TOSHIBA PHOTOINTERRUPTER INFRARED + PHOTODARLINGTONTRANSISTOR

TLP863

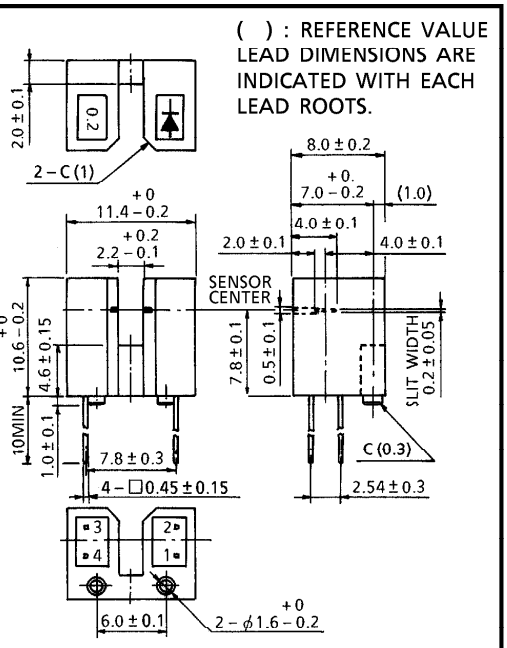
VCR, COMPACT DISC PLAYER

COPYING MACHINE, FACSIMILE, PRINTER

VENDING MACHINE, TICKETING MACHINE

FOR VARIOUS POSITION DETECTION

Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	11-11B1

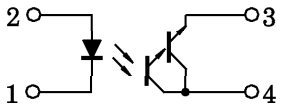
Weight : 0.9g (typ.)

The TLP863 is a photointerrupter combining GaAs infrared LED with high sensitivity Si photodarlingtontransistor. The TLP863 has a high current transfer ratio, can be driven by low input current and is best suited to a low power circuit.

Because of the oblong detection slit, this phototransistor is best suited to the upward-downward position detection.

- Small package
- Printed wiring board direct mounting type (with a locating pin)
- Gap : 2.2mm
- High resolution : Slit width 0.2mm (the oblong slit)
- High current transfer ratio : $I_C / I_F = 25\%$ (min) at $I_F = 1mA$
- The detector side is of visible light cut type.
- Material of the package : Polycarbonate

PIN CONNECTION



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

961001EBC2

MAXIMUM RATINGS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	ΔI_F / °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)	ΔP_C / °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

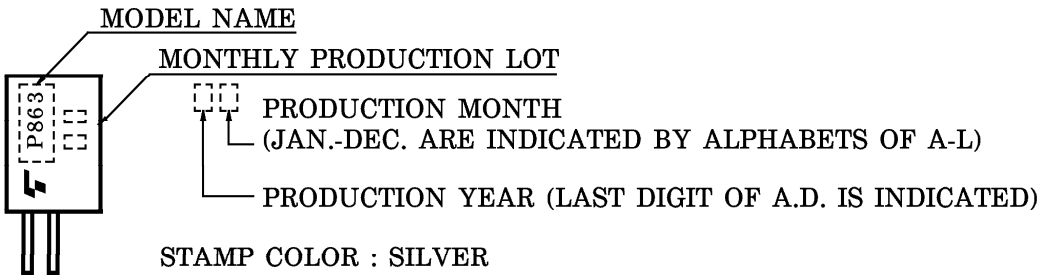
RECOMMENDED OPERATING CONDITIONS

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	25	—	1000	%
	Collector-Emitter Saturation Voltage	$V_{CE\ (sat)}$	I_F = 2mA, I_C = 0.25mA	—	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



PRECAUTION

Please be careful of the followings.

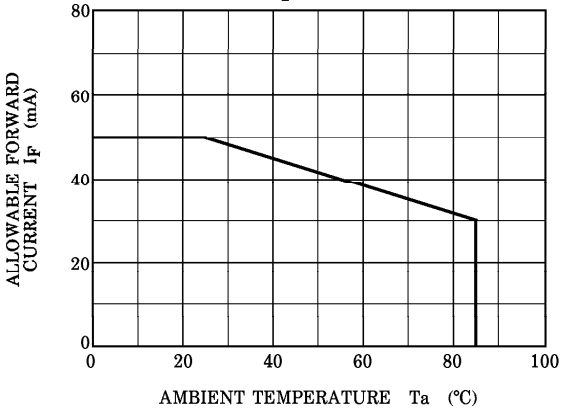
1. If chemical are used for cleaning, the soldered surface only shall be cleaned with chemicals avoiding the whole cleaning of the package.
2. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with pertochemicals (such as benzene,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

