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RELEASE

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Through Hole Lamp LTL760RGBPBJWP1

Through Hole Lamp

LTL760RGBPBJWP1

<u>Rev</u>	Description	<u>By</u>	<u>Date</u>
P01	Preliminary Specification (RDR-20181608-01). New Cutting Dim.	Javy H.	12/03/2018
P02	Update Iv and Bin Table	Javy H.	12/07/2018
P03	Update Vf Specification	Javy H.	12/10/2018
P04	Update Packing Quantity	Javy H.	12/13/2018
B001	Update packing spec.	Norah	5/16/2022
B002	Add tolerance for outline dim. 2.65mm as customer request	Norah	5/27/2022
	Above data for PD and Customer track	ing only	
-	New Specification Upload On OPNC	Chalerm Ya.	12/13/2018
A	Update Bin Table and Reverse Current (IR) Spec.	Javy H.	05/13/2019
В	Add typ. Wd and Wp as customer request	Norah	8/24/2019
С	Update packing spec. & outline dimensions	Norah	3/31/2023





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1. Description

Through hole LEDs are offered in a variety of packages such as 3mm, 4mm, 5mm, rectangular, and cylinder which are suitable for all applications requiring status indication. Several intensity and viewing angle choices are available in each color for design flexibility.

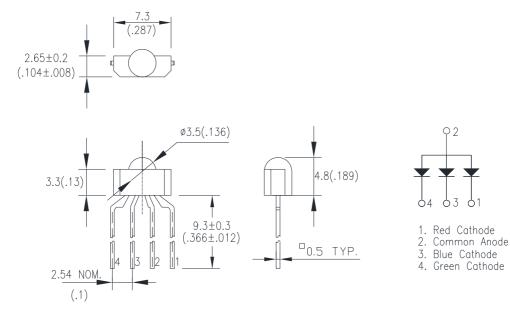
1.1. Features

- Lead(Pb) free products and RoHS compliant.
- Low power consumption & High efficiency.
- Versatile mounting on P.C. Board or panel.
- . RGB lamp & White Diffused Lens.

1.2. Applications

- Communication
- Computer
- Consumer
- Home appliance
- Industrial

2. Outline Dimensions



Notes :

- 1. All dimensions are in millimeters (inches).
- 2. Tolerance is ±0.25mm (.010") unless otherwise noted.
- 3. Protruded resin under flange is 1.0mm (.04") max.
- 4. Lead spacing is measured where the leads emerge from the package.
- 5. Specifications are subject to change without notice.



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3. Absolute Maximum Ratings at TA=25℃

Parameter	Red	Green	Blue	Unit	
Power Dissipation	100	144	99	mW	
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	100	100	100	mA	
DC Forward Current	40	30	30	mA	
Derating Linear From 40°C for Red Derating Linear From 30°C for Green & Blue	0.66	0.36	0.36	mA/℃	
Operating Temperature Range	-30℃ to + 85℃				
Storage Temperature Range	-40℃ to + 100℃				
Lead Soldering Temperature [2.0mm(.0787") From Body]	260°C for 5 Seconds Max.				

4. Electrical / Optical Characteristics at TA=25℃

Parameter	Symbol	Color	Min.	Тур.	Max.	Unit	Test Condition
Luminous Intensity	١v	-	1900		3200	mcd	Red IF_p = 40mA , Green IF_p = 36mA , Blue IF_p = 17mA , Note 1,4.
Viewing Angle	2 0 _{1/2}	-		110		deg	Note 2 (Fig.6)
		Red		631			
Peak Emission Wavelength	λ _P	Green		515			
		Blue		462			
	avelength λ_d	Red		621			Red IFp = 40mA, Green IFp = 36mA,
Dominant Wavelength		Green		518			Blue IFp = $17mA$,
		Blue		468			Blue II $p = 17 \text{ mA}$,
Chromaticity Coordinates	х	-		0.25			
Chromaticity Ocordinates	у	-		0.29			
		Red	1.8		2.9		Red IFp = 40mA ,
Forward Voltage	VF	Green	3.2		4.0	V	Green IFp = 36mA ,
		Blue	2.5		3.5		Blue IFp = 17mA ,
		Red			5	μA	
Reverse Current	urrent I _R	Green			5		V _R = 5V,Note 6
		Blue			5		

