

**BLV**

series

5W, 150 lm/W**HIGH POWER
LED****TECHNICAL
DATASHEET**

INTRODUCTION

Octa Light high power BLV 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 BLV LED Series Features:

- Extremely low forward voltage @ nominal current - down to 2.8 V
- High output at varied driving currents
- Drivable at 700mA = 2.2 W
- Drivable at 1500mA = 5 W
- 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

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General Coding instructionsn for Octa Light BST LED series Product Binning and Labelling

OCTL – BLV – WW J - F 8A C – T 70 X1 X2 X3 X6 X4 X5 X7 X8 X9

X1 Comp. name	X2 Series name	X3 Color type	X4 Optical type	X5 Chromaticity coordinates BIN ¹	X6 Minimum Flux BIN (Lm)	X7 Testing current (mA)	X8 Vf range at nominal current (V)	X9 CRI range	
OCTL	BLV	CW - Cool White	F - 110 deg Focused	1 (A, B, C, D, E, F, O) ²	F - 60	C - 350	I - 2.8 -3.0	60 - >60	
				2 (A, B, C, D, E, F, O)	G - 70				
				3 (A, B, C, D, E, F, O)	H - 80			J - 3.0 -3.2	70 - >70
				4 (A, B, C, D, E, F, O)	I - 90				
		5 (A, B, C, D, E, F, O)		J - 100			80 - >80		
		6 (A, B, C, D, E, F, O)		K - 110					
		7 (A, B, C, D, E, F, O)		L - 120			90 - >90		
		8 (A, B, C, D, E, F, O)		M - 130					
		BL (Blue)		N - 140			95 - >95		
		RB (Royal Blue)		O - 150					
		VL (Violet)		P - 160					
		RD (Red)		Q - 170					
		RD (Red- Orange)		R - 180					
		PK (Pink)		S - 190					
		YE(yellow)		T - 200					
		OR (Orange)							
		AM (Amber)							
		GN (Green)							
		CY (Cyan)							
		GN - Green							

Notes:

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

ENVIRONMENTAL COMPLIANCE

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



PRODUCT SELECTION

Table 2.1

Product Selection for Octa Light BLV Series LEDs- High lm/W range

Example nomenclatures for BLV LEDs series with highest lm/W combinations

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux(lm) @350mA	Typical Luminous Flux (lm) @ 350mA	Forward voltage range @ 350mA
Warm White	2700K	OCTL - BLV -WWN-F80C-I70	70	75	140	145	2.8-3.0 V
	3000K	OCTL - BLV -WWN-F70A-I70	70	75	140	145	2.8-3.0 V
	3500K	OCTL - BLV -WWN-F60A-I70	70	75	140	145	2.8-3.0 V
Neutral White	4000K	OCTL - BLV -NWD-F50A-I70	70	75	150	155	2.8-3.0 V
	4500K	OCTL - BLV -NWD-F40A-I70	70	75	150	155	2.8-3.0 V
Cool White	5000K	OCTL - BLV -CWD-F30A-I70	70	75	150	155	2.8-3.0 V
	5700K	OCTL - BLV -CWD-F20A-I70	70	75	150	155	2.8-3.0 V
	6500K	OCTL - BLV -CWD-F10A-I70	70	75	150	155	2.8-3.0 V

Table 2.2

Product Selection for Octa Light BLV Series LEDs- High CRI range

Example nomenclatures for BLV LEDs series with high lm/W and High CRI combinations

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux(lm) @350mA	Typical Luminous Flux (lm) @ 350mA	Forward voltage range @ 350mA
Warm White	2700K	OCTL-BLV -WWM-F80C-I80	80	85	130	135	2.8-3.0 V
	3000 K	OCTL-BLV -WWM-F70A-I80	80	85	130	135	2.8-3.0 V
	3500 K	OCTL-BLV -WWM-F60A-I80	80	85	130	135	2.8-3.0 V
Neutral White	4000K	OCTL- BLV -NWN-F50A-I80	80	85	140	145	2.8-3.0 V
	4500K	OCTL- BLV -NWN-F40A-I80	80	85	140	145	2.8-3.0 V
Cool White	5000K	OCTL- BLV -CWD-F30A-I80	80	85	140	145	2.8-3.0 V
	5700K	OCTL- BLV -CWD-F20A-I80	80	85	140	145	2.8-3.0 V
	6500K	OCTL- BLV -CWD-F10A-I80	80	85	140	145	2.8-3.0 V

