TOSHIBA PHOTOINTERRUPTER INFRARED + PHOTODARLINGTONTRANSISTOR

TLP507A

OPTO-ELECTRONIC SWITCH

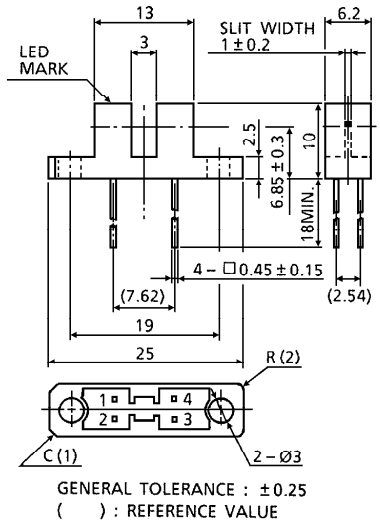
AUTOMATIC CONTROL UNIT

POSITION AND ROTATIONAL SPEED SENSOR

TLP507A is a high current transfer ratio (I_C / I_F) type photo-interrupter.

- Gap : 3mm
- Resolution : Slit width 1mm
- High current transfer ratio : $I_C / I_F = 30\%$ (Min.)
- Dark current : $I_D = 0.25\mu A$ (Max.)
- Material of the package : Polycarbonate

Unit in mm



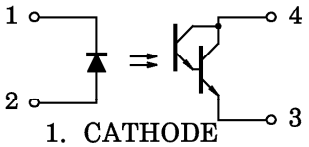
JEDEC	—
EIAJ	—
TOSHIBA	11-13B1

Weight : 0.83g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

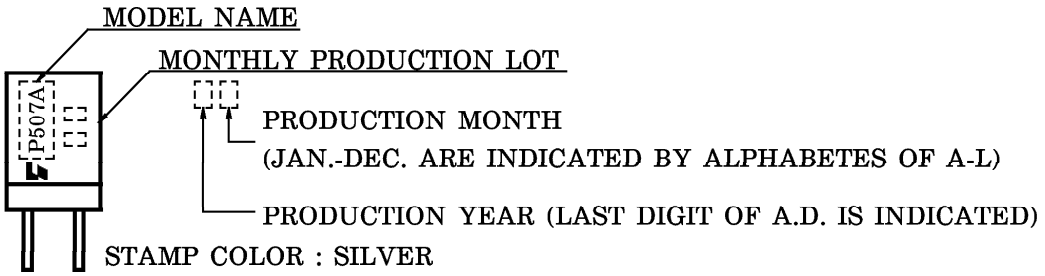
	CHARACTERISTIC	SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	ΔI_F / °C	−0.33	mA / °C
	Reverse Voltage	V_R	5	V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	30	V
	Emitter-Collector Voltage	V_{ECO}	5	V
	Collector Power Dissipation	P_C	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	ΔP_C / °C	−1	mW / °C
	Collector Current	I_C	50	mA
Operating Temperature Range		T_{opr}	−25~85	°C
Storage Temperature Range		T_{stg}	−30~100	°C

PIN CONNECTION



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

PRODUCT INDICATION



961001EBC2

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	—	—	800	—	nm
COUPLED	Current Transfer Ratio	I_C / I_F	V_{CE} = 2V, I_F = 10mA	30	—	440	%
	Rise Time	t_r	V_{CC} = 5V, I_C = 10mA	—	200	—	μA
	Fall Time	t_f	R_L = 100Ω	—	200	—	

PRECAUTION

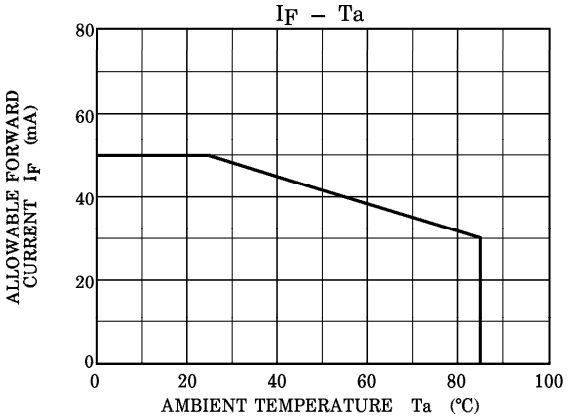
Please be careful of the followings.

