

**HIGH ISOLATION VOLTAGE  
AC INPUT, HIGH CTR  
6-PIN PHOTOCOUPLER**

-NEPOC™ Series-

**DESCRIPTION**

The PS2607, PS2608, PS2607L, PS2608L are optically coupled isolators containing GaAs light emitting diodes and an NPN silicon darlington-connected phototransistor in a plastic DIP (Dual In-line Package).

The PS2607L, PS2608L are lead bending type (Gull-wing) for surface mount.

**FEATURES**

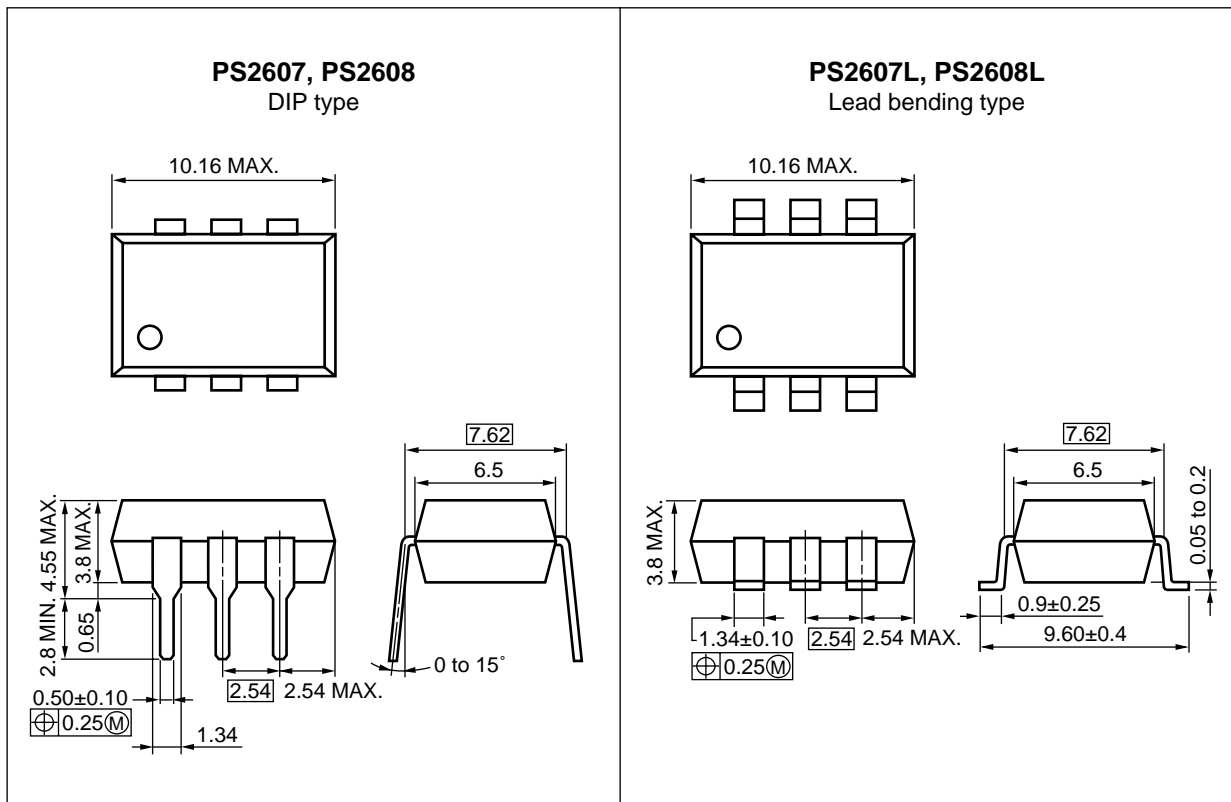
- High Isolation voltage (BV = 5 000 Vr.m.s.)
- AC input response
- High-speed switching ( $t_r, t_f = 100 \mu s$  TYP.)
- High current transfer ratio (CTR = 2 000 % TYP.)
- UL approved: File No. E72422 (S)
- Ordering number of taping product: PS2607L-E3, E4, PS2608L-E3, E4

