TOSHIBA Photocoupler Photorelay

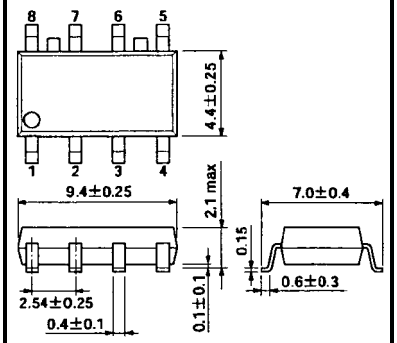
TLP4026G

Telecommunication
Measurement Equipment
Security Equipment
FA

The Toshiba TLP4026G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET and is the 1-form-A/B photorelay with 350-V withstanding voltage.

- Normally closed (1-form-B) device, normally opened (1-form-A) device
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current:120 mA (max)
- On-state resistance: 25 Ω (max)
- Isolation voltage: 1500 Vrms (min)

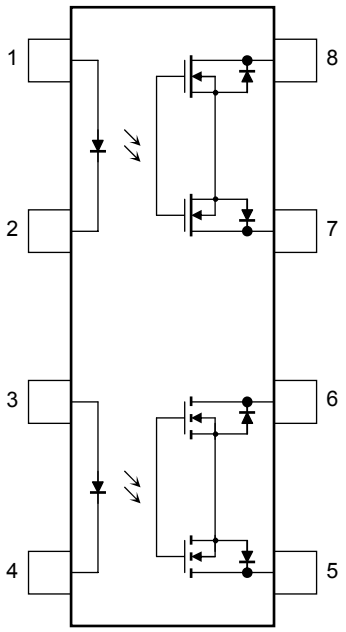
Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	11-10H1

Weight: 0.2 g (typ.)

Pin Configuration (top view)



1: Anode (1b)
2: Cathode (1b)
3: Anode (1a)
4: Cathode (1a)
5: Drain D1 (1a)
6: Drain D2 (1a)
7: Drain D3 (1b)
8: Drain D4 (1b)

Maximum Ratings (Ta = 25°C)

Characteristics			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		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	One channel operation	I_{ON}	120	mA
		Two channel operations (1a1b simultaneous operation)			
	On-state current derating (Ta ≧ 25°C)	One channel operation	ΔI_{ON}/°C	−1.2	mA/°C
		Two channel operations (1a1b simultaneous operation)			
	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 min, R.H. ≦ 60%) (Note 1)			BV_S	1500	Vrms

Note 1: Pins 1, 2, 3 and 4 are shorted together, and pins 5, 6, 7 and 8 are shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{DD}	—	—	280	V
Forward current	I_F	5	—	25	mA
On-state current	I_{ON}	—	—	120	mA
Operating temperature	T_{opr}	−20	—	65	°C

Electrical Characteristics (Ta = 25°C)

Characteristics		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 (1b)	C_{OFF}	V = 0, f = 1 MHz, I_F = 5 mA	—	100	—	pF
	Capacitance (1a)		V = 0, f = 1 MHz, I_F = 0	—	65	—	

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Form	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current		1a	I_{FT}	I_{ON} = 120 mA	—	1	3	mA
		1b	I_{FC}	I_{OFF} = 10 μA				
Return LED current		1a	I_{FC}	I_{OFF} = 10 μA	0.1	—	—	mA
		1b	I_{FT}	I_{ON} = 120 mA				
On-state resistance	(Note 2)	—	R_{ON}	I_{ON} = 120 mA	—	15	25	Ω

