

SPECIFICATIONS FOR COB SERIES

WHITE LED

Model: Metal COB SERIES
Part No: TMN1-16-xxxx-5802AA0

DATE: 2018/11/05

REV. No.: VERSION A00



Features:

- * Compact high flux density light source
- * Uniform, high quality illumination
- * Minimum 80, and 90 CRI options
- * StreaCLined thermal path
- * ENERGY STAR/ ANSI compliant color binning structure with 3 and 5 SDCM standard
- * More energy efficient than incandescent, halogen and fluorescent lamps
- * RoHS and REACH certification

Applications

- * Spotlights/Track Lights
- * Downlights
- * Shop Lighting
- * Hospitality Lighting
- * Architectural and Specialty
- * Street Lighting
- * Parking Lot and Area Lighting
- * Tunnel Lighting

Electro Optical Characteristics, IF = 240mA

CCT	Color Rendering	Luminous Flux		
		Ta=25°C		Ta=85°C
	Min.	Typ.	Min.	Typ.
2700K	80	5615	5053	5025
	90	4715	4243	4220
3000K	80	5830	5157	5128
	90	4985	4486	4461
3500K	80	5841	5310	5281
	90	5075	4567	4542
4000K	80	5850	5265	5235
	90	4919	4472	4447
5000K	80	5910	5265	5235
5700K	80	5910	5265	5235
6500K	80	5910	5265	5235

- * Tolerance of measurements of the Luminous Flux is $\pm 7\%$.
- * Ra measurement tolerance is ± 2 .
- * Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.
- * The lumen table at 85°C is only for reference.

Part Numbering System

T - - - -

X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11

Item Number Code	Description	Content
X1	Base material	M: Mirror aluminum C: ceramic F:PCB
X2	Bit code	N:standart E: economy
X3	Version Code	\
X4	Light Emitting Surface	16=Φ16mm
X5	Nominal CCT	30=3000K
X6	Minimum CRI	80=80CRI
X7	Die Count In Series	\
X8	Die Count In Parallel	\
X9	version	\
X10	ANSI	\
X11	Bom Version	\

Absolute Maximum Ratings at Ta=25°C

Item	Symbol	Absolute Maximum Rating	Unit
Forward current	I _F	400	mA
Power Dissipation	P _D	72	W
Operating Temperature	Topr	-40~+105	°C
Storage Temperature	Tstg	-40~+120	°C
Junction Temperature	Tj	125	°C

- * Condition for I_{fp} are pulse of with 1/10 duty and 0.8msec width (120Hz)
- * LED's properties might be different from suggested values like above and below tables if operation condition will be exceeded our parameter range. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
- * All measurements were made under the standardized environment of Lightning LED.

