TOSHIBA Photocoupler GaAs Ired & Photo-MOS FET

TLP197G

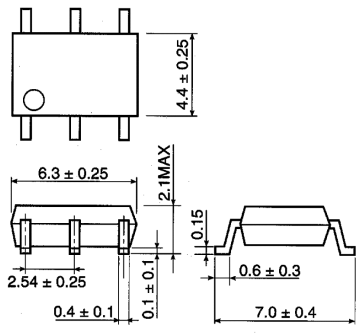
Modem

Fax

PBX

Measurement Instrumentation

Unit in mm



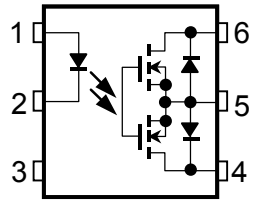
JEDEC	—
EIAJ	—
TOSHIBA	

Weight: 0.13g

The TOSHIBA mini flat photo relay TLP197G is a small outline photo relay,suitable for surface mount assembly.
The TLP197G consists of an gallium arsenide infrared emitting diode optically coupled to a photo—MOS FET in a six lead 2.1mm height package, which enable TLP197G to be applied in card modems.
The TLP197G is a bi—directional switch which can replace mechanical relays in fax machines and modems etc.

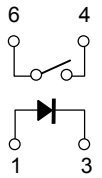
- SOP 6pin(2.54SOP6): 1−form−A
- Peak off−state voltage: 350V (min)
- Trigger LED current: 3mA (max)
- On−state current:120mA(max)
  (A connection)
- On−state resistance: 35Ω(max)
- Isolation voltage: 1500Vrms (min)
- UL recognized: UL1577, file No./E67349
- BSI approved: BS EN60065: 2002, certificate No.8753
  BS EN60950-1: 2002, certificate No.8754
- SEMKO approved: SS EN60065
  SS EN60950
- Option(V4)type
  TUV approved: DIN EN 60747-5-2
  Certificate no. 40009351

Pin Configuration (top view)

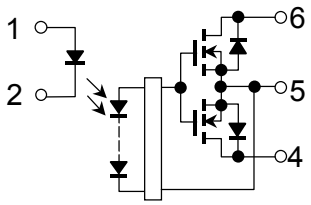


1 : Anode
2 : Cathode
3 : NC
4 : Drain D1
5 : Source
6 : Drain D2

1-Form-a



Schematic



Absolute 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
	Pulse forward current (100μs pulse,100pps)		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}	120	mA
		B connection			
		C connection			
	On−state current derating (Ta ≥ 25°C)	A connection	ΔI_{ON}/°C	−1.2	mA/°C
		B connection			
		C connection			
	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.,RH ≤ 60%) (Note 1)			BV_S	1500	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

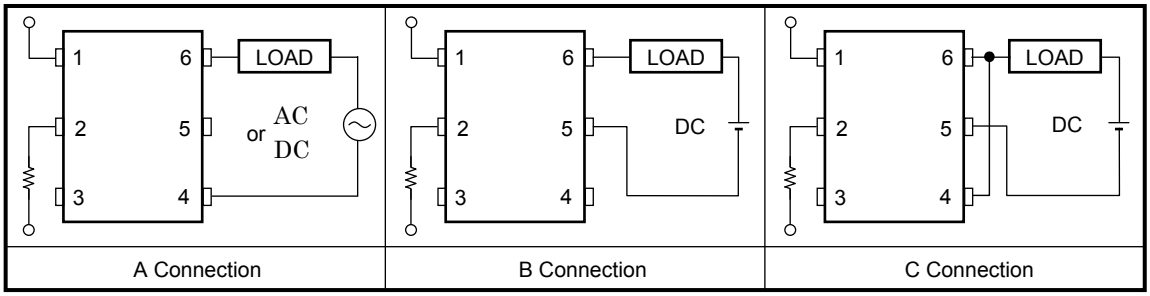
(Note 1): Device considered a two−terminal device: Pins1,2 and 3 shorted together and pins 4,5 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{OFF}	—	—	280	V
Forward current	I_F	5	7.5	25	mA
On−state current(A connection)	I_{ON}	—	—	100	mA
Operating temperature	T_{opr}	−20	—	65	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Circuit Connections



