

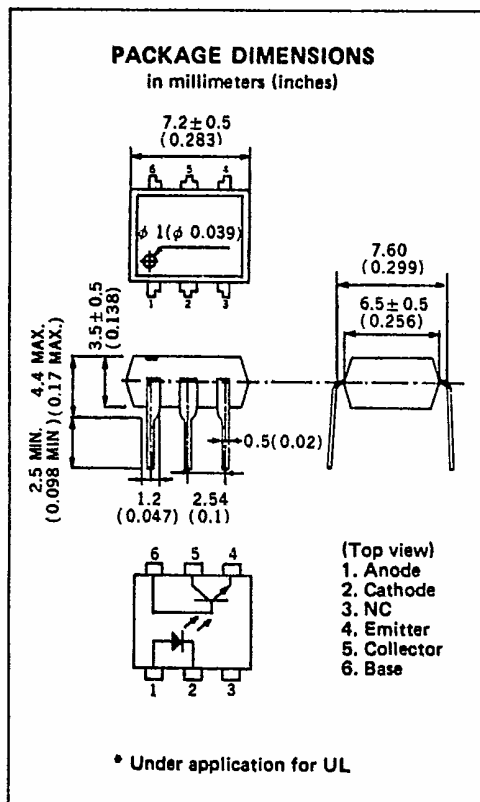
PHOTO COUPLER PS2021

PHOTO COUPLER (High Isolation Voltage) Single Transistor

—NEPOC SERIES—

DESCRIPTION

The PS2021 is an optically coupled isolator containing a GaAs light emitting diode and an NPN silicon photo transistor.



FEATURES

- Small package 7.2 x 6.5 x 3.5 mm
- High isolation voltage 4 000 V_{AC} Rating
- High transfer ratio 50 % MIN.
- High speed switching $t_r, t_f = 3 \mu\text{s}$ TYP.
- Economical, compact, Dual In-Line Plastic Package

APPLICATIONS

- Interface circuit for various instrumentations, control equipments.
- Chopper circuits.
- Computer and peripheral manufactures.
- Pulse transformer.
- Data communication equipment.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Diode

Reverse Voltage	V _R	5.0	V
Forward Current (DC)	I _F	80	mA
Power Dissipation	P _D	150	mW
Peak Forward Current (300 μs, 2 % duty cycle)	I _{F(peak)}	3	A

Transistor

Collector to Emitter Voltage	V _{CEO}	40	V
Collector to Base Voltage	V _{CB0}	70	V
Emitter to Collector Voltage	V _{ECO}	7	V
Collector Current	I _C	100	mA
Power Dissipation	P _C	150	mW
Isolation Voltage * 1	BV	4000	V _{AC}
Storage Temperature	T _{stg}	-55 to +150	°C
Operating Temperature	T _{opt}	-55 to +100	°C
Lead Temperature (Soldering 10 s)		260	°C
Total Power Dissipation	P _T	250	mW

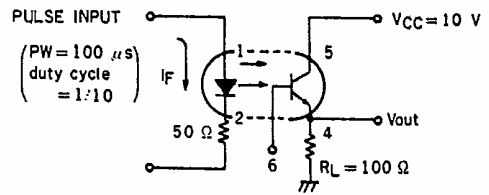
ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

CHARACTERISTIC		SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Diode	Forward Voltage	V _F		1.1	1.4	V	I _F = 10 mA
	Forward Voltage	V _F		1.2	1.5	V	I _F = 50 mA
	Reverse Current	I _R			10	μA	V _R = 5 V
	Junction Capacitance	C		50		pF	V = 0, f = 1.0 MHz
Transistor	Collector to Emitter Dark Current	I _{CEO}			50	nA	V _{CE} = 10V, I _F = 0
	DC Current Gain	h _{FE}		700			I _C = 2 mA, V _{CE} = 5.0 V
	Collector to Emitter Breakdown Voltage	BV _{CEO}	40	60		V	I _C = 1 mA, I _B = 0
	Collector to Base Breakdown Voltage	BV _{CBO}	70	120		V	I _C = 100 μA, I _E = 0
	Emitter to Collector Breakdown Voltage	BV _{ECO}	7	9		V	I _E = 100 μA, I _B = 0
Coupled	Current Transfer Ratio *2	CTR (I _C /I _F)	50			%	I _F = 10 mA, V _{CE} = 5.0 V
	Collector Saturation Voltage	V _{CE (sat)}			0.3	V	I _F = 10 mA, I _C = 2.0 mA
	Isolation Resistance	R ₁₋₂	10 ¹¹			Ω	V _{in-out} = 1.0 kV
	Isolation Capacitance	C ₁₋₂		0.5		pF	V = 0, f = 1.0 MHz
	Rise Time *3	t _r		3		μs	V _{CC} = 10 V, I _C = 2 mA, R _L = 100 Ω
	Fall Time *3	t _f		3		μs	V _{CC} = 10 V, I _C = 2 mA, R _L = 100 Ω

