

# TLP561G

Triac Driver  
 Programmable Controllers  
 AC-Output Module  
 Solid State Relay

The TOSHIBA TLP561G consists of a zero voltage crossing turn-on photo-triac optically coupled to an infrared emitting diode in a six lead plastic DIP package.

- Peak off-state voltage: 400 V (min)
- Trigger LED current: 10 mA (max)
- On-state current: 100 mA (max)
- Isolation voltage: 2500 V<sub>rms</sub> (min)
- UL-recognized: UL 1577, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A  
 File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)  
 Note 1 : When a VDE approved type is needed,  
 please designate the **Option(D4)**.

### Trigger LED current

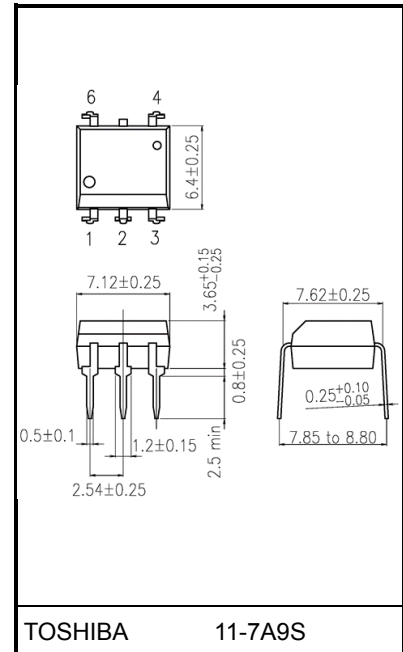
Classification (Note 2)	Trigger LED Current (mA)		Marking of Classification
	V <sub>T</sub> = 3V, Ta = 25°C		
	Min	Max	
(IFT5)	—	5	T5
(IFT7)	—	7	T5, T7
Standard	—	10	T5, T7, blank

Note: Application type name for certification test, please use standard product type name, i.e.  
 TLP561G (IFT5): TLP561G

Note: According to VDE0110, table 4.

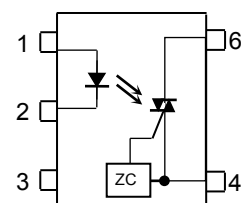
Note 2: Specify both the part number and a rank in this format when ordering. Example: TLP561G (IFT5)

Unit: mm



Weight: 0.39 g (typ.)

### Pin Configuration (top view)



- 1 : ANODE
- 2 : CATHODE
- 3 : N.C.
- 4 : TRIAC TERMINAL
- 6 : TRIAC TERMINAL

Start of commercial production  
 1984-01

**Absolute Maximum Ratings (Ta = 25°C)**

Characteristic		Symbol	Rating	Unit	
LED	Forward current	$I_F$	50	mA	
	Forward current derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C	
	Peak forward current (100 μs pulse, 100 pps)	$I_{FP}$	1	A	
	Reverse voltage	$V_R$	5	V	
	Input power dissipation	$P_D$	100	mW	
	Input power dissipation derating (Ta ≥ 53°C)	$\Delta P_D / ^\circ\text{C}$	-1.4	mW/°C	
	Junction temperature	$T_j$	125	°C	
Detector	Off-state output terminal voltage	$V_{DRM}$	400	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 (100 μs pulse, 120 pps)	$I_{TP}$	2	A	
	Peak non-repetitive surge current (Pw = 10ms)	$I_{TSM}$	1.2	A	
	Output power dissipation	$P_O$	300	mW	
	Output power dissipation derating (Ta ≥ 25°C)	$\Delta P_O / ^\circ\text{C}$	-3.0	mW / °C	
	Junction temperature	$T_j$	115	°C	
Storage temperature range	$T_{stg}$	-55 to 125	°C		
Operating temperature range	$T_{opr}$	-40 to 100	°C		
Lead soldering temperature (10 s)	$T_{sol}$	260	°C		
Isolation voltage (AC, 60 s, R.H. ≤ 60 %) (Note 3)	$BV_S$	2500	V <sub>rms</sub>		

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 3: This device is considered as a two-terminal device: Pins 1, 2 and 3 are shorted together, and pins 4 and 6 are shorted together.

**Recommended Operating Conditions**

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	$V_{AC}$	—	—	120	V <sub>ac</sub>
Forward current	$I_F$	15	20	25	mA
Peak on-state current	$I_{TP}$	—	—	1	A
Operating temperature	$T_{opr}$	-25	—	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the devices. Each item also has its own independent guideline document. In developing designs using these products, please confirm the specified characteristics shown in these documents.

