

TOSHIBA Photocoupler Photorelay

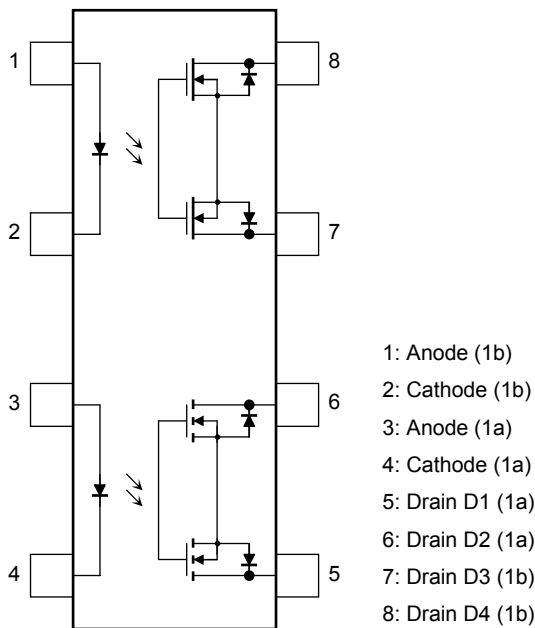
TLP4026G

Telecommunication
Measurement Equipment
Security Equipment
FA

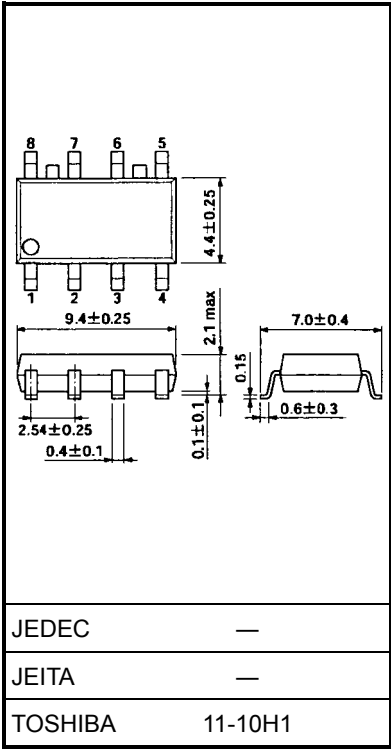
The Toshiba TLP4026G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET and is the 1-form-A/B photorelay with 350-V withstanding voltage.

- 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)

Pin Configuration (top view)



Unit: mm



Weight: 0.2 g (typ.)

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	V _{rms}

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	$I_F = 10\text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5\text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{ MHz}$	—	30	—	pF
Detector	Off-state current	I_{OFF}	$V_{OFF} = 350\text{ V}$	—	—	1	μA
	Capacitance (1b)	C_{OFF}	$V = 0, f = 1\text{ MHz}, I_F = 5\text{ mA}$	—	100	—	pF
	Capacitance (1a)		$V = 0, f = 1\text{ MHz}, I_F = 0$	—	65	—	

Coupled Electrical Characteristics (Ta = 25°C)

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

Note 2: 1-form-A: $I_F = 5 \text{ mA}$, 1-form-B: $I_F = 0 \text{ mA}$

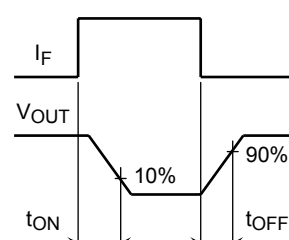
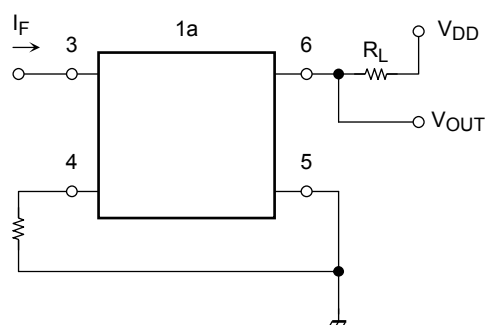
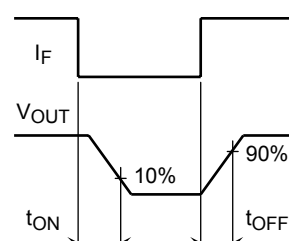
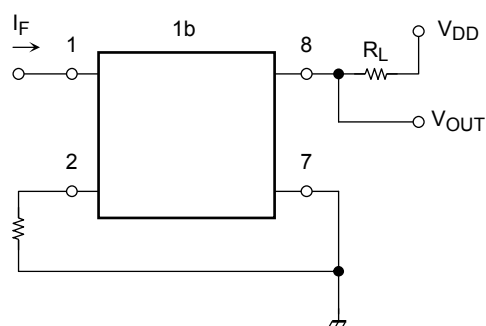
Isolation Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	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

