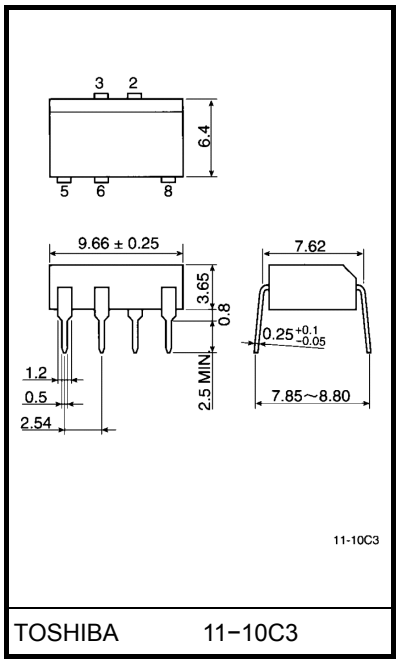
TOSHIBA Photocoupler GaAs Ired & Photo−Triac

TLP3502

Trica Driver
Programmable Controllers
AC−Output Module
Solid State Relay

Unit in mm



TOSHIBA 11−10C3

Weight: 0.52 g

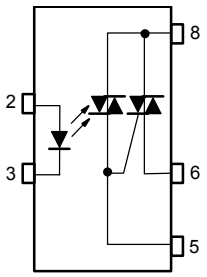
The TOSHIBA TLP3502 consists of a photo−triac optically coupled to a gallium arsenide infrared emitting diode in a 8 lead plastic DIP package.

- 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); TLP3502(IFT5)
(Note) Application type name for certification test, please use standard product type name, i.e.
TLP3502(IFT5): TLP3502

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 (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}	−25	—	85	°C

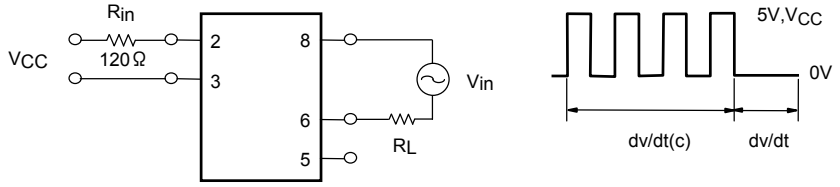
Individual Electrical Characteristics (Ta = 25°C)

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	—	—	—	25	mA
	Critical rate of rise of off−state voltage	dv/dt	V_{in}=120Vrms (fig.1)	200	500	—	V/μs
	Critical rate of rise of commutating voltage	dv/dt(c)	V_{in}=120Vrms, I_T=0.5Arms (fig. 1)	—	5	—	V/μs

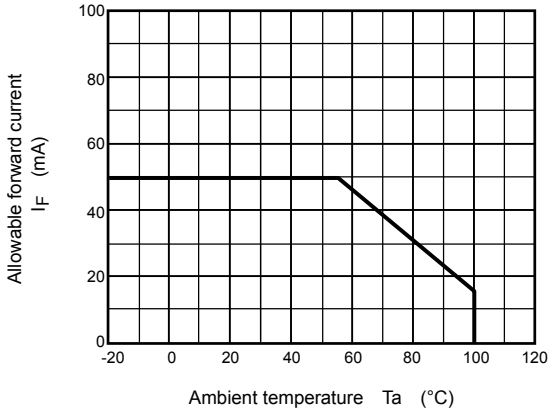
Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_T=6V	—	—	10	mA
Capacitance (input to output)	C_S	V_S=0, f=1MHz	—	1.5	—	pF
Isolation resistance	R_S	V_S=500V	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}

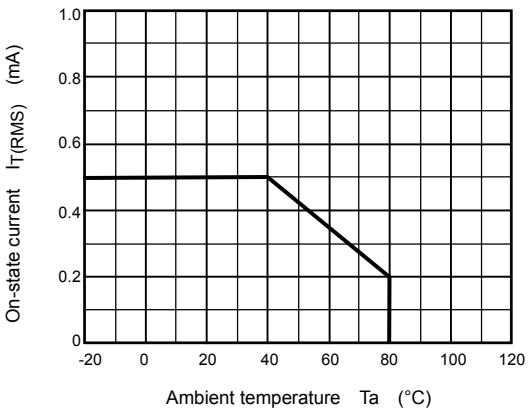
Fig. 1: dv/dt test circuit



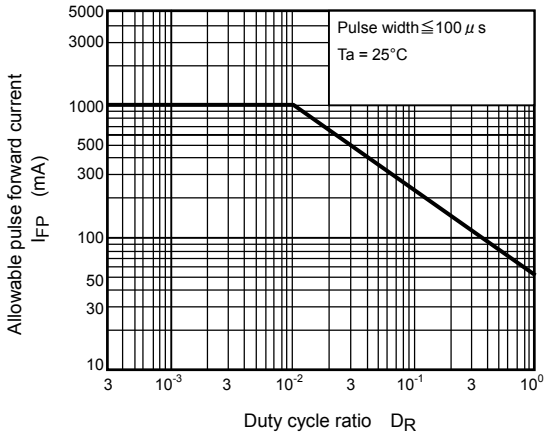
I_F – Ta



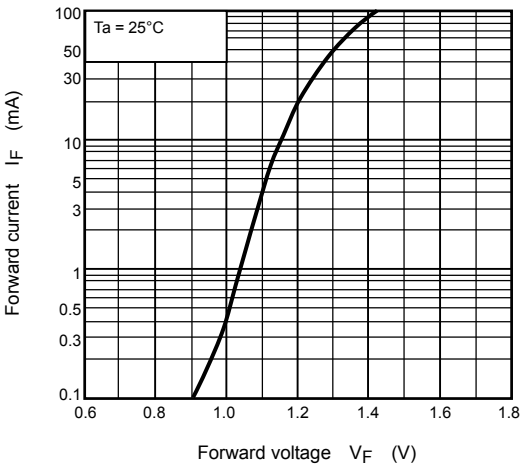
$I_{T(RMS)}$ – Ta



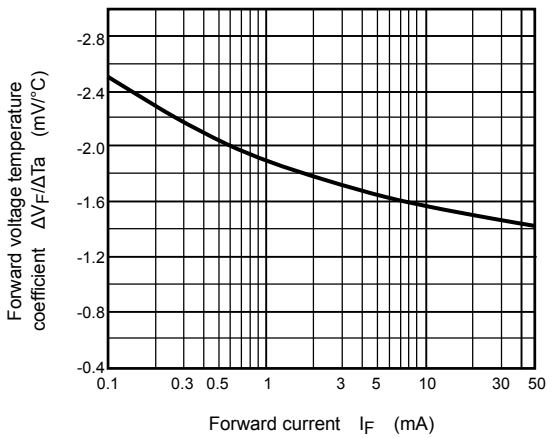
I_{FP} – D_R



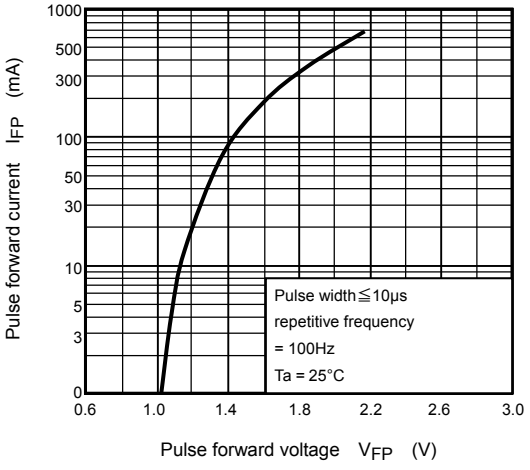
I_F – V_F



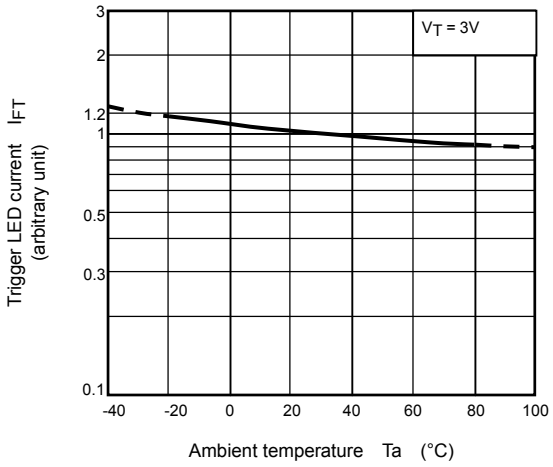
$\Delta V_F/\Delta Ta$ – I_F



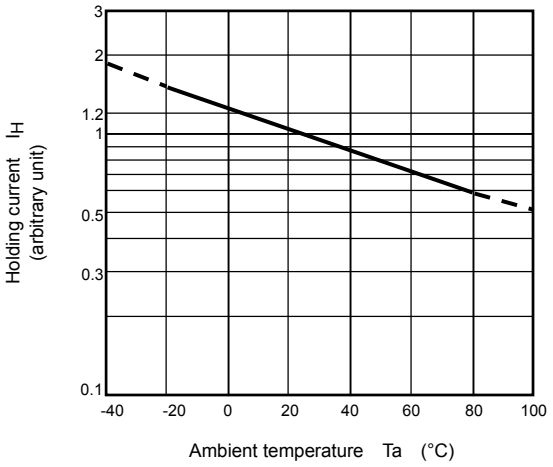
