

TOSHIBA Photocoupler Photorelay

# TLP4222G,TLP4222G-2

Telecommunication

Measurement Equipment

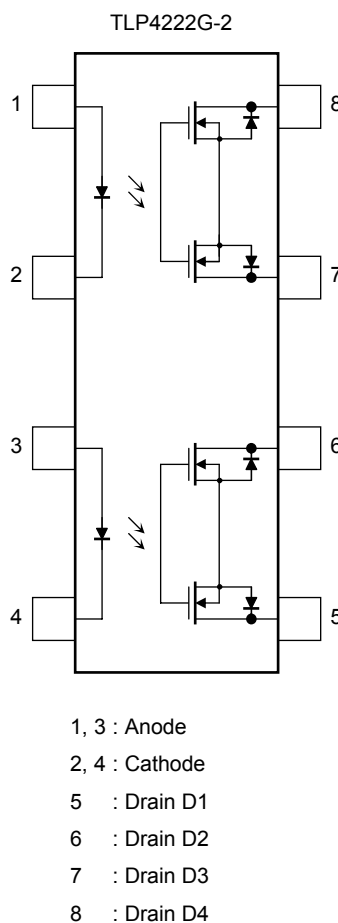
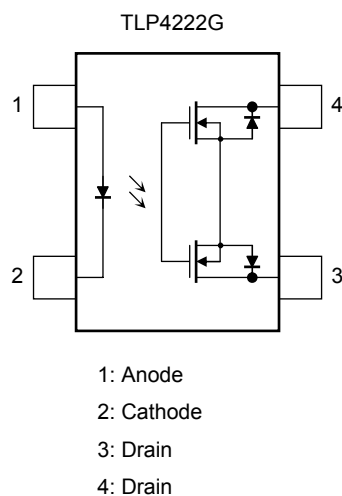
Security Equipment

FA

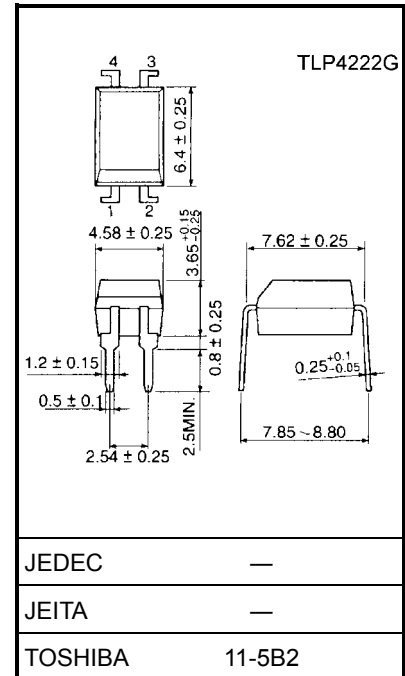
The Toshiba TLP4222G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET and is the normally closed photorelay with 350-V withstanding voltage.

- Normally closed device
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 100 mA (max)
- On-state resistance: 50  $\Omega$  (max)
- Isolation voltage: 2500 Vrms (min)
- UL Recognized: UL1577, File No. E67349

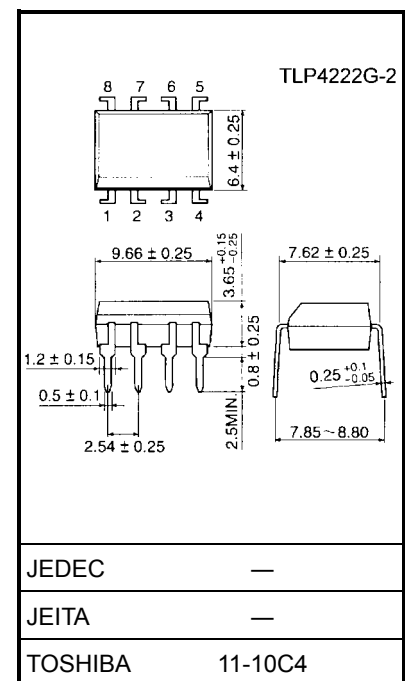
## Pin Configuration (top view)



Unit: mm



Weight: 0.26 g (typ.)



