

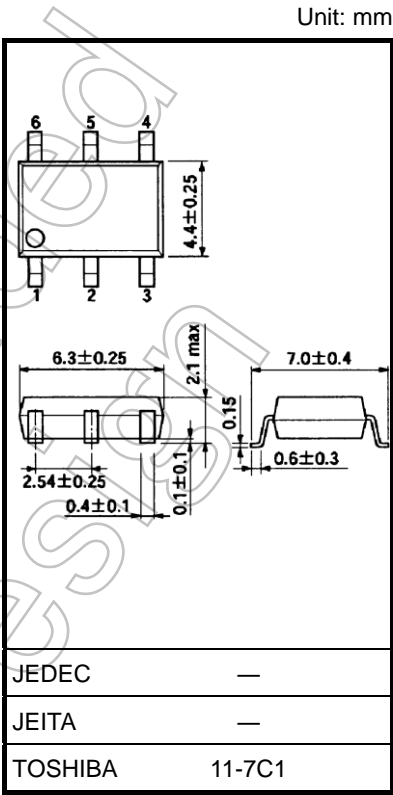
TLP197D

PC Card Modems
PBX
Measurement Equipment

The Toshiba TLP197D consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP package.

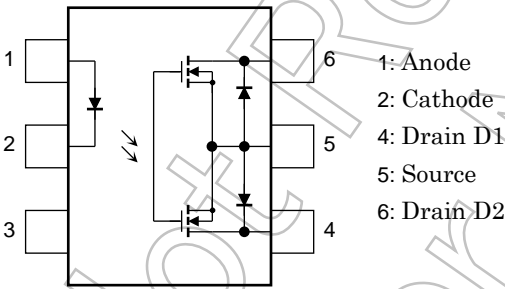
TLP197D is housed in a compact and thin SOP package and has characteristics of high-withstanding voltage and low ON-state resistance, which enable TLP197D to be applied in hook switches, dial-pulse switches for modems and facsimiles, and switches for test circuit switching in PBXs.

- 6-pin SOP (2.54SOP6): Height = 2.1 mm, pitch = 2.54 mm
- Normally open (1-form-A) device
- Peak OFF-state voltage: 200 V (min)
- Trigger LED current: 3 mA (max)
- ON-state current: 200 mA (max)
- ON-state resistance: 8 Ω (max)
- Isolation voltage: 1500 Vrms (min)
- UL approved: UL1577, File No.E67349
- cUL approved :CSA Component Acceptance Service
No. 5A, File No.E67349

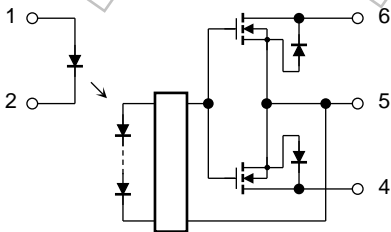


Weight: 0.13 g (typ.)

Pin Configuration (top view)



Schematic



Start of commercial production
2002-02

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
	Peak forward current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse voltage		V _R	5	V
	Diode power dissipation		P _D	50	mW
	Diode power dissipation derating (Ta≥25°C)		ΔP _D /°C	-0.5	mW/°C
	Junction temperature		T _j	125	°C
Detector	Off-state output terminal voltage		V _{OFF}	200	V
	On-state current	A connection	I _{ON}	200	mA
		B connection		200	
		C connection		400	
	On-state current derating (Ta ≥25°C)	A connection	ΔI _{ON} /°C	-2.0	mA/°C
		B connection		-2.0	
		C connection		-4.0	
	Output power dissipation	A connection	P _O	300	mW
		B connection			
		C connection			
	Output power dissipation derating (Ta ≥ 25°C)	A connection	Δ P _O /°C	-3.0	mW /°C
		B connection			
		C connection			
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 minute, R.H. ≤ 60%) (Note 1)			BV _S	1500	V _{rms}

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.).

