

TOSHIBA Photocoupler GaAs Ired & Photo-Triac

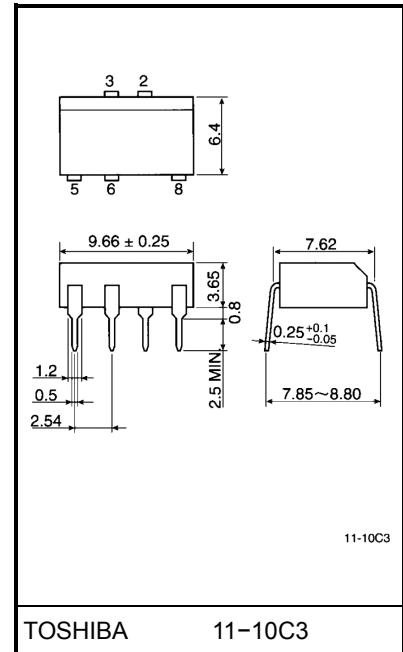
TLP3502

- Trica Driver
- Programmable Controllers
- AC-Output Module
- Solid State Relay

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

Unit in mm



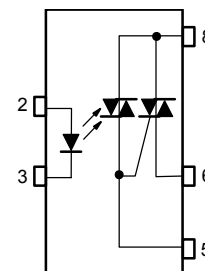
Weight: 0.52 g

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); 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)	$\Delta I_F/^\circ\text{C}$	-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	$I_T(\text{RMS})$	Ta=40°C	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}	-25	—	85	°C

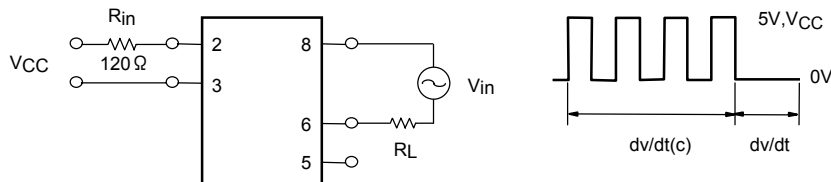
Individual Electrical Characteristics (Ta = 25°C)

