

# PRODUCT SPECIFICATION

DATE : 01/20/2010

<b>cosmo</b> ELECTRONICS CORPORATION	Photocoupler : <b>KP4010S</b>	NO.61P20007	REV.
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## High Reliability Photocoupler

### ● Features

1. High current transfer ratio ( $V_{ce0} : 300V \text{ min}$ )  
( CTR : Min. 600% at  $I_F=1mA$   $V_{CE}=2V$  )
2. High isolation voltage between input and output  
( Viso : 5000Vrms )
3. Compact surface mount type package.

### ● Application :

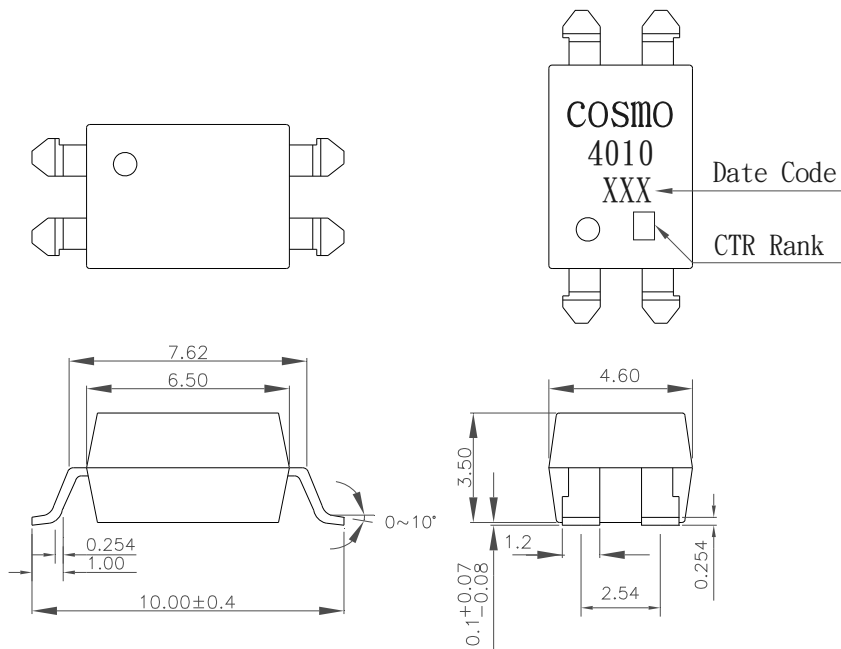
1. System appliances, measuring instruments.
2. Industrial robots.
3. Copiers, automatic vending machines.
4. Signal transmission between circuits of different potentials and impedances.
5. Telephone sets.
6. Copiers, facsimiles.
7. Interface with various power supply circuits, power distribution boards.
8. Numerical control machines.

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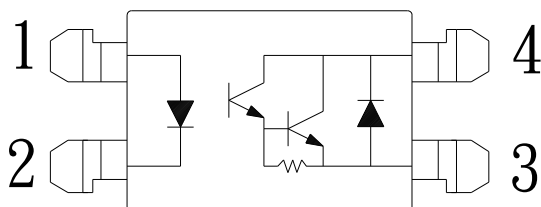
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## ● Outside Dimension : Unit ( mm )



**TOLERANCE : ±0.2mm**

## ● 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	$V_{CEO}$	300	V
	Emitter-collector voltage	$V_{ECO}$	0.1	V
	Collector current	$I_C$	150	mA
	Collector power dissipation	$P_C$	200	mW
Total power dissipation		$P_{tot}$	200	mW
Isolation voltage 1 minute		$V_{iso}$	5000	Vrms
Operating temperature		$T_{opr}$	-55 to +100	°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	$V_{FM}$	$I_{FM}=0.5A$	-	-	3.5	V
	Reverse current	$I_R$	$V_R=4V$	-	-	10	$\mu A$
	Terminal capacitance	$C_t$	$V=0, f=1KHz$	-	30	-	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=200V$	-	-	1.0	$\mu A$
Transfer characteristics	Current transfer ratio	CTR	$I_F=1mA, V_{CE}=2V$	600	-	9000	%
	Collector-emitter saturation	$V_{CE(sat)}$	$I_F=20mA, I_C=5mA$	-	-	1.5	V
	Isolation resistance	$R_{iso}$	DC500V	$5 \times 10^{10}$	-	-	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.6	1.0	pF
	Cut-off frequency	$f_C$	$V_{CC}=5V, I_C=2mA, R_L=100\Omega$	-	7	-	KHz
	Response time ( Rise )	$t_r$	$V_{CE}=2V, I_C=20mA, R_L=100\Omega$	-	60	300	$\mu s$
	Response time ( Fall )	$t_f$		-	50	250	$\mu s$

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Classification table of current transfer ratio is shown below.

