TLP222A, TLP222A-2

TOSHIBA Photocoupler Photorelay

TLP222A, TLP222A-2

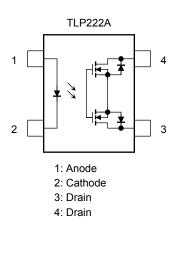
Telecommunications Measurement and Control Equipment Data Acquisition System Measurement Equipment

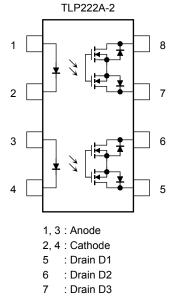
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The Toshiba TLP222A and TLP222A-2 consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a DIP package whose withstanding voltage is 60 V. These photorelays have higher output current rating than phototransistor-type photocoupler; hence, they are suitable for use as On/Off control for high current.

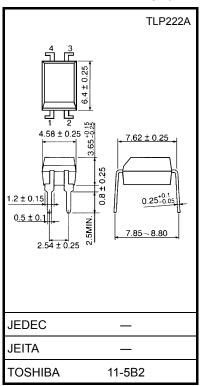
- Normally open (1-form-A and 2-form-A) devices
- Peak off-state voltage: 60 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 500 mA (max)
- On-state resistance: 2Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL recognized: UL1557, File No.E67349

Pin Configuration (top view)

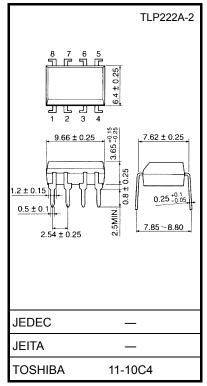








Weight: 0.26 g (typ.)



Weight: 0.54 g (typ.)

Unit: mm

Absolute Maximum Rating (Ta = 25°C)

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	Chara	cteristics		Symbol	Rating	Unit	
	Forward current			lF	50	mA	
	Forward curr	ent derating (Ta≧ 25°C)	∆I _F /°C	-0.5	mA/°C	
LED	Peak forward	d current		I _{FP}	1	А	
	Reverse volt	age		V _R	5	V	
	Junction tem	perature		Тj	125	°C	
Off-state output terminal voltage				V _{OFF}	60	V	
		TLP222A					
	On-state current	TLP222A-2	One channel operation	I _{ON}	500	mA	
			Two channel operations				
Detector	Forward current derating (Ta ≧ 25°C)	TLP222A					
		TLP222A-2	One channel operation	∆l _{ON} /°C	-5.0	mA/°C	
		TEF 222A-2	Two channel operations				
	Junction tem	perature		Tj	125	°C	
Storage to	emperature			T _{stg}	–55 to 125	°C	
Operating temperature				T _{opr}	-40 to 85	°C	
Lead soldering temperature (10 s)				T _{sol}	260	°C	
Isolation	voltage (AC, 1	min, R.H. ≦ 6	60%) (Note 1)	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: LED pins are shorted together. Detector pins are also shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	V _{DD}	—	—	48	V
Forward current	١ _F	5	7.5	25	mA
On-state current	I _{ON}	_	_	500	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.

Electrica	Characteristics	(Ta = 25°C)
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	Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
	Forward voltage	VF	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
LED	Reverse current	I _R	$V_R = 5 V$	_	_	10	μA
	Capacitance	CT	V = 0, f = 1 MHz	_	30	_	pF
Detector	Off-state current	IOFF	V _{OFF} = 60 V	_	_	1	μA
	Capacitance	C _{OFF}	V = 0, f = 1 MHz	_	130	_	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current	I _{FT}	I _{ON} = 500 mA	_	1.6	3	mA
Return LED current	I _{FC}	I _{OFF} = 100 μA	0.1	_	_	mA
On-state resistance	R _{ON}	I _{ON} = 500 mA, I _F = 5 mA	_	1	2	Ω

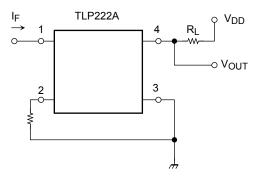
Isolation Characteristics (Ta = 25°C)

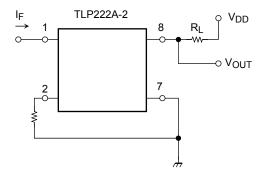
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	CS	$V_S = 0 V$, f = 1 MHz	_	0.8	_	pF
Isolation resistance	R _S	$V_S = 500 \text{ V}, \text{ R.H.} \leq 60\%$	$5 imes 10^{10}$	10 ¹⁴	_	Ω
	BVS	AC, 1 min	2500	_	_	Vrms
Isolation voltage		AC, 1 s, in oil		5000	_	
		DC, 1 min, in oil	—	5000	_	Vdc

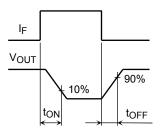
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time	t _{ON}	R _L = 200 Ω	_	0.8	2	ms
Turn-off time	tOFF	$V_{DD} = 20 \text{ V}, \text{ I}_{\text{F}} = 5 \text{ mA}$ (Note 2)	_	0.1	0.5	1113

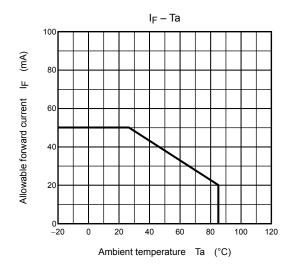
Note 2: Switching time test circuit

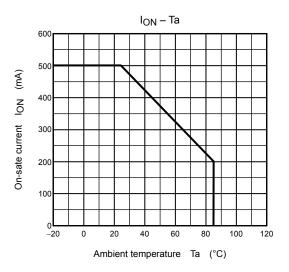


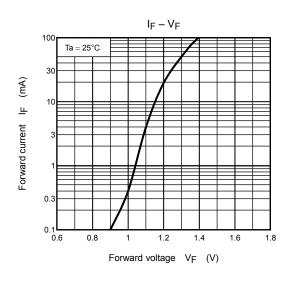


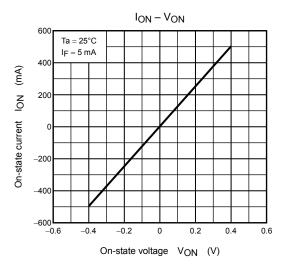


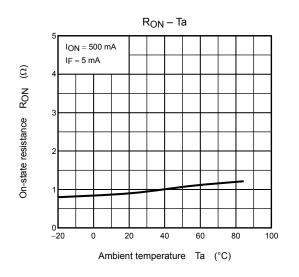
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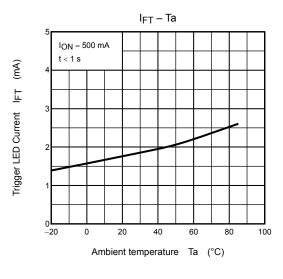




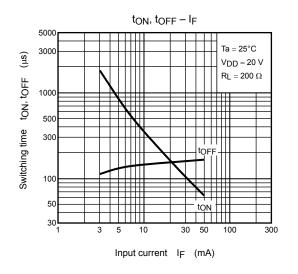


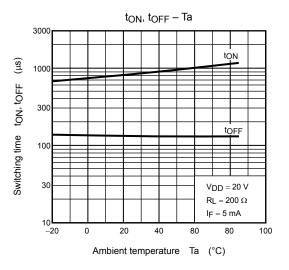


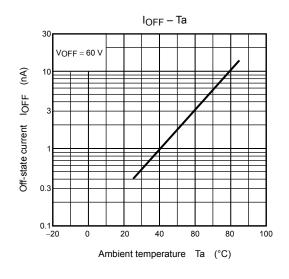




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