

TLP598G

TELECOMMUNICATION

DATA ACQUISITION

MEASUREMENT INSTRUMENTATION

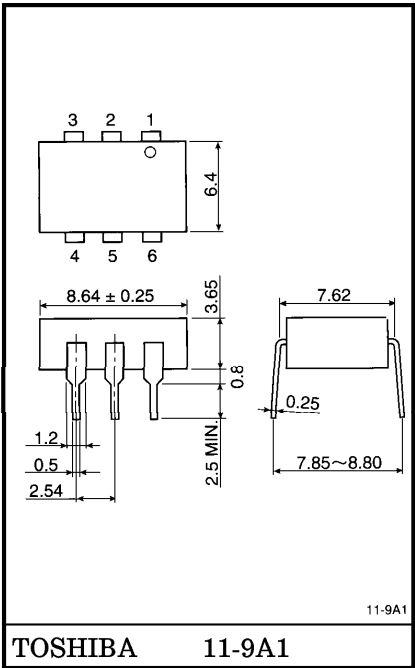
The TOSHIBA TLP598G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a six lead plastic DIP package (DIP6).  
The TLP598G is a bi-directional switch which can replace mechanical relays in many applications.

- Peak Off-State Voltage : 400 V (MIN.)
- On-State Current : 150 mA (MAX.) (A Connection)
- On-State Resistance : 12 Ω (MAX.) (A Connection)
- Isolation Voltage : 2500 Vrms (MIN.) (A Connection)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current (Ta = 25°C)

| CLASSIFICATION<br>(Note 1) | Trigger LED Current<br>(mA) |      | MARKING OF<br>CLASSIFICATION |
|----------------------------|-----------------------------|------|------------------------------|
|                            | @I <sub>ON</sub> = 150 mA   |      |                              |
|                            | Min.                        | Max. |                              |
| (IFT2)                     | —                           | 2    | T2                           |
| Standard                   | —                           | 5    | T2, blank                    |

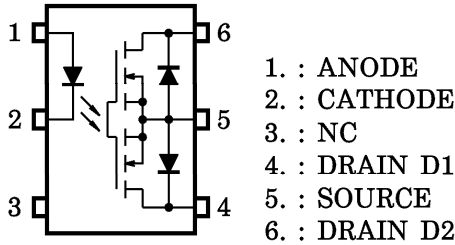
(Note 1) : Application type name for certification test,  
please use standard product type name, i.e.  
TLP598G (IFT2) : TLP598G

Unit in mm

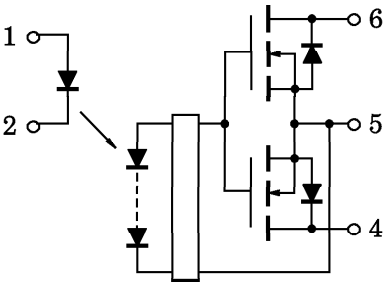


Weight : 0.49 g

PIN CONFIGURATION (TOP VIEW)



SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

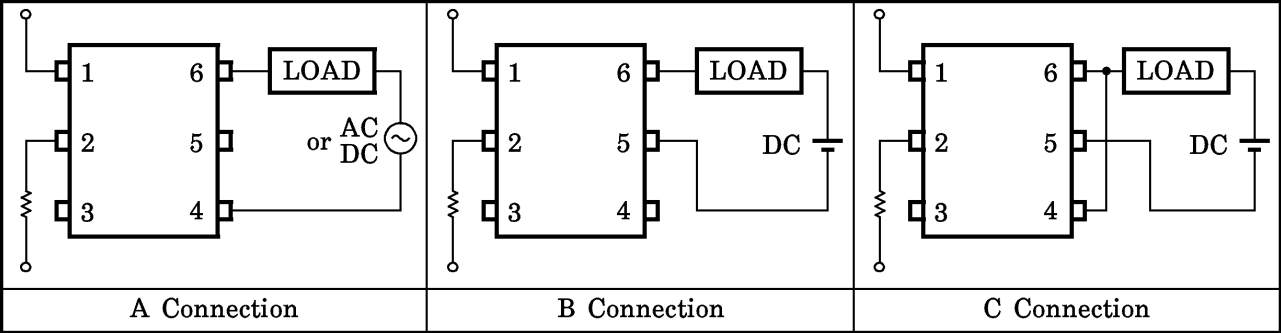
| CHARACTERISTIC                             |                                              |                  | SYMBOL                | RATING | UNIT             |
|--------------------------------------------|----------------------------------------------|------------------|-----------------------|--------|------------------|
| LED                                        | Forward Current                              |                  | I <sub>F</sub>        | 30     | mA               |
|                                            | Forward Current Derating (Ta ≥ 25°C)         |                  | ΔI <sub>F</sub> / °C  | −0.3   | 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 RMS Current                         | A Connection     | I <sub>ON</sub>       | 150    | mA               |
|                                            |                                              | B Connection     |                       | 200    |                  |
|                                            |                                              | C Connection     |                       | 300    |                  |
|                                            | On-State Current Derating (Ta ≥ 25°C)        | A Connection     | ΔI <sub>ON</sub> / °C | −1.5   | mA / °C          |
|                                            |                                              | B Connection     |                       | −2.0   |                  |
|                                            |                                              | C Connection     |                       | −3.0   |                  |
|                                            | 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> | −40~85                | °C     |                  |
| Lead Soldering Temperature (10 s)          |                                              | T <sub>sol</sub> | 260                   | °C     |                  |
| Isolation Voltage (AC, 1 min., R.H. ≤ 60%) |                                              | (Note 2)         | BV <sub>S</sub>       | 2500   | V <sub>rms</sub> |

