OPTOELECTRONICS

Through Hole Lamp
Product Data Sheet
LTL-R42FTGBH229

Spec No. :DS20-2021-0067
Effective Date: 11/17/2021
Revision: -

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

Through Hole Lamp

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Rev	Description	By	Date
P01	Preliminary Specification (RDR-20200806-01). Tape & Reel Packing	Javy H.	11/04/2020
P02	Updated Packing Specification and Soldering Condition	Javy H	12/18/2020
P03	Change PIN length from 2.1mm to 2.8mm	Tina	02/24/2021
Above data for PD and Customer tracking only			
-	New Specification. Upload on OPB2 System	Chalerm Ya.	09/28/2021

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1. Description

CBI (Circuit Board Indicator) is a black plastic right angle Holder (Housing) which mates with Lite-On LED lamps. Lite-On CBI is available in a wide variety of packages, including top-view (Spacer) or right angle and horizontal or vertical arrays which is stackable and easy to assembly.

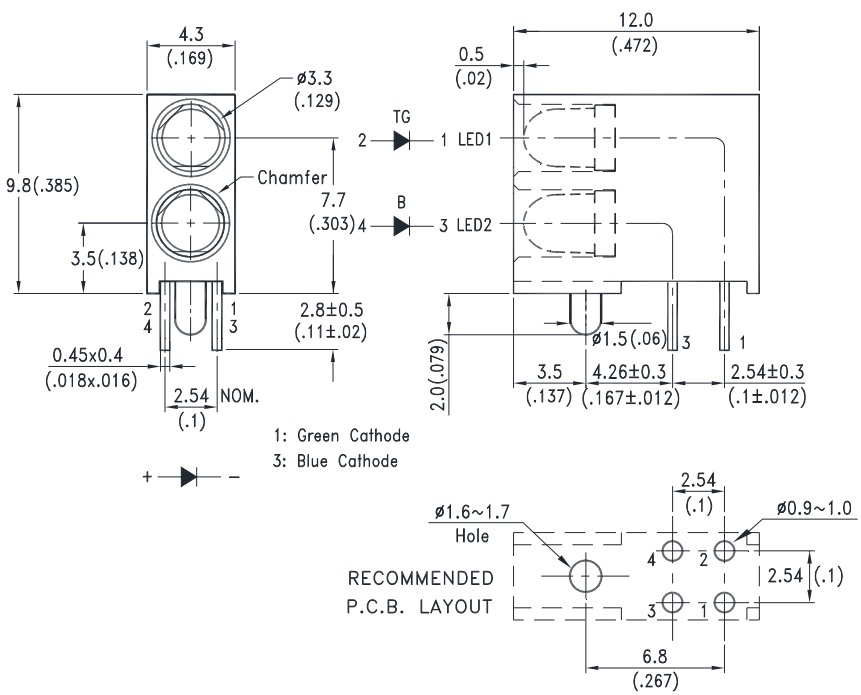
1. 1. Features

- Designed for ease in circuit board assembly
- Black case enhance contrast ratio
- Low power consumption & High efficiency
- Lead free product & RoHS Compliant
- T-1 lamp : Source color are InGaN green 525nm and InGaN blue 470nm chips
- It is in tape and reel packing.

1.2. Applications

- Communication
- Computer
- Consumer
- Industrial

2. Outline Dimensions



Notes :

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (.010") unless otherwise noted.
3. The Holder (Housing) material is plastic / black.
4. LED1 is green (525nm) color & green lens; LED2 is blue color & blue diffused lens.
5. Specifications are subject to change without notice.

3. Absolute Maximum Ratings at TA=25℃

Parameter	Green	Blue	Unit
Power Dissipation	70	70	mW
Peak Forward Current (Duty Cycle≦1/10, Pulse Width≦10μs)	60	60	mA
DC Forward Current	20	20	mA
Operating Temperature Range	-30℃ to + 85℃		
Storage Temperature Range	-40℃ to + 100℃		
Lead Soldering Temperature [2.0mm (.079") From Body]	Refer 8.5 Soldering		

4. Electrical / Optical Characteristics at TA=25℃

Parameter	Symbol	Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	IV	Green	180	420	880	mcd	IF=10mA Note 1,4,5
		Blue	65	140	310		
Viewing Angle	2θ1/2	Green		100		deg	Note 2 (Fig.6)
		Blue		100			
Peak Emission Wavelength	λP	Green		526		nm	Measurement @Peak (Fig.1)
		Blue		468			
Dominant Wavelength	λd	Green	516	525	535	nm	IF=10mA, Note 3
		Blue	460	470	475		
Spectral Line Half-Width	Δλ	Green		35		nm	
		Blue		35			
Forward Voltage	VF	Green	2.4	2.9	3.3	V	IF=10mA
		Blue	2.5	3.1	3.6		
Reverse Current	IR	Green			10	μA	VR=5V, Note 6
		Blue			10		

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. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
4. Iv guarantee must be included with ±15% testing tolerance.
5. Reverse current is controlled by dice source.
6. Reverse voltage (VR) condition is applied for IR test only. The device is not designed for reverse operation.

5. Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

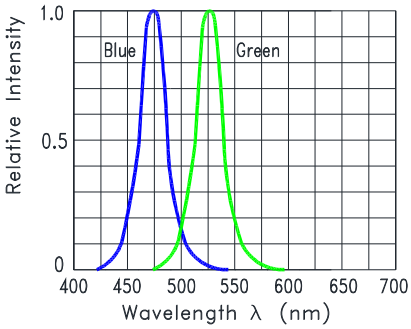


Fig.1 Relative Intensity VS. Wavelength

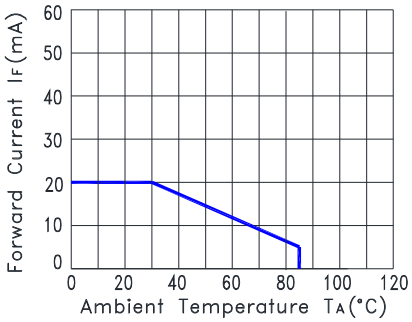


Fig.2 Forward Current Derating Curve

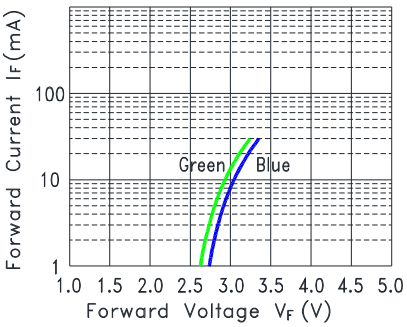


Fig.3 Forward Current vs. Forward Voltage

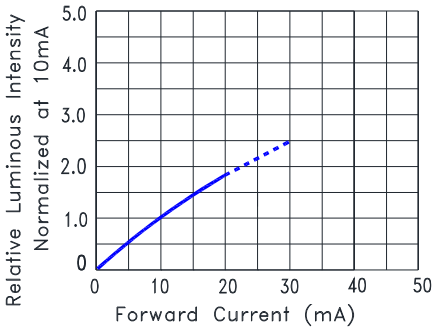


Fig.4 Relative Luminous Intensity vs. Forward Current

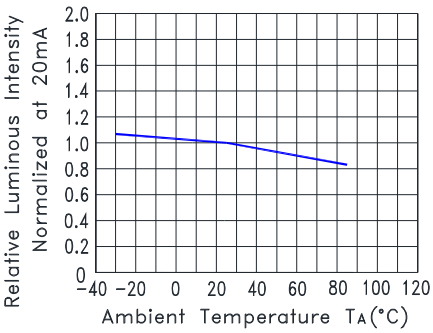


Fig.5 Relative Luminous Intensity VS. Ambient Temperature

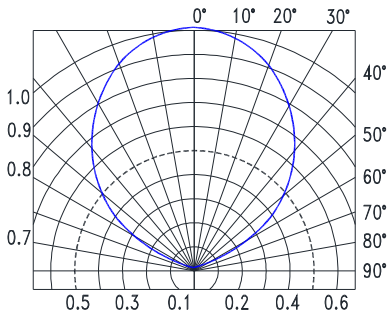
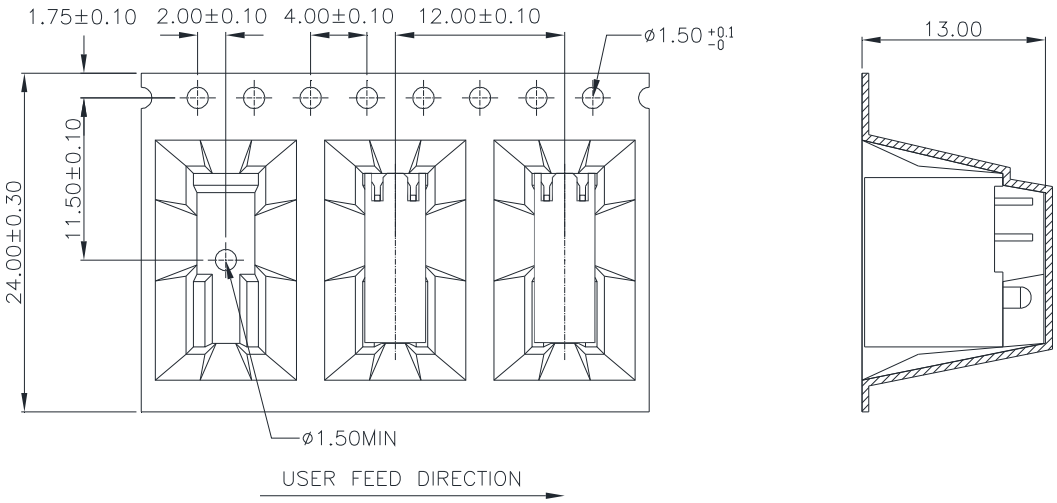


