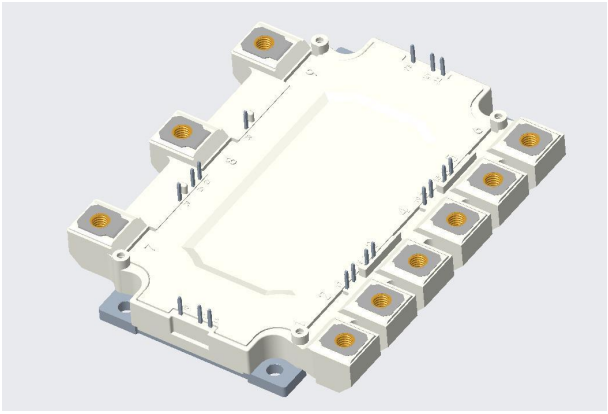
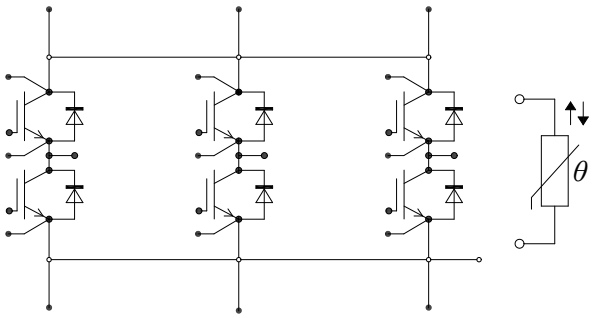
采用沟槽栅极/场截止结构 IGBT 和温度检测 NTC

SHH3N450T08S1 with Trench Gate/Field Stop IGBT and NTC





V_{CES} = 750V

$I_{C\ nom}$ = 450 A

典型应用	Typical Application
· 交流马达控制	· AC Motor Control
· 逆变器	· Inverters
· 电机传动	· Motor Drives
电气特性	**Electrical Characteristics**
· 低导通和开关损耗	· Ultra Low Conduction and Switching Loss
· 高短路能力	· High Short Circuit Capability
· 反并联超快速软恢复二极管	· Including Ultra Fast & Soft Recovery Anti-parallel FWD
机械特性	**Mechanical Properties**
· 铜基板	· Cu Substrate
· 标准封装	· Standard Package

Module Label Code

Barcode Code 128:

Data Matrix Code:

Content of the Code	Digit
Sample or Mass Production	1
Module Serial Number	2 – 5
Datecode (Production Year)	6 – 7
Datecode (Production Week)	8 – 9
Production Batch Number	10 – 11
Production Serial Number	12 – 13

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Approved by : FJY	Revision : V1.0

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- conclusion of quality agreement;
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If necessary, please give similar instructions to your customers according to actual needs.
Retain the right to modify product specifications.

IGBT，逆变器/ IGBT, Inverter

最大额定值/ Maximum rated Values

参数/ Parameter	符号/ Symbol	条件/ Conditions	值/ Values	单位/ Unit
集电极-发射极电压/ Collector-emitter voltage	V_{CES}	T_{vj} = 25℃	750	V
连续集电极直流电流/ Continuous DC collector current	$I_{C\ nom}$	T_F =45℃, $T_{vj\ max}$ = 175℃	450	A
集电极重复峰值电流/ Repetitive peak collector current	I_{CRM}	t_P =1 ms	900	A
总功率损耗/ Total power dissipation	P_{tot}	T_F = 25℃, $T_{vj\ max}$ = 175℃	949	W
栅极-发射极峰值电压/ Gate-emitter peak voltage	V_{GES}		±20	V

特征值/ Characteristic Values

参数/ Parameter	符号/ Symbol	条件/ Conditions		值/ Values			单位/ Unit
				最小/ Min.	典型/ Typ.	最大/ Max.	
集电极-发射极饱和电压/ Collector-emitter saturation voltage	$V_{CE(SAT)}$	V_{GE} = 15 V, I_C = 450 A	T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	1.55 1.75 1.80	2.0 - -	V
栅极阈值电压/ Gate threshold voltage	$V_{GE(th)}$	I_C =23 mA, V_{CE} = V_{GE}, T_{vj} = 25℃		4.0	6.07	7.0	V
集电极-发射极截止电流/ Collector-emitter cut-off current	I_{CES}	V_{CE}= 750 V ,V_{GE} = 0 V T_{vj} = 25℃		-	-	1	mA
栅极-发射极漏电流/ Gate-emitter leakage current	I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25℃		-	-	400	nA
栅极电荷/ Gate charge	Q_G	V_{CC} = 400V, I_C=450 A, V_{GE} =±15 V		-	2370	-	nC
开通延迟时间（电感负载）/ Turn-on delay time	$t_{d(on)}$	V_{CE} =400 V, I_C = 450 A , V_{GE} =±15 V, R_G = 30Ω	T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	1.14 1.06 1.01	- - -	μs
上升时间（电感负载）/ Rise time, inductive load	t_r		T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	0.30 0.35 0.37	- - -	
关断延迟时间（电感负载）/ Turn-off delay time, inductive load	$t_{d(off)}$		T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	2.24 2.34 2.37	- - -	
下降时间（电感负载）/ Fall time, inductive load	t_f		T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	0.21 0.21 0.21	- - -	
开通损耗能量（每脉冲）/ Turn-on energy loss per pulse	E_{on}		T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	102 108 114	- - -	mJ
关断损耗能量（每脉冲）/ Turn-off energy loss per pulse	E_{off}		T_{vj} = 25℃ T_{vj} = 125℃ T_{vj} = 150℃	- - -	65 66 68	- - -	
短路数据/ SC data	I_{SC}	V_{GE} = 15 V,V_{CC} = 400 V t_P = 5 μs, T_{vj} = 150℃		-	1800	-	A
结-冷却液热阻/ Thermal resistance, junction-cooling fluid	R_{thJF}	每个 IGBT/ per IGBT		-	-	0.158	K/W
在开关状态下的温度/ Temperatureunder switching conditions	$T_{vj\ op}$			-40	-	150	℃

二极管，逆变器/ Diode, Inverter

最大额定值/ Maximum ratings Values

参数/ Parameter	符号/ Symbol	条件/ Conditions	值/ Values	单位/ Unit
反复重复峰值电压/ Repetitive peak reverse voltage	V_{RRM}	T_{vj} = 25°C	750	V
连续正向电流/ Continuous DC forward current	I_F		450	A
正向重复峰值电流/ Repetitive peak forward current	I_{FRM}	t_P = 1 ms	900	A

特征值/ Characteristic Values

参数/ Parameter	符号/ Symbol	条件/ Conditions		值/ Values			单位/ Unit
				最小/ Min.	典型/ Typ.	最大/ Max.	
正向电压/ Forward voltage	V_F	V_{GE} = 0 V, I_F = 450 A	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	- - -	1.80 1.88 1.87	2.5 - -	V
反向恢复峰值电流/ Peak reverse recovery current	I_{RM}	V_R = 400 V, I_F = 450 A	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	- - -	85 103 114	- - -	A
恢复电荷/ Recovery charge	Q_r		T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	- - -	5.39 5.35 5.11	- - -	µC
反向恢复损耗（每脉冲）/ Reverse recovery energy per pulse	E_{rec}	I_F = 450 A, V_R = 400 V, V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	- - -	1.64 3.08 3.94	- - -	mJ
结-冷却液热阻/ Thermal resistance, junction-cooling fluid	R_{thJF}	每个二极管/ per diode		-	-	0.239	K/W
在开关状态下的温度/ Temperature under switching conditions	$T_{vj\ op}$			-40	-	150	°C

负温度系数热敏电阻/ NTC-Thermistor

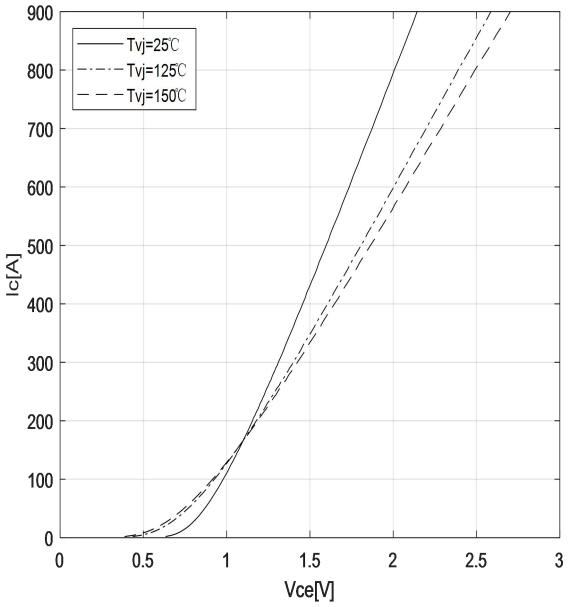
特征值/ Characteristic Values

参数/ Parameter	符号/ Symbol	条件/ Conditions	值/ Value	单位/ Unit
额定电阻值/ Rated resistance	R_{25}	T_{NTC} = 25°C	5.00	kΩ
R100 偏差/ Deviation of R100	$\|\Delta R\|/R$	T_{NTC} = 100°C, R_{100} = 493 Ω	5	%
B-值/ B-value	$B_{25/50}$	25 和 50°C电阻值计算得到/ Calculated from resistance value at 25°C and 50°C	3375	K
B-值/ B-value	$B_{25/80}$	25 和 80°C电阻值计算得到/ Calculated from resistance value at 25°C and 80°C	3411	K
B-值/ B-value	$B_{25/100}$	25 和 100°C电阻值计算得到/ Calculated from resistance value at 25°C and 100°C	3433	K

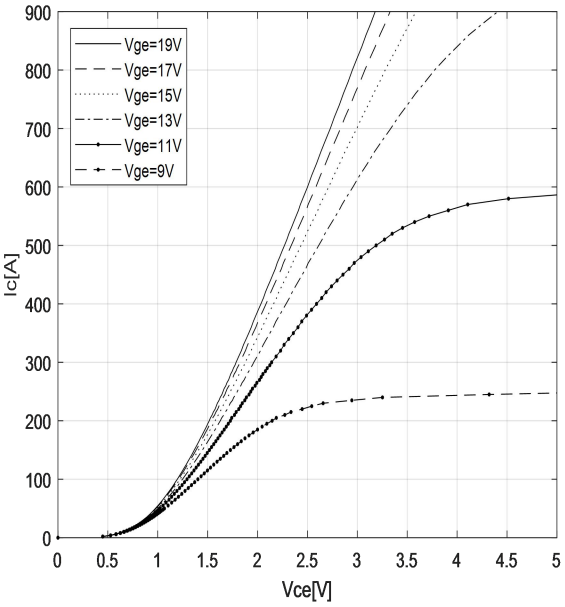
模块/ Module

参数/ Parameter	符号/ Symbol	条件/ Conditions	值/ Values	单位/ Unit
绝缘测试电压/ Isolation test voltage	V_{ISOL}	RMS, f = 0 Hz, t = 1.2 sec	4.7	kV
模块基板材料/ Material of Module baseplate			Cu	
内部绝缘材料/ Material of Internal Isolation			Al_2O_3	
爬电距离/ Creepage distance		端子-散热器/ Terminal to heatsink 端子- 端子 / terminal to terminal	12.0 6.1	mm
电气间隙/Clearance		端子- 散热器 / terminal to heatsink 端子- 端子 / terminal to terminal	12.0 6.1	mm
存储温度/ Storage temperature	T_{stg}		-40 ~ 125	℃
模块安装扭矩/ Mounting torque for module 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	3.0 ~ 6.0	N·m
端子联接扭矩/ Terminal connection torque	M	螺丝 M6 根据相应的应用手册进行安装/ Screw M6 - Mounting according to valid application note	3.0 ~ 6.0	N·m
重量/ Weight	G		697	g

