LITEON®
OPTOELECTRONICS

Through Hole Lamp

Product Data Sheet

LTL27KGEKJ-022A

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LITE-ON DCC

RELEASE

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Rev	Description	By	Date
P001	Preliminary SPEC (RDR-20131553-01)	Norah	11/25/2013
Above data for PD and Customer tracking only			
-	NPPR Received and Upload on OPNC	Sasipan	12/03/2013

Through Hole Lamp
LTL27KGEKJ-022A

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. There are 3 types of technology base for our LEDs lamps. GaP based technologies for low intensity output requirements; AlInGaP and InGaN technologies for high brightness. Several intensity choices are available in each color for design flexibility.

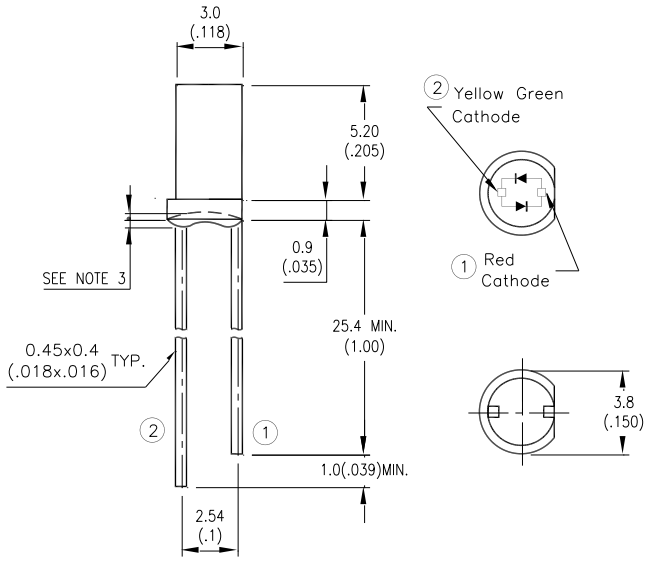
1. 1. Features

- Pb Free and RoHS compliant
- Halogen free product (Cl < 900 ppm, Br < 900 ppm, and Cl + Br < 1500 ppm)
- Long life solid state reliability
- Low power consumption
- I.C. compatible
- AlInGaP Red / Yellow Green & 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 over edge is 0.1mm(.02") max and depressed resin under edge is 0.5mm(.02") max. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

3. Absolute Maximum Ratings at TA=25°C

Parameter	Red	Yellow Green	Unit
Power Dissipation	130	130	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	100	100	mA
Continuous Forward Current	50	50	mA
Operating Temperature Range	-40°C to + 85°C		
Storage Temperature Range	-40°C to + 100°C		
Lead Soldering Temperature [2.0mm(.787") From Body]	260°C for 5 Seconds Max.		

4. Electrical / Optical Characteristics at TA=25°C

Parameter	Symbol	Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	IV	Red Yellow Green	70 70	125 125	180 180	mcd	IF = 50mA Note 1,4
Viewing Angle	2θ1/2	Red Yellow Green	-	120	-	deg	Note2 (Fig.6)
Peak Wavelength	λp	Red Yellow Green	-	632 575	-	nm	Measurement @Peak (Fig.1)
Dominant Wavelength	λd	Red Yellow Green	-	625 574	-	nm	IF = 50mA Note 3
Spectral Line Half-Width	Δλ	Red Yellow Green	-	20 15	-	nm	
Forward Voltage	VF	Red Yellow Green	-	2.15 2.15	2.6 2.6	V	IF = 50mA

NOTE:

1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. θ1/2 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. The Iv guarantee should be added ±30% .

5. Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

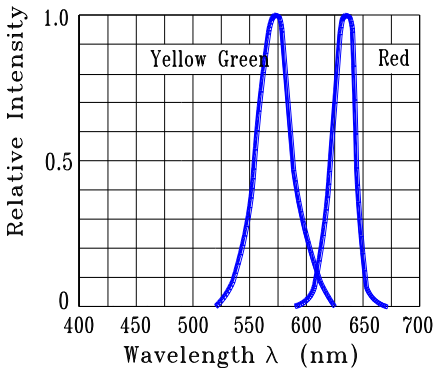


Fig.1 Relative Intensity VS. Wavelength

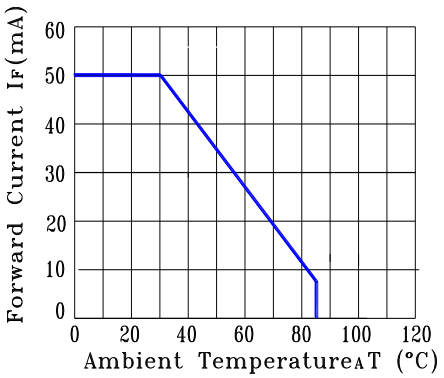


Fig.2 Forward Current Derating Curve

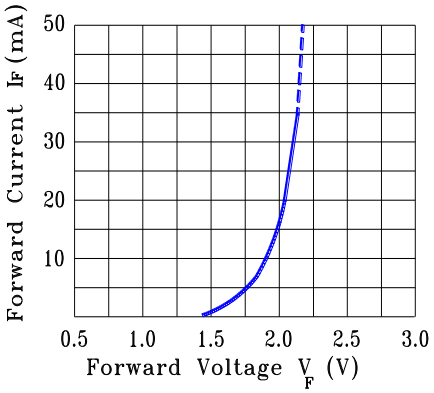


Fig.3 Forward Current vs. Forward Voltage

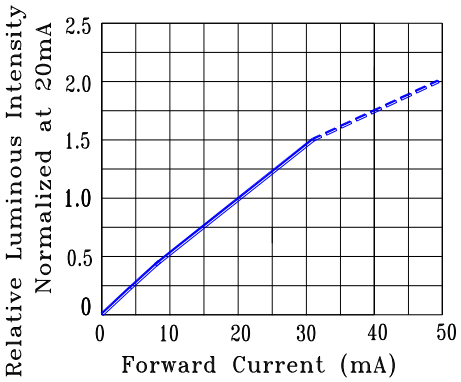


Fig.4 Relative Luminous Intensity vs. Forward Current

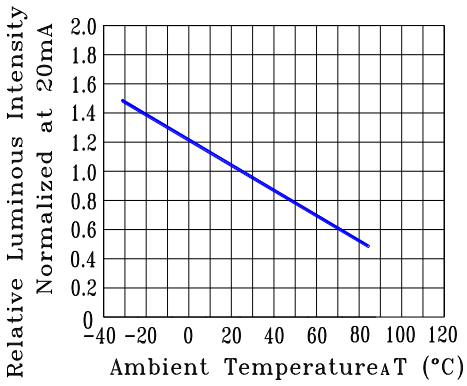


Fig.5 Relative Luminous Intensity VS. Ambient Temperature

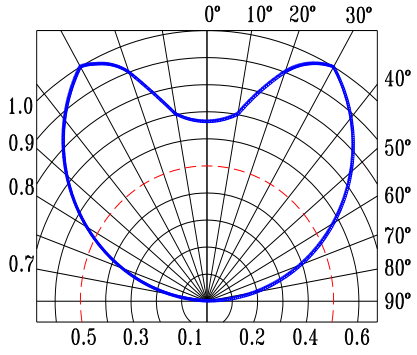
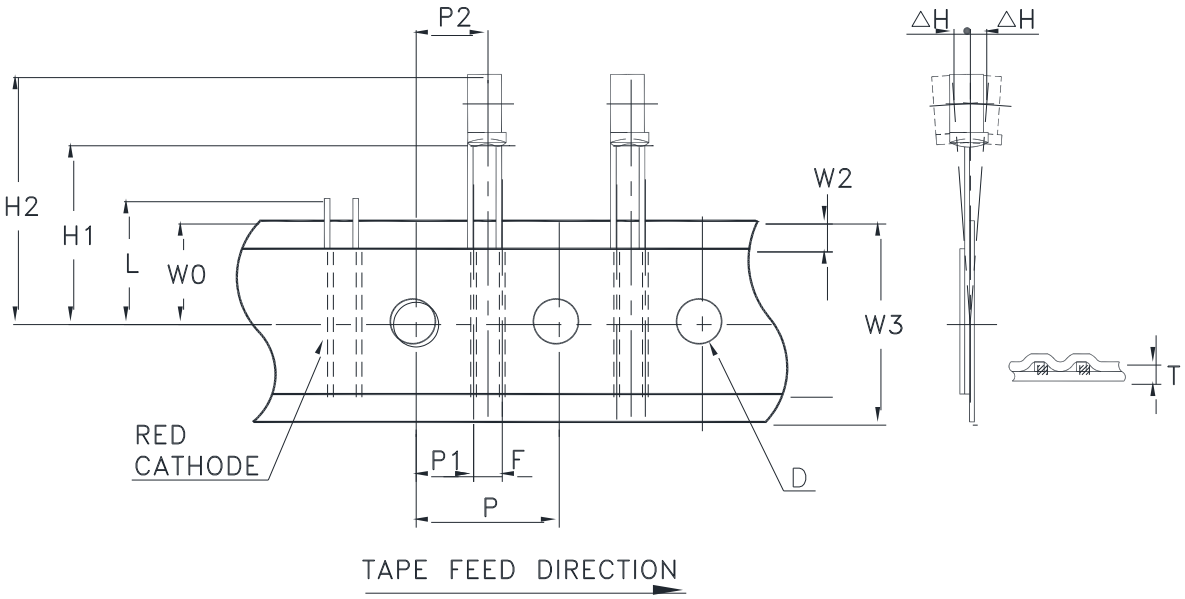


Fig.6 Spatial Distribution

6. Taping Features

* Compatible with radial lead automatic insertion equipment.
* Most radial lead plastic lead lamps available packaged in tape and folding.
