

SB4040S 40A SCRs

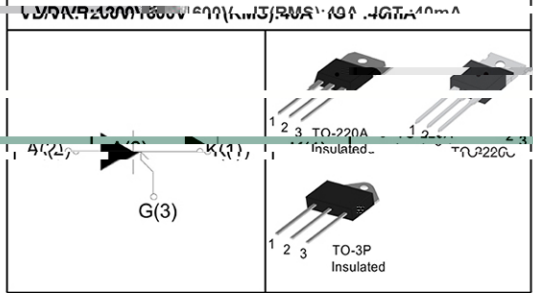
FEATURES

- High thermal conductivity
- 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



ABSOLUTE MAXIMUM RATINGS			
Parameter	Symbol	Value	Unit
Storage junction temperature range	T _{stg}	-40 ~ 150	°C
Operating junction temperature range	T _j	-40 ~ 125	°C
Repetitive peak off-state voltage	V _{DRM}	1200/1600	V
Repetitive peak reverse voltage	V _{RRM}	1200/1600	V
Non repetitive surge peak Off-state voltage	V _{DSM}	V _{DRM} + 100	V
Non repetitive peak reverse voltage	V _{RSM}	V _{RRM} + 100	V
Non repetitive surge peak on-state current	I _{TSM}	420	A
RMS on-state current (180° conduction angle)	I _{T(RMS)}	40	A
Average on-state current (180° conduction angle)	I _{T(AV)}	25	A
I ² t value for fusing (tp=10ms)	I ² t	880	A ² 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

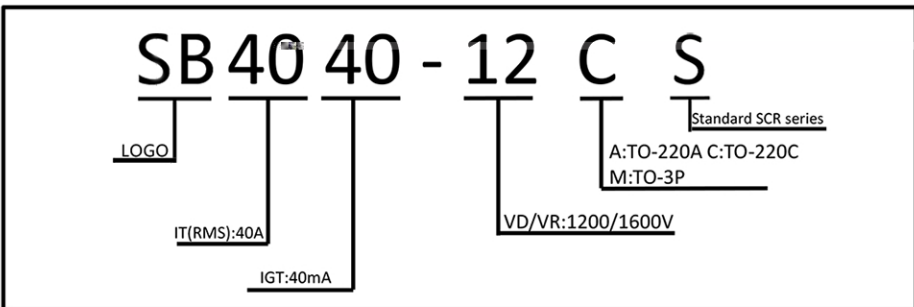
REPEATABLE THRESHOLD CHARACTERISTICS = 75% unless otherwise specified

Symbol	Parameter	Test Conditions	Max.	Min.
V_{GT}	Gate Trigger Voltage	$V_{DRM} = 1200V$	MAX.	1.5V
V_{DRM}	Reverse Blocking Voltage	$I_T = 1.21A$	MAX.	1200V
I_{DRM}	Reverse Blocking Current	$V_{DRM} = 1200V$	MAX.	1.0mA
I_{TSM}	Surge Current	$t_p = 100\mu s$	MAX.	100A

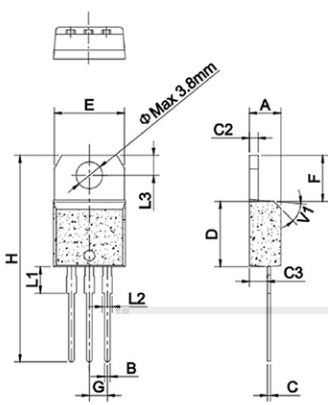
STATIC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Max.	Min.
V_{TM}	Thyristor Turn-Off Voltage	$I_{TM} = 60A$ $t_p = 380\mu s$		
I_{DRM}	Reverse Blocking Current	$T_j = 25^\circ C$		1.0mA
I_{RRM}	Reverse Blocking Current	$T_j = 125^\circ C$		1.0mA

