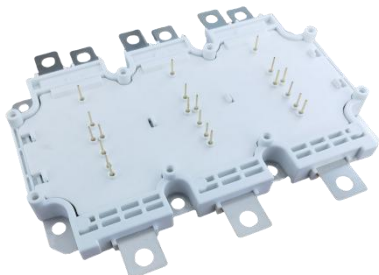


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➤ 产品外观 / Appearance



$V_{CES} = 750\text{ V}$

$I_{C\text{ nom}} = 650\text{ A} / I_{CRM} = 1300\text{ A}$

➤ 特性 / Features

- a. Field Stop Trench Gate IGBT
- b. Low CE Saturation Voltage
- c. Low Switching Loss

沟槽型电场截止型 IGBT

低饱和电压

低开通损耗

➤ 用途 / Applications

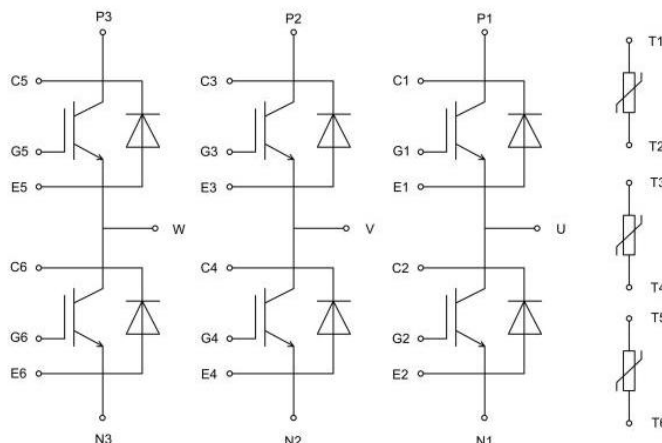
- a. Automotive Application
- b. Motor Drives
- c. High Power Converters

电动汽车应用

电机传动

大功率变流器

➤ 电路拓扑 / Circuit Topology



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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}	750	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^\circ\text{C}, T_J \text{ max} = 175^\circ\text{C}$	$I_{c \text{ nom}}$	650	A
集电极重复峰值电流 Repetitive peak collector current	$T_P = 1\text{ms}$	I_{CRM}	1300	A
栅极-发射极峰值电压 Gate-emitter peak voltage		V_{GES}	+/-20	V

电特性/ Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
集电极-发射极饱和电压 Collector-Emitter Saturation Voltage	$V_{GE} = 15\text{ V}, I_C = 375\text{ A}$	$V_{CE(sat)}$		$T_J = 25^\circ\text{C}$ 1.15		V
				$T_J = 150^\circ\text{C}$ 1.25		
	$V_{GE} = 15\text{ V}, I_C = 650\text{ A}$			$T_J = 175^\circ\text{C}$ 1.30		
				$T_J = 25^\circ\text{C}$ 1.45		
				$T_J = 150^\circ\text{C}$ 1.65		
栅极-发射极阈值电压 Gate-Emitter Threshold Voltage	$V_{GE} = V_{CE}, I_C = 26\text{ mA}$	$V_{GE(th)}$		5.80		V
总栅极电荷 Total Gate Charge	$V_{GE} = -8\text{ V} \dots +15\text{ V}, V_{CC} = 400\text{ V}$	Q_g		2.5		μC
内部栅极电阻 Internal gate resistor	$T_J = 25^\circ\text{C}$	R_{Gint}		1.7		Ω
输入电容 Input Capacitance	$V_{CE} = 25\text{ V}$	C_{ies}		110		nF
输出电容 Output Capacitance	$V_{GE} = 0\text{ V}$ $f = 1\text{ MHz}$					
集电极-发射极截止电流 Collector-Emitter Cut-off Current	$V_{GE} = 0\text{ V}, V_{CE} = 750\text{ V}$	I_{CES}			1.0	mA
栅极峰值电流 Gate Leakage Current	$V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	I_{GES}			400	nA
开通延迟时间 Turn-on Delay Time	$V_{CE} = 400\text{ V},$ $I_C = 375\text{ A},$ $V_{GE} = +15/-8\text{ V},$ $R_G = 2\ \Omega,$ Inductive Load	$t_{d(on)}$		$T_J = 25^\circ\text{C}$ 620		
上升时间 Rise Time				$T_J = 150^\circ\text{C}$ 590		
				$T_J = 175^\circ\text{C}$ 580		
关断延迟时间 Turn-off Delay Time	Inductive Load Turn-on ($T_J = 175^\circ\text{C}$): $di/dt = 2420\text{ A}/\mu\text{s}$	$t_{d(off)}$		$T_J = 25^\circ\text{C}$ 820		ns
下降时间 Fall Time				$T_J = 150^\circ\text{C}$ 850		
				$T_J = 175^\circ\text{C}$ 870		
开通损耗能量 Turn-on Switching Loss per Pulse	Turn-off ($T_J = 175^\circ\text{C}$): $dv/dt = 3915\text{ V}/\mu\text{s}$	E_{on}		$T_J = 25^\circ\text{C}$ 7.10		mJ
关断损耗能量 Turn off Switching Loss per Pulse				$T_J = 150^\circ\text{C}$ 8.50		
				$T_J = 175^\circ\text{C}$ 9.50		
短路数据/SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 400\text{ V}$ $t_p \leq 10\ \mu\text{s}, T_J = 150^\circ\text{C}$	I_{sc}		3560		A
芯片 - 外壳热阻 Thermal Resistance - chip-to-case	每个 IGBT / per IGBT	R_{thJC}			0.088	$^\circ\text{C}/\text{W}$
开关状态下温度 Temperature under switching		$T_{j \text{ op}}$	-40 150		150 175	$^\circ\text{C}$

