

# TLP3216

MEASUREMENT INSTRUMENTS

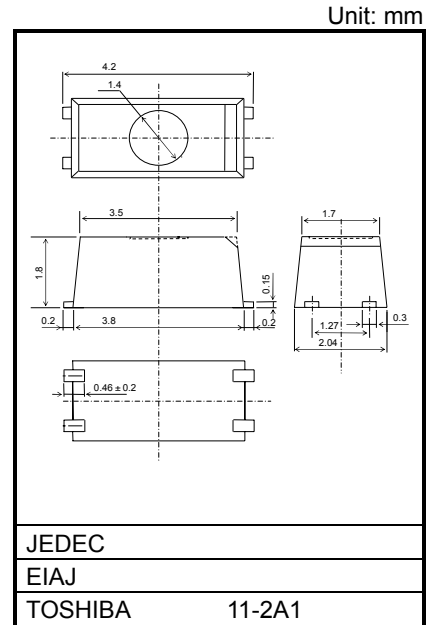
LOGIC IC TESTERS / MEMORY TESTERS

BOARD TESTERS / SCANNERS

The TOSHIBA TLP3216 is a super small-outline photorelay, suitable for surface-mount assembly. The TLP3216 consists of a GaAs 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.

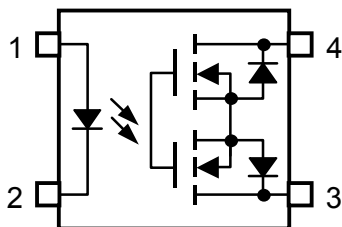
**FEATURES**

- 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 : 4 mA (MAX.)
- On-State Current : 120 mA (MAX.)
- On-State Resistance : 15 (MAX.), 10 (TYP.)
- Output Capacitance : 2.0 pF (MAX.), 1.0 pF (TYP.)
- Isolation Voltage : 1500 Vrms (MIN.)



Weight: 0.03 g

**PIN CONFIGURATION (TOP VIEW)**



- 1 : ANODE
- 2 : CATHODE
- 3 : DRAIN
- 4 : DRAIN

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta ≥ 25°C)	ΔI <sub>F</sub> /°C	-0.5	mA/°C
	Reverse Voltage	V <sub>R</sub>	5	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Off-State Output Terminal Voltage	V <sub>OFF</sub>	40	V
	On-State Current	I <sub>ON</sub>	120	mA
	On-State Current Derating (Ta ≥ 25°C)	ΔI <sub>ON</sub> /°C	-1.2	mA/°C
	Junction Temperature	T <sub>j</sub>	125	°C
Storage Temperature Range		T <sub>stg</sub>	-40~125	°C
Operating Temperature Range		T <sub>opr</sub>	-20~85	°C
Lead Soldering Temperature (10 s)		T <sub>sol</sub>	260	°C
Isolation Voltage (AC, 1 minute, R.H. ≤ 60%) (NOTE1)		BV <sub>S</sub>	1500	Vrms

(NOTE1) : 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.

This device is applying super small package which is free for Moisture-Proof packing. However, the application of this device is premised on use under controlled environmental condition like as measuring instrument. It is necessary to take precautions of storage condition and operating environmental condition.

**RECOMMENDED OPERATING CONDITIONS**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>DD</sub>	—	—	32	V
Forward Current	I <sub>F</sub>	10	—	30	mA
On-State Current	I <sub>ON</sub>	—	—	120	mA
Operating Temperature	T <sub>opr</sub>	25	—	60	°C

**INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V = 0, f = 1 MHz	—	15	—	pF
DETECTOR	Off-State Current	I <sub>OFF</sub>	V <sub>OFF</sub> = 30 V, Ta = 50°C	—	—	1000	pA
	Capacitance	C <sub>OFF</sub>	V = 0, f = 100 MHz, t < 1 s	—	1.0	2.0	pF

**COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	$I_{FT}$	$I_{ON} = 100 \text{ mA}$	—	—	4	mA
Return LED Current	$I_{FC}$	$I_{OFF} = 10 \text{ } \mu\text{A}$	0.2	0.75	—	mA
On-State Resistance	$R_{ON}$	$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}, t < 1 \text{ s}$	—	10	15	$\Omega$

