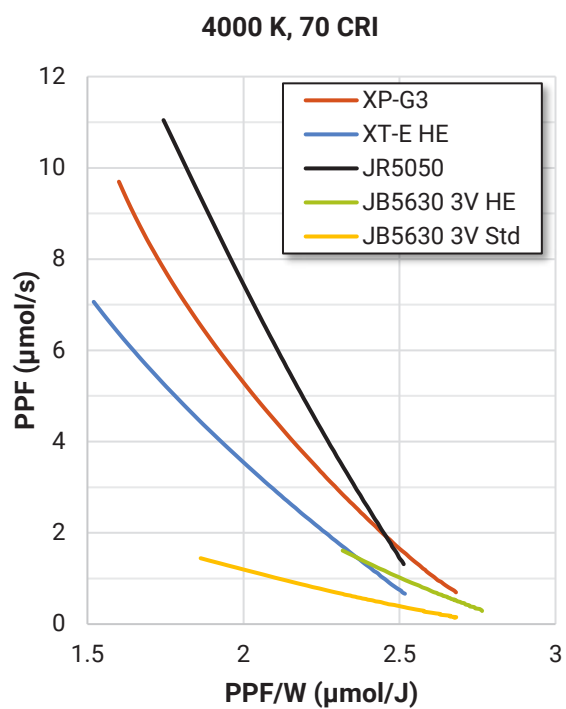
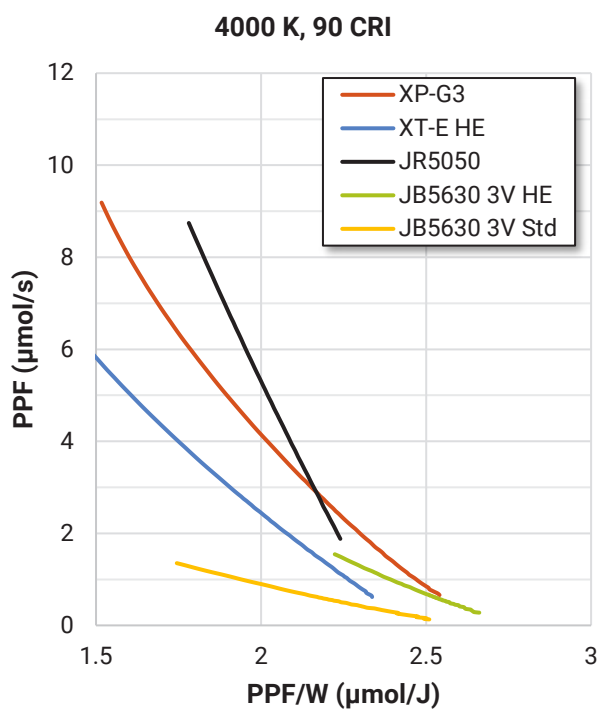
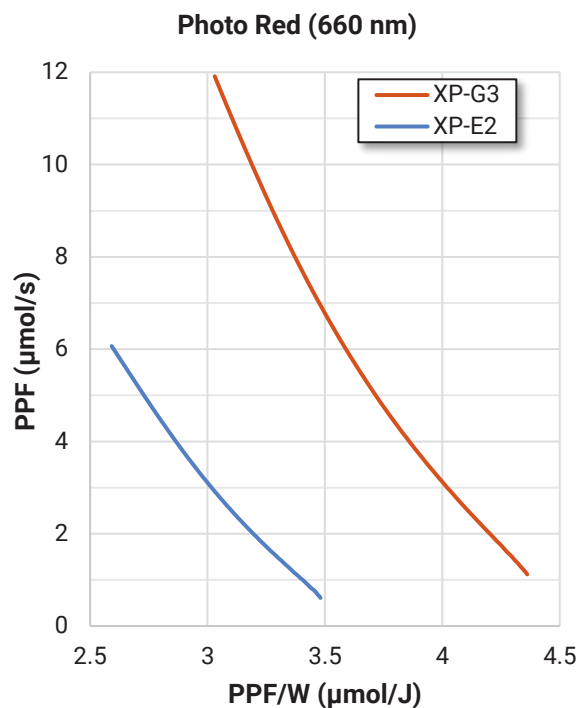
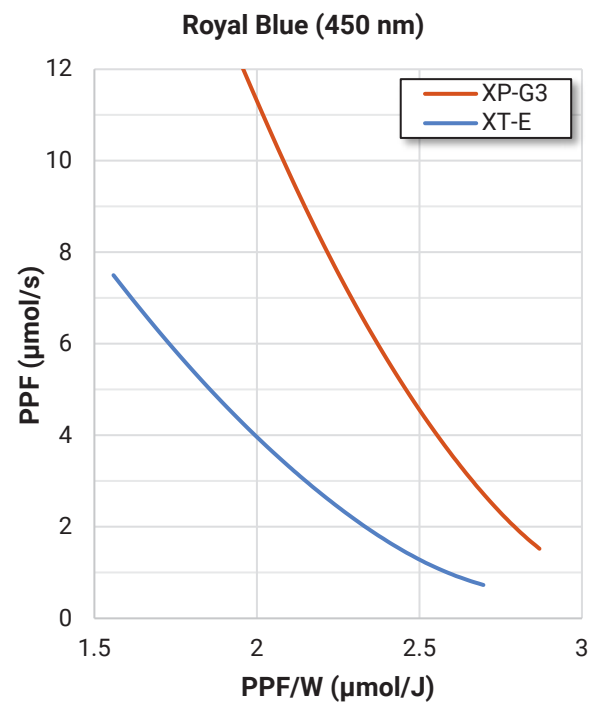




