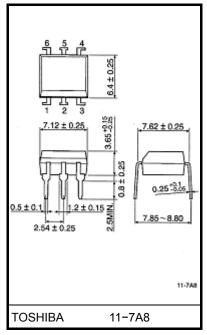
TOSHIBA Photocoupler GaAs Ired & Photo-Thyristor

TLP548J

Office Machine
Household Use Equipment
Solid State Relay
Switching Power Supply

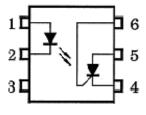
The TOSHIBA TLP548J consists of a photo–thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak off-state voltage: 600 V (min)
- Trigger LED current: 7 mA (max)
- On-state current: 150 mA (max)
- Isolation voltage: 2500 V_{rms} (min)
- UL recognized: UL1577, file no. E67349



Weight: 0.4 g (typ.)

Pin Configuration (top view)



- 1: ANODE (LED)
- 2: CATHODE (LED)
- 3: N.C.
- 4: CATHODE (SCR)
- 5: ANODE (SCR)
- 6: GATE

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit	
LED	Forward current	lF	50	mA	
	Forward current derating (Ta ≥ 53°C)	ΔI _F / °C	-0.7	mA / °C	
	Peak forward current (100 µs pulse, 100 pps)	I _{FP}	1	Α	
	Reverse voltage	V_{R}	5	V	
	Peak forward voltage ($R_{GK} = 27k\Omega$)	V_{DRM}	600	V	
	Peak reverse voltage ($R_{GK} = 27k\Omega$)	V_{RRM}	600	٧	
ō	On-state current	I _{T (RMS)}	150	mA	
Detector	On–state current derating (Ta ≥ 25°C)	ΔI _T / °C	-2.0	mA / °C	
ă	Peak on–state current (100 μs pulse, 120 pps)	I _{TP}	3	Α	
	Peak one cycle surge current	I _{TSM}	2	Α	
	Peak reverse gate voltage	V_{GM}	5	V	
Opera	Operating temperature range		-40 to 100	°C	
Storag	Storage temperature range		-55 to 125	°C	
Lead s	e temperature range T _{stg} oldering temperature (10 s) T _{sol}		260	°C	
Isolatio	on voltage (AC, 1 min., R.H. ≤ 60%) (Note 1)	BV_S	2500	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).

Note 1: 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	Тур.	Max	Unit
Supply voltage	V _{AC}	_	_	240	V _{ac}
Forward current	IF	10	_	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

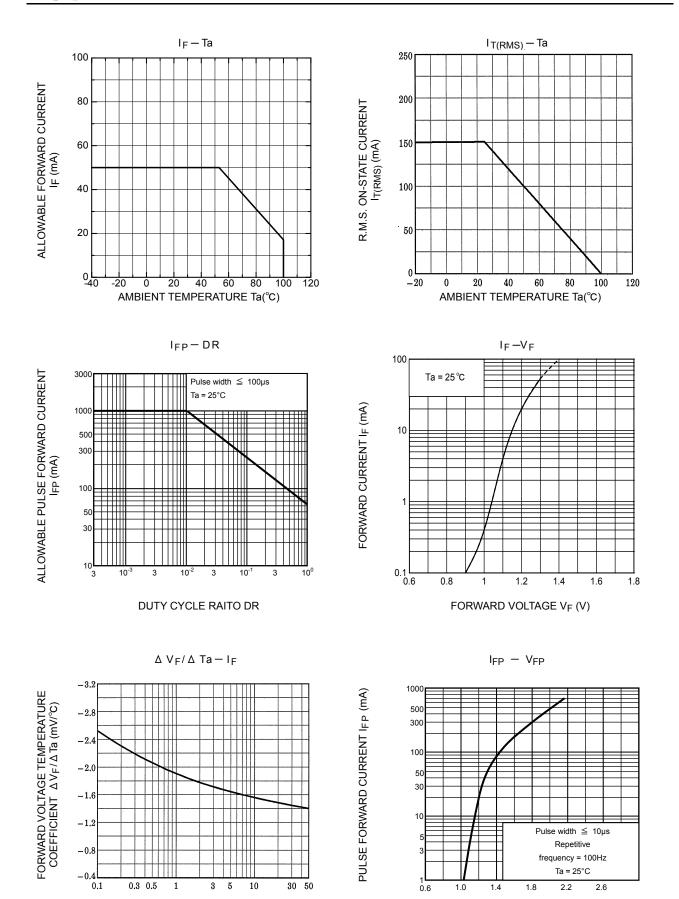
Note 2: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition		Min	Тур.	Max	Unit
	Forward voltage	V _F	I _F = 10 mA		1.0	1.15	1.3	V
LED	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}	$V_{AK} = 600 \text{ V}, R_{GK} = 27 \text{ k}\Omega$		_	_	5	μΑ
	Reverse current	I _{RRM}	$V_{KA} = 600 \text{ V}, R_{GK} = 27 \text{ k}\Omega$		_	_	5	μΑ
	On-state voltage	V _{TM}	I _{TM} = 100 mA, I _F = 7 mA		_	1.25	1.45	V
	Holding current	lΗ	R _{GK} = 27 kΩ		_	0.5	1	mA
	Off-state dv/dt	dv/dt	V _{AK} = 420 V, R _{GK} = 27 kΩ		5	_	_	V/µs
	Capacitance C_j $V = 0, f = 1 \text{ MHz}$	V = 0 f = 4 MH=	Anode to gate	_	5	_		
		Gate to cathode		500	_	pF		

Coupled Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current	I _{FT}	V_{AK} = 6 V, R_{GK} = 27 k Ω	_	3	7	mA
Turn-on time	t _{on}	I_F = 30 mA, V_{AA} = 50 V, R_{GK} = 27 k Ω	_	10	-	μs
Capacitance (input to output)	CS	V _S = 0, f = 1 MHz	_	0.8	_	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60%	5×10 ¹⁰	10 ¹⁴	_	Ω
		AC, 1 minute	2500	_	_	V _{rms}
Isolation voltage		AC, 1 second, in oil	_	5000	_	vrms
		DC, 1 minute, in oil	_	5000	_	V _{dc}



^{*:} The above graphs show typical characteristics.

FORWARD CURRENT IF (mA)

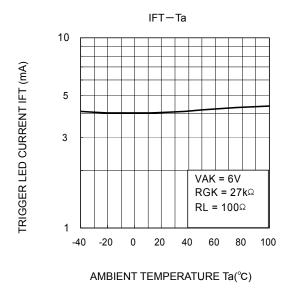
0.3 0.5

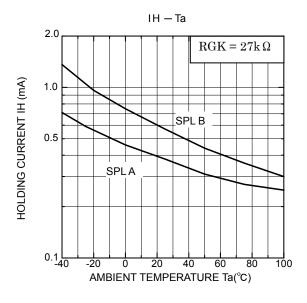
PULSE FORWARD VOLTAGE VFP (V)

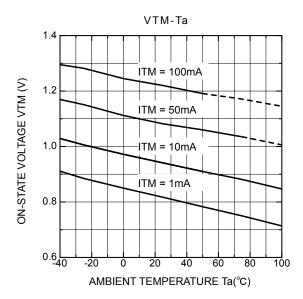
2.2

0.6

30 50







*: The above graphs show typical characteristics.

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