

电气特性

- $T_{vj\ op} = 150^{\circ}C$
- 低 V_{CESat}

Electrical Features

- $T_{vj\ op} = 150^{\circ}C$
- Low V_{CESat}

机械特性

- 标准封装

Mechanical Features

- Standard housing



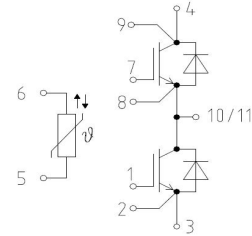
$V_{CES} = 1200V$
 $I_C\ nom = 600A$ / $ICRM = 1200A$

潜在应用

- 伺服驱动器
- 电机传动
- UPS系统
- 风力发电机

Potential Applications

- Servo drives
- Motor drives
- UPS Systems
- Wind Turbines



IGBT, 逆变器 / IGBT, Inverter

最大额定值 / Maximum Rated Values

Parameter	Conditions	Symbol	Values	Units
集电极 - 发射极电压 Collector-emitter voltage	$T_{vj} = 25^{\circ}C$	V_{CES}	1200	V
连续集电极直流电流 Continuous DC collector current	$T_C = 95^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	600	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	1200	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	P_{tot}	4050	W
栅极 - 发射极峰值电压 Gate-emitter peak voltage		V_{GES}	± 20	V

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
集电极 - 发射极饱和电压 Collector-emitter saturation voltage	$I_C = 600A$, $V_{GE} = 15\ V$ $T_{vj} = 25^{\circ}C$ $I_C = 600A$, $V_{GE} = 15\ V$ $T_{vj} = 125^{\circ}C$	$V_{CE\ sat}$		1.89 2.075		V V
栅极阈值电压 Gate threshold voltage	$I_C = 23\ mA$, $V_{CE} = V_{GE}$, $T_{vj} = 25^{\circ}C$	V_{GEth}		5.47		V
栅极电荷 Gate charge	$V_{GE} = -15 / 15\ V$	Q_G		8577		μC
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}C$	R_{gint}		1.2		Ω
输入电容 Input capacitance	$f = 1\ MHz$, $T_{vj} = 25^{\circ}C$, $V_{CE} = 25\ V$, $V_{GE} = 0\ V$	C_{ies}		37		nF
反向传输电容 Reverse transfer capacitance	$f = 1\ MHz$, $T_{vj} = 25^{\circ}C$, $V_{CE} = 25\ V$, $V_{GE} = 0\ V$	C_{res}		2.05		nF
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE} = 1200\ V$, $V_{GE} = 0\ V$, $T_{vj} = 25^{\circ}C$	I_{CES}			1.0	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0\ V$, $V_{GE} = 20\ V$, $T_{vj} = 25^{\circ}C$	I_{GES}			400	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 600A$, $V_{CE} = 600\ V$ $T_{vj} = 25^{\circ}C$ $V_{GE} = -15 / 15\ V$, $R_{Gon} = 20\ \Omega$ $T_{vj} = 125^{\circ}C$	$t_{d\ on}$		0.448 0.444		μs μs
上升时间(电感负载) Rise time, inductive load	$I_C = 600A$, $V_{CE} = 600\ V$ $T_{vj} = 25^{\circ}C$ $V_{GE} = -15 / 15\ V$, $R_{Gon} = 20\ \Omega$ $T_{vj} = 125^{\circ}C$	t_r		0.194 0.208		μs μs
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 600A$, $V_{CE} = 600\ V$ $T_{vj} = 25^{\circ}C$ $V_{GE} = -15 / 15\ V$, $R_{Goff} = 20\ \Omega$ $T_{vj} = 125^{\circ}C$	$t_{d\ off}$		1.484 1.484		μs μs
下降时间(电感负载) Fall time, inductive load	$I_C = 600A$, $V_{CE} = 600\ V$ $T_{vj} = 25^{\circ}C$ $V_{GE} = -15 / 15\ V$, $R_{Goff} = 20\ \Omega$ $T_{vj} = 125^{\circ}C$	t_f		0.14 0.15		μs μs
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 600A$, $V_{CE} = 600\ V$ $T_{vj} = 25^{\circ}C$ $V_{GE} = -15 / 15\ V$, $R_{Gon} = 20\ \Omega$ $T_{vj} = 125^{\circ}C$	E_{on}		175.81 179.94		mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 600A$, $V_{CE} = 600\ V$ $T_{vj} = 25^{\circ}C$ $V_{GE} = -15 / 15\ V$, $R_{Goff} = 20\ \Omega$ $T_{vj} = 125^{\circ}C$	E_{off}		97.623 100.38		mJ mJ

Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
短路数据 SC data	$V_{GE} \leq 15 \text{ V}$, $V_{CC} = 600 \text{ V}$ $V_{CEmax} = V_{CES} - L_{CE} \cdot di/dt$ $t_p \leq 10 \mu s$, $T_{vj} = 25^\circ C$	I_{SC}		2057		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT	R_{thJC}			0.05	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{Paste} = 1 \text{ W}/(m \cdot K)$ / $\lambda_{grease} = 1 \text{ W}/(m \cdot K)$	R_{thCH}		0.045		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj op}$	-40		150	$^\circ C$

二极管, 逆变器 / Diode, Inverter 最大额定值 / Maximum Rated Values

Parameter	Conditions	Symbol	Values	Units
反向重复峰值电压 Repetitive peak reverse voltage	$T_{vj} = 25^\circ C$	V_{RRM}	1200	V
连续正向直流电流 Continuous DC forward current		I_F	600	A
正向重复峰值电流 Repetitive peak forward current	$t_p = 1 \text{ ms}$	I_{FRM}	1200	A

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F = 600 \text{ A}$, $V_{GE} = 0 \text{ V}$ $T_{vj} = 25^\circ C$ $I_F = 600 \text{ A}$, $V_{GE} = 0 \text{ V}$ $T_{vj} = 125^\circ C$	V_F		2.205 2.05		V V
反向恢复峰值电流 Peak reverse recovery current	$I_F = 600 \text{ A}$ $T_{vj} = 25^\circ C$ $V_R = 600 \text{ V}$, $V_{GE} = -15 \text{ V}$ $T_{vj} = 125^\circ C$	I_{RM}		100.83 149.15		A A
恢复电荷 Recovered charge	$I_F = 600 \text{ A}$ $T_{vj} = 25^\circ C$ $V_R = 600 \text{ V}$, $V_{GE} = -15 \text{ V}$ $T_{vj} = 125^\circ C$	Q_r		17.88 81.86		μC μC
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 600 \text{ A}$ $T_{vj} = 25^\circ C$ $V_R = 600 \text{ V}$, $V_{GE} = -15 \text{ V}$ $T_{vj} = 125^\circ C$	E_{rec}		7.532 42.436		mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0.08	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个二极管 / per diode $\lambda_{Paste} = 1 \text{ W}/(m \cdot K)$ / $\lambda_{grease} = 1 \text{ W}/(m \cdot K)$	R_{thCH}		0.05		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj op}$	-40		150	$^\circ C$

负温度系数热敏电阻 / NTC-Thermistor 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
额定电阻值 Rated resistance	$T_{NTC} = 25^\circ C$	R_{25}		5		k Ω
R100 偏差 Deviation of R100	$T_{NTC} = 100^\circ C$, $R_{100} = 493 \text{ W}$	DR/R	-5		5	%
耗散功率 Power dissipation	$T_{NTC} = 25^\circ C$	P_{25}			20	Mw
B-值 B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15 \text{ K}))]$	$B_{25/50}$		3380		K

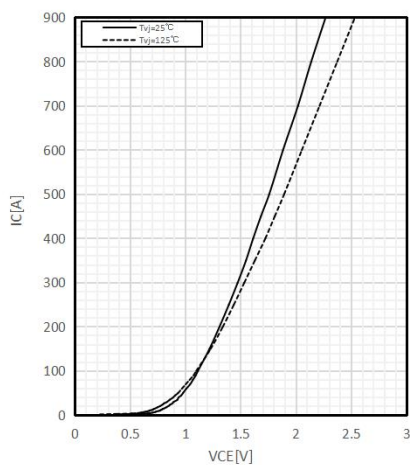
模块 / Module

Parameter	Conditions	Symbol	Values	Units		
绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	VISOL	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 (class 1, 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		14.5 13	mm		
电气间隙 Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		12.5 10	mm		
相对电痕指数 Comperative tracking index		CTI	> 200			
Parameter	Conditions	Symbol	Values			Units
			Min.	Typ.	Max.	
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个模块 / per module lPaste = 1 W/(m·K) / lgrease = 1 W/(m·K)	R _{thCH}		0.01		K/W
杂散电感, 模块+夹具 Stray inductance module and fixture		L _{sCE}		113		nH
模块引线电阻, 端子-芯片 Module lead resistance, terminals - chip	TC = 25°C, 每个开关 / per switch	R _{CC'+EE'} R _{AA'+CC'}		4 3		mΩ
储存温度 Storage temperature		T _{stg}	-40		125	°C
模块安装的安装扭矩 Mounting torque for modul mounting	螺丝 M5 根据相应的应用手册进行安装 Screw M5 - Mounting according to valid application note	M	3		6	Nm
端子联接扭矩 Terminal connection torque	螺丝 M6 根据相应的应用手册进行安装 Screw M6 - Mounting according to valid application note	M	3		6	Nm
重量 Weight		G		345		g

