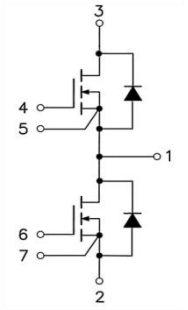
34mm Half Bridge SiC Module

Parameter	Value	Unit
V_{DS}	1200	V
I_D	130	A
$R_{DS(ON)}$	11.2	mΩ
Q_G	500	nC



Features:

- High Current Density
- Low Inductive Design
- Low Switching Losses
- High-frequency Operation
- Zero Turn-off Tail Current from MOSFET

Applications:

- High Power Converters
- Motor Drives
- UPS Systems

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage	1200	V
V_{GS}	Gate-source Voltage	-10/+22	V
I_D	Drain Current (continuous) (T_C=25°C)	210	A
I_D	Drain Current (continuous) (T_C=90°C)	130	A
I_{DM}	Drain Current (pulsed)	400	A
T_{op};T_{stg}	Operating and Storage Temperature Range	-40 to +150	°C
T_J	Junction Temperature	175	°C
$R_{th(j-c)}$	Thermal Resistance, Junction-to- heat sink	0.14	°C/W

MOSFET Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Static characteristics (at TC=25°C unless otherwise specified)						
B_{VDS}	Drain-source Breakdown Voltage	1200	-	-	V	V_{GS}=0V
I_{DSS}	Zero Gate Voltage Drain Current	-	-	40	μA	V_{DS}=1200V; V_{GS}=0V
I_{GSS}	Gate-body Leakage Current	-	-	2.0	μA	V_{GS}=-10/+20V; V_{DS}=0V
$V_{GS(th)}$	Gate Threshold Voltage	2.0	-	4.0	V	V_{DS}=V_{GS} ; I_D=40mA
$R_{DS(on)}$	Static Drain-source on Resistance	-	11.2	13	mΩ	V_{GS}=18V; I_D=80A; T_J=25°C
		-	20.2	-	mΩ	V_{GS}=18V; I_D=80A; T_J=175°C
$V_{GS(on)}$	Recommended Turn-on Voltage	-	18	-	V	Static
$V_{GS(off)}$	Recommended Turn-off Voltage	-	-5	-	V	
R_G	Gate Resistance	-	1.3	-	Ω	V_{GS}=0V; f=1MHz

Dynamic characteristics (at TC=25°C unless otherwise specified)						
C_{iss}	Input Capacitance	-	10.3	-	nF	V_{DS}=1000V; f=1MHz; V_{AC}=25mV
C_{oss}	Output Capacitance	-	0.44	-		
C_{rss}	Reverse Transfer Capacitance	-	16	-	pF	
E_{on}	Turn-on Switching Energy	-	8.2	-	mJ	V_{DD}=800V; V_{GS}=-5/+18V; I_D=120A; $R_{G(ext)}$=5Ω Load=100μH
E_{off}	Turn-off Switching Energy	-	5.8	-		
Q_{GS}	Gate-Source Charge	-	128	-	nC	V_{DD}=800V; V_{GS}=-5/+18V; I_D=80A
Q_{GD}	Gate-drain Charge	-	132	-		
Q_G	Total Gate Charge	-	500	-		
$t_{d(on)}$	Turn-on Delay Time	-	77	-	ns	V_{DD}=800V; V_{GS}=-5/+18V; I_D=120A; $R_{G(ext)}$=5Ω Load=100μH
t_r	Rise Time	-	55	-		
$t_{d(off)}$	Turn-off Delay Time	-	193	-		
t_f	Fall Time	-	43	-		

Body Diode Characteristics (T_J =25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{FSD}	Forward Voltage	-	-	6	V	V_{GS}=0V; I_F=120A
I_S	Continuous Diode Forward Current	-	120	-	A	V_{GS}=0V; T_C=25°C
T_{RR}	Reverse Recovery Time	-	27	-	ns	V_{GS}=-5/+18V; I_F=120A; V_R=800V
Q_{RR}	Reverse Recovery Charge	-	2848	-	nC	
I_{RRM}	Peak Reverse Recovery Current	-	39	-	A	

