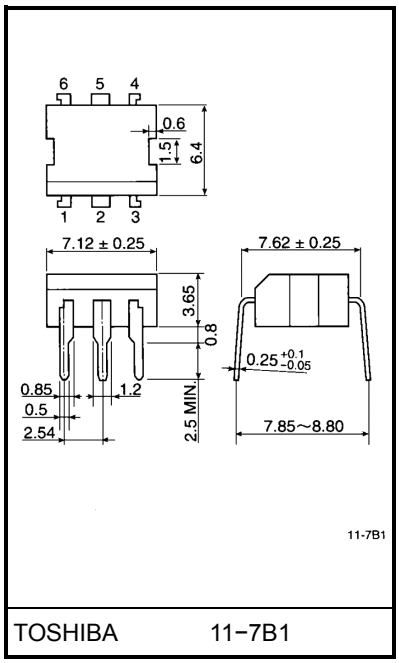
TOSHIBA Photocoupler GaAs IRed & Photo-Thyristor

TLP741J

Office Machine
Household Use Equipment
Solid State Relay
Switching Power Supply

Unit in mm



TOSHIBA 11−7B1

Weight: 0.35 g

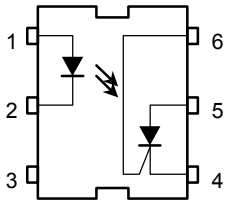
The TOSHIBA TLP741J consists of a photo−thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak off−state voltage: 600 V (min.)
- Trigger LED current: 10 mA (max.)
- On−state current: 150 mA (max.)
- UL recognized: UL1577, file no. E67349
- BSI approved: BS EN60065: 1994
  Certificate no. 6617
  BS EN60950: 1992
  Certificate no. 7366
  Isolation voltage: 4000 V_{rms} (min.)
- Option (D4) type
  VDE approved: DIN VDE0884 / 08,87
  Certificate no. 65640
  Maximum operating insulation voltage: 630 V_{PK}
  Highest permissible over voltage: 6000 V_{PK}

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

	7.62 mm pich standard type	10.16 mm pich (LF2) type
• Creepage distance:	7.0 mm (min.)	8.0 mm (min.)
Clearance:	7.0 mm (min.)	8.0 mm (min.)
Insulation thickness:	0.5 mm (min.)	0.5 mm (min.)

Pin Configuration (top view)



1 : ANODE
2 : CATHODE
3 : N.C.
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 (100 μs pulse, 100 pps)	I_{FP}	1	A
	Power dissipation	P_D	100	mW
	Power dissipation derating (Ta ≥ 25°C)	ΔP_D / °C	−1.0	mW / °C
	Reverse voltage	V_R	5	V
	Junction temperature	T_j	125	°C
Detector	Peak forward voltage (R_{GK} = 27 kΩ)	V_{DRM}	600	V
	Peak reverse voltage (R_{GK} = 27 kΩ)	V_{RRM}	600	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, 120 pps)	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}	−55~100	°C
Lead soldering temperature (10 s)		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, 1 min., R.H.≤ 60%)		BV_S	4000	V_{rms}

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	240	V_{ac}
Forward current	I_F	15	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

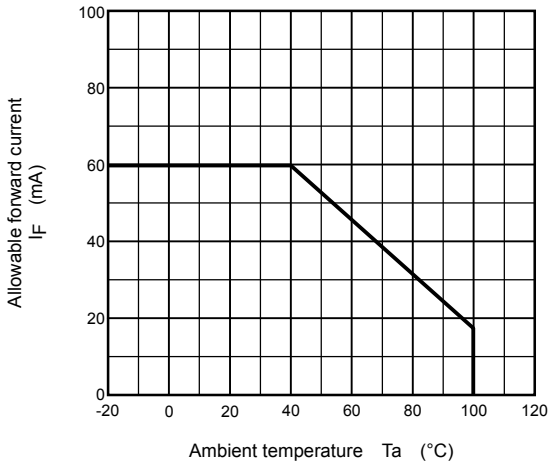
Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition		Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10 mA		1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5 V		—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz		—	30	—	pF
Detector	Off−state current	I_{DRM}	V_{AK} = 600 V R_{GK} = 27 kΩ	Ta = 25°C	—	10	5000	nA
				Ta = 85°C	—	1	150	μA
	Reverse carrent	I_{RRM}	V_{KA} = 600 V R_{GK} = 27 kΩ	Ta = 25°C	—	10	5000	nA
				Ta = 85°C	—	1	150	μA
	On−state voltage	V_{TM}	I_{TM} = 100 mA		—	0.9	1.3	V
	Holding current	I_H	R_{GK} = 27 kΩ		—	0.2	—	mA
	Off−state dv / dt	dv / dt	V_{AK} = 420 V, R_{GK} = 27 kΩ		—	10	—	V/μs
	Capacitance	C_j	V = 0, f = 1 MHz	Anode to gate	—	20	—	pF
				Gate to cathode	—	350	—	