**★ APPLICATIONS**

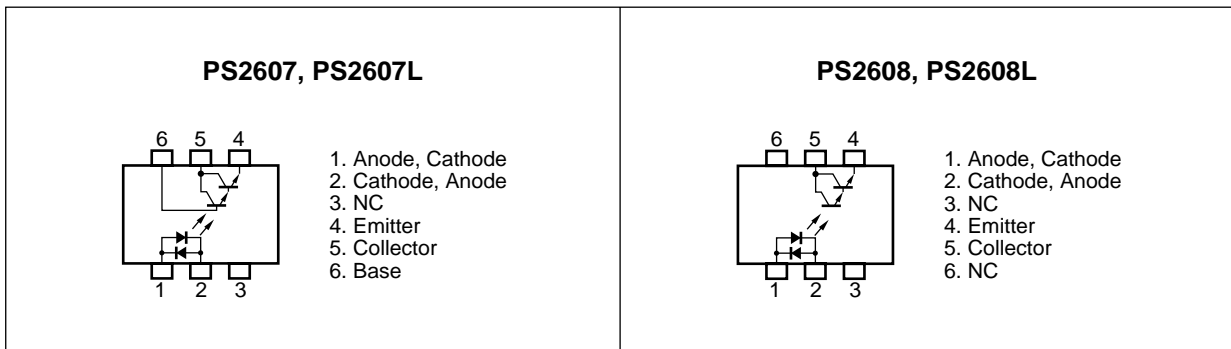
- Telephone
- FAX/OA equipment
- AC/DC line interface
- Measurement equipment

The information in this document is subject to change without notice.

★ PACKAGE DIMENSIONS (in millimeters)



PIN CONNECTIONS (TOP VIEW)



**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C, unless otherwise specified)**

Parameter		Symbol	Ratings	Unit
Diode	Forward Current (DC)	I <sub>F</sub>	±80	mA
	Power Dissipation Derating	ΔP <sub>D</sub> /°C	1.5	mW/°C
	Power Dissipation	P <sub>D</sub>	150	mW
	Peak Forward Current <sup>*1</sup>	I <sub>FP</sub>	±1	A
Transistor	Collector to Emitter Voltage	V <sub>CEO</sub>	40	V
	Emitter to Collector Voltage	V <sub>ECO</sub>	6	V
	Collector Current	I <sub>C</sub>	200	mA
	Power Dissipation Derating	ΔP <sub>C</sub> /°C	2.0	mW/°C
	Power Dissipation	P <sub>C</sub>	200	mW
Isolation Voltage <sup>*2</sup>		BV	5 000	Vr.m.s.
Operating Ambient Temperature		T <sub>A</sub>	-55 to +100	°C
Storage Temperature		T <sub>stg</sub>	-55 to +150	°C

\*1 PW = 100 μs, Duty Cycle = 1 %

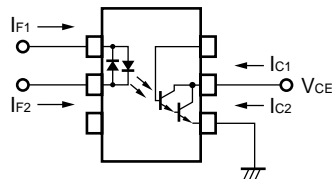
\*2 AC voltage for 1 minute at T<sub>A</sub> = 25 °C, RH = 60 % between input and output

