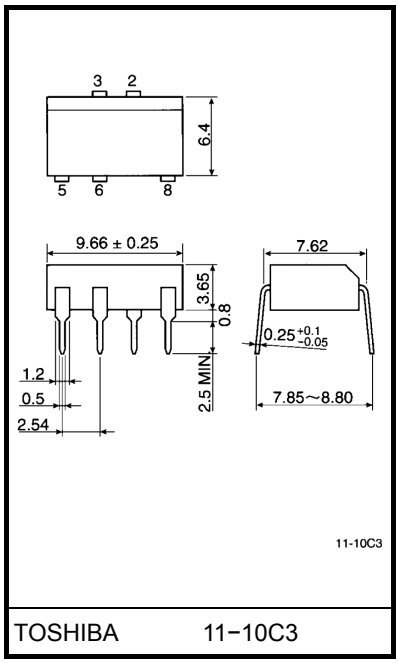
TOSHIBA Photocoupler GaAs Ired & Photo-Triac

TLP3507

Triac Driver
Programmable Controllers
AC−Output Module
Solid State Relay

Unit in mm



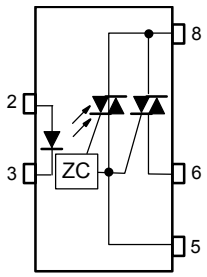
TOSHIBA 11−10C3

Weight: 0.52g

The TOSHIBA TLP3507 consists of a zero voltage crossing turn-on photo−triac optically coupled to a gallium arsenide infrared emitting diode in a 8 lead plastic DIP package.

- Peak off−state voltage: 600 V (min.)
- Trigger LED current: 10 mA (max.)
- On−state current: $0.5A_{rms}$ (max.)
- Isolation voltage: 2500 V_{rms} (min.)
- Zero crossing fanction
- UL recognized: UL1577, file no. E67349

Pin Configurations (top view)



2 : Anode
3 : Cathode
5 : Triac gate
6 : Triac T1
8 : Triac T2

Maximum Ratings (Ta = 25°C)

Characteristic			Symbol	Rating	Unit
LED	Forward current		I_F	50	mA
	Forward current derating (Ta ≥ 53°C)		ΔI_F / °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}	600	V
	On−state RMS current	Ta = 40°C	$I_{T(RMS)}$	0.5	A
		Ta = 60°C		0.35	
	On−state current derating (Ta ≥ 40°C)		ΔI_T / °C	−7.2	mA / °C
	Peak current from snubber circuit (100μs pulse, 120 pps)		I_{SP}	2	A
	Peak nonrepetitive surge current (50Hz, peak)		I_{TSM}	5	A
	Junction temperature		T_j	110	°C
Storage temperature range			T_{stg}	−40~125	°C
Operating temperature range			T_{opr}	−20~80	°C
Lead soldering temperature (10s)			T_{sol}	260	°C
Isolation voltage (AC, 1 min., R.H.≤ 60%) (Note)			BV_S	2500	V_{rms}

(Note) Device considereded a two−terminal device: Pins 2 and 3 shorted together, and pins 5, 6 and 8 shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	240	V_{ac}
Forward current	I_F	15	20	25	mA
Peak current from snubber circuit	I_{SP}	—	—	1	A
Operating temperature	T_{opr}	−20	—	80	°C

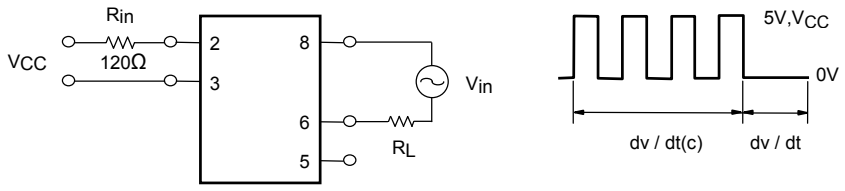
Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10 mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	30	—	pF
Detector	Peak off−state current	I_{DRM}	V_{DRM} = 600 V, Ta = 110°C	—	—	100	μA
	Peak on−state voltage	V_{TM}	I_{TM} = 0.75 A	—	—	3.0	V
	Holding current	I_H	R_L = 100Ω	—	—	25	mA
	Critical rate of rise of off−state voltage	dv / dt	V_{in} = 240 V_{rms} (Fig.1)	—	500	—	V / μs
	Critical rate of rise of commutating voltage	dv / dt (c)	V_{in} = 240 V_{rms}, I_T = 0.5 A_{rms} (Fig.1)	—	5	—	V / μs

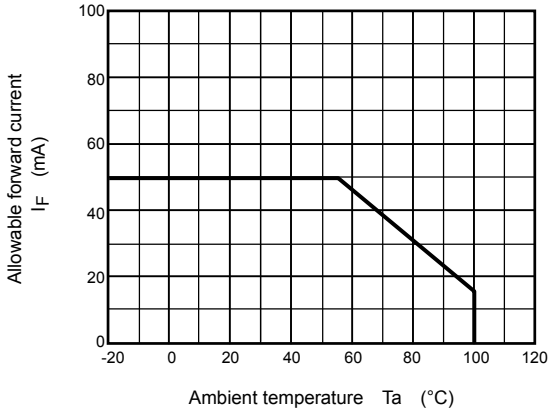
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_T = 6 V	—	—	10	mA
Inhibit voltage	V_{IH}	I_F = rated I_{FT}	—	—	50	V
Leakage in inhibited state	I_{IH}	I_F = rated I_{FT} V_T = rated V_{DRM}	—	200	—	μA
Capacitance (input to output)	C_S	V_S = 0, f = 1 MHz	—	1.5	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H.≤ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	V_{dc}

