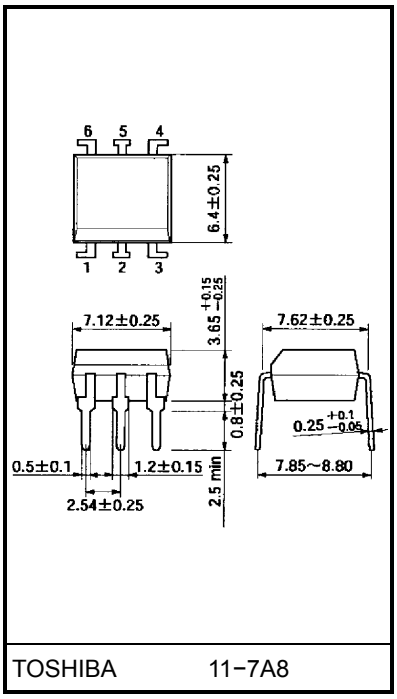
TENTATIVE

TOSHIBA Photocoupler Photo Relay

TLP598GA

Telecommunication
Data Acquisition
Measurement Instrumentation

Unit in mm



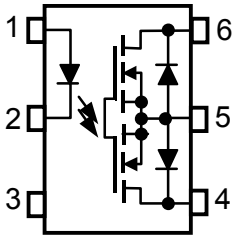
TOSHIBA 11−7A8

Weight: 0.4 g

The TOSHIBA TLP598GA 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 TLP598GA is a bi-directional switch which can replace mechanical relays in many applications.

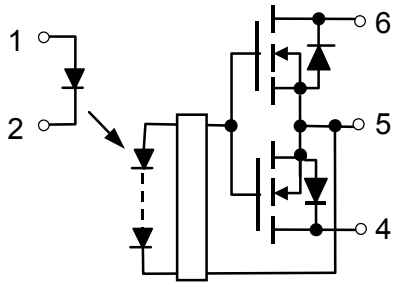
- Peak off−state voltage: 400 V (min.)
- On−state current: 150 mA (max.) (A connection)
- On−state resistance: 12 Ω (max.) (A connection)
- Isolation voltage: 2500 Vrms (min.) (A connection)

Pin Configuration (top view)



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

Schematic



Maximum Ratings (Ta = 25°C)

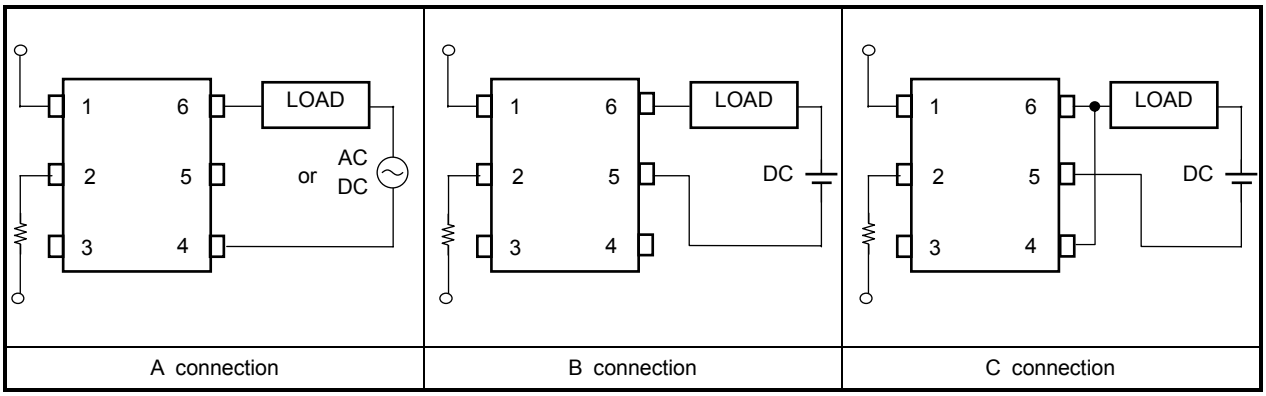
Characteristic			Symbol	Rating	Unit
LED	Forward current		I_F	30	mA
	Forward current derating (Ta ≥ 25°C)		ΔI_F / °C	−0.3	mA / °C
	Peak forward current (100 μs pulse, 100 pps)		I_{FP}	1	A
	Reverse voltage		V_R	5	V
	Junction temperature		T_j	125	°C
Detector	Off−state output terminal voltage		V_{OFF}	400	V
	On−state RMS current	A connection	I_{ON}	150	mA
		B connection		200	
		C connection		300	
	On−state current derating (Ta ≥ 25°C)	A connection	ΔI_{ON} / °C	−1.5	mA / °C
		B connection		−2.0	
		C connection		−3.0	
	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 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}	—	—	320	V
Forward current	I_F	5	7.5	20	mA
On−state current (A connection)	I_{ON}	—	—	150	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	1.18	1.33	1.48	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} = 400 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} = 150 mA	—	1	3	mA
On−state resistance	A connection	R_{ON}	I_{ON} = 150 mA, I_F = 5 mA	—	8	12	Ω
	B connection		I_{ON} = 200 mA, I_F = 5 mA	—	4	6	
	C connection		I_{ON} = 300 mA, I_F = 5 mA	—	2	3	

