

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)

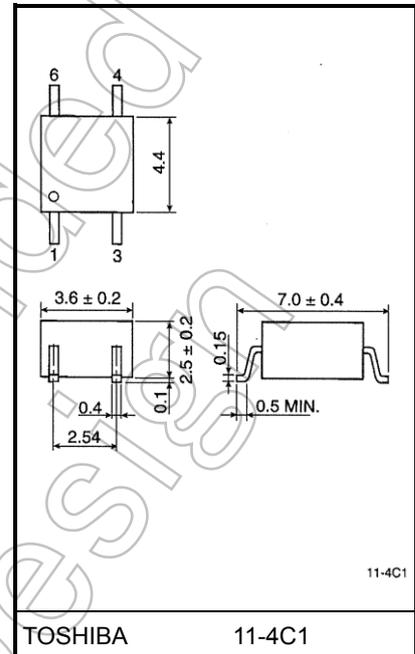
Trigger LED Current

| Classification (Note 1) | Trigger LED Current (mA) | | Product Classification Marking |
|----------------------------|---|-----|--------------------------------------|
| | V _T = 3 V, T _a = 25°C | | |
| | Min | Max | |
| (IFT7) | — | 7 | T7 |
| Standard | — | 10 | T7, blank |

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

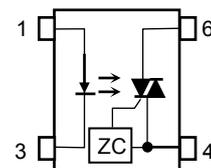
Note: Be sure to use standard product type names when submitting type names for safety certification testing, i.e., TLP261J (IFT7): TLP261J.

Unit: mm



Weight: 0.09 g (typ.)

Pin Configuration



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

Start of commercial production
 2003-07

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 | |
| | Diode power dissipation | P_D | 100 | mW | |
| | Diode power dissipation derating (Ta ≥ 53°C) | $\Delta P_D / ^\circ\text{C}$ | -1.4 | mW / °C | |
| | Junction temperature | T_j | 125 | °C | |
| Detector | Off-state output terminal voltage | V_{DRM} | 600 | V | |
| | On-state RMS current | Ta = 25°C | $I_{T(RMS)}$ | 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 | |
| | Output power dissipation | P_O | 200 | mW | |
| | Output power dissipation derating (Ta ≥ 25°C) | $\Delta P_O / ^\circ\text{C}$ | -2.0 | mW / °C | |
| | 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, 60 s, 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.

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 | $V_F = 0 \text{ V}, f = 1 \text{ MHz}$ | — | 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 | — | $\text{V}/\mu\text{s}$ |
| | Critical rate of rise of commutating voltage | $dv/dt(c)$ | $V_{in} = 60 \text{ Vrms}, I_T = 15 \text{ mA}$ (Fig. 1) | — | 0.2 | — | $\text{V}/\mu\text{s}$ |

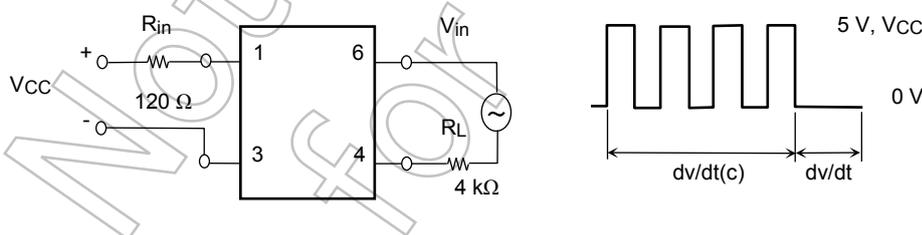
Coupled Electrical Characteristics (Ta = 25°C)

