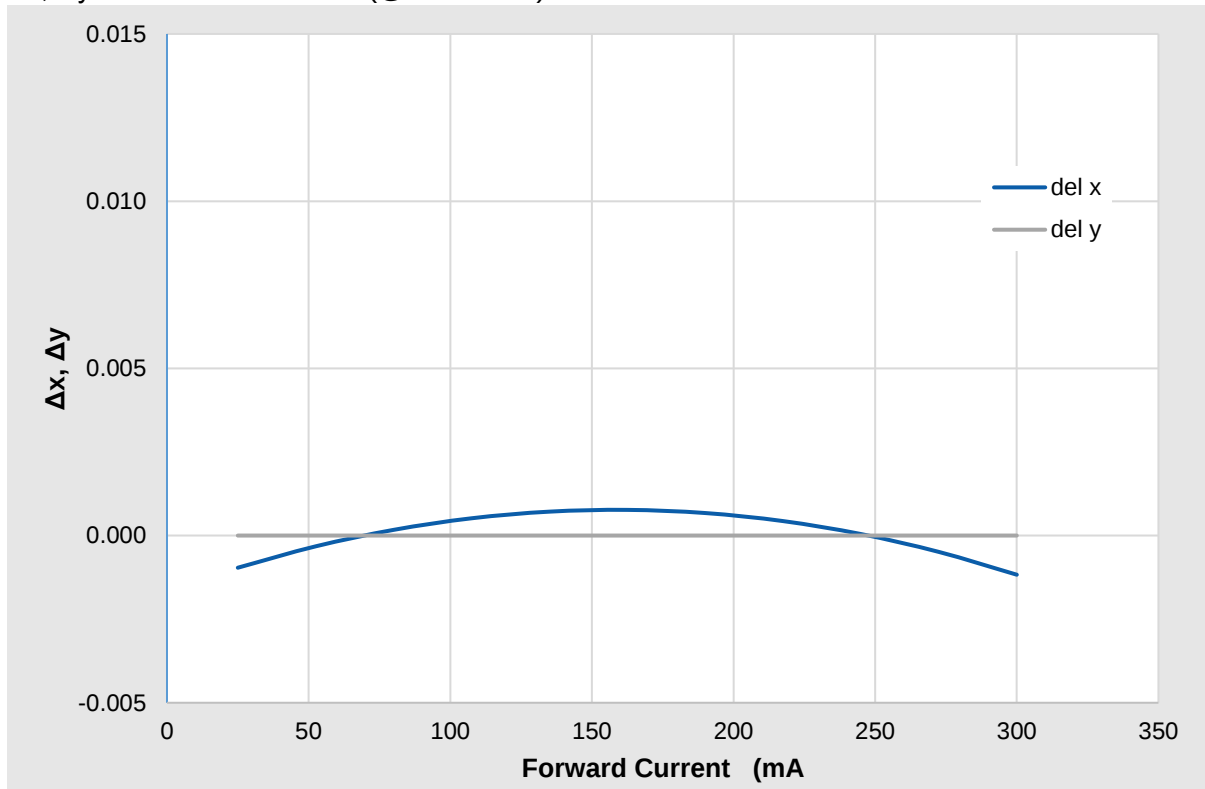
Relative Luminous Intensity vs. Forward Current (@ $T_J = 25^\circ\text{C}$)