Model No.	CTR (%)
KP40102A	600 ~ 2000
KP40102B	1500 ~ 4000
KP40102C	3000 ~ 6000
KP40102D	5000 ~ 9000
KP40102E	600 ~ 9000

Fig.1

Current Transfer Ratio vs. Forward Current

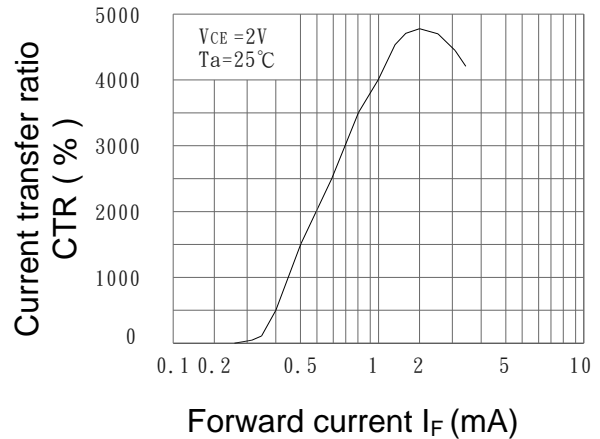


Fig.2

Collector Power Dissipation vs. Ambient Temperature

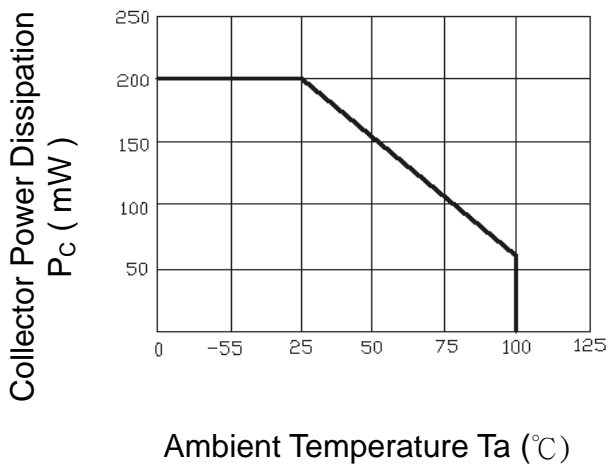


Fig.3

Collector Dark Current vs. Ambient Temperature

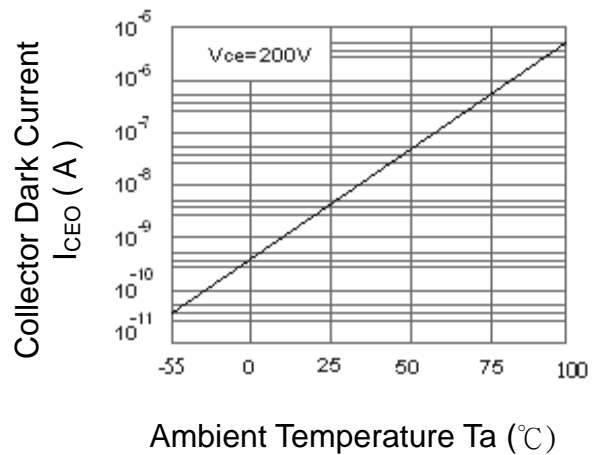


Fig.4

Forward Current vs. Ambient Temperature

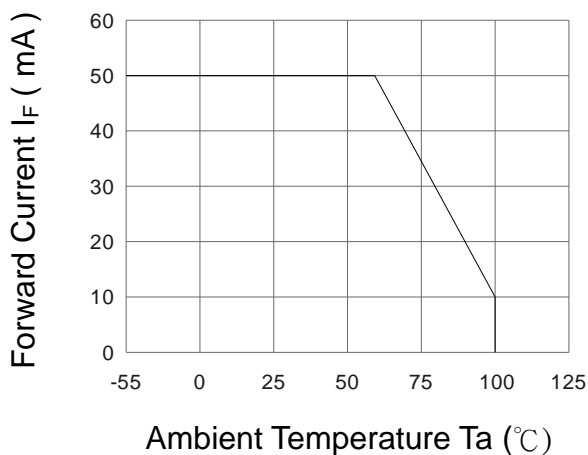
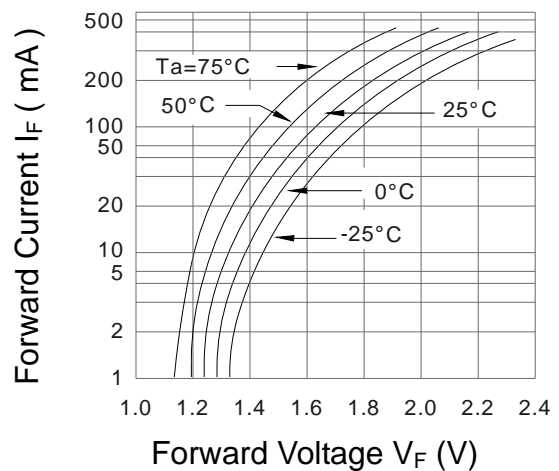


