



OCTA LIGHT BULGARIA Plc



BULLSTAR SERIES

HIGH POWER LED

TECHNICAL DATASHEET

INTRODUCTION

Octa Light high power white LEDs are optimized to bring high performance and quality of light needed for today's wide range of lighting applications, such as general, decorative, indoor, outdoor, industrial or commercial lighting etc. In addition to delivering specified Correlated Color Temperature and Color Rendering combinations, BullStar series emitters deliver good efficacy, lifetime and reliability. This document contains the performance data needed to design LED based applications.

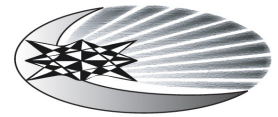
Unlike most fluorescent sources Octa Light Bullstar series LEDs contain no mercury and it is more energy efficient than incandescent and halogen light sources.

Octa Light BullStar Series Features

- High efficacy for sustainable design
- More light delivered at both low and high operating temperatures
- Specified CCT & CRI combinations
- ANSI compliant Quarter binning
- Exceed Energy Star® lumen maintenance requirements
- Low voltage operation and instant lighting
- Reflow process compatibility
- Optimized optical performance for higher light output compared to market competitors

TABLE OF CONTENTS

Product Nomenclature	3
Product Selection	4
Environmental Compliance	4
Electrical Characteristics	5
Absolute Maximum Ratings	7
Current Derating Curves	8
Relative Spectral Power Distribution Characteristics	9
Light Output Characteristics Over Temperature	11
Emission Angle Characteristics.....	12
LED Package Dimensions and Polarity	14
Packaging information	15
Company Information	16



PRODUCT NOMENCLATURE

OCTL – BST – WW J - F 8A C

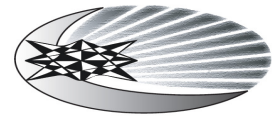
X1 X2 X3 X6 X4 X5 X7

Table 1. Product Part Number explanation

X1	X2	X3	X4	X5	X6	X7
Company name	Series name	Color type	Optical type	Chromaticity coordinates BIN ¹	Minimum Flux BIN (Lm)	Testing current (mA)
OCTL	BST	CW - Cool White	A ³ - 140 deg Lambertian	1 (A, B, C, D, E, F, O) ²	A - 5	A - 150
			B ³ - Batwing	2 (A, B, C, D, E, F, O)	B - 20	B - 250
			C ³ - 100 Deg Lambertian	3 (A, B, C, D, E, F, O)	C - 30	C - 350
			E ³ - Side Emitting	4 (A, B, C, D, E, F, O)	D - 40	D - 500
			F - 110 deg Focused	5 (A, B, C, D, E, F, O)	E - 50	E - 700
			L ³ - 120 deg Lambertian	6 (A, B, C, D, E, F, O)	F - 60	F - 1000
				7 (A, B, C, D, E, F, O)	G - 70	
				8 (A, B, C, D, E, F, O)	H - 80	
		BL - Blue	BL (Blue)	I - 90		
			RB (Royal Blue)	J - 100		
			VL (Violet)	K - 110		
			RD (Red)	L - 120		
		RD - Red	RO (Red- Orange)	M - 130		
			PK (Pink)			
			YE (yellow)			
		YE - Yellow	OR (Orange)			
AM (Amber)						
GN (Green)						
GN - Green	GN (Green)					
	CY (Cyan)					

Notes:

- Information about chromaticity coordinates bin can be found in Binning information file.
- Chromaticity coordinates bin 10 includes all of the bins 1A, 1B, 1C, 1D, 1E, 1F. This applies for all bins.
- For future products.



PRODUCT SELECTION

Table 2. Product Selection for Octa Light BullStar Series LED

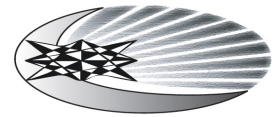
	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimum Luminous Flux(lm) Φ_v	Typical Luminous Flux(lm) Φ_v
Warm White	2700K	OCTL-XXX-WWH-F80C	80	85	70	80
	3000K	OCTL-XXX-WWH-F70C	80	85	70	80
	3500K	OCTL-XXX-WWH-F60C	80	85	70	80
Neutral White	4000K	OCTL-XXX-NWI-F50C	70	75	80	90
	4500K	OCTL-XXX-NWJ-F40C	70	75	90	100
Cool White	5000K	OCTL-XXX-CWK-F30C	65	70	100	110
	5700K	OCTL-XXX-CWK-F20C	65	70	100	110
	6500K	OCTL-XXX-CWK-F10C	65	70	100	110

Notes:

1. Octa Light LED maintains a tolerance of $\pm 5\%$ on luminous flux and $\pm 2\%$ on CRI measurements.
2. Test current is 350mA for all products.
3. Thermal pad temperature = 25°C

ENVIRONMENTAL COMPLIANCE

Octa Light BullStar SERIES LEDs are compliant to the Restriction of Hazardous Substances Directive or RoHS. The restricted materials including lead, mercury cadmium hexavalent chromium, polybrominated bipheyls (PBB) and polybrominated diphenyl ether (PBDE) are not used in Octa Light BullStar Series LEDs to provide an environmentally friendly product to the customers.



