

TOSHIBA PHOTOINTERRUPTER INFRARED + PHOTODARLINGTONTRANSISTOR

# TLP869

VCR, COMPACT DISC PLAYER

COPYING MACHINE, FACSIMILE, PRINTER

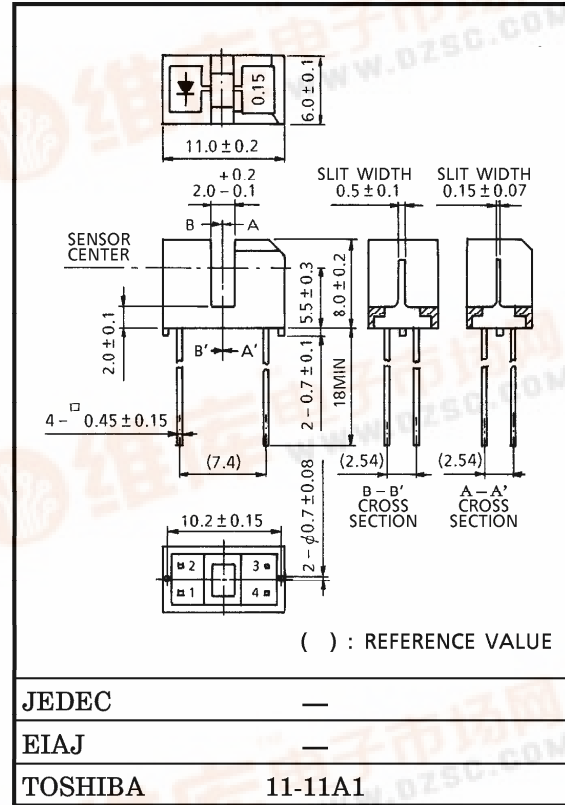
VENDING MACHINE, TICKETING MACHINE

FOR VARIOUS POSITION DETECTION

Unit in mm

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

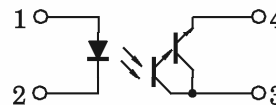
The TLP869 has a high current transfer ratio can be driven by low input current and is best suited to a low power circuit.



JEDEC	—
EIAJ	—
TOSHIBA	11-11A1

Weight : 0.56g (typ.)

**PIN CONNECTION**



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

- 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  $I_F = 1mA$
- The detector side is of visible light cut type.

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MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta > 25°C)	ΔI <sub>F</sub> / °C	-0.33	mA / °C
	Reverse Voltage	V <sub>R</sub>	5	V
DETECTOR	Collector-Emitter Voltage	V <sub>CEO</sub>	30	V
	Emitter-Collector Voltage	V <sub>ECO</sub>	5	V
	Collector Power Dissipation	P <sub>C</sub>	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	ΔP <sub>C</sub> / °C	-1	mW / °C
	Collector Current	I <sub>C</sub>	40	mA
Operating Temperature Range		T <sub>opr</sub>	-25~85	°C
Storage Temperature Range		T <sub>stg</sub>	-40~100	°C
Soldering Temperature (5s)		T <sub>sol</sub>	260	°C

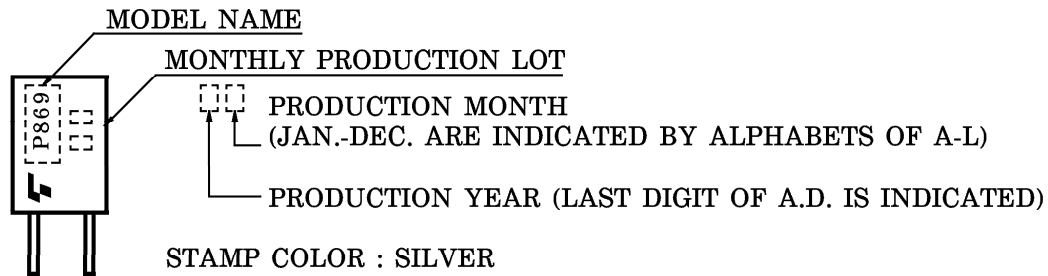
RECOMMENDED OPERATING CONDITION

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>CC</sub>	—	5	16	V
Forward Current	I <sub>F</sub>	—	—	20	mA
Operating Temperature	T <sub>opr</sub>	-10	—	70	°C

OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10mA	1.00	1.15	1.30	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5V	—	—	10	μA
	Peak Emission Wavelength	λ <sub>P</sub>	I <sub>F</sub> = 10mA	—	940	—	nm
DETECTOR	Dark Current	I <sub>D</sub> (I <sub>CEO</sub> )	V <sub>CE</sub> = 16V, I <sub>F</sub> = 0	—	—	0.25	μA
	Peak Sensitivity Wavelength	λ <sub>P</sub>		—	870	—	nm
COUPLED	Current Transfer Ratio	I <sub>C</sub> / I <sub>F</sub>	V <sub>CE</sub> = 2V, I <sub>F</sub> = 1mA	30	—	1200	%
	Collector-Emitter Saturation Voltage	V <sub>CE</sub> (sat)	I <sub>F</sub> = 2mA, I <sub>C</sub> = 0.3mA	—	0.75	1	V
	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 5V, I <sub>C</sub> = 1mA	—	600	—	μs
	Fall Time	t <sub>f</sub>	R <sub>L</sub> = 1kΩ	—	500	—	

PRODUCT INDICATION



PRECAUTION

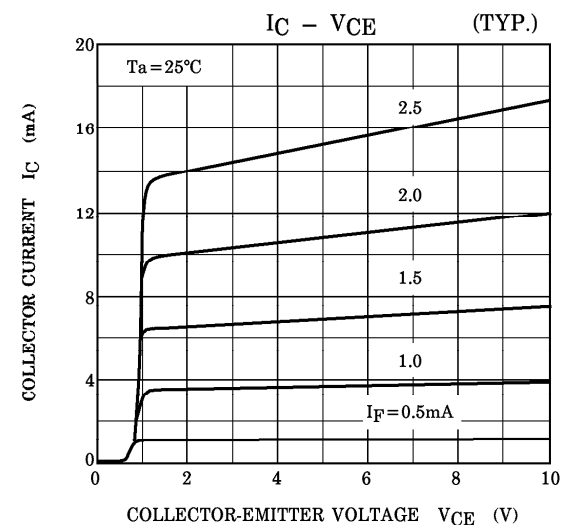
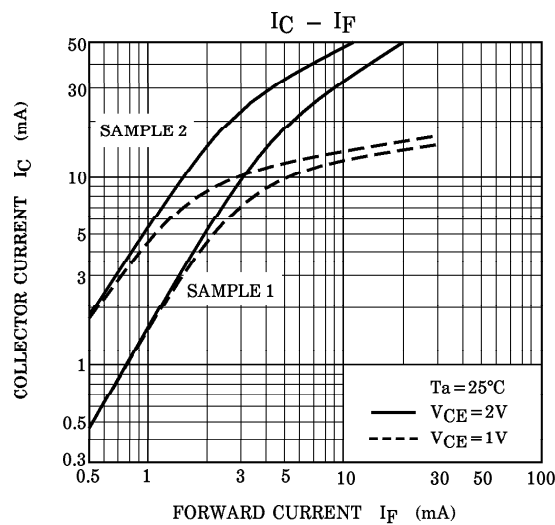
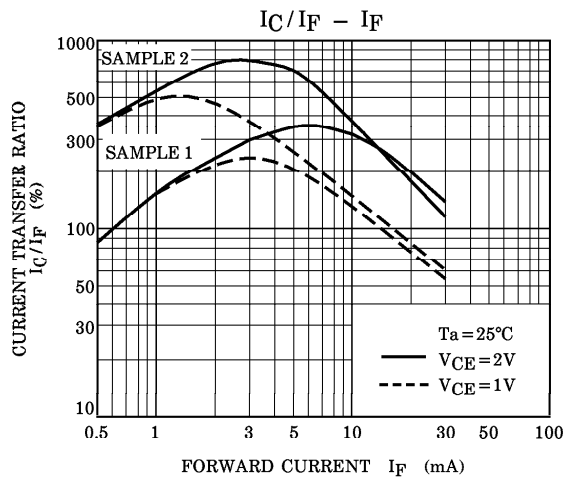
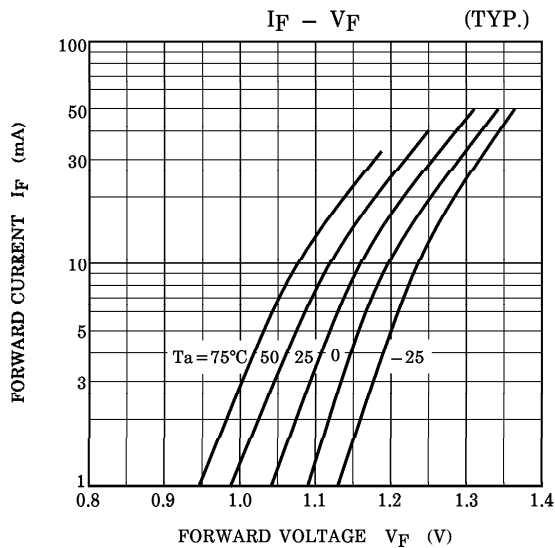
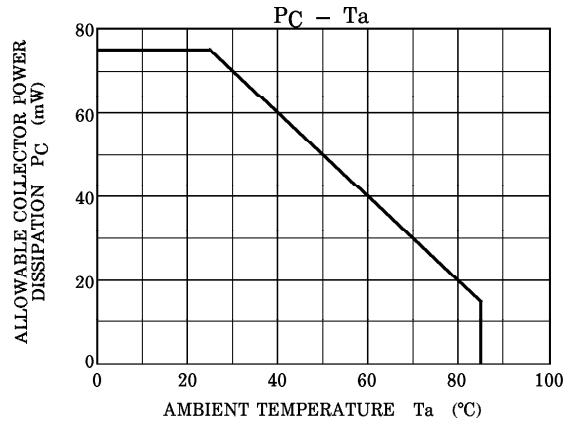
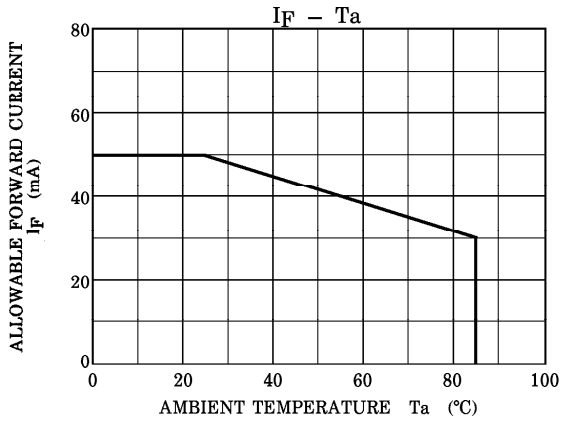
Please be careful of the followings.

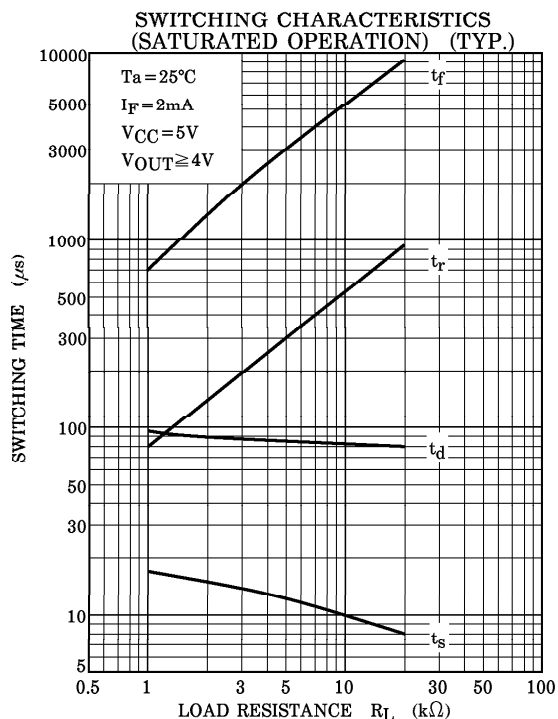
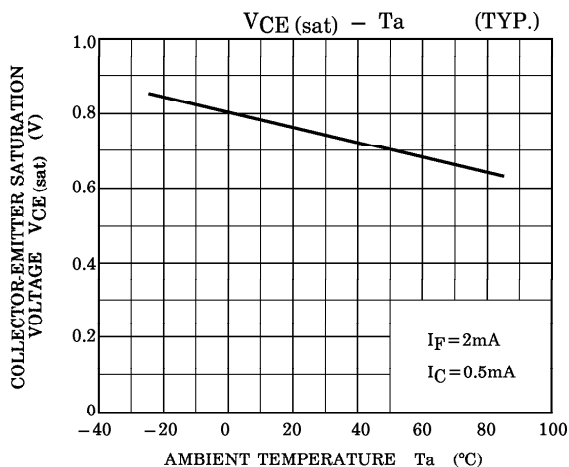
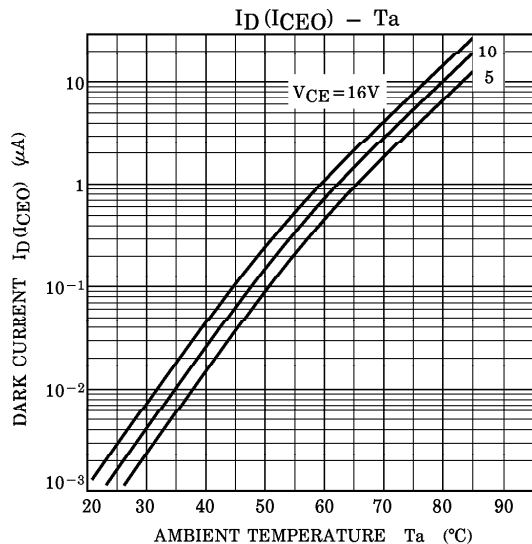
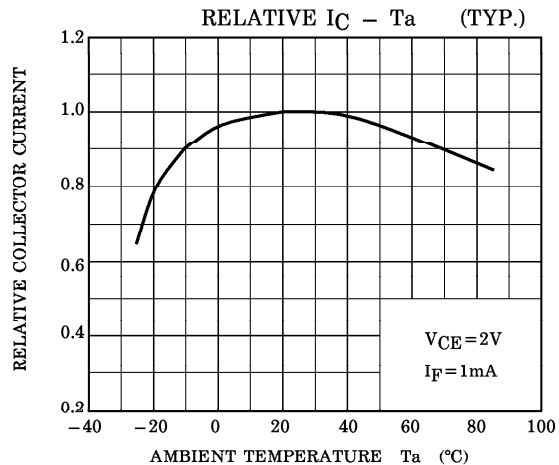
1. If chemical are used for cleaning, the soldered surface only shall be cleaned with chemicals avoiding the whole cleaning of the package.
2. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with pectochemicals (such as benzene, toluene, and acetone), alkali, aromatic hydrocarbons, or chloric hydrocarbons, polycarbonate becomes cracked, swollen, or melted. Please take care when chosing a packaging material by referencing the table below.

<Chemicals to avoid with polycarbonate>

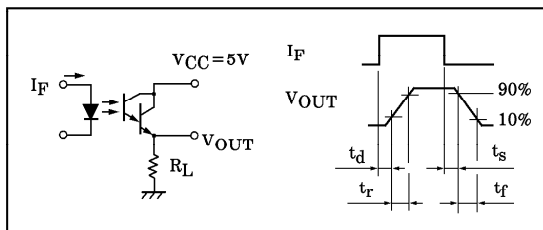
	PHENOMENON	CHEMICALS
A	Little deterioration but staining	<ul style="list-style-type: none"> <li>• nitric acid (low concentration), hydrogen peroxide, chlorine</li> </ul>
B	Cracked, crazed, or swollen	<ul style="list-style-type: none"> <li>• acetic acid (70% or more)</li> <li>• gasoline</li> <li>• methyl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

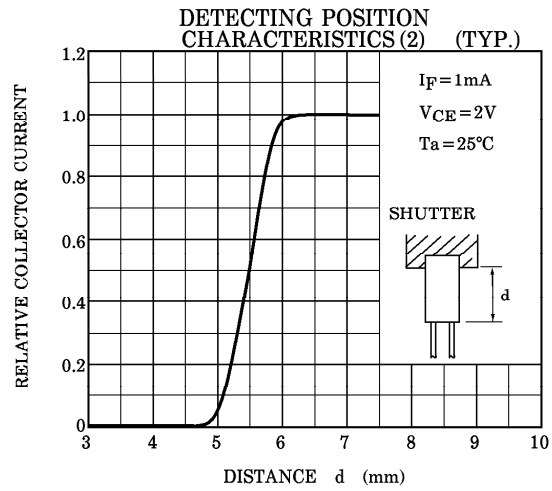
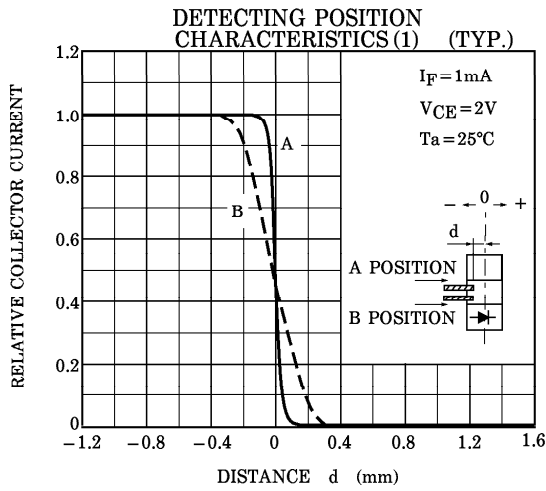
3. TLP869 shall be mounted on an unwarped surface.





**SWITCHING TIME TEST CIRCUIT**

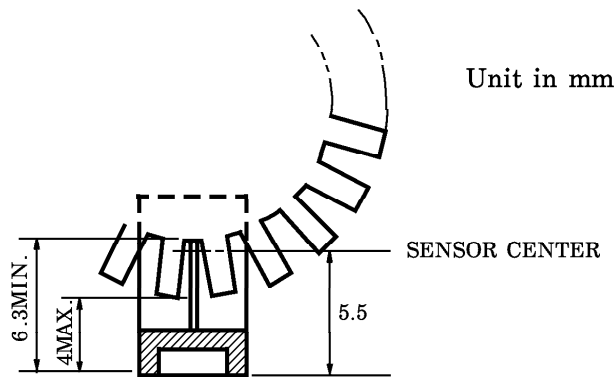
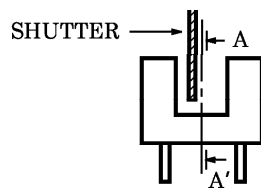




**POSITIONING OF SHUTTER AND DEVICE**

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**