Module Physical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{ISOL}	Isolation Test Voltage	-	3.0	-	kV	f=50Hz; t=1min
L_{Stray}	Stray Inductance	-	30	-	nH	
W	Weight	-	160	-	g	
M	Mounting Torque	2.5	-	5.0	N·m	M5

Typical Characteristics

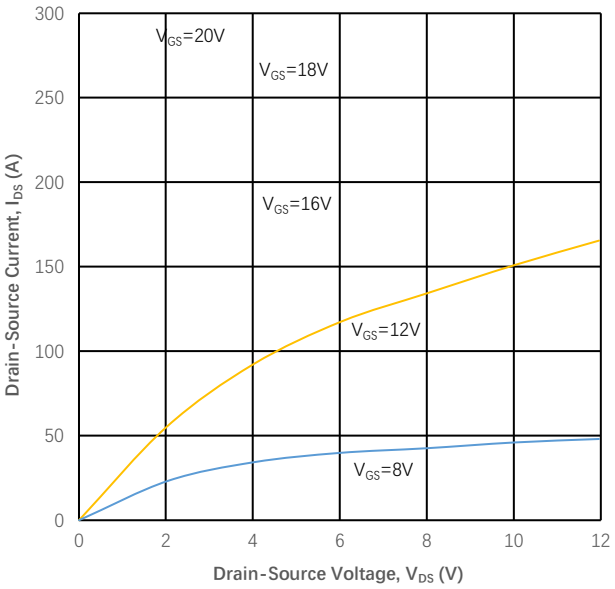


Figure 1

Output Characteristics (T_J=25 °C)

