plessey

Stellar

PLWS1000C0 Series

Orion-Mini™ Beam Forming Module

Advanced Product Information

Orion-Mini ™ is the latest addition to the innovative Stellar™ family and offers a 10° beam angle whilst delivering up to 1000lm.

An exceptionally compact replacement for COB modules in directional lighting applications with improved thermal resistance.

A complete LED lighting module, including optics, from a module thickness of just 11mm.

Features

- 11mm depth
- 45mm diameter footprint
- Plessey Stellar ™ optic technology
- 10 Degree FWHM
- Up to 13,000 CBCP
- SELV
- RoHS compliant
- Range of standard colour temperatures

Applications

- Track lighting
- Retail lighting
- Architectural lighting
- Specialist lighting (Museum/Gallery)
- High intensity lighting
- Spot lights
- Directional lighting

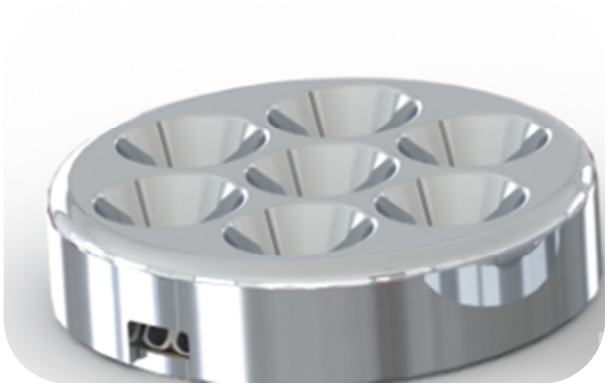


Image 1.1 shows the Orion™ Mini

Advanced Product Information Description

Plessey's Orion™ PLWS1000C0 series LED array module enables new concepts in LED lighting design.

The new addition to the Stellar™ family uses Plessey's optical beam forming technology to make a light module which is simple to integrate into your product whilst helping to solve many key challenges of existing COB type modules. The Orion-Mini™ provides an innovative approach to directional lighting applications opening new opportunities for creativity in industrial and architectural lighting design. The key is Plessey's innovative Stellar™ beam forming optics which with a module at only 15mm in thickness achieves a beam angle of 10° FWHM.

The Orion-Mini™ removes common restraints found in a typical small COB, such as requiring a second optic that can be >50mm in depth with a very wide diameter and difficulty in controlling colour over angle. Plessey's key combination of LED technology and innovative Stellar™ beam forming optics interact to help solve this challenge. The commonly encountered restraints such as size, difficulty in controlling colour over angle and beam angle are significantly improved with the new Orion™. By adding a driver and a lightweight heat sink consumers can experience a new quality of directional light.

One example of an innovative application of the Orion-Mini™ is Plessey's ability to re-create an LED version MR16 downlight or track spot, at less than 55mm in depth including LEDs, optics and a heatsink. Further information can be found in the Orion-Mini™ application notes.

The Orion-Mini™ is available from Plessey in a range of CCT and CRI as outlined in the product family.

Plessey Stellar™ part number system (Tc = 25°C)

Plessey[A] White[B] Technology[C] Output[D] Form Factor[E] FWHM[F] CRI[G] CCT[H]

Example: AA-B-C-DDDD-E-F-G-HHHH becomes: PL-W-S-1000-C-2-8-4000.

A: Plessey
B: Colour: White
C: Technology: Stellar
D: Rated Continuous output (lumens)
E: Form Factor: C=Circular L= Linear
F: Beam angle FWHM 0=10/ 1=15/ 2=25/ 3=50
G: CRI 8=80/ 7=70/ 9=90
H: CCT 3000/4000/5000

Ordering information table (Tc = 25°C) @400mA.

