TOSHIBA PHOTOREFLECTIVE SENSORS INFRARED LED + PHOTOTRANSISTOR

TLP908, TLP908(LB)

DETECTION OF START AND END MARKS ON VCR AND AUDIO TAPE

DETECTION OF VCR REEL ROTATION

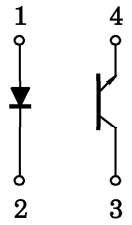
DETECTION OF INDEX WRITE-PROTECT AND PRESENCE OF DISK IN FLOPPY DISK DRIVE

TIMING DETECTION IN ELECTRONIC PRINTERS AND TYPEWRITERS

READING OF CAMERA FILM INFORMATION (DX CODES)

- Very small package : 2.6 × 3.4 mm (height 1.5 mm)
  - TLP908 : Flat lead type
  - TLP908 (LB) : Small DIP type
- Short detection distance : Optimum distance 0.5 mm~1.5 mm
- High sensitivity : t_r, t_f = 10 μs (typ.)
- Black mold package impermeable to visible light

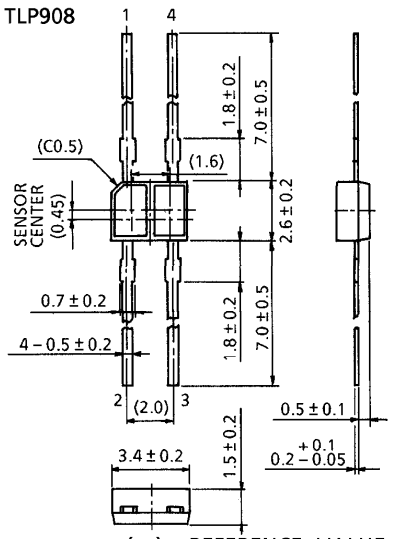
PIN CONNECTION



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

Unit : mm

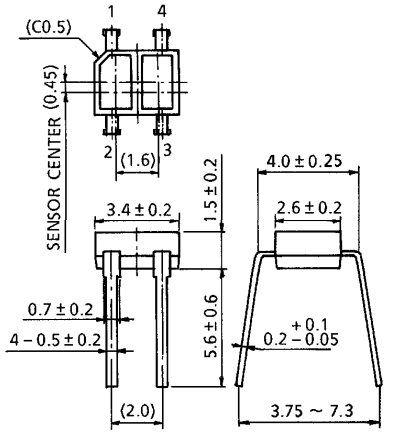
TLP908



( ) : REFERENCE VALUE

JEDEC	—
JEITA	—
TOSHIBA	11-4B1

TLP908 (LB)



( ) : REFERENCE VALUE

JEDEC	—
JEITA	—
TOSHIBA	11-4B101

Weight : 0.05g (typ.)

MAXIMUM RATINGS (Ta = 25°C)

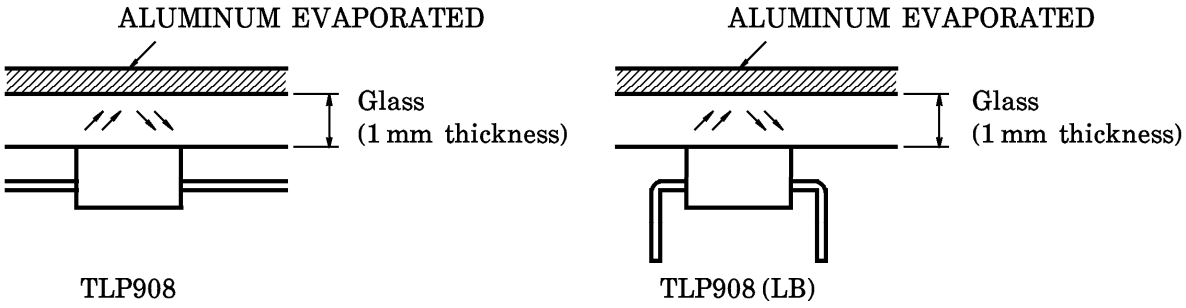
	CHARACTERISTIC	SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	ΔI_F / °C	−0.67	mA / °C
	Pulse Forward Current (Note 1)	I_{FP}	400	mA
	Reverse Voltage	V_R	5	V
DETECTOR	Collector-Emitter Voltage	V_{CEO}	30	V
	Emitter-Collector Voltage	V_{ECO}	5	V
	Collector Power 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}	−30~100	°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 = 10 mA		—	940	—	nm
DETECTOR	Dark Current	I_D (I_{CEO})	V_{CE} = 10 V, I_F = 0		—	—	0.1	μA
	Peak Sensitivity Wavelength	λ_P	—		—	900	—	nm
COUPLED	Current Current	I_C	V_{CE} = 5 V, I_F = 10 mA	TLP908	50	—	750	μA
				TLP908 (R)	50	—	150	
				TLP908 (O)	110	—	330	
				TLP908 (LB)	50	—	750	
				TLP908 (R, LB)	50	—	150	
				TLP908 (O, LB)	110	—	330	
	Leakage Current	I_{LEAK}	V_{CE} = 5 V, I_F = 10 mA No reflecting substance exists.		—	—	0.1	μA
	Collector-Emitter Saturation Voltage	$V_{CE\,(sat)}$	I_F = 10 mA, I_C = 25 μA		—	0.15	0.4	V
	Rise Time	t_r	V_{CC} = 10 V, I_C = 1 mA, R_L = 1 kΩ		—	10	—	μs
	Fall Time	t_f			—	10	—	

