

TOSHIBA PHOTOINTERRUPTER INFRARED + PHOTODARLINGTONTRANSISTOR

TLP862, TLP866, TLP867

VCR, COMPACT DISC PLAYER
 COPYING MACHINE, FACSIMILE, PRINTER
 VENDING MACHINE, TICKETING MACHINE
 FOR VARIOUS POSITION DETECTION

The TLP862, TLP866 and TLP867 are photointerrupters with an GaAs infrared LED and a high sensitivity Si photodarlingtontransistor combined. They have a high current transfer ratio, and be driven by low input current and is best suited to a low power circuit.

- Small package
- Side mounting type : TLP862
- PWB direct mounting type : TLP866
TLP867 (the oblong slit)
- Gap : 5mm
- Resolution : Slit width 0.5mm
- High current transfer ratio : $I_C / I_F = 30\%$ (min) at $I_F = 1\text{mA}$
- The detector side is of visible light cut type.
- Material of the package : Polycarbonate

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	$\Delta I_F / ^\circ\text{C}$	-0.33	mA / °C
	Reverse Voltage	V_R	5	V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	30	V
	Emitter-Collector Voltage	V_{ECO}	5	V
	Collector Power Dissipation	P_C	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	$\Delta P_C / ^\circ\text{C}$	-1	mW / °C
	Collector Current	I_C	40	mA
Operating Temperature Range		T_{opr}	-25~85	°C
Storage Temperature Range		T_{stg}	-40~100	°C
Soldering Temperature (5s)		T_{sol}	260	°C

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RECOMMENDED OPERATING CONDITIONS

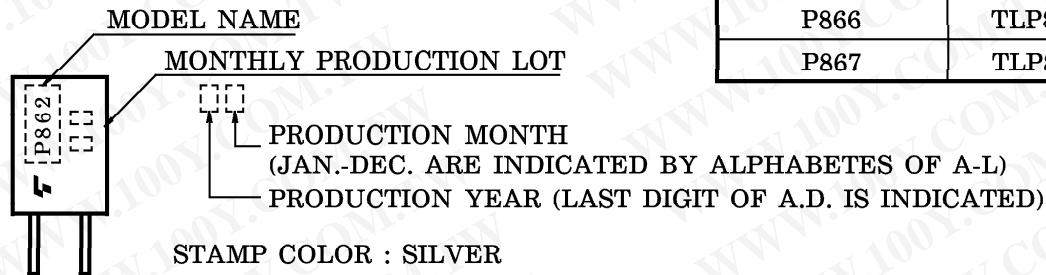
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	—	5	16	V
Forward Current	I _F	—	—	20	mA
Operating Temperature	T _{opr}	-10	—	70	°C

OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V _F	I _F = 10mA	1.00	1.15	1.30	V
	Reverse Current	I _R	V _R = 5V	—	—	10	μA
	Peak Emission Wavelength	λ _P	I _F = 10mA	—	940	—	nm
DETECTOR	Dark Current	I _D (I _{CEO})	V _{CE} = 16V, I _F = 0	—	—	0.25	μA
	Peak Sensitivity Wavelength	λ _P	—	—	870	—	nm
COUPLED	Current Transfer Ratio	I _C / I _F	V _{CE} = 2V, I _F = 1mA	30	—	1200	%
	Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _F = 2mA, I _C = 0.3mA	—	0.75	1	V
	Rise Time	t _r	V _{CC} = 5V, I _C = 1mA R _L = 1kΩ	—	600	—	μs
	Fall Time	t _f		—	500	—	

PRODUCT INDICATION

ABBREVIATION	TYPE
P862	TLP862
P866	TLP866
P867	TLP867



PRECAUTION

Please be careful of the followings.

