

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

TLP3061(S), TLP3062(S), TLP3063(S)

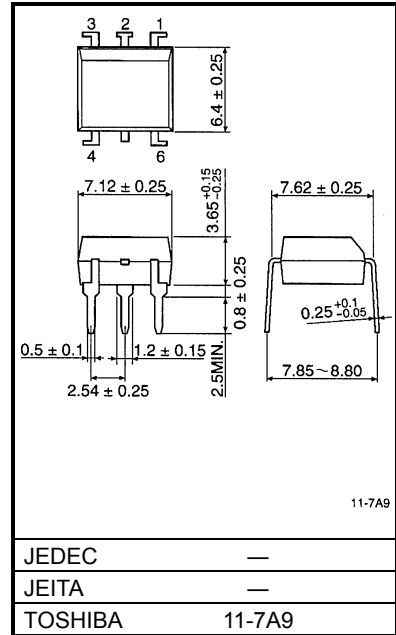
OFFICE MACHINE
 HOUSEHOLD USE EQUIPMENT
 TRIAC DRIVER
 SOLID STATE RELAY

The TOSHIBA TLP3061 (S), TLP3062 (S), TLP3063 (S) consist of a zero voltage crossing turn-on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak Off-State Voltage : 600 V (min)
 - Trigger LED Current : 15 mA (max) (TLP3061(S))
 10 mA (max) (TLP3062(S))
 5 mA (max) (TLP3063(S))
 - On-State Current : 100 mA (max)
 - Isolation Voltage : 5000 Vrms (min)
 - UL Recognized : UL1577, File No. E67349
 - SEMKO Approved : SS EN60065
 SS EN60950, File No.9841113
 - BSI Approved : BS EN60065, File No.8385
 BS EN60950, File No.8386
 - Option (D4) type
 VDE approved: DIN EN60747-5-2
 Approved No. 40009302
 Maximum operating insulation voltage: 890V_{PK}
 Highest permissible over voltage: 8000V_{PK}
- (Note):When a EN60747-5-2 approved type is needed, please designate the "Option (D4)"

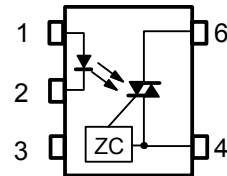
| | Construction mechanical rating | |
|----------------------|--------------------------------|---------------------------------|
| | 7.62 mm pitch Standard Type | 10.16 mm pitch TLPxxxxF type |
| Creepage Distance | 7.0 mm (Min) | 8.0 mm (Min) |
| Clearance | 7.0 mm (Min) | 8.0 mm (Min) |
| Insulation Thickness | 0.5 mm (Min) | 0.5 mm (Min) |

Unit: mm



weight: 0.39g (typ.)

Pin Configuration (top view)



- 1: Anode
- 2: Cathode
- 3: N.C.
- 4: Terminal 1
- 6: Terminal 2

ZC: Zero-cross Circuit

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 | |
| | Power dissipation | P_D | 100 | mW | |
| | Power dissipation derating (Ta ≥ 25°C) | $\Delta P_D / ^\circ\text{C}$ | -1.0 | mW / °C | |
| | 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 | 100 | mA |
| | | | Ta = 70°C | 50 | |
| | On-state current derating (Ta ≥ 25°C) | $\Delta I_T / ^\circ\text{C}$ | -1.1 | mA / °C | |
| | Peak on-state current (100μs pulse, 120 pps) | I_{TP} | 2 | A | |
| | Peak nonrepetitive surge current (Pw = 10 ms) | I_{TSM} | 1.2 | A | |
| | Power dissipation | P_D | 300 | mW | |
| | Power dissipation derating (Ta ≥ 25°C) | $\Delta P_D / ^\circ\text{C}$ | -4.0 | mW / °C | |
| Junction temperature | T_j | 115 | °C | | |
| Storage temperature range | T_{stg} | -55 to 150 | °C | | |
| Operating temperature range | T_{opr} | -40 to 100 | °C | | |
| Lead soldering temperature (10 s) | T_{sol} | 260 | °C | | |
| Total package power dissipation | P_T | 330 | mW | | |
| Total package power dissipation derating (Ta ≥ 25°C) | $\Delta P_T / ^\circ\text{C}$ | -4.4 | mW / °C | | |
| Isolation voltage (AC, 1 min., R.H. ≤ 60%) | (Note 1) BVS | 5000 | 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 a two terminal device: Pins 1, 2 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 | Vac |
| 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 device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