(Note 2) : Collector current test method



TLP908 TLP908 (LB)

PRECAUTIONS

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

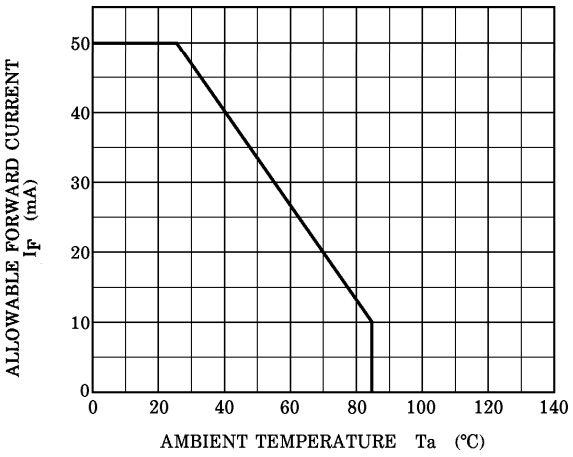
TLP908 TLP908 (LB)

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

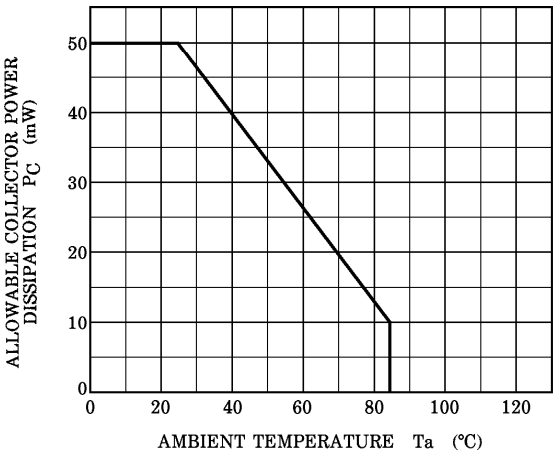
- When forming the leads, be careful not to apply stress to the main body of the device (the resin part). Soldering must be performed after the leads have been formed.
- The collector current increases over time due to current flowing in the infrared LED. The design of circuits which incorporate the device must take into account the change in collector current over time. The change in collector current is equal to the reciprocal of the change in LED infrared optical output.

