

Module No.: RS-05FA

### 1. General Description

RS-05FA reflective sensor combines a GaAs infrared light emitting diode with a high sensitive phototransistor in a super mini chip-type package, reducing installation space.

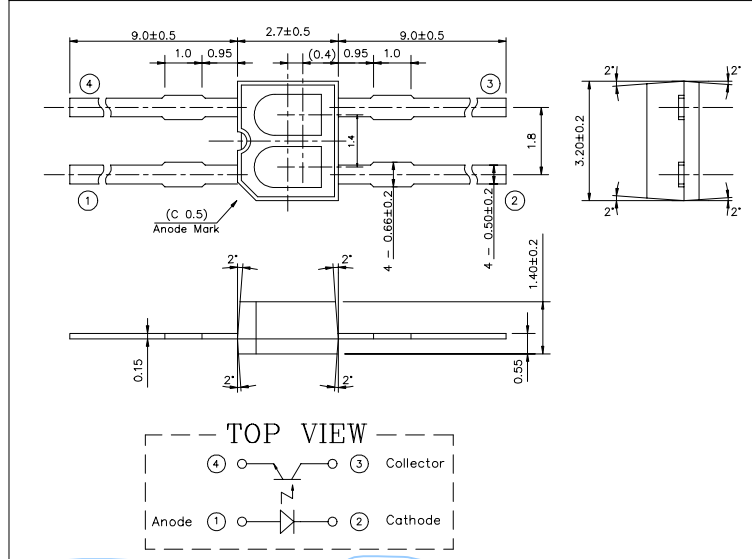
### 2. Features

- Compact
- High performance
- High speed response
- Easy to mount on P.C.B.
- Widely applicable

### 3. Applications

- ▣ Timing sensors
- ▣ Edge sensors
- ▣ Micro floppy disc drives
- ▣ Level sensors of liquid

### Dimensions (Unit: mm)



### 4. Maximum Ratings

(Ta=25°C)

|                          | Item                        | Symbol    | Rating    | Unit |
|--------------------------|-----------------------------|-----------|-----------|------|
| Input                    | Power Dissipation           | $P_D$     | 75        | mW   |
|                          | Reverse Voltage             | $V_R$     | 5         | V    |
|                          | Forward Current             | $I_F$     | 50        | mA   |
|                          | Pulse Forward Current *1    | $I_{FP}$  | 1         | A    |
| Output                   | Collector Power Dissipation | $P_c$     | 50        | mW   |
|                          | Collector Current           | $I_c$     | 20        | mA   |
|                          | C-E Voltage                 | $V_{CEO}$ | 30        | V    |
|                          | E-C Voltage                 | $V_{ECO}$ | 3         | V    |
| Operating Temperature    |                             | $T_{opr}$ | -25 ~ +85 | °C   |
| Storage Temperature      |                             | $T_{stg}$ | -30 ~ +95 | °C   |
| Soldering Temperature *2 |                             | $T_{sol}$ | 240       | °C   |

\*1.  $t_w=100\mu\text{sec}$ .  $T=10\text{msec}$ .

\*2. At the position of 2mm from the bottom of the package within 5 seconds.

### 5. Electro-optical Characteristics

(Ta=25°C)

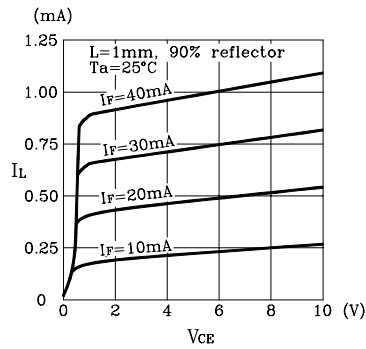
|                  | Item                   | Symbol      | Conditions                                                           | Min. | Typ. | Max. | Unit            |
|------------------|------------------------|-------------|----------------------------------------------------------------------|------|------|------|-----------------|
| Input            | Forward Voltage        | $V_F$       | $I_F=10\text{mA}$                                                    |      |      | 1.3  | V               |
|                  | Reverse Current        | $I_R$       | $V_R=5\text{V}$                                                      |      |      | 10   | $\mu\text{A}$   |
|                  | Capacitance            | $C_t$       | $V=0\text{V}$ , $f=1\text{kHz}$                                      |      | 25   |      | pF              |
|                  | Peak Wavelength        | $\lambda_p$ |                                                                      |      | 940  |      | nm              |
| Output           | Collector Dark Current | $I_{CEO}$   | $V_{CE}=10\text{V}$                                                  |      |      | 0.2  | $\mu\text{A}$   |
|                  | Light Current          | $I_L$       | $V_{CE}=5\text{V}$ , $I_F=10\text{mA}$                               | 90   |      |      | $\mu\text{A}$   |
|                  | Leakage Current        | $I_{CEOD}$  | $V_{CE}=5\text{V}$ , $I_F=10\text{mA}$                               |      |      | 0.2  | $\mu\text{A}$   |
| Switching Speeds | Rise Time              | $t_r$       | $V_{CC}=2\text{V}$ , $I_c=100\mu\text{A}$ ,<br>$R_L=1\text{k}\Omega$ |      | 30   |      | $\mu\text{sec}$ |
|                  | Fall Time              | $t_f$       |                                                                      |      | 25   |      | $\mu\text{sec}$ |



