Features

- Uniform light output
- Low power consumption
- I.C. Compatible
- Long life-solid state reliability
- Compliance with EU REACH
- The product itself will remain RoHS compliant.

RS PRO LEDs

RS Stock No.: 0588790

RS PRO is the own brand of RS. The RS PRO Seal of Approval is your assurance of professional quality, a guarantee that every part is rigorously tested, inspected, and audited against demanding standards. Making RS PRO the Smart Choice for our customers.

Product Description

5mm RGB Multi-color Round with Flange，Four Leads with One Common Anode.
Lens color: Water Clear
This LED adopts a solid-state design, with a long lifetime and reliable and uniform light output. Use with:

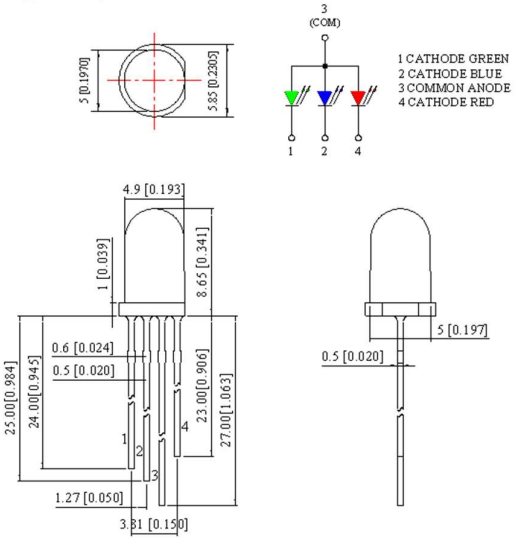
- TV set
- Monitor
- Telephone
- Computer
- Circuit board, etc

General Specifications

LED Colour	RGB
Dimensions	5mm

Mechanical Specifications

Mechanical Life	Recommended Soldering Pad Dimensions Soldering Temperature: 260□ for 5 Seconds



Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010□) unless otherwise noted.
3. Protruded resin under flange is 1.00mm (.039□) max.

Electrical Specifications

Absolute Maximum Ratings at Ta=25℃

Parameters		Symbol	Max.	Unit
Power Dissipation	Red	Pd	60	mW
	Green		90	
	Blue		90	
Peak Forward Current (Per Chip) (a)		IFP	100	mA
Forward Current (Per Chip) (b)	Red	IF	25	mA
	Green		25	
	Blue		25	
Reverse Voltage (Per Chip)		VR	5	V
Operating Temperature Range		Topr	-40□ to +85□	
Storage Temperature Range		Tstg	-40□ to +85□	
Lead Soldering Temperature		Tsld	260□ for 5 Seconds	

Notes:

a. Duty Factor = 10%, Frequency = 1 kHz.

b. Derate linearly as shown in derating curve.

Electrical Optical Characteristics at Ta=25℃

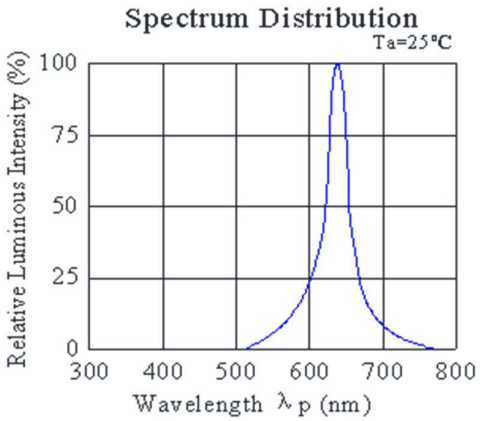
Parameters	Symbol	Emitting Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity(a)	IV	Red	600	1000	---	mcd	IF=20mA
		Green	2000	4000	---		
		Blue	400	700	---		
Viewing Angle (b)	$2\theta_{1/2}$	Red	---	25	---	Deg	IF=20mA
		Green	---	25	---		
		Blue	---	25	---		
Peak Emission Wavelength	λp	Red	---	632	---	nm	IF=20mA
		Green	---	520	---		
		Blue	---	468	---		
Dominant Wavelength(c)	λd	Red	---	624	---	nm	IF=20mA
		Green	---	525	---		
		Blue	---	470	---		
Spectral Line Half-Width	△λ	Red	---	20	---	nm	IF=20mA
		Green	---	20	---		
		Blue	---	20	---		
Forward Voltage	VF	Red	1.60	2.00	2.40	V	IF=20mA
		Green	2.80	3.20	3.60		
		Blue	2.80	3.20	3.60		
Reverse Current	IR	Red	---	---	10	μA	V_R=5V
		Green					
		Blue					

