

TOSHIBA Photocoupler GaAs IRed & Photo-Triac

TLP3503

Triac Driver
 Programmable Controllers
 AC-Output Module
 Solid State Relay

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.

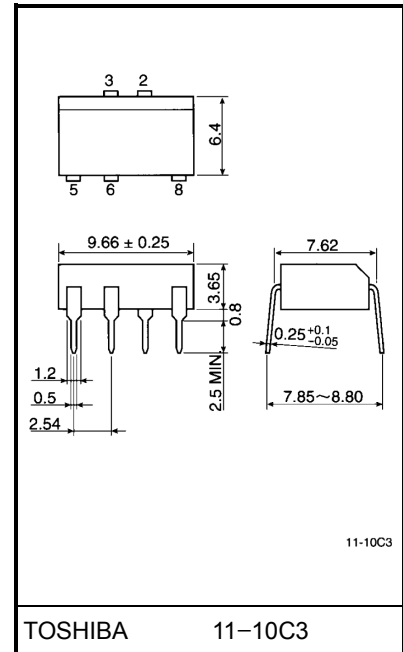
- Peak off-state voltage: 400V (min.)
- Trigger LED current: 10mA (max.)
- On-state current: 0.5A_{rms} (max.)
- Isolation voltage: 2500V_{rms} (min.)
- UL recognized: UL1577, file No. E67349
- Trigger LED Current

Classi- fication*	Trigger LED Current (mA)		Marking Of Classification
	V _T = 6V, T _a = 25°C		
	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

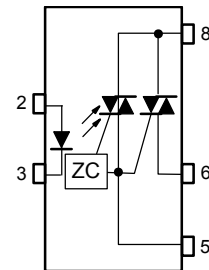
Unit in mm



TOSHIBA 11-10C3

Weight: 0.52 g

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)	$\Delta I_F / ^\circ\text{C}$	-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)	$\Delta I_T / ^\circ\text{C}$	-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

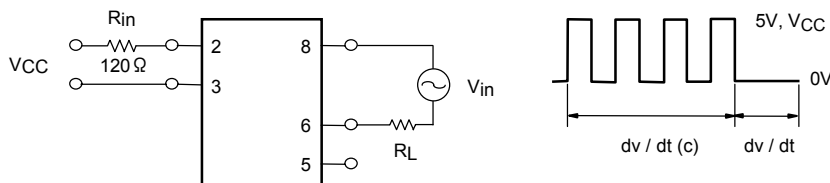
Individual Electrical Characteristics (Ta = 25°C)

