Specifications Horticulture 3030 LEDs

Higher performing 3030 family LED with well known superior robustness, high reliability, long lifetime, low thermal resistance. Perfectly addressing applications demanding for high efficiency and long lifetime requirement. LEDs engineered to deliver the precise wavelengths of light needed to improve crop yield.
The 3030 Series is purpose-built to enable ease of system design for Horticulture applications. The 3030 Series offers the only LEDs available today that are binned and tested based on Photosynthetic Photon Flux (PPF).

Features:

- Package: white SMD package, colored diffused silicone resin.
- package options 3.0mm x 3.2mm for design freedom.
- Viewing angle at 50 % IV: 120°
- Color: White (3000K-7000K).
- RA 80
- ANSI compliant color binning structure with 2, 3 and 5 SDCM standard.
- Product series and company logo on the front.
- RoHS compliant, lead free and REACH.
- LM 80

Applications:

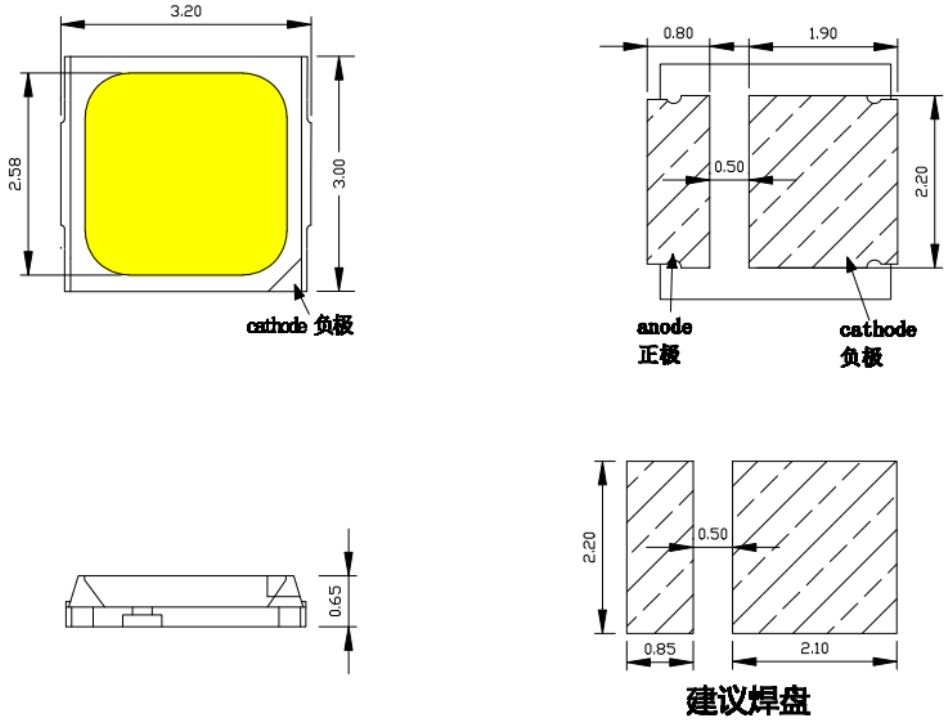
- **Horticulture**

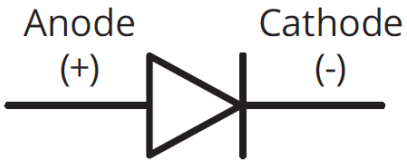
1. Performance Characteristics

1.1Product Information

TLS-P30FR-0102BB-E50A0	
TLS: Product series	E:RA 80
P30FR: SMD Type	50A0: CCT 5000K 5SDMC
0102: Die Count In 1 Serie and 2 Parallel	
BB: Flux Level	

1.2 Mechanical Dimension





Notes:

1. All dimension tolerance is ±0.2mm unless otherwise noted.
2. Tc measurement point at anode pad of product.

2. Performance Characteristics

2.1 Product Selection Guide.

Table 1. Product performance of 3030 at 65mA, Tj=25°C. Ra 80

Part Number	Color	CCT (K)		PAR (m W)		PPF (μ mol/s)		PPE (μ mol/J)			Flux (Lm)		Flux (Lm/w)	
		Min	Max	Min	Max	Min	Max	Min	AVG	Max	Min	Max	Min	Max
TLS-P30FR-0102BB	E30A0	2850-3150K		95	120	0.50	0.535	2.85	2.92	3.05	36	38	205	215
	E35A0	3350-3650K		100	120	0.51	0.55	2.9	2.96	3.1	37	39	210	220
	E40A0	3800-4200K		100	120	0.515	0.555	2.92	3.0	3.1	38	40	210	225
	E50A0	4750-5250K		100	120	0.520	0.56	2.94	3.03	3.15	38	40	210	225
	E65A0	6250-6750K		100	120	0.525	0.565	2.96	3.05	3.2	38	40	210	225

Notes for Tables

1. TYF maintains a tolerance of ±5% on μ mol/s for 3030 Horticulture.
2. PAR is the photosynthetic active radiation from 380 to 800nm.
3. PPF is the photosynthetic active radiation from 400 to 700nm.
4. Far Red typical PFFR and Par is measured from 700 to 800nm.
5. YPF is the photosynthetic active radiation from 380 to 800nm.

