

FEATURES

- **HIGH ISOLATION VOLTAGE**
BV: 3.75 k Vr.m.s.
- **SOP (SMALL OUT-LINE PACKAGE)**
- **HIGH SPEED SWITCHING**
 $t_r = 5 \mu\text{s TYP}$, $t_f = 7 \mu\text{s TYP}$
- **ORDERING NUMBER OF TAPING PRODUCT**
PS2701A-1-F3, F4

DESCRIPTION

NEC's PS2701A-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

- HYBRID IC
- MEASURING INSTRUMENTS
- POWER SUPPLY
- TELEPHONE/TELEGRAPH LINE RECEIVER
- PROGRAMMABLE LOGIC CONTROLLERS

ELECTRICAL CHARACTERISTICS (TA = 25°C)

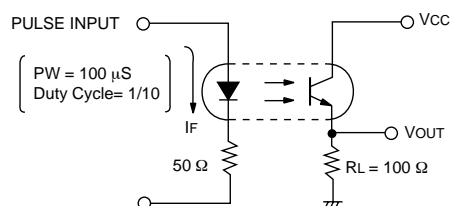
PART NUMBER			PS2701A-1		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 5 mA	V	1.2	1.4
	I _R	Reverse Current, V _R = 5 V	μA		5
	C _t	Terminal Capacitance, V = 0, f = 1 MHz	pF		10
Transistor	I _{CEO}	Collector to Emitter Current, I _F = 0 mA, V _{CE} = 70	nA		100
Coupled	CTR	Current Transfer Ratio ¹ , I _F = 5 mA, V _{CE} = 5 V	%	50	300
	V _{CE (sat)}	Collector Saturation Voltage, I _F = 10 mA, I _C = 2 mA	V		0.13
	R _{I-O}	Isolation Resistance, V _{IN-OUT} = 1 k VDC	Ω	10 ¹¹	
	C _{I-O}	Isolation Capacitance, V = 0, f = 1 MHz	pF		0.4
	t _r	Rise Time ² , V _{CC} = 5 V, I _C = 2 mA, R _L = 100 Ω	μs		5
t _f	Fall Time ² , V _{CC} = 5 V, I _C = 2 mA, R _L = 100 Ω	μs		7	

Notes:

1. CTR rank

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

2. Test Circuit for Switching Time



ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

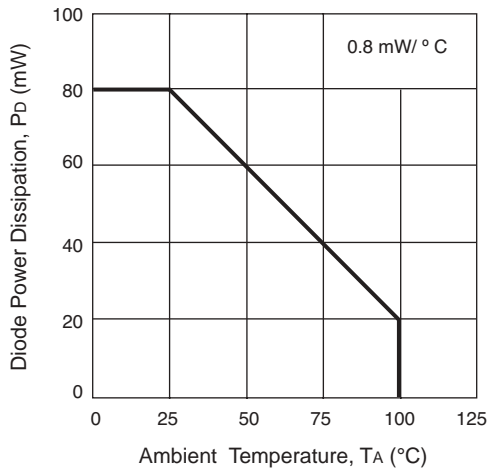
SYMBOLS	PARAMETERS	UNITS	RATINGS PS2701A-1
Diode			
I _F	Forward Current (DC)	mA	30
V _R	Reverse Voltage	V	6
ΔP _D /°C	Power Dissipation Derating	mW/Ch	0.8
P _D	Power Dissipation	mW	80
I _{F P}	Peak Forward Current (P _W = 100 μs, Duty Cycle 1%)	A	0.5
Transistor			
V _{CEO}	Collector to Emitter Voltage (I _c = 1mA, I _b = 0)	V	70
V _{ECO}	Emitter to Collector Voltage (I _E = 100μA, I _b = 0)	V	5
I _c	Collector Current	mA	30
ΔP _C /°C	Power Dissipation Derating	mW/°C	1.5
P _C	Power Dissipation	mW	150
Coupled			
BV	Isolation Voltage ²	V _{r.m.s.}	3750
T _{STG}	Storage Temperature	°C	-55 to +150
T _A	Operating Ambient	°C	-55 to +100

Notes:

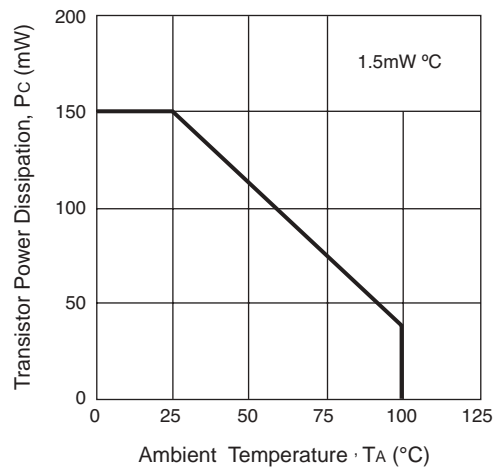
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

