

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

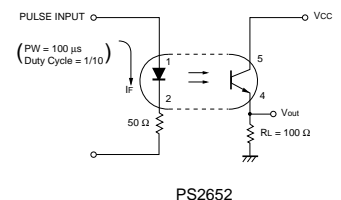
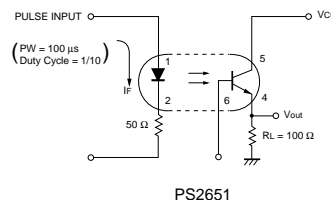
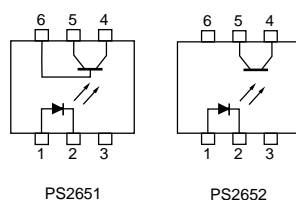
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$)

| 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, $V_R = 5 \text{ V}$ | μA | | 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 ¹ , $I_F = 5 \text{ mA}$, $V_{CE} = 5 \text{ V}$ | % | 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, $V_{in-out} = 1.0 \text{ k V}$ | Ω | 10^{11} | | |
| | C1-2 | Isolation Capacitance, $V = 0$, $f = 1.0 \text{ MHz}$ | pF | | 0.6 | |
| | t_r | Rise Time ² , $V_{CC} = 5 \text{ V}$, $I_C = 2 \text{ mA}$ | μs | | 3 | |
| t_f | Fall Time ² , $V_{CC} = 5 \text{ V}$, $I_C = 2 \text{ mA}$ | μs | | 5 | | |

1. CTR rank

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

2. Test Circuit for Switching Time



ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

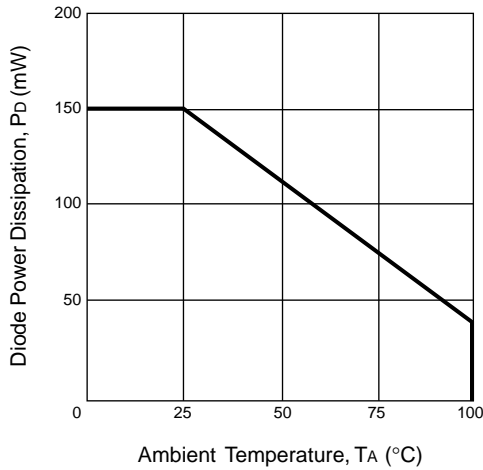
| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|-----------------------|--|---------------------|-------------|
| Diode | | | |
| V _R | Reverse Voltage | V | 6 |
| I _F | Forward Current | mA | 80 |
| P _D | Power Dissipation | mW | 150 |
| I _{F (Peak)} | Peak Forward Current PW = 100 μs, Duty Cycle 1% | A | 1 |
| Transistor | | | |
| V _{CEO} | 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 ² | V _{r.m.s.} | 5000 |
| T _{STG} | Storage Temperature | °C | -55 to +150 |
| T _{OP} | Operating Temperature | °C | -55 to +100 |

Notes:

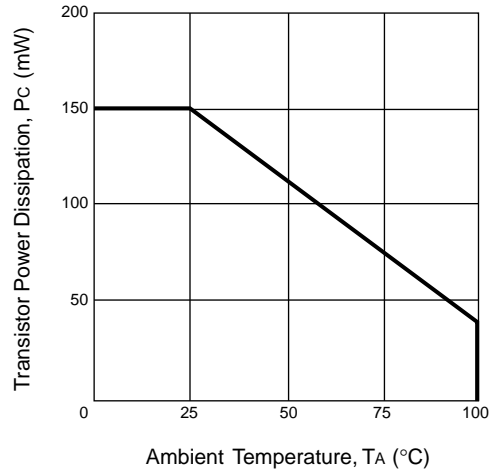
1. Operation in excess of any one of these parameters may result in permanent damage.
2. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input (Pin No. 1, 2, 3 Common) and output (Pin No. 4, 5, 6 Common).

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

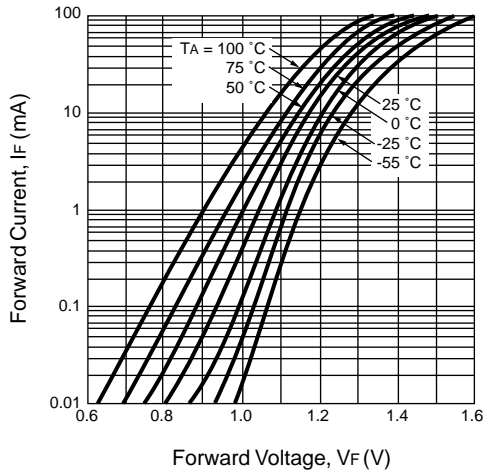
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



