

# PRODUCT SPECIFICATION

DATE : 01/10/2013

<b>cosmo</b> ELECTRONICS CORPORATION	Photocoupler : <b>K1010 1T</b>	NO.60P00046	REV.
		SHEET 1 OF 6	4

## 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 ( $V_{iso}:5000\text{Vrms}$ ).
- 4.Compact dual-in-line 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 :

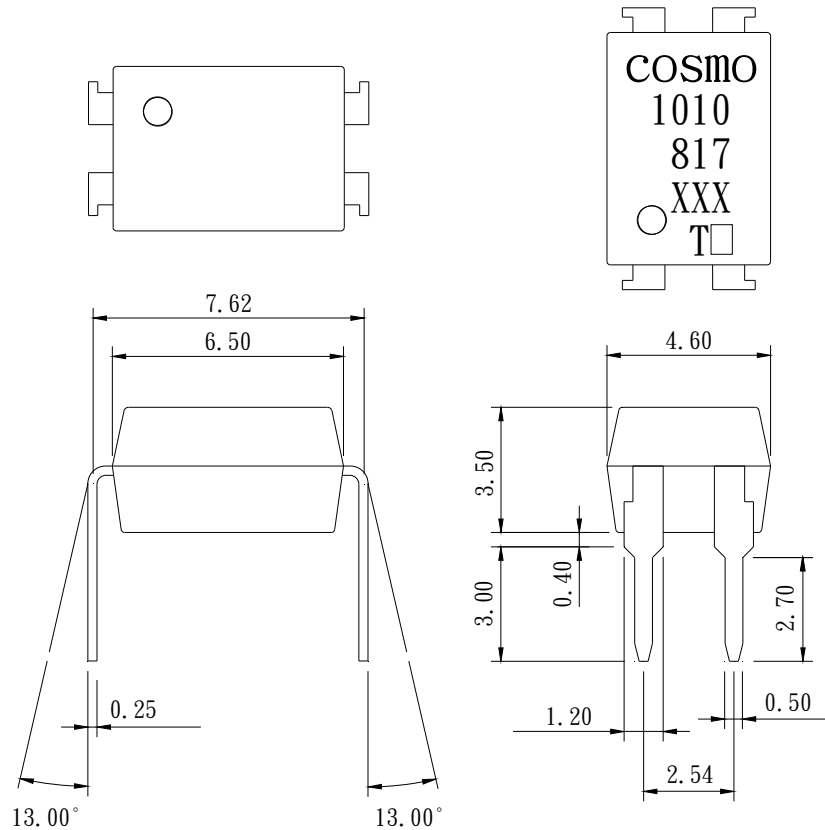
- 1.Computer terminals, programmable controllers.
- 2.Facsimile equipment, Audio, Video.
- 3.Communications, telephone, etc..

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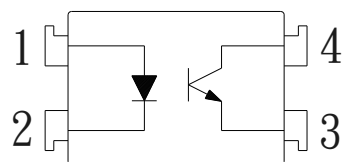
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## 1. OUTSIDE DIMENSION : UNIT (mm)



TOLERANCE :  $\pm 0.2\text{mm}$

## 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	$\mu A$
	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	$I_F=1mA, V_{CE}=5V$	50	-	600	%
	Collector-emitter saturation	$V_{CE(sat)}$	$I_F=20mA, I_C=1mA$	-	0.1	0.2	V
	Isolation resistance	$R_{iso}$	DC500V	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$
	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	$\mu s$
	Response time ( Fall )	$t_f$		-	3	18	$\mu s$

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Classification table of current transfer ratio is shown below.

