

TOSHIBA Photocoupler Photo Relay

# TLP227G, TLP227G-2

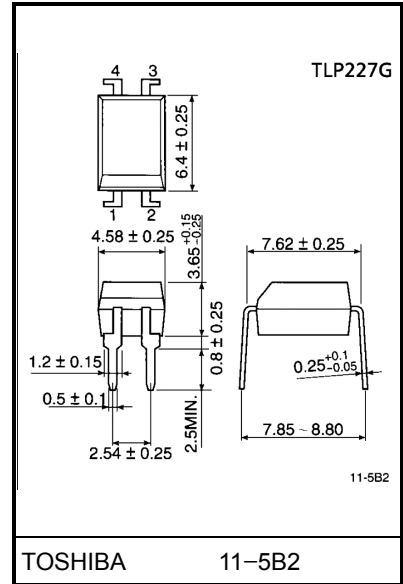
Cordless Telephone  
PBX  
Modem

The TOSHIBA TLP227G series consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic DIP package.

The TLP227G series are a bi-directional switch which can replace mechanical relays in many applications.

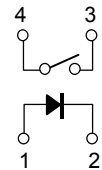
- TLP227G: 4 pin DIP(DIP4), 1 channel type(1 form A)
- TLP227G-2: 8 pin DIP(DIP8), 2 channel type(2 form A)
- Peak off-state voltage: 350V(min.)
- Trigger LED current: 3mA(max.)
- On-state current: 120mA(max.)
- On-state resistance: 35Ω(max.)
- Isolation voltage: 2500Vrms (min.)
- Isolation thickness: 0.4mm(min.)
- BSI approved: BS EN60065: 1994, certificate no.8275  
BS EN60950: 1992, certificate no.8276
- Option(D4) type  
TUV approved: DIN VDE0884 / 06.92,  
certificate no.9850585

Unit in mm

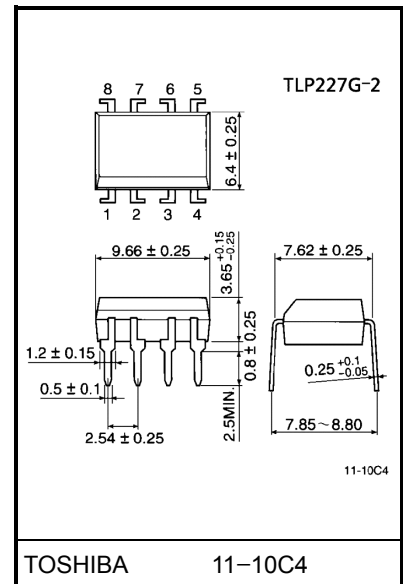
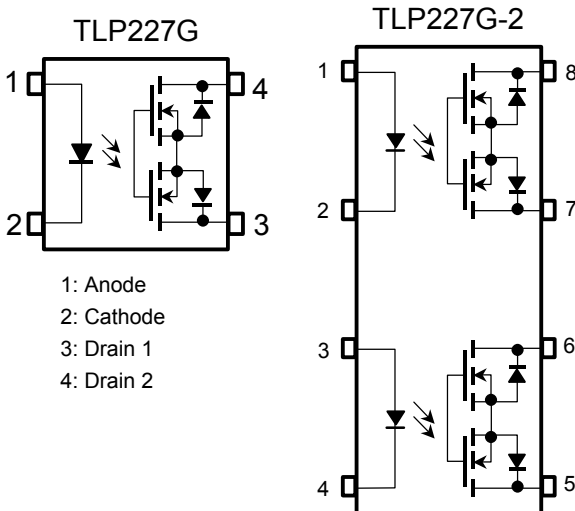


Weight: 0.26g

1 Form A

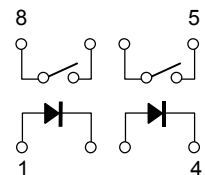


## Pin Configuration (top view)



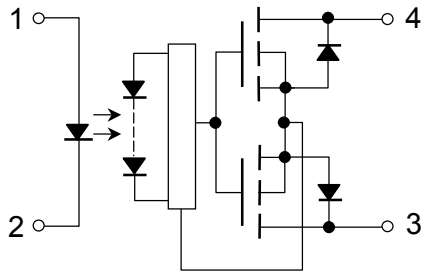
Weight: 0.54g

2 Form A



## Internal Circuit

(TLP227G)



