

350-V OFF-State Voltage and Low-End Photorelay

TLP222G, TLP172G, etc.: Normally Open (1-form-a)
TLP4222G, TLP4172G, etc.: Normally Closed (1-form-b)

► Overview

The TLP222G Series is a normally open (1-form-a) photorelay with a 350-V OFF-state voltage. Also, the TLP4222G Series is a normally closed (1-form-b) photorelay with a 350-V OFF-state voltage; since its output remains in the ON state even when the LED is not emitting, this device is best suited to those applications requiring a longer ON state.

► Features

Normally open type (1-form-a)

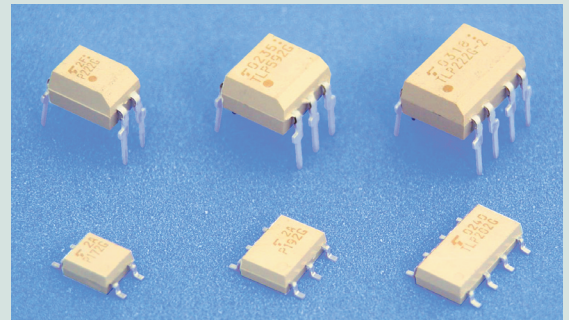
1-form-a: TLP222G, TLP592G, TLP172G, TLP192G
Two-channel 1-form-a: TLP222G-2, TLP202G

- ON-state current: DIP package $I_{ON} = 120 \text{ mA}$ (max)
SOP package $I_{ON} = 110 \text{ mA}$ (max)
- OFF-state voltage: $V_{OFF} = 350 \text{ V}$
- ON-resistance: $R_{ON} = 25 \Omega$ (typ.)

Normally closed type (1-form-b)

1-form-b: TLP4222G, TLP4592G, TLP4172G, TLP4192G
Two-channel 1-form-b: TLP4222G-2, TLP4202G

- ON-state current: DIP package $I_{ON} = 100 \text{ mA}$ (max)
SOP package $I_{ON} = 90 \text{ mA}$ (max)
- OFF-state voltage: $V_{OFF} = 350 \text{ V}$
- ON-resistance: $R_{ON} = 27 \Omega$ (typ.)



Package		4-pin	6-pin	8-pin (two-channel)
DIP	1-form-a	TLP222G	TLP592G	TLP222G-2
	1-form-b	TLP4222G	TLP4592G	TLP4222G-2
SOP	1-form-a	TLP172G	TLP192G	TLP202G
	1-form-b	TLP4172G	TLP4192G	TLP4202G

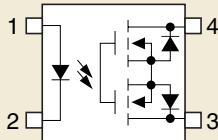
- Trigger LED current: $I_{FT} = 3 \text{ mA}$ (max)
- Safety standards: UL-approved (all devices), SEMKO-approved (TLP222G, TLP222G-2)
- Isolation voltage: DIP package = 2500 Vrms (min), SOP package = 1500 Vrms (min)

Applications

Fax machines, various communications devices, replacement mechanical relays

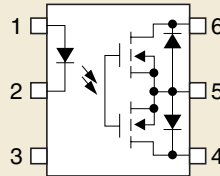
Pin Configuration

① 4-pin type



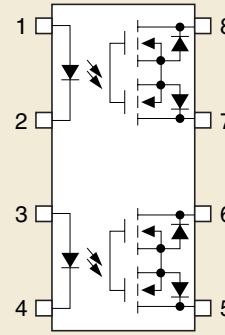
1 : Anode
2 : Cathode
3 : Drain
4 : Drain

② 6-pin type



1 : Anode
2 : Cathode
4 : Drain D1
5 : Source
6 : Drain D2

③ 8-pin type



1,3 : Anode
2,4 : Cathode
5 : Drain D1
6 : Drain D2
7 : Drain D3
8 : Drain D4

*: The above internal equivalent circuits show only the 1-form-a photorelay.

