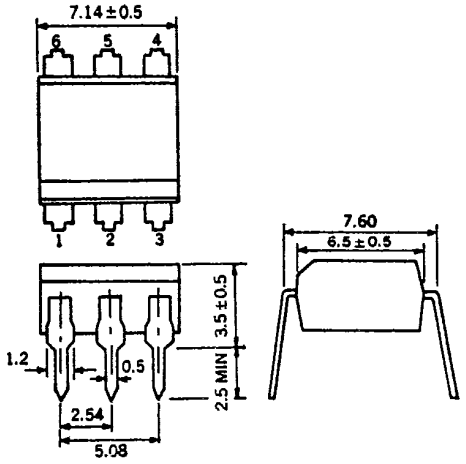
PHOTO COUPLER

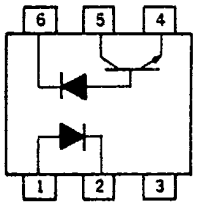
PS2041

HIGH SPEED 6PIN PHOTO COUPLER

PACKAGE DIMENSIONS
(Unit: mm)



(PS2041)



1. Anode
2. Cathode
3. NC
4. Emitter
5. V_O
6. V_{CC}

FEATURES

- High Speed Response 0.3 μs TYP.
- High Isolation Voltage 2 500 $V_{r.m.s.}$
- Compact, Dual In-Line Package

APPLICATIONS

1. Interface circuit for various instrumentations, control equipments.
2. Computer and peripheral manufactures.
3. TV sets.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Diode			
Forward Current	I_F	25	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	45	mW
Detector			
Supply Voltage	V_{CC}	−0.5 to 15	V
Output Voltage	V_O	−0.5 to 15	V
Output Current	I_O	8	mA
Power Dissipation	P_C	100	mW
Isolation Voltage*	BV	2500	$V_{r.m.s.}$
Storage Temperature	T_{stg}	−55 to +125	°C
Operating Temperature	T_{opt}	−55 to +100	°C
Lead Temperature (10 s)		260	°C

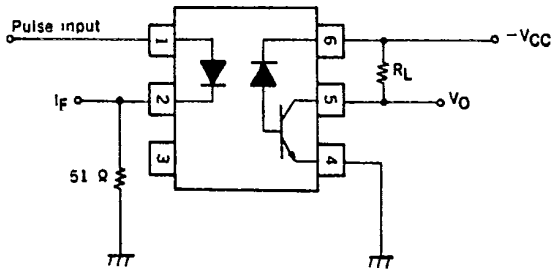
* Condition
AC Voltage for 1 minute at T_a = 25 °C, RH = 60 %
between input (pin No. 1, 2, 3, Common) and output (pin No. 4, 5, 6)

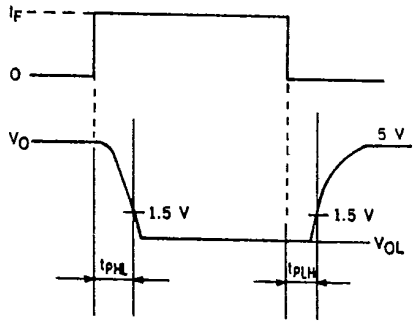
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

	CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Diode	Forward Voltage	V_F		1.7	2.2	V	I_F = 16 mA
	Reverse Current	I_R		0.01	10	μA	V_R = 5 V
	Forward Voltage Temperature Coefficient	$\frac{\Delta V_F}{\Delta T}$		−1.6		mV/°C	I_F = 16 mA
	Capacitance	C_t		60		pF	V = 0, f = 1 MHz
Detector	High Level Output Current	I_{OH} (1)		3	500	nA	I_F = 0 mA, V_{CC} = V_O = 5.5 V
	High Level Output Current	I_{OH} (2)			100	μA	I_F = 0 mA, V_{CC} = V_O = 15 V
Coupled	Current Transfer Ratio	CTR *	15	22		%	I_F = 16 mA, V_{CC} = 4.5 V, V_O = 0.4 V
	Low Level Output Voltage	V_{OL}		0.1	0.4	V	I_F = 16 mA, V_{CC} = 4.5 V, I_O = 2.4 mA
	Low Level Supply Current	I_{CCL}		50		μA	I_F = 16 mA, V_O = Open, V_{CC} = 15 V
	High Level Supply Current	I_{CCH}		0.01	1	μA	I_F = 0 mA, V_O = Open, V_{CC} = 15 V
	Isolation Resistance	R_{1-2}	10^{11}			Ω	V_{in-out} = 1 kV_{DC}
	Isolation Capacitance	C_{1-2}		0.7		pF	V = 0, f = 1 MHz
	Propagation Delay Time to Low Output Level	t_{PHL} **		0.3	0.8	μs	I_F = 16 mA, V_{CC} = 5 V, R_L = 1.9 kΩ
	Propagation Delay Time to High Output Level	t_{PLH} **		(K/L/R) 0.3/1.0/0.8	(K/L/R) 0.8/1.5/1.25	μs	I_F = 16 mA, V_{CC} = 5 V, R_L = 1.9 kΩ