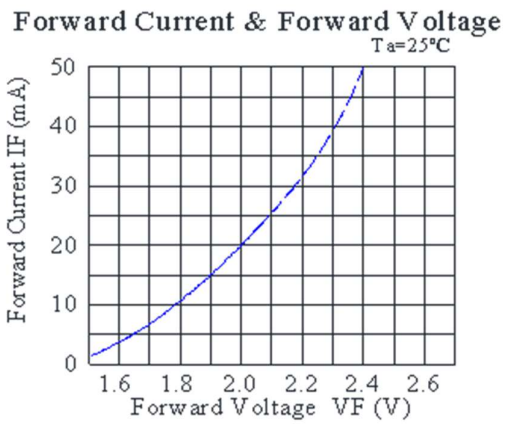
Notes:
a. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve. The Iv guarantee must be included with ±15% testing tolerance.
b. 2θ1/2 is the o-axis angle where the luminous intensity is 1⁄ 2 the peak intensity.
c. The dominant wavelength (λd) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

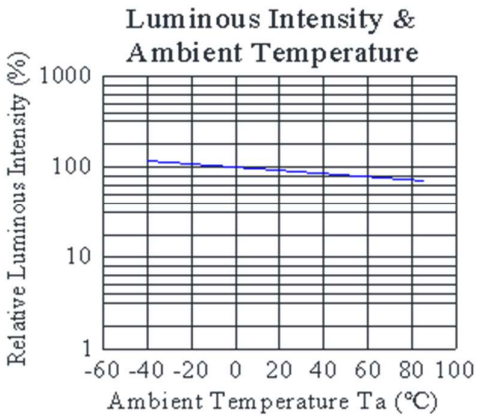
Typica lElectrical / Optical Characteristics Curves

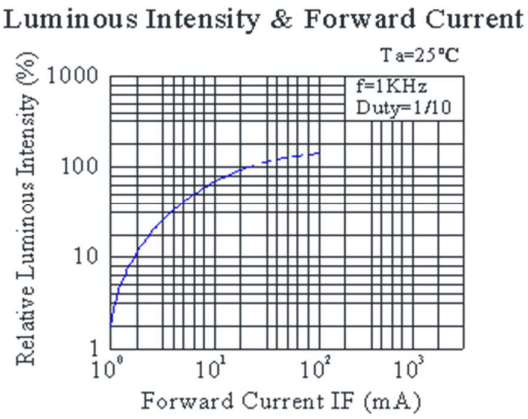
(25℃ Ambient Temperature Unless Otherwise Noted)

