

TOSHIBA Photocoupler Photo Relay

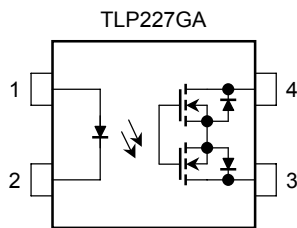
## TLP227GA, TLP227GA-2

Modem  
Telecommunications  
PBXs

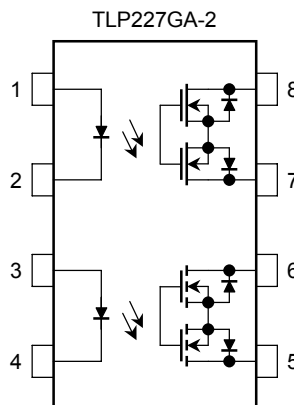
The Toshiba TLP227GA series consist of a gallium arsenide infrared-emitting diode optically coupled to a photo-MOSFET in a 4-pin DIP or a 8-pin DIP package, and has a peak off-State voltage of 400 V.

- Normally off function
- TLP227GA : DIP4 (1 form A)  
TLP227GA-2 : DIP8 (2 form A)
- Peak off-state voltage : 400 V (min)
- Trigger LED current : 3 mA (max)
- On-state current : 120 mA (max)
- On-state resistance : 35Ω (max)
- Isolation voltage : 2500 Vrms (min)

### Pin Configuration (top view)

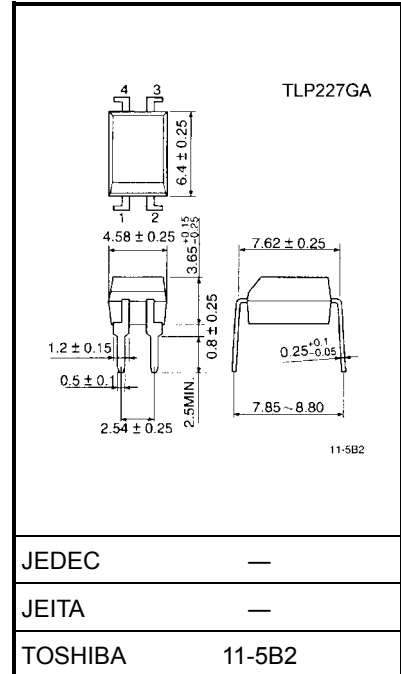


1: Anode  
2: Cathode  
3: Drain  
4: Drain

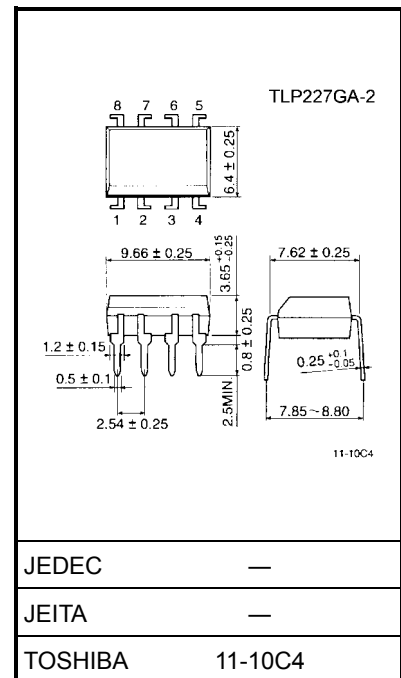


1, 3: Anode  
2, 4: Cathode  
5 : Drain D1  
6 : Drain D2  
7 : Drain D3  
8 : Drain D4

Unit: mm



Weight: 0.26 g (typ.)



Weight: 0.54 g (typ.)

## Maximum Rating (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 (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		$V_{OFF}$	400	V
	On-state current	TLP227GA	$I_{ON}$	120	Ma
		TLP227GA-2			
	On-state current rating (Ta ≥ 25°C)	TLP227GA	$\Delta I_{ON}/^\circ\text{C}$	-1.2	mA/°C
		TLP227GA-2			
	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 1)		$BV_S$	2500	Vrms	

Note 1: LED pins are shorted together. Detector pins are also shorted together.

## Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	$V_{DD}$	—	—	320	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	μA
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	$I_{OFF}$	$V_{OFF} = 400 \text{ V}$	—	—	1	μA
	Capacitance	$C_{OFF}$	$V = 0, f = 1 \text{ MHz}$	—	—	—	pF

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

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	$I_{FT}$	$I_{ON} = 120 \text{ mA}$	—	1	3	mA
On-state resistance	$R_{ON}$	$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	18	35	$\Omega$

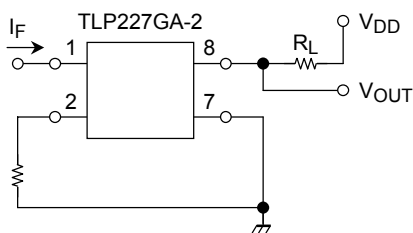
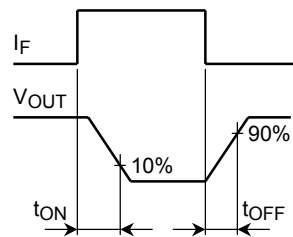
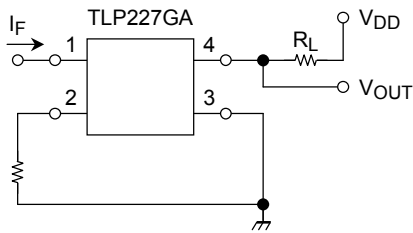
## Isolation Characteristics (Ta = 25°C)

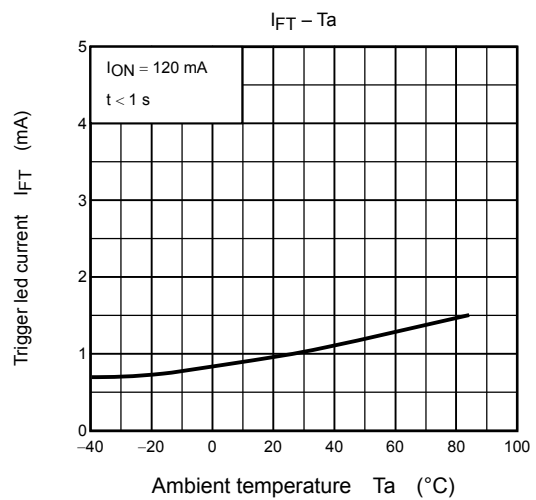
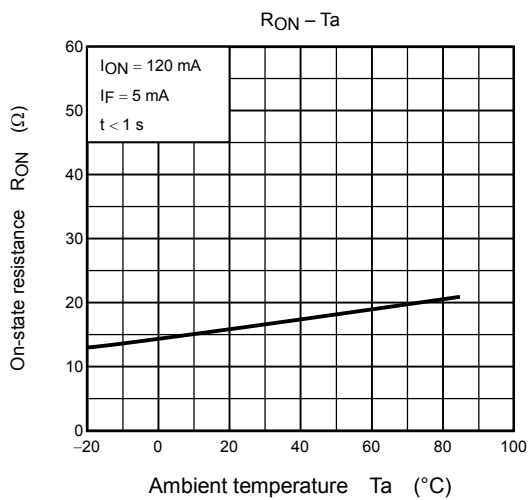
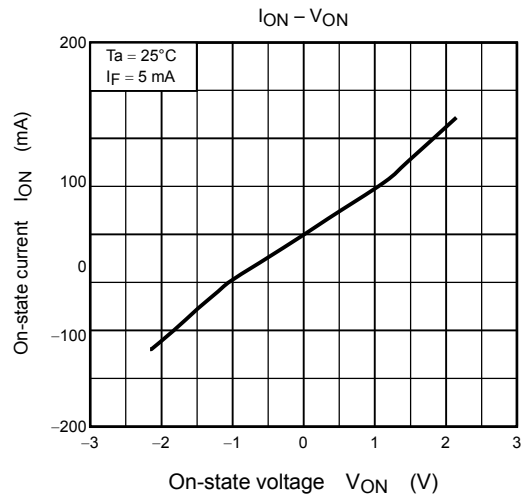
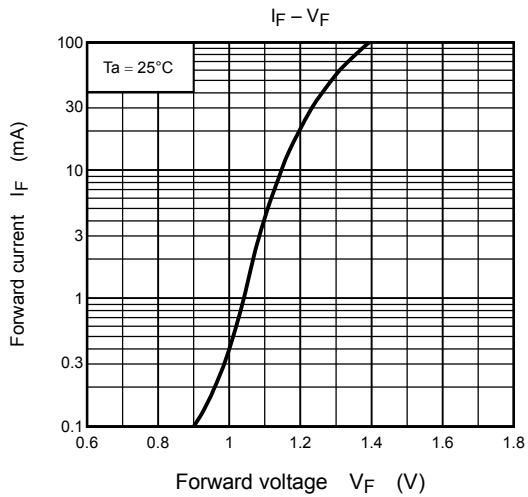
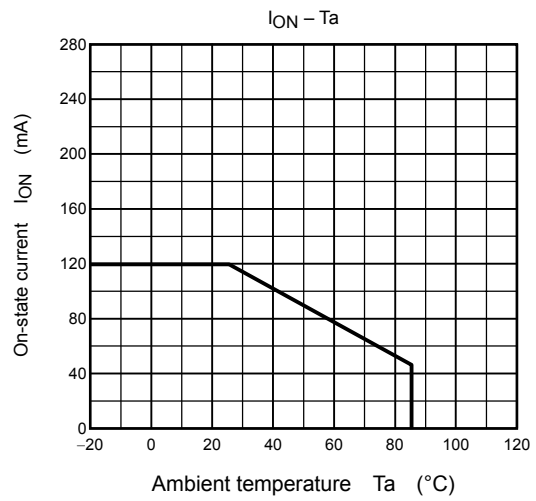
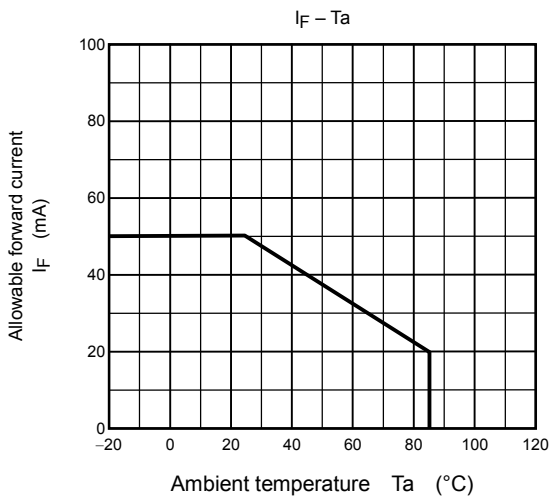
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, R.H. \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 min	2500	—	—	Vrms
		AC, 1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

