

ITR-3427E Datasheet

8TR3427000000002

Features

- Fast response time
- High sensitivity
- Cut-Off visible wavelength
- Thin
- Compact
- Pb free



Applications

- Camera
- VCR
- Floppy disk driver
- Cassette type recorder
- Various microcomputer control equipment

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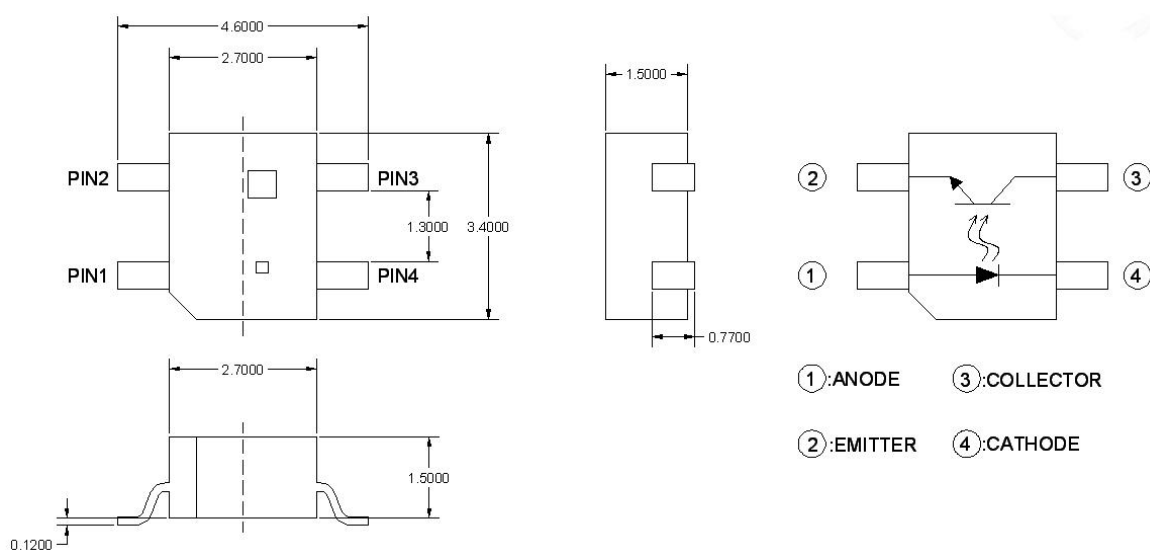
DISCLAIM

ITR-3427E(8TR3427000000002) is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo-transistor with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side-by-side in a plastic package.

Device Selection Guide

Device No.	Chip Material
IR	GaAlAs
PT	Silicon

Package Dimension



Soldering terminals may shift in the x, y direction.

Notes:

- 1.All dimensions are in millimeters
- 2.Tolerances unless dimensions $\pm 0.15\text{mm}$
- 3.Lead spacing is measured where the lead emerge from the package

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Symbol	Parameters	Ratings	Units	Notes
INPUT (Emitter)				
V_R	Reverse Voltage	5	V	
I_F	Forward Current	50	mA	
I_F	Peak Forward Current	1	A	1
P_d	Total Power Dissipation	75	mW	
OUTPUT (Detector)				
BV_{CEO}	Collector-Emitter Breakdown Voltage	30	V	2
BV_{ECO}	Emitter-Collector Breakdown Voltage	5	V	3
I_C	Collector Current	20	mA	
P_d	Total Power Dissipation	75	mW	
SENSOR				
T_{opr}	Operating Temperature	-40 ~ +85	$^{\circ}\text{C}$	
T_{stg}	Storage Temperature	-40 ~ +100	$^{\circ}\text{C}$	
T_{sol}	Soldering Temperature	260	$^{\circ}\text{C}$	4

Notes:

1. IFP Conditions--Pulse Width $\leq 100\mu\text{s}$ and Duty $\leq 1\%$.
2. Test conditions : $I_C=100\mu\text{A}$, $E_e=0\text{mW}/\text{cm}^2$.
3. Test conditions : $I_E=100\mu\text{A}$, $E_e=0\text{mW}/\text{cm}^2$
4. Soldering time ≤ 5 seconds.

