

TLP296G

TELECOMMUNICATION

DATA ACQUISITION

MEASUREMENT INSTRUMENTATION

The TOSHIBA TLP296G consists of gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a 8 lead DIP package (DIP8).

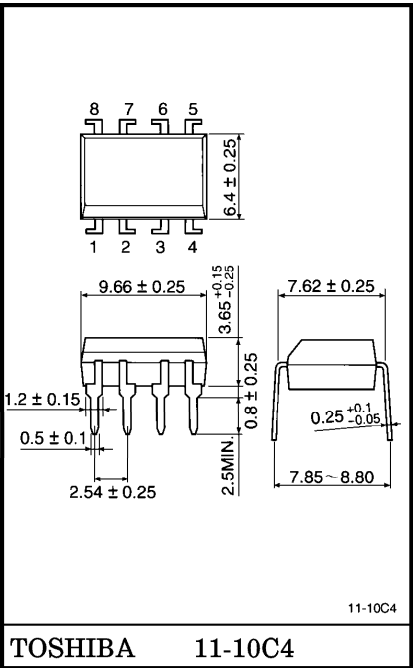
The TLP296G is a bi-directional switch which can replace mechanical relay in many applications.

- 8 PIN DIP (DIP8), 2 Channel Type (2-Form-A)
- Peak Off-State Voltage : 400 V (MIN.)
- Trigger LED Current : 5 mA (MAX.)
- On-State Current : 100 mA (MAX.)
- On-State Resistance : 30 Ω (MAX.)
- Isolation Voltage : 2500 V<sub>rms</sub> (MIN.)
- Trigger LED Current (Ta = 25°C)

| CLASSIFICATION | TRIGGER LED<br>CURRENT (mA) |      | MARKING OF<br>CLASSIFICATION |
|----------------|-----------------------------|------|------------------------------|
|                | @I <sub>ON</sub> = 100 mA   |      |                              |
|                | MIN.                        | MAX. |                              |
| (IFT2)         | —                           | 2    | T2                           |
| Standard       | —                           | 5    | T2, blank                    |

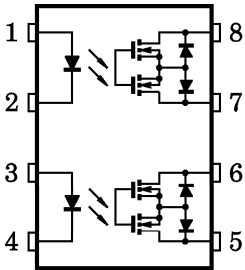
(\*) : Ex. Rank IFT2 : TLP296G (IFT2)

Unit in mm



Weight : 0.54 g

PIN CONFIGURATION (Top view)



## 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 (100 μs pulse, 100 pps) |                     | 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 Current                             | Both Channel Note 1 | I <sub>ON</sub>       | 100              | mA      |
|                                                       |                                              | One Channel         |                       | 120              |         |
|                                                       | On-State Current Derating (Ta ≥ 25°C)        | Both Channel Note 1 | ΔI <sub>ON</sub> / °C | −1.0             | mA / °C |
|                                                       |                                              | One Channel         |                       | −1.2             |         |
|                                                       | Junction Temperature                         |                     | T <sub>j</sub>        | 125              | °C      |
| Storage Temperature Range                             |                                              | T <sub>stg</sub>    | −55~125               | °C               |         |
| Operating Temperature Range                           |                                              | T <sub>opr</sub>    | −20~85                | °C               |         |
| Lead Soldering Temperature (10 s)                     |                                              | T <sub>sol</sub>    | 260                   | °C               |         |
| Isolation Voltage (AC, 1min., R.H. ≤ 60%)      Note 2 |                                              | BV <sub>S</sub>     | 2500                  | V <sub>rms</sub> |         |

(Note 1) : Two channels operating simultaneously.

(Note 2) : Device considered a two-terminal device : Pins 1, 2, 3 and 4 shorted together and Pins 5, 6, 7 and 8 shorted together.

## RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC        | SYMBOL    | MIN. | TYP. | MAX. | UNIT |
|-----------------------|-----------|------|------|------|------|
| Supply Voltage        | $V_{DD}$  | —    | —    | 320  | V    |
| Forward Current       | $I_F$     | 7.5  | 15   | 25   | mA   |
| On-State Current      | $I_{ON}$  | —    | —    | 100  | mA   |
| 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   | $\mu\text{A}$ |
|                | 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 (Ta = 25°C)

| CHARACTERISTIC      | SYMBOL   | TEST CONDITION                                 | MIN. | TYP. | MAX. | UNIT     |
|---------------------|----------|------------------------------------------------|------|------|------|----------|
| Trigger LED Current | $I_{FT}$ | $I_{ON} = 100 \text{ mA}$                      | —    | 2    | 5    | mA       |
| On-State Resistance | $R_{ON}$ | $I_{ON} = 100 \text{ mA}, I_F = 10 \text{ mA}$ | —    | 20   | 30   | $\Omega$ |

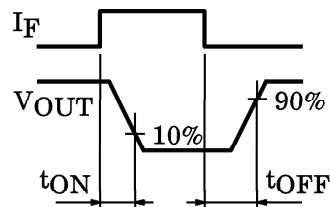
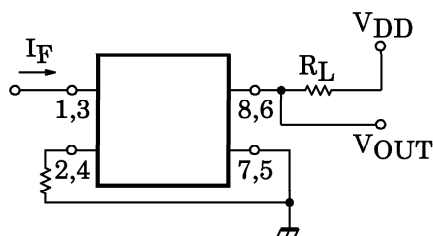
## ISOLATION CHARACTERISTICS (Ta = 25°C)

