



SMD LED

Product Data Sheet

LTST-S32F2KT-10A

Spec No.: DS22-2004-188

Effective Date: 07/22/2010

Revision: C

LITE-ON DCC

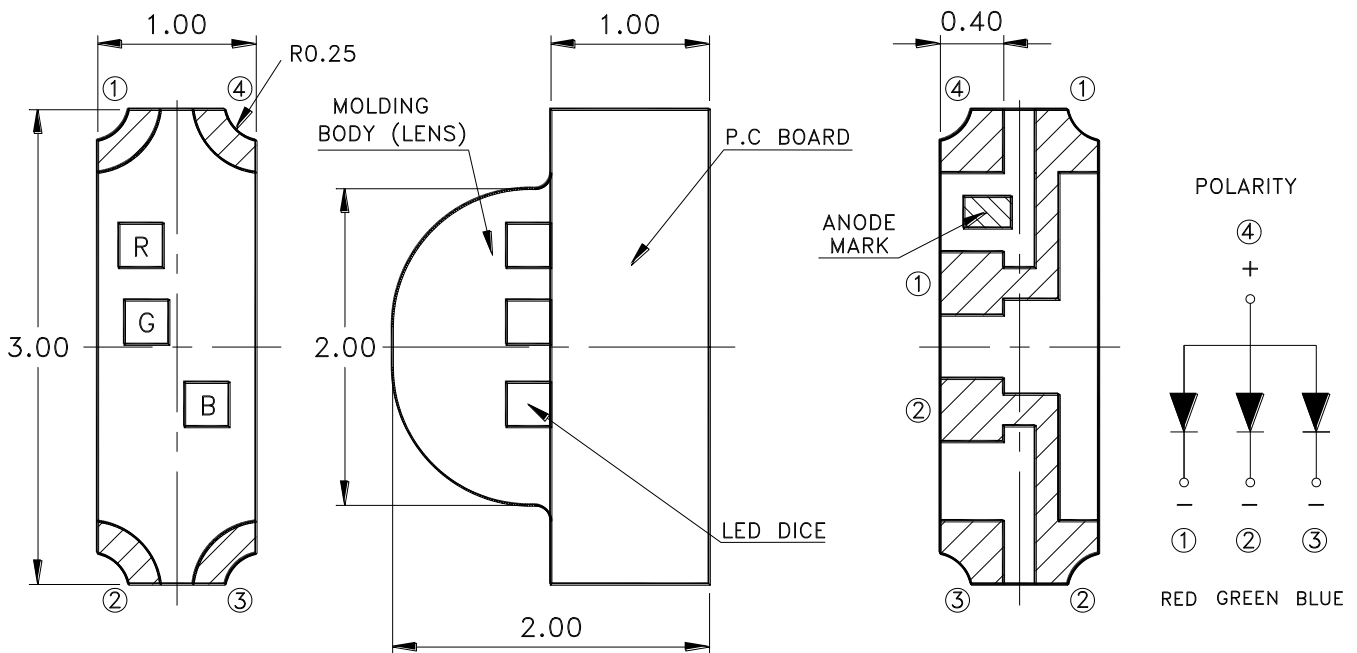
RELEASE

BNS-OD-FC001/A4

Features

- * Meet ROHS, Green Product.
- * Full color chip LED.
- * Side looking special for LCD backlight.
- * Package in 8mm tape on 7" diameter reels.
- * Compatible with automatic placement equipment.
- * Compatible with infrared and vapor phase reflow solder process.
- * EIA STD package.
- * I.C. compatible.

Package Dimensions



Part no.	Lens	Source Color	Pin Assignment
LTST-S32F2KT-10A	Water Clear	AlInGaP Red	1
		InGaN Green	2
		InGaN Blue	3

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.10 mm (.004") unless otherwise noted.

