

MAGIC LED

PLW16A120 Series

Advance Product Information



Description

Plessey PLW16A120 SMT LEDs are designed for 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 pieces; every reel will be shipped in single intensity and colour bin, to provide close uniformity.

Features

- 5630 footprint
- 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.
PLW16A120WW	Warm White	2870K	3220K
PLW16A120NW	Neutral White	3710K	4260K
PLW16A120CW	Cool White	5310K	6020K

Absolute Maximum Ratings

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

Parameter	Symbol	Minimum	Maximum	Unit
DC Forward Current	I_F	-	150	mA
Peak Pulse Forward Current ^[1]	I_{FP}	-	180	mA
Reverse Voltage	V_R	-	5	V
Storage Temperature	T_{stg}	-40	+105	$^{\circ}\text{C}$
Junction Temperature	T_j	-40	+105	$^{\circ}\text{C}$

[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	V_F	$I_F = 100\text{mA}$	2.8	3.2	3.4	V
Reverse Current	I_R	$V_R = 5\text{V}$	-	-	10	μA
Correlated Colour Tempertaure	CCT	$I_F = 100\text{mA}$	2870		3220	K
			3710		4260	
			5310		6020	
Colour Rendering Index	CRI	$I_F = 100\text{mA}$	80		85	%
Luminous Flux		$I_F = 100\text{mA}$ 3000K		28		lm
		$I_F = 100\text{mA}$ 4000K		30		
		$I_F = 100\text{mA}$ 5700K		30		
Thermal Resistance	R_{thj-sp}		-	18	-	K/W
Half-Intensity Angle	$2\Theta_{1/2}$	$I_F = 100\text{mA}$	-	120	-	deg

Recommended Operating Conditions

In typical applications, for optimum LED performance

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

Intensity Bin Groups

$I_F = 100\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

Group	Luminous flux ^[1] (lm)	
	Min.	Max.
C2	24	28
C3	28	34

^[1] Tolerance $\pm 11\%$

Forward Voltage Bin Groups

$I_F = 100\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, 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 $\pm 0.05\text{V}$

Relative Spectral Emission

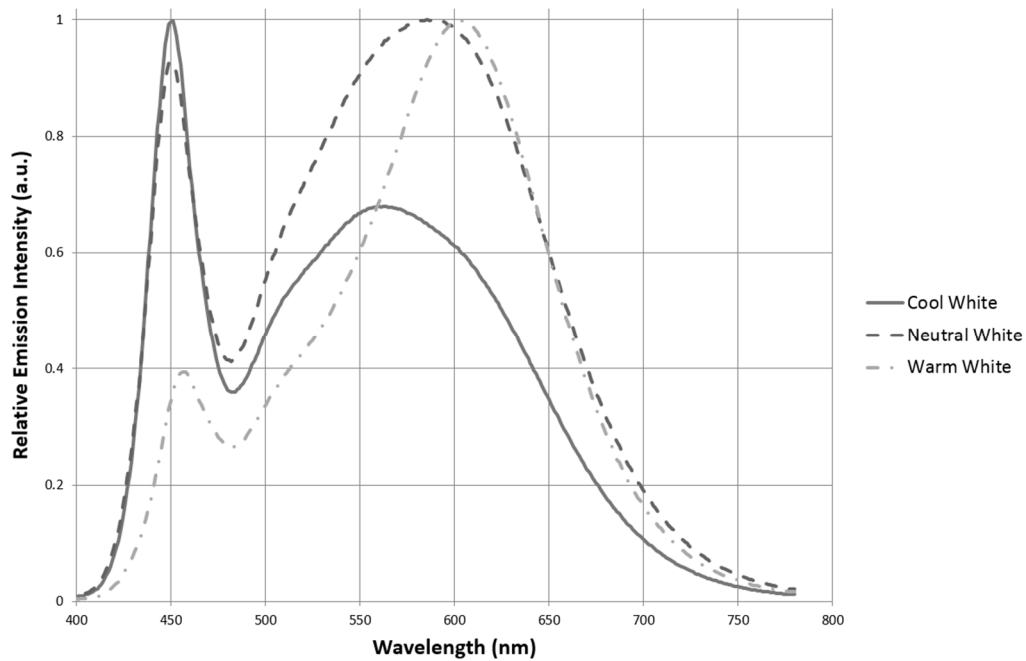


Figure 1. Normalised spectral power distribution (Neutral white)

