

# Cree XLamp® 20 & 26.5mm XR Range



## Carclo Technical Plastics

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# CREE XR<sup>®</sup>, XR-E<sup>®</sup> & XR-C<sup>®</sup> 20mm range

Part No.	Description	White XR			Red/Amber XR			Cyan/Green XR			White XR-E			White XR-C		
		FWHM#	EFF	Cd/lm	FWHM#	EFF	Cd/lm	FWHM#	EFF	Cd/lm	FWHM#	EFF	Cd/lm	FWHM#	EFF	Cd/lm
10199	Plain Tight	13	87%	6.7	13	91%	19	10	90%	15.9	8.4	91%	31	5.3	89%	49
10200	Frosted Narrow	16	87%	5.6	14	91%	15	13	90%	9.0	10	90%	17	9.6	86%	19
10210	Ripple Medium	25	89%	3.0	16	90%	7.7	18	91%	5	16	88%	6.9	12	87%	9.5
10201	Frosted Medium	23	87%	2.8	21	89%	5.3	22	89%	3.26	20	89%	4.2	18	84%	4.4
10211	Ripple Wide	47.9	84%	1.4	24	86%	2.5	41	84%	2.1	44	86%	1.8	42	86%	1.6
10202	Frosted Wide	35.6	81%	1.8	36.2	88%	1.6	36	89%	1.5	36	84%	2	39	81%	1.97
10203	Elliptical	46 X 9	85%	5.8	37 x 14	90%	4.7	47 x 12	89%	3.44	41 x 10	90%	5.1	41 x 8.4	84%	7.1
10204	Elliptical Orthogonal*	8.8X45.6	85%	6.2	14 x 37	90%	4.7	13 x 48	89%	31	10 x 41	90%	5.1	8.4 x 41	84%	7.1
10357	Fibre	Optimised for coupling into 0.5NA fibre bundles of 8 - 12mm diameter In development														

\*Orthogonal is the elliptical beam turned through 90deg.

#Full Width Half Maximum i.e. total viewing angle



Part No.	Colour	Description	Part No.	Colour	Description
10205	Black	Round Holder	10425	Black	Star Board feet
10206	Clear	Round Holder	10426	Clear	Star Board feet
10207	White	Round Holder	10427	White	Star Board feet
10276	White	50mm Triple holder long leg	10428	Black	Star Board no feet
10286	White	50 mm Triple holder short leg	10429	Clear	Star Board no feet
10296	Black	50 mm Triple holder Long leg	10430	White	Star Board no feet
10306	Black	50 mm Triple holder short leg			

# CREE XR<sup>®</sup>, XR-E<sup>®</sup> & XR-C<sup>®</sup> 26.5mm range

Part no.	Description	White XR			Red/Amber XR			Cyan/Green XR			White XR-E			White XR-C		
		FWHM	EFF	Cd/l	FWHM	EFF	Cd/l	FWHM	EFF	Cd/l	FWHM	EFF	Cd/l	FWHM	EFF	Cd/l
10048	Plain tight	10.2	88.5%	13.75	11.4	90.5%	18.5	7.6	88.9%	25.2	5.65	88.3%	42.2	5.4	88.5%	52.3
10124	frosted narrow	15	85.4%	7.9	14.8	86.4%	9.9	12.4	86.6%	11.4	11.3	84.9%	14.5	10.6	85.4%	20.4
10108	Frosted medium	25.8	84.2%	3.1	22.5	87.7%	4	23.3	85.5%	3.3	22.15	84.3%	3.8	20.9	84.8%	4.21
10260	Frosted Wide	32.5	84.1%	2.2	36.25	86%	2.1	35.4	83.2%	2	35.1	81.8%	2.1	35.2	82.2%	2.21
10049	Elliptical	44.5*14.6	85.5%	3.7	41.3*12.8	86.1%	4.9	45.3*11.7	87.5%	4.3	43.7*9	87.3%	6	43.5*7.7	86.5%	7.37
10224	Elliptical Orthogonal	13.7*46	85.9%	3.7	13.5*47	88.2%	3.9	11.4*47.9	85%	4.1	9*48	85%	5.1	9.3*48	84.6%	5.4
10234	Elliptical Ramp Optic	44.6*13.8	86.3%	3.8	44.5*13.4	88.3%	4.5	45.8*11.5	86.9%	4.2	46*8.8	87%	5.5	45.7*9.1	86.7	6.2

\*Orthogonal is the elliptical beam turned through 90deg.

#Full Width Half Maximum i.e. total viewing angle



Part No.	Colour	Description
10445	White	4.3mm legs
10455	White	2.0mm legs
10465	White	0.8mm legs
10475	Black	4.3mm legs
10485	Black	2.0mm legs
10495	Black	0.8mm legs

# Cree XLamp<sup>®</sup> 20 & 26.5mm MC Range



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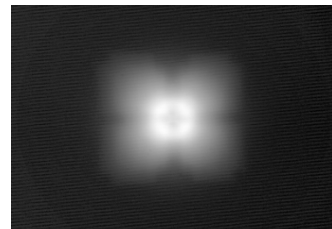
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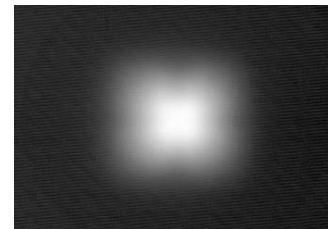
# CREE XLamp® MC-E LED 20mm range

Part no.	Description	Cree MC-E		
		FWHM	EFF	Cd/l
10193	Plain tight	20	84.5	5.8
10194	Frosted Narrow	24	83	4.5
10208	Rippled Medium	29	82.5	3.3
10195	Frosted medium	27.5	78	2.6
10209	Ripple Wide	36.5	80	1.9
10196	Frosted Wide	45	70	1.4
10197	Elliptical	44 X 23	81	2.3
10198	Elliptical Orthogonal	22 X 44	80	2.5
10356	Fibre			

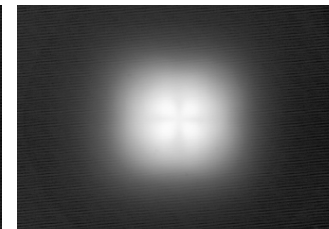
Part No.	Colour	Description
10512	Black	Round MC-E Holder
10513	White	Round MC-E Holder
10514	Clear	Round MC-E Holder
10276	White	50mm Triple holder long leg
10286	White	50 mm Triple holder short leg
10296	Black	50 mm Triple holder Long leg
10306	Black	50 mm Triple holder short leg
10425	Black	Star board with feet
10426	Clear	Star board with feet
10427	White	Star board with feet
10428	Black	Star board with no feet
10429	Clear	Star board with no feet
10430	White	Star board with no feet



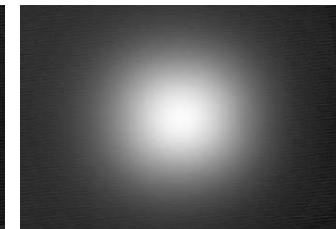
Tight plain fronted optic  
10193 "the four chips are projected"



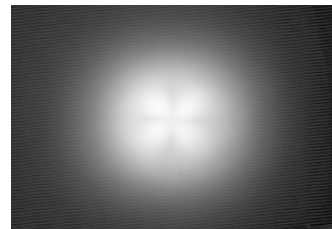
Narrow frosted optic  
10194



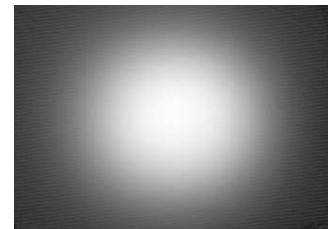
Medium rippled optic  
10208



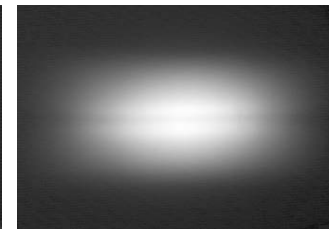
Medium frosted optic  
10195



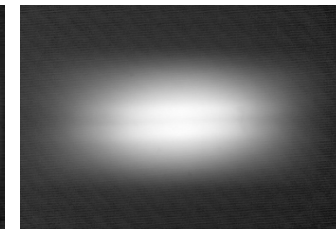
Wide rippled optic  
10209



Wide frosted optic  
10196



Elliptical 10197  
"Note the dark line caused by the gap in the chips"



Elliptical orthogonal  
10198  
"Note the dark line caused by the gap in the chips"



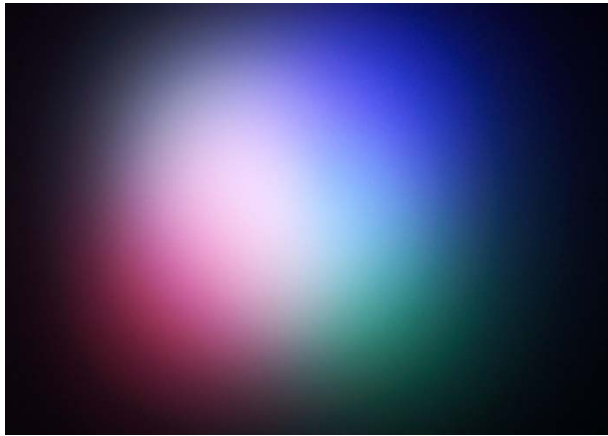
# CREE XLamp<sup>®</sup> MC-E RGBW LED 26.5mm range

Part No.	Description	White		
		FWHM#	EFF	Cd/lm
10391	Plain Tight			
10392	Frosted Narrow	19.43* 18.18	84.4%	9.3
10393	Medium Frosted	25.77* 25.13	81.4%	5.4
10394	Frosted Wide	34.83* 34.04	83.9%	3.4
10395	Elliptical			
10396	Elliptical Orthogonal*			

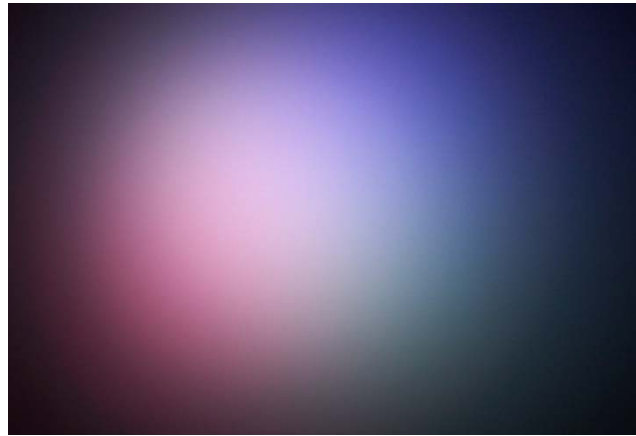
\*Orthogonal is the elliptical beam turned through 90deg.

