TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP227A,TLP227A-2

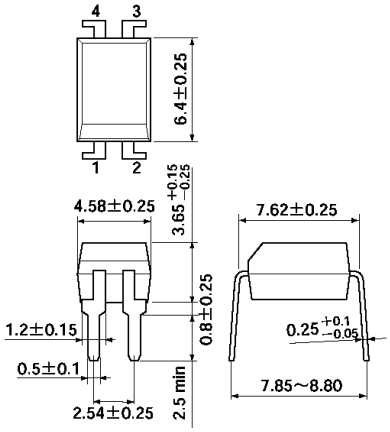
CORDLESS TELEPHONE

PBX

MODEM

Unit: mm

TLP227A



JEDEC	
EIAJ	
TOSHIBA	11−5B2

Weight: 0.26 g

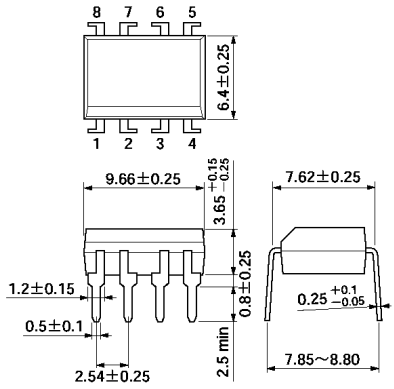
The TOSHIBA TLP227A series consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic DIP package.
The TLP227A series are a bi-directional switch, which can replace mechanical relays in many applications.

FEATURES

- TLP227A : 4 pin DIP (DIP4)
  1 Channel Type (1 Form A)
- TLP227A-2 : 8 pin DIP (DIP8)
  2 Channel Type (2 Form A)
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 3 mA (MAX.)
- On-State Current : 500 mA (MAX.)
- On-State Resistance : 2 Ω (MAX.)
- Isolation Voltage : 2500 Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

Unit: mm

TLP227A-2

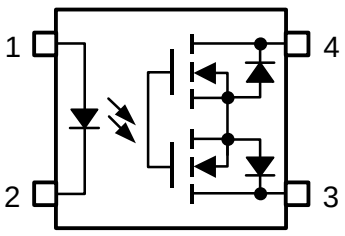


JEDEC	
EIAJ	
TOSHIBA	11−10C4

Weight: 0.54 g

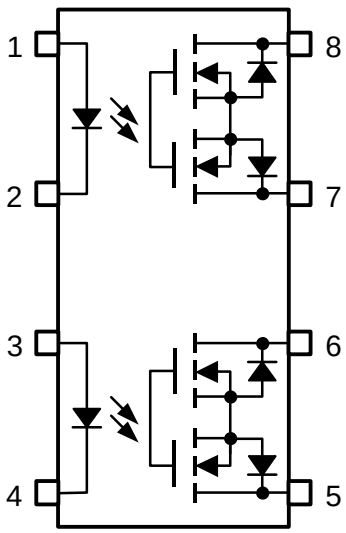
PIN CONFIGURATION (TOP VIEW)

TLP227A



1 : ANODE
2 : CATHODE
3 : DRAIN
4 : DRAIN

TLP227A-2



1, 3 : ANODE
2, 4 : CATHODE
5 : DRAIN D1
6 : DRAIN D2
7 : DRAIN D3
8 : DRAIN D4

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, 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}	60	V
	On-State Current	TLP227A		I_{ON}	500	mA
		TLP227A-2	One Channel			
			Both Channel (Note 1)			
	On-State Current Derating (Ta ≧ 25°C)	TLP227A		ΔI_{ON}/°C	−5.0	mA/°C
		TLP227A-2	One Channel			
			Both Channel (Note 1)			
	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 minute, R.H. ≦ 60%) (Note 2)				BV_S	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.

RECOMMANDED OPERATING CONDISIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	—	—	48	V
Forward Current	I_F	5	7.5	25	mA
On-State Current	I_{ON}	—	—	400	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} = 60 V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	130	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I_{FT}	I_{ON} = 300 mA	—	1	3	mA
Close LED Current	I_{FC}	I_{OFF} = 100 μA	0.1	—	—	mA
On-State Resistance	R_{ON}	I_{ON} = 300 mA, I_F = 5 mA	—	1	2	Ω

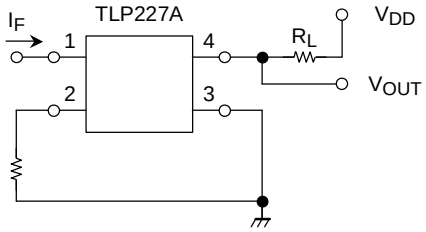
ISOLATION CHARACTERISTICS (Ta = 25°C)

