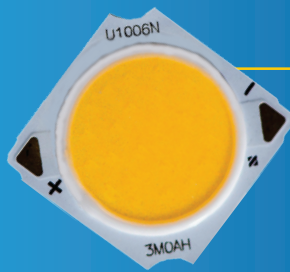


LED Components

Product & Application Guide



XLamp® LEDs



J Series® LEDs



High Brightness LEDs





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
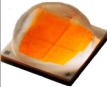
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XLamp® LEDs

- Industry's best lumen density and optical control
- Excellent L90 lifetimes across the entire portfolio
- XP-G3 S Line provides industry's best sulfur resistance and best-in-class efficacy

LEDs		Footprint (mm)	Voltage Class (V)	Typical LPW @ 85 °C	Maximum Drive Current (A)	Maximum Power (W)
	XT-E High Efficacy	3.45	3	169 @ 1 W	1.50	5
	XP-G2 High Efficacy		3	174 @ 1 W	2.00	6
	XP-G3 S Line		3	195 @ 1 W 173 @ 2 W	2.00	6
	XP-L2		3	165 @ 3 W	3.00	10
	XHP35.2 High Density		12	165 @ 4 W	1.05	13
	XHP50.3 High Density	5.00	6 12	148 @ 8 W	3.00 1.50	18
	XHP70.3	7.00	6 12	150 @ 12 W	4.80 2.40	29

J Series® LEDs

- High-efficacy, low-cost solutions with good optical control
- Long TM-21 lifetimes: L90 > 72.6k hrs & L70 > 102k hrs

LEDs		Footprint (mm)	Voltage Class (V)	Typical LPW @ 85 °C	Maximum Drive Current (A)	Maximum Power (W)
	JR5050B K Class	5.00	6 30	203 @ 1 W 190 @ 2 W	1.000 0.240	6
	JR5050 P Class		6 9 24	197 @ 1 W 183 @ 2 W	1.000 0.660 0.240	6

GENERAL LIGHTING – INDOOR (LOW DENSITY)



- 70, 80 & 90 CRI options for complete 6500 K–2700 K CCT range
- 3-step color kits aligned to Cree’s EasyWhite® bins
- 2200 K CCT and 98 CRI options available

J Series® LEDs: 2835

Voltage Class (V)	Series	Product/Class	Typical Current (mA)	Typical Voltage (V)	4000 K, 80 CRI	3000 K, 90 CRI	Maximum Current (mA)
					Typical LPW	Typical LPW	
3	High Efficacy	JB2835B / G	55	2.67	217	174	480
		JB2835B / J	55	2.68	210	168	480
	Standard	JE2835B / N	150	2.86	182	145	240
		JE2835B / P	150	3.00	169	133	240
		JE2835 / R	150	2.95	166	132	240
Value	JB2835 / W	60	2.91	174	140	150	
6	Standard	JK2835 / P	150	6.07	169	136	240
	Value	JK2835B / W	150	6.35	144	117	200

J Series® LEDs: 3030

Voltage Class (V)	Series	Product/Class	Typical Current (mA)	Typical Voltage (V)	4000 K, 80 CRI	3000 K, 90 CRI	Maximum Current (mA)
					Typical LPW	Typical LPW	
3	High Efficacy	JB3030 / B	65	2.70	208	164	480
		JB3030 / D	65	2.79	200	157	240
	Standard	JB3030 / P	65	2.81	185	148	240
		JK3030 / P	350	3.15	140	108	400
6	High Efficacy	JK3030 / B	150	6.00	170	136	240
	Standard	JK3030 / P	150	6.05	162	130	240

J Series® LEDs: 5630





Voltage Class (V)	Series	Product/Class	Typical Current (mA)	Typical Voltage (V)	4000 K, 80 CRI	3000 K, 90 CRI	Maximum Current (mA)
					Typical LPW	Typical LPW	
3	High Efficacy	JB5630 / H	65	2.71	209	160	240
	Standard	JB5630 / P	65	2.80	200	153	240

GENERAL LIGHTING – INDOOR (HIGH DENSITY)



XLamp® LEDs: High Intensity

- New XHP High Intensity LEDs enable maximum intensity from small luminaires
- XLamp XQ-E High Intensity LEDs also available in a full range of colors

LEDs		LES (mm)	Footprint (mm)	Maximum Light Output (lm)	Voltage Class (V)	Maximum Drive Current (A)
	XQ-E High Intensity	~1	1.60	334	3	1.00
	XP-L High Intensity	~3	3.45	1,095	3	3.00
	XHP35.2 High Intensity	~3	3.45	1,584	12	1.05
	XHP50.3 High Intensity	~4	5.00	2,654	6 12	3.00 1.50

XLamp® LEDs: COB




- Industry’s best lumen density & reliability for both ceramic and metal COBs
- Full range of performance, LES & CRI options
- High Fidelity (98 CRI) & Specialty options


Series	Product Family	LES (mm)							
		4.5	6	9	9.8	12	14	14.5	19
High Density	CXBxxxx (Ceramic)		1310	1520					
	CMAxxxx (Metal)	1303	1306	1516		1825	1840		2550
High Efficacy	CMUxxxx (Metal)				1013 1010 1006 1003			1532 1526 1519 1516	
	CXBxxxx (Ceramic)		1304	1512 1507		1820 1816	1830		2540 2530



XLamp® LEDs

- XP-G3 S Line versions provide best-in-class efficiency & sulfur resistance
- Reported DLC Horticulture lifetimes up to Q90 > 90.7k hrs

Color	LEDs		Footprint (mm)	Typical PPF (μmol/s)	Typical PPE (μmol/J)	Maximum Drive Current (A)
450 nm		XP-G3 Royal Blue	3.45	2.77	2.83	2.000
Full Spectrum (4000K 70 CRI)		XP-G3 White (S Line)	3.45	2.72	2.80	2.000
Full Spectrum (4000K 90 CRI)		XP-G3 White (Standard)	3.45	2.22	2.29	2.000
660 nm		XP-G3 Photo Red (S Line)	3.45	2.83	4.15	1.500

Color	LEDs		Footprint (mm)	Typical PF _{FR} (μmol/s)	Typical PF _{FR} /W (μmol/J)	Maximum Drive Current (A)
730 nm		XP-E2 Far Red	3.45	2.2	3.44	1.000

J Series® LEDs

- Cost-effective, high PPF/W LEDs for full spectrum lighting
- Reported DLC Horticulture lifetimes up to Q90 > 72.6k hrs

Color	LEDs		Footprint (mm)	Typical PPF (μmol/s)	Typical PPE (μmol/J)	Maximum Drive Current (A)
Full Spectrum (4000K 70 CRI)		JB2835B 3-V G Class	2.8 x 3.5	0.45	3.04	0.480
		JR5050B K Class	5.00	6.06	2.67	1.000 (6V) 0.240 (30V)
		JR5050 P Class	5.00	5.88	2.55	1.000 (6V) 0.660 (9V) 0.240 (24V)
Full Spectrum (4000K 90 CRI)		JB2835B 3-V G Class	2.8 x 3.5	0.42	2.86	0.480
		JR5050B K Class	5.00	5.50	2.42	1.000 (6V) 0.240 (30V)
		JR5050 P Class	5.00	5.41	2.34	1.000 (6V) 0.660 (9V) 0.240 (24V)



XLamp® COB LEDs: Premium Color

- Industry's best lumen maintenance and color stability over time
- Standard 2-step color consistency on most offerings



Fidelity		CCT	Name
On BBL for Halogen Appearance	98 CRI	4000 K	L5A
		3500 K	35H
		3000 K	30H
		2700 K	27H


Specialty		CCT	Name
Below BBL for CMH Appearance	98 CRI	3000 K	L7C
	92 CRI	3100 K	31Q
		3000 K	30Q
		3000 K	30U
	80 CRI	3000 K	L7B

Series	Product Family	LES (mm)							
		4.5	6	9	9.8	12	14	14.5	19
High Density	CXBxxxx (Ceramic)		1310	1520					
	CMAxxxx (Metal)	1303	1306	1516		1825	1840		2550
High Efficacy	CMUxxxx (Metal)				1013 1010 1006 1003			1532 1526 1519 1516	
	CXBxxxx (Ceramic)		1304	1512 1507		1820 1816	1830		2540 2530

J Series® LEDs

- 3-step color consistency options






Fidelity		CCT	Name
On BBL for Halogen Appearance	98 CRI	5000 K	50E
		4000 K	40E
		3000 K	30E
		2700 K	27E

LEDs	Voltage Class	Typical Drive Current (mA)	4000 K, 98 CRI	3000 K, 98 CRI	Maximum Drive Current (mA)
			Typical Efficacy (LPW)	Typical Efficacy (LPW)	
 JE2835 0.5-W Standard	3-V	150	133	122	240



Single Color LEDs

- Industry's broadest portfolio of single color high-power LEDs
- Versatile XLamp XQ family LEDs deliver intensity, lumen density & reliability

Power Class	LEDs	Footprint (mm)	Maximum Power (W)	White	Blue	Green	Red
High Power (1+ W)	XLamp XP-E2	3.45	3				
	XLamp XB-D	2.45	3				
	XLamp XQ-E High Density	1.60	3				
	XLamp XQ-E High Intensity	1.60	3				
Mid Power (0.5 W)	XLamp XQ-A	1.60	0.8				
Low Power (<0.5 W)	CLX6F	3.4 x 3.5	0.4				

Multi-Color LEDs





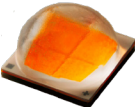
- Broad selection of RGBW LEDs optimized for architectural lighting

Power Class	LEDs	Footprint (mm)	Maximum Power (W)	RGB	RGBW
High Power (1+ W)	XLamp XM-L Color	5.00	10		
	CLQ6B-TKW	5.0 x 5.2	2.6		
Mid Power (0.5 W)	CLR6A-TKW	3.8	1.0		
Low Power (<0.5 W)	CLW6A-TKW	3.5	0.5		
	CLX6F-FKC CLX6E-FKC	3.4 x 3.5	0.4		
	CLV6F-FKB	5.5 x 5.5	0.4		









XLamp® LEDs: Lumen Optimized

- Optimized for maximum lumen output at high drive current

LEDs		Footprint (mm)	Voltage Class (V)	Lumens @ Maximum Current	Lumens @ Overdrive Current
	XT-E High Efficacy	3.45	3	629 @ 1.5 A	1,000 @ 3.0 A
	XP-G2 High Efficacy		3	822 @ 2.0 A	1,350 @ 4.0 A
	XP-L2		3	1,300 @ 3.0 A	2,000 @ 5.0 A
	XHP50.3 High Density	5.00	3	2,654 @ 6.0 A	---
	XHP70.3	7.00	6	4,292 @ 4.8 A	---

XLamp® LEDs: Beam Distance Optimized

- Optimized for maximum beam distance

LEDs		Footprint (mm)	Voltage Class (V)	Lumens @ Maximum Current	Lumens @ Overdrive Current
	XP-G2 Standard	3.45	3	658 @ 1.5 A	1,100 @ 3.0 A
	XP-P		3	767 @ 3.0 A	---
	XP-L High Intensity		3	1,100 @ 3.0 A	1,850 @ 5.0 A
	XHP35.2 High Intensity	5.00	12	1,527 @ 1.0 A	---
	XM-L3		3	1,860 @ 5.0 A	---
	XHP50.3 High Intensity		6	2,191 @ 3.0 A	---

VIDEO SCREENS – FULL-COLOR SCREENS



Surface Mount RGB

- Application optimized: IPX8 waterproofing, matte surface for contrast, small size
- Proven lifetime for displays that last under all viewing conditions