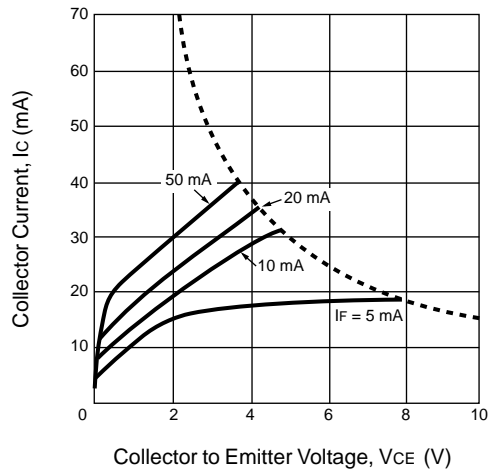
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



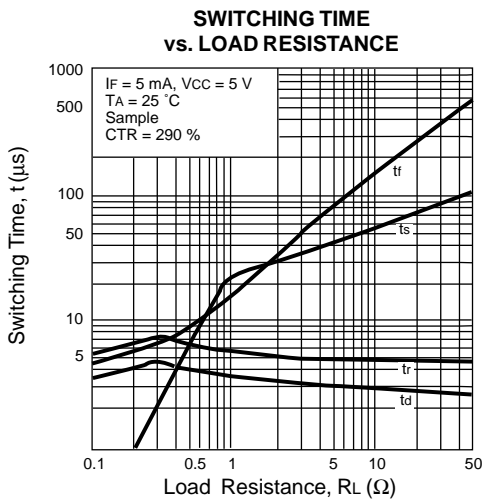
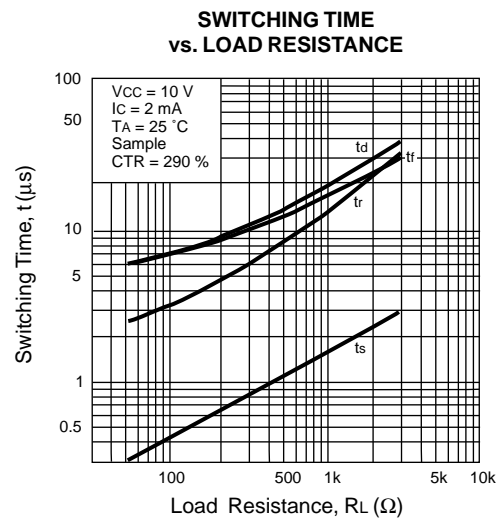
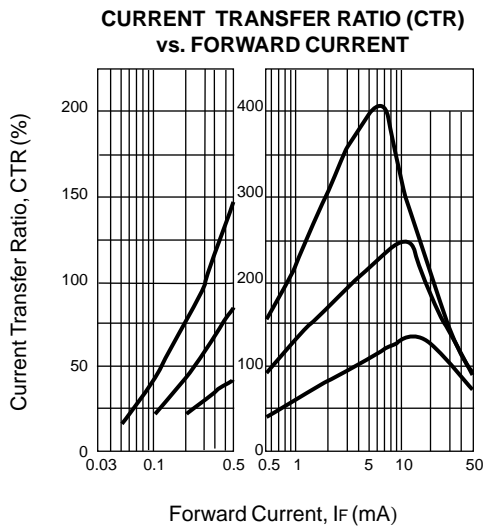
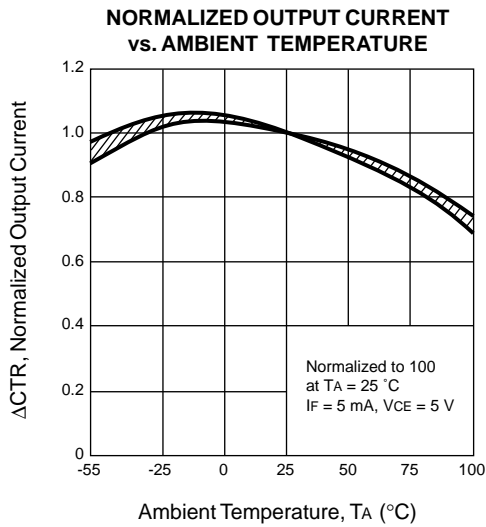
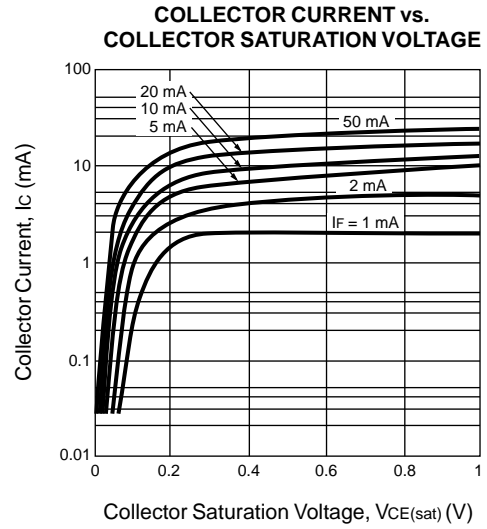
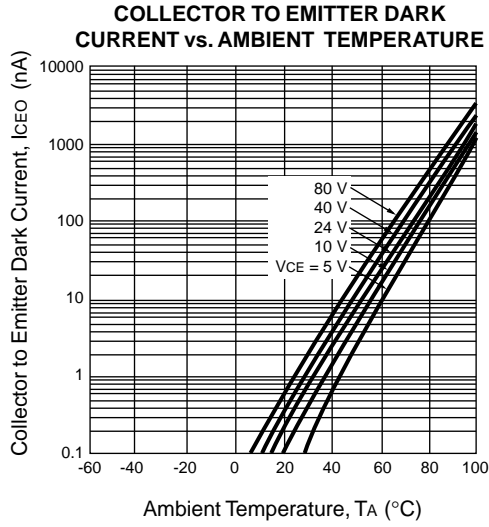
FORWARD CURRENT vs. FORWARD VOLTAGE



