

TOSHIBA PHOTOINTERRUPTER INFRARED + PHOTODARLINGTONTRANSISTOR

TLP869

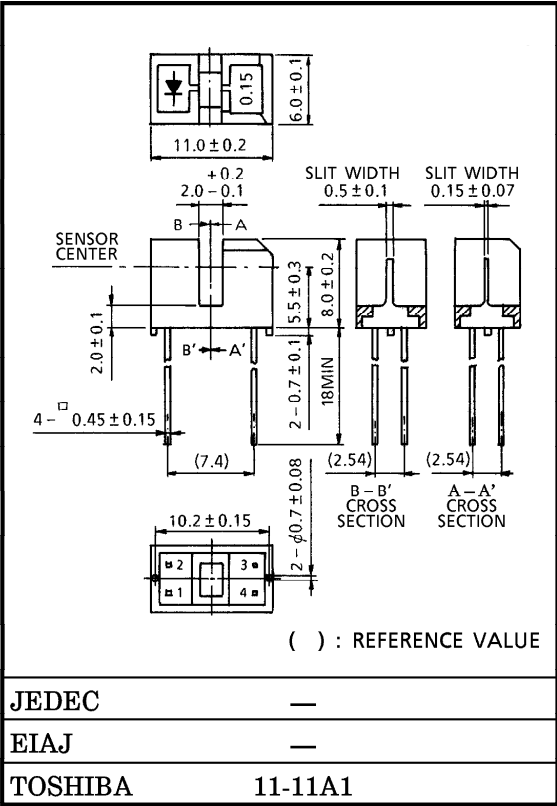
VCR, COMPACT DISC PLAYER
COPYING MACHINE, FACSIMILE, PRINTER
VENDING MACHINE, TICKETING MACHINE
FOR VARIOUS POSITION DETECTION

The TLP869 is a photointerrupter combining GaAs infrared LED with high sensitivity Si photodarlingtontransistor.

The TLP869 has a high current transfer ratio can be driven by low input current and is best suited to a low power circuit.

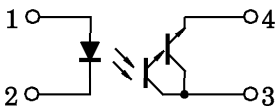
- Small package
- Printed wiring board direct mounting type (with a locating pin)
- Gap : 2mm
- High resolution : Slit width
0.15mm (Detector side)
0.5mm (LED side)
- High current transfer ratio: $I_C / I_F = 50\%$ (min) at $I_F = 1\text{mA}$
- The detector side is of visible light cut type.

Unit in mm



Weight : 0.56g (typ.)

PIN CONNECTION



1. ANODE
2. CATHODE
3. COLLECTOR
4. EMITTER

961001EBC2

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● 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.

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● The information contained herein is subject to change without notice.

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

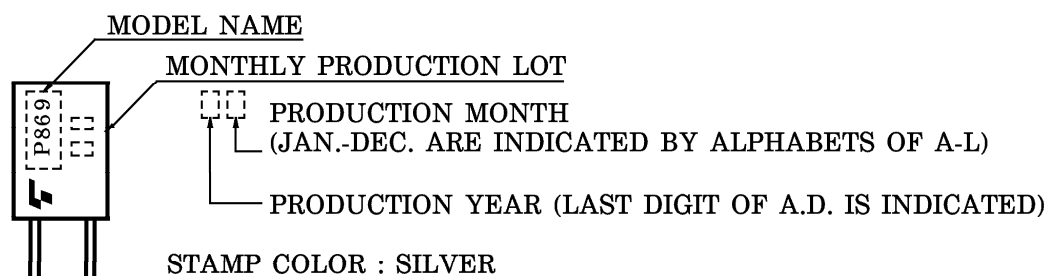
RECOMMENDED OPERATING CONDITION

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	$I_F = 10\text{mA}$	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	$I_D (I_{CEO})$	$V_{CE} = 16\text{V}, I_F = 0$	—	—	0.25	μA
	Peak Sensitivity Wavelength	λ_P		—	870	—	nm
COUPLED	Current Transfer Ratio	I_C / I_F	$V_{CE} = 2\text{V}, I_F = 1\text{mA}$	30	—	1200	%
	Collector-Emitter Saturation Voltage	$V_{CE (sat)}$	$I_F = 2\text{mA}, I_C = 0.3\text{mA}$	—	0.75	1	V
	Rise Time	t_r	$V_{CC} = 5\text{V}, I_C = 1\text{mA}$ $R_L = 1\text{k}\Omega$	—	600	—	μs
	Fall Time	t_f		—	500	—	

