TOSHIBA Photocoupler Photorelay

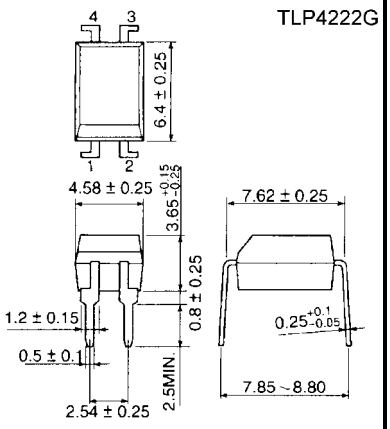
TLP4222G,TLP4222G-2

Telecommunication
Measurement Equipment
Security Equipment
FA

The Toshiba TLP4222G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET and is the normally closed photorelay with 350-V withstanding voltage.

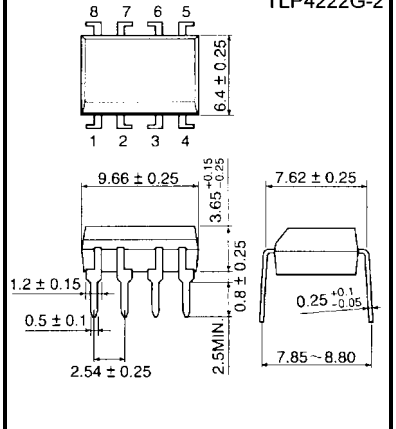
- Normally closed device
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 100 mA (max)
- On-state resistance: 50 Ω (max)
- Isolation voltage: 2500 Vrms (min)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	11-5B2

Weight: 0.26 g (typ.)

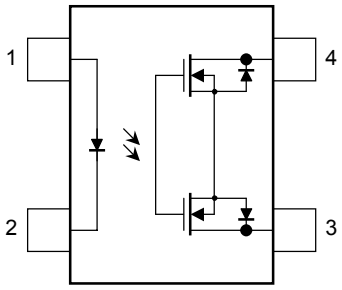


JEDEC	—
JEITA	—
TOSHIBA	11-10C4

Weight: 0.54 g (typ.)

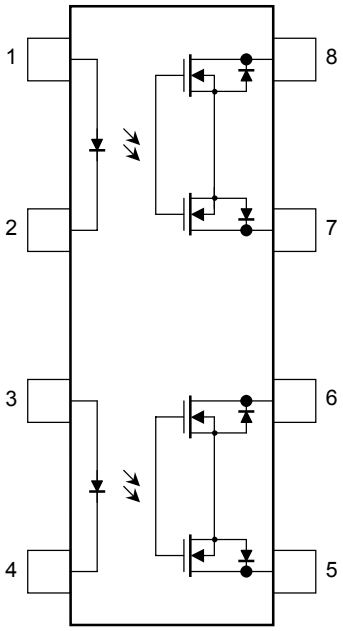
Pin Configuration (top view)

TLP4222G



1: Anode
2: Cathode
3: Drain
4: Drain

TLP4222G-2



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

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 (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}	350	V
	On-state current	TLP4222G		I_{ON}	100	mA
		TLP4222G-2	One channel operation			
			Two channel operations			
	On-state current derating (Ta ≧ 25°C)	TLP4222G		ΔI_{ON}/°C	−1.0	mA/°C
		TLP4222G-2	One channel operation			
			Two channel operations			
	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	2500	Vrms

Note 1: For TLP4222G, Pins 1 and 2 are shorted together, and pins 3 and 4 are shorted together.
For TLP4222G-2, 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}	—	—	100	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, I_F = 5 mA	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz, I_F = 5 mA	—	30	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FC}	I_{OFF} = 10 μA	—	1	3	mA
Return LED current	I_{FT}	I_{ON} = 100 mA	0.1	—	—	mA
On-state resistance	R_{ON}	I_{ON} = 100 mA	—	30	50	Ω

