NEC

HIGH SENSITIVITY PHOTO TRIAC OUTPUT TYPE SOP PHOTOCOUPLER

PS3701-1
PS3702-1

FEATURES

- **LOW INPUT TRIGGER CURRENT**
  I_{FT}: 5 mA MAX
- **HIGH CRITICAL RATE OF RISE OF OFF-STATE VOLTAGE**
  dV/dt: 500 V/μs TYP
- **HIGH REPETITIVE PEAK OFF-STATE VOLTAGE**
  PS3701-1: V_{DRM}: 600 V MIN
  PS3702-1: V_{DRM}: 400 V MIN
- **HIGH ISOLATION VOLTAGE**
  BV: 2500 $V_{r.m.s.}$ MIN
- **TAPING PRODUCT NAME**
  PS3701-1-F3, PS3702-1-F3

DESCRIPTION

PS3701-1 and PS3702-1 are optically coupled isolators containing a GaAs light emitting diode and photo triac. Each is mounted in a plastic SOP (Small Out-Line Package) for high density applications.

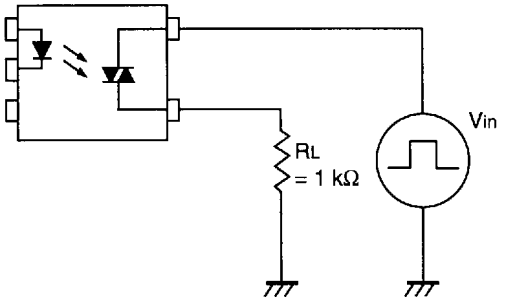
APPLICATIONS

- **SSR**
- **PROGRAMMABLE CONTROLLER**
- **ELECTRIC HOME APPLIANCE**

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER				PS3701-1, PS3702-1		
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, I_F = 10 mA	V		1.1	1.4
	I_R	Reverse Current, V_R = 5 V	μA			5
	C_t	Capacitance, V = 0, f = 1 MHz	pF		30	
Triac	I_{DRM}	Peak Off-State Current, V_{DRM} = Rated	nA			100
	V_{TM}	Peak On-State Voltage, I_{TM} = ± Rated	V		2.3	3
	I_H	Holding Current	mA		0.2	
	dV/dt	Critical Rate of Rise of Off-State Voltage[1], V_{in} = ± 1/√2 Rated	V/μs		500	
Coupled	I_{FT}	Trigger Input Current, V_T = ± 6 V	mA		2	5
	R_{1-2}	Isolation Resistance, V_{in-out} = 1 k V_{DC}	Ω	10^{11}		
	C_{1-2}	Isolation High Capacitance, V = 0, f = 1 MHz	pF		0.4	

Notes:
1. Test Circuit for Critical Rate of Rise of Off-State Voltage



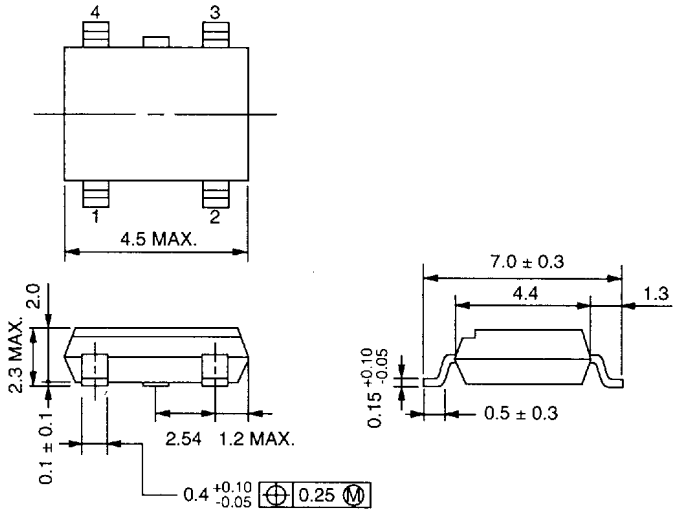
ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS3701-1	PS3702-1
Diode				
I_F	Forward Current	mA	50	50
V_R	Reverse Voltage	V	6	6
ΔP_D/°C	Power Dissipation Derating	mW/°C	0.8	0.8
P_D	Power Dissipation	mW	80	80
I_{FP}	Peak Forward Current PW = 100 µs, Duty Cycle 1%	A	1	1
Triac				
V_{DRM}	Repetitive Peak Off-State Voltage	V	600	400
$I_{T(RMS)}$	RMS On State Current	mA	80	80
I_{TSM}	Peak 1 Cycle Serge on Current[2]	A	0.5	0.5
ΔP_C/°C	Power Dissipation Derating	mW/°C	1.5	1.5
P_C	Power Dissipation	mW	150	150
Coupled				
BV	Isolation Voltage[3]	$V_{r.m.s.}$	2500	
T_{STG}	Storage Temperature	°C	-40 to +125	
T_{OP}	Operating Temperature	°C	-30 to +100	

