

TOSHIBA Photocoupler GaAlAs Ired & Photo-Triac

# TLP668J(S)

Office Machine  
Household Use Equipment  
Triac Driver  
Solid State Relay

The TOSHIBA TLP668J(S) consists of a zero voltage crossing turn-on photo-triac optically coupled to a GaAlAs infrared emitting diode in a six lead plastic DIP package.

- Peak off-state voltage: 600V (Min.)
- Trigger LED current: 3mA (Max.)
- On-state current: 100mA (Max.)
- Isolation voltage: 5000Vrms (Min.)
- UL recognized: UL1577, file No. E67349
- BSI approved: BS EN60065:2002, file No. 8385  
BS EN60950-1:2002, file No. 8386
- SEMCO approved: EN60065, EN60950-1, EN60335-1  
Certificate no. 708960
- Option(D4) type  
VDE approved: DIN EN 60747-5-2  
Certificate No. 40009302

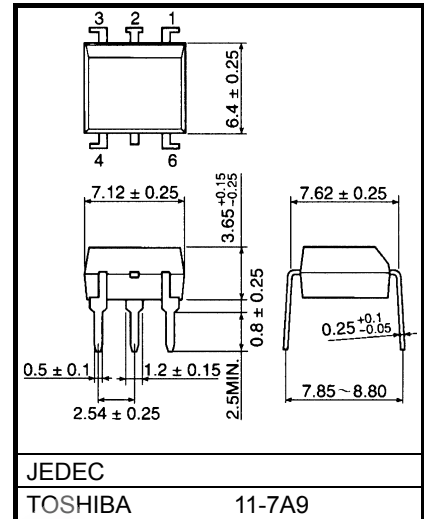
Maximum operating insulation voltage : 890Vpk  
Highest permissible over voltage : 8000 Vpk

(Note) When an EN60747-5-2 approved type is needed, please designate the "Option(D4)".

•Construction mechanical rating

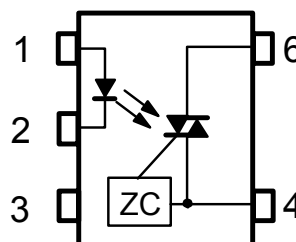
	7.62 mm pich standard type	10.16 mm pich TLPXXXX type
Creepage distance	7.0 mm (Min.)	8.0 mm (Min.)
Clearance	7.0 mm (Min.)	8.0 mm (Min.)
Insulation thickness	0.5 mm (Min.)	0.5 mm (Min.)

Unit: mm



Weight: 0.39 g (Typ.)

### Pin configuration (top view)



- 1: Anode
- 2: Cathode
- 3: N.C.
- 4: Terminal 1
- 6: Terminal 2

ZC: Zero-cross circuit

## Absolute 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 (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	$V_{DRM}$	600	V	
	On-state RMS current	Ta=25°C	$I_{T(RMS)}$	100	mA
		Ta=70°C		50	
	On-state current derating (Ta≥25°C)	$\Delta I_T / ^\circ\text{C}$	-1.1	mA / °C	
	Peak on-state current (100μs pulse, 120pps)	$I_{TP}$	2	A	
	Peak nonrepetitive surge current (Pw=10ms,DC=10%)	$I_{TSM}$	1.2	A	
	Junction temperature	$T_j$	110	°C	
Operating temperature range	$T_{opr}$	-40~100	°C		
Storage temperature range	$T_{stg}$	-55~125	°C		
Lead soldering temperature (10s)	$T_{sol}$	260	°C		
Isolation voltage (AC, 1min., R.H. ≤60%)	(Note 2) $BV_S$	5000	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 2) Device considered a two terminal device: Pins 1, 2 and 3 shorted together and pin 4 and pin 6 shorted together.

## Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	$V_{AC}$	—	—	240	Vac
Forward current	$I_F$	4.5	6	7.5	mA
Peak on-state current	$I_{TP}$	—	—	1	A
Operating temperature	$T_{opr}$	-10	—	85	°C

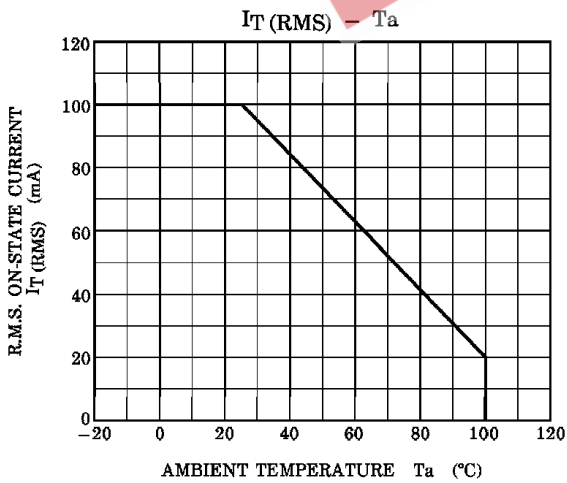
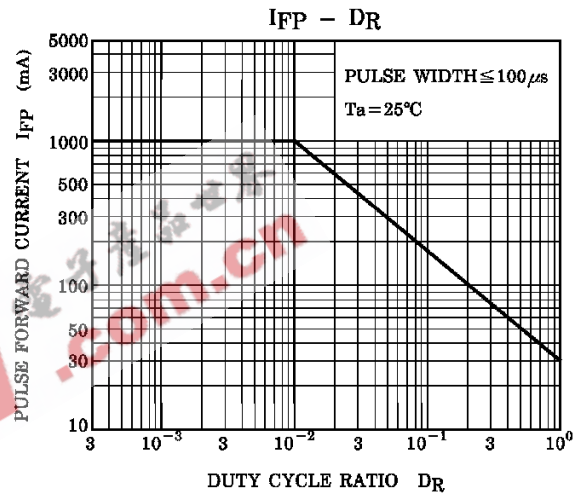
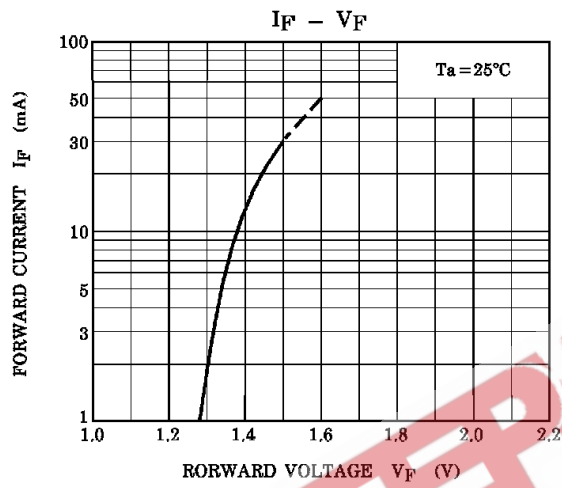
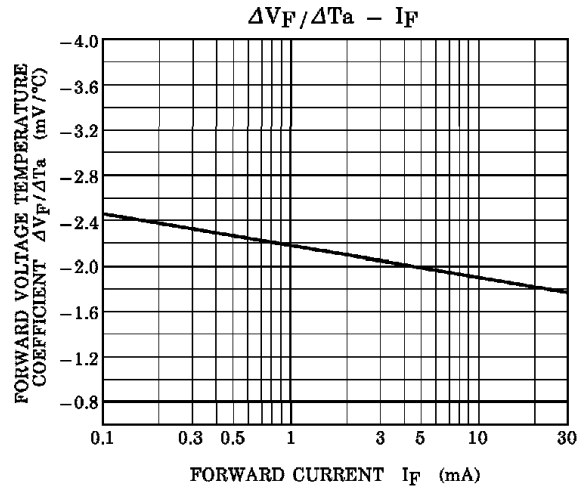
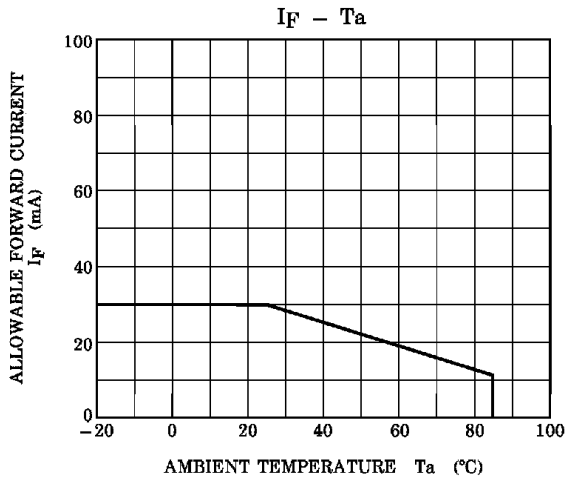
Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