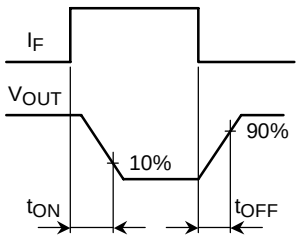
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—	5000	—	Vdc

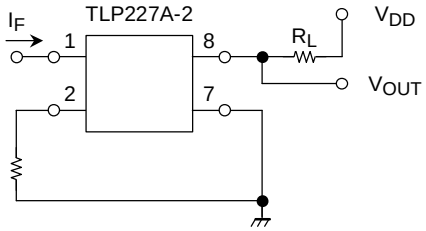
SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	R_L = 200 Ω, V_{DD} = 20 V, I_F = 5 mA (Note 3)	—	0.6	2	ms
Turn-off Time	t_{OFF}		—	0.1	1	
Turn-on Time	t_{ON}	R_L = 200 Ω, V_{DD} = 20 V, I_F = 10 mA (Note 3)	—	0.3	1	ms
Turn-off Time	t_{OFF}		—	0.1	1	

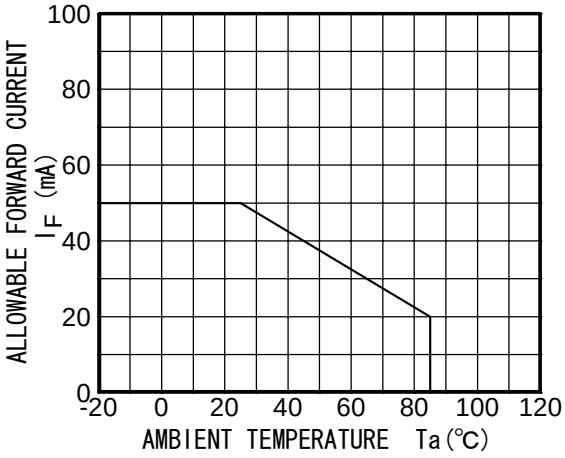
(Note 3) : SWITCHING TIME TEST CIRCUIT



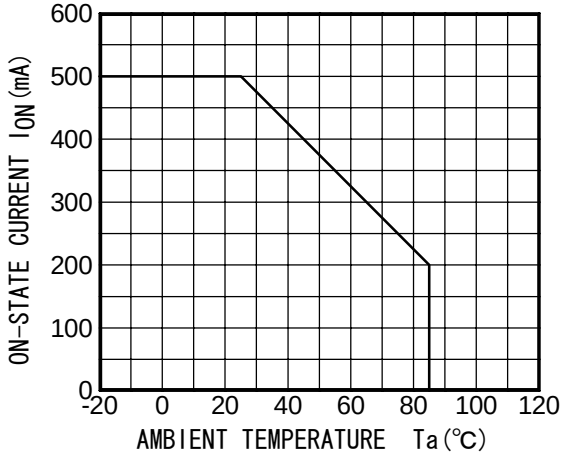




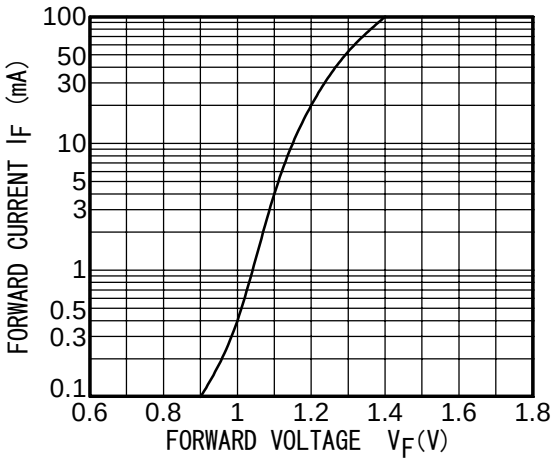
