TOSHIBA PHOTOCOUPLER PHOTO RELAY

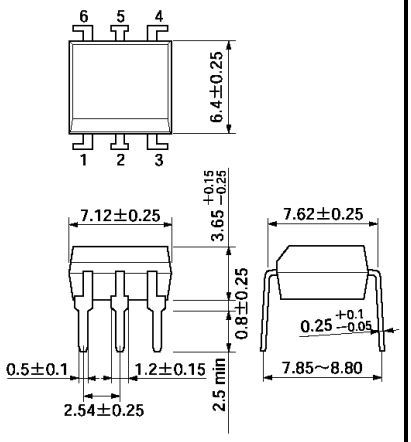
T L P 7 9 7 J

TELECOMMUNICATION

MEASUREMENT EQUIPMENT

FA

Unit: mm



JEDEC	
EIAJ	
TOSHIBA	11–7A8

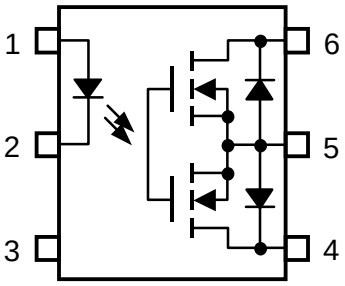
Weight: 0.4 g

The TOSHIBA TLP797J consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).
The TLP797J is a bi-directional switch can replace mechanical relays in many applications.

FEATURES

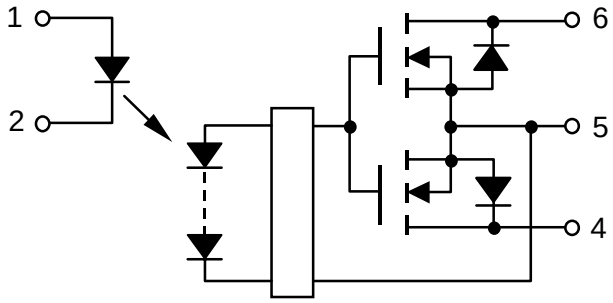
- 6 pin DIP (DIP6)
- 1-Form-A
- Peak Off-State Voltage : 600 V (MIN.)
- Trigger LED Current : 5mA (MAX.)
- On-State Current : 100 mA (MAX.)
- On-State Resistance : 35 Ω (MAX.)
- Isolation Voltage : 5000 Vrms (MIN.)

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)

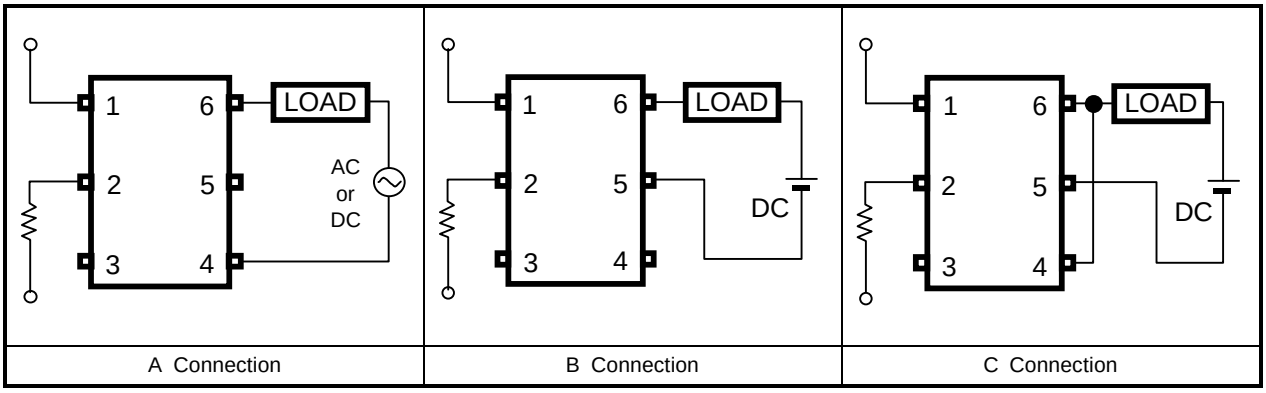
CHARACTERISTIC			SYMBOL	RATING	UNIT
LED	Forward Current		I_F	50	mA
	Forward Current Derating (Ta ≧ 25°C)		ΔI_F/°C	−0.5	mA/°C
	Peak Forward Current (100 μs pulse, 100 pps)		I_{FP}	1	A
	Reverse Voltage		V_R	5	V
	Junction Temperature		T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage		V_{OFF}	600	V
	On-State Current	A Connection	I_{ON}	100	mA
		B Connection		100	
		C Connection		200	
	On-State Current Derating (Ta ≧ 25°C)	A Connection	ΔI_{ON}/°C	−1.0	mA/°C
		B Connection		−1.0	
		C Connection		−2.0	
	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%) (NOTE1)			BV_S	5000	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}	—	—	480	V
Forward Current	I_F	7.5	15	25	mA
On-State Current	I_{ON}	—	—	100	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} = 600 V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	120	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current		I_{FT}	I_{ON} = 100 mA	—	1.6	5	mA
Return LED Current		I_{FC}	I_{OFF} = 100 μA	0.1	—	—	mA
On-State Resistance	A Connection	R_{ON}	I_{ON} = 100 mA, I_F = 10 mA, t < 1 s	—	25	35	Ω
			I_{ON} = 100 mA, I_F = 10 mA	—	30	45	
	B Connection		I_{ON} = 100 mA, I_F = 10 mA	—	23	35	
	C Connection		I_{ON} = 200 mA, I_F = 10 mA	—	12	—	

