



CREE  | Horticulture LED Portfolio



CREE HORTICULTURE LED PERFORMANCE OVERVIEW (TYPICAL FLUX @ $T_j=85^\circ\text{C}$)

Royal Blue (450 nm)

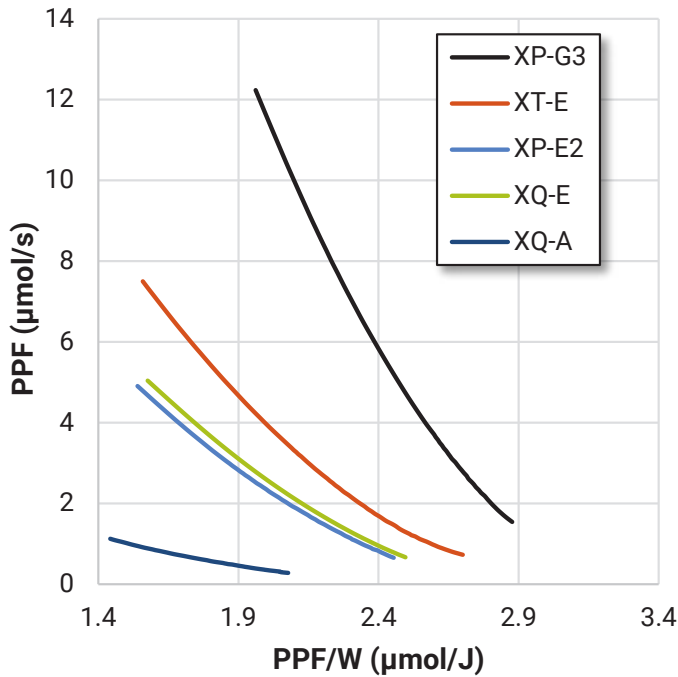
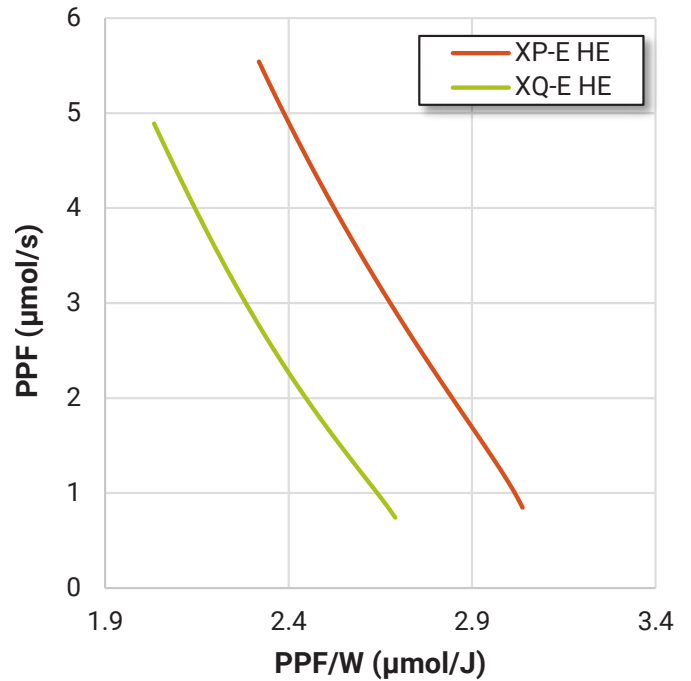
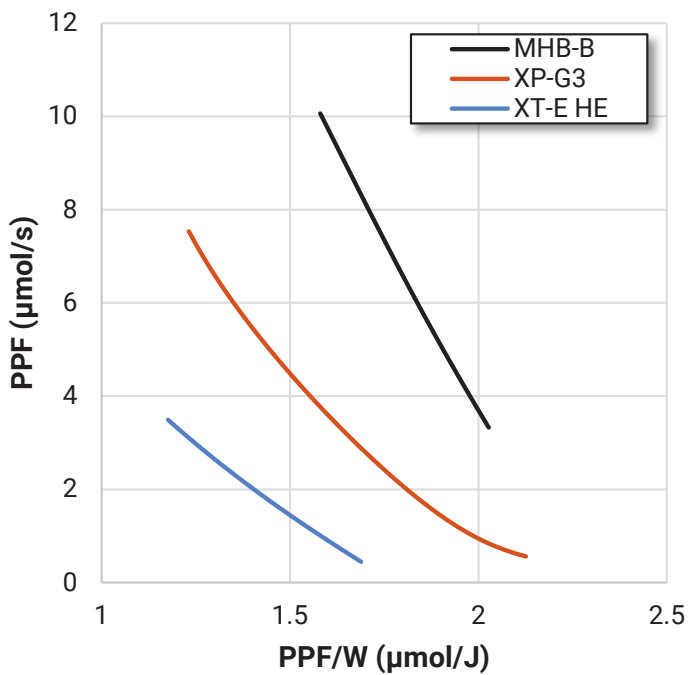


