

TOSHIBA Photocoupler Photorelay

TLP4597G

PBX

Telecommunication

Modem·FAX Cards, Modems In PC

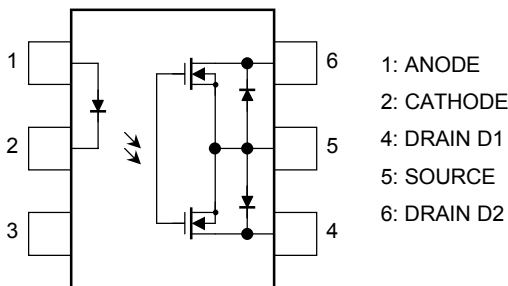
Measurement Instrumentation

The TOSHIBA TLP4597G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a six lead plastic DIP package (DIP6).

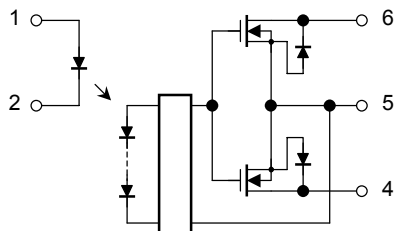
The TLP4597G is a bi-directional switch can replace mechanical relays in many applications.

- 6 pin DIP (DIP6)
- 1-form-B
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 150 mA (max)
- On-state resistance: 25 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL recognized: UL1577, File No. E67349

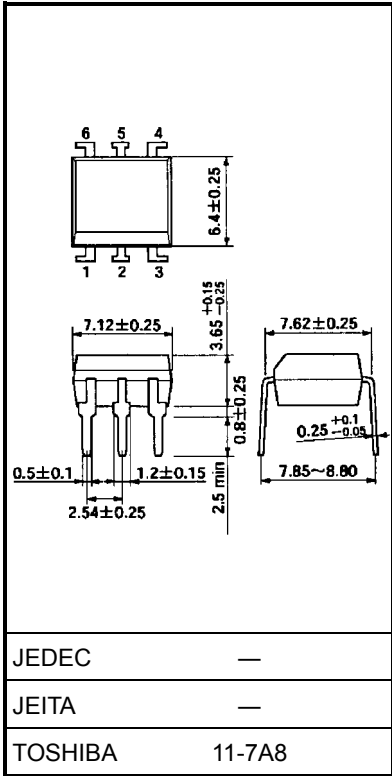
Pin Configuration (top view)



Schematic



Unit: mm



Weight: 0.4 g (typ.)

Maximum Ratings (Ta = 25°C)

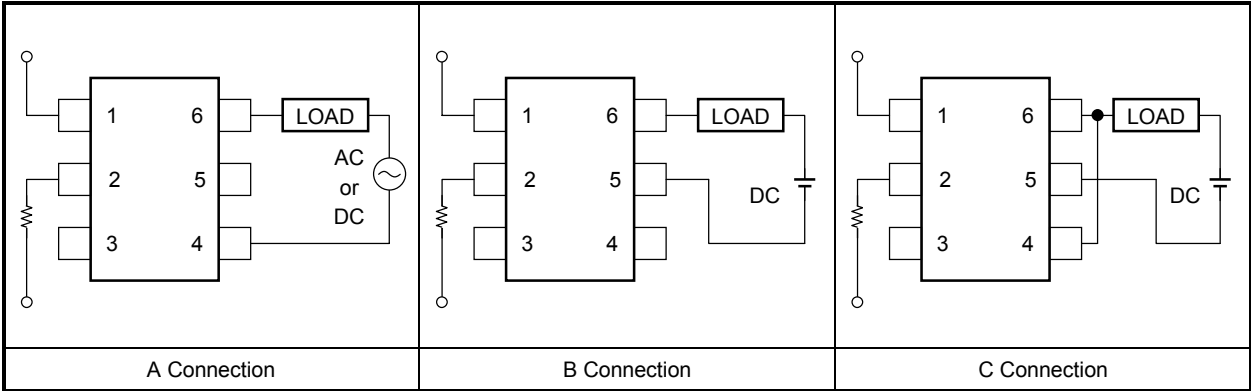
Characteristics			Symbol	Rating	Unit
LED	Forward current		I _F	50	mA
	Forward current derating (T _a ≥ 25°C)		ΔI _F /°C	−0.5	mA/°C
	Peak forward current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse voltage		V _R	5	V
	Junction temperature		T _j	125	°C
Detector	Off-state output terminal voltage		V _{OFF}	350	V
	On-state current	A connection	I _{ON}	150	mA
		B connection		150	
		C connection		300	
	On-state current derating (T _a ≥ 25°C)	A connection	ΔI _{ON} /°C	−1.5	mA/°C
		B connection		−1.5	
		C connection		−3.0	
	Junction temperature		T _j	125	°C
Operating temperature range		T _{opr}	−40 to 85	°C	
Storage temperature range		T _{stg}	−55 to 125	°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: Device considered a two-terminal device: LED side pins shorted together, and DETECTOR side pins shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	VDD	—	—	280	V
Forward current	IF	5	—	25	mA
On-state current	ION	—	—	150	mA
Operating temperature	Topr	−20	—	65	°C

