



48" Full Spectrum Horticulture Linear Reference Design

2835G Photophyll™ Select White,
XP-G3 S Line Photo Red)

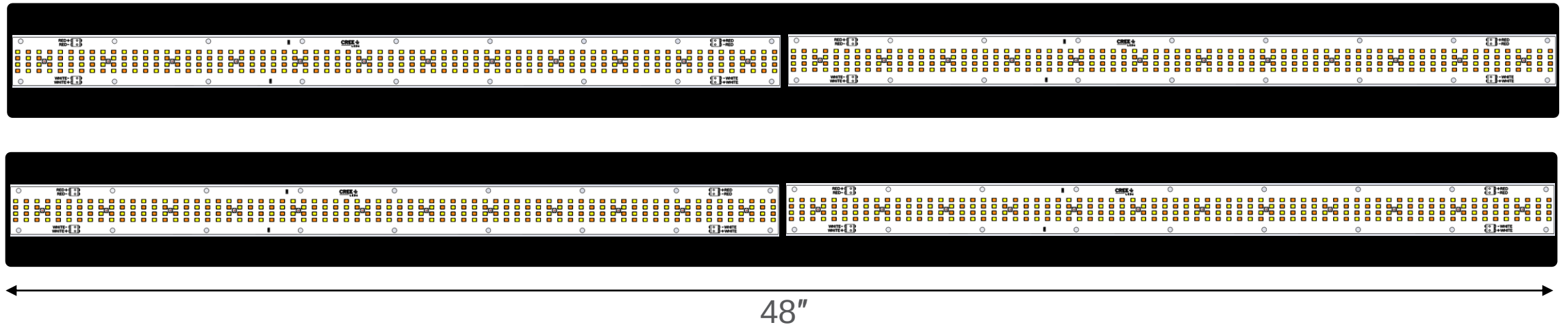


Purpose

The purpose of this reference design is to demonstrate the efficiency of using the J Series® 2835 G class Photophyll™ white LEDs working together with the XLamp® XP-G3 S Line photo red LEDs for high-efficiency broad-spectrum grow lights

