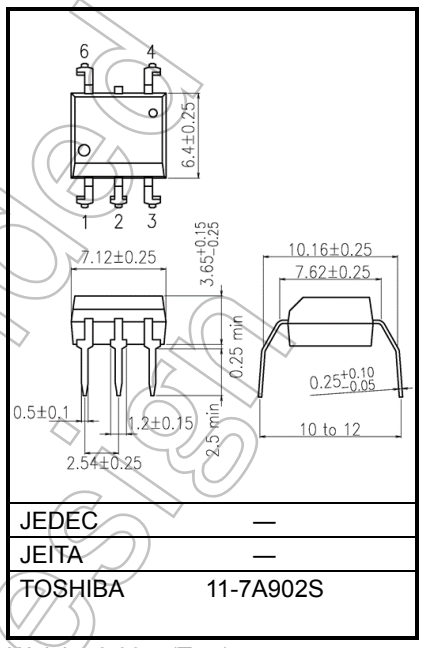
TOSHIBA Photocoupler IRED & Photo−Triac

# TLP3082F(S)

Unit: mm




| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 11-7A902S |

Weight: 0.39 g (Typ.)

Office Machine

Household Use Equipment

Triac Driver

Solid State Relay

The TOSHIBA TLP3082F(S) consists of a zero voltage crossing turn-on photo-triac optically coupled to an infrared emitting diode in a six lead plastic DIP package.

## Features

- Peak off-state voltage: 800 V (min)
- Trigger LED current: 10 mA (max)
- On-state current: 100 mA (max)
- Isolation voltage: 5000 Vrms (min)
- UL-recognized: UL 1577, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A
  File No.E67349
- VDE-approved : EN 60747-5-5 , EN 62368-1 (Note 1)

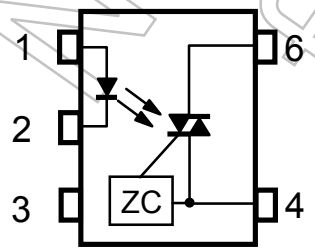
Note1 : When a VDE approved type is needed, please designate the **Option(D4)**.

Note : When specifying the application type name for certification testing, be sure to use the standard product type name, e.g. TLP3082

- Construction mechanical rating

| | 7.62 mm pitch standard type | 10.16 mm pitch TLPXXXF type |
|---|---|---|
| Creepage distance | 7.0 mm (min) | 8.0 mm (min) |
| Clearance | 7.0 mm (min) | 8.0 mm (min) |
| Insulation thickness | 0.4 mm (min) | 0.4 mm (min) |

## Pin configuration (top view)




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

ZC:Zero-cross Circuit



Start of commercial production
2007-01

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

| Characteristic | | | Symbol | Rating | Unit |
|---|---|---|---|---|---|
| LED | Forward current | | $I_F$ | 50 | mA |
| | Forward current derating (Ta≥53°C) | | $\Delta I_F$ /°C | −0.7 | mA /°C |
| | Peak forward current (100μs pulse, 100pps) | | $I_{FP}$ | 1 | A |
| | Reverse voltage | | $V_R$ | 5 | V |
| | Power Dissipation | | $P_D$ | 100 | mW |
| | Power Dissipation Derating (Ta ≥ 53°C) | | $\Delta P_D$ /°C | -1.4 | mW/°C |
| | Junction temperature | | Tj | 125 | °C |
| Detector | Off-state output terminal voltage | | $V_{DRM}$ | 800 | V |
| | On-state RMS current | Ta=25°C | $I_{T(RMS)}$ | 100 | mA |
| | | Ta=70°C | | 50 | |
| | On-state current derating (Ta≥25°C) | | $\Delta I_T$ / °C | -1.1 | mA /°C |
| | Peak on-state current (100μs pulse, 120pps) | | $I_{TP}$ | 2 | A |
| | Peak nonrepetitive surge current (Pw=10ms) | | $I_{TSM}$ | 1.2 | A |
| | Output Power Dissipation | | $P_O$ | 300 | mW |
| | Output Power Dissipation Derating (Ta ≥ 25°C) | | $\Delta P_O$ /°C | -3.3 | mW/°C |
| | Junction temperature | | $T_j$ | 115 | °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) | $BV_S$ | 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: Pins1, 2 and 3 shorted together and pin4 and pin6 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 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.

