

3014 LED

PLW3014AA Series

Product Datasheet



Description

Plessey PLW3014AA SMT LEDs are designed for flashlights, backlighting, linear tubes 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 2000 or 1000 pieces; each individual reel will be shipped in single intensity and colour bin, to provide close uniformity.

Features

- 3014 footprint (3.0 x 1.4 x 0.8mm)
- High reliability PLCC packaging
- Diffused pale yellow resin
- 120 degree wide viewing angle
- ANSI binning

Applications

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

Variant	Colour	CCT	
		Min.	Max.
PLW3014AA-2700	Warm White 2700K	2600K	2850K
PLW3014AA-3000	Warm White 3000K	2850K	3200K
PLW3014AA-3500	Warm White 3500K	3200K	3700K
PLW3014AA-4000	Neutral White 4000K	3700K	4250K
PLW3014AA-4500	Neutral White 4500K	4250K	4750K
PLW3014AA-5000	Neutral White 5000K	4750K	5300K
PLW3014AA-5700	Cool White 5700K	5300K	6000K
PLW3014AA-6500	Cool White 6500K	6000K	7000K

Absolute Maximum Ratings

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

Parameter	Symbol	Minimum	Maximum	Unit
DC Forward Current	I_F	-	50	mA
Peak Pulse Forward Current ^[1]	I_{FP}	-	100	mA
Power Dissipation	P_d	-	0.18	W
Storage Temperature	T_{stg}	-40	+100	$^{\circ}\text{C}$
Junction Temperature	T_j	-40	+120	$^{\circ}\text{C}$

^[1] Pulse width $\leq 10\text{ms}$, duty cycle $\leq 10\%$

Electro-optical Characteristics

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage ^[1]	V_F	$I_F = 30\text{mA}$	2.8		3.5	V
Reverse Current	I_R	$V_R = 5\text{V}$	-	-	10	μA
Colour Rendering Index ^[2]	CRI	$I_F = 30\text{mA}$	80			%
Thermal Resistance	R_{thj-sp}		-	45	-	K/W
Half-Intensity Angle	$2\Theta_{1/2}$	$I_F = 30\text{mA}$	-	120	-	deg

^[1] tolerance $\pm 0.1\text{V}$

^[2] tolerance ± 3

Recommended Operating Conditions

In typical applications, for optimum LED performance

Parameter	Symbol	Minimum	Maximum	Unit
Operating Ambient Temperature	T_{opr}	-40	+85	$^{\circ}\text{C}$

Ordering Information

Name	Order Code	Luminous Flux Range	V _F Range
PLW3014AA-2700	PLW3014AAW27000	1A, 2A, 3A	V1-V7
PLW3014AA-3000	PLW3014AAW30000		
PLW3014AA-3500	PLW3014AAW35000		
PLW3014AA-4000	PLW3014AAN40000	2A, 3A, 4A	
PLW3014AA-4500	PLW3014AAN45000		
PLW3014AA-5000	PLW3014AAN50000		
PLW3014AA-5700	PLW3014AAC57000		
PLW3014AA-6500	PLW3014AAC65000		

Intensity Bin Groups

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

Group	Luminous flux ^[1] (lm)	
	Min.	Max.
1A	8	9
2A	9	10
3A	10	11
4A	11	12
5A	12	13
6A	13	14

^[1] Tolerance ±10%

Forward Voltage Bin Groups

I_F = 30mA, T_{amb} = +25°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
V7	3.4	3.5

^[1] Tolerance ±0.1V

Relative Spectral Emission

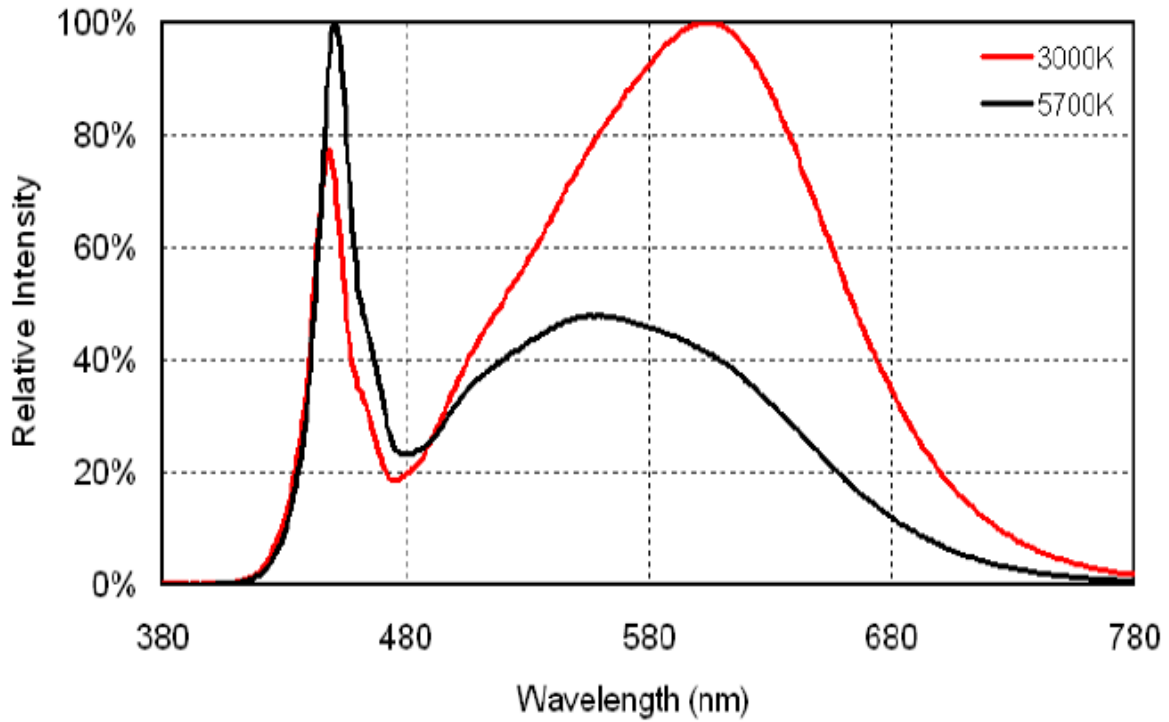


Figure 1. Normalised spectral power distribution (3000K & 5700K)

