

PRODUCT SPECIFICATION

DATE : 01/10/2013

cosmo ELECTRONICS CORPORATION	Photocoupler : K1010 4T	NO.61P00063	REV.
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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 surface mount 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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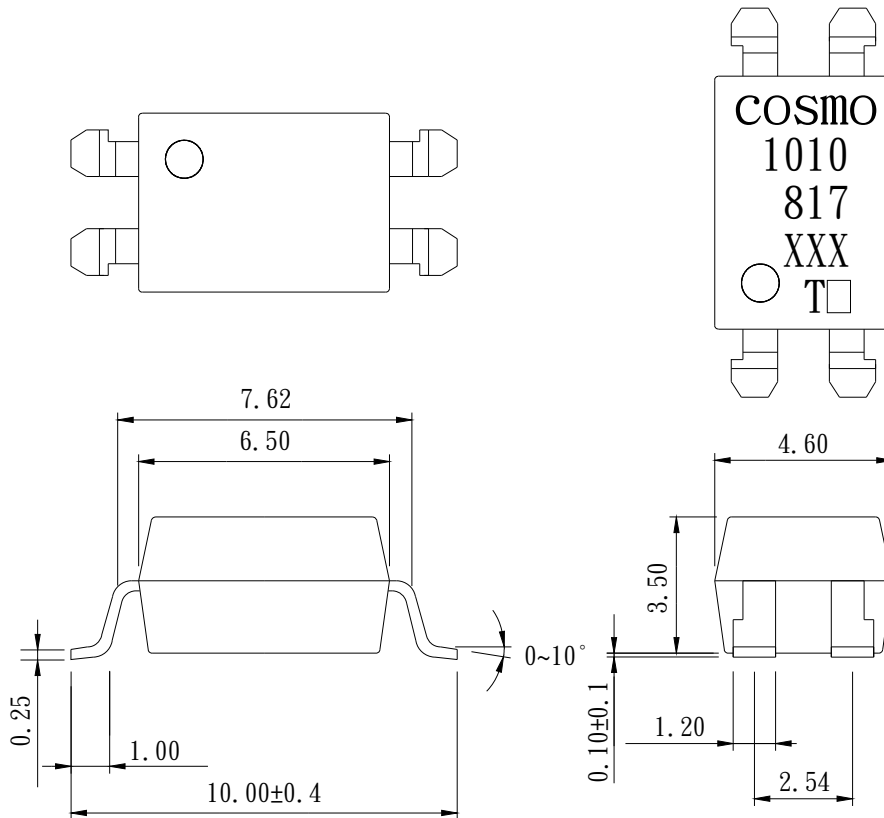
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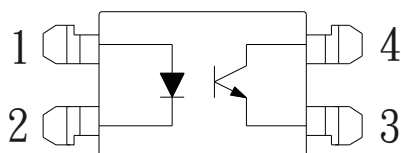
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1. OUTSIDE DIMENSION : UNIT (mm)



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 (%)
K10104TA	100 TO 600
K10104TB	200 TO 500
K10104TC	160 TO 400
K10104TD	120 TO 300
K10104TE	50 TO 600

