

# Helixeon – RGB in One Series

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Helixeon RGB in one Emitter provides high

luminous flux and efficiency for color mixing capability and color changing applications. By utilizing 3-in-1 approach mounting the RGB LED dies into the same package, Helixeon RGB in one emitter enables light sources to achieve better quality than the separately packaged devices.

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## Features

- Three chips in one package
- Independent control
- Color mixing capability
- Long operation
- RoHs complaint

## Application

- Beacon lights
- Architectural lighting
- Stage lighting
- Contour lights



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# Product Nomenclature

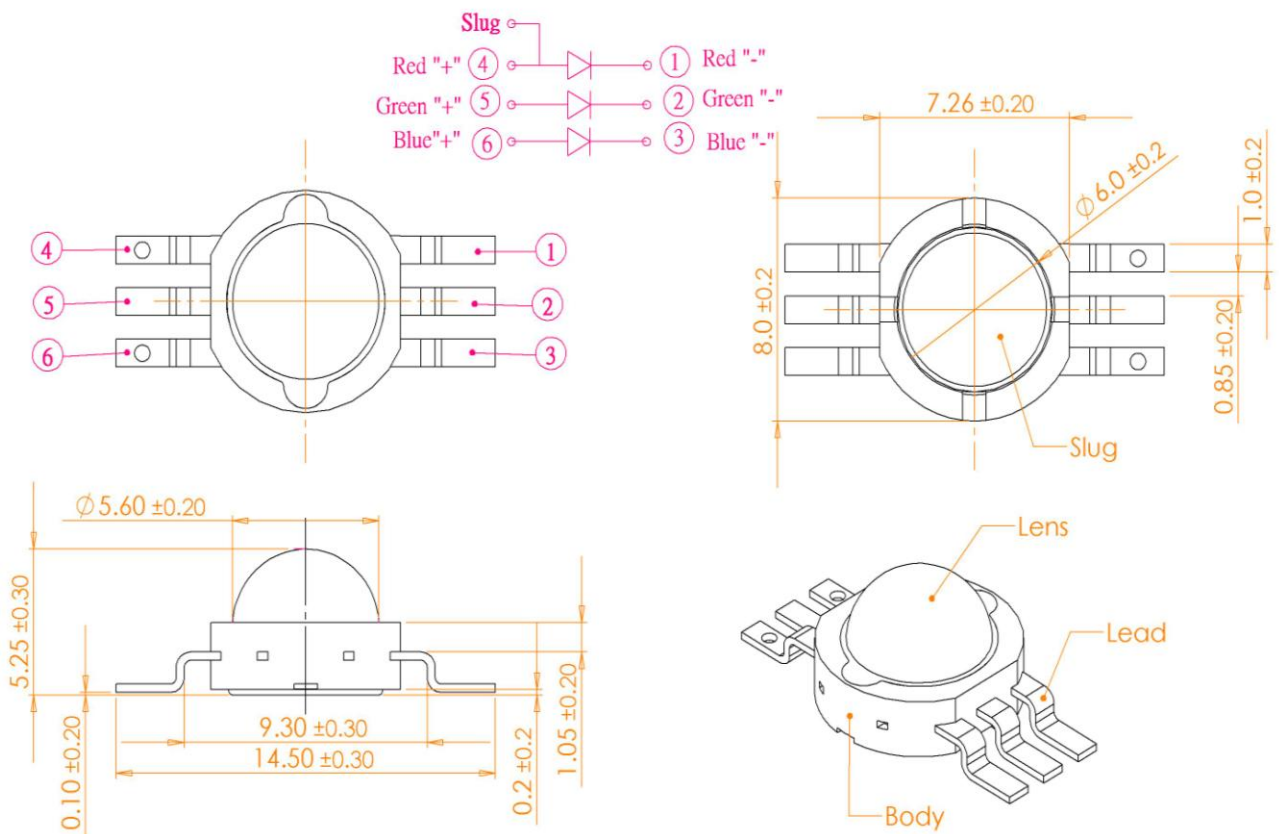
HM HP - E 1 L RGB  
X1 X2 X3 X4 X5 X6

X1 LED Item		X2 Power Classification		X3 Module		X4 Power	
Code	Type	Code	Type	Code	Type	Code	Type
HM	Molding	HP	High Power	E	Emitter	1	1W

