TOSHIBA PHOTOREFLECTIVE SENSORS INFRARED LED + PHOTODARLINGTON TRANSISTOR

TLP907, TLP907 (LB)

DETECTION OF START AND END MARKS ON VIDEO AND AUDIO TAPE

DETECTION OF VCR REEL ROTATION

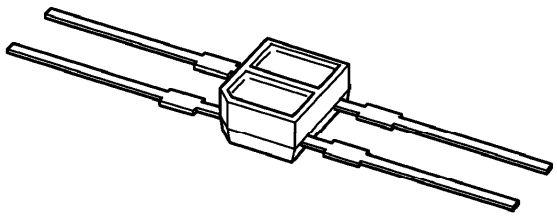
DETECTION OF INDEX WRITE-PROTECT AND PRESENCE OF DISK FOR FLOPPY DISK DRIVE

TIMING DETECTION IN ELECTRONIC PRINTERS AND TYPEWRITERS

READING OF CAMERA FILM INFORMATION (DX CODE)

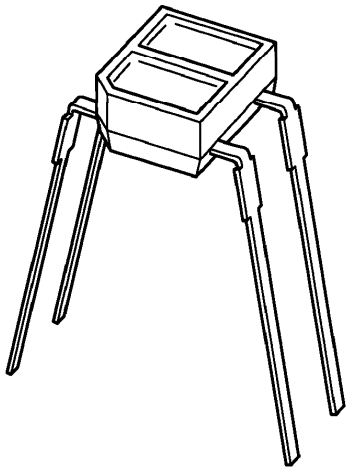
- Very small package : 2.6 mm × 3.4 mm (height 1.5 mm)
  - TLP907 : Flat-lead type
  - TLP907 (LB) : Small DIP
- Short detection distance : Optimum distance 0.5 mm~1.5 mm
- High sensitivity : I_C = 3 mA (typ.)
- Protected from external light by black mold package.

TLP907



TOSHIBA 11-4B1

TLP907 (LB)



TOSHIBA 11-4B101

Weight : 0.05 g (typ.)

MAXIMUM RATINGS (Ta = 25°C)

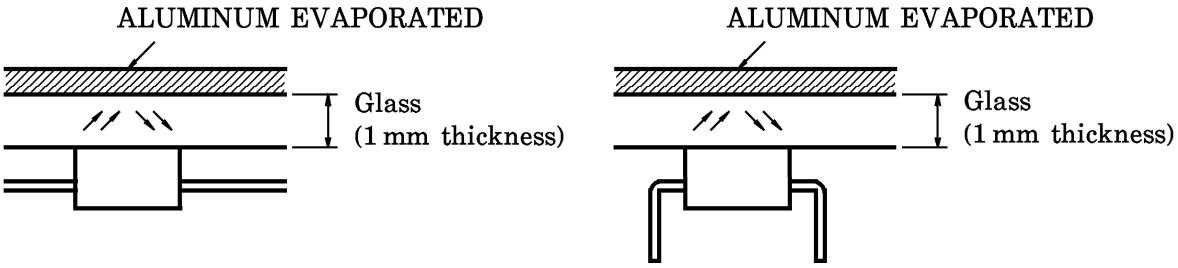
	CHARACTERISTIC	SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	ΔI_F / °C	−0.67	mA / °C
	Pulse Forward Current (Note 1)	I_{FP}	400	mA
	Reverse Voltage	V_R	5	V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	30	V
	Emitter-Collector Voltage	V_{ECO}	5	V
	Collector Power Dissipation	P_C	50	mW
	Collector Power Dissipation Derating (Ta > 25°C)	ΔP_C / °C	−0.67	mW / °C
	Collector Current	I_C	20	mA
Operating Temperature Range		T_{opr}	−25~85	°C
Storage Temperature Range		T_{stg}	−30~10	°C

