



*ProLight Opto*  
Technology Corporation



**ProLight PG1N-3LXC-SD**  
**3W Star/O**  
**Technical Datasheet**  
**Version: 2.2**

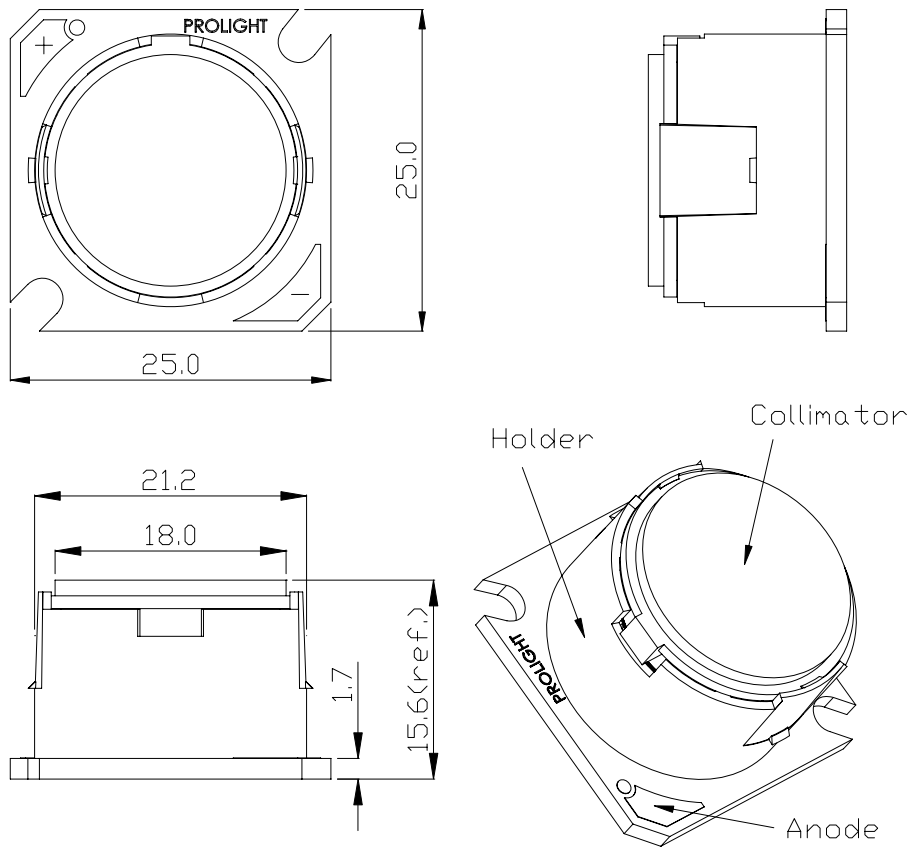
## Features

- High Flux per LED
- Very long operating life(up to 100k hours)
- Various colors
- Viewing angle:  $2\theta_{1/2}=15^\circ$ ,  $2\theta_{0.3}=25^\circ$
- Good color uniformity
- More energy efficient than incandescent and most halogen lamps
- Low Voltage DC operated
- Instant light (less than 100ns)
- No UV
- Superior ESD protection

## Typical Applications

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

## Star/O 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. Do not subject to temperatures greater than 75°C as plastic deformation may occur. Protect collimator against exposure to solvents and adhesives that are not compatible with it. Use care in handling the optic to avoid scratches or other damage that will effect the optical performance.
4. Drawing not to scale.
5. All dimensions are in millimeters.
6. All dimendions without tolerances are for reference only.