ELECTRICAL CHARACTERISTICS

Forward voltage characteristics at $I_f = 350$ mA and thermal pad temperature 25°C :

Table 3.

Color	Part Name	Forward Voltage V_f (V)			$\Delta V_f/\Delta T_j$ (mV/ $^\circ\text{C}$), at $I_m=5\text{mA}$	$R_{th\ j-c}$ ($^\circ\text{C}/\text{W}$)
		Min.	Typical	Max.		
Cool white	OCTL-XXX-CWK-F10C	2.8	3.2	3.6	1.6	9
	OCTL-XXX-CWK-F20C	2.8	3.2	3.6	1.6	9
	OCTL-XXX-CWK-F30C	2.8	3.2	3.6	1.6	9
Neutral white	OCTL-XXX-NWJ-F40C	2.8	3.2	3.6	1.6	9
	OCTL-XXX-NWI-F50C	2.8	3.2	3.6	1.6	9
Warm white	OCTL-XXX-WWH-F60C	2.8	3.2	3.6	1.6	9
	OCTL-XXX-WWH-F70C	2.8	3.2	3.6	1.6	9
	OCTL-XXX-WWH-F80C	2.8	3.2	3.6	1.6	9

Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.

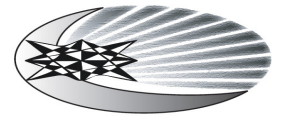
Forward voltage characteristics at $I_f = 700$ mA and thermal pad temperature 25°C :

Table 4.

Color	Part Name	Forward Voltage V_f (V)			$\Delta V_f/\Delta T_j$ (mV/ $^\circ\text{C}$), at $I_m=5\text{mA}$	$R_{th\ j-c}$ ($^\circ\text{C}/\text{W}$)
		Min.	Typical	Max.		
Cool white	OCTL-XXX-CWK-F10C	3	3.55	4	1.6	9
	OCTL-XXX-CWK-F20C	3	3.55	4	1.6	9
	OCTL-XXX-CWK-F30C	3	3.55	4	1.6	9
Neutral white	OCTL-XXX-NWJ-F40C	3	3.55	4	1.6	9
	OCTL-XXX-NWI-F50C	3	3.55	4	1.6	9
Warm white	OCTL-XXX-WWH-F60C	3	3.55	4	1.6	9
	OCTL-XXX-WWH-F70C	3	3.55	4	1.6	9
	OCTL-XXX-WWH-F80C	3	3.55	4	1.6	9

Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.



Current & Forward Voltage at 10°C, 25°C and 50°C thermal pad temperature

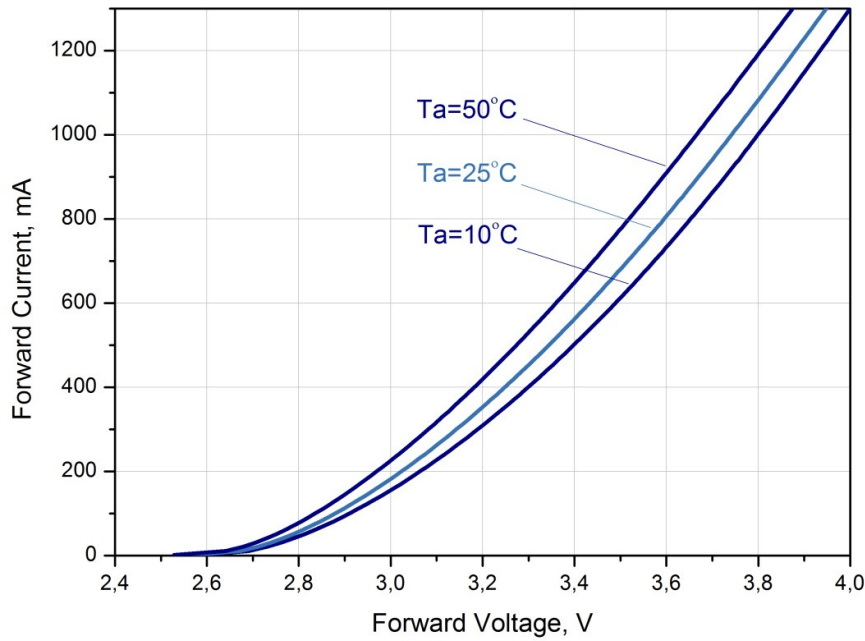


Figure 1. Forward Current over Forward Voltage.