2.2 Optical Characteristics

Table 2. Optical characteristics for 3030 Series at specified test conditions

Part Number	Color	TYPICAL SPECTRAL HALF-WIDTH (nm)	TYPICAL TEMPERATURE WAVELENGTH (nm/°C)	Typical Total Included Angle	Typical Viewing Angle
TLS-P30FR-0102BB	White	-	-	150	120

Notes for Table 2:

1. Total angle at which 75% of total luminous flux is captured.
2. Viewing angle is the off ax is angle from lamp centerline where the luminous intensity is ½ of the peak value.

2.3 Electrical and Thermal Characteristics

Table 3: Electrical and thermal characteristics at 65mA, Tj=25°C. Ra 80.

Part Number	Color	Forward Voltage			Typical Temperature Coefficient of Forward Voltage (mV/°C)	Typical Thermal Resistance—Junction Minimum Typical MAXIMUM to Solder Pad (°C/W)
		Min	Type	Max		
TLS-P30FR-0102BB	White	2.6	2.8	3.0	-3	12

Notes for Table 3:

1. TYF SMD3030 maintains a tolerance of ±0.1V on forward voltage measurements.
2. Measured Tj=25°C.

3. Absolute Maximum Ratings

Table 4. Absolute maximum ratings

Parameter	White
DC Forward Current	350 mA
Peak Pulsed Forward Current	600 mA
Max Power	1.1W
LED Junction Temperature	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature	-40~85°C
LED Storage Temperature	-40~85°C
Soldering Temperature	20°C to 260°C
Allowable Reflow Cycles	3
Reverse Voltage *4	0.1mA VF>2.4V
Reverse Current*4	VR=5 IR<3uA

Notes for Table 4:

1. Max power and positive current mean the maximum setting value of the bottom temperature of led light source by using the appropriate heat sink.
2. Pulse operation with the maximum peak pulse forward current is acceptable if the pulse on time is ≤5ms per cycle and the duty cycle is ≤50%
3. In order to keep the Tj temperature below the rated, you should make sure that the radiator has enough heat dissipation performance. Measurement of Surface Temperature: TC on this point is shown in the figure below. The lifespan of the lamp can be judged according to the TC Temperature. Product data sheet is corresponding to the lifespan of TC temperature.

4. Connection error and off-limits voltage may damage LED chip. At a maximum reverse current of 10μA.SMD 3030 LEDs are not designed to be driven in reverse bias.

4. Reliability

Tab5.Testing items and testing conditions

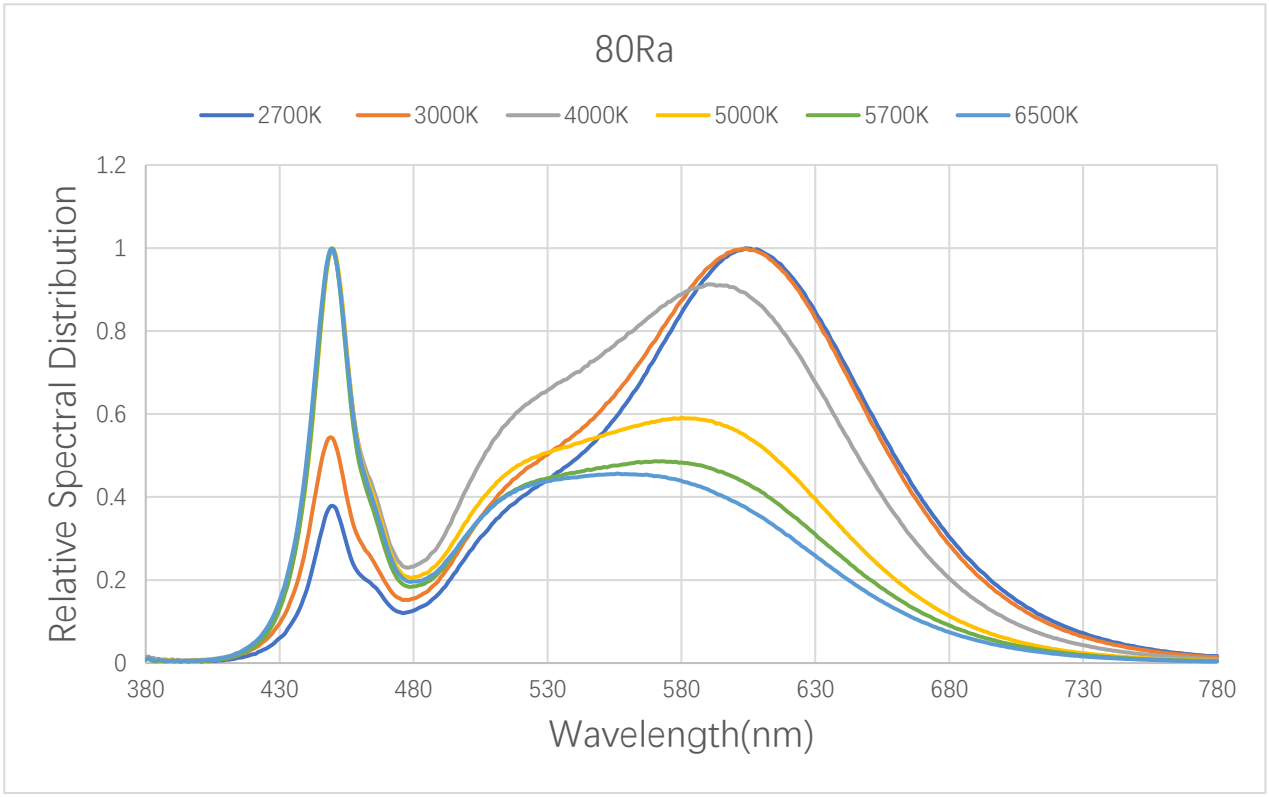
Serial No.	Test Item	reference standard	Test condition	Sample Quantity	Failure Quantity
1	Thermal shock	JESD22-A104E	(-40-15min) ----+120(15min), ↑↓10sec,200cycles	22pcs	0
2	High Temperature Storage	JESD22-A103D	+100℃，1000h	22pcs	0
3	Low Temperature Storage	JESD22-A119	-40℃，1000h	22pcs	0
4	Temperature, High Humidity, Aging Test	JESD22-A101C	T=+85℃,RH=85% IF=300mA 1000h	22pcs	0
5	High-temperature operation	IESLM80-2015	T=+105℃,IF=300mA 6000h	22pcs	0
6	Low temperature operation	JESD22-A108D	T=-40℃,IF=300mA 1000h	22pcs	0
7	Moisture/Reflow Sensitivity Test	J-STD-020E	Precondition: 60℃.60%RH.168H Tsld=260℃. 10sec. 3 Reflows	22pcs	0

