

TOSHIBA PHOTOCOUPLER PHOTO RELAY

TLP225A

PROGRAMMABLE CONTROLLERS

I/O BOARD INTERFACE

DC-OUTPUT MODULE

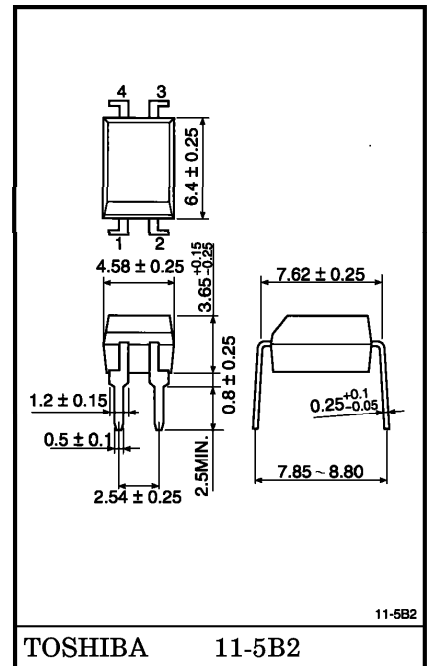
REPLACEMENT FOR DC MECHANICAL RELAY

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

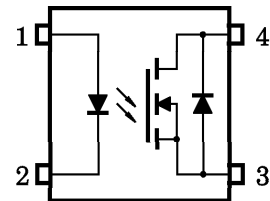
Unit in mm



TOSHIBA 11-5B2

Weight : 0.27 g

PIN CONFIGURATION (TOP VIEW)



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.5	mA / °C
	Peak Forward Current (100 μs 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 ≥ 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. ≤ 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	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}	$V = 0, f = 1 \text{ MHz}$	—	—	—	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	Ω

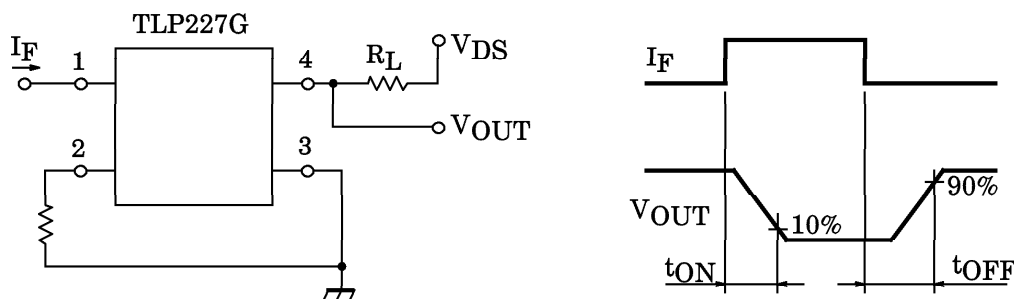
ISOLATION CHARACTERISTICS (Ta = 25°C)

