

# TLP222A, TLP222A-2

Telecommunications

Measurement and Control Equipment

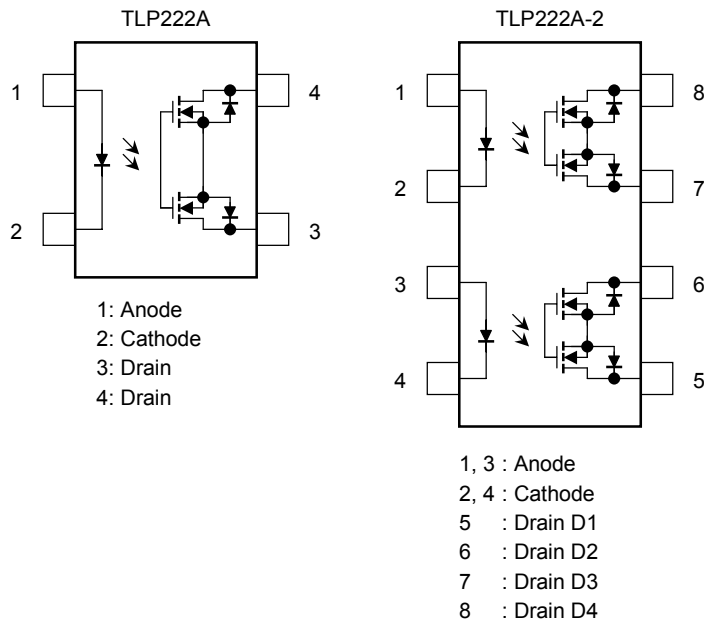
Data Acquisition System

Measurement Equipment

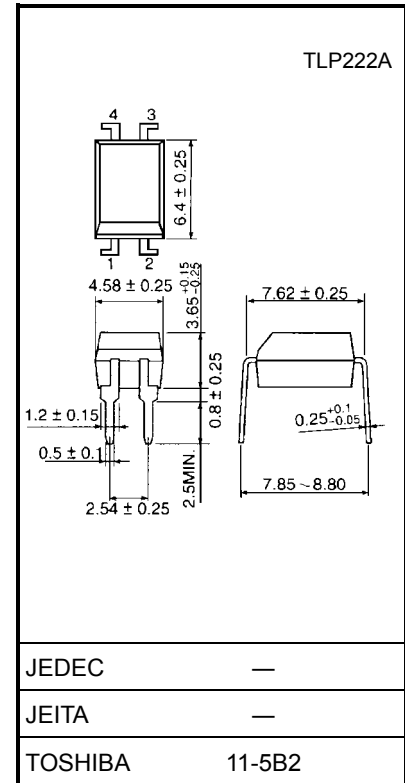
The Toshiba TLP222A and TLP222A-2 consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a DIP package whose withstanding voltage is 60 V. These photorelays have higher output current rating than phototransistor-type photocoupler; hence, they are suitable for use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

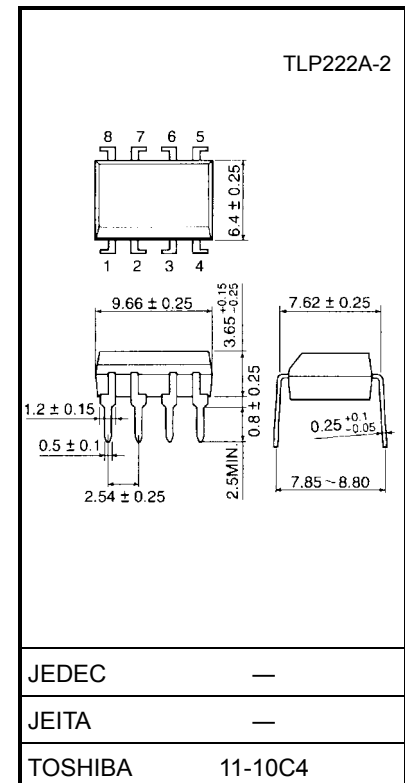
## Pin Configuration (top view)



Unit: mm



Weight: 0.26 g (typ.)



Weight: 0.54 g (typ.)

**Maximum Rating (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			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>	60	V
	On-state current	TLP222A		I <sub>ON</sub>	500	mA
		TLP222A-2	One channel operation			
			Two channel operations			
	Forward current derating (Ta ≥ 25°C)	TLP222A		ΔI <sub>ON</sub> /°C	−5.0	mA/°C
		TLP222A-2	One channel operation			
			Two channel operations			
	Junction temperature			T <sub>j</sub>	125	°C
Storage temperature				T <sub>stg</sub>	−55 to 125	°C
Operating temperature				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: 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 (Ta = 25°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	$I_{FT}$	$I_{ON} = 500 \text{ mA}$	—	1.6	3	mA
Return LED current	$I_{FC}$	$I_{OFF} = 100 \mu\text{A}$	0.1	—	—	mA
On-state resistance	$R_{ON}$	$I_{ON} = 500 \text{ mA}$ , $I_F = 5 \text{ mA}$	—	1	2	$\Omega$

