<u>TOSHIBA</u>

TOSHIBA Photocoupler Photorelay

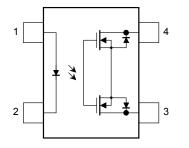
TLP4172G

Telecommunication Measurement Equipment Security Equipment FA

The Toshiba TLP4172G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP package. This 1-form-B (NC) photorelay features a withstanding voltage of 350 V.

- 4-pin SOP (2.54SOP4): Height = 2.1 mm, pitch = 2.54 mm
- Normally closed (1-form-B) device
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 90 mA (max)
- On-state resistance: 50Ω (max)
- Isolation voltage: 1500 Vrms (min)
- UL Recognized: UL1577, File No. E67349

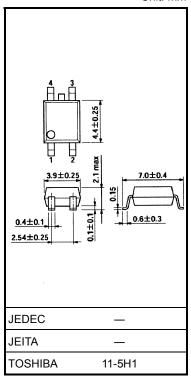
Pin Configuration (top view)



1: Anode

2: Cathode

- 3: Drain
- 4: Drain



Weight: 0.1 g (typ.)

Unit: mm

Maximum Ratings (Ta = 25°C)

	Charac	Symbol	Rating	Unit		
LED	Forward current		١ _F	50	mA	
	Forward current derating (Ta	∆I _F /°C	-0.5	mA/°C		
	Peak forward current (100 µ	s pulse, 100 pps)	I _{FP}	1	А	
	Reverse voltage	V _R	5	V		
	Junction temperature		Тj	125	°C	
	Off-state output terminal volt	V _{OFF}	350	V		
	On-state current	One channel operation				
ctor		Two channel operations (1a1b simultaneous operation)	I _{ON}	90	mA	
Detector	0	One channel operation				
	On-state current derating (Ta ≧ 25°C)	Two channel operations (1a1b simultaneous operation)	∆l _{ON} /°C	-0.9	mA/°C	
	Junction temperature	Тј	125	°C		
Stora	age temperature range	T _{stg}	–55 to 125	°C		
Ope	rating temperature range	T _{opr}	-40 to 85	°C		
Lead	soldering temperature (10 s)	T _{sol}	260	°C		
Isola	tion voltage (AC, 1 min, R.H.	BVS	1500	Vrms		

Note 1: Pins 1 and 2 are shorted together, and pins 3 and 4 are shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	V _{DD}	_	_	280	V
Forward current	١ _F	5	_	25	mA
On-state current	I _{ON}	_	_	90	mA
Operating temperature	T _{opr}	-20		65	°C

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
LED	Forward voltage	V _F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I _R	$V_R = 5 V$	_	_	10	μA
	Capacitance	CT	V = 0, f = 1 MHz	_	30	_	pF
ie C	Off-state current	I _{OFF}	$V_{OFF} = 350 \text{ V}, \text{ I}_F = 5 \text{ mA}$	_	_	1	μA
	Capacitance	C _{OFF}	V = 0, f = 1 MHz, I _F = 5 mA	_	30	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current	I _{FC}	$I_{OFF} = 10 \ \mu A$	_	1	3	mA
Return LED current	I _{FT}	I _{ON} = 90 mA	0.1	_	_	mA
On-state resistance	R _{ON}	I _{ON} = 90 mA		27	50	Ω

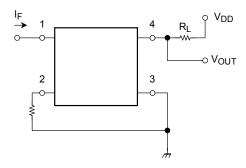
Isolation Characteristics (Ta = 25°C)

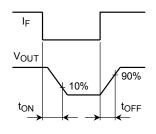
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	CS	$V_S = 0, f = 1 MHz$	_	0.8	_	pF
Isolation resistance	R _S	$V_S = 500 \text{ V}, \text{ R.H.} \leq 60\%$	$5 imes 10^{10}$	10 ¹⁴	_	Ω
		AC, 1 min	1500	_	_	Vrms
Isolation voltage	BVS	AC, 1 s, in oil	—	3000	_	VIIIIS
		DC, 1 min, in oil		3000	_	Vdc

Switching Characteristics (Ta = 25°C)

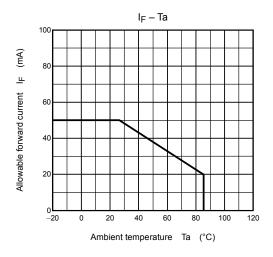
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time		$R_L = 200 \ \Omega$	_	0.25	0.5	ms
Turn-off time	tOFF	$V_{DD} = 20 \text{ V}, \text{ I}_{\text{F}} = 5 \text{ mA}$ (Note 2)	_	0.5	1	ms

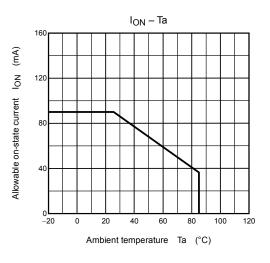
Note 2: Switching time test circuit

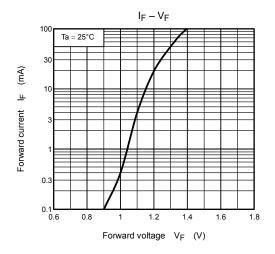




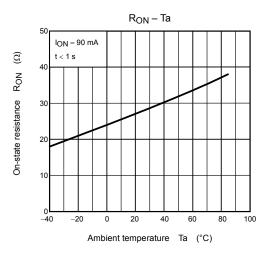
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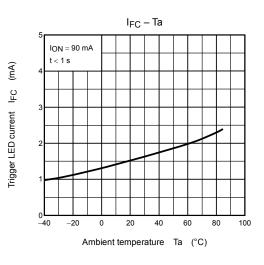


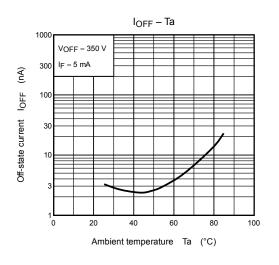


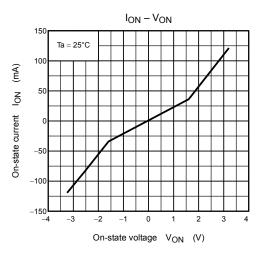


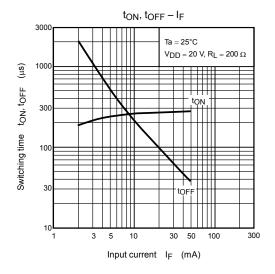
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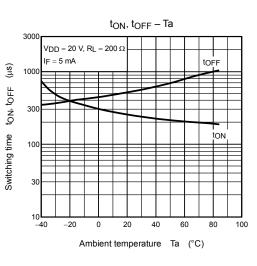












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