Package Size (mm)	LEDs	Angle (°)	Typ. Red Intensity (mcd)	Typ. Green Intensity (mcd)	Typ. Blue Intensity (mcd)	IPX8 Rated	
1.0 x 1.0	 UHD1110-FKA	120	78	106	24		
1.5 x 1.5	 CLMUD-FKA	110	54	180	30		
2.0 x 2.0	 CLMVC-FKC CLMVC-FKA	120	420 80	650 225	145 43		
2.19 x 1.8 2.1 x 1.8	 CLMXB-FKC CLMXB-FKA	120	515 275	1200 565	240 103	•	
2.8 x 2.8		CLYBB-FKA	110	420	730	135	•
		CLY6C-FKC	110	500	900	245	•
		CLY6D-FKC	110	750	1,350	240	•
3.5 x 3.4		CLX6E-FKC	110	500	950	240	•
		CLX6F-FKC	110	750	1,350	240	•
9.4 x 4.2		30	6,000	12,000	2,300	•	

Through-Hole: P2





Product Series		Angle (°)	Typ. Red Intensity (mcd)	Typ. Green Intensity (mcd)	Typ. Blue Intensity (mcd)
4 mm Oval	C4SMA	90/45	1,500	2,500	900
	C4SMB	90/45	2,800	7,500	1,400
	C4SMM	115/65	1,050	1,800	380
	C4SMR	115/65	1,100	2,300	440
	S4SMS	105/50	1,200	3,800	660
5 mm Oval	C566D	70/30	3,000	7,000	2,000
	C5SMF	100/40	2,200	4,400	1,100

Photo: Prismview, A Samsung Electronics Company



- Small form factor enables compact and more-aerodynamic light bars
- Industry’s best lumen density and optical control
- Available in PC Blue for higher lumens and more sparkle
- Common XLamp XQ package for color and white LEDs simplifies design

Power Class	LEDs	Footprint (mm)	Maximum Power (W)	White	Blue / PC Blue	PC Amber	Red-Orange
High Power (1+ W)	XLamp XB-D	2.45	3				
	XLamp XQ-E High Density	1.60	3				
	XLamp XQ-E High Intensity	1.60	3				
Mid Power (0.5 W)	XLamp XQ-A	1.60	0.8				

Power Class	LEDs	Footprint (mm)	Maximum Power (W)	White	Amber	Orange	Red
Low Power (<0.5 W)	CP41B CP41A	7.6	0.1				

- High-power LEDs that deliver the industry's highest lumen density and efficacy
- Application-optimized solutions to enable differentiated products and lower system cost
- Excellent L90 lifetimes across the entire portfolio

LEDs		Footprint (mm)	Voltage Class (V)	Maximum Light Output (lm)	Maximum Drive Current (A)	Maximum Power (W)
	XQ-A	1.6	3	89	0.300	0.8
	XQ-E High Density		3	334	1.00	3
	XQ-E High Intensity		3	334	1.00	3
	XD16		3	726	2.00	6
	XB-D	2.45	3	309	1.00	3
	XT-E High Efficacy	3.45	3	629	1.50	5
	XP-P		3	767	3.00	10
	XP-G2 High Efficacy		3	822	2.00	6
	XP-G3 Standard & S Line		3	854	2.00	6
	XP-L2		3	1,300	3.00	10
	XHP35.2 High Intensity		12	1,527	1.05	13
	XHP35.2 High Density		12	1,718	1.05	13
	XM-L3	5.00	3	1,860	5.00	16
	XHP50.3 High Intensity		6 12	2,191	3.00 1.50	18
	XHP50.3 High Density		6 12	2,654	3.00 1.50	18
	XHP70.3	7.00	6 12	4,292	4.80 2.40	29

- Largest portfolio of color High-Power LEDs
- Leading performance for all major color-lighting applications
- Industry's best options for small optical source sizes

XLamp	XM-L	XP-G3	XP-E2	XB-D	XQ-E HD	XQ-E HI	XQ-A
Footprint (mm)	5.00	3.45		2.45	1.60		
Maximum Power (W)	13	6	3	3	3	3	0.8
Royal Blue 450 - 465 nm							
Blue 465 - 485 nm							
PC Blue							
Green 520 - 535 nm							
Amber 585 - 595 nm							
PC Amber							
Red-Orange 610 - 620 nm							
Red 620 - 630 nm							
Photo Red 650 - 670 nm							
Far Red 720 - 740 nm							
RGBW							

XLAMP® COB LED ARRAYS (CERAMIC)

