Unit: mm

TOSHIBA Photocoupler Photorelay

## **TLP4202G**

# Telecommunication Measurement Equipment Security Equipment FA

The Toshiba TLP4202G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP package. This 2-form-B (NC) photorelay features a withstanding voltage of  $350~\rm V$ .

• 8-pin SOP (2.54SOP8): Height = 2.1 mm, pitch = 2.54 mm

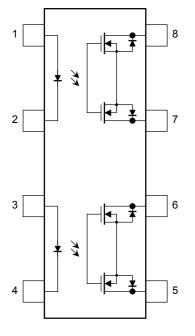
Normally closed (2-form-B) device
Peak off-state voltage: 350 V (min)

• Trigger LED current: 3 mA (max)

On-state current: 90 mA (max)
On-state resistance: 50 Ω (max)

• Isolation voltage: 1500 Vrms (min)

#### Pin Configuration (top view)



1, 3: Anode

2, 4: Cathode

5 : Drain D1

6 : Drain D2

7 : Drain D3

8 : Drain D4

1

8 7 6 5 9.4±0.25 7.0±0.4

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TOSHIBA 11-10H1

Weight: 0.2 g (typ.)

2.54±0.25 0.4±0.1

**JEDEC** 

2002-12-26

#### **Maximum Ratings (Ta = 25°C)**

	Characteristics	Symbol	Rating	Unit
	Forward current	l <sub>F</sub>	50	mA
	Forward current derating (Ta ≧ 25°C)	ΔI <sub>F</sub> /°C	-0.5	mA/°C
LED	Peak forward current (100 μs pulse, 100 pps)	I <sub>FP</sub>	1	Α
	Reverse voltage	V <sub>R</sub>	5	V
	Junction temperature	Tj	125	°C
Detector	Off-state output terminal voltage	V <sub>OFF</sub>	350	V
	On-state current	I <sub>ON</sub>	90	mA
	On-state current derating (Ta $\geqq$ 25°C)	Δl <sub>ON</sub> /°C	-0.9	mA/°C
	Junction temperature	Tj	125	°C
Storage temperature range		T <sub>stg</sub>	-55 to 125	°C
Oper	rating temperature range	T <sub>opr</sub> -40 to 85		°C
Lead	soldering temperature (10 s)	T <sub>sol</sub>	260	°C
Isola	tion voltage (AC, 1 min, R.H. ≦ 60%) (Note 1)	BVS	1500	Vrms

Note 1: Pins 1, 2, 3 and 4 are shorted together, and pins 5, 6, 7 and 8 are shorted together.

#### **Recommended Operating Conditions**

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	$V_{DD}$	_	_	280	V
Forward current	lF	5	_	25	mA
On-state current	I <sub>ON</sub>	_	_	90	mA
Operating temperature	T <sub>opr</sub>	-20	_	65	°C

#### **Electrical Characteristics (Ta = 25°C)**

	Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
LED	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 5 V	_	_	10	μА
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz	_	30	_	pF
ctor	Off-state current	l <sub>OFF</sub>	V <sub>OFF</sub> = 350 V, I <sub>F</sub> = 5 mA	_	_	1	μА
Detector	Capacitance	C <sub>OFF</sub>	$V = 0$ , $f = 1$ 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 <sub>FC</sub>	$I_{OFF} = 10 \mu A$	_	1	3	mA
Return LED current	I <sub>FT</sub>	I <sub>ON</sub> = 90 mA	0.1	_	_	mA
On-state resistance	R <sub>ON</sub>	I <sub>ON</sub> = 90 mA	_	30	50	Ω

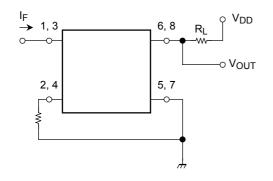
#### **Isolation Characteristics (Ta = 25°C)**

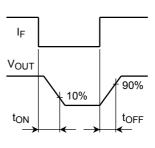
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	CS	V <sub>S</sub> = 0, f = 1 MHz	_	0.8	_	pF
Isolation resistance	R <sub>S</sub>	V <sub>S</sub> = 500 V, R.H. ≦ 60%	$5 \times 10^{10}$	10 <sup>14</sup>	_	Ω
		AC, 1 min	1500	_	_	Vrms
Isolation voltage	$BV_S$	AC, 1 s, in oil	_	3000	_	VIIIIS
		DC, 1 min, in oil	_	3000	_	Vdc

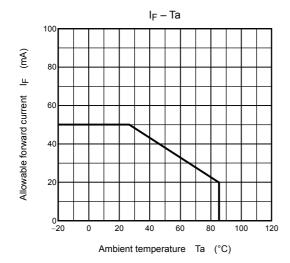
#### **Switching Characteristics (Ta = 25°C)**

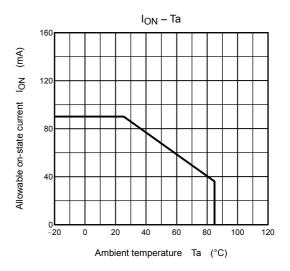
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time	t <sub>ON</sub>	$R_L = 200 \Omega$	_	0.25	0.5	ms
Turn-off time	toff	$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$ (Note	2)	0.5	1	ms

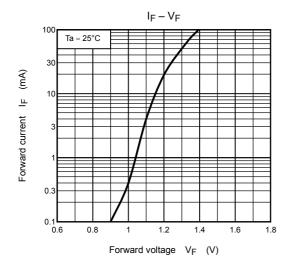
Note 2: Switching time test circuit



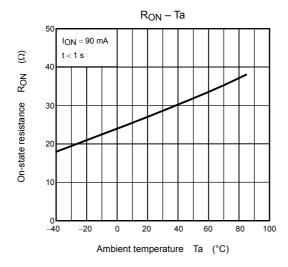


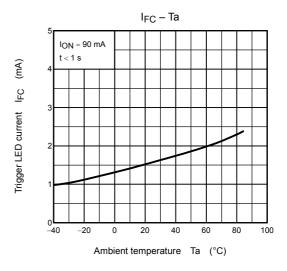


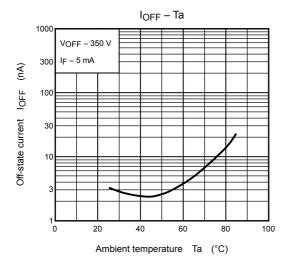


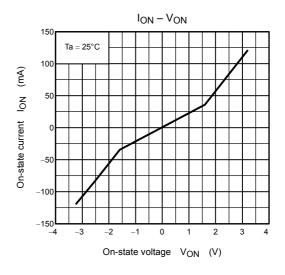


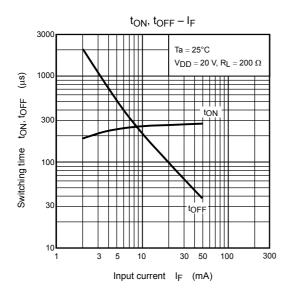
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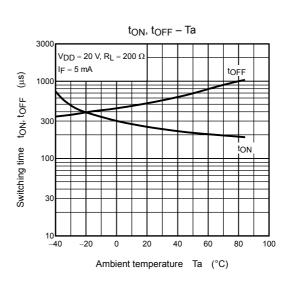












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