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PLCC-4 TOPLED



Lead-Free Parts

**LURF9553-4S/TR1**

# DATA SHEET

DOC. NO : QW0905-LURF9553-4S/TR1

REV : A

DATE : 31 - Mar.- 2008



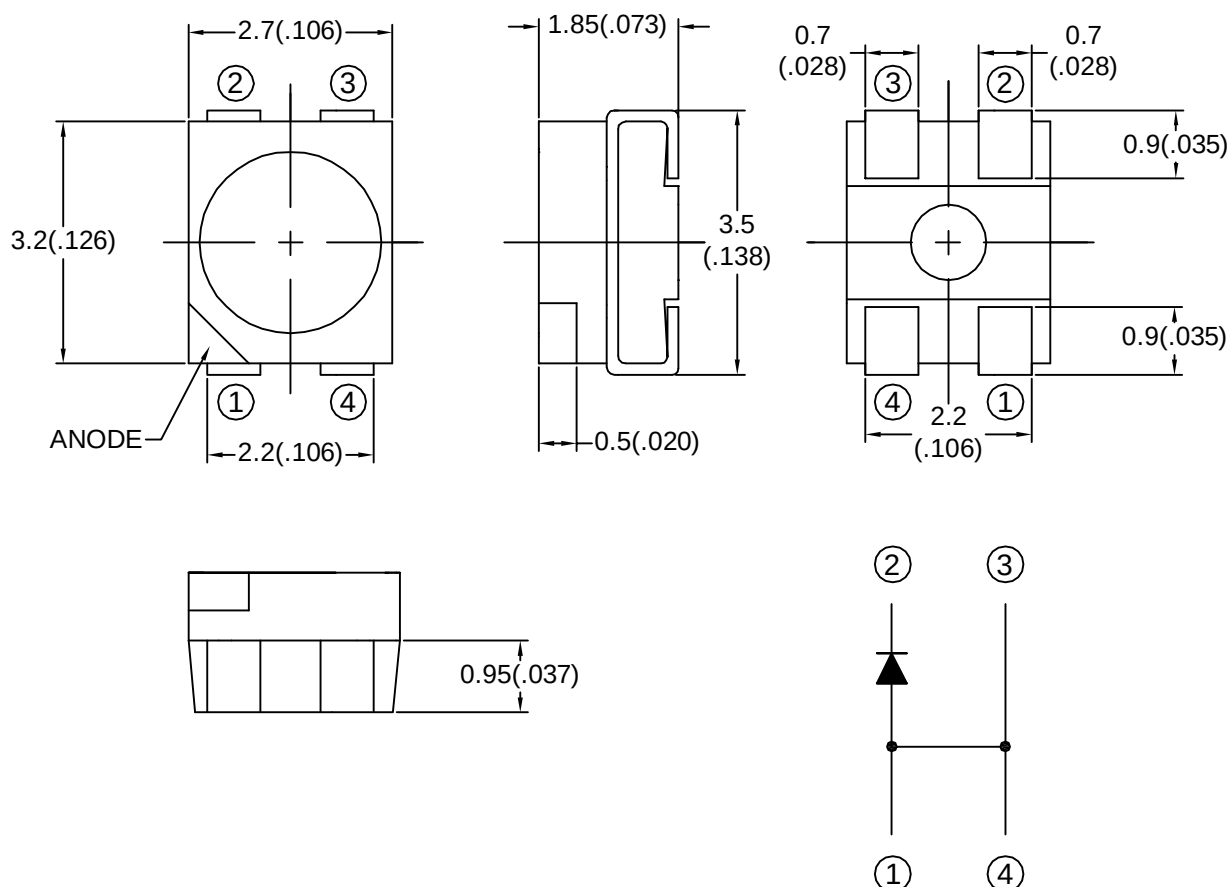
## Features

- \***package** : 12mm tape on 7" diameter reels.
- \***feature of the device** : more light due to higher optical efficiency, higher ambient temperature at the same current possible compared to TOPLED
- \***assembly methods** : suitable for all SMT assembly methods
- \***ESD-withstand voltage** : up to 2kv acc. to JESD22-A114-B

