Applications

- AC and DC Motor Control
- DC/DC Converter
- Solar Applications
- UPS and SMPS
- Inverter for Motor Drive

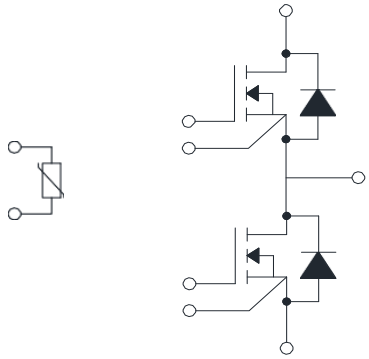
Product Summary

V_{CE}	RDS(on)
1200V	5.3mΩ

All-SiC Power Module

Features

- **Low Inductance**
- **Isolated Copper Baseplate Using DBC Technology**
- Low Switching Losses
- Integrated NTC Temperature Sensor
- Compact Design
- High Power Density



Equivalent Circuit Schematic

Absolute Maximum Ratings (T_{vj} =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DSmax}		1200	V
Continuous Drain Current	I_D	V_{GS}=18V, T_H=25℃	270	A
		V_{GS}=18V, T_H=80℃	225	
Gate-SourceVoltage	V_{GSmax}	Absolute Maximum Values	-8/+22	V
Gate-Source Voltage	V_{GSop}	Recommended Operational Values	-4/+18	V
Maximum Pulsed Drain-Source Current	$I_{D(pulsed)}$	V_{GS}=18V, T_{vj}=25℃, t_{pmax}Limited by $T_{vj\ max}$	450	A
Operating Junction Temperature	$T_{vj\ op}$		-40～+150	℃
Maximum Junction Temperature	$T_{vj\ max}$		175	℃
Total power dissipation	P_{tot}	T_H=80℃	413	W

● MOSFET Characteristics (T_{vj} =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=69mA	2.0	2.6	4	V
		V_{DS}=V_{GS}, I_D=69mA, T_{vj}=175℃		1.8		
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V		3	300	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=-8V/+22V		30	750	nA
On State Resistance	$R_{DS(on)}$	V_{GS}=18V, I_{DS}=225A		5.3	7.3	mΩ
		V_{GS}=18V, I_{DS}=225A, T_{vj}=175℃		9.6		mΩ
Input Capacitance	C_{iss}	V_{DS}=1000V, V_{GS}=0V f=1MHz		12.6		nF
Output Capacitance	C_{oss}			750		pF
Reverse Transfer Capacitance	C_{rss}			48		pF
Gate-Source Charge	Q_{GS}	V_{DS}=600V, V_{GS} =-4V/+18V I_D=225A		162		nC
Gate-Drain Charge	Q_{GD}			87		nC
Total Gate Charge	Q_G			825		nC
Turn-On Delay Time	$t_{d(on)}$	I_D=225A V_{DS}=600V V_{GS} =-4V/+18V R_G=10Ω T_{vj}=25℃		TBD		ns
Rise Time	t_r			TBD		ns
Turn-Off Delay Time	$t_{d(off)}$			TBD		ns
Fall Time	t_f			TBD		ns
Energy Dissipation during Turn-On Time	E_{on}			TBD		mJ
Energy Dissipation during Turn-Off Time	E_{off}			TBD		mJ
Turn-On Delay Time	$t_{d(on)}$	I_D=225A V_{DS}=600V V_{GS} =-4V/+18V R_G=10Ω T_{vj}=150℃		TBD		ns
Rise Time	t_r			TBD		ns
Turn-Off Delay Time	$t_{d(off)}$			TBD		ns
Fall Time	t_f			TBD		ns
Energy Dissipation during Turn-On Time	E_{on}			TBD		mJ
Energy Dissipation during Turn-Off Time	E_{off}			TBD		mJ

Body Diode Characteristics

Parameter	Symbol	Conditions	Value	Unit
DC Body Diode Forward Current	I_{SD}	V_{GS}=-4V,T_H=80℃	129	A
Pulsed body diode current	$I_{SDpulse}$	verified by design,t_p limited by T_{vjmax}	360	A