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

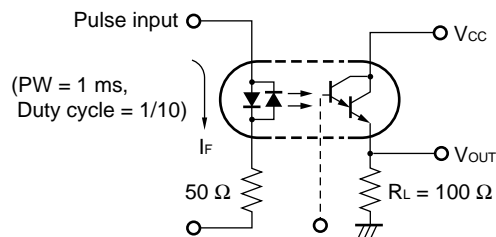
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = ±10 mA		1.1	1.4	V
	Terminal Capacitance	C <sub>t</sub>	V = 0 V, f = 1.0 MHz		60		pF
Transistor	Collector to Emitter Dark Current	I <sub>CEO</sub>	V <sub>CE</sub> = 40 V, I <sub>F</sub> = 0 mA			400	nA
	DC Current Gain <sup>*1</sup>	h <sub>FE</sub>	I <sub>C</sub> = 2 mA, V <sub>CE</sub> = 5 V		180		
Coupled	Current Transfer Ratio (I <sub>C</sub> /I <sub>F</sub> )	CTR	I <sub>F</sub> = ±1 mA, V <sub>CE</sub> = 2 V	200	2 000		%
	CTR Ratio <sup>*2</sup>	CTR1/CTR2	I <sub>F</sub> = ±1 mA, I <sub>C</sub> = 2 mA	0.3	1.0	3.0	
	Collector Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> = ±1 mA, I <sub>C</sub> = 2 mA			1.0	V
	Isolation Resistance	R <sub>I-O</sub>	V <sub>I-O</sub> = 1.0 kV <sub>bc</sub>	10 <sup>11</sup>			Ω
	Isolation Capacitance	C <sub>I-O</sub>	V = 0 V, f = 1.0 MHz		0.6		pF
	Rise Time <sup>*3</sup>	t <sub>r</sub>	V <sub>CC</sub> = 5 V, I <sub>C</sub> = 10 mA, R <sub>L</sub> = 100 Ω		100		μs
	Fall Time <sup>*3</sup>	t <sub>f</sub>			100		

\*1 Second stage transistor (PS2607, PS2607L only)

\*2 CTR1 = I<sub>C1</sub>/I<sub>F1</sub>, CTR2 = I<sub>C2</sub>/I<sub>F2</sub>

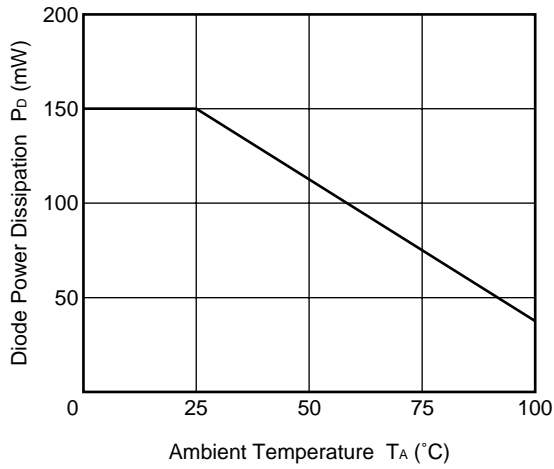


\*3 Test circuit for switching time

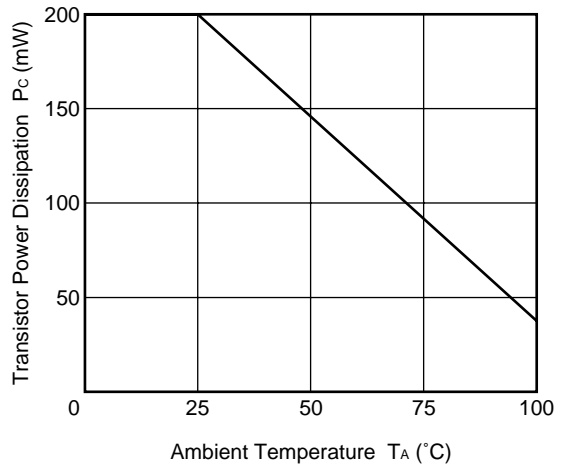


★ TYPICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

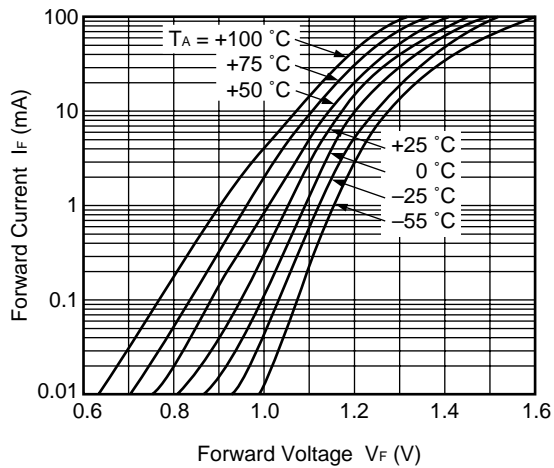
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