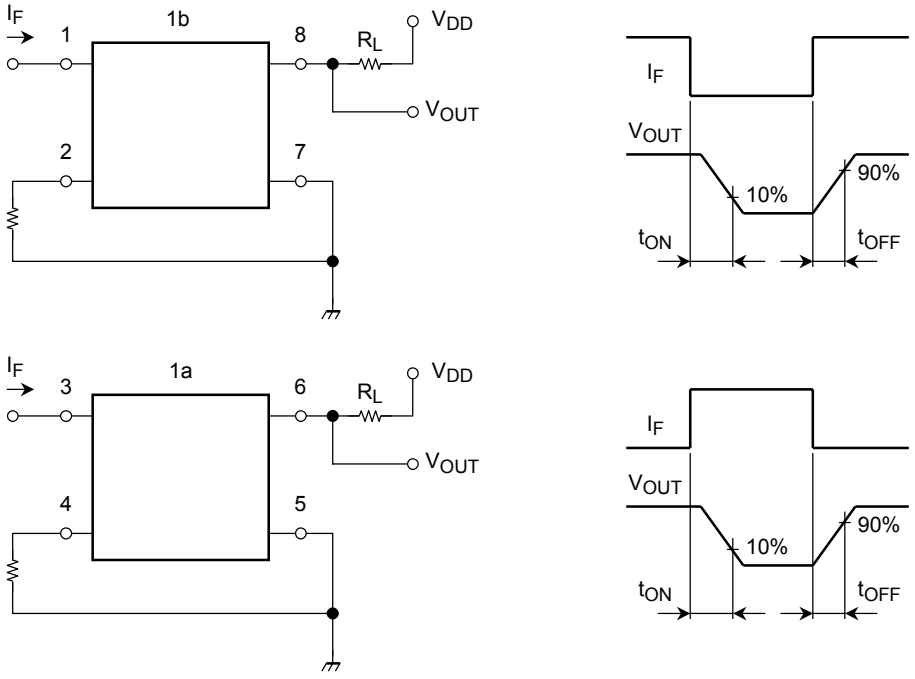
Isolation Characteristics (Ta = 25°C)

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	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	Vdc

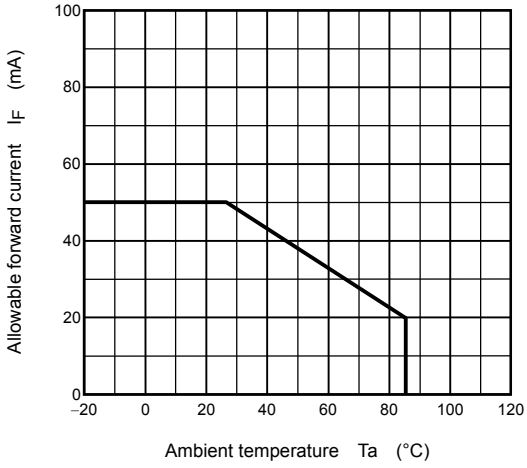
Switching Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	R_L = 200 Ω V_{DD} = 20 V, I_F = 5 mA (Note 2)	—	0.25	0.5	ms
Turn-off time	t_{OFF}		—	0.5	1	ms

