

TLP797J

Telecommunication
Measurement Instrumentation
FA

The TOSHIBA TLP797J consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).

The TLP797J is a bi-directional switch can replace mechanical relays in many applications.

- 6 pin DIP (DIP6)
- 1-form-A
- Peak off-state voltage: 600 V (min)
- Trigger LED current: 5 mA (max)
- On-state current: 100 mA (max)
- On-state resistance: 35 Ω (max)
- Isolation voltage: 5000 Vrms (min)
- UL recognized: UL1577, file No. E67349
- Option(D4) type

VDE approved: DIN EN 60747-5-2

Certificate No. 40009302

Maximum operating insulation voltage: 890 Vpk

Maximum permissible over voltage: 6000 Vpk

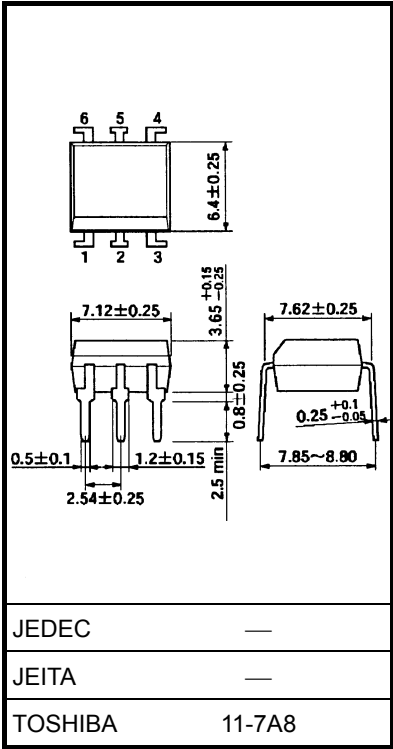
Note: When ordering an EN60747-5-2 approved device, "Option (D4)" should be designated.

- Construction mechanical rating

	7.62 mm pitch standard type	10.16 mm pitch TLPXXXXF type
Creepage distance	7.0 mm (Min)	8.0 mm (Min)
Clearance	7.0 mm (Min)	8.0 mm (Min)
Insulation thickness	0.4 mm (Min)	0.4 mm (Min)

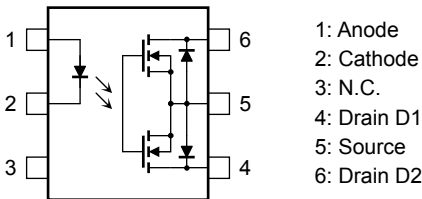
Note: When applying safety standard certification, use the standard part number, e.g., TLP797J.

Unit: mm

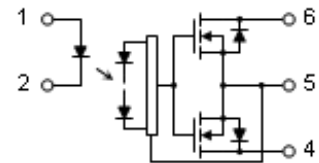


Weight: 0.4 g (typ.)

Pin Configurations (top view)



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
	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}	600	V
	On-state current	A connection	I _{ON}	100	mA
		B connection		100	
		C connection		200	
	On-state current derating (Ta ≥ 25°C)	A connection	ΔI _{ON} /°C	−1.0	mA/°C
		B connection		−1.0	
		C connection		−2.0	
	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, 1 minute, R.H. ≤ 60%) (Note 1)		BV _S	5000	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).

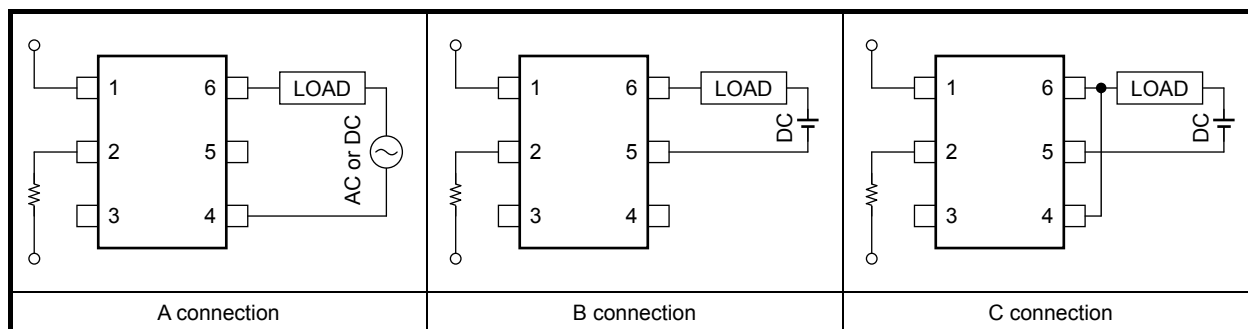
Note 1: Device considered a two-terminal device: Pins 1, 2 and 3 shorted together, and pins 4, 5 and 6 shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{DD}	—	—	480	V
Forward current	I_F	7.5	15	25	mA
On-state current	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



