

## SB4040S 40A SCRs

### FEATURES

High thermal conductivity for more

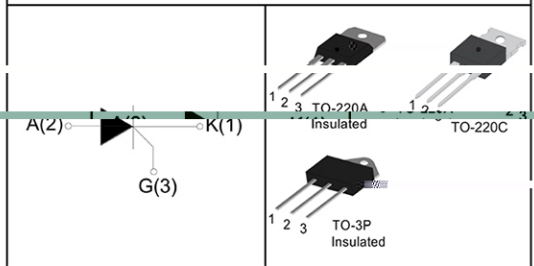
- High voltage capacity
- Very high current surge capability

### APPLICATIONS

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

### Parameters Summary

V<sub>DRM</sub>: 1200/1600V V<sub>RRM</sub>: 1200/1600V I<sub>T(RMS)</sub>: 40A I<sub>GM</sub>: 40mA



ABSOLUTE MAXIMUM RATINGS			
Parameter	Symbol	Value	Unit
Storage junction temperature range	T <sub>stg</sub>	-40 ~ 150	°C
Operating junction temperature range	T <sub>j</sub>	-40 ~ 125	°C
Repetitive peak off-state voltage	V <sub>DRM</sub>	1200/1600	V
Repetitive peak reverse voltage	V <sub>RRM</sub>	1200/1600	V
Non repetitive surge peak Off-state voltage	V <sub>DSM</sub>	V <sub>DRM</sub> +100	V
Non repetitive peak reverse voltage	V <sub>RSM</sub>	V <sub>RRM</sub> +100	V
Non repetitive surge peak on-state current	I <sub>TSM</sub>	120	A
RMS on-state current (180° conduction angle)	I <sub>T(RMS)</sub>	40	A
Average on-state current (180° conduction angle)	I <sub>T(AV)</sub>	25	A
I <sup>2</sup> t value for fusing (tp=10ms)	I <sup>2</sup> t	880	A <sup>2</sup> S
Critical rate of rise of on-state current (I = 2×I <sub>GT</sub> , tr ≤ 100 ns)	di/dt	150	A/μS
Peak gate current	I <sub>GM</sub>	4	A
Peak gate power	PGM	5	W

Thermal Resistances			
Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case (DC)	TO-220A	1.2
		TO-220C	0.8
		TO-3P	0.7

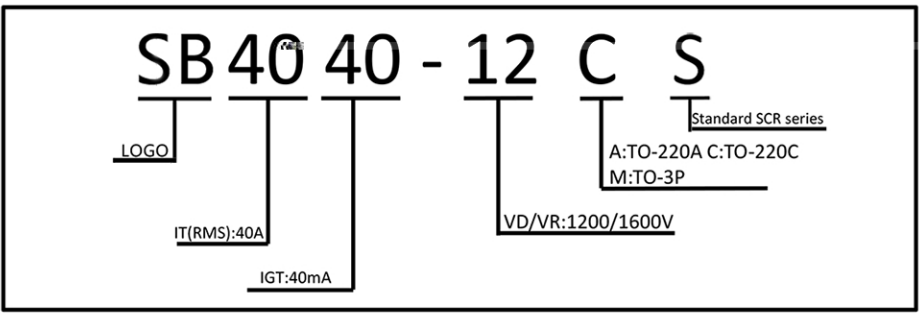
REPEATABLE THRESHOLD VOLTAGE  $\geq 75\%$  unless otherwise specified

Symbol	Parameter	Test Conditions	MAX.	MIN.
$V_{GT}$	Gate Trigger Voltage	$I_{GT} = 100\text{mA}$	1.5	
$V_{DRM}$	Reverse Blocking Voltage	$V_D = V_{DRM}$ $I_T = 125^\circ\text{C}$		
$I_T$	Forward Current	$I_T = 1.2\text{A}$		
$I_{TSM}$	Surge Current	$I_{TSM} = 100\text{A}$		
$I_{TAV}$	Average Current	$I_{TAV} = 2.5\text{A}$ (max. duty)		

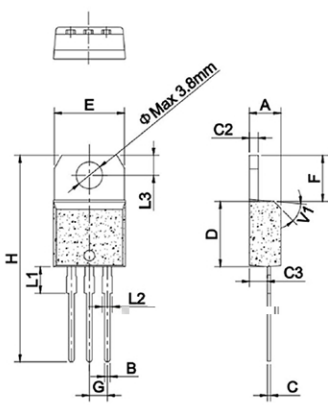
### STATIC CHARACTERISTICS

Symbol	Parameter	Test Conditions	MAX.	MIN.
$V_{TM}$	Turn-on Voltage	$I_{TM} = 60\text{A}$ $t_p = 380\mu\text{s}$		
$I_{DRM}$	Reverse Current	$T_j = 25^\circ\text{C}$		
$I_{RRM}$	Reverse Recovery Current	$T_j = 125^\circ\text{C}$		

