

# TLP3240

## Measurement Instruments

## Logic IC Testers / Memory Testers

## Board Testers / Scanners

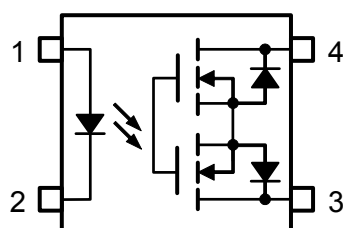
The TOSHIBA TLP3240 is a super small-outline photorelay, suitable for surface-mount assembly. The TLP3240 consists of a GaAlAs infrared-emitting diode optically coupled to a photo-MOS FET and housed in a 4-pin package.

Its characteristics also include low OFF-state current and low output pin capacitance, enabling it to be used in high-frequency measuring instruments.

## Features

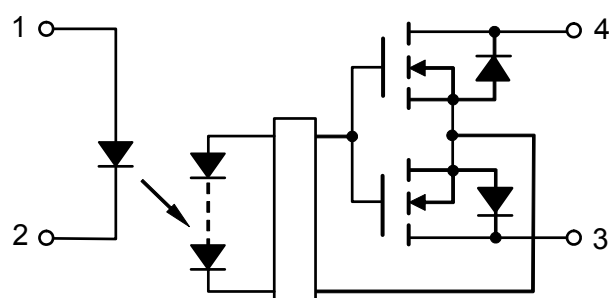
- 4 pin SSOP (SSOP4) : 1.8 mm high, 1.27 mm pitch
- 1-Form-A
- Peak off-state voltage : 40 V (Min.)
- Trigger LED current : 3 mA (Max.)
- On-state current : 120 mA (Max.)
- On-state resistance : 14 (Max.), 12 (Typ.)
- Output capacitance : 0.8 pF (Max.), 0.45 pF (Typ.)
- Isolation voltage : 1500 Vrms (Min.)

## Pin configuration (top view)

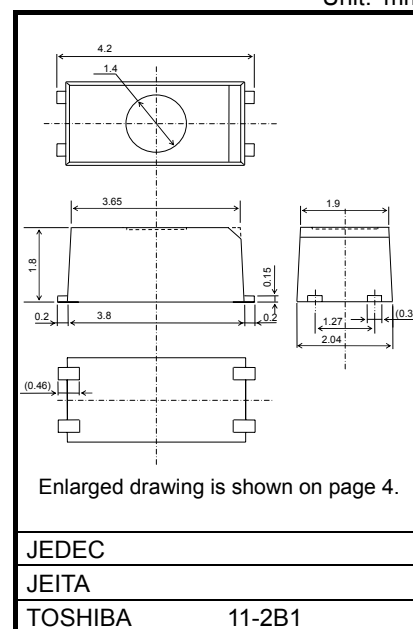


- 1 : Anode
- 2 : Cathode
- 3 : Drain
- 4 : Drain

## Schematic



Unit: mm



Weight: 0.03 g (Typ.)

**Absolute Maximum Ratings (Ta = 25°C)**

Characteristic		Symbol	Rating	Unit
LED	Forward current	$I_F$	30	mA
	Forward current derating (Ta ≥ 25°C)	$\Delta I_F/^\circ\text{C}$	-0.3	mA/°C
	Reverse voltage	$V_R$	5	V
	Junction temperature	$T_j$	125	°C
Detector	Off-State output terminal voltage	$V_{OFF}$	40	V
	On-State current	$I_{ON}$	120	mA
	On-State current derating (Ta ≥ 25°C)	$\Delta I_{ON}/^\circ\text{C}$	-1.2	mA/°C
	Junction temperature	$T_j$	125	°C
Storage temperature range		$T_{stg}$	-40~125	°C
Operating temperature range		$T_{opr}$	-20~85	°C
Lead soldering temperature (10 s)		$T_{sol}$	260	°C
Isolation voltage (AC, 1 min., R.H. ≤ 60%) (Note 1)		$BV_S$	1500	Vrms

(Note 1): Device considered a two-terminal device: Pins 1 and 2 shorted together, and pins 3 and 4 shorted together.

**Caution**

This device is sensitive to electrostatic discharge. When using this device, please ensure that all tools and equipment are earthed.