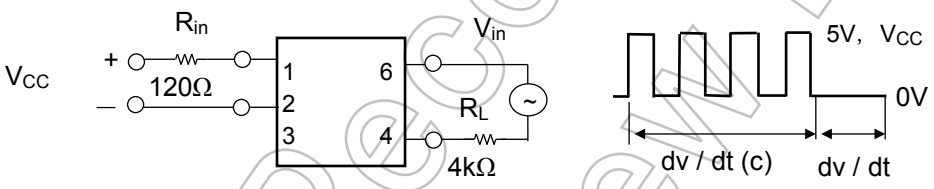
## Electrical Characteristics (Ta = 25°C)

| | Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| LED | Forward voltage | $V_F$ | $I_F$ = 10 mA | 1.0 | 1.15 | 1.3 | V |
| | Reverse current | $I_R$ | $V_R$ = 5 V | — | — | 10 | μA |
| | Capacitance | $C_T$ | V = 0 V, f = 1 MHz | — | 30 | — | pF |
| Detector | Peak off-state current | $I_{DRM}$ | $V_{DRM}$ = 800 V | — | 10 | 1000 | nA |
| | Peak on-state voltage | $V_{TM}$ | $I_{TM}$ = 100 mA | — | 1.7 | 3.0 | V |
| | Holding current | $I_H$ | — | — | 0.6 | — | mA |
| | Critical rate of rise of off-state voltage | dv/dt | Vin = 240 Vrms , Ta = 85 °C (Note 2) | 200 | 500 | — | V/μs |
| | Critical rate of rise of commutating voltage | dv/dt(c) | Vin = 60 Vrms , $I_T$ = 15 mA (Note 2) | — | 0.2 | — | V/μs |

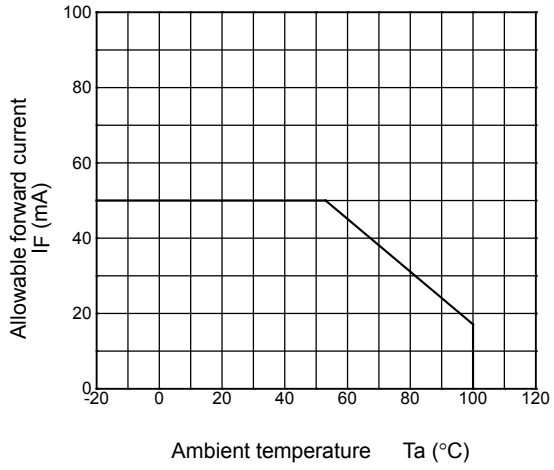
## Coupled Electrical Characteristics (Ta = 25°C)

| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Trigger LED current | $I_{FT}$ | $V_T$ = 3 V | — | 5 | 10 | mA |
| Inhibit voltage | $V_{IH}$ | $I_F$ = Rated $I_{FT}$ | — | — | 50 | V |
| Leakage in inhibited state | $I_{IH}$ | $I_F$ = Rated $I_{FT}$ , $V_T$ = Rated $V_{DRM}$ | — | 200 | 600 | μA |
| Capacitance (input to output) | $C_S$ | $V_S$ = 0 V , f = 1 MHz | — | 0.8 | — | pF |
| Isolation resistance | $R_S$ | $V_S$ = 500 V, R.H.≤ 60 % | $1\times10^{12}$ | $10^{14}$ | — | Ω |
| Isolation voltage | $BV_S$ | AC , 60 s | 5000 | — | — | Vrms |

