

# Brighter and Cooler

Lower Junction Temperature / Increased Lumens

P15-3S3P Chip on Board (COB) is a high-performance LED module based on Flip Chip Opto’s patented LED Flip Chip and Packaging technologies. Due to its extremely low thermal resistance between the LED junctions and the bottom of the entire module, illumination designers are able to maximize their “lumens / cost” ratio via over drive scheme, smaller optics and smaller heatsinks.

A comparison of our patented COB is illustrated below illustrates our enhanced performance characteristics when compared with conventional flip chip COBs. Flip Chip Opto’s COB enables direct thermal dissipation to the metal core through its patented pillar structure, while the conventional COB must diffuse its thermal energy through the thermal resistant insulation layer between the LED flip chip and the metal core.

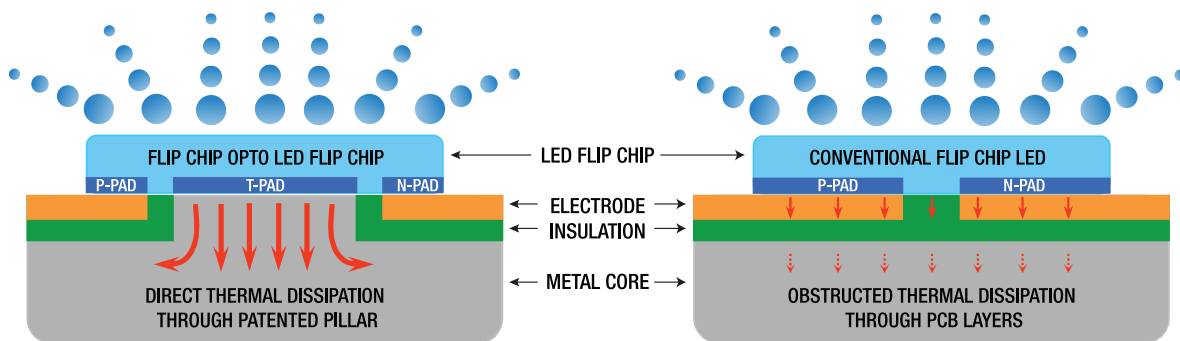


## Features:

- 45x45mil Flip Chip on Cu Based Board
- Lowest Thermal Resistance of 0.08C/W
- Guaranteed Over Drive Solution
- Minimized Light Emitting Surface
- Low Tj & Minimum of Thermal Decay
- Patented LED & Packaging Technologies

## Benefits:

- Optimizes lumen per dollar value
- Enables smaller and less expensive optics
- Enables smaller heatsinks
- Extends LED life span



*A single 45x45mil LED flip chip integrated Starlite COB is measured with its junction temperature (Tj) of 50.2C @ 1A driving current, which is 25°C lower than that of a single 45x45mil LED flip chip integrated conventional COB.*



**CHARACTERISTICS:** (TA=25C)

MODEL	CCT (TYPICAL)	CRI (MIN)	TEST CURRENT	LUMINOUS FLUX	Vf	LES
P15-3S3P-30	3000	80	700ma	850lm (±30lm)	9.0V (±0.5V)	10mm
			1050ma	1030lm (±30lm)	9.4V (±0.5V)	
			2100ma	1700lm (±30lm)	9.6V (±0.5V)	
P15-3S3P-40	4000	70	700ma	930lm (±30lm)	9.0V (±0.5V)	
			1050ma	1130lm (±30lm)	9.4V (±0.5V)	
			2100ma	1850lmv	9.6V (±0.5V)	
P15-3S-3P-50	5000	70	700ma	950lm (±30lm)	9.0V (±0.5V)	
			1050ma	1150lm (±30lm)	9.4V (±0.5V)	
			2100ma	1900lm (±30lm)	9.6V (±0.5V)	

**THERMAL AND OPTICAL CHARACTERISTICS:**1. Thermal Resistance  $R_{th\ j-b} = 0.08$  <?>

- Thermal resistance  $R_{th\ j-b}$  is measured between the LED “Junction” and the “Bottom” of the COB metal core.
- LED Junction Temperature  $T_j = T_b + \text{Power (W)} \times R_{th\ j-b}$ , where  $T_b$  is the temperature of the bottom of the COB metal core.
- TR Measurement point shown in the Mechanical Dimension is part of the COB metal core, and its temperature is used as a reference for  $T_b$ .