CREE 

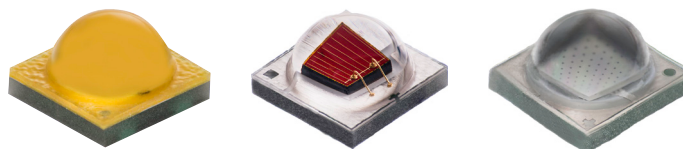
Horticulture LED Portfolio

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



XLAMP® LEDs

- Industry's highest output & efficiency
- Huge ecosystem of PCBs & optics available
- Ceramic high-power LED optical control & reliability

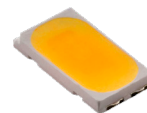
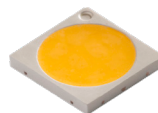


Color	LED	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPF (μmol/s)	PPF/W (μmol/J)	Minimum PPF @ Max. (μmol/s)	Order Code
4000 K/ 70 CRI	XTE High Efficacy	1.500	85 °C	0.350	2.2	2.23	7.1	XTEAWT-E0-0000-00000BLE5
					2.1	2.12	6.7	XTEAWT-E0-0000-00000BKE5
	XP-G3 S Line	2.000	85 °C	0.350	2.3	2.40	9.7	XPGDWT-BS-0000-00ME5
					2.2	2.29	9.2	XPGDWT-BS-0000-00LE5
4000 K/ 90 CRI	XTE High Efficacy	1.500	85 °C	0.350	2.0	2.08	6.6	XTEAWT-E0-0000-00000UGE5
					1.9	1.95	6.2	XTEAWT-E0-0000-00000UFE5
	XP-G3 Standard	2.000	85 °C	0.350	2.2	2.28	9.2	XPGDWT-U1-0000-00H5E
					2.0	2.13	8.6	XPGDWT-U1-0000-00G5E
Royal Blue (450 nm)	XTE Royal Blue	1.500	85 °C	0.350	2.3	2.28	7.5	XTEARY-00-0000-000000Q01
					2.2	2.18	7.2	XTEARY-00-0000-000000P01
					2.1	2.09	6.9	XTEARY-00-0000-000000N01
	XP-G3 Royal Blue	2.000	25 °C	0.350	2.8	2.83	13.0	XPGDRY-L1-0000-00601
					2.6	2.64	12.1	XPGDRY-L1-0000-00501
					2.4	2.46	11.3	XPGDRY-L1-0000-00401
Photo Red (660 nm)	XP-E2 Photo Red	1.000	25 °C	0.350	2.5	3.44	6.9	XPEBPR-L1-0000-00D01
					2.3	3.25	6.5	XPEBPR-L1-0000-00C01
	XP-G3 Photo Red	1.500	25 °C	0.350	2.9	4.13	12.1	XPGDPR-L1-0000-00G01
					2.7	3.93	11.6	XPGDPR-L1-0000-00F01
					2.6	3.74	11.0	XPGDPR-L1-0000-00E01

