TOSHIBA Photocoupler IRED & Photo-MOS FET

TLP176G

Modem-Fax Cards PBX STB Measurement Equipment

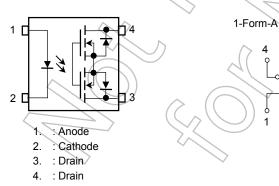
The TOSHIBA TLP176G consists of an infrared emitting diode optically coupled to a photo-MOS FET in a SOP, which is suitable for surface mount assembly.

Because of the high-voltage MOSFET used to output terminals, TLP176G is suitable for a hook relay of a modem, a facsimile, and dial pulls relay.

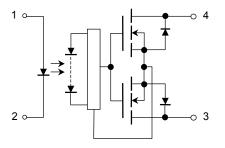
- 4-pin SOP(2.54SOP4)
- Peak off-state voltage: 350 V (min) On-state current:120 mA (max)
- Trigger LED current: 3 mA (max)
- On-state resistance: 35 Ω (max)
- Isolation voltage: 1500 Vrms (min)
- UL-recognized: UL 1577, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

Note 1: When a VDE approved type is needed, please designate the **Option(V4)**.

Pin Configuration (top view)



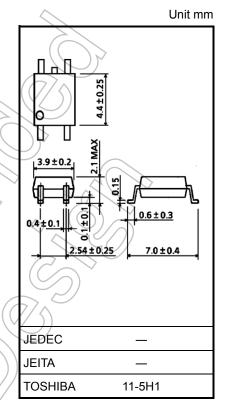
Schematic



Start of commercial production 1997-10







Weight: 0.1 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

	Characteristic	Symbol	Rating	Unit
	Forward current	lF	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _F / °C	-0.5	mA / °C
	Pulse forward current (100µs pulse,100pps)	IFP	1	A
LED	Reverse voltage	VR	5	V
	Diode power dissipation	PD	50	mW
	Diode power dissipation derating (Ta \ge 25°C)	ΔP _D /°C	-0.5	mW/°C
	Junction temperature	Тј	125	°C
	Off-state output terminal voltage	Voff	350	V
	On-state current	ION	120	mA)
Detector	On-state current derating (Ta ≥ 25°C)	Δlon / °C	-1.2	mA / °C
Dete	Output power dissipation	Po	300	mW
	Output power dissipation derating (Ta \ge 25°C)	ΔP _O /°C	-3.0	mW / °C
	Junction temperature	Тј	125	°c
Tota	I power dissipation	PT	350	mW
Tota	I power dissipation derating(Ta \ge 25°C)	ΔΡΤ / °C	-3.5	mW / °C
Stor	age temperature range	Tstg	-55 to 125	ç
Ope	rating temperature range	Topr	-40 to 85	
Lead	d soldering temperature(10 s)	Tsol	260	°C
Isola	tion voltage (AC, 60 s, R.H.≤ 60 %) (Note 1)	BVs	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: Pin 1 and 2 shorted together and pin 3 and 4 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min	Тур.	Max	Unit
Supply voltage	VDD	_	_	280	V
Forward current) IF	5	7.5	25	mA
On-state current	ION	-	-	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.

Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
	Forward voltage	VF	I _F = 10mA	1.0	1.15	1.3	V
LED	Reverse current	IR	V _R = 5V	_	_	10	μA
_	Capacitance	CT	V _F = 0 V, f = 1 MHz	/	30	_	pF
r	Off-state current	IOFF	Voff = 350 V		-	1	μA
Detector	Capacitance between terminals	COFF	V = 0 V, f = 1 MHz		40	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

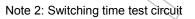
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	IFT	ION = 120 mA	- ~	22	3	mA
On-state resistance	Ron	ION = 120 mA, IF = 5 mA	-76	22	35	Ω
Return LED current	IFC	I _{OFF} = 100 μA	0.1	IA.	—	mA

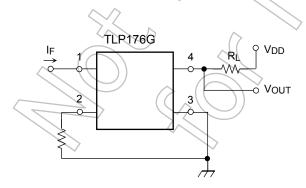
Isolation Characteristics (Ta = 25°C)

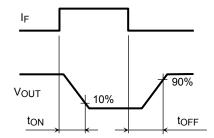
Characteristic	Symbol Test Condition Min Typ. Max	Unit
Capacitance input to output	Cs Vs=0V, f=1 MHz - 0.8 -	pF
Isolation resistance	Rs Vs = 500 V, R.H \leq 60 % 5×10 ¹⁰ 10 ¹⁴ -	Ω
Isolation voltage	BV _S AC, 60 s 1500	Vrms

