

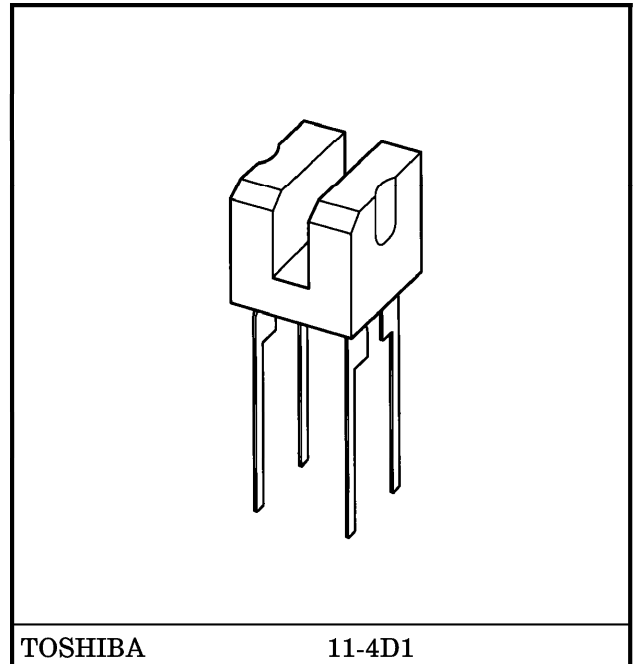
TOSHIBA PHOTO-INTERRUPTER INFRARED LED + PHOTOTRANSISTOR

# TLP812

MOTOR ROTATION AND IRIS DETECTION FOR CAMERAS

TRACK DETECTION IN MICRO FLOPPY DISK DRIVE

- Very small package
- High resolution : Slit width = 0.4 mm
- Gap : 1 mm
- Can be mounted directly on PCB using the stand off of lead.



TOSHIBA

11-4D1

Weight : 0.08 g (typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta > 25°C)	I <sub>F</sub> / °C	-0.67	mA / °C
	Reverse Voltage	V <sub>R</sub>	5	V
DETECTOR	Collector-Emitter Voltage	V <sub>CEO</sub>	35	V
	Emitter Collector Voltage	V <sub>ECO</sub>	5	V
	Collector Current	I <sub>C</sub>	20	mA
	Collector Power Dissipation	P <sub>C</sub>	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	ΔP <sub>C</sub> / °C	-1	mW / °C
	Operating Temperature Range	T <sub>opr</sub>	-25~85	°C
Storage Temperature Range	T <sub>stg</sub>	-40~100	°C	

## OPTICAL AND ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA	1.00	1.15	1.30	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz	—	30	—	pF
DETECTOR	Dark Current	I <sub>D</sub> (I <sub>CEO</sub> )	V <sub>CE</sub> = 20 V, I <sub>F</sub> = 0	—	—	100	nA
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz	—	13	—	pF
COUPLED	Current Transfer Ratio	I <sub>C</sub> /I <sub>F</sub>	V <sub>CE</sub> = 0.6 V, I <sub>F</sub> = 5 mA	5	—	—	%
	Collector-Emitter Saturation Voltage	V <sub>CE</sub> (sat)	I <sub>F</sub> = 8 mA, I <sub>C</sub> = 0.1 mA	—	0.1	0.4	V
	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 5 V, I <sub>C</sub> = 2 mA, R <sub>L</sub> = 1 kΩ	—	50	—	μs
	Fall Time	t <sub>f</sub>		—	50	—	

## PRECAUTIONS

The following points must be borne in mind.

- Soldering temperature : 260°C max  
Soldering time : 5 s max  
(Soldering must be performed 1.5 mm under the package body.)
- Ensure that no residual flux or chemicals adhere to the light-emitting and light-receiving surfaces.

## ENVIRONMENT

- The device should not be exposed to corrosive gases, such as hydrogen sulfide gas and a sea breeze.
- The device should not be exposed to dust.
- The device should not be exposed to direct sunlight.  
In essence, the device should not be subjected to any load which may result in deformation or performance deterioration.

