

# TLP3106

## 1. Applications

- Mechanical relay replacements
- Security Systems
- Measuring Instruments
- Factory Automation (FA)
- Amusement Equipment

## 2. General

The TLP3106 photorelay consists of a photo MOSFET optically coupled to an infrared light emitting diode. It is housed in a 2.54SOP6 package. The low ON-state resistance and the high permissible ON-state current of the the TLP3106 make it suitable for power line control applications.

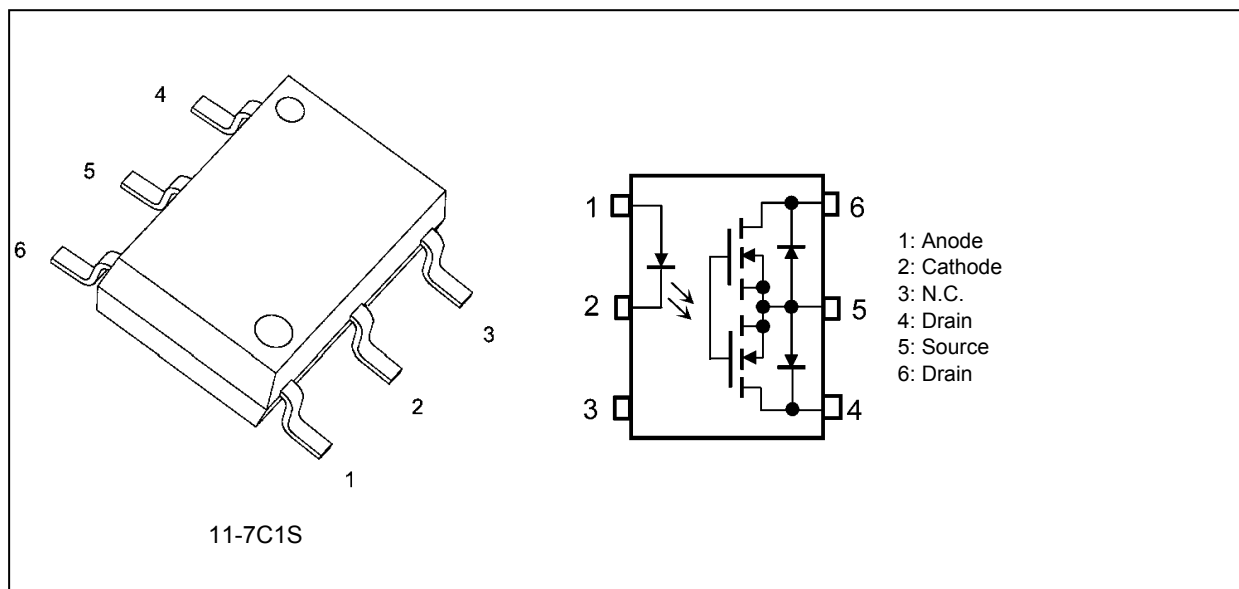
## 3. Features

- (1) Normally opened (1-Form-A)
- (2) OFF-state output terminal voltage: 30 V (min)
- (3) Trigger LED current: 3 mA (max)
- (4) ON-state current: 4.0 A (max) (A connection)
- (5) ON-state resistance: 40 mΩ (max) (A connection)
- (6) Isolation voltage: 1500 Vrms (min)
- (7) Safety standards

UL under application : UL1577 File No.E67349

cUL under application : CSA Component Acceptance Service No.5A, File No.E67349

## 4. Packaging and Pin Assignment





**7. Recommended Operating Conditions (Note)**

Characteristics	Symbol	Note	Min	Typ.	Max	Unit
Supply voltage	$V_{DD}$		—	—	24	V
Input forward current	$I_F$		5	10	25	mA
ON-state current (A connection)	$I_{ON}$		—	—	4.0	A
Operating temperature	$T_{opr}$		-20	—	65	°C

Note: The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this datasheet should also be considered.

