

# SUBMINIATURE PHOTOINTERRUPTER

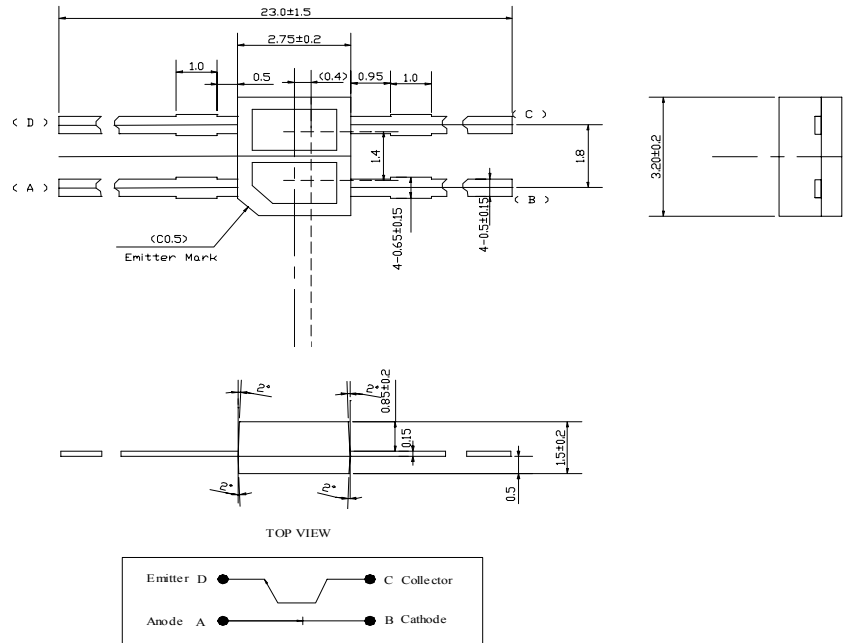
## MIR-3301-P

### Description

The MIR-3301-P consists of a Gallium Arsenide infrared emitting diode and a NPN silicon phototransistor built in a black plastic housing. It is a reflective subminiature photointerrupter.

### Package Dimensions

Unit: mm



### Features

- Compact and thin
- MIR-3301 : long lead type
- Optimum detecting distance : 0.8 - 1.0 mm
- Wavelength : 940nm
- Visible light cut-off type
- Flat lead type

NOTE :

- (1).Tolerance:±0.2mm
- (2). ( ) Reference dimensions

### Absolute Maximum Ratings

@ T<sub>A</sub>=25°C

| Parameter   |                                     | Symbol               | Minimum Rating    | Maximum Rating | Unit |
|---|-------------------------------------|----------------------|-------------------|----------------|------|
| INPUT   | Continuous Forward Current          | I <sub>F</sub>       |                   | 50             | mA   |
|   | Reverse Voltage                     | V <sub>R</sub>       |                   | 5              | V    |
|   | Power Dissipation                   | P <sub>ad</sub>      |                   | 75             | mW   |
| OUTPUT  | Collector-emitter breakdown voltage | V <sub>(BR)CEO</sub> | 30                |                | V    |
|   | Emitter-Collector breakdown voltage | V <sub>(BR)ECO</sub> | 5                 |                | V    |
|   | Collector power dissipation         | P <sub>C</sub>       |                   | 75             | mW   |
| Total power dissipation   |                                     | P <sub>TOT</sub>     |                   | 100            | mW   |
| Operating Temperature Range   |                                     | T <sub>opr</sub>     | -25 °C to + 85°C  |                |      |
| Storage Temperature Range   |                                     | T <sub>stg</sub>     | -40 °C to + 100°C |                |      |
| Lead Soldering Temperature (within 5 sec, minimum 1.6mm from body) at 260°C |                                     |                      |                   |                |      |

