

FEATURES

- **HIGH ISOLATION VOLTAGE**
BV: 3.75 k Vr.m.s. MIN
- **SOP (SMALL OUT-LINE PACKAGE)**
- **ISOLATED CHANNELS PER EACH PACKAGE**
- **HIGH COLLECTOR TO EMITTER VOLTAGE**
V_{CEO}: 120 V MIN
- **HIGH SPEED SWITCHING**
tr, tf = 10 μs TYP
- **LOW COLLECTOR DARK CURRENT**
I_{CEO}: 5 nA TYP @ TA = 25 °C, V_{CE} = 40 V
- **TAPE AND REEL AVAILABLE**

DESCRIPTION

NEC's PS2703-1 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 Out-line 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**

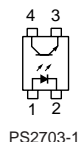
ELECTRICAL CHARACTERISTICS (TA = 25°C)

PART NUMBER			PS2703-1			
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 5 mA	V		1.1	1.4
	I _R	Reverse Current, V _R = 5 V	μA			5
	C _t	Terminal Capacitance, V = 0, f = 1.0 MHz	pF		30	
Transistor	I _{CEO}	Collector to Emitter Dark Current, V _{CE} = 120 V, I _F = 0	nA			100
Coupled	CTR	Current Transfer Ratio ¹ , I _F = 5 mA, V _{CE} = 5 V	%	50	150	400
		I _F = 1 mA, V _{CE} = 5 V	%	10	80	
	V _{CE (sat)}	Collector Saturation Voltage, I _F = 10 mA, I _C = 2 mA	V			0.3
	R _{I-O}	Isolation Resistance, V _{in-out} = 1.0 k VDC	Ω	10 ¹¹		
	C _{I-O}	Isolation Capacitance, V = 0, f = 1.0 MHz	pF		0.4	
	tr	Rise Time ² , V _{CC} = 5 V, I _C = 2 mA, R _L = 1 k Ω	μs		10	
tf	Fall Time ² , V _{CC} = 5 V, I _C = 2 mA, R _L = 1 k Ω	μs		10		

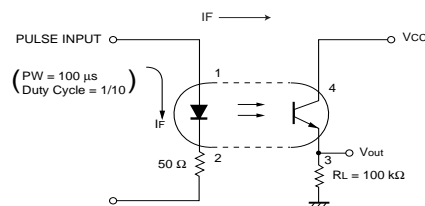
Notes:

1. CTR rank:

CTR Rank	CTR (%)	Conditions
K	200 to 400	I _F = 5 mA, V _{CE} = 5 V
	80 to	I _F = 1 mA, V _{CE} = 5 V
L	100 to 300	I _F = 5 mA, V _{CE} = 5 V
	25 to	I _F = 1 mA, V _{CE} = 5 V
M	50 to 150	I _F = 5 mA, V _{CE} = 5 V
	10 to	I _F = 1 mA, V _{CE} = 5 V



2. Test Circuit for Switching



ABSOLUTE MAXIMUM RATINGS¹ (TA = 25°C)

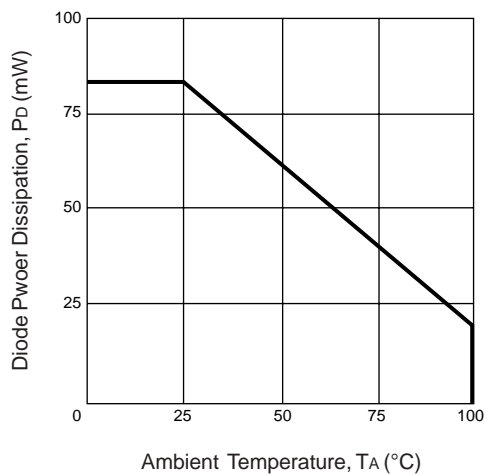
SYMBOLS	PARAMETERS	UNITS	RATINGS
			PS2703-1
Diode			
IF	Forward Current (DC)	mA	50
VR	Reverse Voltage	V	6
PD	Power Dissipation	mW/Ch	80
IF (PEAK)	Peak Forward Current (PW = 100 μs, Duty Cycle 1%)	A	1
Transistor			
VCEO	Collector to Emitter Voltage (IC = 1mA, IB = 0)	V	120
VECO	Emitter to Collector Voltage (IE = 100μA, IB = 0)	V	6
IC	Collector Current	mA/Ch	30
PD	Power Dissipation	mW/Ch	150
Coupled			
BV	Isolation Voltage ²	V _{r.m.s.}	3750
TSTG	Storage Temperature	°C	-55 to +150
TA	Operating Ambient Temperature	°C	-55 to +100

Notes:

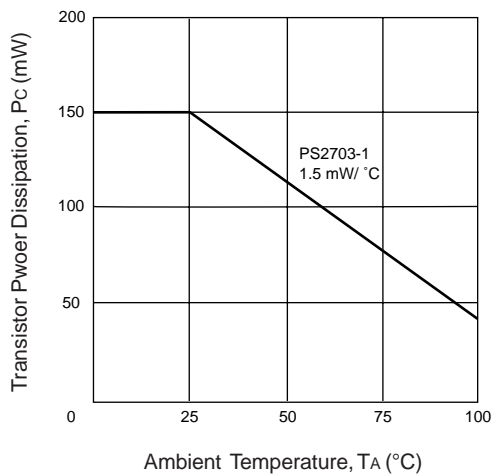
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at TA = 25 °C, RH = 60 % between input and output.