1. If chemical are used for cleaning, the soldered surface only shall be cleaned with chemicals avoiding the whole cleaning of the package.
2. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with petrochemicals (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 >

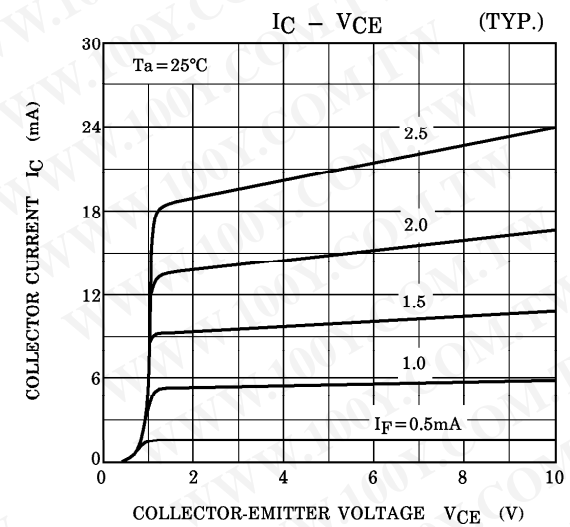
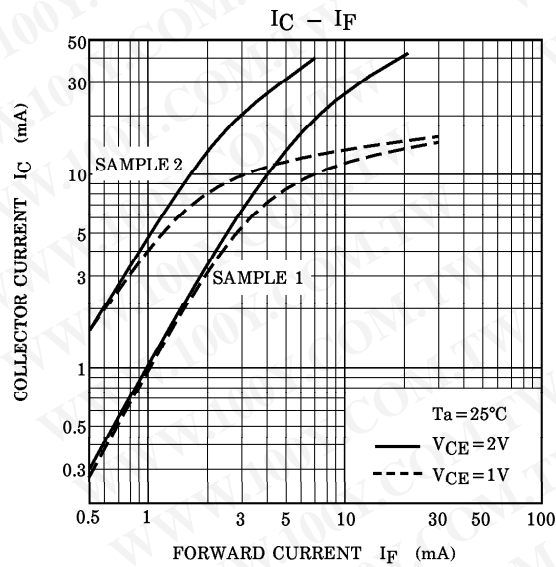
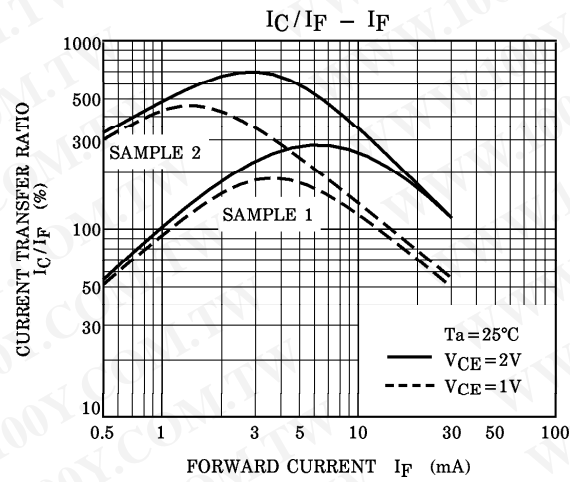
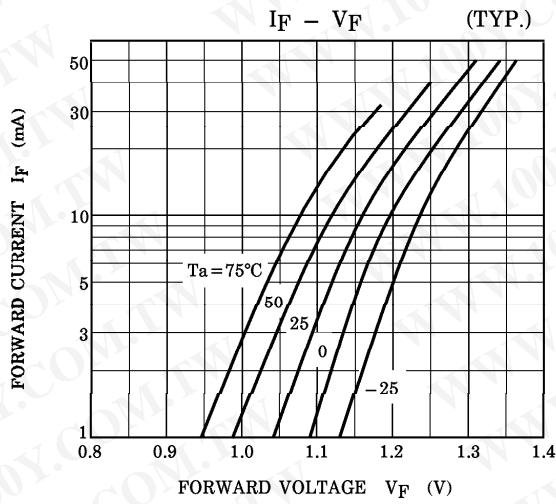
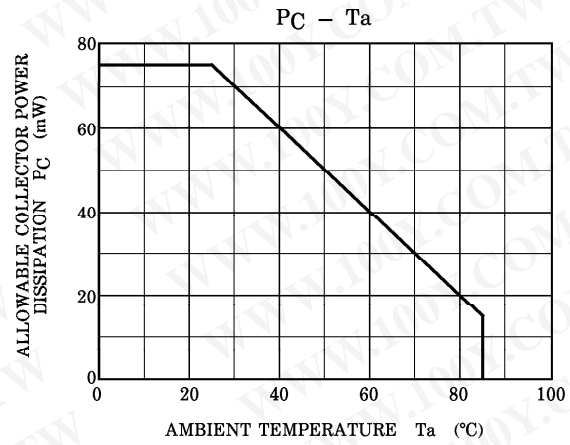
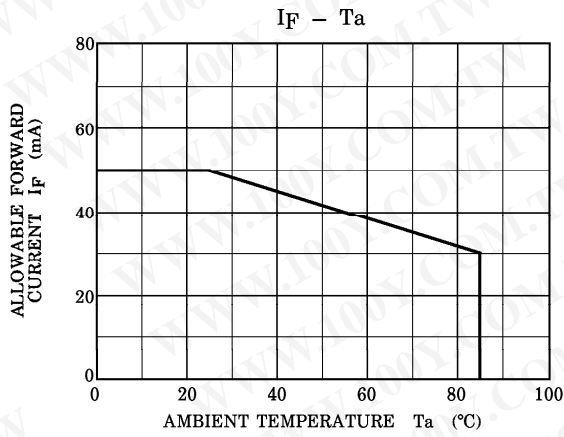
	PHENOMENON	CHEMICALS
A	Little deterioration but staining	<ul style="list-style-type: none"> • nitric acid (low concentration), hydrogen peroxide, chlorine
B	Cracked, crazed, or swollen	<ul style="list-style-type: none"> • acetic acid (70% or more) • gasoline • methyl ethyl ketone, ethyl acetate, butyl 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

