

TOSHIBA Photocoupler GaAs IRED + Photo-Triac

TLP261J

Triac Drivers

Programmable Controllers

AC-Output Modules

Solid-State Relays

The TOSHIBA mini-flat coupler TLP261J is housed in a small-outline package and suitable for surface-mount assembly.

The TLP261J consists of a gallium arsenide infrared emitting diode optically coupled to a triac-output photocoupler.

- Peak off-state voltage: 600 V (min)
- Trigger LED current: 10 mA (max)
- On-state current: 70 mA (max)
- Isolation voltage: 3000 Vrms (min)
- Zero-crossing function
- UL-recognized: UL1577, file no. E67349
- Option (V4) type

VDE-approved: EN60747-5-2 satisfied

Maximum operating insulation voltage: 565 Vpk

Maximum permissible overvoltage: 6000 Vpk

Note: When an EN60747-5-2 approved type is needed, be sure to specify "Option (V4)".

- Construction Mechanical Rating
 Creepage distance: 4.0 mm (min)
 Clearance: 4.0 mm (min)
 Insulation thickness: 0.4 mm (min)

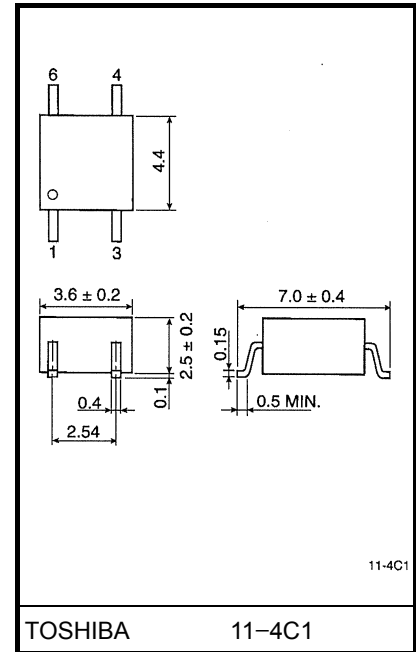
Trigger LED Current

Classification*	Trigger LED Current (mA)		Product Classification Marking
	$V_T = 3\text{ V}, T_a = 25^\circ\text{C}$		
	Min	Max	
(IFT7)	—	7	T7
Standard	—	10	T7, blank

*E.g. (IFT7): TLP261J (IFT7)

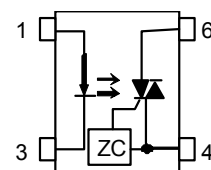
Note: Be sure to use standard product type names when submitting type names for safety certification testing, i.e., TLP261J (IFT7): TLP261J.

Unit: mm



Weight: 0.09 g (typ.)

Pin Configuration



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

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit	
LED	Forward current	I_F	50	mA	
	Forward current derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C	
	Peak forward current (100 μs pulse, 100 pps)	I_{FP}	1	A	
	Reverse voltage	V_R	5	V	
	Junction temperature	T_j	125	°C	
Detector	Off-state output terminal voltage	V_{DRM}	600	V	
	On-state RMS current	$I_{T(RMS)}$	Ta = 25°C	70	mA
			Ta = 70°C	40	
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ\text{C}$	-0.67	mA / °C	
	Peak on-state current (100 μs pulse, 120 pps)	I_{TP}	2	A	
	Peak nonrepetitive surge current (PW = 10 ms)	I_{TSM}	1.2	A	
	Junction temperature	T_j	100	°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 ≤ 60%)	(Note 1) BV_S	3000	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 1: Device considered as a two-terminal device: Pins 1 and 3 shorted together and pins 4 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{AC}	—	—	240	V_{ac}
Forward current	I_F	15	20	25	mA
Peak on-state current	I_{TP}	—	—	1	A
Operating temperature	T_{opr}	-25	—	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the devices. Each item also has its own independent guideline document. In developing designs using these products, please confirm the specified characteristics shown in these documents.

Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{\text{DRM}} = 600 \text{ V}$	—	10	1000	nA
	Peak on-state voltage	V_{TM}	$I_{\text{TM}} = 70 \text{ mA}$	—	1.7	2.8	V
	Holding current	I_H	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	dv / dt	$V_{\text{in}} = 240 \text{ Vrms}, T_a = 85^\circ\text{C}$ (Fig. 1)	200	500	—	$\text{V}/\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv / dt(c)$	$V_{\text{in}} = 60 \text{ Vrms}, I_T = 15 \text{ mA}$ (Fig. 1)	—	0.2	—	$\text{V}/\mu\text{s}$

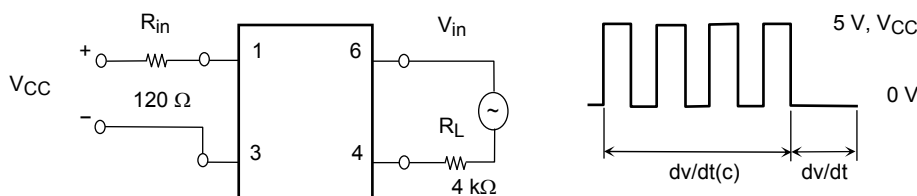
Coupled Electrical Characteristics (Ta = 25°C)

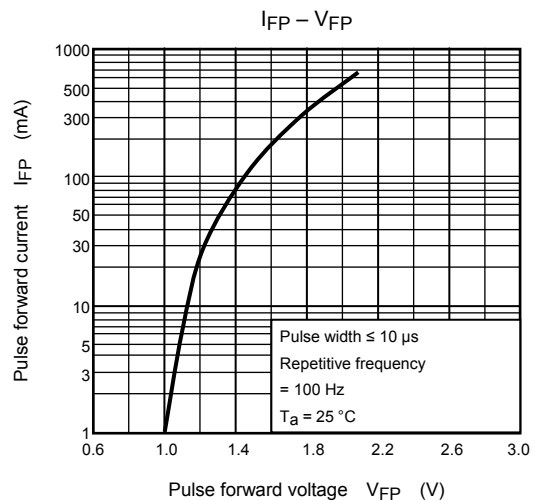
