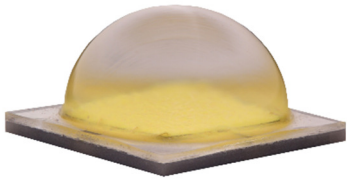
PLW7070GA Series
High Power LED
Advanced Product Datasheet



Description

Plessey's MAGIC PLW7070GA white LED is designed for a wide range of high power applications such as spot lights, flood lights, street lighting and high bay lighting. The LEDs are supplied in reels containing 1000 pieces; each reel will be shipped in single luminous flux and colour bins, to provide close uniformity.

Features

- Industry standard 7070 footprint
- GaN-on-Si die technology
- Domed silicone lens
- 120 degree wide viewing angle
- 12V forward voltage
- ESD protection
- RoHS compliant

Applications

- High intensity lights
- High bay lighting
- Spot lights
- Flood lights
- Directional lamps
- Street lights

Variant	Colour	CCT	
		Min.	Max.
PLW7070GAWW27	Warm White 2700K	2580K	2870K
PLW7070GAWW30	Warm White 3000K	2870K	3220K
PLW7070GANW40	Neutral White 4000K	3710K	4260K
PLW7070GACW50	Cool White 5000K	4745K	5311K
PLW7070GACW57	Cool White 5700K	5310K	6020K

Ordering Information[1]

Name	Order code	CCT range /K	Minimum luminous flux	Forward voltage range	Min. CRI
PLW7070GAWW27	PLW7070GAW27001	2580-2870	3L	V1-V3	80
	PLW7070GAW27002	2580-2870	9K		90
PLW7070GAWW30	PLW7070GAW30001	2870-3220	5L		70
	PLW7070GAW30002	2870-3220	4L		80
	PLW7070GAW30003	2870-3220	9K		90
PLW7070GANW40	PLW7070GAN40001	3710-4260	6L		70
	PLW7070GAN40002	3710-4260	5L		80
PLW7070GACW50	PLW7070GAC50001	4745-5311	6L		70
	PLW7070GAC50002	4745-5311	5L		80
PLW7070GACW57	PLW7070GAC57001	5310-6020	6L		70
	PLW7070GAC57002	5310-6020	5L		80

[1] Shaded areas- parts not currently available

Absolute Maximum Ratings

T_{amb} = +25ºC unless otherwise stated

Parameter	Symbol	Minimum	Maximum	Unit
DC Forward Current	I_F	-	1250	mA
ESD Voltage (JEDEC JS-001-2011)	V_{ESD}	5	-	kV
Storage Temperature	T_{stg}	-40	+105	ºC
Junction Temperature	T_j	-40	+135	ºC

Electro-optical Characteristics

T_{amb} = +25ºC unless otherwise stated

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage (Tj=85°C)	V_F	I_F = 700mA	11.2	11.6	12.4	V
Correlated Colour Temperature	CCT	I_F =700mA CCT=3000K	2870	-	3220	K
		I_F = 700mA CCT=4000K	3710	-	4260	
		I_F = 700mA CCT=5000K	4745	-	5311	
Colour Rendering Index	CRI [1]	I_F = 700mA	70	-	-	-
Luminous Flux (Tj=85°C)	lm	I_F = 700mA CCT=3000K CRI = 80	780	-	-	lm
		I_F = 700mA CCT =4000K CRI = 70	900	-	-	
		I_F = 700mA CCT =4000K CRI = 70	900	-	-	
Thermal Resistance	R_{thj-sp}		-	1.75	-	K/W
Half-Intensity Angle	$2\Theta_{1/2}$	I_F = 700mA	-	120		deg.
Forward voltage temperature coefficient	$\frac{dVf}{dT}$	I_F=700mA		-7.5		mV/°C

[1] Tolerance ±2

Luminous Flux Bin Groups

I_F = 700mA, Tj=85°C[1]

CCT	CRI	Luminous Flux Bin [2] [3]								
		9K	1L	2L	3L	4L	5L	6L	7L	8L
		630 - 680 lm	630 - 680 lm	680 - 730 lm	730 - 780 lm	780 - 840 lm	840 - 900 lm	900 - 970 lm	970 - 1040 lm	1040 - 1120 lm
5700	70							✓	✓	✓
	80							✓	✓	✓
5000	70							✓	✓	✓
	80						✓	✓	✓	✓
4000	70							✓	✓	✓
	80						✓	✓	✓	
3500	70						✓	✓	✓	✓
	80					✓	✓	✓	✓	
3000	70						✓	✓	✓	✓
	80					✓	✓	✓		
	90	✓	✓	✓	✓					
2700	80				✓	✓	✓	✓		
	90	✓	✓	✓						

[1] Pulse test, t_p=10mS
[2] Tolerance ±7%
[3] Shaded options not currently available

Forward Voltage Bin Groups

I_F = 700mA, T_j = +85°C, unless otherwise stated

Group	V_F [1] (V)	
	Min.	Max.
V1	11.2	11.6
V2	11.6	12.0
V3	12.0	12.4

[1] Tolerance ±0.10V

Colour Rendering Index

I_F = 700mA, T_{amb} = +25°C, unless otherwise stated

CRI 1	CRI 2	Colour Rendering Index CRI (Ra)	
		Min	Max
BA	B0	65	68
	B1	68	70
CA	C0	70	75
	C1	75	80
CB	C2	80	85
	C3	85	90
CC	C4	90	95
	C5	>95	-

Note: CRI bins controlled to +/-2.

