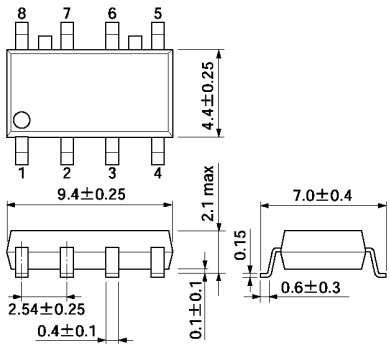
TOSHIBA PHOTOCOUPLER PHOTO RELAY

T L P 2 0 9 D

MEASUREMENT INSTRUMENTS
LOGIC IC TESTERS / MEMORY TESTERS
BOARD TESTERS / SCANNERS

Unit: mm



JEDEC	
EIAJ	
TOSHIBA	11–10H1

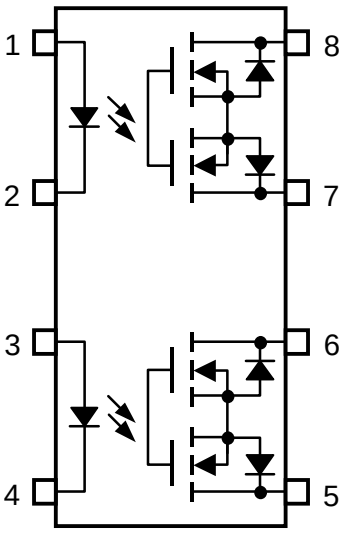
Weight: 0.2 g

The TOSHIBA TLP209D consist of a gallium arsenide infrared emitting diode optically coupled to a photo-MOS FET in a plastic SOP package. Its characteristics include low OFF-state current and low output pin capacitance, enabling it to be used in high-frequency mearsurement instruments.

FEATURES

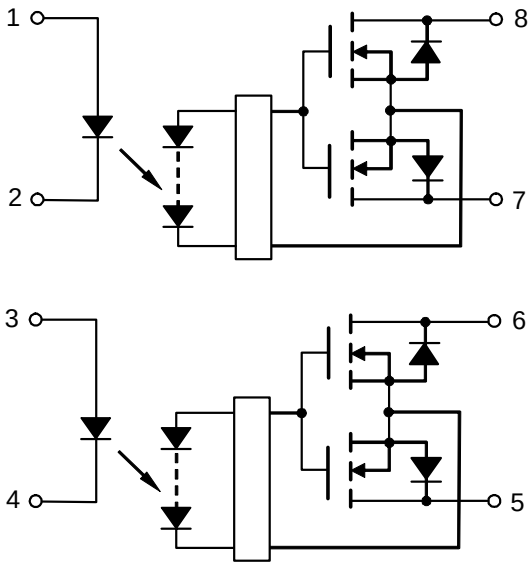
- 8 pin SOP (2.54SOP8) : 2.1 mm high, 2.54 mm pitch
- 2-Form-A
- Peak Off-State Voltage : 200 V (min)
- Trigger LED Current : 3 mA (max)
- On-State Current : 50 mA (max)
- On-State Resistance : 50 ohm (max)
- Output Capacitance : 20 pF (max)
- Isolation Voltage : 1500 Vrms (min)

PIN CONFIGURATION (TOP VIEW)



1, 3 : ANODE
2, 4 : CATHODE
5 : DRAIN D1
6 : DRAIN D2
7 : DRAIN D3
8 : DRAIN D4

SCHEMATIC



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta ≧ 25°C)	ΔI_F/°C	−0.5	mA/°C
	Reverse Voltage	V_R	5	V
	Junction Temperature	T_j	125	°C
DETECTOR	Off-State Output Terminal Voltage	V_{OFF}	200	V
	On-State Current	I_{ON}	50	mA
	On-State Current Derating (Ta ≧ 25°C)	ΔI_{ON}/°C	−0.5	mA/°C
	Junction Temperature	T_j	125	°C
Storage Temperature Range		T_{stg}	−55~125	°C
Operating Temperature Range		T_{opr}	−40~85	°C
Lead Soldering Temperature (10 s)		T_{sol}	260	°C
Isolation Voltage (AC, 1 minute, R.H. ≦ 60%) (NOTE1)		BV_S	1500	Vrms

(NOTE1) : Device considered a two-terminal device : LED side pins shorted together, and DETECTOR side pins shorted together.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	—	—	160	V
Forward Current	I_F	5	7.5	15	mA
On-State Current	I_{ON}	—	—	50	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 mA	1.0	1.15	1.3	V
	Reverse Current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	30	—	pF
DETECTOR	Off-State Current	I_{OFF}	V_{OFF} = 160 V	—	—	1	nA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	15	20	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
Trigger LED Current	I_{FT}	I_{ON} = 50 mA	—	1	3	mA
Return LED Current	I_{FC}	I_{OFF} = 100 μA	0.1	—	—	mA
On-State Resistance	R_{ON}	I_{ON} = 50 mA, I_F = 5 mA	—	40	50	Ω

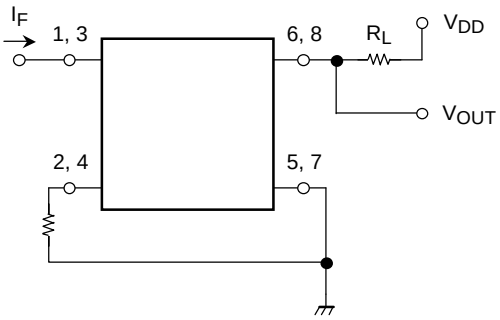
ISOLATION CHARACTERISTICS (Ta = 25°C)

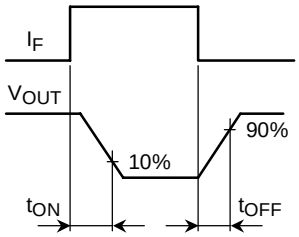
CHARACTERISTIC	SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
Capacitance Input to Output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	1500	—	—	Vrms
		AC, 1 second (in oil)	—	3000	—	
		DC, 1 minute (in oil)	—	3000	—	Vdc

SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
Turn-on Time	t_{ON}	R_L = 200 Ω (NOTE 2) V_{DD} = 10 V, I_F = 5 mA	—	0.03	0.5	ms
Turn-off Time	t_{OFF}		—	0.07	0.2	

(NOTE 2) : SWITCHING TIME TEST CIRCUIT





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