输出特性 IGBT, 逆变器 (典型)

output characteristic IGBT, Inverter (typical)

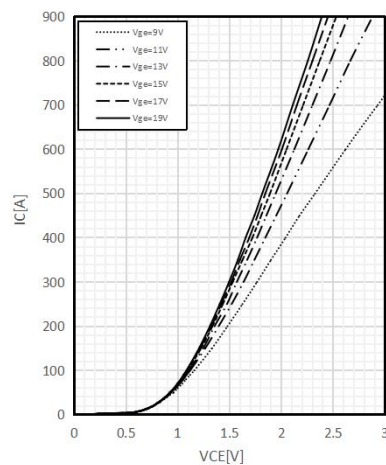
IC = f (VCE)
VGE = 15 V



输出特性 IGBT, 逆变器 (典型)

output characteristic IGBT, Inverter (typical)

IC = f (VCE)
Tvj = 125°C

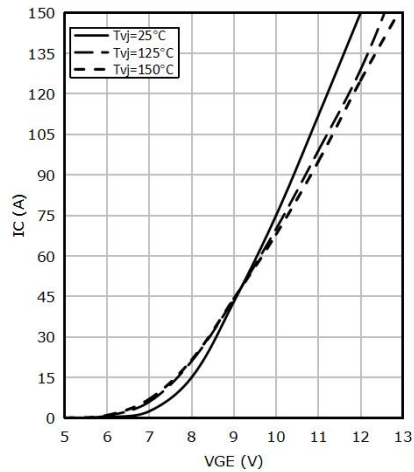


传输特性 IGBT, 逆变器 (典型)

transfer characteristic IGBT, Inverter (typical)

$I_C = f(V_{GE})$

$V_{CE} = 20\text{ V}$

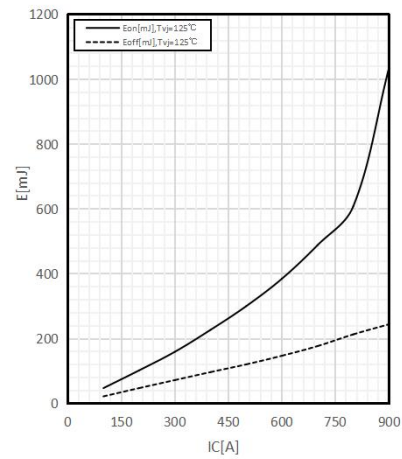


开关损耗 IGBT, 逆变器 (典型)

switching losses IGBT, Inverter (typical)

$E_{on} = f(I_C)$, $E_{off} = f(I_C)$

$V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 20\Omega$, $R_{Goff} = 20\Omega$, $V_{CE} = 600\text{ V}$

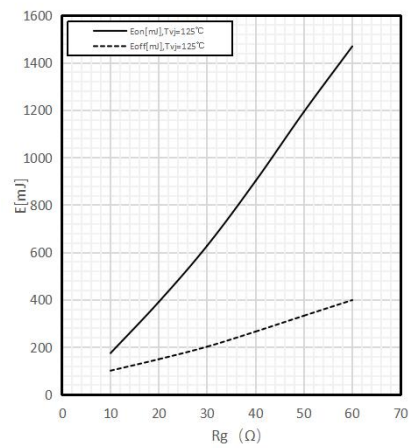


开关损耗 IGBT, 逆变器 (典型)

switching losses IGBT, Inverter (typical)

$E_{on} = f(R_G)$, $E_{off} = f(R_G)$

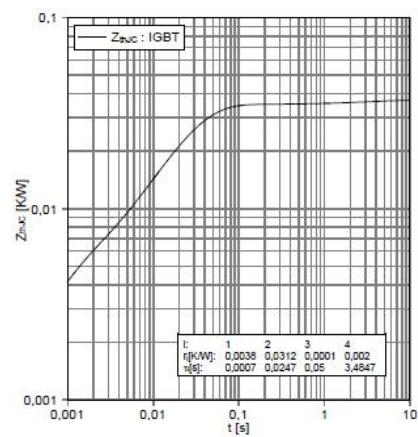
$V_{GE} = \pm 15\text{ V}$, $I_C = 15\text{ A}$, $V_{CE} = 600\text{ V}$