(Note 1) : Pulse width ≦ 100 μs, Repetitive frequency = 100 Hz

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 = 4 mA		—	940	—	nm
DETECTOR	Dark Current	I_D (I_{CEO})	V_{CE} = 16 V, I_F = 0		—	—	0.25	μA
	Peak Sensitivity Wavelength	λ_P	—		—	900	—	nm
COUPLED	Current Current	I_C	V_{CE} = 2 V, I_F = 4 mA	TLP907	0.5	3	15	mA
				TLP907 (R)	0.5	—	1.9	
				TLP907 (O)	1.45	—	5.4	
				TLP907 (Y)	4.5	—	15	
				TLP907 (LB)	0.5	3	15	
				TLP907 (R, LB)	0.5	—	1.9	
				TLP907 (O, LB)	1.45	—	5.4	
				TLP907 (Y, LB)	4.5	—	15	
	Leakage Current	I_{LEAK}	V_{CE} = 2 V, I_F = 4 mA without reflector		—	—	0.25	μA
	Collector-Emitter Saturation Voltage	$V_{CE\,(sat)}$	I_F = 4 mA, I_C = 0.25 mA		—	0.85	1.2	V
	Rise Time	t_r	V_{CC} = 5 V, I_C = 10 mA, R_L = 100 Ω		—	100	—	μs
	Fall Time	t_f			—	100	—	

(Note 2) : Collector current test method



TLP907 TLP907 (LB)

PRECAUTIONS

- Soldering temperature : 260°C max Soldering time : 3 s max

TLP907 TLP907 (LB)

The diagonally shaded part in the diagrams on the left represent the soldering area.

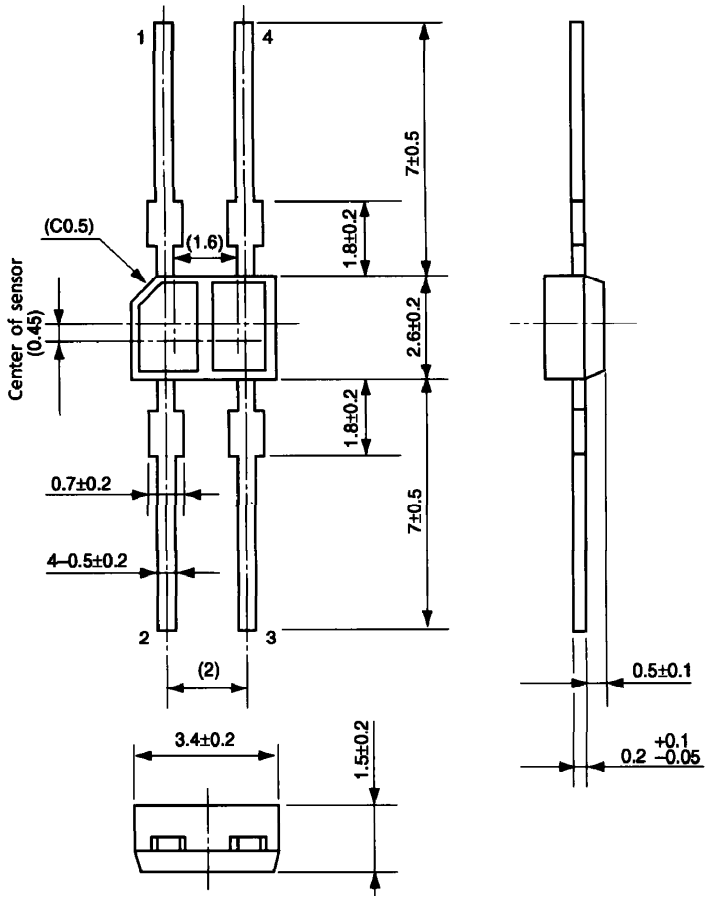
- When forming the leads, be careful not to apply stress to the main body of the device (the resin part). Soldering must be performed after the leads have been formed.
- Collector current falls over time due to the current which flows in the infrared LED. When designing a circuit, take into account this change in conversion efficiency over time. The ratio fluctuation in collector current to fluctuation in infrared LED optical output is 1 : 1.

