

**TG**

series

0.5 W**3.14 x 1.8 MM LED****TECHNICAL
DATASHEET****INTRODUCTION**

Octa Light low power white LEDs are optimized to bring high performance and quality of light needed for wide range of LED lamps and luminaires, such as LED bulbs, LED tubes, accent lighting, back light applications, multisource lighting fixtures. In addition to delivering specified Correlated Color Temperature and Color Rendering combinations, TG series emitters are characterized by good efficacy, long life and reliability. This document contains the performance data needed to design LED based applications.

Unlike fluorescent sources Octa Light TG series LEDs contain NO mercury and are more energy efficient than incandescent and halogen light sources.

Main features

- High efficacy and sustainable design
- High beam angle of illumination > 140 degree
- Compact design, higher achievable power density in luminaire systems
- Wide range of specified CCT & CRI combinations
- ANSI compliant Quarter binning
- Tested according to LM-80 Lumen maintenance standards
- Reflow process compatible
- Optimized optical performance for higher light output compared to market competitors



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General Coding instructions for Octa Light
TG LED series
Product Binning and Labelling

OCTL-TG-WW J - F 8A C - T 70

X1 X2 X3 X6 X4 X5 X7 X8 X9

Table 1

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	TG	CW - Cool White	L - 140 deg. Lambertian	1 (A, B, C, D, E, F, O) ²	A - 5	A - 150	I - 2.8 - 3.0	60 -> 60	
				2 (A, B, C, D, E, F, O)	A1 - 6				J - 3.0 - 3.2
				3 (A, B, C, D, E, F, O)	A2 - 7				
		4 (A, B, C, D, E, F, O)		A3 - 8	80 -> 80				
		5 (A, B, C, D, E, F, O)		A4 - 9					
		6 (A, B, C, D, E, F, O)		A5 - 10					
		7 (A, B, C, D, E, F, O)		A6 - 12					
		8 (A, B, C, D, E, F, O)		A7 - 14					
		BL (Blue)		A8 - 16					
		RB (Royal Blue)		A9 - 18					
		VL (Violet)		B - 20					
		RD (Red)		C - 30					
		RO (Red- Orange)		D - 40					
		PK (Pink)		E - 50					
		GN (Green)		F - 60					
		CY (Cyan)		G - 70*					

Notes:

1. Information about chromaticity coordinates bin can be found in Binning information file.
2. Chromaticity coordinates bin 10 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 TG 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 TG Series LEDs- **High lm/W range**

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

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux (lm) Φ_v @150mA	Typical Luminous Flux (lm) Φ_v @150mA	Forward voltage range
Warm White	2700K	OCTL-TG-WWE-A80A-170	70	75	50	55	2.8-3.0 V
	3000K	OCTL-TG-WWE-A70A-170	70	75	50	55	2.8-3.0 V
	3500K	OCTL-TG-WWE-A60A-170	70	75	50	55	2.8-3.0 V
Neutral White	4000K	OCTL-TG-NWF-A50A-170	70	75	60	65	2.8-3.0 V
	4500K	OCTL-TG-NWF-A40A-170	70	75	60	65	2.8-3.0 V
Cool White	5000K	OCTL-TG-CWF-A30A-170	70	75	60	65	2.8-3.0 V
	5700K	OCTL-TG-CWF-A20A-170	70	75	60	65	2.8-3.0 V
	6500K	OCTL-TG-CWF-A10A-170	70	75	60	65	2.8-3.0 V