Electro-Optical Characteristics ($T_a=25^{\circ}\text{C}$)

Symbol	Parameters	Test conditions	Min	Typ	Max	Units	Notes
INPUT (Emitter)							
V_F	Forward Voltage	$I_F=20\text{mA}$	-	1.2	1.6	V	
λ_P	Peak Wavelength	$I_F=10\text{mA}$	-	940	-	nm	
I_R	Reverse Current	$V_R=5\text{V}$	-	-	10	μA	
OUTPUT (Detector)							
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=2\text{mA}$ $E_e=1\text{mW}/\text{cm}^2$	-	-	0.4		
I_{CEO}	Collector Dark Current	$V_{CE}=10\text{V}$ $E_e=0\text{mW}/\text{cm}^2$	-	-	100	nA	
SENSOR							
$I_{C(ON)}$	Collector Light Current	$V_{CE}=5\text{V}$ $I_F=10\text{mA}$ $d=1\text{mm}$	0.18	-	0.40	mA	5
I_{LEAK}	Leakage Current	$V_{CE}=5\text{V}$ $I_F=10\text{mA}$ with no reflection	-	-	1	μA	
t_r	Rise Time	$V_{CE}=2\text{V}$ $I_C=100\mu\text{A}$	-	20	-	μS	
t_f	Fall Time	$R_L=1\text{K}\Omega$ $d=1\text{mm}$	-	20	-	μS	6

Rank :

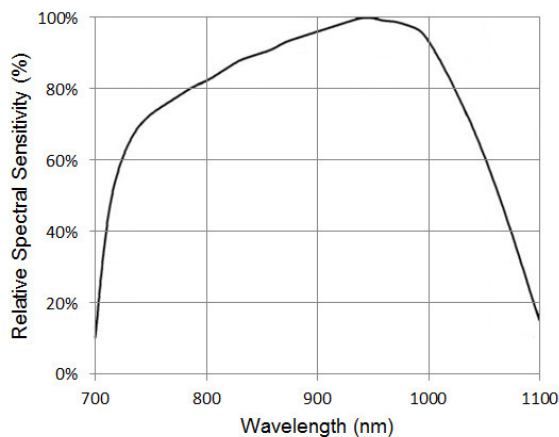
 Conditions : $I_F=10\text{mA}$
 $V_{CE}=5\text{V}$

(mA) :