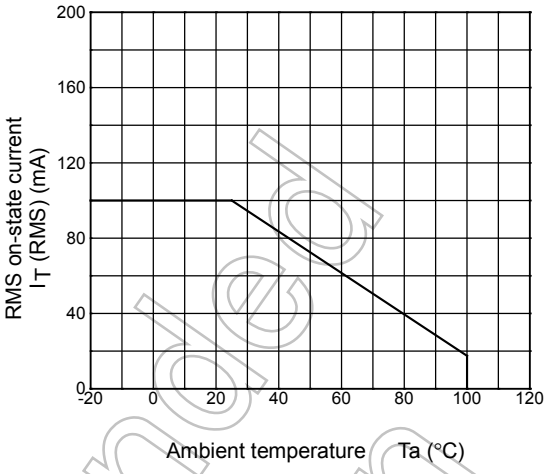
(Note 2) dv / dt test circuit



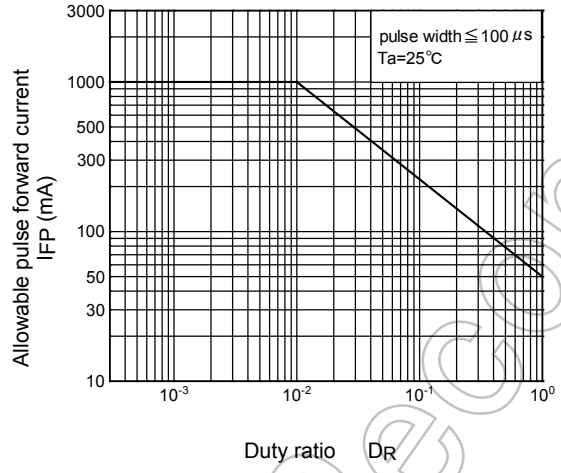
$I_F$ – Ta



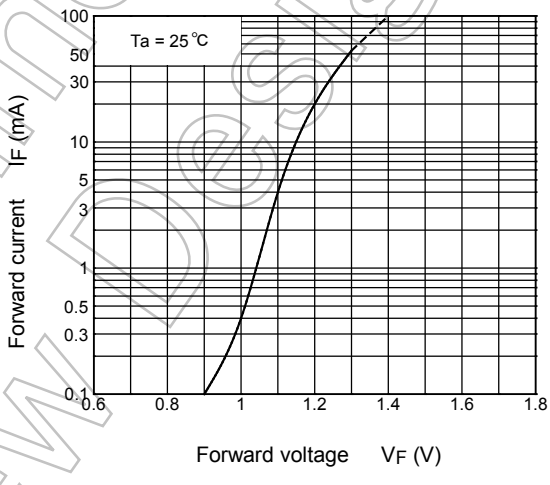

$I_T$ (RMS) – Ta



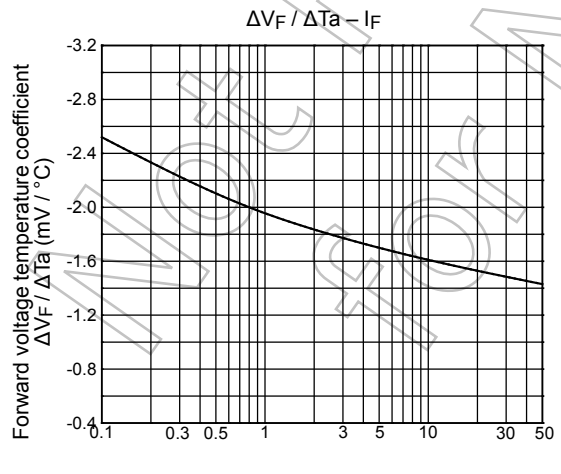

$I_{FP}$ – $D_R$



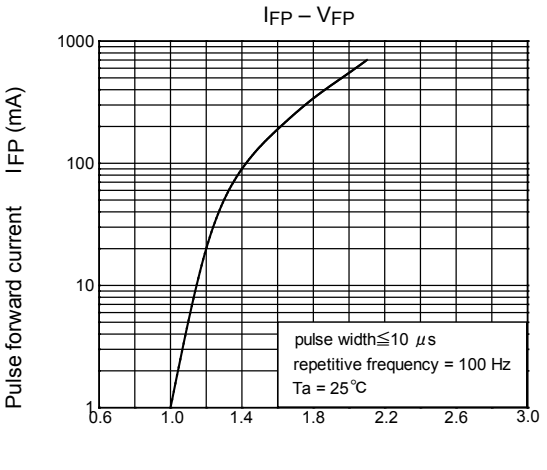

$I_F$ – $V_F$




$\Delta V_F / \Delta Ta$ – $I_F$



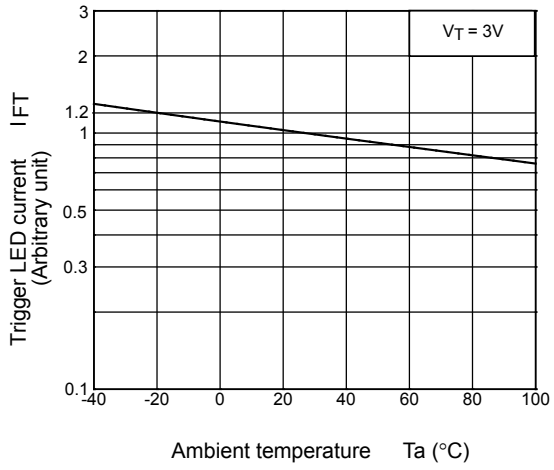

$I_{FP}$ – $V_{FP}$



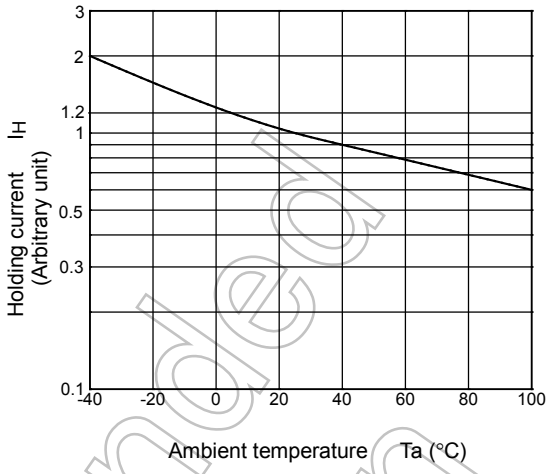