Note 2: 1-form-A: I_F = 5 mA, 1-form-B: I_F = 0 mA

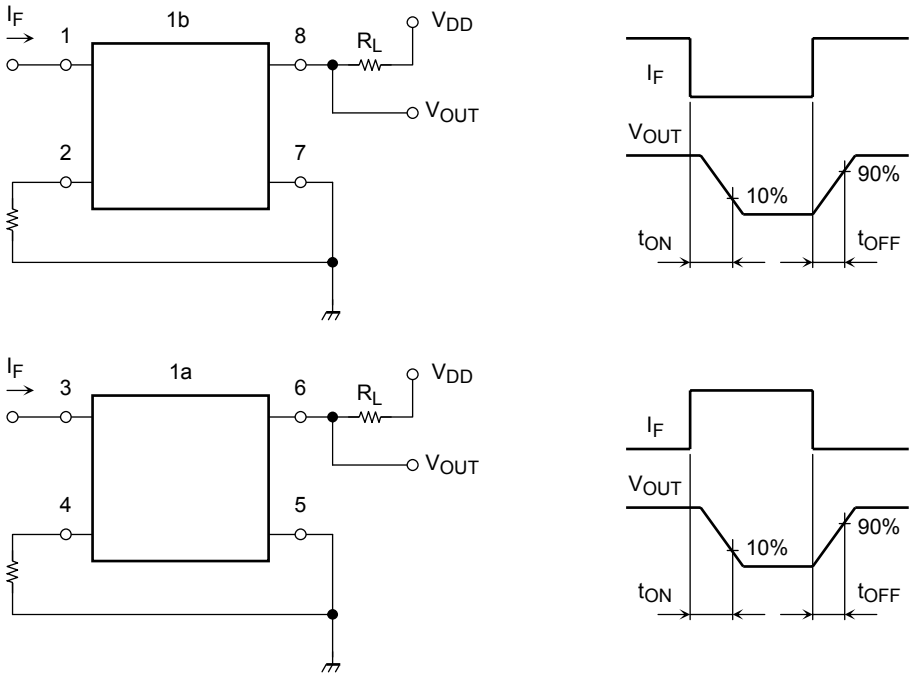
Isolation Characteristics (Ta = 25°C)

Characteristics	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 min	1500	—	—	Vrms
		AC, 1 s, in oil	—	3000	—	
		DC, 1 min, in oil	—	3000	—	Vdc

Switching Characteristics (Ta = 25°C)

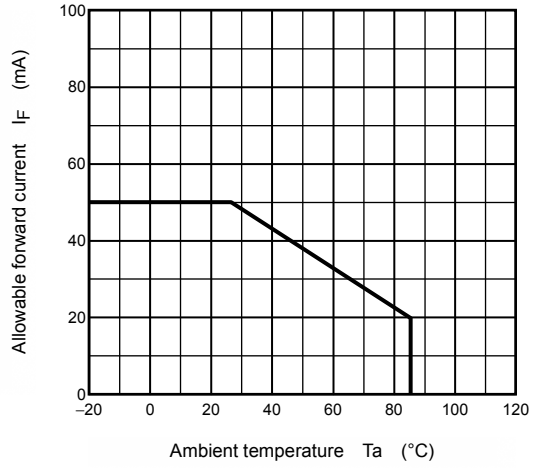
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
1b	Turn-on time	t_{ON}	R_L = 200 Ω, V_{DD} = 20 V, I_F = 5 mA (Note 3)	—	—	1	ms
	Turn-off time	t_{OFF}		—	—	3	
1a	Turn-on time	t_{ON}	R_L = 200 Ω, V_{DD} = 20 V, I_F = 5 mA (Note 3)	—	—	1	ms
	Turn-off time	t_{OFF}		—	—	1	