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

Angular Light Distribution

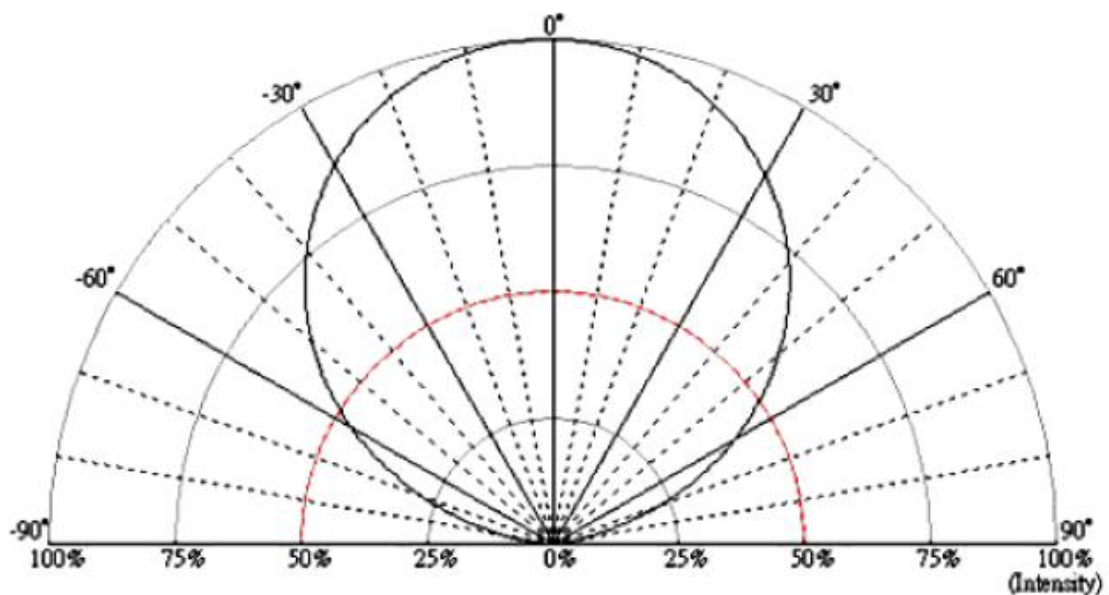


Figure 2. Angular distribution pattern of emitted light

Colour Chromaticity – Warm White 2700-3500K

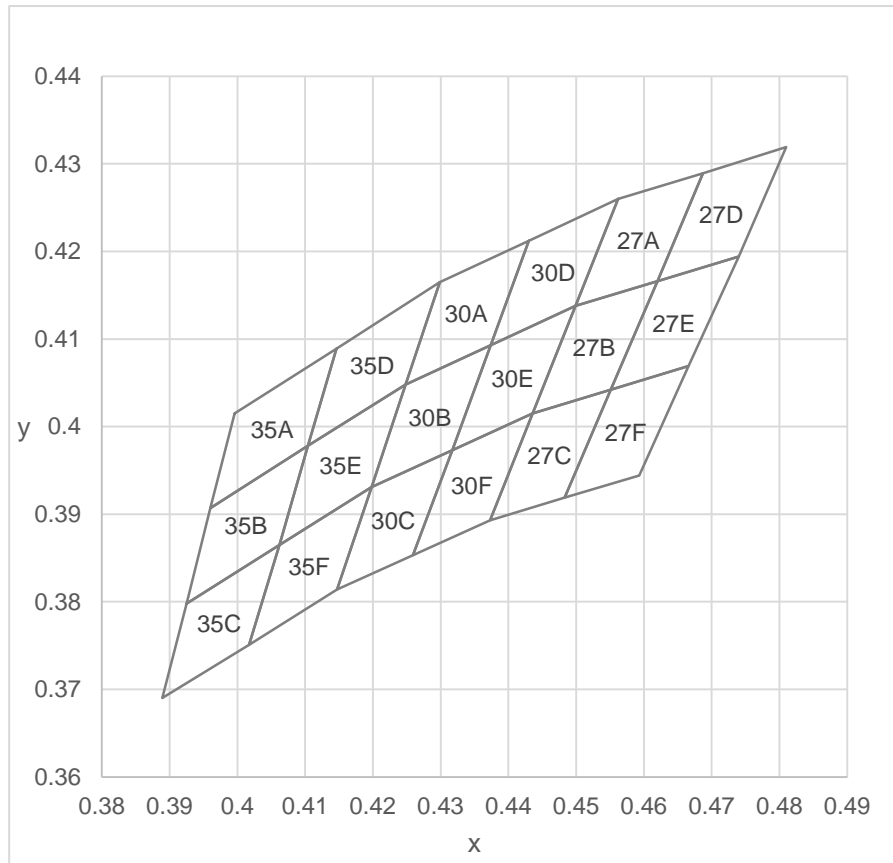


Figure 3A. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

PLW3014AA Series | Product Datasheet

	x	y		x	y		x	y
27A	0.4562	0.426	30A	0.4299	0.4165	35A	0.3996	0.4015
	0.4499	0.4138		0.4248	0.4048		0.396	0.3907
	0.462	0.4166		0.4374	0.4093		0.4104	0.3978
	0.4687	0.4289		0.443	0.4212		0.4146	0.4089
27B	0.4499	0.4138	30B	0.4248	0.4048	35B	0.396	0.3907
	0.4436	0.4015		0.4198	0.3931		0.3925	0.3798
	0.4551	0.4042		0.4317	0.3973		0.4062	0.3865
	0.462	0.4166		0.4374	0.4093		0.4104	0.3978
27C	0.4436	0.4015	30C	0.4198	0.3931	35C	0.3925	0.3798
	0.4373	0.3893		0.4147	0.3814		0.3889	0.369
	0.4483	0.3919		0.4259	0.3853		0.4017	0.3751
	0.4551	0.4042		0.4317	0.3973		0.4062	0.3865
27D	0.4687	0.4289	30D	0.443	0.4212	35D	0.4146	0.4089
	0.462	0.4166		0.4374	0.4093		0.4104	0.3978
	0.474	0.4194		0.4499	0.4138		0.4248	0.4048
	0.481	0.4319		0.4562	0.426		0.4299	0.4165
27E	0.462	0.4166	30E	0.4374	0.4093	35E	0.4104	0.3978
	0.4551	0.4042		0.4317	0.3973		0.4062	0.3865
	0.4666	0.4069		0.4436	0.4015		0.4198	0.3931
	0.474	0.4194		0.4499	0.4138		0.4248	0.4048
27F	0.4551	0.4042	30F	0.4317	0.3973	35F	0.4062	0.3865
	0.4483	0.3919		0.4259	0.3853		0.4017	0.3751
	0.4593	0.3944		0.4373	0.3893		0.4147	0.3814
	0.4666	0.4069		0.4436	0.4015		0.4198	0.3931

