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SURFACE MOUNT TAPE AND REEL



Lead-Free Parts

**LSR9033/TR2**

**DATA SHEET**

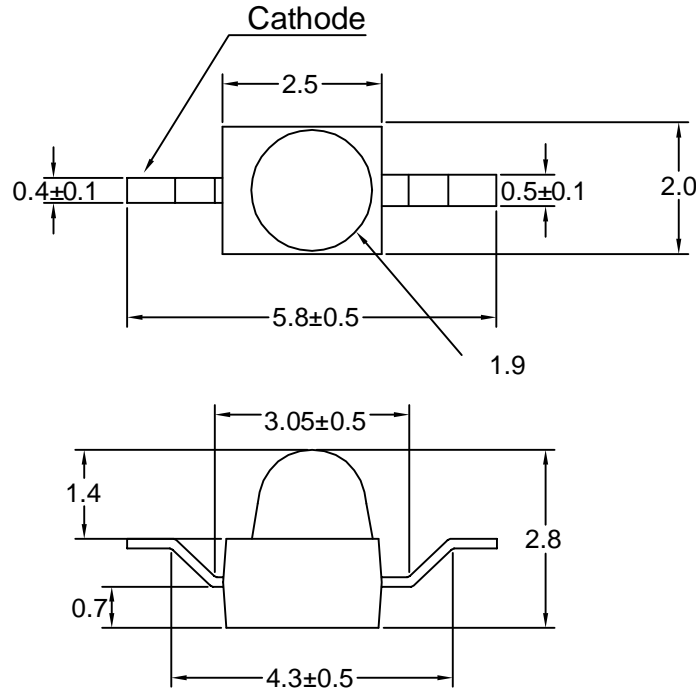
DOC. NO : QW0905-LSR9033/TR2

REV. : A

DATE : 12 - Sep - 2005

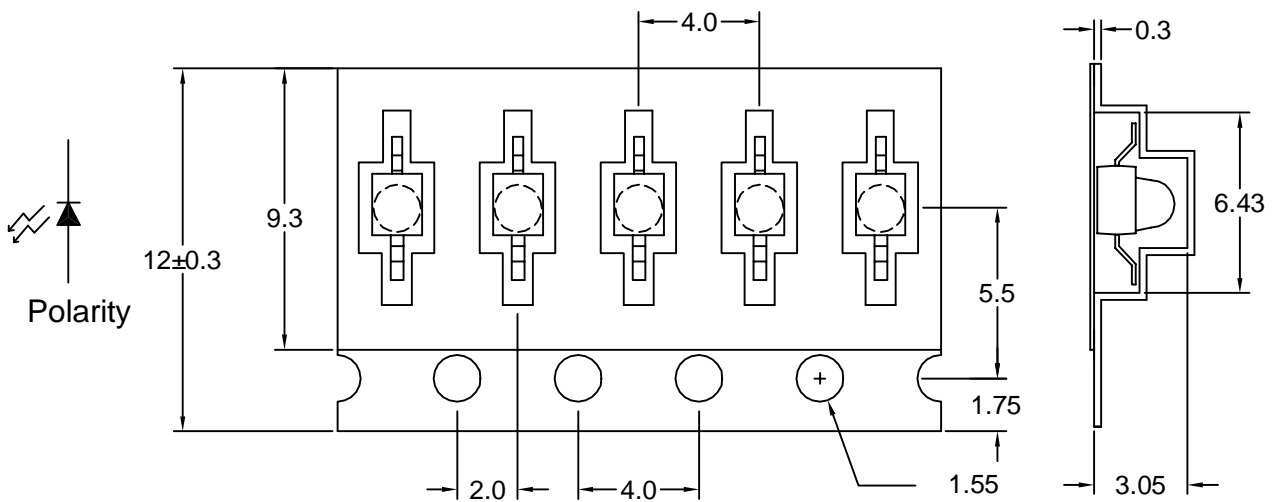


### Package Dimensions



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.