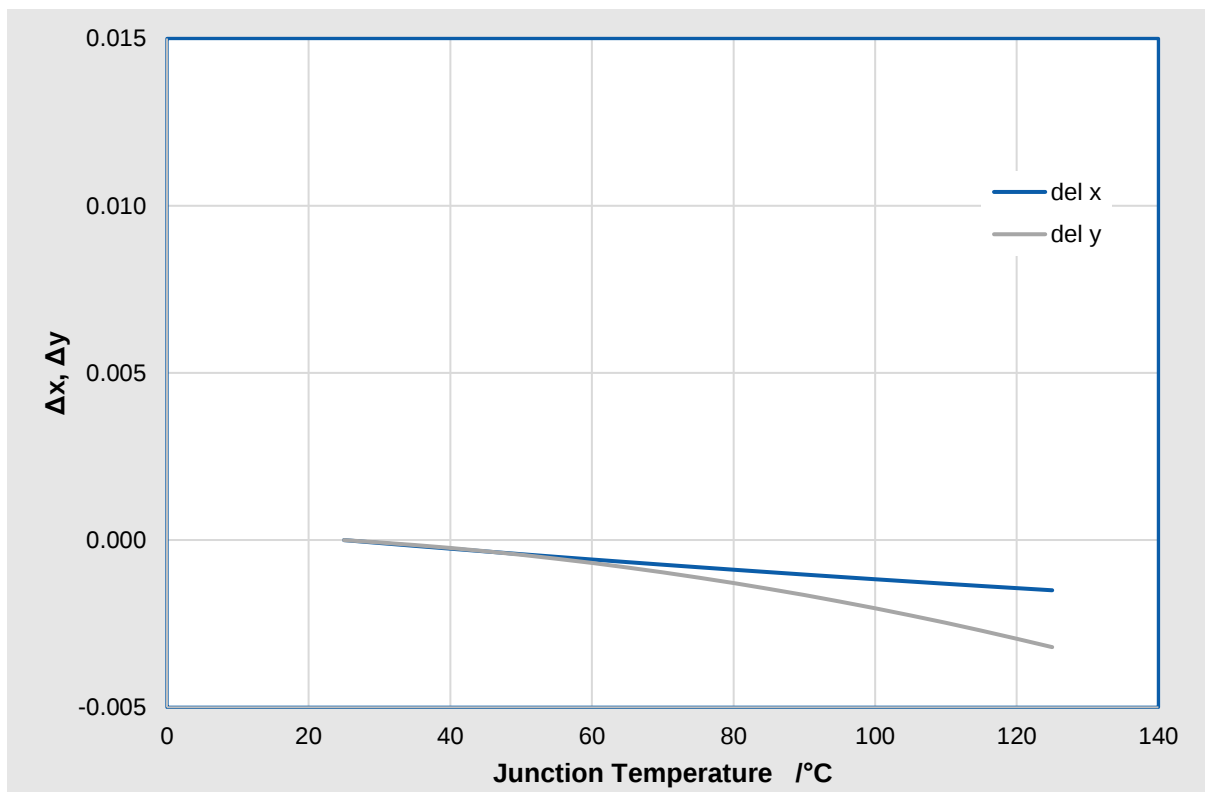
Relative Luminous Intensity vs. Junction Temperature (@ $I_F = 65\text{ mA}$)



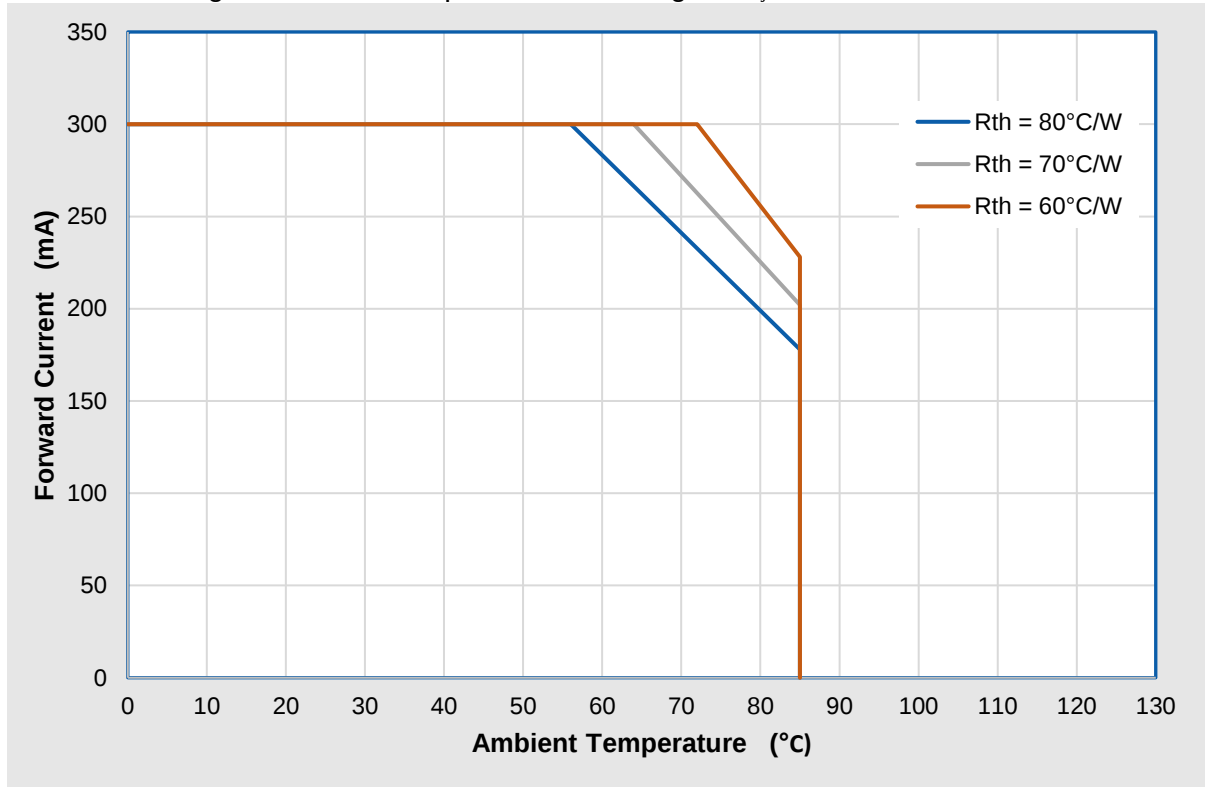
$\Delta x, \Delta y$ vs. Forward Current (@ $T_J = 25^\circ\text{C}$)