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二极管，逆变器/ Diode, Inverter

最大额定值/Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	$T_j = 25^\circ\text{C}$	V_{RRM}	750	V
连续正向直流电流 Continuous DC forward current		I_F	650	A
正向重复峰值电流 Repetitive peak forward current	$t_p = 1\text{ ms}$	I_{FRM}	1300	A

电特性/ Electrical Characteristics ($T_j = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
二极管正向电压 Diode Forward Voltage	$V_{GE} = 15\text{ V}, I_C = 375\text{ A}$	V_F		1.50 1.60 1.55		V
	$V_{GE} = 15\text{ V}, I_C = 650\text{ A}$			1.80 2.00		
反向恢复电荷 Reverse Recovery Charge	$V_{CE} = 400\text{ V},$ $I_C = 375\text{ A},$ $V_{GE} = -8\text{ V},$	I_{RM}		195 240 255		A
反向恢复峰值电流 Peak Reverse Recovery Current	$-di_F/dt = 1900\text{ A}/\mu\text{s}$	Q_r		18.5 35.0 40.0		μC
反向恢复能量 Reverse Recovery Energy		E_{rec}		6.0 10.5 12.5		mJ
芯片 - 外壳热阻 Thermal Resistance - chip-to-case	每个二极管 / per diode	R_{thJC}			0.126	$^\circ\text{C}/\text{W}$
在开关状态下温度 Temperature under switching		$T_{j\text{op}}$	-40 150		150 175	$^\circ\text{C}$

负温度系数热敏电阻

特征值 / Characteristic Values

Parameter		Symbol	Min	Typ	Max	Unit
额定阻值 Rated resistance	$T_C = 25^\circ\text{C}$	R_{25}		5.00		$\text{k}\Omega$
阻值误差 Deviation of R100	$T_C = 100^\circ\text{C}, R_{100} = 465\ \Omega$	$\Delta R/R$	-5		5	%
功率损耗 Power dissipation	$T_C = 25^\circ\text{C}$	P_{25}			10.0	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
B 值/ B - value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298.15\text{K}))]$	$B_{25/80}$		3425		K
B 值/ B - value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298.15\text{K}))]$	$B_{25/100}$		3443		K

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模块 / Module

绝缘配置 / Insulation Coordination

Parameter	Test Conditions	Symbol	Typ.	Unit
隔离试验电压 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	
内部隔离 Internal Isolation	基本绝缘 (class 1, IEC61140) Basic insulation (class 1, IEC61140)		Al_2O_3	
爬电距离 Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal	dCreep	9.83 9.73	mm
间距 Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal	dClear	7.46 5.14	mm
相对漏电起痕指数 Comparative tracking index		CTI	> 200	