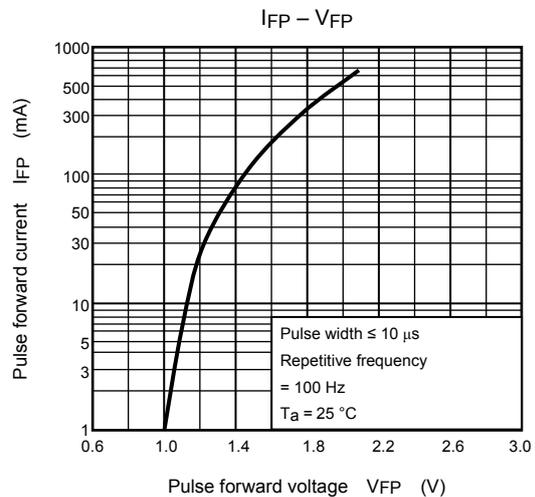
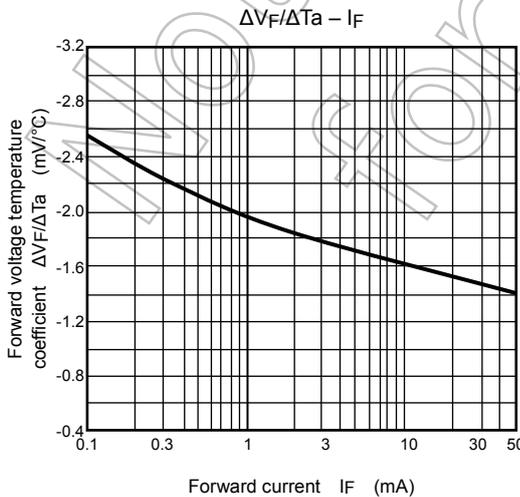
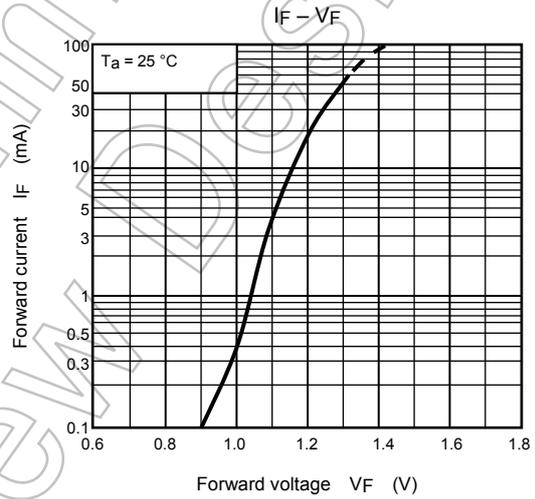
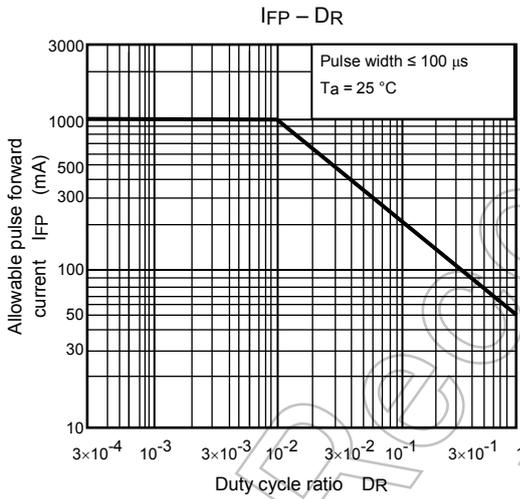
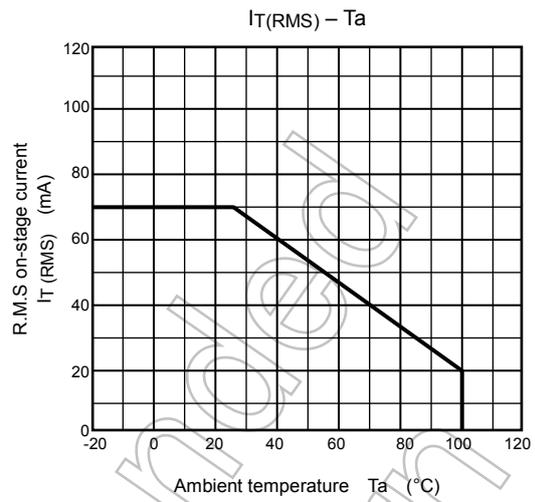
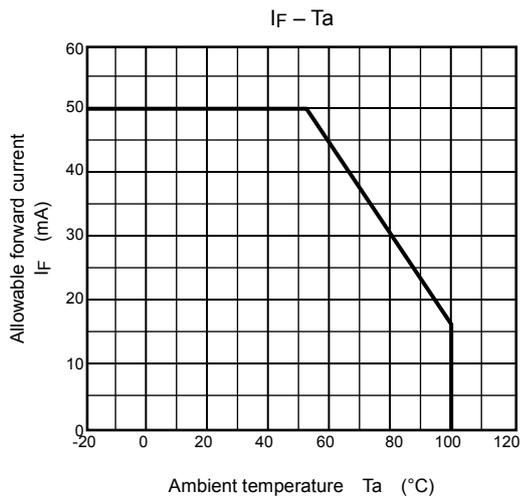
| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|----------------------------|----------|---|-----|------|-----|---------------|
| Trigger LED current | I_{FT} | $V_T = 3 \text{ V}$ | — | — | 10 | mA |
| Inhibit voltage | V_{IH} | $I_F = \text{Rated } I_{FT}$ | — | — | 20 | V |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

Isolation Characteristics (Ta = 25°C)

