

# Product Data

## Crab Series

The Crab series, a small type SMT power LED (4×5×1.5mm) with an enhanced heat dissipation capability, enables a lower and higher drive current (60/80/150/350/700mA). The package is extremely reliable and has a long operating lifetime with minimum degradation due to advanced silicone resin material. With its miniature size and power ratings, Crab series offers customers the future of new generation lighting fixture.

### Main Applications

Fluorescent lighting  
Strip-lights  
Channel and counter lighting  
Decoration lighting

### Features

Compatible with IR reflow soldering processes  
Super wide viewing angle: 140°  
Moisture sensitivity level: JEDEC 1

### Crab-PP6N Collimator

Collimator P/N PP6N-FN20 PP6N-FN25

Holder P/N



Diameter (mm)

35

35

Angle

25°

35°



勝特力材料 886-3-5753170

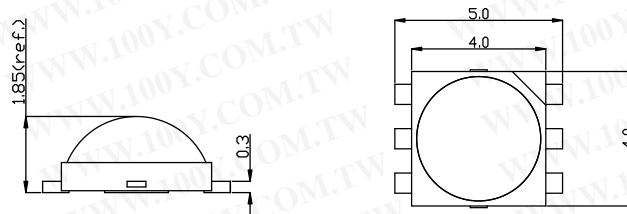
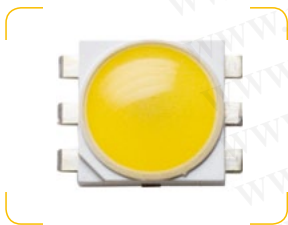
勝特力电子(上海) 86-21-34970699

勝特力电子(深圳) 86-755-83298787

Http://www.100y.com.tw

# Product Data

## Crab Series



0.2 Watt Crab

Part No.	Color	Photometric Luminous Flux Bin	Lumens Flux (Min.)	Test Current	Vf (V)	CCT/λd(nm)	2θ½ [°]
					Typ.		
PP6N-TLWE-3	White	N/P	18.1/22	60mA	3.3	6020~7050K	140°
PP6N-TLNE-3	Neutral White	N	22		3.3	3710~4745K	
PP6N-TLVE-3	Warm White	N/P*	18.1/22*		3.3	2870~3220K	
PP6N-TLME-3	Crimson	D/E/F*	1.7/2.22/2.9*		2.2	635~645nm	
PP6N-TLDE-3	Royal Blue	G/H*	65/85* mW		3.3	450~460nm	
PP6N-TLWE	White	N/P	18.1/22		3.4	5310~7050K	
PP6N-TLNE	Neutral White	N	22		3.4	3710~4745K	
PP6N-TLVE	Warm White	N/P*	18.1/22*		3.4	2870~3220K	
PP6N-TLBE	Blue	E/F	2.2/2.9		3.4	455~475nm	
PP6N-TLGE	Green	L/M*	10.7/13.9*		3.4	515~535nm	
PP6N-TLAE	Amber	H/J	4.9/6.3		2.2	587~597nm	
PP6N-TLRE	Red	H/J	4.9/6.3		2.2	613.5~631nm	

\*ask for stock

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# Product Data

## Crab Series

### 0.5 Watt Crab

Part No.	Color	Photometric Luminous Flux Bin	Lumens Flux (Min.)	Test Current	Vf (V)	CCT/λd(nm)	2θ <sub>1/2</sub> [°]
					Typ.		
PP6N-FLWE	 White	R/S1*	39.8/51.7*	150mA	3.4	6020~7050K	140°
PP6N-FLVE	 Warm White	R/S1*	39.8/51.7*		3.4	2870~3220K	
PP6N-FLBE	 Blue	J/K*	6.3/8.2*		3.4	455~475nm	
PP6N-FLGE	 Green	N/P	18.1/23.5		3.4	515~535nm	
PP6N-FLAE	 Amber	M/N	13.9/18.1		2.2	587~597nm	
PP6N-FLRE	 Red	L/M	10.7/13.9		2.2	613.5~631nm	
PP6N-FLWE-3SC	 White	Q/R*	30.6/39.8*	50mA	11.1	6020~7050K	
PP6N-FLNE-3SC	 Neutral White	P/Q*	23.5/30.6*		11.1	3710~4745K	
PP6N-FLVE-3SC	 Warm White	P/Q	23.5/30.6		11.1	2870~3220K	
PP6N-FLWE-3	 White	Q/R*	30.6/39.8*	150mA	3.7	6020~7050K	
PP6N-FLNE-3	 Neutral White	P/Q*	23.5/30.6*		3.7	3710~4745K	
PP6N-FLVE-3	 Warm White	P/Q	23.5/30.6		3.7	2870~3220K	

\*ask for stock

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# Product Data

## 1 Watt Crab High CRI

### 1 Watt Crab High CRI

Part No.	Color	Photometric Luminous Flux Bin	Lumens Flux (Min.)	CRI	Test Current	Vf (V)	CCT/ld(nm)	2θ½ [°]
						Typ.		
PP6N-1LVE-R7	Warm White	T1*/T2/U1/U2/V1*	67.2*/76.6/87.4/100/110*	77	350mA	3.4	2700~4100K	140°
PP6N-1LWE-R8	White	T2*/U1/U2/V1/V2*	76.3*/87.4/100/110/120*	84		3.4	4100~10000K	
PP6N-1LVE-R8	Warm White	T1/T2/U1/U2/V1*	67.2/76.6/87.4/100/110*	80		3.4	2700~4100K	
PP6N-1LNE-3R8	Neutral White	T2/U1/U2*	76.6/87.4/100*	80	350mA	3.2	3710~4745K	
PP6N-1LVE-3R8	Warm White	T1/T2/U1*	67.2/76.6/87.4*	80		3.2	2580~3220K	
PP6N-1LNE-3SCR8	Neutral White	T2/U1/U2*	76.6/87.4/100*	80	120mA	9.6	3710~4745K	
PP6N-1LVE-3SCR8	Warm White	T1/T2/U1*	67.2/76.6/87.4*	80		9.6	2580~3220K	

\*ask for stock



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**ProLight PP6N-1Lxx**  
**1W Power LED**  
**Technical Datasheet**  
**Version: 2.7**

### Features

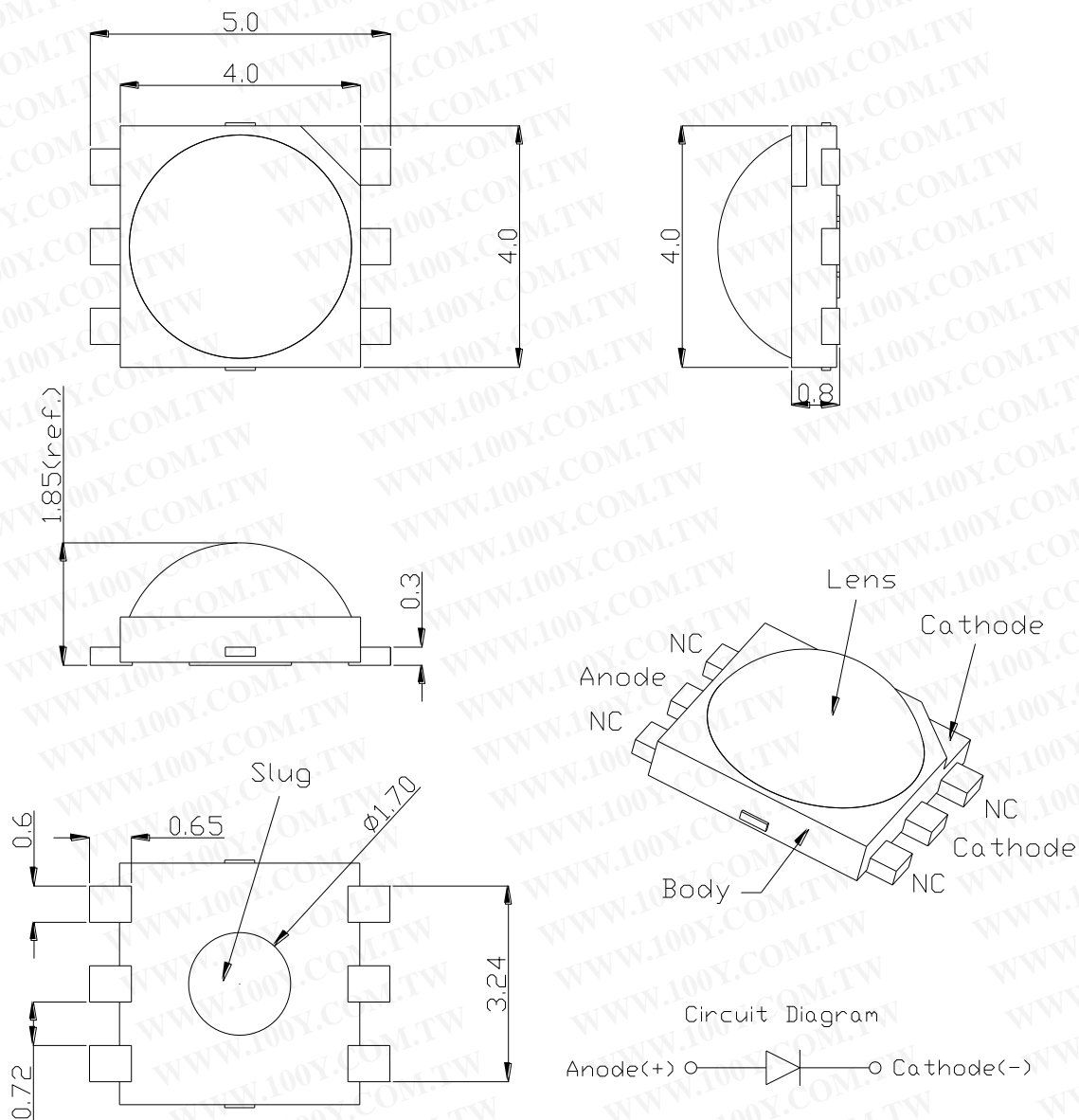
- High flux per LED
- Various colors
- Good color uniformity
- Industry best moisture sensitivity level - JEDEC 1
- Lead free reflow soldering
- More energy efficient than incandescent and most halogen lamps
- Low Voltage DC operated
- Instant light (less than 100ns)
- No UV