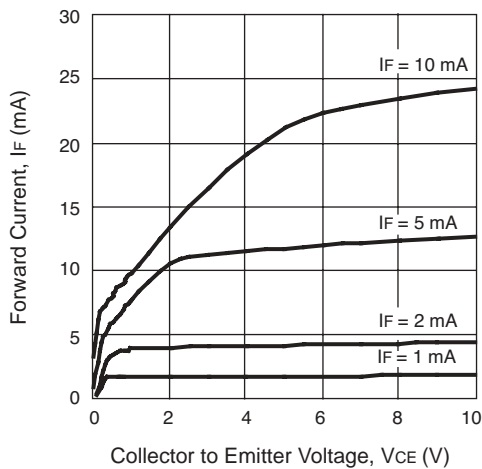
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



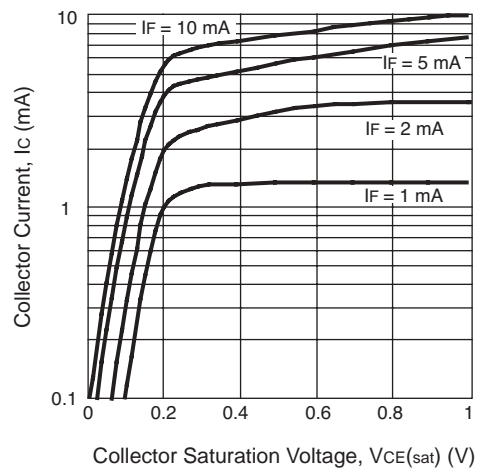
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

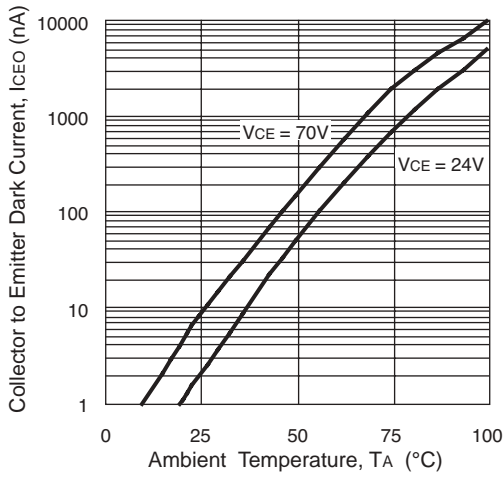


COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE

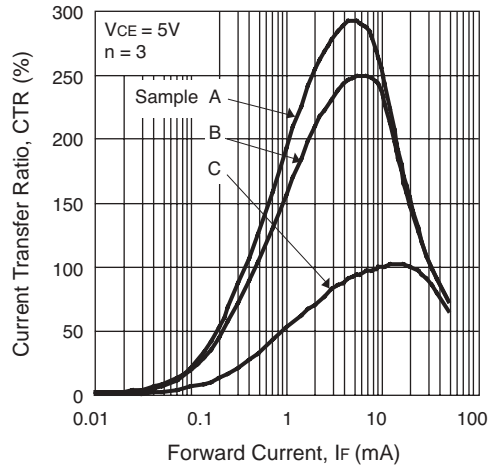


TYPICAL PERFORMANCE CURVES ($T_A = 25\text{ }^\circ\text{C}$)

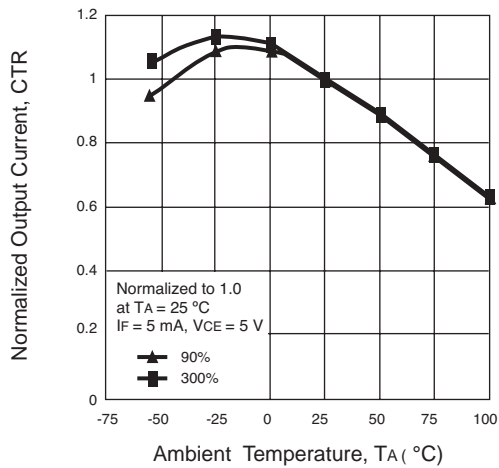
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



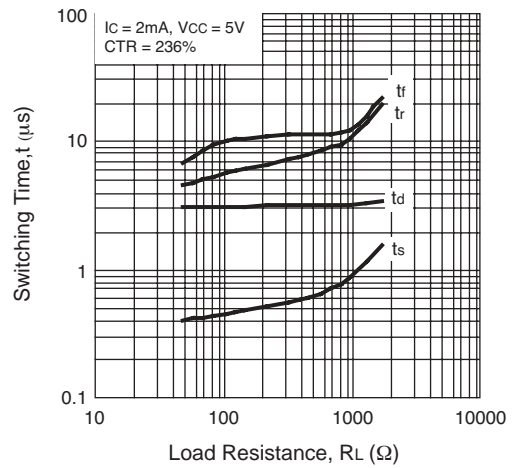
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



