NEC
NEC Electronics Inc.

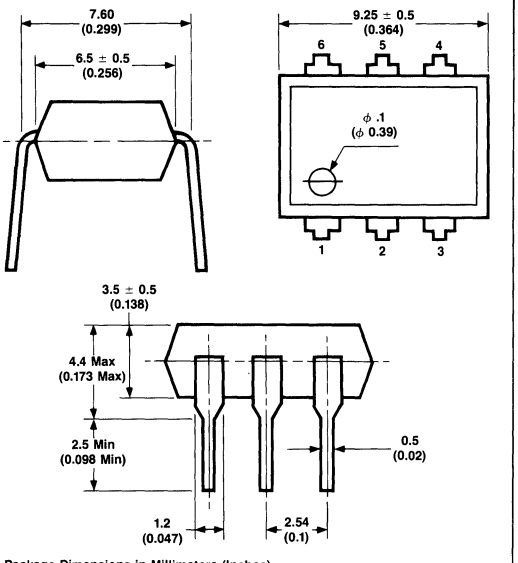
PS2004B
PHOTO COUPLER
DARLINGTON TRANSISTOR

NEPOC SERIES

Description

The PS2004B is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon Darlington photo transistor in a plastic DIP (Dual In-line Package).

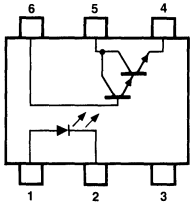
Package Dimensions



Package Dimensions in Millimeters (Inches)

83-000421A

Pin Connection



1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. Base

83-000400A

Features

- ☐ High-voltage isolation: 2500V min
- ☐ Ultra high transfer ratio: 1300% min
- ☐ High output current: 200mA max
- ☐ Economical, compact, plastic dual in-line package

Applications

- ☐ Copy machine
- ☐ Replacement for mechanical and reed relays
- ☐ Replacement of pulse transformers

Absolute Maximum Ratings

T_A = +25°C

Diode	
Reverse Voltage, V_R	5.0V
Forward Current, I_F	50mA
Power Dissipation, P_D	100mW
Transistor	
Collector to Emitter Voltage, V_{CEO}	30V
Collector Current, I_C	200mA
Power Dissipation, P_D	200mW
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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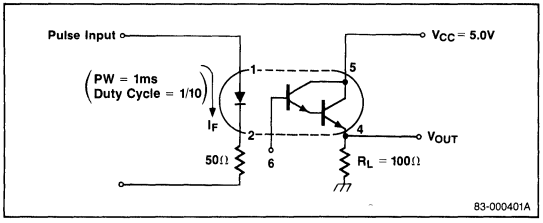
Electrical Characteristics
T_A = 25°C

Parameter	Symbol	Limits Min	Typ	Max	Unit	Test Conditions
Diode						
Forward Voltage	V_F			1.4	V	I_F = 20mA
Reverse Current	I_R			5.0	μA	V_R = 4.0V
Junction Capacitance	C		100		pF	V = 0, f = 1.0MHz
Transistor						
Collector to Emitter Dark Current	I_{CEO}			400	nA	V_{CE} = 10V, I_F = 0
Coupled						
Current Transfer Ratio	CTR (I_C/I_F)	1300			%	I_F = 5.0mA, V_{CE} = 2.0V
Collector Saturation Voltage	$V_{CE(sat)}$			1.2	V	I_F = 5.0mA, I_C =2.0mA
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		100		μs	V_{CC} = 5.0V, I_F = 5.0mA, R_L = 100Ω[2]
Fall Time	t_f		250		μs	V_{CC} = 5.0V, I_F = 5.0mA, R_L = 100Ω[2]

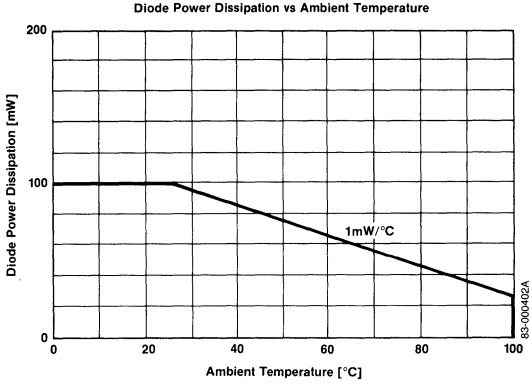
Notes: 1. Measuring Conditions: DC or AC voltage for 1 min at T_A = +25°C, RH = 60% between input (pins 1, 2, and 3 common) and output (pins 4, 5, and 6 common).

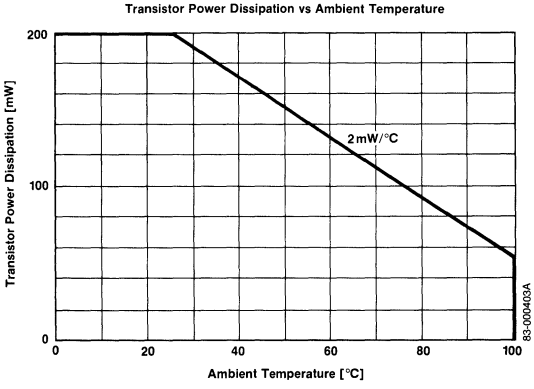
2. Test circuit for switching time.

