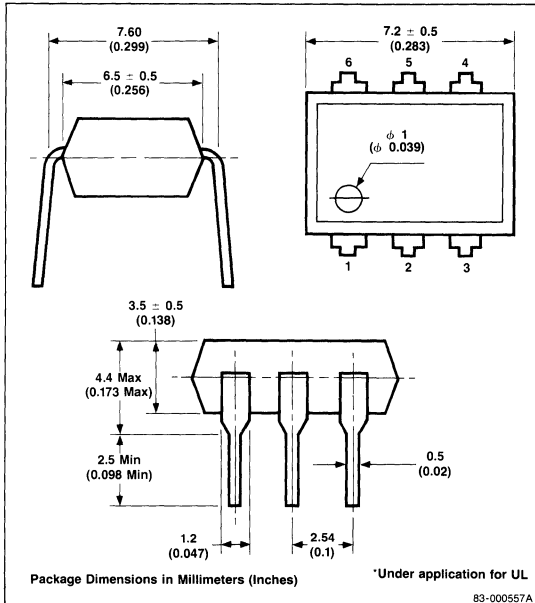


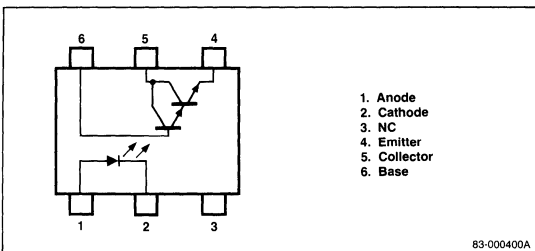
### Description

The PS2022 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon Darlington-connected photo transistor.

### Package Dimensions



### Pin Connection



### Features

- Small package:  $7.2 \times 6.5 \times 3.5\text{mm}$
- High isolation voltage:  $4000V_{AC}$  rating
- High transfer ratio: 200% min
- High speed switching:  $t_r, t_f = 80\mu\text{s}$  typ
- Economical, compact, dual in-line plastic package

### Applications

- Interface circuit for various instruments and control equipment
- Chopper circuits
- Computer and peripheral manufacture
- Pulse transformers
- Data communication equipment

### Absolute Maximum Ratings

$T_A = +25^\circ\text{C}$

Diode	
Reverse Voltage, $V_R$	5.0V
Forward Current (DC), $I_F$	80mA
Power Dissipation, $P_D$	150mW
Peak Forward Current (300 $\mu\text{s}$ , 2% duty cycle), $I_F$ (peak)	3A
Transistor	
Collector to Emitter Voltage, $V_{CE0}$	40V
Collector to Base Voltage, $V_{CBO}$	40V
Emitter to Collector Voltage, $V_{ECO}$	7V
Collector Current, $I_C$	100mA
Power Dissipation, $P_D$	150mW
Isolation Voltage <sup>1</sup> , BV	4000V <sub>AC</sub>
Storage Temperature, $T_{STG}$	-55°C to +150°C
Operating Temperature, $T_{OPT}$	-55°C to +100°C
Lead Temperature (Soldering 10s)	260°C
Total Power Dissipation, $P_T$	250mW

