



JT600N065F2MH1E

主要参数 MAIN CHARACTERISTICS

I _c	600 A
V _{CEs}	650 V
V _{cesat_typ} (@V _{ge} =15V)	1.55V

用途

- 电机驱动
- 伺服驱动
- UPS 电源
- 风力发电

产品特性

- 低栅极电荷
- FS 技术
- 低通态压降, V_{CE(sat)},
typ = 1.55V @ I_c =
600A and TC = 25°C
- RoHS 产品

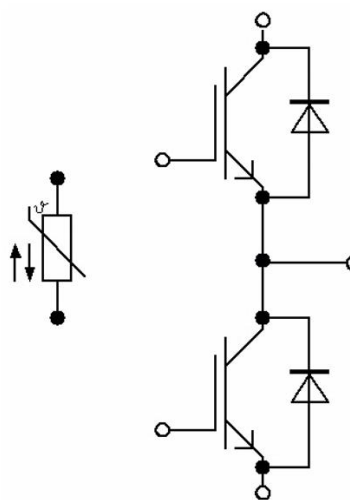
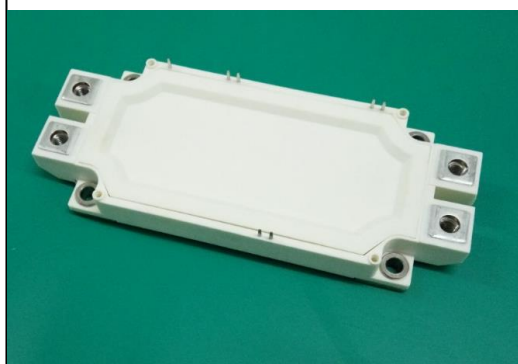
APPLICATIONS

- Motor Drives
- Servo Drives
- UPS System
- Wind Turbines

FEATURES

- Low gate charge
- FS Technology
- Low saturation voltage:
V_{CE(sat)}, typ = 1.55V @
I_C = 600A and TC = 25°C
- RoHS product

封装 Package



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
JT600N065F2MH1E	JT600N065F2MH1E	两单元模块	盒装	349g(typ)



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

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
最高集电极—发射极直流电压 Collector-Emmitter Voltage	V_{CES}	650	V
连续集电极极电流 Collector Current-continuous	I_C $T=25^\circ\text{C}$	700	A
	$T=100^\circ\text{C}$	600	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-Emmitter Voltage	V_{GES}	± 20	V
短路时间 short circuit time	tsc	10	μs
耗散功率 Power Dissipation	P_D $T_c=25^\circ\text{C}$	1800	W
结温范围 Junction Temperature	T_{vj}	175	$^\circ\text{C}$
	$T_{vj\ op}$	-40~+150	
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	$^\circ\text{C}$

*漏极电流由最高结温限制

*Collector current limited by maximum junction temperature





电特性 ELECTRICAL CHARACTERISTICS

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-Emmitter Voltage	BV_{CES}	$I_C=9.6mA, V_{GE}=0V$	650	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$I_C=9.6mA$, referenced to $25^\circ C$	-	0.6	-	V/ $^\circ C$
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V,$ $T_C=25^\circ C$	-	-	1.0	mA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0V, V_{GE}=20V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0V, V_{GE}=-20V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate-Emmitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C=4.8mA$	5.5	-	6.5	V
饱和压降（芯片） Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V I_C=600A$ $T_C=25^\circ C$ $T_C=125^\circ C$ $T_C=150^\circ C$	- - -	1.55 1.7 1.75	1.95 - -	V
饱和压降（模块） Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V I_C=600A$ $T_C=25^\circ C$ $T_C=125^\circ C$ $T_C=150^\circ C$		2.15 2.4 2.5	2.5	V
短路电流（注2） Short Collector current（Note 2）	$I_{C(SC)}$	$V_{GE}=15V V_{CE}=300V t_{sc} \leq$ $10\mu s T_C=25^\circ C$		3600		A
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHz$	-	41.7		nF
输出电容 Output capacitance	C_{oes}		-	7.38		nF
反向传输电容 Reverse transfer capacitance	C_{res}		-	0.77		nF





