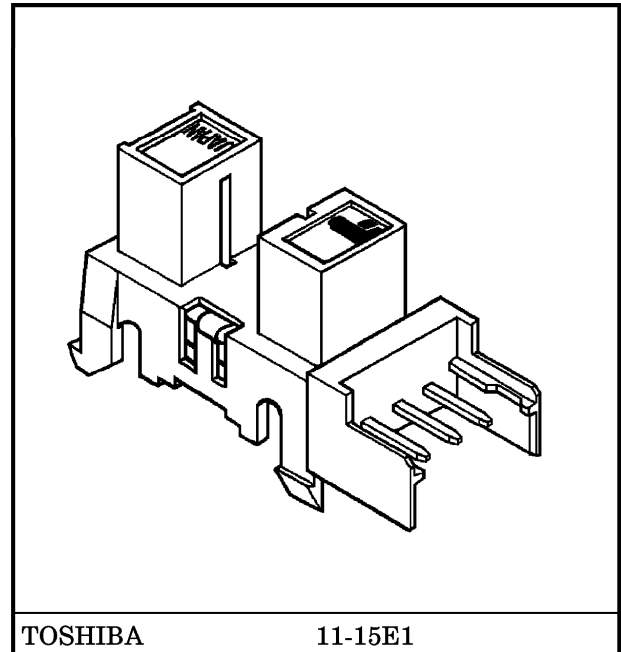


TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTO IC

TPL1251(C5)

COPIER, PAGE PRINTER, FACSIMILE
 TERMINAL EQUIPMENT IN BANKING FACILITIES,
 GAME MACHINE
 FAN-HEATER, AIR CONDITIONER

TLP1251(C5) is a compact photointerrupter with attached connector which uses a high-radiant power GaAs infrared LED and a Si photo-IC. TLP1251(C5) is a photointerrupter in highly reliable package which eliminates the need for printed circuit board and soldering. It is optimum as a paper carrier location sensor for copiers and page printers. Operating temperature is up to 95°C. Thus the device can be used for high-temperature applications like paper-out sensors or air direction for air conditioner louvers. When the light is shielded, outputs are at high level.

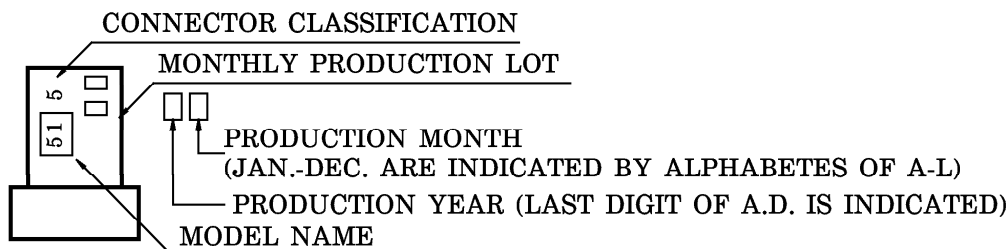


TOSHIBA 11-15E1

Weight : 1.4 g (Typ.)

- Small package
- Mountable by one touch (Snap-in mounting type)
- Mountable to boards in 3 kinds of thickness (1.0 mm, 1.2 mm, 1.6 mm)
- Gap : 5 mm
- Resolution : Slit width 0.5 mm
- Supply voltage : 5 V
- High temperature operating : $T_{opr} = 95^{\circ}\text{C}$ (Max.)
- Low current consumption : $I_{CC} = 14 \text{ mA}$ (Max.)
- Digital output (open collector)
- Connected to the CT connector (2 mm pitch MT receptacle type) made by AMP (Japan), Ltd.
- Material of the case : Body Polycarbonate (UL94V-2, Black)
 : Connector .. Polybutylene terephthalate (UL94V-0, White)

PRODUCT INDICATION



980910EBC2

- 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.
- 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 the foreign exchange and foreign trade 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.
- The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	7.5	V
Output Voltage	V _O	15	V
Low Level Output Current	I _{O_L}	16	mA
Low Level Output Current Derating (Ta > 76°C)	ΔI _{O_L} /°C	-0.67	mA/°C
Operating Temperature Range	T _{opr}	-25~95	°C
Storage Temperature Range	T _{stg}	-40~100	°C

RECOMMENDED OPERATING CONDITIONS

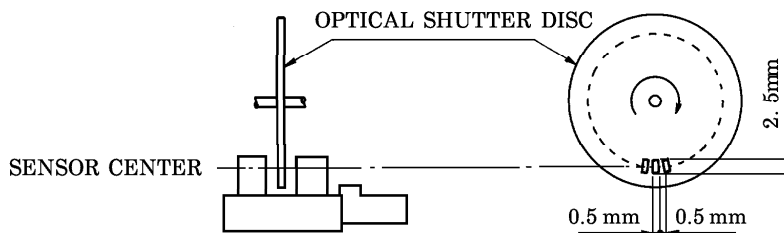
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	4.5	5.0	5.5	V
Output Voltage	V _O	—	5.0	13.2	V
Low Level Output Current	I _{O_L}	—	—	16	mA

