



TOSHIBA PHOTointERRUPTER INFRARED LED + PHOTOTRANSISTOR

# TLP1231(C5)

COPIER, LASER BEAM PRINTER

FACSIMILE, PRINTER, ELECTRONIC TYPEWRITER

AUTOMATIC VENDING MACHINE, TERMINAL EQUIPMENT IN BANKING FACILITIES

VARIOUS POSITION DETECTION SENSOR

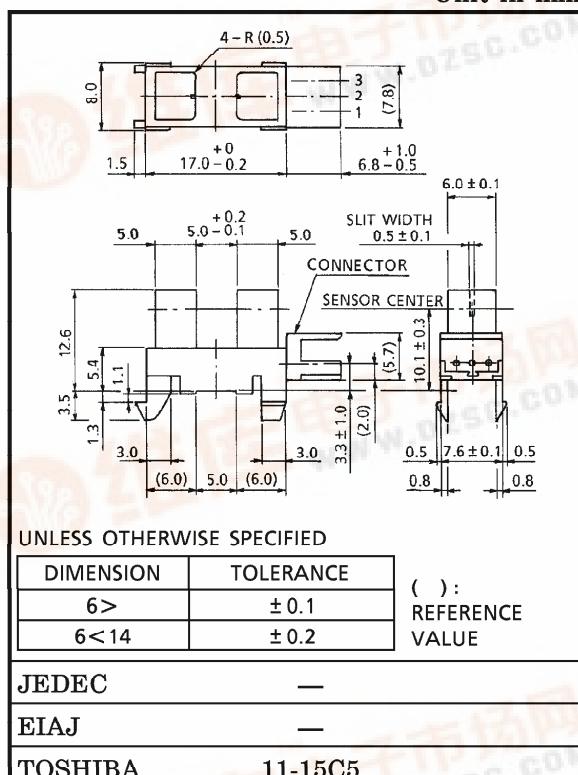
The TLP1231(C5) is a photointerrupter with a connector using an GaAs infrazred LED at the emitter side and a Si photo IC at the detector side respectively. The photo transistor is turned off when a substance is detected (when the light is shield).

This product is also usable in applications requiring severe using temperature condition such as detection of paper exit on copier, etc.

- Small package
- Phototransistor output (Anode, collector common)
- Mountable by one touch (Snap-in mounting type)
- Mountable to boards in 2 kinds of thickness (1.0mm, 1.2mm)
- Gap : 5mm
- Resolution : Slit width 0.5mm
- Large operating temperature range :  $T_{opr} = -25\text{--}95^\circ\text{C}$
- High current transfer ratio :  $I_C/I_F = 5\% \text{ (min)}$
- UL recognized PWB adopted : UL94V-0
- Material of the case : Polycarbonate
- Connector

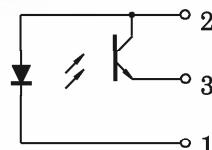
175487-3 (AMP (Japan), Ltd. made CT connector)

Unit in mm



Weight : 1.14g (typ.)

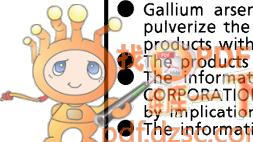
## PIN CONNECTION



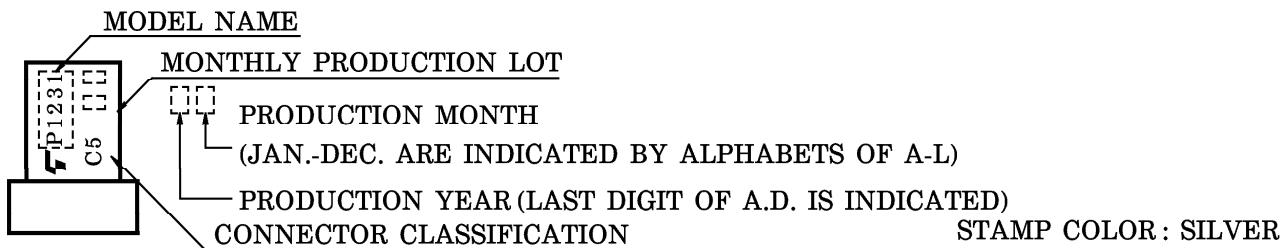
1. CATHODE
2. ANODE,  
COLLECTOR
3. EMITTER