Tab6 Failure criteria

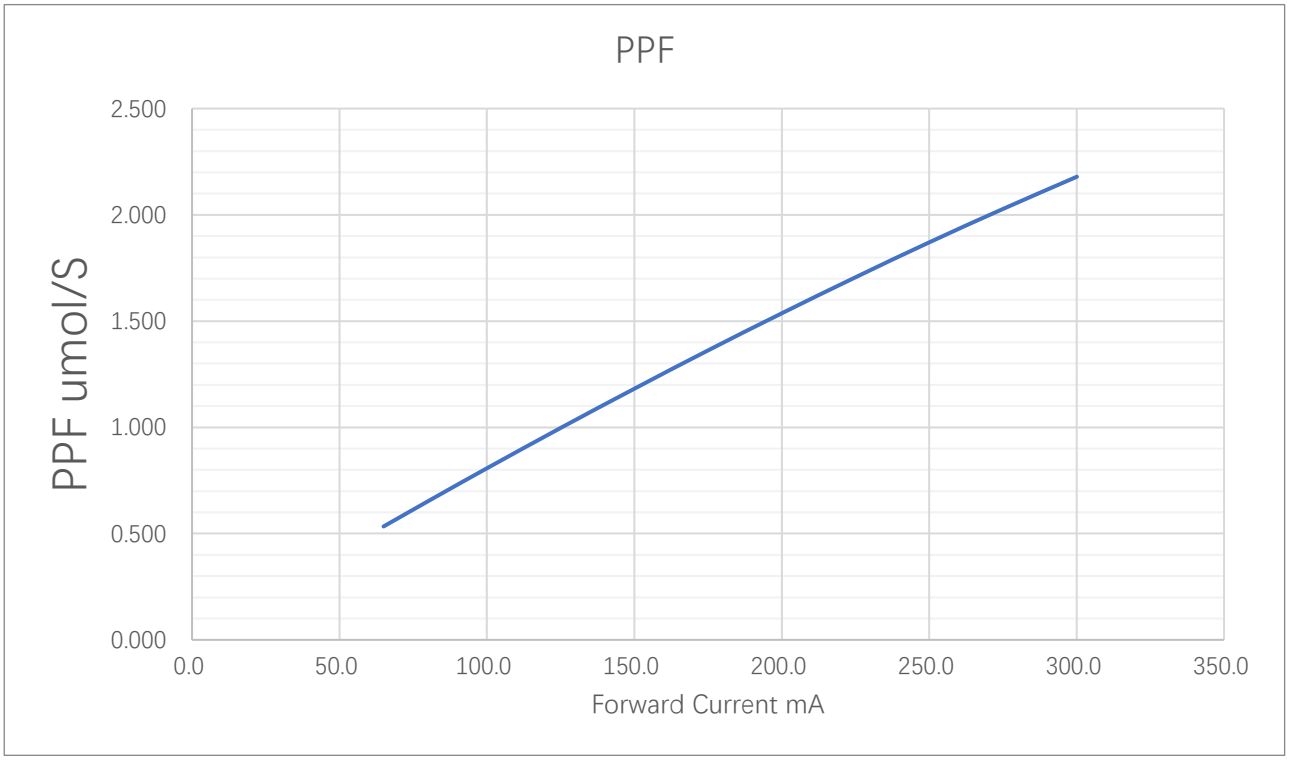
Test Items	Test Condition	Criteria for Judgement	
		Min.	Max.
Forward Voltage	IF=350mA	/	U.S.L*) x1.1
Reverse Current	=5V	/	U.S.L*) x2.0
Luminous Flux	IF=350mA	L.S.L*) x0.7	/