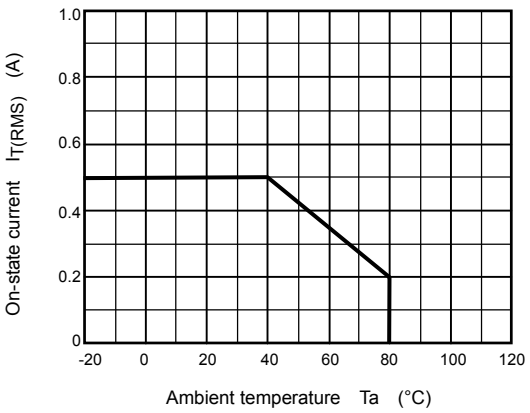
Fig.1: dv / dt test circuit



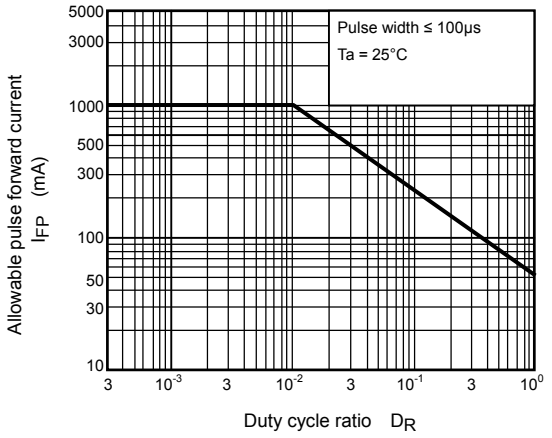
I_F – Ta



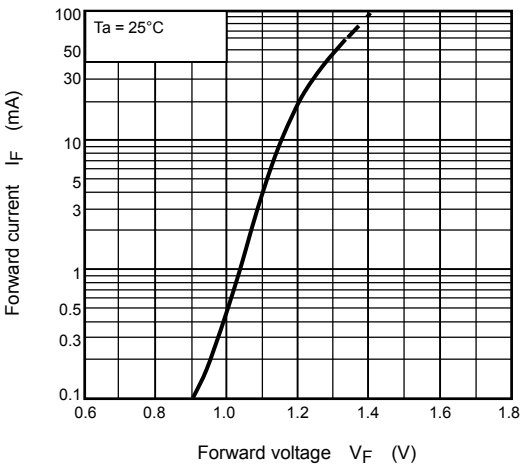
$I_{T(RMS)}$ – Ta



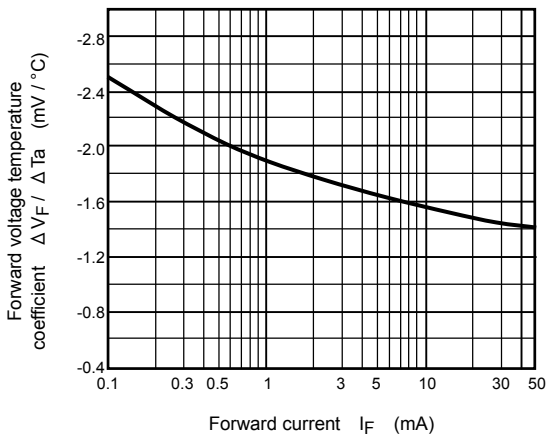
I_{FP} – D_R



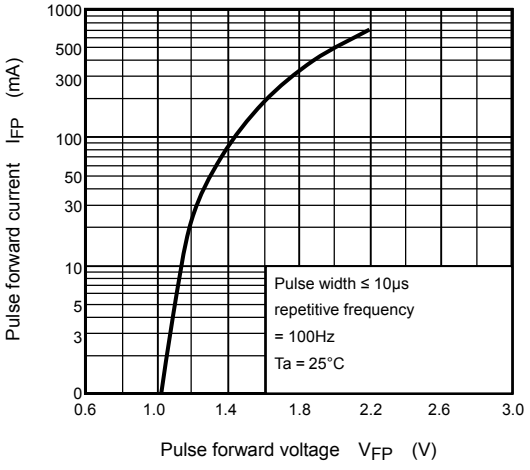
I_F – V_F



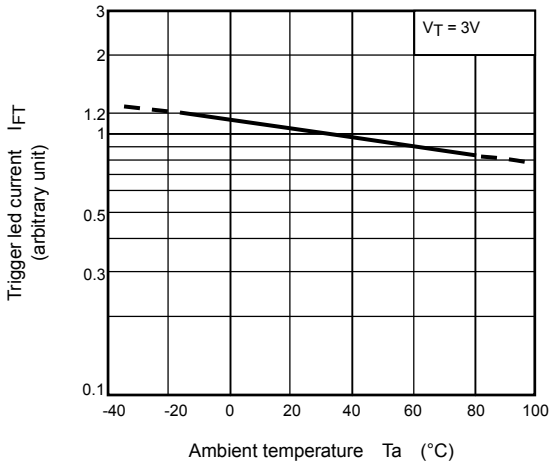
$\Delta V_F / \Delta Ta$ – I_F



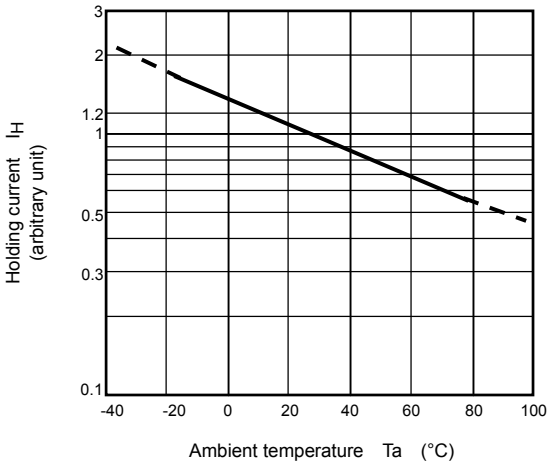