**Recommended Operating Conditions**

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	$V_{DD}$	—	—	32	V
Forward current	$I_F$	—	—	20	mA
Operating temperature	$T_{opr}$	25	—	60	°C

Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

**Individual Electrical Characteristics (Ta = 25°C)**

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F = 5 \text{ mA}$	1.15	1.30	1.45	V
	Reverse current	$I_R$	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	$I_{OFF}$	$V_{OFF} = 35 \text{ V}$	—	10	200	pA
	Capacitance	$C_{OFF}$	$V = 0, f = 100 \text{ MHz}, t < 1 \text{ s}$	—	0.45	0.8	pF

## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{FT}$	$I_{ON} = 100 \text{ mA}$	—	—	3	mA
Return LED current	$I_{FC}$	$I_{OFF} = 1 \text{ }\mu\text{A}$	0.1	—	—	mA
On-state resistance	$R_{ON}$	$I_{ON} = 120 \text{ mA}$ , $I_F = 5 \text{ mA}$ , $t < 1 \text{ s}$	—	12	14	$\Omega$

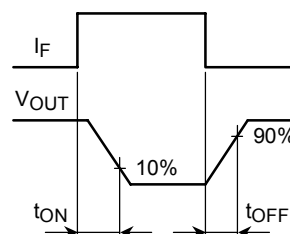
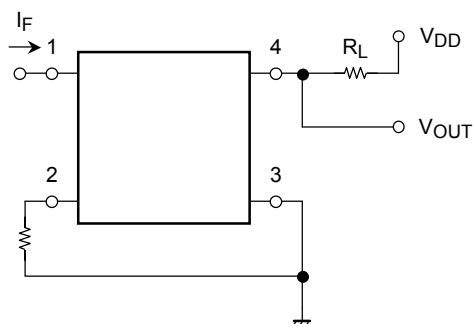
## Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	$C_S$	$V_S = 0 \text{ V}$ , $f = 1 \text{ MHz}$	—	0.6	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}$ , R.H. $\leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	
		DC, 1 minute (in oil)	—	3000	—	Vdc

## Switching Characteristics (Ta = 25°C)

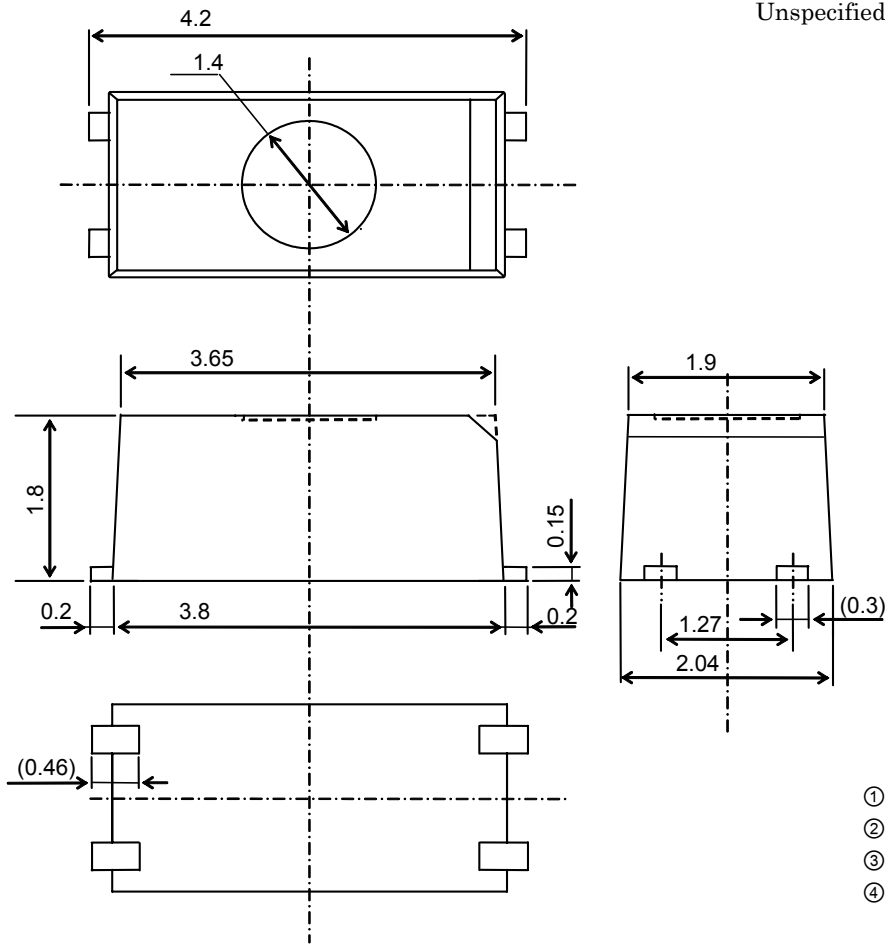
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on time	$t_{ON}$	$R_L = 200 \text{ }\Omega$ $V_{DD} = 10 \text{ V}$ , $I_F = 5 \text{ mA}$ (Note 2)	—	26	200	$\mu\text{s}$
Turn-off time	$t_{OFF}$		—	140	200	