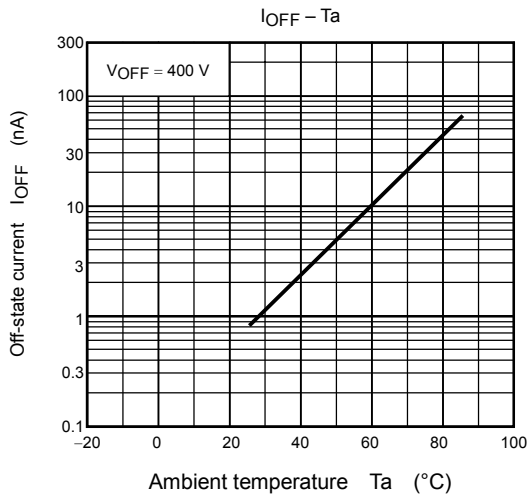
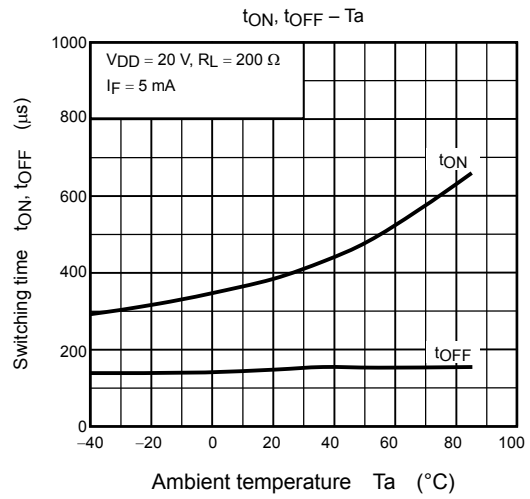
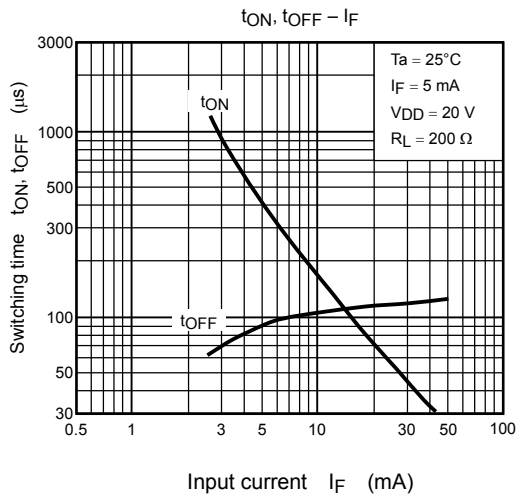
## Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$	$R_L = 200 \Omega$ $V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$ (Note 2)	—	—	1	ms
Turn-off time	$t_{OFF}$		—	—	1	

Note 2: Switching time test circuit







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