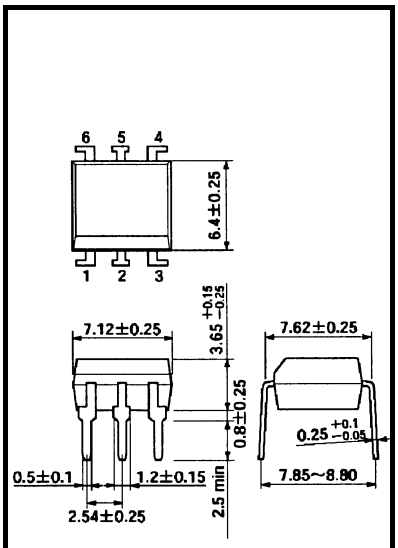
TOSHIBA Photocoupler Photorelay

TLP4592G

Telecommunication
Measurement Equipment
Security Equipment
FA

Unit: mm



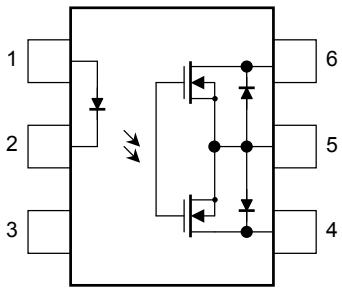
JEDEC	—
JEITA	—
TOSHIBA	11-7A8

Weight: 0.4 g (typ.)

The Toshiba TLP4592G consists of an aluminum gallium arsenide infrared emitting diode optically coupled to a photo-MOSFET in a DIP package.

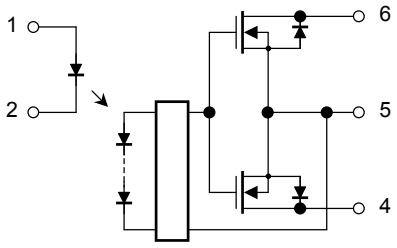
- 6-pin DIP (DIP6)
- Normally closed (1-form-B) device
- Peak off-state voltage: 350 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 100 mA (max)
- On-state resistance: 50 Ω (max)
- Isolation voltage: 2500 Vrms (min)
- UL Recognized: UL1577, File No. E67349

Pin Configuration (top view)



1: アノード
2: カソード
4: ドレインD1
5: ソース
6: ドレインD2

Schematic



Maximum Ratings (Ta = 25°C)

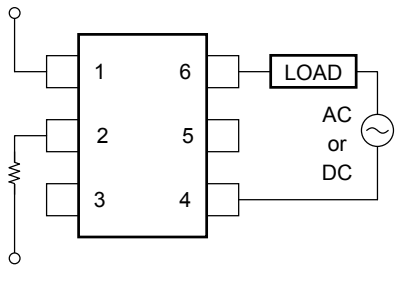
Characteristics			Symbol	Rating	Unit
LED	Forward current		I_F	50	mA
	Forward current derating (Ta ≧ 25°C)		ΔI_F/°C	−0.5	mA/°C
	Peak forward current (100 μs pulse, 100 pps)		I_{FP}	1	A
	Reverse voltage		V_R	5	V
	Junction temperature		T_j	125	°C
Detector	Off-state output terminal voltage		V_{OFF}	350	V
	On-state current	A connection	I_{ON}	100	mA
		B connection		100	
		C connection		200	
	On-state current derating (Ta ≧ 25°C)	A connection	ΔI_{ON}/°C	−1.0	mA/°C
		B connection		−1.0	
		C connection		−2.0	
	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: Pins 1, 2 and 3 are shorted together, and pins 4, 5 and 6 are shorted together.

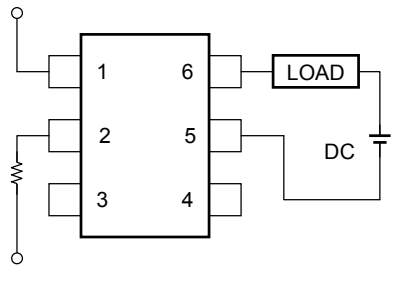
Recommended Operating Conditions

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

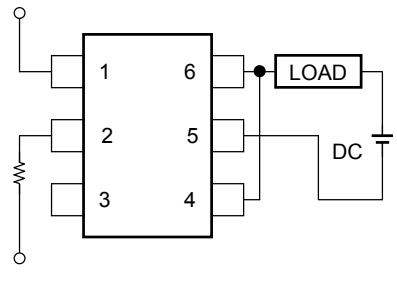
Circuit Connections



A connection



B connection



C connection

Electrical Characteristics (Ta = 25°C)

	Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	I_F = 20 mA	1.0	1.15	1.3	V
LED	Reverse current	I_R	V_R = 5 V	—	—	10	μA
LED	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
Detector	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	A connection	R_{ON}	I_{ON} = 100 mA	—	27	50	Ω
	B connection		I_{ON} = 100 mA	—	20	43	
	C connection		I_{ON} = 200 mA	—	10	—	

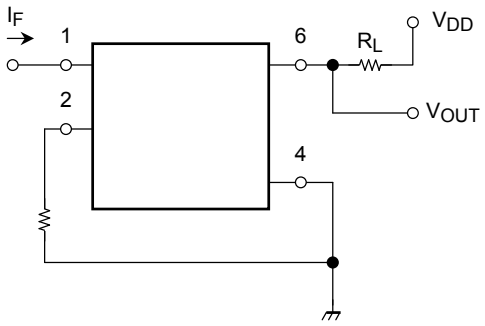
Isolation Characteristics (Ta = 25°C)

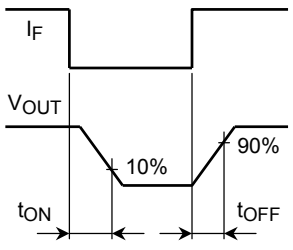
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Capacitance input to output	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≦ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 min	2500	—	—	Vrms
		AC, 1 s, in oil	—	5000	—	
		DC, 1 min, in oil	—	5000	—	Vdc

Switching Characteristics (Ta = 25°C)

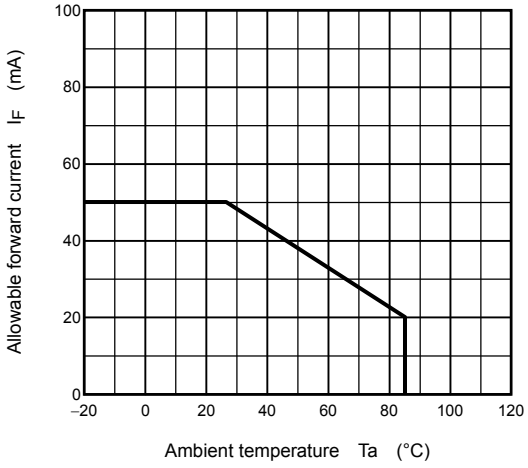
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Turn-on time	t_{ON}	R_L = 200 Ω V_{DD} = 20 V, I_F = 5 mA (Note 2)	—	0.25	0.5	ms
Turn-off time	t_{OFF}		—	0.5	1	ms

