

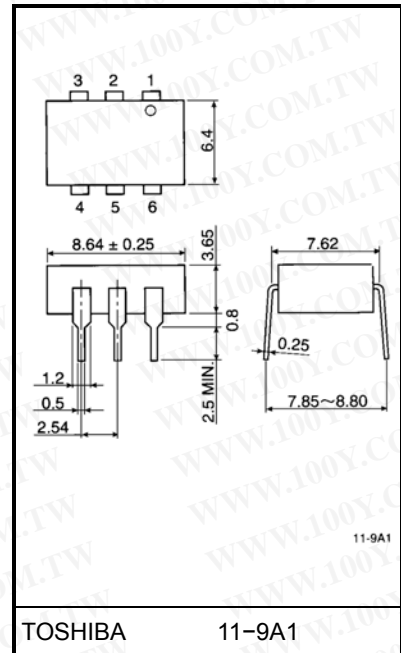
TOSHIBA Photocoupler Photo Relay

TLP598G

Telecommunication
Data Acquisition
Measurement Instrumentation

Unit in mm

The TOSHIBA TLP598G 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 TLP598G is a bi-directional switch which can replace mechanical relays in many applications.



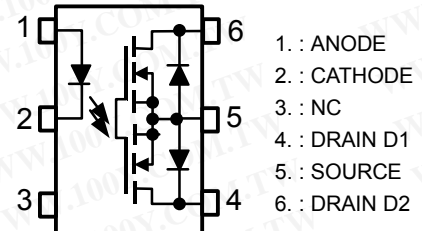
Weight: 0.49 g

- 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)
- UL recognized: UL1577, file no. E67349
- Trigger LED current (Ta = 25°C)

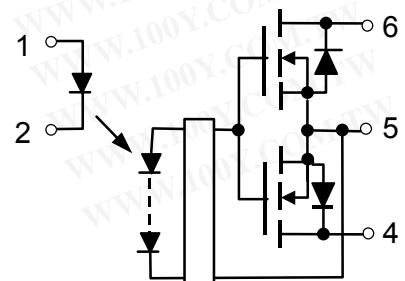
Classification (Note 1)	Trigger LED Current (mA)		Marking Of Classification
	@I _{ON} = 150 mA		
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

(Note 1): Application type name for certification test,
please use standard product type name, i.e.
TLP598G (IFT2): TLP598G

Pin Configuration (top view)



Schematic



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Maximum Ratings (Ta = 25°C)

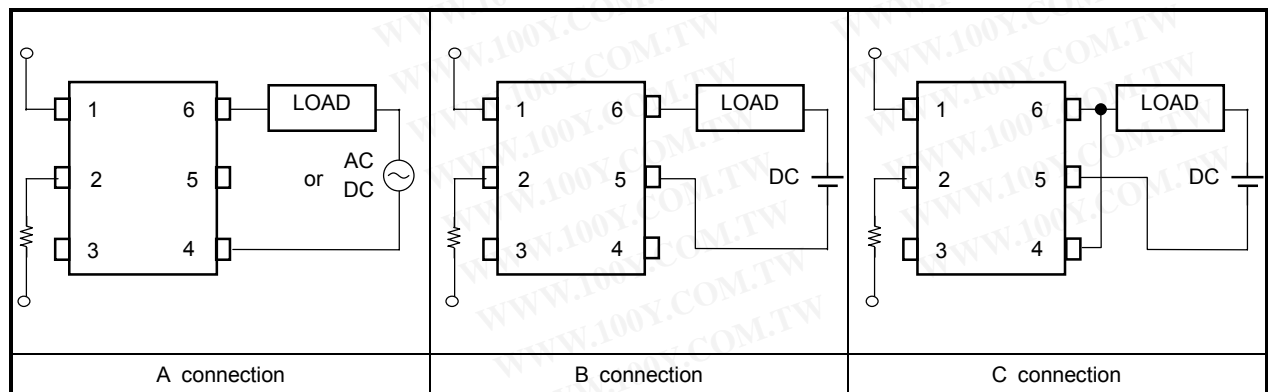
Characteristic		Symbol	Rating	Unit	
LED	Forward current	I_F	30	mA	
	Forward current derating (Ta ≥ 25°C)	$\Delta I_F / ^\circ\text{C}$	-0.3	mA / °C	
	Peak forward current (100 μs pulse, 100 pps)	I_{FP}	1	A	
	Reverse voltage	V_R	5	V	
	Junction temperature	T_j	125	°C	
Detector	Off-state output terminal 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	$\Delta I_{ON} / ^\circ\text{C}$	-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	10	15	20	mA
On-state current	I_{ON}	—	—	150	mA
Operating temperature	T_{opr}	-20	—	80	°C

