TOSHIBA Photocoupler Photo Relay

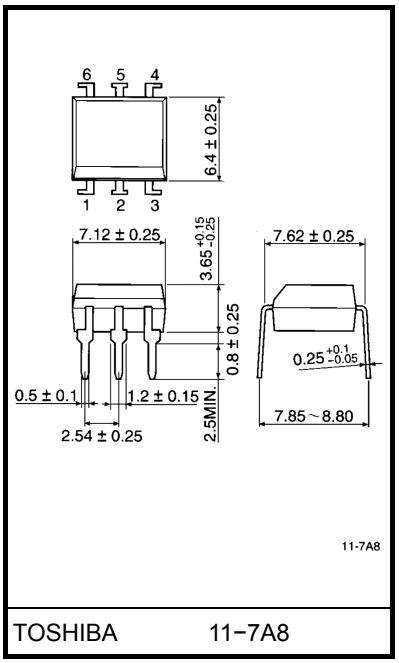
TLP594G

Modems

PBXes

Telecommunications

Unit in mm



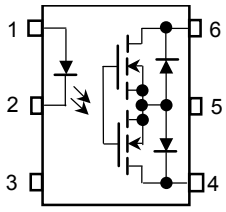
TOSHIBA 11−7A8

Weight: 0.4g

The TOSHIBA TLP594G consists of a gallium arsenide infrared emitting diode optically coupled to a photo−MOS FET in a DIP (DIP6), which is suitable for equipment for high tech communications, including modems. The TLP594G complies with FCC part 68 rules with current limiting function.

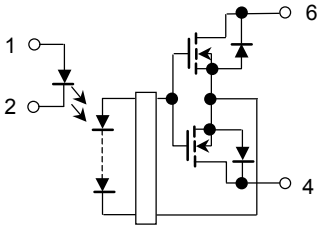
- Peak off-state voltage: 350V (min.)
- Trigger LED current: 3mA (max)
- On-state current: 120mA(max)
- Load current limiting: 150mA~300mA (t = 5ms)
- On−state resistance: 35Ω (max)
- Isolation voltage: 2500Vrms (min)
- UL recognized: UL1577, file no.E67349

Pin Configurations (top view)



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

Schematic



Absolute 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
	Pulse forward current (100μs pulse, 100pps)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Junction temperature	T_j	125	°C
Detector	Off−state output terminal voltage	V_{OFF}	350	V
	On−state RMS current	I_{ON}	120	mA
	On−state current derating (Ta ≥ 25°C)	ΔI_{ON} / °C	−1.2	mA / °C
	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 1)		BV_S	2500	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

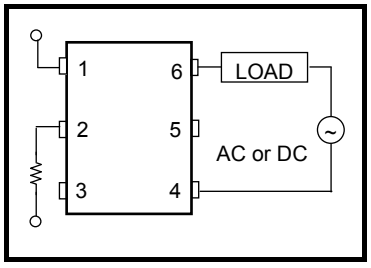
(Note 1): Device considered a two−terminal device: Pins1, 2 and 3 shorted together and pins4, 5 and 6 shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{DD}	—	—	280	V
Forward current	I_F	5	7.5	25	mA
On−state current	I_{ON}	—	—	120	mA
Operating temperature	T_{opr}	−20	—	65	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Circuit Connections



Individual Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	I_F = 10mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1MHz	—	30	—	pF
Detector	Off−state current	I_{OFF}	V_{OFF} = 350V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1MHz	—	40	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	MIn	Typ.	Max	Unit
Trigger LED current	I_{FT}	I_{ON} = 120mA	—	—	3	mA
On−state resistance	R_{ON}	I_{ON} = 120mA, I_F = 5mA	—	22	35	Ω
		I_{ON} = 20~120mA, I_F = 5mA	—	26	40	Ω
Load current limiting	I_{LIM}	I_F = 5mA, V_{DD} = 5V, t = 5ms	150	—	300	mA

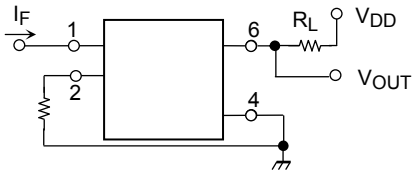
Isolation Characteristics (Ta = 25°C)

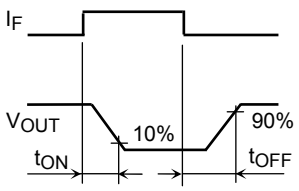
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≤ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000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

Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn−on time	t_{ON}	R_L = 200Ω (Note2) V_{DD} = 20V, I_F = 5mA	—	—	1	ms
Turn−off time	t_{OFF}		—	—	1	

(Note2): Switching time test circuit





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20070701-EN

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