

## LONG CREEPAGE TYPE HIGH ISOLATION VOLTAGE 6 PIN OPTOCOUPLER

PS2651  
PS2651L2  
PS2652  
PS2652L2

### FEATURES

- **HIGH ISOLATION VOLTAGE**  
BV: 5 k Vr.m.s. MIN
- **LONG CREEPAGE AND CLEARANCE DISTANCE**  
8 mm MIN
- **HIGH COLLECTOR TO EMITTER VOLTAGE**  
 $V_{CE0}$ : 80 V MIN
- **HIGH SPEED SWITCHING**  
 $t_r = 3 \mu s$ ,  $t_f = 5 \mu s$  TYP
- **HIGH CURRENT TRANSFER RATIO**  
CTR = 200% TYP
- **6 PIN DUAL IN-LINE PACKAGE**

### DESCRIPTION

PS2651 and PS2652 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon phototransistor in a plastic DIP (Dual In-Line Package). PS2651 has a base pin and PS2652 has no base pin. Creepage distance and clearance of leads are over 8 millimeters. PS2651L2 and PS2652L2 are lead bending type (Gull-wing) for surface mounting.

### APPLICATIONS

Interface circuit for various instrumentations and control equipment.

- AC LINE/DIGITAL LOGIC
- DIGITAL LOGIC INTERFACE
- TWISTED PAIR LINE RECEIVER
- TELEPHONE/TELEGRAPH LINE RECEIVER
- HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL
- RELAY CONTACT MONITOR
- POWER SUPPLY MONITOR

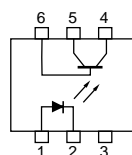
### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ C$ )

PART NUMBER			PS2651, PS2651L2, PS2652, PS2652L2			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	
Diode	$V_F$	Forward Voltage, $I_F = 10 \text{ mA}$	V	1.1	1.4	
	$I_R$	Reverse Current, $V_R = 5 \text{ V}$	$\mu A$		5	
	C	Junction Capacitance, $V = 0$ , $f = 1.0 \text{ MHz}$	pF	30		
Transistor	$I_{CE0}$	Collector to Emitter Dark Current, $V_{CE} = 80 \text{ V}$ , $I_F = 0$	nA		100	
	$BV_{CEO}$	Collector to Emitter Breakdown Voltage, $I_C = 1 \text{ mA}$ , $I_B = 0$	V	80		
	$BV_{ECO}$	Emitter to Collector Breakdown Voltage, $I_E = 100 \mu A$ , $I_B = 0$	V	7		
Coupled	CTR	Current Transfer Ratio <sup>1</sup> , $I_F = 5 \text{ mA}$ , $V_{CE} = 5 \text{ V}$	%	50	200	400
	$V_{CE(sat)}$	Collector Saturation Voltage, $I_F = 10 \text{ mA}$ , $I_C = 2 \text{ mA}$	V			0.3
	R1-2	Isolation Resistance, $V_{in-out} = 1.0 \text{ k V}$	$\Omega$	$10^{11}$		
	C1-2	Isolation Capacitance, $V = 0$ , $f = 1.0 \text{ MHz}$	pF		0.6	
	$t_r$	Rise Time <sup>2</sup> , $V_{CC} = 5 \text{ V}$ , $I_C = 2 \text{ mA}$	$\mu s$		3	
$t_f$	Fall Time <sup>2</sup> , $V_{CC} = 5 \text{ V}$ , $I_C = 2 \text{ mA}$	$\mu s$		5		

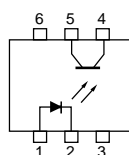
#### 1. CTR rank

KD : 160 to 400 (%)  
LD : 80 to 240 (%)  
MD : 50 to 120 (%)

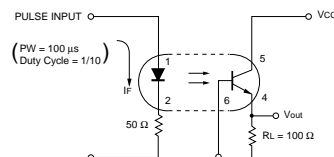
#### 2. Test Circuit for Switching Time



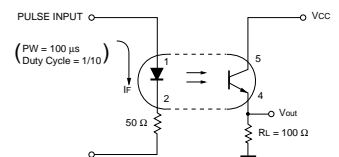
PS2651



PS2652



PS2651



PS2652

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** ( $T_A = 25^\circ\text{C}$ )

