

TOSHIBA Photocoupler IRED & Photo-Triac

TLP665GF(S)

Office Machine
Household Use Equipment
Triac Driver
Solid State Relay

The TOSHIBA TLP665GF(S) consists of a photo-triac optically coupled to an infrared emitting diode in a six lead plastic DIP.

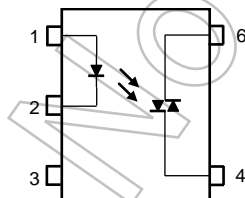
- Peak off-state voltage: 400V (min.)
- Trigger LED current: 10mA (max.)
- On-state current: 100mA (max.)
- Isolation voltage: 5000V_{rms} (min.)
- UL-recognized: UL 1577, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A
File No.E67349
- VDE-approved: EN 60747-5-5, EN 62368-1 (Note 1)

Note 1 : When a VDE approved type is needed,
please designate the **Option (D4)**.

- Structural parameter

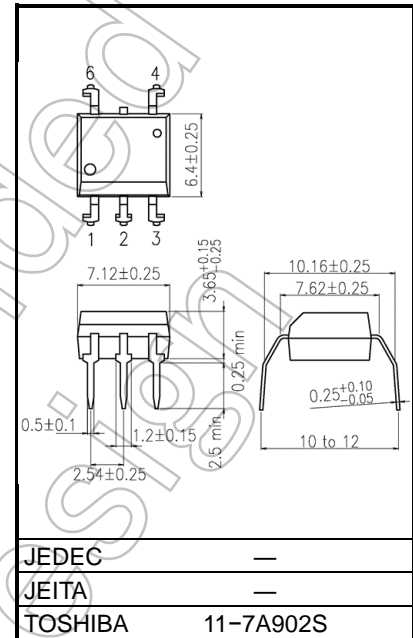
	10.16mm pitch TLPxxxF type
Creepage distance	8.0 mm (min.)
Clearance	8.0 mm (min.)
Insulation thickness	0.5 mm (min.)

Pin Configuration (top view)



- 1 : Anode
- 2 : Cathode
- 3 : N.C.
- 4 : Terminal 1
- 6 : Terminal 2

Unit: mm



Weight: 0.39g(typ.)

Start of commercial production
1986-04

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I_F	50	mA
	Forward current derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C
	Peak forward current (100 μs pulse, 100 pps)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Input power dissipation	PD	100	mW
	Input power dissipation derating (Ta ≥ 53°C)	$\Delta PD / ^\circ\text{C}$	-1.39	mW / °C
	Junction temperature	T_j	125	°C
Detector	Off-state output terminal voltage	V_{DRM}	400	V
	On-state RMS current	Ta = 25°C	100	mA
		Ta = 70°C	50	
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ\text{C}$	-1.1	mA / °C
	Peak on-state current (100 μs pulse, 120 pps)	I_{TP}	2	A
	Peak nonrepetitive surge current (PW = 10ms, DC = 10%)	I_{TSM}	1.2	A
	Output power dissipation	P_O	300	mW
	Output power dissipation derating (Ta ≥ 25°C)	$\Delta P_O / ^\circ\text{C}$	-3.0	mW / °C
Junction temperature	T_j	115	°C	
Storage temperature range		T_{stg}	-55 to 125	°C
Operating temperature range		T_{opr}	-40 to 100	°C
Lead soldering temperature (10 s)		T_{sol}	260	°C
Isolation voltage (AC, 60 s., R.H. ≤ 60 %)		BV_S	5000	V _{rms}

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Device considered a two terminal device: Pins 1, 2 and 3 shorted together pin 4 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	120	Vac
Forward current	I_F	15	20	25	mA
Peak on-stage current	I_{TP}	—	—	1	A
Operating temperature	T_{opr}	-25	—	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

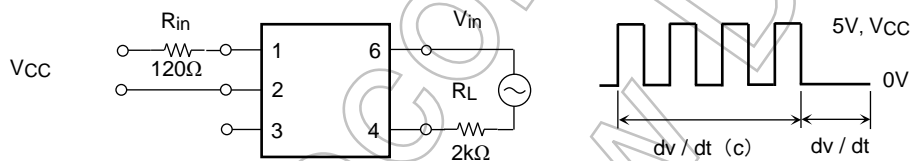
Electrical Characteristics (Ta = 25°C)

