

TOSHIBA Photocoupler Photo Relay

TLP597G

Cordless Telephone

PBX

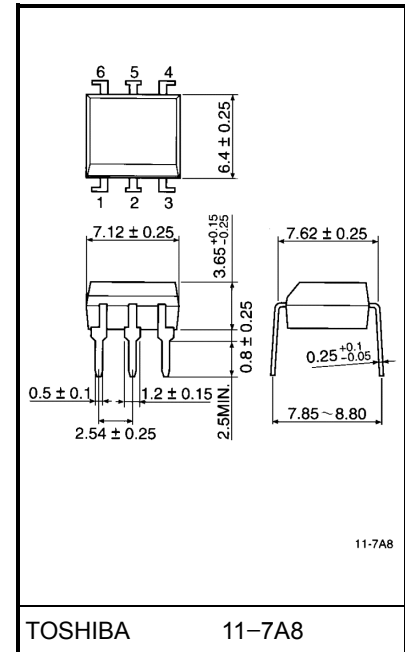
Modem

The TOSHIBA TLP597G consists of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).

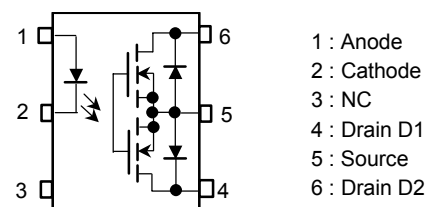
The TLP597G is a bi-directional switch which can replace mechanical relay in many applications.

- Peak off-state voltage: 350V (min.)
- Trigger LED current: 3mA (max.)
- On-state current: 120mA (max.) (A connection)
- On-state resistance: 35Ω (max.) (A connection)
- Isolation voltage: 2500V_{rms} (min.)
- Isolation thickness: 0.4mm (min.)
- UL recognized: UL1577, file no. E67349
- BSI approved: BS EN60065: 1994, certificate no. 8275
BS EN60950: 1992, certificate no. 8276
- Option (D4) type
: TUV approved: DIN VDE0884 / 06.92,
Certificate no. R9850585

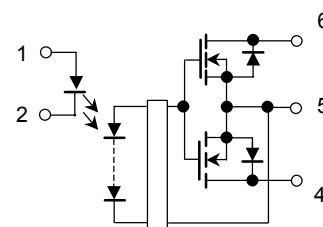
Unit in mm



Pin Configuration (top view)



Schematic



Maximum Ratings (Ta = 25°C)

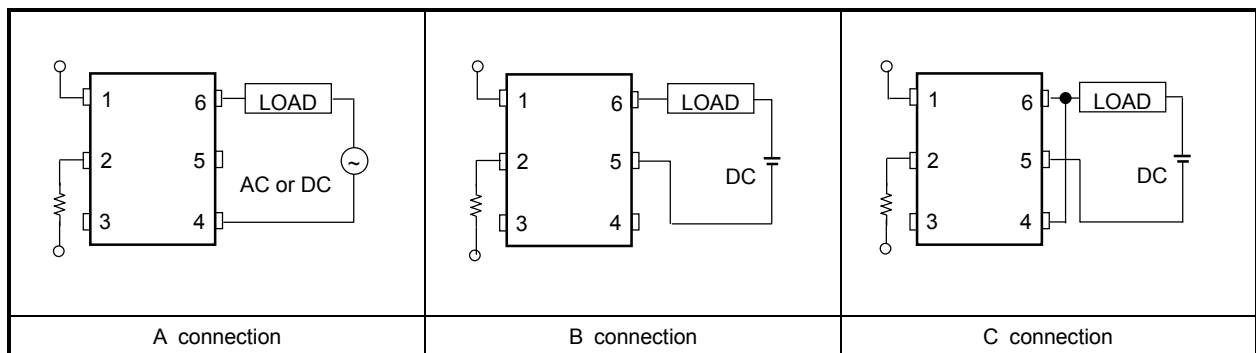
Characteristic			Symbol	Rating	Unit
LED	Forward current		I _F	50	mA
	Forward current derating (Ta ≥ 25°C)		ΔI _F / °C	−0.5	mA / °C
	Peak forward current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse voltage		V _R	5	V
	Junction temperature		T _j	125	°C
Detector	Off-state output terminal voltage		V _{OFF}	350	V
	On-state RMS current	A connection	I _{ON}	120	mA
		B connection		120	
		C connection		160	
	On-state current derating (Ta ≥ 25°C)	A connection	ΔI _{ON} / °C	−1.2	mA / °C
		B connection		−1.2	
		C connection		−1.6	
	Junction temperature		T _j	125	°C
Storage temperature range		T _{stg}	−55~125	°C	
Operating temperature range		T _{opr}	−40~85	°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): Device considered a two-terminal device: Pins 1, 2 and 3 shorted together and pins 4, 5 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}	—	—	280	V
Forward current	I_F	5	7.5	25	mA
On-state current	I_{ON}	—	—	120	mA
Operating temperature	T_{opr}	-20	—	65	°C