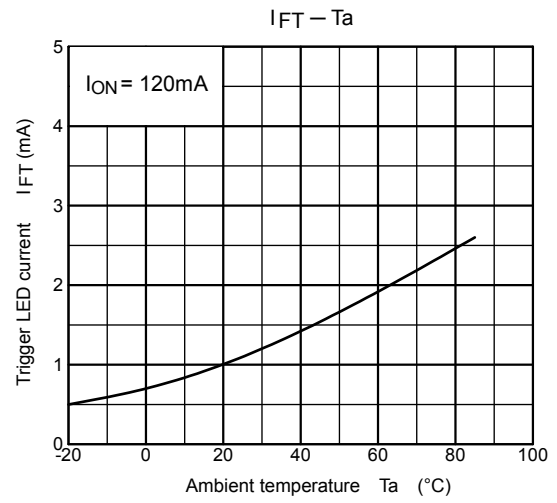
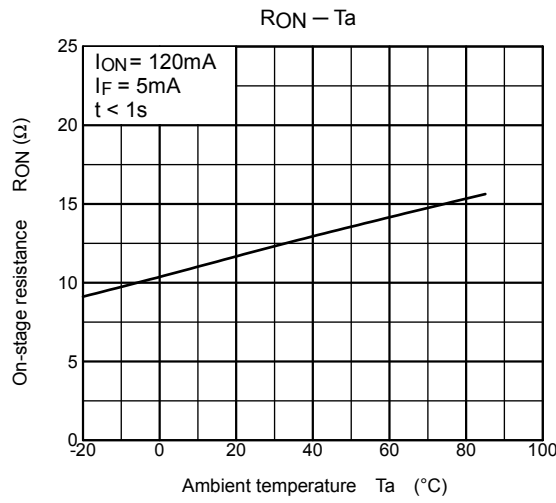
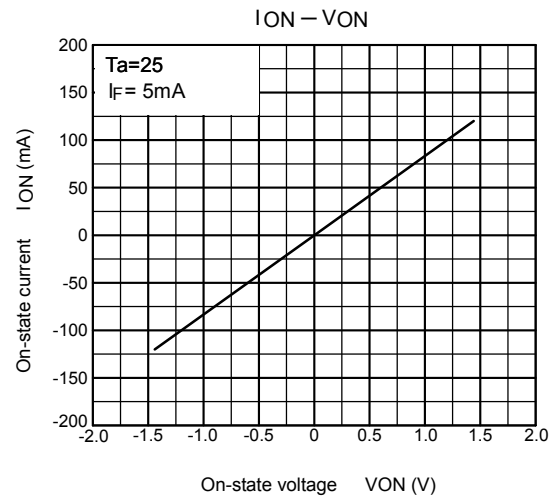
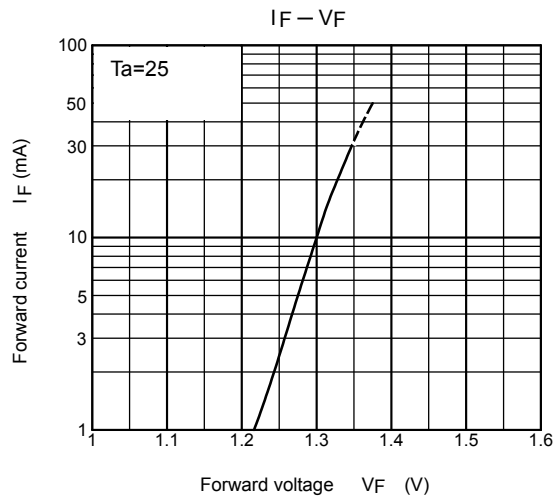
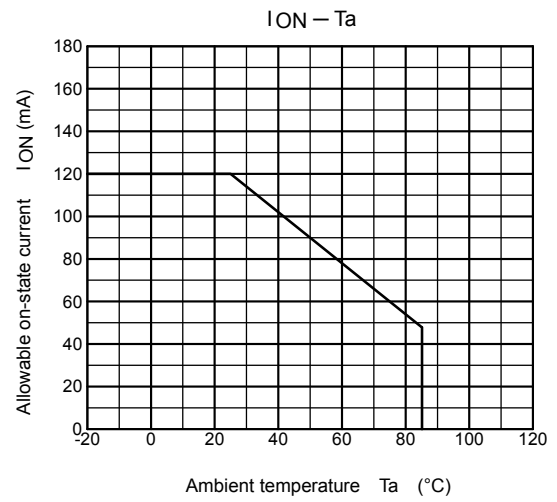
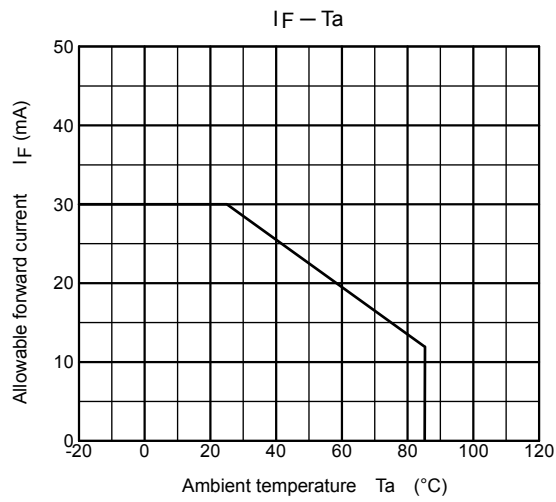
(Note 2): switching time test circuit