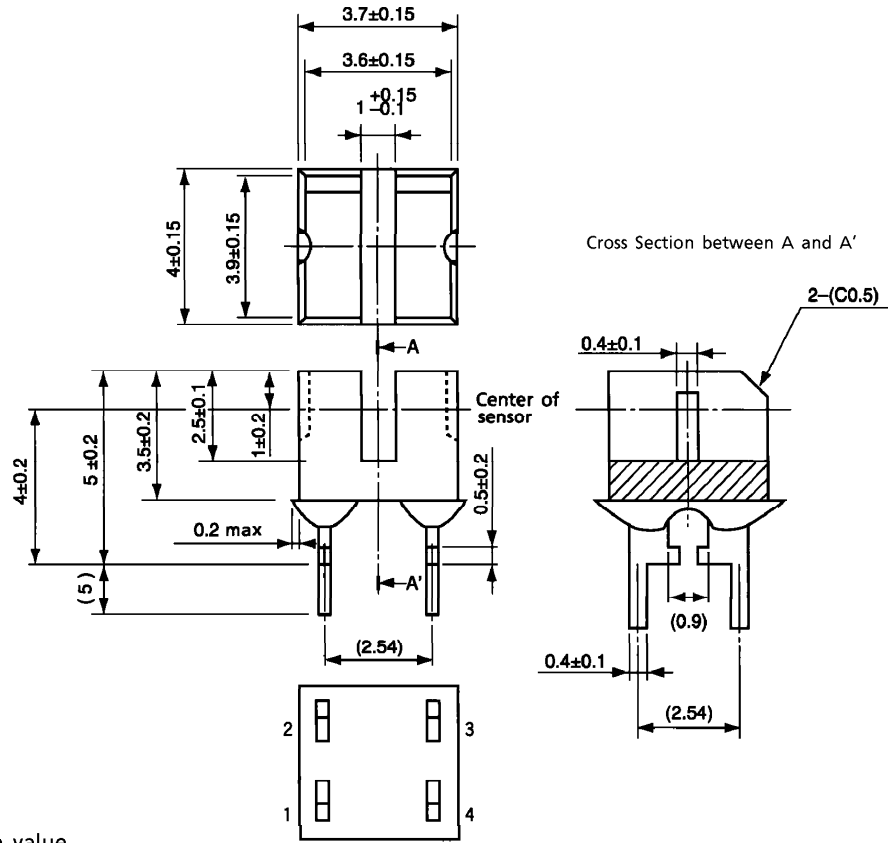
## CIRCUIT DESIGN

- 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.

