TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-THYRISTOR

TLP747J

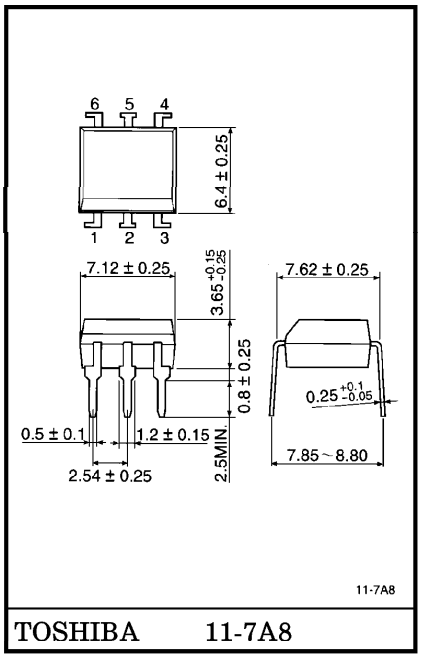
OFFICE MACHINE

HOUSEHOLD USE EQUIPMENT

SOLID STATE RELAY

SWITCHING POWER SUPPLY

Unit in mm



TOSHIBA 11-7A8

Weight : 0.42g

The TOSHIBA TLP747J consists of a photo-thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP.

- Peak Off-State Voltage: 600V 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

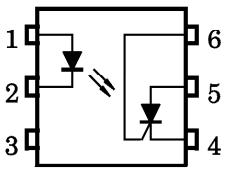
  VDE Approved : DIN VDE0884 / 06.92
  Certificate No. 74286, 91808

  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.)
Isolation Thickness	:	0.5mm (Min.)	0.5mm (Min.)

PIN CONFIGURATIONS (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)	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}	600	V
	Peak Reverse Voltage (R_{GK} = 27kΩ)	V_{RRM}	600	V
	On-StateCurrent	$I_{T\,(RMS)}$	150	mA
	On-StateCurrent Derating (Ta ≧ 25°C)	ΔI_T / °C	−2.0	mA / °C
	Peak On-StateCurrent (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 Temperatur (10s)		Tsol	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	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}	—	—	240	Vac
Forward Current	I_F	20	—	25	mA
Operating Temperature	T_{opr}	−25	—	85	°C
Gate to Cathode Resistance	R_{GK}	—	10	27	kΩ
Gate to Cathode Capacity	C_{GK}	—	0.01	0.1	μF

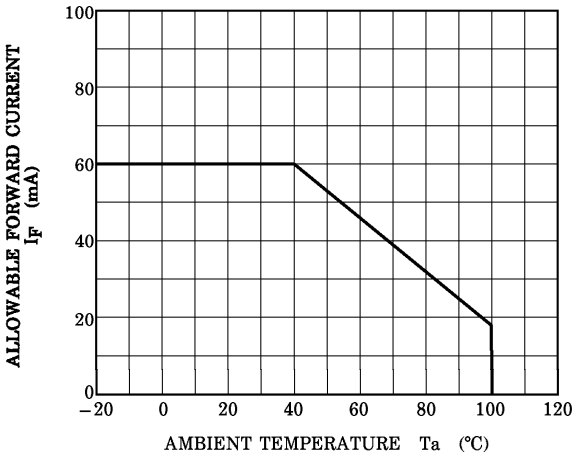
INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	I_F = 10mA		1.0	1.15	1.3	V
	Reverse Current	I_R	V_R = 5V		—	—	10	μA
	Capacitance	C_T	V = 0, f = 1MHz		—	30	—	pF
DETECTOR	Off-State Current	I_{DRM}	V_{AK} = 400V, R_{GK} = 27kΩ	Ta = 25°C	—	10	5000	nA
				Ta = 85°C	—	1	100	μA
	Reverse Current	I_{RRM}	V_{KA} = 400V, R_{GK} = 27kΩ	Ta = 25°C	—	10	5000	nA
				Ta = 85°C	—	1	100	μA
	On-State Voltage	V_{TM}	I_{TM} = 100mA		—	0.9	1.3	V
	Holding Current	I_H	R_{GK} = 27kΩ		—	0.2	—	mA
	Off-State dv / dt	dv / dt	V_{AK} = 280V, R_{GK} = 27kΩ		5	10	—	V / μs
	Capacitance	C_j	V = 0, f = 1MHz	Anode to Gate	—	20	—	pF
				Gate to Cathode	—	350	—	