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

RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC        | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------|--------|------|------|------|------|
| Supply Voltage        | VDD    | —    | —    | 320  | V    |
| Forward Current       | IF     | 10   | 15   | 20   | mA   |
| On-State Current      | ION    | —    | —    | 150  | mA   |
| Operating Temperature | Topr   | −20  | —    | 80   | °C   |

CIRCUIT CONNECTIONS



## INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC |                   | SYMBOL    | TEST CONDITION             | MIN. | TYP. | MAX. | UNIT          |
|----------------|-------------------|-----------|----------------------------|------|------|------|---------------|
| LED            | Forward Voltage   | $V_F$     | $I_F = 10 \text{ mA}$      | 1.2  | 1.4  | 1.7  | V             |
|                | Reverse Current   | $I_R$     | $V_R = 3 \text{ V}$        | —    | —    | 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 |              | $I_{FT}$ | $I_{ON} = 150 \text{ mA}$                      | —    | 1    | 5    | mA       |
| On-State Resistance | A Connection | $R_{ON}$ | $I_{ON} = 150 \text{ mA}, I_F = 10 \text{ mA}$ | —    | 8    | 12   | $\Omega$ |
|                     | B Connection |          | $I_{ON} = 200 \text{ mA}, I_F = 10 \text{ mA}$ | —    | 4    | 6    |          |
|                     | C Connection |          | $I_{ON} = 300 \text{ mA}, I_F = 10 \text{ mA}$ | —    | 2    | 3    |          |

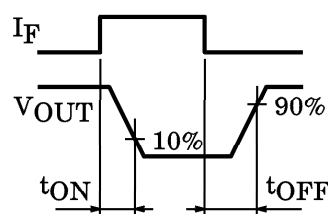
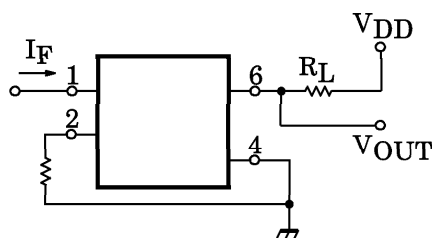
## ISOLATION CHARACTERISTICS (Ta = 25°C)

