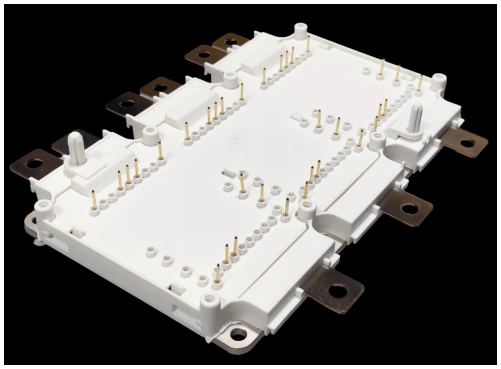
JX400N1200MK2

1200V SiC MOSFET Module



Features

- High Temperature, Humidity, and Bias Operation
- Ultra Low Loss <10nH
- High-Frequency Operation
- Zero Turn-off Tail Current from MOSFET
- Normally-off, Fail-safe Device Operation
- Ease of Paralleling
- Cu Baseplate and Aluminum Nitride Insulator
- Isolated voltage to DC 4200 V

System Benefits

- Enables Compact, Lightweight, Efficient Systems
- Harsh Outdoor Environment Installation
- Mitigates Over-voltage Protection
- Reduced Thermal Requirements
- Reduced System Cost

Package 154.5mm x 126.5mm x 32mm

Part Number	Package	Marking
JX400N1200MK2	MK2	JX400N1200MK2

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(dynamic)	- 10/+25	V
I_D	Drain Current	400	A
I_{DM}	Drain Current (pulsed)	800	A
P_D	Power Dissipation T_C = 25°C	1250	W
T_C,Tstg	Operating and Storage Temperature Range	-40 to +175	°C
T_J	Junction Temperature	175	°C
L_{Stray}	Stray Inductance	8.5	nH
V_{ISOL}	Isolation test voltage(DC 2mA,t= 10s)	4.2	kV
M	Mounting torque for modul mounting(Screw M4 baseplate to heatsink)	2.0	Nm

Electrical Characteristics (T_C = 25℃ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source BreakdownVoltage	V_{GS}=0V	1200			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =1200V, V_{GS} =0V			400	uA
I_{GSS}	Gate-body Leakage Current	V_{GS}=20V,V_{DS}=0V			4	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=40mA	2.0		4.0	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS}=20V, I_D=200A		4.2	5.5	mΩ
R_G	Gate Resistance	V_{GS}=0V,f=1MHz		3.0		Ω
C_{iss}	Input Capacitance	V_{DS}=800V， f=100kHZ, V_{AC}=25mV		19.1		nF
C_{oss}	Output Capacitance			0.49		
C_{rss}	Reverse Transfer Capacitance			100		pF
Q_{GS}	Gate-Source Charge	V_{DD}= 1000V, V_{GS}=-5/+20V I_D=300A,		306.8		nC
Q_{GD}	Gate-Drain Charge			313.2		
Q_G	Total Gate Charge			952		
td（on）	Turn-on delay time	V_{DD}=600V,V_{GS}=-5/+20V I_D=300A,R_G(ext=5Ω) Load=77uH,T_J= 150°C		76		nS
tr	Rise Time			69		
td(off)	Turn-offdelay time			165		
tf	Fall Time			42		
Vsd	Diode Forward voltage	If=300A, V_{GS}=0			6	V

Typical Performance-Reverse Diode(T J = 25 C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VFSD	Forward Voltage	V_{GS} =0V， I_F =200A, T_J =25℃			6	V
*I*s	Continuous Diode Forward Current	V_{GS} =0V， T_J =25℃		200		A
I_{Spulse}	Pulsed body diode current			400		A
trr	Reverse Recovery Time	V_{GS} =-5V， I_F =200A, VR=800V， di/dt=3.6kA/μs T_J =25℃		98		ns
Qrr	Reverse Recovery Time			306		nC
Irrm	Peak Reverse Recovery Current			52		A

Thermal Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to cooling fluid	Tc=65°C			0.12	。C/W

NTC-Thermistor

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R_{25}	Ratedresistance	Tc=25°C		5.00		kΩ
ΔR/R	Deviation ofR100	T_C= 100°C, R_{100}= 477Ω	-5		5	%
$B_{25/50}$	B-value	R_2= R_{25} exp [$B_{25/50}$(1/T_2 - 1/(298,15 K))]		3380		k
$B_{25/80}$	B-value	R_2= R_{25} exp [$B_{25/80}$(1/T_2 - 1/(298,15 K))]		3468		k
$B_{25/100}$	B-value	R_2= R_{25} exp [$B_{25/100}$(1/T_2 - 1/(298,15 K))]		3523		k

