SURFACE MOUNT LED TAPE AND REEL


Lead-Free Parts

# LHIR9S53

# DATA SHEET

DOC. NO : QW0905-LHIR9S53

REV. : A

DATE : 22 - Aug. - 2014

## Features:

1. Top view LED.

2. white SMT package.

3. Leadframe package with individual 2 pin.

4.Wide viewing angle.

5.Soldering methods:IR reflow soldering.

6.Feature of the device:more light due to higher optical efficiency;extremely wide viewing angle;ideal for backlighting and coupling in light guide.

## Descriptions:

The LHIR9S53 SMD has wide viewing angle and optimized light coupling by inter reflector,The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

## Applications:

1. Smoke detector.

2. VCR.

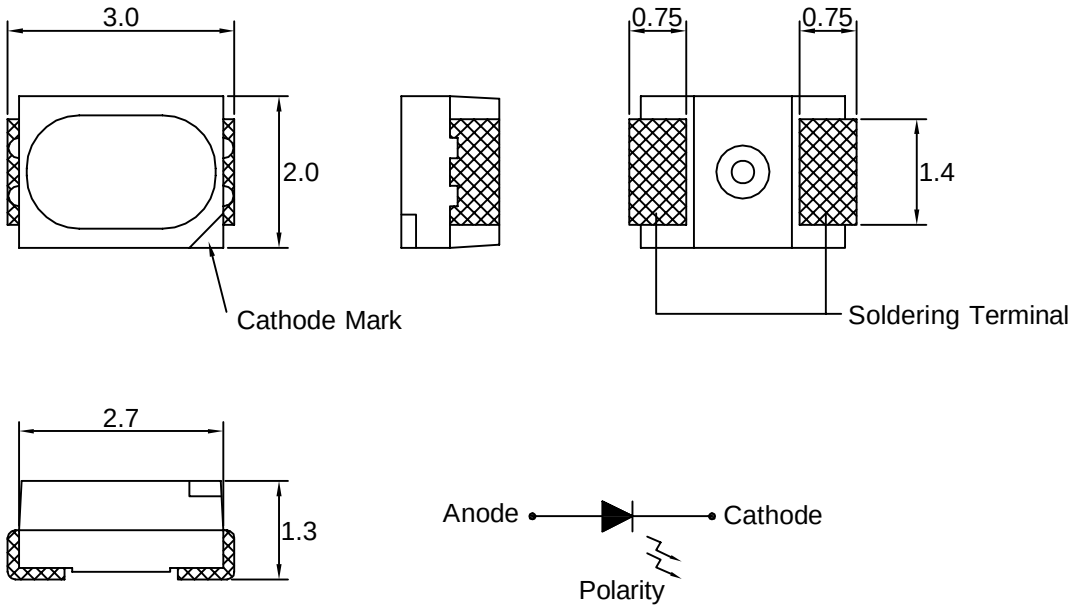
3. Optoelectronic Switch.

4. Sensor.

## Device Selection Guide:

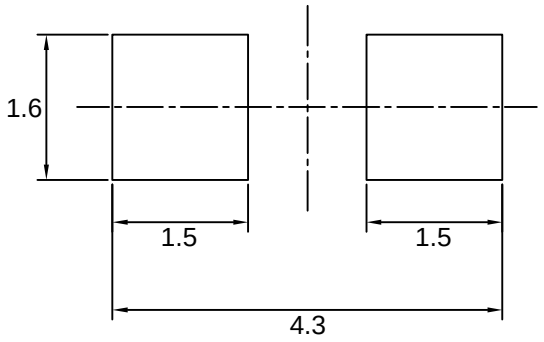
| PART NO | MATERIAL | LENS COLOR |
|---|---|---|
| LHIR9S53 | GaAlAs | Water Clear |

## Package Dimensions




Note : 1.All dimension are in millimeter tolerance is ±0.2mm unless otherwise noted.
2.Specifications are subject to change without notice.

