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# S108T01/S108T02 S208T01/S208T02

## Low Profile Type Solid State Relays

### ■ Features

1. Low profile type (height : 16mm)
2. Built-in zero-cross circuit (**S108T02/S208T02**)
3. RMS ON-state current  $I_r$  : MAX. 8Arms
4. Approved by TÜV, No. R9750791 (**S208TY1/S208TY2**)  
Input-Output : Basic Insulation

### ■ Applications

1. Programmable controllers
2. Air conditioners
3. Copiers
4. Automatic vending machines

### ■ Model line-ups

	For 100V lines	For 200V lines
No zero-cross circuit	<b>S108T01</b>	<b>S208T01</b>
Built-in zero-cross circuit	<b>S108T02</b>	<b>S208T02</b>

### ■ Absolute Maximum Ratings

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

Parameter		Symbol	Rating	Unit	
Input	Forward current	$I_F$	50	mA	
	Reverse voltage	$V_R$	6	V	
	RMS ON-state current	$I_r$	*1 8	$A_{rms}$	
	*2 Peak one cycle surge current	$I_{surge}$	80	A	
Output	Repetitive peak OFF-state voltage	$V_{DRM}$	<b>S108T01</b> <b>S108T02</b>	400	V
			<b>S208T01</b> <b>S208T02</b>	600	
	Non-repetitive peak OFF-state voltage	$V_{DSM}$	<b>S108T01</b> <b>S108T02</b>	400	V
			<b>S208T01</b> <b>S208T02</b>	600	
	Critical rate of rise of ON-state current	$dI_r/dt$	50	$A/\mu s$	
	Operating frequency	$f$	45 to 65	Hz	
Operating temperature	$T_{opr}$	-25 to +100	$^{\circ}\text{C}$		
Storage temperature	$T_{stg}$	-30 to +125	$^{\circ}\text{C}$		
*3 Isolation voltage	$V_{iso}$	3.0	$kV_{rms}$		
*4 Soldering temperature	$T_{sol}$	260	$^{\circ}\text{C}$		

\*1 Refer to Fig.2, Fig.3

\*2 60Hz sine wave, start at  $T_j=25^{\circ}\text{C}$

\*3 Isolation voltage measuring method

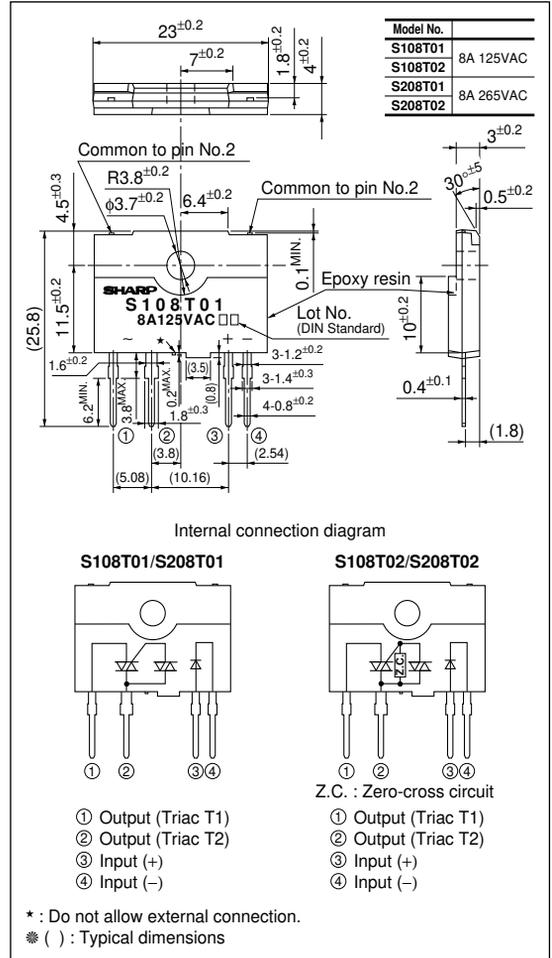
- (1) Dielectric withstand voltage tester with zero cross circuit shall be used.
- (2) The applied voltage waveform shall be sine wave.
- (3) Voltage shall be applied between input and output.  
(Input and output terminals shall be shorted respectively.)

(4) AC 60Hz, 1min, 40 to 60%RH.

