

TOSHIBA Photocoupler Photorelay

TLP4227G, TLP4227G-2

PBX

Telecommunication

Modem · FAX Cards, Modems In PC

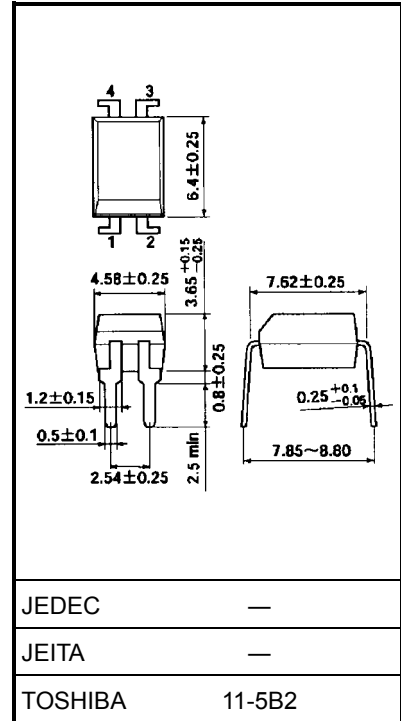
Measurement Instrumentation

The TOSHIBA TLP4227G series consists of an gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a plastic DIP package.

The TLP4227G series are a bi-directional switch, which can replace mechanical relays in many applications.

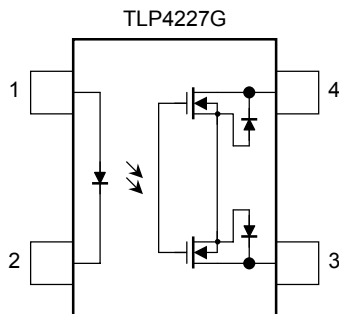
- TLP4227G: 4 pin DIP (DIP4), 1 channel type (1 form B)
- TLP4227G-2: 8 pin DIP (DIP8), 2 channel type (2 form B)
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 150 mA (max)
- On-state resistance: 25 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL recognized: UL1577 File No. E67349

Unit: mm

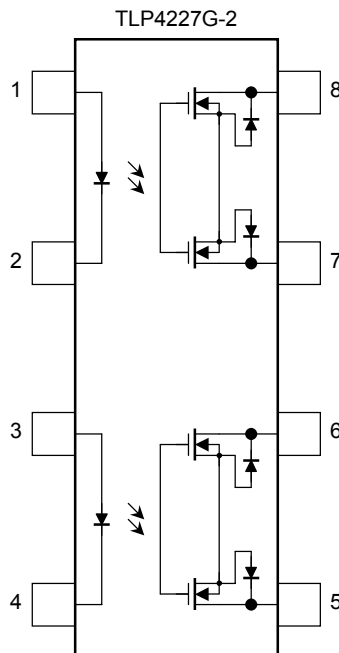


Weight: 0.26 g (typ.)

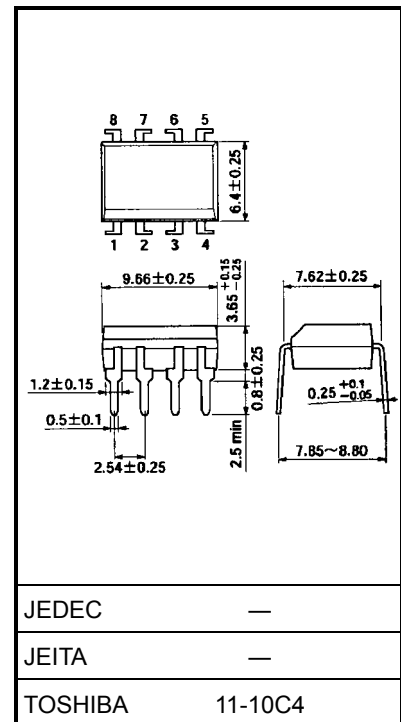
Pin Configuration (top view)



- 1: ANODE
- 2: CATHODE
- 3: DRAIN
- 4: DRAIN



- 1, 3: ANODE
- 2, 4: CATHODE
- 5 : DRAIN D1
- 6 : DRAIN D2
- 7 : DRAIN D3
- 8 : DRAIN D4



Weight: 0.54 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics			Symbol	Rating	Unit
LED	Forward current		I_F	50	mA
	Forward current derating (Ta ≥ 25°C)		$\Delta I_F/^\circ\text{C}$	-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}	350	V
	On-state current	TLP4227G	I_{ON}	150	mA
		TLP4227G-2			
	On-state current derating (Ta ≥ 25°C)	TLP4227G	$\Delta I_{ON}/^\circ\text{C}$	-1.5	mA/°C
		TLP4227G-2			
	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 min, R.H. ≤ 60%) (Note 2)		BV_S	2500	Vrms	

Note 1: Two channels operating simultaneously.

