

Technical Data Sheet

OPTO INTERRUPTER ITR

ITR20403

■ Features

- Fast response time
- High sensitivity
- Thin and small package
- Pb free
- This product itself will remain within RoHS compliant version

■ Descriptions

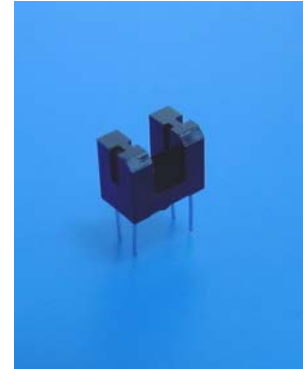
The **ITR20403** consists of an infrared emitting diode and a silicon phototransistor encased in a black thermo-plastic housing. The advantage of the device is the small package. Phototransistor receives radiation from the IR LED only, and avoids the noise from ambient light.

■ Applications

- Camera
- Copier
- Scanner
- Non-contact Switching

■ Device Selection Guide

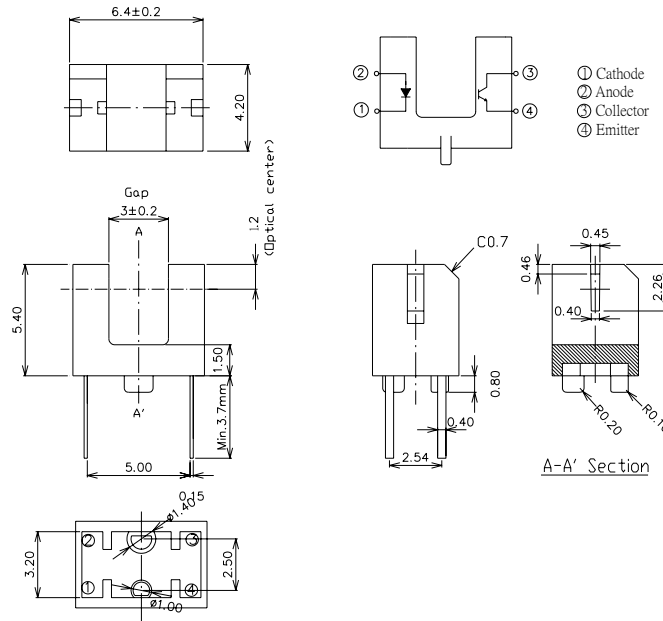
| Device No. | Chip Material |
|------------|---------------|
| IR1918C | GaAlAs |
| PT1918B | Silicon |



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Package Dimensions



- Notes:** 1.All dimensions are in millimeters
2.Tolerances unless dimensions $\pm 0.2\text{mm}$

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

| Parameter | | Symbol | Ratings | Unit |
|---------------------------------|---|-------------|---------|------------------|
| Input | Power Dissipation at(or below) 25°C Free Air Temperature | P_d | 75 | mW |
| | Reverse Voltage | V_R | 5 | V |
| | Forward Current | I_F | 50 | mA |
| | Peak Forward Current (*1) Pulse width $\leq 100 \mu\text{s}$, Duty cycle=1% | I_{FP} | 1 | A |
| Output | Collector Power Dissipation | P_C | 75 | mW |
| | Collector Current | I_C | 20 | mA |
| | Collector-Emitter Voltage | $B V_{CEO}$ | 30 | V |
| | Emitter-Collector Voltage | $B V_{ECO}$ | 5 | V |
| Operating Temperature | | T_{opr} | -25~+85 | $^\circ\text{C}$ |
| Storage Temperature | | T_{stg} | -40~+85 | $^\circ\text{C}$ |
| Lead Soldering Temperature (*2) | | T_{sol} | 260 | $^\circ\text{C}$ |

(*1) $t_w=100 \mu\text{sec.}$, $T=10 \text{msec.}$ (*2) $t=5 \text{Sec}$



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ITR20403**Electro-Optical Characteristics (Ta=25°C)**

