

TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTO IC

TLP1034

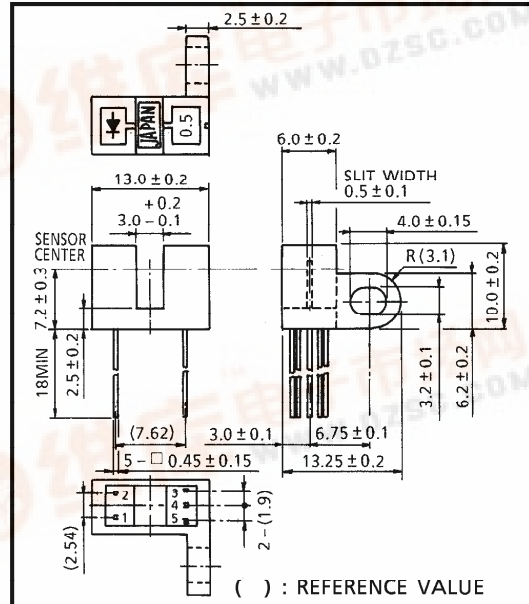
PRINTER, ELECTRONIC TYPEWRITER, FACSIMILE
 COPYING MACHINE, LATHER BEAMING PRINTER
 VCR, VIDEODISC, COMPACT DISC
 VARIOUS POSITION DETECTION

Unit in mm

TLP1034 is a digital output photointerrupter with an GaAs infrared LED and a high sensitive and high gain Si photo IC combined.

This photointerrupter has a response speed faster than the photo transistor output and is capable of high speed position detection.

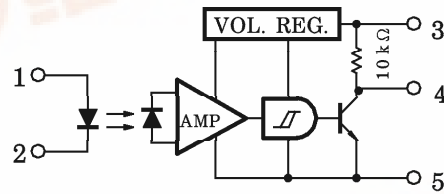
Further because of large output current and a built-in Schmitt trigger circuit, this photointerrupter is connectable directly to a microcomputer or logic IC. Its output becomes low level when the light is shielded. The TLP1024 with a pull-up resistor in the same shape as this photointerrupter is also available.



JEDEC	—
EIAJ	—
TOSHIBA	11-13M2

Weight : 0.87g (Typ.)

PIN CONNECTION



- 1. ANODE
- 2. CATHODE
- 3. VCC
- 4. OUT
- 5. GND

- Side mounting type
- Gap : 3mm
- Resolution : Slit width 0.5mm
- Digital output (with a pull-up resistor)
- Directly connectable to TTL, LS TTL and CMOS.
- Threshold input current : $I_{FLH} = 4\text{mA}$ (Max.) at $T_a = 25^\circ\text{C}$
- Operating supply voltage : $V_{CC} = 4.5 \sim 17\text{V}$
- Built-in Schmitt trigger circuit
- Fast response speed : $t_{pLH} = 3\mu\text{s}$, $t_{pHL} = 6\mu\text{s}$ (Typ.)
- Detector side is of visible light cut type.

961001EBC2

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● Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

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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	-0.33	mA / °C
	Reverse Voltage	V _R	5	V
DETECTOR	Supply Voltage	V _{CC}	17	V
	Output Current	I _O	50	mA
	Power Dissipation	P _O	250	mW
	Power Dissipation Derating (Ta > 25°C)	ΔP _O / °C	-3.33	mW / °C
Operating Temperature Range		T _{opr}	-25~85	°C
Storage Temperature Range		T _{stg}	-40~100	°C
Soldering Temperature (5s)		T _{sol}	260	°C