Table 2.3

Product Selection for Octa Light BLV Series LEDs - Cost Efficiency Range

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux(lm) @350mA	Typical Luminous Flux (lm) @ 350mA	Forward voltage range @ 350mA
Warm White	2700K	OCTL-BLV -WWJ-F80C-I70	70	75	100	105	2.8-3.0 V
	3000 K	OCTL-BLV -WWJ-F70A-I70	70	75	100	105	2.8-3.0 V
	3500 K	OCTL-BLV -WWJ-F60A-I70	70	75	100	105	2.8-3.0 V
Neutral White	4000K	OCTL- BLV -NWK-F50A-I70	70	75	110	115	2.8-3.0 V
	4500K	OCTL- BLV -NWK-F40A-I70	70	75	110	115	2.8-3.0 V
Cool White	5000K	OCTL- BLV -CWK-F30A-I70	70	75	110	115	2.8-3.0 V
	5700K	OCTL- BLV -CWK-F20A-I70	70	75	110	115	2.8-3.0 V
	6500K	OCTL- BLV -CWK-F10A-I70	70	75	110	115	2.8-3.0 V

Notes:

1. Octa Light maintains a tolerance of $\pm 5\%$ on forward voltage measurements.
2. All binning are at 25C color temperature



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-BLV-CWN-F10C-XXX	2.8	2.85	3.2	1.6	5
	OCTL- BLV-CWN-F20C-XXX	2.8	2.85	3.2	1.6	5
	OCTL- BLV-CWN-F30C-XXX	2.8	2.85	3.2	1.6	5
Neutral white	OCTL- BLV-NWD-F40C-XXX	2.8	2.85	3.2	1.6	5
	OCTL- BLV-NWD-F50C-XXX	2.8	2.85	3.2	1.6	5
Warm white	OCTL- BLV-WWD-F60C-XXX	2.8	2.85	3.2	1.6	5
	OCTL- BLV-WWD-F70C-XXX	2.8	2.85	3.2	1.6	5
	OCTL- BLV-WWD-F80C-XXX	2.8	2.85	3.2	1.6	5

Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.
2. Based on order codes, Octa Light PLC can deliver a specific V_f binning range as follows:
 - a. V_f Range 2.8 -3.0 - V_f bin I, see column X8 in BST coding guidelines
 - b. V_f Range 3.0-3.2 - V_f Bin J, see column X8 in BST coding guidelines

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- BLV-CWK-F10C	2.9	3.0	3.4	1.6	5
	OCTL- BLV-CWK-F20C	2.9	3.0	3.4	1.6	5
	OCTL- BLV-CWK-F30C	2.9	3.0	3.4	1.6	5
Neutral white	OCTL- BLV-NWJ-F40C	2.9	3.0	3.4	1.6	5
	OCTL- BLV-NWI-F50C	2.9	3.0	3.4	1.6	5
Warm white	OCTL- BLV-WWH-F60C	2.9	3.0	3.4	1.6	5
	OCTL- BLV-WWH-F70C	2.9	3.0	3.4	1.6	5
	OCTL- BLV-WWH-F80C	2.9	3.0	3.4	1.6	5

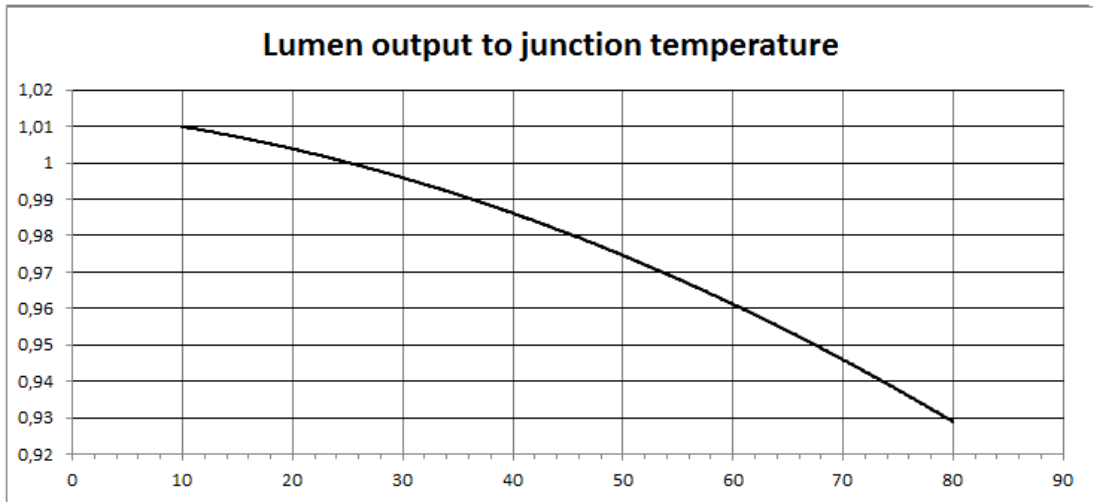
Notes:

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



Light output characteristics over temperature

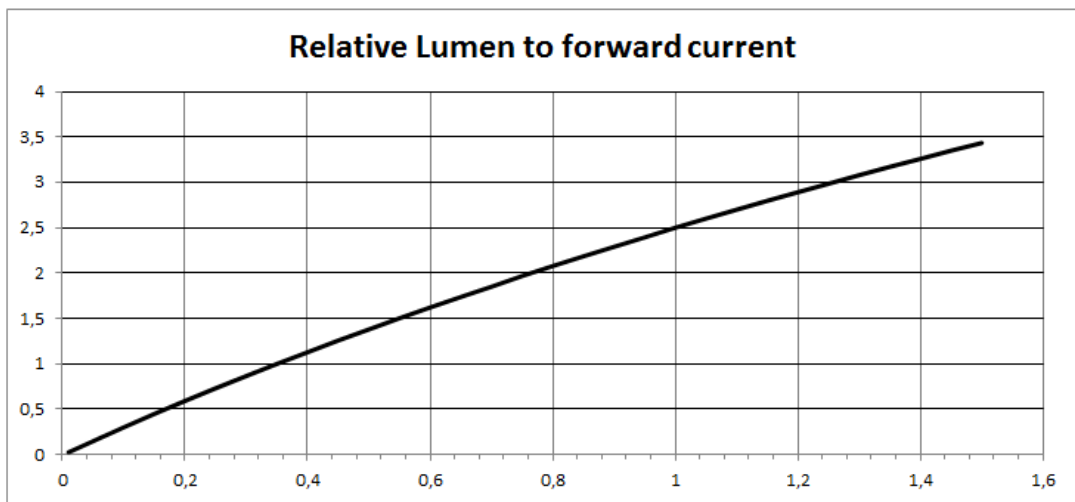
At nominal current, normalized for 25 Degree Celsius



