

TLP597GA

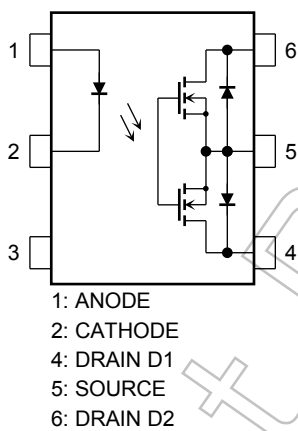
Cordless Telephone
PBX
Modem

The TOSHIBA TLP597GA consists of an infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).

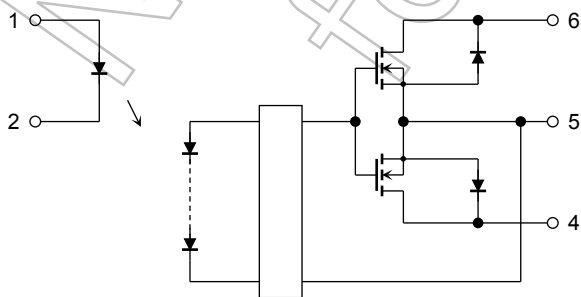
The TLP597GA is a bi-directional switch which can replace mechanical relays in many applications.

- 6 pin DIP (DIP6)
- 1-form-A
- Peak off-state voltage: 400 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 120 mA (max)
- On-state resistance: 35 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL-recognized: UL 1577, File No.E67349

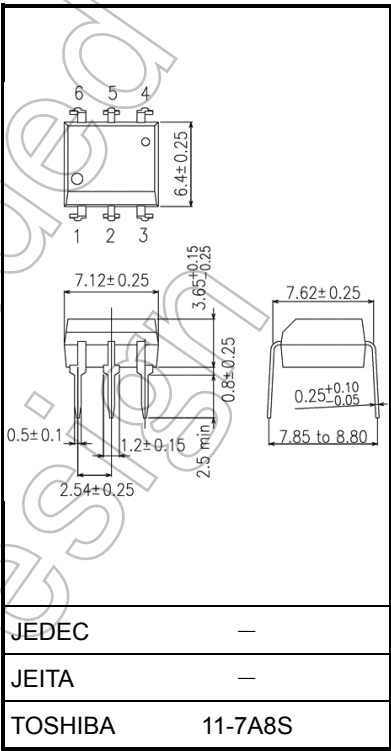
Pin Configuration (top view)



Schematic



Unit: mm



Weight: 0.4 g (typ.)

Start of commercial production
2001-01

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}	400	V
	On-state current	A connection	I _{ON}	120	mA
		B connection		120	
		C connection		240	
	On-state current derating (Ta ≥ 25°C)	A connection	ΔI _{ON} /°C	-1.2	mA/°C
		B connection		-1.2	
		C connection		-2.4	
	Output power dissipation	A connection	P _O	453	mW
		B connection		345	
		C connection		690	
	Output power dissipation derating (Ta ≥ 25°C)	A connection	ΔP _O /°C	-4.53	mW / °C
		B connection		-3.45	
		C connection		-6.9	
Junction temperature		T _j	125	°C	
Storage temperature range			T _{stg}	-55 to 125	°C
Operating temperature range			T _{opr}	-40 to 85	°C
Lead soldering temperature (10 s)			T _{sol}	260	°C
Isolation voltage (AC, 60 s, R.H. ≤ 60 %) (Note 1)			BV _S	2500	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).

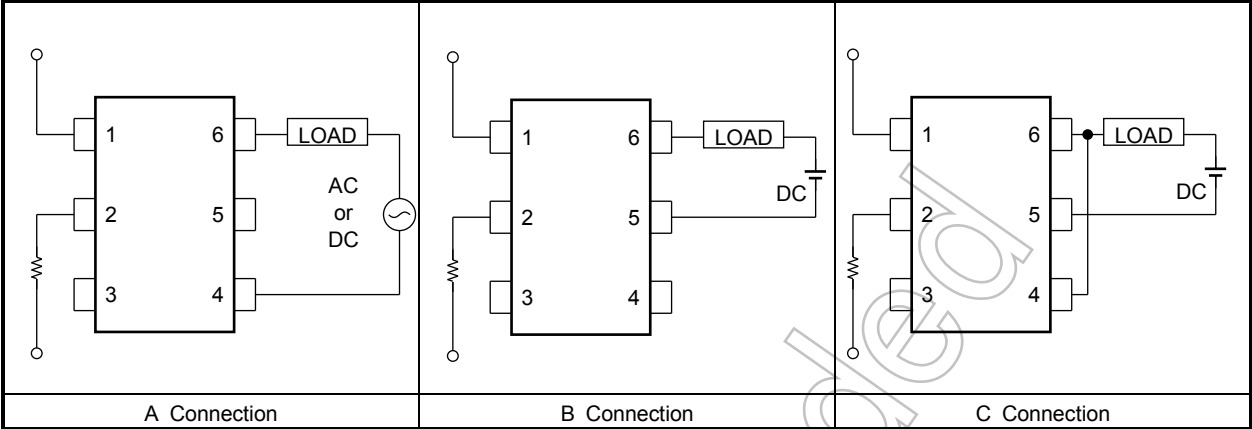
Note 1: Device considered a two-terminal device : Pins 1, 2 and 3 are shorted together, and pins 4, 5 and 6 are shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V _{DD}	—	—	320	V
Forward current	I _F	5	7.5	25	mA
On-state current	I _{ON}	—	—	120	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



