

HIGH ISOLATION VOLTAGE AC INPUT RESPONSE TYPE SOP MULTI PHOTOCOUPLER

PS2705-1
PS2705-2
PS2705-4

FEATURES

- **HIGH ISOLATION VOLTAGE**
BV:3.75 k V_{r.m.s.} MIN
- **SOP (SMALL OUT-LINE PACKAGE)**
- **ISOLATED CHANNELS PER EACH PACKAGE**
- **AC INPUT RESPONSE**
- **HIGH SPEED SWITCHING**
 $t_r = 3 \mu s$, $t_f = 5 \mu s$ TYP
- **LOW COLLECTOR TO EMITTER DARK CURRENT**
 $I_{CEO} = 5 \text{ nA}$ TYP @ $T_A = 25^\circ C$, $V_{CE} = 40 \text{ V}$
- **TAPE AND REEL AVAILABLE**

DESCRIPTION

PS2705-1, -2 and -4 are optically coupled isolators containing GaAs light emitting diodes and an NPN silicon phototransistor. Each is mounted in a plastic SOP (Small Out-line Package) for high density applications. This package has a shield effect to cut off ambient light.

APPLICATIONS

Interface circuit for various instrumentations and control equipment.

- **AC LINE/DIGITAL LOGIC**
- **DIGITAL LOGIC INTERFACE**
- **TWISTED PAIR LINE RECEIVER**
- **TELEPHONE/TELEGRAPH LINE RECEIVER**
- **SEQUENCE CONTROLLERS**
- **SYSTEMS APPLICATIONS, MEASURING INSTRUMENTS**

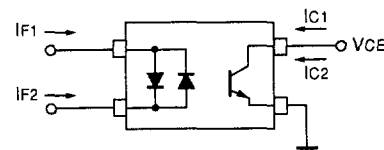
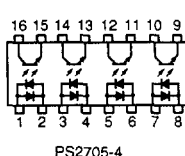
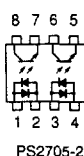
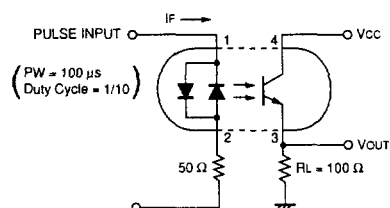
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$)

PART NUMBER			PS2705-1, -2, -4		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, $I_F = \pm 5 \text{ mA}$		1.1	1.4
	C	Junction Capacitance, $V = 0$, $f = 1.0 \text{ MHz}$		60	
Transistor	I_{CEO}	Collector to Emitter Dark Current, $V_{CE} = 40 \text{ V}$, $I_F = 0$			100
Coupled	CTR	Current Transfer Ratio, $I_F = \pm 5 \text{ mA}$, $V_{CE} = 5 \text{ V}$	50	100	300
	CTR ₁ /CTR ₂	CTR Ratio ² , $I_F = \pm 5 \text{ mA}$, $V_{CE} = 5 \text{ V}$	0.3	0.1	3.0
	$V_{CE}(\text{sat})$	Collector Saturation Voltage, $I_F = \pm 10 \text{ mA}$, $I_C = 2 \text{ mA}$			0.3
	R ₁₋₂	Isolation Resistance, $V_{in-out} = 1.0 \text{ kV}$	10^{11}		
	C ₁₋₂	Isolation Capacitance, $V = 0$, $f = 1.0 \text{ MHz}$		0.4	
	t_r	Rise Time ¹ , $V_{CC} = 5 \text{ V}$, $I_C = 2 \text{ mA}$, $R_L = 100 \Omega$		3	
	t_f	Fall Time ¹ , $V_{CC} = 5 \text{ V}$, $I_C = 2 \text{ mA}$, $R_L = 100 \Omega$		5	

Notes:

1. Test Circuit for Switching Time

2. $CTR_1 = I_{C1}/I_{F1}$, $CTR_2 = I_{C2}/I_{F2}$

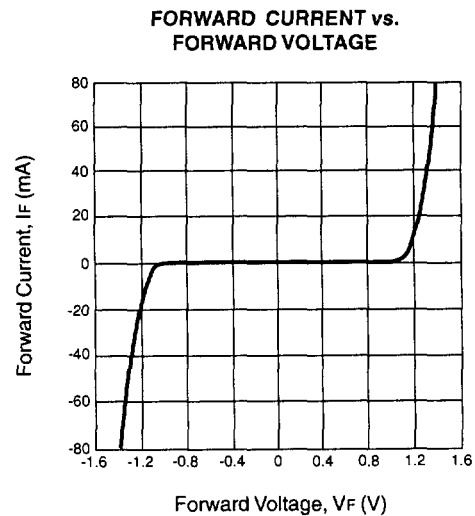
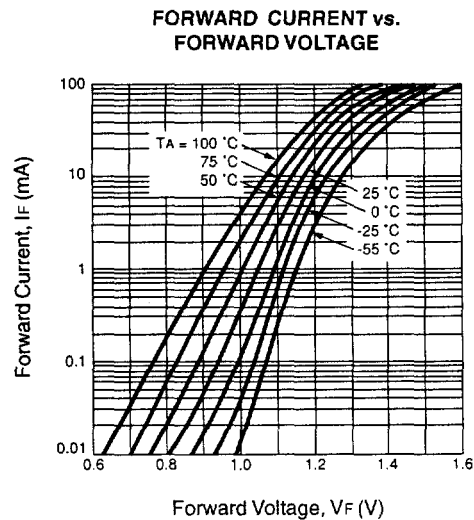
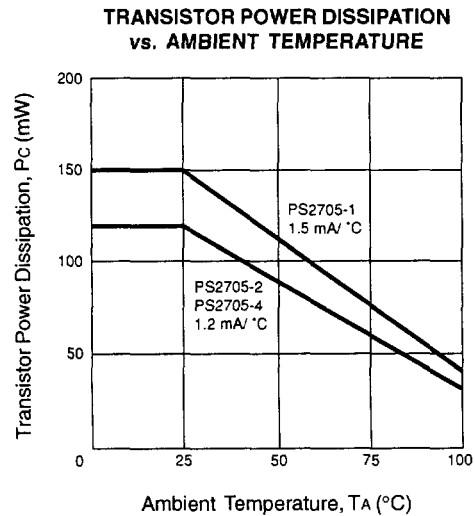
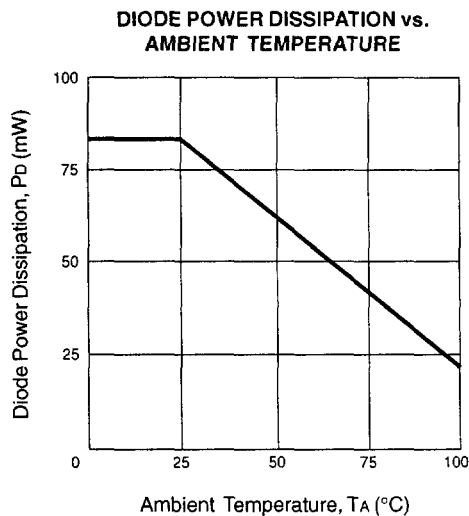


ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS2705-1	PS2705-2,-4
Diode				
I _F	Forward Current	mA	±50	±50
P _D	Power Dissipation	mW/Ch	80	80
I _F (PEAK)	Peak Forward Current (PW = 100 μs, Duty Cycle 1%)	A	±1	±1
Transistor				
V _{CEO}	Collector to Emitter Voltage (I _C = 1mA, I _B = 0)	V	40	40
V _{ECO}	Emitter to Collector Voltage (I _E = 100μA, I _B = 0)	V	6	6
I _C	Collector Current	mA/Ch	80	80
P _C	Power Dissipation	mW/Ch	150	120
Coupled				
BV	Isolation Voltage ²	V _{r.m.s.}	3750	3750
T _{STG}	Storage Temperature	°C	-55 to +150	-55 to +150
T _{OP}	Operating Temperature	°C	-55 to +100	-55 to +100

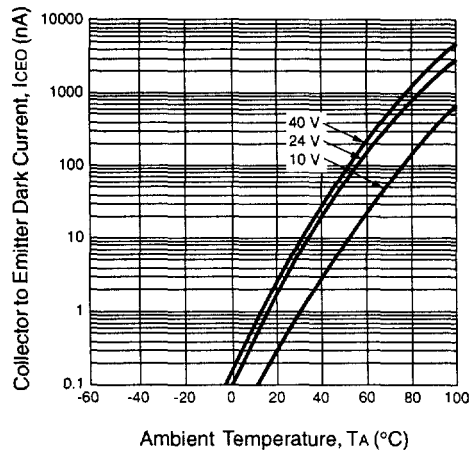
Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- AC voltage for 1 minute at $T_A = 25^\circ\text{C}$, $RH = 60\%$ between input and output.

