

TOSHIBA Photo-Interrupters Infrared LED + Phototransistor

TLP822(F),TLP827(F)

Lead Free Product

Vcrs, Compact Disc Players

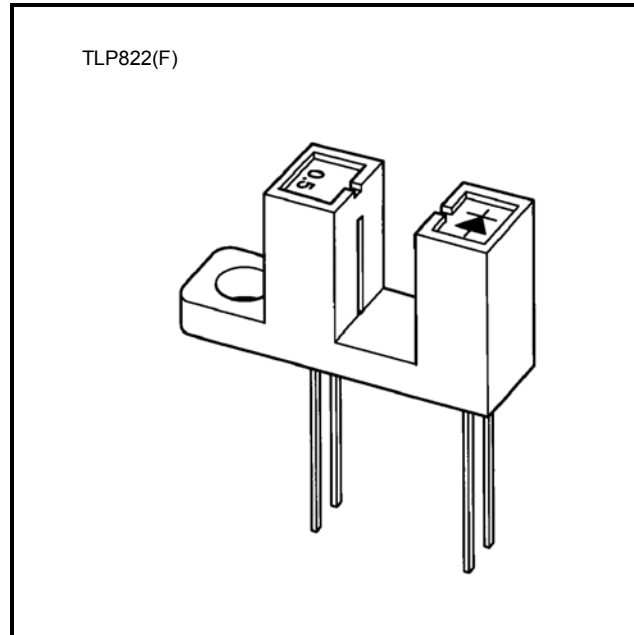
Floppy Disk Drives, Fax Machines,
Printers

Vending Machines

Various Position Detection Sensors

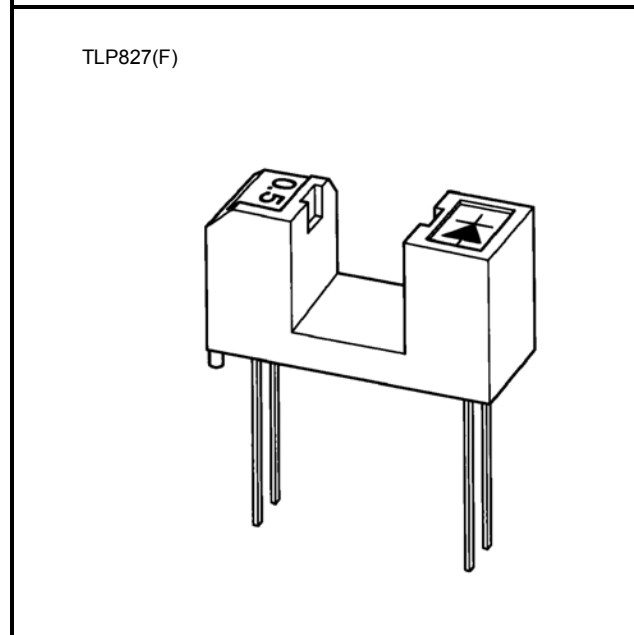
The TLP822(F) and TLP827(F) photo-interrupters combine a high-radiant-power GaAs infrared LED with an Si phototransistor.

- Small package
- Side mounting type: TLP822(F)
- Designed for direct mounting on printed circuit boards: TLP827(F) (the oblong slit)
- Gap: 5mm
- Resolution: Slit width = 0.5mm
- High current transfer ratio: $I_C / I_F = 5\%$ (min) at $I_F = 10\text{mA}$
- Detector impermeable to visible light
- Package material: polycarbonate



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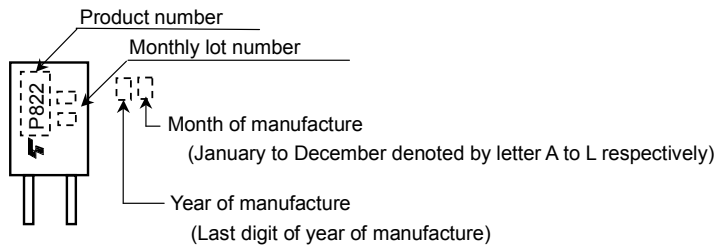


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Weight: 0.87g (typ.)
0.72g (typ.)