### Ordering Information Scheme

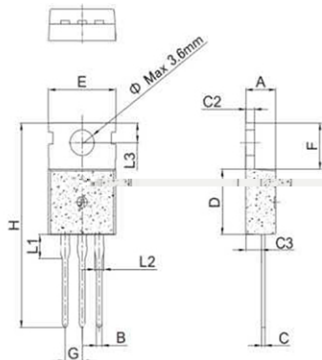


### TO-220A Package Mechanical Data



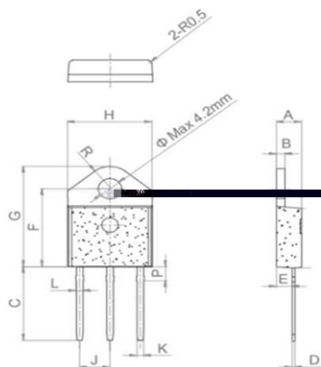
Dimension	Value	Units
A	1.10	mm
B	1.30	mm
C	2.20	mm
D	5.90	mm
E	1.10	mm
F	0.50	mm
G	0.50	mm
H	1.10	mm
Lead Spacing	2.54	mm
Lead Length	1.27	mm
Lead Angle	15	degrees
Lead Thickness	0.10	mm
Lead Width	0.10	mm
Lead Pitch	2.54	mm
Lead Diameter	0.10	mm
Lead Spacing	2.54	mm
Lead Length	1.27	mm
Lead Angle	15	degrees
Lead Thickness	0.10	mm
Lead Width	0.10	mm
Lead Pitch	2.54	mm
Lead Diameter	0.10	mm

## TO-220C Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.30		1.80	0.048		0.053
C3	2.20		2.60	0.087		0.102
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
e		3.6			0.142	

## TO-3P Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	1.40		1.60	0.055		0.062
C	15.48		15.88	0.609		0.625
C2	0.50		0.70	0.019		0.027
C3	2.70		2.90	0.106		0.114
E	20.27		20.67	0.798		0.813
F	15.15		15.35	0.590		0.604
G		5.45			0.214	0.216
H	1.10		1.30	0.043		0.051
L1	1.15		1.35	0.045		0.053
L2	2.68		3.08	0.105		0.121
L3		4.20			0.165	
e	4.40		4.60	0.173		0.181

FIG.1 Maximum power dissipation versus on-state current.

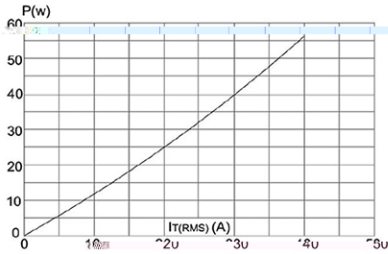


FIG.2: on-state current versus case temperature.

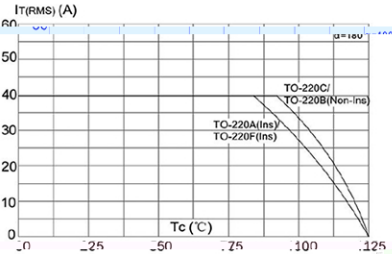


FIG.3: Surge peak on-state current versus number of cycles

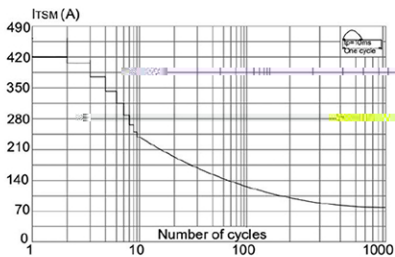


FIG.4: On-state characteristics (maximum values)

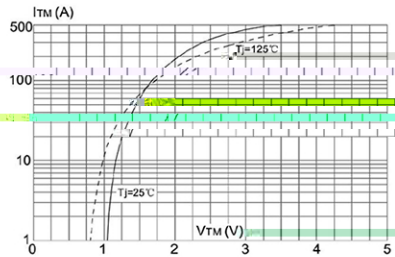


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I_2 t (di/dt < 50\text{A}/\mu\text{s})$

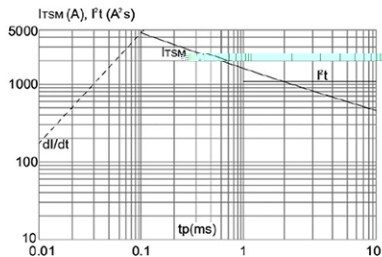


FIG.6: Relative variations of gate trigger current holding current and latching current versus junction temperature