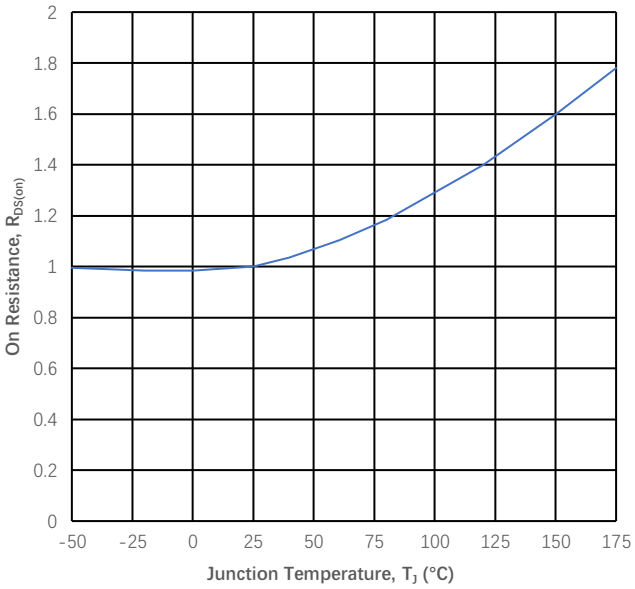


Figure 2

Normalized On-Resistance vs. Temperature

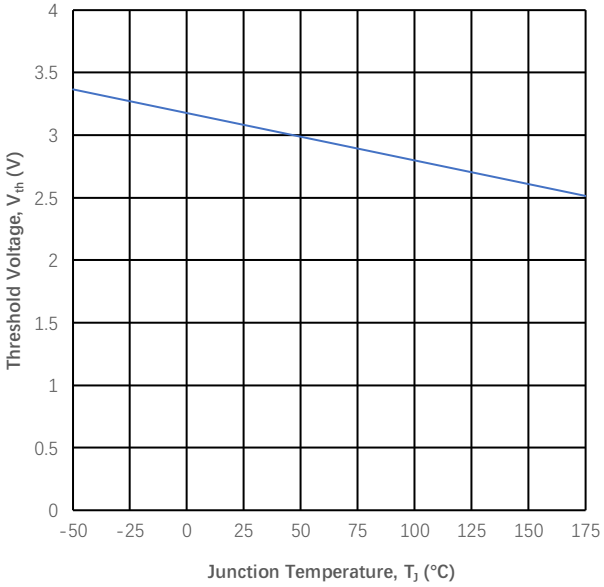


Figure 3

Threshold Voltage vs. Temperature

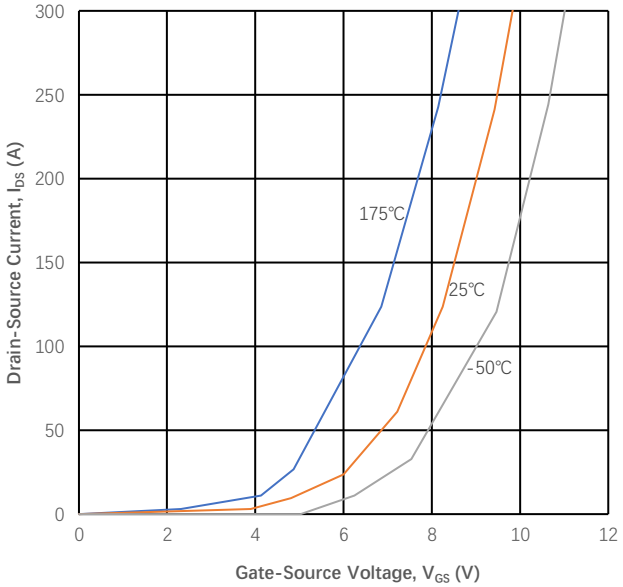


Figure 4

Transfer Characteristic for Various T_J

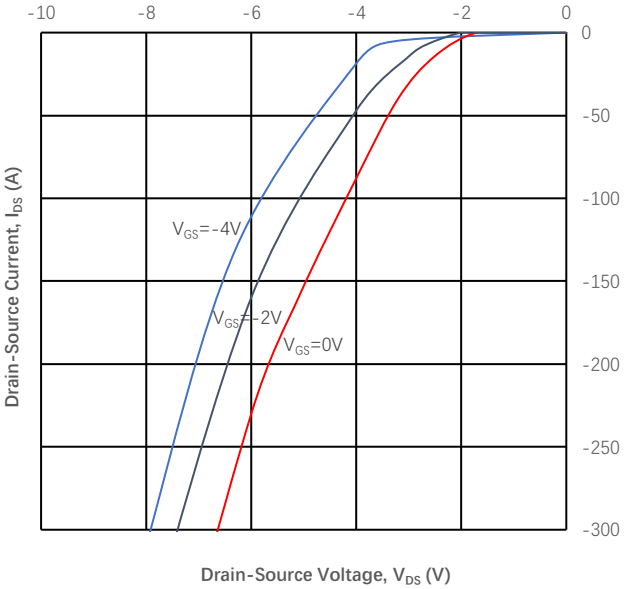


Figure 5