OPTO-ELECTRICAL CHARACTERISTICS

(Unless Otherwise Specified, Ta = -25~95°C, V_{CC} = 5 V ± 10%)

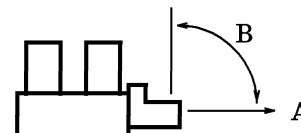
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Voltage	V _{CC}		4.5	5	5.5	V	
Supply Current	High Level	I _{CC_H}	Shutter In	—	—	14	mA
	Low Level	I _{CC_L}	Without Shutter	—	—	14	
Output Voltage	High Level	V _{OH}	Shutter In, R _L = 47 kΩ	0.9V _{CC}	—	—	V
	Low Level	V _{OL}	Without Shutter I _{O_L} = 16 mA, Ta = 25°C	—	0.07	0.35	
			Without Shutter, I _{O_L} = 16 mA	—	—	0.4	
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 = 47 kΩ, Ta = 25°C, (Note)	3000	—	—	Hz	
Rise Time	t _r		—	8	—	μs	
Fall Time	t _f		—	0.03	—	μs	

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



TERMINAL STRENGTH (Ta = 25°C)

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



MATCHED CONNECTOR

AMP (Japan), Ltd. made CT connector (2 mm pitch MT receptacle type)

HOUSING-TERMINAL EN BLOCK TYPE	TYPE No.	TERMINAL MATERIAL	AWG SIZE	INSULATION DIAMETER
	173977-3	PHOSPHOR BRONZE	AWG26~28	0.85~1.05 mm

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

Note that the device cannot be connected to a MT crimp receptacle type connector housing.

PRECAUTION

- When V_{CC} is turned on, it takes at least 100 μs for the internal circuit to stabilize. During this time the output signal is unstable. Please do not use the unstable signal as the output signal.
- A visible light cut-off type photo IC which blocks light with frequencies of 700 nm or less is used. However, the device cannot block ambient light with a wavelength of 700 nm or more, or sunlight. Install avoiding interference from external light.
- The environment to install the device should be determined carefully. Oil or chemicals may cause the package to be dissolved or cracked.
- When installing, avoid to work by holding the connector by hand. Always, install by holding the main body of the device while assuring the metal board is not warped or twisted. The connectors shall be inserted or pulled out at normal temperature.
- It is recommended to mount this product by inserting from the metal board pressed side.
- We recommend checking the strength of the mounting on metal board by mounting the device in advance.
- Do not solder to the pins of the connector block. Use the matched connector.
- When connecting / disconnecting the connector, hold the matched connector and power line in parallel to the TLP1251 pins. Pushing or pulling diagonally may damage the connector block or degrade the connection.

