

TOSHIBA Photocoupler Photorelay

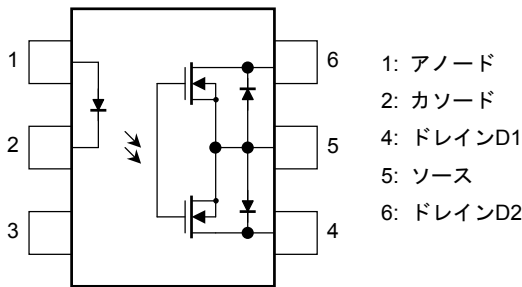
TLP4592G

Telecommunication
Measurement Equipment
Security Equipment
FA

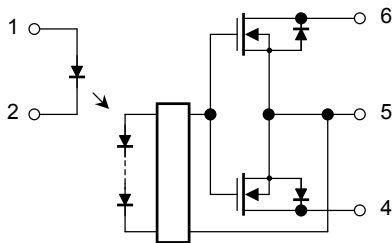
The Toshiba TLP4592G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a DIP package.

- 6-pin DIP (DIP6)
- Normally closed (1-form-B) device
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 100 mA (max)
- On-state resistance: 50 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL Recognized: UL1577, File No. E67349

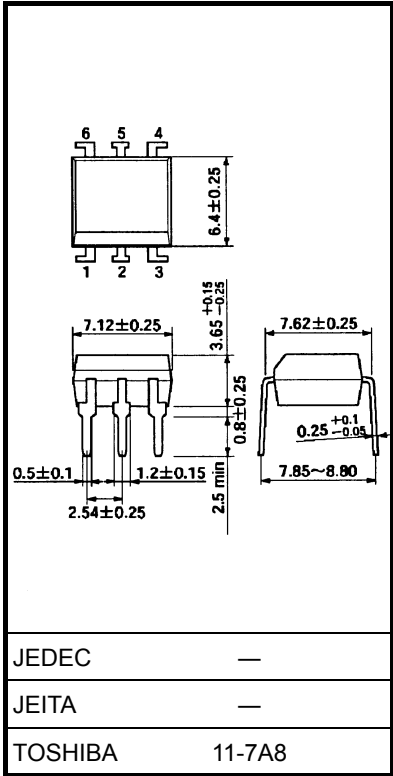
Pin Configuration (top view)



Schematic



Unit: mm



Weight: 0.4 g (typ.)

Maximum Ratings (Ta = 25°C)

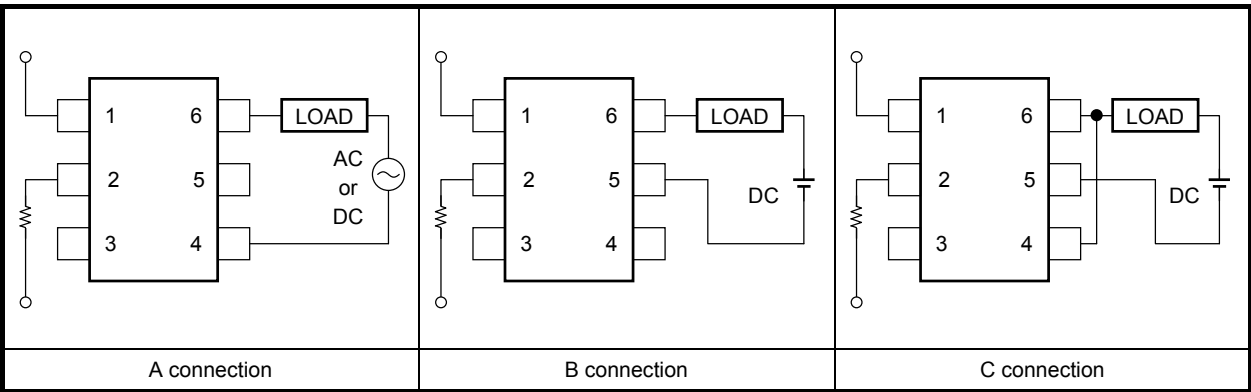
Characteristics			Symbol	Rating	Unit
LED	Forward current		I _F	50	mA
	Forward current derating (Ta ≥ 25°C)		ΔI _F /°C	−0.5	mA/°C
	Peak forward current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse voltage		V _R	5	V
	Junction temperature		T _j	125	°C
Detector	Off-state output terminal voltage		V _{OFF}	350	V
	On-state current	A connection	I _{ON}	100	mA
		B connection		100	
		C connection		200	
	On-state current derating (Ta ≥ 25°C)	A connection	ΔI _{ON} /°C	−1.0	mA/°C
		B connection		−1.0	
		C connection		−2.0	
	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	2500	V _{rms}	