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

## Flux Characteristics of LED at 700mA, T<sub>J</sub> = 25°C

Radiation Pattern	Color	Part Number Module	Lumious Flux Φ <sub>v</sub> (lm)	
			Minimum	Typical
Lambertian	White	PG1N-3LWC-SD	67.2	110
	Warm White	PG1N-3LVC-SD	67.2	100
	Green	PG1N-3LGC-SD	87.4	105
	Blue	PG1N-3LBC-SD	18.1	26
	Amber	PG1N-3LAC-SD	58.9	84
	Red	PG1N-3LRC-SD	58.9	80

- ProLight maintains a tolerance of ± 10% on flux and power measurements.
- Please do not drive at rated current more than 3 second without proper heat sink.

## Electrical Characteristics of Module at 700mA, T<sub>J</sub> = 25°C

Color	Forward Voltage V <sub>F</sub> (V)			Dynamic Resistance (Ω)	Temperature Coefficient of V <sub>F</sub> (mV/ °C) ΔV <sub>F</sub> / ΔT <sub>J</sub>	Thermal Resistance Junction to Board (°C/ W)
	Min.	Typ.	Max.			
White	2.8	3.5	4.3	1.0	-2.0	13
Warm White	2.8	3.5	4.3	1.0	-2.0	13
Green	2.8	3.5	4.3	1.0	-2.0	13
Blue	2.8	3.5	4.3	1.0	-2.0	13
Amber	1.9	2.7	3.1	2.4	-2.0	15
Red	1.9	2.7	3.1	2.4	-2.0	15

## Optical Characteristics of Module at 700mA, T<sub>J</sub> = 25°C

Radiation Pattern	Color	Dominant Wavelength λ <sub>D</sub> , or Color Temperature CCT			Spectral Half-width (nm) Δλ <sub>1/2</sub>	Temperature Coefficient of Dominant Wavelength (nm/ °C) Δλ <sub>D</sub> / ΔT <sub>J</sub>	Total included Angle (degrees) θ <sub>0.90V</sub>	Viewing Angle (degrees) 2 θ <sub>1/2</sub>
		Min.	Typ.	Max.				
Spot	White	4100 K	5500 K	10000 K	---	---	30	15
	Warm White	2700 K	3300 K	4100 K	---	---	30	15
	Green	515 nm	525 nm	535 nm	35	0.04	30	15
	Blue	455 nm	465 nm	475 nm	25	0.04	30	15
	Amber	587 nm	592 nm	597 nm	20	0.05	30	15
	Red	613.5 nm	623 nm	631 nm	20	0.05	30	15

- ProLight maintains a tolerance of ± 1nm for dominant wavelength measurements.
- ProLight maintains a tolerance of ± 5% for CCT measurements.

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## Absolute Maximum Ratings

Parameter	White/Warm White/ Green/Blue	Amber/Red
DC Forward Current (mA)	700	700
Peak Pulsed Forward Current (mA)	1000	1000
Average Forward Current (mA)	700	700
ESD Sensitivity	±16000V HBM	
LED Junction Temperature (°C)	135	120
Aluminum-core PCB Temperature (°C)	75	75
Storage & Operating Temperature (°C)	-40 to +75	-40 to +75