### Typical Applications

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Uplighters/Downlighters
- Decorative/Entertainment
- Bollards/Security/Garden
- Cove/Underself/Task
- Indoor/Outdoor Commercial and Residential Architectural
- Automotive Ext (Stop-Tail-Turn, CHMSL, Mirror Side Repeat)
- LCD backlights

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## Emitter Mechanical Dimensions



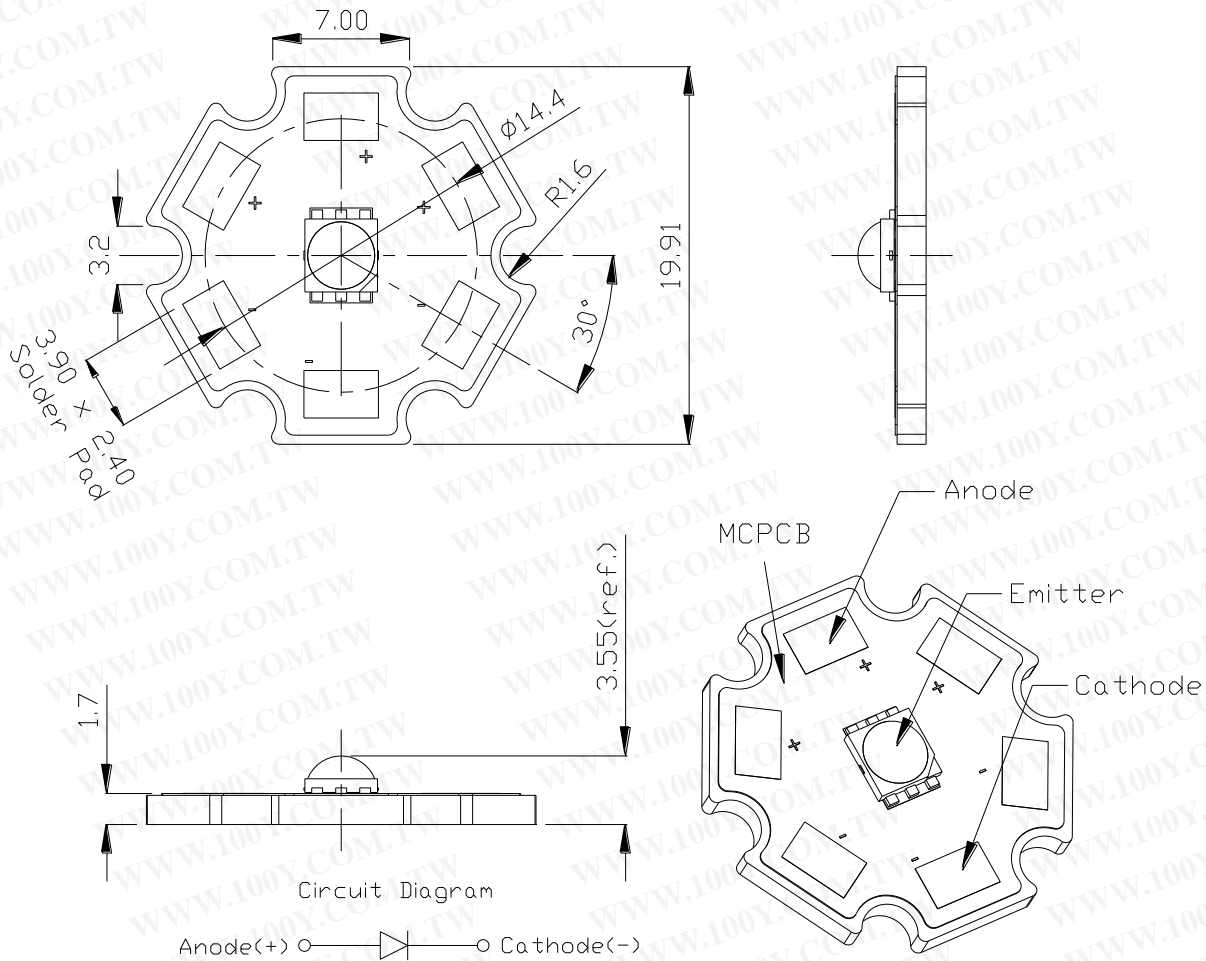
### Notes:

1. The cathode side of the device is denoted by the chamfer on the part body.
2. Electrical insulation between the case and the board is required --- slug of device is not electrically neutral. Do not electrically connect either the anode or cathode to the slug.
3. Drawing not to scale.
4. All dimensions are in millimeters.
5. All dimendions without tolerances are for reference only.
6. Please do not bend the leads of the LED, otherwise it will damage the LED.
7. **Please do not use a force of over 3kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.**

\*The appearance and specifications of the product may be modified for improvement without notice.

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## Star Mechanical Dimensions



### Notes:

1. Slots in aluminum-core PCB for M3 or #4 mounting screw.
2. Electrical interconnection pads labeled on the aluminum-core PCB with "+" and "-" to denote positive and negative, respectively. All positive pads are interconnected, as are all negative pads, allowing for flexibility in array interconnection.
3. Drawing not to scale.
4. All dimensions are in millimeters.
5. All dimensions without tolerances are for reference only.
6. **Please do not use a force of over 3kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.**

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## Flux Characteristics at 350mA, T<sub>J</sub> = 25°C

Radiation Pattern	Color	Part Number		LumiousFlux or Power	
		Emitter	Star	Minimum	Typical
Lambertian	White	PP6N-1LWE	PP6N-1LWS	87.4 lm	137 lm
	Warm White	PP6N-1LVE	PP6N-1LVS	87.4 lm	131 lm
	Crimson	PP6N-1LME	PP6N-1LMS	18.1 lm	23 lm
	Red	PP6N-1LRE	PP6N-1LRS	39.8 lm	50 lm
	Amber	PP6N-1LAE	PP6N-1LAS	39.8 lm	57 lm
	Green	PP6N-1LGE	PP6N-1LGS	67.2 lm	82 lm
	Blue	PP6N-1LBE	PP6N-1LBS	13.9 lm	21 lm
	Royal Blue	PP6N-1LDE	PP6N-1LDS	355 mW	470 mW

- ProLight maintains a tolerance of  $\pm 10\%$  on flux and power measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

## Electrical Characteristics at 350mA, T<sub>J</sub> = 25°C

Color	Forward Voltage V <sub>F</sub> (V)			Thermal Resistance	Thermal Resistance
	Min.	Typ.	Max.	Junction to Slug (°C/ W)	Junction to Board (°C/ W)
White	2.85	3.4	4.1	10	13
Warm White	2.85	3.4	4.1	10	13
Crimson	1.75	2.2	3.0	10	13
Red	1.75	2.2	3.0	10	13
Amber	1.75	2.2	3.0	10	13
Green	2.85	3.4	4.1	10	13
Blue	2.85	3.4	4.1	10	13
Royal Blue	2.85	3.4	4.1	10	13

- ProLight maintains a tolerance of  $\pm 0.1$  for Voltage measurements.