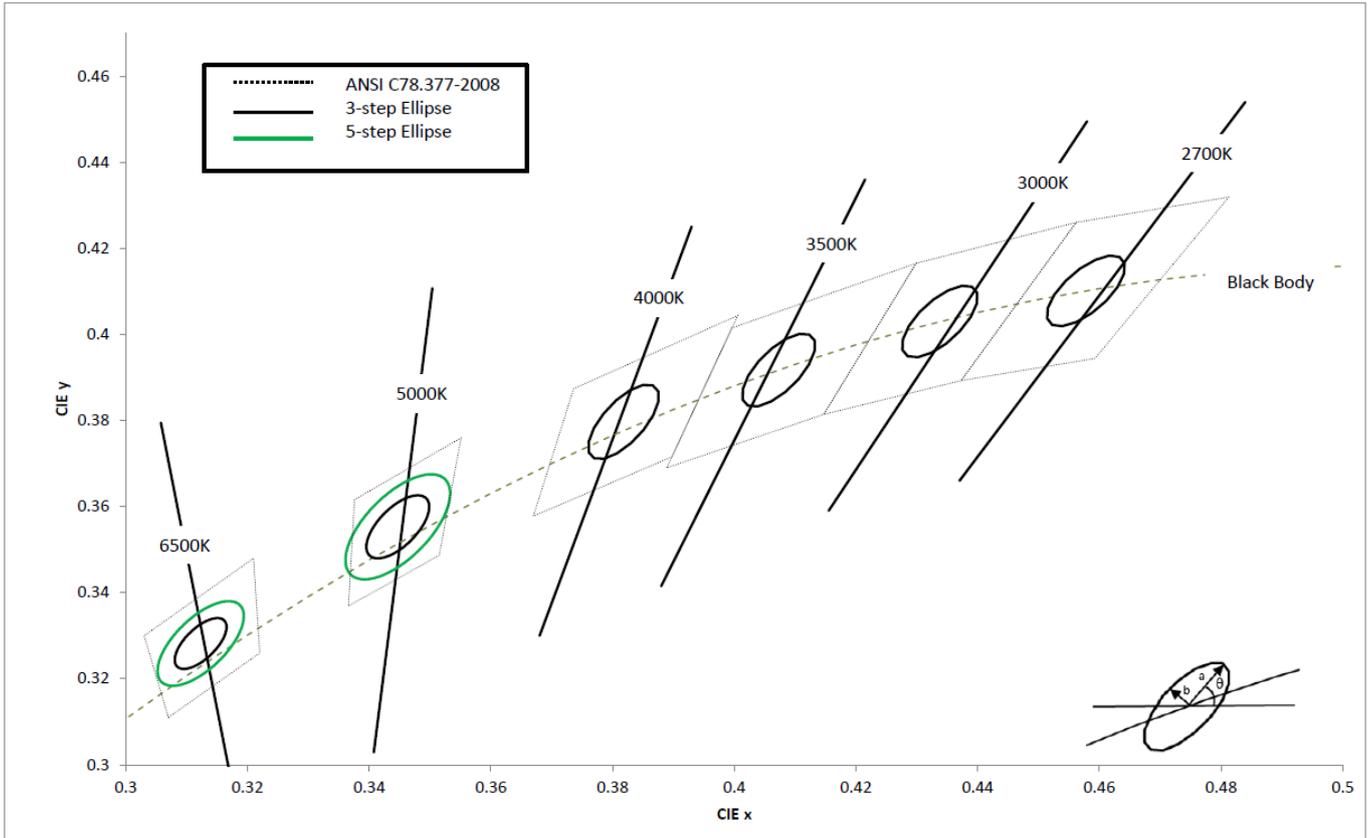
Electrical/Optical Characteristics at Ta=25°C

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward Voltage	V_F	166	170		V	$I_F=240mA$
Luminous Flux	Φ_V		5850		lm	
View Angle	$2\theta_{1/2}$	-	120	-	°	
Correlated Color Temperature	CCT	2700	4000	6500	K	
Color Rendering Index	Ra	80			-	
Color Rendering Index	R9	-	-	-	-	
Characteristics Coordinates	x	-	0.4338	-	-	
	y	-	0.4030	-	-	
Thermal resistance	($R_{th\ j-sp}$)	-	1.5	-	°C/W	

- * Tolerance of measurements of the Forward Voltage is $\pm 3\%$.
- * Tolerance of measurements of the Luminous Flux is $\pm 7\%$.
- * $2\theta_{1/2}$ is the off-axis where the luminous intensity is $1/2$ of the peak intensity.
- * Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.
- * Ra measurement tolerance is ± 2 .
- * R9 measurement tolerance is ± 2 .
- * Tolerance of measurements of the chromaticity Coordinate is ± 0.005 .
- * $R_{th\ j-sp}$ is the thermal resistance from LED junction to solder point on MCPCB with electrical power.