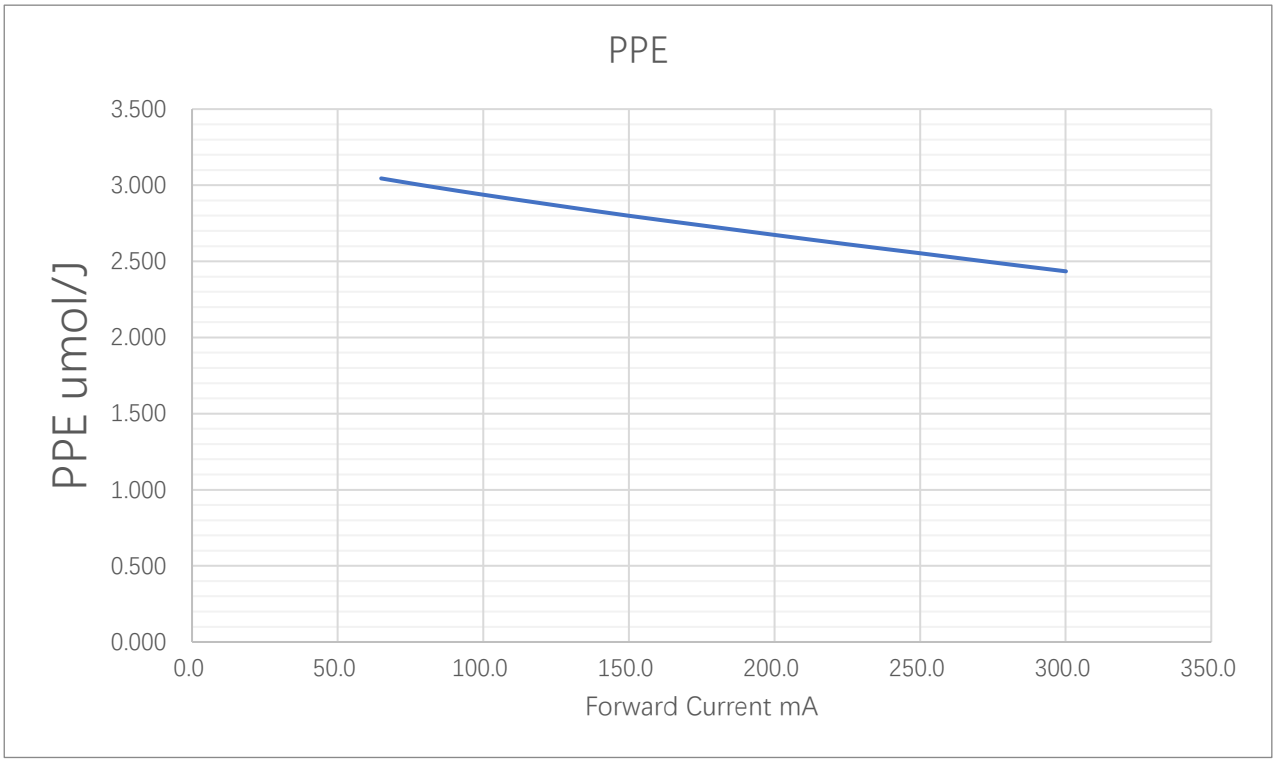
5. Characteristic Curves

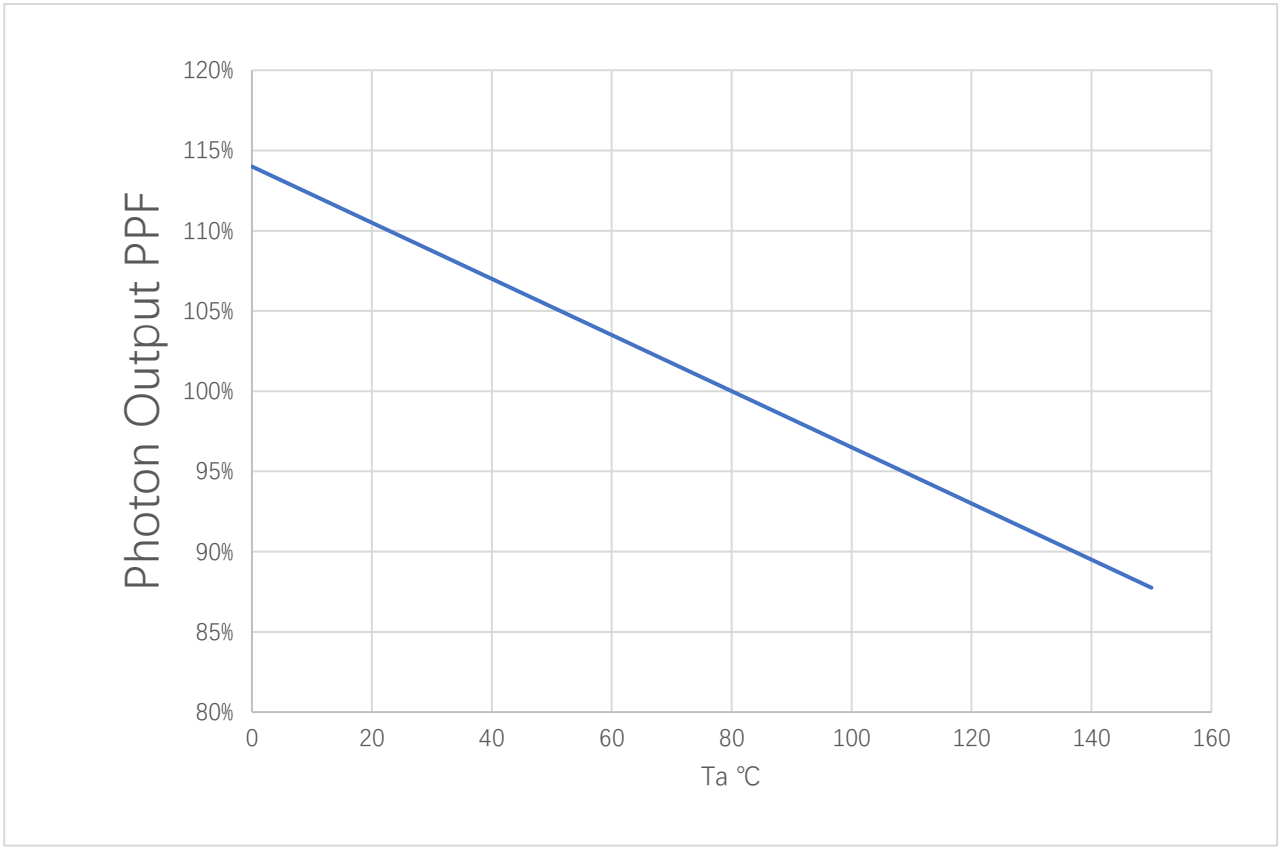
5.1 Spectral Power Distribution Characteristics



