

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 an 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: UL 1577, File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

Note 1: When a VDE approved type is needed,  
please designate the **Option(V4)**.

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

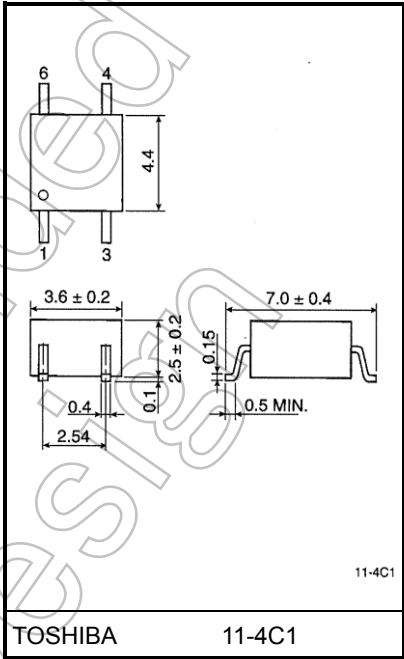
Trigger LED Current

Classification (Note 1)	Trigger LED Current (mA)		Product Classification Marking
	V <sub>T</sub> =3 V, T <sub>a</sub> = 25°C		
	Min	Max	
(IFT7)	—	7	T7
Standard	—	10	T7, blank

Note 1: E.g. (IFT7): TLP261J (IFT7)

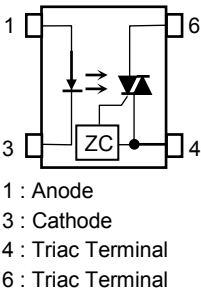
Note: Be sure to use standard product type names when submitting type names for safety certification testing, i.e., TLP261J (IFT7): TLP261J.

Unit: mm



Weight: 0.09 g (typ.)

Pin Configuration



Start of commercial production  
2003-07

## Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I <sub>F</sub>	50	mA
	Forward current derating (Ta ≥ 53°C)	ΔI <sub>F</sub> / °C	-0.7	mA / °C
	Peak forward current (100 μs pulse, 100 pps)	I <sub>FP</sub>	1	A
	Reverse voltage	V <sub>R</sub>	5	V
	Diode power dissipation	P <sub>D</sub>	100	mW
	Diode power dissipation derating (Ta ≥ 53°C)	ΔP <sub>D</sub> / °C	-1.4	mW / °C
	Junction temperature	T <sub>j</sub>	125	°C
Detector	Off-state output terminal voltage	V <sub>DRM</sub>	600	V
	On-state RMS current	I <sub>T(RMS)</sub>	70	mA
			40	
	On-state current derating (Ta ≥ 25°C)	ΔI <sub>T</sub> / °C	-0.67	mA / °C
	Peak on-state current (100 μs pulse, 120 pps)	I <sub>TP</sub>	2	A
	Peak nonrepetitive surge current (P <sub>W</sub> = 10 ms)	I <sub>TSM</sub>	1.2	A
	Output power dissipation	P <sub>O</sub>	200	mW
	Output power dissipation derating (Ta ≥ 25°C)	ΔP <sub>O</sub> / °C	-2.0	mW / °C
	Junction temperature	T <sub>j</sub>	100	°C
Storage temperature range		T <sub>stg</sub>	-55 to 125	°C
Operating temperature range		T <sub>opr</sub>	-40 to 100	°C
Lead soldering temperature (10 s)		T <sub>sol</sub>	260	°C
Isolation voltage (AC, 60 s, R.H ≤ 60 %) (Note 1)		BV <sub>S</sub>	3000	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.).

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 <sub>AC</sub>	—	—	240	V <sub>ac</sub>
Forward current	I <sub>F</sub>	15	20	25	mA
Peak on-state current	I <sub>TP</sub>	—	—	1	A
Operating temperature	T <sub>opr</sub>	-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.