NOTES:

1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

2. θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

3. Iv classification code is marked on each packing bag.

4. The Iv guarantee must be included with $\pm 15\%$ testing tolerance.

5. The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram..

6. Reverse voltage (VR) condition is applied for IR test only. The device is not designed for reverse operation.

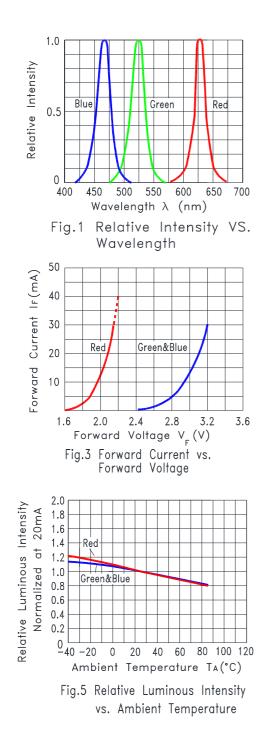




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5. Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)



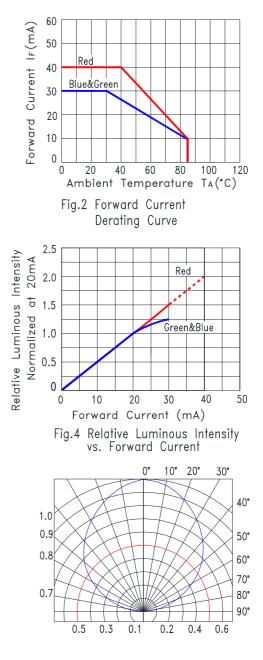


Fig.6 Spatial Distribution

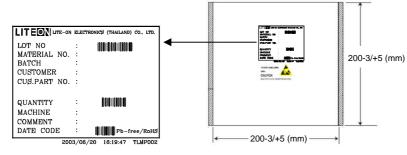
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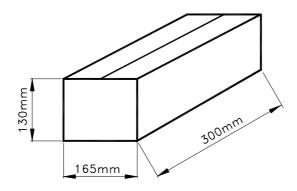
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6. Packing Spec.

2000, or 1500, 1000, 500 pcs per packing bag

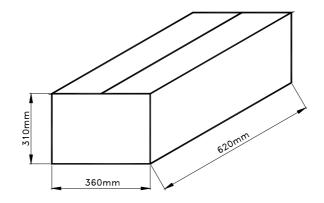


5 packing bags per Inner carton Total 10,000 pcs per Inner carton



8 inner cartons per outer carton Total 80,000 pcs per outer carton

In every shipping lot, only the last pack will be non-full packing







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7. Bin Table Specification

8. Luminous Intensity Unit : mcd						
9. @ Red IF _P = 40mA, Green IF _P = 36mA, Blue IF _P = 17mA.						
Bin Code Min. Max.						
S	1900	2500				
Т	2500	3200				

Note: Tolerance of each bin limit is ±15%

	Chromaticity Coordinates, CC(x, y),						
Hue Ranks	@ Red II	⁼ _p = 40mA, G	reen IF _p = 36	mA, Blue IF _r	= 17mA.		
A1-1	х	0.220	0.220	0.230	0.230		
AI-I	у	0.244	0.266	0.270	0.248		
A1-2	х	0.230	0.230	0.240	0.240		
A1-2	У	0.248	0.270	0.274	0.252		
40.4	х	0.220	0.220	0.230	0.230		
A2-1	У	0.266	0.288	0.292	0.270		
40.0	х	0.230	0.230	0.240	0.240		
A2-2	У	0.270	0.292	0.296	0.274		
40.4	х	0.220	0.220	0.230	0.230		
A3-1	У	0.288	0.310	0.314	0.292		
40.0	х	0.230	0.230	0.240	0.240		
A3-2	У	0.292	0.314	0.318	0.296		
	х	0.240	0.240	0.250	0.250		
B1-1	У	0.252	0.274	0.278	0.256		
D4 0	х	0.250	0.250	0.260	0.260		
B1-2	у	0.256	0.278	0.282	0.260		
D0.4	х	0.240	0.240	0.250	0.250		
B2-1	у	0.274	0.296	0.300	0.278		