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## PRODUCT INDICATION

MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

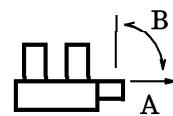
CHARACTERISTIC	SYMBOL	RATING	UNIT
Forward Current	$I_F$	50	mA
Forward Current Derating	$T_a > 25^\circ\text{C}$	$\Delta I_F / ^\circ\text{C}$	$-0.33$
	$T_c > 85^\circ\text{C}$		$-2$
Reverse Voltage	$V_R$	5	V
Collector-Emitter Voltage	$V_{CEO}$	35	V
Emitter-Collector Voltage	$V_{ECO}$	5	V
Collector Power Dissipation	$P_C$	75	mW
Collector Power Dissipation Derating ( $T_a > 25^\circ\text{C}$ )	$\Delta P_C / ^\circ\text{C}$	$-1$	$\text{mW} / ^\circ\text{C}$
Collector Current	$I_C$	50	mA
Operating Temperature Range	$T_{opr}$	$-25 \sim 95$	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	$-40 \sim 100$	$^\circ\text{C}$

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	$\mu\text{A}$
	Peak Emission Wavelength	$\lambda_P$	$I_F = 20\text{mA}$	—	940	—	nm
DETECTOR	Dark Current	$I_D$	$V_{CE} = 24\text{V}, I_F = 0$	—	—	0.1	$\mu\text{A}$
	Peak Sensitivity Wavelength	$\lambda_P$	—	—	870	—	nm
COUPLED	Current Transfer Ratio	$I_C / I_F$	$V_{CE} = 5\text{V}, I_F = 20\text{mA}$	5	—	100	%
	Collector-Emitter Saturation Voltage	$V_{CE} (\text{sat})$	$I_F = 20\text{mA}, I_C = 0.5\text{mA}$	—	0.15	0.4	V
	Rise Time	$t_r$	$V_{CC} = 5\text{V}, I_C = 2\text{mA}$	—	6	—	$\mu\text{s}$
	Fall Time	$t_f$		—	6	—	

TERMINAL STRENGTH ( $T_a = 25^\circ\text{C}$ )

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



## RECOMMENDABLE MATCHED CONNECTOR

AMP (Japan), Ltd. made CT connector

HOUSING-TERMINAL EN BLOCK TYPE	TYPE No.	TERMINAL MATERIAL	AWG SIZE	INSULATION DIAMETER
	173977-3	PHOSPHOR BRONZE	AWG 26~28	0.85~1.05mm

