Photocouplers Infrared LED & Photo IC

# TLP5772

## 1. Applications

- Photovoltaic (PV) Power Conditioning Systems
- AC Servos
- Compact Motor Drivers
- Industrial Sewing Machines
- Industrial Inverters

## 2. General

The TLP5772 consists of an infrared LED and an integrated high-gain, high-speed photodetector and is housed in the 6-pin SO6L package.

The TLP5772 is 50 % smaller than the 8-pin DIP package and meets the reinforced insulation class requirements of international safety standards.

Therefore the mounting area can be reduced in equipment requiring the safety standard certification.

The TLP5772 has an internal faraday shield that provides a guaranteed common-mode transient immunity of ±35 kV/μs.

In particular, this photocoupler guarantees operation with a low threshold input current. It allows bufferless direct drive from a microcomputer. In addition, the TLP5772 has rail to rail output, and this enables stable operation and better switching performance in system.

## 3. Features

(1) Buffer logic type (totem pole output)
(2) Output peak current: ±2.5 A (max)
(3) Operating temperature: -40 to 110 ℃
(4) Supply current: 3 mA (max)
(5) Supply voltage: 10 to 30 V
(6) Threshold input current: 2 mA (max)
(7) Propagation delay time: 150 ns (max)
(8) Common-mode transient immunity: ±35 kV/μs (min)
(9) Isolation voltage: 5000 Vrms (min)
(10) Safety standards
UL-recognized: UL 1577, File No.E67349
cUL-recognized: CSA Component Acceptance Service No.5A File No.E67349
VDE-approved: EN IEC 60747-5-5, EN IEC 62368-1 **(Note 1)**
CQC-approved: GB4943.1 Japan and Thailand Factory

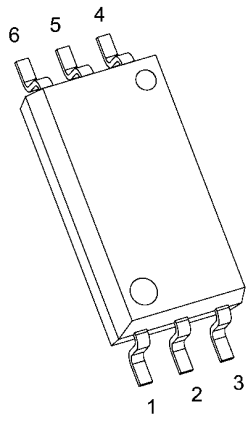
Note 1: When a VDE approved type is needed, please designate the **Option (D4)**.

Start of commercial production
2016-02

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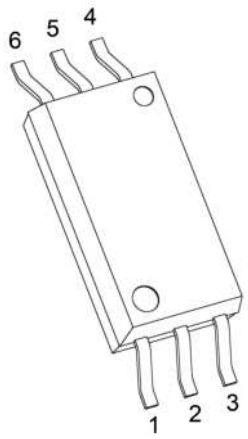
## 4. Packaging (Note)

TLP5772




11-4N1A

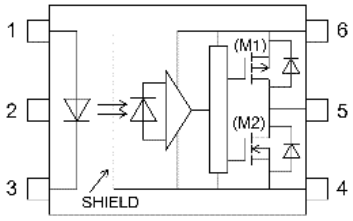
TLP5772(LF4)




11-4N101A

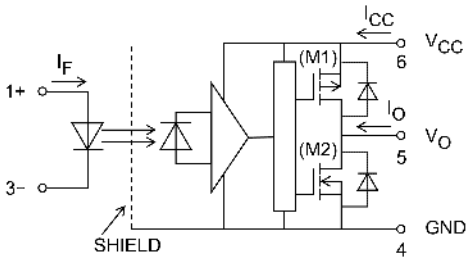
Note: Lead-formed product: (LF4)

## 5. Pin Assignment




1: Anode
2: N.C.
3: Cathode
4: GND
5: $V_O$ (Output)
6: $V_{CC}$

## 6. Internal Circuit (Note)




Note: A 1 μF bypass capacitor must be connected between pin 6 and pin 4.

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# 7. Principle of Operation

## 7.1. Truth Table

| Input | LED | M1 | M2 | Output |
|---|---|---|---|---|
| H | ON | ON | OFF | H |
| L | OFF | OFF | ON | L |

## 7.2. Mechanical Parameters

| Characteristics | Size | Unit |
|---|---|---|
| Height | 2.3 (max) | mm |
| Creepage distances | 8.0 (min) | |
| Clearance distances | 8.0 (min) | |
| Internal isolation thickness | 0.4 (min) | |

# 8. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a$ = 25 °C)

| | Characteristics | | Symbol | Note | Rating | Unit |
|---|---|---|---|---|---|---|
| LED | Input forward current | | $I_F$ | | 8 | mA |
| | Input forward current derating | ($T_a \geq$ 105 °C) | $\Delta I_F/\Delta T_a$ | | -0.4 | mA/°C |
| | Peak transient input forward current | | $I_{FPT}$ | (Note 1) | 1 | A |
| | Peak transient input forward current derating | ($T_a \geq$ 85 °C) | $\Delta I_{FPT}/\Delta T_a$ | | -25 | mA/°C |
| | Input reverse voltage | | $V_R$ | | 5 | V |
| | Input power dissipation | | $P_D$ | | 20 | mW |
| | Input power dissipation derating | ($T_a \geq$ 85 °C) | $\Delta P_D/\Delta T_a$ | | -0.5 | mW/°C |
| | Junction temperature | | $T_j$ | | 125 | °C |
| Detector | Peak high-level output current | ($T_a$ = -40 to 110 °C) | $I_{OPH}$ | (Note 2) | -2.5 | A |
| | Peak low-level output current | ($T_a$ = -40 to 110 °C) | $I_{OPL}$ | (Note 2) | +2.5 | |
| | Output voltage | | $V_O$ | | -0.5 to 35 | V |
| | Supply voltage | | $V_{CC}$ | | -0.5 to 35 | |
| | Output power dissipation | | $P_O$ | | 500 | mW |
| | Output power dissipation derating | ($T_a \geq$ 85 °C) | $\Delta P_O/\Delta T_a$ | | -12.5 | mW/°C |
| | Junction temperature | | $T_j$ | | 125 | °C |
| Common | Operating temperature | | $T_{opr}$ | | -40 to 110 | |
| | Storage temperature | | $T_{stg}$ | | -55 to 125 | |
| | Lead soldering temperature | (10 s) | $T_{sol}$ | (Note 3) | 260 | |
| | Isolation voltage | (AC, 60 s, R.H. ≤ 60 %) | $BV_S$ | (Note 4) | 5000 | Vrms |

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: Pulse width (PW) ≤ 1 μs, 300 pps

Note 2: Exponential waveform. Pulse width ≤ 2 μs, f ≤ 15 kHz

Note 3: ≥ 2 mm below seating plane.