X5 Lens Item		X6 Color	
Code	Type	Code	Type
L	Lambertian	RGB	RGB in One

# Package Dimensions

## SMT Lead Form



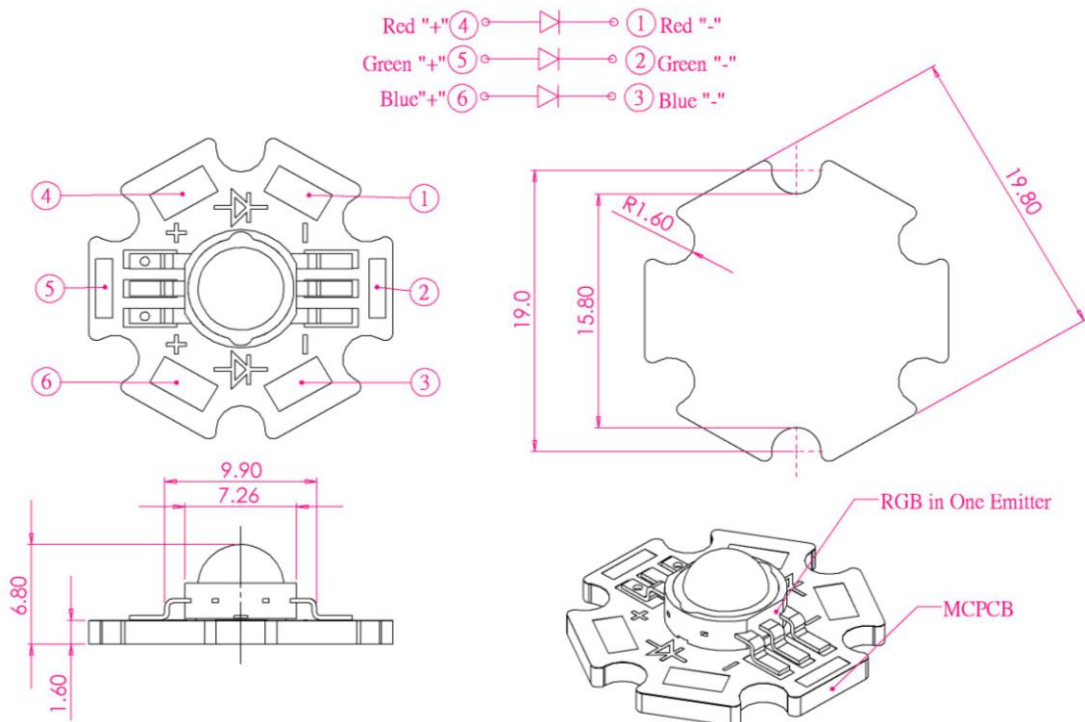
**Note:**

1. The anode side of the device is denoted by a hole in the lead frame.
2. Electrical insulation between the case and the board is required. The slug of the device is no electrically neutral.
3. Drawings are not to scale.
4. All dimensions are all in millimeter.
5. All dimensions without tolerance are for reference only.
6. Specifications are subject to change without notice.

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# Package Dimensions

## Star MCPCB Form



### Note:

1. Slots in aluminum-core PCB for M3 mounting screw.
2. Electrical interconnection pads labeled on the aluminum-PCB with "+" and "-" to denote positive and negative, respectively.
3. Drawings are not to scale.
4. All dimensions are in millimeters.



