

# TLP597A

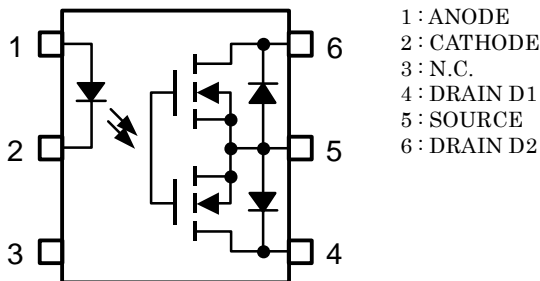
TELECOMMUNICATION  
 DATA ACQUISITION  
 MEASUREMENT INSTRUMENTATION

The TOSHIBA TLP597A 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 TLP597A is a bi-directional switch can replace mechanical relays in many applications.

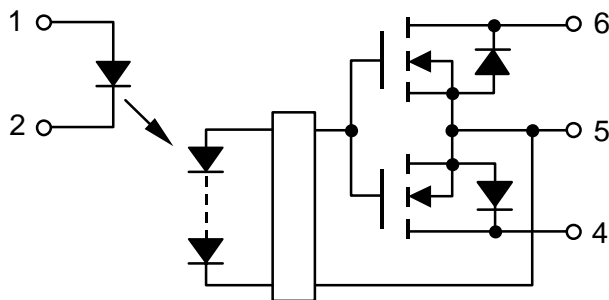
**FEATURES**

- 6 pin DIP (DIP6)
- 1-Form-A
- Peak Off-State Voltage : 60 V (MIN.)
- Trigger LED Current : 3 mA (MAX.)
- On-State Current : 500 mA (MAX.)
- On-State Resistance : 2 Ω (MAX.)
- Isolation Voltage : 2500 Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

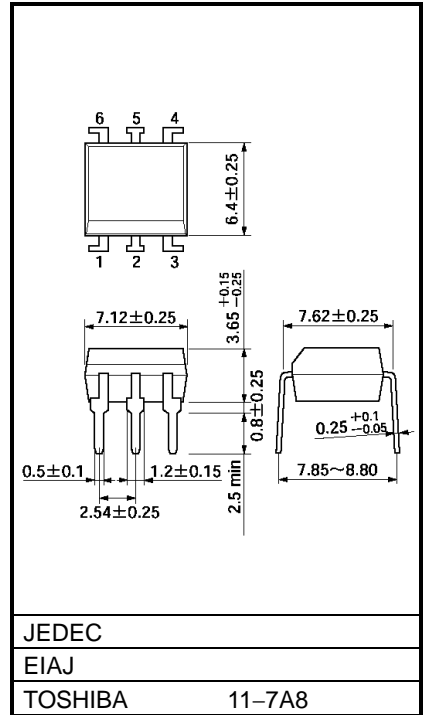
**PIN CONFIGURATION (TOL VIEW)**



**SCHEMATIC**



Unit: mm



Weight: 0.4 g

## MAXIMUM RATINGS (Ta = 25°C)

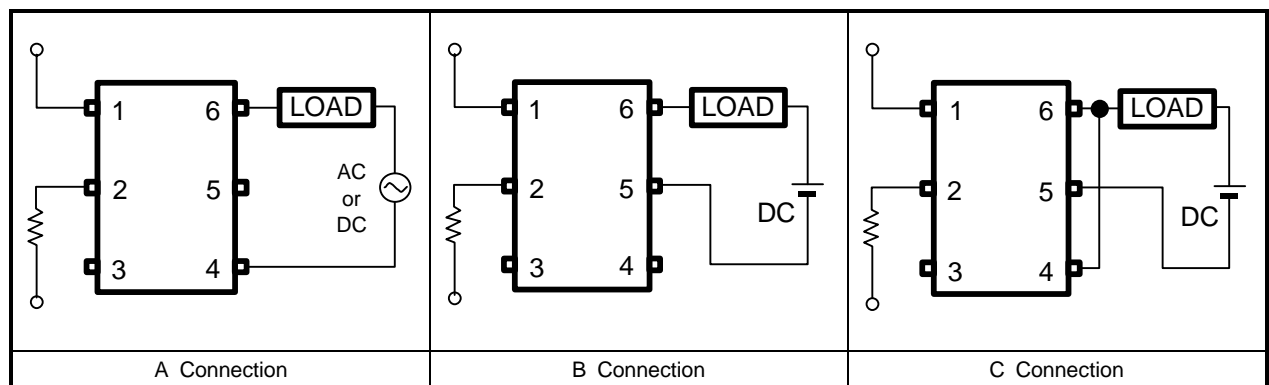
| CHARACTERISTIC                                       |  | SYMBOL                      | RATING                         | UNIT  |       |
|--|--|-----------------------------|--------------------------------|-------|-------|
| LED  | Forward Current                              | $I_F$                       | 50                             | mA    |       |
|  | Forward Current Derating (Ta ≥ 25°C)         | $\Delta I_F/^\circ\text{C}$ | -0.5                           | mA/°C |       |
|  | Peak Forward Current (100 μs pulse, 100 pps) | $I_{FP}$                    | 1                              | A     |       |
|  | Reverse Voltage                              | $V_R$                       | 5                              | V     |       |
|  | Junction Temperature                         | $T_j$                       | 125                            | °C    |       |
| DETECTOR   | Off-State Output Terminal Voltage            | $V_{OFF}$                   | 60                             | V     |       |
|  | On-State RMS Current                         | A Connection                | $I_{ON}$                       | 500   | mA    |
|  |  | B Connection                |                                | 500   |       |
|  |  | C Connection                |                                | 1000  |       |
|  | On-State Current Derating (Ta ≥ 25°C)        | A Connection                | $\Delta I_{ON}/^\circ\text{C}$ | -5.0  | mA/°C |
|  |  | B Connection                |                                | -5.0  |       |
|  |  | C Connection                |                                | -10.0 |       |
| Junction Temperature                                 | $T_j$  | 125                         | °C                             |       |       |
| Operating Temperature Range                          |  | $T_{opr}$                   | -40~85                         | °C    |       |
| Storage Temperature Range                            |  | $T_{stg}$                   | -55~125                        | °C    |       |
| Lead Soldering Temperature (10 s)                    |  | $T_{sol}$                   | 260                            | °C    |       |
| Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1) |  | $BV_S$                      | 2500                           | Vrms  |       |

