

# TLP560G

Triac Driver  
 Programmable Controllers  
 AC-Output Module  
 Solid State Relay

The TOSHIBA TLP560G consists of a photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak off-state voltage: 400V(min.)
- On-state current: 100mA(max.)
- Isolation voltage: 2500V<sub>rms</sub>(min.)
- UL recognized: File No. E67349
- Isolation operating voltage: 2500V<sub>ac</sub> or 300V<sub>dc</sub> for isolation group C\*<sup>1</sup>
- Trigger LED current

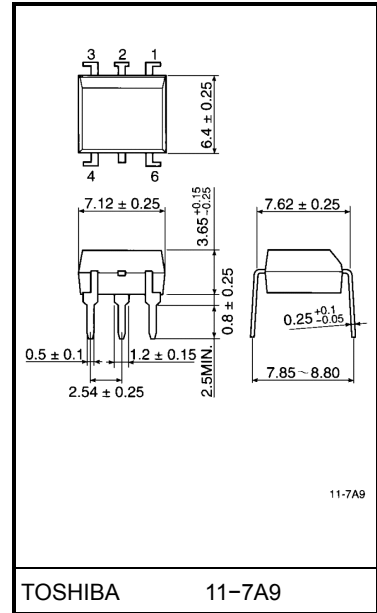
Classi- fication*	Trigger LED Current (mA)		Marking of Classification
	V <sub>T</sub> = 6V, T <sub>a</sub> = 25°C		
	Min.	Max.	
(IFT5)	—	5	T5
(IFT7)	—	7	T5, T7
Standard	—	10	T5, T7, blank

\*Ex. (IFT5); TLP560G(IFT5)

(Note) Application type name for certification test, please use standard product type name, i.e.  
 TLP560G(IFT5): TLP560G

\*1: According to VDE0110, table 4.

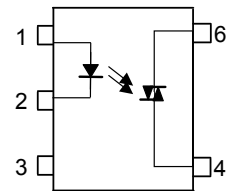
Unit in mm



TOSHIBA 11-7A9

Weight: 0.39g (typ.)

### Pin Configuration (top view)



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

**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	
Detector	Off-state output terminal voltage	$V_{DRM}$	400	V	
	On-state RMS current	$I_{T(RMS)}$	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 nonrepetitive surge current (Pw = 10ms)	$I_{TSM}$	1.2	A	
	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 (10s)	$T_{sol}$	260	°C		
Isolation voltage (AC, 1min., R.H. ≤ 60%)	$BV_S$	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).

**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 device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

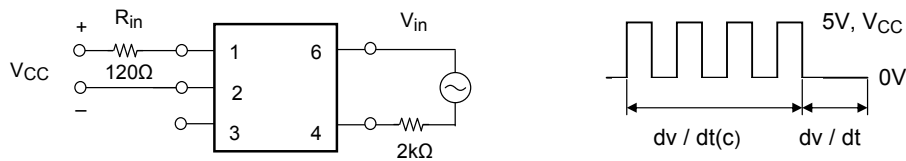
**Individual Electrical Characteristics (Ta = 25°C)**

