

TOSHIBA PHOTOCOUPLER PHOTO RELAY

# TLP227A, TLP227A-2

CORDLESS TELEPHONE

PBX

MODEM

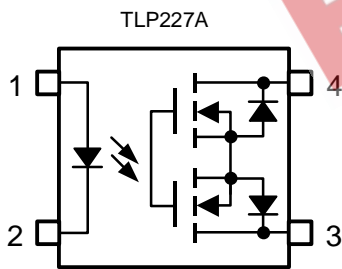
The TOSHIBA TLP227A series consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic DIP package.

The TLP227A series are a bi-directional switch, which can replace mechanical relays in many applications.

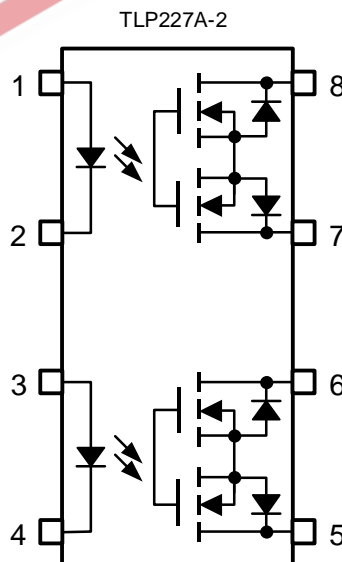
## FEATURES

- 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

## PIN CONFIGURATION (TOP VIEW)

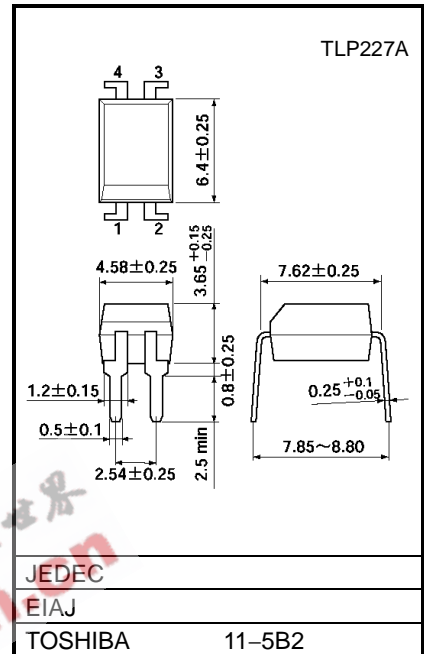


1 : ANODE  
2 : CATHODE  
3 : DRAIN  
4 : DRAIN



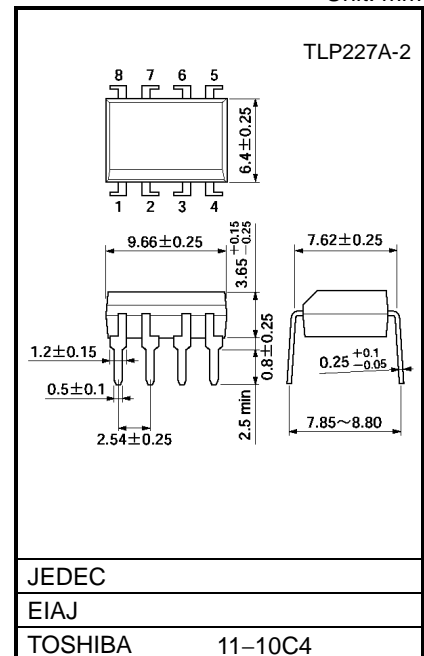
1, 3 : ANODE  
2, 4 : CATHODE  
5 : DRAIN D1  
6 : DRAIN D2  
7 : DRAIN D3  
8 : DRAIN D4

Unit: mm



Weight: 0.26 g

Unit: mm



Weight: 0.54 g

**MAXIMUM RATINGS (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 (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	$\Delta I_{ON}/^\circ\text{C}$	-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%)		$BV_S$	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.

**RECOMMENDED 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	$V_F$	$I_F = 10 \text{ mA}$	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	$I_{OFF}$	$V_{OFF} = 60 \text{ V}$	—	—	1	µA
	Capacitance	$C_{OFF}$	$V = 0, f = 1 \text{ MHz}$	—	130	—	pF

## COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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

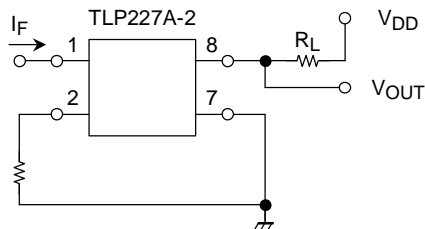
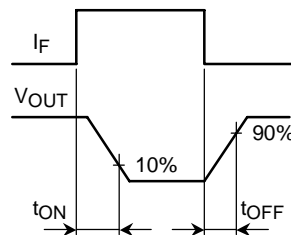
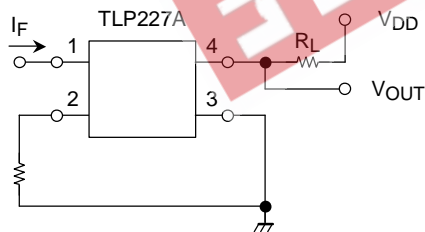
## ISOLATION CHARACTERISTICS (Ta = 25°C)

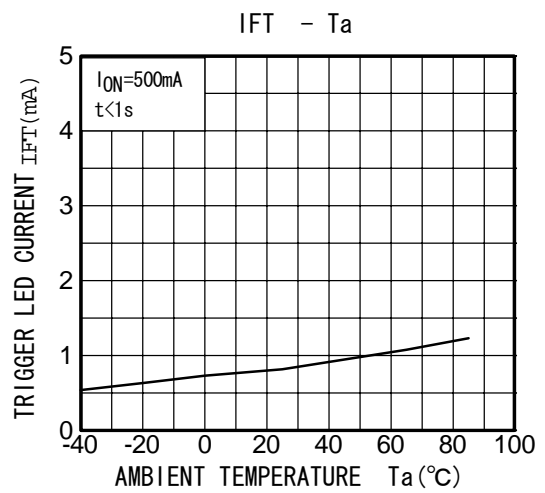
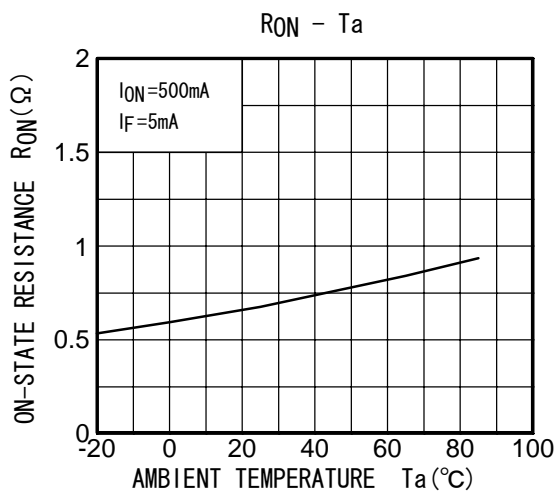
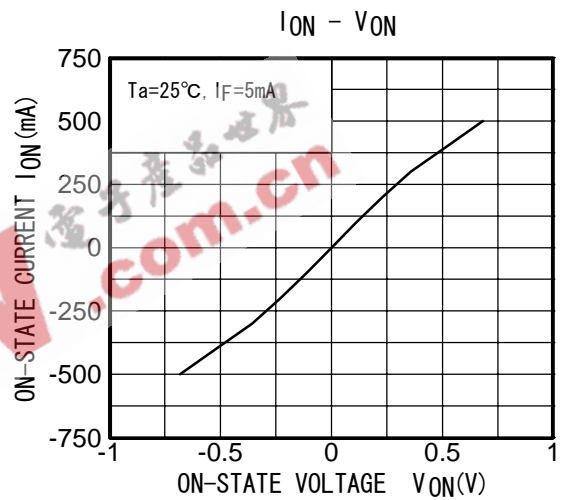
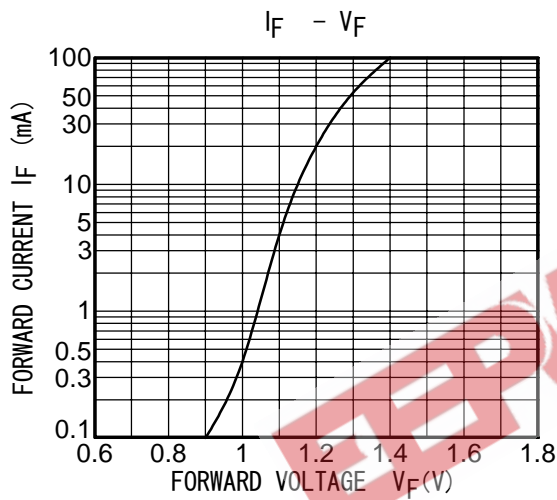
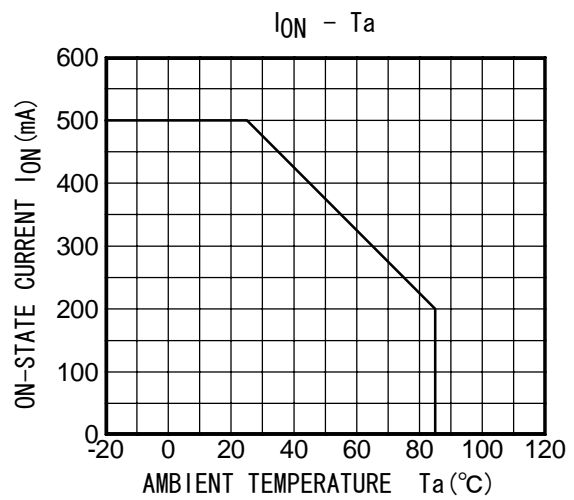
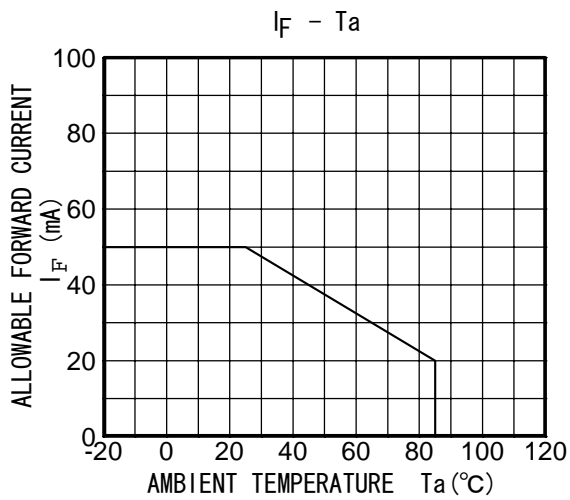
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms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