Circuit Connections



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Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.2	1.4	1.7	V
	Reverse current	I_R	$V_R = 3 \text{ V}$	—	—	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	5	mA
On-state resistance	A connection	R_{ON}	$I_{ON} = 150 \text{ mA}, I_F = 10 \text{ mA}$	—	8	12	Ω
	B connection		$I_{ON} = 200 \text{ mA}, I_F = 10 \text{ mA}$	—	4	6	
	C connection		$I_{ON} = 300 \text{ mA}, I_F = 10 \text{ mA}$	—	2	3	

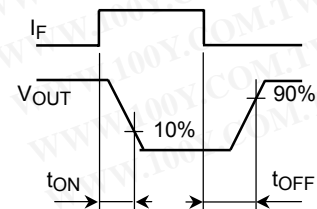
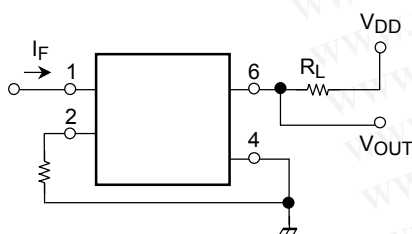
Isolation Characteristics (Ta = 25°C)

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

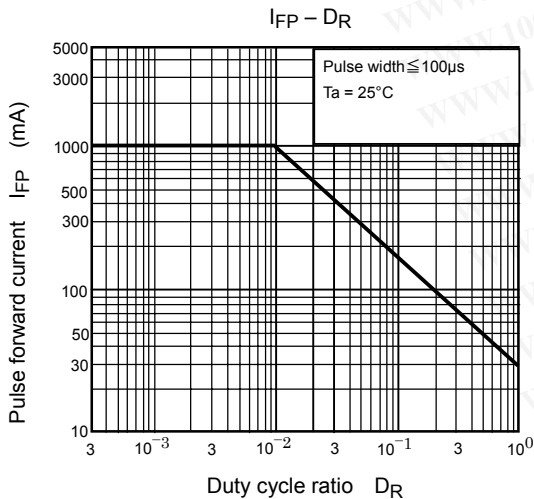
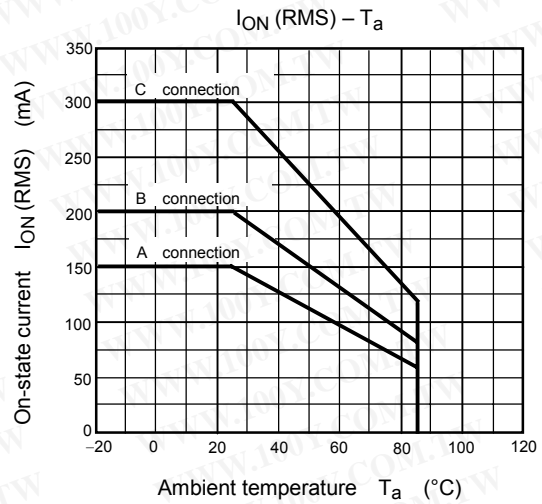
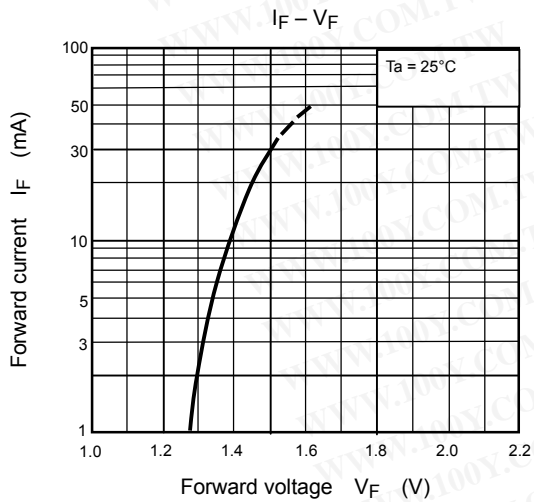
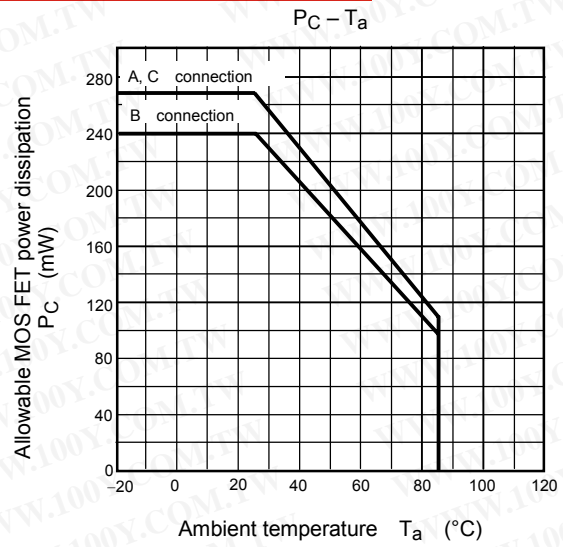
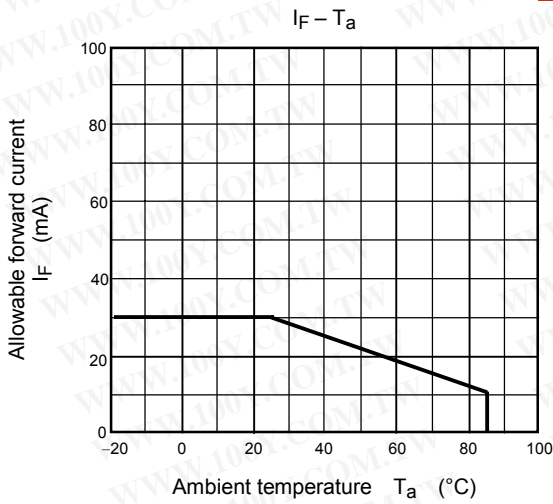
Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on time	t_{ON}	$V_{DD} = 20 \text{ V}, R_L = 200 \Omega$ $I_F = 10 \text{ mA}$ (Note 3)	—	0.3	1.0	ms
Turn-off time	t_{OFF}		—	0.2	1.0	