#Full Width Half Maximum i.e. total viewing angle

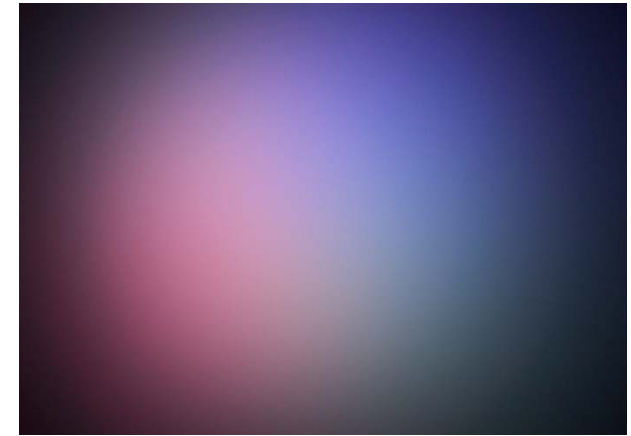
Part No.	Colour	Description
10446	White	4.3mm leg
10456	White	2.0mm leg
10466	White	0.8mm leg
10476	Black	4.3mm leg
10486	Black	2.0mm leg
10496	Black	0.8mm leg



10392



10393

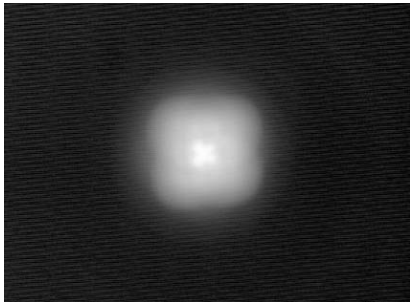


10394

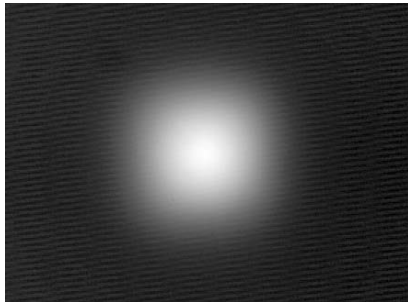
# 26.5mm OPTIC

MANUFACTURER	TYPE	CARCLO OPTIC		Eff	FWHM	Cd/lm
		Part No.	TYPE	%	Deg	
Cree	MC-E 	10391	Plain Tight	83.9	15.2	10.4
		10392	Narrow Frosted	81.3	18.7	6.6
		10393	Medium Frosted	77.8	26.1	3.2
		10394	Wide Frosted	83.5%	35	2.2

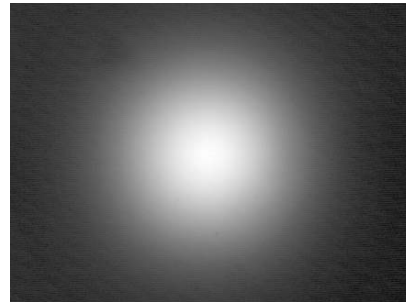
WHITE HOLDERS			BLACK HOLDERS		
4.3 PEG Not stocked	2.0 PEG Not stocked	0.8 PEG Not stocked	4.3 PEG Not Stocked	2.0 PEG Not stocked	0.8 PEG Stocked
10446	10456	10466	10476	10486	10496



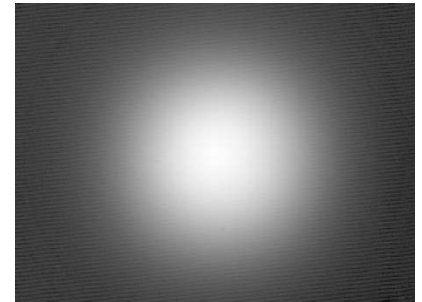
10391



10392



10393

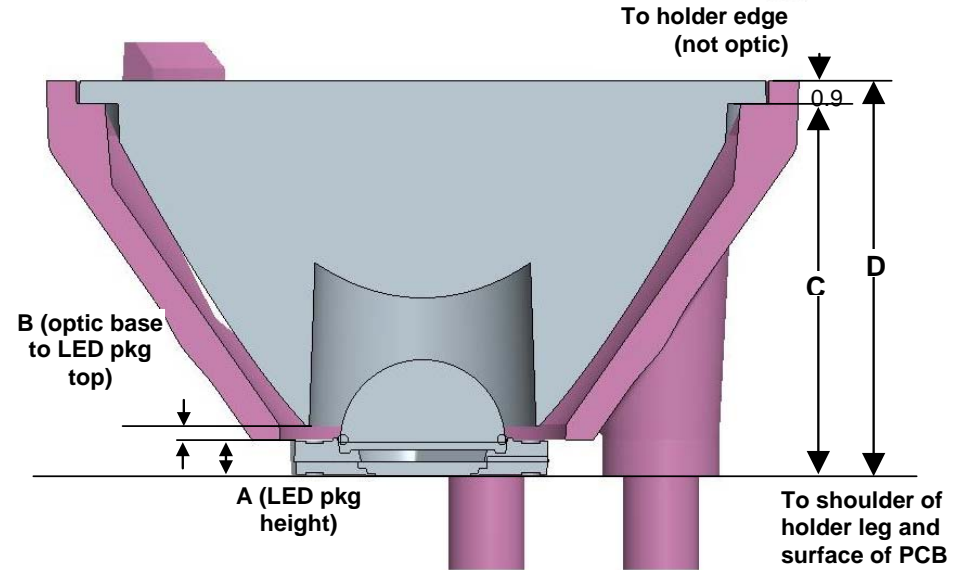
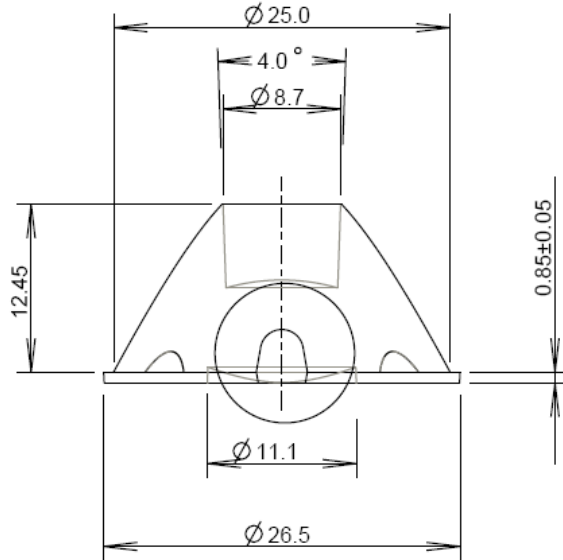


10394



# 26.5mm Holder details

Part No.	TYPE
10391	Plain Tight
10392	Narrow Frosted
10393	Medium Frosted
10394	Wide Frosted
10395	Elliptical
10396	Elliptical Ortho

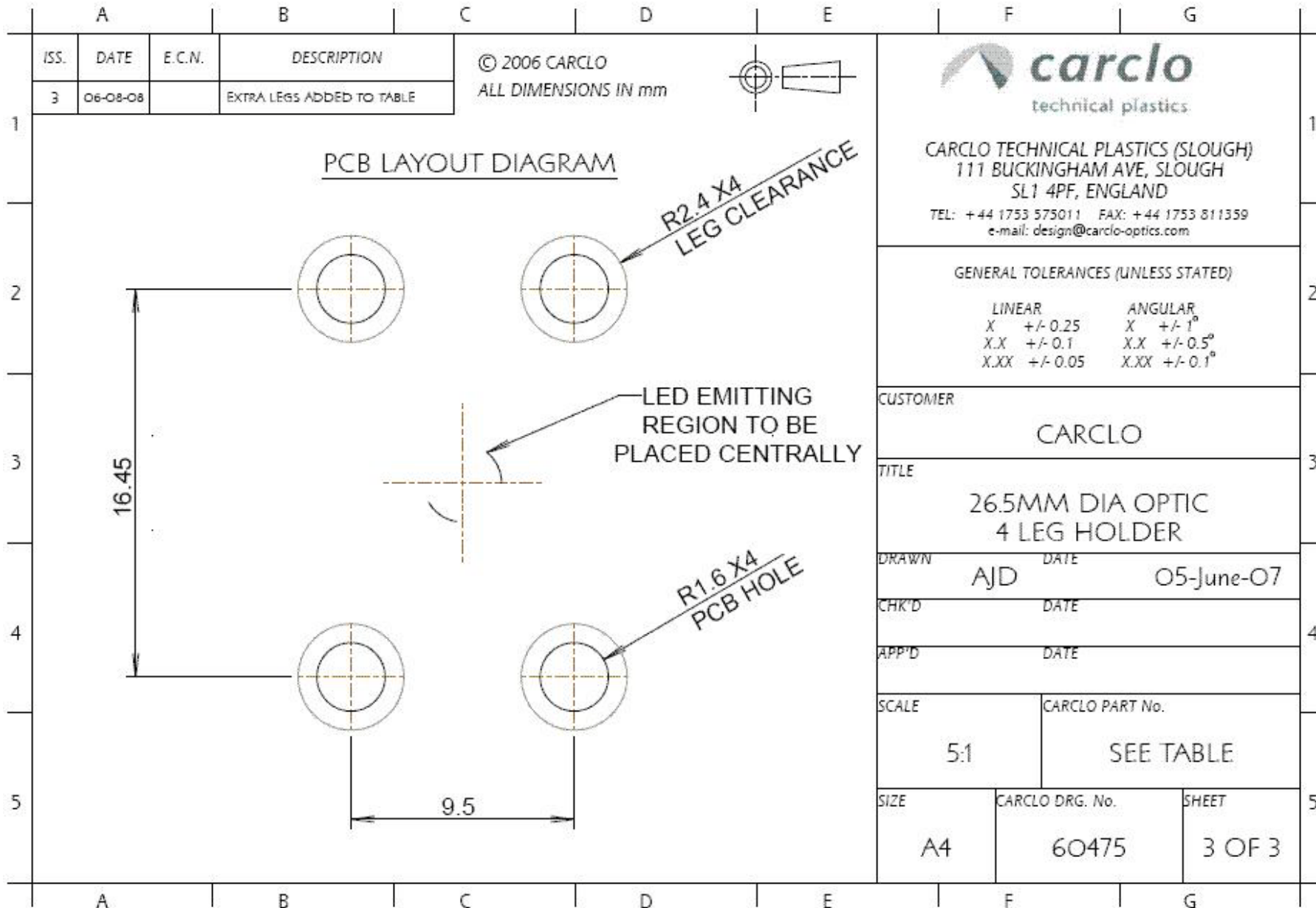


**Notes:**

1. CARCLO multi-chip holder compatible with LED package mounted on 19.9mm (across flats) star board, otherwise drill holes on PCB for location pegs on legs. Refer to Drawing 60475 for hole separation
2. The multichip holder leg height includes an extra 1.0mm for the AcuLED since only a 13mm (across flats) star board is available. The CARCLO holder reaches over the AcuLED star board so that the holder sits directly on the PCB (and not the star board).



# 26.5mm holder location holes



# Cree XLamp<sup>®</sup> 10, 20 & 26.5mm XP Range



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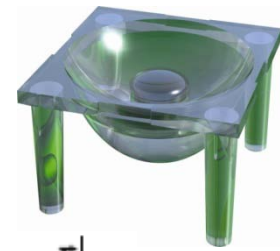
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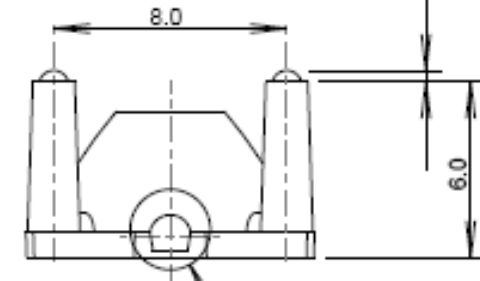
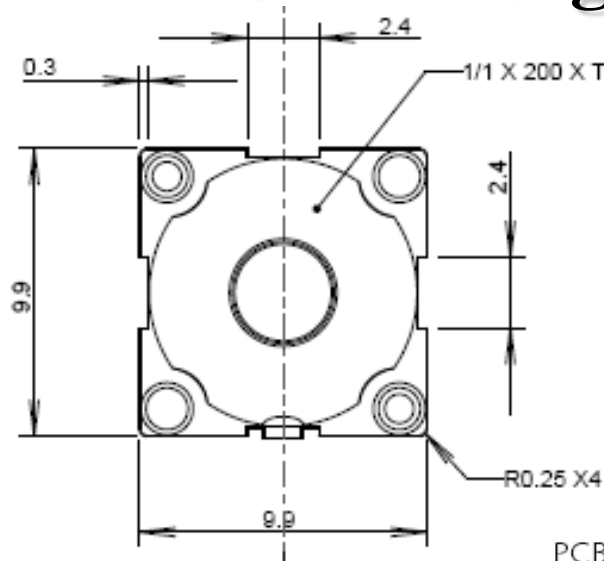
05 March 2010



