

TOSHIBA Photocoupler GaAs Ired & Photo-Triac

# TLP3520

Triac Driver  
Programmable Controllers  
AC-Output Module  
Solid State Relay

The TOSHIBA TLP3520 consists of a photo-triac optically coupled to a gallium arsenide infrared emitting diode in a 16 lead plastic DIP package.

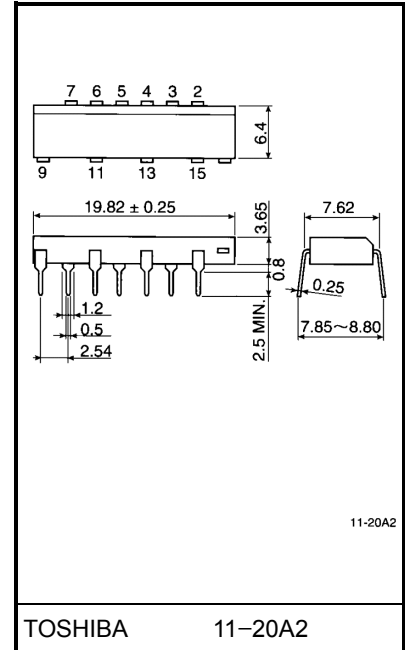
- Peak off-state voltage: 400 V (min.)
- Trigger LED current: 10 mA (max.)
- On-state current: 1.0 A<sub>rms</sub> (max.)
- Isolation voltage: 2500 V<sub>rms</sub> (min.)
- UL recognized: UL1577, file no. E67349
- Trigger LED current

Classi- fication *	Trigger LED Current (mA)		Marking Of Classification
	V <sub>T</sub> = 6 V, T <sub>a</sub> = 25°C		
	Min.	Max.	
(IFT5)	—	5.0	T5
(IFT7)	—	7.0	T5, T7
Standard	—	10	T5, T7, blank

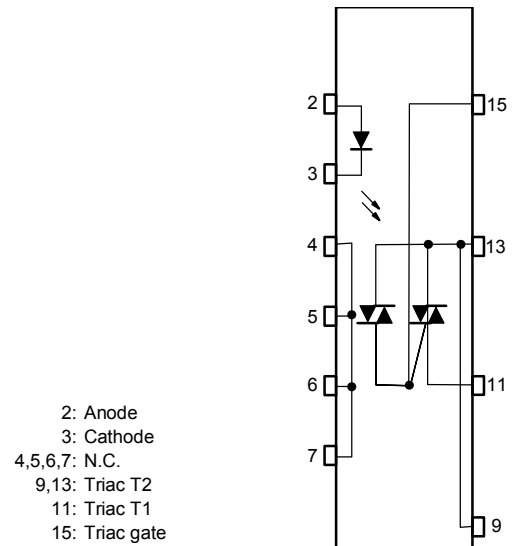
\*Ex. (IFT5); TLP3520 (IFT5)

(Note) Application type name for certification test, please use standard product type name, i.e. TLP3520 (IFT5): TLP3520

Unit in mm



## Pin Configuration (top view)



## 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 (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	$V_{DRM}$	400	V
	On-state RMS current	Ta = 40°C	1.0	A
		Ta = 60°C	0.7	
	On-state current derating (Ta ≥ 40°C)	$\Delta I_T / ^\circ\text{C}$	-14.3	mA / °C
	Peak current from snubber circuit (100 μs pulse, 120 pps)	$I_{SP}$	2	A
	Peak nonrepetitive surge current (50 Hz, peak)	$I_{TSM}$	10	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 (10 s)	$T_{sol}$	260	°C	
Isolation voltage (AC, 1 min., R.H. ≤ 60%) (Note)	$BV_S$	2500	$V_{rms}$	