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------|------------------------|---------------|------|------|------|-----------------|---|
| Input | Forward Voltage | V_F | --- | 1.2 | 1.6 | V | $I_F=20\text{mA}$ |
| | Reverse Current | I_R | --- | --- | 10 | μA | $V_R=5\text{V}$ |
| | Peak Wavelength | λ_P | --- | 940 | --- | nm | $I_F=20\text{mA}$ |
| Output | Dark Current | I_{CEO} | --- | 1 | 100 | nA | $V_{CE}=10\text{V}$ |
| | C-E Saturation Voltage | $V_{CE(sat)}$ | --- | --- | 0.4 | V | $I_C=2\text{mA}$ $E_e=1\text{mW/cm}^2$ |
| Transfer Characteristics | Collector Current | $I_{C(ON)}$ | 0.2 | --- | 5 | mA | $V_{CE}=5\text{V}$, $I_F=20\text{mA}$ |
| | Leakage Current | I_{CEOD} | --- | --- | 1 | μA | $V_{CE}=5\text{V}$ $I_F=20\text{mA}$ |
| | Rise time | t_r | --- | 15 | --- | μsec | $V_{CE}=2\text{V}$ $I_C=1\text{mA}$ $R_L=1\text{K}\Omega$ |
| | Fall time | t_f | --- | 15 | --- | μsec | |

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Typical Electrical/Optical/Characteristics Curves for IR