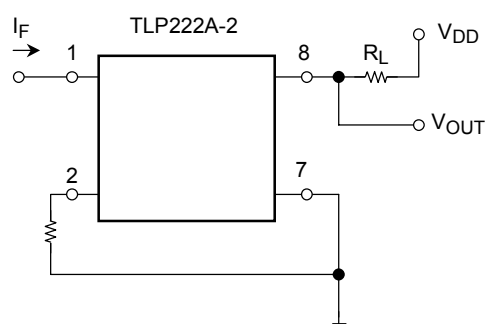
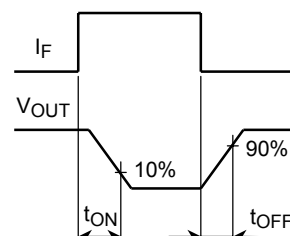
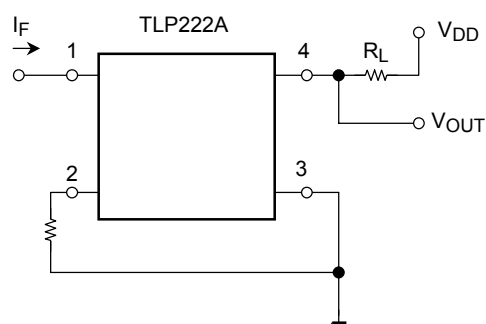
## Isolation Characteristics (Ta = 25°C)

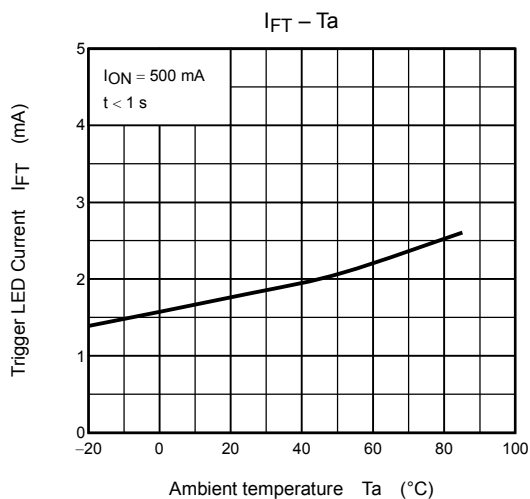
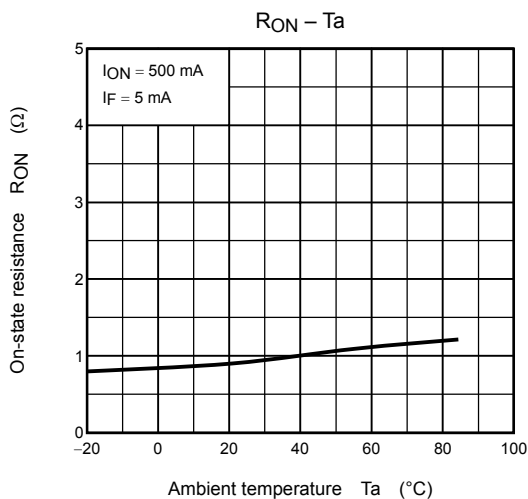
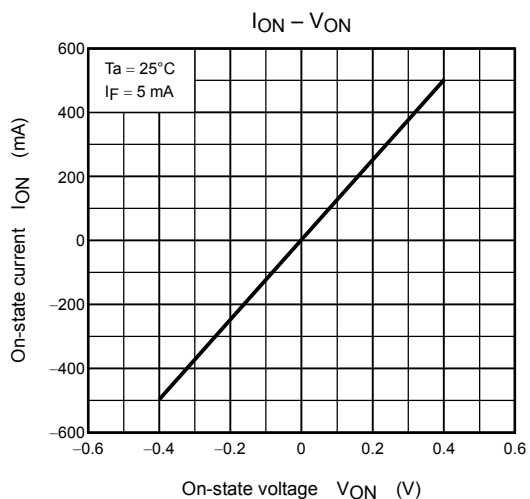
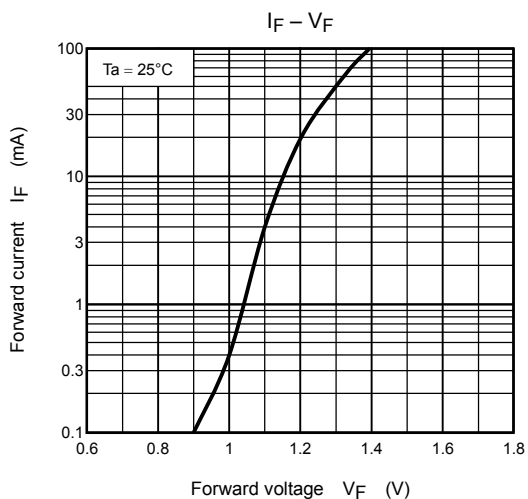
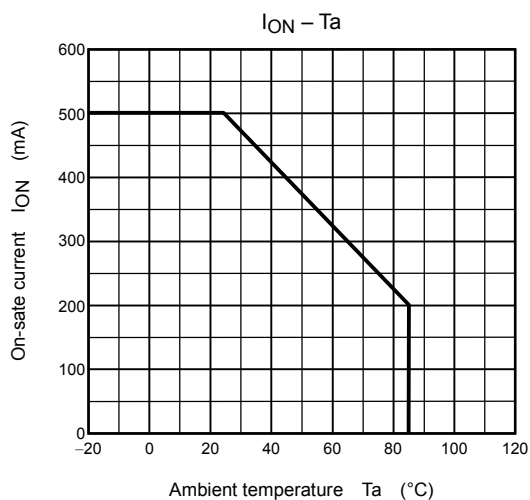
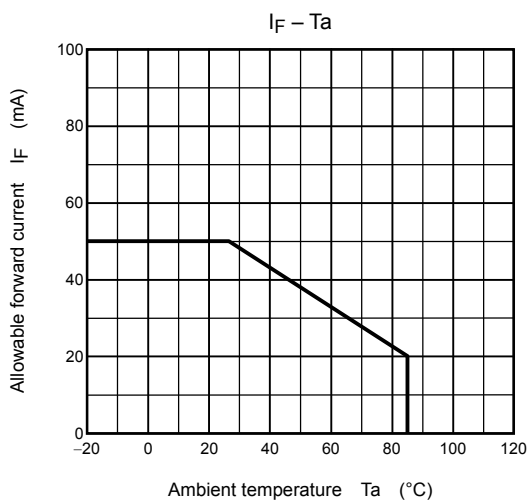
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0 \text{ V}$ , $f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}$ , R.H. $\leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 min	2500	—	—	Vrms
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