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## Absolute Maximum Ratings

Parameter	RBG in One
Peak Forward Current (1/10 Duty Cycle at 1KHz)	500mA
Continuous Forward Current	350mA
LED Junction Temperature	120°C
Operation Temperature	-40°C ~+105°C
Storage Temperature	-40°C ~+120°C
ESD Sensitivity	> 500V
Reverse Voltage (V)	not designed for reverse operation

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## Luminous Flux Characteristics

### Luminous Flux Characteristics at Test Current, Junction Temperature at 25°C

Color	Part Number	Luminous Flux <sup>(1)</sup> (lm)			Remark
		Min	Type	Max	
Red	HMHP-E1LRGB	30.6	33	--	350mA
Green	HMHP-E1LRGB	45.7	53	--	350mA
Blue	HMHP-E1LRGB	10.7	12	--	350mA

Note:

1. Minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of  $\pm 10\%$  on luminous flux measurements.



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## Optical Characteristics

### Optical Characteristics at 350mA, Junction Temperature at 25°C

Color	Dominant Wavelength $W_d^{(2)}$ (nm)			Typical Spectral Half-width (nm)	Typical View Angle (Degrees)
	Min	Type	Max	$\Delta\lambda_{1/2}^{(3)}$	$2\Theta_{1/2}^{(1)}$
Red	620	--	630	20	150
Green	520	--	535	37	150
Blue	460	--	470	25	150

#### Note:

1.  $\Theta_{1/2}$  is the off axis angle from emitter centerline where the radiometric intensity is 1/2 of the peak value.
2. Dominant wavelength is derived from the CIE1931 chromaticity diagram and represents the perceived color. The tester tolerance of dominant wavelength is  $\pm 0.5\text{nm}$ .
3. Spectral width at 1/2 of the peak intensity.



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## Electrical Characteristics

### Electrical Characteristics at 350mA, Junction Temperature at 25°C

Color	Forward Voltage $V_F^{(1)}$ (V)			Typical Temperature Coefficient of Forward Voltage (mV/°C)	Typical Thermal Resistance Junction to Case (°C/W)
	Min	Type	Max	$\Delta V_F / \Delta T^{(2)}$	$R_{\theta J-C}$
Red	2.0	--	3.0	-2	16
Green	3.0	--	4.0	-2	16
Blue	3.0	--	4.0	-2	16

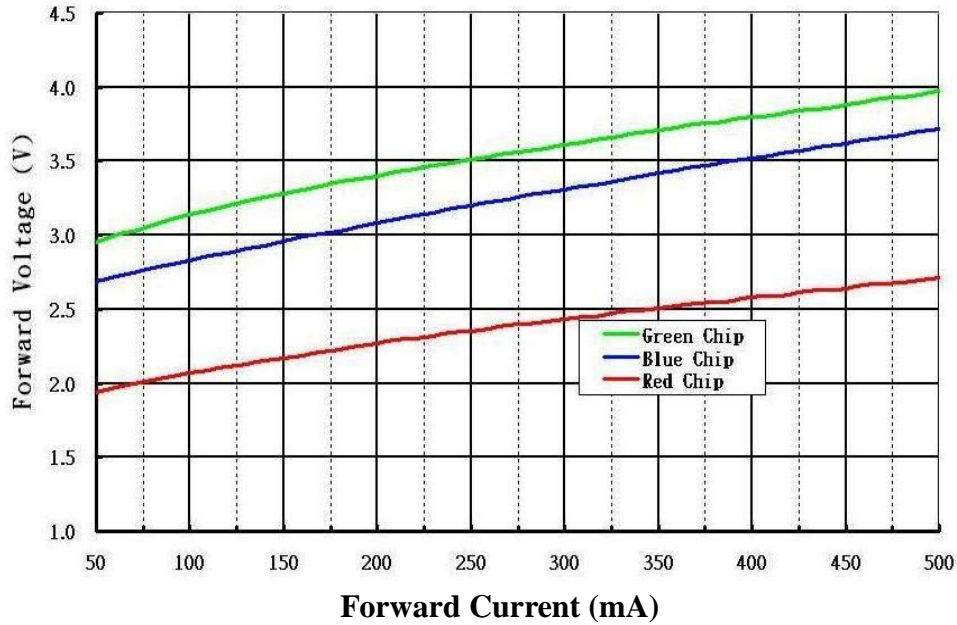
#### Note:

1. HELIO maintains a tolerance of  $\pm 0.06V$  on forward voltage measurements.
2. The temperature coefficients of forward voltage are measured between  $T_j=30$  and  $T_j=120$  at 350mA.