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

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## 9. Recommended Operating Conditions (Note)

| Characteristics | Symbol | Note | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Input on-state current | $I_{F(ON)}$ | (Note 1) | 3 | — | 6 | mA |
| Input off-state voltage | $V_{F(OFF)}$ | | 0 | — | 0.8 | V |
| Supply voltage | $V_{CC}$ | (Note 2) | 10 | — | 30 | |
| Peak high-level output current | $I_{OPH}$ | | — | — | -2.5 | A |
| Peak low-level output current | $I_{OPL}$ | | — | — | +2.5 | |
| Operating frequency | f | (Note 3) | — | — | 50 | kHz |

Note: The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this data sheet should also be considered.

Note: A ceramic capacitor (1 μF) should be connected between pin 6 ($V_{CC}$) and pin 4 (GND) to stabilize the operation of a high-gain linear amplifier. Otherwise, this photocoupler may not switch properly. The bypass capacitor should be placed within 1 cm of each pin.

Note 1: The rise and fall times of the input on-current should be less than 0.5 μs.

Note 2: Denotes the operating range, not the recommended operating condition.

Note 3: Exponential waveform. $I_{OPH} \geq$ -2.5 A (≤ 90 ns), $I_{OPL} \leq$ 2.5 A (≤ 90 ns), $T_a$ = 110 °C

## 10. Electrical Characteristics (Note) (Unless otherwise specified, $T_a$ = -40 to 110 °C)

| Characteristics | Symbol | Note | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Input forward voltage | $V_F$ | | | $I_F$ = 8 mA, $T_a$ = 25 °C | 1.5 | 1.65 | 1.9 | V |
| Input forward voltage temperature coefficient | $\Delta V_F/\Delta T_a$ | | | $I_F$ = 8 mA | — | -1.8 | — | mV/°C |
| Input reverse current | $I_R$ | | | $V_R$ = 5 V, $T_a$ = 25 °C | — | — | 10 | μA |
| Input capacitance | $C_t$ | | | V = 0 V, f = 1 MHz, $T_a$ = 25 °C | — | 60 | — | pF |
| Peak high-level output current | $I_{OPH}$ | (Note 1) | Fig. 13.1.1 | $I_F$ = 5 mA, $V_{CC}$ = 30 V, $V_{6\text{-}5}$ = -3.5 V | — | — | -1.2 | A |
| | | | | $I_F$ = 5 mA, $V_{CC}$ = 10 V, $V_{6\text{-}5}$ = -7 V | — | — | -2.5 | |
| Peak low-level output current | $I_{OPL}$ | (Note 1) | Fig. 13.1.2 | $I_F$ = 0 mA, $V_{CC}$ = 30 V, $V_{5\text{-}4}$ = 2.5 V | 1.2 | — | — | |
| | | | | $I_F$ = 0 mA, $V_{CC}$ = 10 V, $V_{5\text{-}4}$ = 7 V | 2.5 | — | — | |
| High-level output voltage | $V_{OH}$ | | Fig. 13.1.3 | $I_F$ = 2 mA, $V_{CC}$ = 10 V, $I_O$ = -100 mA | 9.7 | — | — | V |
| Low-level output voltage | $V_{OL}$ | | Fig. 13.1.4 | $V_F$ = 0.8 V, $V_{CC}$ = 10 V, $I_O$ = 100 mA | — | — | 0.2 | |
| High-level supply current | $I_{CCH}$ | | Fig. 13.1.5 | $I_F$ = 5 mA, $V_{CC}$ = 30 V, $V_O$ = Open | — | 1.8 | 3 | mA |
| Low-level supply current | $I_{CCL}$ | | Fig. 13.1.6 | $I_F$ = 0 mA, $V_{CC}$ = 30 V, $V_O$ = Open | — | 1.7 | 3 | |
| Threshold input current (L/H) | $I_{FLH}$ | | | $V_{CC}$ = 10 V, $V_O$ > 1 V | — | — | 2 | |
| Threshold input voltage (H/L) | $V_{FHL}$ | | | $V_{CC}$ = 10 V, $V_O$ < 1 V | 0.8 | — | — | V |
| Supply voltage | $V_{CC}$ | | | — | 10 | — | 30 | |
| UVLO threshold voltage | $V_{UVLO+}$ | | | $I_F$ = 5 mA, $V_O$ > 2.5 V | 7.5 | 8.6 | 9.5 | |
| | $V_{UVLO-}$ | | | $I_F$ = 5 mA, $V_O$ < 2.5 V | 7.5 | 8.3 | 9.5 | |
| UVLO hysteresis | $UVLO_{HYS}$ | | | — | — | 0.3 | — | |

Note: All typical values are at $T_a$ = 25 °C.

Note 1: $I_O$ application time ≤ 50 μs; single pulse.

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## 11. Isolation Characteristics (Unless otherwise specified, $T_a$ = 25 °C)

| Characteristics | Symbol | Note | Test Conditions | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Total capacitance (input to output) | $C_S$ | (Note 1) | $V_S$ = 0 V, f = 1 MHz | — | 1.0 | — | pF |
| Isolation resistance | $R_S$ | (Note 1) | $V_S$ = 500 V, R.H. ≤ 60 % | $10^{12}$ | $10^{14}$ | — | Ω |
| Isolation voltage | $BV_S$ | (Note 1) | AC, 60 s | 5000 | — | — | Vrms |

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

## 12. Switching Characteristics (Note) (Unless otherwise specified, $T_a$ = -40 to 110 °C)

| Characteristics | Symbol | Note | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Propagation delay time (L/H) | $t_{pLH}$ | (Note 1) | Fig. 13.1.7 | $I_F$ = 0 → 5 mA, $V_{CC}$ = 30 V, $R_g$ = 10 Ω, $C_g$ = 25 nF | 50 | — | 150 | ns |
| Propagation delay time (H/L) | $t_{pHL}$ | | | $I_F$ = 5 → 0 mA, $V_{CC}$ = 30 V, $R_g$ = 10 Ω, $C_g$ = 25 nF | 50 | — | 150 | |
| Rise time | $t_r$ | (Note 1) | | $I_F$ = 0 → 5 mA, $V_{CC}$ = 30 V, $R_g$ = 10 Ω, $C_g$ = 25 nF | — | 56 | — | |
| Fall time | $t_f$ | (Note 1) | | $I_F$ = 5 → 0 mA, $V_{CC}$ = 30 V, $R_g$ = 10 Ω, $C_g$ = 25 nF | — | 25 | — | |
| Pulse width distortion | $\lvert t_{pHL}-t_{pLH} \rvert$ | (Note 1) | | $I_F$ = 0 ←→ 5 mA, $V_{CC}$ = 30 V, $R_g$ = 10 Ω, $C_g$ = 25 nF | — | — | 50 | |
| Propagation delay skew (device to device) | $t_{psk}$ | (Note 1), (Note 2) | | | -80 | — | 80 | |
| High-level common-mode transient immunity | $CM_H$ | (Note 3) | Fig. 13.1.8 | $V_{CM}$ = 1000 $V_{p-p}$, $I_F$ = 5 mA, $V_{CC}$ = 30 V, $T_a$ = 25 °C, $V_{O(min)}$ = 26 V | ±35 | ±40 | — | kV/μs |
| Low-level common-mode transient immunity | $CM_L$ | (Note 4) | | $V_{CM}$ = 1000 $V_{p-p}$, $I_F$ = 0 mA, $V_{CC}$ = 30 V, $T_a$ = 25 °C, $V_{O(max)}$ = 1 V | ±35 | ±40 | — | |

