



Intertek



5050 white & 5050 RGB

series

0.5 W
PLCC 5.0x5.0 MM

TECHNICAL DATASHEET

INTRODUCTION

Octa Lighthigh low and mid power PLCC 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, our PLCC LEDs 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 5050 Series Features

- Multiple source from one package - White, RGB and RGB open anode variants
- Wide range of specified CCT & CRI combinations
- ANSI compliant Quarter binning for white series
- ITE international standards compliant Color series
- Tested according to LM-80 Lumen maintenance standards
- Reflow process compatible
- Optimized optical performance for higher light output compared to market competitors

General Coding instructions for Octa Light 5050 PLCC LED series Product Binning and Labelling

OCTL – 550 – WW J – F 8A C-T 70

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	550	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			
		NW - Neutral White	3 (A, B, C, D, E, F, O)	A2 - 7	J - 3.0 - 3.2	70 - >70		
			4 (A, B, C, D, E, F, O)					
			5 (A, B, C, D, E, F, O)					
			6 (A, B, C, D, E, F, O)					
			7 (A, B, C, D, E, F, O)					
			8 (A, B, C, D, E, F, O)					
		WW - Warm White	BL (Blue)	A3 - 8	K - 3.2 - 3.4	80 - >80		
			RB (Royal Blue)	A4 - 9				
			VL (Violet)	A5 - 10				
			RD (Red)	A6 - 12				
		BL - Blue	RD (Red)	A7 - 14	A8 - 16			
			RO (Red- Orange)					
		RD - Red	PK (Pink)	A9 - 18	B - 20			
			GN (Green)					
		GN - Green	CY (Cyan)	C - 30	D - 40			
			CL (Color)					
		CL - RGB	E - 50	F - 60				
			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 product



PRODUCT SELECTION

Table 2.1 Product Selection for Octa Light 5050 Series LEDs- **High lm/W range**

Example nomenclatures for 5050 PLCC LED 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) @ 150mA	Forward voltage range
Warm White	2700K	OCTL-550-WWE-A80A-I70	70	75	50	55	2.8-3.0 V
	3000 K	OCTL-550-WWE-A70A-I70	70	75	50	55	2.8-3.0 V
	3500 K	OCTL-550-WWE-A60A-I70	70	75	50	55	2.8-3.0 V
Neutral White	4000K	OCTL-550-NWF-A50A-I70	70	75	60	65	2.8-3.0 V
	4500K	OCTL-550-NWF-A40A-I70	70	75	60	65	2.8-3.0 V
Cool White	5000K	OCTL-550-CWF-A30A-I70	70	75	60	65	2.8-3.0 V
	5700K	OCTL-550-CWF-A20A-I70	70	75	60	65	2.8-3.0 V
	6500K	OCTL-550-CWF-A10A-I70	70	75	60	65	2.8-3.0 V

Table 2.2 Product Selection for Octa Light 5050 Series LEDs- **High CRI range**

Example nomenclatures for 5050 PLCC 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) @ 150mA	Forward voltage range
Warm White	2700K	OCTL-550-WWE-A80A-I80	80	85	50	55	2.8-3.4 V
	3000 K	OCTL-550-WWE-A70A-I80	80	85	50	55	2.8-3.4 V
	3500 K	OCTL-550-WWE-A60A-I80	80	85	50	55	2.8-3.4 V
Neutral White	4000K	OCTL-550-NWF-A50A-I80	80	85	60	65	2.8-3.4 V
	4500K	OCTL-550-NWF-A40A-I80	80	85	60	65	2.8-3.4 V
Cool White	5000K	OCTL-550-CWF-A30A-I80	80	85	60	65	2.8-3.4 V
	5700K	OCTL-550-CWF-A20A-I80	80	85	60	65	2.8-3.4 V
	6500K	OCTL-550-CWF-A10A-I80	80	85	60	65	2.8-3.4 V

Table 2.3 Product Selection for Octa Light 5050 Series LEDs- **Cost Efficiency Range**