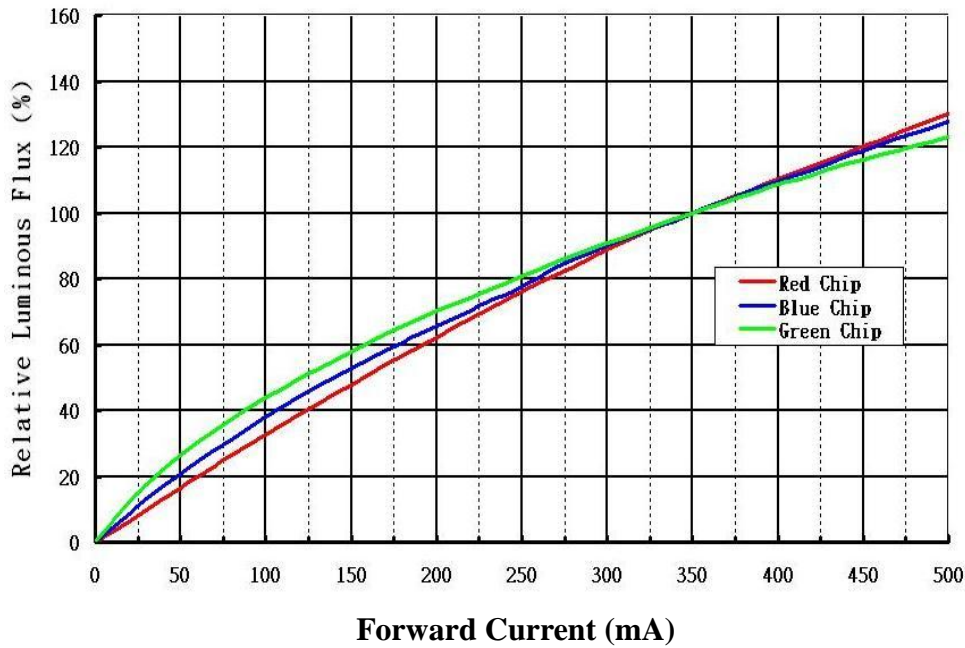


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## Typical Forward Current Characteristics



## Typical Light Output Characteristics over Forward Current



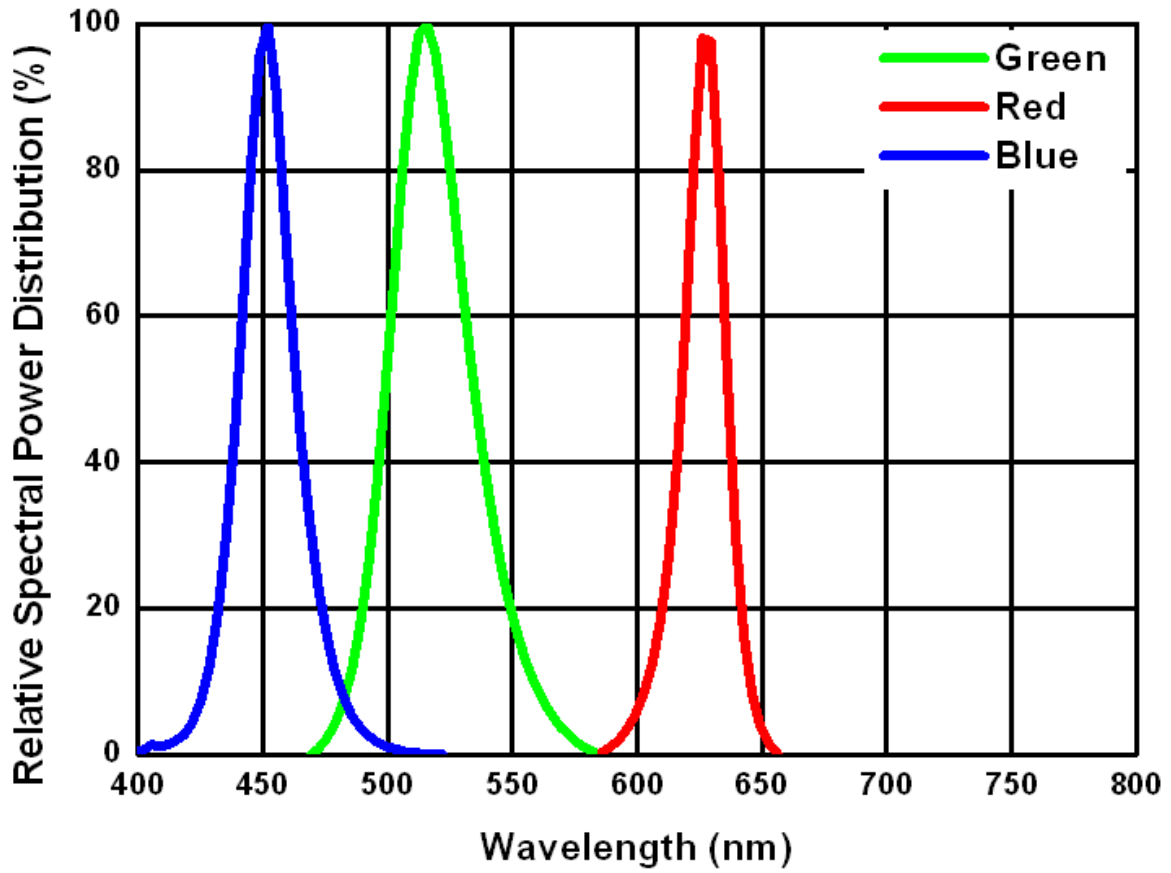
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## Wavelength Characteristics

