

TOSHIBA Photocoupler GaAs Ired & Photo-Thyristor

# TLP747G

- Office Machine
- Household Use Equipment
- Solid State Relay
- Switching Power Supply

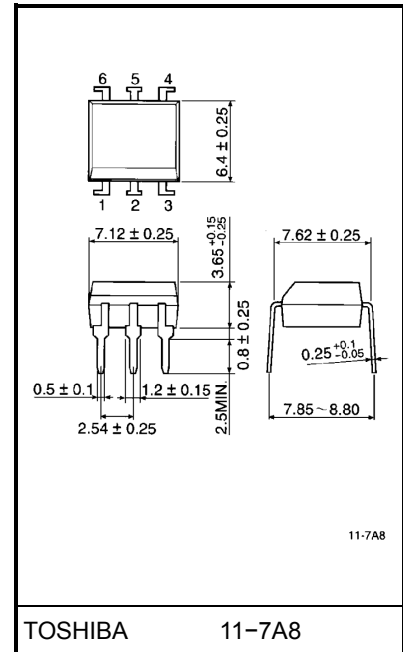
The TOSHIBA TLP747G consists of a photo-thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP.

- 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: 1994  
Certificate No. 7364  
BS EN60950: 1992  
Certificate No. 7365
- SEMKO approved: SS4330784, certificate No. 9325163, 9522142  
Isolation voltage: 4000 Vrms (min.)
- Option (D4) type  
VDE approved: DIN VDE0884 / 06.92,  
Certificate No. 74286, 91808  
Maximum operating insulation voltage: 630, 890 VPK  
Highest permissible over voltage: 6000, 8000 VPK

**(Note)** When a VDE0884 approved type is needed, please designate the "option (D4)"

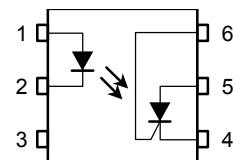
	7.62mm pich standard type	10.16mm pich TLPxxxF type
• Creepage distance	: 7.0mm (min.)	8.0mm (min.)
Clearance	: 7.0mm (min.)	8.0mm (min.)
Insulation thickness	: 0.5mm (min.)	0.5mm (min.)

Unit in mm



Weight: 0.42 g

### Pin Configuration (top view)



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

## Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	$I_F$	60	mA
	Forward current derating (Ta ≥ 39°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	Peak forward voltage (RGK = 27kΩ)	$V_{DRM}$	400	V
	Peak reverse voltage (RGK = 27kΩ)	$V_{RRM}$	400	V
	On-state current	$I_{T(RMS)}$	150	mA
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ\text{C}$	-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)	$\Delta P_D / ^\circ\text{C}$	-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)		$\Delta P_T / ^\circ\text{C}$	-3.3	mW / °C
Isolation voltage (AC, 1min., R.H. ≤ 60%) (Note)		$BV_S$	4000	Vrms