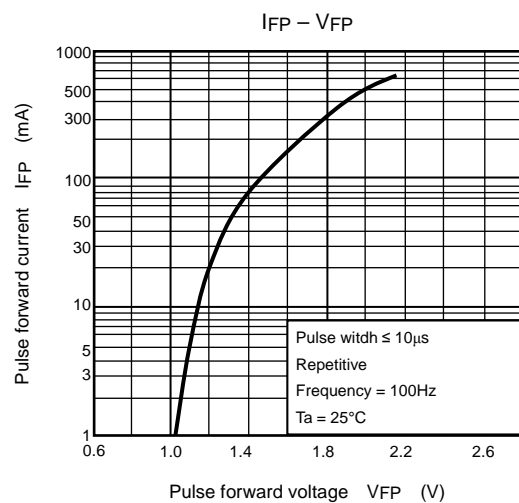
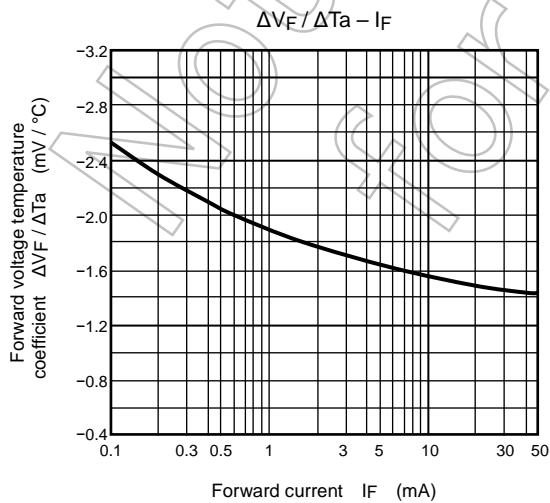
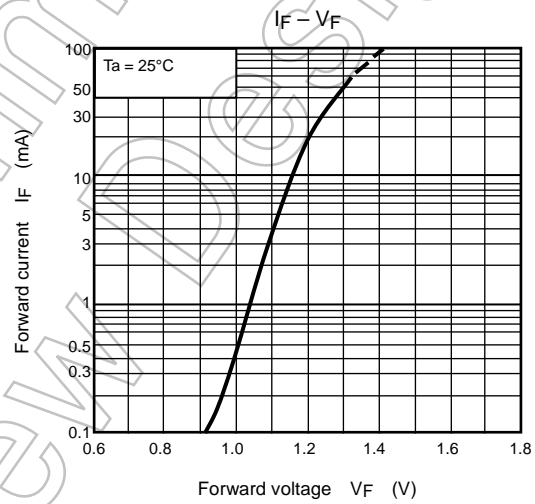
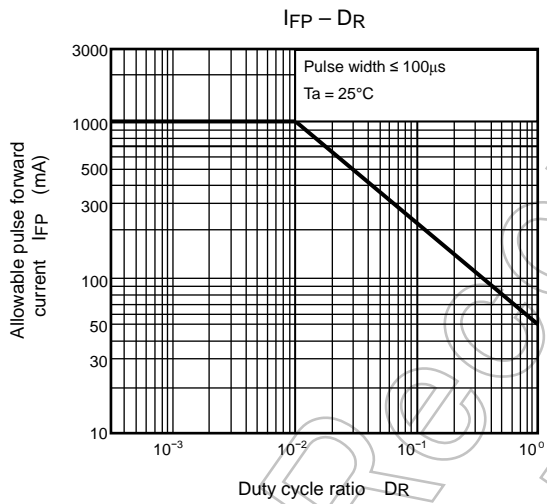
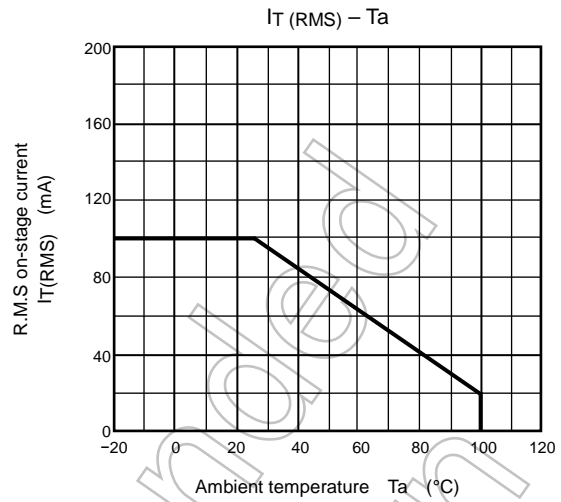
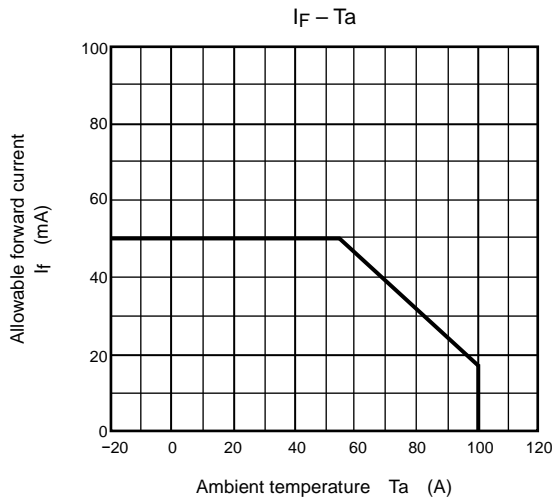
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0 \text{ V}, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{DRM} = 400 \text{ V}$	—	10	100	nA
	Peak on-state voltage	V_{TM}	$I_{TM} = 100 \text{ mA}$	—	1.7	3.0	V
	Holding current	I_H	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	dv/dt	$V_{in} = 120 \text{ V}, T_a = 85 \text{ }^\circ\text{C}$ (Note 2)	200	500	—	$\text{V}/\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv/dt(c)$	$V_{in} = 30 \text{ V}_{rms}, I_T = 15 \text{ mA}$ (Note 2)	—	0.2	—	$\text{V}/\mu\text{s}$