Color	LED	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PF _{FR} (μmol/s)	PF _{FR} /W (μmol/J)	Minimum PF _{FR} @ Max. (μmol/s)	Order Code
Far Red (730 nm)	XP-E2 Far Red	1.000	25 °C	0.350	2.0	3.01	5.3	XPEBFR-L1-0000-00901
					1.8	2.80	4.9	XPEBFR-L1-0000-00801
					1.7	2.58	4.5	XPEBFR-L1-0000-00701

J SERIES™ LEDs

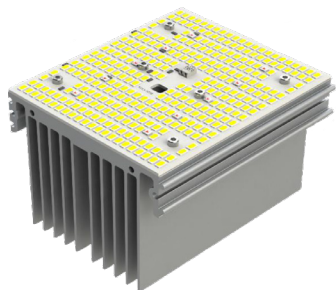
- Cost-effective LEDs for white lighting
- High PPf/W to enable DLC full-spectrum applications
- 3-step color kits ensure spectral consistency across luminaires



Color	LED	Maximum Current (A)	Test Temperature	Test Current (A)	Minimum PPf (μmol/s)	PPf/W (μmol/J)	Minimum PPf @ Max. (μmol/s)	Order Code
4000 K / 70 CRI	JB5630 3-V HE	0.240	25 °C	0.065	0.5	2.90	1.8	JB5630AWT-00-0000-0C0A0BE240E
	JB5630 3-V Standard	0.240	25 °C	0.065	0.5	2.70	1.6	JB5630AWT-00-0000-0P0A0BD540E
	JR5050 6-V	1.000	25 °C	0.400	5.4	2.40	12.4	JR5050AWT-00-0000-000B0BQ440E
	JR5050 9-V	0.660	25 °C	0.260	5.4	2.40	12.4	JR5050AWT-00-0000-000C0BQ440E
	JR5050 36-V	0.165	25 °C	0.065	5.4	2.40	12.4	JR5050AWT-00-0000-000N0BQ240E
4000 K / 90 CRI	JB5630 3-V HE	0.240	25 °C	0.065	0.5	2.78	1.6	JB5630AWT-00-0000-0C0A0BE240E
	JB5630 3-V Standard	0.240	25 °C	0.065	0.5	2.53	1.5	JB5630AWT-00-0000-0P0A0BD540E
	JR5050 6-V	1.000	25 °C	0.400	5.1	2.28	11.7	JR5050AWT-00-0000-000B0UQ240E
	JR5050 9-V	0.660	25 °C	0.260	5.1	2.28	11.7	JR5050AWT-00-0000-000C0UP440E
	JR5050 36-V	0.165	25 °C	0.065	5.1	2.28	11.7	JR5050AWT-00-0000-000N0UP440E

REFERENCE DESIGN BUILDING BLOCK: WHITE + RED GREENHOUSE

Modular design meets the revised DLC requirements for horticulture with smaller footprint to prevent shadowing



System Measurements (Steady-State)

