



TO-220BK Plastic-Encapsulate Thyristors

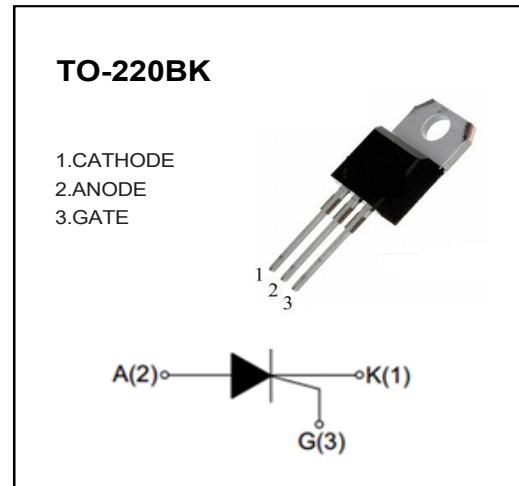
CR816B Standard SCRs

MAIN CHARACTERISTICS

$I_{T(AV)}$	10A
V_{DRM}/V_{RRM}	800V
V_{TM}	1.6V

FEATURES

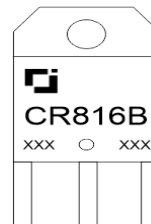
- PNP 4-layer Structure SCRs
- Mesa Glass Passivated Technology
- Multi Layers Metal Electrodes



APPLICATIONS

- LED Controller
- Motorcycle Voltage Regulator
- Hair Straightener

MARKING



CR816B:Part
Number XXX:Internal
Code

ABSOLUTE RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Test condition	Value	Unit
V_{DRM}/V_{RRM}	Repetitive peak off-state voltage	$T_j=25^{\circ}C$	800	V
$I_{T(AV)}$	Average on-state current	TO-220BK($T_C \leq 110^{\circ}C$)	10	A
$I_{T(RMS)}$	RMS on-state current	TO-220BK($T_C \leq 110^{\circ}C$), Fig. 1,2	16	A
I_{TSM}	Non repetitive surge peak on-state current	Full sine wave , $T_j(\text{init})=25^{\circ}C$, $t_p=20\text{ms}$; Fig. 3,5	190	A
I^2t	I^2t value	$t_p=10\text{ms}$	180	A^2s
di_T/dt	Critical rate of rise of on-state current	$I_G=2 \cdot I_{GT}$, $t_r \leq 10\text{ns}$, $F=120\text{Hz}$, $T_j=125^{\circ}C$	50	$A/\mu s$
I_{GM}	Peak gate current	$t_p=20\mu s$, $T_j=125^{\circ}C$	4	A
$P_{G(AV)}$	Average gate power	$T_j=125^{\circ}C$	1	W
T_{STG}	Storage temperature		-40~+150	°C
T_j	Operating junction temperature		-40~+125	

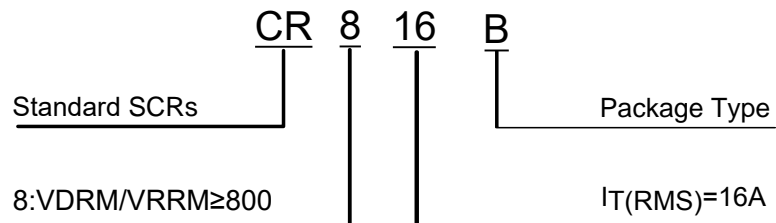
ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

Symbol	Parameter	Test condition	Value			Unit
			Min	Nom	Max	
I _{GT}	Gate trigger current	V _D =12V, R _L =33Ω, T _j =25°C, Fig. 6	-	-	25	mA
V _{GT}	Gate trigger voltage	V _D =12V, R _L =33Ω, T _j =25°C	-	-	1.0	V
V _{GD}	Non-triggering gate voltage	V _D =V _{DRM} , R _L =3.3kΩ, T _j =125°C	0.2	-	-	V
I _H	Holding current	I _T =500mA, T _j =25°C,	-	-	40	mA
I _L	Latching current	I _G =1.2I _{GT} , T _j =25°C,	-	-	60	mA
dV _D /dt	Critical rate of rise of off-state	V _D =67%V _{DRM} , Gate OPEN, T _j =125°C	200	-	-	V/μs
V _{TM}	On-state Voltage	I _{TM} =28A, Fig. 4	-	-	1.6	V
I _{DRM} / I _{RRM}	Repetitive peak off-state current	V _D =V _{DRM} /V _R RM, T _j =25°C	-	-	5	μA
		V _D =V _{DRM} /V _R RM, T _j =125°C	-	-	1	mA

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R _{th} (j-c)	Junction to case (AC)	TO-220BK	1.1 °C/W
R _{th} (j-a)	Junction to ambient	TO-220BK	60 °C/W

