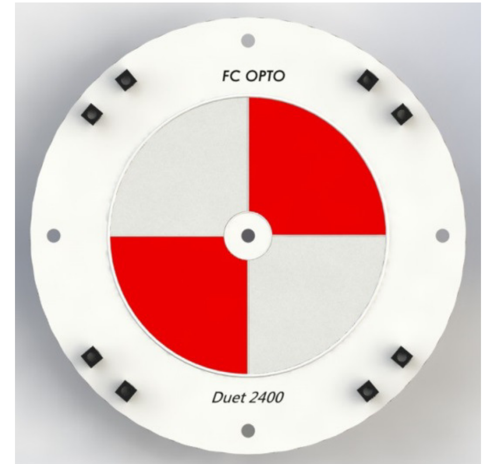
Duet D2400

Best Lumen / Watt
Plant Growth COB Module



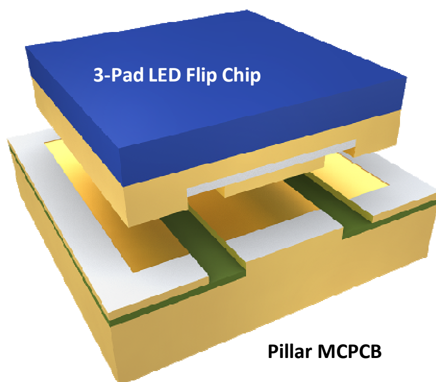
Dynamic and Cooler

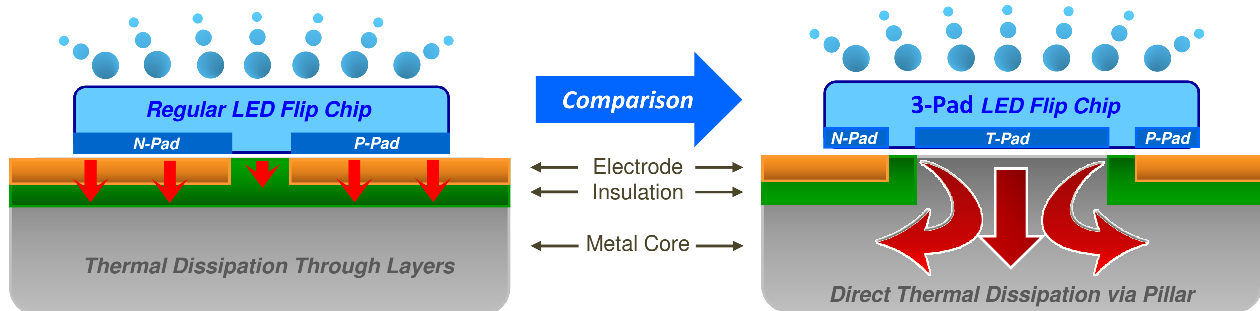
High Efficacy & Lower Thermal Resistance

Duet D2400 is a high power **Plant Grow** lighting module offering independent and adjustable power control in Royal Blue and Broadband Red spectrums. The lighting module is structured based on patented **3-Pad LED Flip Chips** and **Pillar MCPCB** to further decrease the thermal resistance and results in minimal thermal decay.

Features:

- Patented COB Technologies
- 4x Independent Illuminating Sections
- 2x Red sections and 2x Blue Sections
- 1216W Maximum Power in Red Sections
- 1216W Maximum Power in Blue Sections
- Peak Options of Red Spectrum at 650±2nm, 640±2nm, and 627±2nm
- 106mm Light Emitting Surface
- 0.003°C/W Thermal Resistance
- 45x45mil Patented Flip Chips
- Low Temperature Bonding
- No Wire Bonding
- RoHS Compliant





FLIP CHIP OPTO

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Absolute Maximum Ratings (Ta=25°C):

Parameter	Symbol	Max. Rating	Conditions
Red / Blue Power Dissipation	P_d	1216W / 1216W	Tj≤140°C
Red / Blue DC Forward Current	I_F	24A / 24A	Tj≤140°C
Junction Temperature	Tj	140°C	
Reverse Voltage	V_r	-5V	$T_{ambient}$ = 25°C
Reverse Current	I_r	≤1µA	Vr = -5V
Operating Case Temperature	T_C	-40°C to 105°C	
Storage Temperature	T_{ST}	-40°C to 120°C	