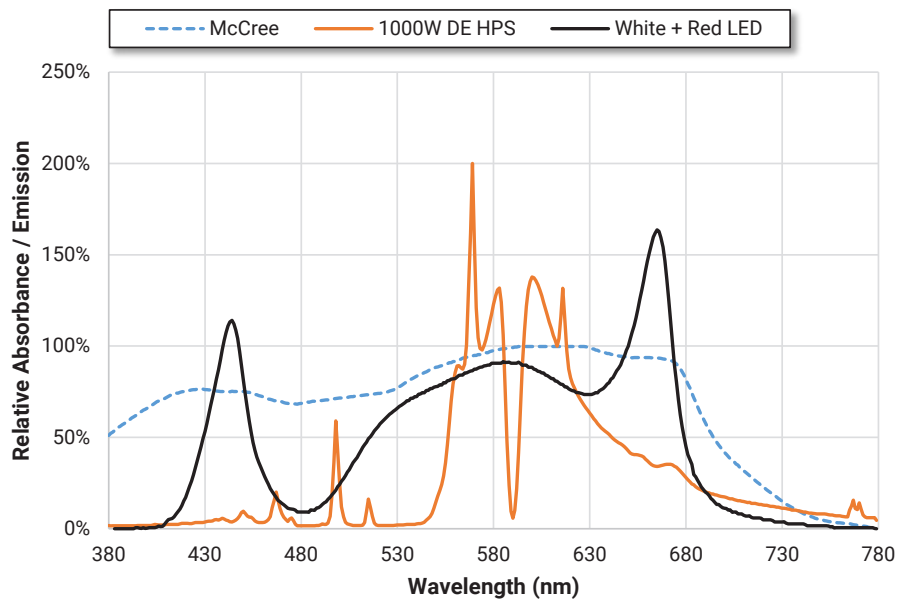
Output Mode	Low	Medium	High
PPF*	137 $\mu\text{mol/s}$	262 $\mu\text{mol/s}$	373 $\mu\text{mol/s}$
PPF/W*	2.91 $\mu\text{mol/J}$	2.73 $\mu\text{mol/J}$	2.54 $\mu\text{mol/J}$
Power	47 W	96 W	147 W
Dimensions (LWH)	5" x 4.25" x 3.25" / 12.7 cm x 10.8 cm x 8.3 cm		
Weight	2 lbs / .9 kg		

* Stable measurement includes optic losses (no driver)

Parts List

Part	Description	Part Number	Quantity
LED	Cree JB5630 High Efficacy	JB5630AWT-00-0000-0C0A0BE250E	320
LED	Cree XP-E2 Photo Red 660 nm	XPEBPR-L1-0000-00D01	10
PCB	Opulent Americas	Custom	1
Heat Sink	Opulent Americas	Custom	1
Driver	ERP	SLM120W-2.0-56-TA	1

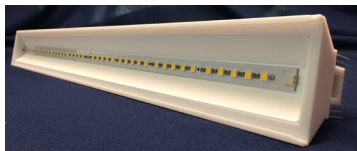
Spectral Content



REFERENCE DESIGN: WHITE + RED LINEAR

REFERENCE DESIGN: BLUE + RED LINEAR

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



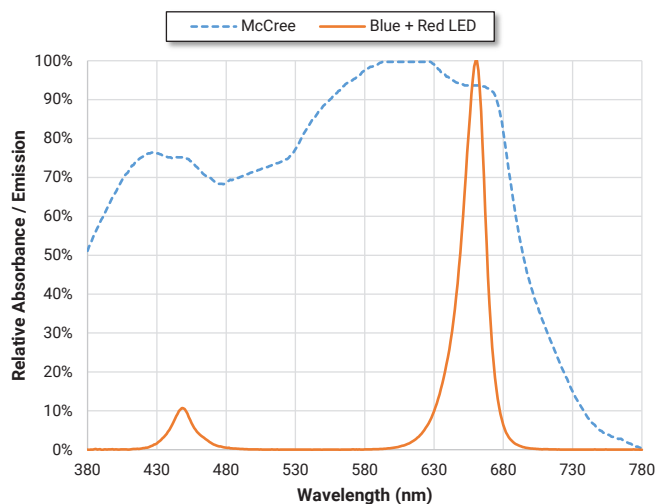
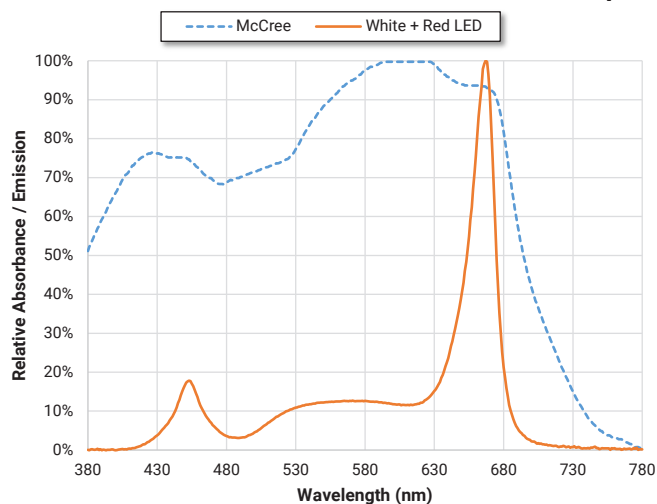
System Measurements (Steady-State) - Excludes Driver Losses