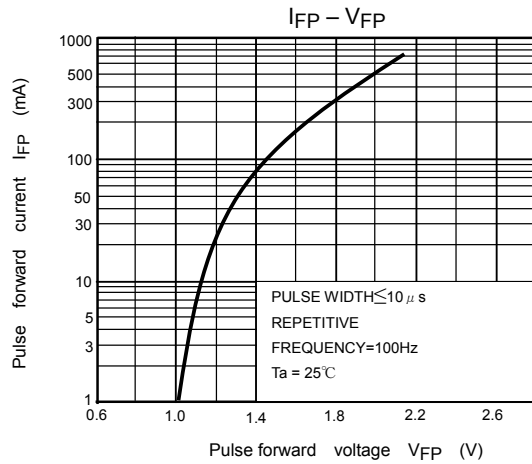
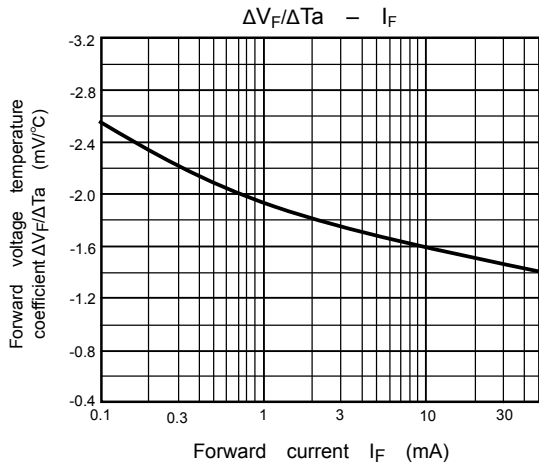
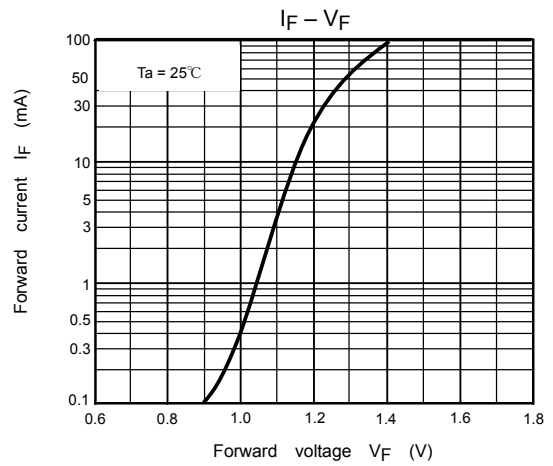
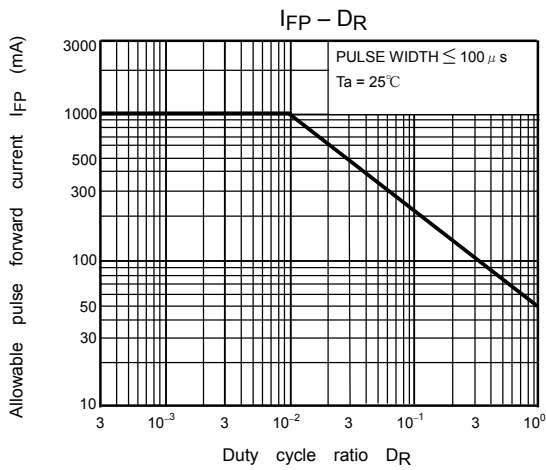
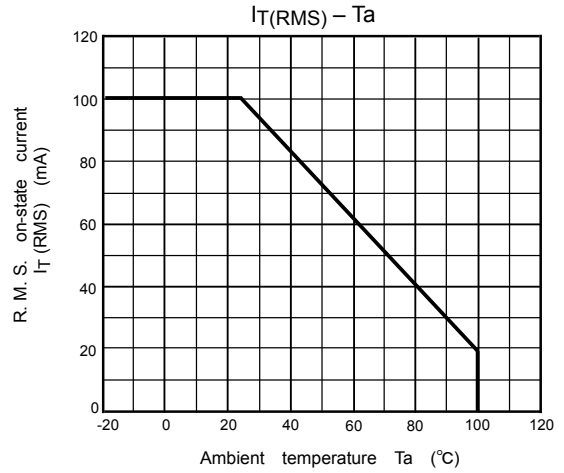
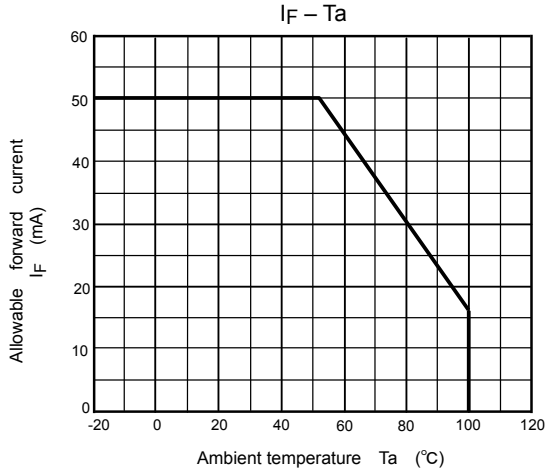
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	10	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM} = 400\text{V}$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