特征值 / Characteristic Values

Parameter		Symbol	Min	Typ	Max	Unit
杂散电感, 模块 Stray inductance module		L_{sCE}		12		nH
模块引线电阻 Module lead resistance	$T_c = 25^\circ C$, 每个开关 / per switch	$R_{CC', +EE'}$		0.75		m Ω
储存温度 Storage temperature		T_{stg}	-40		125	$^\circ C$
模块安装的安装扭矩 Mounting torque for module	螺丝 M5 / Screw M5	M	1.8		2.2	Nm
端子联接扭矩 Terminal connection torque	螺丝 M6 / Screw M6	M	3.0		5.0	Nm
重量 Weight		G		574		g

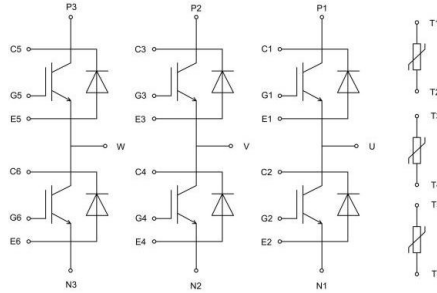
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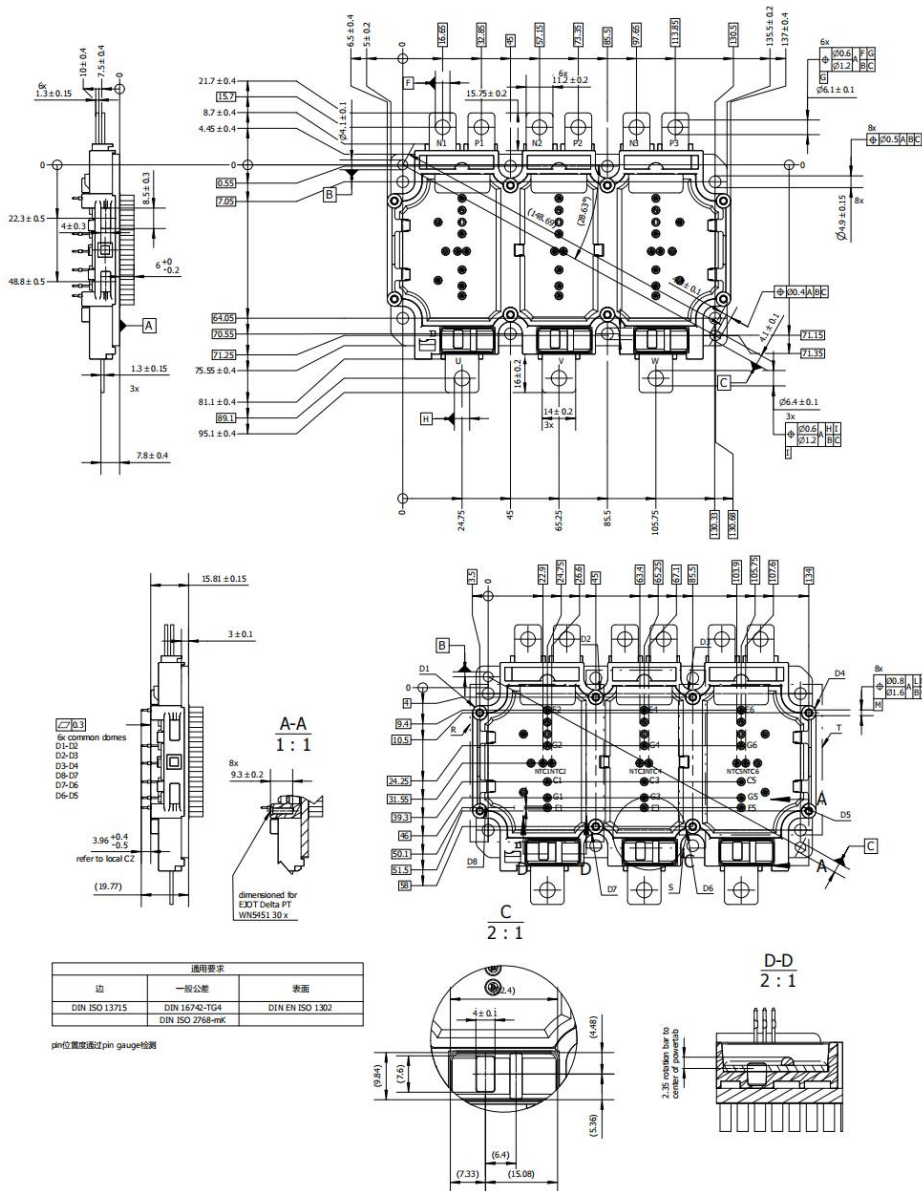
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封装/Package