Colour Chromaticity Bins

Neutral White 3710-4260 K

Tj=85°C unless otherwise stated

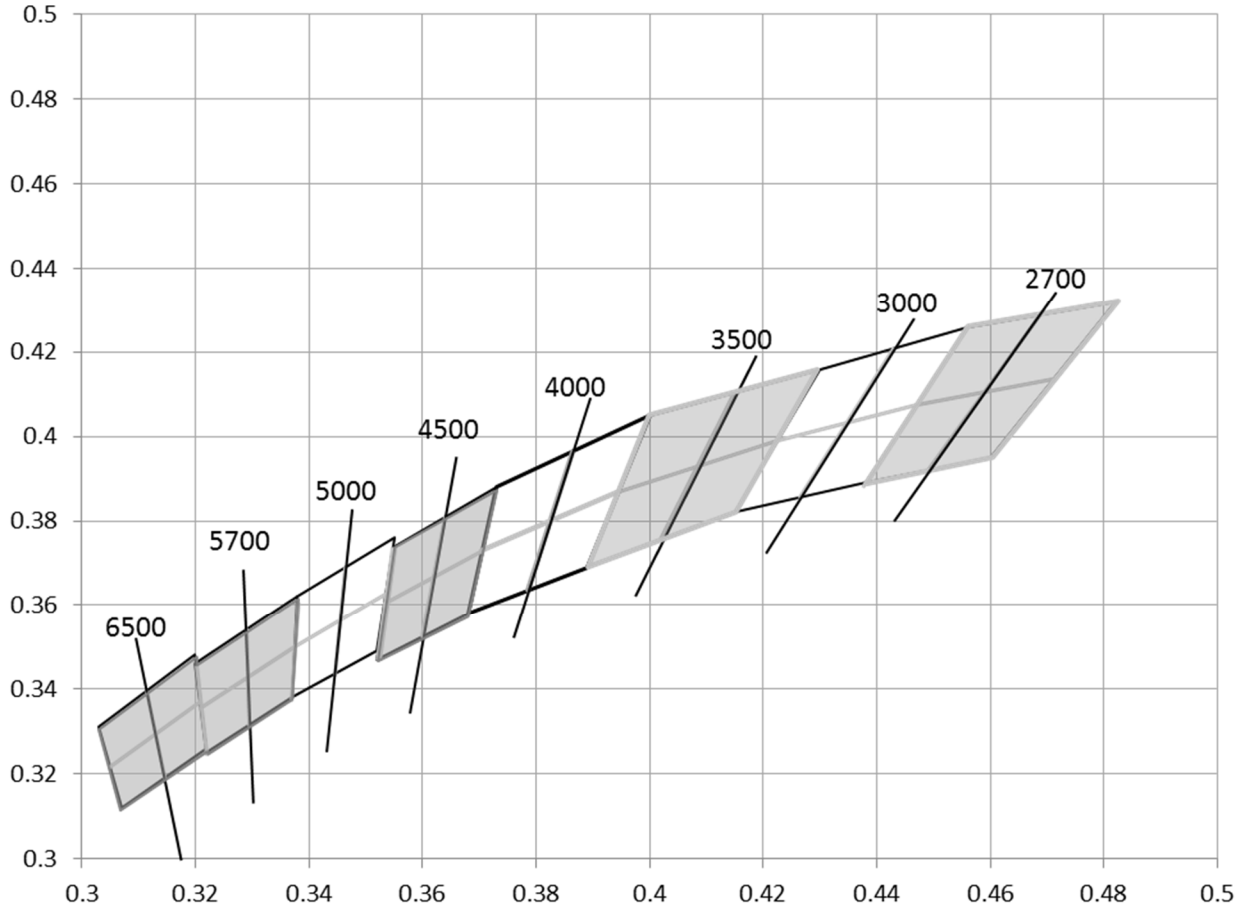


Figure 1(a) : Chromaticity chart - shaded bins are under development

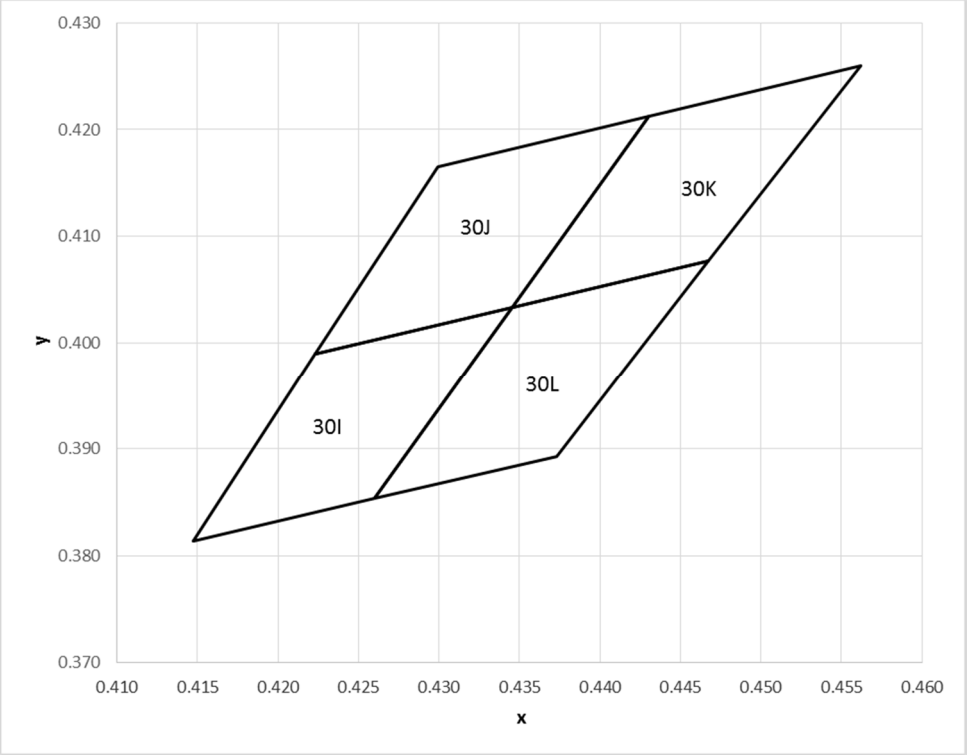


Figure 1(b) : Detail of 3000K chromaticity

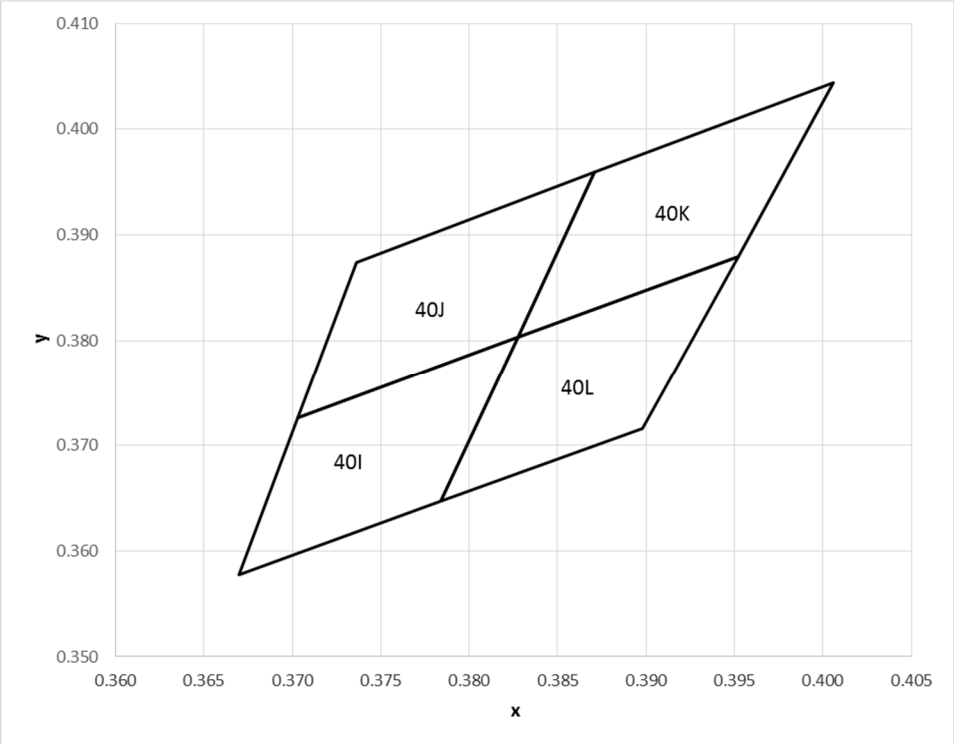


Figure 1(c) : 4000K chromaticity

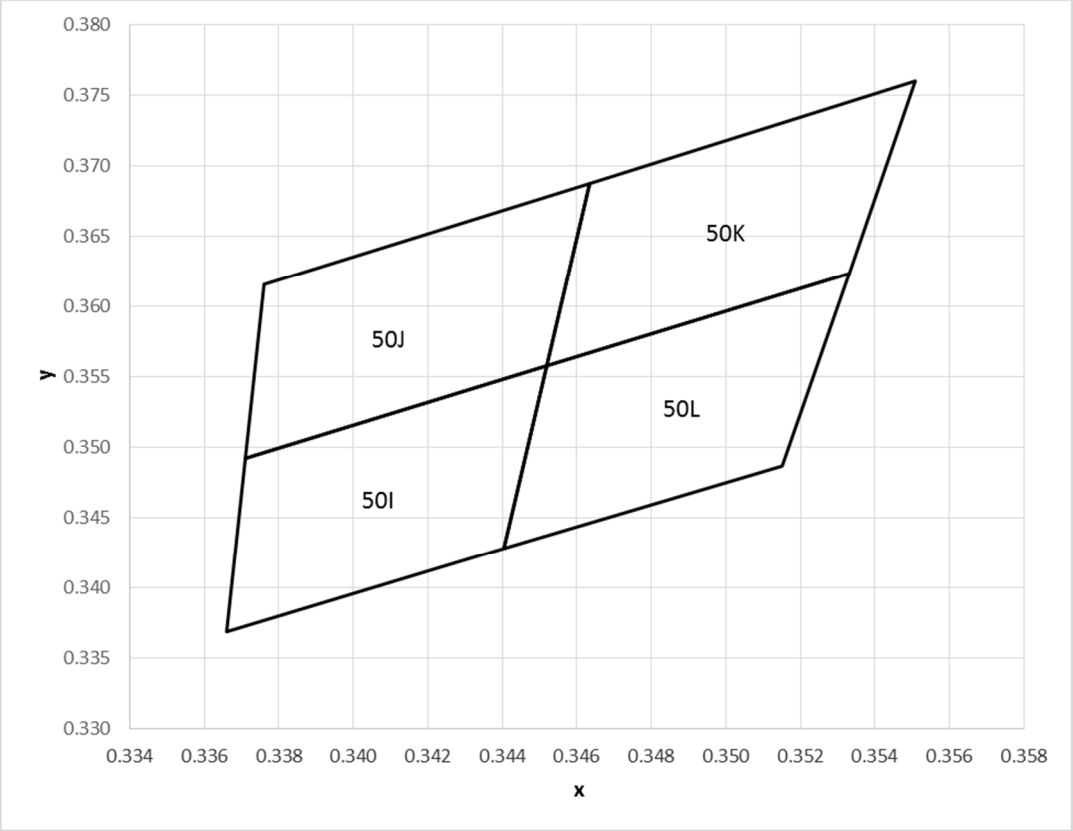


Figure 1(d) : 5000K chromaticity