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	$V = 0 \text{ V}, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 400 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0 \text{ V}, f = 1 \text{ MHz}$	—	70	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current		I_{FT}	$I_{ON} = 120 \text{ mA}$	—	1	3	mA
Return LED current		I_{FC}	$I_{OFF} = 100 \mu\text{A}$	0.1	—	—	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	17	35	Ω
			$I_{ON} = 20 \text{ to } 120 \text{ mA}, I_F = 5 \text{ mA}$	—	20	40	
	B connection		$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	11	20	
	C connection		$I_{ON} = 240 \text{ mA}, I_F = 5 \text{ mA}$	—	6	—	

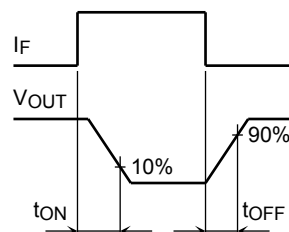
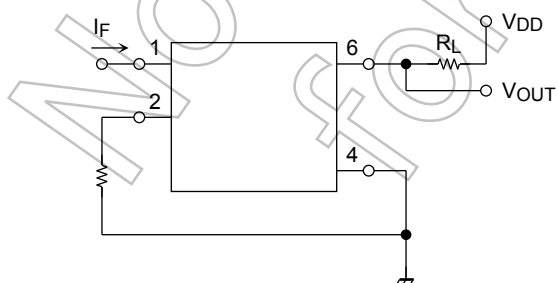
Isolation Characteristics (Ta = 25°C)

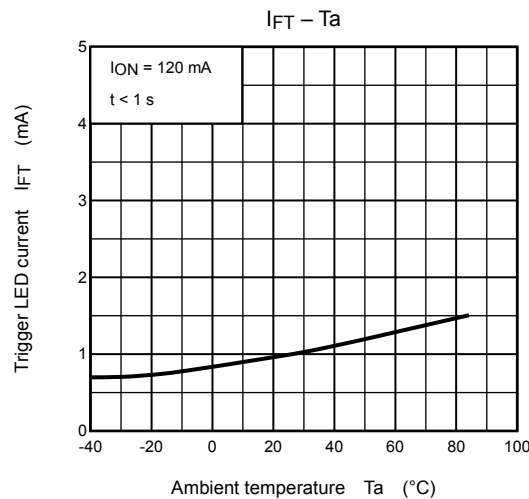
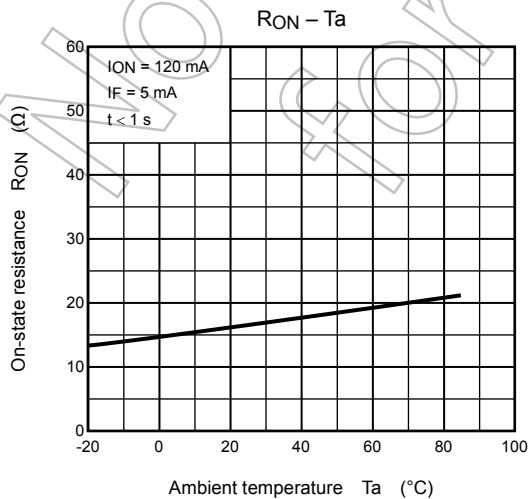
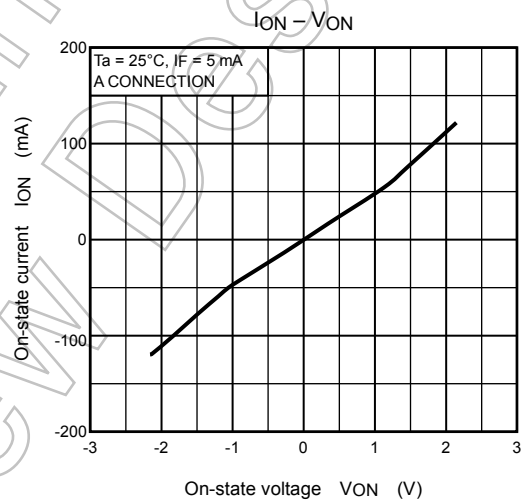
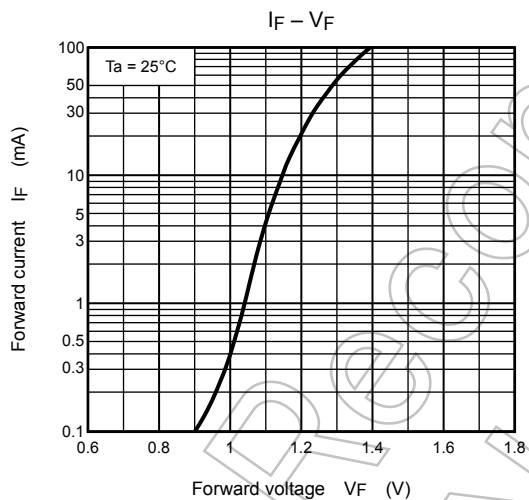
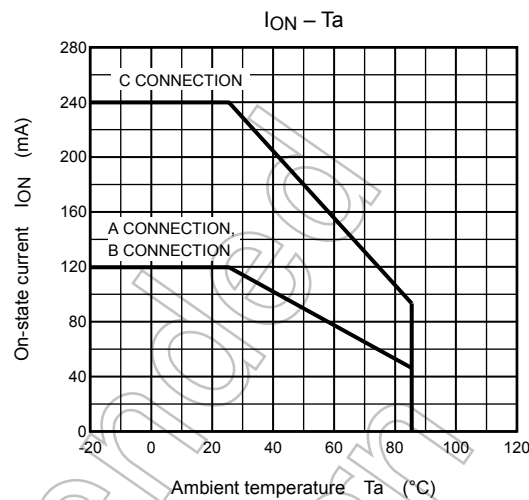
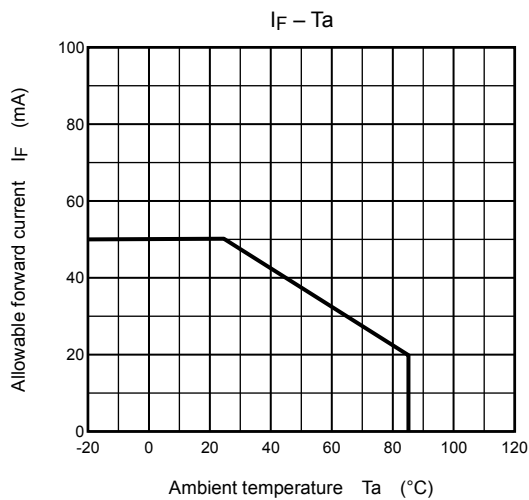
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60 \%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 60 s	2500	—	—	Vrms