Forward Current & Relative Luminous Flux at Thermal pad temperature 25 °C

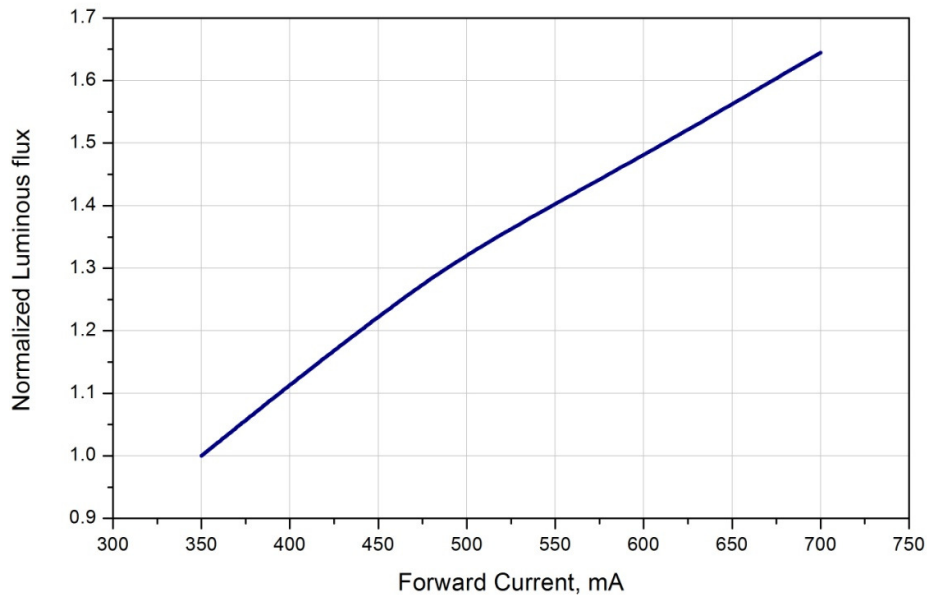
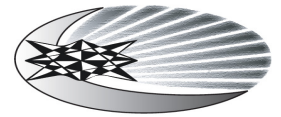


Figure 2. Relative Luminous Flux over Forward Current



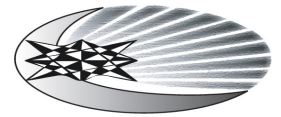
ABSOLUTE MAXIMUM RATINGS

Table 5. Absolute maximum ratings for thermal pad temperature 25 °C

Parameter	Symbol	Rating
Peak pulse forward current (1/10 duty cycle @ 1kHz)	IFMAX	800 mA
Reverse Voltage	VR	7 V
Reverse Current	IR	7.5 μ A @ Vr = 7V
Maximum Forward Voltage	Vfmax	4 V
Max LED junction temperature	Tj	125 °C
Operating temperature at 350mA	Top	-30 °C to +100 °C
Storage temperature	Tst-	-40 °C to +110 °C
Soldering temperature (reflow)	-	280°C < 10sec
Manual soldering time at 260°C(Max)	-	8 Sec.

Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.
2. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
3. Light Emitting Diodes are not designed to be driven in reverse bias.
4. Allowable reflow cycles are 3 times for each LED.



CURRENT DERATING CURVES

Current Derating Curve for 350 mA Drive current

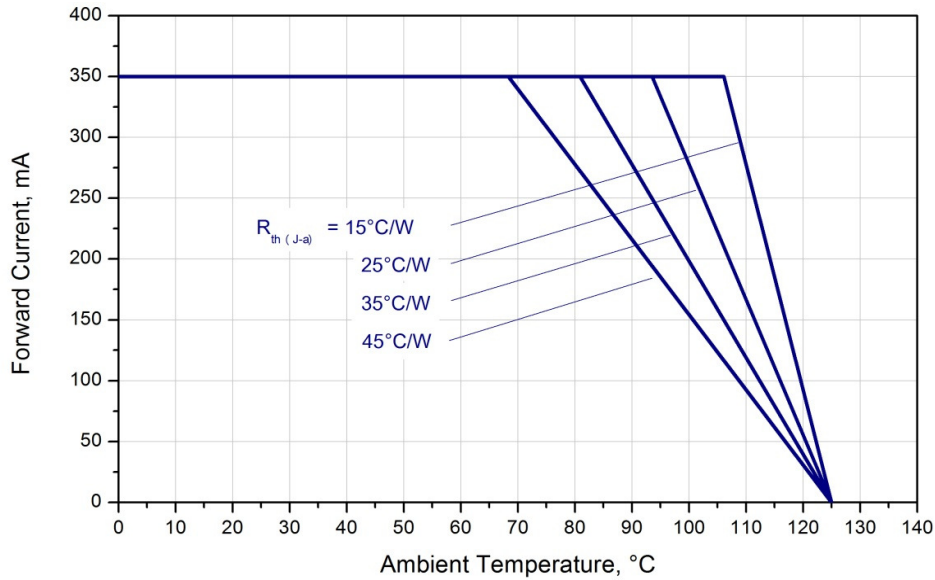
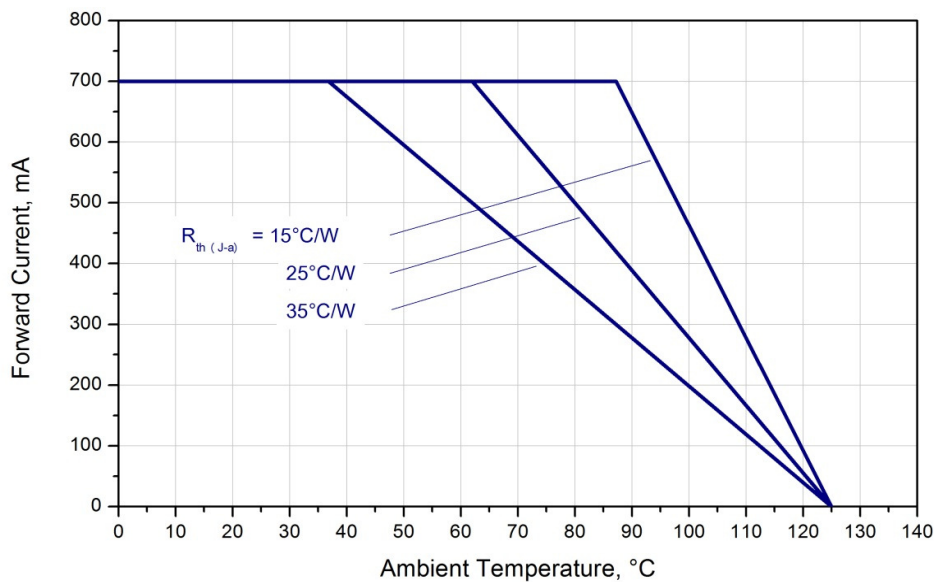