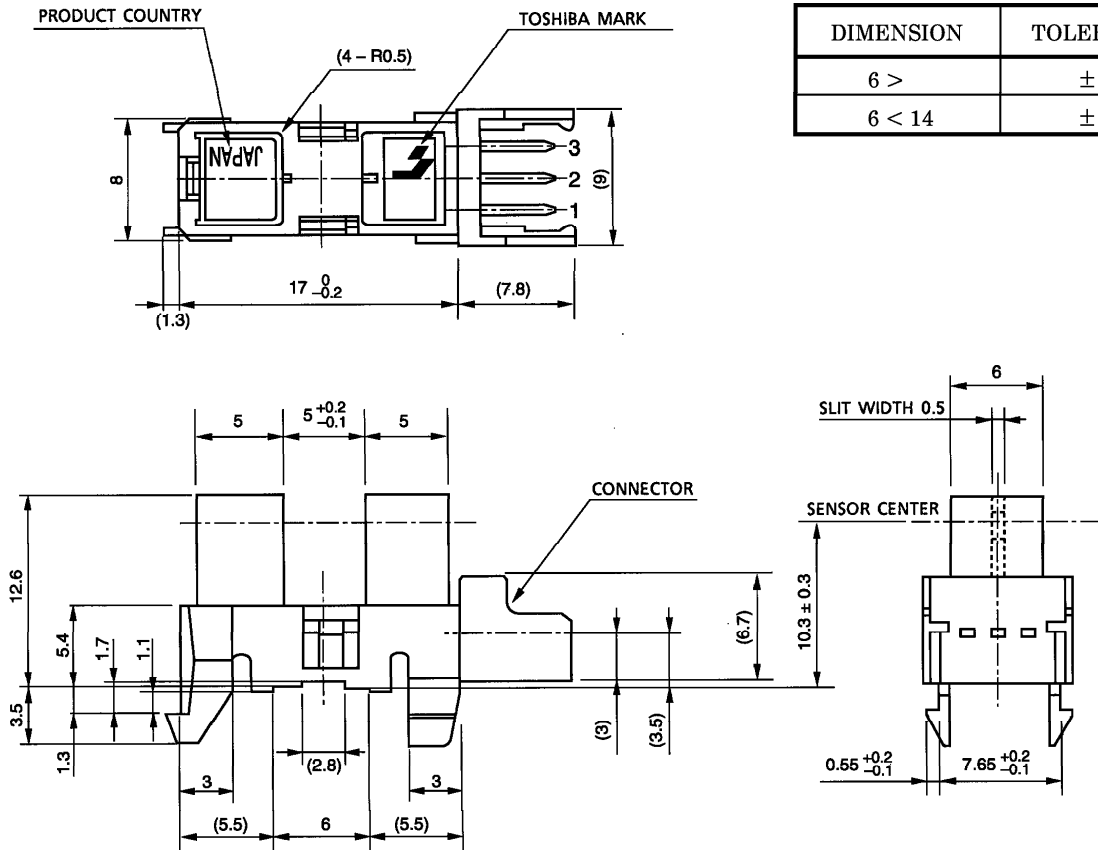
OUTLINE : TOSHIBA 11-15E1

Unit in mm

() : REFERENCE VALUE

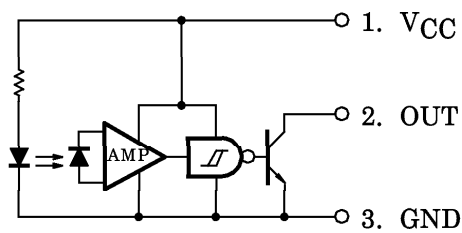
UNLESS OTHERWISE SPECIFIED

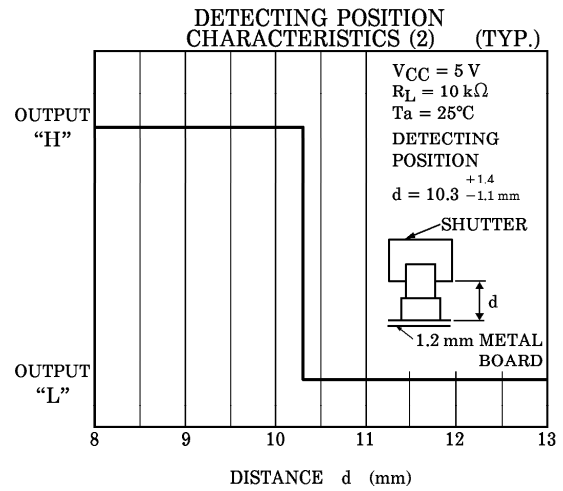
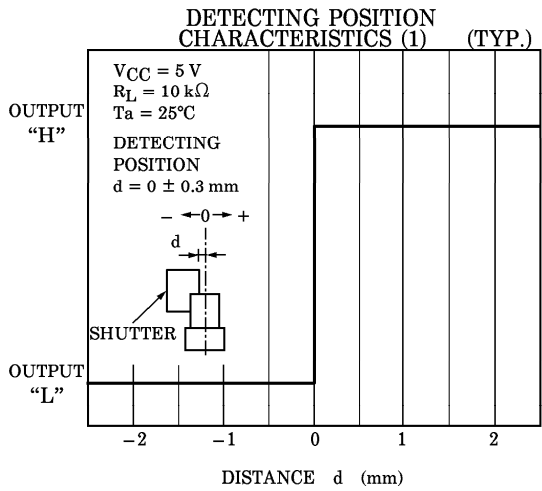
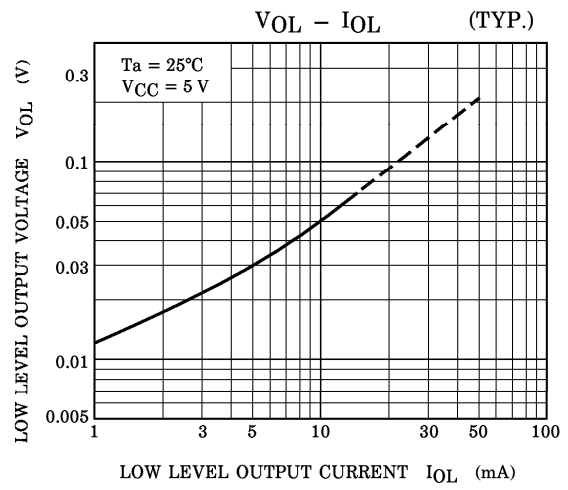
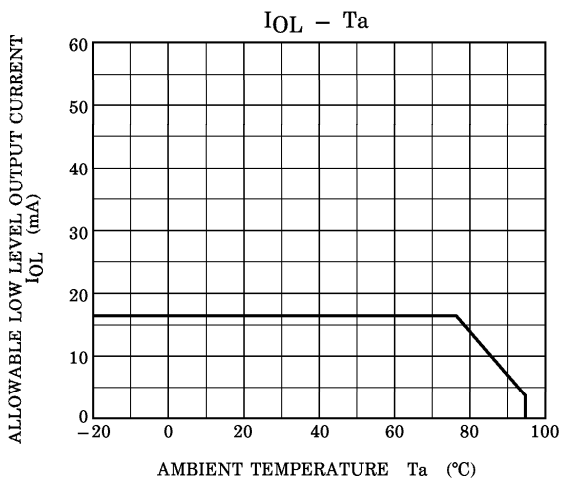
DIMENSION	TOLERANCE
6 >	±0.1
6 < 14	±0.2