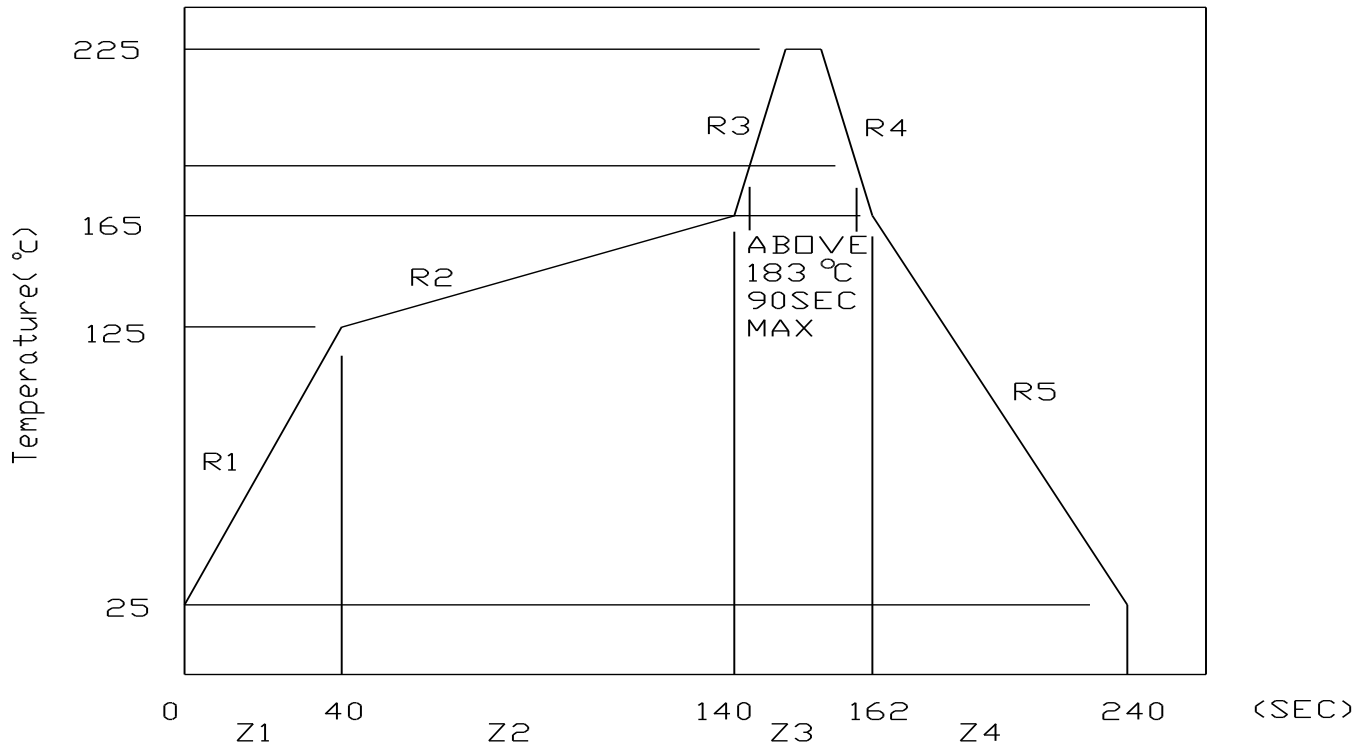
Absolute Maximum Ratings At Ta=25°C

Parameter	LTST-S32F2KT-10A			Unit
	Red	Green	Blue	
Power Dissipation	75	80	80	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	80	100	100	mA
DC forward current	30	20	20	mA
Derating Linear From 25°C	0.4	0.25	0.25	mA/°C
Reverse Voltage ^{Note A}	5	5	5	V
Operating Temperature Range	-20°C to + 80°C			
Storage Temperature Range	-30°C to + 100°C			
Wave Soldering Condition	260°C For 5 Seconds			
Infrared Soldering Condition	260°C For 5 Seconds			
Vapor Phase Soldering Condition	215°C For 3 Minutes			