Figure 3. Maximum Forward current Vs. Ambient temperature based on $T_{jMAX} = 125^{\circ}C$

Current Derating Curve for 700 mA Drive current



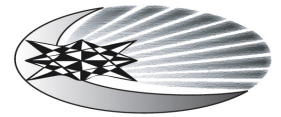


Figure 4. Maximum Forward current Vs. Ambient temperature based on $T_{jMAX} = 125^{\circ}C$

RELATIVE SPECTRAL POWER DISTRIBUTION CHARACTERISTICS

Warm White LED Relative spectral power distribution at 350mA test current

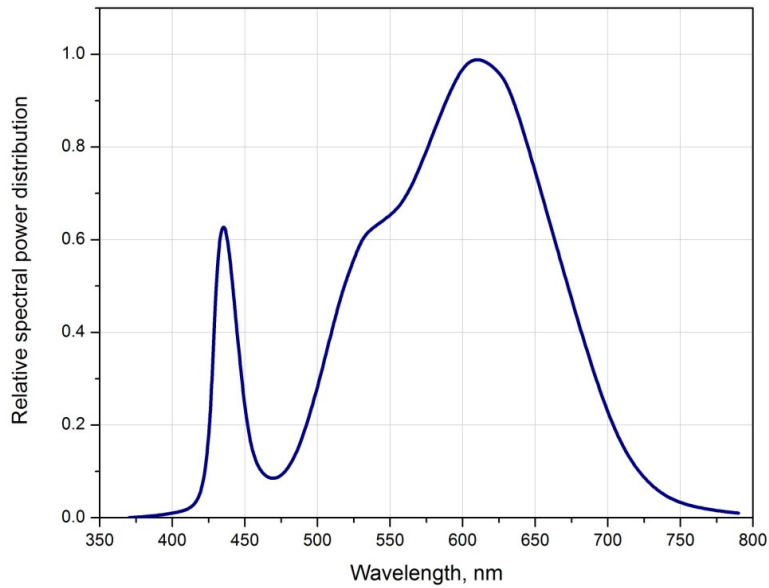


Figure 5. Indicative Warm White color spectrum for thermal pad temperature 25°C

Neutral White LED Relative spectral power distribution at 350mA test current

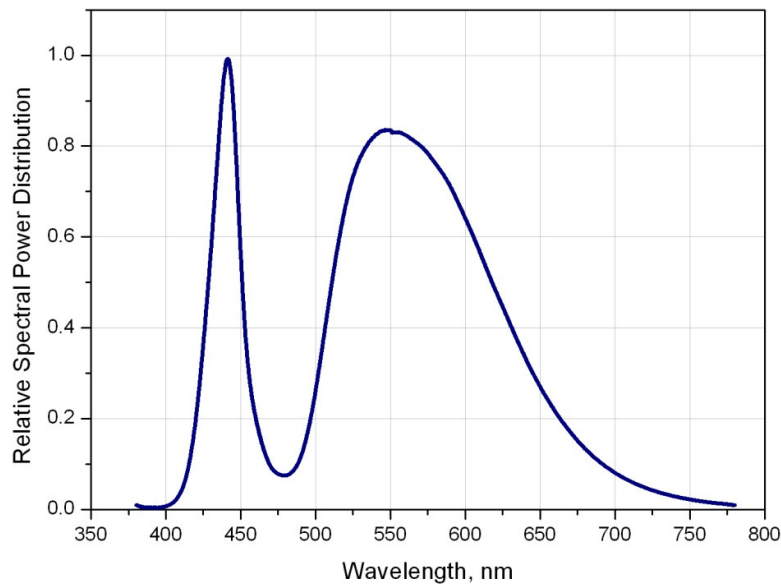


Figure 6. Indicative Neutral White color spectrum for thermal pad temperature 25°C



