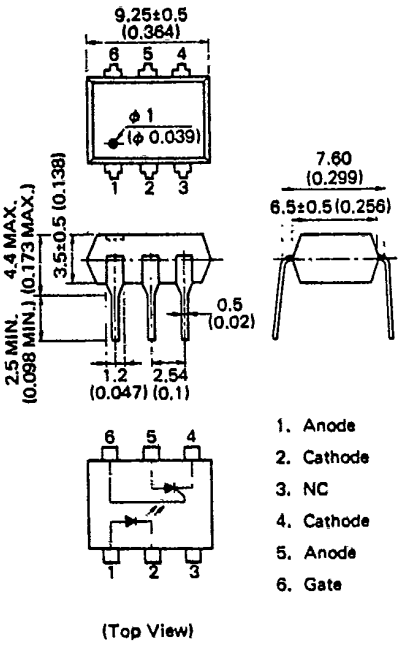
PHOTO SCR COUPLERS
PS3001(1), PS3002(1)

PHOTO SCR COUPLER

DESCRIPTION

The PS3001 and PS3002 are optically coupled isolators containing GaAs infrared emitting diode and a PNPN silicon photo SCR.

PACKAGE DIMENSIONS
in millimeters (inches)



1. Anode
2. Cathode
3. NC
4. Cathode
5. Anode
6. Gate

(Top View)

FEATURES

- High Voltage Isolation — 2 500 V_{DC} MIN.
- Low Turn on Current — 12 mA MAX.
- Plastic dual-in-line package
- High Speed Switching
- Economical, Compact.

APPLICATIONS

- Interface circuit for various instrumentations, control equipments
- Replaceable from a reed relay

ABSOLUTE MAXIMUM RATINGS (Ta=25 °C)

Diode		
Reverse Voltage	V_R	6 V
Forward Current (DC)	I_F	80 mA
Peak Forward Current	I_{FP}	3 A
Power Dissipation	P_D	100 mW
SCR		
Peak Off and Reverse Voltage	V_{DRM}, V_{RRM}	PS3001 200 V PS3002 400 V
Direct On-State Current	I_T	300 mA
Peak pulse current *1	I_{TP}	3 A
Peak surge on Current	I_{TSM}	3 A
Power Dissipation	P_{SCR}	350 mW
Isolation Voltage *2	BV	2500 V_{AC}
Storage Temperature	Tstg	−55 to +125 °C
Operation Temperature	Topt	−55 to +100 °C
Lead Soldering Time (at 260 °C)		10 s.

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

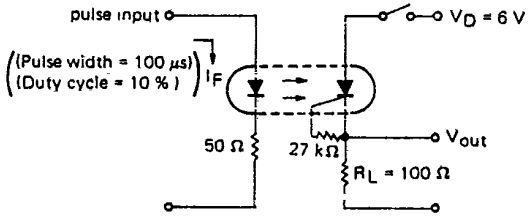
	CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Diode	Forward Voltage	V_F		1.1	1.4	V	I_F=20 mA
	Reverse Current	I_R			10	μA	V_R=6 V
	Junction Capacitance	C_t		50		pF	V=0, f=1.0 MHz
Photo SCR	Peak Off-State Current	I_{DRM}			10	μA	V_{DRM}=Rated R_{GK}=27 kΩ Ta=100 °C
	Reverse Current	I_{RRM}			10	μA	
	On State Voltage	V_{TM}			1.3	V	I_T=300 mA
	Holding Current	I_H		0.2	1	mA	R_{GK}=27 kΩ, V_D=24 V
	Rate of rise of forward blocking Voltage	dV/dt	0.5	1.0		V/μs	V_{DRM}=Rated R_{GK}=27 kΩ, Ta=100 °C
Coupled	Turn on Current *3	I_{FT}		5	12	mA	V_D=6 V, R_{GK}=27 kΩ
	Isolation breakdown Voltage	V_{1-2}	2500			V_{DC}	DC/1 minute
	Isolation Resistance	R_{1-2}	10^{11}			Ω	Vin-out=1.0 kV
	Isolation Capacitance	C_{1-2}		0.8		pF	V=0, f=1.0 MHz
	Turn on Time *4	t_{on}		10		μs	I_{FT}=50 mA, V_D=6 V R_{GK}=27 kΩ, R_L=100 Ω