Weight: 0.54 g (typ.)

## Maximum Ratings (Ta = 25°C)

Characteristics				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
	Peak forward current (100 μs pulse, 100 pps)			I <sub>FP</sub>	1	A
	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>	350	V
	On-state current	TLP4222G		I <sub>ON</sub>	100	mA
		TLP4222G-2	One channel operation			
			Two channel operations			
	On-state current derating (Ta ≥ 25°C)	TLP4222G		ΔI <sub>ON</sub> /°C	−1.0	mA/°C
		TLP4222G-2	One channel operation			
			Two channel operations			
	Junction temperature			T <sub>j</sub>	125	°C
Storage temperature range				T <sub>stg</sub>	−55 to 125	°C
Operating temperature range				T <sub>opr</sub>	−40 to 85	°C
Lead soldering temperature (10 s)				T <sub>sol</sub>	260	°C
Isolation voltage (AC, 1 min, R.H. ≤ 60%) (Note 1)				BV <sub>S</sub>	2500	Vrms

Note 1: For TLP4222G, Pins 1 and 2 are shorted together, and pins 3 and 4 are shorted together.

For TLP4222G-2, Pins 1, 2, 3 and 4 are shorted together, and pins 5, 6, 7 and 8 are shorted together.

## Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V <sub>DD</sub>	—	—	280	V
Forward current	I <sub>F</sub>	5	—	25	mA
On-state current	I <sub>ON</sub>	—	—	100	mA
Operating temperature	T <sub>opr</sub>	−20	—	65	°C

## Electrical Characteristics (Ta = 25°C)

Characteristics		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	—	30	—	pF
Detector	Off-state current	I <sub>OFF</sub>	V <sub>OFF</sub> = 350 V, I <sub>F</sub> = 5 mA	—	—	1	μA
	Capacitance	C <sub>OFF</sub>	V = 0, f = 1 MHz, I <sub>F</sub> = 5 mA	—	30	—	pF

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	$I_{FC}$	$I_{OFF} = 10 \mu A$	—	1	3	mA
Return LED current	$I_{FT}$	$I_{ON} = 100 \text{ mA}$	0.1	—	—	mA
On-state resistance	$R_{ON}$	$I_{ON} = 100 \text{ mA}$	—	27	50	$\Omega$

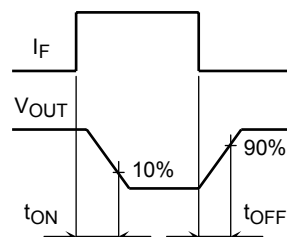
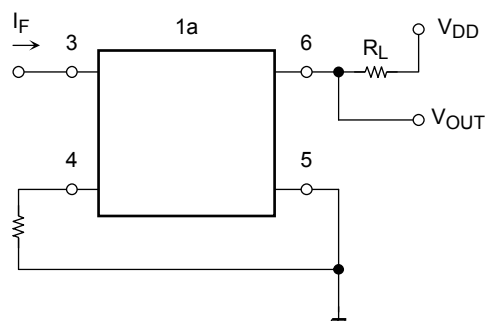
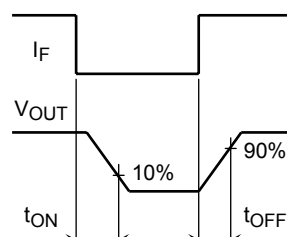
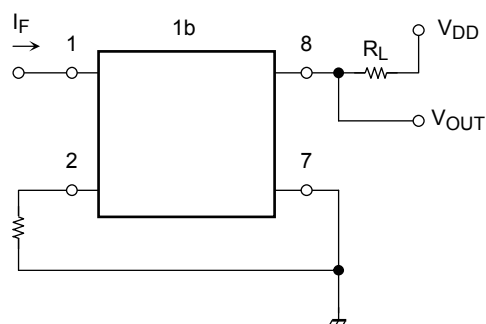
## Isolation Characteristics (Ta = 25°C)