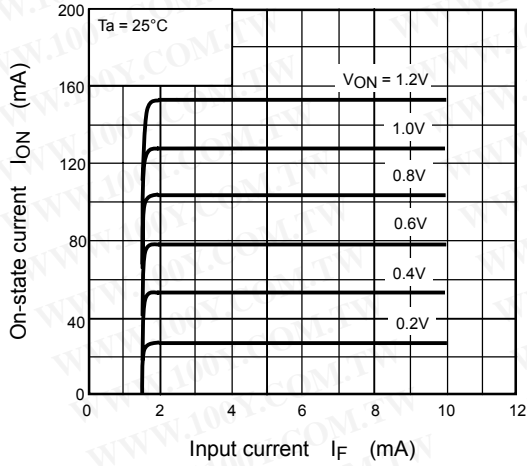
(Note 3): Switching time test circuit



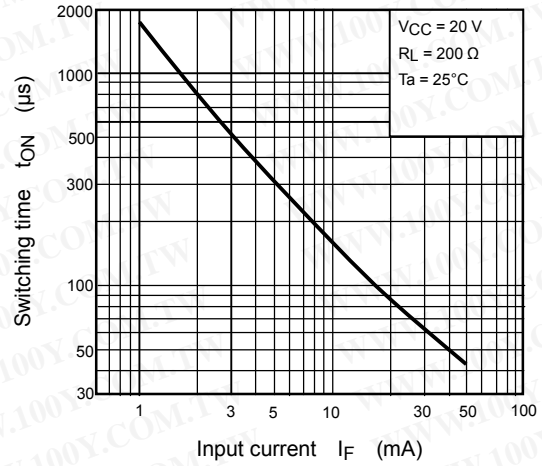
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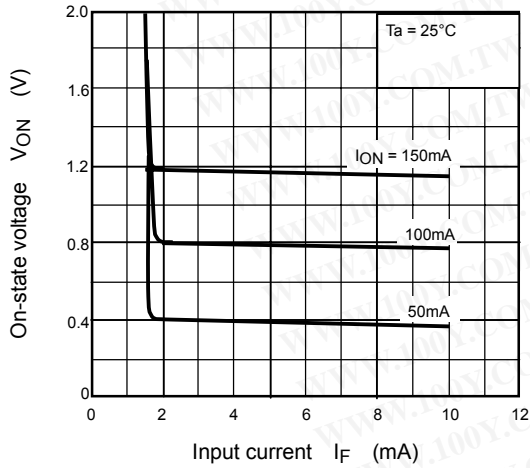
$I_{ON} - I_F$ (A Connection)