电路拓扑/Circuit Topology



封装尺寸 / Package outlines



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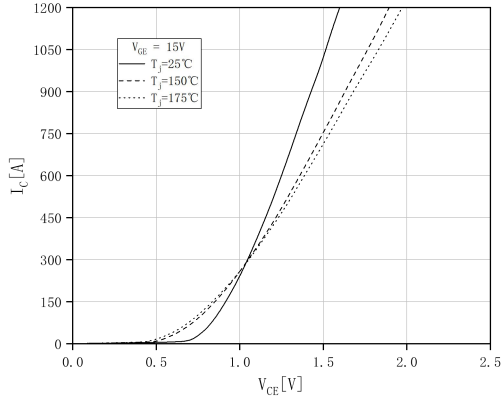


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性能/ Performance

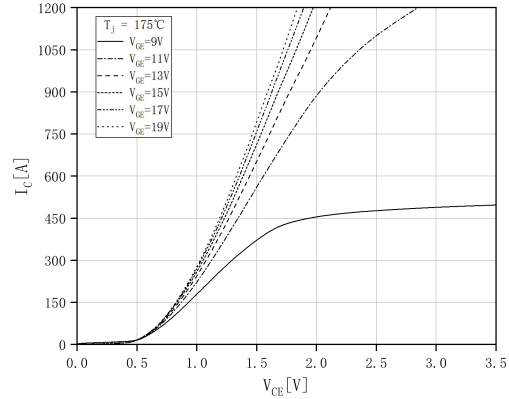
输出特性 IGBT, 逆变器 (典型)

output characteristic IGBT, Inverter (typical)



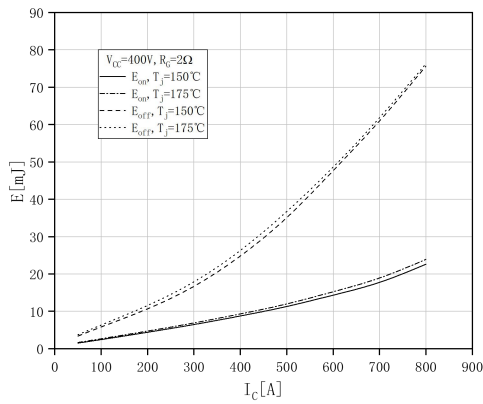
输出特性 IGBT, 逆变器 (典型)

output characteristic IGBT, Inverter (typical)



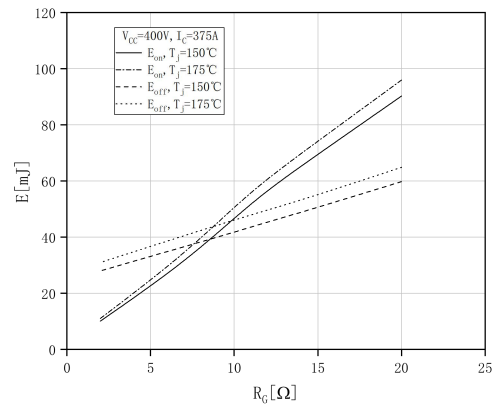
开关损耗 IGBT, 逆变器 (典型)

switching losses IGBT, Inverter (typical)



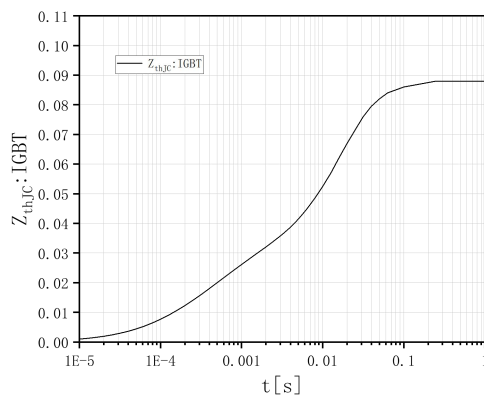
开关损耗 IGBT, 逆变器 (典型)

switching losses IGBT, Inverter (typical)



