

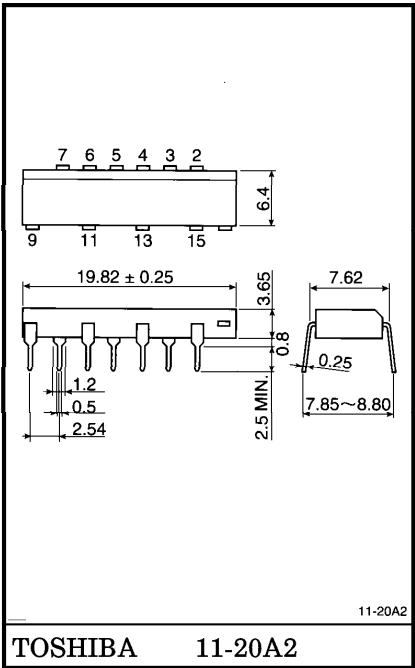
TLP3521

Unit in mm

TRIAC DRIVER  
PROGRAMMABLE CONTROLLERS  
AC-OUTPUT MODULE  
SOLID STATE RELAY

The TOSHIBA TLP3521 consists of a zero voltage crossing turn-on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a 16 lead plastic DIP package.

- Peak Off-State Voltage : 400V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- On-State Current : 1.0A<sub>rms</sub> (MAX.)
- Isolation Voltage : 2500V<sub>rms</sub> (MIN.)
- UL Recognized : UL1577, File No. E67349
- Trigger LED Current



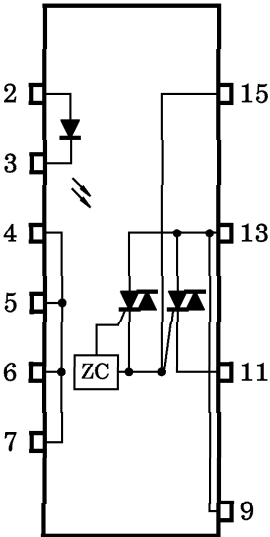
Weight : 1.13g

CLASSI- FICATION*	TRIGGER LED CURRENT (mA)		MARKING OF CLASSIFICATION
	V <sub>T</sub> =6V, T <sub>a</sub> =25°C		
	MIN.	MAX.	
(IFT5)	—	5.0	T5
(IFT7)	—	7.0	T5, T7
Standard	—	10	T5, T7, Blank

\*Ex. (IFT5) ; TLP3521 (IFT5)  
(Note) Application type name for certification test, please use standard product type name, i.e. TLP3521 (IFT5) : TLP3521

- 2 : ANODE
- 3 : CATHODE
- 4, 5, 6, 7 : N.C.
- 9, 13 : TRIAC T2
- 11 : TRIAC T1
- 15 : TRIAC GATE

PIN CONFIGURATION (TOP VIEW)



## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	$I_F$	50	mA
	Forward Current Derating ( $T_a \geq 53^\circ\text{C}$ )	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C
	Peak Forward Current (100 $\mu\text{s}$ 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	$I_T$ (RMS)	1.0	A
			0.7	
	On-State Current Derating ( $T_a \geq 40^\circ\text{C}$ )	$\Delta I_T / ^\circ\text{C}$	-14.3	mA / °C
	Peak Current from Snubber Circuit (100 $\mu\text{s}$ pulse, 120pps)	$I_{SP}$	2	A
	Peak Nonrepetitive Surge Current (50Hz, 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 (10s)		$T_{sol}$	260	°C
Isolation Voltage (AC, 1 min., R.H. $\leq$ 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

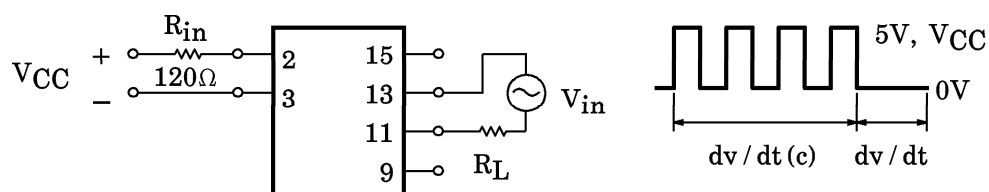
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{AC}$	—	—	120	$V_{ac}$
Forward Current	$I_F$	15	20	25	mA
Peak Current from Snubber Circuit	$I_{SP}$	—	—	1	A
Operating Temperature	$T_{opr}$	-20	—	80	°C