Note 1: Pins 1, 2 and 3 are shorted together, and pins 4, 5 and 6 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}	—	—	100	mA
Operating temperature	T_{opr}	-20	—	65	$^\circ\text{C}$

Circuit Connections



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	1.15	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}	$I_{OFF} = 10 \mu\text{A}$	—	1	3	mA
Return LED current		I_{FT}	$I_{ON} = 100 \text{ mA}$	0.1	—	—	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 100 \text{ mA}$	—	27	50	Ω
	B connection		$I_{ON} = 100 \text{ mA}$	—	20	43	
	C connection		$I_{ON} = 200 \text{ mA}$	—	10	—	

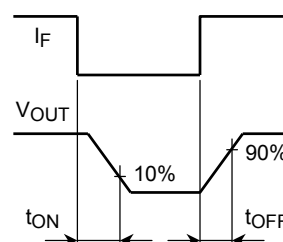
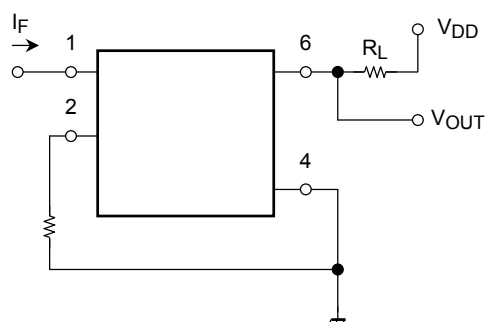
Isolation Characteristics (Ta = 25°C)

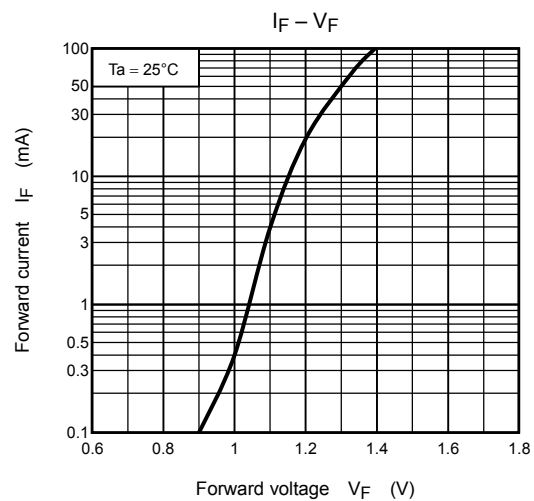
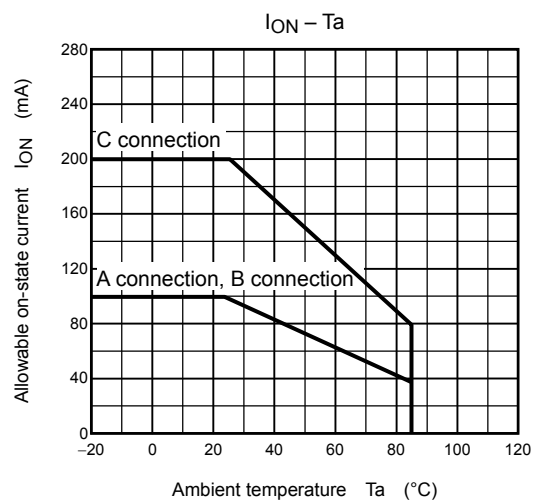
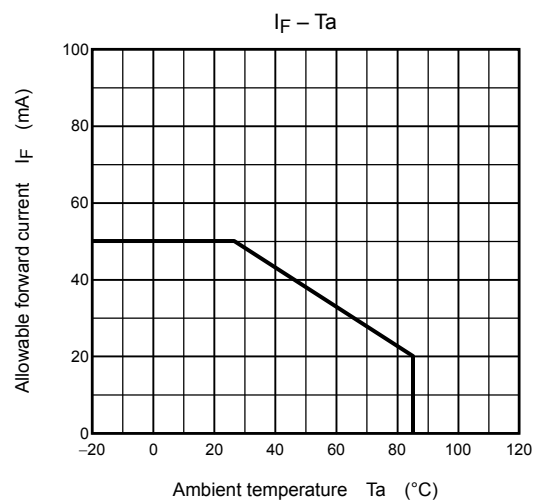
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 min	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	Vdc

