TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP599B

TELECOMMUNICATION
DATA ACQUISITION
MEASUREMENT INSTRUMENTATION

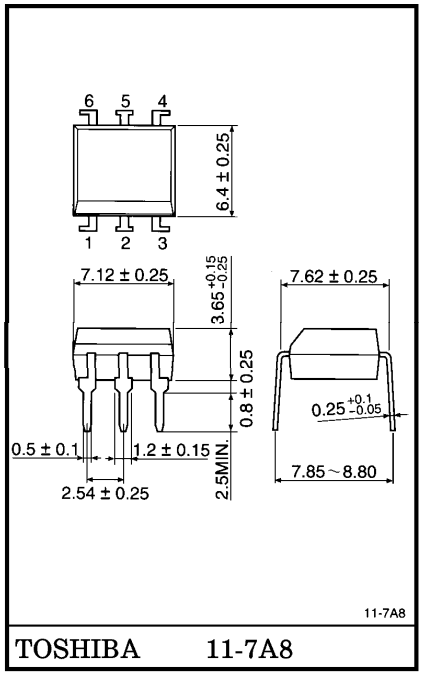
The TOSHIBA TLP599B consists of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP (DIP6).
The TLP599B is a bi-directional switch which can replace mechanical relays in many applications.

- Peak Off-State Voltage : 100 V (MIN.)
- On-State Current : 200 mA (MAX.) (A Connection)
- On-State Resistance : 4 Ω (MAX.) (A Connection)
- Insulation Thickness : 0.4 mm (MAX.)
- Isolation Voltage : 2500 Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current (Ta = 25°C)

CLASSIFICATION (Note 1)	Trigger LED Current (mA) @ I_{ON} = 200 mA		MARKING OF CLASSIFICATION
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

(Note 1) : Application type name for certification test, please use standard product type name, i.e.
TLP599B (IFT2) : TLP599B

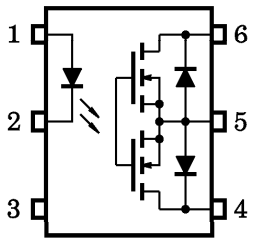
Unit in mm



TOSHIBA 11-7A8

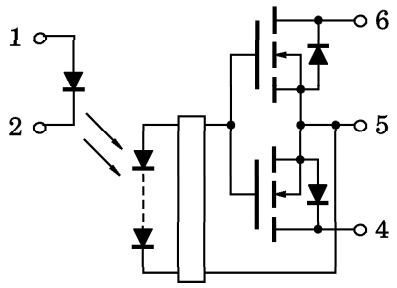
Weight : 0.4 g

PIN CONFIGURATION (TOP VIEW)



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

SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

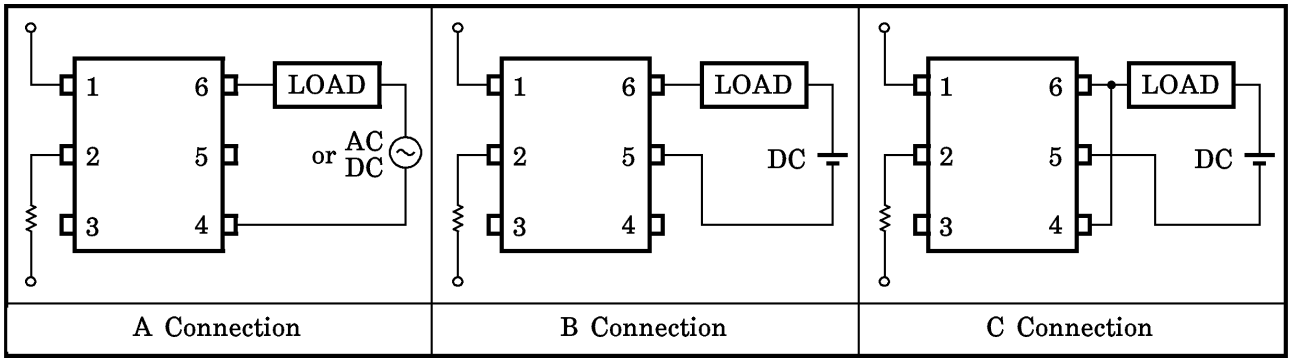
	CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current		I_F	50	mA
	Forward Current Derating (Ta ≧ 25°C)		ΔI_F / °C	−0.5	mA / °C
	Peak Forward Current (100 μs pulse, 100 pps)		I_{FP}	1	A
	Reverse Voltage		V_R	5	V
	Junction Temperature		T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage		V_{OFF}	100	V
	On-State RMS Current	A Connection	I_{ON}	200	mA
		B Connection		300	
		C Connection		400	
	On-State Current Derating (Ta ≧ 25°C)	A Connection	ΔI_{ON} / °C	−2	mA / °C
		B Connection		−3	
		C Connection		−4	
	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 min., R.H. ≦ 60%)		(Note 2)	BV_S	2500	Vrms