PART NUMBER



CHARACTERISTICS CURVES

FIG.1: Maximum power dissipation versus RMS on-state current (full cycle)

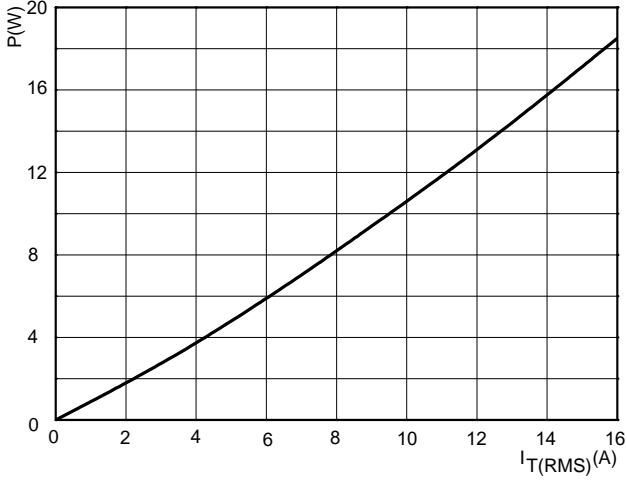


FIG.2: RMS on-state current versus case temperature (full cycle)

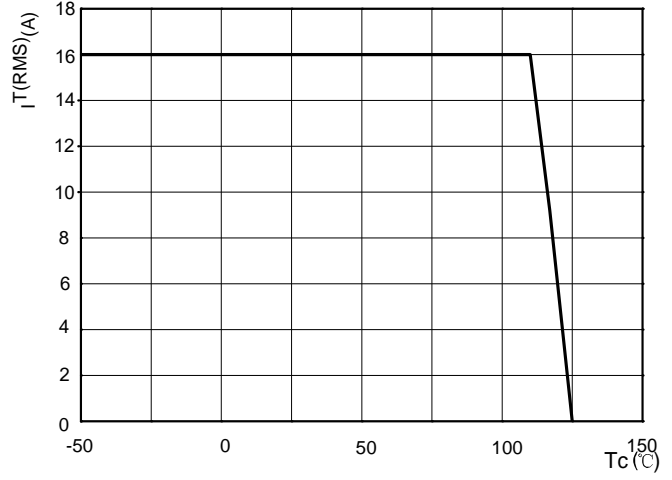


FIG.3: Surge peak on-state current versus number of cycles

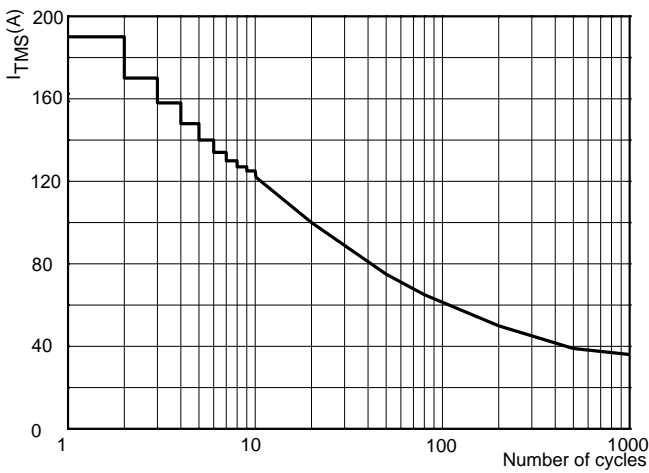


FIG.4: On-state characteristics (maximum values)

