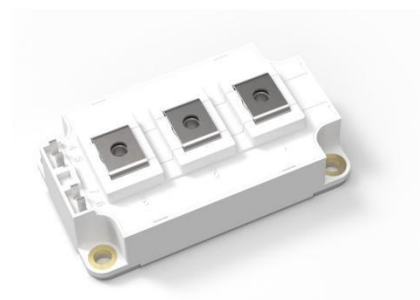
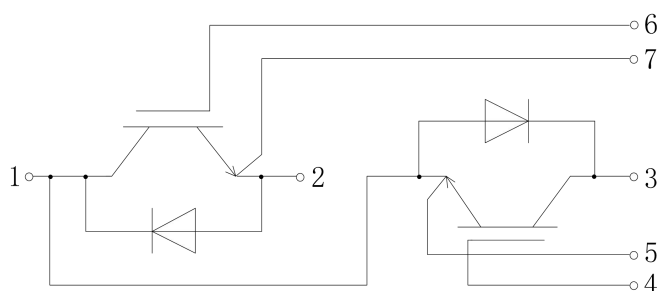


等效电路原理图/Equivalent Circuit Schematic



400A/1700V

特性 / Features

- 低 V_{CEsat} Low V_{CEsat}
- 低开关损耗 Low Switching Loss
- 功率端子超声焊接 Ultrasonic Welding of Power Terminals
- 标准封装 Standard Housing

典型应用/Typical Applications

- 电机传动 Motor Drives
- 风力发电机 Wind Turbines
- 大功率变流器 High Power Converters

IGBT, 逆变器 / IGBT ,Inverter

最大额定值 / Maximum Rated Values

集电极-发射极电压 Collector-emitter voltage	$T_j = 25^\circ\text{C}$	V_{CES}	1700	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^\circ\text{C}, T_{j\max} = 175^\circ\text{C}$	$I_{C\text{ nom}}$	400	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\text{ ms}$	I_{CRM}	800	A
栅极-发射极峰值电压 Gate-emitter peak voltage		V_{GES}	+/-20	V

特征值 / Characteristic Values

				Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-emitter saturation voltage	$I_C = 400\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	$V_{CE\text{ sat}}$		1.75 2.05 2.20		V
栅极阈值电压 Gate threshold voltage	$I_C = 17\text{ mA}$, $V_{CE} = V_{GE}$, $T_j = 25^\circ\text{C}$		$V_{GE\text{ th}}$		5.60		V
栅极电荷/Gate charge	$V_{GE} = -15\text{ V} \dots +15\text{ V}$		Q_G		2.45		μC
内部栅极电阻 Internal gate resistor	$T_j = 25^\circ\text{C}$		$R_{G\text{ int}}$		2.5		Ω
输入电容/Input capacitance	$f = 1\text{ MHz}$, $T_j = 25^\circ\text{C}$, $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$		C_{ies}		16.5		nF
反向传输电容 Reverse transfer capacitance			C_{res}		0.25		nF
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE} = 1700\text{ V}$, $V_{GE} = 0\text{ V}$, $T_j = 25^\circ\text{C}$		I_{CES}			1.0	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$, $T_j = 25^\circ\text{C}$		I_{GES}			200	nA
开通延迟时间 Turn-on delay time	$I_C = 400\text{ A}$, $V_{CE} = 900\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_G = 1\ \Omega$ Inductive Load Turn-on($T_j = 150^\circ\text{C}$): $di/dt = 2460\text{ A}/\mu\text{s}$ Turn-off($T_j = 150^\circ\text{C}$): $dv/dt = 3090\text{ V}/\mu\text{s}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	$t_{\text{d on}}$		250 270 275		ns
上升时间/Rise time		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	t_r		105 125 130		ns
关断延迟时间 Turn-off delay time		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	$t_{\text{d off}}$		520 640 670		ns
下降时间/Fall time		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	t_f		370 590 670		ns
开通损耗能量 Turn-on energy loss		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	E_{on}		30 59 65		mJ
关断损耗能量 Turn-off energy loss		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	E_{off}		100 138 151		mJ
短路数据/SC data	$V_{GE} \leq 15\text{ V}$, $V_{CC} = 1000\text{ V}$ $t_p \leq 10\mu\text{s}$, $T_j = 150^\circ\text{C}$		I_{SC}		1770		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}		0.065		K/W
在开关状态下温度 Temperature under switching			$T_{j\text{ op}}$	-40		150	$^\circ\text{C}$

二极管, 逆变器 / Diode, Inverter

最大额定值 / Maximum Ratings

反向重复峰值电压 Repetitive peak reverse voltage	$T_j = 25^\circ\text{C}$	V_{RRM}	1700	V
连续正向直流电流 Continuous DC forward current		I_F	400	A
正向重复峰值电流 Repetitive peak forward current	$t_p = 1\text{ ms}$	I_{FRM}	800	A

