

PHOTO COUPLERS

PS2502-1, PS2502-2, PS2502-3, PS2502-4

MULTI PHOTO COUPLER

HIGH ISOLATION VOLTAGE DARLINGTON TRANSISTOR TYPE

DESCRIPTION

The PS2502-1, -2, -3 and -4 series are optically coupled isolator containing a GaAs light emitting diode and an NPN silicon darlington-connected phototransistor. Each is mounted in a dual in-line package.

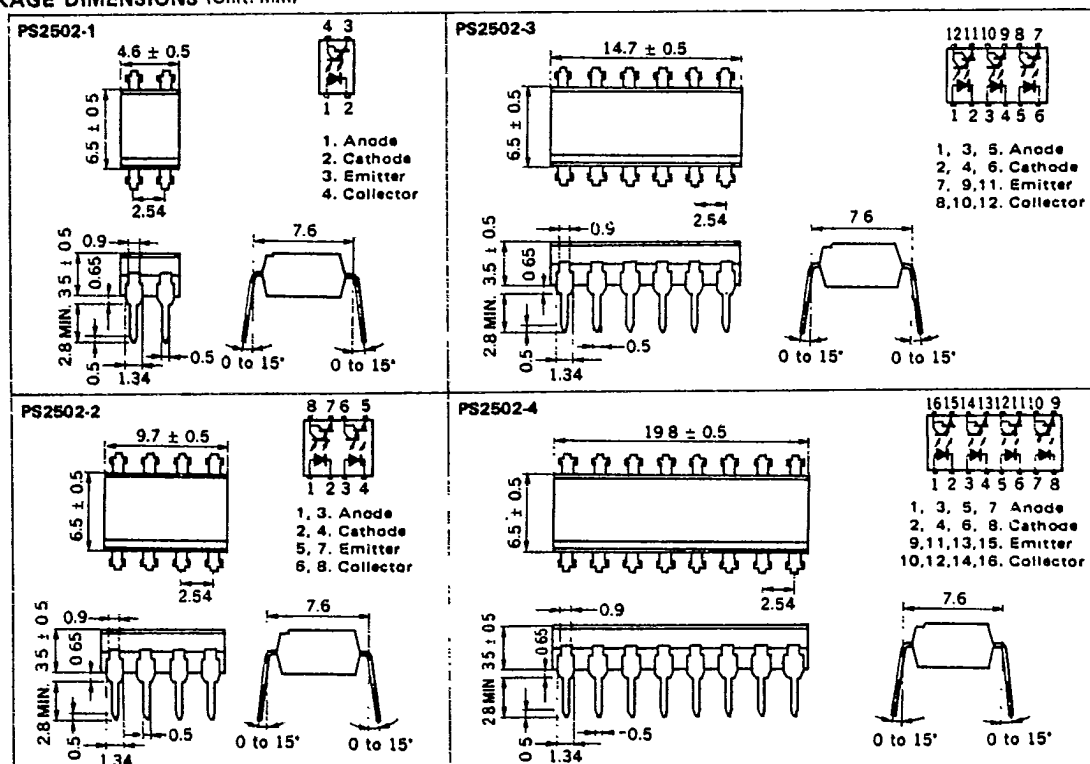
FEATURES

- Small package size.
- Each isolated channels per package.
- High isolation voltage 5 000 V_{ac} Rating.
- High transfer ratio CTR : 2 000 % TYP.
- High speed switching $t_r, t_f = 100 \mu s$ TYP.
- Low cost.

APPLICATIONS

- Interface circuit for various instrumentations, control equipments.
- AC Line/Digital Logic Isolate high voltage transients
- Digital Logic/Digital Logic Eliminate spurious ground loops
- Twisted Pair Line Receiver Eliminate ground loop pick-up
- Telephone/Telegraph Line Receiver Isolate high voltage transients
- High Frequency Power Supply Feedback Control Maintain floating ground
- Relay Contact Monitor Isolate floating grounds and transients
- Power Supply Monitor Isolate transients and ground systems

PACKAGE DIMENSIONS (Unit: mm)



PS2502-1, PS2502-2, PS2502-3, PS2502-4

NEC ELECTRON DEVICE

T-41-85

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Diode		(PS2502-1)	(PS2502-2, PS2502-3, PS2502-4)	
Reverse Voltage	V_R	6.0	6.0	V
Forward Current (DC)	I_F	80	80	mA
Power Dissipation	P_D	150	120	mW/Unit
Peak Forward Current (100 μs , 1 % Duty Cycle)	$I_{F(\text{peak})}$	1	1	A
Transistor				
Collector to Emitter Voltage	V_{CEO}	40	40	V
Emitter to Collector Voltage	V_{ECO}	6	6	V
Collector Current	I_C	200	180	mA
Power Dissipation	P_C	200	160	mW/Unit
Isolation Voltage *1	BV	5000	5000	V_{ac}
Storage Temperature	T_{stg}	-55 to +150	-55 to +150	$^\circ\text{C}$
Operating Temperature	T_{opt}	-55 to +100	-55 to +100	$^\circ\text{C}$
Lead Temperature (Soldering 10 s)	T_{sol}	260	260	$^\circ\text{C}$
Total Power Dissipation	P_T	250	200	mW/Unit