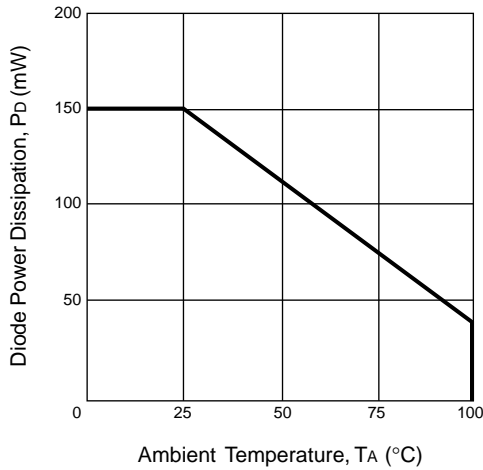
SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
$V_R$	Reverse Voltage	V	6
$I_F$	Forward Current	mA	80
$P_D$	Power Dissipation	mW	150
$I_F$ (Peak)	Peak Forward Current PW = 100 $\mu\text{s}$ , Duty Cycle 1%	A	1
Transistor			
$V_{CE0}$	Collector to Emitter Voltage	V	80
$V_{ECO}$	Emitter to Collector Voltage	V	7
$I_C$	Collector Current	mA	50
$P_C$	Power Dissipation	mW	150
Coupled			
$BV$	Isolation Voltage <sup>2</sup>	V <sub>r.m.s.</sub>	5000
$T_{STG}$	Storage Temperature	$^\circ\text{C}$	-55 to +150
$T_{OP}$	Operating Temperature	$^\circ\text{C}$	-55 to +100

Notes:

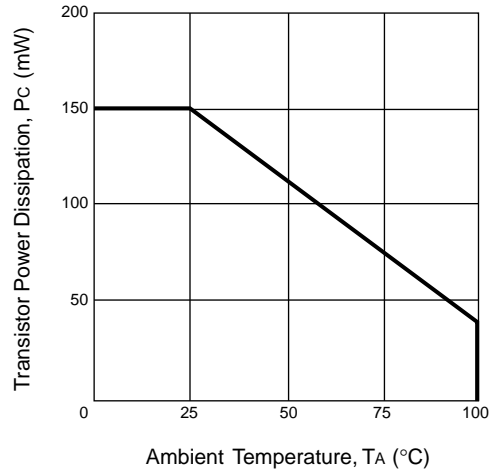
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at  $T_A = 25^\circ\text{C}$ , RH = 60 % between input (Pin No. 1, 2, 3 Common) and output (Pin No. 4, 5, 6 Common).

**TYPICAL PERFORMANCE CURVES** ( $T_A = 25^\circ\text{C}$ )

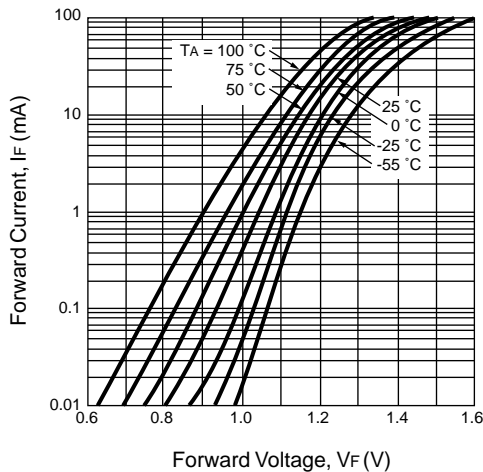
**DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE**



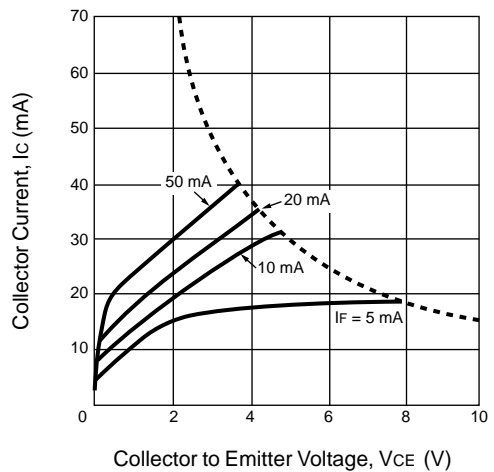
**TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE**