电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CE}=300V,$ $I_C=600A,$ $R_G=5.1\Omega$ Inductive Load $T_C=25^\circ C$	-	270	-	ns
上升时间 Turn-On rise time	t_r		-	249	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	428	-	ns
下降时间 Turn-Off Fall time	t_f		-	255	-	ns
开启损耗 Turn-on energy	E_{on}		-	7.2	-	mJ
关断损耗 Turn-off energy	E_{off}		-	48.5	-	mJ
总的开关损耗 Total switching energy	E_{total}		-	55.7	-	mJ
栅极电荷总量 Total Gate Charge	Q_g	$V_{CE} = 300V,$ $I_C = 600A$ $V_{GE} = 15V$ (note 3, 4)	-	1.44	-	μC
内部栅极电阻 Internal gate resistance	R_{Gint}			1.33		Ω
反并联二极管特性及最大额定值 Anti-Parallel Diode Characteristics and Maximum Ratings						
正向压降 (芯片) Diode Forward Voltage (chip)	V_F	$V_{GE}=0V,$ $I_F=600A$ $T_C=25^\circ C$ $T_C=125^\circ C$ $T_C=150^\circ C$		1.50 1.45 1.4	1.95	V
峰值反向恢复电流 Peak Reverse recovery current	I_{RM}			180		A
反向恢复时间 Diode Reverse recovery time	t_{rr}	$V_{GE}=0V,$ $V_R=300V$ $I_F=600A$ $di_F/dt=4500A/\mu s$ (note 4)	-	0.18	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	9	-	μC
反向恢复电荷 Reverse recovery energy	E_{rec}				2.5	





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	$R_{th(j-c)}$	-	-	0.083	$^{\circ}\text{C}/\text{W}$
管壳到散热底座的热阻 Thermal Resistance, Case to heatsink	Per/IGBT	$R_{th(c-h)}$	-	0.03	-	$^{\circ}\text{C}/\text{W}$
结到管壳的热阻 Thermal Resistance, Junction to Case	Per/FRED	$R_{th(j-c)}$	-	-	0.145	$^{\circ}\text{C}/\text{W}$
管壳到散热底座的热阻 Thermal Resistance, Case to heatsink	Per/FRED	$R_{th(c-h)}$	-	0.045	-	$^{\circ}\text{C}/\text{W}$

NTC Thermistor Characteristics

Item	Symbol	Conditions	Values			Unit
			Min. Max.	Typ.		
Rated resistance	R_{25}	$T_C=25^{\circ}\text{C}$	-	5	-	$\text{k}\Omega$
Deviation of resistance	$\Delta R/R$	$T_C=100^{\circ}\text{C}, R_{100}=493\Omega$	-5	-	5	%
Power dissipation	P_{25}	$T_C=25^{\circ}\text{C}$	-	-	20	mW
B-constant	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15\text{K}))]$	-	3375	-	K
B-constant	$B_{25/80}$	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15\text{K}))]$	-	3411	-	
B-constant	$B_{25/100}$	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298.15\text{K}))]$	-	3433	-	

Mechanical Characteristics

Item	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Mounting torque	Mt	Main terminals, M6 screw	3	-	6	Nm
Mounting torque	Ms	Mounting to heat sink, M5 screw	3	-	6	Nm
Creepage distance	ds	Terminal to terminal	11.55	-	-	mm





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		Terminal to base plate	12.32	-	-	
Clearance		Terminal to terminal	10	-	-	mm
		Terminal to base plate	10.85	-	-	
Weight		-	-	349	-	g

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
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu\text{s}$, 占空比 $\leq 2\%$
- 4: 基本与工作温度无关

Notes:

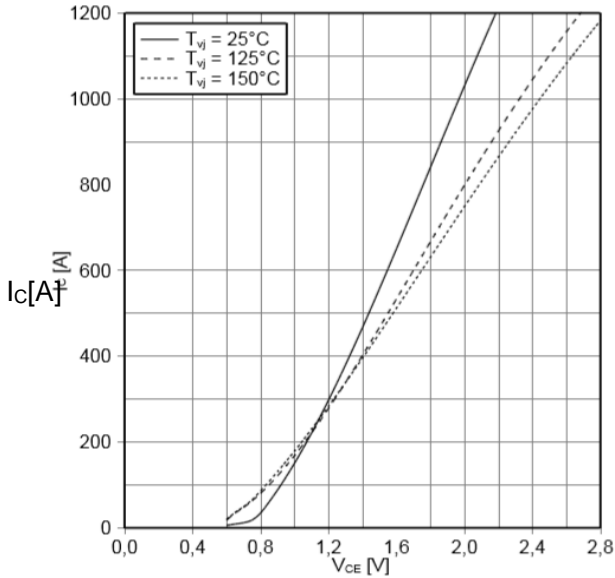
- 1: Pulse width limited by maximum junction temperature
- 2: Allowed number of short circuits: <1000; time between short circuits: >1s.
- 3: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- 4: Essentially independent of operating temperature



