

JX600N1700MK4

1700V, 600A, Half-Bridge, Silicon Carbide MOSFET Module Product Data Sheet

JXC-3T03-11A A/1



General Description

JX MED series Silicon Carbide MOSFET module with JX 1700V Gen3 N-channel SiC MOSFET, Aluminum Nitride Insulator, and Copper baseplate. NTC temperature sensor inside.

Features

- High Temperature, Humidity and Bias Operation
- Ultra Low Loss
- High-Frequency Operation
- Zero Turn-Off Tail Current from MOSFET
- Normally-Off, Fail-Safe Device Operation
- Integrated NTC Temperature Sensor
- Copper Baseplate and Aluminum Nitride Insulator



Applications

- High Power Converters
- Motor Drives
- Servo Drives
- UPS Systems
- Wind Turbines

Ordering Informations

Order Number / Marking	JX600N1700MK4
Package Type	MED

Key Parameters

Symbol	Parameter	Values			Unit	Test Conditions
Absolute maximum rating						
V _{DS}	Drain-Source Voltage	1700			V	T _c =25°C
I _b	Drain Current(continuous)	600			A	T _c =25°C
T _J	Junction Temperature	175			°C	
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Static characteristics						
R _{DS(on)}	Static Drain-source On Resistance	-	4.3	5.0	mΩ	V _{GS} =20V; I _b =300A; T _c =25°C
Dynamic characteristics						
Q _G	Total Gate Charge	-	1008	-	nC	V _{DD} =1200V; V _{GS} =-5/+20V; T _c =25°C
Q _{GD}	Gate-Drain Charge	-	300	-		
Source-drain diode						
Q _{RR}	Reverse Recovery Charge	-	5305	-	nC	V _{GS} =-5V; I _F =300A; V _R =1200V; R _{G(off)} =5.0Ω; Load=100uH

Absolute Maximum Ratings (at $T_c=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	1700	V
V_{GS}	Gate-Source Voltage (dynamic)	-10/+22	V
I_D	Drain Current (continuous)	600	A
I_{DM}	Drain Current (pulsed)	1200	A
T_{op}, T_{stg}	Operating and Storage Temperature Range	-40 to +175	$^{\circ}\text{C}$
T_J	Junction Temperature	175	$^{\circ}\text{C}$
L_{Stray}	Stray Inductance	20	nH
V_{isol}	Isolation Test Voltage (DC; 2mA; t=10s)	4.2	kV
$R_{th Jh}$	Thermal Resistance, Junction-to-heatsink	0.13	$^{\circ}\text{C/W}$

MOSFET Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Static characteristics (at $T_J=25^{\circ}\text{C}$ unless otherwise specified)						
BV_{DS}	Drain-source Breakdown Voltage	1700	-	-	V	$V_{GS}=0\text{V}$
I_{DSS}	Zero Gate Voltage Drain Current	-	-	300	μA	$V_{DS}=1700\text{V}; V_{GS}=0\text{V}$
I_{GSS}	Gate-body Leakage Current	-	-	3	μA	$V_{GS}=-10/20\text{V}; V_{DS}=0\text{V}$
$V_{GS(th)}$	Gate Threshold Voltage	2.0	-	4.0	V	$V_{DS}=V_{GS}; I_D=60\text{mA}$
$R_{DS(on)}$	Static Drain-source on Resistance	-	4.3	5.0	$\text{m}\Omega$	$V_{GS}=20\text{V}; I_D=300\text{A}$
$V_{GS(on)}$	Recommended Turn-on Voltage	-	18	-	V	Static
$V_{GS(off)}$	Recommended Turn-off Voltage	-	-5	-	V	
R_G	Gate Resistance	-	0.58	-	Ω	$V_{AC}=25\text{mV}; f=1\text{MHz}$
Dynamic characteristics (at $T_J=25^{\circ}\text{C}$ unless otherwise specified)						
C_{iss}	Input Capacitance	-	38.8	-	nF	$V_{DS}=1200\text{V}; f=100\text{kHz}; V_{AC}=25\text{mV}$
C_{oss}	Output Capacitance	-	1.19	-		
C_{riss}	Reverse Transfer Capacitance	-	96	-	pF	
E_{on}	Turn-on Energy Loss Per Pulse	-	36.6	-	mJ	$V_{DD}=1200\text{V}; V_{GS}=-5/+18\text{V}$ $I_D=300\text{A}; \text{Load}=100\mu\text{H}; R_{G(ext)}=5.0\Omega$
E_{off}	Turn-off Energy Loss Per Pulse	-	24.3	-		
Q_{GS}	Gate-Source Charge	-	312	-	nC	$V_{DD}=1200\text{V}; V_{GS}=-5/+20\text{V}; I_D=300\text{A}$
Q_{GD}	Gate-Drain Charge	-	300	-		
Q_G	Total Gate Charge	-	1008	-		
$t_{d(on)}$	Turn-on Delay Time	-	93.1	-	ns	$V_{DD}=1200\text{V}; V_{GS}=-5/+18\text{V}$ $I_D=300\text{A}; R_{G(ext)}=5\Omega; \text{Load}=100\mu\text{H}$
t_r	Rise Time	-	70.6	-		
$t_{d(off)}$	Turn-off Delay Time	-	353.6	-		
t_f	Fall Time	-	106.1	-		

