

TOSHIBA**TLP560G**

TOSHIBA Photocoupler GaAs Ired & Photo-Triac

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_{rms}(min.)
- UL recognized: File No. E67349
- Isolation operating voltage: 2500V_{ac} or 300V_{dc} for isolation group C*¹
- Trigger LED current

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

*Ex. (IFT5); TLP560G(IFT5)

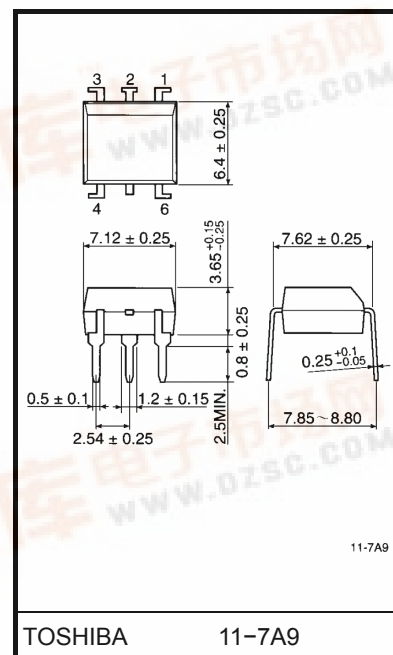
(Note) Application type name for certification test, please

use standard product type name, i.e.

TLP560G(IFT5): TLP560G

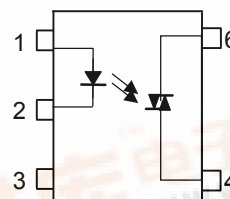
*1: According to VDE0110, table 4.

Unit in mm



Weight: 0.39g

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	$I_{T(RMS)}$	100	mA
			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	115	°C
Storage temperature range		T_{stg}	-55~125	°C
Operating temperature range		T_{opr}	-40~100	°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.

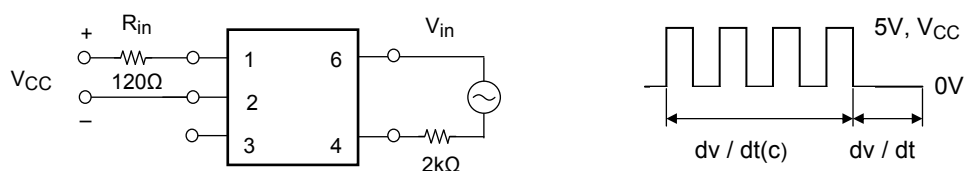
Individual Electrical Characteristics (Ta = 25°C)