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

PACKAGE DIMENSIONS

11-4B1

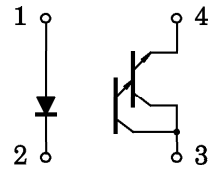
Unit : mm



( ) : Reference value

Weight : 0.05 g (typ.)

PIN CONNECTION

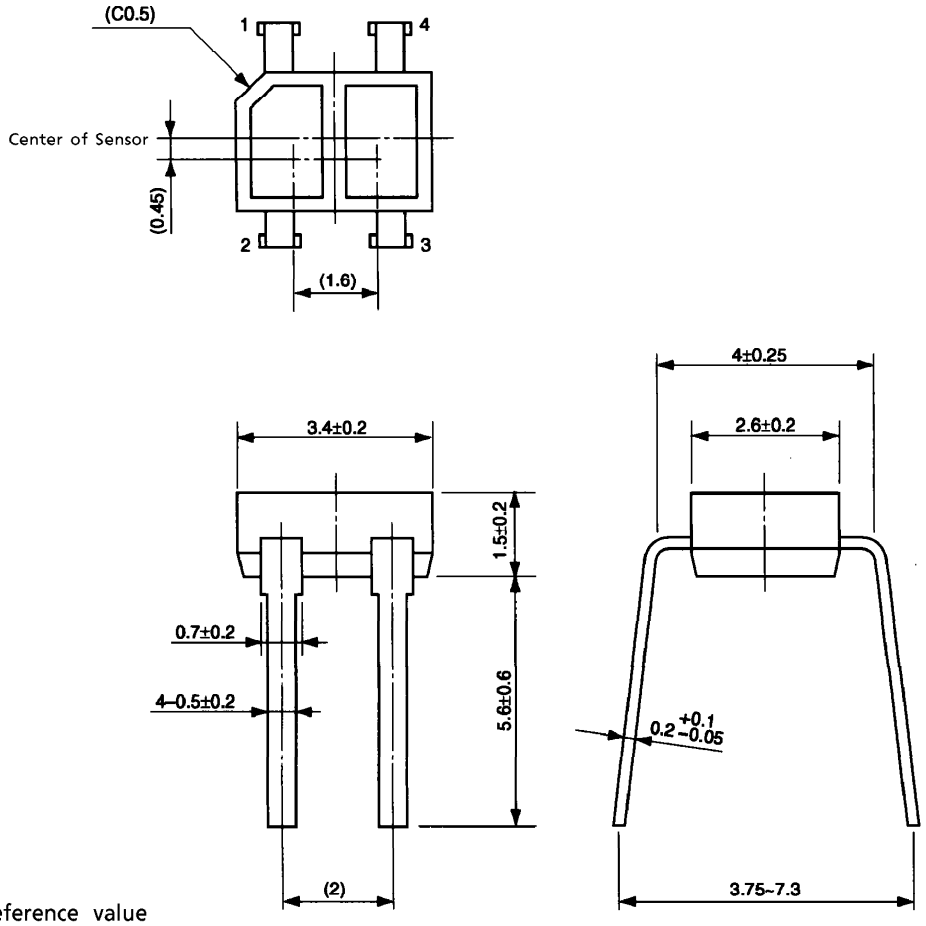


1. Anode
2. Cathode
3. Collector
4. Emitter

PACKAGE DIMENSIONS

11-4B101

Unit : mm



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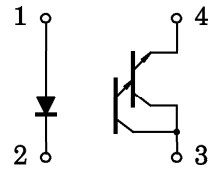
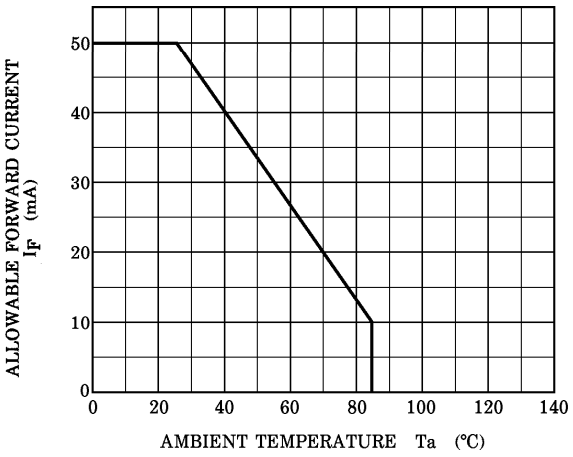
PIN CONNECTION