(Note 2) : 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}	—	—	80	V
Forward Current	I_F	7.5	15	25	mA
On-State Current	I_{ON}	—	—	200	mA
Operating Temperature	T_{opr}	−20	—	80	°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} = 100 V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	—	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current		I_{FT}	I_{ON} = 200 mA	—	1	5	mA
On-State Resistance	A Connection	R_{ON}	I_{ON} = 200 mA, I_F = 10 mA	—	3.0	4	Ω
	B Connection		I_{ON} = 300 mA, I_F = 10 mA	—	1.5	2	
	C Connection		I_{ON} = 400 mA, I_F = 10 mA	—	0.75	1	

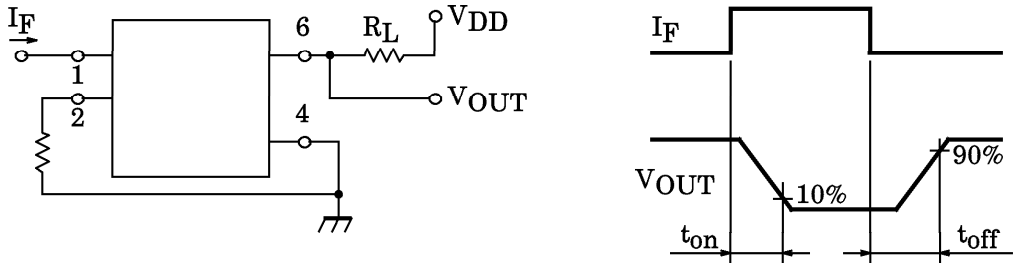
ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	V_S = 0, 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	—	V_{dc}

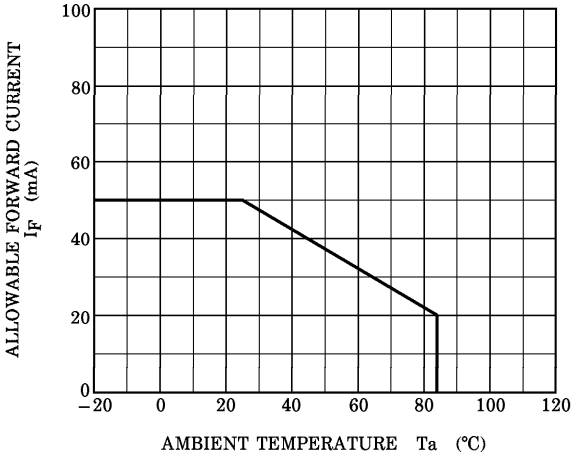
SWITCHING CHARACTERISTICS (Ta = 25°C)

