

LS24 Standard Product Family

PRODUCT DESCRIPTION

The LS24 standard product family is equipped with 24 J Series® 5050 LEDs, either JR5050C E Class, JK5050B H Class or JR5050B K Class LEDs, providing three different levels of performance.

These PCBAs are available in a 24-LED rectangular configuration with two single-pole connectors and a TVS diode for circuit protection.

J Series 5050 LEDs are optimized for medium-density lighting applications where high efficacy and long lifetime are critical, such as street lights, outdoor area and indoor directional lights.

FEATURES

- Three performance options with either JR5050C E Class, JK5050B H Class or JR5050B K Class LEDs
- 2700-5000 K ANSI CCTs
- 70 CRI (other options available)
- 3-step MacAdam ellipse
- Flux and chromaticity binned at $T_c = 60^\circ\text{C}$
- 2 single-pin poke-in connectors
- 2000-V, Class 2 ESD-rated LEDs
- REACH and RoHS compliant
- UL® recognized BOM components (pending UL recognition)



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MAXIMUM RATINGS & TYPICAL CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Viewing angle (FWHM) - Standard	degrees		120	
ESD classification (HBM per Mil-Std-883L)	-	Class 2 (<2 kV)		
Isolation breakdown voltage (V_{ac})	V	> 3000		
LED junction temperature (T_j)	°C			125
PCBA case temperature (T_c)	°C			105
Ambient operating humidity, non-condensing	RH%			80
Storage temperature	°C	-40		85
Color consistency (MacAdam ellipse)	-			3-step

ELECTRICAL CHARACTERISTICS & CIRCUIT DESIGNS

LED Class	LED Qty	Circuit Design		Current		Voltage @ 60 °C			Power @ 60 °C		
		Series	Parallel	Binning Current (A)	Maximum Current (A)	Minimum Voltage (V)	Typical Voltage (V)	Maximum Voltage (V)	Minimum Power (W)	Typical Power (W)	Maximum Power (W)
E	24	8	3	1.4	3	43.4	45.0	46.5	60.7	62.9	65.1
H						45.6	47.3	48.9	63.9	66.2	68.5
K						43.6	45.2	46.8	61.1	63.3	65.5

1. Voltage and power calculations are based on the typical current condition.
2. Maximum current and power are based on the maximum number of LEDs. PCBA power must be managed by heat sink or duty cycle to remain below the stated maximum temperature.

ORDER CODE FORMAT

Order codes for LS24 Standard PCBAs are configured as follows:

Order Code Example: L2-0406000008-50500EB27GFF000A

Expanded:	L2-0406	000	008	-	5050	0E	B	27	G	FF	000A
Code Details:	<u>AA-AAAA</u>	<u>BBB</u>	<u>CCC</u>	-	<u>DDDD</u>	<u>EE</u>	<u>F</u>	<u>GG</u>	<u>H</u>	<u>JJ</u>	<u>KKKK</u>
PCB Design											
Customer Code											
000 = Standard											
LED Quantity											
LED Type											
5050 = J Series 5050 LEDs											
LED Class or Min Flux											
0E = E Class											
0H = H Class											
0K = K Class											
CRI (Color Rendering Index)											
B = 70 CRI											
Color Region (CCT)											
50 = 5000 K											
40 = 4000 K											
30 = 3000 K											
27 = 2700 K											
MacAdam Ellipse											
G = 3-Step											
L x W Dimensions											
FF = 70 x 70 mm											
Internal Use											

FLUX CHARACTERISTICS ($T_J = 60^\circ\text{C}$)

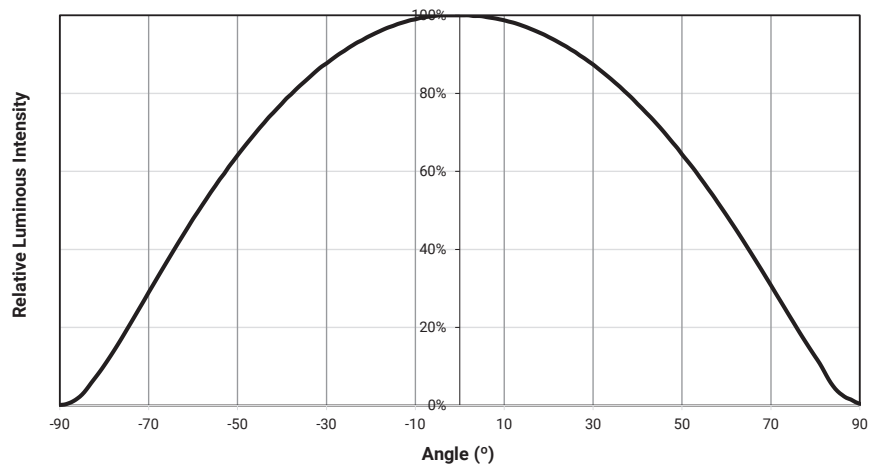
All values are @ 60°C , 1.4 A.

