

PRODUCT SPECIFICATION

DATE : 01/10/2013

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|-----------------------------------------|-----------------------------------|--------------|------|
| cosmo ELECTRONICS CORPORATION | Photocoupler : K1010 3T | NO.62P00056 | REV. |
| | | SHEET 1 OF 6 | 2 |

High Reliability Photocoupler

● Features

- 1.Low input current type ($I_F=1\text{mA}$).
- 2.Current transfer ratio (CTR : 50~600% at $I_F=1\text{mA}$ $V_{ce}=5\text{V}$).
- 3.High isolation voltage between input and output ($V_{iso}:5000\text{V}_{rms}$).
- 4.Compact long creepage distance type package.
- 5.Pb free and RoHS compliant.
- 6.Agency Approvals
 - UL UL1577 / CUL C22.2 No.1 & NTC No.5, File No. E169586
 - VDE EN60747, File No.101347
 - FIMKO EN60065, File No.FI23149
 - FIMKO EN60950, File No.FI24584
 - SEMKO EN60065, File No.1016484
 - SEMKO EN60950, File No.1016433
 - CQC GB4943 / GB8898, File No.CQC10001049555/CQC08001023986

● Application :

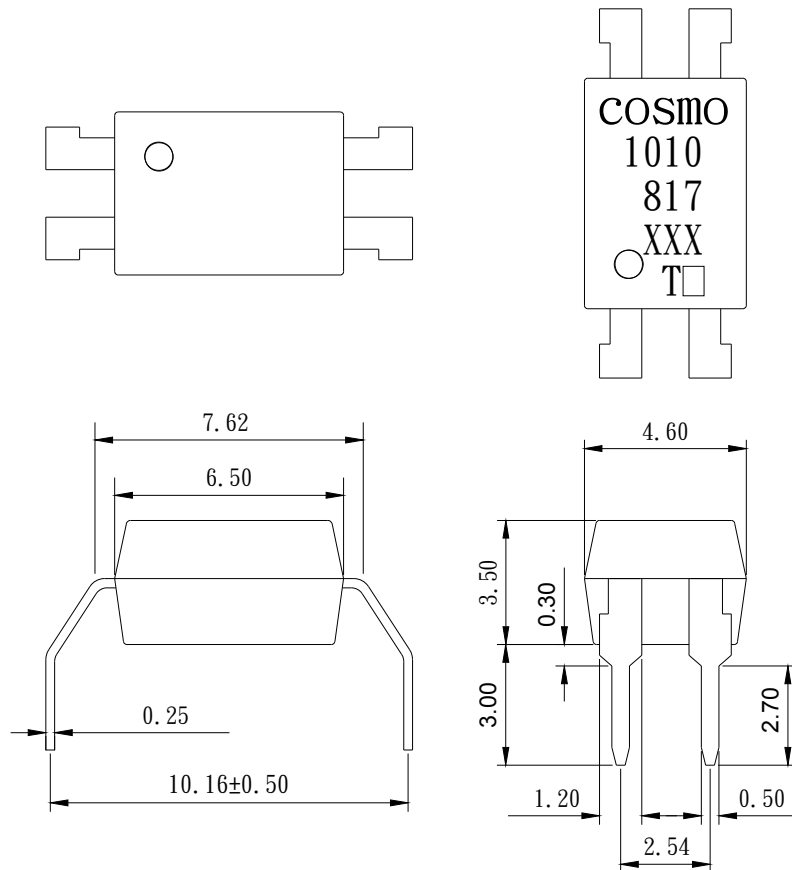
- 1.Computer terminals, programmable controllers.
- 2.Facsimile equipment, Audio, Video.
- 3.Communications, telephone, etc..