RECOMMENDED OPERATING CONDITIONS

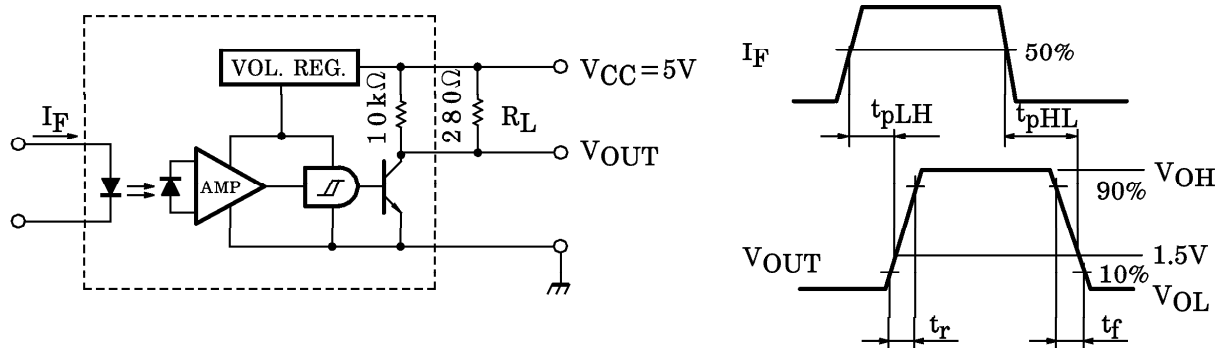
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Forward Current	I _F	14*	—	20	mA
Supply Voltage	V _{CC}	4.5	5	17	V
Low Level Output Current	I _{OL}	—	—	16	mA
Operating Temperature	T _{opr}	-25	—	85	°C

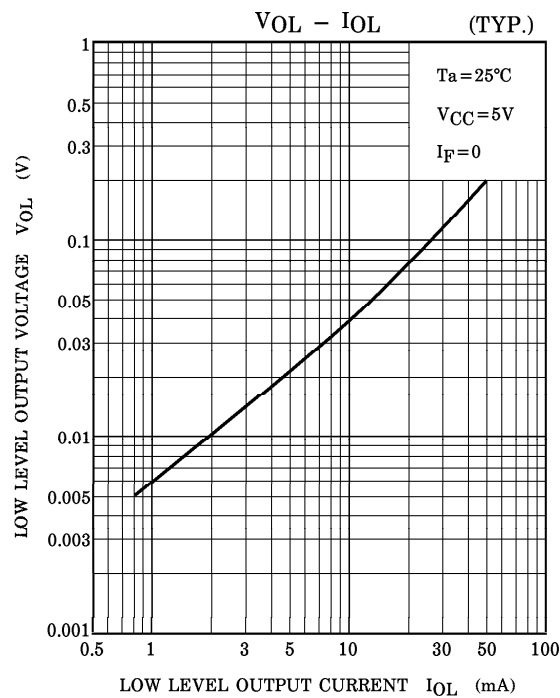
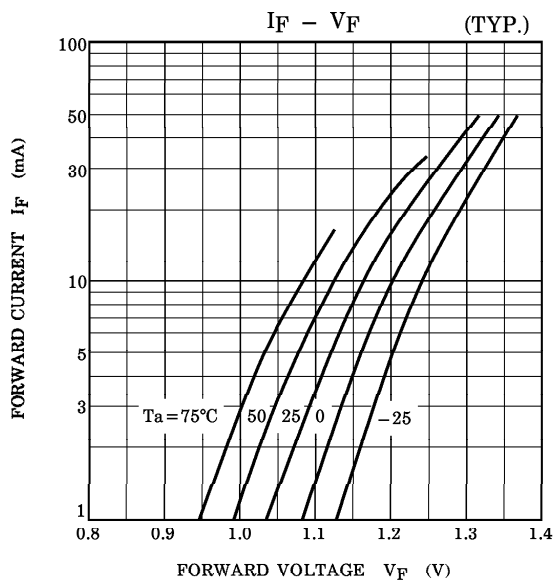
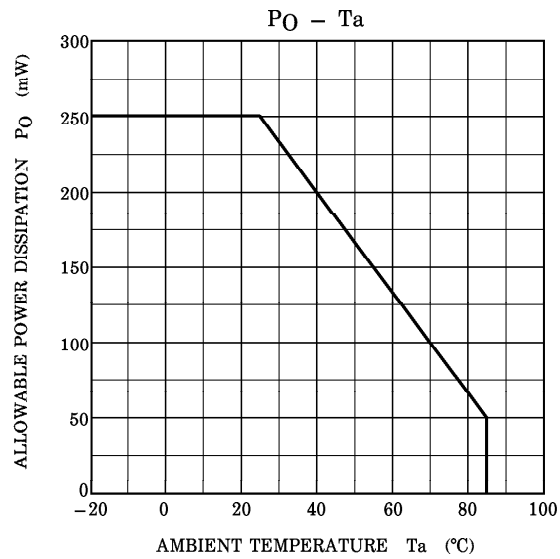
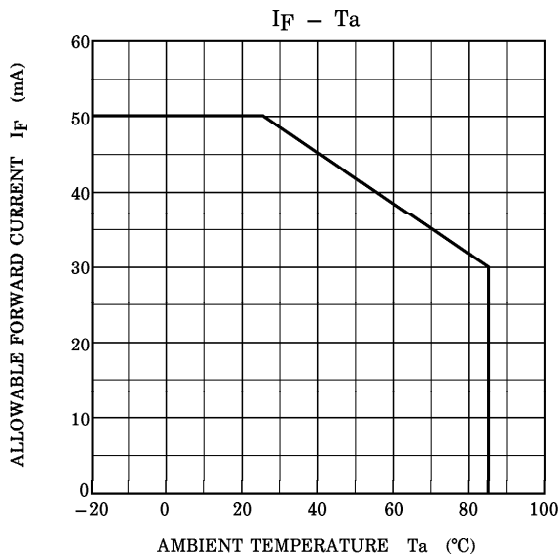
* 14mA is a value when 50% LED deterioration is taken into consideration.
Initial threshold input current shall be 7mA MAX.