Electro-Optical Characteristics (Ta=25°C):

Viewing Angle $2\theta_{1/2}$ = 140°

Per Quarter	Peak Wavelength (nm)	FWHM (nm)	V_F (V) @ I_F=6A	PPFD (µmol/s)	LES (mm)
Red	627±2	65	47.1	370.2	106
Deep Red	640±2	80	47.1	341.5	
Deep Red	650±2	80	47.1	287.1	
Royal Blue	449~453	25	47.1	485	

Thermal Characteristics:

Parameter	Symbol	°C/W	Definition
Thermal Resistance	$R_{th(j-b)}$	0.003	Between LED Junction and COB Bottom Surface

- Junction Temperature Tj = Tb + Power(W) x Rth(j-b), where Tb is the temperature at COB bottom surface.

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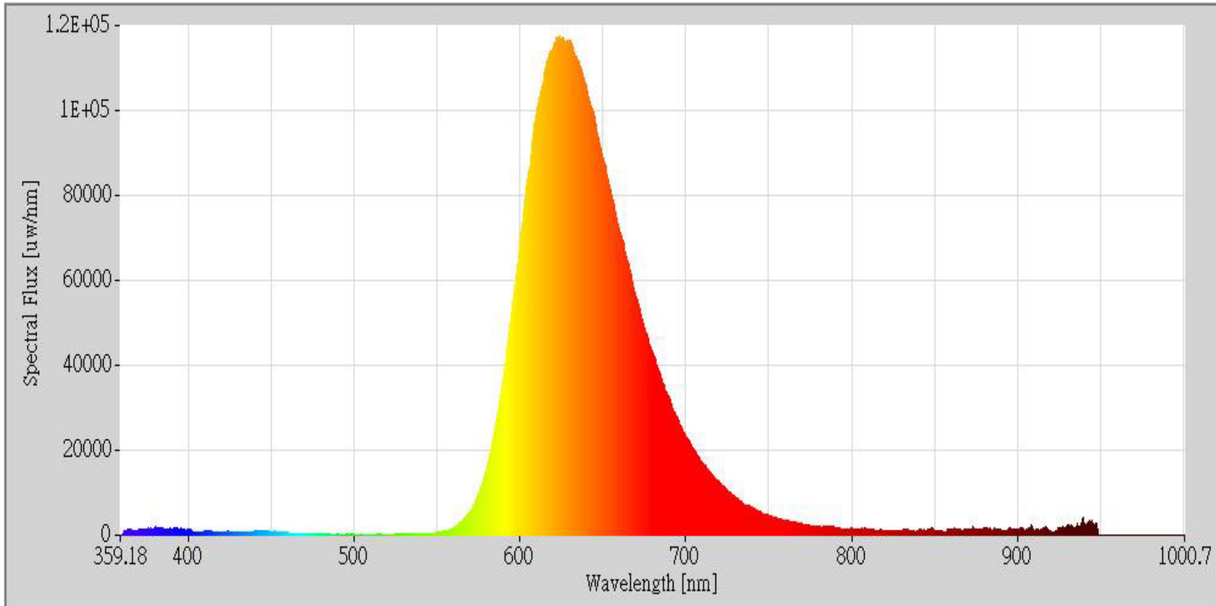
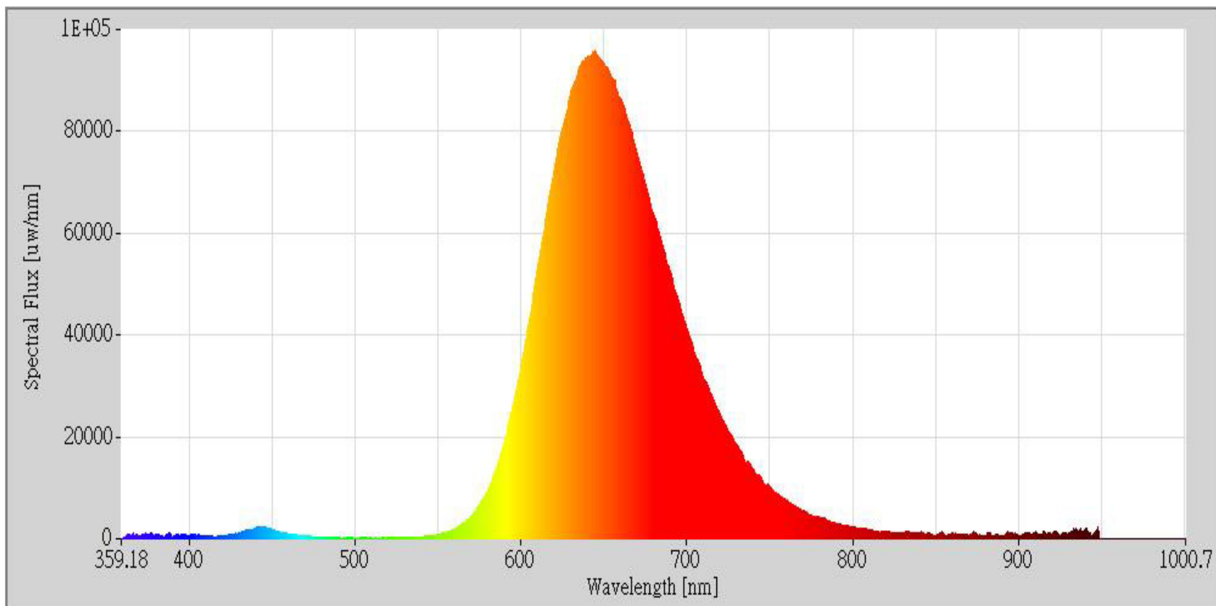
Red Peak 627nm Emitting Spectrum (Ta=25°C):



Deep Red Peak 640nm Emitting Spectrum (Ta=25°C):



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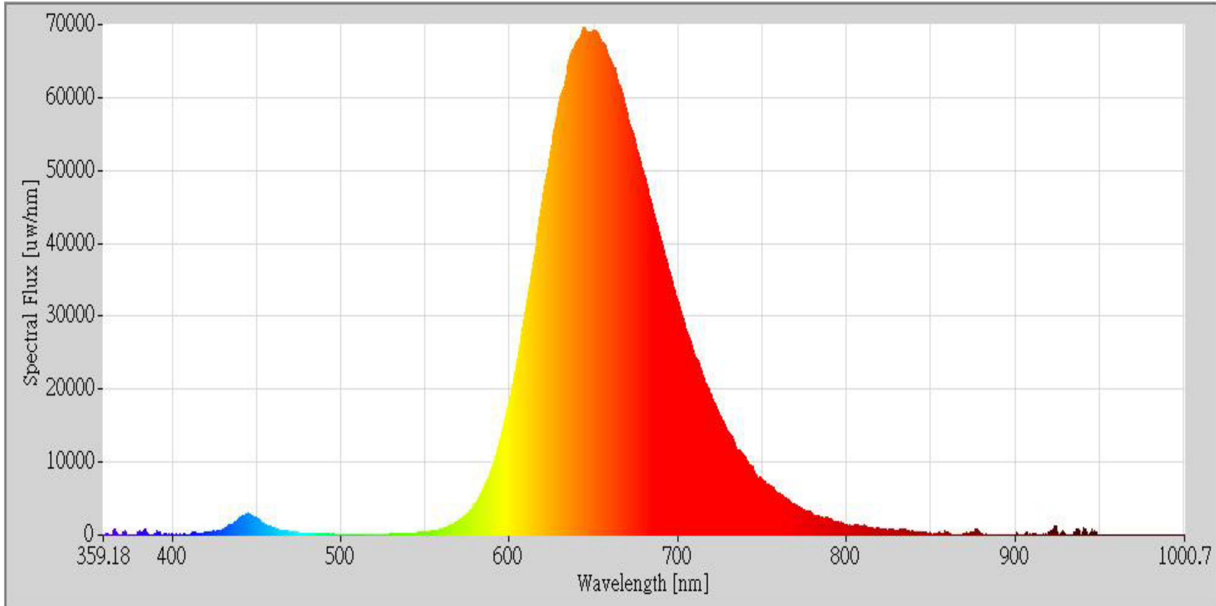
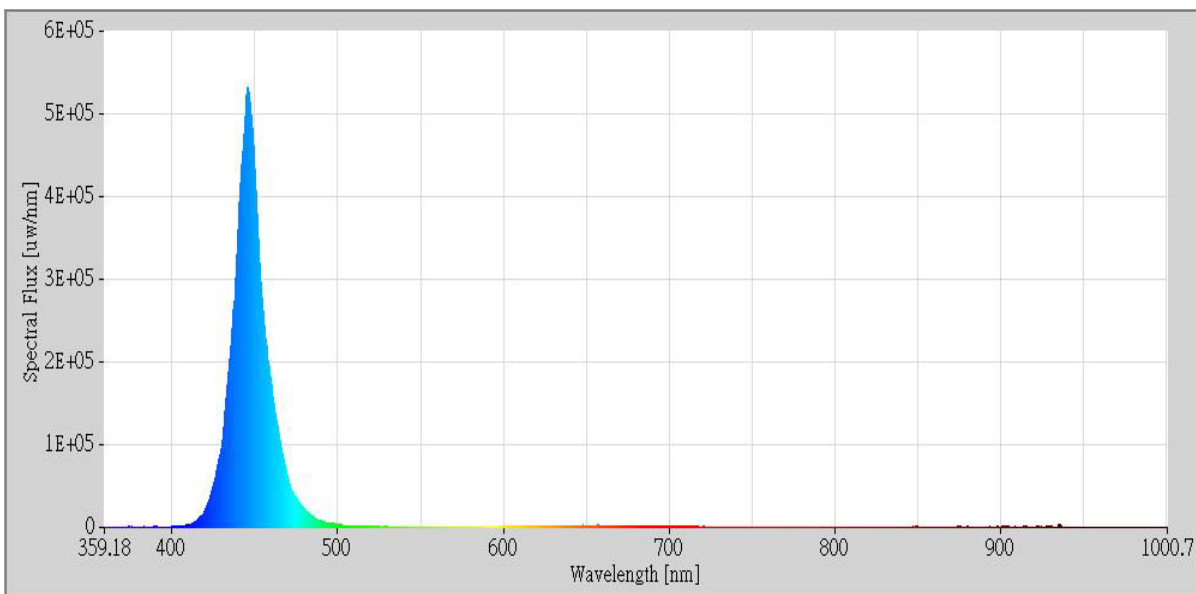
Deep Red Peak 650nm Emitting Spectrum (Ta=25°C):

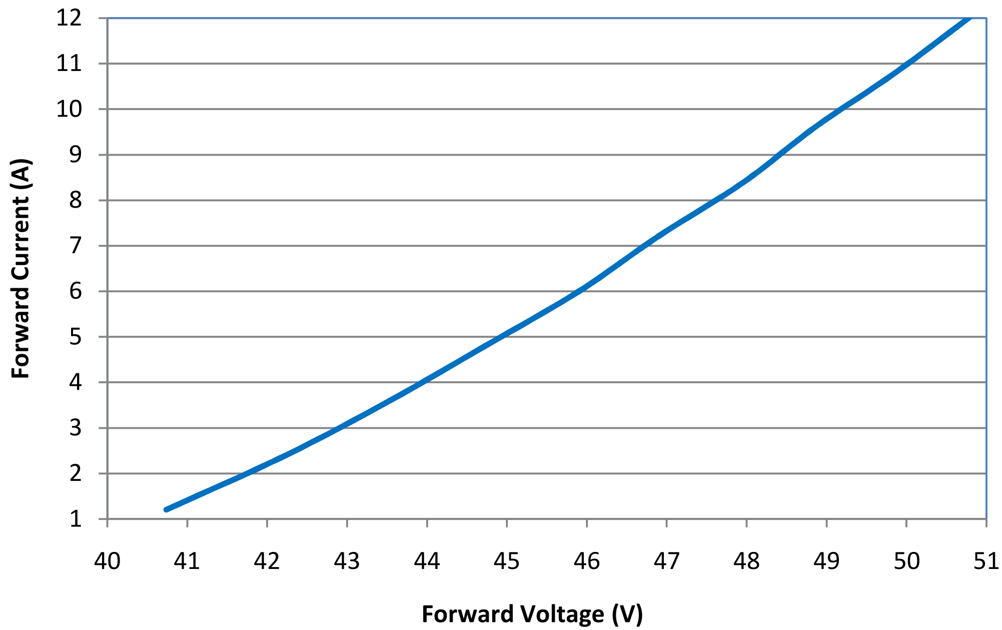


Royal Blue 450nm Emitting Spectrum (Ta=25°C):

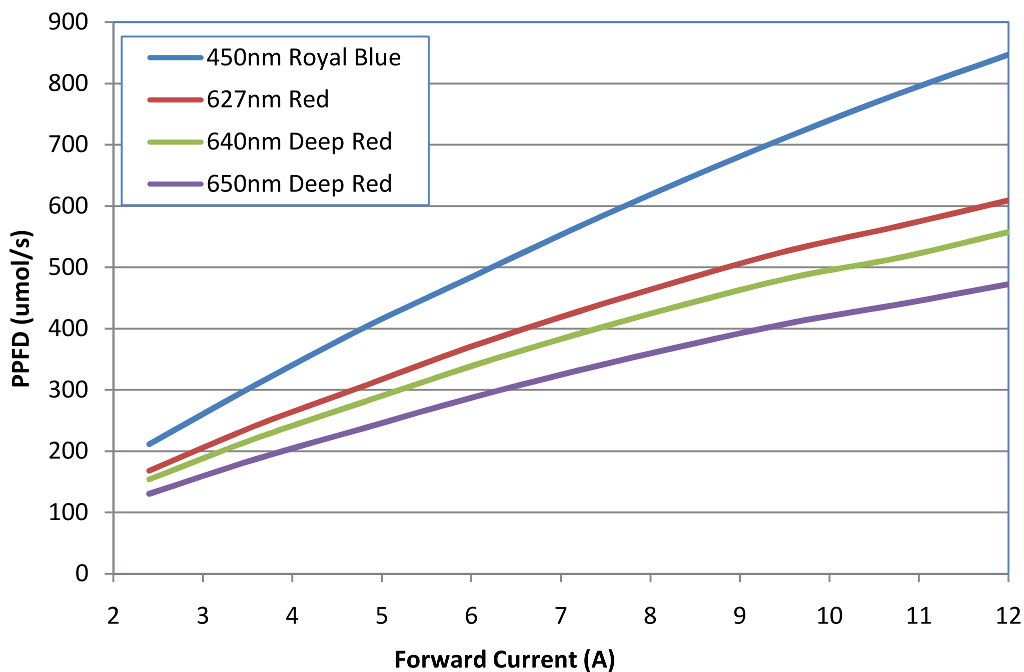


Characteristic Graphs (Ta=25°C):

(i) Typical Forward Current (I_F) vs. Forward Voltage (V_F) of Each Section



(ii) Typical Output PPFD (µmol/s) vs. Forward Current (I_F) of Each Section



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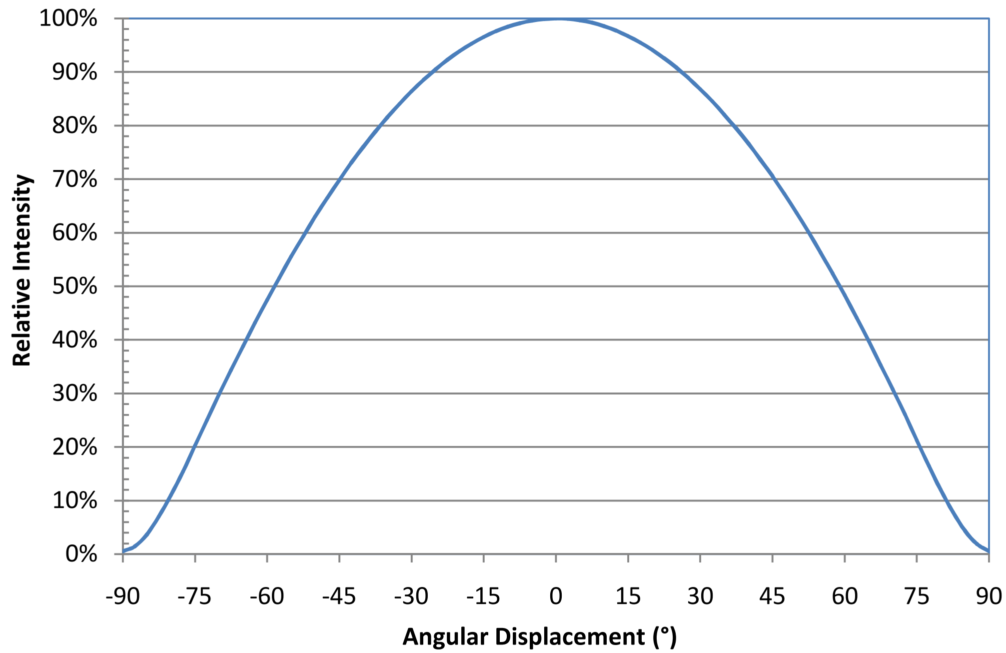
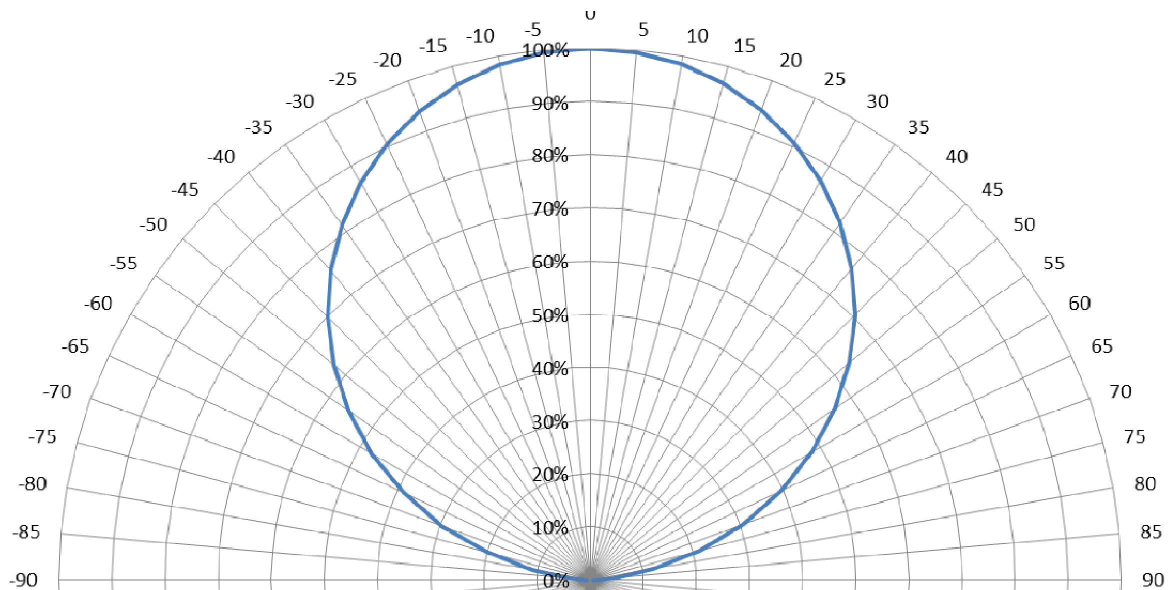
(iii) Typical Spatial Radiation Pattern



(iv) Typical Polar Radiation Pattern



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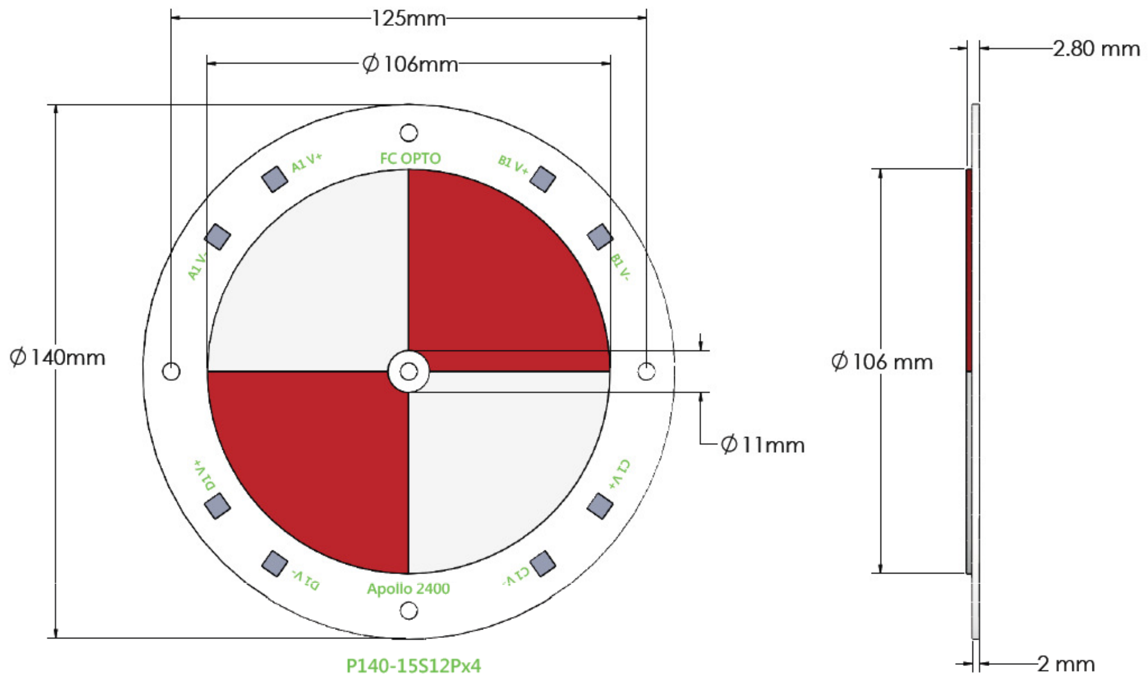
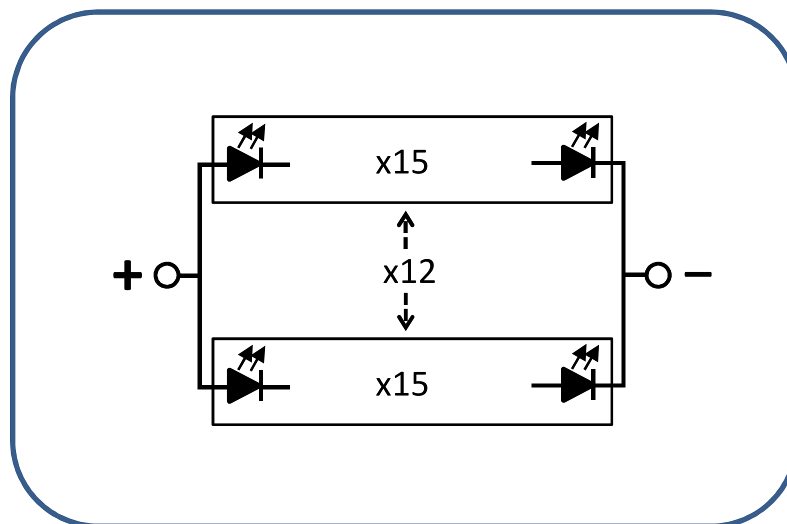
Mechanical Dimensions:

- Solder pads are labeled "+" and "-" to denote positive and negative, respectively.
- Drawing dimensions are in millimeters, and are not to scale.
- Tolerance: ±0.2mm
- The optical center of the LED Array is defined by the mechanical center of the array.



Circuit Diagram of Each Quarter is Identical:



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Cautions:

1. Circuit Protection is recommended during the assembly and operation.
   i. MOV, TVS, current fuse, thermal fuse, capacitor, resistor are options to avoid unexpected circuit faults.

2. Storage Conditions
   i. Moisture Controlled environment is recommended to avoid COB damages during storage. Moisture may cause circuit damages and result in brightness reduction or failure in circuit contacts.
   ii. COB in moisture-proof sealed bags should be stored in ambient conditions of temperature less than 30°C and humidity less than 90%RH.
   iii. COB in open air should be kept in ambient conditions of temperature less than 30°C and humidity less than 60%RH.
   iv. COB should be restored in moisture-proof bag with moisture absorbent together.

3. Handling Light Emitting Surface (LES)
   i. LES is a silicone lens and should not have direct contact with sharp tools and human fingers.

4. Recommendation on Assembly with Heat Sink
   i. Apply thermal grease over the heatsink contact surface to seal the voids and roughness pre-existing on the contact surface.
   ii. Attach COB onto heatsink contact surface with thermal grease in between. Thermal grease thickness is suggested less than 25um (1 mil)
   iii. Apply sufficient pressure to secure the COB, and ensure (a) full contact between COB and heatsink, (b) no voids within thermal grease, (c) minimal thermal grease thickness.

5. Flip Chip Opto is not responsible to the damages caused by the operation under the parameters exceeding the values described in the specification.

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