Technical Data Sheet
1.8mm Round Subminiature Infrared LED

Features

- Compatible with infrared and vapor phase reflow solder process.
- Low forward voltage
- Good spectral matching to Si photodetector
- Pb free
- The product itself will remain within RoHS compliant version.

Descriptions

- HIR42-21C/TR8 is an infrared emitting diode in miniature SMD package which is molded in a water clear plastic with spherical top view lens.
- The device is spectrally matched with silicon photodiode and phototransistor.

Applications

- PCB mounted infrared sensor
- Infrared emitting for miniature light barrier
- Floppy disk drive
- Optoelectronic switch
- Smoke detector

Device Selection Guide

<table>
<thead>
<tr>
<th>LED Part No.</th>
<th>Chip Material</th>
<th>Lens Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIR</td>
<td>GaAlAs</td>
<td>Water clear</td>
</tr>
</tbody>
</table>
Package Dimensions

Notes: 1. All dimensions are in millimeters
2. Tolerances unless dimensions ±0.1mm

Absolute Maximum Ratings (Ta=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Forward Current</td>
<td>I_F</td>
<td>65</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>V_R</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>T_opr</td>
<td>-25 ~ +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_stg</td>
<td>-40 ~ +100</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature</td>
<td>T_sol</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Power Dissipation at(or below) 25°C Free Air Temperature</td>
<td>P_d</td>
<td>130</td>
<td>mW</td>
</tr>
</tbody>
</table>

Notes: *1: Soldering time ≤ 5 seconds.
### Electro-Optical Characteristics (Ta=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiant Intensity</td>
<td>$I_e$</td>
<td>$I_F=20mA$</td>
<td>2.0</td>
<td>5.0</td>
<td>15</td>
<td>mW/sr</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F=100mA$</td>
<td></td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulse Width $\leq 100 \mu s$ , Duty $\leq 1%$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Wavelength</td>
<td>$\lambda_p$</td>
<td>$I_F=20mA$</td>
<td>--</td>
<td>850</td>
<td>--</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Bandwidth</td>
<td>$\Delta \lambda$</td>
<td>$I_F=20mA$</td>
<td>--</td>
<td>45</td>
<td>--</td>
<td>nm</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>$V_F$</td>
<td>$I_F=20mA$</td>
<td>--</td>
<td>1.45</td>
<td>1.65</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F=100mA$</td>
<td></td>
<td>1.80</td>
<td>2.40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulse Width $\leq 100 \mu s$ , Duty $\leq 1%$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse Current</td>
<td>$I_R$</td>
<td>$V_R=5V$</td>
<td>--</td>
<td>--</td>
<td>10</td>
<td>$\mu$A</td>
</tr>
<tr>
<td>View Angle</td>
<td>$2 \theta 1/2$</td>
<td>$I_F=20mA$</td>
<td>--</td>
<td>20</td>
<td>--</td>
<td>deg</td>
</tr>
</tbody>
</table>
Typical Electro-Optical Characteristics Curves

Fig. 1 Forward Current vs. Ambient Temperature

Fig. 2 Spectral Distribution

Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

Fig. 4 Forward Current vs. Forward Voltage
Typical Electro-Optical Characteristics Curves

Fig. 5 Relative Intensity vs. Forward Current

Fig. 6 Relative Radiant Intensity vs. Angular Displacement

Fig. 7 Relative Intensity vs. Ambient Temperature(°C)

Fig. 8 Forward Current vs. Ambient Temperature(°C)
Precautions For Use

1. Over-current-proof
   Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage
   2.1 Do not open moisture proof bag before the products are ready to use.
   2.2 Before opening the package, the LEDs should be kept at 30°C or less and 90%RH or less.
   2.3 The LEDs should be used within a year.
   2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.
   2.5 The LEDs should be used within 168 hours (7 days) after opening the package.
   2.6 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.
      Baking treatment: 60±5°C for 24 hours.

3. Soldering Condition
   3.1 Pb-free solder temperature profile

   3.2 Reflow soldering should not be done more than two times.
   3.3 When soldering, do not put stress on the LEDs during heating.
   3.4 After soldering, do not warp the circuit board.
4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 280°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.
Confidence level: 90%
LTPD: 10%

<table>
<thead>
<tr>
<th>NO.</th>
<th>Item</th>
<th>Test Conditions</th>
<th>Test Hours/ Cycles</th>
<th>Sample Sizes</th>
<th>Failure Judgement Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>REFLOW Soldering</td>
<td>TEMP. : 260℃±5℃ 5secs</td>
<td>6Mins</td>
<td>22pcs</td>
<td>$I_R \geq U \times 2$</td>
</tr>
<tr>
<td>2</td>
<td>Temperature Cycle</td>
<td>H : +100℃ L : -40℃</td>
<td>15mins 5mins 15mins</td>
<td>50cycles 22pcs</td>
<td>$E_e \leq L \times 0.8 , , , , V_F \geq U \times 1.2$</td>
</tr>
<tr>
<td>3</td>
<td>Thermal Shock</td>
<td>H : +100℃ L : -10℃</td>
<td>5mins 10secs 5mins</td>
<td>50cycles 22pcs</td>
<td>$U$ : Upper Specification Limit</td>
</tr>
<tr>
<td>4</td>
<td>High Temperature Storage</td>
<td>TEMP. : +100℃</td>
<td>1000hrs</td>
<td>22pcs</td>
<td>$L$ : Lower Specification Limit</td>
</tr>
<tr>
<td>5</td>
<td>Low Temperature Storage</td>
<td>TEMP. : -40℃</td>
<td>1000hrs</td>
<td>22pcs</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>DC Operating Life</td>
<td>$I_F=20mA$</td>
<td>1000hrs</td>
<td>22pcs</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>High Temperature/ High Humidity</td>
<td>85℃ / 85% R.H</td>
<td>1000hrs</td>
<td>22pcs</td>
<td></td>
</tr>
</tbody>
</table>
Package Dimensions

![Package Dimensions Diagram]

Taping Dimensions

![Taping Dimensions Diagram]

Unit: mm
Packing Quantity Specification
1. 1000 Pcs/1 Volume • 1 Volume/1 Bag
2. 10 Boxes/1 Carton

Label Form Specification

- CPN: Customer’s Production Number
- P/N: Production Number
- QTY: Packing Quantity
- CAT: Ranks
- HUE: Peak Wavelength
- REF: Reference
- LOT No: Lot Number
- MADE IN TAIWAN: Production Place

Notes
1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
3. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don’t reproduce or cause anyone to reproduce them without EVERLIGHT’s consent.