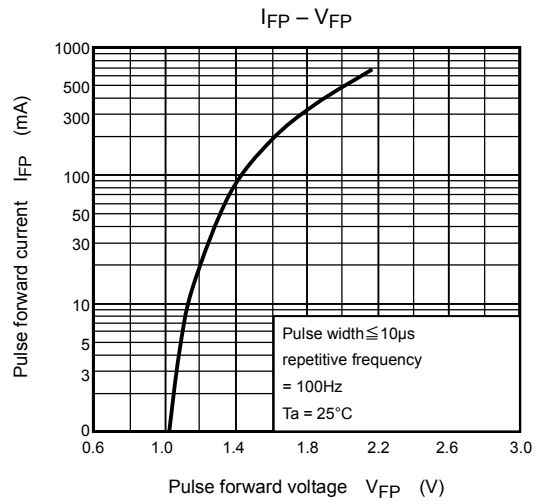
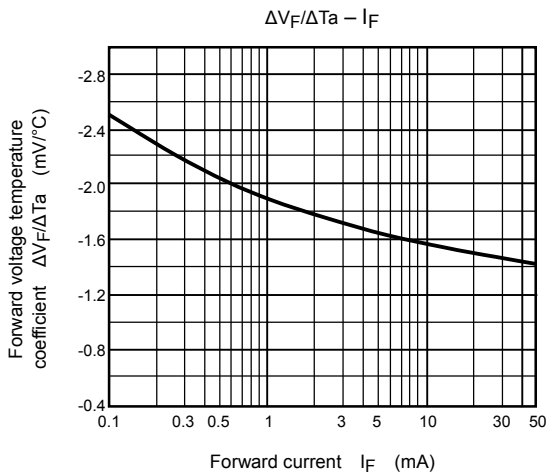
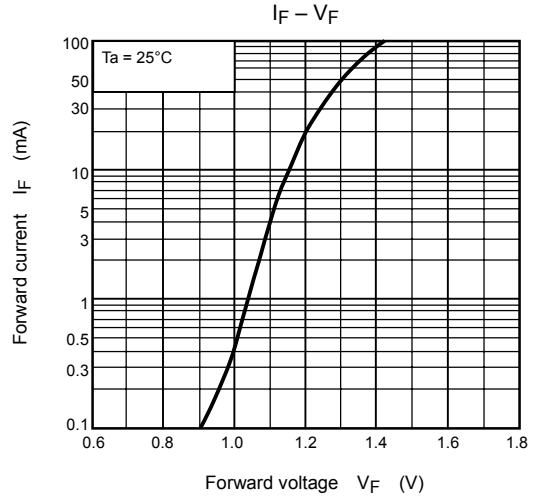
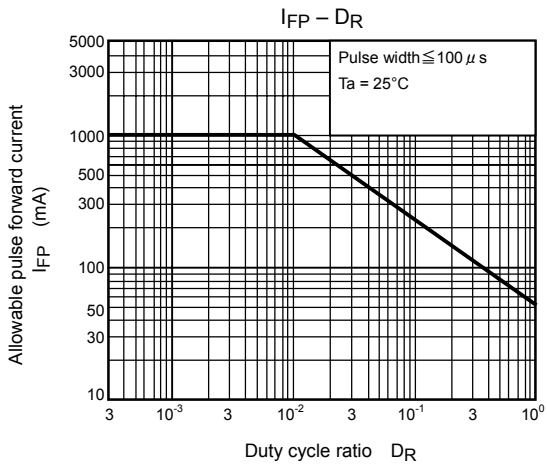
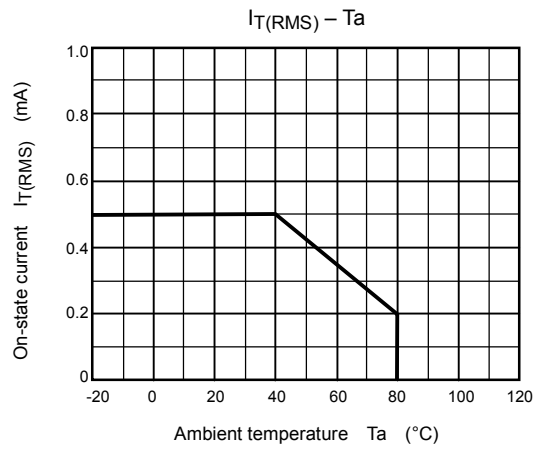
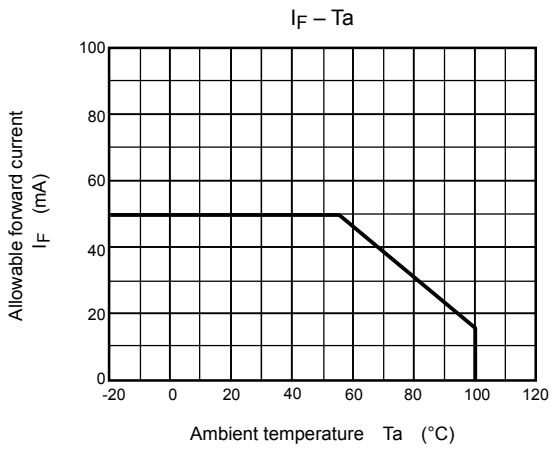
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F=10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R=5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V=0, f=1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{DRM}=400\text{V}, T_a=110^\circ\text{C}$	—	—	100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

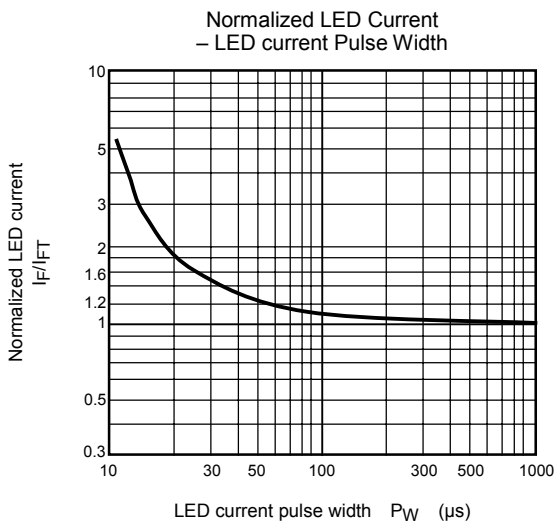
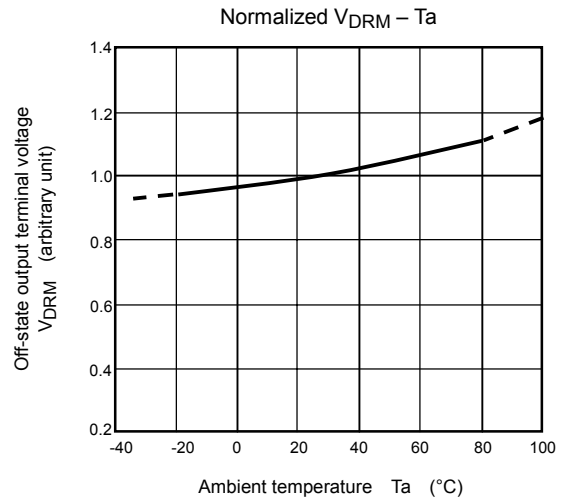
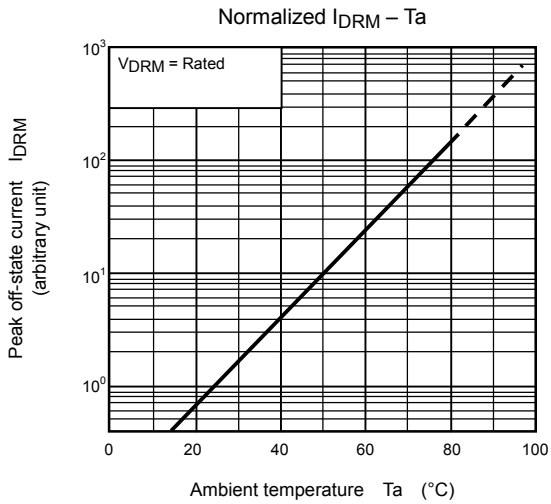
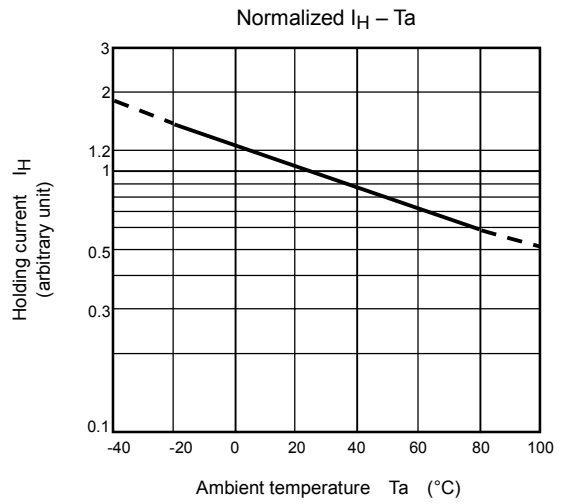
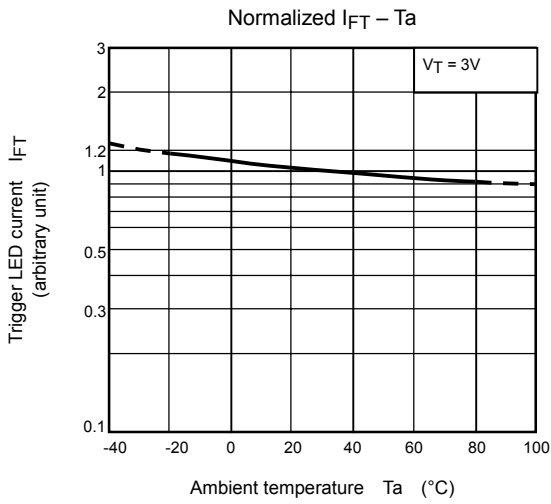
Coupled Electrical Characteristics (Ta = 25°C)

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







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000707EBC

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