\*4 For 10s

### ■ Outline Dimensions

(Unit : mm)

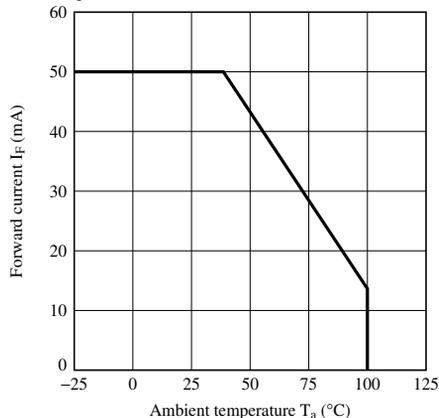


## ■ Electrical Characteristics

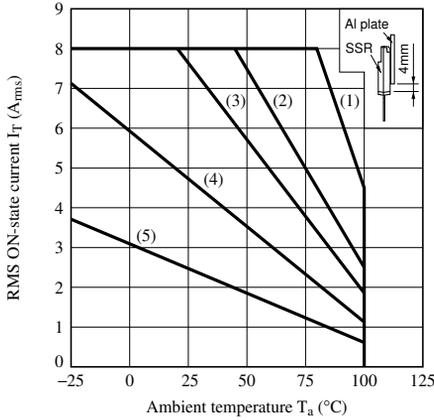
(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$V_F$	$I_F=20\text{mA}$	–	1.2	1.4	V	
	Reverse current	$I_R$	$V_R=3\text{V}$	–	–	$1 \times 10^{-4}$	A	
	Repetitive peak OFF-state current	$I_{DRM}$	$V_D=V_{DRM}$	–	–	$1 \times 10^{-4}$	A	
Output	ON-state voltage	$V_T$	$I_T=2\text{A}_{rms}$ , Resistance load, $I_F=20\text{mA}$	–	–	1.5	$V_{rms}$	
	Holding current	$I_H$	–	–	–	50	mA	
	Critical rate of rise of OFF-state voltage	$dV/dt$	$V_D=2/3V_{DRM}$	30	–	–	V/ $\mu\text{s}$	
	Critical rate of rise of OFF-state voltage at commutation	$(dV/dt)_C$	$T_j=125^\circ\text{C}$ , $V_D=2/3V_{DRM}$ , $dI/dt=-4\text{A/ms}$	5	–	–	V/ $\mu\text{s}$	
Transfer characteristics	Minimum trigger current	S108T01/S208T01	$V_D=12\text{V}$ , $R_L=30\Omega$	–	–	8	mA	
		S108T02/S208T02						$V_D=6\text{V}$ , $R_L=30\Omega$
	Zero cross voltage	S108T02/S208T02	$V_{OX}$	$I_F=8\text{mA}$	–	–	35	V
	Isolation resistance		$R_{iso}$	DC500V, 40 to 60%RH	$1 \times 10^{10}$	–	–	$\Omega$
	Turn-on time	S108T01	$t_{on}$	$V_D=100\text{V}_{rms}$ , AC50Hz, $I_T=2\text{A}_{rms}$ , Resistance load, $I_F=20\text{mA}$	–	–	1	ms
		S208T01						
		S108T02						
	S208T02	$V_D=200\text{V}_{rms}$ , AC50Hz, $I_T=2\text{A}_{rms}$ , Resistance load, $I_F=20\text{mA}$	10					
Turn-off time	S108T01	$t_{off}$	$V_D=100\text{V}_{rms}$ , AC50Hz, $I_T=2\text{A}_{rms}$ , Resistance load, $I_F=20\text{mA}$	–	–	10	ms	
	S108T02							
	S208T01							
S208T02	$V_D=200\text{V}_{rms}$ , AC50Hz, $I_T=2\text{A}_{rms}$ , Resistance load, $I_F=20\text{mA}$							
Thermal resistance (Between junction and case)		$R_{th(j-c)}$	–	–	4.5	–	$^\circ\text{C/W}$	
Thermal resistance (Between junction and ambience)		$R_{th(j-a)}$	–	–	40	–		

**Fig.1 Forward Current vs. Ambient Temperature**

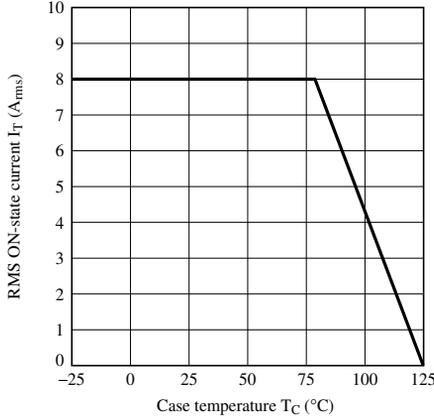


**Fig.2 RMS ON-state Current vs. Ambient Temperature**

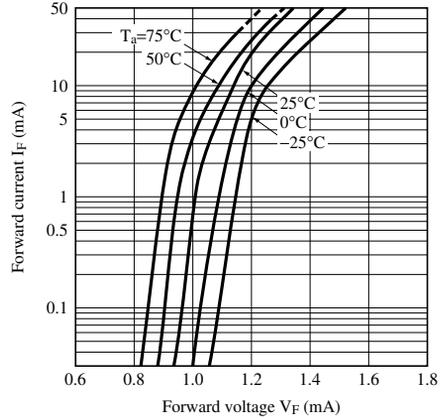


- (1) With infinite heat sink
  - (2) With heat sink (200×200×2mm Al plate)
  - (3) With heat sink (100×100×2mm Al plate)
  - (4) With heat sink (50×50×2mm Al plate)
  - (5) Without heat sink
- (Note) With the Al heat sink set up vertically, tighten the device with a torque of 0.4N•m and apply thermal conductive silicone grease on the mounting face of heat sink. Forced cooling shall not be carried out. (Please use an isolation sheet if necessary.)

