

TOSHIBA

TLP225A

TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP225A

PROGRAMMABLE CONTROLLERS

I/O BOARD INTERFACE

DC-OUTPUT MODULE

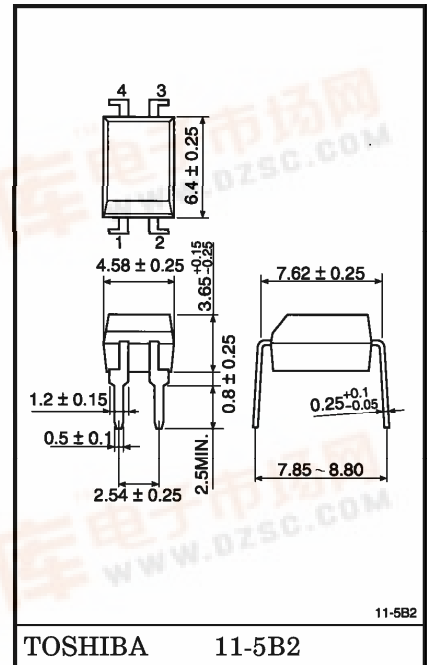
REPLACEMENT FOR DC MECHANICAL RELAY

The TOSHIBA TLP225A consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a four lead plastic DIP package (DIP4).

(The TLP225A is MOSFET output and can control a current of 0.5 A which is suitable for DC output module.)

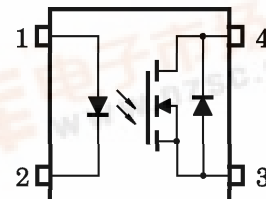
- Peak Off-State Voltage : 60 V (Min.)
- Trigger LED Current : 5 mA (Max.)
- On-State Current : 500 mA (Max.)
- On-State Resistance : 1.1 Ω (Max.)
- Isolation Voltage : 2500 Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



Weight : 0.27 g

PIN CONFIGURATION (TOP VIEW)



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

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|--|--|----------------------------------|---------|---------|
| LED | Forward Current | I_F | 50 | mA |
| | Forward Current Derating (Ta \geq 53°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 Current | I_{ON} | 500 | mA |
| | On-State Current Derating (Ta \geq 25°C) | $\Delta I_{ON} / ^\circ\text{C}$ | -5.0 | mA / °C |
| | Junction Temperature | T_j | 125 | °C |
| Storage Temperature Range | | T_{stg} | -55~125 | °C |
| Operating Temperature Range | | T_{opr} | -20~85 | °C |
| Lead Soldering Temperature (10 s) | | T_{sol} | 260 | °C |
| Isolation Voltage (AC, 1min., R.H. \leq 60%) (Note 1) | | BVS | 2500 | Vrms |

(Note 1) : Pins 1 and 2 shorted together and pins 3 and 4 shorted together.

RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------|-----------|------|------|------|------|
| Supply Voltage | V_{DS} | — | — | 48 | V |
| Forward Current | I_F | 12 | 20 | 30 | mA |
| Collector Current | I_{ON} | — | — | 300 | mA |
| Operating Temperature | T_{opr} | -20 | — | 60 | °C |

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 | μA |
| | Capacitance | C_T | $V = 0, f = 1 \text{ MHz}$ | — | 30 | — | pF |
| DETECTOR | Off-State Current | I_{OFF} | $V_{OFF} = 60 \text{ V}$ | — | — | 1 | μA |
| | Capacitance | C_{OFF} | $V = 0, f = 1 \text{ MHz}$ | — | — | — | 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 | 5 | mA |
| On-State Resistance | R_{ON} | $I_{ON} = 500 \text{ mA}, I_F = 10 \text{ mA}$ | — | 0.8 | 1.1 | Ω |

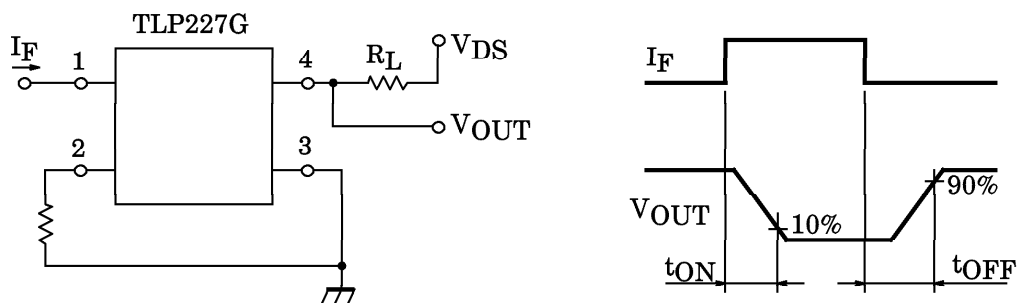
ISOLATION CHARACTERISTICS (Ta = 25°C)

