

TOSHIBA Photocoupler GaAs Ired & Photo-Triac

# TLP665G

- Office Machine
- Household Use Equipment
- Triac Driver
- Solid State Relay

The TOSHIBA TLP665G consists of a photo-triac optically coupled to a gallium arsenide 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.)
- UL recognized: UL1577, file No. E67349
- Isolation voltage: 5000V<sub>rms</sub> (min.)
- Option (D4) type

VDE approved: DIN VDE0884 / 08.87,  
certificate No. 68383

Maximum operating insulation voltage: 630V<sub>PK</sub>

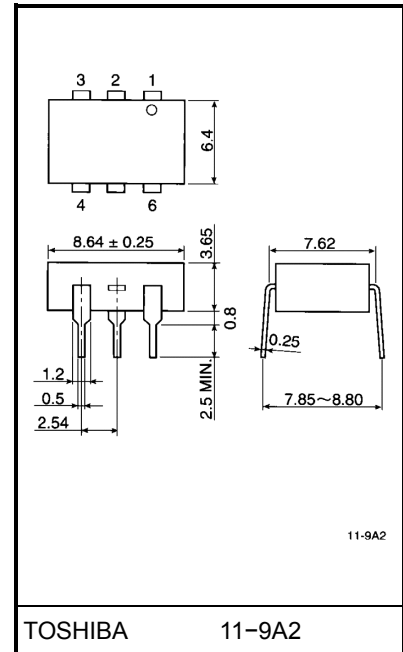
Highest permissible over voltage: 6000V<sub>PK</sub>

**(Note) When a VDE0884 approved type is needed, please designate the "option (D4)"**

- Structural parameter

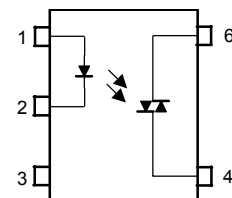
	7.62mm pitch standard type
Creepage distance	7.0 mm (min.)
Clearance	7.0 mm (min.)
Insulation thickness	0.5 mm (min.)

Unit in mm



Weight: 0.44g

## Pin Configuration (top view)



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

## Maximum Ratings (Ta = 25°C)

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
	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
	Junction temperature	$T_j$	115	°C
Storage temperature range	$T_{stg}$	-55~125	°C	
Operating temperature range	$T_{opr}$	-40~100	°C	
Lead soldering temperature (10s)	$T_{sol}$	260	°C	
Isolation voltage (AC, 1 min., R.H. ≤ 60%) (Note 1)	$BV_S$	5000	$V_{rms}$	

(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

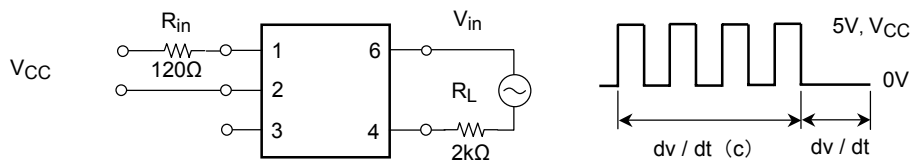
**Electrical Characteristics (Ta = 25°C)**

