



JT600N120F2MH1E

主要参数 MAIN CHARACTERISTICS

Ic	600 A
Vces	1200 V
Vcesat_typ (Vge=15V)	1.95V

用途

- 电机驱动
- UPS 电源
- 风力发电

APPLICATIONS

- Motor Drives
- UPS System
- Wind Turbines

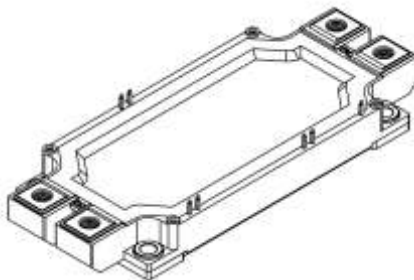
产品特性

- VCESat 正温度系数
- FS 技术

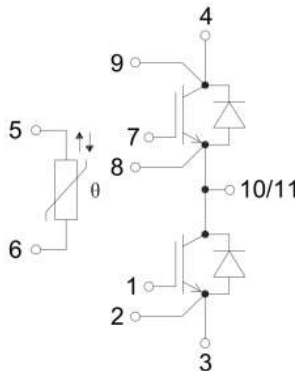
FEATURES

- VCESat with positive Temperature Coefficient
- FS Technology

封装 Package

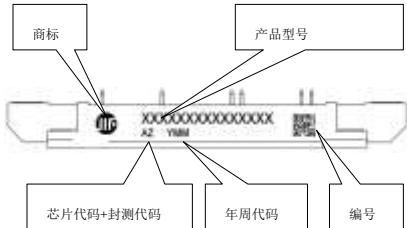


外形示意图



电路示意图

印记定义 mark definition



年周代码说明: Y(年代码, 执行内部定义)+WW (周代码)

产品型号说明: 产品类别+电流+开关速度+电压+电路拓扑+封装形式+工艺版本。

订货信息 ORDER MESSAGE

订货型号 Order codes	印记 Marking	封装 Package	包装 Packaging	器件重量 Device Weight
JT600N120F2MH1E	JT600N120F2MH1E	MH1	盒装	350g(typ)



绝对最大额定值 ABSOLUTE RATINGS (除非特别说明 $T_c=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位
		JT600N120F2MH1E	Unit
最高集电极—发射极直流电压 Collector-Emitter Voltage	V_{CES}	1200	V
连续集电极极电流 Collector Current-continuous	I_C	600	A
	$T_c=100^{\circ}\text{C}$		A
最大脉冲集电极极电流 (注 1) Collector Current – pulse (note 1)	I_{CM}	1200	A
最高栅极发射极电压 Gate-Emitter Voltage	V_{GES}	± 20	V
耗散功率 Power Dissipation	P_D $T_c=25^{\circ}\text{C}$	3650	W
结温范围 Junction Temperature	T_{vjmax}	175	$^{\circ}\text{C}$
	T_{vjop}	-40~+150	
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	260	$^{\circ}\text{C}$



电特性 ELECTRICAL CHARACTERISTICS (除非特殊说明 $T_{vj}=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
关态特性 Off –Characteristics						
集电极—发射极击穿电压 Collector-Emitter Voltage	BV_{CES}	$I_C=1\text{mA}, V_{GE}=0\text{V}$	1200	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$I_C=23\text{mA}$, referenced to 25°C	-	0.6	-	$\text{V}/^{\circ}\text{C}$
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$	-	-	1	mA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0\text{V}, V_{GE}=20\text{V}$	-	-	200	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0\text{V}, V_{GE}=-20\text{V}$	-	-	-200	nA
通态特性 On-Characteristics						
阈值电压 Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C=7.4\text{mA}$	5.3	-	6.3	V
饱和压降（模块） Collector-Emitter saturation Voltage	V_{CESAT}	$V_{GE}=15\text{V}, I_C=600\text{A}$ $T_{vj}=25^{\circ}\text{C}$ $T_{vj}=125^{\circ}\text{C}$ $T_{vj}=150^{\circ}\text{C}$	- - -	1.95 2.25 2.35	2.4 - -	V
短路电流（注 2） Short Collector current（Note 2）	$I_{C(SC)}$	$V_{GE}=15\text{V}, V_{CE}=600\text{V}, t_{sc} < 10\mu\text{s}, T_{vj}=25^{\circ}\text{C}$		3000		A
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1.0\text{MHz}$	-	78		nF
输出电容 Output capacitance	C_{oes}		-	3.7		nF
反向传输电容 Reverse transfer capacitance	C_{res}		-	1.34		nF