Weight : 1.4 g (typ.)

PIN CONNECTION



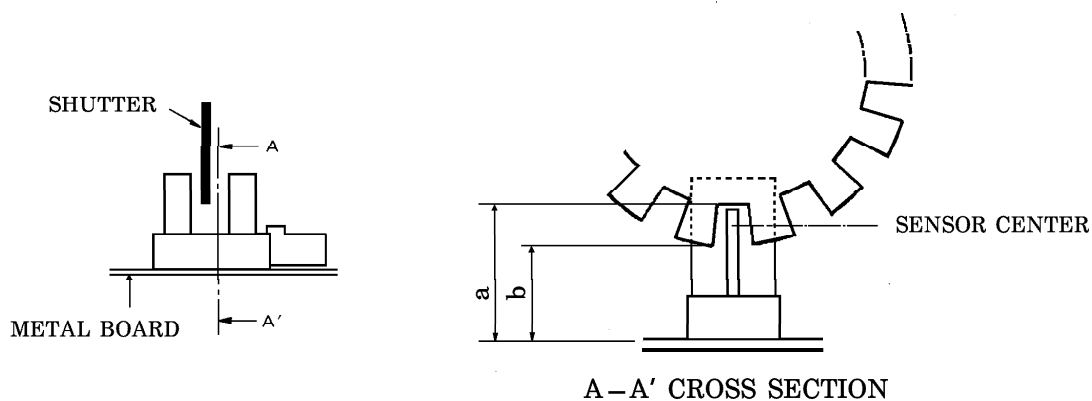


POSITIONING OF SHUTTER AND DEVICE

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 the slit width of the device.
Determine the width taking the switching time into consideration.

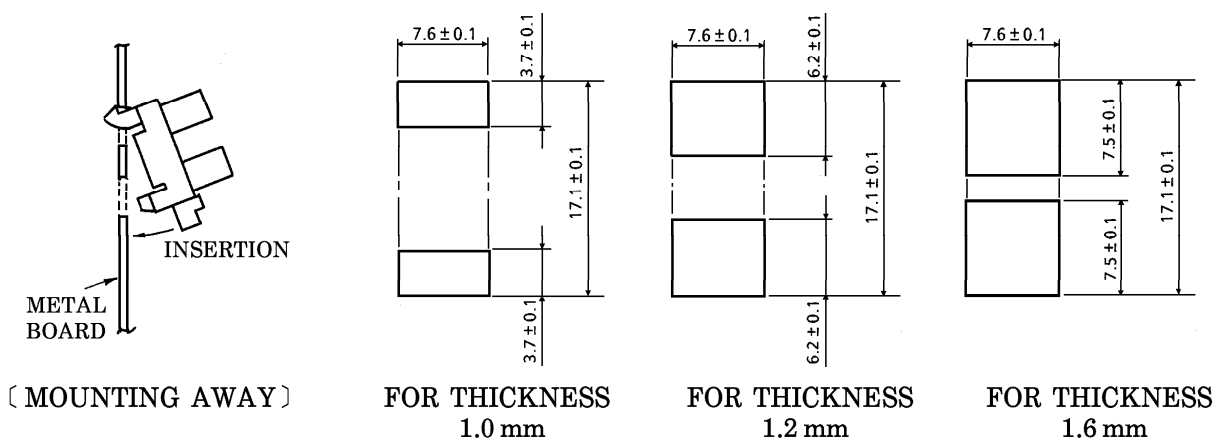
Unit in mm



Unit in mm

METAL BOARD THICKNESS	a SIZE	b SIZE
1.0	11.9 MIN.	9.4 MAX.
1.2	11.7 MIN.	9.2 MAX.
1.6	11.3 MIN.	8.8 MAX.

RECOMMENDED MOUNTING HOLE (Unit in mm)



When mounting on other than metal board as shown above, contact TOSHIBA.