Note: All typical values are at $T_a$ = 25 °C.

Note 1: Input signal (f = 25 kHz, duty = 50 %, $t_r$ = $t_f$ = 5 ns or less).

Note 2: The propagation delay skew, $t_{psk}$, is equal to the magnitude of the worst-case difference in $t_{pHL}$ and/or $t_{pLH}$ that will be seen between units at the same given conditions (supply voltage, input current, temperature, etc).

Note 3: $CM_H$ is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic high state ($V_O$ > 26 V).

Note 4: $CM_L$ is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic low state ($V_O$ < 1 V).

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# 13. Test Circuits and Characteristics Curves

## 13.1. Test Circuits

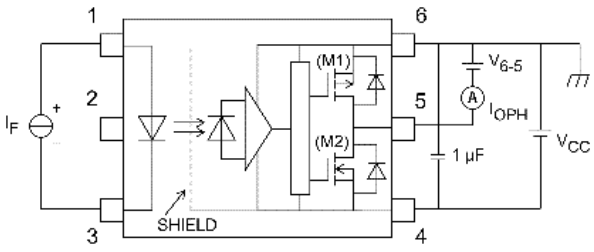



Fig. 13.1.1 $I_{OPH}$ Test Circuit

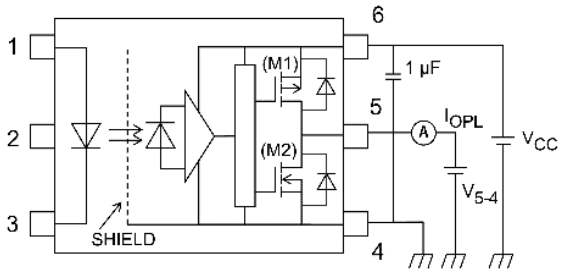



Fig. 13.1.2 $I_{OPL}$ Test Circuit