	Nominal CCT	Part Number	Minimum CRI	Typical CRI	Minimal Luminous Flux(lm) Φ_v @150mA	Typical Luminous Flux (lm) @ 150mA	Forward voltage range
Warm White	2700K	OCTL-550-WWD-A80A-I70	70	75	40	40	2.8-3.4 V
	3000 K	OCTL-550-WWD-A70A-I70	70	75	40	40	2.8-3.4 V
	3500 K	OCTL-550-WWD-A60A-I70	70	75	40	40	2.8-3.4 V
Neutral White	4000K	OCTL-550-NWE-A50A-I70	70	75	50	45	2.8-3.4 V
	4500K	OCTL-550-NWE-A40A-I70	70	75	50	45	2.8-3.4 V
Cool White	5000K	OCTL-550-CWE-A30A-I70	70	75	50	45	2.8-3.4 V
	5700K	OCTL-550-CWE-A20A-I70	70	75	50	45	2.8-3.4 V
	6500K	OCTL-550-CWE-A10A-I70	70	75	50	45	2.8-3.4 V

Notes:

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



ELECTRICAL CHARACTERISTICS

Forward voltage characteristics at $I_f = 150 \text{ mA}$ and thermal pad temperature 25°C :

Table 3.

Color	Part Name	Forward Voltage Vf (V)			$\Delta V_f/\Delta T_j$ (mV/°C), at $I_m=5\text{mA}$	Rth j-c (°C/W)
		Min.	Typical	Max.		
Cool white	OCTL-550-CWK-F10C	2.8	3.2	3.6	1.6	10
	OCTL-550-CWK-F20C	2.8	3.2	3.6	1.6	10
	OCTL-550-CWK-F30C	2.8	3.2	3.6	1.6	10
Neutral white	OCTL-550-NWJ-F40C	2.8	3.2	3.6	1.6	10
	OCTL-550-NWI-F50C	2.8	3.2	3.6	1.6	10
Warm white	OCTL-550-WWH-F60C	2.8	3.2	3.6	1.6	10
	OCTL-550-WWH-F70C	2.8	3.2	3.6	1.6	10
	OCTL-550-WWH-F80C	2.8	3.2	3.6	1.6	10

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 Vf binning range as follows:
 - a. Vf Range 2.8 -3.0 – Vf bin I, see column X8 in TG coding guidelines
 - b. Vf Range 3.0-3.2 – Vf Bin J, see column X8 in TG coding guidelines
 - c. Vf range 3.2-3.4 – Vf 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)	$I_{f_{max}}$	200 mA
Maximum Pulsed current (10 mS pulse width, 10% duty cycle)	$I_{f_{peak}}$	400 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 + 140
Soldering temperature	$T_{solder_{max}}$	260 C **
Storage temperature	T_{store}	-40C to +120 C
Allowable Reflow cycles	/	3 times
Reverse voltage at maximal reverse current $10\mu\text{A}$	V_r	5 V

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

** JEDEC 020D

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	120
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