## Maximum Ratings (Ta = 25°C)

Characteristic			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 (100µs pulse, 100pps)		$I_{FP}$	1	A
	Reverse voltage		$V_R$	5	V
	Junction temperature		$T_j$	125	°C
	Off-state output terminal voltage		$V_{OFF}$	350	V
Detector	On-state current	TLP227G	$I_{ON}$	120	mA
		TLP227G-2		One channel	
	Both channel (Note 1)			100	
	On-state current derating (Ta ≥ 25°C)	TLP227G	$\Delta I_{ON} / ^\circ\text{C}$	-1.2	mA / °C
TLP227G-2		One channel		-1.2	
	Both channel (Note 1)	-1.0			
Junction temperature		$T_j$	125	°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
Isolation voltage (AC, 1 min., R.H. ≤ 60%) (Note 2)			$BV_S$	2500	$V_{rms}$

(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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	$V_{DD}$	—	—	280	V
Forward current	$I_F$	5	7.5	25	mA
On-state current	$I_{ON}$	—	—	100	mA
Operating temperature	$T_{opr}$	-20	—	65	°C

## Individual Electrical Characteristics (Ta = 25°C)

Characteristic		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	$\mu\text{A}$
	Capacitance	$C_T$	$V=0, f=1\text{MHz}$	—	30	—	pF
Detector	Off-state current	$I_{OFF}$	$V_{OFF}=350\text{V}$	—	—	1	$\mu\text{A}$
	Capacitance	$C_{OFF}$	$V=0, f=1\text{MHz}$	—	40	—	pF

## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{FT}$	$I_{ON}=120\text{mA}$	—	2	3	mA
On-state resistance	$R_{ON}$	$I_{ON}=120\text{mA}, I_F=5\text{mA}$	—	22	35	$\Omega$
		$I_{ON}=20\sim 120\text{mA}, I_F=5\text{mA}$	—	26	40	

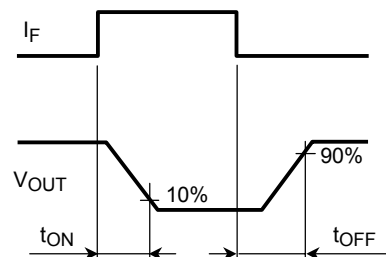
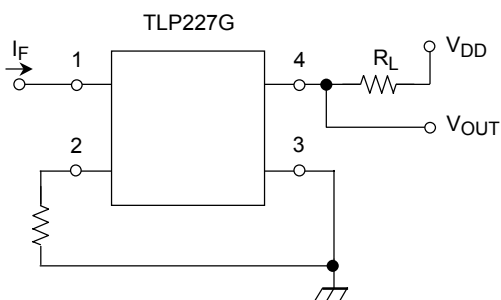
## Isolation Characteristics (Ta = 25°C)