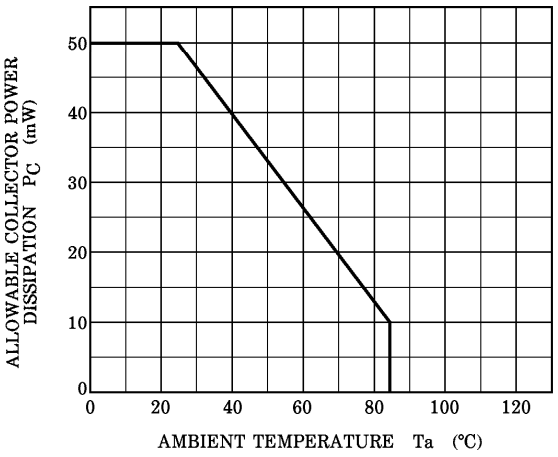


1. Anode
2. Cathode
3. Collector
4. Emitter

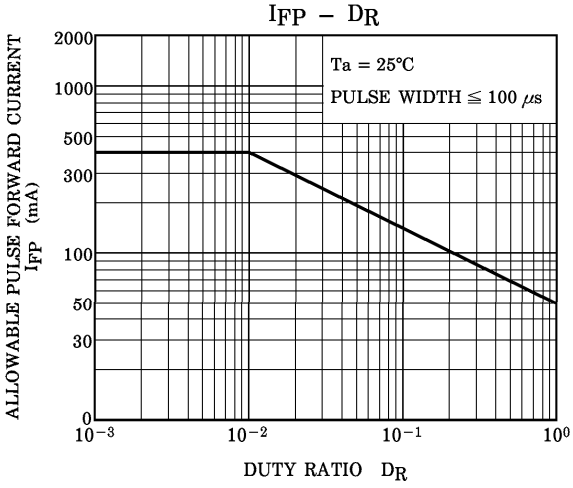
I_F – Ta



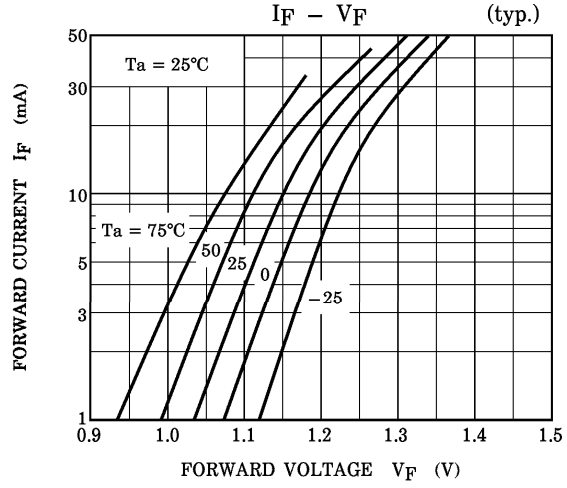
P_C – Ta



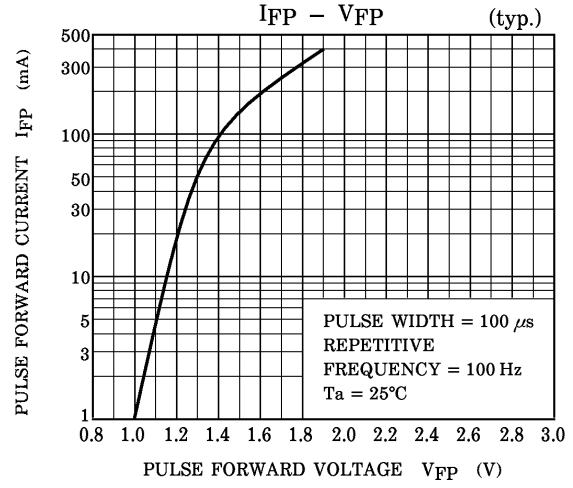