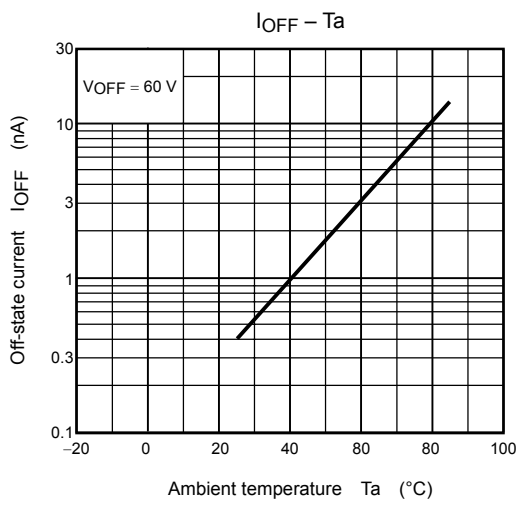
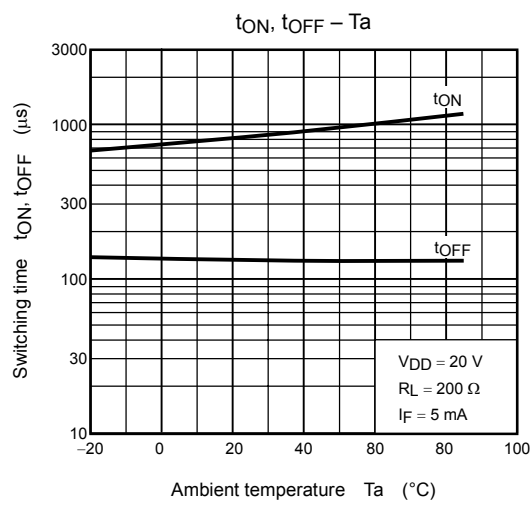
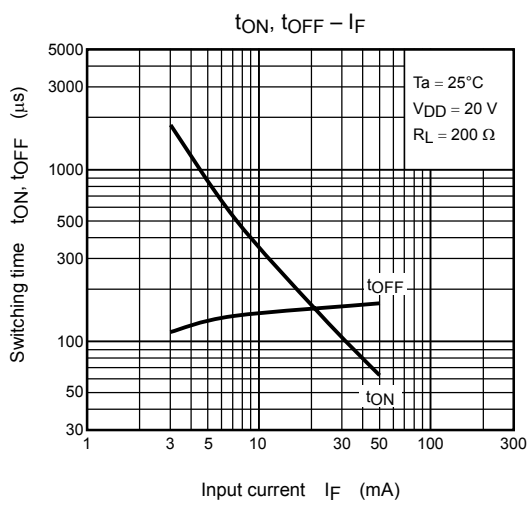
## Switching Characteristics (Ta = 25°C)

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)	—	0.8	2	ms
Turn-off time	$t_{OFF}$		—	0.1	0.5	

Note 2: Switching time test circuit







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