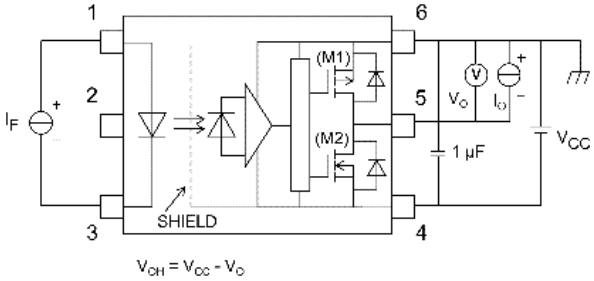



Fig. 13.1.3 $V_{OH}$ Test Circuit

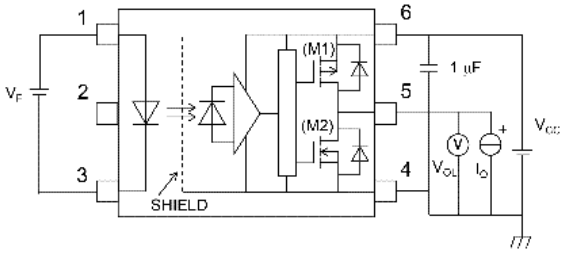



Fig. 13.1.4 $V_{OL}$ Test Circuit

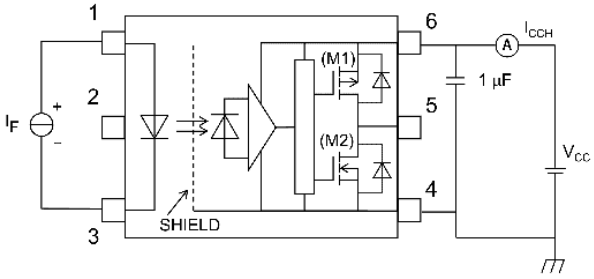



Fig. 13.1.5 $I_{CCH}$ Test Circuit

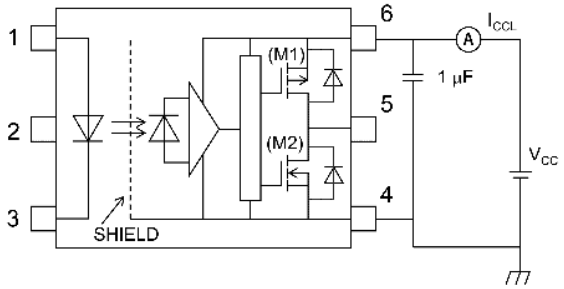



Fig. 13.1.6 $I_{CCL}$ Test Circuit

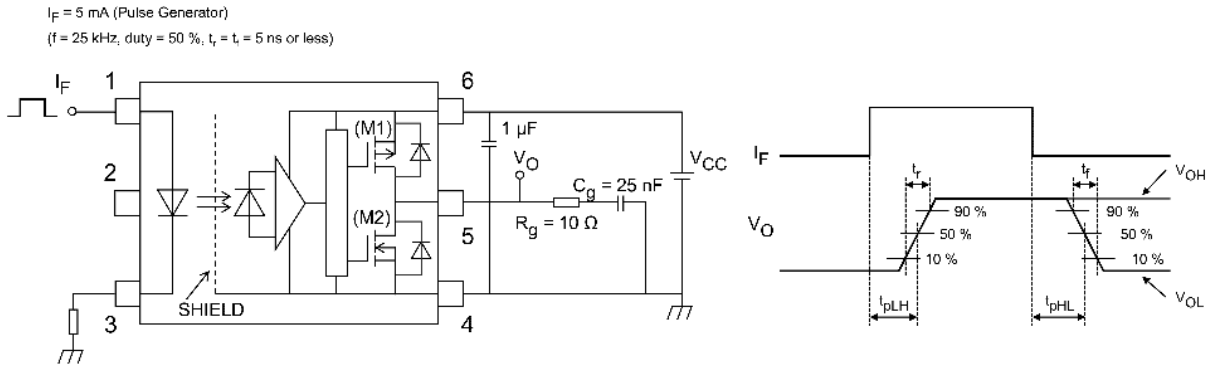



Fig. 13.1.7 Switching Time Test Circuit and Waveform

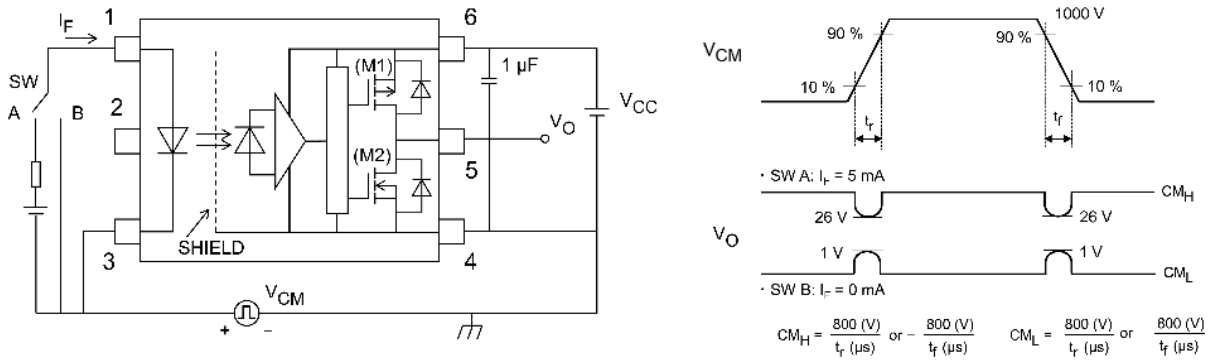



**Fig. 13.1.8 Common-Mode Transient Immunity Test Circuit and Waveform**

## 13.2. Characteristics Curves (Note)

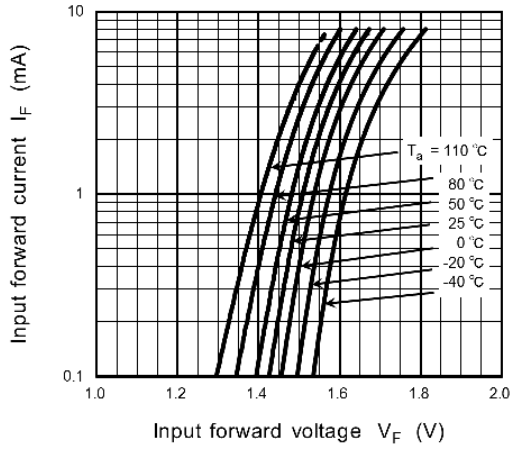



Fig. 13.2.1 $I_F$ - $V_F$

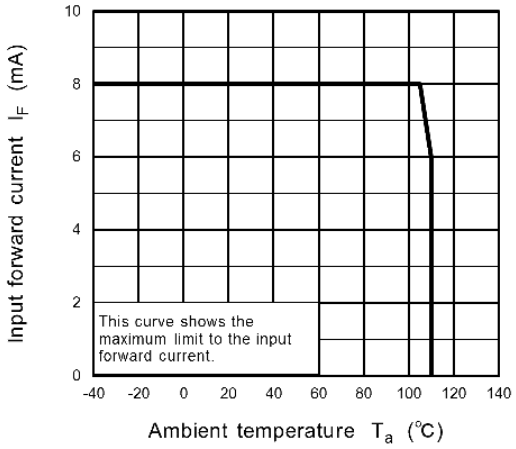



Fig. 13.2.2 $I_F$ - $T_a$

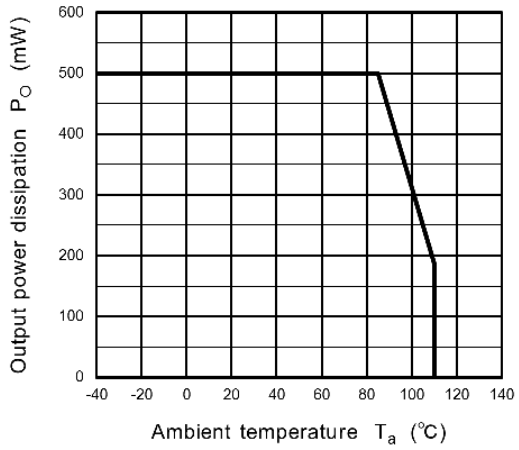



Fig. 13.2.3 $P_O$ - $T_a$

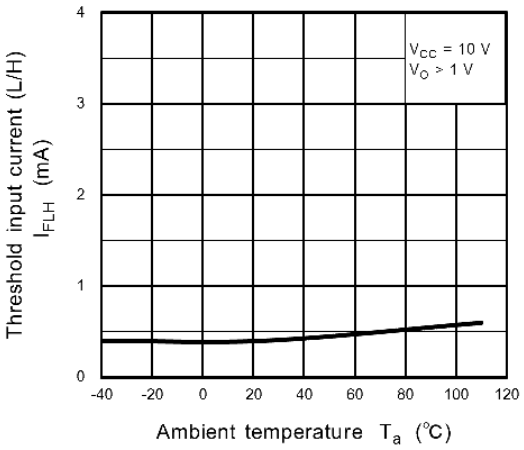



Fig. 13.2.4 $I_{FLH}$ - $T_a$

