CREE

Horticulture LED Portfolio

CREE HORTICULTURE LED PERFORMANCE OVERVIEW (TYPICAL FLUX @ T_J=85 °C)

Royal Blue (450 nm)

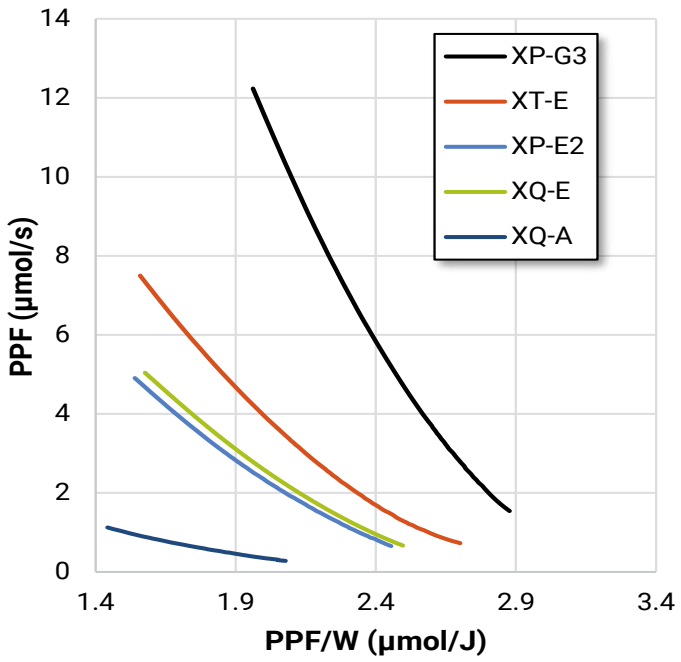
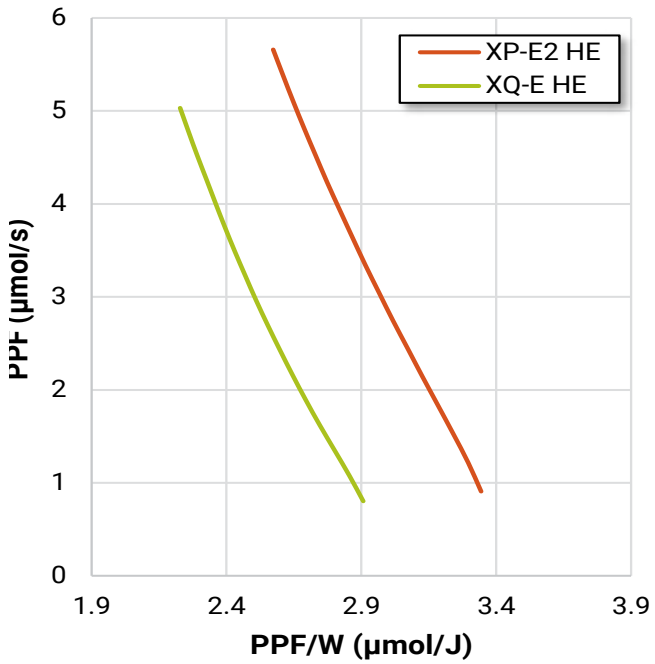
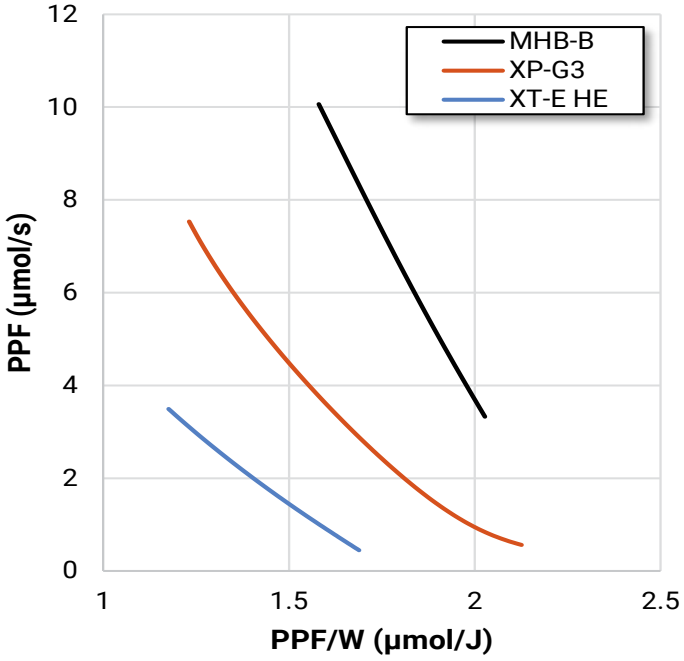