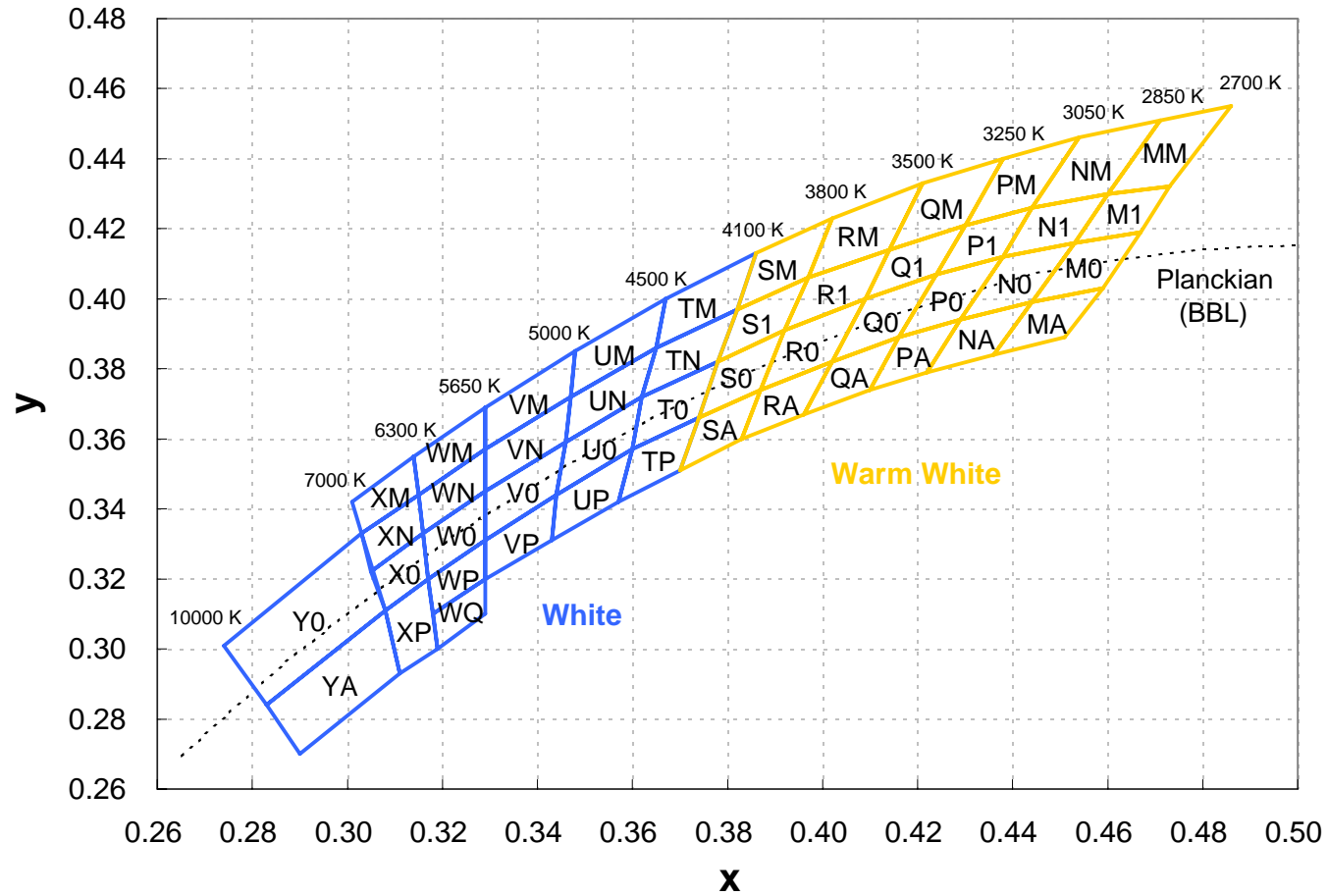
## Photometric Luminous Flux Bin Structure

Color	Bin Code	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
White	T1	67.2	76.6
	T2	76.6	87.4
	U1	87.4	99.6
	U2	99.6	113.6
	V1	113.6	129.5
Warm White	T1	67.2	76.6
	T2	76.6	87.4
	U1	87.4	99.6
	U2	99.6	113.6
	V1	113.6	129.5
Green	U1	87.4	99.6
	U2	99.6	113.6
	V1	113.6	129.5
	V2	129.5	147.7
Blue	N	18.1	23.5
	P	23.5	30.6
	Q	30.6	39.8
Amber	S2	58.9	67.2
	T1	67.2	76.6
	T2	76.6	87.4
	U1	87.4	99.6
Red	S2	58.9	67.2
	T1	67.2	76.6
	T2	76.6	87.4
	U1	87.4	99.6

- ProLight maintains a tolerance of ± 10% on flux and power measurements.