(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

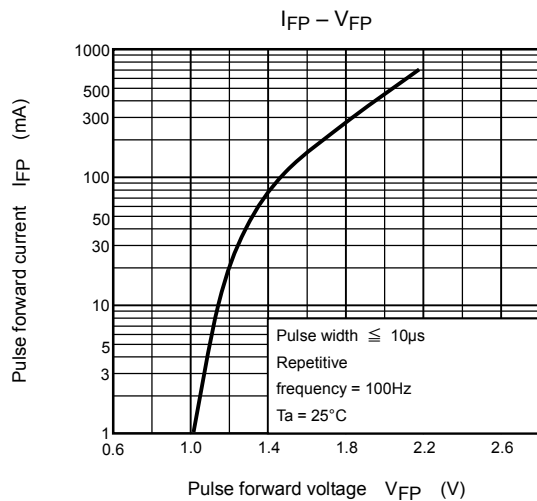
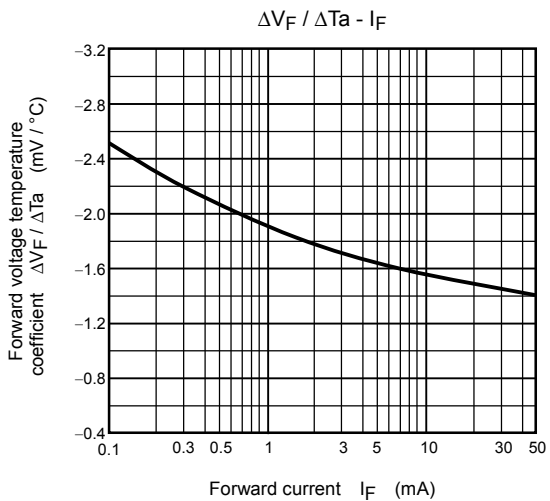
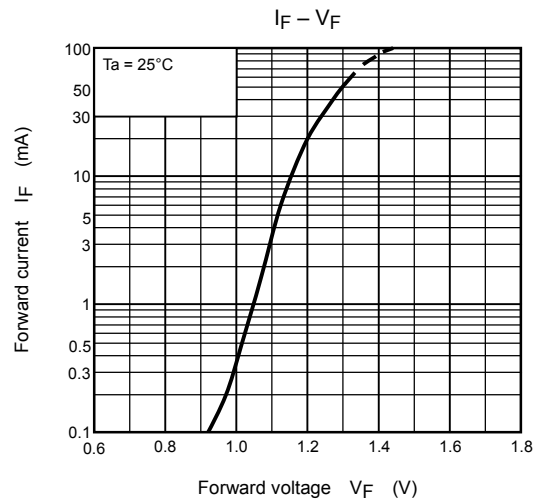
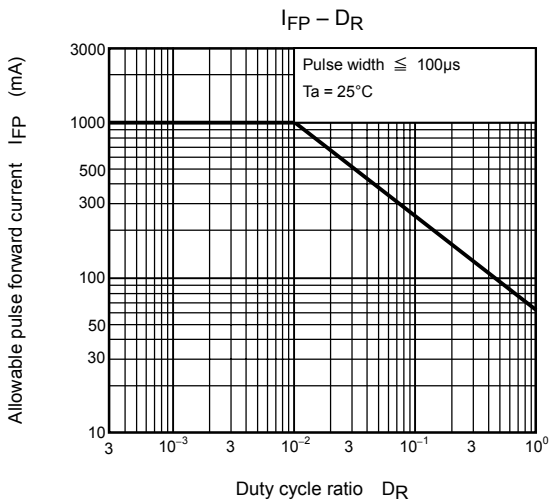
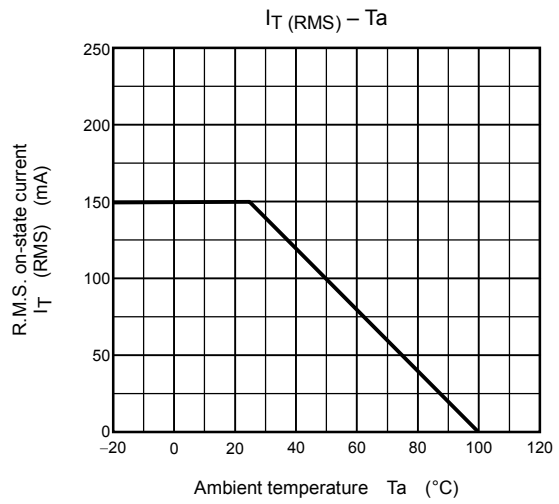
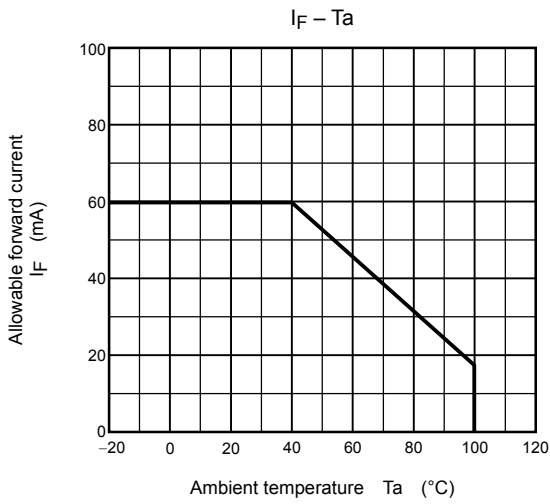
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	$V_{AC}$	—	—	120	Vac
Forward current	$I_F$	20	—	25	mA
Operating temperature	$T_{opr}$	-25	—	85	°C
Gate to cathode resistance	$R_{GK}$	—	27	33	kΩ
Gate to cathode capacity	$C_{GK}$	—	0.01	0.1	µF

