PLW3014CA Series 3014
Low Power LED

Product Datasheet

Description

Plessey PLW3014CA SMT LEDs are designed for linear tubes, spot lights, indicator, bulb replacements and other general lighting applications. The light is emitted close to a Lambertian distribution and hence this SMT package is naturally suitable for backlighting panels and symbols. The LEDs are packed in reels containing 4000 pieces; each individual reel will be shipped in single intensity and colour bin, to provide close uniformity.

Features

- 3014 (3.05 x 1.40 x 0.70mm)
- Colour binning
- High reliability PLCC packaging
- Diffused pale yellow resin
- 120 degree wide viewing angle

Applications

- Decoration Lighting
- Instrument panel backlighting
- Illumination symbols
- General lighting
- Signage lighting

Variant	Colour	CCT	
		Min.	Max.
PLW3014CA-3000	Warm White 3000K	2700K	3225K
PLW3014CA-4000	Neutral White 4000K	3700K	4500K
PLW3014CA-5700	Cool White 5700K	5300K	6040K
PLW3014CA-6500	Cool White 6500K	6040K	7030K

Absolute Maximum Ratings

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

Parameter	Symbol	Minimum	Maximum	Unit
DC Forward Current	I_F	-	40	mA
Peak Pulse Forward Current[1]	I_{FP}	-	100	mA
Power Dissipation	P_d	-	130	mW
Storage Temperature	T_{stg}	-40	+100	°C
Junction Temperature	Tj		+115	oC

[1] Pulse width ≤10ms, duty cycle ≤10%

Electro-optical Characteristics

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F = 30mA	2.8	3.1	3.4	V
Reverse Current	I_R	V_R = 5V	-	-	10	µA
Colour Rendering Index	CRI	I_F = 30mA	80			%
Thermal Resistance	R_{thj-sp}		-	70	-	°C/W
Half-Intensity Angle	$2\Theta_{1/2}$	I_F = 30mA	-	120	-	deg

Recommended Operating Conditions

In typical applications, for optimum LED performance

Parameter	Symbol	Minimum	Maximum	Unit
Operating Ambient Temperature	T_{opr}	-40	+85	^{o}C

Ordering Information

Name	Order Code	Luminous Flux Range	Forward Voltage Range
PLW3014CA-3000	PLW3014CAW30000	1A, 2A, 3A, 4A, 5A	V1-V6
PLW3014CA-4000	PLW3014CAN40000	2A, 3A, 4A, 5A, 6A	
PLW3014CA-5700	PLW3014CAC57000		
PLW3014CA-6500	PLW3014CAC65000		

Intensity Bin Groups

I_F = 30mA, T_{amb} = +25^{o}C, unless otherwise stated

Group	Luminous flux [1] (lm)	
	Min.	Max.
1A	9	10
2A	10	11
3A	11	12
4A	12	13
5A	13	14
6A	14	15

[1] Tolerance ±7%

Forward Voltage Bin Groups

I_F = 30mA, T_{amb} = +25^{o}C, unless otherwise stated

Group	V_F [1] (V)	
	Min.	Max.
V1	2.8	2.9
V2	2.9	3.0
V3	3.0	3.1
V4	3.1	3.2
V5	3.2	3.3
V6	3.3	3.4