Markings



Abbreviation	Type
P822	TLP822(F)
P827	TLP827(F)

Letter color: Silver

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit	
LED	Forward current	I_F	50	mA	
	Forward current derating	$\Delta I_F / ^\circ\text{C}$	(Ta > 25°C)	-0.33	
			(Ta > 85°C)	-2(Notes)	
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		$\Delta P_C / ^\circ\text{C}$	-1	mW / °C
	Collector current		I_C	50	mA
Operating temperature range	TLP822(F)	T_{opr}	-25~85	°C	
	TLP827(F)		-25~95		
Storage temperature range		T_{stg}	-40~100	°C	
Soldering temperature (5 s)		T_{sol}	260	°C	

(Note): TLP827(F) only

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{CC}	—	5	24	V
Forward current	I_F	—	10	20	mA
Operating temperature	T_{opr}	-10	—	75	°C

Optical And Electrical Characteristics(Ta = 25°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	$I_F = 10\text{mA}$	—	940	—	nm
Detector	Dark current	$I_D(I_{CEO})$	$V_{CE}=24\text{V}, I_F=0$	—	—	0.1	μA
	Peak sensitivity wavelength	λ_P	—	—	870	—	nm
Coupled	Current transfer ratio	I_C / I_F	$V_{CE}=2\text{V}, I_F=10\text{mA}$	5	—	75	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=20\text{mA}, I_C=0.5\text{mA}$	—	0.1	0.4	V
	Rise time	t_r	$V_{CC}=5\text{V}, I_C=1\text{mA}, R_L=1\text{k}\Omega$	—	15	50	μs
	Fall time	t_f		—	15	50	

Precautions

The following points must be borne in mind.

1. Clean only the soldered part of the leads. Do not immerse the entire package in the cleaning solvent.
2. The package is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol and aliphatic hydrocarbons; however, with petrochemicals (such as benzene, toluene and acetone), alkalis, aromatic hydrocarbons, or chloric hydrocarbons, polycarbonate may crack, swell or melt. Please take this into account when choosing a packaging material by referring to the table below.

<Chemicals Which Should Not Be Used With Polycarbonate>

	Phenomenon	Chemicals
A	Staining and slight deterioration	<ul style="list-style-type: none"> • Nitric acid (diluted), hydrogen peroxide, chlorine
B	Cracking, crazed or swelling	<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	Melting (): 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	Decomposition	<ul style="list-style-type: none"> • Ammonia water • Other alkalis

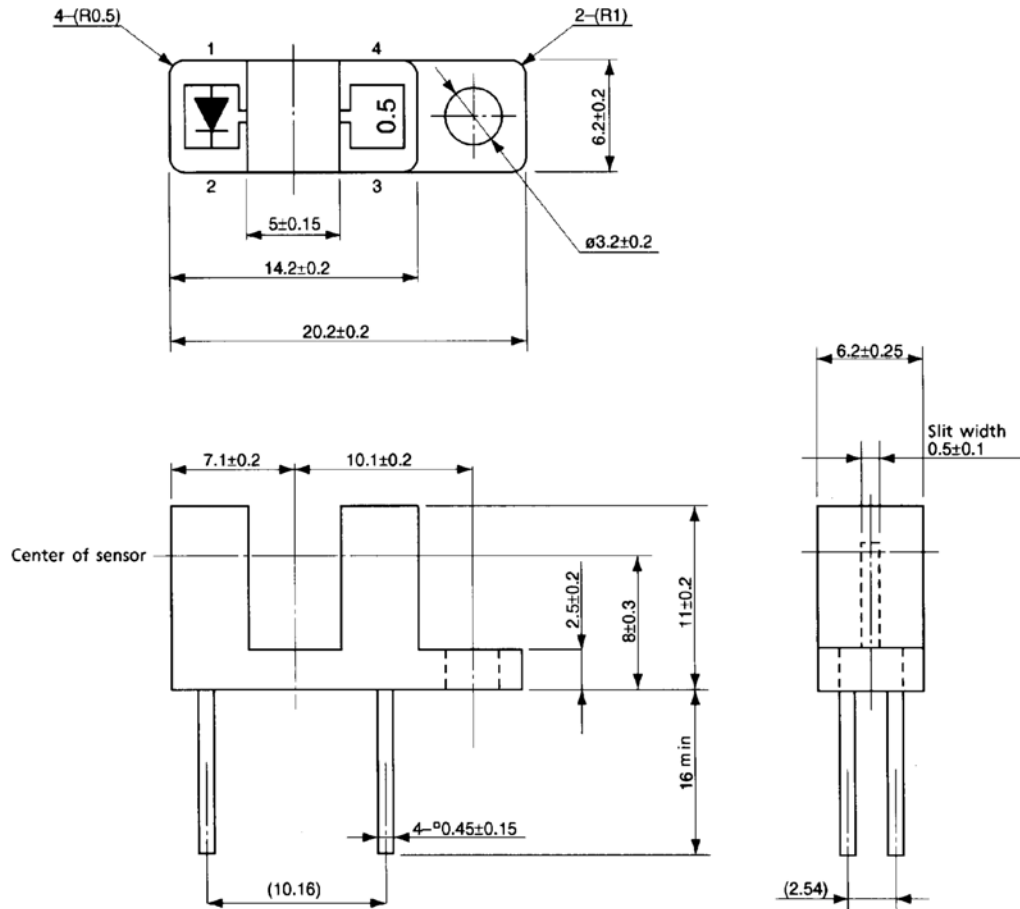
3. Mount the device on a level surface.
4. Screws should be tightened to a clamping torque of 0.59N·m.
5. Conversion efficiency falls over time due to the current which flows in the infrared LED. When designing a circuit, take into account this change in conversion efficiency over time. The ratio of fluctuation in conversion efficiency to fluctuation in infrared LED optical output is 1: 1.

