

TOSHIBA AC SWITCH OPTICALLY ISOLATED AC SWITCH

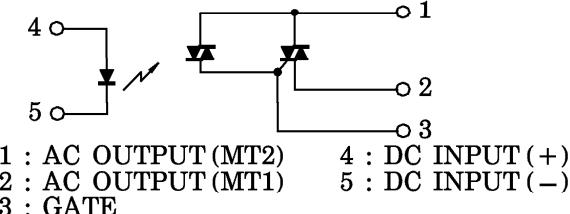
**TSA2100G, TSA2100J**

- R.M.S. On-State Current :  $I_T$  (RMS) = 0.1~2A
- 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 ( $T_a = 25^\circ C$ )

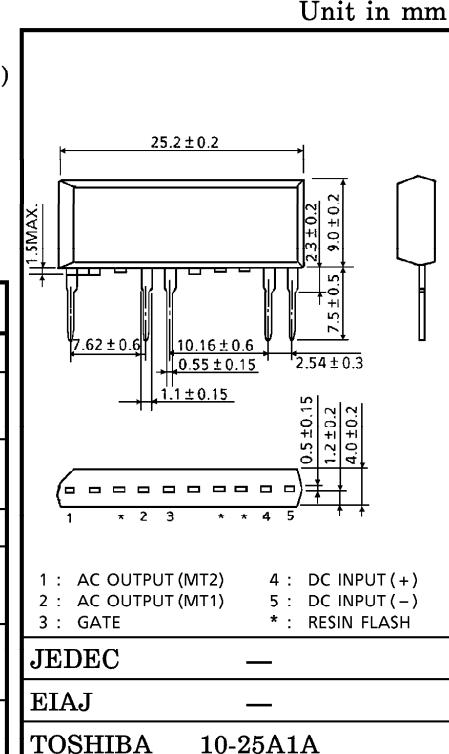
CHARACTERISTIC		SYMBOL	RATING	UNIT
INPUT	Control Input Current	$I_F$ (IN)	50	mA
	Forward Current Derating ( $T_a \geq 53^\circ C$ )	$\Delta I_F$ / $^\circ C$	-0.7	mA / $^\circ C$
	Peak Forward Current (100 $\mu$ s pulse, 100pps)	$I_{FP}$	1	A
	Reverse Voltage	$V_R$	5	V
OUTPUT	Repetitive Peak Off-State Voltage	$V_{DRM}$	400	V
	TSA2100G		600	
	TSA2100J			
	Nominal AC Line Voltage (Note 1)	$V_{AC}$	80~125	V
	TSA2100G		80~250	
	TSA2100J			
	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) 22 (60Hz)	A
	$I^2t$ Limit Value ( $t=1\sim10ms$ )	$I^2t$	2	$A^2s$
	Operating Frequency Range	$f$	45~65	Hz
	Operating Temperature Range	$T_{opr}$	-40~100	$^\circ C$
	Storage Temperature Range	$T_{stg}$	-40~100	$^\circ C$
	Isolation Voltage (Input to Output) Note 2	$BV_s$	3000	V

## EQUIVALENT CIRCUIT



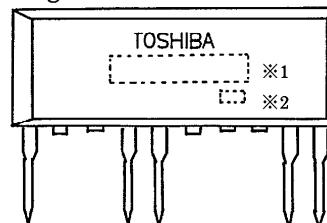
(The cutted pins near by Pin No.1 &amp; No.3 is connecting in electrically with output terminal)

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

Weight : 2g

Marking



NUMBER	SYMBOL	MARK
※1	TYPE	TSA2100G TSA2100J
※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

● 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 <sub>F</sub>	I <sub>F</sub> =10mA	1.0	1.15	1.3	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V <sub>T</sub> =0V, f=1MHz	—	20	—	pF
OUTPUT	Peak Off-State Current	I <sub>DRM</sub>	V <sub>DRM</sub> =Rated	—	—	10	μA
	Peak On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> =3.0A	—	—	1.5	V
	Holding Current	I <sub>H</sub>	V <sub>D</sub> =6V, Beginning Current=1A	—	—	25	mA
	Critical Rate of Rise of Off-State Voltage	dv / dt	V <sub>DRM</sub> =Rated	—	2000	—	V / μs
	Critical Rate of Rise of Commutating Voltage	(dv / dt) c	V <sub>D</sub> =400V, -di / dt=20A / ms	—	20	—	V / μs
	Thermal Resistance	R <sub>th</sub> (j-ℓ)	AC	—	—	22	°C / W
	Junction to Ambient	R <sub>th</sub> (j-a)	AC	—	—	90	°C / W

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I <sub>FT</sub>	V <sub>D</sub> =6V, R <sub>L</sub> =20Ω	—	—	10	mA
Capacitance (Input to output)	C <sub>S</sub>	V <sub>S</sub> =0V, f=1MHz	—	0.5	—	pF
Isolation Resistance	R <sub>S</sub>	V=500V, RH≤60%	10 <sup>9</sup>	—	—	Ω
Turn-off Time	t <sub>off</sub>	OUTPUT : Sine Waveform	—	—	3 / 4	cycle

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## &lt;REMARK&gt;

## PHASE CONTROL APPLICATION

In case of using in phase control application.  $\Delta t$  must be at least 1ms ( $\Delta t$  : The time starting from the end of INPUT SIGNAL "point a" to the point at which load current become ZERO "point b"). And, Load current "IT" at "point a" must be at least double the maximum Holding Current (IH) specification in each operating temperature.