Output Mode	Low	Medium	High	Output Mode	Low	Medium	High
Current	700 mA	1000 mA	1600 mA	Current	750 mA	1400 mA	2000 mA
PPF	166.7 $\mu\text{mol/s}$	226.7 $\mu\text{mol/s}$	340 $\mu\text{mol/s}$	PPF	153 $\mu\text{mol/s}$	281 $\mu\text{mol/s}$	386 $\mu\text{mol/s}$
PPF/W	3.06 $\mu\text{mol/J}$	2.89 $\mu\text{mol/J}$	2.64 $\mu\text{mol/J}$	PPF/W	3.78 $\mu\text{mol/J}$	3.72 $\mu\text{mol/J}$	3.25 $\mu\text{mol/J}$
Power	54.5 W	78.4 W	128.9 W	Power	40.5 W	75.6 W	118.86 W
LED Tsp	45 °C	65 °C	85 °C	LED Tsp	45 °C	65 °C	90 °C

Parts Lists

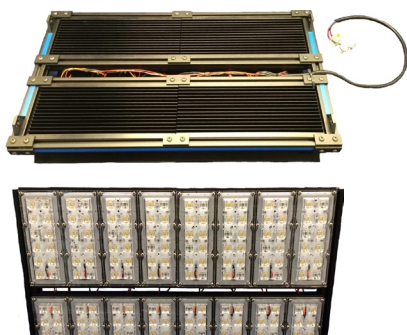
Part	Description	Part Number	Quantity	Part	Description	Part Number	Quantity
LED	Cree XP-E2 Photo Red 660 nm	XPEBPR-L1-0000-00D01	80	LED	Cree XP-G3 Photo Red 660 nm	XPGDPR-L1-0000-00F01	104
LED	Cree MHB-B 4000 K, 70 CRI	MHBBWT-0000-000COBE240E	40	LED	Cree XP-G3 Royal Blue 450 nm	XPGDRY-L1-0000-00501	4
Optic	Brightview Smoothing Film	Custom	1	Optic	Brightview Smoothing Film	Custom	1
PCB	Galaxy Circuits Inc. MCPCB	Gerber Files Available from Cree	1	PCB	Galaxy Circuits Inc. MCPCB	Gerber Files Available from Cree	1
Heat Sink	Aavid	Custom	1	Heat Sink	Aavid	Custom	1
TIM	NeoGraf .25 Foil	GMT0EG0015 HT1210	1	TIM	NeoGraf .25 Foil	GMT0EG0015 HT1210	1
Driver	ERP	TLM160W-1.8-85	1	Driver	ERP	SLM100W-1.7-56-TA	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)