Table 2.2

Product Selection for Octa Light TG Series LEDs- **High CRI range**

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

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux (lm) Φ_v @150mA	Typical Luminous Flux (lm) Φ_v @150mA	Forward voltage range
Warm White	2700K	OCTL-TG-WWE-A80A-180	80	85	50	55	2.8-34 V
	3000 K	OCTL-TG-WWE-A70A-180	80	85	50	55	2.8-34 V
	3500 K	OCTL-TG-WWE-A60A-180	80	85	50	55	2.8-34 V
Neutral White	4000K	OCTL-TG-NWF-A50A-180	80	85	60	65	2.8-34 V
	4500K	OCTL-TG-NWF-A40A-180	80	85	60	65	2.8-34 V
Cool White	5000K	OCTL-TG-CWF-A30A-180	80	85	60	65	2.8-34 V
	5700K	OCTL-TG-CWF-A20A-180	80	85	60	65	2.8-34 V
	6500K	OCTL-TG-CWF-A10A-180	80	85	60	65	2.8-34 V

Table 2.3

Product Selection for Octa Light TG Series LEDs - **Cost Efficiency Range**

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux (lm) Φ_v @150mA	Typical Luminous Flux (lm) Φ_v @150mA	Forward voltage range
Warm White	2700K	OCTL-TG-WWD-A80A-170	70	75	40	45	2.8-34 V
	3000 K	OCTL-TG-WWD-A70A-170	70	75	40	45	2.8-34 V
	3500 K	OCTL-TG-WWD-A60A-170	70	75	40	45	2.8-34 V
Neutral White	4000K	OCTL-TG-NWE-A50A-170	70	75	50	55	2.8-34 V
	4500K	OCTL-TG-NWE-A40A-170	70	75	50	55	2.8-34 V
Cool White	5000K	OCTL-TG-CWE-A30A-170	70	75	50	55	2.8-34 V
	5700K	OCTL-TG-CWE-A20A-170	70	75	50	55	2.8-34 V
	6500K	OCTL-TG-CWE-A10A-170	70	75	50	55	2.8-34 V

Notes:

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



ELECTRICAL CHARACTERISTICS

*Forward voltage characteristics for series connection,
Test current $I_f = 150$ 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-TG-XXX-CWK-F10C	2.8	3.2	3.4	1.6	1.5
	OCTL-TG-XXX-CWK-F20C	2.8	3.2	3.4	1.6	1.5
	OCTL-TG-XXX-CWK-F30C	2.8	3.2	3.4	1.6	1.5
Neutral white	OCTL-TG-XXX-NWJ-F40C	2.8	3.2	3.4	1.6	1.5
	OCTL-TG-XXX-NWI-F50C	2.8	3.2	3.4	1.6	1.5
Warm white	OCTL-TG-XXX-WWH-F60C	2.8	3.2	3.4	1.6	1.5
	OCTL-TG-XXX-WWH-F70C	2.8	3.2	3.4	1.6	1.5
	OCTL-TG-XXX-WWH-F80C	2.8	3.2	3.4	1.6	1.5

Notes:

1. Octa Light PLC maintains 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 TG coding guidelines
 - b. V_f Range 3.0-3.2 – V_f Bin J, see column X8 in TG coding guidelines
 - c. V_f range 3.2-3.4 – V_f Bin K, see column X8 in TG coding guidelines

ABSOLUTE MAXIMUM RATINGS

Table 4.

Absolute maximum ratings for thermal pad temperature 25°C

Parameter	Symbol	Max rate
Maximum DC forward current (continuous)	$I_{f\max}$	350 mA
Maximum pulse current (10 mS pulse width, 10% duty cycle)	$I_{f\text{peak}}$	450 mA
Absolute Max forward voltage @ 150 mA	$V_{f\max\ 150\text{mA}}$	3.4 V
Max forward voltage @ 350 mA	$V_{f\max\ 350\text{mA}}$	3.8 V
Maximal LED junction temperature	$T_{j\max}$	150°C
ESD sensitivity	V	Class 2 *
Operating Case temperature at 150mA	$T_{c\max}$	$-60^\circ + 140^\circ$
Soldering temperature	$T_{\text{soldermax}}$	260°C^{**}
Storage temperature	T_{store}	-40°C to $+120^\circ\text{C}$
Allowable Reflow cycles	/	3 times
Reverse voltage at maximal reverse current $10\mu\text{A}$	V_r	15 V

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

** JEDEC Q20D



Thermal and Optical Characteristics

Table 5.

