

TENTATIVE

TOSHIBA Photocoupler Photo Relay

TLP598GA

Telecommunication

Data Acquisition

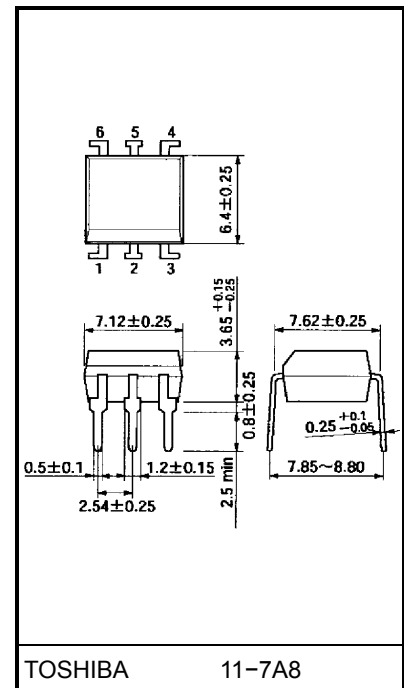
Measurement Instrumentation

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.

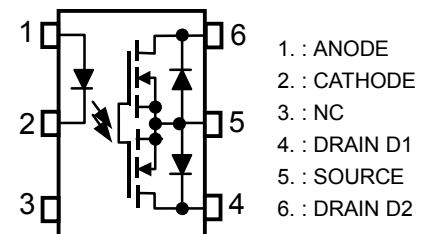
- Peak off-state voltage: 400 V (min.)
- On-state current: 150 mA (max.) (A connection)
- On-state resistance: 12 Ω (max.) (A connection)
- Isolation voltage: 2500 Vrms (min.) (A connection)

Unit in mm

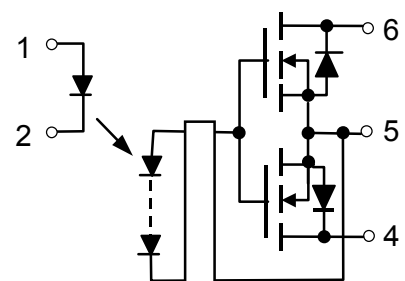


Weight: 0.4 g

Pin Configuration (top view)



Schematic



Maximum Ratings (Ta = 25°C)

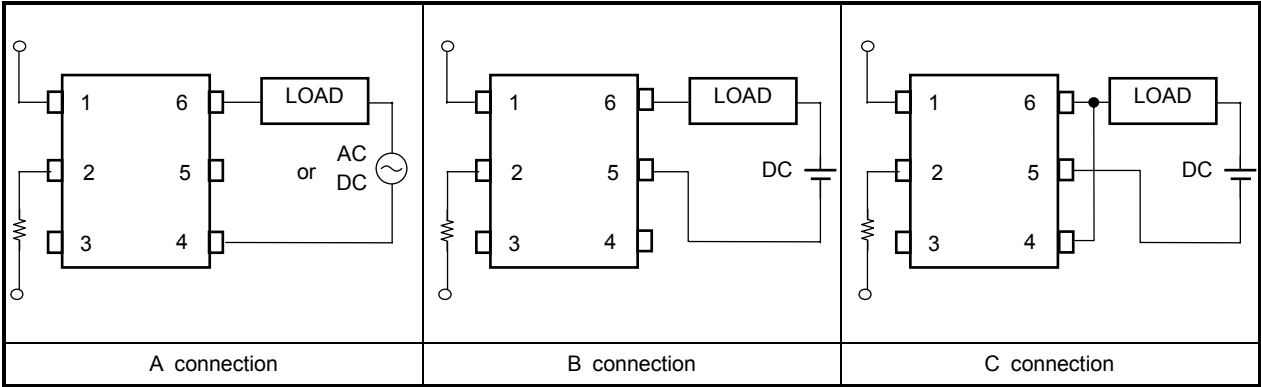
Characteristic			Symbol	Rating	Unit
LED	Forward current		I _F	30	mA
	Forward current derating (Ta ≥ 25°C)		ΔI _F / °C	−0.3	mA / °C
	Peak forward current (100 μs pulse, 100 pps)		I _{FP}	1	A
	Reverse voltage		V _R	5	V
	Junction temperature		T _j	125	°C
Detector	Off-state output terminal voltage		V _{OFF}	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	V _{rms}	

(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	VDD	—	—	320	V
Forward current	IF	5	7.5	20	mA
On-state current (A connection)	ION	—	—	150	mA
Operating temperature	Topr	−20	—	80	°C

Circuit Connections



Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.18	1.33	1.48	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 400 \text{ V}$	—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$	—	—	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current		I_{FT}	$I_{ON} = 150 \text{ mA}$	—	1	3	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 150 \text{ mA}, I_F = 5 \text{ mA}$	—	8	12	Ω
	B connection		$I_{ON} = 200 \text{ mA}, I_F = 5 \text{ mA}$	—	4	6	
	C connection		$I_{ON} = 300 \text{ mA}, I_F = 5 \text{ mA}$	—	2	3	

