

TENTATIVE-RESTRICTIVE DATA

TOSHIBA AC SWITCH

OPTICALLY ISOLATED AC SWITCH WITH ZERO VOLTAGE TURN-ON FUNCTION

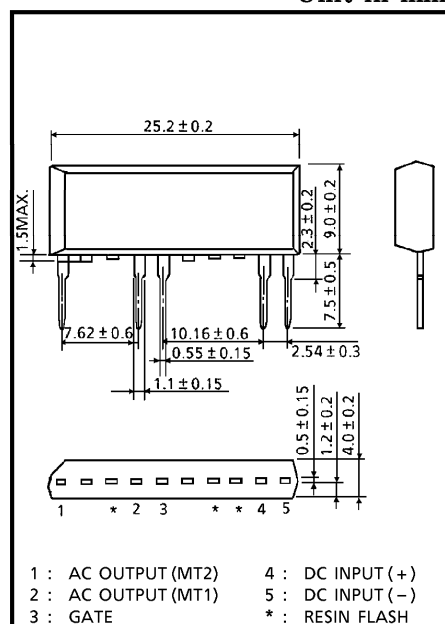
TSA2000G, TSA2000J

- R.M.S. On-State Current : $I_T(\text{RMS})=0.1\sim 2\text{A}$
- Repetitive Peak Off-State Voltage : $V_{\text{DRM}}=400, 600\text{V}$
- Isolation Voltage between Input to Output : $3000\text{VAC}(t=1\text{min.})$
- Thickness of Inner Insulation Material : $0.8\text{mm}(\text{Min.})$
- Creepage Distances, Clearances for Insulation between Input and Output Side : $6\text{mm}(\text{Min.})$
- TTL drive is Available

Unit in mm

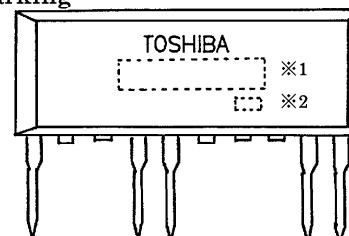
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC			SYMBOL	RATING	UNIT
INPUT	Control Input Current		I _F (IN)	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
OUTPUT	Repetitive Peak Off-State Voltage	TSA2000G	V _{DRM}	400	V
		TSA2000J		600	
	Nominal AC Line Voltage (Note 1)	TSA2000G	V _{AC}	80~125	V
		TSA2000J		80~250	
	R.M.S On-State Current (Sine Waveform, R.M.S.)		I _T (RMS)	0.1~2	A
	Peak One Cycle Surge On-State Current (Non-Repetitive)		I _{TSM}	20 (50Hz)	A
				22 (60Hz)	
I ² t Limit Value		I ² t	2	A ² s	
Operating Frequency Range			f	45~65	Hz
Operating Temperature Range			T _{opr}	−40~100	°C
Storage Temperature Range			T _{stg}	−40~100	°C
Isolation Voltage (Input to Output) Note 2			BV _s	3000	V

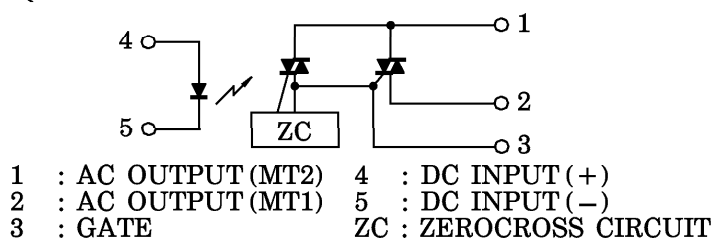


JEDEC	—
EIAJ	—
TOSHIBA	10-25A1A

Weight : 2g
Marking



EQUIVALENT CIRCUIT

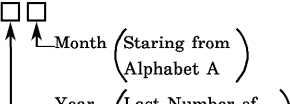


(The cutted pins near by Pin No.1 & No.3 is connecting in electrically with output terminal)

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=60s, RH $\leq$ 60%

Note 3 : Soldering of printed wiring board should be used under 260°C and 10 seconds.

NUMBER	SYMBOL		MARK	
※1	TYPE	TSA2000G	TYPE	TSA2000G
		TSA2000J		TSA2000J
※2	Lot Number 		Example 3A : January 1993 3B : February 1993 3L : December 1993	

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- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

ELECTRICAL CHARACTERISTICS (Ta = 25°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	μA
	Capacitance	C_T	$V_T = 0\text{V}$, $f = 1\text{MHz}$	—	20	—	pF
OUTPUT	Peak Off-State Current	I_{DRM}	$V_{\text{DRM}} = \text{Rated}$	—	—	10	μA
	Peak On-State Voltage	V_{TM}	$I_{\text{TM}} = 3\text{A}$	—	—	1.5	V
	Holding Current	I_H	$V_D = 6\text{V}$, Beginning Current = 1A	—	—	25	mA
	Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{\text{DRM}} = \text{Rated}$	—	2000	—	$\text{V} / \mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$(dv/dt)_c$	$V_D = 400\text{V}$, $-di/dt = 20\text{A/ms}$	—	20	—	$\text{V} / \mu\text{s}$
	Thermal Resistance	Junction to Lead	$R_{\text{th(j-l)}}$	—	—	22	$^{\circ}\text{C/W}$
		Junction to Ambient	$R_{\text{th(j-a)}}$	—	—	90	$^{\circ}\text{C/W}$

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°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	$V = 500\text{V}$, $R_H \leq 60\%$	10^9	—	—	Ω
Turn-off Time	t_{off}	OUTPUT : Sine Waveform	—	—	3 / 4	cycle

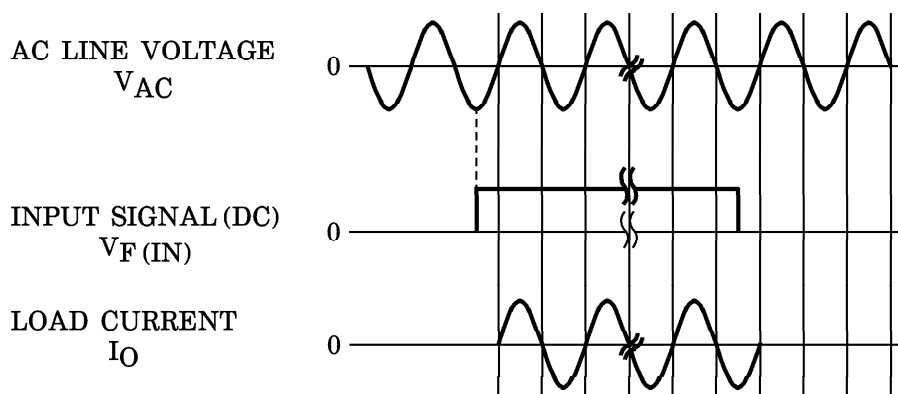


Fig.1 ZERO VOLTAGE SWITCHING WAVEFORM

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