Note A: Reverse Voltage can't be continued operating

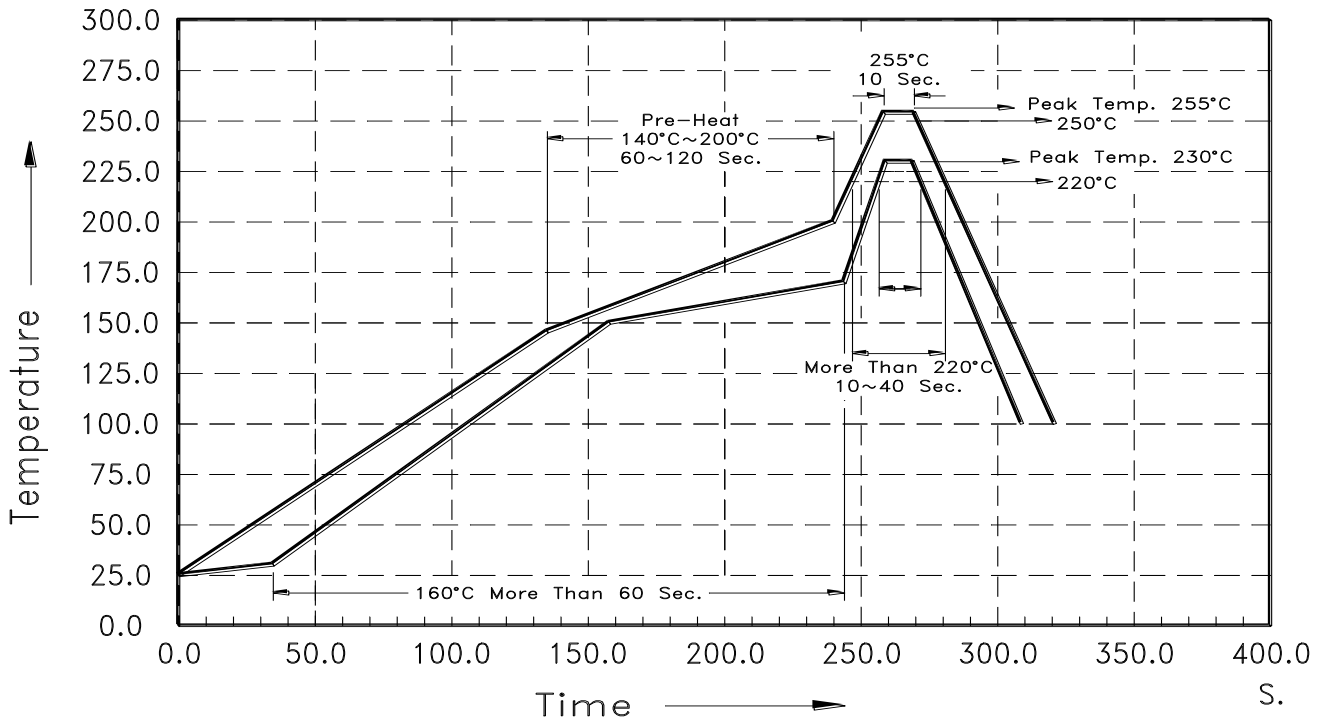
Suggestion Profile:

(1) Suggestion IR Reflow Profile For Normal Process



(2) Suggestion IR Reflow Profile For Pb Free Process

Degree C. Recommended Profile Between Assemble And Heat-Resistance Line



The Profile is available that must to use SnAg (x=3.3~3.8) Cu (y=0.2~0.7) solder paste

Electrical Optical Characteristics At Ta=25°C

Parameter	Symbol		LTST-S32F2KT-10A			Unit	Test Condition
			Red	Green	Blue		
Luminous Intensity	IV	MIN.	45.0	112.0	28.0	mcd	IF = 10mA Note 1
		TYP.	-	-	-		
		MAX.	112.0	280.0	71.0		
Viewing Angle	2θ1/2	TYP.	130			deg	Note 2 (Fig.6)
Peak Emission Wavelength	λPeak	TYP.	611	520	468	nm	Measurement @Peak (Fig.1)
Dominant Wavelength	λd	TYP.	605	527	470	nm	IF = 10mA Note 3
Spectral Line Half-Width	Δλ	TYP.	17	35	26	nm	
Forward Voltage	VF	TYP.	1.90	3.00	3.00	V	IF = 10mA
		MAX.	2.30	3.15	3.15		
Reverse Current	IR	MAX.	10	10	10	μA	VR = 5V

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. The dominant wavelength, λ d is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

