

TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP798G

TELECOMMUNICATION

DATA ACQUISITION

MEASUREMENT INSTRUMENTATION

The TOSHIBA TLP798G 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 TLP798G is a bi-directional switch which can replace mechanical relays in many applications.

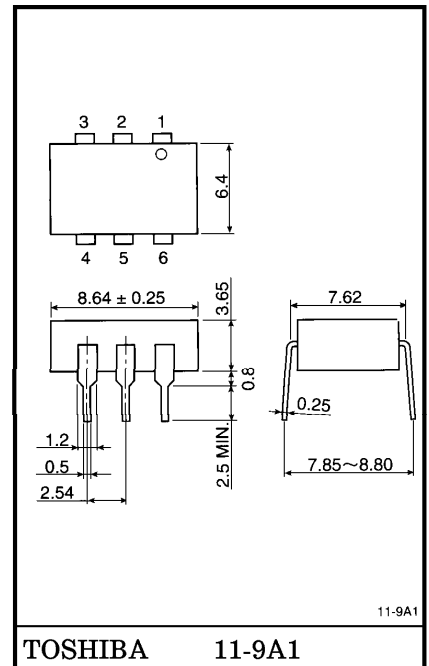
- Peak Off-State Voltage : 400 V (MIN.)
- On-State Current : 150 mA (MAX.) (A Connection)
- On-State Resistance : 12 Ω (MAX.) (A Connection)
- Isolation Voltage : 5000 Vrms (MIN.) (A Connection)
- Isolation Thickness : 0.4 mm (MIN.)
- Trigger LED Current (Ta = 25°C)

| CLASSIFICATION (Note 1) | Trigger LED Current (mA) | | MARKING OF CLASSIFICATION |
|----------------------------|-----------------------------|------|------------------------------|
| | @ION = 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. TLP798G (IFT2) : TLP798G

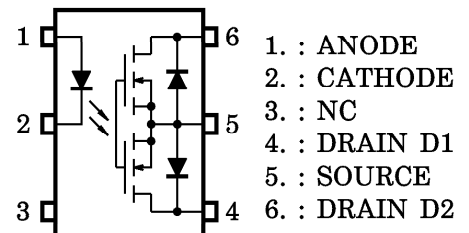
- BSI Approved : BS EN60065 : 1994, Certificate No. 8318
BS EN60950 : 1992, Certificate No. 8319
- Option (D4) type
TUV Approved : DIN VDE0884 / 06.92,
Certificate No. 9850585

Unit in mm

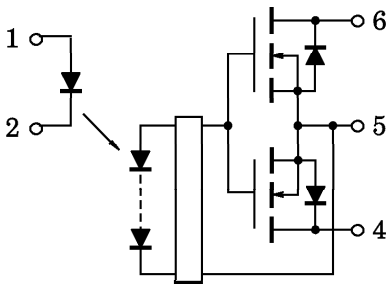


Weight : 0.49 g

PIN CONFIGURATION (TOP VIEW)



SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

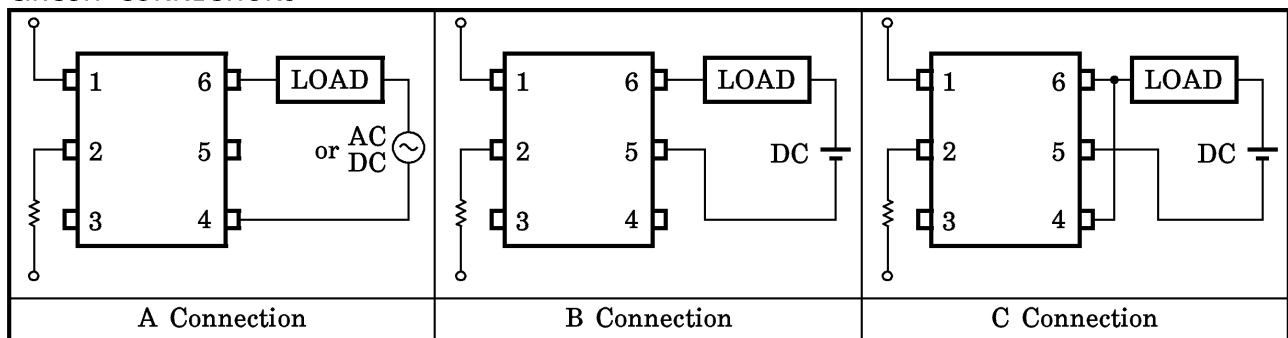
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|--|-------------------------|--------|---------|
| LED | Forward Current | I_F | 30 | mA |
| | Forward Current Derating (Ta ≥ 25°C) | $\Delta I_F / ^\circ C$ | -0.3 | mA / °C |
| | Peak Forward Current (100 μs pulse, 100 pps) | I_{FP} | 1 | A |
| | Reverse Voltage | V_R | 5 | V |
| | Junction Temperature | T_j | 125 | °C |
| DETECTOR | Off-State Output Terminal Voltage | V_{OFF} | 400 | V |
| | On-State RMS Current | A Connection | 150 | mA |
| | | B Connection | 200 | |
| | | C Connection | 300 | |
| | On-State Current Derating (Ta ≥ 25°C) | A Connection | -1.5 | mA / °C |
| | | B Connection | -2.0 | |
| C Connection | | -3.0 | | |
| 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 (10 s) | T_{sol} | 260 | °C | |
| Isolation Voltage (AC, 1min., R.H. ≤ 60%)(Note 2) | BV_S | 5000 | Vrms | |