## Recommended Soldering Pad Dimensions




Note : The tolerances unless mentioned is ±0.1mm,Unit=mm.

## Absolute Maximum Ratings at Ta=25 ℃

| Parameter | Symbol | Ratings | UNIT |
|---|---|---|---|
| | | HIR | |
| Power Dissipation | PD | 80 | mW |
| Peak Forward Current (300pps,10 μs Pulse) | $I_{FP}$ | 1 | A |
| Forward Current | $I_F$ | 50 | mA |
| Operating Temperature | $T_{opr}$ | - 40 ~ + 85 | ℃ |
| Storage Temperature | Tstg | - 40 ~ + 100 | ℃ |

## Typical Electrical & Optical Characteristics (Ta=25 ℃)

| PARAMETER | SYMBOL | Min. | Typ. | Max. | UNIT | CONDITION |
|---|---|---|---|---|---|---|
| Radiant Intensity | Po | 2.4 | 3.2 | ---- | mW/sr | IF=20mA |
| Peak Wavelength | λP | ---- | 850 | ---- | nm | IF=20mA |
| Spectral Line Half Width | △λ | ---- | 50 | ---- | nm | IF=20mA |
| Forward Voltage | $V_F$ | ---- | 1.2 | 1.6 | V | IF=20mA |
| Reverse Current | IR | ---- | ---- | 100 | μA | VR=5V |
| Viewing Angle | 2θ 1/2 | ---- | 120 | ---- | deg | IF=20mA |

Note : 1.The Radiant intensity data did not including ±15% testing tolerance.

# Luminous Intensity Classification

| BIN CODE | Po(mw/sr) at 20mA | |
|---|---|---|
| | Min. | Max. |
| N | 2.4 | 3.2 |
| P | 3.2 | 4.2 |
| Q | 4.2 | 5.5 |

