

TOSHIBA PHOTOCOUPLER PHOTO-RELAY

# TLP224G, TLP224G-2

MODEMS

PBX

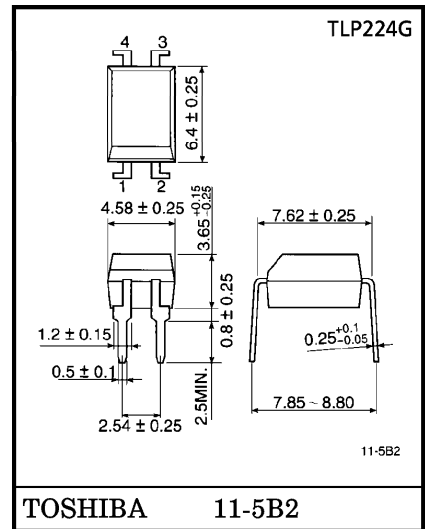
TELECOMMUNICATIONS

The TOSHIBA TLP224G series consists of gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a 4pin DIP (DIP4), which is suitable for equipment for high tech communications, including modems.

The TLP224G series complies with FCC part 68 rules with current limiting function.

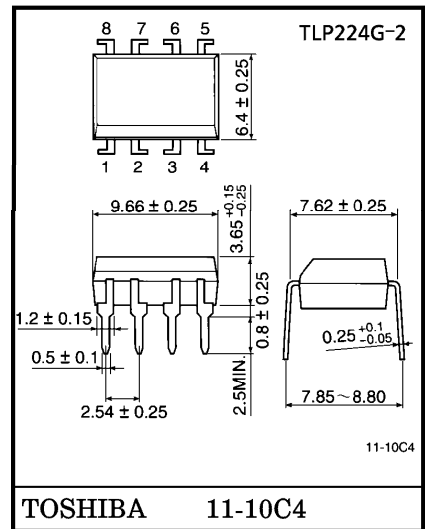
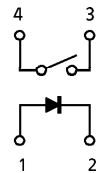
- TLP224G : 4 PIN DIP, 1 Channel Type (1 Form A)
- TLP224G-2 : 8 PIN DIP, 2 Channel Type (2 Form A)
- Peak Off-State Voltage : 350 V (min)
- Trigger LED Current : 3 mA (max)
- On-State Current : 120 mA (max)
- Load Current Limiting : 150 mA~300 mA (t = 5 ms)
- On-State Resistance : 35 Ω (max)
- Isolation Voltage : 2500 Vrms (min)
- UL Recognized : UL1577, File No. E67349

Unit in mm



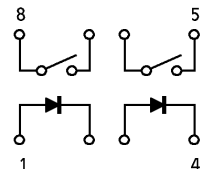
Weight : 0.26 g

1 Form A

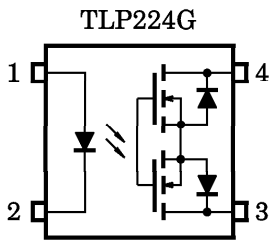


Weight : 0.54 g

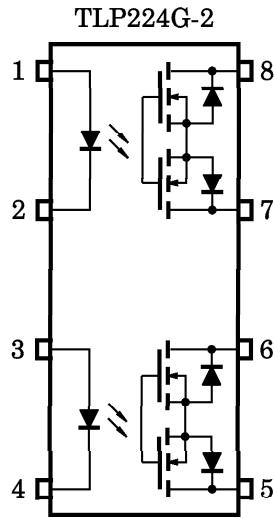
2 Form A



PIN CONFIGURATION (TOP VIEW)