Note 2: Device considered a two-terminal device: LED side pins shorted together, and DETECTOR side pins shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{DD}	—	—	280	V
Forward current	I_F	5	—	25	mA
On-state current	I_{ON}	—	—	150	mA
Operating temperature	T_{opr}	-20	—	65	°C

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}	$V_{OFF} = 350 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}, I_F = 5 \text{ mA}$	—	65	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FC}	$I_{OFF} = 10 \mu\text{A}$	—	1	3	mA
Return LED current	I_{FT}	$I_{ON} = 150 \text{ mA}$	0.1	—	—	mA
On-state resistance	R_{ON}	$I_{ON} = 150 \text{ mA}$	—	15	25	Ω

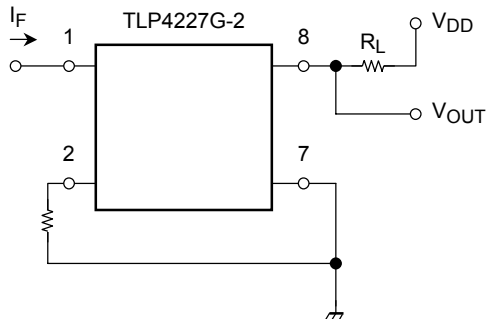
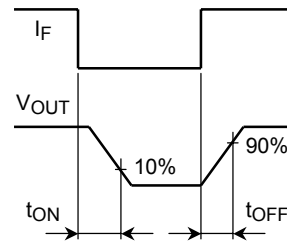
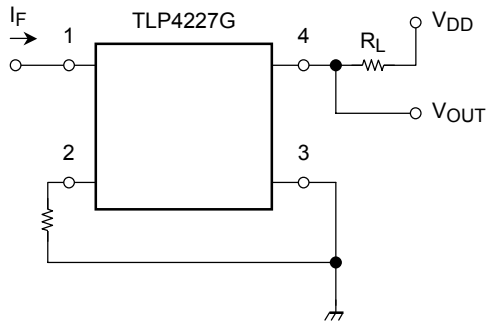
Isolation Characteristics (Ta = 25°C)

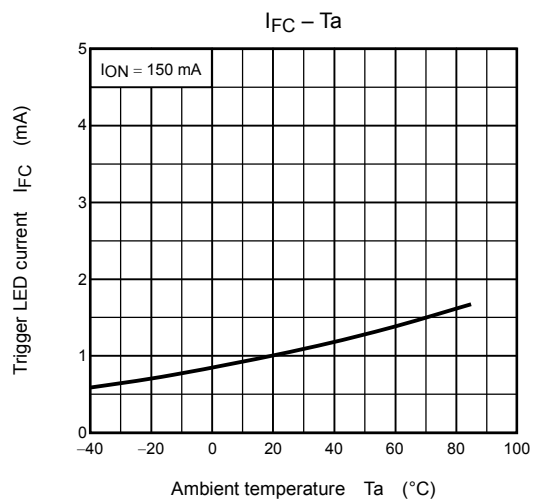
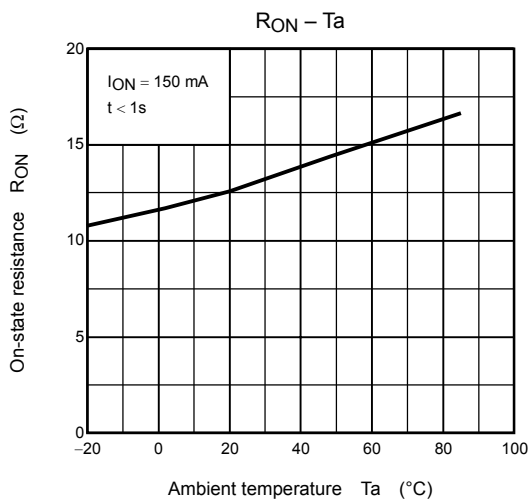
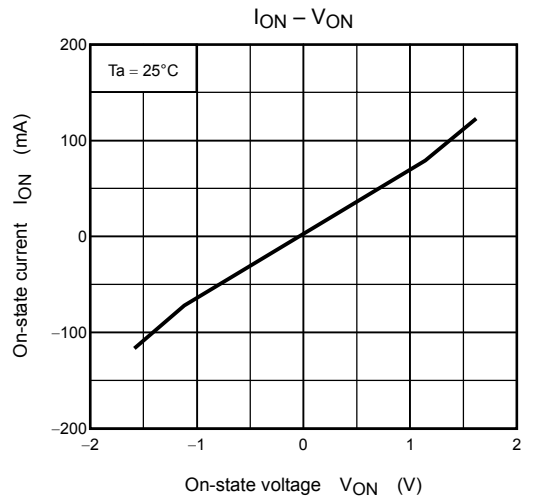
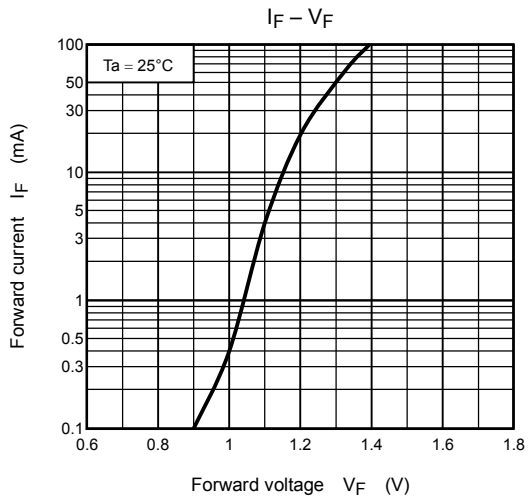
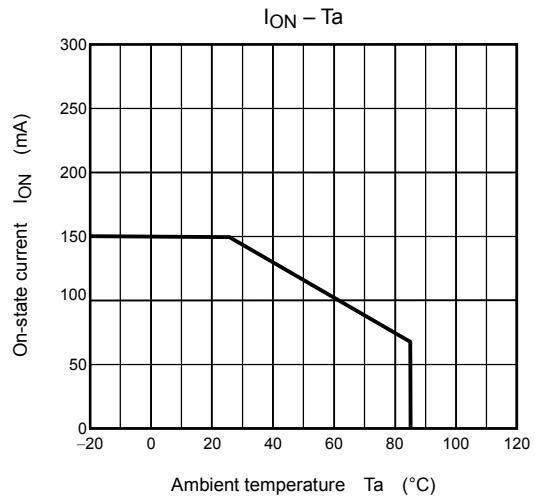
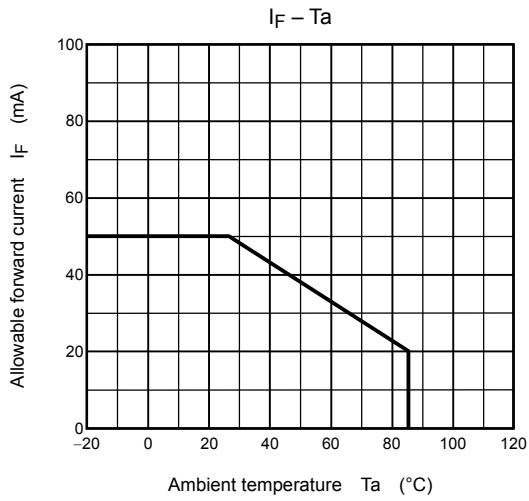
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 min	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	Vdc

