TOSHIBA Photocoupler Photo Relay

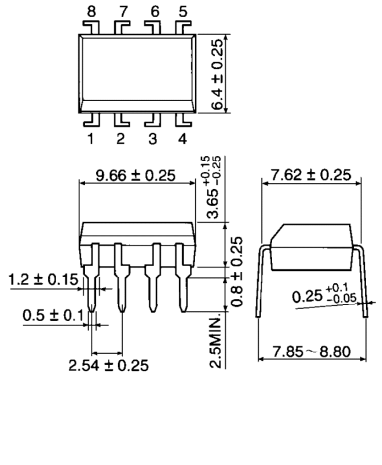
TLP296G

Telecommunication

Data Acquisition

Measurement Instrumentation

Unit in mm



TOSHIBA 11−10C4

Weight: 0.54 g

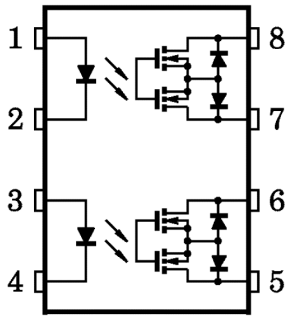
The TOSHIBA TLP296G consists of gallium arsenide infrared emitting diode optically coupled to a photo−MOS FET in a 8 lead DIP package (DIP8).
The TLP296G is a bi−directional switch which can replace mechanical relay in many applications.

- 8 pin DIP (DIP8), 2 channel type (2−form−A)
- Peak off−state voltage: 400 V (min.)
- Trigger LED current: 5 mA (max.)
- On−state current: 100 mA (max.)
- On−state resistance: 30 Ω (max.)
- Isolation voltage: 2500 V_{rms} (min.)
- Trigger LED current (Ta = 25°C)

Classification	Trigger LED Current (mA) @I_{ON} = 100 mA		Marking Of Classification
	Min.	Max.	
(IFT2)	—	2	T2
Standard	—	5	T2, blank

(*): Ex. Rank IFT2: TLP296G (IFT2)

Pin Configuration (top view)



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

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
	Peak forward current (100 μs pulse, 100 pps)			I_{FP}	1	A
	Reverse voltage			V_R	5	V
	Junction temperature			T_j	125	°C
Detector	Off−state output terminal voltage			V_{OFF}	400	V
	On−state current	Both channel	Note 1	I_{ON}	100	mA
		One channel			120	
	On−state 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}	−55~125	°C
Operating temperature range				T_{opr}	−20~85	°C
Lead soldering temperature (10 s)				T_{sol}	260	°C
Isolation voltage (AC, 1 min., R.H.≤ 60%)			Note 2	BV_S	2500	V_{rms}

(Note 1): Two channels operationg simultaneously.

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

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}	—	—	320	V
Forward current	I_F	7.5	15	25	mA
On−state current	I_{ON}	—	—	100	mA
Operating temperature	T_{opr}	−20	—	80	°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} = 400 V	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	—	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ	Max.	Unit
Trigger LED current	I_{FT}	I_{ON} = 100 mA	—	2	5	mA
On−state resistance	R_{ON}	I_{ON} = 100 mA, I_F = 10 mA	—	20	30	Ω

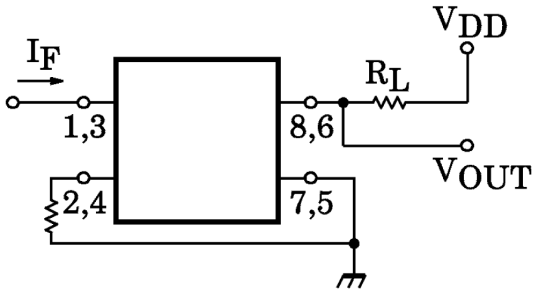
Isolation Characteristics (Ta = 25°C)

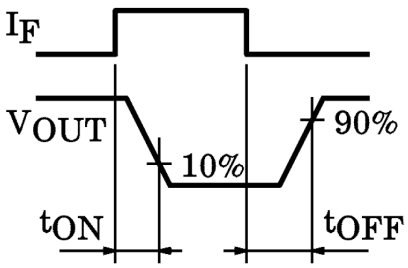
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H.≤ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second (in oil)	—	5000	—	
		DC, 1 minute (in oil)	—	5000	—	Vdc

Switching Characteristics (Ta = 25°C)