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

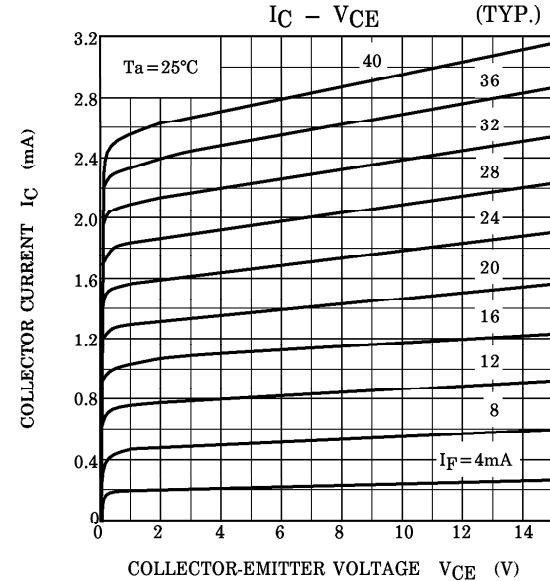
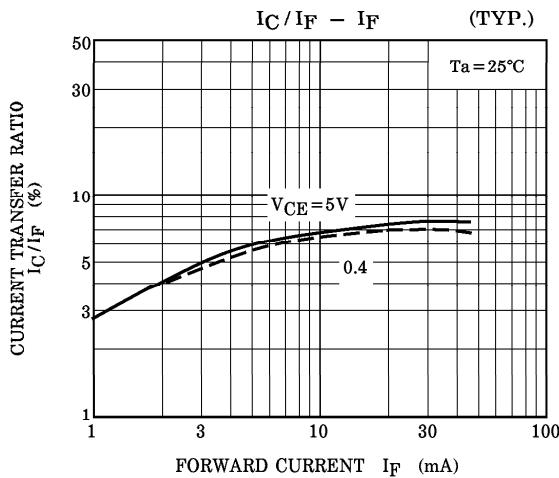
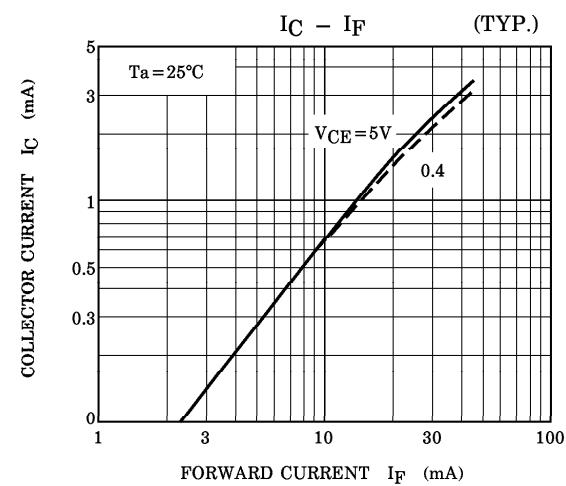
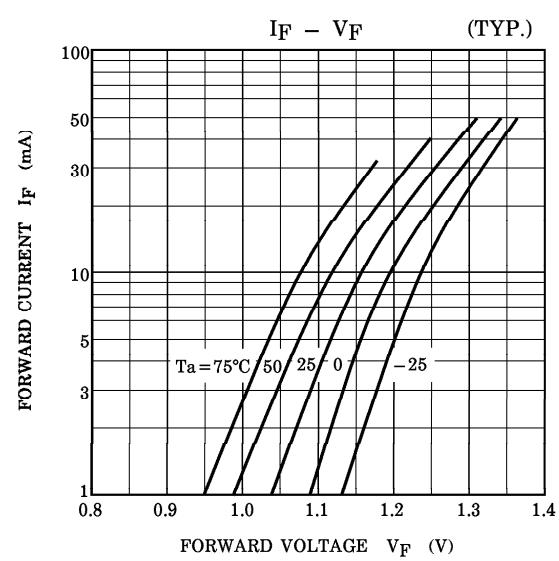
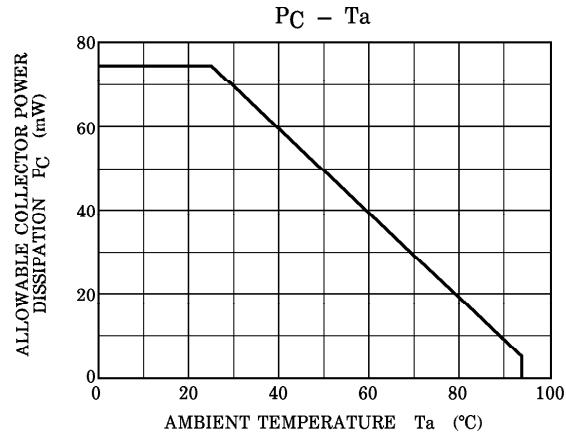
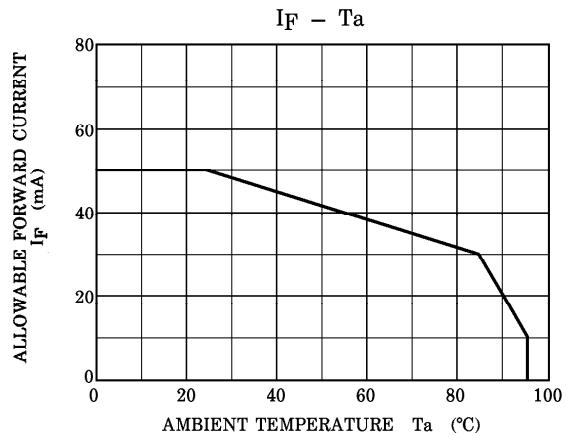
## PRECAUTION