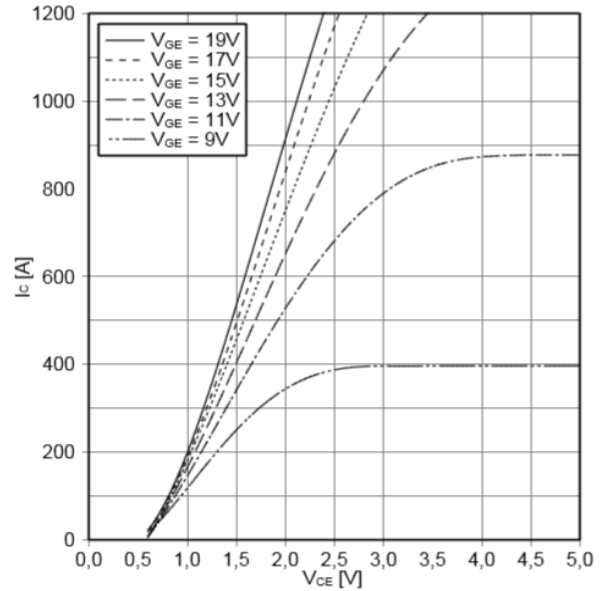


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

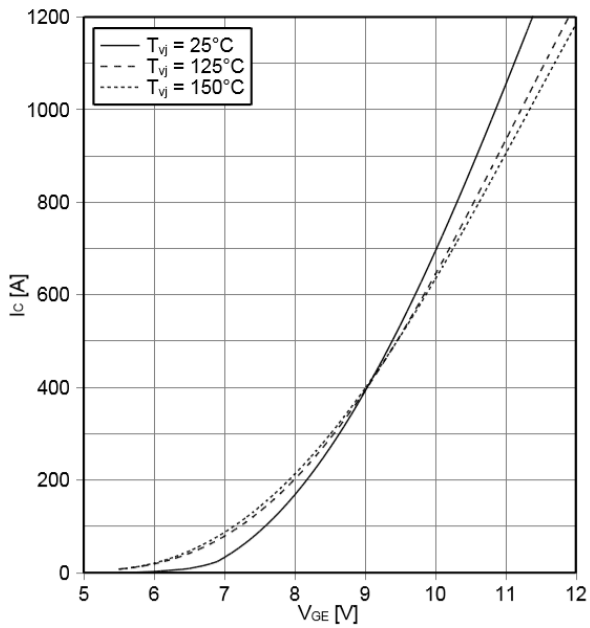
Typical Output Characteristics($V_{GE}=15V$)



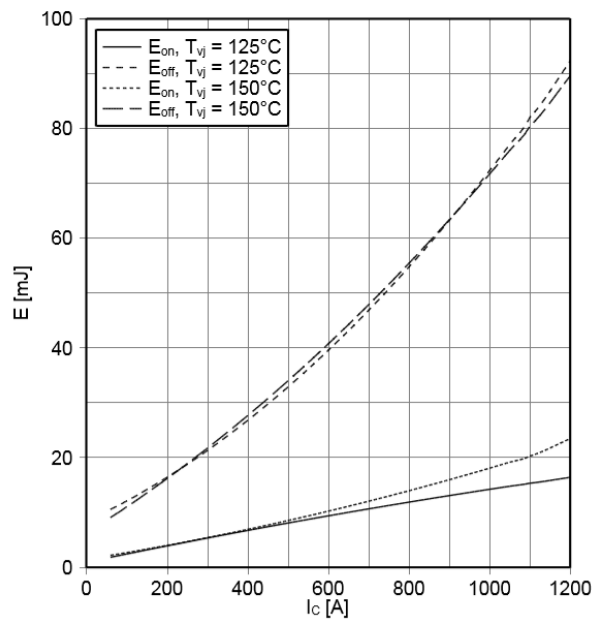
Typical Output Characteristics($T_j=150^{\circ}C$)



