TLP227GA, TLP227GA-2

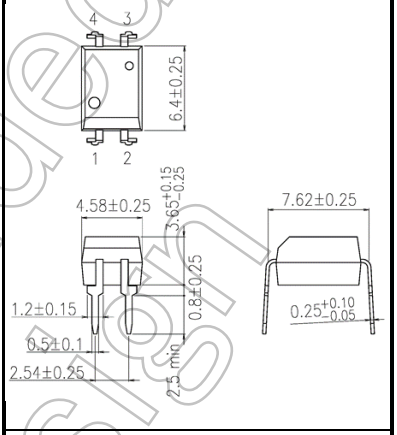
Modem
Telecommunications
PBXs

The Toshiba TLP227GA series consist of an 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 : 35 Ω (max)
- Isolation voltage : 2500 Vrms (min)
- UL-recognized : UL 1577, File No.E67349
- cUL-recognized : CSA Component Acceptance Service No.5A
  File No.E67349

Unit: mm

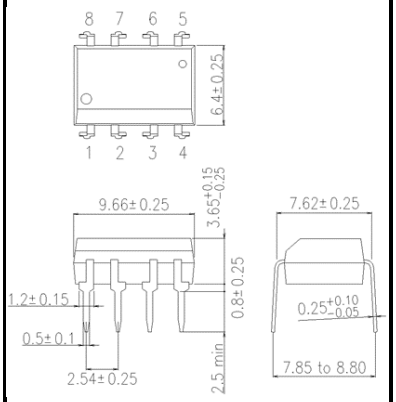
TLP227G



JEDEC	—
JEITA	—
TOSHIBA	11-5B2S

Weight: 0.26 g (typ.)

TLP227GA-2

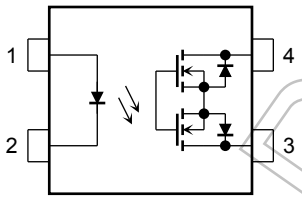


JEDEC	—
JEITA	—
TOSHIBA	11-10C4S

Weight: 0.54 g (typ.)

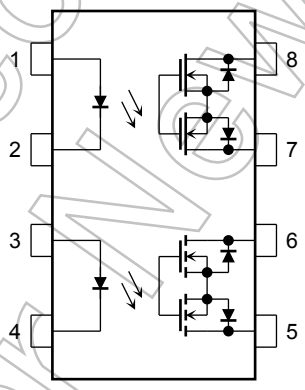
Pin Configuration (top view)

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

Start of commercial production
2000-04

Absolute Maximum Ratings (Ta = 25°C)

Characteristics				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
	Diode power dissipation			P_D	50	mW
	Diode power dissipation derating (Ta ≥25°C)			ΔP_D /°C	-0.5	mW/°C
	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			
	Output power dissipation		TLP227GA	Po	432	mW
			TLP227GA-2		600	
	Output power dissipation derating (Ta ≥ 25°C)		TLP227GA	ΔPo / °C	−4.32	mW / °C
			TLP227GA-2		−6.0	
	Junction temperature			T_j	125	°C
Storage temperature range				T_{stg}	−55 to 125	°C
Operating temperature range				T_{opr}	−40 to 85	°C
Lead soldering temperature (10 s)				T_{sol}	260	°C
Isolation voltage (AC, 60 s, R.H. ≤ 60 %) (Note 1)				BV_S	2500	Vrms

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

Recommended Operating Conditions

Characteristics	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

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)

	Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	I_F = 10 mA	1.0	1.15	1.3	V
LED	Reverse current	I_R	V_R = 5 V	—	—	10	μA
LED	Capacitance	C_T	VF = 0 V, f = 1 MHz	—	30	—	pF
Detector	Off-state current	I_{OFF}	V_{OFF} = 400 V	—	—	1	μA

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	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

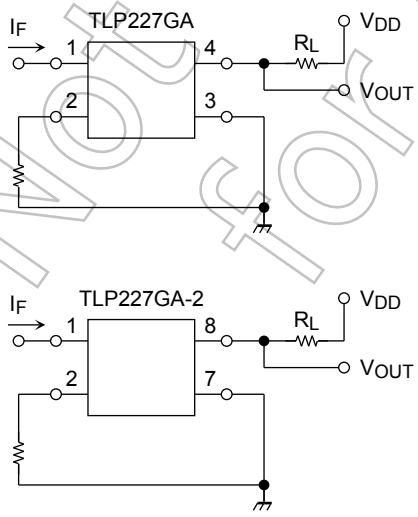
Isolation Characteristics (Ta = 25°C)