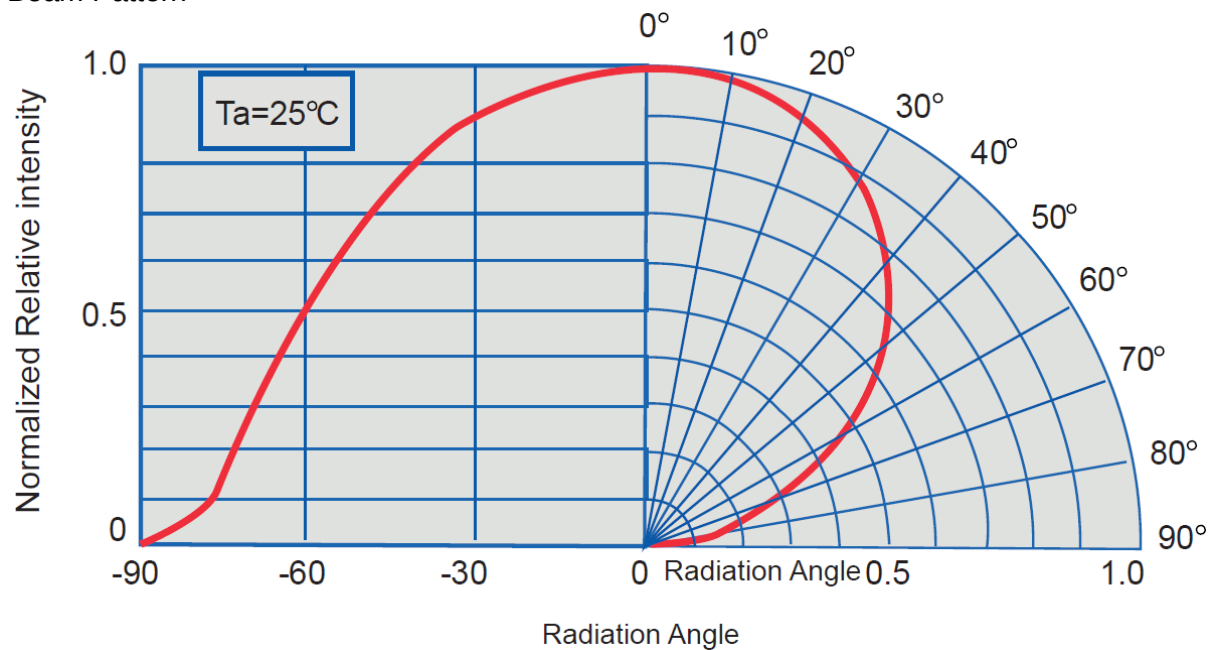
$\Delta x, \Delta y$ vs. Temperature (@ $T_J = 25^\circ\text{C}$)