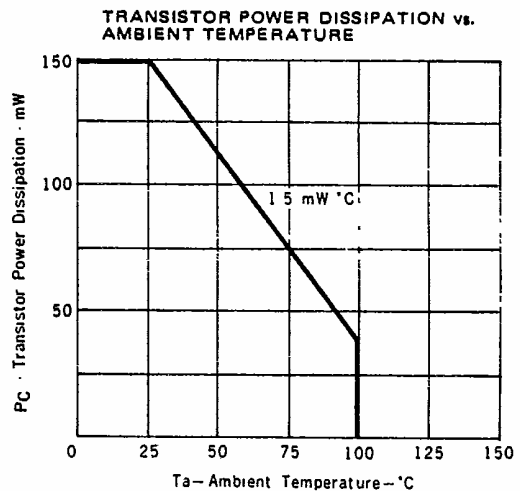
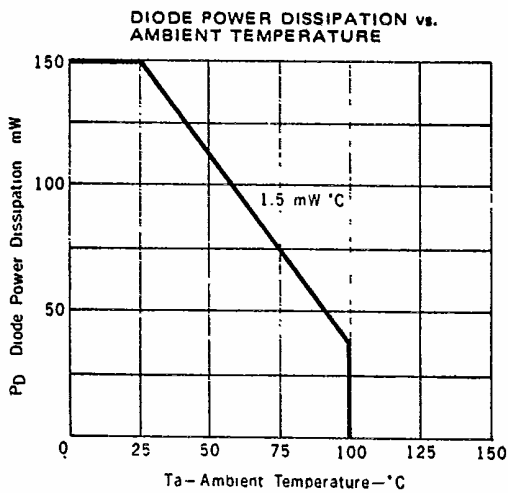
* 1 Measuring Condition
 DC or AC voltage for 1 minute at Ta = 25 °C,
 RH = 60 %
 Between input (pin No. 1, 2 and No. 3 Common)
 and output (pin No. 4, 5 and No. 6 Common)