[1] Tolerance ±0.1V

Chromaticity Binning

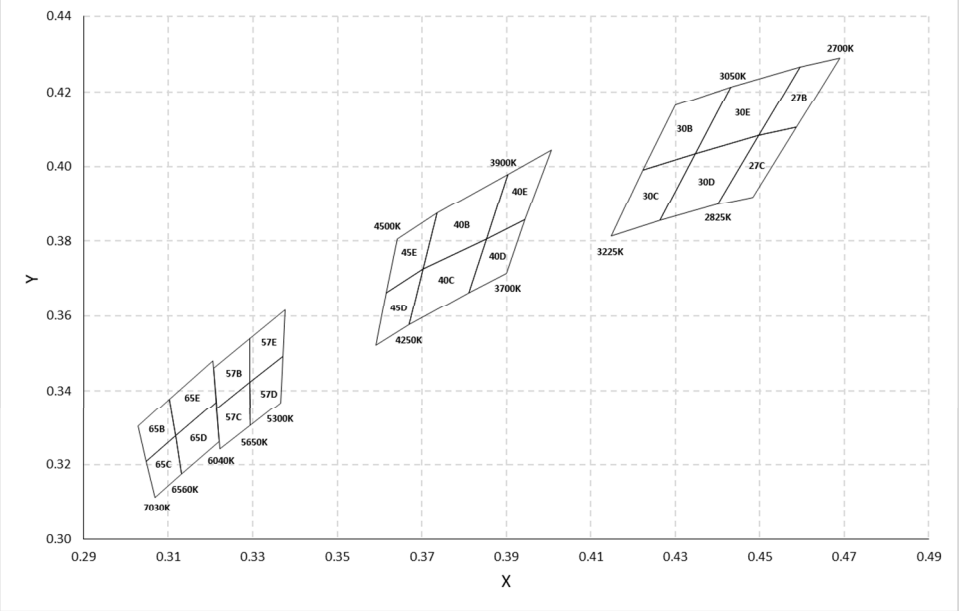


Figure 1. Colour Chromaticity Binning

	X1	Y1	X2	Y2	X3	Y3	X4	Y4
57B	0.3206	0.3461	0.3292	0.3539	0.3293	0.3423	0.3214	0.3352
57C	0.3214	0.3352	0.3293	0.3423	0.3294	0.3306	0.3222	0.3243
57D	0.3293	0.3423	0.3371	0.3493	0.3366	0.3369	0.3294	0.3306
57E	0.3292	0.3539	0.3376	0.3616	0.3371	0.3493	0.3293	0.3423
65B	0.3028	0.3304	0.3102	0.3378	0.3117	0.3277	0.3048	0.3209
65C	0.3048	0.3209	0.3117	0.3277	0.3132	0.3175	0.3068	0.3113
65D	0.3117	0.3277	0.3213	0.3371	0.3221	0.3261	0.3132	0.3175
65E	0.3102	0.3378	0.3205	0.3481	0.3213	0.3371	0.3117	0.3277
45D	0.3591	0.3521	0.3616	0.3663	0.3703	0.3726	0.3670	0.3578
45E	0.3616	0.3663	0.3642	0.3805	0.3736	0.3874	0.3703	0.3726
40B	0.3703	0.3726	0.3736	0.3874	0.3903	0.3979	0.3852	0.3806
40C	0.3670	0.3578	0.3703	0.3726	0.3852	0.3806	0.3810	0.3663
40D	0.3810	0.3663	0.3852	0.3806	0.3944	0.3856	0.3899	0.3716
40E	0.3852	0.3806	0.3903	0.3979	0.4006	0.4044	0.3944	0.3856
30B	0.4223	0.3990	0.4299	0.4165	0.4431	0.4213	0.4347	0.4034
30C	0.4147	0.3814	0.4223	0.3990	0.4347	0.4034	0.4262	0.3854
30D	0.4262	0.3854	0.4347	0.4034	0.4497	0.4084	0.4399	0.3899
30E	0.4347	0.4034	0.4431	0.4213	0.4594	0.4267	0.4497	0.4084
27B	0.4497	0.4084	0.4594	0.4267	0.4689	0.4290	0.4586	0.4105
27C	0.4399	0.3899	0.4497	0.4084	0.4586	0.4105	0.4483	0.3918