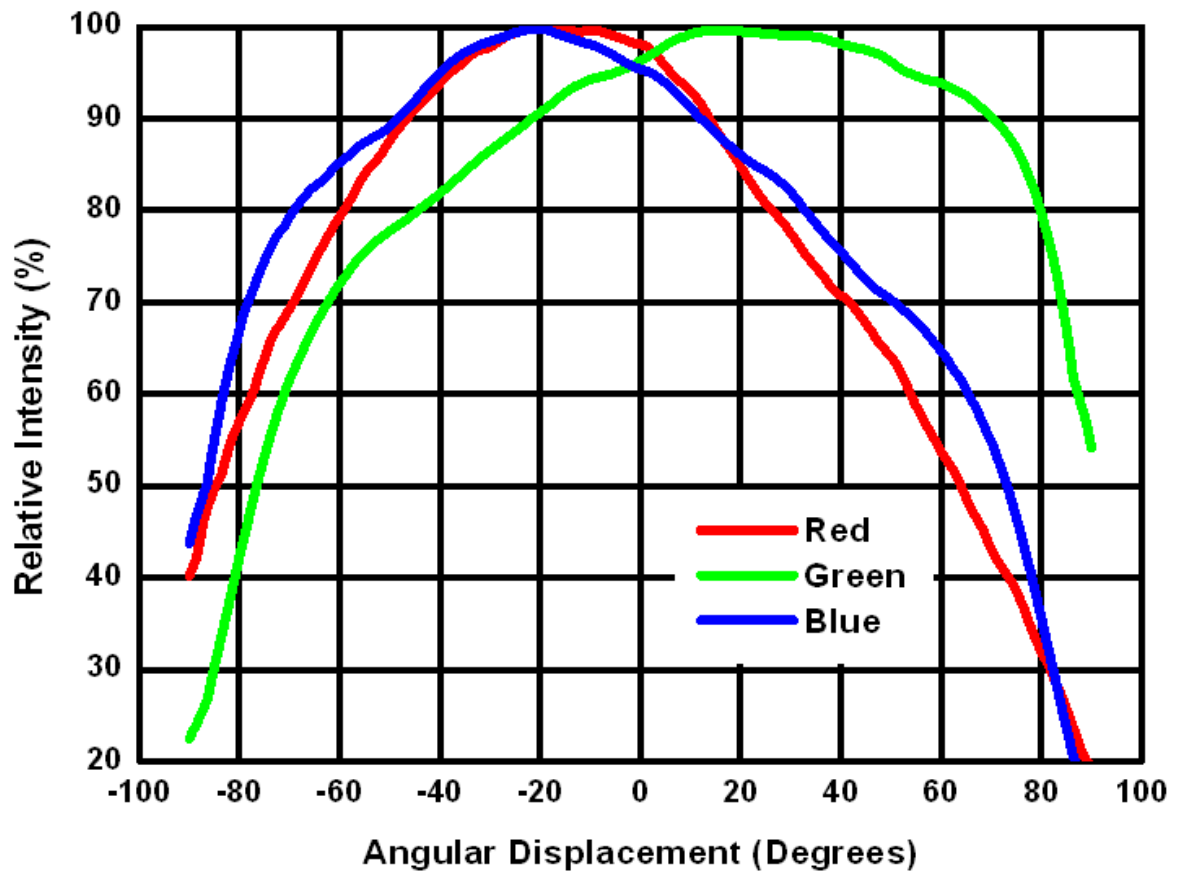
Test Current at 350mA, Junction Temperature at 25°C