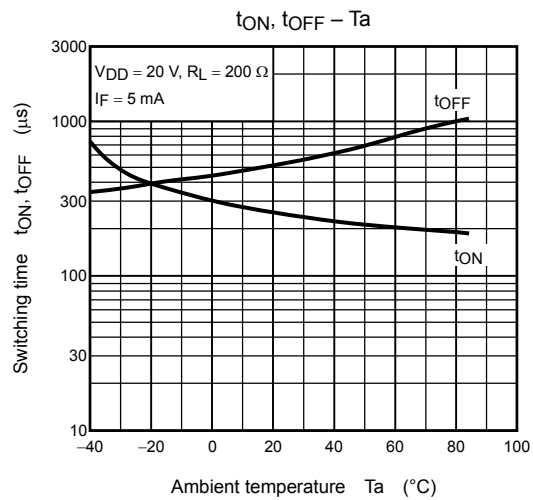
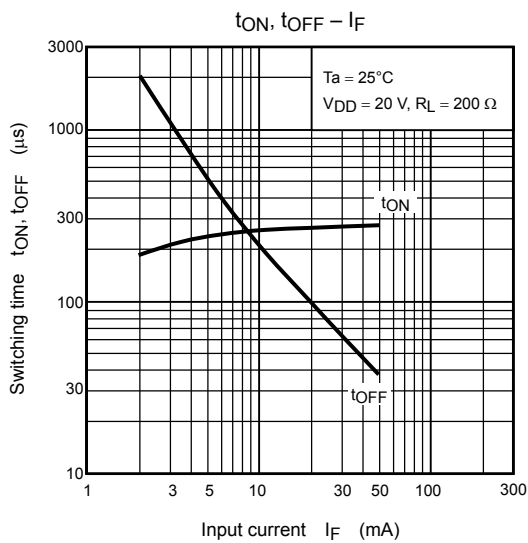
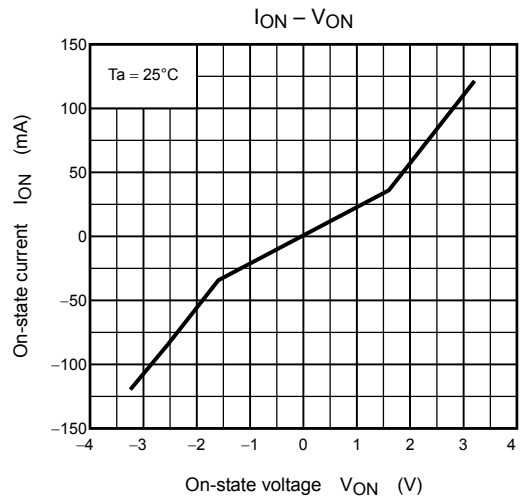
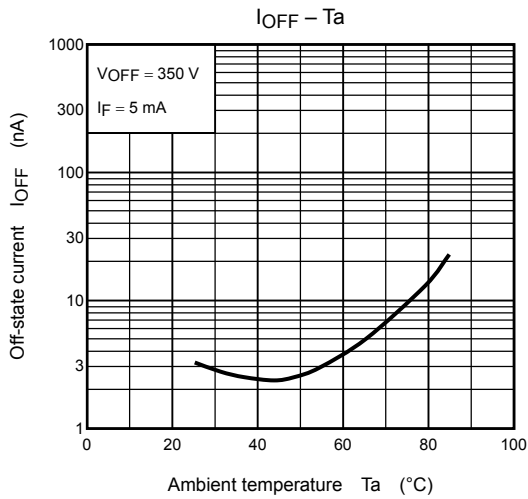
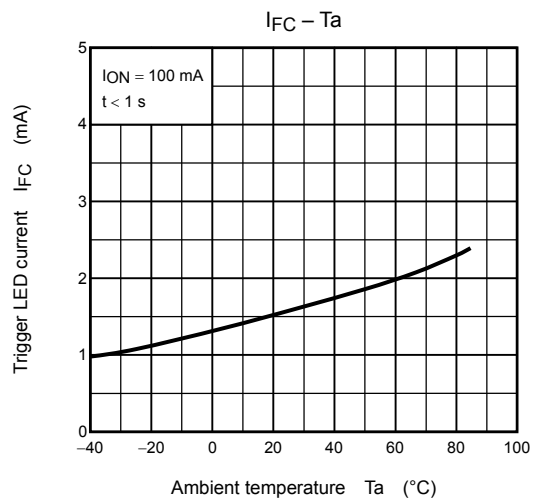
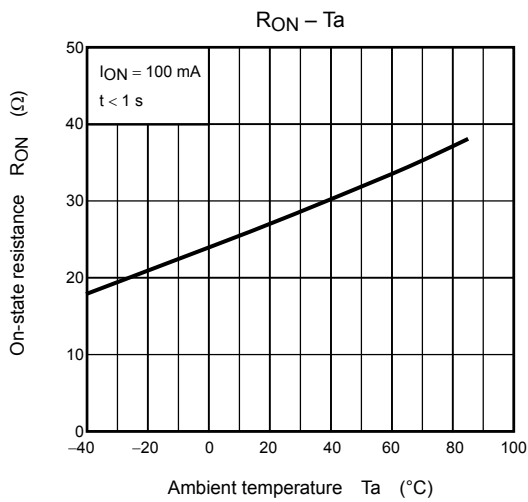
Switching Characteristics (Ta = 25°C)

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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