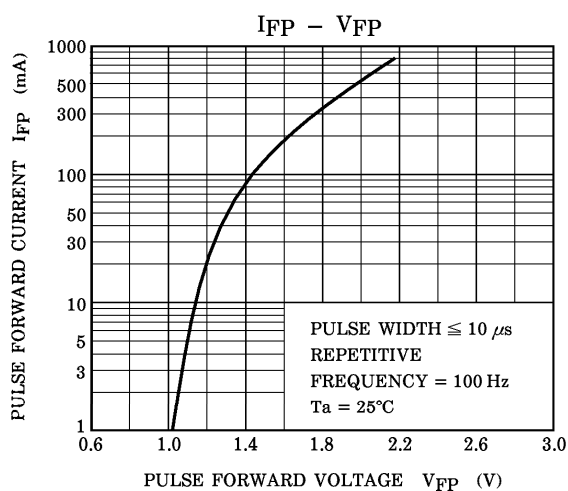
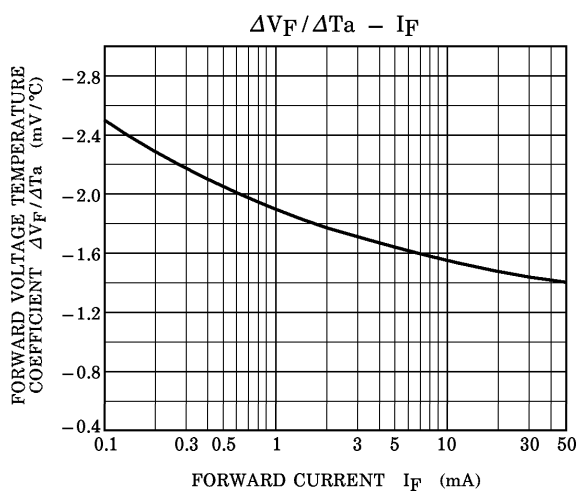
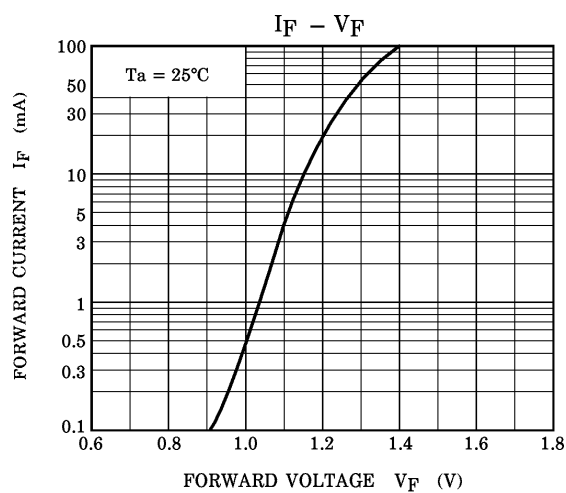
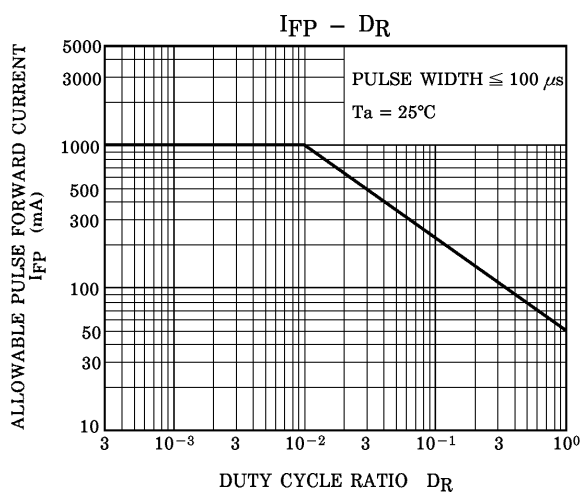
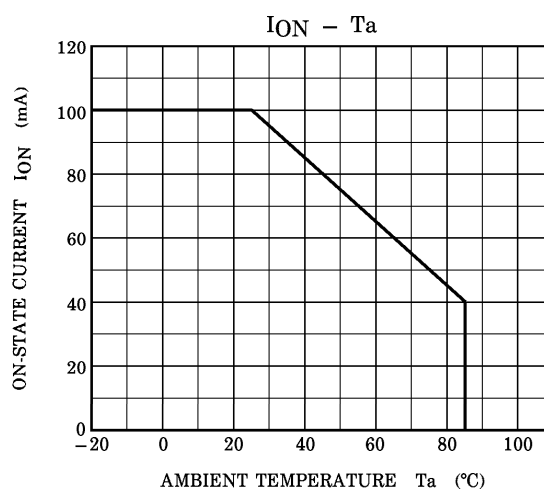
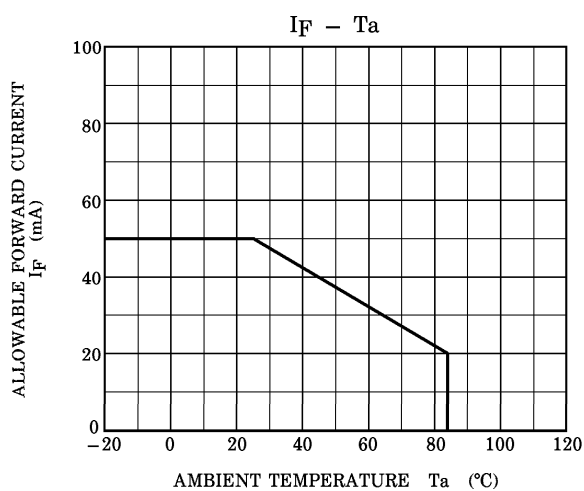
| CHARACTERISTIC              | SYMBOL | TEST CONDITION                               | MIN.               | TYP.      | MAX. | UNIT      |
|-----------------------------|--------|----------------------------------------------|--------------------|-----------|------|-----------|
| Capacitance Input to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