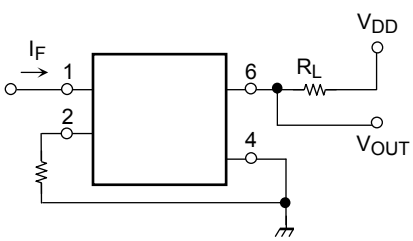
Isolation Characteristics (Ta = 25°C)

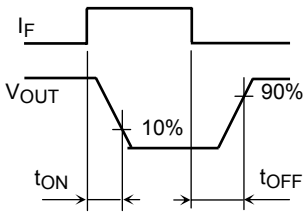
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≤ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—	5000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

Switching Characteristics (Ta = 25°C)

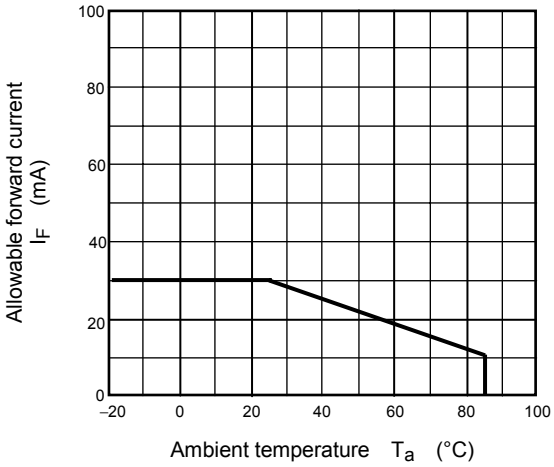
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn−on time	t_{ON}	V_{DD} = 20 V, R_L = 200 Ω I_F = 5 mA (Note 3)	—	0.3	1.0	ms
Turn−off time	t_{OFF}		—	0.2	1.0	

(Note 3): Switching time test circuit

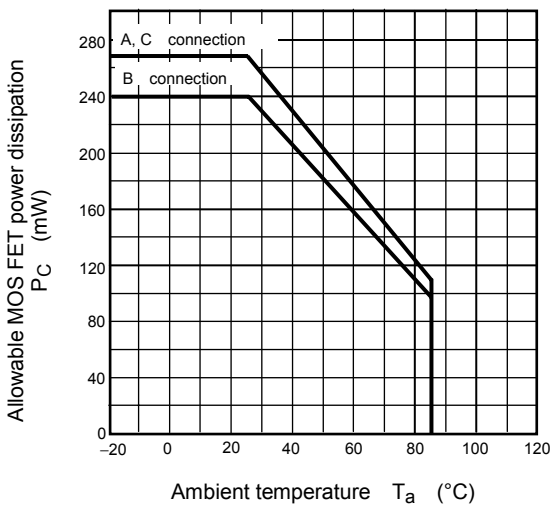




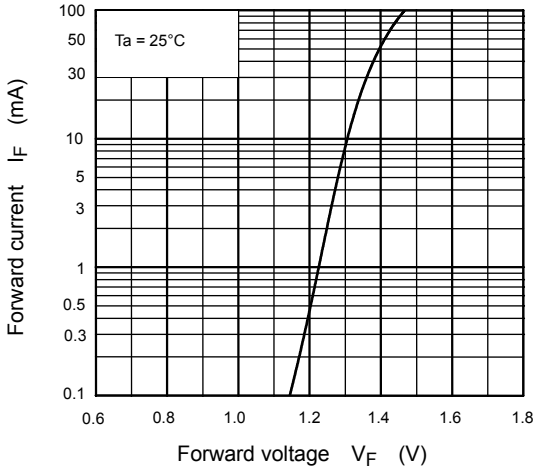
$I_F - T_a$



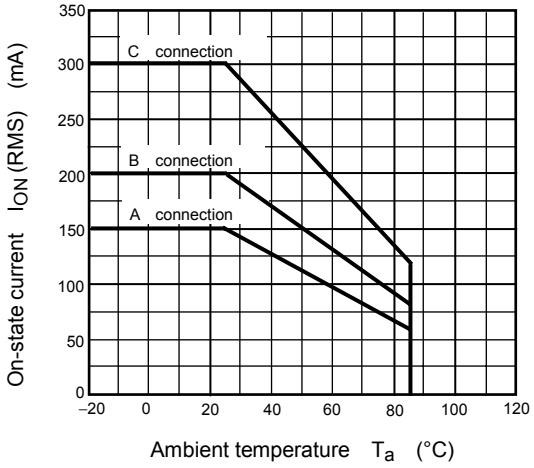
$P_C - T_a$



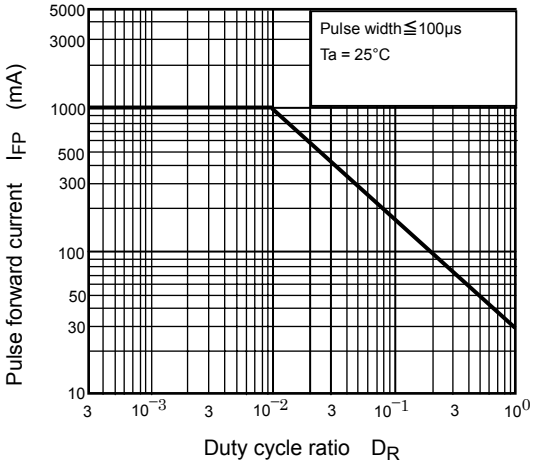
$I_F - V_F$



I_{ON} (RMS) – T_a



$I_{FP} - D_R$



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