

Preliminary

TOSHIBA Photocoupler Photorelay

TLP3114

Measurement Instruments

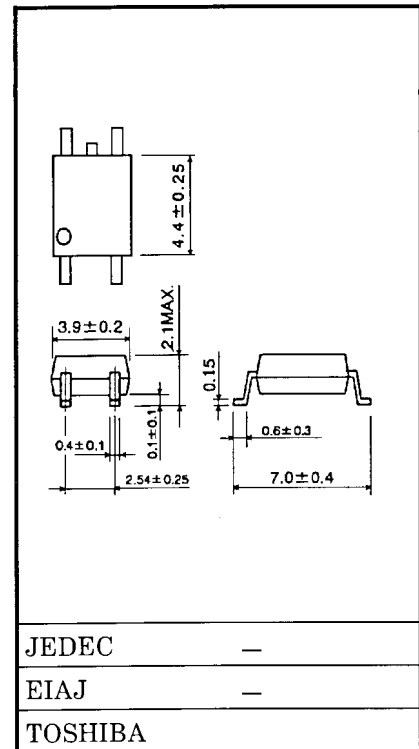
- Logic IC Testers/memory Testers
- Board Testers/Scanners

Unit in mm

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.

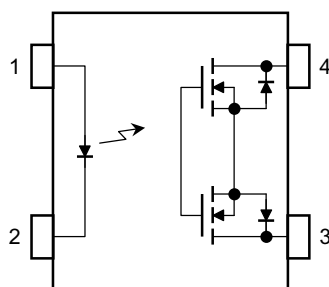
Its characteristics include low OFF-state current and low output pin capacitance, enabling it to be used in high-frequency measuring instruments.

- 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

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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

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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	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	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}	$R_L = 200 \text{ } \Omega$ $V_{DD} = 20 \text{ V}, I_F = 10 \text{ mA}$ (Note 2)	—	—	500	μs
Turn-OFF Time	t_{OFF}		—	—	500	

Note 2: Switching Time Test Circuit