注释:

- 1: 脉冲宽度由最高结温限制
- 2: 两次短路之间的间隔大于 1 秒时, 允许短路测试的次数最大为 1000 次

Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: Allowed number of short circuits: <1000; time between short circuits: >1s.



电特性 ELECTRICAL CHARACTERISTICS(除非特殊说明 $T_c=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
开关特性 Switching Characteristics						
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CE}=600V$, $I_C=600A$, $R_G=1.5\Omega$, Inductive Load, $di/dt=6000A/\mu s$, $dv/dt=8000V/\mu s$, $T_{vj}=25^{\circ}\text{C}$	-	255	-	ns
上升时间 Turn-On rise time	t_r		-	82	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	400	-	ns
下降时间 Turn-Off Fall time	t_f		-	80	-	ns
开启损耗 Turn-on energy	E_{on}		-	14	-	mJ
关断损耗 Turn-off energy	E_{off}		-	45	-	mJ
总的开关损耗 Total switching energy	E_{total}		-	59	-	mJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CE}=600V$, $I_C=600A$, $R_G=1.5\Omega$, Inductive Load, $di/dt=3000A/\mu s$, $dv/dt=6000V/\mu s$, $T_{vj}=150^{\circ}\text{C}$	-	256	-	ns
上升时间 Turn-On rise time	t_r		-	105	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	480	-	ns
下降时间 Turn-Off Fall time	t_f		-	160	-	ns
开启损耗 Turn-on energy	E_{on}		-	50	-	mJ
关断损耗 Turn-off energy	E_{off}		-	69	-	mJ
总的开关损耗 Total switching energy	E_{total}		-	119	-	mJ
栅极电荷总量 Total Gate Charge	Q_g	$V_{CE}=600V, I_C=600A$, $V_{GE}=15V$	-	4.0	-	μC
内部栅极电阻 Internal gate resistance	R_{Gint}			1.8		Ω
反并联二极管特性 Anti-Parallel Diode Characteristics						
正向压降（模块） Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=600A, T_{vj}=25^{\circ}\text{C}$	-	1.8	2.3	V
		$V_{GE}=0V, I_F=600A, T_{vj}=150^{\circ}\text{C}$		1.6		V
峰值反向恢复电流 Peak Reverse recovery current	I_{RM}	$V_{GE}=0V, V_R=600V$, $I_F=600A$, $dI_F/dt=3600A/\mu s$, $T_{vj}=25^{\circ}\text{C}$		440		A
反向恢复时间 Diode Reverse recovery time	t_{rr}		-	200	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	50	-	μC
反向恢复能量 Reverse recovery energy	E_{rec}			24		mJ
峰值反向恢复电流 Peak Reverse recovery current	I_{RM}	$V_{GE}=0V$, $V_R=600V, I_F=600A$, $dI_F/dt=2000A/\mu s$, $T_{vj}=150^{\circ}\text{C}$		600		A
反向恢复时间 Diode Reverse recovery time	t_{rr}		-	470	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	150	-	μC
反向恢复能量 Reverse recovery energy	E_{rec}			66		mJ





热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最小 Min	典型 typ	最大 Max	单 位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Per/IGBT $R_{th(j-c)}$	-	-	0.048	°C/W
结到管壳的热阻 Thermal Resistance, Junction to Case	Per/FRED $R_{th(j-c)}$	-	-	0.08	°C/W