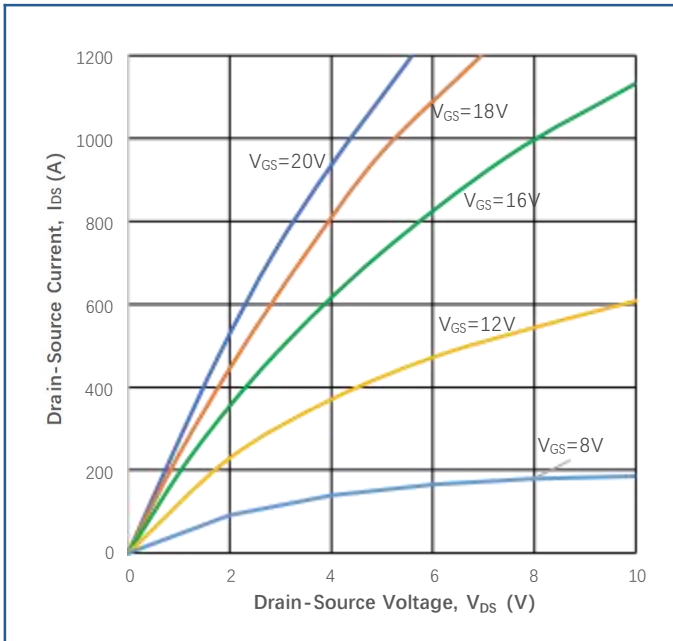
Diode Characteristics (at $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{FSD}	Forward Voltage	-	3.6	6	V	$V_{GS}=0\text{V}$; $I_F=300\text{A}$
I_S	Continuous Diode Forward Current	-	300	-	A	$V_{GS}=0\text{V}$; $T_C=25^{\circ}\text{C}$
t_{RR}	Reverse Recovery Time	-	89.9	-	ns	$V_{GS}=-5\text{V}$; $I_F=300\text{A}$; $V_R=1200\text{V}$; $R_{G(off)}=5.0\Omega$; Load=100 μH
Q_{RR}	Reverse Recovery Charge	-	5305	-	nC	
I_{RRM}	Peak Reverse Recovery Current	-	170	-	A	

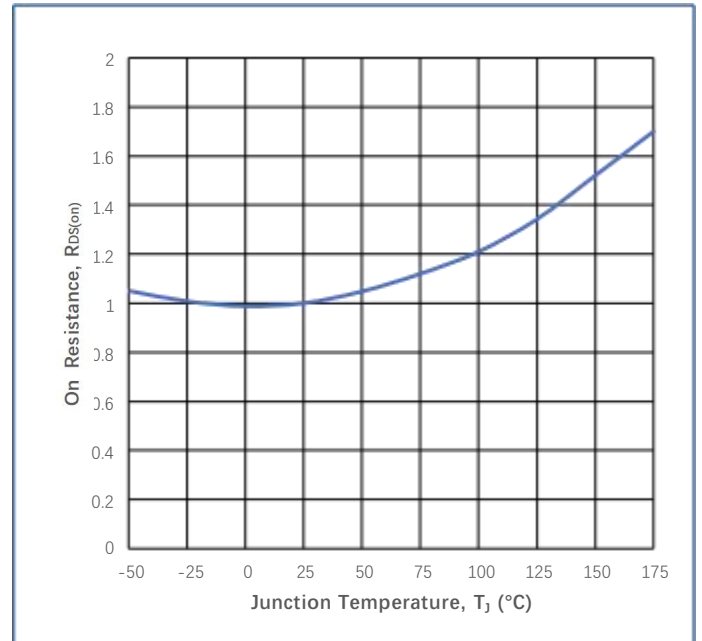
NTC Thermistor Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
R_{25}	Rated Resistance	-	5.00	-	k Ω	$T_{NTC}=25^{\circ}\text{C}$
$\Delta R/R$	Deviation of R_{100}	-5	-	5	%	$T_{NTC}=100^{\circ}\text{C}$; $R_{100}=493.3\Omega$
$B_{25/50}$	Beta Value for 25°C to 50°C	-	3375	-	K	$R_2=R_{25} \exp[B_{25/50}(1/T_2 - 1/(298.15\text{K}))]$
$B_{25/80}$	Beta Value for 25°C to 80°C	-	3414	-	K	$R_2=R_{25} \exp[B_{25/80}(1/T_2 - 1/(298.15\text{K}))]$
$B_{25/100}$	Beta Value for 25°C to 100°C	-	3436	-	K	$R_2=R_{25} \exp[B_{25/100}(1/T_2 - 1/(298.15\text{K}))]$