Individual 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	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 600 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$	—	120	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current		I_{FT}	$I_{ON} = 100 \text{ mA}$	—	1.6	5	mA
Close LED current		I_{FC}	$I_{OFF} = 100 \mu\text{A}$	0.1	—	—	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 100 \text{ mA}, I_F = 10 \text{ mA}, t < 1 \text{ s}$	—	25	35	Ω
	B connection		$I_{ON} = 100 \text{ mA}, I_F = 10 \text{ mA}$	—	30	45	
	C connection		$I_{ON} = 100 \text{ mA}, I_F = 10 \text{ mA}$	—	23	35	
	C connection		$I_{ON} = 200 \text{ mA}, I_F = 10 \text{ mA}$	—	12	—	

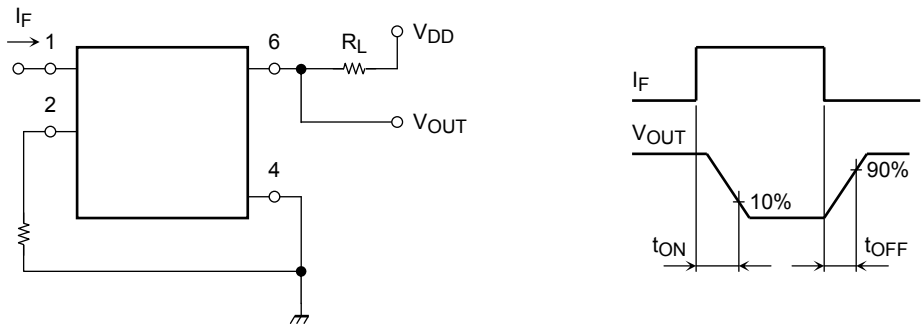
Isolation Characteristics (Ta = 25°C)

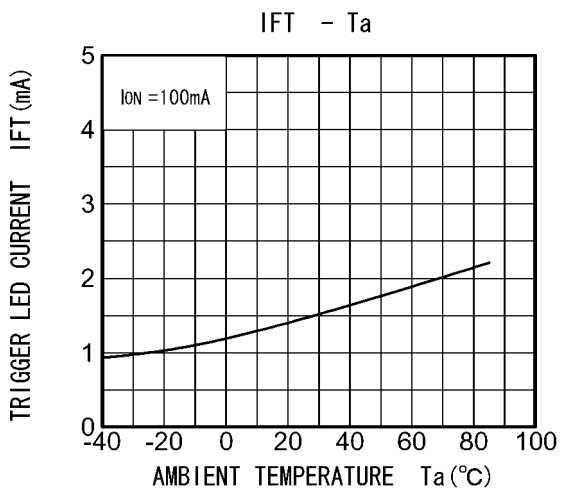
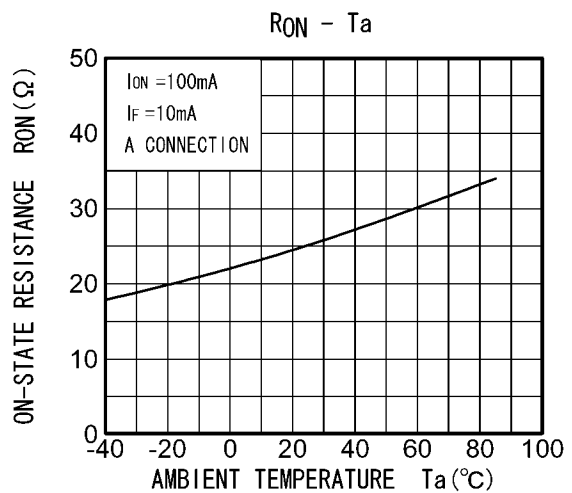
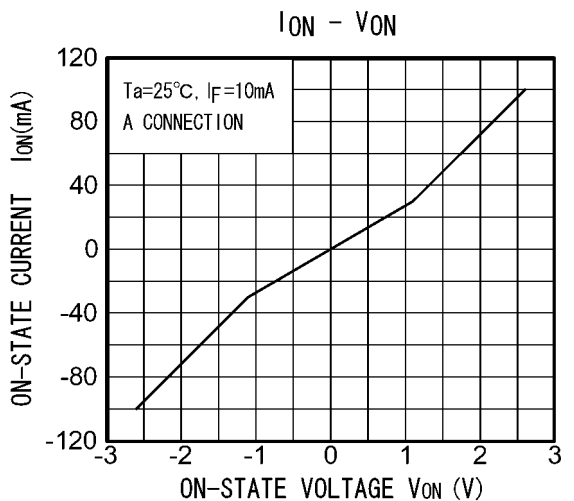
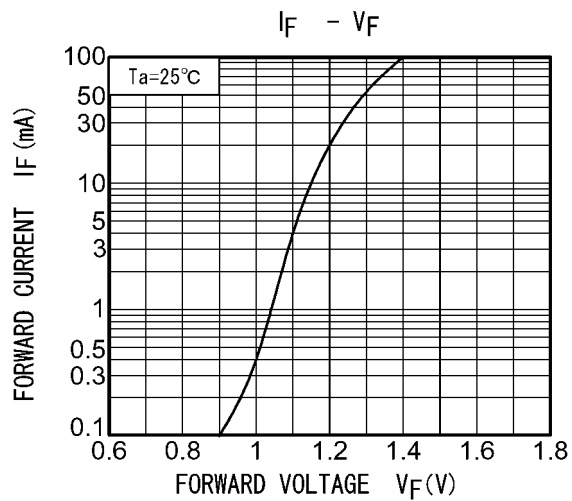
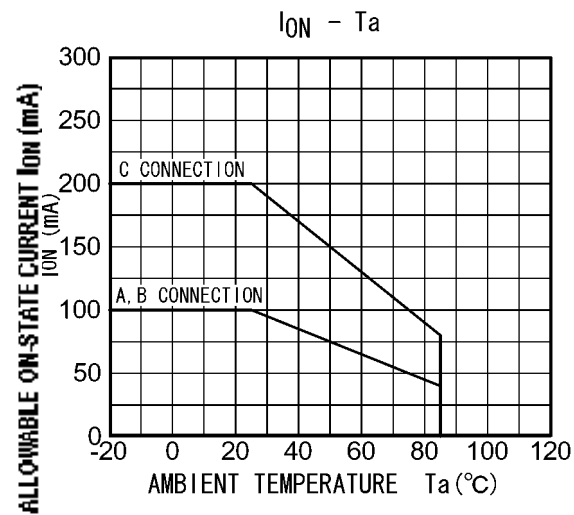
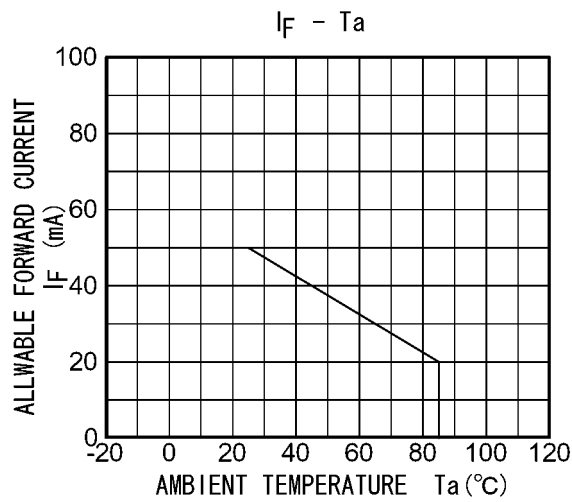
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	5000	—	—	Vrms
		AC, 1 s (in oil)	—	10000	—	
		DC, 1 minute (in oil)	—	10000	—	Vdc