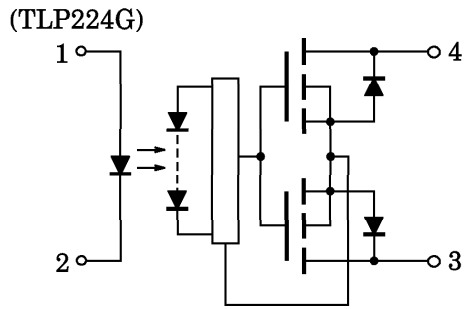


- 1 : ANODE
- 2 : CATHODE
- 3 : DRAIN 1
- 4 : DRAIN 2



- 1, 3 : ANODE
- 2, 4 : CATHODE
- 5 : DRAIN 1
- 6 : DRAIN 2
- 7 : DRAIN 3
- 8 : DRAIN 4

INTERNAL CIRCUIT



## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		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 (100 μs pulse, 100 pps)	I <sub>FP</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	6	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Off-State Output Terminal Voltage	V <sub>OFF</sub>	350	V
	On-State Current (Note 1)	I <sub>ON</sub>	120	mA
	On-State Current Derating (Ta ≥ 25°C) (Note 1)	ΔI <sub>ON</sub> / °C	-1.2	mA / °C
	Junction Temperature	T <sub>j</sub>	125	°C
Storage Temperature Range		T <sub>stg</sub>	-55~125	°C
Operating Temperature Range		T <sub>opr</sub>	-40~85	°C
Lead Soldering Temperature (10 s)		T <sub>sol</sub>	260	°C
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 2)		BV <sub>S</sub>	2500	V <sub>rms</sub>

(Note 1) : Two channles operating simultaneously.

(Note 2) : Device considered a two-terminal device : LED side pins shoted together, and Detector side pins shored together.

## RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN	TYP.	MAX	UNIT
Supply Voltage	V <sub>DD</sub>	—	—	280	V
Forward Current	I <sub>F</sub>	5	7.5	25	mA
On-State Current	I <sub>ON</sub>	—	—	100	mA
Operating Temperature	T <sub>opr</sub>	-20	—	65	°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	$I_R$	$V_R = 6 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Off-State Current	$I_{OFF}$	$V_{OFF} = 350 \text{ V}$	—	—	1	$\mu\text{A}$
	Capacitance	$C_{OFF}$	$V = 0, f = 1 \text{ MHz}$	—	40	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Trigger LED Current	$I_{FT}$	$I_{ON} = 120 \text{ mA}$	—	1	3	mA
Load Current Limiting	$I_{LIM}$	$I_F = 5 \text{ mA}, V_{DD} = 5 \text{ V}, t = 5 \text{ ms}$	150	—	300	mA
On-State Resistance	$R_{ON}$	$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	22	35	$\Omega$

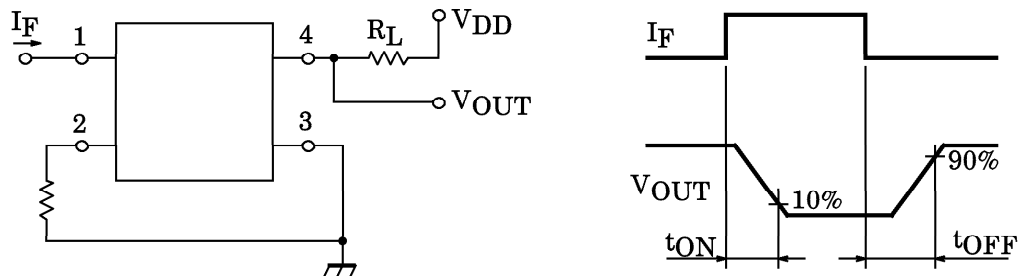
ISOLATION CHARACTERISTICS (Ta = 25°C)

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

SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Turn-on Time	$t_{ON}$	$R_L = 200 \Omega$ (Note 1)	—	—	1	ms
Turn-off Time	$t_{OFF}$	$V_{CC} = 20 \text{ V}, I_F = 5 \text{ mA}$	—	—	1	

(Note 1) : SWITCHING TIME TEST CIRCUIT



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000707EBC

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