TYPICAL PERFORMANCE CURVES (TA = 25 °C)

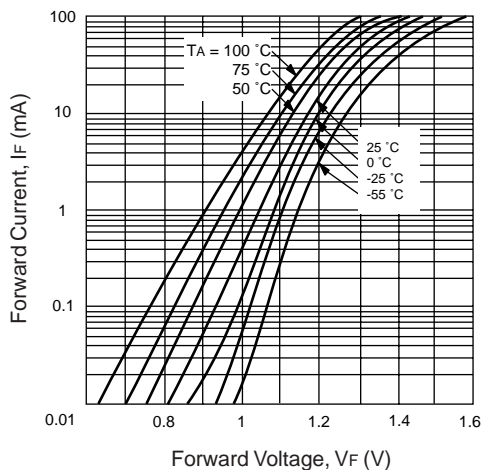
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



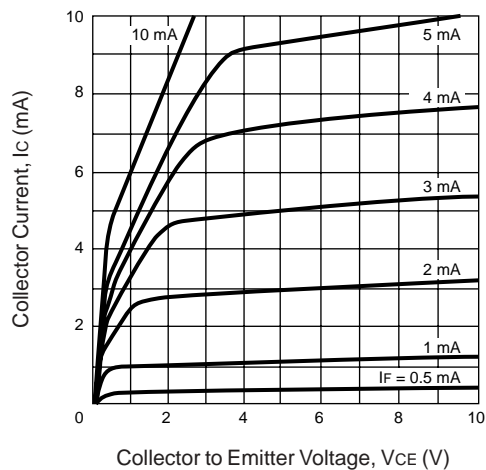
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



FORWARD CURRENT vs. FORWARD VOLTAGE

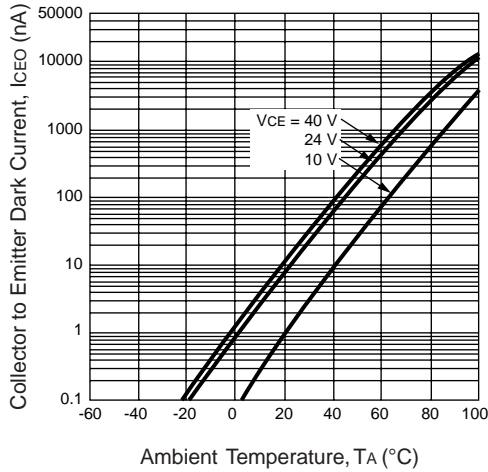


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

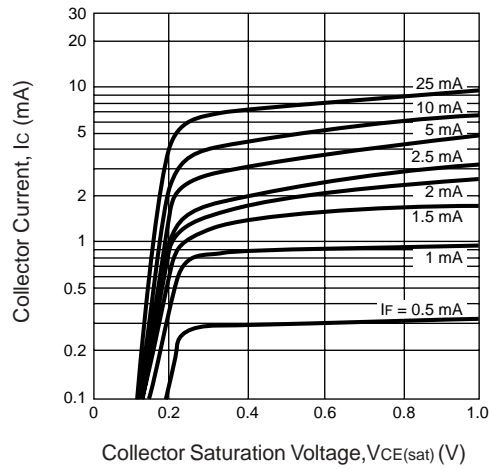


TYPICAL PERFORMANCE CURVES (TA = 25 °)

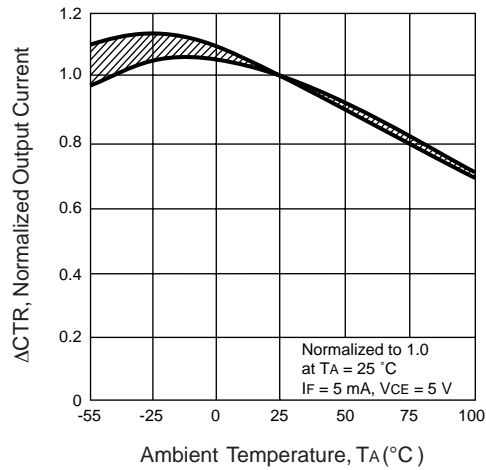
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