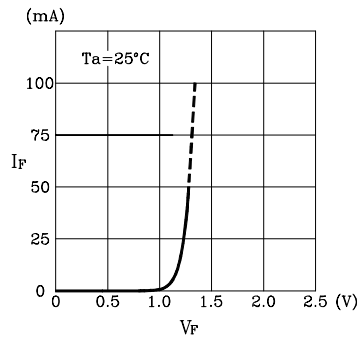
## Photo Reflective Sensor

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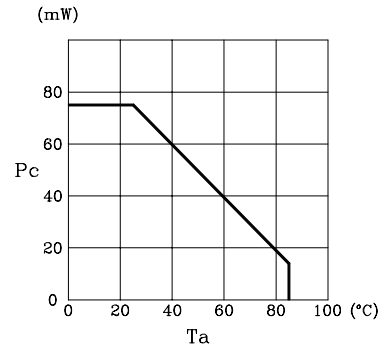
Light Current vs  
Collector-Emitter Voltage



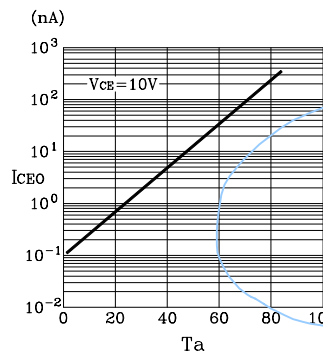
Forward Current vs  
Forward Voltage



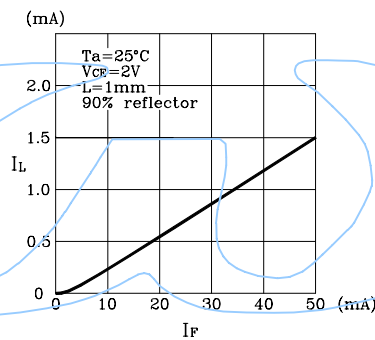
Power Dissipation vs  
Ambient Temperature



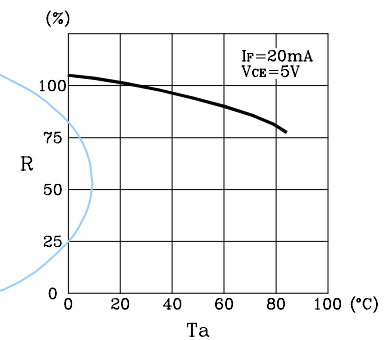
Dark Current vs  
Ambient Temperature



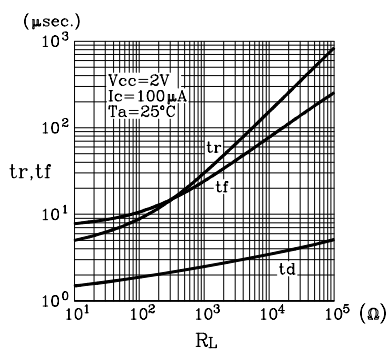
Light Current vs  
Forward Current



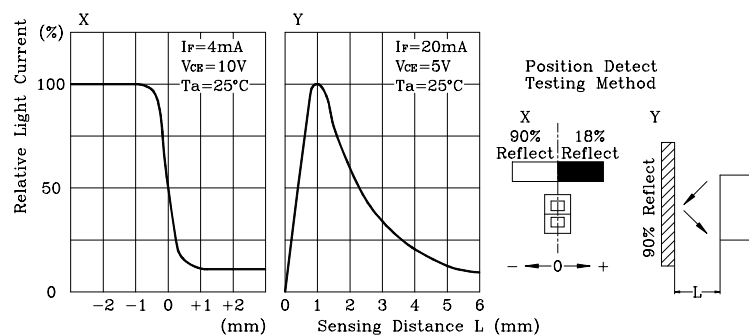
Relative Light Current vs  
Ambient Temperature



Response Time vs  
Load Resistance



Position Detect  
Characteristics



Response Time Test Conditions