$$\frac{I_C / I_F(t)}{I_C / I_F(0)} = \frac{P_O(t)}{P_O(0)}$$

Package Dimensions

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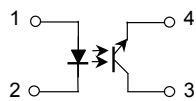
Unit : mm



() : Reference value

Weight: 0.87 g (typ.)

Pin Connection

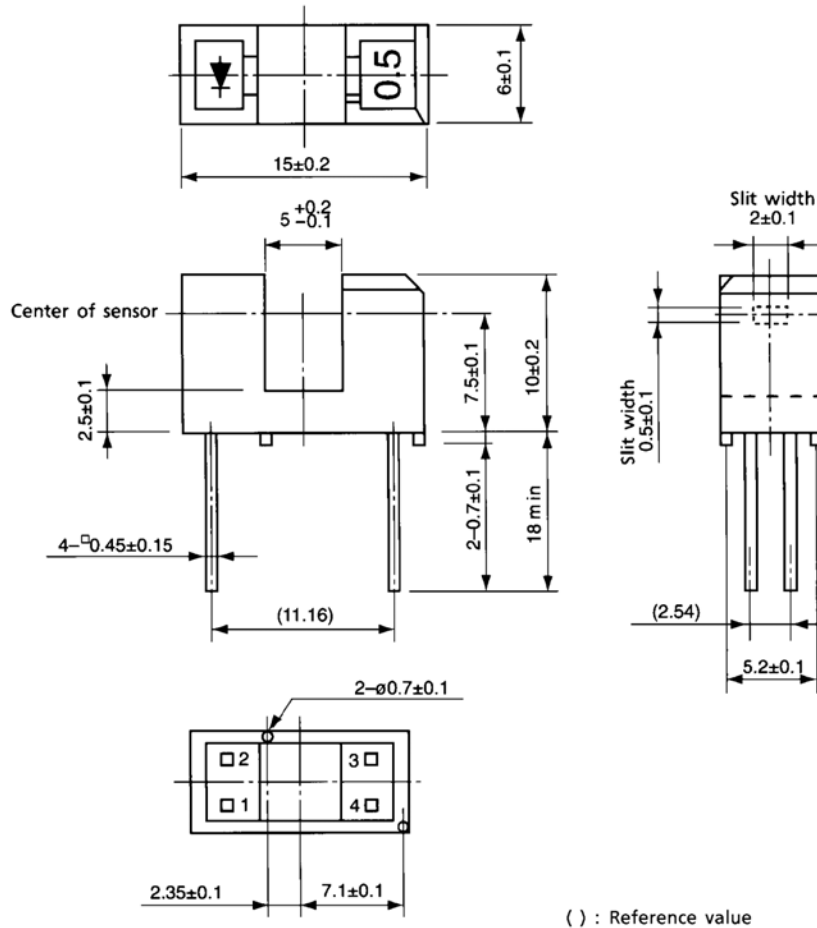


1. Anode
2. Cathode
3. Collector
4. Emitter