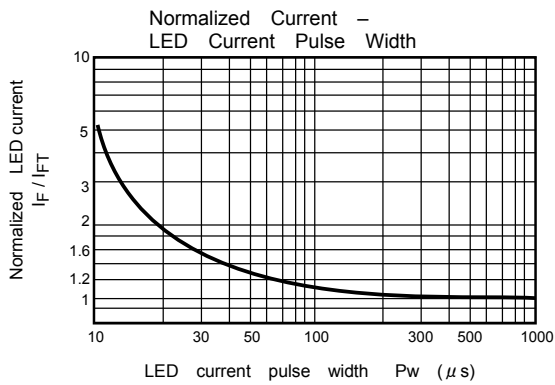
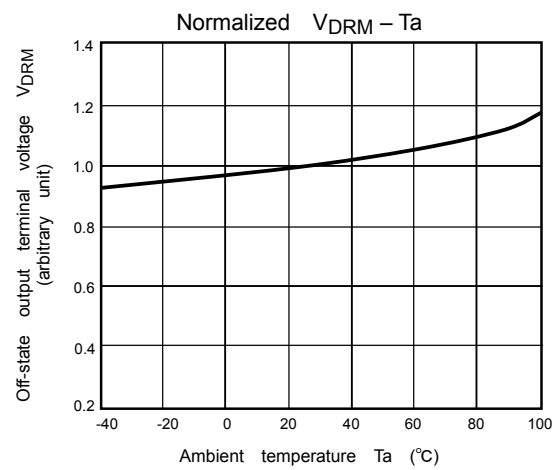
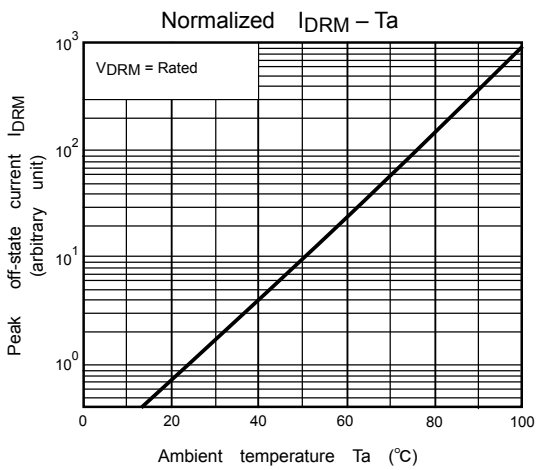
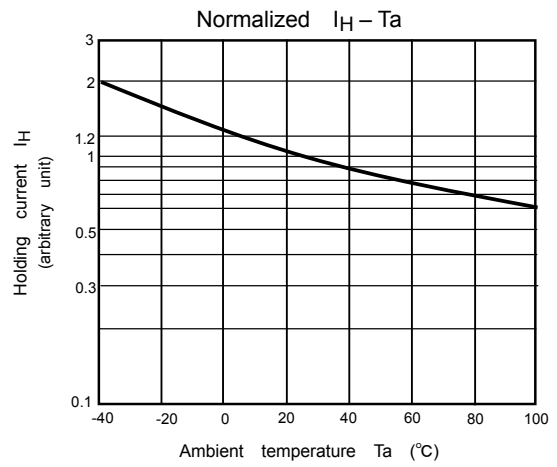
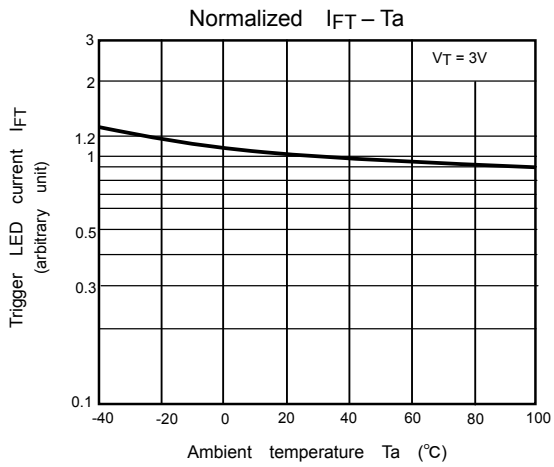
**Coupled Electrical Characteristics (Ta = 25°C)**

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{FT}$	$V_T = 3\text{V}$	—	5	10	mA
Capacitance (input to output)	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500\text{V}$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	$V_{rms}$
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	$V_{dc}$

Fig.1:  $dv / dt$  test circuit







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