Switching Characteristics (Ta = 25°C)

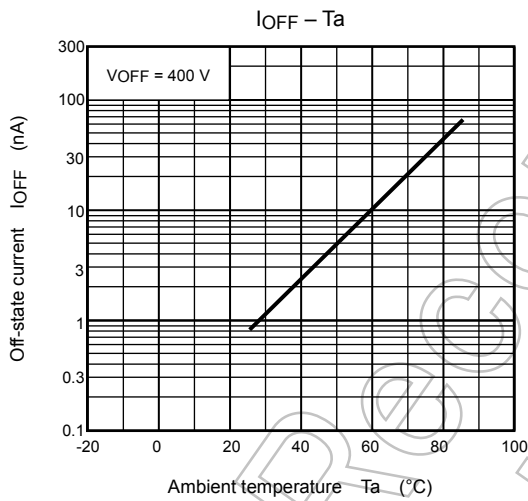
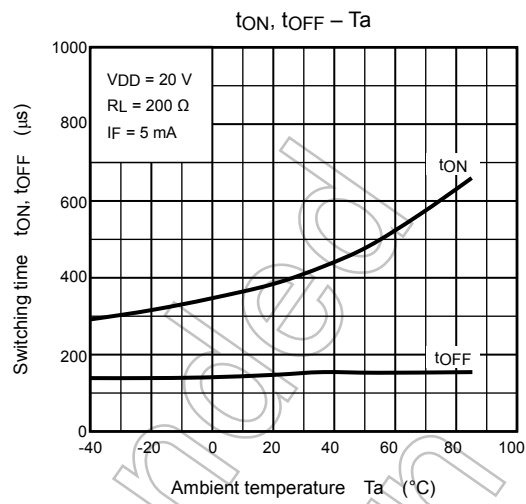
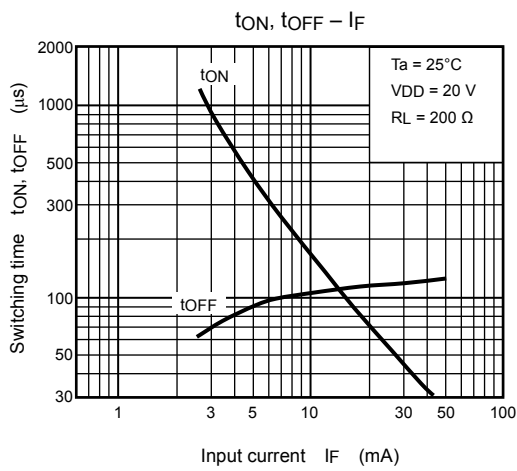
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	$R_L = 200 \Omega$ (Note 2)	—	0.3	1	ms
Turn-off time	t_{OFF}	$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$	—	0.1	1	ms

Note 2: Switching time test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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