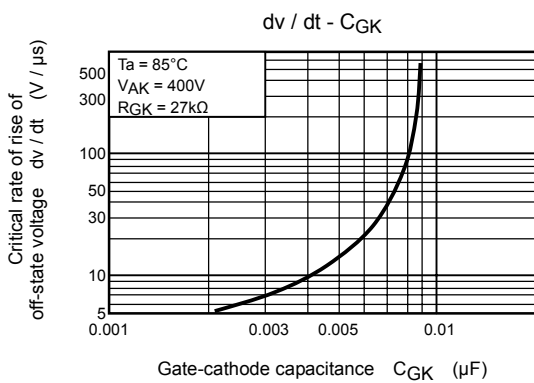
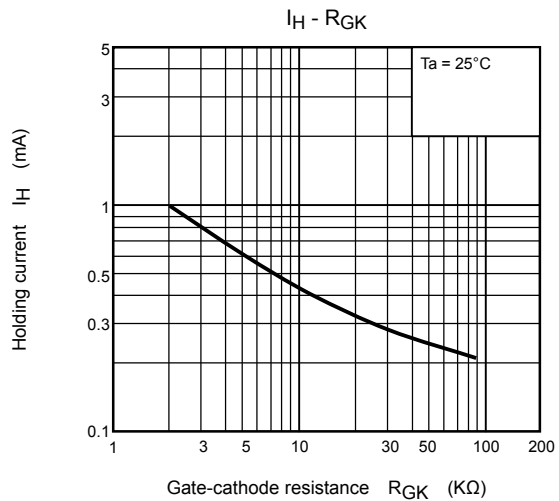
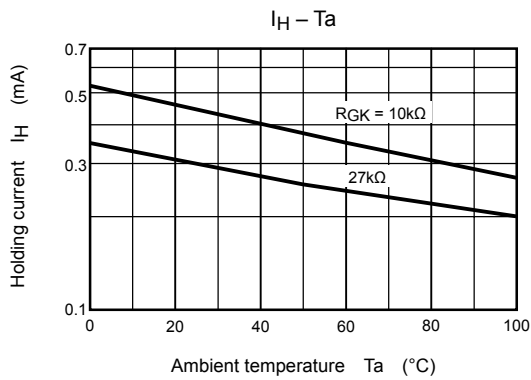
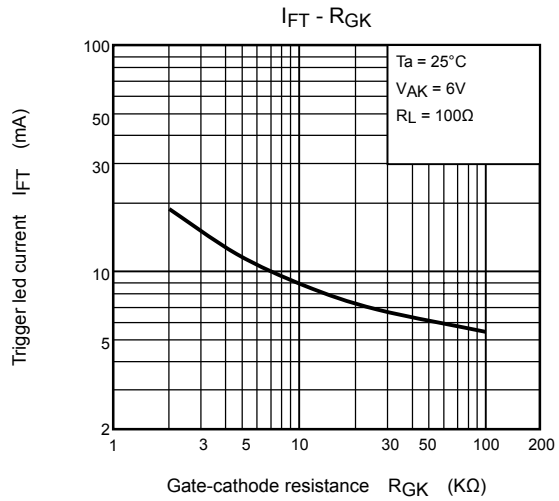
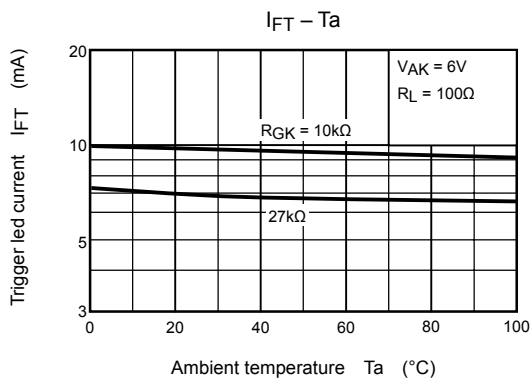
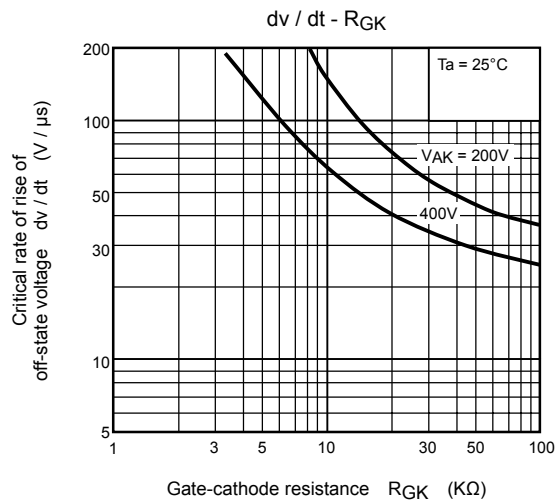
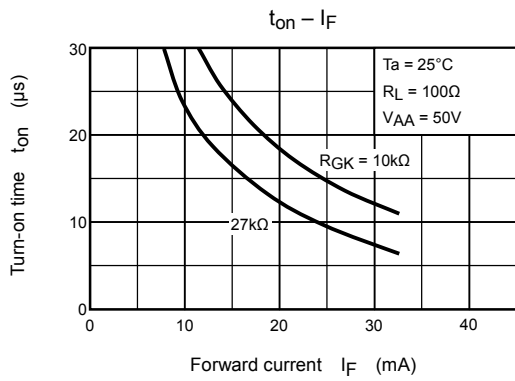
## Individual Electrical Characteristics (Ta = 25°C)