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

REFLOW SOLDERING CHARACTERISTICS

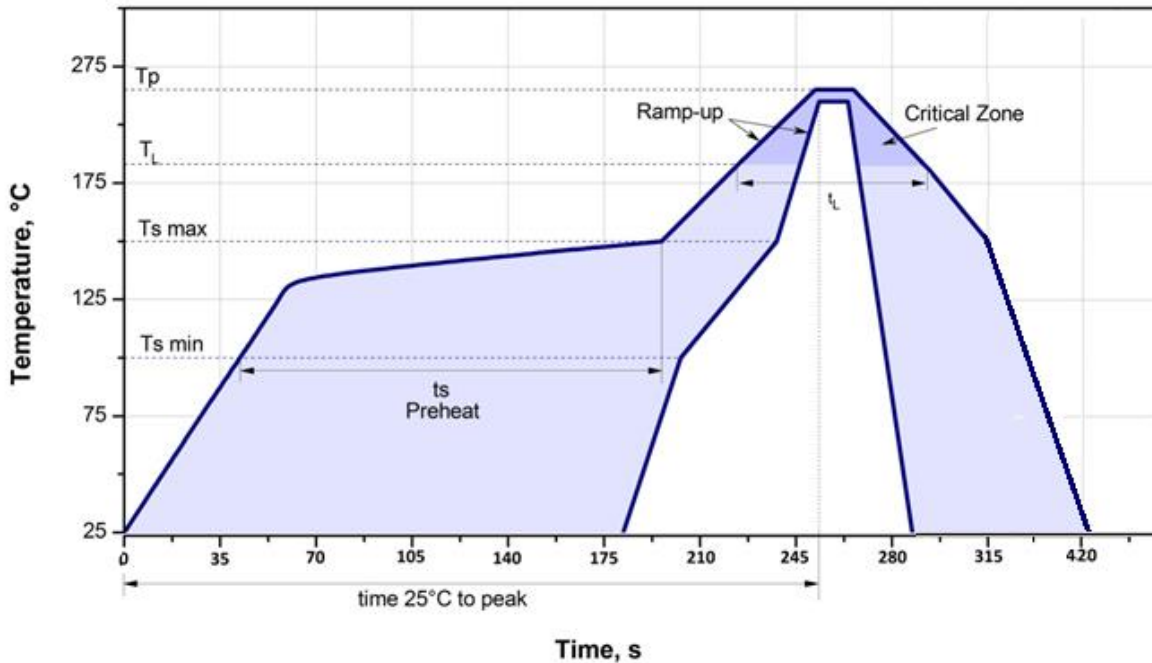


Figure 1. Reflow Soldering Profile

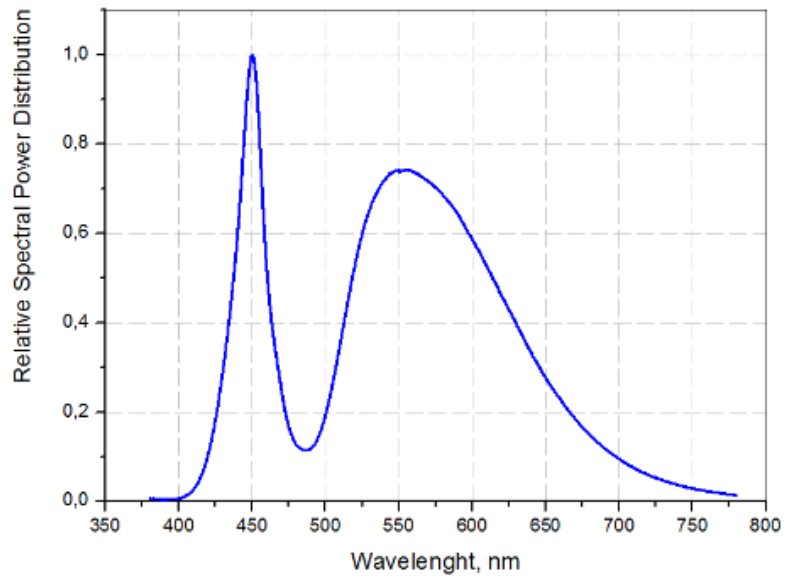
Profile Feature	Assembly
Average Ramp-up rate (Tsmax to Tp)	3°C/second max.
Preheat:	
- Temperature Min (Tsmín)	100°C
- Temperature Min (Tsmáx)	150°C
- Time (Tsmín to Tsmáx)	60-120 seconds
Liquidous Temperature T_L	220°C
Maximum maintained time T_{timetL}	60-120 seconds
Absolute Maximum Peak package 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.