1. Soldering temperature : 260°C MAX. Soldering time : 5s MAX.
   (Soldering portion of lead : above 1.5mm from the body of the device)
2. If chemical are used for cleaning, the soldered surface only shall be cleaned with chemicals avoiding the whole cleaning of the package.
3. TLP507A shall be mounted on an unwarped surface.
4. Screw shall be tightenend to clamping torque of 0.59N·m.
5. 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.

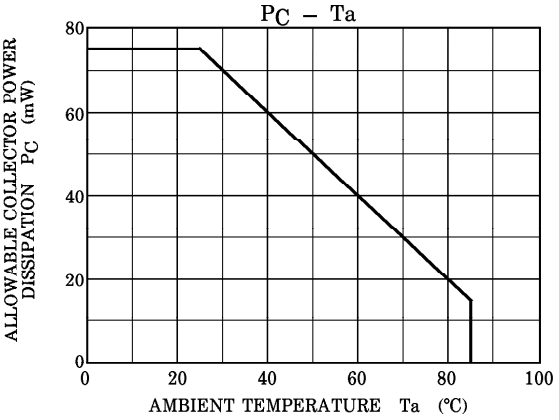
<Chemicals to avoid with polycarbonate>

	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

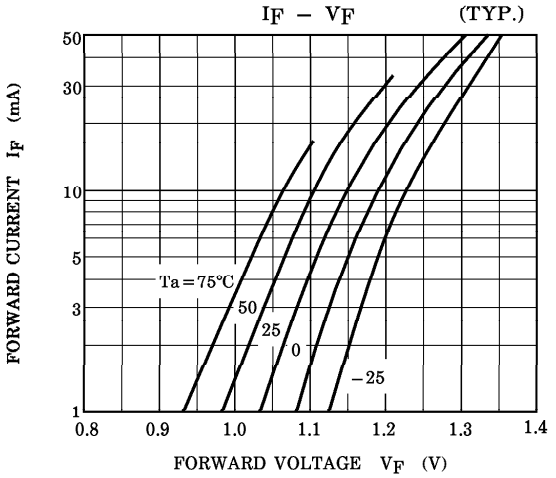
I_F – Ta



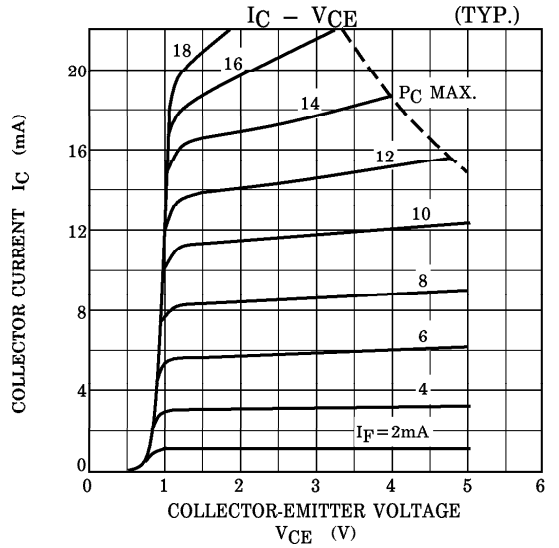
P_C – Ta



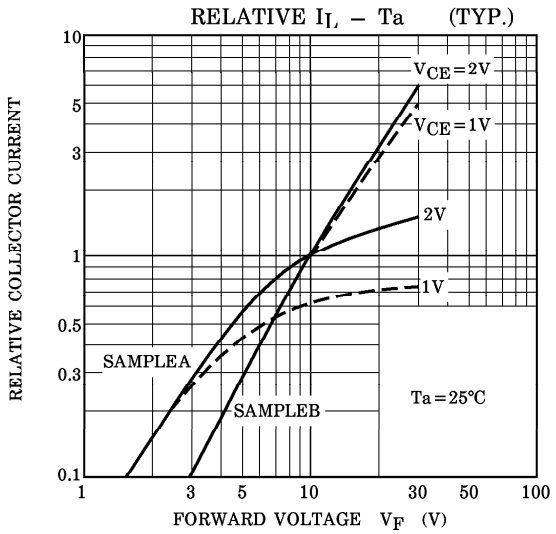
I_F – V_F (TYP.)