## Electrical Characteristics (Ta = 25°C)

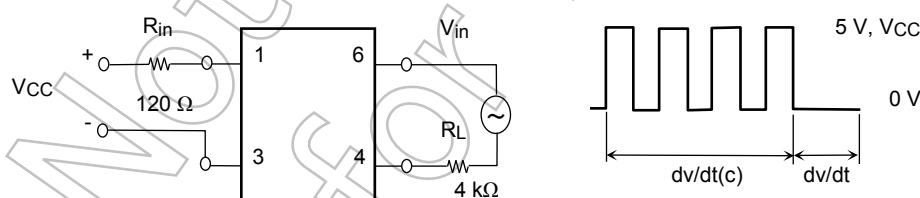
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	$V_F$	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V_F = 0 \text{ V}$ , $f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM}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

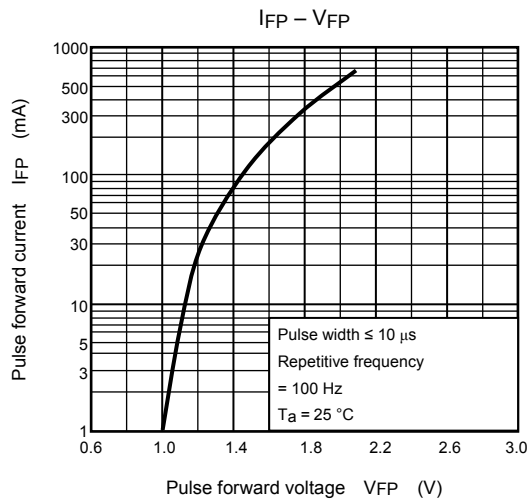
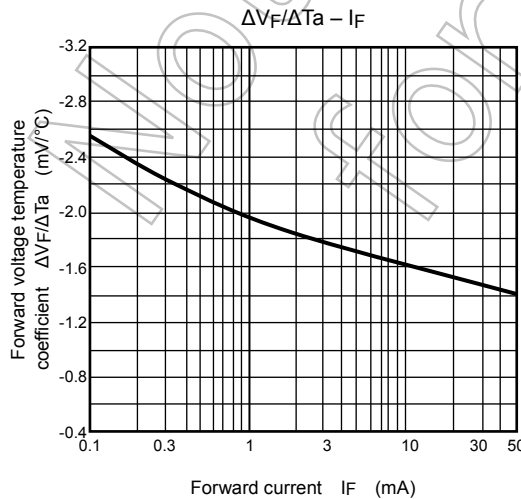
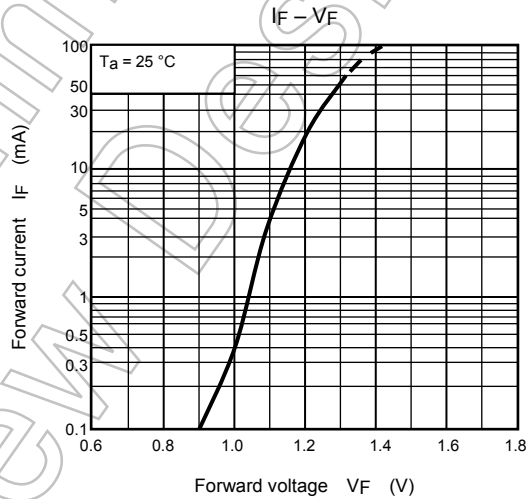
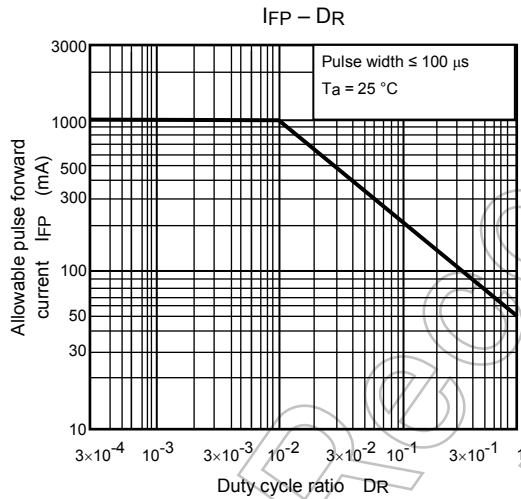
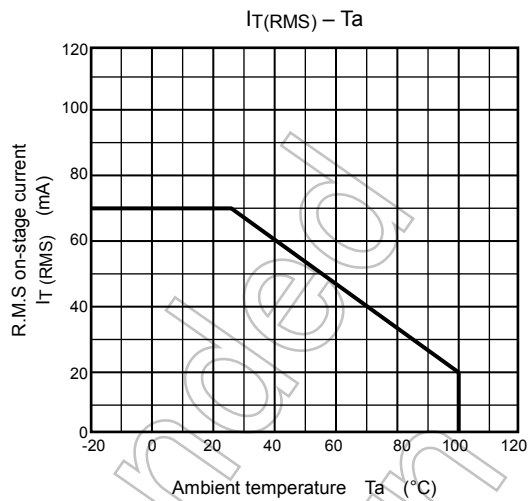
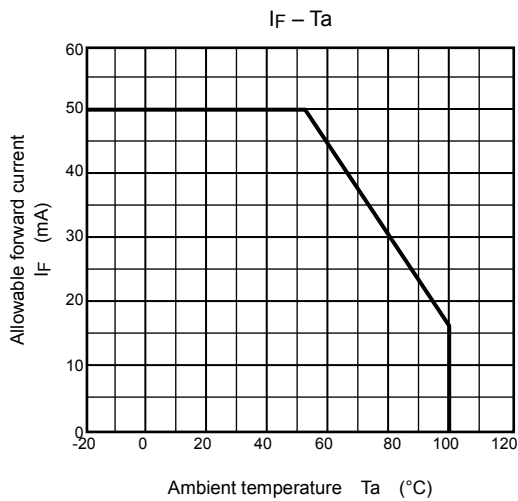
## Coupled Electrical Characteristics (Ta = 25°C)