Variant	FWHM $2\Theta_{1/2}$	Description	CRI	CCT	Output (lm) *
PLWS1000C083000	10°	Warm White >80 CRI 3000K	>80	3000K	850
PLWS1000C084000	10°	Neutral White >80 CRI 4000K	>80	4000K	950
PLWS1000C085000	10°	Cool White >80CRI 5000K	>80	5000K	950

- * Luminous flux tolerance of ±7%

Fixed module characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance	R_{thj-Tc}				K/W
Half-Intensity Angle	$2\Theta_{1/2}$		12		Deg.
Forward Voltage	V_F		23		V
Forward Current	I_F		400**	450***	mA
Operating temperature (Tc)	°Tc	-40		90	°C
Storage temperature	°Tstg	-40		70	°C

- ** Suggested maximum for continuous use. Always observe Tc Max.
- *** Electrical maximum unit if pulsed with sufficient cooling.

Angular light distribution

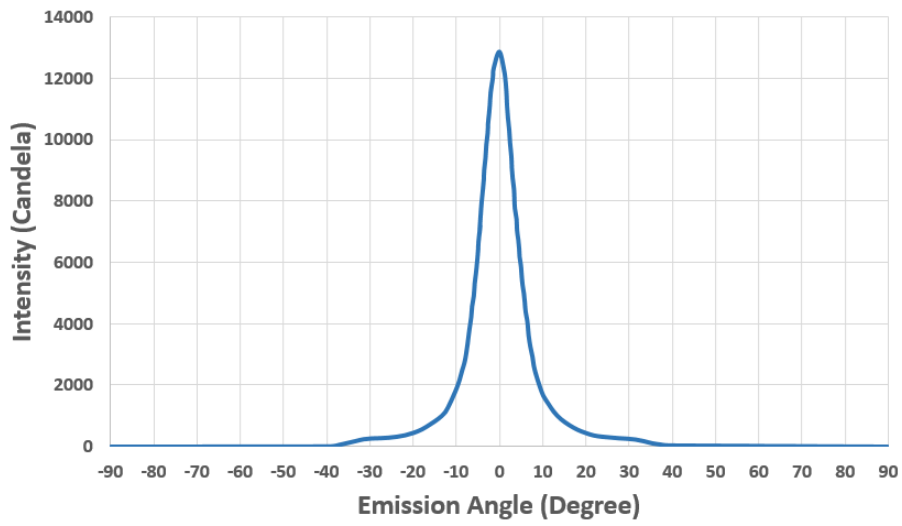


Figure 1: Light intensity versus emission angle (I_F=400mA)

Forward current characteristics

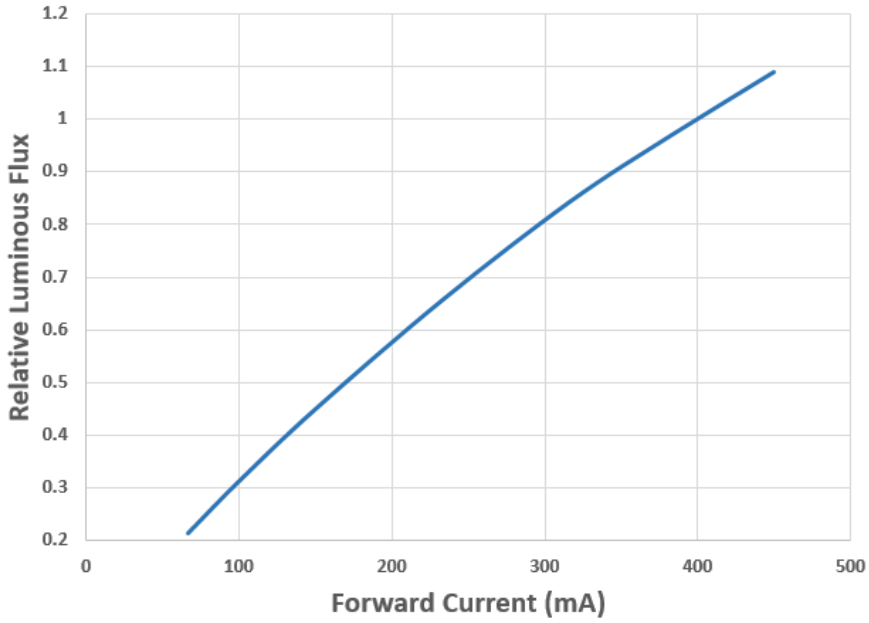


Figure 2: Relative luminous flux as function of forward current (Tc=+25°C)