热敏电阻特性 NTC Thermistor Characteristics

项 目 Parameter	符号 Symbol	最小 Min	典型 Typ	最大 Max	单位 Unit
额定电阻值 Rated resistance	$T_C = 25^{\circ}\text{C}$ R_{25}		5		k Ω
Deviation of R100	$T_C = 100^{\circ}\text{C}, R_{100} = 493.3 \Omega$ $\Delta R/R$	-5		5	%
耗散功率 Power dissipation	$T_C = 25^{\circ}\text{C}$ P_{25}	-	-	20	mW
B-值 B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298.15 \text{ K}))]$ $B_{25/50}$		3375		K
工作温度	-	-50	-	200	°C





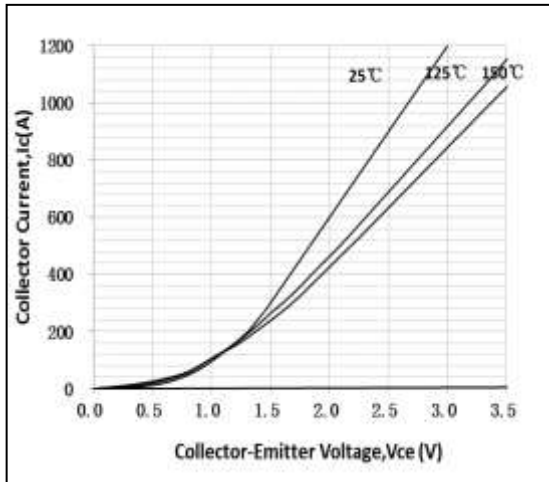
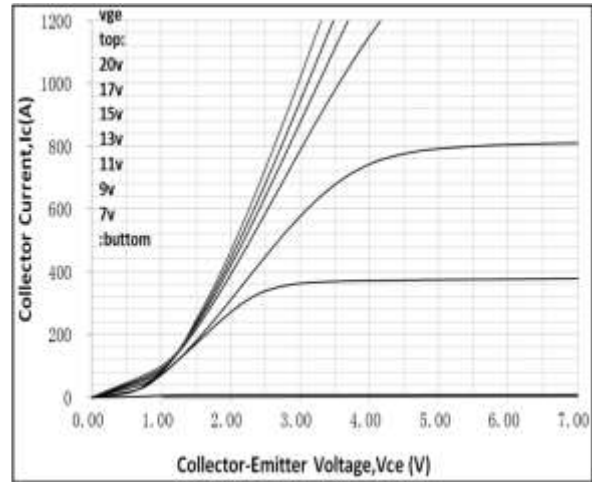
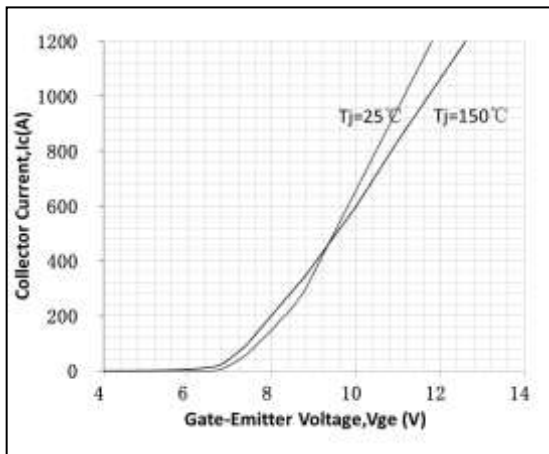
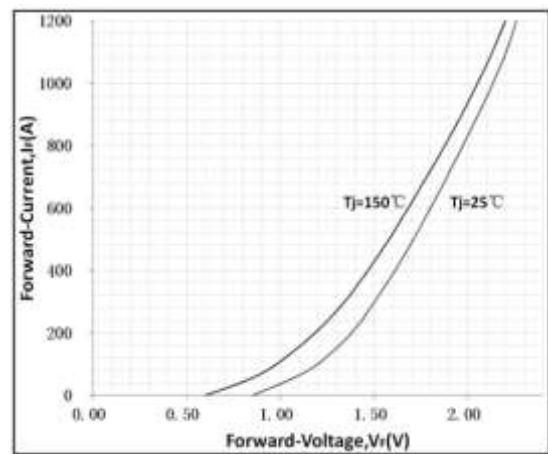
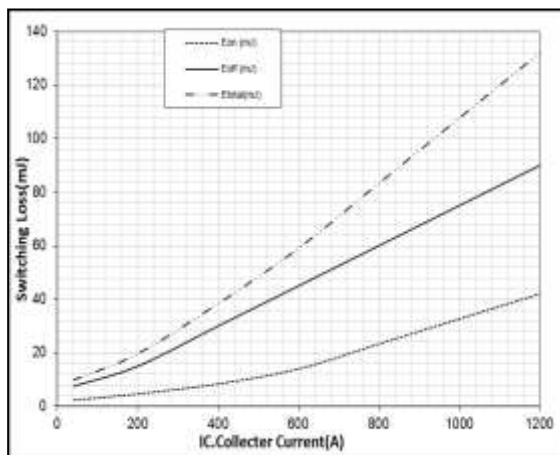
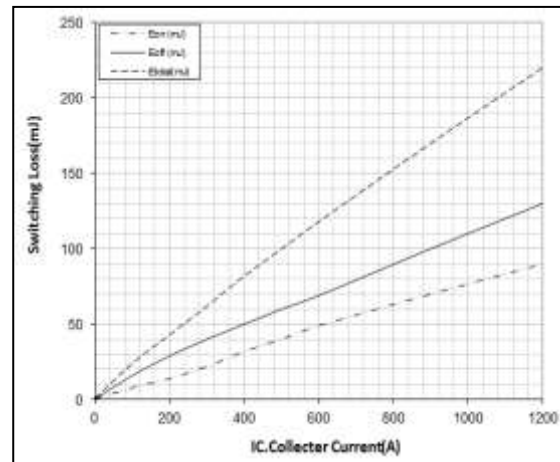
模块特性/Module Characteristics

