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SURFACE MOUNT LED TAPE AND REEL



Lead-Free Parts

LVIR9033/TR2

# DATA SHEET

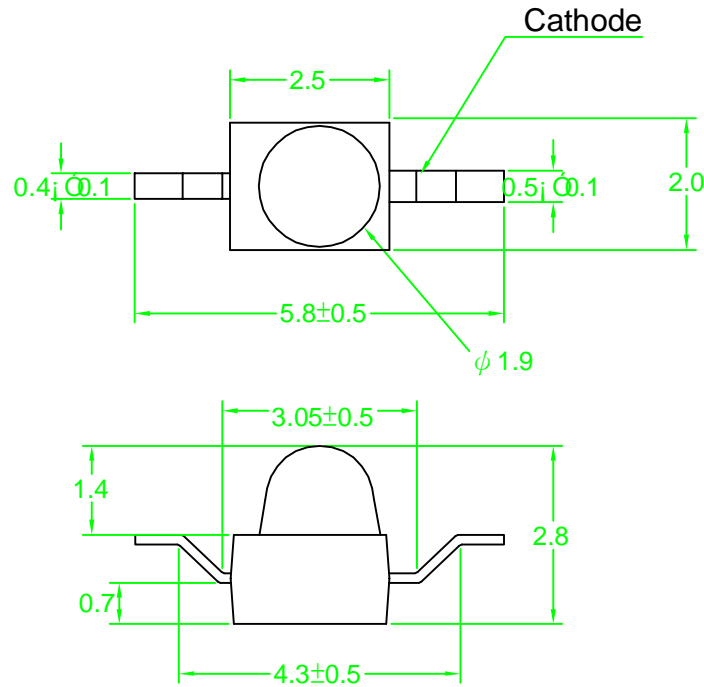
DOC. NO : QW0905-LVIR9033/TR2

REV. : D

DATE : 28 - Jul. - 2011

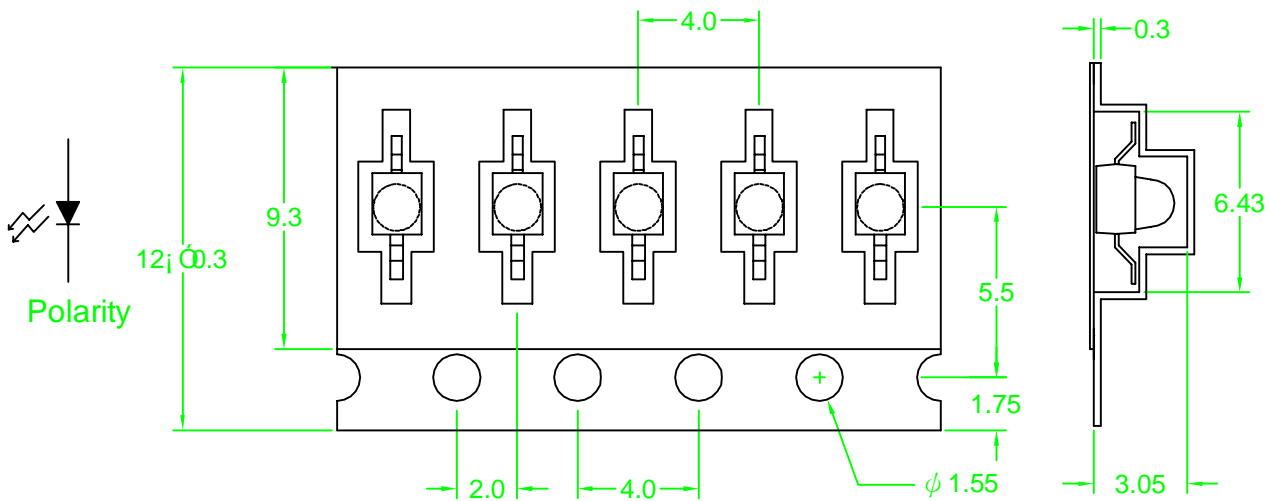


## Package Dimensions



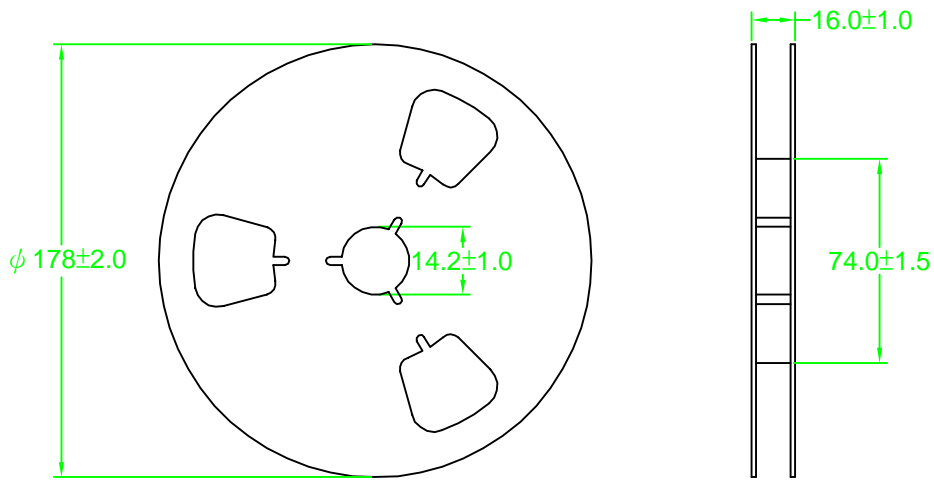
Note : 1.All dimension are in millimeter tolerance is  $\pm 0.2\text{mm}$  unless otherwise noted.  
2.Specifications are subject to change without notice.

## Carrier Type Dimensions



Note : The tolerances unless mentioned is  $\pm 0.2\text{mm}$ , Angle  $\pm 0.5$ . Unit=mm.

### Reel Dimensions



| Description        | Quantity/Reel |
|--------------------|---------------|
| 12.0mm tape,7"reel | 1500 devices  |

### Features:

1. High radiant intensity.
2. Suitable for pulsed applications.
3. Low average degradation.

### Descriptions:

The LVIR9033/TR2 series are super-high efficiency Gallium Aluminum Arsenide infrared emitting diodes encapsulated in water clear plastic T-1 3/4 package individually

### Device Selection Guide:

| PART NO      | MATERIAL | LENS COLOR  |
|--------------|----------|-------------|
| LVIR9033/TR2 | GaAIAs   | Water Clear |

Absolute Maximum Ratings at Ta=25 °C

| Parameter                                   | Symbol | Ratings                                    | UNIT |
|---|--------|--|------|
|   |        | VIR  |      |
| Power Dissipation                           | PD     | 100  | mW   |
| Peak Forward Current<br>(300PPS,1 μs Pulse) | IFP    | 3  | A    |
| Forward Current                             | IF     | 50   | mA   |
