

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.

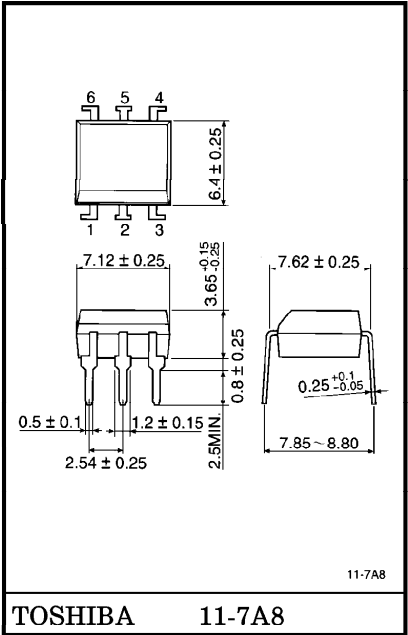
- Peak Off-State Voltage : 400V (Min.)
- Trigger LED Current : 15mA (Max.)
- On-State Current : 150mA (Max.)
- UL Recognized : UL1577, File No. E67349
- BSI Approved : BS EN60065:1994
Certificate No. 7364
BS EN60950:1992
Certificate No. 7365
- SEMKO Approved : SS4330784, Certificate No. 9325163, 9522142
Isolation Voltage : 4000Vrms (Min.)
- Option (D4) type
VDE Approved : DIN VDE0884/06.92,
Certificate No. 74286, 91808

Maximum Operating Insulation Voltage : 630, 890V_{PK}
Highest Permissible Over Voltage : 6000, 8000V_{PK}

(Note) When a VDE0884 approved type is needed,
please designate the “Option (D4)”

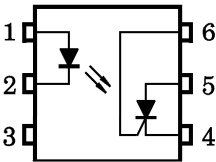
	7.62mm pich standard type	10.16mm pich TLP×××F type
• Creepage Distance	: 7.0mm (Min.)	8.0mm (Min.)
Clearance	: 7.0mm (Min.)	8.0mm (Min.)
Insulation Thickness	: 0.5mm (Min.)	0.5mm (Min.)

Unit in mm



Weight : 0.42g

PIN CONFIGURATIONS (TOP VIEW)



- 1 : ANODE
- 2 : CATHODE
- 3 : NC
- 4 : CATHODE
- 5 : ANODE
- 6 : GATE

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● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

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 (100μs 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) 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

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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
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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}	$V_{AK} = 400\text{V}$ $R_{GK} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	Reverse Current	I_{RRM}	$V_{KA} = 400\text{V}$ $R_{GK} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	On-State Voltage	V_{TM}	$I_{TM} = 100\text{mA}$		—	0.9	1.3	V
	Holding Current	I_H	$R_{GK} = 27\text{k}\Omega$		—	0.2	—	mA
	Off-State dv/dt	dv/dt	$V_{AK} = 280\text{V}, R_{GK} = 27\text{k}\Omega$		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}	$V_{AK} = 6\text{V}, R_{GK} = 27\text{k}\Omega$	—	—	15	mA
Turn-on Time	t_{on}	$I_F = 30\text{mA}, V_{AA} = 50\text{V}$ $R_{GK} = 27\text{k}\Omega$	—	10	—	μs
Coupled dv/dt	dv/dt	$V_S = 500\text{V}, R_{GK} = 27\text{k}\Omega$	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	—	—	V_{rms}
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc

