

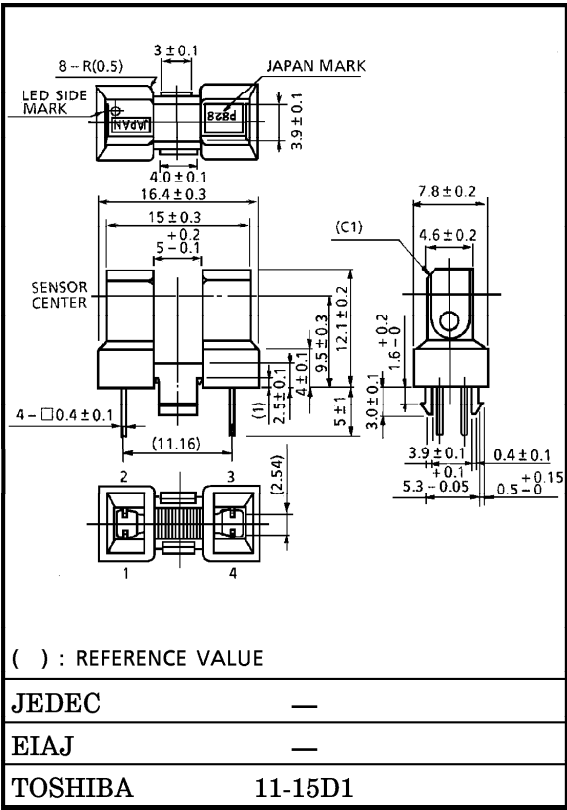
TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTOTRANSISTOR

TLP828

MOTOR ROTATION SENSOR FOR OIL-FIRED HEATER
LOUVER LOCATION SENSOR FOR AIR CONDITIONER
PAPER PASSING DETECTION FOR THE TICKET VENDING MACHINE
PAPER DETECTION FOR THE PRINTER AND FACSIMILE

TLP828 is a photointerrupter incorporating GaAs infrared LED and fast-response Si phototransistor in a dust-proof package.

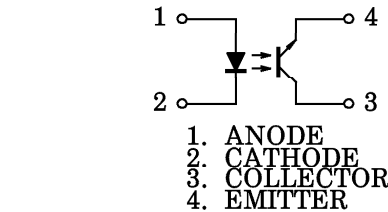
- Snap-in mounting type (1.6mm thickness of PCB)
- The package is only dust-proof for the sensor because there are no slits.
- High current transfer ratio : $I_C / I_F = 7.5\%$ (min)
- Gap : 5mm
- Resolution : 1.5mm
- Material of the package : Polycarbonate (UL94V-2)
- Detector side is of visible light cut type.
- Fast response speed : $t_r, t_f = 15\mu s$ (typ.)



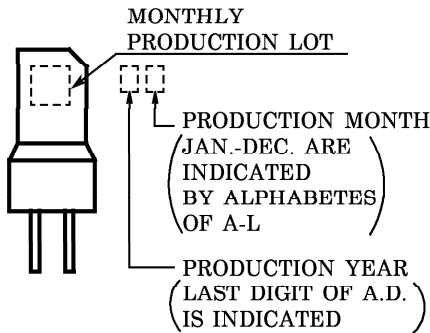
Weight : 0.7g (typ.) PIN CONNECTION

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	$\Delta I_F / ^\circ C$	-0.33	mA / °C
	Reverse Voltage	V_R	5	V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	35	V
	Emitter-Collector Voltage	V_{ECO}	5	V
	Collector Power Dissipation	P_C	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	$\Delta P_C / ^\circ C$	-1	mW / °C
	Collector Current	I_C	50	mA
	Operating Temperature Range	T_{opr}	-25~85	°C
Storage Temperature Range		T_{stg}	-40~100	°C
Soldering Temperature (5s)		T_{sol}	260	°C



PRODUCT INDICATION



961001EBC2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	5	24	V
Forward Current	I_F	—	—	25	mA

OPTO-ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 10\text{mA}$	1.00	1.15	1.30	V
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Peak Emission Wavelength	λ_P	$I_F = 20\text{mA}$	—	940	—	nm
DETECTOR	Dark Current	I_D	$V_{CE} = 24\text{V}$, $I_F = 0$	—	—	0.1	μA
	Peak Sensitivity Wavelength	λ_P	—	—	870	—	nm
COUPLED	Current Transfer Ratio	I_C / I_F	$V_{CE} = 5\text{V}$, $I_F = 10\text{mA}$	7.5	—	—	%
	Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_F = 20\text{mA}$, $I_C = 0.75\text{mA}$	—	0.15	0.35	V
	Leakage Current	I_{LEAK}	$V_{CE} = 5\text{V}$, $I_F = 50\text{mA}$ (Note 1)	—	—	10	μA
	Switching Times	Rise Time	$V_{CC} = 5\text{V}$, $I_C = 1\text{mA}$ $R_L = 1\text{k}\Omega$	—	15	50	μs
		Fall Time		—	15	50	

Note 1: When light is blocked for the top 5.1mm of the device using a shutter.

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.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
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PRECAUTION

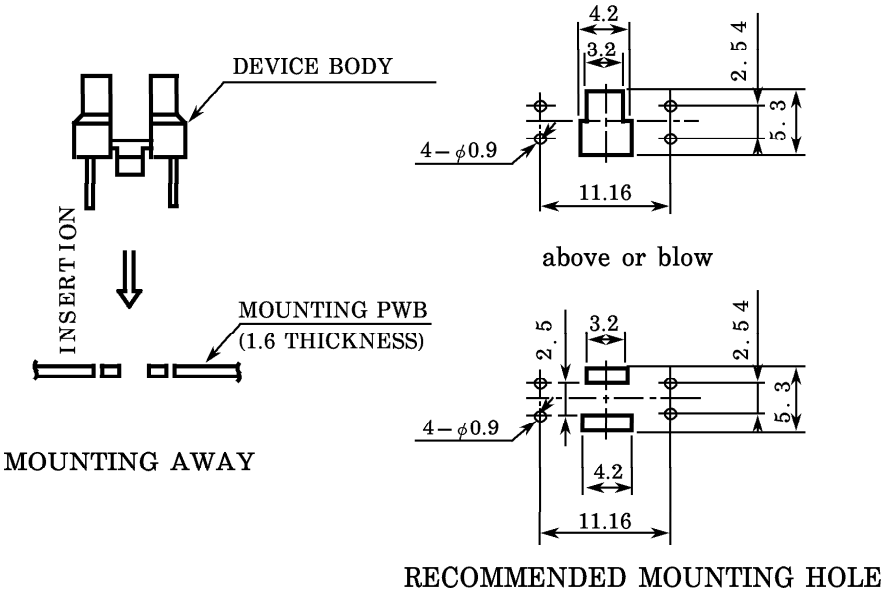
1. Be careful that no solder is attached to the case body.
2. If the chemical are used for cleaning, the soldered surface only shall be cleaned with chemicals avoiding the whole cleaning of the package.
3. Shall be mounted on an unwarped surface.
4. Do not solder the lead or printed circuit board to the connector. Connect the connector to the recommended connector correctly.
5. A visible light cut-off type photo transistor 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.
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

RECOMMENDED MOUNTING HOLE

Unit in mm



POSITIONING OF SHUTTER AND DEVICE

To operate correctly, make sure that the shutter and the device are positioned as shown in the figure below.

The slit pitch of the shutter must be set wider than 1.5mm.

Determine the width taking the switching time into consideration.