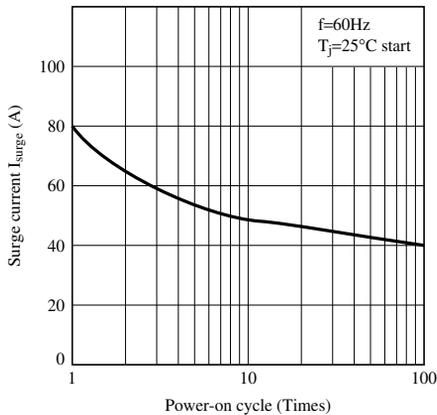
**Fig.3 RMS ON-state Current vs. Case Temperature**



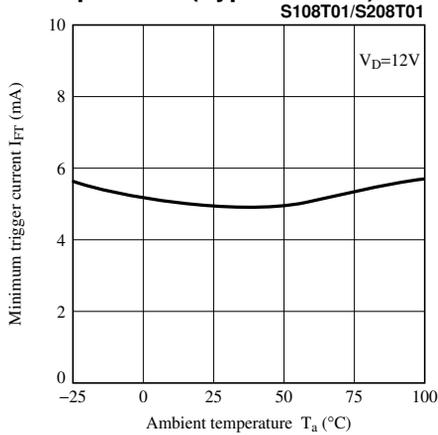
**Fig.4 Forward Current vs. Forward Voltage**



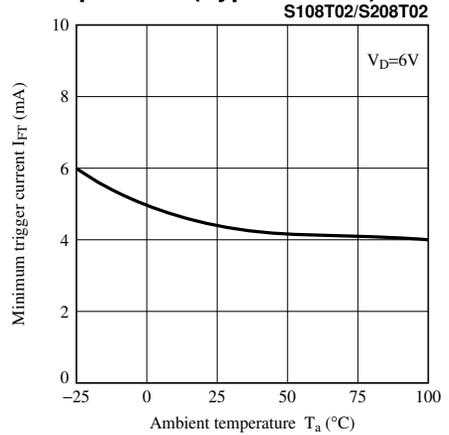
**Fig.5 Surge Current vs. Power-on Cycle**



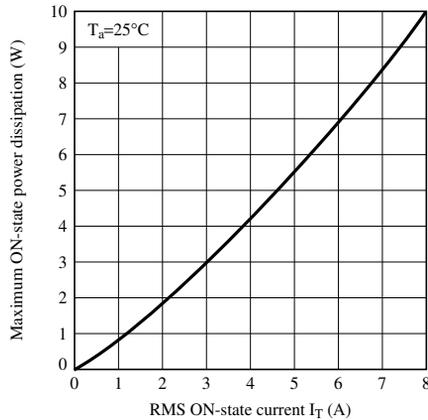
**Fig.6 Minimum Trigger Current vs. Ambient Temperature (Typical Value)**



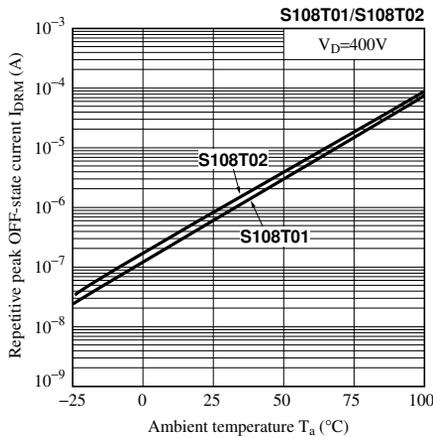
**Fig.7 Minimum Trigger Current vs. Ambient Temperature (Typical Value)**



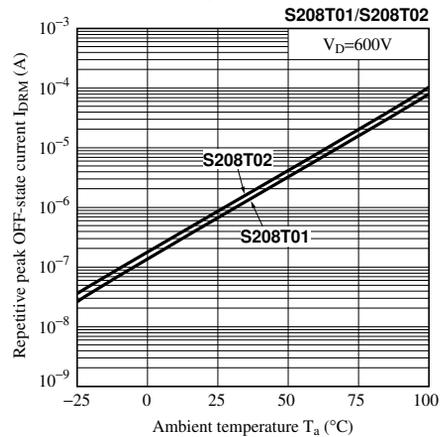
**Fig.8 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)**



**Fig.9 Repetitive Peak OFF-state Current vs. Ambient Temperature**



**Fig.10 Repetitive Peak OFF-state Current vs. Ambient Temperature**



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