Circuit Connections



Individual 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}	$V = 0, f = 1 \text{ MHz}, I_F = 5 \text{ mA}$	—	65	—	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}	$I_{ON} = 150 \text{ mA}$	0.1	—	—	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 150 \text{ mA}$	—	15	25	Ω
	B connection		$I_{ON} = 150 \text{ mA}$	—	8	14	
	C connection		$I_{ON} = 300 \text{ mA}$	—	4	—	

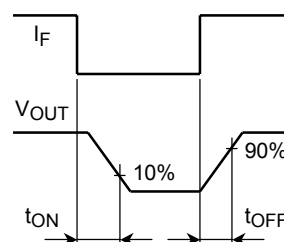
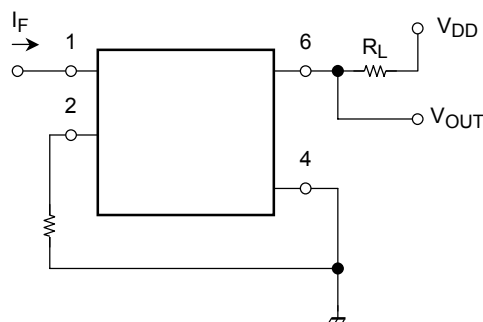
Isolation Characteristics (Ta = 25°C)

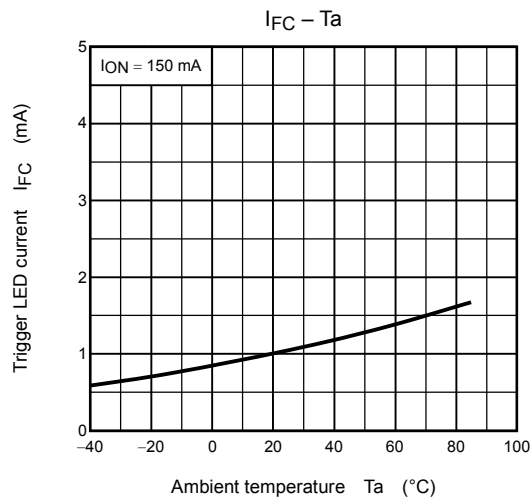
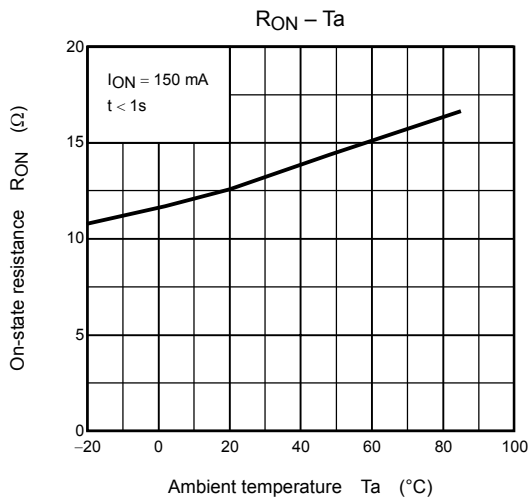
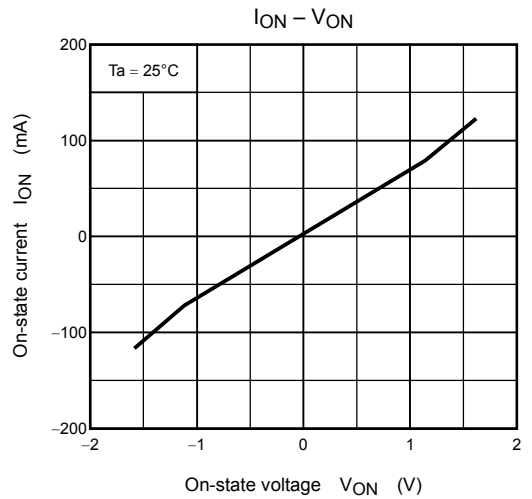
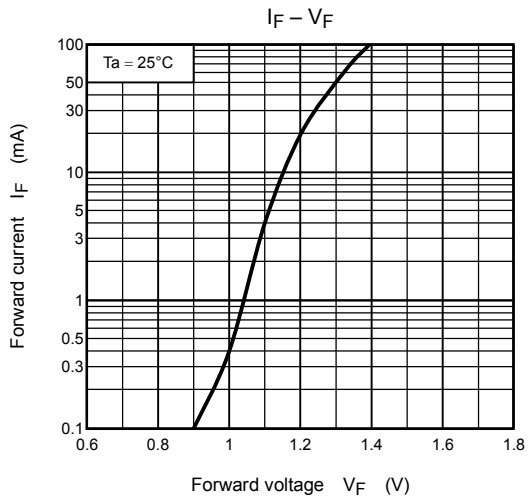
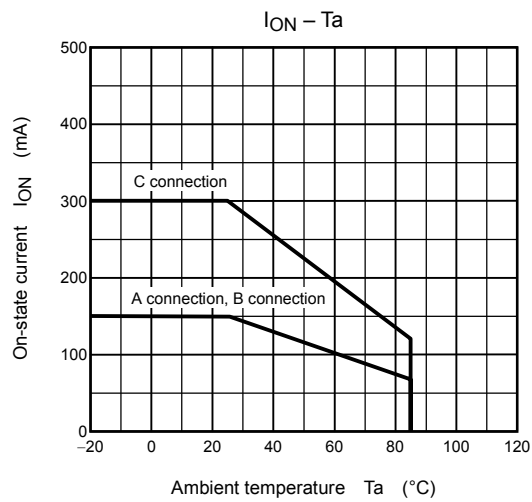
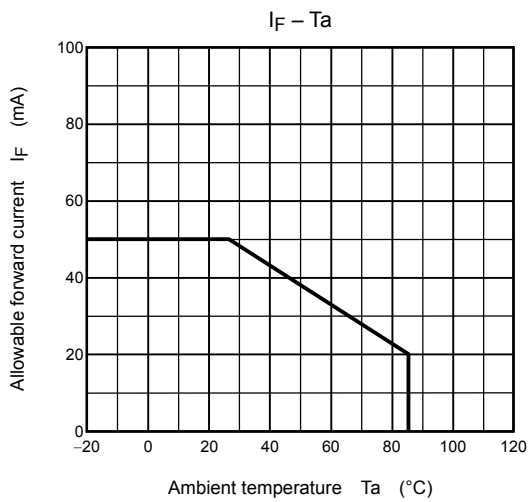
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 min	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC,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