A Connection | B Connection | C Connection

Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Led	Forward voltage	V_F	I_F=10mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R=5V	—	—	10	μA
	Capacitance	C_T	V=0, f=1MHz	—	30	—	pF
Detector	Off−state current	I_{OFF}	V_{OFF}=350V	—	—	1	μA
	Capacitance	C_{OFF}	V=0, f=1MHz	—	40	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current		I_{FT}	I_{ON}=120mA	—	1	3	mA
On−state resistance	A connection	R_{ON}	I_{ON}=120mA, I_F=5mA	—	22	35	Ω
			I_{ON}=20~120mA, I_F=5mA	—	26	40	

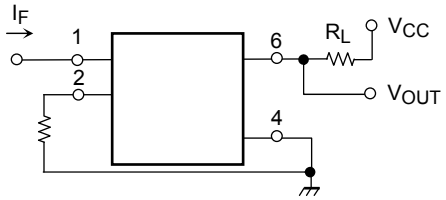
Isolation Characteristics (Ta = 25°C)

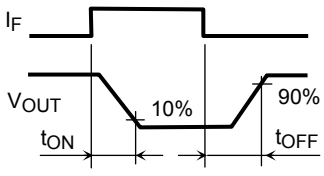
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	V_S=0, f=1MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S=500V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC,1minute	1500	—	—	V_{rms}
		AC,1second (in oil)	—	3000	—	
		DC,1minute (in oil)	—	3000	—	V_{dc}

Switching Characteristics (Ta = 25°C)

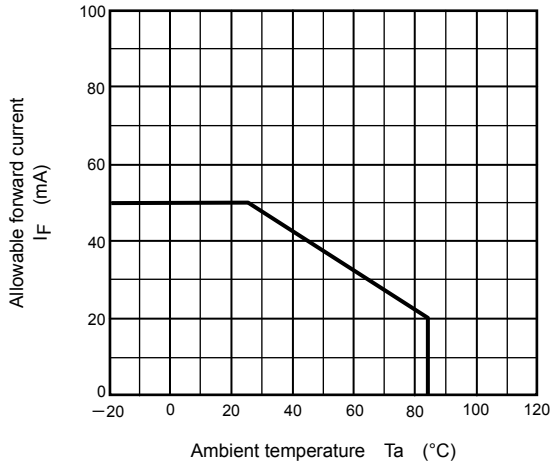
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn−on time	t_{ON}	R_L=200Ω (Note 2)	—	0.3	1	ms
Turn−off time	t_{OFF}	V_{CC}=20V, I_F=5mA	—	0.1	1	