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Use Dealer	Chromaticity Coordinates, CC(x, y),						
Hue Ranks	@ Red II	[₽] _p = 40mA, G	reen IF _P = 36	mA, Blue IF	= 17mA.		
B2-2	х	0.250	0.250	0.260	0.260		
D2-2	у	0.278	0.300	0.304	0.282		
D2 4	х	0.240	0.240	0.250	0.250		
B3-1	у	0.296	0.318	0.322	0.300		
D 2 0	х	0.250	0.250	0.260	0.260		
B3-2	у	0.300	0.322	0.326	0.304		
C1-1	х	0.260	0.260	0.270	0.270		
01-1	У	0.260	0.282	0.286	0.264		
01.0	х	0.270	0.270	0.280	0.280		
C1-2	у	0.264	0.286	0.290	0.268		
02.4	х	0.260	0.260	0.270	0.270		
C2-1	у	0.282	0.304	0.308	0.286		
C2-2	х	0.270	0.270	0.280	0.280		
02-2	У	0.286	0.308	0.312	0.290		
02.1	х	0.260	0.260	0.270	0.270		
C3-1	у	0.304	0.326	0.330	0.308		
C2 2	х	0.270	0.270	0.280	0.280		
C3-2	у	0.308	0.330	0.334	0.312		

Note: Color Coordinates Measurement allowance is ±0.01

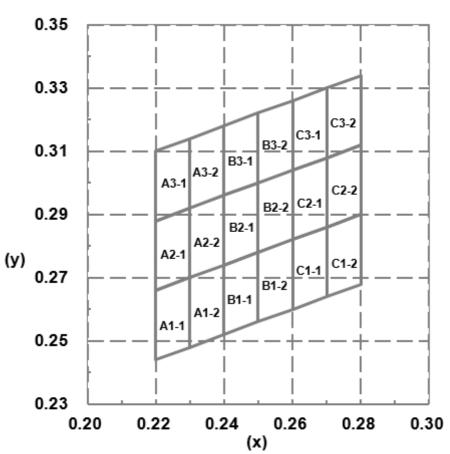
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C.I.E. 1931 Chromaticity Diagram





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8. CAUTIONS

8.1. Application

This LED lamp is good for application of indoor and outdoor sign, also ordinary electronic equipment.

8.2. Storage

The storage ambient for the LEDs should not exceed 30°C temperature or 70% relative humidity. It is recommended that LEDs out of their original packaging are used within three months. For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant or in desiccators with nitrogen ambient.

8.3. Cleaning

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

8.4. Lead Forming & Assembly

During lead forming, the leads should be bent at a point at least 3mm 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.

8.5. Soldering

When soldering, leave a minimum of 2mm clearance from the base of the lens to the soldering point. Dipping the lens into the solder must be avoided. Do not apply any external stress to the lead frame during soldering while the LED is at high temperature.

Recommended soldering conditions:

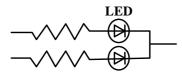
	Soldering iron	Wave soldering		
Temperature Soldering time	350°C Max. 3 seconds Max. (one time only)	Pre-heat Pre-heat time Solder wave	100°C Max. 60 seconds Max. 260°C Max.	
Position	No closer than 2mm from the base of the epoxy bulb	Soldering time Dipping Position	5 seconds Max. No lower than 2mm from the base of the epoxy bulb	

Note: Excessive soldering temperature and/or time might result in deformation of the LED lens or catastrophic failure of the LED. IR reflow is not suitable process for through hole type LED lamp product.

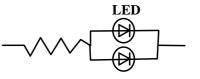
8.6. Drive Method

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.

