TOSHIBA Photocoupler Photo Relay

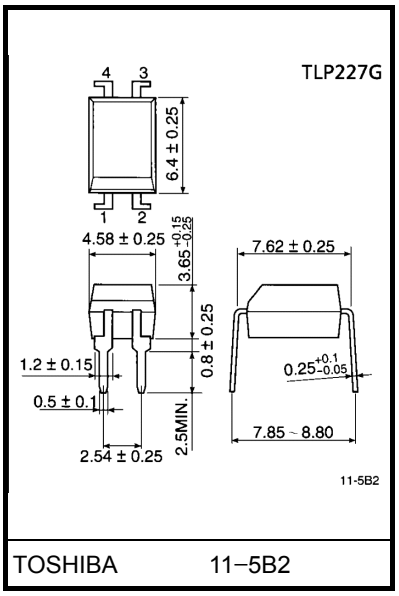
TLP227G,TLP227G−2

Cordless Telephone

PBX

Modem

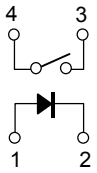
Unit in mm



TOSHIBA 11−5B2

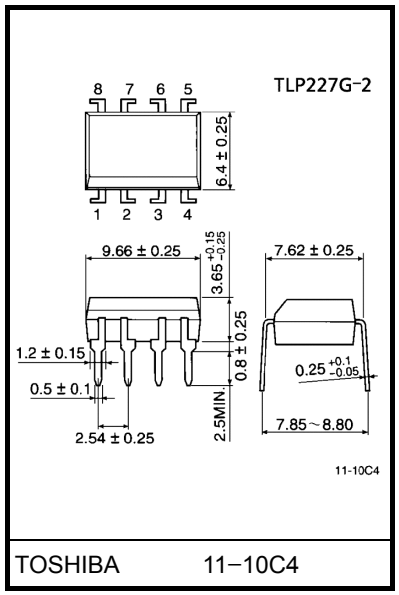
Weight: 0.26g

1 Form A



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.

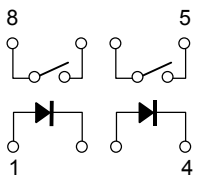
- TLP227G: 4 pin DIP(DIP4),1 channel type(1 form A)
- TLP227G−2: 8 pin DIP(DIP8),2 channel type(2 form A)
- Peak off−state voltage: 350V(min.)
- Trigger LED current: 3mA(max.)
- On−state current: 120mA(max.)
- On−state resistance: 35Ω(max.)
- Isolation voltage: 2500Vrms (min.)
- Isolation thickness: 0.4mm(min.)
- BSI approved: BS EN60065: 2002, certificate no.8275
  BS EN60950-1: 2002, certificate no.8276
- Option(D4) type
  TUV approved: DIN EN 60747-5-2,
  certificate no. 40011913



TOSHIBA 11−10C4

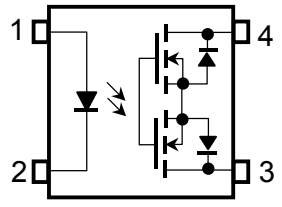
Weight: 0.54g

2 Form A



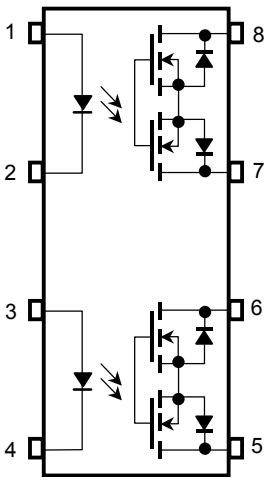
Pin Configuration (top view)

TLP227G



1: Anode
2: Cathode
3: Drain 1
4: Drain 2

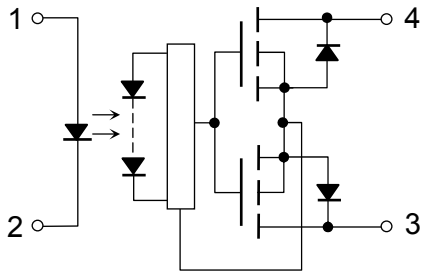
TLP227G-2



1, 3: Anode
2, 4: Cathode
5: Drain 1
6: Drain 2
7: Drain 3
8: Drain 4

Internal Circuit

(TLP227G)



Absolute Maximum Ratings (Ta = 25°C)

Characteristic				Symbol	Rating	Unit
LED	Forward current			I_F	50	mA
	Forward current derating(Ta ≥ 25°C)			ΔI_F / °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		120	
			Both channel (Note 1)		100	
	On-state current derating(Ta ≥ 25°C)	TLP227G		ΔI_{ON} / °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: 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): 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

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.