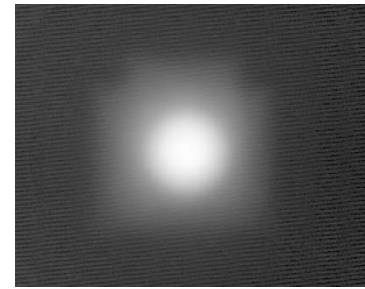
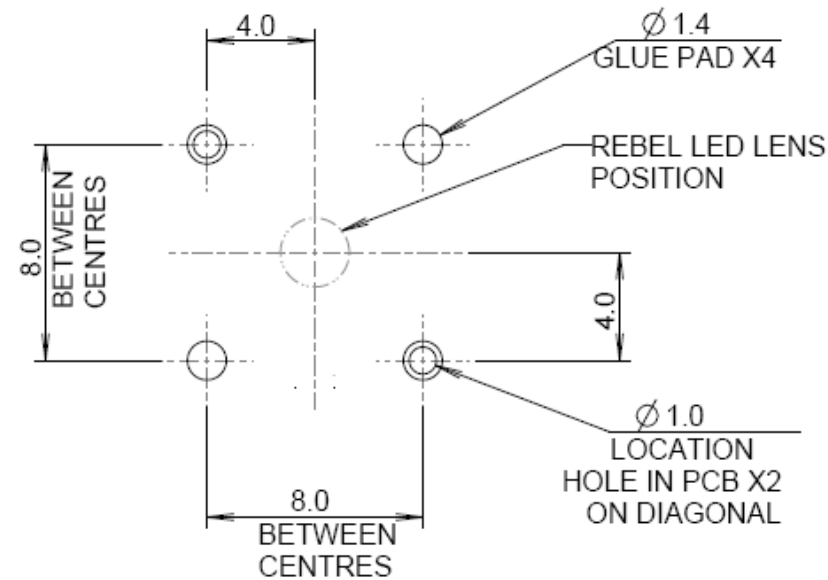
# Cree® XP 10mm range



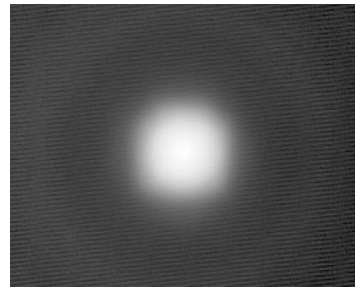
Part No.	Description	White		
		FWHM*	EFF	Cd/lm
10412	Plain medium Flat front	16.5	91.8%	9.3
10417	Plain medium Lens front	16.4	88.7%	9.8
10413	Frosted medium	25.9	87.2%	3.2
10414	Frosted Wide	36.7	80%	1.66
10415	Elliptical	43 X 16	88.1%	3.5



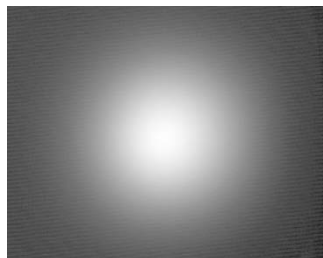
PCB GLUE PAD AND ALIGNMENT HOLE LAYOUT DIMENSIONS



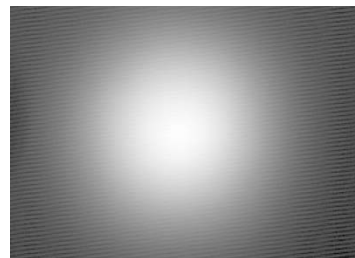
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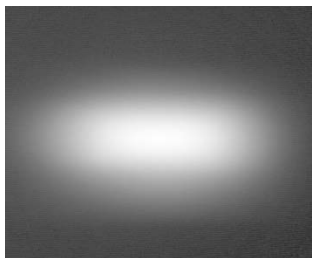
10417



10413



10414

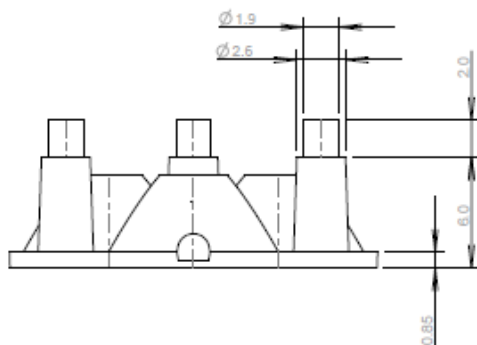
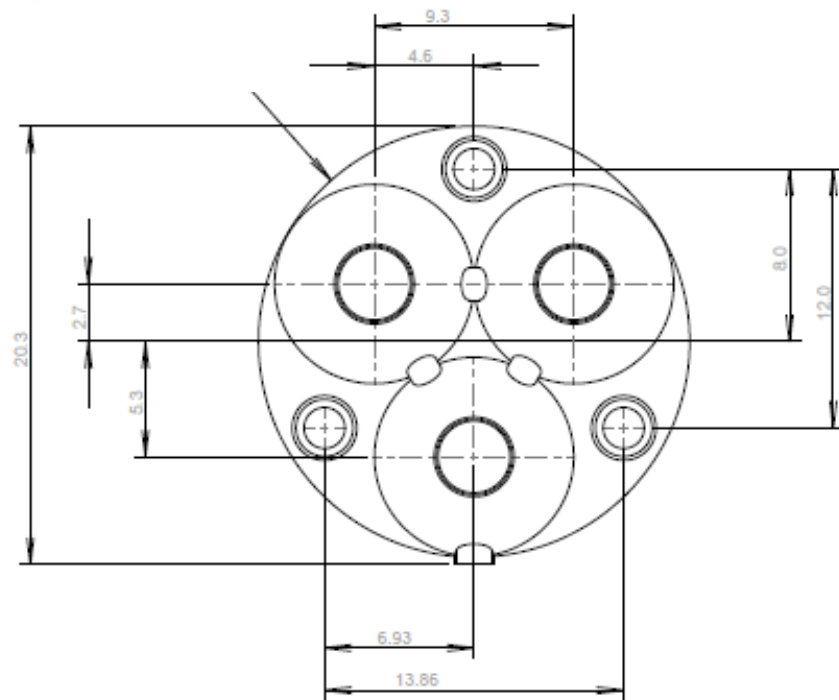
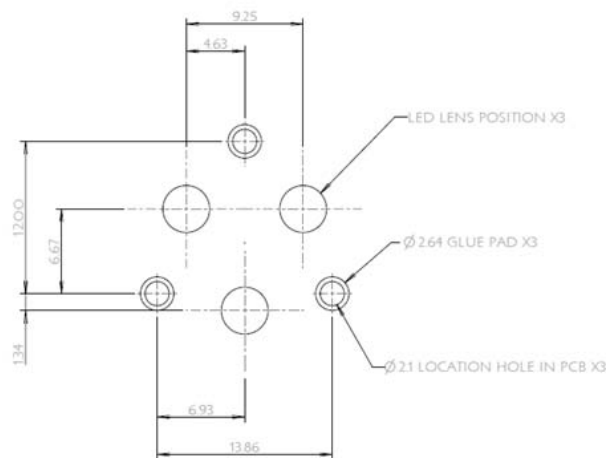


10415

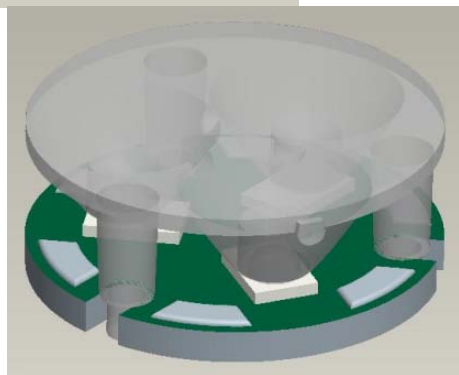
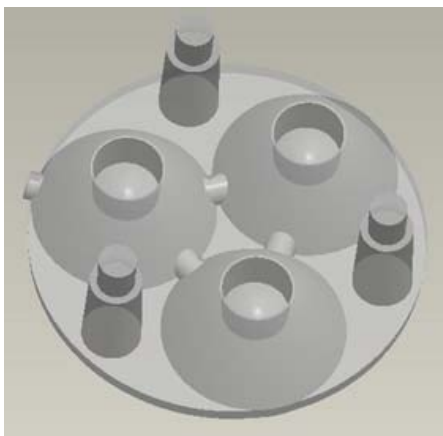
# Cree® XP 10mm Triple Optic

Part No.	Description	White		
		FWHM*	EFF	Cd/lm
10507	Narrow lens front	16.4	88.7%	9.8
10508	Medium Frosted	25.9	87.2%	3.2
10509	Wide Frosted	36.7	80%	1.66
10510	Elliptical	43 * 16	88.1%	3.5
10511	Narrow Frosted			

PCB HOLE & GLUE PAD LOCATION



#Full Width Half Maximum i.e. total viewing angle

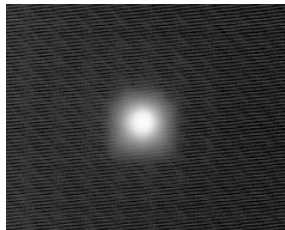


# Cree® XP 20mm range

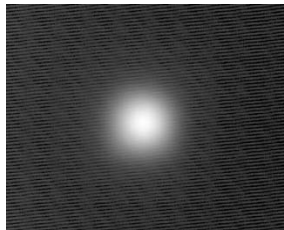
Part No. Optics on their own	Description	White		
		FWHM	EFF	Cd/Im
10193	Plain Tight	8.2	87.3%	36.3
10194	Frosted Narrow	10.35	86.9%	20.75
10208	Ripple Medium	19.5	86.9%	7.16
10195	Frosted Medium	17.9	82.9%	5.95
10209	Ripple Wide	20.5	81.7%	3.4
10196	Frosted Wide	31.5	78.1%	2.46
10170	Wide Angle Reflector	72	92.2%	0.82
10197	Elliptical	47 X 8	86%	6.5
10198	Elliptical Orthogonal	8 X 47	85.6%	6.6
10356	Fibre	Optimised for coupling into 0.5NA fibre bundles of 8 - 12mm diameter		

\*Orthogonal is the elliptical beam turned through 90deg.  
#Full Width Half Maximum i.e. total viewing angle

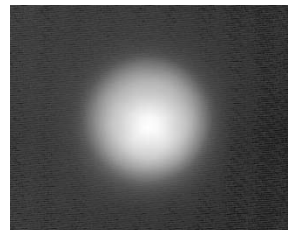
Part No.	Colour	Description
10566	Black	Round Holder (Stocked)
10567	White	Round Holder (Not Stocked)
10568	Clear	Round Holder (Not Stocked)
10750	Black	Hex holder for 3.5mm Square LEDs
10751	Clear	Hex holder for 3.5mm Square LEDs
10752	White	Hex holder for 3.5mm Square LEDs
10572	Black	Hex holder (Stocked)
10573	Clear	Hex holder (Not Stocked)
10574	White	Hex holder (Not Stocked)
10279	White	50mm Triple holder long leg (Not Stocked)
10289	White	50 mm Triple holder short leg (Stocked)
10299	Black	50 mm Triple holder Long leg (Not Stocked)
10309	Black	50 mm Triple holder short leg (Not Stocked)



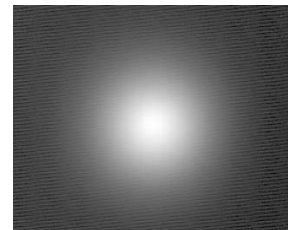
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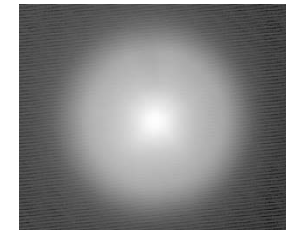
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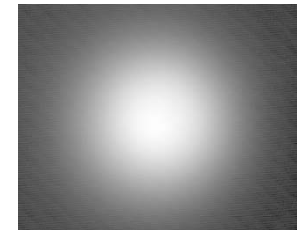
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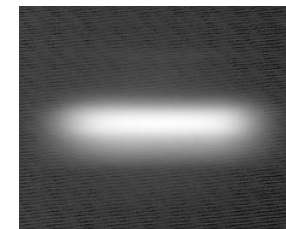
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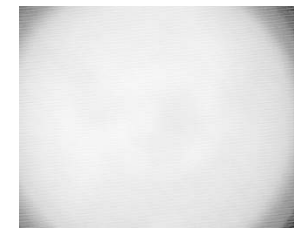
10209



