

TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTO IC

TLP1209(C7), TLP1221(C7)

COPIER, PAGE PRINTER, FACSIMILE

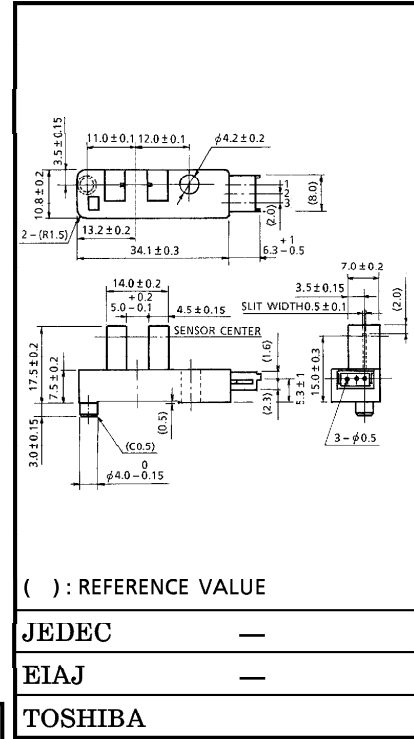
AUTOMATIC VENDING MACHINE, TERMINAL EQUIPMENT IN BANKING FACILITIES

VARIOUS POSITION DETECTION SENSOR

Unit in : mm

The TLP1209 (C7) and 1221 (C7) are digital output photointerrupters having a connector with a GaAs infrared LED and a high sensitivity low current consumption Si photo IC combined. The output becomes low level when the light is shielded.

- Single sided screw mounting type.
- For 5V of power supply voltage
- Digital output (open collector)
- Gap : 5mm
- Resolution : Slit width 0.5mm
- Low current consumption : $I_{CC} = 16.5\text{mA}$ (max)
- Material of the case : Polycarbonate (UL94V-2)
- UL recongnized PWB adopted : UL94V-0
- Connectors : TXL-P03P-A1(Taiko Denki Co., Ltd. made TXL-P Series connector)



| | |
|---------|---|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | |

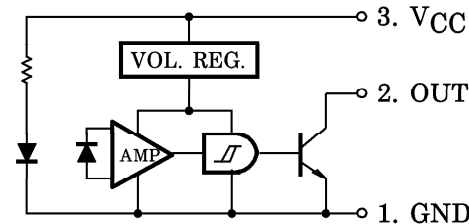
Weight : 2.5g (typ.)

MAXIMUM RATINGS (Ta = 25°C)

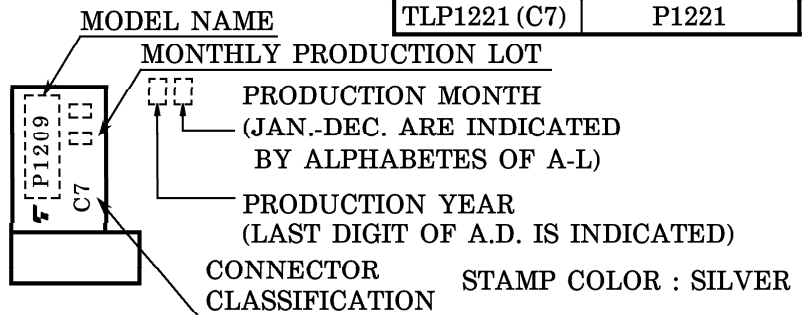
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|-------------|----------------------------------|--------|---------|
| Supply Voltage | TLP1209(C7) | V_{CC} | 10 | V |
| | TLP1221(C7) | | 15 | |
| Output Voltage | | V_O | 28 | V |
| Low Level Output Current | | I_{OL} | 50 | mA |
| Low Level Output Current Derating (Ta > 25°C) | | $\Delta I_{OL} / ^\circ\text{C}$ | -0.67 | mA / °C |
| Operating Temperature Range | | T_{opr} | -25~75 | °C |
| Storage Temperature Range | | T_{stg} | -40~85 | °C |

| TYPE | ABBREVIATION |
|--------------|--------------|
| TLP1209 (C7) | P1209 |
| TLP1221 (C7) | P1221 |

PIN CONNECTION



PRODUCT INDICATION



961001EBC2

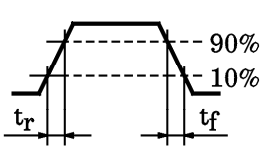
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RECOMMENDED OPERATING CONDITIONS

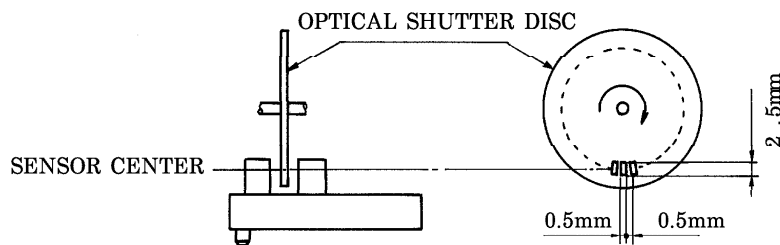
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--------------------------|-----------------|------|------|------|------|
| Output Voltage | TLP1209 (C7) | — | 5 | 17 | V |
| | TLP1221 (C7) | — | 12 | 17 | |
| Low Level Output Current | I _{OL} | — | — | 16 | mA |

