

# PRODUCT SPECIFICATION

DATE : 05/14/2007

|   |                                |              |      |
|---|--------------------------------|--------------|------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :<br><b>K3010</b> | NO.60P10018  | REV. |
|   |                                | SHEET 1 OF 6 | 2    |

## High Reliability Photocoupler

### ● Features

- 1.Current transfer ratio  
( CTR : Min. 60% at  $I_F = \pm 1\text{mA}$   $V_{CE} = 5\text{V}$  )
2. High isolation voltage between input and output  
( Viso : 5000Vrms )
- 3.Compact dual-in-line package.
- 4.AC input.

### ● Application :

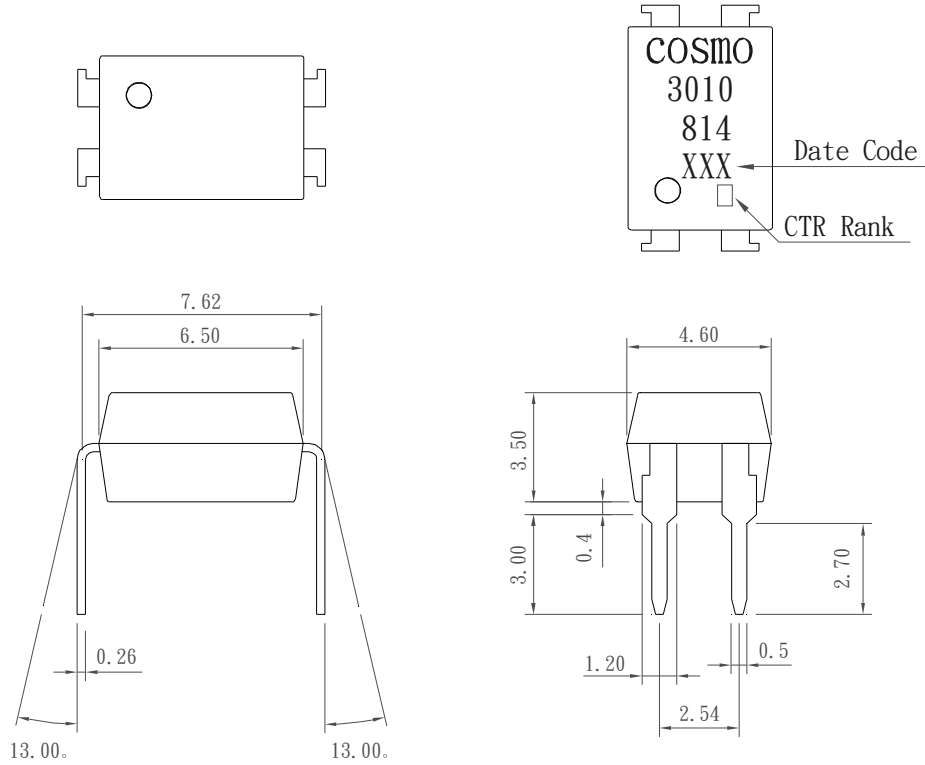
- 1.Programmable Controller Applications for Low Input Photocouplers and High Vceo Photocouplers.
- 2.Telephone sets, telephone exchangers.
- 3.System appliances, Limit Switches, Sensors, Thermostats etc.
- 4.Signal transmission between circuits of different potentials and impedances.

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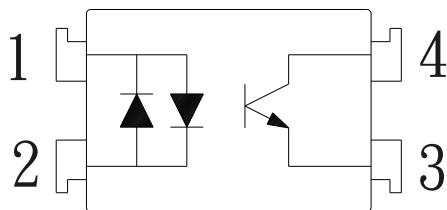
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| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :<br><b>K3010</b> | NO.60P10018  | REV.<br>2 |
|   |                                | SHEET 2 OF 6 |           |

## ● Outside Dimension : Unit ( mm )



**TOLERANCE : ±0.2mm**

## ● Schematic : Top View



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

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|   |                                | SHEET 3 OF 6 | 2    |

