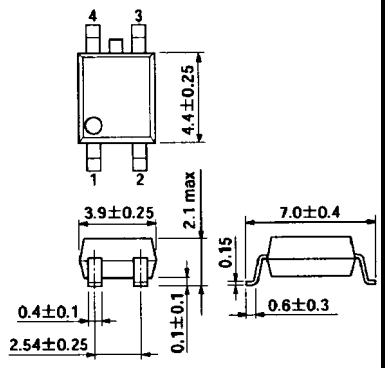
TOSHIBA Photocoupler Photorelay

TLP192G

PC Card Modems
PBX
STB (Set Top Boxes)
Measurement Equipment

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	11-7C1

Weight: 0.2 g (typ.)

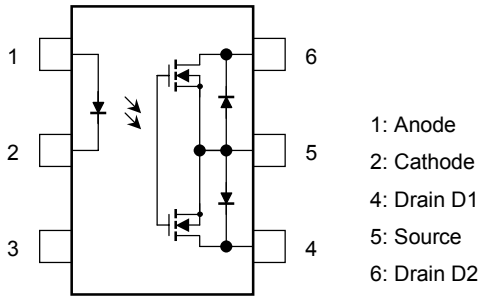
The Toshiba TLP192G consists of a gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a 6-pin SOP package.

This photorelay has a characteristic of high-withstanding voltage between output pins which enables TLP192G to be applied in hook relays and dial-pulse for modems and facsimiles.

Moreover, the TLP192G is used for PCMCIA-compliant card modems because the maximum mounted height of SOP package is as small as 2.1 mm.

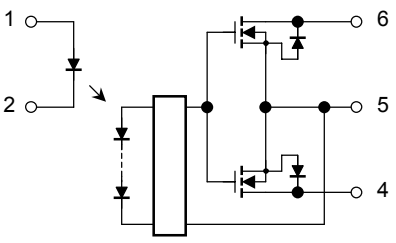
- 6-pin SOP (2.54SOP4): Height = 2.1 mm, Pitch = 2.54 mm
- Normally open (1-form-A) device
- Peak Off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 110 mA (max)
- On-state resistance: 35 Ω (max, t < 1 s)
- On-state resistance: 50 Ω (max, continuous)
- Isolation voltage: 1500 Vrms (min)
- UL recognized: UL1557, File No.E67349

Pin Configuration (top view)



1: Anode
2: Cathode
4: Drain D1
5: Source
6: Drain D2

Schematic



Maximum Rating (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
	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	I_{ON}	110	mA
	Forward current derating (Ta ≧ 25°C)	ΔI_{ON}/°C	−1.1	mA/°C
	Junction temperature	T_j	125	°C
Storage temperature range		T_{stg}	−55~125	°C
Operating temperature range		T_{opr}	−40~85	°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: LED pins are shorted together. Detector pins are also shorted together.

Recommended Operating Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{DD}	—	—	280	V
Forward current	I_F	5	10	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	—	—	1	μA
	Capacitance	C_{OFF}	V = 0, f = 1 MHz	—	30	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current		I_{FT}	I_{ON} = 110 mA	—	1	3	mA
Return LED current		I_{FC}	I_{OFF} = 100 μA	0.1	—	—	mA
On-state resistance	A connection	R_{ON}	I_{ON} = 110 mA, I_F = 5 mA, t < 1 s	—	25	35	Ω
			I_{ON} = 110 mA, I_F = 5 mA		35	50	
	B connection		I_{ON} = 110 mA, I_F = 5 mA		28	40	
	C connection		I_{ON} = 220 mA, I_F = 5 mA	—	14	20	

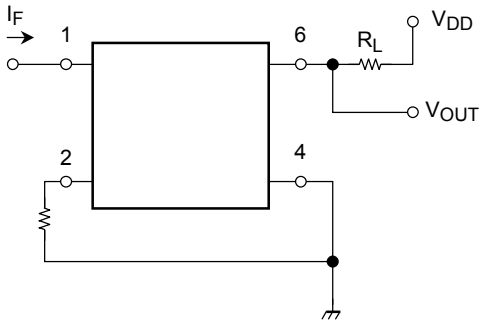
Switching Characteristics (Ta = 25°C)