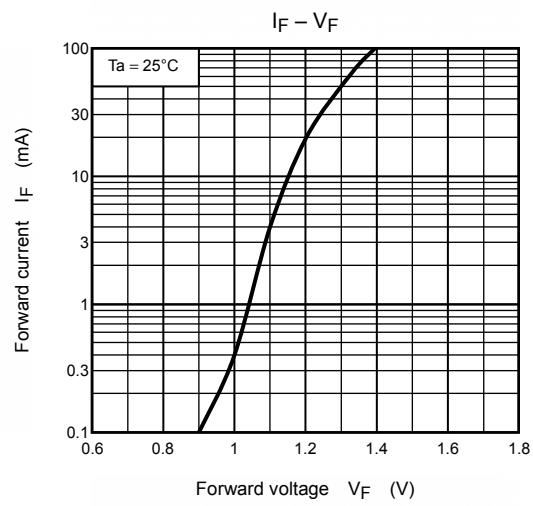
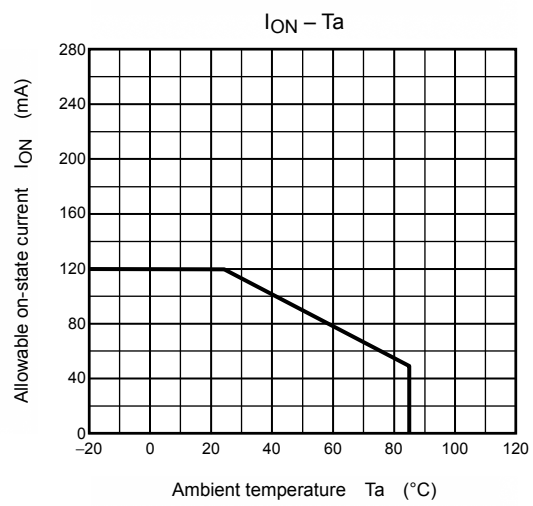
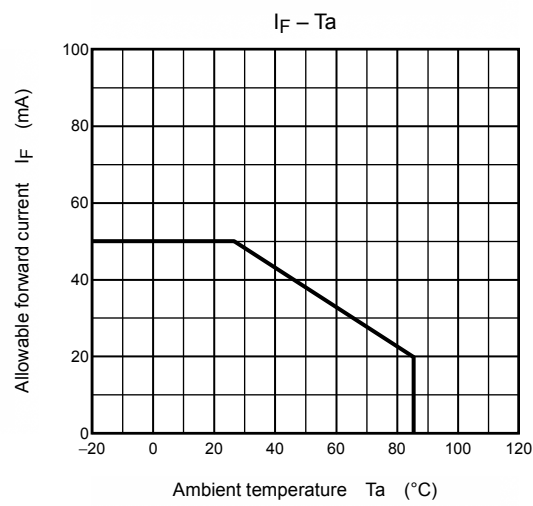
Switching Characteristics (Ta = 25°C)