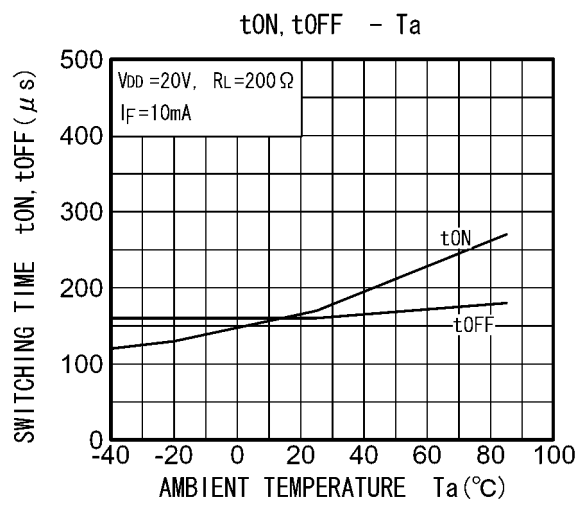
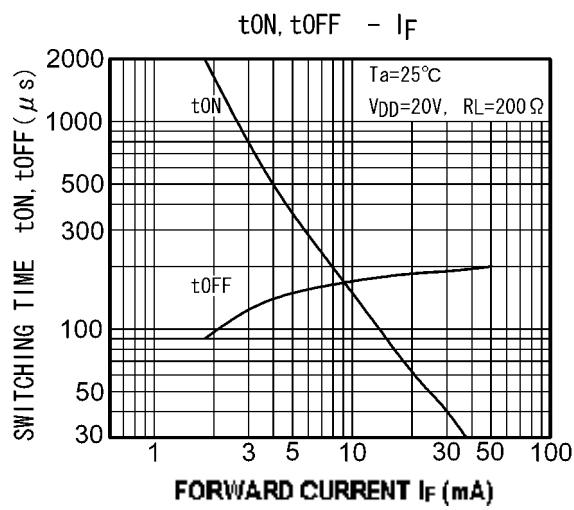
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t _{ON}	R _L = 200 Ω V _{DD} = 20 V, I _F = 10 mA (Note)	—	0.2	1.5	ms
Turn-off time	t _{OFF}		—	0.2	1	ms

Note: Switching time test circuit







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