



Spec No. :DS20-2018-0201 Effective Date: 08/11/2023

Revision: B

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4



Through Hole Lamp

LTL1KHTGP7DZ-011A

Rev	<u>Description</u>	<u>By</u>	<u>Date</u>
P001	Preliminary SPEC (RDR-20180594)	Nick	05/03/2018
P002	Add epoxy depressed line on package outline dim.	Nick	05/04/2018
	Above data for PD and Customer track	ing only	
-	NPPR Received and Upload on OPNC	Chalinee	11/12/2018
Α	Revise Absolute Maximum Ratings	BoRui	01/13/2023
В	Correct Luminous Intensity Maximum	BoRui	07/10/2023

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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.

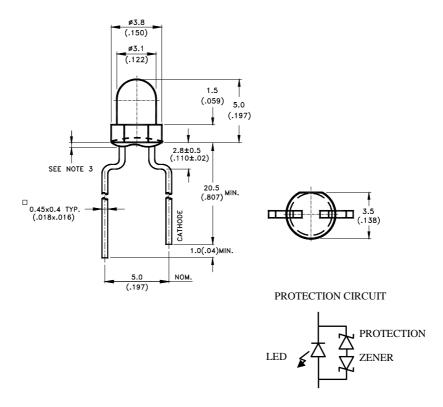
1. 1. Features

- Low power consumption & High efficiency
- Lead free & RoHS Compliant
- Popular T-1 diameter
- Green 525nm Lamp & Green diffused lens
- ESD protected

1.2. Applications

- Communication
- Computer
- Consumer
- Home appliance

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.



3. Absolute Maximum Ratings at TA=25℃

Parameter	Maximum Rating	Unit	
Power Dissipation	120	mW	
Peak Forward Current			
(Duty Cycle≦1/10, Pulse Width≦10us)	100	mA	
DC Forward Current	30	mA	
Electrostatic Discharge Threshold(HBM)	2000	V	
Operating Temperature Range	-30℃ to + 85℃		
Storage Temperature Range	-40℃ to + 100℃		
Lead Soldering Temperature			
[2.0mm (.079") From Body]	260℃ for 5 Seconds Max.		

4. Electrical / Optical Characteristics at TA=25℃

Parameter	Symbol	Min.	Тур.	Max.	Unit	Test Condition
Luminous Intensity	IV	520	1000	1450	mcd	IF = 20mA Note 1,5
Viewing Angle	201/2	70	80		deg	Note 2 (Fig.6)
Peak Emission Wavelength	λP		525		nm	Measurement @Peak (Fig.1)
Dominant Wavelength	λd	523	530	538	nm	IF = 20mA Note 4
Spectral Line Half-Width	Δλ		30		nm	
Forward Voltage	VF	2.6		4.0	V	IF = 20mA
Reverse Current	IR			10	μA	VR = 5V

NOTE:

- 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- $2. \theta 1/2$ 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 dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
- 5. Iv guarantee must be included with ±15% testing tolerance.
- 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℃ Ambient Temperature Unless Otherwise Noted)

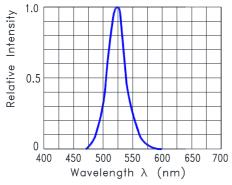
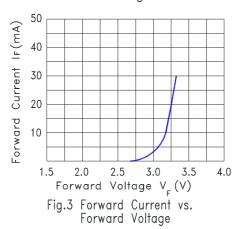


Fig.1 Relative Intensity VS. Wavelength



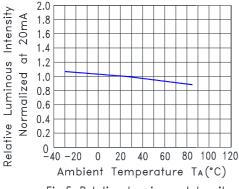


Fig.5 Relative Luminous Intensity VS. Ambient Temperature

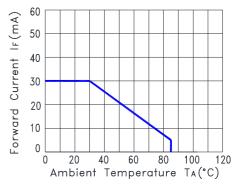


Fig.2 Forward Current Derating Curve

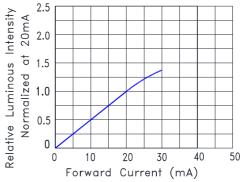


Fig.4 Relative Luminous Intensity vs. Forward Current

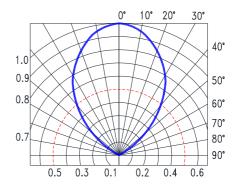


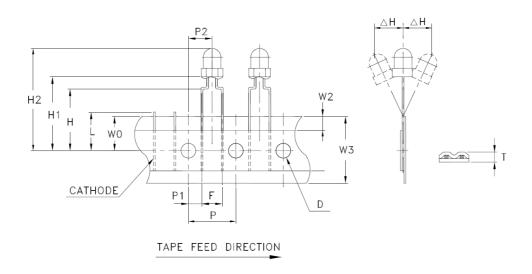
Fig.6 Spatial Distribution



6. Taping Features

- * Compatible with radial lead automatic insertion equipment.
- * Most radial lead plastic lead lamps available packaged in tape and folding.
- * 2.54mm (0.1") straight lead spacing available.
- * Folding packaging simplifies handling and testing.
- * Reel packaging is available by removing suffix "A" on option.