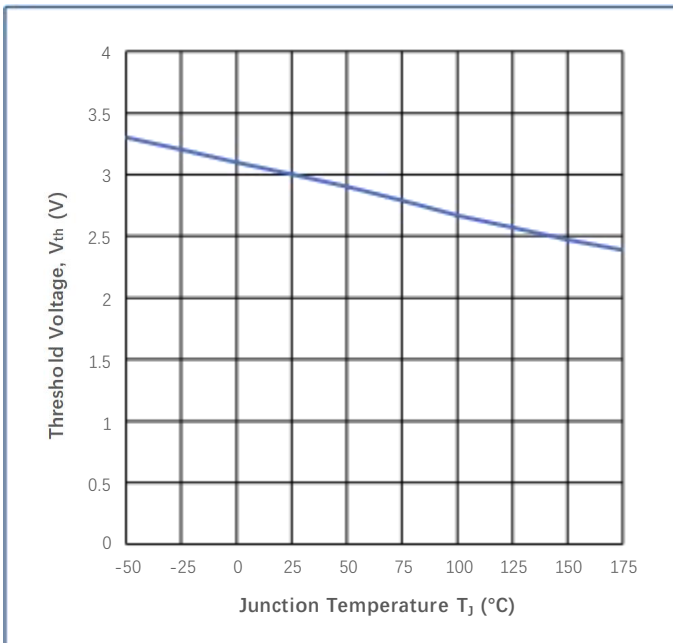
Typical Performance


Figure 1

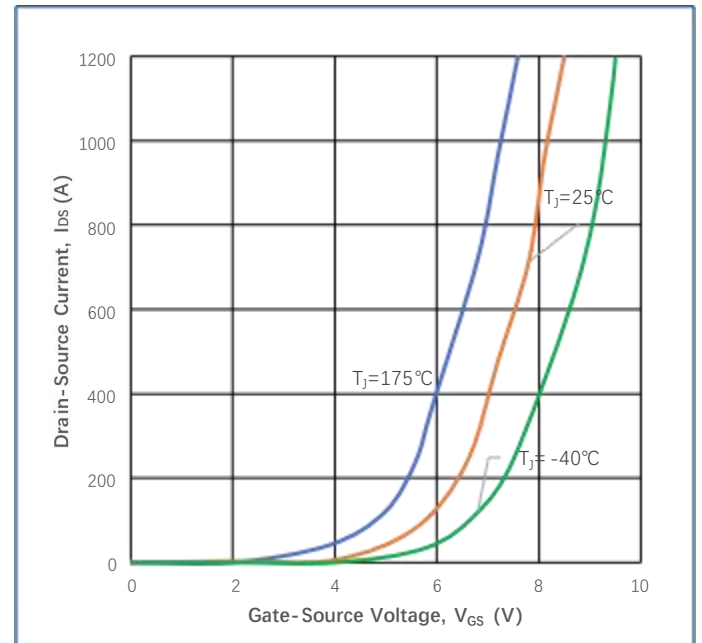
Output Characteristics (T_J = 25 °C)


Figure 2

Normalized On-Resistance vs. Temperature

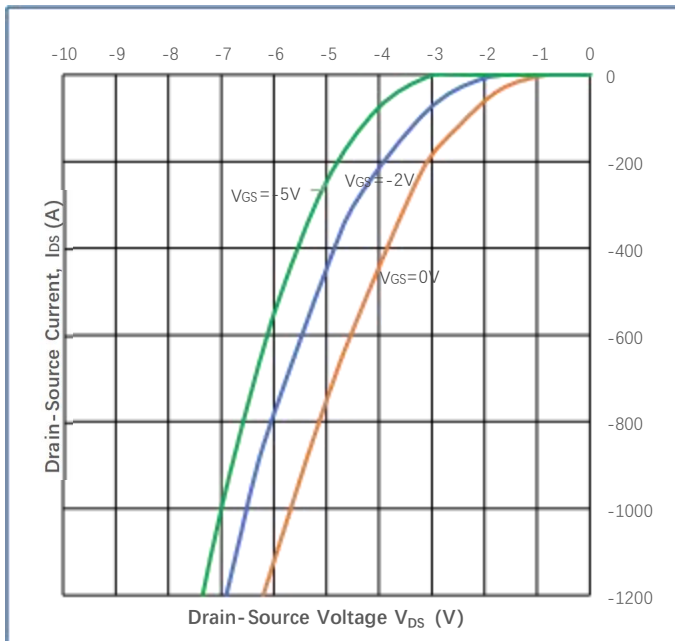

Figure 3

Threshold Voltage vs. Temperature

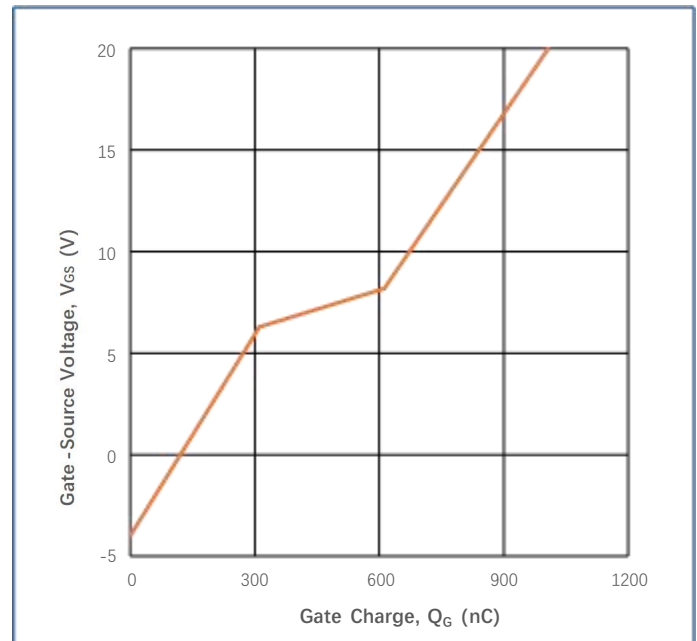

Figure 4

Transfer Characteristic for Various T_J

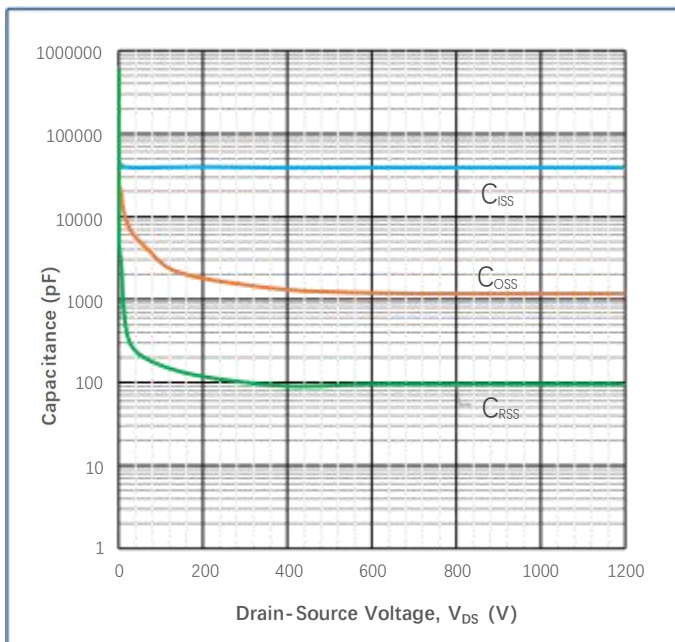
Typical Performance


Figure 5

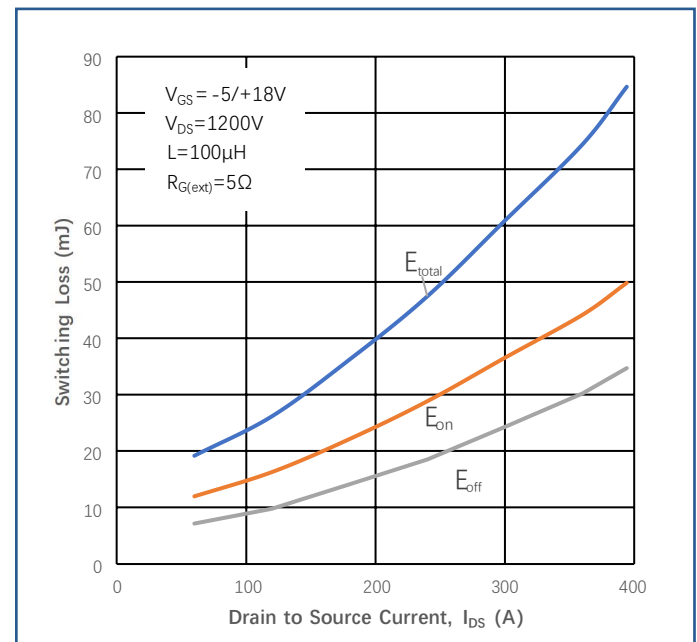
Diode Characteristic ($T_J = 25\text{ }^{\circ}\text{C}$)