Fig.1 Forward Current vs. Ambient Temperature

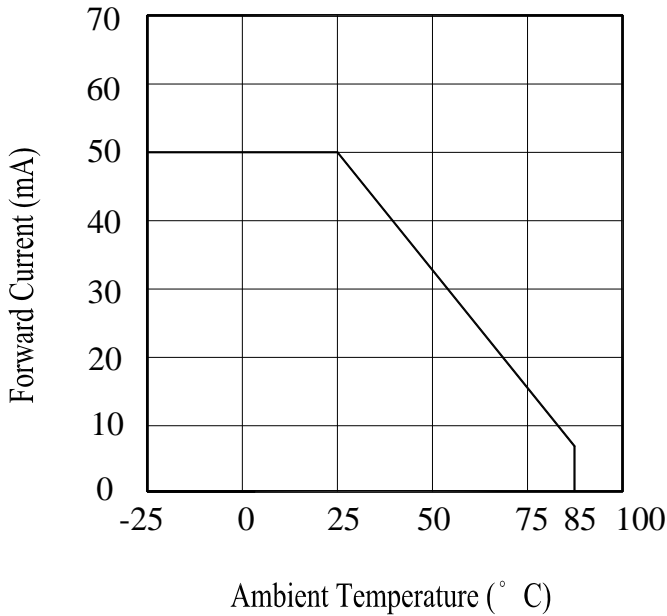


Fig.2 Spectral Distribution

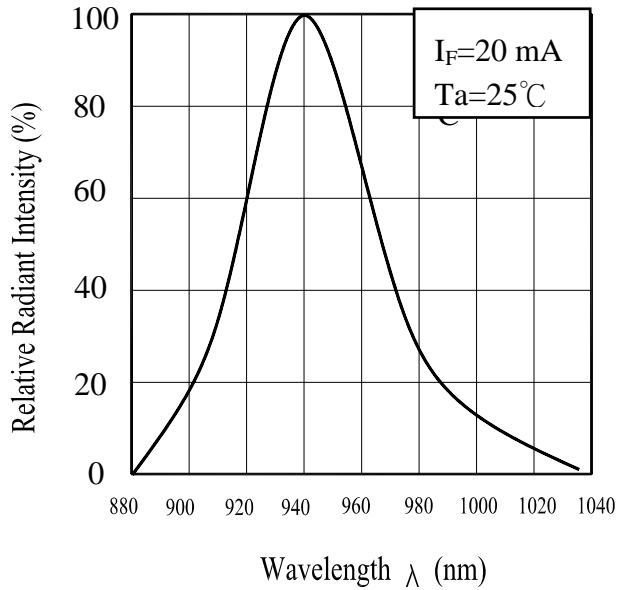


Fig.3 Peak Emission Wavelength vs. Ambient Temperature

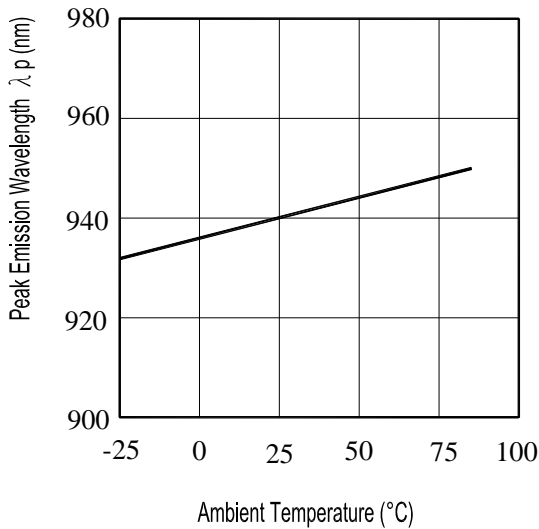