Note 3: Switching time test circuit

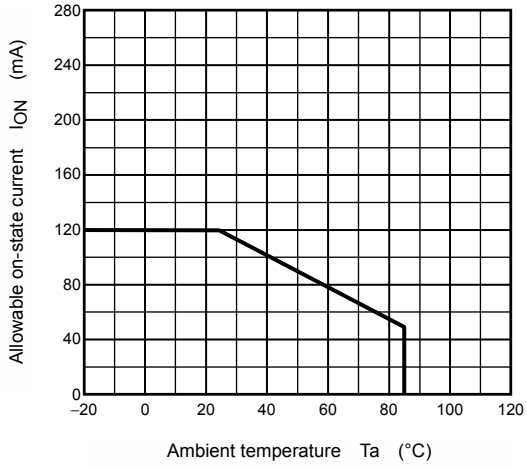


Characteristics curves for 1-form-A/B

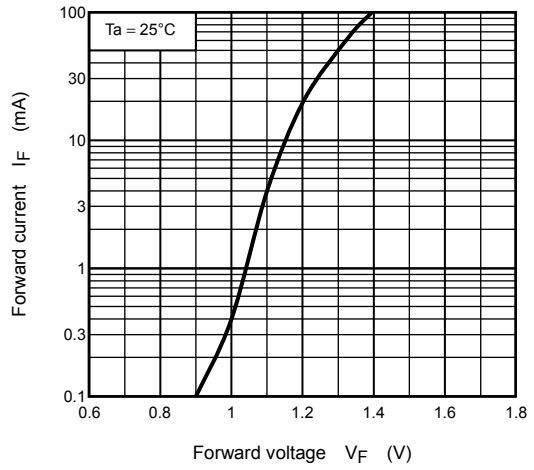
I_F – Ta



I_{ON} – Ta

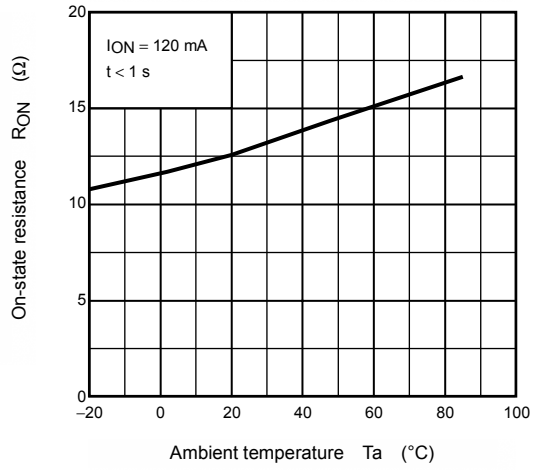


I_F – V_F

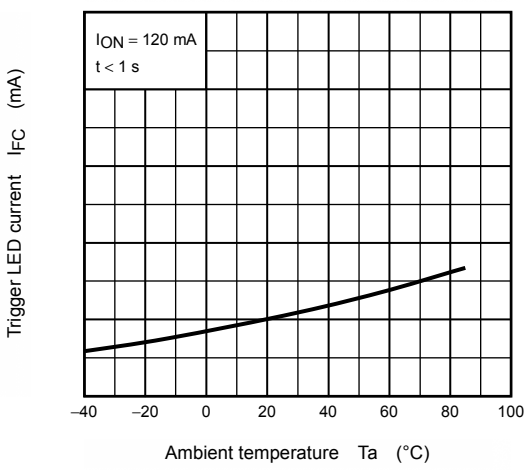


Characteristics curves for 1-form-B

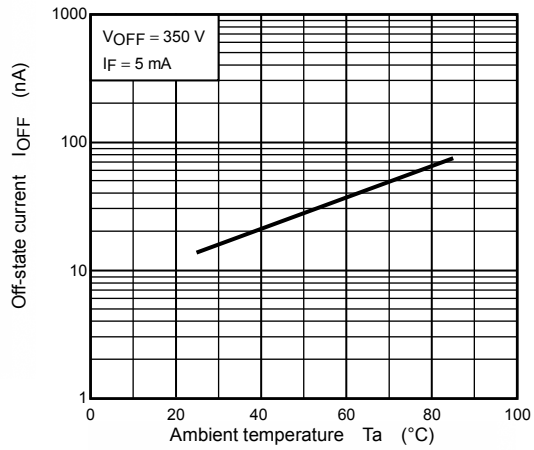
