

TOSHIBA AC SWITCH OPTICALLY ISOLATED AC SWITCH WITH ZERO VOLTAGE TURN-ON FUNCTION

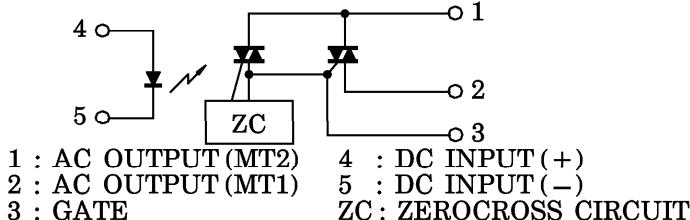
**TSA3001G, TSA3001J**

- R.M.S. ON-STATE CURRENT :  $I_T$  (RMS) = 0.2~3A
- Repetitive Peak Off-State Voltage :  $V_{DRM}$  = 400, 600V
- Isolation Voltage between input to output : 3000VAC (t=1min.)
- Thickness of inner insulation material : 0.8mm (min.)
- Creepage distances, Clearances for insulation between input and output side : 6mm (min.)
- TTL drive is available

MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

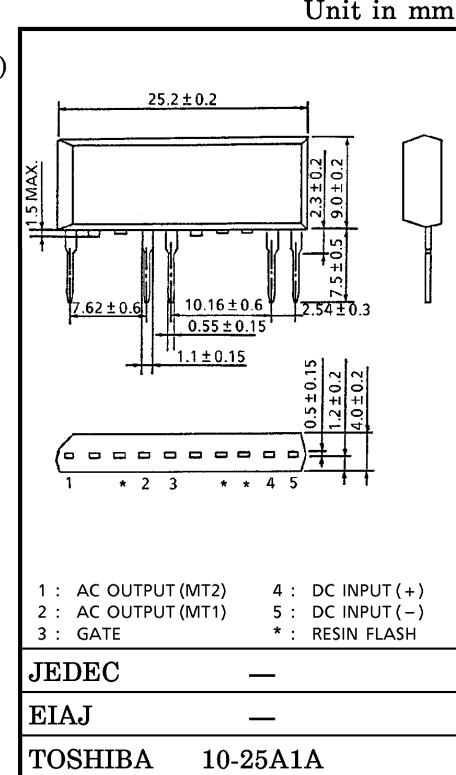
CHARACTERISTIC		SYMBOL	RATING	UNIT
INPUT	Forward Current	$I_F$ (IN)	50	mA
	Forward Current Derating ( $T_a \geq 53^\circ\text{C}$ )	$\Delta I_F$ / $^\circ\text{C}$	-0.7	mA / $^\circ\text{C}$
	Peak Forward Current (100 $\mu\text{s}$ pulse, 100pps)	$I_{FP}$	1	A
	Reverse Voltage	$V_R$	5	V
OUTPUT	Repetitive Peak Off-State Voltage	$V_{DRM}$	400	V
	TSA3001G		600	
	TSA3001J			
	Nominal AC Line Voltage (Note 1)	$V_{AC}$	80~125	V
	TSA3001G		80~250	
	TSA3001J			
	R.M.S. On-State Current (Sine Waveform, R.M.S.)	$I_T$ (RMS)	0.2~3	A
	Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{TSM}$	80 (50Hz) 88 (60Hz)	A
	$I^2t$ Limit Value	$I^2t$	32	$\text{A}^2\text{s}$
	Operating Frequency Range	$f$	45~65	Hz
	Operating Temperature Range	$T_{opr}$	-40~100	$^\circ\text{C}$
	Storage Temperature Range	$T_{stg}$	-40~100	$^\circ\text{C}$
	Isolation Voltage (Input to Output) Note 2	$BV_s$	3000	V

## EQUIVALENT CIRCUIT



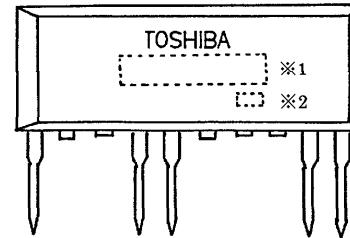
(The cutted pins near by Pin No.1 &amp; No.3 is connecting in electrically with output terminal)

Note 1 : When the voltage larger than applied AC voltage is applied to the device such as 2 phase motor and others, please derating for this maximum rating value.

Note 2 : TEST CONDITION : AC,  $t=60\text{s}$ ,  $\text{RH} \leq 60\%$ Note 3 : Soldering of printed wiring board should be used under  $260^\circ\text{C}$  and 10 seconds.

Weight : 2g (TYP.)