Relative Spectral Emission

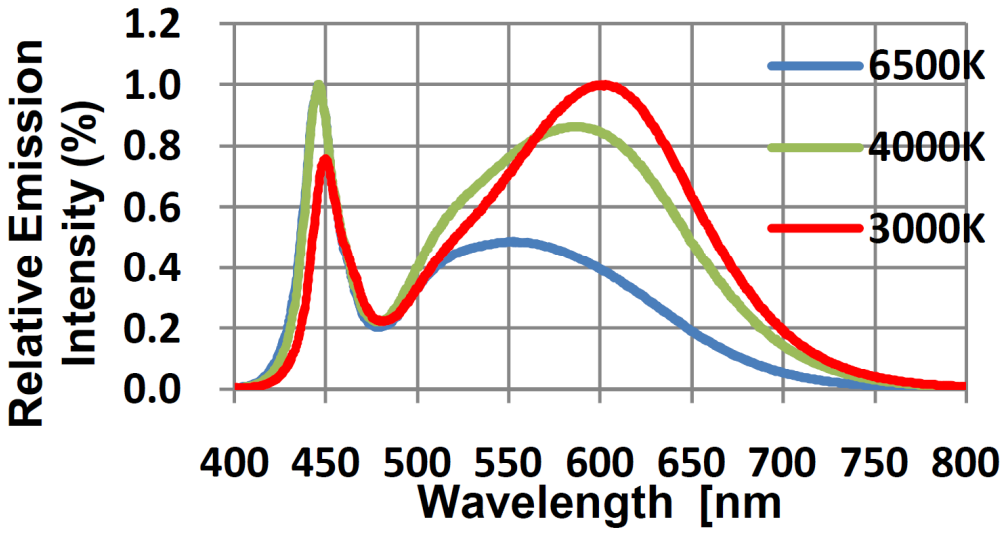


Figure 2. Normalised spectral power distribution (3000K, 4000K & 6500K)