| Reverse Voltage                             | Vr     | 5  | V    |
| Electrostatic Discharge                     | ESD    | 2000                                       | V    |
| Operating Temperature                       | Topr   | -55 ~ +100                                 | °C   |
| Storage Temperature                         | Tstg   | -55 ~ +100                                 | °C   |
| Soldering Temperature                       | Tsol   | Max 260°C for 5 sec Max<br>(2mm from body) |      |

Electrical Optical Characteristics (Aa=25°C)

| PARAMETER                  | SYMBOL | Min. | Typ. | Max. | UNIT               | TEST CONDITION |
|----------------------------|--------|------|------|------|--------------------|----------------|
| Radiant Intensity          | Le     | 1.6  | 6.0  |      | mW/sr              | IF=20mA        |
| Aperture Radiant Incidence | Ee     | 0.2  | 0.4  |      | mW/cm <sup>2</sup> | IF=20mA        |
| Peak Emission Wavelength   | λ peak |      | 940  |      | nm                 | IF=20mA        |
| Spectral Line Half Width   | Δλ     |      | 50   |      | nm                 | IF=20mA        |
| Forward Voltage            | VF     |      | 1.2  | 1.6  | V                  | IF=20mA        |
| Reverse Current            | IR     |      |      | 100  | μA                 | VR=5V          |
| Viewing Angle              | 2θ 1/2 |      | 20   |      | deg                |                |

Note : 1.The forward voltage data did not including ±0.1V testing tolerance.  
2. The radiant intensity data did not including ±15% testing tolerance.

