

TLP222A, TLP222A-2

Telecommunications

Measurement and Control Equipment

Data Acquisition System

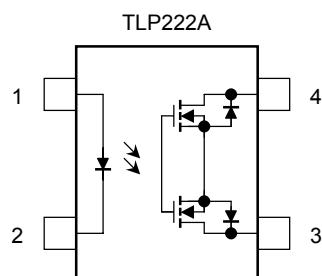
Measurement Equipment

Unit: mm

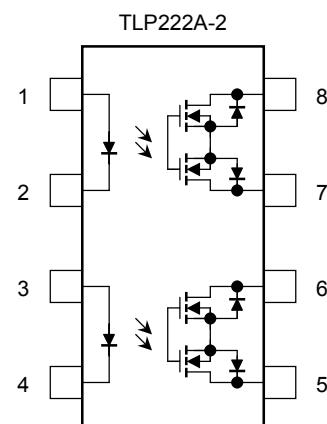
The Toshiba TLP222A and TLP222A-2 consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a DIP package whose withstand voltage is 60 V. These photorelays have higher output current rating than phototransistor-type photocoupler, hence, they are suitable for use as 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: 2 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL recognized: UL1557, File No.E67349

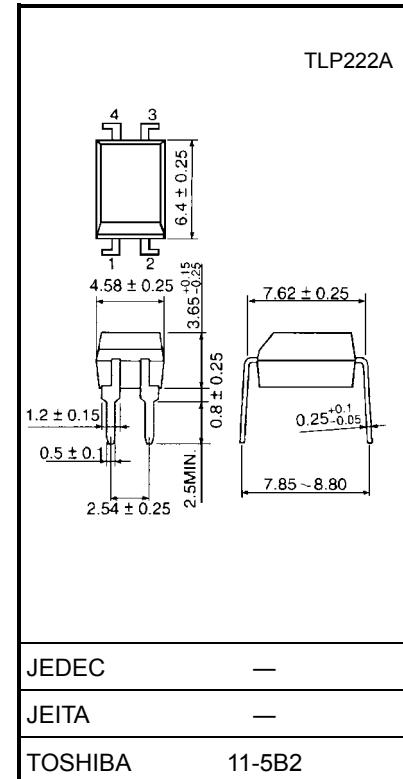
Pin Configuration (top view)



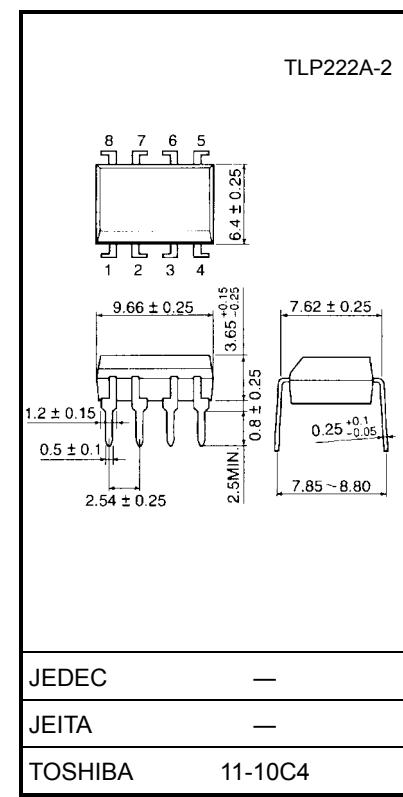
1: Anode
2: Cathode
3: Drain
4: Drain



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



Weight: 0.26 g (typ.)



Weight: 0.54 g (typ.)

Maximum Rating ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit	
LED	Forward current	I_F	50	mA	
	Forward current derating ($T_a \geq 25^\circ\text{C}$)	$\Delta I_F/\text{ }^\circ\text{C}$	-0.5	mA/°C	
	Peak forward current	I_{FP}	1	A	
	Reverse voltage	V_R	5	V	
	Junction temperature	T_j	125	°C	
Detector	Off-state output terminal voltage	V_{OFF}	60	V	
	On-state current	TLP222A	I_{ON}	500	
	TLP222A-2	One channel operation			
		Two channel operations			
	Forward current derating ($T_a \geq 25^\circ\text{C}$)	TLP222A	$\Delta I_{ON}/\text{ }^\circ\text{C}$	-5.0	
	Junction temperature		T_j	125	
	Storage temperature		T_{stg}	-55 to 125	
	Operating temperature		T_{opr}	-40 to 85	
	Lead soldering temperature (10 s)		T_{sol}	260	
	Isolation voltage (AC, 1 min, R.H. $\leq 60\%$) (Note 1)		B_{VS}	2500	
				Vrms	

Note 1: LED pins are shorted together. Detector pins are also shorted together.

