Full Spectrum 12″ Horticulture Linear Reference Design v3

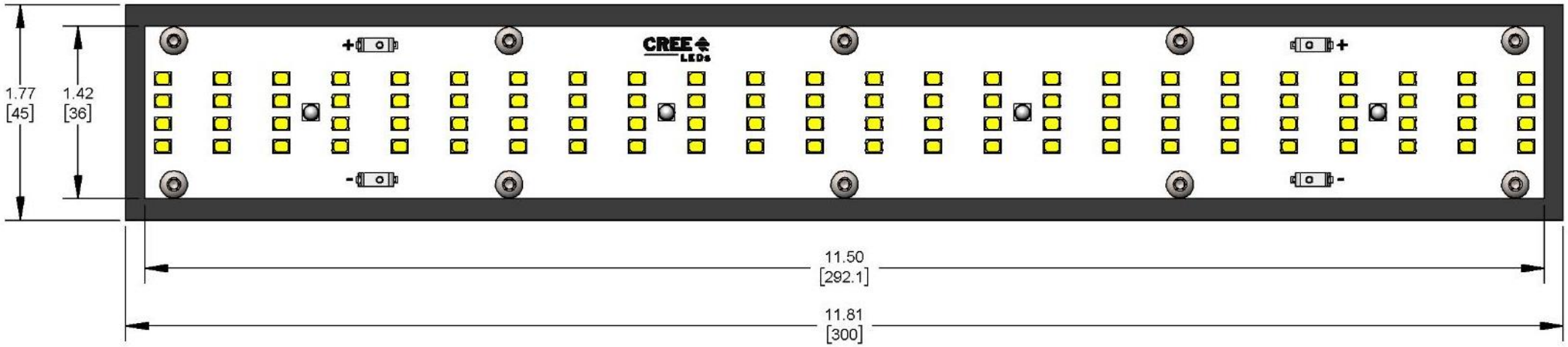
(J Series® 2835G Photophyll™ Select White, XLamp® XP-G3 S Line Photo Red)