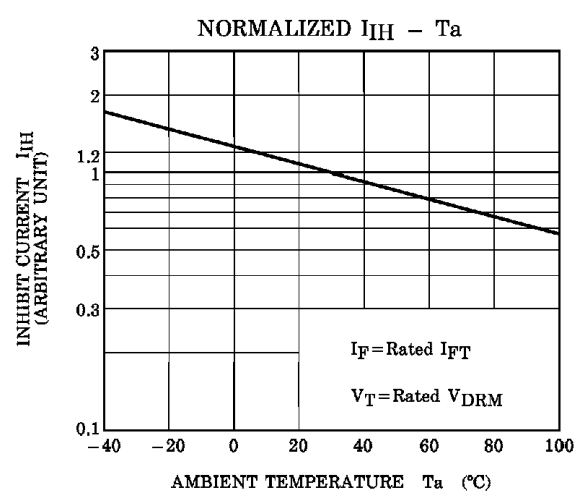
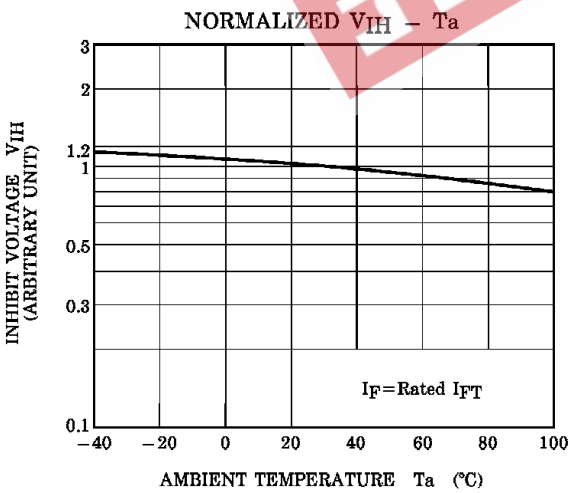
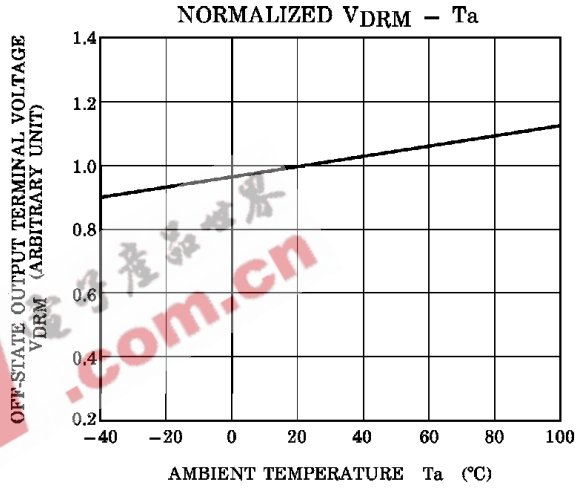
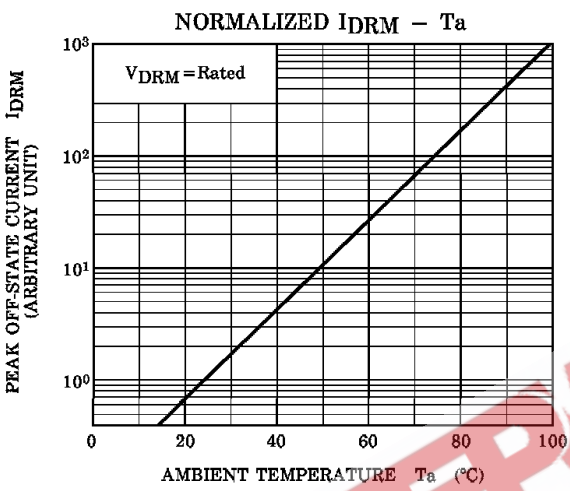
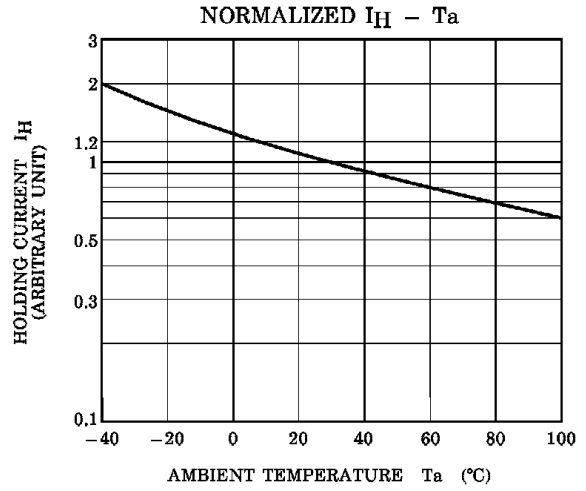
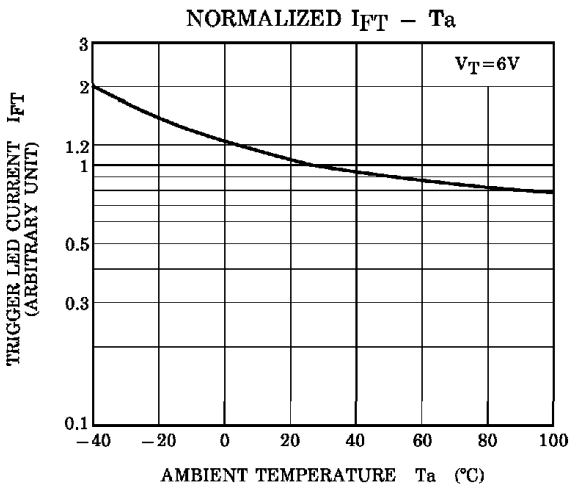
## Electrical Characteristics (Ta = 25°C)

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	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f=1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM} = 600\text{V}$	—	10	1000	nA
	Peak on-state voltage	$V_{TM}$	$I_{TM} = 100\text{mA}$	—	—	3.0	V
	Holding current	$I_H$	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	$dv/dt$	$V_{in}=240\text{Vrms}, Ta=85^\circ\text{C}$	200	500	—	$\text{V}/\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv/dt(c)$	$V_{in}=60\text{Vrms}, I_T=15\text{mA}$	—	0.2	—	$\text{V}/\mu\text{s}$

## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{FT}$	$V_T = 6\text{V}$ , Resistive load	—	—	3	mA
Inhibit voltage	$V_{IH}$	$I_F = \text{Rated } I_{FT}$	—	—	50	V
Leakage in inhibited state	$I_{IH}$	$I_F = \text{Rated } I_{FT}, V_T = \text{rated } V_{DRM}$	—	200	600	$\mu\text{A}$
Capacitance (input to output)	$C_S$	$V_S = 0, f=1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500\text{V}$	$1 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1minute	5000	—	—	Vrms
		AC, 1second, in oil	—	10000	—	
		DC, 1minute, in oil	—	10000	—	Vdc





**RESTRICTIONS ON PRODUCT USE**

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