

TOSHIBA Photocoupler GaAs IRED & Photo-Triac

TLP666L(S)

Office Equipment
Household Appliances
Triac Drivers
Solid State Relays

The TOSHIBA TLP666L(S) consists of a GaAs infrared emitting diode optically coupled to a triac-output photocoupler featuring a zero-cross voltage and is housed in a 6-pin DIP package.

Features

- Peak off-state voltage: 800 V (min)
- Trigger LED current: 10 mA (max)
- On-state current: 100 mA (max)
- Isolation voltage: 5000 Vrms (min)
- UL recognized: UL1577, file No. E67349
- Option(D4) type

VDE approved: DIN EN 60747-5-2

Certificate No. 40009302

Maximum operating insulation voltage: 890 Vpk

Maximum permissible over voltage: 8000 Vpk

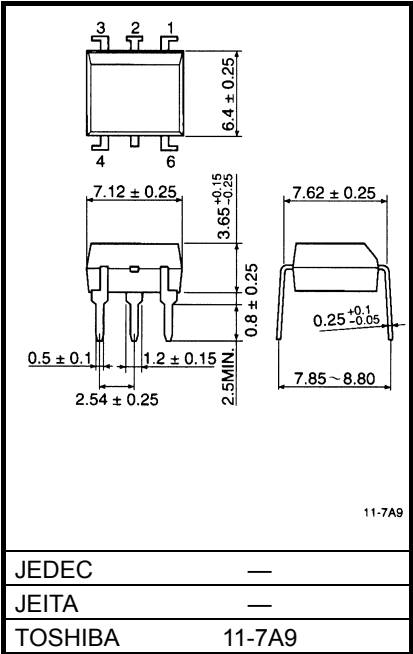
Note: When ordering an EN60747-5-2 approved device, "Option (D4)" should be designated.

When applying safety standard certification, use the standard part number, e.g., TLP666L.

- Construction mechanical rating

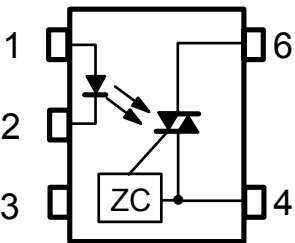
	7.62 mm pitch standard type	10.16 mm pitch TLPXXXXF type
Creepage distance	7.0 mm (Min)	8.0 mm (Min)
Clearance	7.0 mm (Min)	8.0 mm (Min)
Insulation thickness	0.4 mm (Min)	0.4 mm (Min)

Unit: mm



Weight: 0.39 g (typ.)

Pin configuration (top view)



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

ZC:Zero-cross Circuit

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
	Junction temperature	T_J	125	°C
Detector	Off-state output terminal voltage	V_{DRM}	800	V
	On-state RMS current	$I_{T(RMS)}$	100	mA
			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=10 ms)	I_{TSM}	1.2	A
	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, 1 min., R.H. ≤ 60%) (Note 1)		BV_S	5000	Vrms

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: Pins1, 2 and 3 shorted together and pins 4 and 6 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{AC}	—	—	240	Vac
Forward current	I_F	15	20	25	mA
Peak on-state 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.

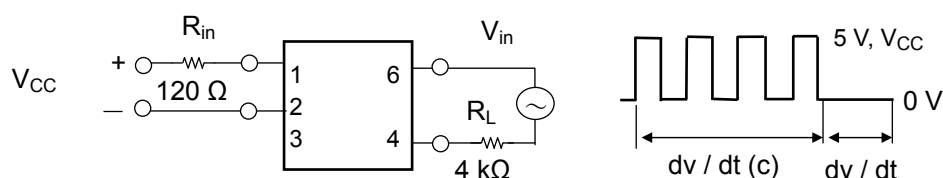
Electrical Characteristics (Ta = 25°C)