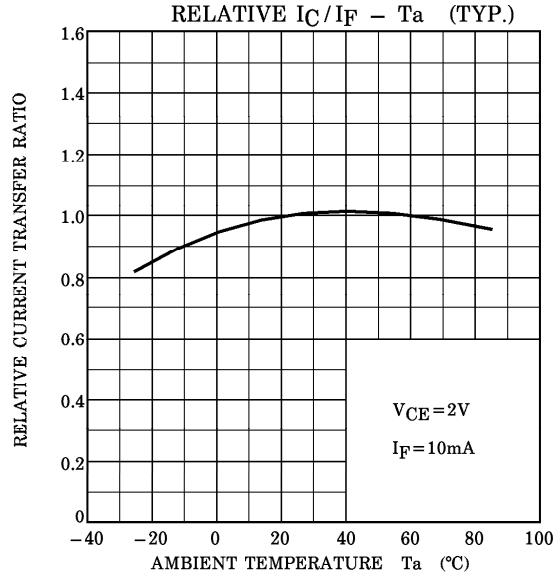
I_C – V_{CE} (TYP.)



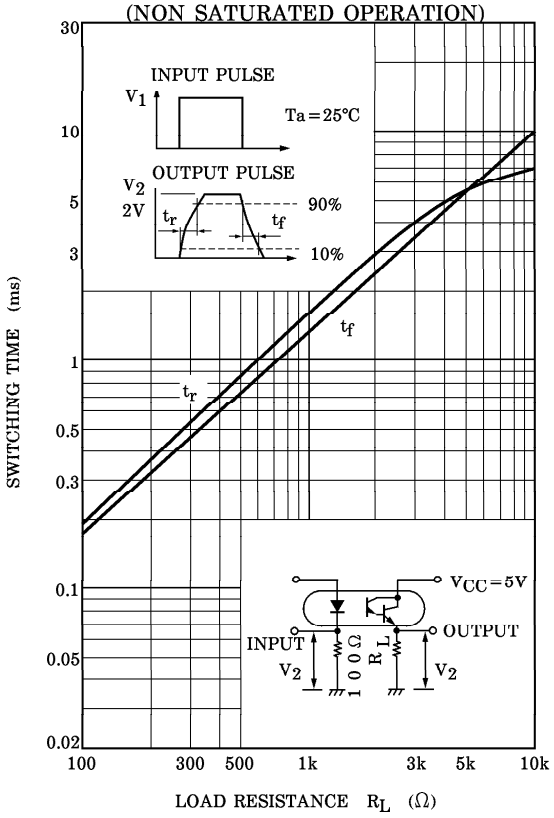
RELATIVE I_L – Ta (TYP.)



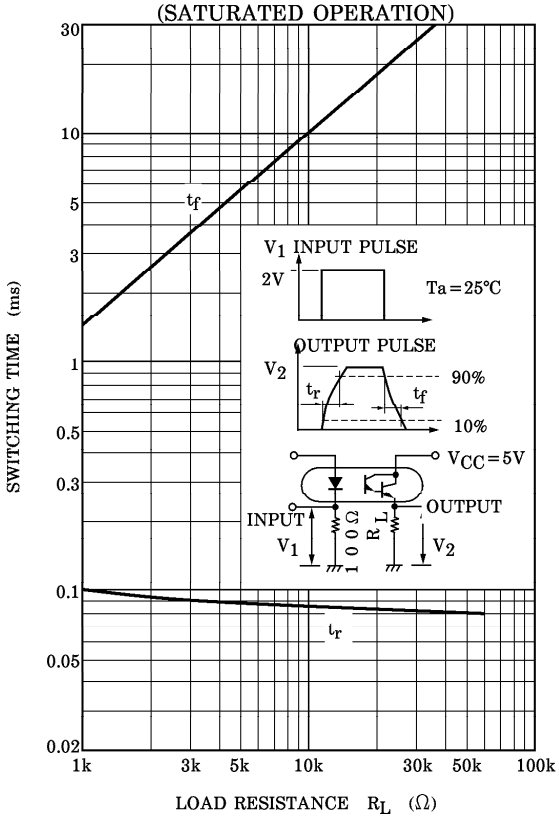
RELATIVE I_C/I_F – Ta (TYP.)