(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 | V_{DD} | — | — | 320 | V |
| Forward Current | I_F | 10 | 15 | 20 | mA |
| On-State Current | I_{ON} | — | — | 150 | mA |
| Operating Temperature | T_{opr} | -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 mA | 1.2 | 1.4 | 1.7 | V |
| | Reverse Current | I _R | V _R = 3 V | — | — | 10 | μA |
| | Capacitance | C _T | V = 0, f = 1 MHz | — | 30 | — | pF |
| DETECTOR | Off-State Current | I _{OFF} | V _{OFF} = 400 V | — | — | 1 | μA |
| | Capacitance | C _{OFF} | V = 0, f = 1 MHz | — | 150 | — | pF |

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---------------------|--------------|-----------------|--|------|------|------|------|
| Trigger LED Current | | I _{FT} | I _{ON} = 150 mA | — | 1 | 5 | mA |
| On-State Resistance | A Connection | R _{ON} | I _{ON} = 150 mA, I _F = 10 mA | — | 8 | 12 | Ω |
| | B Connection | | I _{ON} = 200 mA, I _F = 10 mA | — | 4 | 6 | |
| | C Connection | | I _{ON} = 300 mA, I _F = 10 mA | — | 2 | 3 | |

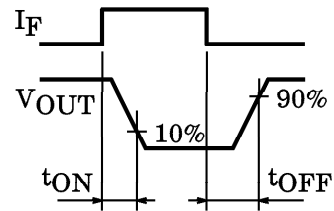
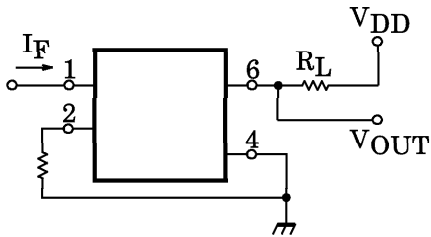
ISOLATION CHARACTERISTICS (Ta = 25°C)