10196



10197 & 10198



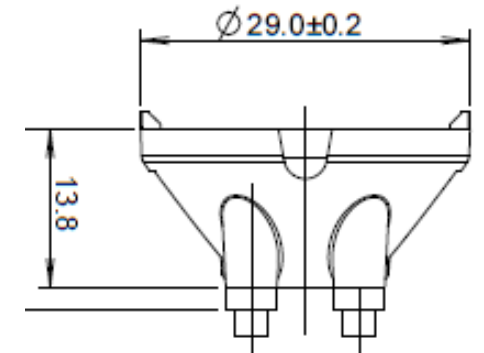
10170

# CREE XP-E LED 26.5mm range

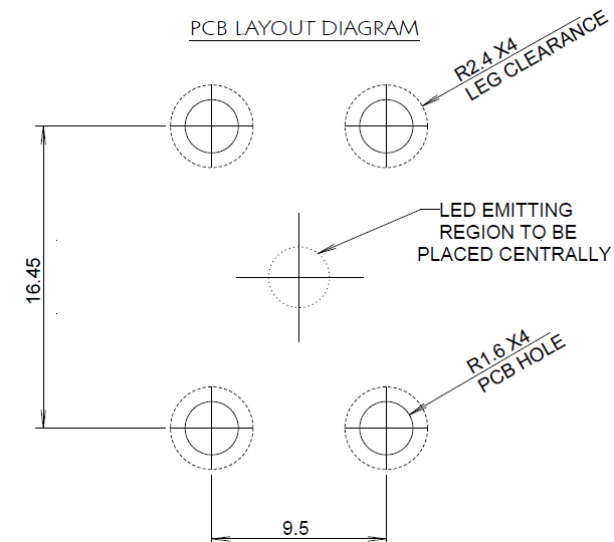
Part No. Optics on their own	Description	White		
		FWHM	EFF	Cd/lm
10048	Plain tight	6.1	86.9%	46.43
10124	frosted narrow	9.6	83.1%	19.9
10108	Frosted medium	20.3	80.2%	4.37
10260	Frosted Wide	32.2	79.3%	2.28
10049	Elliptical	43.8*6.3	82.9%	8.33
10224	Elliptical Orthogonal	6.8*47.8	83.3%	6.62
10234	Elliptical Ramp Optic	44.9*6	82.4%	7.76



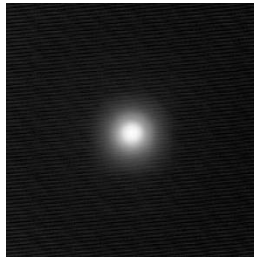
Part No.	Colour	Description
10442	White	4.3mm foot (not Stocked)
10452	White	2.0mm foot (Not Stocked)
10462	White	0.8mm foot (Stocked)
10472	Black	4.3mm foot (Not Stocked)
10482	Black	2.0mm foot (Not Stocked)
10492	Black	0.8mm foot (Not Stocked)



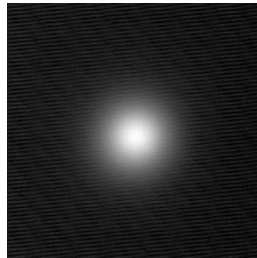
PCB LAYOUT DIAGRAM



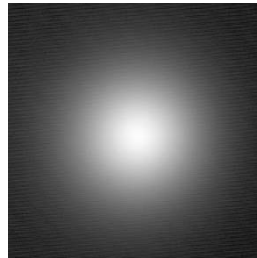
\*Orthogonal is the elliptical beam turned through 90deg.  
# Full Width Half Maximum i.e. total viewing angle



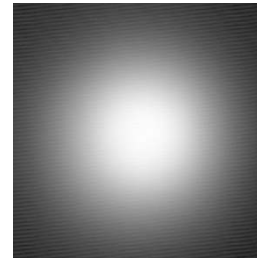
10048



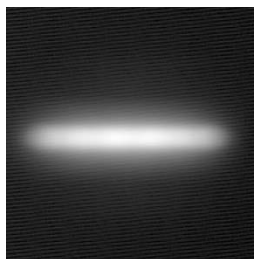
10124



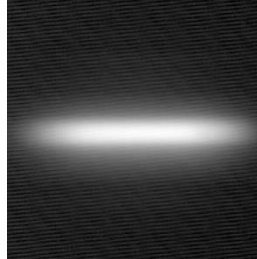
10108



10260



10049 & 10224

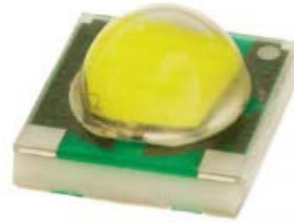


10234

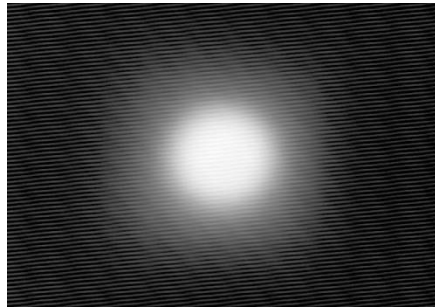


# CREE XP-G 10mm range

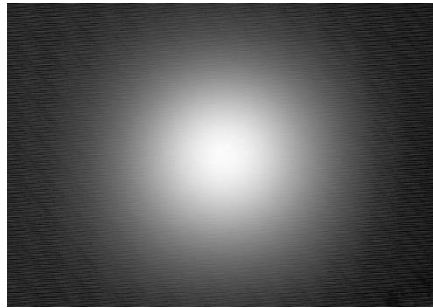
No.	Description	FWHM#	EFF	Cd/lm
10412	Plain medium	24	91.0%	4.6
10413	Frosted medium	30	84.7%	2.7
10414	Frosted wide	40	78.3%	1.5
10415	Elliptical	43.60*23.33	86.5%	2.6
10417	Narrow	24	87.3%	4.9



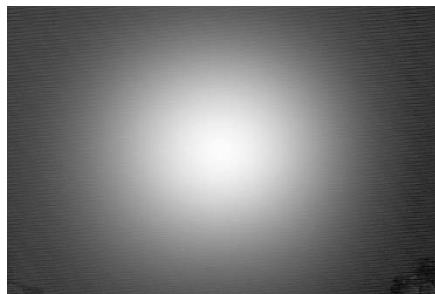
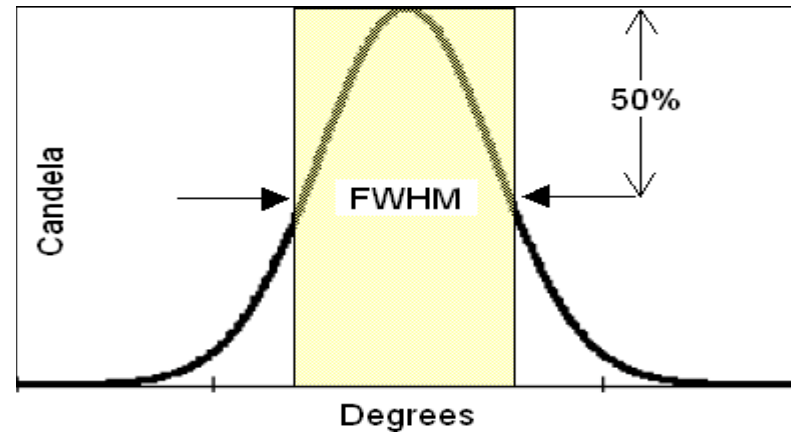
#Full Width Half Maximum i.e. total viewing angle  
 N.B. Holders are not required for these optics as they have their own legs.



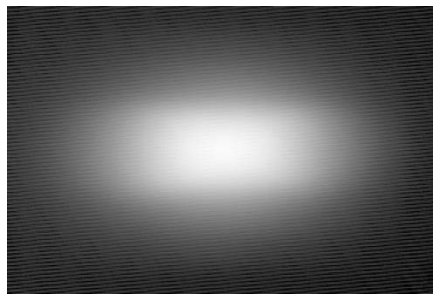
10412



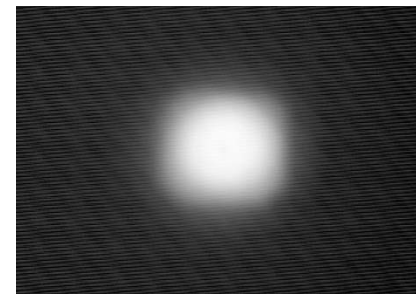
10413



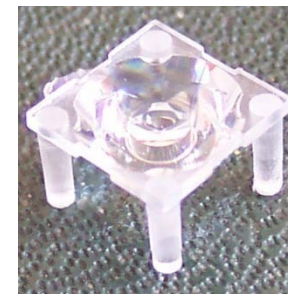
10414



10415



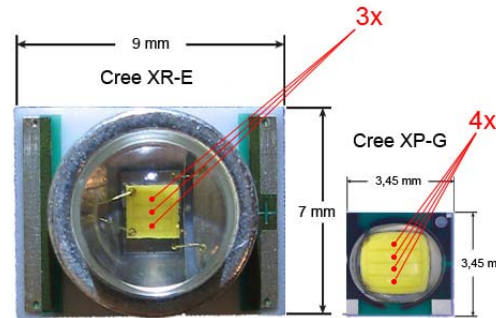
10417





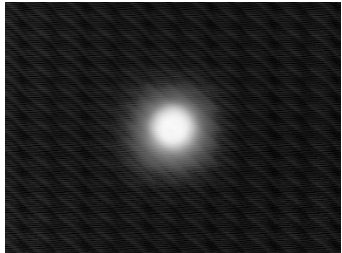
# CREE XP-G 20mm range

Part No.	Description	White		
		FWHM#	EFF	Cd/lm
10003	Plain Tight	12.4	87.9%	16.7
10138	Frosted Narrow	14.3	86.4%	11.4
10003/15	Ripple Medium	28.8	85.7%	4.3
10139	Medium Frosted	21.2	82.1%	5.0
10003/25	Ripple Wide	41.6	82.9%	2.1
10140 [R2]	Wide Frosted	31.1	79.1%	2.6
10003/L25	Elliptical	44.10*11.87	84.7%	5.3
10192	Elliptical Orthogonal*	47.07*12.64	85.5%	4.5
10170	Wide angle Reflector	69.4	87.9%	1.1

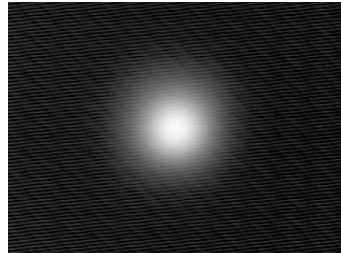


Part No.	Colour	Description
10634	White	4.3mm leg
10654	White	2.0mm leg
10674	White	0.8mm leg
10694	Black	4.3mm leg
10714	Black	2.0mm leg
10734	Black	0.8mm leg

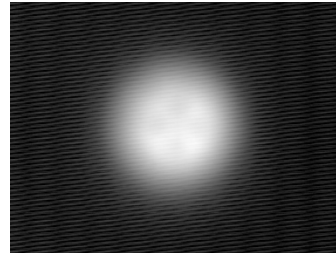
\*Orthogonal is the elliptical beam turned through 90deg.  
 # Full Width Half Maximum i.e. total viewing angle



