Solid-State Light. Done Right.

APPROVAL SHEET

AOT MODEL NAME	IR2220
AOT PART NUMBER	2220C-NR01
CUSTOMER NAME	General
DATE	2021 / June
Version	01

MAKER			CUSTOMER			
Prepared	Checked	Approved				
Dimitri						

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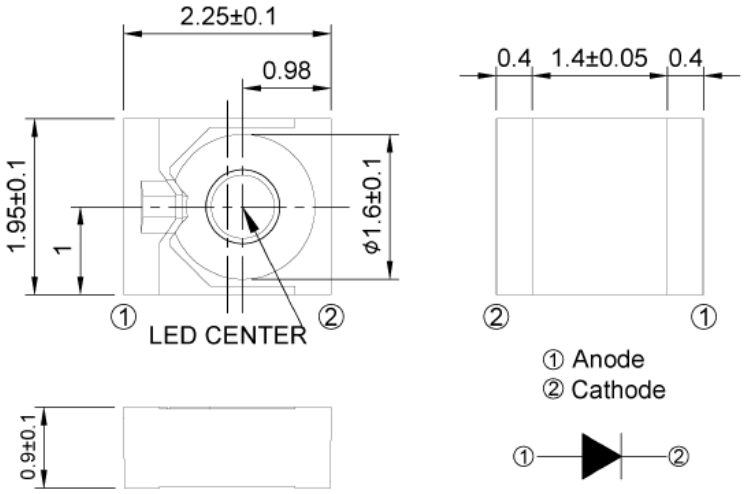
Revision Note

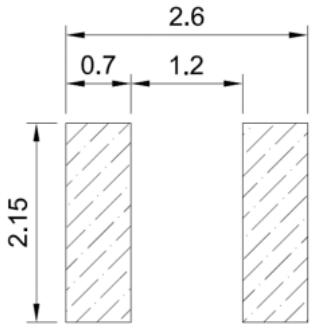
Date	Revision	Page	Version
2021-06-16	Initiate Document	14	01

Package Outline

Model name: **2220C-SR01**
Unit: mm, Tolerance: ± 0.1 mm



NOTE : General tolerance of body is ±0.1mm, circuit is ±0.05mm.



Soldering pattern for top looker

Infra-red SMD LED
PLCC 2.2x2.0x0.9mm
Emitting Color : Infra-red 940nm
Encapsulation : Silicone Resin
Weight : 7.1mg ± 0.5mg

Model No.	Material	Lighting Color	Lens Color
2220C-NR01	InP based	Non-Visible	Water Clear

Features

- 1. High luminous intensity using MOCVD technology
- 2. High reliability package using silicone encapsulation
- 3. Narrow viewing angle down to Typ. 25 °
- 4. Compatible with Lead-free reflow soldering process
- 5. JEDEC MSL 2aPLCC 2.2x2.0x0.9mm

Applications

- 1. Sensor light source in compact devices

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Optical/Electronic Characteristics (Ts=25°C)

Item	Symbol	Condition	Min	Typ.	Max	Unit
Optical Power	Po	I_F =300mA	30	-	250	mW/sr
Forward Voltage	V_F	I_F =300mA	1.85	-	2.65	V
Reverse Current	IR	VR=5V	-	-	1	uA
Peak Wavelength	λ_p	I_F =300mA	925	940	950	nm
Viewing angle	2θ 1/2	I_F =300mA	-	25	-	Deg
Max. DC Forward Current	I_F	T_a = 25°C	-		300	mA
Max. Junction Temperature	T_{max}	-	-	-	120	°C

* Tolerance of measurements of the Forward Voltage is ± 0.1 V.
* Tolerance of measurements of the Radiant Intensity is ± 15%.
* Tolerance of measurements of the Peak emission wavelength is ±1nm