PRODUCT INDICATION



PRECAUTION

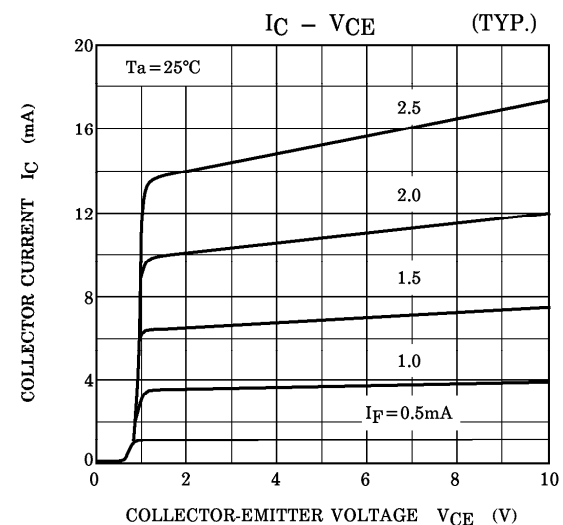
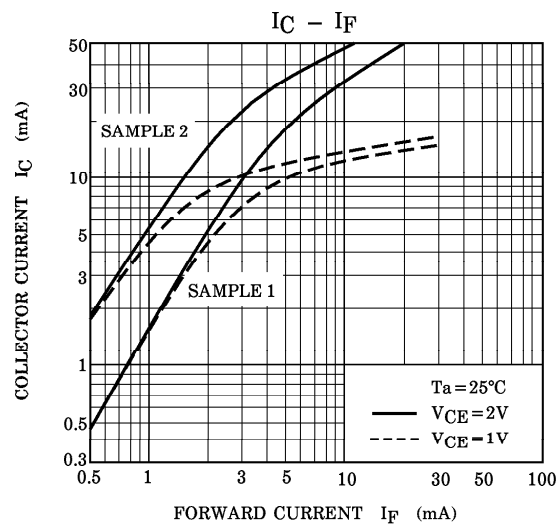
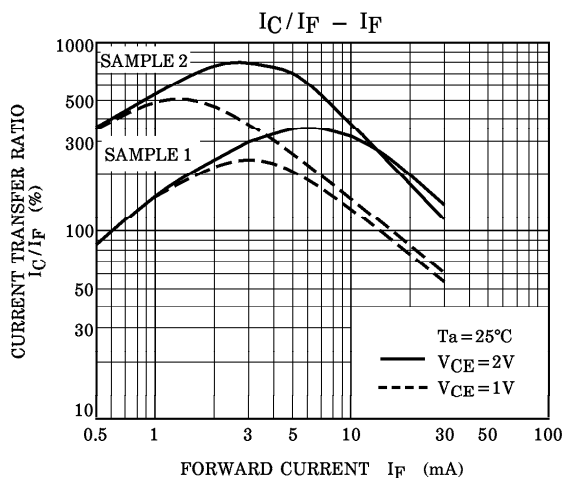
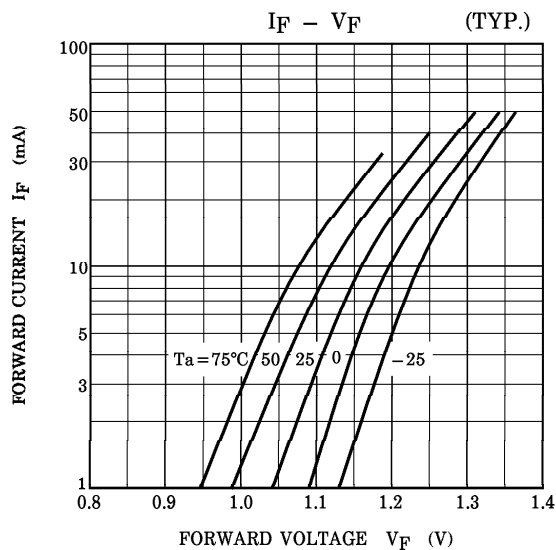
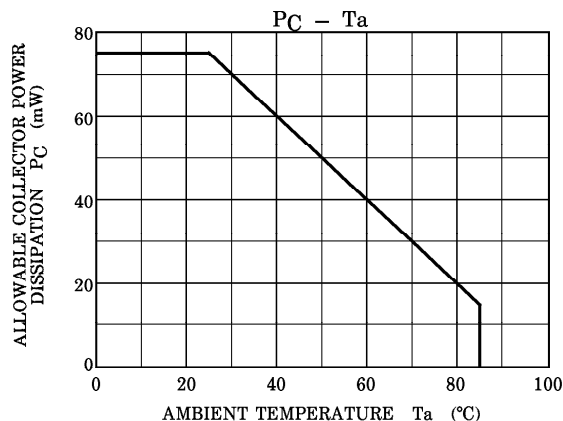
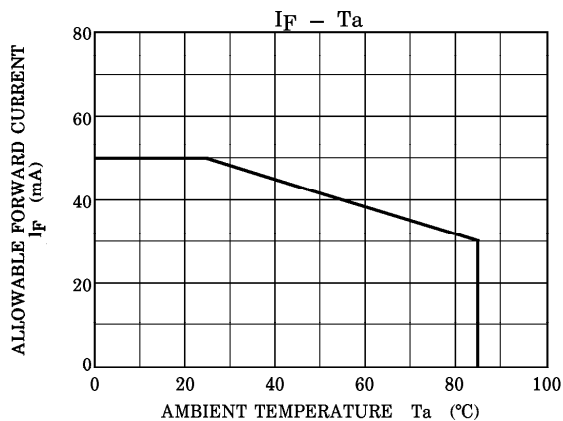
Please be careful of the followings.