OPTO-ELECTRICAL CHARACTERISTICS (Unless Otherwise Specified, Ta = -25~85°C, VCC = 4.5~5.5V)

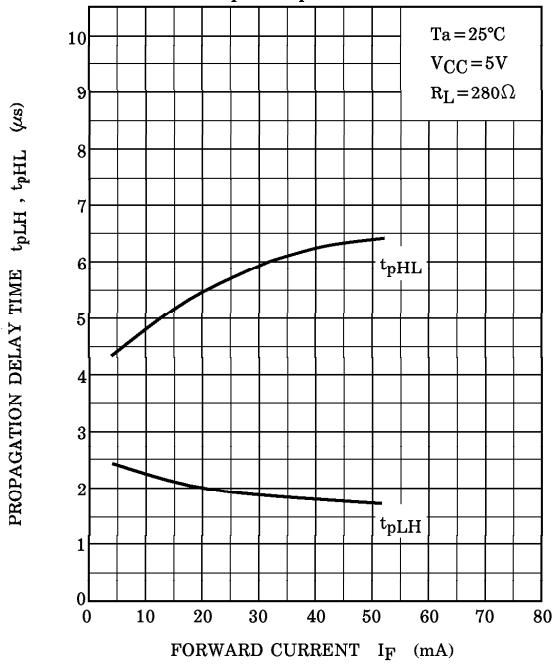
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Current	V_F	$I_F = 10\text{mA}$, $T_a = 25^\circ\text{C}$	1.00	1.15	1.30	V	
	Reverse Current	I_R	$V_R = 5\text{V}$, $T_a = 25^\circ\text{C}$	—	—	10	μA	
	Peak Emission Wavelength	λ_P	$I_F = 15\text{mA}$, $T_a = 25^\circ\text{C}$	—	940	—	nm	
DETECTOR	Supply Voltage	V_{CC}	—	4.5	—	17	V	
	Low Level Supply Current	I_{CCL}	$I_F = 0$	—	—	6.0	mA	
			$I_F = 0$, $V_{CC} = 17\text{V}$	—	—	7.5		
	High Level Supply Current	I_{CCH}	$I_F = 15\text{mA}$	—	—	3.0	mA	
			$I_F = 15\text{mA}$, $V_{CC} = 17\text{V}$	—	—	3.2		
	Low Level Output Voltage	V_{OL}	$I_{OL} = 16\text{mA}$, $I_F = 0$ $T_a = 25^\circ\text{C}$	—	0.07	0.3	V	
			$I_{OL} = 16\text{mA}$, $I_F = 0$ $V_{CC} = 17\text{V}$	—	—	0.4		
High Level Output Voltage	V_{OH}	$I_F = 15\text{mA}$	$0.9V_{CC}$	—	—	V		
Peak Sensitivity Wavelength	λ_P	$T_a = 25^\circ\text{C}$	—	900	—	nm		
COUPLED	Threshold Input Current (H→L)	I_{FLH}	$T_a = 25^\circ\text{C}$	—	—	4	mA	
			$V_{CC} = 17\text{V}$	—	—	7		
	Hysteresis Ratio	I_{FHL} / I_{FLH}	—	—	0.67	—		
	Propagation Delay Time	L→H	t_{pLH}	$V_{CC} = 5\text{V}$, $I_F = 15\text{mA}$ $R_L = 280$, $T_a = 25^\circ\text{C}$ (Note)	—	3	—	μs
		H→L	t_{pHL}		—	6	—	
Rise Time	t_r	—	0.1		—			
Fall Time	t_f	—	0.05		—			