Cool White LED Relative spectral power distribution at 350mA test current

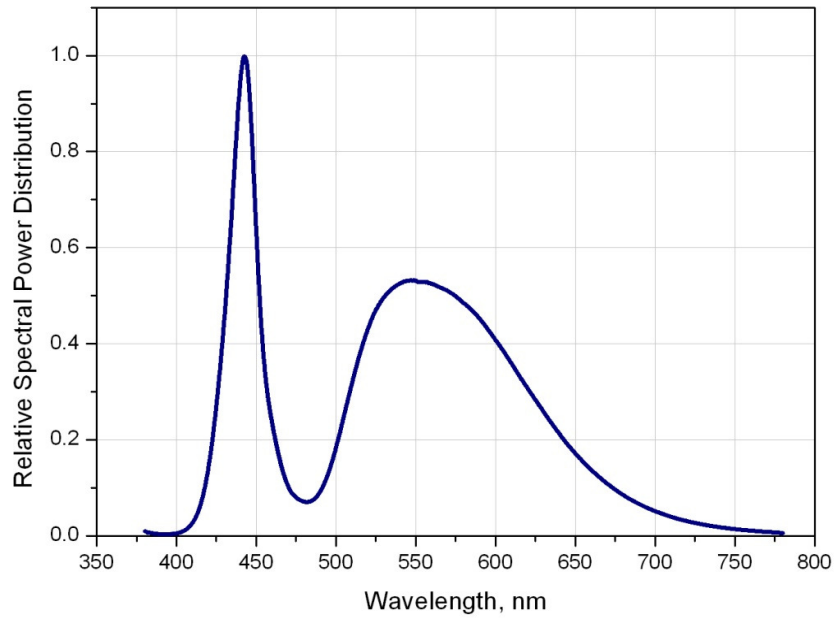


Figure 7. Indicative Cool white color spectrum for thermal pad temperature 25°C



LIGHT OUTPUT CHARACTERISTICS OVER TEMPERATURE

Normalized Luminous Flux at 25°C, $I_f = 350\text{mA}$ and Std Dev.