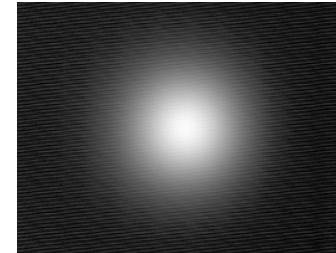
10003



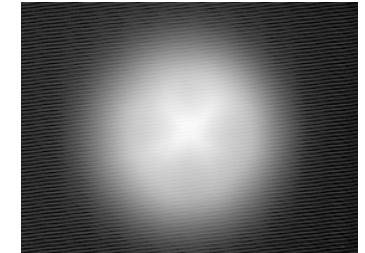
10138



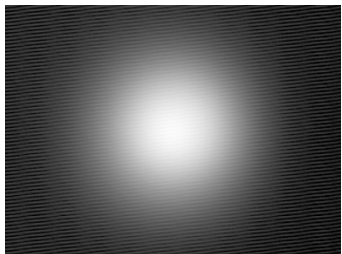
10003/15



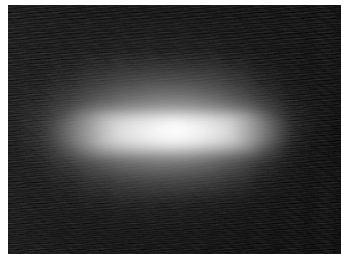
10139



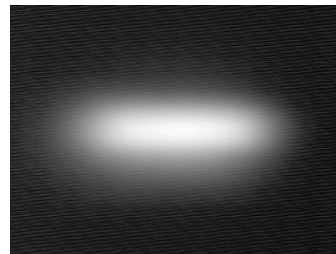
10003/25



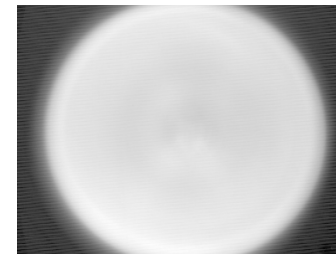
10140 [R2]



10003/L25



10192



10170



# CREE XP-G 26.5mm range

Part No.	Description	White		
		FWHM#	EFF	Cd/lm
10048	Plain Tight	8.6	85.8%	31.2
10124	Frosted Narrow	11.6	82.3%	15.7
10108	Medium Frosted	20.9	78.9%	4.6
10260	Frosted Wide	34	77.9%	2.4
10049	Elliptical	43.79*9.07	81.5%	6.6
10224	Elliptical Orthogonal*	47.86*9.38	81.8%	5.6
10234	Elliptical Ramp Optic	45.61*8.92	81.2%	6.1

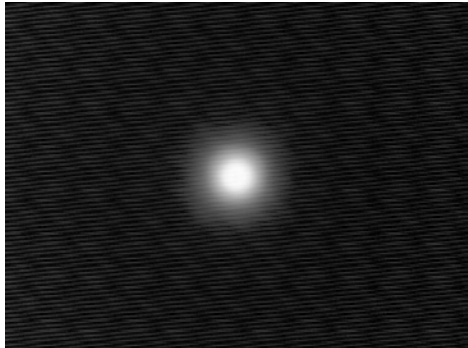


10048

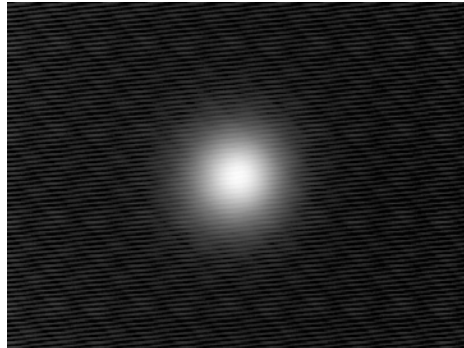
Part No.	Colour	Description
10445	White	4.3mm leg
10455	White	2.0mm leg
10465	White	0.8mm leg
10475	Black	4.3mm leg
10485	Black	2.0mm leg
10495	Black	0.8mm leg

\*Orthogonal is the elliptical beam turned through 90deg.

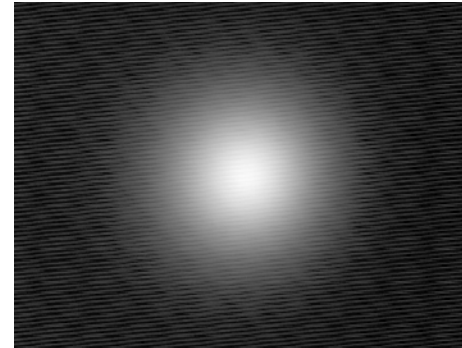
# Full Width Half Maximum i.e. total viewing angle



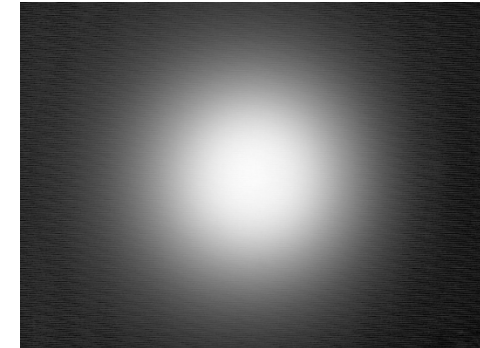
10048



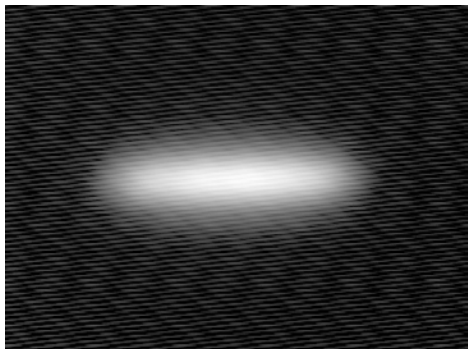
10124



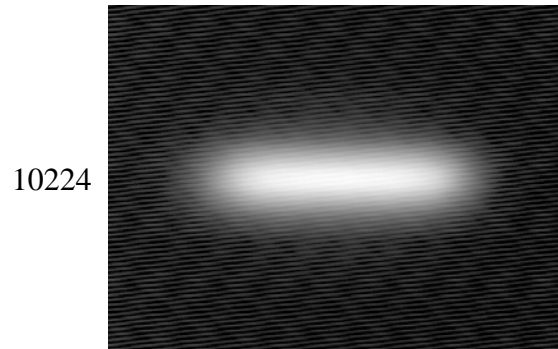
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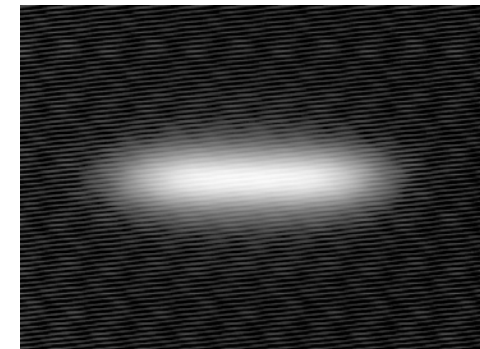
10260



10049



10224



10234

# CREE MX-6 LED 20mm range

Part No.	Description	White		
		FWHM#	EFF	Cd/lm
10003	Plain Tight	15	90.2%	8.5
10138	Frosted Narrow	20	89.9%	5.5
10003/15	Ripple Medium	27.5	89.5%	3.8
10139	Medium Frosted	25.8	87.4%	3.5
10003/25	Ripple Wide	36.5	85.1%	2.2
10140 [R2]	Wide Frosted	42.5	82.3%	1.6
10003/L25	Elliptical	43.59*18.48	88.2%	3.4
10192	Elliptical Orthogonal*	46.38*19.55	89.7%	3.0

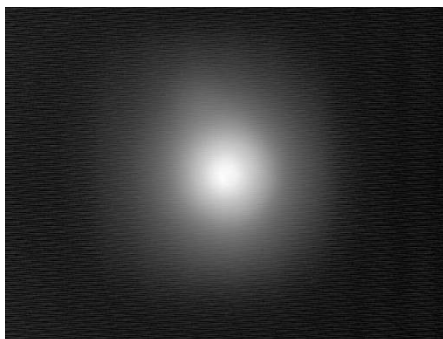


Part No.	Colour	Description
10637	White	4.3mm leg
10657	White	2.0mm leg
10677	White	0.8mm leg
10697	Black	4.3mm leg
10717	Black	2.0mm leg
10737	Black	0.8mm leg

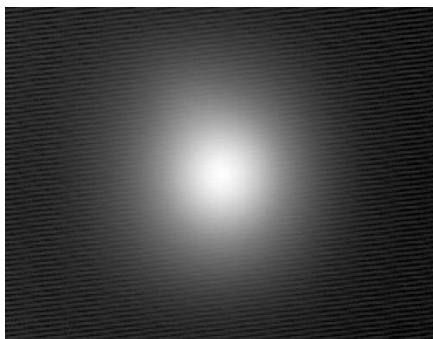
\*Orthogonal is the elliptical beam turned through 90deg.

# Full Width Half Maximum i.e. total viewing angle

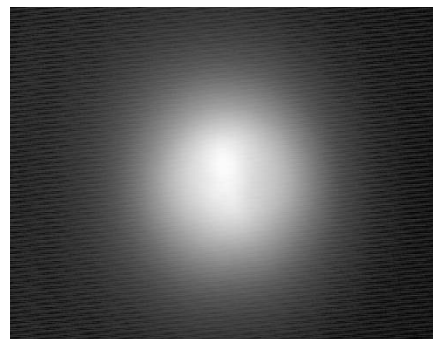
N.B. 10140 [R2] touches the top of the LED package.



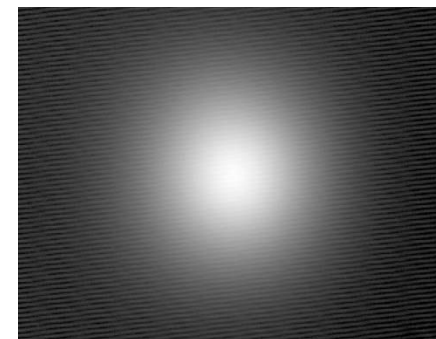
10003



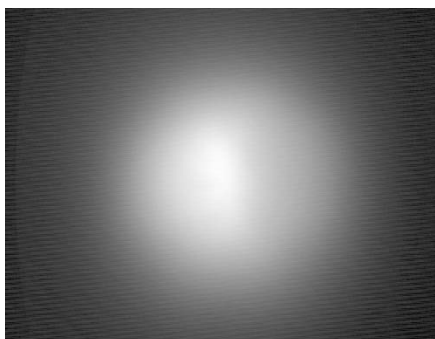
10138



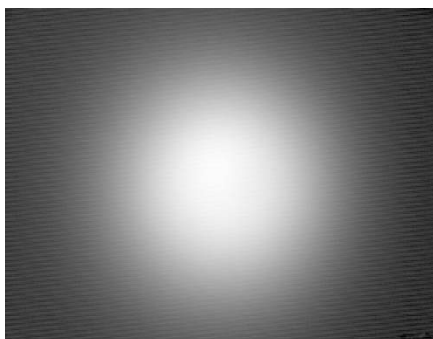
10003/15



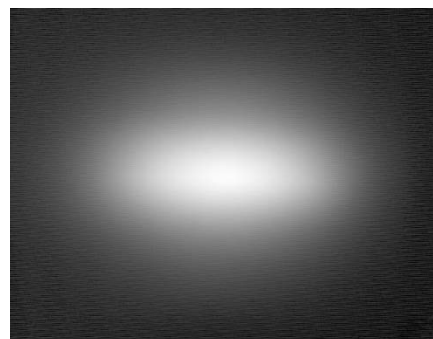
10139



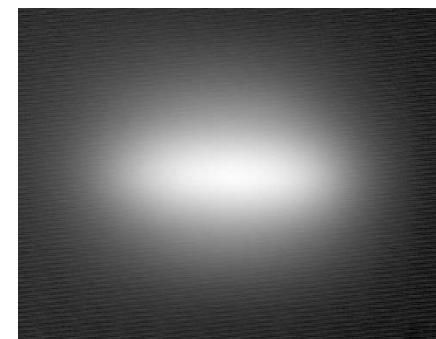
10003/25



10140[R2]



10003/L25



10192



# CREE MX-6 26.5mm range

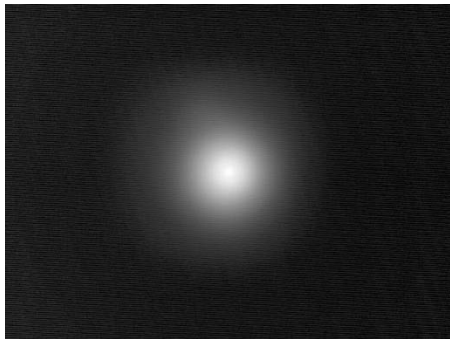
Part No.	Description	White		
		FWHM#	EFF	Cd/lm
10048	Plain Tight	10.5	89.1%	16.7
10124	Frosted Narrow	15	83.1%	9.6
10108	Medium Frosted	25.1	79.9%	3.6
10260	Frosted Wide	37	76.8%	2.0
10049	Elliptical	42.24* 13.57	81.0%	4.7
10224	Elliptical Orthogonal*	46.93* 15.27	82.1%	3.8
10234	Elliptical Ramp Optic	44.68* 13.26	80.9%	4.4



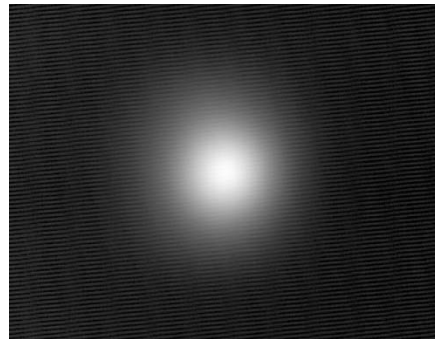
Part No.	Colour	Description
10445	White	4.3mm leg
10455	White	2.0mm leg
10465	White	0.8mm leg
10475	Black	4.3mm leg
10485	Black	2.0mm leg
10495	Black	0.8mm leg

\*Orthogonal is the elliptical beam turned through 90deg.