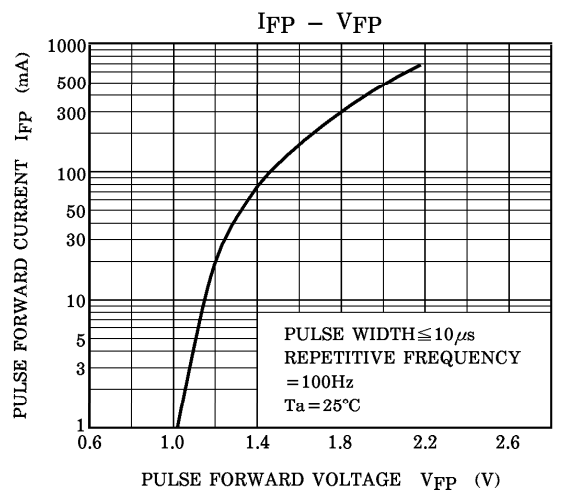
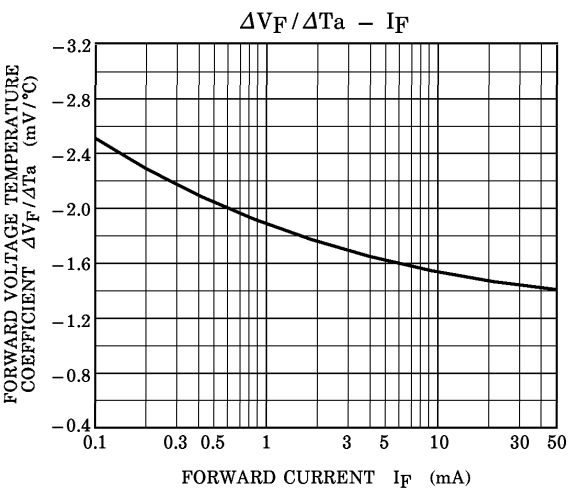
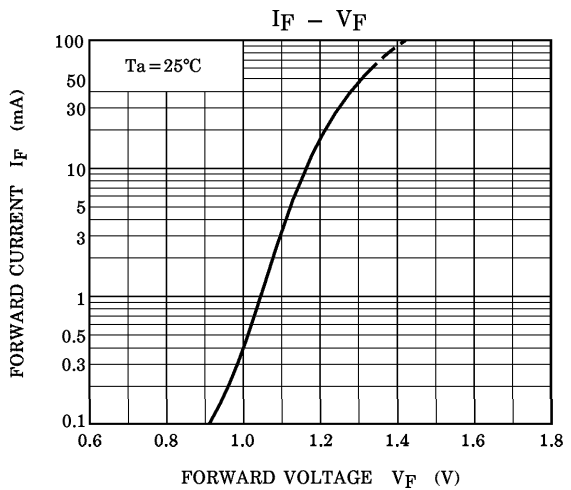
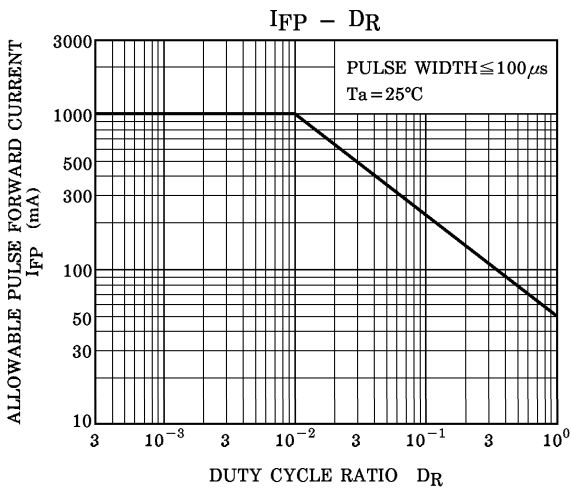
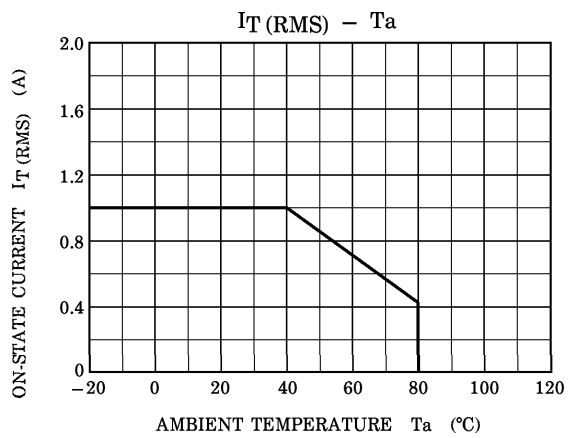
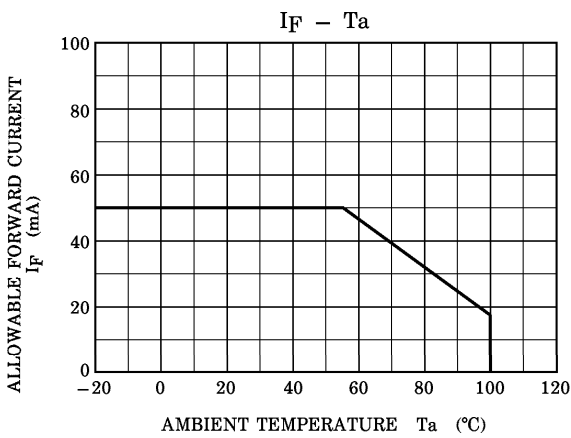
## INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