## Applications

- \*traffic lights
- \*backlighting(LCD, switches, keys, displays, illuminated advertising)
- \*interior and exterior automotive lighting(e.g. dashboard backlighting, turn signal lamps, sidemarkers, brake lights)
- \*substitution of micro incandescent lamps
- \*marker lights(e.g. exit ways, etc.)
- \*signal and symbol luminaire

## Package Dimensions

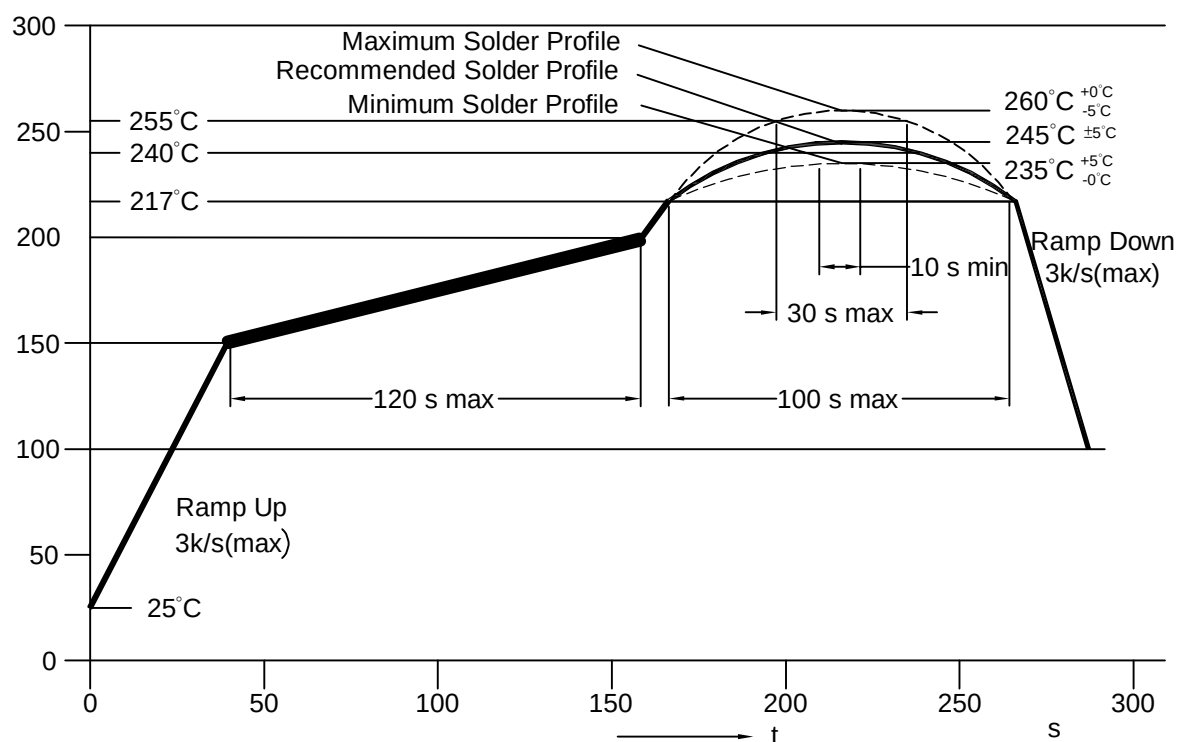


Note : 1.All dimension are in millimeter tolerance is  $\pm 0.2\text{mm}$  unless otherwise noted.  
2.Specifications are subject to change without notice.

**Absolute Maximum Ratings at Ta=25 °C**

| Parameter                               | Symbol | Ratings    | UNIT    |
|-----------------------------------------|--------|------------|---------|
|                                         |        | URF(S)     |         |
| Forward Current                         | IF     | 50         | mA      |
| Peak Forward Current<br>Duty 1/10@10KHz | IFP    | 90         | mA      |
| Power Dissipation                       | PD     | 120        | mW      |
| Reverse Current @5V                     | Ir     | 10         | $\mu$ A |
| Electrostatic Discharge( * )            | ESD    | 2000       | V       |
| Operating Temperature                   | Topr   | -40 ~ +85  | °C      |
| Storage Temperature                     | Tstg   | -40 ~ +100 | °C      |

