

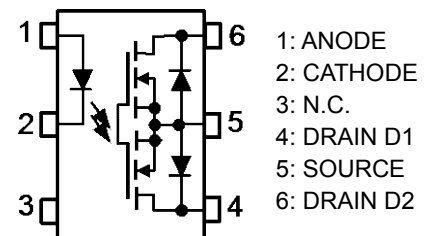
TLP598GA

Measurement Instrumentation

The TLP598GA 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)
- On-state resistance: 12 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL approved: UL1577, File No.E67349

Pin Configuration (top view)



2017-06-08

Absolute Maximum Ratings (Ta = 25°C)

| Characteristic | | | Symbol | Rating | Unit |
|---|---|------------------|-----------------------|------------------|---------|
| LED | Forward current | | I _F | 30 | mA |
| | Forward current derating (Ta ≥ 25°C) | | ΔI _F / °C | -0.3 | mA / °C |
| | Peak forward current (100 μs pulse, 100 pps) | | I _{FP} | 1 | A |
| | Reverse voltage | | V _R | 5 | V |
| | Diode power dissipation | | P _D | 50 | mW |
| | Diode power dissipation derating (Ta >25°C) | | ΔP _D /°C | -0.5 | mW/°C |
| | Junction temperature | | T _j | 125 | °C |
| Detector | Off-state output terminal voltage | | V _{OFF} | 400 | V |
| | On-state RMS current | A connection | I _{ON} | 150 | mA |
| | | B connection | | 200 | |
| | | C connection | | 300 | |
| | On-state current derating (Ta ≥ 25°C) | A connection | ΔI _{ON} / °C | -1.5 | mA / °C |
| | | B connection | | -2.0 | |
| | | C connection | | -3.0 | |
| | Output power dissipation | A connection | P _O | 270 | mW |
| | | B connection | | 240 | |
| | | C connection | | 270 | |
| | Output power dissipation derating (Ta ≥ 25°C) | A connection | ΔP _O / °C | -2.7 | mW / °C |
| | | B connection | | -2.4 | |
| | | C connection | | -2.7 | |
| | Junction temperature | | T _j | 125 | °C |
| Storage temperature range | | T _{stg} | -55 to 125 | °C | |
| Operating temperature range | | T _{opr} | -40 to 85 | °C | |
| Lead soldering temperature (10 s) | | T _{sol} | 260 | °C | |
| Isolation voltage (AC, 60 s, R.H. ≤ 60%) (Note 1) | | BV _s | 2500 | V _{rms} | |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

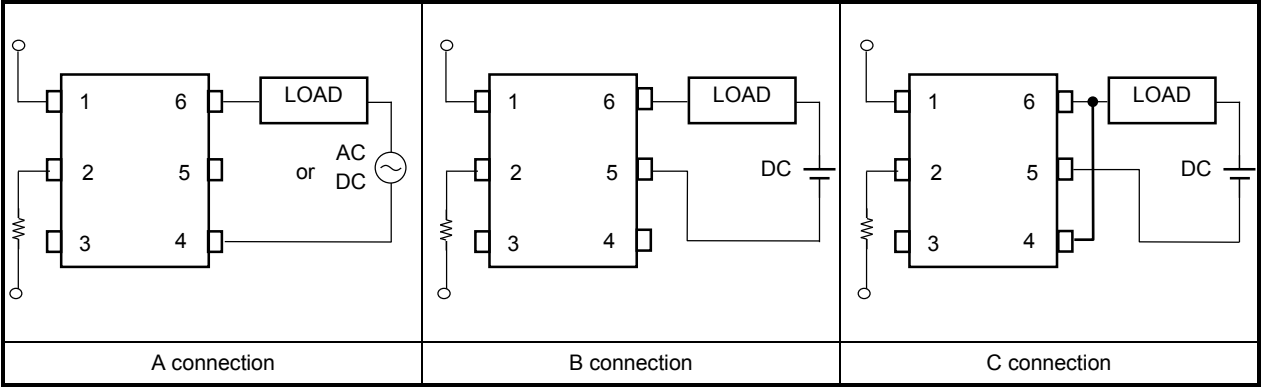
Note 1: Device considered a two-terminal device: Pins 1, 2 and 3 shorted together, and pins 4, 5 and 6 shorted together.

