

# Photocoupler



## K401 • K402 • K404

These Photocouplers consist of two Gallium Arsenide Infrared Emitting Diodes and a Silicon NPN Photo Darlington transistor per a channel.

The K401 has one channel in a 4-pin mini-flat SMD package.

The K402 has two channels in a 8-pin mini-flat SMD package.

The K404 has four channels in a 16-pin mini-flat SMD package.

### FEATURES

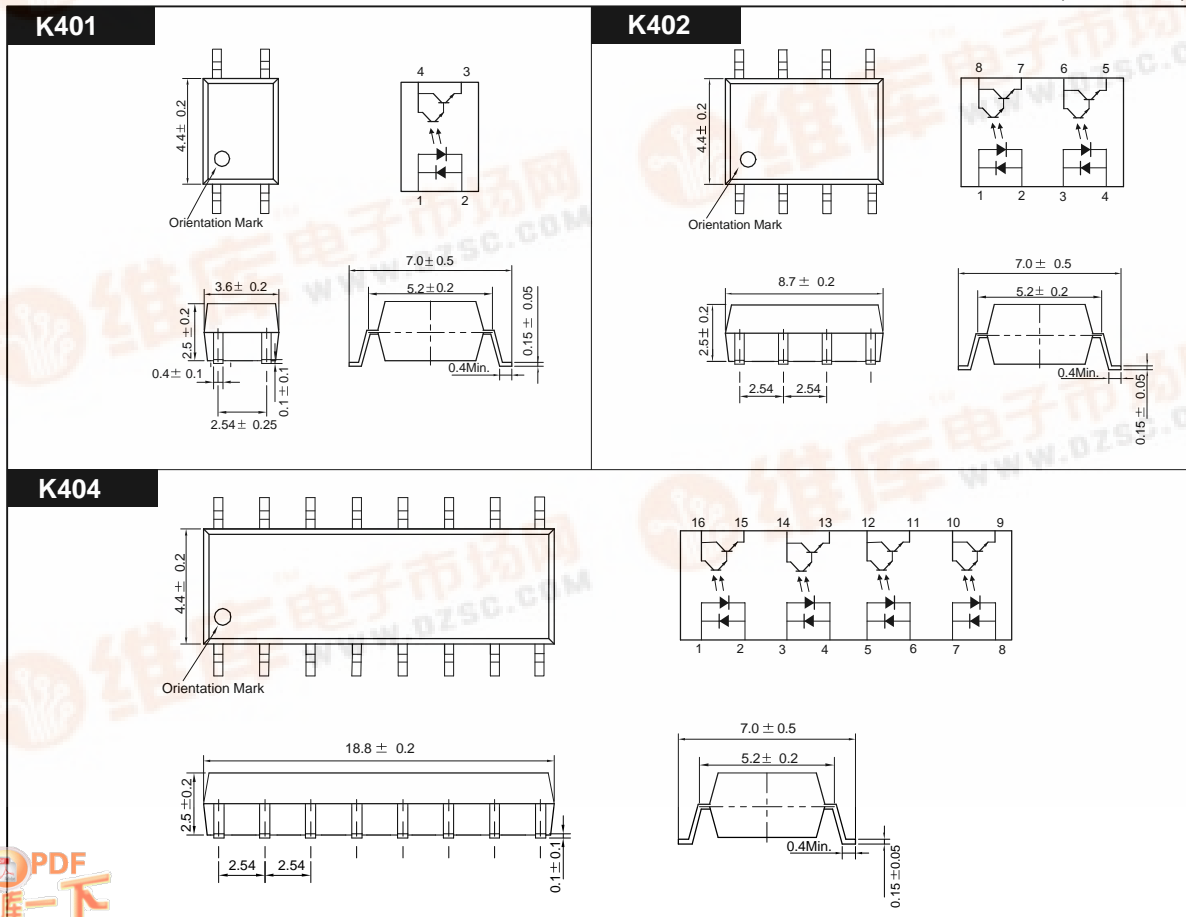
- Mini-flat Package
- Collector-Emitter Voltage : Min.30V
- Current Transfer Ratio : Type 600%  
(at  $I_F = \pm 1\text{mA}$ ,  $V_{CE} = 2\text{V}$ )
- Electrical Isolation Voltage : AC3750Vrms

### APPLICATIONS

- AC Signal Input
- Interface between two circuits of different potential
- Automatic Vending Machine
- Copiers, Industrial Robots

### DIMENSION

(Unit : mm)



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### MAXIMUM RATINGS

(Ta=25 )

Parameter		Symbol	Rating	Unit
Input	Forward Current	IF	± 50	mA
	Peak Forward Current <sup>*1</sup>	IFP	± 1	A
	Power Dissipation	PD	70	mW
	Junction temperature	TJ	125	
Output	Collector-Emitter Breakdown Voltage	BVCEO	30	V
	Emitter-Collector Breakdown Voltage	BVECO	5	V
	Collector Current	IC	50	mA
	Collector Power Dissipation	PC	150	mW
Input to Output Isolation Voltage <sup>*2</sup>		Viso	AC3750	Vrms
Storage Temperature		Tstg	-55~+125	
Operating Temperature		Topr	-30~+85	
Lead Soldering Temperature <sup>*3</sup>		Tsol	260	
Total Power Dissipation		Ptot	250	mW