Parameter	Symbol	Conditions		Value			Unit
				Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	I_F=150A,V_{GS}=-4V	T_{vj}=25℃		4.2	5.0	V
			T_{vj}=150℃		3.8		
Forward Recovery Time	t_{rr}	I_D = 225A V_{DS} = 600V V_{GS} = -4V	T_{vj}=25℃		TBD		ns
			T_{vj}=150℃		TBD		
Peak Reverse Recovery Current	I_{rrm}		T_{vj}=25℃		TBD		A
			T_{vj}=150℃		TBD		
Recovered Charge	Q_{rr}		T_{vj}=25℃		TBD		nC
			T_{vj}=150℃		TBD		
Reverse Recovery Energy	E_{rec}		T_{vj}=25℃		TBD		uJ
			T_{vj}=150℃		TBD		

NTC Thermistor

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		kΩ
Deviation of R100	ΔR/R	T_{NTC}=100,R_{100}=493.3Ω	-5		5	%
Power Dissipation	P_{25}			20.0		mW
B-Value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3375		K

Module Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Case Isolation Voltage	V_{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	$T_{vj\ max}$				175	℃
Operating Junction Temperature	$T_{vj\ op}$		-40		150	℃
Storage Temperature	T_{stg}		-40		125	℃
Stray Inductance Module	L_{sCE}			8		nH
Thermal Resistance Junction to Case	R_{thJH}	per MOSFET		0.21	0.23	K/W
Weight of Module	G			40		g

