TOSHIBA Photocoupler Photo Relay

TLP227GA, TLP227GA-2

Modem

Telecommunications

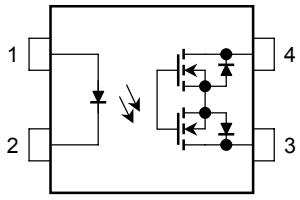
PBXs

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)

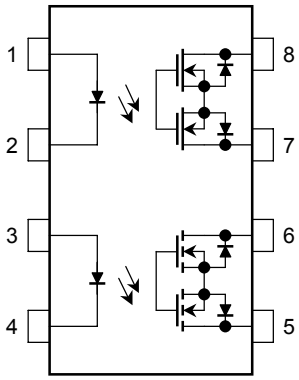
Pin Configuration (top view)

TLP227GA



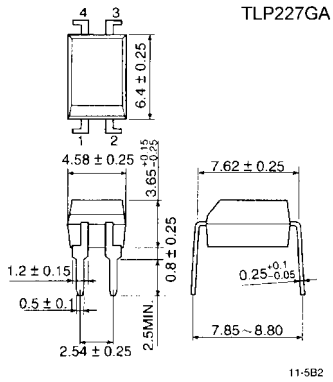
1: Anode
2: Cathode
3: Drain
4: Drain

TLP227GA-2



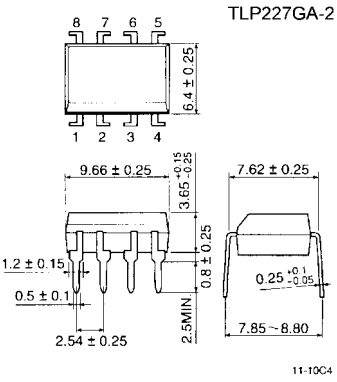
1, 3: Anode
2, 4: Cathode
5 : Drain D1
6 : Drain D2
7 : Drain D3
8 : Drain D4

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	11-5B2

Weight: 0.26 g (typ.)



JEDEC	—
JEITA	—
TOSHIBA	11-10C4

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)			ΔI_F/°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	One channel			
			Both channel			
	On-state current rating (Ta ≧ 25°C)	TLP227GA		ΔI_{ON}/°C	−1.2	mA/°C
		TLP227GA-2	One channel			
			Both channel			
	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 mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	30	—	pF
Detector	Off-state current	I_{OFF}	V_{OFF} = 400 V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	—	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

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

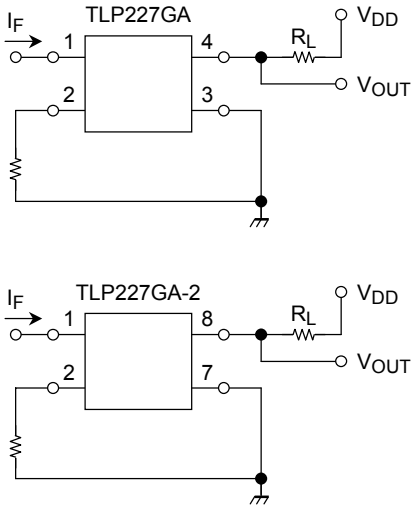
Isolation Characteristics (Ta = 25°C)

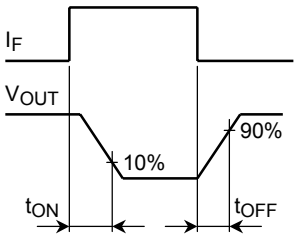
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 min	2500	—	—	Vrms
		AC, 1 s (in oil)	—	5000	—	
		DC, 1 min (in oil)	—	5000	—	Vdc

Switching Characteristics (Ta = 25°C)