I_{FP} – D_R



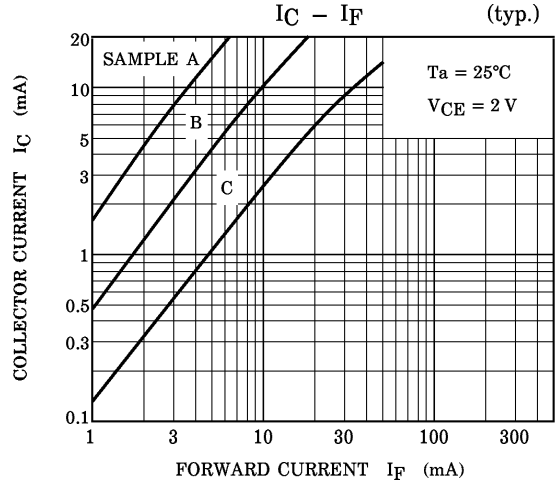
I_F – V_F (typ.)



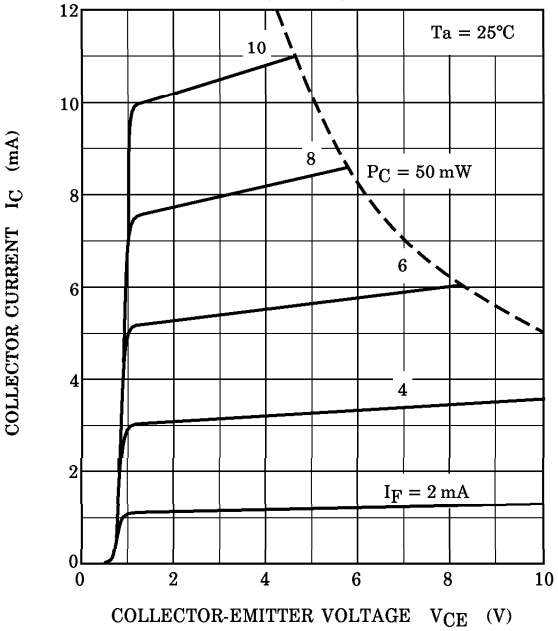
I_{FP} – V_{FP} (typ.)



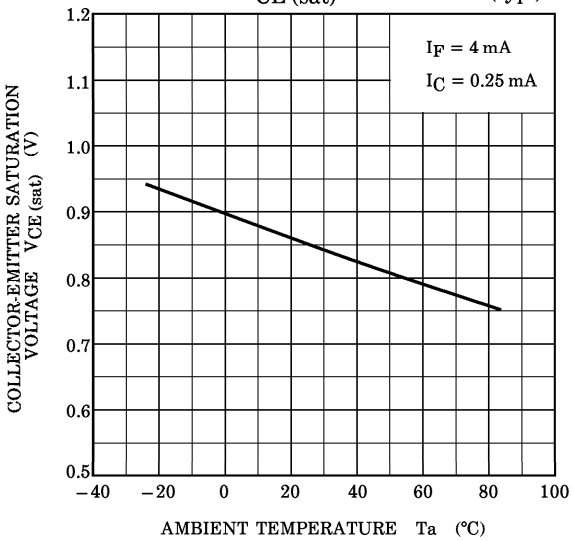
I_C – I_F (typ.)