Note: The relative spectral emission corresponds to a random LED sample

Angular Light Distribution

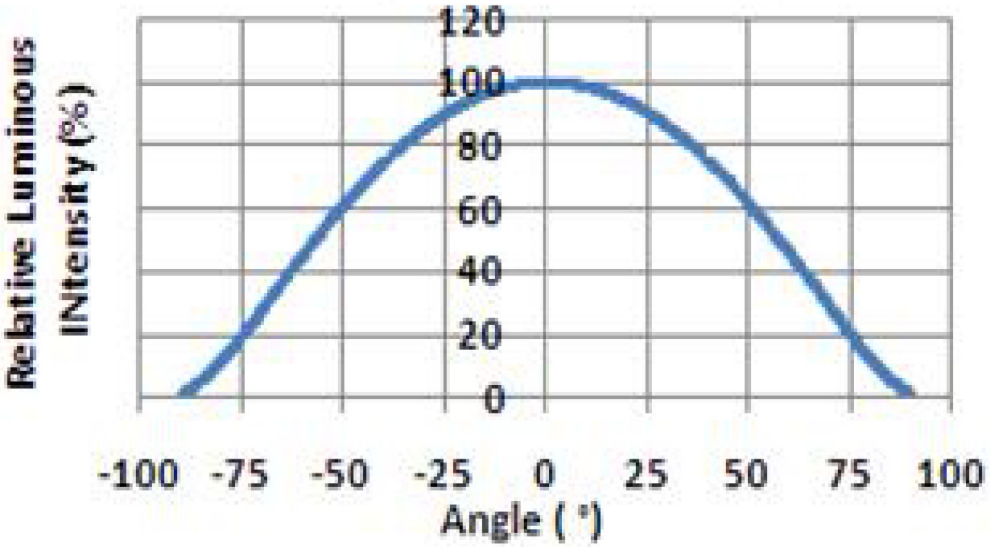


Figure 3. Angular distribution pattern of emitted light

Forward Current Characteristics

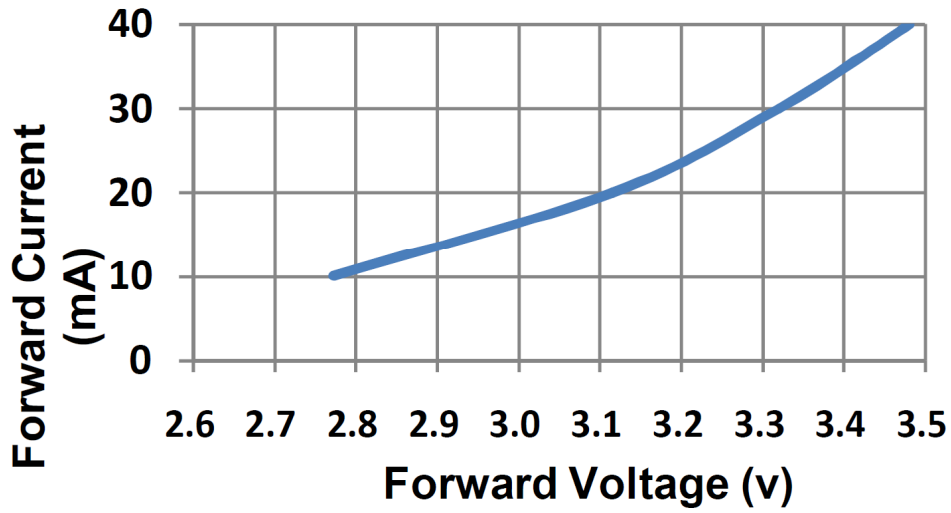


Figure 4. Typical forward current versus forward voltage (T_a=+25C)

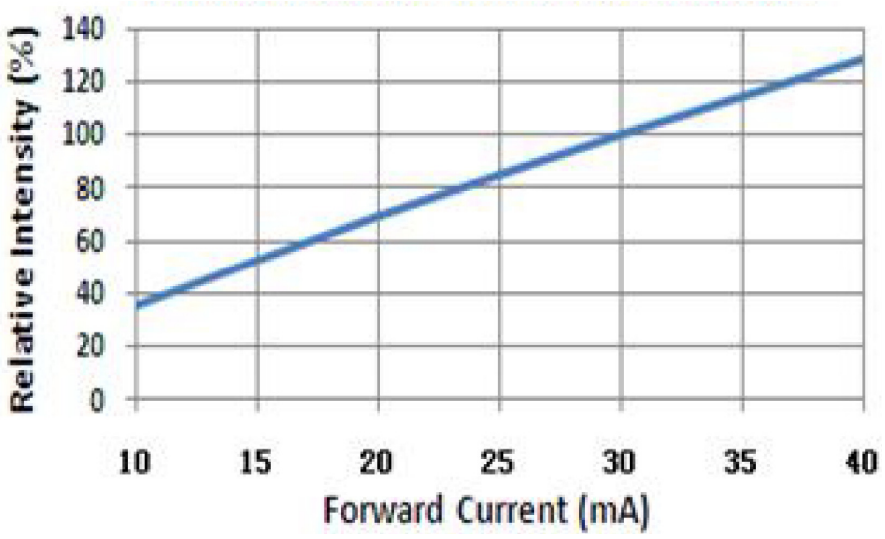


Figure 5. Relative luminous flux versus forward current (T_a=+25C)

Temperature Characteristics

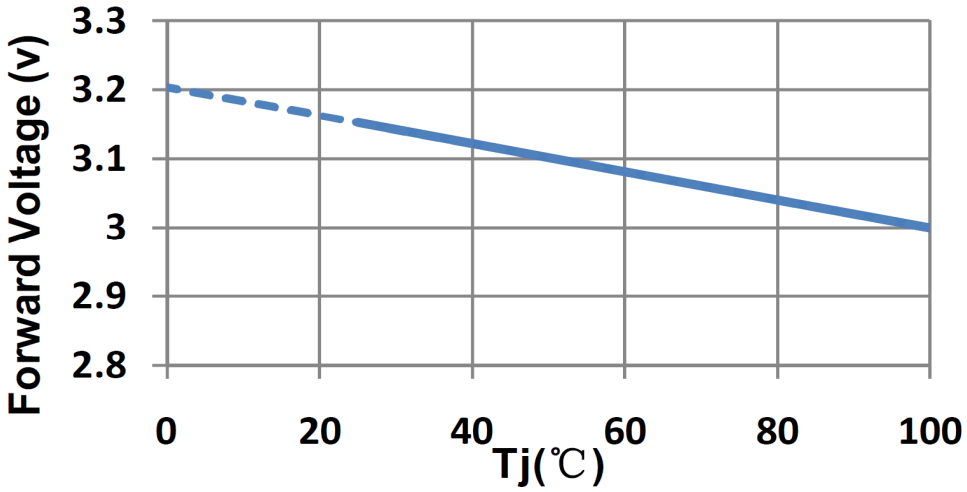


Figure 6. Typical forward voltage versus junction temperature (I_F=30mA)