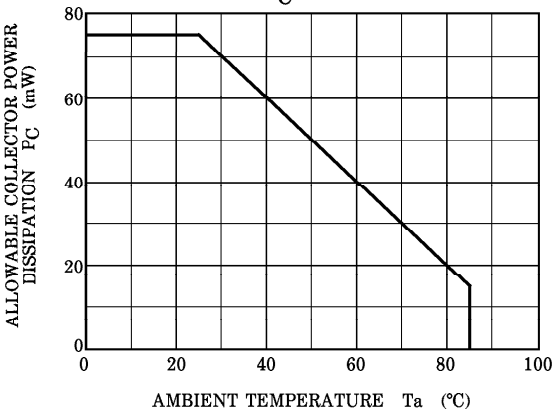
	PHENOMENON	CHEMICALS
A	Little deterioration but staining	• nitric acid (low concentration), hydrogen peroxide, chlorine
B	Cracked, crazed, or swollen	• acetic acid (70% or more) • gasoline • methyl ethyl ketone, ehtyl acetate, butyl acetate • ethyl methacrylate, ethyl ether, MEK • acetone, m-amino alcohol, carbon tetrachloride • carbon disulfide, trichloroethylene, cresol • thinners, oil of turpentine • triethanolamine, TCP, TBP
C	Melted { } : Used as solvent.	• concentrated sulfuric acid • benzene • styrene, acrylonitrile, vinyl acetate • ethylenediamine, diethylenediamine • {chloroform, methyl chloride, tetrachloromethane, dioxane, 1, 2-dichloroethane}
D	Decomposed	• ammonia water • other alkali

