

HIGH ISOLATION VOLTAGE SOP MULTI PHOTOCOUPLER

PS2701-1
PS2701-2
PS2701-4

FEATURES

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

DESCRIPTION

PS2701-1, -2, and -4 are optically coupled isolators containing a GaAs light emitting diode and a NPN silicon phototransistor. Each is mounted in a plastic SOP (Small Outline 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
- HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL
- RELAY CONTACT MONITOR
- POWER SUPPLY MONITOR

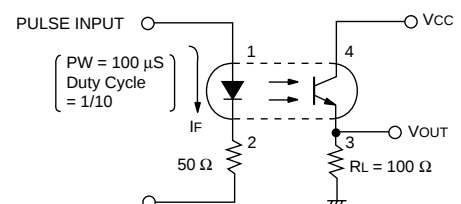
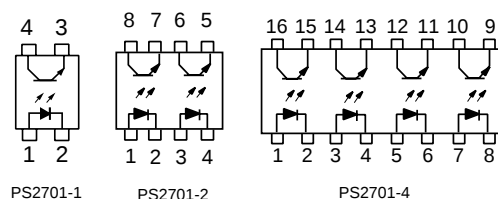
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$)

PART NUMBER			PS2701-1, -2, -4		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, $I_F = 5 \text{ mA}$	V	1.1	1.4
	I_R	Reverse Current, $V_R = 5 \text{ V}$	μA		5
	C	Junction Capacitance, $V = 0$, $f = 1.0 \text{ MHz}$	pF	30	
Transistor	I_{CEO}	Collector to Emitter Dark Current, $V_{CE} = 40 \text{ V}$, $I_F = 0$	nA		100
Coupled	CTR	Current Transfer Ratio ¹ , $I_F = 5 \text{ mA}$, $V_{CE} = 5 \text{ V}$	%	50	300
	$V_{CE(sat)}$	Collector Saturation Voltage, $I_F = 10 \text{ mA}$, $I_C = 2 \text{ mA}$	V		0.3
	R1-2	Isolation Resistance, $V_{IN-OUT} = 1.0 \text{ k Vdc}$	Ω	10^{11}	
	C1-2	Isolation Capacitance, $V = 0$, $f = 1.0 \text{ MHz}$	pF		0.4
	t_r	Rise Time ² , $V_{CC} = 5 \text{ V}$, $I_C = 2 \text{ mA}$, $R_L = 100 \Omega$	μs		3
	t_f	Fall Time ² , $V_{CC} = 5 \text{ V}$, $I_C = 2 \text{ mA}$, $R_L = 100 \Omega$	μs		5

Notes:

1. CTR rank (PS2701-1 only)
L: 100 to 300 %
M: 50 to 150 %

2. Test Circuit for Switching Time

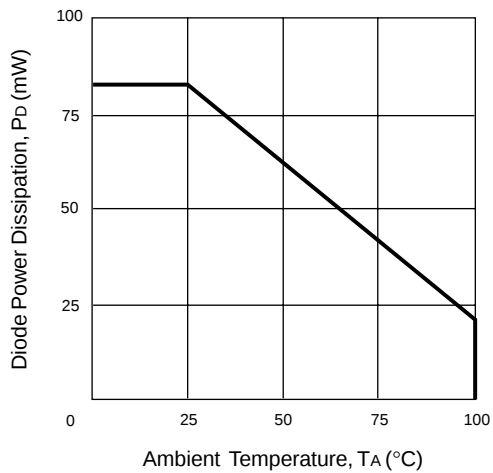
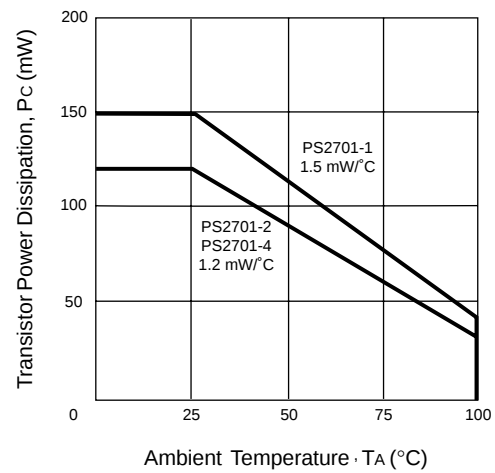
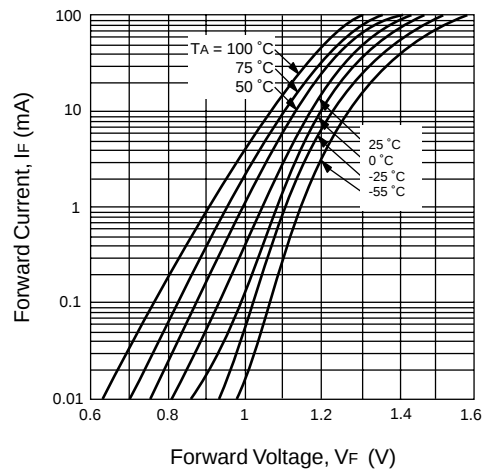
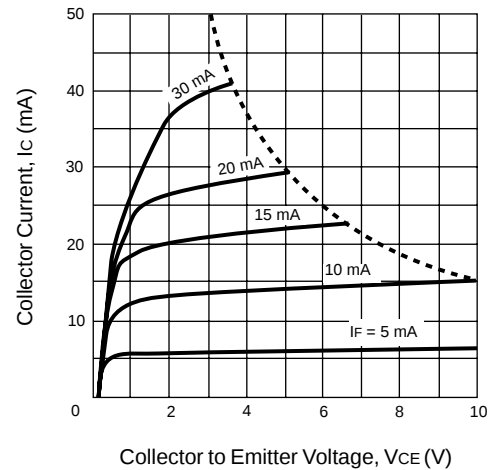


ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

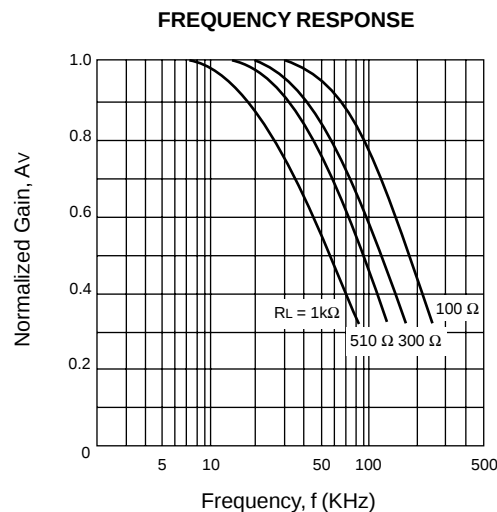
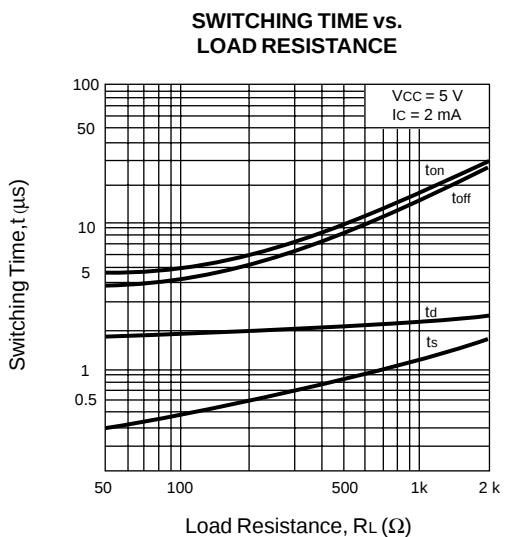
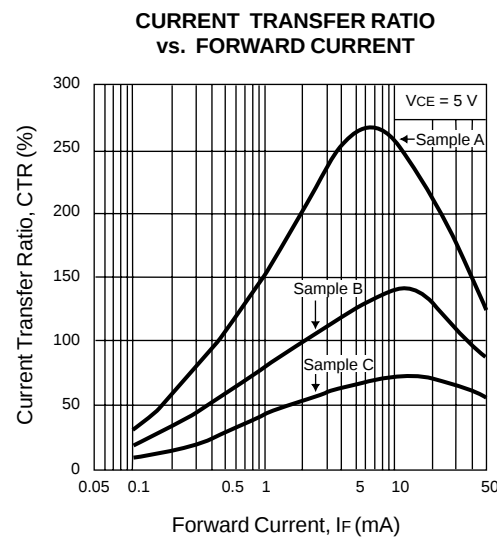
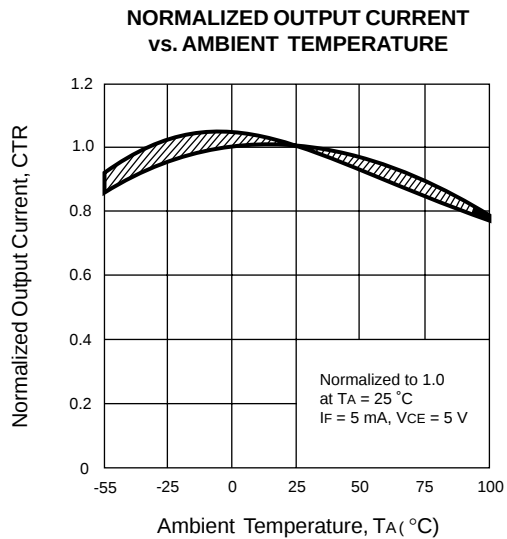
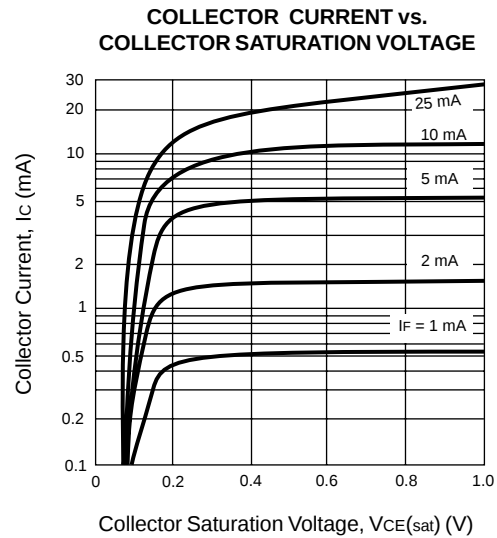
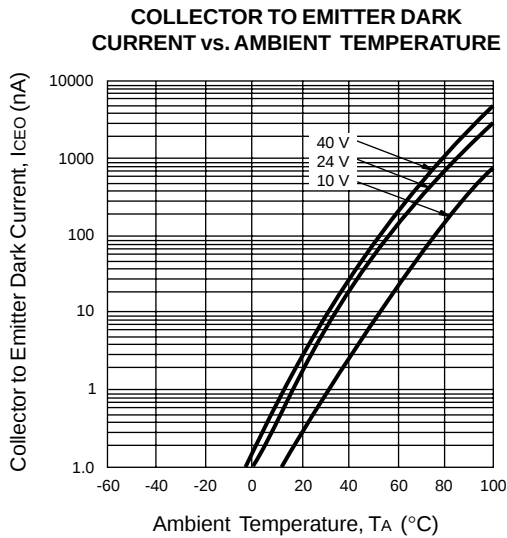
SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS2701-1	PS2701-2, -4
Diode				
I _F	Forward Current (DC)	mA	50	50
V _R	Reverse Voltage	V	6	6
P _D	Power Dissipation	mW/Ch	80	80
I _F (PEAK)	Peak Forward Current (P _W = 100 μs, Duty Cycle 1%)	A	1	1
Transistor				
V _{CEO}	Collector to Emitter Voltage (I _C = 1mA, 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	
T _{OPT}	Operating Temperature	°C	-55 to +100	

Notes:

