NEC
NEC Electronics Inc.

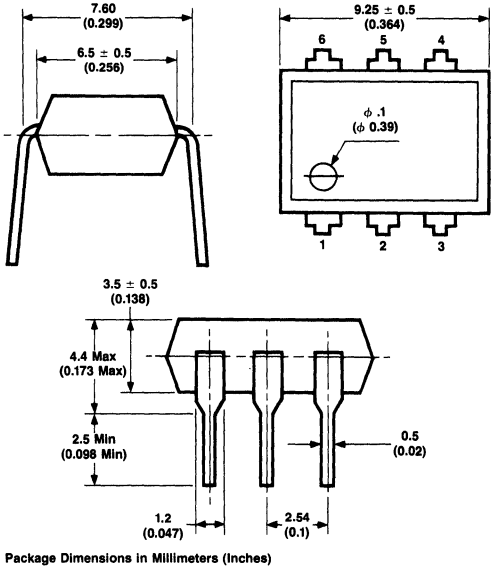
PS2005B
PHOTO COUPLER
HIGH IMPACT CURRENT
SINGLE TRANSISTOR

NEPOC SERIES

Description

The PS2005B is an optically coupled isolator containing a GaAsP light emitting diode and an NPN silicon photo transistor.

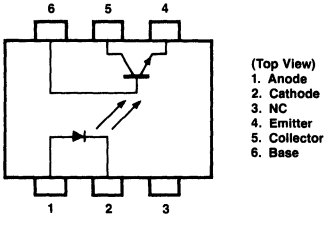
Package Dimensions



Package Dimensions in Millimeters (Inches)

83-000421A

Pin Connection



(Top View)
1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. Base

83-000385A

Features

- ☐ High-voltage isolation: 2500V
- ☐ Large forward input (current): 150mA max
- ☐ High transfer ratio: 10% min
- ☐ High speed switching: t_r, t_f = 5μs typ
- ☐ Economical, compact, dual in-line plastic package

Applications

- ☐ Telephone/telegraph line receivers
- ☐ Replacement for reed relays

Absolute Maximum Ratings

T_A = +25°C

Diode	
Reverse Voltage, V_R	7.0V
Forward Current, I_F	150mA
Power Dissipation, P_D	200mW
Transistor	
Collector to Emitter Voltage, V_{CEO}	30V
Collector Current, I_C	50mA
Power Dissipation, P_D	150mW
Total Power Dissipation, P_{TOTAL}	250mW
Isolation Voltage[1], BV	$2500V_{DC}$
Isolation Voltage[1], BV	$2000V_{AC}$ (rms)
Storage Temperature, T_{STG}	−55°C to +125°C
Operating Temperature, T_{OPT}	−55°C to +100°C

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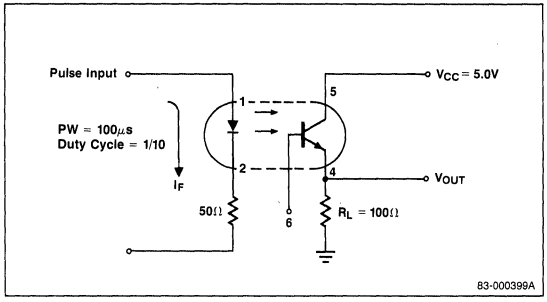
Electrical Characteristics
T_A = +25°C

Parameter	Symbol	Limits Min	Typ	Max	Unit	Test Conditions
Diode						
Forward Voltage	V_F			2.0	V	I_F = 100mA
Reverse Current	I_R			5.0	μA	V_R = 4.0V
Junction Capacitance	C		250		pF	V = 0, f = 1.0MHz
Transistor						
Collector to Emitter Dark Current	I_{CEO}			200	nA	V_{CE} = 10V, I_F = 0
DC Current Gain	h_{FE}		400			I_C = 4.0mA, V_{CE} = 5.0V
Coupled						
Current Transfer Ratio	CTR (I_C/I_F)	10			%	I_F = 100mA, V_{CE} = 5.0V
Collector Saturation Voltage	$V_{CE(sat)}$			0.3	V	I_F = 100mA, I_C =4.0mA
Isolation Resistance	R_{1-2}	10^{11}			Ω	V_{IN-OUT} = 1.0kV
Isolation Capacitance	C_{1-2}		0.8		pF	V = 0, f = 1.0MHz
Rise Time	t_r		5.0		μs	V_{CC} = 5.0V, I_F = 100mA, R_L = 100Ω[2]
Fall Time	t_f		5.0		μs	V_{CC} = 5.0V, I_F = 100mA, R_L = 100Ω[2]

Notes: 1. Measuring Conditions: DC or AC voltage for 1 min at T_A = +25°C, RH = 60% between input (pins 1, 2, and 3 common) and output (pins 4, 5, and 6 common).