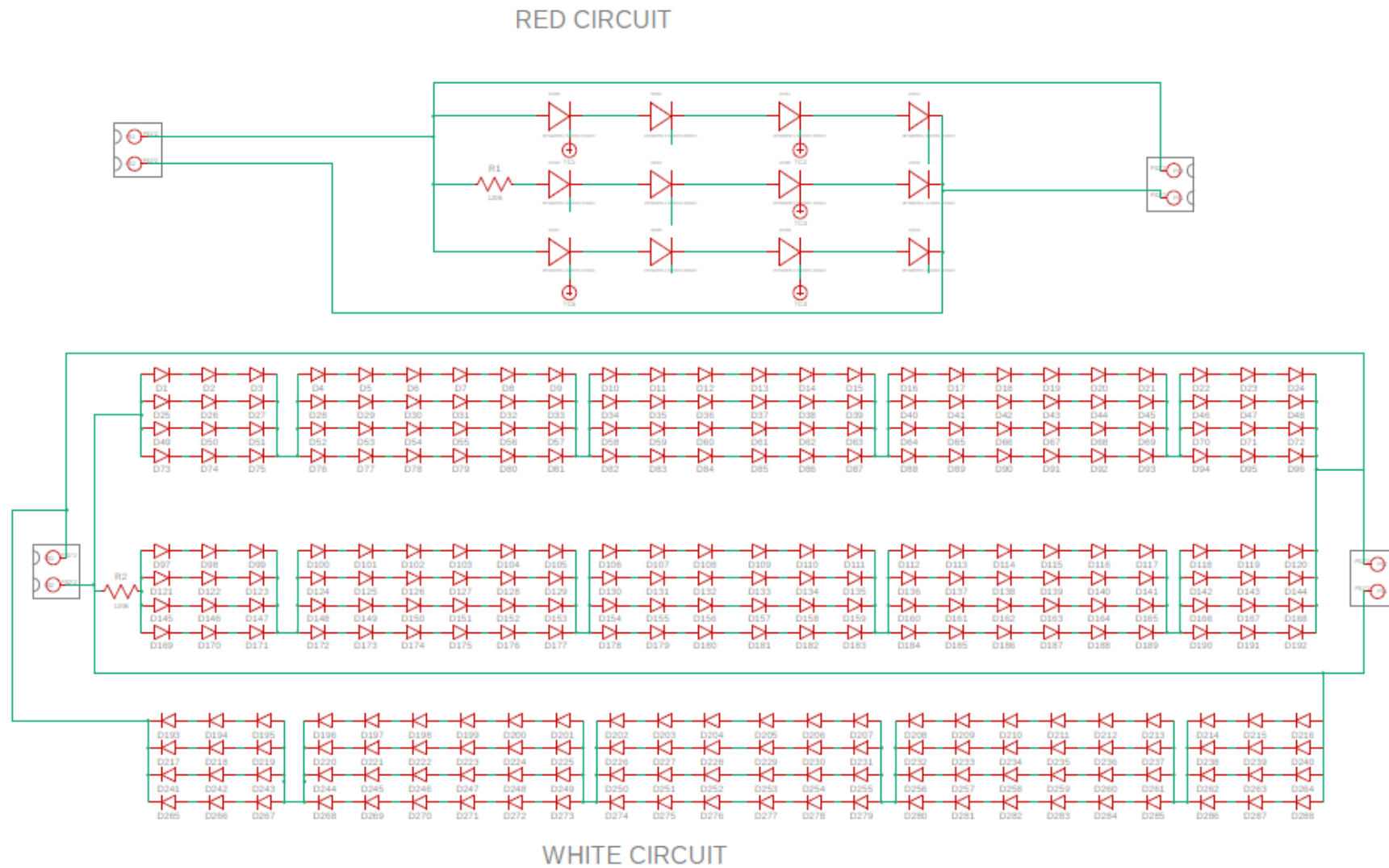


Rendering & PCB Orientation

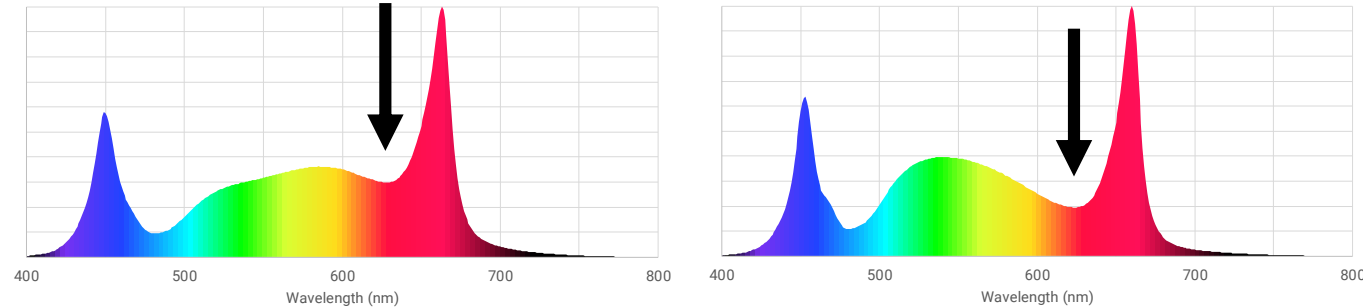


- 1200 LEDs total (1152 white, 48 red)
- (4) 22" populated PCBs in total
- (2) PCBs mounted to 48"L heat sink extrusion
- Heatsinks mounted to black anodized 80/20 material

Schematic



System Test Results



- Photophyll™ Select luminaire:
- Reduced short red (590-640 nm) – Basically trading low-efficiency short-red photons for an increase in green content which helps growers operate while still providing deep canopy penetration
 - Allows for much higher currents from efficient 660 nm photo red LEDs for the same red PAR % target
- Outperforms white + red with same LED count
 - 6% higher PPF & PPF/W
 - 17% higher lumens & LPW

Parameter	Baseline Recipe Luminaire		New Photophyll™ Select Recipe Luminaire	
LED 1	1,152 pcs J Series® 2835 G Class LEDs 50% 6500K 70 CRI & 50% 3500K 80 CRI		1,152 pcs J Series® 2835 G Class LEDs Photophyll Select	
LED 2	48 pcs XLamp® XP-G3 Photo Red S Line LEDs		48 pcs XLamp® XP-G3 Photo Red S Line LEDs	
Output Mode	Low	High	Low	High
LED 1 Current	58 mA	117 mA	59 mA	119 mA
LED 2 Current	468 mA	925 mA	473 mA	928 mA
PPF (μmol/s)	695	1,294	734	1,350
Power (W)	226	472	226	466
PPF/W (μmol/J)	3.08	2.74	3.25	2.90
Green/Blue Ratio	2.2	2.1	2.3	2.2
Red PAR %	49%	48%	41%	41%

*Values presented do not include driver loss

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Reference Design Photos



Design featured at LightFair 2022, May 21-23, 2022



Parts List

Item	Description	Manufacturer	P/N	Qty
LED	J Series® 2835 G class Photophyll™ Select	Cree LED	Engineering samples used – order codes coming soon...	1152
LED	XLamp® XP-G3 S Line photo red	Cree LED	XPGDPR-LS-P20-33-Y-01	48
PCB	22" PCB	New Energy	New Energy	4
PCB Connector	Wire-to-board terminal block	WAGO	2059-302/998-4031	16
TIM	3W/mK, 22" long	New Energy	2000-1033	4
Heatsink*	48" black Al extruded	New Energy	New Energy	2
Driver (White Channel)	Constant current, 0/10 dimmable	Meanwell	HLG-320H-C2800B	2
Driver (Red Channel)	Constant current, 0/10 dimmable	Meanwell	HLG-185H-12B	1
Dimmer	0/10 Dimmer, one for red channel, one for white channel	LEDdynamics LUXdrive	A019	2

*Heat sink was designed to operate fixture in low power mode for demonstration purposes only.



For more information, visit: www.cree-led.com/horticulture