The following table lists LS24 Standard PCBA order codes. For chromaticity bin definitions, please see the Chromaticity section.

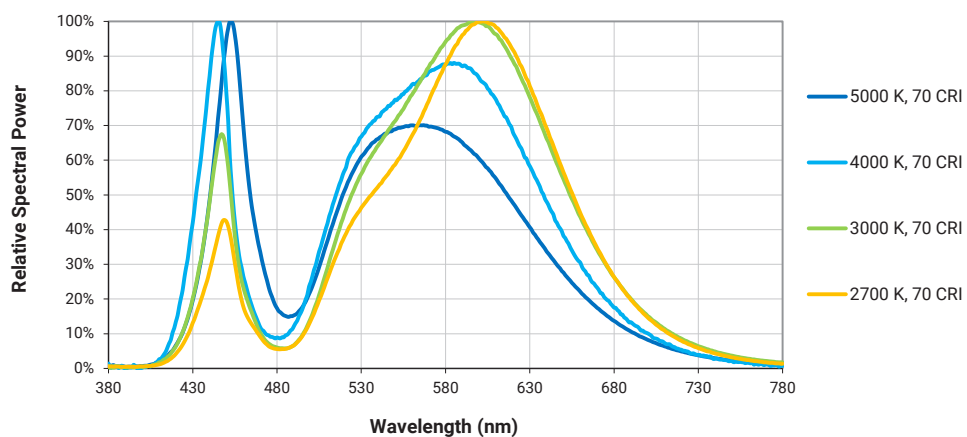
Final PN	LED Class	LED Qty	CCT	CRI	Minimum LPW	Typical LPW	Maximum LPW	Minimum Flux	Typical Flux	Maximum Flux
L2-0418000024-50500EB27GGE000A	E	24	2700	70	169	182	195	10,669	11,472	12,275
L2-0418000024-50500EB30GGE000A	E	24	3000	70	175	189	202	11,048	11,880	12,712
L2-0418000024-50500EB40GGE000A	E	24	4000	70	188	202	216	11,852	12,744	13,636
L2-0418000024-50500EB50GGE000A	E	24	5000	70	188	202	216	11,852	12,744	13,636
L2-0419000024-50500HB27GGE000A	H	24	2700	70	159	171	183	10,557	11,352	12,147
L2-0419000024-50500HB30GGE000A	H	24	3000	70	169	182	195	11,205	12,048	12,891
L2-0419000024-50500HB40GGE000A	H	24	4000	70	180	194	207	11,941	12,840	13,739
L2-0419000024-50500HB50GGE000A	H	24	5000	70	180	194	207	11,941	12,840	13,739
L2-0419000024-50500KB27GGE000A	K	24	2700	70	159	171	182	10,044	10,800	11,556
L2-0419000024-50500KB30GGE000A	K	24	3000	70	167	179	192	10,557	11,352	12,147
L2-0419000024-50500KB40GGE000A	K	24	4000	70	175	188	202	11,093	11,928	12,763
L2-0419000024-50500KB50GGE000A	K	24	5000	70	175	188	202	11,093	11,928	12,763