Individual Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F=10mA	1.0	1.15	1.3	V
LED	Reverse current	I_R	V_R=5V	—	—	10	μA
LED	Capacitance	C_T	V=0,f=1MHz	—	30	—	pF
Detector	Off−state current	I_{OFF}	V_{OFF}=350V	—	—	1	μA
Detector	Capacitance	C_{OFF}	V=0,f=1MHz	—	40	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	I_{ON}=120mA	—	2	3	mA
On−state resistance	R_{ON}	I_{ON}=120mA,I_F=5mA	—	22	35	Ω
		I_{ON}=20~120mA, I_F=5mA	—	26	40	

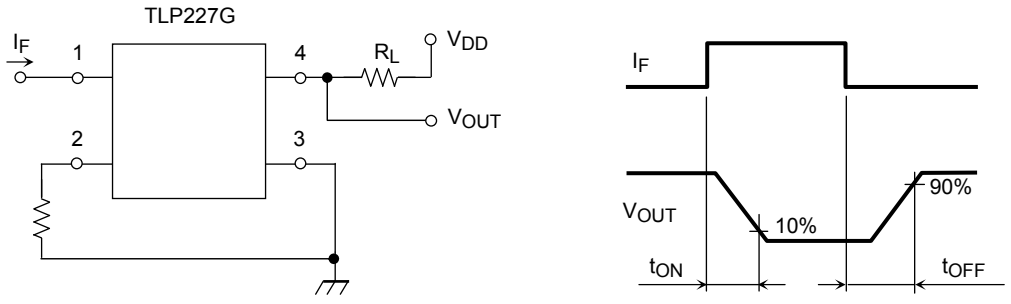
Isolation Characteristics (Ta = 25°C)

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

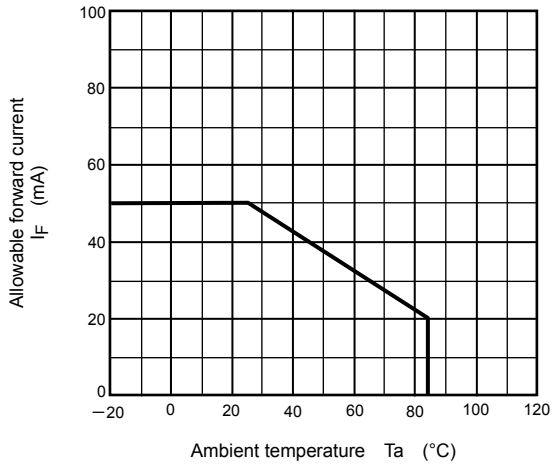
Switching Characteristics (Ta = 25°C)