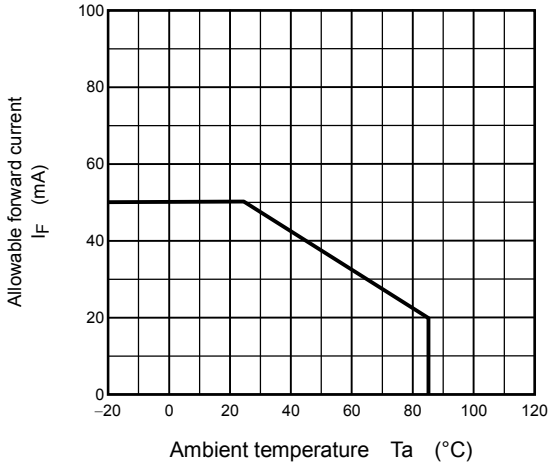
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	R_L = 200 Ω V_{DD} = 20 V, I_F = 5 mA (Note 2)	—	—	1	ms
Turn-off time	t_{OFF}		—	—	1	

Note 2: Switching time test circuit

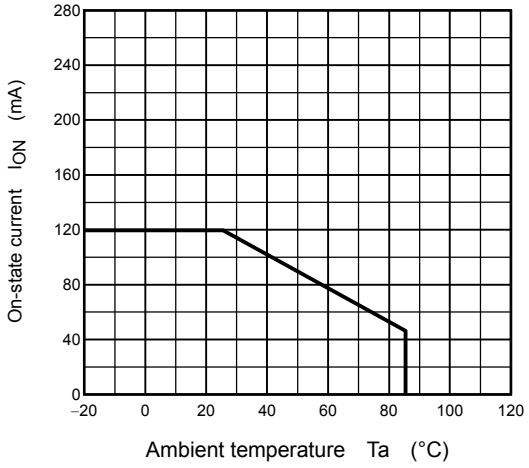




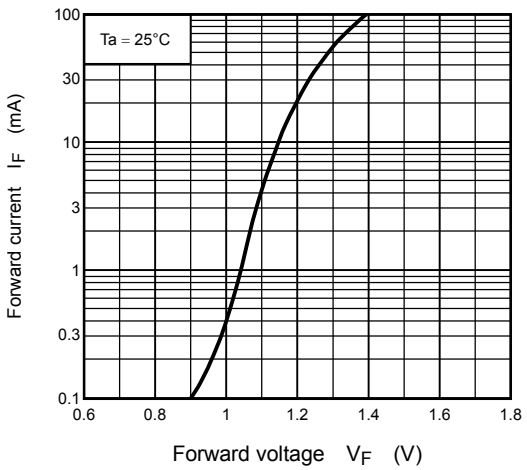
I_F – Ta



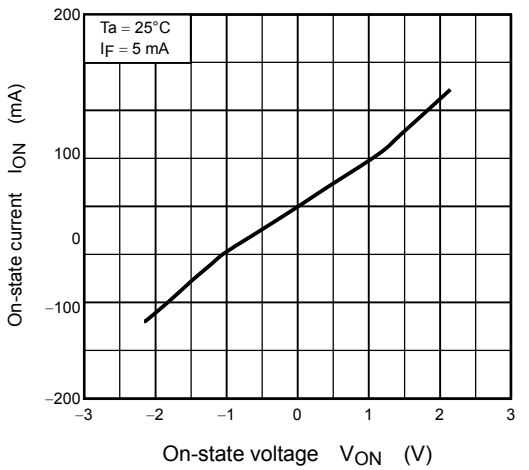
I_{ON} – Ta