Absolute maximum ratings for thermal pad temperature 25 °C

Parameter	Symbol	Typical
Thermal resistance, junction to solder point	C/W	2.0
Viewing Angle Lambertian Distribution (FWHM)	Degrees	140
Color Shift Versus angle Δx and Δy at 80 degree viewing angle, CIE 1931 Optical distribution type A	$\Delta x, \Delta y$	0.04, 0.04

JEDEC MOISTURE SENSITIVITY

Table 6.

LEVEL	Floor Life		Soak Requirements	
	Time	Condition	Time	Condition
3	168 hours	30, 60% RH	192 Hrs +5 -0 Hrs	30°C 62% RH

REFLOW SOLDERING CHARACTERISTICS

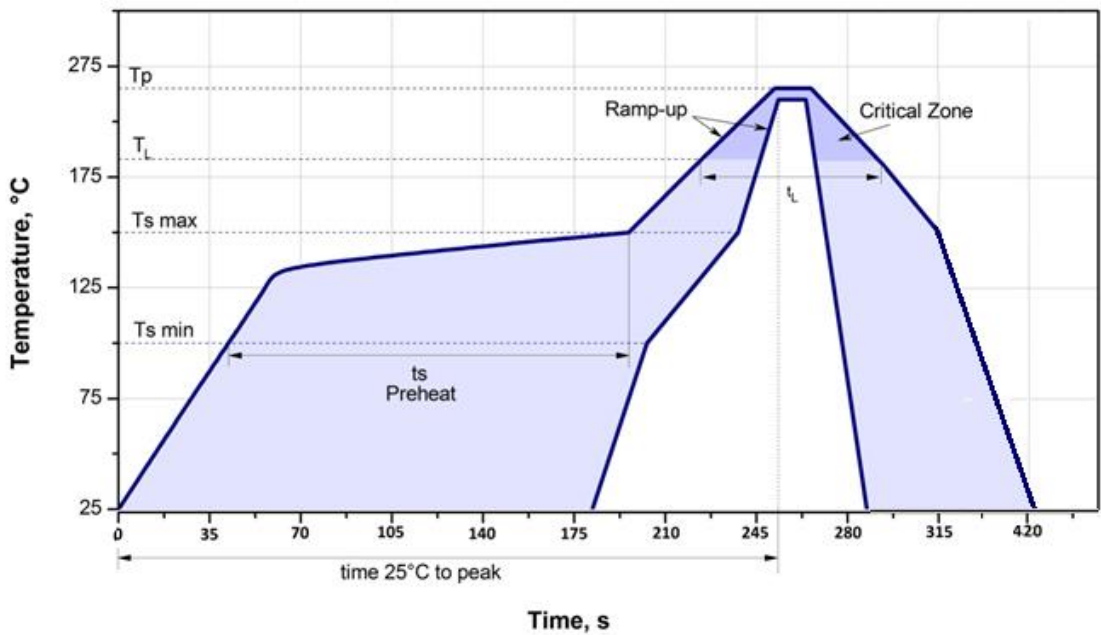


Figure 1.
Reflow Soldering Profile



Table 7.
Reflow Profile Features

Profile Feature	Assembly
Average Ramp-up rate (T _{smax} to T _p)	3°C/second max.
Preheat:	
- Temperature Min (T _{smin})	100°C
- Temperature Max (T _{smax})	150°C
- Time (T _{smin} to T _{smax})	60-120 seconds
Liquidous Temperature T _L	220°C
Maximum maintained time Time t _L	60-120 seconds
Absolute Maximum Peak package body Temperature (T _p)	260°C
Recommended Peak Package temperature	240°C
Time within 5°C of recommended Peak Package temperature (t _p)	10-30 seconds
Ramp-down rate	6°C/second max
Time 25°C to peak temperature	7 minutes max.