# Color Bin

## White and Warm White Binning Structure Graphical Representation



## 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	W0	0.329	0.345	5970
	0.374	0.366			0.329	0.331	
	0.360	0.357			0.317	0.320	
	0.362	0.372			0.316	0.333	
TN	0.382	0.397	4300	WN	0.329	0.345	5970
	0.378	0.382			0.316	0.333	
	0.362	0.372			0.315	0.344	
	0.365	0.386			0.329	0.357	
TP	0.374	0.366	4300	WP	0.329	0.331	5970
	0.370	0.351			0.329	0.320	
	0.357	0.342			0.318	0.310	
	0.360	0.357			0.317	0.320	
TM	0.386	0.413	4300	WQ	0.329	0.320	5970
	0.382	0.397			0.329	0.310	
	0.365	0.386			0.319	0.300	
	0.367	0.400			0.318	0.310	
U0	0.362	0.372	4750	WM	0.329	0.369	5970
	0.360	0.357			0.329	0.357	
	0.344	0.344			0.315	0.344	
	0.346	0.359			0.314	0.355	
UN	0.365	0.386	4750	X0	0.308	0.311	6650
	0.362	0.372			0.305	0.322	
	0.346	0.359			0.316	0.333	
	0.347	0.372			0.317	0.320	
UP	0.360	0.357	4750	XN	0.305	0.322	6650
	0.357	0.342			0.303	0.333	
	0.343	0.331			0.315	0.344	
	0.344	0.344			0.316	0.333	
UM	0.365	0.386	4750	XP	0.308	0.311	6650
	0.367	0.400			0.317	0.320	
	0.348	0.385			0.319	0.300	
	0.347	0.372			0.311	0.293	
V0	0.329	0.331	5320	XM	0.301	0.342	6650
	0.329	0.345			0.314	0.355	
	0.346	0.359			0.315	0.344	
	0.344	0.344			0.303	0.333	
VN	0.329	0.345	5320	Y0	0.308	0.311	8000
	0.329	0.357			0.283	0.284	
	0.347	0.372			0.274	0.301	
	0.346	0.359			0.303	0.333	
VP	0.329	0.331	5320	YA	0.308	0.311	8000
	0.344	0.344			0.311	0.293	
	0.343	0.331			0.290	0.270	
	0.329	0.320			0.283	0.284	
VM	0.329	0.357	5320				
	0.329	0.369					
	0.348	0.385					
	0.347	0.372					

- 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	
MA	0.459	0.403	2770	QA	0.416	0.389	3370
	0.444	0.399			0.402	0.382	
	0.436	0.384			0.396	0.367	
	0.451	0.389			0.410	0.374	
MM	0.471	0.451	2770	QM	0.421	0.433	3370
	0.460	0.430			0.414	0.414	
	0.473	0.432			0.430	0.421	
	0.486	0.455			0.438	0.440	
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	
NA	0.444	0.399	2950	RA	0.387	0.374	3650
	0.429	0.394			0.383	0.360	
	0.422	0.379			0.396	0.367	
	0.436	0.384			0.402	0.382	
NM	0.454	0.446	2950	RM	0.421	0.433	3650
	0.444	0.426			0.414	0.414	
	0.460	0.430			0.397	0.406	
	0.471	0.451			0.402	0.423	
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	
PA	0.429	0.394	3150	SA	0.387	0.374	3950
	0.416	0.389			0.383	0.360	
	0.410	0.374			0.370	0.351	
	0.422	0.379			0.374	0.366	
PM	0.438	0.440	3150	SM	0.402	0.423	3950
	0.430	0.421			0.397	0.406	
	0.444	0.426			0.382	0.397	
	0.454	0.446			0.386	0.413	

- 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.

