

TOSHIBA PHOTOCOUPLER PHOTO RELAY

# TLP227G, TLP227G-2

CORDLESS TELEPHONE

PBX

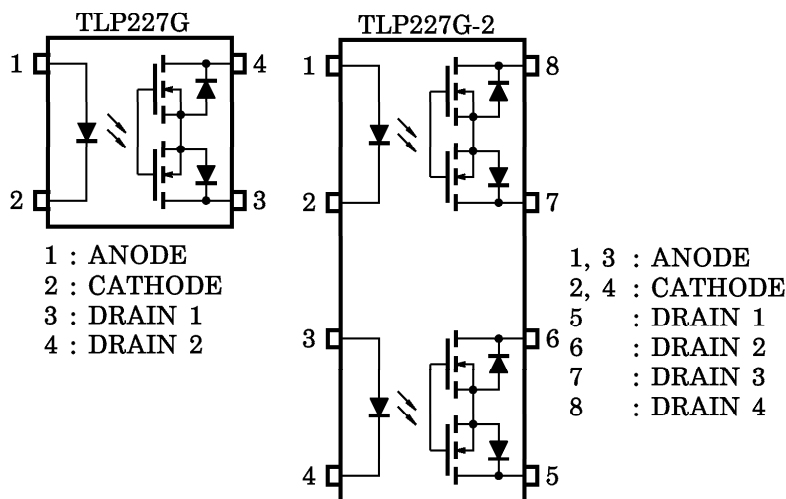
MODEM

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

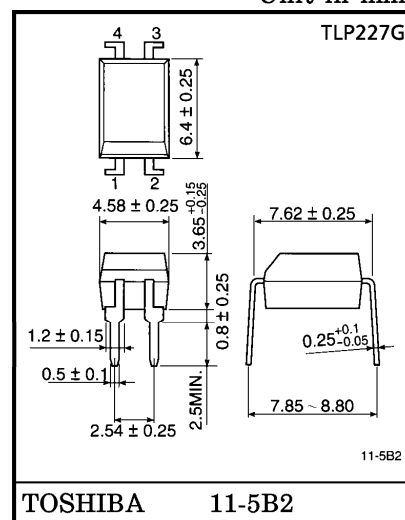
The TLP227G series are a bi-directional switch which can replace mechanical relays in many applications.

- 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 : 350 V (Min.)
- Trigger LED Current : 3mA (Max.)
- On-State Current : 120 mA (Max.)
- On-State Resistance : 35  $\Omega$  (Max.)
- Isolation Voltage : 2500 Vrms (Min.)
- Isolation Thickness : 0.4 mm (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

PIN CONFIGURATION (TOP VIEW)

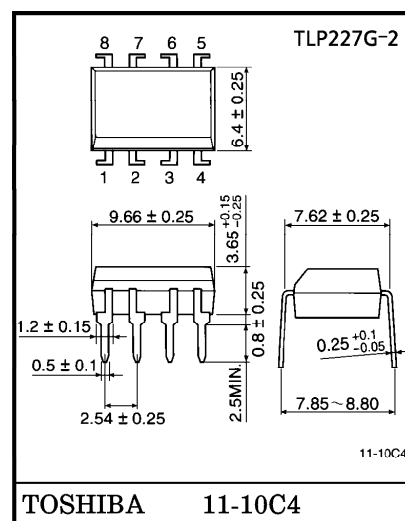
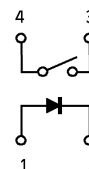


Unit in mm



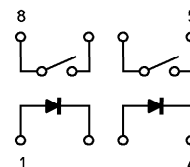
Weight : 0.26 g

1 Form A



Weight : 0.54 g

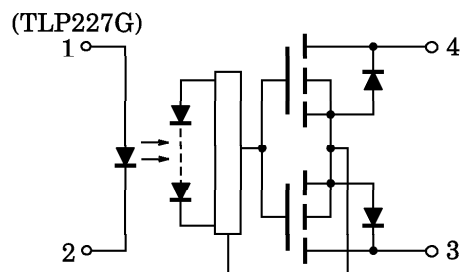
2 Form A



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● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

## INTERNAL CIRCUIT



## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC				SYMBOL	RATING	UNIT
LED	Forward Current			I <sub>F</sub>	50	mA
	Forward Current Derating (Ta ≥ 25°C)			ΔI <sub>F</sub> / °C	−0.5	mA / °C
	Peak Forward Current (100 μs pulse, 100 pps)			I <sub>FP</sub>	1	A
	Reverse Voltage			V <sub>R</sub>	5	V
	Junction Temperature			T <sub>j</sub>	125	°C
	Off-State Output Terminal Voltage			V <sub>OFF</sub>	350	V
DETECTOR	On-State Current	TLP227G		I <sub>ON</sub>	120	mA
		TLP227G-2	One Channel		120	
			Both Channel (Note 1)		100	
	On-State Current Derating (Ta ≥ 25°C)	TLP227G		ΔI <sub>ON</sub> / °C	−1.2	mA / °C
		TLP227G-2	One Channel		−1.2	
			Both Channel (Note 1)		−1.0	
	Junction Temperature			T <sub>j</sub>	125	°C
	Storage Temperature Range			T <sub>stg</sub>	−55~125	°C
Operating Temperature Range			T <sub>opr</sub>	−40~85	°C	
Lead Soldering Temperature (10 s)			T <sub>sol</sub>	260	°C	
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 2)			BV <sub>S</sub>	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

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

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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
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- The information contained herein is subject to change without notice.

## 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	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	2500	—	—	$V_{rms}$
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—	5000	—	Vdc

## 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

