

## DESCRIPTION:

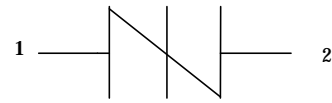
TSS-SMB series thyristors are a type of semi-conduct component. They are designed in applications, modems, telephones, line cards, answering machines, FAX machines, SLICs, T1/E1, xDSL, PBXs and more.

## FEATURES:

- ✧ Lower capacitance
- ✧ Excellent capability of absorbing transient surge
- ✧ Quick response to surge voltage (ns Level)
- ✧ Eliminates overvoltage caused by fast rising transients
- ✧ Moisture sensitivity level: Level 1
- ✧ Non degenerative



SMB



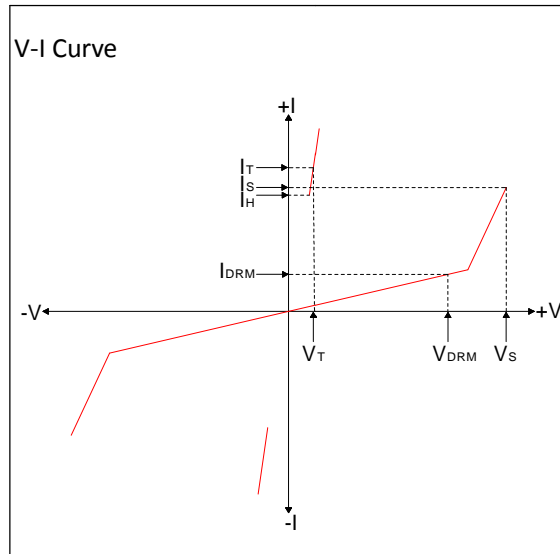
Symbol

## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage temperature range	$T_{stg}$	-60 to +150	$^\circ\text{C}$
Operating junction temperature range	$T_j$	-40 to +150	$^\circ\text{C}$
Repetitive peak pulse current	$I_{PP}$	80	A

## ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ )

Symbol	Parameter
$V_{DRM}$	Peak off-state voltage
$I_{DRM}$	Off-state current
$V_S$	Switching voltage
$I_S$	Switching current
$V_T$	On-state voltage
$I_T$	On-state current
$I_H$	Holding current
$C_O$	Off-state capacitance



**ELECTRICAL CHARACTERISTICS (TA=25°C, continued)**

Part Number	I <sub>DRM</sub> @V <sub>DRM</sub>		V <sub>S</sub> <sup>①</sup> @I <sub>S</sub>		V <sub>T</sub> @I <sub>T</sub>		I <sub>H</sub>	C <sub>O</sub> <sup>②</sup>
	μA	V	V	mA	V	A	mA	pF
	max		max	max	max	max	min	max
BEP0080SB	5	6	25	800	4	2.2	30	45
BEP0080SB-MC	5	6	25	800	4	2.2	30	30
BEP0220SB	5	18	30	800	4	2.2	30	100
BEP0220SB-MC	5	18	30	800	4	2.2	30	50
BEP0300SB	5	25	40	800	4	2.2	30	100
BEP0300SB-MC	5	25	40	800	4	2.2	30	50
BEP0640SB	5	58	77	800	4	2.2	120	80
BEP0640SB-MC	5	58	77	800	4	2.2	120	40
BEP0720SB	5	66	87	800	4	2.2	120	75
BEP0720SB-MC	5	66	87	800	4	2.2	120	40
BEP0900SB	5	75	98	800	4	2.2	120	70
BEP0900SB-MC	5	75	98	800	4	2.2	120	40
BEP1100SB	5	90	130	800	4	2.2	120	70
BEP1100SB-MC	5	90	130	800	4	2.2	120	35
BEP1300SB	5	120	160	800	4	2.2	120	60
BEP1300SB-MC	5	120	160	800	4	2.2	120	35
BEP1500SB	5	140	180	800	4	2.2	120	55
BEP1500SB-MC	5	140	180	800	4	2.2	120	35
BEP1800SB	5	170	220	800	4	2.2	120	50
BEP1800SB-MC	5	170	220	800	4	2.2	120	35
BEP2300SB	5	190	260	800	4	2.2	120	50
BEP2300SB-MC	5	190	260	800	4	2.2	120	30
BEP2600SB	5	220	300	800	4	2.2	120	45
BEP2600SB-MC	5	220	300	800	4	2.2	120	30
BEP3100SB	5	275	350	800	4	2.2	120	45
BEP3100SB-MC	5	275	350	800	4	2.2	120	25
BEP3500SB	5	320	400	800	4	2.2	120	45
BEP3500SB-MC	5	320	400	800	4	2.2	120	25
BEP3800SB	5	340	450	800	4	2.2	120	45
BEP3800SB-MC	5	340	450	800	4	2.2	120	25
BEP4200SB	5	340	450	800	4	2.2	120	45
BEP4200SB-MC	5	340	450	800	4	2.2	120	25