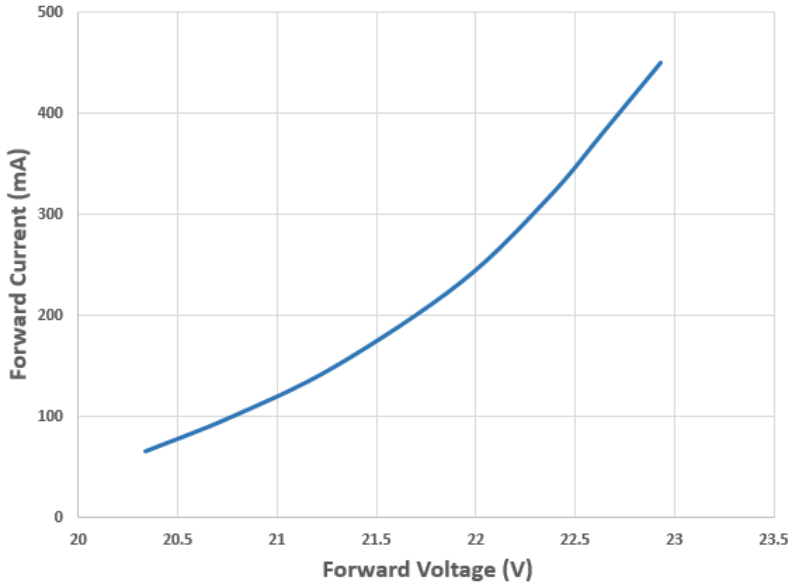


Figure 3: Forward current versus forward voltage (Tc=+25°C)