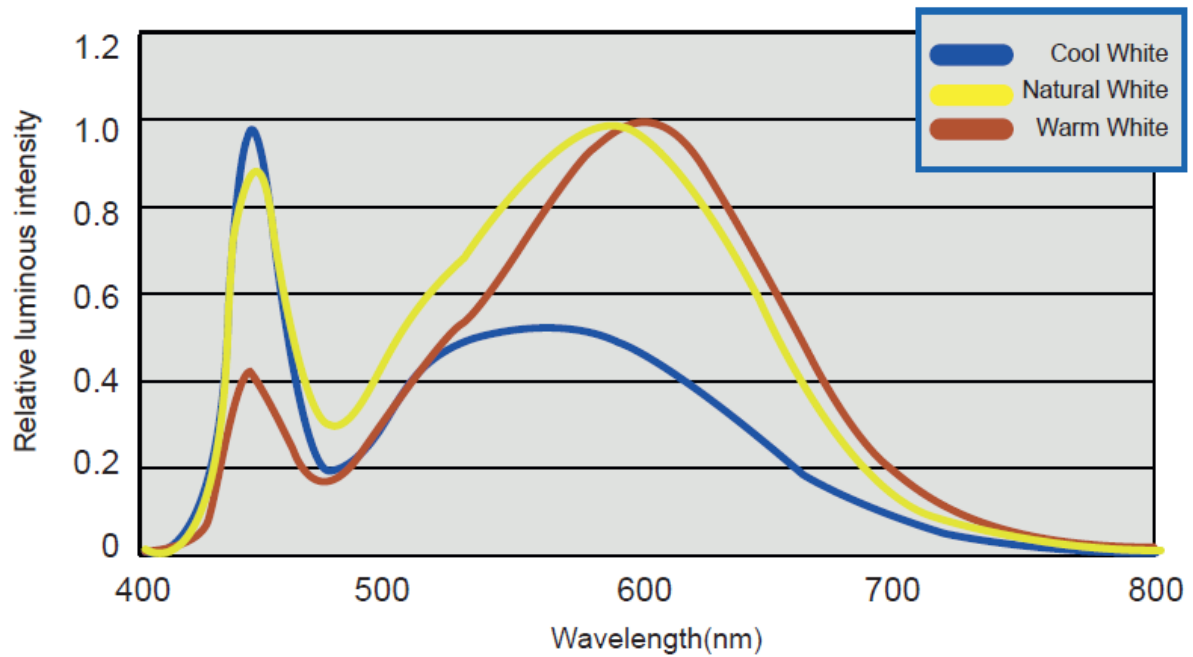
Current Derating vs Ambient Temperature for a range of $R_{j\text{-}n\text{-}amb}$



Beam Pattern

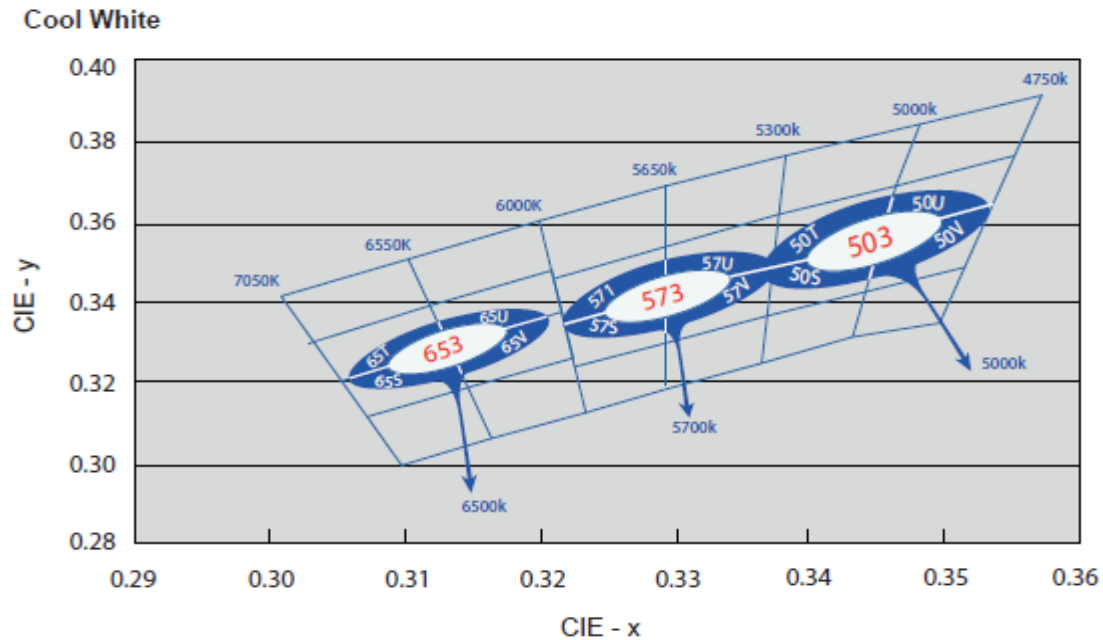


Colour Spectrum (CRI 80)



