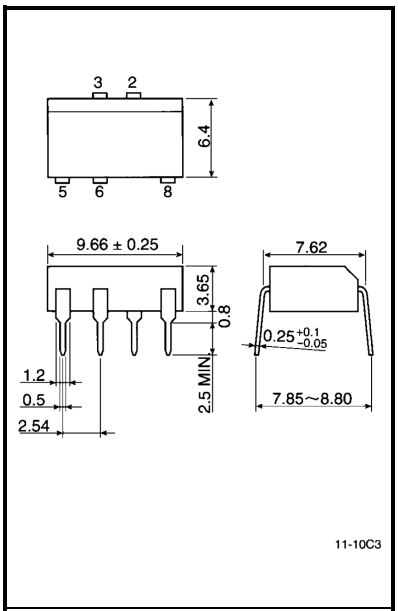
TOSHIBA Photocoupler GaAs IRed & Photo−Triac

TLP3503

Triac Driver
Programmable Controllers
AC−Output Module
Solid State Relay

Unit in mm



TOSHIBA 11−10C3

Weight: 0.52 g

The TOSHIBA TLP3503 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.

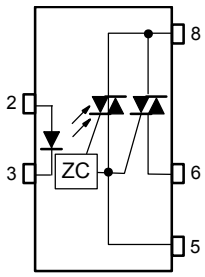
- Peak off−state voltage: 400V (min.)
- Trigger LED current: 10mA (max.)
- On−state current: $0.5A_{rms}$ (max.)
- Isolation voltage: $2500V_{rms}$ (min.)
- UL recognized: UL1577, file No. E67349
- Trigger LED Current

Classi−fication*	Trigger LED Current (mA) V_T = 6V, Ta = 25°C		Marking Of Classification
	Min.	Max.	
(IFT5)	—	5.0	T5
(IFT7)	—	7.0	T5, T7
Standard	—	10	T5, T7, blank

*Ex. (IFT5); TLP3503 (IFT5)

(Note)Application type name for certification test, please use standard product type name, i.e.
TLP3503 (IFT5): TLP3503

Pin Configuration (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 (100μs pulse, 100pps)		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 = 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, 120pps)		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, 1min., R.H. ≤ 60%) (Note)			BV_S	2500	Vrms

(Note) Device considered a two terminal: LED side pins shorted together and detector side pins shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	120	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

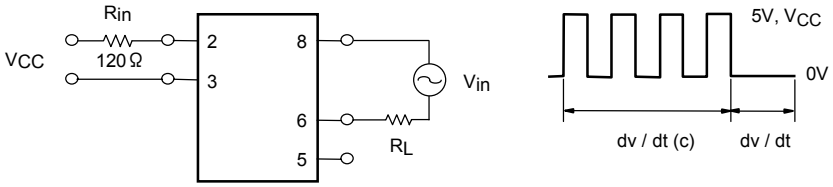
Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1MHz	—	30	—	pF
Detector	Peak off−state current	I_{DRM}	V_{DRM} = 400V, Ta = 110°C	—	—	100	μA
	Peak on−state voltage	V_{TM}	I_{TM} = 0.75A	—	—	3.0	V
	Holding current	I_H	RL = 100Ω	—	—	25	mA
	Critical rate of rise of off−state voltage	dv / dt	V_{in} = 120V_{rms} (fig.1)	200	500	—	V / μs
	Critical rate of rise of commutating voltage	dv / dt (c)	V_{in} = 120V_{rms}, I_T = 0.5A_{rms} (fig. 1)	—	5	—	V / μs

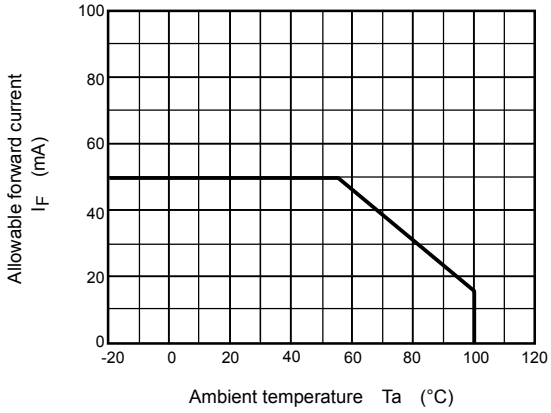
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_T=6V	—	—	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=1MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S=500V	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	V_{dc}

