

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP627, TLP627-2, TLP627-4

PROGRAMMABLE CONTROLLERS.
DC - OUTPUT MODULE.
TELECOMMUNICATION.

The TOSHIBA TLP627, -2, and -4 consist of a gallium arsenide infrared emitting diode optically coupled to a darlington connected phototransistor which has an integral base-emitter resistor to optimize switching speed and elevated temperature characteristics.

The TLP627-2 offers two isolated channels in a eight lead plastic DIP, while the TLP627-4 provide four isolated channels per package.

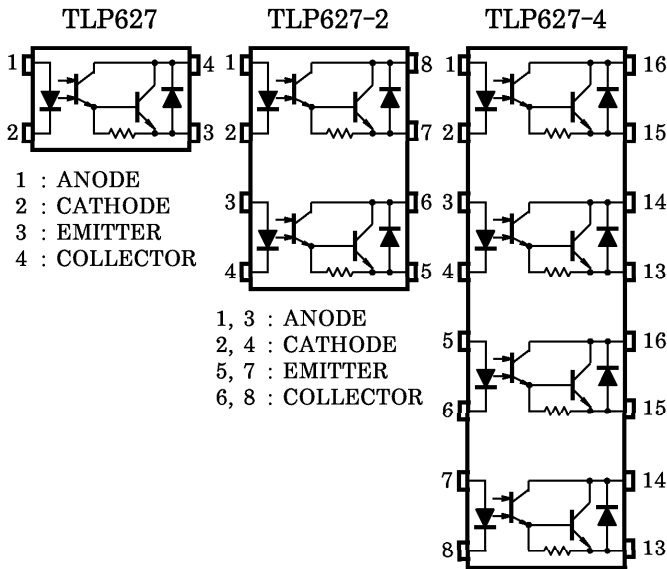
- Collector-Emitter Voltage : 300V (Min.)
- Current Transfer Ratio : 1000% (Min.)
- Isolation Voltage : 5000Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

| | MADE IN JAPAN | | MADE IN THAILAND | |
|---------------|---------------|----|------------------|----|
| UL Recognized | E67349 | *1 | E152349 | *1 |
| BSI Approved | 7426, 7427 | *2 | 7426, 7427 | *2 |

*1 UL1577

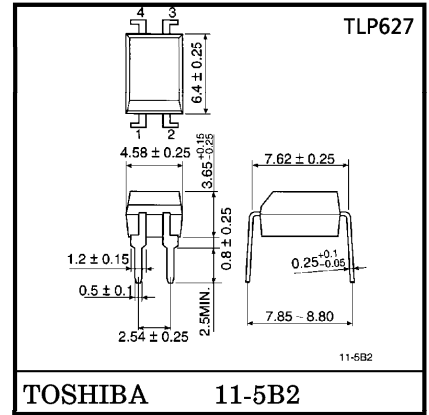
*2 BS EN60065 : 1994, BS EN60950 : 1992

PIN CONFIGURATIONS (TOP VIEW)

