

TOSHIBA Photocoupler Photorelay

# TLP3100

## Measurement Equipment

FA (Factory Automation)

Power Line Control

The Toshiba TLP3100 consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP, which is suitable for surface-mount assembly. The TLP3100 features high ON-state current and low ON-state resistance, hence the TLP3100 is suitable to control a power line.

- 6-pin SOP (2.54SOP6): 2.1 mm high, 2.54 mm pitch
- Normally opened (form A) device
- Peak OFF-state voltage: 20 V (min)
- Trigger LED current: 3 mA (max)
- ON-state current: 2.5 A (max) ( $T_a=50^\circ\text{C}$ )
- ON-state resistance: 0.02  $\Omega$  (typ), 0.05  $\Omega$  (max)
- Capacitance: 1000 pF (typ)
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## Absolute Maximum Ratings (Ta = 25°C)

Characteristics		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
	Off-state output terminal voltage	$V_{OFF}$	20	V
On-state current	A connection	$I_{ON}$	2.5	A
	B connection		2.5	
	C connection		5.0	
Forward current derating (Ta ≥	A connection		-33.3	
	B connection		-33.3	

## Circuit Connections

A connection	B connection	C connection

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

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward current	$V_F$	$I_F = 10 \text{ mA}$	1.18	1.33	1.48	V
	Reverse current	$I_R$	$V_R = 5 \text{ V}$			10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$		70		pF
Detector	OFF-state current	$I_{OFF}$	$V_{OFF} = 20 \text{ V}$			10	nA
	Capacitance	$C_{OFF}$	$V = 0, f = 1 \text{ MHz}$		1000		pF

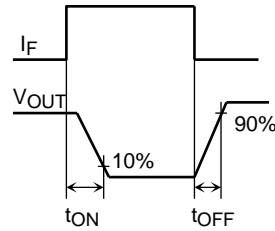
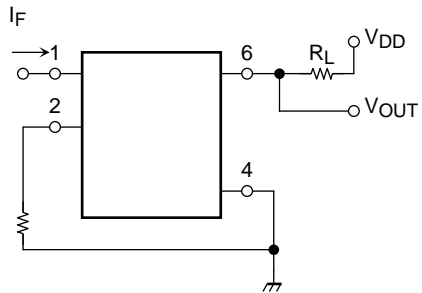
## Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current		$I_{FT}$	$I_{ON} = 100 \text{ mA}$			3	mA
Return LED current		$I_{FC}$	$I_{OFF} = 10 \mu\text{A}$	0.1			mA
On-state resistance	A connection	$R_{ON}$	$I_{ON} = 2.0 \text{ A}, I_F = 5 \text{ mA}, t < 1 \text{ s}$		0.02	0.05	$\Omega$
	B connection		$I_{ON} = 2.0 \text{ A}, I_F = 5 \text{ mA}, t < 1 \text{ s}$		0.01	0.025	
	C connection		$I_{ON} = 4.0 \text{ A}, I_F = 5 \text{ mA}, t < 1 \text{ s}$		0.005		

## Isolation CBN

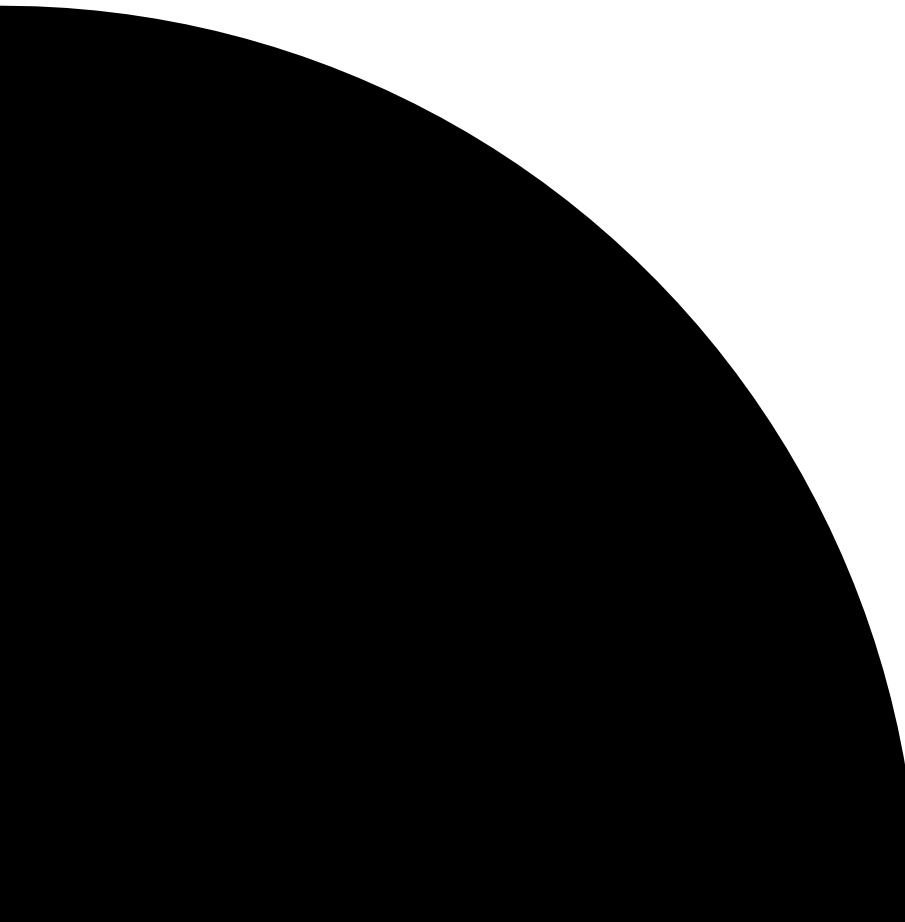
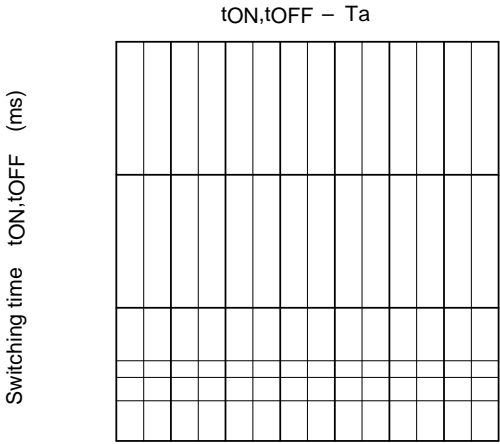
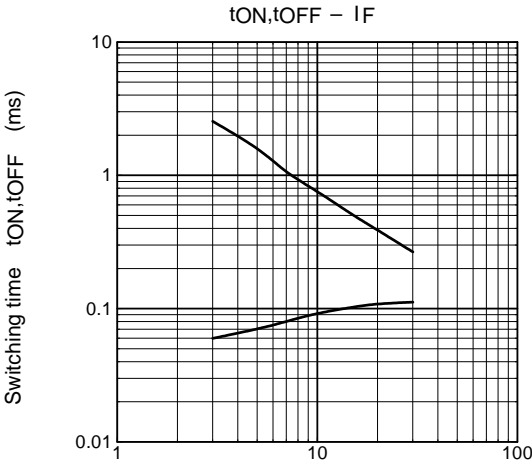
**Switching Characteristics (Ta = 25°C)**

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-ON time	$t_{ON}$	$R_L = 200 \Omega$ $V_{DD} = 10 \text{ V}, I_F = 5 \text{ mA}$ (Note 2)		1.5	5.0	ms
Turn-OFF time	$t_{OFF}$			0.1	1.0	



Note 2: Switching time test circuit





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