

FEATURES

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

DESCRIPTION

NEC's PS2701-1 is an optically coupled isolator containing a GaAs light emitting diode and a NPN silicon phototransistor. This device is mounted in a plastic SOP (Small Outline Package) for high density applications and 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**

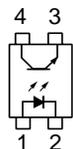
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

PART NUMBER			PS2701-1			
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_t	Terminal 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	100	300
	$V_{CE(sat)}$	Collector Saturation Voltage, $I_F = 10 \text{ mA}$, $I_C = 2 \text{ mA}$	V			0.3
	Ri-o	Isolation Resistance, $V_{IN-OUT} = 1.0 \text{ k Vdc}$	Ω	10^{11}		
	CI-o	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:

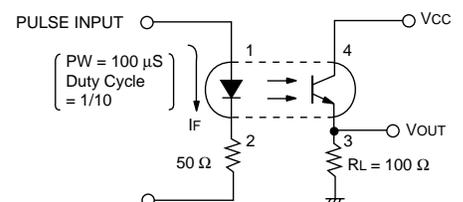
1. CTR rank

L: 100 to 300 %
M: 50 to 150 %
P: 150 to 300%



PS2701-1

2. Test Circuit for Switching Time



ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

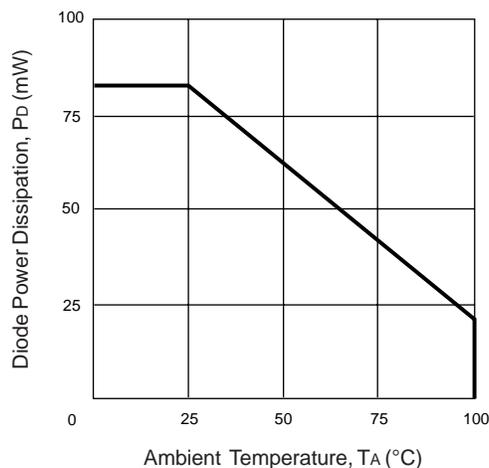
SYMBOLS	PARAMETERS	UNITS	RATINGS
			PS2701-1
Diode			
I _F	Forward Current (DC)	mA	50
V _R	Reverse Voltage	V	6
P _D	Power Dissipation	mW/Ch	80
I _F (PEAK)	Peak Forward Current (PW = 100 μs, Duty Cycle 1%)	A	1
Transistor			
V _{CEO}	Collector to Emitter Voltage (I _C = 1mA, I _B = 0)	V	40
V _{ECO}	Emitter to Collector Voltage (I _E = 100μA, I _B = 0)	V	6
I _C	Collector Current	mA/Ch	80
P _C	Power Dissipation	mW/Ch	150
Coupled			
BV	Isolation Voltage ²	V _{r.m.s.}	3750
T _{STG}	Storage Temperature	°C	-55 to +150
T _A	Operating Ambient Temperature	°C	-55 to +100

Notes:

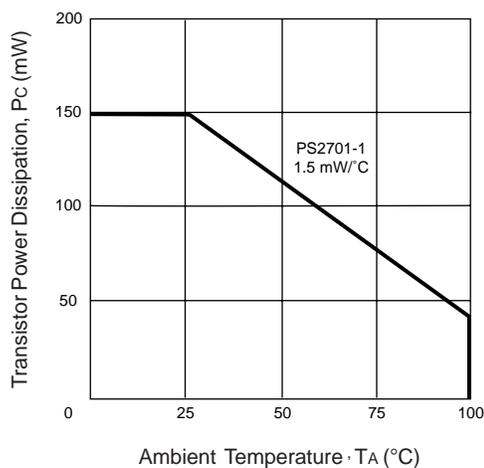
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

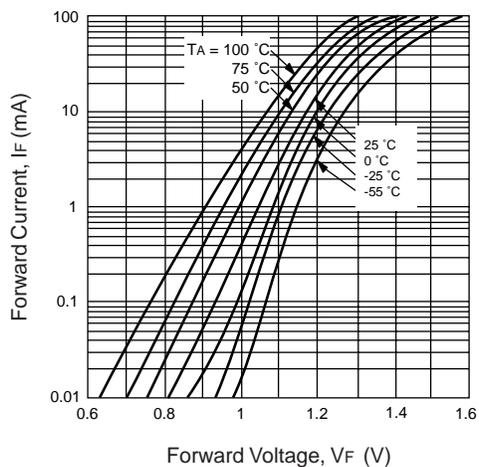
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