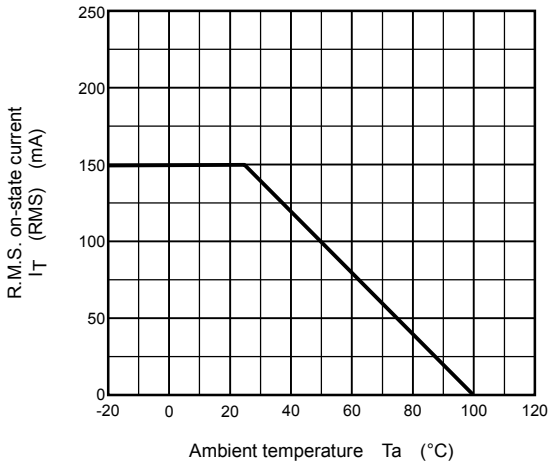
Coupled Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_{AK} = 6 V, R_{GK} = 27 kΩ	—	5	10	mA
Turn−on time	t_{ON}	I_F = 30 mA, V_{AA} = 50 V R_{GK} = 27 kΩ	—	10	—	μs
Coupled dv / dt	dv / dt	V_S = 500 V, R_{GK} = 27 kΩ	500	—	—	V / μs
Capacitance (input to output)	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V	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	—	V_{dc}