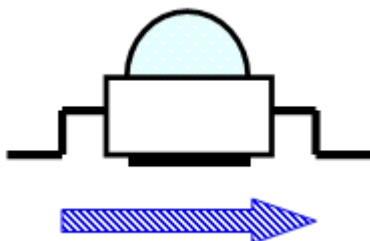
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## Typical Radiation Patterns

### Typical Representative Spatial Radiation Pattern in X-axis



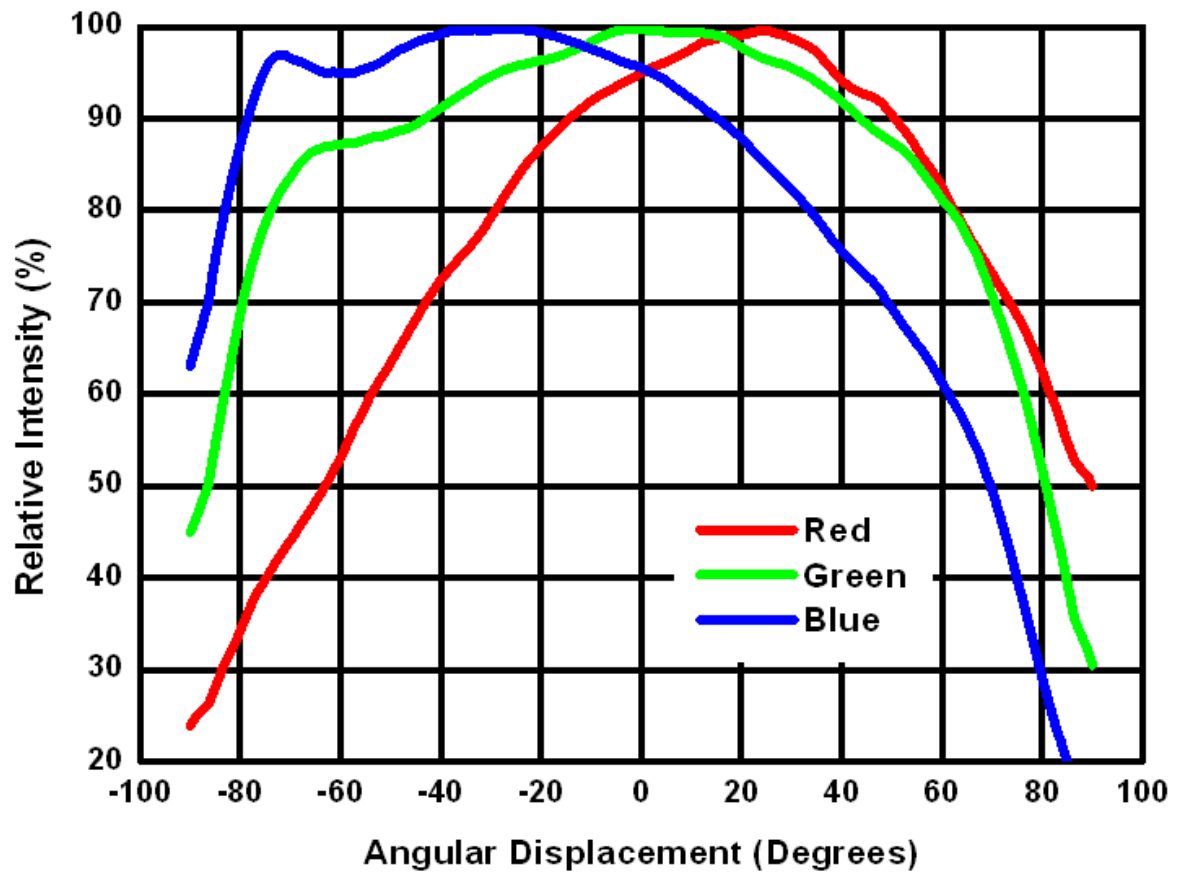
### Measurement Direction



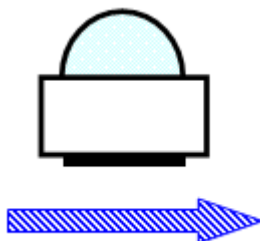
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## Typical Radiation Patterns, Continued

Typical Representative Spatial Radiation Pattern in Y-axis



Measurement Direction



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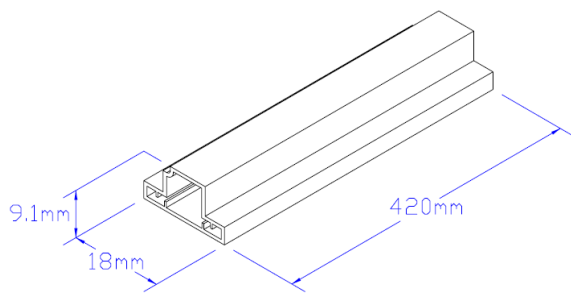
## Reliability Test List

Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to soldering heat (reflow soldering)	JEITA ED-4701 300 301	Ta=260°C, 10sec. (Pre treatment 25°C,70%,168hrs.)	2 times	0/10
Solderability (reflow soldering)	JEITA ED-4701 300 303	Tsld=215±5°C, 3sec. (Lead Solder)	1 time over 95%	0/10
Steady state operating life		Ta=25°C, I <sub>F</sub> = 350mA Tested with Helio standard circuit board	1000 hrs.	0/10