※ In the case of TLP3062

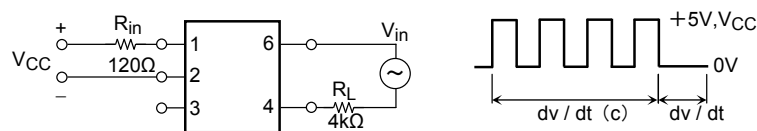
Individual Electrical Characteristics (Ta = 25°C)

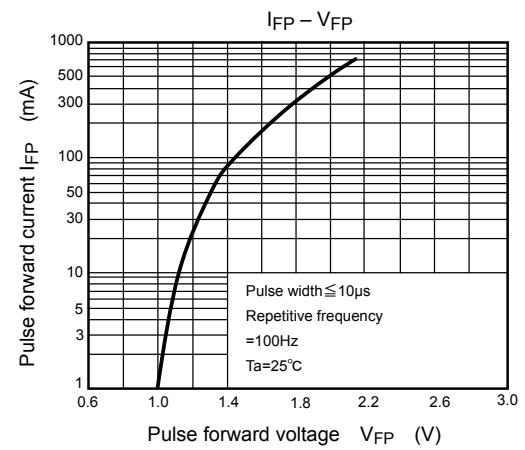
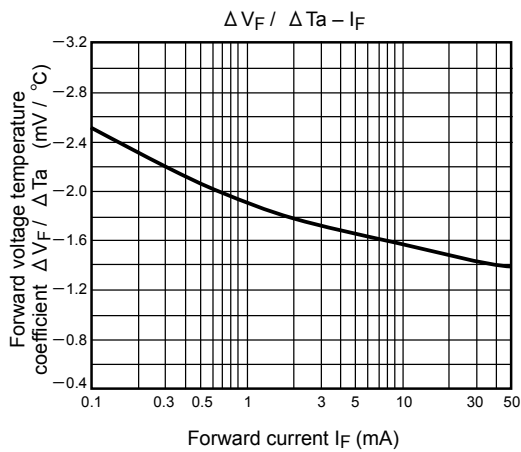
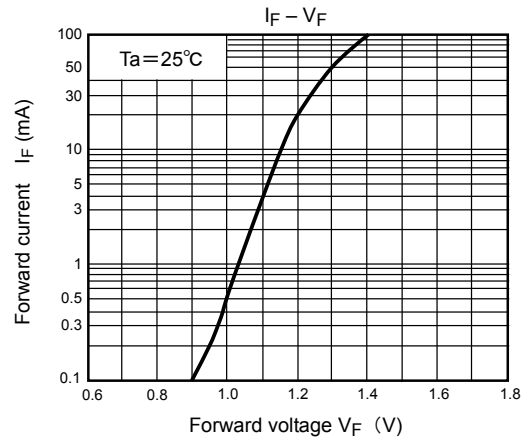
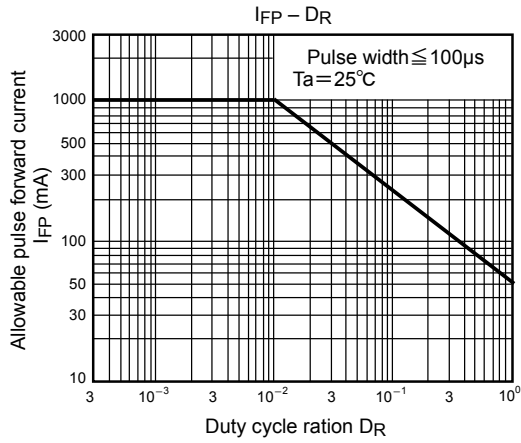
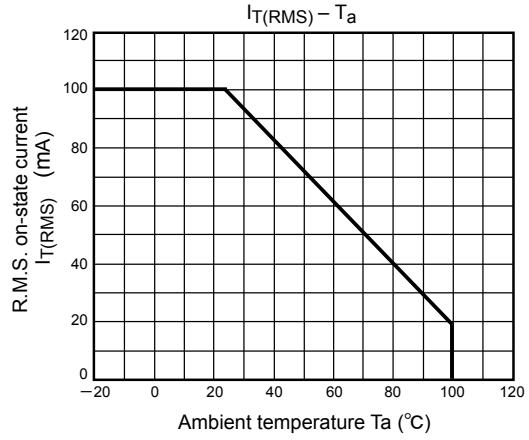
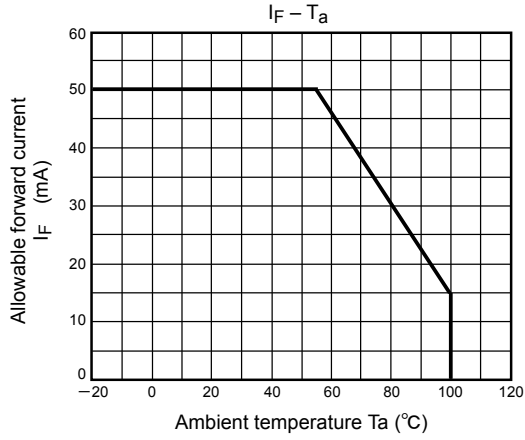
| Characteristic | | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|----------------|--|---------------|--|------|------|------|-------------------|
| LED | Forward voltage | V_F | $I_F = 10 \text{ mA}$ | 1.0 | 1.15 | 1.3 | V |
| | Reverse current | I_R | $V_R = 5 \text{ V}$ | — | — | 10 | μA |
| | Capacitance | C_T | $V = 0, f = 1 \text{ MHz}$ | — | 10 | — | pF |
| Detector | Peak off-state current | I_{DRM} | $V_{DRM} = 600 \text{ V}$ | — | 10 | 1000 | nA |
| | Peak on-state voltage | V_{TM} | $I_{TM} = 100 \text{ mA}$ | — | 1.7 | 3.0 | 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 / μs |
| | 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 / μs |

