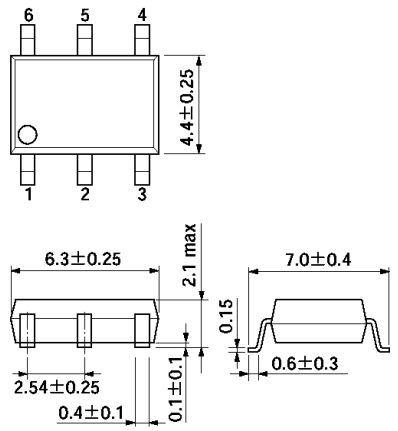
TOSHIBA PHOTOCOUPLER PHOTO RELAY

T L P 1 9 7 A

TELECOMMUNICATION
DATA ACQUISITION
MEASUREMENT INSTRUMENT
PROGRAMMABLE CONTROL

Unit: mm



JEDEC	
EIAJ	
TOSHIBA	11−7C1

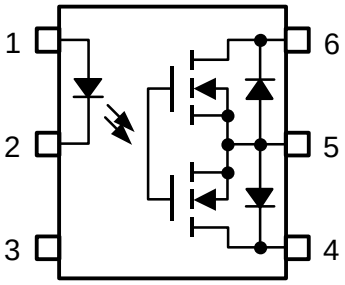
Weight: 0.13 g

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

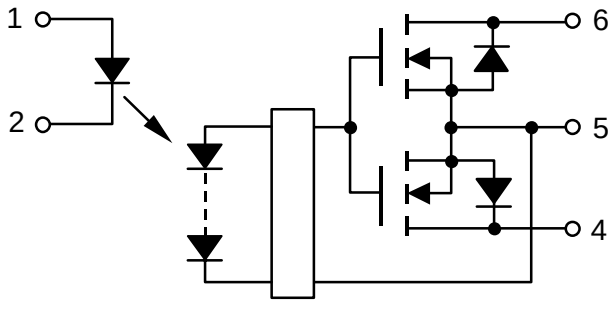
- 6 pin SOP (2.54SOP6) : 2.1 mm high, 2.54 mm pitch
- 1-Form-A
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 3 mA (MAX.)
- On-State Current : 400 mA (MAX.)
- On-State Resistance : 2 Ω (MAX.)
- Isolation Voltage : 1500 Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

PIN CONFIGURATION (TOL VIEW)



1 : ANODE
2 : CATHODE
3 : N.C.
4 : DRAIN D1
5 : SOURCE
6 : DRAIN D2

SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

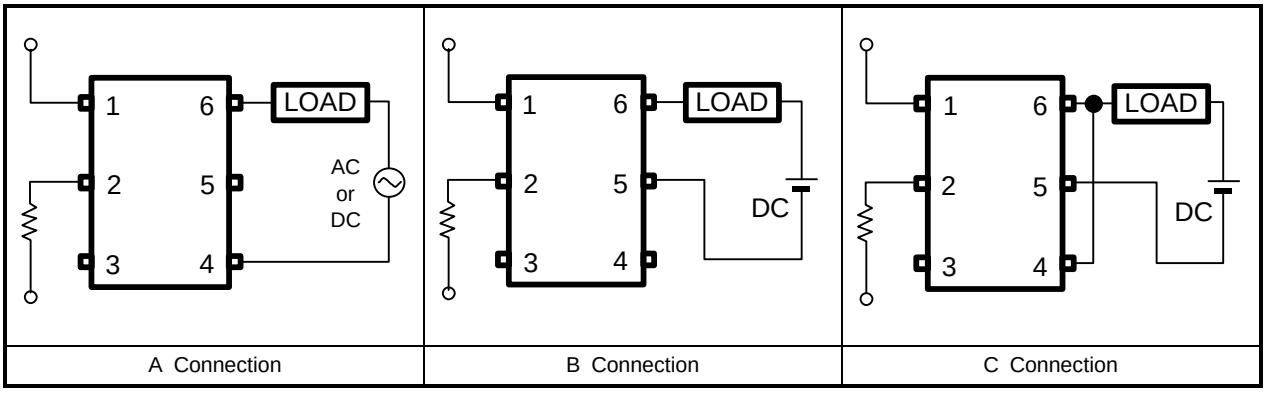
CHARACTERISTIC			SYMBOL	RATING	UNIT
LED	Forward Current		I_F	50	mA
	Forward Current Derating (Ta ≧ 25°C)		ΔI_F/°C	−0.5	mA/°C
	Peak Forward Current (100 μs pulse, 100 pps)		I_{FP}	1	A
	Reverse Voltage		V_R	5	V
	Junction Temperature		T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage		V_{OFF}	60	V
	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	ΔI_{ON}/°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