Chromaticity Bin Structure

Chromaticity Bins: 1931 CIE Curve



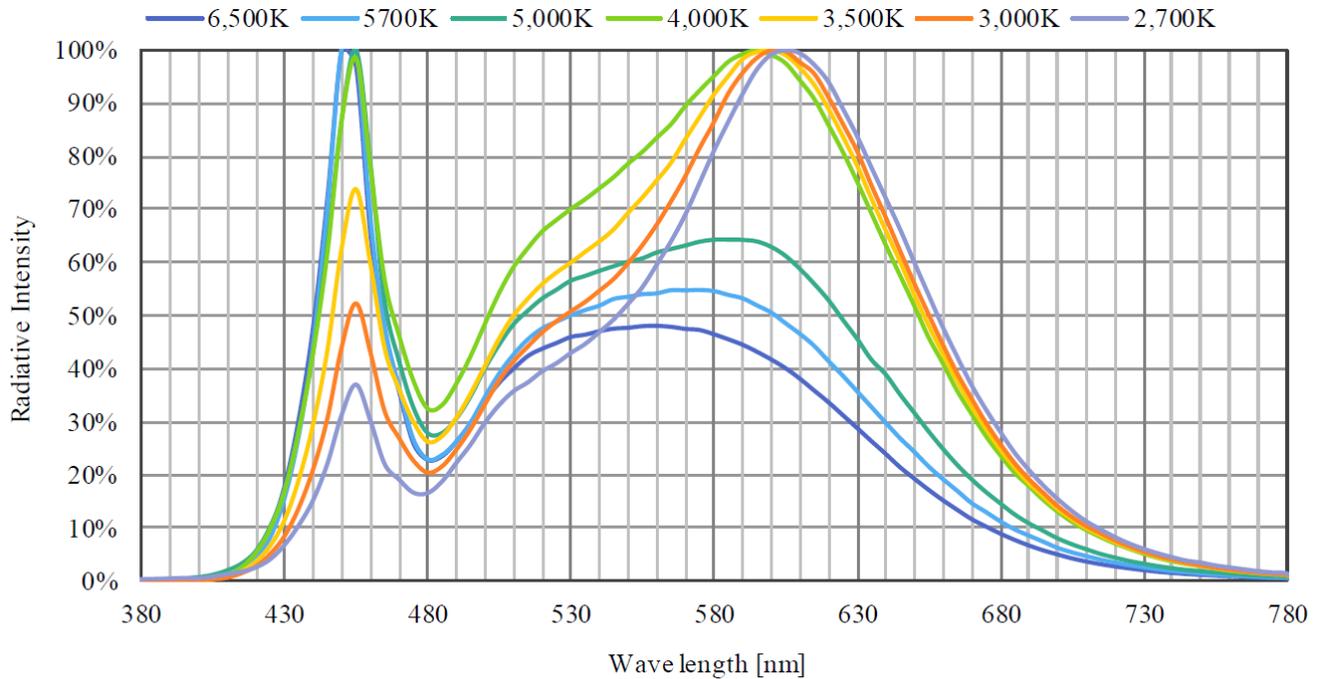
The color ranks have chromaticity ranges within 3-step&5-step MacAdam ellipse

CCT	Center Point		3-step Bin		5-step Bin		Angle(deg)
	x	y	a	b	a	b	Φ
2700	0.4578	0.4101	0.0081	0.0042	0.0135	0.007	53.70
3000	0.4338	0.4030	0.00834	0.00408	0.0139	0.0068	53.20
3500	0.4073	0.3917	0.00927	0.00414	0.01545	0.0069	54.00
4000	0.3818	0.3797	0.00939	0.00402	0.01565	0.0067	53.72
5000	0.3447	0.3553	0.00822	0.00354	0.0137	0.0059	59.60
5700	0.3287	0.3417	0.00746	0.0032	0.01243	0.00533	59.09
6500	0.3123	0.3282	0.00669	0.00285	0.01115	0.00475	58.57

* Energy Star binning applied to all 2700~6500K(2700~4000K 3-step,5000~6500K 5-step).

* Tolerance of measurements of the chromaticity Coordinate is ± 0.005 .

