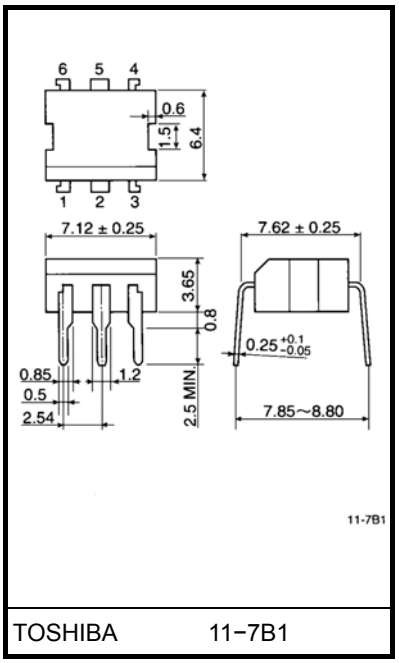
TOSHIBA Photocoupler GaAs IRed & Photo-Thyristor

TLP741J

Office Machine
Household Use Equipment
Solid State Relay
Switching Power Supply

Unit in mm



TOSHIBA 11−7B1

Weight: 0.35 g (typ.)

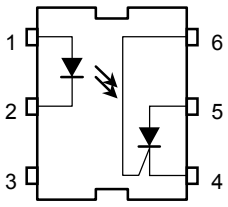
The TOSHIBA TLP741J consists of a photo−thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- 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: 2002
  Certificate no. 8877
  BS EN60950-1: 2002
  Certificate no. 8878
  Isolation voltage: 4000 V_{rms} (min.)
- Option (D4) type
  VDE approved: DIN EN 60747-5-2
  Certificate no. 40009302
  Maximum operating insulation voltage: 630 V_{PK}
  Highest permissible over voltage: 6000 V_{PK}

(Note) When a EN 60747-5-2 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

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 (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}

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).

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

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.

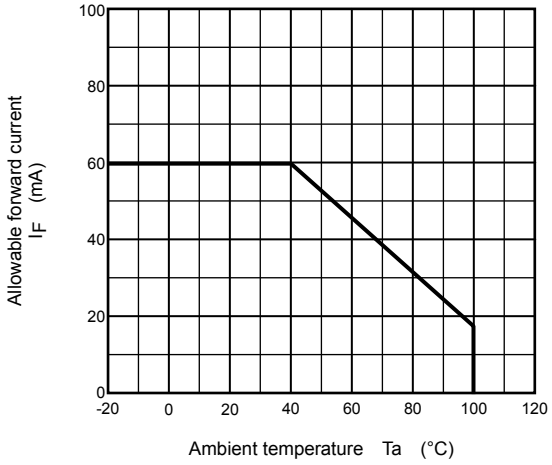
Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition		Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10 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 current	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	—	

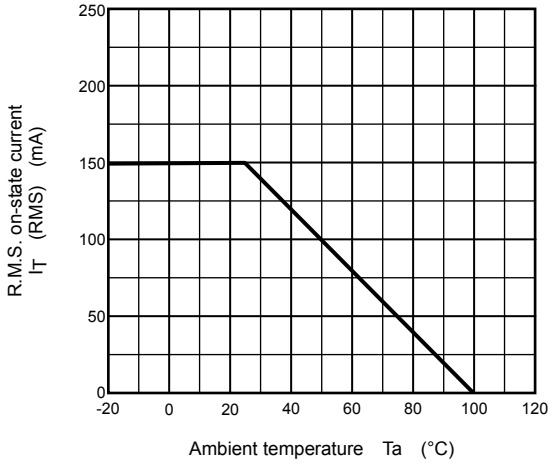
Coupled Characteristics (Ta = 25°C)