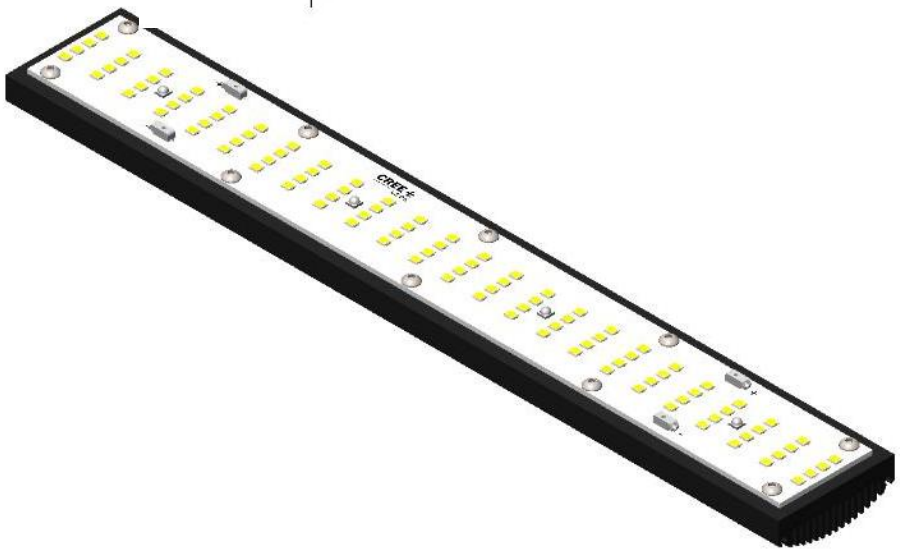
Purpose

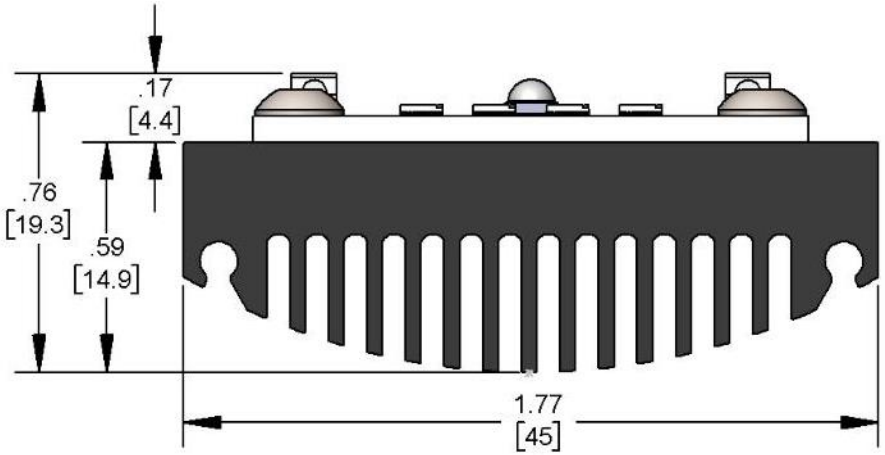
- The J Series® 2835 G class Photophyll™ Select LEDs are designed to replace white LEDs common in white + red horticulture luminaires. Completely binned in horticulture metrics, designers can now utilize these LEDs to directly control the green/blue/red (GBR) ratios in their designs
- The purpose here is to demonstrate the J Series 2835 G class Photophyll Select white LEDs working together with the XLamp® XP-G3 S Line Photo Red LEDs in a 12″ vertical farming module
- **This version of the demo uses (96) J Series 2835 G class Photophyll select white LEDs along with (4) XLamp XP-G3 Photo Red S Line LEDs producing an improved 3.07 PPF/W compared with the previous demo (using 144 white and 6 red LEDs). A 33% reduction in LED count providing better performance while maintaining the same GBR Red %**

Rendering and Dimensions

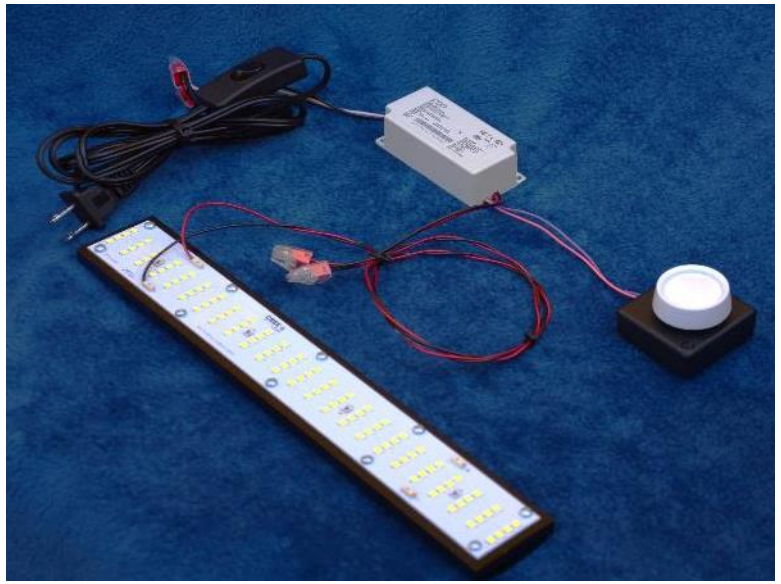
Inch
[mm]

