

TOSHIBA Photocoupler GaAs Ired + Photo-Triac

TLP161J

Triac Drive

Programmable Controllers

Ac-Output Module

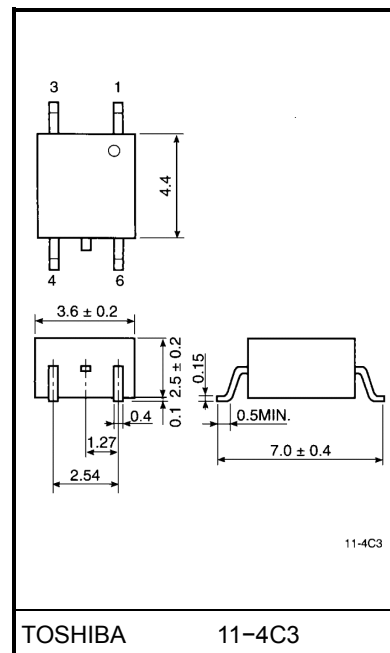
Solid State Relay

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: 600V (min.)
- Trigger LED current: 10mA (max.)
- On-state current: 70mA (max.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349

Unit in mm



Weight: 0.09 g

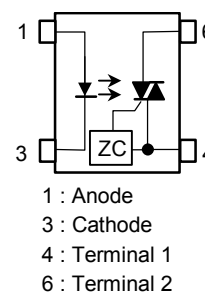
Trigger LED Current

| Classification* | Trigger LED Current (mA) | | Marking Of Classification |
|-----------------|--------------------------------|------|---------------------------|
| | V _T = 6V, Ta = 25°C | | |
| | Min. | Max. | |
| (IFT7) | — | 7 | T7 |
| 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

Pin Configuration



Maximum Ratings (Ta = 25°C)

| Characteristic | | | Symbol | Rating | Unit |
|-------------------------------------------------|--------------------------------------------------------|-----------|----------------------|---------|---------|
| LED | Forward current | | I _F | 50 | mA |
| | Forward current derating (Ta ≥ 53°C) | | ΔI _F / °C | −0.7 | mA / °C |
| | Peak forward current (100μs pulse, 100pps) | | 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 | Ta = 25°C | I _{T(RMS)} | 70 | mA |
| | | Ta = 70°C | | 40 | |
| | On-state current derating (Ta ≥ 25°C) | | ΔI _T / °C | −0.67 | mA / °C |
| | Peak on-state current (100μs pulse, 120pps) | | I _{TP} | 2 | A |
| | Peak nonrepetitive surge current (PW = 10ms, DC = 10%) | | I _{TSM} | 1.2 | A |
| | Junction temperature | | T _j | 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, 1min., R.H ≤ 60%) (Note) | | | BV _S | 2500 | Vrms |

(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. | 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 |

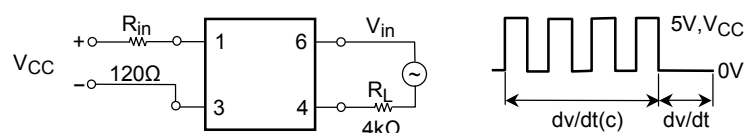
Individual Electrical Characteristics (Ta = 25°C)

