

TOSHIBA Photocoupler Photorelay

TLP4597G

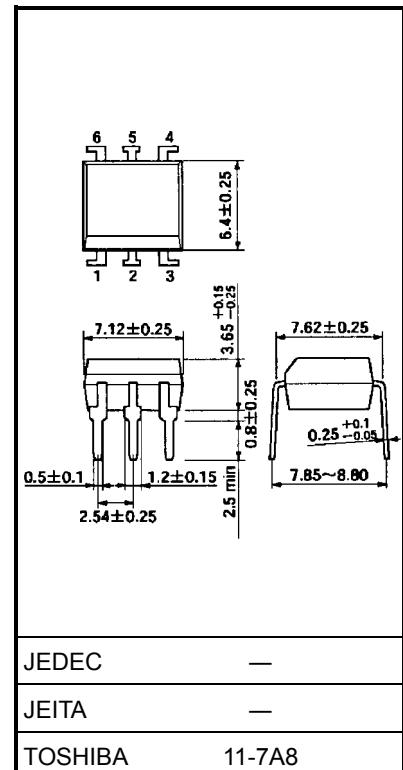
PBX

Telecommunication

Modem·FAX Cards, Modems In PC

Measurement Instrumentation

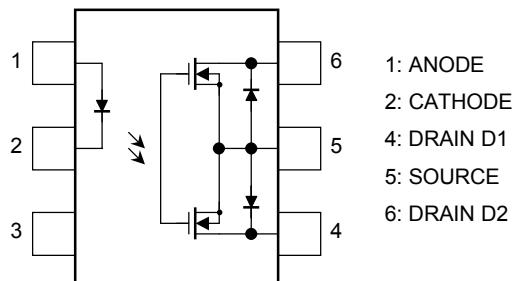
Unit: mm



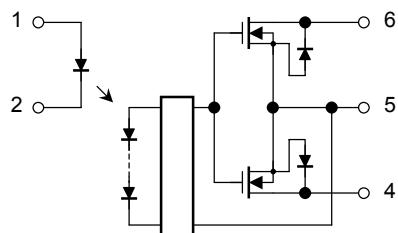
The TOSHIBA TLP4597G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a six lead plastic DIP package (DIP6).

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)

Weight: 0.4 g (typ.)

Schematic

Maximum Ratings ($T_a = 25^\circ\text{C}$)

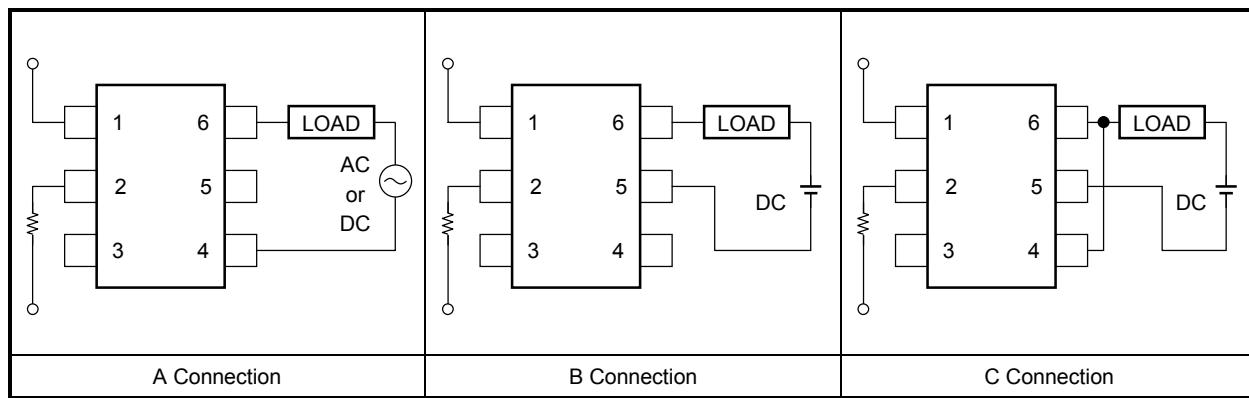
Characteristics		Symbol	Rating	Unit
LED	Forward current	I_F	50	mA
	Forward current derating ($T_a \geq 25^\circ\text{C}$)	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C
	Peak forward current (100 μs pulse, 100 pps)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
Junction temperature		T_j	125	°C
Detector	Off-state output terminal voltage	V_{OFF}	350	V
	On-state current	I_{ON}	150	mA
			150	
			300	
	On-state current derating ($T_a \geq 25^\circ\text{C}$)	$\Delta I_{ON}/^\circ\text{C}$	-1.5	mA/°C
			-1.5	
			-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. $\leq 60\%$) (Note 1)		BV_S	2500	Vrms

