TOSHIBA Photocoupler GaAs IRed & Photo-Thyristor

# TLP741J

Office Machine
Household Use Equipment
Solid State Relay
Switching Power Supply

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

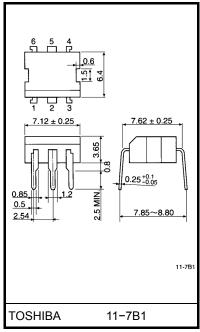
Certificate no. 40009302

Maximum operating insulation voltage: 630  $\ensuremath{\mathrm{VPK}}$  Highest permissible over voltage: 6000  $\ensuremath{\mathrm{VPK}}$ 

(Note) When a EN 60747-5-2 approved type is needed, please designate the "option (D4)"

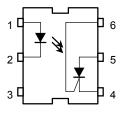
		7.62 mm pich	10.16 mm pich
		standard type	(LF2) type
•	Creepage distance:	7.0 mm (min.)	8.0 mm (min.)
	Clearance:	7.0 mm (min.)	8.0 mm (min.)
	Insulation thickness:	0.5 mm (min.)	0.5 mm (min.)

Unit in mm



Weight: 0.35 g

### 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	
	Forward current	l <sub>F</sub>	60	mA	
	Forward current derating (Ta ≥ 39°C)	ΔI <sub>F</sub> / °C	-0.7	mA / °C	
	Peak forward current (100 µs pulse, 100 pps)	I <sub>FP</sub>	1	Α	
LED	Power dissipation	P <sub>D</sub>	100	mW	
	Power dissipation derating (Ta ≥ 25°C)	ΔP <sub>D</sub> / °C	-1.0	mW / °C	
	Reverse voltage	V <sub>R</sub>	5	V	
	Junction temperature	Tj	125	°C	
	Peak forward voltage ( $R_{GK}$ = 27 k $\Omega$ )	$V_{DRM}$	600	V	
	Peak reverse voltage ( $R_{GK}$ = 27 k $\Omega$ )	V <sub>RRM</sub>	600	V	
	On-state current	I <sub>T(RMS)</sub>	150	mA	
	On–state current derating (Ta ≥ 25°C)	ΔI <sub>T</sub> / °C	-2.0	mA / °C	
Detector	Peak on-state current (100µs pulse, 120 pps)	I <sub>TP</sub>	3	Α	
Dete	Peak one cycle surge current	I <sub>TSM</sub>	2	Α	
	Peak reverse gate voltage	$V_{GM}$	5	V	
	Power dissipation	P <sub>D</sub>	150	mW	
	Power dissipation derating (Ta ≥ 25°C)	ΔP <sub>D</sub> / °C	-2.0	mW / °C	
	Junction temperature	Tj	100	°C	
Storag	Storage temperature range		-55~125	°C	
Operating temperature range		T <sub>opr</sub>	-55~100	°C	
Lead s	oldering temperature (10 s)	T <sub>sol</sub>	260	°C	
Total p	ackage power dissipation	PT	250	mW	
Total p	eackage power dissipation derating (Ta ≥ 25°C)	ΔP <sub>T</sub> / °C	-3.3	mW / °C	
Isolatio	on voltage (AC, 1 min., R.H.≤ 60%)	BVS	4000	V <sub>rms</sub>	

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.	Min. Typ.		Unit
Supply voltage	V <sub>AC</sub>	_	_	240	V <sub>ac</sub>
Forward current	lF	15	20	25	mA
Operating temperature	T <sub>opr</sub>	-25	_	85	°C
Gate to cathode resistance	R <sub>GK</sub>	_	10	27	kΩ
Gate to cathode capacity	C <sub>GK</sub>	_	0.01	0.1	μF

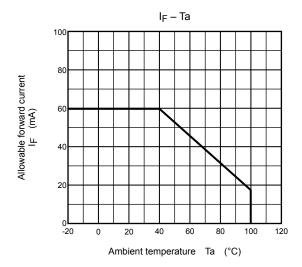
Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

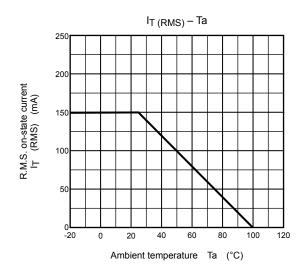
## Individual Electrical Characteristics (Ta = 25°C)