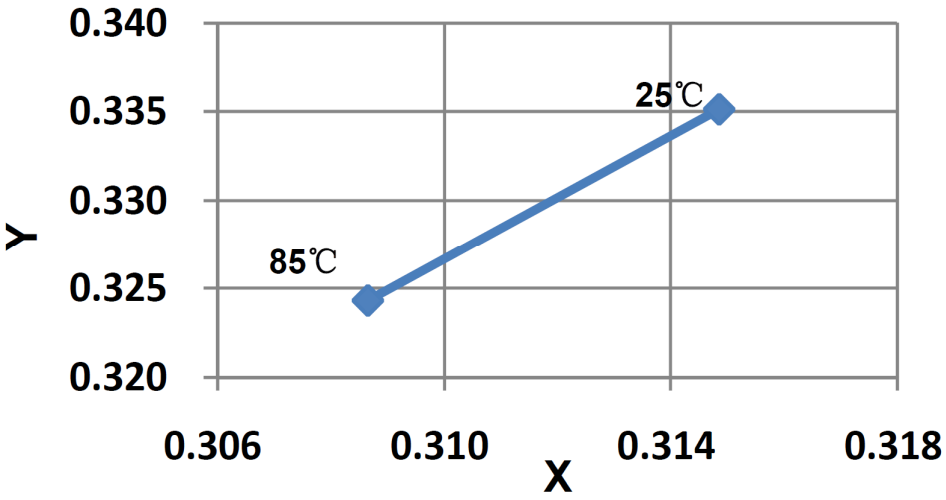


Figure 7. Chromaticity coordinates versus ambient temperature

Temperature Characteristics

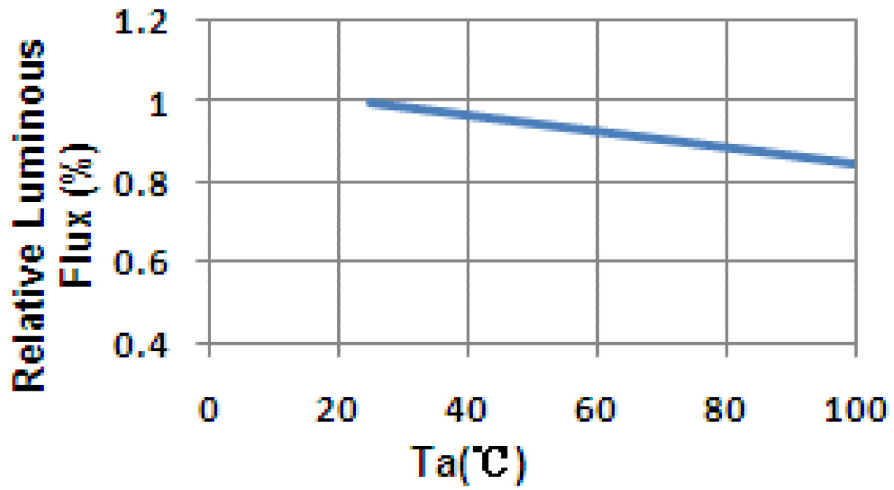


