

PRODUCT SPECIFICATION

DATE : 01/20/2010

cosmo ELECTRONICS CORPORATION	Photocoupler : KP4010S	NO.61P20007	REV.
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High Reliability Photocoupler

● Features

1. High current transfer ratio ($V_{ceo} : 300V \text{ min}$)
(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 :

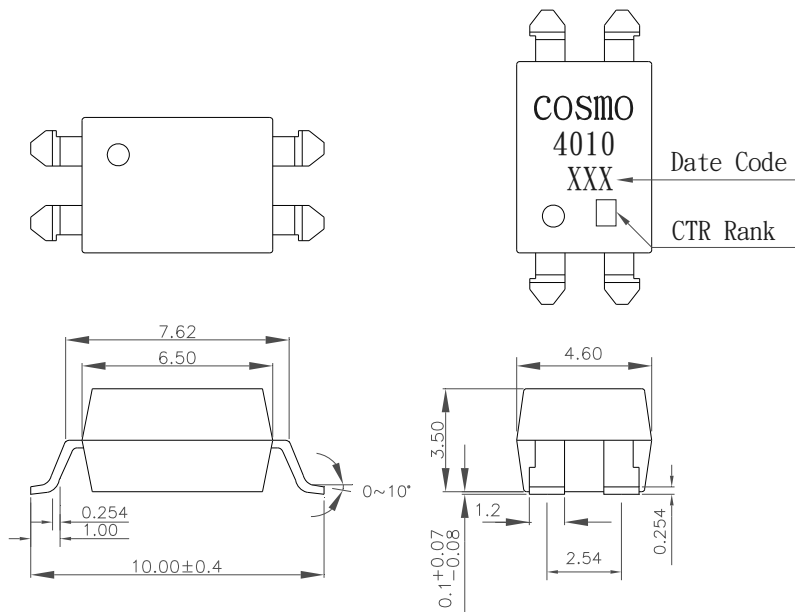
1. System appliances, measuring instruments.
2. Industrial robots.
3. Copiers, automatic vending machines.
4. Signal transmission between circuits of different potentials and impedances.
5. Telephone sets.
6. Copiers, facsimiles.
7. Interface with various power supply circuits, power distribution boards.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

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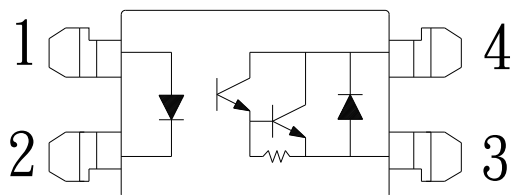
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● Outside Dimension : Unit (mm)



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	μA
	Terminal capacitance	C_t	$V=0, f=1KHz$	-	30	-	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=200V$	-	-	1.0	μA
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	5×10^{10}	-	-	Ω
	Floating capacitance	C_f	$V=0, f=1MHz$	-	0.6	1.0	pF
	Cut-off frequency	f_c	$V_{CC}=5V, I_C=2mA, R_L=100\Omega$	-	7	-	KHz
	Response time (Rise)	t_r	$V_{CE}=2V, I_C=20mA, R_L=100\Omega$	-	60	300	μs
	Response time (Fall)	t_f		-	50	250	μs

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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