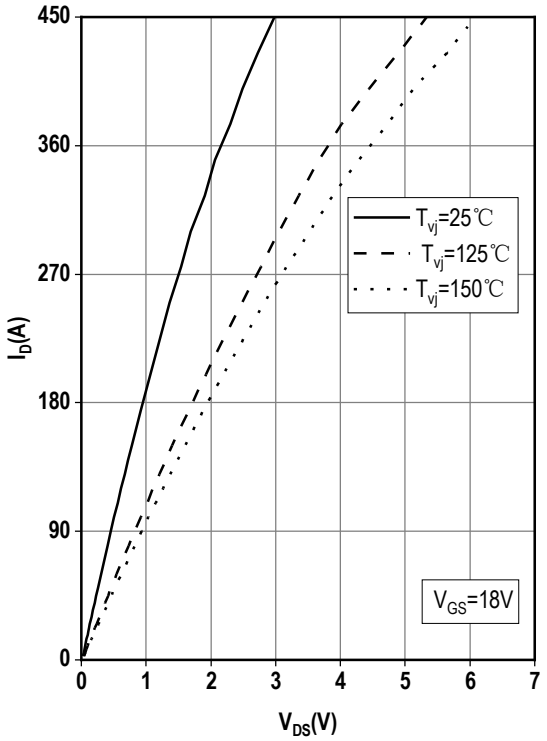


Fig.1 Output Characteristic (MOSFET), $I_D=f(V_{DS})$

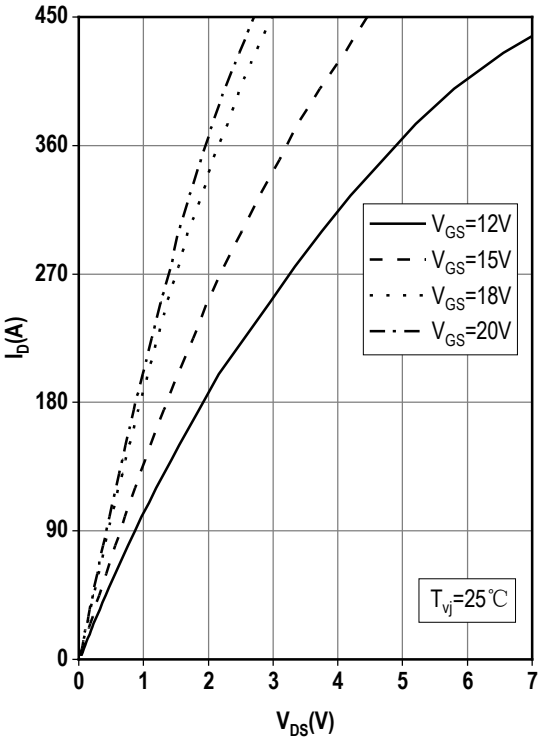


Fig.2 Output Characteristic (MOSFET), $I_D=f(V_{DS})$

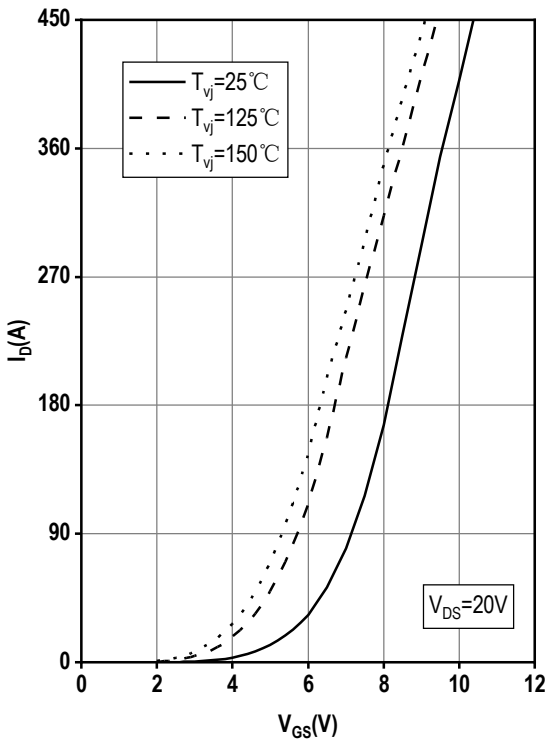


Fig.3 Transfer Characteristic (MOSFET), $I_D=f(V_{GS})$

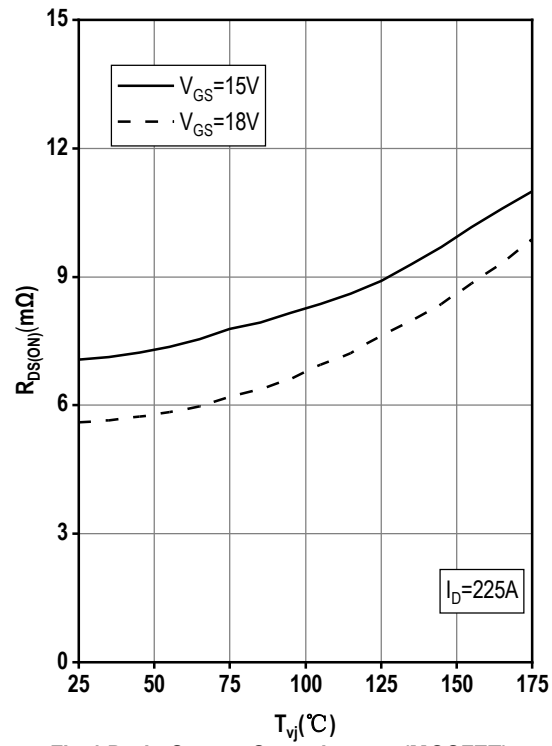