I_{FP} – V_{FP}



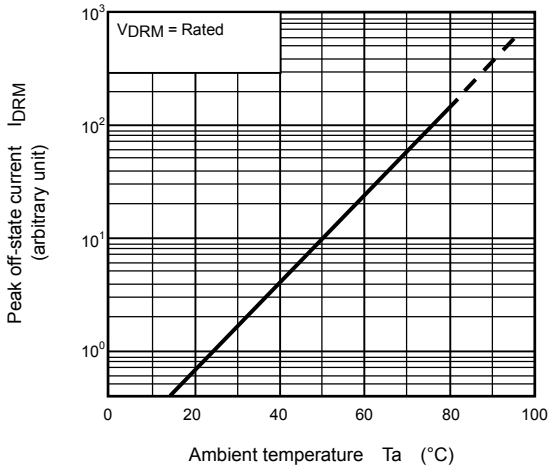
Normalized I_{FT} – Ta



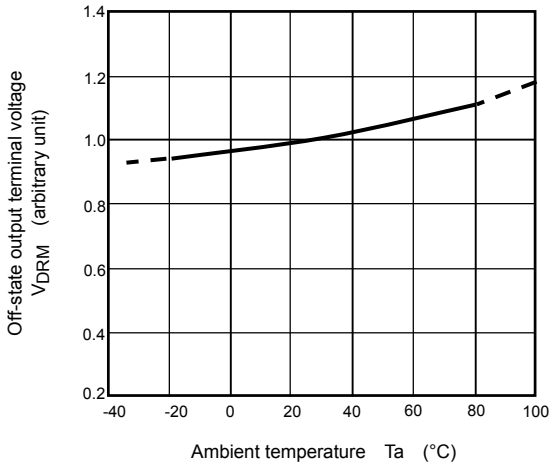
Normalized I_H – Ta



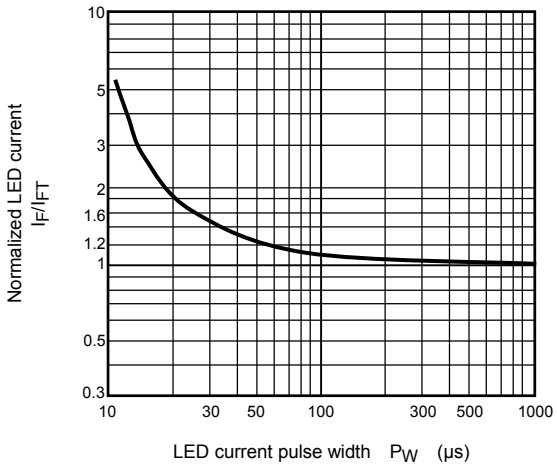
Normalized I_{DRM} – Ta



Normalized V_{DRM} – Ta



Normalized LED Current
– LED current Pulse Width



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20070701-EN

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