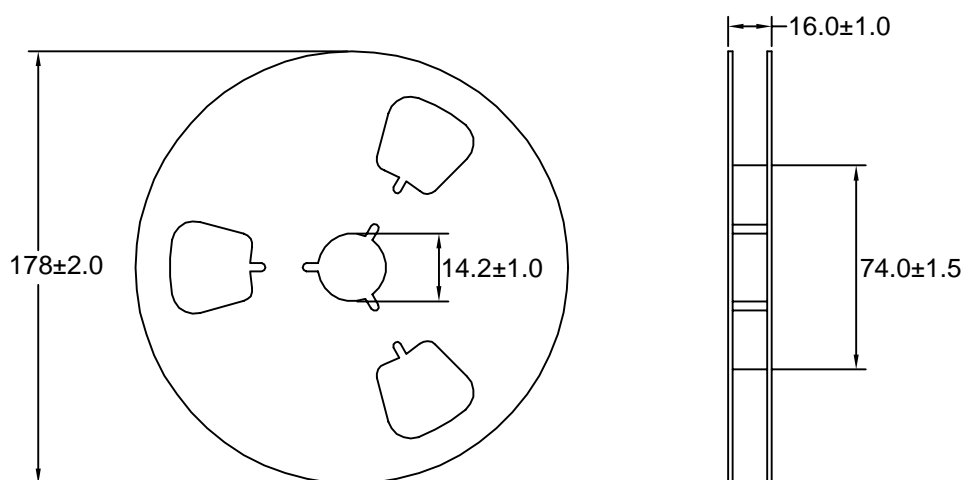
### Carrier Type Dimensions



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



### Reel Dimensions



| Part No.    | Description        | Quantity/Reel |
|-------------|--------------------|---------------|
| LSR9033/TR2 | 12.0mm tape,7"reel | 1500 devices  |

**Absolute Maximum Ratings at Ta=25**

| Parameter                               | Symbol | Ratings                                  | UNIT |
|---|--------|--|------|
|   |        | SR                                       |      |
| Forward Current                         | IF     | 30                                       | mA   |
| Peak Forward Current<br>Duty 1/10@10KHz | IFP    | 100                                      | mA   |
| Power Dissipation                       | PD     | 100                                      | mW   |
| Reverse Current @5V                     | Ir     | 10                                       | μ A  |
| Operating Temperature                   | Topr   | -40 ~ +85                                |      |
| Storage Temperature                     | Tstg   | -40 ~ +100                               |      |
| Soldering Temperature                   | Tsol   | Max 260 for 5 sec Max<br>(2mm from body) |      |

**Typical Electrical & Optical Characteristics (Ta=25 )**

| PART NO     | MATERIAL | COLOR   |             | Peak wave length<br>Pnm | Spectral halfwidth<br>nm | Forward voltage<br>@20 mA(V) |      | Luminous intensity<br>@20mA(mcd) |      | Viewing angle<br>2 1/2<br>(deg) |
|-------------|----------|---------|-------------|-------------------------|--------------------------|------------------------------|------|----------------------------------|------|---------------------------------|
|             |          | Emitted | Lens        |                         |                          | Min.                         | Max. | Min.                             | Typ. |                                 |
| LSR9033/TR2 | GaAIAs   | Red     | Water Clear | 660                     | 20                       | 1.5                          | 2.4  | 90                               | 180  | 20                              |

Note : 1.The forward voltage data did not including  $\pm 0.1V$  testing tolerance.  
2. The luminous intensity data did not including  $\pm 15\%$  testing tolerance.