\*1. Input current with 100μs pulse width, 1% duty cycle

\*2. Measured at RH=40~60% for 1min

\*3. 1/16 inch form case for 10sec

### ELECTRO-OPTICAL CHARACTERISTICS

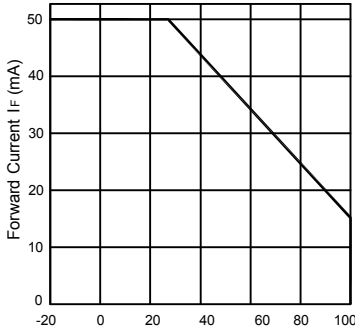
(Ta=25 , unless otherwise noted)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit.
Input	Forward Voltage	VF	IF= ± 10mA	-	1.15	1.30	V
	Capacitance	CT	V=0, f=1kHz	-	30	-	pF
Output	Collector-Emitter Breakdown Voltage	BVCEO	Ic=0.5mA	30	-	-	V
	Emitter-Collector Breakdown Voltage	BVECO	IE=0.1mA	5	-	-	V
	Collector Dark Current	ICEO	IF=0, VCE=10V	-	-	100	nA
	Capacitance	CCE	VCE=0, f=1KHz	-	10	-	pF
Coupled	Current Transfer Ratio <sup>*4</sup>	CTR	IF= ± 1mA, VCE=2V	300	-	-	%
	Collector-Emitter Saturation Voltage	VCE(SAT)	IF= ± 1mA, IC=2mA	-	0.8	1.2	V
	Input-Output Capacitance	CIO	V=0, f=1KHz	-	5	-	pF
	Input-Output Isolation Resistance	RIO	RH=40~60%, V=500V	-	10 <sup>11</sup>	-	
	Rise Time	tr	VCE=10V, RL=100	-	90	-	μs
	Fall Time	tf	Ic=10mA	-	120	-	μs

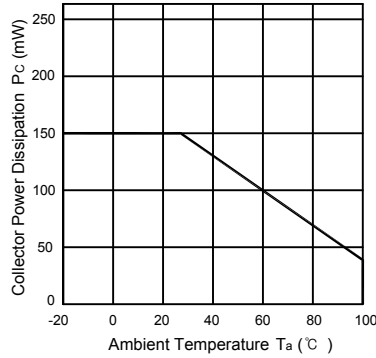
\*4. CTR=(Ic/IF) X 100 (%)

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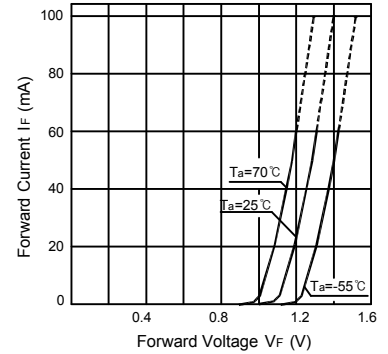
**Forward Current vs. Ambient Temperature**



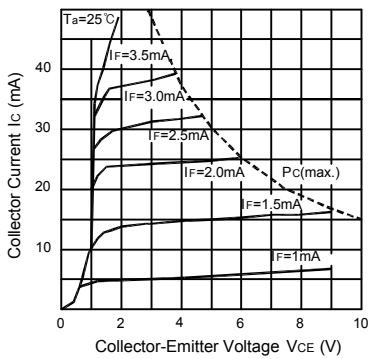
**Collector Power Dissipation vs. Ambient Temperature**



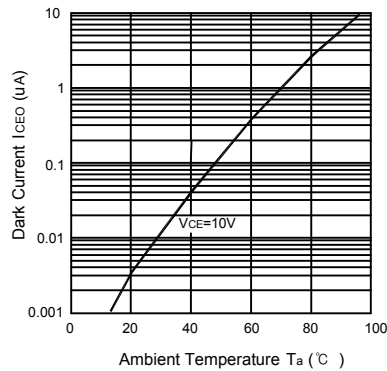
**Forward Current vs. Forward Voltage**



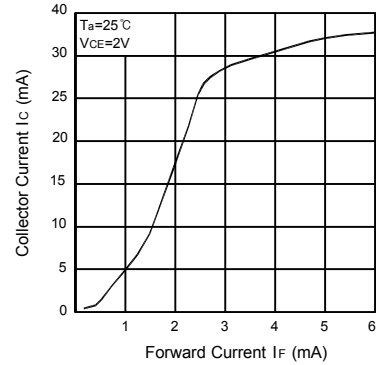
**Collector Current vs. Collector-Emitter Voltage**



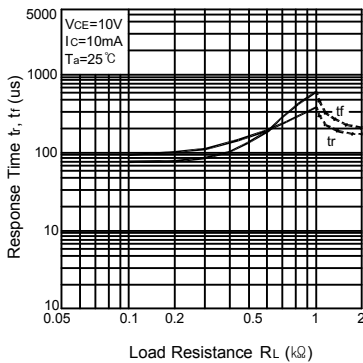
**Dark Current vs. Ambient Temperature**



**Collector Current vs. Forward Current**



**Response Time vs. Load Resistance**



**Switching Time Test Circuit**