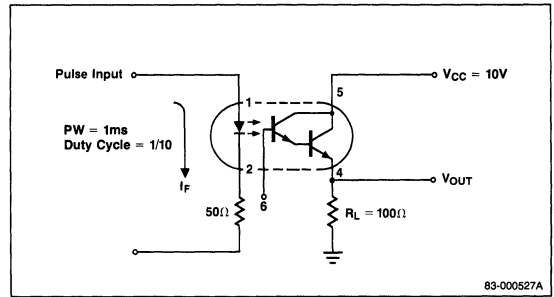
**Electrical Characteristics**

T<sub>A</sub> = +25°C

Parameter	Symbol	Limits			Unit	Test Conditions
		Min	Typ	Max		
<b>Diode</b>						
Forward Voltage	V <sub>F</sub>	1.1	1.4		V	I <sub>F</sub> = 10mA
Forward Voltage	V <sub>F</sub>	1.2	1.5		V	I <sub>F</sub> = 50mA
Reverse Current	I <sub>R</sub>		10		μA	V <sub>R</sub> = 5V
Junction Capacitance	C	50			pF	V = 0, f = 1.0MHz
<b>Transistor</b>						
Collector to Emitter Dark Current	I <sub>CEO</sub>		100		nA	V <sub>CE</sub> = 10V, I <sub>F</sub> = 0
DC Current Gain	h <sub>FE</sub>					I <sub>C</sub> = 0.5mA, V <sub>CE</sub> = 5.0V
Collector to Emitter Breakdown Voltage	BV <sub>CEO</sub>	40	60		V	I <sub>C</sub> = 1mA, I <sub>B</sub> = 0
Collector to Base Breakdown Voltage	BV <sub>CBO</sub>	40	90		V	I <sub>C</sub> = 100μA, I <sub>E</sub> = 0
Emitter to Collector Breakdown Voltage	BV <sub>EBO</sub>	7	9		V	I <sub>E</sub> = 100μA, I <sub>B</sub> = 0
Coupled Current Transfer Ratio <sup>2</sup>	CTR (I <sub>C</sub> /I <sub>F</sub> )	200			%	I <sub>F</sub> = 10mA, V <sub>CE</sub> = 5.0V
Collector Saturation Voltage	V <sub>CE(sat)</sub>		1.0		V	I <sub>F</sub> = 5mA, I <sub>C</sub> = 2.0mA
Isolation Resistance	R <sub>1-2</sub>	10 <sup>11</sup>			Ω	V <sub>IN-OUT</sub> = 1.0kV
Isolation Capacitance	C <sub>1-2</sub>	0.5			pF	V = 0, f = 1.0MHz
Rise Time <sup>3</sup>	t <sub>R</sub>	80			μs	V <sub>CC</sub> = 10V, I <sub>C</sub> = 50mA, R <sub>L</sub> = 100Ω
Fall Time <sup>3</sup>	t <sub>F</sub>	80			μs	V <sub>CC</sub> = 10V, I <sub>C</sub> = 50mA, R <sub>L</sub> = 100Ω

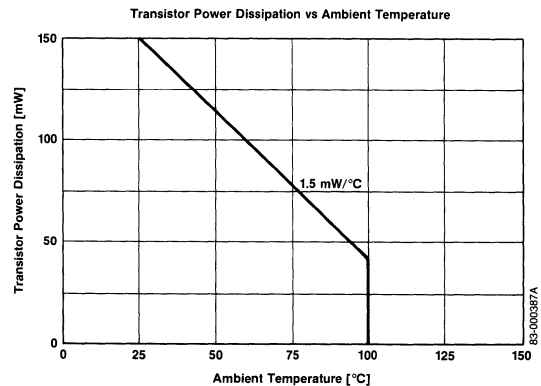
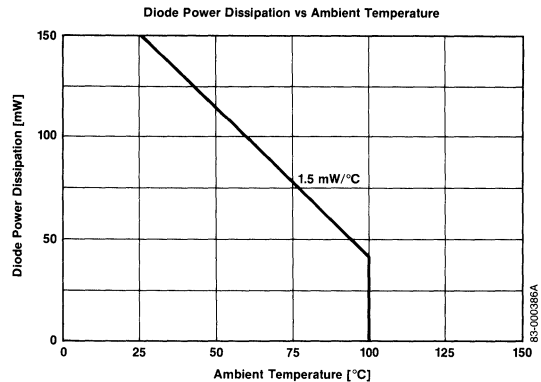
- Notes:**
1. Measuring Conditions: DC or AC voltage for 1 min at T<sub>A</sub> = +25°C, RH = 60% between input (pins 1, 2, and 3 common) and output (pins 4, 5, and 6 common).
  2. CTR rank: K: ~ 900%, L: ~ 500%, M: ~ 200%.
  3. Test circuit for switching time.

