

TLP168J

- Triac Driver
- Programmable Controllers
- AC-Output Modules
- Solid State Relays

The TOSHIBA mini-flat coupler TLP168J is a small-outline coupler suitable for surface mount assembly. The TLP168J consists of a GaAlAs infrared emitting diode optically coupled to a triac-output photocoupler.

- Zero-voltage crossing turn-on
- Peak off-state voltage: 600 V (min)
- Trigger LED current: 3 mA (max)
- On-state current: 70 mA (max)
- Isolation voltage: 2500 Vrms (min)

Absolute Maximum Ratings (Ta = 25°C)

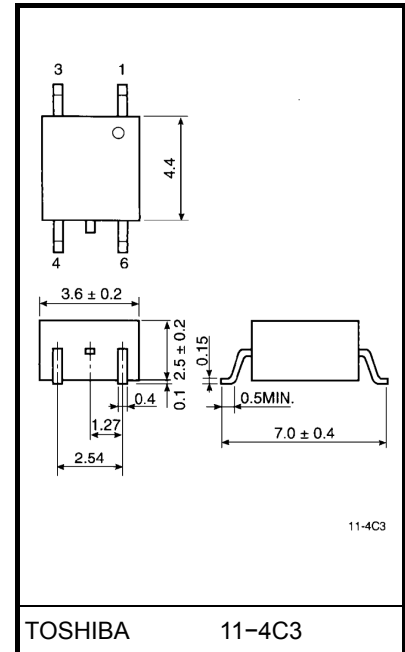
Characteristic		Symbol	Rating	Unit
LED	Forward current	I_F	20	mA
	Forward current derating (Ta ≥ 25°C)	$\Delta I_F / ^\circ C$	-0.2	mA / °C
	Peak forward current (100 μs pulse, 100 pps)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Junction temperature	T_j	125	°C
Detector	Off-state output terminal voltage	V_{DRM}	600	V
	On-state RMS current	Ta = 25°C	70	mA
		Ta = 70°C	40	
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ C$	-0.67	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	2500	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).

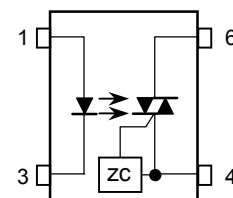
(Note 1) Device considered a two-terminal device: Pins 1 and 3 shorted together and Pin 4 and 6 shorted together.

Unit: mm



Weight: 0.09 g (typ.)

Pin Configurations



- 1: Anode
- 3: Cathode
- 4: Terminal 1
- 6: Terminal 2

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ.	Max	Unit
Supply voltage	V_{AC}	—	—	240	Vac
Forward current	I_F	4.5	6	7.5	mA
Peak on-state current	I_{TP}	—	—	1	A
Operating temperature	T_{opr}	-10	—	85	°C