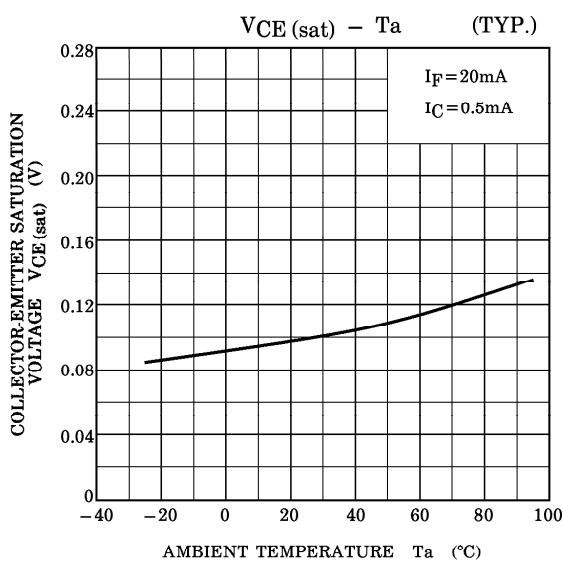
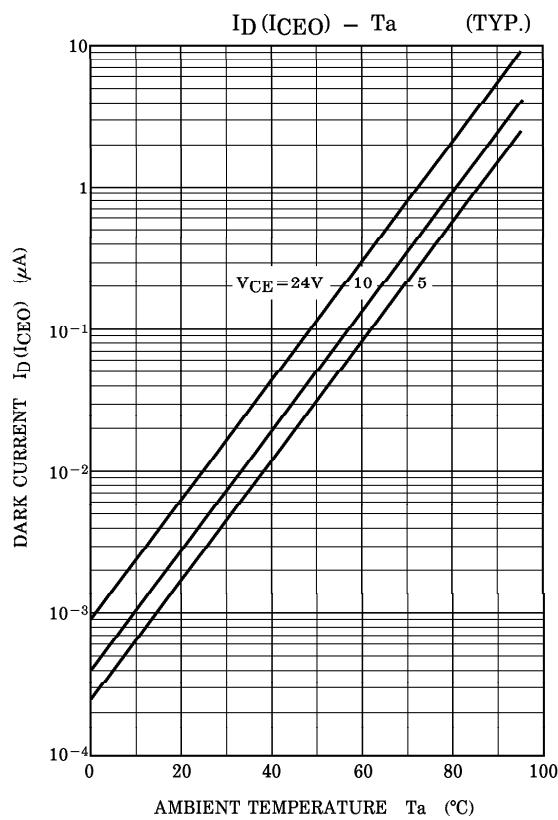
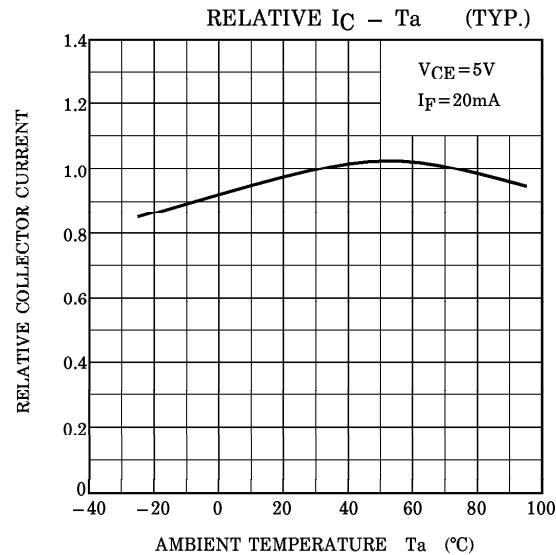
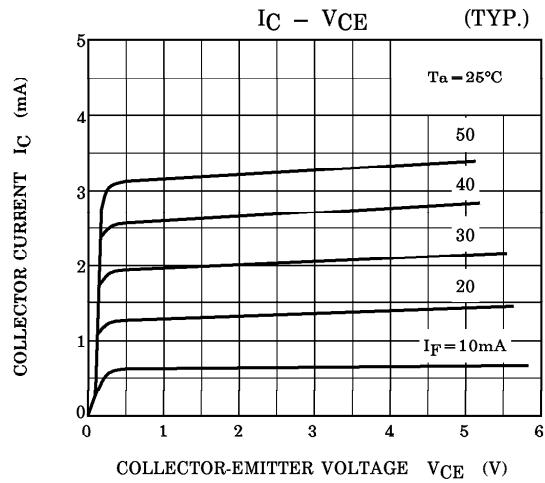
Please be careful of the followings.

