# PRODUCT SPECIFICATION

DATE：11/03/2006

| cosmo ELECTRONICS CORPORATION | Photocoupler： K1010 | NO.60P00057 | REV. 1 |
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## High Reliability Photocoupler

### ● Features

1. Current transfer ratio
   ( CTR：Min. 50% at IF=5mA $V_{CE}$=5V )
2. High isolation voltage between input and output
   ( Viso：5000Vrms )
3. Compact dual-in-line package.

### ● Application：

1. Registers, copies, automatic vending machines.
2. System appliances, measuring instruments.
3. Computer terminals, programmable controllers.
4. Communications, telephone, etc.
5. Electric home appliances, such as oil fan heaters, Microwave Oven, Washer, Refrigerator, Air conditioner, etc.
6. Medical instruments, physical and chemical equipment.
7. Signal transmission between circuits of different potentials and impedances.
8. Facsimile equipment, Audio, Video.
9. Switching power supply, Laser beam printer.

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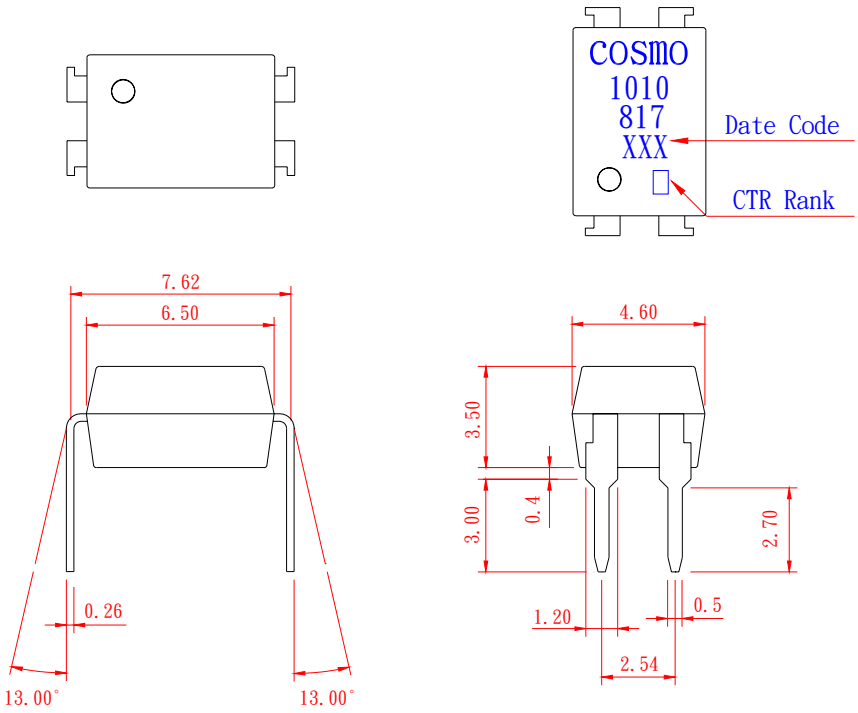
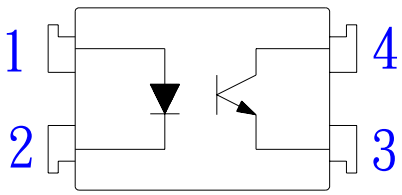
## ● Outside Dimension：Unit ( mm )




TOLERANCE：±0.2mm

## ● Schematic：Top View




1. Anode
2. Cathode
3. Collector
4. Emitter

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## ● Absolute Maximum Ratings

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input | Forward current | $I_F$ | 50 | mA |
| | Peak forward current | $I_{FM}$ | 1 | A |
| | Reverse voltage | $V_R$ | 6 | V |
| | Power dissipation | $P_D$ | 70 | mW |
| Output | Collector-emitter voltage | $V_{CEO}$ | 60 | V |
| | Emitter-collector voltage | $V_{ECO}$ | 6 | V |
| | Collector current | $I_C$ | 50 | mA |
| | Collector power dissipation | $P_C$ | 150 | mW |
| | Junction temperature | Tj | 125 | ℃ |
| | Total power dissipation | $P_{tot}$ | 200 | mW |
| | Isolation voltage 1 minute | $V_{iso}$ | 5000 | Vrms |
| | Operating temperature | $T_{opr}$ | -30 to +115 | ℃ |
| | Storage temperature | $T_{stg}$ | -55 to +125 | ℃ |
| | Soldering temperature 10 second | $T_{sol}$ | 260 | ℃ |