Relative Spectral Distribution (mW Versus Wavelength)

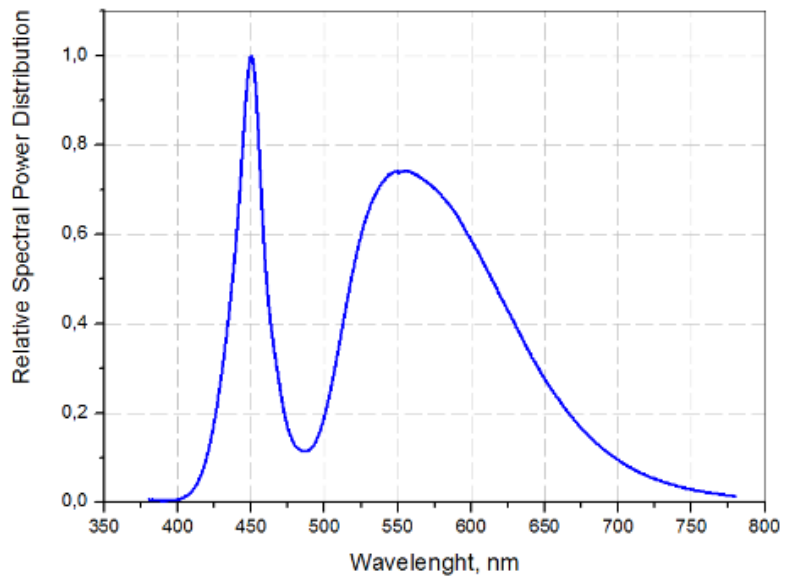


Figure 2.
Relative Cool White Spectral power distribution

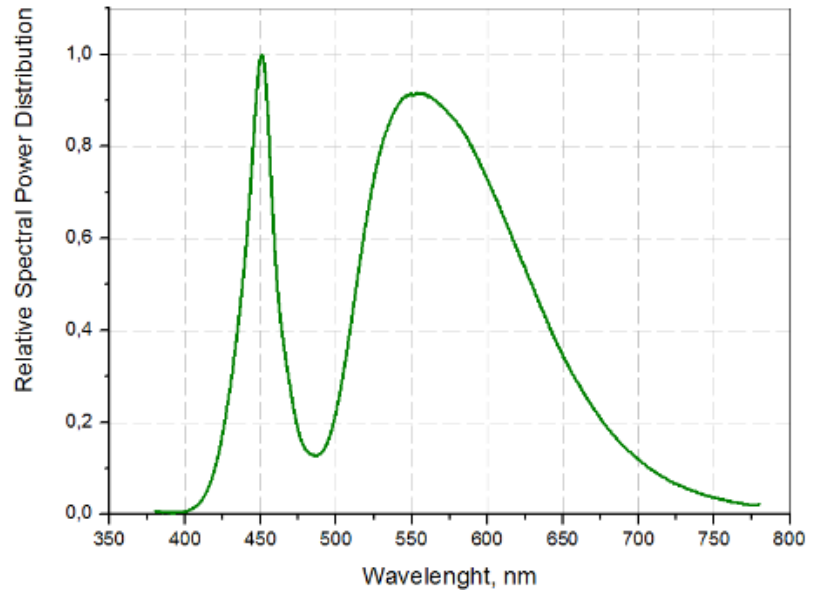


Figure 3.
Relative Neutral White Spectral power distribution

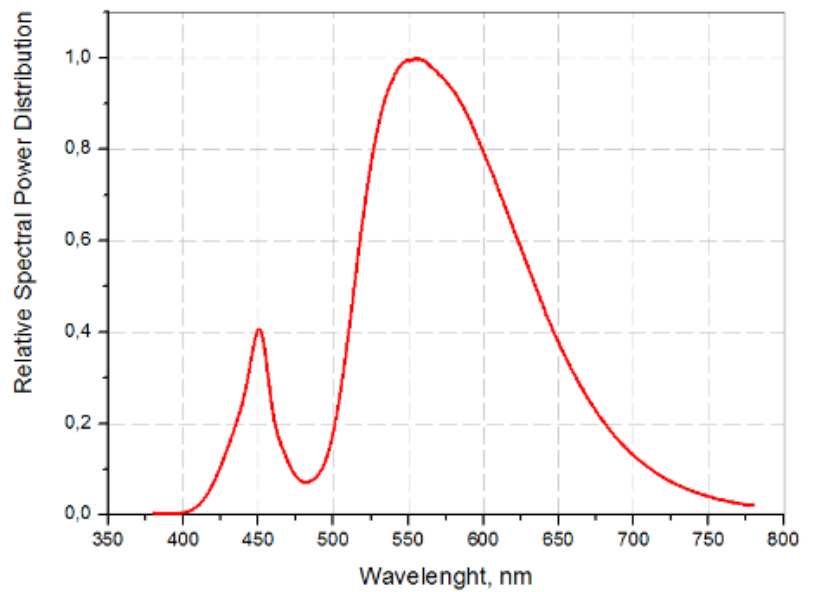