* 5mm (0.197") formed lead and 2.54mm (0.1") straight lead spacing available.
* Folding packaging simplifies handling and testing.
* Reel packaging is available by removing suffix “A” on option.

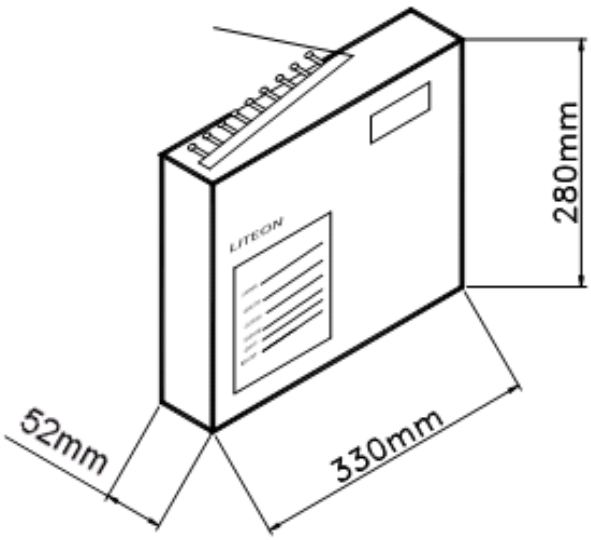
Package Dimensions



Item	Symbol	Specification			
		Minimum		Maximum	
		mm	inch	mm	inch
Tape Feed Hole Diameter	D	3.8	0.149	4.2	0.165
Component Lead Pitch	F	2.3	0.091	3.0	0.118
Front to Rear Deflection	△H	--	--	2.0	0.078
Feed Hole to Bottom of Component	H1	25.5	1.004	26.5	1.043
Feed Hole to Overall Component Height	H2	31.3	1.232	32.9	1.295
Lead Length After Component Height	L	W0		11.0	0.433
Feed Hole Pitch	P	12.4	0.488	13.0	0.511
Lead Location	P1	4.4	0.173	5.8	0.228
Center of Component Location	P2	5.05	0.198	7.65	0.301
Total Tape Thickness	T	--	--	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

