TOSHIBA Photocoupler Photorelay

TLP222G, TLP222G-2

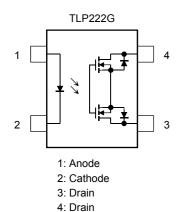
Cordless Telephones PBX Modems

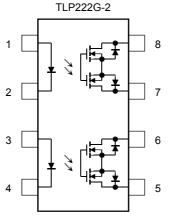
The Toshiba TLP222G series consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a DIP package.

The TLP222G series are a bi-directional switch, which can replace mechanical relays in many applications.

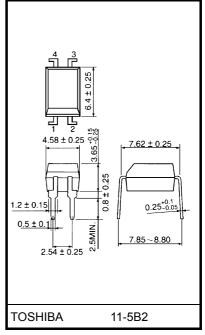
- TLP222G: 4-pin DIP (DIP4), 1-channel type (1-form-A)
- TLP222G-2: 8-pin DIP (DIP8), 2-channel type (2-form-A)
- Peak Off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 120 mA (max)
- On-state resistance: 35Ω (max, t < 1 s)
- On-state resistance: 50Ω (max, continuous)
- Isolation voltage: 2500 Vrms (min)
- BSI approved: BS EN60065:2002, certificate no.8773
 BS EN60950-1:2002, certificate no.8774

Pin Configuration (top view)

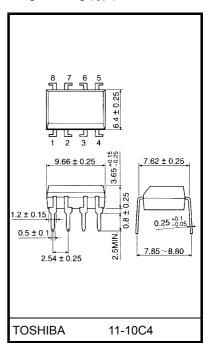




1, 3 : Anode 2, 4 : Cathode 5 : Drain D1 6 : Drain D2 7 : Drain D3 8 : Drain D4 Unit: mm



Weight: 0.26 g (typ.)



Weight: 0.54 g (typ.)



Absolute Maximum Rating (Ta = 25°C)

	(Characteristics	Symbol	Rating	Unit	
	Forward curr	rent		l _F	50	mA
	Forward curr	ent derating (Ta ≥ 25°C)	ΔI _F /°C	-0.5	mA/°C
LED	Peak forward (100 μs puls			I _{FP}	1	Α
	Reverse volt	age		V _R	5	V
	Junction tem	perature		Tj	125	°C
	Off-state out	put terminal v	oltage	V _{OFF}	350	V
		TLP222G		I _{ON}	120	
	On-state current	TLP222G-2	One channel operation			mA
Detector			Two channel operations (Note 1)			
Detector	On-state current derating (Ta ≥ 25°C)	TLP222G			-1.2	
		TLP222G-2	One channel operation	Δl _{ON} /°C		mA/°C
		TLF 222G-2	Two channel operations (Note 1)			
	Junction tem	perature		Tj	125	°C
Storage to	emperature ra	inge	T _{stg}	-55 to 125	°C	
Operating	temperature	range	T _{opr}	-40 to 85	°C	
Lead sold	lering tempera	ature (10 s)	T _{sol}	260	°C	
Isolation	voltage (AC, 1	minute, R.H.	BVS	2500	Vrms	

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Two channels operating simultaneously.

Note 2: Device considered a two-terminal device: LED side pins shorted together and detector side pins shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	V_{DD}	_	_	280	V
Forward current	lF	5	7.5	25	mA
On-state current	I _{ON}	_	_	100	mA
Operating temperature	T _{opr}	-20	_	65	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Electrical Characteristics (Ta = 25°C)

	Characteristics		Test Condition	Min	Тур.	Max	Unit
	Forward voltage	V _F	I _F = 10 mA	1.0	1.15	1.3	V
LED	Reverse current	I _R	V _R = 5 V	_	_	10	μΑ
	Capacitance	CT	V = 0, f = 1 MHz	_	30	_	pF
Detector	Off-state current	loff	V _{OFF} = 350 V			1	μΑ
Detector	Capacitance	C _{OFF}	V = 0, f = 1 MHz	_	30	_	pF