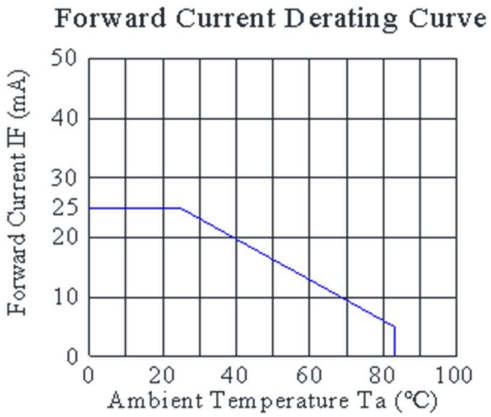
Red：

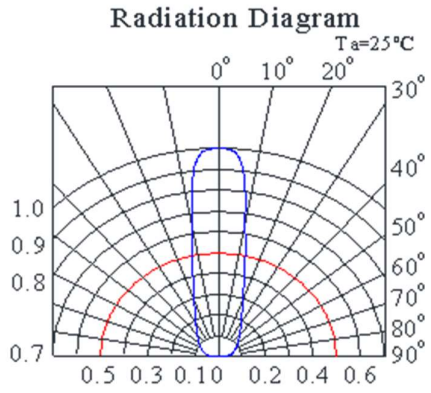

Spectrum Distribution
Ta=25℃
Relative Luminous Intensity (%)
100
75
50
25
0
300 400 500 600 700 800
Wavelength λp (nm)


Forward Current & Forward Voltage
Ta=25℃
Forward Current IF (mA)
50
40
30
20
10
0
1.6 1.8 2.0 2.2 2.4 2.6
Forward Voltage VF (V)


Luminous Intensity &
Ambient Temperature
Relative Luminous Intensity (%)
1000
100
10
1
-60 -40 -20 0 20 40 60 80 100
Ambient Temperature Ta (℃)

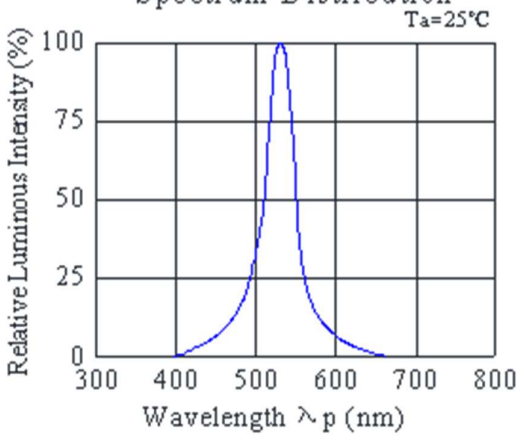

Luminous Intensity & Forward Current
Ta=25℃
f=1KHz
Duty=1/10
Relative Luminous Intensity (%)
1000
100
10
1
10⁰ 10¹ 10² 10³
Forward Current IF (mA)


Forward Current Derating Curve
Forward Current IF (mA)
50
40
30
25
20
10
0
0 20 40 60 80 100
Ambient Temperature Ta (℃)

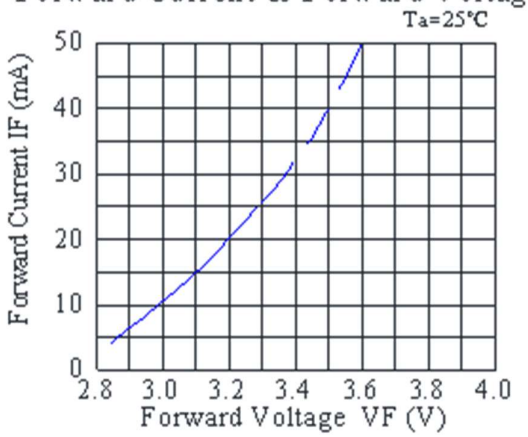

Radiation Diagram
Ta=25℃
0° 10° 20°
30°
40°
50°
60°
70°
80°
90°
1.0
0.9
0.8
0.7
0.5 0.3 0.1 0 0.2 0.4 0.6