Circuit Connections



Individual Electrical Characteristics (Ta = 25°C)

Characteristic		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}	$V_{OFF} = 350 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$	—	40	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current		I_{FT}	$I_{ON} = 120 \text{ mA}$	—	1	3	mA
On-state Resistance	A connection	R_{ON}	$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	22	35	Ω
			$I_{ON} = 20 \sim 120 \text{ mA}, I_F = 5 \text{ mA}$	—	26	40	Ω
	B connection		$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	13	20	Ω
	C connection		$I_{ON} = 160 \text{ mA}, I_F = 5 \text{ mA}$	—	7	10	Ω

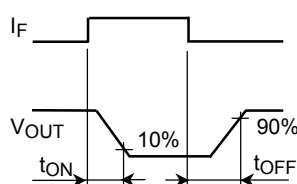
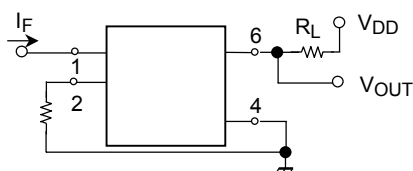
Isolation Characteristics (Ta = 25°C)

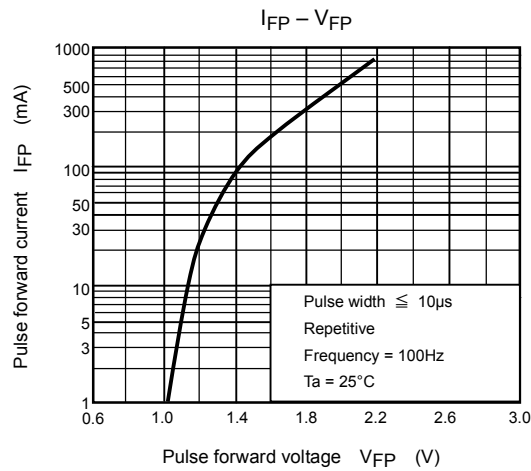
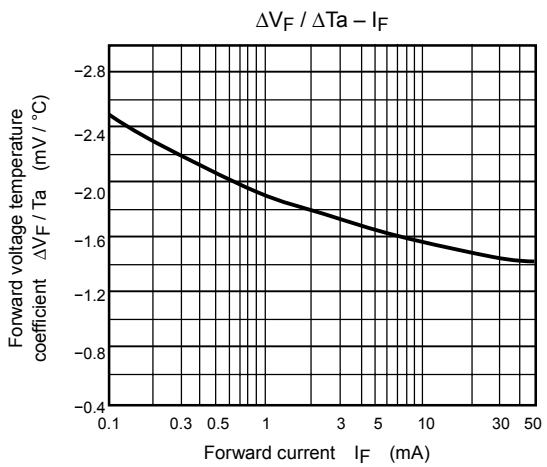
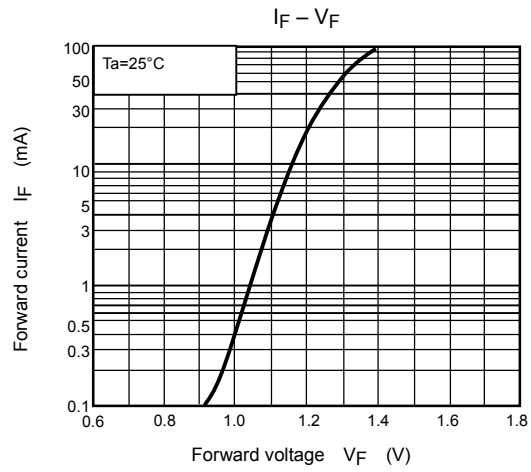
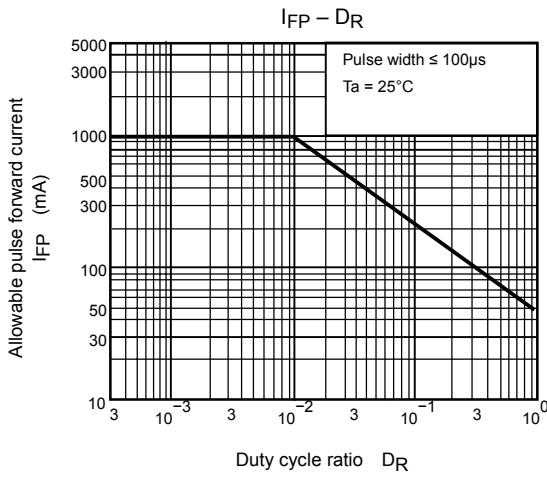
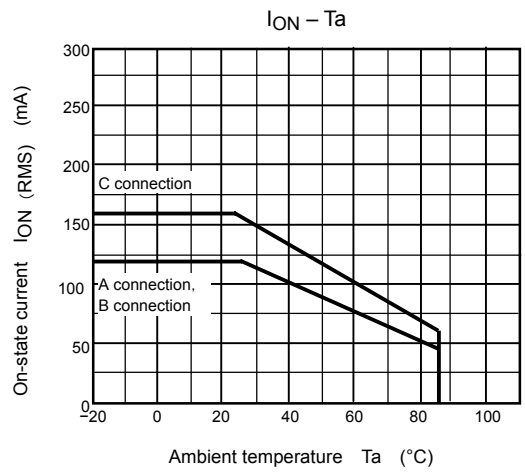
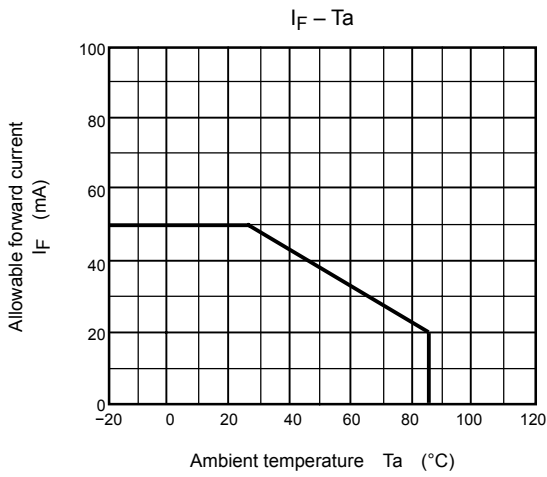
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second, in oil	—	5000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