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

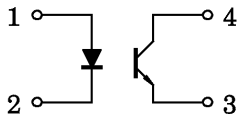
**PACKAGE DIMENSIONS**  
11-4D1

Unit : mm

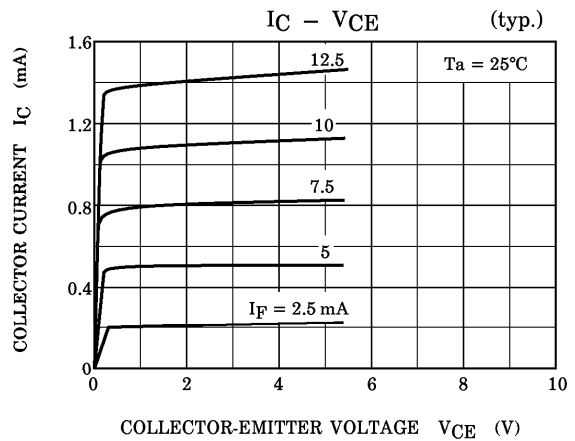
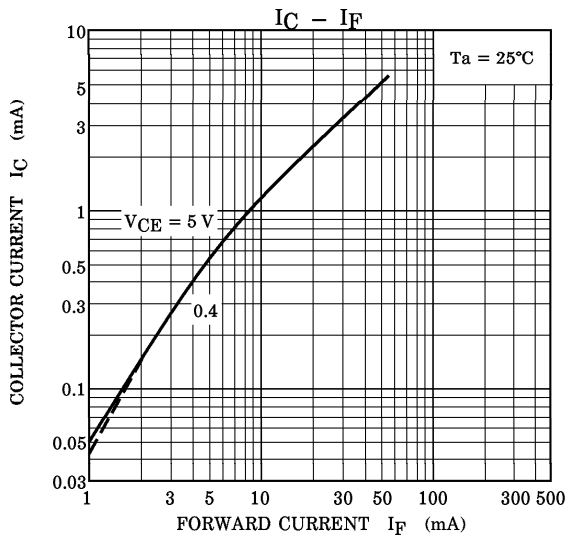
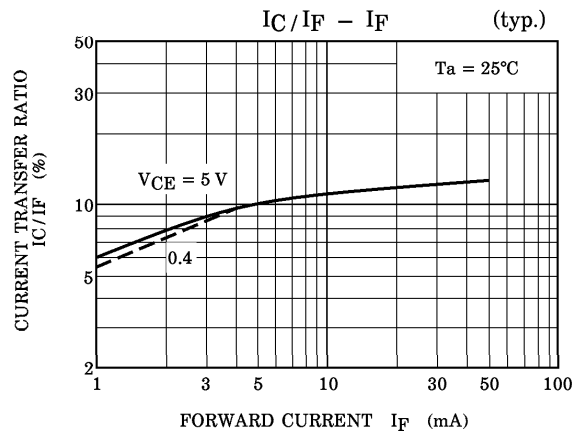
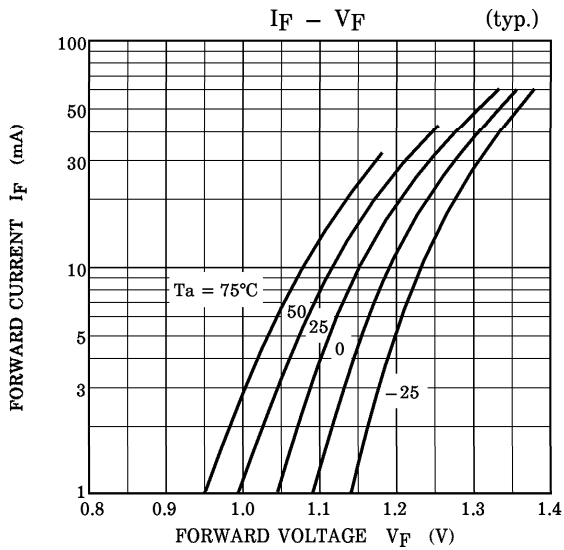
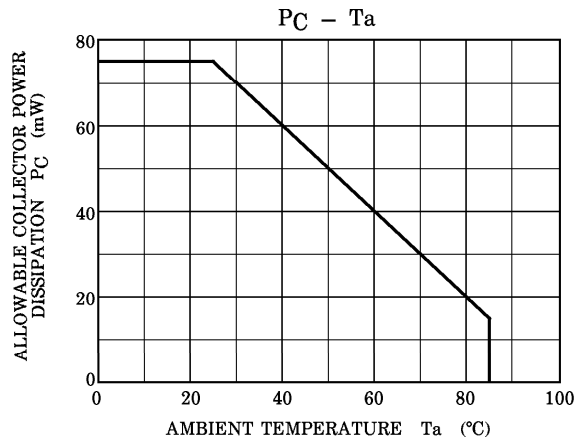
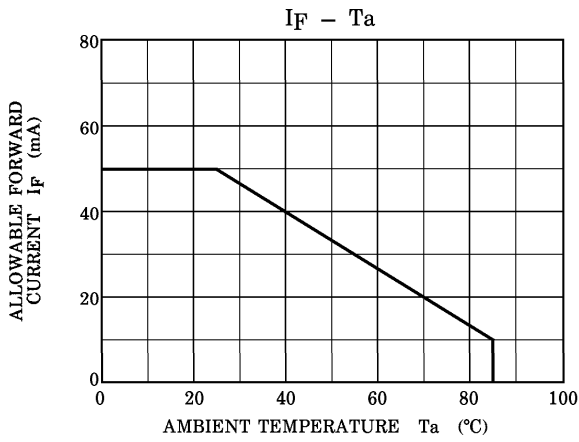