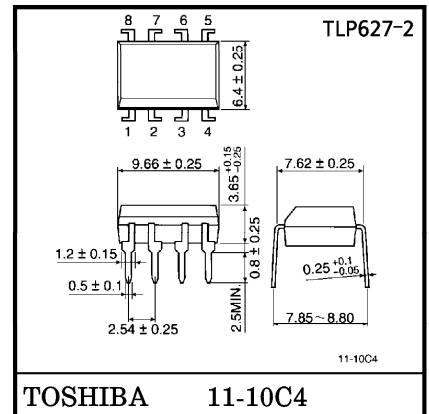


1, 3, 5, 7 : ANODE
2, 4, 6, 8 : CATHODE
9, 11, 13, 15 : EMITTER
10, 12, 14, 16 : COLLECTOR

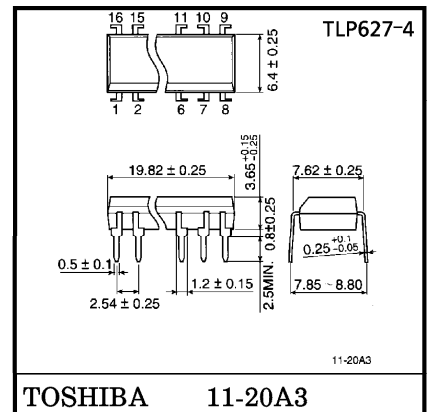
Unit in mm



Weight : 0.26g



Weight : 0.54g



Weight : 1.1g

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | RATING | | UNIT |
|---|---|-------------------------|------------------------------|----------------------|---------|
| | | | TLP627 | TLP627-2 TLP627-4 | |
| LED | Forward Current | I_F | 60 | 50 | mA |
| | Forward Current Derating | $\Delta I_F / ^\circ C$ | -0.7 (Ta ≥ 39°C) | -0.5 (Ta ≥ 25°C) | mA / °C |
| | Pulse Forward Current | I_{FP} | 1 (100μs pulse, 100pps) | | A |
| | Power Dissipation (1 Circuit) | P_D | 100 | 70 | mW |
| | Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit) | $\Delta P_D / ^\circ C$ | -1.0 | -0.7 | mW / °C |
| | Reverse Voltage | V_R | 5 | | V |
| | Junction Temperature | T_j | 125 | | °C |
| DETECTOR | Collector-Emitter Voltage | V_{CEO} | 300 | | V |
| | Emitter-Collector Voltage | V_{ECO} | 0.3 | | V |
| | Collector Current | I_C | 150 | | mA |
| | Collector Power Dissipation (1 Circuit) | P_C | 150 (*300) | 100 | mW |
| | Collector Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit) | $\Delta P_C / ^\circ C$ | -1.5 (*-3.5) | -1.0 | mW / °C |
| | Junction Temperature | T_j | 125 | | °C |
| Storage Temperature Range | | T_{stg} | -55~125 | | °C |
| Operating Temperature Range | | T_{opr} | -55~100 | | °C |
| Lead Soldering Temperature | | T_{sold} | 260 (10sec) | | °C |
| Total Package Power Dissipation (1 Circuit) | | P_T | 250 (*320) | 150 | mW |
| Total Package Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit) | | $\Delta P_T / ^\circ C$ | -2.5 (*-3.2) | -1.5 | mW / °C |
| Isolation Voltage | | BV_S | 5000 (AC, 1min., R.H. ≤ 60%) | | Vrms |

* $I_F = 20mA$ Max

RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------------------|-----------|------|------|------|------|
| Supply Voltage | V_{CC} | — | — | 200 | V |
| Forward Current | I_F | — | 16 | 25 | mA |
| Collector Current | I_C | — | — | 120 | mA |
| Operating Temperature | T_{opr} | -25 | — | 85 | °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 | Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 0.1\text{mA}$ | 300 | — | — | V |
| | Emitter-Collector Breakdown Voltage | $V_{(BR)ECO}$ | $I_E = 0.1\text{mA}$ | 0.3 | — | — | V |
| | Collector Dark Current | I_{CEO} | $V_{CE} = 200\text{V}$ | — | 10 | 200 | nA |
| | | | $V_{CE} = 200\text{V}, T_a = 85^\circ\text{C}$ | — | — | 20 | μA |
| Capacitance Collector to Emitter | C_{CE} | $V = 0, f = 1\text{MHz}$ | — | 10 | — | pF | |

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|-------------------------|---|------|------|------|------|
| Current Transfer Ratio | I_C / I_F | $I_F = 1\text{mA}, V_{CE} = 1\text{V}$ | 1000 | 4000 | — | % |
| Saturated CTR | $I_C / I_F(\text{sat})$ | $I_F = 10\text{mA}, V_{CE} = 1\text{V}$ | 500 | — | — | % |
| Collector-Emitter Saturation Voltage | $V_{CE}(\text{sat})$ | $I_C = 10\text{mA}, I_F = 1\text{mA}$ | — | — | 1.0 | V |
| | | $I_C = 100\text{mA}, I_F = 10\text{mA}$ | 0.3 | — | 1.2 | |

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 | $V_S = 500\text{V R.H.} \leq 60\%$ | 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 | — | Vdc |

SWITCHING CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------|---|------|------|------|---------|
| Rise Time | t_r | $V_{CC} = 10V$ $I_C = 10mA$ $R_L = 100\Omega$ | — | 40 | — | μs |
| Fall Time | t_f | | — | 15 | — | |
| Turn-on Time | t_{on} | | — | 50 | — | |
| Turn-off Time | t_{off} | | — | 15 | — | |
| Turn-on Time | t_{ON} | $R_L = 180\Omega$ (Fig.1) $V_{CC} = 10V, I_F = 16mA$ | — | 5 | — | μs |
| Strage Time | t_s | | — | 40 | — | |
| Tuen-off Time | t_{OFF} | | — | 80 | — | |

Fig.1 SWITCHING TIME TEST CIRCUIT