Temperature characteristics

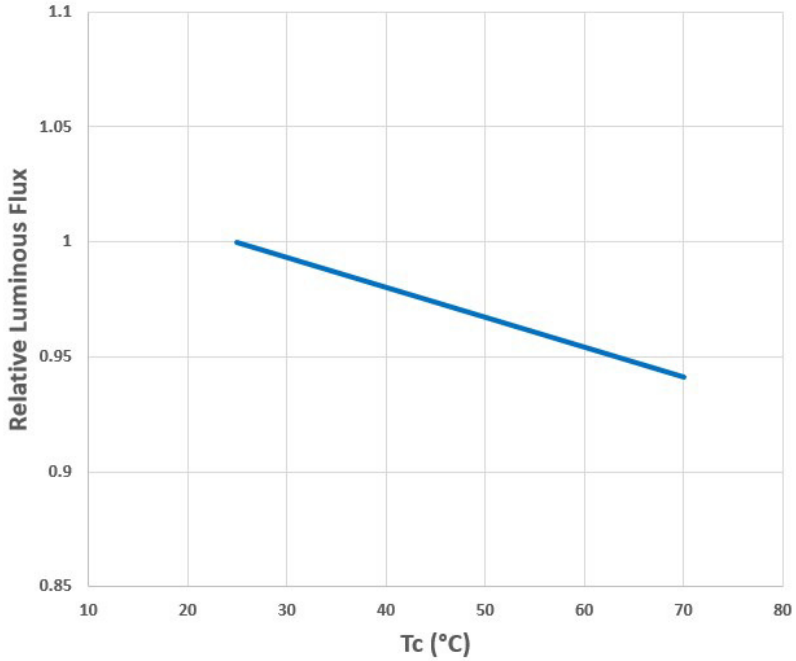
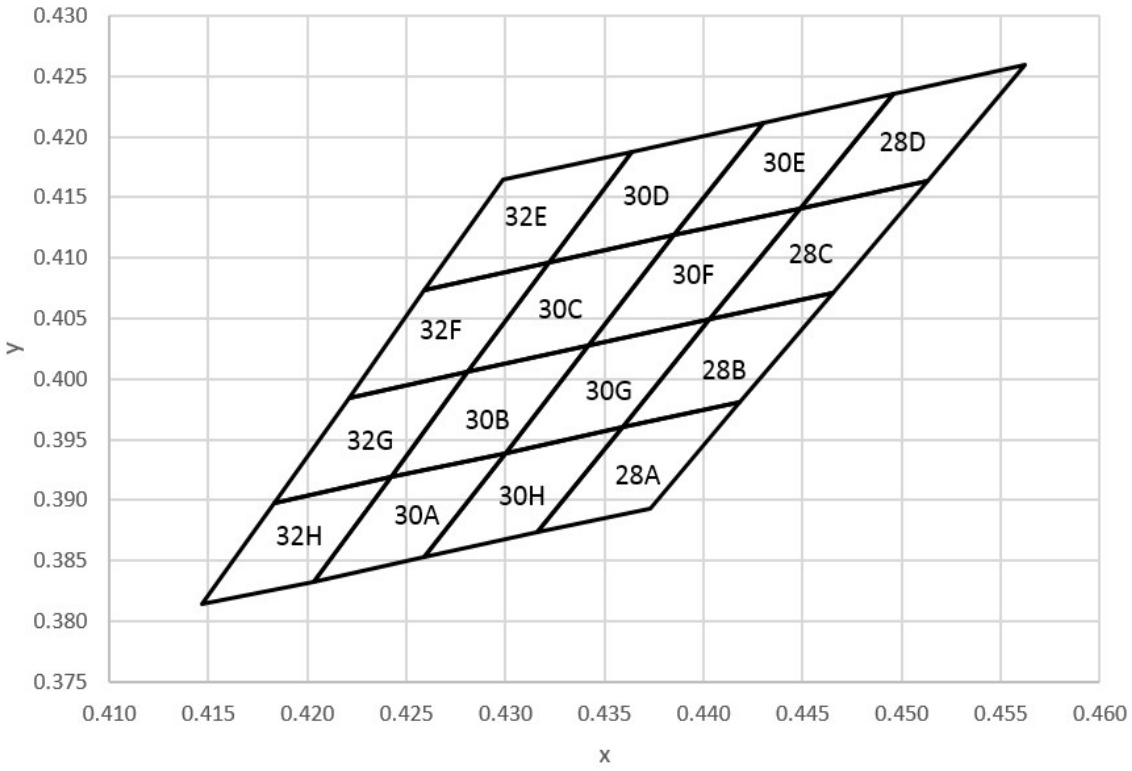


Figure 4: Relative luminous flux as function of temperature Tc (I_F= 400mA)



Colour chromaticity – warm white 3000K (I_F=150mA)

Figure 5: Colour coordinates region 3000K

32E		32F		32G		32H	
x	y	x	y	x	y	x	y
0.4259	0.4073	0.4221	0.3984	0.4183	0.3898	0.4147	0.3814
0.4299	0.4165	0.4259	0.4073	0.4221	0.3984	0.4183	0.3898
0.4364	0.4188	0.4322	0.4096	0.4281	0.4006	0.4242	0.3919
0.4322	0.4096	0.4281	0.4006	0.4242	0.3919	0.4203	0.3833
30A		30B		30C		30D	
x	y	x	y	x	y	x	y
0.4203	0.3833	0.4242	0.3919	0.4281	0.4006	0.4322	0.4096
0.4242	0.3919	0.4281	0.4006	0.4322	0.4096	0.4364	0.4188
0.4300	0.3939	0.4342	0.4028	0.4385	0.4119	0.4430	0.4212
0.4259	0.3853	0.4300	0.3939	0.4342	0.4028	0.4385	0.4119
30E		30F		30G		30H	
x	y	x	y	x	y	x	y
0.4385	0.4119	0.4342	0.4028	0.4300	0.3939	0.4259	0.3853
0.4430	0.4212	0.4385	0.4119	0.4342	0.4028	0.4300	0.3939
0.4496	0.4236	0.4449	0.4141	0.4403	0.4049	0.4359	0.3960
0.4449	0.4141	0.4403	0.4049	0.4359	0.3960	0.4316	0.3873
28A		28B		28C		28D	
x	y	x	y	x	y	x	y
0.4316	0.3873	0.4359	0.3960	0.4403	0.4049	0.4449	0.4141
0.4359	0.3960	0.4403	0.4049	0.4449	0.4141	0.4496	0.4236
0.4418	0.3981	0.4465	0.4071	0.4513	0.4164	0.4562	0.4260
0.4373	0.3893	0.4418	0.3981	0.4465	0.4071	0.4513	0.4164