30I		30J		30K		30L	
x	y	x	y	x	y	x	y
0.4345	0.4033	0.4431	0.4213	0.4562	0.4260	0.4468	0.4077
0.4223	0.3990	0.4299	0.4165	0.4431	0.4213	0.4345	0.4033
0.4147	0.3814	0.4223	0.3990	0.4345	0.4033	0.4260	0.3854
0.4260	0.3854	0.4345	0.4033	0.4468	0.4077	0.4373	0.3893

Table 1(a) 3000K chromaticity coordinates

40I		40J		40K		40L	
x	y	x	y	x	y	x	y
0.3828	0.3803	0.3871	0.3959	0.4006	0.4044	0.3952	0.3880
0.3703	0.3726	0.3736	0.3874	0.3871	0.3959	0.3828	0.3803
0.3670	0.3578	0.3703	0.3726	0.3828	0.3803	0.3784	0.3647
0.3784	0.3647	0.3828	0.3803	0.3952	0.3880	0.3898	0.3716

Table 1(b) 4000K chromaticity coordinates

50I		50J		50K		50L	
x	y	x	y	x	y	x	y
0.3452	0.3558	0.3464	0.3688	0.3551	0.3760	0.3533	0.3624
0.3371	0.3493	0.3376	0.3616	0.3464	0.3688	0.3452	0.3558
0.3366	0.3369	0.3371	0.3493	0.3452	0.3558	0.3441	0.3428
0.3441	0.3428	0.3452	0.3558	0.3533	0.3624	0.3515	0.3487