## Dominant Wavelength Bin Structure

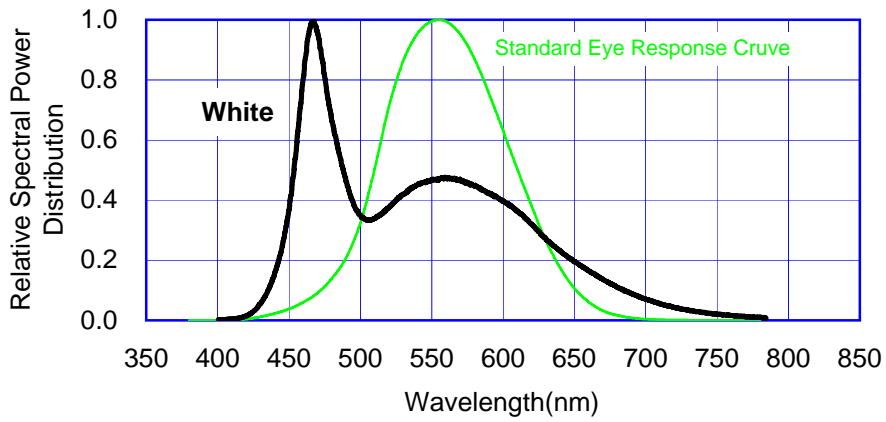
Color	Bin Code	Minimum Dominant Wavelength (nm)	Maximum Dominant Wavelength (nm)
Green	A	515	520
	1	520	525
	2	525	530
	3	530	535
Blue	A	455	460
	1	460	465
	2	465	470
	3	470	475
Amber	2	587.0	589.5
	4	589.5	592.0
	6	592.0	594.5
	7	594.5	597.0
Red	2	613.5	620.5
	4	620.5	631.0

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

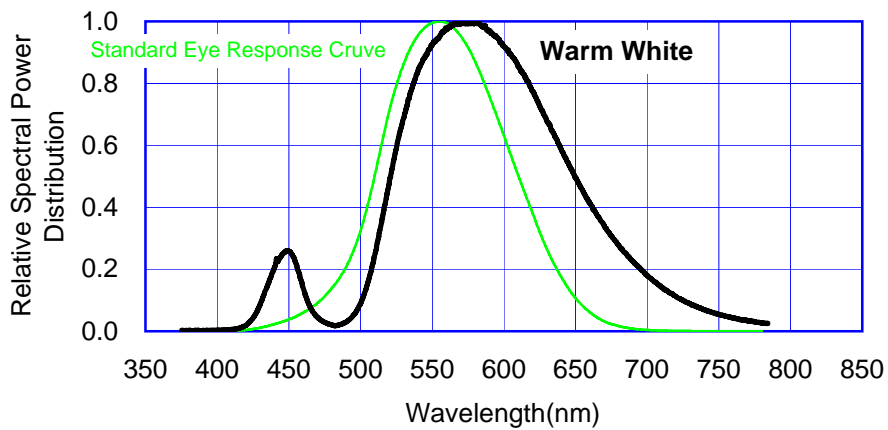
Note: Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all colors.