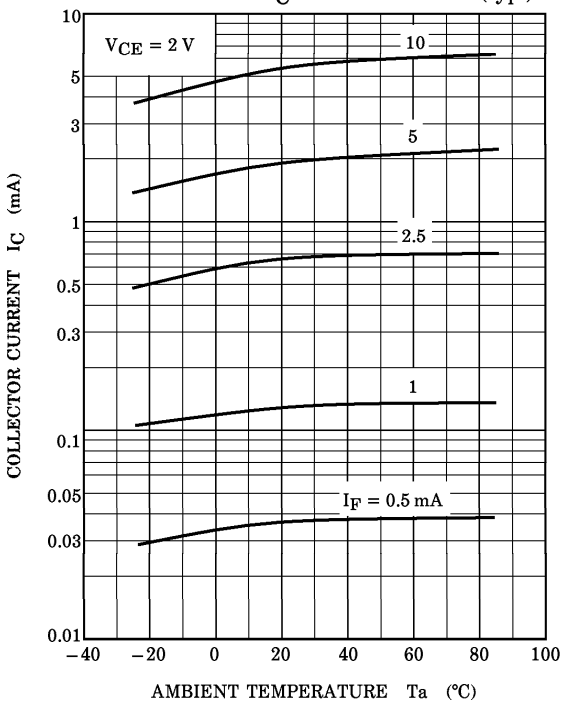
$I_C - V_{CE}$ (typ.)



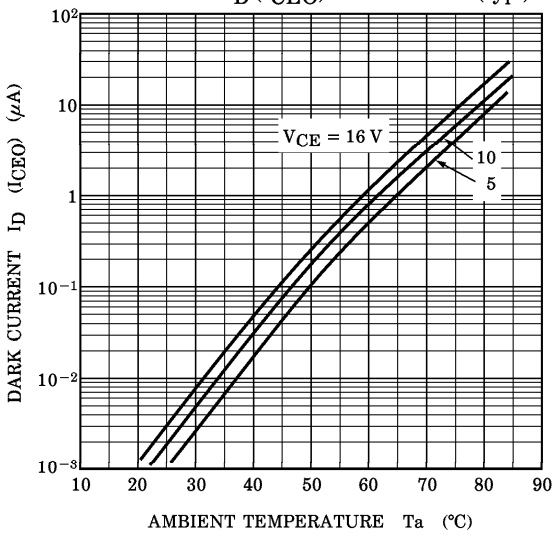
$V_{CE\,(sat)} - Ta$ (typ.)



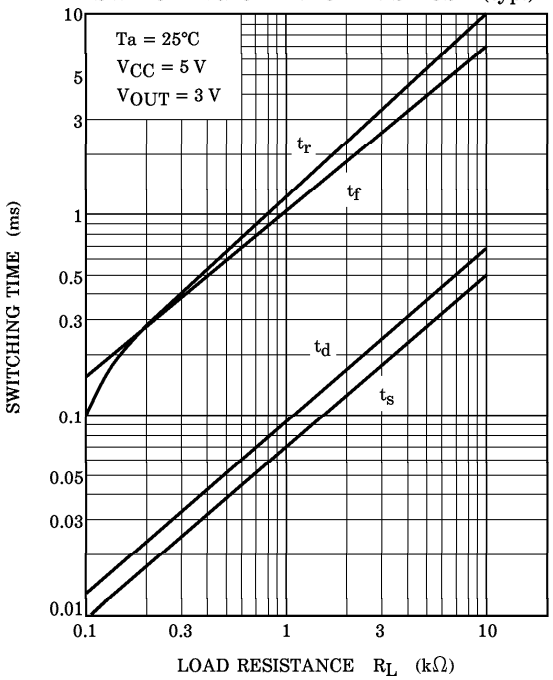
$I_C - Ta$ (typ.)