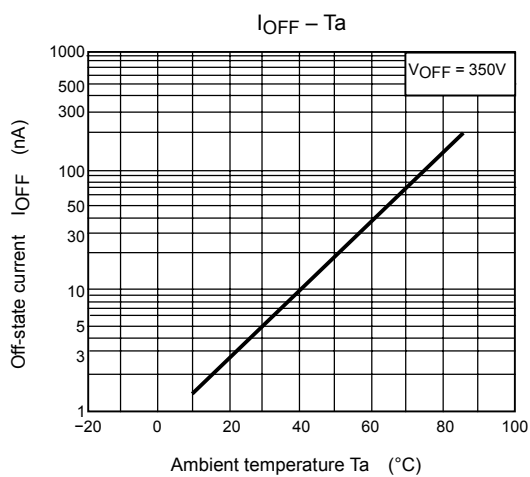
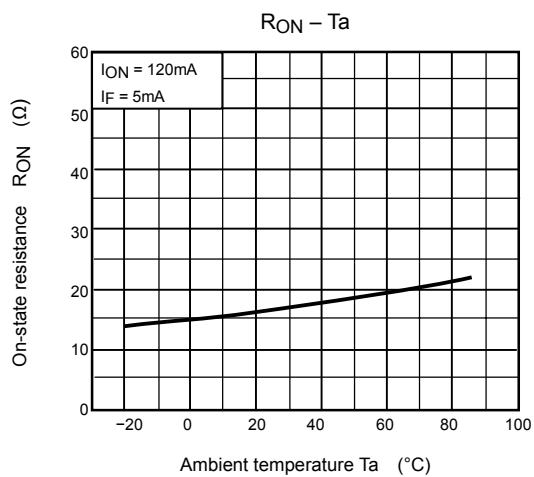
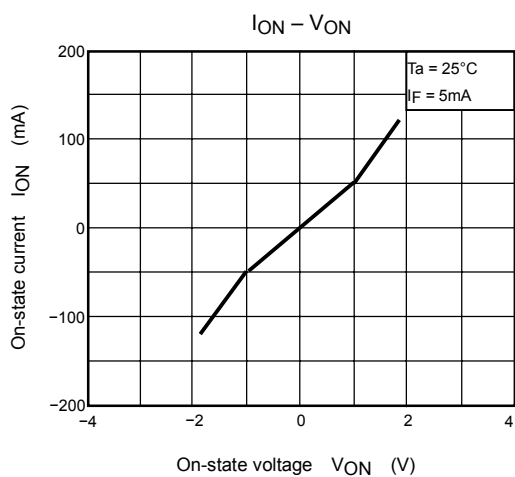
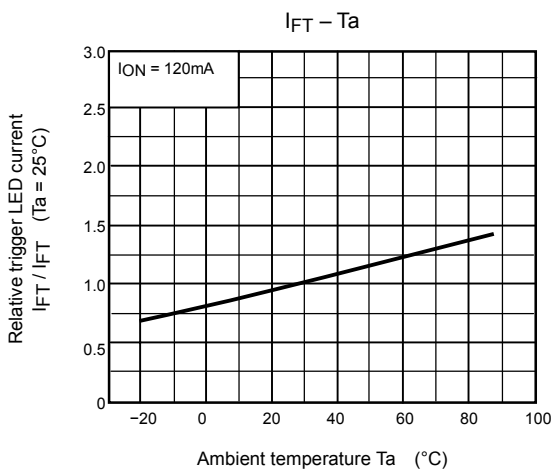
Switching Characteristics (Ta = 25°C)

Characteristic	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)	—	0.3	1	ms
Turn-off time	t_{OFF}		—	0.1	1	

(Note 2): Switching time test circuit







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