I_F – Ta



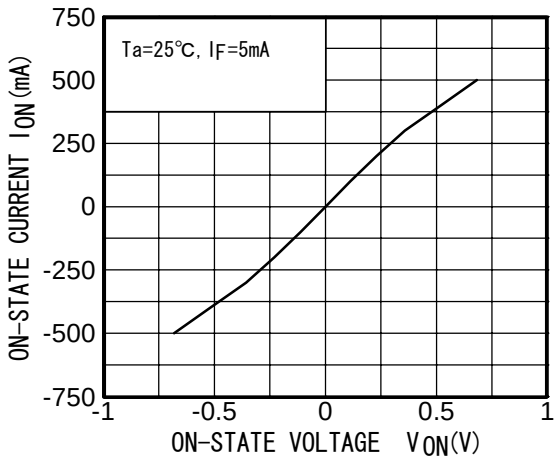
I_{ON} – Ta



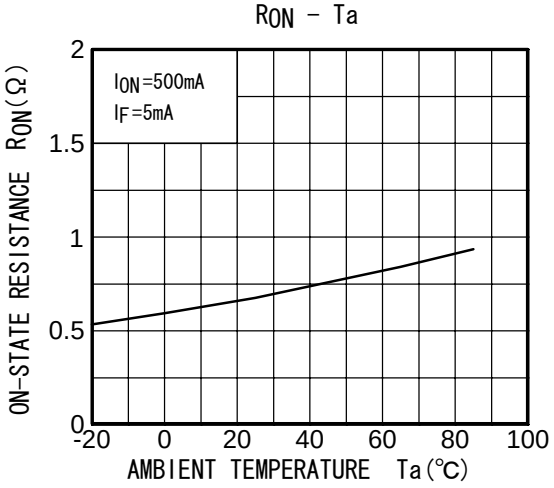
I_F – V_F



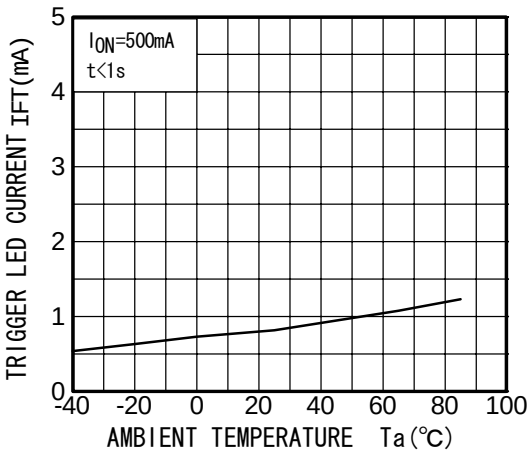
I_{ON} – V_{ON}



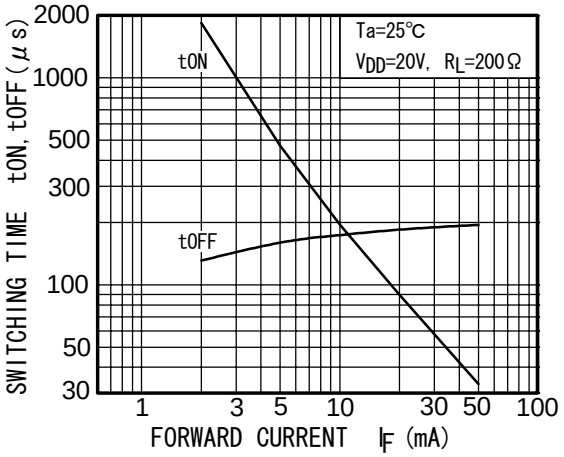
R_{ON} – Ta



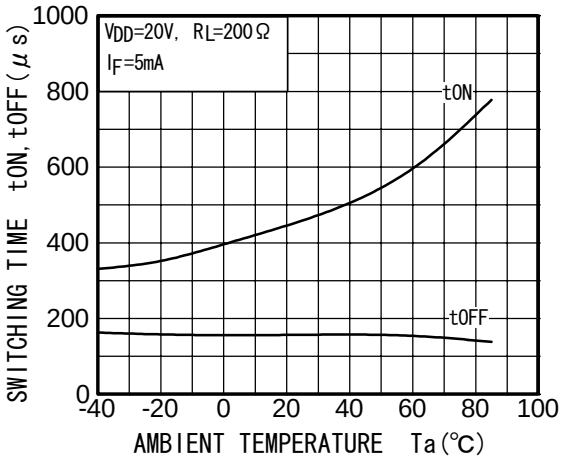
IFT – Ta



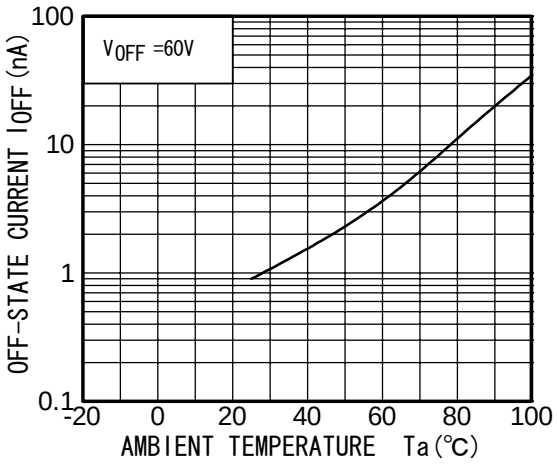
tON, tOFF – I_F



tON, tOFF – Ta



I_{OFF} – Ta



RESTRICTIONS ON PRODUCT USE

000707EBC

- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- 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.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.