TOSHIBA Photocoupler Photo Relay

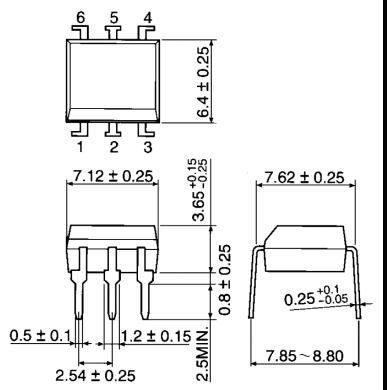
TLP599A

Telecommunication

Data Acquisition

Measurement Instrumentation

Unit in mm



TOSHIBA 11−7A8

Weight: 0.4 g

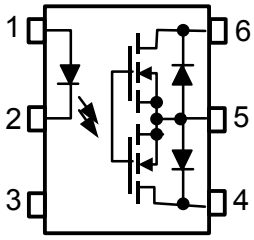
The TOSHIBA TLP599A consists of a gallium arsenide infrared emitting diode optically coupled to a photo−MOS FET in a six lead plastic DIP package (DIP6).
The TLP599A is a bi−directional switch which can replace mechanical relays in many applications.

- Peak off−state voltage: 60V (min.)
- On−state current: 300mA (max.) (A connection)
- On−state resistance: 2Ω (max.) (A connection)
- Insulation Thickness: 0.4 mm (max.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349
- Trigger LED current (Ta = 25°C)

Classification (Note 1)	Trigger LED Current (mA) @I_{ON} = 300mA		Marking Of Classification
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

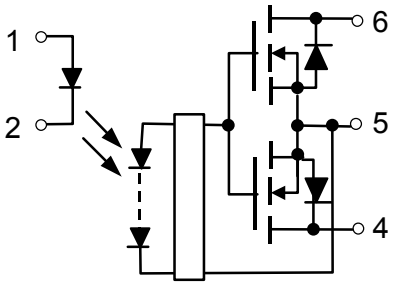
(Note 1): Application type name for certification test, please use standard product type name, i.e.
TLP599A (IFT2) : TLP599A

Pin Configuration (top view)



1. : Anode
2. : Cathode
3. : NC
4. : Drain D1
5. : Source
6. : Drain D2

Schematic



Maximum Ratings (Ta = 25°C)

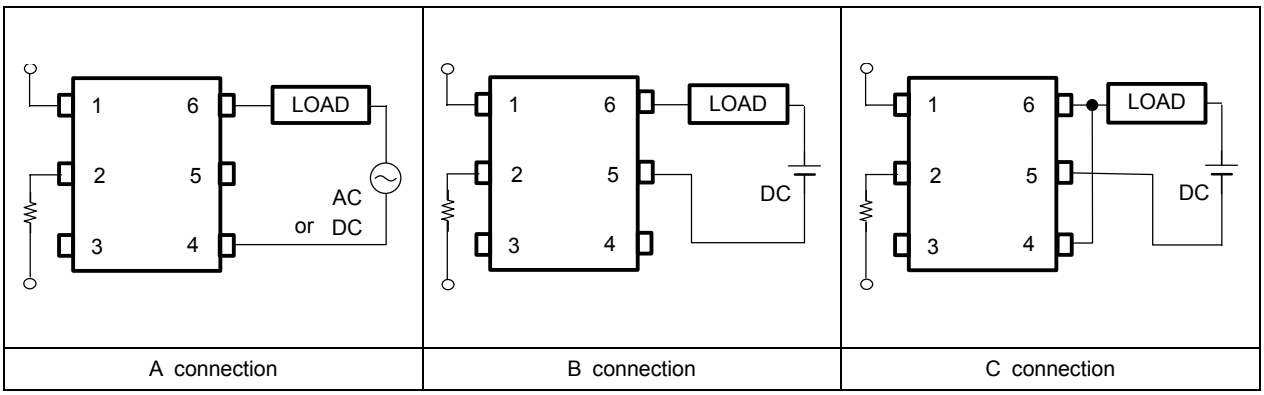
Characteristic			Symbol	Rating	Unit
LED	Forward current		I_F	50	mA
	Forward current derating (Ta ≥ 25°C)		ΔI_F / °C	−0.5	mA / °C
	Peak forward current (100 μs pulse, 100 pps)		I_{FP}	1	A
	Reverse voltage		V_R	5	V
Detecter	Junction temperature		T_j	125	°C
	Off−state output terminal voltage		V_{OFF}	60	V
	On−state RMS current	A connection	I_{ON}	300	mA
		B connection		450	
		C connection		600	
	On−state current derating (Ta ≥ 25°C)	A connection	ΔI_{ON} / °C	−3	mA / °C
		B connection		−4.5	
		C connection		−6	
	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}	—	—	48	V
Forward current	I_F	7.5	15	25	mA
On−state current	I_{ON}	—	—	300	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} = 60 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} = 300 mA	—	1	5	mA
On−state Resistance	A connection	R_{ON}	I_{ON} = 300 mA, I_F = 10 mA	—	1.4	2	Ω
	B connection		I_{ON} = 450 mA, I_F = 10 mA	—	0.7	1	
	C connection		I_{ON} = 600 mA, I_F = 10 mA	—	0.35	0.5	