Junction temperature
Degree Celsius

Relative Luminous Flux from forward current at junction temperature 25 °C

1 = nominal lumen output for chosen Lumen bin

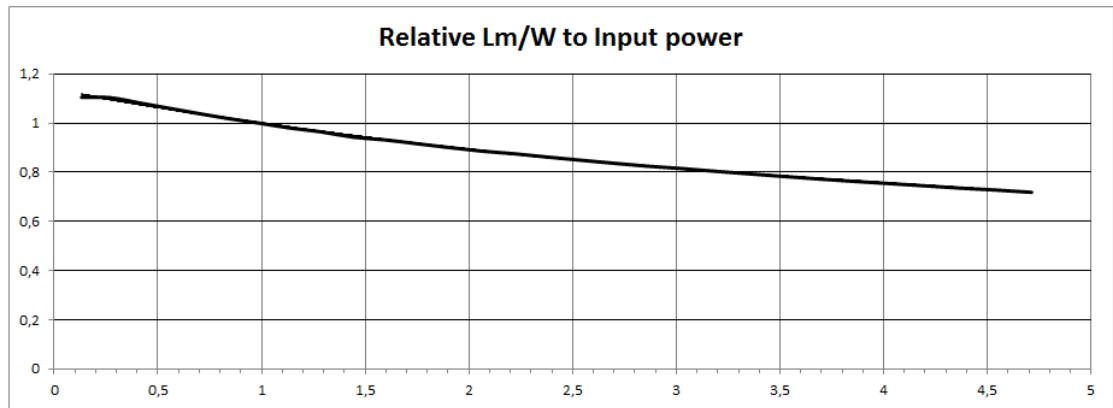


Forward Current
mA



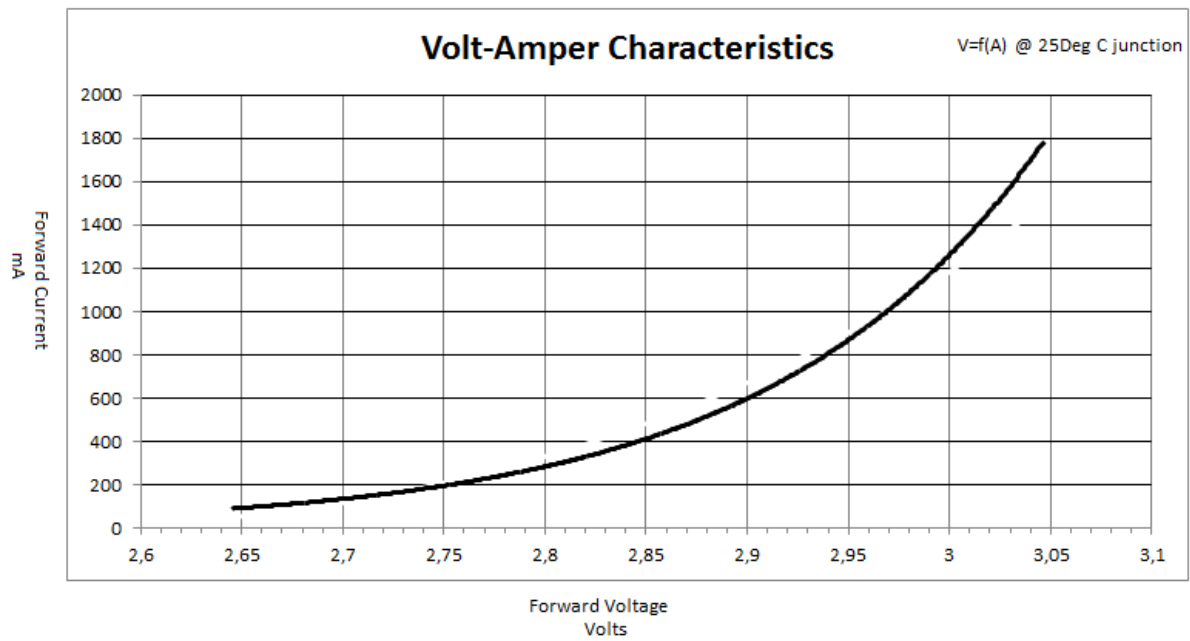
Relative Lumen/W output from input power consumption at junction temperature 25 °C

Relative lm/W output
 I = nominal lm/W output for chosen Lumen and Vf bin



Relative input power
 1 = nominal input power

Volt-Ampere characteristics at Junction temperature 25 °C





ABSOLUTE MAXIMUM RATINGS

Table 5

Absolute maximum ratings at thermal pad temperature 25 °C

Parameter	Symbol	Max rate
Maximum DC forward current (continuous)	$I_{f_{max}}$	1500 mA
Maximum Pulsed current (10 mS pulse width, 10% duty cycle)	$I_{f_{peak}}$	1700 mA
Absolute Max forward voltage @ 350 mA	$V_{fmax\ 350mA}$	3.7 V
Maximal Led junction teperature	T_{jmax}	150 C
ESD sensitivity	V	Class 2 *
Operating Case temperature @ 350mA	T_{cmax}	-60 + 140
Soldering temperature	$T_{soldermax}$	230 C **
Storage temperature	T_{store}	-40C to +120 C
Allowable Reflow cycles	/	3 times
Reverse voltage at maximal reverse current 10 μ A	V_r	5 V
	-	8 Sec.

* ESD sensitivity CLASS II, human body model, ANSI/ESDA/JEDEC JS-001-2012

** JEDEC 020D

THERMAL AND OPTICAL CHARACTERISTICS

Table 6

Absolute maximum ratings for thermal pad temperature 25 °C

Parameter	Symbol	Typical
Thermal resistance, junction to solder point	C/W	5
Viewing Angle Lambertian Distribution (FWHM)	Degrees	110 Focused *
Color Shift Versus angle Δx and Δy at 80 degree viewing angle, CIE 1931 Optical distribution type A	$\Delta x, \Delta y$	0.03, 0.06

* See optical advantage sheet for more detailed information about distribution angle