Table 6. Reflow Profile Features

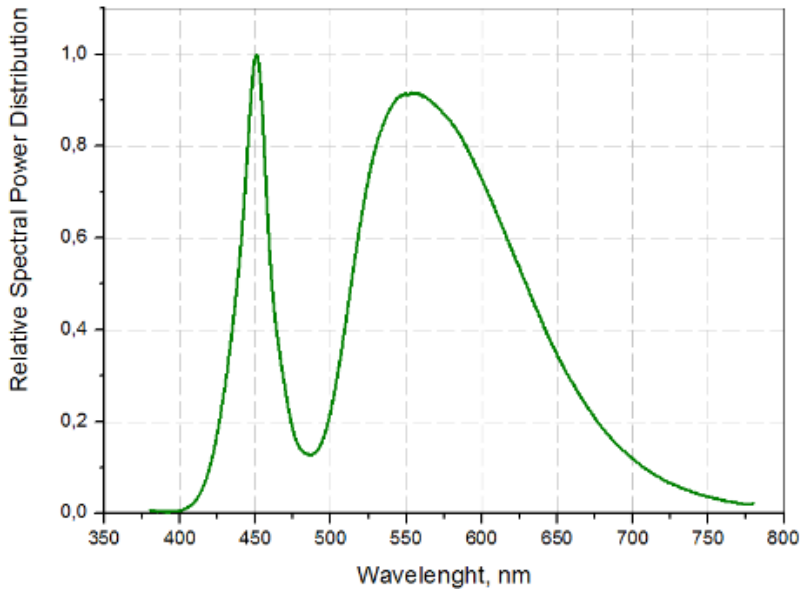


Relative Spectral Distribution (mW Vs. Wavelength)

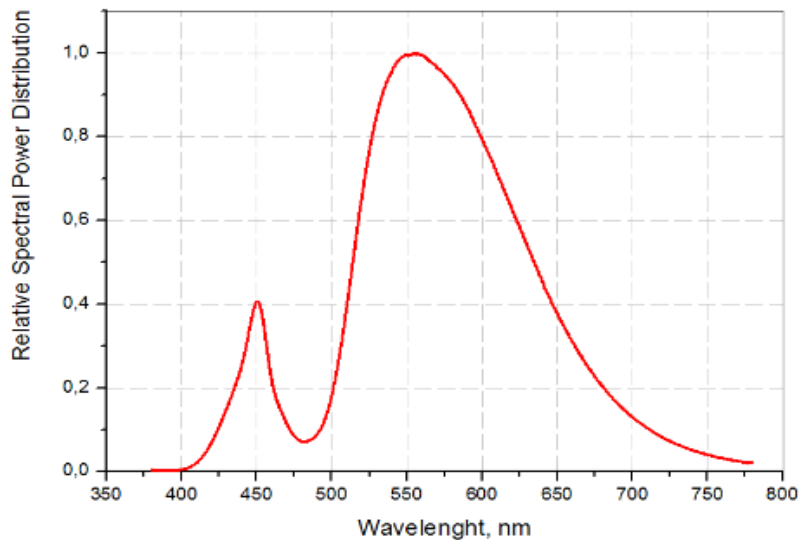
Relative Cool White Spectral power distribution



