

TOSHIBA PHOTOCOUPLER PHOTO RELAY

**TLP197A**

TELECOMMUNICATION

DATA ACQUISITION

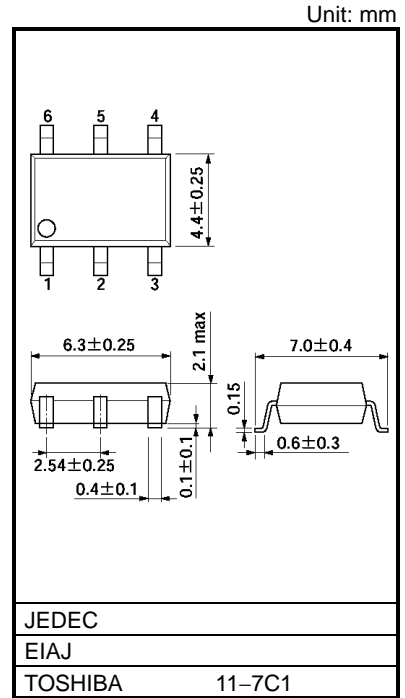
MEASUREMENT INSTRUMENT

PROGRAMMABLE CONTROL

The TOSHIBA TLP197A consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a SOP, which is suitable for surface mount assembly. The TLP197A is suitable for replacement of mechanical relays in many applications which require space savings.

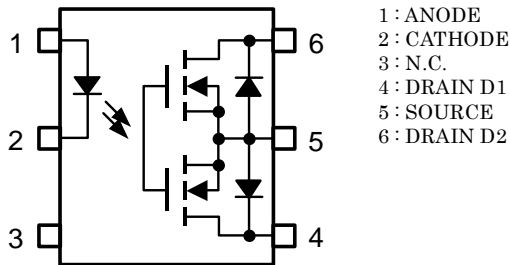
**FEATURES**

- 6 pin SOP (2.54SOP6) : 2.1 mm high, 2.54 mm pitch
- 1-Form-A
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 3 mA (MAX.)
- On-State Current : 400 mA (MAX.)
- On-State Resistance : 2 Ω (MAX.)
- Isolation Voltage : 1500 Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

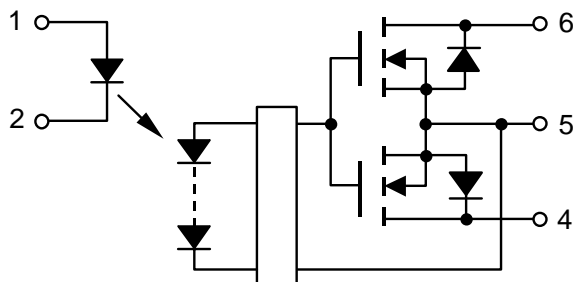


Weight: 0.13 g

**PIN CONFIGURATION (TOL VIEW)**



**SCHEMATIC**



## MAXIMUM RATINGS (Ta = 25°C)

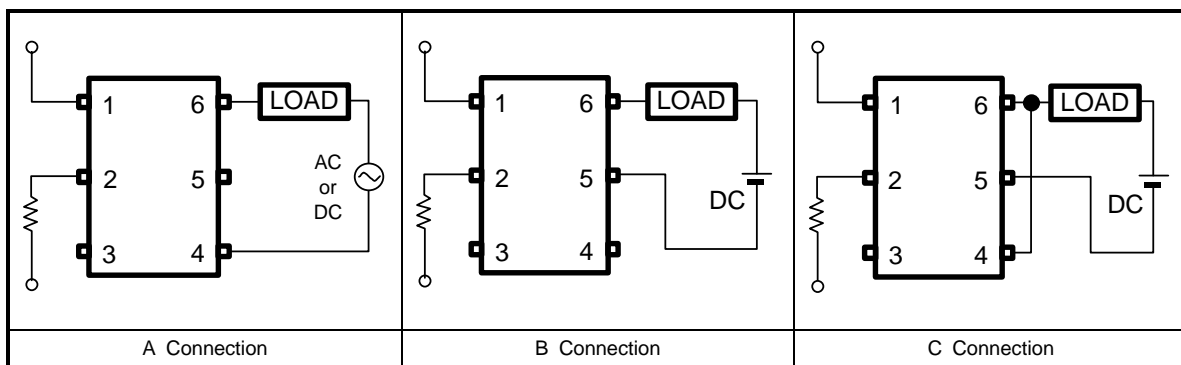
CHARACTERISTIC		SYMBOL	RATING	UNIT	
LED	Forward Current	$I_F$	50	mA	
	Forward Current Derating (Ta ≥ 25°C)	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C	
	Peak Forward Current (100 μs pulse, 100 pps)	$I_{FP}$	1	A	
	Reverse Voltage	$V_R$	5	V	
	Junction Temperature	$T_j$	125	°C	
DETECTOR	Off-State Output Terminal Voltage	$V_{OFF}$	60	V	
	On-State RMS Current	A Connection	$I_{ON}$	400	mA
		B Connection		400	
		C Connection		800	
	On-State Current Derating (Ta ≥ 25°C)	A Connection	$\Delta I_{ON}/^\circ\text{C}$	-4.0	mA/°C
		B Connection		-4.0	
		C Connection		-8.0	
Junction Temperature	$T_j$	125	°C		
Operating Temperature Range		$T_{opr}$	-40~85	°C	
Storage Temperature Range		$T_{stg}$	-55~125	°C	
Lead Soldering Temperature (10 s)		$T_{sol}$	260	°C	
Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1)		$BV_S$	1500	Vrms	

(NOTE1) :Device considered a two-terminal device : Pins 1, 2 and 3 shorted together, and pins 4, 5 and 6 shorted together.

## RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{DD}$	—	—	48	V
Forward Current	$I_F$	5	7.5	25	mA
On-State Current	$I_{ON}$	—	—	300	mA
Operating Temperature	$T_{opr}$	-20	—	65	°C

## CIRCUIT CONNECTIONS



**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	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Off-State Current	$I_{OFF}$	$V_{OFF} = 60 \text{ V}$	—	—	1	$\mu\text{A}$
	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		$I_{FT}$	$I_{ON} = 400 \text{ mA}$	—	—	3	mA
Close LED Current		$I_{FC}$	$I_{OFF} = 100 \mu\text{A}$	0.1	—	—	mA
On-State Resistance	A Connection	$R_{ON}$	$I_{ON} = 400 \text{ mA}, I_F = 5 \text{ mA}$	—	1	2	$\Omega$
	B Connection		$I_{ON} = 400 \text{ mA}, I_F = 5 \text{ mA}$	—	0.5	1	
	C Connection		$I_{ON} = 800 \text{ mA}, I_F = 5 \text{ mA}$	—	0.25	—	

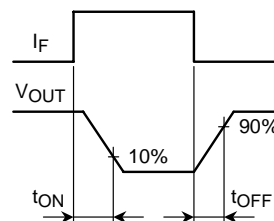
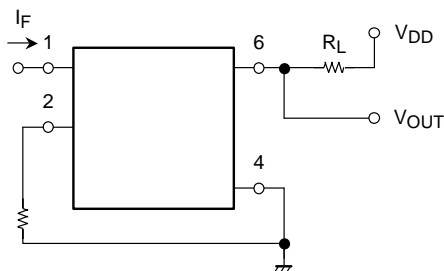
**ISOLATION CHARACTERISTICS (Ta = 25°C)**

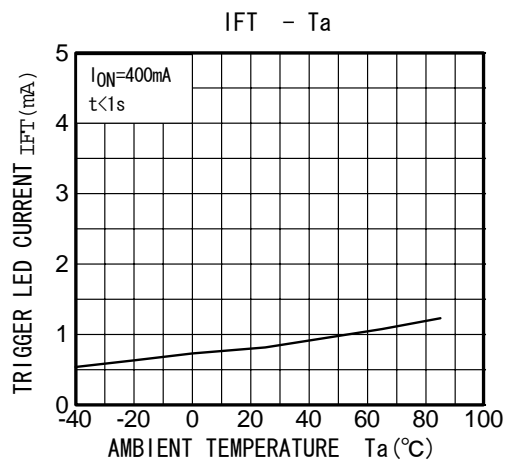
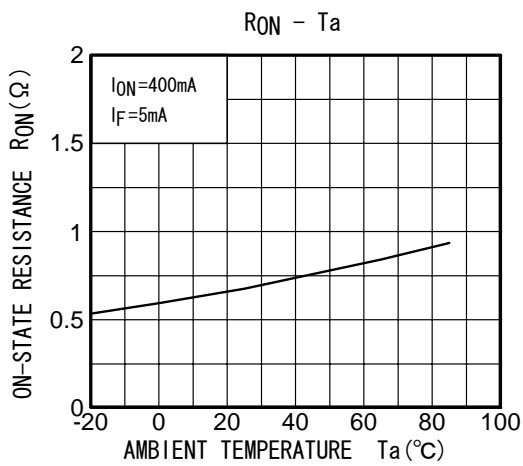
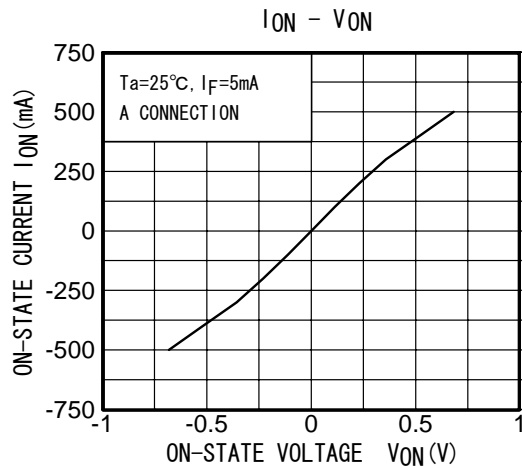
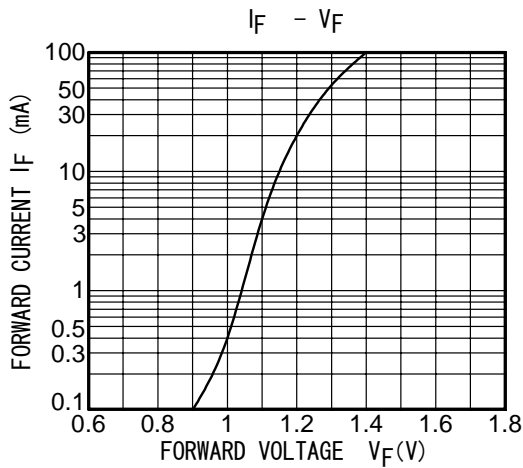
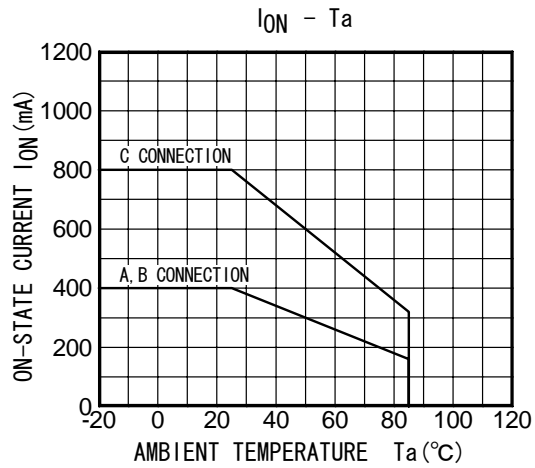
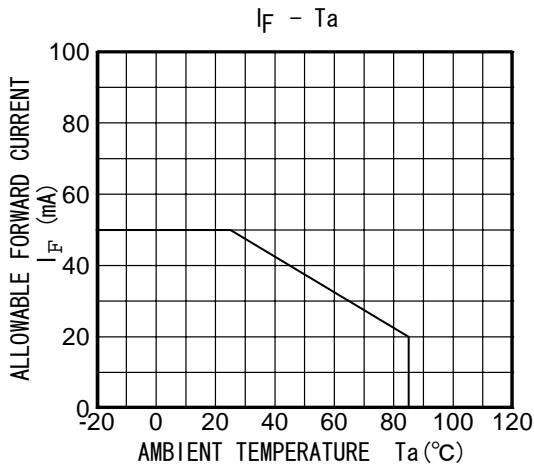
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	
		DC, 1 minute (in oil)	—	3000	—	Vdc