Typical Saturation Voltage Characteristics

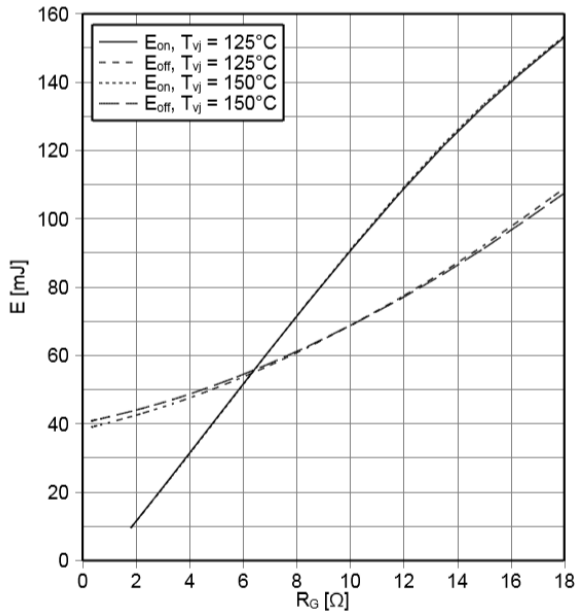


Switching Loss vs. Collector Current ($V_{GE}=15V, V_{CE}=300V, R_g=5.1 \Omega$)

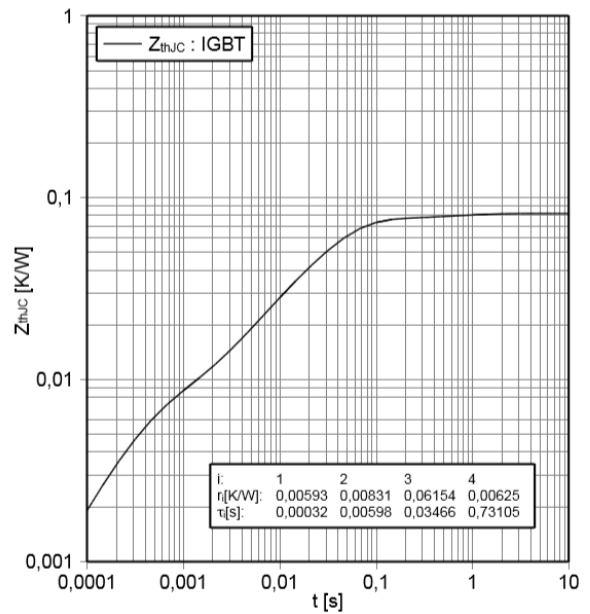




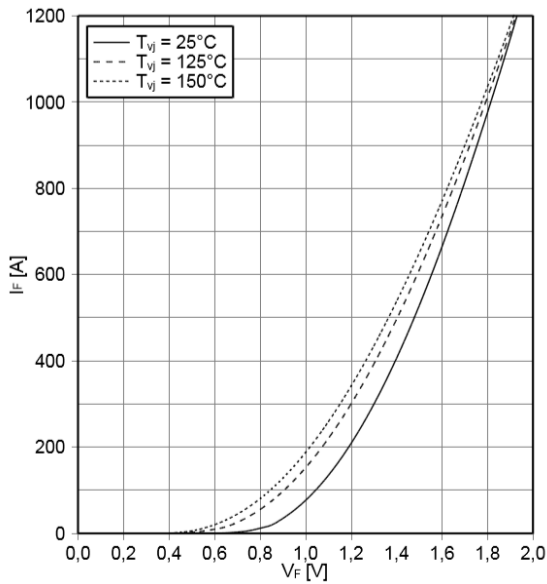
**Switching Loss vs. Gate Resistance
(Vge=15V, Vce=300V, Ic=600A)**