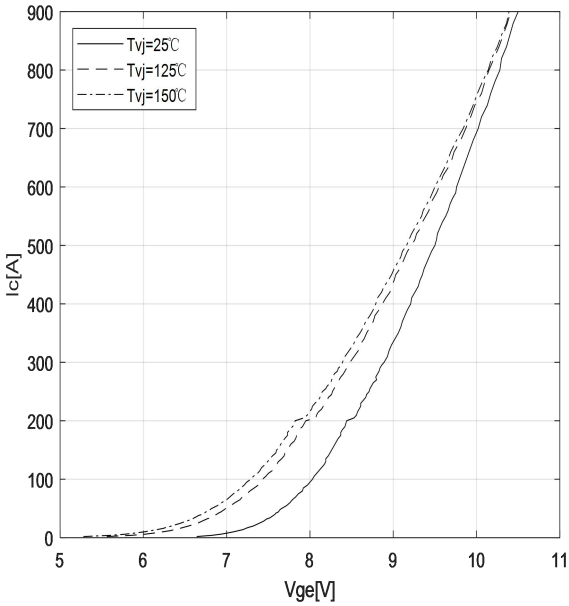
输出特性 IGBT，逆变器（典型）
Output characteristic IGBT, Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = 15 V



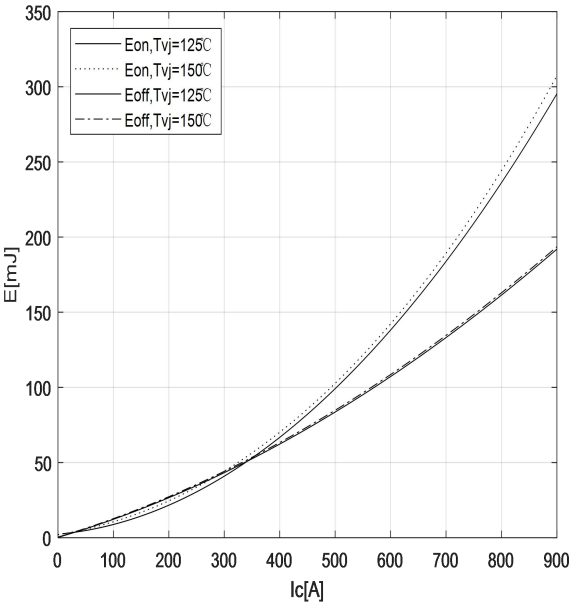
输出特性 IGBT，逆变器（典型）
Output characteristic IGBT, Inverter (typical)
$I_C = f(V_{CE})$
T_{vj} = 150℃



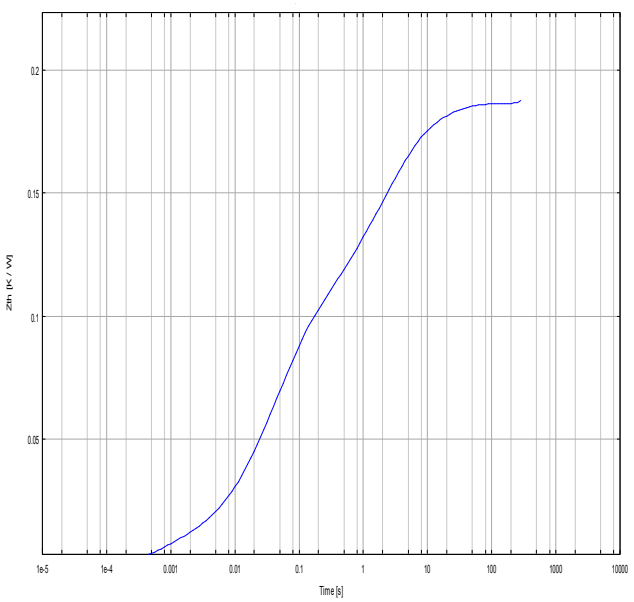
传输特性 IGBT,逆变器（典型）
Transfer characteristic IGBT, Inverter (typical)
$I_C = f(V_{GE})$
V_{CE} = 20 V