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Unit
绝缘测试电压 Isolation test voltage	V _{ISOL}	RMS, f = 50 Hz, t = 1min		2.5		KV
模块基板材料 Material of module baseplate	Cu					
内部绝缘 Internal isolation	基本绝缘 (class 1, IEC 61140) Basic insulation (class1, IEC 61140)		Al ₂ O ₃			
爬电距离 Creepage distance		端子-散热片 terminal to heatsink	-	14.5	-	mm
		端子-端子 Terminal to terminal	-	13	-	
电气间隙 Clearance		端子-散热片 terminal to heatsink	-	12.5	-	mm
		端子-端子 Terminal to terminal	-	10	-	
相对电痕指数 Comperative tracking index	CT1		200			
储存温度 Storage temperature	T _{stg}		-40		125	℃
安装扭矩 Mounting torque for modul mounting	M	螺丝 M5 根据相应的应用手册进行安装 Screw M5 - Mounting according to valid application note	3		6	Nm
重量 Weight	G		-	350	-	g



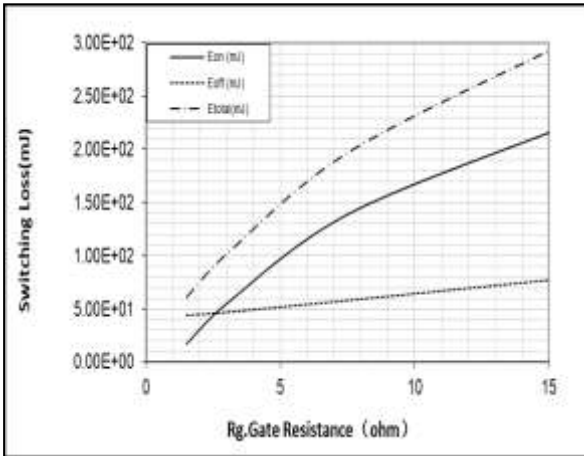
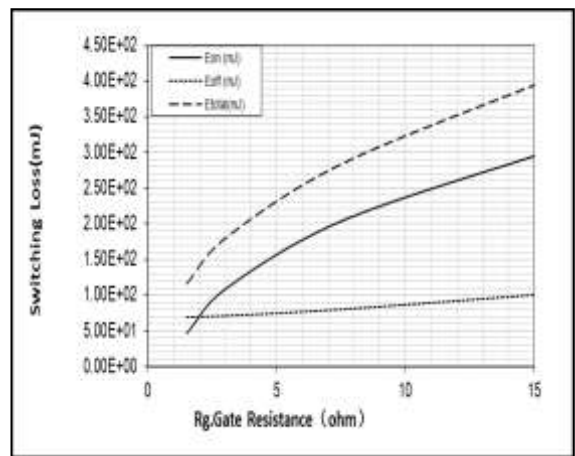
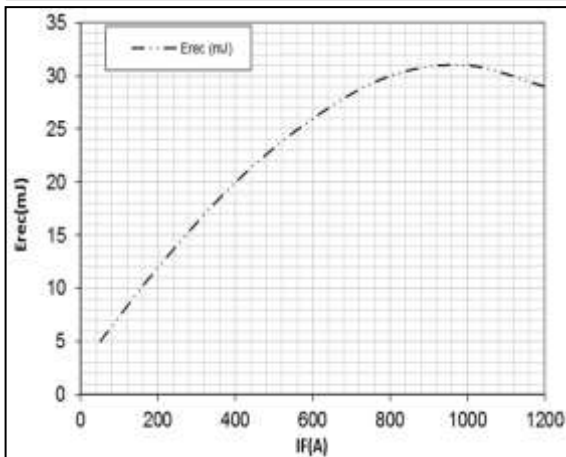
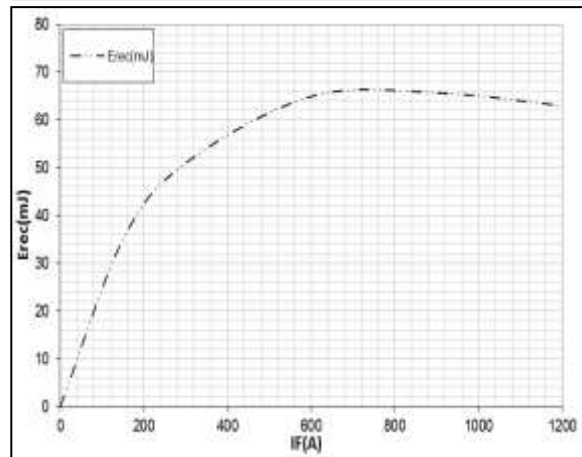
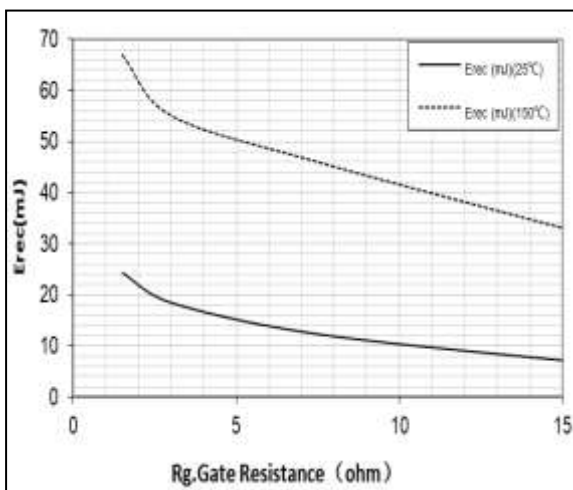


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

Typical Output
Characteristics($V_{GE}=15V$)Typical Output
Characteristics($T_{vj}=150^\circ C$)Typical Saturation Voltage
CharacteristicsFRD
Forward CharacteristicsSwitching Loss vs. Collector Current
($R_G=1.5\Omega$, $V_{GE}=15V$, $T_{vj}=25^\circ C$)Switching Loss vs. Collector Current
($R_G=1.5\Omega$, $V_{GE}=15V$, $T_{vj}=150^\circ C$)