Fig.6 Spatial Distribution

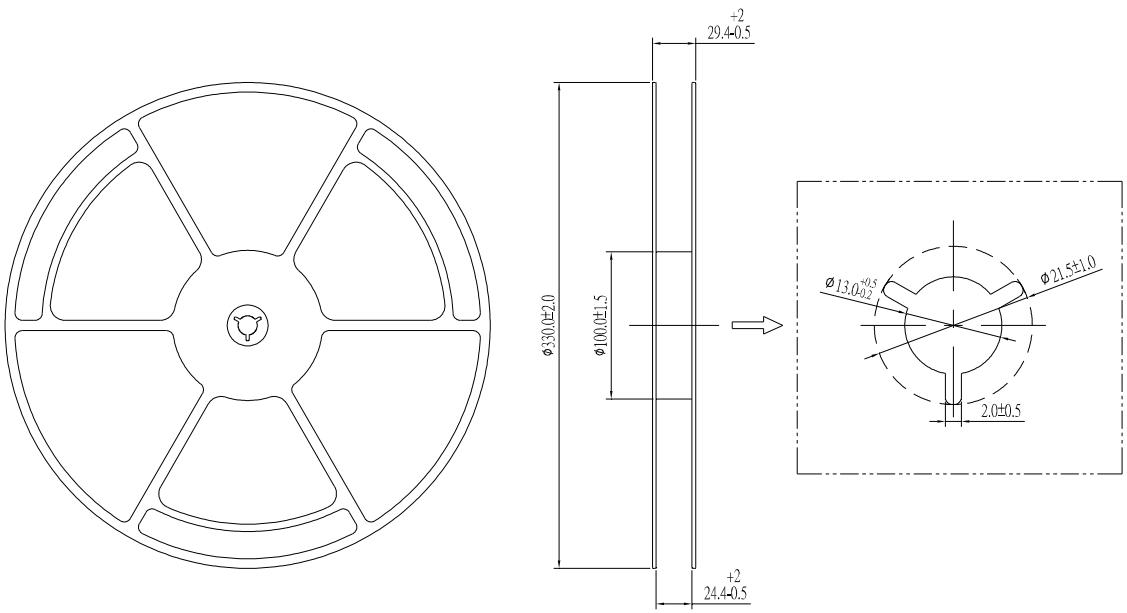
6. Packing Specification

Packing Carrier Dimensions



1. 10 sprocket hole pitch cumulative tolerance ±0.20
2. Material : Black Conductive Polystyrene Alloy
3. Thickness : 0.50 ±0.06 mm
4. Component load per 13" reel : 350pcs

Packing Reel Dimensions



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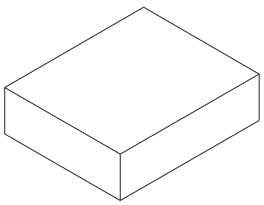
Carton Specification

1 Reel with 1 Humidity indicator card and 1 Desiccant are packed in 1 Moisture Barrier Bag (MBB)

2 Moisture Barrier Bag packed in 1 Inner Carton

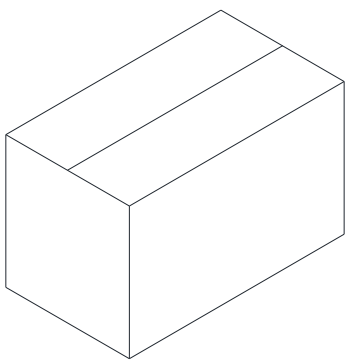
Total 700pcs (350pcs * 2) per Inner Carton



INNER CARTON
361 x 358 x 75 mm

10 Inner Cartons per Outer Carton

Total 7,000pcs (700pcs*10) per Outer Carton



OUTER CARTON
740 x 390 x 395 mm

7. Bin Table Specification for Reference

Green color

Luminous Intensity Unit : mcd @10mA		
Bin Code	**Min.**	**Max.**
HJ	180	310
KL	310	520
MN	520	880

Note: Tolerance of each bin limit is ±15%

Dominant Wavelength Unit : nm @10mA		
Bin Code	**Min**	**Max**
G09	516.0	520.0
G10	520.0	527.0
G11	527.0	535.0

Note: Tolerance of each bin limit is ±1nm

Blue color

Luminous Intensity Unit : mcd @10mA		
Bin Code	**Min.**	**Max.**
DE	65	110
FG	110	180
HJ	180	310