Package Dimensions

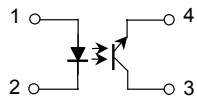
11-15B1

Unit : mm

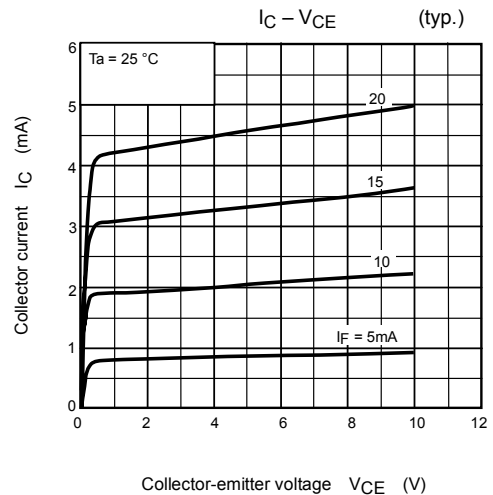
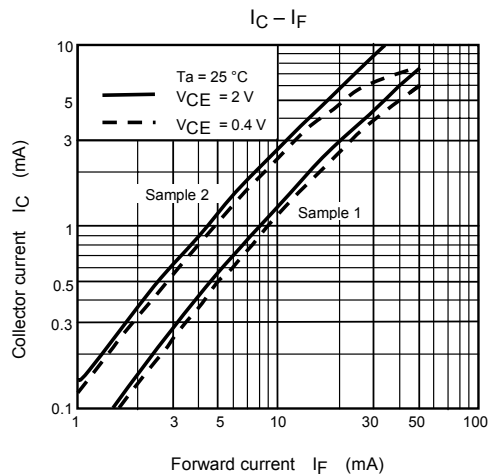
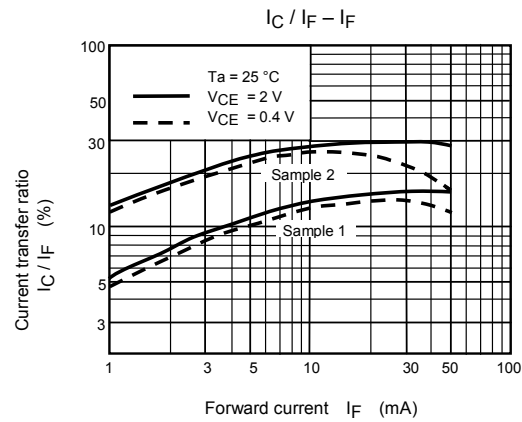
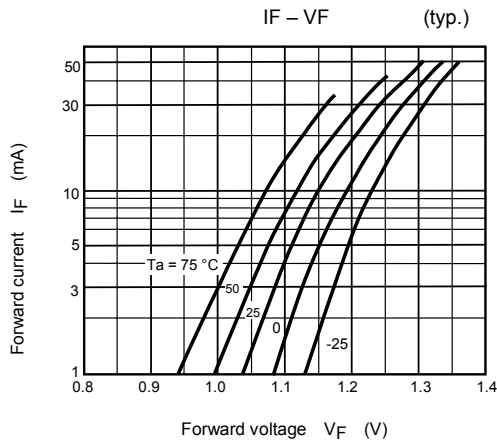
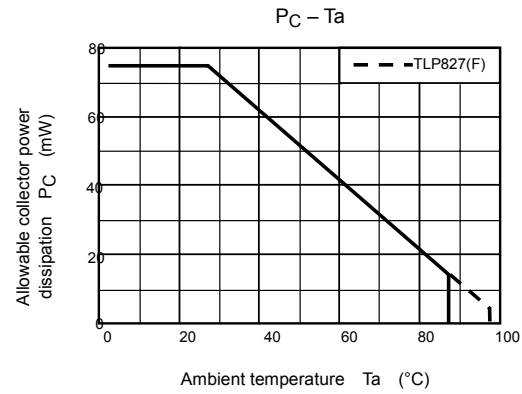
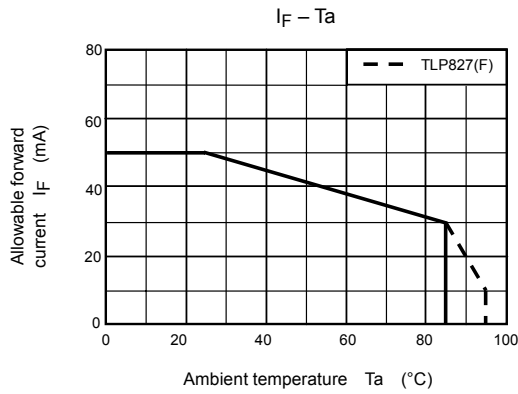