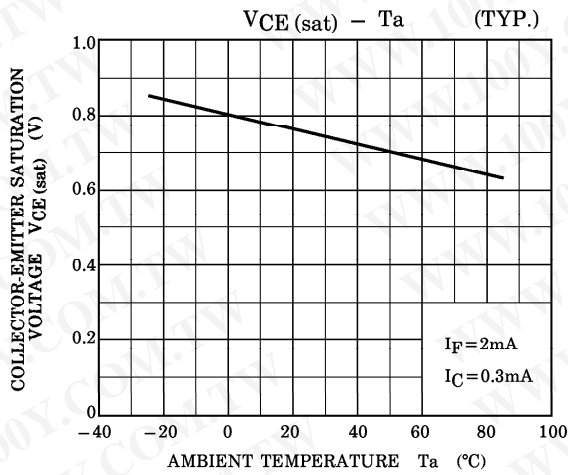
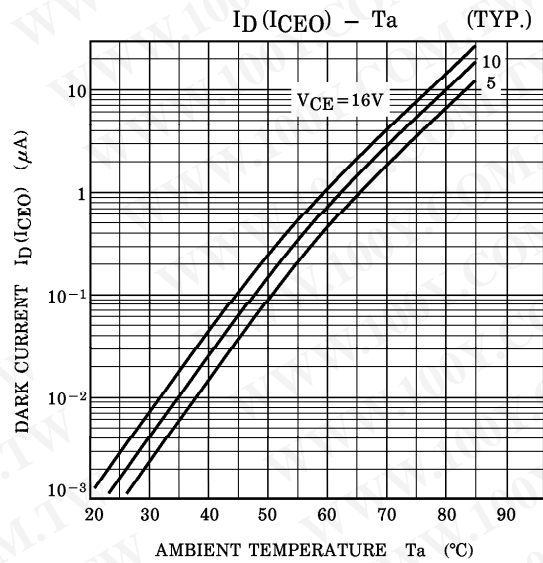
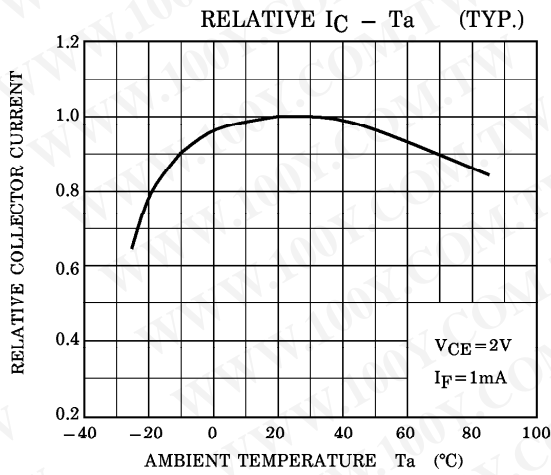
3. TLP862, TLP866, TLP867 shall be mounted on an unwarped surface.
4. Screw shall be tightened to clamping torque of 0.59N·m. (TLP862)