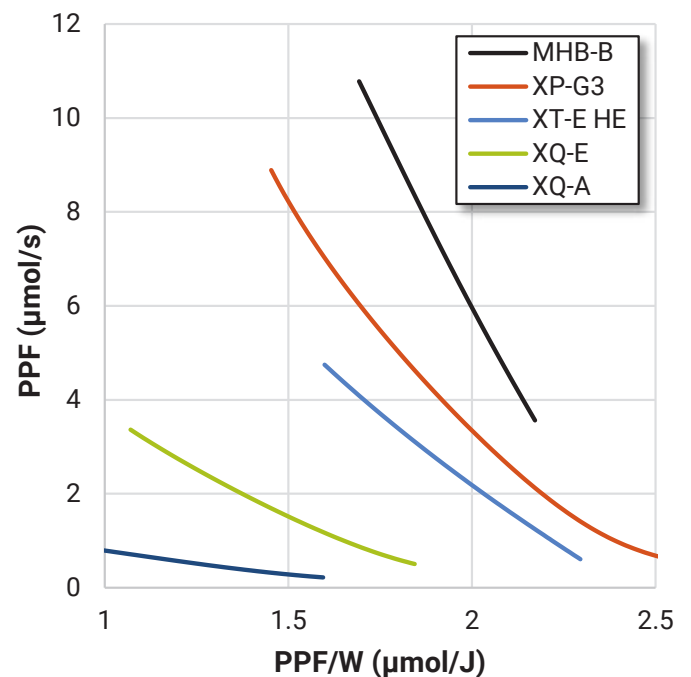
Photo Red (660 nm)



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



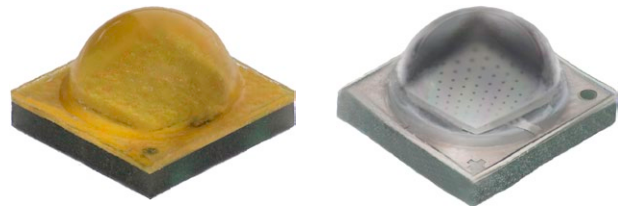
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF * (μmol/s)	PPF/W * (μmol/J)	Min. PPF @ Max. ** (μmol/s)	Order Code
MHB-B 4000 K/ 70 CRI	5.00	0.700 (9 V) 0.350 (18 V) 0.175 (36 V)	85 °C	0.480 (9 V) 0.240 (18 V) 0.120 (36 V)	7.9	1.87	10.8	MHBBWT-0000-000C0BE240E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

* 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



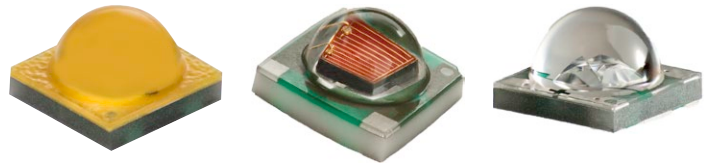
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF * (μmol/s)	PPF/W * (μmol/J)	Min. PPF @ Max. ** (μmol/s)	Order Code
XP-G3 4000 K/ 70 CRI	3.45	2.000	85 °C	0.350	2.2	2.29	9.3	XPGDWT-B1-0000-00L5E
					2.1	2.18	8.9	XPGDWT-B1-0000-00K5E
					2.0	2.07	8.4	XPGDWT-B1-0000-00J5E
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.

XLAMP® XP-E & 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)	Min. 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

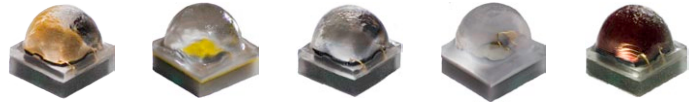
LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum Flux * (mW)	WPE * (%)	Min. Flux @ Max. ** (mW)	Order Code
XP-E Far Red 730 nm	3.45	1.000	25 °C	0.350	250	37.6%	589	XPEFAR-L1-0000-00701
					210	31.6%	495	XPEFAR-L1-0000-00601