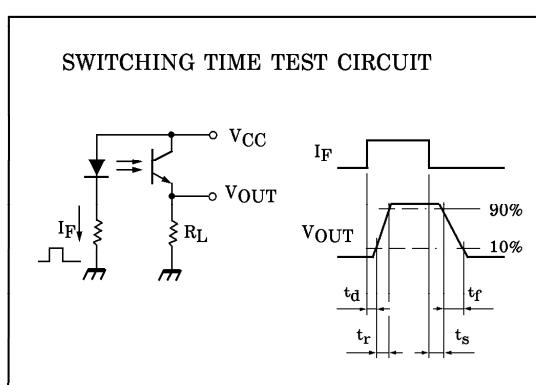
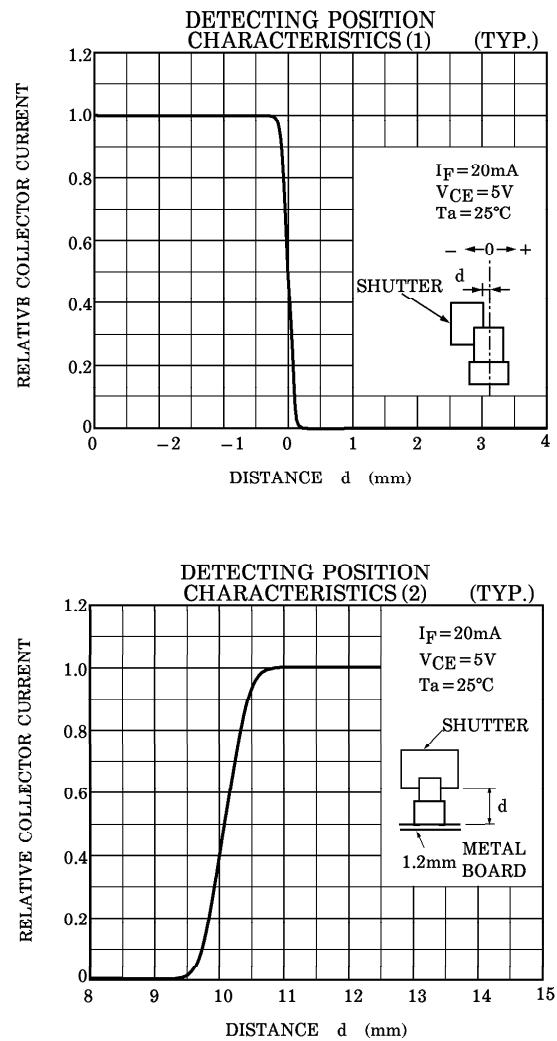
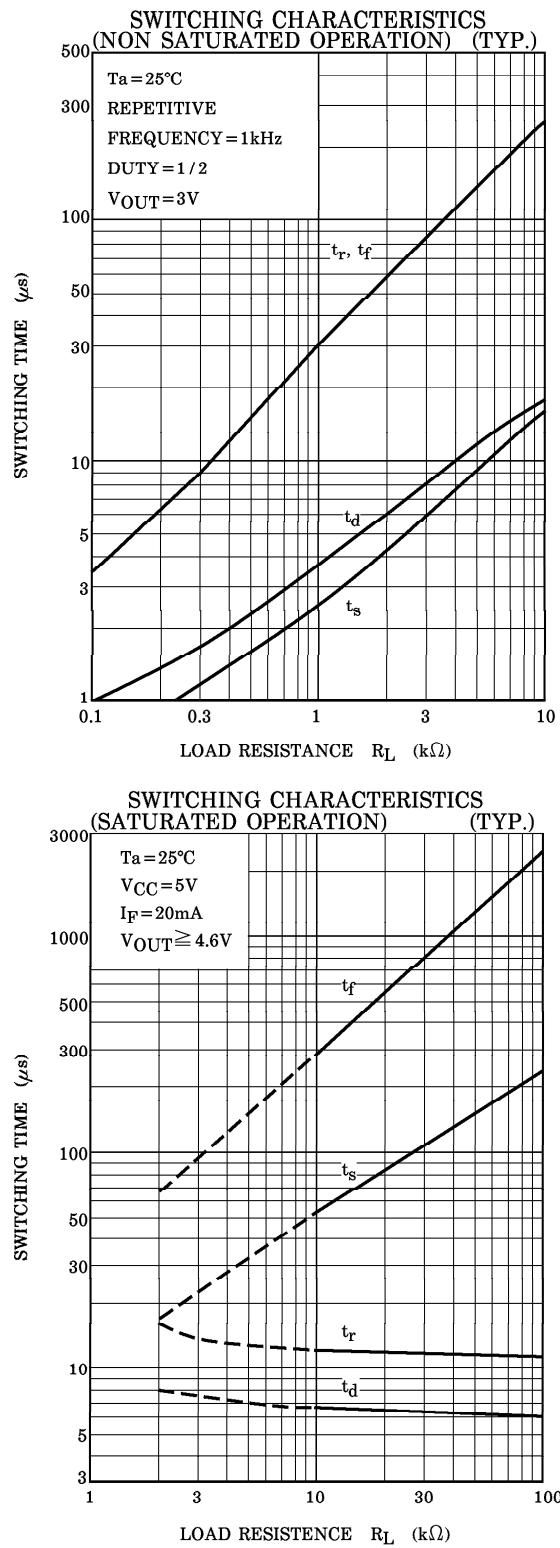
1. When installing, avoid to work by holding the connector by hand. Always, install by holding the main body of the element while assuring the mounting board is not warped or twisted. The connectors shall be inserted or pulled out at normal temperature.
2. It is recommended to mount this product by inserting from the sheet metal pressed side.
3. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with pertochemicals (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"><li>• nitric acid (low concentration), hydrogen peroxide, chlorine</li></ul>
B	Cracked, crazed, or swollen	<ul style="list-style-type: none"><li>• acetic acid (70% or more)</li><li>• gasoline</li><li>• methyl ethyl ketone, ethyl acetate, butyl acetate</li><li>• ethyl methacrylate, ethyl ether, MEK</li><li>• acetone, m-amino alcohol, carbon tetrachloride</li><li>• carbon disulfide, trichloroethylene, cresol</li><li>• thinners, oil of turpentine</li><li>• triethanolamine, TCP, TBP</li></ul>
C	Melted { } : Used as solvent.	<ul style="list-style-type: none"><li>• concentrated sulfuric acid</li><li>• benzene</li><li>• styrene, acrylonitrile, vinyl acetate</li><li>• ethylenediamine, diethylenediamine</li><li>• chloroform, methyl chloride, tetrachloromethane, dioxane, } • 1, 2-dichloroethane }</li></ul>
D	Decomposed	<ul style="list-style-type: none"><li>• ammonia water</li><li>• other alkali</li></ul>