R_{ON} – Ta



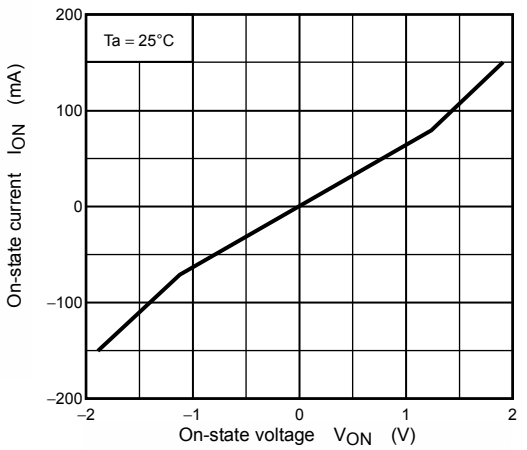
I_{FC} – Ta



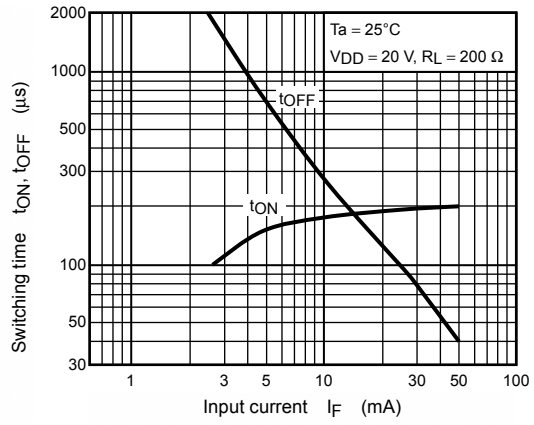
I_{OFF} – Ta



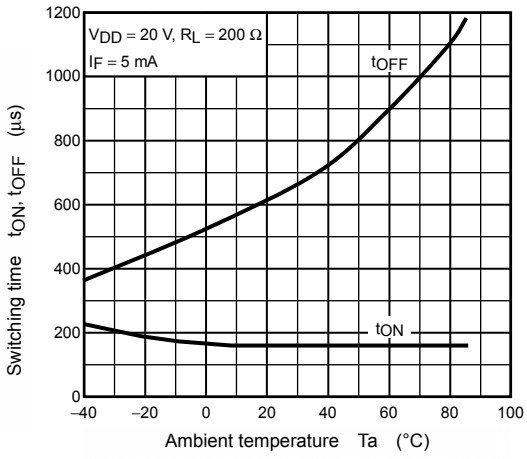
I_{ON} – V_{ON}



t_{ON}, t_{OFF} – I_F

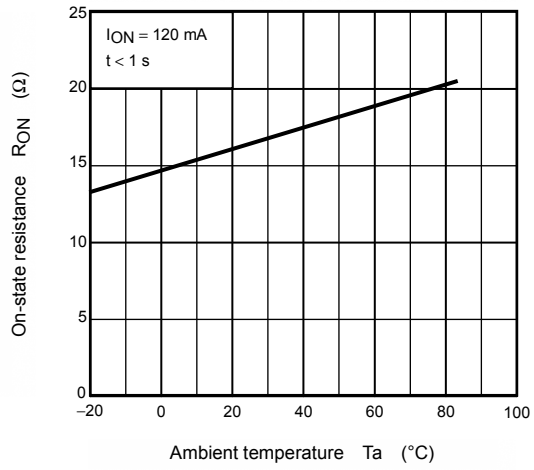


t_{ON}, t_{OFF} – Ta

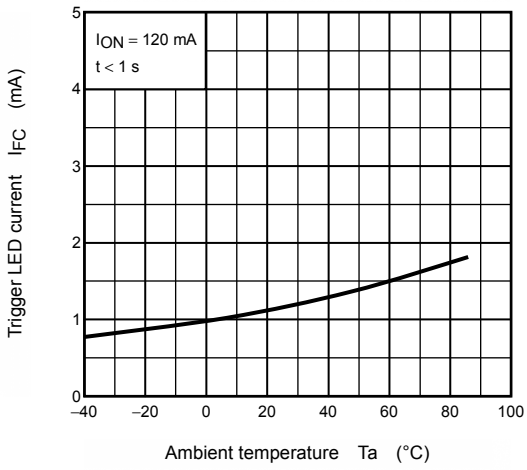


Characteristics curves for 1-form-A