特征值 / Characteristic Values

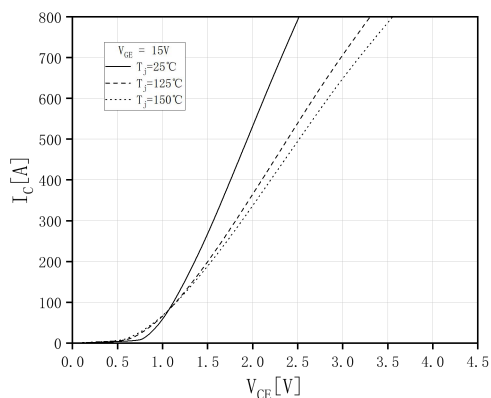
				Min.	Typ.	Max.	
正向电压/Forward voltage	$I_F = 400\text{ A}$, $V_{GE} = 0\text{ V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	V_F		2.00 2.20 2.25		V
反向恢复峰值电流 Peak reverse recovery current		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	I_{RM}		560 590 600		A
恢复电荷/Recovered charge	$I_F = 400\text{ A}$, $V_{CE} = 900\text{ V}$ $V_{GE} = -15\text{ V}$ $-di_F/dt = 2950\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	Q_r		110 150 175		μC
反向恢复损耗 Reverse recovery energy		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$	E_{rec}		89 115 125		mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}			0.102	K/W
在开关状态下温度 Temperature under switching			$T_{j\text{ op}}$	-40		150	$^\circ\text{C}$

模块 / Module

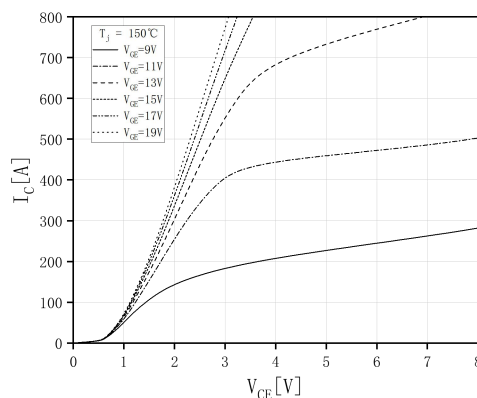
绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V _{ISOL}	4.0	kV	
模块基板材料 Material of module baseplate			Cu		
内部绝缘/Internal isolation	基本绝缘 (class 1, IEC 61140) Basic insulation (class1, IEC 61140)		Al ₂ O ₃		
爬电距离/Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		29.0 23.0	mm	
电气间隙/Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		23.0 11.0	mm	
相对电痕指数 Comperative tracking index		CTI	> 400		
			Min.	Typ.	Max.
杂散电感，模块 Stray inductance module		L _{sCE}		20	nH
模块引线电阻 Module lead resistance	T _c = 25℃，每个开关 / per switch	R _{CC'+EE'}		0.69	mΩ
储存温度/Storage temperature		T _{stg}	-40		125℃
模块安装的安装扭距 / Mounting torque for module mounting	螺丝 M6 / Screw M6	M	3.00		6.00Nm
端子联接扭距 Terminal connection torque	螺丝 M6 / Screw M6	M	2.5		5.0Nm
重量/Weight		G		314	g

电气特性（曲线）/Electrical Characteristics (curves)

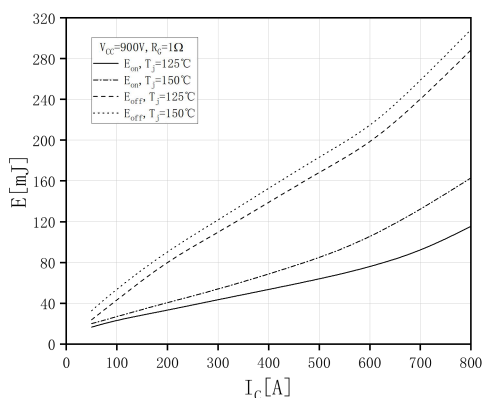
输出特性 IGBT, 逆变器（典型）
output characteristic IGBT, Inverter (typical)



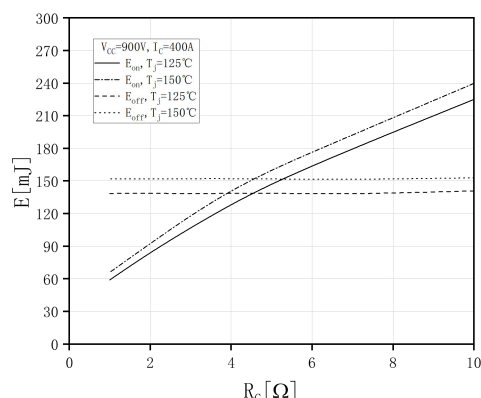
输出特性 IGBT, 逆变器（典型）
output characteristic IGBT, Inverter (typical)



