TOSHIBA Photocoupler GaAs Ired & Photo-MOS FET

TLP176G

Modems In PC
Modem-Fax Cards

Telecommunications

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

The TLP176G is suitable for the modem applications which require space savings.

• Peak off-state voltage: 350V (min)

• Trigger LED current: 3mA (max)

• On–state resistance: 35Ω (max)

• Isolation voltage: 1500Vrms (min)

• UL recognized: UL1577, file No. E67349

BSI approved

: BS EN60065: 2002, certificate No.8753 BS EN60950-1: 2002, certificate No.8754

• SEMKO approved: SS EN60065

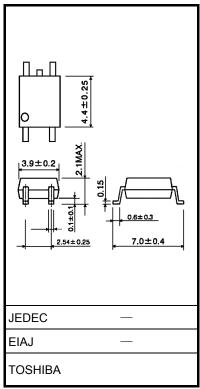
SS EN60950

• Option(V4)type

TUV approved: DIN EN 60747-5-2

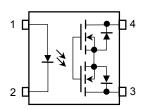
Certificate No.40009351

Unit in mm

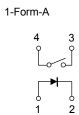


Weight: 0.1 g

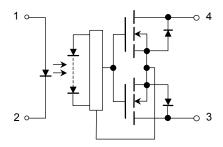
Pin Configuration (top view)



: Anode
 : Cathode
 : Drain
 : Drain



Schematic



Absolute Maximum Ratings (Ta = 25°C)

	Characteristic	Symbol	Rating	Unit
	Forward current	ΙF	50	mA
	Forward current derating (Ta ≥ 25°C)	ΔI _F / °C	-0.5	mA / °C
ED.	Pulse forward current (100µs pulse,100pps)	IFP	1	Α
	Reverse voltage	V _R	5	V
	Junction temperature	Tj	125	°C
	Off-state output terminal voltage	V _{OFF}	350	V
Detector	On-state current	I _{ON}	120	mA
Dete	On–state current derating (Ta ≥ 25°C)	Δl _{ON} / °C	-1.2	mA / °C
	Junction temperature	Tj	125	°C
Total power dissipation		PT	350	mW
Total power dissupation derating(Ta ≥ 25°C)		ΔPT / °C	-0.35	mW / °C
Storage temperature range		T _{stg}	-55~125	°C
Operating temperature range		T _{opr}	−40~85	°C
Lead soldering temperature(10 s)		T _{sol}	260	°C
Isola	tion voltage (AC,1 min., 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	V_{DD}	_	_ 280		V
Forward current	l _F	5	7.5	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.

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Individual Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
	Forward voltage	V_{F}	I _F = 10mA	1.0	1.15	1.3	V
LED	Reverse current	I _R	V _R = 5V	_	_	10	μА
	Capacitance	C _T	V = 0,f = 1MHz	_	30	_	pF
or	Off-state current	loff	V _{OFF} = 350V	_	_	1	μΑ
Detector	Capacitance	C _{OFF}	V = 0,f = 1MHz	I	40	ı	pF

Coupled Electrical Characteristics (Ta = 25°C)

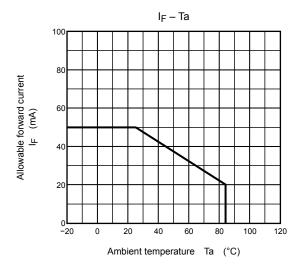
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Trigger LED current	I _{FT}	I _{ON} = 120mA	_	1	3	mA
On-state resistance	R _{ON}	I _{ON} = 120mA,I _F = 5mA	_	22	35	Ω

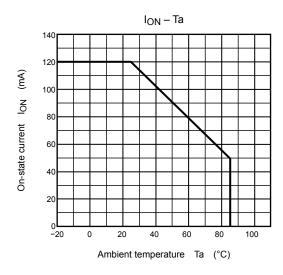
Isolation Characteristics (Ta = 25°C)

