

**Preliminary**

TOSHIBA Photocoupler Photorelay

# TLP3114

## Measurement Instruments

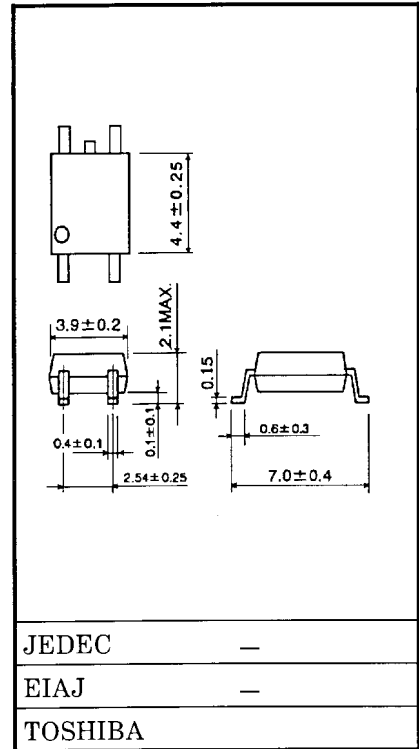
- Logic IC Testers/memory Testers
- Board Testers/Scanners

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.

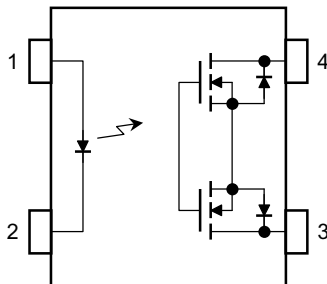
- SOP (2.54SOP4): 2.1 mm high, 2.54-mm pitch
- 1 Form A
- Peak OFF-State Voltage: 40 V (min)
- Trigger LED Current: 4 mA (max)
- ON-State Current: 300 mA (max)
- ON-State Resistance: 3.0 Ω (max), 2.0 Ω (typ.)
- Output Capacitance: 7.0 pF (max), 5.0 pF (typ.)
- Isolation Voltage: 1500 Vrms (min)

Unit in mm



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	$\Omega$

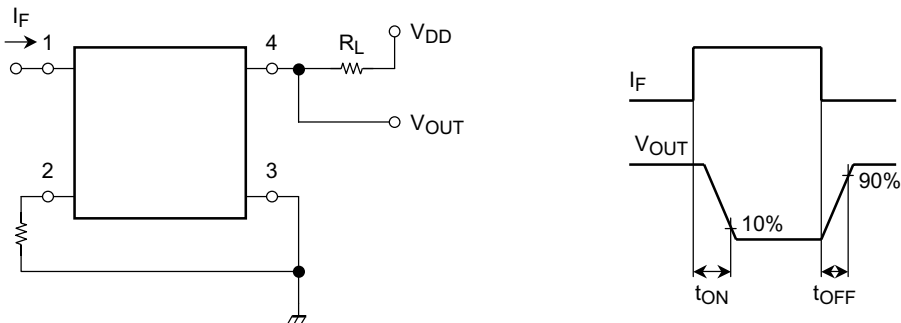
**Isolation Characteristics (Ta = 25°C)**

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	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
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	$\mu\text{s}$
Turn-OFF Time	$t_{OFF}$		—	—	500	

Note 2: Switching Time Test Circuit



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