### Typical Electro-Optical Characteristics Curve

SR CHIP

Fig.1 Forward current vs. Forward Voltage

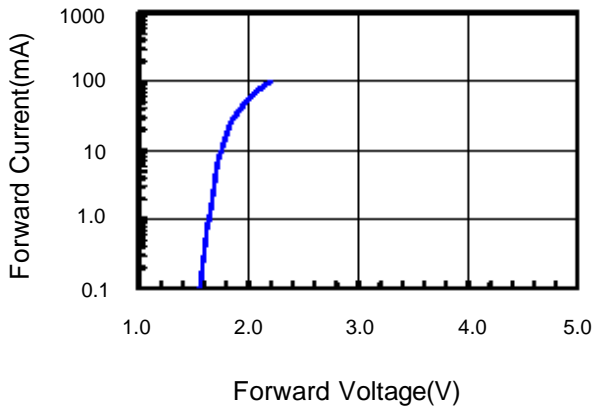


Fig.2 Relative Intensity vs. Forward Current

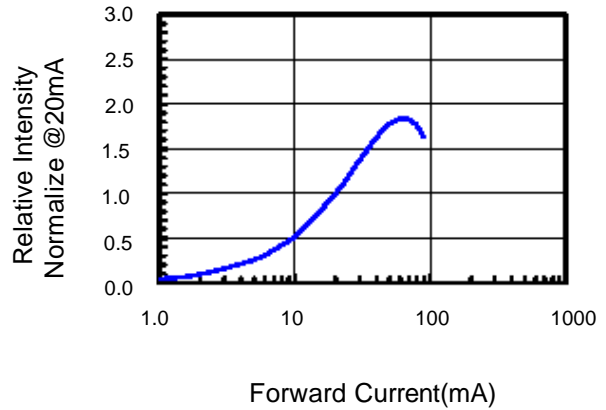


Fig.3 Forward Voltage vs. Temperature

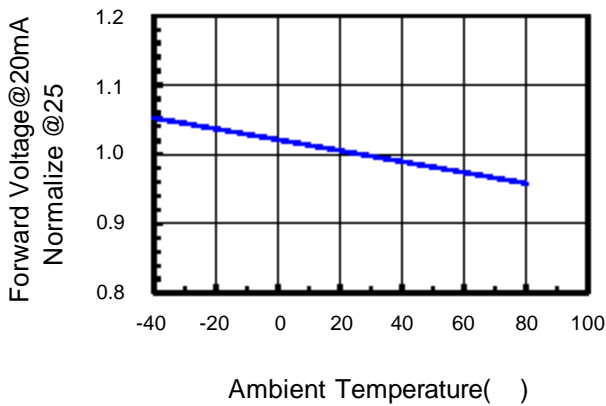


Fig.4 Relative Intensity vs. Temperature

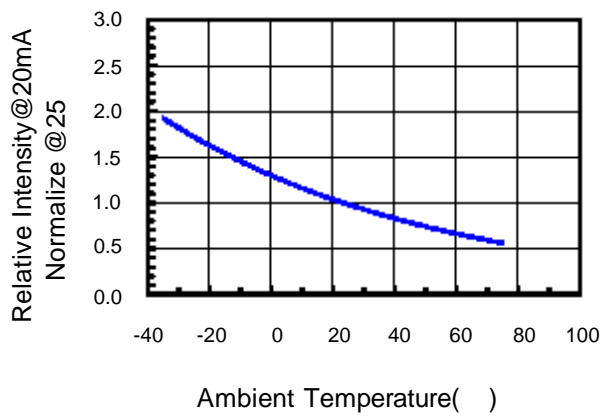
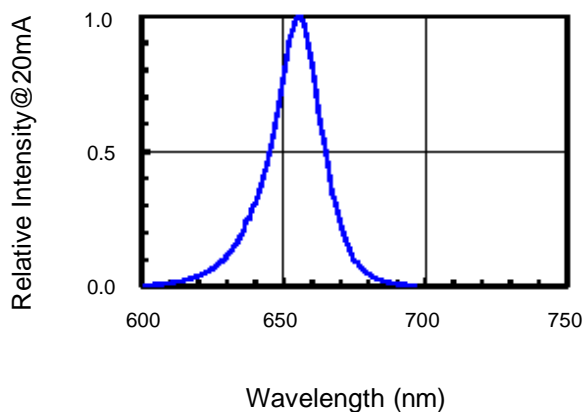