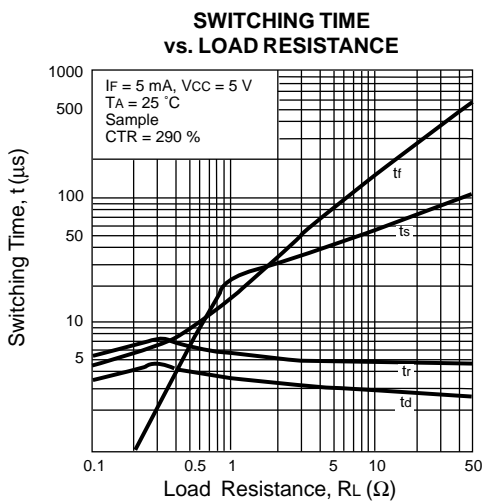
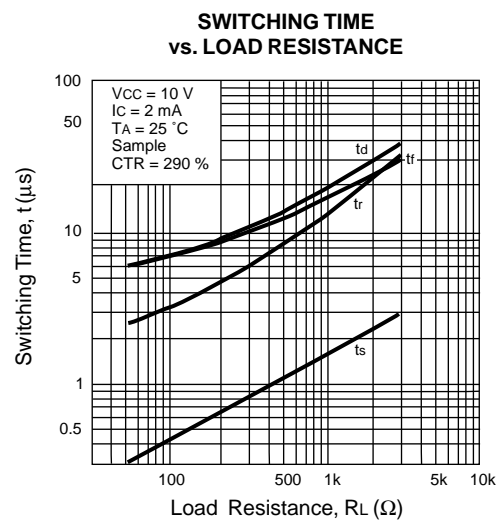
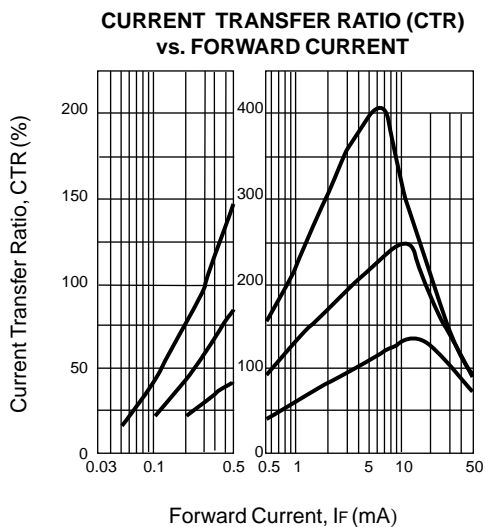
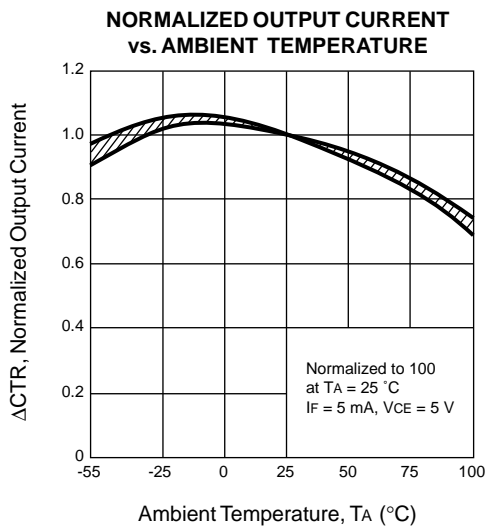
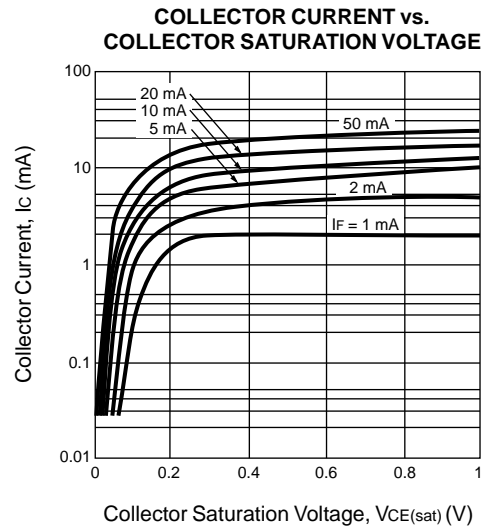
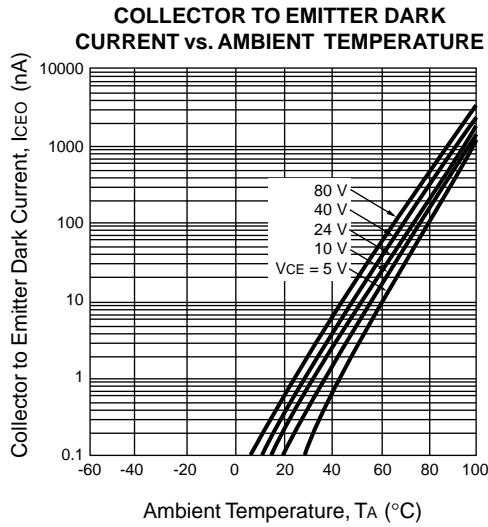
**FORWARD CURRENT vs. FORWARD VOLTAGE**