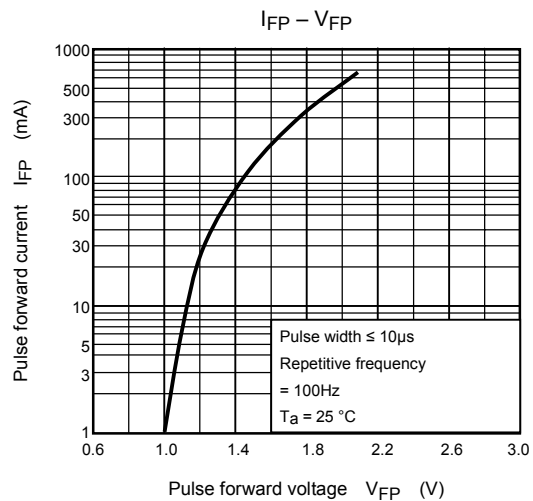
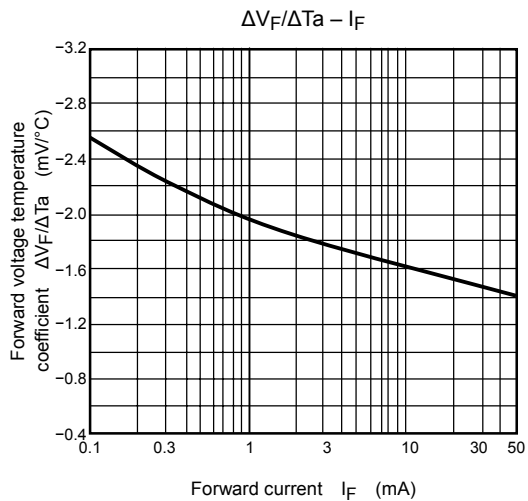
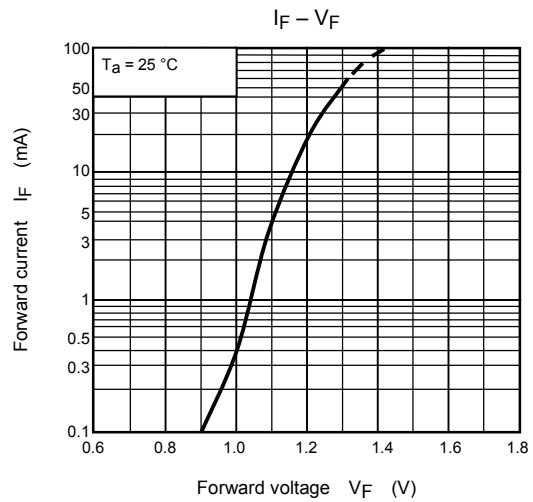
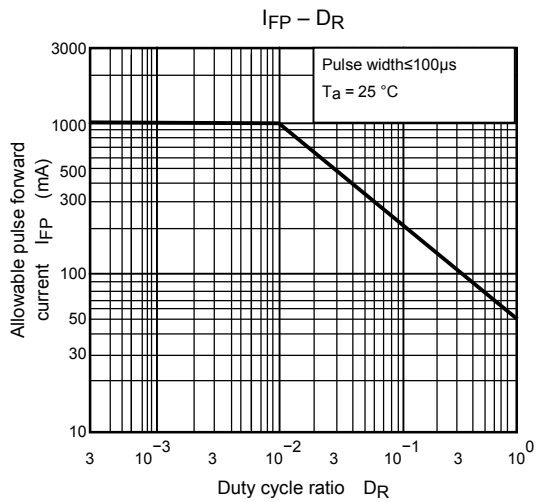
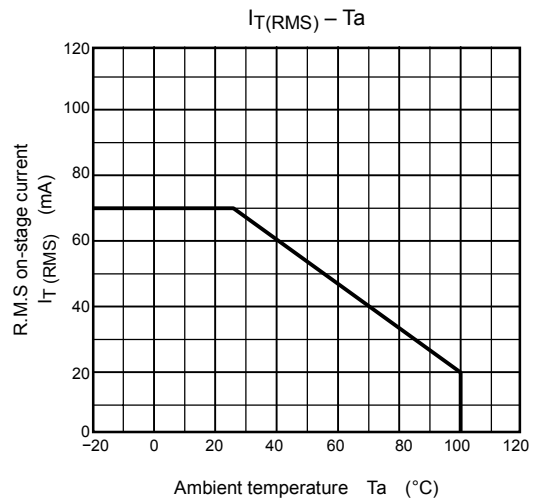
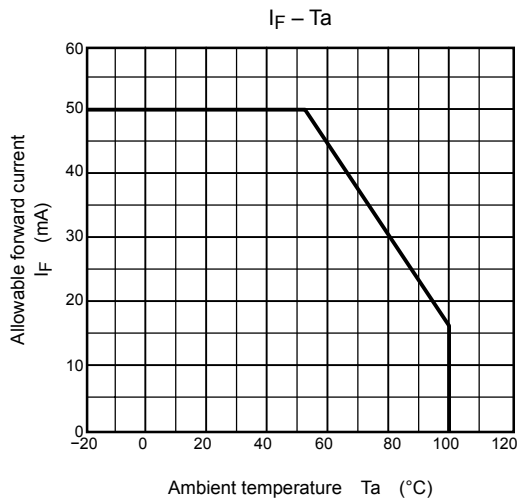
| Characteristic | | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|----------------|----------------------------------------------|------------------|------------------------------------------------------------------|------|------|------|------------------|
| LED | Forward voltage | V_F | $I_F = 10\text{mA}$ | 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 | — | V/ μs |
| | 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 | — | V/ μs |