OUTLINE DRAWINGS

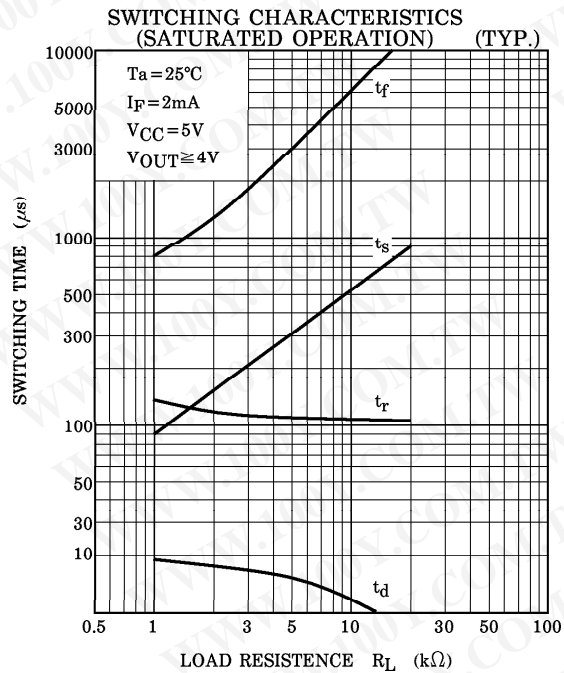
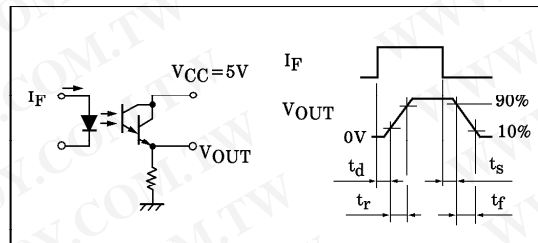
Unit in mm