## Typical Electro-Optical Characteristics Curve VIR CHIP

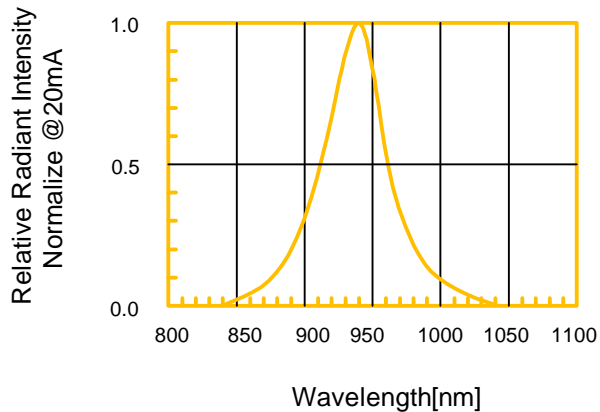
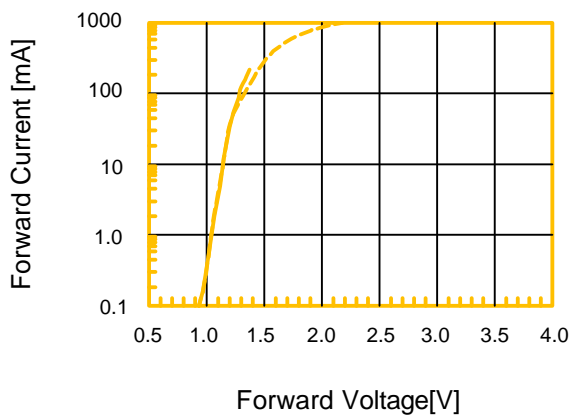


Fig.3. Relative Radiant Power vs. Forward Peak Current

Fig.4 Relative Radiant Power vs. Forward Peak Current

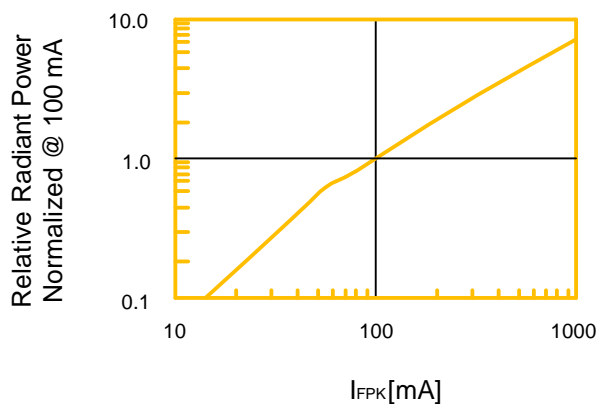
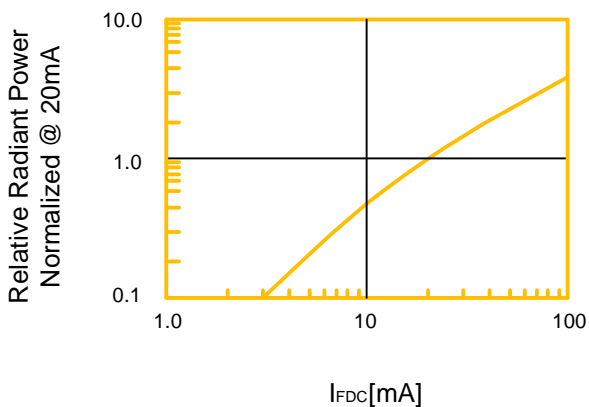
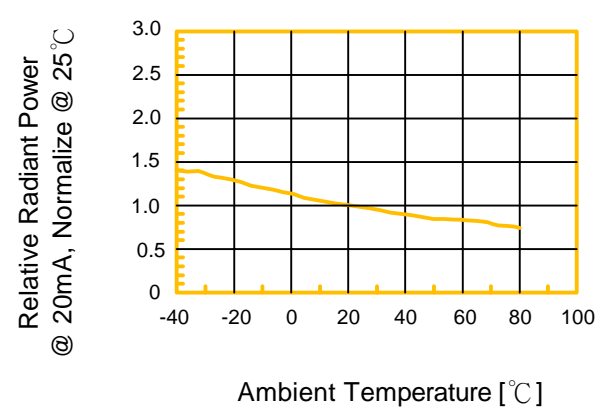
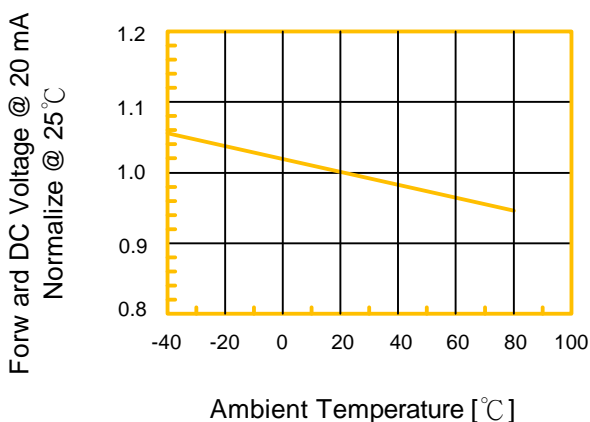


