

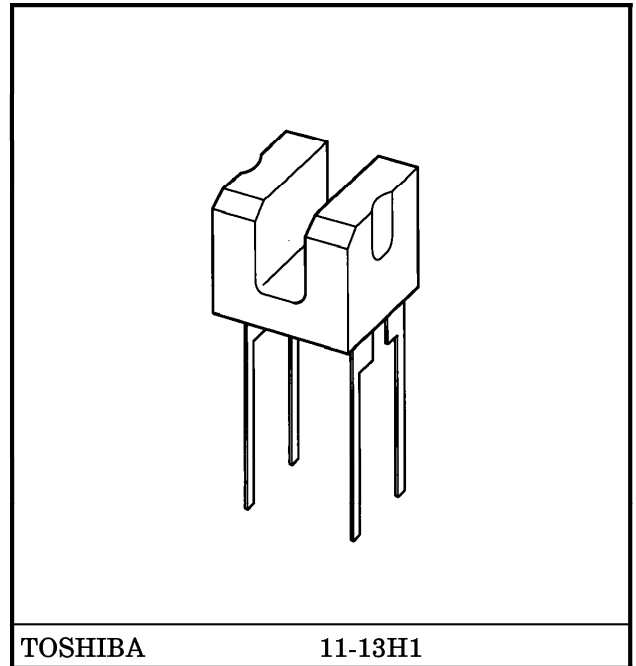
TOSHIBA PHOTO-INTERRUPTER INFRARED LED + PHOTOTRANSISTOR

TLP814

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 : 1.5 mm
- Current transfer ratio : $I_C / I_F = 2\%$ (min)
- Can be mounted directly on PCB using the stand off of lead.



TOSHIBA 11-13H1

Weight : 0.1 g (typ.)

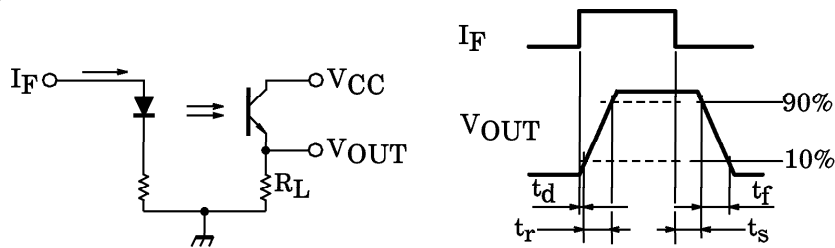
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	$\Delta I_F / ^\circ C$	-0.67	mA / °C
	Reverse Voltage	V_R	5	V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	35	V
	Emitter-Collector Voltage	V_{ECO}	5	V
	Collector Power Dissipation	P_C	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	$\Delta P_C / ^\circ C$	-1	mW / °C
	Collector Current	I_C	20	mA
Operating Temperature Range		T_{opr}	-25~85	°C
Storage Temperature Range		T_{stg}	-40~100	°C

OPTICAL AND ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
LED	Forward Voltage	V _F	I _F = 10 mA	1.00	1.15	1.30	V
	Reverse Current	I _R	V _R = 5 V	—	—	10	μA
	Peak Emission Wavelength	λ _P	I _F = 5 mA	—	940	—	nm
DETECTOR	Dark Current	I _D (I _{CEO})	V _{CE} = 20 V, I _F = 0	—	—	0.1	μA
	Peak Sensitivity Wavelength	λ _P		—	800	—	nm
COUPLED	Current Transfer Ratio	I _C / I _F	V _{CE} = 0.6 V, I _F = 5 mA	2	5	—	%
	Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _F = 8 mA, I _C = 0.1 mA	—	0.1	0.4	V
	Rise Time	t _r	V _{CC} = 5 V, I _C = 0.2 mA, R _L = 1 kΩ (Note)	—	50	—	μs
	Fall Time	t _f		—	50	—	

(Note) : t_r, t_f Test circuit



PRECAUTIONS

The following points must be borne in mind.

1. Soldering temperature : 260°C max
Soldering time : 5 s max
(Soldering must be performed 1.5 mm under the package body.)
2. 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.