Chromaticity Groups

Cool White; 5000, 5700 and 6500K



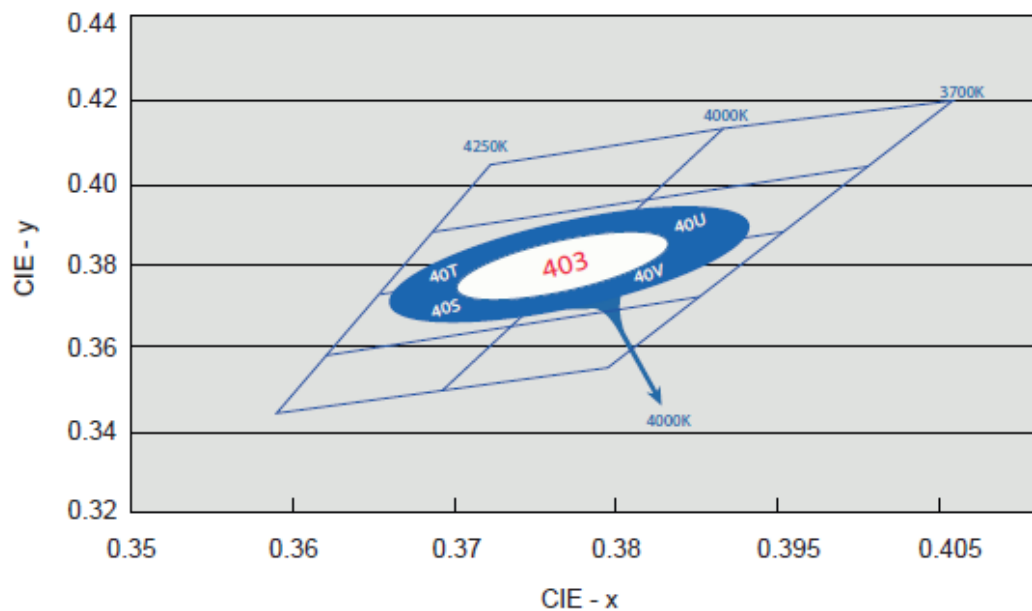
CCT	MacAdam Steps	Cx	Cy	a	b	theta °
5000	5	0.3447	0.3553	0.01370	0.00590	59.62
5700	5	0.3287	0.3417	0.01243	0.00533	59.09
6500	5	0.3123	0.3282	0.01115	0.00475	58.57

Chromaticity Bins

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

Neutral White; 4000K

Neutral White



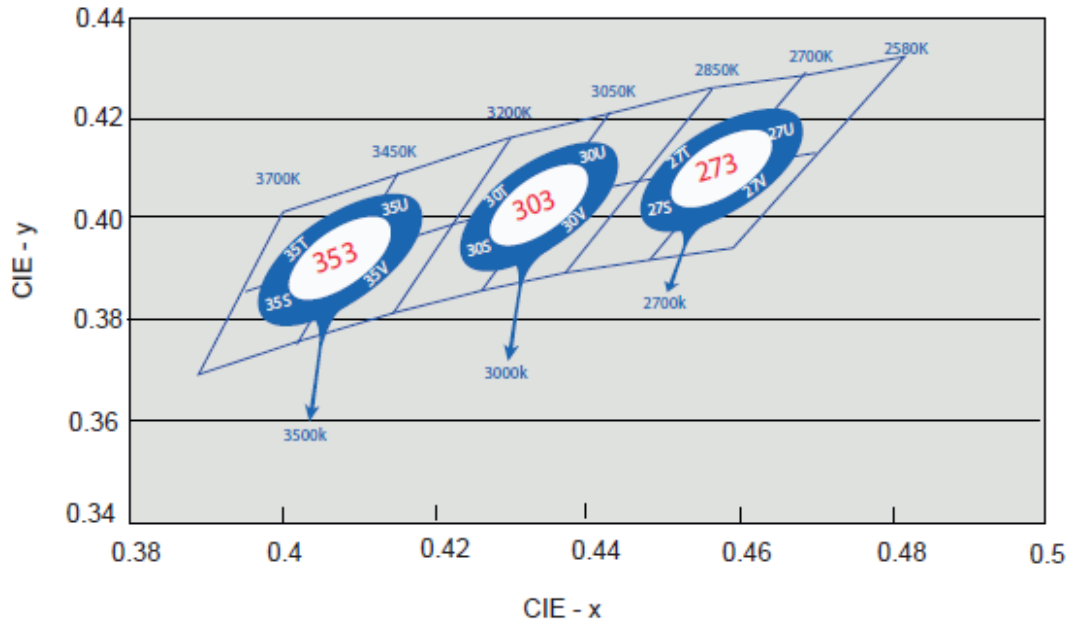
CCT	MacAdam Steps	Cx	Cy	a	b	theta °
4000	5	0.3818	0.3797	0.01565	0.00670	53.72