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Sine Wave f = 50 Hz
3. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input (pin No. 1, 2 Common) and output (pin No. 3, 4 Common).

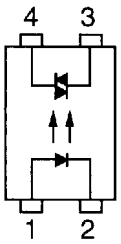
OUTLINE DIMENSIONS (Units in mm)

PS3701-1, PS3702-1



PIN CONNECTIONS (Top View)

PS3701-1, PS3702-1



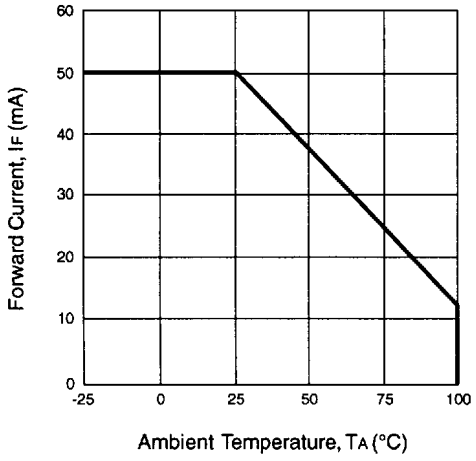
1. Anode
2. Cathode
3. Triac
4. Triac

RECOMMENDED OPERATING CONDITIONS

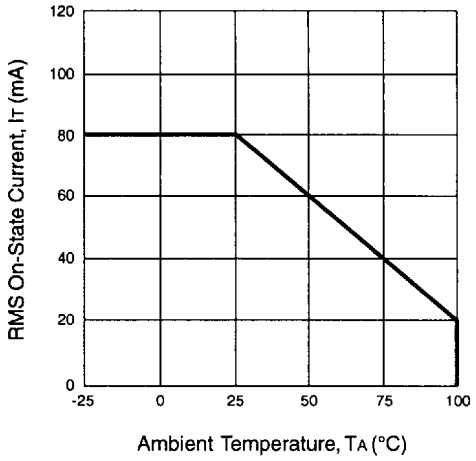
PART NUMBER				PS3701-1, PS3702-1		
SYMBOL	PARAMETERS		UNITS	MIN	TYP	MAX
V_{AC}	Supply Voltage	PS3701	V_{AC}			240
		PS3702				120
I_F	Forward Current		mA	7	10	15
T_{OP}	Operating Temperature		°C	-25		+85

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

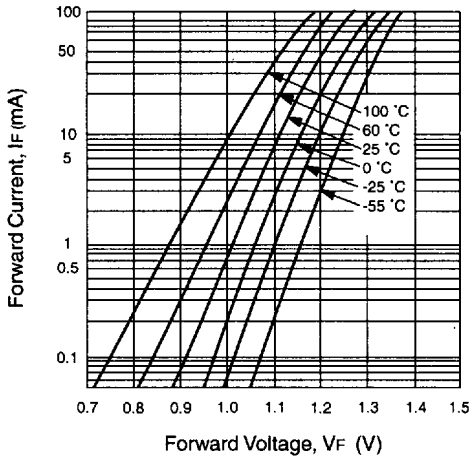
FORWARD CURRENT vs. AMBIENT TEMPERATURE



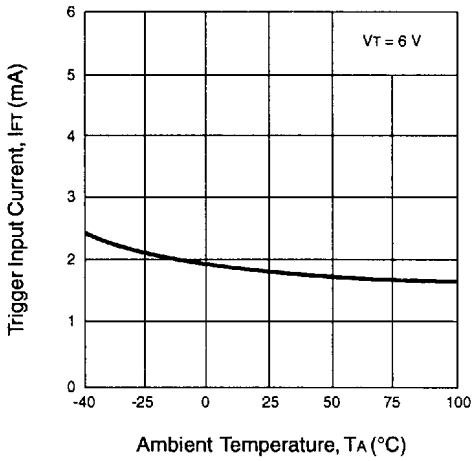
RMS ON-STATE CURRENT vs. AMBIENT TEMPERATURE