Fig.5

Forward Current vs. Forward Voltage

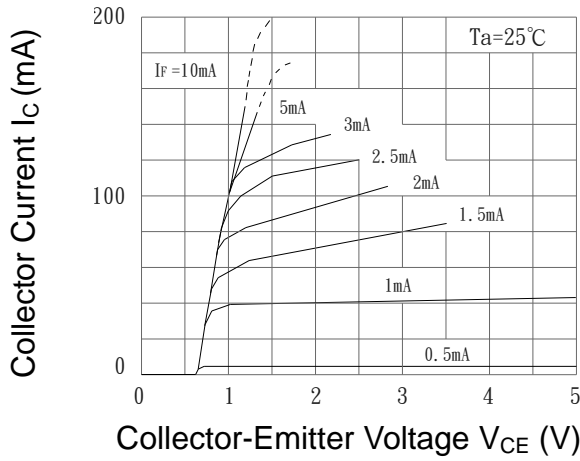


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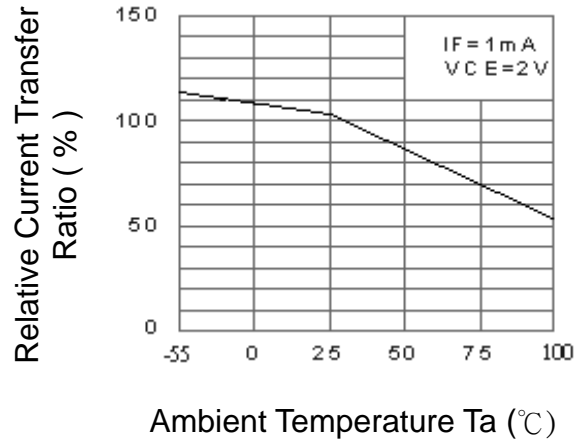
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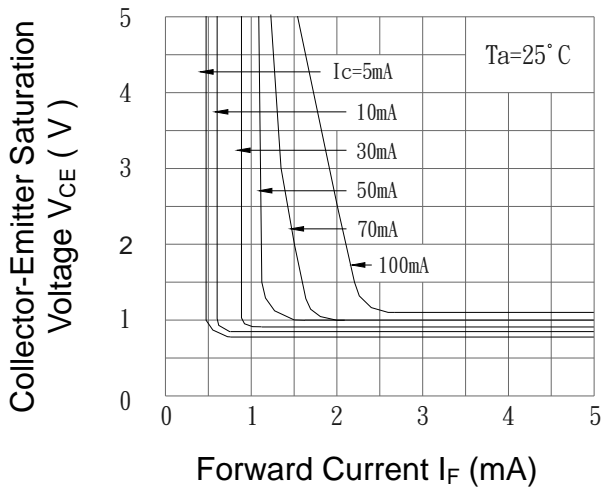
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



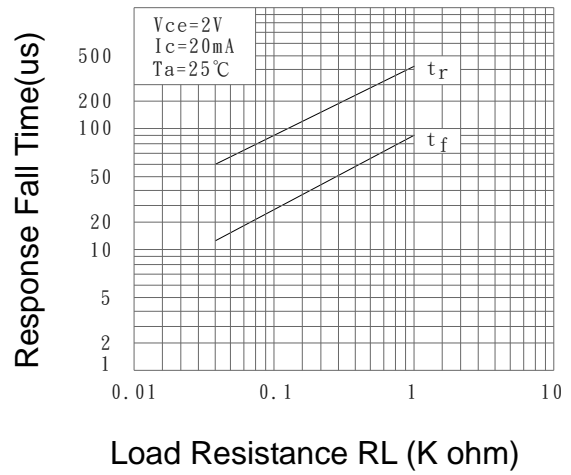
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



**Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current**



**Fig.9 Response time vs. Load Resistance**



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