

# RS12xxA/RS12xxB 12A TRIACs

**DESCRIPTION:**

High current density due to double mesa technology, SIPOS and Glass Passivation.

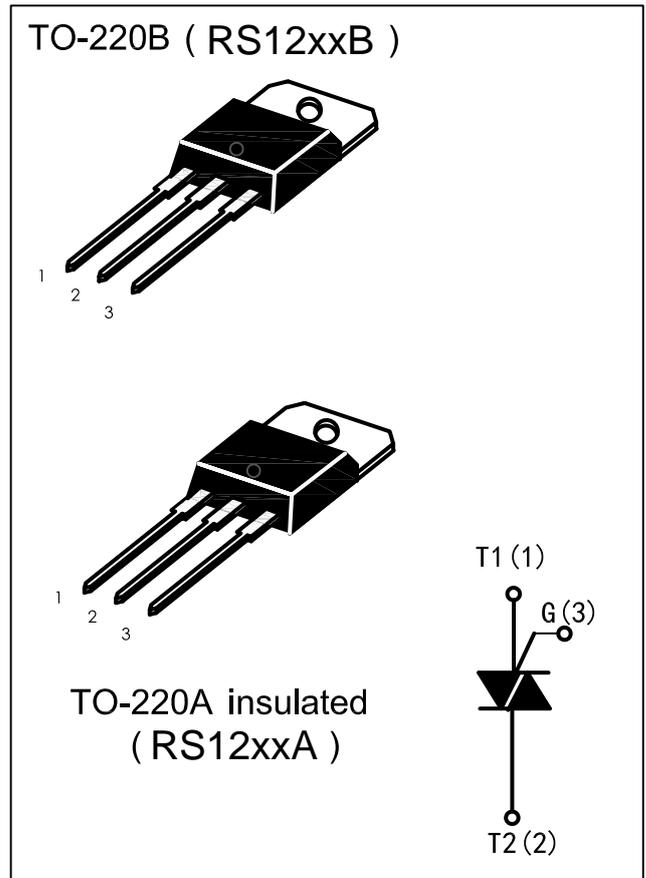
RS12xx series triacs is suitable for or for phase control operation, light dimmers, motor speed ON/OFF function in applications such as static relays, general purpose AC switching, They can be used as an heating regulation, induction motor starting circuits...controllers.

RS12xx-TW -SW -CW -BW are 3 quadrants triacs, They are specially recommended for use on inductive loads.

RS12xx are isolated internally. they provide a 2500V RMS isolation voltage from all three terminals to external heat sink.

**MAIN FEATURES**

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
$V_{DRM}/V_{RRM}$	600and800	V
$V_{TM}$	$\leq 1.55$	V


**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Value	Unit	
Storage junction temperature range	$T_{stg}$	-40 to +150	$^{\circ}C$	
Operating junction temperature range	$T_j$	-40 to +125	$^{\circ}C$	
Repetitive Peak Off-state Voltage Repetitive Peak Reverse Voltage	$V_{DRM}$ $V_{RRM}$	600and800 600and800	V	
Non repetitive Surge Peak Off-state Voltage Non repetitive Peak Reverse Voltage	$V_{DSM}$ $V_{RSM}$	700and900 700and900	V	
RMS on-state current (full sine wave)	TO-220AB $T_c=105^{\circ}C$	$I_{T(RMS)}$	12	A
	TO-220AB Ins $T_c=90^{\circ}C$			
Non repetitive surge peak on-state current (full cycle, $T_j=25^{\circ}C$ )	f = 50 Hz t=20ms	$I_{TSM}$	120	A
	f = 60 Hz t=16.7ms		126	
$I^2t$ Value for fusing tp=10ms	$I^2t$	78	$A^2s$	
Critical rate of rise of on-state current $I_G=2 \times I_{GT}$ , $t_r \leq 100$ ns, f=120Hz, $T_j=125^{\circ}C$	di / dt	50	A/us	
Peak gate current tp=20us, $T_j=125^{\circ}C$	$I_{GM}$	4	A	
Average gate power dissipation $T_j=125^{\circ}C$	$P_{G(AV)}$	1	W	

ELECTRICAL CHARACTERISTICS (T<sub>j</sub>=25°C unless otherwise specified)

## ● 3 Quadrants

Symbol	Test Condition	Quadrant		RS12xxB/RS12xxA				Unit
				TW	SW	CW	BW	
I <sub>GT</sub>	V <sub>D</sub> =12V R <sub>L</sub> =30Ω	I - II - III	MAX.	5	10	35	50	mA
V <sub>GT</sub>		I - II - III	MAX.	1.3				V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3KΩ T <sub>j</sub> =125°C	I - II - III	MIN..	0.2				V
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III	MAX.	10	25	50	70	mA
		II		15	30	60	80	
I <sub>H</sub>	I <sub>T</sub> =100mA		MAX.	10	15	35	50	mA
dV/dt	V <sub>D</sub> =67%V <sub>DRM</sub> gate open T <sub>j</sub> =125°C		MIN.	20	40	500	1000	V/μs
(dI/dt) <sub>c</sub>	(dV/dt) c=0.1V/μs T <sub>j</sub> =125°C		MIN.	3.5	6.5	----	----	A/ms
	(dV/dt) c=10V/μs T <sub>j</sub> =125°C			1.0	2.9	----	----	
	Without snubber T <sub>j</sub> =125°C			----	----	6.5	12	