Fig.5 Forward DC Voltage vs. Temperature

Fig.6 Relative Radiant Power vs. Temperature

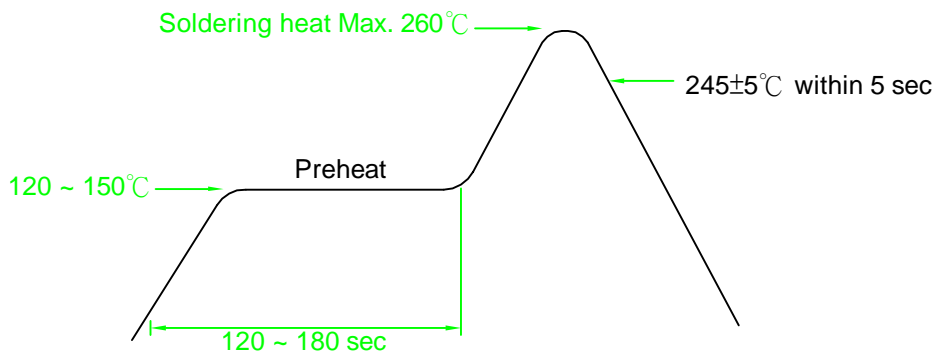


## Recommended Soldering Conditions

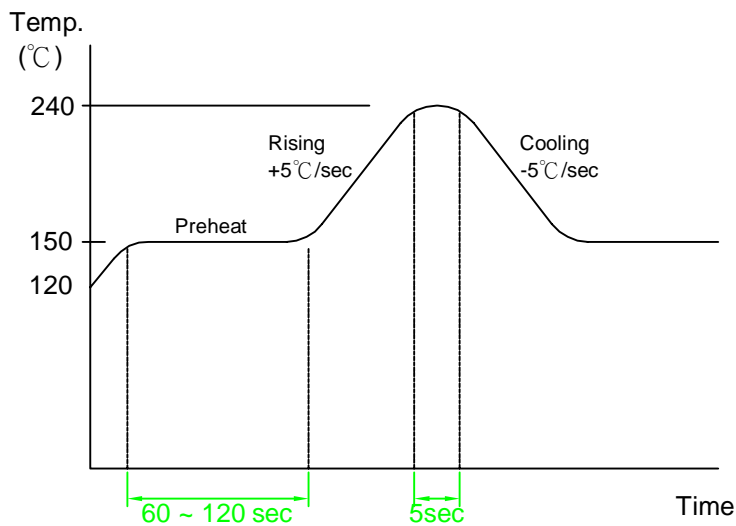
### 1. Hand Solder

Basic spec is  $\leq 280^{\circ}\text{C}$  3 sec one time only.

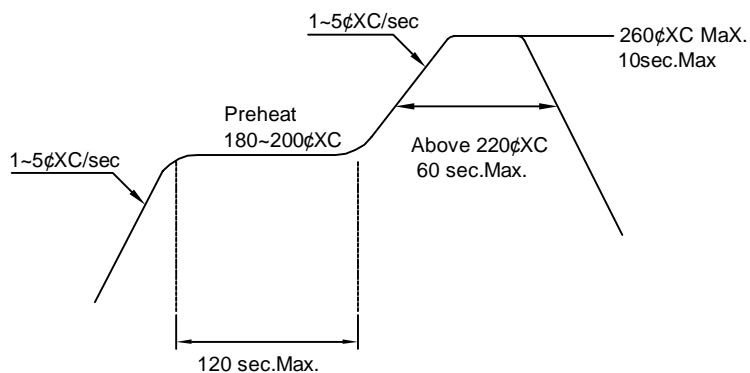
### 2. Wave Solder



### 3-1. LEAD Reflow Solder



### 3-2 PB-Free Reflow Solder



Reflow Soldering should not be done more than two times.