Typical Performance

Figure 1. Output Characteristics for Various TJ

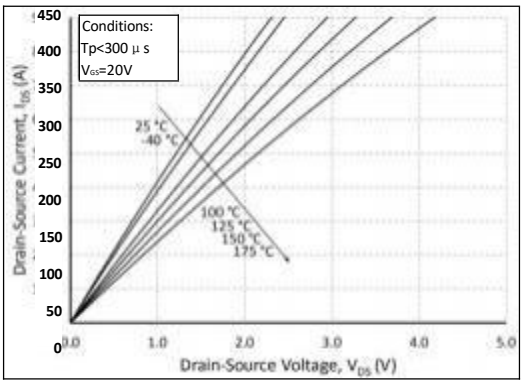


Figure 2. Normalized On-Resistance vs. Temperature

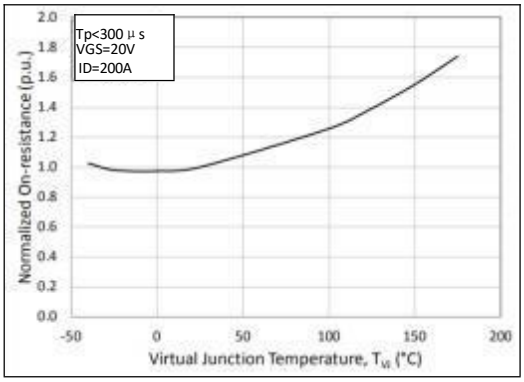


Figure 3. Threshold Voltage vs. Temperature

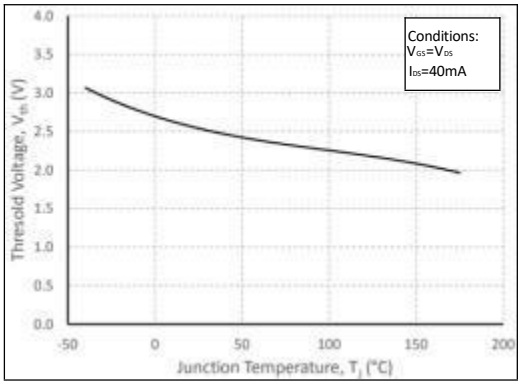


Figure 4. Transfer Characteristic for Various TJ

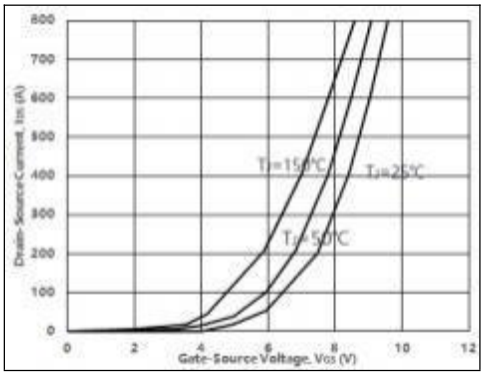


Figure 5. Diode Characteristic at 25 ˚C

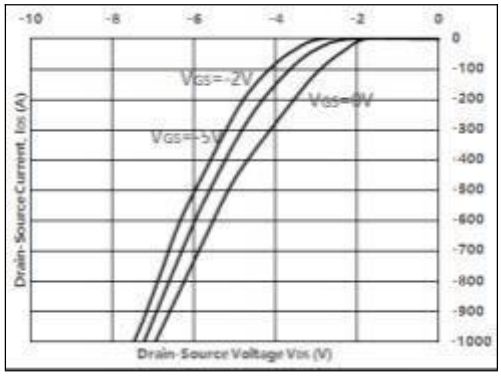