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## Optical Characteristics at 350mA, T<sub>J</sub> = 25°C

Color	Dominant Wavelength $\lambda_D$ , or Color Temperature CCT			Total included Angle (degrees)	Viewing Angle (degrees)
	Min.	Typ.	Max.	$\theta_{0.90V}$	$2\theta_{1/2}$
White	4100 K	5500 K	10000 K	160	140
Warm White	2700 K	3300 K	4100 K	160	140
Crimson <sup>[1]</sup>	635 nm	640 nm	645 nm	160	140
Red	613.5 nm	623 nm	631 nm	160	140
Amber	587 nm	592 nm	597 nm	160	140
Green	515 nm	525 nm	535 nm	160	140
Blue	455 nm	465 nm	475 nm	160	140
Royal Blue	450 nm	455 nm	460 nm	160	140

- ProLight maintains a tolerance of  $\pm 1$ nm for dominant wavelength measurements.
- ProLight maintains a tolerance of  $\pm 5\%$  for CCT measurements.
- <sup>[1]</sup> Dominant wavelength 640nm equals to peak wavelength around 660nm.

## Absolute Maximum Ratings

Parameter	White/Warm White/Crimson/ Red/Amber/Green/Blue/Royal Blue
DC Forward Current (mA)	350
Peak Pulsed Forward Current (mA)	500
Average Forward Current (mA)	350
ESD Sensitivity (HBM per MIL-STD-883E Method 3015.7)	> $\pm 500V$
LED Junction Temperature (°C)	120
Aluminum-core PCB Temperature (°C)	105
Storage & Operating Temperature (°C)	-40 to +105
Soldering Temperature(°C)	260°C

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## Radiometric Power Bin Structure

Color	Bin Code	Minimum Radiometric Power (mW)	Maximum Radiometric Power (mW)	Available Color Bins
Royal Blue	P	355	435	All
	Q	435	515	All
	R	515	635	【1】

- ProLight maintains a tolerance of  $\pm 10\%$  on flux and power measurements.
- The flux bin of the product may be modified for improvement without notice.
- 【1】 The rest of color bins are not 100% ready for order currently. Please ask for quote and order possibility.

## Photometric Luminous Flux Bin Structure

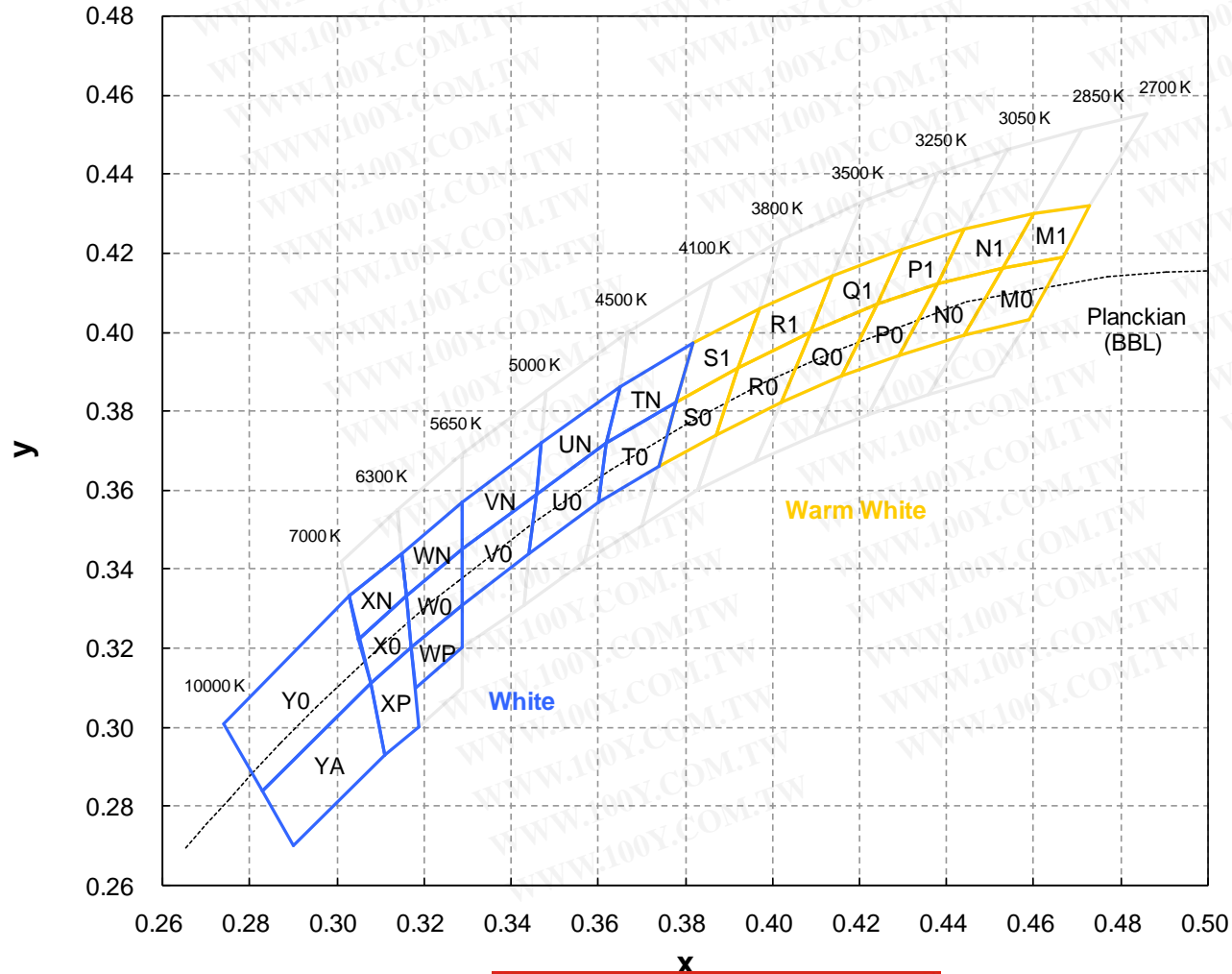
Color	Bin Code	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)	Available Color Bins
White	U1	87.4	100	【1】
	U2	100	110	All
	V1	110	120	All
	V2	120	130	All
	W1	130	140	All
	W2	140	155	【1】
Warm White	U1	87.4	100	【1】
	U2	100	110	All
	V1	110	120	All
	V2	120	130	All
	W1	130	140	All
	W2	140	155	【1】
Crimson	N	18.1	23.5	All
	P	23.5	30.6	【1】
Red	R	39.8	51.7	All
	S1	51.7	58.9	All
	S2	58.9	67.2	【1】
Amber	R	39.8	51.7	All
	S1	51.7	58.9	All
	S2	58.9	67.2	【1】
	T1	67.2	76.6	【1】
Green	T1	67.2	76.6	All
	T2	76.6	87.4	All
	U1	87.4	100	All
	U2	100	110	【1】
Blue	M	13.9	18.1	【1】
	N	18.1	23.5	A, 1 【1】
	P	23.5	30.6	A, 1 【1】

- ProLight maintains a tolerance of  $\pm 10\%$  on flux and power measurements.
- The flux bin of the product may be modified for improvement without notice.
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# Color Bin

## White and Warm White Binning Structure Graphical Representation



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## Color Bins

### White Bin Structure

Bin Code	x	y	Typ. CCT (K)	Bin Code	x	y	Typ. CCT (K)
T0	0.378	0.382	4300	WN	0.329	0.345	5970
	0.374	0.366			0.316	0.333	
	0.360	0.357			0.315	0.344	
TN	0.362	0.372	4300	WP	0.329	0.357	5970
	0.382	0.397			0.329	0.331	
	0.378	0.382			0.329	0.320	
U0	0.362	0.372	4750	X0	0.318	0.310	6650
	0.365	0.386			0.317	0.320	
	0.344	0.344			0.308	0.311	
UN	0.360	0.357	4750	XN	0.305	0.322	6650
	0.346	0.359			0.316	0.333	
	0.346	0.359			0.317	0.320	
V0	0.365	0.386	5320	XP	0.305	0.322	6650
	0.362	0.372			0.303	0.333	
	0.347	0.372			0.315	0.344	
VN	0.347	0.372	5320	Y0	0.316	0.333	8000
	0.329	0.331			0.308	0.311	
	0.329	0.345			0.317	0.320	
W0	0.346	0.359	5970	YA	0.319	0.300	8000
	0.344	0.344			0.311	0.293	
	0.329	0.345			0.308	0.311	
	0.329	0.357			0.283	0.284	
	0.347	0.372			0.274	0.301	
	0.346	0.359			0.303	0.333	
	0.329	0.345			0.308	0.311	
	0.329	0.331			0.311	0.293	
	0.317	0.320			0.290	0.270	
	0.316	0.333			0.283	0.284	

- Tolerance on each color bin (x , y) is  $\pm 0.01$

Note: Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all colors.