Green：

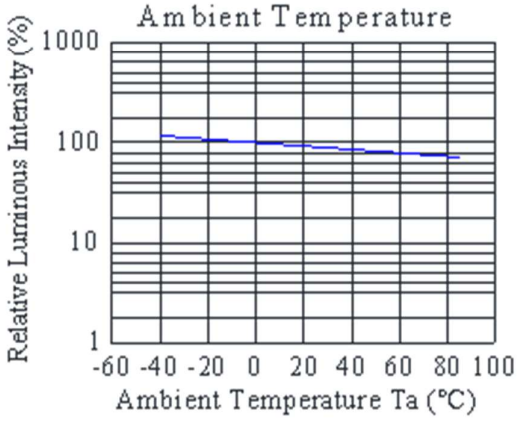
Spectrum Distribution



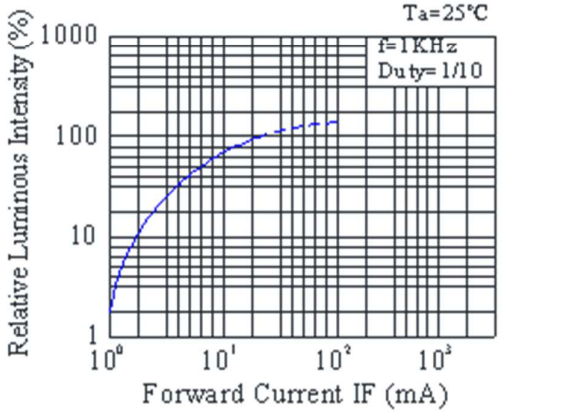
Forward Current & Forward Voltage



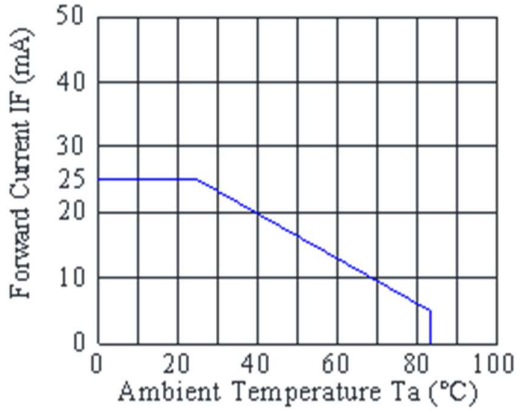
Luminous Intensity & Ambient Temperature



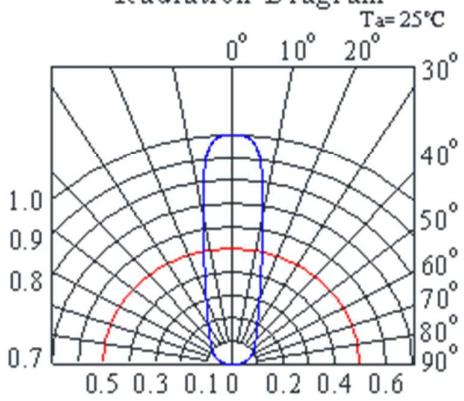
Luminous Intensity & Forward Current



Forward Current Derating Curve

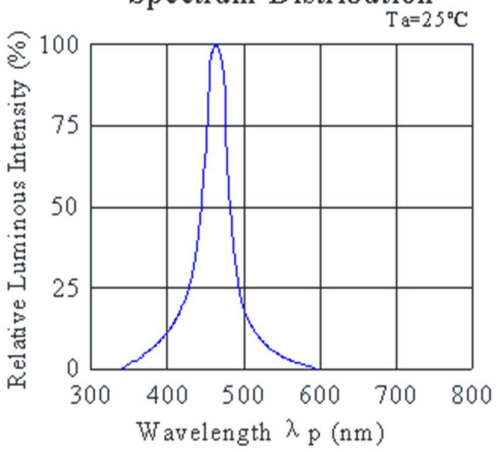


Radiation Diagram

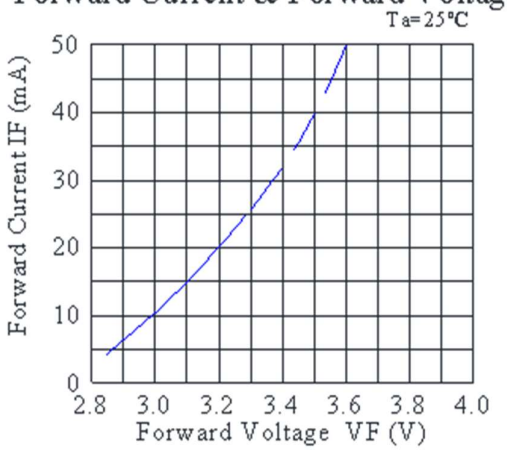


Blue:

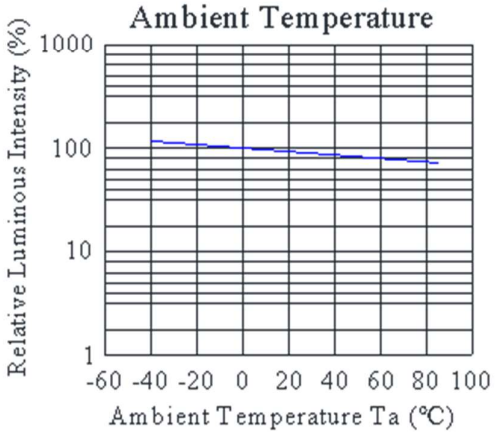
Spectrum Distribution



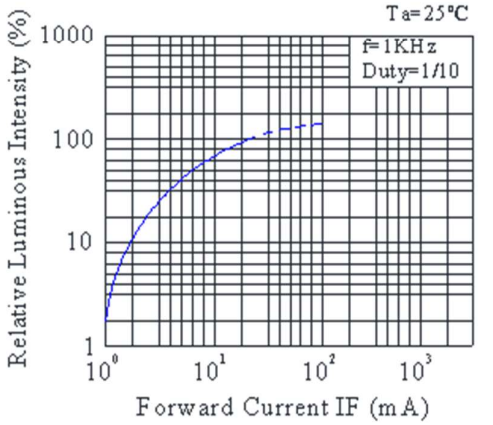
Forward Current & Forward Voltage



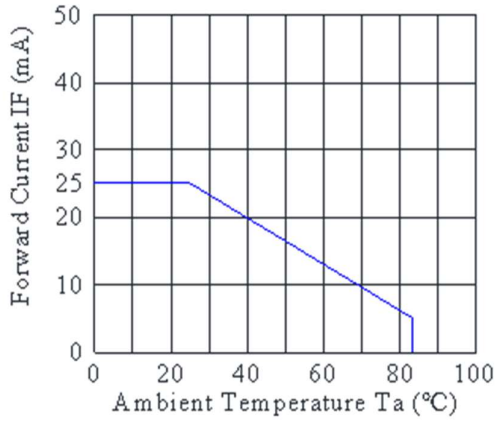
Luminous Intensity & Ambient Temperature



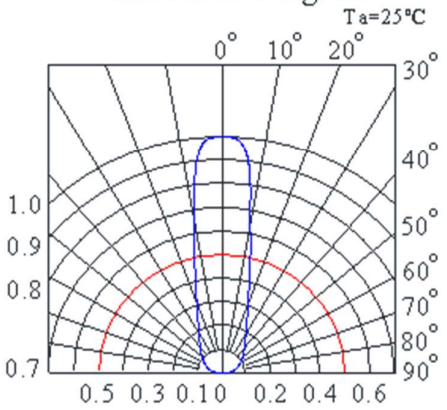
Luminous Intensity & Forward Current



Forward Current Derating Curve



Radiation Diagram



CAUTIONS

1. **Over-current-proof**

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. **Storage**

2.1 The LEDs should be stored at 30°C or less and 70%RH or less after being shipped and the storage life limits are 3 months. If the LEDs are stored for 3 months or more, they can be stored for a year in a sealed container with a nitrogen atmosphere and moisture absorbent material.

2.2 Please avoid rapid transitions in ambient temperature, especially, in high humidity environments where condensation can occur.

3. **Cleaning**

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LEDs if necessary.

4. **Lead Forming & Assembly**

During lead forming, the leads should be bent at a point at least 1.6mm from the base of LED lens. Do not use the base of the lead frame as a fulcrum during forming. Lead forming must be done before soldering, at normal temperature. During assembly on PCB, use minimum clinch force possible to avoid excessive mechanical stress.

5. **Soldering**

When soldering, for Lamp without stopper type and must be leave a minimum of 3mm clearance from the base of the lens to the soldering point. Do not apply any external stress to the lead frame during soldering while the LED is at high temperature.

