

Unit in mm

Telecommunication

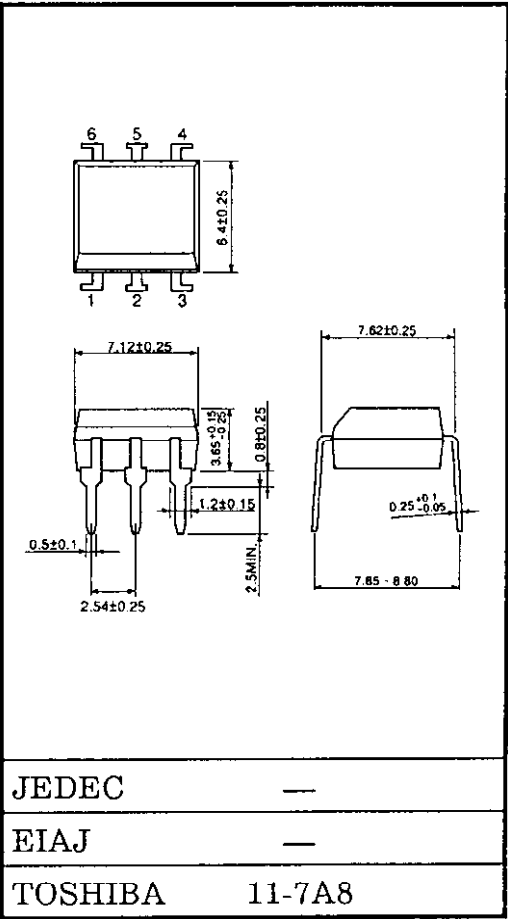
Data Acquisition

Measurement Instrumentation

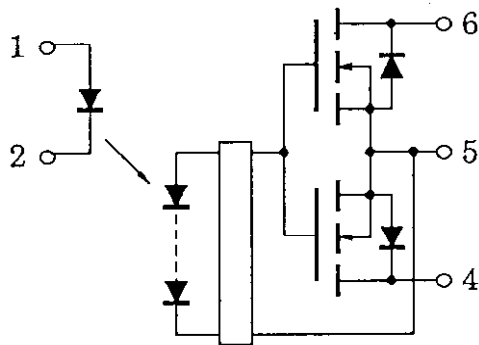
The Toshiba TLP596G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a six lead plastic DIP package. The TLP596G is a bi-directional switch which can replace mechanical relays in many applications.

- Peak Off-State Voltage : 400V (Min.)
- On-State Current : 120mA (Max.) (A Connection)
- On-State Resistance : 30Ω (Max.) (A Connection)
- Insulation Thickness : 0.4mm (Max.)
- Isolation Voltage : 2500Vrms (Min.)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current (Ta = 25°C)

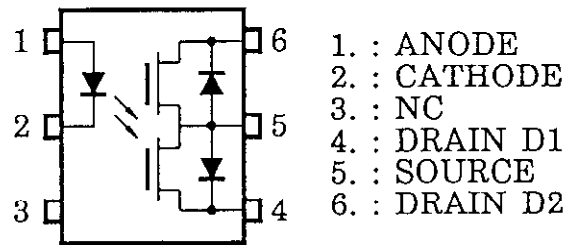
| Supplementary Information | Page (s) |
|---------------------------|----------|
| Lead Form Options         | 31-32    |
| Tape and Reel             | 39-40    |



Pin Configuration (Top View)



Schematic



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| CLASSIFICATION (Note 1) | TRIGGER LED CURRENT (mA) |      | MARKING OF CLASSIFICATION |
|-------------------------|--------------------------|------|---------------------------|
|                         | @I <sub>ON</sub> = 120mA |      |                           |
|                         | MIN.                     | MAX. |                           |
| (IFT2)                  | —                        | 2    | T2                        |
| Standard                | —                        | 5    | T2, Blank                 |

Note 1: Application type name for certification test, please use standard product type name, i.e., TLP596G (IFT2): TLP596G