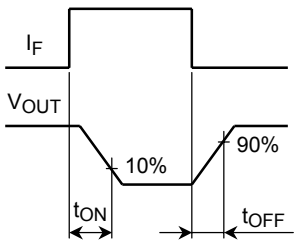
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 min	1500	—	—	Vrms
		AC, 1 s, in oil	—	3000	—	
		DC, 1 min, in oil	—	3000	—	Vdc

Switching Characteristics (Ta = 25°C)

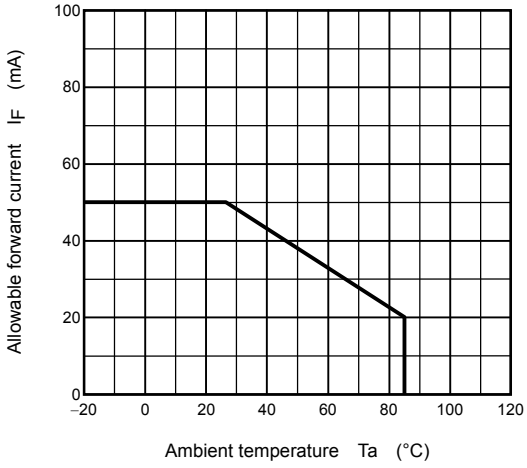
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	R_L = 200 Ω V_{DD} = 20 V, I_F = 5 mA (Note 2)	—	0.3	1	ms
Turn-off time	t_{OFF}		—	0.1	1	