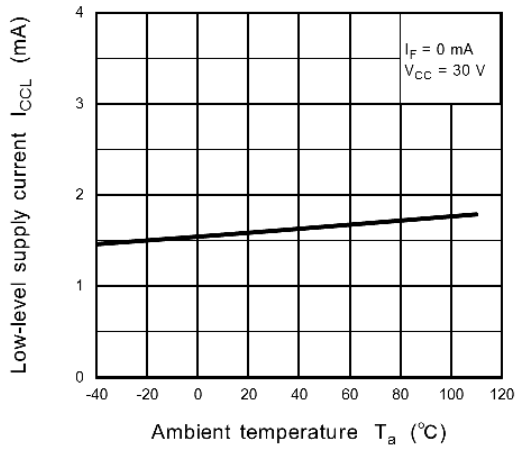



Fig. 13.2.5 $I_{CCL}$ - $T_a$

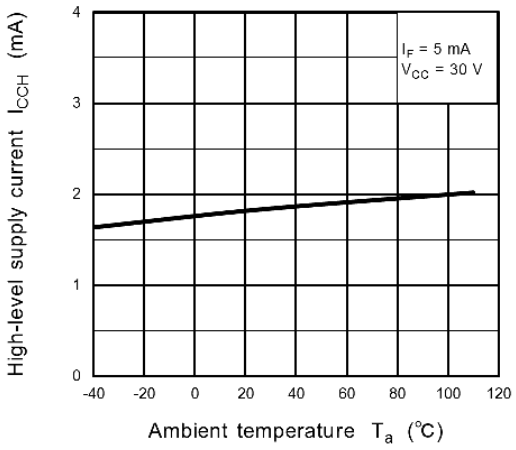



Fig. 13.2.6 $I_{CCH}$ - $T_a$

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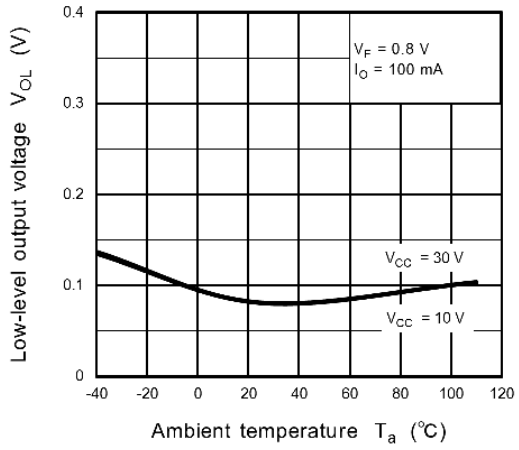



Fig. 13.2.7 $V_{OL}$ - $T_a$

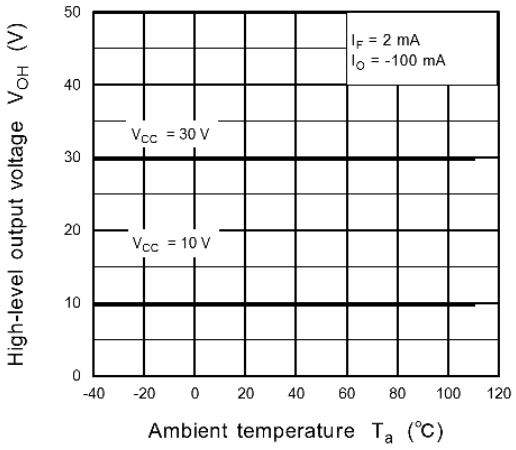



Fig. 13.2.8 $V_{OH}$ - $T_a$

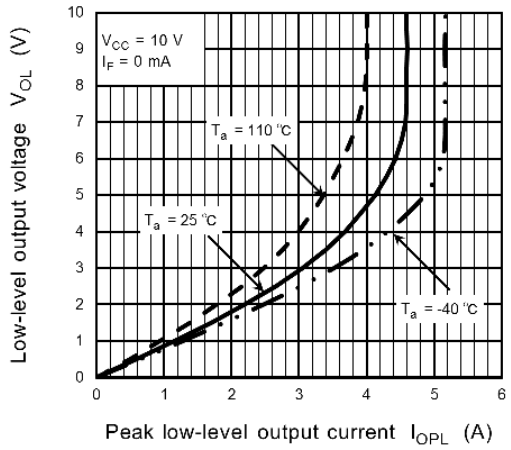



Fig. 13.2.9 $V_{OL}$ - $I_{OPL}$

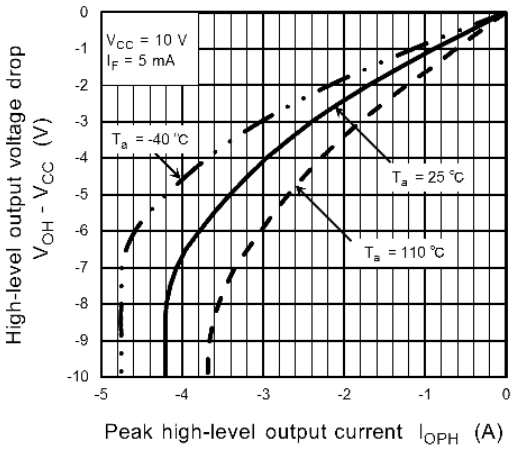



Fig. 13.2.10 ($V_{OH}$ - $V_{CC}$) - $I_{OPH}$

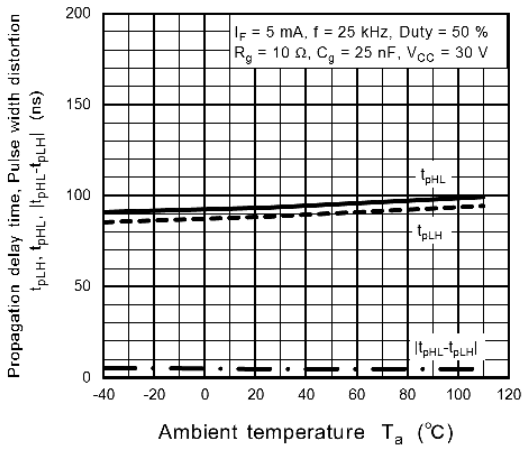



Fig. 13.2.11 $t_{pLH}$, $t_{pHL}$, $|t_{pHL} - t_{pLH}|$ - $T_a$

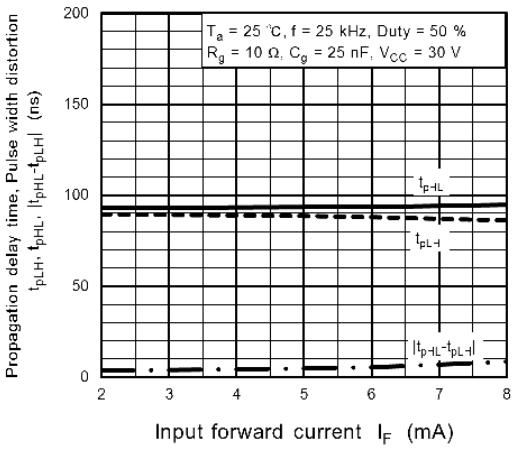



Fig. 13.2.12 $t_{pLH}$, $t_{pHL}$, $|t_{pHL} - t_{pLH}|$ - $I_F$

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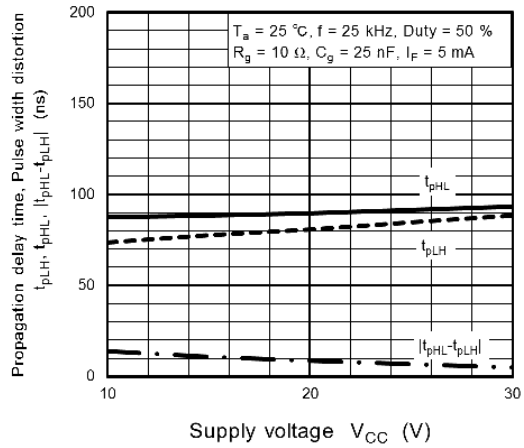