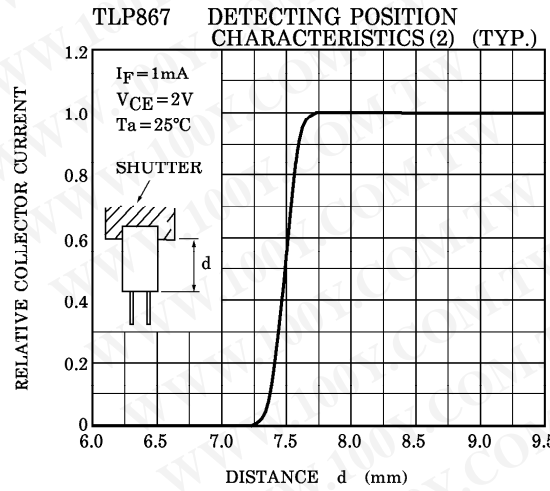
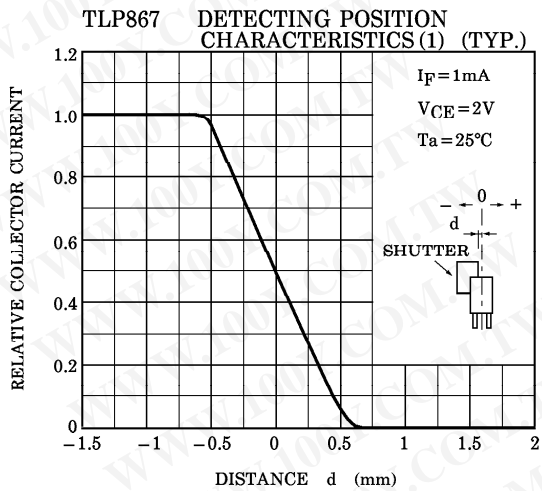
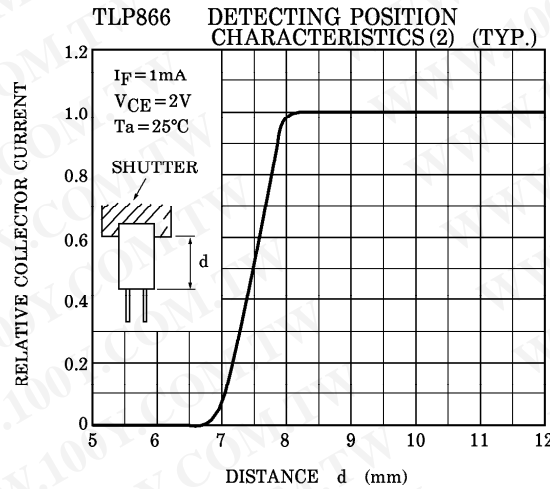
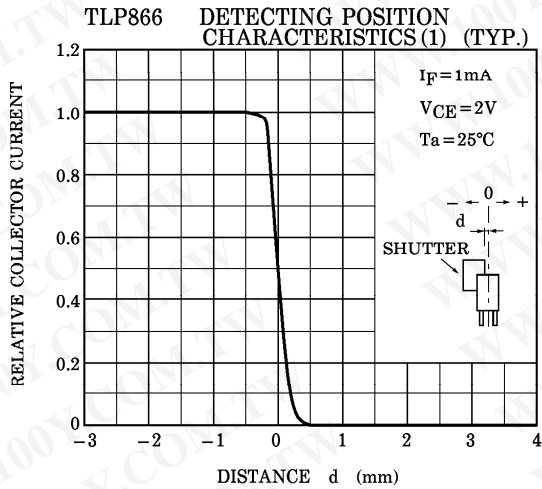
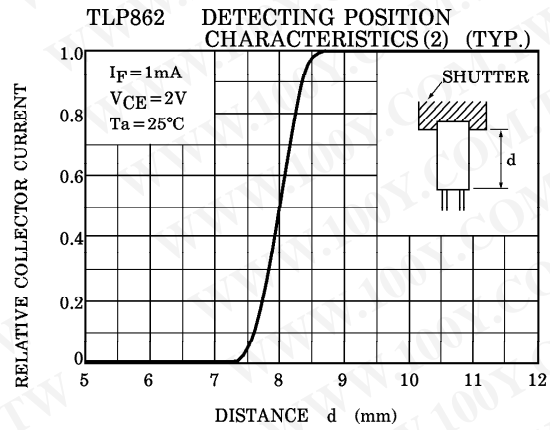
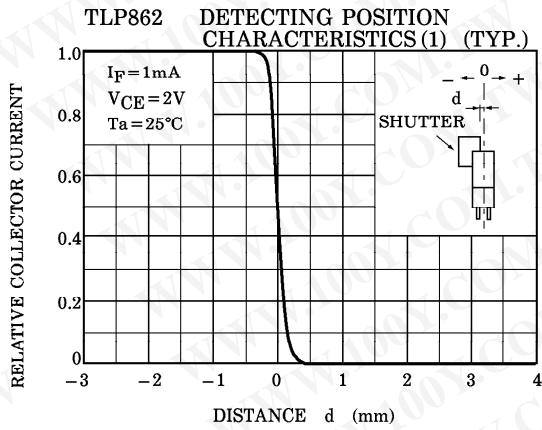
<p>TLP862</p> <p>Dimensions: $\phi 3.2 \pm 0.2$, $2 - R(1)$, 14.2 ± 0.2, 6.2 ± 0.2, 5.0 ± 0.15, 14.2 ± 0.2, 7.1 ± 0.2, 10.1 ± 0.2, SLIT WIDTH 0.5 ± 0.1, SENSOR CENTER, 8 ± 0.3, 11.0 ± 0.2, 2.5 ± 0.2, 16MIN, (10.16), (2.54), $4 - \square 0.45 \pm 0.15$.</p> <p>() : REFERENCE VALUE</p>	<p>TLP866</p> <p>Dimensions: 14.0 ± 0.2, 6.0 ± 0.2, SLIT WIDTH 0.5 ± 0.1, $+0.2$, $5.0 - 0.1$, SENSOR CENTER, 2.5 ± 0.1, 7.5 ± 0.3, 10.0 ± 0.2, (1.7), 18MIN, $2 - 0.7 \pm 0.1$, (10.16), (2.54), $4 - \square 0.45 \pm 0.15$, 5.2 ± 0.1, $2 - \phi 0.7 \pm 0.1$, 2.35 ± 0.1, 6.6 ± 0.1.</p> <p>() : REFERENCE VALUE</p>
<p>JEDEC —</p>	<p>JEDEC —</p>
<p>EIAJ —</p>	<p>EIAJ —</p>
<p>TOSHIBA 11-20B2</p>	<p>TOSHIBA 11-14A1</p>
<p>TLP867</p> <p>Dimensions: 15.0 ± 0.2, 6.0 ± 0.1, $+0.2$, $5.0 - 0.1$, SLIT WIDTH 2.0 ± 0.1, SENSOR CENTER, 2.5 ± 0.1, 7.5 ± 0.1, 10.0 ± 0.2, SLIT WIDTH 0.5 ± 0.1, 18.0MIN, $2 - 0.7 \pm 0.1$, (11.16), (2.54), $4 - \square 0.45 \pm 0.15$, 5.2 ± 0.1, $2 - \phi 0.7 \pm 0.1$, 2.35 ± 0.1, 7.1 ± 0.1.</p> <p>() : REFERENCE VALUE</p>	<p>Weight : 0.85g (typ.) (TLP862) 0.65g (typ.) (TLP866) 0.72g (typ.) (TLP867)</p> <p>PIN CONNECTION</p> <p>1. ANODE 2. CATHODE 3. COLLECTOR 4. EMITTER</p>
<p>JEDEC —</p>	
<p>EIAJ —</p>	
<p>TOSHIBA 11-15B1</p>	