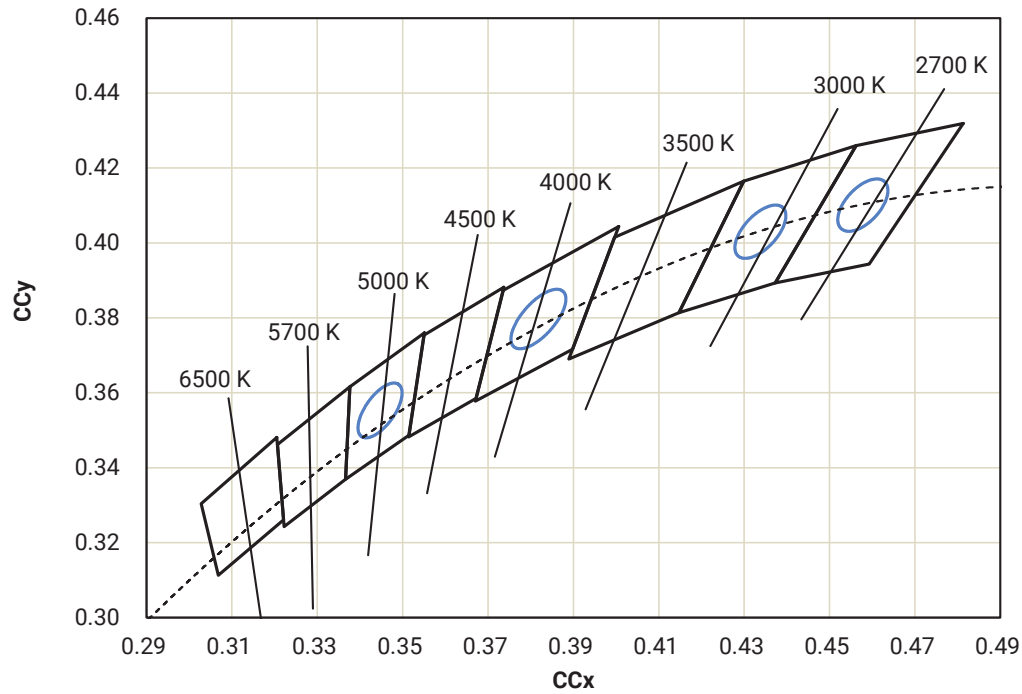
- Cree LED maintains measurement tolerances of $\pm 7\%$ on flux and power, ± 0.005 on chromaticity (CCx, CCy) and ± 2 on CRI.
- Order codes specify a typical flux bin and list minimum and maximum for reference only. Cree LED may ship higher flux than the typical specified without advance notice. Shipments will always adhere to the order code chromaticity bin restrictions.