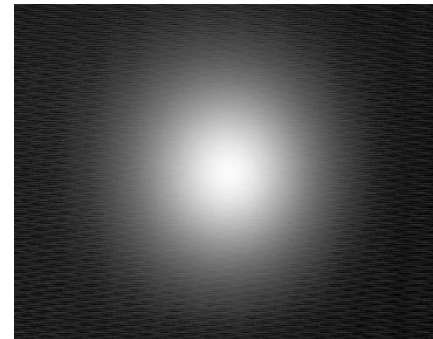
# Full Width Half Maximum i.e. total viewing angle



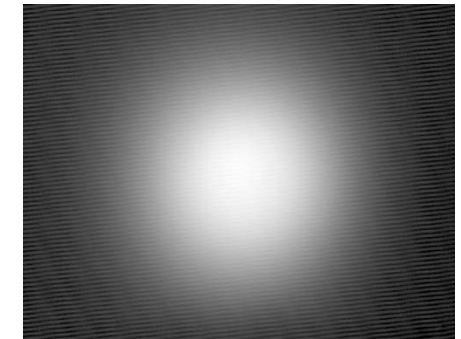
10048



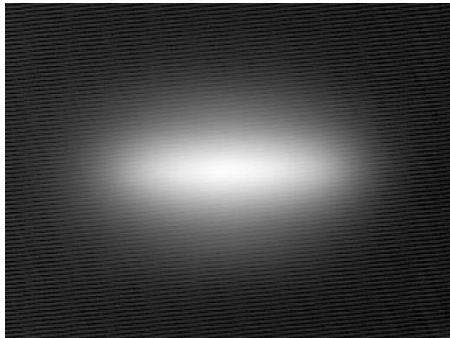
10124



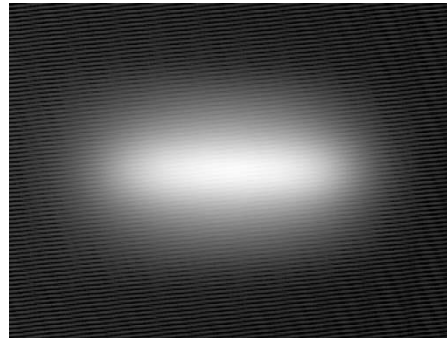
10108



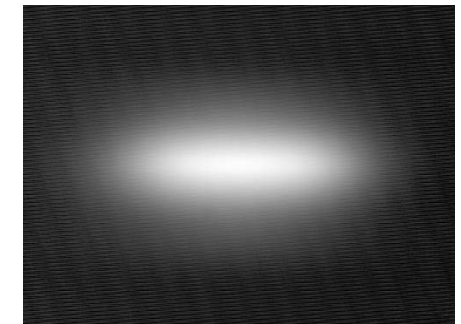
10260



10049



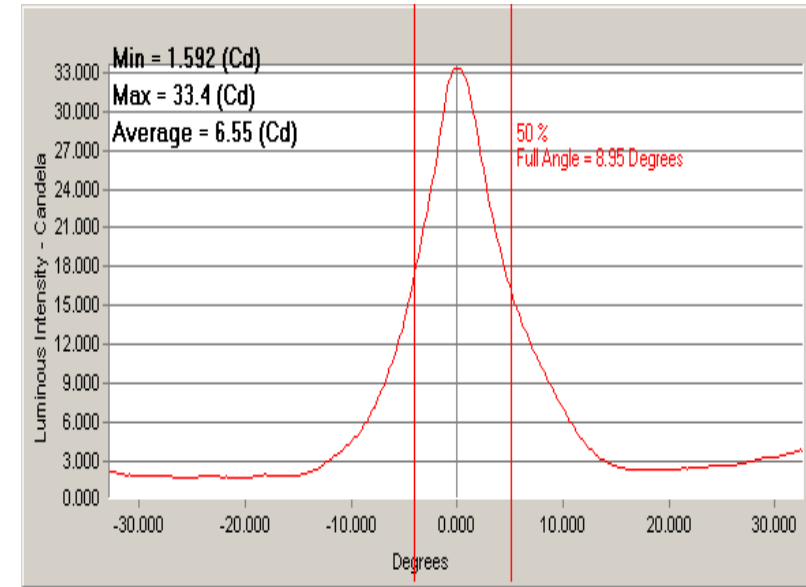
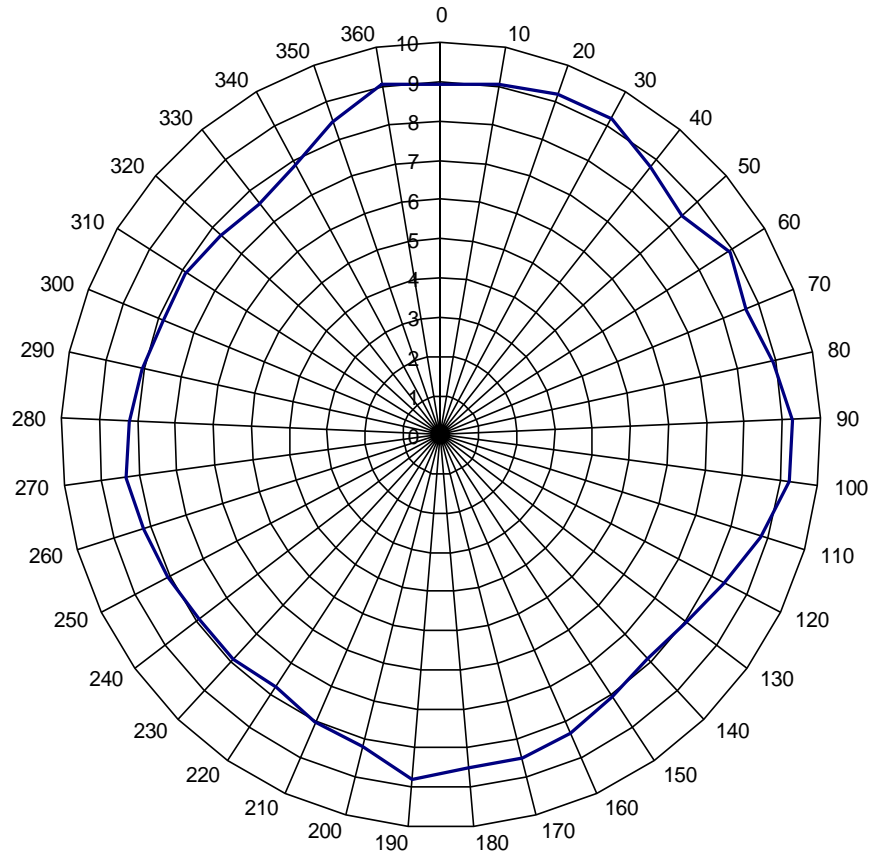
10224



10234

# Side Emitter 10267

FWHM divergence versus side emitter rotation angle



## FWHM:

Average FWHM: 8.4degree;

Minimum FWHM: 7.45degree ;

Maximum FWHM: 9.3degree

Efficiency : 87%

Cd/lm:  $38/46=0.8$  @ 350mA (average of 8 readings)

# Continuous Strip Optic

Here is a optic to fit over a linear strip of LED's to give good even mix along the length whilst controlling the beam in the other direction designed for Cree® XP



## Carclo Technical Plastics

111 Buckingham Avenue, Slough, Berkshire SL1 4PF ENGLAND / 600 Depot Street Latrobe PA. 15650 USA

Web: [www.carclo-optics.com](http://www.carclo-optics.com) e-mail: [sales@carclo-optics.com](mailto:sales@carclo-optics.com)

Tel UK: 0044 (0) 1753 575011 Tel USA 00 (1) 724 539 6982

05 March 2010

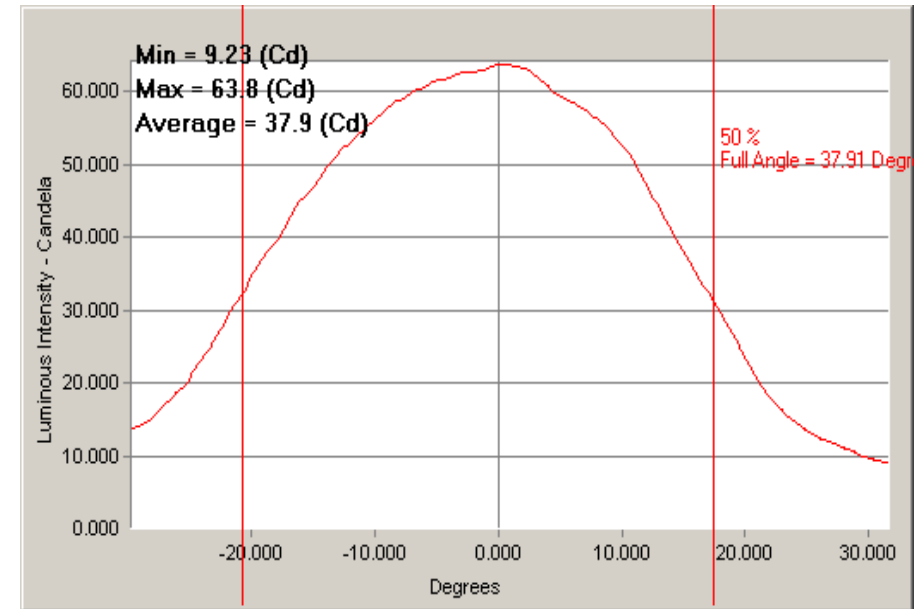
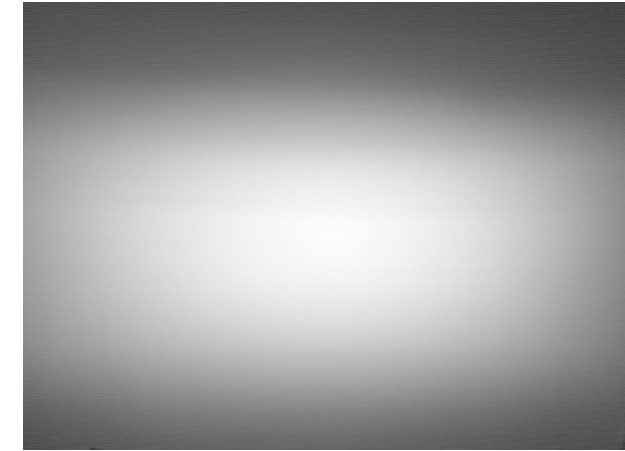
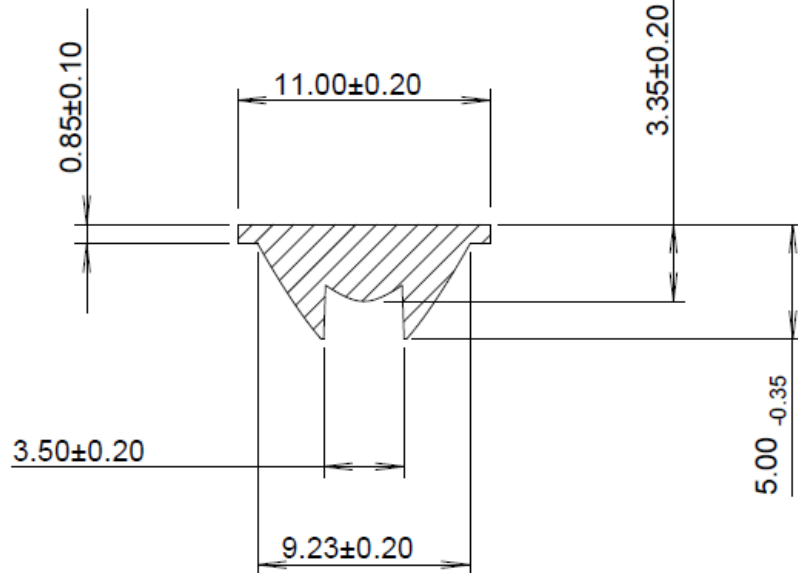
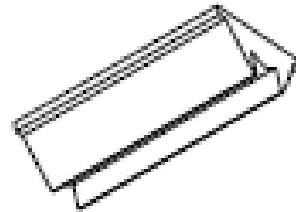