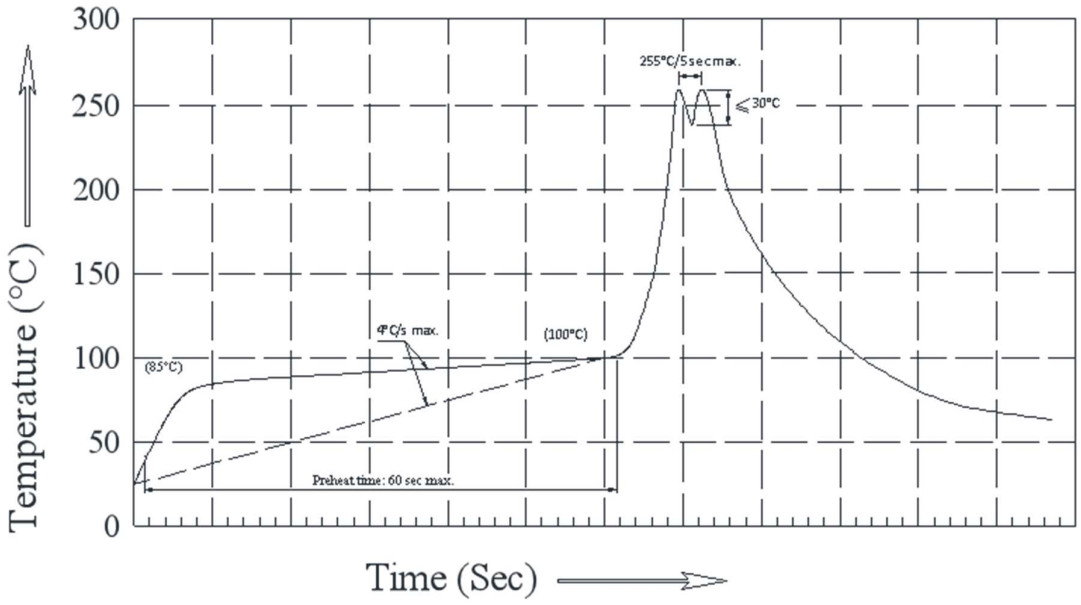
Recommended soldering conditions:

Soldering Iron		Wave Soldering	
Temperature	300□ Max.	Pre-heat	100□ Max.
		Pre-heat Time	60 sec. Max.
Soldering Time	3 sec. Max. (one time only)	Solder Wave	260□ Max.
		Soldering Time	5 sec. Max.

Note:

a. Excessive soldering temperature and / or time might result in deformation of the LED lens or catastrophic failure of the LED.

Recommended Wave Soldering Profiles



Notes:

a.Recommend pre-heat temperature of 105° C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260° C.

b.Peak wave soldering temperature between 245° C ~ 255°C for 3 sec (5 sec max).

c.Do not apply stress to the epoxy resin while the temperature is above 85°C.

d.Fixtures should not incur stress on the component when mounting and during soldering process.

e.SAC 305 solder alloy is recommended.

f.No more than one wave soldering pass.

6. Drive Method

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

(A) Recommended circuit

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

7. Repairing

Repair 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.

8. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

8.1. Use a conductive wrist band or anti- electrostatic glove when handling these LEDs.

8.2. All devices, equipment, and machinery must be properly grounded.

8.3. Work tables, storage racks, etc. should be properly grounded.

8.4. Use ion blower to neutralize the static charge which might have built up on surface of the LEDs plastic lens as a result of friction between LEDs during storage and handing.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no light up" at low currents.

To verify for ESD damage, check for "light up" and VF of the suspect LEDs at low currents.

The VF of "good" LEDs should be >2.0V@0.1mA for InGaN product and >1.4V@0.1mA for AlInGaP product.

9. Others

9.1 The information included in this document reflects representative usage scenarios and is intended for technical reference only.

9.2 The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.

9.3 When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, RS will not be responsible for any subsequent issues.

9.4 The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult RS's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health, such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices.