

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 a gallium arsenide 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_{RMS} (min)
- UL recognized: UL1577, file no. E67349
- Isolation operating voltage: 2500 V_{AC} or 300 V_{DC} for isolation group C*1

Trigger LED current

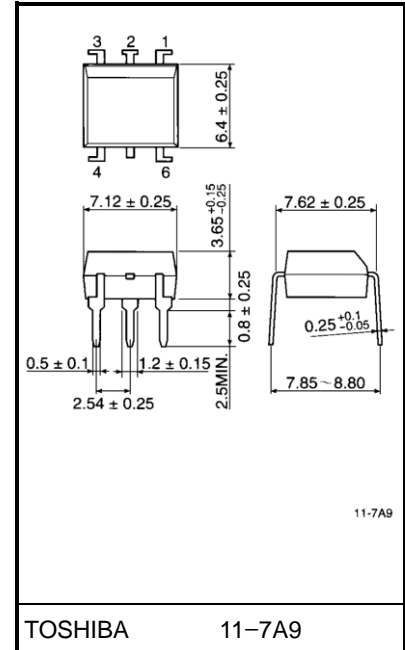
Classification*2	Trigger LED Current (mA)		Marking of Classification
	V _T = 3V, T _a = 25°C		
	Min	Max	
(IFT5)	—	5	T5
(IFT7)	—	7	T5, T7
Standard	—	10	T5, T7, blank

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

*1: According to VDE0110, table 4.

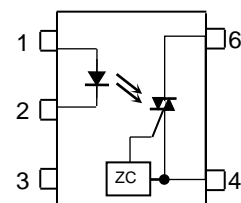
*2: Specify both the part number and a rank in this format when ordering.
 Example: TLP561G (IFT5)

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
 1986

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 (100µs pulse, 100pps)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Junction temperature	T_j	125	°C
	Input power dissipation	P_D	100	mW
Detector	Off-state output terminal voltage	V_{DRM}	400	V
	On-state RMS current	Ta = 25°C	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 non-repetitive surge current (Pw = 10ms)	I_{TSM}	1.2	A
	Junction temperature	T_j	115	°C
	Output power dissipation	P_O	300	mW
Storage temperature range	T_{stg}	-55 to 125	°C	
Operating temperature range	T_{opr}	-40 to 100	°C	
Lead soldering temperature (10s)	T_{sol}	260	°C	
Isolation voltage (AC, 1 min., R.H. ≤ 60%)*3	BV_S	2500	V_{rms}	

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.).

*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_{ac}
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.

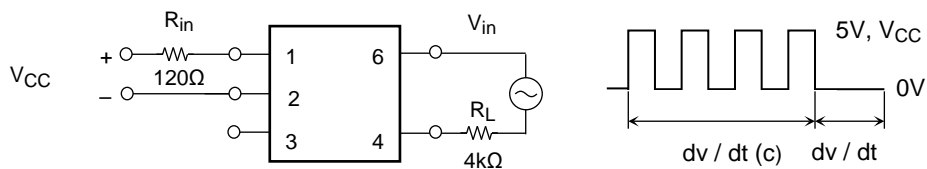
Individual Electrical Characteristics (Ta = 25°C)

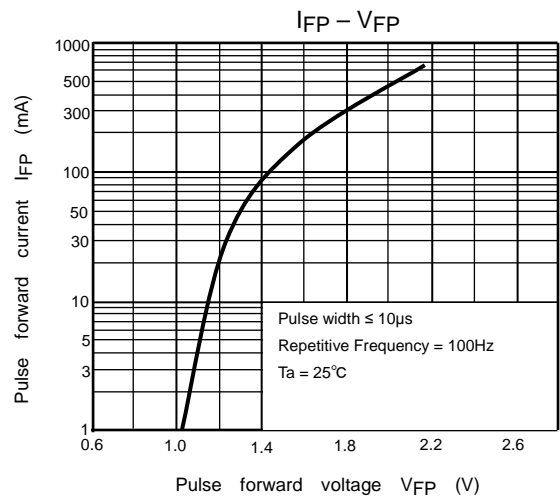
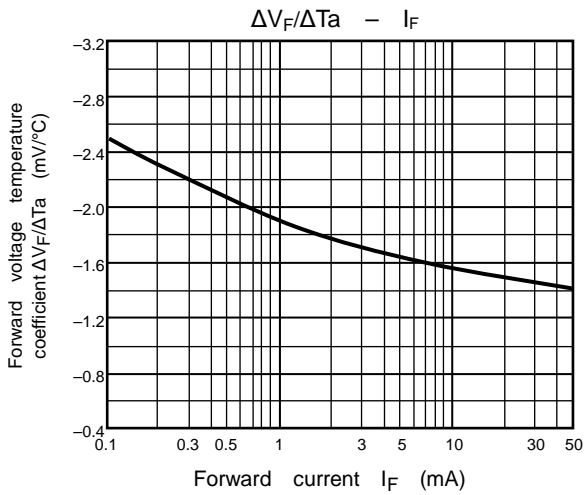
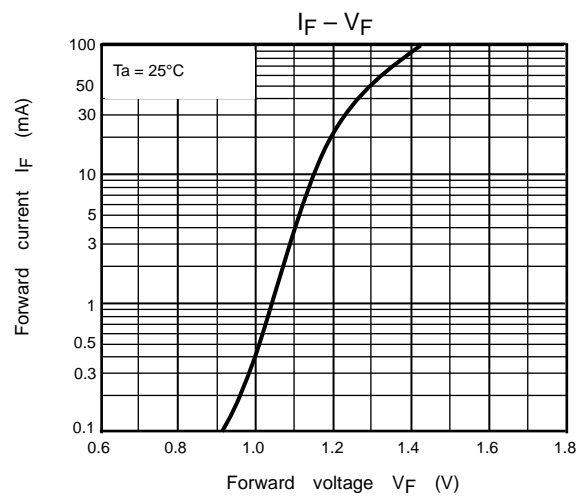
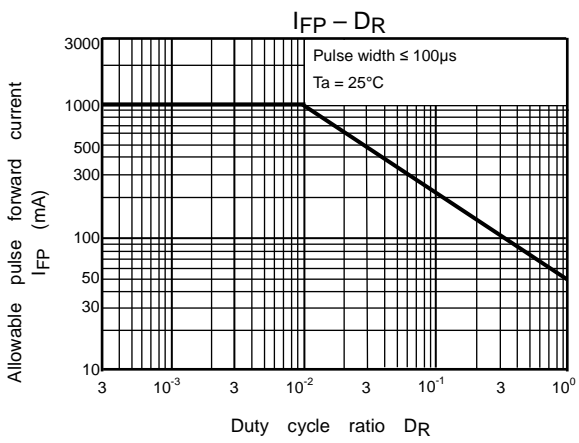
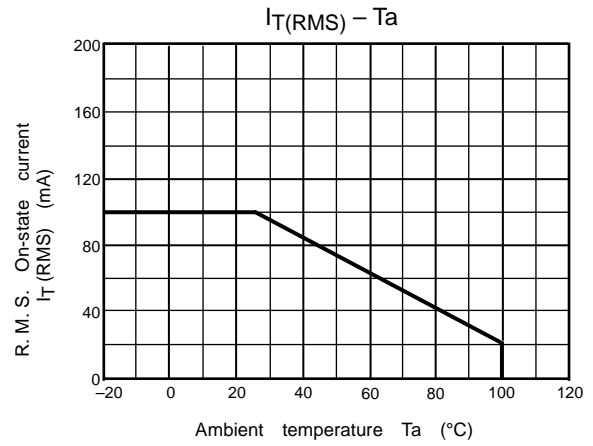
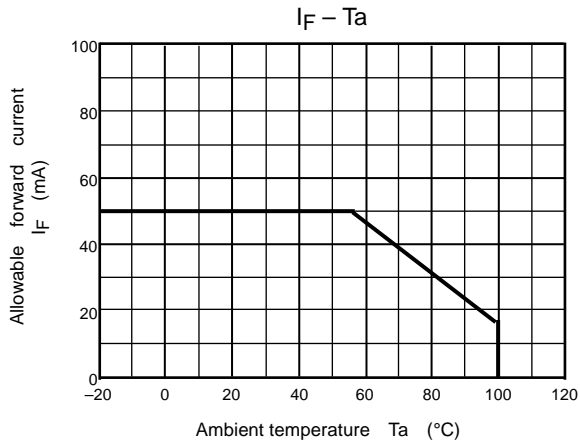
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0\text{V}, f = 1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{DRM} = 400\text{V}$	—	10	100	nA
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