## ● Absolute Maximum Ratings

| Parameter                       |                             | Symbol    | Rating      | Unit        |
|---------------------------------|-----------------------------|-----------|-------------|-------------|
| Input                           | Forward current             | $I_F$     | $\pm 50$    | mA          |
|                                 | Peak forward current        | $I_{FM}$  | $\pm 1$     | A           |
|                                 | 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          |
| Total power dissipation         |                             | $P_{tot}$ | 200         | mW          |
| Isolation voltage 1 minute      |                             | $V_{iso}$ | 5000        | Vrms        |
| Operating temperature           |                             | $T_{opr}$ | -55 to +115 | $^{\circ}C$ |
| Storage temperature             |                             | $T_{stg}$ | -55 to +125 | $^{\circ}C$ |
| Soldering temperature 10 second |                             | $T_{sol}$ | 260         | $^{\circ}C$ |

## ● Electro-optical Characteristics

| Parameter                |                              | Symbol        | Conditions                          | MIN.               | TYP.      | MAX. | Unit     |
|--------------------------|------------------------------|---------------|-------------------------------------|--------------------|-----------|------|----------|
| Input                    | Forward voltage              | $V_F$         | $\pm I_F=20mA$                      | -                  | 1.2       | 1.4  | V        |
|                          | Peak forward voltage         | $V_{FM}$      | $\pm I_{FM}=0.5A$                   | -                  | -         | 3.0  | V        |
|                          | Terminal capacitance         | $C_t$         | $V=0, f=1KHz$                       | -                  | 30        | -    | pF       |
| Output                   | Collector dark current       | $I_{CEO}$     | $V_{CE}=20V$                        | -                  | -         | 0.1  | $\mu A$  |
| Transfer characteristics | Current transfer ratio       | CTR           | $\pm I_F=1mA, V_{CE}=5V$            | 60                 | -         | 600  | %        |
|                          | Collector-emitter saturation | $V_{CE(sat)}$ | $\pm I_F=20mA, I_C=1mA$             | -                  | 0.1       | 0.3  | V        |
|                          | Isolation resistance         | $R_{iso}$     | DC500V                              | $5 \times 10^{10}$ | $10^{11}$ | -    | $\Omega$ |
|                          | Floating capacitance         | $C_f$         | $V=0, f=1MHz$                       | -                  | 0.6       | 1.0  | pF       |
|                          | Cut-off frequency            | $f_C$         | $V_{CC}=5V, I_C=2mA, R_L=100\Omega$ | -                  | 80        | -    | KHz      |
|                          | Response time ( Rise )       | $t_r$         | $V_{CE}=2V, I_C=2mA, R_L=100\Omega$ | -                  | 5         | 20   | $\mu s$  |
|                          | Response time ( Fall )       | $t_f$         |                                     | -                  | 4         | 20   | $\mu s$  |

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NO.60P10018  
SHEET 4 OF 6

REV.  
2

Classification table of current transfer ratio is shown below.

| Model No. | CTR (%)  |
|-----------|----------|
| K30101A   | 60 ~ 600 |
| K30101B   | 60 ~ 300 |