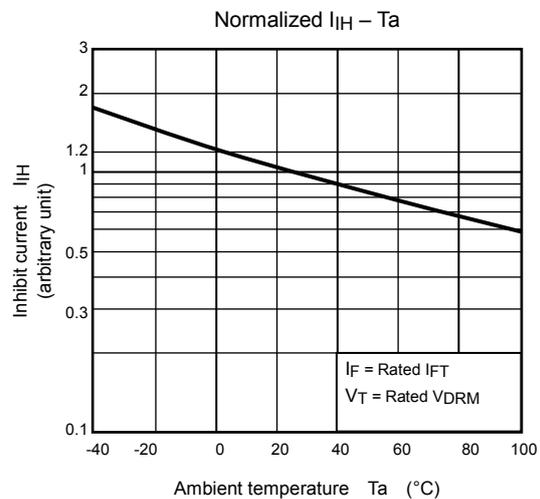
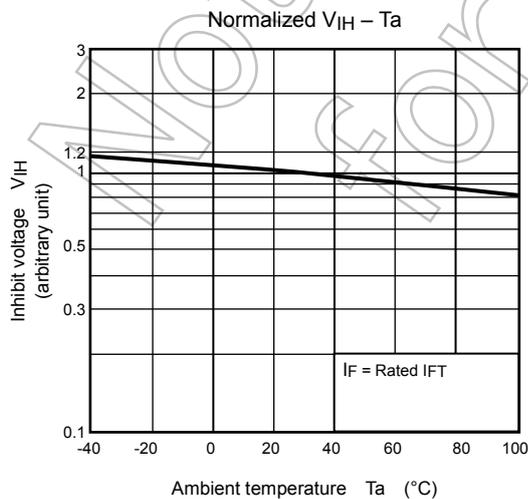
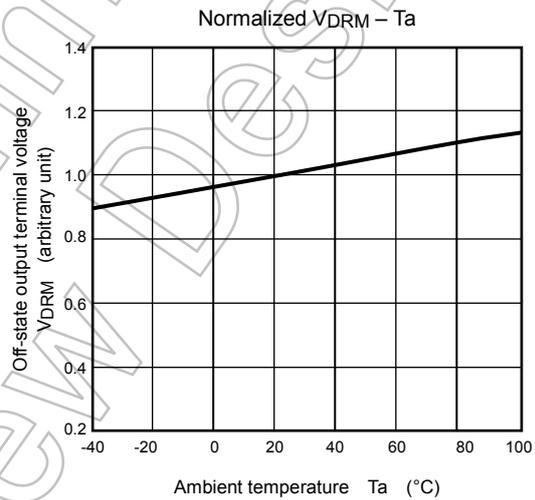
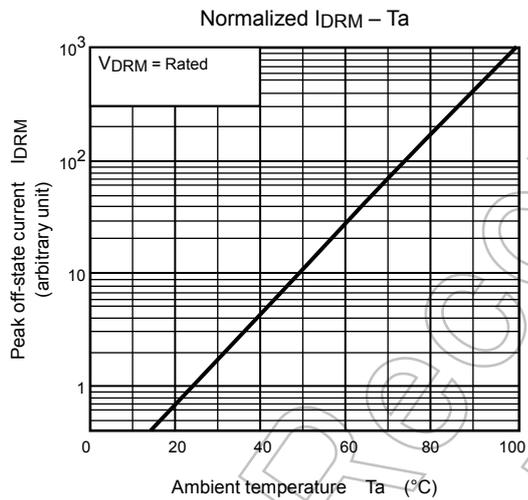
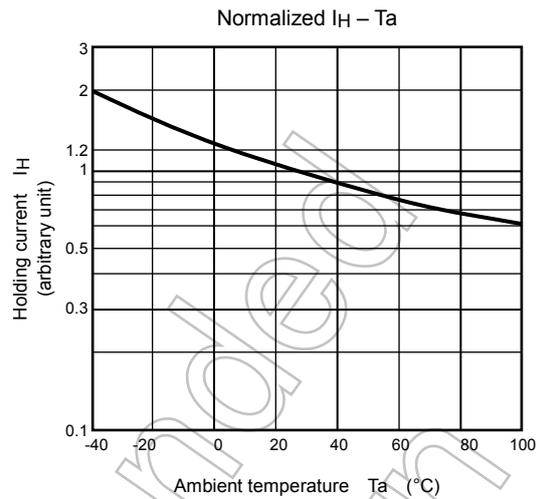
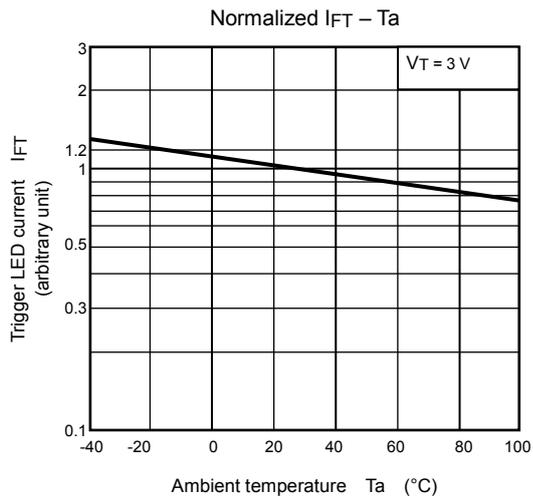
| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------|--------|---|--------------------|-----------|-----|---------------|
| Capacitance (input to output) | C_S | $V_S = 0 \text{ V}, f = 1 \text{ MHz}$ | — | 0.8 | — | pF |
| Isolation resistance | R_S | $V_S = 500 \text{ V}, \text{R.H.} \leq 60 \%$ | 5×10^{10} | 10^{14} | — | Ω |
| 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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