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

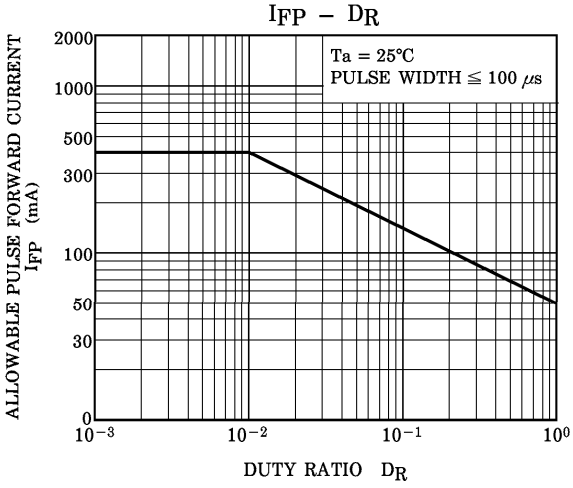
I_F – Ta



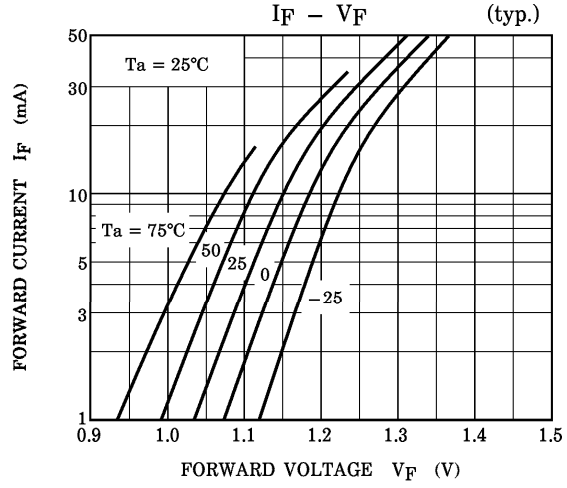
P_C – Ta



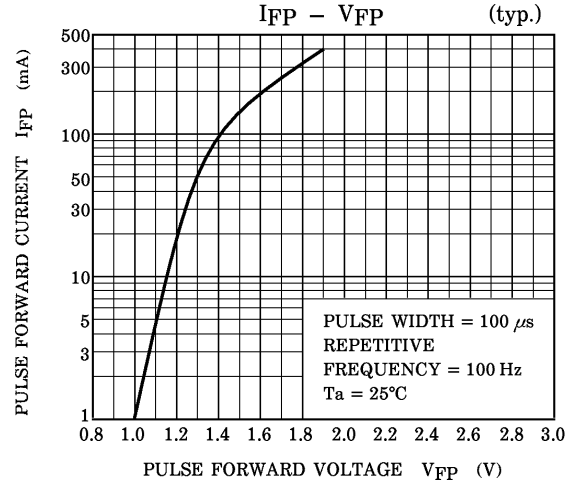
I_{FP} – D_R



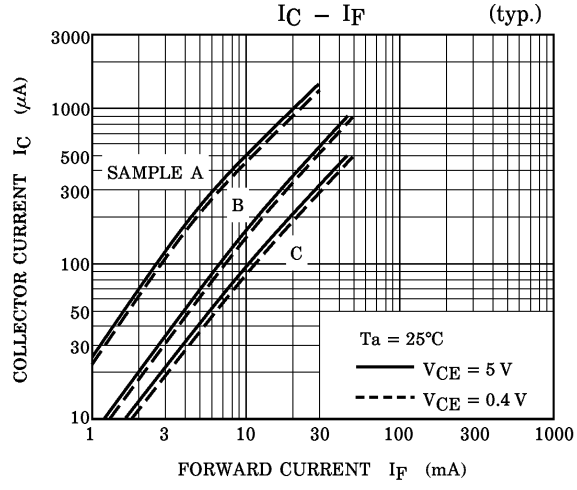
I_F – V_F (typ.)



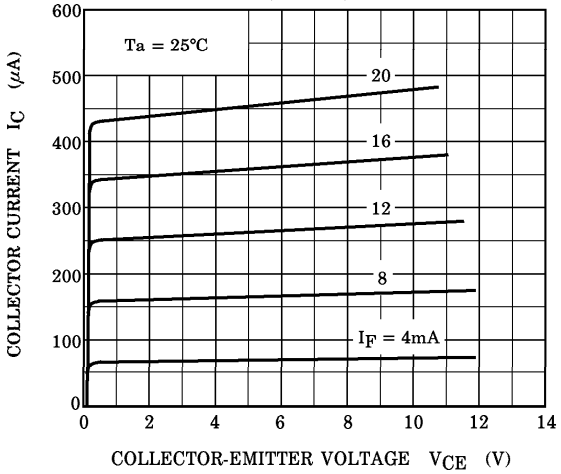
I_{FP} – V_{FP} (typ.)



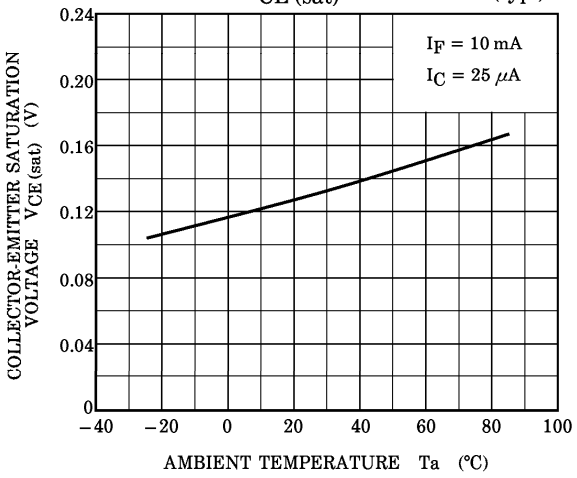
I_C – I_F (typ.)