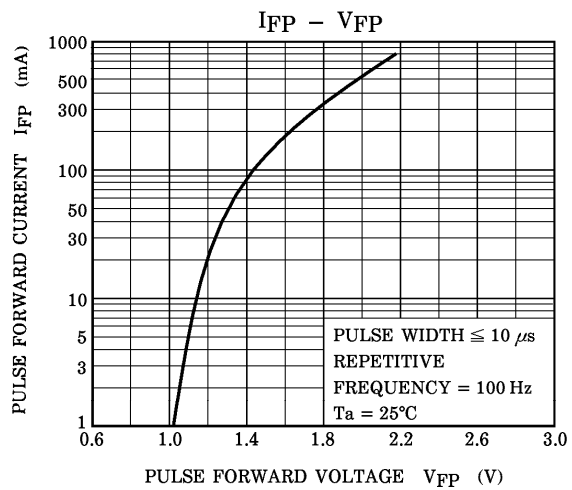
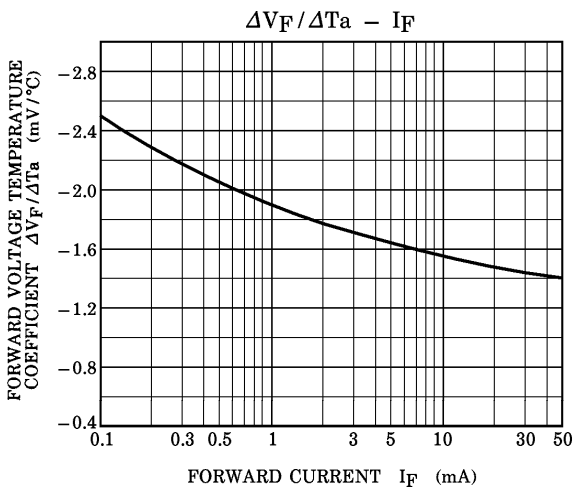
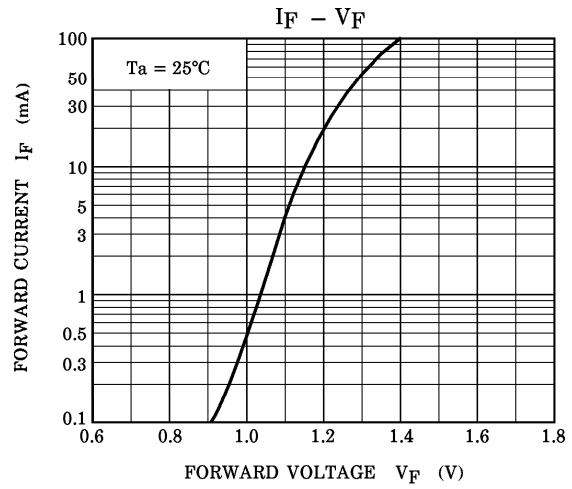
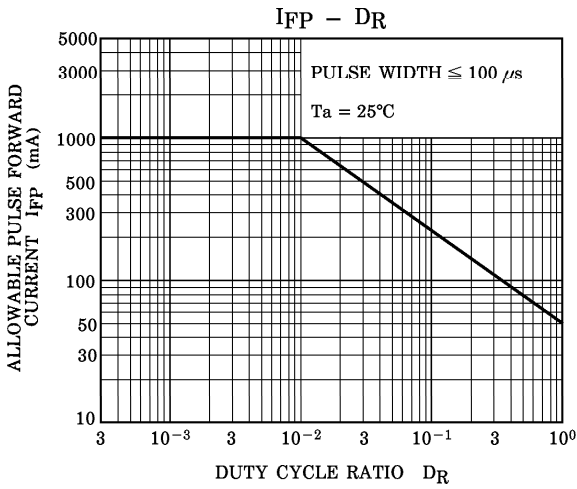
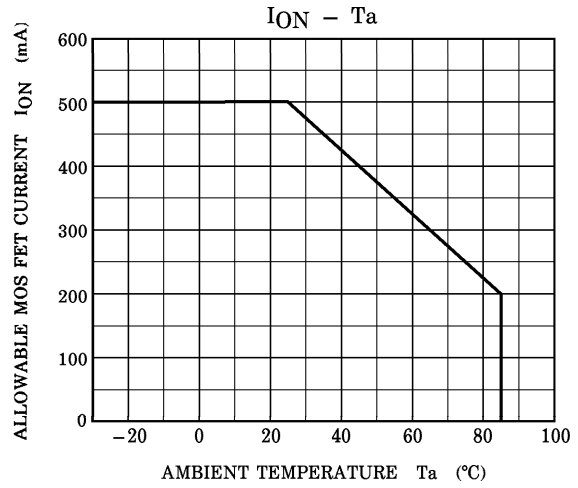
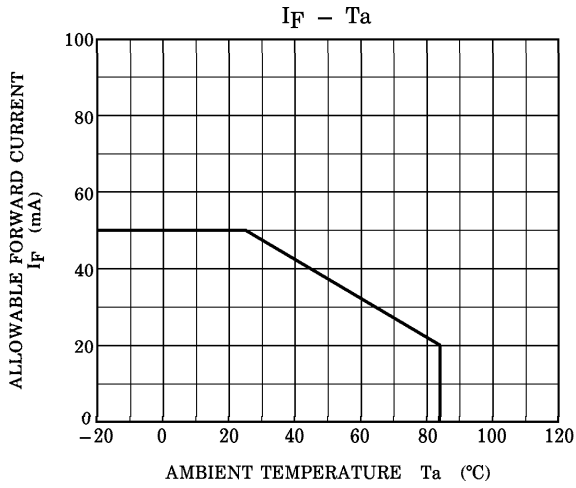
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|--------|--|--------------------|-----------|------|----------|
| Capacitance Input to Output | C_S | $V_S = 0, f = 1 \text{ MHz}$ | — | 0.8 | — | pF |
| Isolation Resistance | R_S | $V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$ | 5×10^{10} | 10^{14} | — | Ω |
| Isolation Voltage | BV_S | AC, 1 minute | 2500 | — | — | Vrms |
| | | AC, 1 second, in oil | — | 5000 | — | — |
| | | DC, 1 minute, in oil | — | 5000 | — | — |