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## Color Bins

### Warm White Bin Structure

Bin Code	x	y	Typ. CCT (K)	Bin Code	x	y	Typ. CCT (K)
M0	0.453	0.416	2770	Q0	0.409	0.400	3370
	0.444	0.399			0.402	0.382	
	0.459	0.403			0.416	0.389	
	0.467	0.419			0.424	0.407	
M1	0.460	0.430	2770	Q1	0.414	0.414	3370
	0.453	0.416			0.409	0.400	
	0.467	0.419			0.424	0.407	
	0.473	0.432			0.430	0.421	
N0	0.438	0.412	2950	R0	0.392	0.391	3650
	0.429	0.394			0.387	0.374	
	0.444	0.399			0.402	0.382	
	0.453	0.416			0.409	0.400	
N1	0.444	0.426	2950	R1	0.414	0.414	3650
	0.438	0.412			0.409	0.400	
	0.453	0.416			0.392	0.391	
	0.460	0.430			0.397	0.406	
P0	0.424	0.407	3150	S0	0.392	0.391	3950
	0.416	0.389			0.387	0.374	
	0.429	0.394			0.374	0.366	
	0.438	0.412			0.378	0.382	
P1	0.430	0.421	3150	S1	0.397	0.406	3950
	0.424	0.407			0.392	0.391	
	0.438	0.412			0.378	0.382	
	0.444	0.426			0.382	0.397	

- Tolerance on each color bin (x , y) is  $\pm 0.01$

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## Dominant Wavelength Bin Structure

Color	Bin Code	Minimum Dominant Wavelength (nm)	Maximum Dominant Wavelength (nm)
Crimson	1	635	645
Red	2	613.5	620.5
	4	620.5	631.0
Amber	2	587.0	589.5
	4	589.5	592.0
	6	592.0	594.5
	7	594.5	597.0
Green	A	515	520
	1	520	525
	2	525	530
	3	530	535
Blue	A	455	460
	1	460	465
	2	465	470
	3	470	475
Royal Blue	5	450	455
	6	455	460

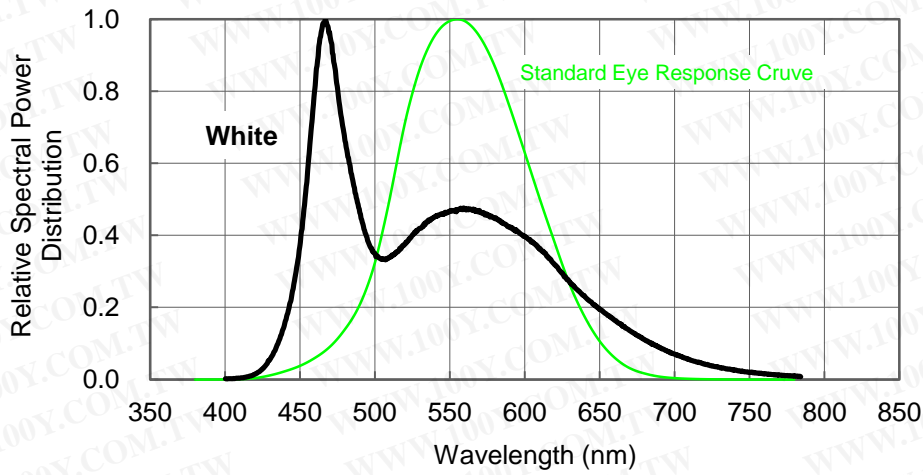
- ProLight maintains a tolerance of  $\pm 1$ nm for dominant wavelength measurements.

Note: Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all colors.

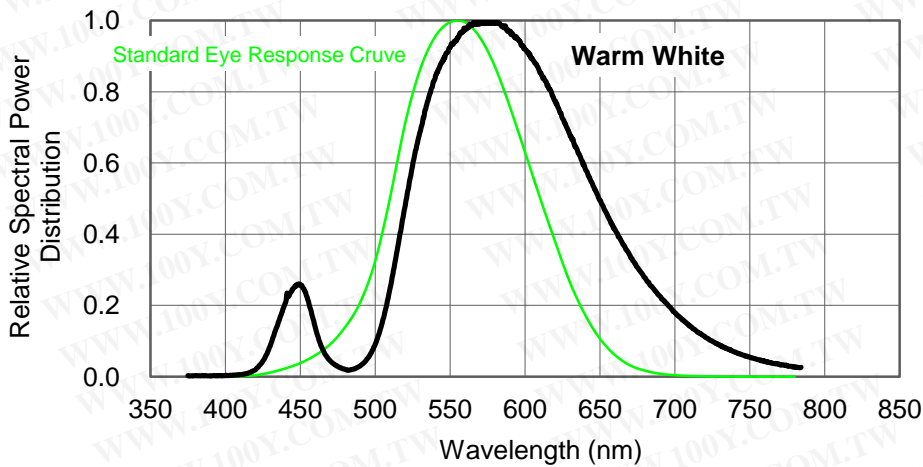
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# Color Spectrum, $T_J = 25^\circ\text{C}$