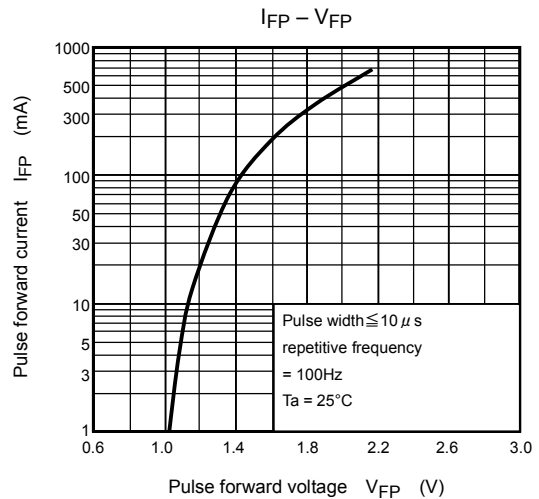
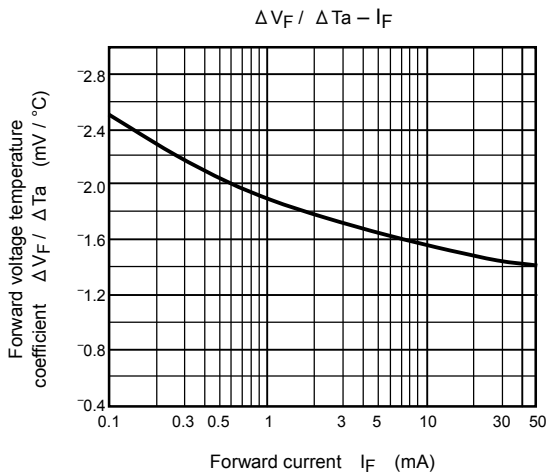
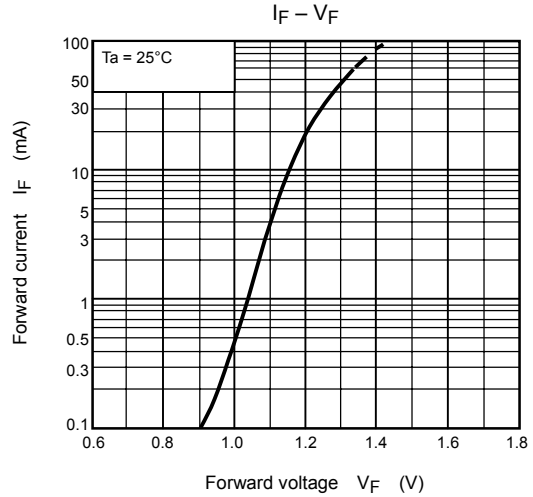
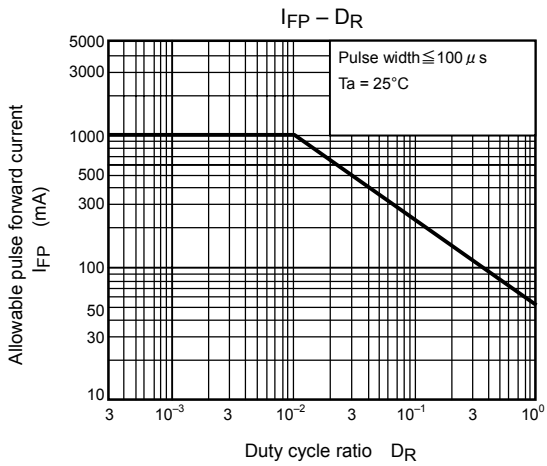
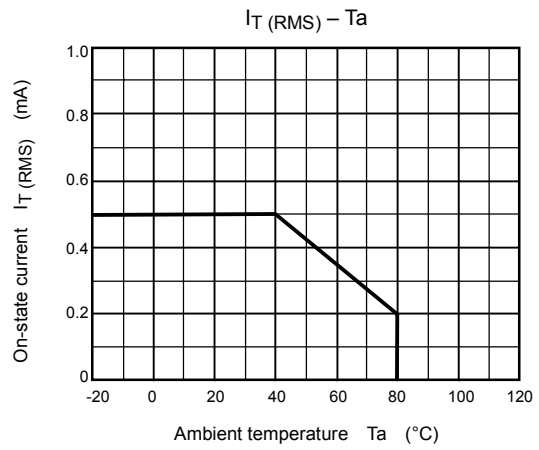
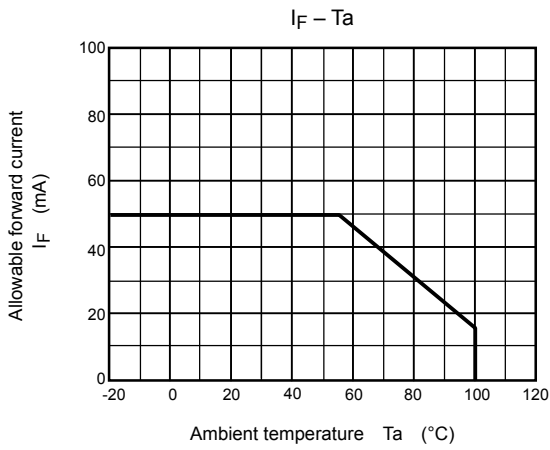
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{\text{DRM}} = 400\text{V}, T_a = 110^\circ\text{C}$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