Rank mark	CTR (%)
K10101TA	100 TO 600
K10101TB	200 TO 500
K10101TC	160 TO 400
K10101TD	120 TO 300
K10101TE	50 TO 600

Fig.1 Current Transfer Ratio vs. Forward Current

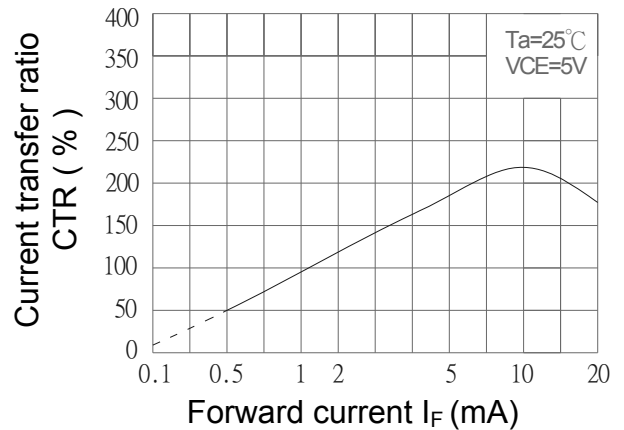


Fig.2 Collector Power Dissipation vs. Ambient Temperature

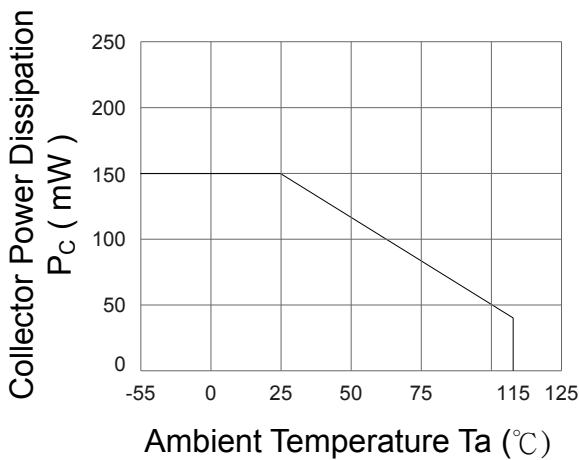


Fig.3 Collector Dark Current vs. Ambient Temperature

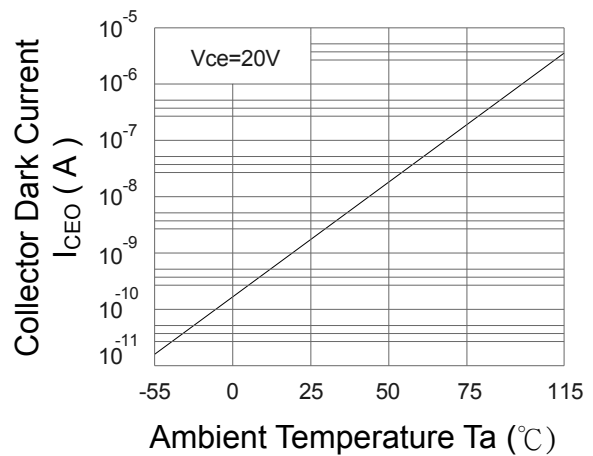


Fig.4 Forward Current vs. Ambient Temperature

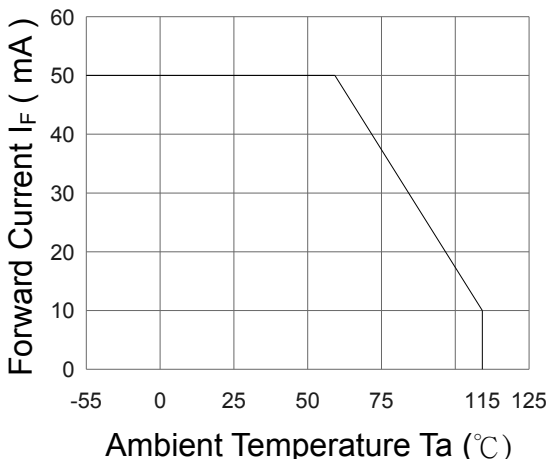
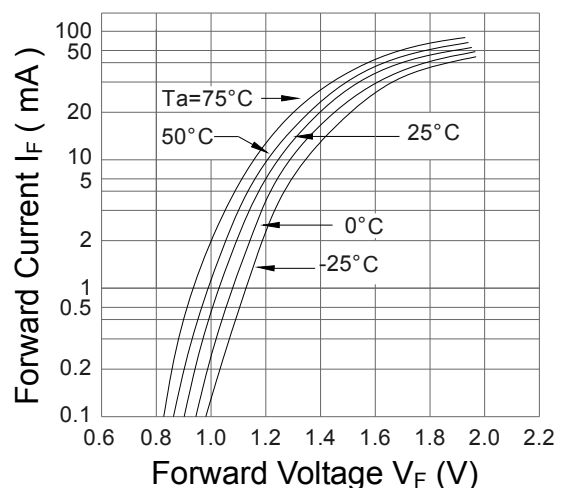