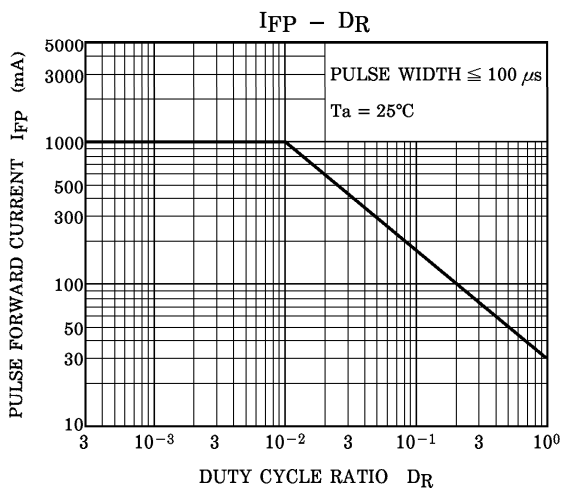
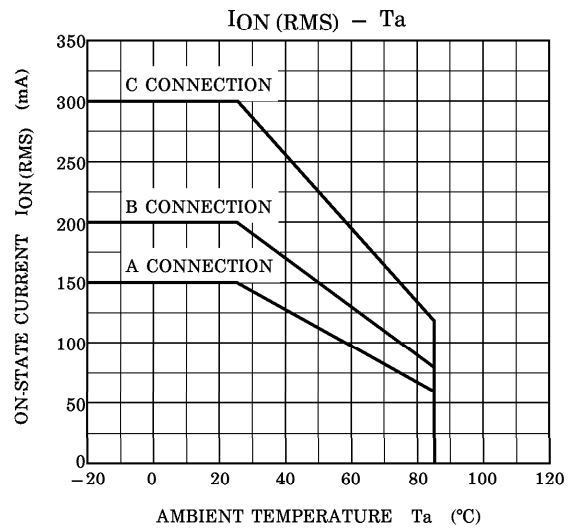
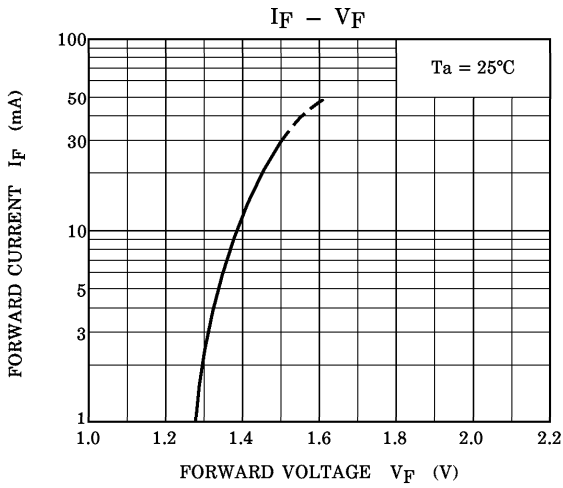
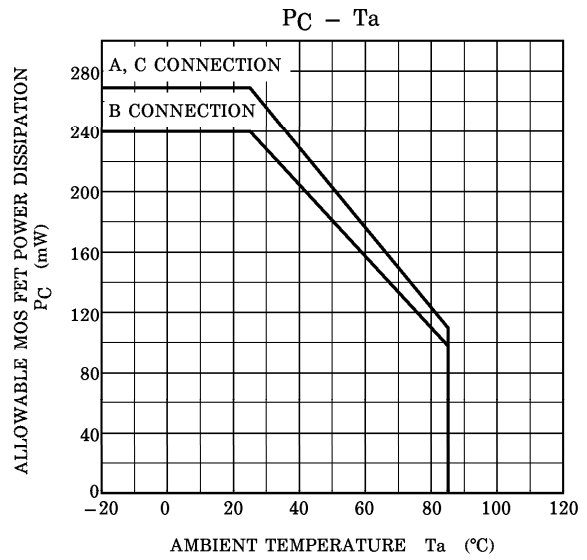
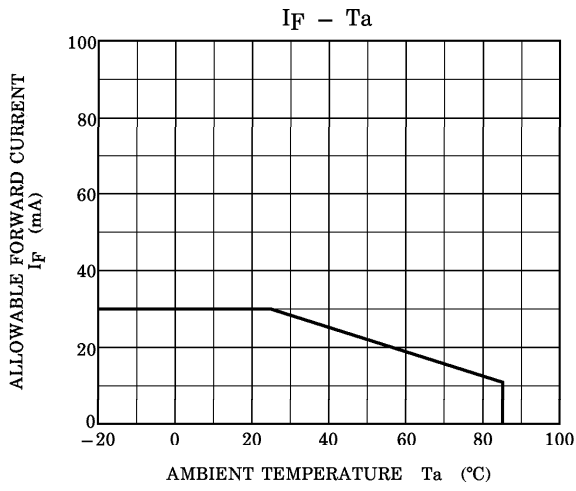
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-----------------|------------------------------------|----------------------|------------------|------|------------------|
| Capacitance Input to Output | C _S | V _S = 0, f = 1 MHz | — | 0.8 | — | pF |
| Isolation Resistance | R _S | V _S = 500 V, R.H. ≤ 60% | 5 × 10 ¹⁰ | 10 ¹⁴ | — | Ω |
| Isolation Voltage | BV _S | AC, 1 minute | 5000 | — | — | V _{rms} |
| | | AC, 1 second (in Oil) | — | 10000 | — | |
| | | DC, 1 minute (in Oil) | — | 10000 | — | V _{DC} |

SWITCHING CHARACTERISTICS (Ta = 25°C)