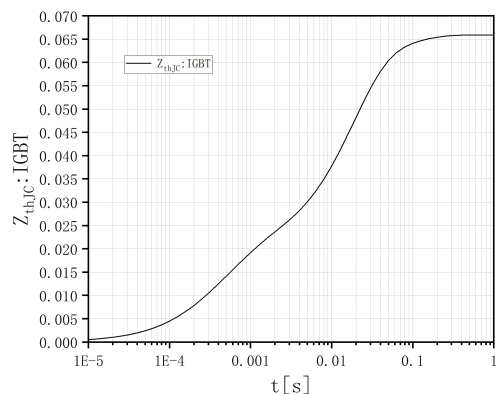
开关损耗 IGBT, 逆变器（典型）
switching losses IGBT, Inverter (typical)



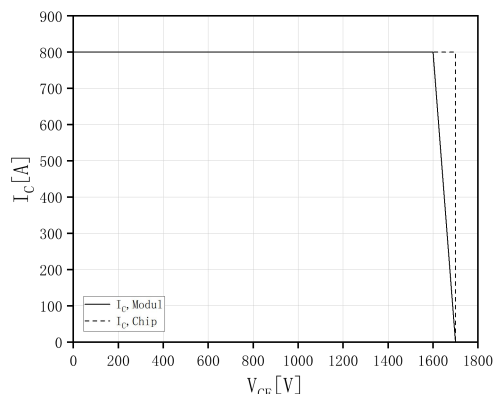
开关损耗 IGBT, 逆变器（典型）
switching losses IGBT, Inverter (typical)



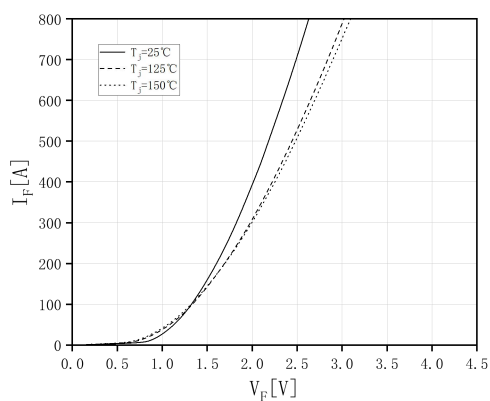
瞬态热阻抗 IGBT, 逆变器
transient thermal impedance IGBT, Inverter



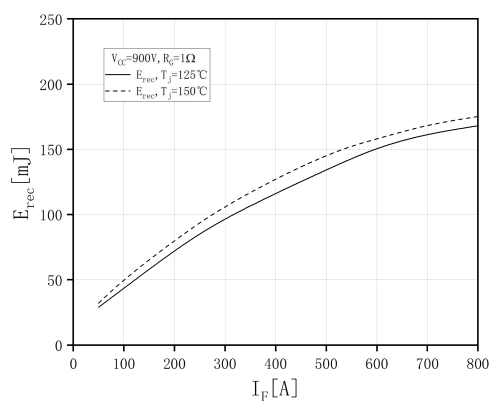
反偏安全工作区 IGBT, 逆变器（RBSOA）
Reverse bias safe operating area IGBT, Inverter(RBSOA)



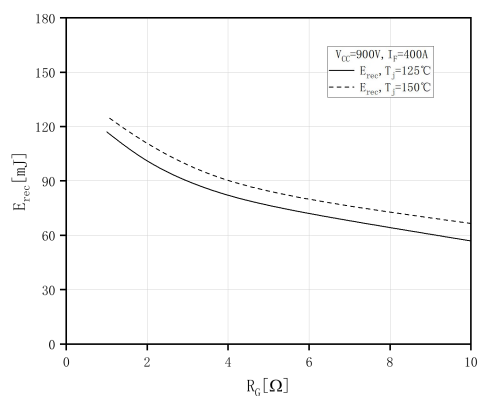
正向偏压特性 二极管,逆变器 (典型)
forward characteristic of Diode, Inverter(typical)



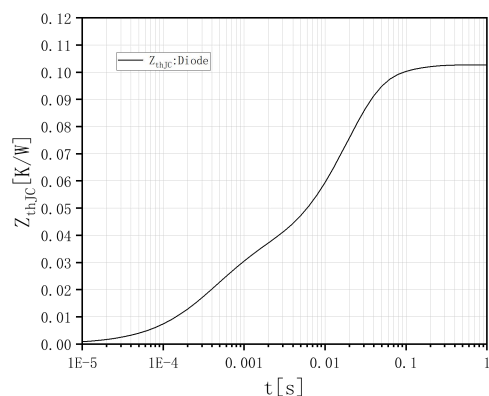
开关损耗 二极管,逆变器 (典型)
switching losses Diode, Inverter(typical)