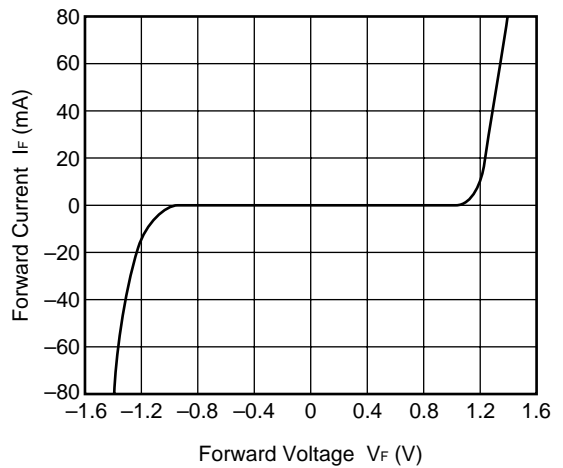
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



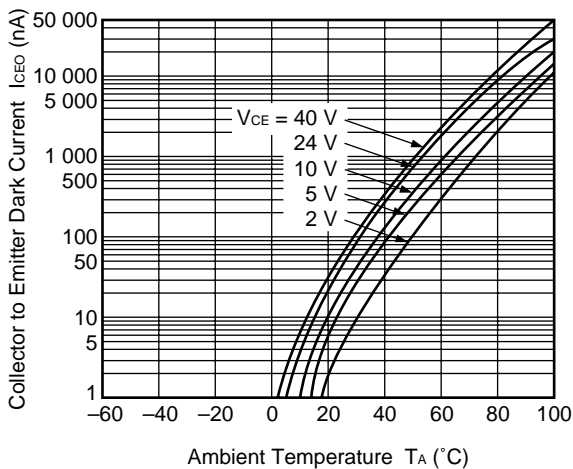
FORWARD CURRENT vs. FORWARD VOLTAGE



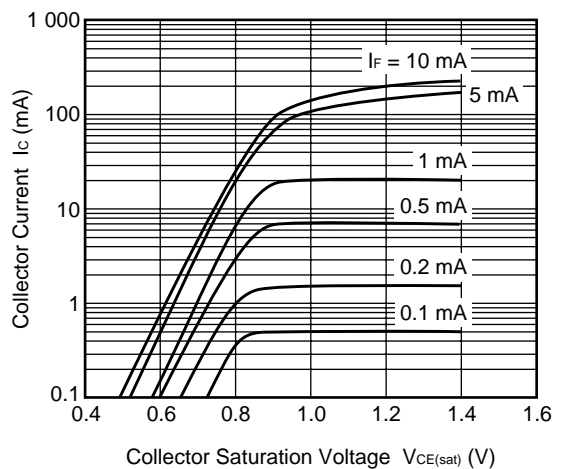
FORWARD CURRENT vs. FORWARD VOLTAGE



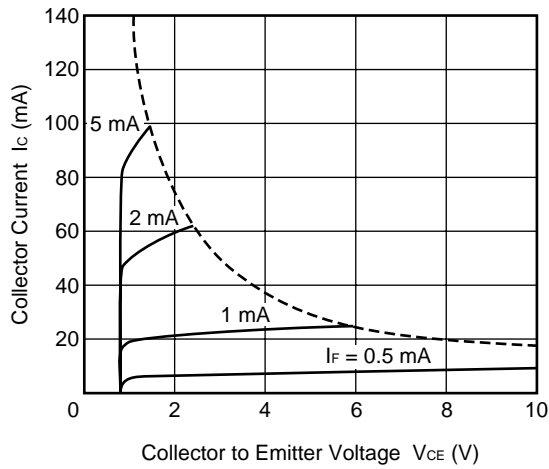
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