## MARKING



NUMBER	SYMBOL		MARK
	TYPE	TSA3001G	
※1	TYPE	TSA3001G	TYPE TSA3001G
		TSA3001J	TSA3001J
※2	Lot Number Month (Starting from Alphabet A) Year (Last Number of the Christian era)		Example 3A : January 1993 3B : February 1993 3L : December 1993

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
INPUT	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	$C_T$	$V_T = 0\text{V}, f = 1\text{MHz}$	—	20	—	pF
OUTPUT	Peak Off-State Current	$I_{DRM}$	$V_{DRM} = \text{Rated}$	—	—	10	$\mu\text{A}$
	Peak On-State Voltage	$V_{TM}$	$I_{TM} = 12\text{A}$	—	—	1.5	V
	Holding Current	$I_H$	$V_D = 6\text{V}, \text{Beginning Current} = 1\text{A}$	—	—	25	mA
	Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DRM} = \text{Rated}$	—	2000	—	$\text{V}/\mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$(dv/dt)_c$	$V_D = 400\text{V}$ $-di/dt = 30\text{A}/\text{ms}$	—	30	—	$\text{V}/\mu\text{s}$
	Thermal Resistance	$R_{th}(j-\ell)$	AC	—	—	20	$^\circ\text{C}/\text{W}$
	Junction to Lead	$R_{th}(j-a)$	AC	—	—	85	$^\circ\text{C}/\text{W}$

COUPLED ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	$I_{FT}$	$V_D = 6\text{V}, R_L = 20\Omega$	—	—	10	mA
Inhibit Voltage	$V_{IH}$	$I_F = 10\text{mA}, R_L = 20\Omega$	—	38	50	V
Capacitance (Input to output)	$C_S$	$V_S = 0\text{V}, f = 1\text{MHz}$	—	0.5	—	pF
Isolation Resistance	$R_S$	$V = 500\text{V}, RH \leq 60\%$	$10^9$	—	—	$\Omega$
Turn-off Time	$t_{off}$	OUTPUT : Sine Waveform	—	—	3/4	cycle