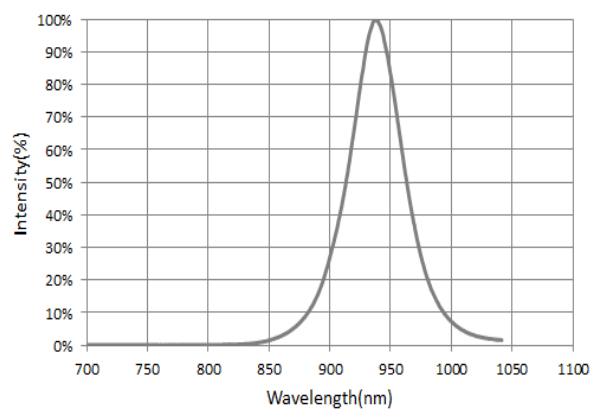
Bin Code	Min	Max
BX	0.18	0.40

Characteristics

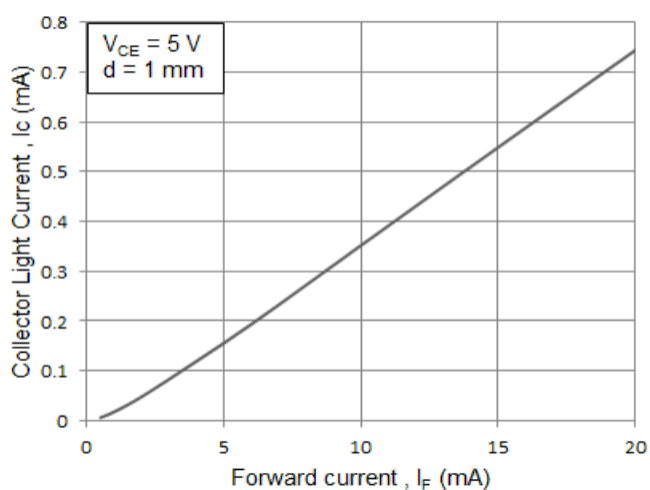
Spectral Sensitivity



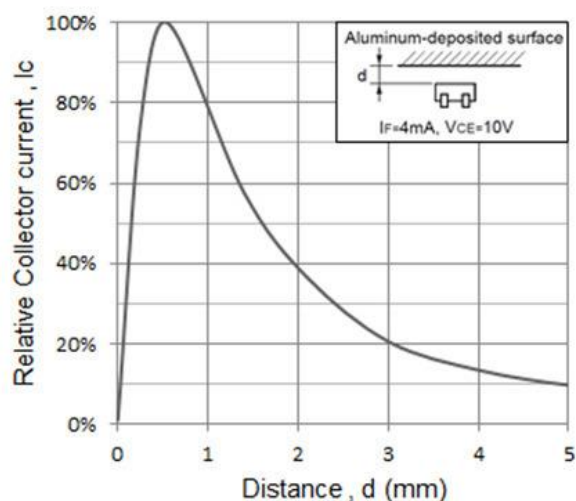
Relative Spectral Emission



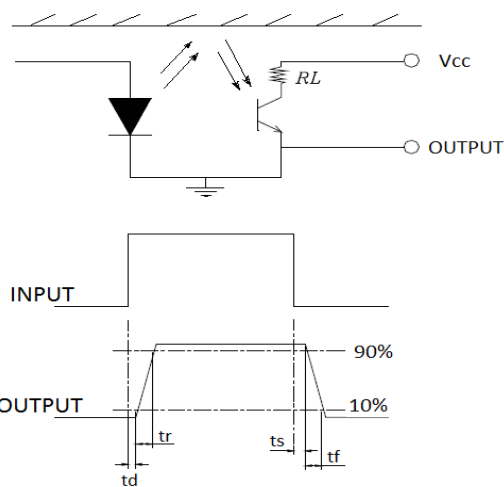
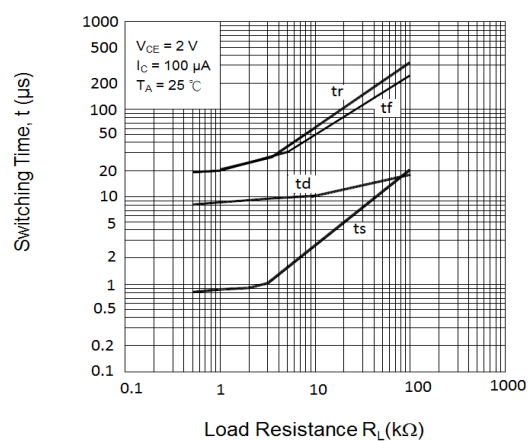
Collector Light Current vs. Forward Current