Table 1(c) 5000K chromaticity coordinates

Note

Chromaticity co-ordinate tolerance for each bin is ±0.01

Luminous Flux with Temperature

I_F = 700mA

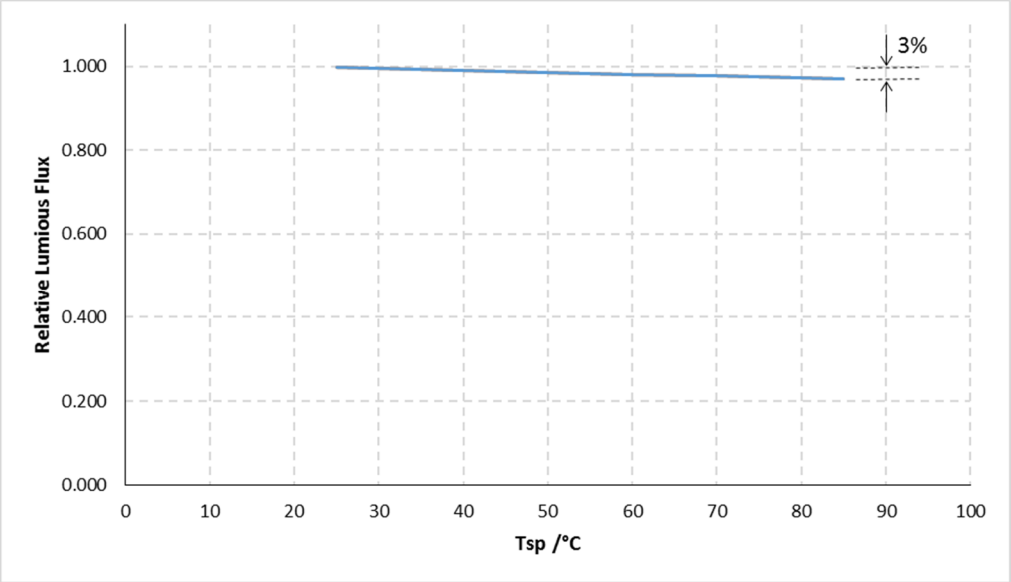


Figure 2 : Variation of relative luminous flux with temperature

Variation of CCT with Temperature

I_F = 700mA

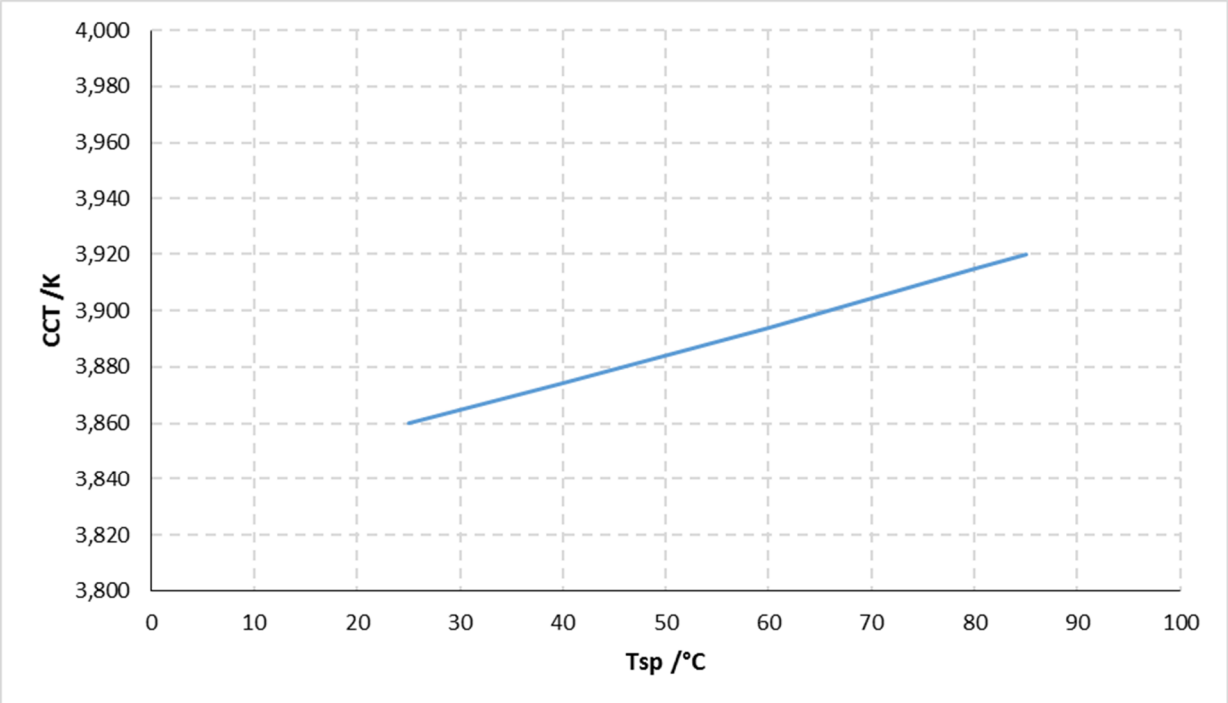


Figure 3 : Typical variation of CCT with temperature for 4000K device

Forward Voltage with Temperature