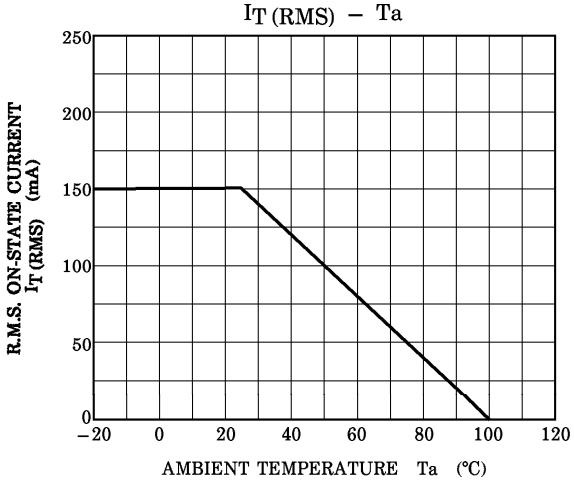
COUPLED CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I_{FT}	V_{AK} = 6V, R_{GK} = 27kΩ	—	—	15	mA
Turn-on Time	t_{ON}	I_F = 30mA, V_{AA} = 50V, R_{GK} = 27kΩ	—	10	—	μs
Coupled dv / dt	dv / dt	V_S = 500V, R_{GK} = 27kΩ	500	—	—	V / μs
Capacitance (Input to Output)	C_S	V_S = 0, f = 1MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S = 500V, R. H. ≦ 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

