TOSHIBA Photocoupler Photorelay

# TLP4197G

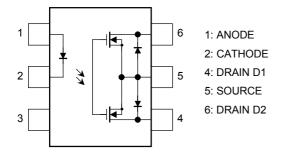
PBX Telecommunication Modem · FAX Cards, Modems In PC Measurement Instrumentation

The TOSHIBA TLP4197G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP, which is suitable for surface mount assembly.

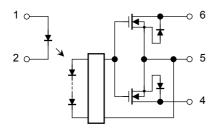
The TLP4197GA is suitable for replacement of mechanical relays in many applications which require space savings.

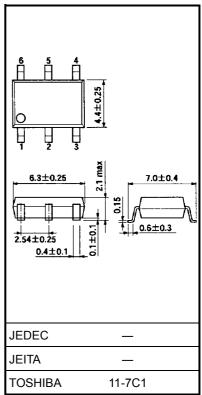
- 6 pin SOP (2.54SOP6): 2.1 mm high, 2.54 mm pitch
- 1-form-B
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 120 mA (max)
- On-state resistance:  $25 \Omega$  (max)
- Isolation voltage: 1500 Vrms (min)

#### Pin Configuration (top view)



#### Schematic





Weight: 0.13 g (typ.)

#### Maximum Ratings (Ta = 25°C)

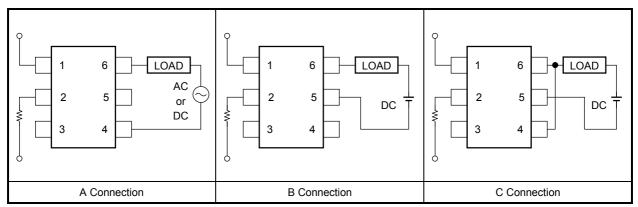
Characteristics			Symbol	Rating	Unit
LED	Forward current		١ <sub>F</sub>	50	mA
	Forward current d (Ta≧25°C)	erating	∆I <sub>F</sub> /°C	-0.5	mA/°C
	Peak forward curr (100 μs pulse, 100		I <sub>FP</sub>	1	А
	Reverse voltage		V <sub>R</sub>	5	V
	Junction temperat	ure	Tj	125	°C
	Off-state output te	rminal voltage	V <sub>OFF</sub>	350	V
	On-state current	A connection	I <sub>ON</sub>	120	
		B connection		120	mA
ctor		C connection		240	
Detector	On-state current derating (Ta ≧ 25°C)	A connection		-1.2	
		B connection	∆l <sub>ON</sub> /°C	-1.2	mA/°C
		C connection		-2.4	
	Junction temperat	ure	Tj	125	°C
Operating temperature range			T <sub>opr</sub>	-40 to 85	°C
Storage temperature range			T <sub>stg</sub>	-55 to 125	°C
Lead soldering temperature (10 s)			T <sub>sol</sub>	260	°C
Isolation voltage (AC, 1 min, R.H. $\leq$ 60%) (Note 1)			BVS	1500	Vrms

Note 1: Device considered a two-terminal device: LED side pins shorted together, and DETECTOR side pins and 6 shorted together.

#### **Recommended Operating Conditions**

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	V <sub>DD</sub>		_	280	V
Forward current	١ <sub>F</sub>	5	_	25	mA
On-state current	I <sub>ON</sub>	_	_	120	mA
Operating temperature	T <sub>opr</sub>	-20		65	°C

#### **Circuit Connections**



#### Individual Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
LED	Forward voltage	VF	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
	Reverse current	I <sub>R</sub>	$V_R = 5 V$		_	10	μA
	Capacitance	CT	V = 0, f = 1 MHz	_	30	_	pF
Detec- tor	Off-state current	I <sub>OFF</sub>	V <sub>OFF</sub> = 350 V, I <sub>F</sub> = 5 mA		_	1	μA
	Capacitance	C <sub>OFF</sub>	$V = 0, f = 1 \text{ MHz}, I_F = 5 \text{ mA}$			_	pF