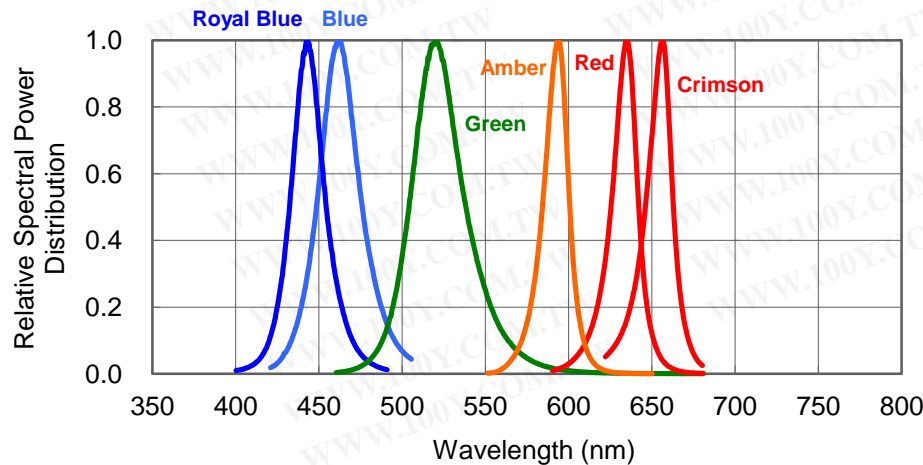
## 1. White



## 2. Warm White



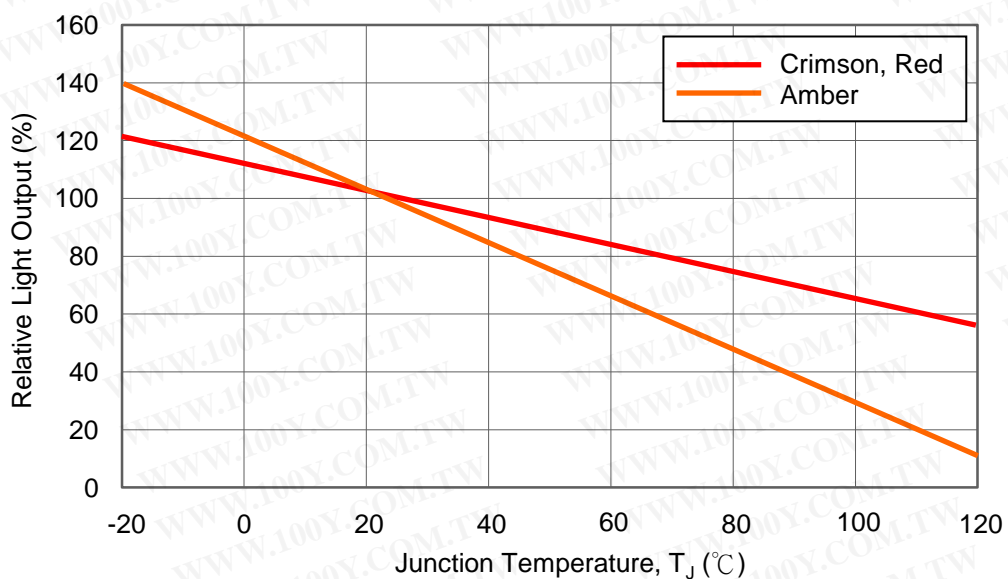
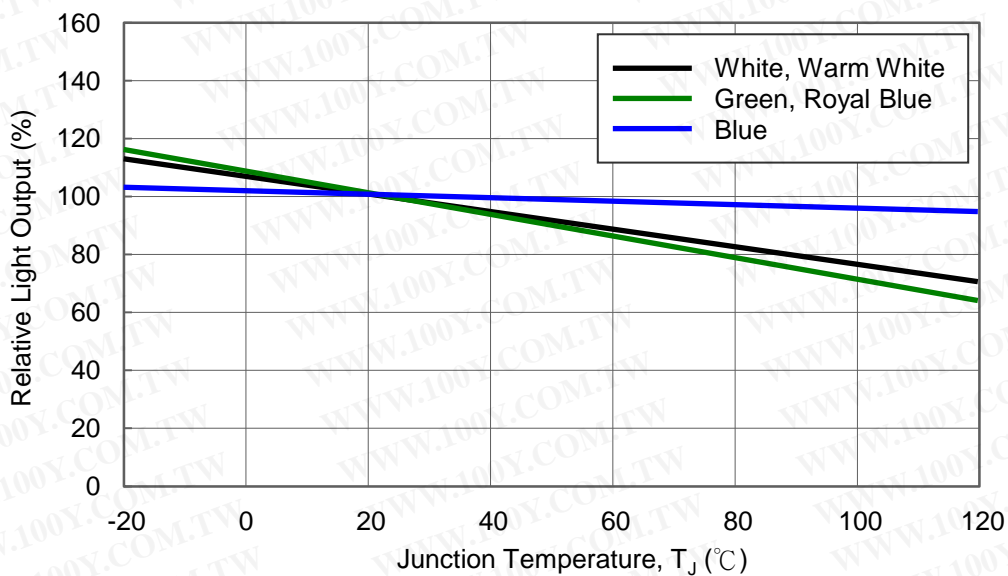
## 3. Royal Blue、Blue、Green、Amber、Red、Crimson



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# Light Output Characteristics

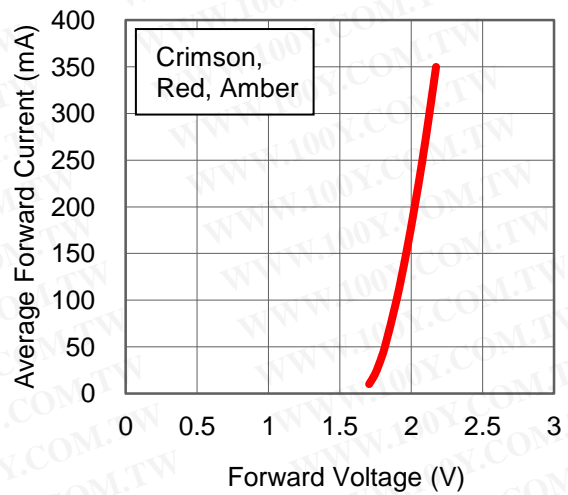
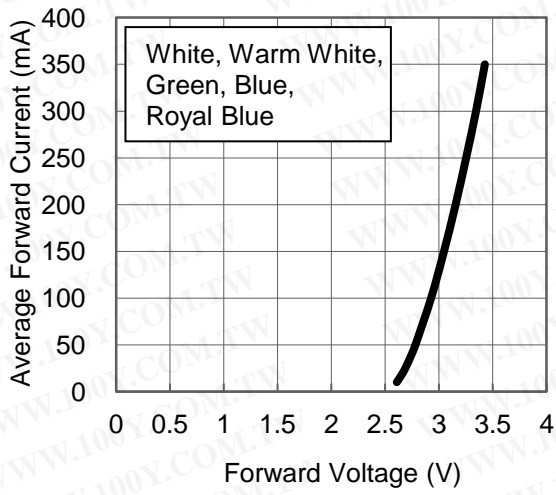
## Relative Light Output vs. Junction Temperature at 350mA



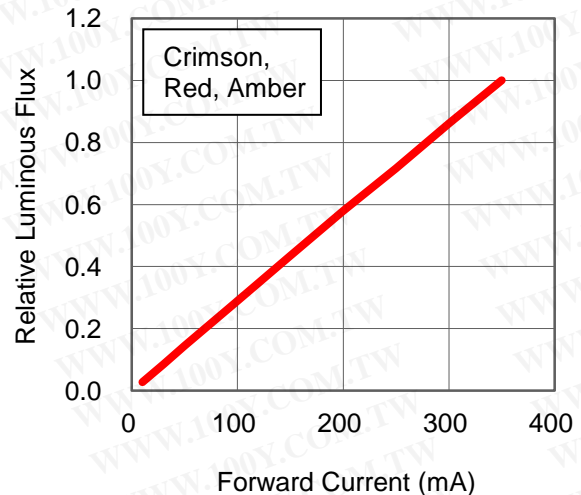
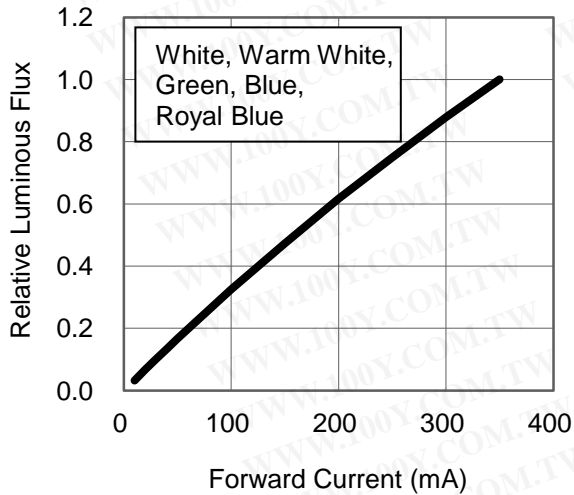
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# Forward Current Characteristics, $T_J = 25^\circ\text{C}$

## 1. Forward Voltage vs. Forward Current



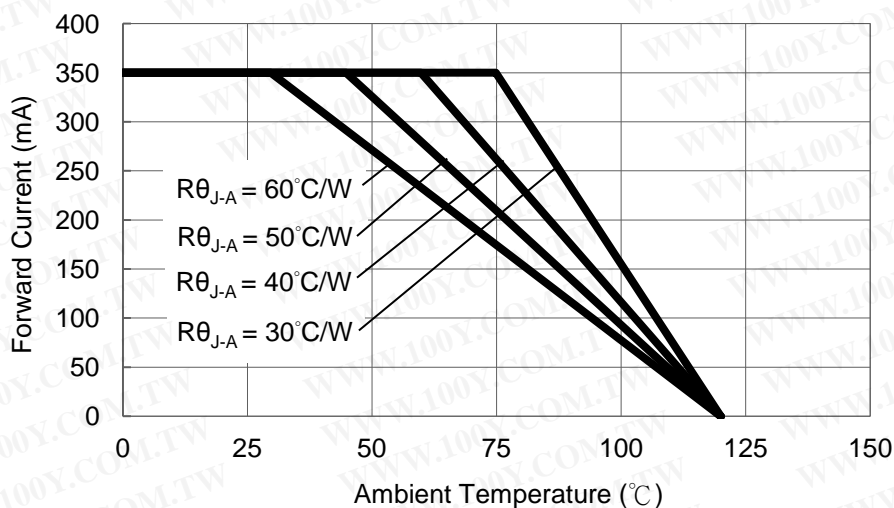
## 2. Forward Current vs. Normalized Relative Luminous Flux