* 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 & XQ-A LEDs

- Highest PPF density: up to 5 $\mu\text{mol/s}$ 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 * ($\mu\text{mol/s}$)	PPF/W * ($\mu\text{mol/J}$)	Min. PPF @ Max. ** ($\mu\text{mol/s}$)	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	2.3	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	2.1	2.81	4.9	XQEEPR-00-0000-000000A01
					1.9	2.62	4.6	XQEEPR-00-0000-000000901

LED & Color	Footprint (mm)	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF * ($\mu\text{mol/s}$)	PPF/W * ($\mu\text{mol/J}$)	Min. PPF @ Max. ** ($\mu\text{mol/s}$)	Order Code
XQ-A 4000 K/ 70 CRI	1.60	0.300	85 °C	0.175	0.7	1.31	1.0	XQAAWT-00-0000-00000B4E5
					0.6	1.16	0.9	XQAAWT-00-0000-00000B3E5
XQ-A Royal Blue 450 nm	1.60	0.250	25 °C	0.175	0.9	1.67	1.1	XQAROY-00-0000-000000701
					0.8	1.40	0.9	XQAROY-00-0000-000000601

* 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: BLUE + RED LINEAR

Small, lightweight linear luminaire optimized for chlorophyll response with uniform spectral output @ 6" distance



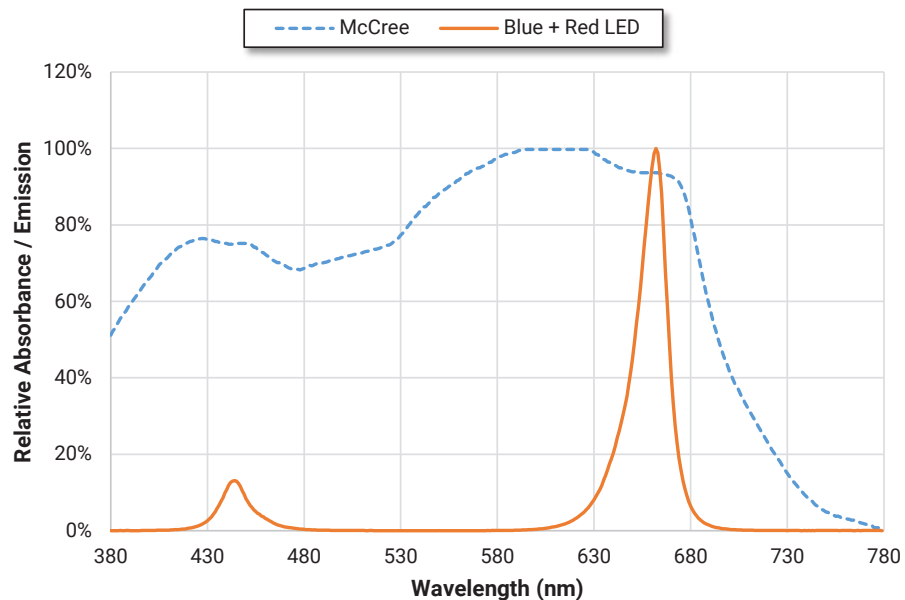
System Measurements (Steady-State) - Excludes Driver Losses

Output Mode	Low	Medium	High
Blue LED Current	350 mA	700 mA	1000 mA
Red LED Current	175 mA	350 mA	500 mA
PPF	144 $\mu\text{mol/s}$	240 $\mu\text{mol/s}$	311 $\mu\text{mol/s}$
PPF/W	3.2 $\mu\text{mol/J}$	2.9 $\mu\text{mol/J}$	2.6 $\mu\text{mol/J}$
Power	45 W	82 W	119 W
LED Tsp	45 °C	65 °C	90 °C

Parts List

Part	Description	P/N	Quantity
Blue LED	Cree XLamp XP-G3 Royal Blue	XPGDRY-L1-0000-00501	4
Red LED	Cree XLamp XP-E High Efficiency Photo Red	XPEEPR-L1-0000-00B01	104
Optic	Brightview	Diffuser Film	1
PCB	Galaxy	MCPCB	1
Heatsink	Aavid	83140	1
TIM	Graftech	HITHERM foil	1
Driver	ERP	Draco Series	1

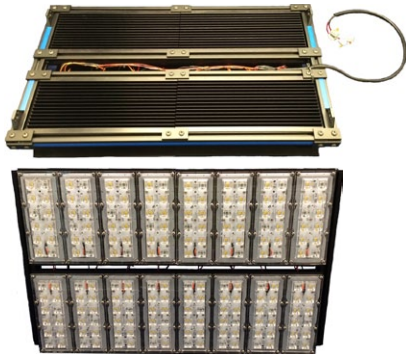
Spectral Content



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)