NOTE : SWITCHING TIME TEST CIRCUIT

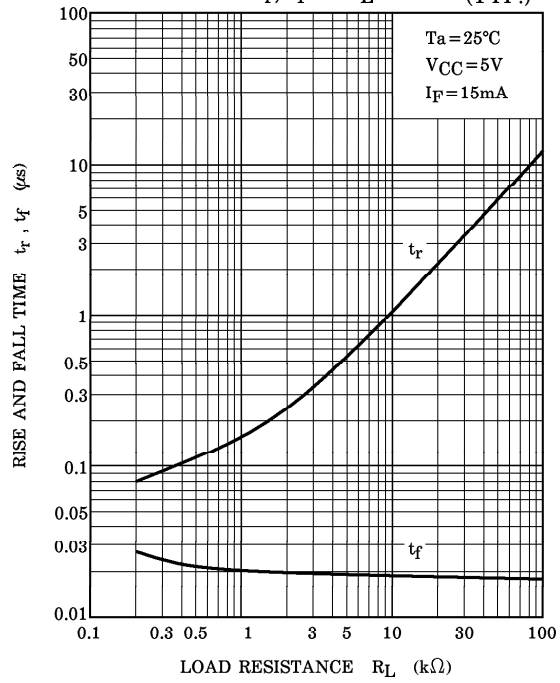




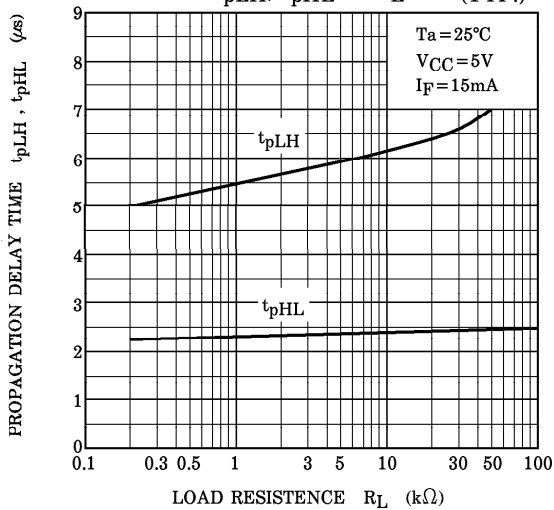
$t_{pLH}, t_{pHL} - I_F$ (TYP.)