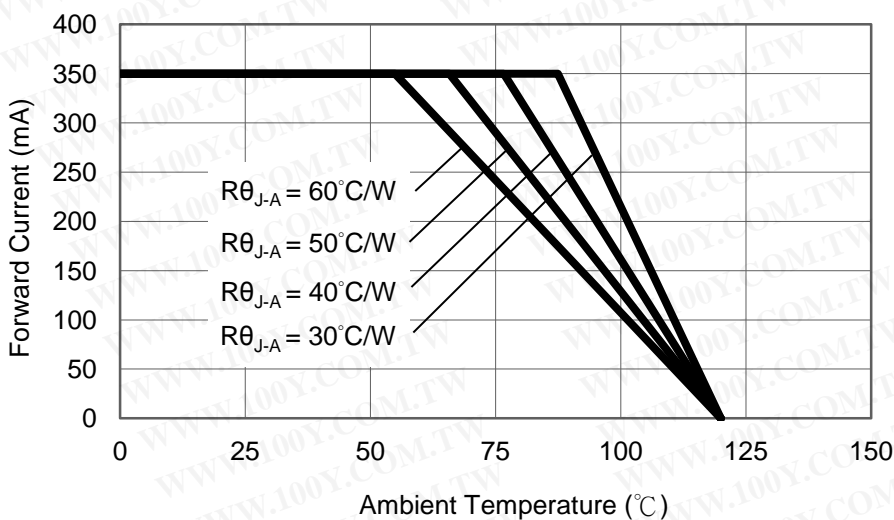
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# Ambient Temperature vs. Maximum Forward Current

## 1. White, Warm White, Green, Blue, Royal Blue ( $T_{JMAX} = 120^{\circ}C$ )



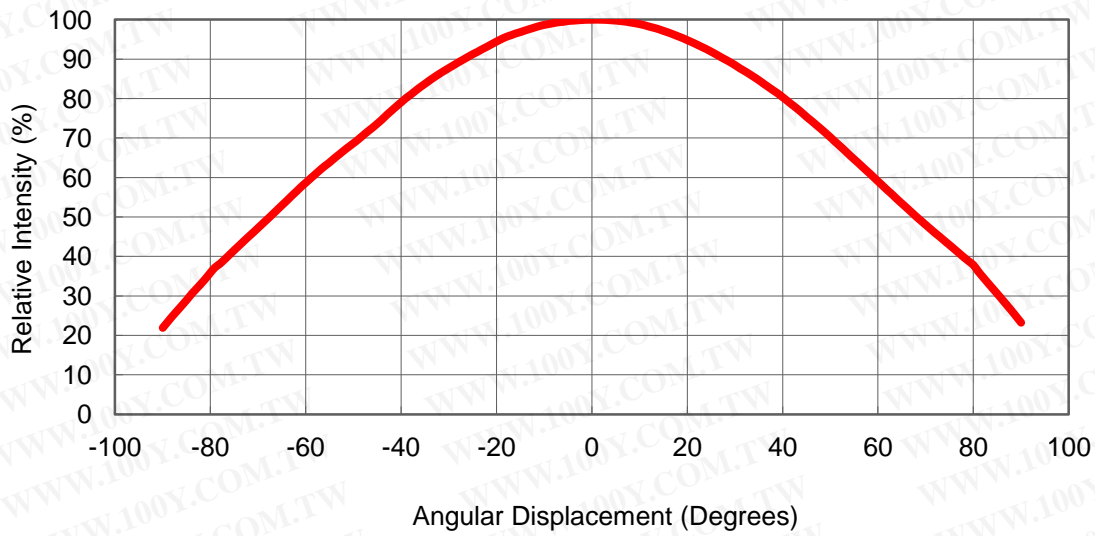
## 2. Crimson, Red, Amber ( $T_{JMAX} = 120^{\circ}C$ )



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# Typical Representative Spatial Radiation Pattern

## Lambertian Radiation Pattern



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## Moisture Sensitivity Level - JEDEC 1

Level	Floor Life		Soak Requirements			
			Standard		Accelerated Environment	
	Time	Conditions	Time (hours)	Conditions	Time (hours)	Conditions
1	Unlimited	≤30°C / 85% RH	168 +5/-0	85°C / 85% RH	NA	NA

- The standard soak time includes a default value of 24 hours for semiconductor manufacture's exposure time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor's facility.
- Table below presents the moisture sensitivity level definitions per IPC/JEDEC's J-STD-020C.

Level	Floor Life		Soak Requirements			
			Standard		Accelerated Environment	
	Time	Conditions	Time (hours)	Conditions	Time (hours)	Conditions
1	Unlimited	≤30°C / 85% RH	168 +5/-0	85°C / 85% RH	NA	NA
2	1 year	≤30°C / 60% RH	168 +5/-0	85°C / 60% RH	NA	NA
2a	4 weeks	≤30°C / 60% RH	696 +5/-0	30°C / 60% RH	120 +1/-0	60°C / 60% RH
3	168 hours	≤30°C / 60% RH	192 +5/-0	30°C / 60% RH	40 +1/-0	60°C / 60% RH
4	72 hours	≤30°C / 60% RH	96 +2/-0	30°C / 60% RH	20 +0.5/-0	60°C / 60% RH
5	48 hours	≤30°C / 60% RH	72 +2/-0	30°C / 60% RH	15 +0.5/-0	60°C / 60% RH
5a	24 hours	≤30°C / 60% RH	48 +2/-0	30°C / 60% RH	10 +0.5/-0	60°C / 60% RH
6	Time on Label (TOL)	≤30°C / 60% RH	Time on Label (TOL)	30°C / 60% RH	NA	NA

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## Qualification Reliability Testing

Stress Test	Stress Conditions	Stress Duration	Failure Criteria
Room Temperature Operating Life (RTOL)	25°C, $I_F = \text{max DC}$ (Note 1)	1000 hours	Note 2
Wet High Temperature Operating Life (WHTOL)	85°C/60%RH, $I_F = \text{max DC}$ (Note 1)	1000 hours	Note 2
Wet High Temperature Storage Life (WHTSL)	85°C/85%RH, non-operating	1000 hours	Note 2
High Temperature Storage Life (HTSL)	110°C, non-operating	1000 hours	Note 2
Low Temperature Storage Life (LTSL)	-40°C, non-operating	1000 hours	Note 2
Non-operating Temperature Cycle (TMCL)	-40°C to 120°C, 30 min. dwell, <5 min. transfer	200 cycles	Note 2
Non-operating Thermal Shock (TMSK)	-40°C to 120°C, 20 min. dwell, <20 sec. transfer	200 cycles	Note 2
Mechanical Shock	1500 G, 0.5 msec. pulse, 5 shocks each 6 axis		Note 3
Natural Drop	On concrete from 1.2 m, 3X		Note 3
Variable Vibration Frequency	10-2000-10 Hz, log or linear sweep rate, 20 G about 1 min., 1.5 mm, 3X/axis		Note 3
Solder Heat Resistance (SHR)	260°C ± 5°C, 10 sec.		Note 3
Solderability	Steam age for 16 hrs., then solder dip at 260°C for 5 sec.		Solder coverage on lead

### Notes:

1. Depending on the maximum derating curve.
2. Criteria for judging failure

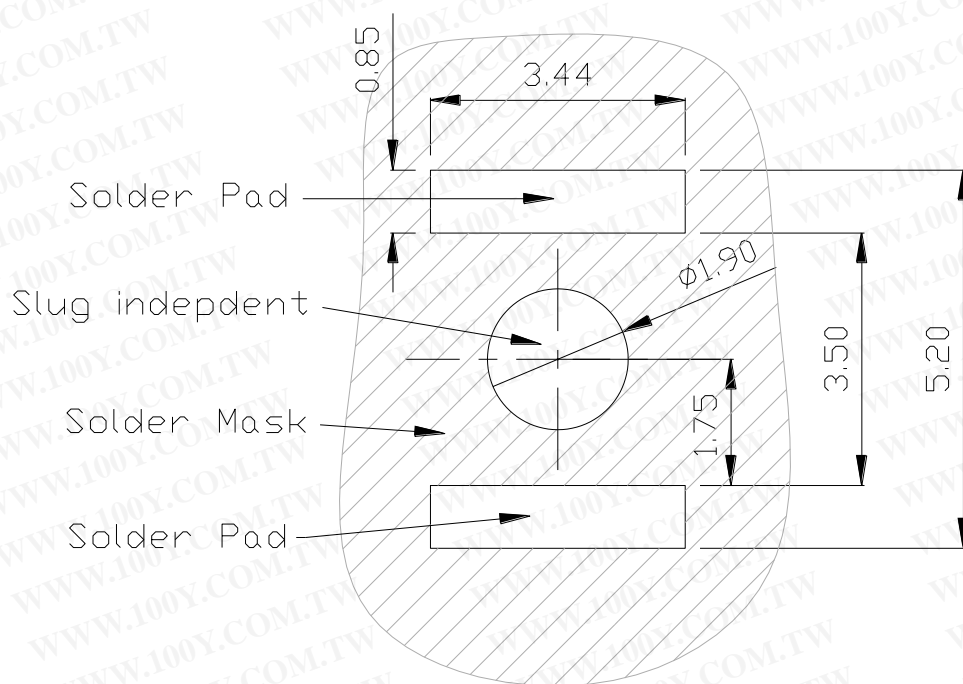
Item	Test Condition	Criteria for Judgement	
		Min.	Max.
Forward Voltage ( $V_F$ )	$I_F = \text{max DC}$	-	Initial Level x 1.1
Luminous Flux or Radiometric Power ( $\Phi_V$ )	$I_F = \text{max DC}$	Initial Level x 0.7	-
Reverse Current ( $I_R$ )	$V_R = 5V$	-	50 $\mu A$

\* The test is performed after the LED is cooled down to the room temperature.