Figure 6. Typical Gate Charge Characteristics

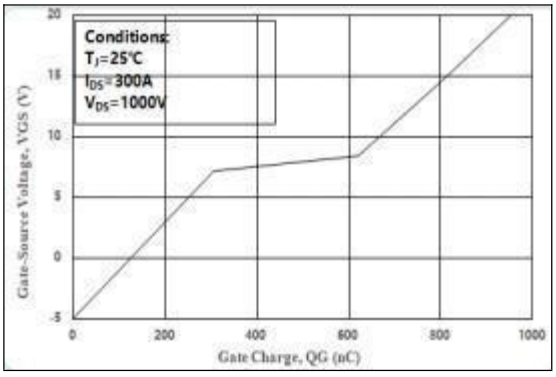


Figure 7. Typical Capacitances vs. Drain-Source Voltage

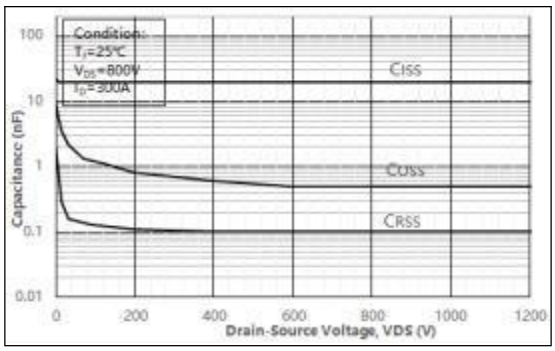


Figure 8. Inductive Switching Energy vs.Drain Current

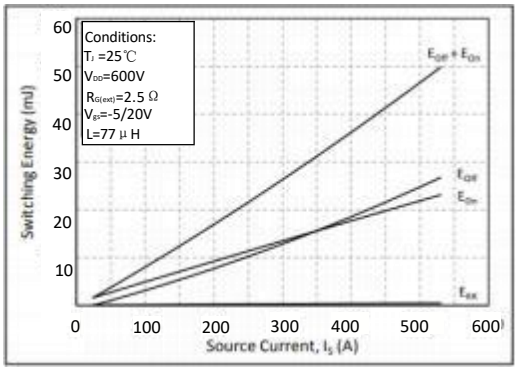


Figure 9. Resistive Switching Time Description

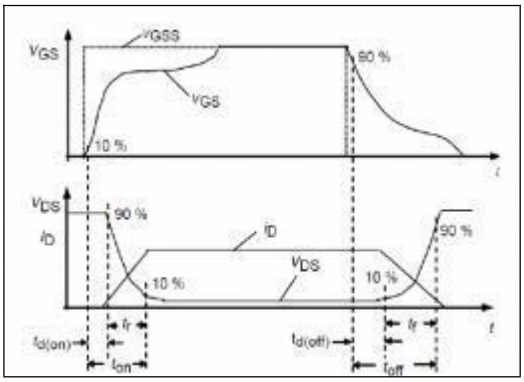
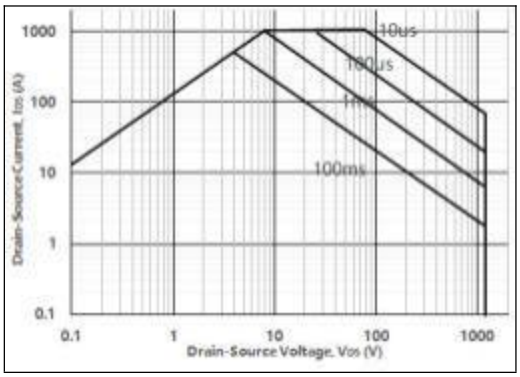
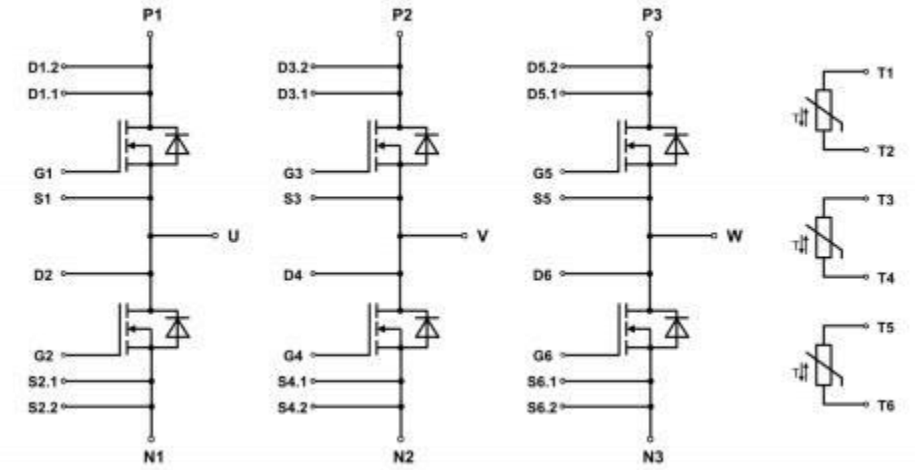