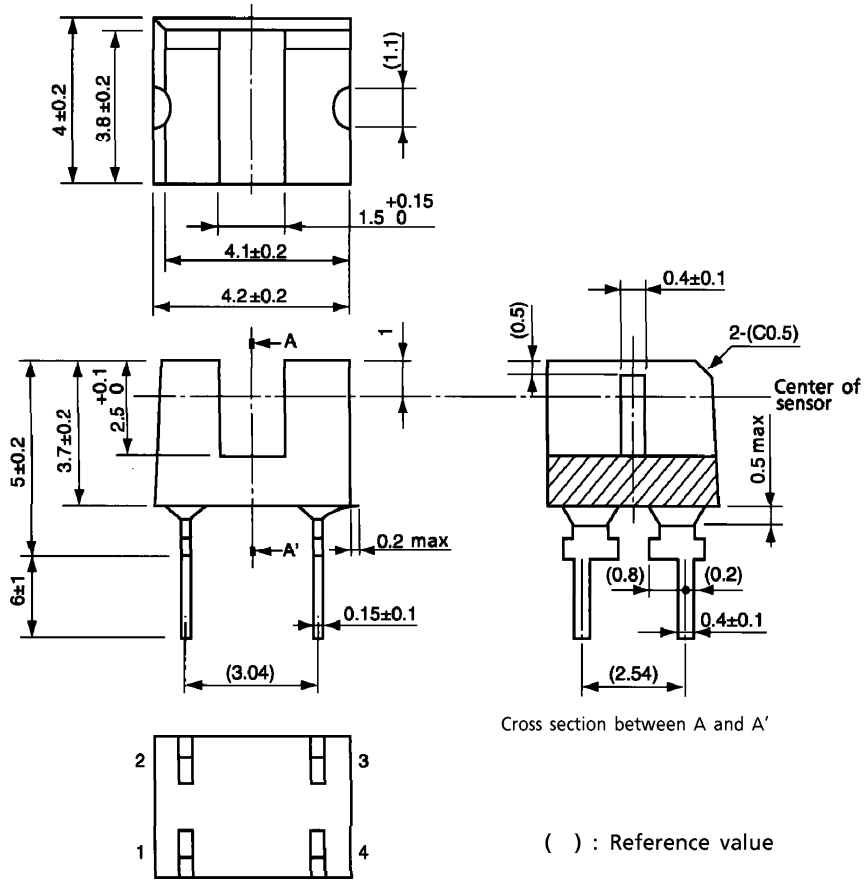
CIRCUIT DESIGN

- 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.