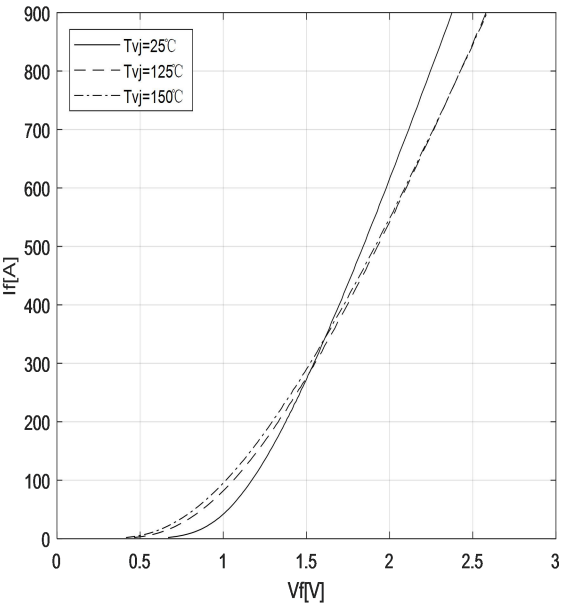
开关损耗 IGBT,逆变器（典型）
Switching losses IGBT, Inverter (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$,
V_{GE} = ±15 V, Rg=30Ω, V_{CE} =400 V



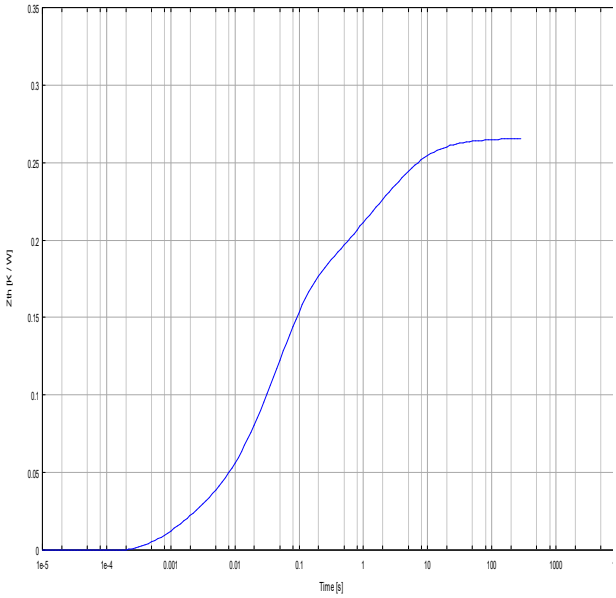
瞬态热阻抗 IGBT，逆变器（典型）
Transient thermal impedance IGBT, Inverter (typical)
$Z_{thJC} = f(t)$



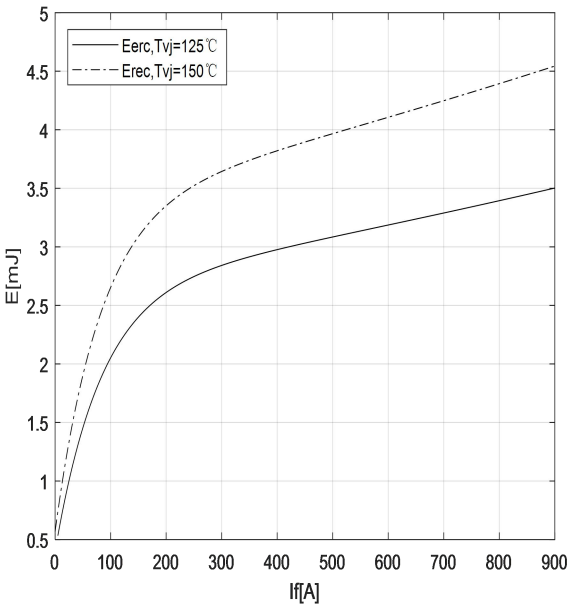
正向偏压特性 二极管，逆变器（典型）
Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$