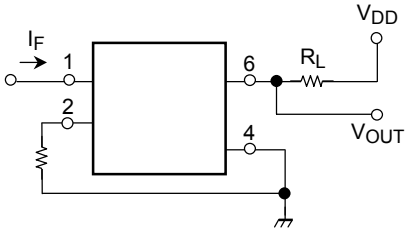
Isolation Characteristics (Ta = 25°C)

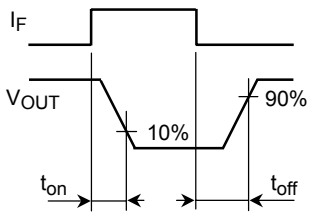
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H.≤ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—	5000	—	V_{dc}

Switching Characteristics (Ta = 25°C)

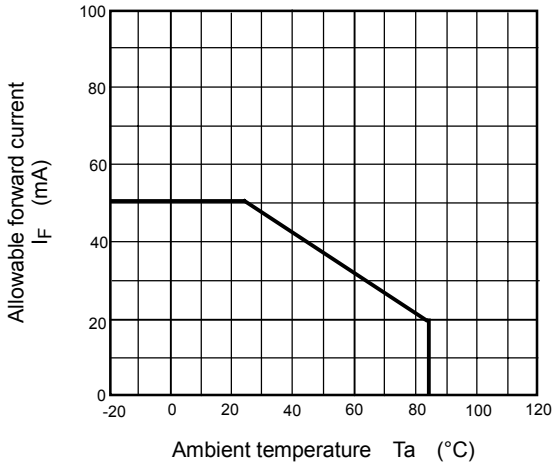
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn−on time	t_{on}	R_L = 200Ω, V_{DD} = 20 V I_F = 10 mA	—	—	2	ms
Turn−off time	t_{off}		—	—	2	