### Maximum Ratings (Ta = 25°C)

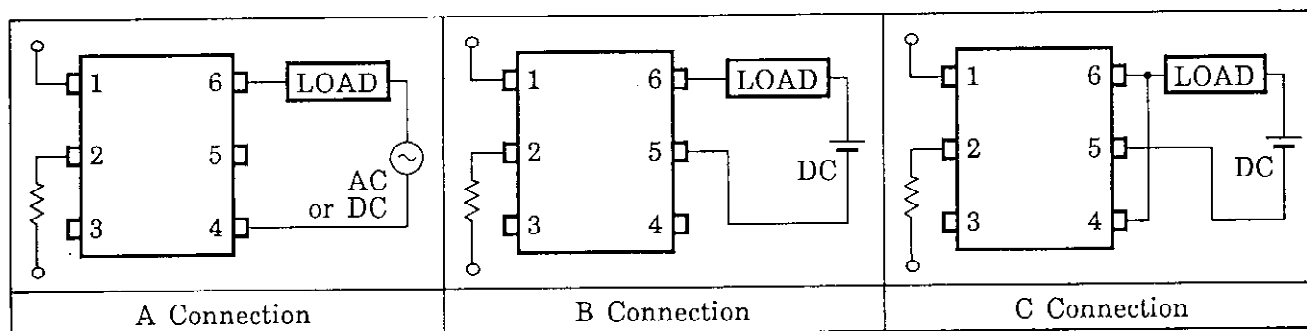
| CHARACTERISTIC                                      |  |              | SYMBOL               | RATING  | UNIT             |
|---|--|--------------|----------------------|---------|------------------|
| LED   | Forward Current                            |              | I <sub>F</sub>       | 50      | mA               |
|   | Forward Current Derating (Ta ≥ 25°C)       |              | ΔI <sub>F</sub> /°C  | -0.5    | mA/°C            |
|   | Peak Forward Current (100μs pulse, 100pps) |              | I <sub>FP</sub>      | 1       | A                |
|   | Reverse Voltage                            |              | V <sub>R</sub>       | 5       | V                |
|   | Junction Temperature                       |              | T <sub>j</sub>       | 125     | °C               |
| DETECTOR  | Off-State Output Terminal Voltage          |              | V <sub>OFF</sub>     | 400     | V                |
|   | On-State RMS Current                       | A Connection | I <sub>ON</sub>      | 120     | mA               |
|   |  | B Connection |                      | 150     |                  |
|   |  | C Connection |                      | 200     |                  |
|   | On-State Current Derating (Ta ≥ 25°C)      | A Connection | ΔI <sub>ON</sub> /°C | -1.2    | mA/°C            |
|   |  | B Connection |                      | -1.5    |                  |
|   |  | C Connection |                      | -2.0    |                  |
|   | Junction Temperature                       |              | t <sub>j</sub>       | 125     | °C               |
| Storage Temperature Range                           |  |              | T <sub>stg</sub>     | -55~100 | °C               |
| Operating Temperature Range                         |  |              | T <sub>opr</sub>     | -20~85  | °C               |
| Lead Soldering Temperature (10s)                    |  |              | T <sub>sol</sub>     | 260     | °C               |
| Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 1) |  |              | BV <sub>S</sub>      | 2500    | V <sub>rms</sub> |

Note 1: Device considered a two terminal device: pins 1, 2 and 3 shorted together, and pins 4, 5 and 8 shorted together.

## Recommended Operating Conditions

| CHARACTERISTIC        | SYMBOL    | MIN. | TYP. | MX. | UNIT |
|-----------------------|-----------|------|------|-----|------|
| Supply Voltage        | $V_D$     | —    | —    | 320 | V    |
| Forward Current       | $I_F$     | 7.5  | 15   | 25  | mA   |
| On-State Current      | $I_{ON}$  | —    | —    | 120 | mA   |
| Operating Temperature | $T_{opr}$ | -20  | —    | 80  | °C   |

## Circuit Connections

Individual Electrical Characteristics ( $T_a = -25^{\circ}\text{C}$ )

| CHARACTERISTIC |                   | SYMBOL    | TEST CONDITION           | MIN. | TYP.* | MX. | 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  | $\mu\text{A}$ |
|                | Capacitance       | $C_T$     | $V = 0, f = 1\text{MHz}$ | —    | 30    | —   | pF            |
| DETECTOR       | Off-State Current | $I_{OFF}$ | $V_{OFF} = 400\text{V}$  | —    | —     | 1   | $\mu\text{A}$ |
|                | Capacitance       | $C_{OFF}$ | $V = 0, f = 1\text{MHz}$ | —    | —     | —   | pF            |