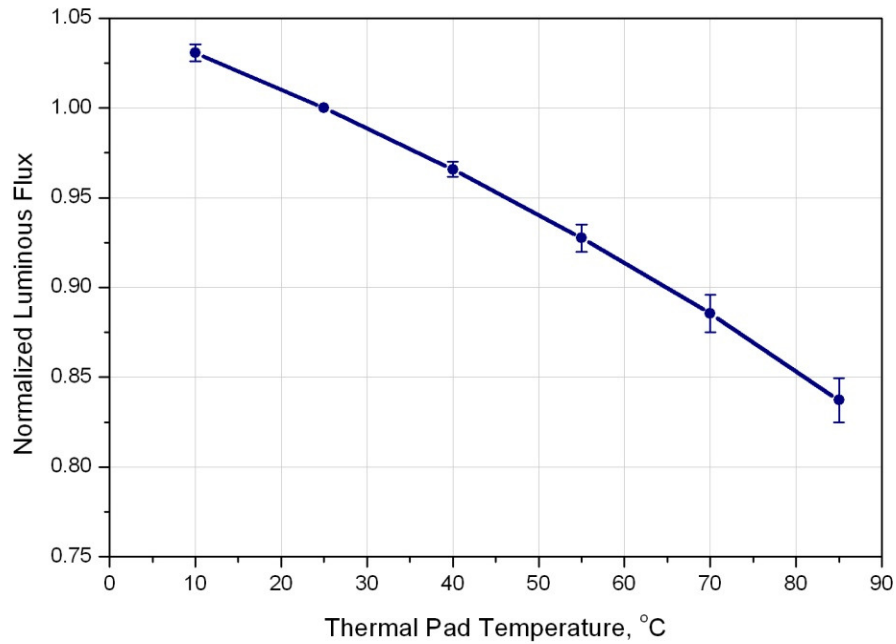


Figure 8. Relative Light output Vs. Thermal pad temperature



EMISSION ANGLE CHARACTERISTICS

Typical Spatial Radiation Pattern

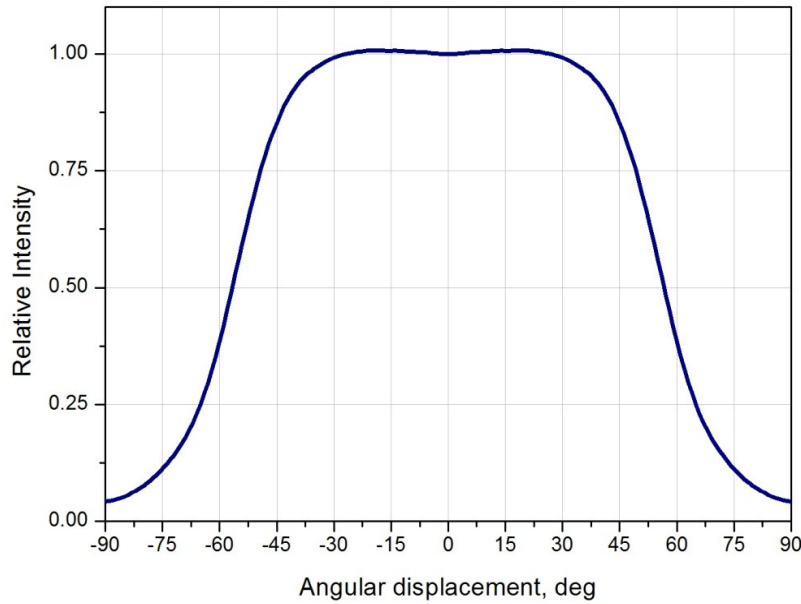


Figure 9. Typical representative spatial radiation pattern for 110° Focused

Typical Polar Radiation Pattern for Focus Optical Type

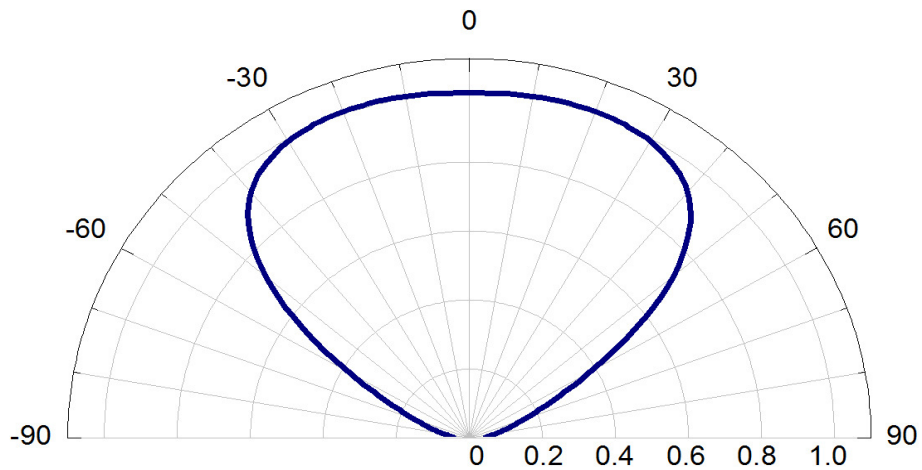