**carclo**  
technical plastics

# Continuous Strip

- A single piece optic that can be made in lengths to suit your needs
- Will be standard in 1.2m (4') and 300mm (1') lengths tol -0.0 /+3.0
- Easily cut to your required length using a fine tooth saw
- Made from optical quality PC for optimal temperature and system performance
- Designed for Cree XP
- Surface mount height tolerance less critical due to diffused front optical surface
- Variable beam angles to mounting heights as show in the table below

Z height from Package	FWHM	Eff
0 mm	38	85%
0.5 mm	34	81%
1 mm	30.7	75.5%





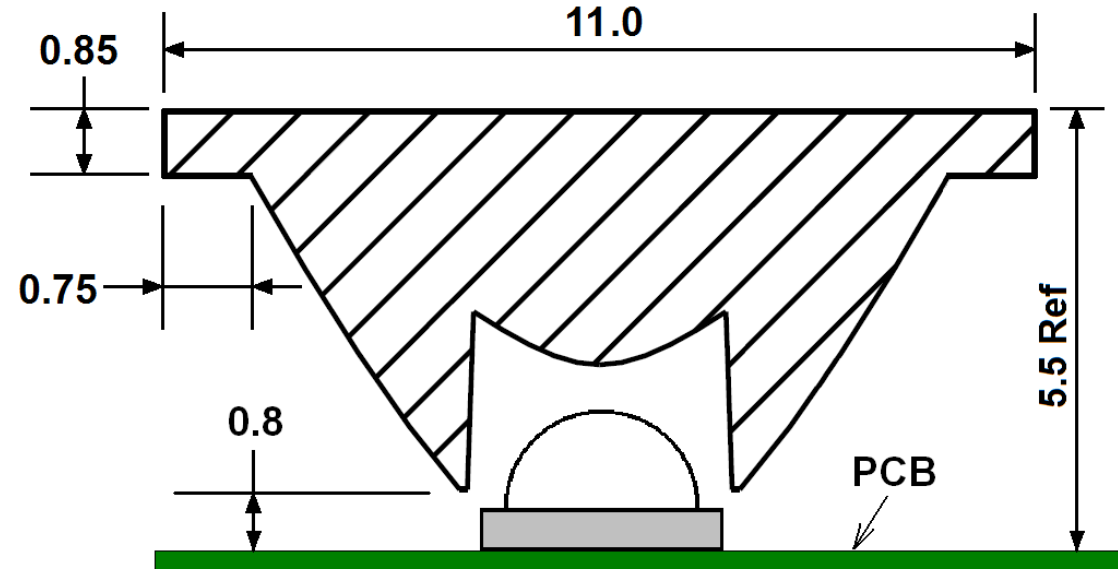
# Application notes

- Two-part epoxies such as Loctite 3430 can be used to join or mount the continuous strip optic without fogging the PC lens
- Ideal for florescent tube replacement fixtures, refrigeration lighting, cove lighting, under cupboard lighting, retail lighting, wall washing, and other general illumination applications, in both single colour as well as RGB mixing.
- Colour binning LED's less critical in most applications as the light is mixed in the long plane.
- Easily mounted in an extruded aluminium housing that can serve as both a heat sink as well as a base unit for a light fixture or a light engine module



Part no	Description
10397	4 foot , 1.2 M Long
10398	1 foot, 300mm Long

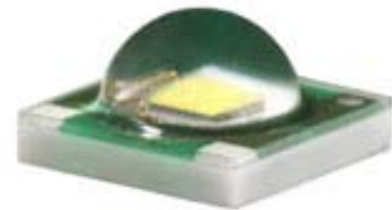
## STRIP OPTIC MOUNTING DIMENSIONS



# Bubble Optics

## Ultra wide

This is a new design and the start of our range of 'Bubble Optics' these optics produce a very wide but even beam on a flat surface idea for wide area lighting designed for the Cree® XP



### Carclo Technical Plastics

111 Buckingham Avenue, Slough, Berkshire SL1 4PF ENGLAND / 600 Depot Street Latrobe PA. 15650 USA

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Tel UK: 0044 (0) 1753 575011 Tel USA 00 (1) 724 539 6982

05 March 2010

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# Ultra Wide Angle Optics

## Optics for Producing uniform illuminance over wide areas

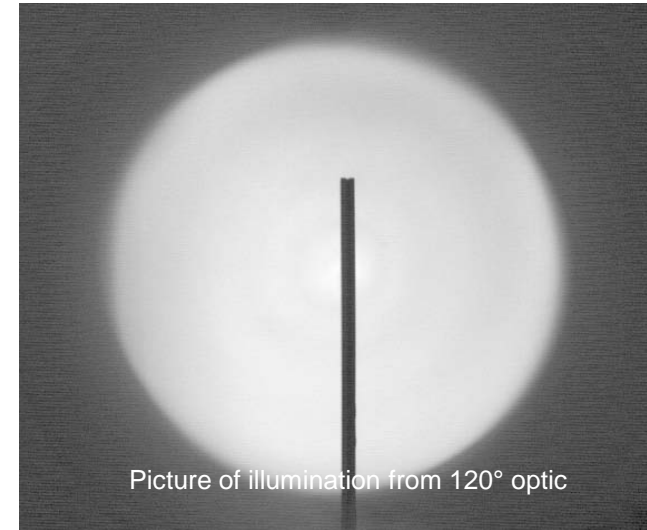
Carclo Ultra Wide Angle Optics are designed to meet the needs of Luminaire designers who need to efficiently light wide areas with very even illumination. These optics are suitable for applications such as emergency lighting, parking facility illumination and many other general illumination areas.

These optics work by re-mapping the light output from the Led to the far-field. Their hemi-spherical outer shape has given rise to their generic name “Bubble optics”.

Mounted at 2.5m (~8 ft.) the 120° optic will evenly illuminate an area 8m (~26 ft.) in diameter, the 130° optic will illuminate a 10m (~33 ft.) diameter.

## Features

- Beam widths of 120 deg FWHM (Part No. 10403) and 130 deg FWHM (Part No. 10406)
- Greater than 90% efficiency.
- One piece design for Cree XP
- Manufactured in lens grade polycarbonate with UL certification.
- Suitable for continuous operation up to 120 °C.

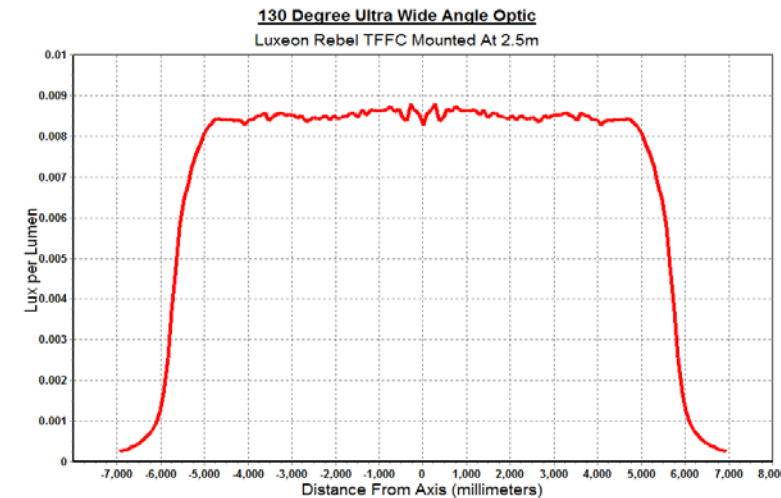
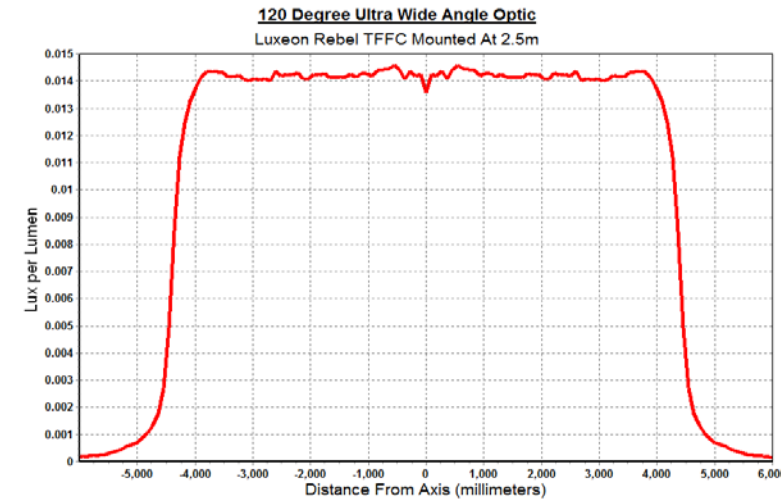
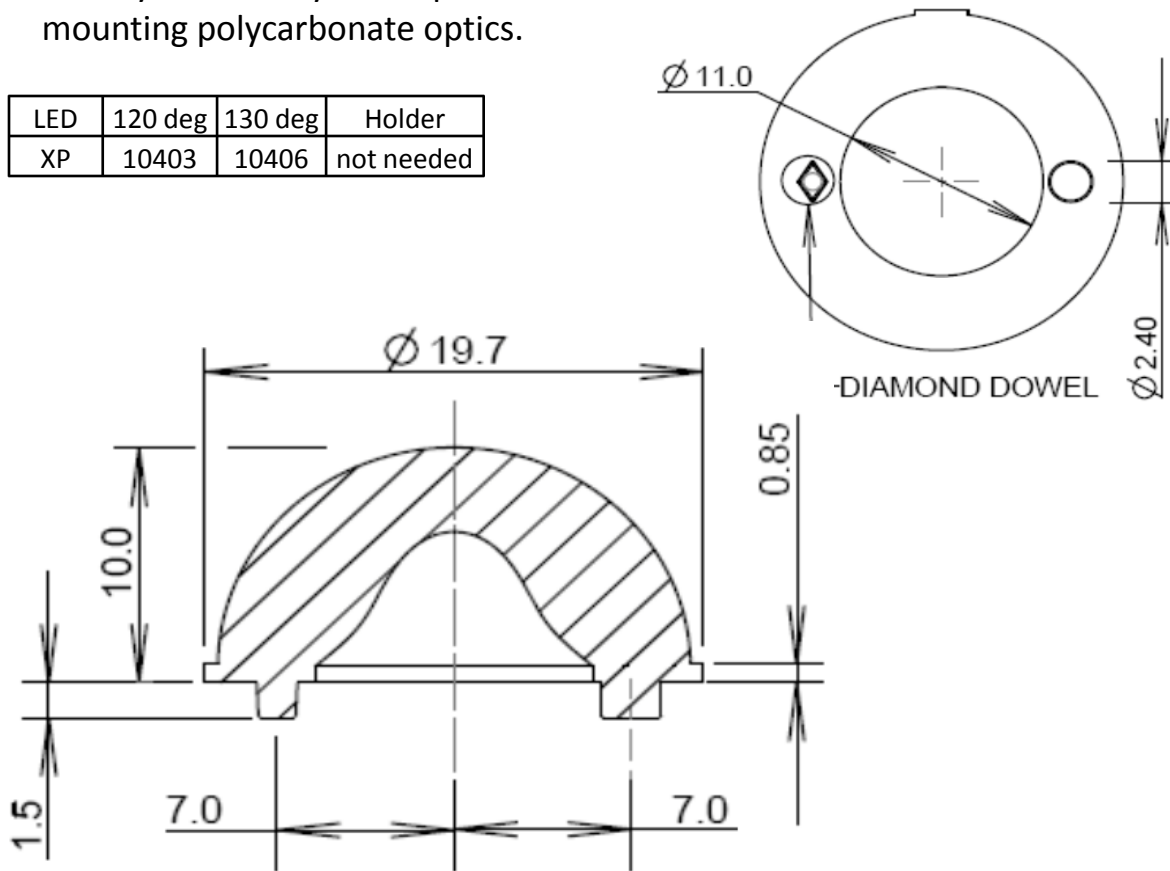