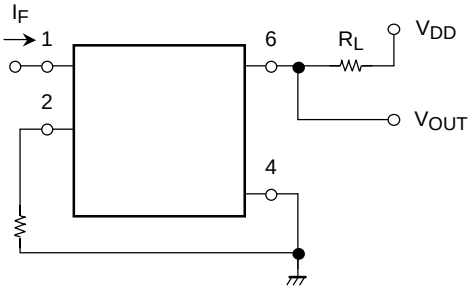
ISOLATION CHARACTERISTICS (Ta = 25°C)

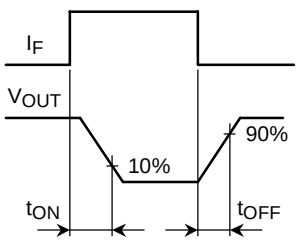
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	5000	—	—	Vrms
		AC, 1 second (in oil)	—	10000	—	
		DC, 1 minute (in oil)	—	10000	—	Vdc

SWITCHING CHARACTERISTICS (Ta = 25°C)

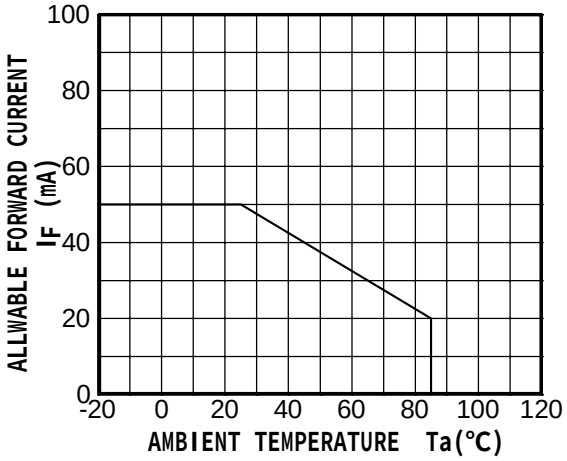
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	t_{ON}	R_L = 200 Ω (NOTE 2) V_{DD} = 20 V, I_F = 10 mA	—	0.2	1.5	ms
Turn-off Time	t_{OFF}		—	0.2	1	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT

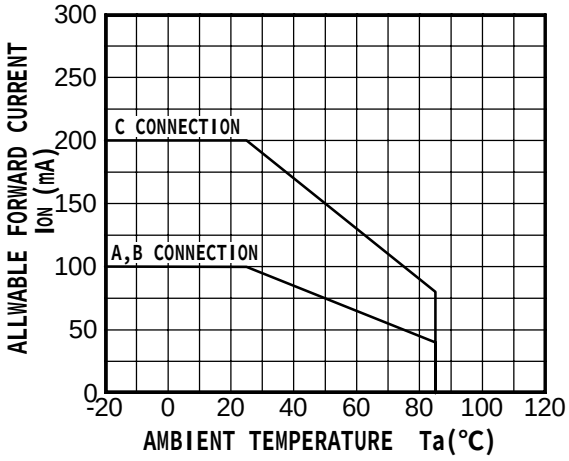




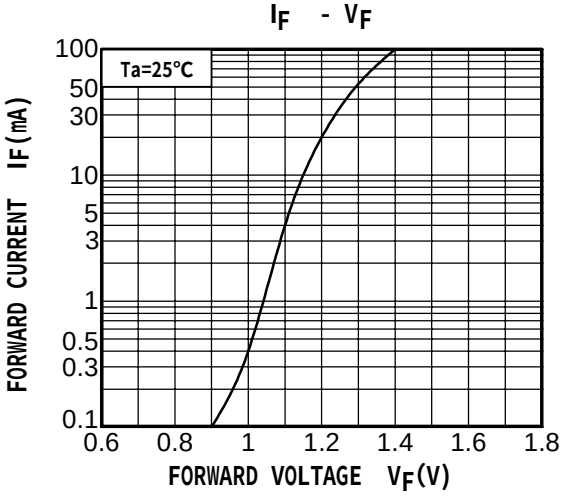
I_F - Ta



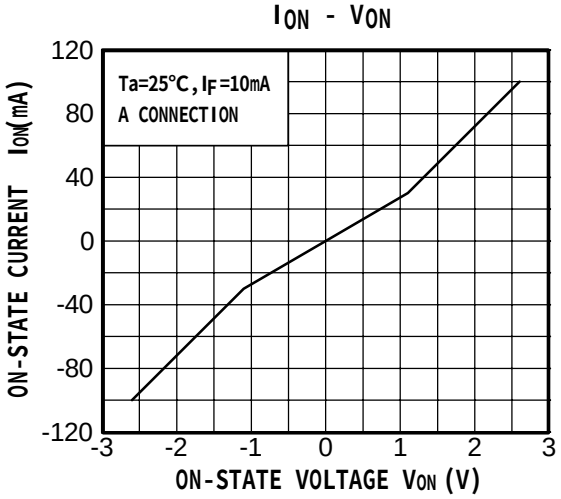
I_{ON} - Ta



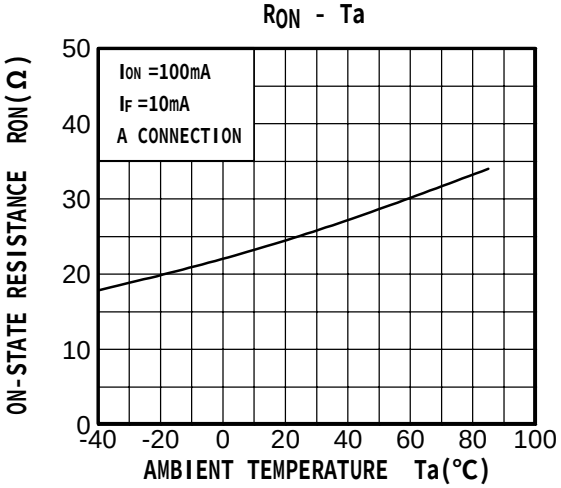
I_F - V_F



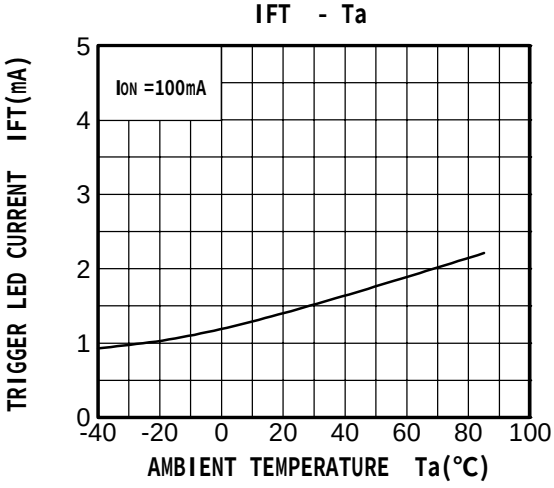
I_{ON} - V_{ON}

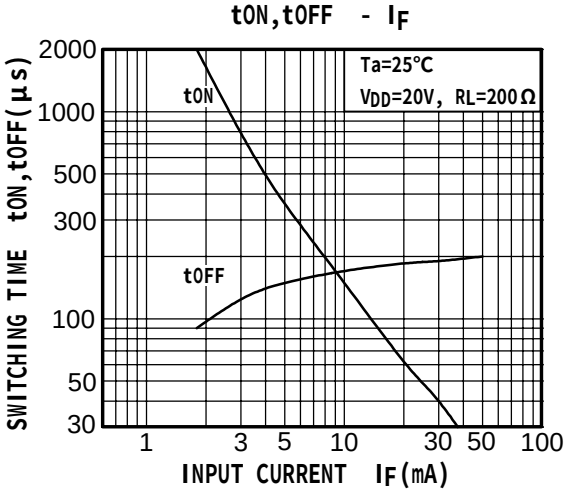


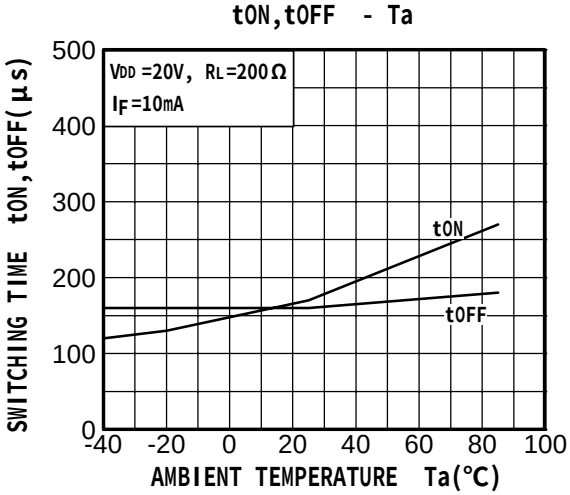
R_{ON} - Ta



IFT - Ta




tON,tOFF - IF
Ta=25°C
VDD=20V, RL=200Ω
tON
tOFF
SWITCHING TIME tON,tOFF(μs)
2000
1000
500
300
100
50
30
1
3
5
10
30
50
100
INPUT CURRENT IF(mA)


tON,tOFF - Ta
VDD=20V, RL=200Ω
IF=10mA
tON
tOFF
SWITCHING TIME tON,tOFF(μs)
500
400
300
200
100
0
-40
-20
0
20
40
60
80
100
AMBIENT TEMPERATURE Ta(°C)

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000707EBC

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