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

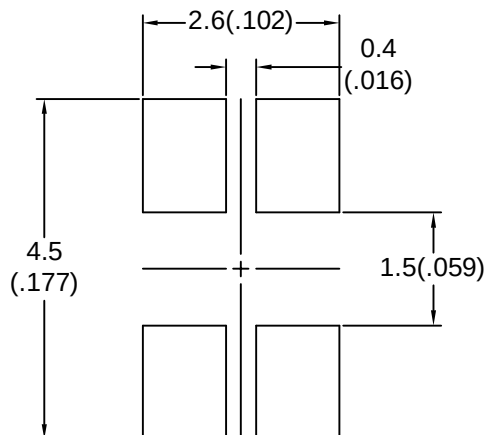
**IR-Reflow Profile for lead free soldering(Acc.to J-STD-020B)**

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

| PART NO         | MATERIAL | COLOR   |             | Dominant wave length<br>$\lambda$ Dnm | Spectral halfwidth<br>$\Delta \lambda$ nm | Forward voltage<br>@50mA(V) |      | Luminous intensity<br>@50mA(mcd) |      | Viewing angle<br>2 $\theta$ 1/2 (deg) |
|-----------------|----------|---------|-------------|---------------------------------------|-------------------------------------------|-----------------------------|------|----------------------------------|------|---------------------------------------|
|                 |          | Emitted | Lens        |                                       |                                           | Min.                        | Max. | Min.                             | Typ. |                                       |
| LURF9553-4S/TR1 | AlGaInP  | Red     | Water Clear | 625                                   | 20                                        | 1.5                         | 2.6  | 500                              | 1250 | 120                                   |

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.