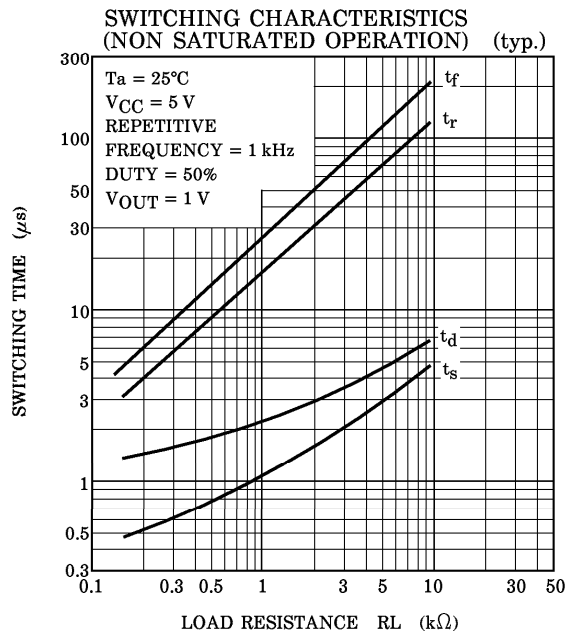
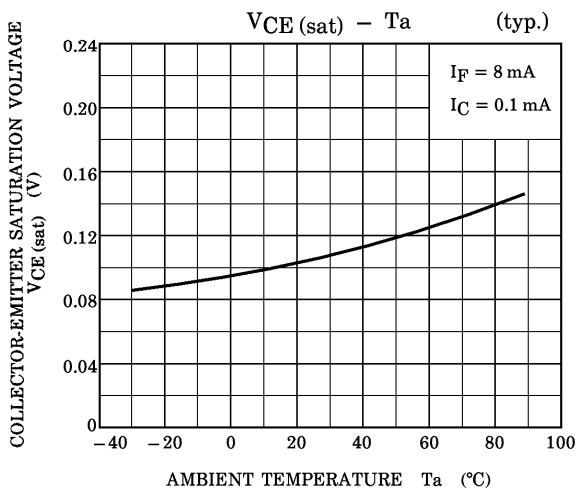
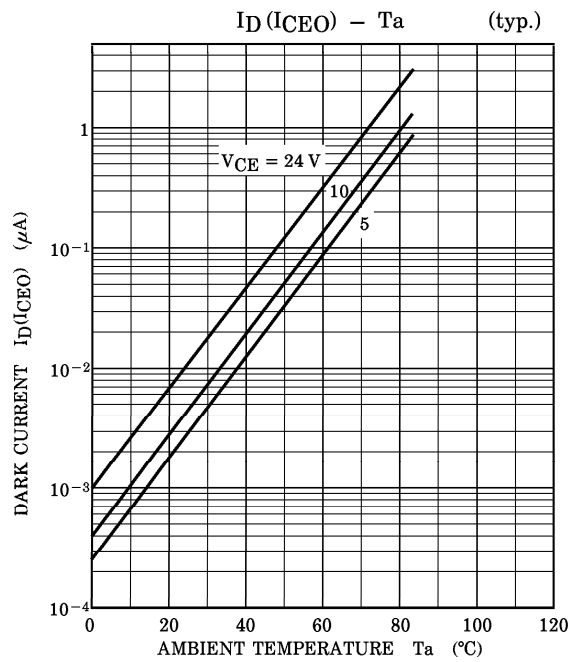
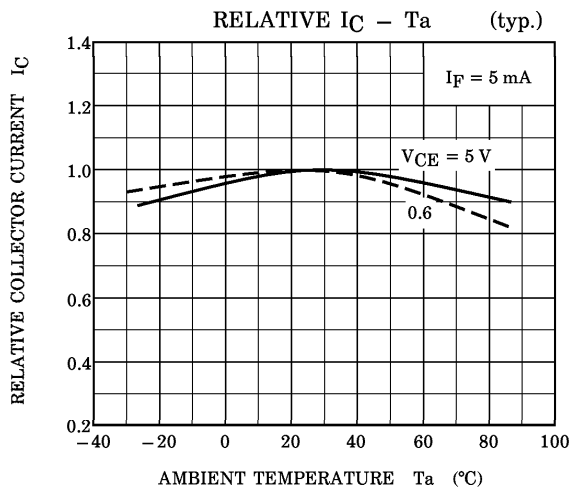
Weight : 0.08 g (typ.)