# Typical Electro-Optical Characteristics Curve

HIR CHIP

Fig.1 Forward Current vs. Rorward Voltage

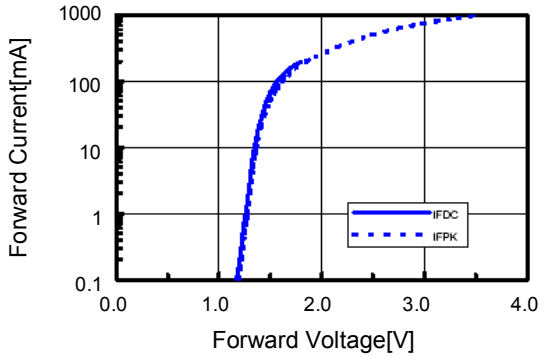



Fig.2 Relative Radiant Power vs. Wavelength

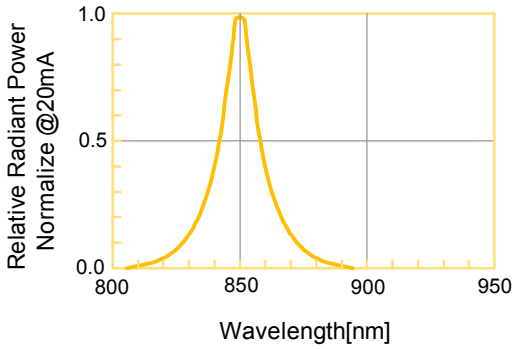



Fig.3 Relative Radiant Power vs. Forward DC Current

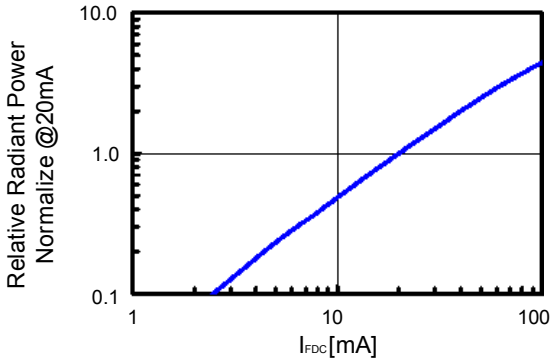



Fig.4 Relative Radiant Power vs. Forward Peak Current

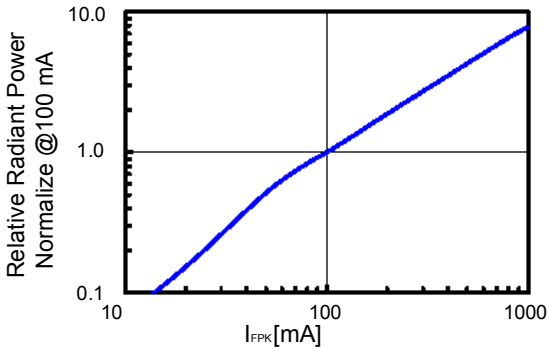



Fig.5 Forward DC Voltage vs. Temperature

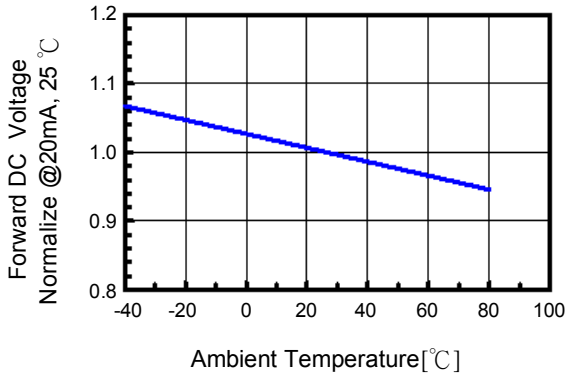



Fig.6 Relative Radiant Power vs. Temperature

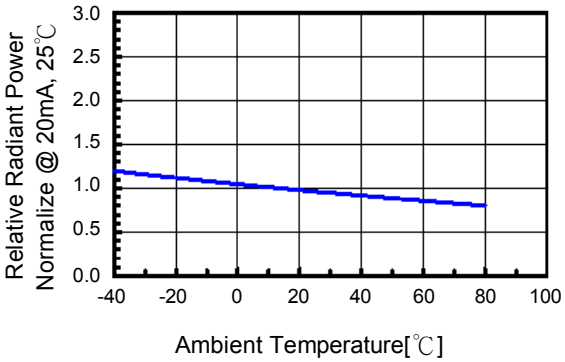
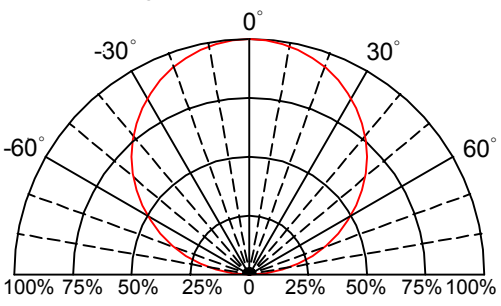
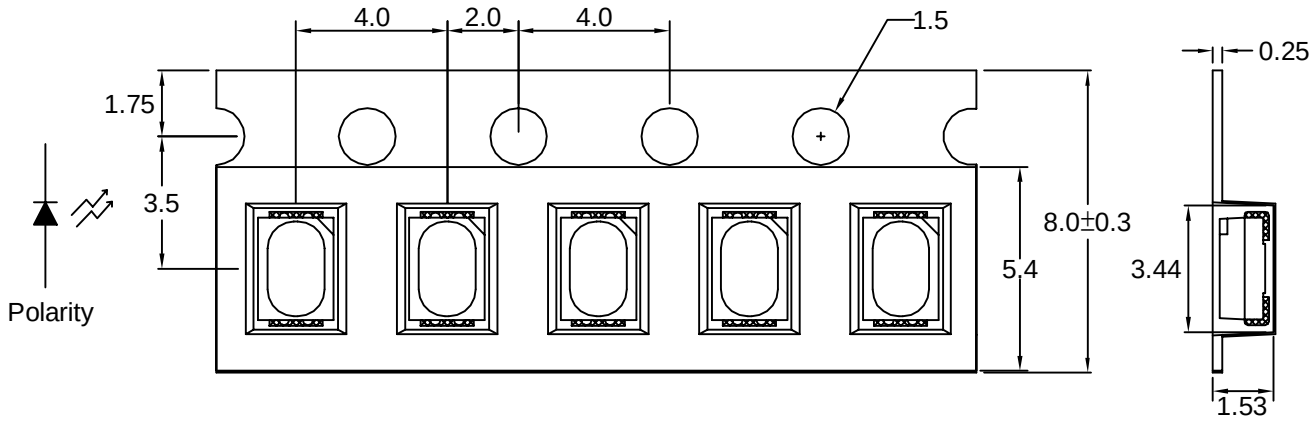