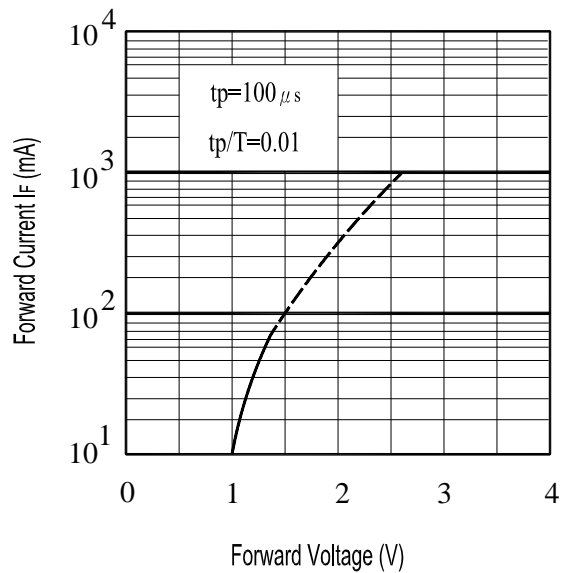


Fig.4 Forward Current vs. Forward Voltage



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Fig.5 Forward Voltage vs. Ambient Temperature(°C)

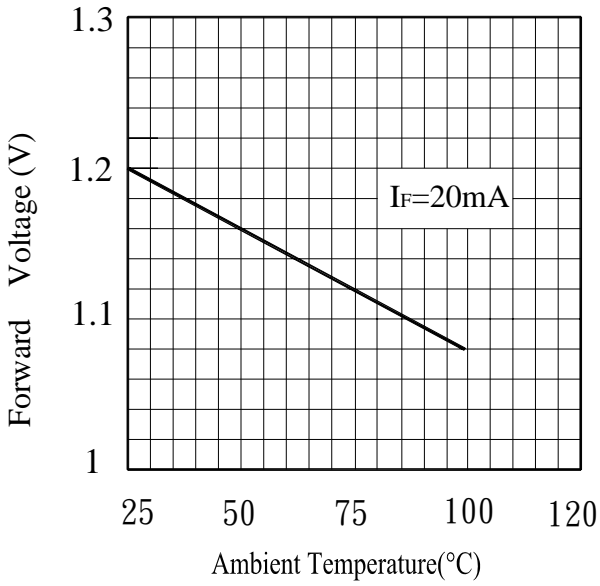
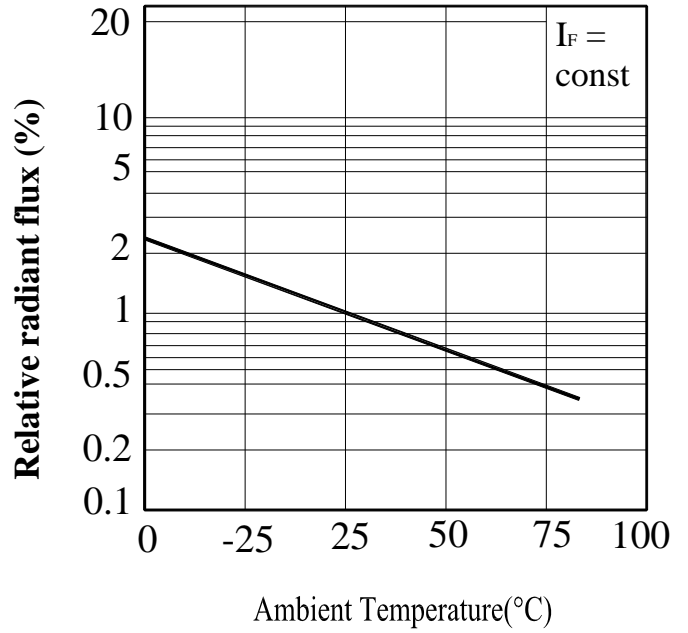