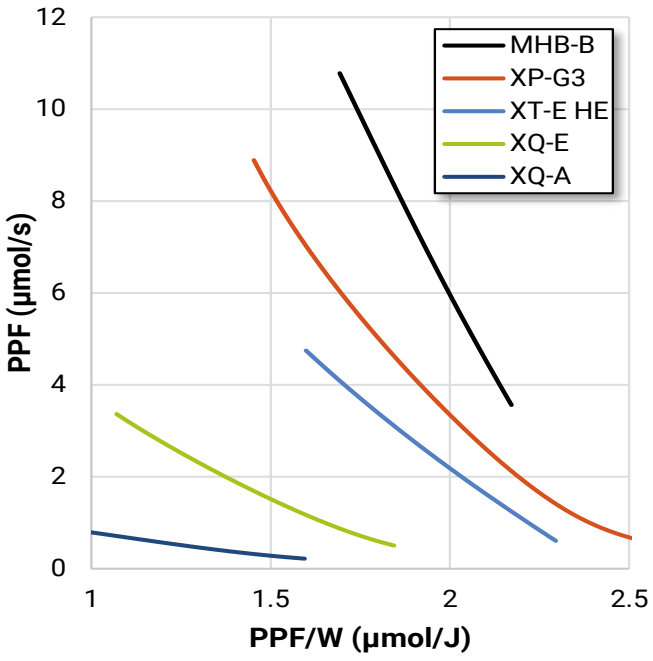
Photo Red (660 nm)



4000 K, 90 CRI



4000 K, 70 CRI



XLAMP® MHB-B LED

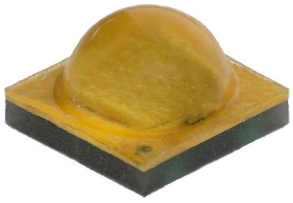
- Best value for high PPF/W, full spectrum light
- 9V, 18V & 36V options provide driver design flexibility
- Can be used in SMD arrays to upgrade the thermal performance of COB designs
- Up to 14k hours of LM-80 test data available

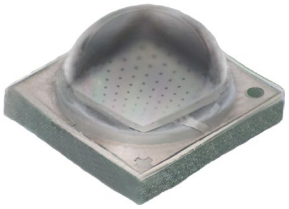
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF * (µmol/s)	PPF/W * (µmol/J)	Min. PPF @ Max. ** (µmol/s)	Order Code
MHB-B 4000 K/ 70 CRI	5.00	0.700 (9 V) 0.350 (18 V) 0.175 (36 V)	85 °C	0.480 (9 V) 0.240 (18 V) 0.120 (36 V)	7.9	1.87	10.8	MHBBWT-0000-000C0BE240E
					7.3	1.75	10.0	MHBBWT-0000-000C0BD440E
MHB-B 4000 K/ 90 CRI					7.3	1.75	10.1	MHBBWT-0000-000C0UC440G
					6.8	1.62	9.3	MHBBWT-0000-000C0UC240G

* Performance for LED with minimum light output & typical voltage at stated test condition.
** Performance for LED with minimum light output & typical voltage at Tj=85 °C, maximum current.

XLAMP® XP-G3 LED

- High PPF & PPF/W full spectrum light in the 3.45 mm XP/XT footprint
- Industry's highest PPF & PPF/W 450 nm LED
- Up to 10k hours of LM-80 test data available





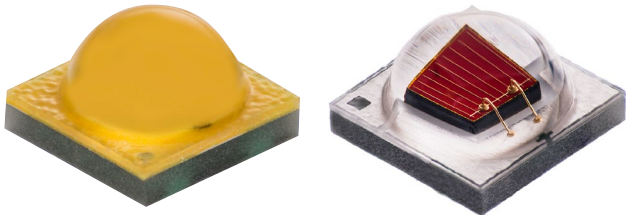
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF * (µmol/s)	PPF/W * (µmol/J)	Min. PPF @ Max. ** (µmol/s)	Order Code
XP-G3 4000 K/ 70 CRI	3.45	2.000	85 °C	0.350	2.2	2.29	9.3	XPGDWT-B1-0000-00L5E
					2.1	2.18	8.9	XPGDWT-B1-0000-00K5E
					2.0	2.07	8.4	XPGDWT-B1-0000-00J5E
XP-G3 4000 K/ 90 CRI					2.0	2.10	8.6	XPGDWT-U1-0000-00G5E
					1.9	1.97	8.1	XPGDWT-U1-0000-00F5E
					1.8	1.85	7.5	XPGDWT-U1-0000-00E5E
XP-G3 Royal Blue 450 nm			25 °C	0.350	2.8	2.80	12.1	XPGDRY-L1-0000-00601
					2.6	2.61	10.8	XPGDRY-L1-0000-00501
					2.4	2.44	10.1	XPGDRY-L1-0000-00401

* Performance for LED with minimum light output & typical voltage at stated test condition.
** Performance for LED with minimum light output & typical voltage at Tj=85 °C, maximum current.

CLD-DS169 Rev 3 (September 2018)

XLAMP® XP-E, XP-E2 & XT-E LEDs

- Huge ecosystem of PCB & optics for 3.45 mm XP/XT footprint
- Highest output & efficiency 660 nm LED available
- LM-80 test data available for all colors



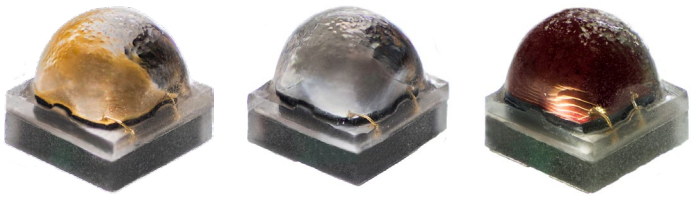
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF* (µmol/s)	PPF/W * (µmol/J)	Minimum PPF @ Max. ** (µmol/s)	Order Code
XT-E HE 4000 K/ 70 CRI	3.45	1.500	85 °C	0.350	2.1	2.15	6.8	XTEAWT-E0-0000-00000BKE5
					2.0	2.04	6.4	XTEAWT-E0-0000-00000BJE5
XT-E HE 4000 K/ 90 CRI	3.45	1.500	85 °C	0.350	1.9	1.95	6.2	XTEAWT-E0-0000-00000UFE5
					1.8	1.82	5.8	XTEAWT-E0-0000-00000UEE5
XT-E Royal Blue 450 nm	3.45	1.500	85 °C	0.350	2.3	2.28	7.7	XTEARY-00-0000-000000Q01
					2.2	2.18	7.4	XTEARY-00-0000-000000P01
					2.1	2.09	7.0	XTEARY-00-0000-000000N01
XP-E HE Photo Red 660 nm	3.45	1.000	25 °C	0.350	2.3	3.18	5.5	XPEEPR-L1-0000-00C01
					2.2	2.99	5.2	XPEEPR-L1-0000-00B01
					2.1	2.81	4.9	XPEEPR-L1-0000-00A01
XP-E2 Photo Red 660 nm◊	3.45	1.000	25 °C	0.350	2.5	3.42	6.8	XPEBPR-L1-0000-00D01
					2.3	3.18	5.5	XPEBPR-L1-0000-00C01

LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum BPF (µmol/s)	BPF/W (µmol/s)	Minimum BPF @ Max. (mW)	Order Code
XP-E2 Far Red 730 nm◊	3.45	1.000	25 °C	0.350	2.3	3.32	8.7	XPEBFR-L1-0000-00A01
					2.1	3.10	8.1	XPEBFR-L1-0000-00901
					2.0	2.88	7.5	XPEBFR-L1-0000-00801
					1.8	2.65	6.9	XPEBFR-L1-0000-00701
					1.7	2.43	6.3	XPEBFR-L1-0000-00601

* Performance for LED with minimum light output & typical voltage at stated test condition.
** Performance for LED with minimum light output & typical voltage at Tj=85 °C, maximum current.

XLAMP® XQ-E LEDs

- Highest PPF density: up to 5 µmol/s from 1.6 x 1.6 mm package
- 2x-3x PPF density of closest competitors
- Enables smallest & highest density luminaires



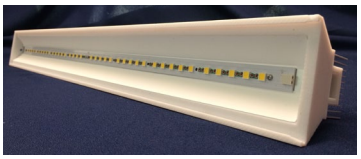
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF * (µmol/s)	PPF/W * (µmol/J)	Min. PPF @ Max. ** (µmol/s)	Order Code
XQ-E 4000 K/ 70 CRI	1.60	1.000	85 °C	0.350	1.5	1.50	3.4	XQEAWT-00-0000-00000BEE5
					1.4	1.41	3.2	XQEAWT-00-0000-00000BDE5
XQ-E Royal Blue 450 nm	1.60	1.000	25 °C	0.350	2.4	2.18	1.7	XQEROY-00-0000-000000R01
					2.3	2.10	4.8	XQEROY-00-0000-000000Q01
					2.2	2.01	4.6	XQEROY-00-0000-000000P01
XQ-E HE Photo Red 660 nm	1.60	1.000	25 °C	0.350	2.2	2.97	6.1	XQEEPR-00-0000-000000B01
					2.1	2.81	4.9	XQEEPR-00-0000-000000A01
					1.9	2.62	4.6	XQEEPR-00-0000-000000901

* Performance for LED with minimum light output & typical voltage at stated test condition.
** Performance for LED with minimum light output & typical voltage at Tj=85 °C, maximum current.

REFERENCE DESIGN: WHITE + RED LINEAR

REFERENCE DESIGN: BLUE + RED LINEAR

Small, lightweight linear luminaires optimized for chlorophyll response with uniform spectral output @ 6” distance