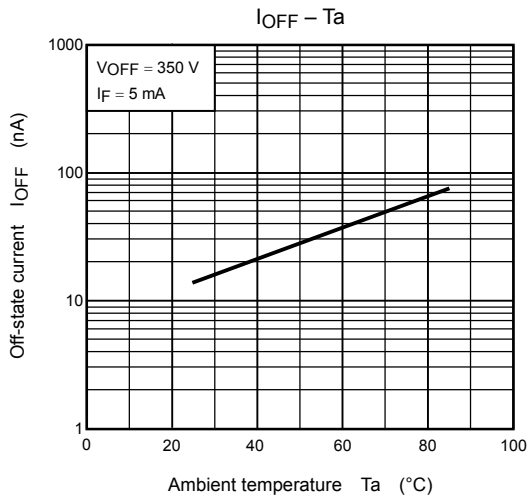
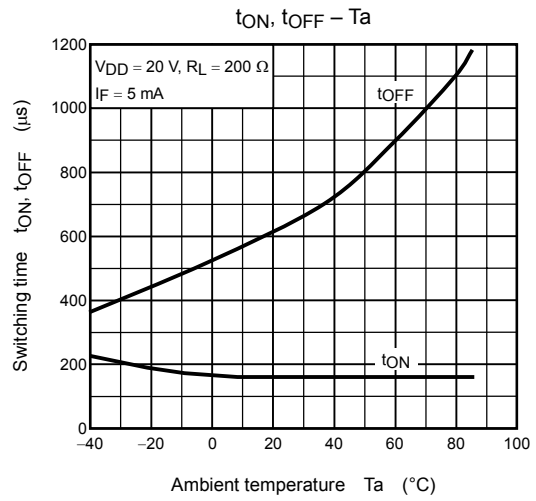
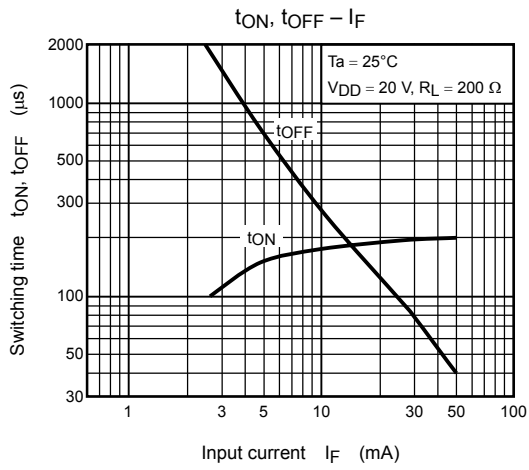
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	$R_L = 200 \Omega$	—	—	1	ms
Turn-off time	t_{OFF}	$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$ (Note 3)	—	—	3	ms

Note 3: Switching time test circuit







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