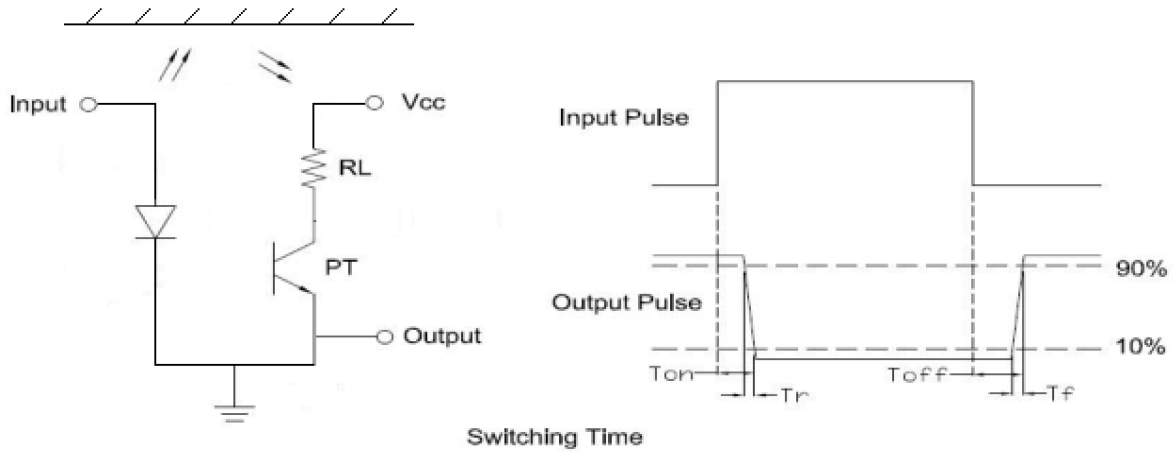
Sensing Distance Characteristics



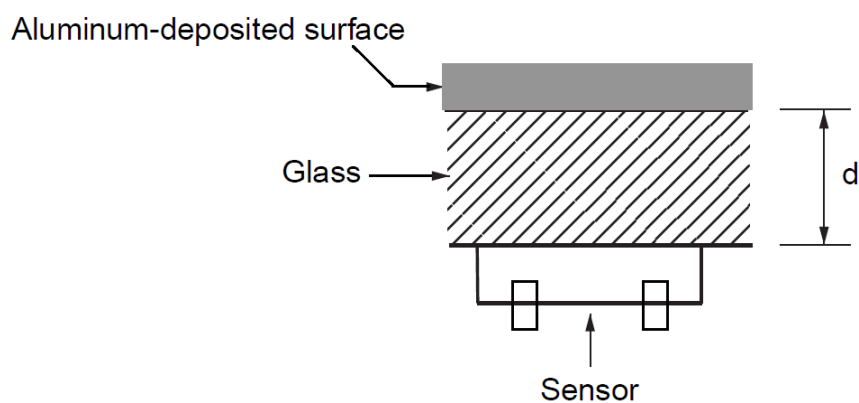
Switching Time vs. Load Resistance



Test circuit



Light Current Measurement Setup Diagram



Product Specifications

Item	Specification	Material	Quantity
Detector Spectral Bandwidth λ_D	700nm~1100nm @ $V_{CE}=5V$ / $T_S = 25^\circ C$		
Emitter Peak Wavelength λ_P	Typ: 940nm @10 mA / $T_S = 25^\circ C$		
Collector Light Current I_C	0.18~0.40 mA @ $V_{CE}=5V$, $I_F=10mA$, $d=1$ mm		
Resin	Black	Silicon	
Carrier tape	EIA 481-1A specs	Conductive black tape	
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT standard	Paper	Non-specified
Others:			

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of I_v , CIE and V_f . Each reel has a label identifying its specification; the immediate box consists of a product label as well.