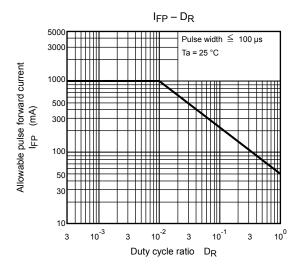
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Capacitance input to output	Cs	V _S = 0,f = 1MHz	_	8.0	_	pF
Isolation resistance	R _S	V _S = 500V,R.H ≤ 60%	5×10 ¹⁰	10 ¹⁴	_	Ω
		AC, 1minute	1500	_	_	Vrms
Isolation voltage		AC, 1second (in oil)	_	3000	_	VIIIIS
		DC, 1minute (in oil)	_	3000	_	Vdc

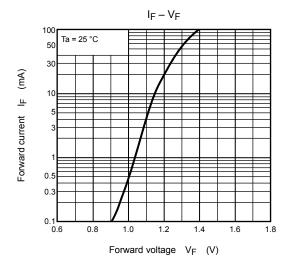
Switching Characteristics (Ta = 25°C)

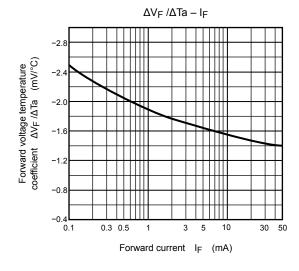
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Turn-on time	t _{ON}	R _L = 200Ω	_	0.3	1	ms
Turn-off time	toff	$V_{CC} = 20V, I_F = 5mA$	_	0.1	1	1115

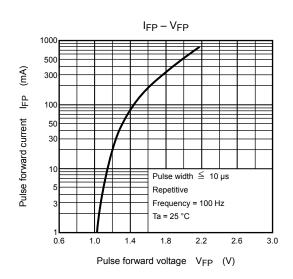


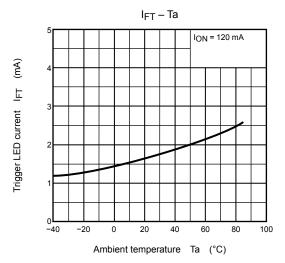


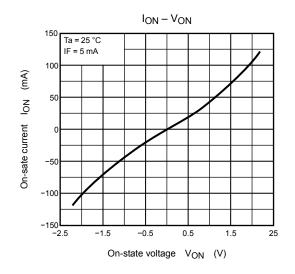


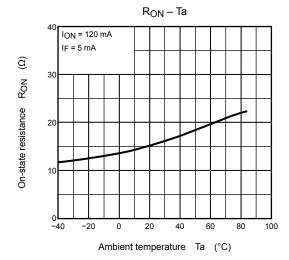


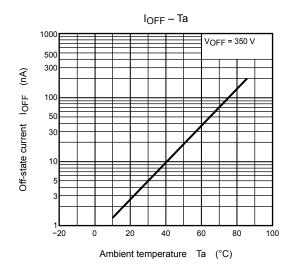


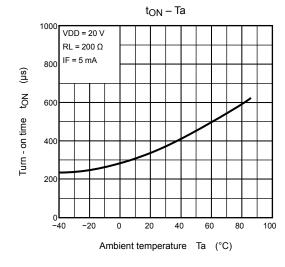


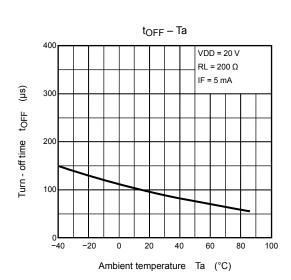


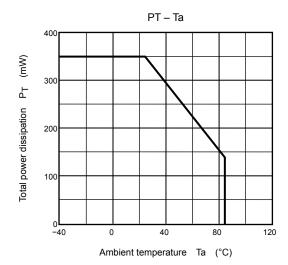












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 In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc.
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