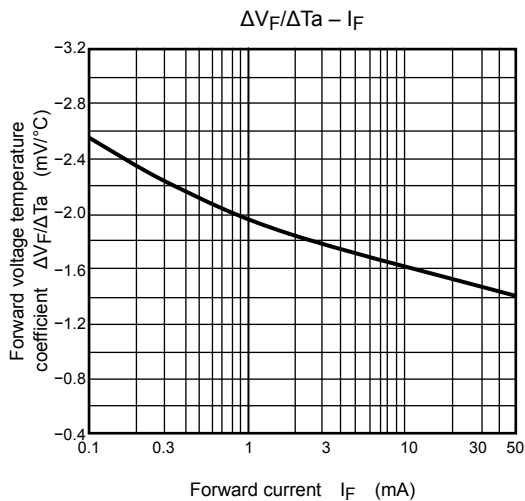
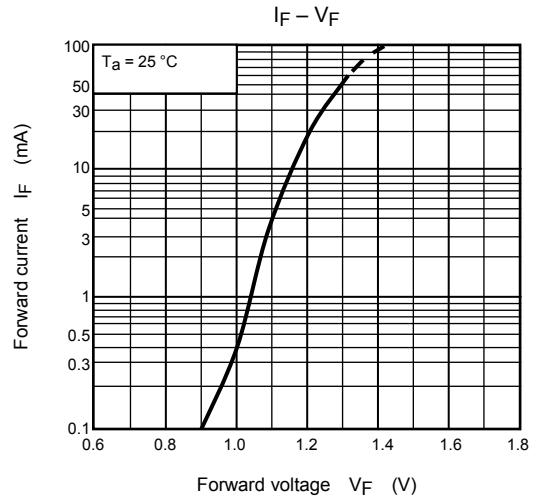
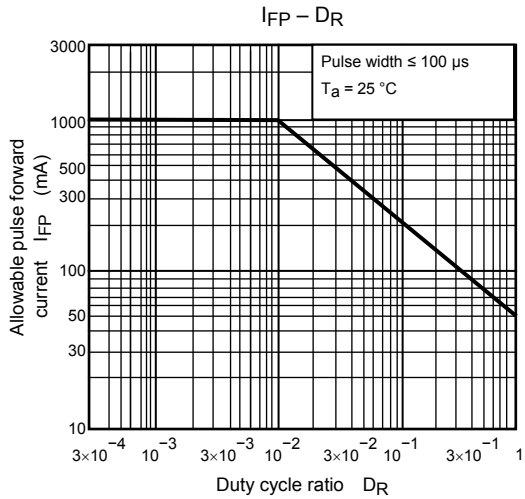
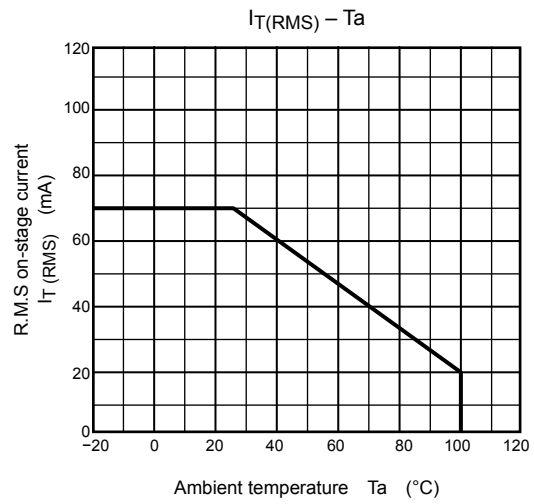
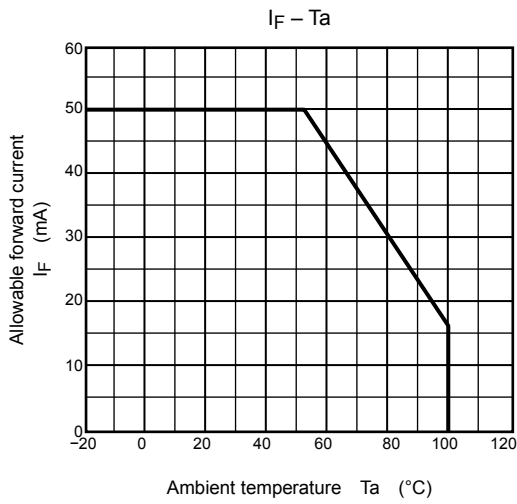
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FT}	$V_T = 3 \text{ V}$	—	—	10	mA
Inhibit voltage	V_{IH}	$I_F = \text{Rated } I_{\text{FT}}$	—	—	20	V
Leakage in inhibited state	I_{IH}	$I_F = \text{Rated } I_{\text{FT}}$ $V_T = \text{Rated } V_{\text{DRM}}$	—	200	600	μA
Turn-on time	t_{ON}	$V_D = 3 \rightarrow 1.5 \text{ V}, R_L = 20 \Omega$ $I_F = \text{rated } I_{\text{FT}} \times 1.5$	—	30	100	μs