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

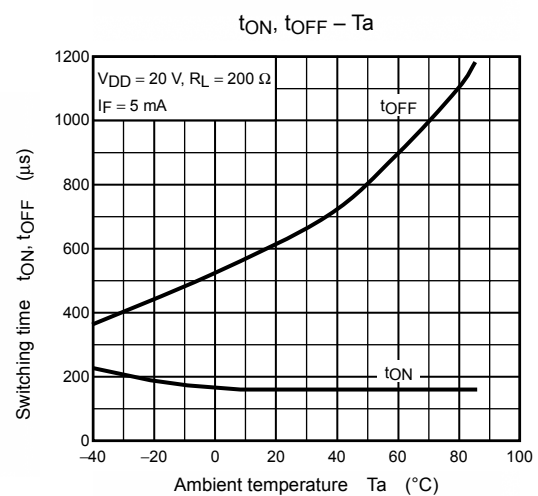
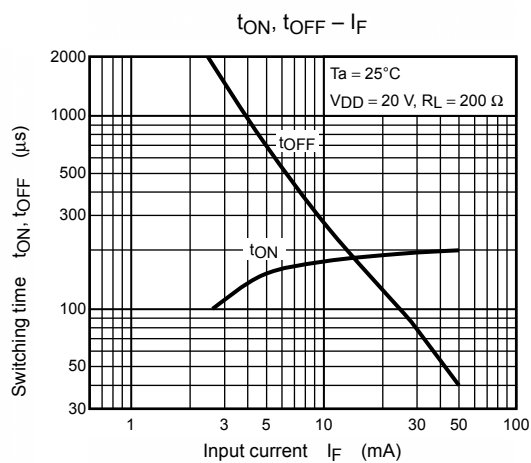
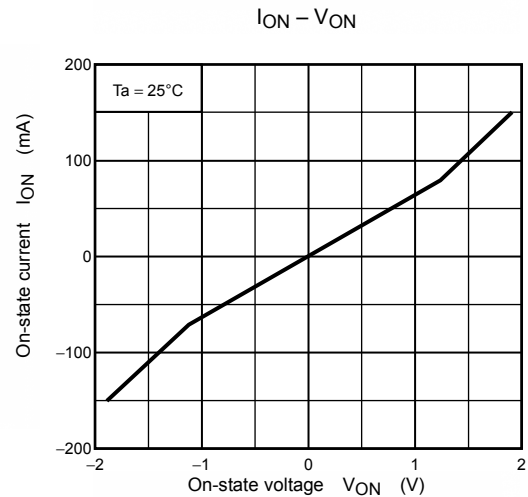
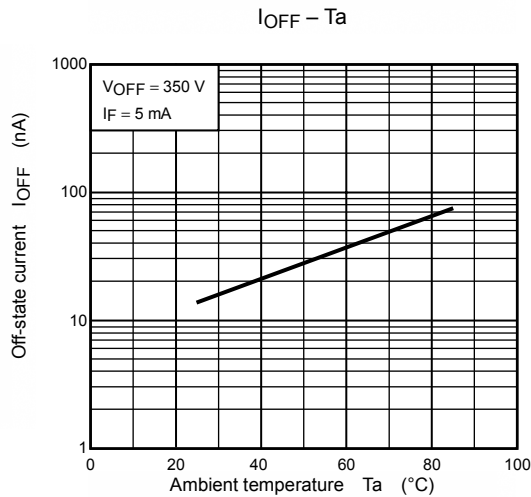
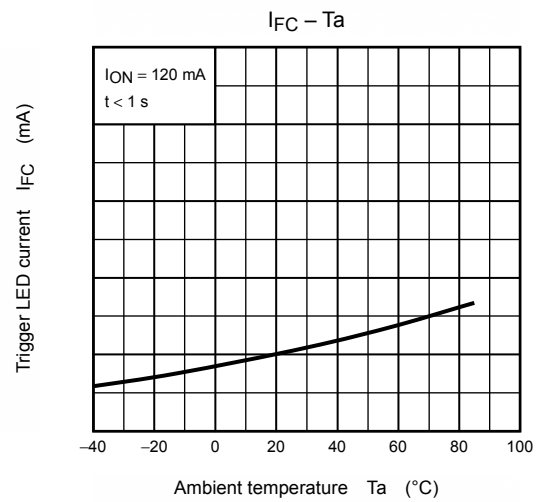
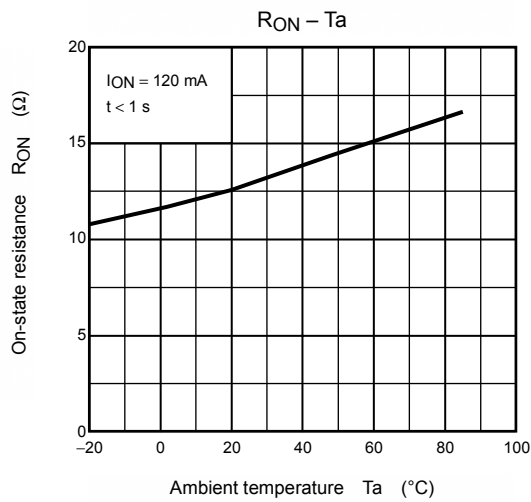
Note 3: Switching time test circuit