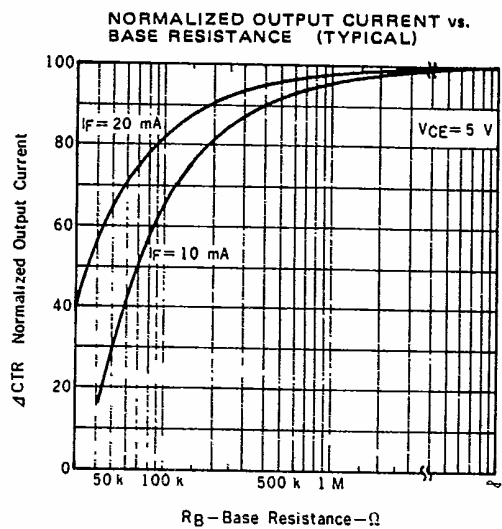
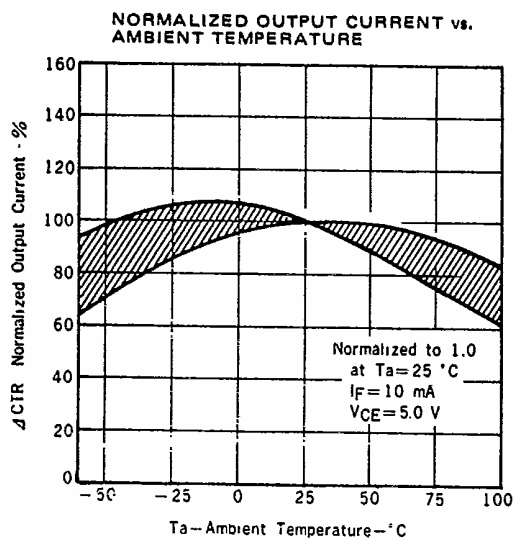
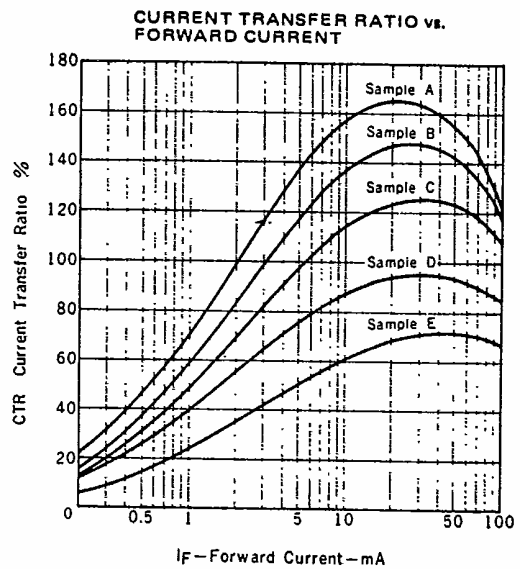
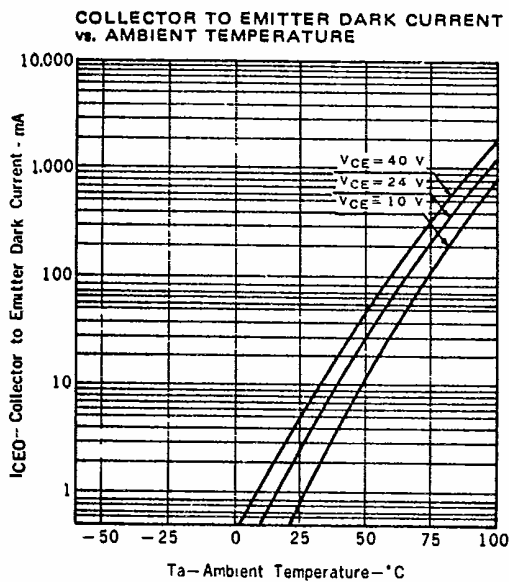
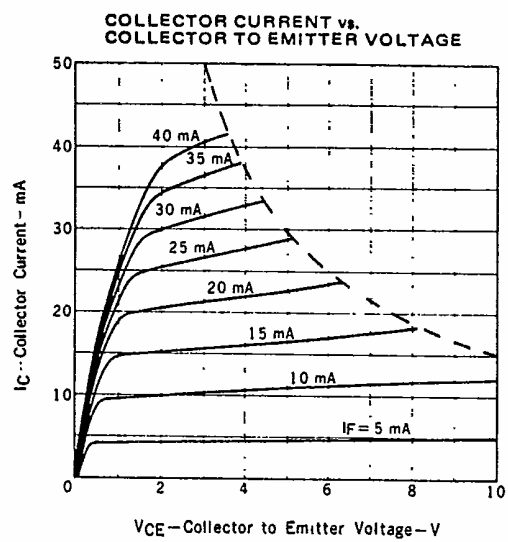
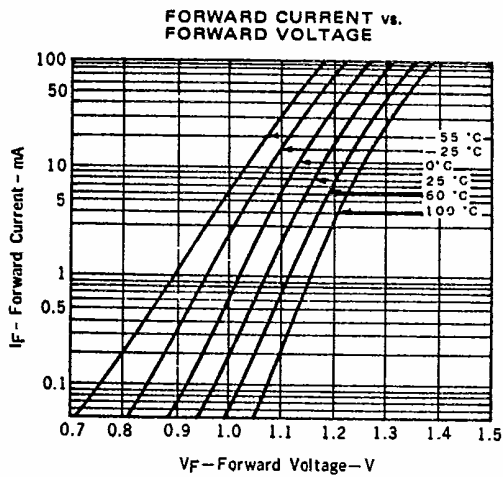
* 2 CTR rank
 K: 150 %~300 %
 L: 90 %~180 %
 M: 50 %~110 %

* 3 Test Circuit for Switching Time



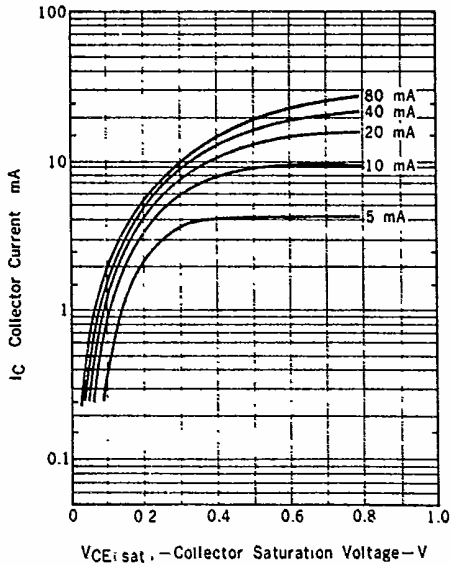
TYPICAL CHARACTERISTICS (Ta = 25 °C)