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	V_{DD}	—	—	280	V
Forward current	I_F	5	—	25	mA
On-state current	I_{ON}	—	—	150	mA
Operating temperature	T_{opr}	-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 mA	1.0	1.15	1.3	V
	Reverse current	I _R	V _R = 5 V	—	—	10	μA
	Capacitance	C _T	V = 0, f = 1 MHz	—	30	—	pF
Detector	Off-state current	I _{OFF}	V _{OFF} = 350 V, I _F = 5 mA	—	—	1	μA
	Capacitance	C _{OFF}	V = 0, f = 1 MHz, I _F = 5 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 μA	—	1	3	mA	
Return LED current	I _{FT}	I _{ON} = 150 mA	0.1	—	—	mA	
On-state resistance	A connection	R _{ON}	I _{ON} = 150 mA	—	15	25	Ω
	B connection		I _{ON} = 150 mA	—	8	14	
	C connection		I _{ON} = 300 mA	—	4	—	

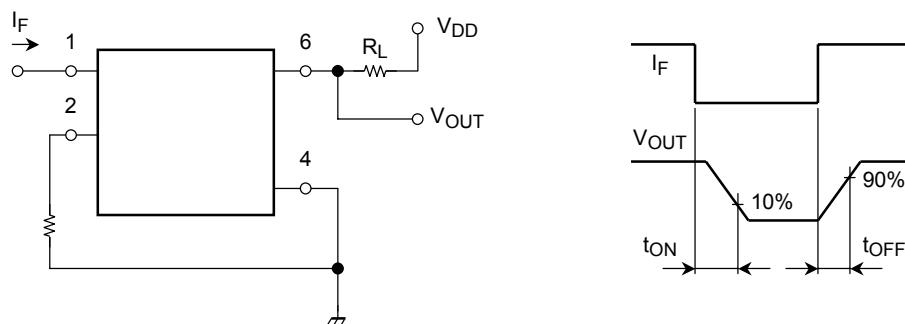
Isolation Characteristics (Ta = 25°C)

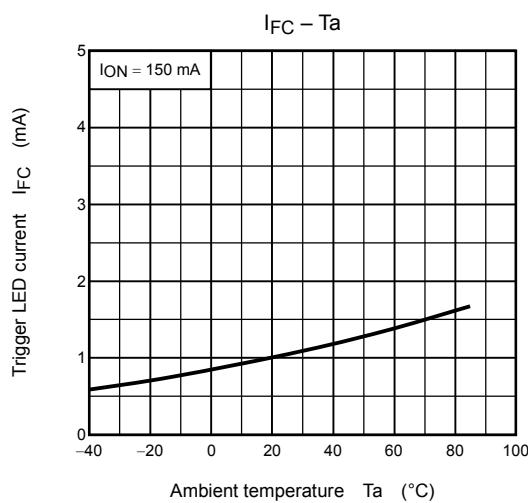
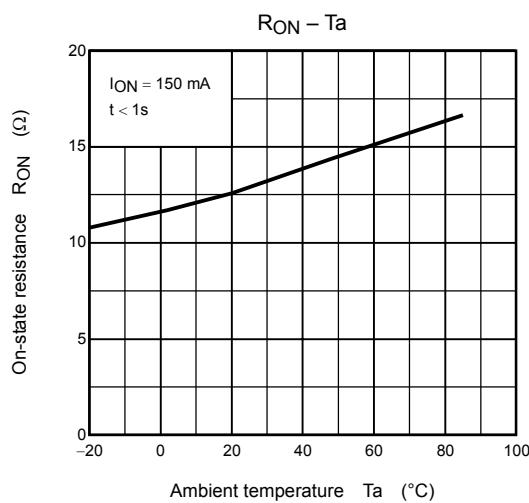
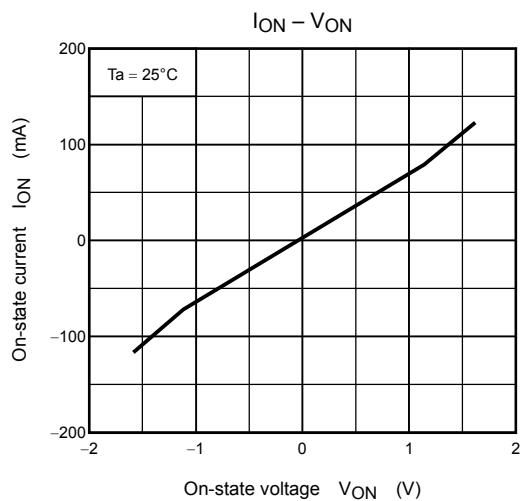
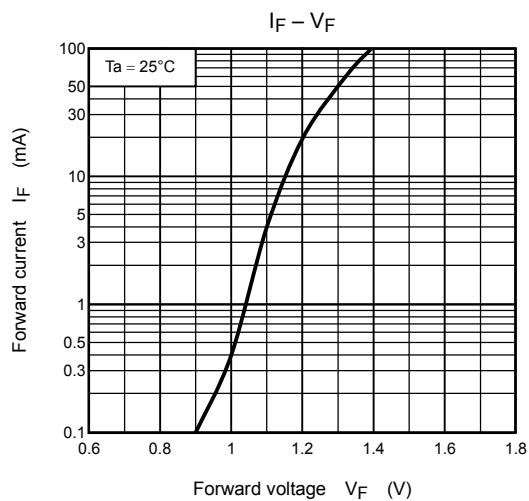
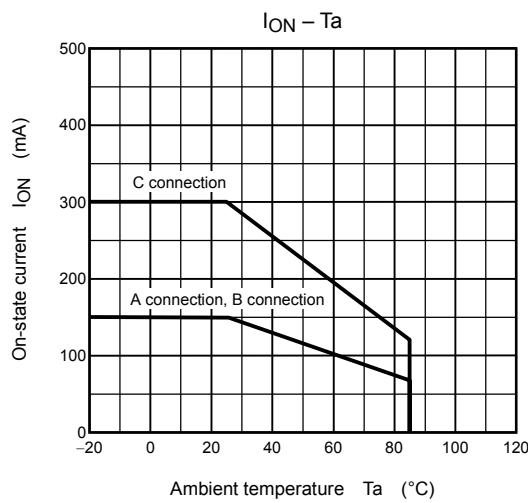
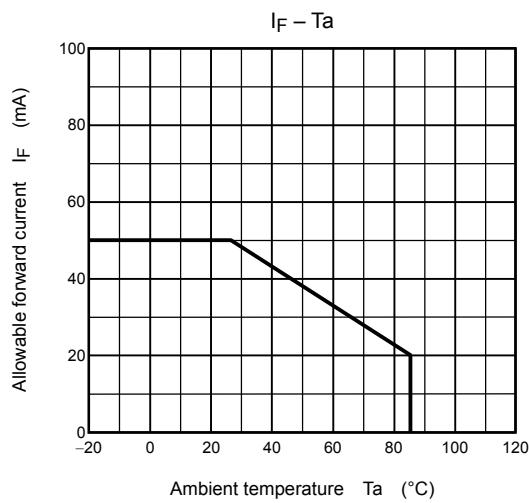
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C _S	V _S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60%	5 × 10 ¹⁰	10 ¹⁴	—	Ω
Isolation voltage	BVs	AC, 1 min	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	Vdc