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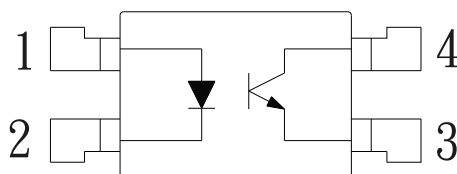
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1. OUTSIDE DIMENSION : UNIT (mm)



TOLERANCE : ±0.2mm

2. SCHEMATIC : TOP VIEW



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

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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} | 80 | V |
| | Emitter-collector voltage | V_{ECO} | 6 | V |
| | Collector current | I_C | 50 | mA |
| | Collector power dissipation | P_C | 150 | mW |
| | Junction temperature | T_j | 125 | °C |
| Total power dissipation | | P_{tot} | 200 | mW |
| Isolation voltage 1 minute | | V_{iso} | 5000 | Vrms |
| Operating temperature | | T_{opr} | -55 to +115 | °C |
| Storage temperature | | T_{stg} | -55 to +125 | °C |
| Soldering temperature 10 second | | T_{sol} | 260 | °C |

● 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 characteristics | Current transfer ratio | CTR | $I_F=1mA, V_{CE}=5V$ | 50 | - | 600 | % |
| | Collector-emitter saturation | $V_{CE(sat)}$ | $I_F=20mA, I_C=1mA$ | - | 0.1 | 0.2 | V |
| | Isolation resistance | R_{iso} | DC500V | 5×10^{10} | 10^{11} | - | Ω |
| | Floating capacitance | C_f | $V=0, f=1MHz$ | - | 0.6 | 1.0 | pF |
| | Response time (Rise) | t_r | $V_{CE}=2V, I_C=2mA, R_L=100\Omega$ | - | 4 | 18 | μs |
| | Response time (Fall) | t_f | | - | 3 | 18 | μs |

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Classification table of current transfer ratio is shown below.

| Rank mark | CTR (%) |
|-----------|------------|
| K10103TA | 100 TO 600 |
| K10103TB | 200 TO 500 |
| K10103TC | 160 TO 400 |
| K10103TD | 120 TO 300 |
| K10103TE | 50 TO 600 |