Fig.6 Relative Radiant Flux vs. Ambient Temperature(°C)



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Typical Electrical/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

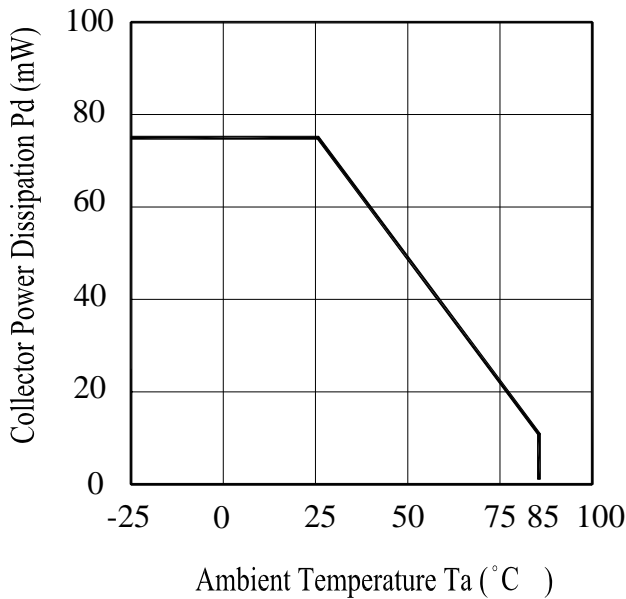


Fig.2 Spectral Sensitivity

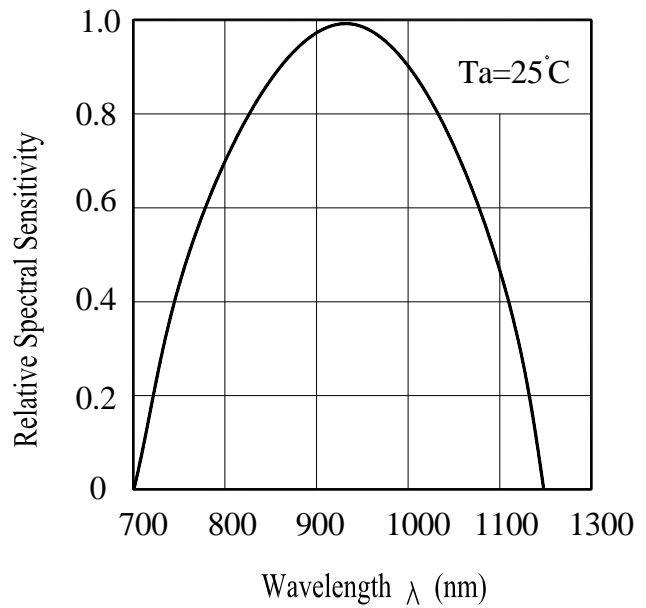


Fig.3. Collector Dark Current vs. Ambient Temperature

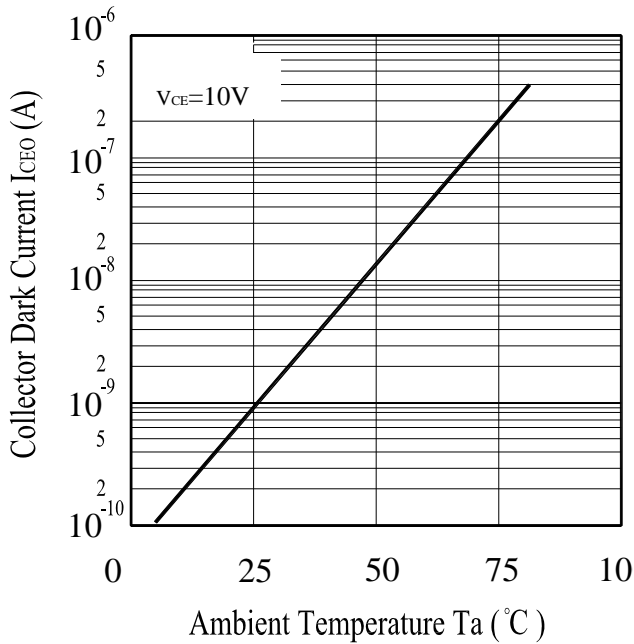
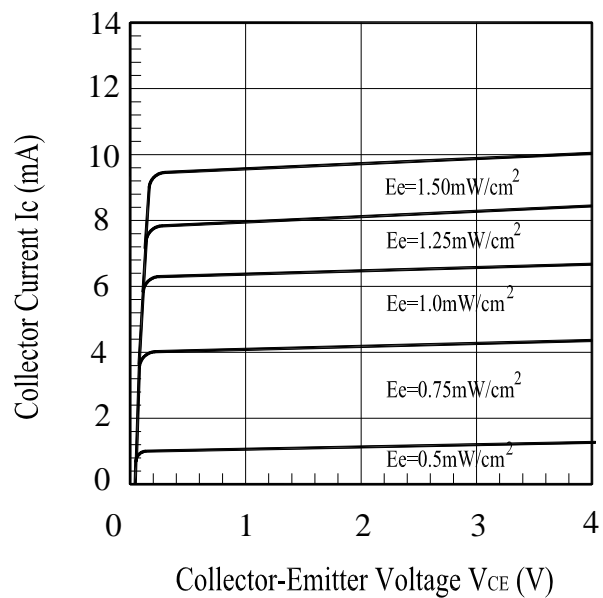


Fig.4 Collector Current vs. Collector-Emitter Voltage





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ITR20403**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/ Cycles | Sample Sizes | Failure Judgment Criteria | Ac/Re |
|-----|------------------------------------|--|-----------------------|-----------------|---|-------|
| 1 | Solder Resistance | Ta = 260 ±5°C | 10 sec | 22pcs | $I_R \geq U \times 2$ $E_e \leq L \times 0.8$ $V_F \geq U \times 1.2$ U : Upper Specification Limit L : Lower Specification Limit | 0/1 |
| 2 | Temperature Cycle | H : +100°C 15mins ↑ 5mins ↓ L : -40°C 15mins | 300Cycles | 22pcs | | 0/1 |
| 3 | Thermal Shock | H : +100°C 5mins ↑ 10secs ↓ L : -10°C 5mins | 300Cycles | 22pcs | | 0/1 |
| 4 | High Temperature Storage | TEMP. : +100°C | 1000hrs | 22pcs | | 0/1 |
| 5 | Low Temperature Storage | TEMP. : -40°C | 1000hrs | 22pcs | | 0/1 |
| 6 | DC Operating Life | V _{CE} =5V | 1000hrs | 22pcs | | 0/1 |
| 7 | High Temperature/ High Humidity | 85°C / 85% R.H | 1000hrs | 22pcs | | 0/1 |