*1 pulse width = 100 μs
Repetitive Frequency = 100 Hz

*2 Measuring Condition
DC voltage for 1 minute at Ta = 25 °C; RH = 60 %
Between input (pin No. 1, 2 and No. 3 Common)
and output (pin No. 4, 5 and No. 6 Common)

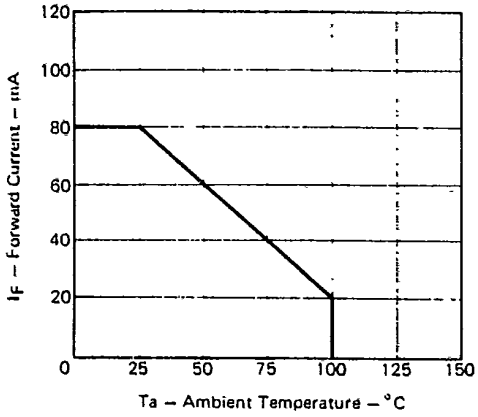
*3 I_{FT} rank
KX : to 12 mA
LX : to 7 mA

*4 Turn on Time Test Circuit

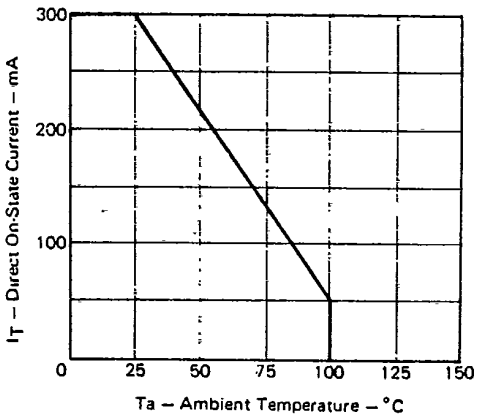


TYPICAL CHARACTERISTICS (Ta=25 °C)

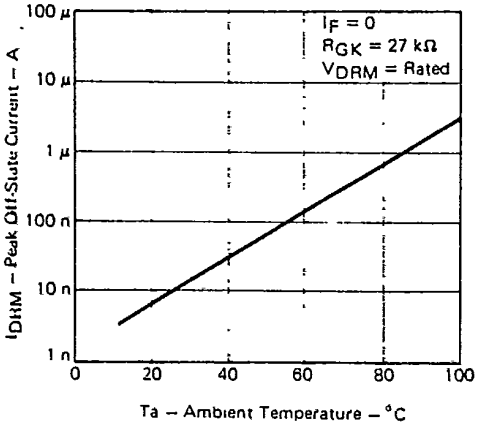
FORWARD CURRENT vs. AMBIENT TEMPERATURE



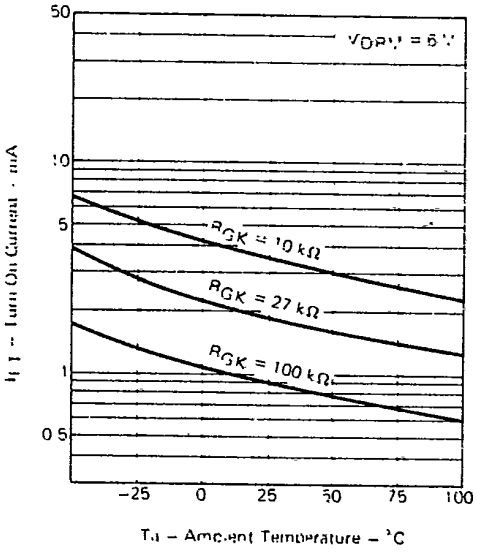
DIRECT ON-STATE CURRENT vs. AMBIENT TEMPERATURE



PEAK OFF-STATE CURRENT vs. AMBIENT TEMPERATURE



TURN ON CURRENT vs. AMBIENT TEMPERATURE



TURN ON CURRENT vs. GATE-CATHODE RESISTANCE