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

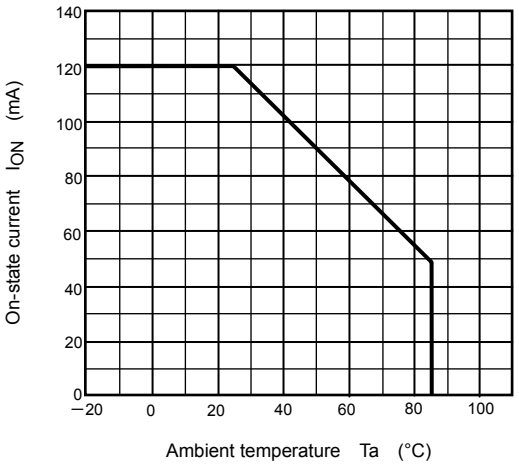
Switching Time Test Circuit



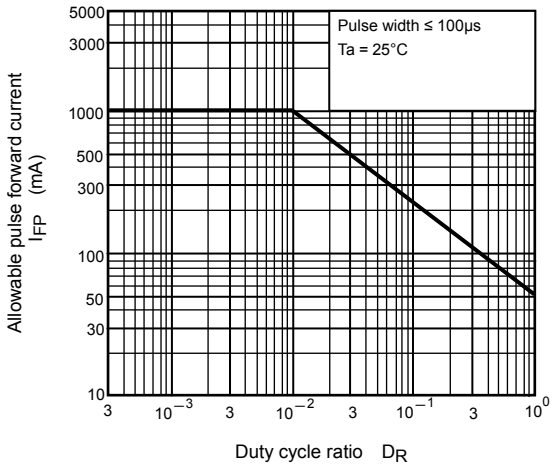
I_F – Ta



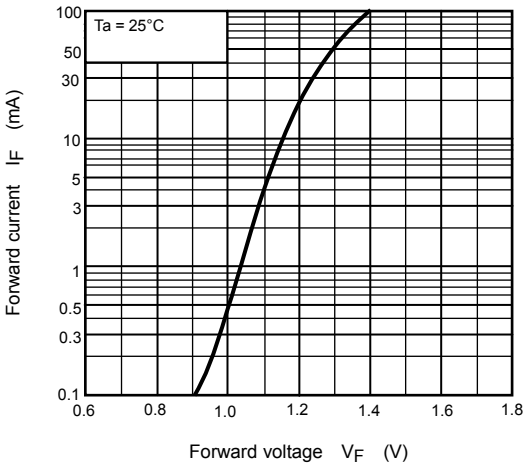
I_{ON} – Ta



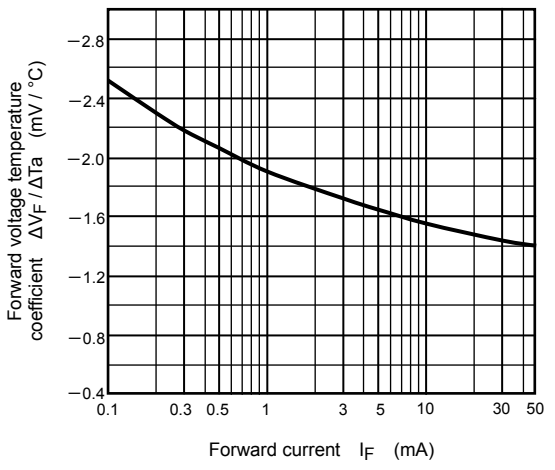
I_{FP} – D_R



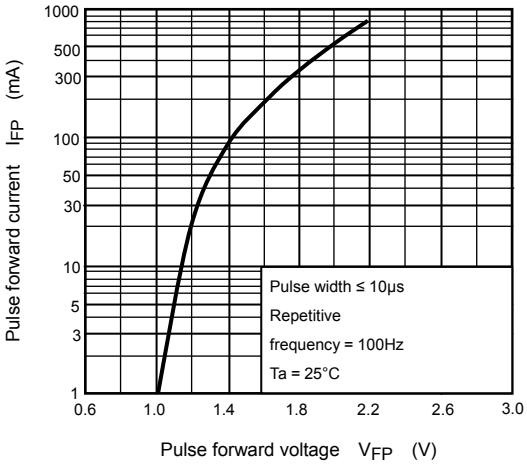
I_F –V_F



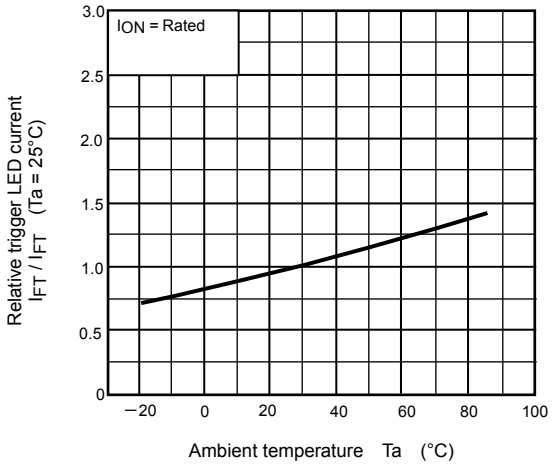
ΔV_F / ΔTa – I_F



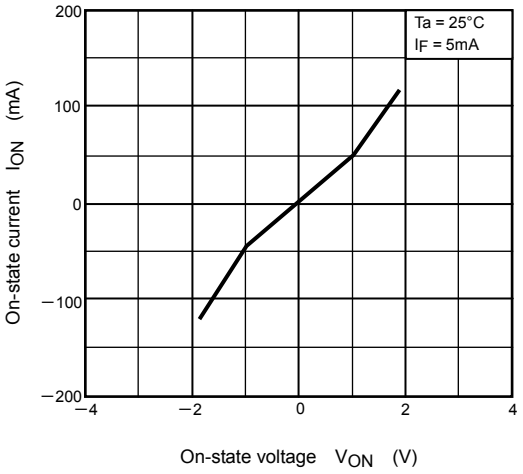
I_{FP} – V_{FP}



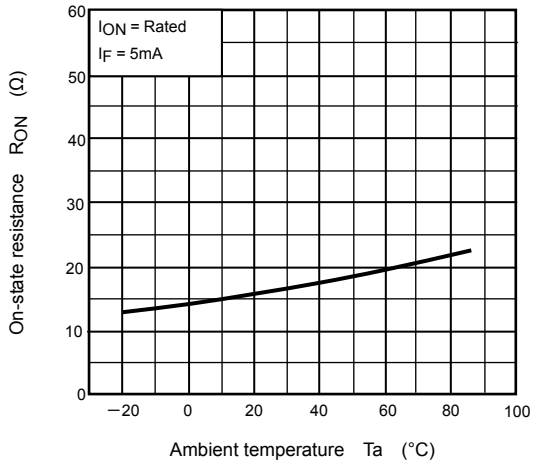
I_{FT} – Ta



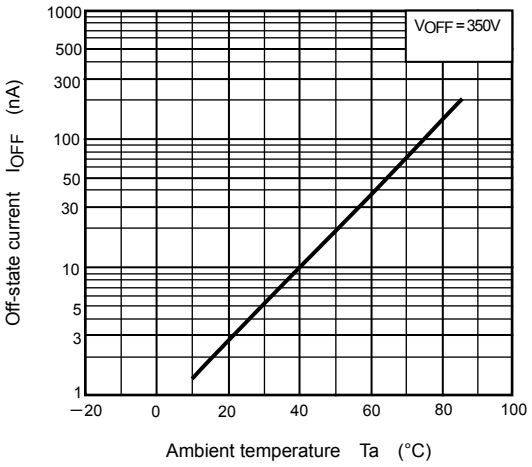
I_{ON} – V_{ON}



R_{ON} – Ta



I_{OFF} – Ta



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20070701-EN

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