4. Caution in ESD:

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

Bin Code List

Forward Voltage Color : <u>Red</u> , Unit : V @10mA		
Bin Code	Min.	Max.
1	1.70	2.00
2	2.00	2.30
Forward Voltage Color : <u>Green</u> , Unit : V @10mA		
Bin Code	Min.	Max.
4	2.70	2.85
5	2.85	3.00
6	3.00	3.15
Forward Voltage Color : <u>Blue</u> , Unit : V @10mA		
Bin Code	Min.	Max.
8	2.70	2.90
9	2.90	3.15
Tolerance on each Forward Voltage bin is +/-0.1 volt		

Luminous Intensity Color : <u>Red</u> , Unit : mcd @10mA		
Bin Code	Min.	Max.
P	45.0	71.0
Q	71.0	112.0
Luminous Intensity Color : <u>Green</u> , Unit : mcd @10mA		
Bin Code	Min.	Max.
R	112.0	180.0
S	180.0	280.0
Luminous Intensity Color : <u>Blue</u> , Unit : mcd @10mA		
Bin Code	Min.	Max.
N	28.0	45.0
P	45.0	71.0
Tolerance on each Intensity bin is +/-15%		

Bin Batch List on Barcode

1A	148/PRN	2A	158/PRN	3A	168/PRN	4A	248/PRN	5A	258/PRN	6A	268/PRN
1B	148/PRP	2B	158/PRP	3B	168/PRP	4B	248/PRP	5B	258/PRP	6B	268/PRP
1C	148/PSN	2C	158/PSN	3C	168/PSN	4C	248/PSN	5C	258/PSN	6C	268/PSN
1D	148/PSP	2D	158/PSP	3D	168/PSP	4D	248/PSP	5D	258/PSP	6D	268/PSP
1E	148/QRN	2E	158/QRN	3E	168/QRN	4E	248/QRN	5E	258/QRN	6E	268/QRN
1F	148/QRP	2F	158/QRP	3F	168/QRP	4F	248/QRP	5F	258/QRP	6F	268/QRP
1G	148/QSN	2G	158/QSN	3G	168/QSN	4G	248/QSN	5G	258/QSN	6G	268/QSN
1H	148/QSP	2H	158/QSP	3H	168/QSP	4H	248/QSP	5H	258/QSP	6H	268/QSP
1J	149/PRN	2J	159/PRN	3J	169/PRN	4J	249/PRN	5J	259/PRN	6J	269/PRN
1K	149/PRP	2K	159/PRP	3K	169/PRP	4K	249/PRP	5K	259/PRP	6K	269/PRP
1L	149/PSN	2L	159/PSN	3L	169/PSN	4L	249/PSN	5L	259/PSN	6L	269/PSN
1M	149/PSP	2M	159/PSP	3M	169/PSP	4M	249/PSP	5M	259/PSP	6M	269/PSP
1N	149/QRN	2N	159/QRN	3N	169/QRN	4N	249/QRN	5N	259/QRN	6N	269/QRN
1P	149/QRP	2P	159/QRP	3P	169/QRP	4P	249/QRP	5P	259/QRP	6P	269/QRP
1Q	149/QSN	2Q	159/QSN	3Q	169/QSN	4Q	249/QSN	5Q	259/QSN	6Q	269/QSN
1R	149/QSP	2R	159/QSP	3R	169/QSP	4R	249/QSP	5R	259/QSP	6R	269/QSP

Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

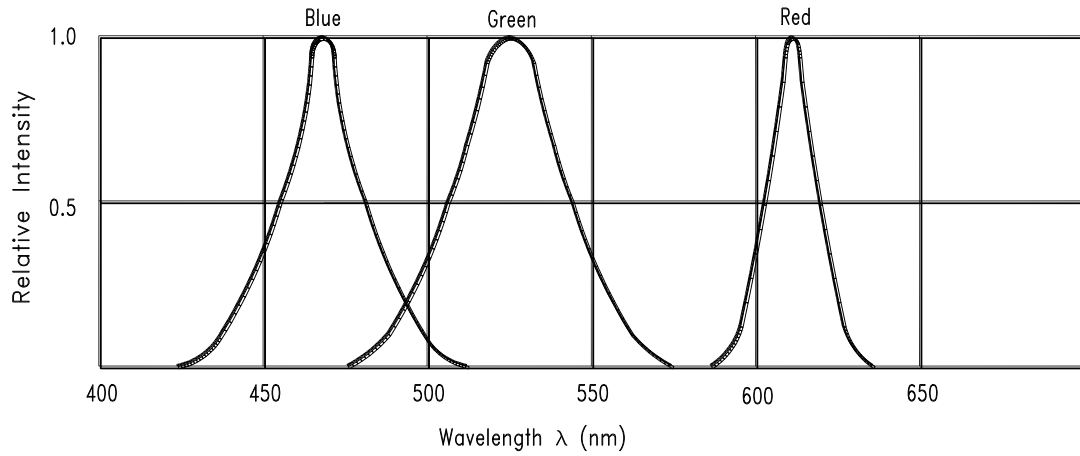


Fig.1 Relative Intensity vs. Wavelength

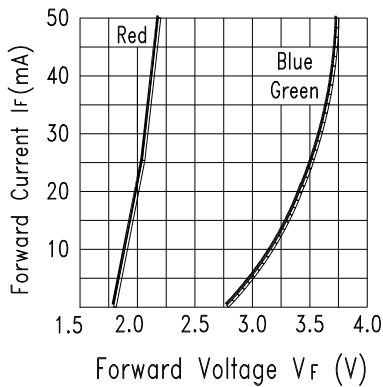


Fig.2 Forward Current vs. Forward Voltage

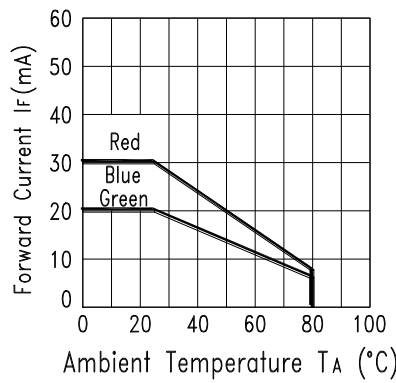


Fig.3 Forward Current Derating Curve

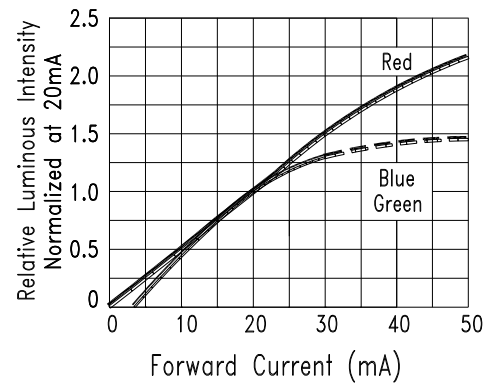