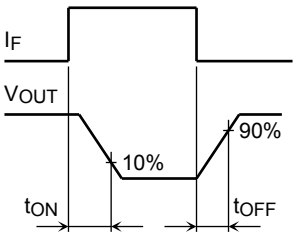
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≦ 60 %	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 60 s	2500	—	—	Vrms

Switching Characteristics (Ta = 25°C)

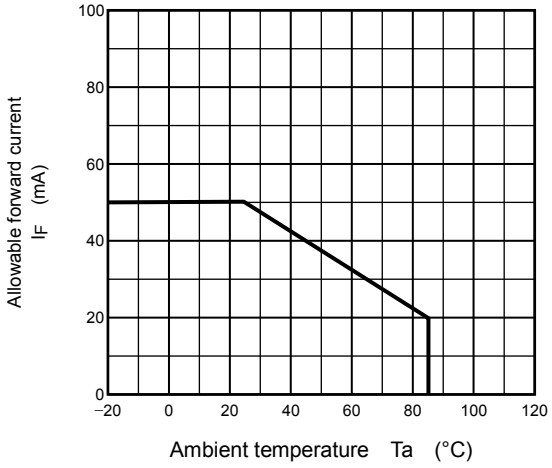
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	R_L = 200 Ω, V_{DD} = 20 V, I_F = 5 mA (Note 2)	—	—	1	ms
Turn-off time	t_{OFF}		—	—	1	ms