**8. Electrical Characteristics (Unless otherwise specified,  $T_a = 25\text{ °C}$ )**

	Characteristics	Symbol	Note	Test Condition	Min	Typ.	Max	Unit
LED	Input forward voltage	$V_F$		$I_F = 10\text{ mA}$	1.18	1.33	1.48	V
	Input reverse current	$I_R$		$V_R = 5\text{ V}$	—	—	10	$\mu\text{A}$
	Input capacitance	$C_t$		$V = 0\text{ V}, f = 1\text{ MHz}$	—	70	—	pF
Detector	OFF-state current	$I_{OFF}$		$V_{OFF} = 30\text{ V}$	—	—	1	$\mu\text{A}$
				$V_{OFF} = 20\text{ V}$	—	—	20	nA
	Output capacitance	$C_{OFF}$		$V = 0\text{ V}, f = 1\text{ MHz}$	—	1100	—	pF

**9. Coupled Electrical Characteristics (Unless otherwise specified,  $T_a = 25\text{ °C}$ )**

Characteristics	Symbol	Note	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	$I_{FT}$		$I_{ON} = 100\text{ mA}$	—	0.3	3	mA
Return LED current	$I_{FC}$		$I_{OFF} = 10\text{ }\mu\text{A}$	0.1	—	—	
ON-state resistance (A connection)	$R_{ON}$	(Note 1)	$I_{ON} = 4.0\text{ A}, I_F = 5\text{ mA}, t < 1\text{ s}$	—	20	40	m $\Omega$
ON-state resistance (B connection)				—	8	20	
ON-state resistance (C connection)				—	4	10	

Note 1: For an application circuit example, see Fig. 12.2.

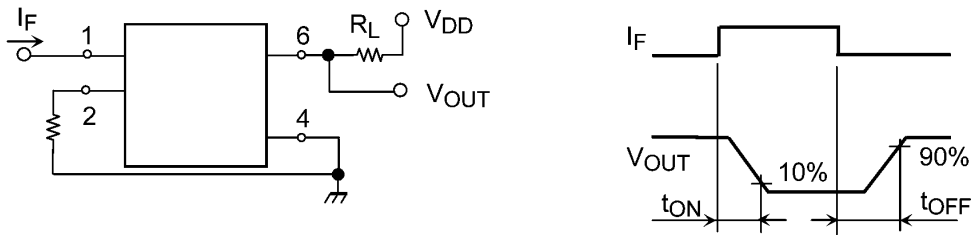
**10. Isolation Characteristics (Unless otherwise specified,  $T_a = 25\text{ °C}$ )**

Characteristics	Symbol	Note	Test Condition	Min	Typ.	Max	Unit
Total capacitance (input to output)	$C_S$	(Note 1)	$V_S = 0\text{ V}, f = 1\text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	(Note 1)	$V_S = 500\text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	(Note 1)	AC, 60 s	1500	—	—	Vrms
			AC, 1 s in oil	—	3000	—	
			DC, 60 s, in oil	—	3000	—	Vdc

Note 1: This device is considered as a two-terminal device: Pins 1, 2 and 3 are shorted together, and pins 4, 5 and 6 are shorted together.

**11. Switching Characteristics (Unless otherwise specified,  $T_a = 25\text{ }^\circ\text{C}$ )**

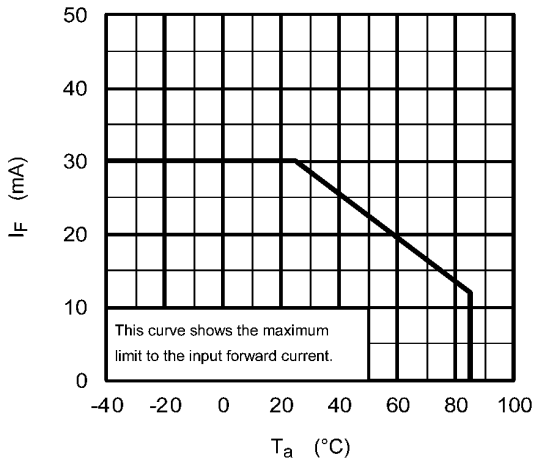
Characteristics	Symbol	Note	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$		See Fig. 11.1. $R_L = 200\ \Omega$ , $V_{DD} = 20\ \text{V}$ , $I_F = 5\ \text{mA}$	—	1.1	5.0	ms
			See Fig. 11.1. $R_L = 200\ \Omega$ , $V_{DD} = 20\ \text{V}$ , $I_F = 10\ \text{mA}$	—	0.6	3.0	
Turn-off time	$t_{OFF}$		See Fig. 11.1. $R_L = 200\ \Omega$ , $V_{DD} = 20\ \text{V}$ , $I_F = 5\ \text{mA}$	—	0.1	1.0	
			See Fig. 11.1. $R_L = 200\ \Omega$ , $V_{DD} = 20\ \text{V}$ , $I_F = 10\ \text{mA}$	—	0.1	1.0	