(NOTE1) :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        | $V_{DD}$  | —    | —    | 48   | V    |
| Forward Current       | $I_F$     | 5    | 7.5  | 25   | mA   |
| On-State Current      | $I_{ON}$  | —    | —    | 400  | mA   |
| Operating Temperature | $T_{opr}$ | -20  | —    | 65   | °C   |

## CIRCUIT CONNECTIONS



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

| CHARACTERISTIC |                   | SYMBOL    | TEST CONDITION             | MIN. | TYP. | MAX. | UNIT          |
|----------------|-------------------|-----------|----------------------------|------|------|------|---------------|
| LED            | Forward Voltage   | $V_F$     | $I_F = 10 \text{ mA}$      | 1.0  | 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 | $I_{OFF}$ | $V_{OFF} = 60 \text{ V}$   | —    | —    | 1    | $\mu\text{A}$ |
|                | Capacitance       | $C_{OFF}$ | $V = 0, f = 1 \text{ MHz}$ | —    | 130  | —    | pF            |

**COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

| CHARACTERISTIC      |              | SYMBOL   | TEST CONDITION                                 | MIN. | TYP. | MAX. | UNIT     |
|---------------------|--------------|----------|--|------|------|------|----------|
| Trigger LED Current |              | $I_{FT}$ | $I_{ON} = 500 \text{ mA}$                      | —    | —    | 3    | mA       |
| Close LED Current   |              | $I_{FC}$ | $I_{OFF} = 100 \mu\text{A}$                    | 0.1  | —    | —    | mA       |
| On-State Resistance | A Connection | $R_{ON}$ | $I_{ON} = 500 \text{ mA}, I_F = 5 \text{ mA}$  | —    | 1    | 2    | $\Omega$ |
|                     | B Connection |          | $I_{ON} = 500 \text{ mA}, I_F = 5 \text{ mA}$  | —    | 0.5  | 1    |          |
|                     | C Connection |          | $I_{ON} = 1000 \text{ mA}, I_F = 5 \text{ mA}$ | —    | 0.25 | —    |          |

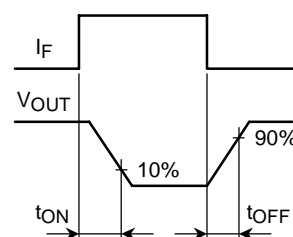
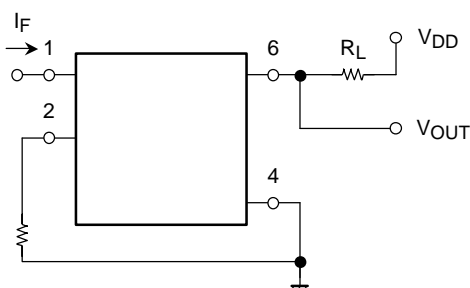
**ISOLATION CHARACTERISTICS (Ta = 25°C)**