Note 2: Switching time test circuit

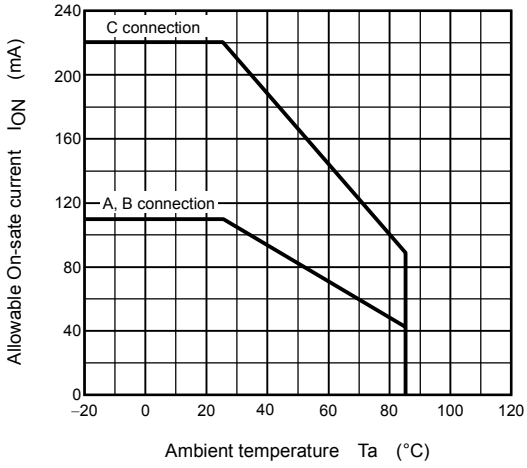




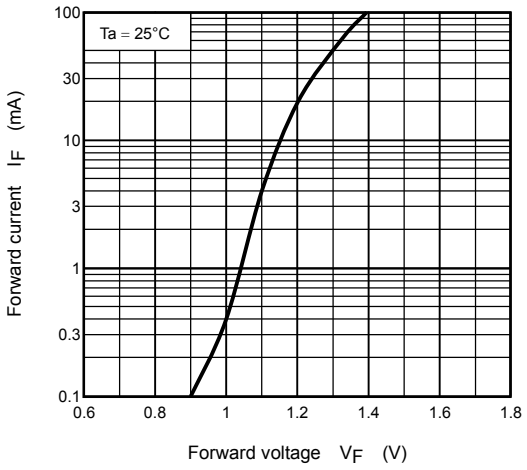
I_F – Ta



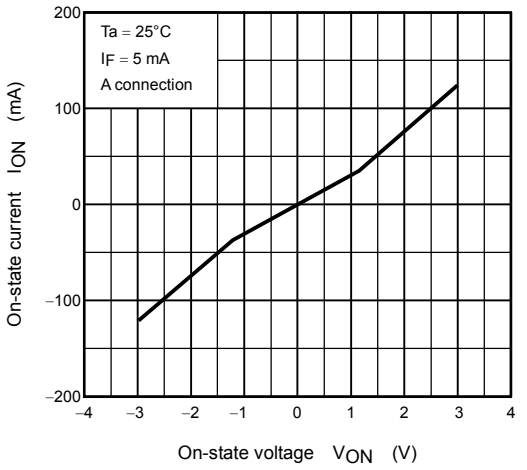
I_{ON} – Ta



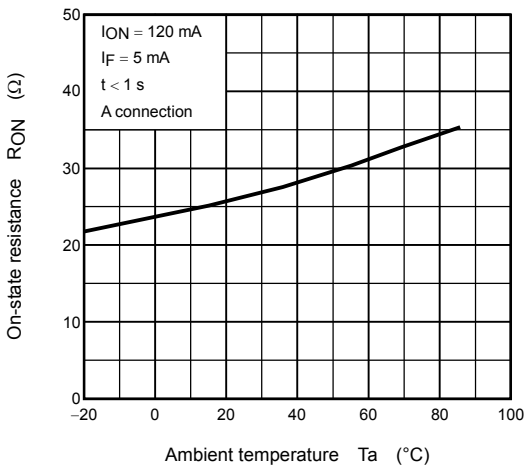
I_F – V_F



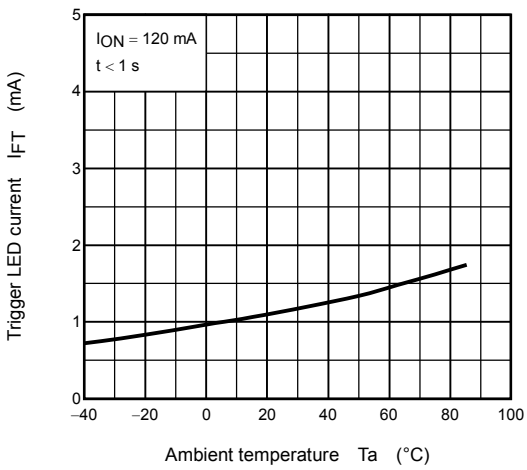
I_{ON} – V_{ON}



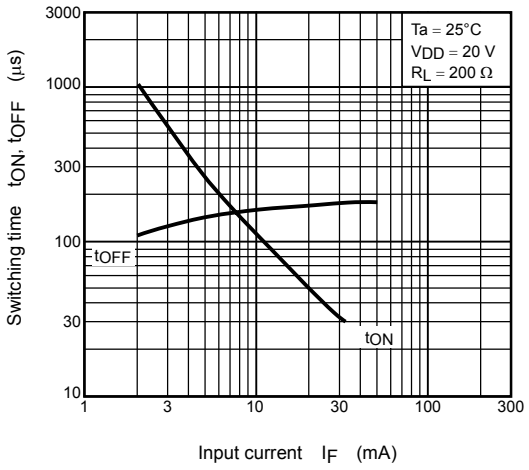
R_{ON} – Ta



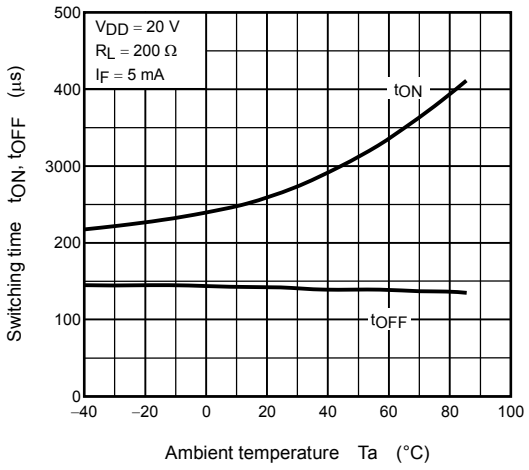
I_{FT} – Ta



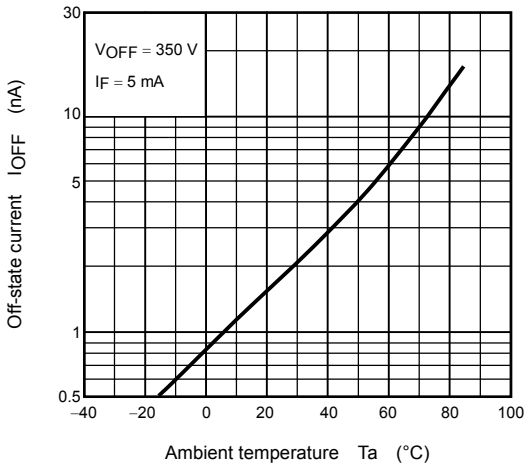
t_{ON}, t_{OFF} – I_F



t_{ON}, t_{OFF} – Ta



I_{OFF} – Ta



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