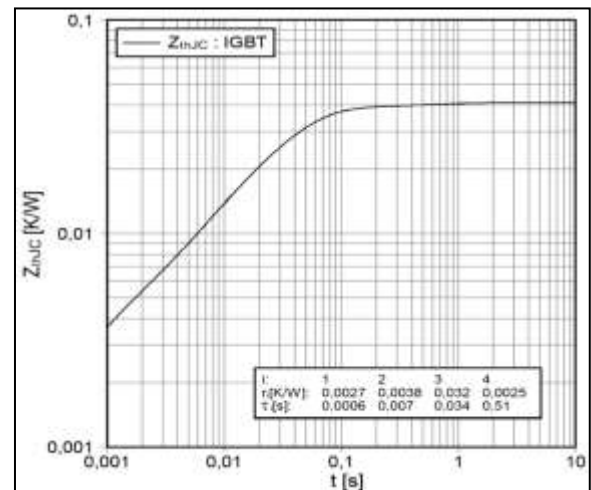


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

Switching Loss vs. R_G $(V_{GE}=\pm 15V, T_{vj}=25^{\circ}C)$ Switching Loss vs. R_G $(V_{GE}=\pm 15V, T_{vj}=150^{\circ}C)$ Switching Loss Diode, E_{rec} vs. R_G $(R_G=1.5\Omega, V_{CE}=600V, T_{vj}=25^{\circ}C)$ Switching Loss Diode, E_{rec} vs. I_F $(R_G=1.5\Omega, V_{CE}=600V, T_{vj}=150^{\circ}C)$ Switching loss Diode, E_{rec} vs. R_G $(I_F=600A, V_{CE}=600V)$ 

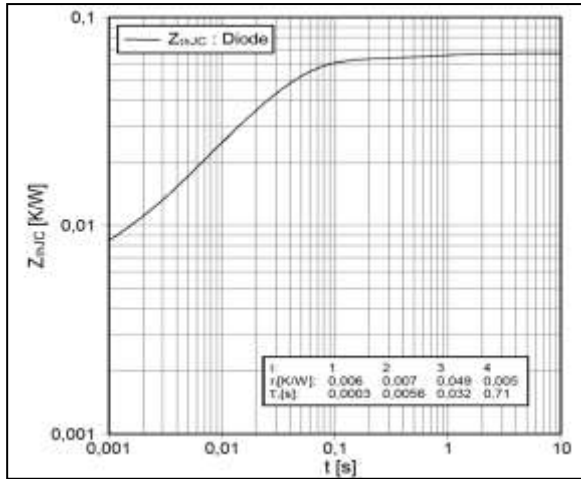
Transient Thermal Impedance

(IGBT)

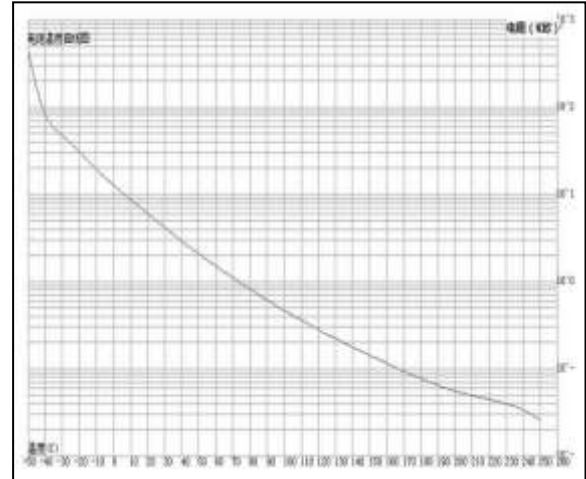


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

Transient Thermal Impedance (FRD)