Recommended Operating Conditions

Characteristics		Symbol	Min	Typ.	Max	Unit
Supply voltage		V_{DD}	—	—	48	V
Forward current		I_F	5	7.5	25	mA
On-state current		I_{ON}	—	—	500	mA
Operating temperature		T_{opr}	-20	—	65	°C

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Test Condition		Min	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$		1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$		—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$		—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 60 \text{ V}$		—	—	1	μA
	Capacitance	C_{OFF}	$V = 0, f = 1 \text{ MHz}$		—	130	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	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

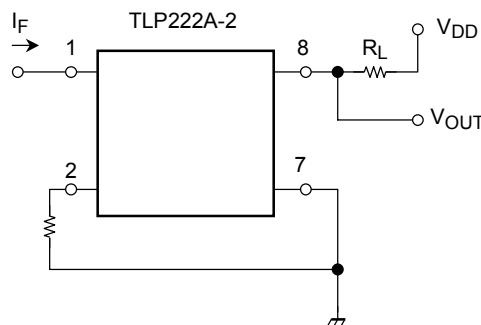
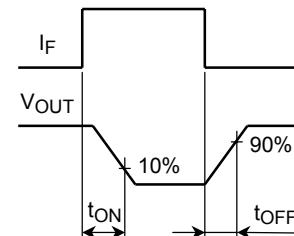
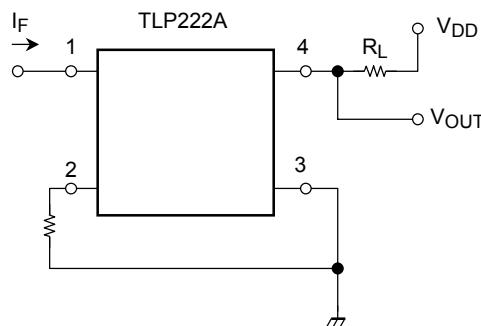
Isolation Characteristics (Ta = 25°C)

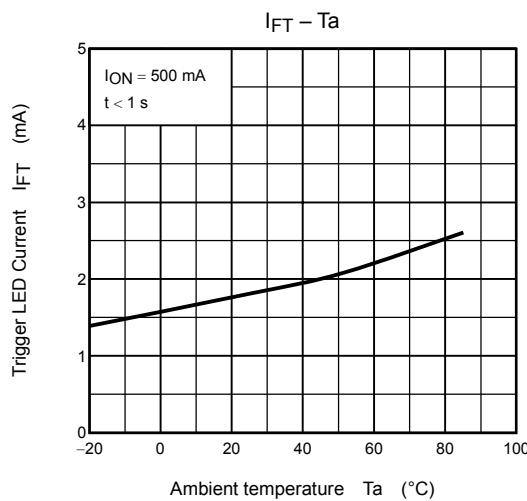
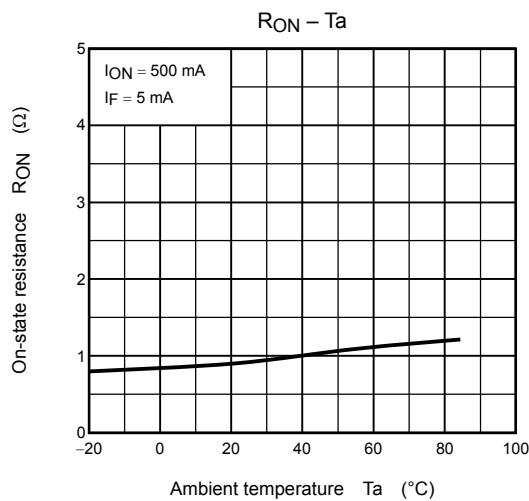
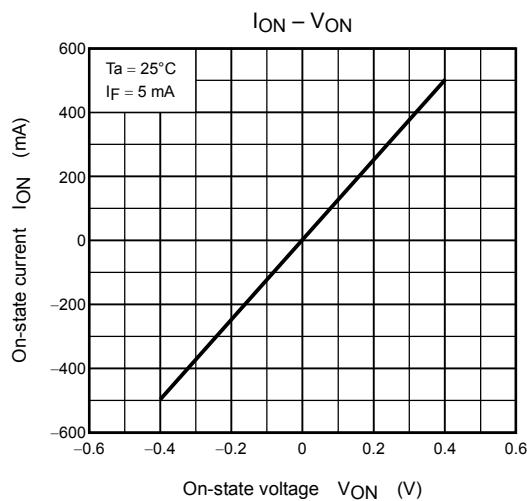
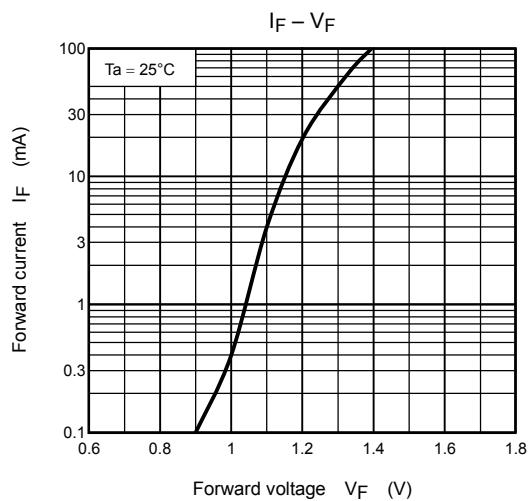
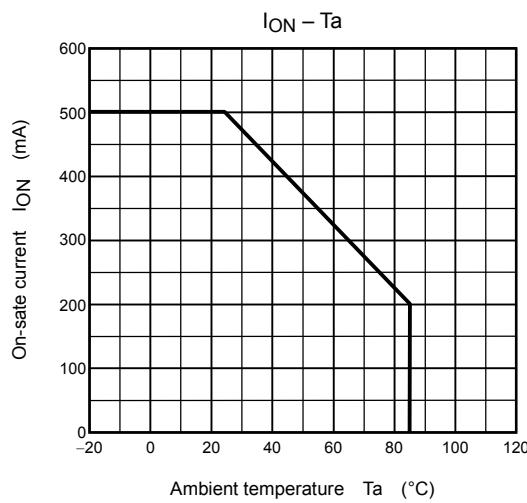
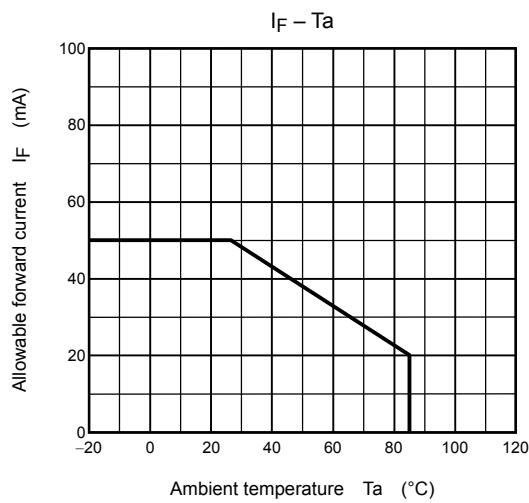
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C _S	V _S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60%	5 × 10 ¹⁰	10 ¹⁴	—	Ω
Isolation voltage	B _{VS}	AC, 1 min	2500	—	—	V _{rms}
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	V _{dc}