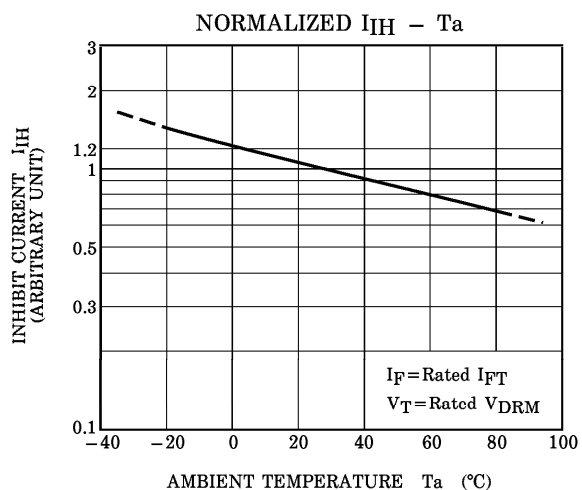
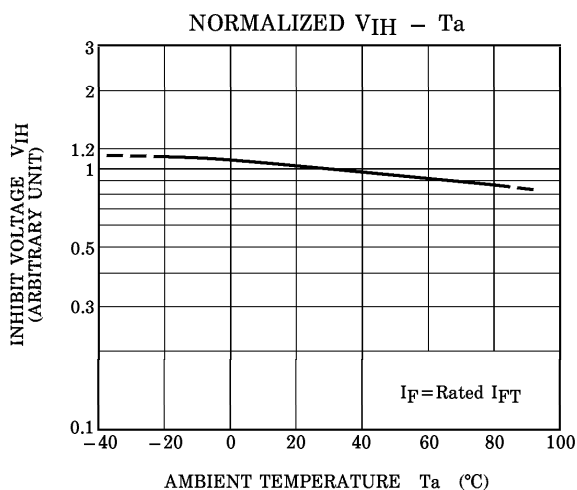
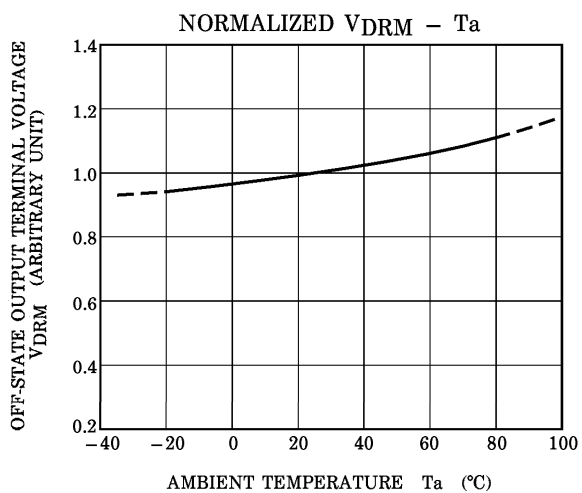
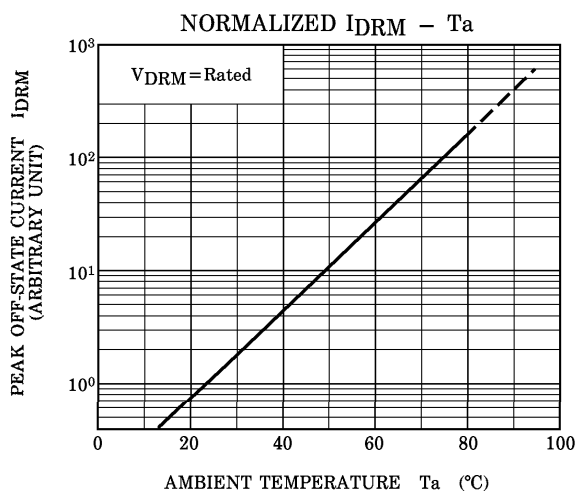
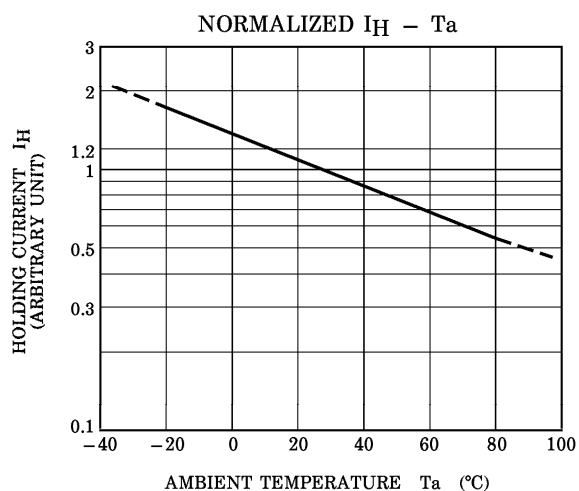
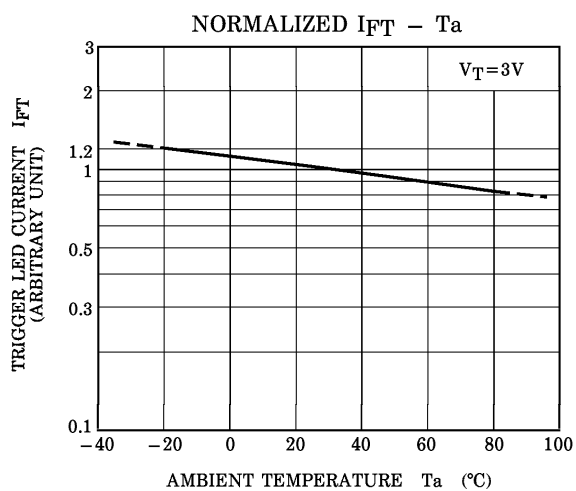
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	$V_F$	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	$I_R$	$V_R = 5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
DETECTOR	Peak Off-State Current	$I_{DRM}$	$V_{DRM} = 400\text{V}, T_a = 110^\circ\text{C}$	—	—	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	$dv/dt$	$V_{in} = 120V_{rms}$ (Fig.1)	200	500	—	$V/\mu s$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$V_{in} = 120V_{rms}, I_T = 1.0A_{rms}$ (Fig.1)	—	5	—	$V/\mu s$

## 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	$V_{IH}$	$I_F = \text{Rated } I_{FT}$	—	—	50	V
Leakage in Inhibited State	$I_{IH}$	$I_F = \text{Rated } I_{FT}$ $V_T = \text{Rated } V_{DRM}$	—	200	—	$\mu\text{A}$
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





**RESTRICTIONS ON PRODUCT USE**

000707EBC

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