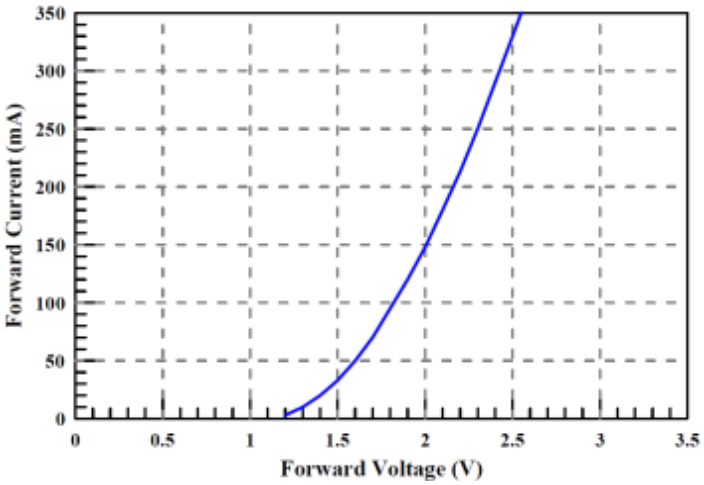
Absolute Maximum Ratings (Ts=25°C)

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	Refer to the following table	mA
Reverse Voltage	V_r	5	V
Operating Temperature	T_{opr}	-25~+85	°C
Storage Temperature	T_{stg}	-40~+100	°C

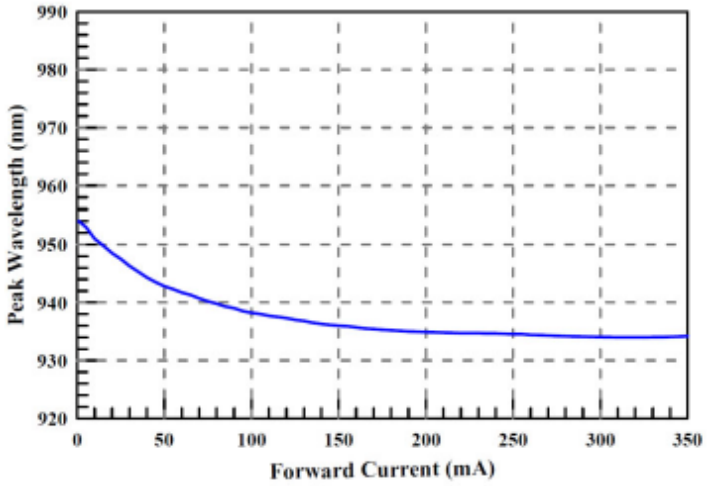
* Max condition is not guarantee for life time

Optical and electrical characteristics

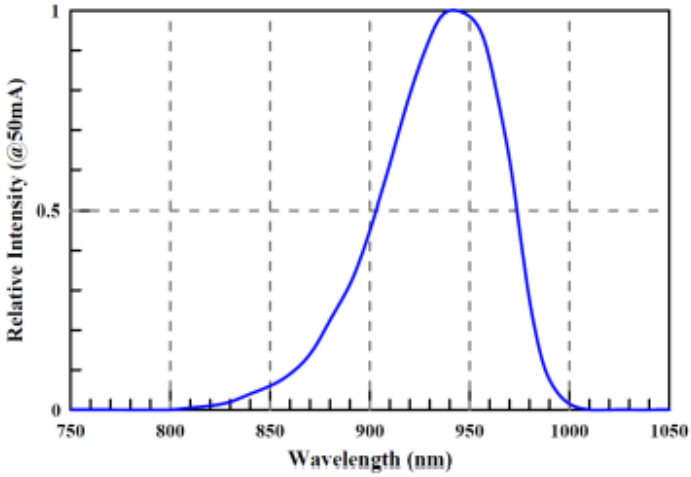
Forward Current vs. Forward Voltage (Ta=25℃)