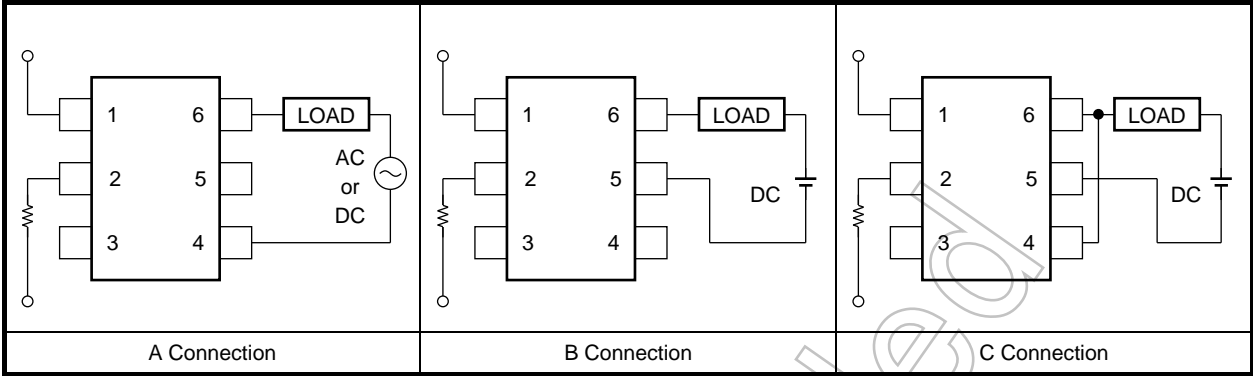
Note 1: Pins 1, 2 and 3 are shorted together, and pins 4, 5 and 6 are shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V _{DD}	—	—	160	V
Forward current	I _F	5	7.5	25	mA
On-state current	I _{ON}	—	—	130	mA
Operating temperature	T _{opr}	-20	—	60	°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



Not Recommended for New Design

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	$V_F = 0 \text{ V}, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 200 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0 \text{ V}, f = 1 \text{ MHz}$	—	100	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current		I_{FT}	$I_{ON} = 200 \text{ mA}$	—	1	3	mA
Return LED current		I_{FC}	$I_{OFF} = 100 \mu\text{A}$	0.1	—	—	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 200 \text{ mA}, I_F = 5 \text{ mA}$	—	5	8	Ω
	B connection		$I_{ON} = 200 \text{ mA}, I_F = 5 \text{ mA}$	—	3	5	
	C connection		$I_{ON} = 400 \text{ mA}, I_F = 5 \text{ mA}$	—	1.4	—	

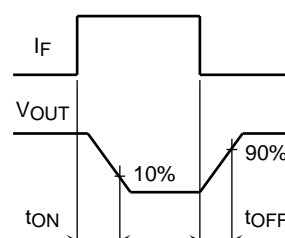
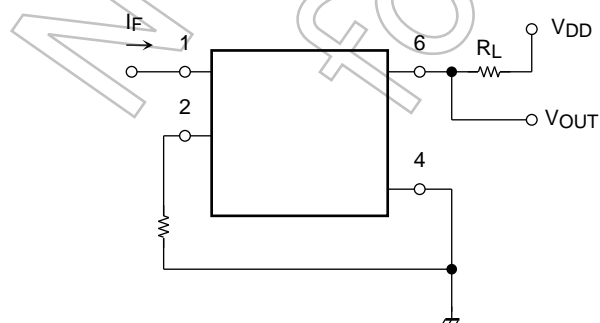
Isolation Characteristics (Ta = 25°C)