3. A failure is an LED that is open or shorted.

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## Recommended Solder Pad Design

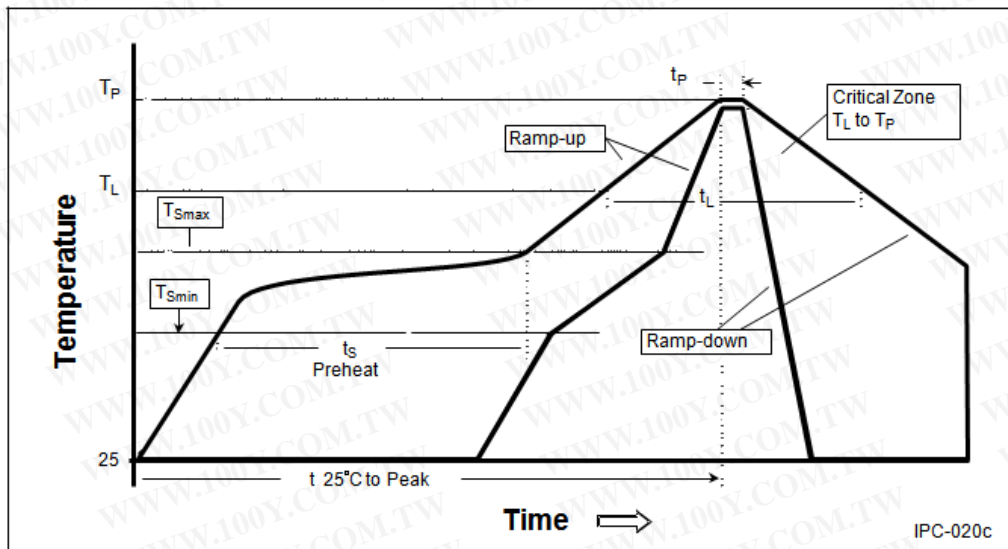


- All dimensions are in millimeters.
- Electrical isolation is required between Slug and Solder Pad.

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## Reflow Soldering Condition

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate ( $T_{Smax}$ to $T_P$ )	3°C / second max.	3°C / second max.
Preheat <ul style="list-style-type: none"> <li>- Temperature Min (<math>T_{Smin}</math>)</li> <li>- Temperature Max (<math>T_{Smax}</math>)</li> <li>- Time (<math>t_{Smin}</math> to <math>t_{Smax}</math>)</li> </ul>	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: <ul style="list-style-type: none"> <li>- Temperature (<math>T_L</math>)</li> <li>- Time (<math>t_L</math>)</li> </ul>	183°C 60-150 seconds	217°C 60-150 seconds
Peak/Classification Temperature ( $T_P$ )	240°C	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	10-30 seconds	20-40 seconds
Ramp-Down Rate	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

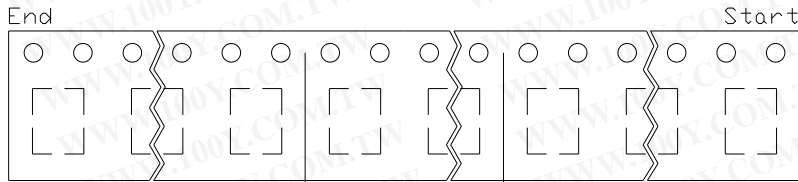
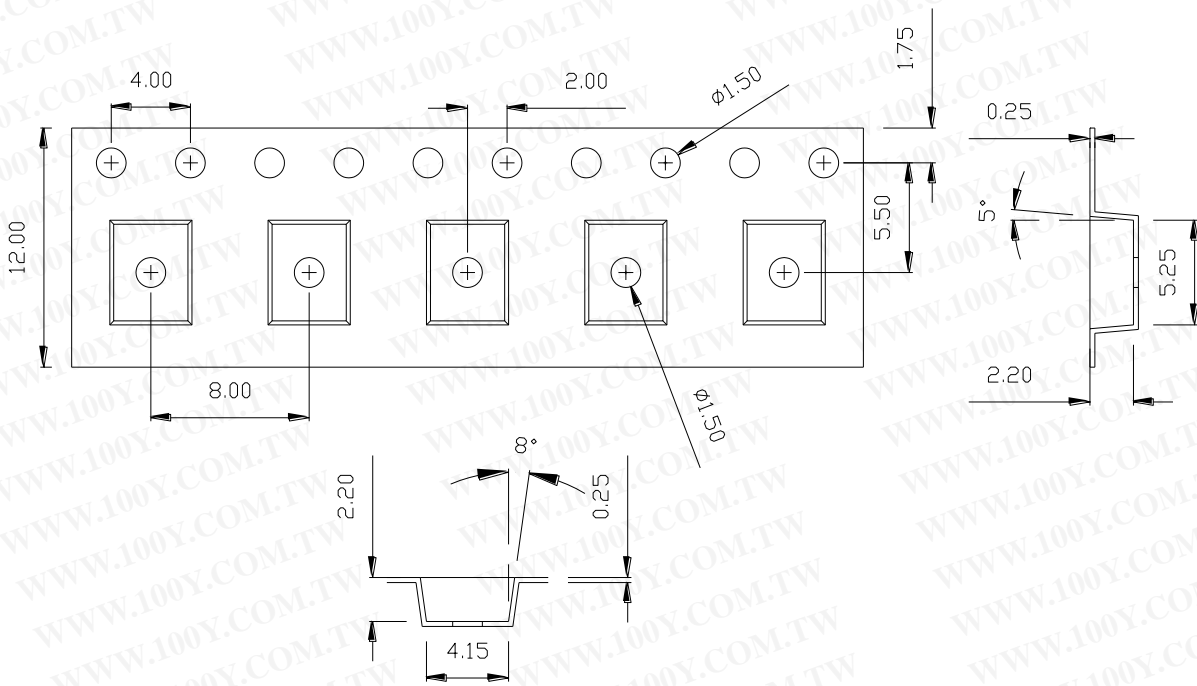


● We recommend using the M705-S101-S4 solder paste from SMIC (Senju Metal Industry Co., Ltd.) for lead-free soldering.

- All temperatures refer to topside of the package, measured on the package body surface.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than two times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

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# Emitter Reel Packaging



There shall be a minimum of 160mm (6.3 inch) of empty component pockets sealed with cover tape.

Mounted with components.

