

TOSHIBA PHOTOCOUPLER GaAs IRED + PHOTO-TRIAC

TLP165J

TRIAC DRIVE

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

SOLID STATE RELAY

The TOSHIBA MINI FLAT COUPLER TLP165J is a small outline coupler, suitable for surface mount assembly.

The TLP165J consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

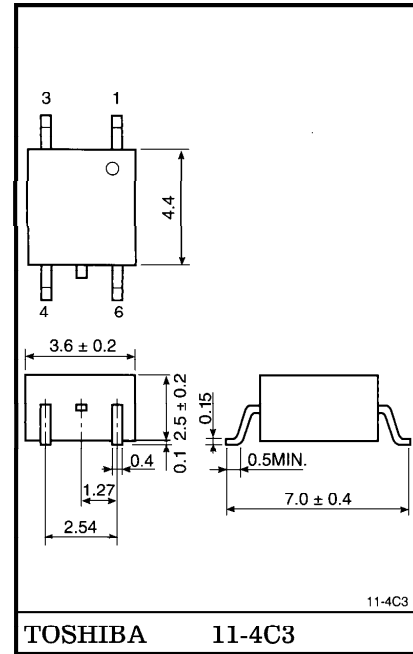
- Peak Off-State Voltage : 600V (MIN.)
 - Trigger LED Current : 10mA (MAX.)
 - On-State Current : 70mA (MAX.)
 - Isolation Voltage : 2500Vrms (MIN.)
 - UL Recognized : UL1577, File No. E67349
 - Option (V4) type
- VDE Approved : VDE 0884 Satisfied
 Maximum Operating Insulation Voltage : 565Vpk
 Highest Permissible Over Voltage : 4000Vpk

TRIGGER LED CURRENT

| TYPE (Note 1) | TRIGGER LED CURRENT (mA) | | MARKING OF CLASSIFICATION |
|------------------|------------------------------|------|---------------------------|
| | $V_T = 6V, T_a = 25^\circ C$ | | |
| | Min. | Max. | |
| (IFT7) | — | 7 | T7 |
| None | — | 10 | T7, blank |

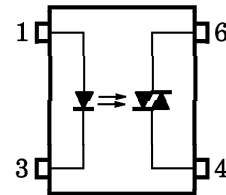
* Exp. Rank IFT7 : TLP165J (IFT7)
 (Note 1) Application type name for certification test, please use standard product type name, i.e.
 TLP165J (IFT7) : TLP165J

Unit in mm



Weight : 0.09g

PIN CONFIGURATIONS



1. ANODE
3. CATHODE
4. TERMINAL 1
6. TERMINAL 2

961001EBC2

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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.

● The products described in this document are subject to foreign exchange and foreign trade control laws.

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● The information contained herein is subject to change without notice.

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 (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 | 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 (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 (10s) | T_{sol} | 260 | °C | |
| Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 2) | BV_S | 2500 | Vrms | |

(Note 2) Device considered a two terminal device : Pins 1 and 3 shorted together and 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 |

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} | $V_{DRM} = 600\text{V}$ | — | 10 | 1000 | nA |
| | Peak On-State Voltage | V_{TM} | $I_{TM} = 70\text{mA}$ | — | 1.7 | 2.8 | V |
| | Holding Current | I_H | — | — | 1.0 | — | mA |
| | Critical Rate of Rise of Off-State Voltage | dv/dt | $V_{in} = 240\text{Vrms}, Ta = 85^\circ\text{C}$ (Note 3) | — | 500 | — | $\text{V}/\mu\text{s}$ |
| | Critical Rate of Rise of Commutating Voltage | $dv/dt(c)$ | $I_T = 15\text{mA}, V_{in} = 60\text{Vrms}$ (Note 3) | — | 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} | $V_T = 6\text{V}$ | — | — | 10 | mA |
| 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 | — | — | Vrms |
| | | AC, 1 second, in oil | — | 5000 | — | — |
| | | DC, 1 minute, in oil | — | 5000 | — | Vdc |
| Turn-on Time | t_{ON} | $V_D = 6 \rightarrow 4\text{V}, R_L = 100\Omega$ $I_F = \text{Rated } I_{FT} \times 1.5$ | — | — | 100 | μs |

(Note 3) dv/dt TEST CIRCUIT