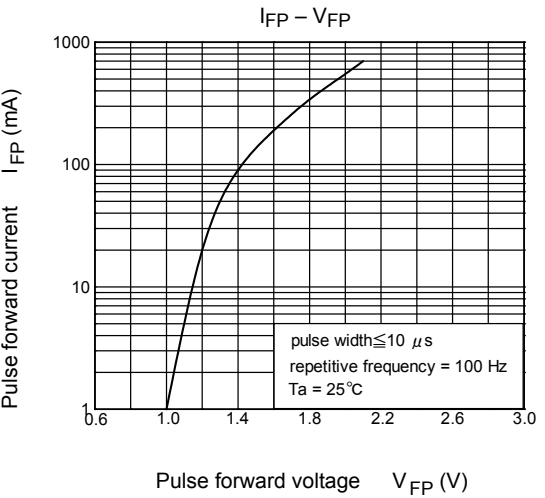
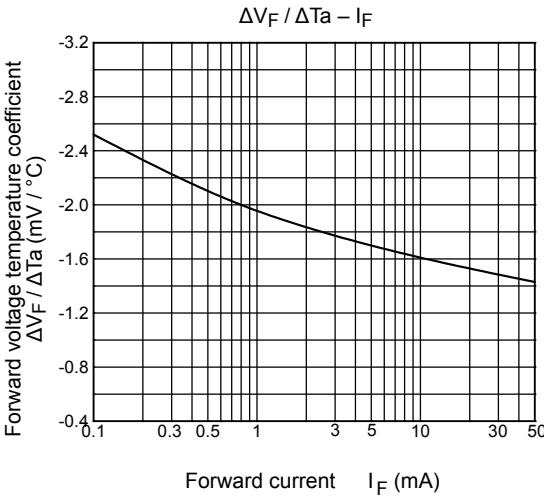
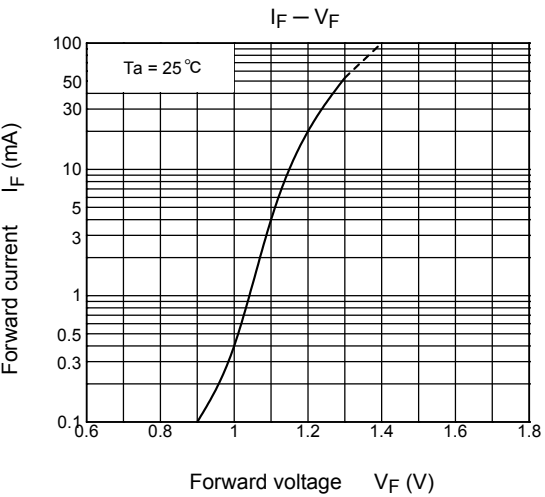
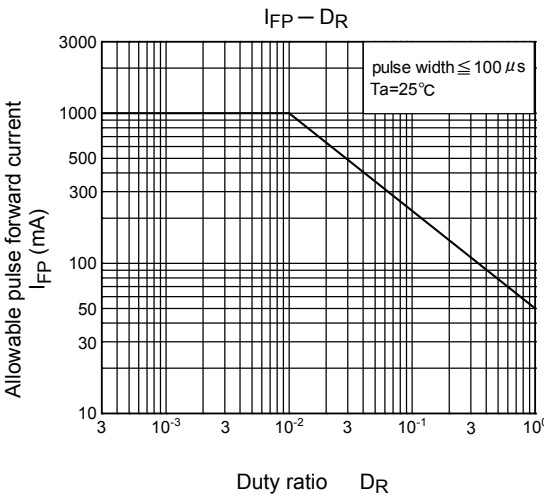
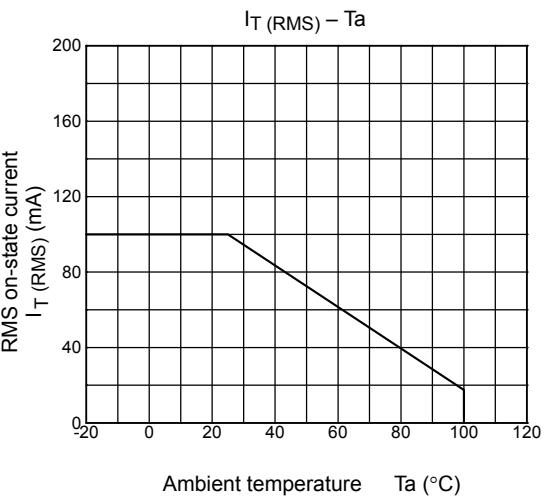
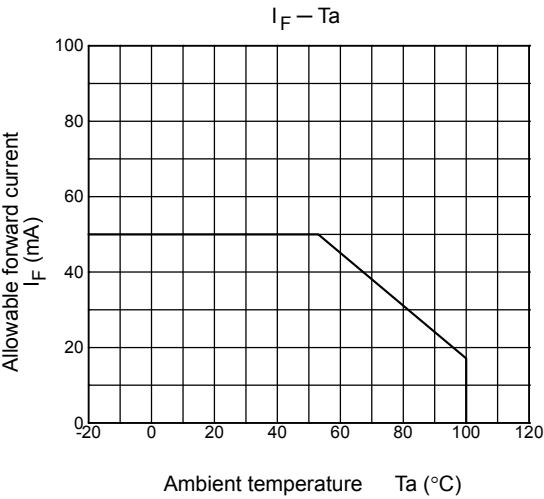
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{\text{DRM}} = 800 \text{ V}$	—	10	1000	nA
	Peak on-state voltage	V_{TM}	$I_{\text{TM}} = 100 \text{ mA}$	—	1.7	3.0	V
	Holding current	I_H	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	dv/dt	$V_{\text{in}} = 240 \text{ Vrms}, T_a = 85^\circ\text{C}$ (Note 2)	200	500	—	$\text{V}/\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv/dt(c)$	$V_{\text{in}} = 60 \text{ Vrms}, I_T = 15 \text{ mA}$ (Note 2)	—	0.2	—	$\text{V}/\mu\text{s}$

Coupled Electrical Characteristics (Ta = 25°C)

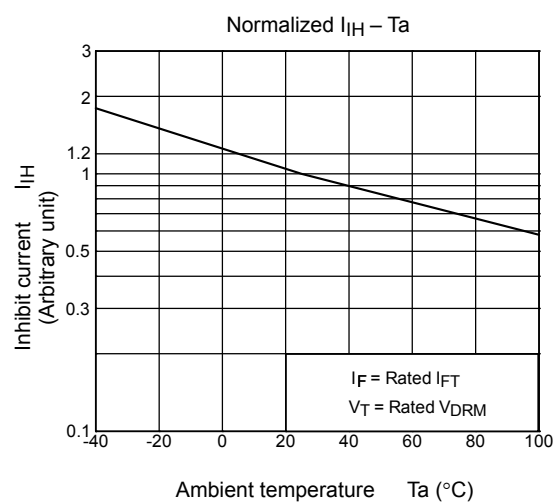
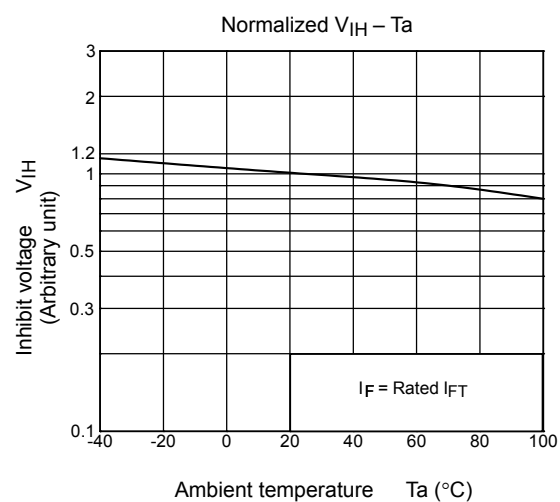
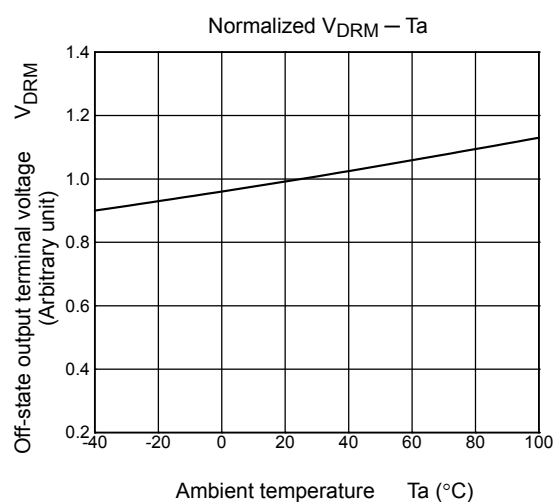
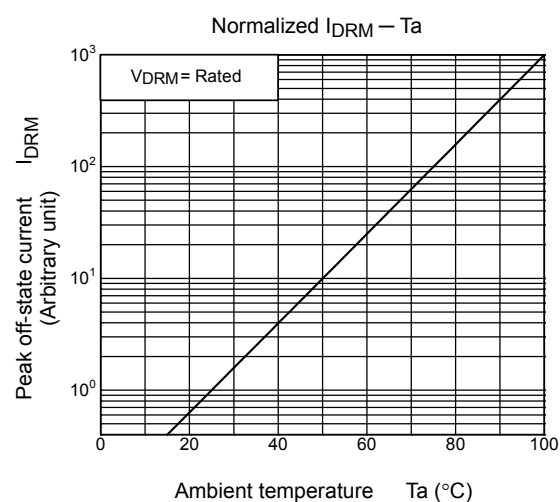
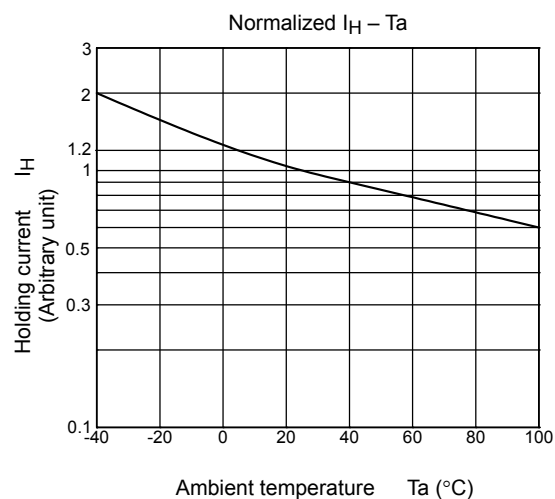
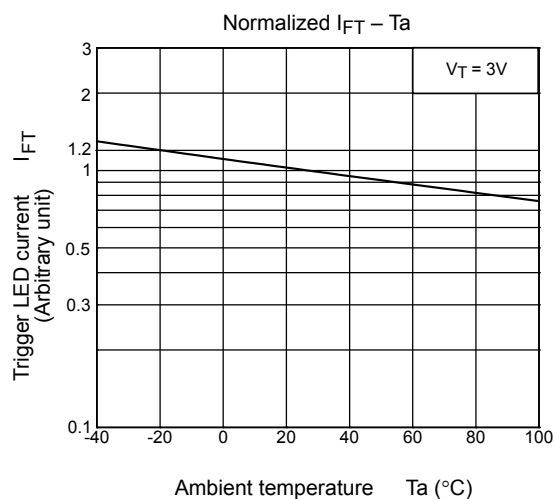
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FT}	$V_T = 3 \text{ V}$	—	5	10	mA
Inhibit voltage	V_{IH}	$I_F = \text{Rated } I_{\text{FT}}$	—	—	50	V
Leakage in inhibited state	I_{IH}	$I_F = \text{Rated } I_{\text{FT}}, V_T = \text{Rated } V_{\text{DRM}}$	—	200	600	μA
Capacitance (input to output)	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	1×10^{12}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1minute	5000	—	—	Vrms
		AC, 1second, in oil	—	10000	—	
		DC, 1minute, in oil	—	10000	—	Vdc

(Note 2) dv/dt test circuit





* The above graphs show typical characteristics.



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