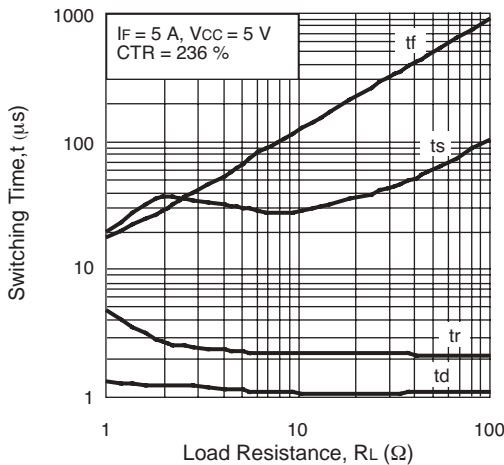
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



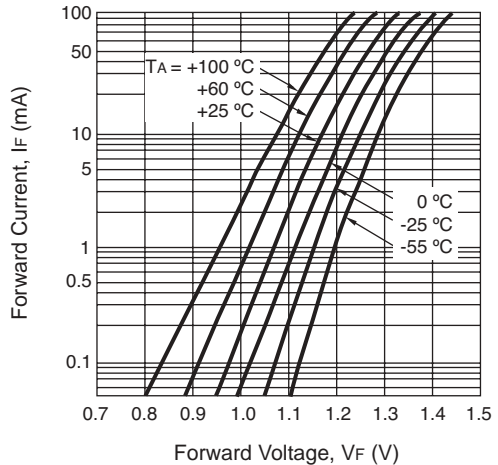
SWITCHING TIME vs. LOAD RESISTANCE



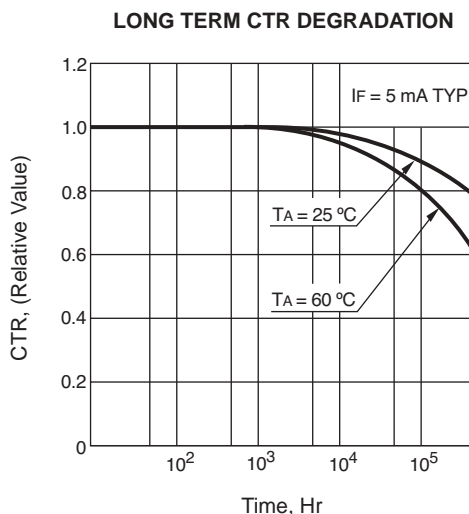
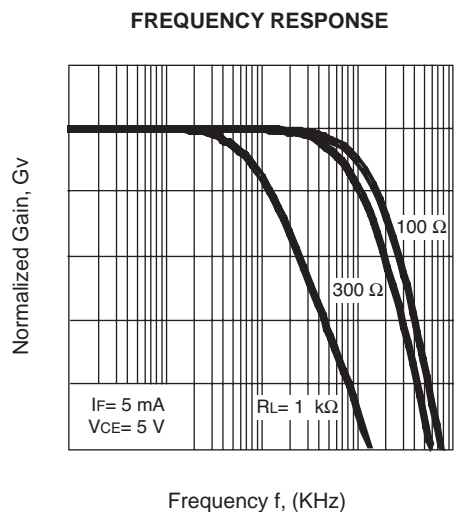
SWITCHING TIME vs. LOAD RESISTANCE



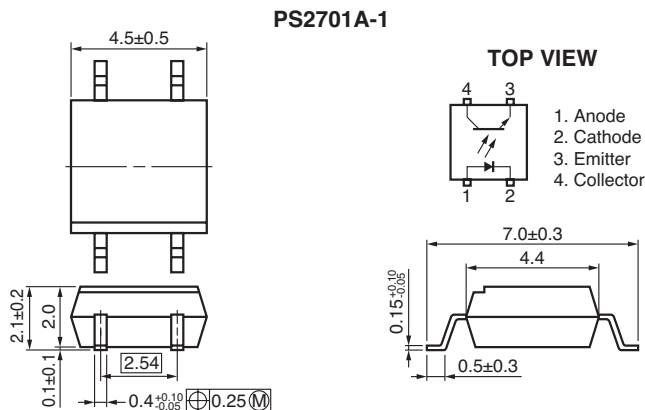
FORWARD CURRENT vs. FORWARD VOLTAGE



TYPICAL PERFORMANCE CURVES (TA = 25 °C)



OUTLINE DIMENSIONS (Units in mm)



ORDERING INFORMATION

PART NUMBER	PACKAGE	PACKAGE STYLE
PS2701A-1	Magazine case 100 pcs	PS2701A-1
PS2701A-1-F3	Embossed Tape 3500 pcs/reel	
PS2701A-1-F4		
PS2701A-1-V	Magazine case 100 pcs	PS2701A-1
PS2701A-1-V-F3	Embossed Tape 3500 pcs/reel	
PS2701A-1-V-F4		

Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

CEL California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.
4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • FAX (408) 988-0279 • www.cel.com

DATA SUBJECT TO CHANGE WITHOUT NOTICE

10/13/2003