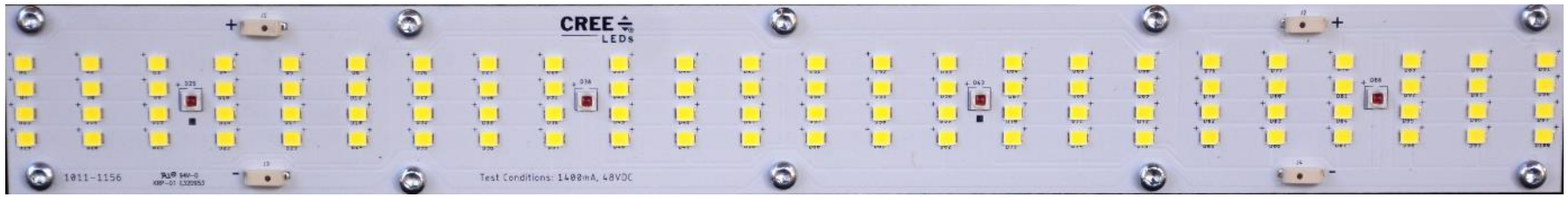






Reference Design Photos





Application Photo

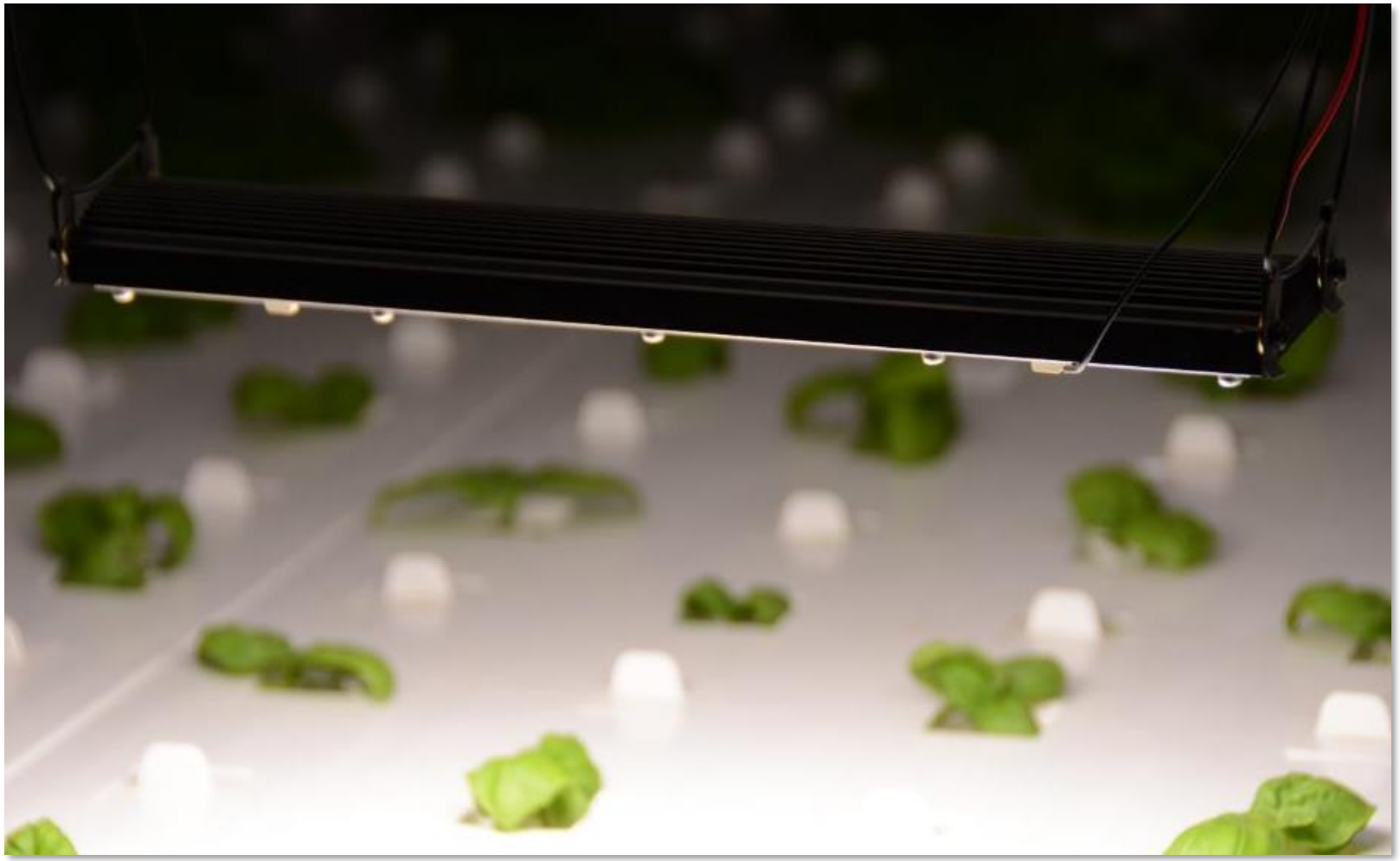
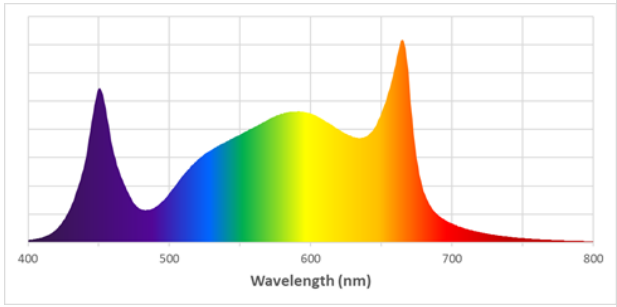
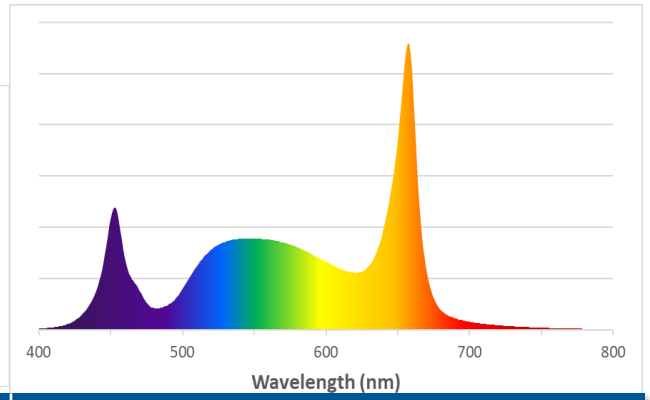