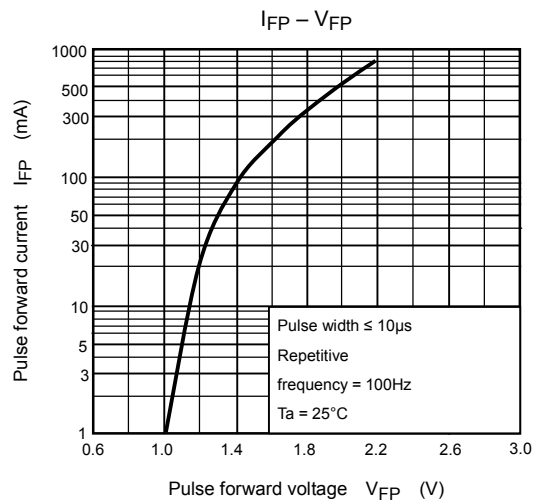
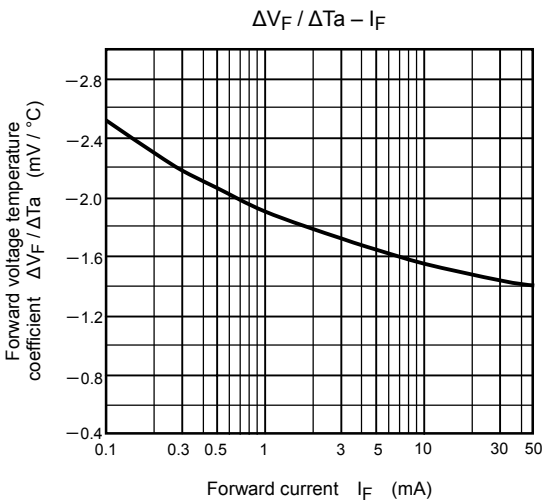
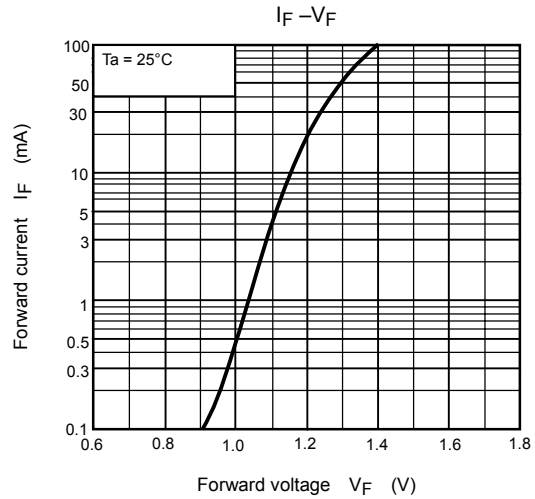
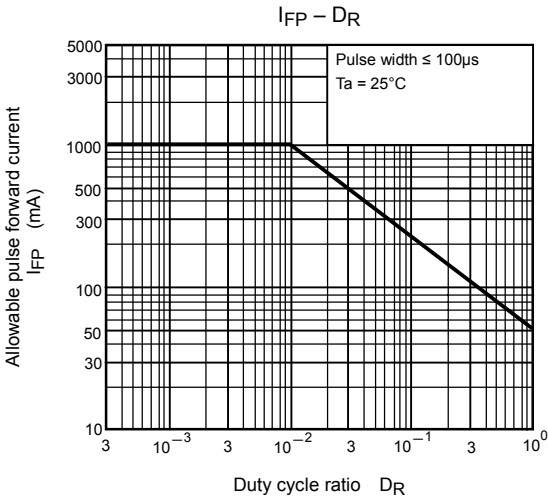
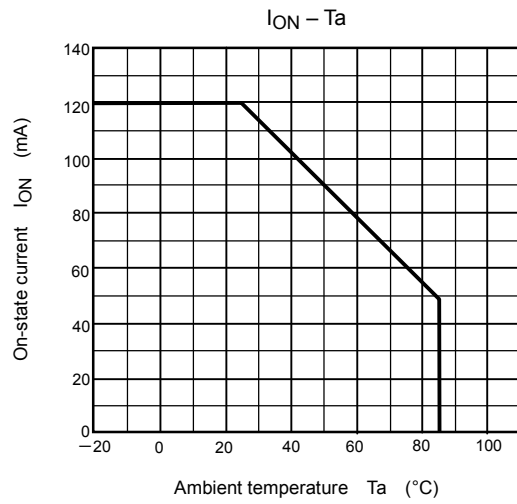
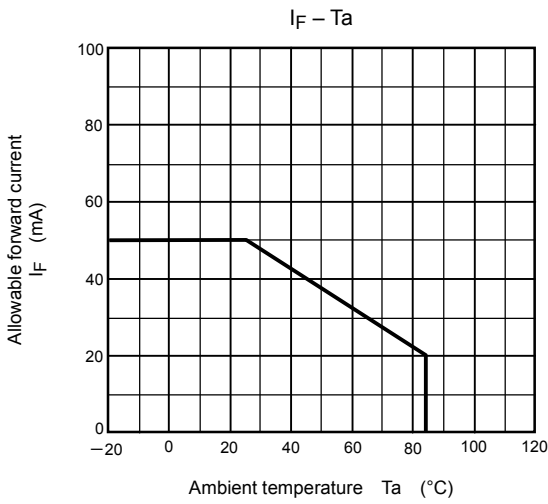
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	$C_S$	$V_S=0, f=1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S=500\text{V}, R.H.\leq 60\%$	$5\times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	$V_{rms}$
		AC, 1 second(in oil)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