Figure 6

Typical Gate Charge Characteristics


Figure 7

Typical Capacitances vs. Drain-Source Voltage


Figure 8

Inductive Switching Energy vs. Drain Current

Typical Performance

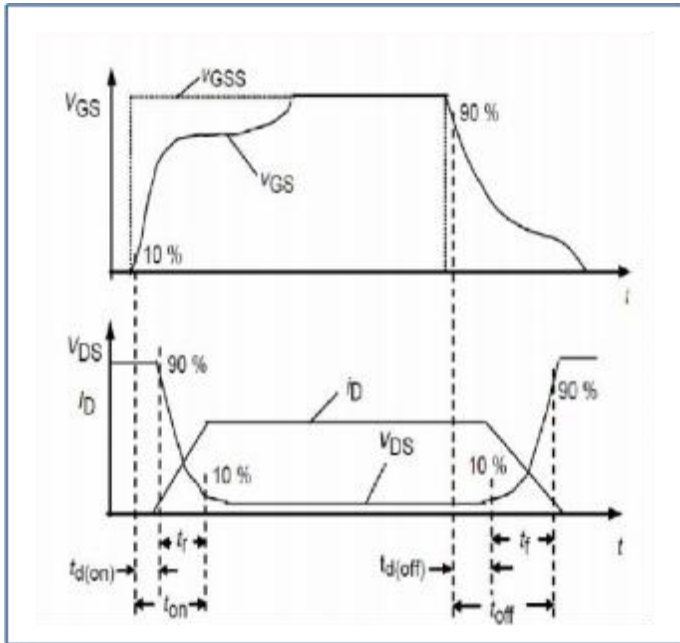


Figure 9

Switching Time Description

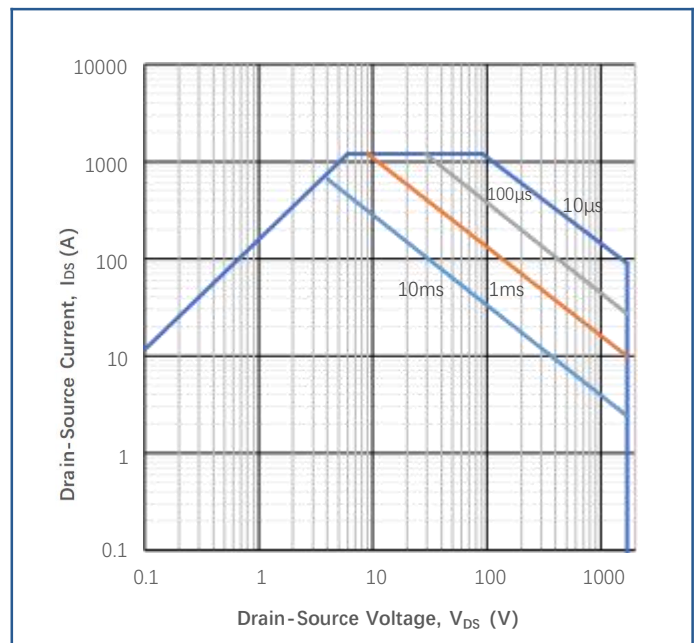
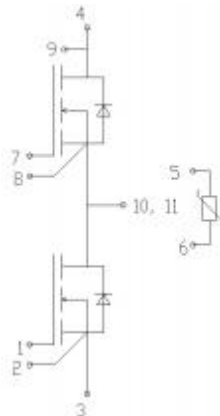