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

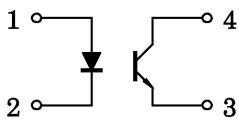
PACKAGE DIMENSIONS
11-13H1

Unit : mm

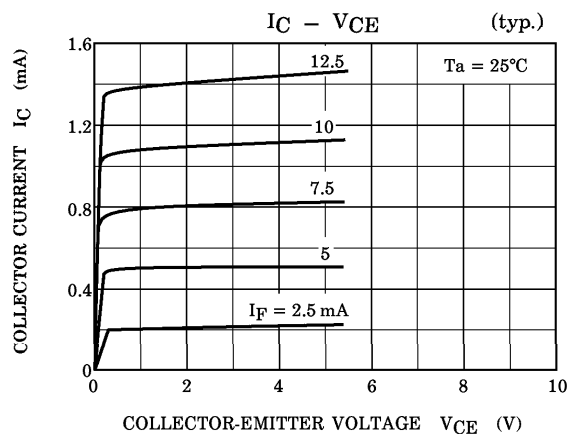
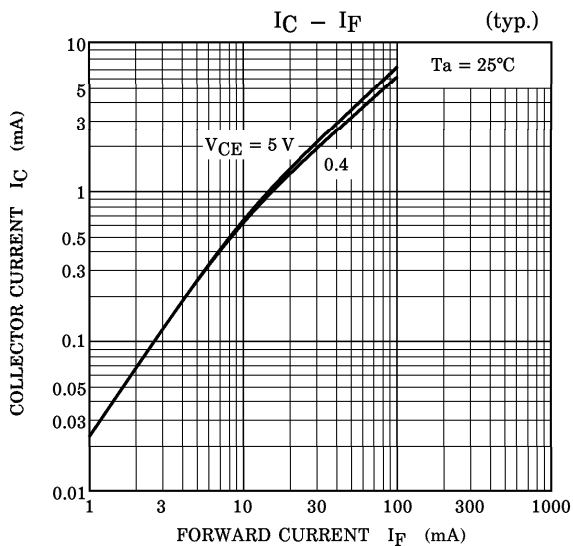
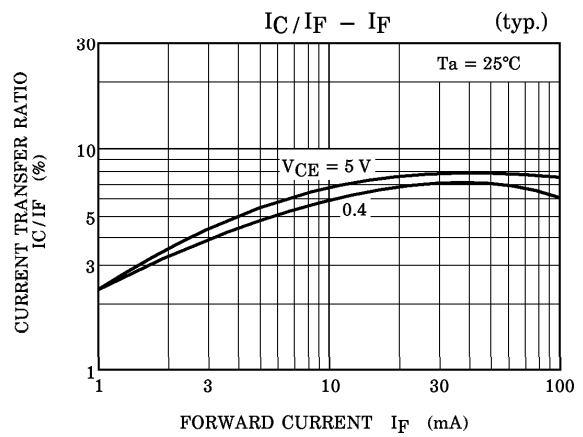
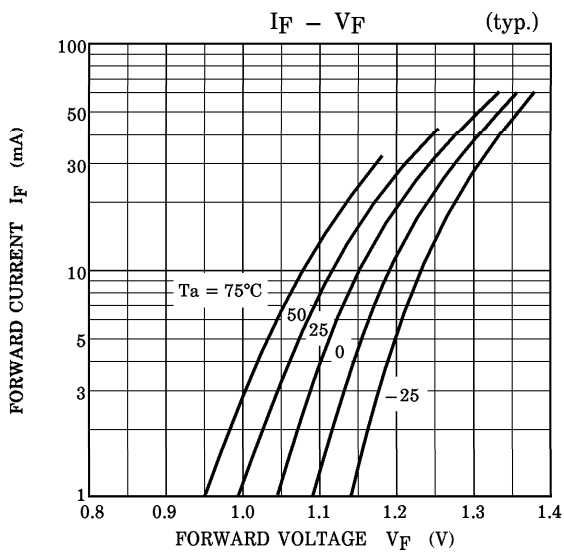
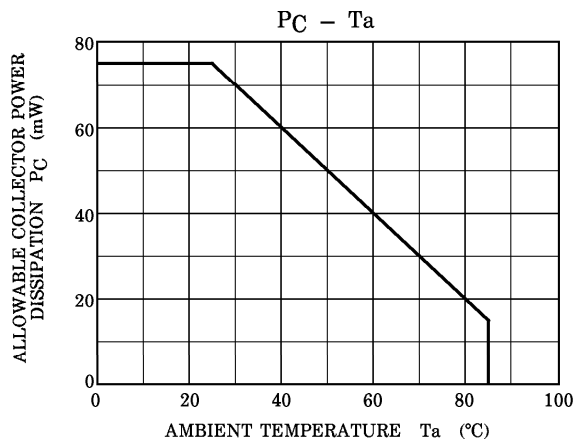
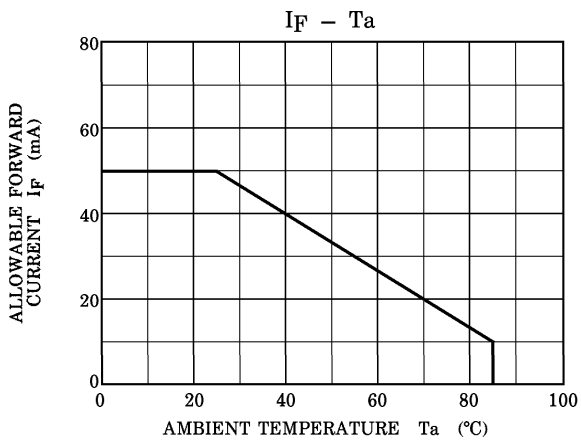