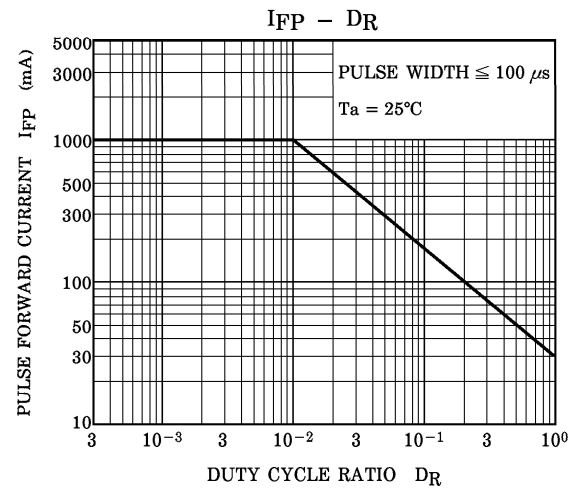
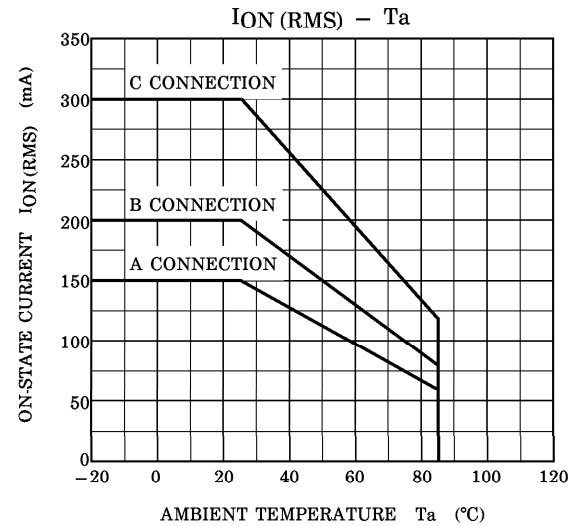
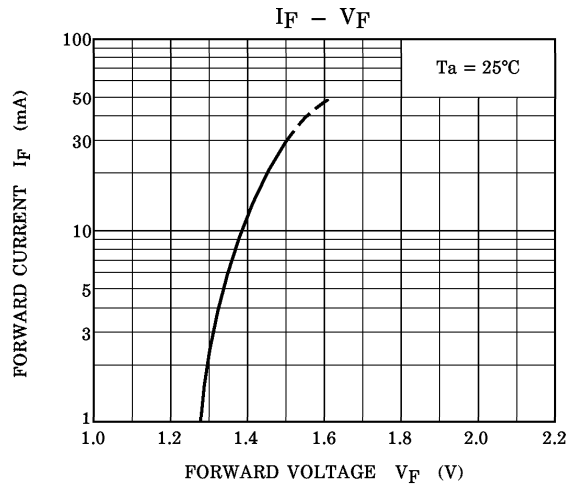
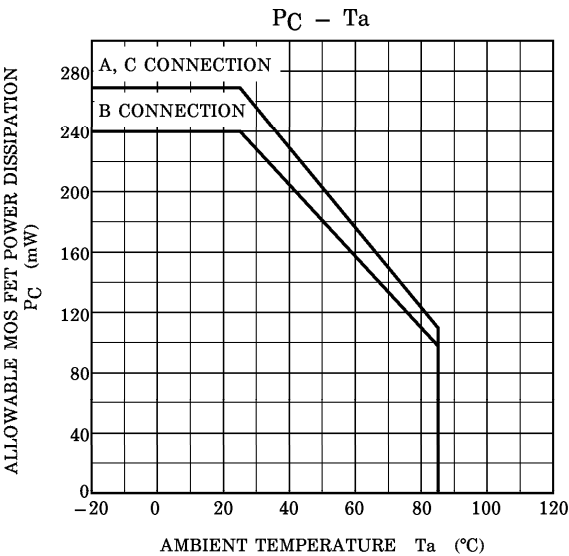
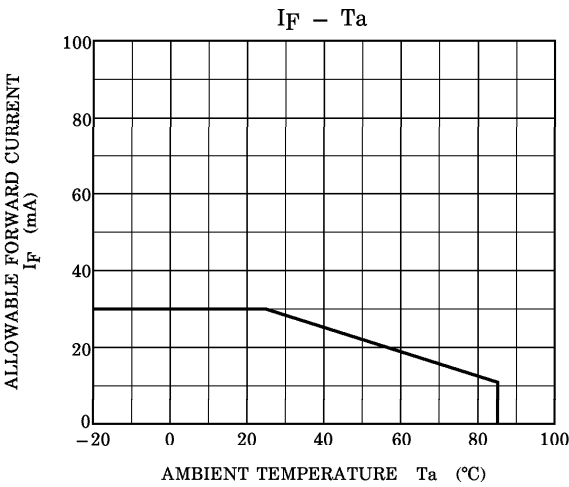
| CHARACTERISTIC              | SYMBOL | TEST CONDITION                        | MIN.               | TYP.      | MAX. | UNIT     |
|-----------------------------|--------|---------------------------------------|--------------------|-----------|------|----------|
| Capacitance Input to Output | $C_S$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