**ELECTRICAL CHARACTERISTICS (TA=25°C, continued)**

Part Number	I <sub>DRM</sub> @V <sub>DRM</sub>		V <sub>S</sub> <sup>①</sup> @I <sub>S</sub>		V <sub>T</sub> @I <sub>T</sub>		I <sub>H</sub>	C <sub>O</sub> <sup>②</sup>
	μA	V	V	mA	V	A	mA	pF
	max		max	max	max	max	min	max
BEP0080SC	5	6	25	800	4	2.2	30	80
BEP0080SC-MC	5	6	25	800	4	2.2	30	45
BEP0220SC	5	18	30	800	4	2.2	30	80
BEP0220SC-MC	5	18	30	800	4	2.2	30	45
BEP0300SC	5	25	40	800	4	2.2	30	80
BEP0300SC-MC	5	25	40	800	4	2.2	30	45
BEP0640SC	5	58	77	800	4	2.2	120	80
BEP0640SC-MC	5	58	77	800	4	2.2	120	45
BEP0720SC	5	66	87	800	4	2.2	120	75
BEP0720SC-MC	5	66	87	800	4	2.2	120	40
BEP0900SC	5	75	98	800	4	2.2	120	75
BEP0900SC-MC	5	75	98	800	4	2.2	120	40
BEP1100SC	5	90	130	800	4	2.2	120	75
BEP1100SC-MC	5	90	130	800	4	2.2	120	40
BEP1300SC	5	120	160	800	4	2.2	120	75
BEP1300SC-MC	5	120	160	800	4	2.2	120	40
BEP1500SC	5	140	180	800	4	2.2	120	70
BEP1500SC-MC	5	140	180	800	4	2.2	120	35
BEP1800SC	5	170	220	800	4	2.2	120	70
BEP1800SC-MC	5	170	220	800	4	2.2	120	35
BEP2300SC	5	190	260	800	4	2.2	120	70
BEP2300SC-MC	5	190	260	800	4	2.2	120	35
BEP2600SC	5	220	300	800	4	2.2	120	70
BEP2600SC-MC	5	220	300	800	4	2.2	120	35
BEP3100SC	5	275	350	800	4	2.2	120	65
BEP3100SC-MC	5	275	350	800	4	2.2	120	30
BEP3500SC	5	320	400	800	4	2.2	120	65
BEP3500SC-MC	5	320	400	800	4	2.2	120	30
BEP3800SC	5	340	450	800	4	2.2	120	65
BEP3800SC-MC	5	340	450	800	4	2.2	120	30
BEP4200SC	5	340	450	800	4	2.2	120	65
BEP4200SC-MC	5	340	450	800	4	2.2	120	30

**ELECTRICAL CHARACTERISTICS (TA=25°C, continued)**

Part Number	I <sub>DRM</sub> @V <sub>DRM</sub>		V <sub>S</sub> <sup>①</sup> @I <sub>S</sub>		V <sub>T</sub> @ I <sub>T</sub>		I <sub>H</sub>	C <sub>O</sub> <sup>②</sup>
	μA	V	V	mA	V	A	mA	pF
	max		max	max	max	max	min	max
BEP0080SD	5	6	25	800	4	2.2	50	150
BEP0640SD	5	58	77	800	4	2.2	50	150
BEP0720SD	5	65	87	800	4	2.2	50	150
BEP0900SD	5	75	98	800	4	2.2	50	140
BEP1100SD	5	90	130	800	4	2.2	50	110
BEP1300SD	5	120	160	800	4	2.2	50	100
BEP1500SD	5	140	180	800	4	2.2	50	90
BEP1800SD	5	170	220	800	4	2.2	50	90
BEP2300SD	5	190	260	800	4	2.2	50	80
BEP2600SD	5	220	300	800	4	2.2	50	70
BEP3100SD	5	275	350	800	4	2.2	50	60
BEP3500SD	5	320	400	800	4	2.2	50	60
BEP3800SD	5	340	450	800	4	2.2	50	60
BEP4200SD	5	400	520	800	4	2.2	100	35

① V<sub>s</sub> is measured at 100KV/s

② Off-state capacitance is measured in V<sub>DC</sub>=2V, V<sub>RMS</sub>=1V, f=1MHz

**SURGE RATINGS**

Series	I <sub>PP</sub> (A) min			
	2×10us	8×20us	10×360us	10×1000us
B	250	250	125	80
C	500	400	175	100
D	1000	800	---	200