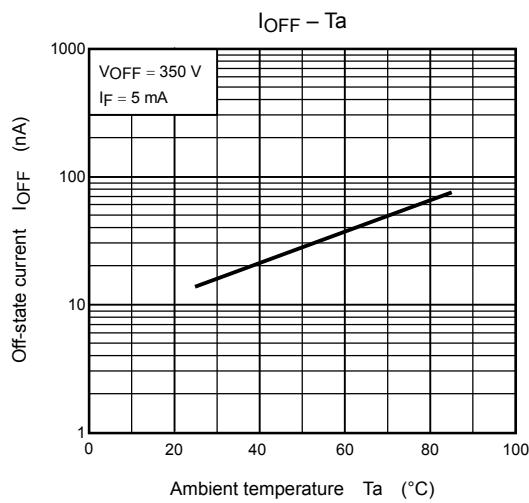
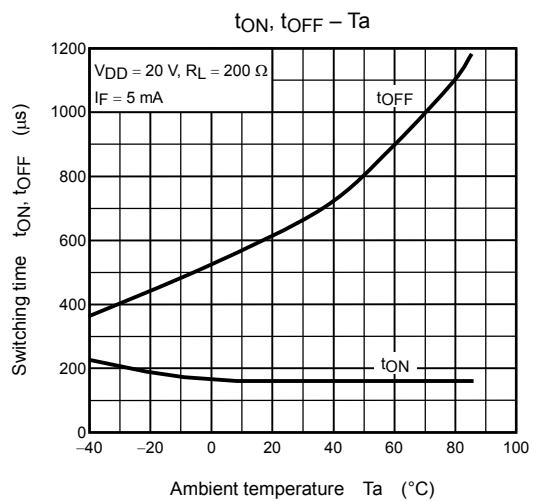
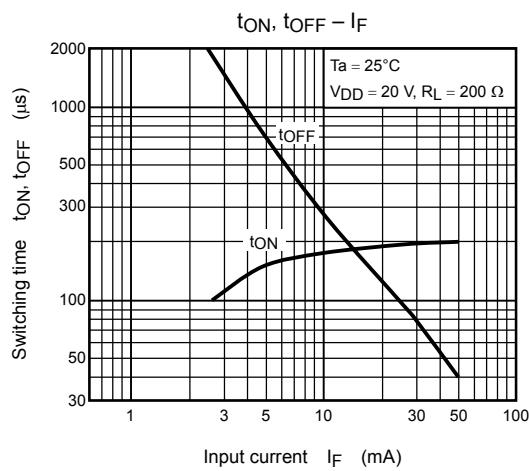
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t _{ON}	R _L = 200 Ω (Note 2)	—	—	1	ms
Turn-off time	t _{OFF}	V _{DD} = 20 V, I _F = 5 mA	—	—	3	ms

Note 2: Switching time test circuit







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