Chromaticity Bins

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

Warm White; 2700, 3000 and 3500K

Warm White

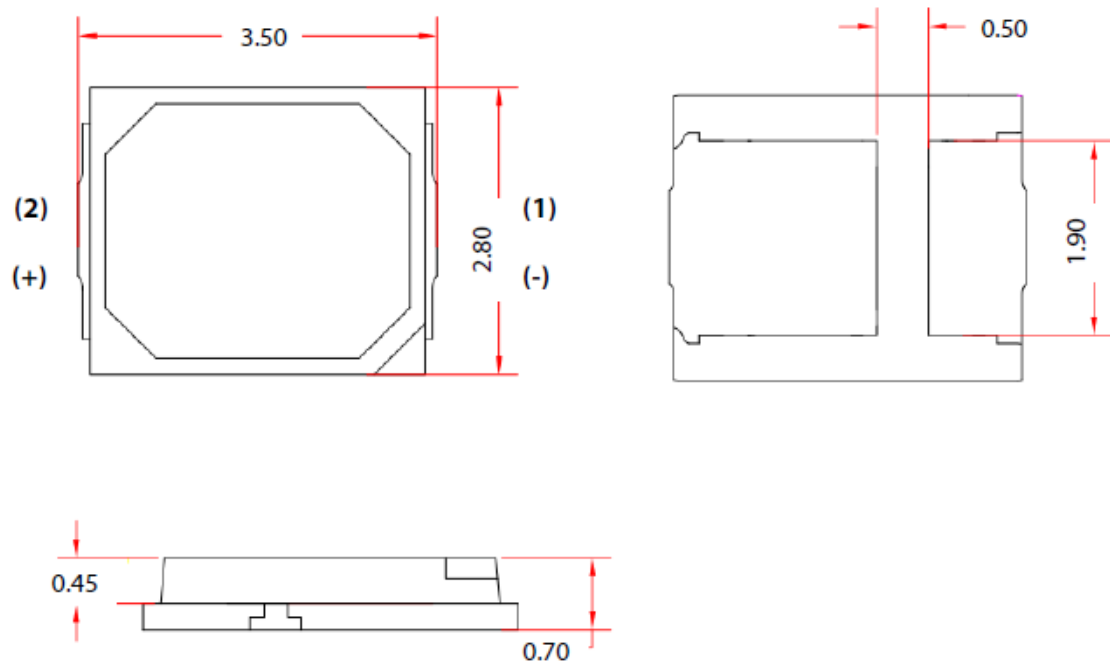


CCT	MacAdam Steps	Cx	Cy	a	b	theta °
2700	5	0.4578	0.4101	0.01350	0.00700	53.70
3000	5	0.4338	0.4030	0.01390	0.00680	53.22
3500	5	0.4073	0.3917	0.01545	0.00690	54.00