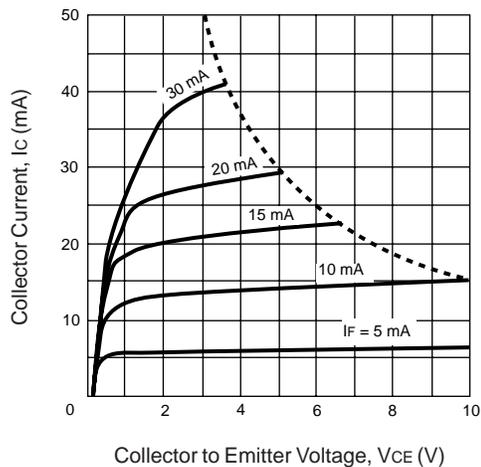
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



FORWARD CURRENT vs. FORWARD VOLTAGE

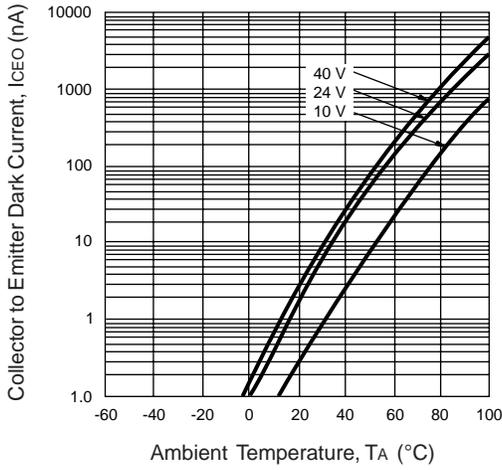


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

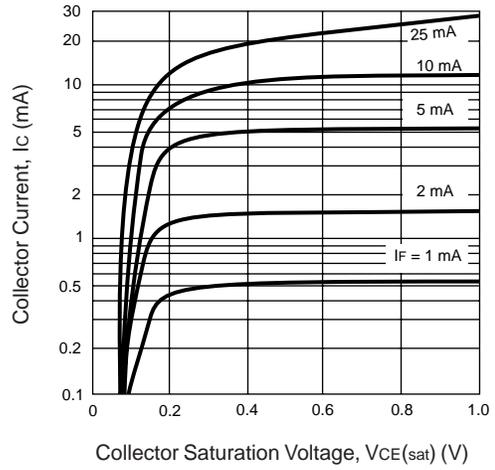


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

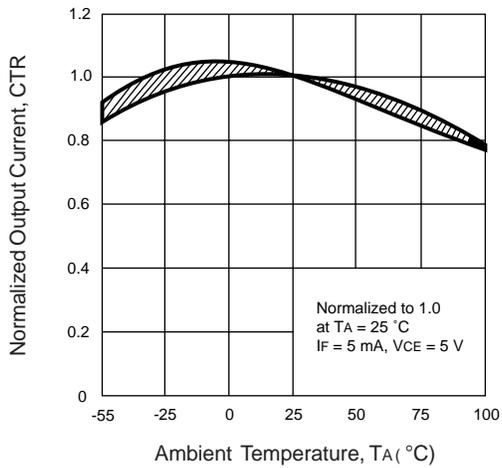
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



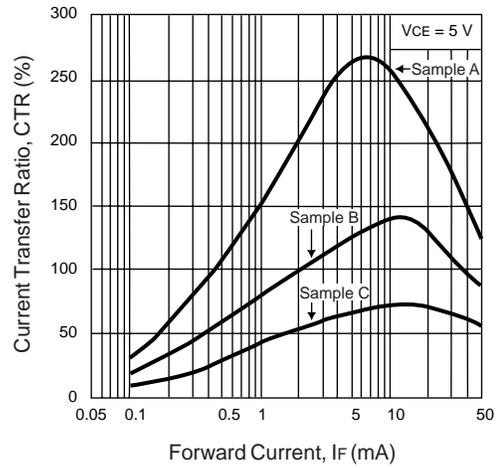
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