**Test circuit for switching time**



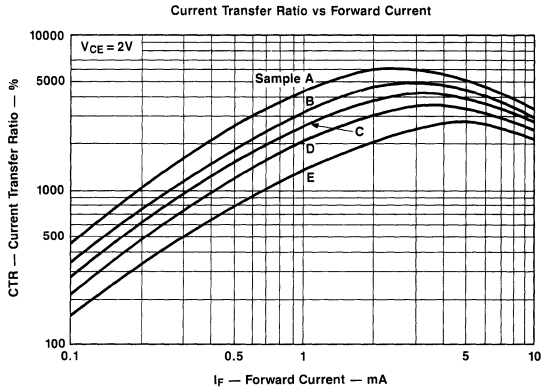
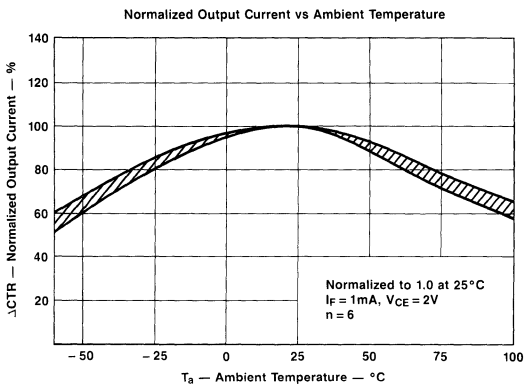
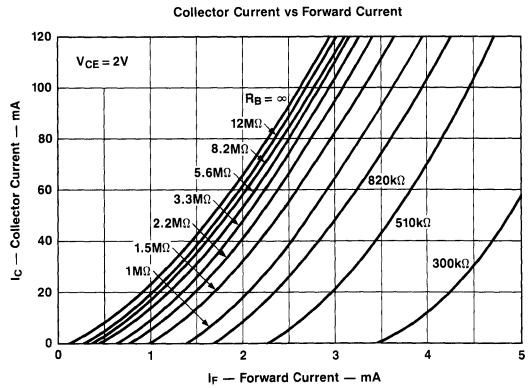
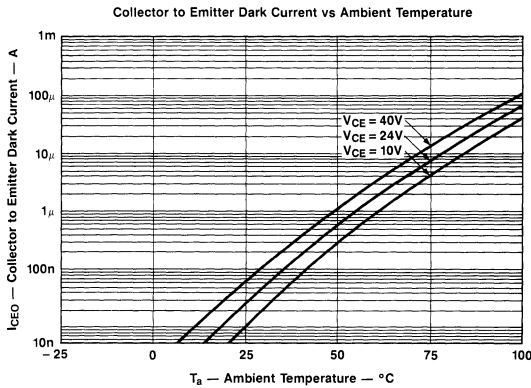
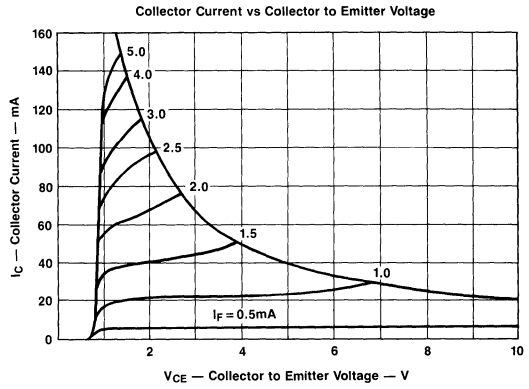
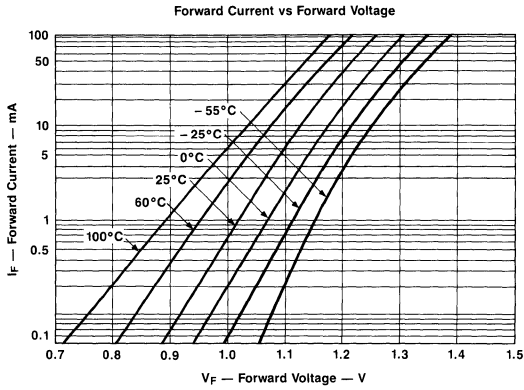
**Typical Characteristics**

T<sub>A</sub> = +25°C



## Typical Characteristics (cont)

$T_A = +25^\circ\text{C}$



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**Typical Characteristics (cont)**

$T_A = +25^\circ\text{C}$