Relative Neutral White Spectral power distribution

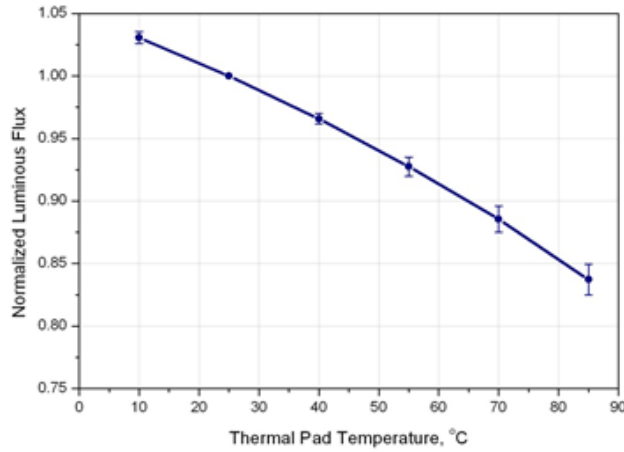


Relative Warm White Spectral power distribution



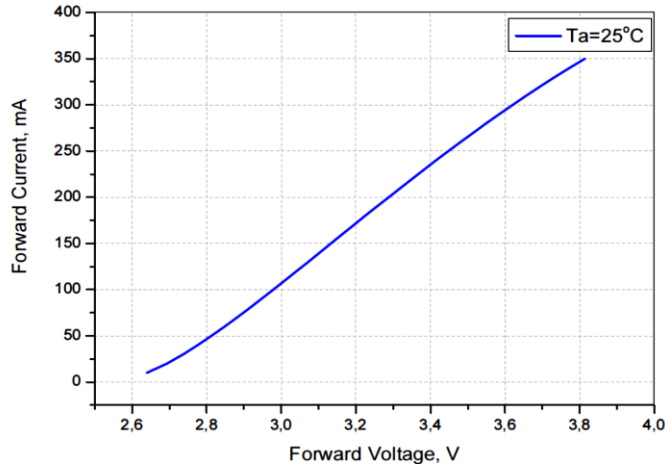


Light output characteristics over temperature

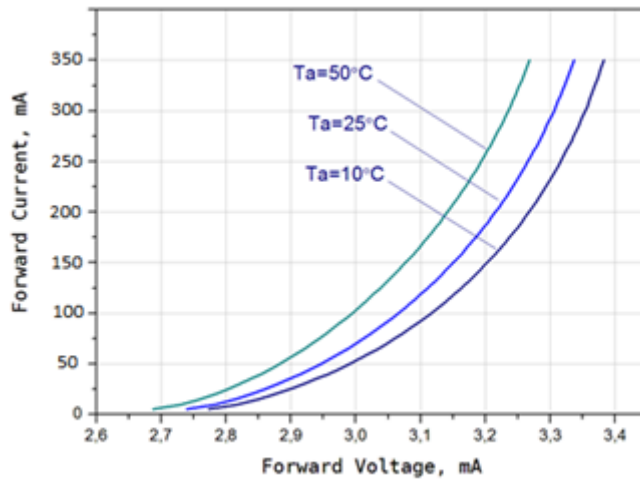


Normalized Luminous Flux at 25°C, If = 150mA

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



Volt-Ampere characteristics at Thermal pad temperature 10 °C, 25 °C and 50 °C

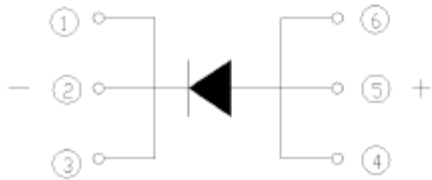
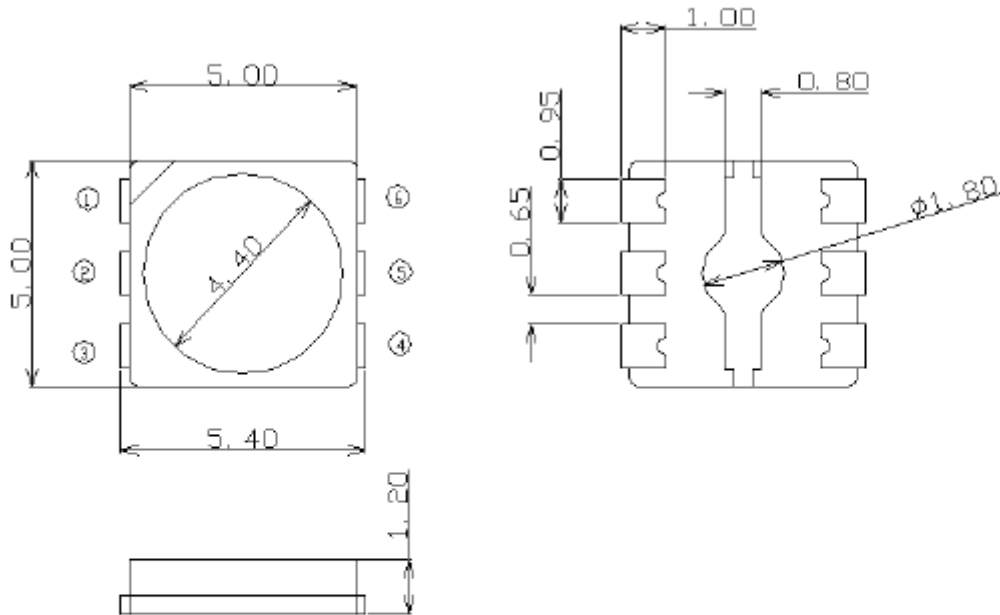


