

TOSHIBA SOLID STATE AC RELAY

**TSZ1G45S, TSZ1J45S, TSZ1G47S, TSZ1J47S**

OPTICALLY ISOLATED, NORMALLY OPEN SSR

Unit in mm

COMPUTER PERIPHERALS  
 MACHINE TOOL CONTROLS  
 PROCESS CONTROL SYSTEMS  
 TRAFFIC CONTROL SYSTEMS

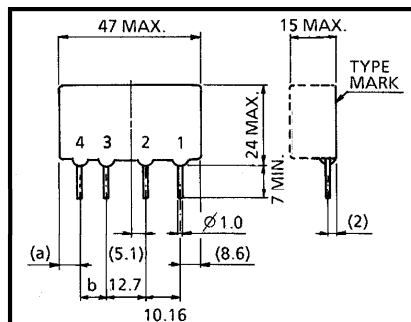
- R.M.S On-State Current :  $I_T(\text{RMS}) = 1\text{A}$
- Repetitive Peak Off-State Voltage :  $V_{\text{DRM}} = 400, 600\text{V}$
- TTL Compatible
- Isolation Voltage : 2060V AC (t=1min.)
- Including Snubber Network

MAXIMUM RATINGS (Ta = 25°C)  
 INPUT (CONTROL)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Control Input Voltage (DC) (Note 1)	$V_F(\text{IN})$	6	V
Control Input Current (DC)	$I_F(\text{IN})$	20	mA

OUTPUT (LOAD)

Repetitive Peak Off-State Voltage	TSZ1G45S TSZ1G47S	$V_{\text{DRM}}$	400	V
	TSZ1J45S TSZ1J47S		600	
Nominal AC Line Voltage	TSZ1G45S TSZ1G47S	$V_{\text{AC}}$	120	V
	TSZ1J45S TSZ1J47S		240	
R.M.S On-State Current	$I_T(\text{RMS})$	1	A	
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{\text{TSM}}$	12 (50Hz)	A	
Operating Frequency Range	f	45~65	Hz	
Isolation Voltage (t=1min., Input to Output)	$BV_S / \text{AC}$	2060	V	
Operating Temperature Range	$T_{\text{opr}}$	-30~80	°C	
Storage Temperature Range	$T_{\text{stg}}$	-30~80	°C	



TYPE	a	b
TSZ1G45S TSZ1J45S	7.2	7.62
TSZ1G47S TSZ1J47S	9.7	5.08

1. OUTPUT (AC)
2. OUTPUT (AC)
3. INPUT (+)
4. INPUT (-)

JEDEC	—	
EIAJ	—	
TOSHIBA	TSZ1G45S TSZ1J45S	10-45B1A
	TSZ1G47S TSZ1J47S	10-45B2A

Weight : 11g

Note 1 : Driving input rating : Insert an external resistance into SSR when the power supply over 6V is used.

Note 2 : Mounting : Soldering of printed wiring board should be used under 260°C and 10 second.

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**  
**INPUT (CONTROL)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Pick Up Voltage	V <sub>FT</sub>	V <sub>AC</sub> = 100V <sub>rms</sub> Resistive Load (R <sub>L</sub> = 100Ω)	—	—	4.5	V
Drop Out Voltage	V <sub>FD</sub>		1.0	—	—	V
Input Resistance	R (IN)		—	300	—	Ω

**OUTPUT (LOAD)**

Off-State Leakage Current	TSZ1G45S TSZ1G47S	I <sub>OL</sub>	V <sub>AC</sub> = 100V <sub>rms</sub> , f = 50Hz	—	—	1	mA
	TSZ1J45S TSZ1J47S		V <sub>AC</sub> = 200V <sub>rms</sub> , f = 50Hz	—	—	2	
Peak On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> = 6A	—	—	2.6	V	
Peak Turn-On Voltage	V <sub>ON</sub>	V <sub>AC</sub> = 100V <sub>rms</sub> (Fig.2)	—	—	10	V	
dv / dt (Off-State)	dv / dt	V <sub>DRM</sub> = 0.7 × Rated	10	—	—	V / μs	
dv / dt (Commutating)	(dv / dt) <sub>c</sub>	V <sub>DRM</sub> = 0.7 × Rated, I <sub>T</sub> = 1A	2	—	—	V / μs	
Turn-On Time	t <sub>on</sub>	V <sub>AC</sub> = 100V <sub>rms</sub> Resistive Load (R <sub>L</sub> = 100Ω)	—	—	1	Cycle	
Turn-Off Time	t <sub>off</sub>		—	—	1 / 2	Cycle	
Isolation Resistance	R <sub>S</sub>	V = 1kV, R.H = 40~60%	—	10 <sup>9</sup>	—	Ω	