## ● Electro-optical Characteristics

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|
| Input | Forward voltage | $V_F$ | $I_F$=20mA | - | 1.2 | 1.4 | V |
| | Peak forward voltage | $V_{FM}$ | $I_{FM}$=0.5A | - | - | 3.0 | V |
| | Reverse current | $I_R$ | $V_R$=4V | - | - | 10 | μA |
| | Terminal capacitance | $C_t$ | V=0, f=1KHz | - | 30 | - | pF |
| Output | Collector dark current | $I_{CEO}$ | $V_{CE}$=20V | - | - | 0.1 | μA |
| Transfer charac-teristics | Current transfer ratio | CTR | $I_F$=5mA, $V_{CE}$=5V | 50 | - | 600 | % |
| | Collector-emitter saturation | $V_{CE(sat)}$ | $I_F$=20mA, $I_C$=1mA | - | 0.1 | 0.2 | V |
| | Isolation resistance | $R_{iso}$ | DC500V | $5x10^{10}$ | $10^{11}$ | - | Ω |
| | Floating capacitance | $C_f$ | V=0, f=1MHz | - | 0.6 | 1.0 | pF |
| | Cut-off frequency | $f_C$ | $V_{CC}$=5V, $I_C$=2mA, $R_L$=100Ω | - | 80 | - | KHz |
| | Response time ( Rise ) | $t_r$ | $V_{CE}$=2V, $I_C$=2mA, $R_L$=100Ω | - | 4 | 18 | μs |
| | Response time ( Fall ) | $t_f$ | | - | 3 | 18 | μs |

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Classification table of current transfer ratio is shown below.

| Model No. | CTR ( % ) |
|---|---|
| K10101A | 80 ~ 160 |
| K10101B | 130 ~ 260 |
| K10101C | 200 ~ 400 |
| K10101D | 300 ~ 600 |
| K10101E | 50 ~ 600 |