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

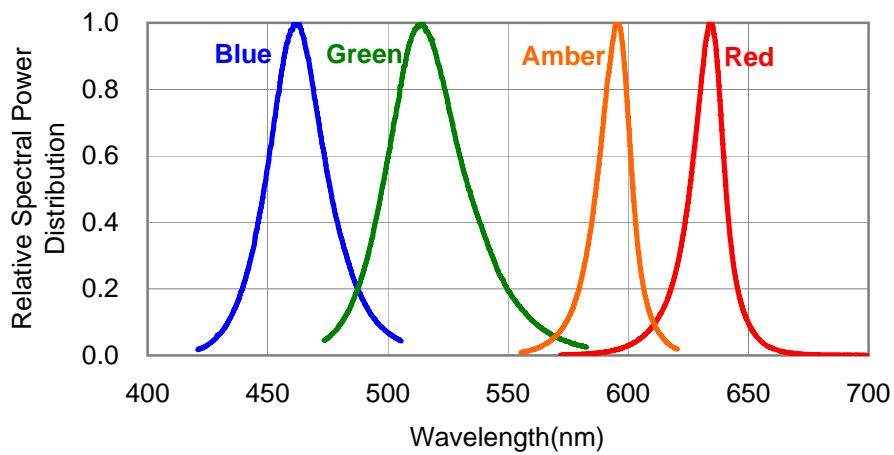
## 1. White



## 2. Warm White

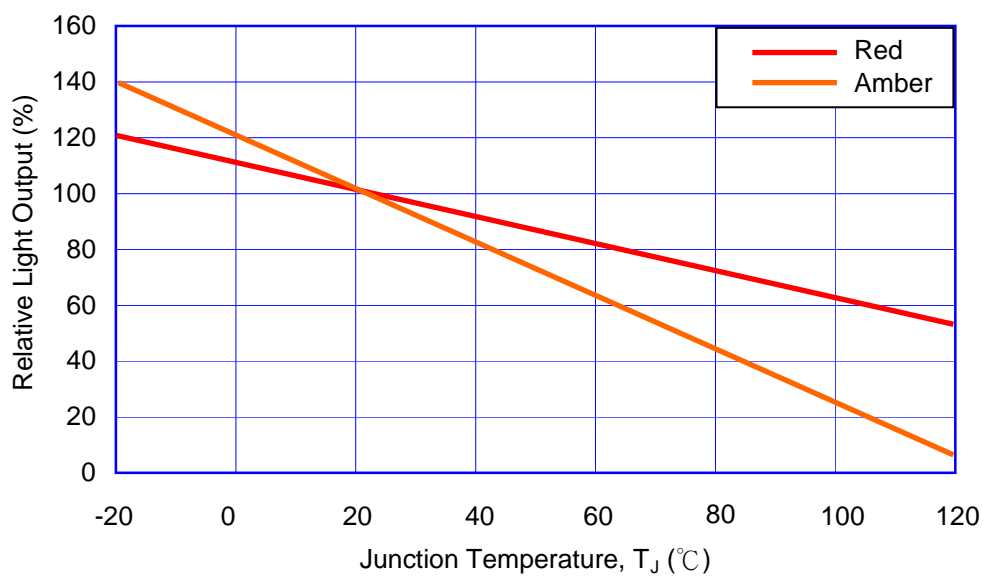
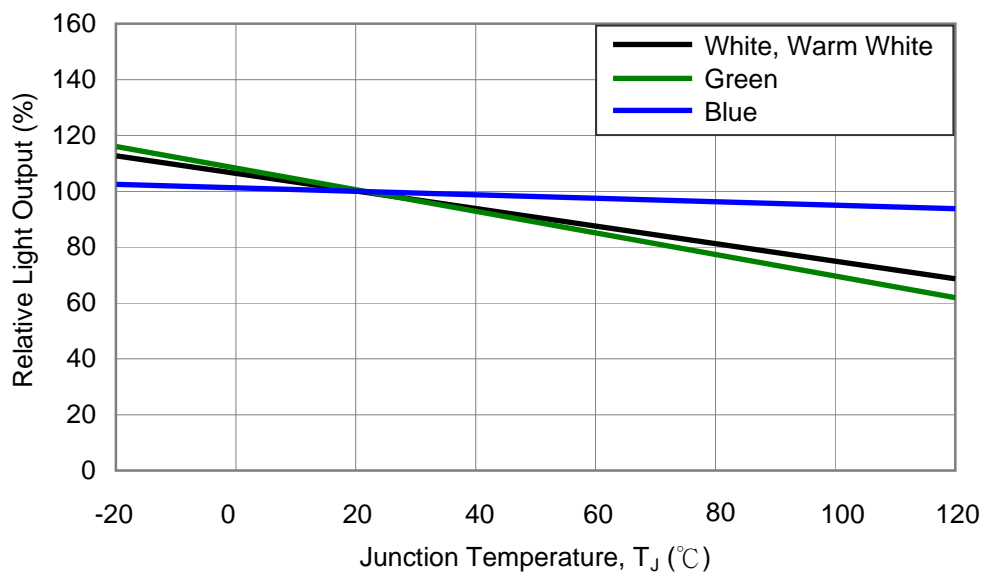