Picture of illumination from 120° optic

# Application notes

- Arrays of 19.7mm diameter Ultra wide optics should be placed no closer than 27mm between centres to avoid shading.
- Locate on PCB using 2x  $\varnothing 2.5$ mm holes equi-spaced 7mm either side of Led emitting area.
- Always use a very low vapour adhesive such as Loctite 3430 when mounting polycarbonate optics.

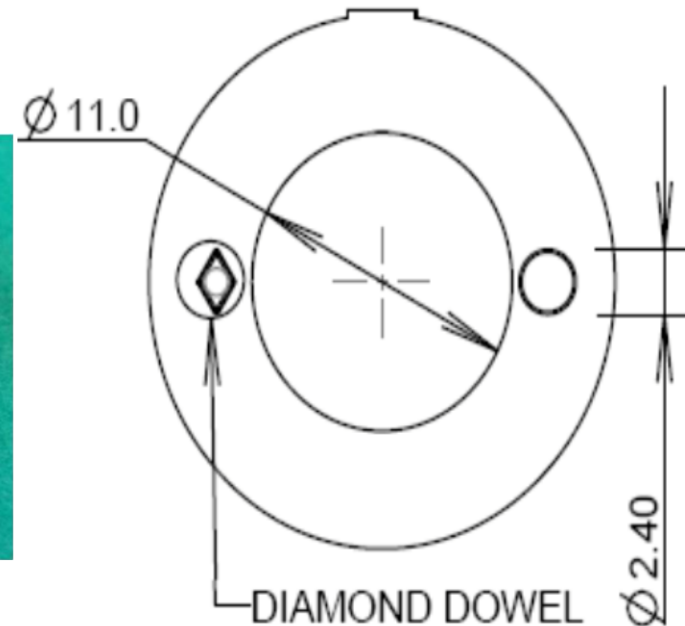
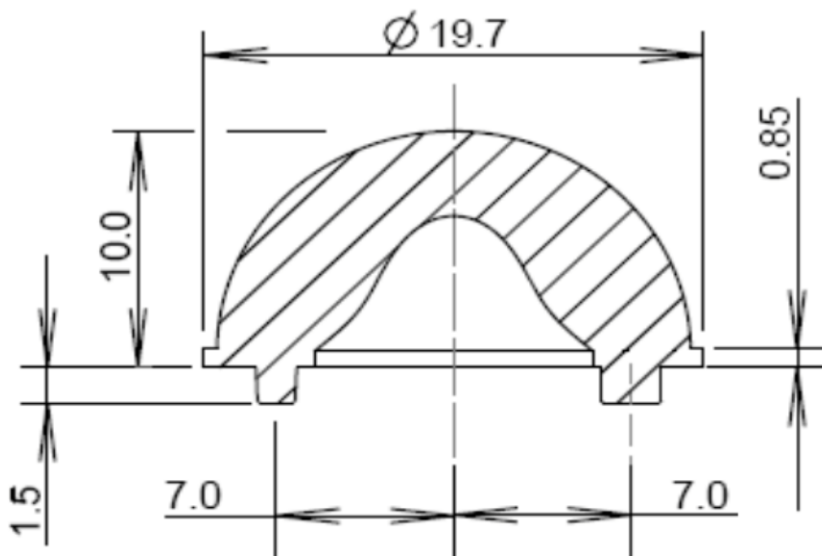
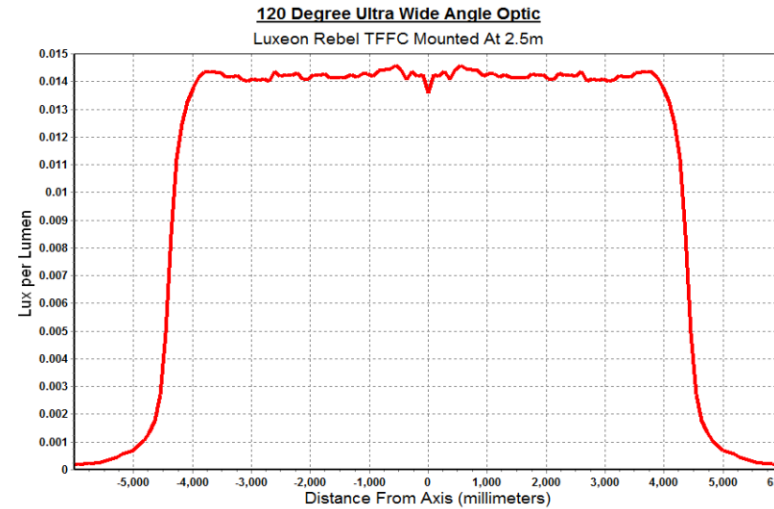
LED	120 deg	130 deg	Holder
XP	10403	10406	not needed



# 120 degree Bubble Optic

- Arrays of 19.7mm diameter Ultra wide optics should be placed no closer than 27mm between centres to avoid shading.
- Locate on PCB using 2x  $\varnothing$  2.5mm holes equi-spaced 7mm either side of Led emitting area.
- Always use a very low vapour adhesive such as Loctite 3430 when mounting polycarbonate optics.

LED	120 deg	130 deg	Hemispherical	Downlight	Holder
XP-E	10403	10406	10620	10628	not needed
XP-G	10403	10406	10620	10628	not needed

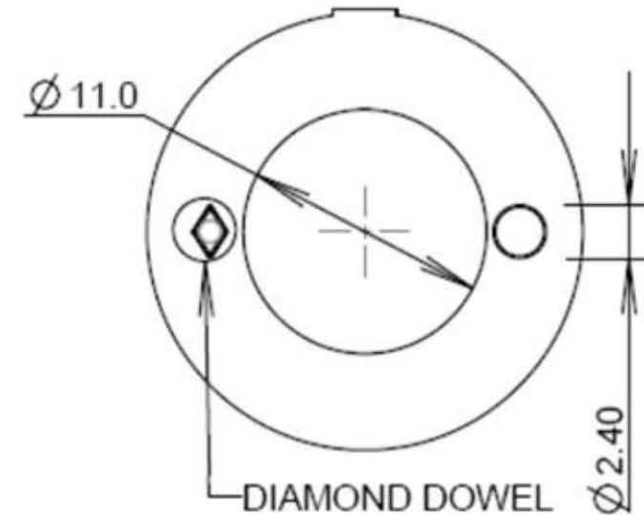
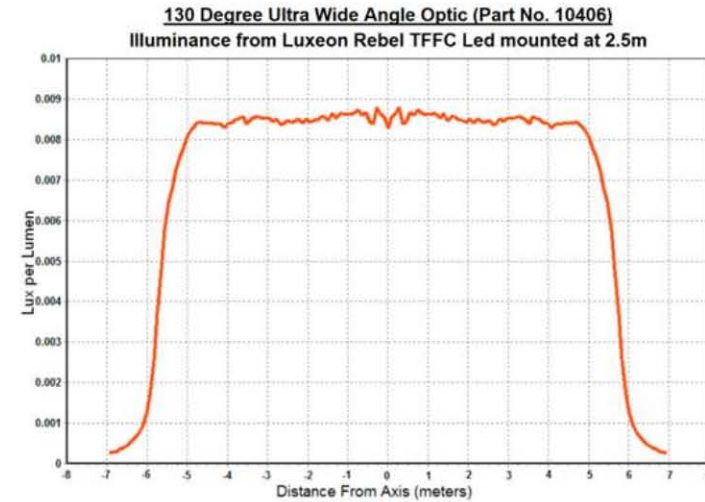




# 130 degree Bubble Optic

- Arrays of 19.7mm diameter Ultra wide optics should be placed no closer than 27mm between centres to avoid shading.
- Locate on PCB using 2x  $\varnothing$  2.5mm holes equi-spaced 7mm either side of Led emitting area.
- Always use a very low vapour adhesive such as Loctite 3430 when mounting polycarbonate optics.

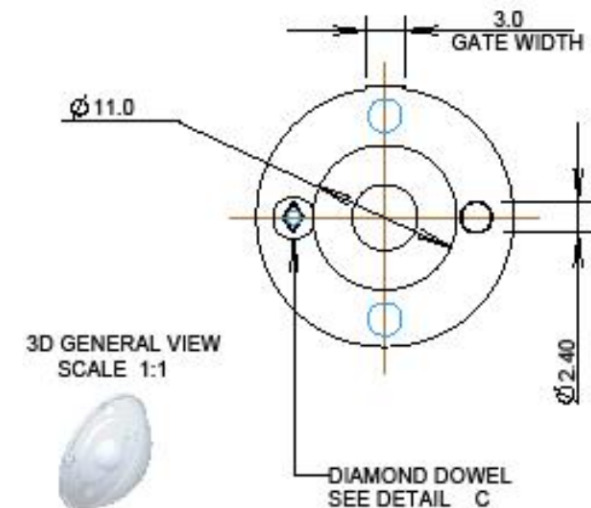
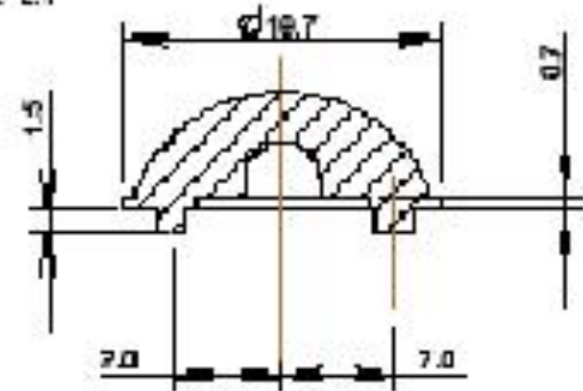
LED	120 deg	130 deg	Hemispherical	Downlight	Holder
XP-E	10403	10406	10620	10628	not needed
XP-G	10403	10406	10620	10628	not needed



# Hemi-spherical Bubble Optic

LED	120 deg	130 deg	Hemispherical	Downlight	Holder
XP-E	10403	10406	10620	10628	not needed
XP-G	10403	10406	10620	10628	not needed

SECTION A-A  
SCALE 2:1





# Downlight Bubble Optic

LED	120 deg	130 deg	Hemispherical	Downlight	Holder
XP-E	10403	10406	10620	10628	not needed
XP-G	10403	10406	10620	10628	not needed