(Note2): Switching time test circuit

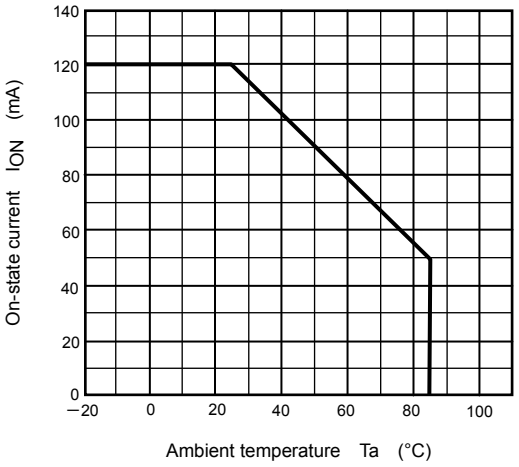




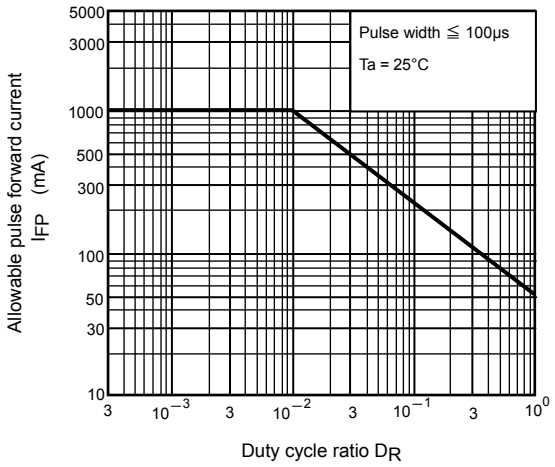
I_F – Ta



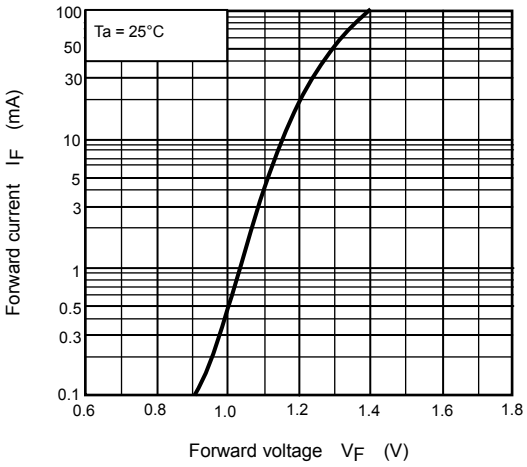
I_{ON} – Ta



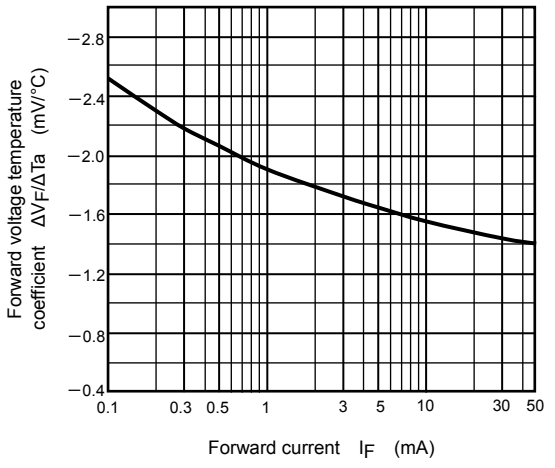
I_{FP} – D_R



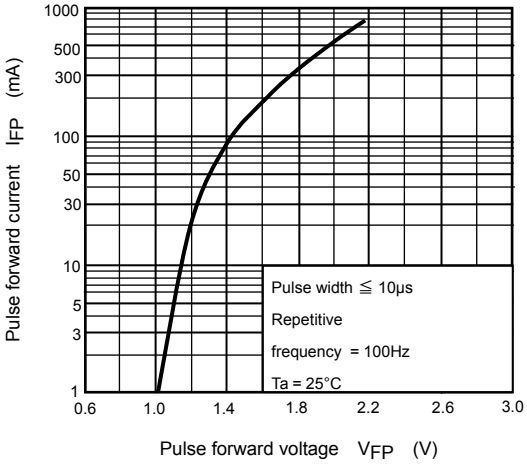
I_F –V_F



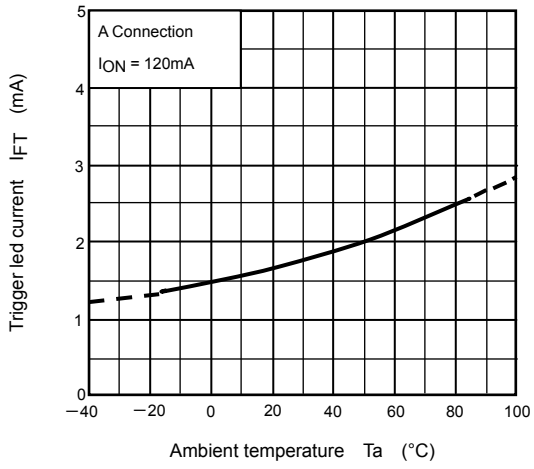
$\Delta V_F/\Delta Ta$ – I_F



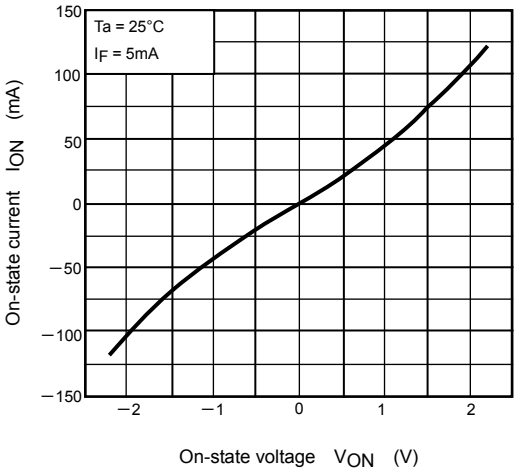