**Precautions For Use:****Storage time:**

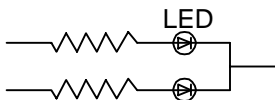
- 1.The operation of Temperatures and RH are :  $5^{\circ}\text{C} \sim 35^{\circ}\text{C}$  ,RH60%.
- 2.Once the package is opened, the products should be used within a week.  
Otherwise, they should be kept in a damp proof box with descanting agent.  
Considering the tape life, we suggest our customers to use our products within a year(from production date).
- 3.If opened more than one week in an atmosphere  $5^{\circ}\text{C} \sim 35^{\circ}\text{C}$  ,RH60%, they should be treated at  $60^{\circ}\text{C} \pm 5^{\circ}\text{C}$  fo r 15hrs.

**Drive Method:**

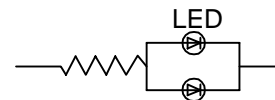
LED is a current operated device, and therefore, requirer some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor placed in series with the LED.

Consider worst case voltage variations than could occur across the current limiting resistor. The forwr d current should not be allowed to change by more than 40 % of its desired value.

Circuit model A



Circuit model B



(A) Recommended circuit.

(B) The difference of brightness between LED could be found due to the VF-IF characteristics of LED.

**Cleaning:**

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

**ESD(Electrostatic Discharge):**

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrosatic glove is recommended when handing these LED. All devices, equipment and machinery must be properly grounded.

### Reliability Test:

| Test Item                           | Test Condition   | Description   | Reference Standard   |
|-------------------------------------|--|---|--|
| Operating Life Test                 | 1.Under Room Temperature<br>2.If=20mA<br>3.t=1000 hrs (-24hrs, +72hrs) | This test is conducted for the purpose of detemining the resiance of a part in electrical and themal stressed.  | MIL-STD-750: 1026<br>MIL-STD-883: 1005<br>JIS C 7021: B-1                      |
| High Temperature Storage Test       | 1.Ta=105 °C±5°C<br>2.t=1000 hrs (-24hrs, +72hrs)                       | The purpose of this is the resistance of the device which is laid under ondition of high temperature for hours.   | MIL-STD-883:1008<br>JIS C 7021: B-10   |
| Low Temperature Storage Test        | 1.Ta=-40 °C±5°C<br>2.t=1000 hrs (-24hrs, +72hrs)                       | The purpose of this is the resistance of the device which is laid under condition of low temperature for hours.   | JIS C 7021: B-12   |
| High Temperature High Humidity Test | 1.Ta=65 °C±5°C<br>2.RH=90 %~95%<br>3.t=240hrs ±2hrs                    | The purpose of this test is the resistance of the device under tropical for hous.   | MIL-STD-202:103B<br>JIS C 7021: B-11   |
| Thermal Shock Test                  | 1.Ta=105 °C±5°C & -40°C±5°C<br>(10min) (10min)<br>2.total 10 cycles    | The purpose of this is the resistance of the device to sudden extreme changes in high and low temperature.  | MIL-STD-202: 107D<br>MIL-STD-750: 1051<br>MIL-STD-883: 1011                    |
| Solder Resistance Test              | 1.T.Sol=260 °C±5°C<br>2.Dwell time= 10 ±1sec.                          | This test intended to determine the thermal characteristic resistance of the device to sudden exposures at extreme changes in temperature when soldering the lead wire. | MIL-STD-202: 210A<br>MIL-STD-750: 2031<br>JIS C 7021: A-1                      |
| Solderability Test                  | 1.T.Sol=230 °C±5°C<br>2.Dwell time=5 ±1sec                             | This test intended to see soldering well performed or not.  | MIL-STD-202: 208D<br>MIL-STD-750: 2026<br>MIL-STD-883: 2003<br>JIS C 7021: A-2 |