瞬态热阻抗 IGBT, 逆变器

transient thermal impedance IGBT, Inverter

$Z_{thJC} = f(t)$

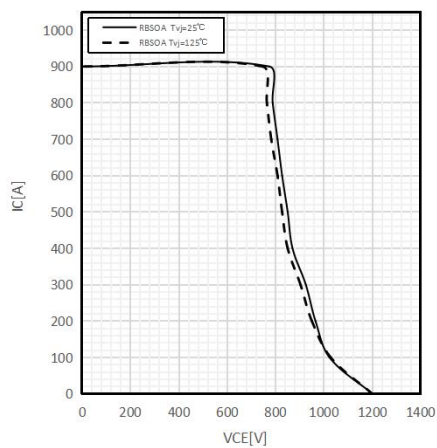


反偏安全工作区 IGBT, 逆变器 (RBSOA)

reverse bias safe operating area IGBT, Inverter (RBSOA)

$I_C = f(V_{CE})$

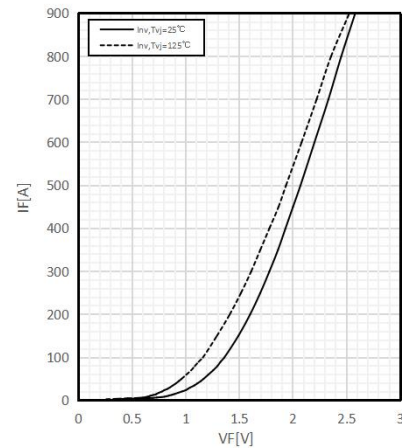
$V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 20\Omega$



正向偏压特性 二极管, 逆变器 (典型)

forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$

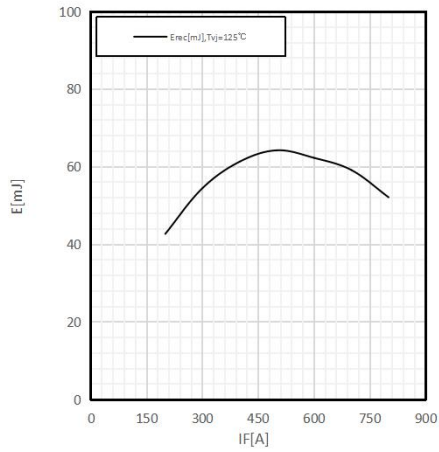


开关损耗 二极管,逆变器 (典型)

switching losses Diode, Inverter (typical)

$E_{rec} = f(IF)$

$R_{Gon} = 20\Omega$, $V_{CE} = 600V$

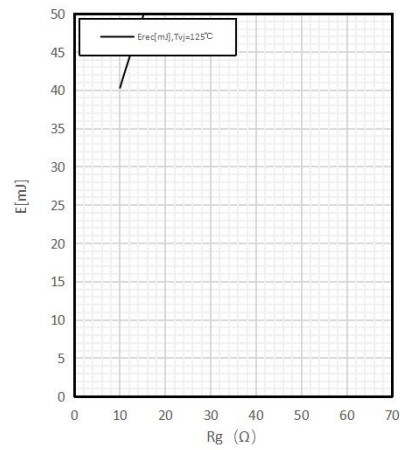


开关损耗 二极管,逆变器 (典型)

switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$

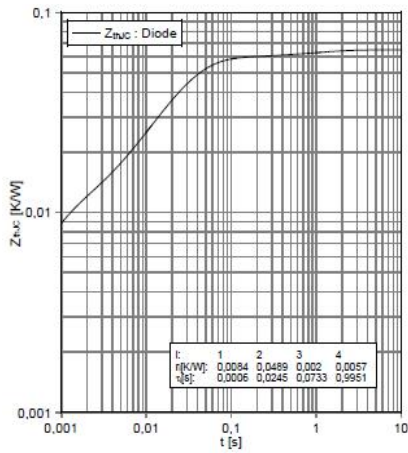
$IF = 15A$, $V_{CE} = 600V$



瞬态热阻抗 二极管,逆变器

transient thermal impedance Diode, Inverter

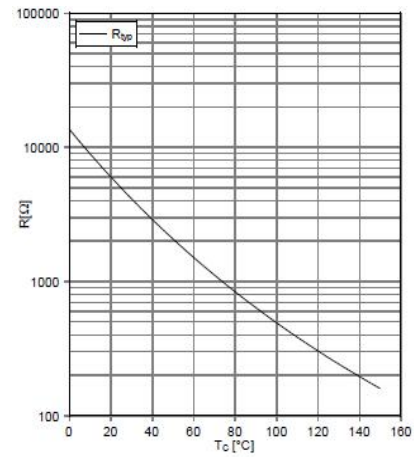
$Z_{thJC} = f(t)$



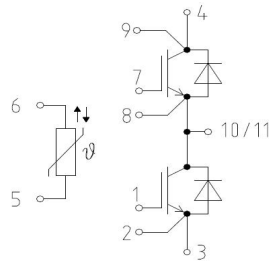
负温度系数热敏电阻 温度特性

NTC-Thermistor-temperature characteristic (typical)

$R = f(T)$



接线图 / Circuit diagram



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