TOSHIBA Photocoupler GaAs Ired & Photo-Triac

TLP160J

Triac Drive
Programmable Controllers
AC-Output Module
Solid State Relay

The TOSHIBA mini flat coupler TLP160J is a small outline coupler, suitable for surface mount assembly.

The TLP160J consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

• 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

Trigger LED Current

Classi– fication*	Trigger LED C	Marking Of Classification	
	V _T =6V, Ta		
	Min.	Max.	Classification
(IFT7)	_	7	T7
Standard	_	10	T7, blank

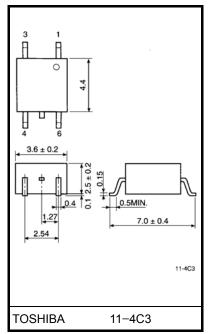
*Ex. (IFT7); TLP160J (IFT7)

(Note) Application type name for certification test, please

use standard product type name, i.e.

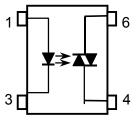
TLP160J (IFT7): TLP160J

Unit in mm



Weight: 0.09 g (typ.)

Pin Configurations



- 1. Anode
- 3. Cathode
- 4. Terminal 1
- 6. Terminal 2

Absolute Maximum Ratings (Ta = 25°C)

	Characteristic	Symbol	Rating	Unit		
-ED	Forward current	lF	50	mA		
	Forward current derating (T	ΔI _F / °C	-0.7	mA / °C		
	Peak forward current (100	us pulse, 100 pps)	IFP	1	Α	
	Reverse voltage		V _R	5	V	
	Junction temperature	Tj	125	°C		
	Off-state output terminal vo	V_{DRM}	600	V		
	On-state RMS current	Ta=25°C	l=(p, (o)	70	mA	
		Ta=70°C	IT(RMS)	40		
Detector	On-state current derating (ΔI _T / °C	-0.67	mA / °C		
Dete	Peak on-state current (100	I _{TP}	2	Α		
	Peak nonrepetitive surge co (PW=10ms, DC=10%)	I _{TSM}	1.2	А		
	Junction temperature	Tj	115	°C		
Storage temperature range			T _{stg}	-55~125	°C	
Operating temperature range			T _{opr}	-40~100	°C	
Lead soldering temperature (10 s)			T _{sol}	260	°C	
Isolation voltage (AC, 1 min., R.H. ≤ 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).

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

Recommended Operating Conditions

Characteristic	Symbol	Min.	Тур.	Max.	Unit
Supply voltage	V _{AC}	-	-	240	Vac
Forward current	Ιϝ	15	20	25	mA
Peak on-state current	I _{TP}	_	_	1	Α
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.

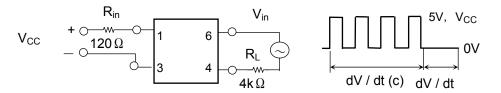
Individual Electrical Characteristics (Ta = 25°C)

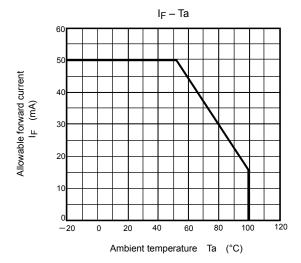
	Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
	Forward voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
LED	Reverse current	I _R	V _R = 5 V	_	_	10	μΑ
	Capacitance	C _T	V = 0, f = 1 MHz	_	30	_	pF
Detector	Peak off-state current	I _{DRM}	V _{DRM} = 600 V	_	10	1000	nA
	Peak on-state voltage	V_{TM}	I _{TM} = 70 mA	_	1.7	2.8	V
	Holding current	lн	_	_	1.0	_	mA
	Critical rate of rise of off–state voltage	dv / dt	V _{in} = 240 Vrms, Ta = 85°C (Fig.1)	_	500	_	V / µs
	Critical rate of rise of commutating voltage	dv / dt(c)	I _T = 15 mA, V _{in} = 60 Vrms (Fig.1)	_	0.2	_	V / µs

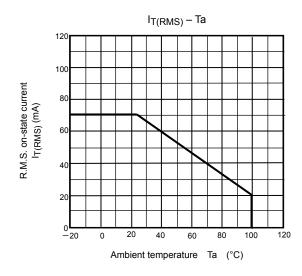
Coupled Electrical Characteristics (Ta = 25°C)

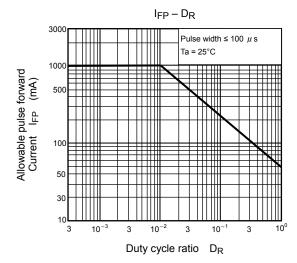
Characteristic	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Trigger LED current	I _{FT}	V _T = 6 V	_	5	10	mA
Capacitance input to output	Cs	V _S = 0, f = 1 MHz	_	0.8	_	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60%	1×10 ¹²	10 ¹⁴	_	Ω
	BVS	AC, 1 minute	2500	_	_	- Vrms
Isolation voltage		AC, 1 second, in oil	_	5000	_	
		DC, 1 minute, in oil	_	5000	_	Vdc
Turn-on time	t _{ON}	$V_D = 6\rightarrow 4V$, $R_L = 100\Omega$ $I_F = \text{rated } I_{FT} \times 1.5$	_	30	100	μs

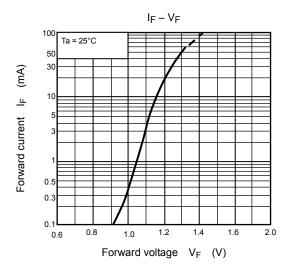
Fig.1 dv / dt test circuit

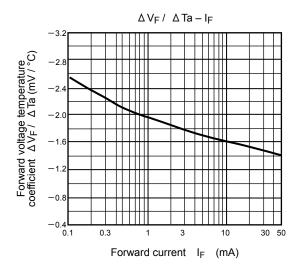


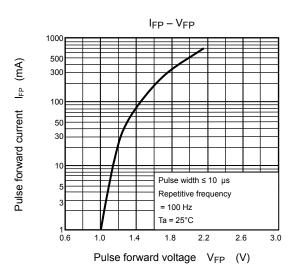


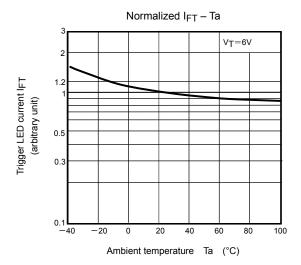


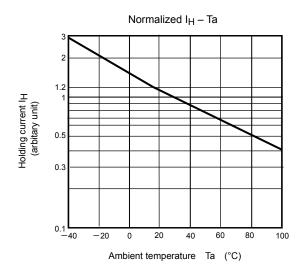


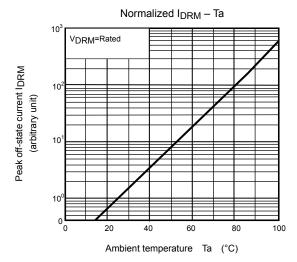


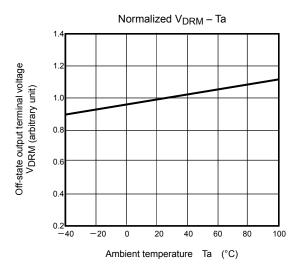


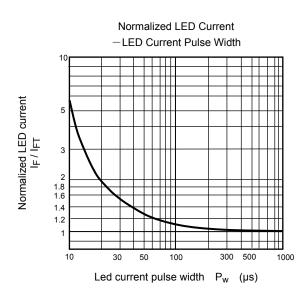












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