Figure 4.
Relative Warm White Spectral power distribution



Light output characteristics over temperature

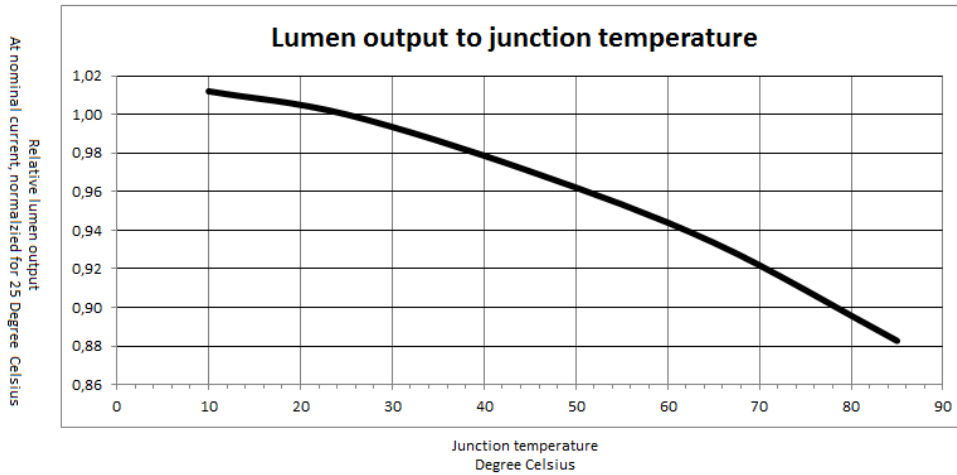


Figure 5.

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

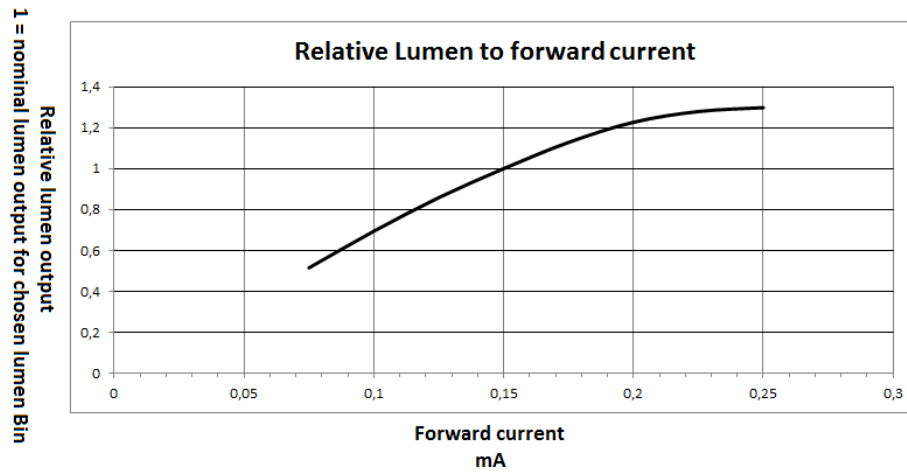


Figure 6.