**Fig. 13.2.13 $t_{pLH}$, $t_{pHL}$, $|t_{pHL} - t_{pLH}|$ - $V_{CC}$**

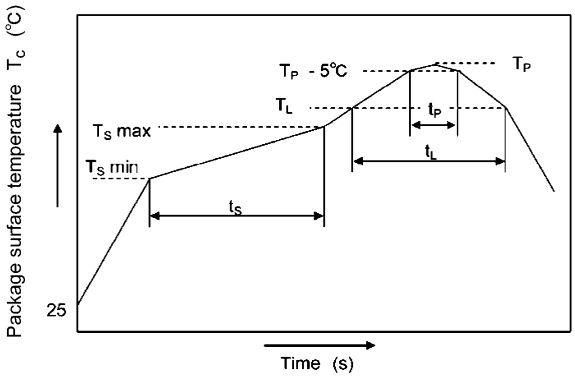
Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

# 14. Soldering and Storage

## 14.1. Precautions for Soldering

The soldering temperature should be controlled as closely as possible to the conditions shown below, irrespective of whether a soldering iron or a reflow soldering method is used.

- When using soldering reflow.
  The soldering temperature profile is based on the package surface temperature.
  (See the figure shown below, which is based on the package surface temperature.)
  Reflow soldering must be performed once or twice.
  The mounting should be completed with the interval from the first to the last mountings being 2 weeks.




| | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Preheat temperature | $T_S$ | 150 | 200 | °C |
| Preheat time | $t_S$ | 60 | 120 | s |
| Ramp-up rate ($T_L$ to $T_P$) | | | 3 | °C/s |
| Liquidus temperature | $T_L$ | 217 | | °C |
| Time above $T_L$ | $t_L$ | 60 | 150 | s |
| Peak temperature | $T_P$ | | 260 | °C |
| Time during which $T_c$ is between ($T_P$ – 5) and $T_P$ | $t_P$ | | 30 | s |
| Ramp-down rate ($T_P$ to $T_L$) | | | 6 | °C/s |

**An Example of a Temperature Profile When Lead(Pb)-Free Solder Is Used**

- When using soldering flow
  Preheat the device at a temperature of 150 °C (package surface temperature) for 60 to 120 seconds.
  Mounting condition of 260 °C within 10 seconds is recommended.
  Flow soldering must be performed once.
- When using soldering Iron
  Complete soldering within 10 seconds for lead temperature not exceeding 260 °C or within 3 seconds not exceeding 350 °C
  Heating by soldering iron must be done only once per lead.

## 14.2. Precautions for General Storage

- Avoid storage locations where devices may be exposed to moisture or direct sunlight.
- Follow the precautions printed on the packing label of the device for transportation and storage.
- Keep the storage location temperature and humidity within a range of 5 °C to 35 °C and 45 % to 75 %, respectively.
- Do not store the products in locations with poisonous gases (especially corrosive gases) or in dusty conditions.
- Store the products in locations with minimal temperature fluctuations. Rapid temperature changes during storage can cause condensation, resulting in lead oxidation or corrosion, which will deteriorate the solderability of the leads.
- When restoring devices after removal from their packing, use anti-static containers.
- Do not allow loads to be applied directly to devices while they are in storage.

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## 15. Land Pattern Dimensions (for reference only)

Unit: mm

TLP5772

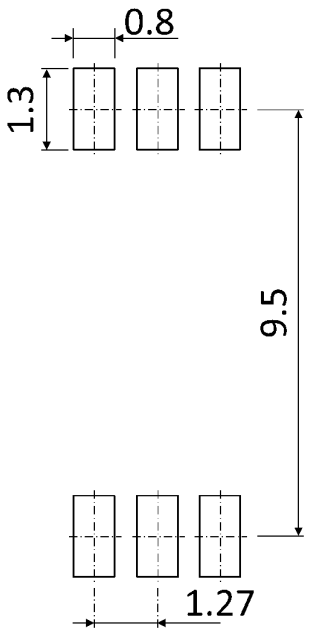



Fig. 15.1 Lead Forming Option (standard)

TLP5772(LF4)

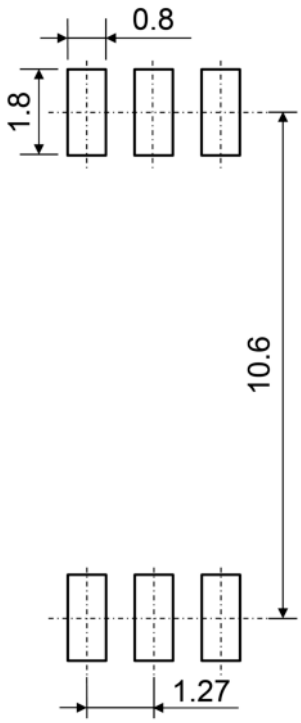
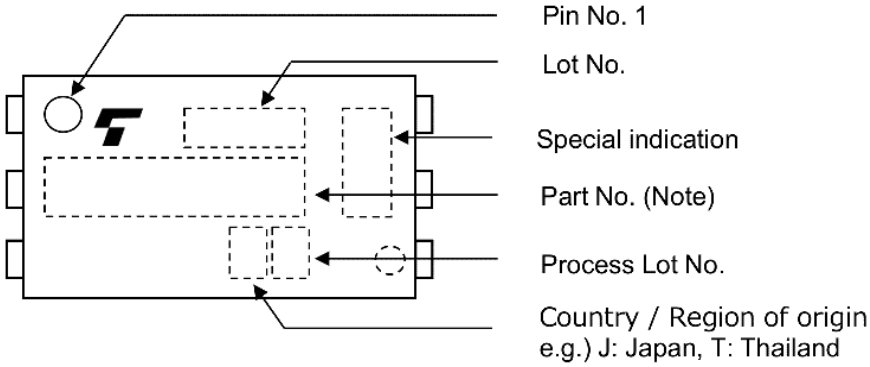



Fig. 15.2 Lead Forming Option (LF4)

## 16. Marking




Note: TLP5772

## 17. EN IEC 60747-5-5 Option (D4) Specification

- Part number: TLP5772 **(Note 1)**
- The following part naming conventions are used for the devices that have been qualified according to option (D4) of EN IEC 60747.