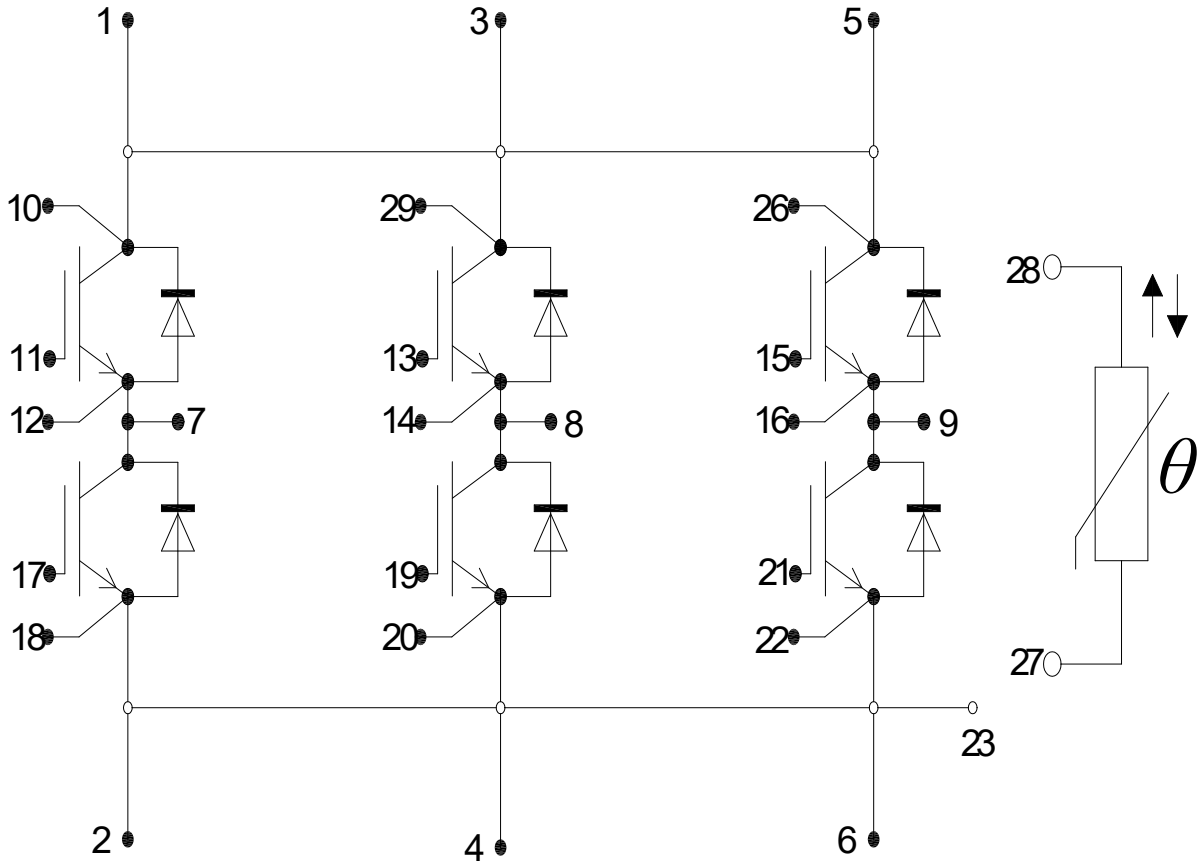
瞬态热阻抗 二极管，逆变器（典型）
Transient thermal impedance Diode, Inverter (typical)
$Z_{thJC} = f(t)$