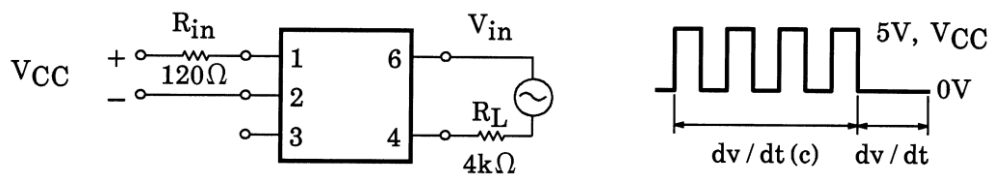
## Electrical Characteristics (Ta = 25°C)

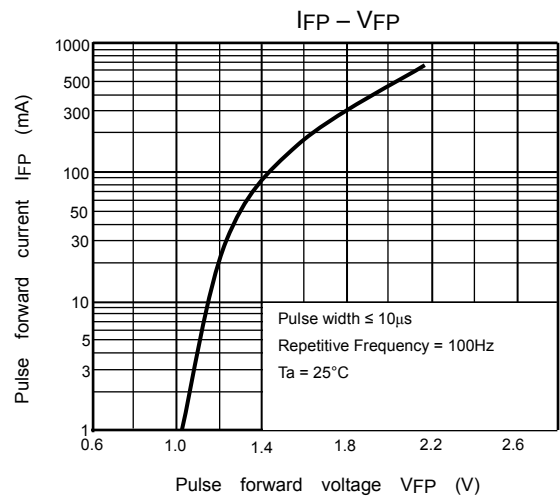
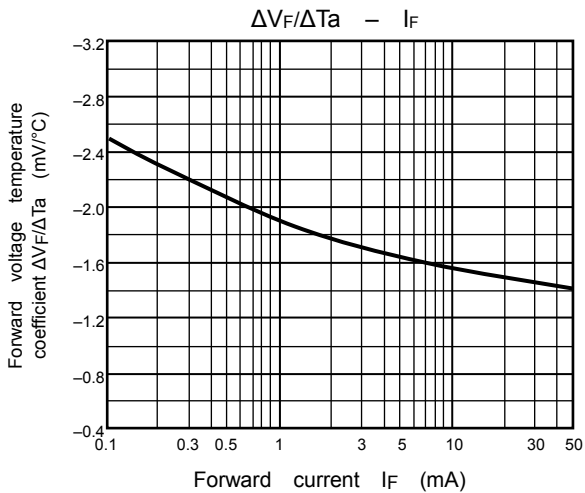
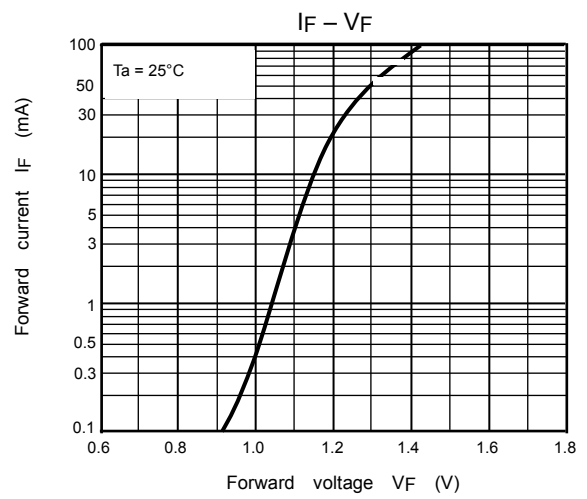
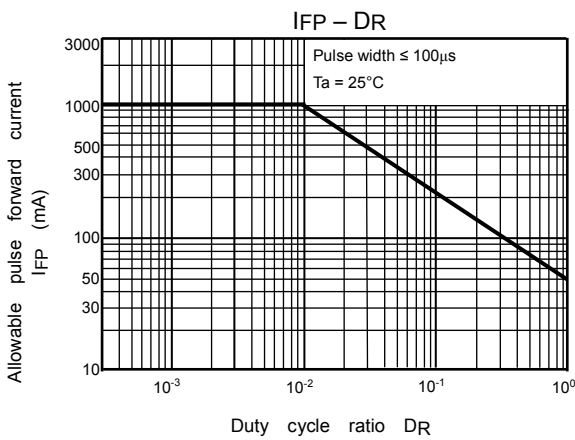
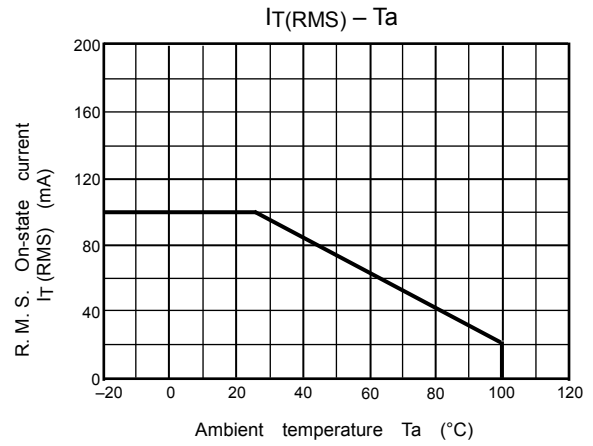
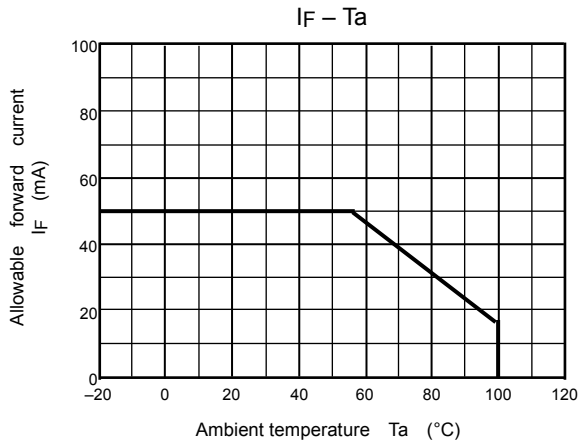
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	$V_F$	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V_F = 0 \text{ V}, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM} = 400 \text{ V}$	—	10	100	nA
	Peak on-state voltage	$V_{TM}$	$I_{TM} = 100 \text{ mA}$	—	1.7	3.0	V
	Holding current	$I_H$	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	$dv / dt$	$V_{in} = 120 \text{ V}_{rms}, T_a = 85 \text{ }^\circ\text{C}$ (Fig.1)	200	500	—	$\text{V} / \mu\text{s}$
	Critical rate or rise of commutating voltage (dv/dt)	$dv / dt (c)$	$V_{in} = 30 \text{ V}_{rms}, I_T = 15 \text{ mA}$ (Fig.1)	—	0.2	—	$\text{V} / \mu\text{s}$