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

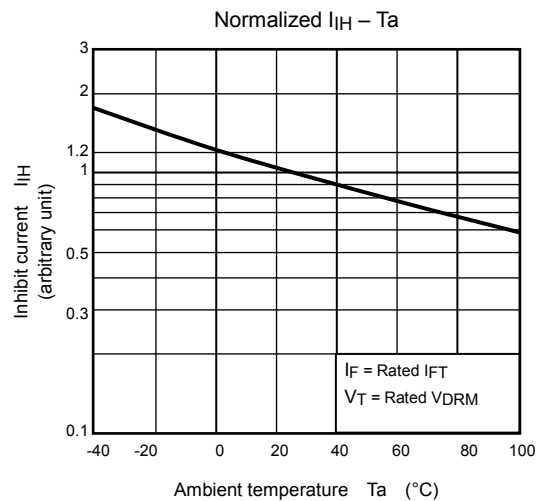
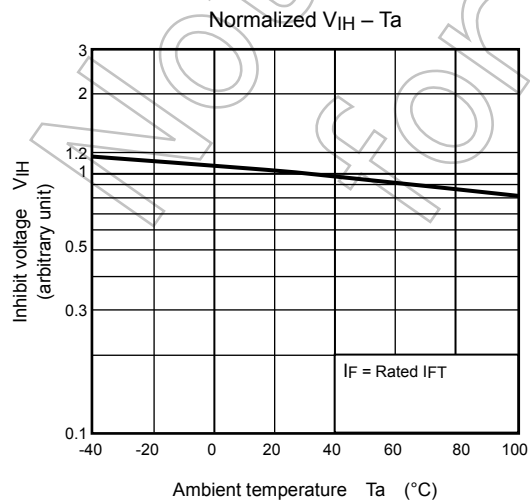
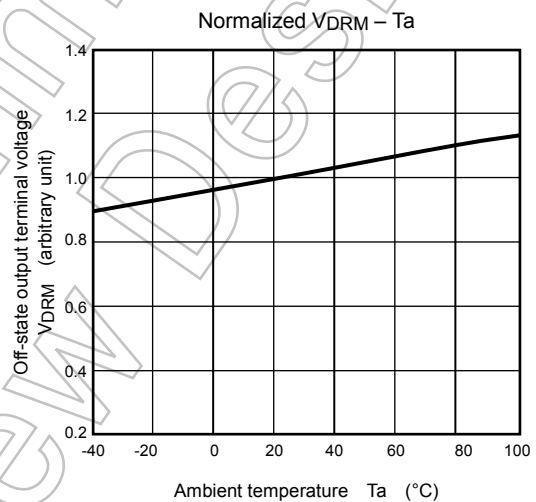
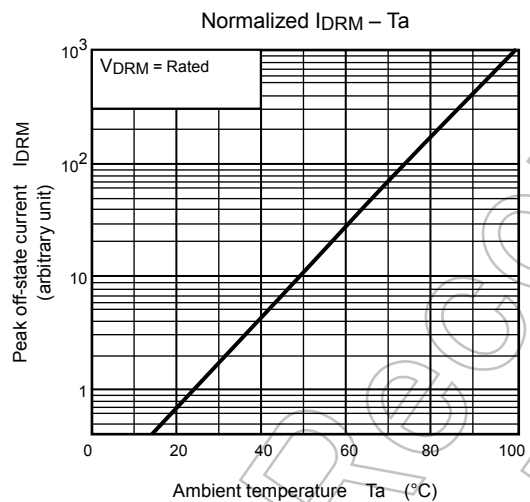
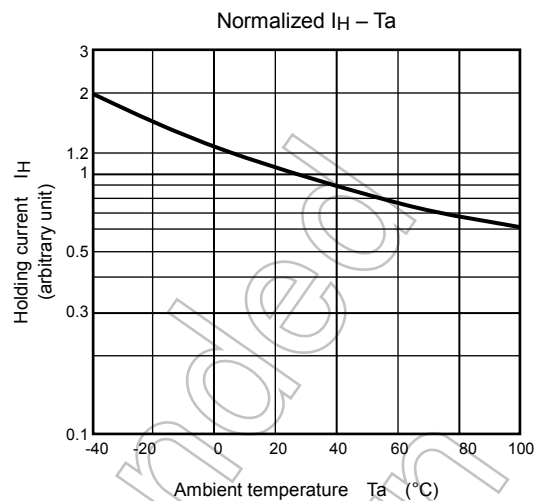
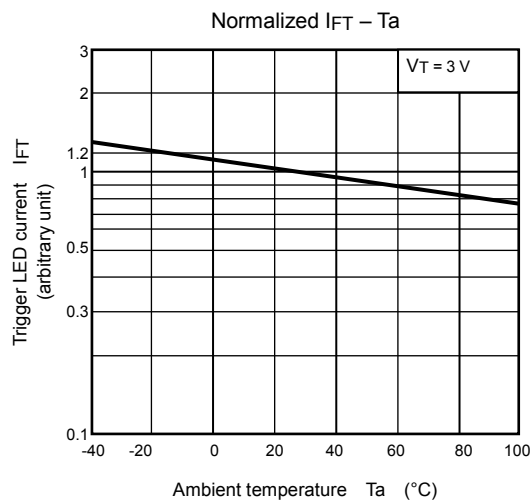
## Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance (input to output)	$C_S$	$V_S = 0 \text{ V}$ , $f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}$ , R.H. $\leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 60 s	3000	—	—	Vrms

Fig. 1:  $dv/dt$  test circuit



NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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