Body Diode Characteristic

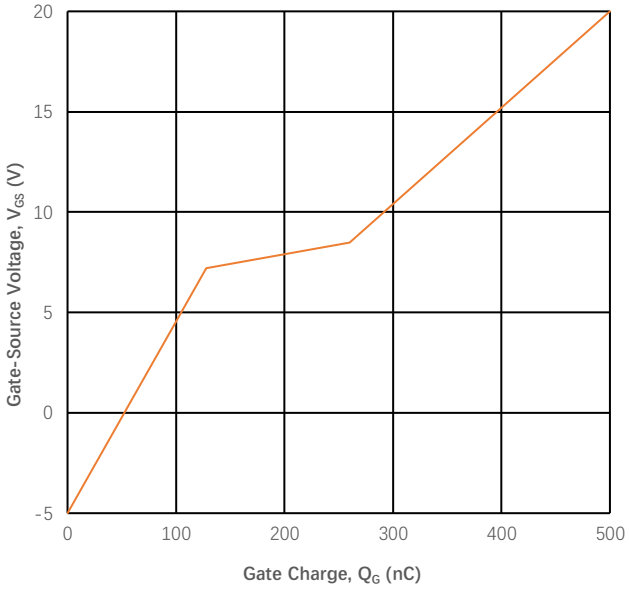


Figure 6

Typical Gate Charge Characteristics

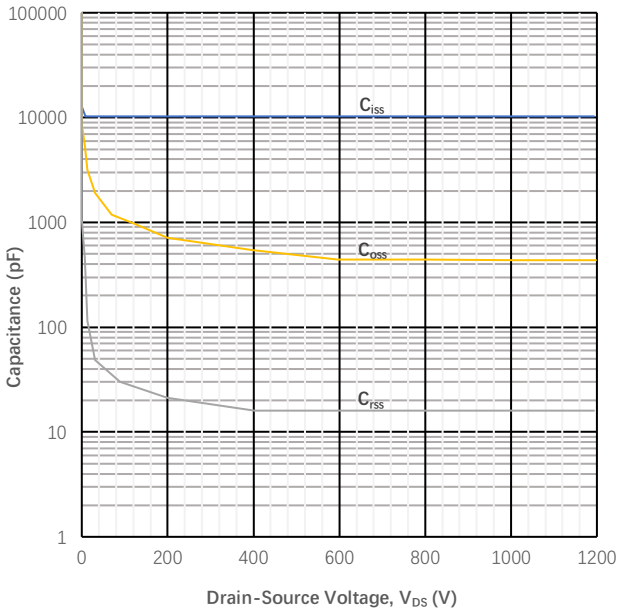


Figure 7

Typical Capacitances vs. Drain-Source Voltage

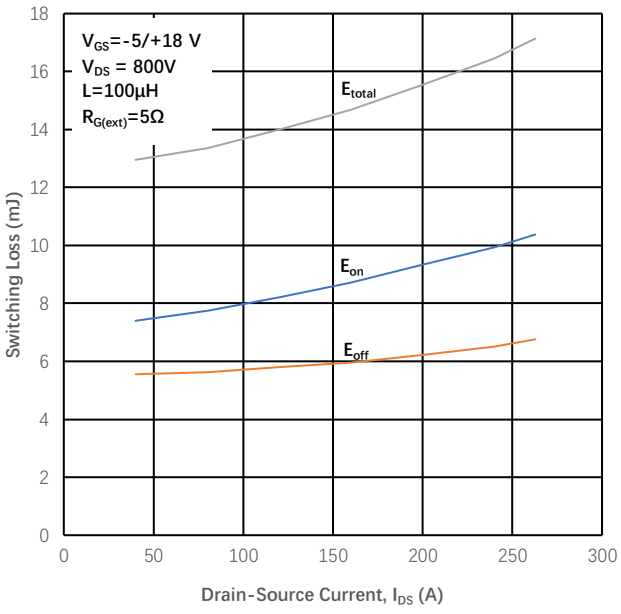


Figure 8

Inductive Switching Energy vs. Drain Current