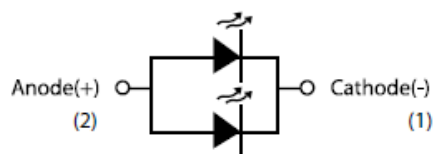
Chromaticity Bins

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

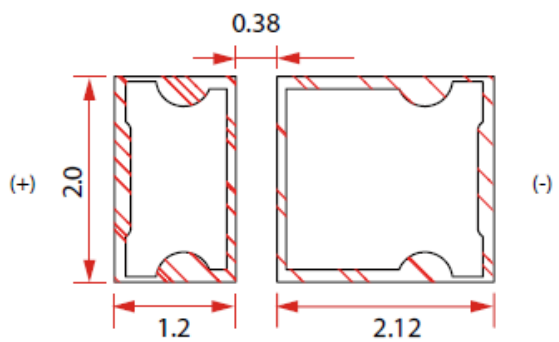
Mechanical Dimensions



Circuit



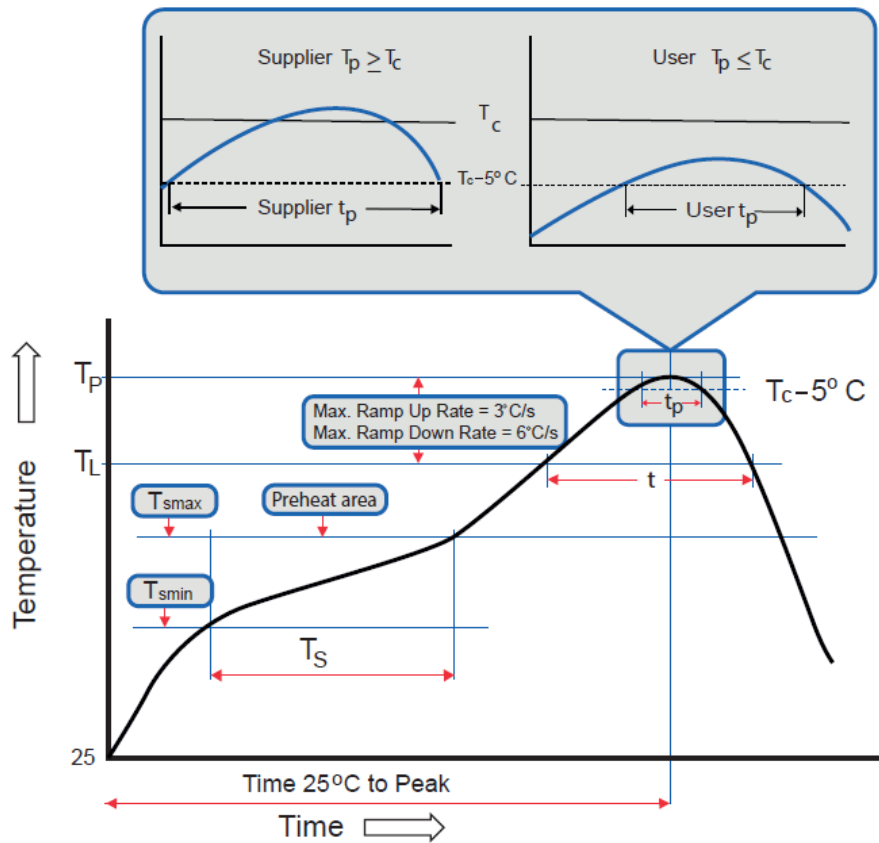
Solder Pad



Notes:

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

Soldering Temperature Profile



Profile Feature	Pb-Free Assembly
Preheat & Soak	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

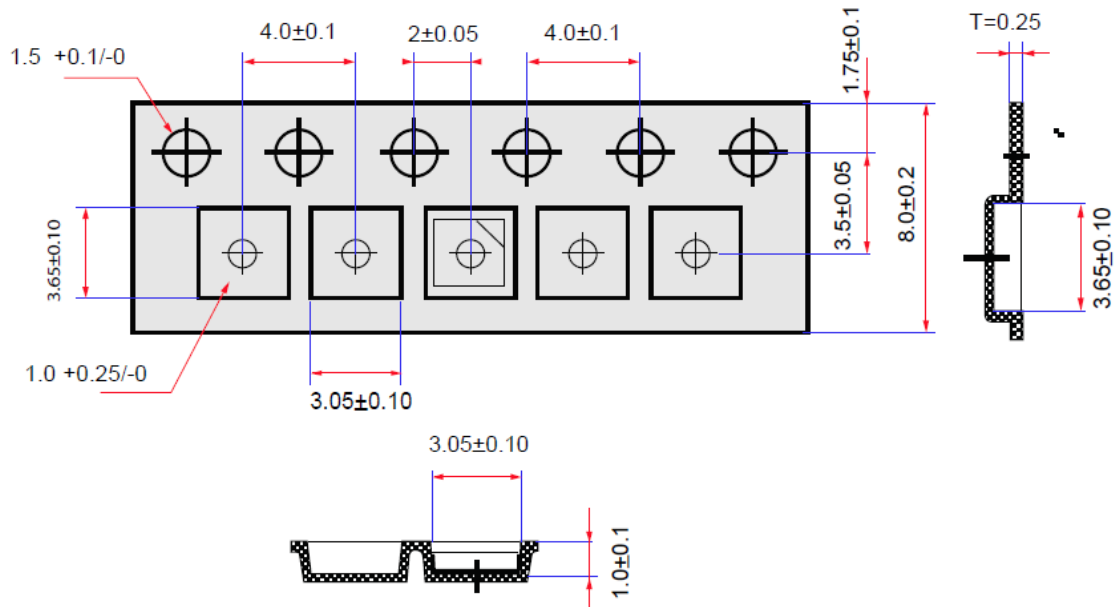
Mode	Failure Criteria	
	Min.	Max
Lumen Maintenance.	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage.	-	Initial data x 1.1
Reverse Current.	-	10 μA
Resistance to soldering heat.	No dead lamps or visual damage	