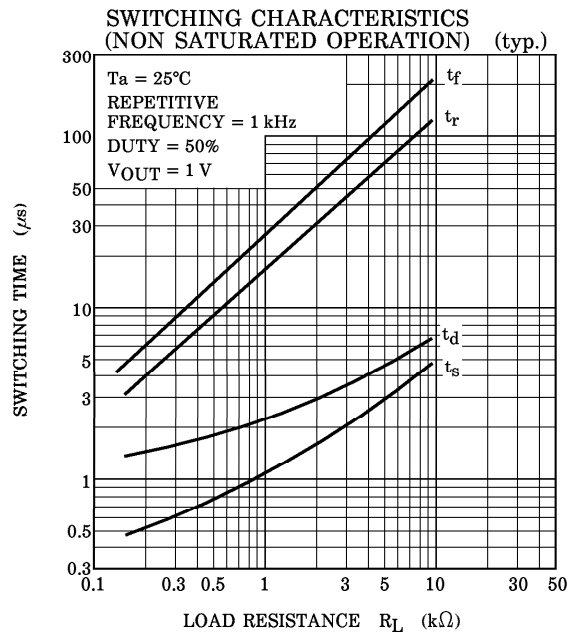
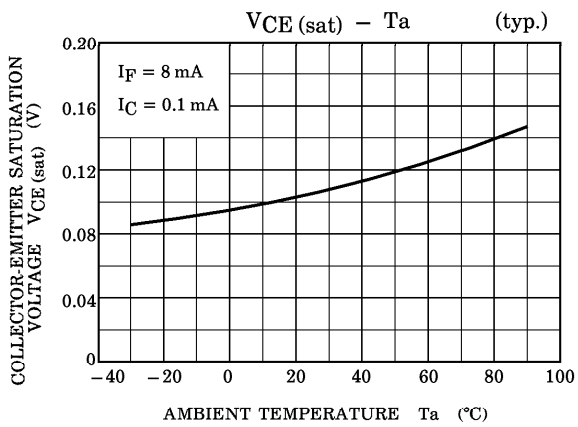
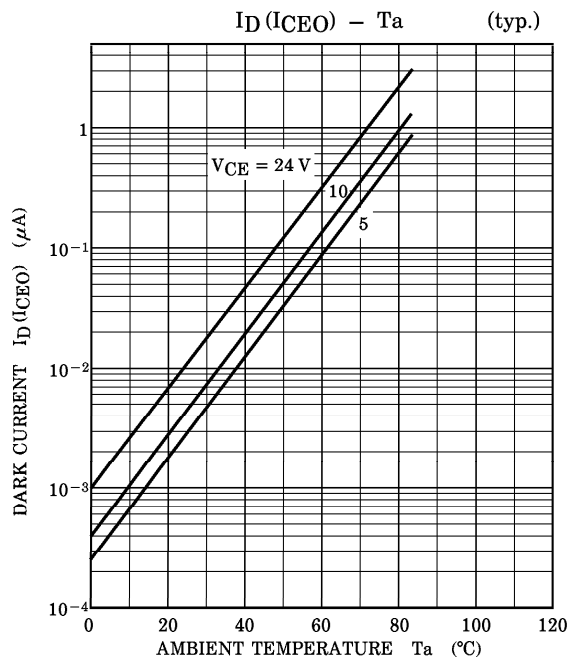
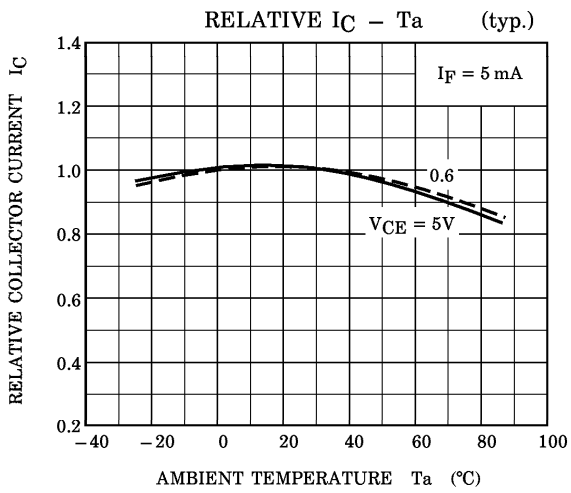
Weight : 0.1 g (typ.)