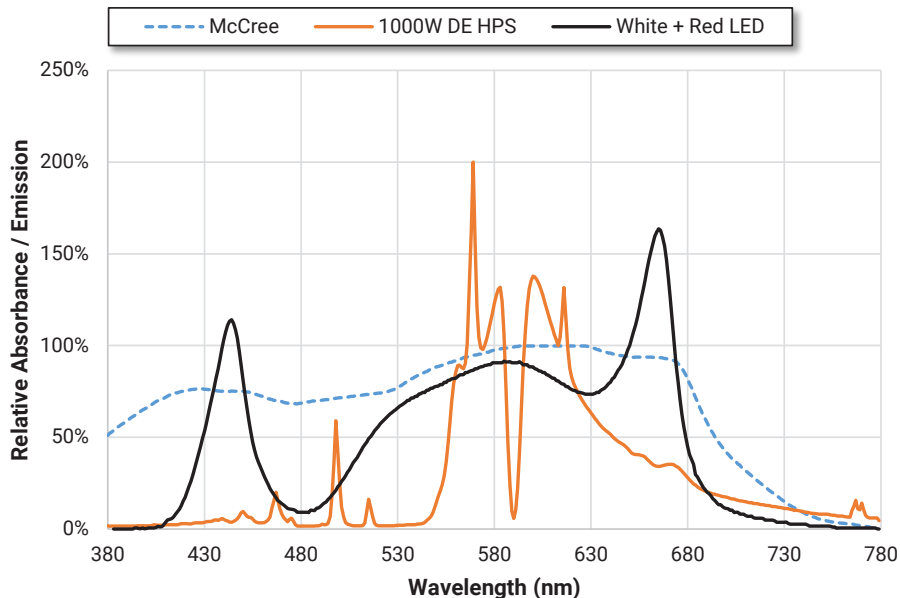
Output Mode	Low	Medium	High
PPF*	316 $\mu\text{mol/s}$	608 $\mu\text{mol/s}$	1110 $\mu\text{mol/s}$
PPF/W*	2.54 $\mu\text{mol/J}$	2.67 $\mu\text{mol/J}$	2.20 $\mu\text{mol/J}$
Power	124.6 W	227.7 W	504.4 W
Dimensions (LWH)	25" x 15" x 3" / 63 cm x 38 cm x 8 cm		
Weight	27 lbs / 12.2 kg		

* Stable measurement includes optic losses (no driver)

Parts List

Part	Description	Part Number	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

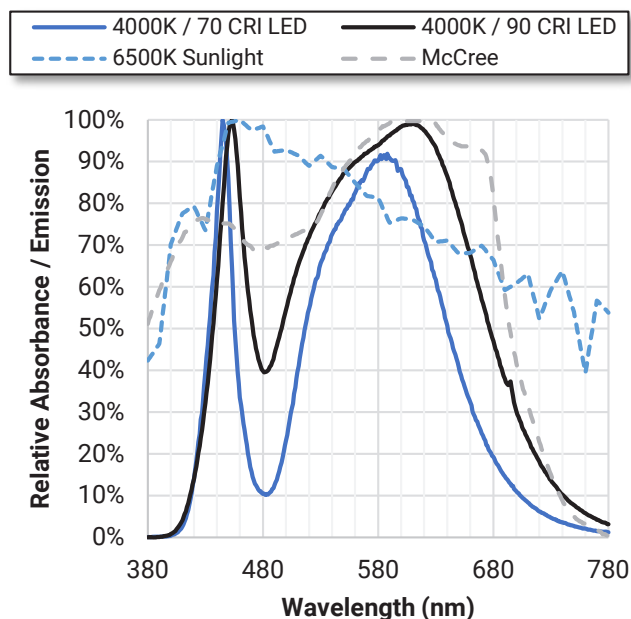
Spectral Content



CREE HORTICULTURE LED PORTFOLIO

LED Series	White		Color			Advantages
	4000 K / 70 CRI	4000 K / 90 CRI	450 nm	660 nm	730 nm	
XLamp LEDs	 XP-G3 S Line	 XP-G3 Standard	 XP-G3 Royal Blue	 XP-G3 Photo Red		- Industry's highest output & efficiency - Huge ecosystem of PCB & optics available - Ceramic high-power LED optical control & reliability
	 XT-E High Efficacy White	 XT-E High Efficacy White	 XT-E Royal Blue	 XP-E2 Photo Red	 XP-E2 Far Red	
J Series LEDs	 5050	 5050				- Cost-effective LEDs for white lighting - High PPF/W to enable DLC full-spectrum applications 3-step color kits ensure spectral consistency across luminaires
	 5630 High Efficacy	 5630 High Efficacy				

Spectral Power Distribution (White)



Spectral Power Distribution (Color)