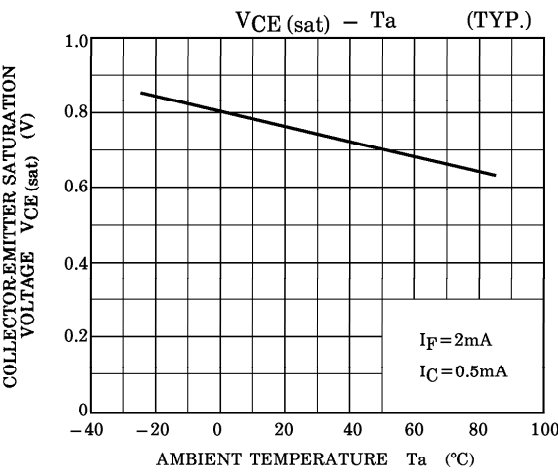
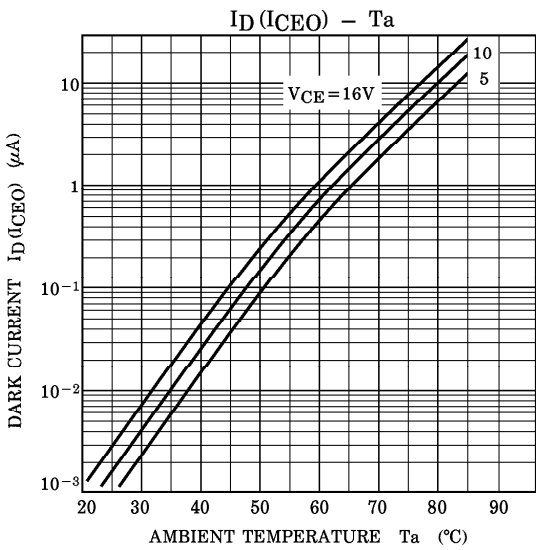
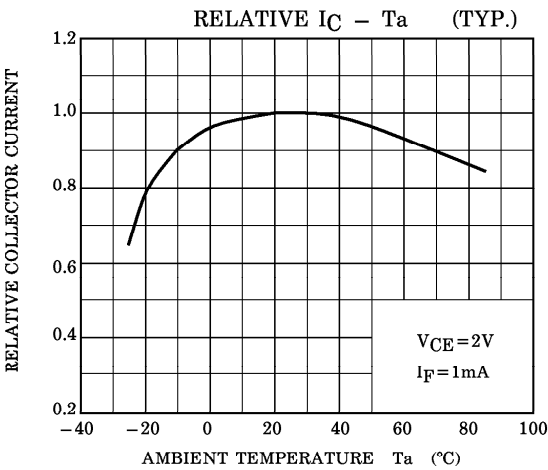
1. If chemical are used for cleaning, the soldered surface only shall be cleaned with chemicals avoiding the whole cleaning of the package.
2. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with peroxochemicals (such as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