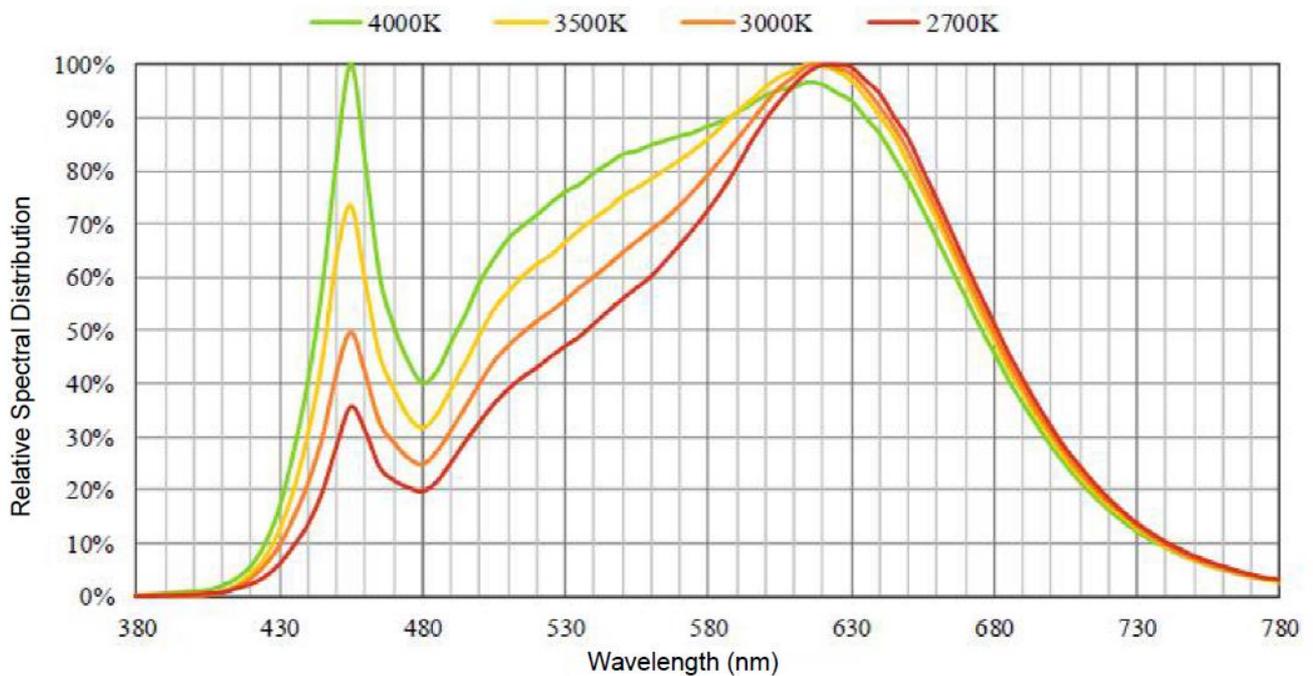
Fig 1. Typical Color Spectrum for 80CRI, Ta = 25°C



*Color spectra measured at nominal current for $T_j = 25^\circ \text{C}$

*Color spectra shown is 2700K 、 3000K、 3500K、 4000K、 5000K、 5700K、 6500K and 80 CRI.

Fig 2. Typical Color Spectrum for 90CRI, Ta = 25°C



*Color spectra measured at nominal current for $T_j = 25^\circ \text{C}$

*Color spectra shown is 2700K 、 3000K、 3500K、 4000K and 90 CRI.