Fig.1 Current Transfer Ratio vs. Forward Current

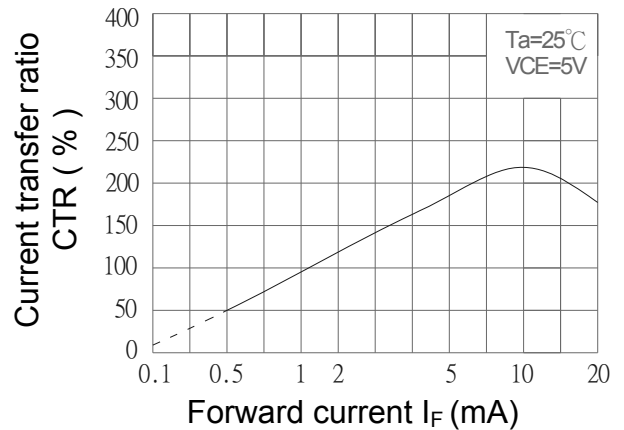


Fig.2 Collector Power Dissipation vs. Ambient Temperature

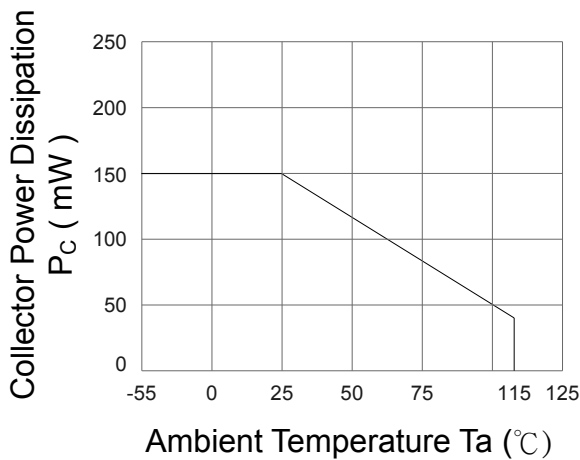


Fig.3 Collector Dark Current vs. Ambient Temperature

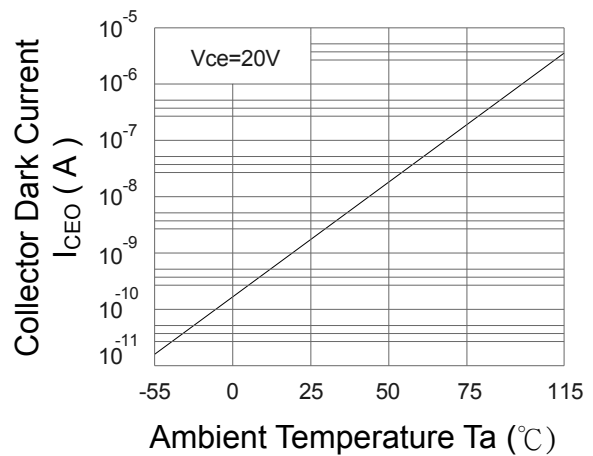


Fig.4 Forward Current vs. Ambient Temperature

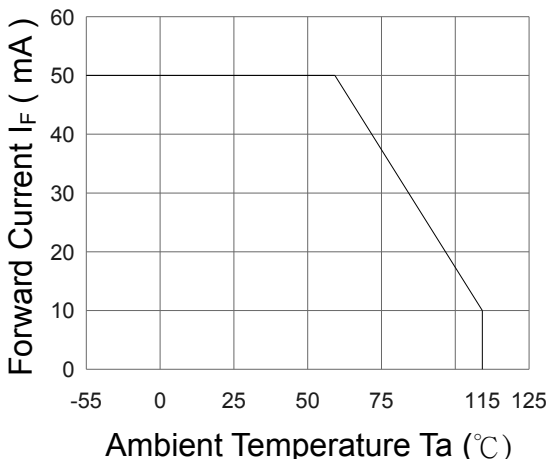
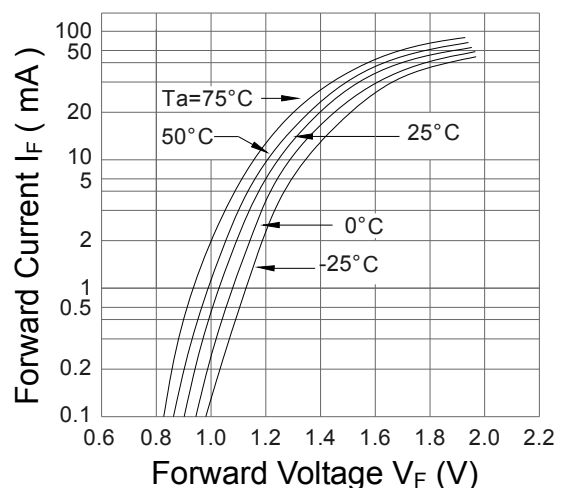


Fig.5 Forward Current vs. Forward Voltage



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Fig.6 Collector Current vs. Collector-Emitter Voltage