Fig.1 Current Transfer Ratio vs. Forward Current

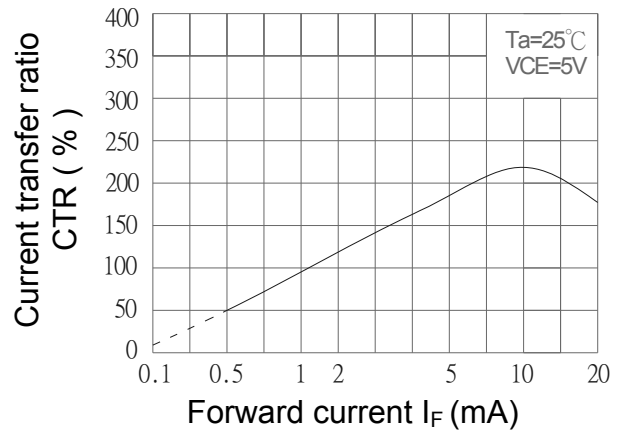


Fig.2 Collector Power Dissipation vs. Ambient Temperature

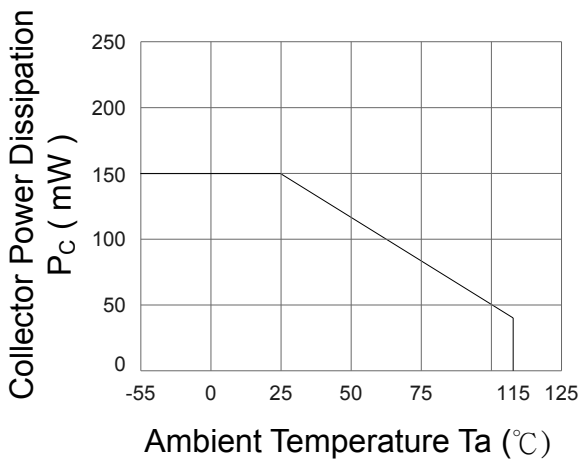


Fig.3 Collector Dark Current vs. Ambient Temperature

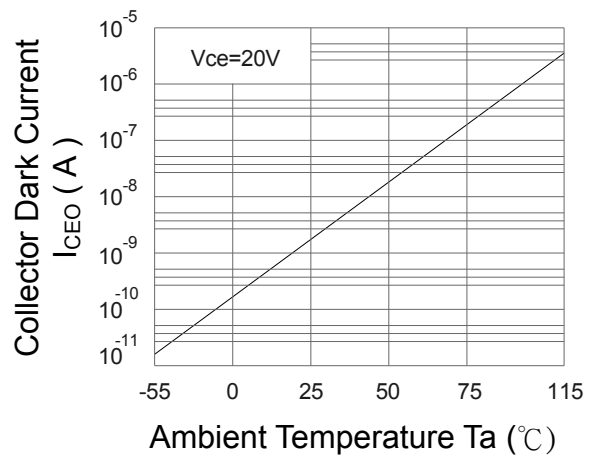


Fig.4 Forward Current vs. Ambient Temperature

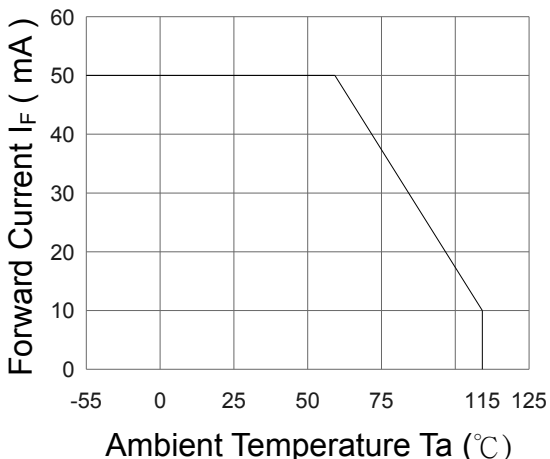
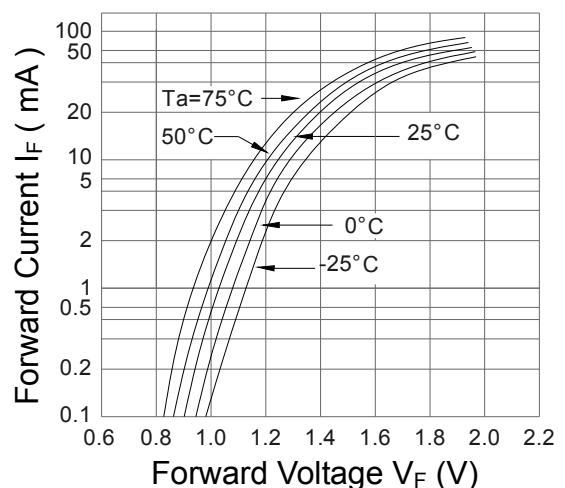


Fig.5 Forward Current vs. Forward Voltage



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Fig.6 Collector Current vs. Collector-Emitter Voltage