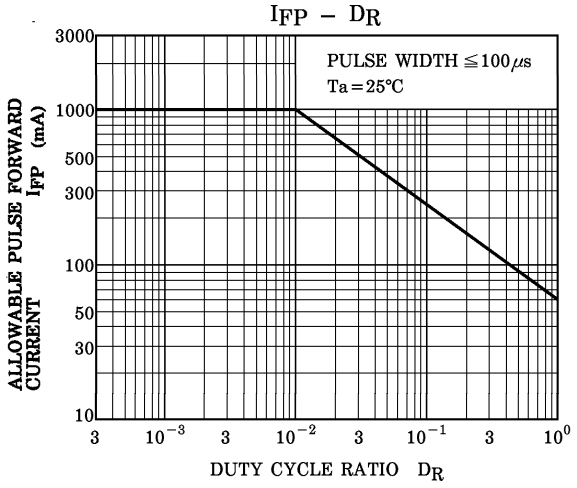
I_F – Ta



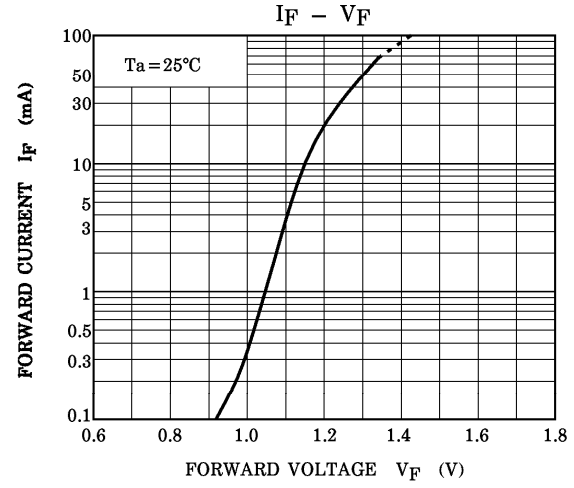
$I_{T\,(RMS)}$ – Ta



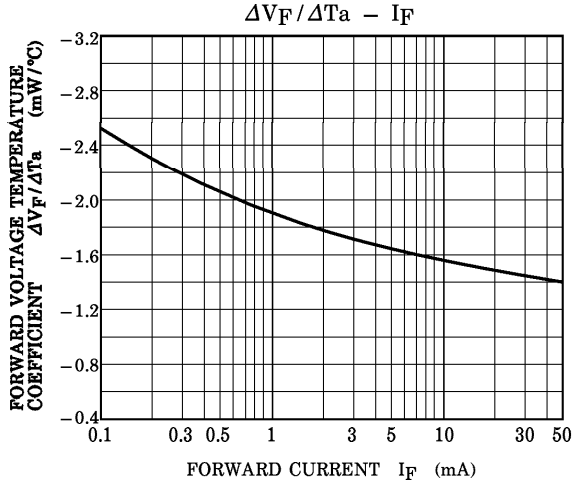
I_{FP} – D_R



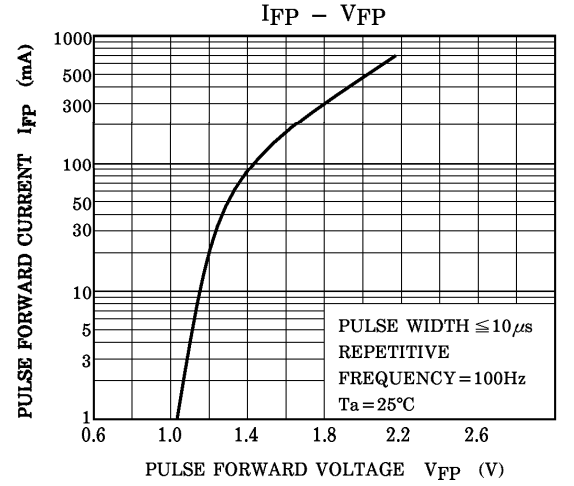
I_F – V_F



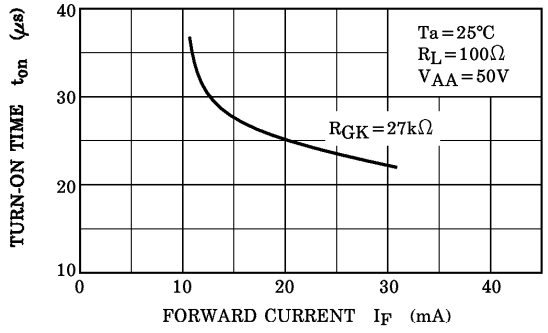
$\Delta V_F / \Delta Ta$ – I_F



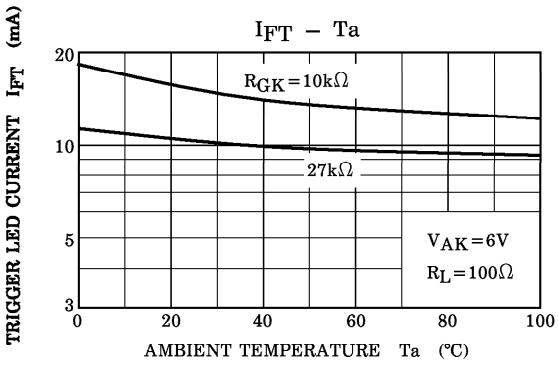
I_{FP} – V_{FP}



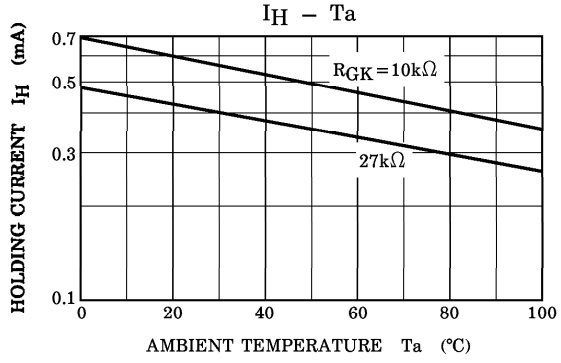
t_{on} – I_F



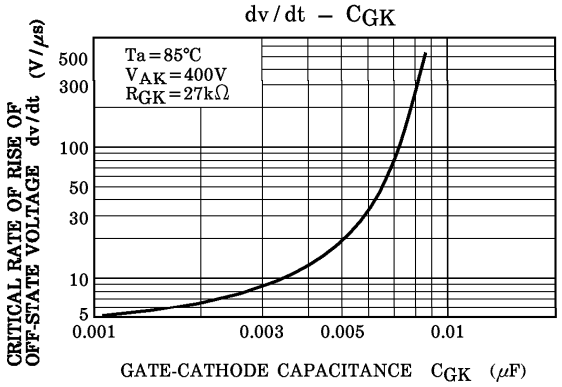