Switching Time Test Circuit

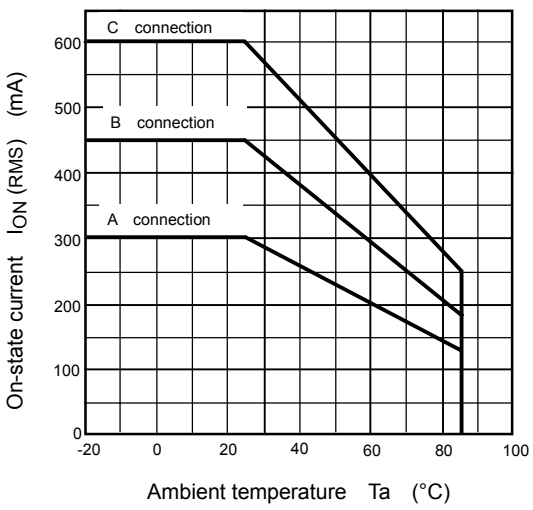




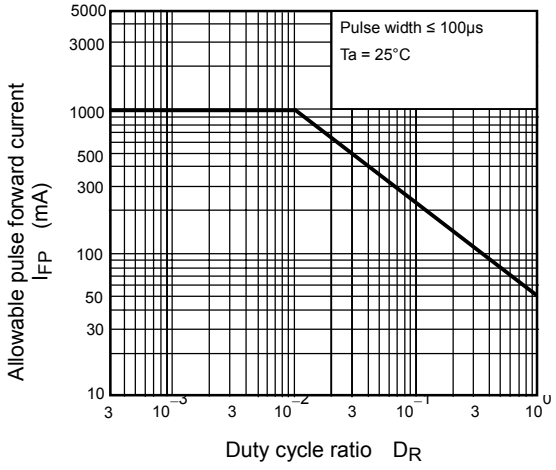
I_F– T_a



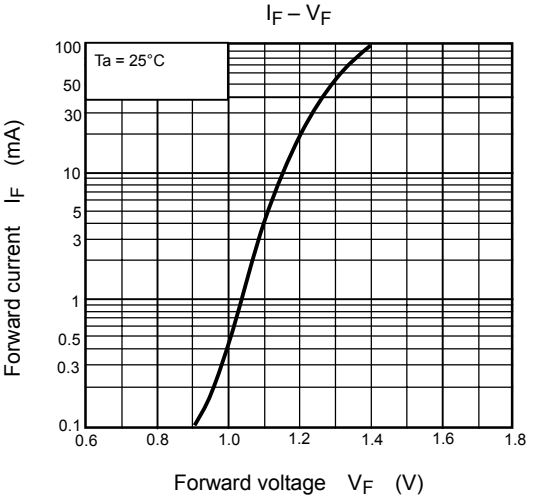
I_{ON} (RMS)– T_a



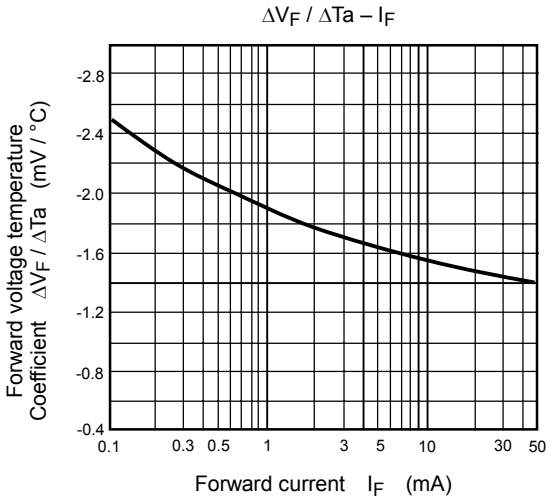
I_{FP} – D_R



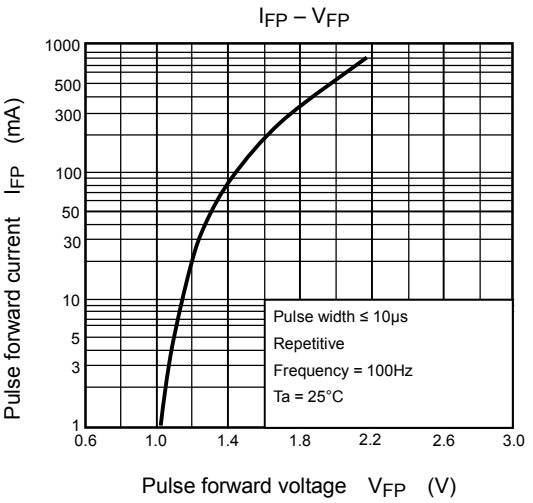
I_F – V_F



ΔV_F / ΔTa – I_F



I_{FP} – V_{FP}



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000707EBC

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