Switching Characteristics (Ta = 25°C)

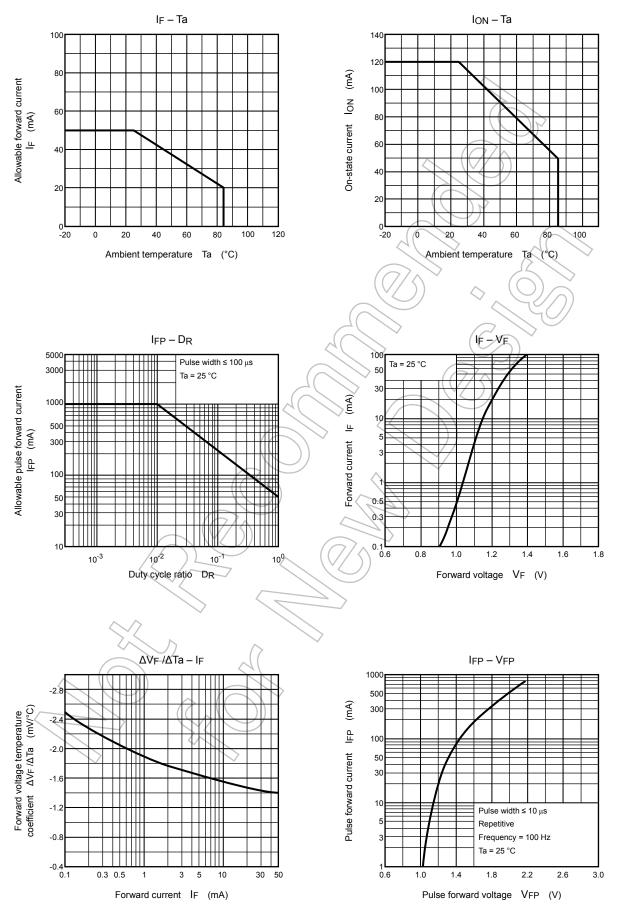
	Characteristic	$\langle \gamma \rangle$	Symbol	Test Condition		Min	Тур.	Max	Unit
Turn-on time			ton	RL = 200 Ω	(Note 2)	-	0.3	1	m 0
Turn-off time			tOFF	VDD = 20 V, IF = 5 mA			0.1	1	ms

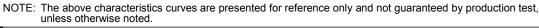


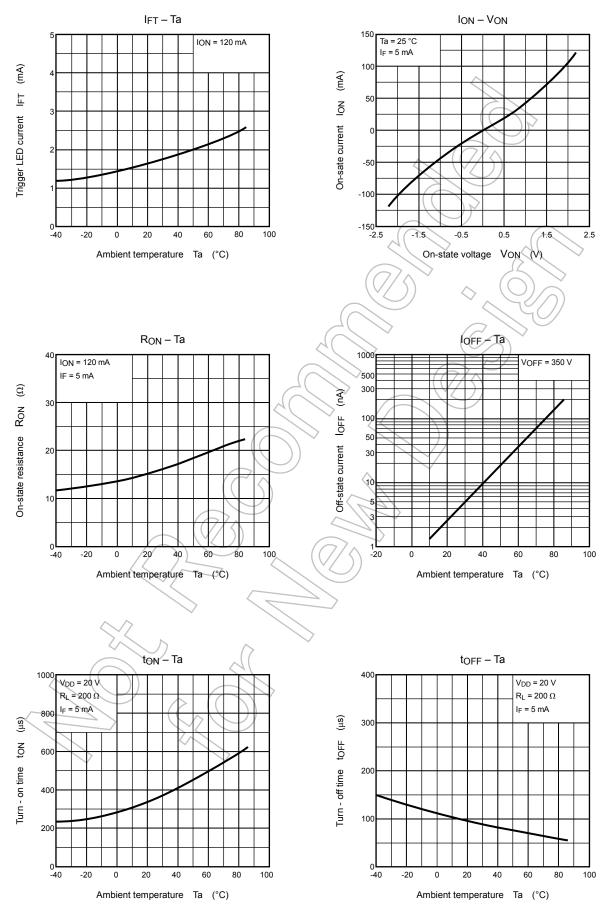


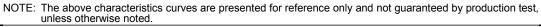


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