Fig.5 Forward Current vs. Forward Voltage

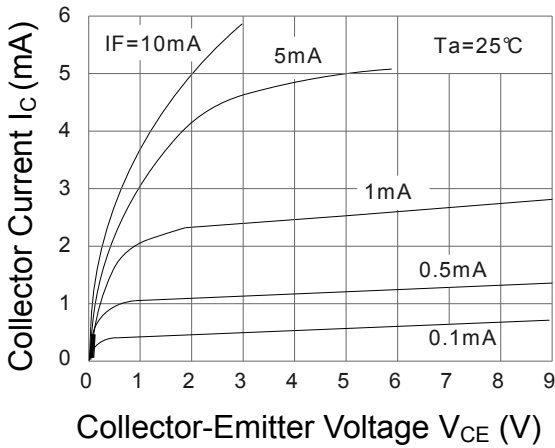


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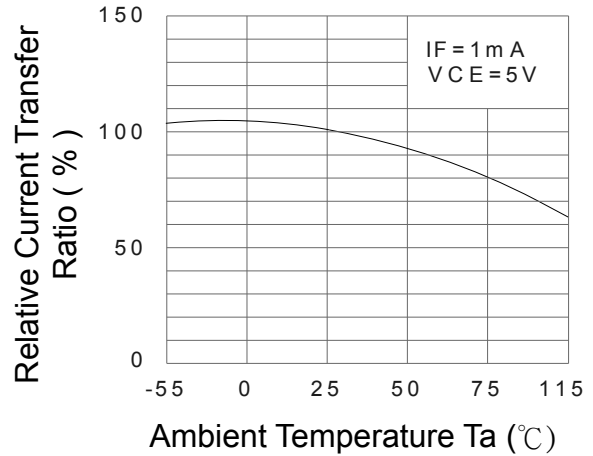
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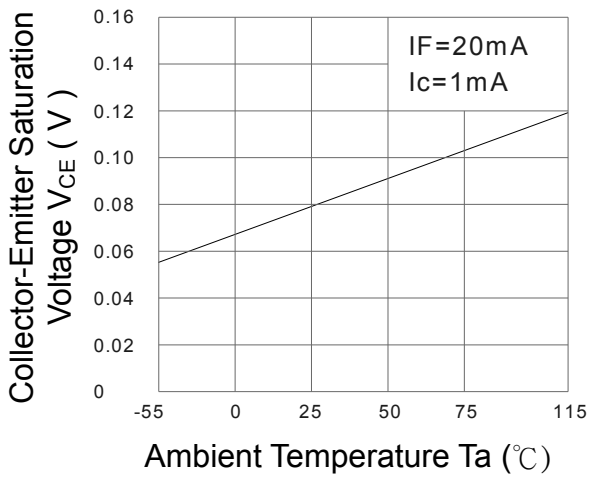
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



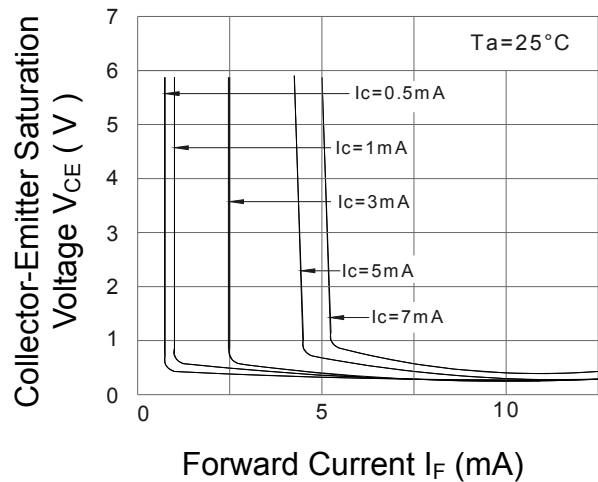
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



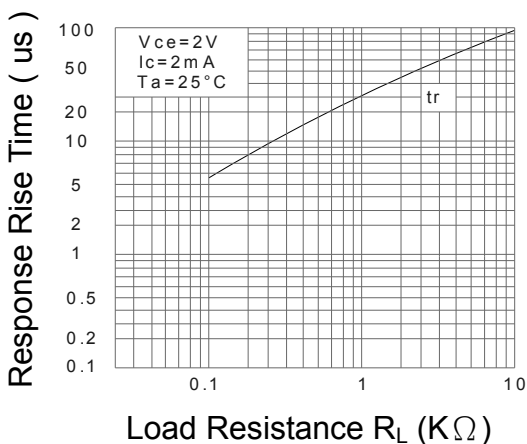
**Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature**



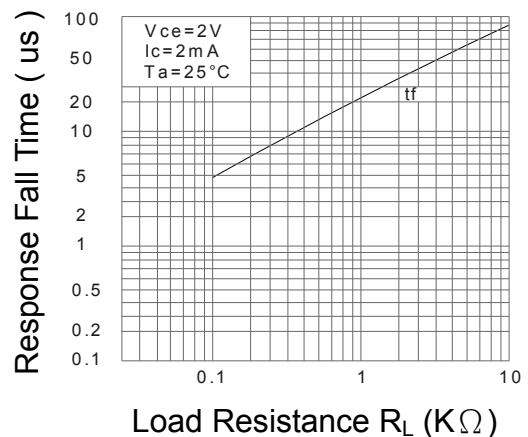
**Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current**



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



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



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