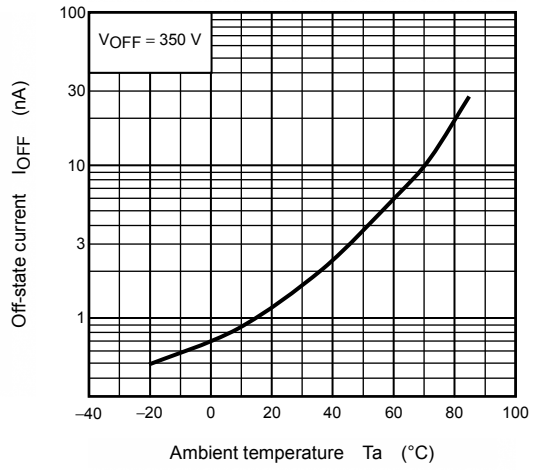
R_{ON} – Ta



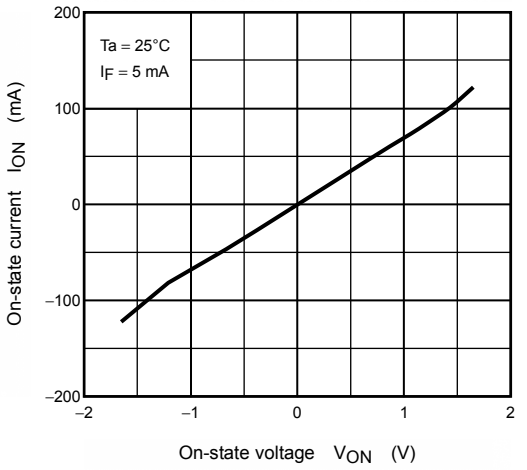
I_{FT} – Ta



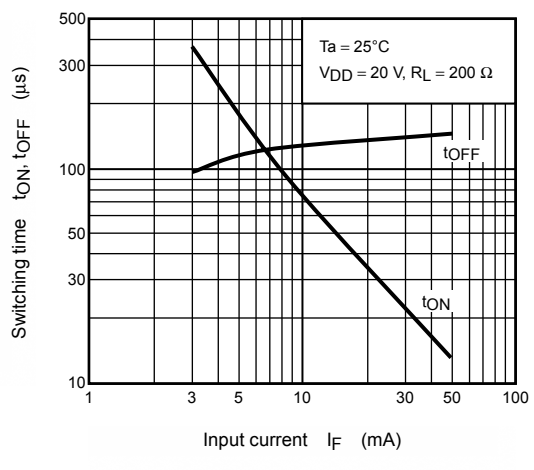
I_{OFF} – Ta



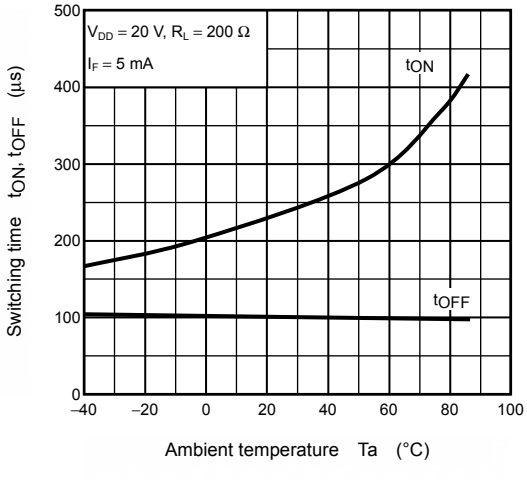
I_{ON} – V_{ON}



t_{ON}, t_{OFF} – I_F



t_{ON}, t_{OFF} – Ta



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