Table 1: Colour coordinates bin boundaries 3000K
Note: Chromaticity measurement tolerances are maintained to ±0.005

Colour chromaticity – neutral white 4000K (I_F=150mA)

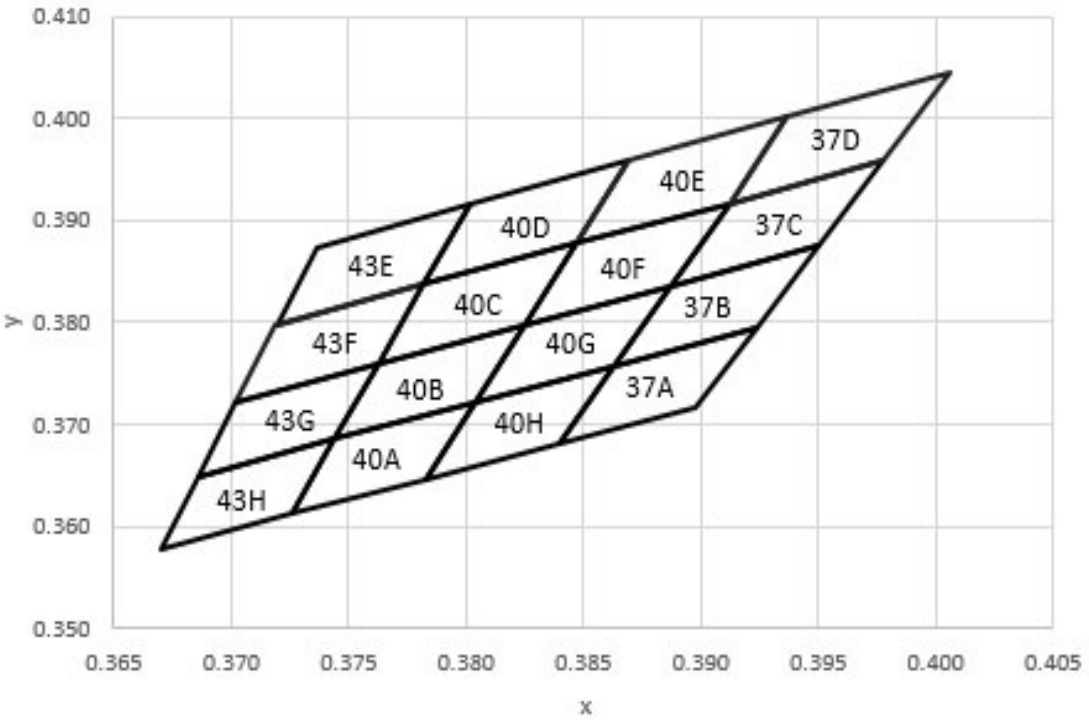


Figure 6: Colour coordinates region 4000K

43E		43F		43G		43H	
x	y	x	y	x	y	x	y
0.3719	0.3797	0.3702	0.3722	0.3686	0.3649	0.367	0.3578
0.3736	0.3874	0.3719	0.3797	0.3702	0.3722	0.3686	0.3649
0.3802	0.3916	0.3782	0.3837	0.3763	0.376	0.3744	0.3685
0.3782	0.3837	0.3763	0.376	0.3744	0.3685	0.3726	0.3612
40A		40B		40C		40D	
x	y	x	y	x	y	x	y
0.3726	0.3612	0.3744	0.3685	0.3763	0.376	0.3782	0.3837
0.3744	0.3685	0.3763	0.376	0.3782	0.3837	0.3802	0.3916
0.3804	0.3721	0.3825	0.3798	0.3847	0.3877	0.3869	0.3958
0.3783	0.3646	0.3804	0.3721	0.3825	0.3798	0.3847	0.3877
40E		40F		40G		40H	
x	y	x	y	x	y	x	y
0.3847	0.3877	0.3825	0.3798	0.3804	0.3721	0.3783	0.3646
0.3869	0.3958	0.3847	0.3877	0.3825	0.3798	0.3804	0.3721
0.3937	0.4001	0.3912	0.3917	0.3887	0.3836	0.3863	0.3758
0.3912	0.3917	0.3887	0.3836	0.3863	0.3758	0.384	0.3681
37A		37B		37C		37D	
x	y	x	y	x	y	x	y
0.384	0.3681	0.3863	0.3758	0.3887	0.3836	0.3912	0.3917
0.3863	0.3758	0.3887	0.3836	0.3912	0.3917	0.3937	0.4001
0.3924	0.3794	0.395	0.3875	0.3978	0.3958	0.4006	0.4044
0.3898	0.3716	0.3924	0.3794	0.395	0.3875	0.3978	0.3958

Table 2: Colour coordinates bin boundaries 4000K (I_F=450mA) Note: Chromaticity measurement tolerances are maintained to ±0.005

Colour chromaticity – cool white 5000K (I_F=150mA)