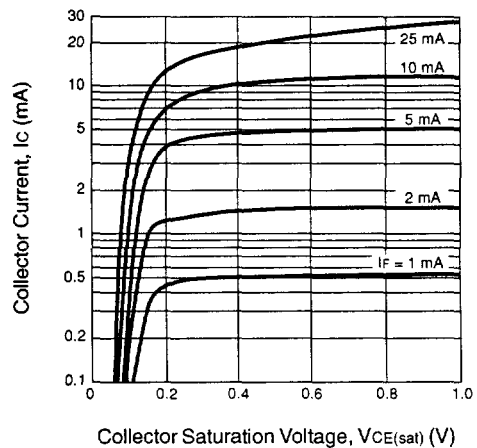
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)

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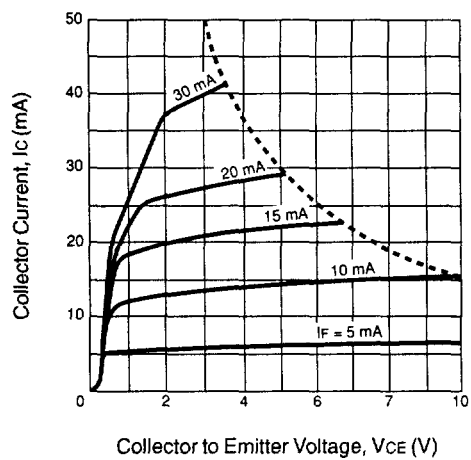
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



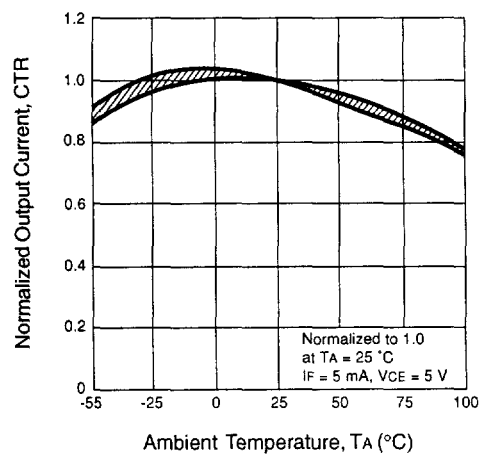
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



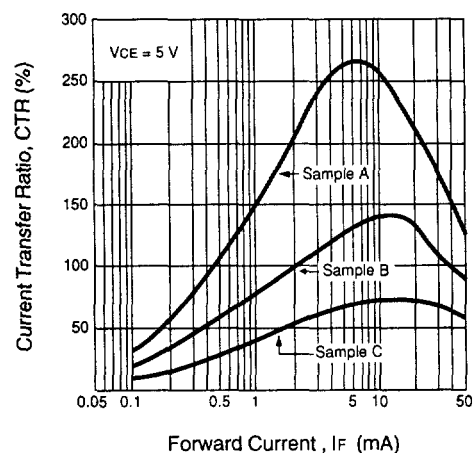
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



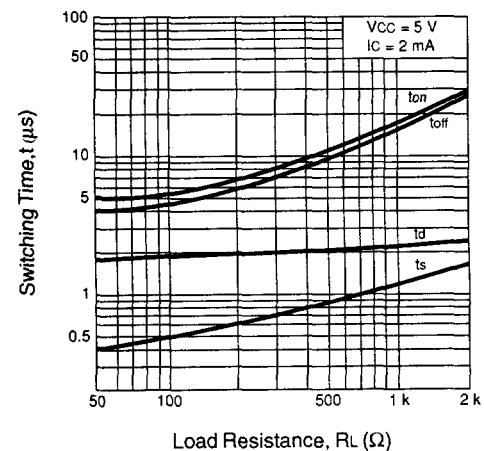
NORMALIZED OUTPUT CURRENT vs. AMBIENT TEMPERATURE



