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TOSHIBA Photocoupler GaAs IRED & Photo-Triac

TLP161J

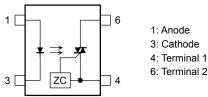
Triac Drive Programmable Controllers AC-Output Module Solid State Relay

The TOSHIBA mini flat coupler TLP161J is a small outline coupler, suitable for surface mount assembly.

The TLP161J consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

- Zero-voltage crossing turn-on •
- Peak off-state voltage: 600 V (min) •
- Trigger LED current: 10 mA (max) •
- On-state current: 70 mA (max) •
- Isolation voltage: 2500 Vrms (min) .
- UL recognized: UL1577, file No. E67349 •

Pin Configurations



4: Terminal 1

1 F 0 4 Н Н 3.6 ± 0.2 0.5MIN. 7.0 ± 0.4 11-4C3 JEDEC JEITA TOSHIBA 11-4C3

Weight: 0.09 g (typ.)

Trigger LED Current (mA)

Trigger LED Current

Classification (*)	V _T = 6 V,	Marking of Classification	
	Min	Max	
(IFT7)	_	7	Τ7
Standard		10	T7, Blank

*: Ex. (IFT7): TLP161J (IFT7)

Note: Application type name for certification test, please use standard product type name, i.e. TLP161J (IFT7): TLP161J

Unit: mm

Absolute Maximum Ratings (Ta = 25°C)

Characteristics			Symbol	Rating	Unit	
	Forward current		lF	50	mA	
	Forward current de $(Ta \ge 53^{\circ}C)$	rating	∆I _F /°C	-0.7	mA/°C	
LED	Peak forward curre (100 μs pulse, 100		I _{FP}	1	А	
	Reverse voltage		V _R	5	V	
	Junction temperatu	ire	Tj	125	°C	
	Off-state output ter	minal voltage	V _{DRM}	600	V	
	On-state RMS current	Ta = 25°C		70	mA	
		Ta = 70°C	I _{T(RMS)}	40	ШA	
Detector	On-state current de $(Ta \ge 25^{\circ}C)$	erating	∆I _T /°C	-0.67	mA/°C	
	Peak on-state curre (100 μs pulse, 120		I _{TP}	2	А	
	Peak nonrepetitive (PW = 10 ms)	surge current	I _{TSM}	1.2	А	
	Junction temperatu	ire	Tj	115	°C	
Storage temperature range			T _{stg} –55 to 125		°C	
Operating temperature range			T _{opr}	-40 to 100	°C	
Lead soldering temperature (10 s)			T _{sol}	260	°C	
Isolation voltage (AC, 1 min., R.H. \leq 60%) (Note)			BVS	2500	Vrms	

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

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	V _{AC}			240	Vac
Forward current	١ _F	15	20	25	mA
Peak on-state current	I _{TP}	_	_	1	А
Operating temperature	T _{opr}	-25		85	°C

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.

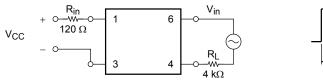
Note: Device considered a two terminal device: Pins 1 and 3 shorted together and pins 4 and 6 shorted together.

Individual Electrical Characteristics (Ta = 25°C)

	Characteristics	Symbol	Test Condition	Min	Тур.	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	CT	V = 0, f = 1 MHz	_	30	_	pF
Detector	Peak off-state current	I _{DRM}	V _{DRM} = 600 V	_	10	1000	nA
	Peak on-state voltage	V _{TM}	I _{TM} = 70 mA	_	1.7	2.8	V
	Holding current	Ι _Η		_	0.6	_	mA
	Critical rate of rise of off-state voltage	dv/dt	V _{in} = 240 Vrms, Ta = 85°C (Figure 1)	200	500	_	V/µs
	Critical rate of rise of commutating voltage	dv/dt(c)	$V_{in} = 60 \text{ Vrms}, I_T = 15 \text{ mA} (Figure 1)$		0.2	_	V/µs