Fig.1 **Current Transfer Ratio vs. Forward Current**

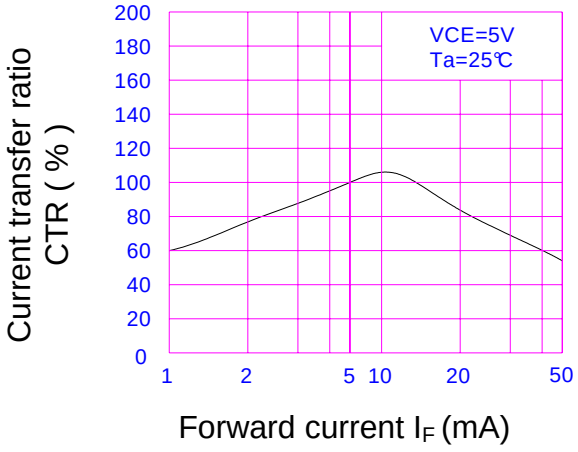


Fig.2 **Collector Power Dissipation vs. Ambient Temperature**

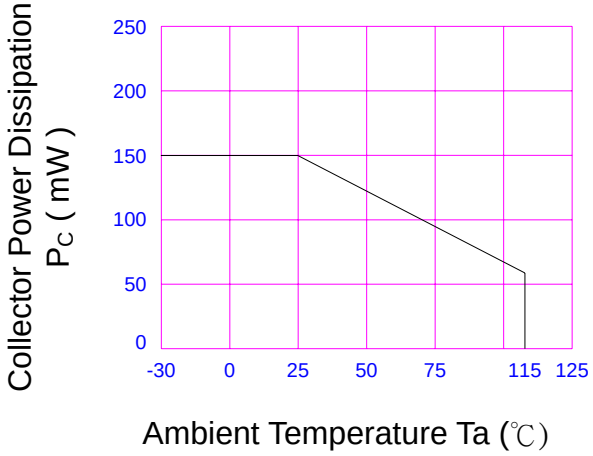


Fig.3 **Collector Dark Current vs. Ambient Temperature**

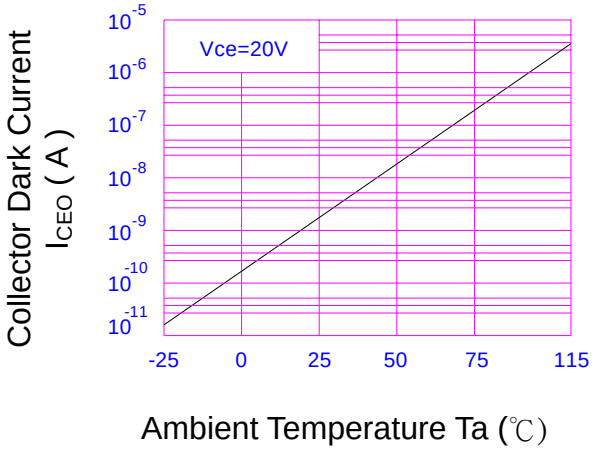


Fig.4 **Forward Current vs. Ambient Temperature**

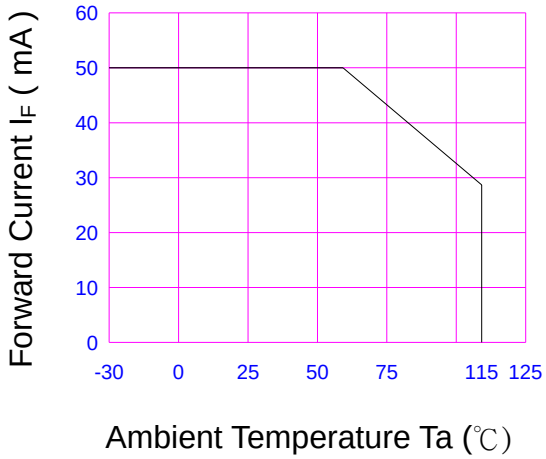


Fig.5 **Forward Current vs. Forward Voltage**

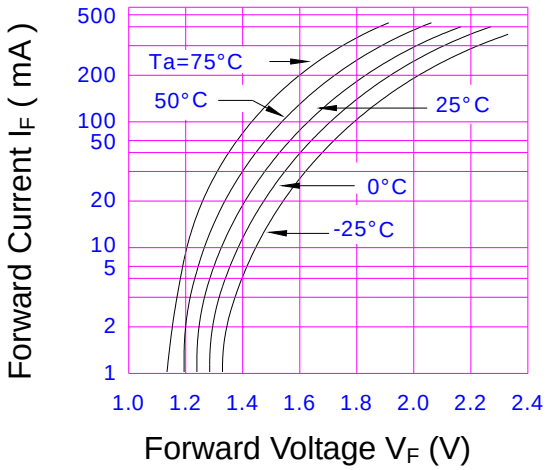

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Fig.6 **Collector Current vs. Collector-Emitter Voltage**