Figure 10. Typical representative polar radiation pattern for 110° Focused



Typical Color vs. Viewing Angle

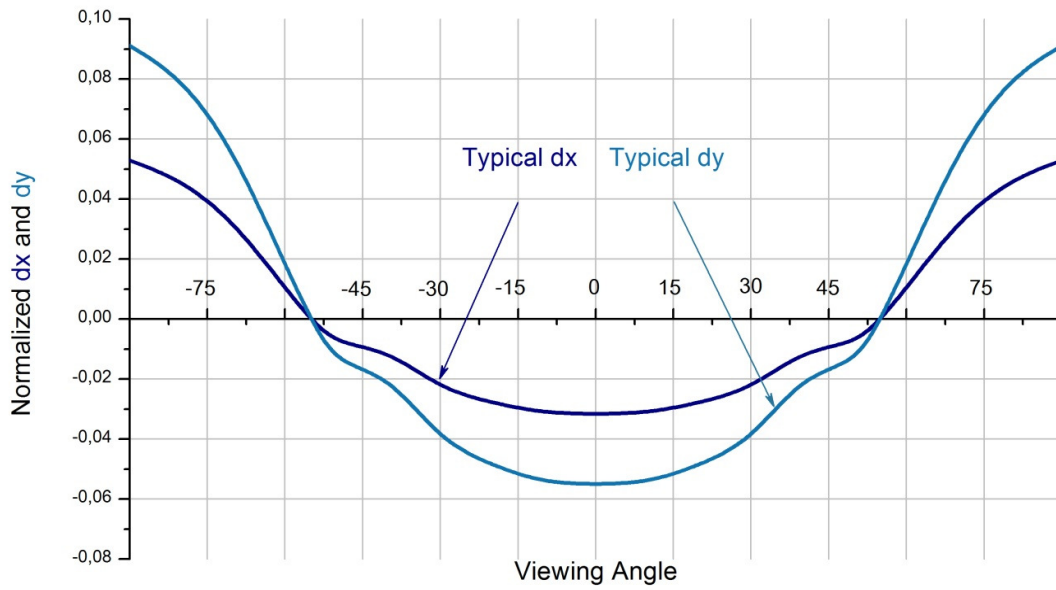
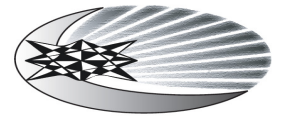
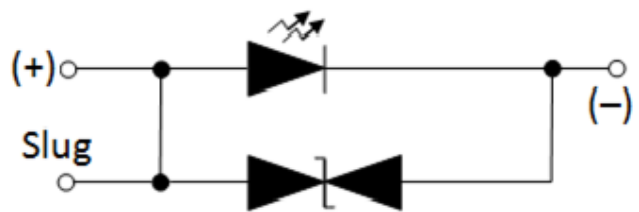
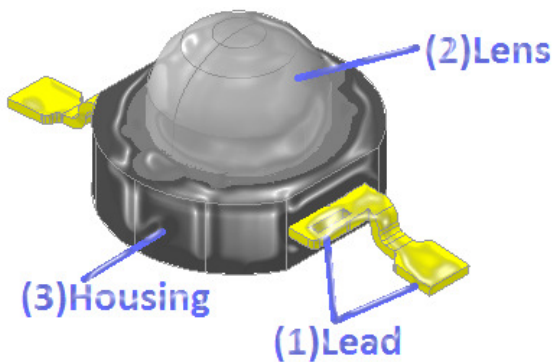
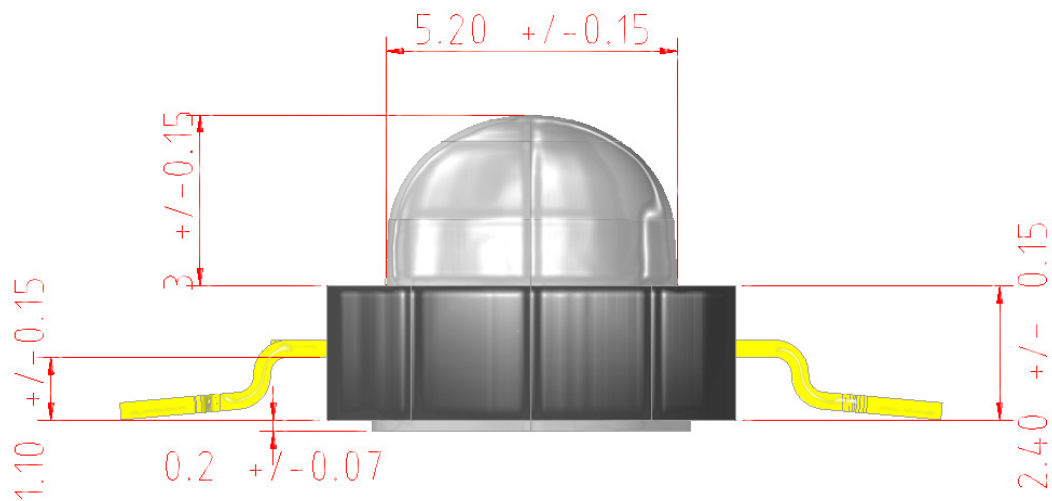
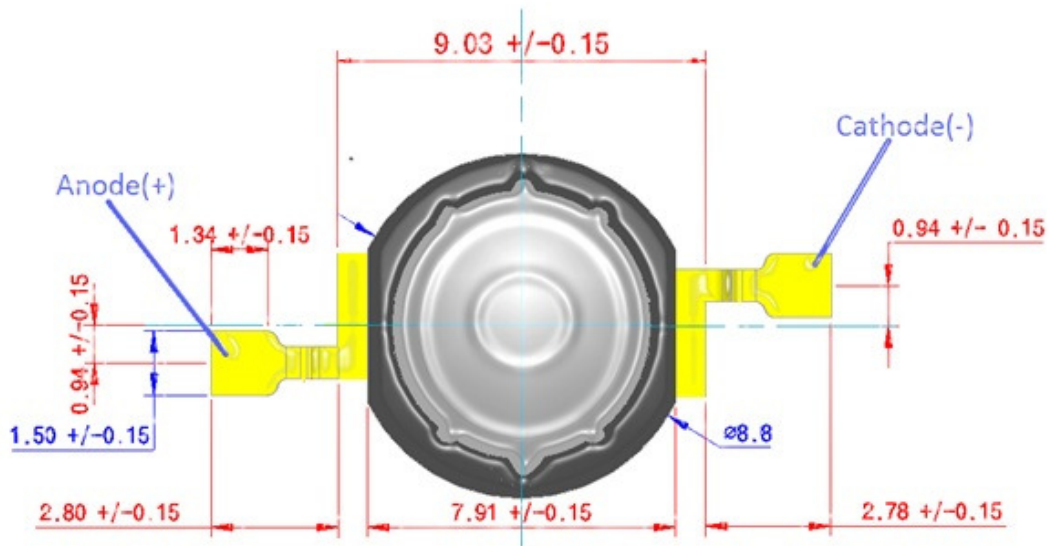