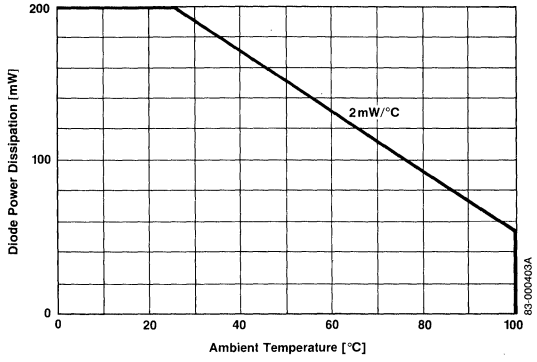
2. Test circuit for switching time.

Test circuit for switching time

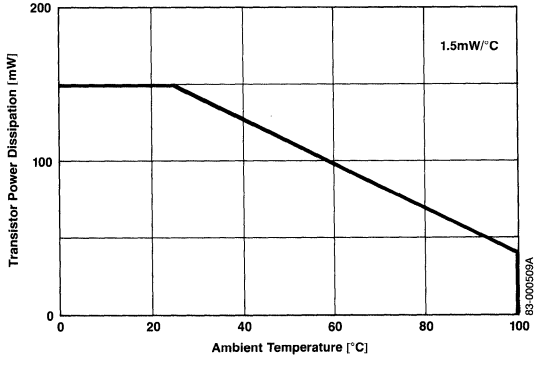


Typical Characteristics
T_A = +25°C

Diode Power Dissipation vs Ambient Temperature



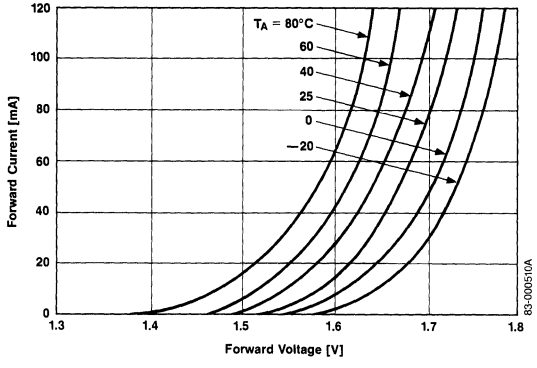
Transistor Power Dissipation vs Ambient Temperature



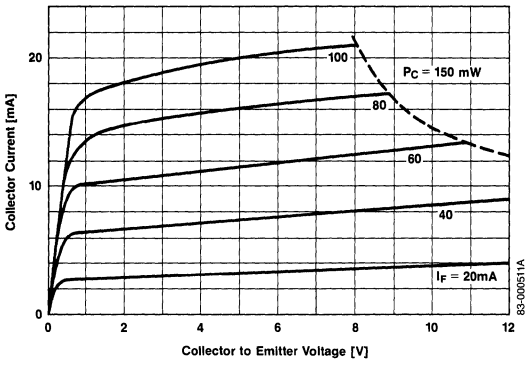
Typical Characteristics (cont)

T_A = +25°C

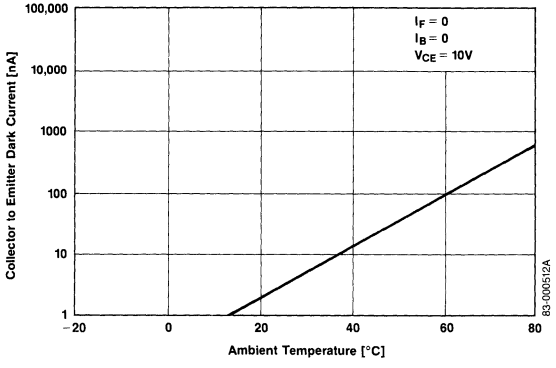
Forward Current vs Forward Voltage



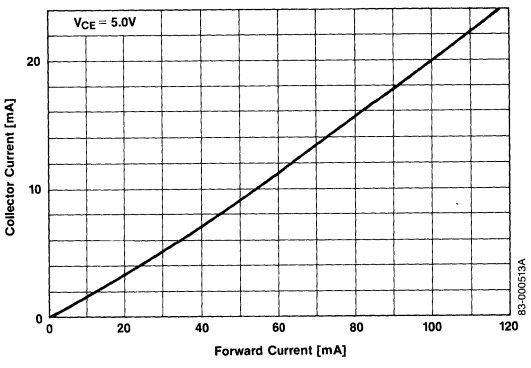
Collector Current vs Collector to Emitter Voltage



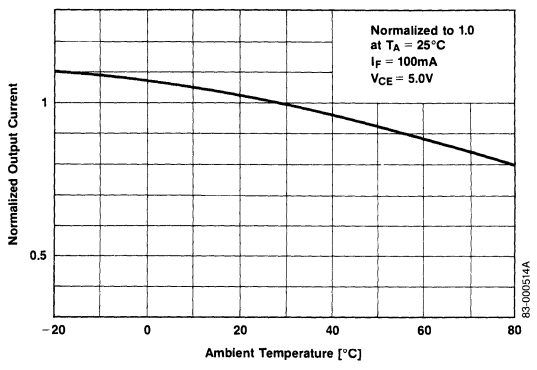
Collector to Emitter Dark Current vs Ambient Temperature



Collector Current vs Forward Current



Normalized Output Current vs Ambient Temperature



Normalized Output Current vs Base Resistance