If=700mA

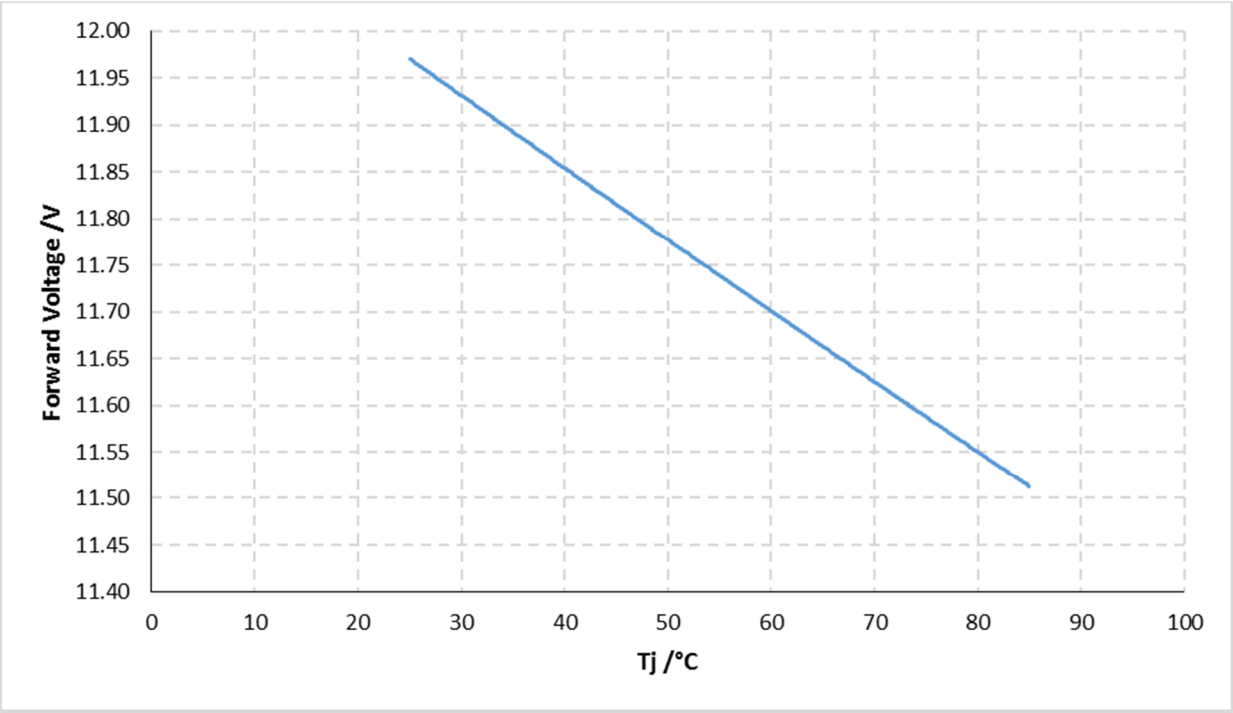


Figure 4 : Variation of forward voltage with temperature

Forward Current with Voltage

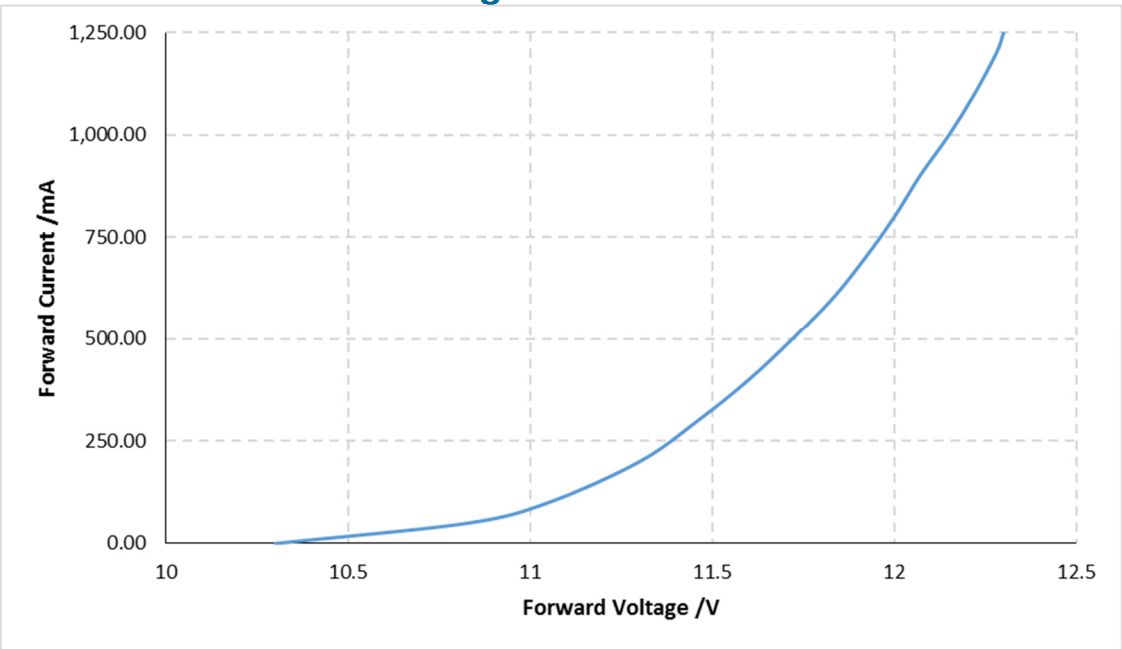


Figure 5 : Variation of forward current with voltage

Current Derating with Temperature

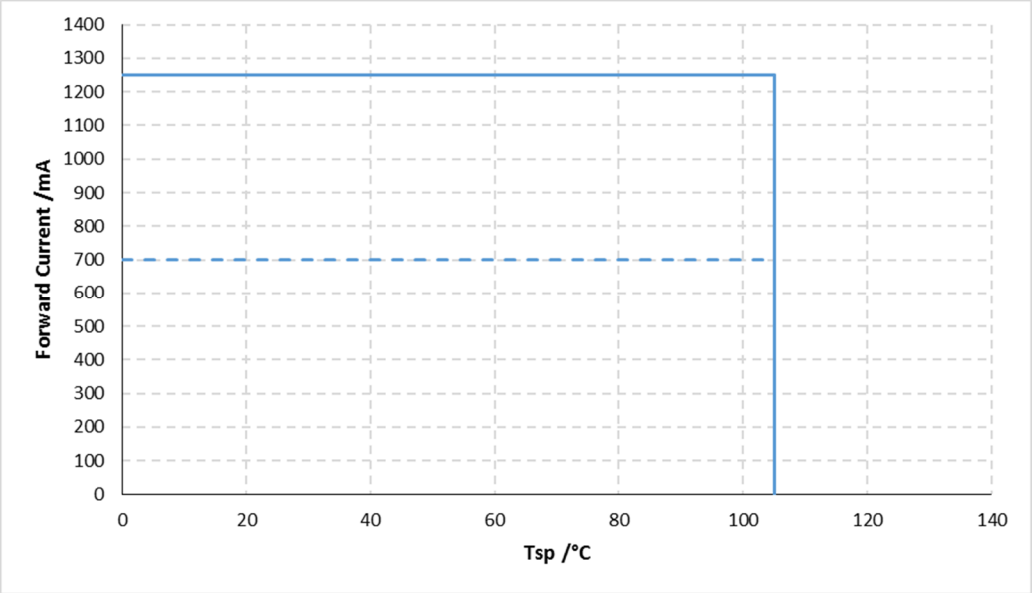


Figure. 6 : Derating of forward current with solder-point temperature. Full current/temperature envelope is available