Fig.4 Relative Luminous Intensity vs. Forward Current

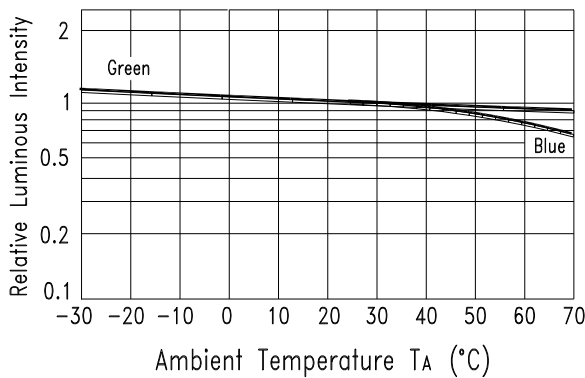


Fig.5 Luminous Intensity vs. Ambient Temperature

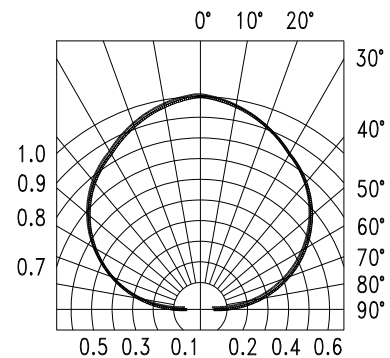


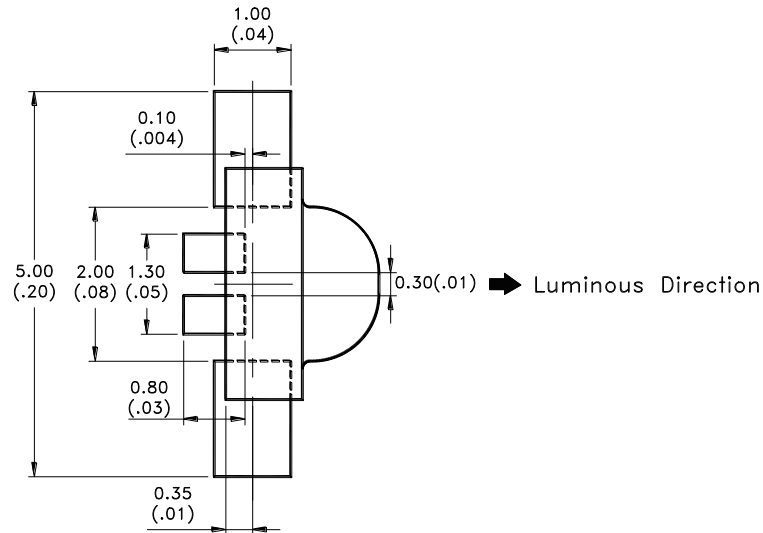
Fig.6 Spatial Distribution

Cleaning

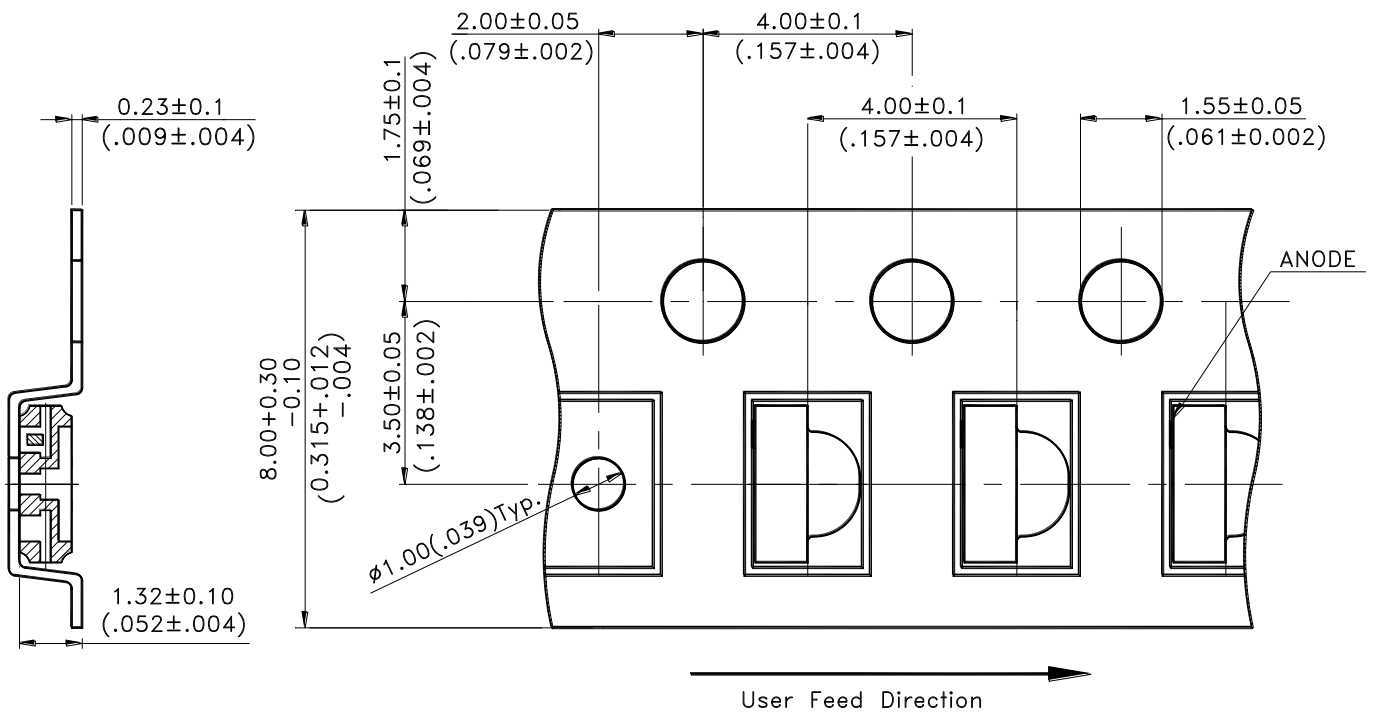
Do not use unspecified chemical liquid to clean LED they could harm the package.