Fig 3. Typical Spatial Radiation Pattern, $T_a = 25^\circ\text{C}$

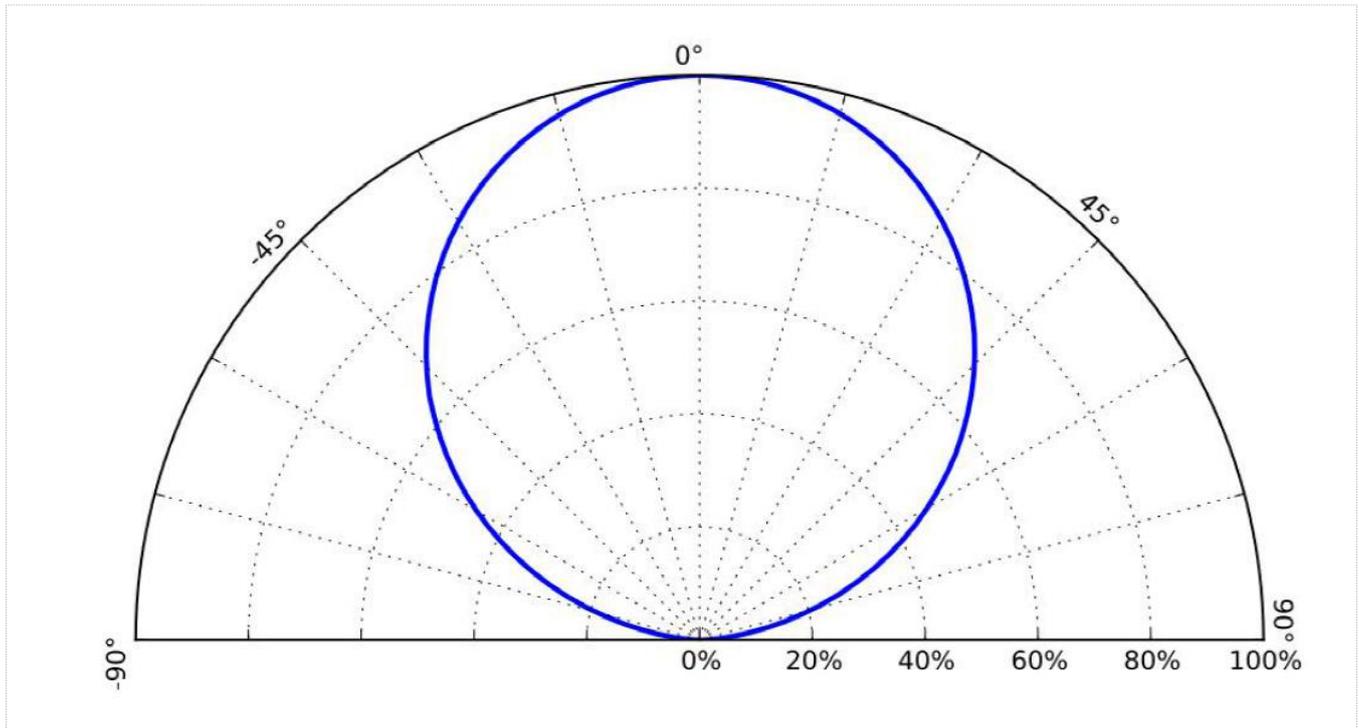
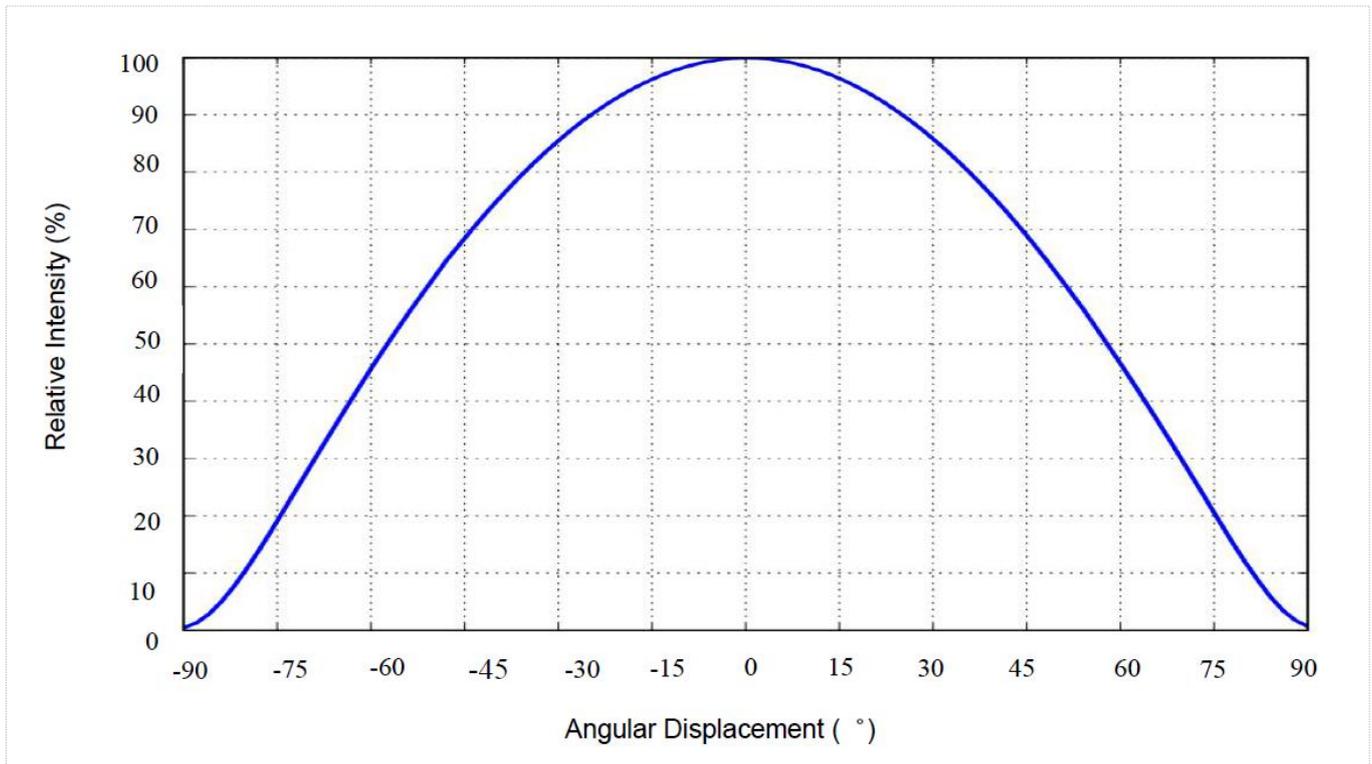