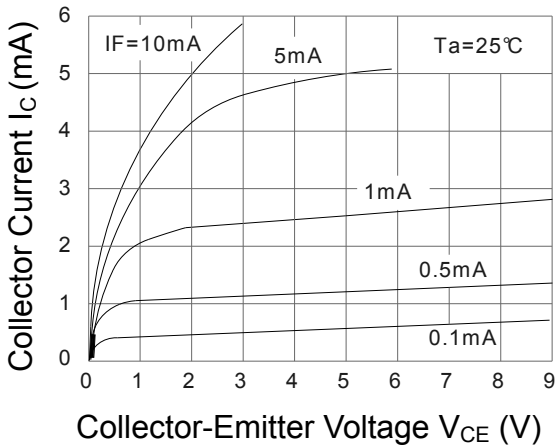


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

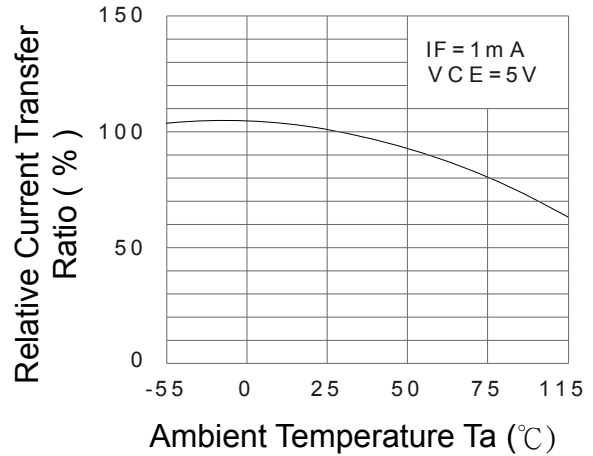


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

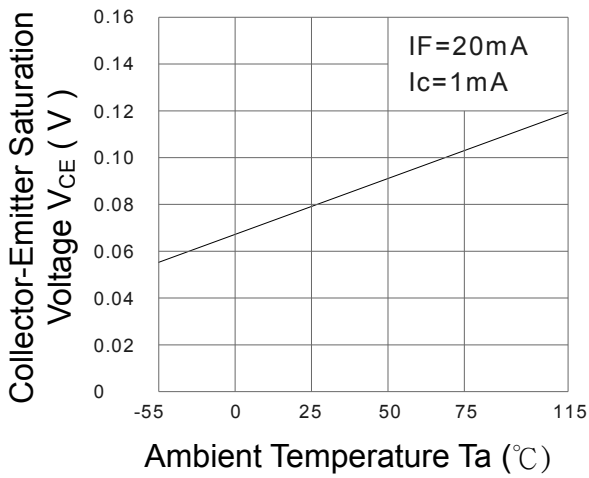


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

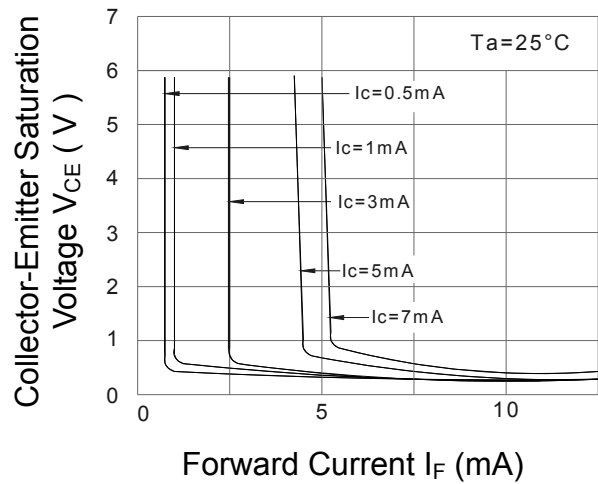


Fig.10 Response Time vs. Load Resistance

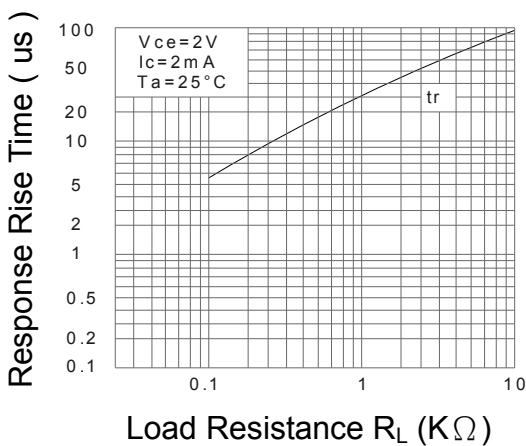
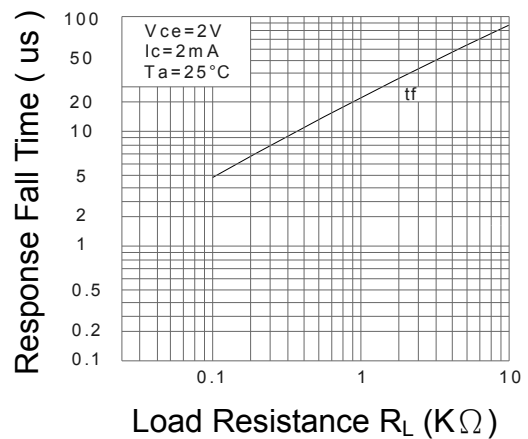


Fig.11 Response Time vs. Load Resistance



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