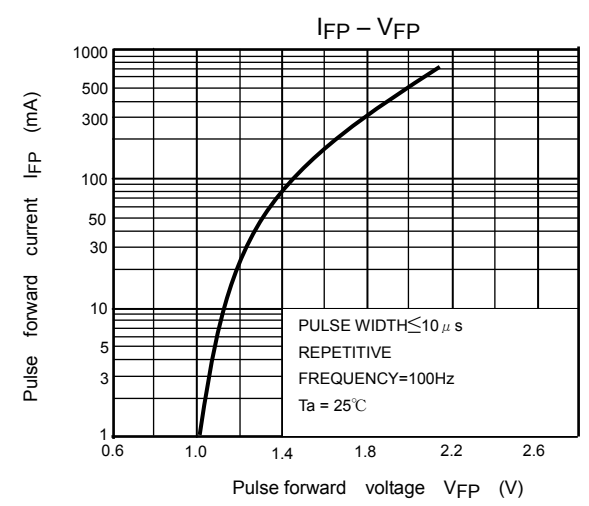
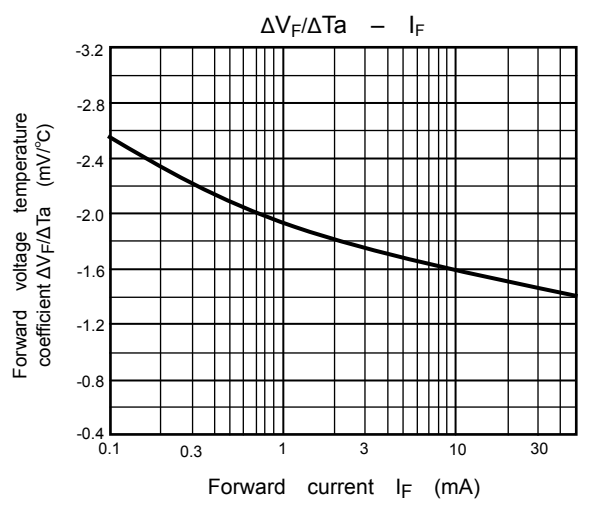
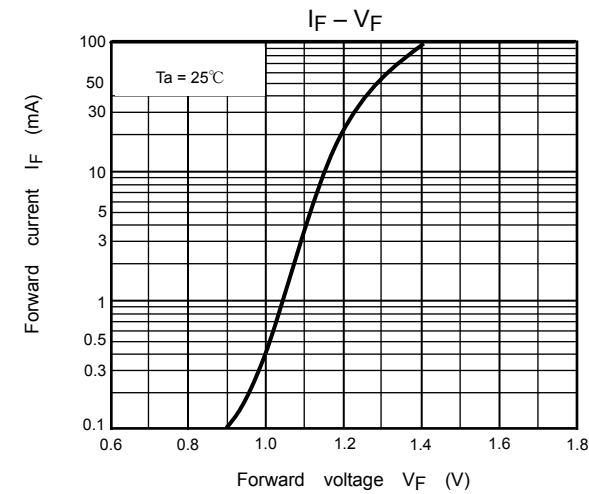
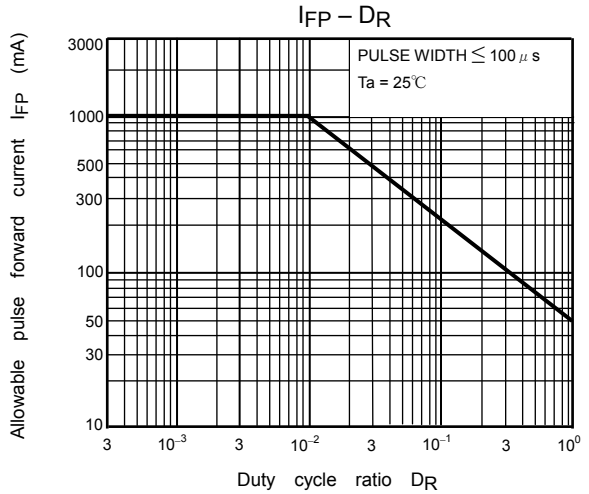
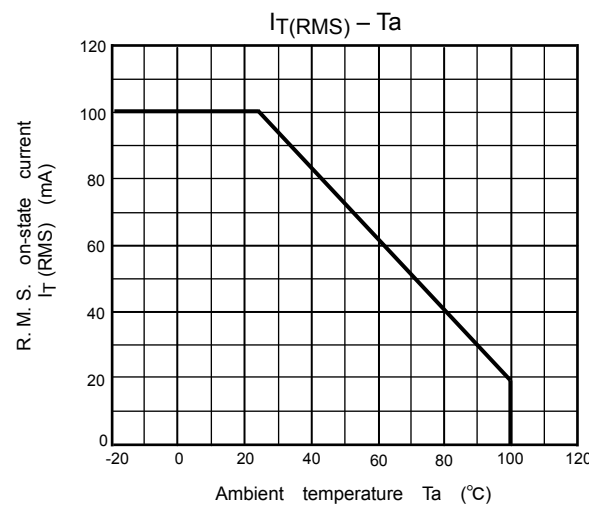
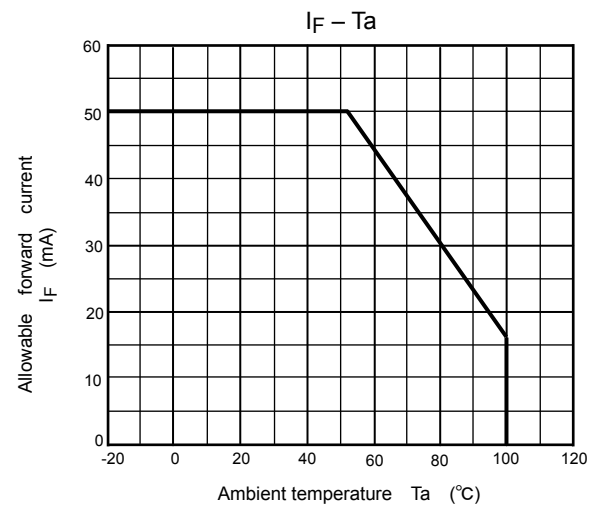
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	10	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{\text{DRM}} = 400\text{V}$	—	10	100	nA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