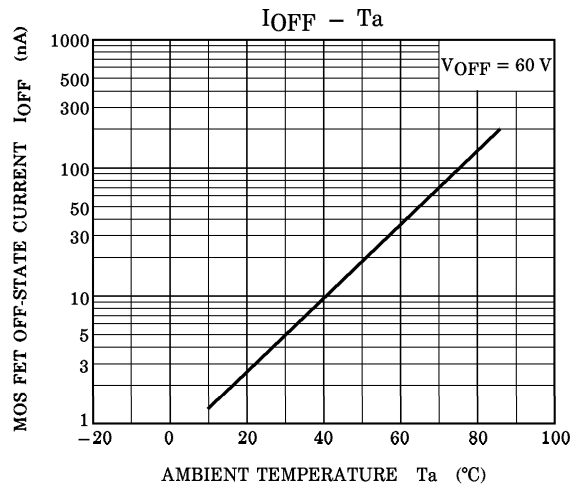
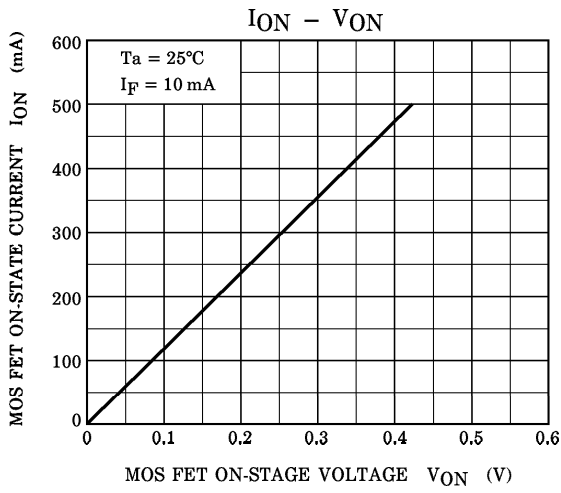
SWITCHING CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------|--|------|------|------|------|
| Turn-on Time | t_{ON} | $R_L = 200 \Omega$ (Note 2) | — | — | 2 | ms |
| Turn-off Time | t_{OFF} | $V_{DS} = 20 \text{ V}, I_F = 10 \text{ mA}$ | — | — | 2 | |

(Note 2) : SWITCHING TIME TEST CIRCUIT







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