Note :This is shipped test conditions

※ Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

ATTENTION: Electrostatic Discharge (ESD) protection



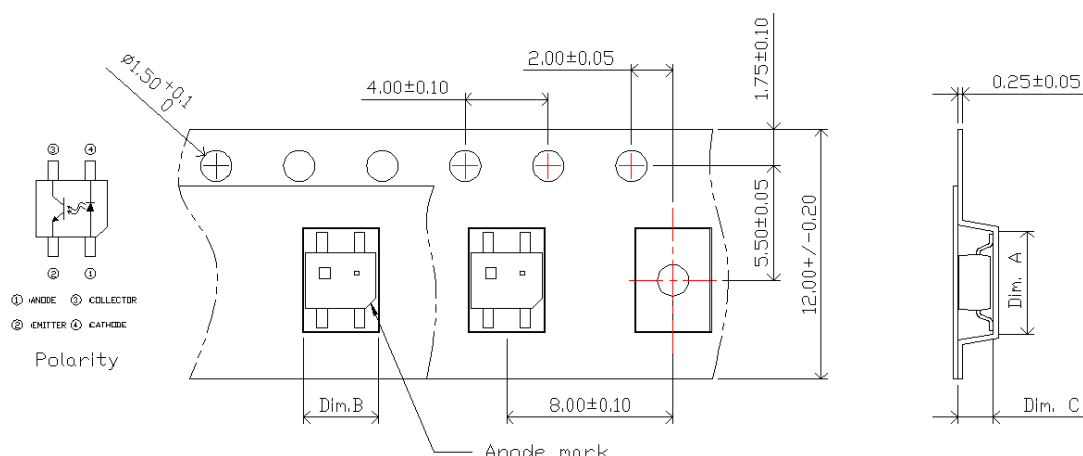
The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based

devices. ESD precaution must be taken during design and assembly.

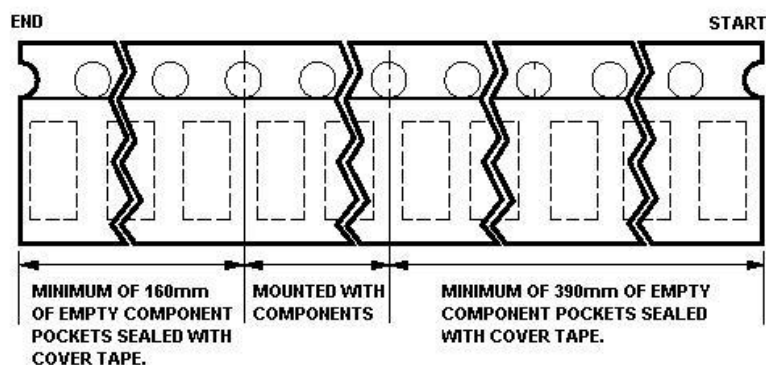
Precaution for Use

1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within 4 weeks after unpacked. Unused products must be repacked in an anti-electrostatic package, folded to close any opening and then stored in a dry and cool space.
5. The appearance and specifications of the products may be modified for improvement without further notice.
6. The LEDs are sensitive to the static electricity and surge. It is strongly recommended to use a grounded wrist band and anti-electrostatic glove when handling the LEDs. If a voltage over the absolute maximum rating is applied to LEDs, it will damage LEDs. Damaged LEDs will show some abnormal characteristics such as remarkable increase of leak current, lower turn-on voltage and getting unlit at low current.