## SWITCHING CHARACTERISTICS (Ta = 25°C)

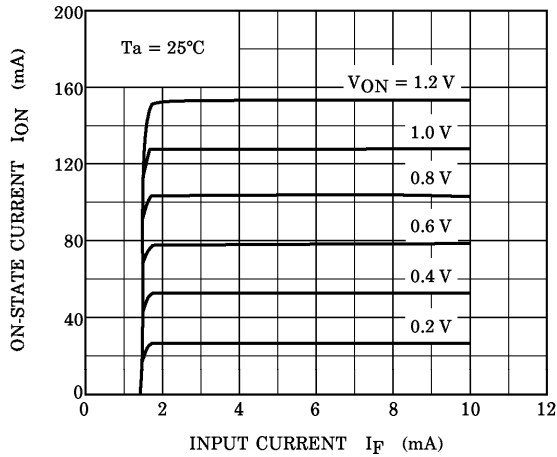
| CHARACTERISTIC | SYMBOL    | TEST CONDITION                                                              | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------|-----------------------------------------------------------------------------|------|------|------|------|
| Turn-on Time   | $t_{ON}$  | $V_{DD} = 20 \text{ V}, R_L = 200 \Omega$<br>$I_F = 10 \text{ mA}$ (Note 3) | —    | 0.3  | 1.0  | ms   |
| Turn-off Time  | $t_{OFF}$ |                                                                             | —    | 0.2  | 1.0  |      |

(Note 3) : SWITCHING TIME TEST CIRCUIT

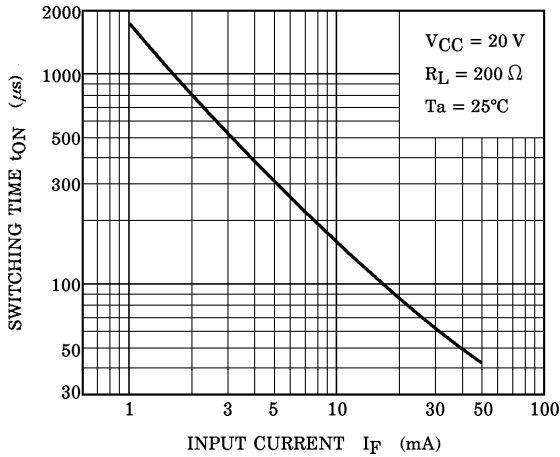




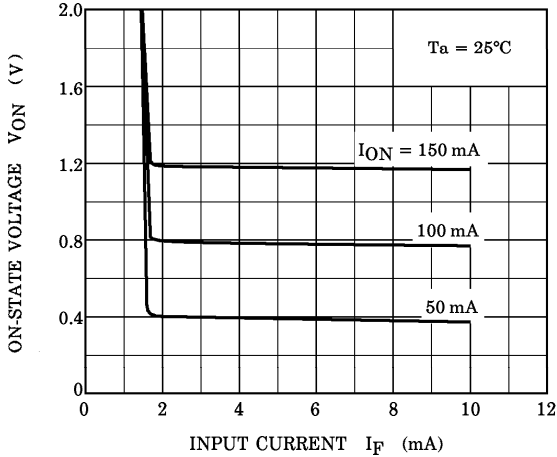
$I_{ON} - I_F$  (A CONNECTION)



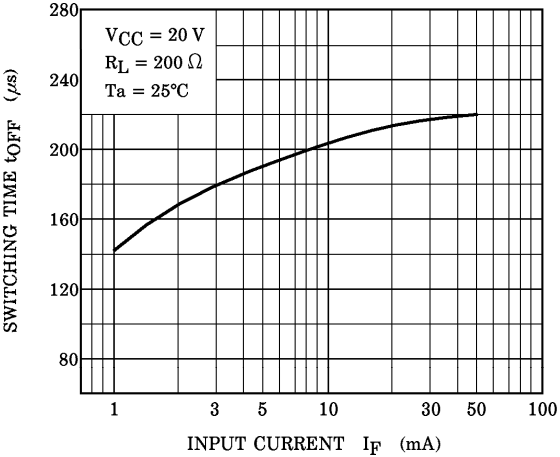
$t_{ON} - I_F$



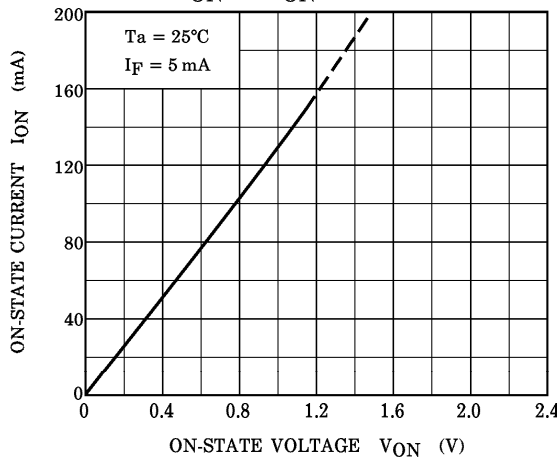
$V_{ON} - I_F$  (A CONNECTION)