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8.7. ESD (Electrostatic Discharge)

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

- Use a conductive wrist band or anti- electrostatic glove when handling these LEDs
- All devices, equipment, and machinery must be properly grounded
- Work tables, storage racks, etc. should be properly grounded
- 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

Suggested checking list:

Training and Certification

8.7.1.1. Everyone working in a static-safe area is ESD-certified?

8.7.1.2. Training records kept and re-certification dates monitored?

Static-Safe Workstation & Work Areas

8.7.2.1. Static-safe workstation or work-areas have ESD signs?

- 8.7.2.2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V?
- 8.7.2.3. All ionizer activated, positioned towards the units?
- 8.7.2.4. Each work surface mats grounding is good?

Personnel Grounding

- 8.7.3.1. Every person (including visitors) handling ESD sensitive (ESDS) items wear wrist strap, heel strap or conductive shoes with conductive flooring?
- 8.7.3.2. If conductive footwear used, conductive flooring also present where operator stand or walk?
- 8.7.3.3. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V*?
- 8.7.3.4. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
- 8.7.3.5. All wrist strap or heel strap checkers calibration up to date?

Note: *50V for Blue LED.

Device Handling

8.7.4.1. Every ESDS items identified by EIA-471 labels on item or packaging?

- 8.7.4.2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
- 8.7.4.3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
- 8.7.4.4. All flexible conductive and dissipative package materials inspected before reuse or recycle?

Others

- 8.7.5.1. Audit result reported to entity ESD control coordinator?
- 8.7.5.2. Corrective action from previous audits completed?
- 8.7.5.3. Are audit records complete and on file?





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9. Reliability Test

Classification	Test Item	Test Condition	Sample Size	Reference Standard
	Operation Life	Ta = Under room temperature IF = per datasheet maximum drive current Test Time= 1000hrs	22 PCS (CL=90%; LTPD=10%)	MIL-STD-750D:1026 (1995) MIL-STD-883G:1005 (2006)
Endurance	High Temperature High Humidity storage	Ta = 60℃ RH = 90% Test Time= 240hrs	22 PCS (CL=90%; LTPD=10%)	MIL-STD-202G:103B (2002) JEITA ED-4701:100 103 (2001)
Test	High Temperature Storage	Ta= 105 ± 5℃ Test Time= 1000hrs	22 PCS (CL=90%; LTPD=10%)	MIL-STD-750D:1031 (1995) MIL-STD-883G:1008 (2006) JEITA ED-4701:200 201 (2001)
	Low Temperature Storage	Ta= -55 ± 5℃ Test Time= 1000hrs	22 PCS (CL=90%; LTPD=10%)	JEITA ED-4701:200 202 (2001)
	Temperature Cycling	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	22 PCS (CL=90%; LTPD=10%)	MIL-STD-750D:1051 (1995) MIL-STD-883G:1010 (2006) JEITA ED-4701:100 105 (2001) JESD22-A104C (2005)
	Thermal Shock	$\begin{array}{llllllllllllllllllllllllllllllllllll$	22 PCS (CL=90%; LTPD=10%)	MIL-STD-750D:1056 (1995) MIL-STD-883G:1011 (2006) MIL-STD-202G:107G (2002) JESD22-A106B (2004)
Environmental Test	Solder Resistance	T.sol = 260 ± 5 °C Dwell Time= 10 ± 1 seconds 3mm from the base of the epoxy bulb	11 PCS (CL=90%; LTPD=18.9%)	MIL-STD-750D:2031(1995) JEITA ED-4701: 300 302 (2001)
	Solderability	T. sol = 245 ± 5 °C Dwell Time= 5 ± 0.5 seconds (Lead Free Solder, Coverage $\geq 95\%$ of the dipped surface)	11 PCS (CL=90%; LTPD=18.9%)	MIL-STD-750D:2026 (1995) MIL-STD-883G:2003 (2006) MIL-STD-202G:208H (2002) IPC/EIA J-STD-002 (2004)
	Soldering Iron	T. sol = $350 \pm 5^{\circ}$ C Dwell Time= 3.5 ± 0.5 seconds	11 PCS (CL=90%; LTPD=18.9%)	MIL-STD-202G:208H (2002) JEITA ED-4701:300 302 (2001)

10. Others

The appearance and specifications of the product may be modified for improvement, without prior notice.

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