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	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF	
Detector	Off-state current	$I_{\text{DRM}}$	$V_{\text{AK}} = 400\text{V}$ $R_{\text{GK}} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	$\mu\text{A}$
	Reverse current	$I_{\text{RRM}}$	$V_{\text{KA}} = 400\text{V}$ $R_{\text{GK}} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	$\mu\text{A}$
	On-state voltage	$V_{\text{TM}}$	$I_{\text{TM}} = 100\text{mA}$	—	0.9	1.3	V	
	Holding current	$I_{\text{H}}$	$R_{\text{GK}} = 27\text{k}\Omega$	—	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 / $\mu\text{s}$	
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	$I_{\text{FT}}$	$V_{\text{AK}} = 6\text{V}, R_{\text{GK}} = 27\text{k}\Omega$	—	—	15	mA
Turn-on time	$t_{\text{on}}$	$I_F = 30\text{mA}, V_{\text{AA}} = 50\text{V}$ $R_{\text{GK}} = 27\text{k}\Omega$	—	10	—	$\mu\text{s}$
Coupled dv / dt	dv / dt	$V_S = 500\text{V}, R_{\text{GK}} = 27\text{k}\Omega$	500	—	—	V / $\mu\text{s}$
Capacitance (input to output)	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	$1 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	4000	—	—	Vrms
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc





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