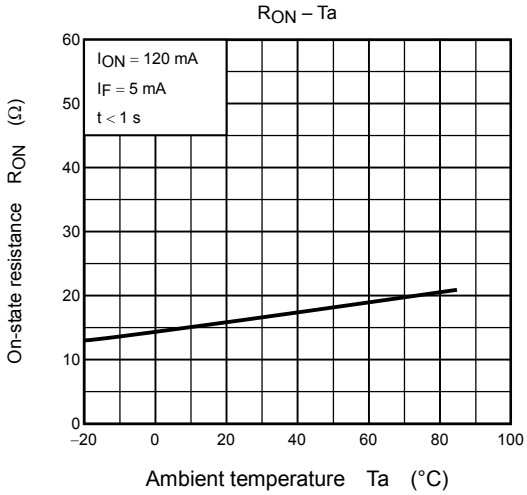
I_F – V_F



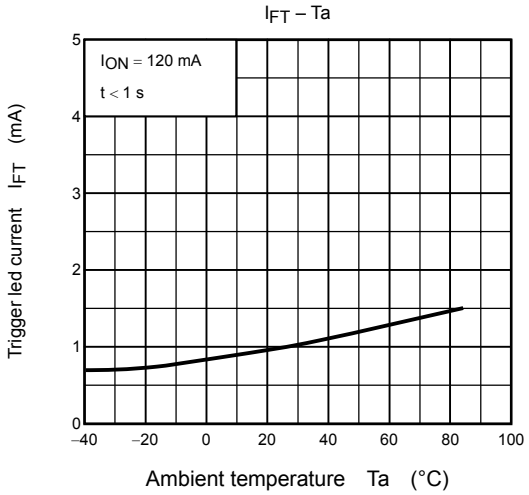
I_{ON} – V_{ON}



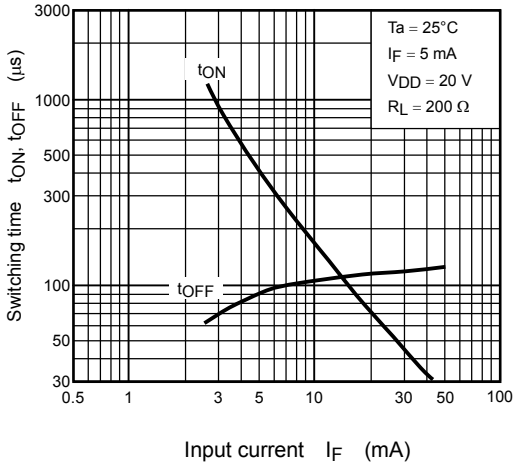
R_{ON} – Ta



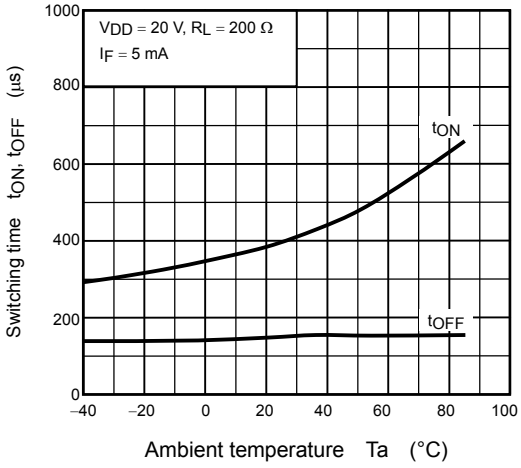
I_{FT} – Ta



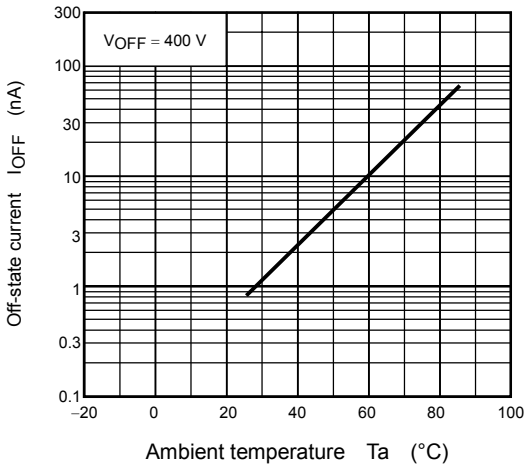
t_{ON}, t_{OFF} – I_F



t_{ON}, t_{OFF} – Ta



I_{OFF} – Ta



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