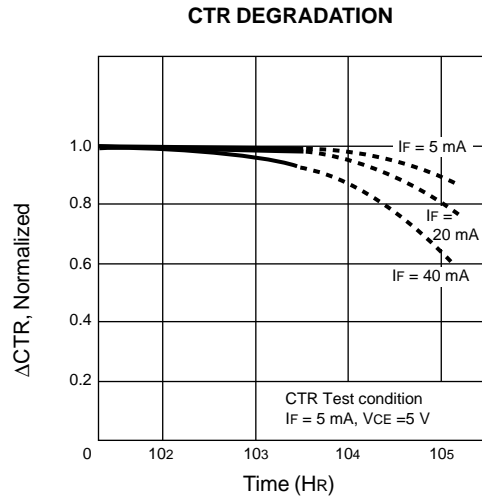
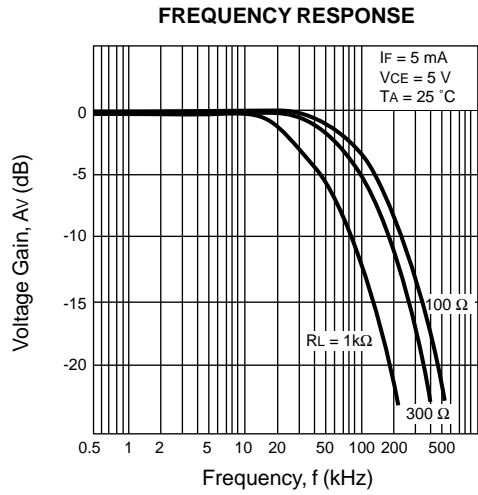
**COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE**



TYPICAL PERFORMANCE CURVES (TA = 25 °C)

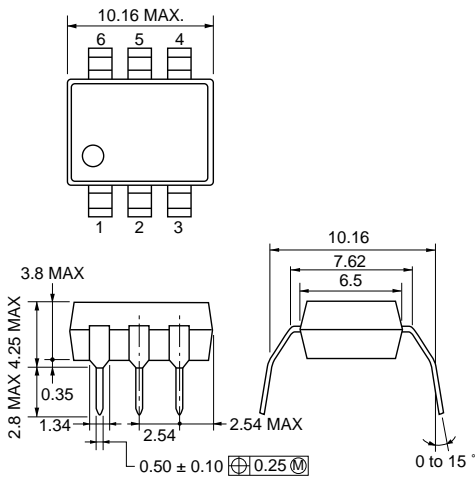


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

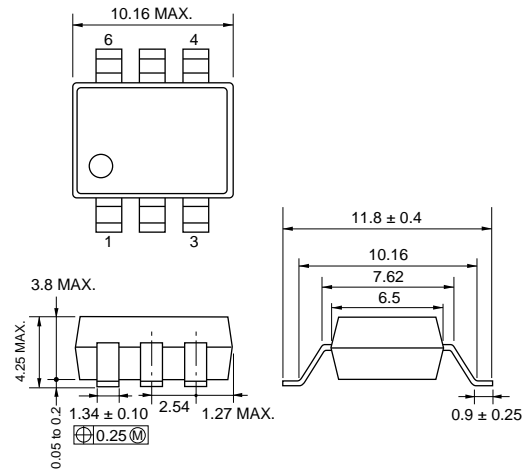


OUTLINE DIMENSIONS (Units in mm)

PS2651, PS2652

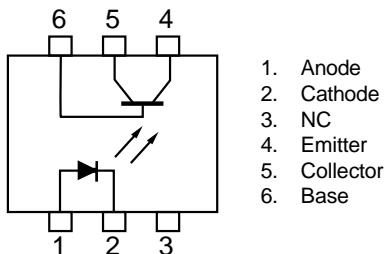


PS2651L2, PS2652L2

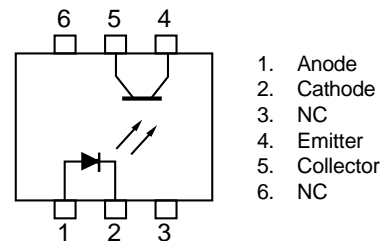


PIN CONNECTION (Top View)

PS2651, PS2651L2



PS2652, PS2652L2



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