  Example: TLP5772(D4-TP,E

  D4: EN IEC 60747 option
  TP: Tape type
  E: [[G]]/RoHS COMPATIBLE **(Note 2)**

Note 1: Use TOSHIBA standard type number for safety standard application.
e.g., TLP5772(D4-TP,E → TLP5772

Note 2: Please contact your Toshiba sales representative for details on environmental information such as the product's RoHS compatibility.
RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

| Description | Symbol | Rating | Unit |
|---|---|---|---|
| Application classification<br><br>for rated mains voltage ≤ 600 Vrms<br>for rated mains voltage ≤ 1000 Vrms | | <br><br>I-IV<br>I-III | — |
| Climatic classification | | 40 / 110 / 21 | — |
| Pollution degree | | 2 | — |
| Maximum operating insulation voltage | $V_{IORM}$ | 1230 | Vpeak |
| Input to output test voltage, Method A<br>$V_{pr}$ = 1.6 × $V_{IORM}$, type and sample test<br>$t_p$ = 10 s, partial discharge < 5 pC | $V_{pr}$ | 1970 | Vpeak |
| Input to output test voltage, Method B<br>$V_{pr}$ = 1.875 × $V_{IORM}$, 100 % production test<br>$t_p$ = 1 s, partial discharge < 5 pC | $V_{pr}$ | 2310 | Vpeak |
| Highest permissible overvoltage<br>(transient overvoltage, $t_{pr}$ = 60 s) | $V_{TR}$ | 8000 | Vpeak |
| Safety limiting values (max. permissible ratings in case of fault, also refer to thermal derating curve)<br>current (input current IF, $P_{so}$ = 0)<br>power (output or total power dissipation)<br>temperature | <br>$I_{si}$<br>$P_{so}$<br>$T_s$ | <br>300<br>700<br>150 | <br>mA<br>mW<br>°C |
| Insulation resistance<br>$V_{IO}$ = 500 V, $T_a$ = 25 °C<br>$V_{IO}$ = 500 V, $T_a$ = 100 °C<br>$V_{IO}$ = 500 V, $T_a$ = $T_s$ | $R_{si}$ | ≥ $10^{12}$<br>≥ $10^{11}$<br>≥ $10^{9}$ | Ω |

**Fig. 17.1 EN IEC 60747 Insulation Characteristics**

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| | | |
|---|---|---|
| Minimum creepage distance | Cr | 8.0 mm |
| Minimum clearance | Cl | 8.0 mm |
| Minimum insulation thickness | ti | 0.4 mm |
| Comparative tracking index | CTI | 500 |

**Fig. 17.2 Insulation Related Specifications (Note)**

Note: This photocoupler is suitable for safe electrical isolation only within the safety limit data. Maintenance of the safety data shall be ensured by means of protective circuits.




**Fig. 17.3 Marking on Packing**

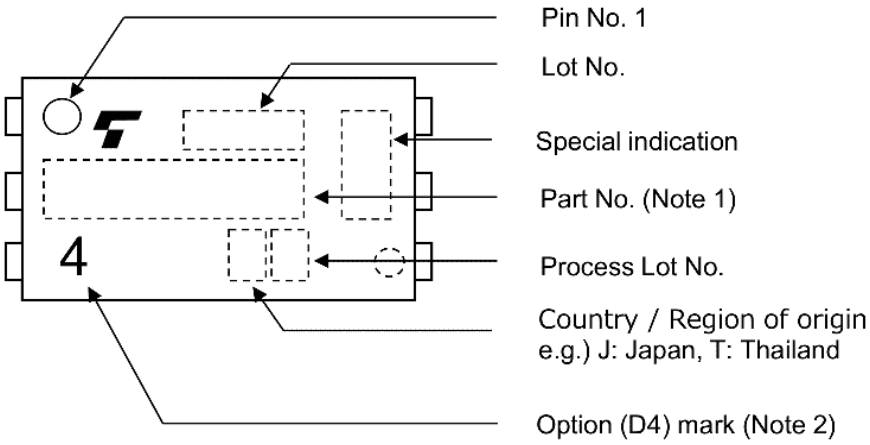



**Fig. 17.4 Marking Example**

Note1: TLP5772

Note2: The above marking is applied to the photocouplers that have been qualified according to option (D4) of EN IEC 60747.

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Figure 1 Partial discharge measurement procedure according to EN IEC 60747
Destructive test for qualification and sampling tests.

Method A

(for type and sampling tests, destructive tests)

| | |
|---|---|
| $t_1$, $t_2$ | = 1 to 10 s |
| $t_3$, $t_4$ | = 1 s |
| $t_p$ (Measuring time for partial discharge) | = 10 s |
| $t_b$ | = 12 s |
| $t_{ini}$ | = 60 s |

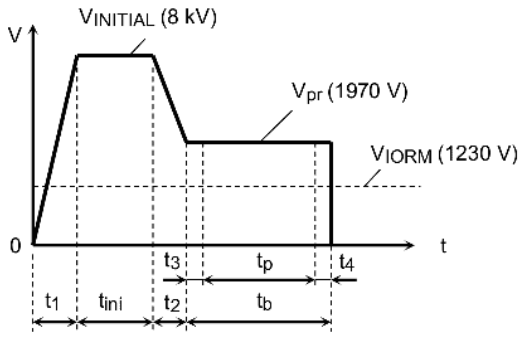



Figure 2 Partial discharge measurement procedure according to EN IEC 60747
Non-destructive test for 100 % inspection.

Method B

(for sample test, non-destructive test)

| | |
|---|---|
| $t_3$, $t_4$ | = 0.1 s |
| $t_p$ (Measuring time for partial discharge) | = 1 s |
| $t_b$ | = 1.2 s |