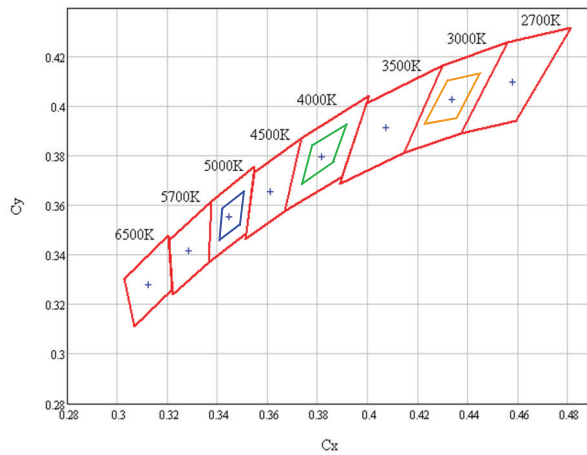
2. Viewing Angle  $2\Theta_{1/2} = 140^\circ$ 

Parameter	Symbol	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
Dominant Wavelength	$\lambda_D$	If=700mA	448	455	462	nm
Radiant Power	PO		900		1020	mw
Forward Voltage	Vf			3.2	3.4	V
Reverse Current	Ir	Vr=-5V		1.0	2.0	$\mu$ A

**MAXIMUM RATINGS:**

Parameter	Maximum Rating
LED Junction Temperature	145°C
DC Forward Current	4500mA
Input Power	45 Watts
Reverse Voltage (Vr)	-5V @ Tambient = 25C
Reverse Current (Ir)	$\leq 1\mu$ A@ Vr = -5V
Operating Case Temperature	-40°C to + 105°C
Storage Temperature	-40°C to + 120°C
Soldering Temperature	280C max for up to 3.5 seconds

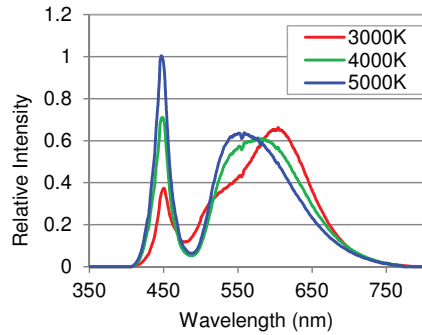
**Bins on the ANSI C78:**



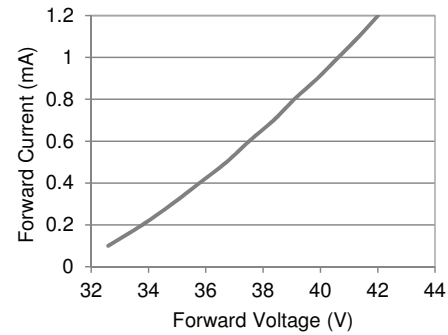
CCT	x	y
3000K	0.4242	0.3919
	0.4322	0.4096
	0.4449	0.4141
	0.4359	0.3960
4000K	0.3744	0.3685
	0.3782	0.3837
	0.3912	0.3917
	0.3863	0.3758
5000K	0.3407	0.3459
	0.3415	0.3586
	0.3499	0.3654
	0.3484	0.3521

