

## SB4040S 40A SCRs

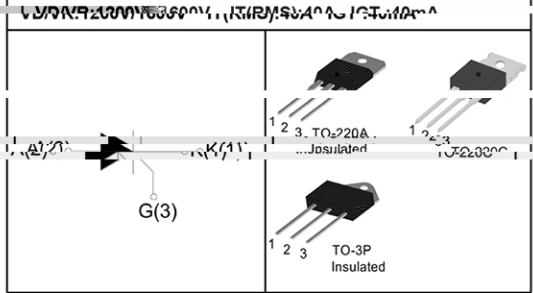
### FEATURES

- High thermal conductivity
- High voltage capacity
- Very high current surge capability

### APPLICATIONS

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

### Parameters Summary



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>	420	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×IGT, tr ≤ 100 ns)	di/dt	150	A/μS
Peak gate current	IGM	4	A
Peak gate power	PGM	5	W

Thermal Resistances			
Symbol	Parameter	Value	Unit
Rth(j-c)	Junction to case (DC)	TO-220A	1.2
		TO-220C	0.8
		TO-3P	0.7

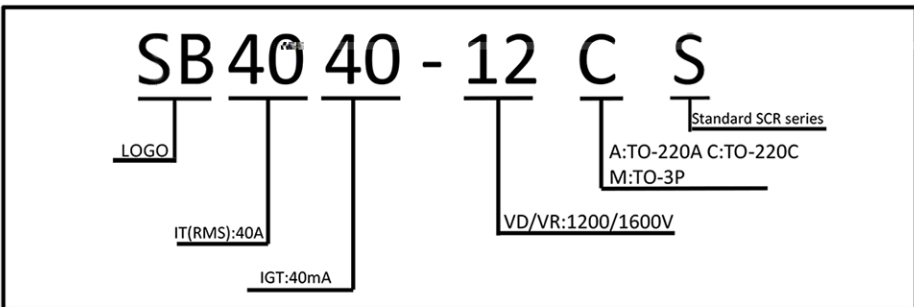
PERFORMANCE CHARACTERISTICS (unless otherwise specified)

Symbol	Parameter	Test Conditions	Typical Value	Max. Value
$I_{TSM}$	Peak Forward Current	$V_{GT} = 1.5V$	1.5A	1.5A
$V_{GT}$	Gate Voltage		1.5V	1.5V
$V_{DRM}$	Reverse Blocking Voltage	$V_D = V_{DRM}$ , $I_T = 0$	1200V	1600V
$I_{TSM}$	Peak Forward Current	$V_{GT} = 1.5V$	1.5A	1.5A
$I_{TSM}$	Peak Forward Current	$V_{GT} = 1.5V$	1.5A	1.5A
$I_{TSM}$	Peak Forward Current	$V_{GT} = 1.5V$	1.5A	1.5A

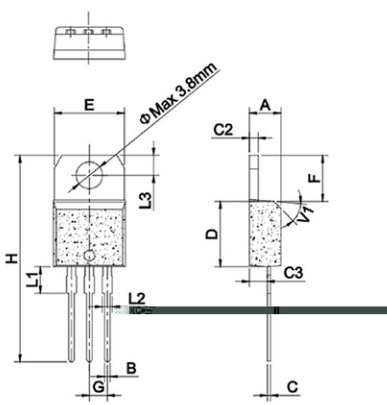
STATIC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Typical Value	Max. Value
$V_{TM}$	Forward Voltage	$I_T = 60A$ , $t_p = 380\mu s$ , $T_j = 25^\circ C$	1.5V	1.5V
$I_{DRM}$	Reverse Current	$V_D = V_{DRM}$ , $T_j = 25^\circ C$	100 $\mu A$	100 $\mu A$
$I_{RRM}$	Reverse Recovery Current	$V_D = V_{DRM}$ , $T_j = 125^\circ C$	100 $\mu A$	100 $\mu A$

### Ordering Information Scheme



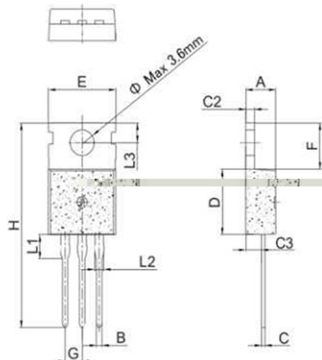
### TO-220A Package Mechanical Data



Dimensions

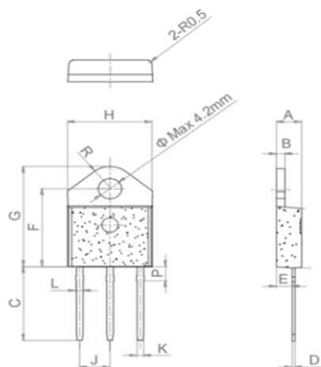
Symbol	Value	Unit
A	1.30	mm
B	1.30	mm
C	1.30	mm
D	1.30	mm
E	1.30	mm
F	1.30	mm
G	1.30	mm
H	1.30	mm
L1	1.30	mm
L2	1.30	mm
L3	1.30	mm

## 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		1.48	0.048		0.052
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
D	15.92		16.32	0.626		0.642
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

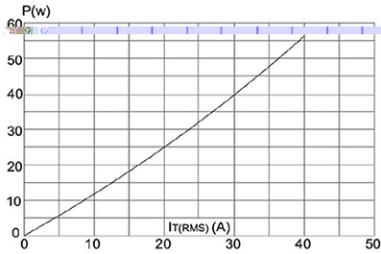


FIG.2: on-state current versus case temperature

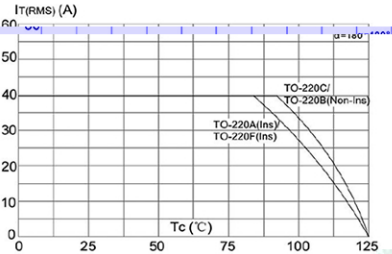


FIG.3: Surge peak on-state current versus number of cycles

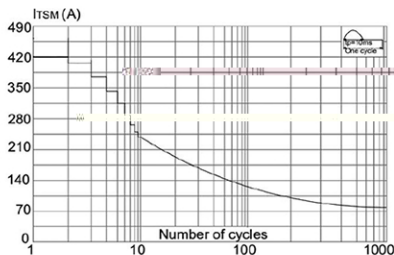


FIG.4: On-state characteristics (maximum values)

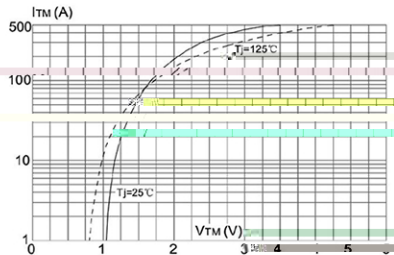


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I_2 t (di/dt < 50\text{A}/\mu\text{s})$

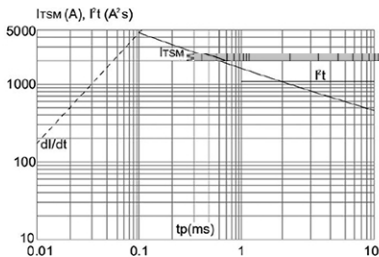


FIG.6: Relative variations of gate trigger current holding current and latching current versus junction temperature

