

TOSHIBA PHOTOREFLECTIVE SENSOR INFRARED LED + PHOTODARLINGTON TRANSISTOR

TLP909

PAPER DETECTORS IN COPIERS, FAX MACHINES, PRINTERS, ETC.

DETECTION OF FILM AND COINS

TIMING AND EDGE SENSORS

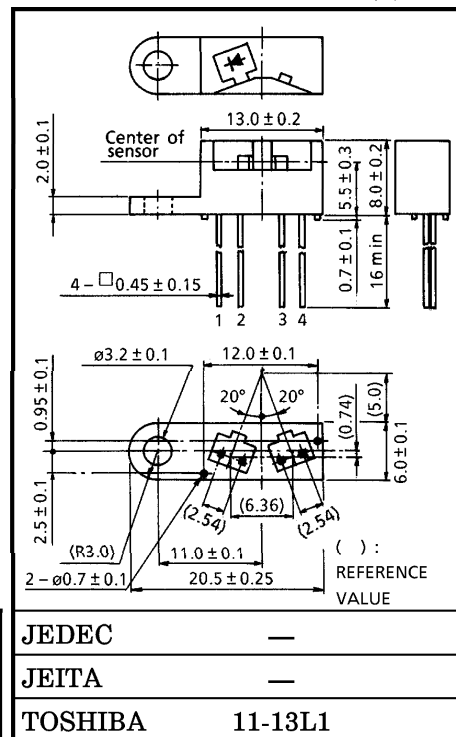
- Large detection distance : Optimum distance 2.5 mm~4.5 mm
- Side mounting type
- Black mold package impermeable to visible light
- Package material : Polycarbonate

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta > 25°C)	$\Delta I_F / ^\circ\text{C}$	-0.33	mA / °C
	Pulse Forward Current (Note 1)	I_{FP}	600	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	75	mW
	Collector Power Dissipation Derating (Ta > 25°C)	$\Delta P_C / ^\circ\text{C}$	-1	mW / °C
	Collector Current	I_C	50	mA
Operating Temperature Range		T_{opr}	-25~85	°C
Storage Temperature Range		T_{stg}	-40~100	°C

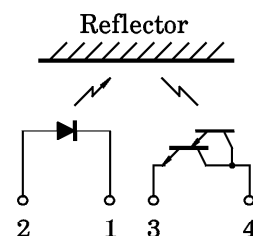
(Note 1) : Pulse width $\leq 100 \mu\text{s}$, Repetitive frequency = 100 Hz

Unit : mm



Weight : 0.83 g (typ.)

PIN CONNECTION



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

OPTICAL AND ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
LED	Forward Voltage	V_F	$I_F = 10 \text{ mA}$	1.00	1.15	1.30	V
	Reverse Current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Peak Emission Wavelength	λ_P	$I_F = 10 \text{ mA}$	—	940	—	nm
DETECTOR	Dark Current	$I_D (I_{CEO})$	$V_{CE} = 16 \text{ V}, I_F = 0$	—	—	0.25	μA
	Peak Sensitivity Wavelength	λ_P	—	—	870	—	nm
COUPLED	Collector Current	I_C	$V_{CE} = 2 \text{ V}, I_F = 10 \text{ mA}$ (Note 2)	1	—	20	mA
	Leakage Current	I_{LEAK}	$V_{CE} = 5 \text{ V}, I_F = 25 \text{ mA}$ Without Reflector	—	—	0.25	μA
	Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_F = 10 \text{ mA}, I_C = 0.5 \text{ mA}$	—	0.85	1.2	V
	Rise Time	t_r	$V_{CC} = 5 \text{ V}, I_C = 10 \text{ mA},$ $R_L = 100 \Omega$	—	100	—	μs
	Fall Time	t_f		—	100	—	

(Note 2) : Reflection ratio 90% at white color paper (KODAK NEUTRAL TEST CARD),
Detecting Distance 5mm.