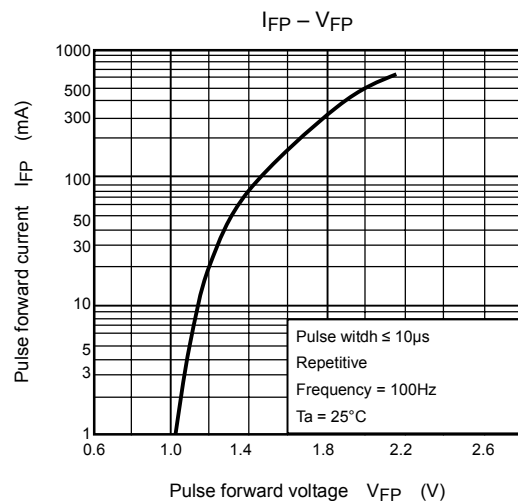
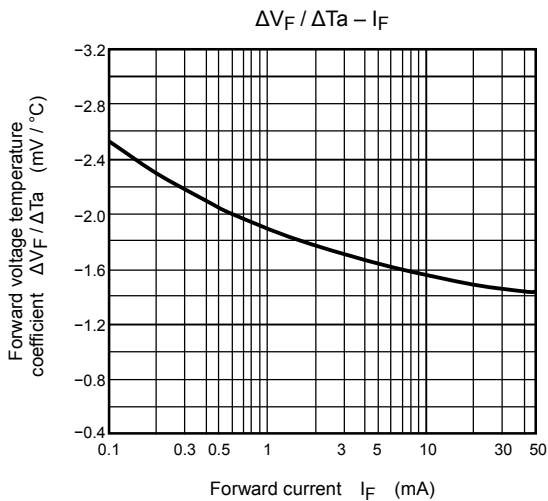
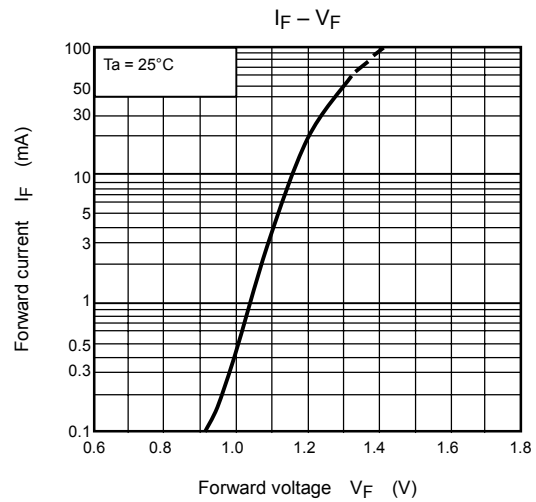
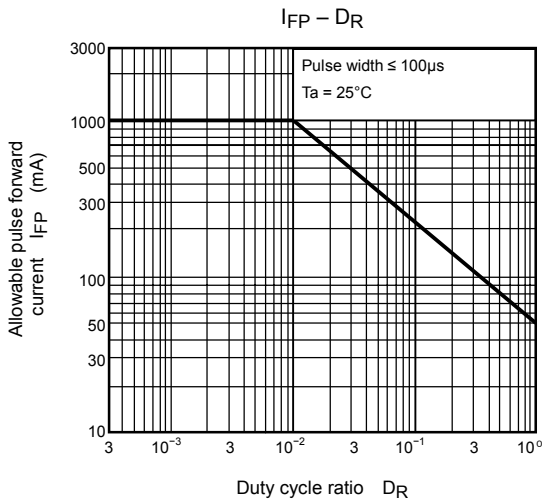
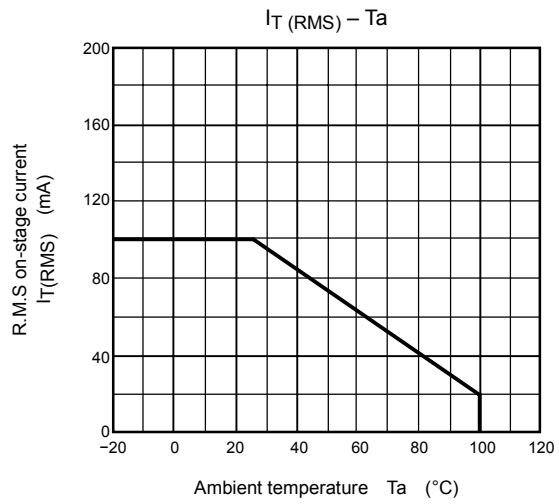
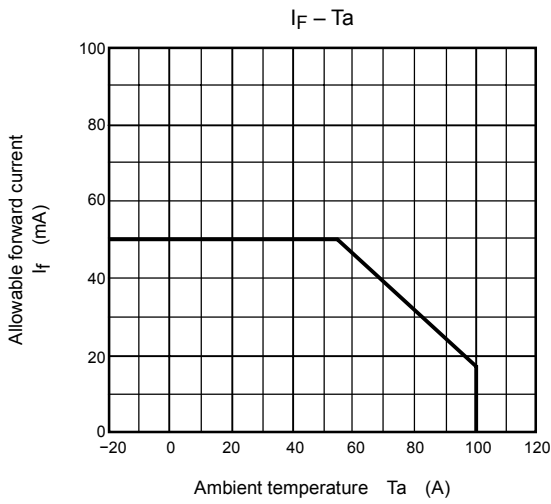
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM} = 400\text{V}$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