Recommended Operating Conditions

| Characteristic | Symbol | Min | Typ. | Max | Unit |
|---------------------------------|------------------|-----|------|-----|------|
| Supply voltage | V _{DD} | — | — | 320 | V |
| Forward current | I _F | 5 | 7.5 | 20 | mA |
| On-state current (A connection) | I _{ON} | — | — | 150 | mA |
| Operating temperature | T _{opr} | -20 | — | 80 | °C |

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Circuit Connections



Electrical Characteristics (Ta = 25°C)

| Characteristic | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|----------------|-------------------|------------------|--------------------------|------|------|------|------|
| LED | Forward voltage | V _F | I _F = 10 mA | 1.18 | 1.33 | 1.48 | V |
| | Reverse current | I _R | V _R = 5 V | — | — | 10 | μA |
| | Capacitance | C _T | V = 0 V, f = 1 MHz | — | 30 | — | pF |
| Detector | Off-state current | I _{OFF} | V _{OFF} = 400 V | — | — | 1 | μA |
| | Capacitance | C _{OFF} | V = 0 V, f = 1 MHz | — | — | — | 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 | 3 | mA |
| On-state resistance | A connection | R _{ON} | I _{ON} = 150 mA, I _F = 5 mA | — | 8 | 12 | Ω |
| | B connection | | I _{ON} = 200 mA, I _F = 5 mA | — | 4 | 6 | |
| | C connection | | I _{ON} = 300 mA, I _F = 5 mA | — | 2 | 3 | |

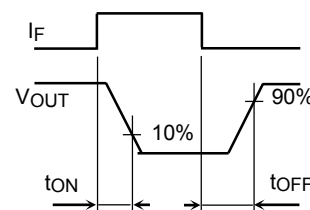
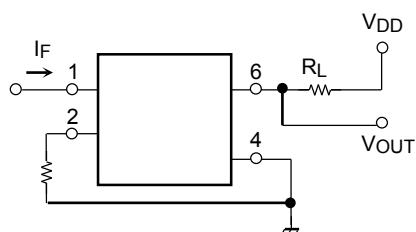
Isolation Characteristics (Ta = 25°C)