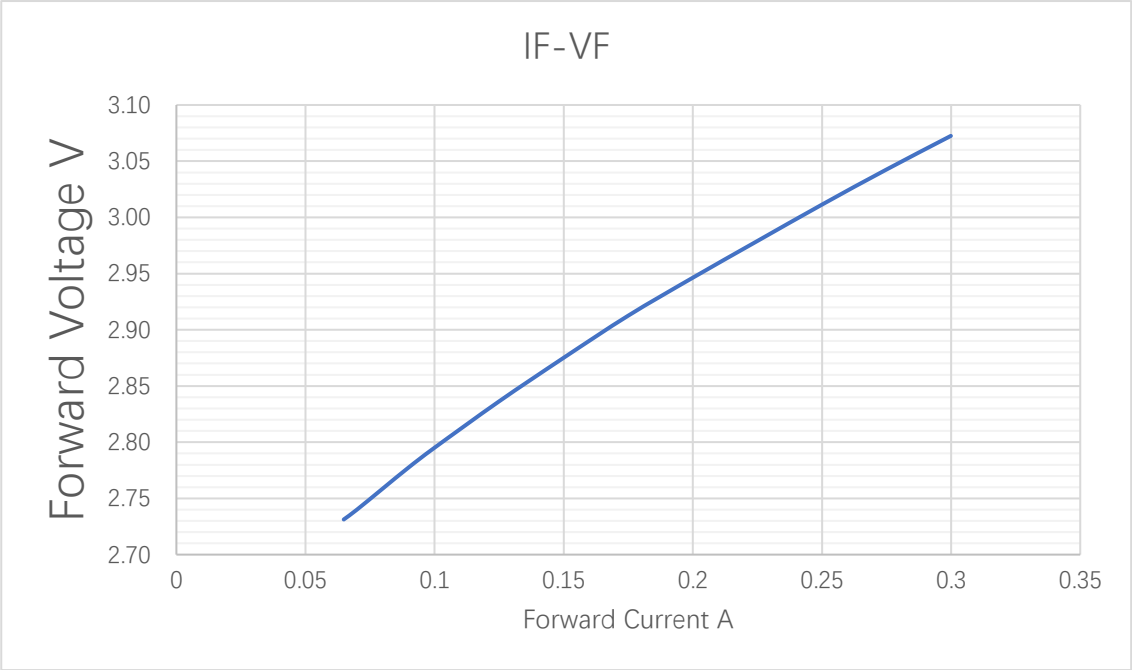
5.2 Photon Output Characteristics

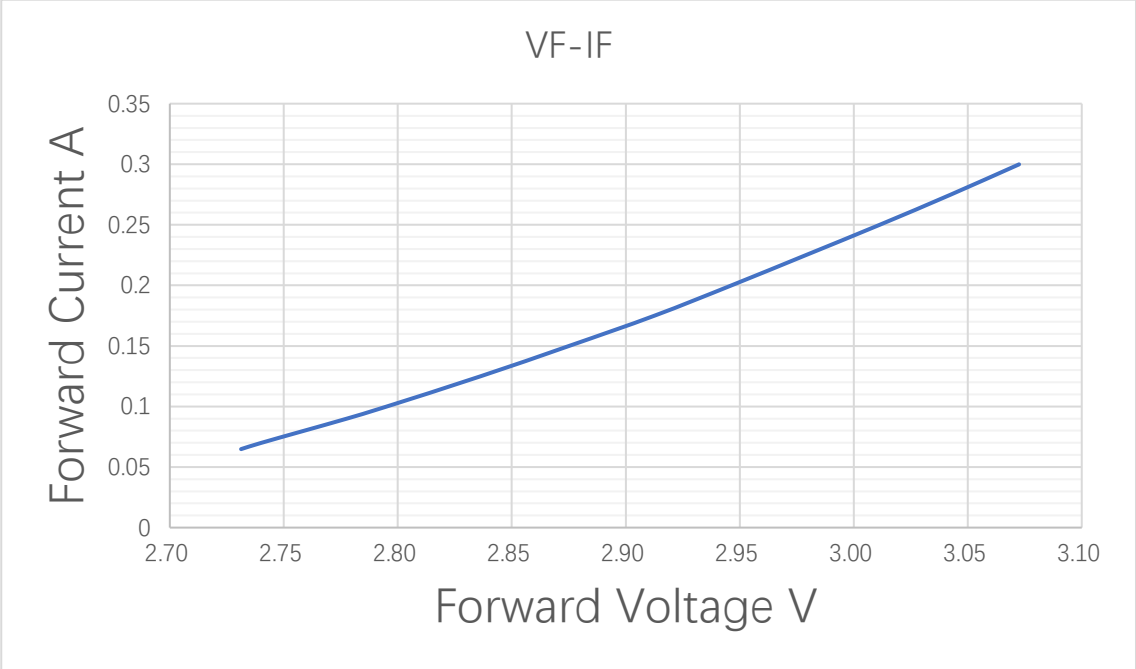



PPE
PPE umol/J
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
Forward Current mA