## 3. Blue 、 Green 、 Amber 、 Red



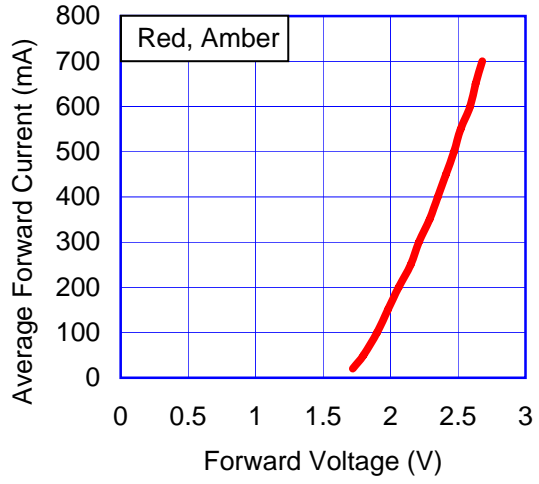
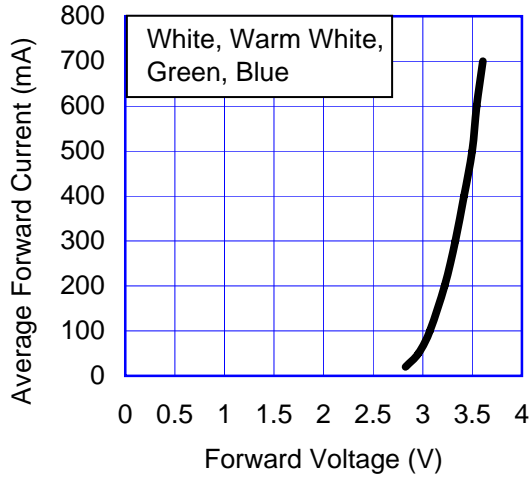
# Light Output Characteristics

## Relative Light Output vs. Junction Temperature at 700mA

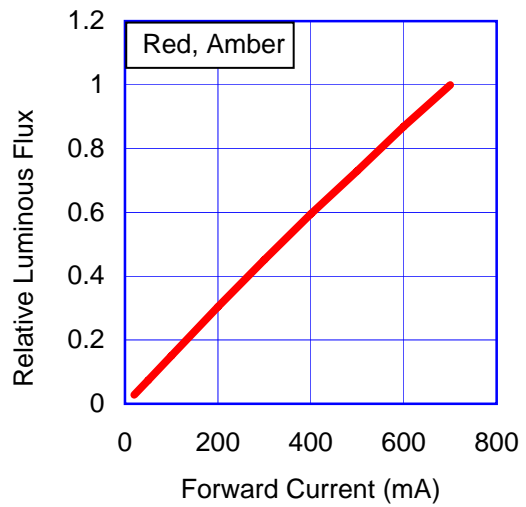
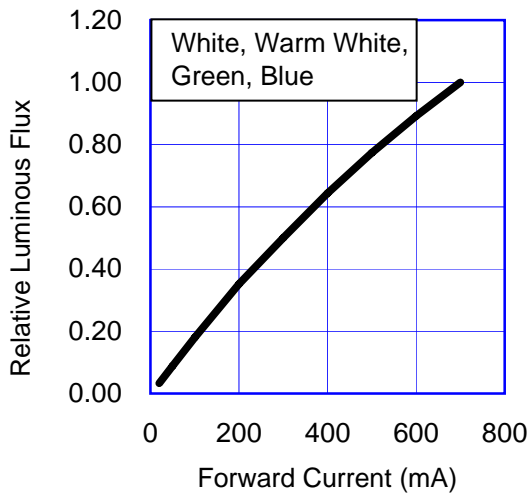


