

TOSHIBA Photocoupler GaAs Ired & Photo-Thyristor

TLP747G

Office Machine
Household Use Equipment
Solid State Relay
Switching Power Supply

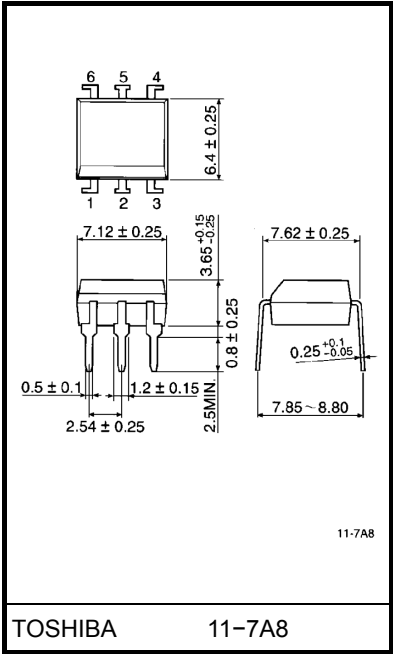
The TOSHIBA TLP747G consists of a photo-thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP.

- Peak off-state voltage: 400 V (min.)
- Trigger LED current: 15 mA (max.)
- On-state current: 150 mA (max.)
- UL recognized: UL1577, file No. E67349
- BSI approved: BS EN60065: 2002
Certificate No. 7364
BS EN60950-1: 2002
Certificate No. 7365
- SEMCO approved: EN60065, EN60950-1, EN60335-1
Certificate no. 302586
- Isolation voltage: 4000 Vrms (min.)
- Option (D4) type
VDE approved: DIN EN 60747-5-2,
Certificate No. 40009373
Maximum operating insulation voltage: 630, 890 VPK
Highest permissible over voltage: 6000, 8000 VPK

(Note) When a EN 60747-5-2 approved type is needed, please designate the “option (D4)”

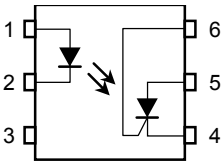
	7.62mm pich standard type	10.16mm pich TLP×××F type
• Creepage distance	: 7.0mm (min.)	8.0mm (min.)
Clearance	: 7.0mm (min.)	8.0mm (min.)
Insulation thickness	: 0.5mm (min.)	0.5mm (min.)

Unit in mm



Weight: 0.42 g

Pin Configuration (top view)



- 1 : Anode
- 2 : Cathode
- 3 : NC
- 4 : Cathode
- 5 : Anode
- 6 : Gate

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I _F	60	mA
	Forward current derating (Ta ≥ 39°C)	ΔI _F / °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	Peak forward voltage (R _{GK} = 27kΩ)	V _{DRM}	400	V
	Peak reverse voltage (R _{GK} = 27kΩ)	V _{RRM}	400	V
	On-state current	I _{T(RMS)}	150	mA
	On-state current derating (Ta ≥ 25°C)	ΔI _T / °C	−2.0	mA / °C
	Peak on-state current (100 μs pulse, 120pps)	I _{TP}	3	A
	Peak one cycle surge current	I _{TSM}	2	A
	Peak reverse gate voltage	V _{GM}	5	V
	Power dissipation	P _D	150	mW
	Power dissipation derating (Ta ≥ 25°C)	ΔP _D / °C	−2.0	mW / °C
	Junction temperature	T _j	100	°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
Total package power dissipation		P _T	250	mW
Total package power dissipation derating (Ta ≥ 25°C)		ΔP _T / °C	−3.3	mW / °C
Isolation voltage (AC, 1min., R.H. ≤ 60%) (Note)		BV _S	4000	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).