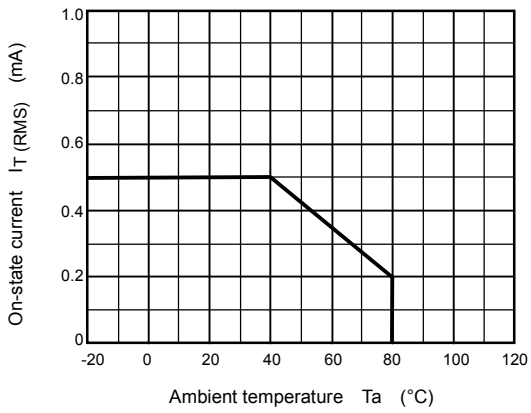
Fig.1: dv / dt test circuit



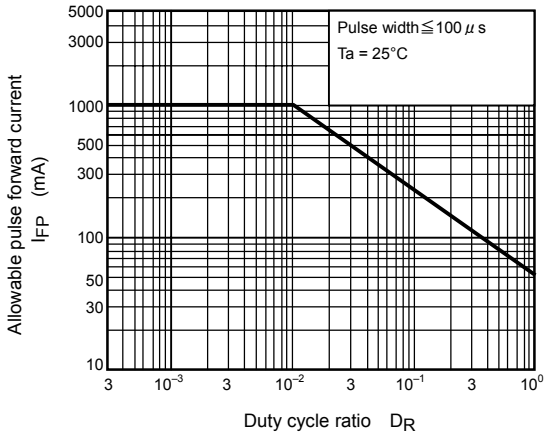
I_F – Ta



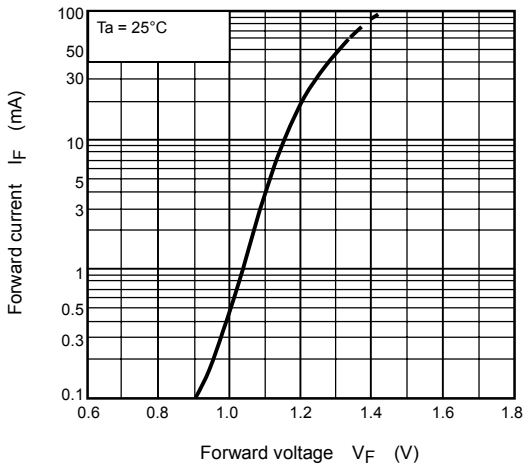
$I_{T\ (RMS)}$ – Ta



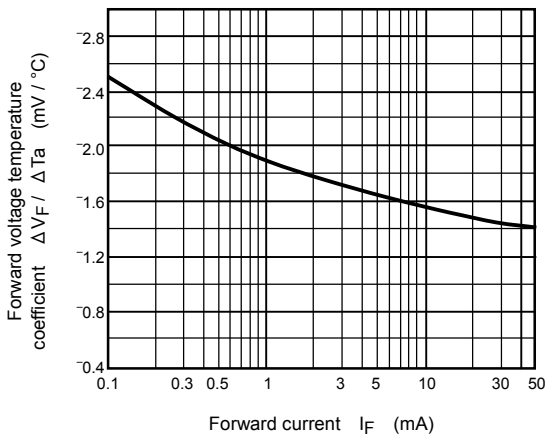
I_{FP} – D_R



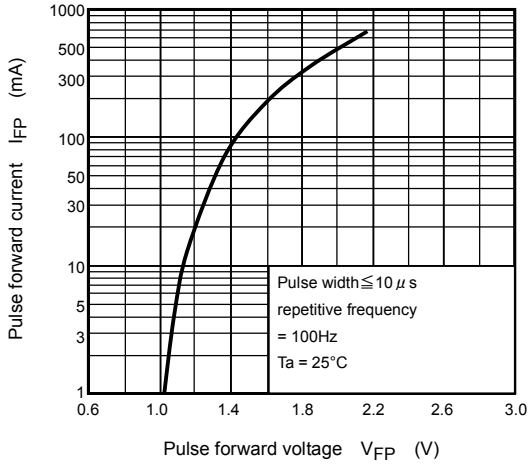
I_F – V_F



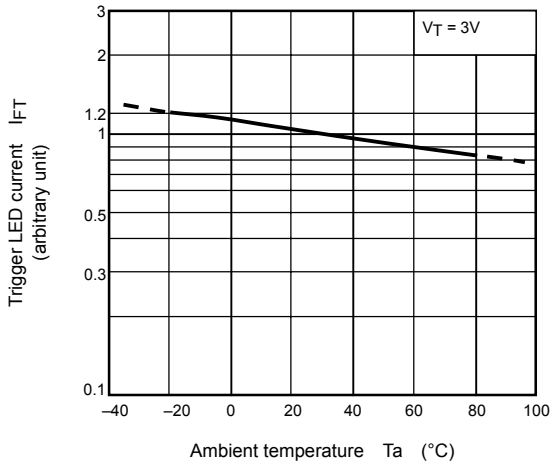
$\Delta V_F / \Delta Ta$ – I_F



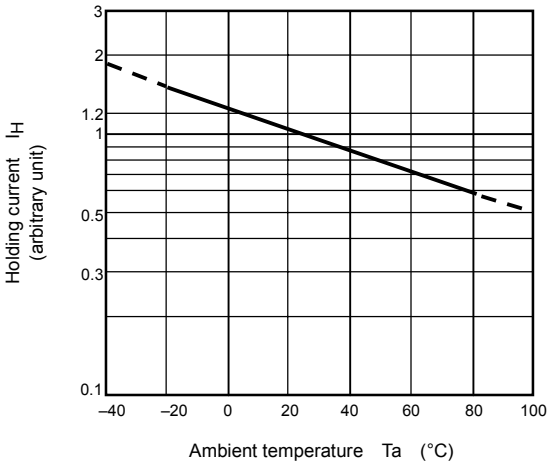