## ● 4 Quadrants

Symbol	Test Condition	Quadrant		RS12xxB/RS12xxA		Unit
				C	B	
I <sub>GT</sub>	V <sub>D</sub> =12V R <sub>L</sub> =30Ω	I - II - III IV	MAX.	25 50	50 100	mA
V <sub>GT</sub>		ALL	MAX.	1.3		V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3KΩ T <sub>j</sub> =125°C	ALL	MIN.	0.2		V
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III - IV	MAX.	40	50	mA
		II		80	100	
I <sub>H</sub>	I <sub>T</sub> =100mA		MAX.	25	50	mA
dV/dt	V <sub>D</sub> =67%V <sub>DRM</sub> gate open T <sub>j</sub> =125°C		MIN.	200	400	V/μs
(dI/dt) <sub>c</sub>	(dV/dt) c=0.1V/μs T <sub>j</sub> =125°C		MIN.	----	----	
	(dV/dt) c=10V/μs T <sub>j</sub> =125°C			----	----	
	Without snubber T <sub>j</sub> =125°C			----	----	

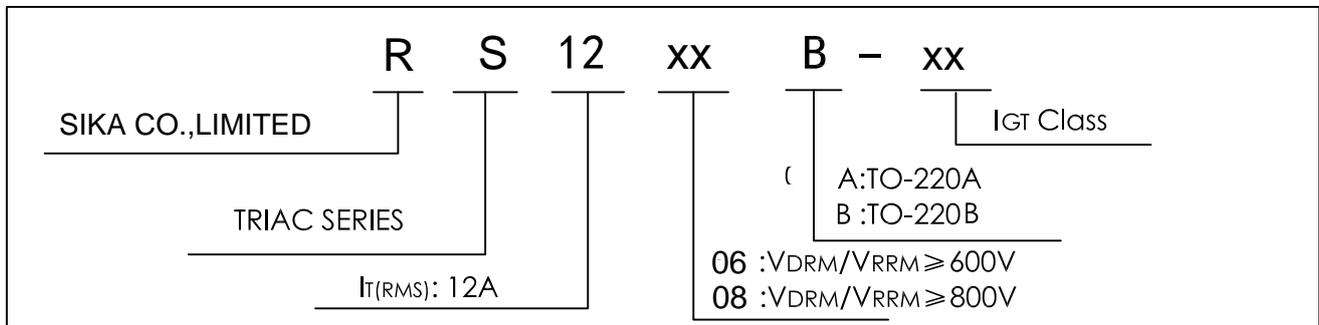
STATIC CHARACTERISTICS

Symbol	Test Conditions		Value (MAX)	Unit
$V_{TM}$	$I_{TM}=17A$ , $t_p=380\mu S$	$T_j=25^\circ C$	1.55	V
$I_{DRM}$	$V_D=V_{DRM}$	$T_j=25^\circ C$	5	$\mu A$
$I_{RRM}$	$V_R=V_{RRM}$	$T_j=125^\circ C$	1	mA

THERMAL RESISTANCES

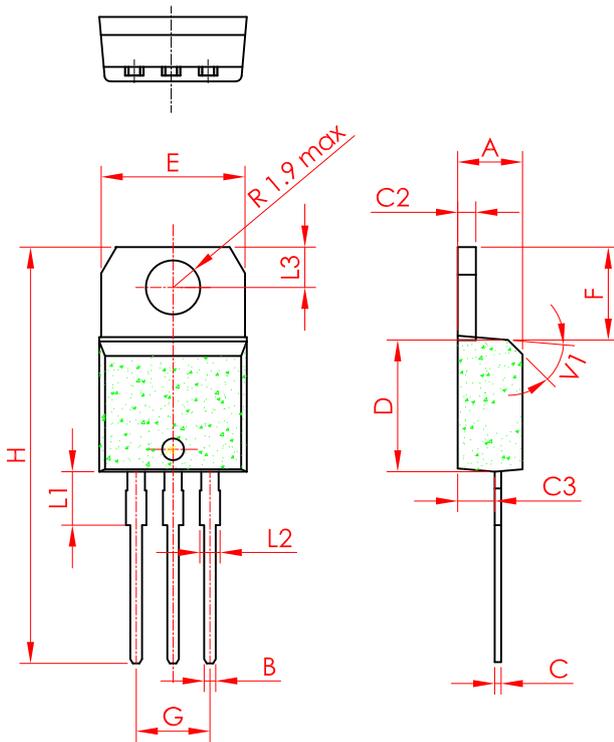
Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	TO-220AB	1.4	$^\circ C/W$
		TO-220AB Insulated	2.3	