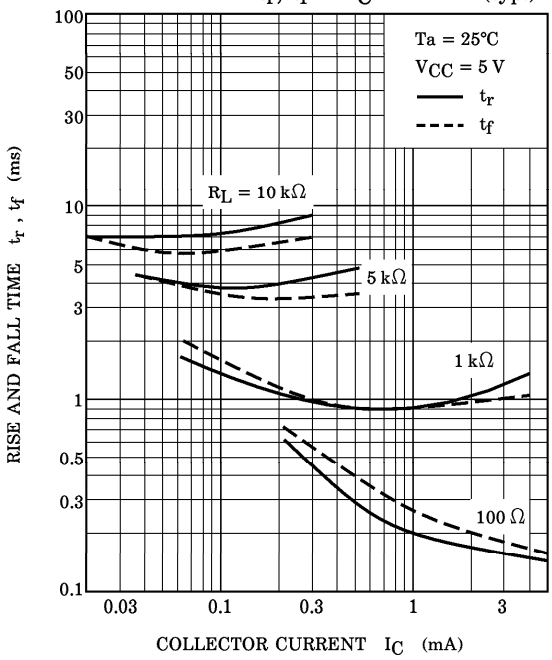
$I_D\,(I_{CEO}) - Ta$ (typ.)



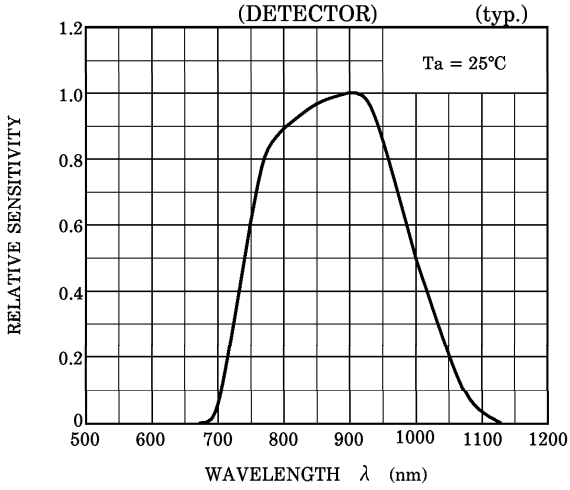
SWITCHING CHARACTERISTICS (typ.)



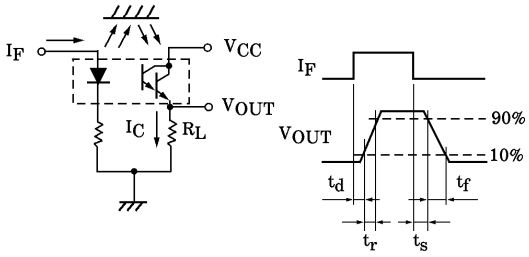
t_r, t_f – I_C (typ.)



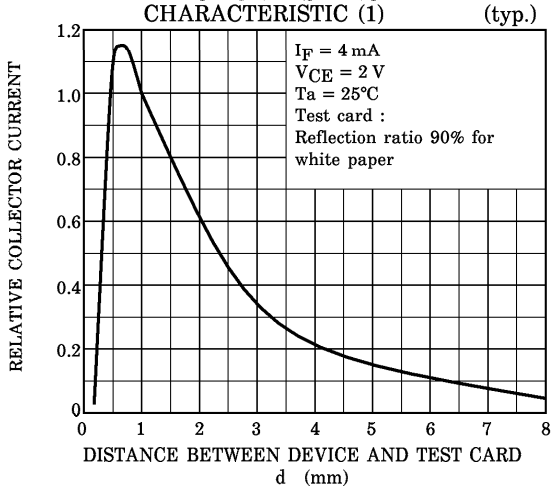
SPECTRAL RESPONCE CHARACTERISTICS (DETECTOR) (typ.)