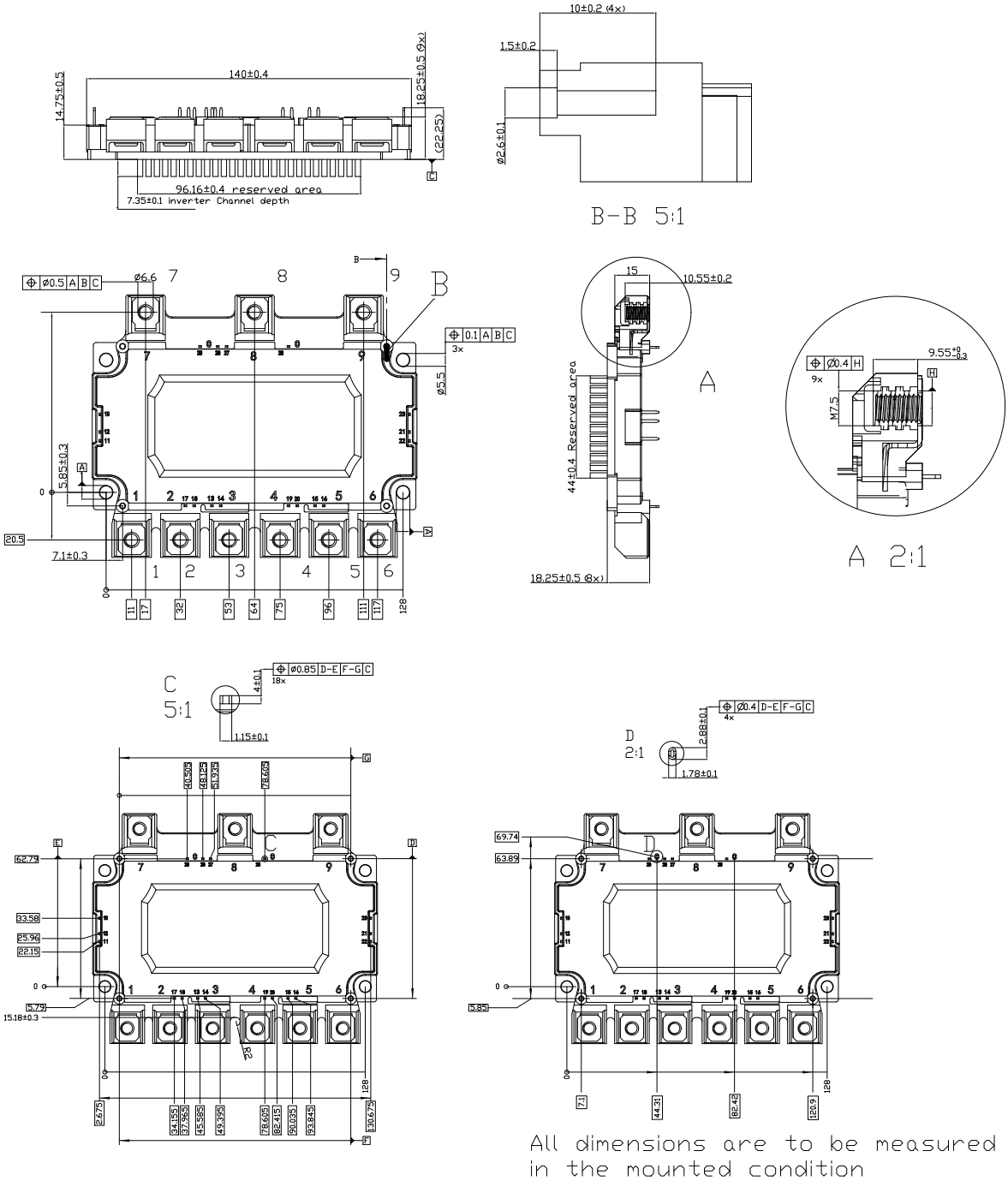
开关损耗 二极管，逆变器（典型）
Switching losses Diode, Inverter (typical)
$E_{rec} = f(I_F)$, $R_G = 30\ \Omega$, $V_{CE} = 400\ V$



接线图 / Circuit_diagram_headline



封装尺寸/Package outlines



单位：mm

LEGAL NOTICE

版本履历 / Revision History

Page or Reference	Description of change
V1.0	Initial Datasheet.