Fig.7 Directive Radiation

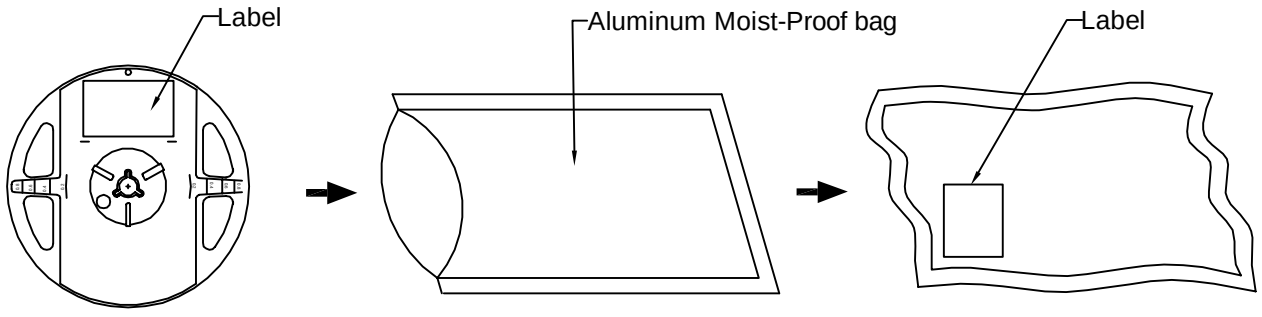


## Carrier Type Dimensions



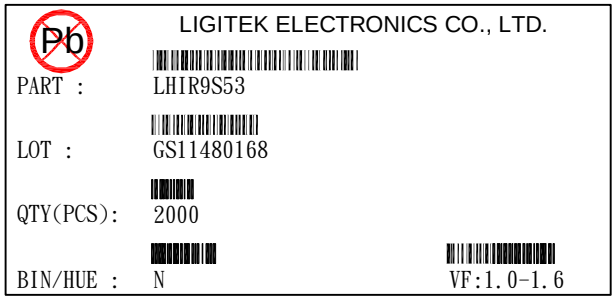

Note : The tolerances unless mentioned is ±0.1mm,Unit=mm.

## • Packing Specifications




| Part No. | Description | Quantity/Reel |
|---|---|---|
| LHIR9S53 | 8.0mm tape,7"reel | 2000 PCS |