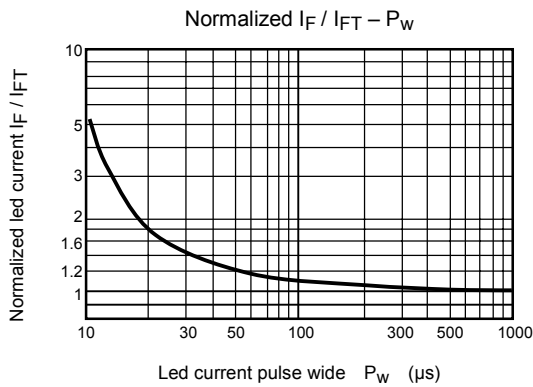
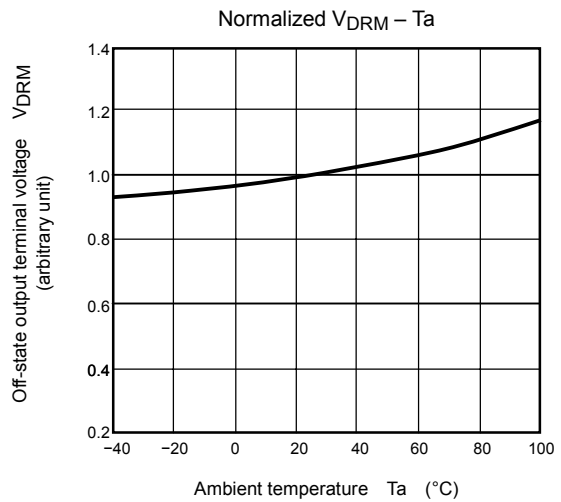
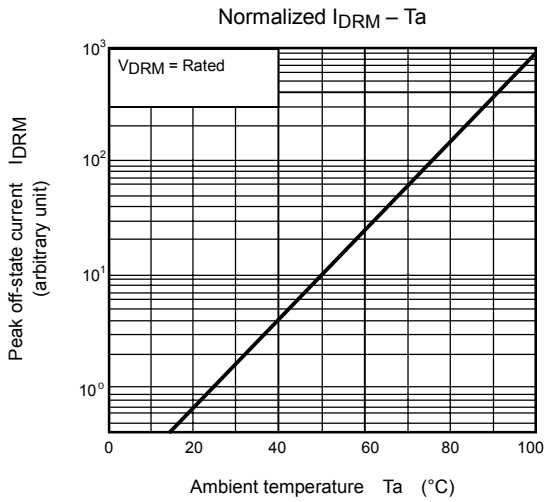
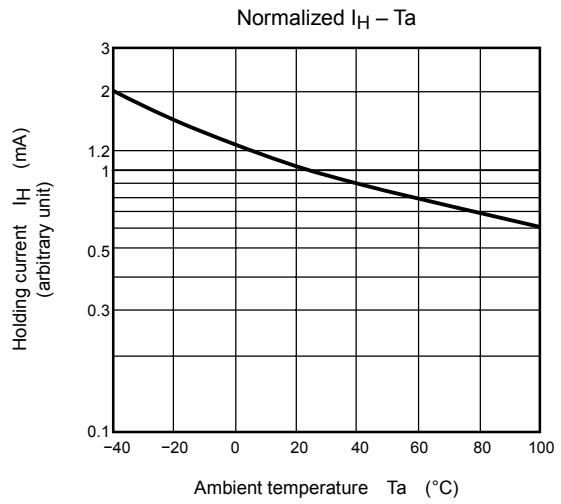
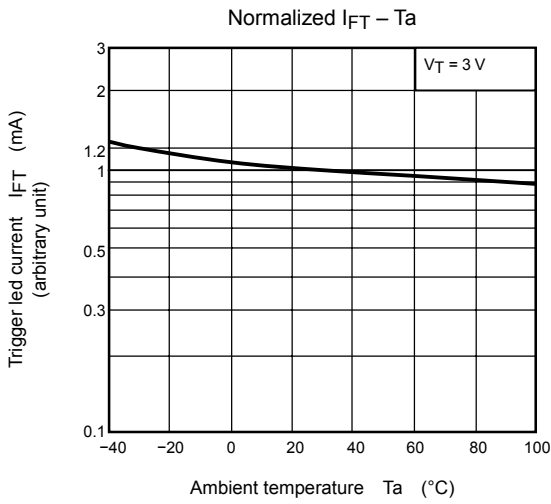
**Coupled Electrical Characteristics (Ta = 25°C)**

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)	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	$1 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	5000	—	—	$V_{\text{rms}}$
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	$V_{\text{dc}}$

(Note 2)  $dv/dt$  test circuit







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