SWITCHING TIME TEST CIRCUIT





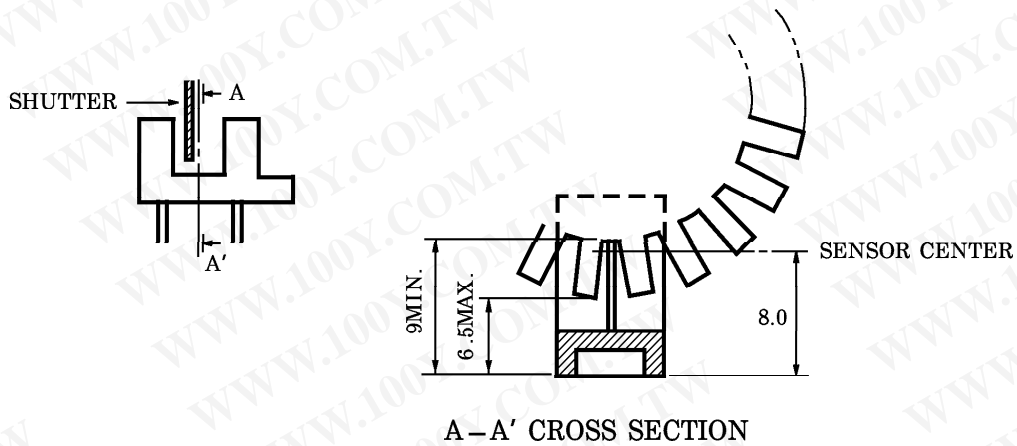
POSITIONING OF SHUTTER AND DEVICE

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.

TLP862

Unit in mm



TLP866