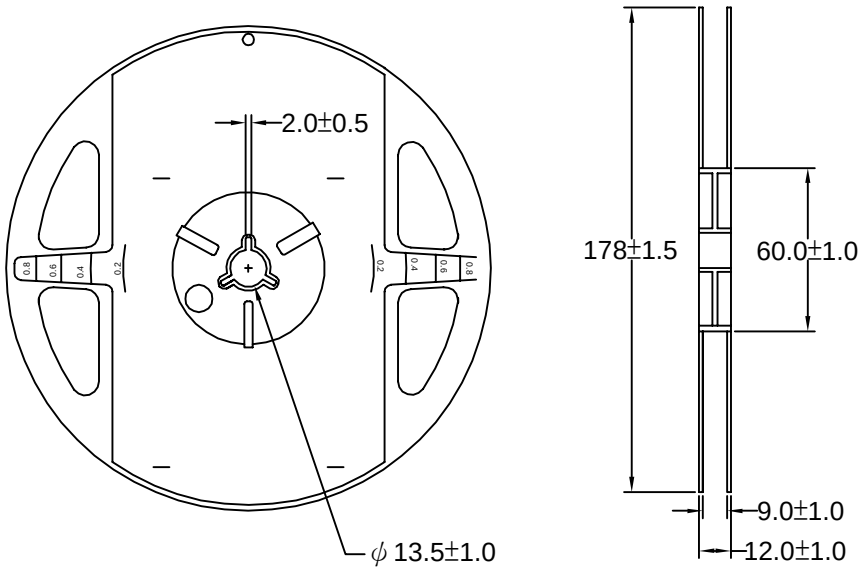
## Label Explanation




BIN : Radiant Intensity

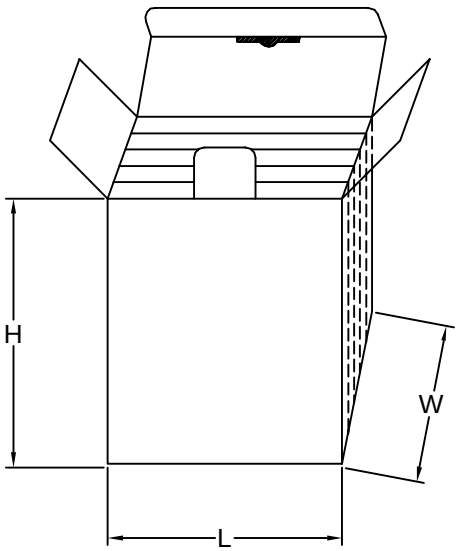
VF : Forward Voltage

## Reel Dimensions

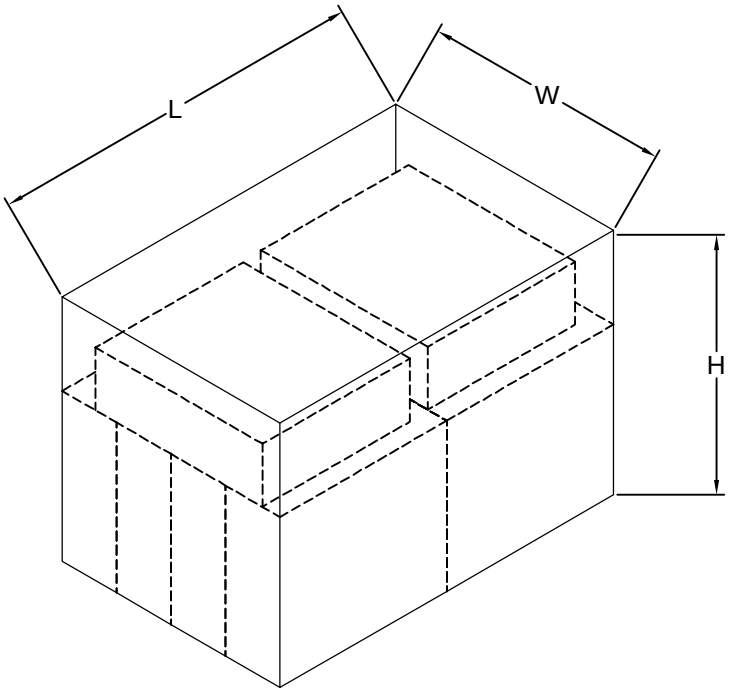


# Box Explanation

1. 5 BAG / INNER BOX
2. INNER BOX SIZE : L X W X H 23cm X 8.5cm x 26cm



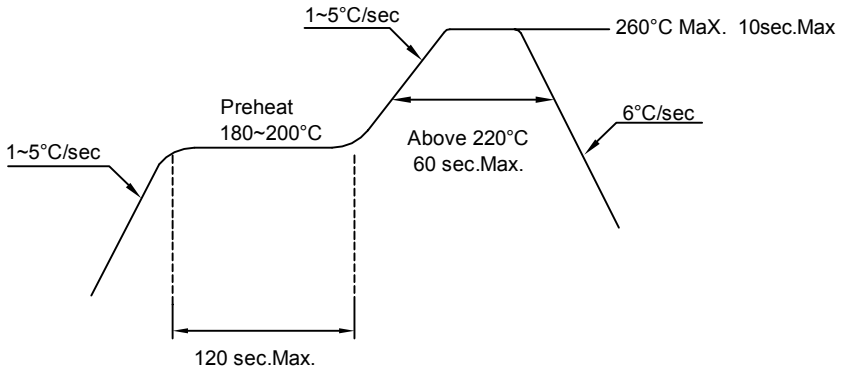

3. 10 INNER BOXES / CARTON
4. CARTON SIZE : L X W X H 58cm X 34cm x 35cm



Recommended Soldering Conditions

1. Hand Solder
   Basic spec is ≦ 320℃ 3 sec one time only.

2. PB-Free Reflow Solder




Note:
1.Reflow soldering should not be done more than two times.
2.When soldering,do not put stress on the LEDs during heating.
3.After soldering,do not warp the circuit board.

## Precautions For Use:

### Storage time:

1.The operation of Temperatures and RH are : 5℃~35℃,RH60%.

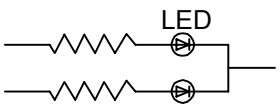
2.Once the package is opened, the products should be used within a week.
Otherwise, they should be kept in a damp proof box with descanting agent.
Considering the tape life, we suggest our customers to use our products within a year(from production date).

3.If opened more than one week in an atmosphere 5℃ ~ 35℃,RH60%,
they should be treated at 60℃±5 ℃fo r 15hrs.

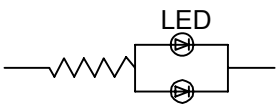
