

TOSHIBA PHOTOCOUPLER PHOTO RELAY

# TLP225A

PROGRAMMABLE CONTROLLERS

I/O BOARD INTERFACE

DC-OUTPUT MODULE

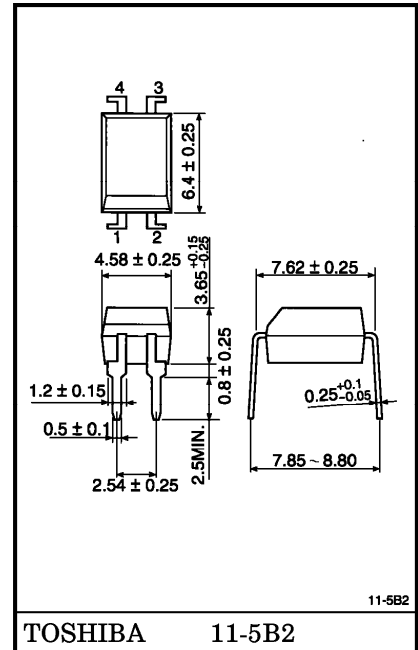
REPLACEMENT FOR DC MECHANICAL RELAY

The TOSHIBA TLP225A consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a four lead plastic DIP package (DIP4).

( The TLP225A is MOSFET output and can control a current of 0.5 A which is suitable for DC output module. )

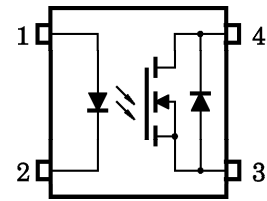
- Peak Off-State Voltage : 60 V (Min.)
- Trigger LED Current : 5 mA (Max.)
- On-State Current : 500 mA (Max.)
- On-State Resistance : 1.1 Ω (Max.)
- Isolation Voltage : 2500 Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



Weight : 0.27 g

PIN CONFIGURATION (TOP VIEW)



- 1 : ANODE
- 2 : CATHODE
- 3 : SOURCE
- 4 : DRAIN

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● 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.

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## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	$I_F$	50	mA
	Forward Current Derating (Ta $\geq$ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.5	mA / °C
	Peak Forward Current (100 $\mu\text{s}$ pulse, 100 pps)	$I_{FP}$	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	$I_{ON}$	500	mA
	On-State Current Derating (Ta $\geq$ 25°C)	$\Delta I_{ON} / ^\circ\text{C}$	-5.0	mA / °C
	Junction Temperature	$T_j$	125	°C
Storage Temperature Range		$T_{stg}$	-55~125	°C
Operating Temperature Range		$T_{opr}$	-20~85	°C
Lead Soldering Temperature (10 s)		$T_{sol}$	260	°C
Isolation Voltage (AC, 1min., R.H. $\leq$ 60%) (Note 1)		$BVS$	2500	Vrms

(Note 1) : Pins 1 and 2 shorted together and pins 3 and 4 shorted together.

## RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{DS}$	—	—	48	V
Forward Current	$I_F$	12	20	30	mA
Collector Current	$I_{ON}$	—	—	300	mA
Operating Temperature	$T_{opr}$	-20	—	60	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		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	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Off-State Current	$I_{OFF}$	$V_{OFF} = 60 \text{ V}$	—	—	1	$\mu\text{A}$
	Capacitance	$C_{OFF}$	$V = 0, f = 1 \text{ MHz}$	—	—	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	$I_{FT}$	$I_{ON} = 500 \text{ mA}$	—	3	5	mA
On-State Resistance	$R_{ON}$	$I_{ON} = 500 \text{ mA}, I_F = 10 \text{ mA}$	—	0.8	1.1	$\Omega$

ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	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	$R_S$	$V_S = 500 \text{ V}, R.H. \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	—
		DC, 1 minute, in oil	—	5000	—	—

SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Turn-on Time	$t_{ON}$	$R_L = 200 \Omega$ (Note 2)	—	—	2	ms
Turn-off Time	$t_{OFF}$	$V_{DS} = 20 \text{ V}, I_F = 10 \text{ mA}$	—	—	2	

(Note 2) : SWITCHING TIME TEST CIRCUIT

