

TOSHIBA Photocoupler Photorelay

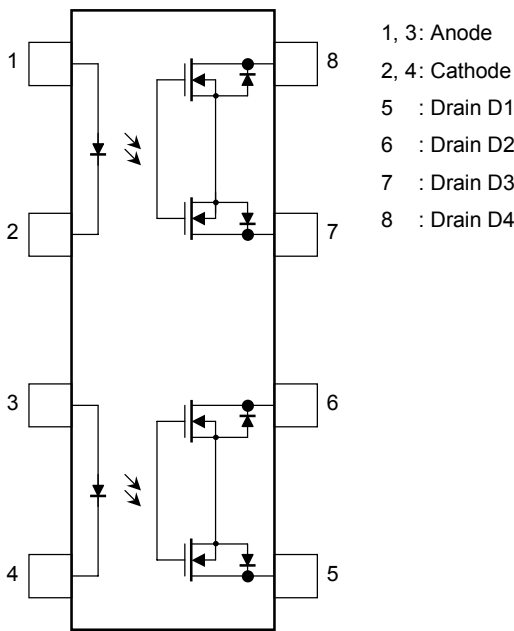
TLP4202G

Telecommunication  
Measurement Equipment  
Security Equipment  
FA

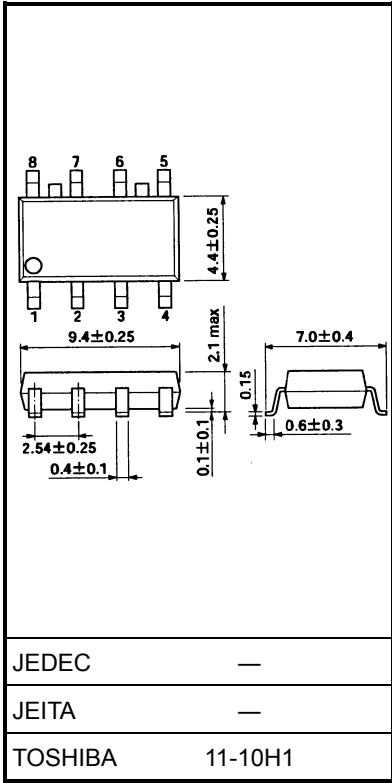
The Toshiba TLP4202G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP package. This 2-form-B (NC) photorelay features a withstanding voltage of 350 V.

- 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)



Unit: mm



Weight: 0.2 g (typ.)

**Maximum Ratings (Ta = 25°C)**

Characteristics		Symbol	Rating	Unit
LED	Forward current	$I_F$	50	mA
	Forward current derating (Ta ≥ 25°C)	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C
	Peak forward current (100 μs pulse, 100 pps)	$I_{FP}$	1	A
	Reverse voltage	$V_R$	5	V
	Junction temperature	$T_j$	125	°C
Detector	Off-state output terminal voltage	$V_{OFF}$	350	V
	On-state current	$I_{ON}$	90	mA
	On-state current derating (Ta ≥ 25°C)	$\Delta I_{ON}/^\circ\text{C}$	-0.9	mA/°C
	Junction temperature	$T_j$	125	°C
Storage temperature range		$T_{stg}$	-55 to 125	°C
Operating temperature range		$T_{opr}$	-40 to 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: 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	Typ.	Max	Unit
Supply voltage	$V_{DD}$	—	—	280	V
Forward current	$I_F$	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	Typ.	Max	Unit
LED	Forward voltage	$V_F$	$I_F = 10\text{ mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5\text{ V}$	—	—	10	μA
	Capacitance	$C_T$	$V = 0, f = 1\text{ MHz}$	—	30	—	pF
Detector	Off-state current	$I_{OFF}$	$V_{OFF} = 350\text{ V}, I_F = 5\text{ mA}$	—	—	1	μA
	Capacitance	$C_{OFF}$	$V = 0, f = 1\text{ MHz}, I_F = 5\text{ mA}$	—	30	—	pF

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	$I_{FC}$	$I_{OFF} = 10\text{ μA}$	—	1	3	mA
Return LED current	$I_{FT}$	$I_{ON} = 90\text{ mA}$	0.1	—	—	mA
On-state resistance	$R_{ON}$	$I_{ON} = 90\text{ mA}$	—	30	50	Ω

