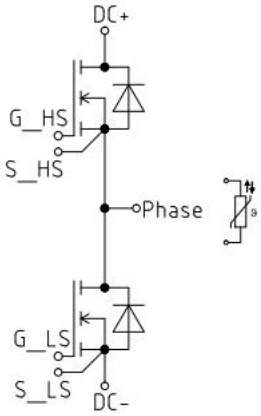
Easy1B Half Bridge SiC Module

Parameter	Value	Unit
V_{DS}	1200	V
I_D	200	A
$R_{DS(ON)}$	8	mΩ
Q_G	476	nC



Features:

- High Current Density
- Low Inductive Design
- Low Switching Losses
- Rugged Mounting Due to Integrated Mounting Clamps

Applications:

- DC/DC Converter
- Solar Applications
- UPS Systems
- High Frequency Switching Application

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-source Voltage	1200	V
V_{GS}	Gate-source Voltage (dynamic)	-10/+22	V
I_D	Drain Current (continuous)	200	A
I_{DM}	Drain Current (pulsed)	400	A
T_{op};T_{stg}	Operating and Storage Temperature Range	-40 to +150	°C
$R_{th(j-c)}$	Thermal Resistance, Junction-to-heatsink	0.3	°C/W
L_{Stray}	Stray Inductance	12	nH
V_{isol}	Isolation Test Voltage (DC; 2mA; t=5s)	4.2	kV
M	Mounting Force Per Clamp (M4)	20 - 50	N
W	Weight	23	g

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	-	-	200	μA	V_{DS}=1200V; V_{GS}=0V
I_{GSS}	Gate-body Leakage Current	-	-	2	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=20mA
$R_{DS(on)}$	Static Drain-source on Resistance	-	8	11	mΩ	V_{GS}=18V; I_D=100A
$V_{GS(on)}$	Recommended Turn-on Voltage	-	18	-	V	Static
$V_{GS(off)}$	Recommended Turn-off Voltage	-	-5	-	V	

R_G	Gate Resistance	-	1.1	-	Ω	V_{GS}=0V; f=1MHz
Dynamic characteristics (at TC=25°C unless otherwise specified)						
C_{iss}	Input Capacitance	-	13700	-	pF	V_{DS}=1000V; f=1MHz; V_{AC}=25mV
C_{oss}	Output Capacitance	-	580	-		
C_{rss}	Reverse Transfer Capacitance	-	26	-		
E_{on}	Turn-on Energy	-	10.9	-	mJ	V_{DS}=900V; V_{GS}=-5/+18V; I_D=200A; Load=100μH
E_{off}	Turn-off Energy	-	8.9	-		
Q_{GS}	Gate-source Charge	-	153	-	nC	V_{DD}=800V; V_{GS}=-5/+18V; I_D=100A
Q_{GD}	Gate-drain Charge	-	156	-		
Q_G	Total Gate Charge	-	476	-		
$t_{d(on)}$	Turn-on Delay Time	-	147	-	ns	V_{DD}=900V; V_{GS}=-5/+18V; I_D=200A; $R_{G(ext)}$=5Ω;
t_r	Rise Time	-	66	-		
$t_{d(off)}$	Turn-off Delay Time	-	243	-		
t_f	Fall Time	-	50	-		

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=100A
I_S	Continuous Diode Forward Current	-	100	-	A	V_{GS}=0V; T_C=25°C
T_{RR}	Reverse Recovery Time	-	30	-	ns	V_{GS}=-5/+18V; I_F=200A V_R=900V
Q_{RR}	Reverse Recovery Charge	-	1226	-	nC	
I_{RRM}	Peak Reverse Recovery Current	-	55	-	A	

NTC Thermistor Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
R_{25}	Rated Resistance	-	5.00	-	kΩ	T_{NTC}=25°C
ΔR/R	Deviation of R_{100}	-5	-	5	%	T_{NTC}=100°C; R_{100}=493.3Ω
$B_{25/50}$	Beta Value for 25°C to 50°C	-	3375	-	K	$R_2=R_{25}\exp[B_{25/50}(1/T2-1/(298.15K))]$
$B_{25/80}$	Beta Value for 25°C to 80°C	-	3414	-	K	$R_2=R_{25}\exp[B_{25/80}(1/T2-1/(298.15K))]$
$B_{25/100}$	Beta Value for 25°C to 100°C	-	3436	-	K	$R_2=R_{25}\exp[B_{25/100}(1/T2-1/(298.15K))]$