Photo taken in vertical farming room with a Nikon D7100 camera, 1/160sec, F/5.3, ISO100, distance of 1M

System Test Results





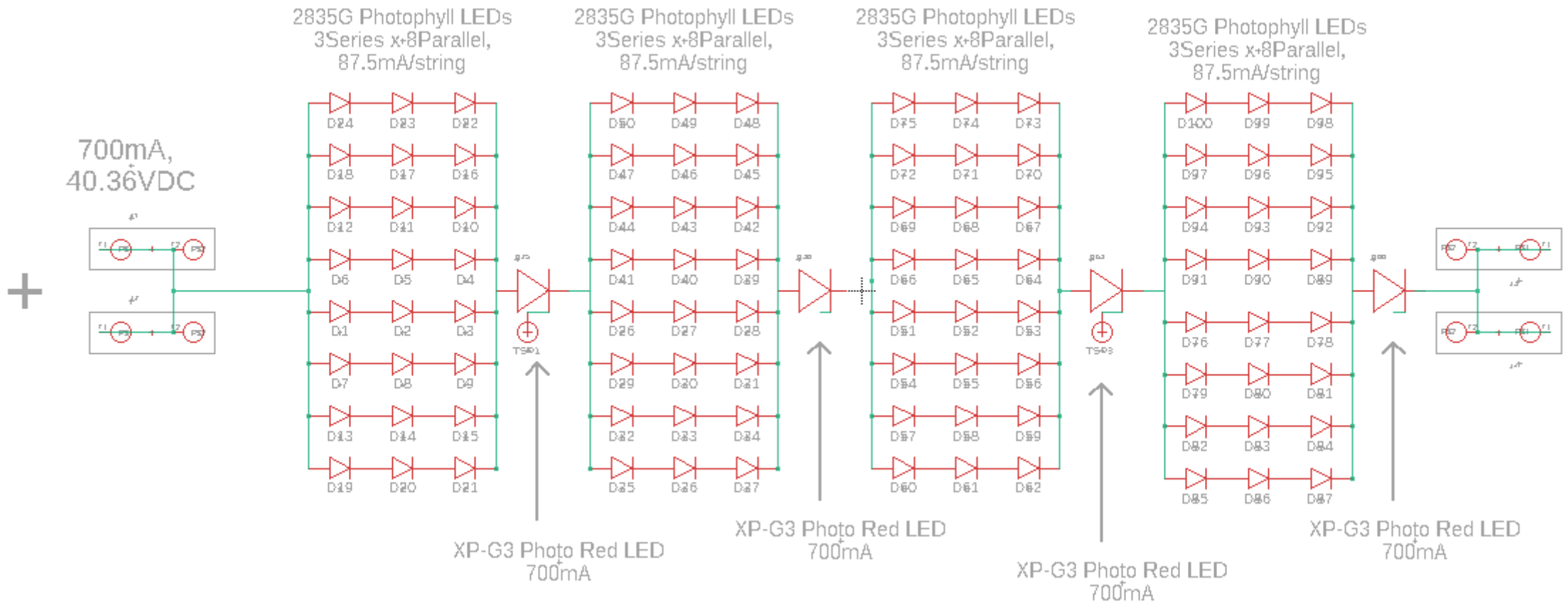
Parameter	Baseline Recipe Module	New Photophyll™ Select Recipe Module
LED 1	144 pcs J Series® 2835 G Class LEDs 50% 6500K 70 CRI & 50% 3500K 80 CRI	96 pcs J Series 2835 G Class Photophyll Select LEDs (8P12S)
Current per LED 1	58 mA	75 mA
LED 2	6 pcs XLamp® XP-G3 Photo Red S Line LEDs	4 pcs XLamp XP-G3 Photo Red S Line LEDs (2P2S)
Current per LED 2	233 mA	705 mA
PPF (µmol/s)	**75.1**	**78.5**
Power (W)	25	25.6
PPF/W (µmol/J)	3.0	3.07
Green/Blue Ratio (GBR)	2.1	2.3
Red PAR (%)	41	42

All values presented do not include driver loss.
All measurements taken at a steady-state condition.

New Photophyll™ Select module

- Massive **33% reduction in LED count** vs standard white/red designs
  - Better performance
  - Same GBR and Red %
- Photophyll Select LEDs allow for maximum contribution from the high efficiency 660 nm Photo Red LEDs
  - Horticulture-optimized spectrum reduces wasted light in 600-650 nm range while still providing broad green coverage

Schematic



Parts List

Item	Description	Manufacturer	MPN/Order Code	Qty
LED 1	J Series® 2835 G class Photophyll™ Select (2.5 GBR)	Cree LED	JB2835BWT-G-Q001A0000-N0000001	96
LED 2	XLamp® XP-G3 S Line Photo Red	Cree LED	XPGDPR-LS-0000-00H01	4
PCB	PCB	New Energy	1011-1142	1
PCB Connector	Wire-to-board terminal block	WAGO	2059-301/998-403	4
TIM	3W/mK	New Energy	2000-1033	1
Heatsink	12″ x 2″ x .7″ Al extruded	New Energy	2100-1020-1	1
Driver	Constant current, 0/10 dimmable	ERP	ESS030W-0700-42	1
Dimmer	0-10V rotary	LEDdynamics LUXdrive	A019	1
Dimmer Box	Dimmer Box	Hammond	1551RBK	1
Power Cord	Two prong with switch	Aplstar	APL-LB012-6	1

Cree LED Branding Partners Participating in the Design

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