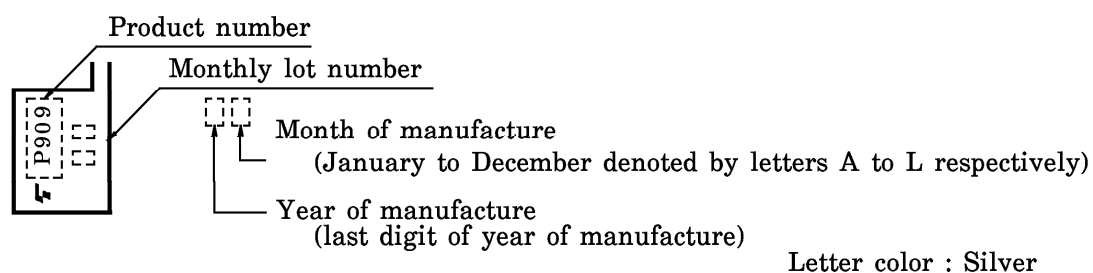
PRECAUTIONS

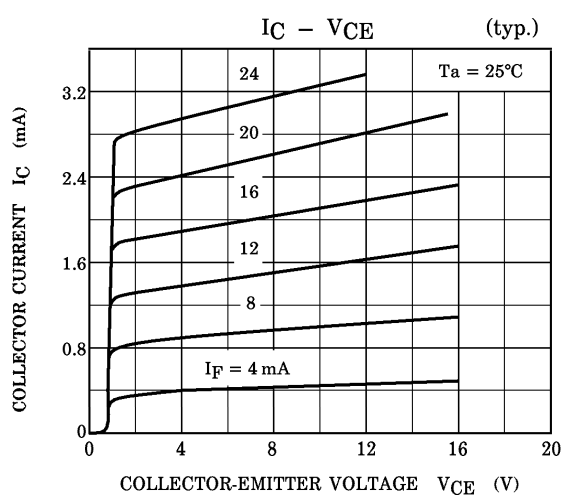
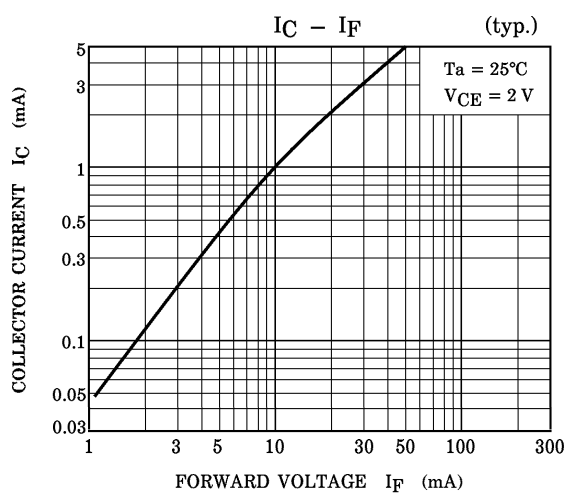
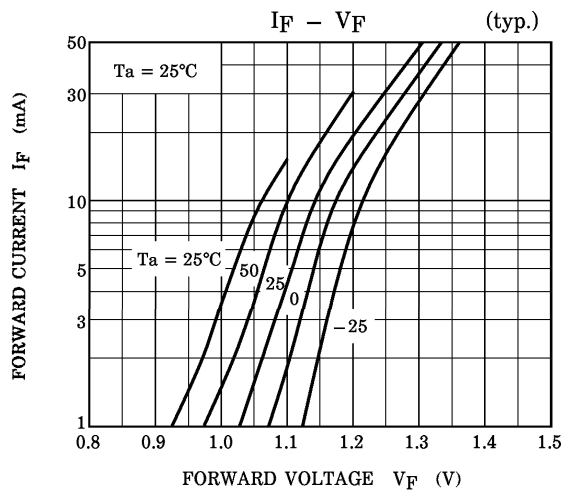
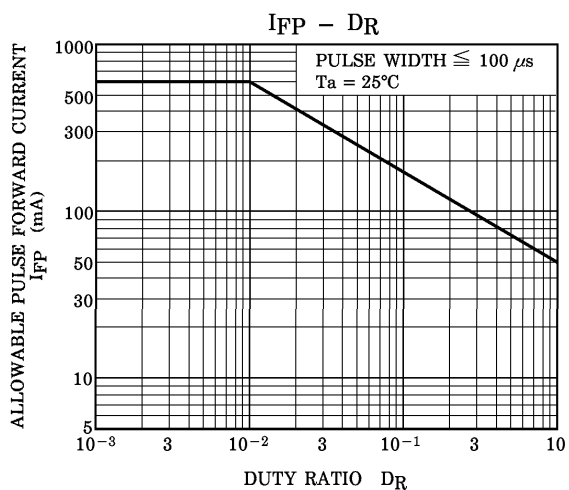
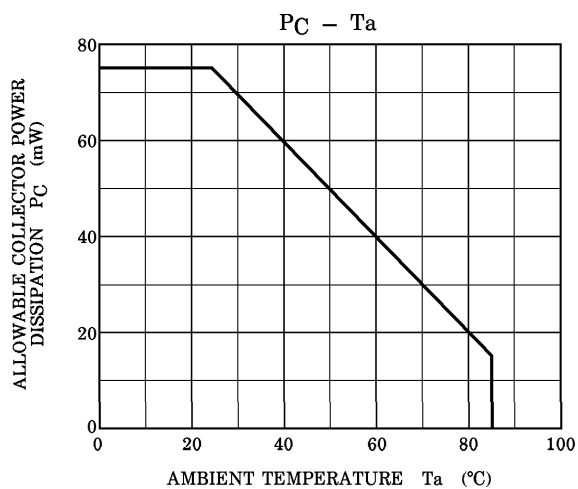
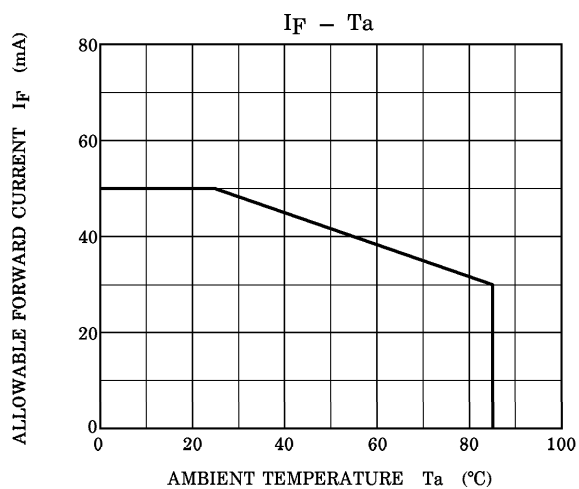
The following points must be borne in mind.