* CTR rank
K: 15 % ~
L: 25 % ~
R: 20 % ~

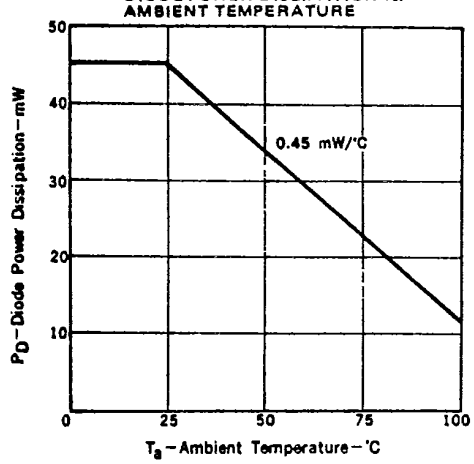
** Measuring circuit



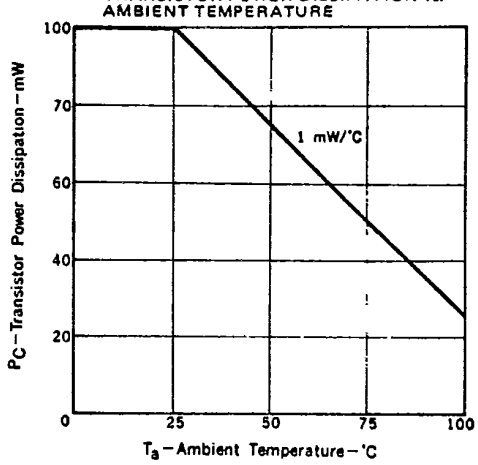


TYPICAL CHARACTERISTICS (T_a = 25 °C)

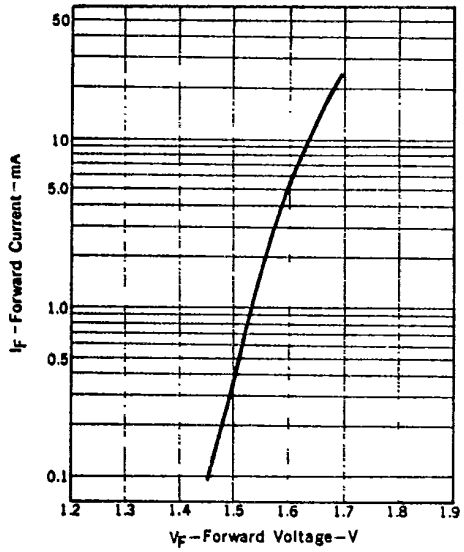
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



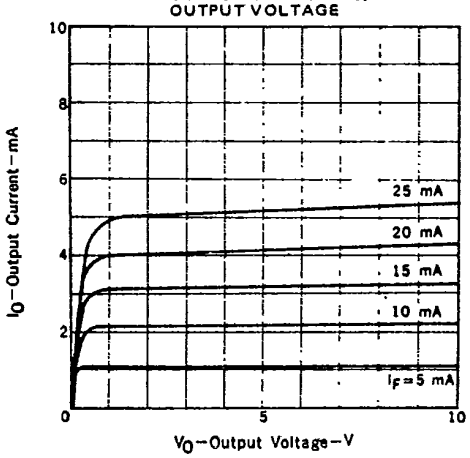
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



