

## Technical Data Sheet

### 3mm Infrared LED , T-1

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#### **HIR204**

#### **Features**

- High reliability
- High radiant intensity
- Peak wavelength  $\lambda_p=850\text{nm}$
- 2.54mm Lead spacing
- Low forward voltage
- Pb free

#### **Descriptions**

- EVERLIGHT's infrared emitting diode(HIR204) is a high intensity diode , molded in a yellow transparent plastic package.
- The device is spectrally matched with phototransistor , photodiode and infrared receiver module.

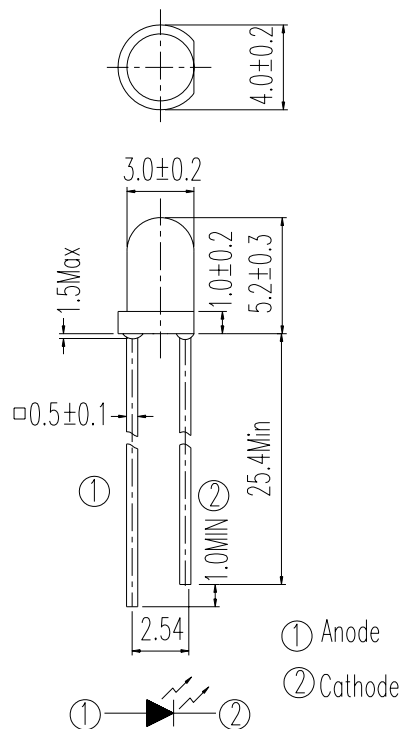


#### **Applications**

- Free air transmission system
- Optoelectronic switch
- Floppy disk drive
- Infrared applied system
- Camera

#### **Device Selection Guide**

| LED Part No. | Chip     | Lens Color |
|--------------|----------|------------|
|              | Material |            |
| HIR          | GaAlAs   | Yellow     |

**Package Dimensions**


**Notes:** 1.All dimensions are in millimeters  
2.Tolerances unless dimensions  $\pm 0.25\text{mm}$

**Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )**

| Parameter                                                                  | Symbol    | Rating         | Units            |
|----------------------------------------------------------------------------|-----------|----------------|------------------|
| Continuous Forward Current                                                 | $I_F$     | 100            | mA               |
| Peak Forward Current                                                       | $I_{FP}$  | 1.0            | A                |
| Reverse Voltage                                                            | $V_R$     | 5              | V                |
| Operating Temperature                                                      | $T_{opr}$ | $-40 \sim +85$ | $^\circ\text{C}$ |
| Storage Temperature                                                        | $T_{stg}$ | $-40 \sim +85$ | $^\circ\text{C}$ |
| Soldering Temperature                                                      | $T_{sol}$ | 260            | $^\circ\text{C}$ |
| Power Dissipation at(or below)<br>25 $^\circ\text{C}$ Free Air Temperature | $P_d$     | 150            | mW               |

**Notes:** \*1: $I_{FP}$  Conditions--Pulse Width  $\leq 100 \mu\text{s}$  and Duty  $\leq 1\%$ .

\*2:Soldering time  $\leq 5$  seconds.

**Electro-Optical Characteristics (Ta=25°C)**

| Parameter          | Symbol            | Condition                                                | Min. | Typ. | Max. | Units |
|--------------------|-------------------|----------------------------------------------------------|------|------|------|-------|
| Radiant Intensity  | Ee                | I <sub>F</sub> =20mA                                     | 7.8  | 17.6 | --   | mW/sr |
|                    |                   | I <sub>F</sub> =100mA<br>Pulse Width ≤ 100 μs ,Duty ≤ 1% | --   | 90   | --   |       |
|                    |                   | I <sub>F</sub> =1A<br>Pulse Width ≤ 100 μs ,Duty ≤ 1%.   | --   | 900  | --   |       |
| Peak Wavelength    | λ <sub>p</sub>    | I <sub>F</sub> =20mA                                     | --   | 850  | --   | nm    |
| Spectral Bandwidth | Δλ                | I <sub>F</sub> =20mA                                     | --   | 45   | --   | nm    |
| Forward Voltage    | V <sub>F</sub>    | I <sub>F</sub> =20mA                                     |      | 1.45 | 1.65 | V     |
|                    |                   | I <sub>F</sub> =100mA<br>Pulse Width ≤ 100 μs ,Duty ≤ 1% | --   | 1.80 | 2.40 |       |
|                    |                   | I <sub>F</sub> =1A<br>Pulse Width ≤ 100 μs ,Duty ≤ 1%.   | --   | 4.10 | 5.25 |       |
| Reverse Current    | I <sub>R</sub>    | V <sub>R</sub> =5V                                       | --   | --   | 10   | μA    |
| View Angle         | 2θ <sub>1/2</sub> | I <sub>F</sub> =20mA                                     | --   | 25   | --   | deg   |

## Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs.  
Ambient Temperature

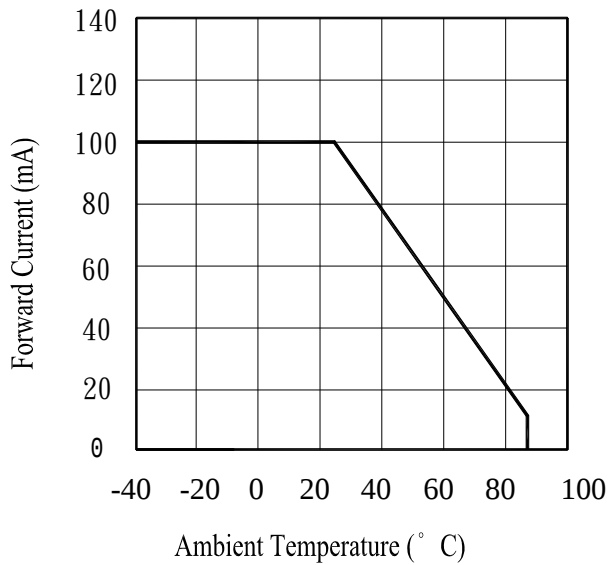


Fig.2 Spectral Distribution

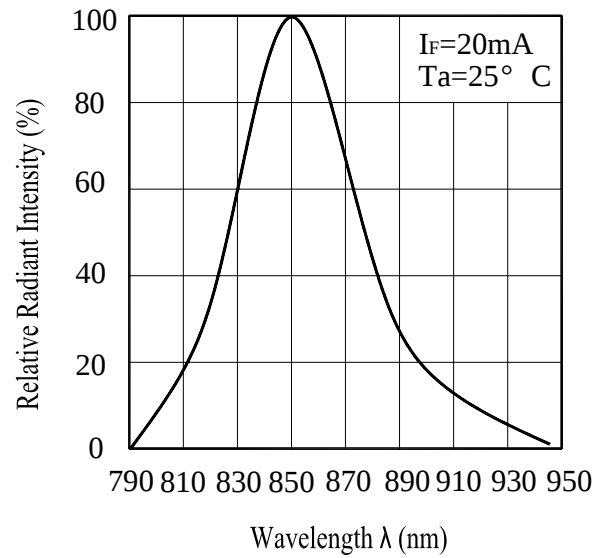


Fig.3 Peak Emission Wavelength  
Ambient Temperature

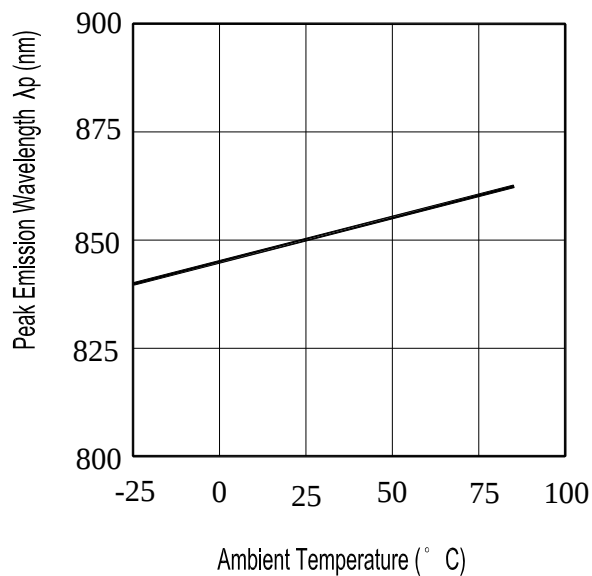
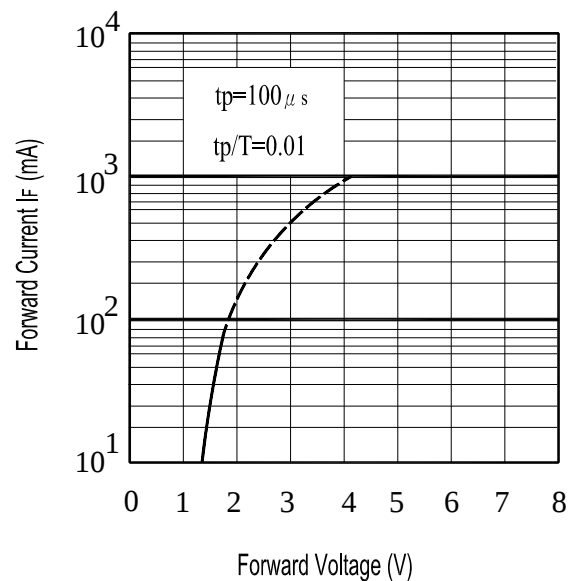


