

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-DIODE ARRAY

TLP591B

TELECOMMUNICATION
 PROGRAMMABLE CONTROLLERS
 MOS GATE DRIVER
 MOS FET GATE DRIVER

The TOSHIBA TLP591B consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a series connected photo-diode array in a six lead plastic DIP package.
 TLP591B is suitable for MOS FET Gate Driver.
 TLP591B has an internal shunt resistor to optimize switching speed.

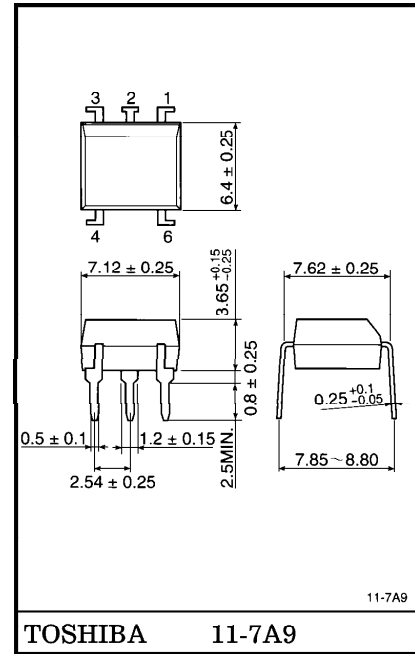
- UL Recognized : UL1577, File No. E67349

MAXIMUM RATINGS (Ta = 25°C)

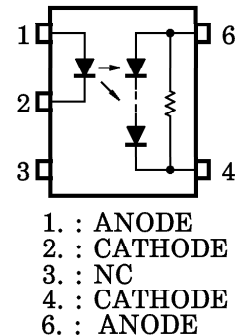
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|--|-------------------------|---------|---------|
| LED | Forward Current | I_F | 50 | mA |
| | Forward Current Derating (Ta ≥ 25°C) | $\Delta I_F / ^\circ C$ | -0.5 | mA / °C |
| | Pulse Forward Current (100 μs pulse, 100pps) | I_{FP} | 1 | A |
| | Reverse Voltage | V_R | 3 | V |
| | Junction Temperature | T_j | 125 | °C |
| DETECTOR | Forward Current | I_{FD} | 50 | μA |
| | Reverse Voltage | V_{RD} | 10 | V |
| | Junction Temperature | T_j | 125 | °C |
| Storage Temperature Range | | T_{stg} | -55~125 | °C |
| Operating Temperature Range | | T_{opr} | -40~85 | °C |
| Lead Soldering Temperature (10sec.) | | T_{sol} | 260 | °C |
| Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 1) | | BV_S | 2500 | Vrms |

(Note 1) Device considered a two terminal device : Pins 1, 2 and 3 shorted together, and pins 4 and 6 shorted together.

Unit in mm



PIN CONFIGURATION (TOP VIEW)



961001EBC2

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RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------|-----------|------|------|------|------|
| Forward Current | I_F | — | 20 | 25 | mA |
| Operating Temperature | T_{opr} | -25 | — | 85 | °C |

INDIVIDUAL ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------|--------------------------------|----------|--------------------------|------|------|------|---------------|
| LED | Forward Voltage | V_F | $I_F = 10\text{mA}$ | 1.2 | 1.4 | 1.7 | V |
| | Reverse Current | I_R | $V_R = 3\text{V}$ | — | — | 10 | μA |
| | Capacitance | C_T | $V = 0, f = 1\text{MHz}$ | — | 30 | 60 | pF |
| DETECTOR | Forward Voltage | V_{FD} | $I_{FD} = 10\mu\text{A}$ | — | 7 | — | V |
| | Reverse Current | I_{RD} | $V_{RD} = 10\text{V}$ | — | 7 | — | μA |
| | Capacitance (Anode to Cathode) | C_{TD} | $V = 0, f = 1\text{MHz}$ | — | — | — | pF |

COUPLED ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------|----------|---------------------|------|------|------|---------------|
| Open Voltage | V_{OC} | $I_F = 20\text{mA}$ | 7 | 8 | — | V |
| Short Current | I_{SC} | $I_F = 20\text{mA}$ | 24 | 40 | — | μA |

ISOLATION CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------|--------|----------------------------|--------------------|-----------|------|------|
| 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} | — | |
| Isolation Voltage | BV_S | AC, 1 minute | 2500 | — | — | Vrms |
| | | AC, 1 second, in oil | — | 5000 | — | |
| | | DC, 1 minute, in oil | — | 5000 | — | Vdc |

SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------|--|------|------|------|------|
| Turn-on Time | t_{on} | $I_F = 20\text{mA}, C_L = 1000\text{pF}$ | — | 0.2 | — | ms |
| Turn-off Time | t_{off} | (Fig.1) | — | 3 | — | ms |

Fig.1 SWITCHING TIME TEST CIRCUIT