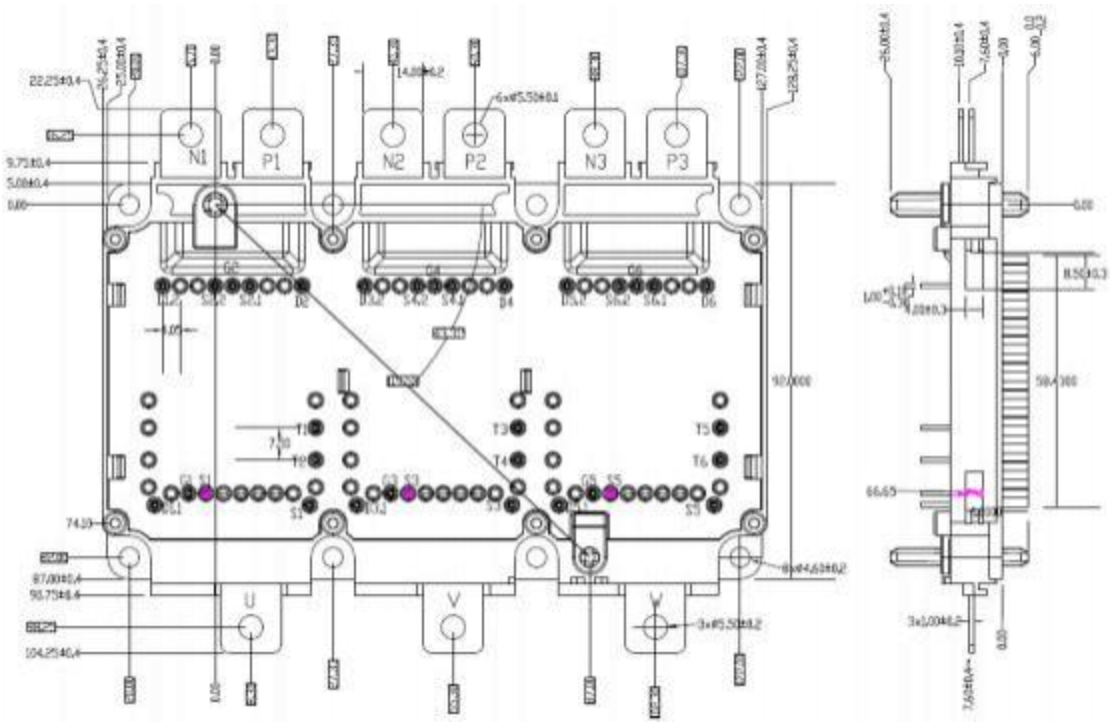
Figure 10. Safe Operating Area

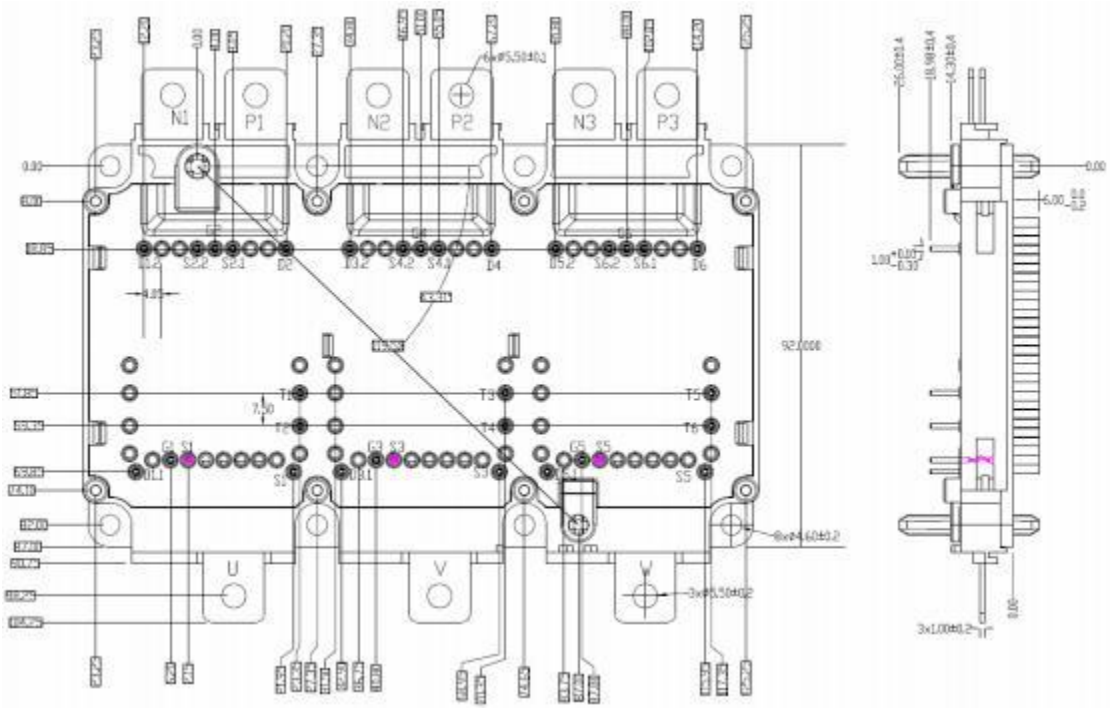


Circuit Diagram Headline



Package Drawing:





未标注线性公差按 GB/1804-2000c级执行	公差分段	0.5-3	3-6	6-30	30-120	120-400
	c级	±0.2	±0.3	±0.5	±0.8	±1.2