CURRENT TRANSFER RATIO vs. FORWARD CURRENT

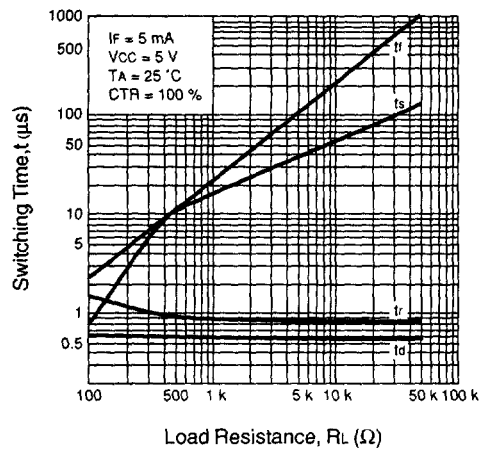


SWITCHING TIME vs. LOAD RESISTANCE

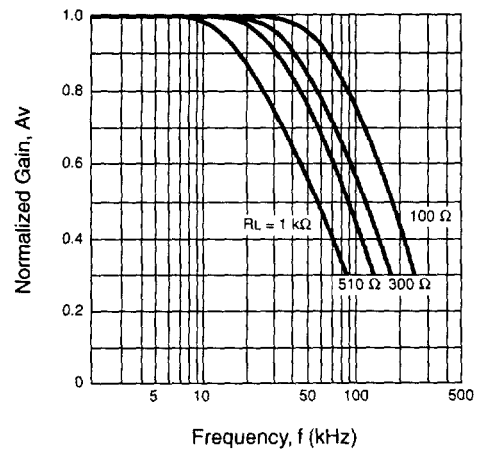


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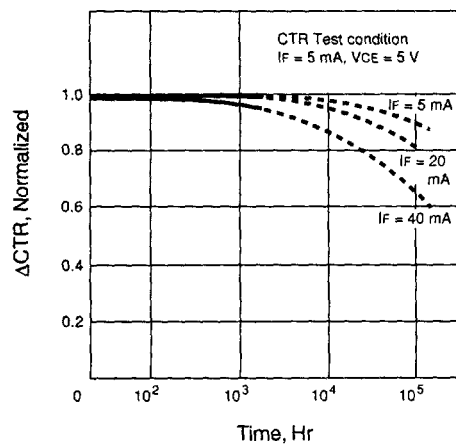
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



CTR DEGRADATION

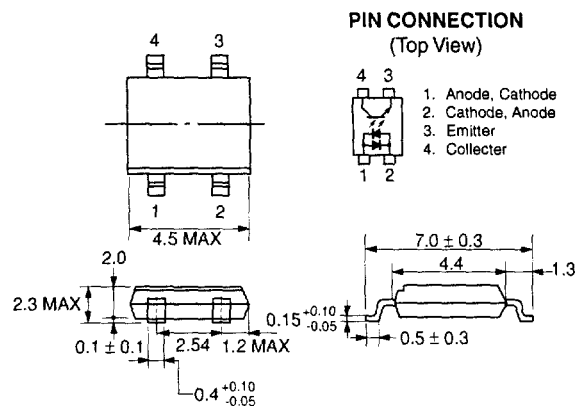


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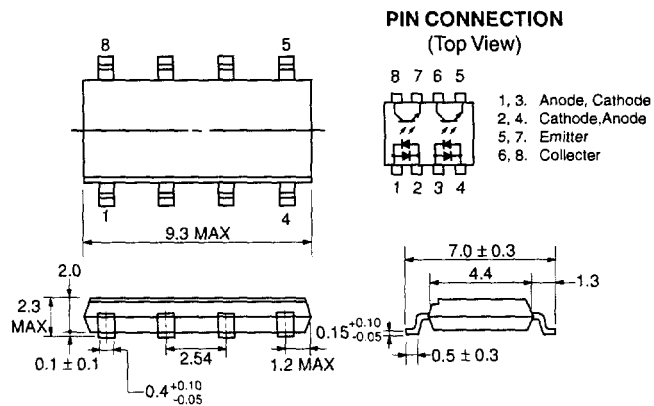
PS2705-1, PS2705-2, PS2705-4

OUTLINE DIMENSIONS (Units in mm)

PS2705-1



PS2705-2



PS2705-4

