TOSHIBA Photocoupler Photorelay

TLP4197G

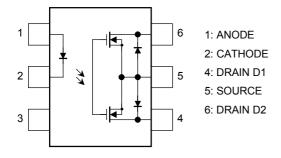
PBX Telecommunication Modem · FAX Cards, Modems In PC Measurement Instrumentation

The TOSHIBA TLP4197G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP, which is suitable for surface mount assembly.

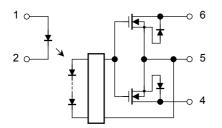
The TLP4197GA is suitable for replacement of mechanical relays in many applications which require space savings.

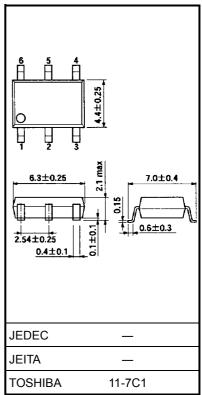
- 6 pin SOP (2.54SOP6): 2.1 mm high, 2.54 mm pitch
- 1-form-B
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 120 mA (max)
- On-state resistance: 25Ω (max)
- Isolation voltage: 1500 Vrms (min)

Pin Configuration (top view)



Schematic





Weight: 0.13 g (typ.)

Maximum Ratings (Ta = 25°C)

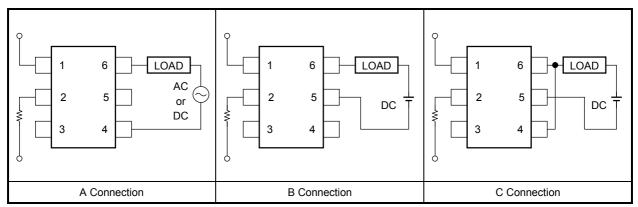
| Characteristics | | | Symbol | Rating | Unit |
|---|---|----------------|----------------------|------------|-------|
| LED | Forward current | | ١ _F | 50 | mA |
| | Forward current d (Ta≧25°C) | erating | ∆I _F /°C | -0.5 | mA/°C |
| | Peak forward curr (100 μs pulse, 100 | | I _{FP} | 1 | А |
| | Reverse voltage | | V _R | 5 | V |
| | Junction temperat | ure | Tj | 125 | °C |
| | Off-state output te | rminal voltage | V _{OFF} | 350 | V |
| | On-state current | A connection | I _{ON} | 120 | |
| | | B connection | | 120 | mA |
| ctor | | C connection | | 240 | |
| Detector | On-state current derating (Ta ≧ 25°C) | A connection | | -1.2 | |
| | | B connection | ∆l _{ON} /°C | -1.2 | mA/°C |
| | | C connection | | -2.4 | |
| | Junction temperat | ure | Tj | 125 | °C |
| Operating temperature range | | | T _{opr} | -40 to 85 | °C |
| Storage temperature range | | | T _{stg} | -55 to 125 | °C |
| Lead soldering temperature (10 s) | | | T _{sol} | 260 | °C |
| Isolation voltage (AC, 1 min, R.H. \leq 60%) (Note 1) | | | BVS | 1500 | Vrms |

Note 1: Device considered a two-terminal device: LED side pins shorted together, and DETECTOR side pins and 6 shorted together.

Recommended Operating Conditions

| Characteristics | Symbol | Min | Тур. | Max | Unit |
|-----------------------|------------------|-----|------|-----|------|
| Supply voltage | V _{DD} | | _ | 280 | V |
| Forward current | ١ _F | 5 | _ | 25 | mA |
| On-state current | I _{ON} | _ | _ | 120 | mA |
| Operating temperature | T _{opr} | -20 | | 65 | °C |

Circuit Connections



Individual Electrical Characteristics (Ta = 25°C)

| Characteristics | | Symbol | Test Condition | Min | Тур. | Max | Unit |
|-----------------|-------------------|------------------|---|-----|------|-----|------|
| LED | Forward voltage | VF | I _F = 10 mA | 1.0 | 1.15 | 1.3 | V |
| | Reverse current | I _R | $V_R = 5 V$ | | _ | 10 | μA |
| | Capacitance | CT | V = 0, f = 1 MHz | _ | 30 | _ | pF |
| Detec- tor | Off-state current | I _{OFF} | V _{OFF} = 350 V, I _F = 5 mA | | _ | 1 | μA |
| | Capacitance | C _{OFF} | $V = 0, f = 1 \text{ MHz}, I_F = 5 \text{ mA}$ | | | _ | pF |