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

Angular Light Distribution

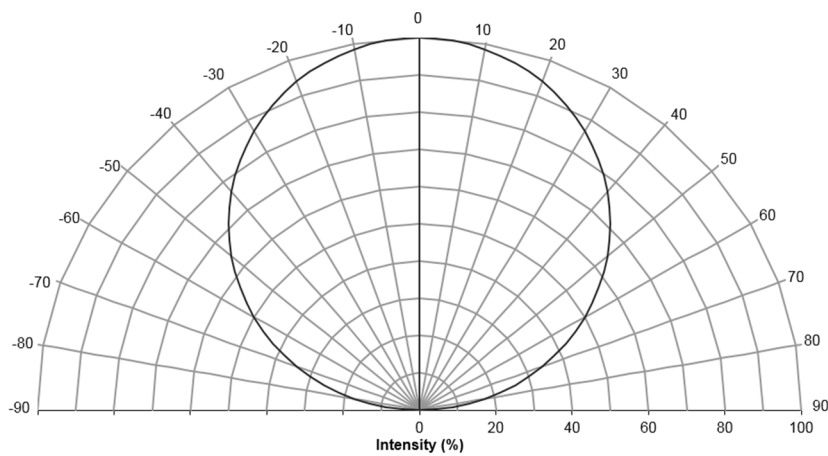


Figure 2. Angular distribution pattern of emitted light

Colour Chromaticity – Warm White

Warm White 2870-3220 K

3SW		3NE		3NW		3SE	
x	y	x	y	x	y	x	y
0.4345	0.4033	0.4562	0.4260	0.4431	0.4213	0.4468	0.4077
0.4223	0.3990	0.4431	0.4213	0.4299	0.4165	0.4345	0.4033
0.4147	0.3814	0.4345	0.4033	0.4223	0.3990	0.4260	0.3854
0.4260	0.3854	0.4468	0.4077	0.4345	0.4033	0.4373	0.3893