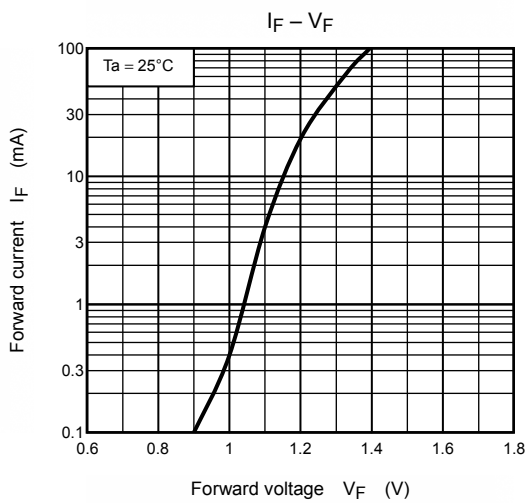
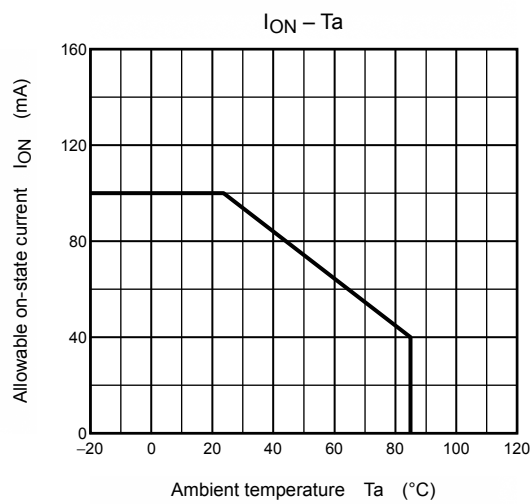
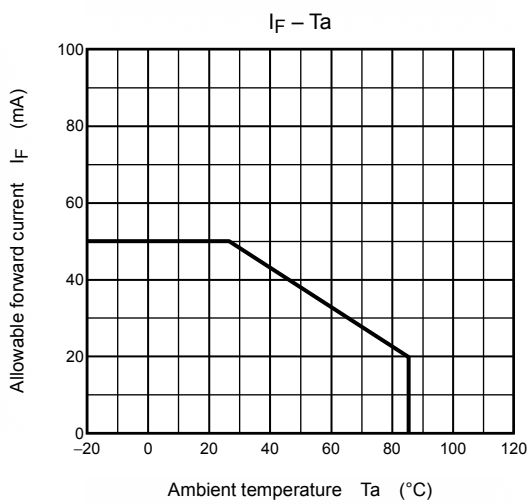
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 min	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	Vdc