Colour Chromaticity – 4000-6500K

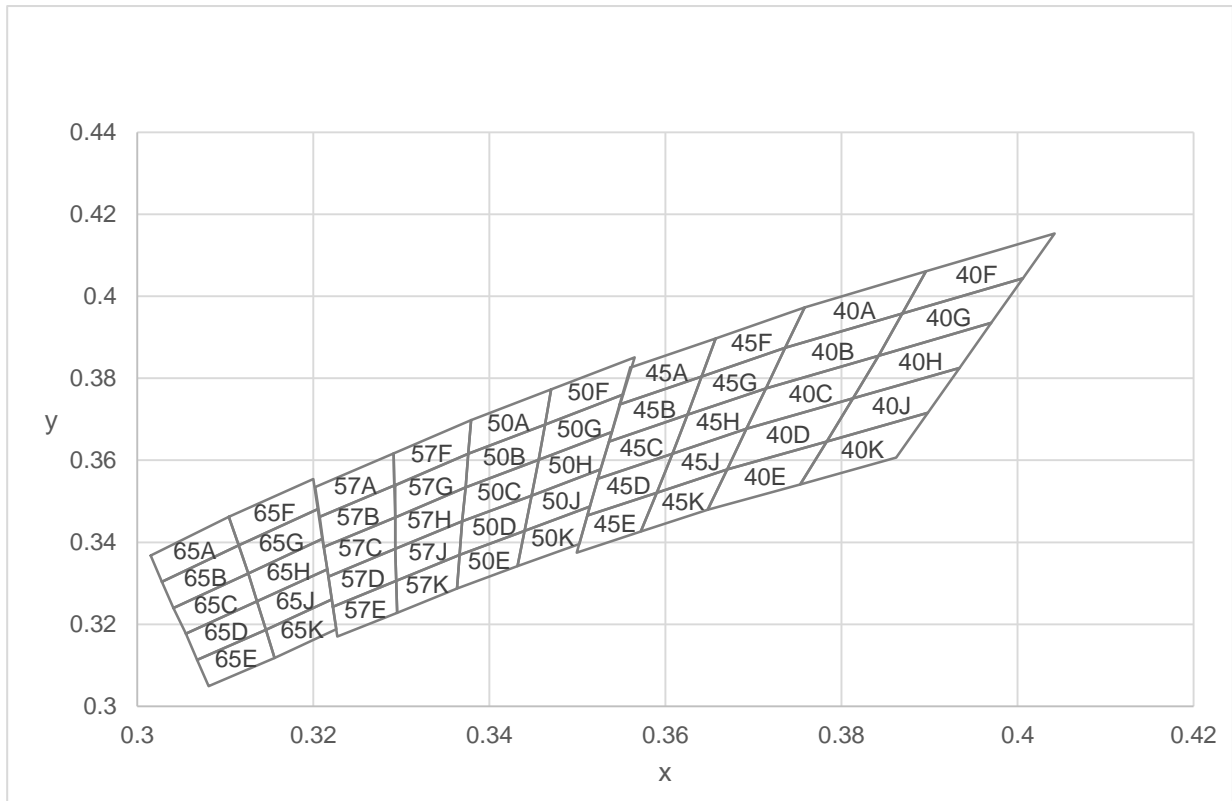


Figure 3B. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

PLW3014AA Series | Product Datasheet

	x	y		x	y		x	y		x	y		x	y
40A	0.3758	0.3973	45A	0.356	0.3826	50A	0.3379	0.3698	57A	0.3202	0.3535	65A	0.3015	0.3368
	0.3736	0.3874		0.3548	0.3736		0.3376	0.3616		0.3207	0.3462		0.3028	0.3304
	0.3869	0.3958		0.3641	0.3804		0.3463	0.3687		0.3292	0.3539		0.3115	0.3393
	0.3896	0.4061		0.3657	0.3897		0.347	0.3773		0.3291	0.3617		0.3104	0.3462
40B	0.3736	0.3874	45B	0.3548	0.3736	50B	0.3376	0.3616	57B	0.3207	0.3462	65B	0.3028	0.3304
	0.3714	0.3775		0.3536	0.3646		0.3373	0.3534		0.3212	0.3389		0.3041	0.324
	0.3842	0.3855		0.3625	0.3711		0.3456	0.3601		0.3293	0.3461		0.3126	0.3324
	0.3869	0.3958		0.3641	0.3804		0.3463	0.3687		0.3292	0.3539		0.3115	0.3393
40C	0.3714	0.3775	45C	0.3536	0.3646	50C	0.3373	0.3534	57C	0.3212	0.3389	65C	0.3041	0.324
	0.3692	0.3677		0.3523	0.3555		0.3369	0.3451		0.3217	0.3316		0.3055	0.3177
	0.3813	0.3751		0.3608	0.3616		0.3448	0.3514		0.3293	0.3384		0.3136	0.3256
	0.3842	0.3855		0.3625	0.3711		0.3456	0.3601		0.3293	0.3461		0.3126	0.3324
40D	0.3692	0.3677	45D	0.3523	0.3555	50D	0.3369	0.3451	57D	0.3217	0.3316	65D	0.3055	0.3177
	0.367	0.3578		0.3511	0.3465		0.3366	0.3369		0.3222	0.3243		0.3068	0.3113
	0.3783	0.3646		0.359	0.3521		0.344	0.3428		0.3294	0.3306		0.3146	0.3187
	0.3813	0.3751		0.3608	0.3616		0.3448	0.3514		0.3293	0.3384		0.3136	0.3256
40E	0.367	0.3578	45E	0.3511	0.3465	50E	0.3366	0.3369	57E	0.3222	0.3243	65E	0.3068	0.3113
	0.3648	0.3479		0.3499	0.3375		0.3363	0.3287		0.3227	0.317		0.3081	0.3049
	0.3753	0.3541		0.3572	0.3426		0.3432	0.3342		0.3295	0.3228		0.3156	0.3118
	0.3783	0.3646		0.359	0.3521		0.344	0.3428		0.3294	0.3306		0.3146	0.3187
40F	0.3896	0.4061	45F	0.3657	0.3897	50F	0.347	0.3773	57F	0.3291	0.3617	65F	0.3104	0.3462
	0.3869	0.3958		0.3641	0.3804		0.3463	0.3687		0.3292	0.3539		0.3115	0.3393
	0.4006	0.4044		0.3736	0.3874		0.3552	0.376		0.3376	0.3616		0.3205	0.3481
	0.4042	0.4153		0.3758	0.3973		0.3565	0.3851		0.3379	0.3698		0.32	0.3554
40G	0.3869	0.3958	45G	0.3641	0.3804	50G	0.3463	0.3687	57G	0.3293	0.3539	65G	0.3115	0.3393
	0.3842	0.3855		0.3625	0.3711		0.3456	0.3601		0.3293	0.3461		0.3126	0.3324
	0.397	0.3935		0.3714	0.3775		0.3539	0.3669		0.3373	0.3534		0.321	0.3408
	0.4006	0.4044		0.3736	0.3874		0.3552	0.376		0.3376	0.3616		0.3205	0.3481
40H	0.3842	0.3855	45H	0.3625	0.3711	50H	0.3456	0.3601	57H	0.3293	0.3461	65H	0.3126	0.3324
	0.3813	0.3751		0.3608	0.3616		0.3448	0.3514		0.3293	0.3384		0.3136	0.3256
	0.3934	0.3825		0.3692	0.3677		0.3526	0.3578		0.3369	0.3451		0.3216	0.3334
	0.397	0.3935		0.3714	0.3775		0.3539	0.3669		0.3373	0.3534		0.321	0.3408
40J	0.3813	0.3751	45J	0.3608	0.3616	50J	0.3448	0.3514	57J	0.3293	0.3384	65J	0.3136	0.3256
	0.3783	0.3646		0.359	0.3521		0.344	0.3428		0.3294	0.3306		0.3146	0.3187
	0.3898	0.3716		0.367	0.3578		0.3514	0.3487		0.3366	0.3369		0.3221	0.3261
	0.3934	0.3825		0.3692	0.3677		0.3526	0.3578		0.3369	0.3451		0.3216	0.3334
40K	0.3783	0.3646	45K	0.359	0.3521	50K	0.344	0.3428	57K	0.3294	0.3306	65K	0.3146	0.3187
	0.3753	0.3541		0.3572	0.3426		0.3432	0.3342		0.3295	0.3228		0.3156	0.3118
	0.3862	0.3607		0.3648	0.3479		0.3502	0.3396		0.3363	0.3287		0.3226	0.3188
	0.3898	0.3716		0.367	0.3578		0.3514	0.3487		0.3366	0.3369		0.3221	0.3261