Figure 8. Ambient Temperature vs Relative Intensity

Package Outline Dimensions

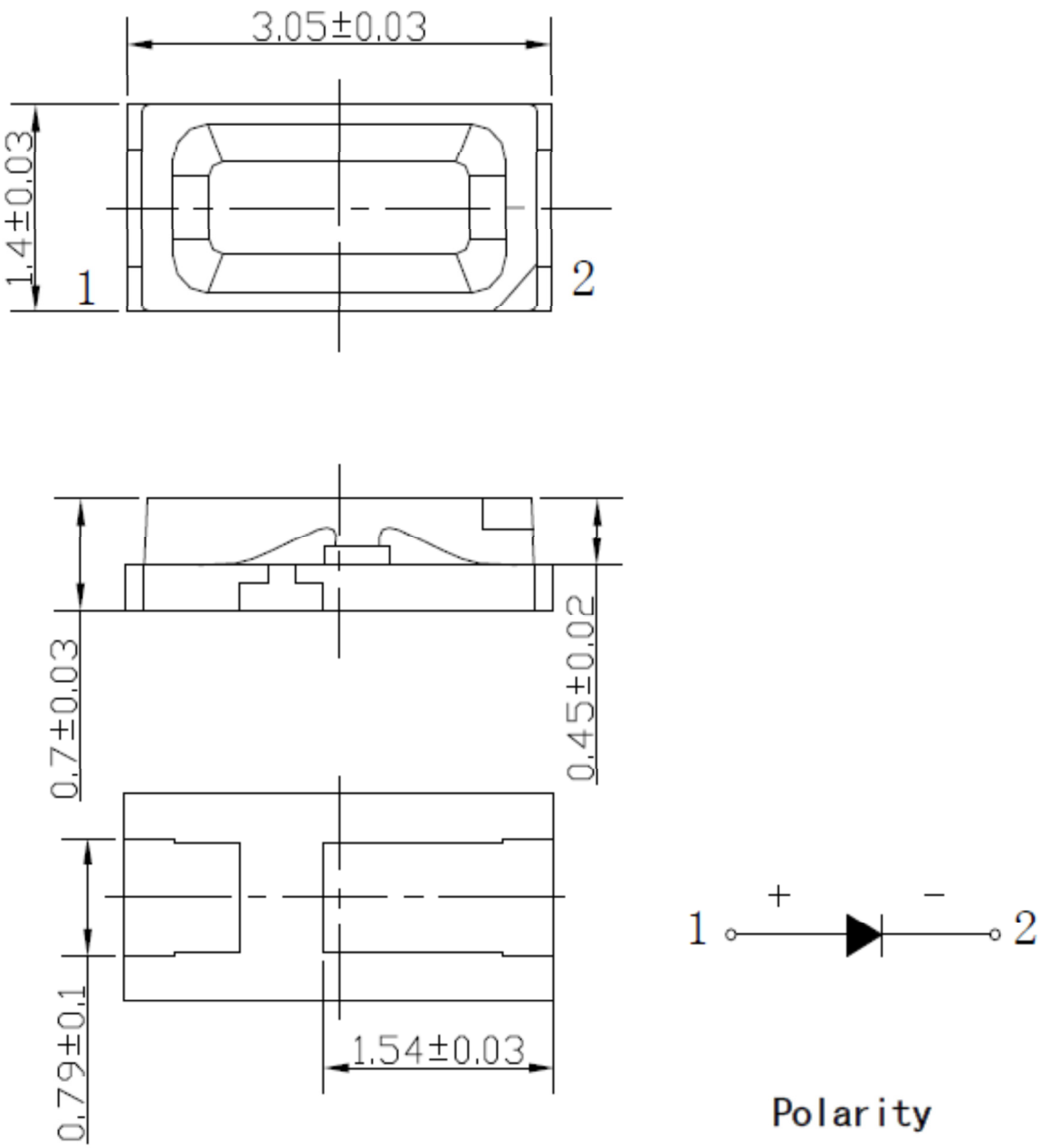


Figure 9. Mechanical drawings of the 3014 package (unit in mm)