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
LED	Forward current	I_F	50	mA
	Junction temperature	T_j	125	°C
Detector	OFF-state voltage	V_{OFF}	350	V
	ON-state current ^(Note1) DIP / SOP	1-form-a	120 / 110	mA
		1-form-b	100 / 90	
Junction temperature		T_j	125	°C
Storage temperature		T_{stg}	-55 to 125	°C
Operating temperature		T_{opr}	-40 to 85	°C
Isolation voltage (AC, 1 min, R.H. ≤ 60%) DIP / SOP		BVs	2500 / 1500	Vrms

Note 1: For 6-pin devices, the rating shows the values when Pin 4 and Pin 6 are shorted.

▶ Electrical Characteristics (Ta = 25 °C)

Normally Open Photorelay (1-form-a)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
ON-state resistance ^(Note 1)	RON	ION = 120 mA ^(Note 2) , IF = 5 mA, t<1s	—	25	35	Ω
		ION = 120 mA ^(Note 2) , IF = 5 mA, Continuous	—	35	50	
OFF-state current	IOFF	VOFF = 350 V	—	—	1	μA
Trigger LED current	IFT	ION = 120 mA ^(Note 2)	—	1	3	mA
Return LED current	IFC	IOFF = 100 μA	0.1	—	—	mA

Note 1: For 6-pin devices, the rating shows the values when Pin 4 and Pin 6 are shorted.

Note 2: ION = 110 mA for the SOP package

Normally Closed Photorelay (1-form-b)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
ON-state resistance ^(Note 1)	RON	ION = 100 mA ^(Note 2) , IF = 5 mA	—	27	50	Ω
OFF-state current	IOFF	VOFF = 350 V	—	—	1	μA
Trigger LED current	IFC	IOFF = 10 μA	—	1	3	mA
Return LED current	IFT	ION = 100 mA	0.1	—	—	mA

Note 1: For 6-pin devices, the rating shows the values when Pin 4 and Pin 6 are shorted.

Note 2: ION = 90 mA for the SOP package

▶ Switching Characteristics (Ta = 25 °C)

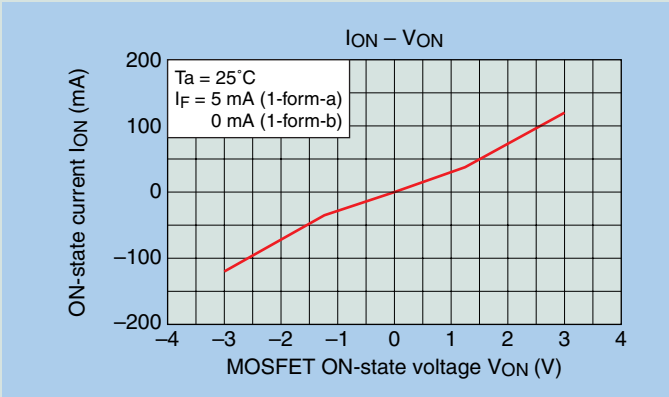
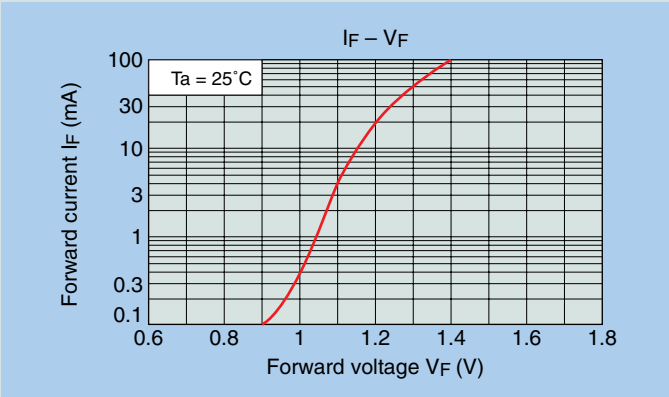
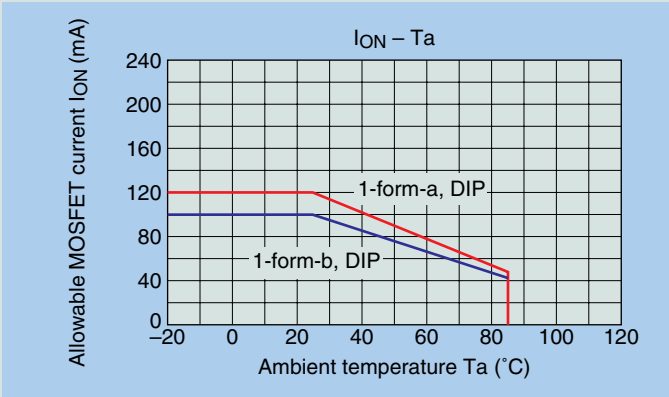
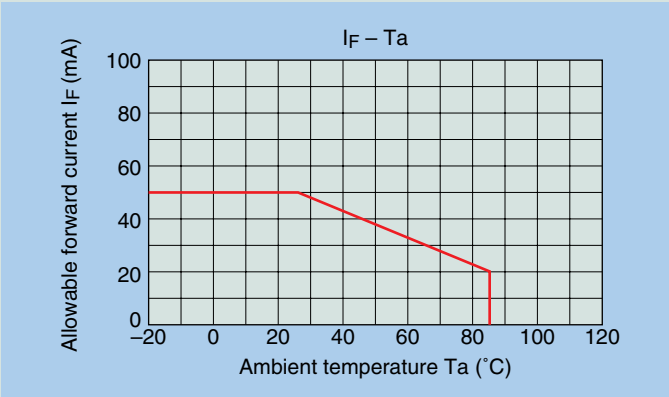
Normally Open Photorelay (1-form-a)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-ON time	tON	RL = 200 Ω VDD = 20 V, IF = 5 mA	—	0.3	1	ms
Turn-OFF time	tOFF		—	0.1	1	