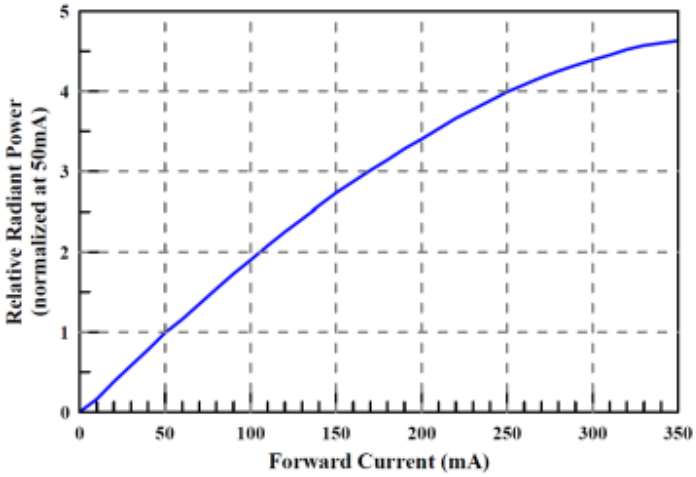
Peak Wavelength vs. Foward Current



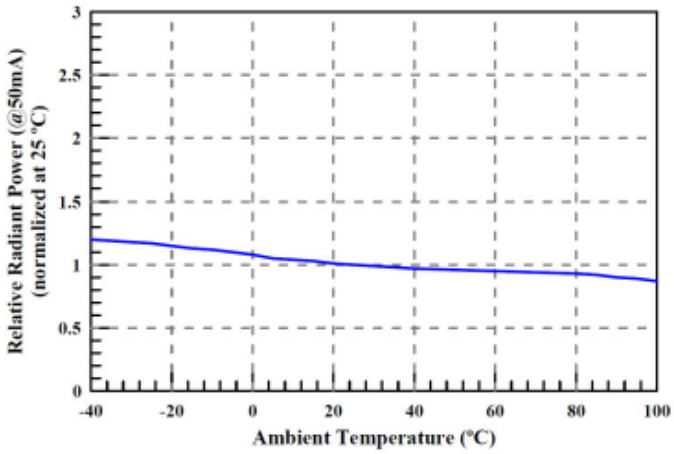
Relative Intensity vs. Wavelength



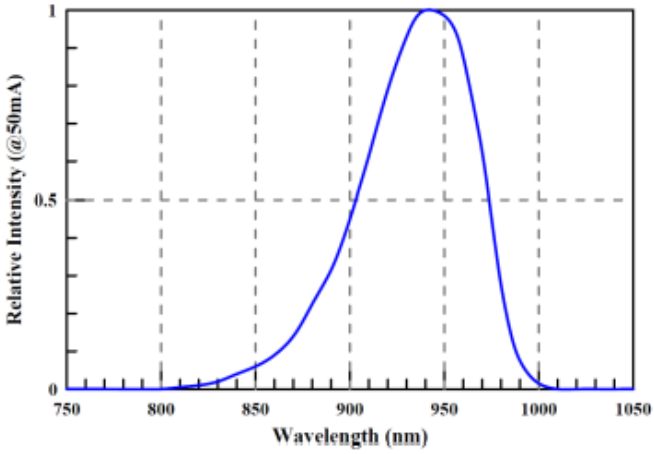
Relative Radiant Power vs. Forward Current



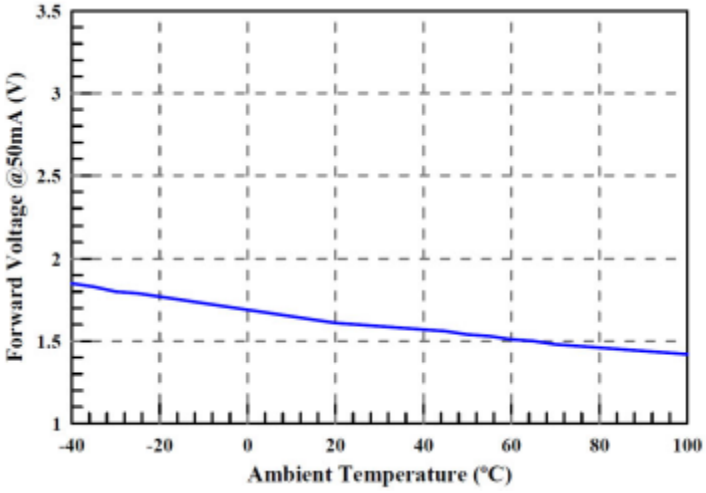
Relative Radiant Power vs. Ambient Temperature