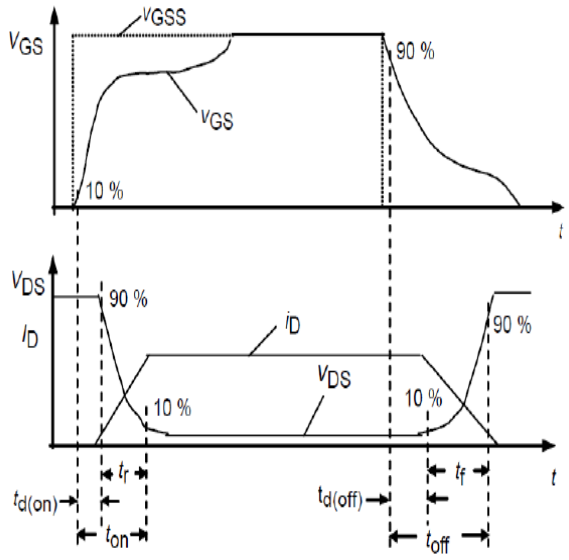


Figure 9
Switching Time Description

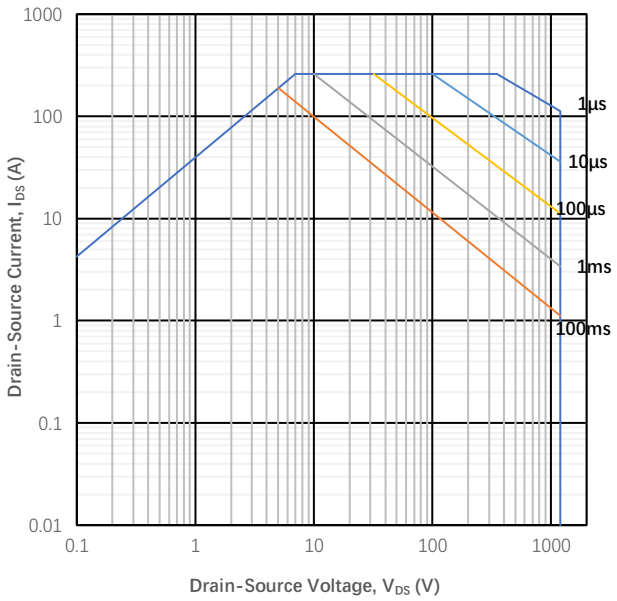
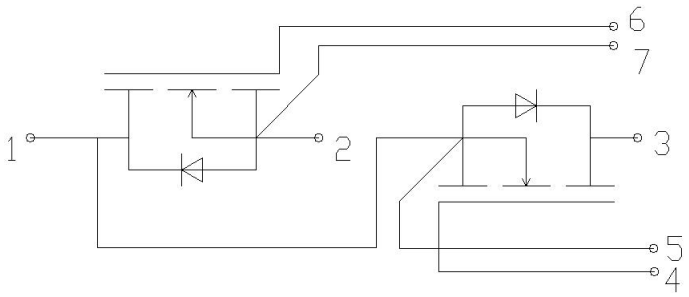
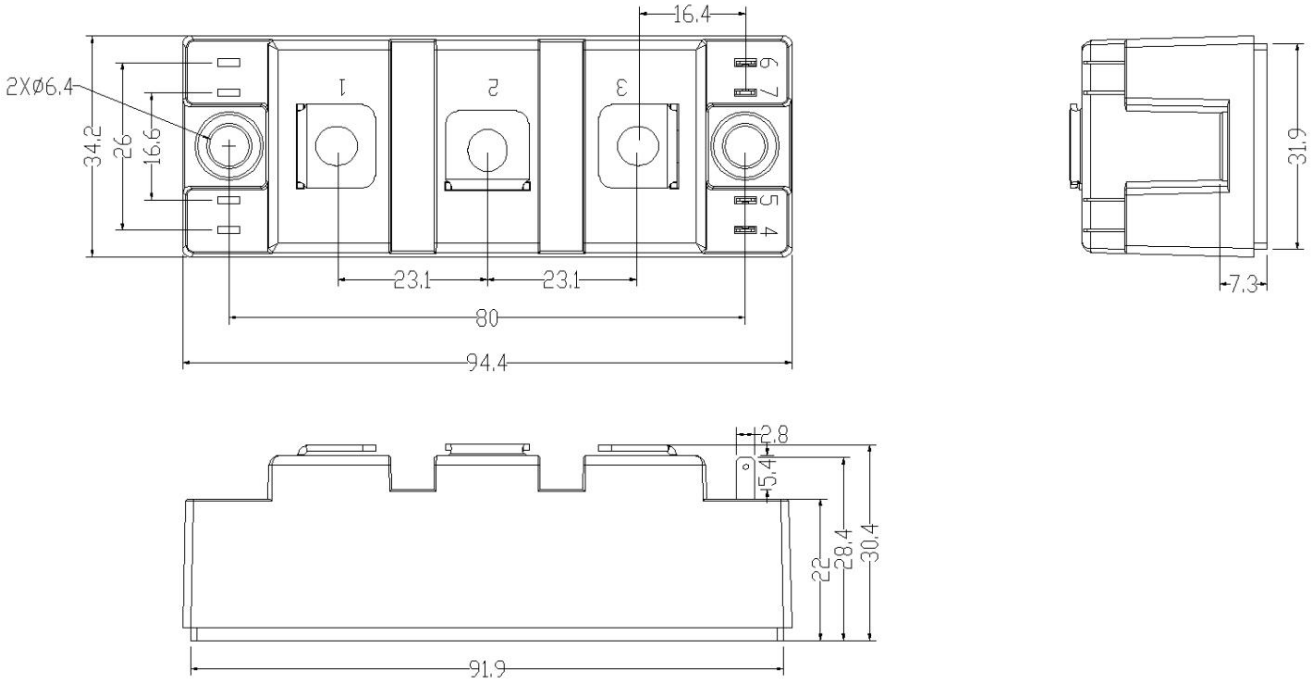


Figure 10
Safe Operating Area

Circuit Diagram



Package Outlines(Unit: mm):



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