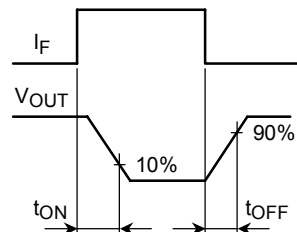
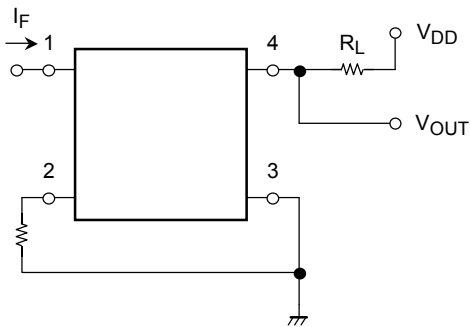
**ISOLATION CHARACTERISTICS (Ta = 25°C)**

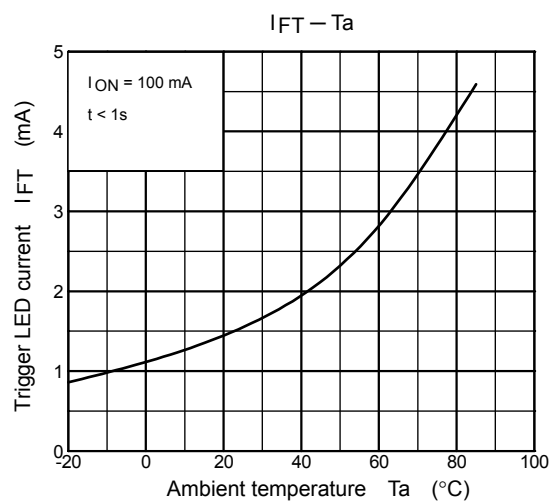
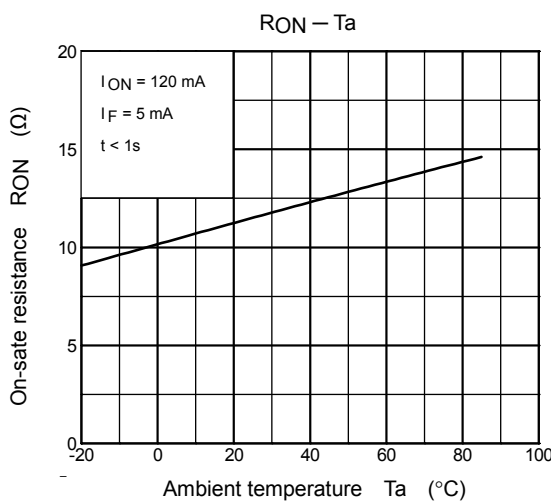
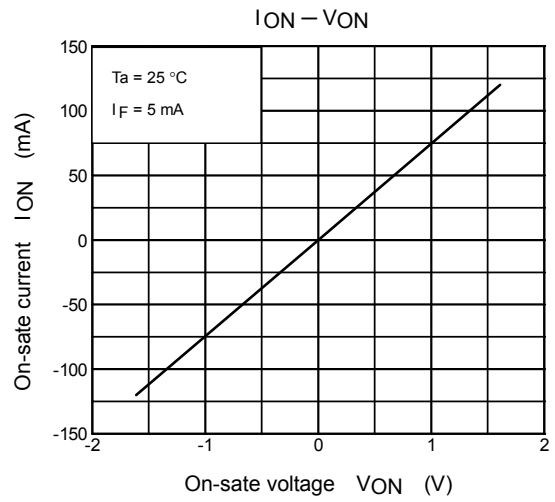
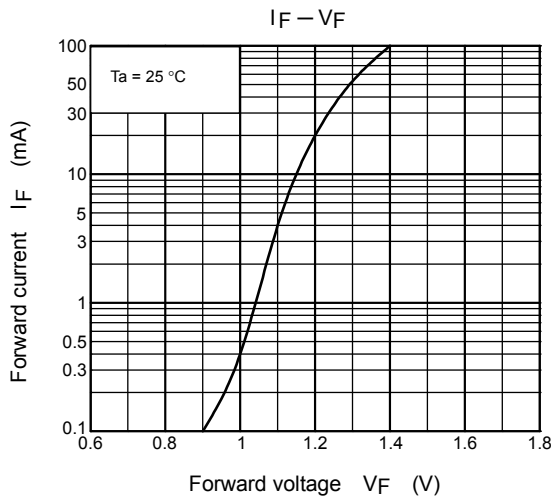
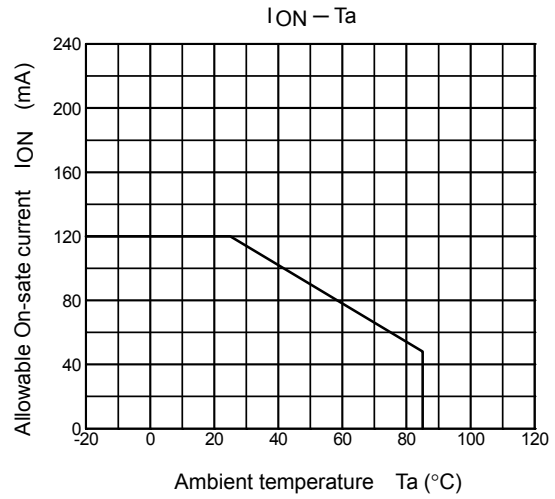
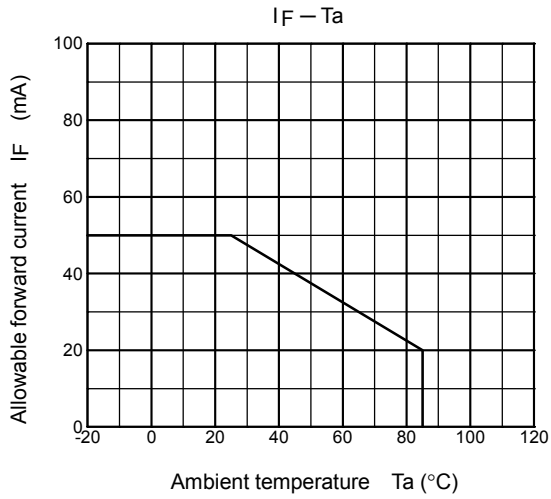
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	—
		DC, 1 minute (in oil)	—	3000	—	Vdc