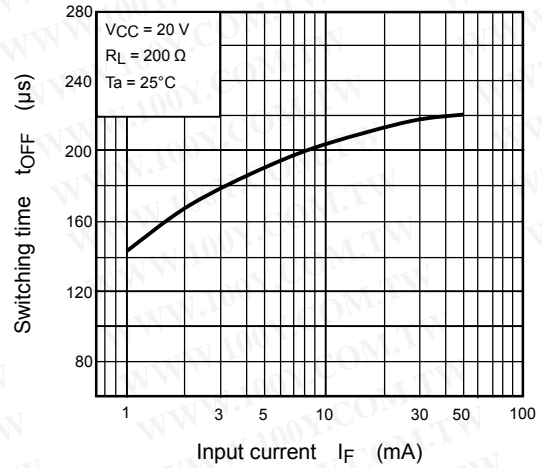
$t_{ON} - I_F$



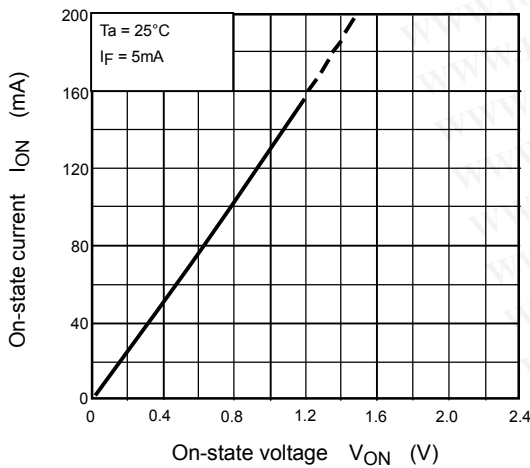
$V_{ON} - I_F$ (A Connection)

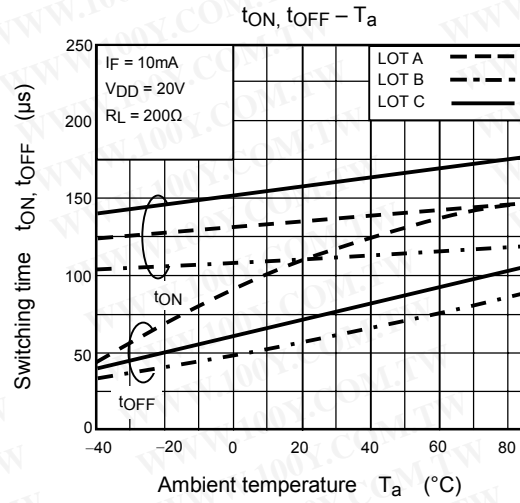
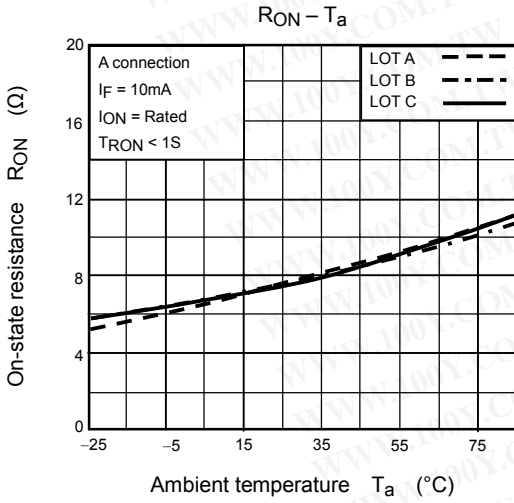
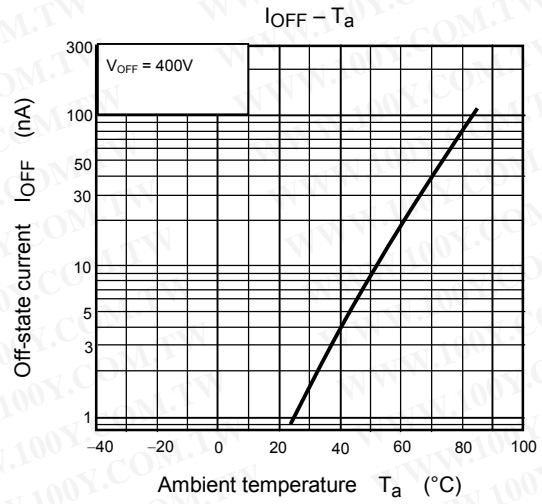
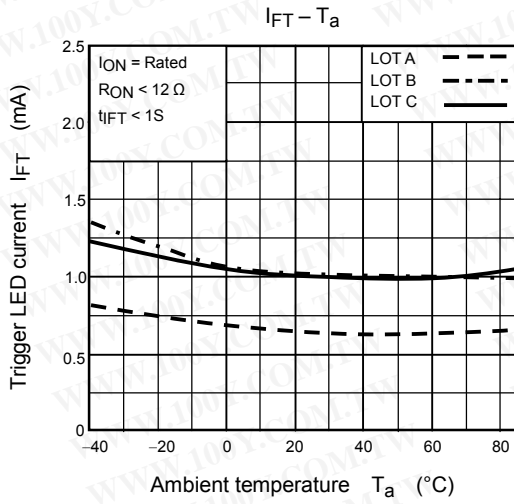


$t_{OFF} - I_F$



$I_{ON} - V_{ON}$ (A Connection)





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