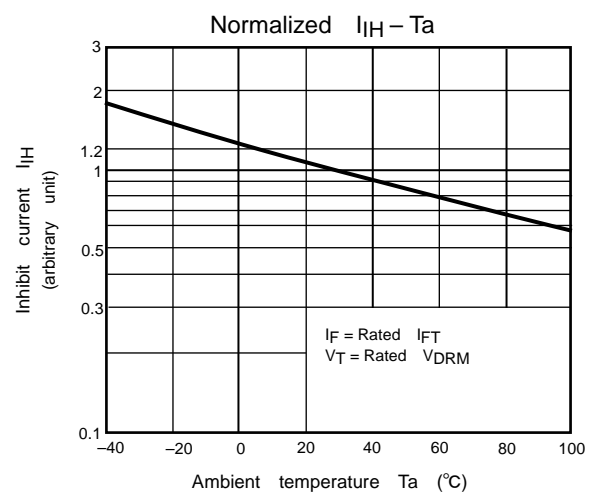
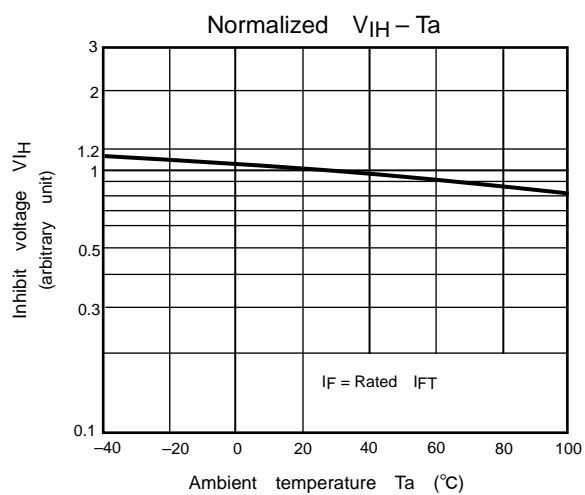
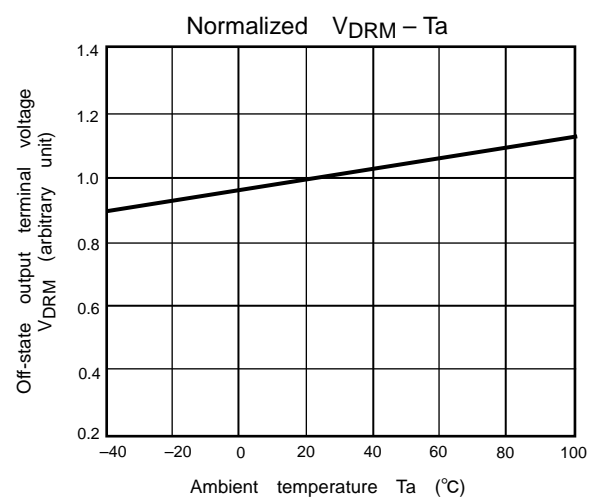
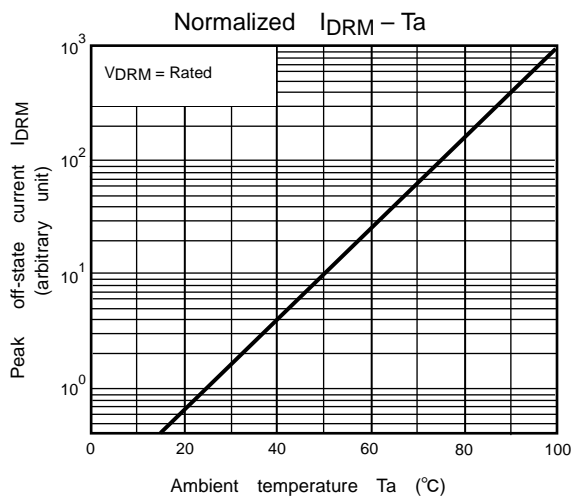
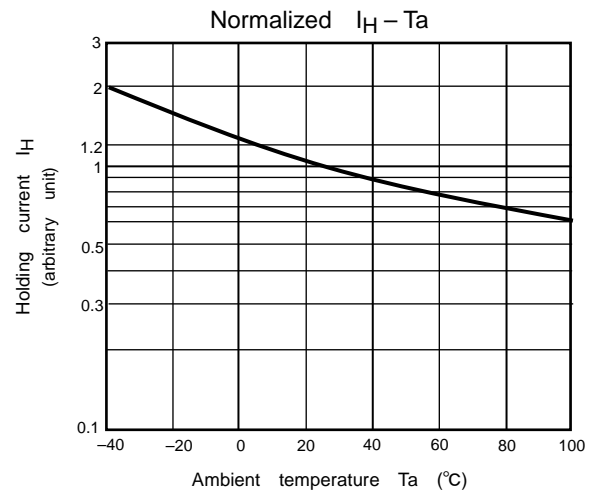
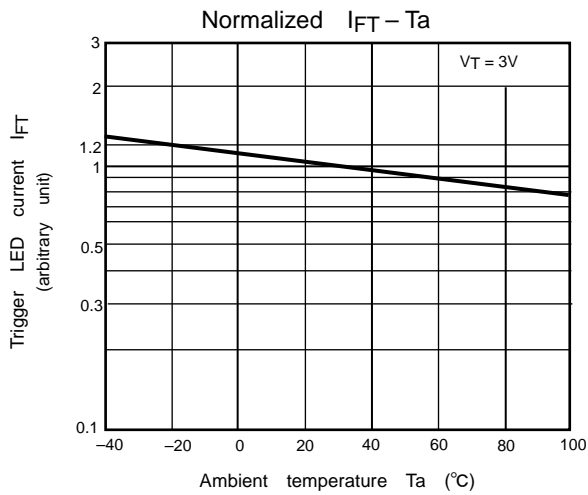
Coupled Electrical Characteristics (Ta = 25°C)

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	μA
Capacitance (input to output)	C_S	$V_S = 0\text{V}, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second, in oil	—	5000	—	V_{rms}
		DC, 1 minute, in oil	—	5000	—	V_{dc}

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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