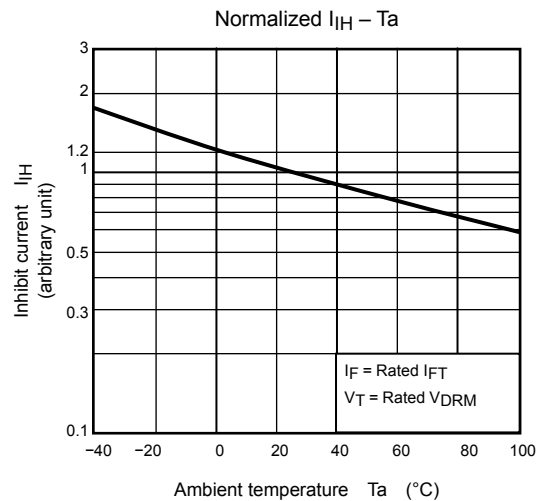
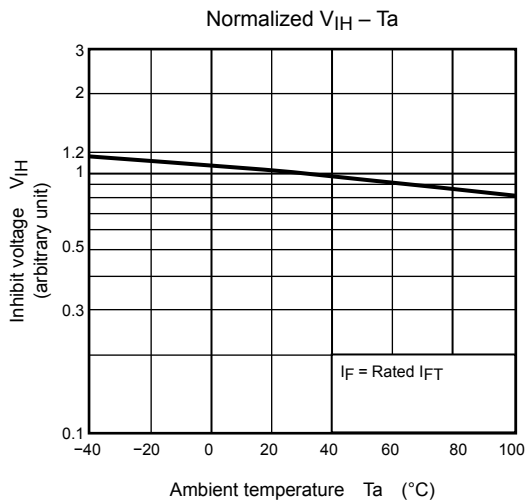
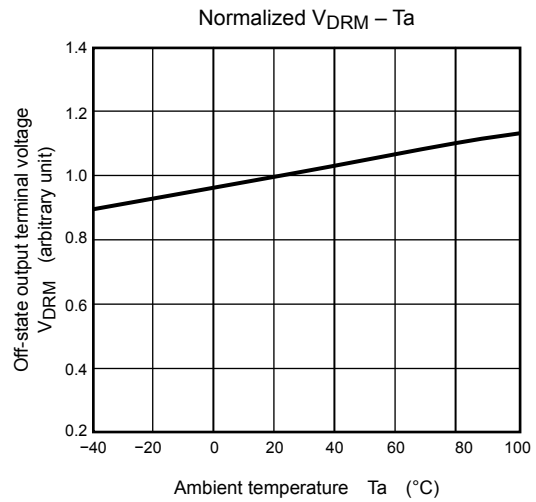
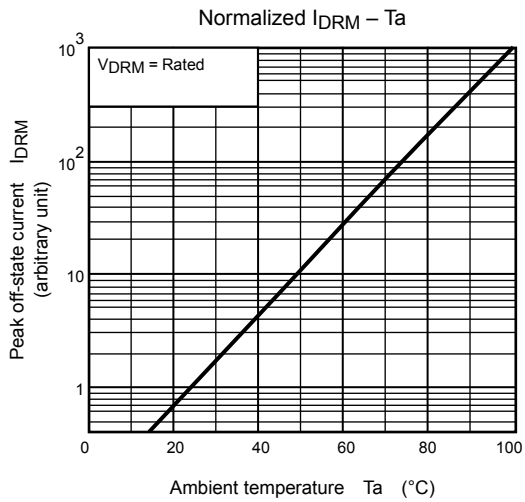
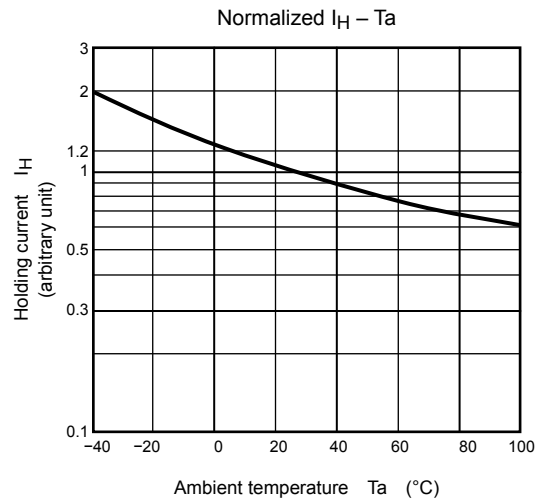
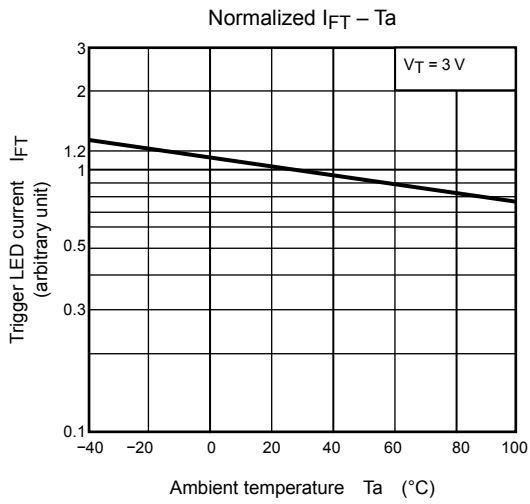
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance (input to output)	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	3000	—	—	V_{rms}
		AC, 1 second, in oil	—	5000	—	
		AC, 1 minute, in oil	—	5000	—	Vdc

Fig. 1: dv / dt test circuit







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