Note 2: Switching time test circuit

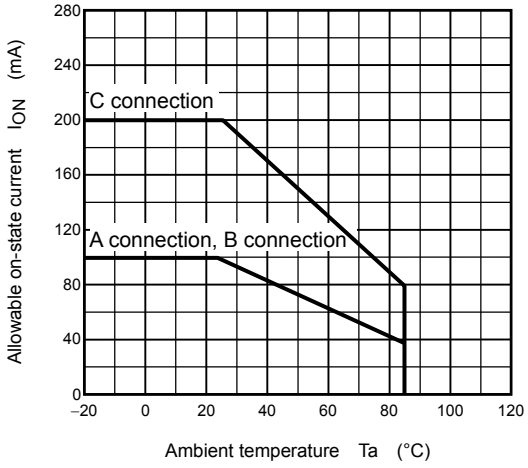




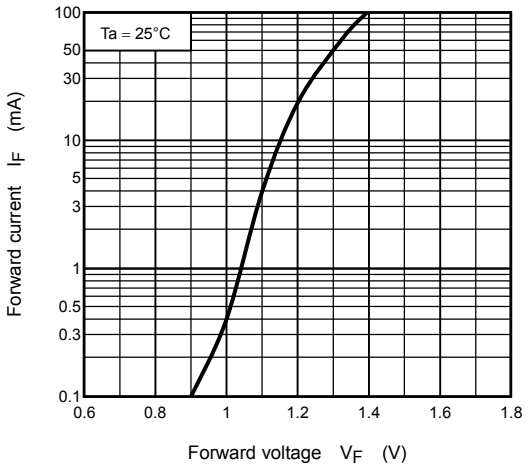
I_F – Ta



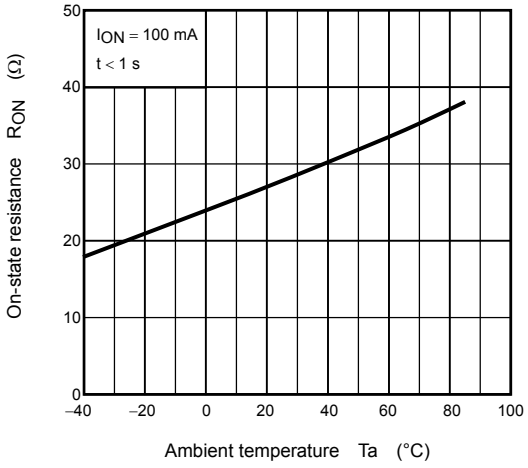
I_{ON} – Ta



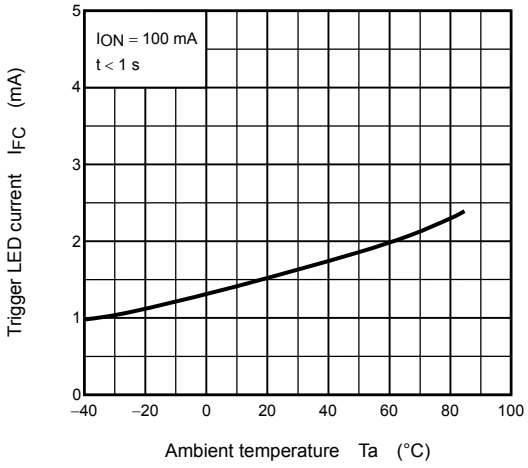
I_F – V_F



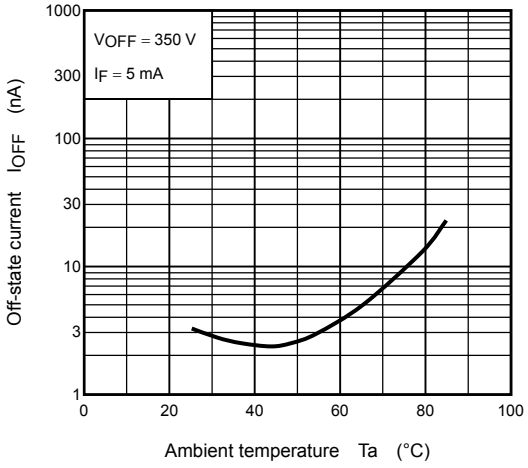
R_{ON} – Ta



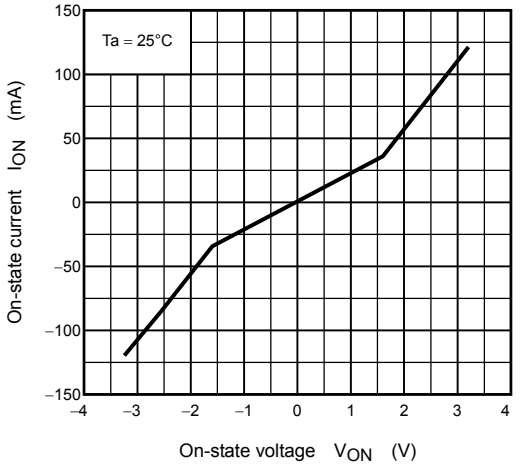
I_{FC} – Ta



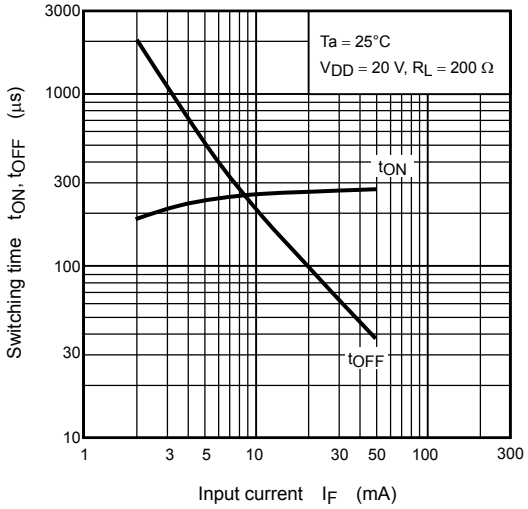
I_{OFF} – Ta



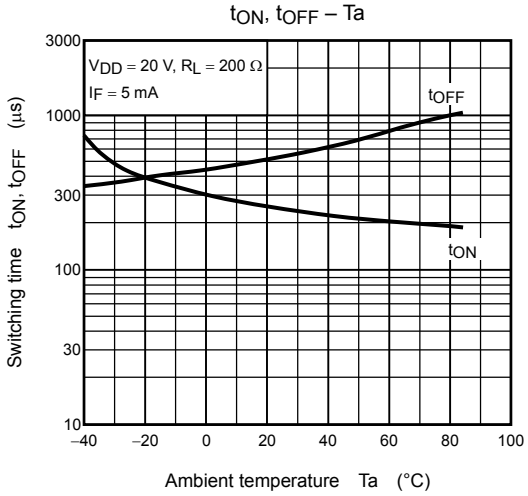
I_{ON} – V_{ON}



t_{ON}, t_{OFF} – I_F



t_{ON}, t_{OFF} – Ta



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