Steady state operating life of high humidity heat		60°C, RH=90%, I <sub>F</sub> = 350mA Tested with Helio standard circuit board	1000 hrs.	0/10
Temperature cycle	JEITA ED-4701 100 105	-40°C ~ 25°C ~ 100°C ~ 25°C 30min. 5min. 30min. 5min.	100 cycles	0/10
Thermal shock	JEITA ED-4701 300 307	0°C ~ 100°C 15sec. 15sec.	20 cycles	0/10
High temperature storage	JEITA ED-4701 200 201	Ta=100°C	1000 hrs.	0/10
Low temperature storage	JEITA ED-4701 200 202	Ta=-40°C	1000 hrs.	0/10
Vibration		2000 Hz, 2directions	60min.	0/10

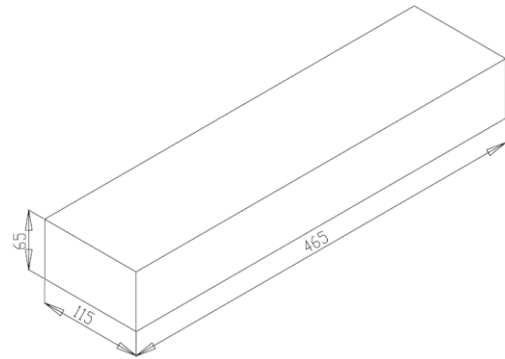
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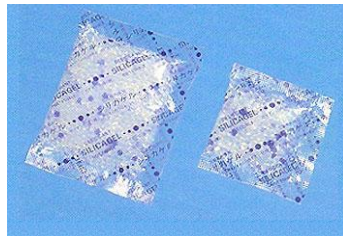
## Tube Package Specifications



Tube



Inner carton



Dry agent

### Note:

1. There are 50pcs emitters in a tube.
2. An antistatic bag contains 20 tubes and a drying agent.
3. There are 20 tubes in an inner carton.
4. All dimensions are all in millimeter.

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