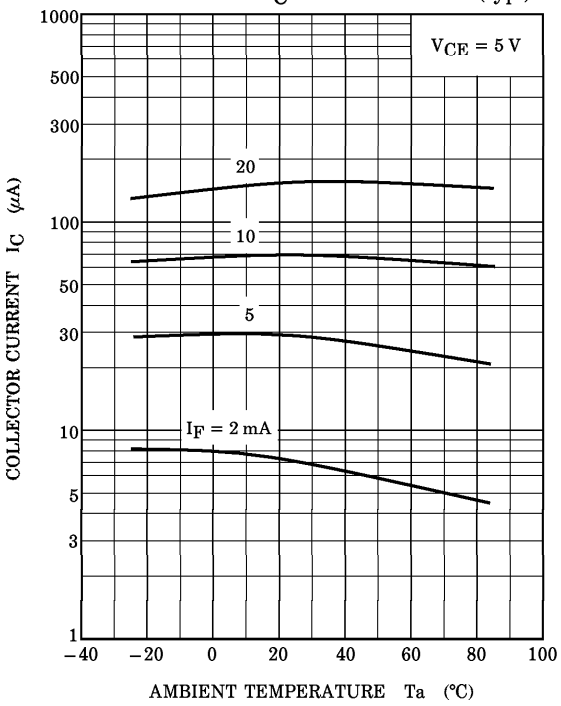
I_C – V_{CE} (typ.)



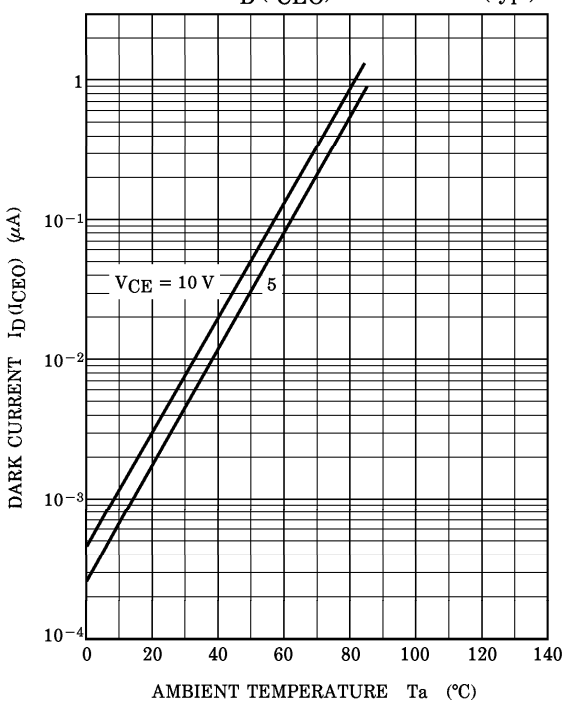
$V_{CE\,(sat)}$ – Ta (typ.)



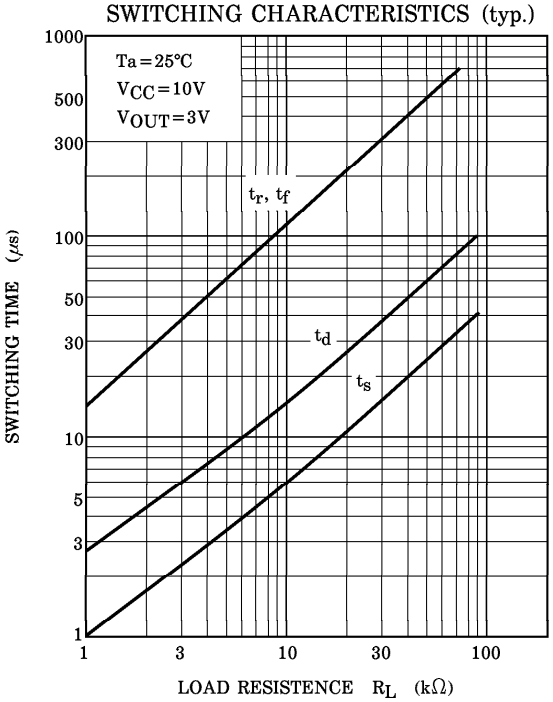
I_C – Ta (typ.)