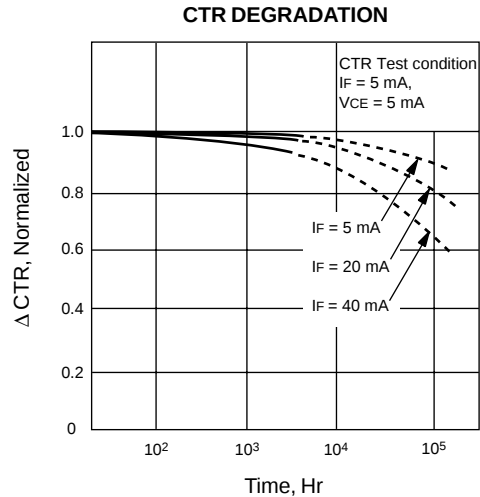
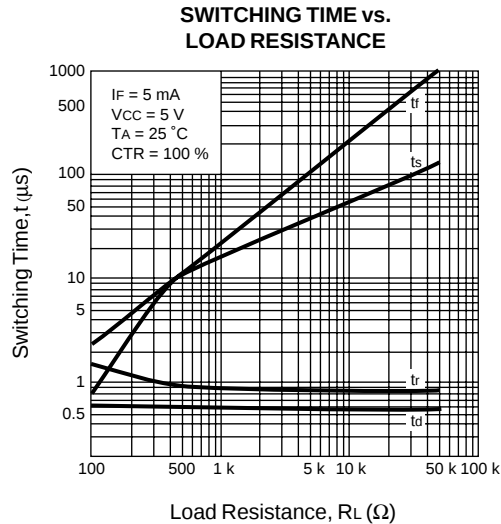
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at $T_A = 25^\circ\text{C}$, $RH = 60\%$ between input and output.

TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)**DIODE POWER DISSIPATION vs.
AMBIENT TEMPERATURE****TRANSISTOR POWER DISSIPATION
vs. AMBIENT TEMPERATURE****FORWARD CURRENT vs.
FORWARD VOLTAGE****COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE**

TYPICAL PERFORMANCE CURVES (TA = 25 °C)



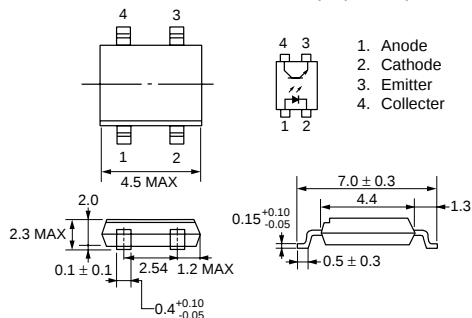
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)



OUTLINE DIMENSIONS (Units in mm)

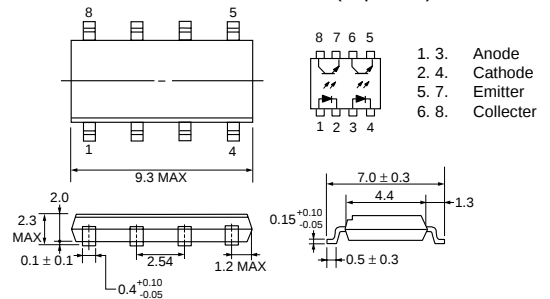
PS2701-1

PIN CONNECTION (Top View)



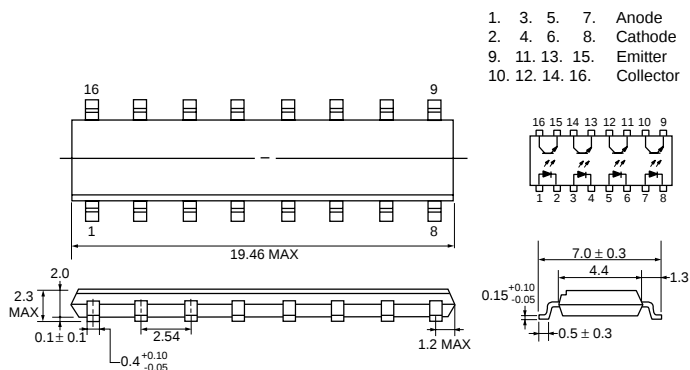
PS2701-2

PIN CONNECTION (Top View)



PS2701-4

PIN CONNECTION (Top View)



EXCLUSIVE NORTH AMERICAN AGENT FOR **NEC** RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

CEL CALIFORNIA EASTERN LABORATORIES • Headquarters • 4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • Telex 34-6393 • FAX (408) 988-0279
24-Hour Fax-On-Demand: 800-390-3232 (U.S. and Canada only) • Internet: <http://WWW.CEL.COM>

DATA SUBJECT TO CHANGE WITHOUT NOTICE

7/26/2000