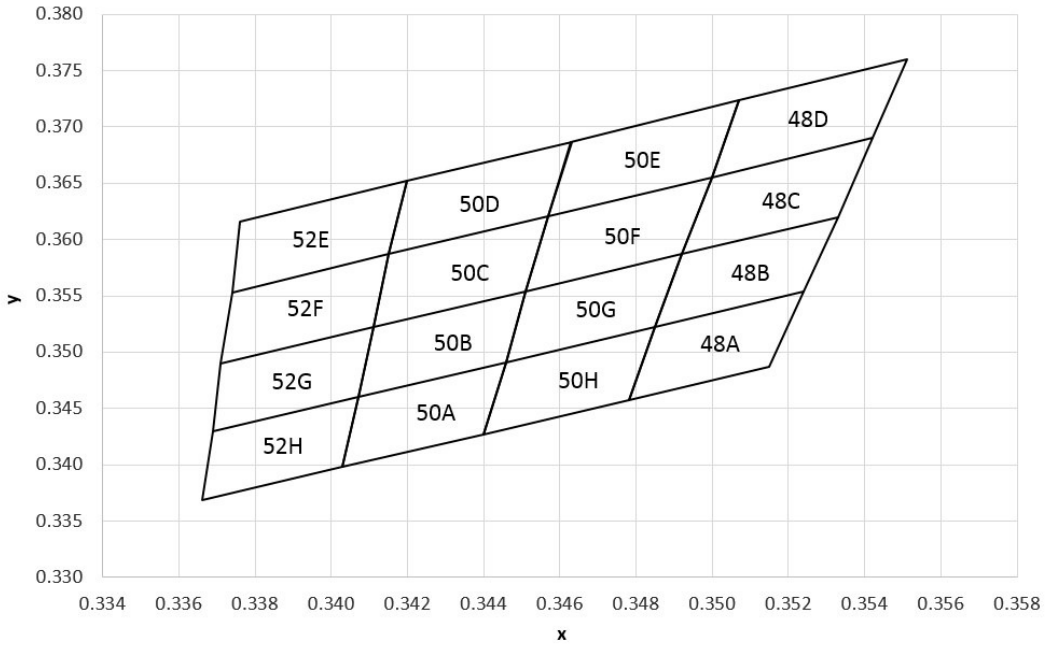


Figure 7: Colour coordinates region 5000K

52E		52F		52G		52H	
x	y	x	y	x	y	x	y
0.3374	0.3553	0.3371	0.3490	0.3369	0.3430	0.3366	0.3369
0.3376	0.3616	0.3374	0.3553	0.3371	0.3490	0.3369	0.3430
0.3420	0.3652	0.3415	0.3587	0.3411	0.3522	0.3407	0.3460
0.3415	0.3587	0.3411	0.3522	0.3407	0.3460	0.3403	0.3398
50A		50B		50C		50D	
x	y	x	y	x	y	x	y
0.3403	0.3398	0.3407	0.3460	0.3411	0.3522	0.3415	0.3587
0.3407	0.3460	0.3411	0.3522	0.3415	0.3587	0.3420	0.3652
0.3446	0.3491	0.3451	0.3554	0.3457	0.3621	0.3463	0.3687
0.3440	0.3427	0.3446	0.3491	0.3451	0.3554	0.3457	0.3621
50E		50F		50G		50H	
x	y	x	y	x	y	x	y
0.3457	0.3621	0.3451	0.3554	0.3446	0.3491	0.3440	0.3427