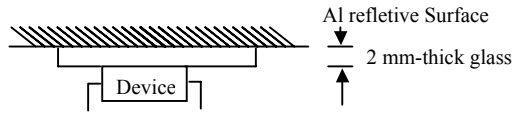
Optical-Electrical Characteristics

| Parameter                |                        | Symbol    | Min . | Typ . | Max .   | Unit .               | Test Conditions           |                      |
|--------------------------|------------------------|-----------|-------|-------|---------|----------------------|---------------------------|----------------------|
| Input                    | Forward Voltage        | $V_F$     | -     | 1.2   | 1.4     | V                    | $I_F=20mA$                |                      |
|                          | Reverse Current        | $I_R$     | -     | -     | 10      | $\mu A$              | $V_R=5V$                  |                      |
| Output                   | Collector Dark Current | $I_{ceo}$ | -     | -     | 100     | nA                   | $V_{ce}=10V$              |                      |
| Transfer Characteristics | *1 Collector Current   | $I_c$     | B     | 38    | -       | 75                   | $\mu A$                   | $I_F=4mA, V_{ce}=5V$ |
|                          |                        |           | C     | 56    | -       | 108                  |                           |                      |
|                          |                        |           | D     | 80    | -       | 151                  |                           |                      |
|                          |                        |           | E     | 112   | -       | 216                  |                           |                      |
|                          | Response Time (RISE)   | $t_r$     | -     | 20    | 100     | $\mu S$              | $I_c=100\mu A, V_{ce}=2V$ |                      |
| Response Time (FALL)     | $t_f$                  | -         | 20    | 100   | $\mu S$ | $R_L=1K, d=1mm$      |                           |                      |
| *2 Leak Current          | $I_{LEAK}$             | -         | -     | 0.1   | $\mu A$ | $I_F=4mA, V_{ce}=5V$ |                           |                      |

\*1 THE CONDITION AND ARRANGEMENT OF THE REFLECTIVE OBJECT ARE SHOWN AS FOLLOWING .

\*2 WITHOUT REFLECTIVE OBJECT.

TEST CONDITION AND ARRANGEMENT FOR COLLECTOR CURRENT



Typical Optical-Electrical Characteristic Curves

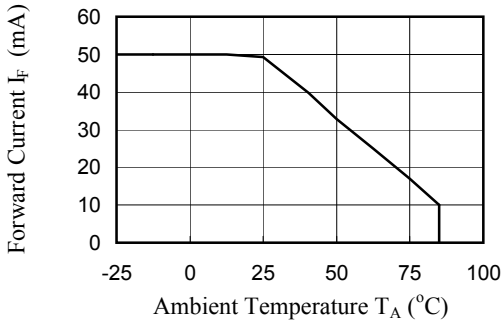


Fig.1 forward Current vs. Ambient Temperature

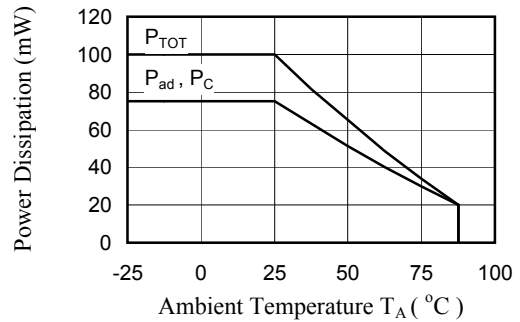


Fig.2 Power Dissipation vs. Ambient Temperature

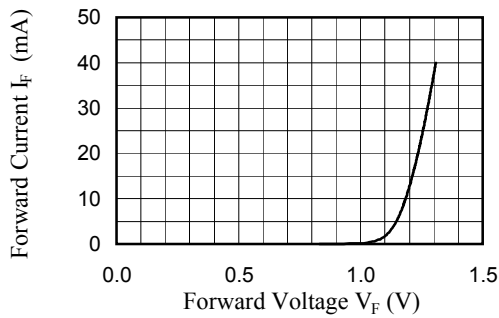


Fig.3 Forward Current vs Forward Voltage

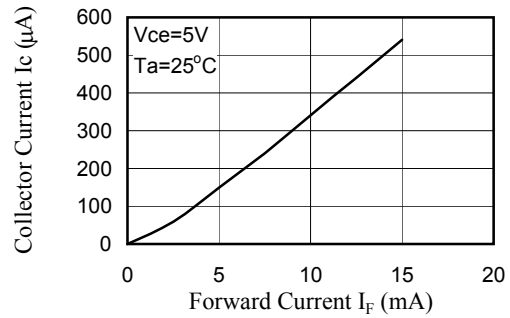


Fig.4 Collector Current vs. Forward Current

Typical Optical-Electrical Characteristic Curves

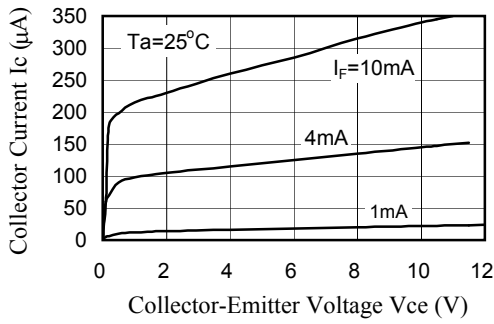


Fig.5 Collector Current vs. Vce

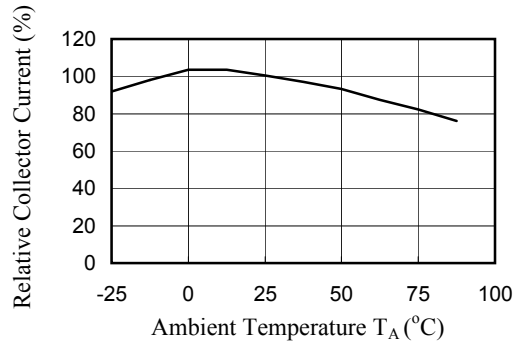


Fig.6 Relative Collector Current vs.

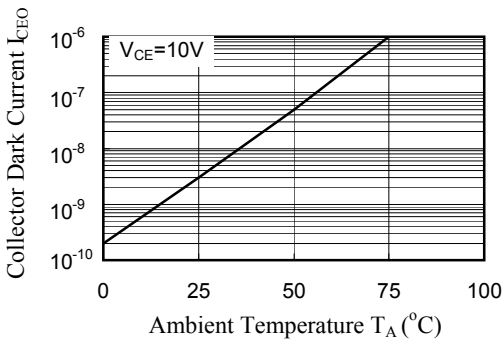


Fig.7 Collector Dark Current vs. Ambient Temperature

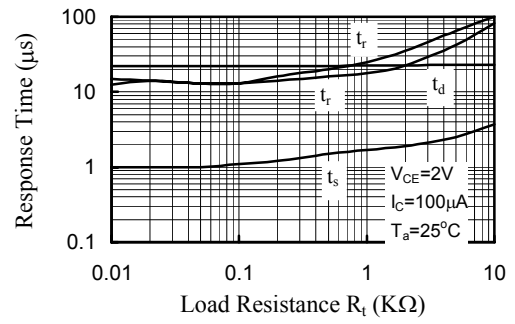


Fig.8 Response Time vs. Load Resistance

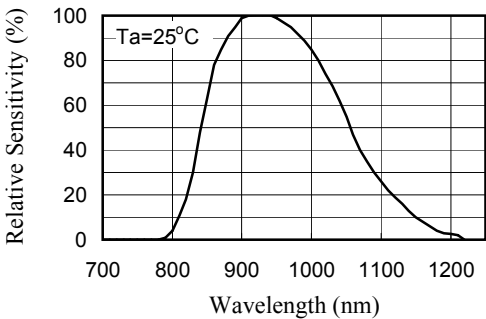


Fig.9 Spectral Sensitivity (Detecting side)

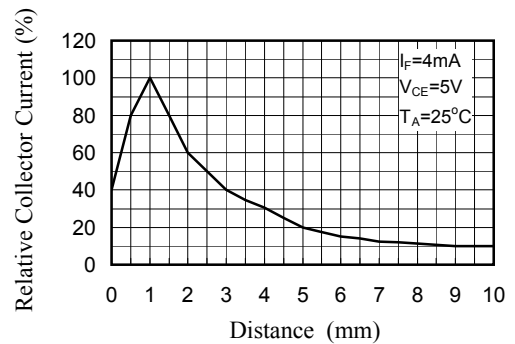


Fig.10 Relative Collector Current vs. Distance between MIR-3301 and Card

Test Circuit for Response Time