Fig.5 Relative Intensity vs. Wavelength



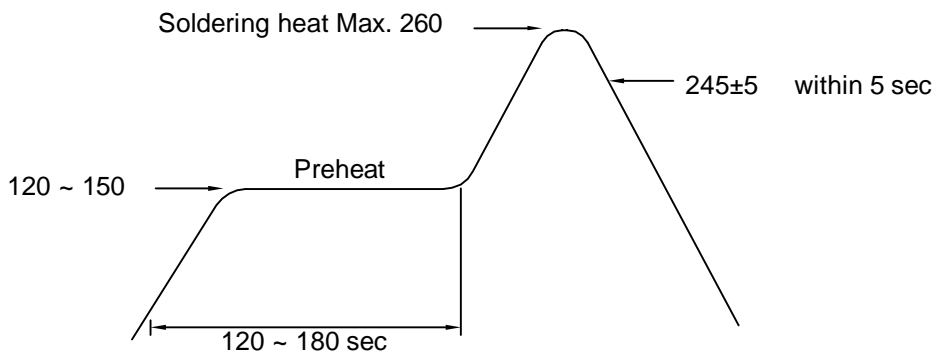


Recommended Soldering Conditions

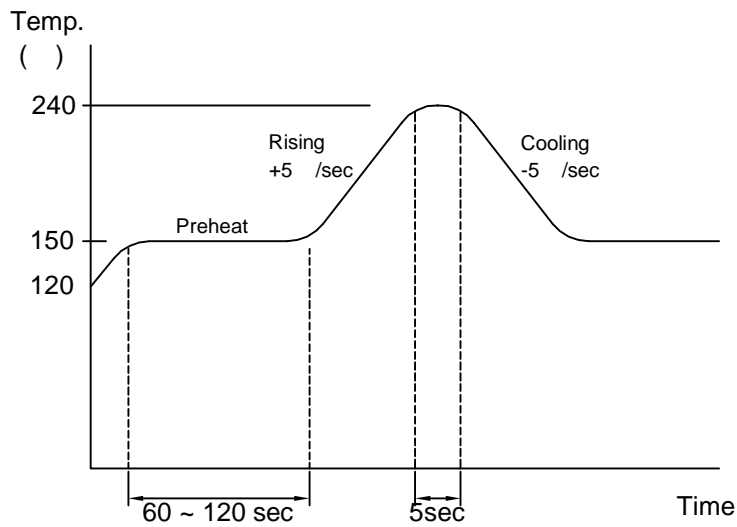
1. Hand Solder

Basic spec is 280 3 sec one time only.

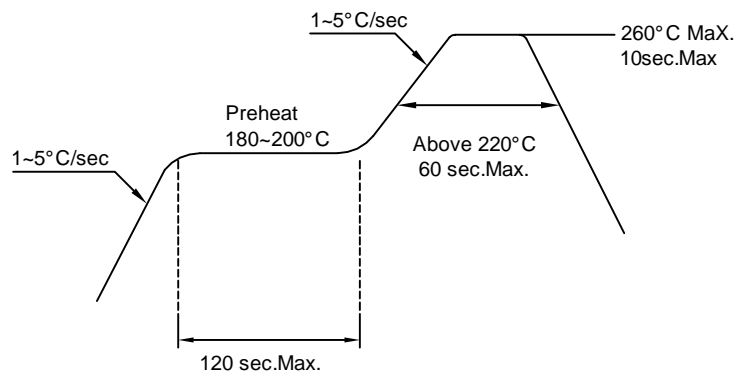
2. Wave Solder



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:

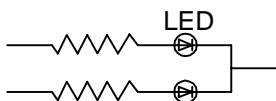
- 1.The operation of Temperatures and RH are : 5 ~35 ,RH60%.
- 2.Once the package is opened, the products should be used within a week.  
Otherwise, they should be kept in a damp proof box with descanting agent.  
Considering the tape life, we suggest our customers to use our products within a year(from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

Drive Method:

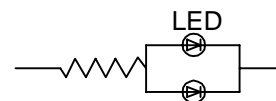
LED is a current operated device, and therefore, requirer some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor placed in series with the LED.

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:

| Classification     | Test Item                                   | Test Condition  | Reference Standard  |
|--------------------|---|---|---|
| Endurance Test     | Operating Life Test                         | 1.Ta=Under Room Temperature As Per Data Sheet Maximum Rating.<br>2.If=20mA<br>3.t=1000 hrs (-24hrs, +72hrs) | MIL-STD-750D: 1026<br>MIL-STD-883D: 1005<br>JIS C 7021: B-1   |
|                    | High Temperature Storage Test               | 1.Ta=105 ±5<br>2.t=1000 hrs (-24hrs, +72hrs)  | MIL-STD-883D:1008<br>JIS C 7021: B-10   |
|                    | Low Temperature Storage Test                | 1.Ta=-40 ±5<br>2.t=1000 hrs (-24hrs, +72hrs)  | JIS C 7021: B-12  |
|                    | High Temperature High Humidity Storage Test | 1.Ta=65 ±5<br>2.RH=90%~95%<br>3.t=1000hrs ±2hrs   | MIL-STD-202F:103B<br>JIS C 7021: B-11   |
| Environmental Test | Thermal Shock Test                          | 1.Ta=105 ±5 & -40 ±5<br>(10min) (10min)<br>2.total 10 cycles  | MIL-STD-202F: 107D<br>MIL-STD-750D: 1051<br>MIL-STD-883D: 1011  |
|                    | Solderability Test                          | 1.T.Sol=235 ±5<br>2.Immersion time 2 ±0.5sec<br>3.Coverage 95% of the dipped surface                        | MIL-STD-202F: 208D<br>MIL-STD-750D: 2026<br>MIL-STD-883D: 2003<br>IEC 68 Part 2-20<br>JIS C 7021: A-2 |
|                    | Temperature Cycling                         | 1.105 ~ 25 ~ -55 ~ 25<br>30mins 5mins 30mins 5mins<br>2.10 Cycles   | MIL-STD-202F: 107D<br>MIL-STD-750D: 1051<br>MIL-STD-883D: 1010<br>JIS C 7021: A-4                     |
|                    | IR Reflow                                   | 1.T=260° C Max. 10sec.Max.<br>2. 6 Min  | MIL-STD-750D:2031.2<br>J-STD-020  |