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

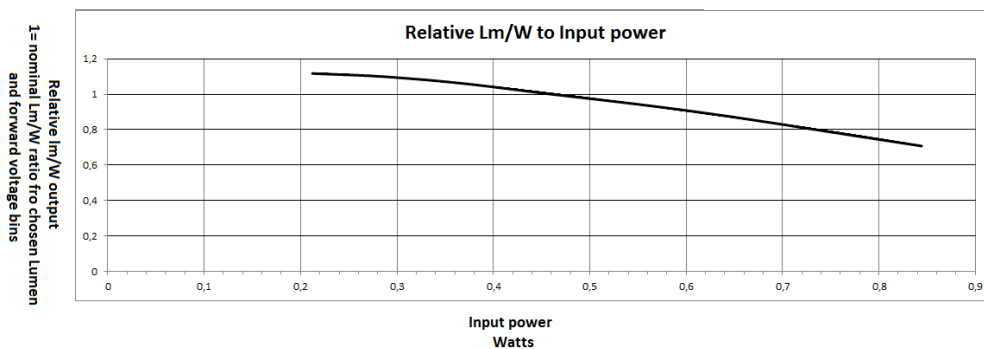


Figure 7.

Volt-Ampere characteristics at Junction temperature 25 °C



LABELLING INFORMATION

LED PART NUMBER

ROHS DIRECTIVE COMPLIANCE

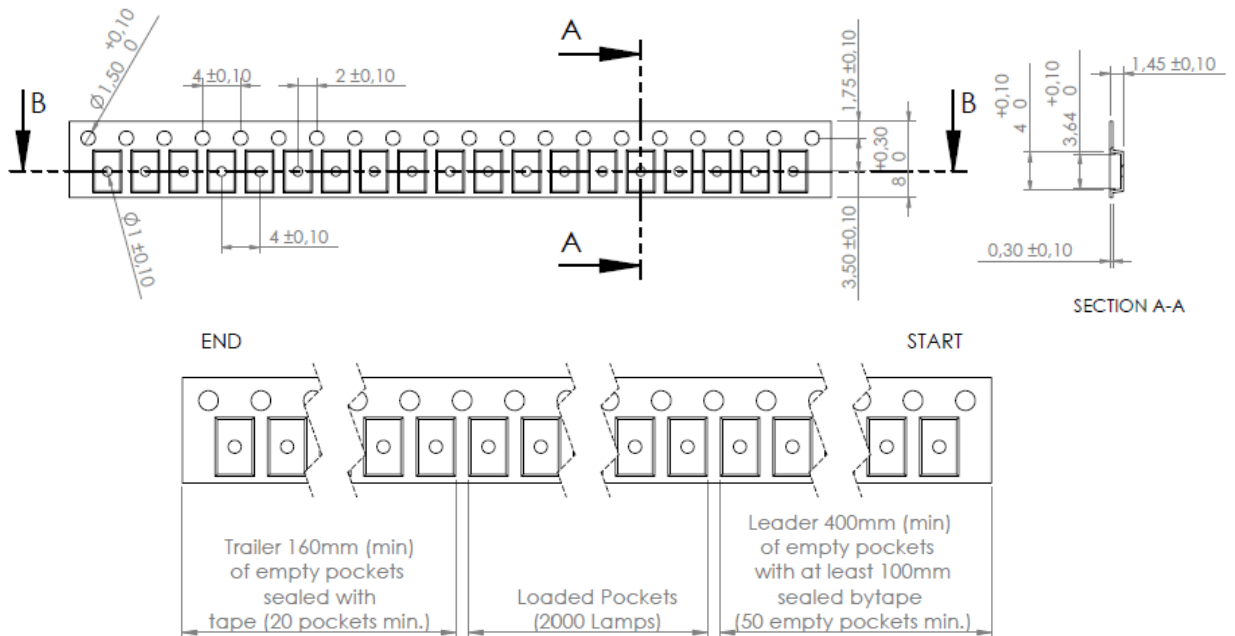
LEAD FREE MARK

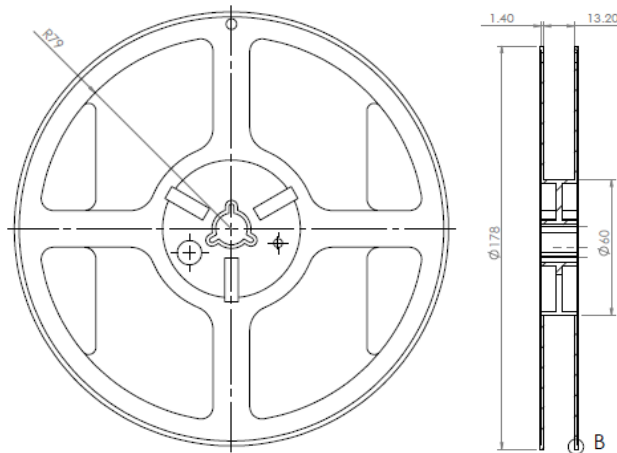


INTERNAL COPANY INFORMATION

QUANTITY

TAPE AND REEL SPECIFICATION

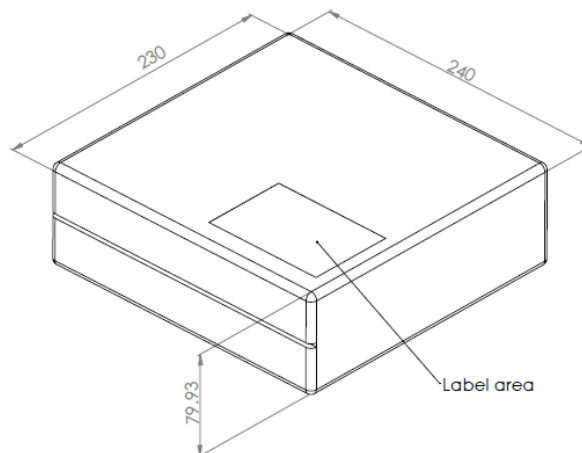




Packaging notes:

- All dimensions are in mm
- Empty pockets sealed with top cover tape
- 7 inch reel, 2000 pieces standard packaging, 500 minimum packaging
- Maximal number of consecutive missing LEDs is three

PACKAGING SPECIFICATION



Packaging notes:

- All dimensions are in mm
- LEDs are delivered in Carton Boxes, each containing up to 5 ESD protective Bags including a vacuum sealed 7 inch Reel
- Label information contains the information regarding the Leds inside each box, as well as reel number inside

COMPANY INFORMATION

Octa Light Bulgaria was established in 2010 as a research and manufacturing center for Light Emitting Diodes (LED) entirely based in the EU. Octa Light Bulgaria own LED portfolio under the OCTALED brand is constantly upgrading and improving to bring high performance and quality of light sources for today's wide range of lighting applications. The company is also OEM and ODM supplier of LED packages.

Today Octa Light is fully vertically integrated manufacturer of LED packages, LED modules, LED lamps and LED luminaires.

Octa Light Bulgaria offers also complete lighting solutions accomplishing a variety of lighting projects with own range of luminaires. Further to its core lighting business the company offers services as a SMT electronic assembly supplier.

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