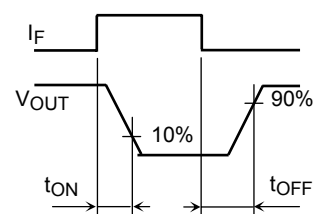
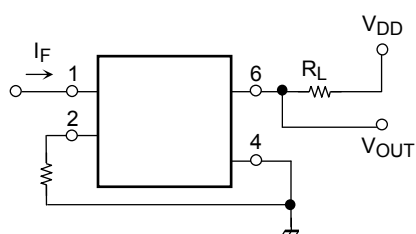
Isolation Characteristics (Ta = 25°C)

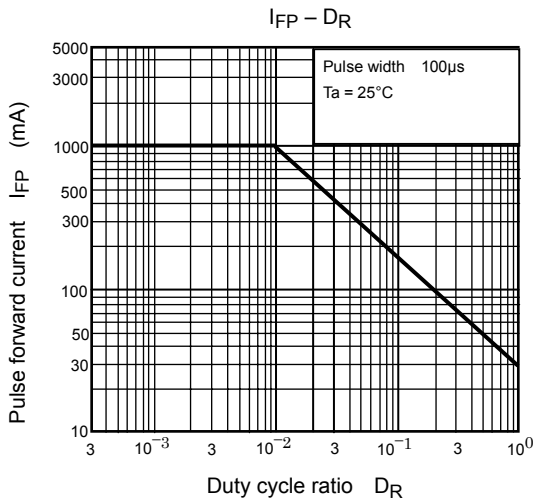
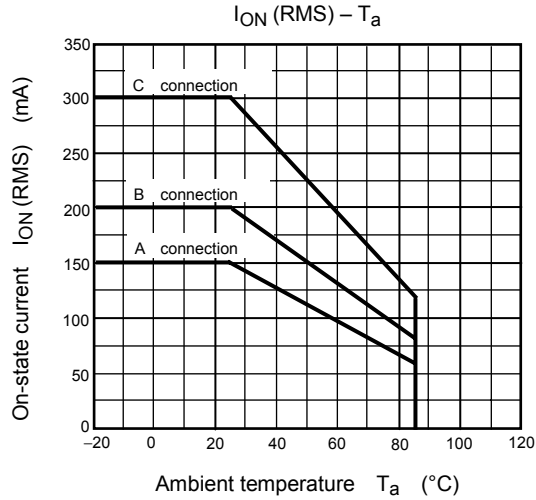
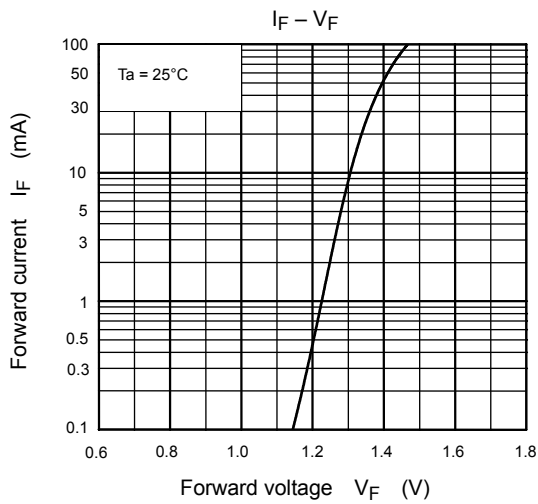
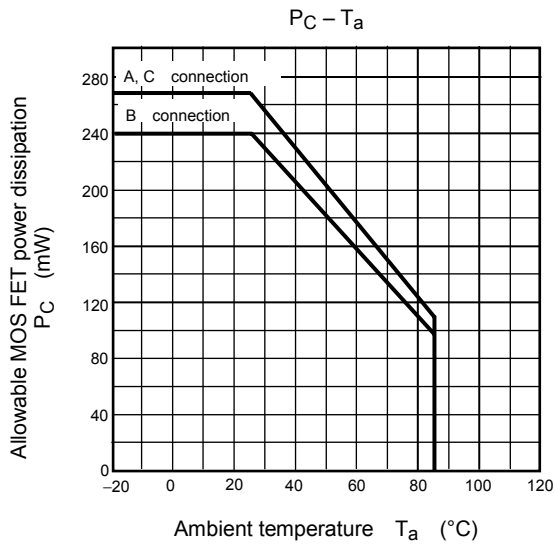
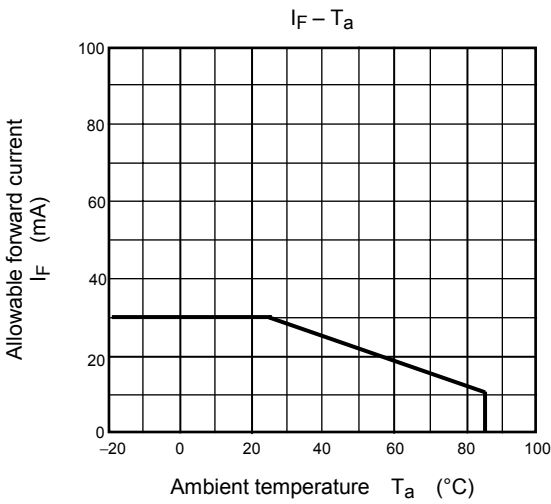
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second (in oil)	—	5000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

Switching Characteristics (Ta = 25°C)

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

(Note 3): Switching time test circuit





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