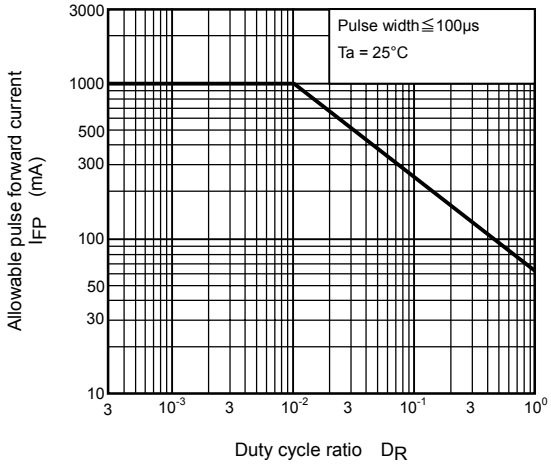
I_F – Ta



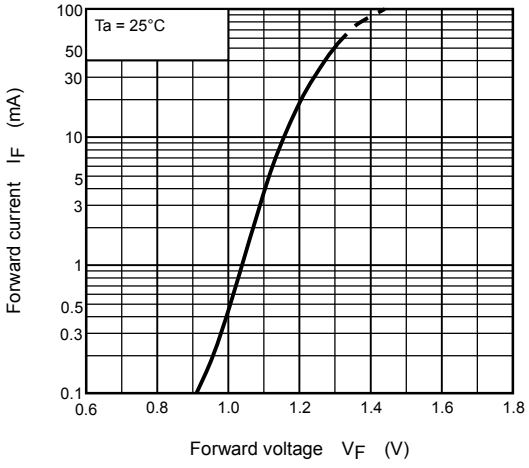
$I_{T\ (RMS)}$ – Ta



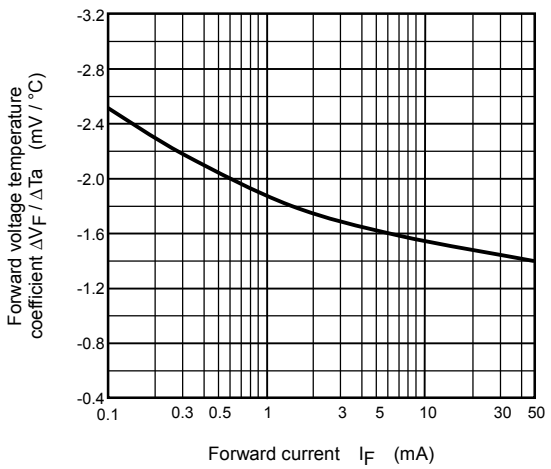
I_{FP} – D_R



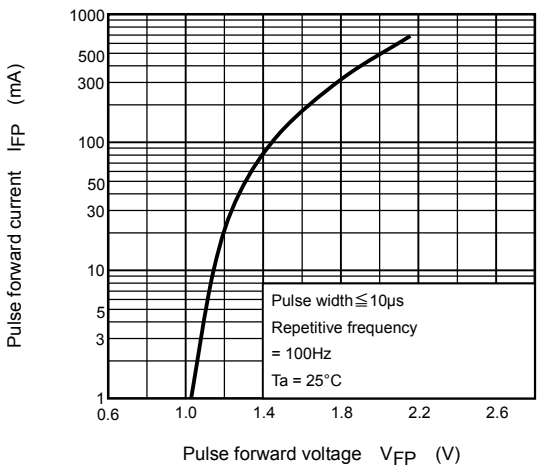
I_F – V_F



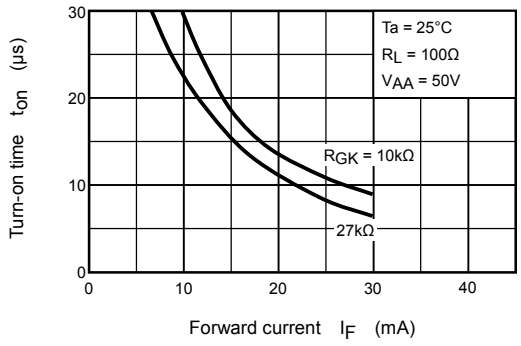
$\Delta V_F / \Delta Ta$ – I_F



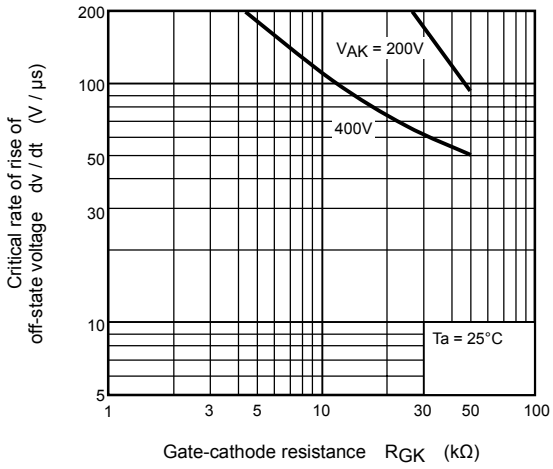
I_{FP} – V_{FP}



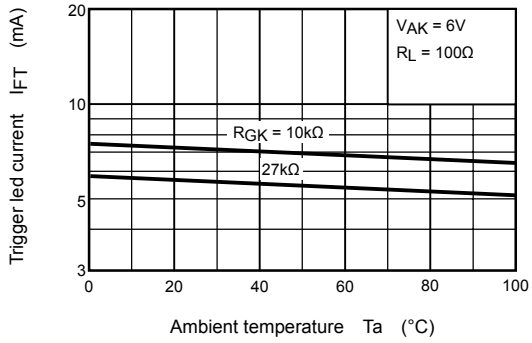
$t_{on} - I_F$



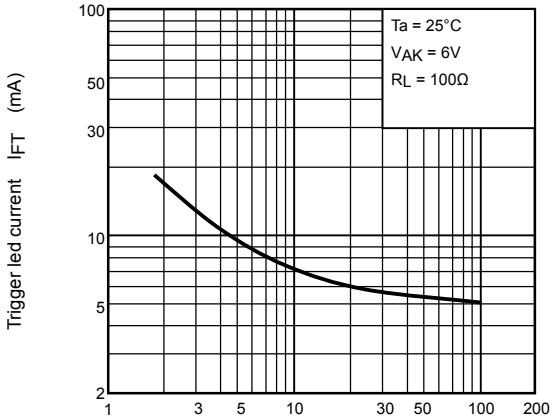
$dv / dt - R_{GK}$



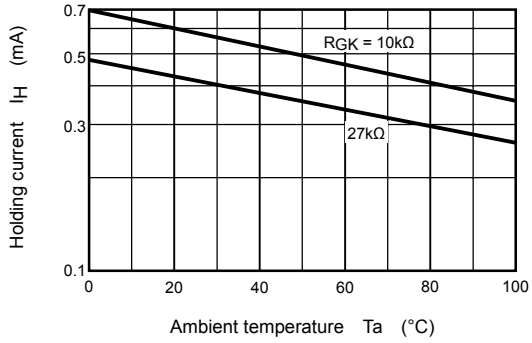
$I_{FT} - Ta$



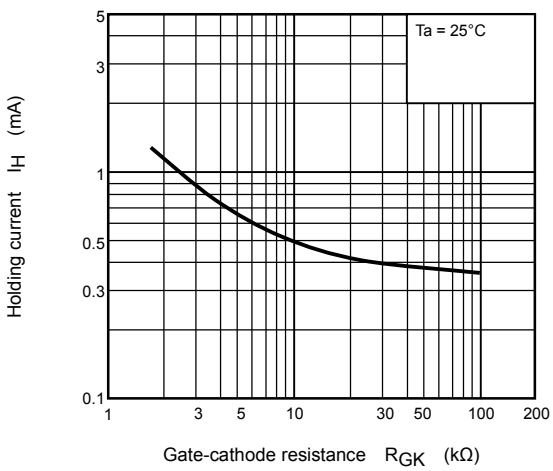
$I_{FT} - R_{GK}$



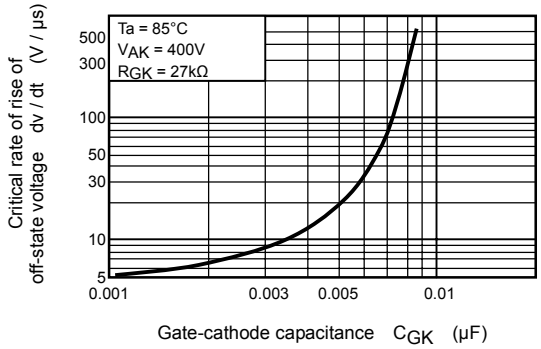
$I_H - Ta$



$I_H - R_{GK}$



$dv / dt - C_{GK}$



RESTRICTIONS ON PRODUCT USE

000707EAA

- 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.
- 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.