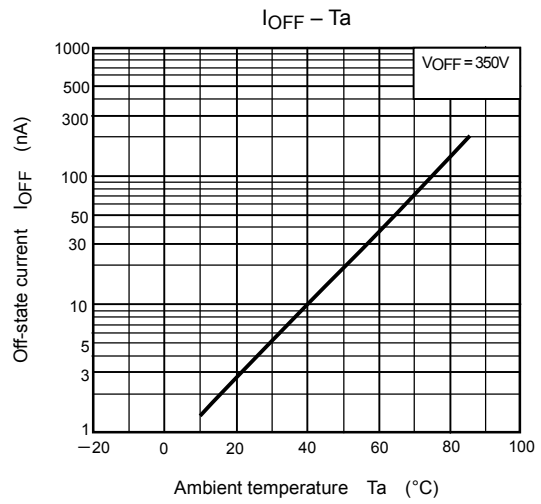
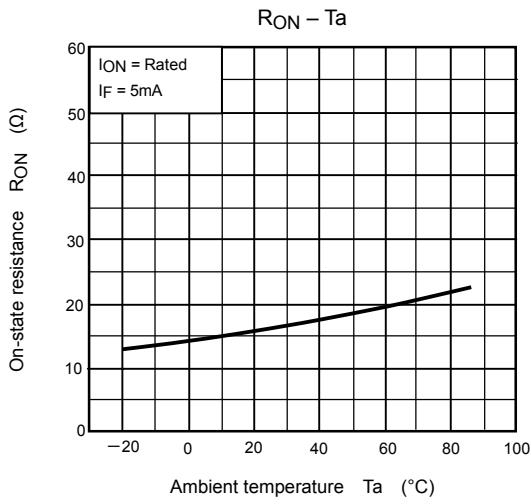
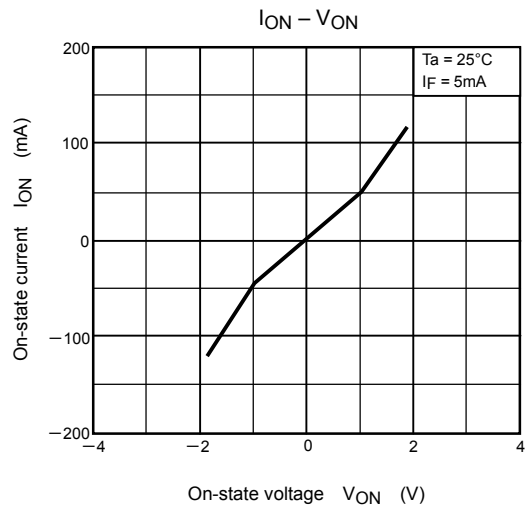
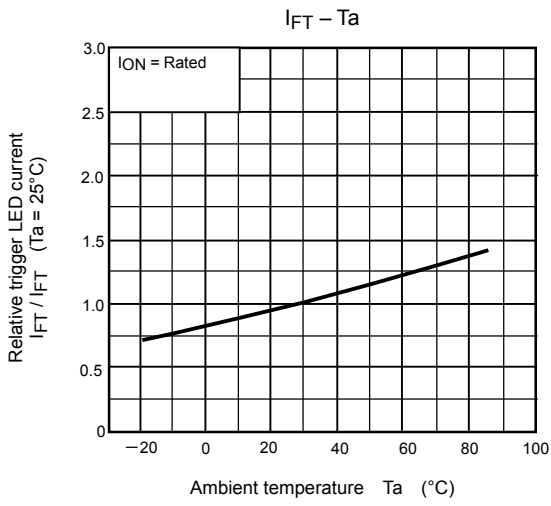
## Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on time	$t_{ON}$	$R_L=200\Omega$	—	0.3	1	ms
Turn-off time	$t_{OFF}$	$V_{DD}=20\text{V}, I_F=5\text{mA}$	—	0.1	1	

## Switching Time Test Circuit







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