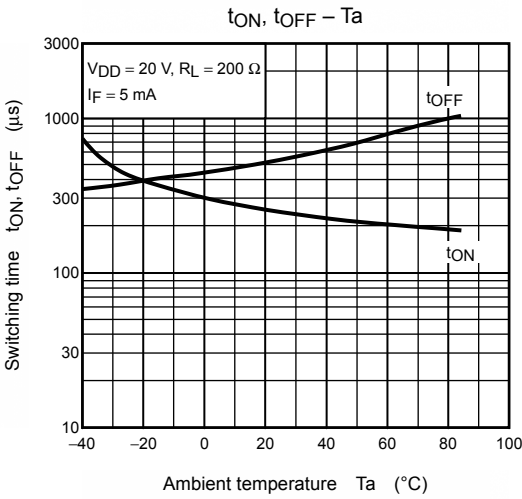
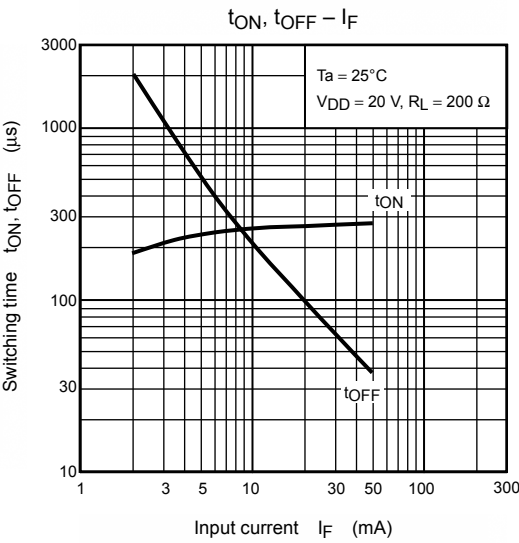
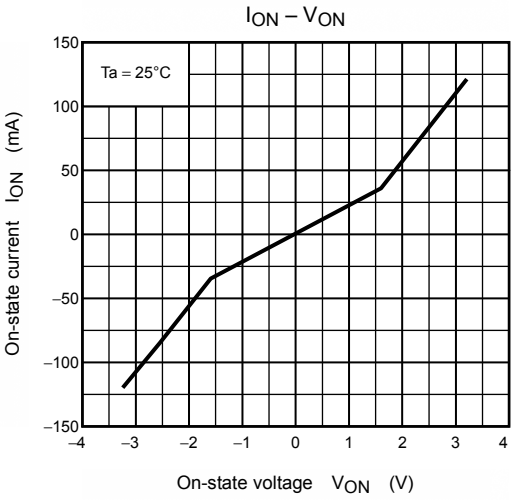
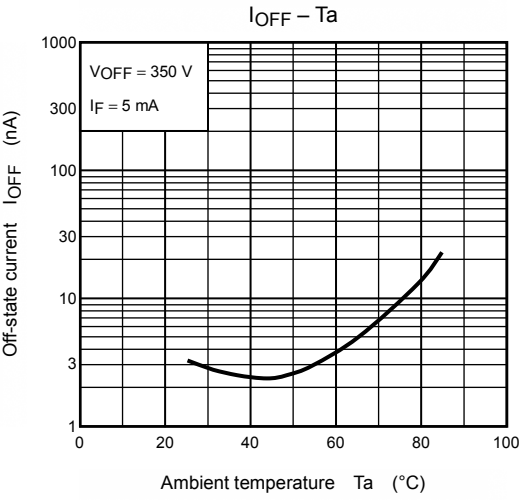
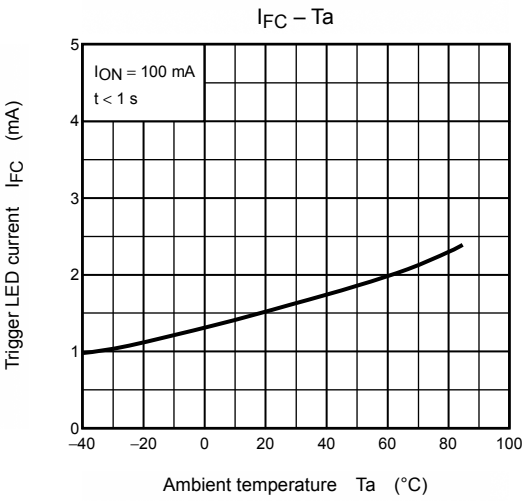
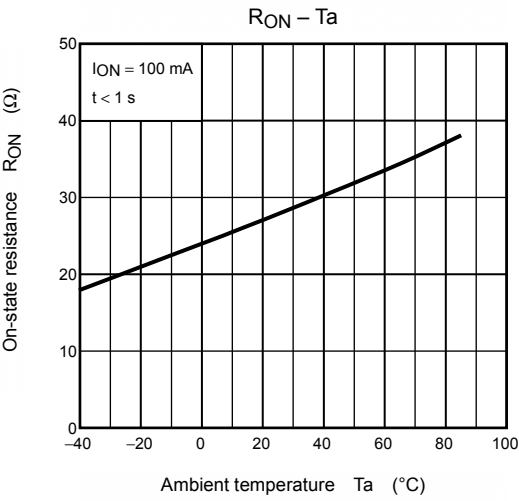
## Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$	$R_L = 200 \Omega$ $V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$ (Note 2)	—	0.25	0.5	ms
Turn-off time	$t_{OFF}$		—	0.5	1	ms

Note 2: Switching time test circuit







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