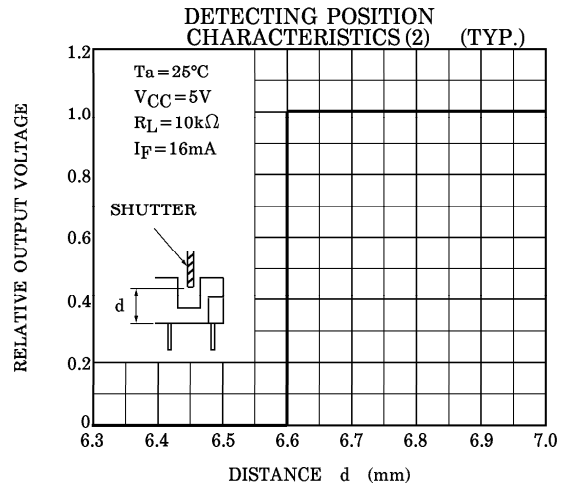
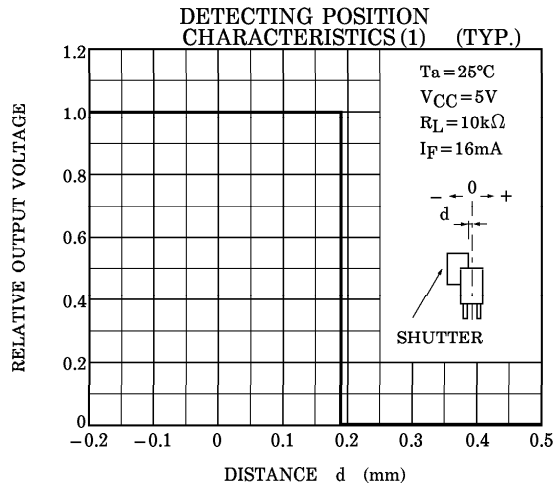


$t_r, t_f - R_L$ (TYP.)



$t_{pLH}, t_{pHL} - R_L$ (TYP.)

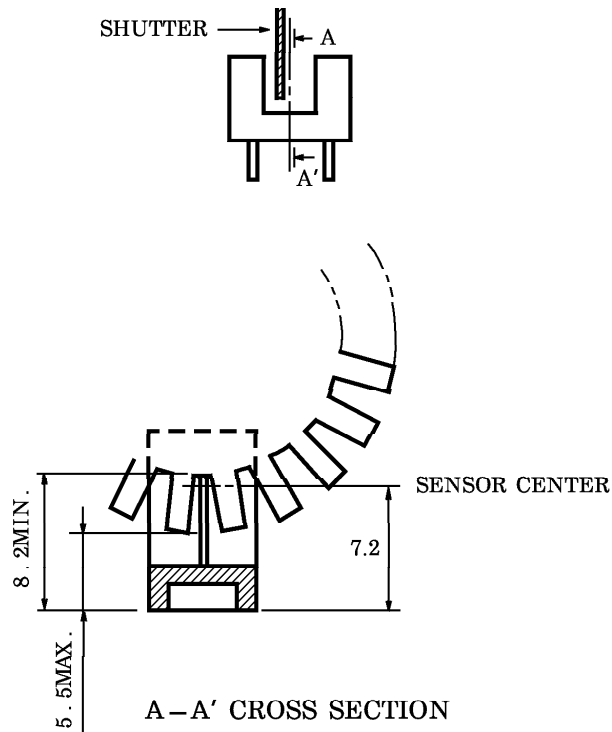




POSITIONING OF SHUTTER AND DEVICE

To operate correctly, make sure that the shutter and the device are positioned as shown in the figure below.

The slit pitch of the shutter must be set wider than the slit width of the device. Determine the width taking the switching time into consideration.



UNIT IN : mm