Figure 10

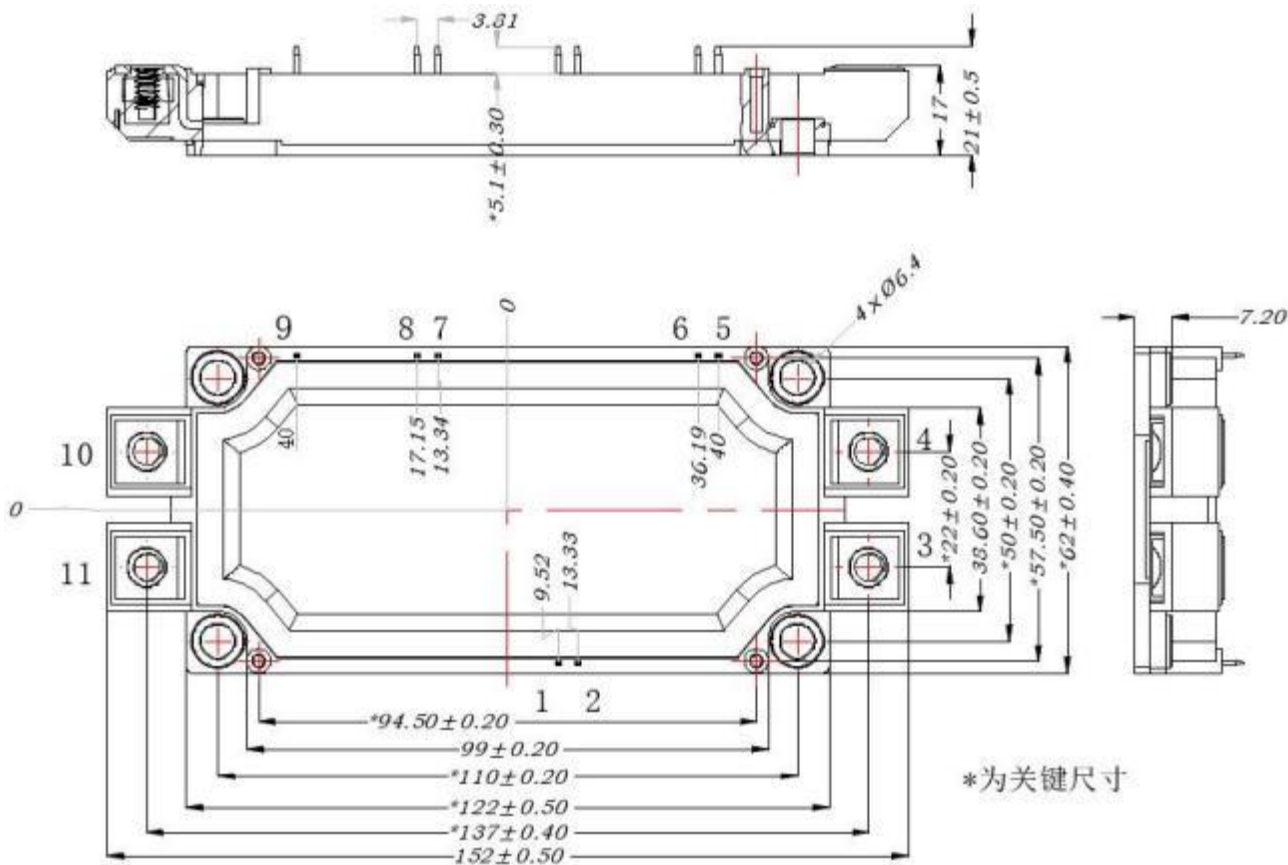
Safe Operating Area

Circuit Diagram Headline



Package Dimensions (mm)

Package Type: MED



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

Notes & Disclaimer

This document and the information contained herein are subject to change without notice. Any such change shall be evidenced by the publication of an updated version of this document by JX Semi. No communication from any employee or agent of JX Semi or any third party shall effect an amendment or modification of this document.

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, JX Semi hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

Any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of JX Semi in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Except as otherwise explicitly approved by JX Technology in a written document signed by authorized representatives, the products of JX Semi may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

Contact Info

Tel: +86 755-21059554

Web: <http://www.junxinsemi.com/>

@2026 Shenzhen JX Semi Company. All Rights Reserved.