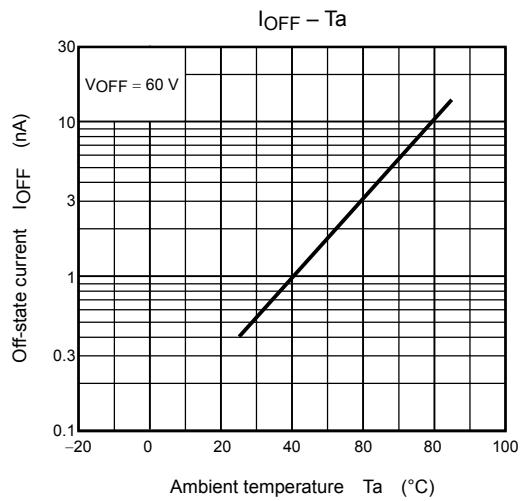
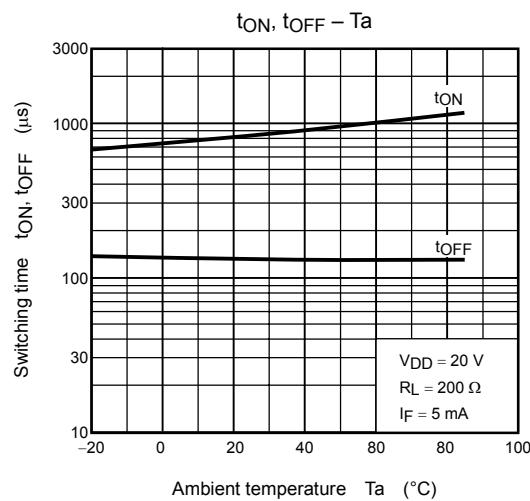
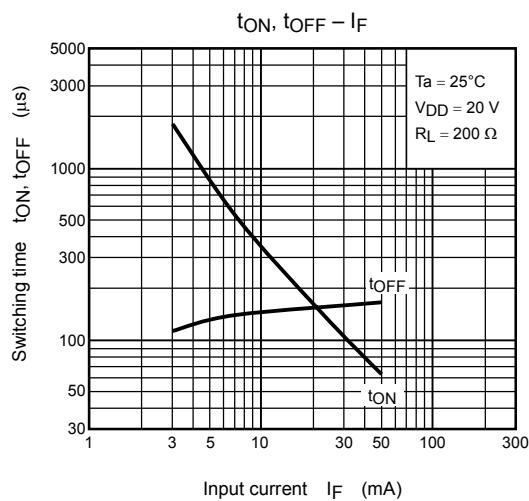
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t _{ON}	R _L = 200 Ω V _{DD} = 20 V, I _F = 5 mA (Note 2)	—	0.8	2	ms
Turn-off time	t _{OFF}		—	0.1	0.5	

Note 2: Switching time test circuit







RESTRICTIONS ON PRODUCT USE

000707EAC

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.