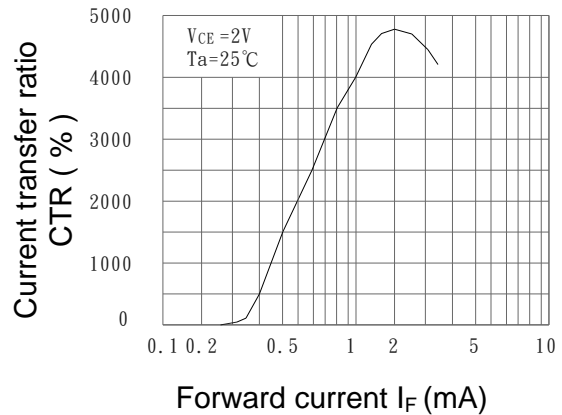


Fig.2

Collector Power Dissipation vs. Ambient Temperature

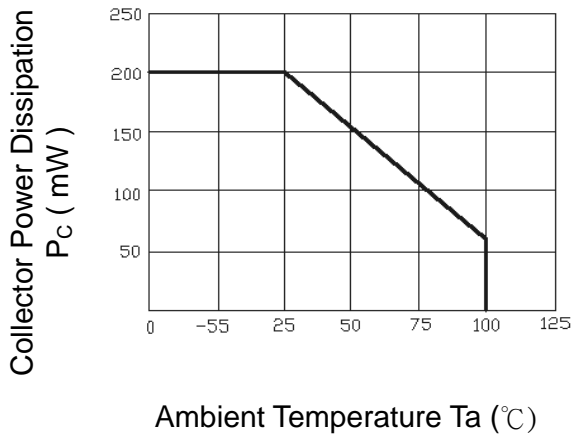


Fig.3

Collector Dark Current vs. Ambient Temperature

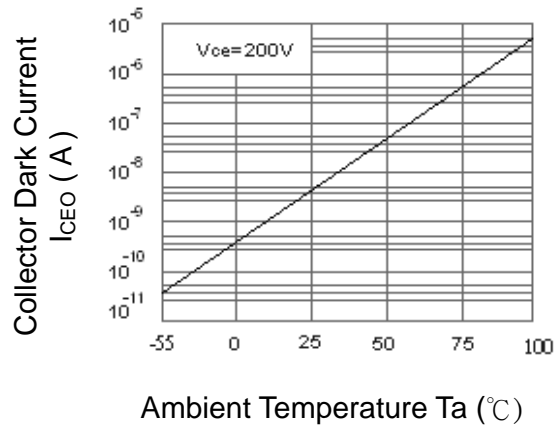


Fig.4

Forward Current vs. Ambient Temperature

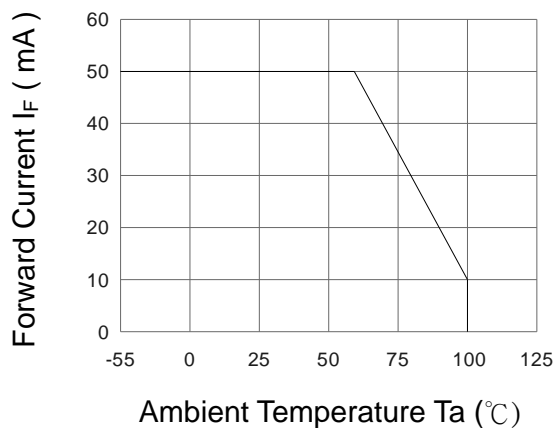
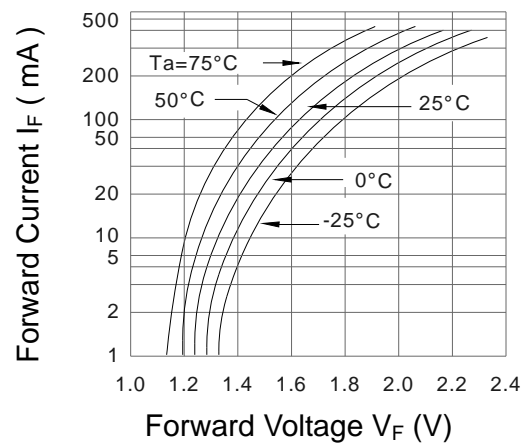


Fig.5

Forward Current vs. Forward Voltage



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Fig.6

Collector Current vs. Collector-Emitter Voltage

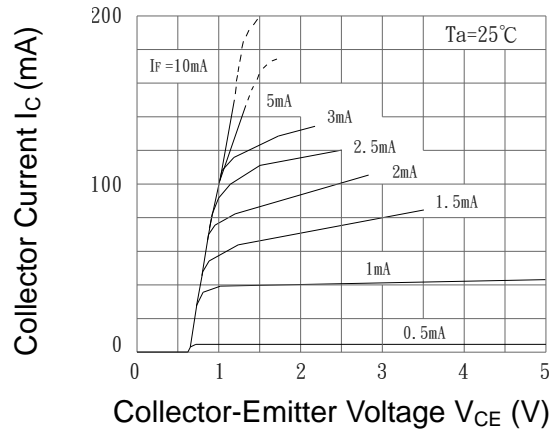


Fig.7

Relative Current Transfer Ratio vs. Ambient Temperature

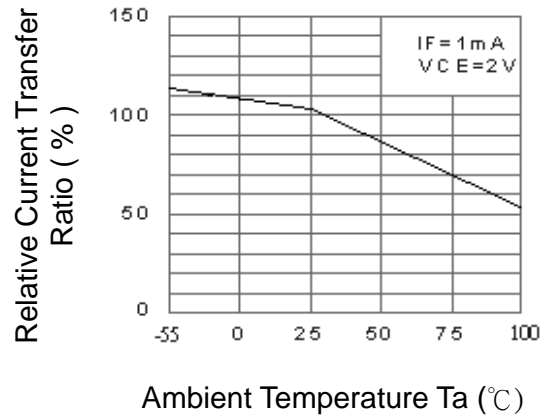


Fig.8

Collector-Emitter Saturation Voltage vs. Forward Current

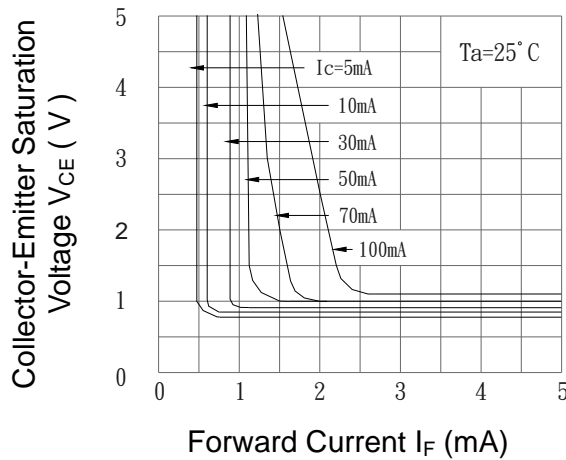
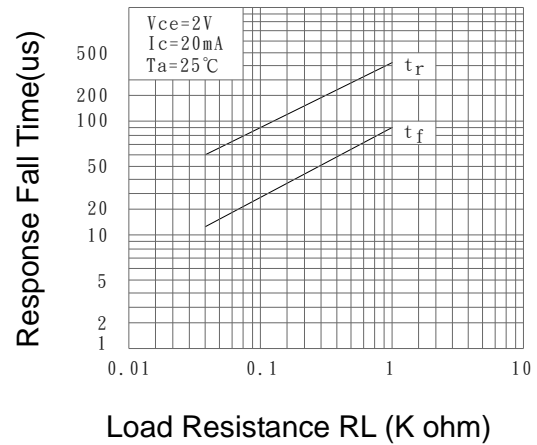


Fig.9

Response time vs. Load Resistance



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