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

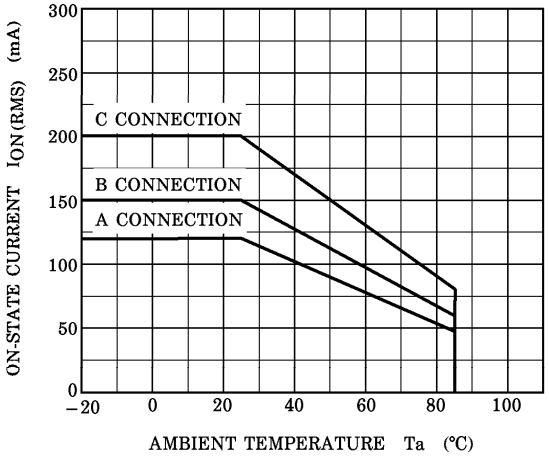
SWITCHING TIME TEST CIRCUIT



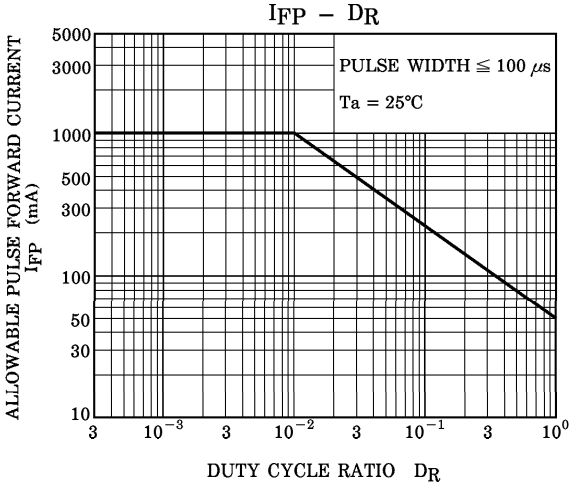
I_F – Ta



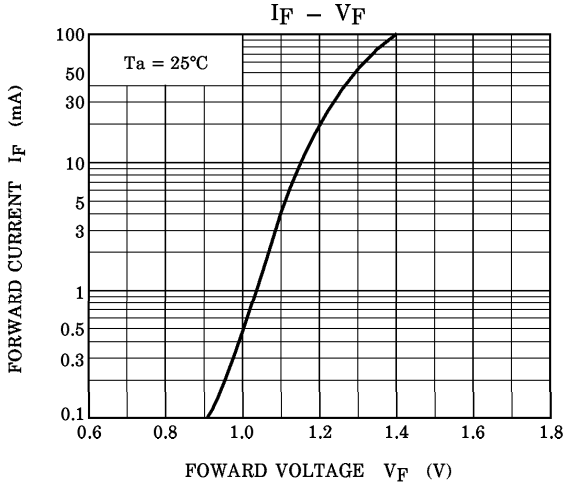
$I_{ON\ (RMS)}$ – Ta



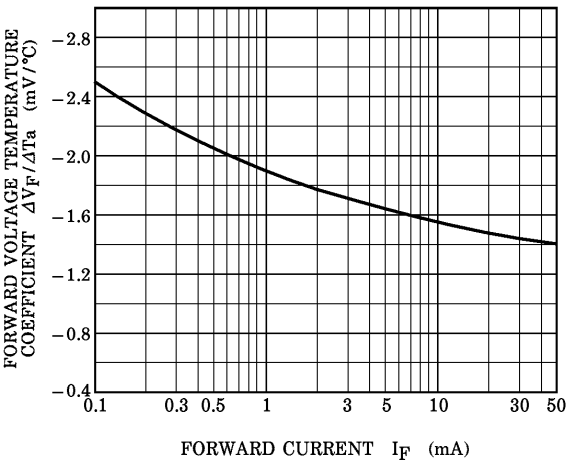
I_{FP} – D_R



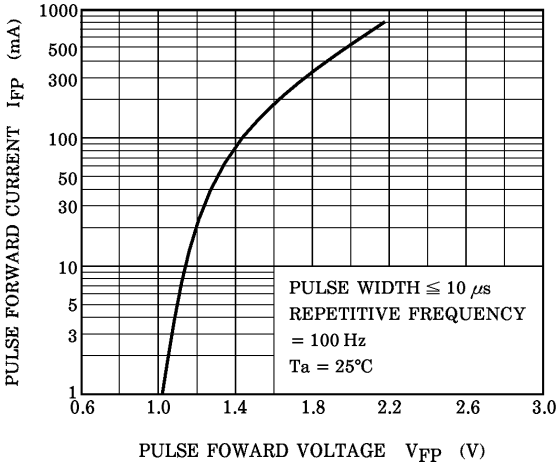
I_F – V_F



$\Delta V_F / \Delta Ta$ – I_F



I_{FP} – V_{FP}



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