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current	I _{FT}	$V_T = 6 V$	—	5	10	mA
Inhibit voltage	VIH	I _F = Rated I _{FT}	_	_	50	V
Leakage in inhibited state	IIН	$I_F = Rated I_{FT}, V_T = Rated V_{DRM}$	_	200	600	μA
Capacitance (input to output)	CS	$V_S = 0, f = 1 MHz$		0.8	—	pF
Isolation resistance	R _S	$V_S=500~V,~R.H.\leq 60\%$	1 × 10 ¹²	10 ¹⁴	_	Ω
	BVS	AC, 1 minute	2500	_	_	Vrms
Isolation voltage		AC, 1 s, in oil	_	5000		
		DC, 1 minute, in oil	_	5000		Vdc



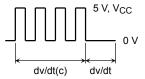
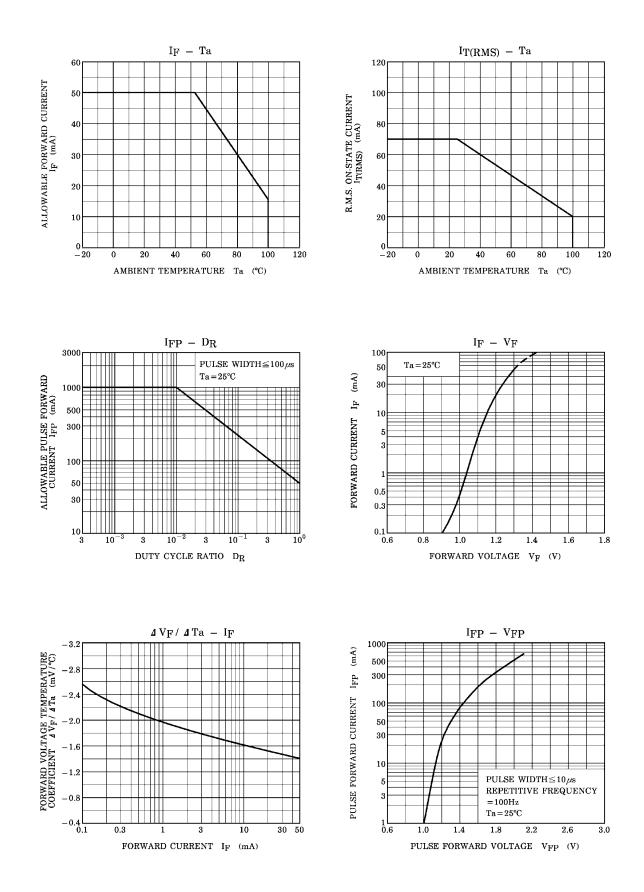
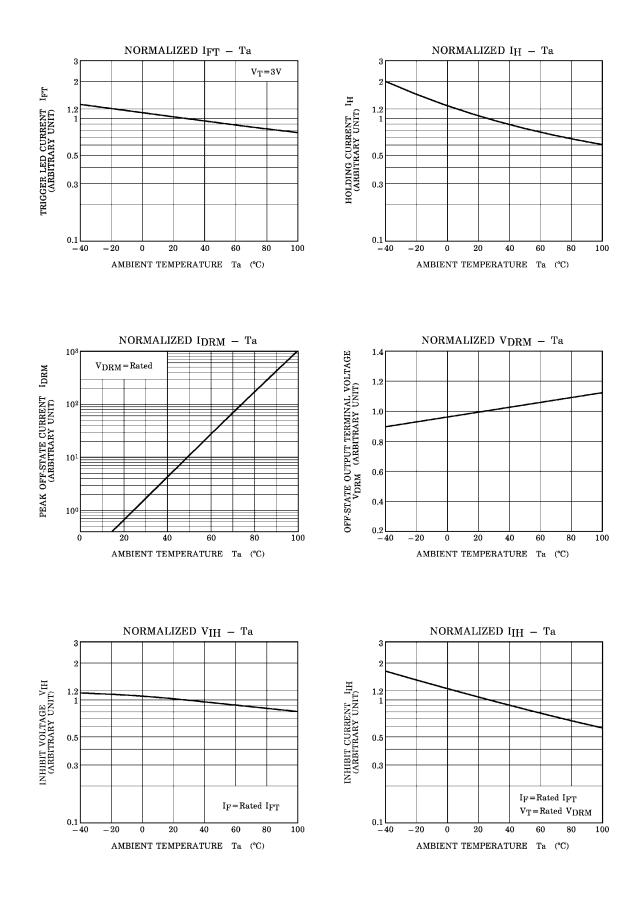


Figure 1 dv/dt Test Circuit

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