A Connection | B Connection | C Connection

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} = 400 mA	—	—	3	mA
Close LED Current		I_{FC}	I_{OFF} = 100 μA	0.1	—	—	mA
On-State Resistance	A Connection	R_{ON}	I_{ON} = 400 mA, I_F = 5 mA	—	1	2	Ω
	B Connection		I_{ON} = 400 mA, I_F = 5 mA	—	0.5	1	
	C Connection		I_{ON} = 800 mA, I_F = 5 mA	—	0.25	—	

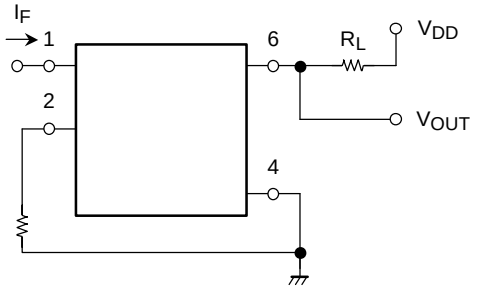
ISOLATION CHARACTERISTICS (Ta = 25°C)

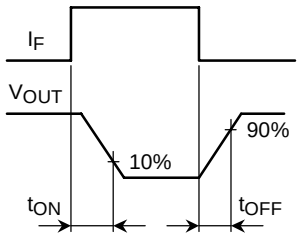
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	
		DC, 1 minute (in oil)	—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

SWITCHING CHARACTERISTICS (Ta = 25°C)

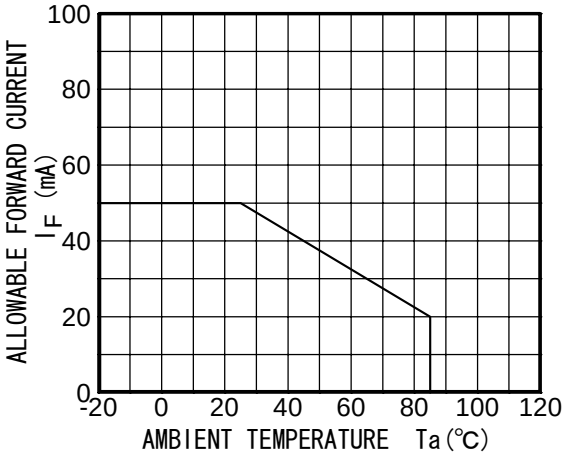
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	R_L = 200 Ω (NOTE 2) V_{DD} = 20 V, I_F = 5 mA	—	0.6	2	ms
Turn-off Time	t_{OFF}		—	0.1	1	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT

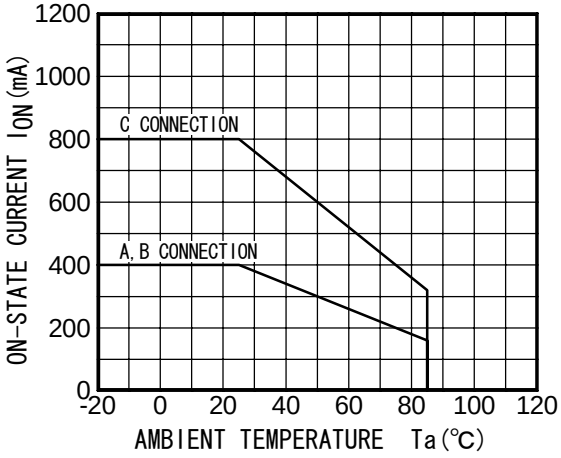




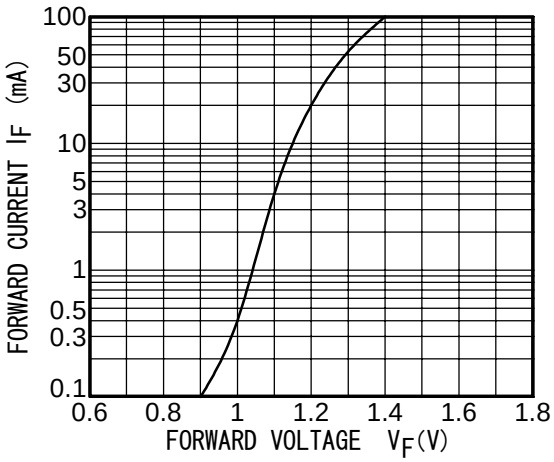
I_F – Ta



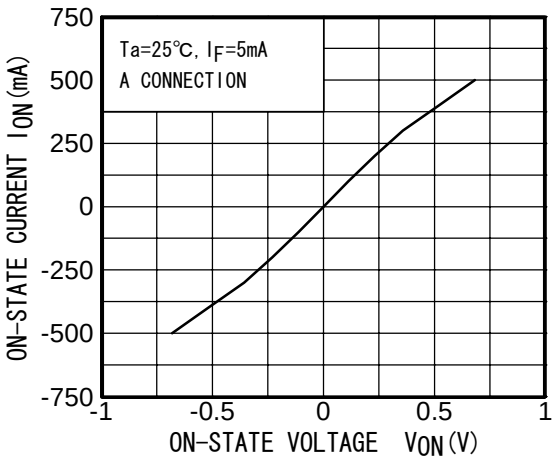
I_{ON} – Ta



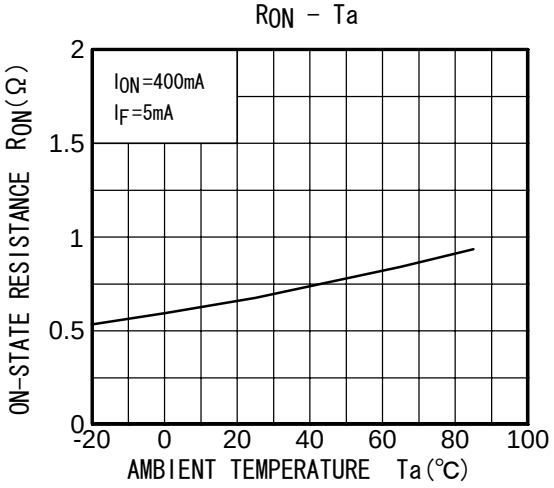
I_F – V_F



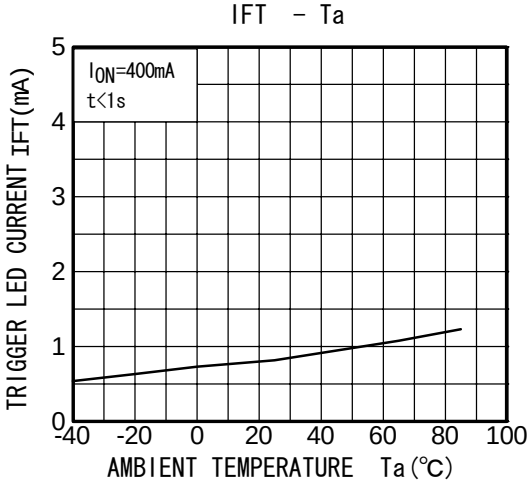
I_{ON} – V_{ON}



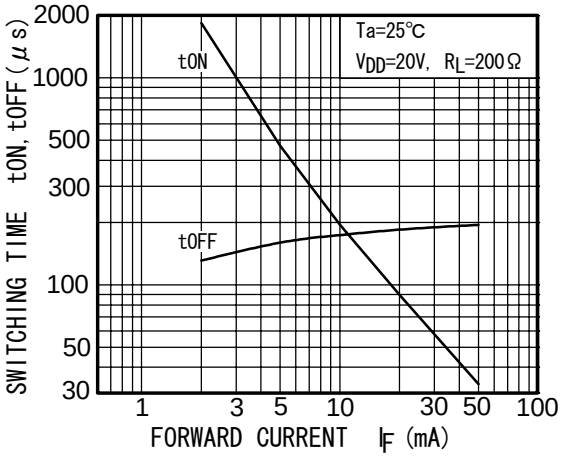
R_{ON} – Ta



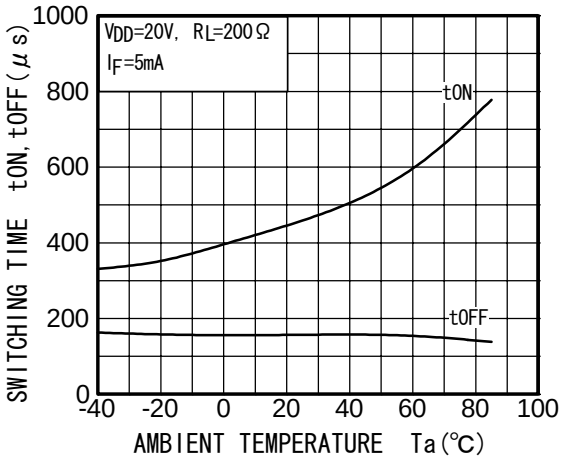
IFT – Ta



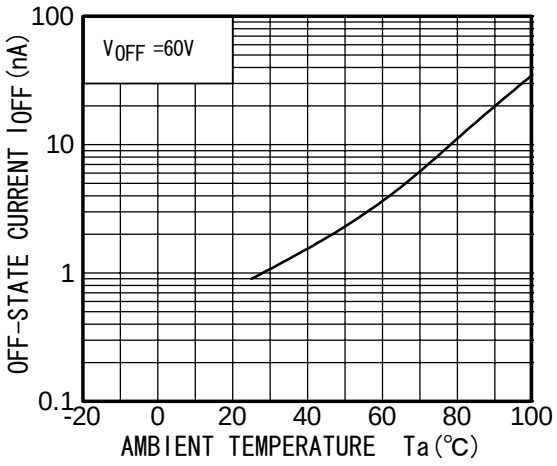
tON, tOFF – I_F



tON, tOFF – Ta



I_{OFF} – Ta



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