

TOSHIBA Photocoupler Photorelay

# TLP4227G, TLP4227G-2

PBX

Telecommunication

Modem·FAX Cards, Modems In PC

Measurement Instrumentation

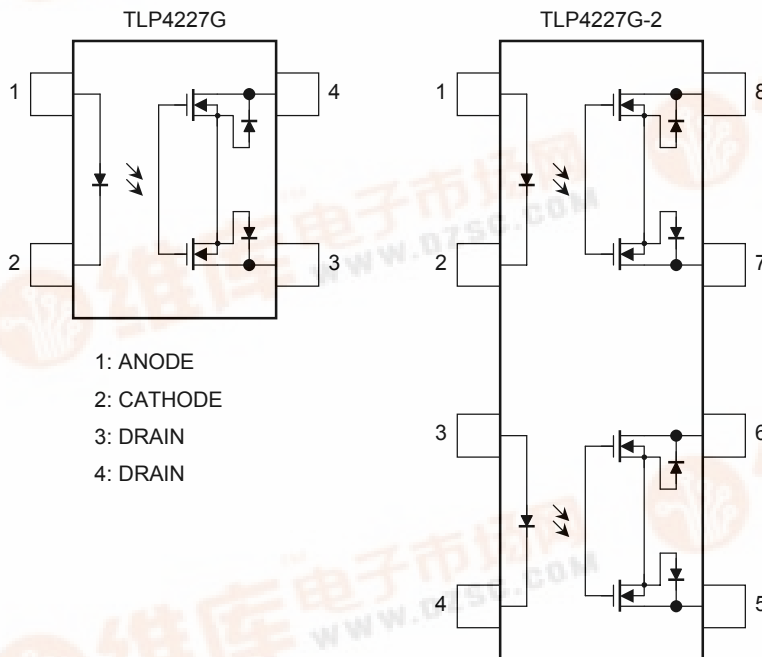
Unit: mm

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.

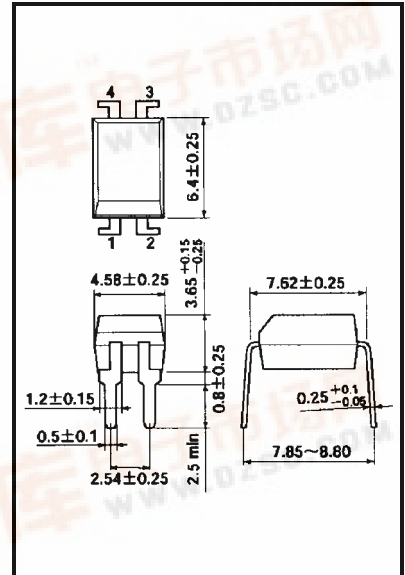
- TLP4227G: 4 pin DIP (DIP4), 1 channel type (1 form B)
- TLP4227G-2: 8 pin DIP (DIP8), 2 channel type (2 form B)
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 150 mA (max)
- On-state resistance: 25 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL recognized: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

## Pin Configuration (top view)



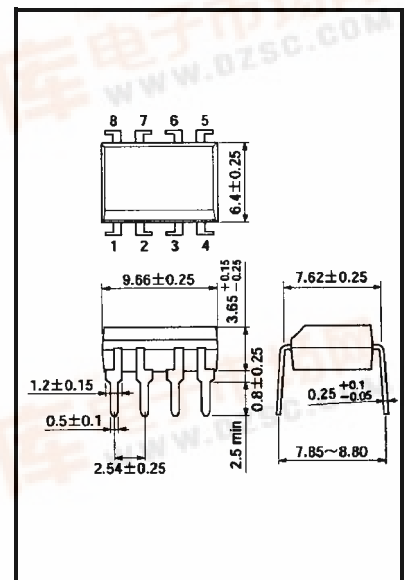
1: ANODE  
2: CATHODE  
3: DRAIN  
4: DRAIN

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



JEDEC	—
JEITA	—
TOSHIBA	11-5B2

Weight: 0.26 g (typ.)



JEDEC	—
JEITA	—
TOSHIBA	11-10C4

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			
			Both channel (Note 1)		
	On-state current derating (Ta ≥ 25°C)	TLP4227G	$\Delta I_{ON}/^\circ\text{C}$	-1.5	mA/°C
		TLP4227G-2			
			Both channel (Note 1)		
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	$\Omega$