Relative Spectral Emission

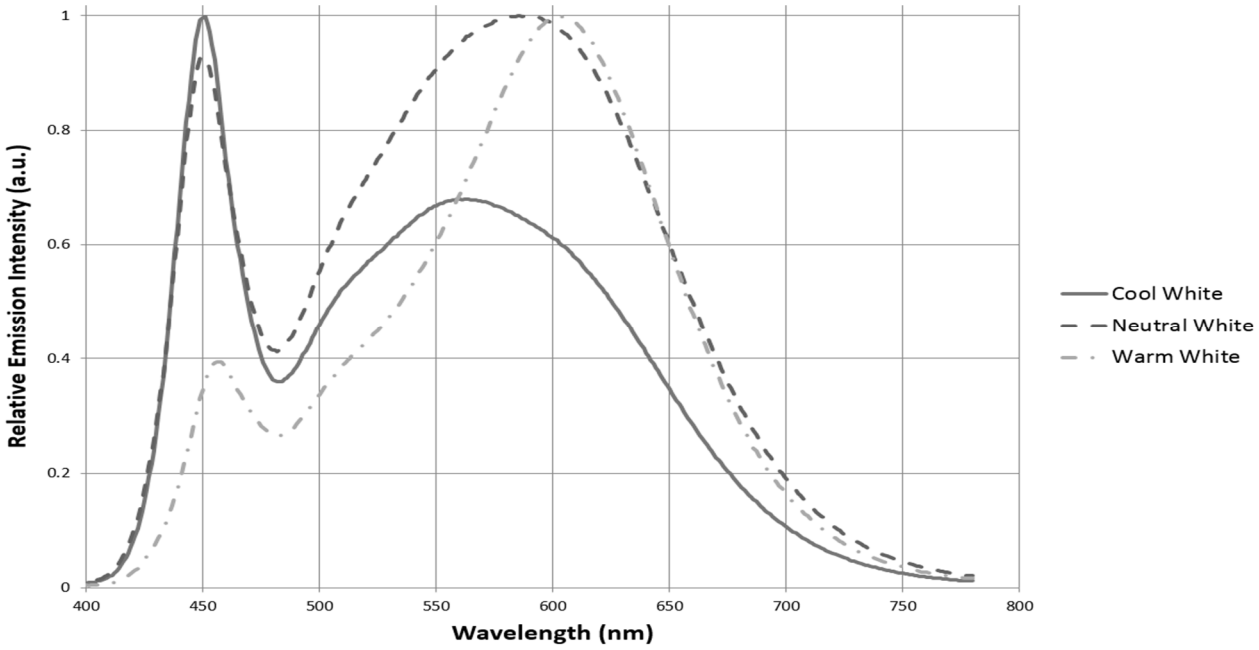


Figure 7 : Normalised spectral power distribution Note: supplied for information only