(Note) Device considered a two terminal device: Pins 1, 2 and 3 shorted together, and pins 4, 5 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V _{AC}	—	—	120	V _{ac}
Forward current	I _F	20	—	25	mA
Operating temperature	T _{opr}	−25	—	85	°C
Gate to cathode resistance	R _{GK}	—	27	33	kΩ
Gate to cathode capacity	C _{GK}	—	0.01	0.1	μF

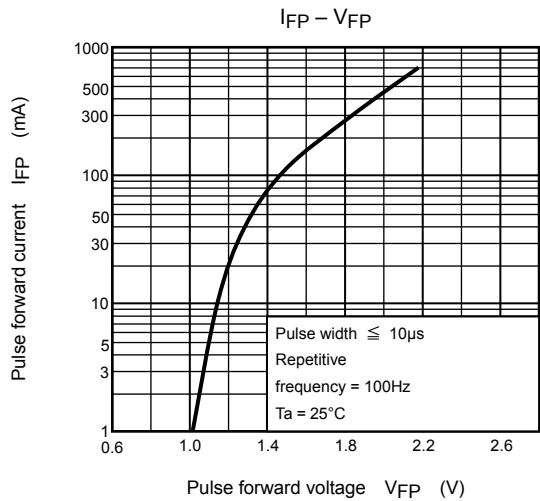
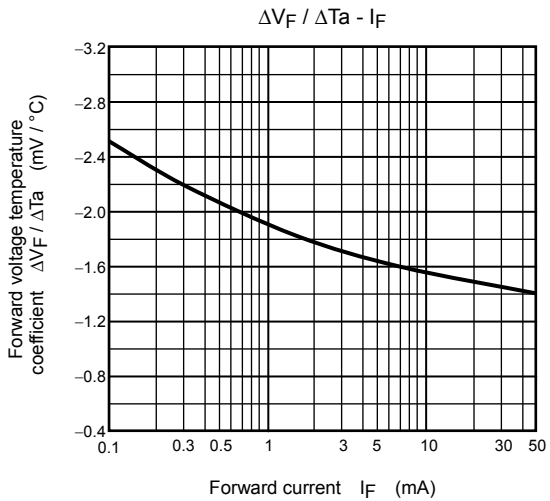
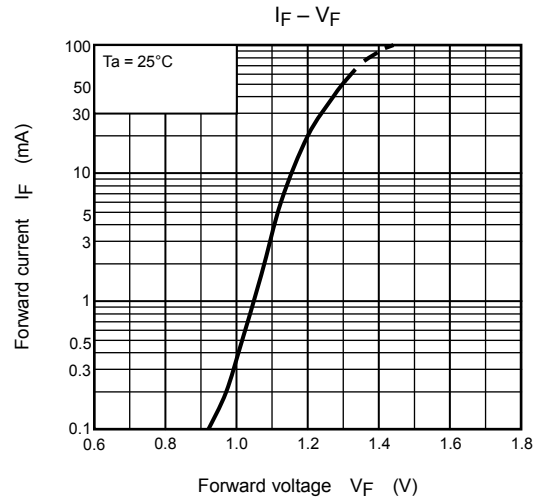
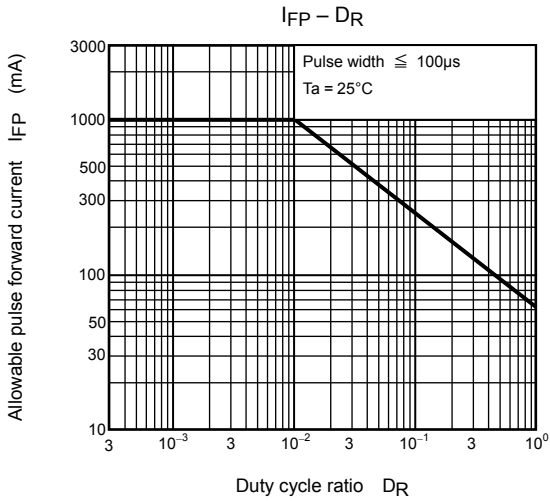
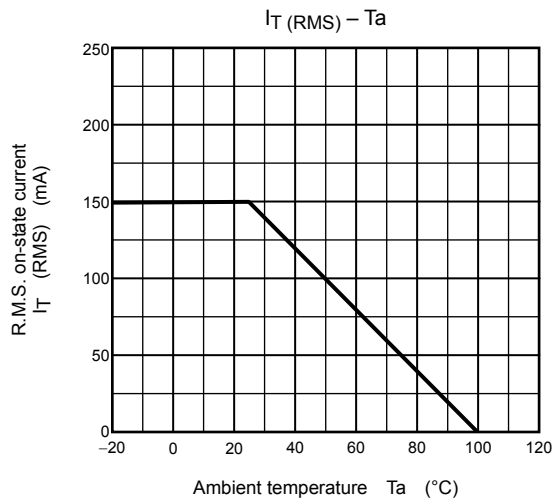
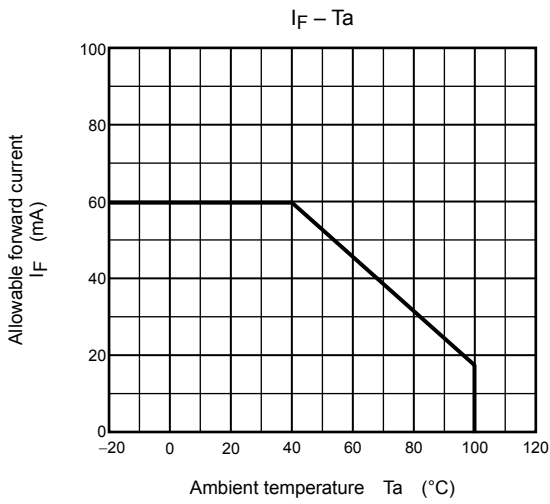
Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