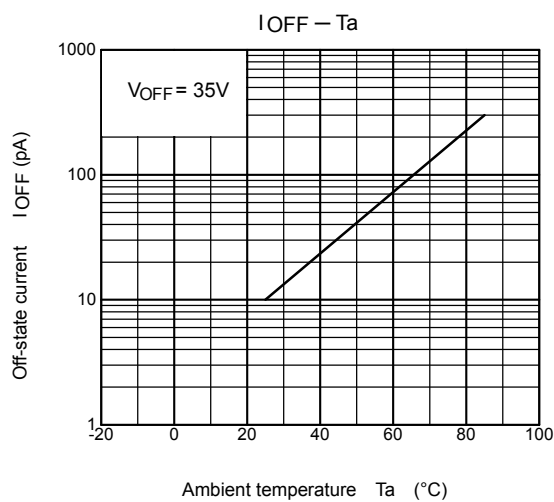
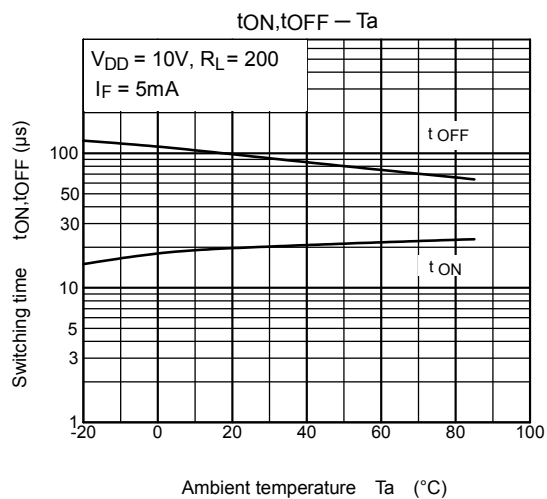
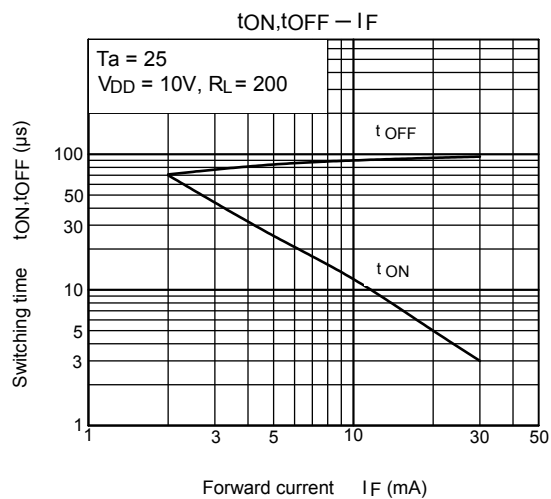


Outline Drawing

Unit: mm  
Unspecified tolerance:  $\pm 0.1$







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