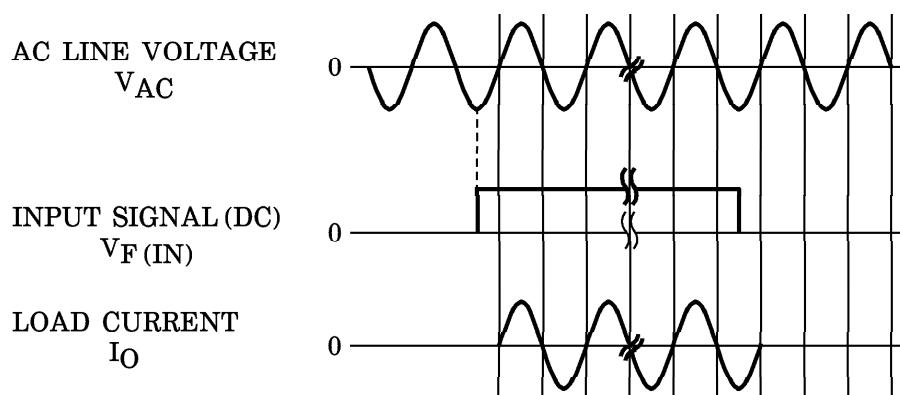
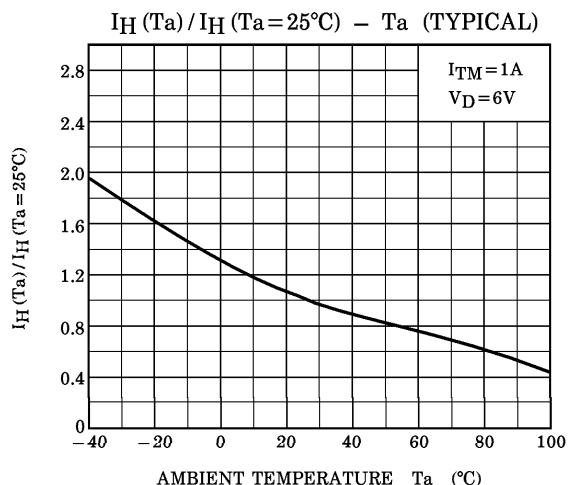
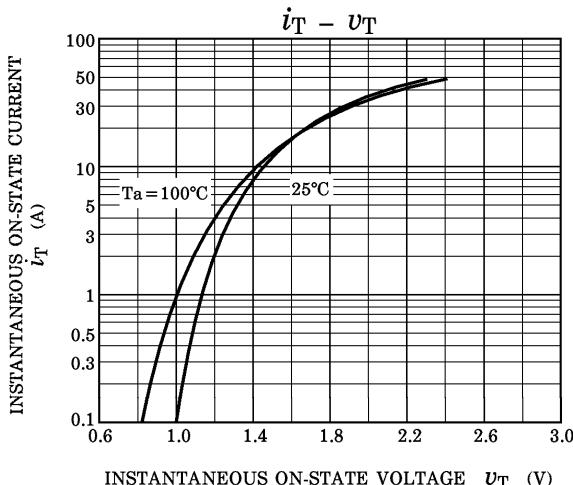
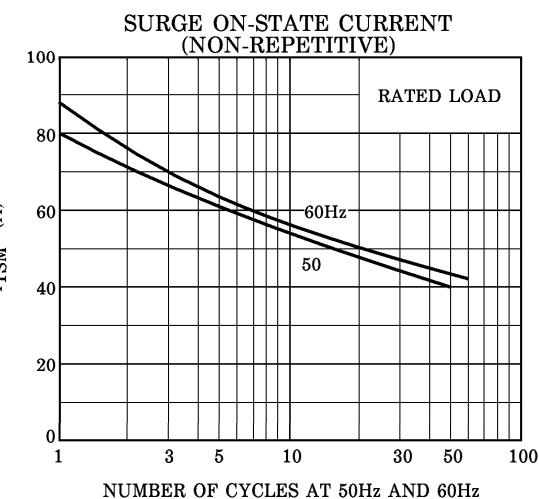
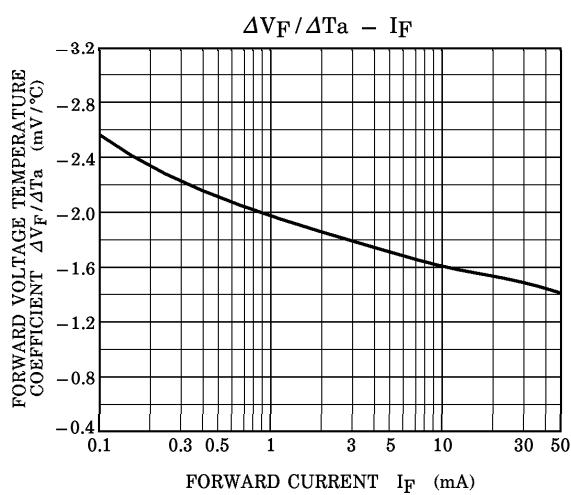
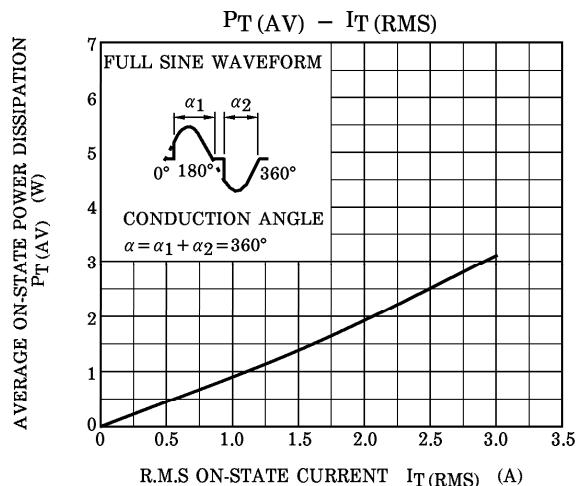
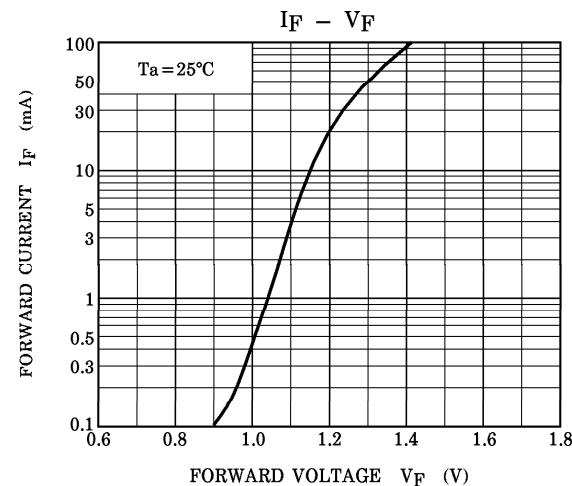
