

5mm Round Standard T-1 3/4 Type  
Full Color Blinking LED  
Technical Data Sheet

Part No.: LL-F506RGBC2E-F2

## Features:

Single lamp with 3 original colors (red, green and blue).  
Designed for bonding with LED chip.  
Triple chips embedded.  
Multiple colors compose full spectrums.  
Electricity control IC embedded.  
Lens size with 5mm / 8mm / 10mm options.  
High intensity.  
Viewing Angles: 15°.  
Fancy, fun, hottest in the market.  
Operating voltage range: 3.00~5.00 V DC.  
Blinking frequency: 0.036Hz ( $V_{DD}=4.50V$ ).  
Frequency tolerance:  $\pm 20\%$ .  
The product itself will remain within RoHS compliant Version.

## Descriptions:

The Hyper Red source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode.

The Pure Green source color devices are made with InGaN on Sapphire substrate Light Emitting Diode.

The Blue source color devices are made with InGaN on Sapphire substrate Light Emitting Diode.

## Benefits:

- New trend creations.
- Low energy consumptions.
- Low maintenance costs.
- High application design flexibility.
- High reliability.

## Applications:

- Status indicators.
- Commercial use.
- Advertising Signs.
- Toys / sports utilities.
- Miniature key chains.
- Effect Lights.
- Display / decoration lights.
- Electronic displays and signals.
- Interior decoration lights.
- Indicator lights.
- Solar energy lights / garden lights.
- Monitor.
- Telephone.
- Computer.
- Circuit board.



**Absolute Maximum Ratings at Ta=25**

Parameters	Symbol	Max.	Unit
Power Dissipation (Per Chip)	PD	200	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	IFP	100	mA
Forward Current	IF	40	mA
Derating Linear From 50		0.4	mA/
Reverse Voltage	VR	5	V
Electrostatic Discharge (HBM)	ESD	400	V
Operating Temperature Range	Topr	-40 to +85	
Storage Temperature Range	Tstg	-40 to +100	
Lead Soldering Temperature [4mm (.157") From Body]	Tsld	260 for 5 Seconds	

**Electrical Optical Characteristics at Ta=25**

Parameters	Symbol	Emitting Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity *	IV	Hyper Red	600	1200	---	mcd	V <sub>DD</sub> =4.50V (Note 1)
		Pure Green	1000	2000	---		
		Blue	400	800	---		
Viewing angle	2θ <sub>1/2</sub>	---	---	15	---	Deg	V <sub>DD</sub> =4.50V (Note 2)
Peak Emission Wavelength	λ <sub>p</sub>	Hyper Red	---	632	---	nm	V <sub>DD</sub> =4.50V
		Pure Green	---	520	---		
		Blue	---	468	---		
Dominant Wavelength	λ <sub>d</sub>	Hyper Red	---	624	---	nm	V <sub>DD</sub> =4.50V (Note 3)
		Pure Green	---	525	---		
		Blue	---	470	---		
Spectral Line Half-Width	λ	Hyper Red	---	20	---	nm	IF=20mA (Per Chip)
		Pure Green	---	35	---		
		Blue	---	25	---		
Blinking Frequency	F	---	---	0.036	---	Hz	V <sub>DD</sub> =4.50V
Frequency tolerance	Fled	---	---	±20%	---	Hz	V <sub>DD</sub> =4.50V
Turn On Time	Duty	---	---	1/20	ms		V <sub>DD</sub> =4.50V
Operating Voltage	V <sub>F</sub>	---	3.00	4.50	5.00	V	
Reverse Current	I <sub>R</sub>	---	---	---	50	μA	V <sub>R</sub> =5V

**Notes:**

- Luminous Intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- θ<sub>1/2</sub> is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
- The dominant wavelength (λ<sub>d</sub>) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
- All specs and applications shown above subject to change without prior notice.

## Reliability Test Items And Conditions (For Only LED Chip):

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%.

LTPD: 10%.

### 1) Test Items and Results:

Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to Soldering Heat	JEITA ED-4701 300 302	Tsld=260±5 , 10sec 3mm from the base of the epoxy bulb	1 time	0/100
Solder ability	JEITA ED-4701 300 303	Tsld=235±5 , 5sec(using flux)	1time over 95%	0/100
Thermal Shock	JEITA ED-4701 300 307	0 ~100 15sec, 15sec	100 cycles	0/100
Temperature Cycle	JEITA ED-4701 100 105	-40 ~25 ~100 ~25 30min,5min,30min,5min	100 cycles	0/100
Moisture Resistance Cycle	JEITA ED-4701 200 203	25 ~65 ~-10 90%RH 24hrs/1cycle	10 cycles	0/100
High Temperature Storage	JEITA ED-4701 200 201	Ta=100	1000hrs	0/100
Terminal Strength (Pull test)	JEITA ED-4701 400 401	Load 10N (1kgf) 10±1sec	No noticeable damage	0/100
Terminal Strength (bending test)	JEITA ED-4701 400 401	Load 5N (0.5kgf) 0°~90°~0° bend 2 times	No noticeable damage	0/100
Temperature Humidity Storage	JEITA ED-4701 100 103	Ta=60 , RH=90%	1000hrs	0/100
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40	1000hrs	0/100
Steady State Operating Life		Ta=25 , IF=30mA	1000hrs	0/100
Steady State Operating Life of High Humidity Heat		Ta=60 , RH=90%, IF=30mA	500hrs	0/100
Steady State Operating Life of Low Temperature		Ta=-30 , IF=20mA	1000hrs	0/100

### 2) Criteria for Judging the Damage:

Item	Symbol	Test Conditions	Criteria for Judgment	
			Min	Max
Forward Voltage	VF	IF=20mA	---	F.V.*)×1.1
Reverse Current	IR	VR=5V	---	F.V.*)×2.0
Luminous Intensity	IV	IF=20mA	F.V.*)×0.7	---

\*) F.V.: First Value.

Please read the following notes before using the product:

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 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the LEDs should be kept at 30 °C or less and 90%RH or less.

2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30 °C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

3. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260 °C for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

4. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

5. Caution in ESD

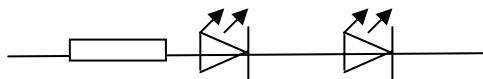
Static Electricity and surge damages the LED. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED. All devices equipment and machinery must be properly grounded.

6. Propose operation method:

6.1 The DC drive current of LED should be between 10 to 20mA no matter for single LED or multiple LEDs.

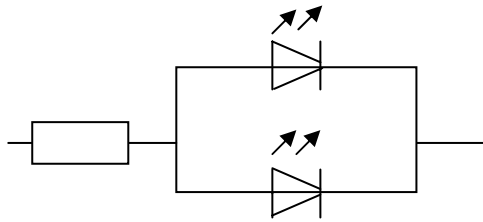
6.2 Drive circuit:

A. series connection





B. parallel way



6.3 The pulse will destroy the fixed inner connection of LED, so the circuit must be designed carefully. When circuit open or close, LED will not be assaulted over-pressed (over-flow).

6.4 In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, we should know well about the drive method and condition of the application. If there is no special requirement from customer, we will ensure the uniformity of LEDs at 20mA binning.

6.5 If want to have the uniform luminance and color, please use the same binning current with our company. And avoid using intermix to cause the differences of luminance and color.