Forward Current Characteristics

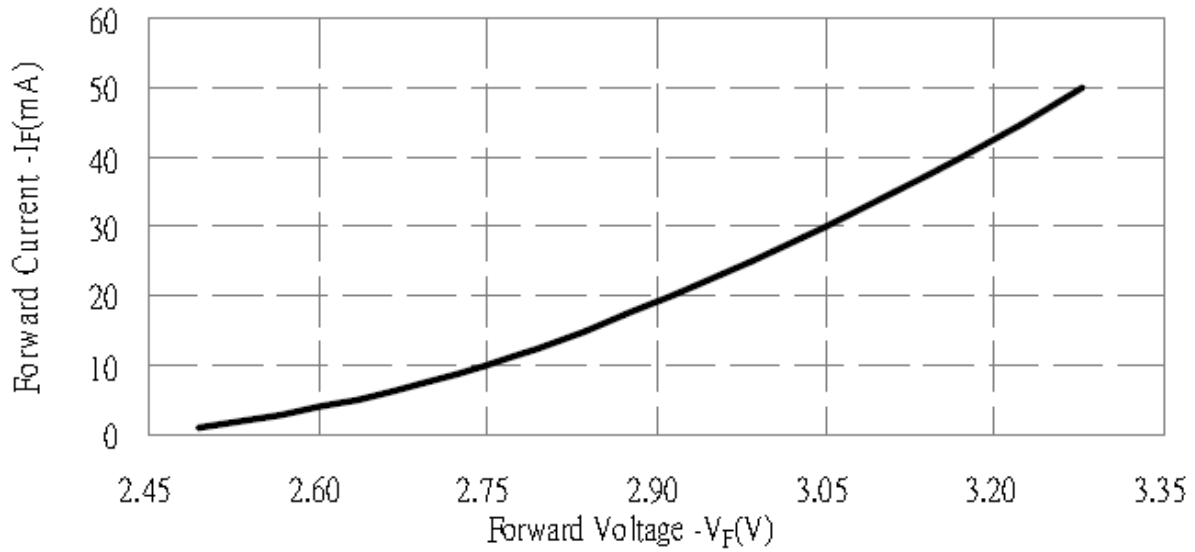


Figure 4. Typical forward current versus forward voltage ($T_a = +25^\circ\text{C}$)

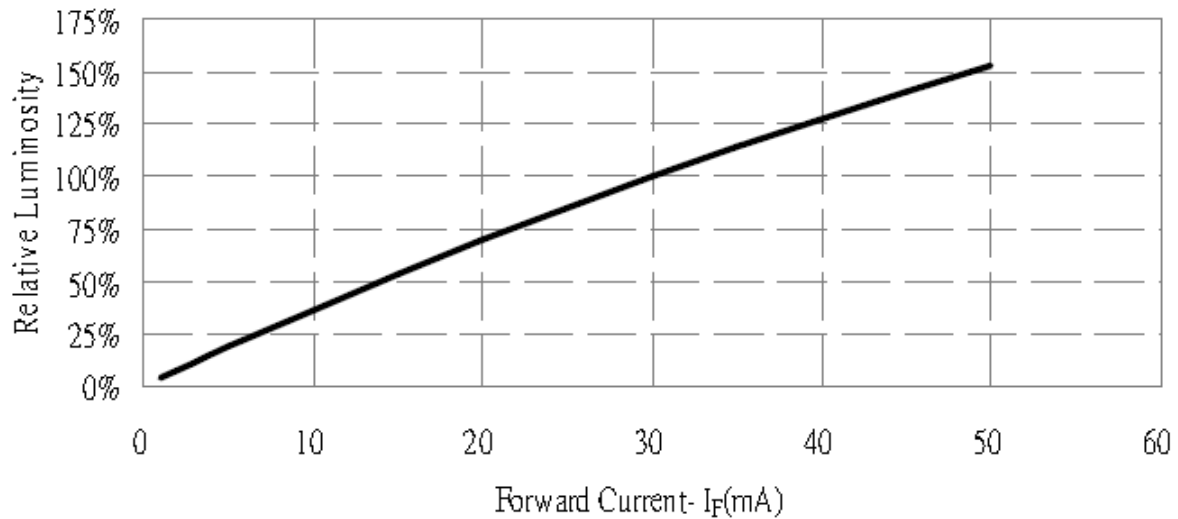


Figure 5. Relative luminous flux versus forward current ($T_a = +25^\circ\text{C}$)

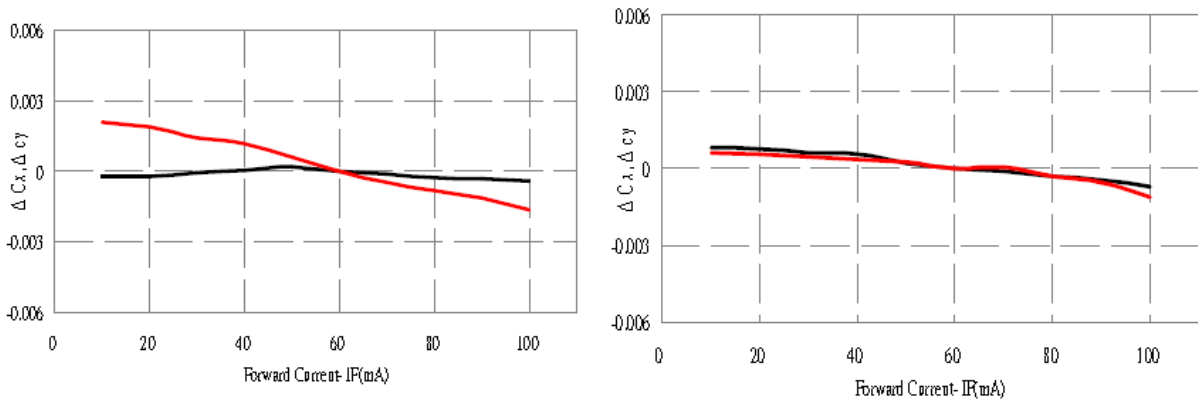


Figure 6. Forward Current versus Chromaticity (3000K & 5700K)

Temperature Characteristics

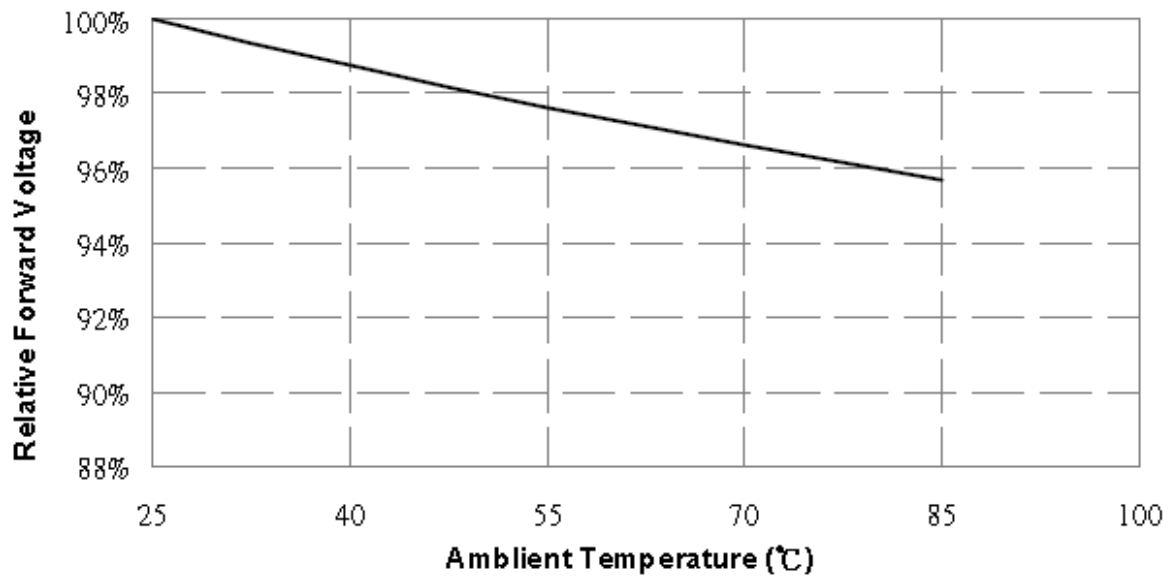


Figure 7. Typical forward voltage versus ambient temperature ($I_f=30mA$)

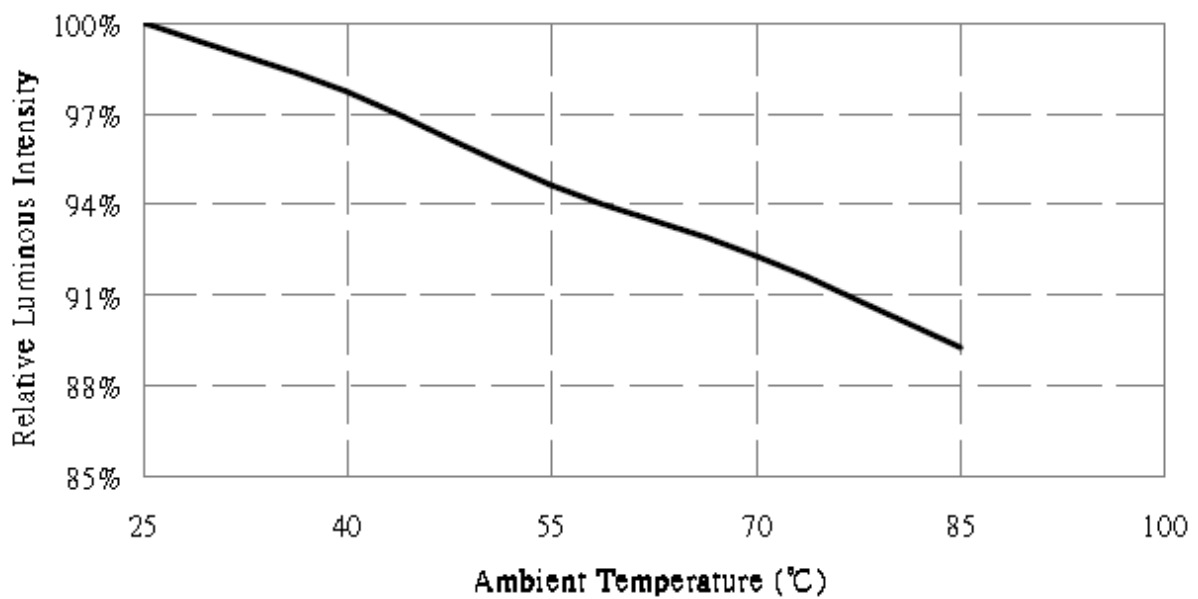


Figure 8. Relative luminous intensity versus ambient temperature

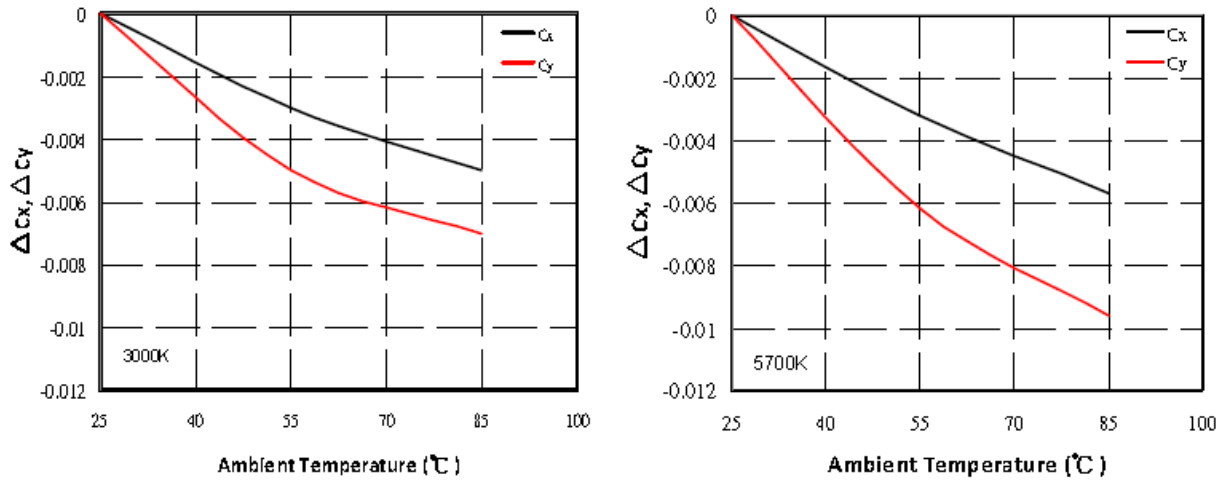


Figure 9. Chromaticity coordinates versus ambient temperature

Package Outline Dimensions

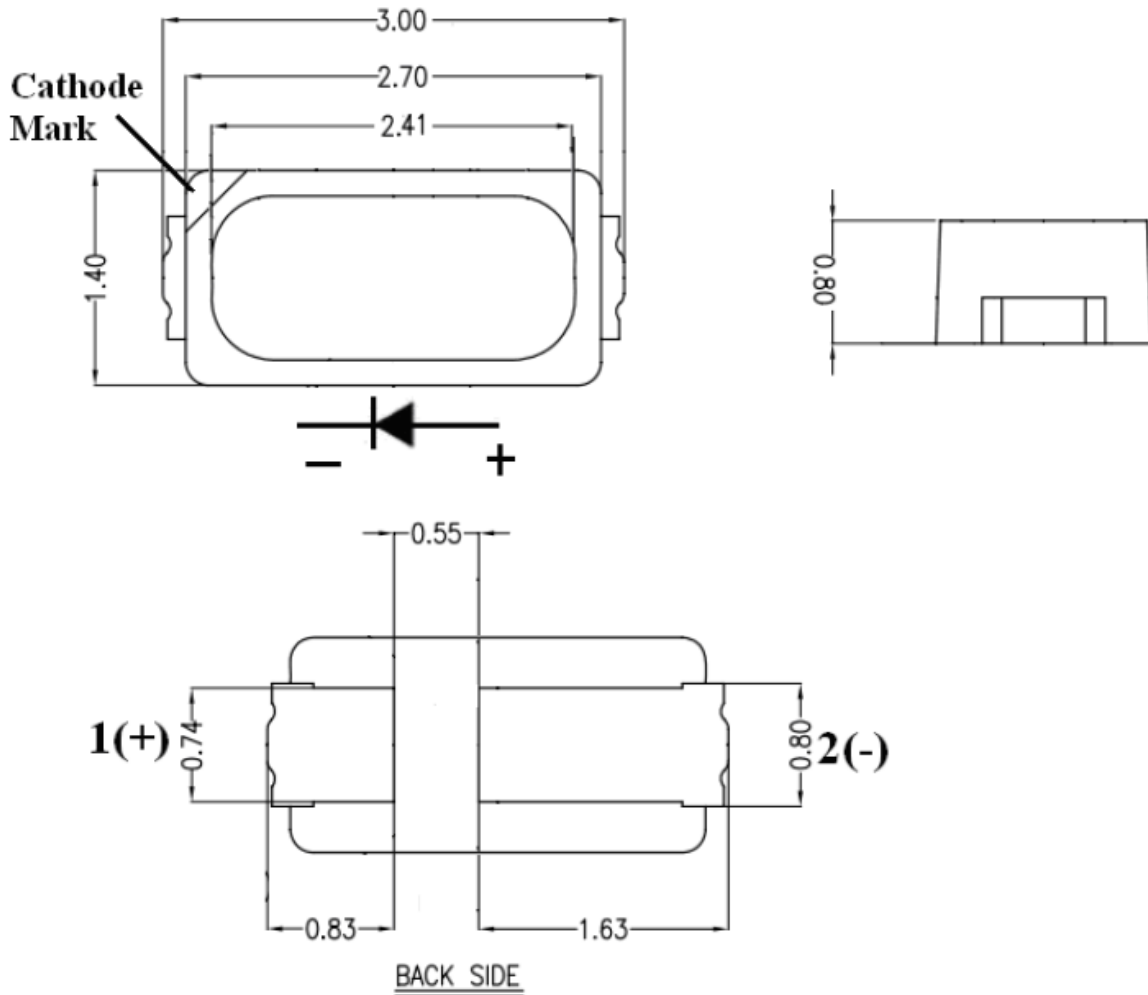


Figure 10. Mechanical drawings of the 3014 package (all dimensions in mm)

Recommended Solder Pad

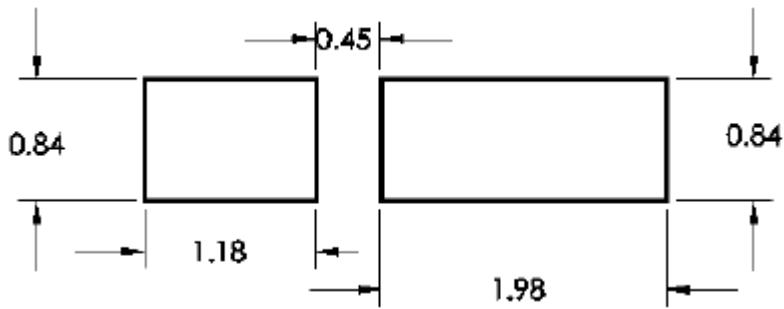


Figure 11. Diagram of soldering pad (unit in mm)

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

Reflow Soldering Profile

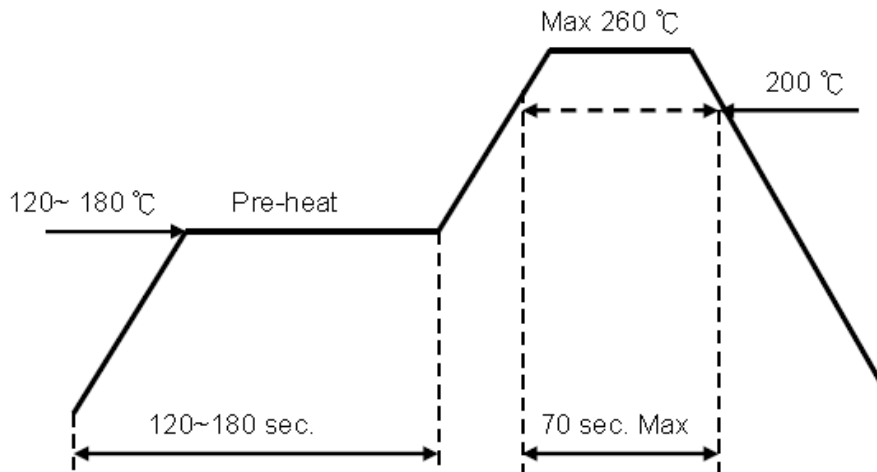


Figure 12. Reflow soldering profile

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

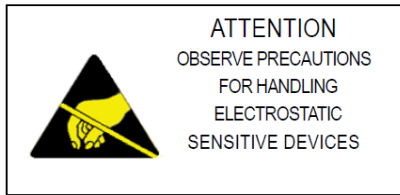
Soldering iron

1. When hand soldering, the temperature of the iron must be $\leq +350^{\circ}\text{C}$ for 3 seconds
2. Hand soldering should be performed only once.

Handling Instructions

Plessey LEDs are not designed to operate with reverse bias.

Precautions are required to prevent reverse bias in applications and during handling.



Moisture Sensitivity

JEDEC Level	Floor life		Bake	
	Time	Conditions	Time	Conditions
3	168 hours	$\leq +30^{\circ}\text{C} / 60\% \text{ RH}$	≥ 82 hours	$+60^{\circ}\text{C} \pm 5^{\circ}\text{C} / 5\% \text{ RH}$

Packing Information

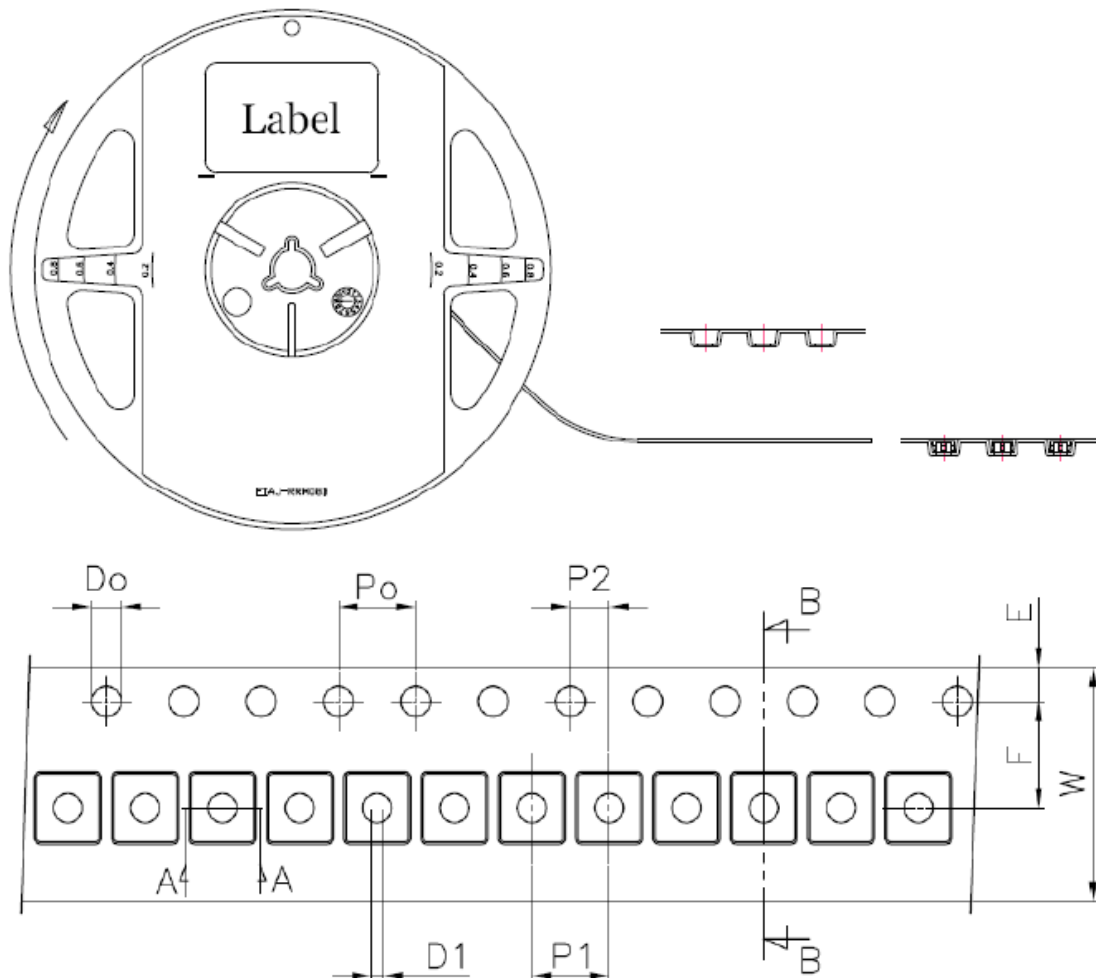


Figure 14. Reel specification (unit in mm)

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