**Recommended Solder Pad useable for PLCC-4 TOPLED**



## Typical Electro-Optical Characteristics Curve

### URFS CHIP

Fig.1 Forward current vs. Forward Voltage

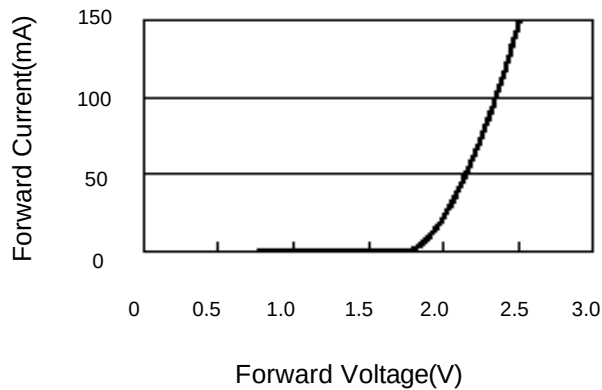


Fig.2 Luminous Intensity vs. Forward Current

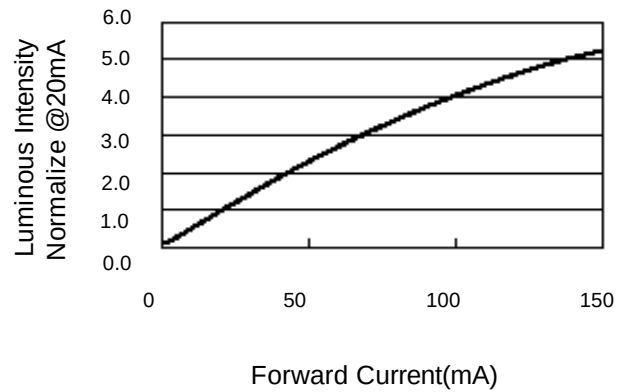


Fig.3 Forward Voltage vs. Temperature

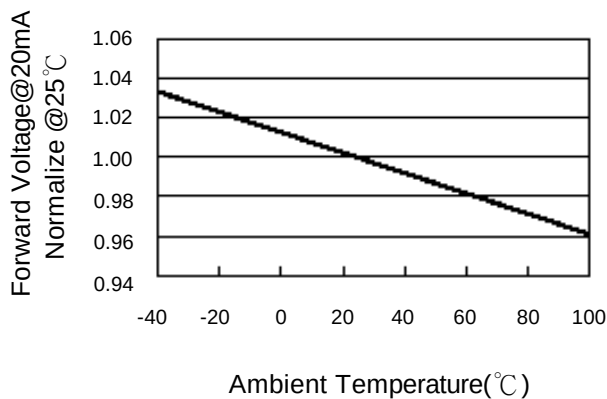


Fig.4 Luminous Intensity vs. Temperature

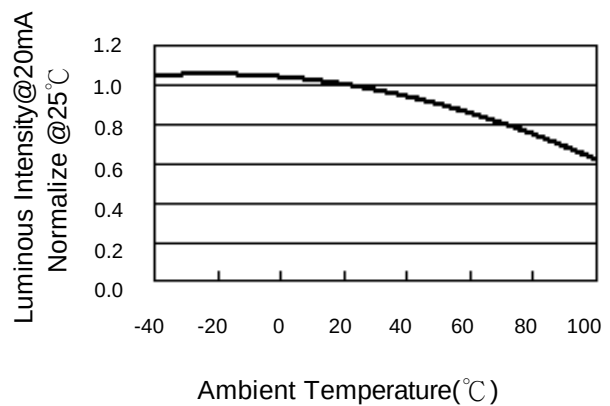


Fig.5 Relative Intensity vs. Wavelength

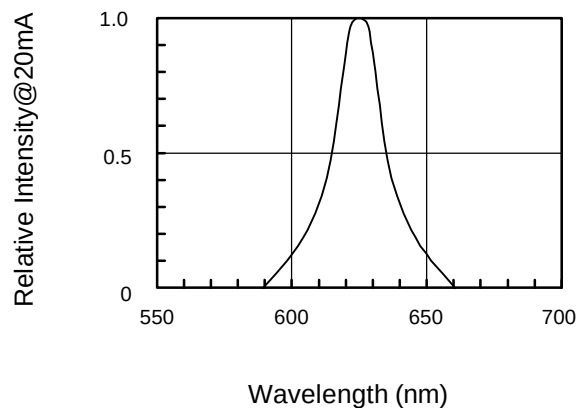
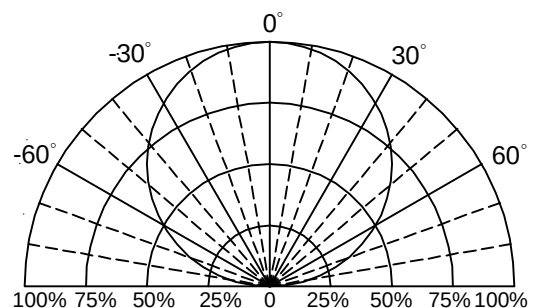