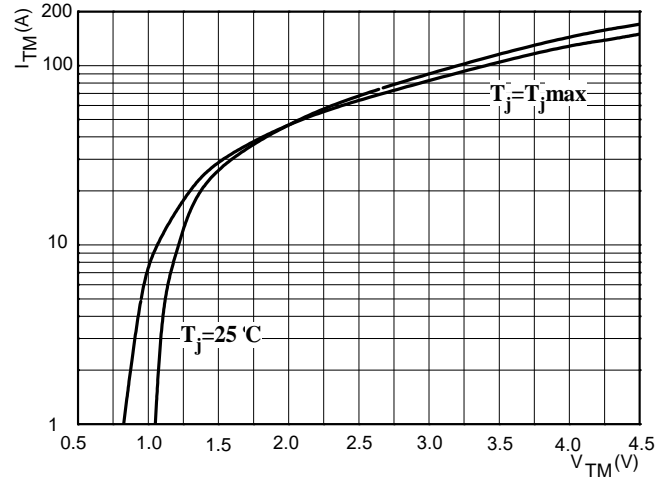


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$

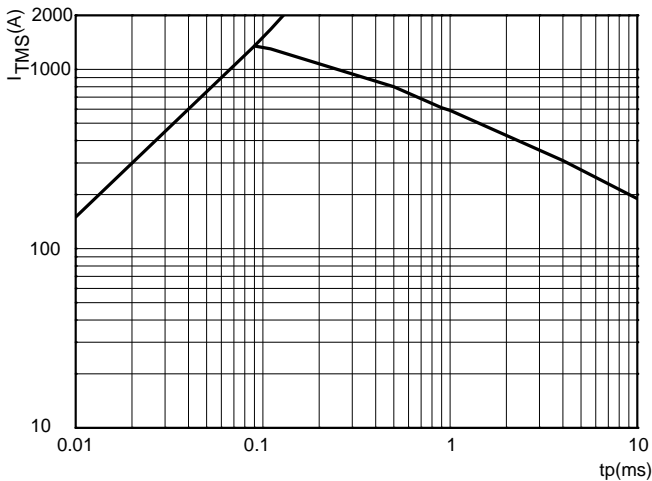
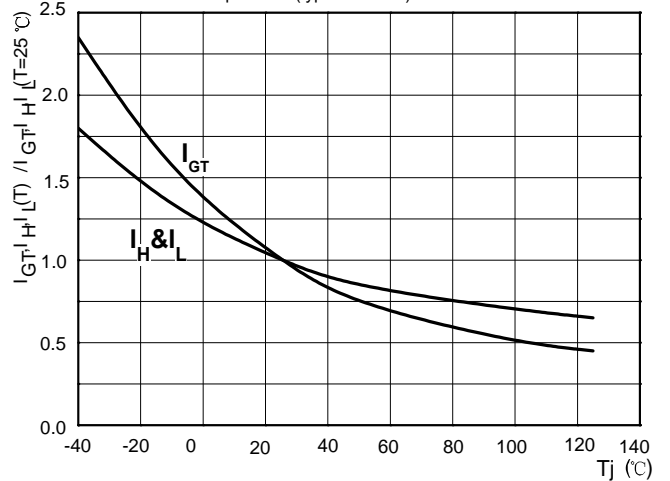
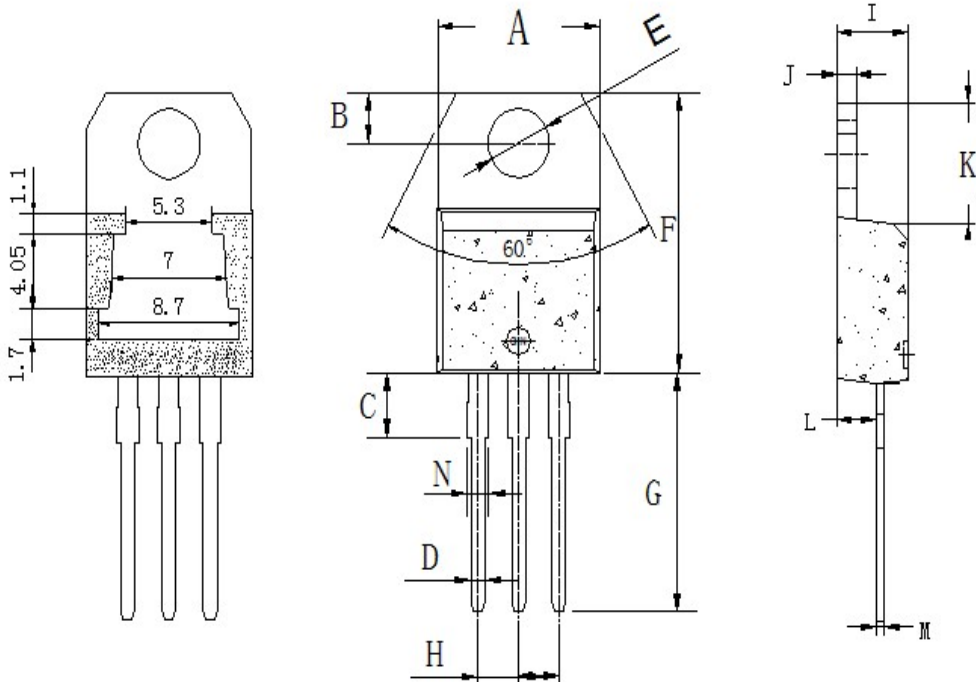


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)



TO-220BK PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.8	10.4	0.385	0.409
B	2.65	3.1	0.104	0.122
C	2.8	4.2	0.110	0.165
D	0.7	0.92	0.027	0.036
E	3.75	3.95	0.147	0.155
F	14.8	16.1	0.582	0.633
G	13.05	13.6	0.513	0.535
H	2.4	2.7	0.094	0.106
I	4.38	4.61	0.172	0.181
J	1.15	1.36	0.045	0.053
K	5.85	6.82	0.230	0.268
L	2.35	2.75	0.092	0.108
M	0.35	0.65	0.013	0.025
N	1.18	1.42	0.046	0.055