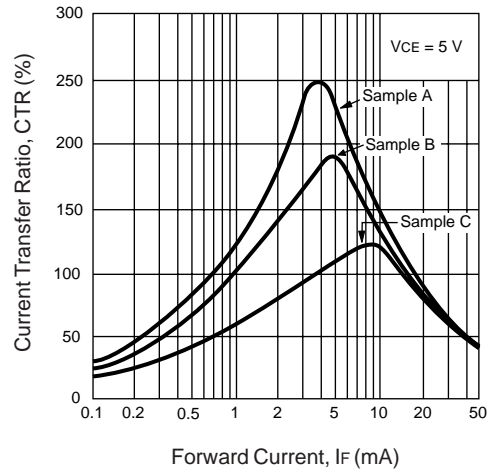
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



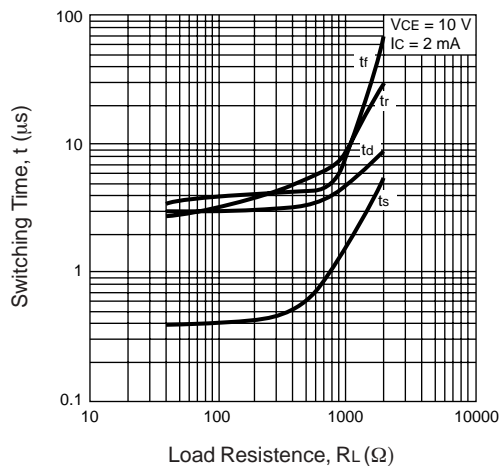
NORMALIZED OUTPUT CURRENT vs. AMBIENT TEMPERATURE



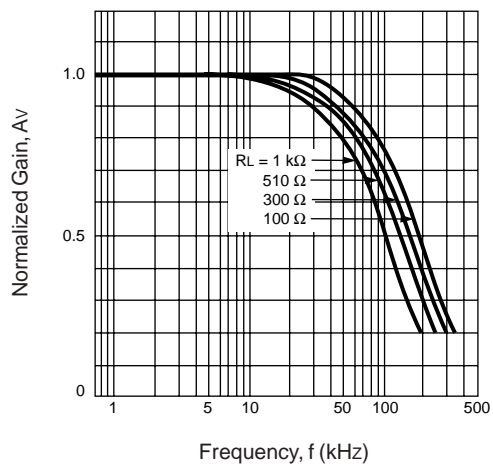
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



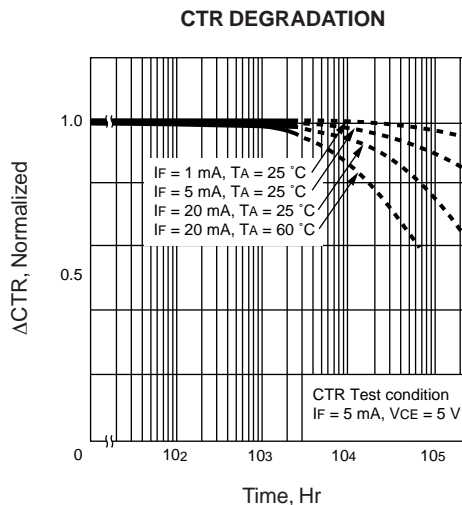
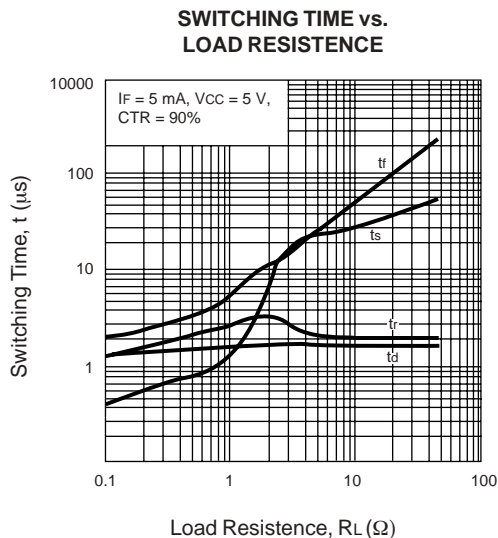
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



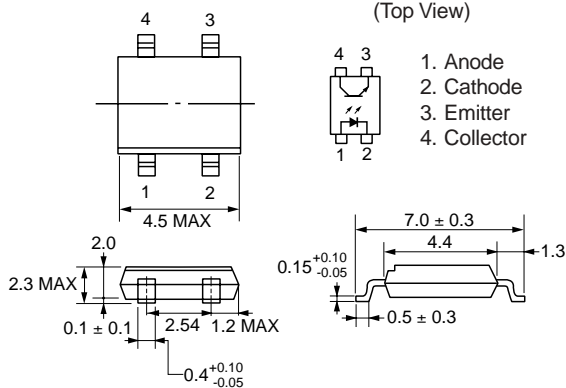
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ$)



OUTLINE DIMENSIONS (Units in mm)

PS2703-1

PIN CONNECTION
(Top View)



- 1. Anode
- 2. Cathode
- 3. Emitter
- 4. Collector

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.

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