Test circuit for switching time



Typical Characteristics
T_A = +25°C

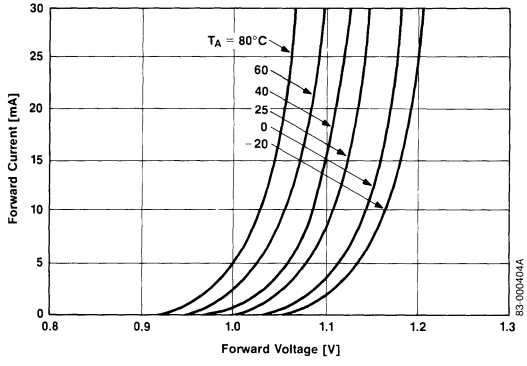




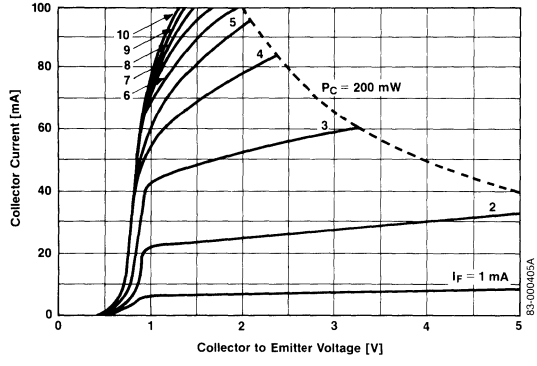
Typical Characteristics (cont)

T_A = +25°C

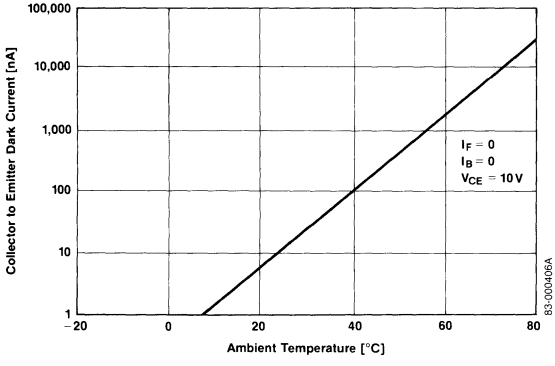
Forward Current vs Forward Voltage



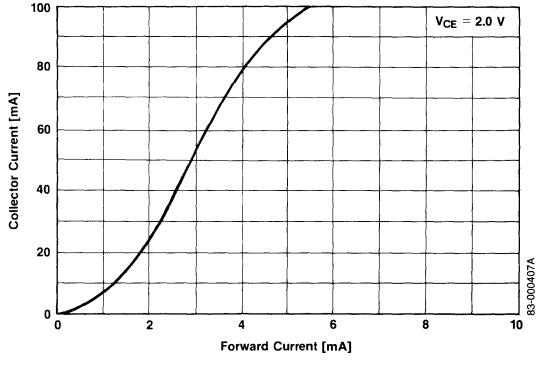
Collector Current vs Collector to Emitter Voltage



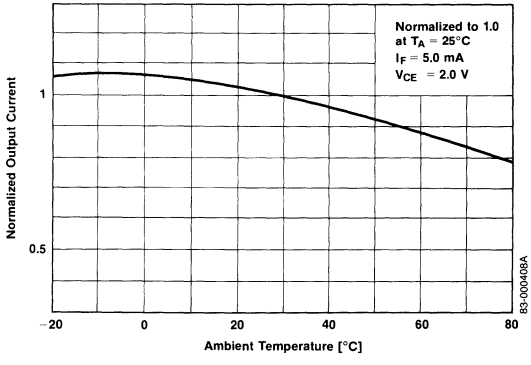
Collector to Emitter Dark Current vs Ambient Temperature



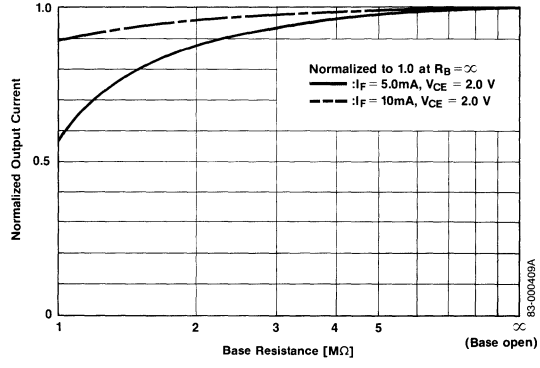
Collector Current vs Forward Current



Normalized Output Current vs Ambient Temperature



Normalized Output Current vs Base Resistance



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