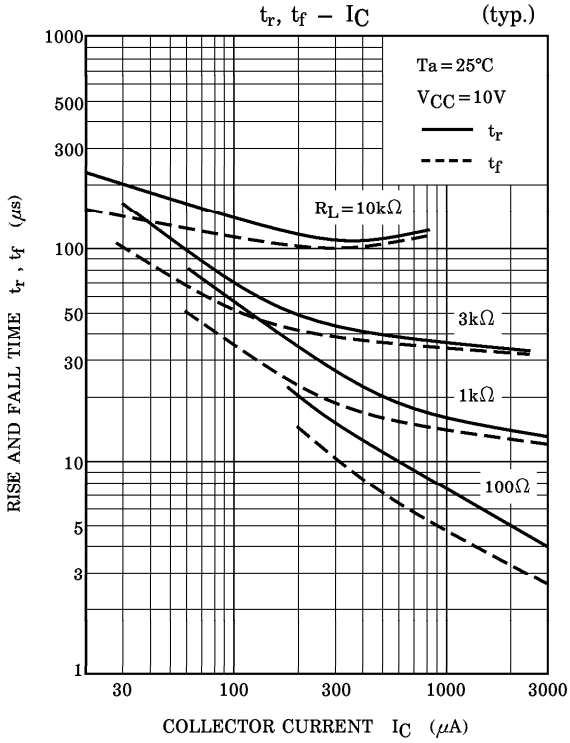
I_D (I_{CEO}) – Ta (typ.)



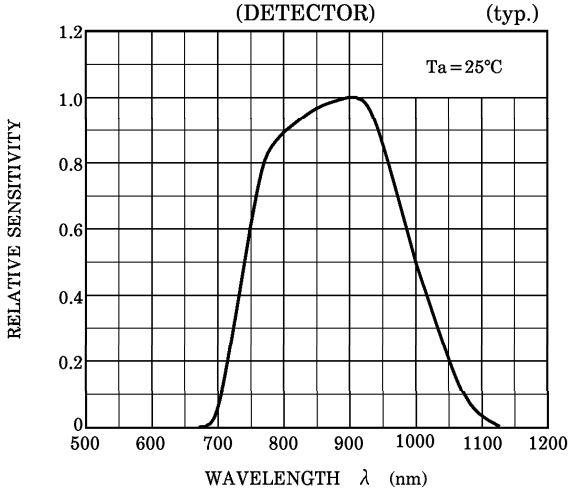
SWITCHING CHARACTERISTICS (typ.)



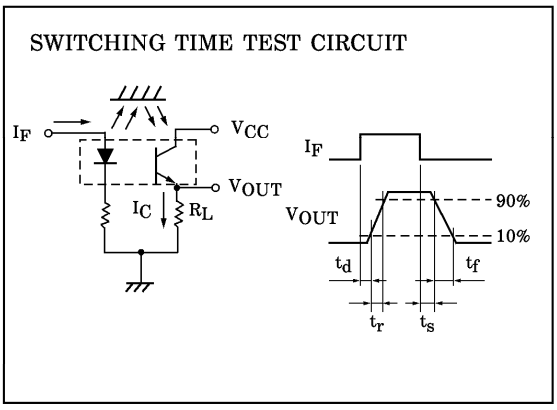
t_r, t_f – I_C (typ.)



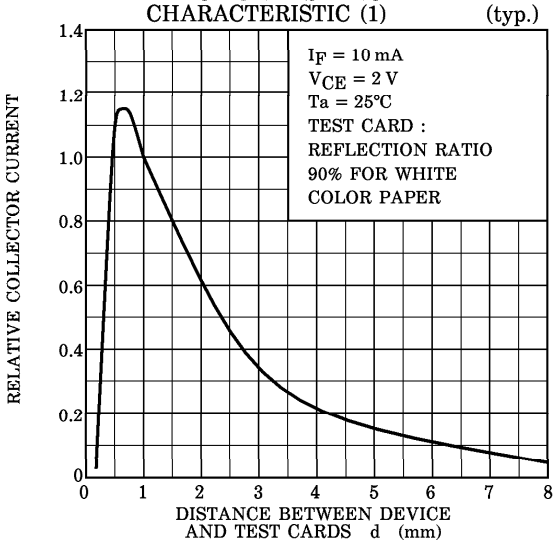
SPECTRAL RESPONCE CHARACTERISTICS (DETECTOR) (typ.)