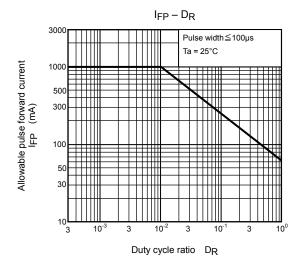
Characteristic		Symbol	Test Condition		Min.	Тур.	Max.	Unit
	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA		1.0	1.15	1.3	V
LED	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 5 V		-	_	10	μΑ
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz		_	30	_	pF
	Off-state current	l==	V <sub>AK</sub> = 600 V R <sub>GK</sub> = 27 kΩ	Ta = 25°C	_	10	5000	nA
		IDRM		Ta = 85°C	_	1	150	μA
	Reverse current I <sub>RRM</sub> On–state voltage V <sub>TM</sub>	1	V <sub>KA</sub> = 600 V R <sub>GK</sub> = 27 kΩ	Ta = 25°C	_	10	5000	nA
٦c		IRRM		Ta = 85°C	-	1	150	μΑ
Detector		V <sub>TM</sub>	I <sub>TM</sub> = 100 mA		-	0.9	1.3	V
De	Holding current	lΗ	R <sub>GK</sub> = 27 kΩ		-	0.2	_	mA
	Off-state dv / dt	dv / dt	V <sub>AK</sub> = 420 V, R <sub>GK</sub> = 27 kΩ		_	10	_	V/µs
	Capacitance $C_j$ $V = 0$ ,		)/ O. f. 4 MIL-	Anode to gate	_	20	_	
		V = 0, f = 1 MHz Gate to c	Gate to cathode	_	350	_	pF	

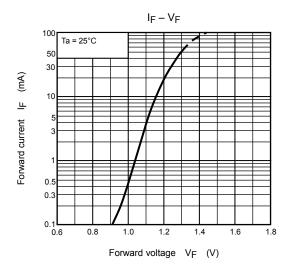
## Coupled Characteristics (Ta = 25°C)

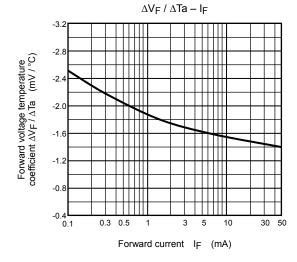
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit	
Trigger LED current	I <sub>FT</sub>	$V_{AK}$ = 6 V, $R_{GK}$ = 27 k $\Omega$	_	5	10	mA	
Turn-on time	n-on time $t_{ON}$ $I_F = 30$ $R_{GK} =$		_	10	_	μs	
Coupled dv / dt	dv / dt	$V_S = 500 \text{ V}, R_{GK} = 27 \text{ k}\Omega$	500	_	_	V / µs	
Capacitance (input to output)	CS	V <sub>S</sub> = 0, f = 1 MHz	_	0.8	_	pF	
Isolation resistance	R <sub>S</sub>	V <sub>S</sub> = 500 V	1×10 <sup>12</sup>	10 <sup>14</sup>	_	Ω	
	BVS	AC, 1 minute	4000	_	_	- V <sub>rms</sub>	
Isolation voltage		AC, 1 second, in oil	_	10000	_		
		DC, 1 minute, in oil	_	10000	_	V <sub>dc</sub>	

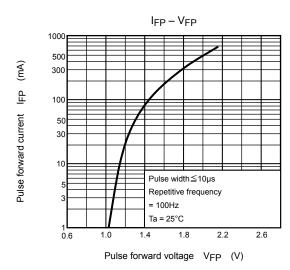




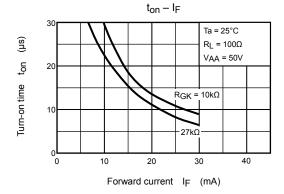


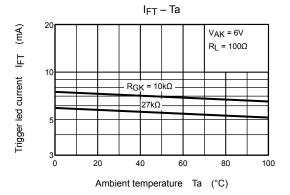


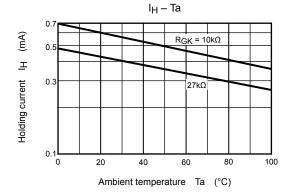


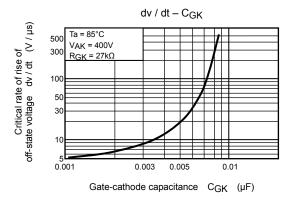


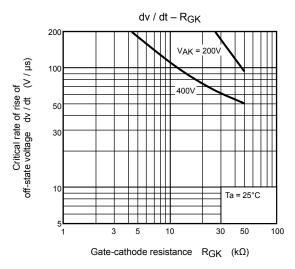
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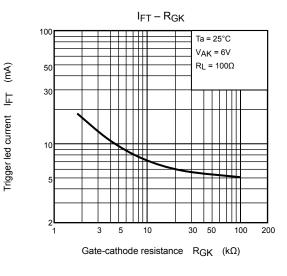


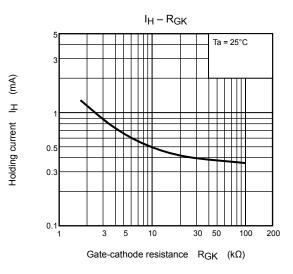












#### **RESTRICTIONS ON PRODUCT USE**

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