If clean is necessary, immerse the LED in ethyl alcohol or in isopropyl alcohol at normal temperature for less one minute.

Suggest Soldering Pad Dimensions

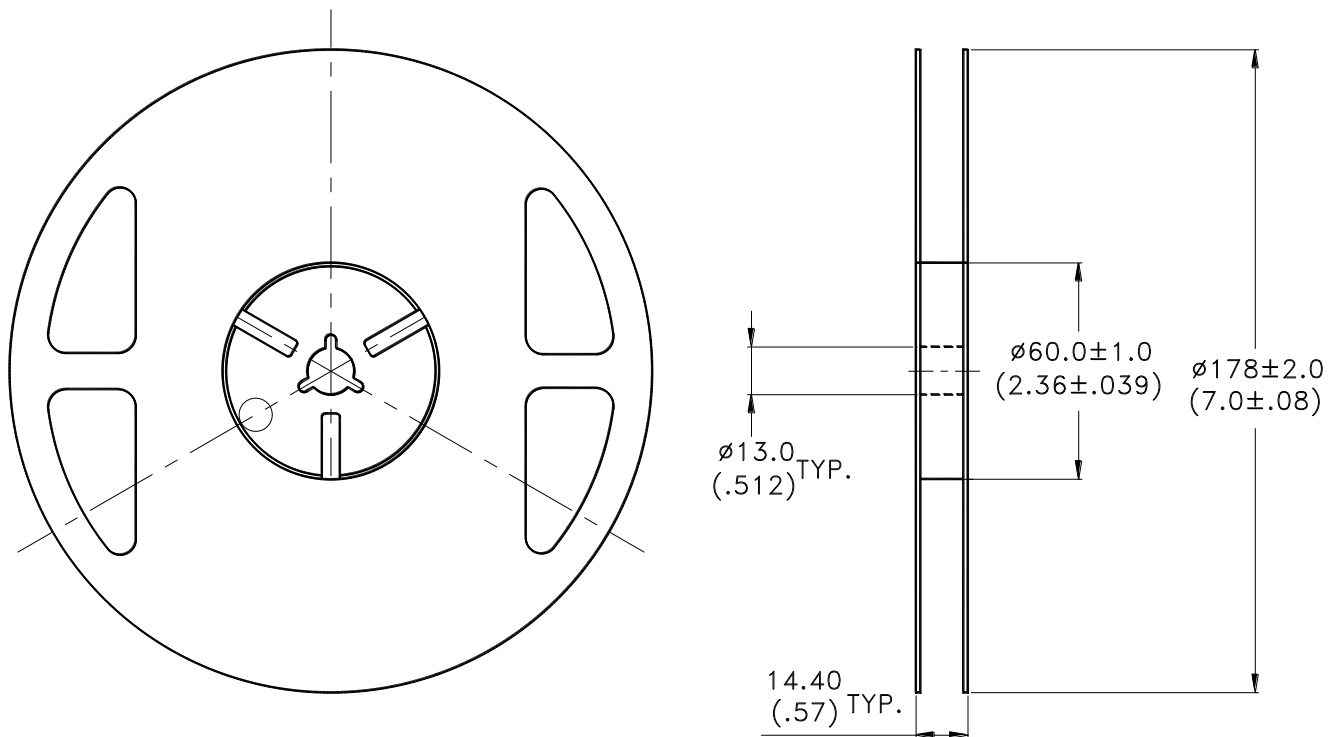


Package Dimensions Of Tape And Reel



Notes:

1. All dimensions are in millimeters (inches).



Notes:

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-3000 pieces per reel.
3. Minimum packing quantity is 500 pcs for remainders.
4. The maximum number of consecutive missing lamps is two.
5. In accordance with ANSI/EIA 481-1-A-1994 specifications.