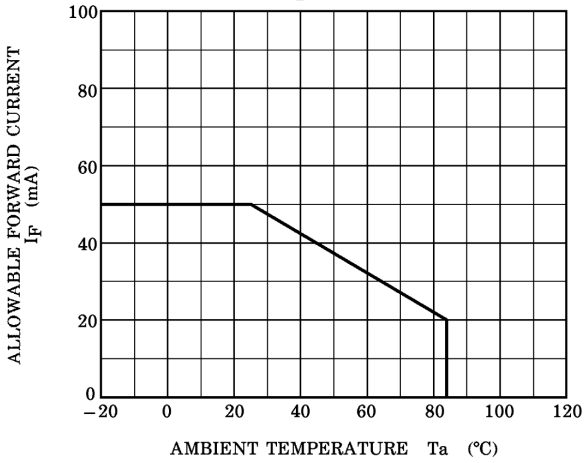
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn−on time	t_{ON}	R_L = 200 Ω (Note 1) V_{DD} = 20 V, I_F = 10 mA	—	—	4	ms
Turn−off time	t_{OFF}		—	—	4	

(Note 1): Switching time test circuit

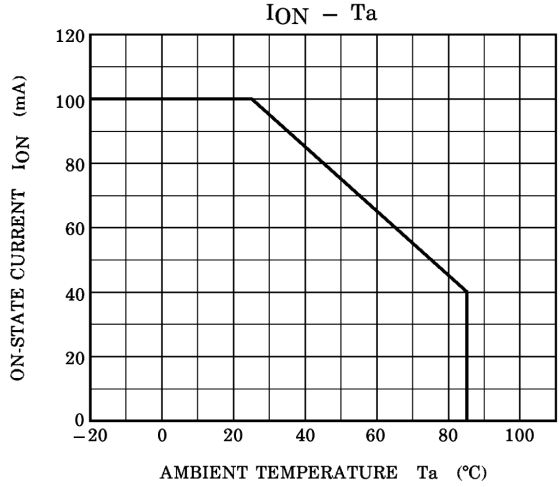




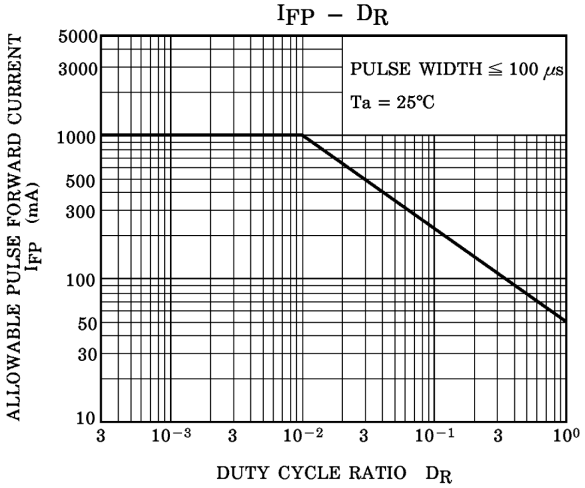
I_F – Ta



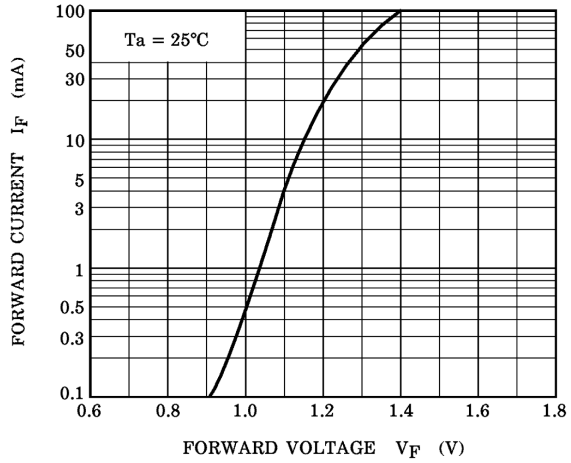
I_{ON} – Ta



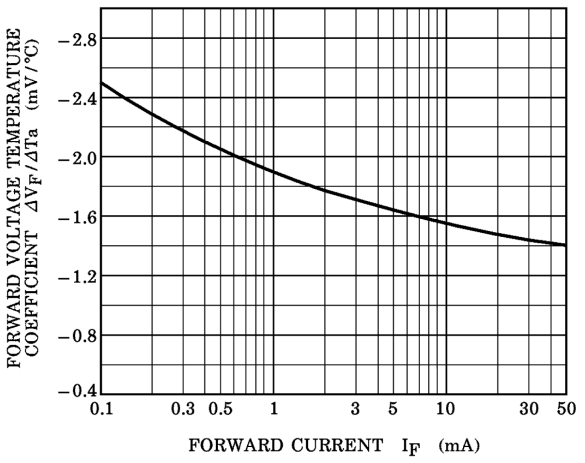
I_{FP} – D_R



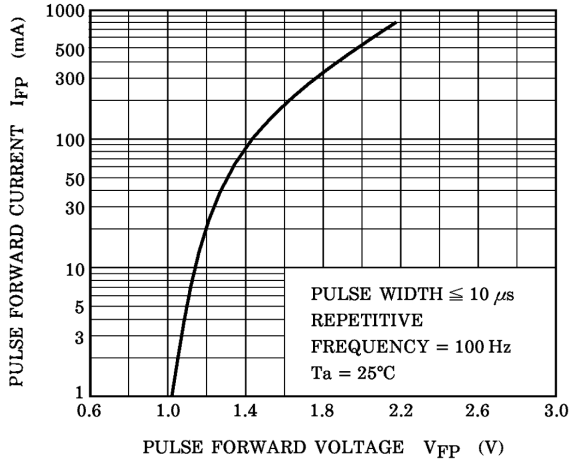
I_F – V_F



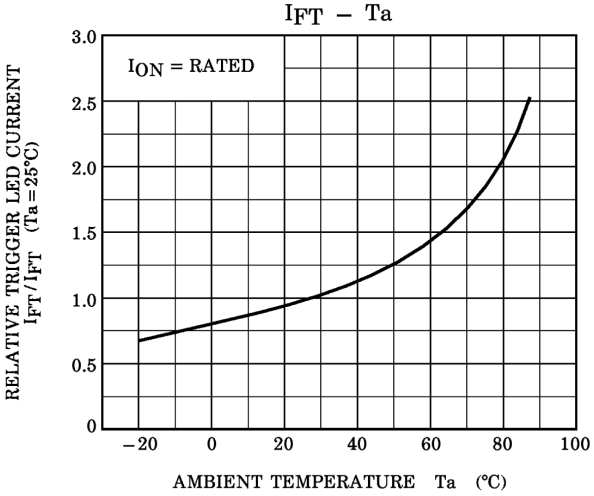
$\Delta V_F / \Delta Ta$ – I_F



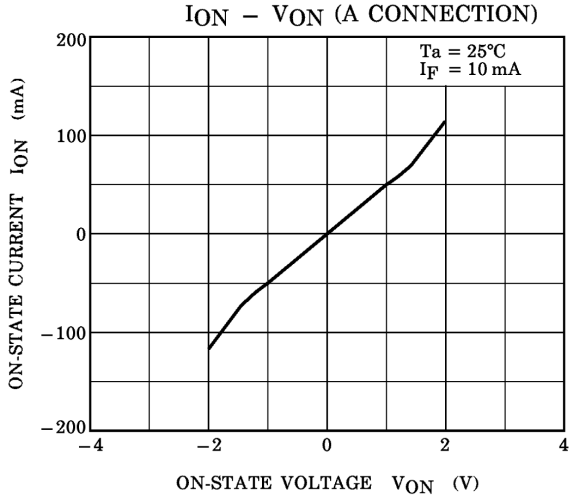
I_{FP} – V_{FP}



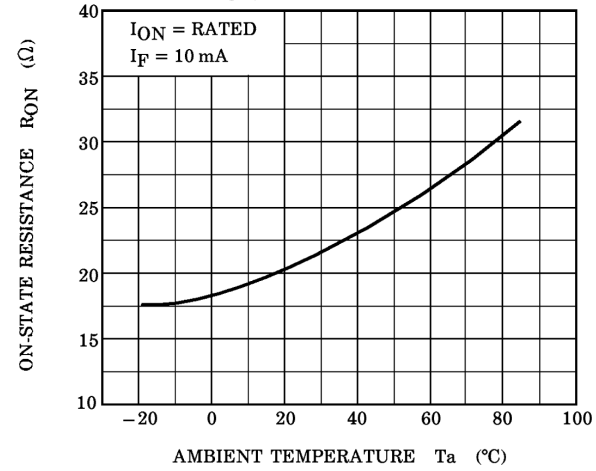
I_{FT} – Ta



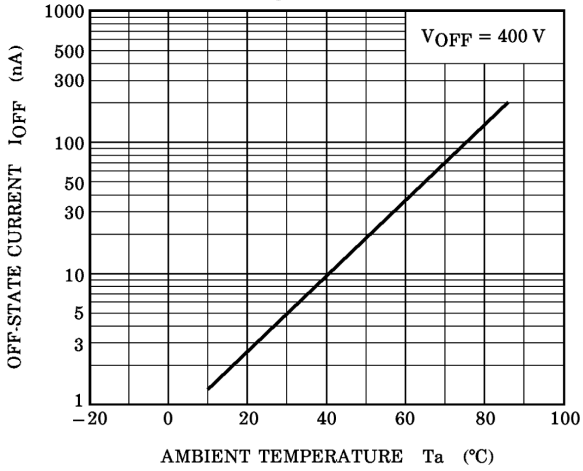
I_{ON} – V_{ON} (A CONNECTION)



R_{ON} – Ta (A CONNECTION)



I_{OFF} – Ta



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