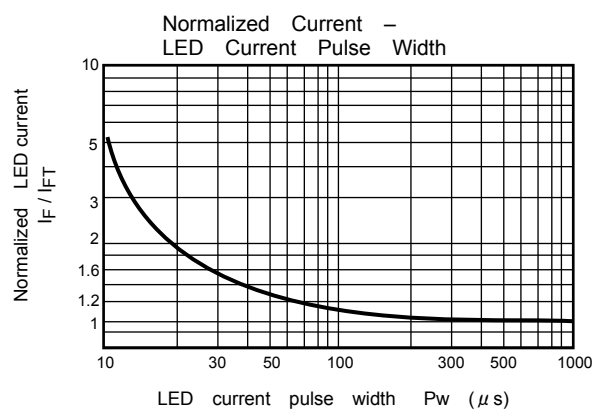
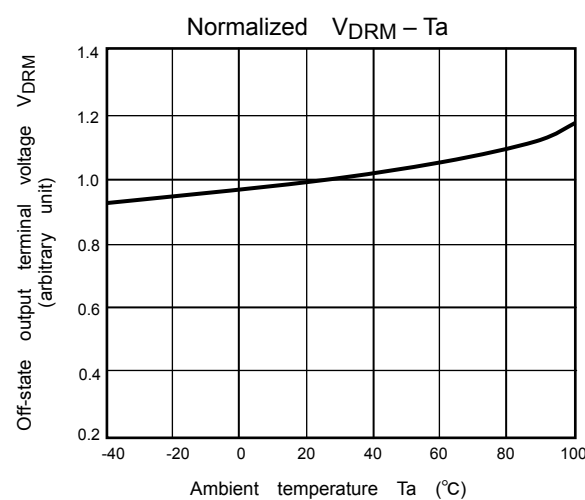
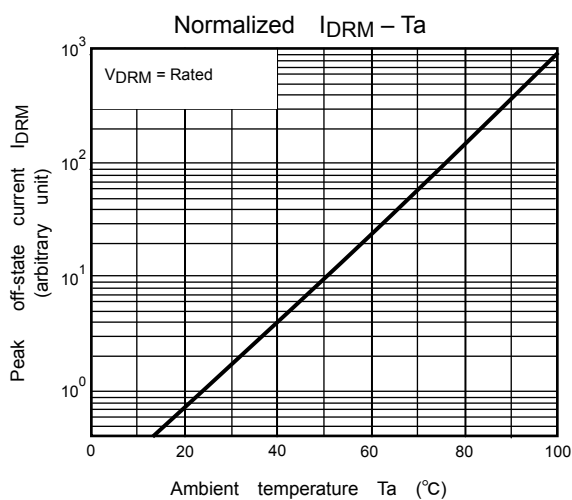
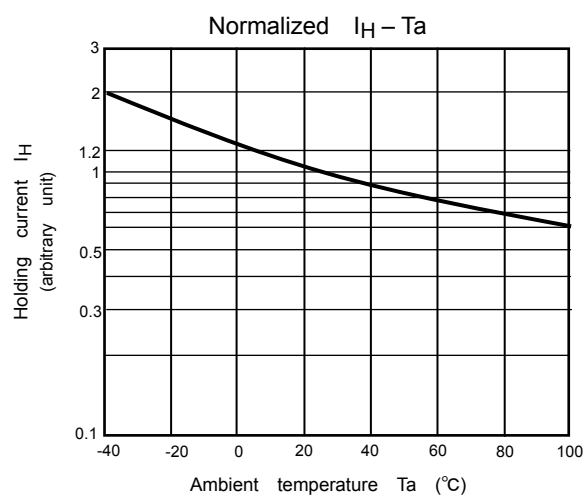
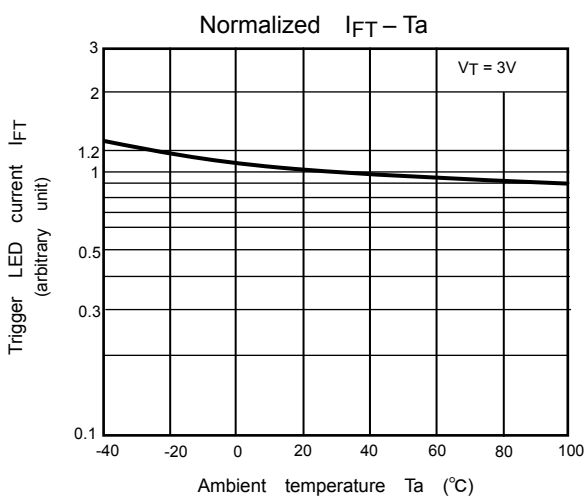
Coupled Electrical Characteristics (Ta = 25°C)

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	$V_S = 500\text{V}$	5×10^{10}	10^{14}	—	Ω
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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20070701-EN

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