CAUTIONS

1. Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Lite-on'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).

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 IR-reflowed within one week.

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 a desiccators with nitrogen ambient.

LEDs stored out of their original packaging for more than a week should be baked at about 60 deg C for at least 24 hours before solder assembly.

3. Cleaning

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

4. Soldering

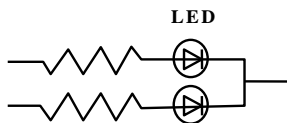
Recommended soldering conditions:

Reflow soldering		Wave Soldering		Soldering iron	
Pre-heat	120~150°C	Pre-heat	100°C Max.	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Pre-heat time	60 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	240°C Max.	Solder wave	260°C Max.		(one time only)
Soldering time	10 sec. Max.	Soldering time	10 sec. Max.		

5. Drive Method

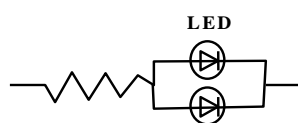
An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model A



(A) Recommended circuit.

Circuit model B



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

6. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED.

Suggestions to prevent ESD damage:

- Use of 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 LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or “ no lightup ” at low currents.

To verify for ESD damage, check for “ lightup ” 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.

7. Reliability Test

Classification	Test Item	Test Condition	Reference Standard
Endurance Test	Operation Life	Ta= Under Room Temperature As Per Data Sheet Maximum Rating *Test Time= 1000HRS (-24HRS,+72HRS)	MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1
	High Temperature High Humidity Storage	IR-Reflow In-Board, 2 Times Ta= $65\pm 5^{\circ}C$, RH= 90~95% *Test Time= 240HRS \pm 2HRS	MIL-STD-202F:103B JIS C 7021:B-11
	High Temperature Storage	Ta= $105\pm 5^{\circ}C$ *Test Time= 1000HRS (-24HRS,+72HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= $-55\pm 5^{\circ}C$ *Test Time=1000HRS (-24HRS,+72HRS)	JIS C 7021:B-12
Environmental Test	Temperature Cycling	$105^{\circ}C \sim 25^{\circ}C \sim -55^{\circ}C \sim 25^{\circ}C$ 30mins 5mins 30mins 5mins 10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4
	Thermal Shock	IR-Reflow In-Board, 2 Times $85 \pm 5^{\circ}C \sim -40^{\circ}C \pm 5^{\circ}C$ 10mins 10mins 10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Solder Resistance	T.sol= $260 \pm 5^{\circ}C$ Dwell Time= 10 ± 1 secs	MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1
	IR-Reflow Normal Process	Ramp-up rate($183^{\circ}C$ to Peak) $+3^{\circ}C$ / second max Temp. maintain at $125(\pm 25)^{\circ}C$ 120 seconds max Temp. maintain above $183^{\circ}C$ 60-150 seconds Peak temperature range $235^{\circ}C +5/-0^{\circ}C$ Time within $5^{\circ}C$ of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate $+6^{\circ}C$ /second max	MIL-STD-750D:2031.2 J-STD-020
	IR-Reflow Pb Free Process	Ramp-up rate($217^{\circ}C$ to Peak) $+3^{\circ}C$ / second max Temp. maintain at $175(\pm 25)^{\circ}C$ 180 seconds max Temp. maintain above $217^{\circ}C$ 60-150 seconds Peak temperature range $260^{\circ}C +0/-5^{\circ}C$ Time within $5^{\circ}C$ of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate $+6^{\circ}C$ /second max	MIL-STD-750D:2031.2 J-STD-020
	Solderability	T.sol= $235 \pm 5^{\circ}C$ Immersion time 2 ± 0.5 sec Immersion rate 25 ± 2.5 mm/sec Coverage $\geq 95\%$ of the dipped surface	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 IEC 68 Part 2-20 JIS C 7021:A-2

8. Others

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

9. Suggested Checking List

Training and Certification

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

Static-Safe Workstation & Work Areas

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

Personnel Grounding

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

Note: *50V for Blue LED.

Device Handling

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

Others

1. Audit result reported to entity ESD control coordinator?
2. Corrective action from previous audits completed?
3. Are audit records complete and on file?