Coupled Electrical Characteristics (Ta = 25°C)

| 項 目 | | 記号 | 測定条件 | 最小 | 標準 | 最大 | 単位 |
|---------------------|--------------|-----------------|--------------------------|-----|----|----|----|
| Trigger LED current | | I _{FC} | $I_{OFF} = 10 \ \mu A$ | _ | 1 | 3 | mA |
| Return LED current | | I _{FT} | I _{ON} = 120 mA | 0.1 | _ | _ | mA |
| | A connection | _ | I _{ON} = 120 mA | | 15 | 25 | |
| On-state resistance | B connection | | I _{ON} = 120 mA | | 8 | 14 | Ω |
| | C connection | | I _{ON} = 240 mA | _ | 4 | _ | |

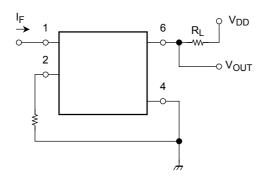
Isolation Characteristics (Ta = 25°C)

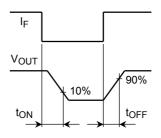
| Characteristics | Symbol | Test Condition | Min | Тур. | Max | Unit |
|-----------------------------|----------------|---|-------------------|------------------|-----|------|
| Capacitance input to output | CS | $V_{S} = 0, f = 1 MHz$ | | 0.8 | _ | pF |
| Isolation resistance | R _S | $V_S = 500 \text{ V}, \text{ R.H.} \leq 60\%$ | 5×10^{10} | 10 ¹⁴ | _ | Ω |
| | BVS | AC, 1 min | 1500 | | | Vrms |
| Isolation voltage | | AC, 1 s, in oil | | 3000 | _ | |
| | | DC, 1 min, in oil | _ | 3000 | _ | Vdc |

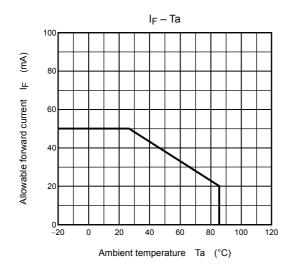
Switching Characteristics (Ta = 25°C)

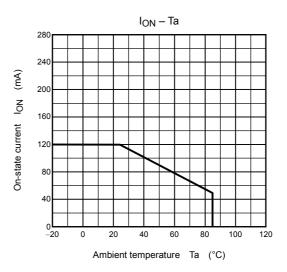
| Characteristics | Symbol | Test Condition | Min | Тур. | Max | Unit |
|-----------------|-----------------|--|-----|------|-----|------|
| Turn-on time | t _{ON} | $R_L = 200 \Omega$ (Note 2) | _ | | 1 | ms |
| Turn-off time | tOFF | $V_{DD} = 20 \text{ V}, \text{ I}_{\text{F}} = 5 \text{ mA}$ | _ | | 3 | ms |

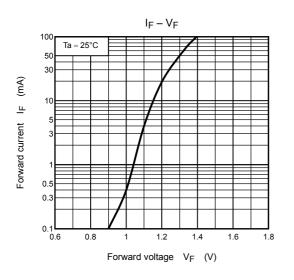
Note 2: Switching time test circuit

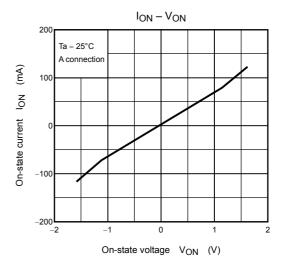


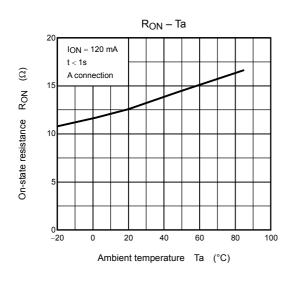


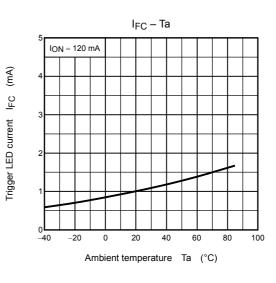


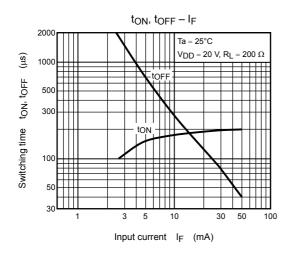


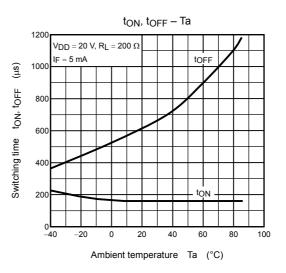


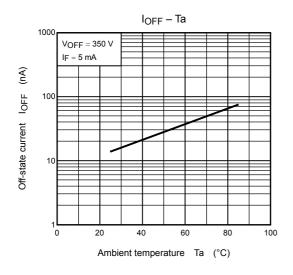












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