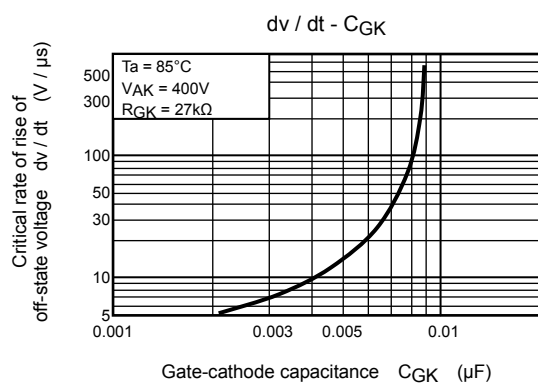
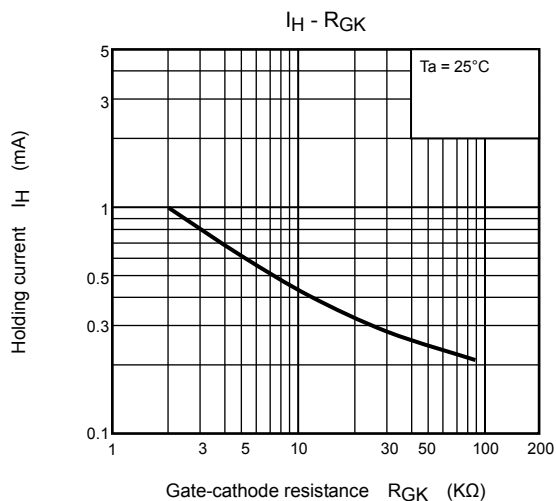
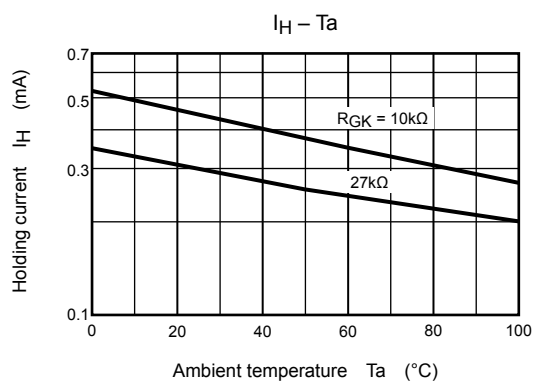
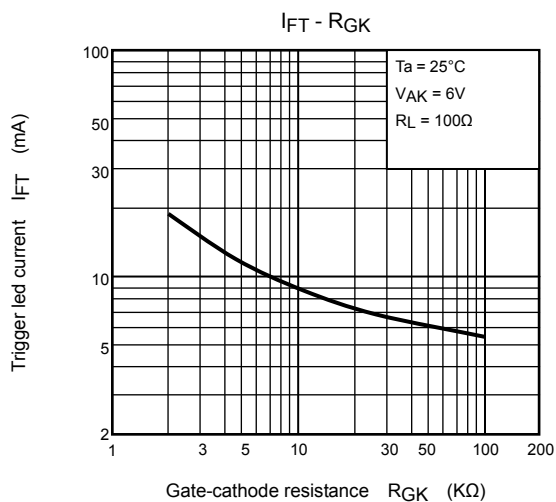
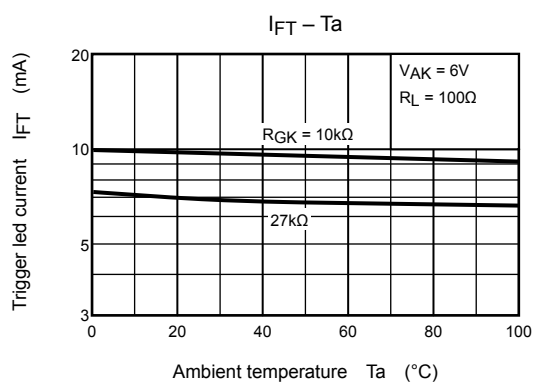
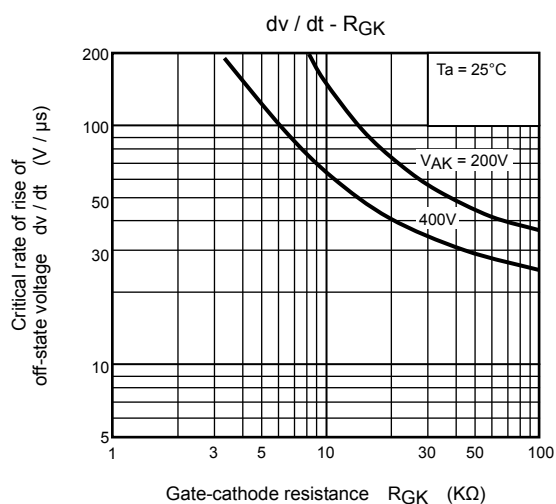
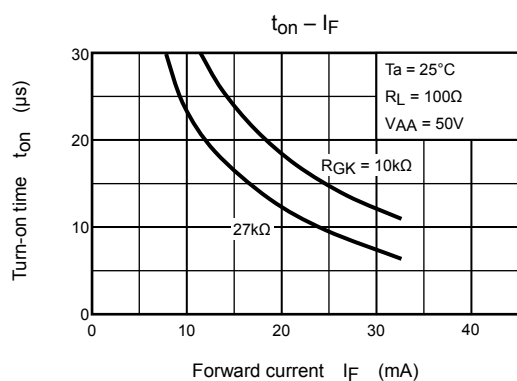
Individual Electrical Characteristics (Ta = 25°C)