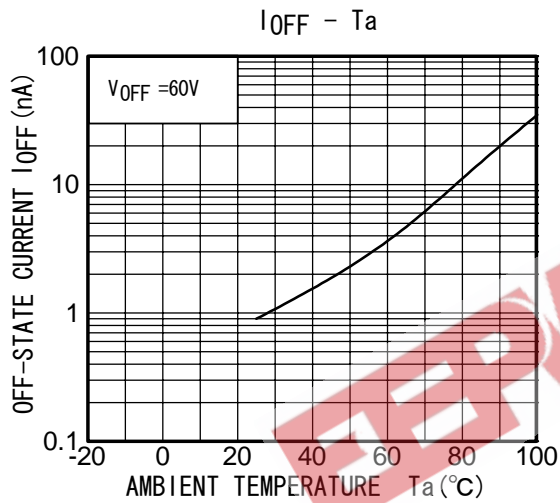
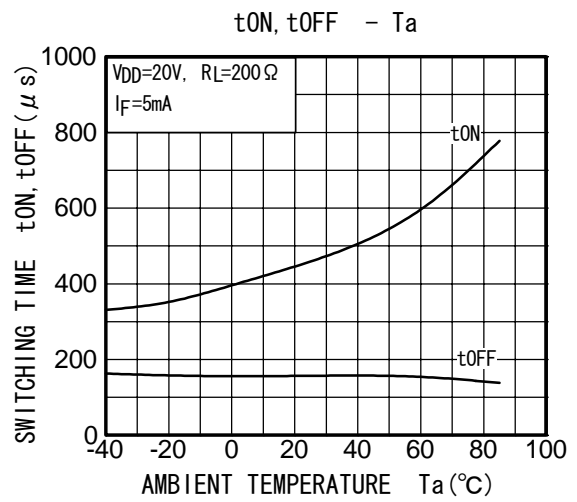
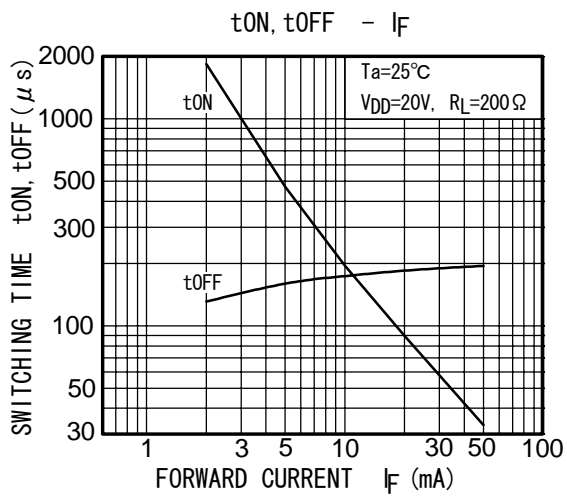
## SWITCHING CHARACTERISTICS (Ta = 25°C)

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

(Note 3): SWITCHING TIME TEST CIRCUIT







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