**PIN CONNECTION**

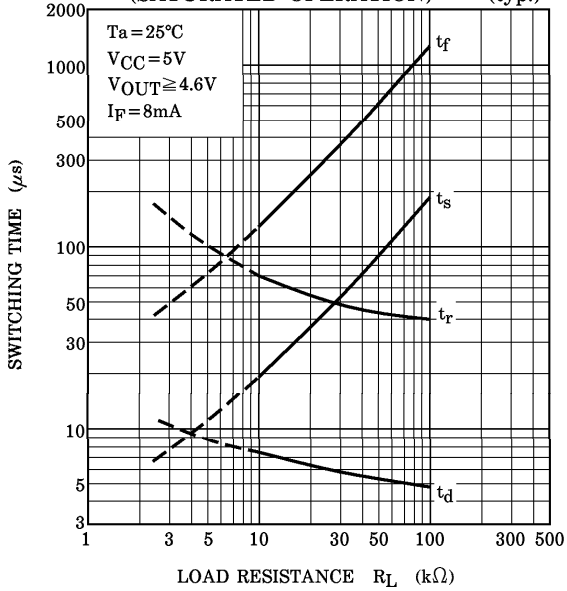


- 1. Cathode
- 2. Anode
- 3. Emitter
- 4. Collector

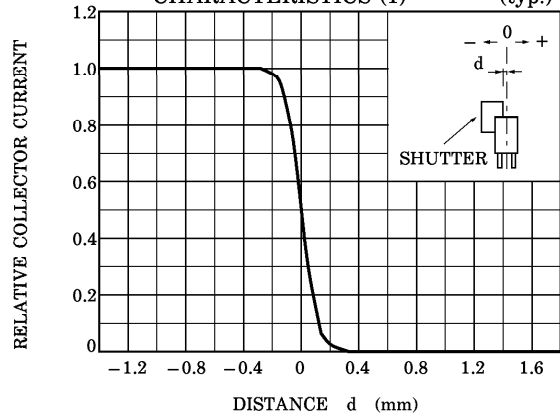




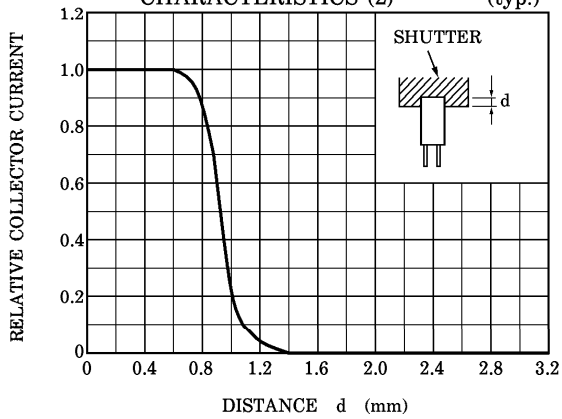
**SWITCHING CHARACTERISTICS (SATURATED OPERATION) (typ.)**



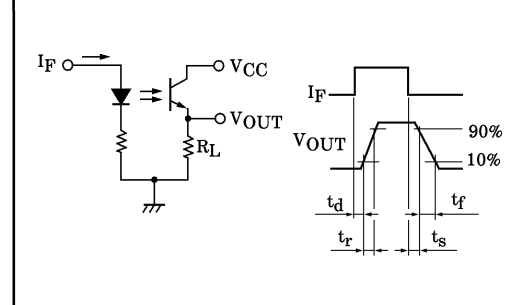
**DETECTION POSITION CHARACTERISTICS (1) (typ.)**



**DETECTION POSITION CHARACTERISTICS (2) (typ.)**



**SWITCHING TIME TEST CIRCUIT**



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