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}

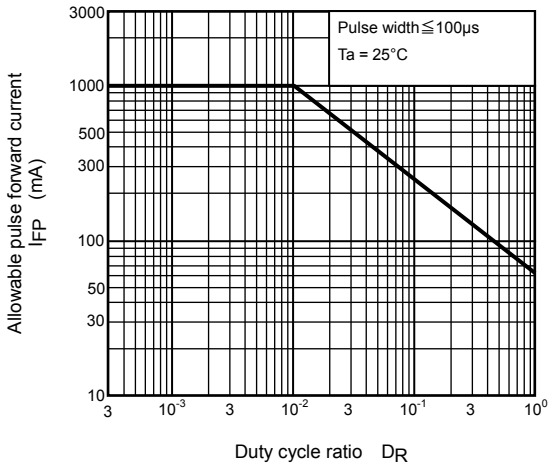
I_F – Ta



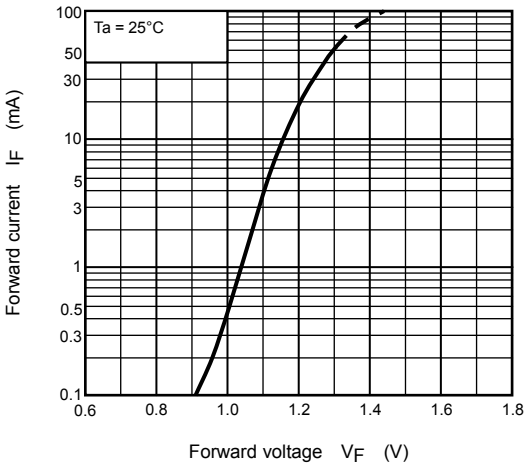
$I_{T\ (RMS)}$ – Ta



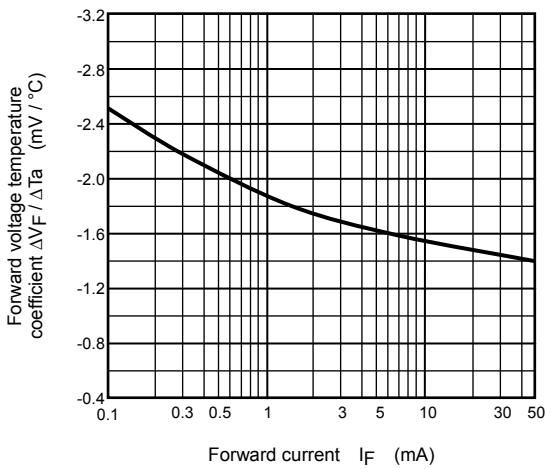
I_{FP} – D_R



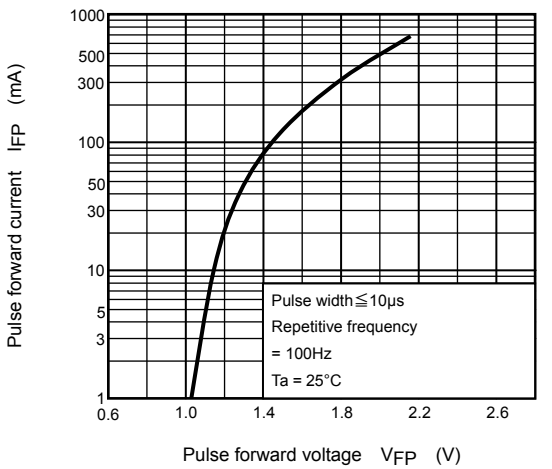
I_F – V_F



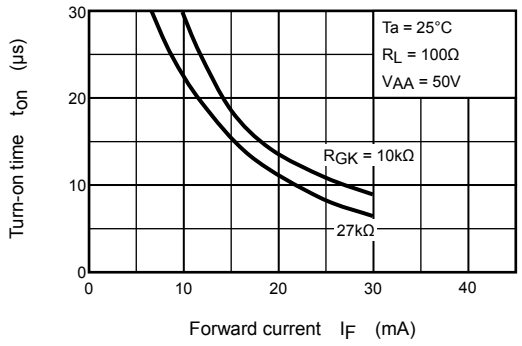
$\Delta V_F / \Delta Ta$ – I_F



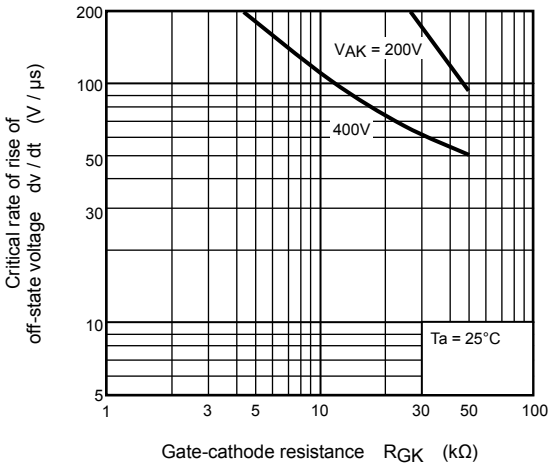