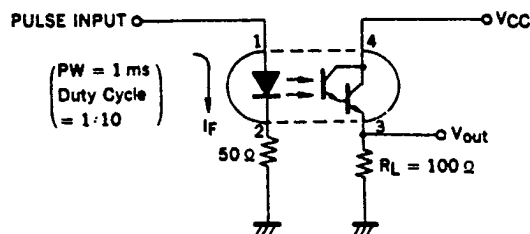
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Diode	Forward Voltage	V_F		1.1	1.4	V	$I_F = 10\text{ mA}$
	Reverse Current	I_R			5	μA	$V_R = 5\text{ V}$
	Junction Capacitance	C		50		pF	$V = 0, f = 1.0\text{ MHz}$
Transistor	Collector to Emitter Dark Current	I_{CEO}			400	nA	$V_{CE} = 40\text{ V}, I_F = 0$
	Collector to Emitter Breakdown Voltage	BV_{CEO}	40	60		V	$I_C = 1\text{ mA}, I_B = 0$
	Emitter to Collector Breakdown Voltage	BV_{ECO}	6	8		V	$I_E = 100\text{ }\mu\text{A}, I_B = 0$
Coupled	Current Transfer Ratio *2	CTR (I_C/I_F)	200	2000		%	$I_F = 1.0\text{ mA}, V_{CE} = 2.0\text{ V}$
	Collector Saturation Voltage	$V_{CE(\text{sat})}$			1.0	V	$I_F = 1.0\text{ mA}, I_C = 2.0\text{ mA}$
	Isolation Resistance	R_{1-2}	10^{11}			Ω	$V_{in-out} = 1.0\text{ kV}$
	Isolation Capacitance	C_{1-2}		0.5		pF	$V = 0, f = 1.0\text{ MHz}$
	Rise Time *3	t_r		100		μs	$V_{CC} = 10\text{ V}, I_C = 10\text{ mA}, R_L = 100\text{ }\Omega$
	Fall Time *3	t_f		100		μs	$V_{CC} = 10\text{ V}, I_C = 10\text{ mA}, R_L = 100\text{ }\Omega$

*1 AC voltage for 1 minute at $T_A = 25^\circ\text{C}$
RH = 50 %

*2 CTR rank (Only PS2502-1)
K : 2 000 (%)
L : 700 to 3 400 (%)
M : 200 to 1 000 (%)

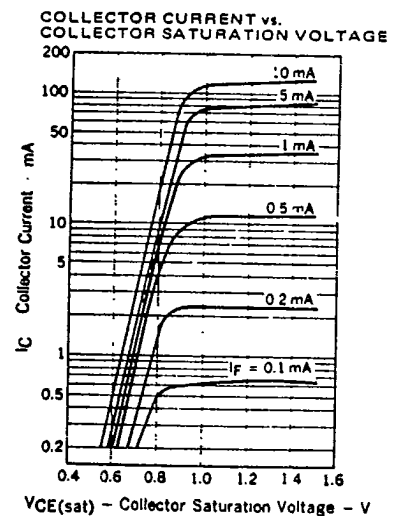
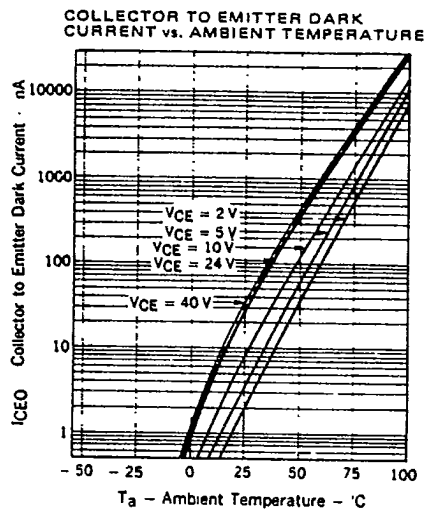
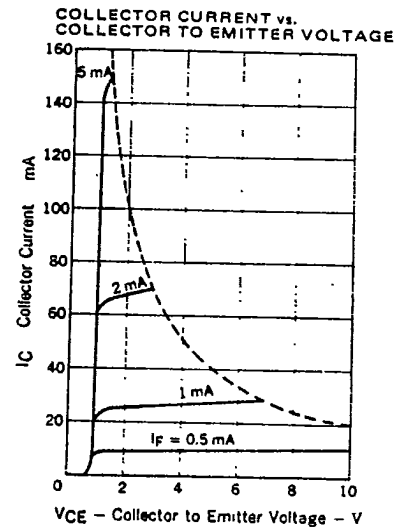
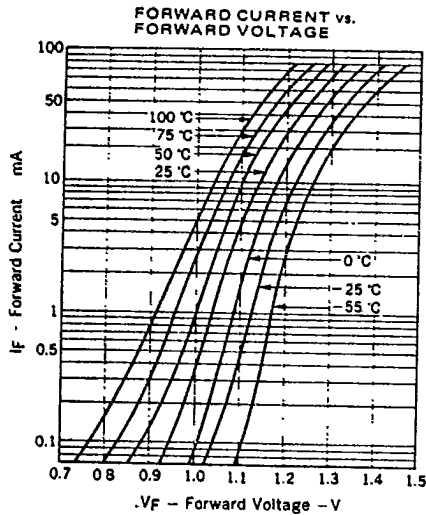
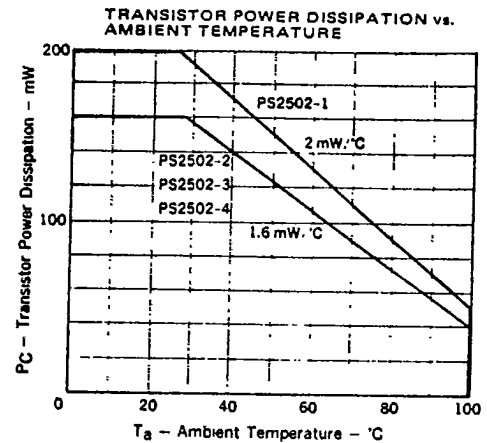
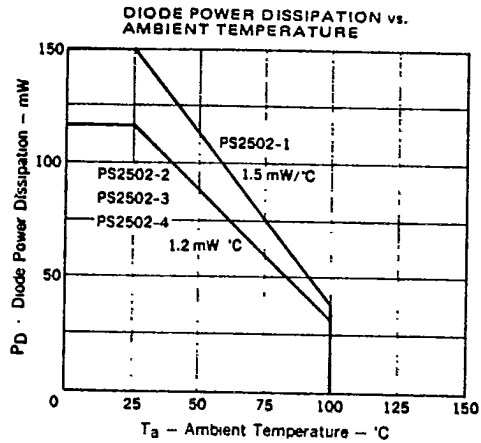
*3 Test Circuit for Switching Time