**CHARACTERISTIC CURVES:**

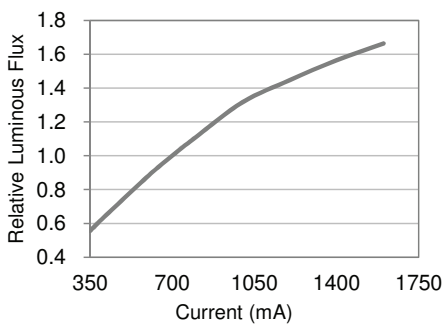
Spectrum @ 700mA/25°C



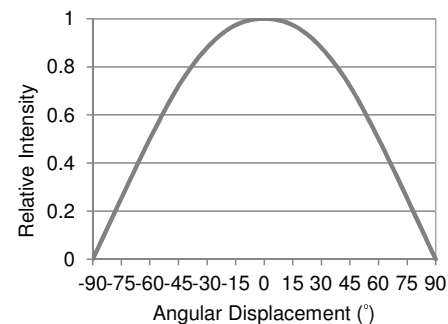
V<sub>f</sub> vs. I<sub>F</sub> @ 25°C



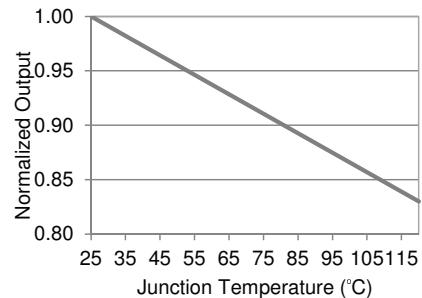
Luminous Flux vs. I<sub>F</sub>



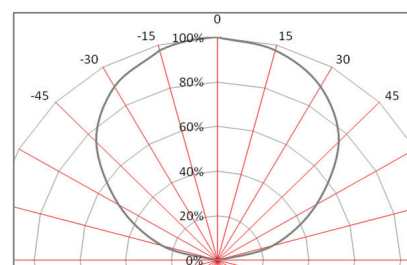
Typ. Spatial Radiation Pattern



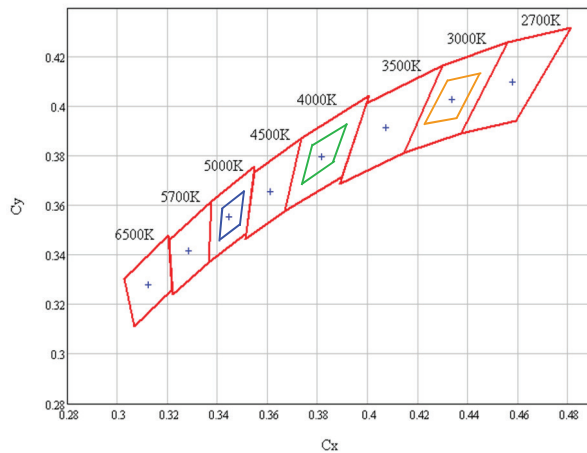
Normalized Output vs. T<sub>j</sub>



Polar Radiation Pattern



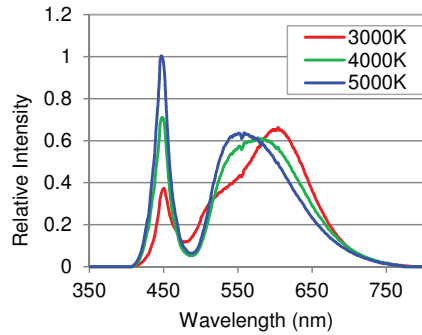
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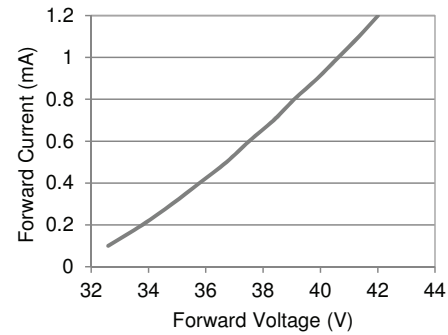
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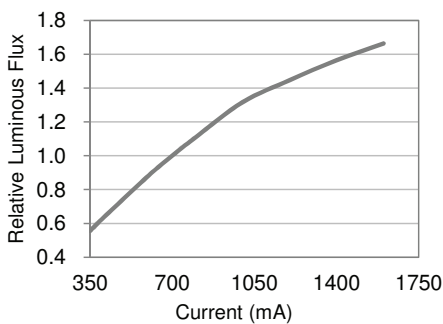
Spectrum @ 700mA/25°C