(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

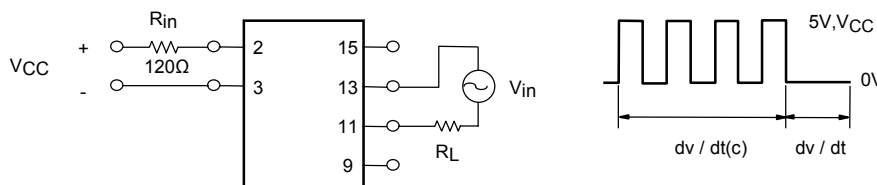
**Individual Electrical Characteristics (Ta = 25°C)**

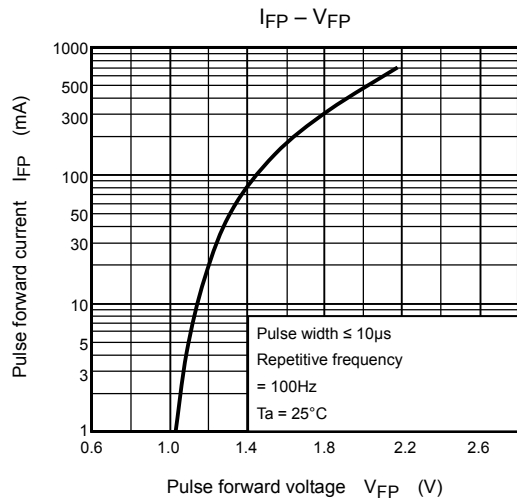
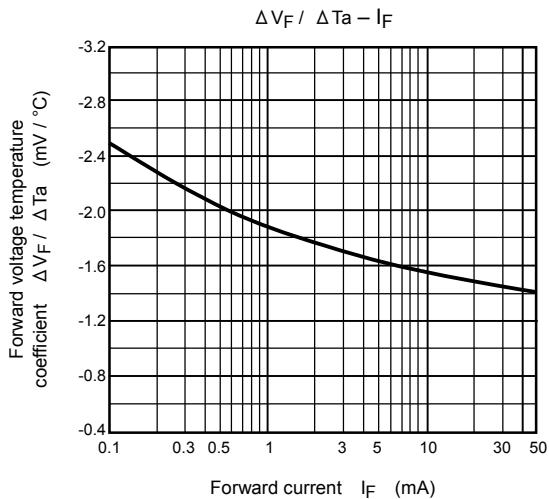
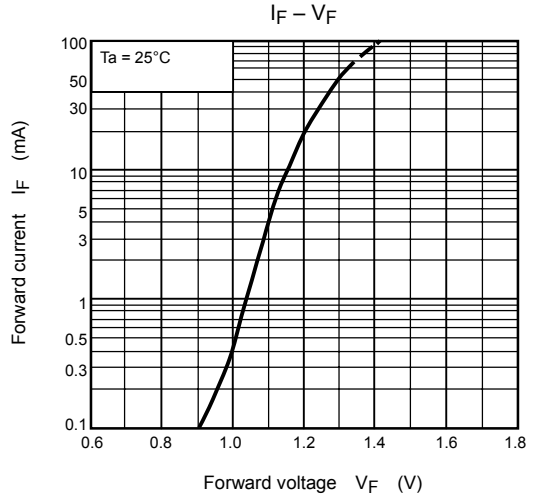
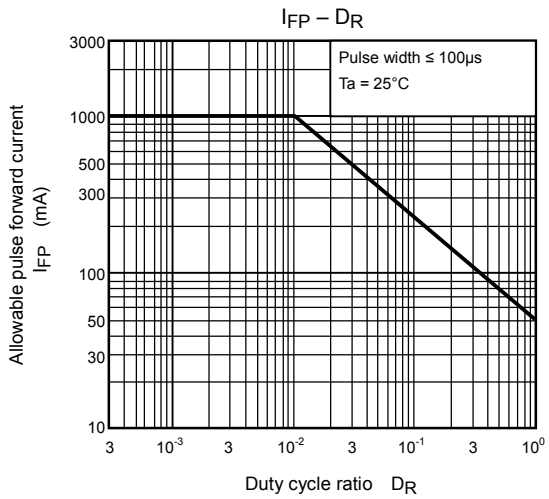
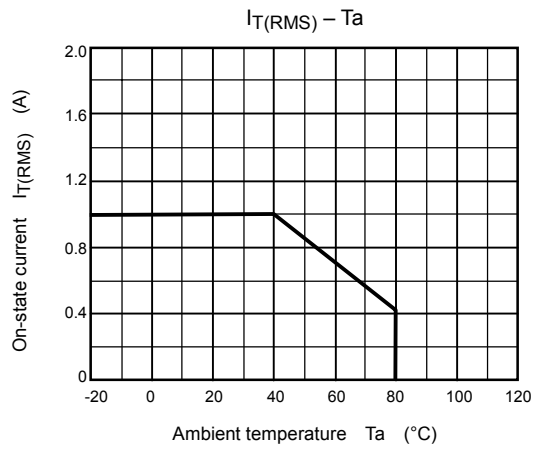
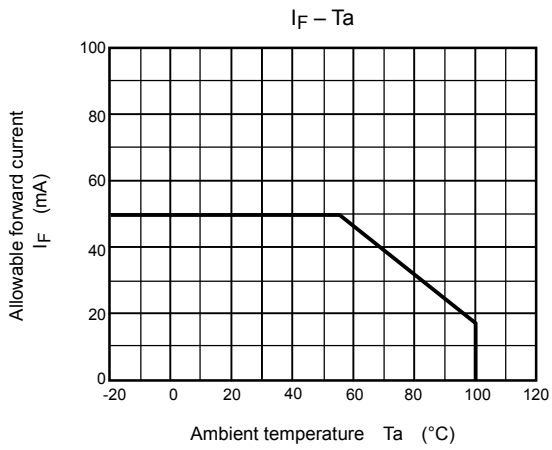
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5 \text{ V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{DRM}$	$V_{DRM} = 400 \text{ V}, T_a = 110^\circ\text{C}$	—	—	100	$\mu\text{A}$
	Peak on-state voltage	$V_{TM}$	$I_{TM} = 1.5 \text{ A}$	—	—	3.0	V
	Holding current	$I_H$	$R_L = 100\Omega$	—	—	25	mA
	Critical rate of rise of off-state voltage	$dv / dt$	$V_{in} = 120 \text{ V}_{rms}$ (Fig.1)	200	500	—	$\text{V} / \mu\text{s}$
	Critical rate of rise of commutating voltage	$dv / dt (c)$	$V_{in} = 120 \text{ V}_{rms}, I_T = 1.0 \text{ A}_{rms}$ (Fig.1)	—	5	—	$\text{V} / \mu\text{s}$