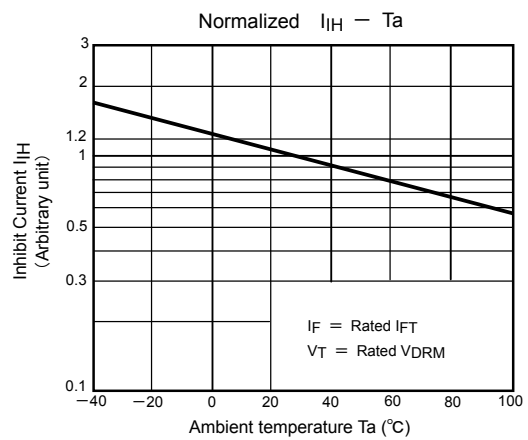
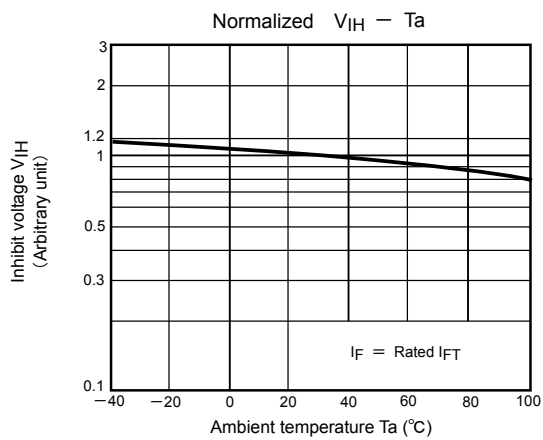
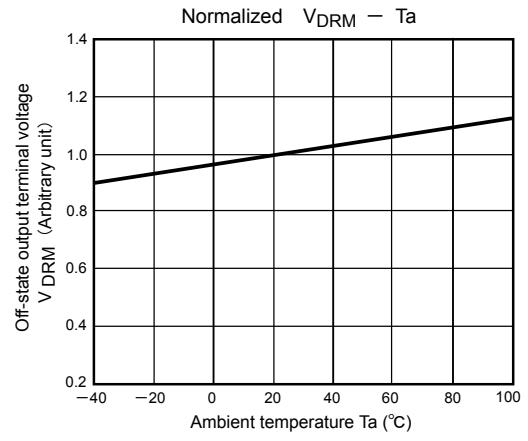
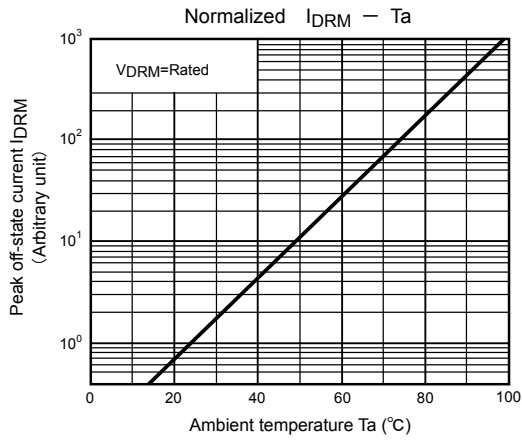
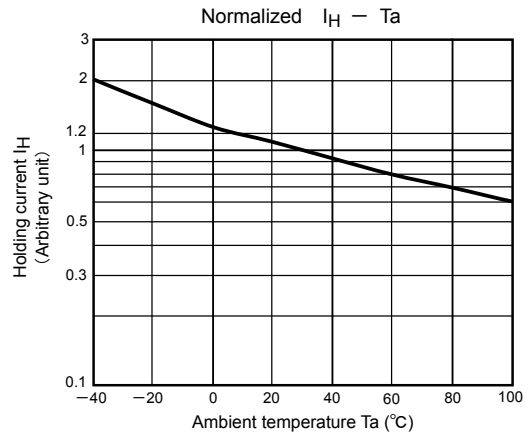
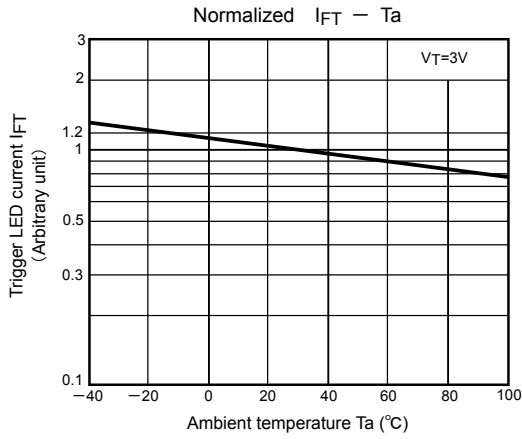
Coupled Electrical Characteristics (Ta = 25°C)

| Characteristic | | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|-----------------------------|------------|---|---------------------|-----------|------|---------------|------|
| Trigger LED current | TLP3061(S) | I_{FT} | $V_T = 6 \text{ V}$ | — | — | 15 | mA |
| | TLP3062(S) | | | — | 5 | 10 | |
| | TLP3063(S) | | | — | — | 5 | |
| Inhibit voltage | V_{IH} | $I_F = \text{rated } I_{FT}$ | — | — | 50 | V | |
| Leakage in inhibited state | I_{IH} | $I_F = \text{rated } I_{FT}$ $V_T = \text{rated } V_{DRM}$ | — | 100 | 300 | μA | |
| Capacitance input to output | C_S | $V_S = 0, f = 1 \text{ MHz}$ | — | 0.8 | — | pF | |
| Isolation resistance | R_S | $V_S = 500 \text{ V (R.H.} \leq 60\%)$ | 5×10^{10} | 10^{14} | — | Ω | |
| Isolation voltage | BV_S | AC, 1 minute | 5000 | — | — | Vrms | |
| | | AC, 1 second, in oil | — | 10000 | — | Vdc | |
| | | DC, 1 minute, in oil | — | 10000 | — | Vdc | |

Fig. 1 dv / dt test circuit







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