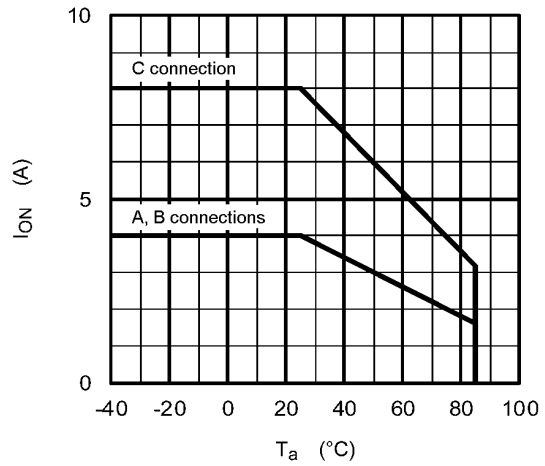
**Fig. 11.1 Switching Time Test Circuit**

**12. Characteristics Curves and Circuit Connections**

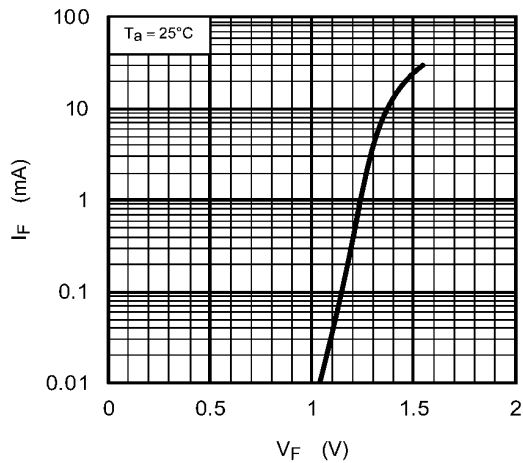
**12.1. Characteristics Curves (Note)**



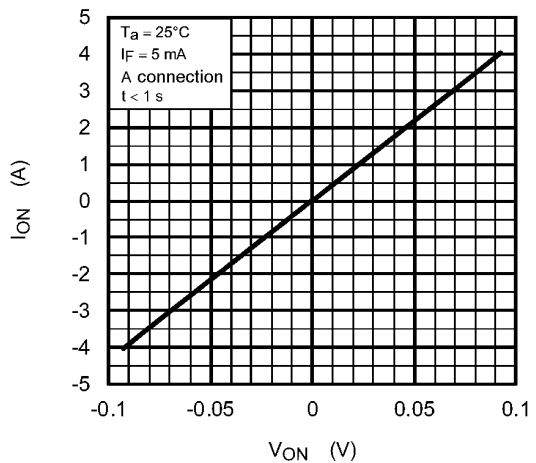
**Fig. 12.1.1  $I_F - T_a$**



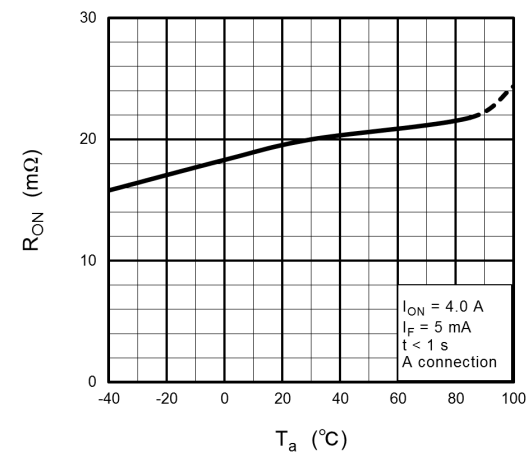
**Fig. 12.1.2  $I_{ON} - T_a$**



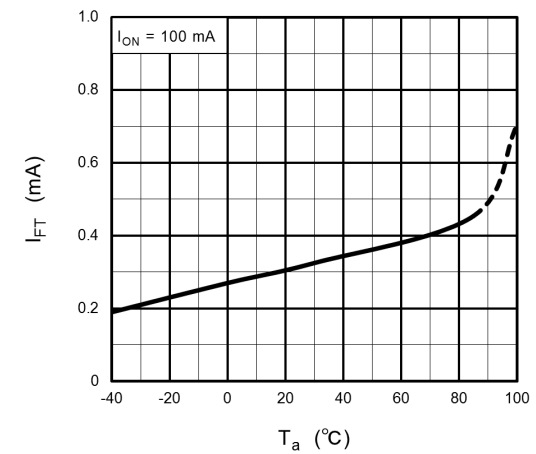
