

Preliminary

TOSHIBA Photocoupler Photorelay

T L P 3 1 1 4

Measurement Instruments

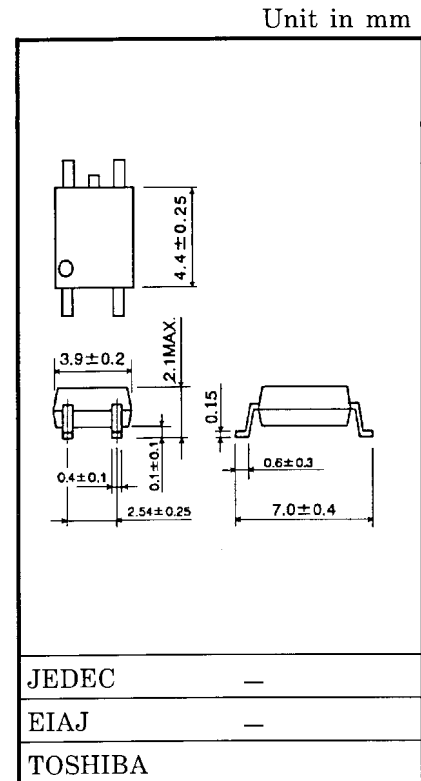
Logic IC Testers/memory Testers

Board Testers/Scanners

The Toshiba TLP3114 SOP photorelay is a small-outline photorelay, suitable for surface-mount assembly. The TLP3114 consists of a GaAs infrared-emitting diode optically coupled to a photo-MOSFET and housed in a 4-pin 2.1-mm high SOP.

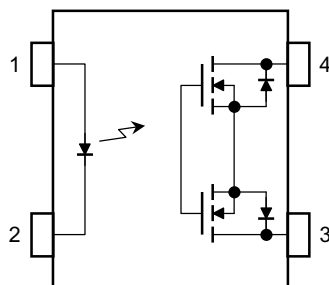
Its characteristics include low OFF-state current and low output pin capacitance, enabling it to be used in high-frequency measuring instruments.

- SOP (2.54SOP4): 2.1 mm high, 2.54-mm pitch
- 1 Form A
- Peak OFF-State Voltage: 40 V (min)
- Trigger LED Current: 4 mA (max)
- ON-State Current: 300 mA (max)
- ON-State Resistance: 3.0 Ω (max), 2.0 Ω (typ.)
- Output Capacitance: 7.0 pF (max), 5.0 pF (typ.)
- Isolation Voltage: 1500 Vrms (min)



Weight : 0.1 g

Pin Configuration (top view)



- 1: ANODE
- 2: CATHODE
- 3: DRAIN
- 4: DRAIN

Preliminary**Maximum Ratings (Ta = 25°C)**

| Characteristics | | Symbol | Rating | Unit |
|--|--|------------|---------|------|
| LED | Forward Current | I_F | 50 | mA |
| | Reverse Voltage | V_R | 6 | V |
| | Junction Temperature | T_j | 125 | °C |
| DETECTOR | OFF-state Output Voltage | V_{OFF} | 40 | V |
| | ON-state Current | I_{ON} | 300 | mA |
| | Peak ON-state Current (t = 100 ms, 1 shot) | I_{PEAK} | 0.9 | A |
| | Junction Temperature | T_j | 125 | °C |
| Storage Temperature | | T_{stg} | -55~125 | °C |
| Operating Temperature | | T_{opr} | -20~85 | °C |
| Lead Soldering Temperature (10 s) | | T_{sol} | 260 | °C |
| Isolation Voltage (AC, 1 min, R.H. ≤ 60%) (Note 1) | | BV_S | 1500 | Vrms |

Note 1: Device considered a two-pin device: Pins 1 and 2 shorted together, and pins 3 and 4 shorted together.

Recommended Operating Conditions

| Characteristics | Symbol | Min | Typ. | Max | Unit |
|-----------------------|-----------|-----|------|-----|------|
| Supply Voltage | V_{OFF} | — | — | 32 | V |
| Forward Current | I_F | 10 | — | 30 | mA |
| ON-state Current | I_{ON} | — | — | 300 | mA |
| Operating Temperature | T_{opr} | 25 | — | 60 | °C |

Individual Electrical Characteristics (Ta = 25°C)

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------|--------------------|-----------|--|-----|------|------|------|
| LED | Forward Voltage | V_F | $I_F = 20 \text{ mA}$ | 1.0 | 1.2 | 1.4 | V |
| | Reverse Voltage | I_R | $V_R = 6 \text{ V}$ | — | — | 10 | μA |
| | Capacitance | C_T | $V = 0, f = 1 \text{ MHz}$ | — | 15 | — | pF |
| DETECTOR | OFF-state Current | I_{OFF} | $V_{OFF} = 30 \text{ V}, T_a = 50^\circ\text{C}$ | — | — | 1000 | pA |
| | Output Capacitance | C_{OFF} | $V = 0, f = 100 \text{ MHz}$ | — | 5.0 | 7.0 | pF |

Preliminary

Coupled Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------|----------|--|-----|------|-----|----------|
| Trigger LED Current | I_{FT} | $I_{ON} = 100\text{ mA}$ | — | — | 4 | mA |
| Close LED Current | I_{FC} | $I_{OFF} = 10\text{ }\mu\text{A}$ | 0.2 | 0.75 | — | mA |
| ON-state Resistance | R_{ON} | $I_{ON} = 100\text{ mA}$, $I_F = 5\text{ mA}$ | — | 2.0 | 3.0 | Ω |

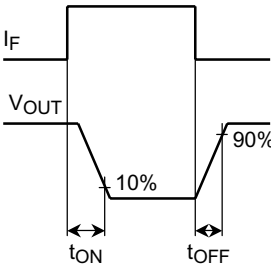
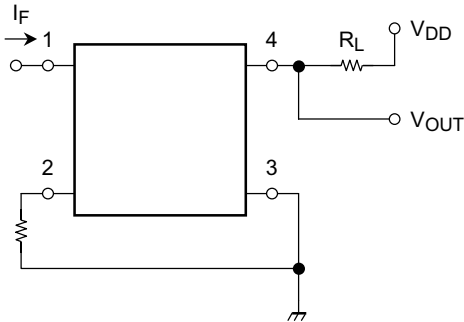
Isolation Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------|--------|---|--------------------|-----------|-----|----------|
| Capacitance Input to Output | C_S | $V_S = 0\text{ V}$, $f = 1\text{ MHz}$ | — | 0.8 | — | pF |
| Isolation Resistance | R_S | $V_S = 500\text{ V}$, R.H. $\leq 60\%$ | 5×10^{10} | 10^{14} | — | Ω |
| Isolation Voltage | BV_S | AC, 1 minute | 1500 | — | — | Vrms |
| | | AC, 1 second (in oil) | — | 3000 | — | |
| | | DC, 1 minute (in oil) | — | 3000 | — | Vdc |

Switching Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------|-----------|---|-----|------|-----|---------------|
| Turn-ON Time | t_{ON} | $R_L = 200\text{ }\Omega$ (Note 2) $V_{DD} = 20\text{ V}$, $I_F = 10\text{ mA}$ | — | — | 500 | μs |
| Turn-OFF Time | t_{OFF} | | — | — | 500 | |

Note 2: Switching Time Test Circuit



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