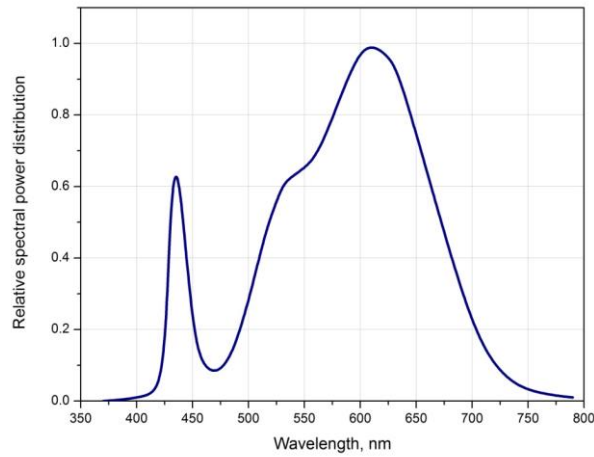
Notes:

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. Maximum soldering temperature is not recommended to exceed 210°C, although the LED could withstand up to 230°C. For more information about reflow process profile and preferred soldering adhesives, please refer to Application datasheet.

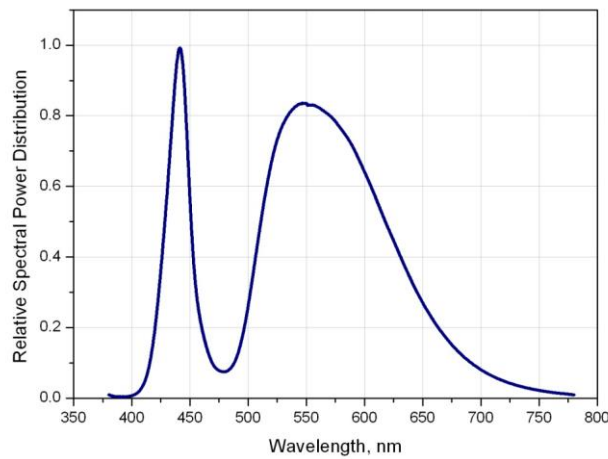


RELATIVE SPECTRAL POWER DISTRIBUTION CHARACTERISTICS

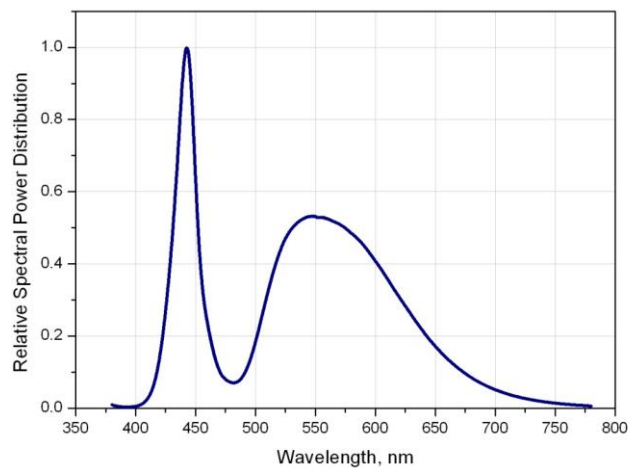
Warm White LED Relative spectral power distribution at 350mA test current



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



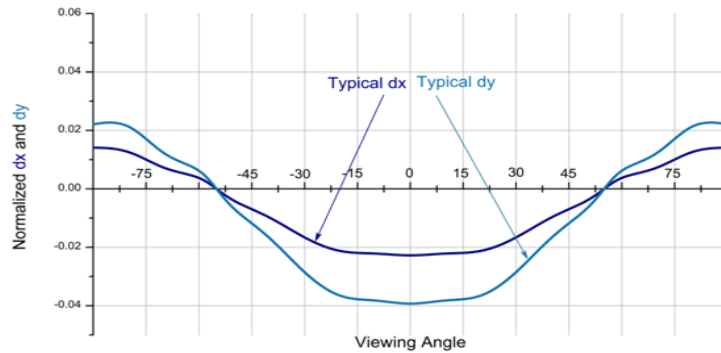
Cool White LED Relative spectral power distribution at 350mA test current