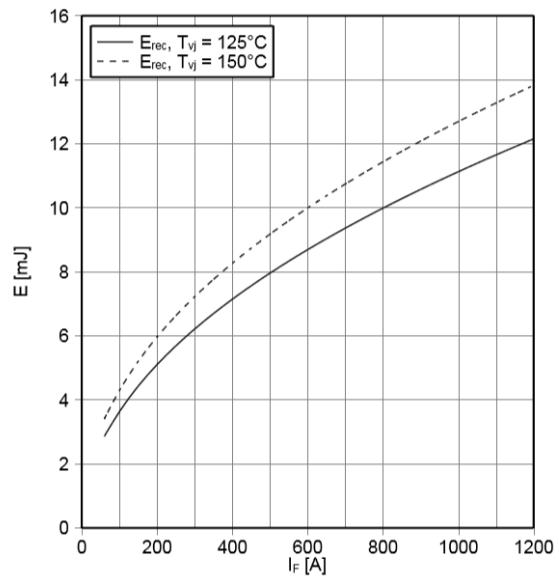
**Transient Thermal Impedance
(IGBT)**



Forward Characteristics

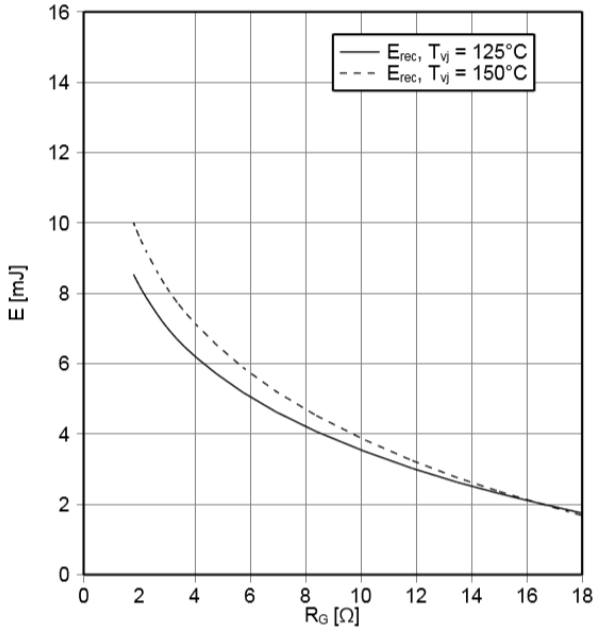


Switching Loss Diode (Rgon=5.1 Ω, Vce=300V)

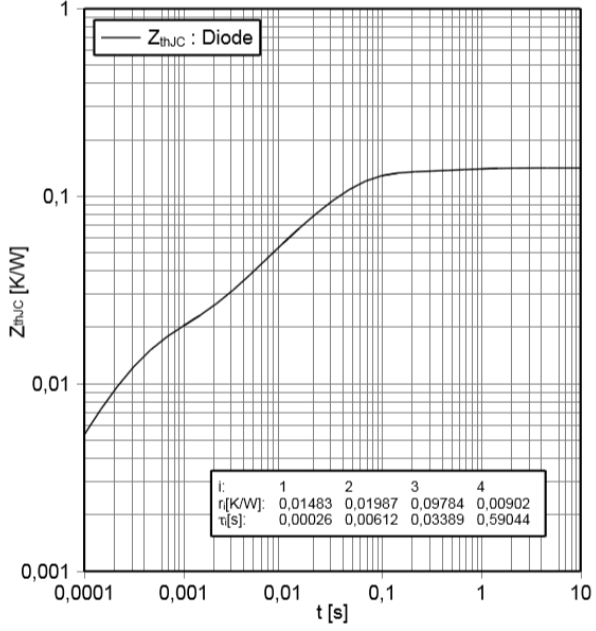




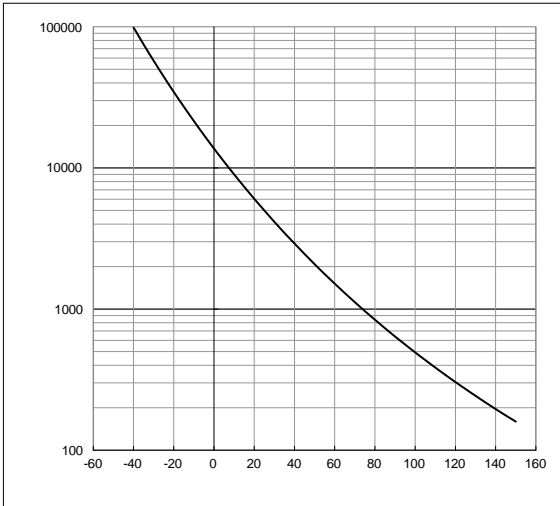
**Switching Loss Diode
(If=600A, Vce=300V)**