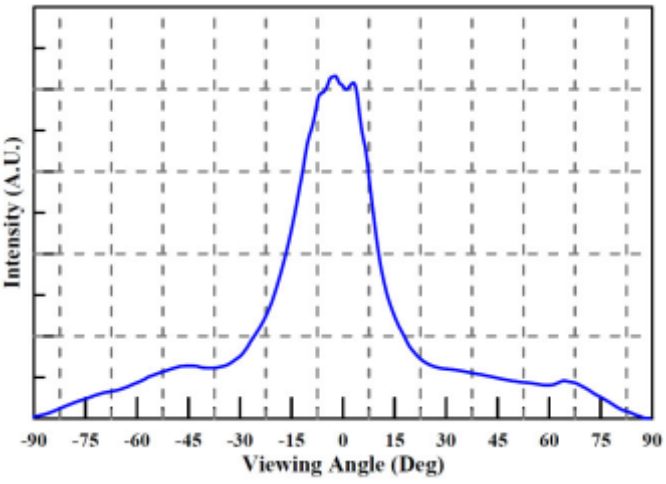
Relative Intensity vs. Wavelength



Forward Voltage vs. Ambient Temperature



Relative Luminosity vs. Radiation Angle



Recommended Reflow Soldering Conditions

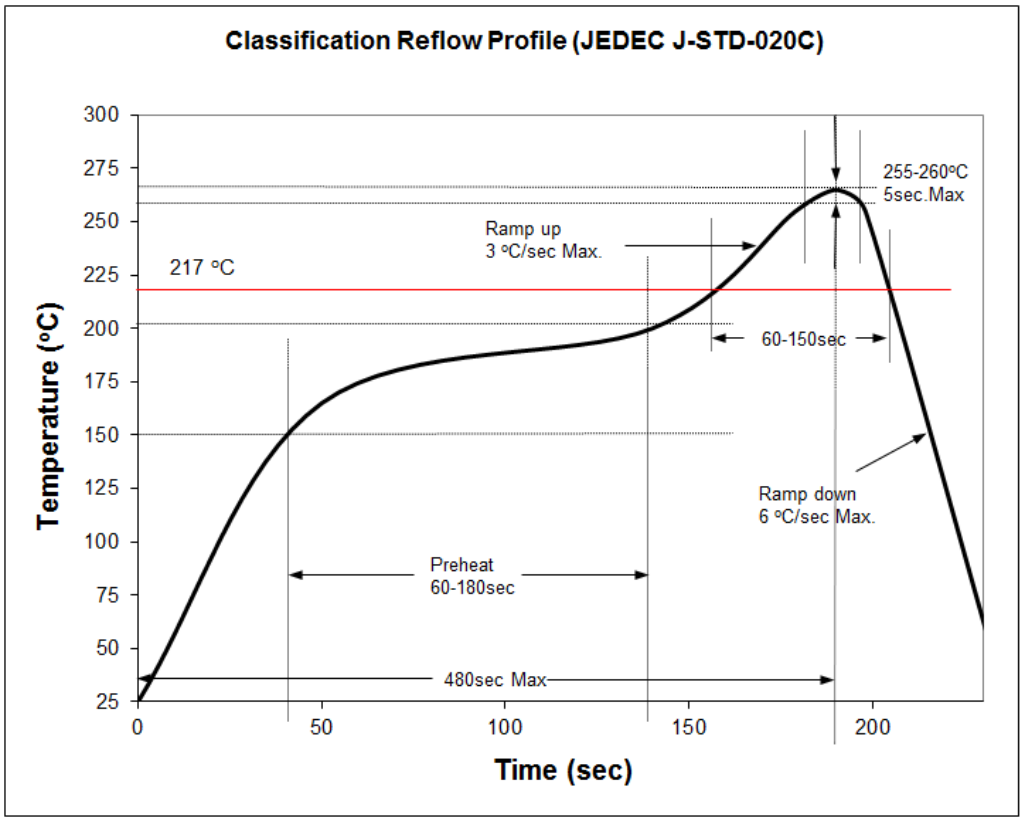
Surface Mounting Condition

In automatic mounting of the SMD LEDs on printed circuit boards, any bending, expanding and pulling forces or shock against the SMD LEDs should be kept min. to prevent them from electrical failures and mechanical damages of the devices.

Soldering Reflow

-Soldering of the SMD LEDs should conform to the soldering condition in the individual specifications.
-SMD LEDs are designed for Reflow Soldering.
-In the reflow soldering, too high temperature and too large temperature gradient such as rapid heating/cooling may cause electrical & optical failures and damages of the devices.
-AOT cannot guarantee the LEDs after they have been assembled using the solder dipping method.

