

# TLP206G

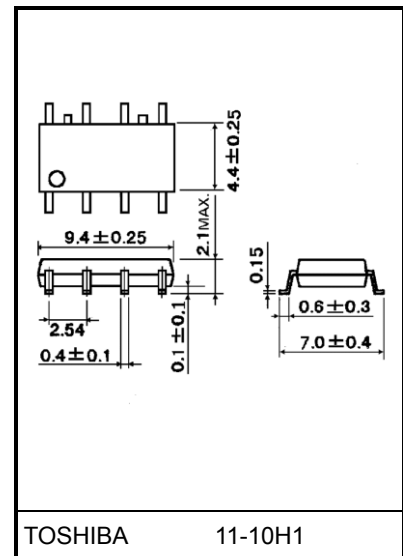
PBX  
Modem·FAX Card  
Measurement Instrument

The TOSHIBA TLP206G consists of an infrared emitting diode optically coupled to a photo-MOS FET in a 8 pin SOP.  
The TLP206G is a 2-Form-A switch which is suitable for replacement of mechanical relays in many applications.

- SOP 8 pin (2.54SOP8): 2-Form-A
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 120 mA (max)
- On-state resistance: 35 Ω (max)
- Isolation voltage: 1500 V<sub>rms</sub> (min)
- UL-recognized: UL 1577, File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

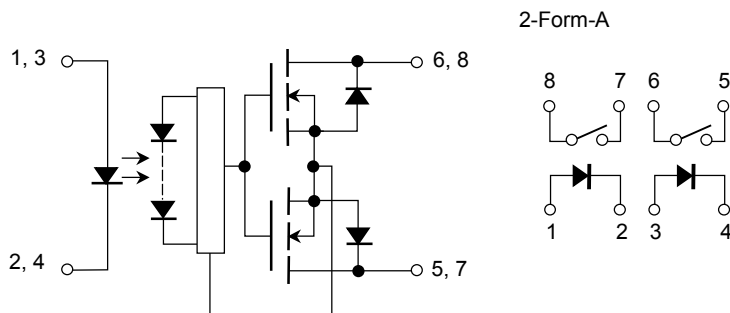
Note 1: When a VDE approved type is needed, please designate the **Option(V4)**.

Unit: mm

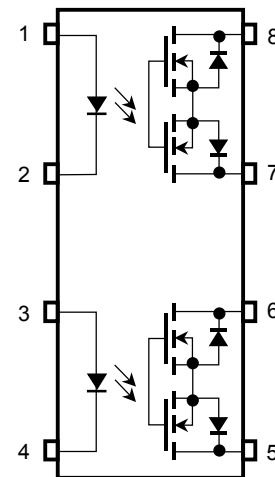


Weight: 0.2 g (typ.)

## Schematic



## Pin Configuration (top view)



- 1, 3: Anode
- 2, 4: Cathode
- 5: Drain D1
- 6: Drain D2
- 7: Drain D3
- 8: Drain D4

Start of commercial production  
1997-08

## Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit	
LED	Forward current	$I_F$	50	mA	
	Forward current derating (Ta ≥ 25°C)	$\Delta I_F / ^\circ\text{C}$	-0.5	mA / °C	
	Pulse forward current (100µs pulse, 100pps)	$I_{FP}$	1	A	
	Reverse voltage	$V_R$	5	V	
	Diode power dissipation	$P_D$	50	mW	
	Diode power dissipation derating (Ta ≥ 25°C)	$\Delta P_D / ^\circ\text{C}$	-0.5	mW/°C	
	Junction temperature	$T_j$	125	°C	
Detector	Off-state output terminal voltage	$V_{OFF}$	350	V	
	On-state current	Both channel	$I_{ON}$	100	mA
		One channel		120	
	On-state RMS current derating (Ta ≥ 25°C)	Both channel	$\Delta I_{ON} / ^\circ\text{C}$	-1.0	mA / °C
		One channel		-1.2	
	Output power dissipation	$P_O$	454	mW	
	Output power dissipation derating (Ta ≥ 25°C)	$\Delta P_O / ^\circ\text{C}$	-4.54	mW / °C	
	Junction temperature	$T_j$	125	°C	
Storage temperature range	$T_{stg}$	-55 to 125	°C		
Operating temperature range	$T_{opr}$	-40 to 85	°C		
Lead soldering temperature (10 s)	$T_{sol}$	260	°C		
Isolation voltage (AC, 60 s, R.H. ≤ 60 %) (Note 1)	$BV_S$	1500	$V_{rms}$		

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Device considered a two-terminal device: Pins 1, 2, 3 and 4 shorted together and pins 5, 6, 7 and 8 shorted together.

## Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	$V_{DD}$	—	—	280	V
Forward current	$I_F$	5	7.5	25	mA
On-state current	$I_{ON}$	—	—	100	mA
Operating temperature	$T_{opr}$	-20	—	65	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

## 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	$C_T$	$V_F = 0 \text{ V}, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Off-state current	$I_{OFF}$	$V_{OFF} = 350 \text{ V}$	—	—	1	$\mu\text{A}$
	Capacitance	$C_{OFF}$	$V = 0 \text{ V}, f = 1 \text{ MHz}$	—	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
On-state resistance	$R_{ON}$	$I_{ON} = 120 \text{ mA}, I_F = 5 \text{ mA}$	—	22	35	$\Omega$

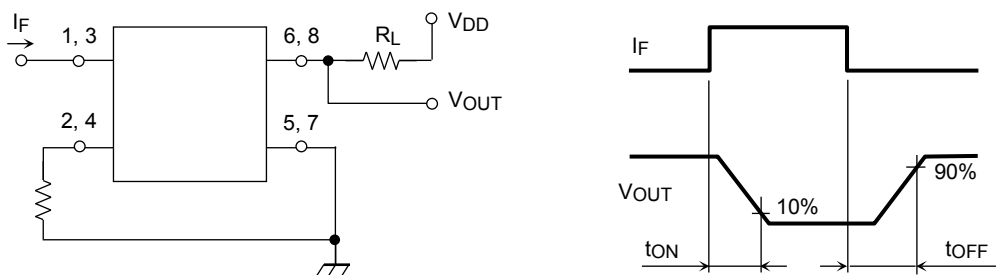
## Isolation Characteristics (Ta = 25°C)

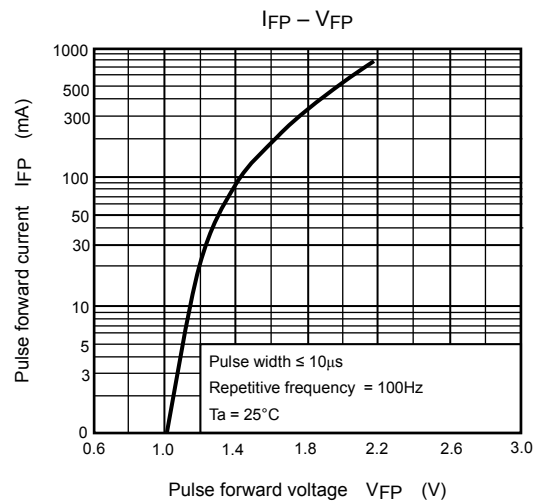
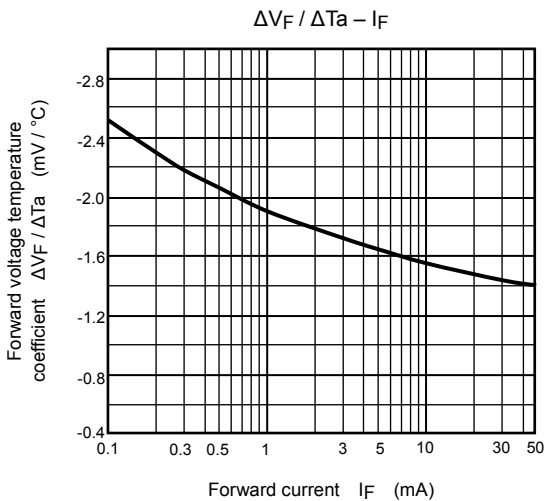
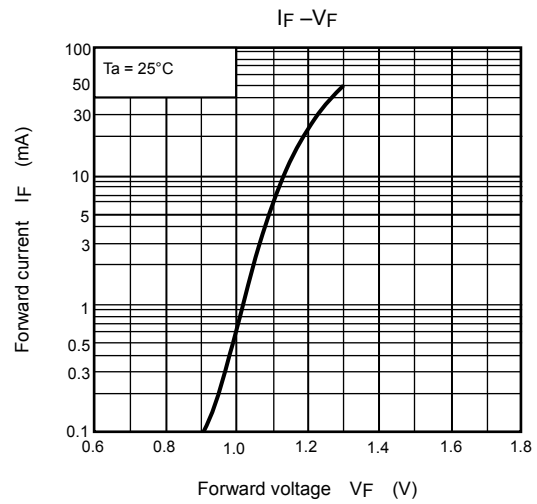
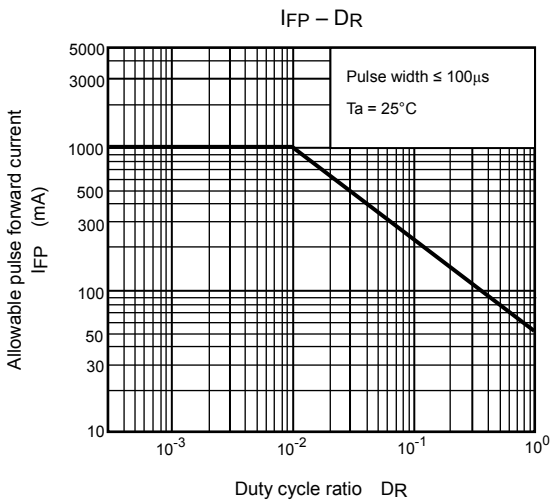
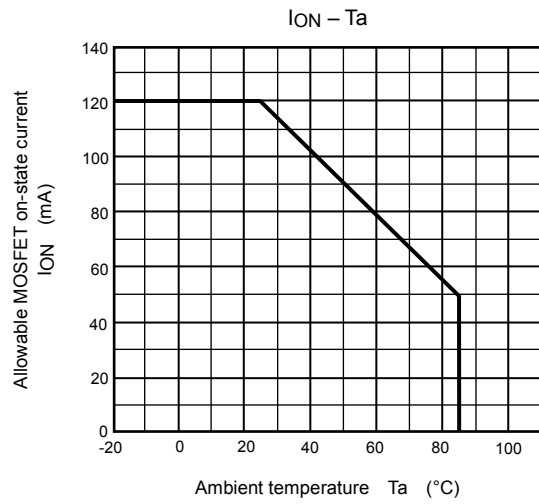
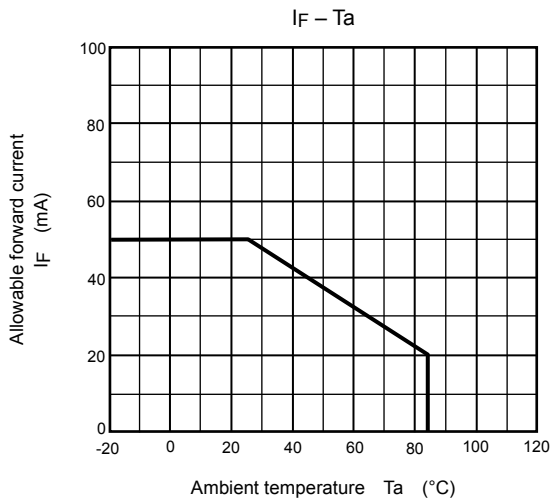
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	$C_S$	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}, \text{R.H.} \leq 60 \%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$B_{VS}$	AC, 60 s	1500	—	—	V <sub>rms</sub>