Angular Light Distribution

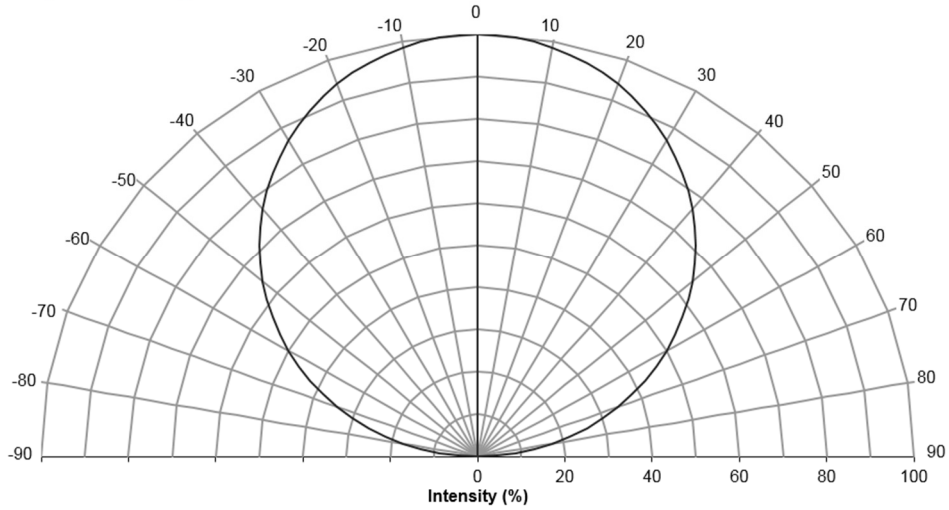


Figure 8 : Angular distribution pattern of emitted light

Package Outline Drawing

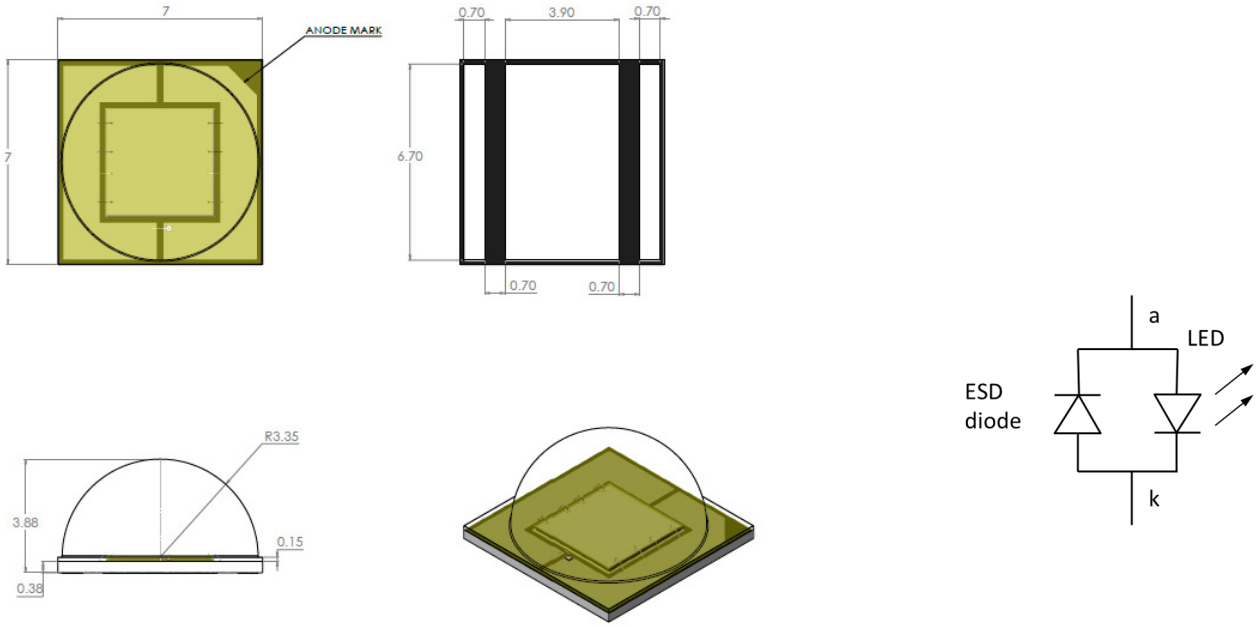


Figure 9 : Package Outline Drawing and schematic

Reflow Soldering Profile

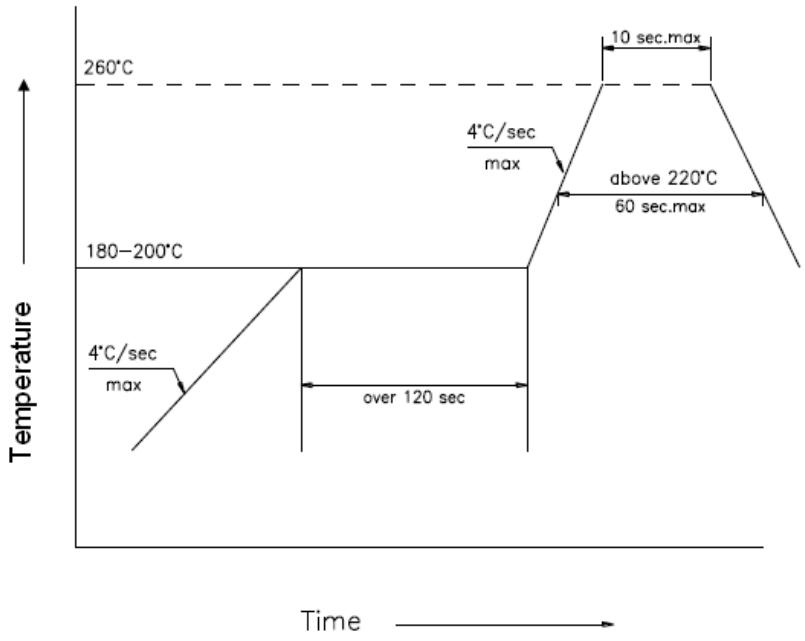


Figure 10 : Reflow soldering profile

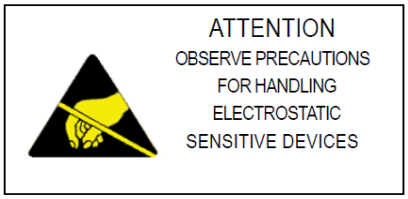
Notes

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

Handling Instructions

PLW7070GA must not be operated in reverse bias. A protection diode is included for ESD protection and will conduct in the reverse direction.

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



Moisture Sensitivity

JEDEC Level	Floor life		Bake (Device)		Bake (Reel)	
	Time	Conditions	Time	Conditions	Time	Conditions
2	1 year	≤+30°C / 60% RH	≥43 hrs	+60°C ±5°C / 5% RH	55 hrs	+55°C

Legal Notice

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:

PLW7070GAN40002 PLW7070GAC50002 PLW7070GAW30003 PLW7070GAW30001