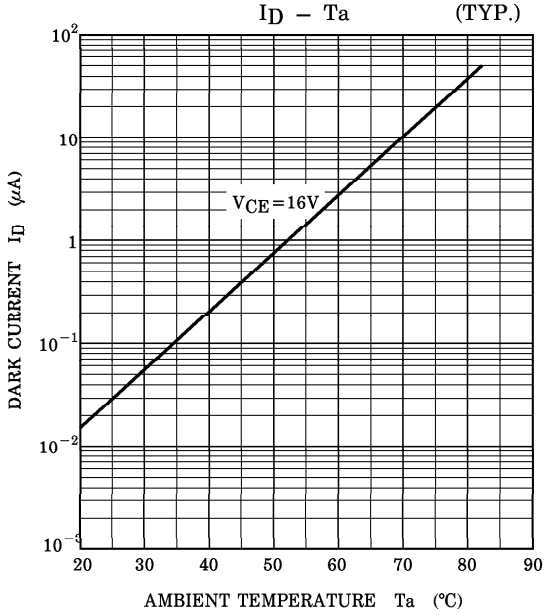
SWITCHING CHARACTERISTICS
(NON SATURATED OPERATION)



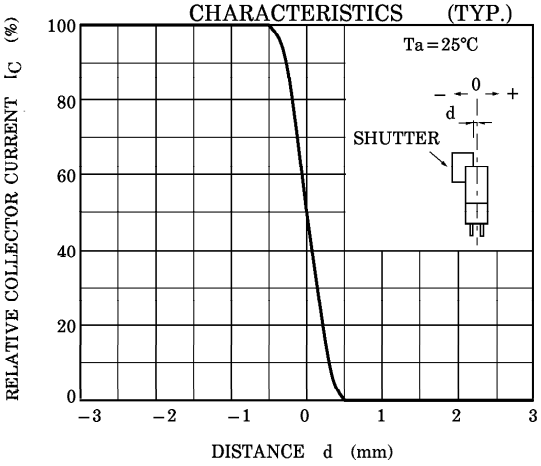
SWITCHING CHARACTERISTICS
(SATURATED OPERATION)



I_D – Ta (TYP.)



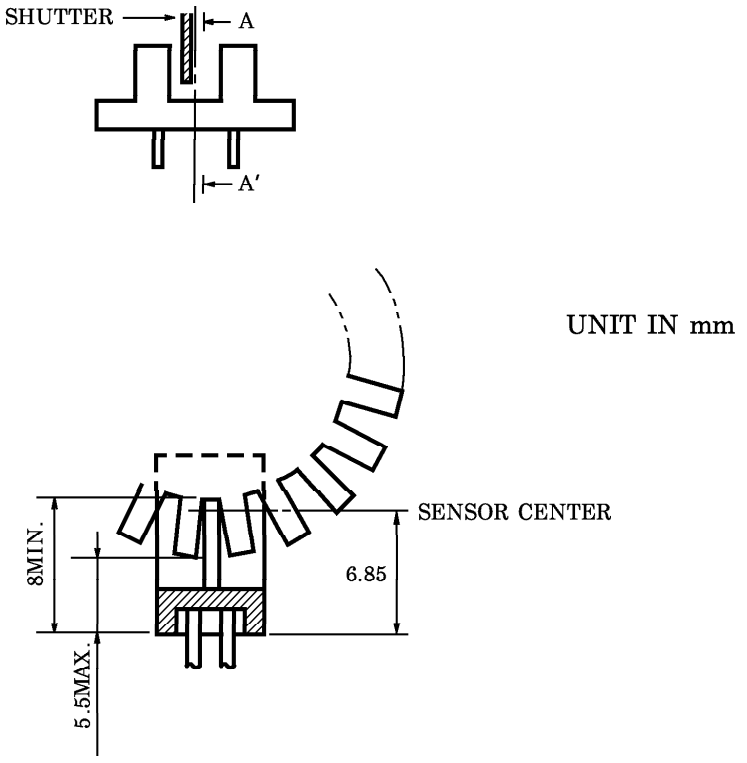
DETECTING POSITION
CHARACTERISTICS (TYP.)



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