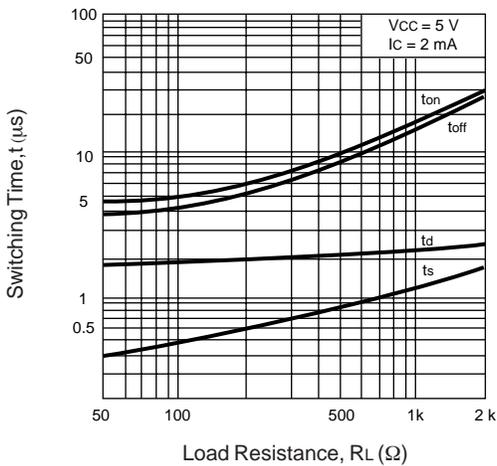
NORMALIZED OUTPUT CURRENT vs. AMBIENT TEMPERATURE



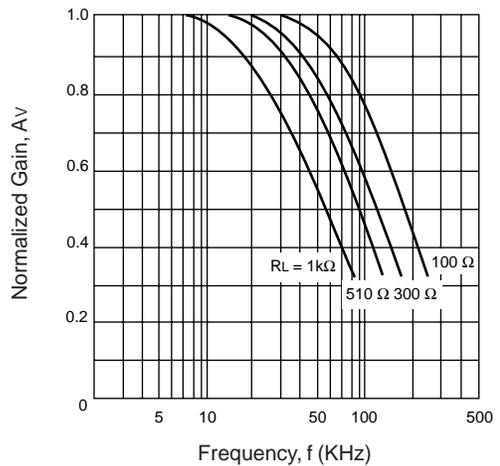
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



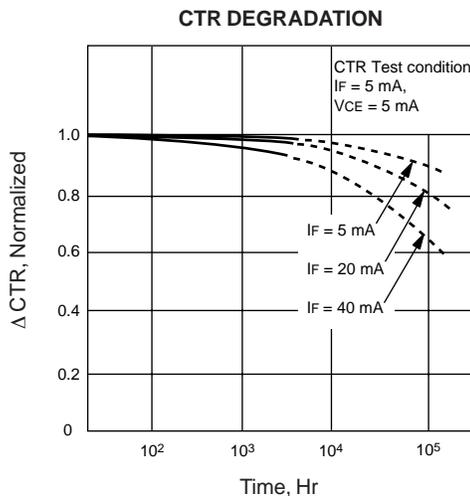
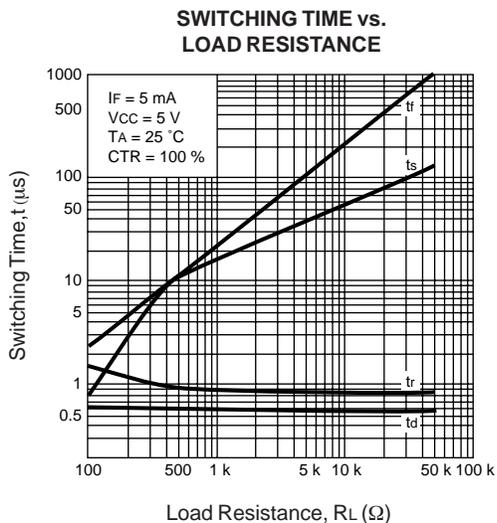
SWITCHING TIME vs. LOAD RESISTANCE



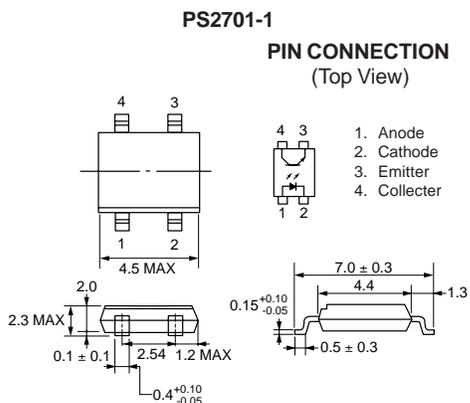
FREQUENCY RESPONSE



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



OUTLINE DIMENSIONS (Units in mm)



Life Support Applications

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