Typical Characteristics

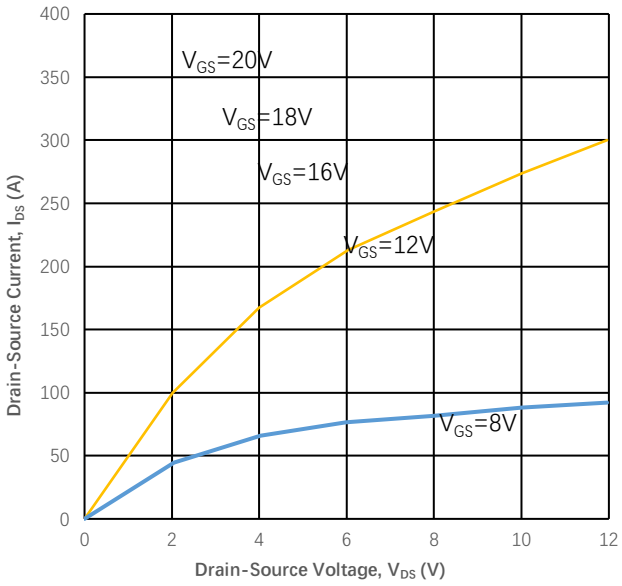


Figure 1

Output Characteristics (T_J=25 °C)

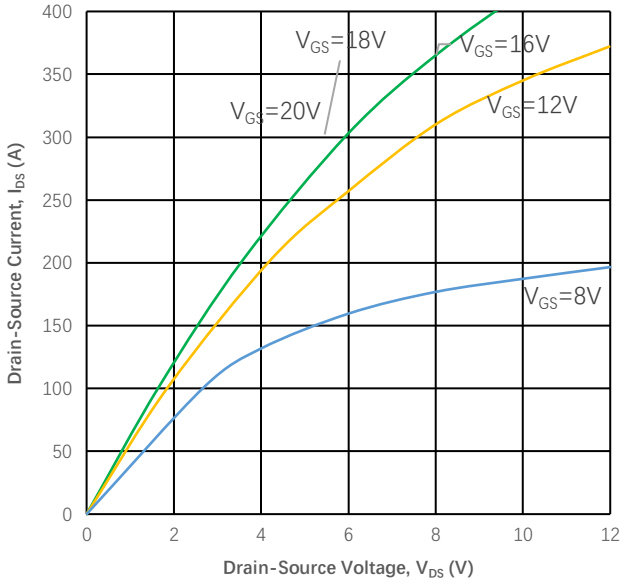
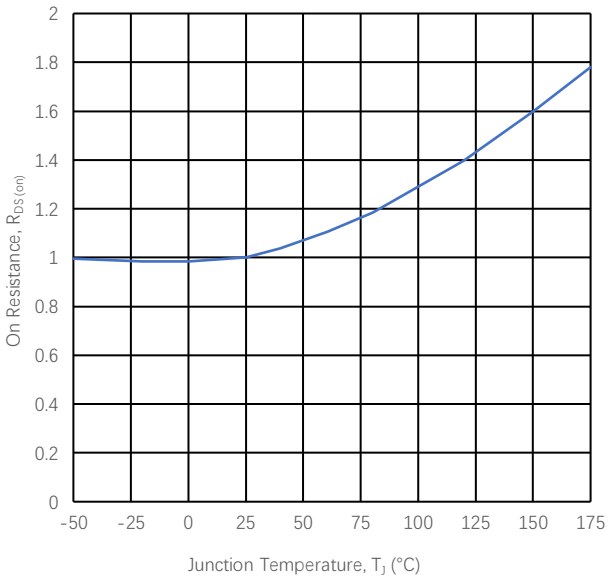


Figure 2

Typical Output Characteristics (T_J=150 °C)