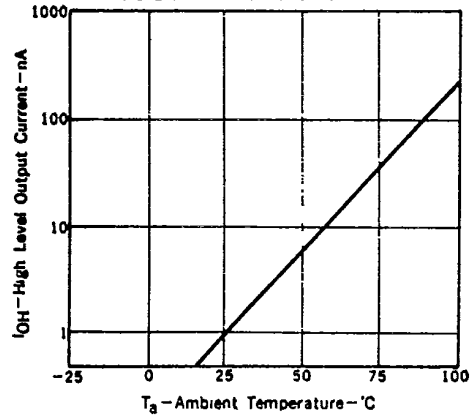
FORWARD CURRENT vs. FORWARD VOLTAGE



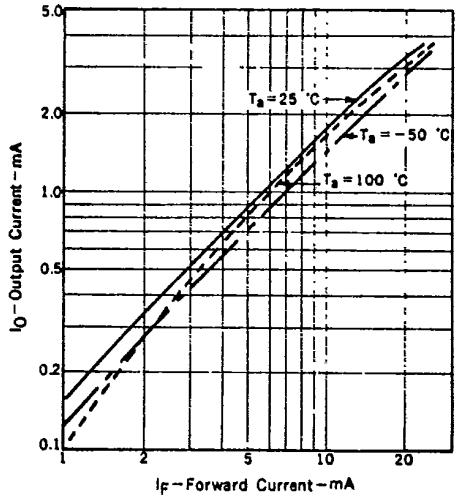
OUTPUT CURRENT vs. OUTPUT VOLTAGE



HIGH LEVEL OUTPUT CURRENT vs. AMBIENT TEMPERATURE



OUTPUT CURRENT vs. FORWARD CURRENT



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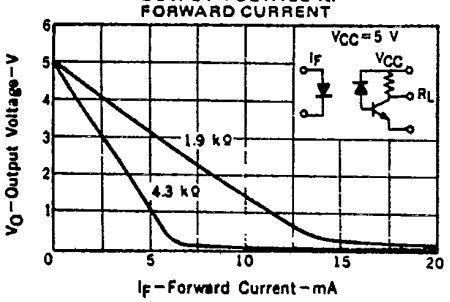
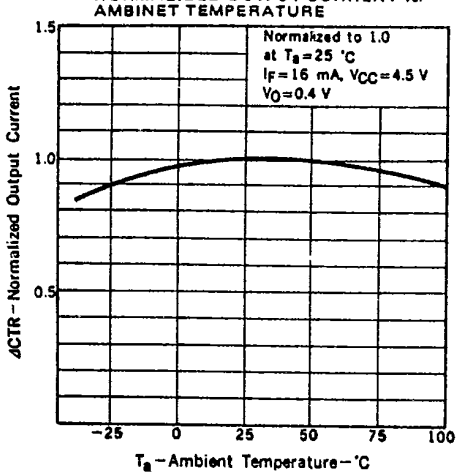
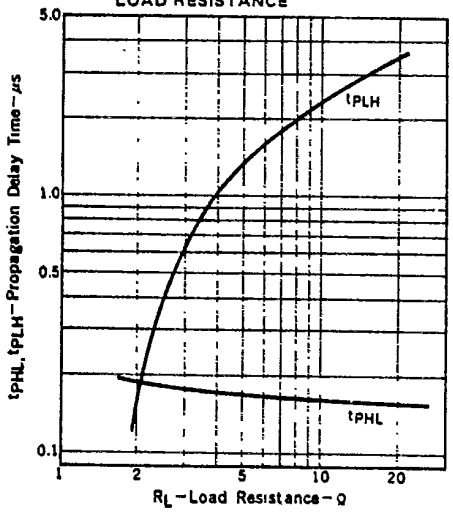
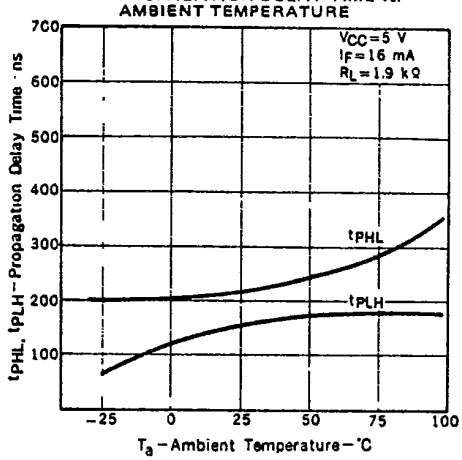
OUTPUT VOLTAGE vs. FORWARD CURRENT



NORMALIZED OUTPUT CURRENT vs. AMBINET TEMPERATURE



PROPAGATION DELAY TIME vs. LOAD RESISTANCE



PROPAGATION DELAY TIME vs. AMBIENT TEMPERATURE