Typ.NTC Temperature Characteristics

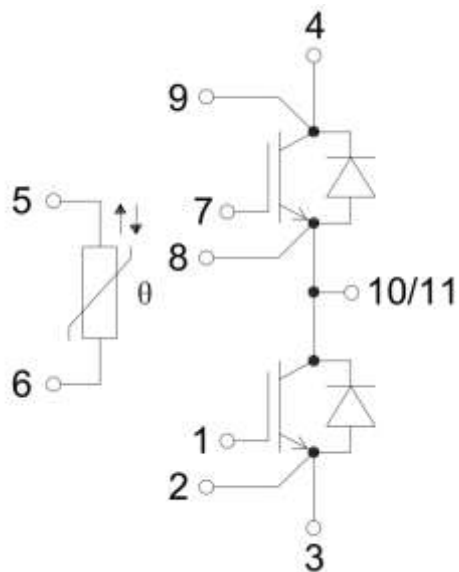




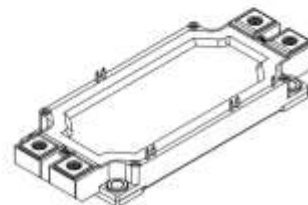
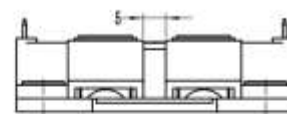
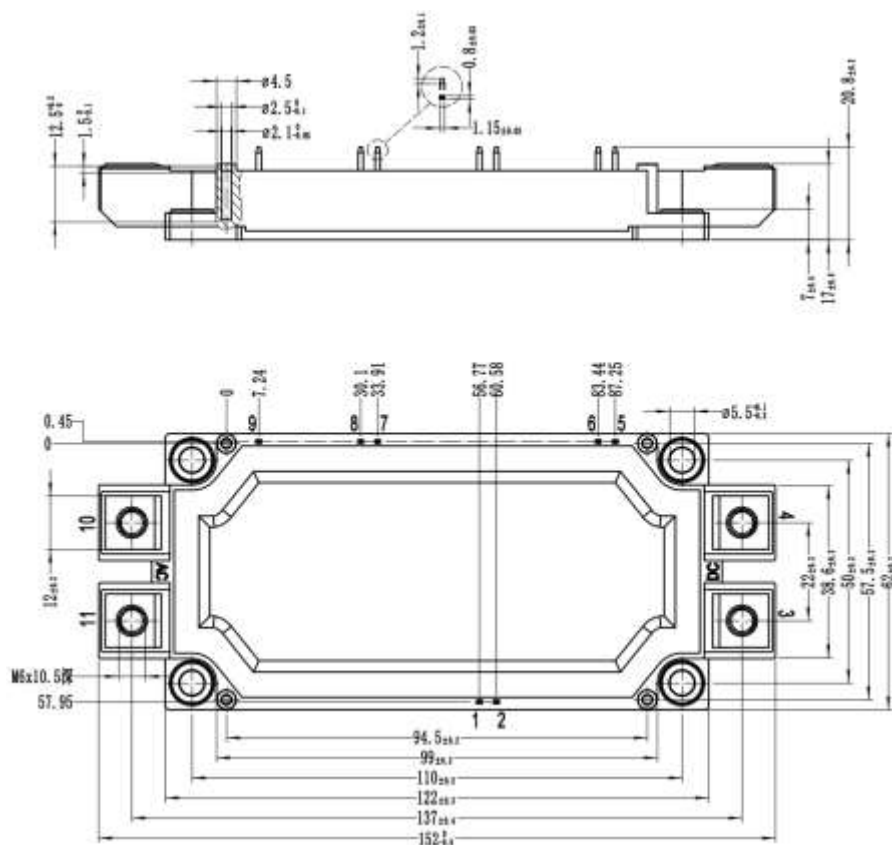
外形尺寸 PACKAGE MECHANICAL DATA

Circuit diagram

单位 Unit: mm



Package outlines





注意事项

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3. 在电路设计时请不要超过器件的绝对最大额定值，否则会影响整机的可靠性。
4. 本说明书如有版本变更不另外告知。

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3. Please do not exceed the absolute maximum ratings of the device when circuit designing.
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