Recommended Solder Pad

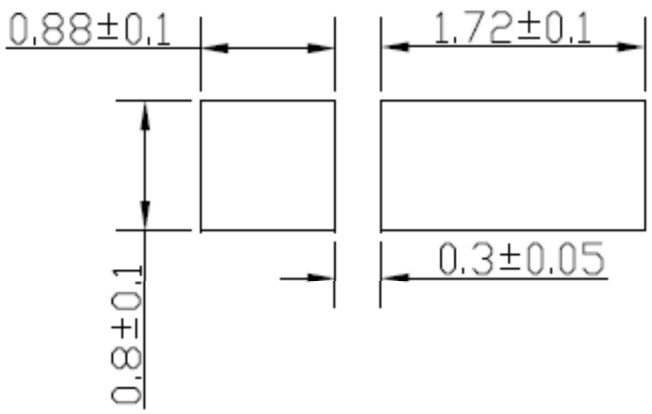


Figure 10. Diagram of soldering pad (unit in mm)

Note: Increased PCB Cu area will reduce the T_j and increase reliability

Reflow Soldering Profile

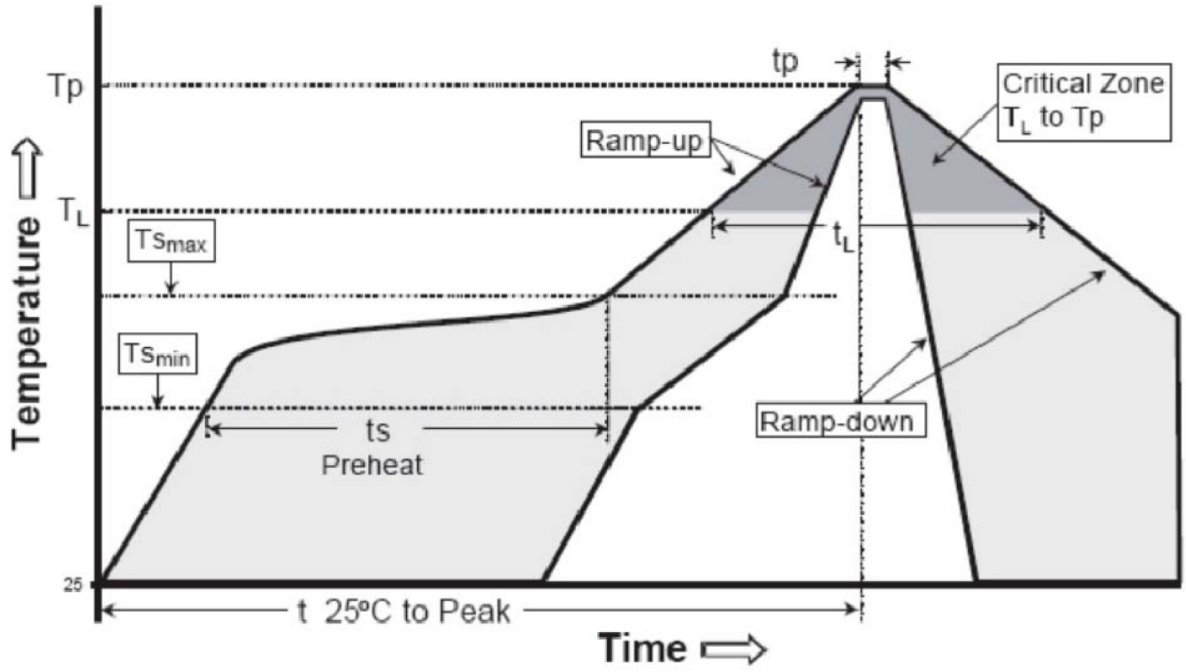


Figure 11. Reflow soldering profile

Reflow Soldering Characteristics

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_s max to T_p)	Max 3°C/sec	Max 3°C/sec
Preheat: Min Temperature(T_{s_min})	100°C	150°C
Preheat: Max Temperature(T_{s_max})	150°C	200°C
Preheat: Time (T_{s_min} to T_{s_max})	60 – 120 sec	60 – 180 sec
Time maintained above: Temperature (T_L)	183°C	217°C
Time maintained above: Time (t_L)	60 – 150 sec	60 – 150 sec
Peak/Classification Temperature T_p	215°C	260°C
Storage time within 5°C of actual peak t_p	10 – 30 sec	20 – 40 sec
Ramp-down rate	Max 6°C/sec	Max 6°C/sec
Time required 25°C to peak temperature	Max 6 mins	Max 8 mins

1. Reflow soldering should not be done more than twice
2. When soldering, do not put stress on the LEDs during heating

Soldering iron

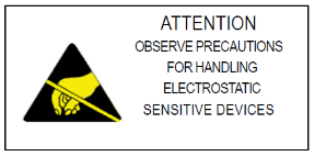
1. When hand soldering, the temperature of the iron must be ≤+300ºC for 3 seconds
2. Hand soldering should be performed only once.