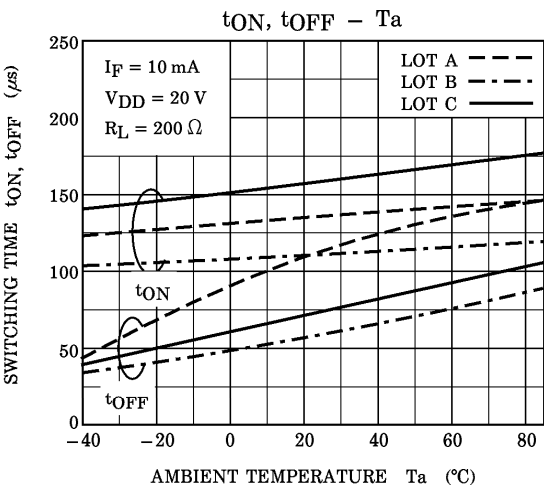
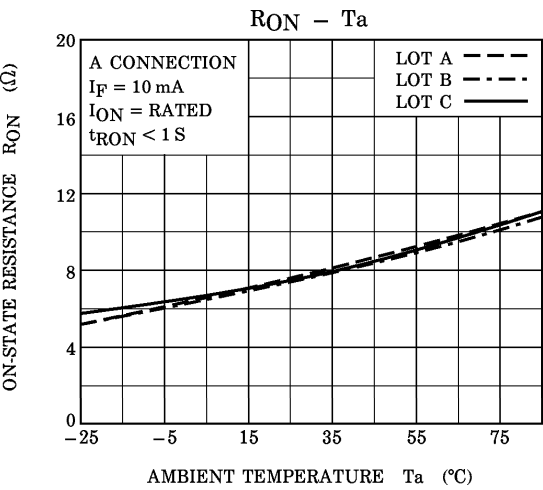
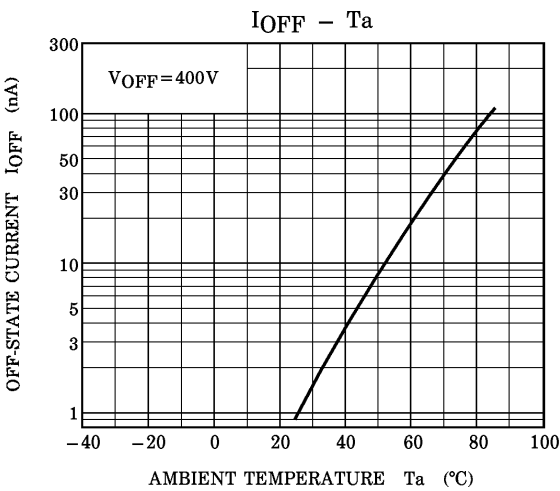
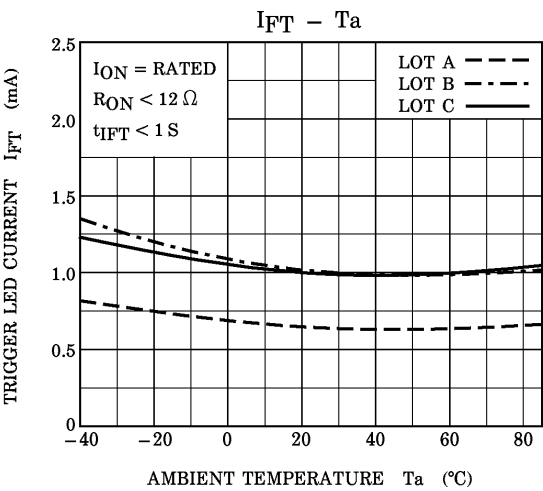


$t_{OFF} - I_F$



$I_{ON} - V_{ON}$  (A CONNECTION)





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000707EBC

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