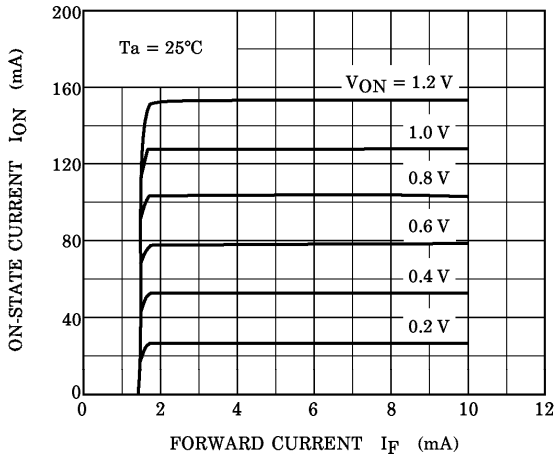
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------|------------------|--|------|------|------|------|
| Turn-on Time | t _{ON} | V _{DD} = 20 V, R _L = 200 Ω | — | 0.3 | 1.0 | ms |
| Turn-off Time | t _{OFF} | I _F = 10 mA (Note 3) | — | 0.2 | 1.0 | |

(Note 3) : SWITCHING TIME TEST CIRCUIT

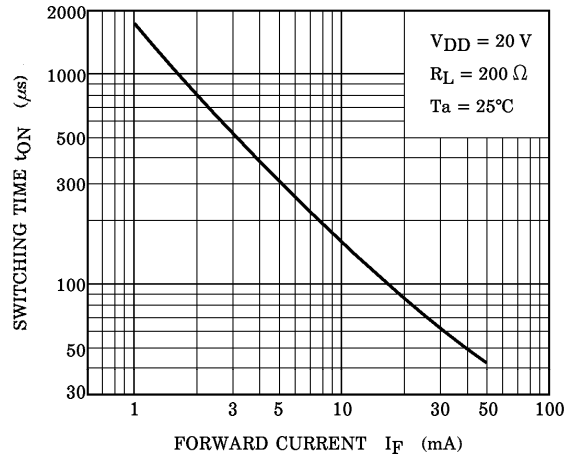




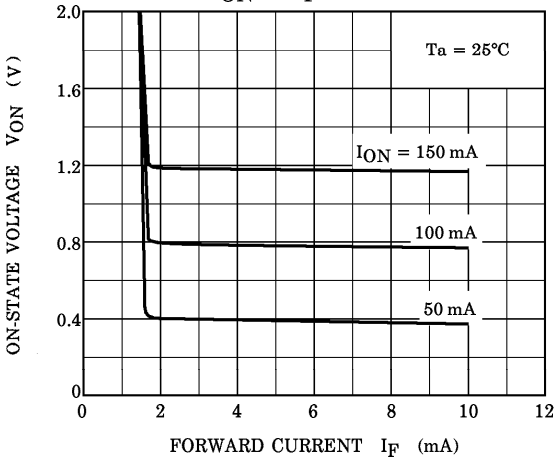
$I_{ON} - I_F$ (A CONNECTION)



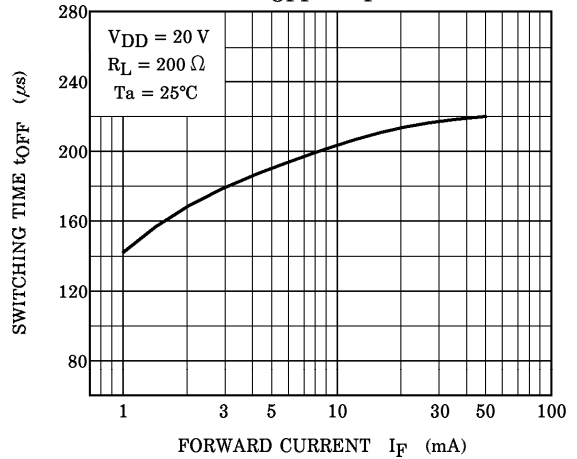
$t_{ON} - I_F$



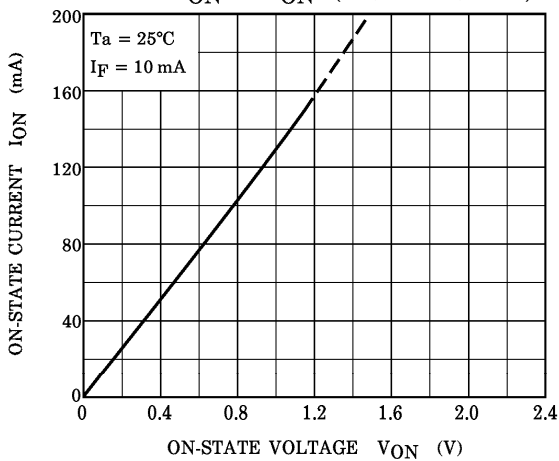
$V_{ON} - I_F$ (A CONNECTION)