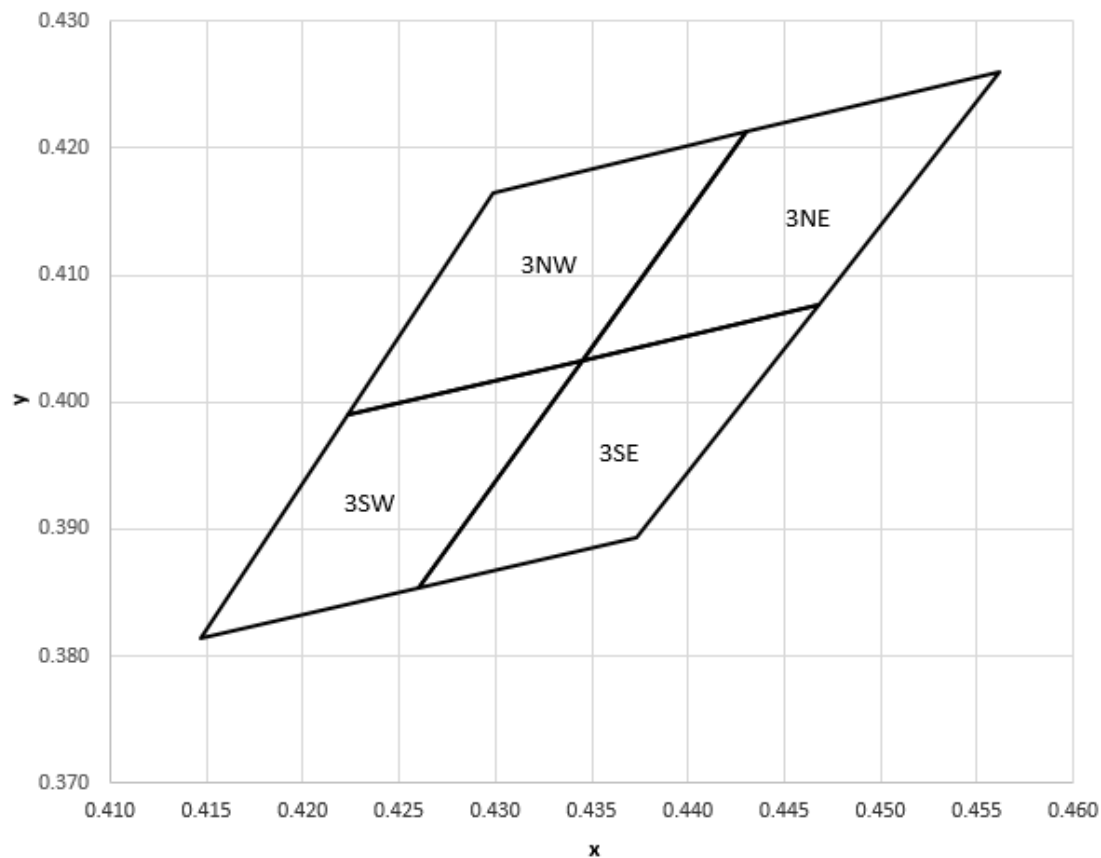
Chromaticity co-ordinate tolerance for each bin is ± 0.01 

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

Colour Chromaticity – Neutral White

Neutral White 3710-4260 K

4SW		4NE		4NW		4SE	
x	y	x	y	x	y	x	y
0.3828	0.3803	0.4006	0.4044	0.3871	0.3959	0.3952	0.3880
0.3703	0.3726	0.3871	0.3959	0.3736	0.3874	0.3828	0.3803
0.3670	0.3578	0.3828	0.3803	0.3703	0.3726	0.3784	0.3647
0.3784	0.3647	0.3952	0.3880	0.3828	0.3803	0.3898	0.3716