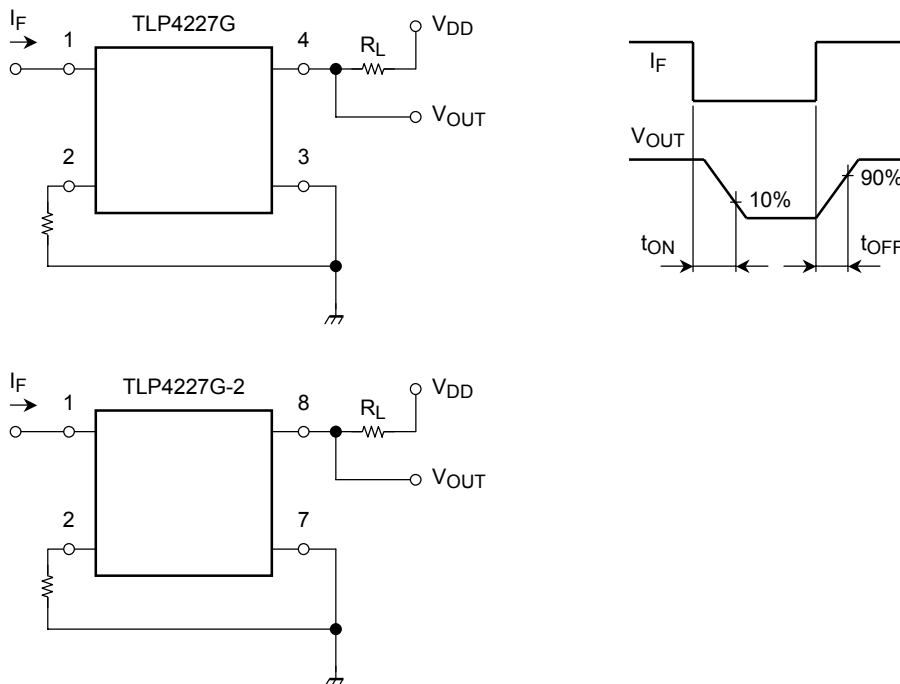
## Isolation Characteristics (Ta = 25°C)

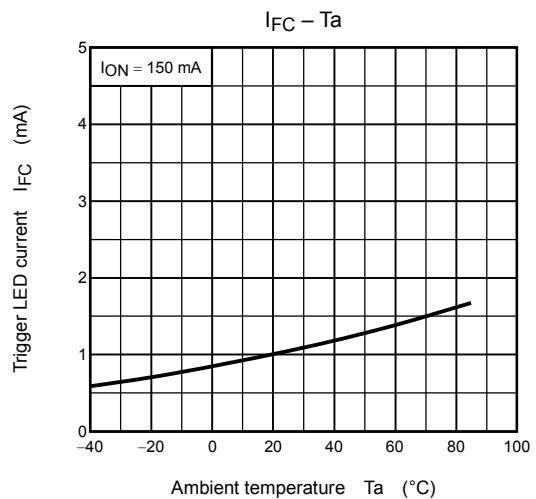
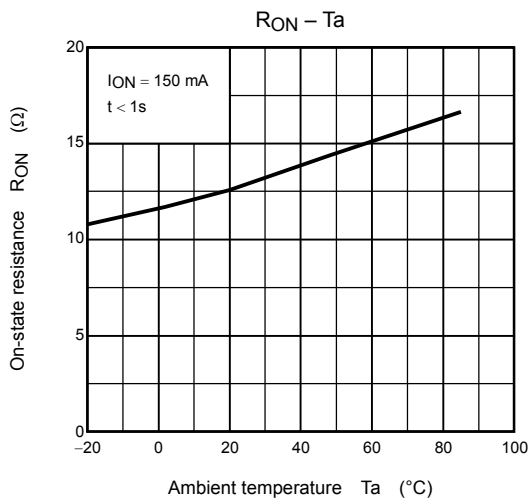
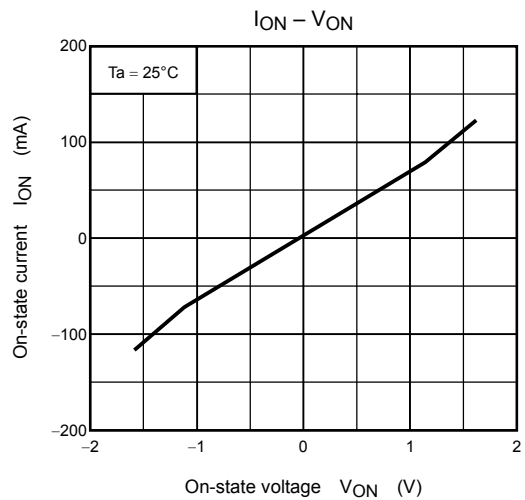
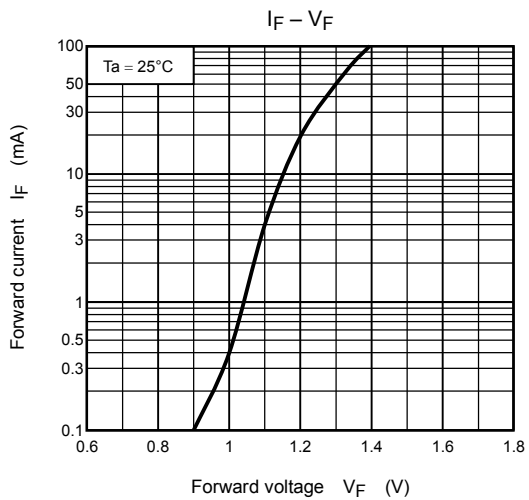
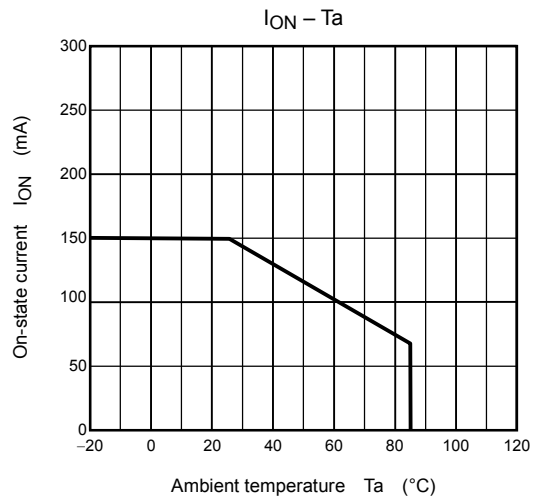
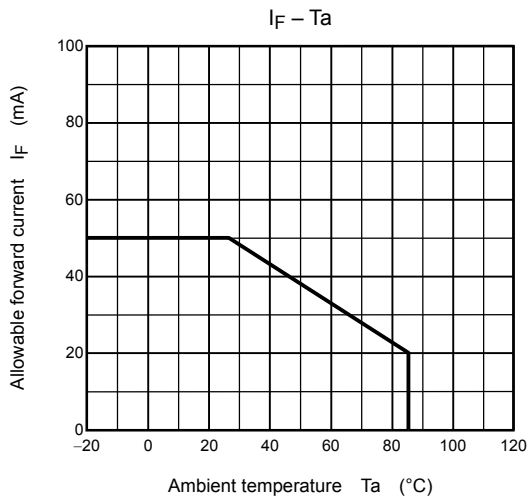
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 min	2500	—	—	Vrms
		AC, 1 s,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