Fig.4 Drain Source On-resistance (MOSFET), $R_{DS(on)}=f(T_{vj})$

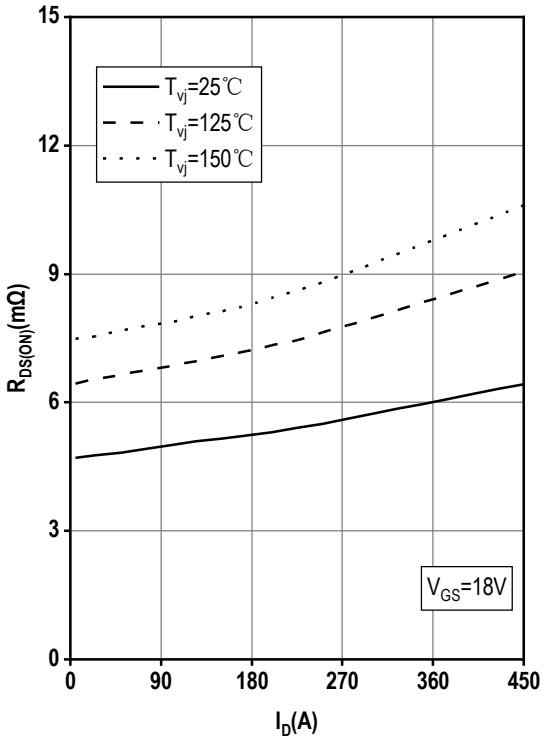


Fig.5 Drain Source On-resistance (MOSFET), $R_{DS(on)}=f(I_D)$

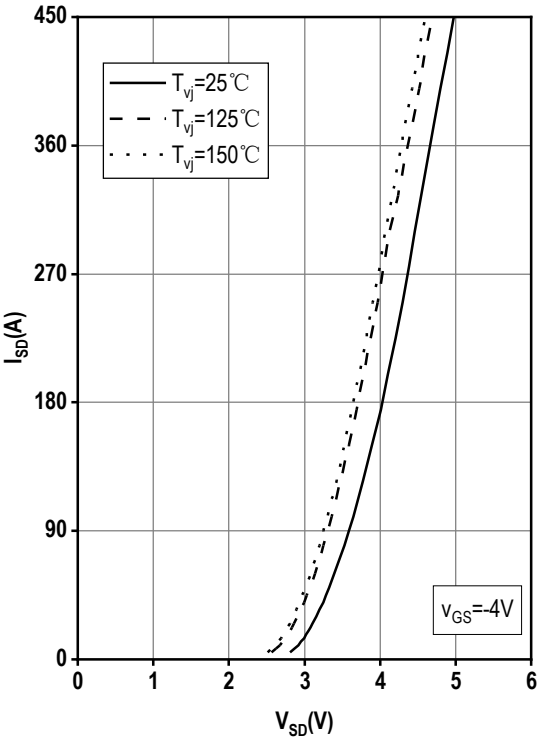


Fig.6 Body Diode Forward Characteristic (MOSFET), $V_{SD}=f(I_{SD})$

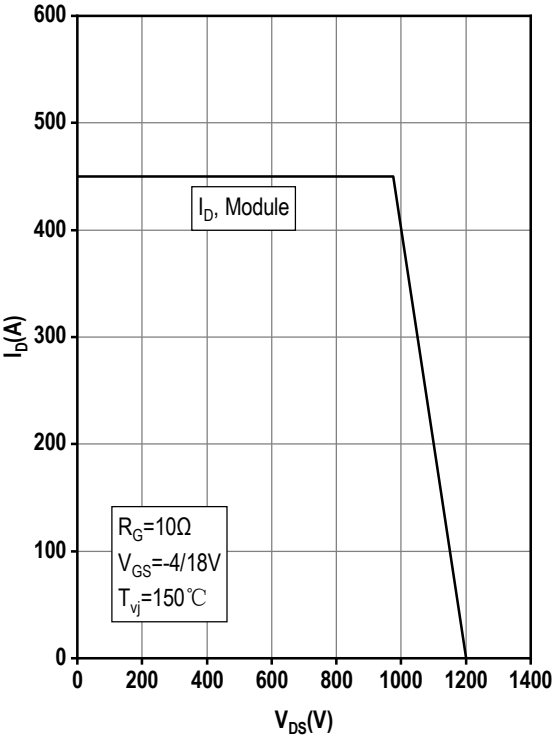


Fig.7 RBSOA

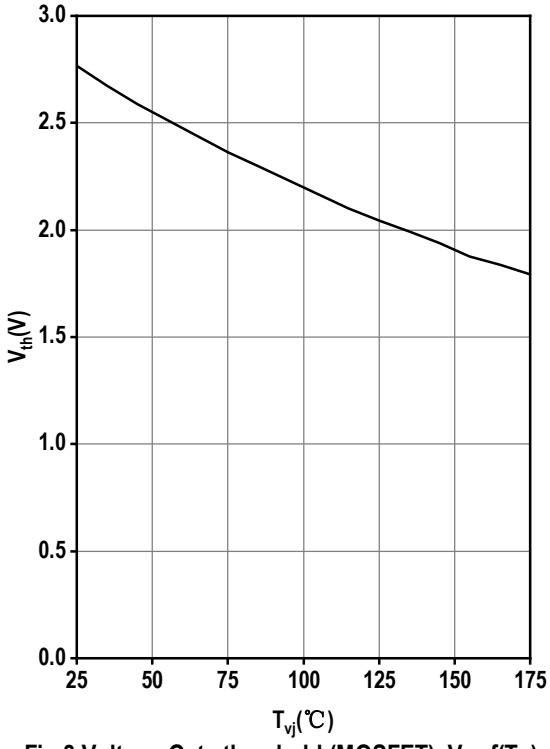