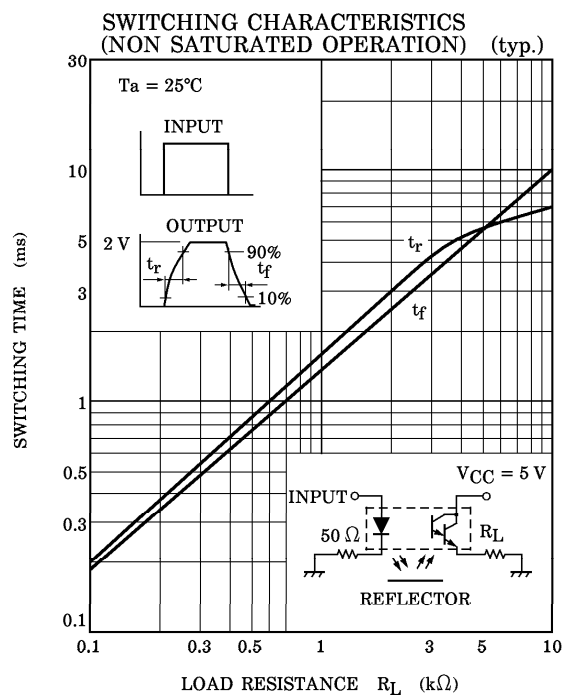
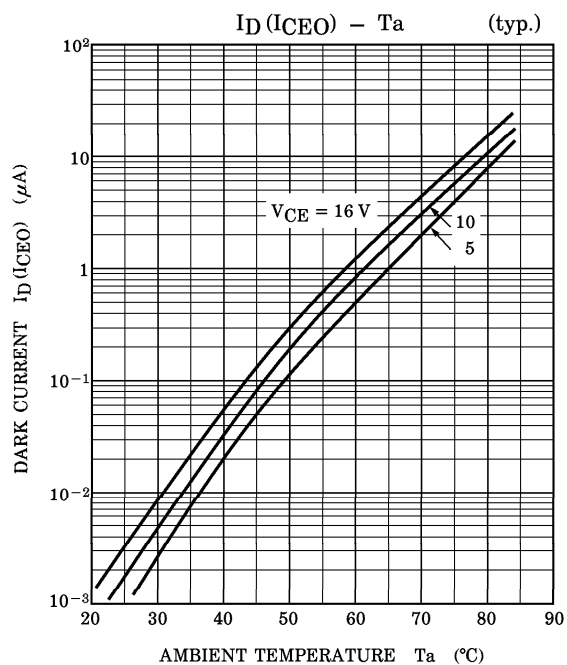
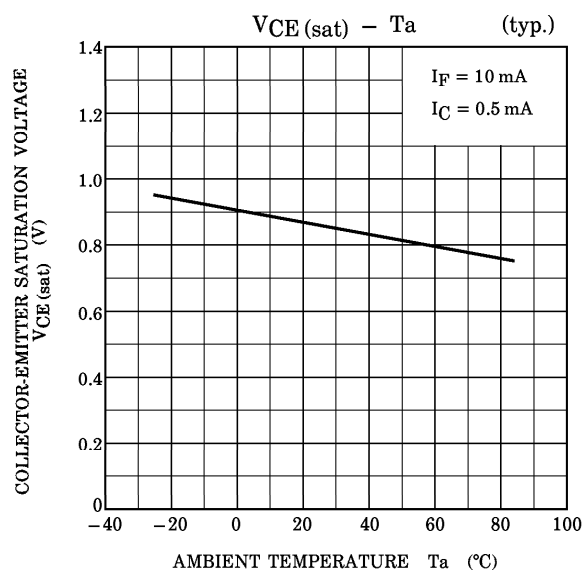
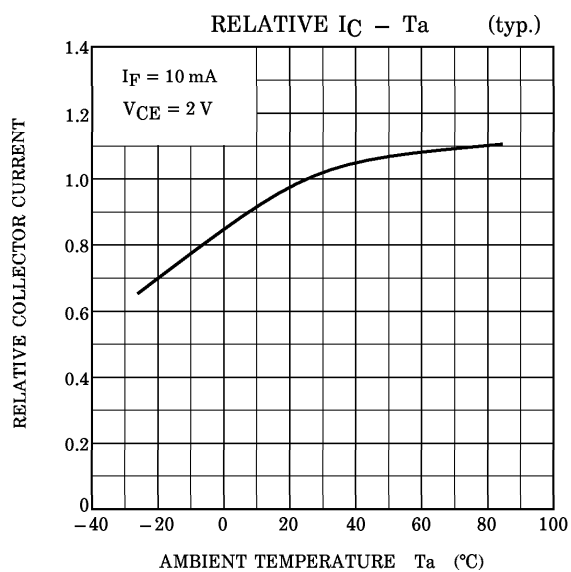
1. Soldering temperature : 260°C max
Soldering time : 5 s max
(Soldering must be performed 1.5 mm under the package body.)
2. Clean only the soldered part of the leads. Do not immerse the entire package in the cleaning solvent.
3. The package is made of polycarbonate. Oil or chemicals may cause the package to melt or crack.
4. Mount the device on a level surface.
5. Screws should be tightened to a clamping torque of 0.59 N·m.
6. 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.