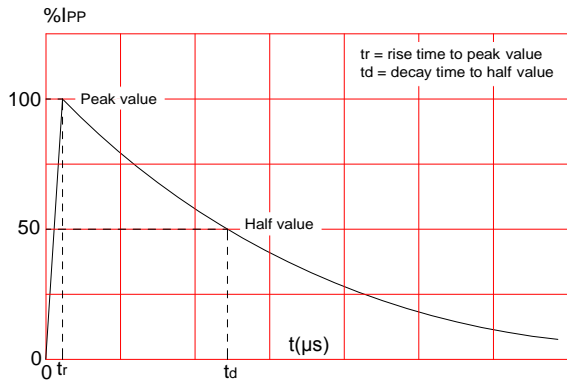
**ORDERING INFORMATION**

<b>BEP</b> BORN'S Semiconductor Surge Arrester	<b>008</b> Median Voltage 0:Bi-direction	<b>0</b>	<b>S</b> Package type	<b>B - MC</b> Low Capacitor	Surge Ratings : B: 4 KV(10/700us) C: 6 KV(10/700us) D:10 KV(10/700us)
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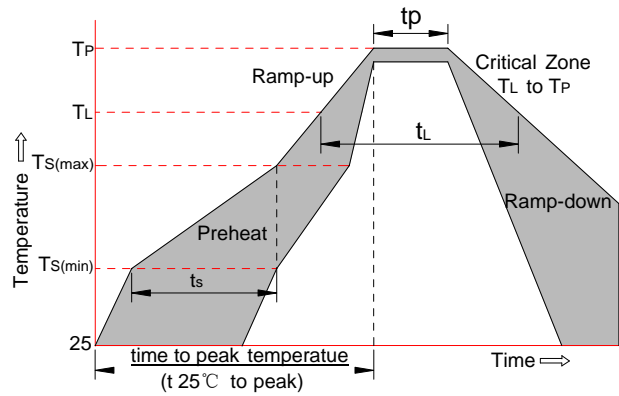
**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see FIG.2)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ ) (Liquid us)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C

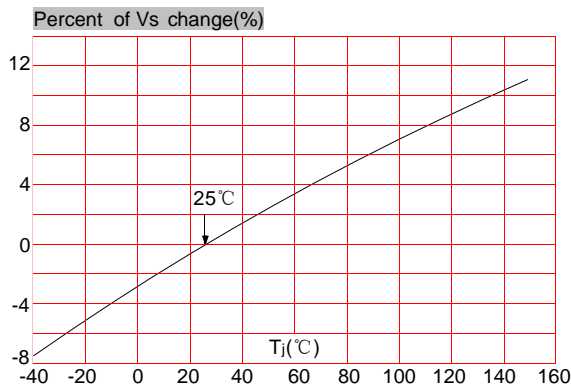
**FIG.1:**  $t_r \times t_d$  pulse waveform



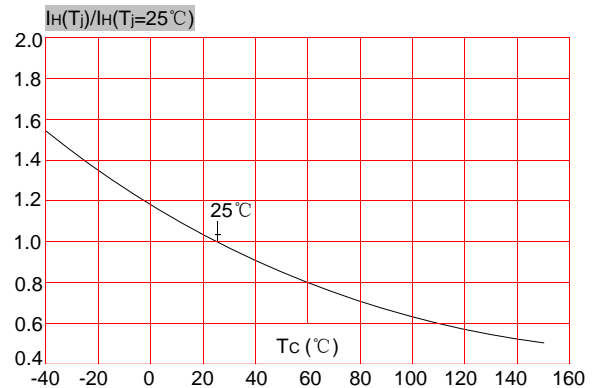
**FIG.2:** Reflow condition



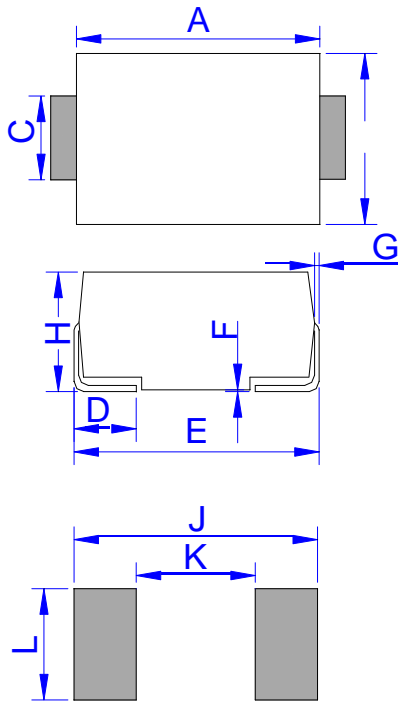
**FIG.3:** Normalized  $V_s$  change vs. junction temperature



**FIG.4:** Normalized DC holding current vs. case temperature



**PACKAGE MECHANICAL DATA**



DO-214AA (SMB)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.75	0.167	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.11	2.44	0.083	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	