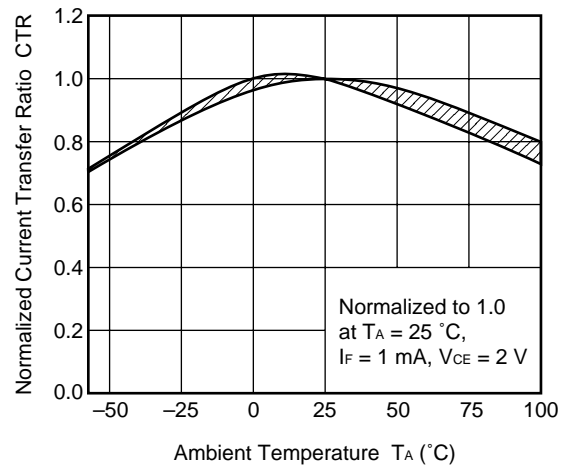
COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE



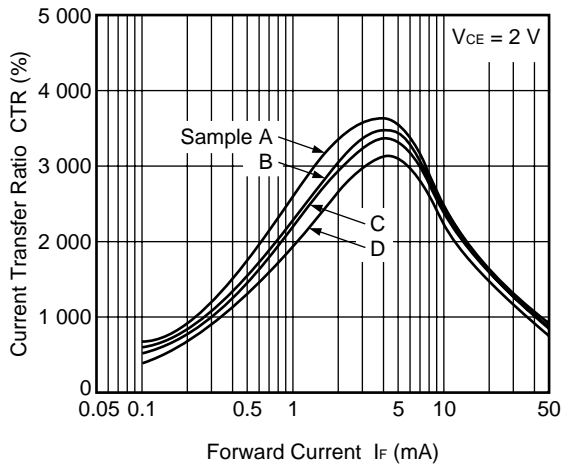
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



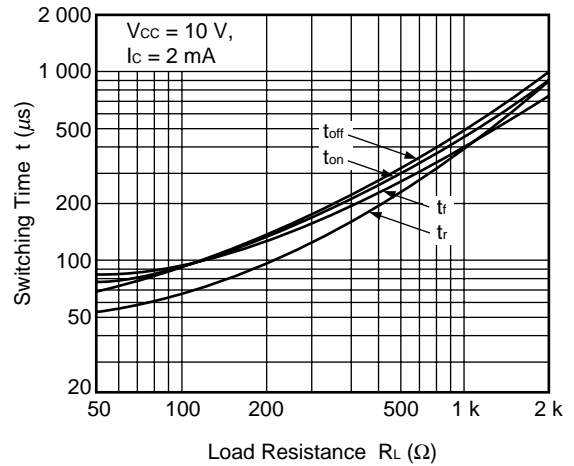
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



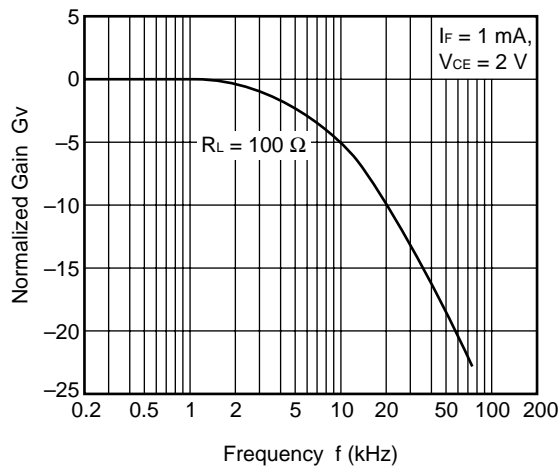
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