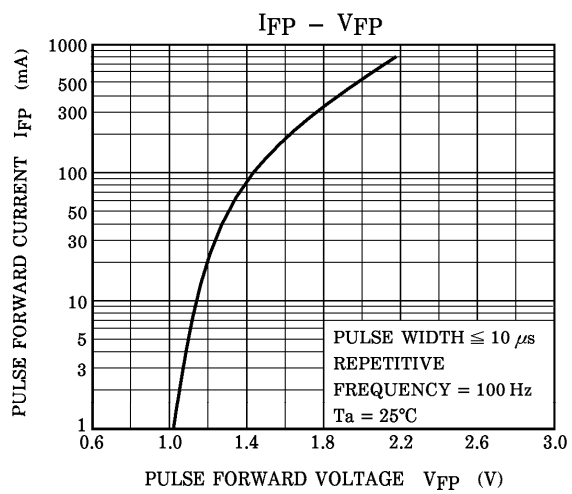
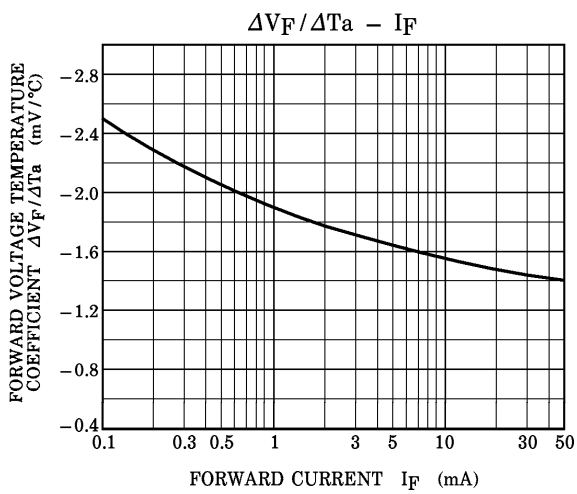
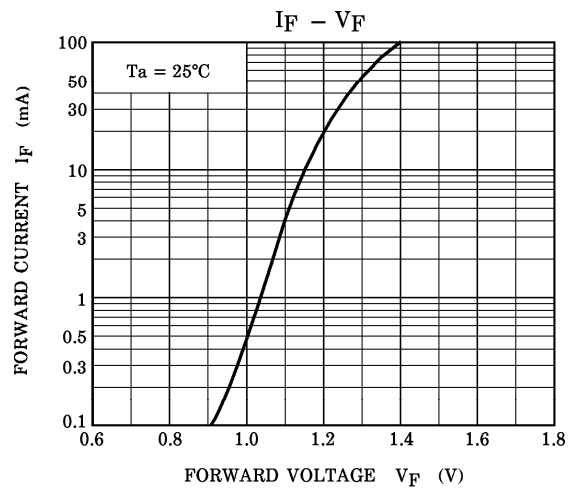
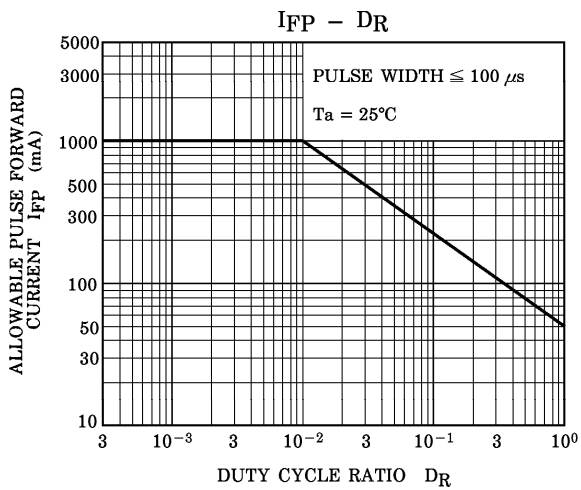
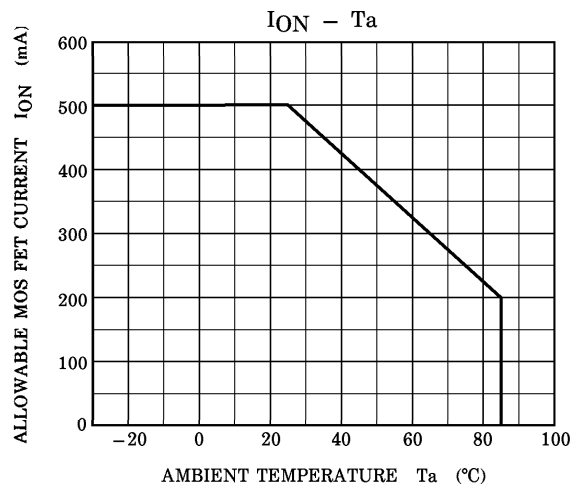
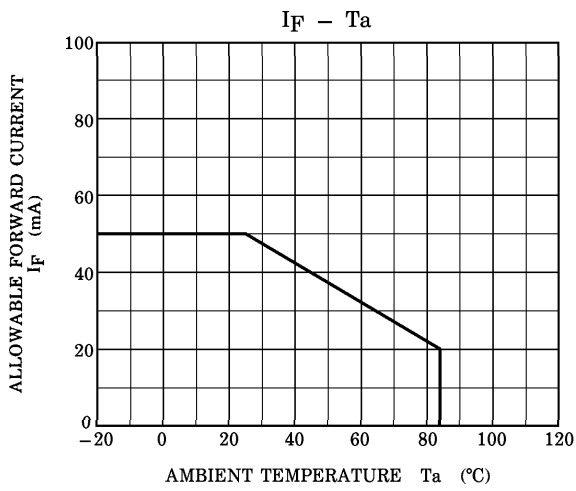
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	—
		DC, 1 minute, in oil	—	5000	—	—

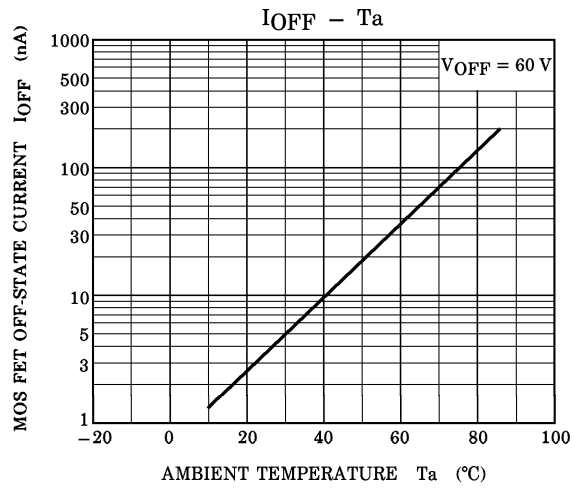
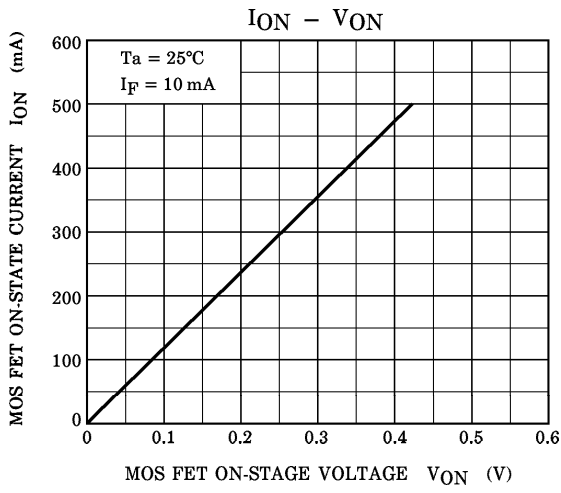
SWITCHING CHARACTERISTICS (Ta = 25°C)

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







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