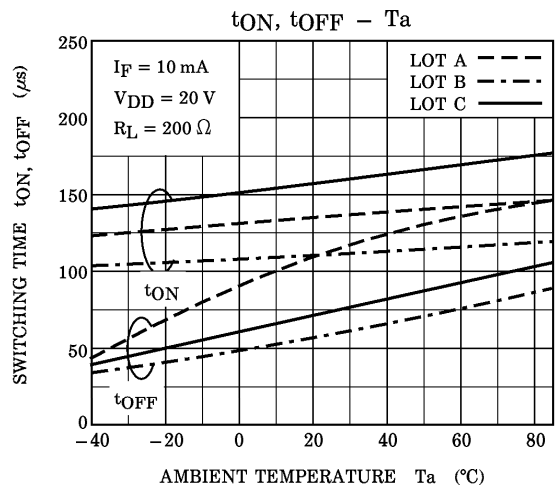
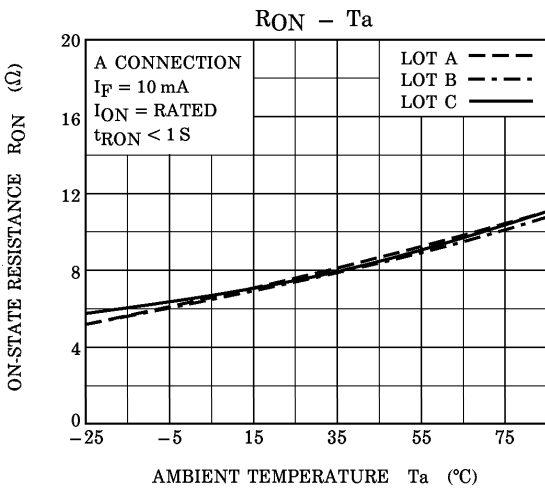
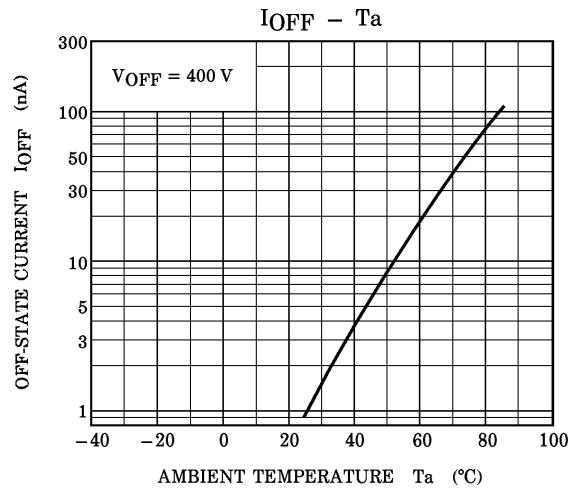
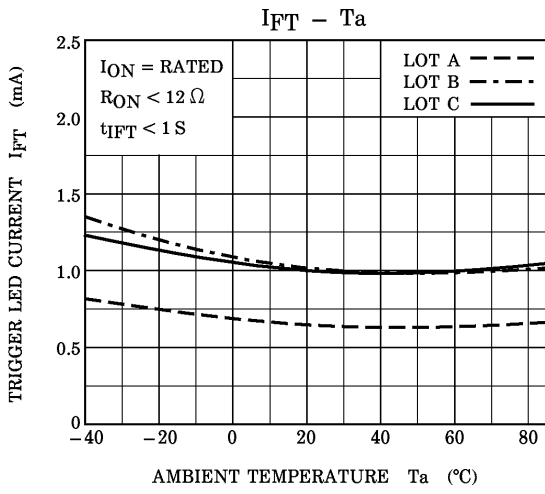


$t_{OFF} - I_F$



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





RESTRICTIONS ON PRODUCT USE

000707EBC

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