## Drive Method:

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 forwrd 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:

(1)Test items and results

| Classification | Test Item | Test Condition | Sample Size |
|---|---|---|---|
| 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 | 22 |
| | High Temperature Storage Test | 1.Ta=100℃±5℃<br>2.t=500 hrs | 22 |
| | Low Temperature Storage Test | 1.Ta=-40℃±5℃<br>2.t=1000 hrs | 22 |
| | High Temperature High Humidity Storage Test | 1.IR-Reflow In-Board, 2 Times<br>2.Ta=85℃±5℃<br>3.RH=85 %<br>4.t=500hrs±2hrs | 22 |
| Environmental Test | Thermal Shock Test | 1.IR-Reflow In-Board,2 times<br>2.Ta=105℃±5℃ &<br>-40℃±5℃<br>(30min) (30min)<br>3.total 100 cycles | 22 |
| | Reflow Soldering Test | 1.T.Sol=260℃±5℃<br>2.Dwell Time= 10 Max. | 22 |
| | Temperature Cycling | 1.105℃ ~ 25℃ ~ -40℃<br>30mins 15mins 30mins<br>2.100 Cyeles | 22 |

(2)Criteria for judging the damage

| Item | Symbol | Test Conditions | Criteria for Judgement | |
|---|---|---|---|---|
| | | | Min. | Max. |
| Forward Voltage | Vf | If=20mA | - | U.S.L x1.2 |
| Reverse Current | Ir | Vr=5V | - | U.S.L x2.0 |
| Radiant Intensity | Iv | If=20mA | L.S.L x 0.5 | - |

Note:
1.U.S.L.:Upper Standard Level.
2.L.S.L.:Lower Standard Level.