Coupled Electrical Characteristics ( $T_a = 25^{\circ}\text{C}$ )

| CHARACTERISTIC      |              | SYMBOL   | TEST CONDITION                             | MIN. | TYP. | MX. | UNIT     |
|---------------------|--------------|----------|--|------|------|-----|----------|
| Trigger LED Current |              | $I_{FT}$ | $I_{ON} = 120\text{mA}$                    | —    | 1    | 5   | mA       |
| On-State Resistance | A Connection | $R_{ON}$ | $I_{ON} = 120\text{mA}, I_F = 10\text{mA}$ | —    | 20   | 30  | $\Omega$ |
|                     | B Connection |          | $I_{ON} = 150\text{mA}, I_F = 10\text{mA}$ | —    | 12   | 20  |          |
|                     | C Connection |          | $I_{ON} = 200\text{mA}, I_F = 10\text{mA}$ | —    | 6    | 10  |          |

Isolation Characteristics (Ta = 25°C)

| CHARACTERISTIC              | SYMBOL | TEST CONDITION                             | MIN.               | TYP.      | MX. | UNIT             |
|-----------------------------|--------|--|--------------------|-----------|-----|------------------|
| Capacitance Input to Output | $C_S$  | $V_S = 0, f = 1\text{MHz}$                 | —                  | 0.8       | —   | pF               |
| Isolation Resistance        | $R_S$  | $V_S = 500\text{V}, \text{R.H.} \leq 60\%$ | $5 \times 10^{10}$ | $10^{14}$ | —   | $\Omega$         |
| Isolation Voltage           | $BV_S$ | AC, 1 minute                               | 2500               | —         | —   | $V_{\text{rms}}$ |
|                             |        | AC, 1 second in oil                        | —                  | 5000      | —   |                  |
|                             |        | DC, 1 minute in oil                        | —                  | 5000      | —   | $V_{\text{dc}}$  |

Switching Characteristics (Ta = 25°C)

| CHARACTERISTIC | SYMBOL           | TEST CONDITION  | MIN. | TYP. | MX. | UNIT |
|----------------|------------------|---|------|------|-----|------|
| Turn-on Time   | $t_{\text{on}}$  | $R_L = 200\Omega$<br>$V_{\text{DD}} = 20\text{mA}, I_F = 10\text{mA}$ | —    | —    | 2   | ms   |
| Turn-off Time  | $t_{\text{off}}$ |   | —    | —    | 2   |      |

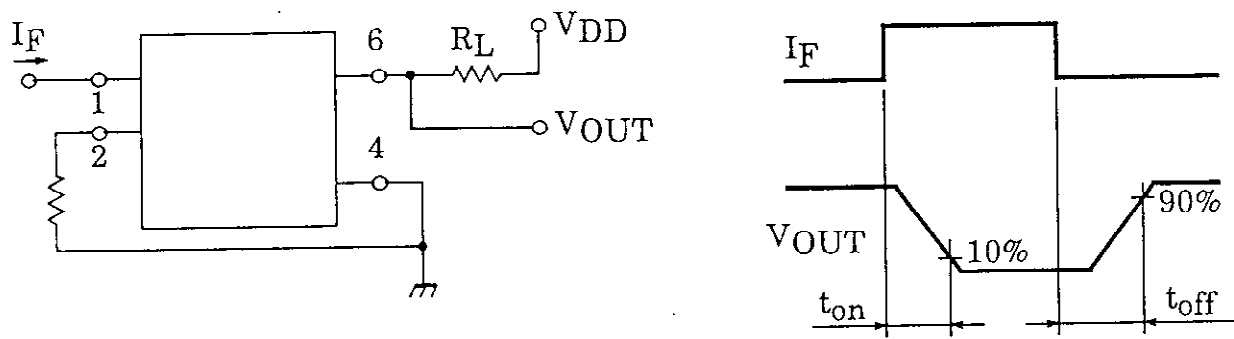


Figure 1. Switching Time Test Circuit