Fig.1 Current Transfer Ratio vs. Forward Current

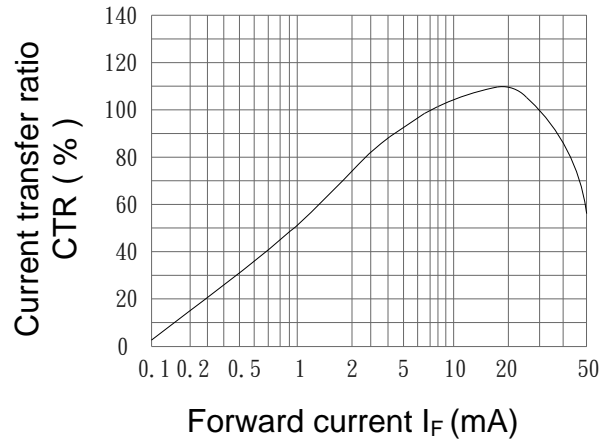


Fig.2 Collector Power Dissipation vs. Ambient Temperature

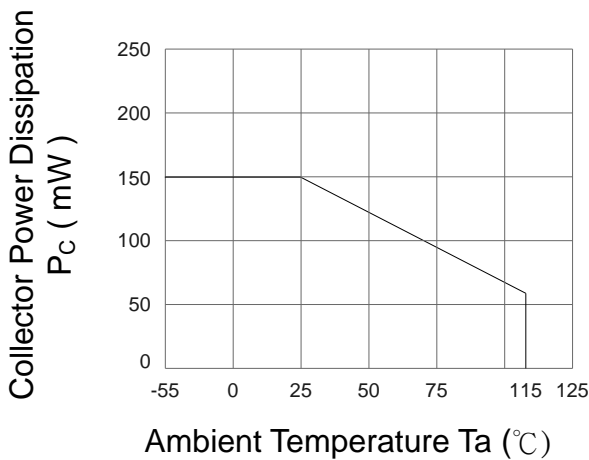


Fig.3 Collector Dark Current vs. Ambient Temperature

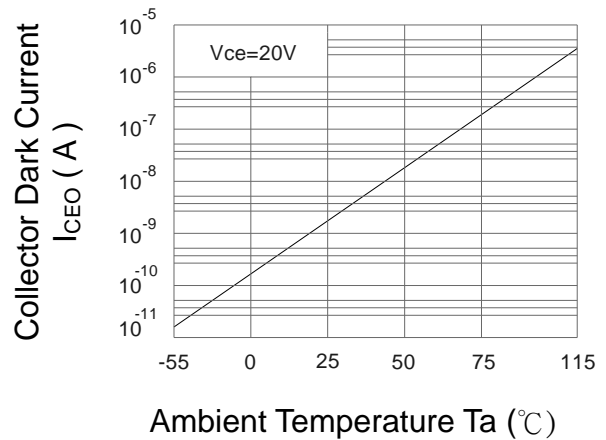


Fig.4 Forward Current vs. Ambient Temperature

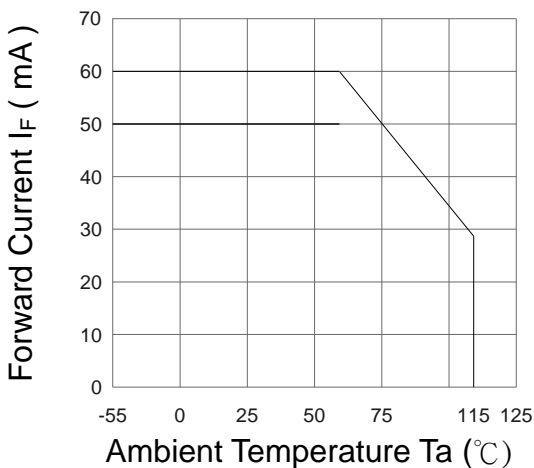
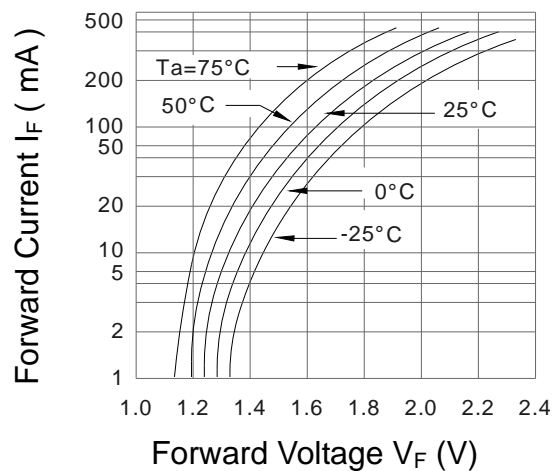