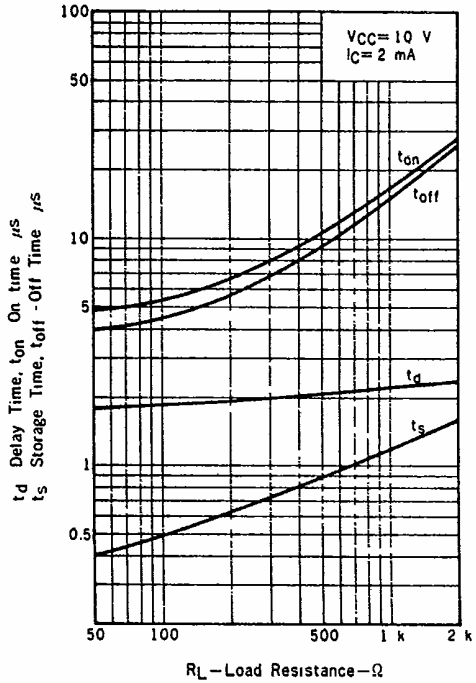


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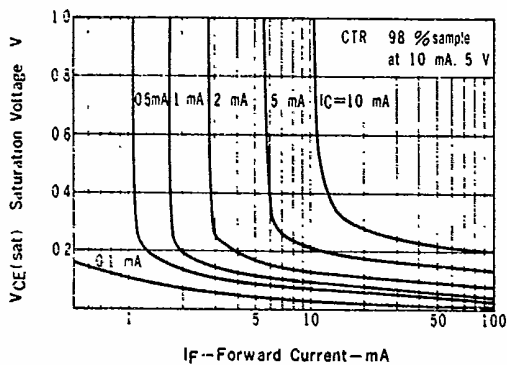
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



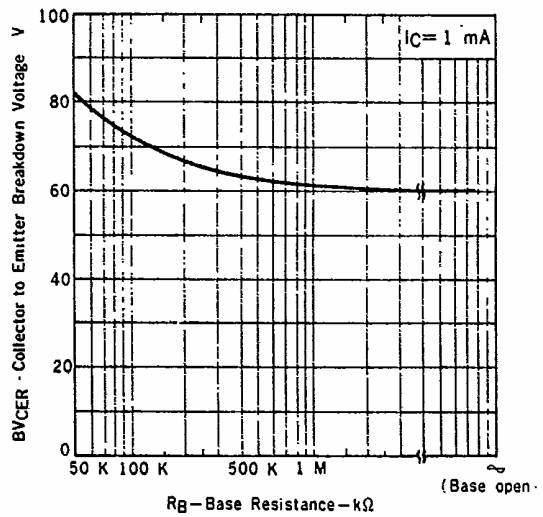
SWITCHING TIME vs. LOAD RESISTANCE



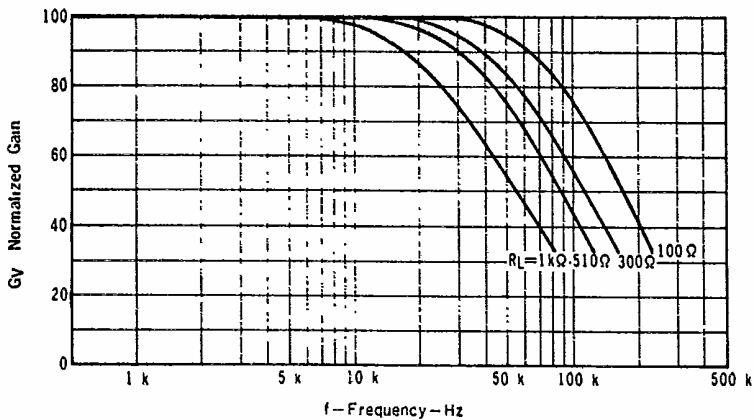
SATURATION VOLTAGE vs. FORWARD CURRENT



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE vs. BASE RESISTANCE



FREQUENCY RESPONSE



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