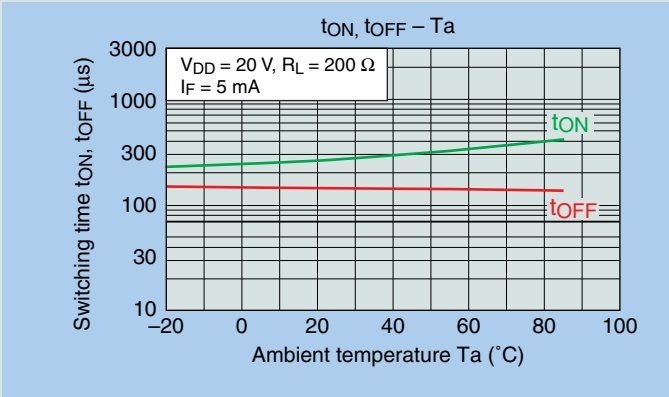
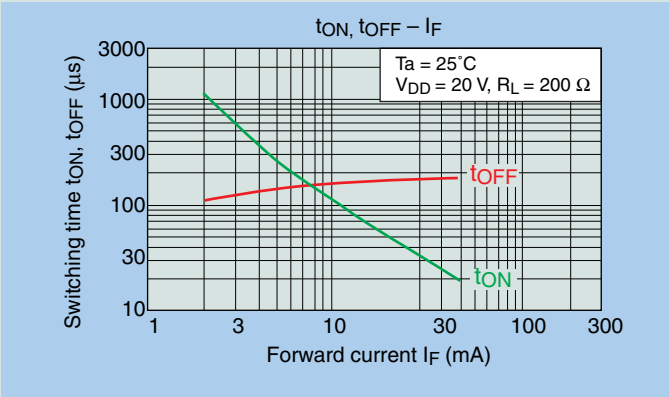
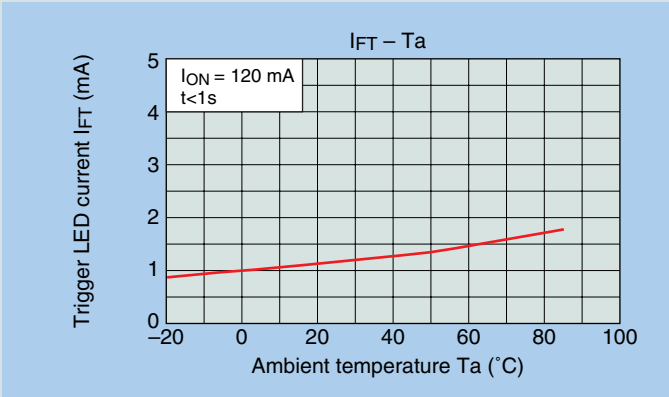
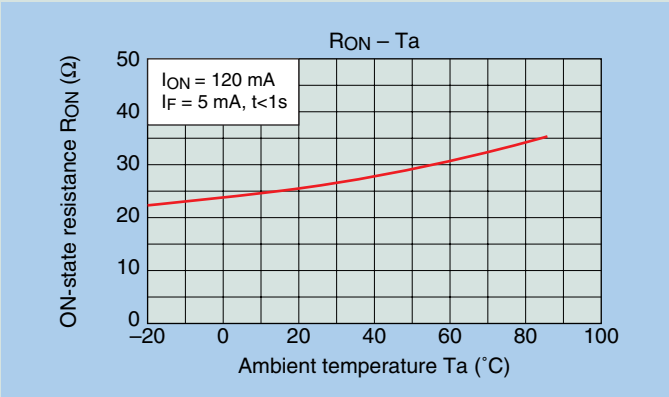
Normally Closed Photorelay (1-form-b)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-ON time	tON	RL = 200 Ω VDD = 20 V, IF = 5 mA	—	0.25	0.5	ms
Turn-OFF time	tOFF		—	0.5	1	