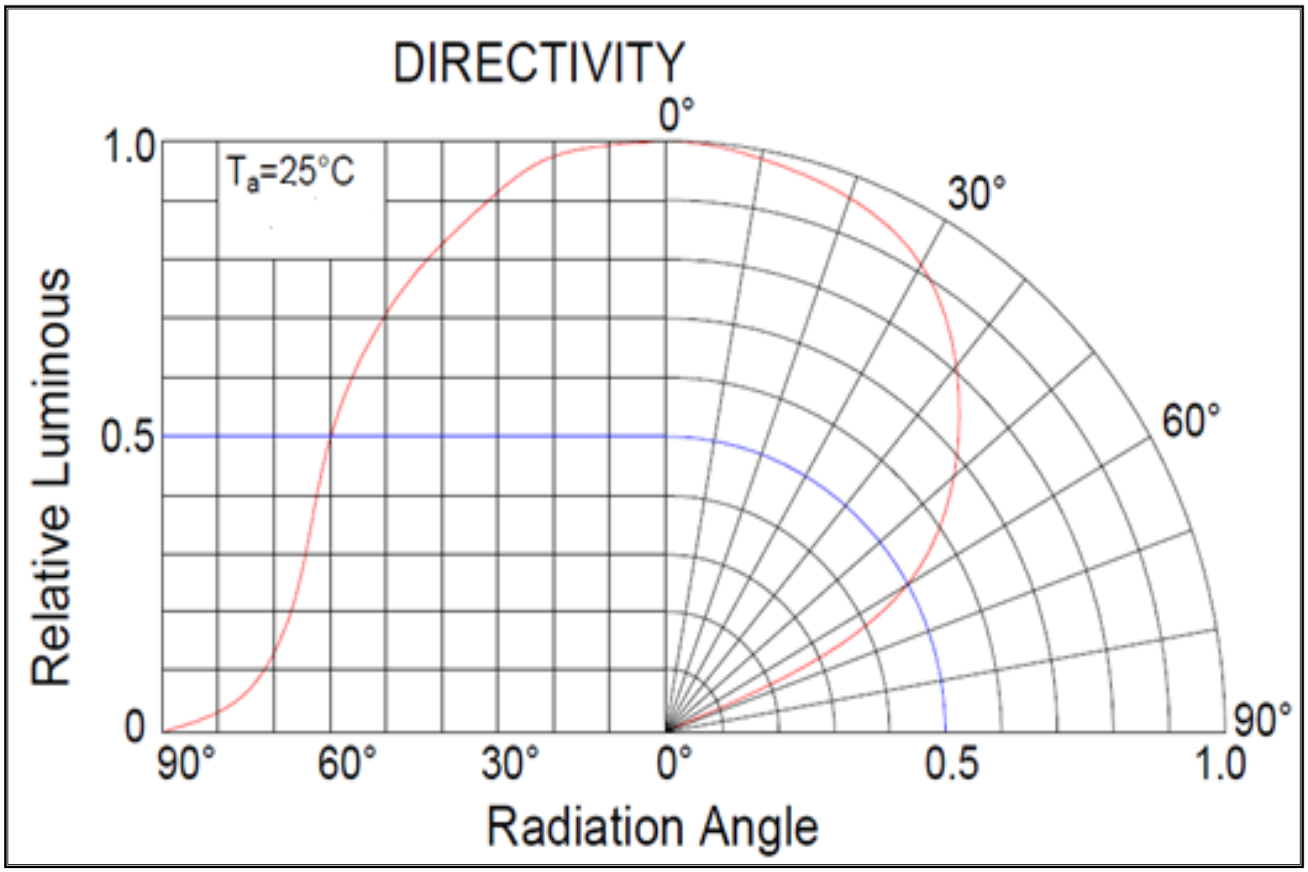

Photon Output PPF
120%
115%
110%
105%
100%
95%
90%
85%
80%
0
20
40
60
80
100
120
140
160
Ta ℃

