

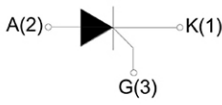
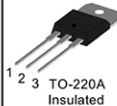
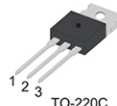
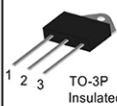
## SB4040S 40A SCRs

### FEATURES

- High thermal cycling performance
- 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	
VD/VR:1200V/1600V IT(RMS):40A IGT :40mA	
	 TO-220A Insulated  TO-220C  TO-3P Insulated



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	°C/W
		TO-220C	0.8	
		TO-3P	0.7	

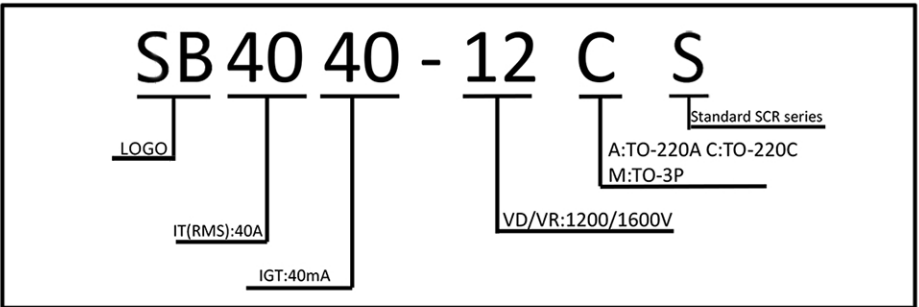
**ELECTRICAL CHARACTERISTICS (T=25°C unless otherwise specified)**

Symbol	Test Condition	Value	Unit
$I_{GT}$	V = 12V R = 140Ω	MAX.	40
$V_{GT}$		MAX.	1.5
$V_{GD}$	VD=VDRM Tj=125°C	MIN.	0.2
$I_L$	$I_G=1.2I_{GT}$	MAX.	200
$I_H$	IT=50mA	MAX.	100
dV/dt	$V_D=2/3V_{DRM}$ Gate Open Tj=125°C	MIN.	1000

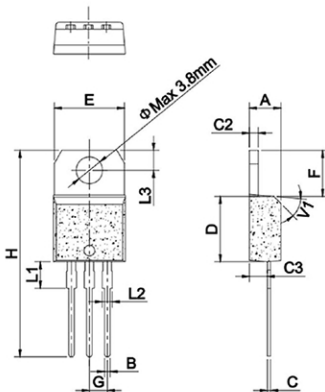
**STATIC CHARACTERISTICS**

Symbol	Parameter	Value(MAX. )	Unit
$V_{TM}$	ITM = 60A tp=380μs	Tj = 25°C	1.5
$I_{DRM}$	$V_D=V_{DRM}$ $V_R=V_{RRM}$	Tj = 25°C	10
$I_{RRM}$		Tj = 125°C	4

**Ordering Information Scheme**

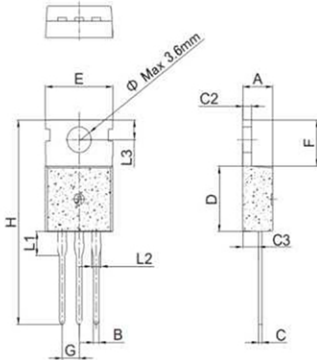


**TO-220A Package Mechanical Data**



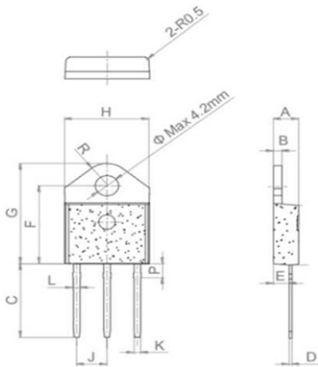
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.30		1.48	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
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-220C Package Mechanical Data



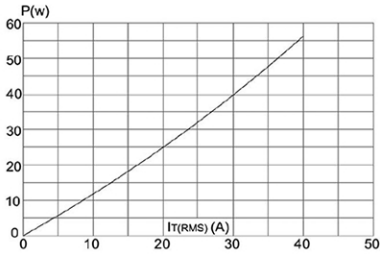
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.30		1.48	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
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

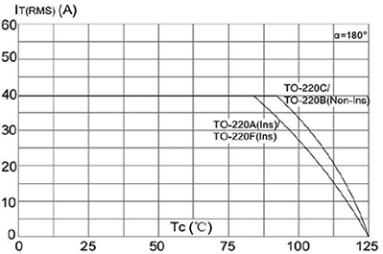


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	1.40		1.60	0.055		0.062
C	15.48		15.88	0.609		0.625
C2	0.50		0.70	0.019		0.027
C3	2.70		2.90	0.106		0.114
D	15.92		16.32	0.626		0.642
E	20.27		20.67	0.798		0.813
F	15.15		15.35	0.590		0.604
G		5.45			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

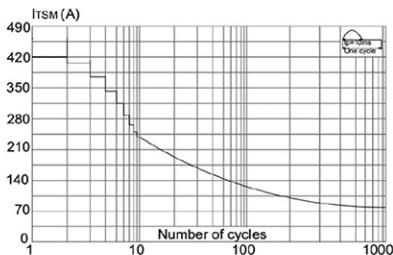
**FIG.1** Maximum power dissipation versus on-state current



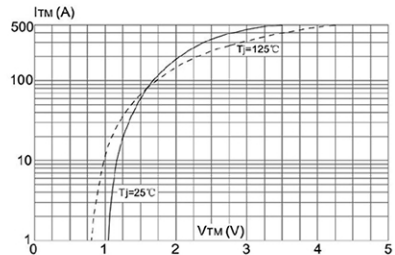
**FIG.2:** on-state current versus case temperature



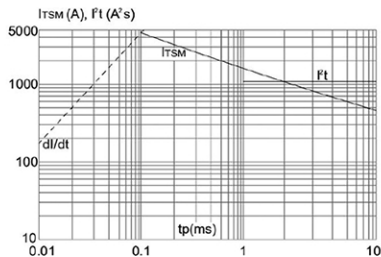
**FIG.3:** Surge peak on-state current versus number of cycles



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



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



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