3. TLP863 shall be mounted on an unwarped surface.

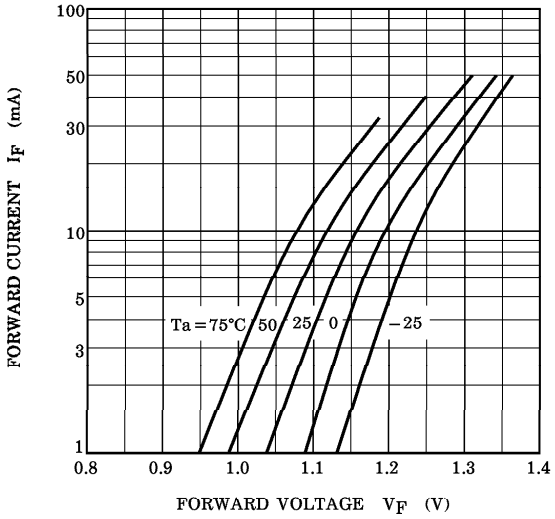
I_F – Ta



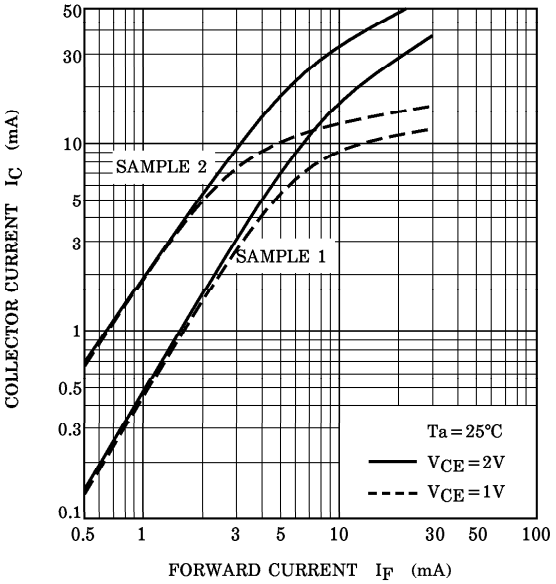
P_C – Ta



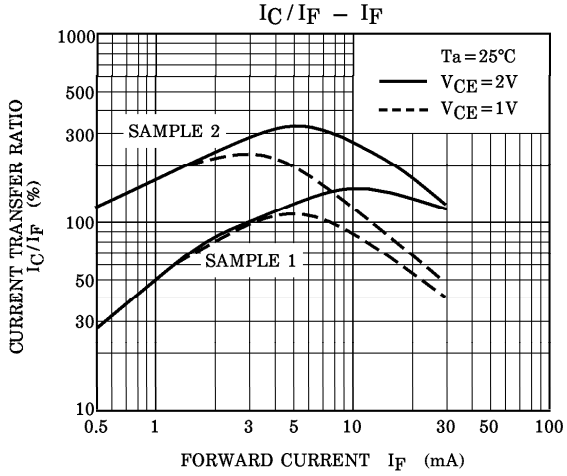
I_F – V_F



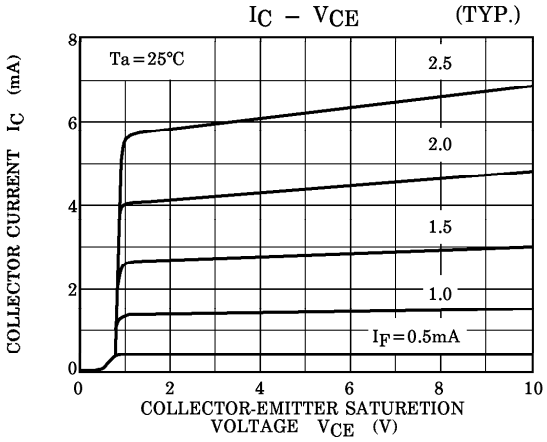
I_C – I_F



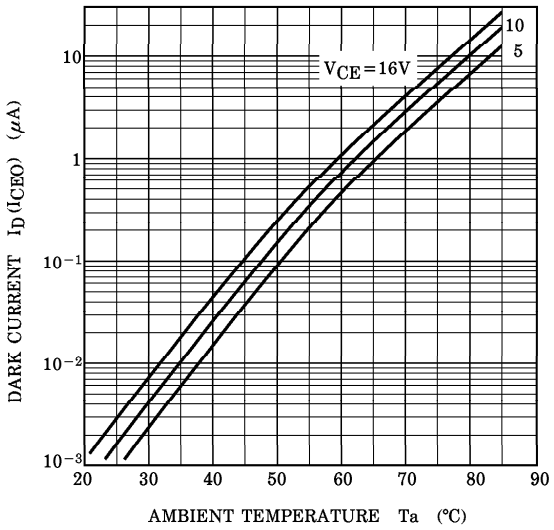
I_C / I_F – I_F



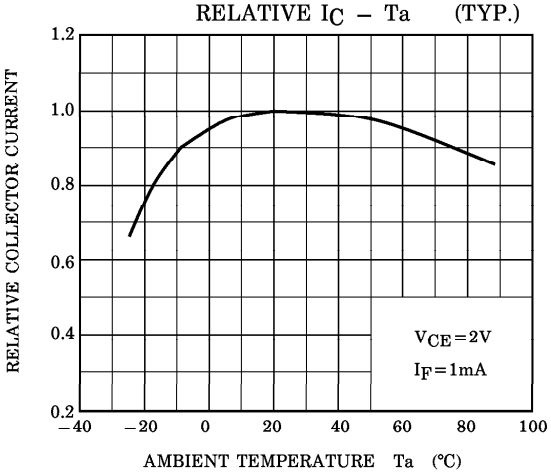
I_C – V_{CE} (TYP.)



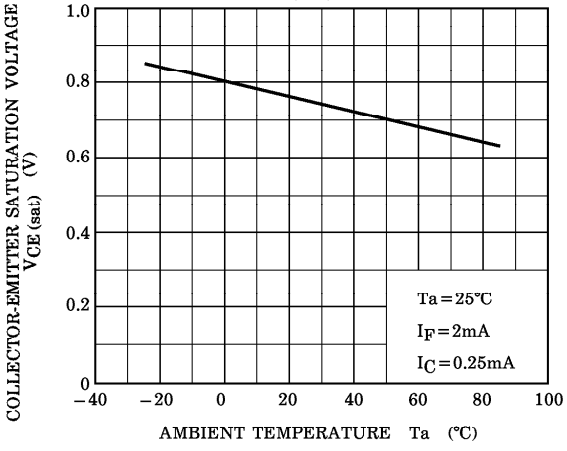
I_D (I_{CEO}) – Ta



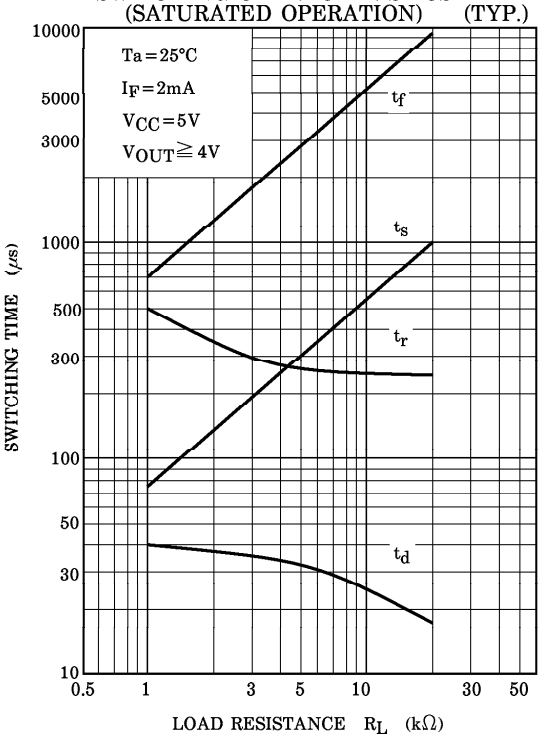
RELATIVE I_C – Ta (TYP.)