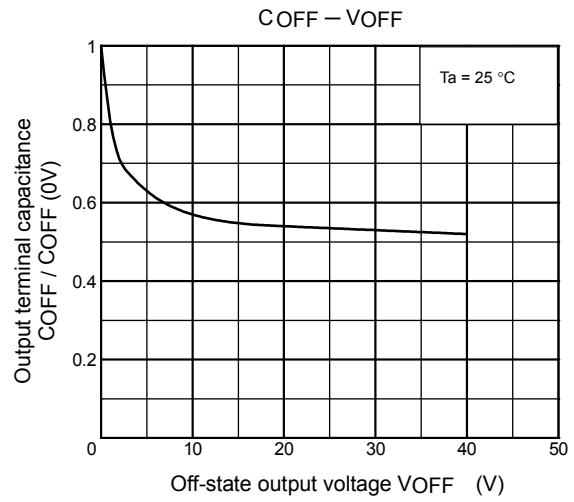
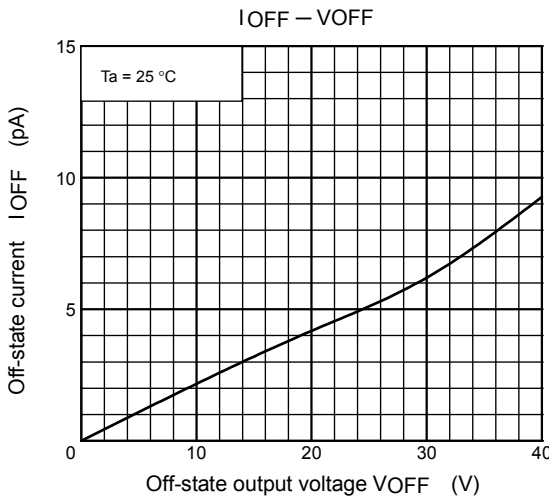
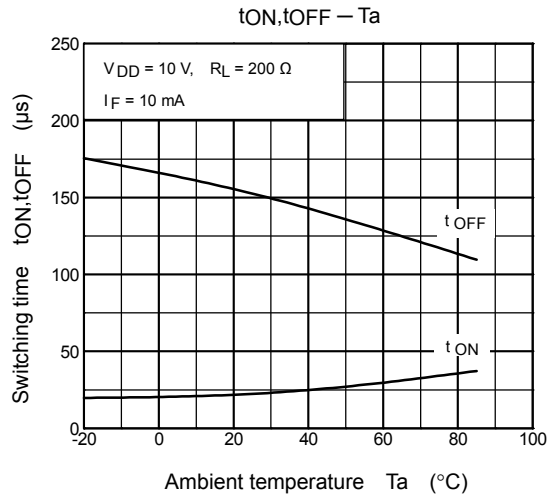
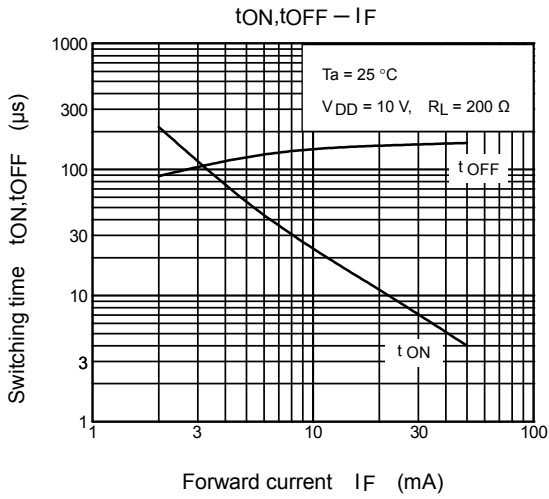
**SWITCHING CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	$t_{ON}$	$R_L \square 200 \text{ } \Omega$ (NOTE 4) $V_{DD} = 10 \text{ V}, I_F = 5 \text{ mA}$	—	50	500	$\mu\text{s}$
Turn-off Time	$t_{OFF}$		—	120	500	