Notes:

1. Octa Light PLC maintains a tolerance of ±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.



LED PACKAGE DIMENSIONS AND POLARITY



Notes:

1. All dimensions are in mm
2. Drawings are not to scale

LABELLING INFORMATION

LED PART NUMBER

ROHS DIRECTIVE COMPLIANCE

LEAD FREE MARK

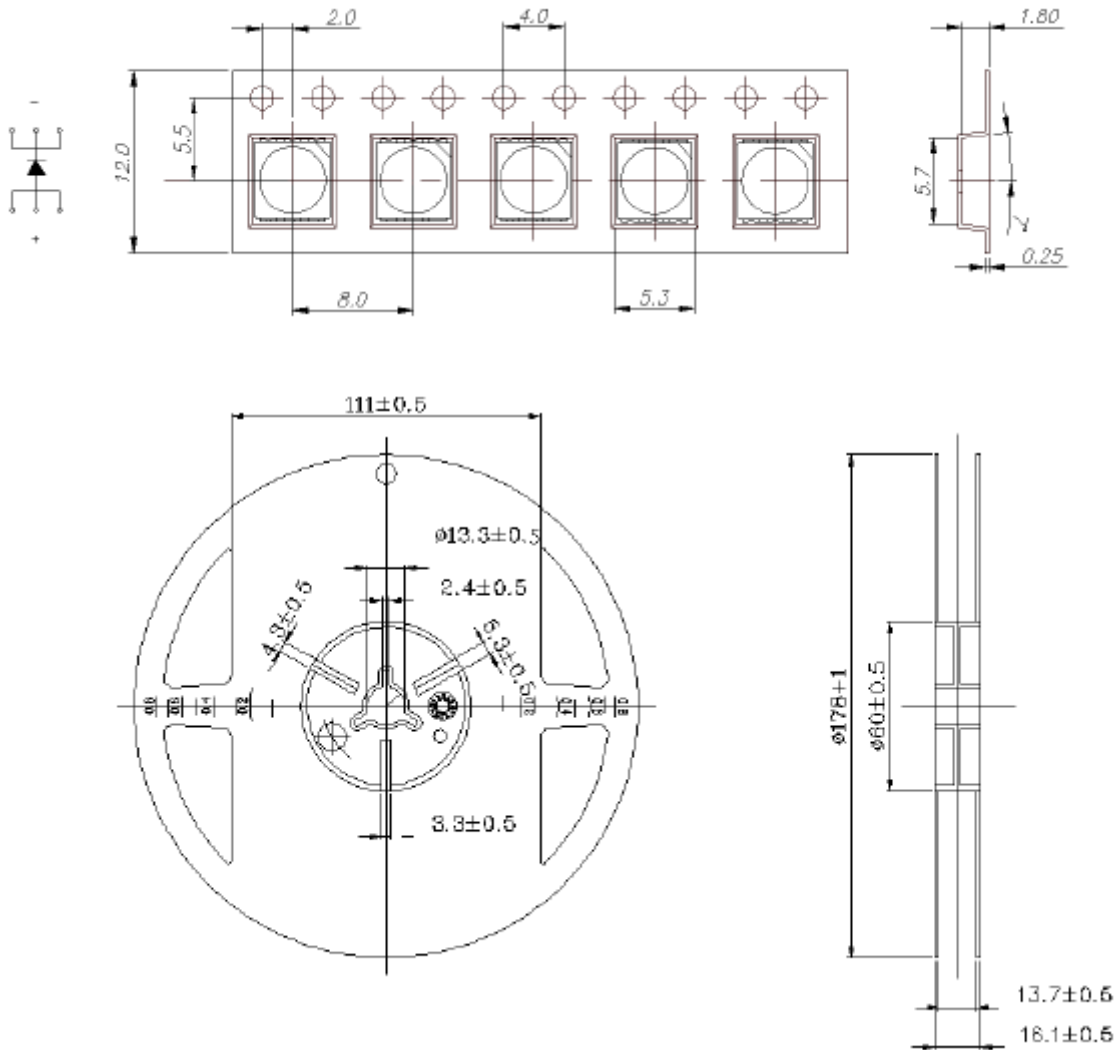


INTERNAL COMPANY INFORMATION

QUANTITY



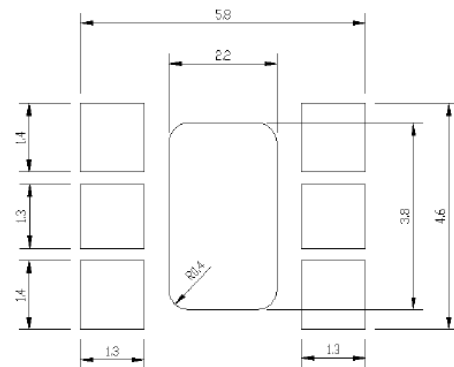
TAPE AND REEL SPECIFICATION



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

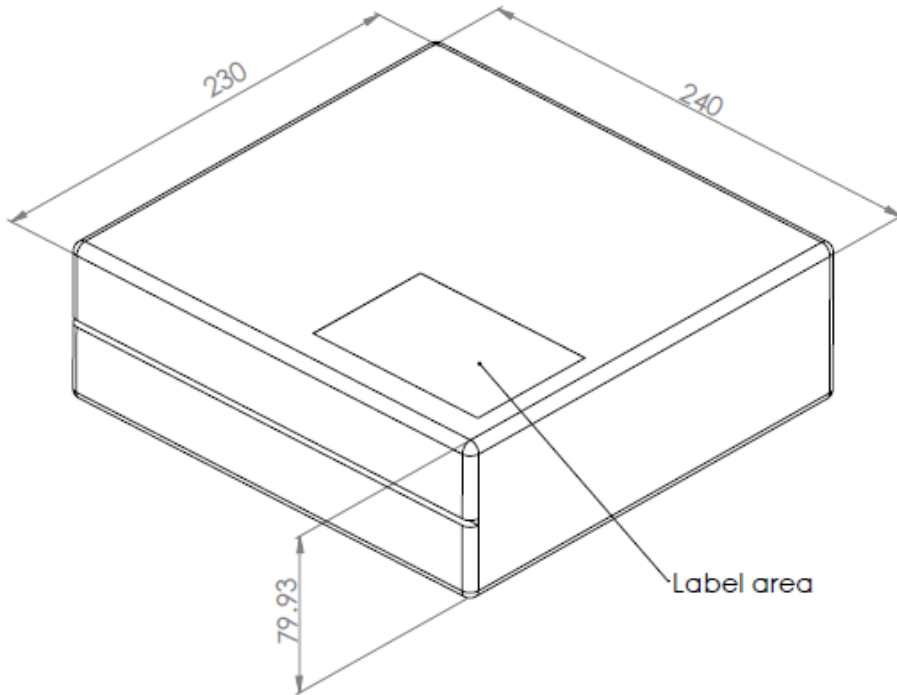
RECOMMENDED SOLDER PAD DESIGN



Notes: All dimensions are in mm; Drawings are not to scale



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) and is entirely based in the EU. Octa Light Bulgaria own LED portfolio includes powerful high-brightness light emitting diodes, last generation of low-power & mid-power LEDs, wide range of COBs and innovative AC LED modules. The company manufactures LEDs 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. We constantly upgrade our LEDs range to bring highest 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 Bulgaria 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 LED luminaires. Further to its core lighting business the company offers Electronic Manufacturing Services (EMS).

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