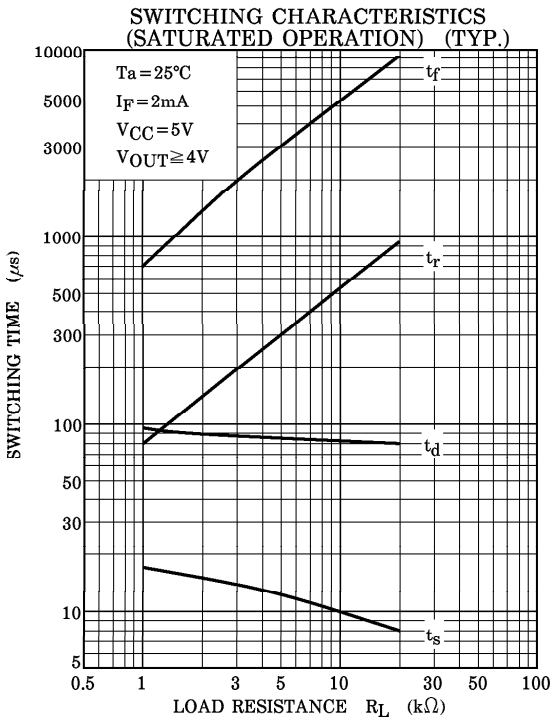
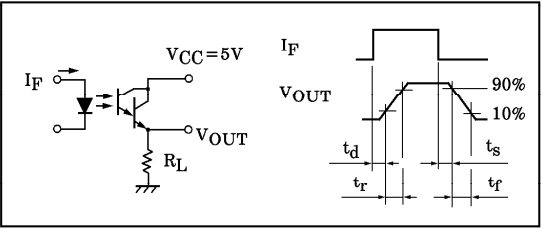
	PHENOMENON	CHEMICALS
A	Little deterioration but staining	<ul style="list-style-type: none"> • nitric acid (low concentration), hydrogen peroxide, chlorine
B	Cracked, crazed, or swollen	<ul style="list-style-type: none"> • acetic acid (70% or more) • gasoline • methyl ethyl ketone, ethyl acetate, butyl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

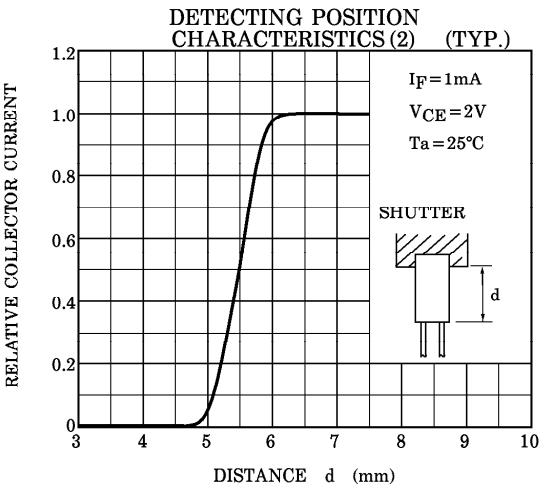
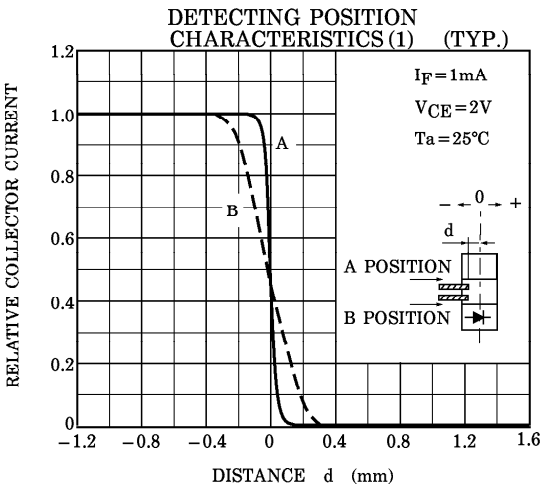
3. TLP869 shall be mounted on an unwarped surface.





SWITCHING TIME TEST CIRCUIT

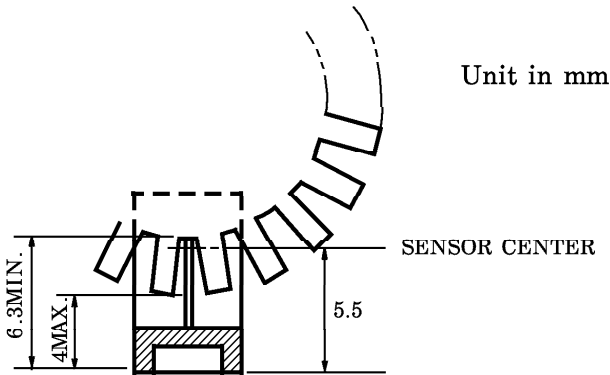
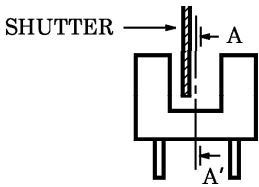




POSITIONING OF SHUTTER AND DEVICE

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.



A-A' CROSS SECTION