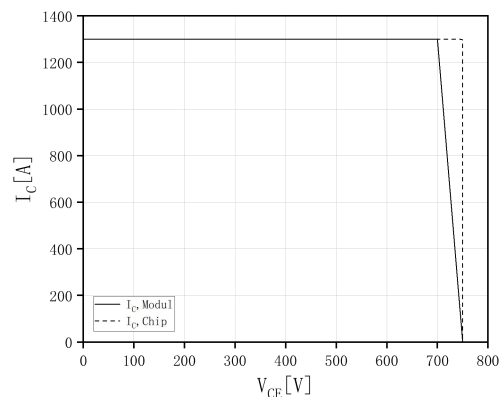
瞬态热阻抗 IGBT, 逆变器

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)



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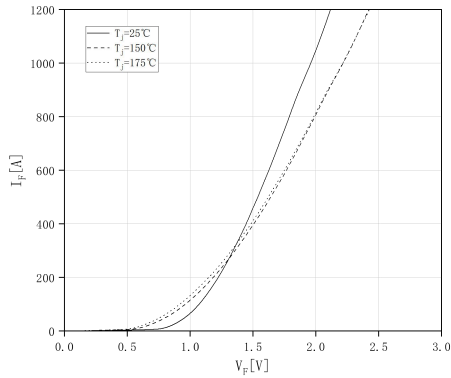


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性能/ Performance

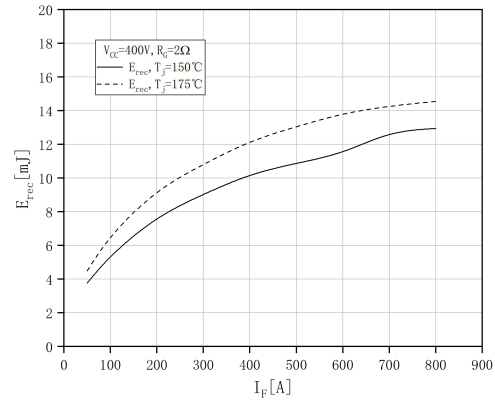
正向偏压特性 二极管,逆变器 (典型)

forward characteristic of Diode, Inverter(typical)



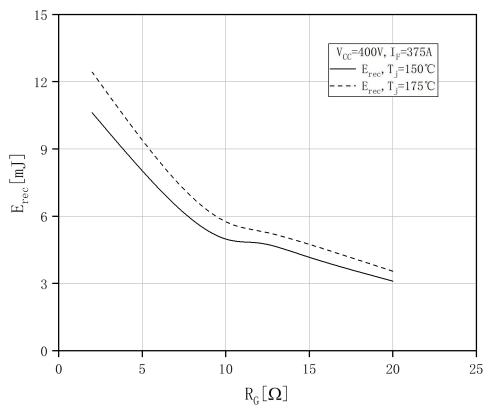
开关损耗 二极管, 逆变器 (典型)

switching losses Diode, Inverter(typical)



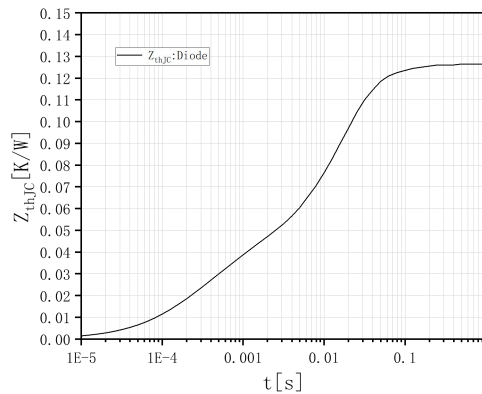
开关损耗 二极管, 逆变器 (典型)

switching losses Diode, Inverter(typical)



瞬态热阻抗 二极管, 逆变器

transient thermal impedance Diode, Inverter



使用条件及条款

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