FORWARD CURRENT vs. FORWARD VOLTAGE

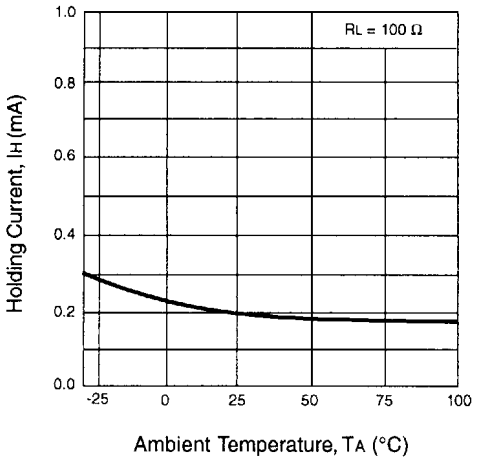


TRIGGER INPUT CURRENT vs. AMBIENT TEMPERATURE

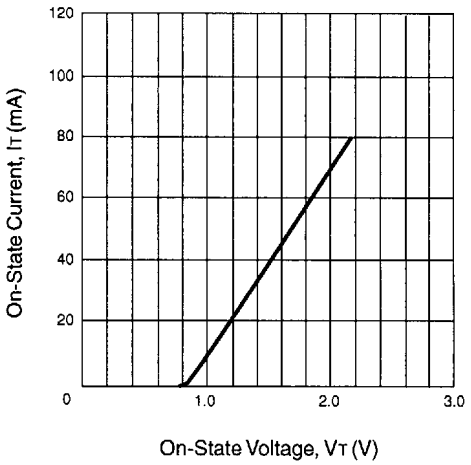


TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

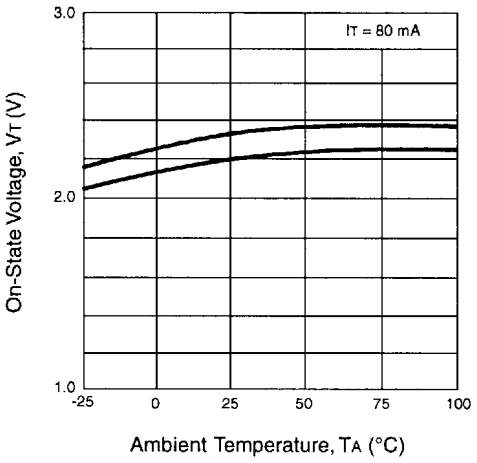
HOLDING CURRENT vs. AMBIENT TEMPERATURE



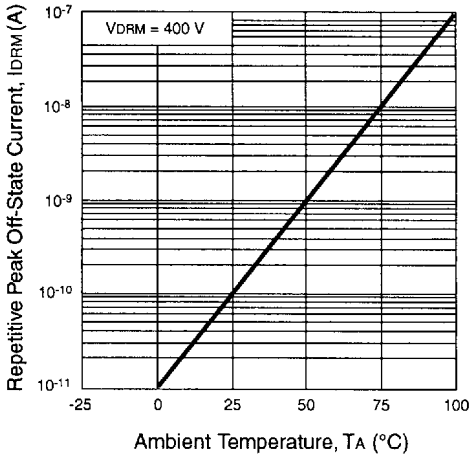
ON-STATE CURRENT vs. ON-STATE VOLTAGE



ON-STATE VOLTAGE vs. AMBIENT TEMPERATURE



REPETITIVE PEAK OFF-STATE CURRENT vs. AMBIENT TEMPERATURE



TURN-ON TIME vs. FORWARD CURRENT