ORDERING INFORMATION



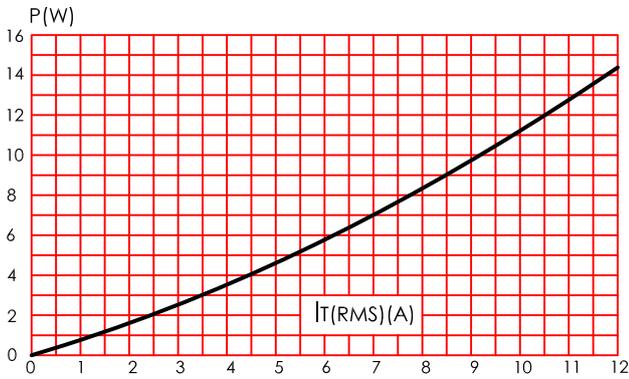
PACKAGE MECHANICAL DATA

TO-220AB

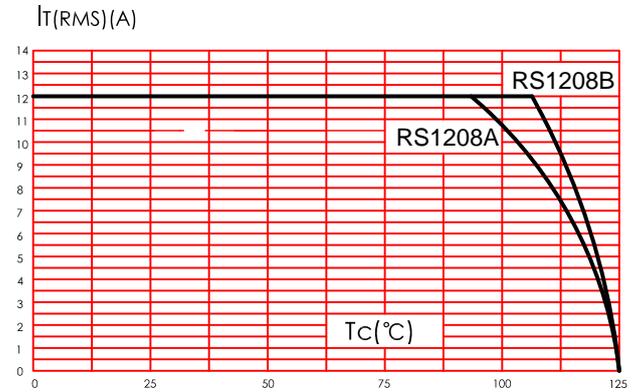


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4		4.6	0.173		1.181
B	0.61		0.88	0.024		0.034
C	0.49		0.70	0.019		0.027
C2	1.23		1.32	0.048		0.051
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.338		0.382
E	10		10.4	0.393		0.409
F	6.2		6.6	0.244		0.259
G	4.8		5.4	0.189		0.213
H	28.0		29.8	11.0		11.7
L1		3.75			0.147	
L2	1.14		1.7	0.044		0.066
L3	2.65		2.95	0.104		0.116
V1		40°			40°	

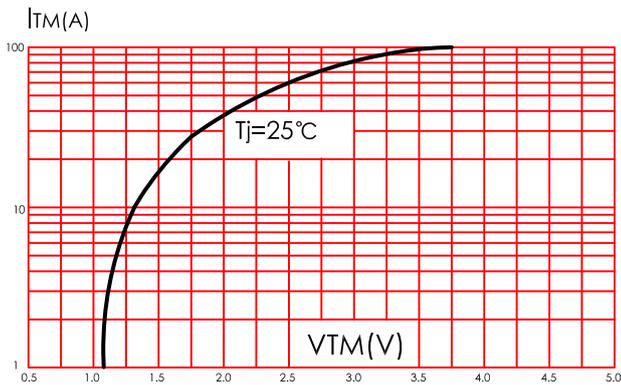
**Fig. 1:** Maximum power dissipation versus RMS on-state current(full cycle)



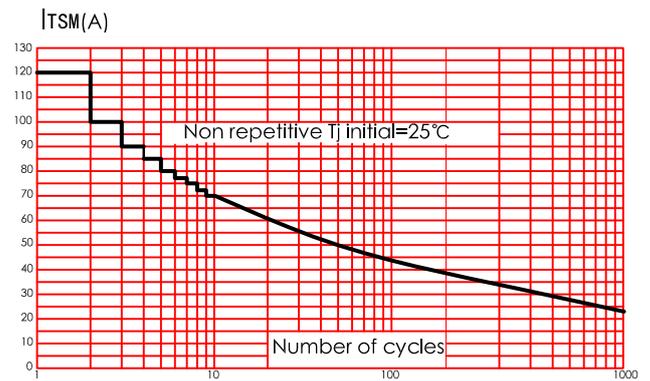
**Fig. 2:** RMS on-state current versus case temperature(full cycle)



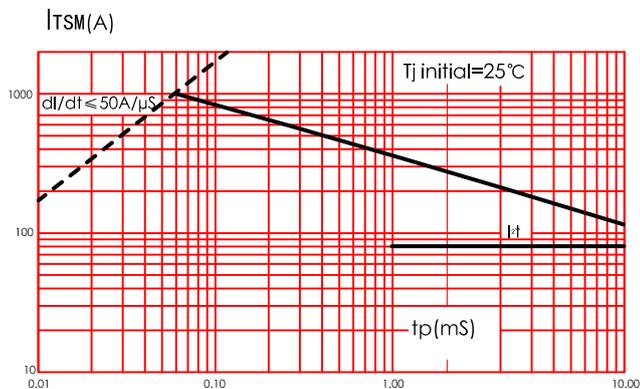
**Fig. 3:** on-state characteristics (maximum values)



**Fig. 4:** Surge peak on-state current versus number of cycles



**Fig. 5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$



**Fig. 6:** Relative variation of gate trigger current, holding current and latching current versus junction temperature(typical values)