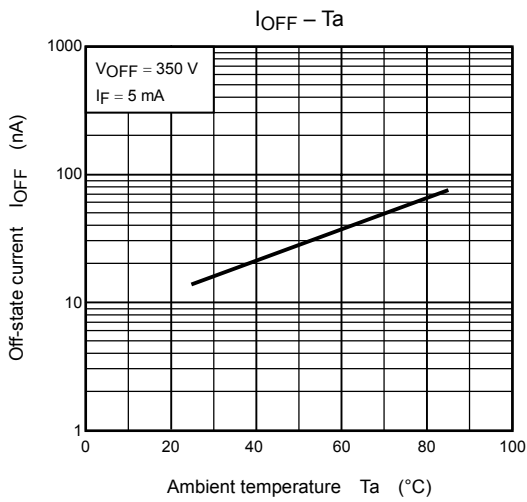
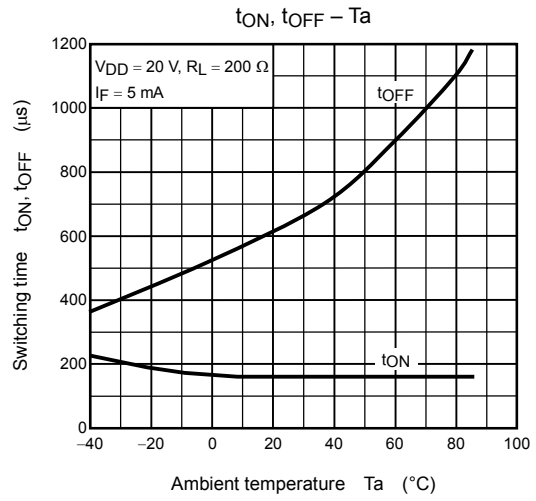
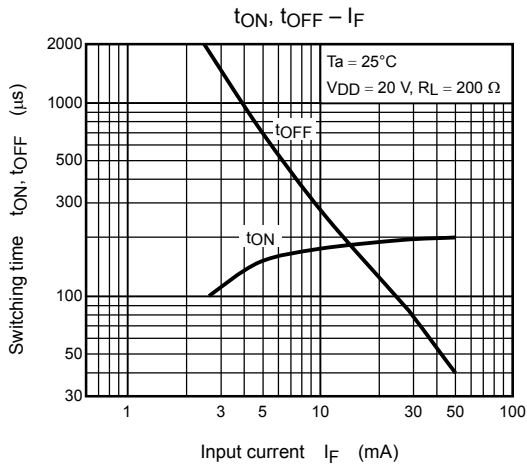
## Switching Characteristics (Ta = 25°C)

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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