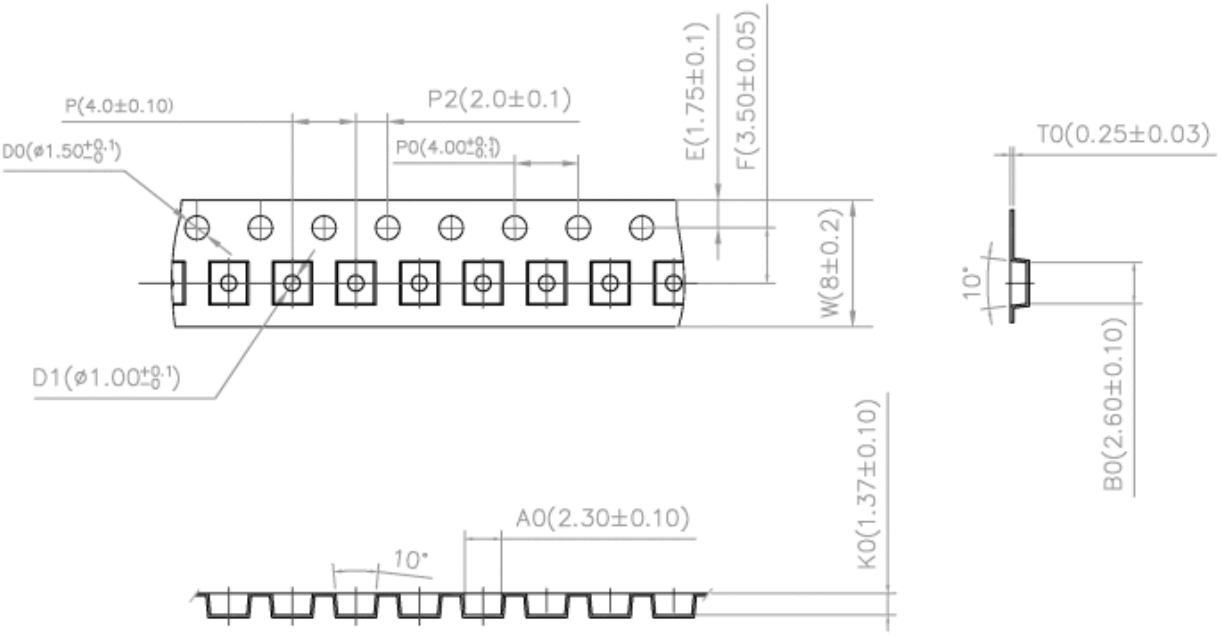
(1) Lead-Free Solder

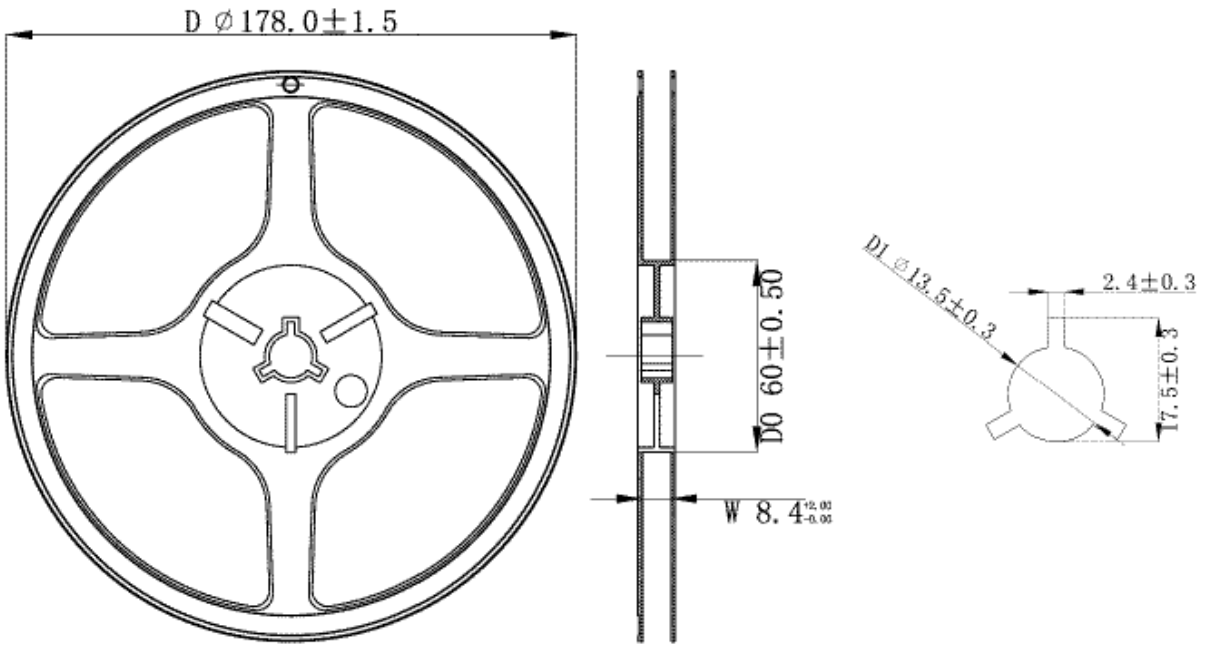


(3) Manual Soldering Conditions

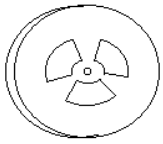
- Lead-free Solder
  Max. 260 °C for Max. 5sec, and only one time.
- There is possibility that the brightness of LEDs is decreased, which is influenced by heat or ambient atmosphere during reflow. It is recommended to use the nitrogen reflow method.
- After LEDs have been soldered, repair should not be done. As repair is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will be damaged by repairing or not.
- Reflow soldering should not be done more than two times