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

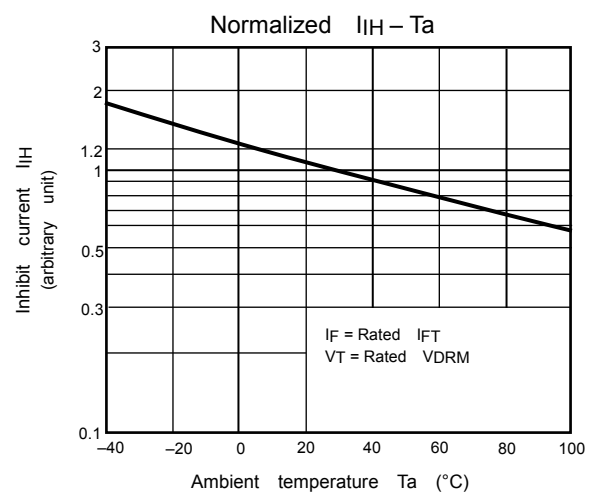
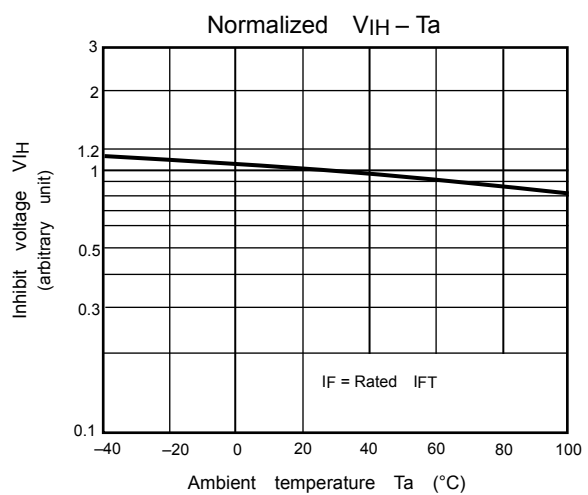
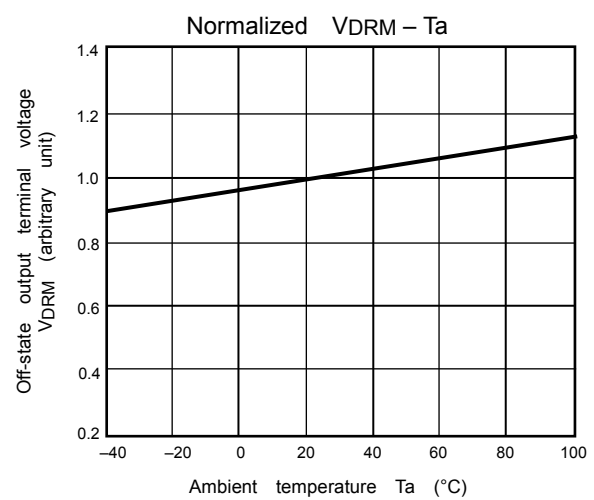
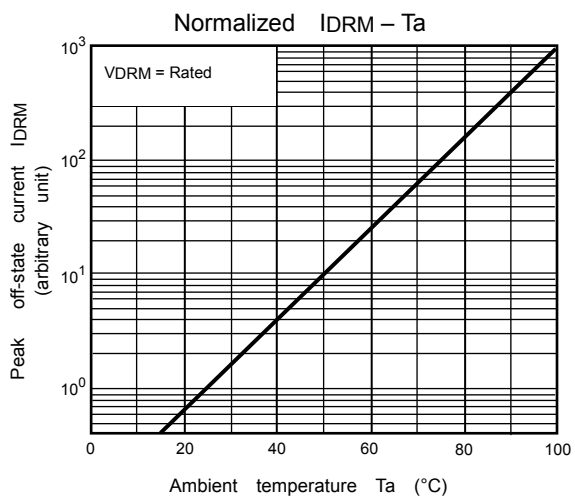
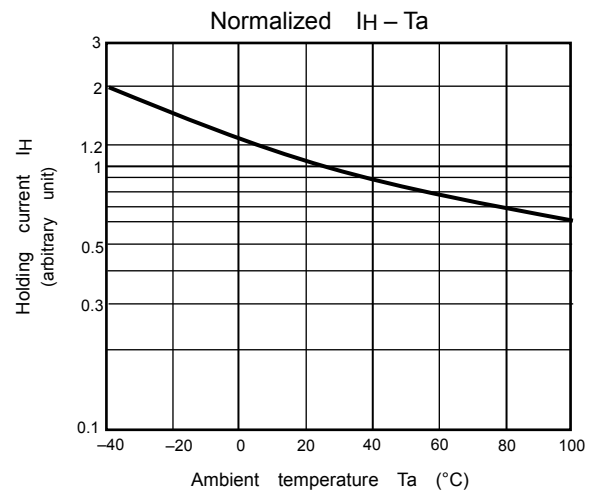
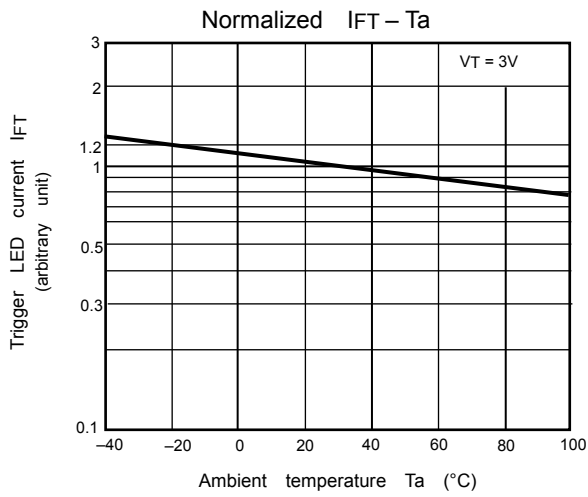
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	$I_{FT}$	$V_T = 3 \text{ V}$	—	5	10	mA
Inhibit voltage	$V_{IH}$	$I_F = \text{rated } I_{FT}$	—	—	40	V
Leakage in inhibited state	$I_{IH}$	$I_F = \text{rated } I_{FT}$ $V_T = \text{rated } V_{DRM}$	—	100	300	$\mu\text{A}$
Capacitance (input to output)	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60 \%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 60 s	2500	—	—	$\text{V}_{rms}$

Fig. 1: dv / dt test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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