I_{FP} – V_{FP}



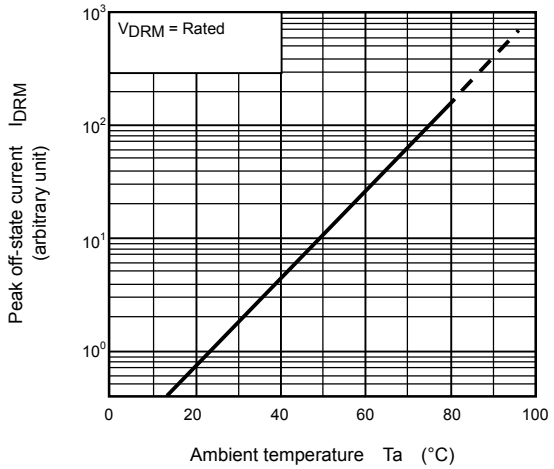
Normalized I_{FT} – Ta



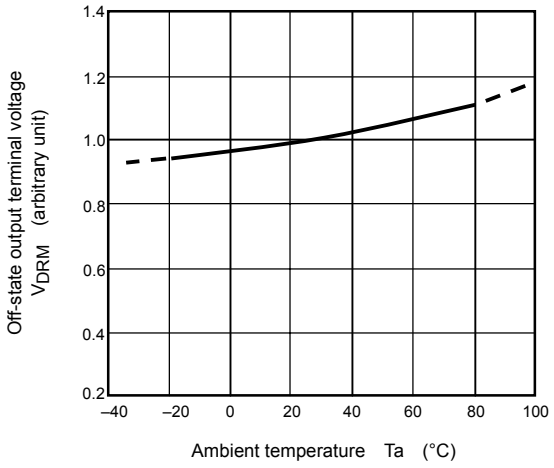
Normalized I_H – Ta



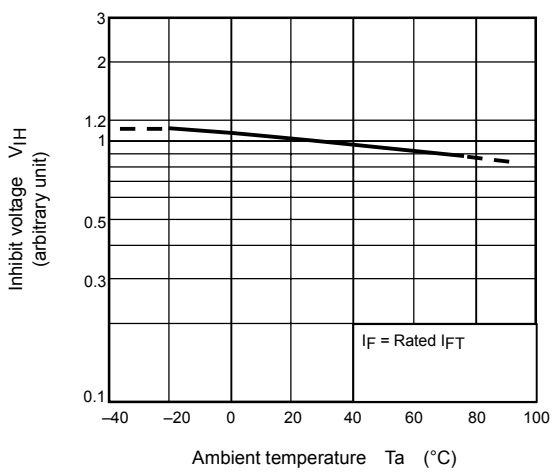
Normalized I_{DRM} – Ta



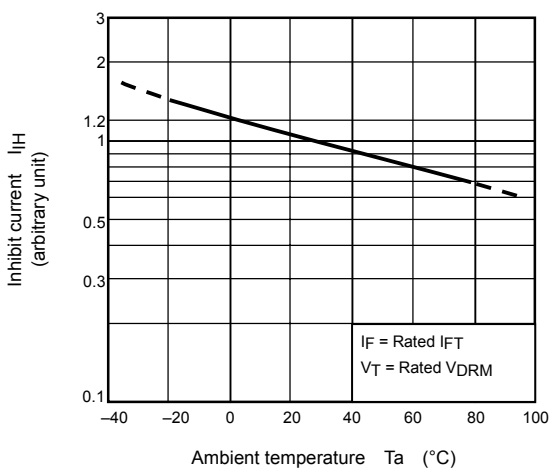
Normalized V_{DRM} – Ta



Normalized V_{IH} – Ta



Normalized I_{IH} – Ta



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