Ordering Information Scheme



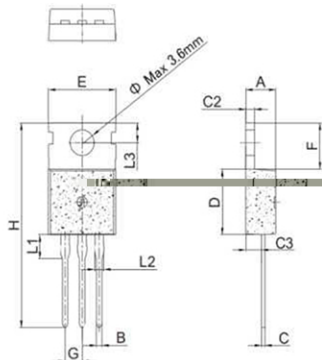
TO-220A Package Mechanical Data



Dimensions

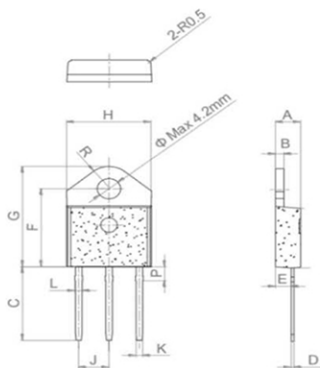
Symbol	Value	Symbol	Value
A	1.30	L1	1.15
B	0.45	L2	1.15
C	1.30	L3	1.15
D	1.30	L4	1.15
E	1.30	L5	1.15
F	0.45	L6	1.15
G	0.45	L7	1.15
H	1.30	L8	1.15
I	1.30	L9	1.15
J	1.30	L10	1.15
K	1.30	L11	1.15
L	1.30	L12	1.15
M	1.30	L13	1.15
N	1.30	L14	1.15
O	1.30	L15	1.15
P	1.30	L16	1.15
Q	1.30	L17	1.15
R	1.30	L18	1.15
S	1.30	L19	1.15
T	1.30	L20	1.15
U	1.30	L21	1.15
V	1.30	L22	1.15
W	1.30	L23	1.15
X	1.30	L24	1.15
Y	1.30	L25	1.15
Z	1.30	L26	1.15
AA	1.30	L27	1.15
AB	1.30	L28	1.15
AC	1.30	L29	1.15
AD	1.30	L30	1.15
AE	1.30	L31	1.15
AF	1.30	L32	1.15
AG	1.30	L33	1.15
AH	1.30	L34	1.15
AI	1.30	L35	1.15
AJ	1.30	L36	1.15
AK	1.30	L37	1.15
AL	1.30	L38	1.15
AM	1.30	L39	1.15
AN	1.30	L40	1.15
AO	1.30	L41	1.15
AP	1.30	L42	1.15
AQ	1.30	L43	1.15
AR	1.30	L44	1.15
AS	1.30	L45	1.15
AT	1.30	L46	1.15
AU	1.30	L47	1.15
AV	1.30	L48	1.15
AW	1.30	L49	1.15
AX	1.30	L50	1.15
AY	1.30	L51	1.15
AZ	1.30	L52	1.15
BA	1.30	L53	1.15
BB	1.30	L54	1.15
BC	1.30	L55	1.15
BD	1.30	L56	1.15
BE	1.30	L57	1.15
BF	1.30	L58	1.15
BG	1.30	L59	1.15
BH	1.30	L60	1.15
BI	1.30	L61	1.15
BJ	1.30	L62	1.15
BK	1.30	L63	1.15
BL	1.30	L64	1.15
BM	1.30	L65	1.15
BN	1.30	L66	1.15
BO	1.30	L67	1.15
BP	1.30	L68	1.15
BQ	1.30	L69	1.15
BR	1.30	L70	1.15
BS	1.30	L71	1.15
BT	1.30	L72	1.15
BU	1.30	L73	1.15
BV	1.30	L74	1.15
BW	1.30	L75	1.15
BX	1.30	L76	1.15
BY	1.30	L77	1.15
BZ	1.30	L78	1.15
CA	1.30	L79	1.15
CB	1.30	L80	1.15
CC	1.30	L81	1.15
CD	1.30	L82	1.15
CE	1.30	L83	1.15
CF	1.30	L84	1.15
CG	1.30	L85	1.15
CH	1.30	L86	1.15
CI	1.30	L87	1.15
CJ	1.30	L88	1.15
CK	1.30	L89	1.15
CL	1.30	L90	1.15
CM	1.30	L91	1.15
CN	1.30	L92	1.15
CO	1.30	L93	1.15
CP	1.30	L94	1.15
CQ	1.30	L95	1.15
CR	1.30	L96	1.15
CS	1.30	L97	1.15
CT	1.30	L98	1.15
CU	1.30	L99	1.15
CV	1.30	L100	1.15
CW	1.30	L101	1.15
CX	1.30	L102	1.15
CY	1.30	L103	1.15
CZ	1.30	L104	1.15
DA	1.30	L105	1.15
DB	1.30	L106	1.15
DC	1.30	L107	1.15
DD	1.30	L108	1.15
DE	1.30	L109	1.15
DF	1.30	L110	1.15
DF	1.30	L111	1.15
DF	1.30	L112	1.15
DF	1.30	L113	1.15
DF	1.30	L114	1.15
DF	1.30	L115	1.15
DF	1.30	L116	1.15
DF	1.30	L117	1.15
DF	1.30	L118	1.15
DF	1.30	L119	1.15
DF	1.30	L120	1.15

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		1.46	0.051		0.058
C3	2.20		2.60	0.087		0.102
D	3.30		3.30	0.130		0.130
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.

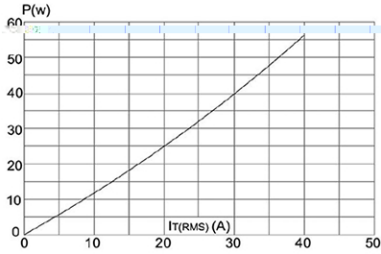


FIG.2: on-state current versus case temperature.

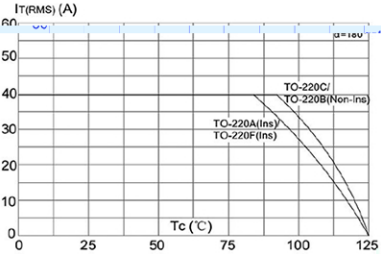


FIG.3: Surge peak on-state current versus number of cycles

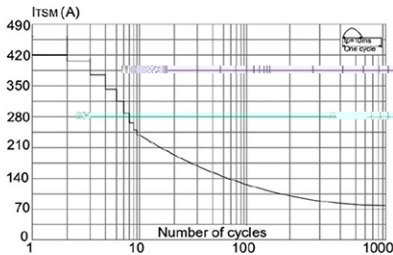


FIG.4: On-state characteristics (maximum values)

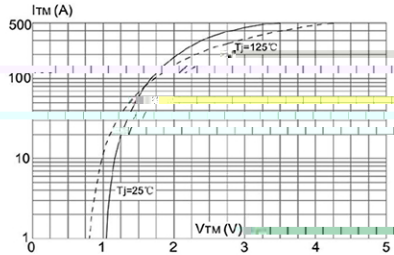


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of $I_2 t (di/dt < 50\text{A}/\mu\text{s})$

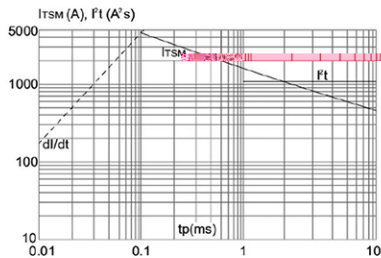


FIG.6: Relative variations of gate trigger current holding current and latching current versus junction temperature