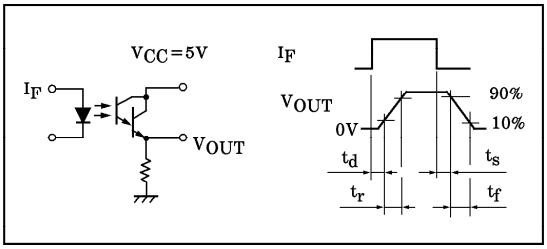
$V_{CE\,(sat)}$ – Ta (TYP.)

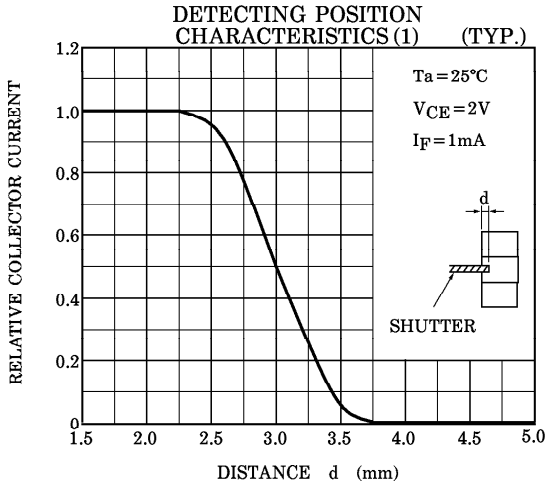


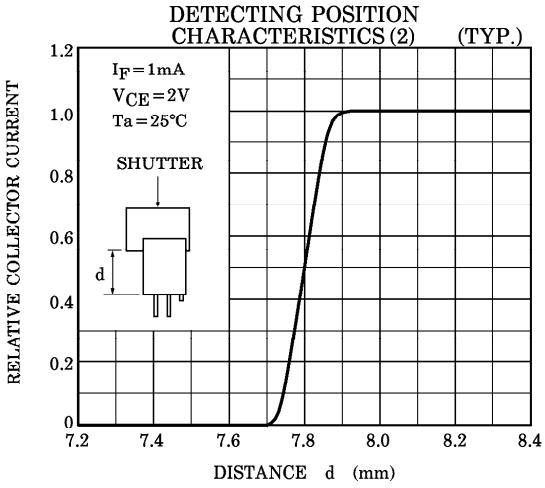
SWITCHING CHARACTERISTICS (SATURATED OPERATION) (TYP.)



SWITCHING TIME TEST CIRCUIT





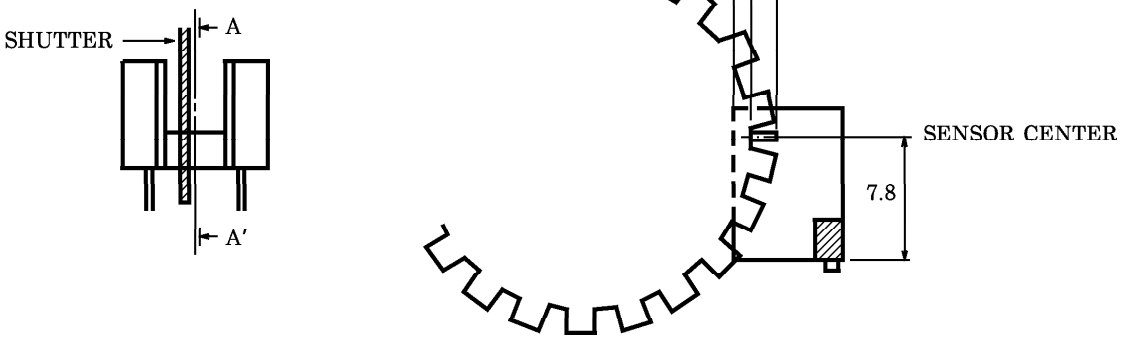


POSITIONING OF SHUTTER AND DEVICE

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

The shit pitch of the shutter must be set wider than the slit width of the device.
Determine the width taking the switching time into consideration.

UNIT IN mm



A – A′ CROSS SECTION