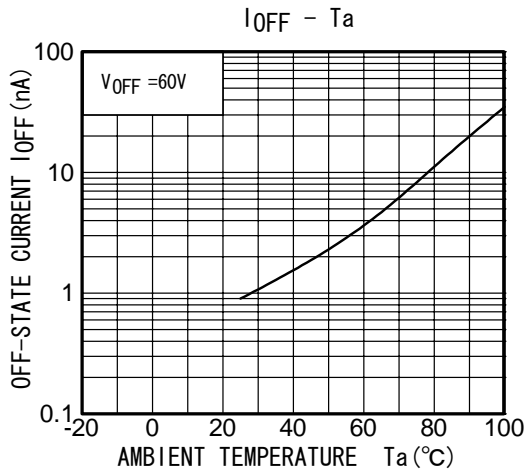
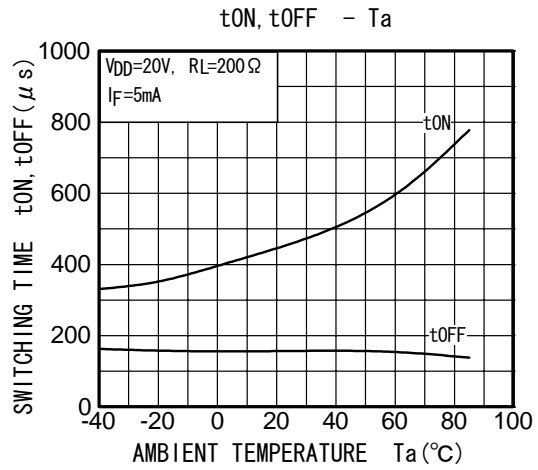
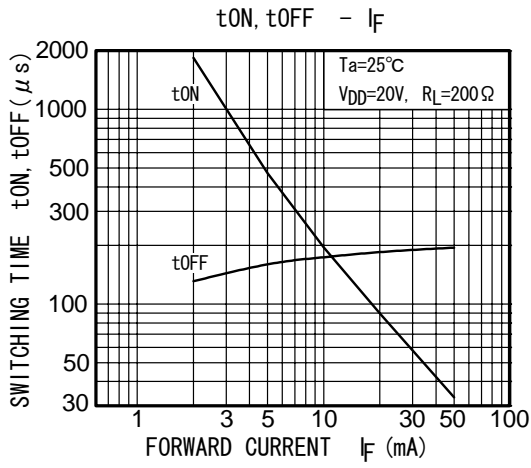
**SWITCHING CHARACTERISTICS (Ta = 25°C)**

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

(NOTE 2) : SWITCHING TIME TEST CIRCUIT







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