**Fig. 12.1.3  $I_F - V_F$**



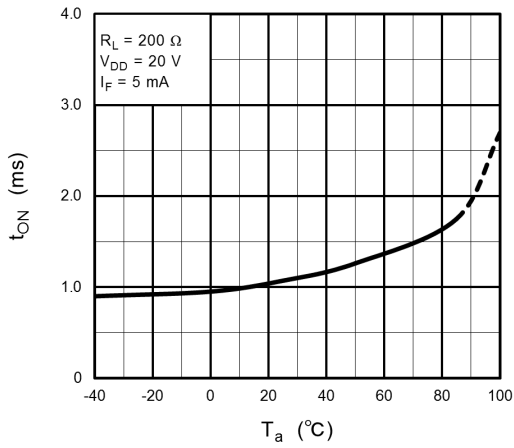
**Fig. 12.1.4  $I_{ON} - V_{ON}$**



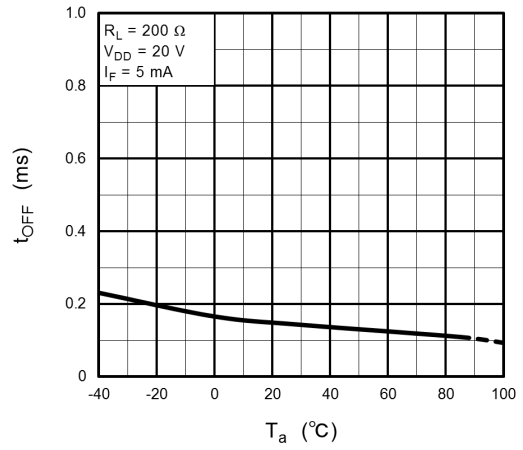
**Fig. 12.1.5  $R_{ON} - T_a$**



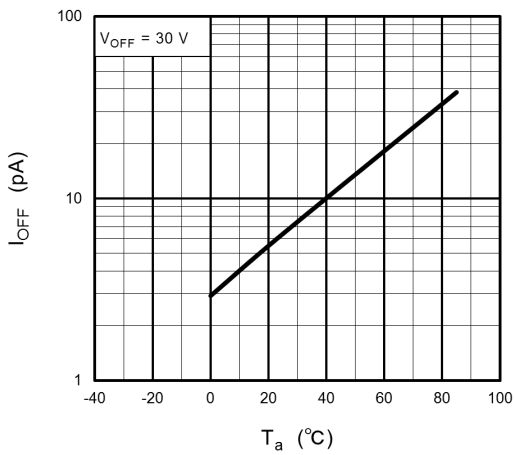
**Fig. 12.1.6  $I_{FT} - T_a$**



**Fig. 12.1.7  $t_{ON} - T_a$**



**Fig. 12.1.8  $t_{OFF} - T_a$**



**Fig. 12.1.9  $I_{OFF} - T_a$**

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