Chromaticity co-ordinate tolerance for each bin is ± 0.01

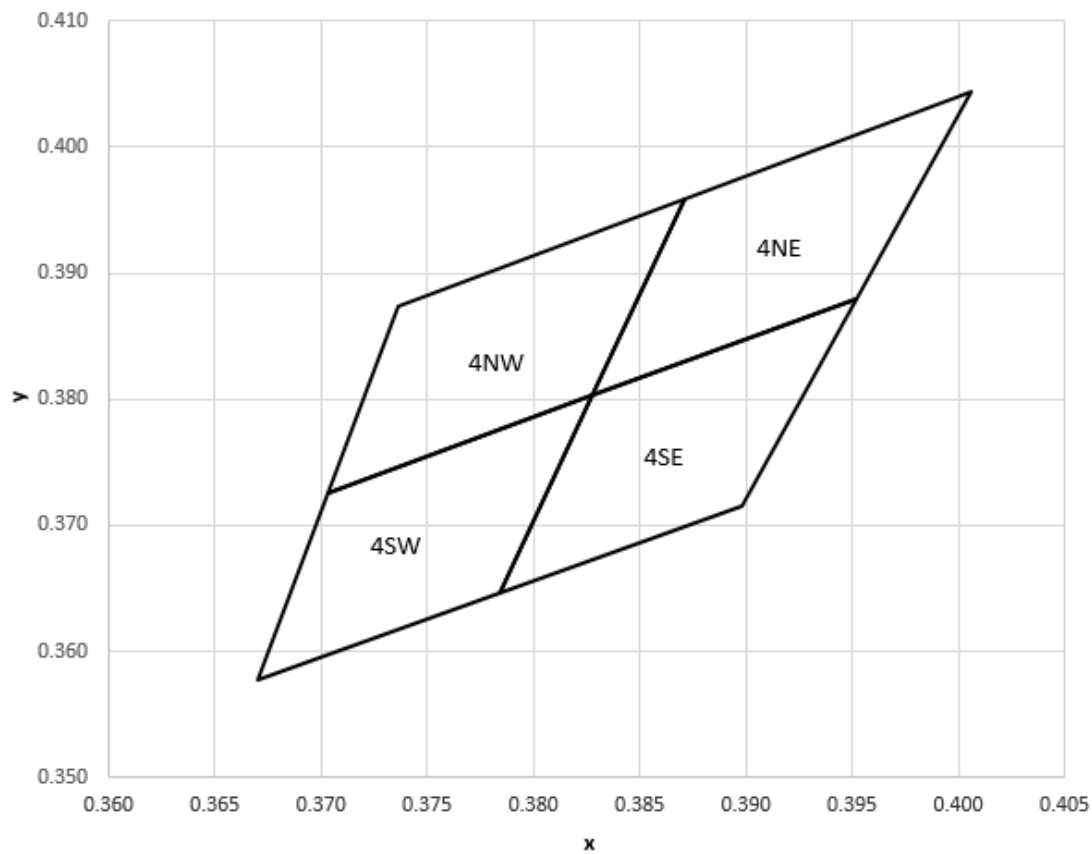


Figure 3B. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

Colour Chromaticity – Cool White

Cool White 5310-6020 K

5SW		5NE		5NW		5SE	
x	y	x	y	x	y	x	y
0.3293	0.3422	0.3376	0.3616	0.3292	0.3539	0.3371	0.3493
0.3215	0.3353	0.3292	0.3539	0.3207	0.3462	0.3293	0.3422
0.3222	0.3243	0.3293	0.3422	0.3215	0.3353	0.3294	0.3306
0.3294	0.3306	0.3371	0.3493	0.3293	0.3422	0.3366	0.3369