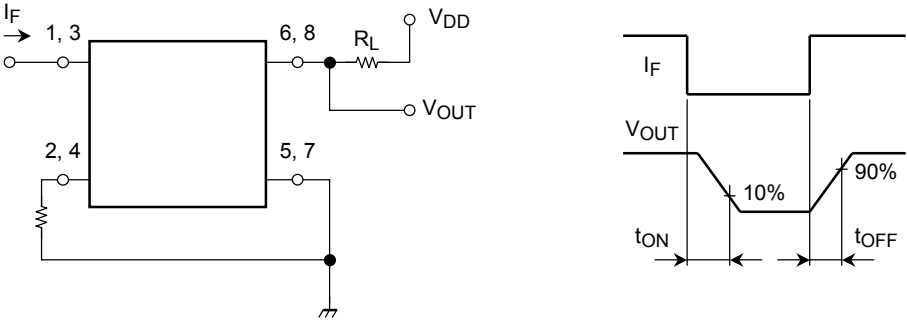
Isolation Characteristics (Ta = 25°C)

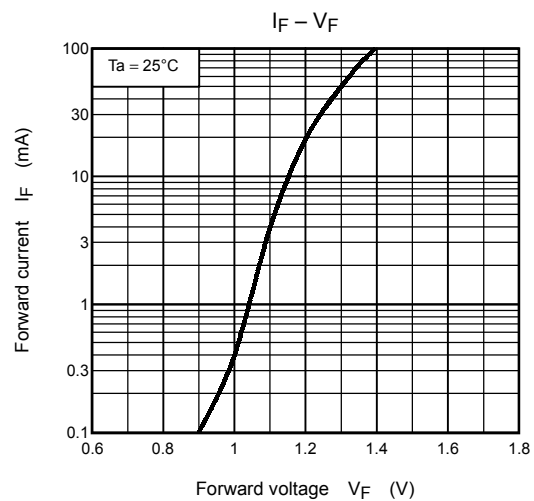
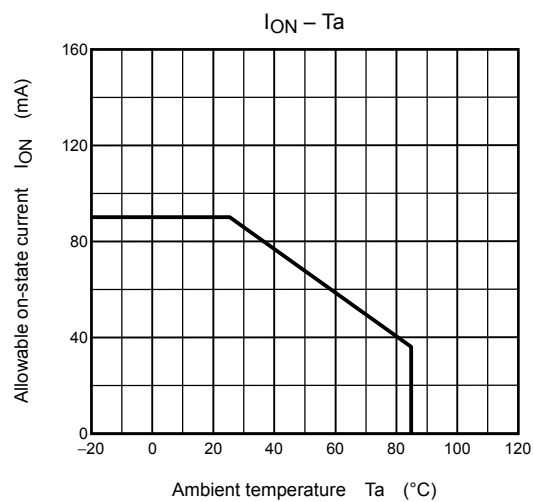
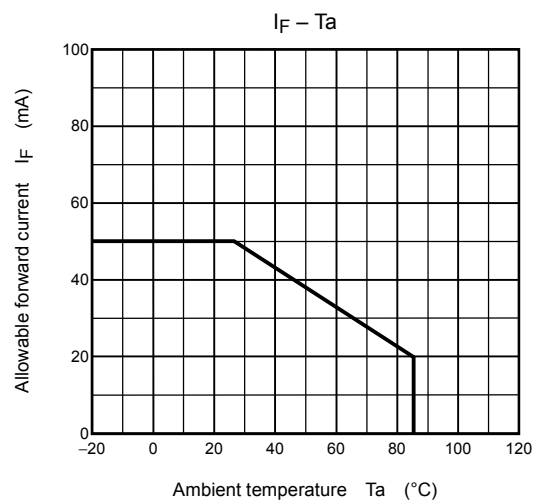
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 min	1500	—	—	Vrms
		AC, 1 s, in oil	—	3000	—	
		DC, 1 min, in oil	—	3000	—	Vdc

