

TOSHIBA SOLID STATE AC RELAY

TSS1G45S, TSS1J45S, TSS1G47S, TSS1J47S

OPTICALLY ISOLATED, ZERO VOLTAGE TURN-ON,
ZERO CURRENT TURN-OFF, NORMALLY OPEN SSR

Unit in mm

COMPUTER PERIPHERALS
MACHINE TOOL CONTROLS
PROCESS CONTROL SYSTEMS
TRAFFIC CONTROL SYSTEMS

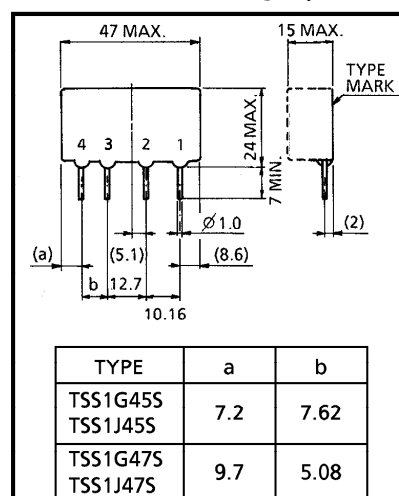
- R.M.S On-State Current : $I_T(\text{RMS}) = 1\text{A}$
- Repetitive Peak Off-State Voltage : $V_{\text{DRM}} = 400, 600\text{V}$
- TTL Compatible
- Isolation Voltage : $2060\text{V AC (t=1min.)}$
- Including Snubber Network

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)
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 | TSS1G45S TSS1G47S | V _{DRM} | 400 | V |
| | TSS1J45S TSS1J47S | | 600 | |
| Nominal AC Line Voltage | TSS1G45S TSS1G47S | V _{AC} | 120 | V |
| | TSS1J45S TSS1J47S | | 240 | |
| R.M.S On-State Current | | I _T (RMS) | 1 | A |
| Peak One Cycle Surge On-State Current (Non-Repetitive) | | I _{TSM} | 12 (50Hz) | A |
| Operating Frequency Range | | f | 45~65 | Hz |
| Isolation Voltage (t=1min., Input to Output) | | BV _S / AC | 2060 | V |
| Operating Temperature Range | | T _{opr} | −30~80 | °C |
| Storage Temperature Range | | T _{stg} | −30~80 | °C |



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

JEDEC —

EIAJ —

| | | |
|---------|----------------------|----------|
| TOSHIBA | TSS1G45S TSS1J45S | 10-45B1A |
| | TSS1G47S TSS1J47S | 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 $^\circ\text{C}$ and 10 second.

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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)
INPUT (CONTROL)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|------------------|----------|---|------|------|------|----------|
| Pick Up Voltage | V_{FT} | $V_{AC}=100V_{rms}$ Resistive Load ($R_L=100\Omega$) | — | — | 4.5 | V |
| Drop Out Voltage | V_{FD} | | 1.0 | — | — | V |
| Input Resistance | $R(IN)$ | | — | 300 | — | Ω |

OUTPUT (LOAD)

| | | | | | | | |
|---------------------------|----------------------|---|--|-----------------|-------|--------|----|
| Off-State Leakage Current | TSS1G45S TSS1G47S | I _{OL} | V _{AC} = 100V _{rms} , f = 50Hz | — | — | 1 | mA |
| | TSS1J45S TSS1J47S | | V _{AC} = 200V _{rms} , f = 50Hz | — | — | 2 | |
| Peak On-State Voltage | V _{TM} | I _T (RMS) = 6A | — | — | 2.6 | V | |
| Peak Turn-On Voltage | V _{ON} | V _{AC} = 100V _{rms} (Fig.2) | — | — | 5 | V | |
| dv / dt (Off-State) | dv / dt | V _{DRM} = 0.7 × Rated | 50 | — | — | V / μs | |
| dv / dt (Commutating) | (dv / dt) c | V _{DRM} = 0.7 × Rated, I _T = 1A | 2 | — | — | V / μs | |
| Turn-On Time | t _{on} | V _{AC} = 100V _{rms} Resistive Load (R _L = 100Ω) | — | — | 1 / 2 | Cycle | |
| Turn-Off Time | t _{off} | | — | — | 1 / 2 | Cycle | |
| Isolation Resistance | R _S | V = 1kV, R.H = 40~60% | — | 10 ⁹ | — | Ω | |

EQUIVALENT CIRCUIT

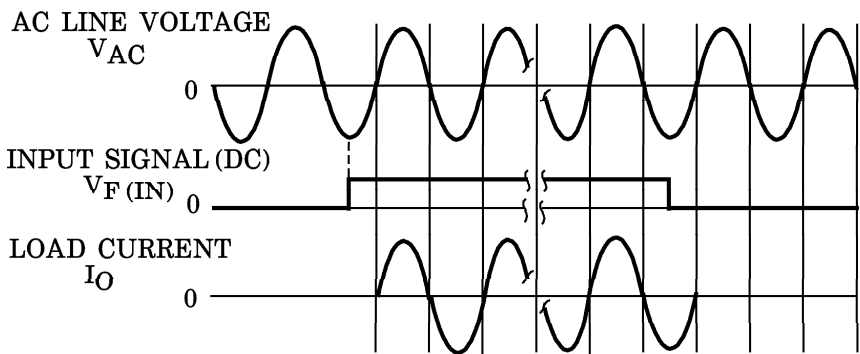
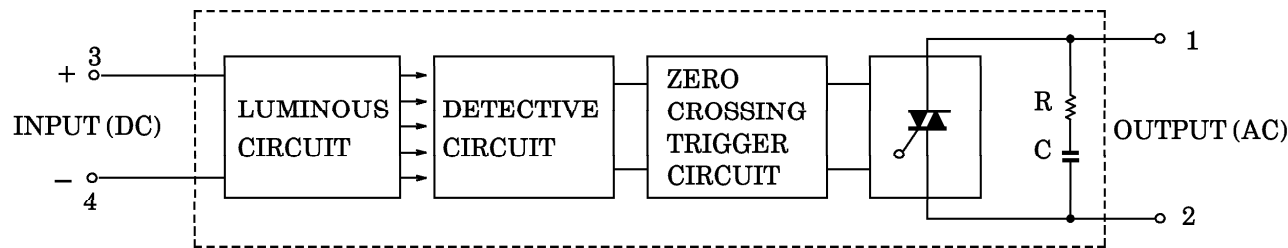


Fig.1 ZERO VOLTAGE SWITCHING WAVEFORM

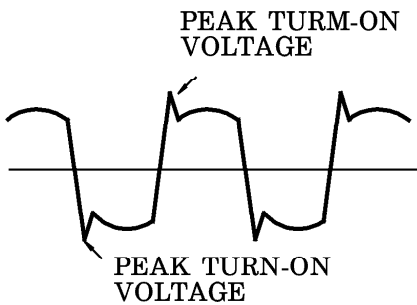


Fig.2 PEAK TURN-ON VOLTAGE WAVEFORM

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