

TOSHIBA PHOTOCOUPLER PHOTO-RELAY

TLP224G, TLP224G-2

MODEMS

PBX

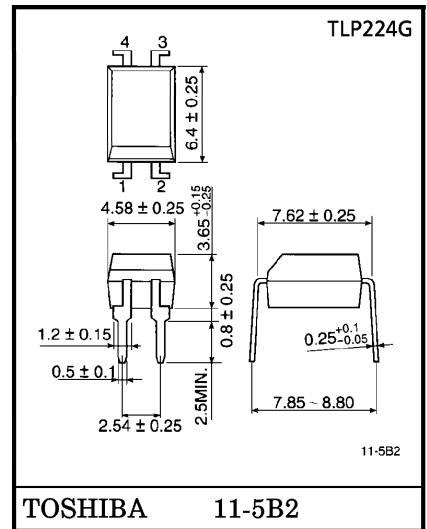
TELECOMMUNICATIONS

The TOSHIBA TLP224G series consists of gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a 4pin DIP (DIP4), which is suitable for equipment for high tech communications, including modems.

The TLP224G series complies with FCC part 68 rules with current limiting function.

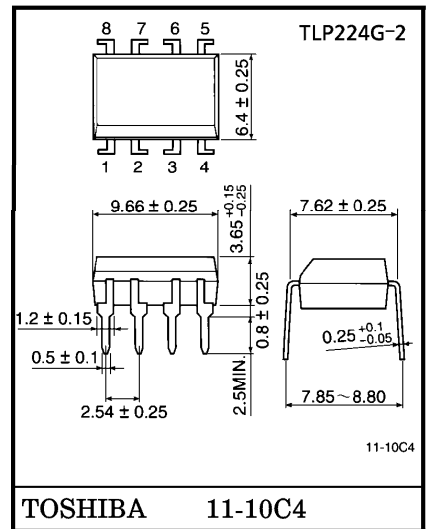
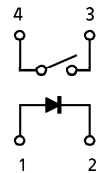
- TLP224G : 4 PIN DIP, 1 Channel Type (1 Form A)
- TLP224G-2 : 8 PIN DIP, 2 Channel Type (2 Form A)
- Peak Off-State Voltage : 350 V (min)
- Trigger LED Current : 3 mA (max)
- On-State Current : 120 mA (max)
- Load Current Limiting : 150 mA~300 mA (t = 5 ms)
- On-State Resistance : 35 Ω (max)
- Isolation Voltage : 2500 Vrms (min)
- UL Recognized : UL1577, File No. E67349

Unit in mm



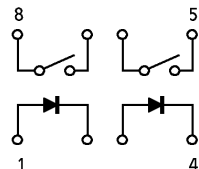
Weight : 0.26 g

1 Form A

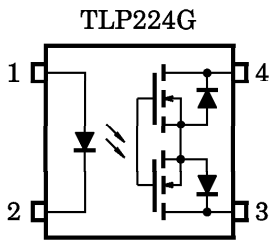


Weight : 0.54 g

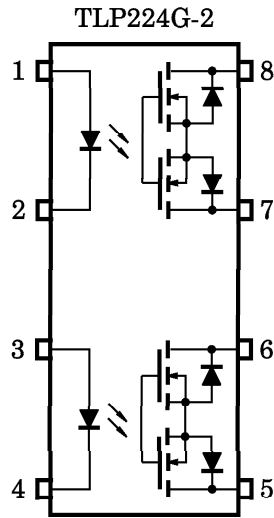
2 Form A



PIN CONFIGURATION (TOP VIEW)