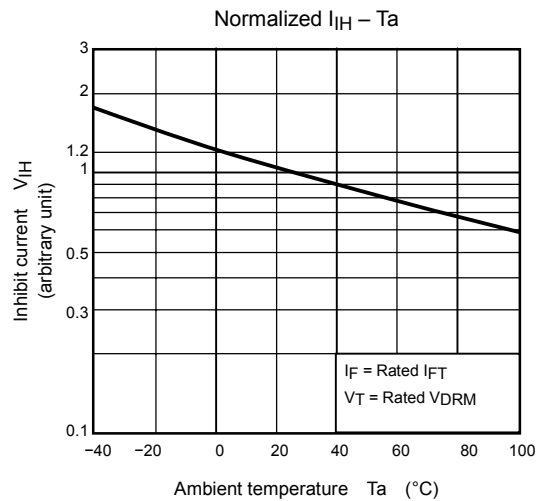
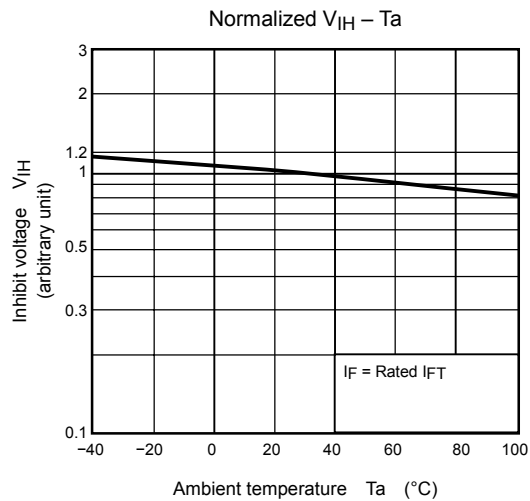
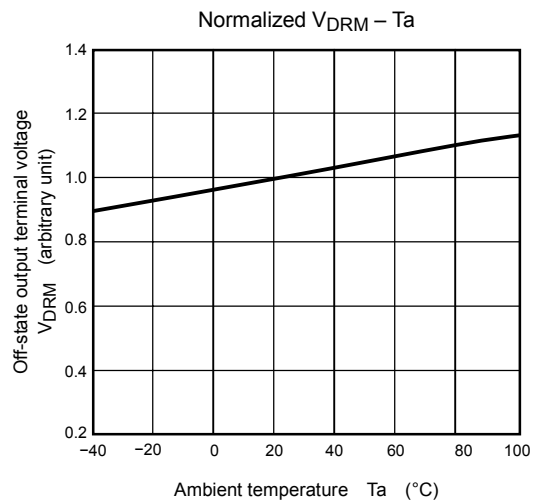
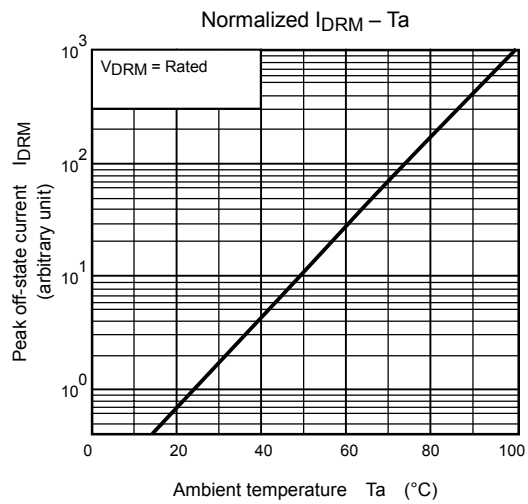
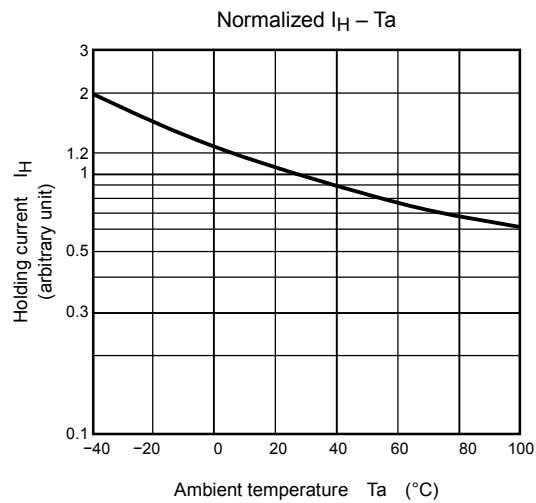
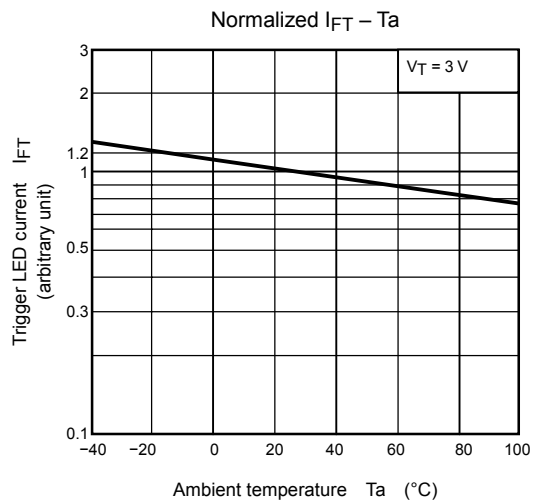
Coupled Electrical Characteristics (Ta = 25°C)

| Characteristic | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|-------------------------------|-----------------|-----------------------------------------------------------------------------|--------------------|-----------|------|------------------|
| Trigger LED current | I_{FT} | $V_T = 6\text{V}$ | — | 5 | 10 | mA |
| Inhibit voltage | V_{IH} | $I_F = \text{Rated } I_{\text{FT}}$ | — | — | 50 | V |
| Leakage in inhibited state | I_{IH} | $I_F = \text{Rated } I_{\text{FT}}$ $V_T = \text{Rated } V_{\text{DRM}}$ | — | 200 | 600 | μA |
| Capacitance (input to output) | C_S | $V_S = 0, f = 1\text{MHz}$ | — | 0.8 | — | pF |
| Isolation resistance | R_S | $V_S = 500\text{V}, \text{R.H.} \leq 60\%$ | 1×10^{12} | 10^{14} | — | Ω |
| Isolation voltage | BV_S | AC, 1 minute | 2500 | — | — | 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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