Note 2: Switching time test circuit

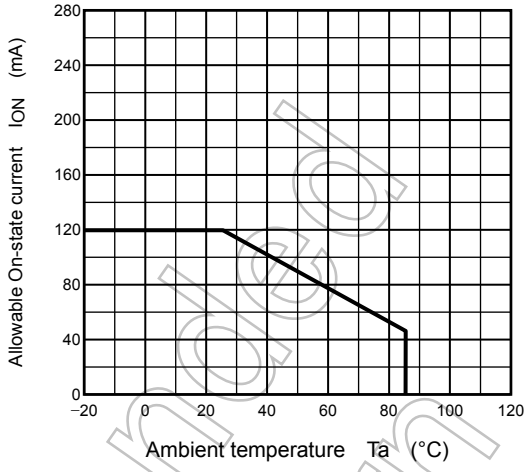




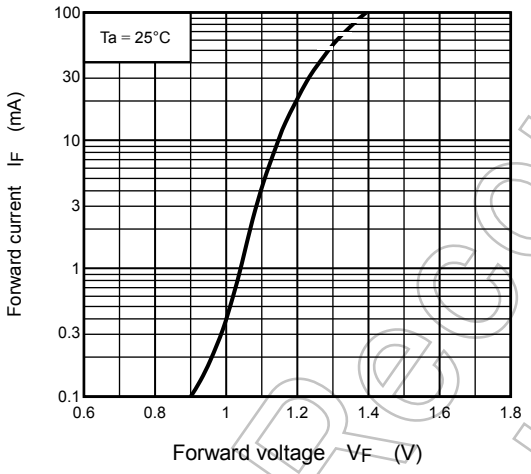
I_F – Ta



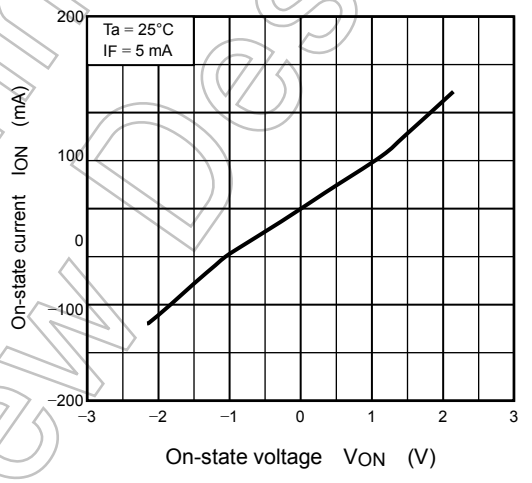
I_{ON} – Ta



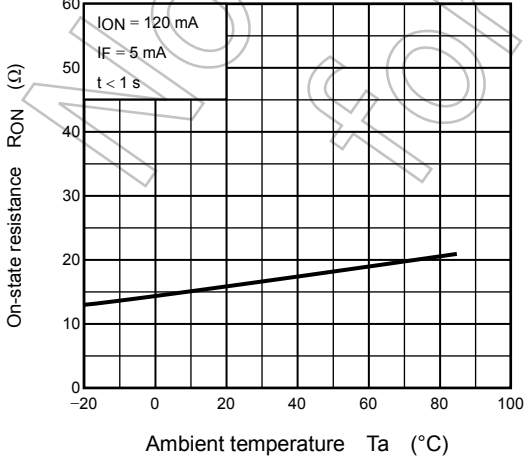
I_F – V_F



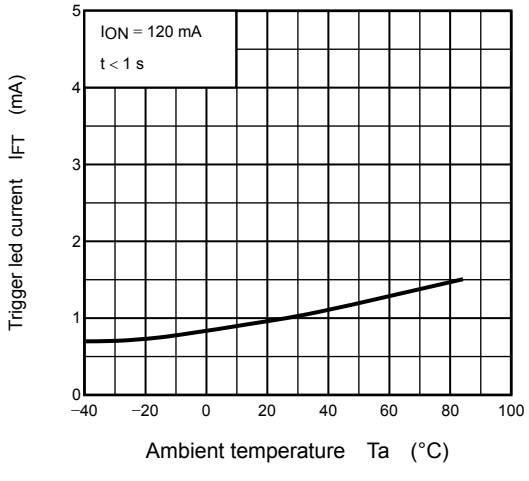
I_{ON} – V_{ON}



R_{ON} – Ta

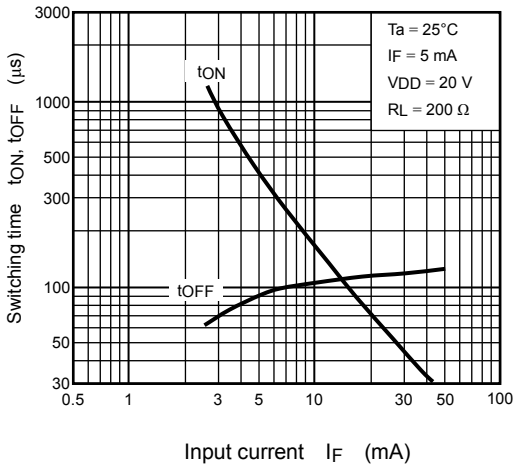


I_{FT} – Ta

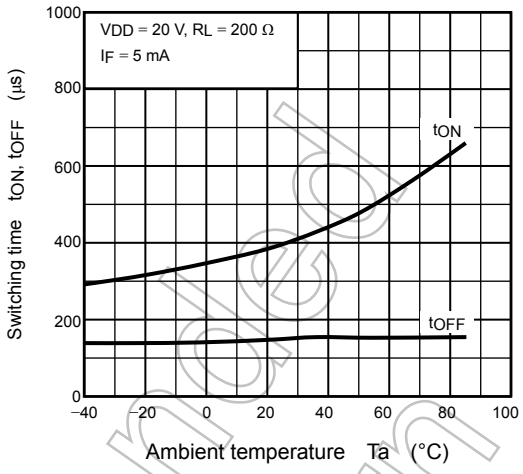


NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

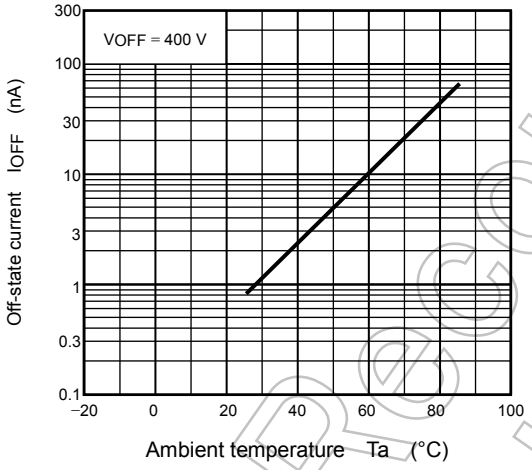
tON, tOFF – IF



tON, tOFF – Ta



IOFF – Ta



NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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