Coupled Electrical Characteristics (Ta = 25°C)

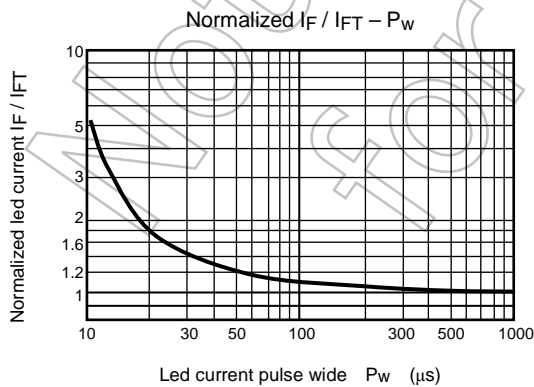
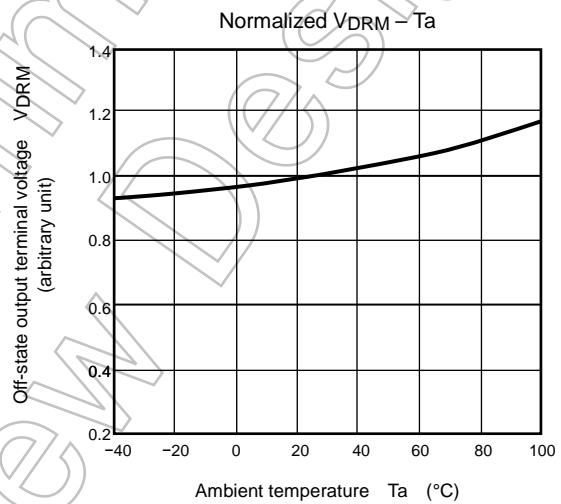
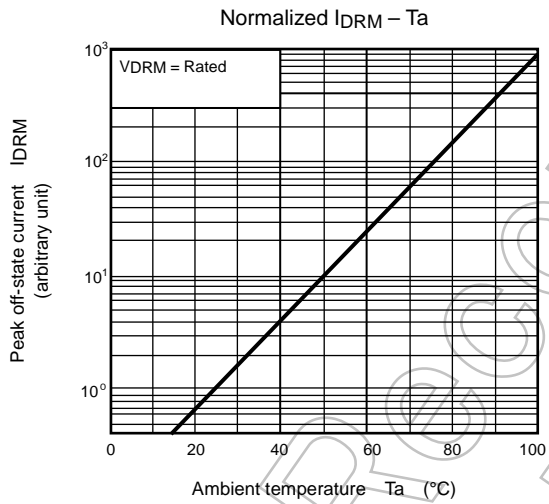
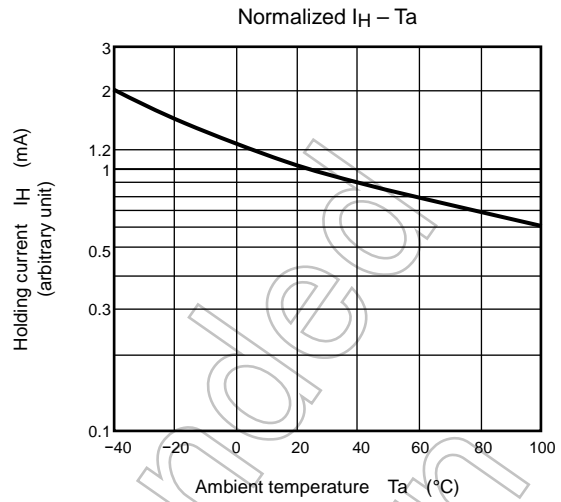
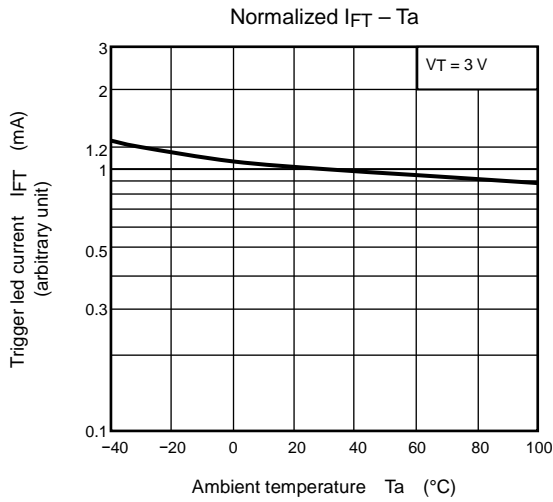
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	$V_T = 3 \text{ V}$	—	5	10	mA
Capacitance (input to output)	C_S	$V_S = 0 \text{ V}, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, R.H. \leq 60 \%$	1×10^{12}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 60 s	5000	—	—	V_{rms}

(Note 2) dv/dt test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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