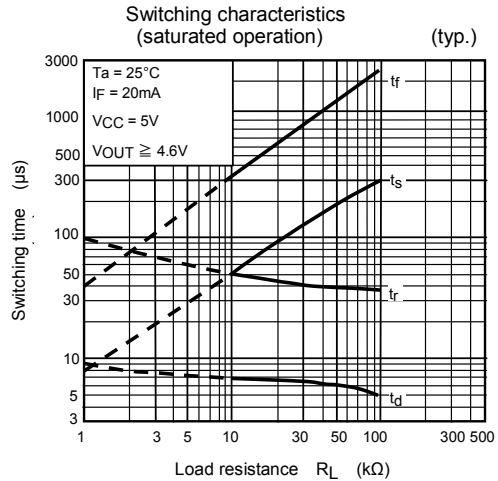
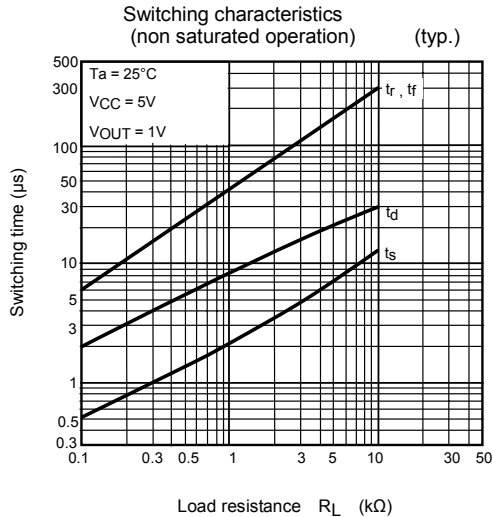
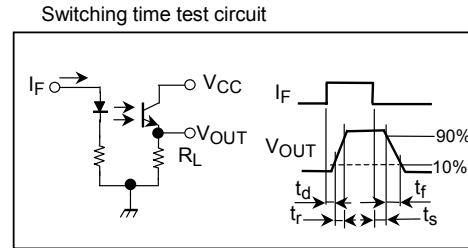
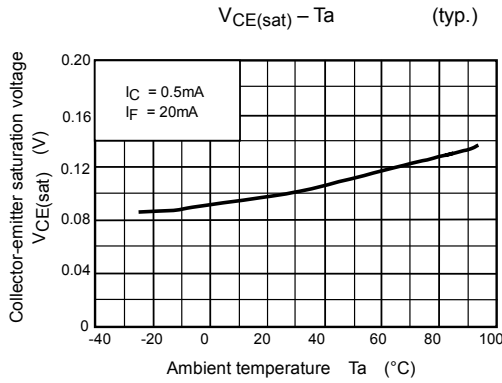
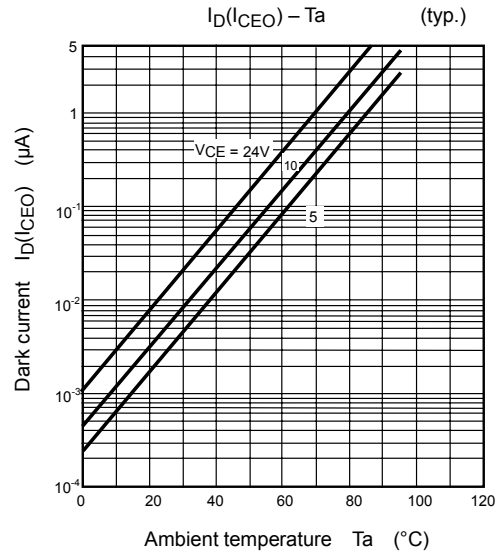
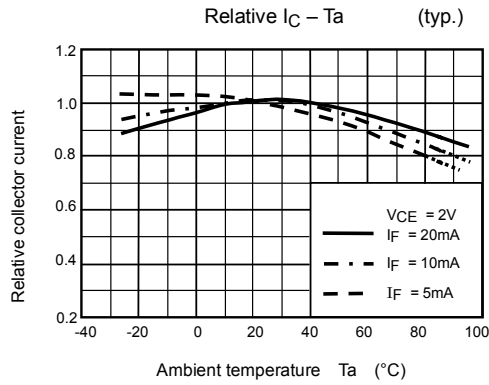
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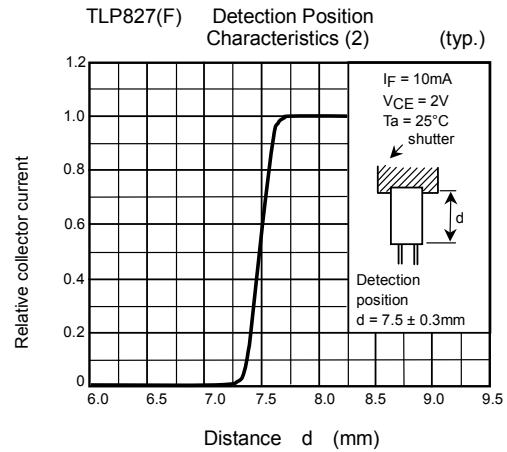
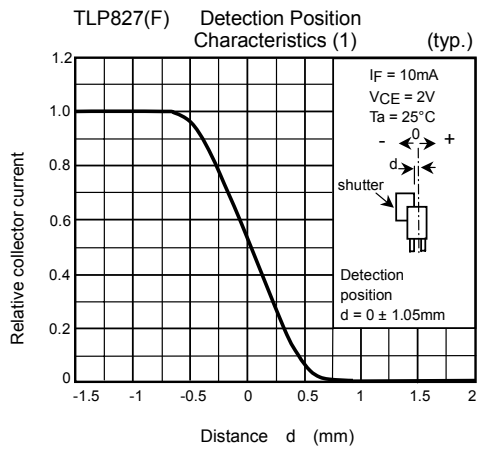
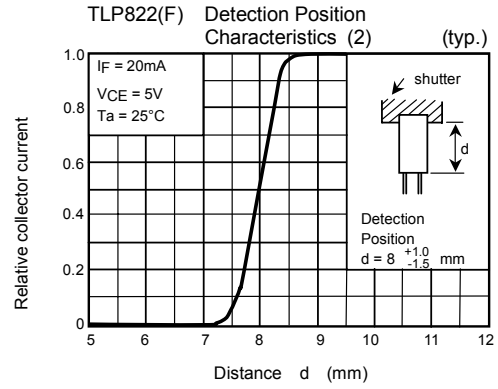
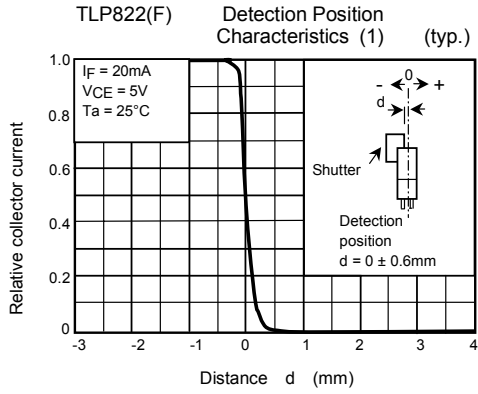
Pin Connection