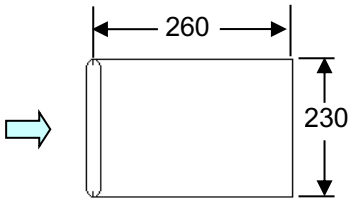
Dimensions (Unit :mm)





Packing Formation

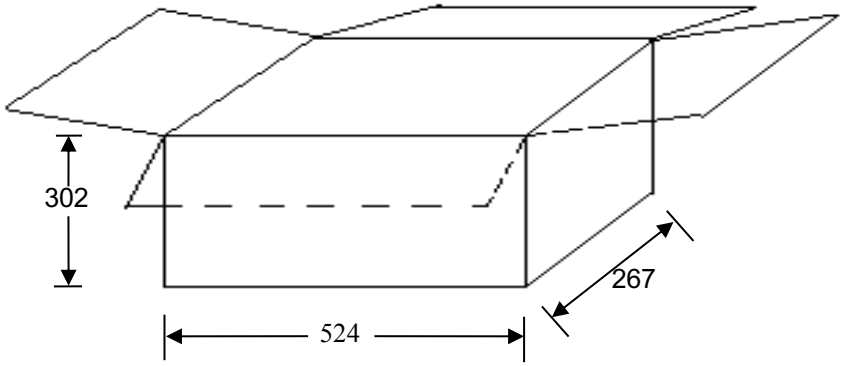




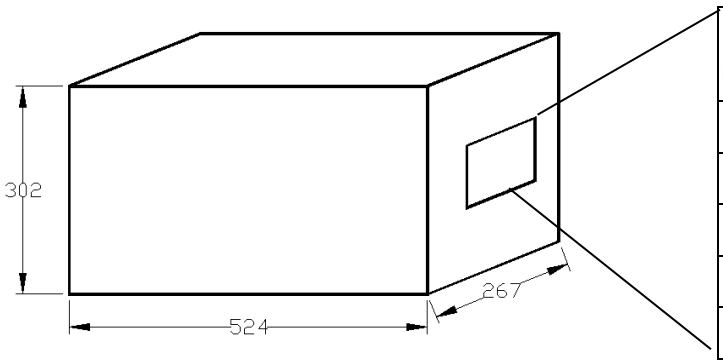
Diameter : 178 mm
Width : 8.4mm
2,000 pcs/Reel
Antistatic Black Reel

Antistatic Shielding Aluminum Bag
1 Reel / Bag

50,000 pcs/ 1Carton



Package Outlook



AOT Advanced Optoelectronic Technology Inc.	
Customer	
Part Number	
Quantity	
Date	
Remarks	

Moisture Level(MSL Level)

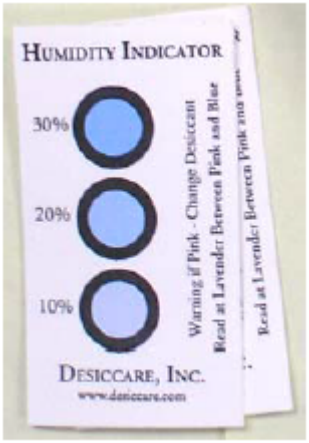
MSL label is attaced on the Aluminum bag and Reel

Moisture Level(MSL Level)

Silica gel is enclosed in the Aluminum bag. (Size：8 cm x 5 cm / Weight：8 gr.)