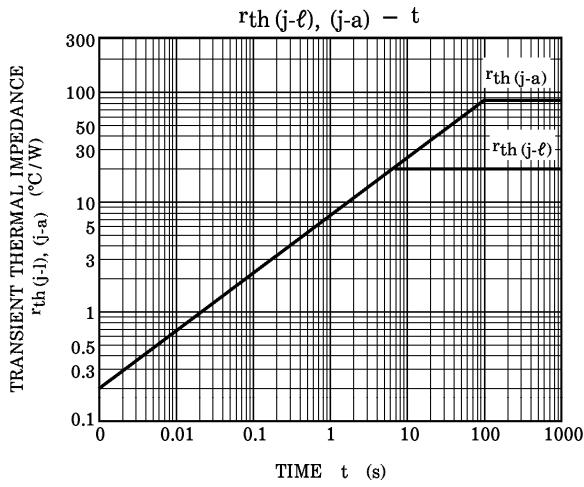
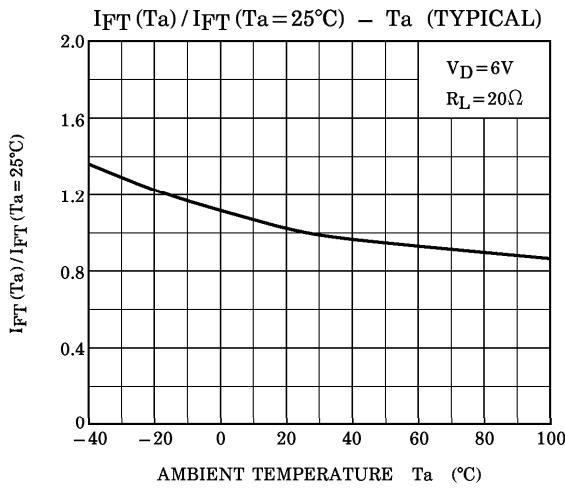
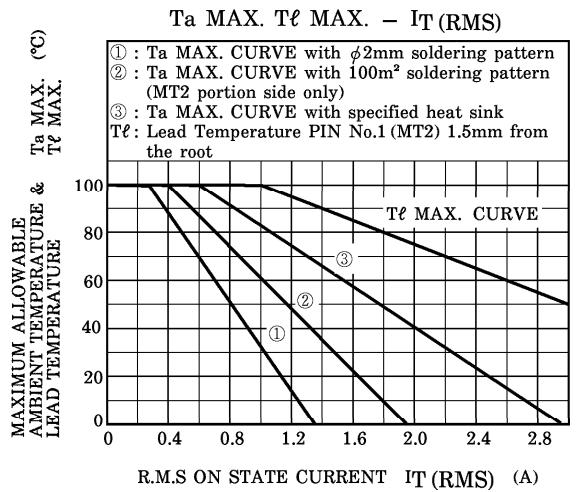
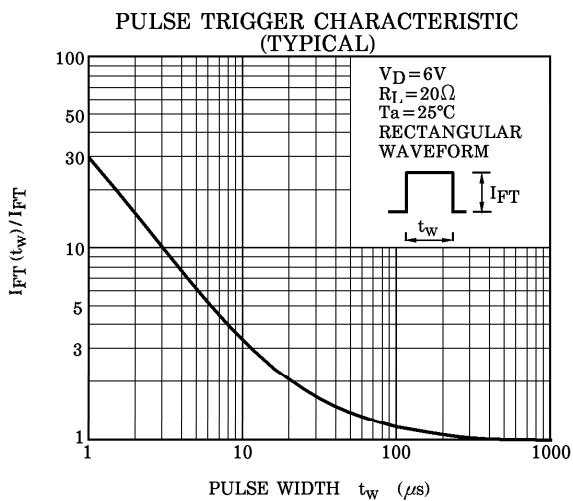
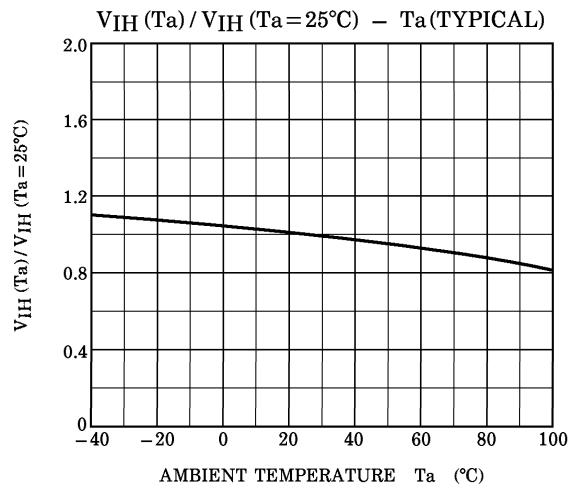


Fig.1 ZERO VOLTAGE SWITCHING WAVEFORM





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