I_{FP} – V_{FP}



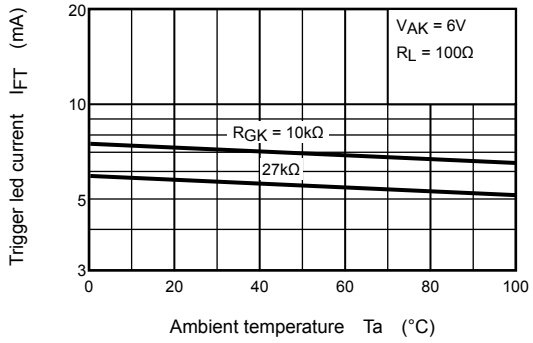
t_{on} – I_F



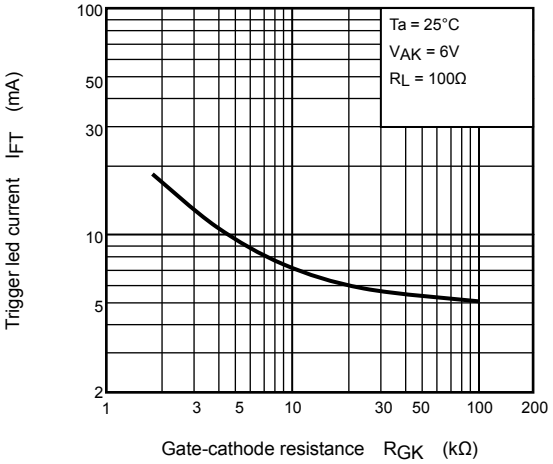
dv / dt – R_{GK}



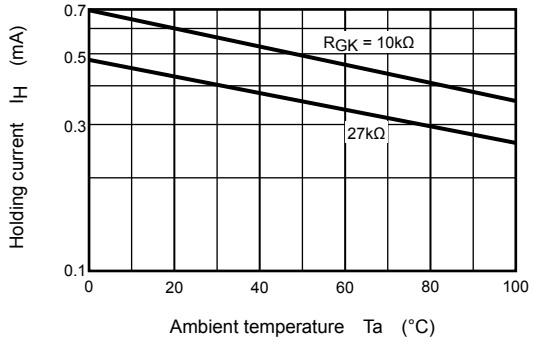
I_{FT} – Ta



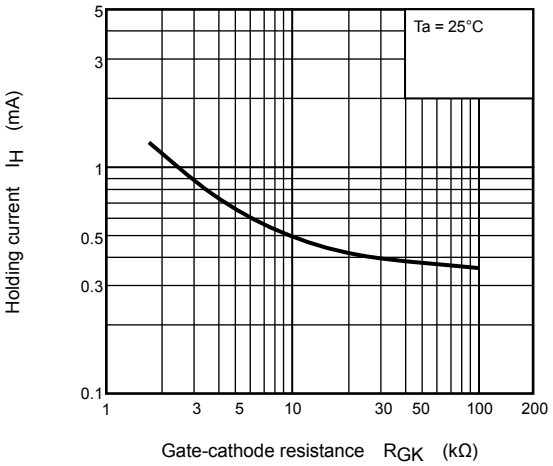
I_{FT} – R_{GK}



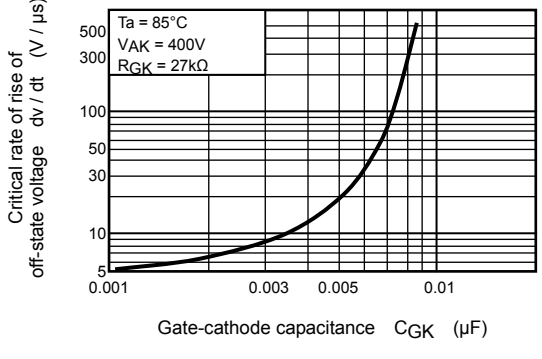
I_H – Ta



I_H – R_{GK}



dv / dt – C_{GK}



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