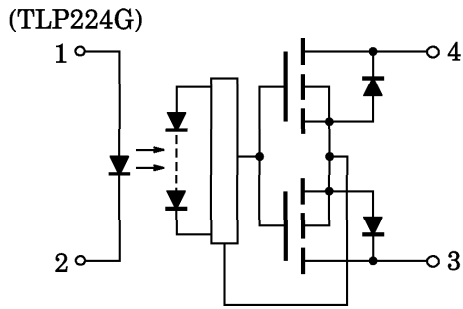


- 1 : ANODE
- 2 : CATHODE
- 3 : DRAIN 1
- 4 : DRAIN 2



- 1, 3 : ANODE
- 2, 4 : CATHODE
- 5 : DRAIN 1
- 6 : DRAIN 2
- 7 : DRAIN 3
- 8 : DRAIN 4

INTERNAL CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|---|-----------------------|---------|------------------|
| LED | Forward Current | I _F | 50 | mA |
| | Forward Current Derating (Ta ≥ 25°C) | ΔI _F / °C | -0.5 | mA / °C |
| | Peak Forward Current (100 μs pulse, 100 pps) | I _{FP} | 1 | A |
| | Reverse Voltage | V _R | 6 | V |
| | Junction Temperature | T _j | 125 | °C |
| DETECTOR | Off-State Output Terminal Voltage | V _{OFF} | 350 | V |
| | On-State Current (Note 1) | I _{ON} | 120 | mA |
| | On-State Current Derating (Ta ≥ 25°C) (Note 1) | ΔI _{ON} / °C | -1.2 | mA / °C |
| | 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, 1 min., R.H. ≤ 60%) (Note 2) | | BV _S | 2500 | V _{rms} |

(Note 1) : Two channles operating simultaneously.

(Note 2) : Device considered a two-terminal device : LED side pins shoted together, and Detector side pins shored together.

RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC | SYMBOL | MIN | TYP. | MAX | UNIT |
|-----------------------|------------------|-----|------|-----|------|
| Supply Voltage | V _{DD} | — | — | 280 | V |
| Forward Current | I _F | 5 | 7.5 | 25 | mA |
| On-State Current | I _{ON} | — | — | 100 | mA |
| Operating Temperature | T _{opr} | -20 | — | 65 | °C |

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN | TYP. | MAX | UNIT |
|----------------|-------------------|------------------|--------------------------|-----|------|-----|------|
| LED | Forward Voltage | V _F | I _F = 10 mA | 1.0 | 1.15 | 1.3 | V |
| | Reverse Current | I _R | V _R = 6 V | — | — | 10 | μA |
| | Capacitance | C _T | V = 0, f = 1 MHz | — | 30 | — | pF |
| DETECTOR | Off-State Current | I _{OFF} | V _{OFF} = 350 V | — | — | 1 | μA |
| | Capacitance | C _{OFF} | V = 0, f = 1 MHz | — | 40 | — | pF |

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN | TYP. | MAX | UNIT |
|-----------------------|------------------|--|-----|------|-----|------|
| Trigger LED Current | I _{FT} | I _{ON} = 120 mA | — | 1 | 3 | mA |
| Load Current Limiting | I _{LIM} | I _F = 5 mA, V _{DD} = 5 V, t = 5 ms | 150 | — | 300 | mA |
| On-State Resistance | R _{ON} | I _{ON} = 120 mA, I _F = 5 mA | — | 22 | 35 | Ω |

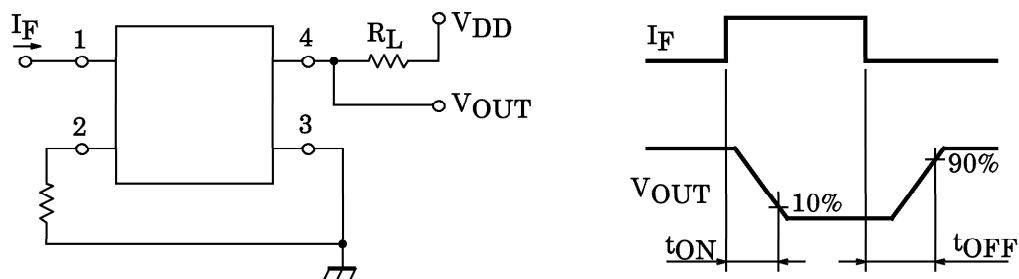
ISOLATION CHARACTERISTICS (Ta = 25°C)

| 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 | 2500 | — | — | V _{rms} |
| | | 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 Ω (Note 1) | — | — | 1 | ms |
| Turn-off Time | t _{OFF} | V _{CC} = 20 V, I _F = 5 mA | — | — | 1 | |

(Note 1) : SWITCHING TIME TEST CIRCUIT



RESTRICTIONS ON PRODUCT USE

000707EBC

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