Note: Tolerance of each bin limit is ±15%

Dominant Wavelength Unit : nm @10mA		
Bin Code	**Min**	**Max**
B07	460.0	465.0
B08	465.0	470.0
B09	470.0	475.0

Note: Tolerance of each bin limit is ±1nm

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℃ temperature or 70% relative humidity. It is re commended 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/Holder to the soldering point. Dipping the lens/Holder 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:

8.5.1 Manual soldering iron process

Manual soldering iron	
Temperature	350℃ Max.
Soldering time	3 seconds Max. (one time only)
Position	No closer than 2mm from the base of the epoxy bulb

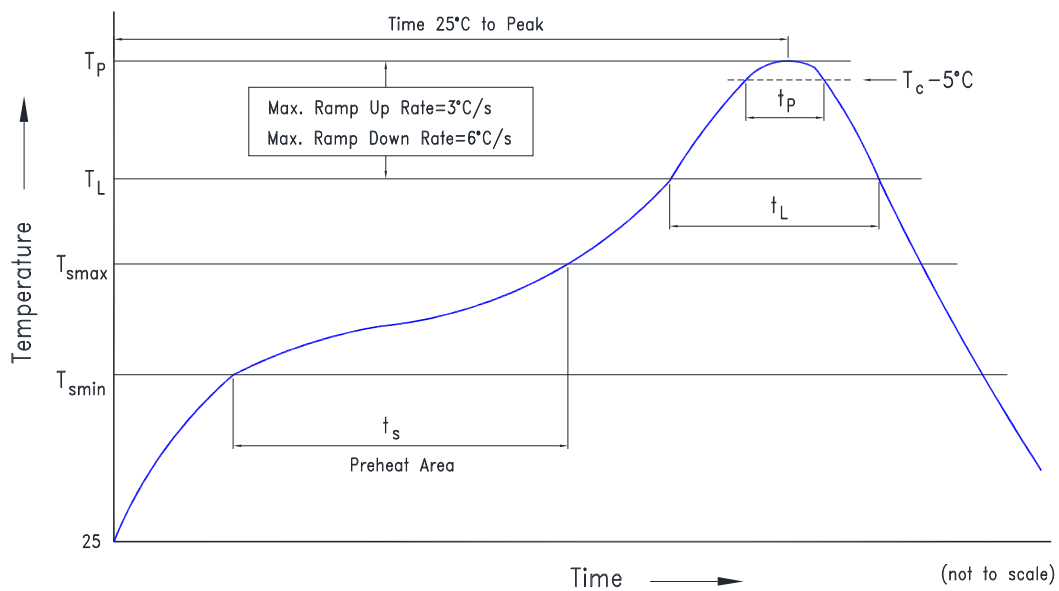
8.5.2 Wave soldering process

Wave soldering process	
Pre-heat	120℃ Max.
Pre-heat time	100 seconds Max.
Solder wave	260℃ Max.
Soldering time	5 seconds Max.
Dipping Position	No lower than 2mm from the base of the epoxy bulb

8.5.3 Reflow soldering process

Reflow soldering process	
Profile Feature	Conditions
Preheat/Soak	
Temperature Min. (T_{smin})	150℃
Temperature Max. (T_{smax})	200℃
Time (t_s) from (T_{smin} to T_{smax})	120 seconds Max.
Liquidous temperature (T_L)	217℃
Time (t_L) maintained above T_L	60~150 seconds
Peak temperature (T_P)*	255℃
Specified classification temperature (T_C)	250℃
Time (t_P) within 5℃ of the temperature T_C	30 seconds Max.
Time 25℃ to peak temperature	5 minutes Max.

Profile for Reference



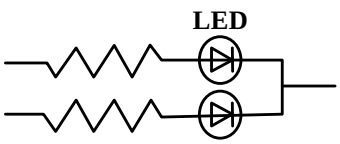
Note: Excessive soldering temperature and/or time might result in deformation of the LED lens or catastrophic failure of the LED.

The lead pitch of LED must match the pitch of the mounting holes on PCB during reflow process. Lead-forming or bending are not suggestion.

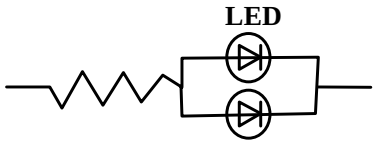
8.6. Drive Method

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.

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.

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?
8.7.3.1. If conductive footwear used, conductive flooring also present where operator stand or walk?
8.7.3.2. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V*?
8.7.3.3. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
8.7.3.4. 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?

9. 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℃ 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℃ 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)
Environmental Test	Temperature Cycling	100℃ ～ 25℃ ～ -40℃ ～ 25℃ 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 (<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℃ 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℃ 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℃ 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.