- Industry-leading performance and reliability for ceramic-based COBs
- Premium color options: Fidelity (98 CRI) and Specialty (Below BBL)



High Density: XLamp CXA2 HD LED Family

- Highest lumen density COBs deliver maximum punch through small optics

CXB LEDs	LES (mm)	Voltage Options (V)	Maximum Power (W)	4000 K, 70 CRI, Tj = 85 °C		3000 K, 80 CRI, Tj = 85 °C		3000 K, 90 CRI, Tj = 85 °C	
				Typ. Flux (lm)	Max. Flux (lm)	Typ. Flux (lm)	Max. Flux (lm)	Typ. Flux (lm)	Max. Flux (lm)
CXB1310	6	18, 36	24	1,718	3,085	1,520	2,730	1,269	2,279
CXB1520	9	36	49	2,559	6,179	2,265	5,469	1,891	4,566



High Efficacy: XLamp CXA2 SD LED Family

CXB LEDs	LES (mm)	Voltage Options (V)	Maximum Power (W)	4000 K, 70 CRI, Tj = 85 °C		3000 K, 80 CRI, Tj = 85 °C	
				Typ. Flux (lm)	Typ. LPW (lm/W)	Typ. Flux (lm)	Typ. LPW (lm/W)
CXB1304	6	9, 18, 36	9.5	567	164	500	145
CXB1507	9	18, 36	14	1,152	167	1,015	147
CXB1512		18, 36	22	1,982	165	1,746	145
CXB1816	12	36	34	2,537	161	2,236	142
CXB1820		36	40	3,235	168	2,850	148
CXB1830	14	36	53	4,712	168	4,152	148
CXB2530	19	36	61	4,560	163	4,018	143
CXB2540		36	79	6,267	164	5,522	144
CXB3050	23	36	93	8,092	166	7,129	146
CXB3070		36	106	11,054	162	9,739	142
CXB3590	30	36, 72	137	14,079	163	12,404	144

- Industry-leading performance and reliability for metal-based COBs
- Premium color options: Fidelity (98 CRI) and Specialty (Below BBL)



High Density: XLamp CMA LED Family (Cree CXA/CXB Compatible)

- Optimized for best lumen output, efficacy and reliability at high drive currents

CMA LEDs	LES (mm)	Voltage Options (V)	Maximum Power (W)	4000 K, 70 CRI, T _j = 85 °C		3000 K, 80 CRI, T _j = 85 °C	
				Typ. Flux (lm)	Typ. LPW (lm/W)	Typ. Flux (lm)	Typ. LPW (lm/W)
CMA1303	4.5	9, 18, 36	15	885	135	780	119
CMA1306	6	9, 18, 36	16	1,037	144	914	127
CMA1516	9	36	41	2,439	155	2,150	137
CMA1825	12	36	61	3,823	158	3,370	139
CMA1840	14	36	87	6,012	158	5,300	139
CMA2550	19	36	122	7,770	163	6,850	144
CMA3090	23	48, 72	174	13,295	163	11,720	144



High Efficacy: XLamp CMU LED Family (Citizen Compatible)

CMT LEDs	LES (mm)	Voltage Options (V)	Maximum Power (W)	4000 K, 70 CRI, T _j = 85 °C		3000 K, 80 CRI, T _j = 85 °C	
				Typ. Flux (lm)	Typ. LPW (lm/W)	Typ. Flux (lm)	Typ. LPW (lm/W)
CMU1003	9.8	36	9	557	184	495	163
CMU1006		36	17	1,100	181	975	161
CMU1010		36	26	1,633	179	1,493	158
CMU1013		36	35	2,136	176	1,879	155
CMU1516	14.5	36	43	2,732	180	2,454	162
CMU1519		36	52	3,263	179	2,914	160
CMU1526		36	69	4,287	177	3,808	157
CMU1532		36	86	5,272	174	4,732	156
CMU2236	22	36	95	6,124	184	5,419	162
CMU2239		36	104	6,647	183	5,909	162
CMU2258		54	156	9,728	178	8,651	159
CMU2287		54	233	14,471	177	12,625	154