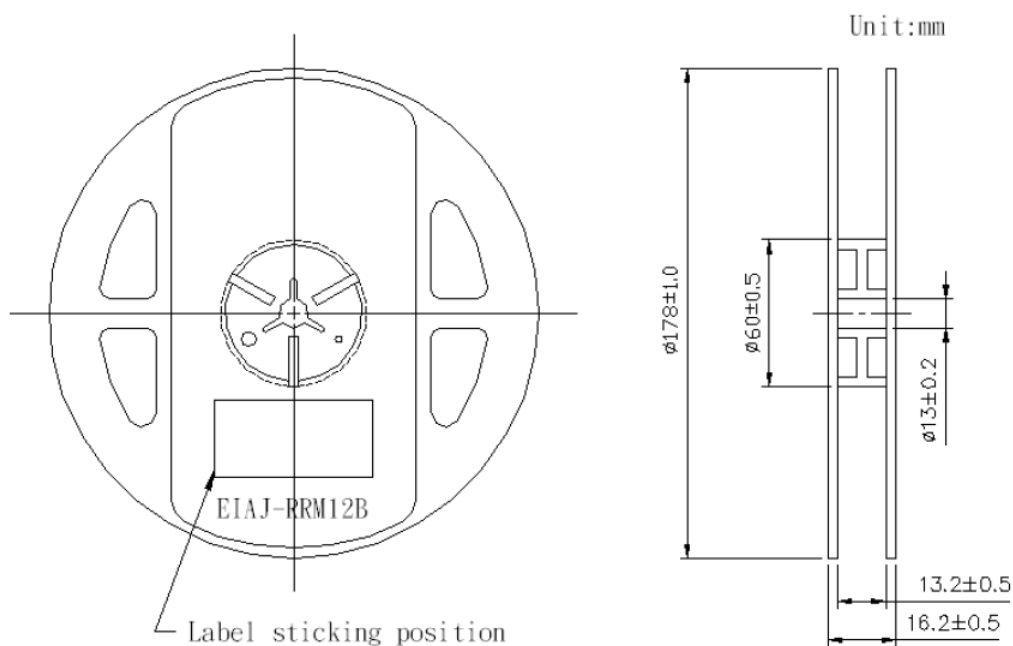
Packaging Tape Dimension



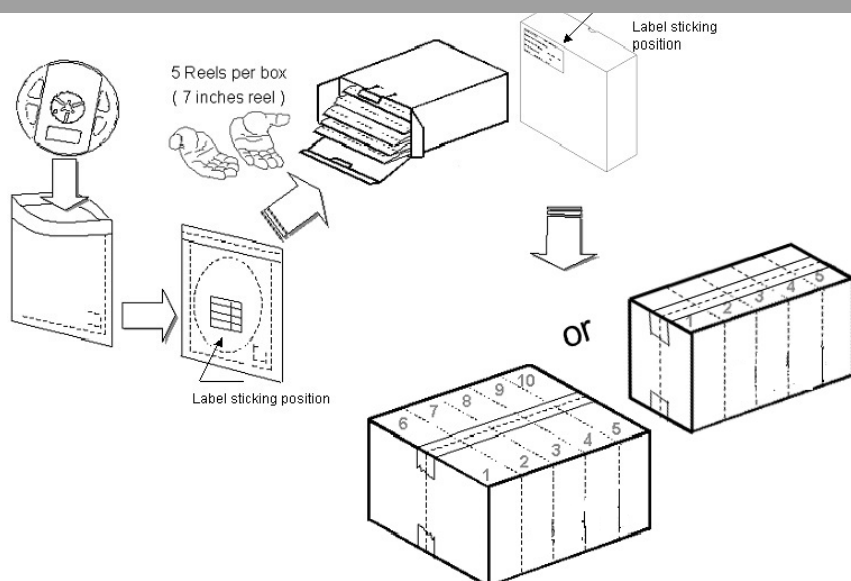
Dim. A	Dim. B	Dim. C	Q'ty/Reel
4.95 ± 0.10	3.60 ± 0.10	1.72 ± 0.10	1K