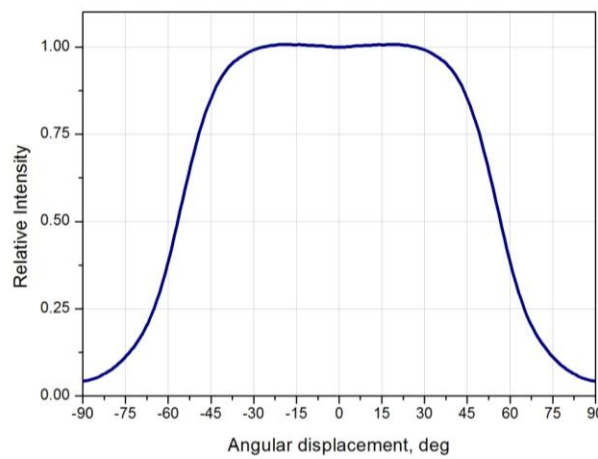
EMISSION ANGLE CHARACTERISTICS

Typical Color vs. Viewing Angle



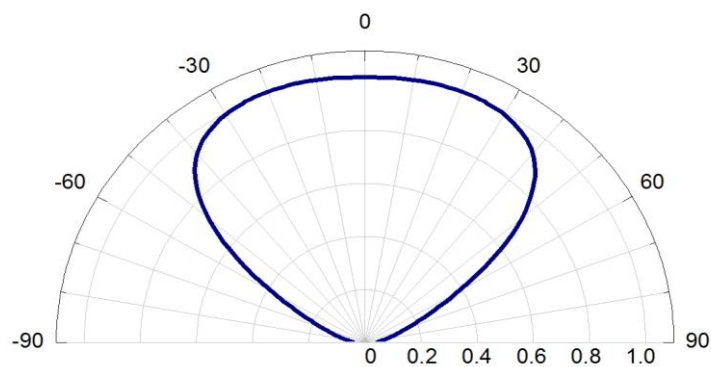
Maximal Color Shifting over viewing angle, normalized for 55 deg

Typical Spatial Radiation Pattern



Typical representative spatial radiation pattern for 110° Focused

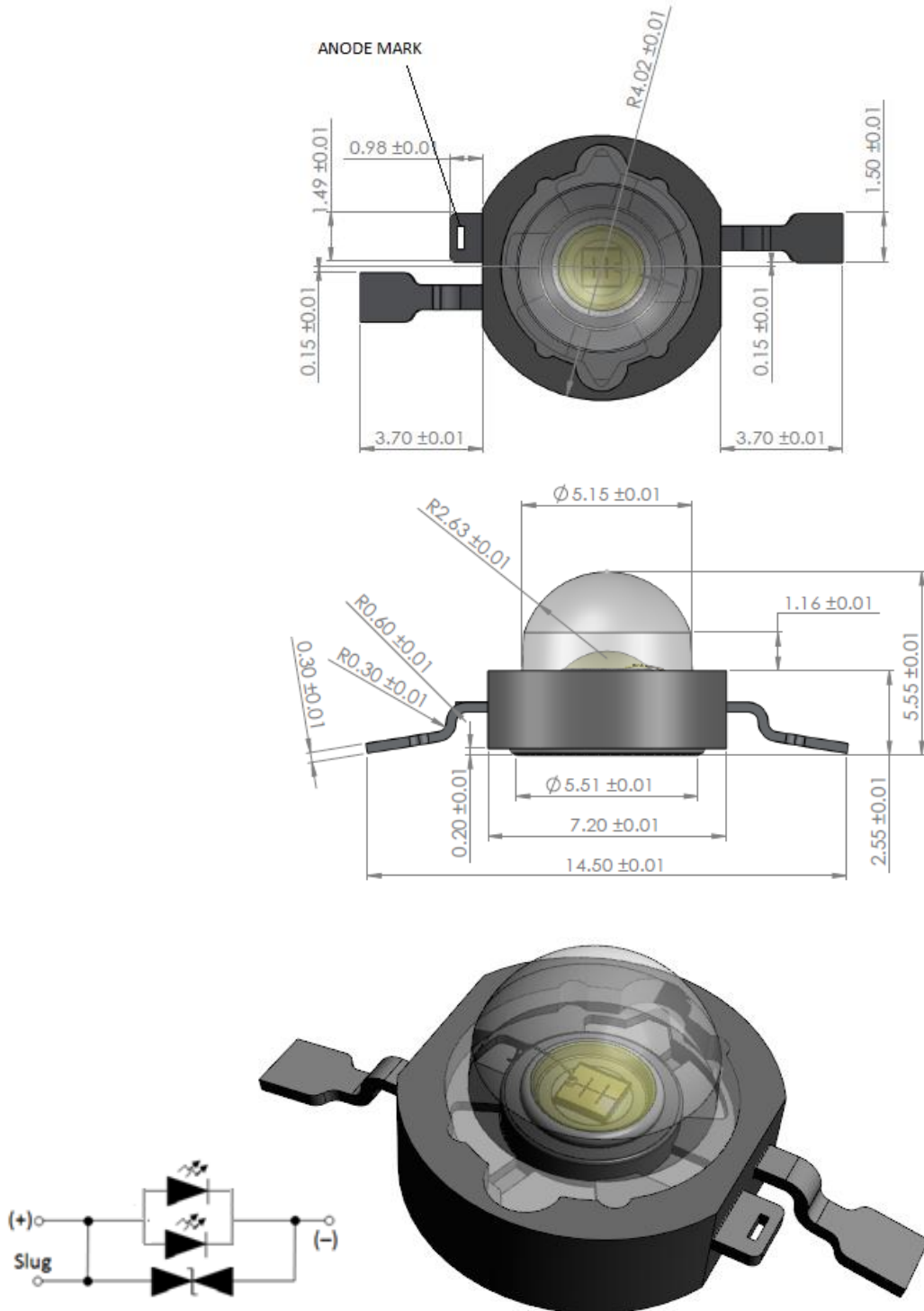
Typical Polar Radiation Pattern for Focus Optical Type