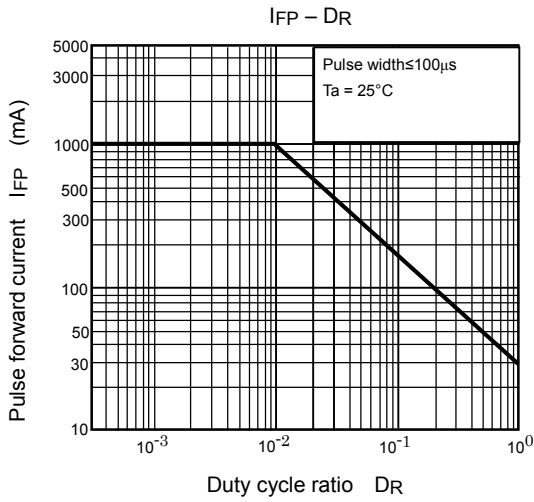
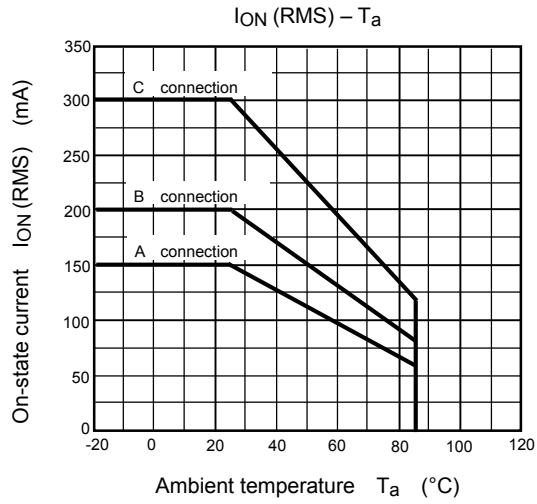
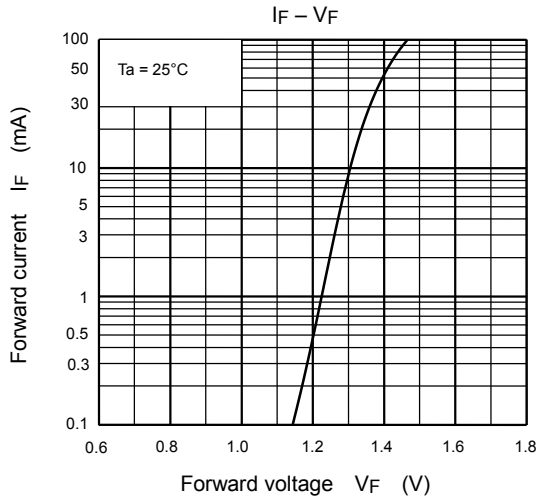
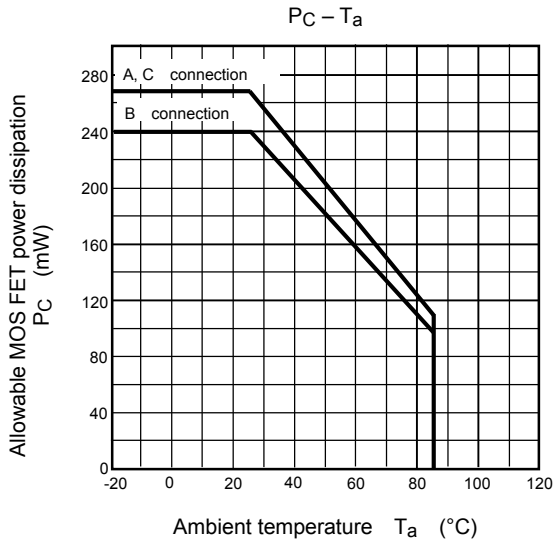
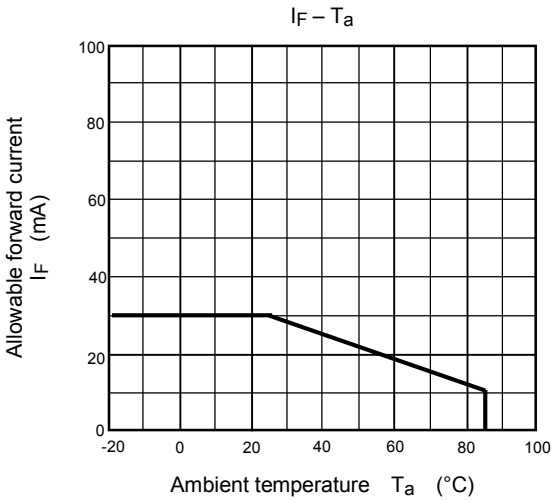
| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------|-----------------|------------------------------------|----------------------|------------------|-----|------------------|
| Capacitance input to output | C _S | V _S = 0, f = 1 MHz | — | 0.8 | — | pF |
| Isolation resistance | R _S | V _S = 500 V, R.H. ≤ 60% | 5 × 10 ¹⁰ | 10 ¹⁴ | — | Ω |
| Isolation voltage | BV _S | AC, 60 s | 2500 | — | — | V _{rms} |
| | | AC, 1 s (in oil) | — | 5000 | — | |
| | | DC, 60 s (in oil) | — | 5000 | — | 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 I _F = 5 mA (Note 2) | — | 0.3 | 1.0 | ms |
| Turn-off time | t _{OFF} | | — | 0.2 | 1.0 | |

Note 2: Switching time test circuit





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