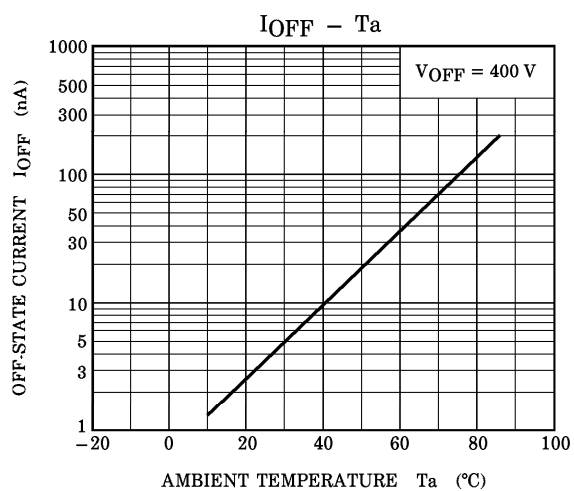
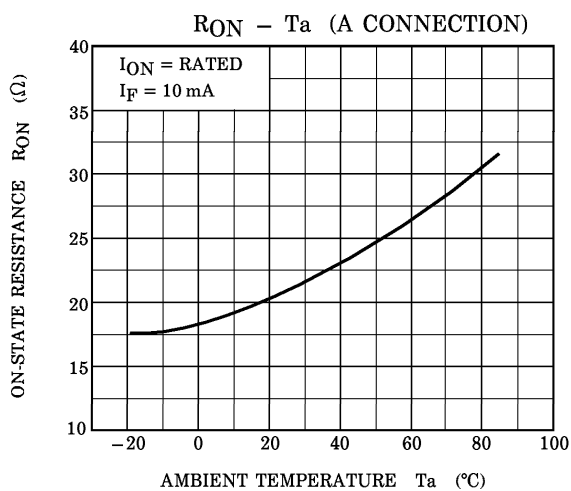
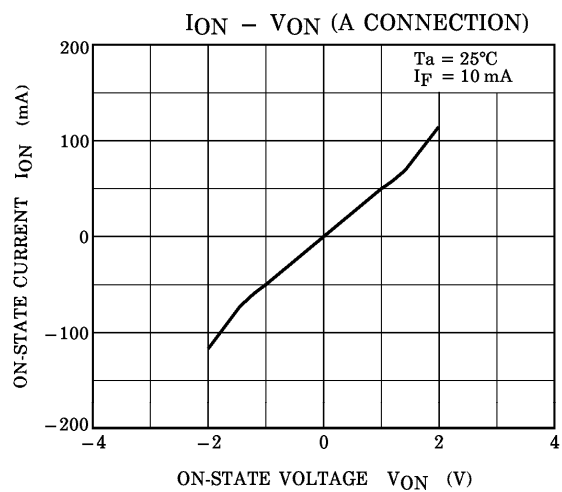
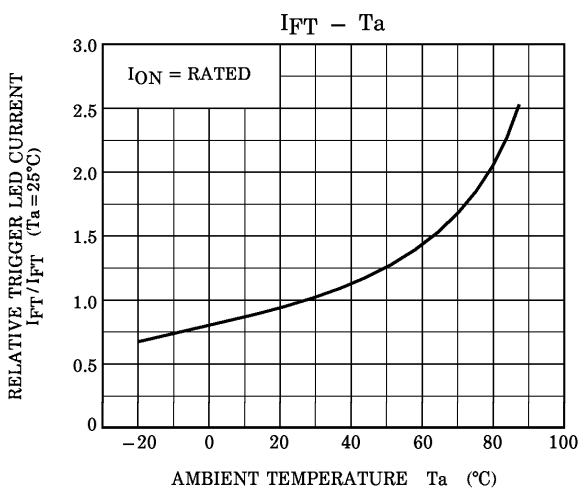
## SWITCHING CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL    | TEST CONDITION                               | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------|----------------------------------------------|------|------|------|------|
| Turn-on Time   | $t_{ON}$  | $R_L = 200 \Omega$ (Note 1)                  | —    | —    | 4    | ms   |
| Turn-off Time  | $t_{OFF}$ | $V_{DD} = 20 \text{ V}, I_F = 10 \text{ mA}$ | —    | —    | 4    |      |

(Note 1) : SWITCHING TIME TEST CIRCUIT







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