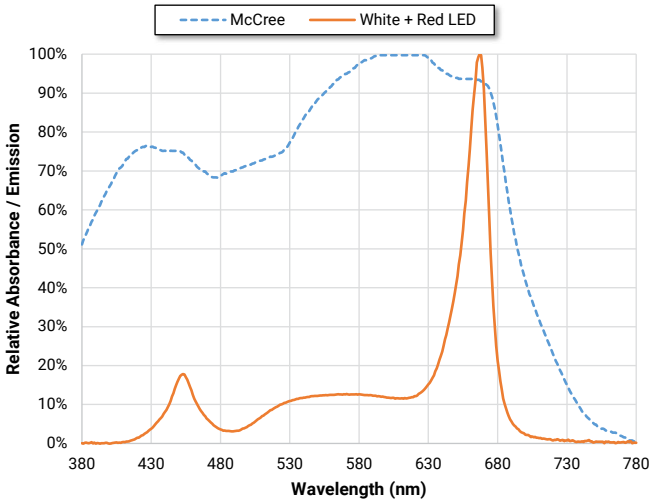


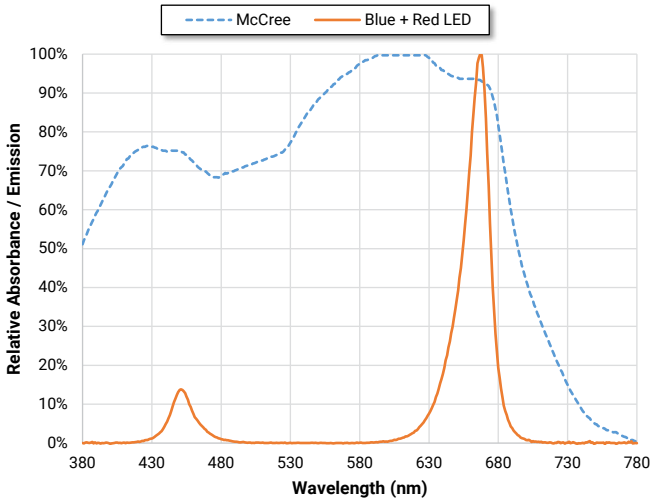
System Measurements (Steady-State) - Excludes Driver Losses

Output Mode	Low	Medium	High
Current	700 mA	1000 mA	1600 mA
PPF	166.7 µmol/s	226.7 µmol/s	340 µmol/s
PPF/W	3.06 µmol/J	2.89 µmol/J	2.64 µmol/J
Power	54.5 W	78.4 W	128.9 W
LED Tsp	45 °C	65 °C	85 °C

Output Mode	Low	Medium	High
Current	750 mA	1400 mA	2000 mA
PPF	143 µmol/s	252 µmol/s	332 µmol/s
PPF/W	3.5 µmol/J	3.15 µmol/J	2.82 µmol/J
Power	41 W	80 W	113 W
LED Tsp	45 °C	65 °C	90 °C

Spectral Content

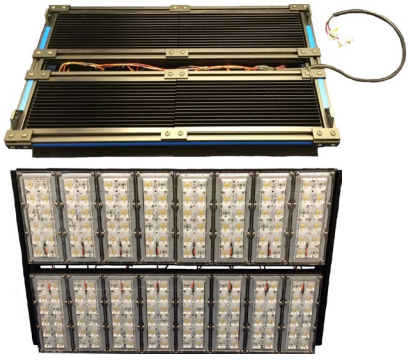




REFERENCE DESIGN: WHITE + RED HIGH BAY

Modular design employing 4 engines - designed to match PPFD of 1000-W DE HPS system

System Measurements (Steady-State)



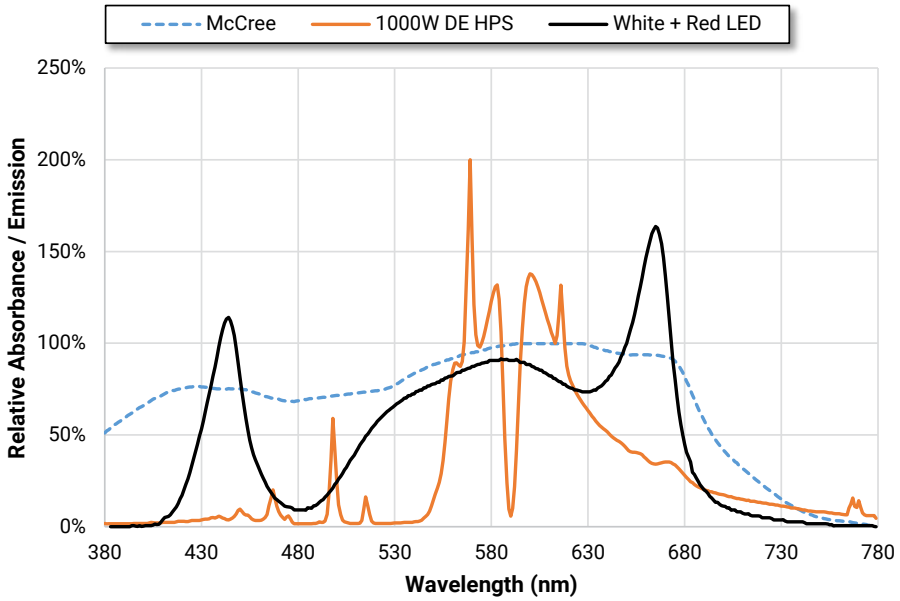
PPF*	1110 µmol s^{-1}	608 µmol s^{-1}	316 µmol s^{-1}
PPF/W*	2.20 µmol J^{-1}	2.49 µmol J^{-1}	2.65 µmol J^{-1}
Power	504.4 W	227.7 W	124.6 W
Dimensions (LWH)	25" x 15" x 3" / 63 cm x 38 cm x 8 cm		
Weight	27 lbs / 12.2 kg		

