TOSHIBA Photocoupler GaAs Ired & Photo−MOS FET

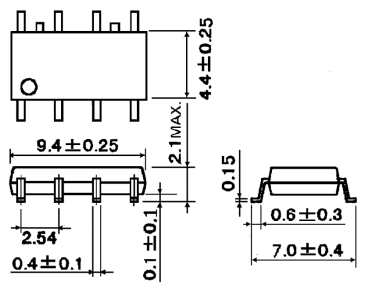
TLP206G

PBX
Modem・FAX Card
Measurement Instrument

The TOSHIBA TLP206G consists of gallium arsenide 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_{rms} (min)
- UL recognized: UL1577, file no. E67349
- BSI approved: BS EN60065: 2002, certificate no.8753
  BS EN60950-1: 2002, certificate no.8754
- SEMKO approved: SS EN60065
  SS EN60950
- Option (V4) type
  TUV approved: DIN EN 60747-5-2,
  certificate No. 40009351

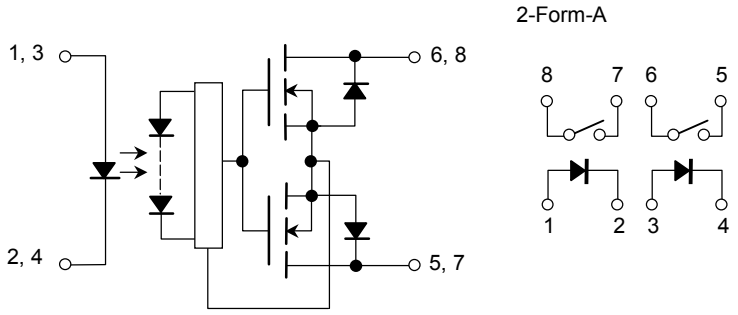
Unit: mm



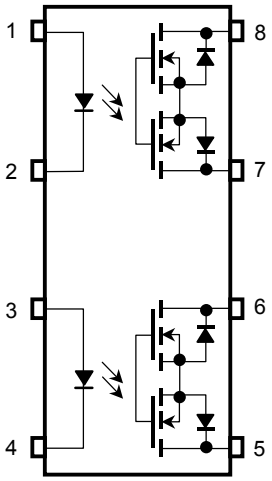
JEDEC	—
JEITA	—
TOSHIBA	

Weight: 0.2 g (typ.)

Schematic



Pin Configuration (top view)



1, 3: Anode
2, 4: Cathpde
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)		ΔI_F / °C	−0.5	mA / °C
	Pulse forward current (100μs pulse, 100pps)		I_{FP}	1	A
	Reverse voltage		V_R	5	V
	Junction temperature		T_j	125	°C
Detector	Off−state output terminal voltage		V_{OFF}	350	V
	On−state current	Both channel (Note 1)	I_{ON}	100	mA
		One channel		120	
	On−state RMS current derating(Ta ≥ 25°C)	Both channel (Note 1)	ΔI_{ON} / °C	−1.0	mA / °C
		One channel		−1.2	
	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, 1 minute, R.H.≤ 60%) (Note 2)			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): Two channels operating simultaneously.

(Note 2): Device considered a two−terminal device: Pins1, 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.

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} = 350 V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1MHz	—	40	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FT}	I_{ON} = 120 mA	—	1	3	mA
On−state resistance	R_{ON}	I_{ON} = 120 mA, I_F = 5 mA	—	22	35	Ω

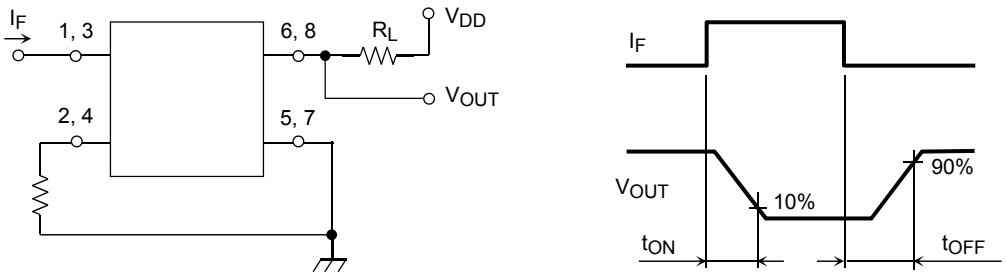
Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0, f = 1 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	—	—	V_{rms}
		AC, 1 second, in oil	—	3000	—	
		DC, 1 minute, in oil	—	3000	—	V_{dc}

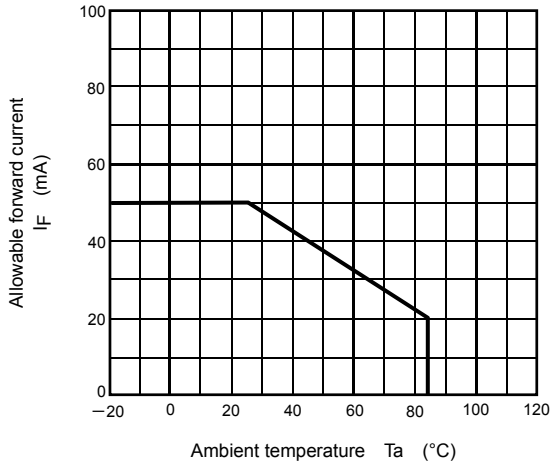
Switching Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn−on time	t_{ON}	R_L = 200Ω (Note 3) V_{DD} = 20 V, I_F = 5 mA	—	0.3	1	ms
Turn−off time	t_{OFF}		—	0.1	1	

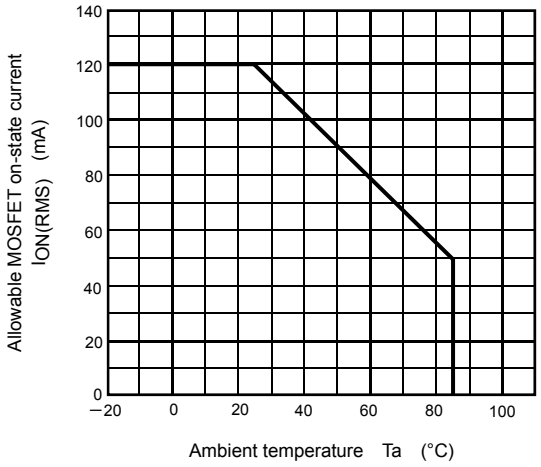
(Note 3): Switching time test circuit



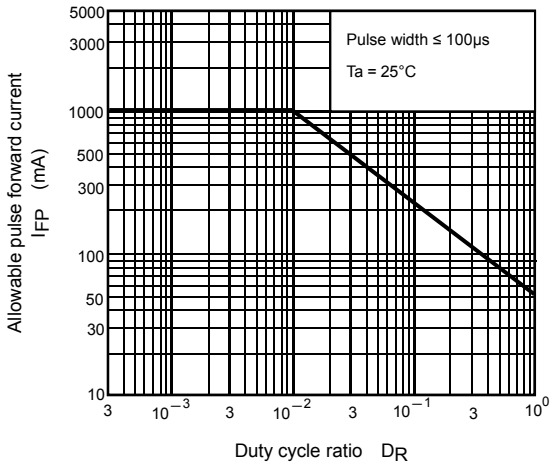
I_F – Ta



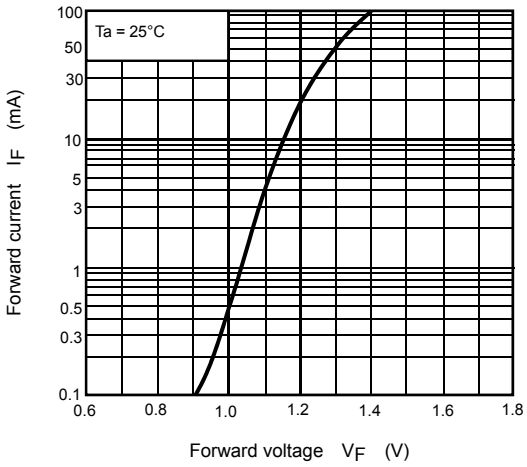
I_{ON} – Ta



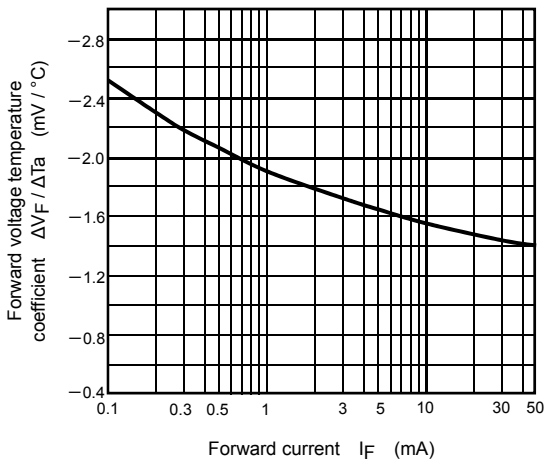
I_{FP} – D_R



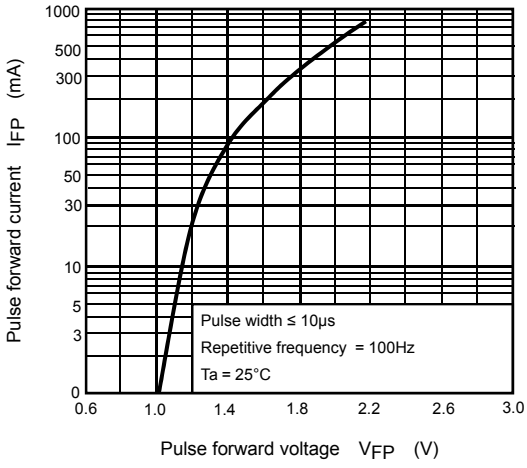
I_F –V_F



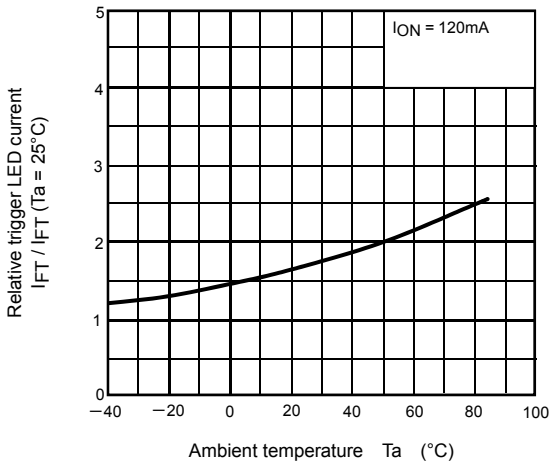
$\Delta V_F / \Delta Ta$ – I_F



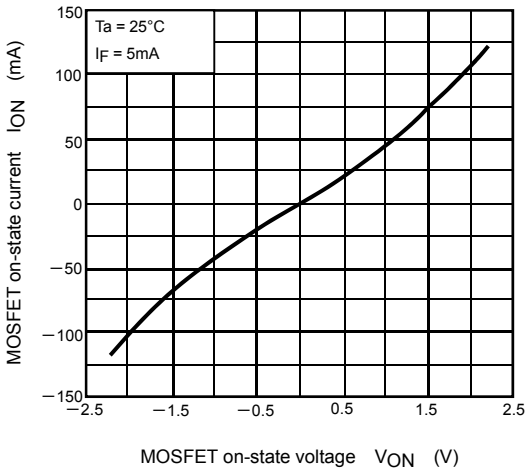
I_{FP} – V_{FP}



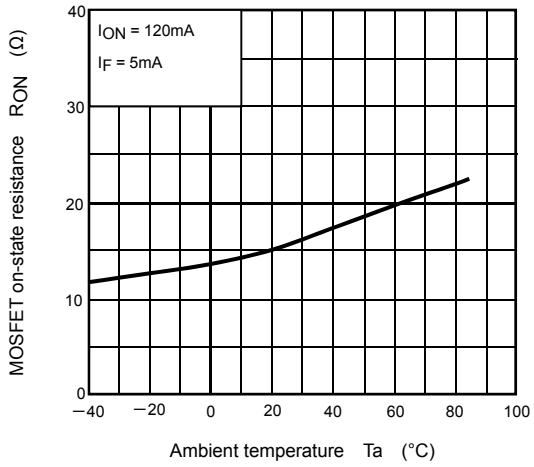
I_{FT} – Ta



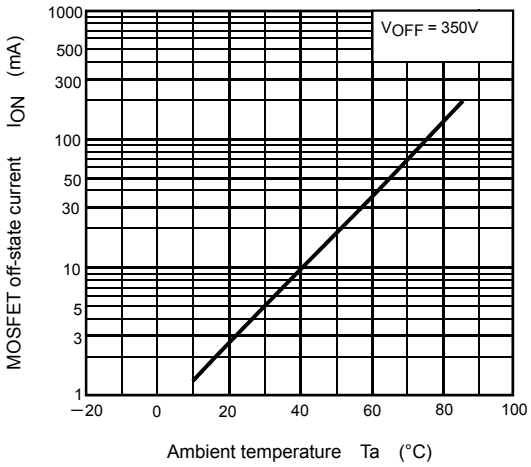
I_{ON} – V_{ON}



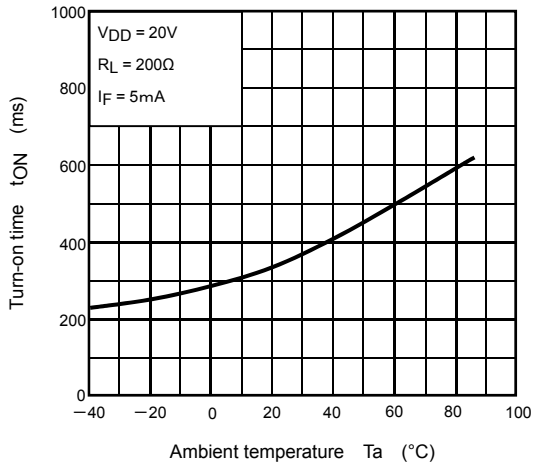
R_{ON} – Ta



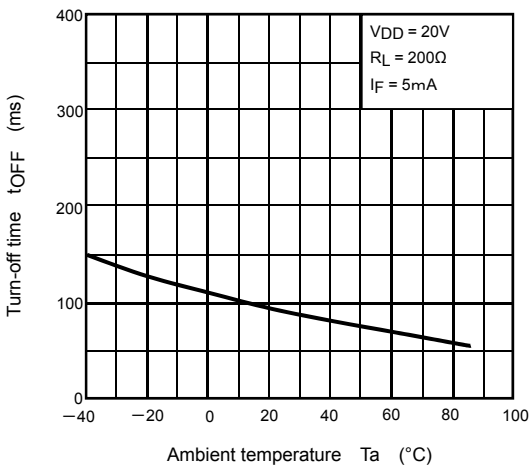
I_{OFF} – Ta



t_{ON} – Ta



t_{OFF} – Ta



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