Normalized on-resistance vs. T_j

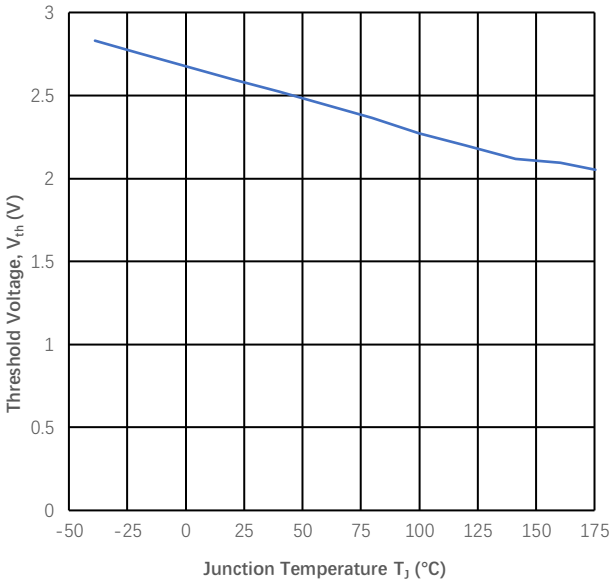


Figure 4

Threshold Voltage vs. Temperature

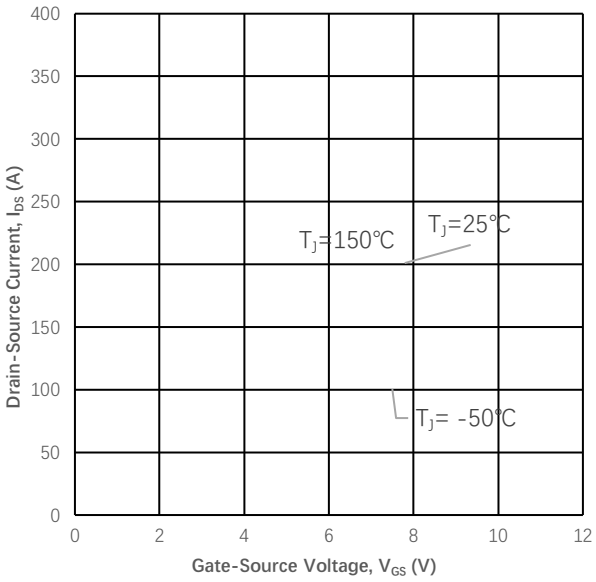


Figure 5
Transfer Characteristic for Various T_j

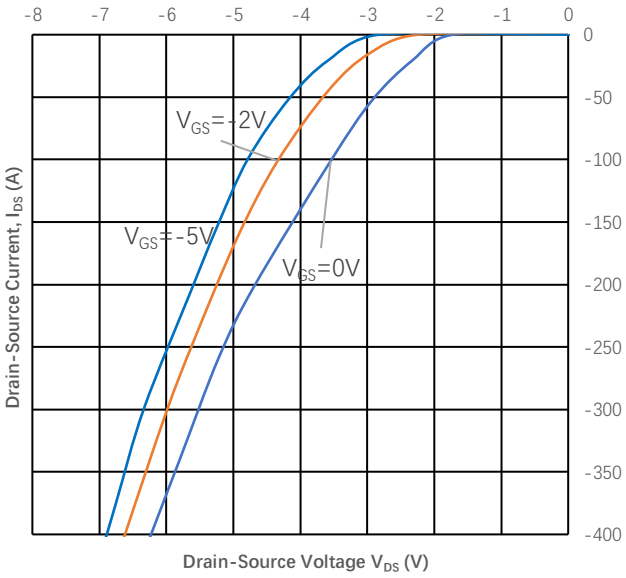


Figure 6
Body Diode Characteristic

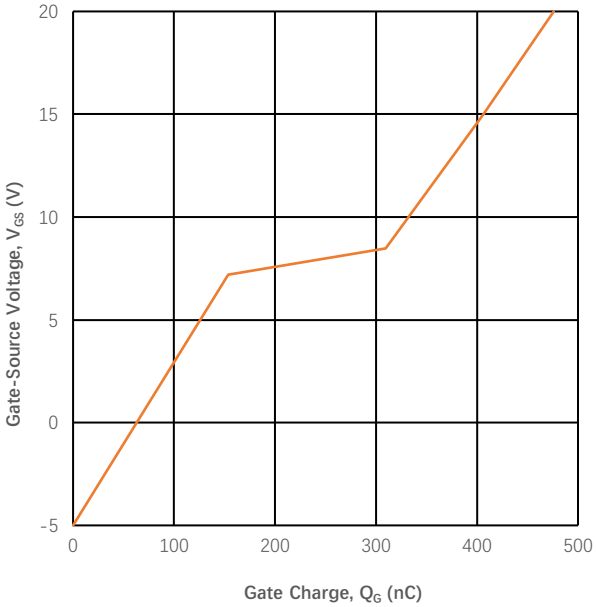