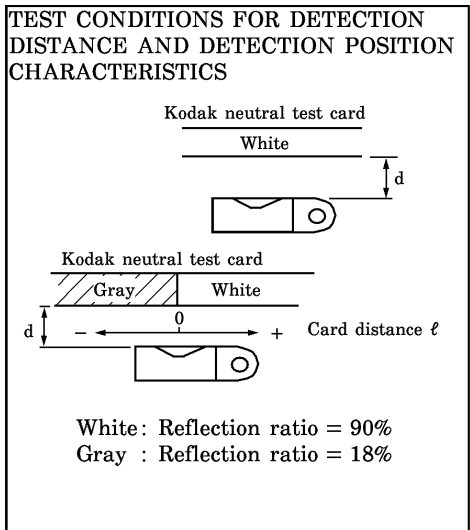
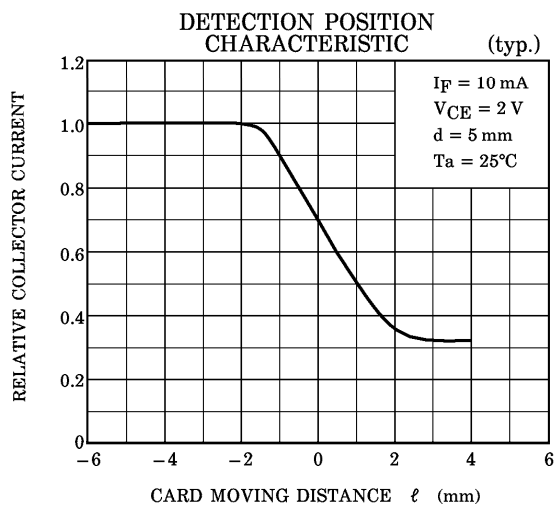
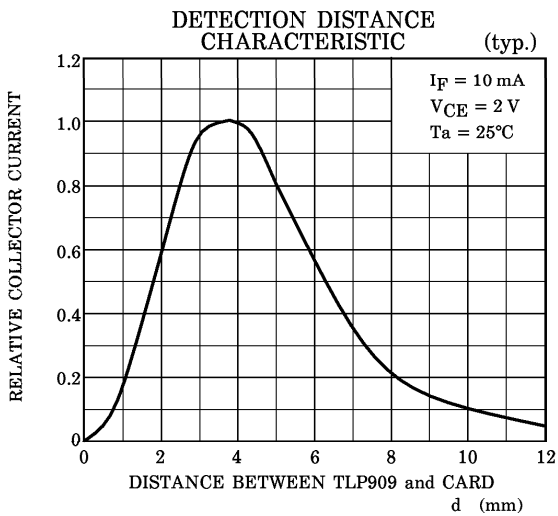
$$\frac{I_C(t)}{I_C(0)} = \frac{P_O(t)}{P_O(0)}$$

MARKINGS









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