**EQUIVALENT CIRCUIT**

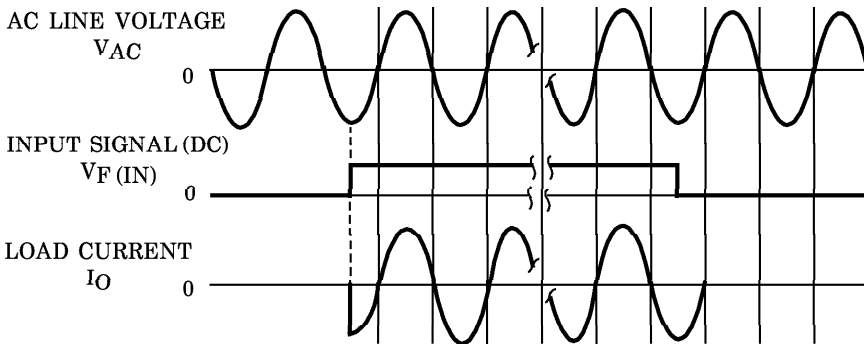
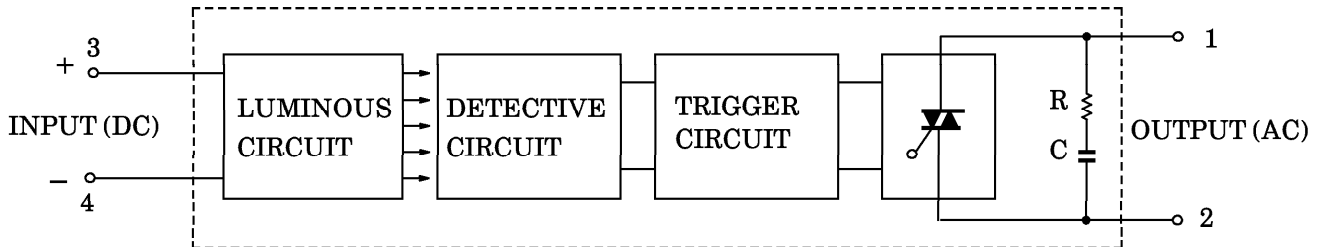


Fig.1 SWITCHING WAVEFORM

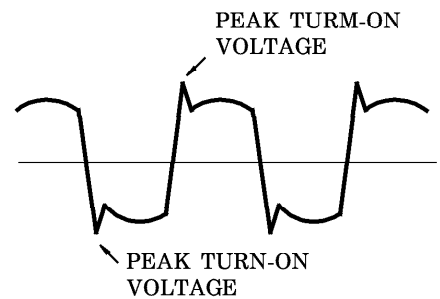
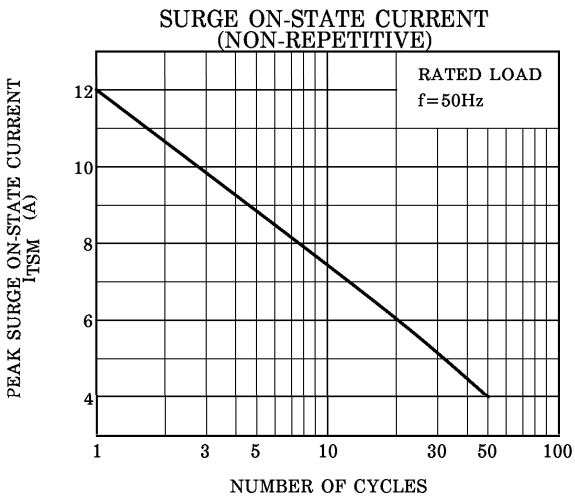
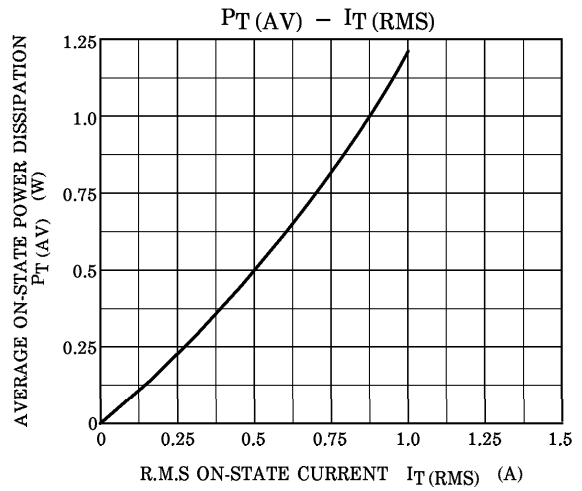
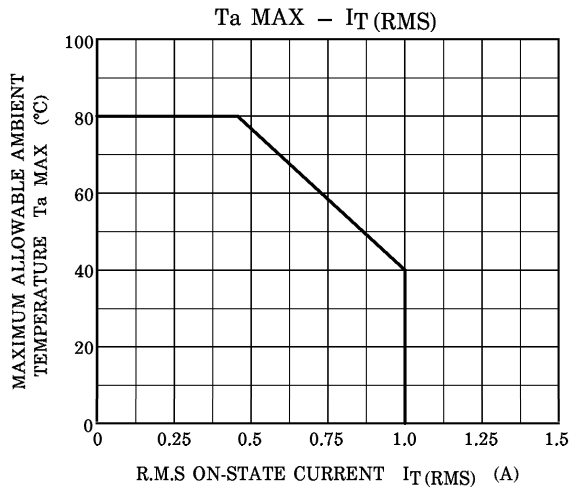


Fig.2 PEAK TURN-ON VOLTAGE WAVEFORM



**RESTRICTIONS ON PRODUCT USE**

000707EBA

- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.