Fig 4. Typical Polar Radiation Pattern, $T_a = 25^\circ\text{C}$



*Typical viewing angle is 120° .

*The viewing angle is defined as the off axis angle from the center line where intensity is $\frac{1}{2}$ of the peak value

Fig 5. Forward Current vs. Relative Intensity, Ta = 25°C

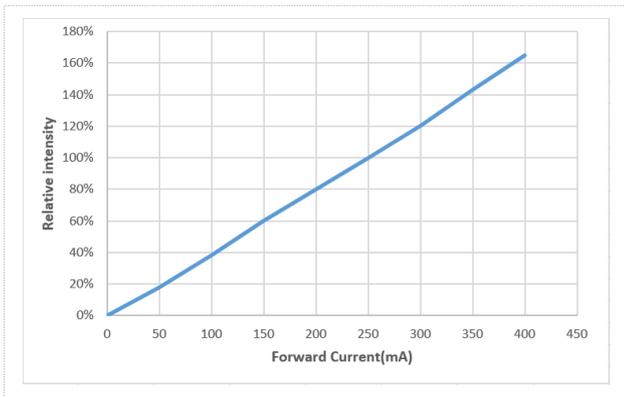


Fig 6. Forward Current vs. Forward Voltage, Ta = 25

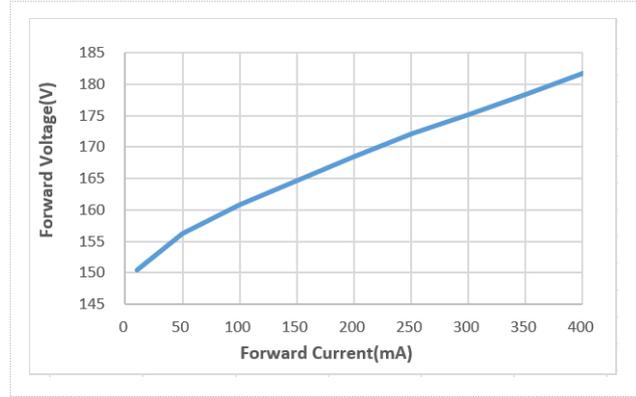


Fig 7. Ambient Temperature vs. Relative Luminous flux (IF=240mA)

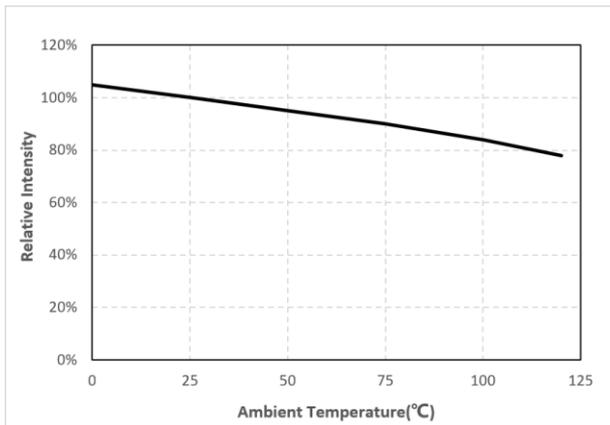
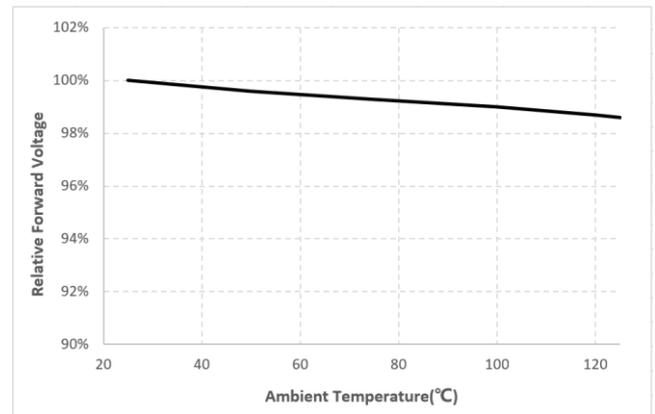
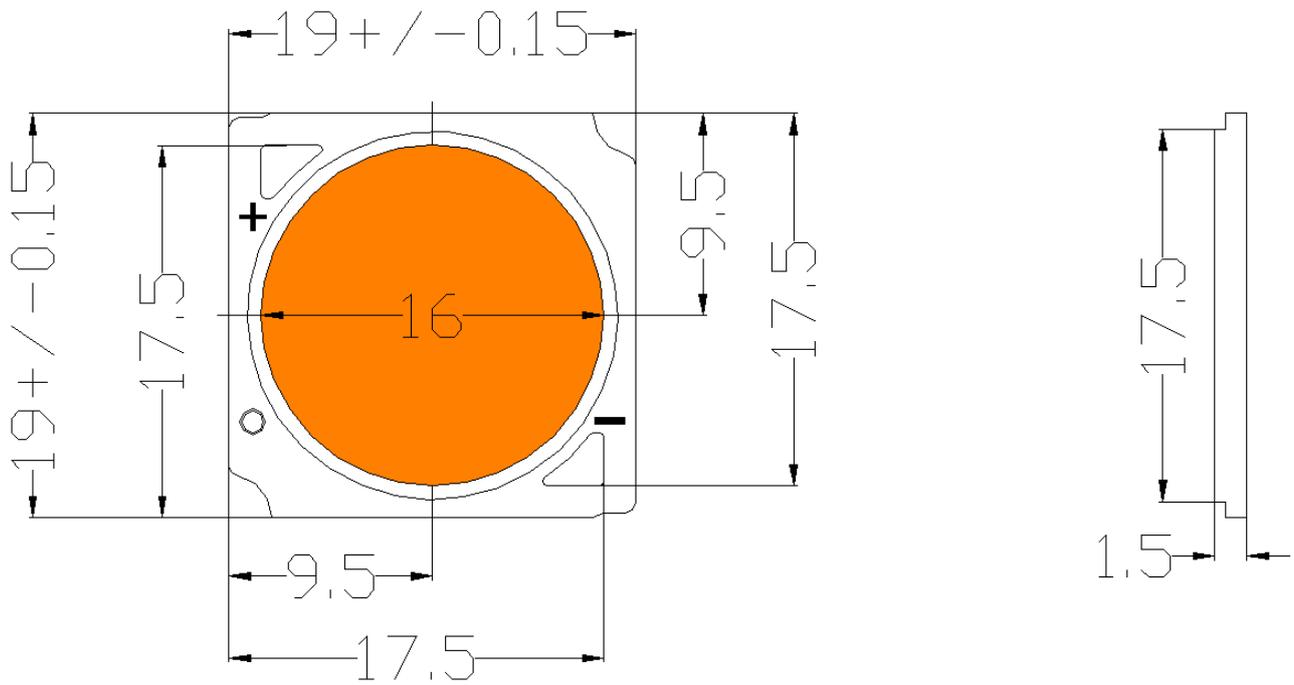