Moisture Sensitivity

JEDEC Level	Floor life		Bake	
	Time	Conditions	Time	Conditions
2a	4 weeks	≤+30°C / 60% RH	≥58 hours	+60°C ±5°C / 5% RH

Handling Instructions

Plessey LEDs are not designed to operate with reverse bias. Precautions are required to prevent reverse bias in applications and during handling.



Packing Information

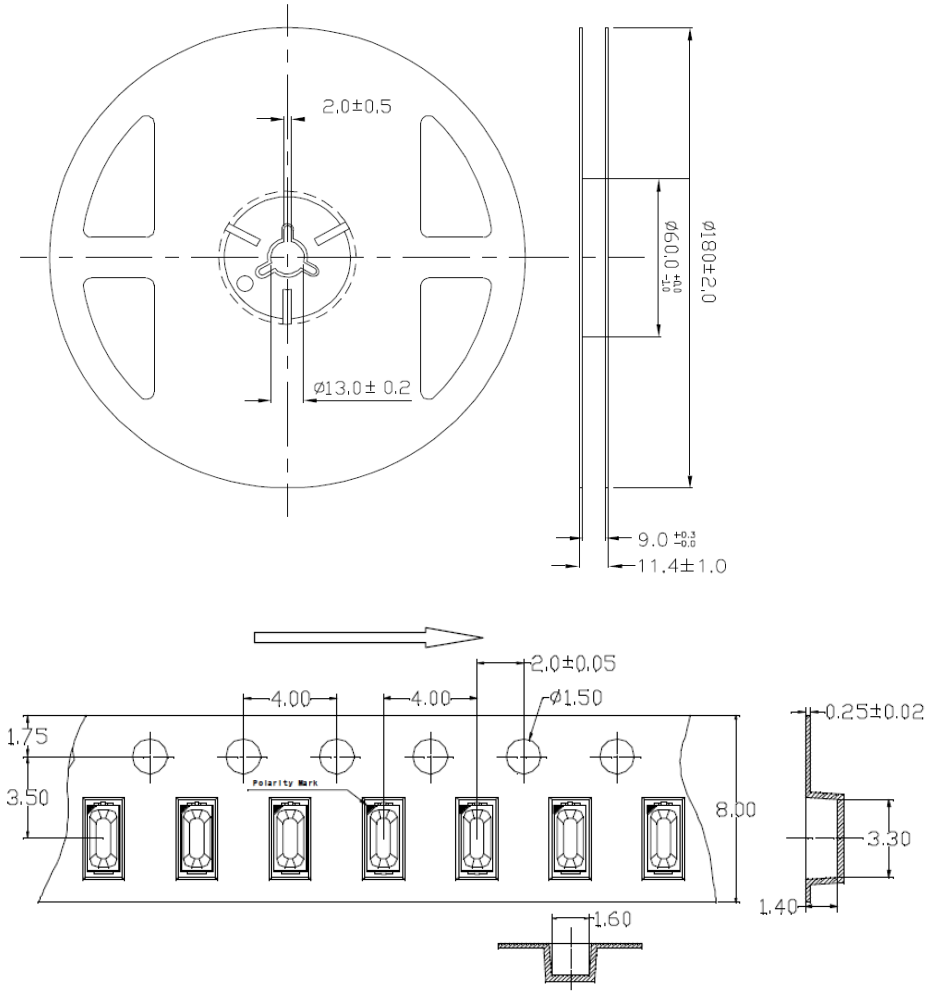


Figure 12. Reel specification (unit in mm)

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