12.2. Circuit Connections

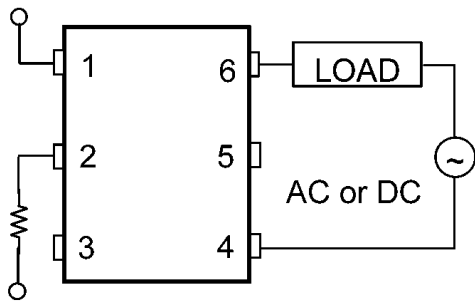


Fig. 12.2.1 A Connection

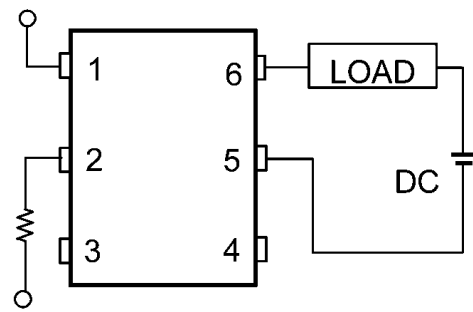


Fig. 12.2.2 B Connection

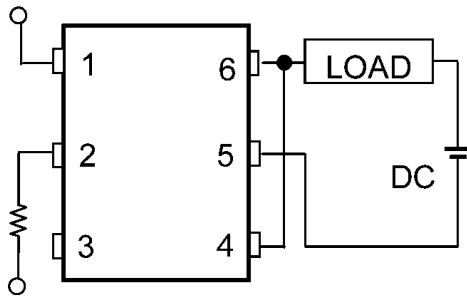
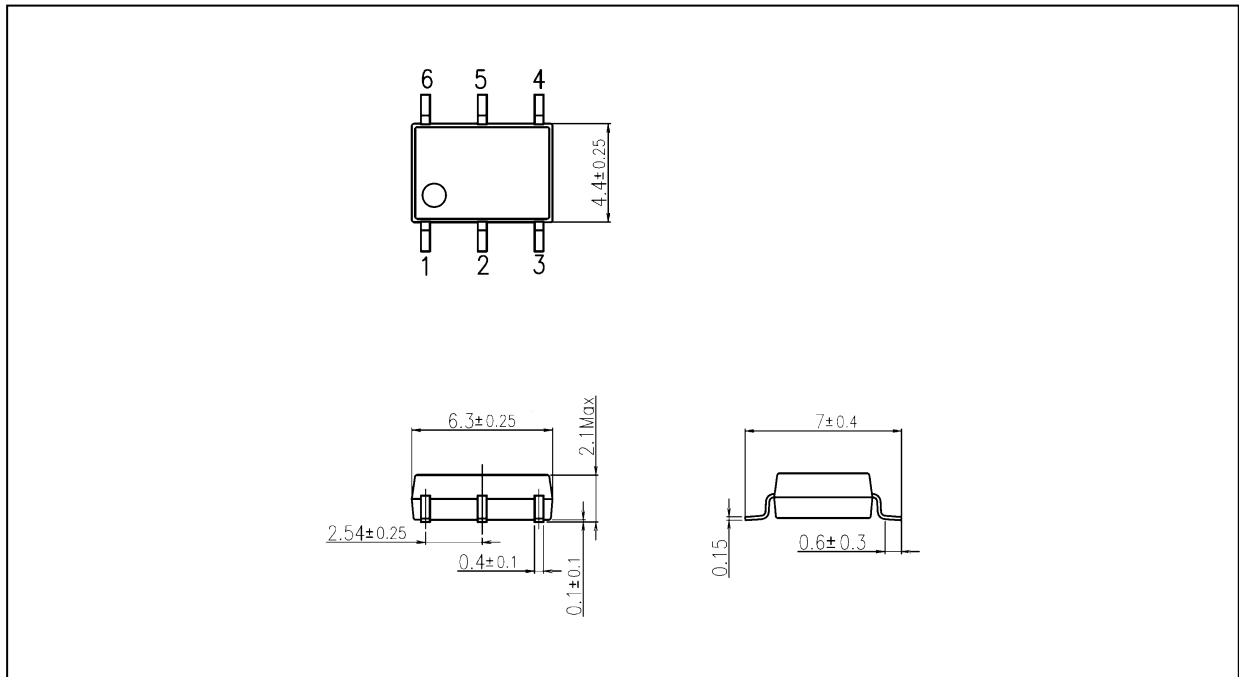


Fig. 12.2.3 C Connection

**Package Dimensions**

Unit: mm



Weight: 0.13 g (typ.)

Package Name(s)
TOSHIBA: 11-7C1S



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