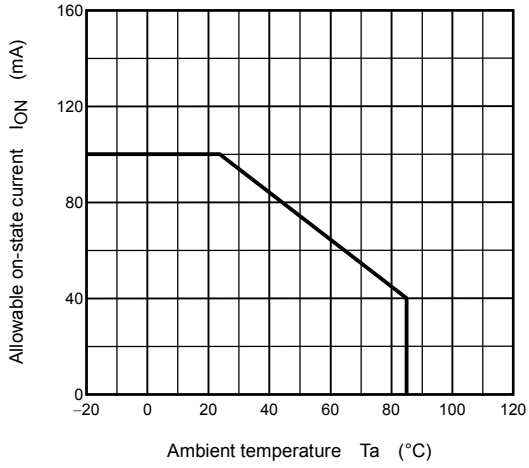
Note 2: Switching time test circuit



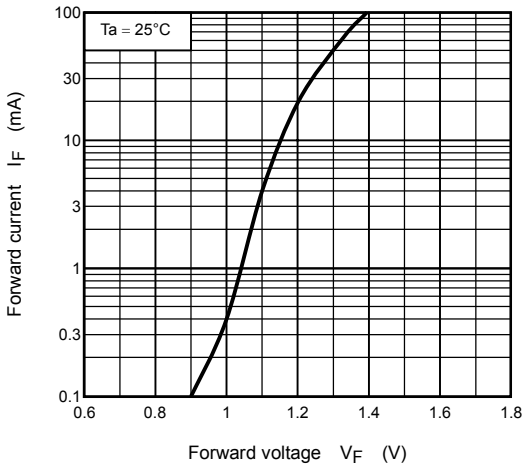
I_F – Ta



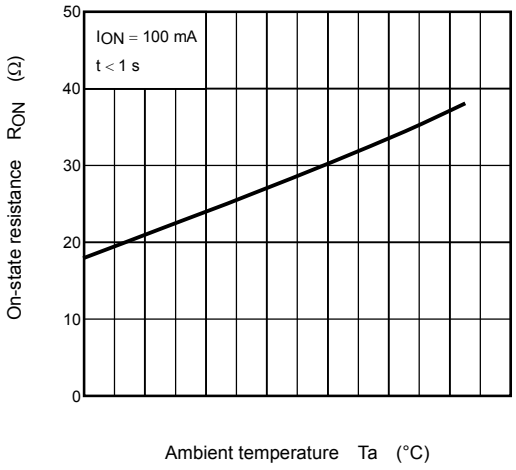
I_{ON} – Ta



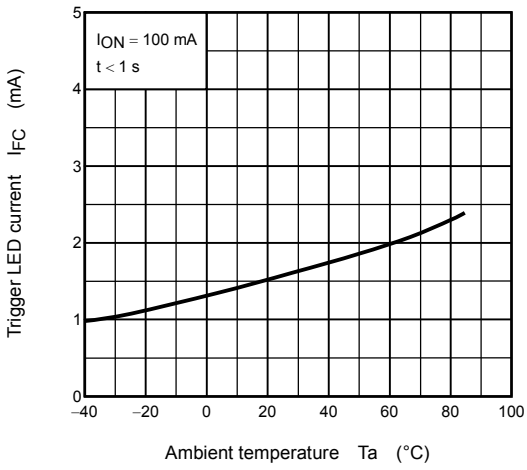
I_F – V_F



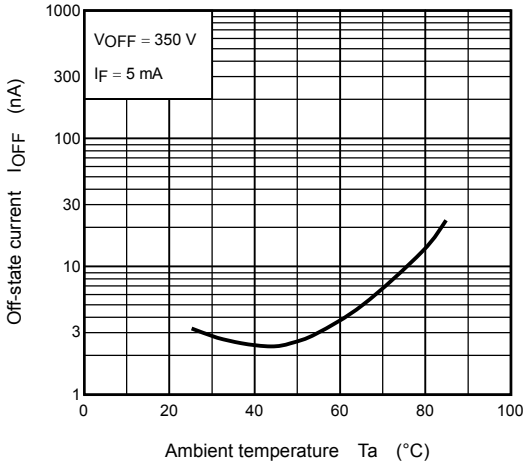
R_{ON} – Ta



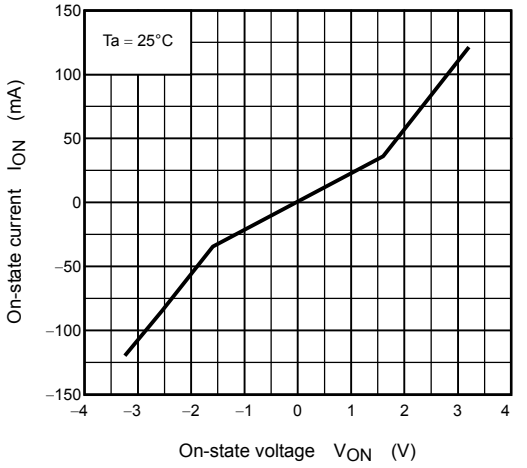
I_{FC} – Ta



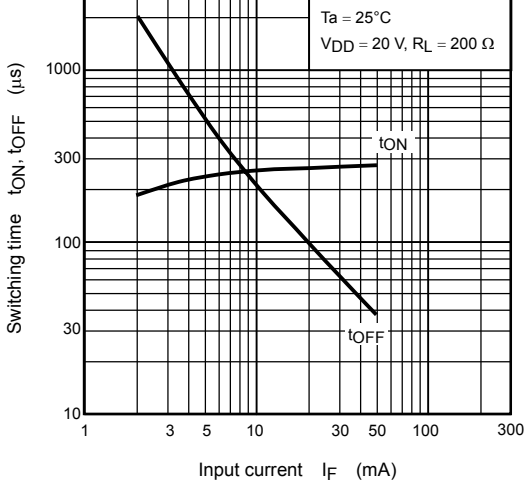
I_{OFF} – Ta



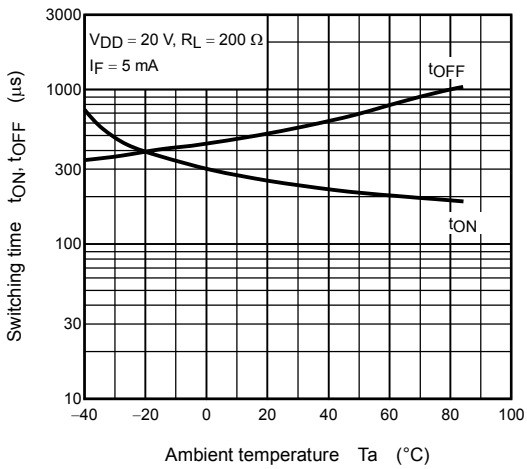
I_{ON} – V_{ON}



t_{ON}, t_{OFF} – I_F



t_{ON}, t_{OFF} – Ta



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