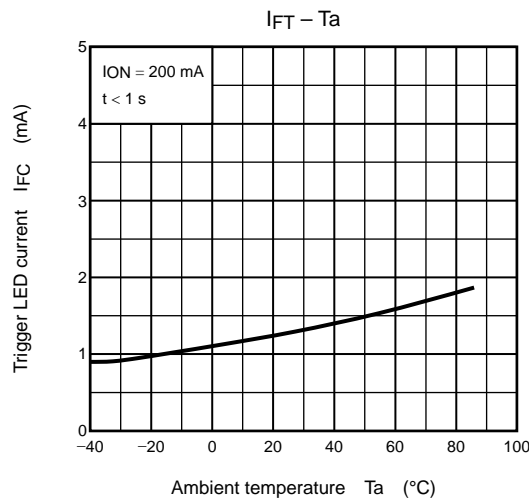
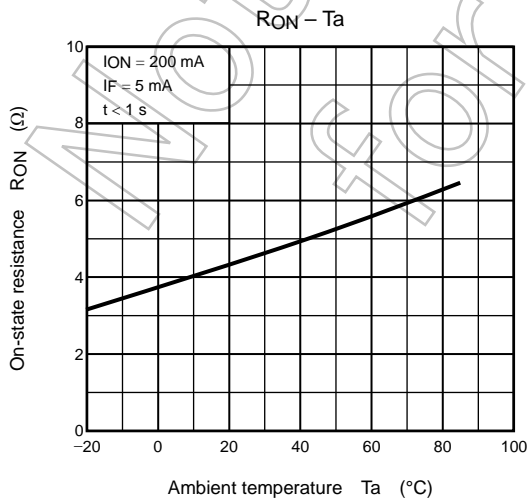
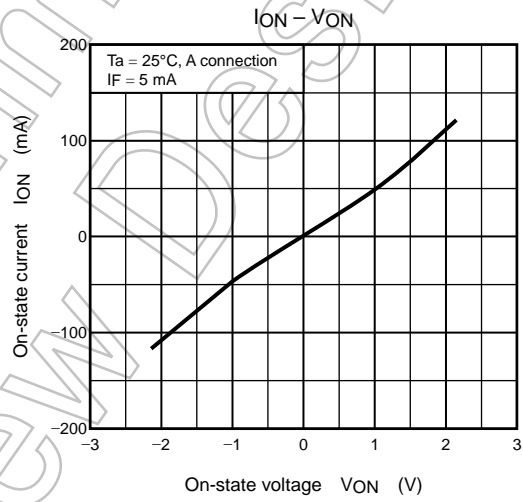
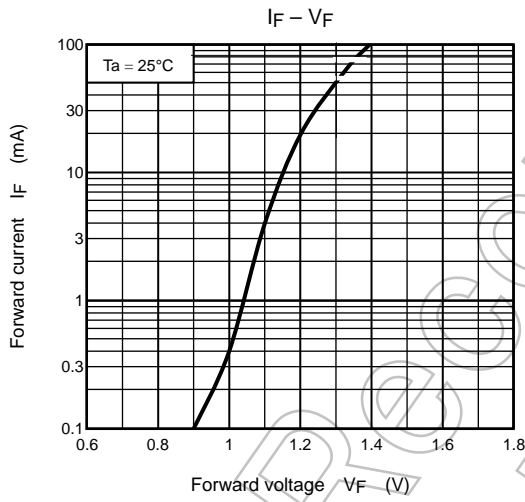
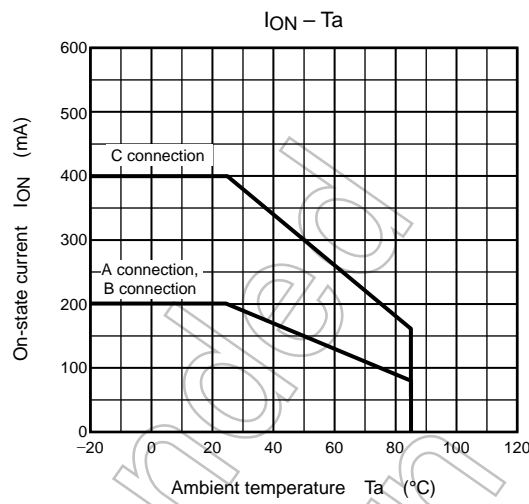
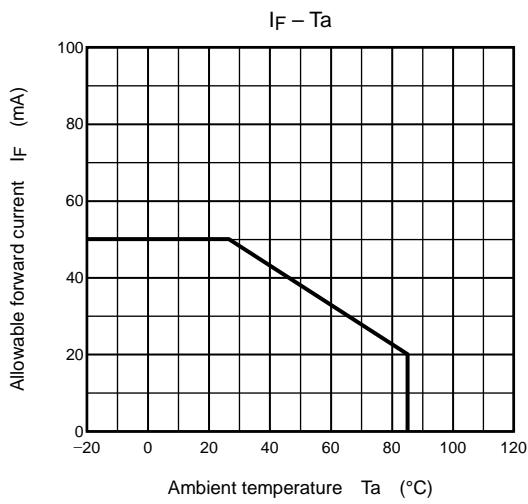
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output		C_S	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance		R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage		BV_S	AC, 1 minute	1500	—	—	V_{rms}
			AC, 1 second,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