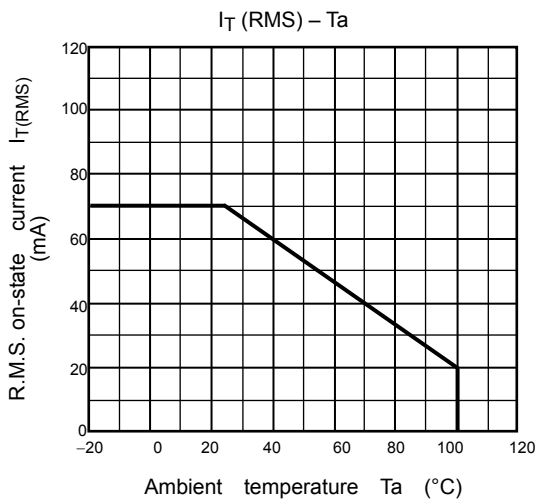
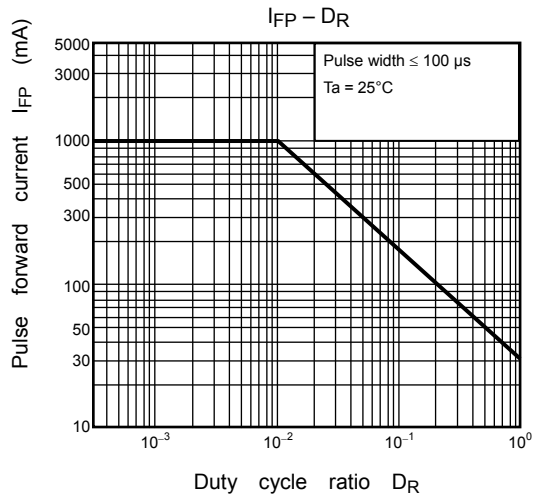
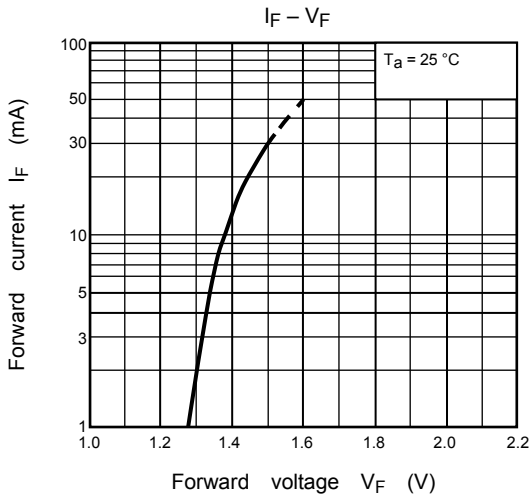
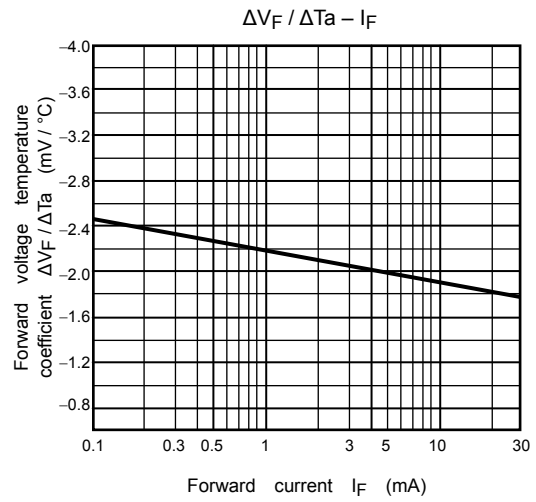
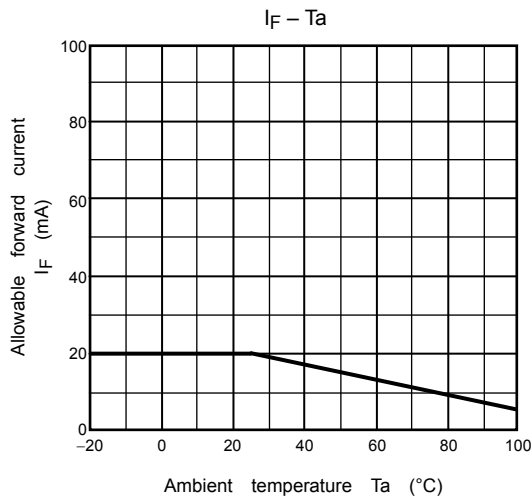
Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