Fig.4 Forward Current  
vs. Forward Voltage



## Typical Electro-Optical Characteristics Curves

Fig.5 Relative Intensity vs.  
Forward Current

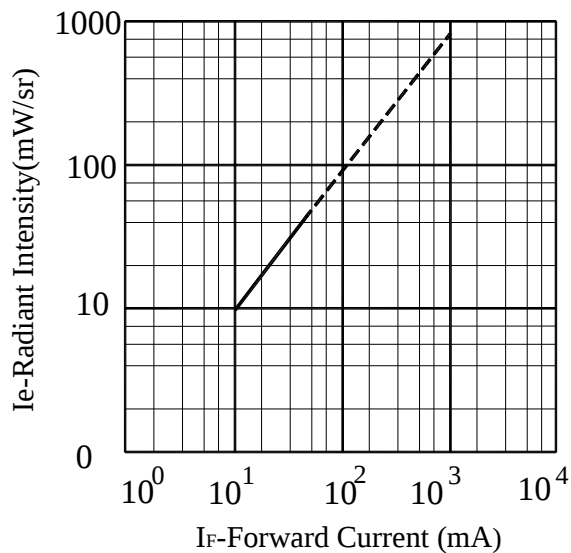


Fig.6 Relative Radiant Intensity vs.  
Angular Displacement

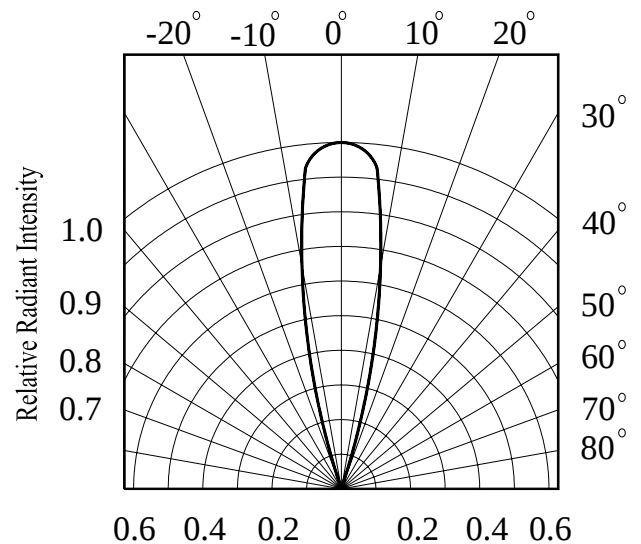


Fig.7 Relative Intensity vs.  
Ambient Temperature(°C)