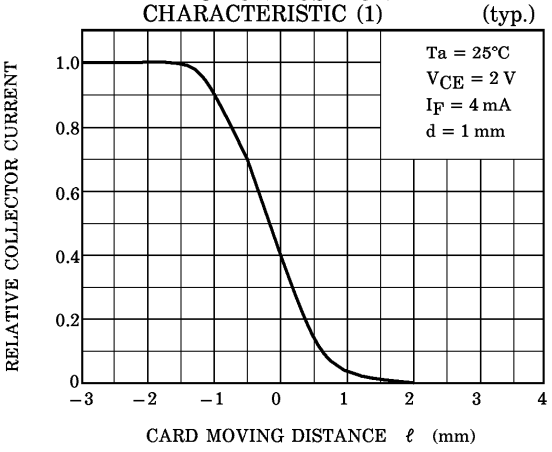
SWITCHING TIME TEST CIRCUIT



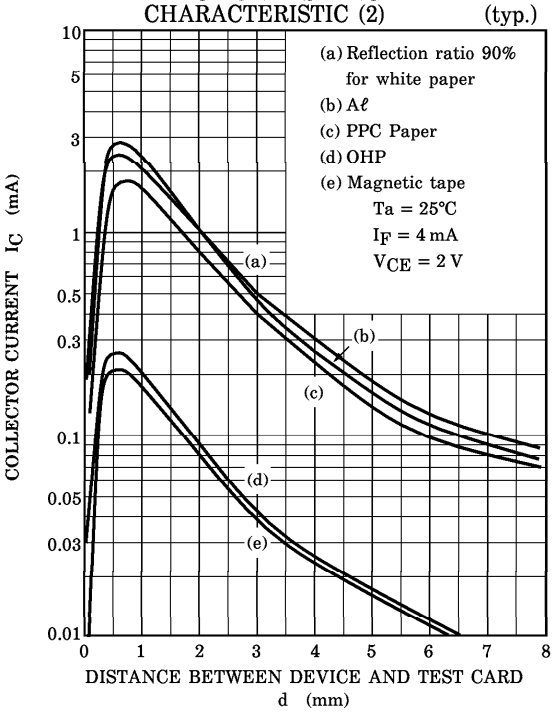
DETECTION DISTANCE CHARACTERISTIC (1) (typ.)



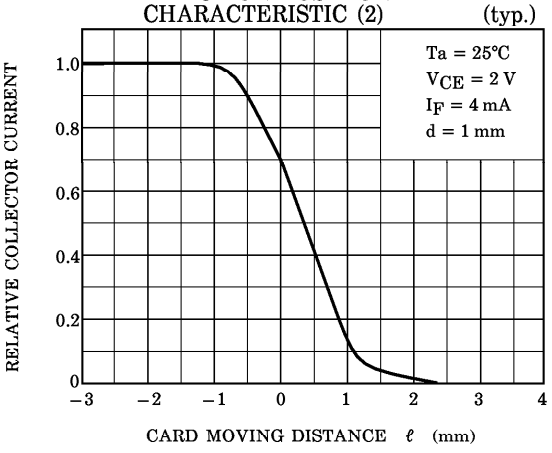
DETECTION POSITION CHARACTERISTIC (1) (typ.)



DETECTION DISTANCE CHARACTERISTIC (2) (typ.)

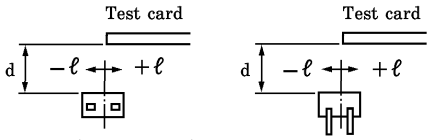


DETECTION POSITION CHARACTERISTIC (2) (typ.)

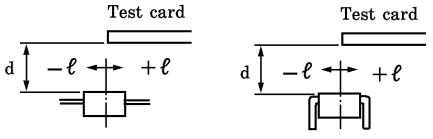


TEST CONDITIONS FOR DETECTION POSITION CHARACTERISTICS

DETECTION POSITION (1)



DETECTION POSITION (2)



Test card : Reflection ratio 90% for white paper (kodak neutral test card)

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