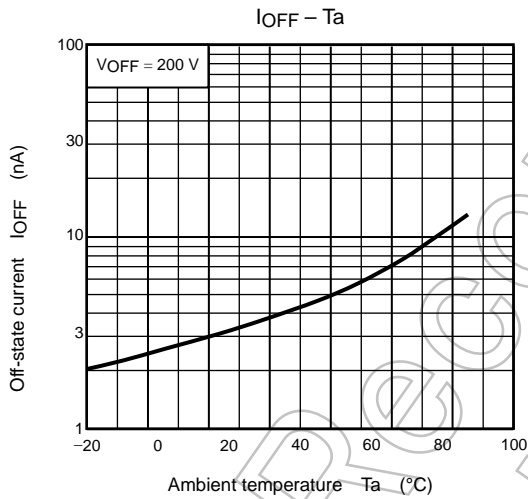
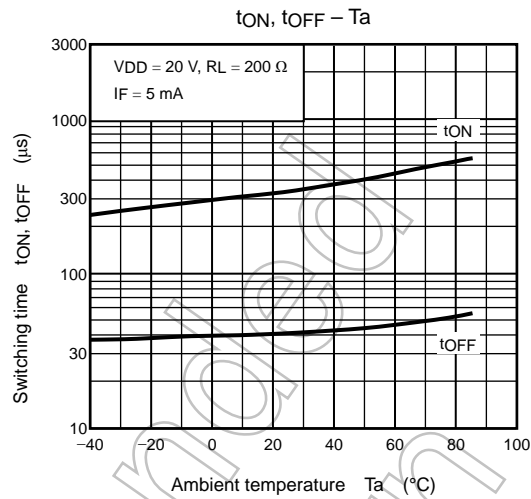
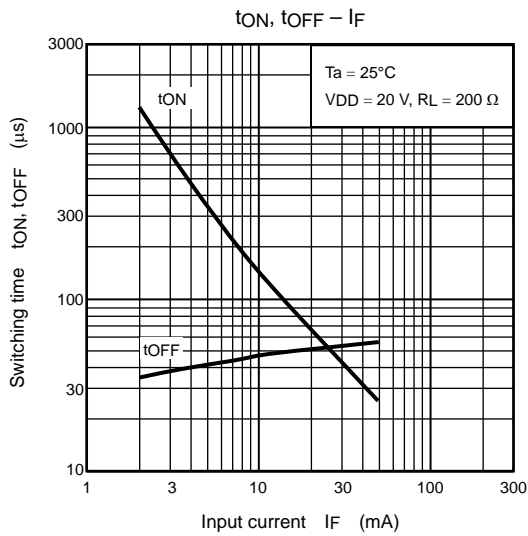
Switching Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time		t_{ON}	$R_L = 200 \Omega$ (Note 2)	—	0.6	1.5	ms
Turn-off time		t_{OFF}	$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$	—	0.1	1.0	ms

Note 2: Switching time test circuit







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