Typical representative polar radiation pattern for 110° Focused



LED PACKAGE DIMENSIONS AND POLARITY



OCTA LIGHT LED CIRCUITS

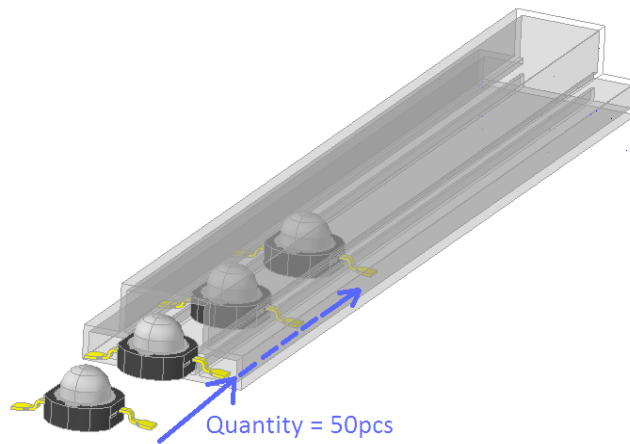
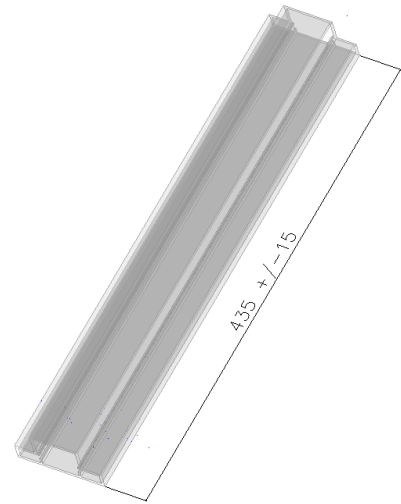
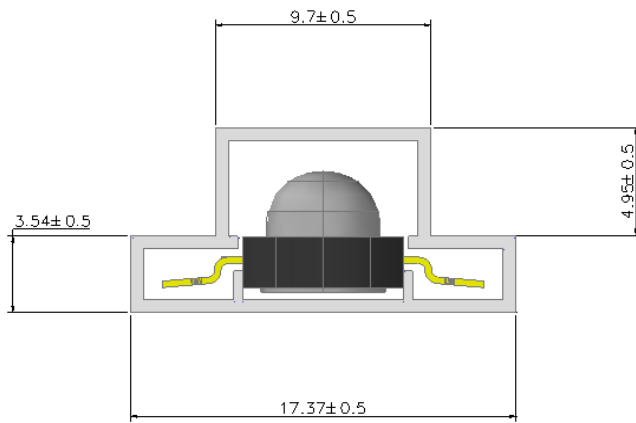
Notes:

1. All dimensions are in mm
2. Drawings are not to scale
3. Metal slug on bottom is electrically connected to Anode of the Light emitting device



PACKAGING INFORMATION

TUBE DIMENSIONS



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

LED PART NUMBER

QUANTITY



COMPANY INTERNAL INFORMATION

ROHS DIRECTIVE COMPLIANT

CE MARKING



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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