TYPICAL SPATIAL DISTRIBUTION



RELATIVE SPECTRAL POWER DISTRIBUTION

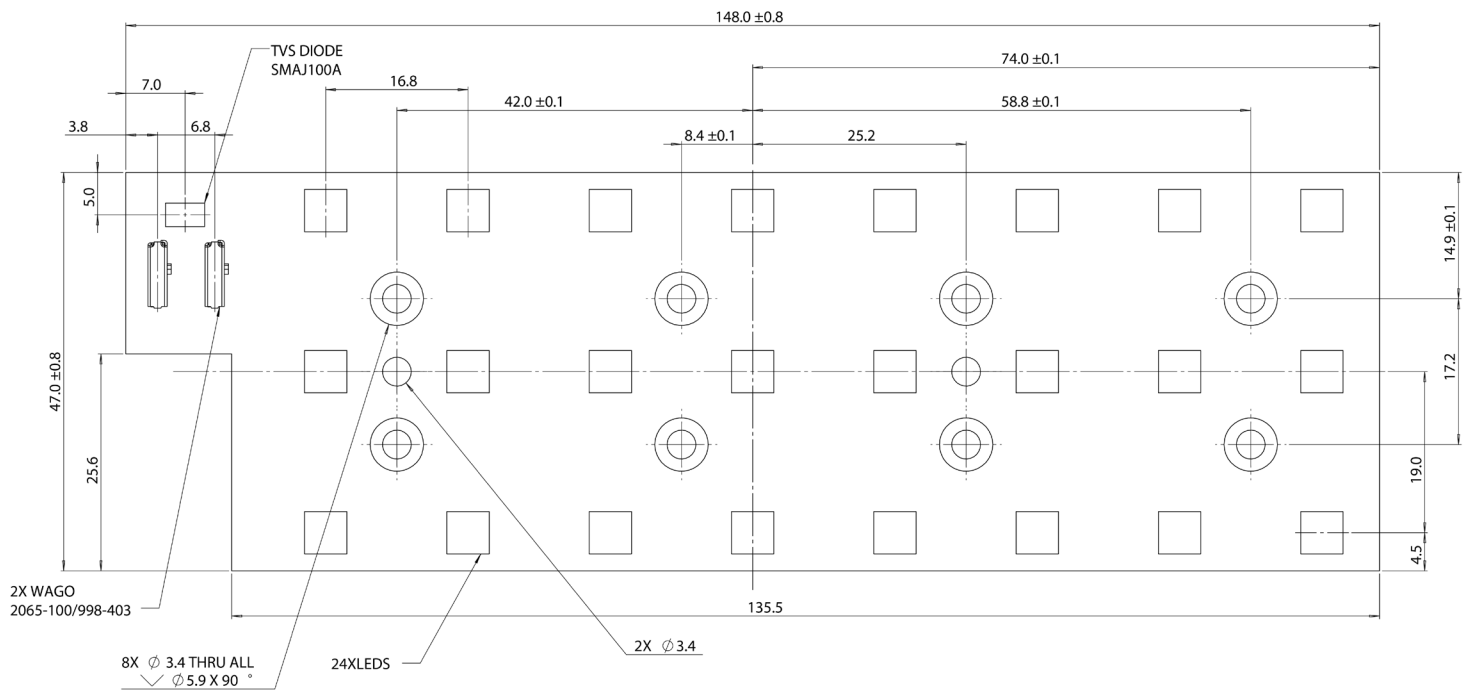


CHROMATICITY ($T_c = 85^\circ\text{C}$)

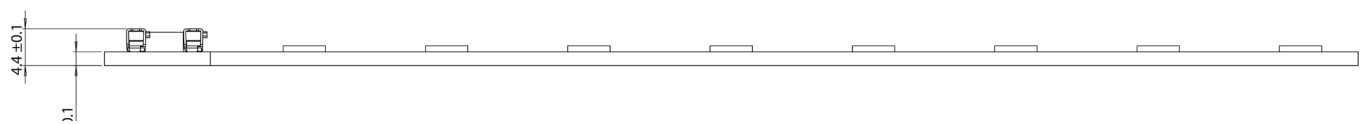
CCT	MacAdam Ellipse	Center Point		Major Axis	Minor Axis	Rotation Angle (°)
		x	y	a	b	
5000 K	3-step	0.3447	0.3553	0.00822	0.00354	59.62
4000 K	3-step	0.3818	0.3797	0.00939	0.00402	53.72
3000 K	3-step	0.4338	0.4030	0.00834	0.00408	53.22
2700 K	3-step	0.4578	0.4101	0.00810	0.00420	53.70

MECHANICAL DETAILS

Tolerances: Length/Width/Thickness: ± 0.1 mm or as shown in the diagram



Top View



Side View

Tolerances for critical dimensions are shown above. All other dimensions are nominal and for reference only.

PCB PROPERTIES & CONFIGURATIONS

Property	PCB Part Number	
	L2-0418	L2-0419
PCB Material	Aluminum MCPCB	
Solder Mask Material	White	
Silkscreen Color	Black	
LED Count	24	
Electrical Connector	Wago 2060-452	
Conductor Entry Angle	0 Degree	

PACKAGING BOX DIMENSIONS

PCB PN	PCBs per Pallet	PCBs per Box	Box Length (mm)	Box Width (mm)	Box Height (mm)	Box Weight (kg)	Pallet Size (mm)	Pallet Weight (kg)	Boxes per Pallet
L2-0418, L2-0419	5600	280	600	400	200	11	1200x800	20	24

PRODUCT LABEL

The CRI, CCT, useful lumens and a 2D datamatrix will be marked on the PCBA.

INNER BOX LABEL

Inner box label example; details will vary by product and specifications. 2D barcode includes all label fields.



NOTES

Measurements

The luminous flux, radiant power, chromaticity, forward voltage and CRI measurements in this document are binning specifications only and solely represent product measurements for the products as shipped by Cree LED. They are not provided or intended as operational values for intended applications. Calculated values are provided for reference and informational purposes only and are not intended or provided as specifications.

ESD

The LED PCBAs carry a Class 2 (2 kV) rating for electrostatic discharge (ESD) based on the ESDS Component Sensitivity Classification - Human Body Model (per ESD STM5.1-2007).

LED PCBAs must be handled with proper ESD handling protocols. Cree LED recommends removing LED PCBAs from packaging at an ESD-safe workstation and using appropriate handling protocols and precautions when handling the LED PCBAs.

Storage Conditions

Store LED PCBAs in their original packaging to minimize potential for unintended contact and contamination. LED PCBAs must be maintained between 0 - 40 °C within 0% to 80% humidity non-condensing.

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree LED representative or from the [Product Ecology](#) section of the Cree LED website.

REACH Compliance

REACH substances of very high concern (SVHCs) information is available for this product. The European Chemical Agency (ECHA) frequently revises the SVHC listing, please contact a Cree LED representative to receive the most up-to-date REACH SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

UL® Recognized Components

This product is constructed with UL recognized components and is under test for UL recognition.

Vision Advisory

Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye. For more information about LEDs and eye safety, please refer to the [LED Eye Safety application note](#).

Hot Plugging

The LED PCBAs must not be electrically connected to an energized driver.