# Forward Current Characteristics, $T_J = 25^\circ\text{C}$

## 1. Forward Voltage vs. Forward Current

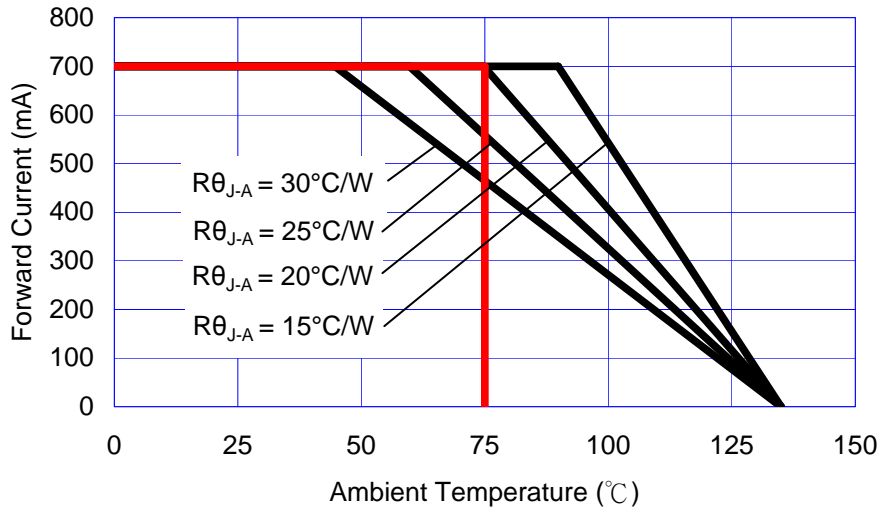


## 2. Forward Current vs. Normalized Relative Luminous Flux

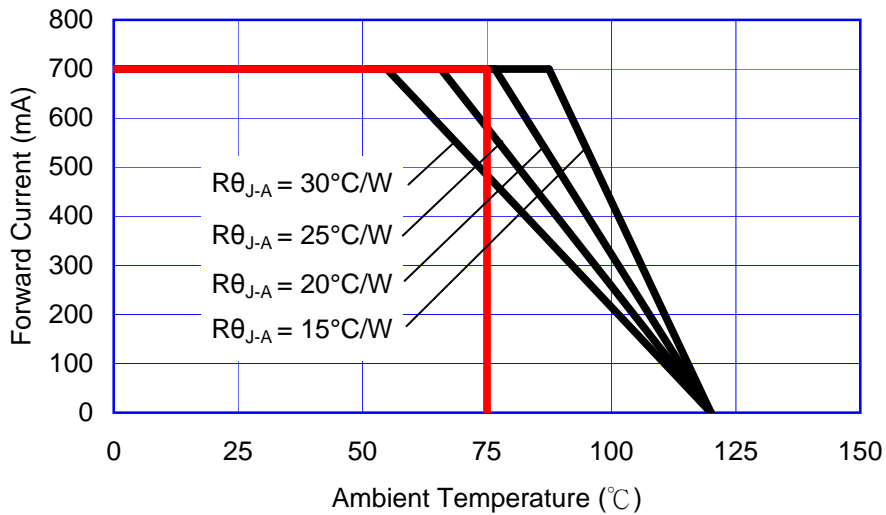


# Ambient Temperature vs. Maximum Forward Current

## 1. White, Warm White, Green, Blue ( $T_{JMAX} = 135^{\circ}\text{C}$ , $T_{Ambient} = 75^{\circ}\text{C}$ )



## 2. Red, Amber ( $T_{JMAX} = 120^{\circ}\text{C}$ , $T_{Ambient} = 75^{\circ}\text{C}$ )



# Typical Representative Spatial Radiation Pattern

## Spot Radiation Pattern