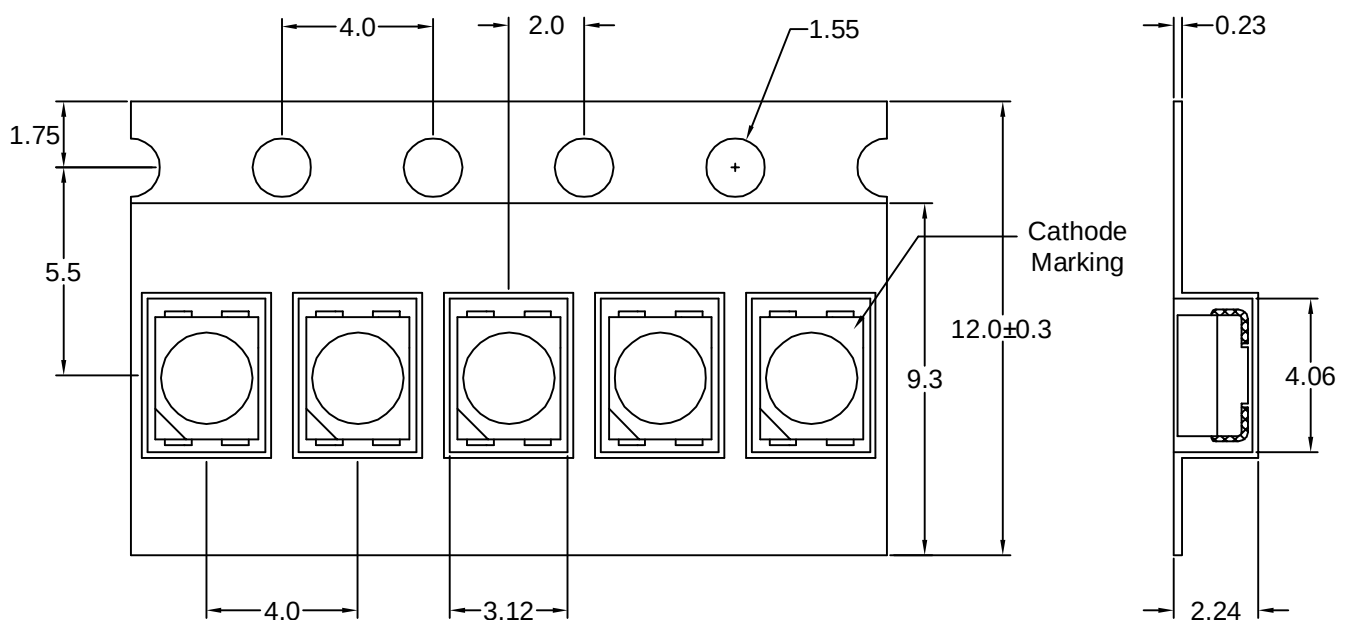
Fig.6 Directivity Radiation





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Technical drawing showing the top and side views of a circular object. The top view shows a circle with a diameter of  $\phi 178 \pm 2.0$  and four protrusions arranged in a cross pattern. The central protrusion has a height of  $14.2 \pm 1.0$ . The side view shows a rectangular profile with a width of  $16.0 \pm 1.0$  and a height of  $74.0 \pm 1.5$ .



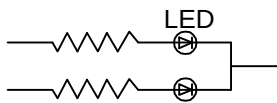
| Part No.        | Description        | Quantity/Reel |
|-----------------|--------------------|---------------|
| LURF9553-4S/TR1 | 12.0mm tape,7"reel | 1500 devices  |



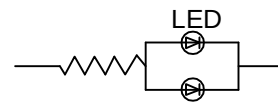
## Drive Method

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 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 if necessary

## ESD(Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling 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=50mA<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=100°C±5°C<br>2.t=1000 hrs (-24hrs, +72hrs)                                                                                                                                                                                                                                         | MIL-STD-883D:1008<br>JIS C 7021: B-10                                                                 |
|                    | Low Temperature Storage Test                | 1.Ta=-40°C±5°C<br>2.t=1000 hrs (-24hrs, +72hrs)                                                                                                                                                                                                                                         | JIS C 7021: B-12                                                                                      |
|                    | High Temperature High Humidity Storage Test | 1.Ta=65°C±5°C<br>2.RH=90%~95%<br>3.t=240hrs±2hrs                                                                                                                                                                                                                                        | MIL-STD-202F:103B<br>JIS C 7021: B-11                                                                 |
| Environmental Test | Thermal Shock Test                          | 1.Ta=105°C±5°C & -40°C±5°C<br>(30min) (30min)<br>2.total 100 cycles                                                                                                                                                                                                                     | MIL-STD-202F: 107D<br>MIL-STD-750D: 1051<br>MIL-STD-883D: 1011                                        |
|                    | Solderability Test                          | 1.T.Sol=235°C±5°C<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°C ~ 25°C ~ -55°C ~ 25°C<br>30mins 5mins 30mins 5mins<br>2.10 Cyeles                                                                                                                                                                                                               | MIL-STD-202F: 107D<br>MIL-STD-750D: 1051<br>MIL-STD-883D: 1010<br>JIS C 7021: A-4                     |
|                    | IR Reflow                                   | Ramp-up rate(217°C to Peak) +3°C second max<br>Temp. maintain at 175( ±25)°C 180 seconds max<br>Temp. maintain above 217°C 60-150 seconds<br>Peak temperature range 260°C +5/-0°C<br>Time within 5°C of actual Peak Temperature(tp)<br>10-30 seconds<br>Ramp-down rate +6 °C/second max | MIL-STD-750D:2031.2<br>J-STD-020B                                                                     |