

TOSHIBA PHOTOCOUPLER PHOTO RELAY

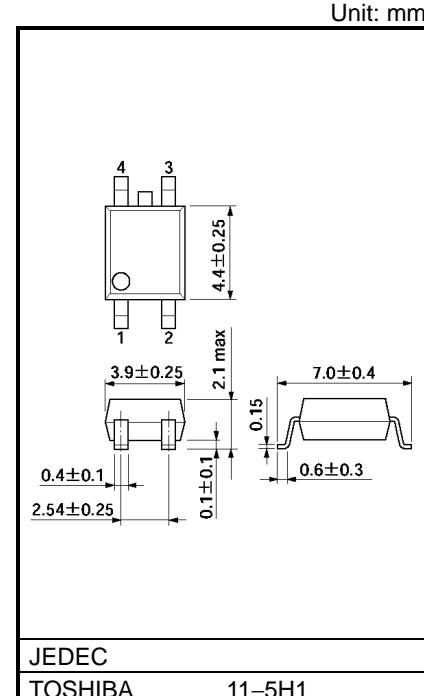
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MEASUREMENT INSTRUMENTS
LOGIC TESTERS / MEMORY TESTERS
BOARD TESTERS / SCANNERS
POWER LINE CONTROL
FA

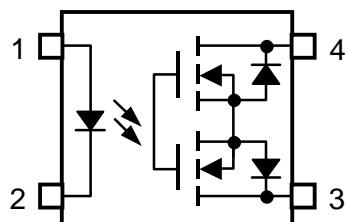
The TOSHIBA TLP3122 consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic SOP package.

The TLP3122 is a bi-directional switch, which can replace mechanical relays in many applications. And its high on-state current maximum rating is suitable to control a power line.

- 4 pin SOP (2.54SOP4) : 2.1 mm high, 2.54 mm pitch
 - 1-Form-A
 - Peak Off-State Voltage : 60 V (MIN.)
 - Trigger LED Current : 3 mA (MAX.)
 - On-State Current : 1A (MAX.)
 - On-State Resistance : 0.25 ohm (Typ)
 - Off-state Capacitance : 90 pF (Typ)
 - Off-state Current : 100nA (MAX)
 - Isolation Voltage : 1500 Vrms (MIN.)



PIN CONFIGURATION (TOP VIEW)



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I _F	50	mA
	Forward Current Derating (Ta ≥ 25°C)	ΔI _F /°C	-0.5	mA/°C
	Reverse Voltage	V _R	5	V
	Junction Temperature	T _j	125	°C
DETECTOR	Off-State Output Terminal Voltage	V _{OFF}	60	V
	On-State Current	I _{ON}	1	A
	On-State Current Derating (Ta ≥ 50°C)	ΔI _{ON} /°C	-13.3	mA/°C
	Junction Temperature	T _j	125	°C
Storage Temperature Range		T _{stg}	-40~125	°C
Operating Temperature Range		T _{opr}	-20~85	°C
Lead Soldering Temperature (10 s)		T _{sol}	260	°C
Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1)		B _{VS}	1500	V _{rms}

(NOTE1) : Device considered a two-terminal device : LED side pins shorted together, and DETECTOR side pins shorted together.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{DD}	—	—	48	V
Forward Current	I _F	5	10	20	mA
On-State Current	I _{ON}	—	—	1	A
Operating Temperature	T _{opr}	25	—	60	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
	Reverse Current	I _R	V _R = 5 V	—	—	10	μA
	Capacitance	C _T	V = 0, f = 1 MHz	—	15	—	pF
DETECTOR	Off-State Current	I _{OFF}	V _{OFF} = 60 V	—	0.2	100	nA
	Capacitance	C _{OFF}	V = 0, f = 1 MHz	—	90	—	pF

COUPLED ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I_{FT}	$I_{ON} = 100 \text{ mA}$	—	1	3	mA
Return LED Current	I_{FC}	$I_{OFF} = 100 \mu\text{A}$	0.1	0.8	—	mA
On-State Resistance	R_{ON}	$I_{ON} = 1 \text{ A}, I_F = 5 \text{ mA}$		0.25	0.7	ohm

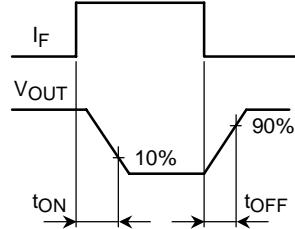
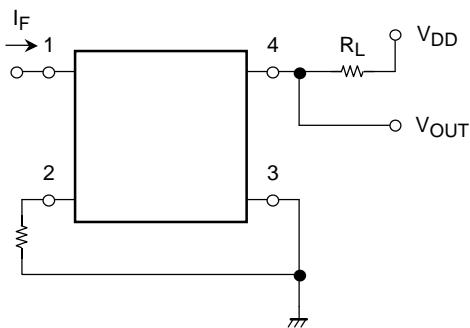
ISOLATION CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	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}	—	ohm
Isolation Voltage	BV_S	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	
		DC, 1 minute (in oil)	—	3000	—	Vdc

SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	$R_L = 200 \Omega$ $V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$	—	1.4	3	ms
Turn-off Time	t_{OFF}		—	0.6	1	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT



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