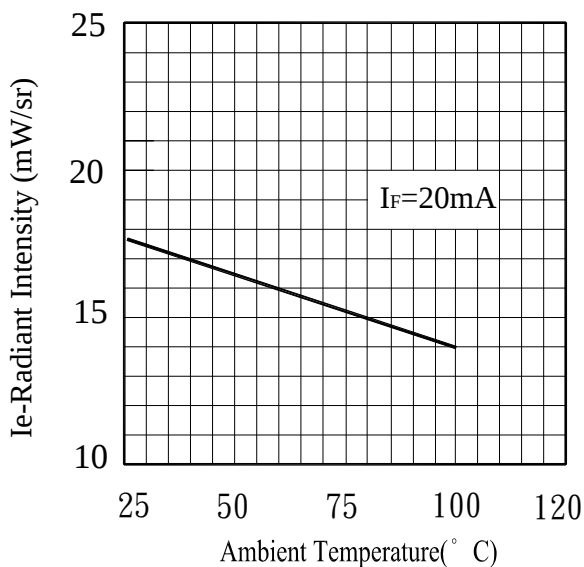
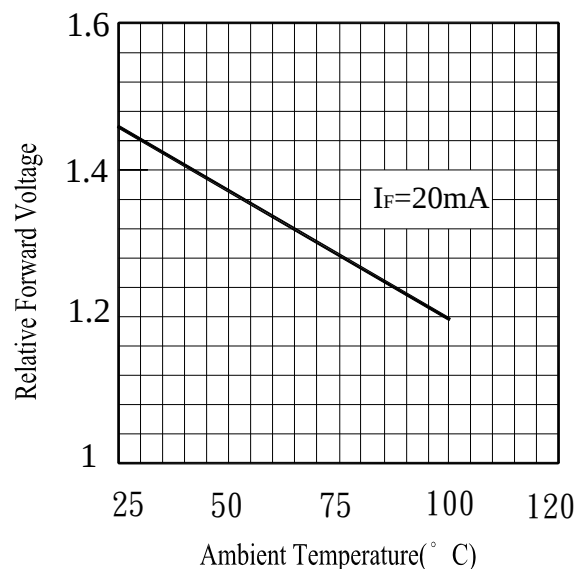


Fig.8 Forward Voltage vs.  
Ambient Temperature(°C)



**Reliability Test Item And Condition**

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

| NO. | Item                               | Test Conditions                                                                               | Test Hours/<br>Cycles | Sample<br>Sizes | Failure<br>Judgement<br>Criteria                                                                                                                                  | Ac/Re |
|-----|------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1   | Solder Heat                        | TEMP. : $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$                                           | 10secs                | 22pcs           | $I_R \geq U \times 2$<br>$E_e \leq L \times 0.8$<br>$V_F \geq U \times 1.2$<br><br>U : Upper<br>Specification<br><br>Limit<br>L : Lower<br>Specification<br>Limit | 0/1   |
| 2   | Temperature Cycle                  | H : $+100^{\circ}\text{C}$ 15mins<br>$\updownarrow$ 5mins<br>L : $-40^{\circ}\text{C}$ 15mins | 50Cycles              | 22pcs           |                                                                                                                                                                   | 0/1   |
| 3   | Thermal Shock                      | H : $+100^{\circ}\text{C}$ 5mins<br>$\updownarrow$ 10secs<br>L : $-10^{\circ}\text{C}$ 5mins  | 50Cycles              | 22pcs           |                                                                                                                                                                   | 0/1   |
| 4   | High Temperature Storage           | TEMP. : $+100^{\circ}\text{C}$                                                                | 1000hrs               | 22pcs           |                                                                                                                                                                   | 0/1   |
| 5   | Low Temperature Storage            | TEMP. : $-40^{\circ}\text{C}$                                                                 | 1000hrs               | 22pcs           |                                                                                                                                                                   | 0/1   |
| 6   | DC Operating Life                  | $I_F = 20\text{mA}$                                                                           | 1000hrs               | 22pcs           |                                                                                                                                                                   | 0/1   |
| 7   | High Temperature/<br>High Humidity | $85^{\circ}\text{C}$ / 85% R.H                                                                | 1000hrs               | 22pcs           |                                                                                                                                                                   | 0/1   |

**Packing Quantity Specification**

1.1000PCS/1Bag , 4Bags/1Box

2.10Boxes/1Carton

**Label Form Specification**

CPN: Customer's Production Numb

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 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.

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