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Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current	I _{FT}	I _{ON} = 120 mA	_	1	3	mA
Return LED current	I _{FC}	I _{OFF} = 100 μA	0.1	_	_	mA
On-state resistance	Ron	I _{ON} = 120 mA, I _F = 5 mA, t < 1 s	_	25	35	Ω
On-state resistance		$I_{ON} = 120$ mA, $I_F = 5$ mA, continuous	_	35	50	

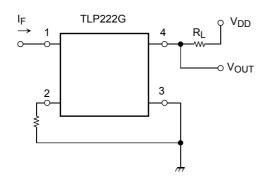
Isolation Characteristics (Ta = 25°C)

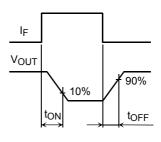
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	Cs	V _S = 0 V, f = 1 MHz	_	8.0	_	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60%	5 × 10 ¹⁰	10 ¹⁴	_	Ω
		AC, 1 minute	2500	_	_	\/rm 0
Isolation voltage	BV_S	AC, 1 second, in oil 5000		5000	_	Vrms
		DC, 1 minute, in oil	_	5000	_	Vdc

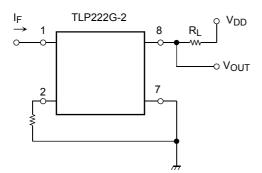
Switching Characteristics (Ta = 25°C)

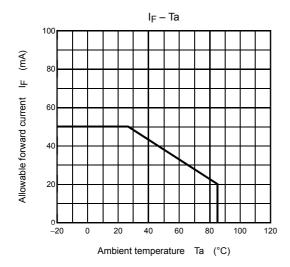
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time		$R_L = 200 \Omega$	_	0.3	1	mo
Turn-off time	t _{OFF}	$V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$ (Note 3)	_	0.1	1	ms

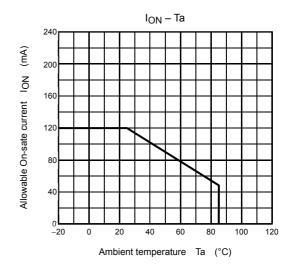
Note 3: Switching time test circuit

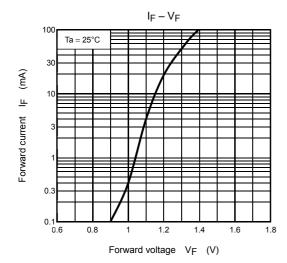


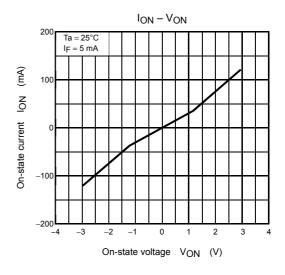


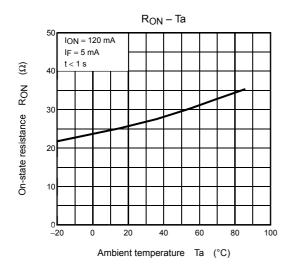


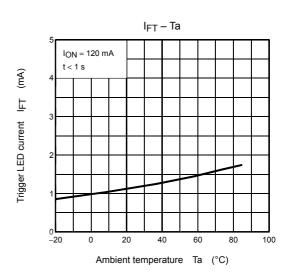


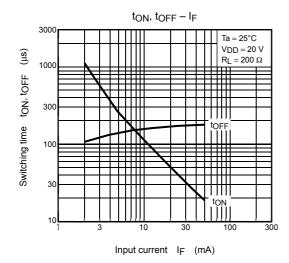


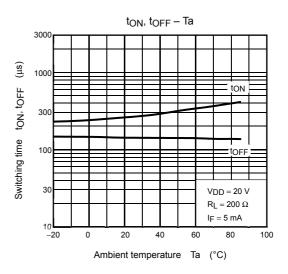


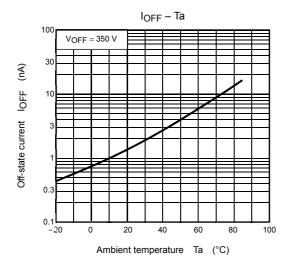












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