J SERIES® LEDS

- 70, 80 & 90 CRI options for complete 6500 K–2700 K CCT range

J Series LEDs: 5050

Voltage Class (V)	Series	Product/Class	Typical Current (mA)	Typical Voltage (V)	4000 K, 70 CRI Typical LPW	3000 K, 80 CRI Typical LPW	Maximum Current (mA)
6	High Eff.	JR5050B / K	400	5.67	201	178	1000
	Standard	JR5050 / P	400	5.77	192	171	1000
		JR5050 / Q	400	5.80	183	166	1000
9	Standard	JR5050 / P	260	8.56	195	172	660
		JR5050 / Q	260	8.60	186	166	660
24	Standard	JR5050 / P	100	23.08	192	171	240
		JR5050 / Q	100	23.5	183	164	240
30	High Eff.	JR5050B / K	80	28.35	201	178	240
36	Standard	JR5050 / Q	65	34.5	185	166	165

J Series LEDs: 3030

Voltage Class	Series	Product/Class	Typical Current (mA)	Typical Voltage (V)	4000 K, 70 CRI Typical LPW	3000 K, 80 CRI Typical LPW	Maximum Current (mA)
3-V	High Efficacy	JB3030 / B	65	2.70	218	194	480
		JB3030 / D	65	2.79	209	186	240
	Standard	JB3030 / P	65	2.81	196	174	240
		JK3030 / P	350	3.15	149	131	400
6-V	High Eff.	JK3030 / B	150	6.00	178	159	240
	Standard	JK3030 / P	150	6.05	171	153	240

J Series LEDs: 2835

Voltage Class	Series	Product/Class	Typical Current (mA)	Typical Voltage (V)	4000 K, 70 CRI Typical LPW	3000 K, 80 CRI Typical LPW	Maximum Current (mA)
3-V	High Efficacy	JB2835B / G	55	2.67	228	204	480
		JB2835B / J	55	2.68	222	197	480
	Standard	JE2835B / N	150	2.91	193	171	240
		JE2835B / P	150	3.04	180	158	240
		JE2835 / R	150	2.95	173	159	240
Value	JB2835 / W	60	2.91	---	167	150	
6-V	Standard	JK2835 / P	150	6.07	178	160	240
	Value	JK2835B / W	150	6.35	150	138	200
9-V	Value	JK2835B / W	100	9.15	152	136	120
18-V	Value	JK2835B / W	50	18.2	145	131	60

Please see the Architectural and Full Color Screens pages for other HB LEDs.

PLCC Surface Mount

Size (mm)	Product Series	Angles (°)	Blue	Green	Cyan	Amber	Orange	Red	Cool White	Warm White
3.2 x 2.8	CLA1	120							•	•
3.2 x 2.8	CLA2	120							•	
3.2 x 2.8	CLM1	120	•	•	•	•		•		
3.2 x 2.7 3.2 x 2.8	CLM2	30 30 min 55 60	•	•	•	•		•		
2.7 x 2.0	CLM3	120	•	•		•		•	•	•
3.2 x 2.7	CLM4	120	•	•		•	•	•		

Through-Hole: P2

Product Series		Angle (°)	Blue	Green	Red	Amber	Cool White	Warm White
5 mm Round	C503C C503B	15	•	•	•	•	•	
		15 min				•		
		23			•	•		
		30	•	•	•	•		
		30 min	•	•	•	•		
	C503D	15					•	
	C543A	20					•	
	C512A	25					•	
C513A	55					•	•	
C535A	110					•	•	
4 mm Oval	C4SMA	90/45	•	•	•			
	C4SMB	90/45	•	•	•	•		
	C4SMM	115/65	•	•	•			
	C4SMR	115/65	•	•	•			
	C4SMS	105/50	•	•	•			
5 mm Oval	C566C	70/30			•	•		
	C566D	70/30	•	•	•	•		
	C5SMF	100/40	•	•	•			

Through-Hole: P4

Product Series		Angle (°)	Amber	Orange	Red	Cool White
CP41B CP41A		40	•	•	•	
		60				•
		70	•	•	•	
		90				•
		100	•	•	•	



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