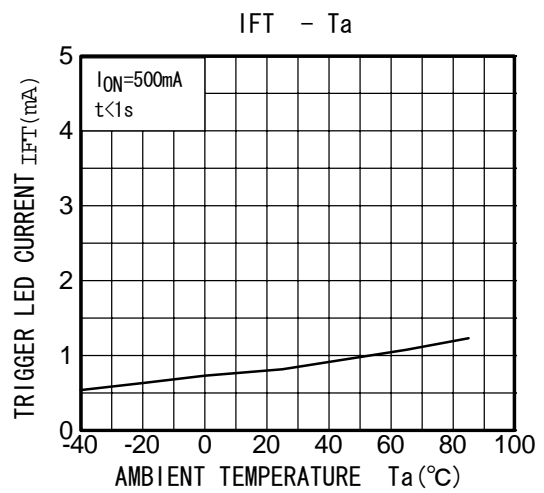
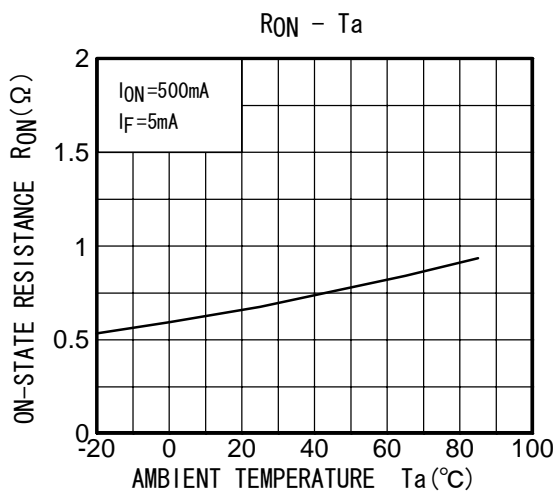
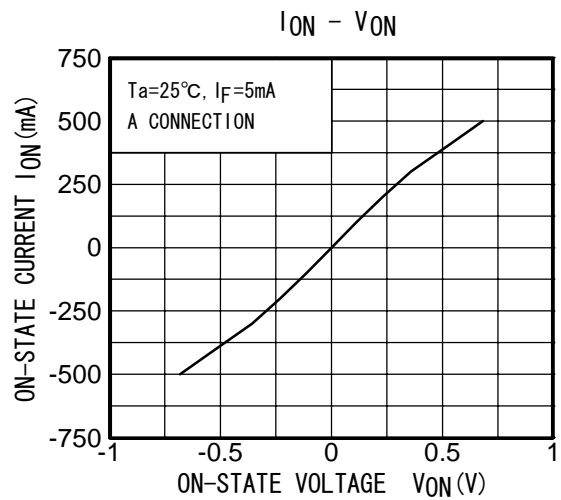
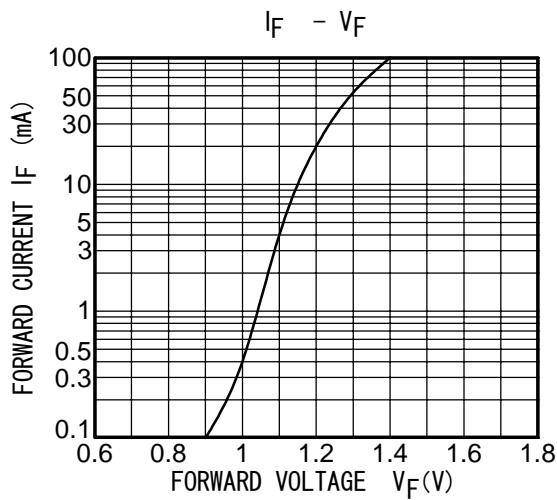
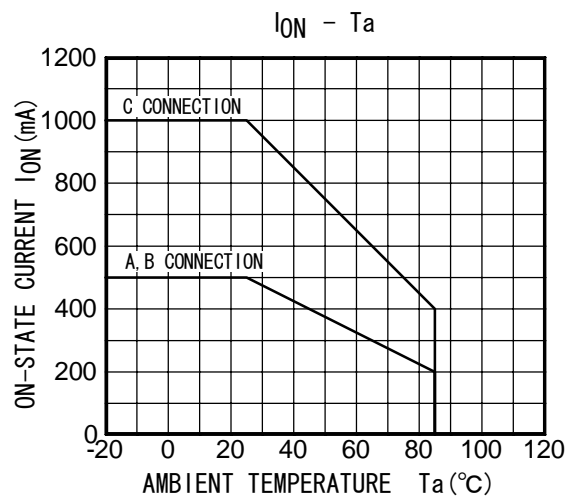
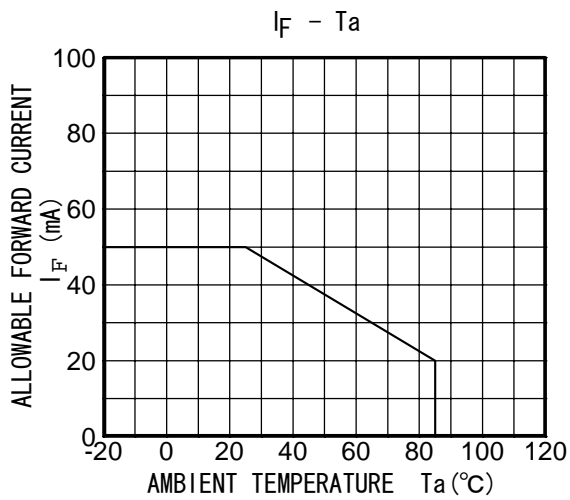
| CHARACTERISTIC              | SYMBOL | TEST CONDITION                               | MIN.               | TYP.      | MAX. | UNIT     |
|-----------------------------|--------|--|--------------------|-----------|------|----------|
| Capacitance Input to Output | $C_S$  | $V_S = 0 \text{ V}, f = 1 \text{ MHz}$       | —                  | 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               | —         | —    | Vrms     |
|                             |        | AC, 1 second (in oil)                        | —                  | 5000      | —    | —        |
|                             |        | DC, 1 minute (in oil)                        | —                  | 5000      | —    | —        |