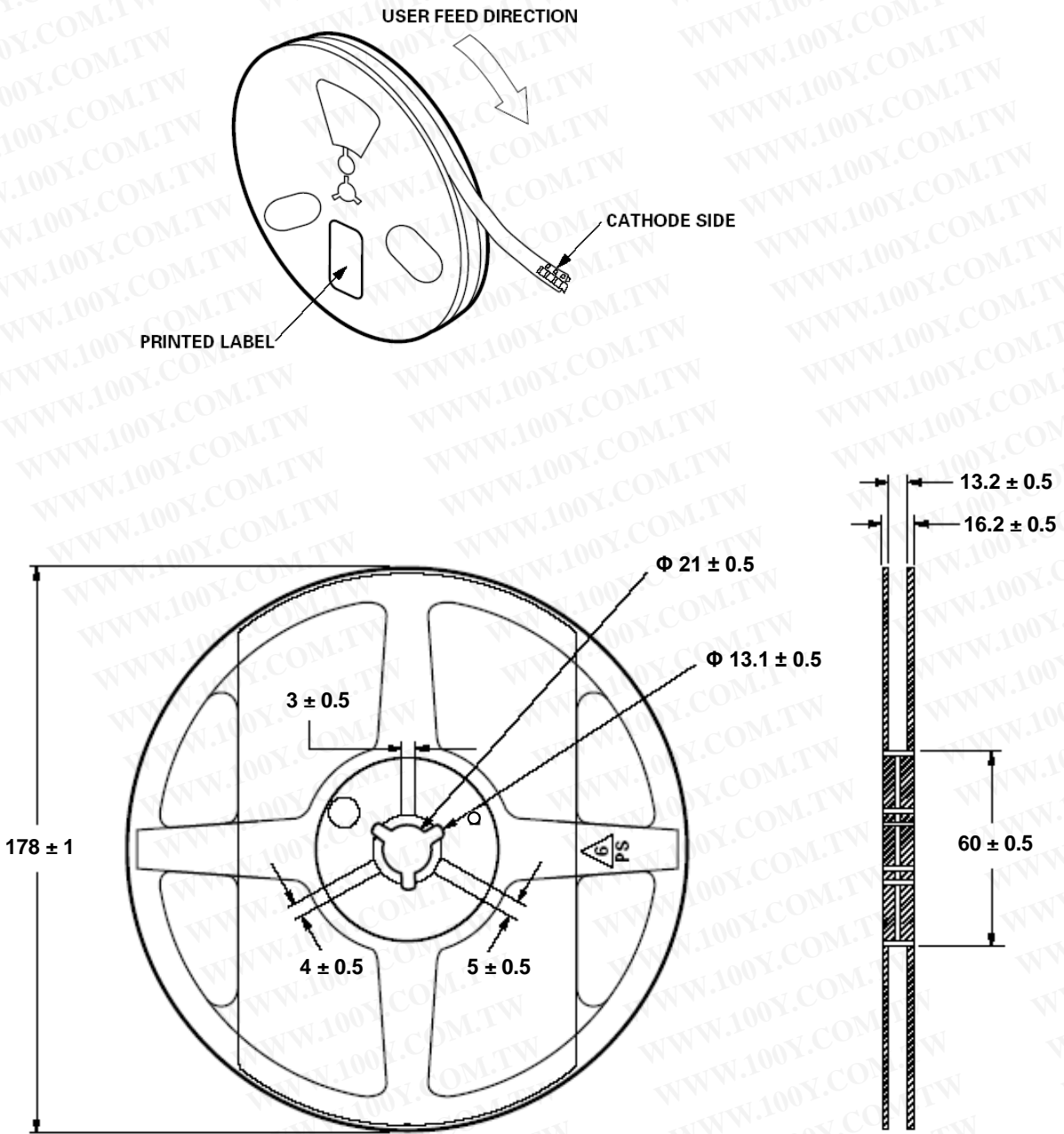
There shall be a minimum of 160mm (6.3 inch) of empty component pockets sealed with cover tape.

## Notes:

1. Drawing not to scale.
2. All dimensions are in millimeters.
3. General tolerance is  $\pm 0.10$  mm.

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# Emitter Reel Packaging

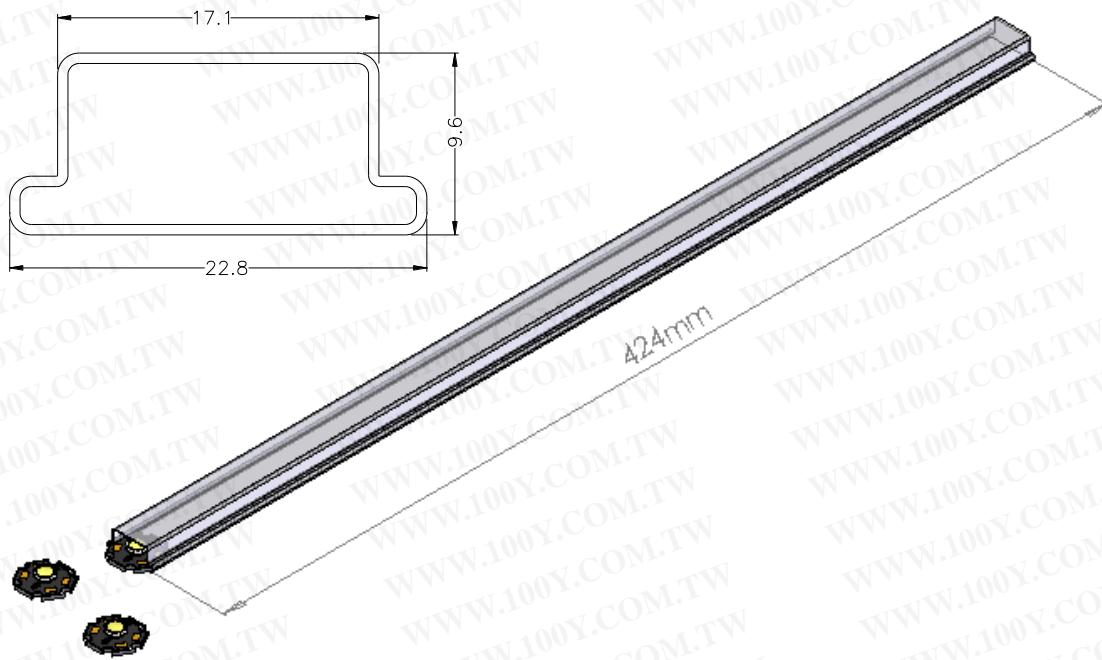


**Notes:**

1. Empty component pockets sealed with top cover tape.
2. 250, 500 and 1000 pieces per reel.
3. Drawing not to scale.
4. All dimensions are in millimeters.

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## Star Tube Packaging



### Notes:

1. 20 pieces per tube.
2. Drawing not to scale.
3. All dimensions are in millimeters.
4. All dimensions without tolerances are for reference only.

\*\*Please do not open the moisture barrier bag (MBB) more than one week. This may cause the leads of LED discoloration. We recommend storing ProLight's LEDs in a dry box after opening the MBB. The recommended storage conditions are temperature 5 to 30°C and humidity less than 40% RH.

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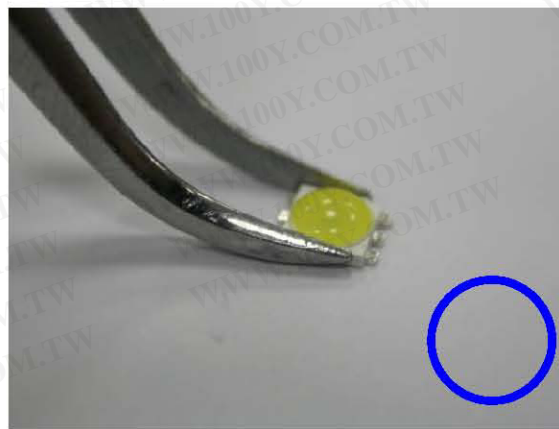
## Precaution for Use

- Storage  
Please do not open the moisture barrier bag (MBB) more than one week. This may cause the leads of LED discoloration. We recommend storing ProLight's LEDs in a dry box after opening the MBB. The recommended storage conditions are temperature 5 to 30°C and humidity less than 40% RH. It is also recommended to return the LEDs to the MBB and to reseal the MBB.
- The slug is not electrically neutral. Therefore, we recommend to isolate the heat sink.
- The LEDs are sensitive to electrostatic discharge. Appropriate ESD protection measures must be taken when working with the LEDs. Non-compliance with ESD protection measures may lead to damage or destruction of the LEDs.
- **We recommend using the M705-S101-S4 solder paste from SMIC (Senju Metal Industry Co., Ltd.) for lead-free soldering.**
- Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.
- Please avoid rapid cooling after soldering.
- Components should not be mounted on warped direction of PCB.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a heat plate should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When cleaning is required, isopropyl alcohol should be used.
- When the LEDs are illuminating, operating current should be decided after considering the package maximum temperature.
- The appearance, specifications and flux bin of the product may be modified for improvement without notice. Please refer to the below website for the latest datasheets.

## Handling of Silicone Lens LEDs

Notes for handling of silicone lens LEDs

- Please do not use a force of over 3kgf impact or pressure on the silicone lens, otherwise it will cause a catastrophic failure.
- The LEDs should only be picked up by making contact with the sides of the LED body.
- Avoid touching the silicone lens especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on the silicone lens.
- Please store the LEDs away from dusty areas or seal the product against dust.
- When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the silicone lens must be prevented.
- Please do not mold over the silicone lens with another resin. (epoxy, urethane, etc)



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