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TOSHIBA Photocoupler Photorelay

# TLP206GA

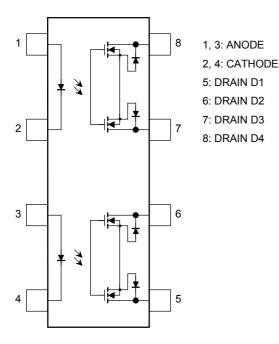
PBX Telecommunication Modem · FAX Cards, Modems In PC Measurement Instrumentation

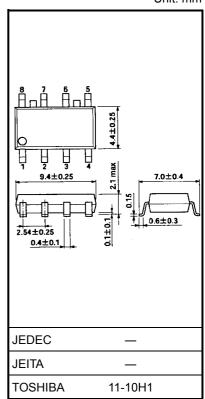
The TOSHIBA TLP206GA consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a SOP, which is suitable for surface mount assembly.

The TLP206GA is a 2-Form-A switch, which is suitable for replacement of mechanical relays in many applications.

- 8 pin SOP (2.54SOP8): 2.1 mm high, 2.54 mm pitch
- 2-form-A
- Peak off-state voltage: 400 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 120 mA (max)
- On-state resistance:  $35 \Omega$  (max)
- Isolation voltage: 1500 Vrms (min)

#### Pin Configuration (top view)





Weight: 0.2 g (typ.)

Unit: mm

#### Maximum Ratings (Ta = 25°C)

	Characteristics	Symbol	Rating	Unit
LED	Forward current	lF	50	mA
	Forward current derating (Ta $\ge$ 25°C)	∆I <sub>F</sub> /°C	-0.5	mA/°C
	Peak forward current (100 μs pulse, 100 pps)	I <sub>FP</sub>	1	А
	Reverse voltage	V <sub>R</sub>	5	V
	Junction temperature	Tj	125	°C
Detector	Off-state output terminal voltage	V <sub>OFF</sub>	400	V
	On-state current	I <sub>ON</sub>	120	mA
	On-state current derating (Ta ≧ 25°C)	∆l <sub>ON</sub> /°C	-1.2	mA/°C
	Junction temperature	Tj	125	°C
Operating temperature range		T <sub>opr</sub>	-40 to 85	°C
Storage temperature range		T <sub>stg</sub>	-55 to 125	°C
Lead	I soldering temperature (10 s)	T <sub>sol</sub>	260	°C
Isolation voltage (AC, 1 min, R.H. $\leq$ 60%) (Note 1)		BVS	1500	Vrms

Note 1: Device considered a two-terminal device: LED side pins shorted together, and DETECTOR side pins shorted together.

#### **Recommended Operating Conditions**

Characteristics	Symbol	Min	Тур.	Max	Unit
Supply voltage	V <sub>DD</sub>	_	_	320	V
Forward current	١ <sub>F</sub>	5	7.5	25	mA
On-state current	I <sub>ON</sub>	_	_	120	mA
Operating temperature	T <sub>opr</sub>	-20		65	°C

#### Individual Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
LED	Forward voltage	VF	I <sub>F</sub> = 10 mA	1.0	1.15	1.3	V
	Reverse current	Ι <sub>R</sub>	$V_R = 5 V$	_	_	10	μA
	Capacitance	CT	V = 0, $f = 1$ MHz	_	30	_	pF
Detec- tor	Off-state current	I <sub>OFF</sub>	V <sub>OFF</sub> = 400 V	_	_	1	μA
	Capacitance	C <sub>OFF</sub>	V = 0, f = 1 MHz		70	_	pF

#### **Coupled Electrical Characteristics (Ta = 25°C)**

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Trigger LED current	I <sub>FT</sub>	I <sub>ON</sub> = 120 mA	_	1	3	mA
Return LED current	I <sub>FC</sub>	I <sub>OFF</sub> = 100 μA	0.1	_	_	mA
On-state resistance	R <sub>ON</sub>	I <sub>ON</sub> = 120 mA, I <sub>F</sub> = 5 mA	_	17	35	Ω

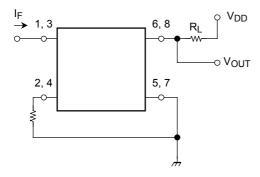
Isolation Characteristics (Ta = 25°C)

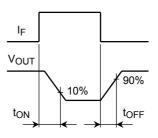
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Capacitance input to output	CS	$V_S = 0, f = 1 MHz$	—	0.8	_	pF
Isolation resistance	R <sub>S</sub>	$V_S = 500 \text{ V}, \text{ R.H.} \leq 60\%$	$5\times 10^{10}$	10 <sup>14</sup>	_	Ω
		AC, 1 min	1500	_	_	Vrms
Isolation voltage	BVS	AC, 1 s, in oil	—	3000	_	VIIIIS
		DC, 1 min, in oil	—	3000	_	Vdc

#### Switching Characteristics (Ta = 25°C)

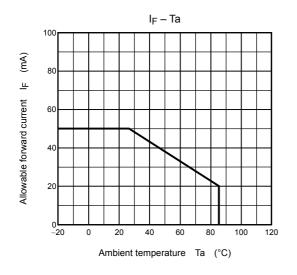
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Turn-on time	t <sub>ON</sub>	$R_L = 200 \ \Omega$ (Note 2)		0.3	1	ms
Turn-off time	tOFF	$V_{DD} = 20 \text{ V}, \text{ I}_{\text{F}} = 5 \text{ mA}$		0.1	1	ms

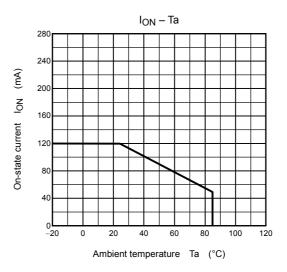
Note 2: Switching time test circuit

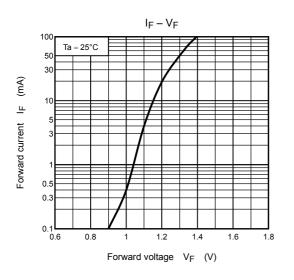


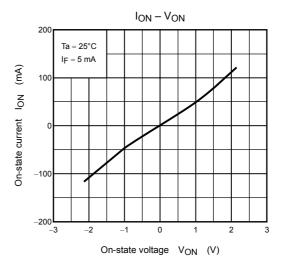


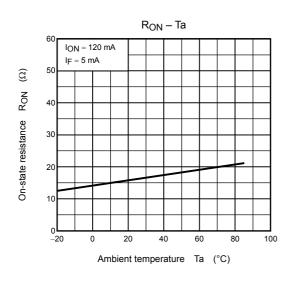
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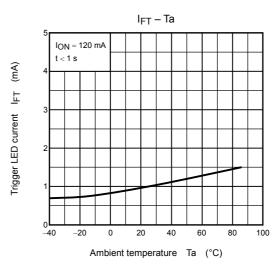




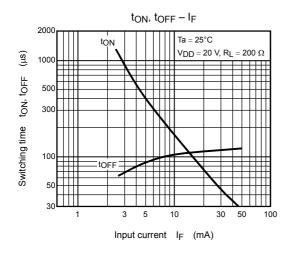


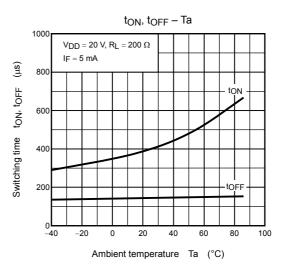


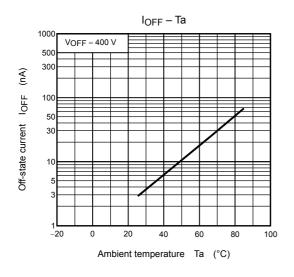




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