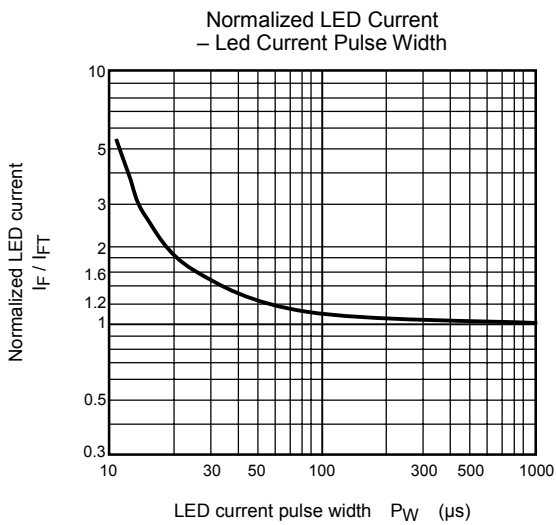
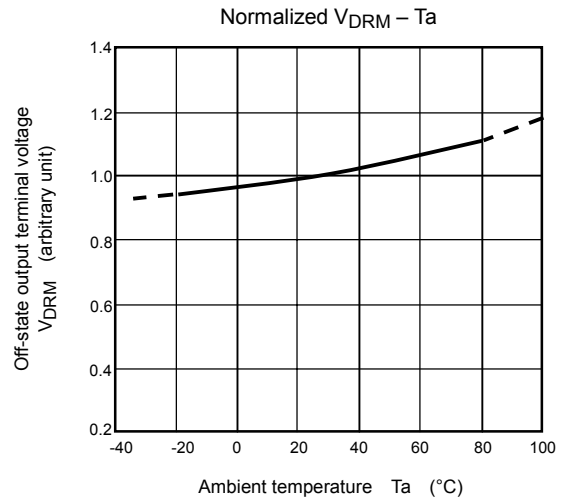
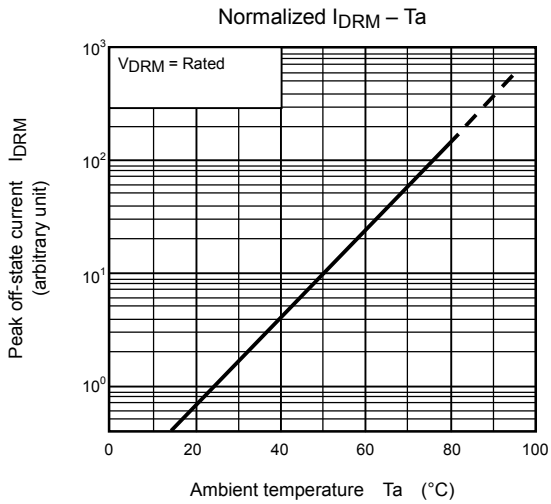
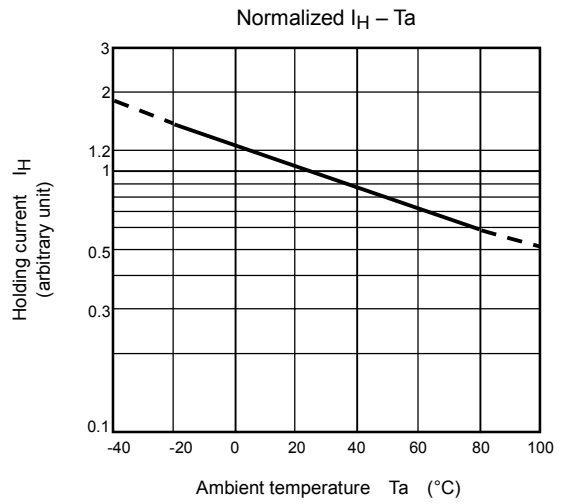
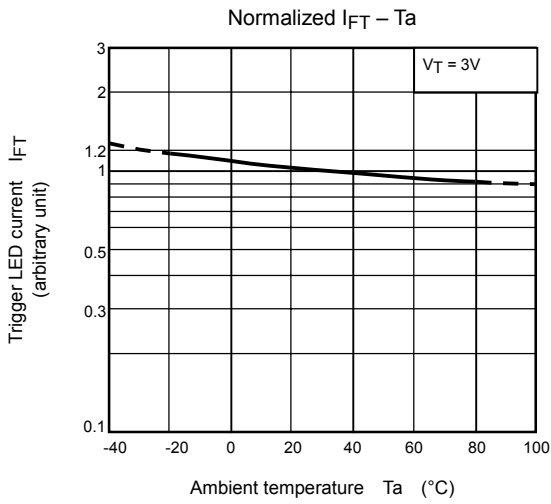
**Coupled Electrical Characteristics (Ta = 25°C)**

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{FT}$	$V_T = 6 \text{ V}$	—	—	10	mA
Capacitance (input to output)	$C_S$	$V_S = 0, f = 1 \text{ MHz}$	—	1.5	—	pF
Isolation resistance	$R_S$	$V_S = 500 \text{ V}$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
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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