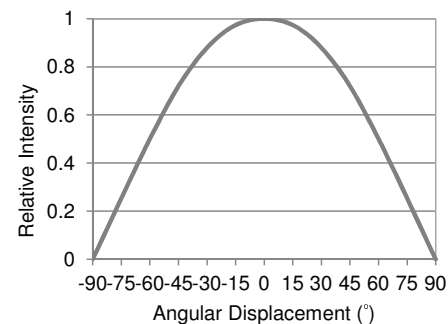
Vf vs. If @ 25°C



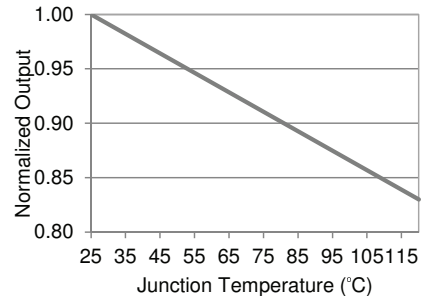
Luminous Flux vs. If



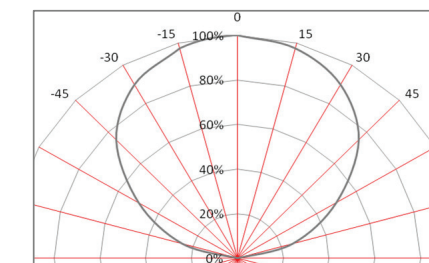
Typ. Spatial Radiation Pattern



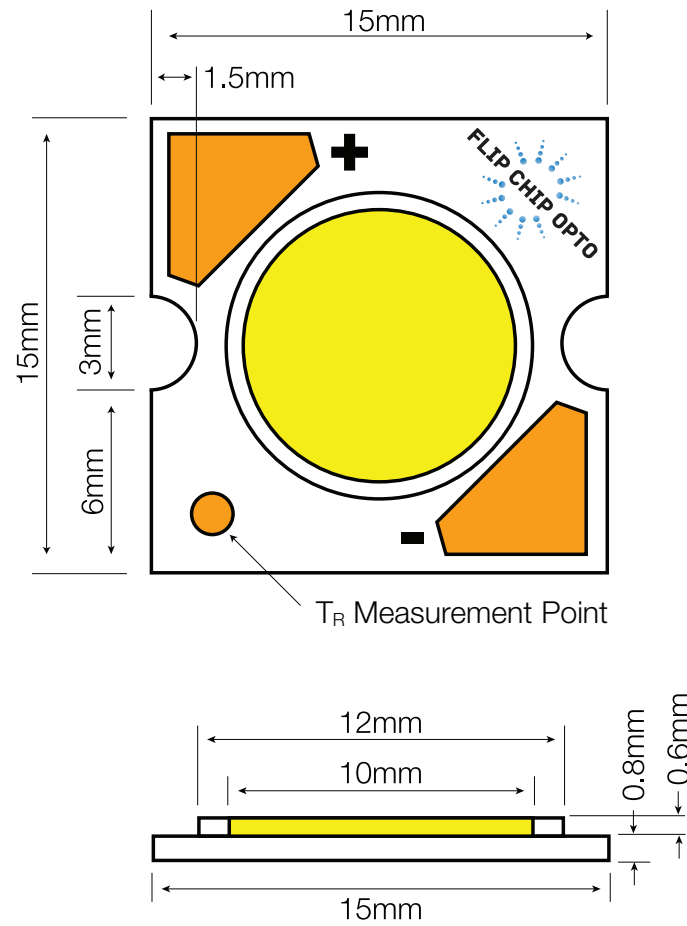
Normalized Output vs. Tj



Polar Radiation Pattern



## MECHANICAL DIMENSIONS:



Note:

1. Solder pads are labeled "+" and "-" to denote positive and negative, respectively.
4. The optical center of the LED Array is defined by the mechanical center of the array.