I_{FP} – V_{FP}



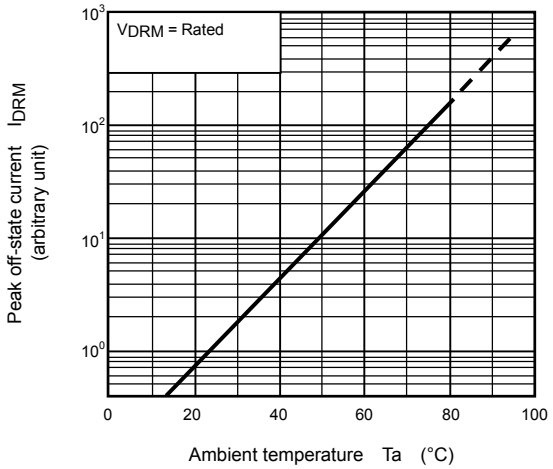
Normalized I_{FT} – Ta



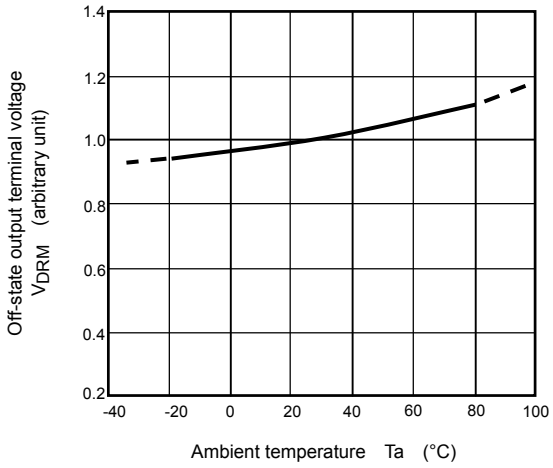
Normalized I_H – Ta



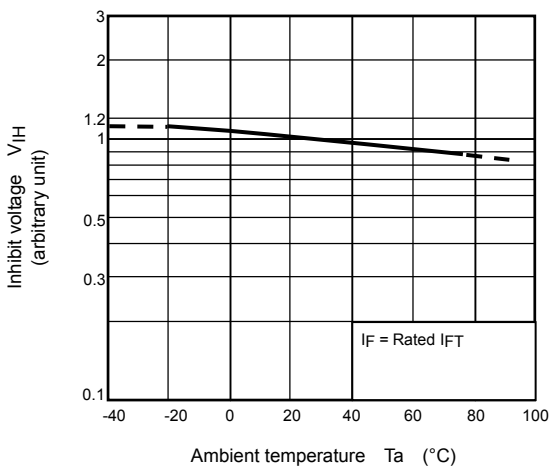
Normalized I_{DRM} – Ta



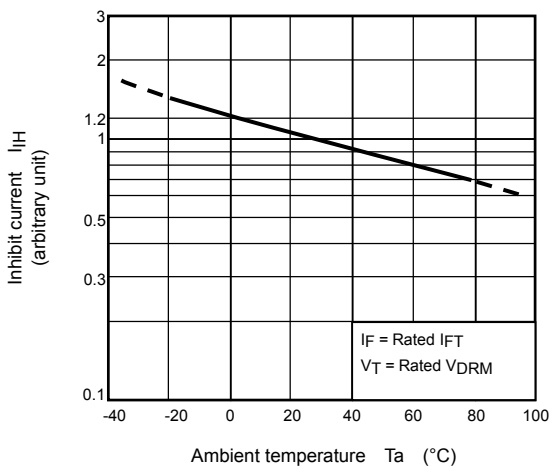
Normalized V_{DRM} – Ta



Normalized V_{IH} – Ta



Normalized I_{IH} – Ta



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