Reliability - Lumen Maintenance

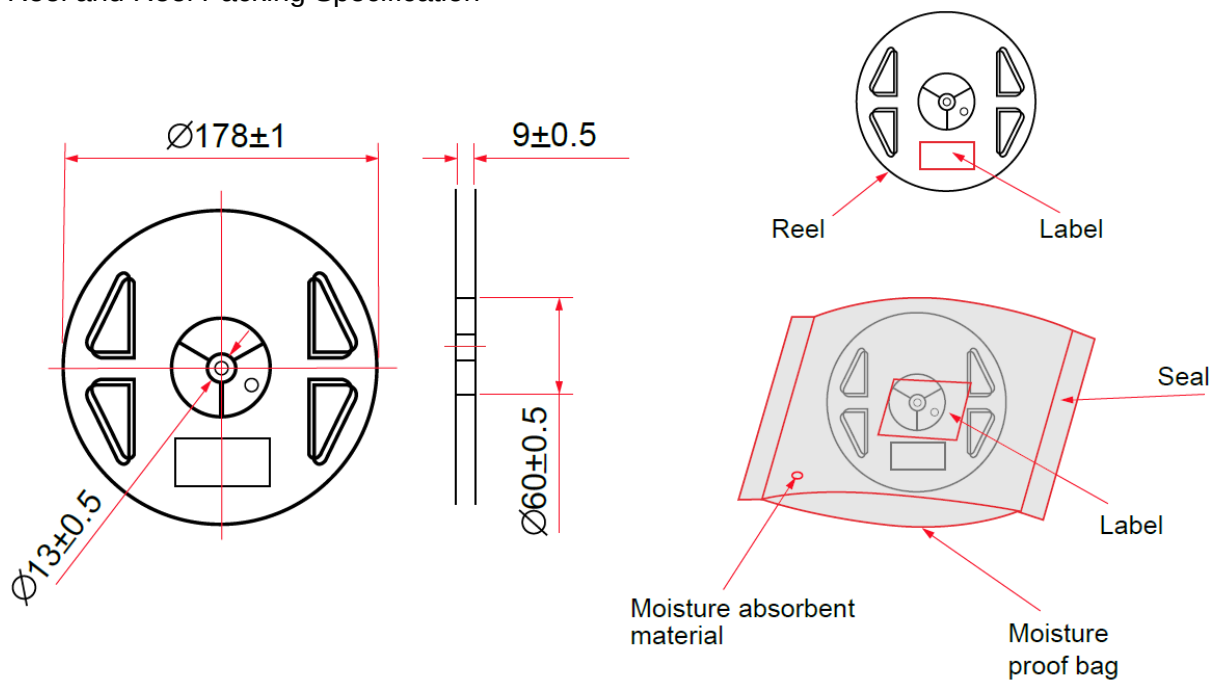
LM-80 verification is conducted according to standardized IES LM-80-08 and TM-21-11 methods. Based on the different testing intervals data, we can extrapolate LED lumen maintenance. For more details on lumen maintenance testing, chromaticity and LED case temperatures please refer to our LM-80 reports.

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

Legal Notice

Product information provided by Plessey Semiconductors Limited ("Plessey") in this document is believed to be correct and accurate. Plessey reserves the right to change/correct the specifications and other data or information relating to products without notice but Plessey accepts no liability for errors that may appear in this document, howsoever occurring, or liability arising from the use or application of any information or data provided herein. Neither the supply of such information, nor the purchase or use of products conveys any licence or permission under patent, copyright, trademark or other intellectual property right of Plessey or third parties.

Products sold by Plessey are subject to its standard Terms and Conditions of Sale that are available on request. No warranty is given that products do not infringe the intellectual property rights of third parties, and furthermore, the use of products in certain ways or in combination with Plessey, or non-Plessey furnished equipments/components may infringe intellectual property rights of Plessey.

The purpose of this document is to provide information only and it may not be used, applied or reproduced (in whole or in part) for any purpose nor be taken as a representation relating to the products in question. No warranty or guarantee express or implied is made concerning the capability, performance or suitability of any product, and information concerning possible applications or methods of use is provided for guidance only and not as a recommendation. The user is solely responsible for determining the performance and suitability of the product in any application and checking that any specification or data it seeks to rely on has not been superseded.

Products are intended for normal commercial applications. For applications requiring unusual environmental requirements, extended temperature range, or high reliability capability (e.g. military, or medical applications), special processing/testing/conditions of sale may be available on application to Plessey.

Contact

Customer Enquiries/Sales
+44 1752 693000 | sales@plesseysemi.com
www.plesseysemi.com

Plessey Semiconductors Ltd | Plymouth
Tamerton Road, Roborough
Plymouth, Devon
PL6 7BQ United Kingdom

P: +44 1752 693000
F: +44 1752 693700

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Plessey Semiconductors:

[PLW2835AID35B5](#) [PLW2835AID27B5](#) [PLW2835AID50B5](#) [PLW2835AID50B3](#) [PLW2835AID30B3](#)
[PLW2835AID27B3](#) [PLW2835AID35B3](#) [PLW2835AID40B5](#) [PLW2835AID30B5](#) [PLW2835AID65B5](#) [PLW2835AID57B3](#)
[PLW2835AID65B3](#) [PLW2835AID40B3](#) [PLW2835AID57B5](#)