Figure 11. Maximal Color Shifting over viewing angle, normalized for 55 deg



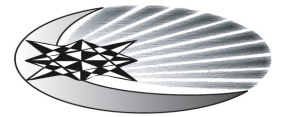
LED PACKAGE DIMENSIONS AND POLARITY



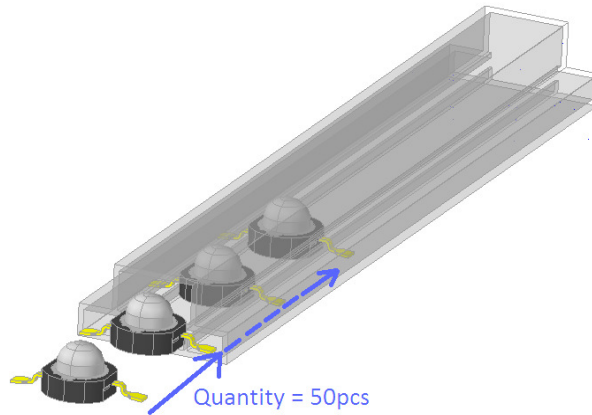
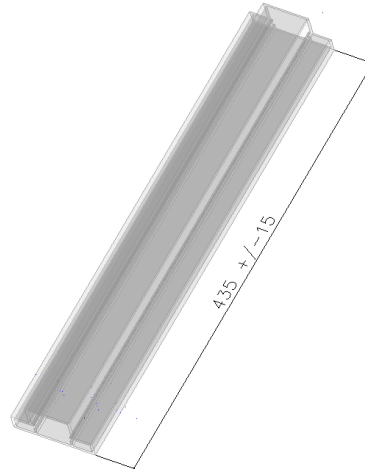
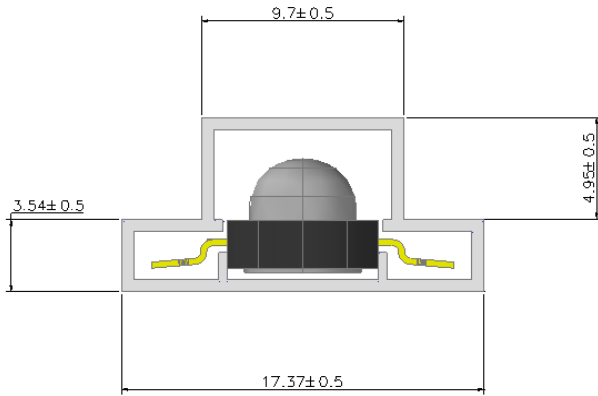
OCTA LIGHT LED CIRCUITS

Notes:

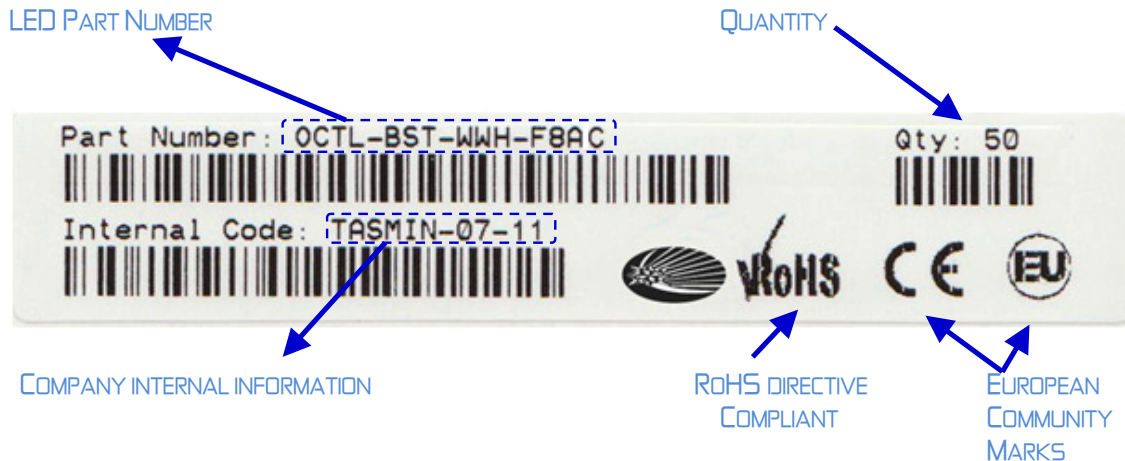
1. All dimensions are in mm
2. Drawings are not to scale
3. It is strongly recommended to apply on electrically isolated heat conducting film between the slug and contact surfaces.

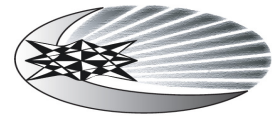


PACKAGING INFORMATION
TUBE DIMENSIONS



The label is placed on the back of each tube and contains product information and quantity of the LEDs inside.





COMPANY INFORMATION

Octa Light Bulgaria Plc is the first Bulgarian Manufacturer of High Power Light Emitting Diodes for general lighting applications. The long year company experience in artificial lighting on LED basis has made possible the creation of the first European LED specially designed for reaching best performance in light output, optical efficacy and thermal management.

Octa Light Products help reduce CO₂ emissions and reduce the need for power plant expansion.

Thanks to its advanced optical properties, the BullStar series enable never before possible applications in outdoor, indoor, industrial, architectural and general lighting when pure white light is necessary. The sophisticated optical properties allow strong package light concentration suitable for most general lighting applications without the need of any secondary optics.

Octa Light is a fully integrated supplier, offering core Light emitting devices in all three base colors - red, green, blue and white, as well as exotic colors as pink, cyan, yellow, purple and other on basis of client requirements. Octa Light Bulgaria Plc is entirely based within Europe, with R&D and manufacturing centers in Bulgaria. Founded in 2010, Octa Light commits to continuously rise the lumen efficiency of its products and to bring its light emitting diodes closer to mass usage within next years.

www.octa-light.com
info@octa-light.com

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