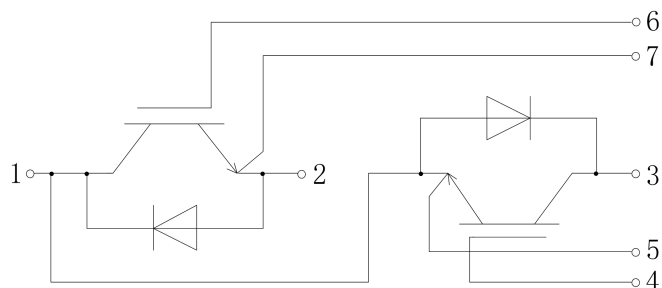
开关损耗 二极管,逆变器 (典型)
switching losses Diode, Inverter(typical)



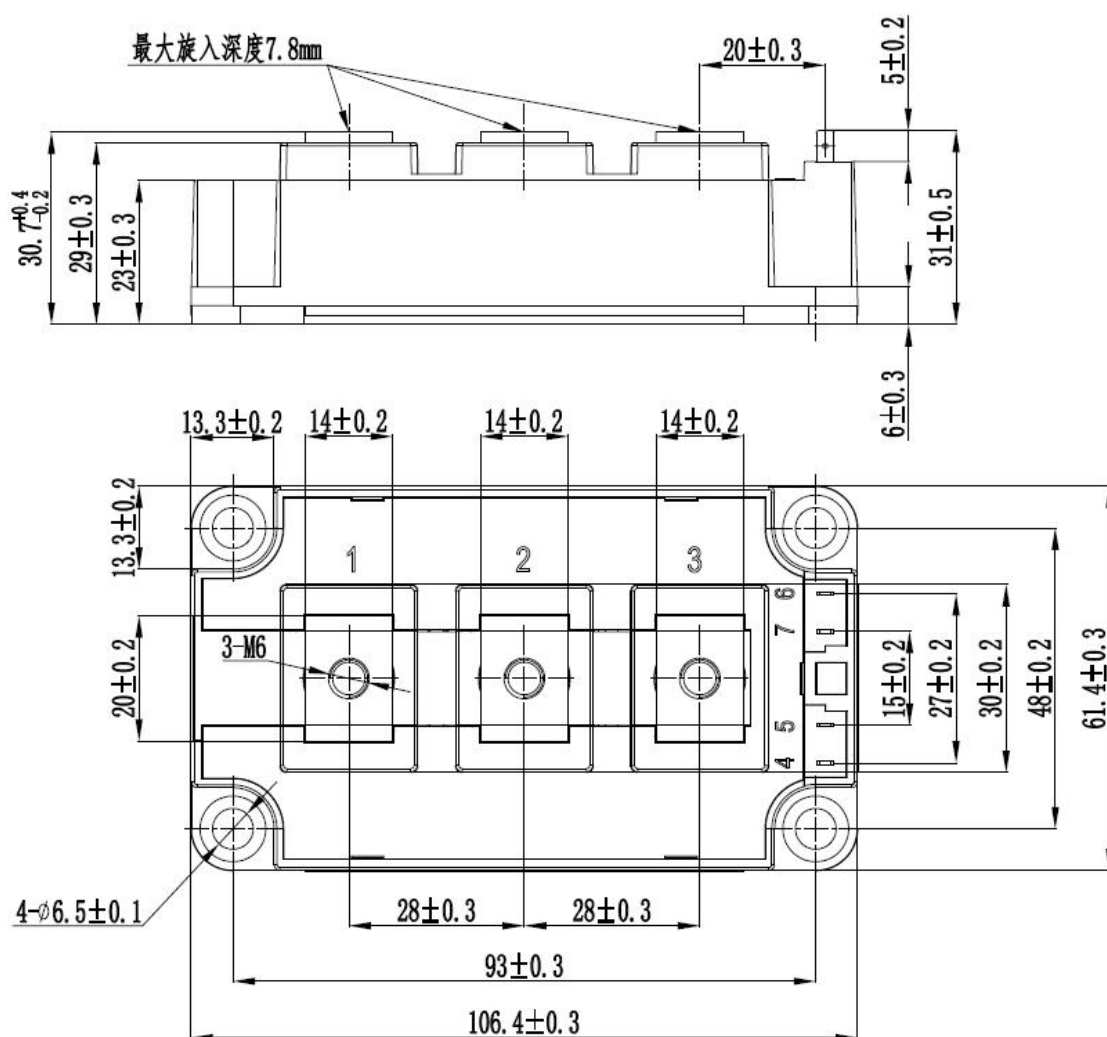
瞬态热阻抗 二极管,逆变器
transient thermal impedance Diode, Inverter



电路图 / Circuit Diagram



封装尺寸 / Package Dimensions



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