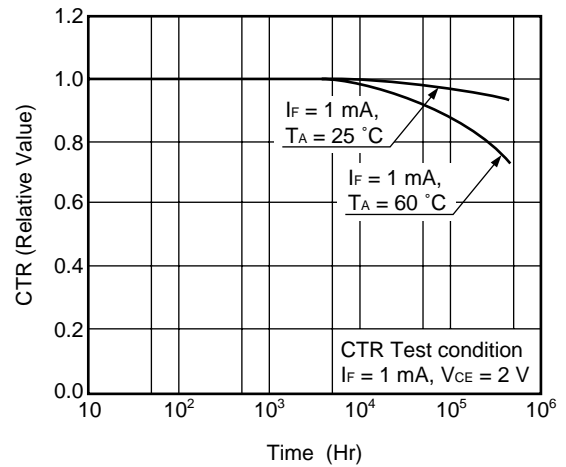
SWITCHING TIME vs. LOAD RESISTANCE



FREQUENCY RESPONSE



LONG TERM CTR DEGRADATION



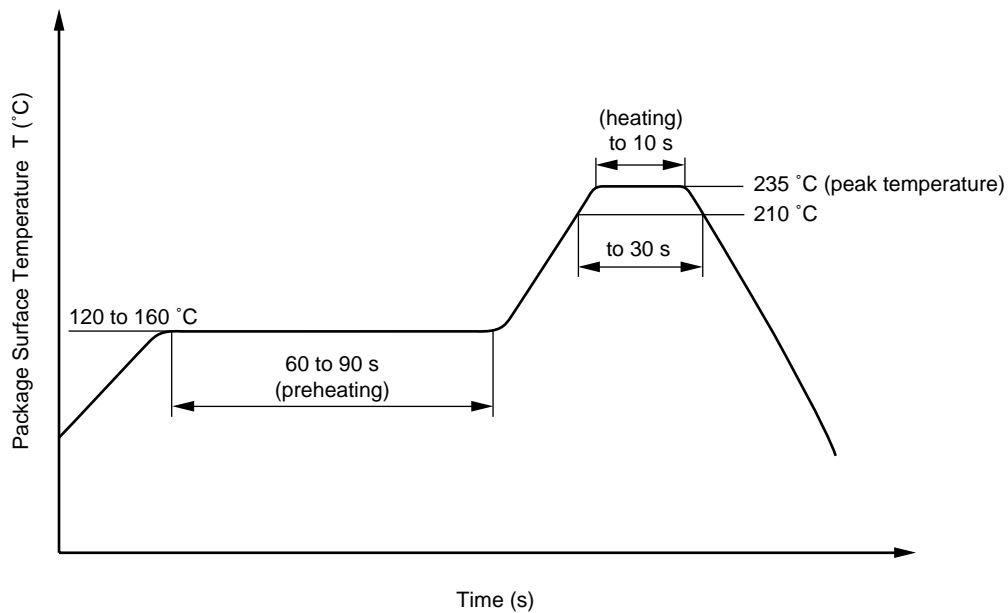
**Remark** The graphs indicate nominal characteristics.

**RECOMMENDED SOLDERING CONDITIONS**

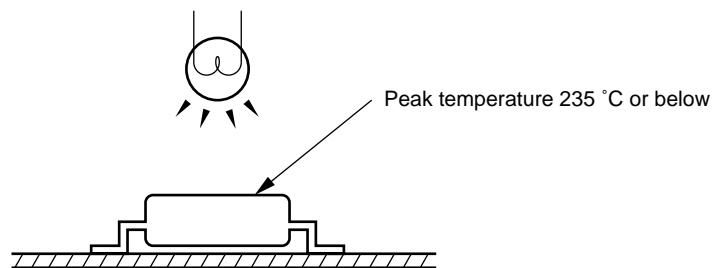
**(1) Infrared reflow soldering**

- Peak reflow temperature 235 °C (package surface temperature)
- Time of temperature higher than 210 °C 30 seconds or less
- Number of reflows Three
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

Recommended Temperature Profile of Infrared Reflow



**Caution** Please avoid removing the residual flux by water after the first reflow process.



**(2) Dip soldering**

- Temperature 260 °C or below (molten solder temperature)
- Time 10 seconds or less
- Number of times One
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

**CAUTION**

**Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.**

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Anti-radioactive design is not implemented in this product.