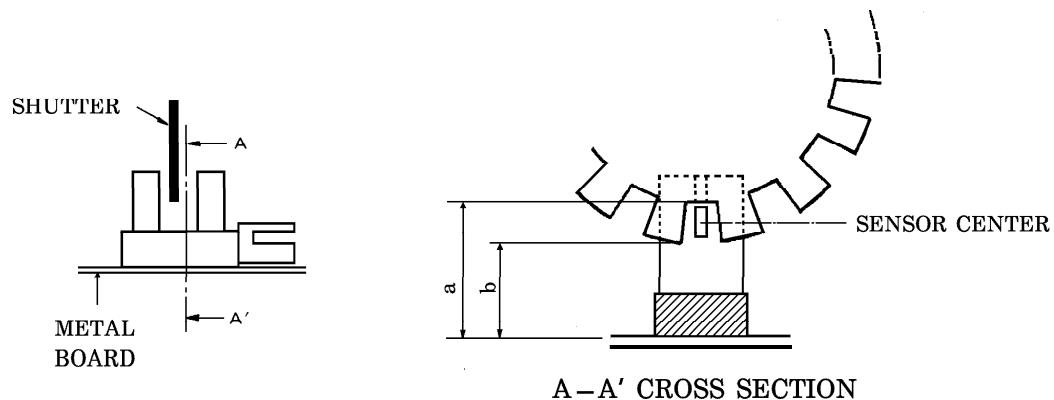




## POSITIONING OF SHUTTER AND DEVICE

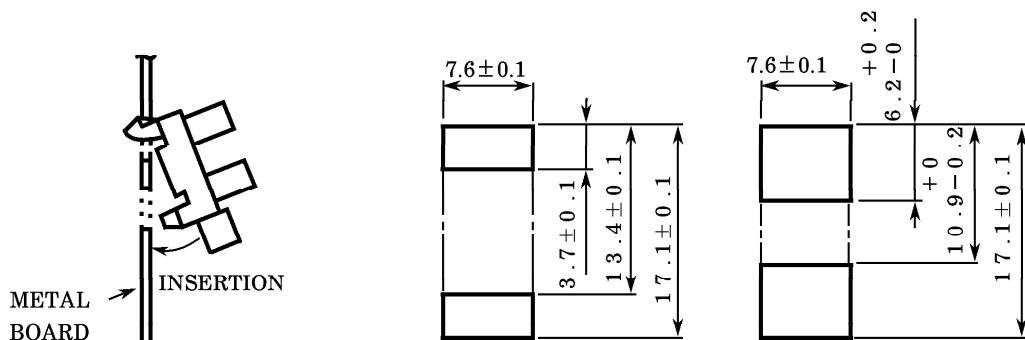
To operate correctly, make sure that the shutter and the device are positioned as shown in the figure below.

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.



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

## RECOMMENDED MOUNTING HOLE



## MOUNTING AWAY

FOR THICKNESS  
1.0mm

FOR THICKNESS  
1.2mm