I_{FT} – Ta



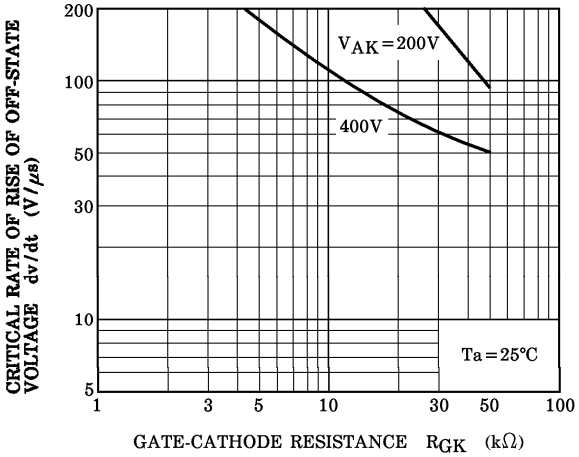
I_H – Ta



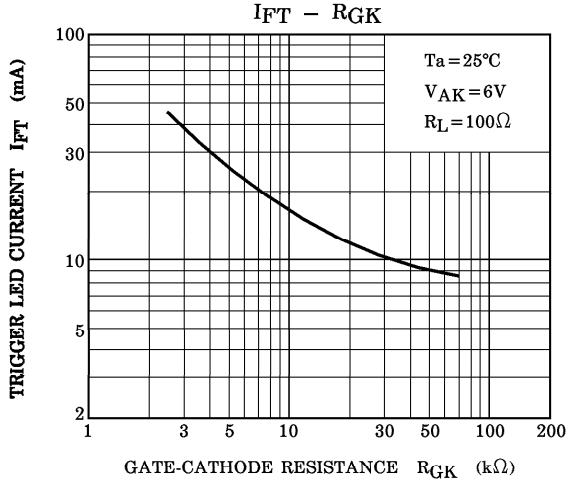
dv / dt – C_{GK}



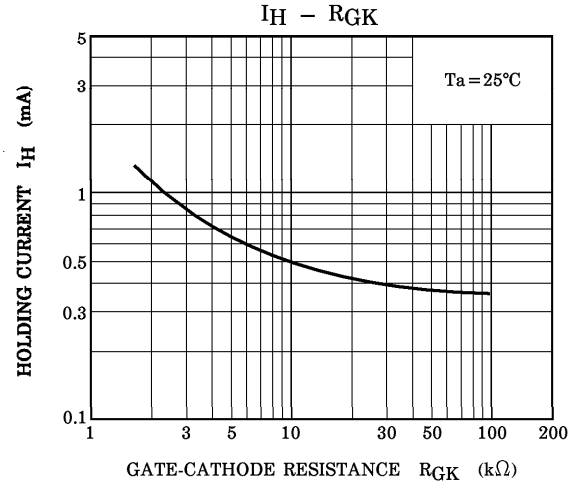
dv / dt – R_{GK}



I_{FT} – R_{GK}



I_H – R_{GK}



RESTRICTIONS ON PRODUCT USE

000707EBC

- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- 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 the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.