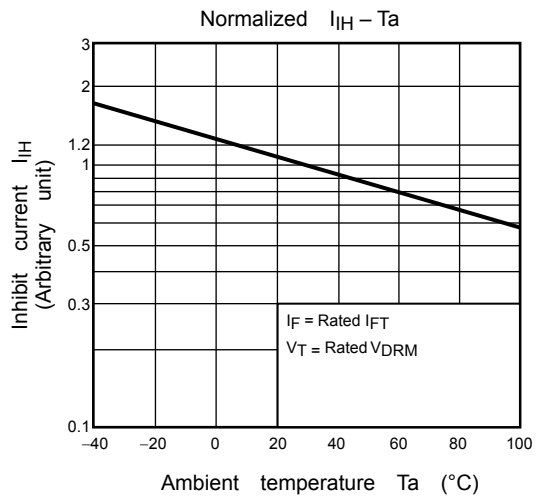
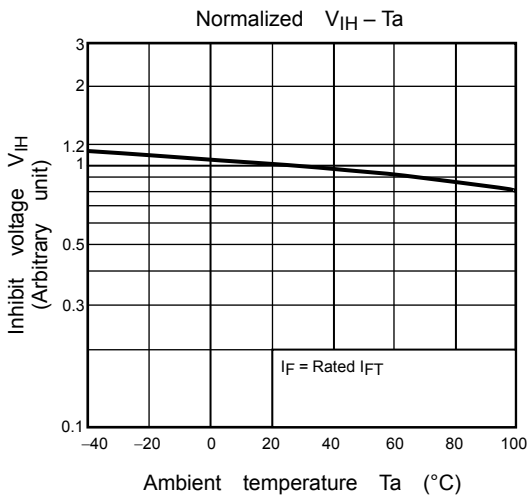
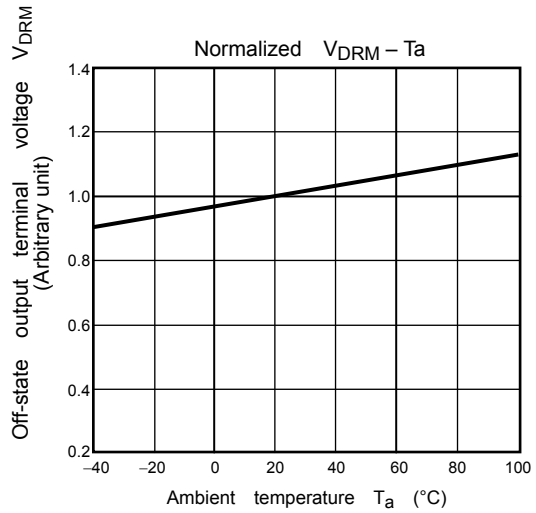
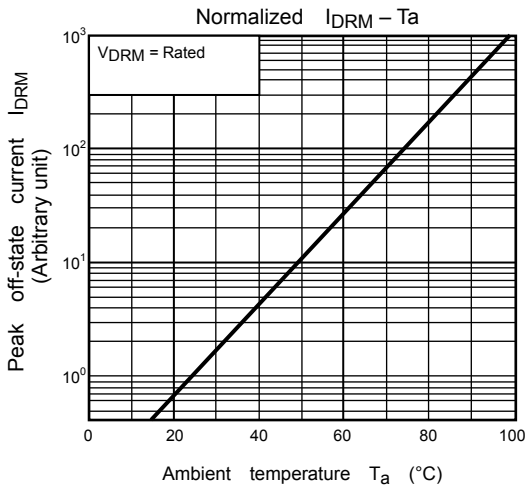
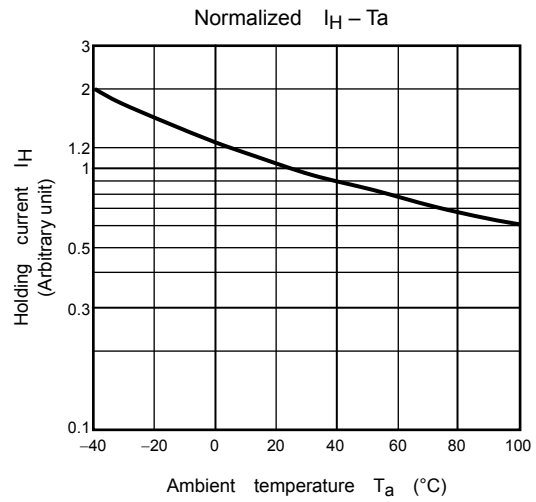
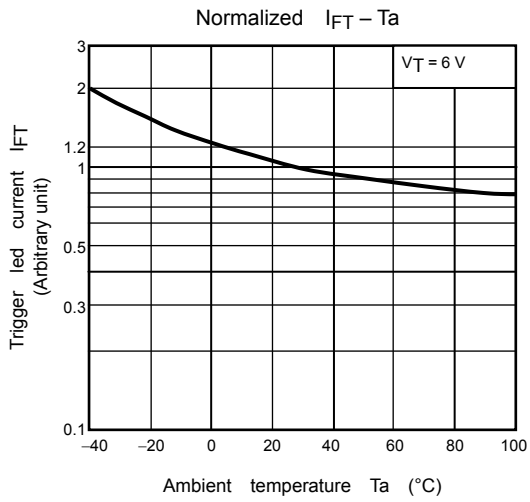
Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
LED	Forward voltage	V_F	$I_F = 10 \text{ mA}$	1.2	1.4	1.7	V
	Reverse current	I_R	$V_R = 3 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{DRM} = 600 \text{ V}$	—	10	1000	nA
	Peak on-state voltage	V_{TM}	$I_{TM} = 70 \text{ mA}$	—	1.7	2.8	V
	Holding current	I_H	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	dv / dt	$V_{in} = 240 \text{ Vrms}, T_a = 85^\circ\text{C}$	200	500	—	V / μs
	Critical rate of rise of commutating voltage	$dv / dt(c)$	$V_{in} = 60 \text{ Vrms}$ $I_T = 15 \text{ mA}$	—	0.2	—	V / μs

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FT}	$V_T = 3 \text{ V}$	—	—	3	mA
Inhibit voltage	V_{IH}	$I_F = \text{Rated } I_{FT}$	—	—	50	V
Leakage in inhibited state	I_{IH}	$I_F = \text{Rated } I_{FT}$ $V_T = \text{Rated } V_{DRM}$	—	200	600	μA
Capacitance (input to output)	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	Vrms
		DC, 1 minute, in oil	—	5000	—	Vdc





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