Figure 7
Gate Charge Characteristics

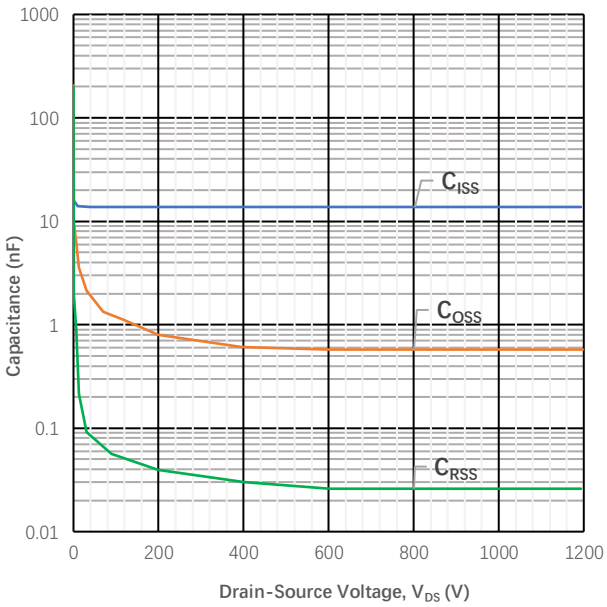


Figure 8
Capacitances vs. V_{DS}

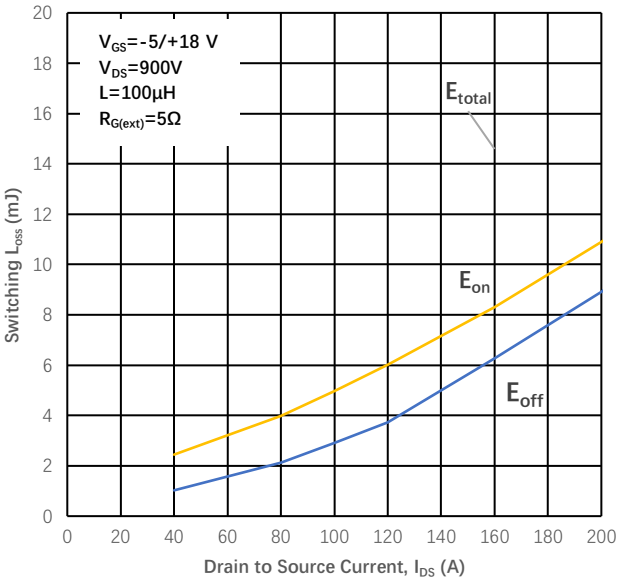


Figure 9

Inductive Switching Energy vs. Drain Current

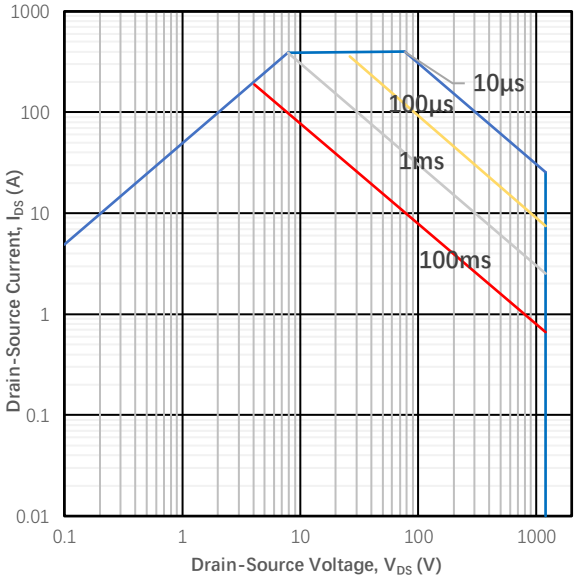
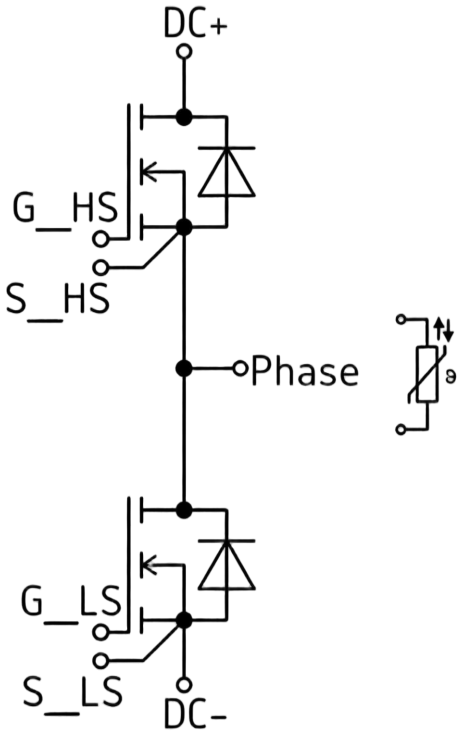