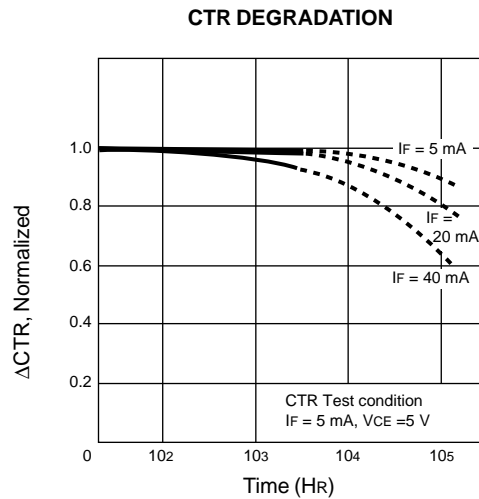
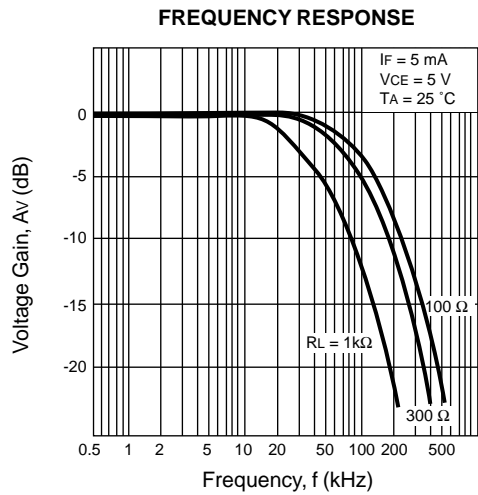
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



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

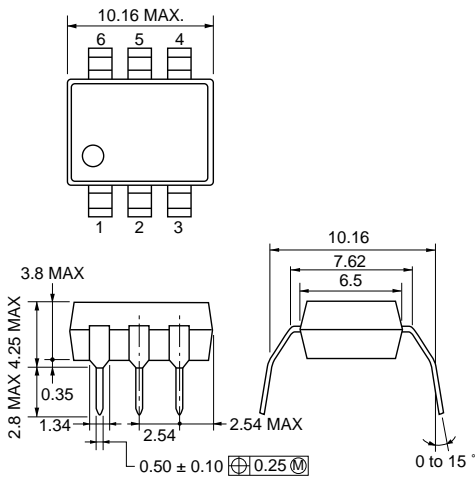


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

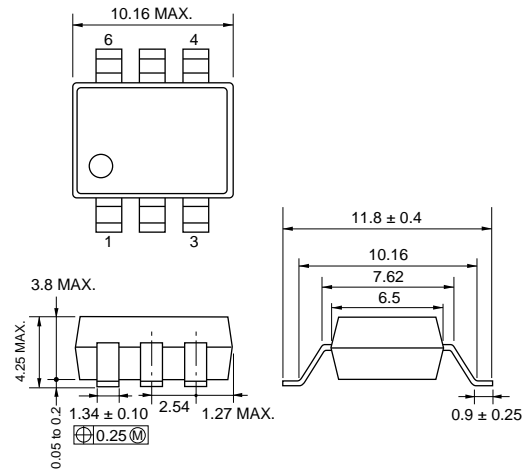


OUTLINE DIMENSIONS (Units in mm)

PS2651, PS2652

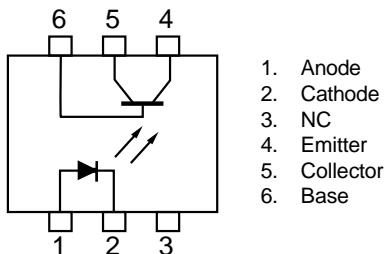


PS2651L2, PS2652L2

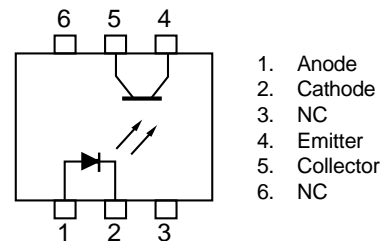


PIN CONNECTION (Top View)

PS2651, PS2651L2



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