Chromaticity co-ordinate tolerance for each bin is ± 0.01

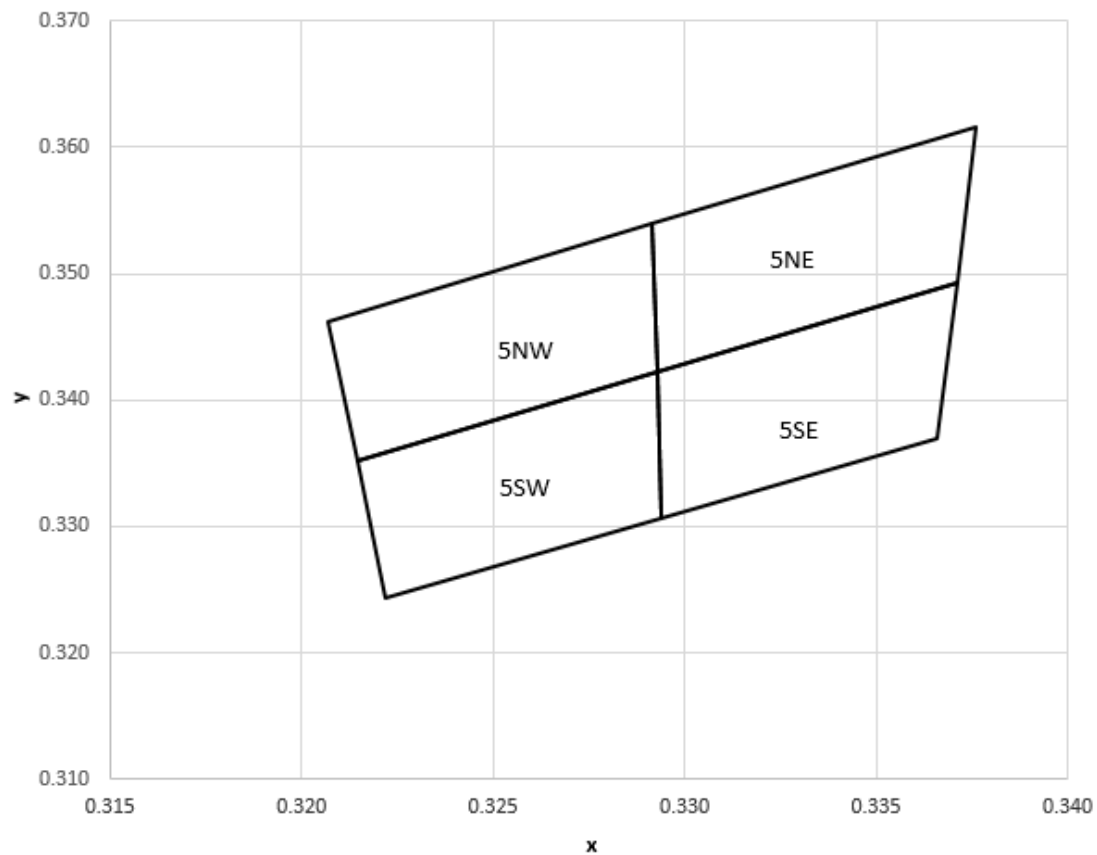


Figure 3C. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

Package Outline Dimensions

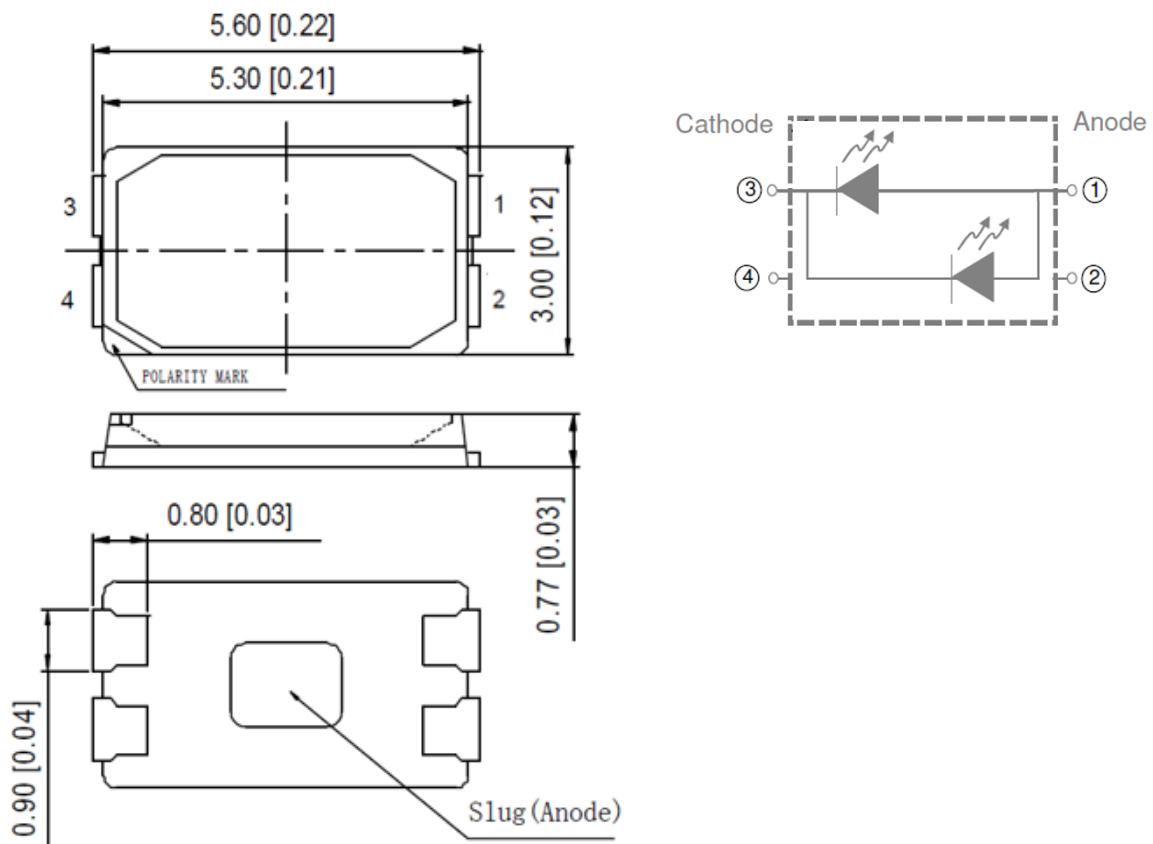


Figure 4. Mechanical drawings of the 5630 package, with unit in millimeter [in inches]

Recommended Solder Pad

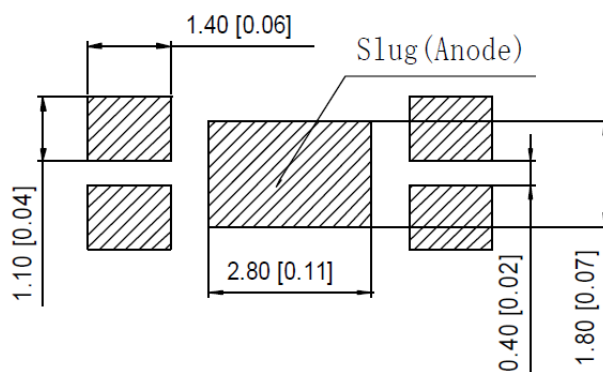


Figure 5. Diagram of soldering pad (unit in mm)