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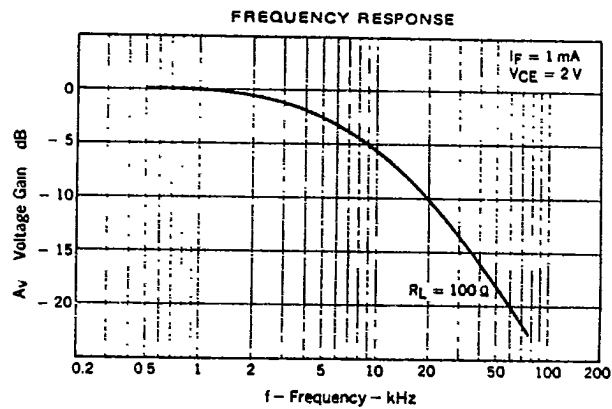
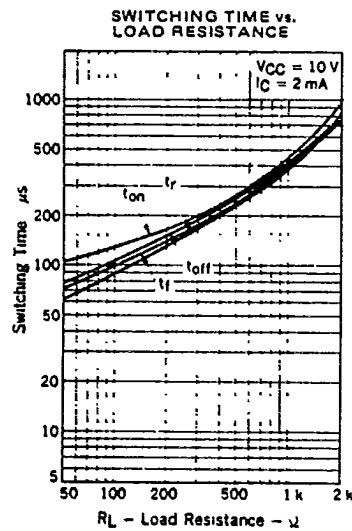
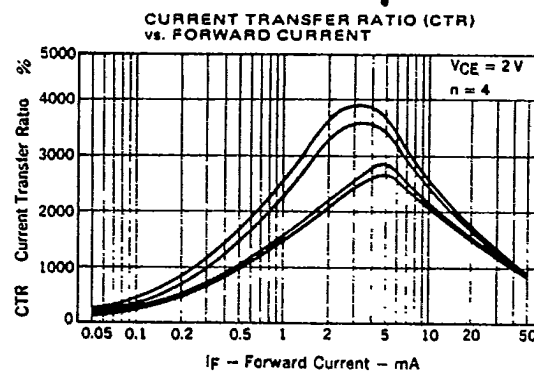
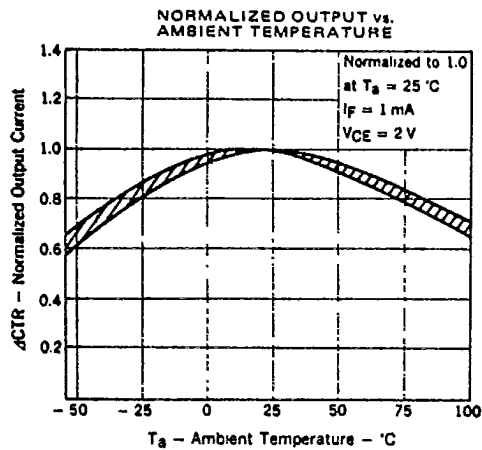
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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