5.3 Forward Current Characteristics





5.4 Radiation Pattern Characteristics



6. Product Bin and Labeling Definitions

7. 6.1 PPF Bins

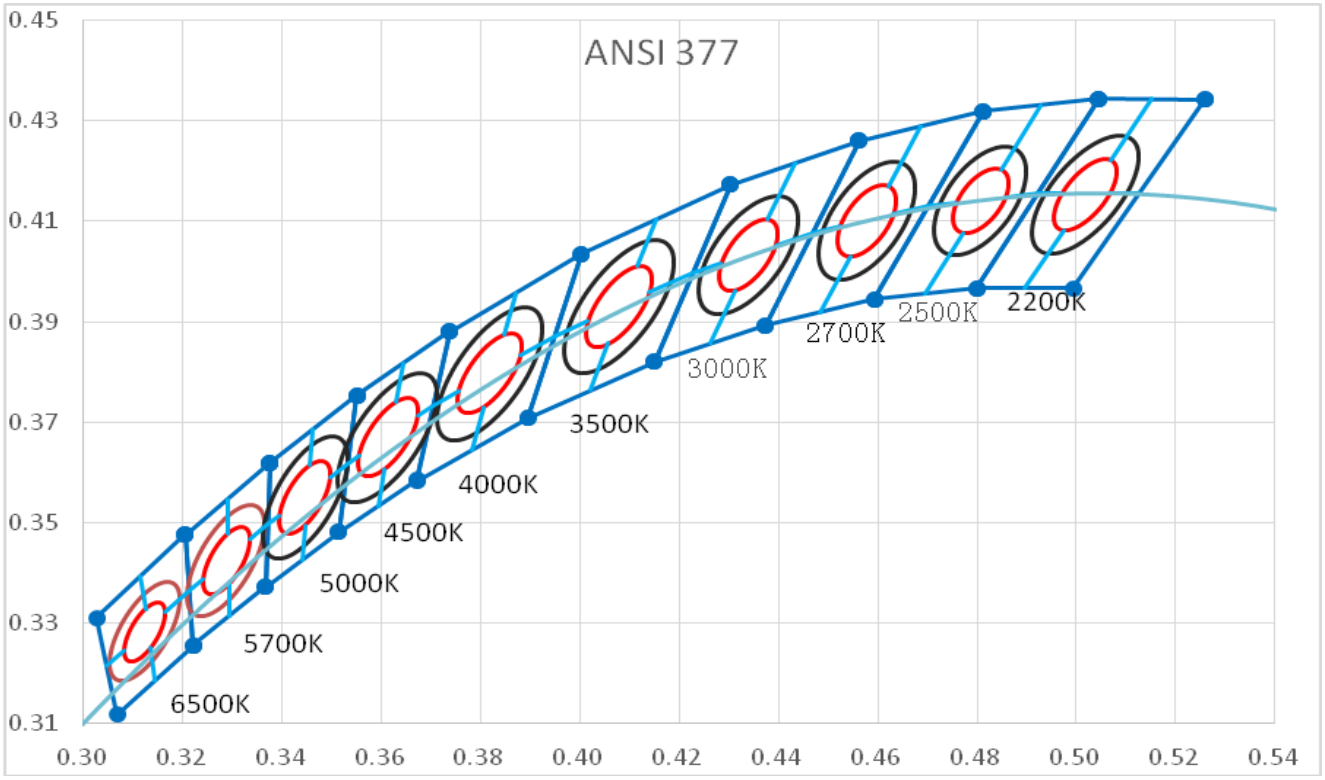
BIN	PPF	
	MIN	MAX
C	0.45	0.5
D	0.5	0.55
E	0.55	0.6
F	0.6	0.7
G	0.75	1
H	1	1.25
I	1.25	1.5
J	1.5	1.75

6.2 Forward Voltage Bins

BIN	VF	
	MIN	MAX
J1-1	2.6	2.7
J1-2	2.7	2.8

6.3 Color Bin Definitions

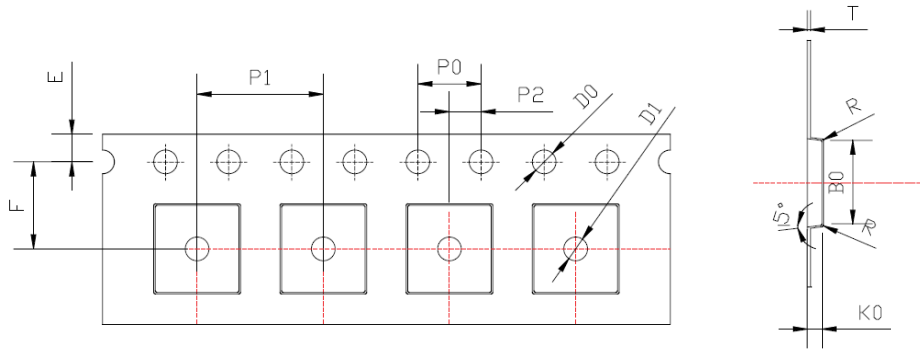
TLS-P30FR-0102BB



Nominal CCT	Center Point		MAJOR AXIS (a , b)			Ellipse Rotation Angel, θ
	X	Y	2-Step	3-Step	5-Step	
2200K	0.5018	0.4153	(0.0058, 0.0027)	(0.0086, 0.0040)	(0.0144, 0.0066)	49.27
2500K	0.4806	0.4141	(0.0050, 0.0027)	(0.0075, 0.0040)	(0.0125, 0.0067)	52.42
2700K	0.4578	0.4101	(0.0054, 0.0028)	(0.0081, 0.0042)	(0.0135, 0.0070)	53.70
3000K	0.4338	0.4030	(0.0056, 0.0027)	(0.0083, 0.0041)	(0.0139, 0.0068)	53.22
3500K	0.4073	0.3917	(0.0063, 0.0028)	(0.0095, 0.0042)	(0.0159, 0.0070)	52.97
4000K	0.3818	0.3797	(0.0063, 0.0027)	(0.0094, 0.0040)	(0.0157, 0.0067)	53.72
5000K	0.3447	0.3553	(0.0055, 0.0024)	(0.0082, 0.0035)	(0.0137, 0.0059)	59.62
5700K	0.3287	0.3417	(0.0050, 0.0021)	(0.0075, 0.0032)	(0.0125, 0.0054)	59.09
6500K	0.3123	0.3283	(0.0045, 0.0019)	(0.0067, 0.0029)	(0.0112, 0.0048)	58.57