Moisture Level(MSL Level)

Humidity indicator is enclosed in the Aluminum bag. (Size：8 cm x 9 cm)



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Reel Label Definition

SMD LED, Top View Pure White Model
Model Name : 2220C-NR01
Part Number : CDKTNR003-1Z00
WD : A
IV : B
VF : C
Quantity : nn ea
Serial No : SHyymmddxxx

A : Wavelength value noted, (925-950)
B : IV value noted,(30-250)
C : VF value noted, (1.85-2.65)
nn : Quantity of LED

SHyymmddxxx : yy : year, mm : month, dd : day, xxx : reel no

*Reel Label to fill in practice data of all LED characteristic

Reliability Test

No.	Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
1	LTO_-40℃	JESD22-A108	I_F=120mA Ta=25℃	1000 hrs	0/20
2	HTHHO(60℃/90%RH)	JESD22-A119	60℃, 90%RH, I_F=120mA	1000 hrs	0/20
3	HTO_65℃	JESD22-A108	Ta=65℃, I_F=120mA	1000 hrs	0/20
4	HTO_85℃	JESD22-A108	Ta=85℃, I_F=120mA	1000 hrs	0/20
5	HTS_100℃	JESD22-A103	Ta=100℃	1000 hrs	0/20
6	Life	NA	I_F=120mA Ta=25℃	1000 hrs	0/20
7	TST-(40℃~100℃)	JESD22-A106	-40℃~100℃	300 cycles	0/50
8	Pulse Life Test	NA	Ta=25℃with bias 120Hz,Duty Ratio 25%	10000 times	0/20
9	Reflow Test	NA	Reflow 260℃ → HTOL 140℃ 2 mins	2 cycles	0/500

Criteria for Judging Damage

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	V_F	I_F =120mA	-	*U.S.L×1.1
Radiant Intensity	φv	I_F =120mA	*L.S.L×0.7	-

* U.S.L: Upper Standard Level
* L.S.L: Lower Standard Level

Caution

(1) Moisture Proof Package

The moisture proof package should be used to prevent moisture in the package as the moisture may Cause damage to optical characteristics of the LEDs.

The aluminum bag with zipper is used for moisture proof package. And, the moisture absorbent Material, Silica gel, is inserted into aluminum bag.

(2) Storage:

Storage Conditions

Before opening the package:

The LEDs should be kept at 30°C or less than 90%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material is recommended.

After opening the package:

After open the package, the LED should be kept at 30°C, 60%RH or less. The LED should be soldered within 168 hours (7 days) after opening the package. If unused LEDs remain, it should be stored in moisture proof condition.

(3) Heat Generation

Thermal design of the end products is of paramount importance. The heat generation must be taken into design consideration when using the LED. The coefficient of the temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components.

(4) Static Electricity

Static electricity or surge voltage damages the LEDs. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handing the LEDs. When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static-damaged LEDs by a light-on test or a V_F test at a lower current. (Below 1mA is recommended).

Criteria: V_F >1.9V at I_F=1uA

(5) Cleaning

Use isopropyl alcohol as a solvent for cleaning the LEDs. The other solvent may dissolve the LEDs package and the epoxy.

Ultrasonic cleaning should not be done.

(6) Electrostatic Discharge (ESD)

The products are sensitive to static electricity or surge voltage, An ESD event may damage its die or reduce its reliability performance. When handling the products, measures against electro static discharge, including the followings, are strongly recommended.

Eliminating the charge;

Wrist strap, ESD footwear and garments, ESD floors

Grounding the equipment and tools at workstation

ESD table / shelf mat (conductive materials)

Proper grounding techniques are required for all devices, equipment and machinery used in the assembly of the products, Also note that surge protection should be considered in the design of customer products.

If tools or equipment contain insulating materials, such as glass or plastic, proper measures against electro static discharge, including the followings are strongly recommended.

Dissipating the charge with conductive materials

Preventing the charge generation with moisture

Neutralizing the charge with ionizer

When performing the characteristics inspection of the LEDs in your application, customer is advised to check on the LEDs whether or not they are damaged by ESD, Such damage can be detected during forward voltage measurement or light up test at low current. (The recommended current is 1mA or lower)

ESD-damaged LEDs may have a current flow at low voltage, or no longer light up at low current, Failure Criteria: V_F <1.9V at I_F=1uA

(7) Others

When using the LEDs, it must care that the reverse voltage will not exceed the absolute maximum rating. The LED light is enough to injure human eyes, so it should avoid looking at LED light directly.

NOTE.

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