0.3463	0.3687	0.3457	0.3621	0.3451	0.3554	0.3446	0.3491
0.3507	0.3724	0.3500	0.3655	0.3492	0.3587	0.3485	0.3522
0.3500	0.3655	0.3492	0.3587	0.3485	0.3522	0.3478	0.3457
48A		48B		48C		48D	
x	y	x	y	x	y	x	y
0.3478	0.3457	0.3485	0.3522	0.3492	0.3587	0.3500	0.3655
0.3485	0.3522	0.3492	0.3587	0.3500	0.3655	0.3507	0.3724
0.3524	0.3554	0.3533	0.3620	0.3542	0.3690	0.3551	0.3760
0.3515	0.3487	0.3524	0.3554	0.3533	0.3620	0.3542	0.3690

Table 3: Colour coordinates bin boundaries 5000K

Note: Chromaticity measurement tolerances are maintained to ±0.005

Outline package drawing

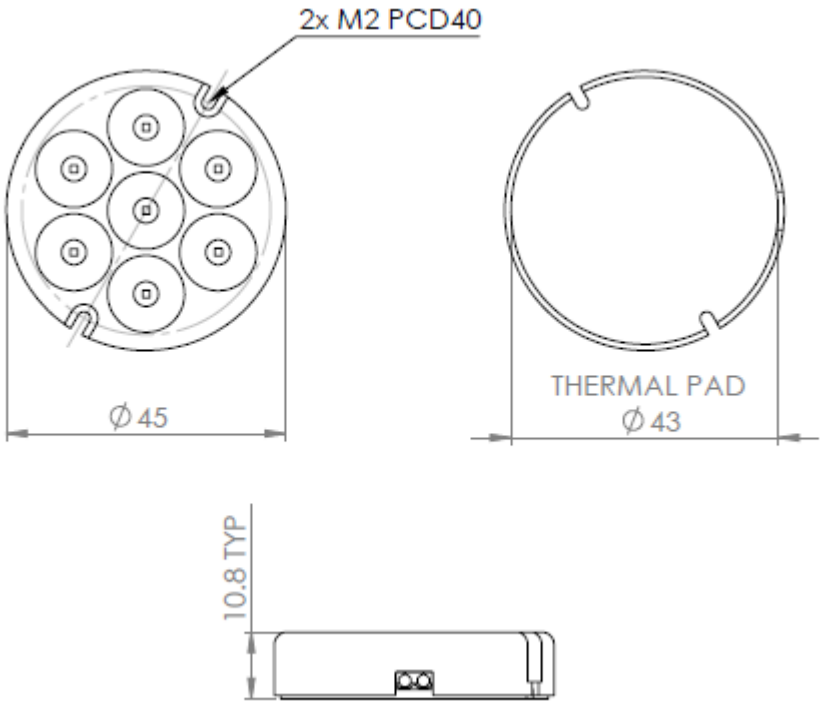
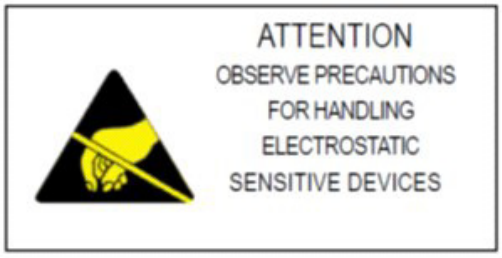