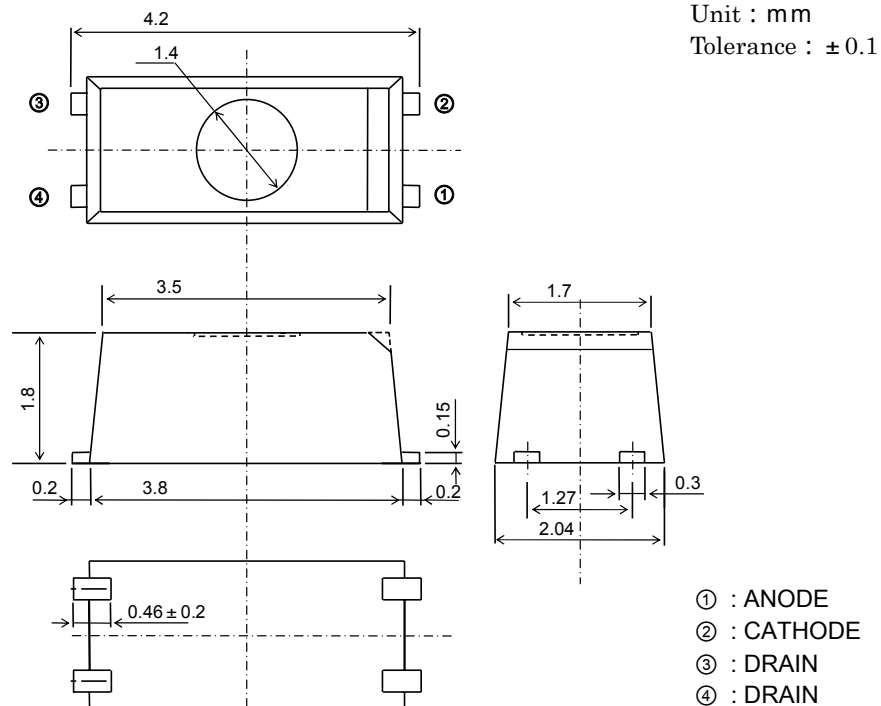
(NOTE 4) : SWITCHING TIME TEST CIRCUIT







## OUTLINE DRAWING



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