OPTO-ELECTRICAL CHARACTERISTICS

(Unless Otherwise Specified, Ta = -25~75°C V_{CC} = 5V ± 10% : TLP1209 (C7), 12V ± 10% : TLP1221 (C7))

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-----------------|---|---|------|--------------------|------|
| Supply Voltage | V _{CC} | TLP1209(C7) | 4.5 | 5 | 5.5 | V |
| | | TLP1221(C7) | 10.8 | 12 | 13.2 | |
| Supply Current | High Level | I _{CCH} | Without Shutter | | — | mA |
| | Low Level | I _{CCL} | Shutter In | | — | |
| Output Voltage | High Level | V _{OH} | Without Shutter, R _L = 47kΩ | | 0.9V _{CC} | V |
| | Low Level | V _{OL} | Shutter In, I _{OL} = 16mA, Ta = 25°C | | — | V |
| | | | Shutter In, I _{OL} = 16mA | | — | |
| Peak Emission Wavelength | λ _P | Ta = 25°C, LED Side | | — | 940 | nm |
| Peak Sensitivity Wavelength | λ _P | Ta = 25°C, Photo IC Side | | — | 900 | nm |
| Response Frequency | f | R _L = 47kΩ, Ta = 25°C (Note) | | 3000 | — | Hz |
| Rise Time | t _r |  | | — | 8 | μs |
| Fall Time | t _f | | | — | 0.03 | |

(Note) A value measured when the disc shown in the following figure was rotated. No DC current should be output.

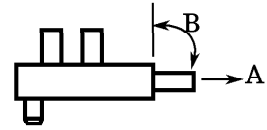


961001EBC2'

- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
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- The information contained herein is subject to change without notice.

TERMINAL STRENGTH (Ta = 25°C)

| CHARACTERISTIC | TEST CONDITION | | LIMIT |
|----------------|----------------|-------------|---|
| PULL | DIRECTION | A | NO DEFECT OF ELECTRICAL CHARACTERISTICS |
| | WEIGHT | 19.6N | |
| | TIME | 5s / ONCE | |
| BEND | DIRECTION | B | |
| | WEIGHT | 9.8N | |
| | TIME | 5s / THRICE | |



PRECAUTION

Please be careful of the followings.

1. During 100 μ s after turning on V_{CC}, output voltage changes for stabilizing the inner circuit.
2. When installing, avoid to work by holding the connector by hand. Always, install by holding the main body of the element while assuring the mounting board is not warped or twisted. The connectors shall be inserted or pulled out at normal temperature.
3. Do not solder the lead or printed circuit board to the connector. Connect the connector to the recommended connector correctly.
4. A visible light cut-off type photo IC which blocks light with frequencies of 700nm or above is used. However, the device cannot block ambient light with a wavelength of 700nm or more or sunlight. Install avoiding the disturbance light.
5. Screw shall be tightened to clamping torque of 0.59N·m.
6. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with peroxochemicals (such as benzene, toluene, and acetone), alkali, aromatic hydrocarbons, or chloric hydrocarbons, polycarbonate becomes cracked, swollen, or melted. Please take care when choosing a packaging material by referencing the table below.

<Chemicals to avoid with polycarbonate>

| | PHENOMENON | CHEMICALS |
|---|-----------------------------------|---|
| A | Little deterioration but staining | <ul style="list-style-type: none"> • nitric acid (low concentration), hydrogen peroxide, chlorine |
| B | Cracked, crazed, or swollen | <ul style="list-style-type: none"> • acetic acid (70% or more) • gasoline • methyl ethyl ketone, ethyl acetate, butyl acetate • ethyl methacrylate, ethyl ether, MEK • acetone, m-amino alcohol, carbon tetrachloride • carbon disulfide, trichloroethylene, cresol • thinners, oil of turpentine • triethanolamine, TCP, TBP |
| C | Melted { } : Used as solvent. | <ul style="list-style-type: none"> • concentrated sulfuric acid • benzene • styrene, acrylonitrile, vinyl acetate • ethylenediamine, diethylenediamine • {chloroform, methyl chloride, tetrachloromethane, dioxane, } • {1, 2-dichloroethane } |
| D | Decomposed | <ul style="list-style-type: none"> • ammonia water • other alkali |

RECOMMENDABLE MATCHED CONNECTOR

Taiko Denki Co., Ltd. made TXL-P series connector

| HOUSING | TXL-P03H-A1 | | | | |
|----------|-------------|--------------|----------|-----------------|---------------------|
| TERMINAL | TYPE No. | PRODUCT FORM | MATERIAL | AWG SIZE | INSULATION DIAMETER |
| | | 085T-1100 | LINKED | PHOSPHOR BRONZE | AWG24~30 |

For details of the connectors, please refer to the connector maker.