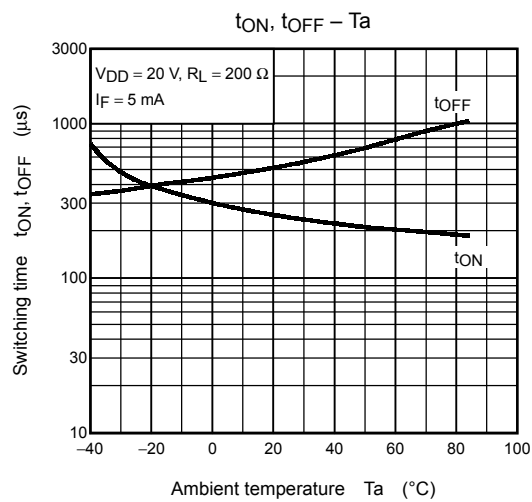
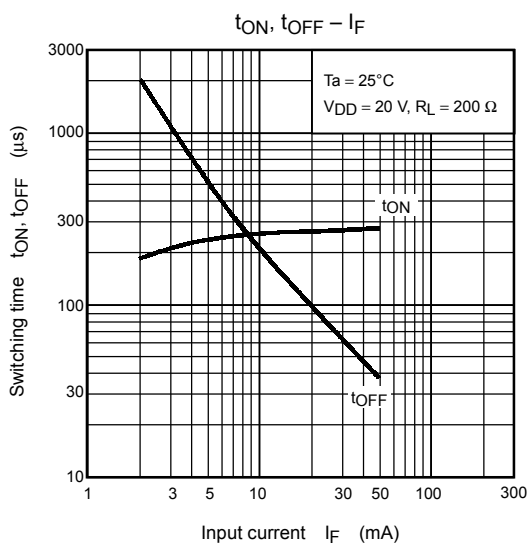
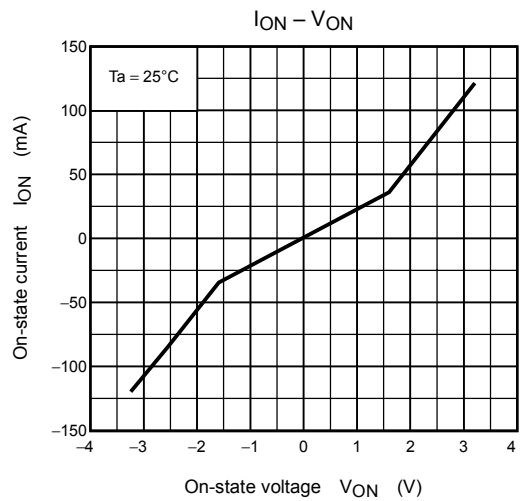
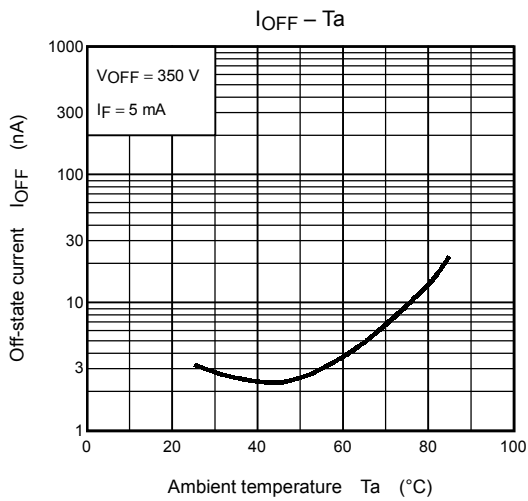
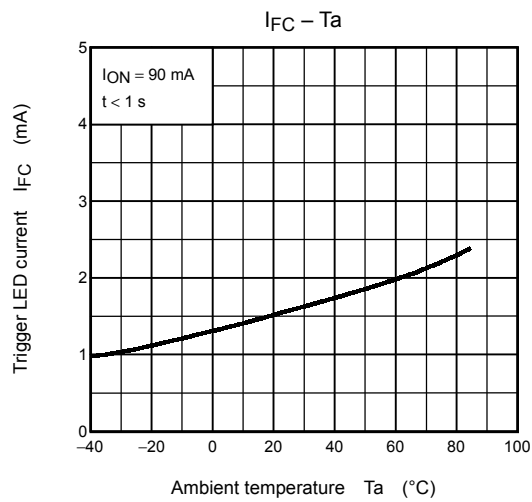
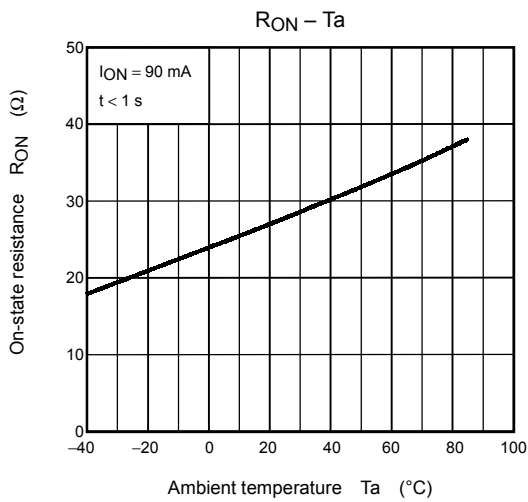
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$	$R_L = 200 \Omega$ $V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$ (Note 2)	—	0.25	0.5	ms
Turn-off time	$t_{OFF}$		—	0.5	1	ms

Note 2: Switching time test circuit







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