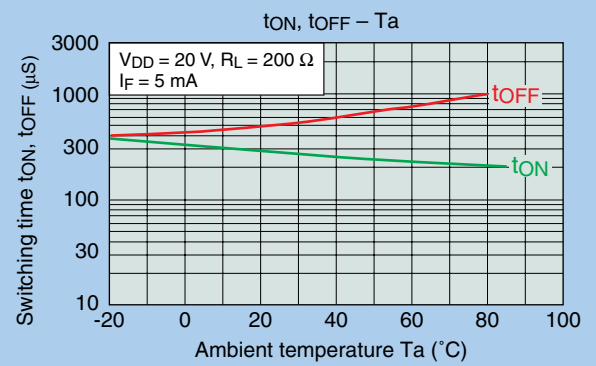
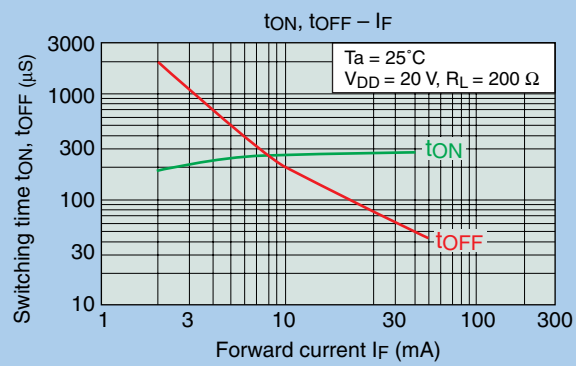
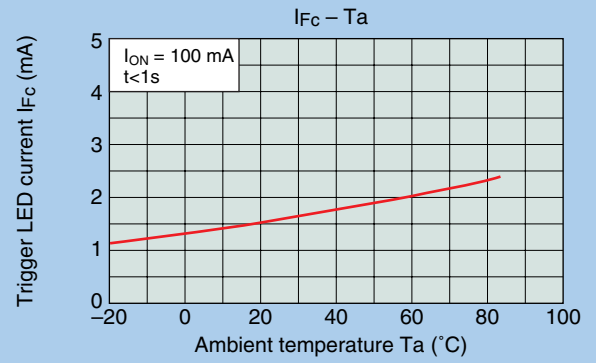
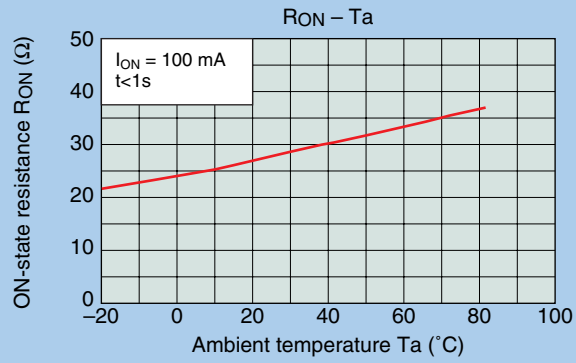
1-form-a/b data



1-form-a Data



1-form-b Data



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