1. Anode
2. Cathode
3. Collector
4. Emitter



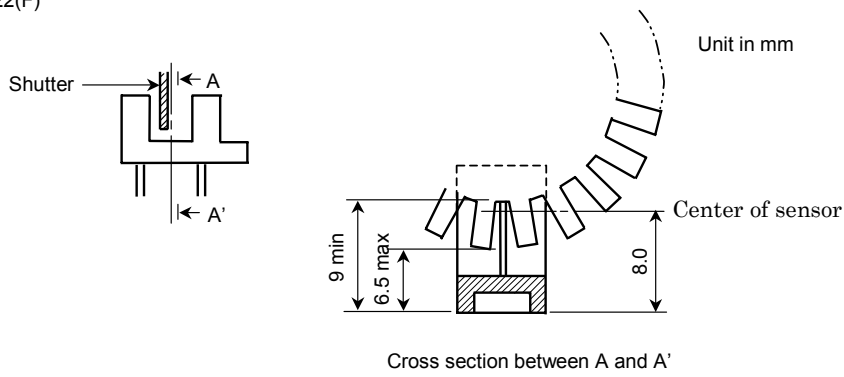




Relative Positioning Of Shutter And Device

For normal operation position the shutter and the device as shown in the figure below. By considering the device's detection position characteristic and switching time, determine the shutter slit width and pitch.

TLP822(F)



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