* Stable measurement includes optic losses (no driver)

Parts List

Part	Description	P/N	Quantity
Red LED	Cree XLamp XP-E High Efficiency Photo Red	XPEEPR-L1-0000-00B01	48
White LED	Cree XLamp XP-L2 White 4000 K, 70 CRI	XPLBWT-00-0000-000BV60E5	144
Optic	LEDiL Strada HB	CS15019-IP-VSM-2x6	16
PCB	Galaxy MCPCB	Custom	16
Heat Sink	Aavid Black Anodized	62625	4
TIM	Graftech HITHERM 1200	G10230	16
Frame	80/20	Various	Various
Driver	MEAN WELL	HLG-320H-C1050B	2

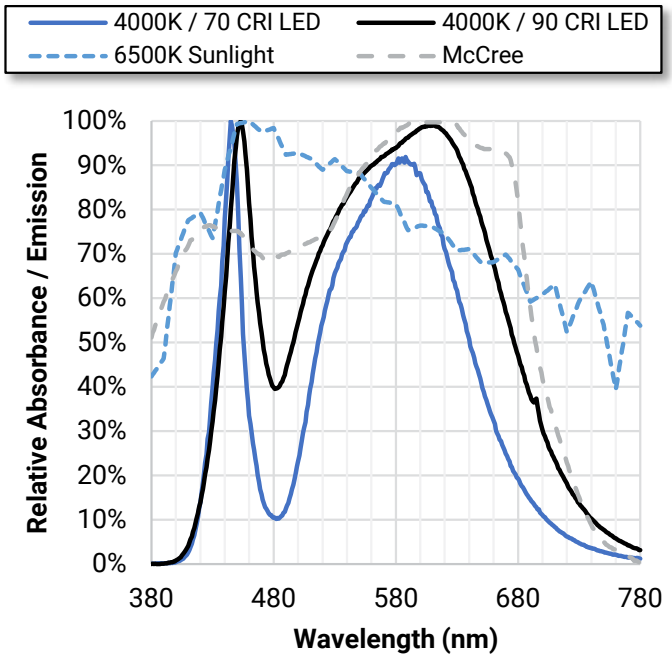
Spectral Content



CREE HORTICULTURE LED PORTFOLIO

Footprint	White		Color			Advantages
	4000 K / 70 CRI	4000 K / 90 CRI	450 nm	660 nm	730 nm	
5.00 mm	 MHB-B White	 MHB-B White				• Best value for high PPF/W, full spectrum light • 9-V, 18-V & 36-V options • Upgrade the thermal performance of COB designs • Up to 14k hours of LM-80 test data available
3.45 mm	 XP-G3 White	 XP-G3 White	 XP-G3 Royal Blue			• Industry-leading PPF & PPF/W in the 3.45 mm XP/XT footprint • Up to 10k hours of LM-80 test data available
	 XT-E High Efficacy White	 XT-E High Efficacy White	 XT-E Royal Blue	 XP-E2 High Efficacy Photo Red	 XP-E2 Far Red	• Huge ecosystem of PCB & optics for 3.45 mm XP/XT footprint • Highest output & efficiency 660 nm LED available • LM-80 test data available for all colors
1.60 mm	 XQ-E White		 XQ-E Royal Blue	 XQ-E High Efficiency Photo Red		• Highest PPF density: up to 6.1 µmol/s from 1.6 x 1.6 mm package • 2x-3x PPF density of closest competitors • Enables smallest & highest density luminaires

Spectral Power Distribution (White)



Spectral Power Distribution (Color)