Figure 8: Package outline drawing of the Orion-Mini™.

Handling instructions

The Orion-Mini™ must not be operated in reverse bias. Precautions are required to prevent reverse bias in applications and during handling. The ESD protection for the Orion™ is 2 kV.



Connector

Wires are not included in the Orion-Mini™ module.

Connection technology	Wire
Conductor Size	**Solid 0.14 – 0.34mm**
AWG	**26-22 "sol"**

Measuring Case Temperature

The case temperature should be lower than 90°C while the LED module is operating. Case temperature (Tc) is the temperature at the center point on the module plate as seen below. Tc should be measured with a thermocouple.

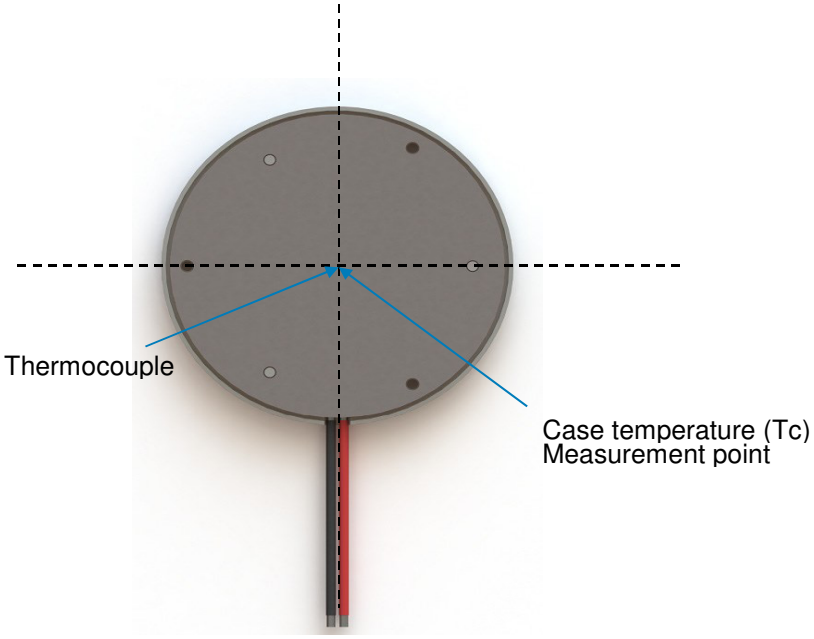


Figure 9: Measuring the Tc in the Orion™ Product Range

Packaging and shipping information

Packaging information is to be confirmed. Due to its slim line size and reduced thermal resistance, customers and consumers will see a vast reduction in packaging, shipping costs and storage space.

Plessey

Plessey is a leading expert in the manufacturing of semiconductor products used in sensing, measurement and controls applications, and is now at the forefront of the Solid State Lighting revolution. It's MaGIC™ (Manufactured on GaN – on – Si I/C) LED technology has won numerous awards for its innovation and ability to cut the cost of LED lighting by using standard silicon manufacturing techniques. By using its understanding of electronics and expertise in micro- electronic product design and manufacture, Plessey is radically enhancing the human experience with micro-electronics solutions such that people achieve more than they thought possible.

Legal Notice

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