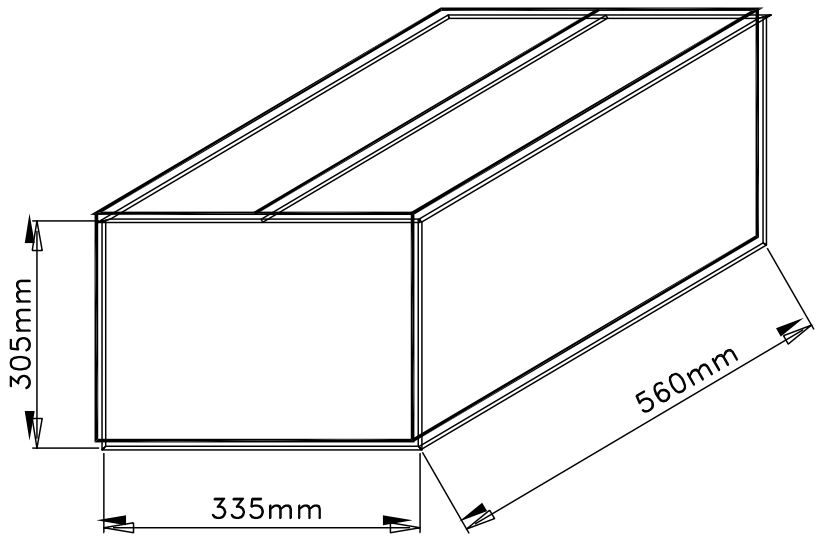
7. Packing Spec.

Total 3,000pcs per inner carton



Tolerance: ±5mm

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

Bin Code	Luminous Intensity (Yellow Green) Unit : mcd @50mA		Bin Code	Luminous Intensity (Red) Unit : mcd @50mA	
	Min.	Max.		Min.	Max.
E	70	110	E	70	110
F	110	140	F	110	140
G	140	180	G	140	180

Note: Tolerance of each bin limit is ±30%

9. CAUTIONS

9.1. Application

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

9.2. 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.

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:

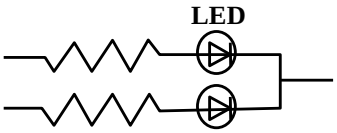
Soldering iron		Wave soldering	
Temperature	350°C Max.	Pre-heat	100°C Max.
Soldering time	3 seconds Max. (one time only)	Pre-heat time	60 seconds Max.
		Solder wave	260°C Max.
Position	No closer than 2mm from the base of the epoxy bulb	Soldering time	5 seconds Max.
		Dipping Position	No lower than 2mm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

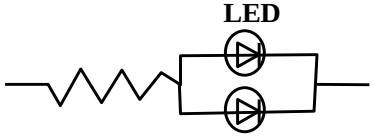
9.6. Drive Method

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?

10. Reliability Test

Classification	Test Item	Test Condition	Sample Size	Reference Standard
Endurance Test	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)
	High Temperature High Humidity storage	Ta = 60°C RH = 90% Test Time= 240hrs	22 PCS (CL=90%; LTPD=10%)	MIL-STD-202G:103B (2002) JEITA ED-4701:100 103 (2001)
	High Temperature Storage	Ta= 105 ± 5°C 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°C Test Time= 1000hrs	22 PCS (CL=90%; LTPD=10%)	JEITA ED-4701:200 202 (2001)
Environmental Test	Temperature Cycling	100°C ～ 25°C ～ -40°C ～ 25°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°C ～ -30°C ± 5°C 15mins 15mins 30 Cycles (<20 secs transfer)	22 PCS (CL=90%; LTPD=10%)	MIL-STD-750D:1056 (1995) MIL-STD-883G:1011 (2006) MIL-STD-202G:107G (2002) JESD22-A106B (2004)
	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 ≧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.