PIN CONNECTION

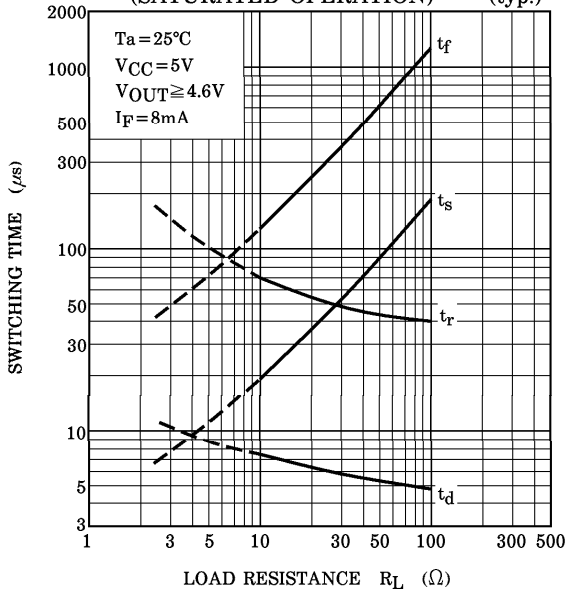


1. Anode
2. Cathode
3. Emitter
4. Collector

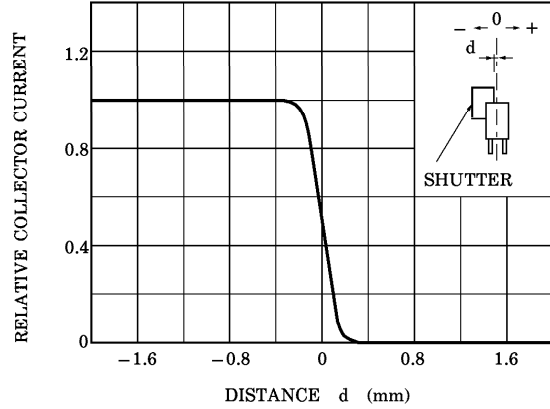




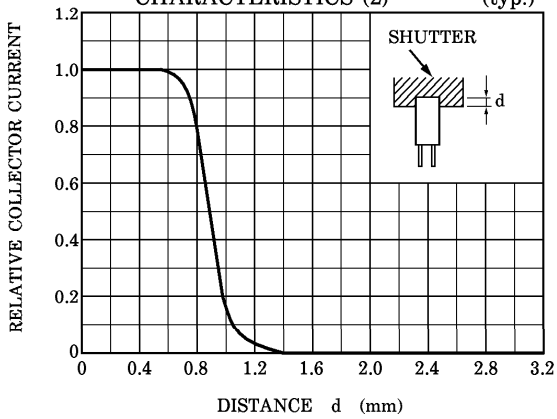
SWITCHING CHARACTERISTICS (SATURATED OPERATION) (typ.)



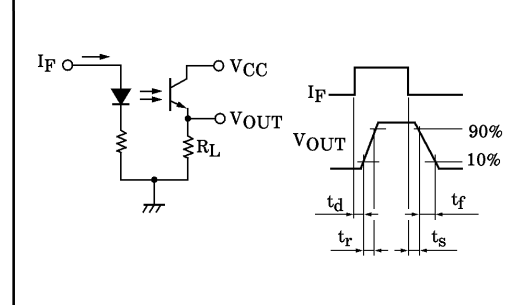
DETECTION POSITION CHARACTERISTICS (1) (typ.)



DETECTION POSITION CHARACTERISTICS (2) (typ.)



SWITCHING TIME TEST CIRCUIT



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