## Switching Characteristics (Ta = 25°C)

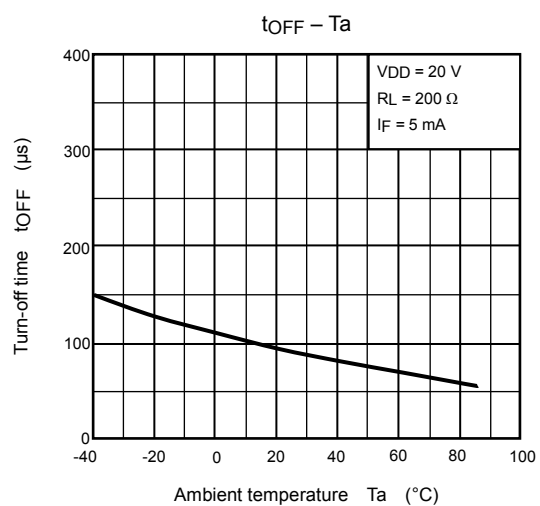
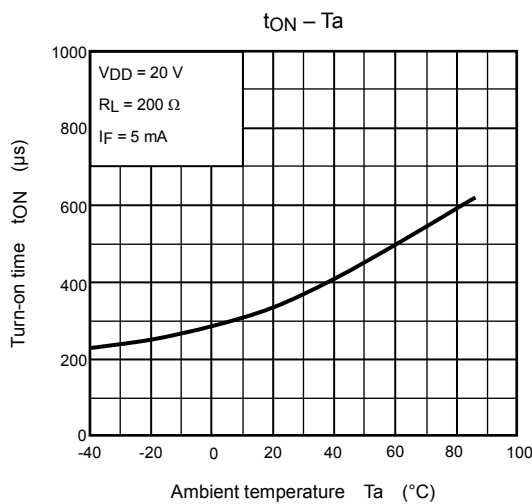
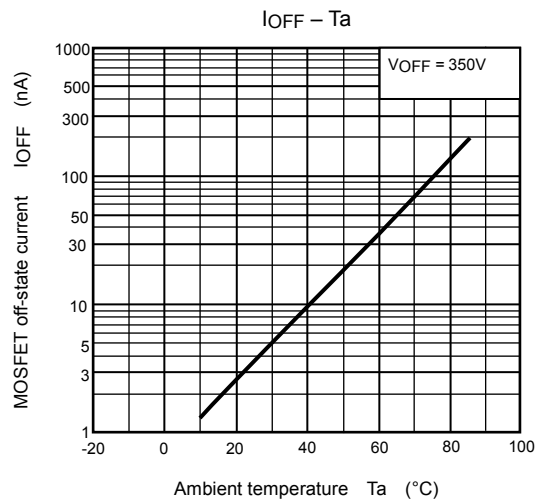
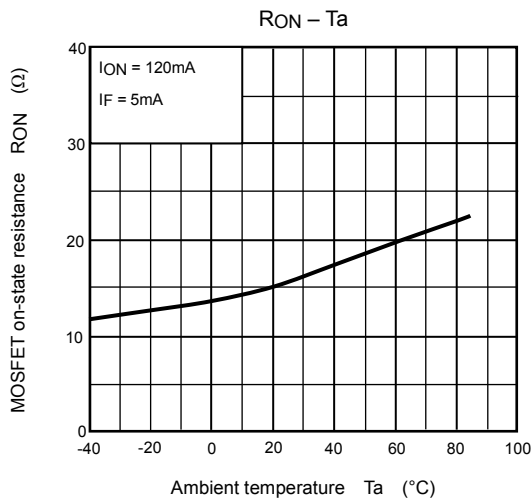
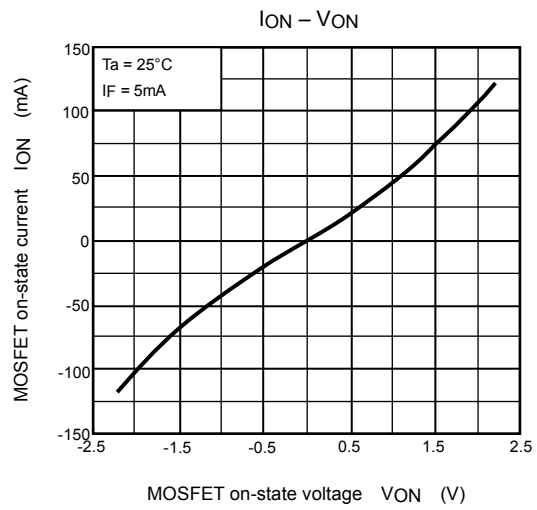
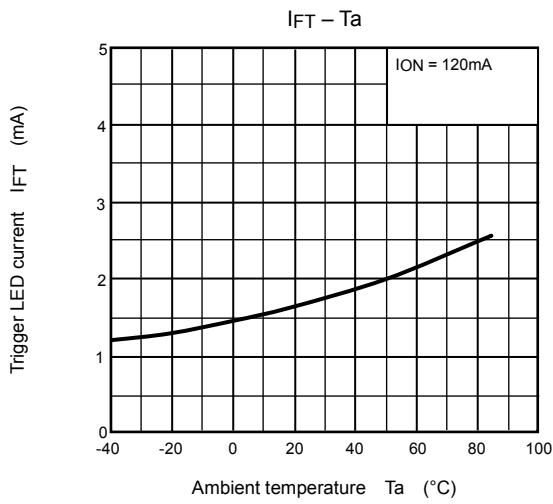
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	$t_{ON}$	$R_L = 200 \Omega$ (Note 2) $V_{DD} = 20 \text{ V}, I_F = 5 \text{ mA}$	—	0.3	1	ms
Turn-off time	$t_{OFF}$		—	0.1	1	

Note 2: Switching time test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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