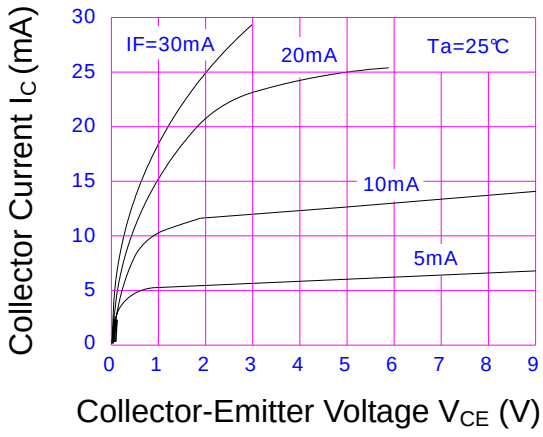



Fig.7 **Relative Current Transfer Ratio vs. Ambient Temperature**

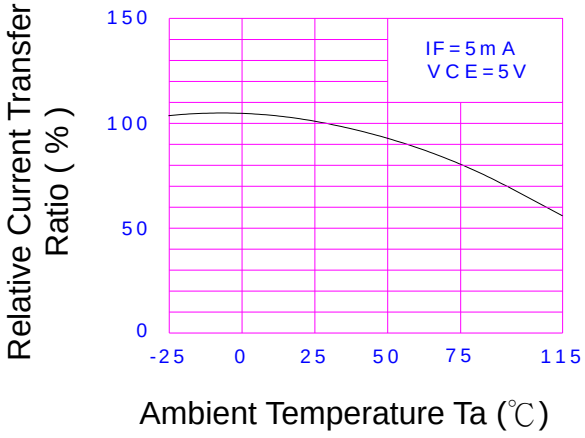



Fig.8 **Collector-Emitter Saturation Voltage vs. Ambient Temperature**

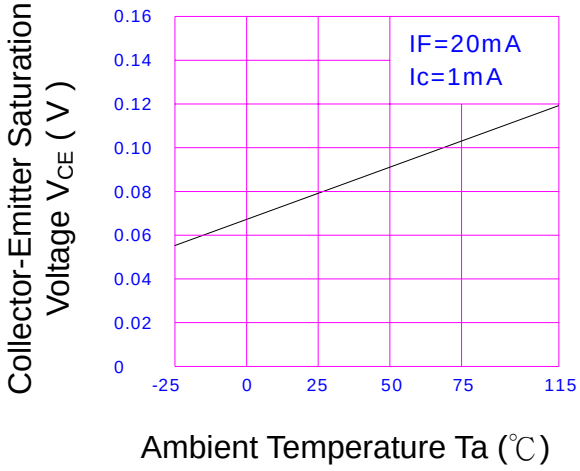



Fig.9 **Collector-Emitter Saturation Voltage vs. Forward Current**

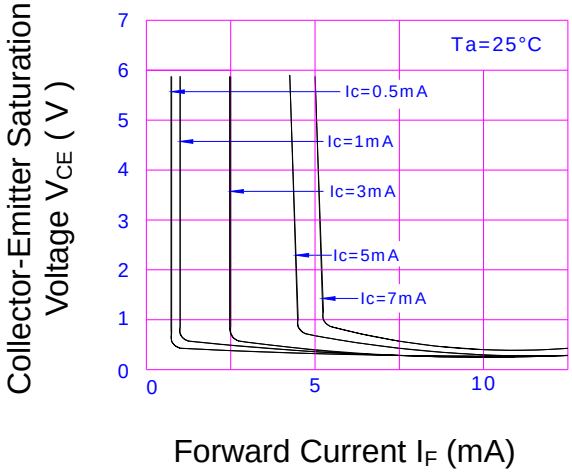



Fig.10 **Response Time vs. Load Resistance**

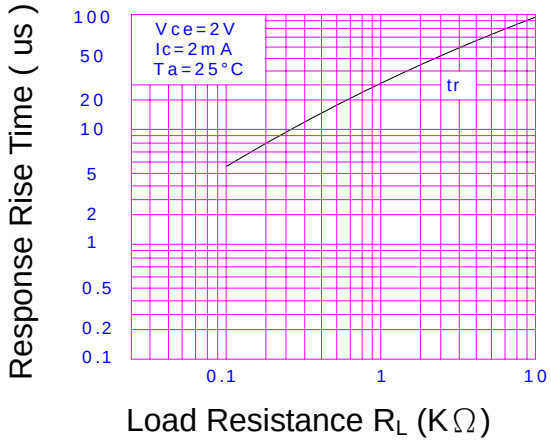
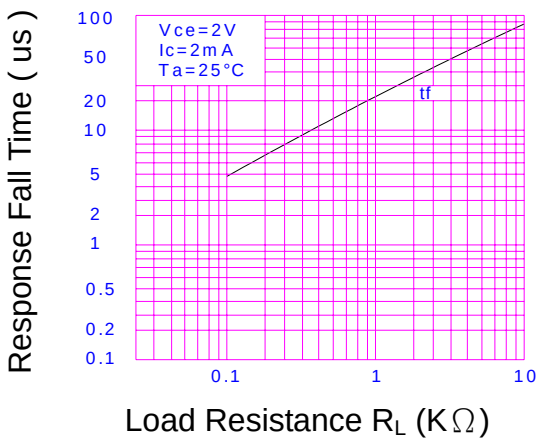



Fig.11 **Response Time vs. Load Resistance**



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## ● Notice

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