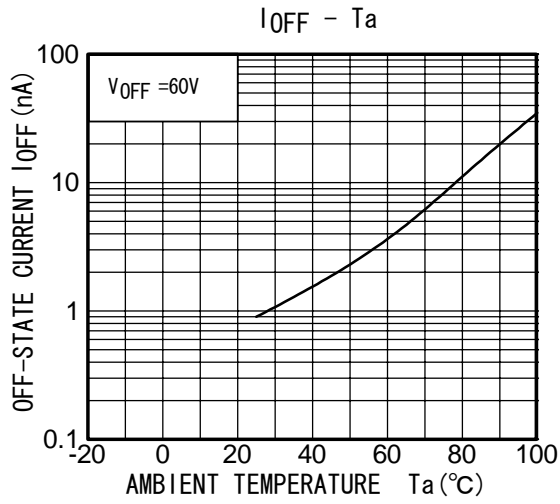
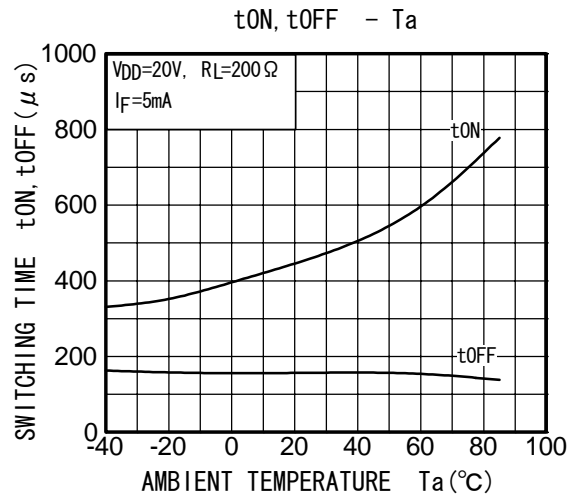
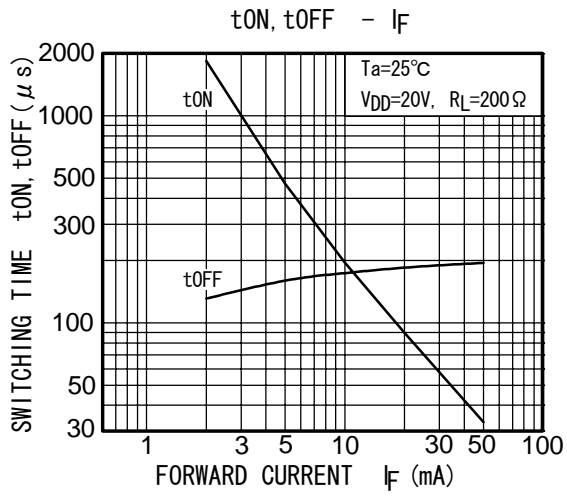
**SWITCHING CHARACTERISTICS (Ta = 25°C)**

| CHARACTERISTIC | SYMBOL    | TEST CONDITION  | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------|---|------|------|------|------|
| Turn-on Time   | $t_{ON}$  | $R_L = 200 \Omega$ (NOTE 2)<br>$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$  | —    | 0.6  | 2    | ms   |
| Turn-off Time  | $t_{OFF}$ |   | —    | 0.1  | 1    |      |
| Turn-on Time   | $t_{ON}$  | $R_L = 200 \Omega$ (NOTE 2)<br>$V_{DD} = 20 \text{ V}, I_F = 10 \text{ mA}$ | —    | 0.3  | 1    | ms   |
| Turn-off Time  | $t_{OFF}$ |   | —    | 0.1  | 1    |      |

(NOTE 2) : SWITCHING TIME TEST CIRCUIT







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