Reel Dimension



Packing

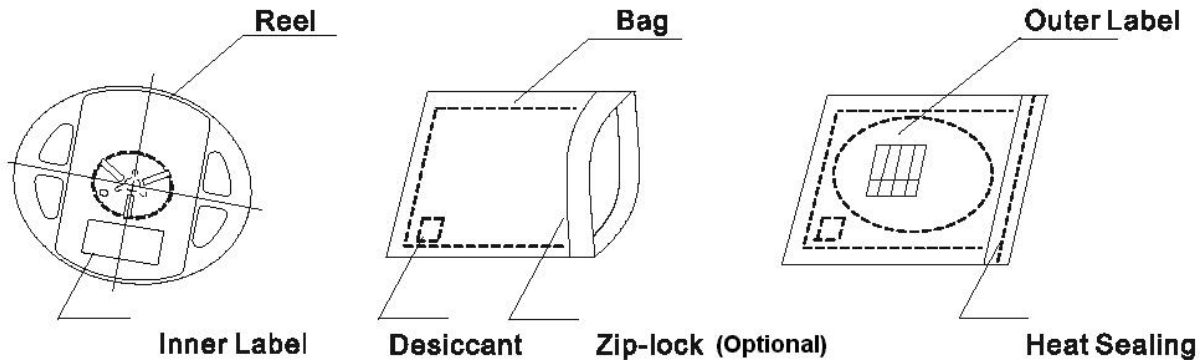


5 or 10 boxes per carton is available depending on shipment quantity.

Dry Pack

All SMD optical devices are MOISTURE SENSITIVE. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

A humidity indicator will be included in the moisture protected anti-static bag prior to shipment. The packaging sequence is as follows:



Baking

Baking before soldering is recommended when the package has been unsealed for 4 weeks.

The conditions are as followings:

1. $60\pm3^{\circ}\text{C} \times (12\sim 24\text{hrs})$ and $<5\%\text{RH}$, taped reel type.
2. $100\pm3^{\circ}\text{C} \times (45\text{min}\sim 1\text{hr})$, bulk type.
3. $130\pm3^{\circ}\text{C} \times (15\text{min}\sim 30\text{min})$, bulk type.

Precautions

1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

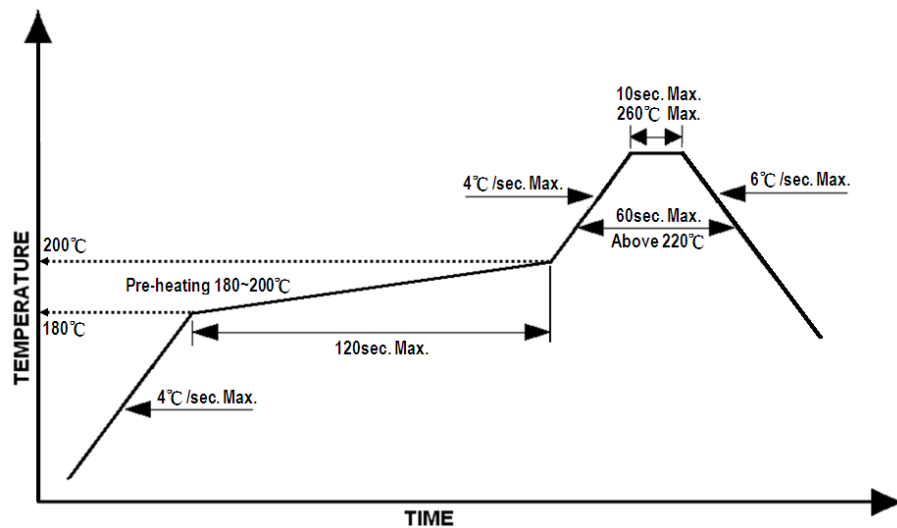
Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 220°C ,60sec
2. Peak temp.:260°C Max.,10sec Max.
3. Reflow soldering should not be done more than two times.
4. Never take next process until the component is cooled down to room temperature after reflow.
5. The recommended reflow soldering profile (measuring on the surface of the LED terminal)

is following:

Lead-free Solder Profile



Reworking

Rework should be completed within 5 seconds under 260°C.

The iron tip must not come in contact with the copper foil.

Twin-head type is preferred.

Cleaning

Following are cleaning procedures after soldering:

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended. Temperature x Time should be 50°C x 30sec. or <30°C x 3min

Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter

Curing: 100°C max, <3min

Cautions of Pick and Place

Avoid stress on the resin at elevated temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component.

Please ensure that the equipment is properly grounded.

Use of an ionizer fan is recommended.

Revision history

Versions	Description	Release Date
1.0	Preliminary	2021/08/31

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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