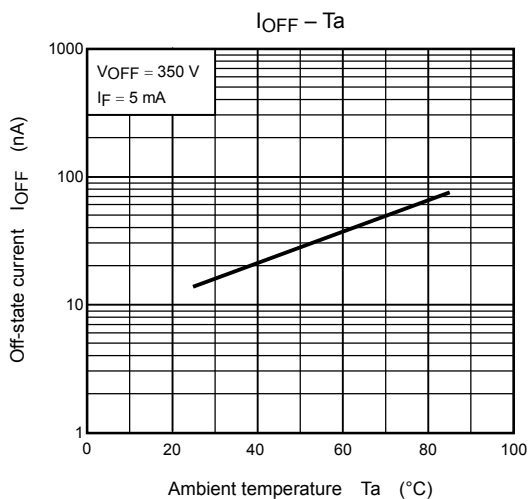
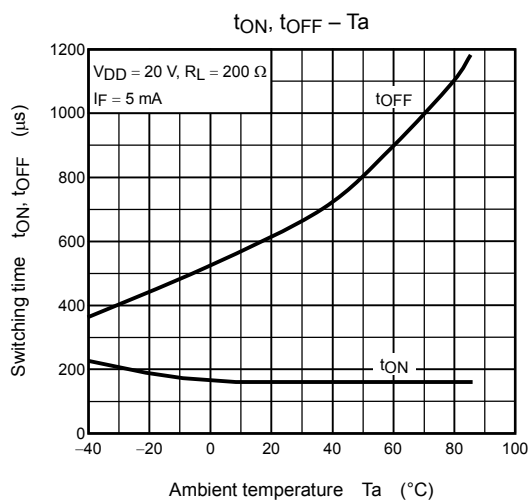
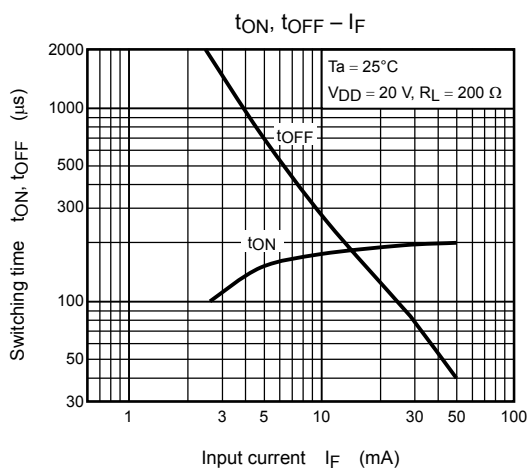
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	$R_L = 200 \Omega$ (Note 2)	—	—	1	ms
Turn-off time	t_{OFF}	$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$	—	—	3	ms

Note 2: Switching time test circuit







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