Package Dimensions

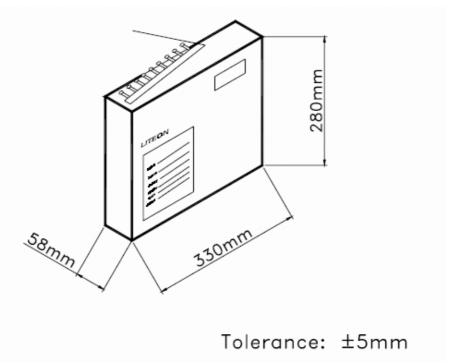


		Specification			
ltem	Symbol	Minimum		Maximum	
		mm	inch	mm	inch
Tape Feed Hole Diameter	D	3.8	0.149	4.2	0.165
Component Lead Pitch	F	4.8	0.188	5.8	0.228
Front to Rear Deflection	ΔH			2.0	0.078
Height of Seating Plane	Н	15.5	0.610	16.5	0.649
Feed Hole to Bottom of Component	H1	19.0	0.748	21.0	0.827
Feed Hole to Overall Component Height	H2	23.7	0.933	26.3	1.035
Lead Length After Component Height	L	V	V0	11.0	0.433
Feed Hole Pitch	Р	12.4	0.488	13.0	0.511
Lead Location	P1	3.15	0.124	4.55	0.179
Center of Component Location	P2	5.05	0.198	7.65	0.301
Total Tape Thickness	Т			0.90	0.035
Feed Hole Location	W0	8.5	0.334	9.75	0.384
Adhesive Tape Position	W2	0	0	3.0	0.118
Tape Width	W3	17.5	0.689	19.0	0.748



7. Packing Spec.

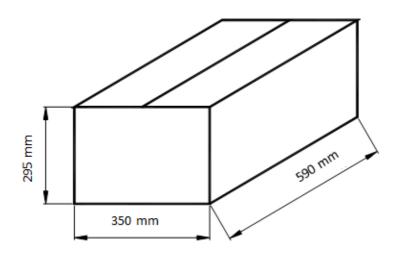
Total 3,000pcs per inner carton



10 Inner cartons per outer carton

Total 30,000 pcs per outer carton

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





8. Bin Table Specification

Luminous Intensity Unit: mcd @20mA					
Bin Code	Min.	Max.			
М	520	680			
N	680	880			
Р	880	1150			
Q	1150	1450			

Note: Tolerance of each bin limit is ±15%

Dominant Wavelength Unit : nm @20mA					
Bin Code	Min	Max			
G11	523.0	527.0			
G12	527.0	531.0			
G13	531.0	535.0			
G14	535.0	538.0			

Note: Tolerance of each bin limit is ±1nm



9. CAUTIONS

9.1. Application

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

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.

9.3. Cleaning

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

9.4. 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.

9.5. 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:

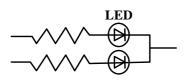
	Soldering iron	1	Wave soldering		
Temperature Soldering time Position	350℃ Max. 3 seconds Max. (one time only) No closer than 2mm from the base of the epoxy bulb	Pre-heat Pre-heat time Solder wave Soldering time Dipping Position	100°C Max. 60 seconds Max. 260°C Max. 5 seconds Max. No lower than 2mm from 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.

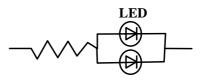
9.6. Drive Method

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.

Circuit model (A)



Circuit model (B)



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



9.7. 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

- 9.7.1.1. Everyone working in a static-safe area is ESD-certified?
- 9.7.1.2. Training records kept and re-certification dates monitored?

Static-Safe Workstation & Work Areas

- 9.7.2.1. Static-safe workstation or work-areas have ESD signs?
- 9.7.2.2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V?
- 9.7.2.3. All ionizer activated, positioned towards the units?
- 9.7.2.4. Each work surface mats grounding is good?

Personnel Grounding

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

Note: *50V for Blue LED.

Device Handling

- 9.7.4.1. Every ESDS items identified by EIA-471 labels on item or packaging?
- 9.7.4.2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
- 9.7.4.3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
- 9.7.4.4. All flexible conductive and dissipative package materials inspected before reuse or recycle?

Others

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

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10. Reliability Test

Classification	Test Item	Test Condition	Sample Size	Reference Standard
	Operation Life	Ta = Under Room Temperature IF = Per Datasheet Maximum Rating 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	$100^\circ \text{C} \sim 25^\circ \text{C} \sim -40^\circ \text{C} \sim 25^\circ \text{C}$ 30mins 5mins 30mins 5mins 30 Cycles	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	100 ± 5℃ ~ -30℃ ± 5℃ 15mins 15mins 30 Cycles	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℃ 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 ≥ 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 ± 5 °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)

11. Others

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