Fig 8. Ambient Temperature vs. Relative Forward Voltage (IF=240mA)



Package Dimensions



Anode

LED device

Cathode

58 S 2 P

* The tolerance unless mentioned is ± 0.1 mm, unit = mm

Package Dimensions of Tray



Note: 45 pcs per tray and 5 trays are stacked together to be sealed in an anti-static bag.



Note: The anti-static bag is boxed for easier storage, 225pcs per box.

Reliability Test Items And Conditions

Test Items	Ref. Standard	Test Conditions	Test time	Failure Quantity
Thermal Shock	JESD22-A106	-40°C(15min)~125°C(15min)	200cycle	0
High Temperature Storage	JESD22-A103	Ta=105°C	1000H	0
Low Temperature Storage	JESD22-A119	Ta=-40°C	1000H	0
High Temperature High Humidity Life Test	JESD22-A101	Ta=85°C, RH>=85%,	1000H	0
High-Temperature Life Test	JESD22-A108	Ta=105°C, IF=240mA@1 serie	1000H	0
Low-Temperature Life Test	JESD22-A108	Ta=-40°C, IF=240mA@1 serie	1000H	0

Precaution for use

1. Handling

- 1) During processing, please avoid the silicone area from being pressed.
- 2) Avoid fingerprints leave on silicone surface, no any organic solution applied on the silicone.

2. Static electricity

LEDs can be damaged by electrostatic discharge (ESD). Please make some protective measures to avoid ESD damage when handling or storage.

3. Thermal Management

- 1) Thermal management is a key to affect life of LEDs. The life of LEDs will reduce with the increase of junction temperature. Please make sure that the temperature of T_j is lower than 125°C during application.
- 2) The silicone begin to degradation at 180°C , and shall be crake in a few days. Please avoid silicone surface temperature higher than 180.

4. Chemical Corrosion

- 1) LEDs is packaging with soft silicone. Its design is NOT water proof, thus please do NOT dip the COB into water directly.
- 2) Please avoid silicone contact with sulfur dioxide, sulfuric acid, concentrated hydrochloric acid.
- 3) Please keep dry and sealed during storage.

4. Eye Protection

Please avoid directly viewing a LED when it is driven at a high current.