Fig.8 Voltage-Gate threshold (MOSFET), $V_{th}=f(T_{vj})$

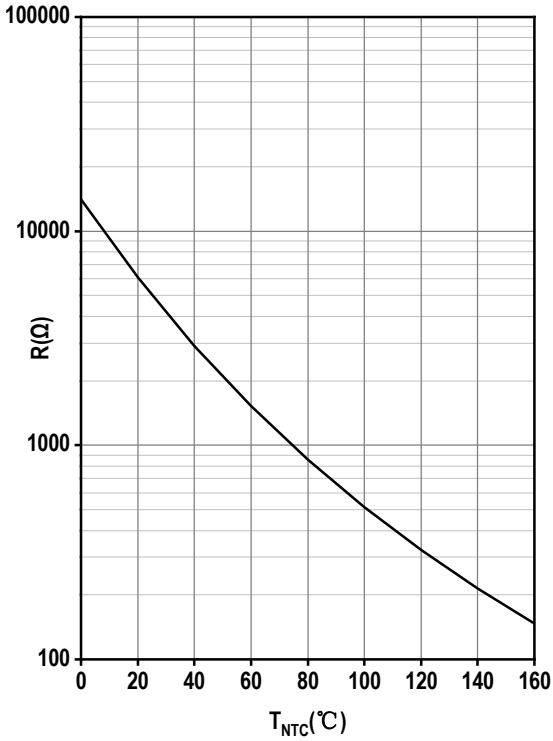
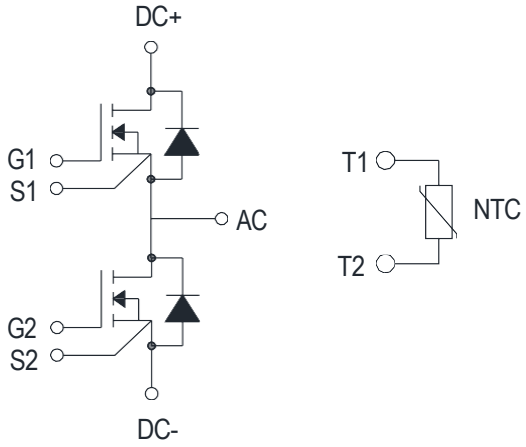


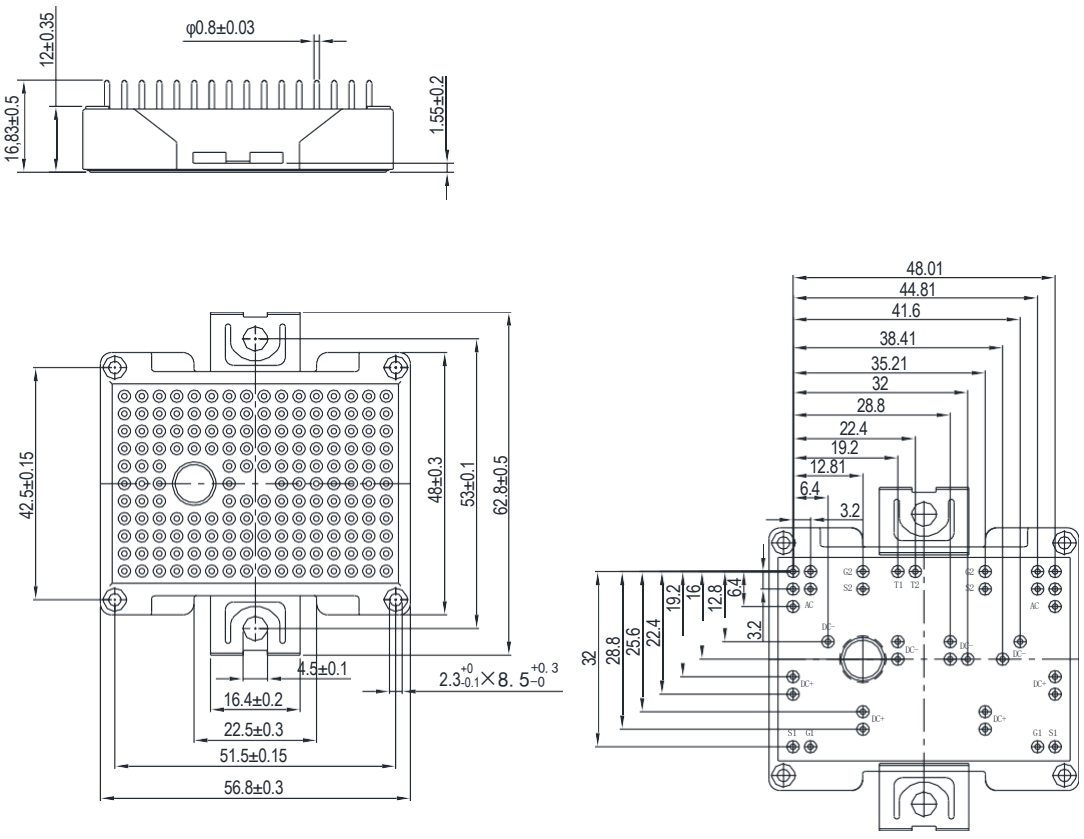
Fig.9 Temperature Characteristic (NTC-Thermistor), $R=f(T_{NTC})$

Circuit Diagram



Package Dimensions

Dimensions in Millimeters



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