#### **Coupled Electrical Characteristics** (Ta = 25°C)

項 目		記号	測定条件	最小	標準	最大	単位
Trigger LED current		I <sub>FC</sub>	$I_{OFF} = 10 \ \mu A$	_	1	3	mA
Return LED current		I <sub>FT</sub>	I <sub>ON</sub> = 120 mA	0.1	_	_	mA
	A connection	_	I <sub>ON</sub> = 120 mA		15	25	
On-state resistance	B connection		I <sub>ON</sub> = 120 mA		8	14	Ω
	C connection		I <sub>ON</sub> = 240 mA	_	4	_	

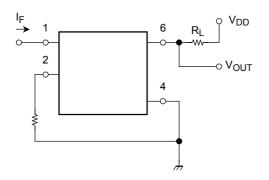
#### Isolation Characteristics (Ta = 25°C)

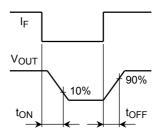
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	CS	$V_{S} = 0, f = 1 MHz$		0.8	_	pF
Isolation resistance	R <sub>S</sub>	$V_S = 500 \text{ V}, \text{ R.H.} \leq 60\%$	$5\times 10^{10}$	10 <sup>14</sup>	_	Ω
	BVS	AC, 1 min	1500			Vrms
Isolation voltage		AC, 1 s, in oil		3000	_	
		DC, 1 min, in oil	_	3000	_	Vdc

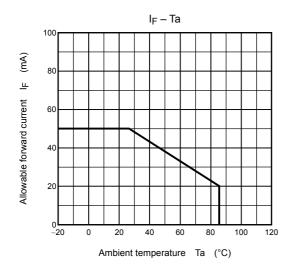
#### Switching Characteristics (Ta = 25°C)

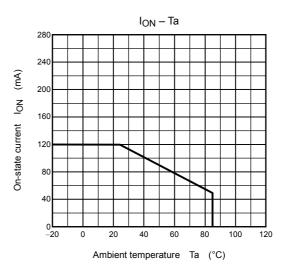
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time	t <sub>ON</sub>	$R_L = 200 \Omega$ (Note 2)	_		1	ms
Turn-off time	tOFF	$V_{DD} = 20 \text{ V}, \text{ I}_{\text{F}} = 5 \text{ mA}$	_		3	ms

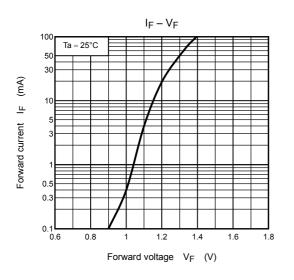
Note 2: Switching time test circuit

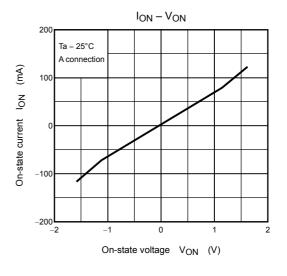


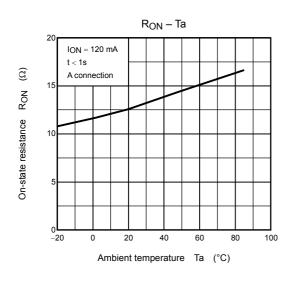


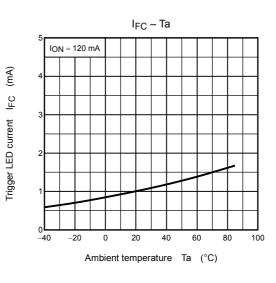


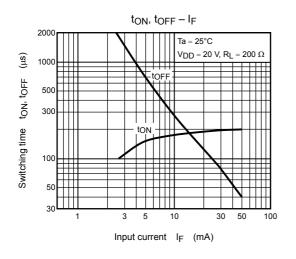


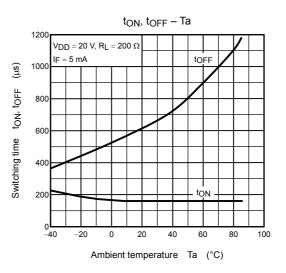


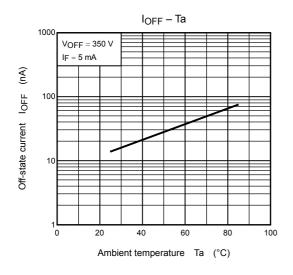












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