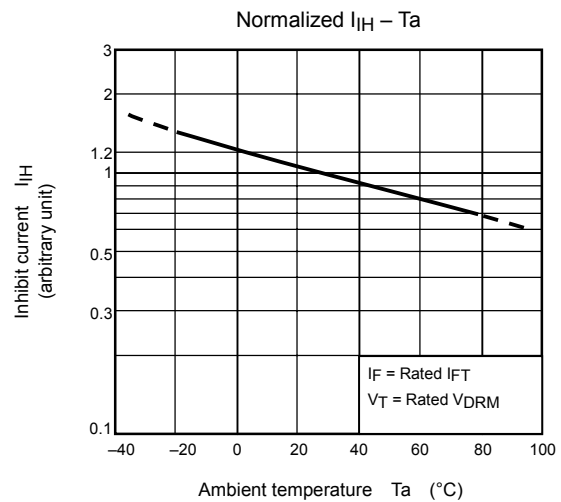
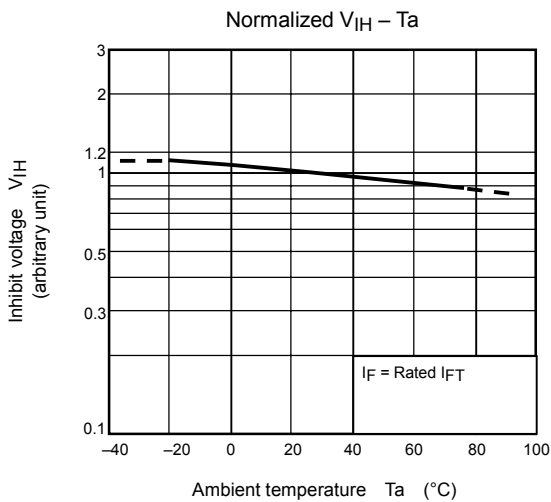
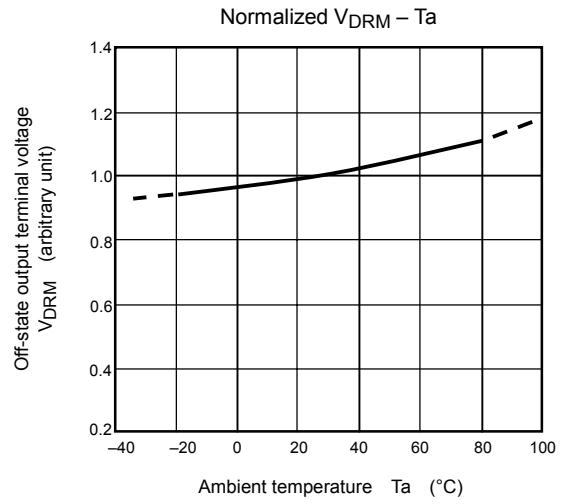
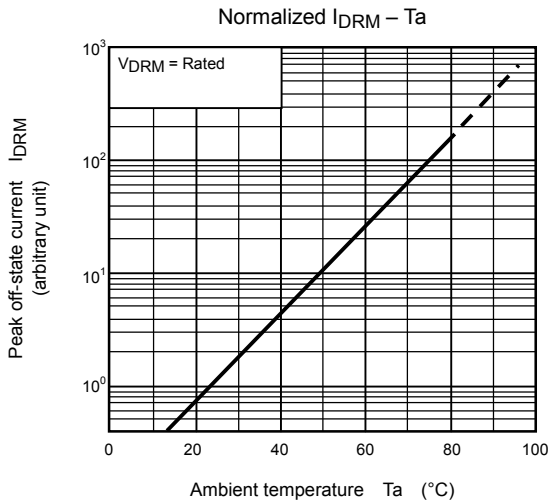
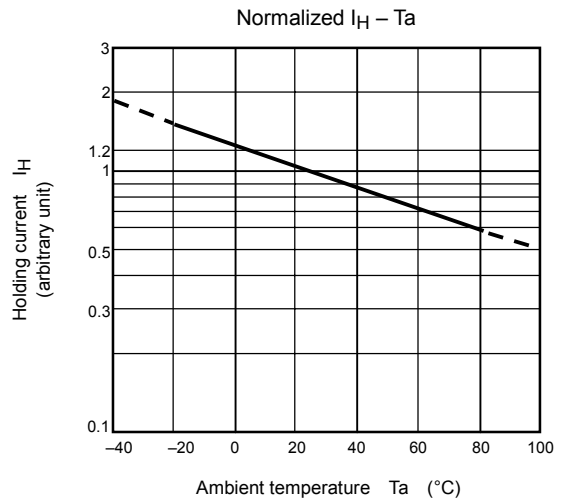
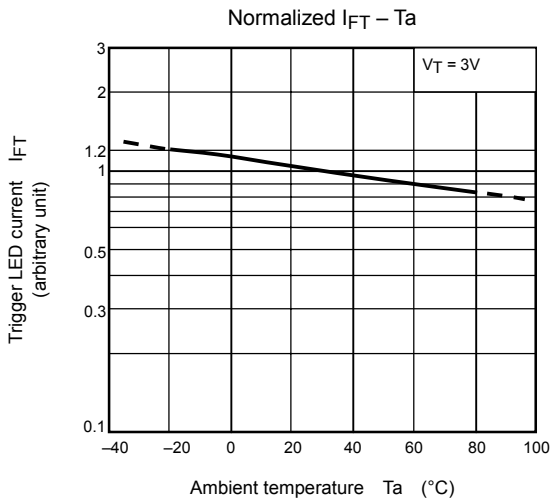
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	$V_T = 6\text{V}$	—	—	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	—	μA
Capacitance (input to output)	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500\text{V}$	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







RESTRICTIONS ON PRODUCT USE

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