I_{FP} – V_{FP}



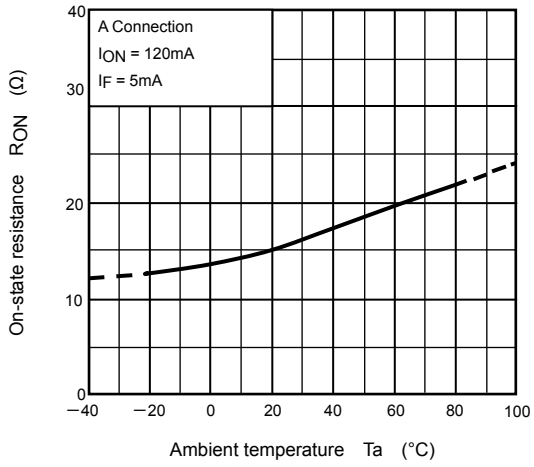
I_{FT} – Ta



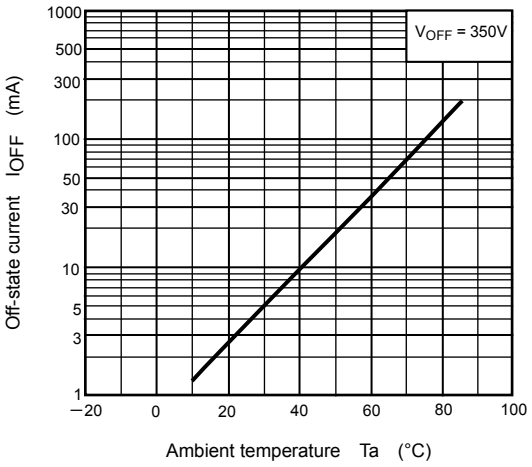
I_{ON} – V_{ON} (A connection)



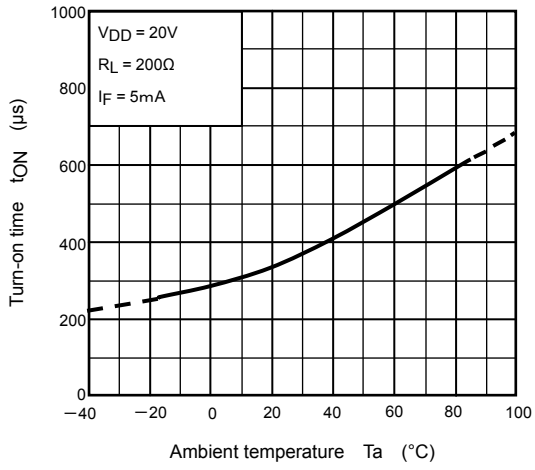
R_{ON} – Ta



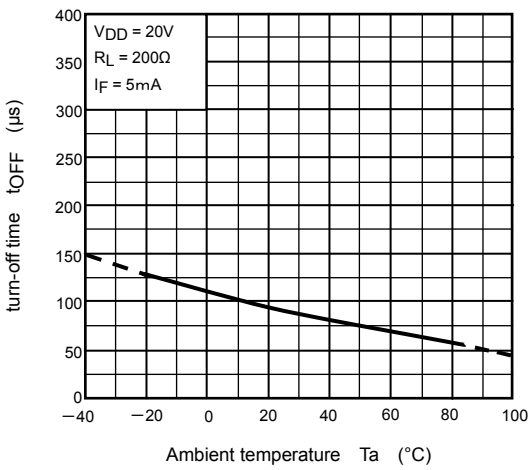
I_{OFF} – Ta



t_{ON} – Ta



t_{OFF} – Ta



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20070701-EN

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