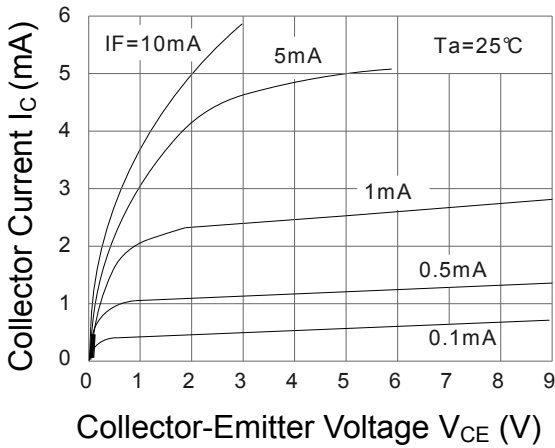


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

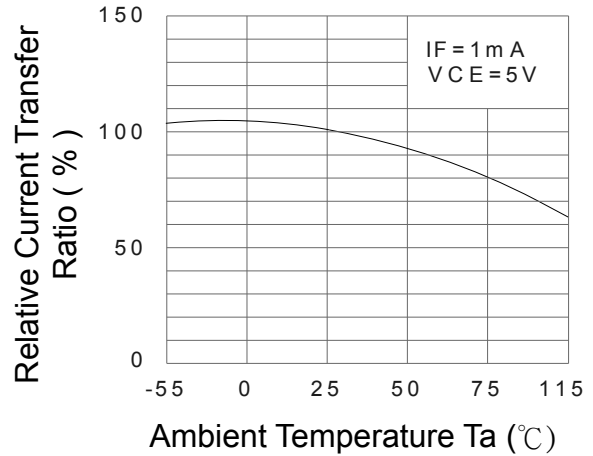


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

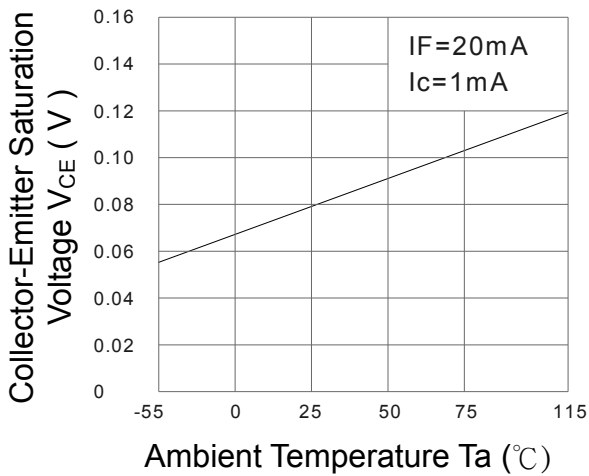


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

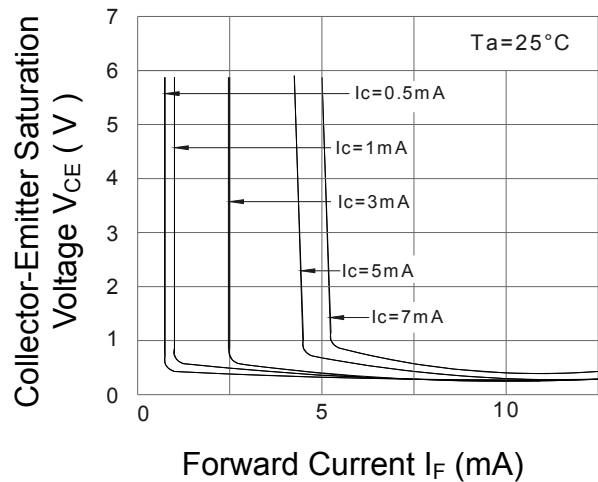


Fig.10 Response Time vs. Load Resistance

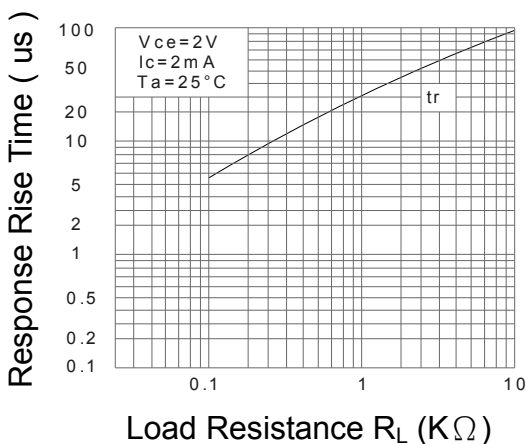
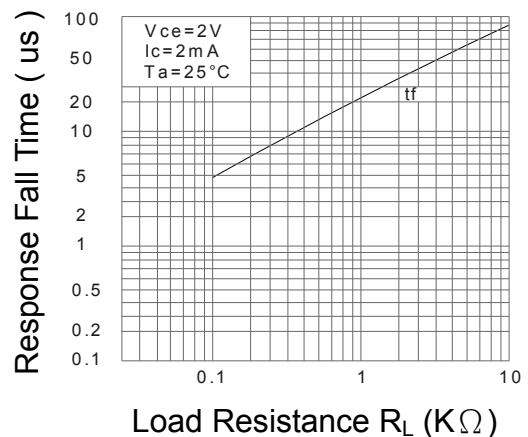


Fig.11 Response Time vs. Load Resistance



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