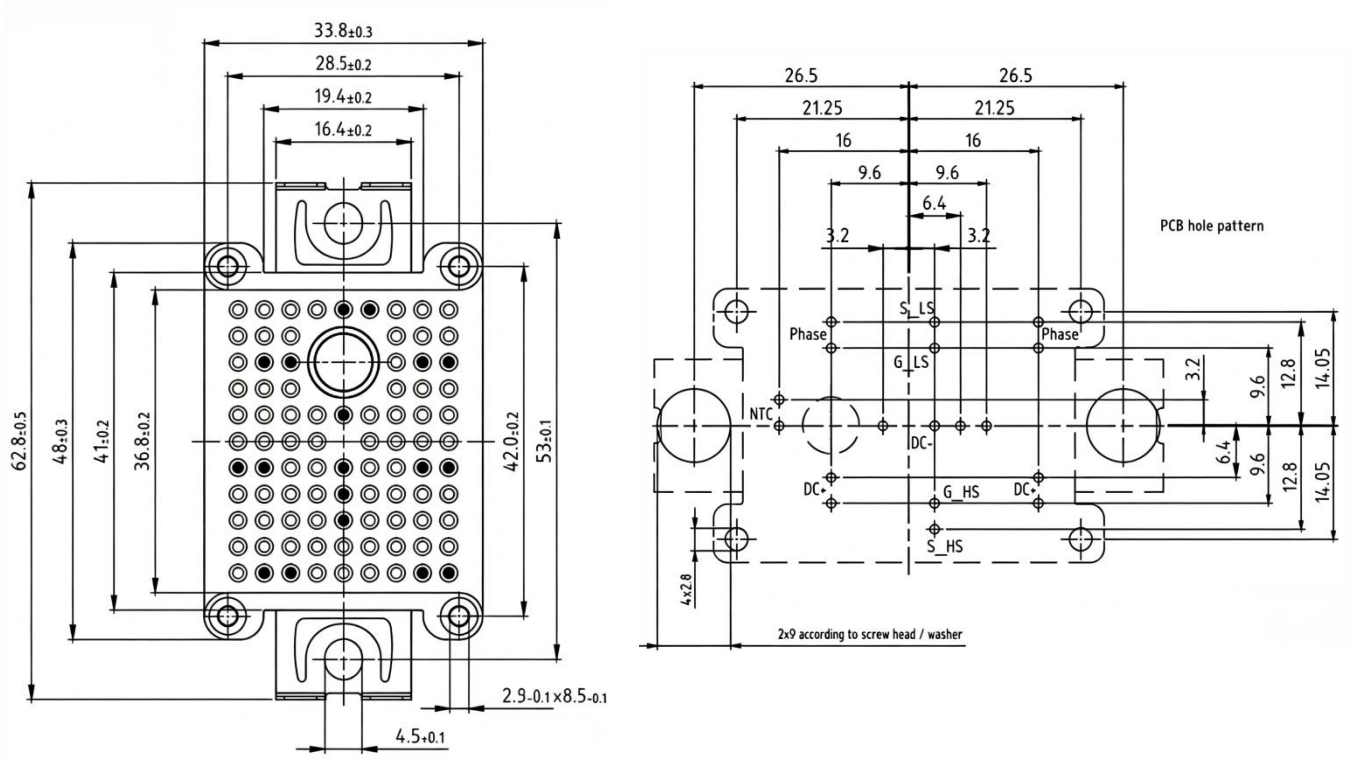
Figure 10

Safe Operating Area

Circuit Diagram



Package Outlines(Unit: mm):



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