

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

TLP3503

TRIAC DRIVER

PROGRAMMABLE CONTROLLERS

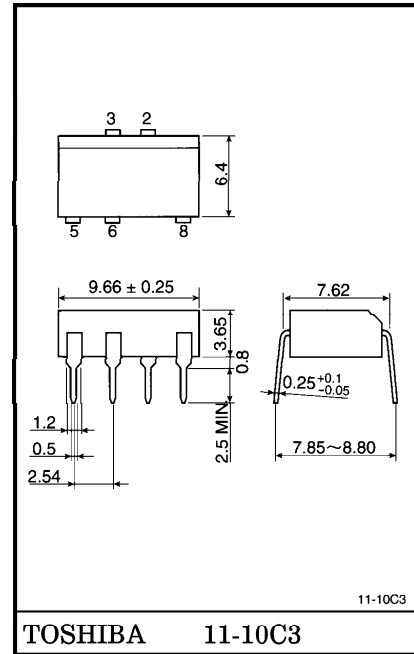
AC-OUTPUT MODULE

SOLID STATE RELAY

The TOSHIBA TLP3503 consists of a zero voltage crossing turn-on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a 8 lead plastic DIP package.

- Peak Off-State Voltage : 400V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- On-State Current : 0.5A_{rms} (MAX.)
- Isolation Voltage : 2500V_{rms} (MIN.)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current

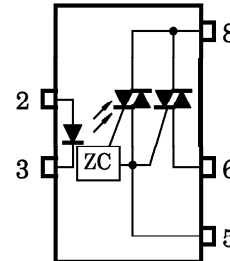
Unit in mm



Weight : 0.52g

| CLASSIFICATION* | TRIGGER LED CURRENT (mA) | | MARKING OF CLASSIFICATION |
|-----------------|--|------|---------------------------|
| | V _T = 6V, T _a = 25°C | | |
| | MIN. | MAX. | |
| (IFT5) | — | 5.0 | T5 |
| (IFT7) | — | 7.0 | T5, T7 |
| Standard | — | 10 | T5, T7, Blank |

PIN CONFIGURATION (TOP VIEW)



- 2 : ANODE
- 3 : CATHODE
- 5 : TRIAC GATE
- 6 : TRIAC T1
- 8 : TRIAC T2

*Ex. (IFT5) ; TLP3503 (IFT5)

(Note) Application type name for certification test, please use standard product type name, i.e. TLP3503 (IFT5) : TLP3503

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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
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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} | 400 | V |
| | On-State RMS Current | Ta = 40°C | 0.5 | A |
| | | Ta = 60°C | 0.35 | |
| | On-State Current Derating (Ta ≥ 40°C) | ΔI _T / °C | -7.2 | mA / °C |
| | Peak Current from Snubber Circuit (100μs pulse, 120pps) | I _{SP} | 2 | A |
| | Peak Nonrepetitive Surge Current (50Hz, Peak) | I _{TSM} | 5 | A |
| | Junction Temperature | T _j | 110 | °C |
| Storage Temperature Range | T _{stg} | -40~125 | °C | |
| Operating Temperature Range | T _{opr} | -20~80 | °C | |
| Lead Soldering Temperature (10s) | T _{sol} | 260 | °C | |
| Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note) | BVS | 2500 | V _{rms} | |

(Note) Device considered a two terminal : LED side pins shorted together and DETECTOR side pins shorted together.

RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------|------------------|------|------|------|-----------------|
| Supply Voltage | V _{AC} | — | — | 120 | V _{ac} |
| Forward Current | I _F | 15 | 20 | 25 | mA |
| Peak Current from Snubber Circuit | I _{SP} | — | — | 1 | A |
| Operating Temperature | T _{opr} | -20 | — | 80 | °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} | $V_{DRM} = 400\text{V}, T_a = 110^\circ\text{C}$ | — | — | 100 | μA |
| | Peak On-State Voltage | V_{TM} | $I_{TM} = 0.75\text{A}$ | — | — | 3.0 | V |
| | Holding Current | I_H | $R_L = 100\Omega$ | — | — | 25 | mA |
| | Critical Rate of Rise of Off-State Voltage | dv/dt | $V_{in} = 120\text{V}_{rms}$ (Fig.1) | 200 | 500 | — | $\text{V}/\mu\text{s}$ |
| | Critical Rate of Rise of Commutating Voltage | $dv/dt(c)$ | $V_{in} = 120\text{V}_{rms}, I_T = 0.5\text{A}_{rms}$ (Fig.1) | — | 5 | — | $\text{V}/\mu\text{s}$ |

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------|----------|---|--------------------|-----------|------|---------------|
| Trigger LED Current | I_{FT} | $V_T = 6\text{V}$ | — | — | 10 | mA |
| Inhibit Voltage | V_{IH} | $I_F = \text{Rated } I_{FT}$ | — | — | 50 | V |
| Leakage in Inhibited State | I_{IH} | $I_F = \text{Rated } I_{FT}$ $V_T = \text{Rated } V_{DRM}$ | — | 200 | — | μA |
| Capacitance (Input to Output) | C_S | $V_S = 0, f = 1\text{MHz}$ | — | 0.8 | — | pF |
| Isolation Resistance | R_S | $V_S = 500\text{V}$ | 5×10^{10} | 10^{14} | — | Ω |
| Isolation Voltage | BV_S | AC, 1 minute | 2500 | — | — | V_{rms} |
| | | AC, 1 second, in oil | — | 5000 | — | V_{rms} |
| | | DC, 1 minute, in oil | — | 5000 | — | V_{dc} |

Fig.1 : dv/dt TEST CIRCUIT