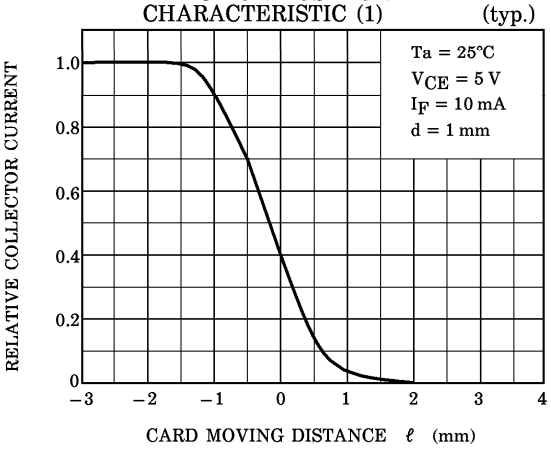
SWITCHING TIME TEST CIRCUIT



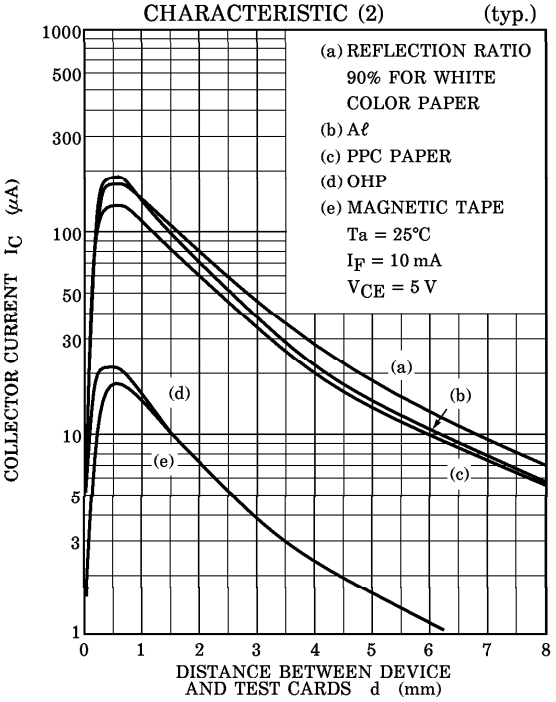
DETECTION DISTANCE CHARACTERISTIC (1) (typ.)



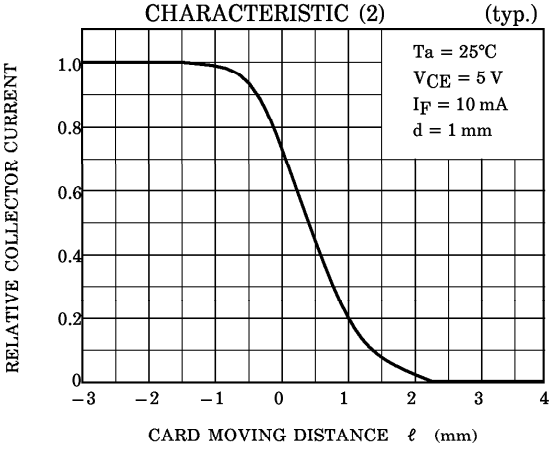
DETECTION POSITION CHARACTERISTIC (1) (typ.)



DETECTION DISTANCE CHARACTERISTIC (2) (typ.)

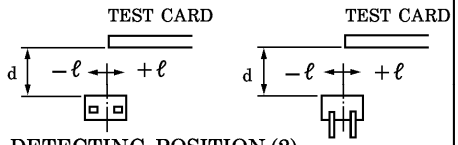


DETECTION POSITION CHARACTERISTIC (2) (typ.)

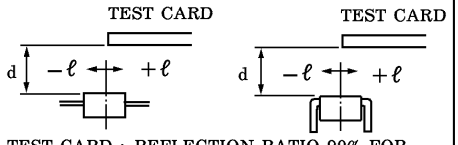


TEST CONDITIONS FOR DETECTION POSITION CHARACTERISTICS

DETECTION POSITION (1)



DETECTING POSITION (2)



TEST CARD : REFLECTION RATIO 90% FOR WHITE COLOR PAPER (KODAK NEUTRAL TEST CARD)

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