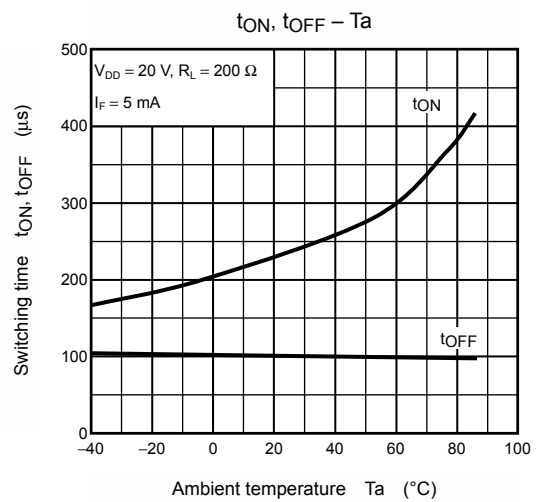
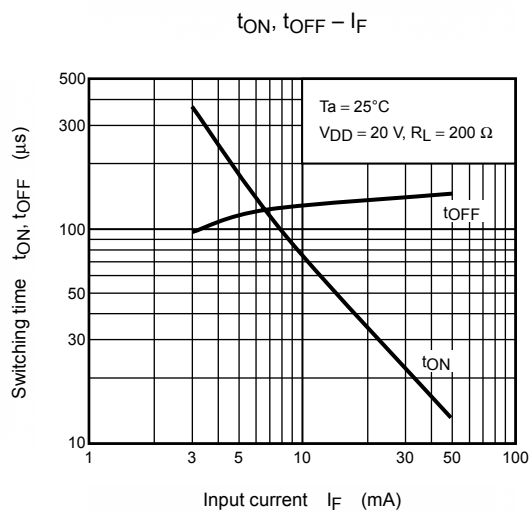
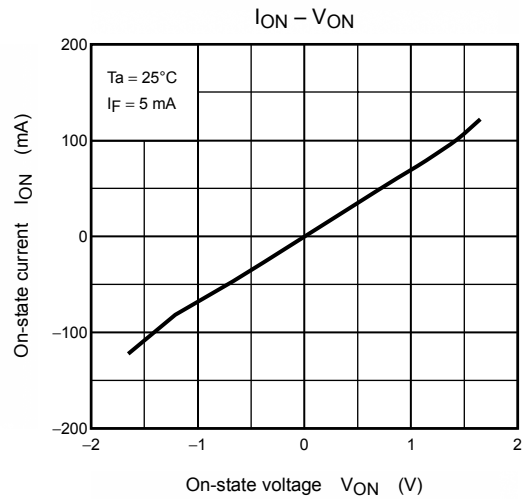
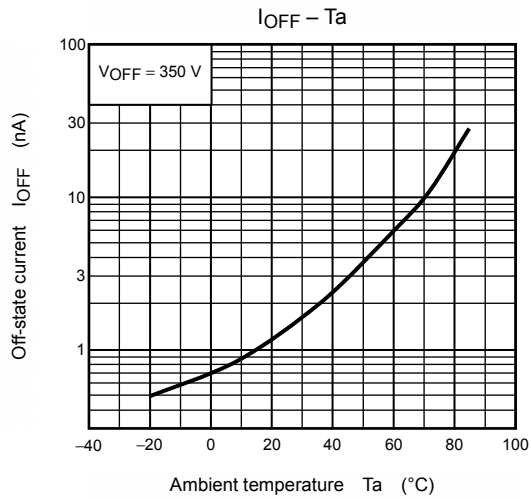
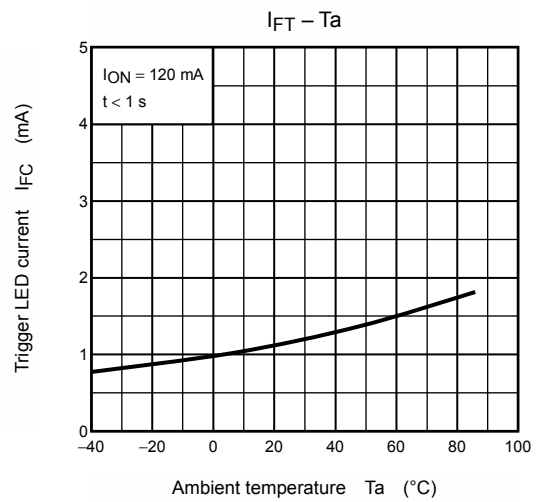
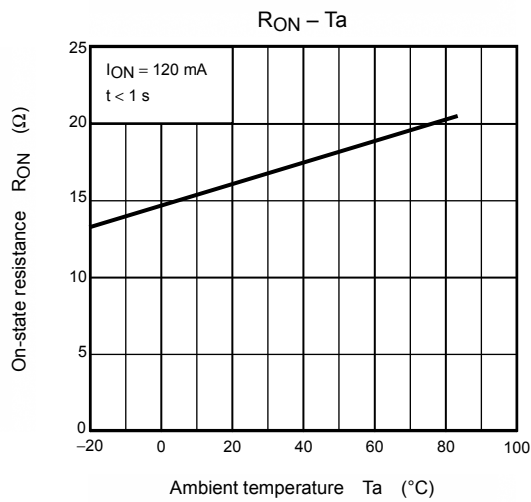
Characteristics curves for 1-form-A/B



Characteristics curves for 1-form-B



Characteristics curves for 1-form-A



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