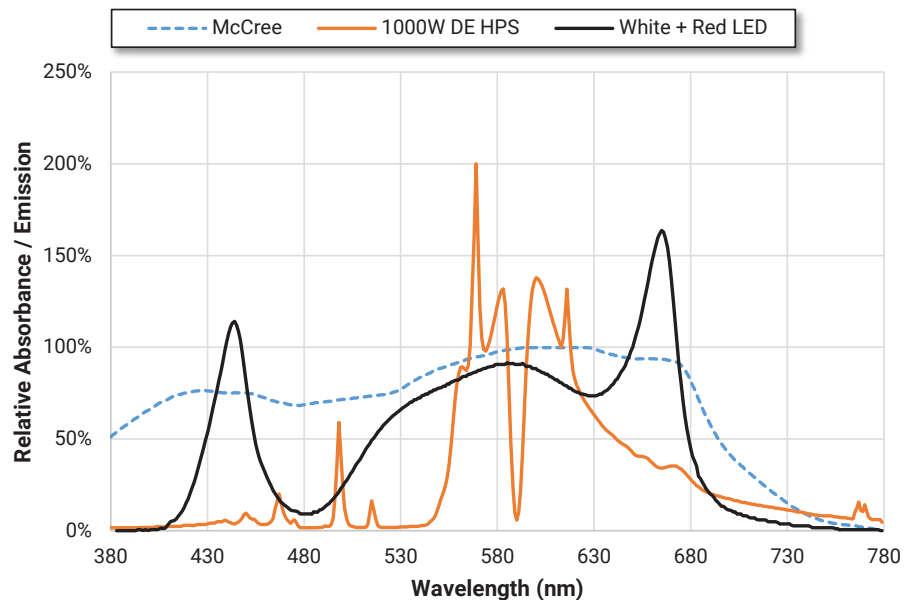


PPFD Average	320 $\mu\text{mol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$ @ 4.9 ft
PPF/W	1.82 $\mu\text{mol}/\text{J}$
Power	553 W
Dimensions (LWH)	25" x 15" x 3" / 63 cm x 38 cm x 8 cm
Weight	27 lbs / 12.2 kg

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-G3 White 4000 K, 70 CRI	XPGDWT-B1-0000-00L5E	144
Optic	LEDiL Strada HB	CS14130_HB-IP-2X6-W	16
PCB	SinkPad Aluminum	1950	16
Heatsink	Aavid Black Anodized	62625	4
Class 1 Flammability Paper	3M	TBA	16
TIM	Graftech HITHERM 1200	G10230	16
Frame	80/20	Various	Various
Driver	MEAN WELL	HLG-320H-C1050B	2
Potting	Henkel	TBA	

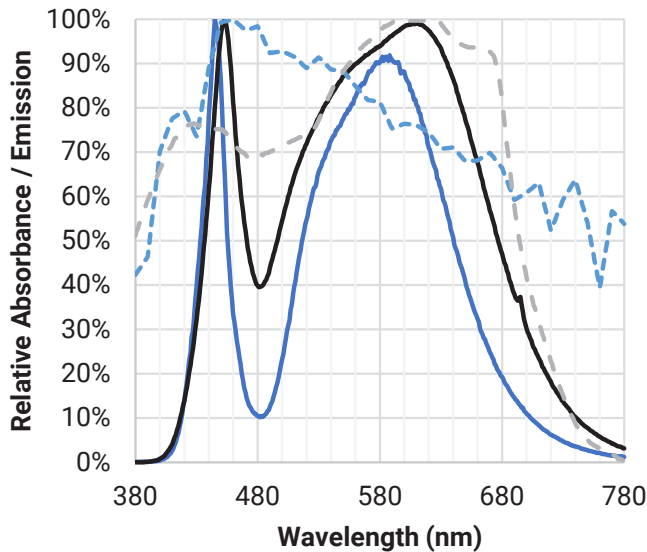
Spectral Content



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				<ul style="list-style-type: none"> • 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			<ul style="list-style-type: none"> • 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-E High Efficiency Photo Red	 XP-E Far Red	
1.60 mm	 XQ-E White		 XQ-E Royal Blue	 XQ-E High Efficiency Photo Red		<ul style="list-style-type: none"> • Highest PPF density: up to 5 $\mu\text{mol/s}$ from 1.6 x 1.6 mm package • 2x-3x PPF density of closest competitors • Enables smallest & highest density luminaires
	 XQ-A White		 XQ-A Royal Blue			

Spectral Power Distribution (White)



Spectral Power Distribution (Color)