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	$V = 0, f = 1\text{MHz}$		—	30	—	pF
Detector	Off-state current	I_{DRM}	$V_{\text{AK}} = 400\text{V}$ $R_{\text{GK}} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	Reverse current	I_{RRM}	$V_{\text{KA}} = 400\text{V}$ $R_{\text{GK}} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	On-state voltage	V_{TM}	$I_{\text{TM}} = 100\text{mA}$		—	0.9	1.3	V
	Holding current	I_{H}	$R_{\text{GK}} = 27\text{k}\Omega$		—	0.2	—	mA
	Off-state dv / dt	dv / dt	$V_{\text{AK}} = 280\text{V}, R_{\text{GK}} = 27\text{k}\Omega$		5	10	—	V / μs
	Capacitance	C_j	$V = 0,$ $f = 1\text{MHz}$	Anode to gate	—	20	—	pF
				Gate to cathode	—	350	—	

Coupled Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	$V_{\text{AK}} = 6\text{V}, R_{\text{GK}} = 27\text{k}\Omega$	—	—	15	mA
Turn-on time	t_{on}	$I_F = 30\text{mA}, V_{\text{AA}} = 50\text{V}$ $R_{\text{GK}} = 27\text{k}\Omega$	—	10	—	μs
Coupled dv / dt	dv / dt	$V_S = 500\text{V}, R_{\text{GK}} = 27\text{k}\Omega$	500	—	—	V / μs
Capacitance (input to output)	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	1×10^{12}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	4000	—	—	Vrms
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc





RESTRICTIONS ON PRODUCT USE

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