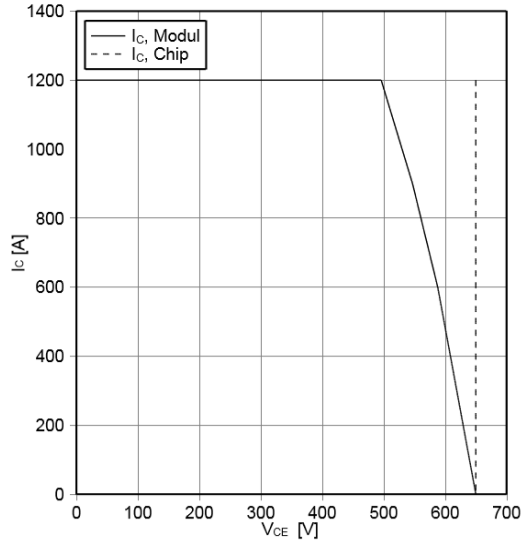
**Transient Thermal Impedance
(FRED)**



Typ.NTC Temperature Characteristics



RBSOA, VGE=±15V, RGon=5.1 Ω

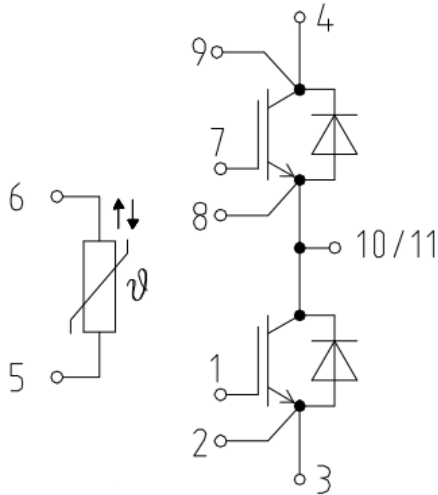




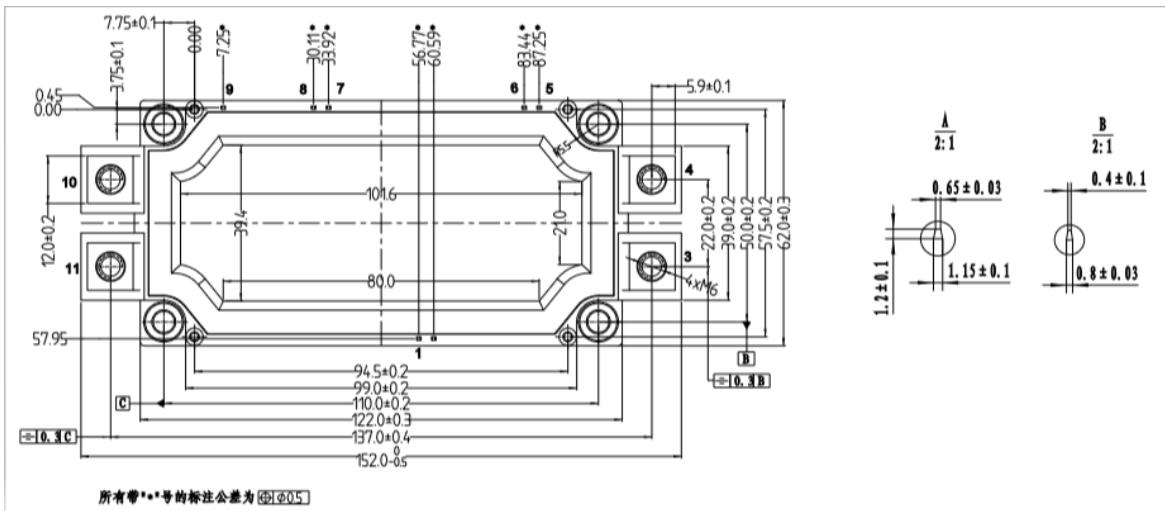
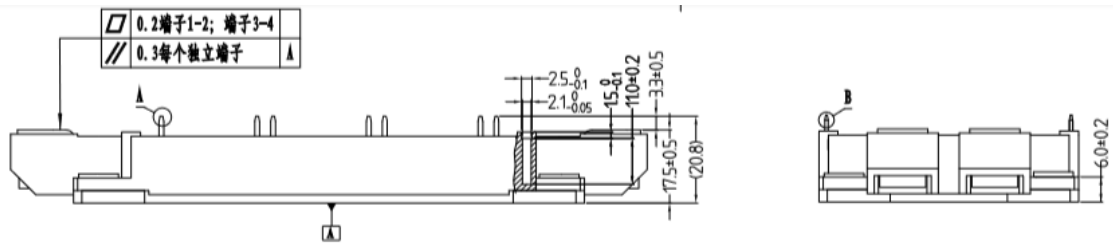
外形尺寸 PACKAGE MECHANICAL DATA

Circuit diagram

单位 Unit: mm



Package outlines





注意事项

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- 4.本说明书如有版本变更不另外告知

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