7.1 Packaging Information

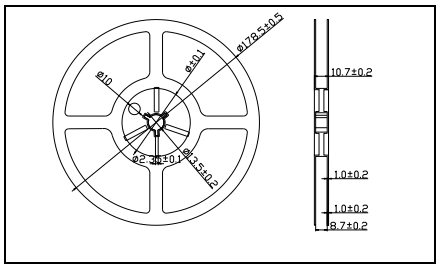
7.1 Pocket Tape Dimensions



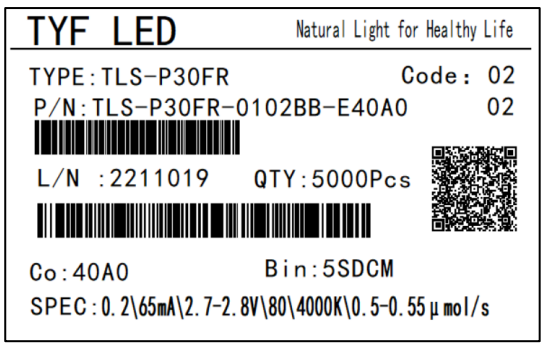
Symbol	A0	B0	K0	P0	P1	P2
Spec	3.7±0.1	3.7±0.1	2.4±0.1	4±0.1	4±0.1	4±0.1
Symbol	W	T	E	F	D0	D1
Spec	12±0.1	0.3±0.1	1.75±0.1	5.5±0.1	1.6±0.1	1.6±0.1

7.2 Reel Dimensions

TLS-P30FR-0102BB Each reel holds 5000pcs SMDs.

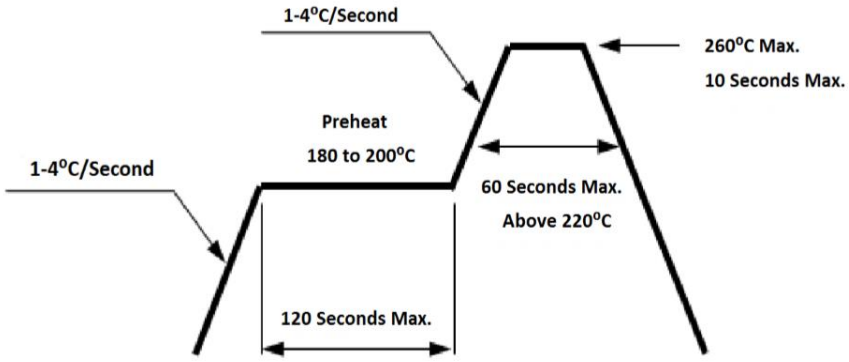


7.3Product Packing and Labeling



8 CAUTION

8.1 RECOMMENDED SOLDERING CONDITION



Features	Lead Free Assembly
Pre-heat: Temperature Range	180℃ - 200℃
Pre-heat Time (Maximum)	120 seconds
Peak Temperature	260℃
Soldering Time (Maximum)	10 seconds
Allowable Reflow Cycles (Max)	2

LEDS can be welded twice at most, it can be welded again after the LEDS are cooled as room temperature.

8.2CAUTION: RISK OF STATIC ELECTRICITY

1.Handling of TYF LED SMD needs countermeasures against static electricity because this is a semiconductor product. Please take adequate measures to prevent any static electricity being produced such as the wearing of a wristband or anti-static gloves when handling this product. Every manufacturing facility in regard to the product (plant,equipment, machine, carrier machine and conveyance unit) should be connected to ground and please avoid the product to be electric-charged. ESD sensitivity of this product is 2000V (HBM, based on JEITA ED-4701/304). After assembling the LEDs into your final product(s), it is recommended to check whether the assembled LEDs are damaged by static electricity (electrical leak phenomenon) or not.

2.Unit chip voltage can no higher than 5 v, chip has positive and negative pad, the chip can not light up if weld wrong.

3.Power Supply Select: This product is powered by using a constant current driver, and the output current of the power range meets the requirement of specifications book, if use constant voltage source or other conditions, please do risk assessment.

8.3 Color difference matters needing attention

The different Bin led has different photoelectric data, before use, please assess carefully.

8.4 CAUTION: TEMPERATURE CONTROL

Suggested Temperature on Tc< 85 ℃ and phosphor Temperature on Tc< 105 ℃, if exceeded, customer needs to make reliability assessment.

8.5 CAUTION: CHEMICAL EXPOSURE HAZARD

8.5.1Exposure to some chemicals commonly used in luminaire manufacturing and assembly can cause damage to the LED SMD. Please consult TYF Installation Instruction for additional information. If use the product in any of the below conditions, please confirm the reliability. Such as: wet, frost, salt air, corrosive gases (Cl, H2S, where NH3, SO2, NOX,Cl,S,N); Exposure under the sun, exposure outdoor, dusty. Water, oil, liquid medical and organic solvent.

8.5.2 LEDs can not be exposed in humid environmen.

8.6 CONTACT WITH LIGHT EMITTING SURFACE (LES)

Avoid any contact with the LES. Do not touch the LES of the LED SMD or apply stress to the LES (yellow phosphor resin area). Contact may cause damage to the LED SMD. Optics and reflectors must not be mounted in contact with the LES (yellow phosphor resin area). Optical devices may be mounted on the top surface of the plastic housing of the TYF LED SMD. If LED surface is dirty, please use alcohol to clean it. Please let it dry for 2 hours before using it. Acetone or corrosive is not acceptable.

8.7 STORAGE

Storage condition: Before opening, the storage temperature should be from 5 ~ 30℃, relative humidity less than 60%. (After opening the bag, LED should be used within 24H.). For unused product, please do dehumidification, vacuum sealed. Dehumidifying conditions: 60℃ ± 5℃, 24H. Effective use for the sealed products is 3 months. If it is not used up in 24 hours after opening the package, the material should be dehumidified for 3 hours under at 60℃ ±5℃.

8.8 EYE SAFETY

Eye safety classification for the use of TYF LED SMDs is in accordance with specification IEC/TR 62778: Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires. We classify TYF LED at 6500K RG1.