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

Reflow Soldering Profile

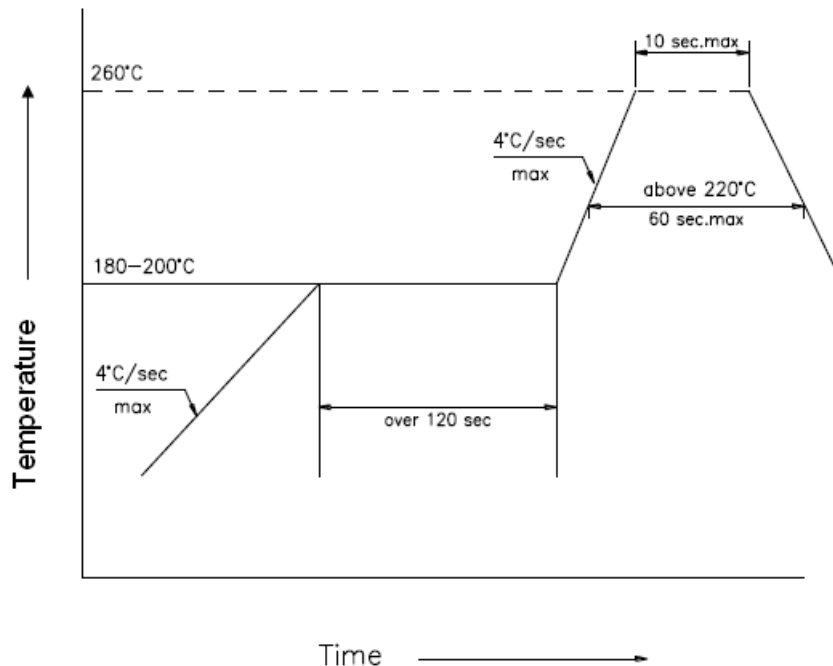


Figure 6. Reflow soldering profile

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 $\leq +300^{\circ}\text{C}$ 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
4	72 hours	$\leq +30^{\circ}\text{C}$ / 60% RH	≥ 24 hours	$+125^{\circ}\text{C} \pm 5^{\circ}\text{C}$

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