Fig.5 Forward Current vs. Forward Voltage

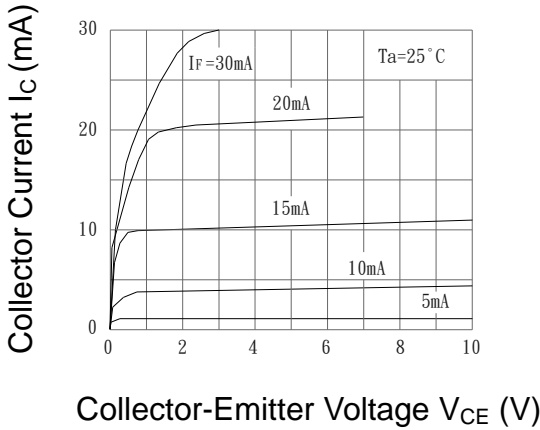


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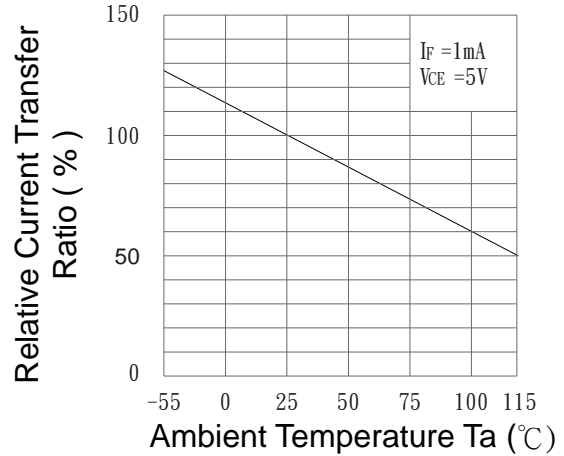
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|   |                                | SHEET 5 OF 6 |           |

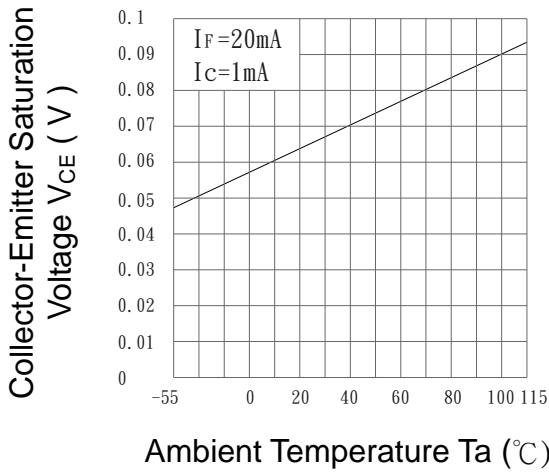
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



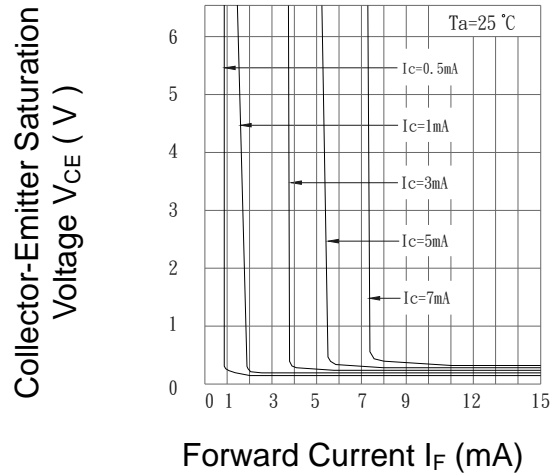
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



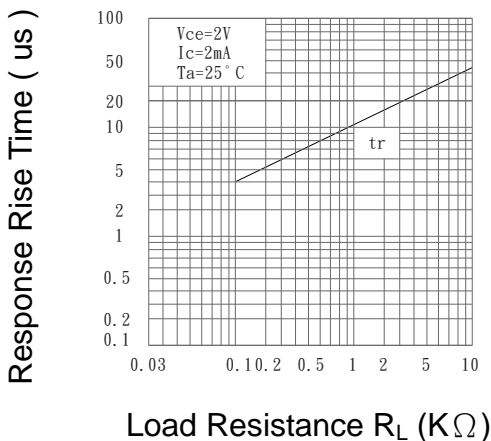
**Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature**



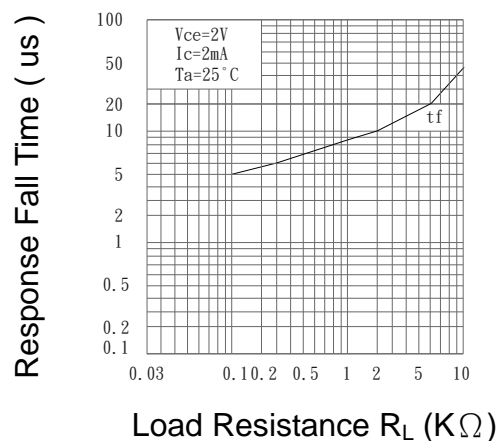
**Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current**



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



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



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|   |                                | SHEET 6 OF 6 | 2    |

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