* The above graphs show typical characteristics.

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

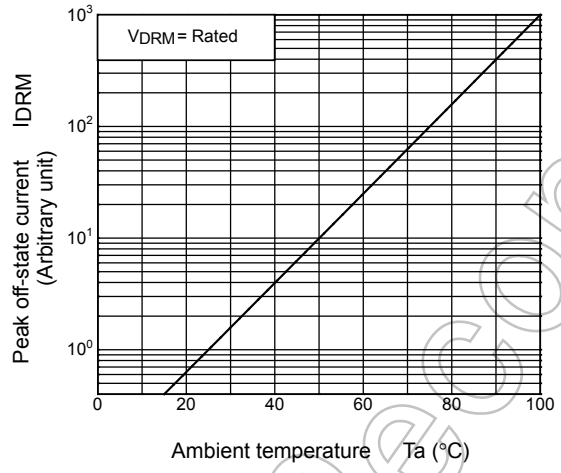
Normalized $I_{FT}$ – Ta



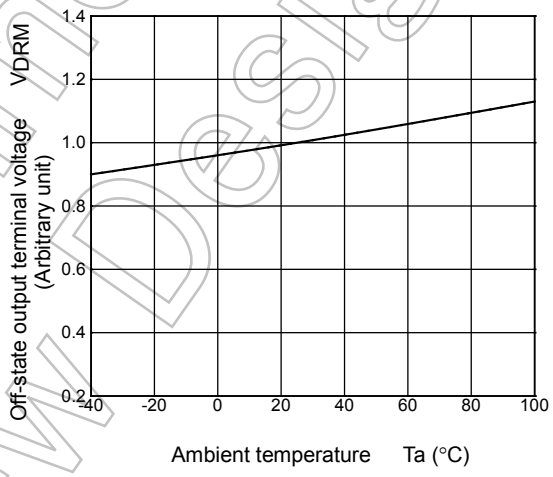

Normalized $I_H$ – Ta



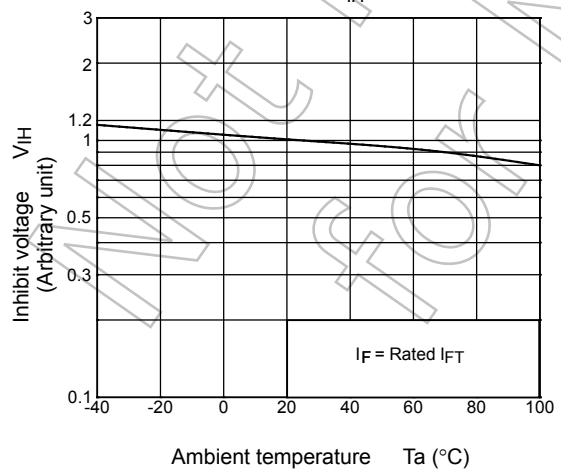

Normalized $I_{DRM}$ – Ta



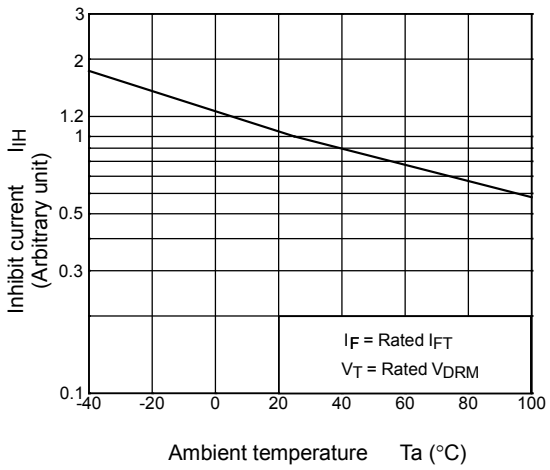

Normalized $V_{DRM}$ – Ta




Normalized $V_{IH}$ – Ta




Normalized $I_{IH}$ – Ta

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