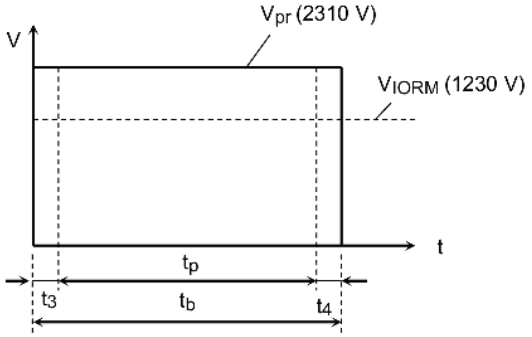



Figure 3 Dependency of maximum safety ratings on ambient temperature

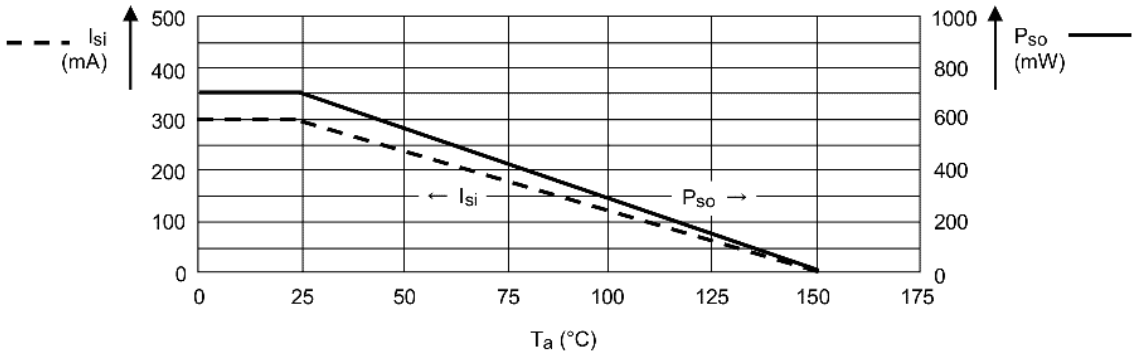



**Fig. 17.5 Measurement Procedure**

## 18. Ordering Information (Example of Item Name)

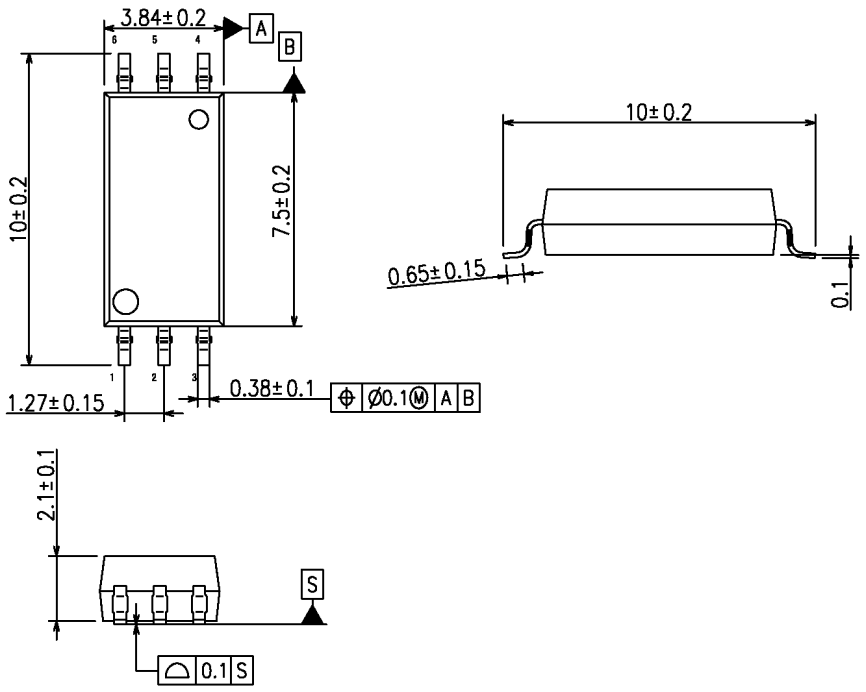
| Item Name | Packaging | VDE Option | Packing (MOQ) |
|---|---|---|---|
| TLP5772(E | | | Magazine (125 pcs) |
| TLP5772(TP,E | | | Tape and reel (1500 pcs) |
| TLP5772(D4,E | | EN IEC 60747-5-5 | Magazine (125 pcs) |
| TLP5772(D4-TP,E | | EN IEC 60747-5-5 | Tape and reel (1500 pcs) |
| TLP5772(LF4,E | LF4, Wide forming | | Magazine (125 pcs) |
| TLP5772(TP4,E | LF4, Wide forming | | Tape and reel (1500 pcs) |
| TLP5772(D4-LF4,E | LF4, Wide forming | EN IEC 60747-5-5 | Magazine (125 pcs) |
| TLP5772(D4-TP4,E | LF4, Wide forming | EN IEC 60747-5-5 | Tape and reel (1500 pcs) |

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## Package Dimensions

Unit: mm

TLP5772



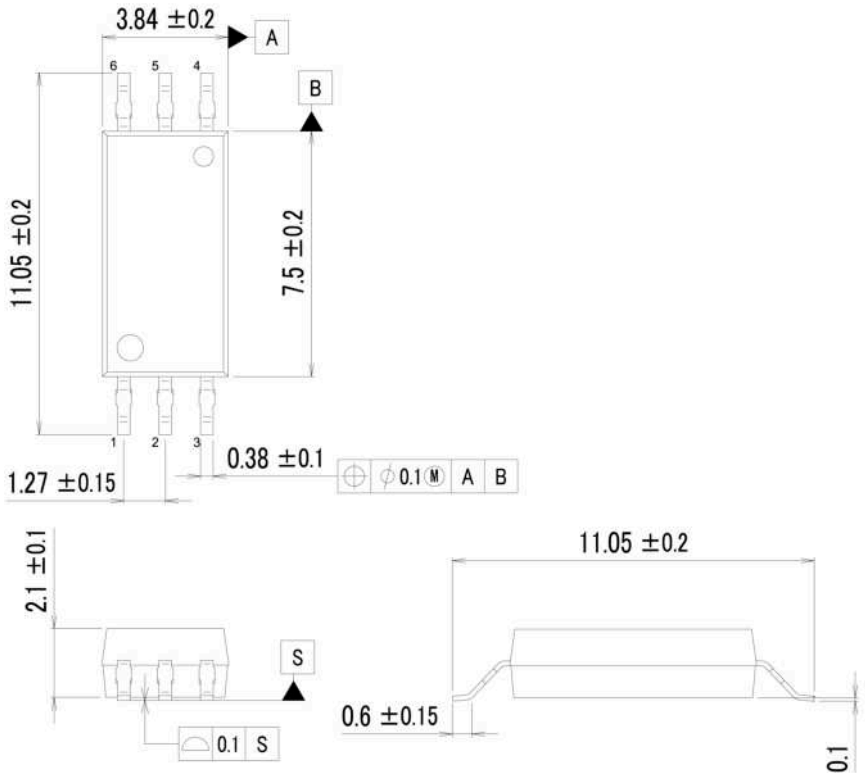

Weight: 0.126 g (typ.)

| Package Name(s) |
|---|
| TOSHIBA: 11-4N1A |

## Package Dimensions

Unit: mm

TLP5772(LF4)




Weight: 0.126 g (typ.)

| Package Name(s) |
|---|
| TOSHIBA: 11-4N101A |

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