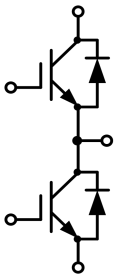
62mm Half Bridge IGBT Module

电气特性:

- 1200V 沟槽栅/场终止工艺
- 低开关损耗
- 正温度系数

典型应用:

- 逆变焊机
- 感应加热
- 高频开关应用
- 逆变器



V_{CES}=1200V，$I_{C\ nom}$=300A / I_{CRM}=600A

IGBT, 逆变器 / IGBT, Inverter

最大额定值 / Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
集电极-发射极电压 Collector-Emitter voltage	T_{vj}=25°C	V_{CES}	1200	V
连续集电极直流电流 Continuous DC collector current	T_C=100°C, $T_{vj\ max}$=175°C	$I_{C\ nom}$	300	A
集电极重复峰值电流 Repetitive peak collector current	t_P=1 ms	I_{CRM}	600	A
栅极-发射极电压 Gate emitter voltage		V_{GE}	±20	V

特征值 / Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-Emitter saturation voltage	V_{GE}=15V, I_C=300A V_{GE}=15V, I_C=300A V_{GE}=15V, I_C=300A	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_{CEsat}		2.10 2.50 2.58	2.65	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	I_C = 8mA, V_{GE}= V_{CE}	T_{vj}=25°C	$V_{GE(th)}$	5.50	6.10	6.70	
栅电荷 Gate charge	V_{GE}=-15V…+15V		Q_G		1.52		µC
内部栅极电阻 Internal gate resistor	T_{vj}=25°C		R_{Gint}		3.48		Ω
输入电容	f=1 MHz, V_{CE}=25 V, V_{GE}=0 V	T_{vj}=25°C	C_{ies}		27.38		nF

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Input capacitance							
反向传输电容 Reverse transfer capacitance			C_{res}		0.21		
集电极-发射极截止电流 Collector-emitter cut-off current	V_{CE}=1200V , V_{GE}= 0 V	T_{vj}=25°C	I_{CES}			2	mA
栅极-发射极漏电流 Gate-emitter leakage current	V_{CE}=0 V, V_{GE}= 20 V	T_{vj}=25°C	I_{GES}			200	nA
开通延迟时间 Turn-on delay time	I_C=300A, V_{CE}=600 V V_{GE}=±15 V, R_G=3.3Ω (电感负载) / (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\,on}$		350 362 363		ns
上升时间 Rise time	I_C=300A, V_{CE}=600 V V_{GE}=±15 V, R_G=3.3Ω (电感负载) / (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_r		87 99 96		
关断延迟时间 Turn-off delay time	I_C=300A, V_{CE}=600 V V_{GE}=±15 V, R_G=3.3Ω (电感负载) / (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\,off}$		227 272 281		
下降时间 Fall time	I_C=300A, V_{CE}=600 V V_{GE}=±15 V, R_G=3.3Ω (电感负载) / (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_f		60 94 96		
开通损耗能量（每脉冲） Turn-on energy loss per pulse	I_C=300A, V_{CE}=600 V V_{GE}=±15 V, R_G=3.3Ω di/dt =2477A/μs (Tvj = 150°C) (电感负载) / (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{on}		25.31 40.84 45.26		mJ
关断损耗能量（每脉冲） Turn-off energy loss per pulse	I_C=300A, V_{CE}=600 V V_{GE}=±15 V, R_G=3.3Ω dv/dt=8706V/μs (Tvj = 150°C) (电感负载) / (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{off}		9.88 14.3 15,87		
在开关状态下温度 Temperature under switching conditions			$T_{vj\,op}$	-40		150	°C

二极管，逆变器 / Diode, Inverter

最大额定值 / Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
反向重复峰值电压 Repetitive peak reverse voltage	T_{vj}=25°C	V_{RRM}	1200	V
连续正向直流电流 Continuous DC forward current		I_F	300	A
正向重复峰值电流 Repetitive peak forward current	t_p=1ms	I_{FRM}	600	A
I^2t 值 I^2t-value	t_p=10ms，sin180°，T_j=125°C	I^2t	34000	A^2S

特征值 / Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
正向电压 Forward voltage	I_F=300A I_F=300A I_F=300A	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		2.08 1.74 1.66	2.55	V
反向恢复峰值电流 Peak reverse recovery current	I_F=300A, -di$_F$/dt=2477A/µs(T_{vj}=150°C) V_R=600V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	I_{RM}		122 224 243		A
恢复电荷 Recovered charge	I_F=300A, -di$_F$/dt=2477A/µs(T_{vj}=150°C) V_R=600V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	Q_r		18.96 50.12 60.12		µC
反向恢复损耗（每脉冲） Reverse recovered energy	I_F=300A, -di$_F$/dt=2477A/µs(T_{vj}=150°C) V_R=600V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{rec}		7.05 17.91 21.72		mJ
在开关状态下温度 Temperature under switching conditions			$T_{vj\ op}$	-40		150	°C

模块 / Module

Parameter	Conditions	Symbol	Value			Unit
绝缘测试电压 Isolation test voltage	RMS, f=50Hz, t=1min	V_{ISOL}	4000			V
内部绝缘 Internal isolation			Al_2O_3			
储存温度 Storage temperature		T_{stg}	-40		125	°C
模块安装的扭矩 Mounting torque for modul mounting		M	3.0		6.0	Nm
端子连接扭矩 Terminal Connection Torque		M	2.5		5.0	Nm
重量 Weight		W		313		g

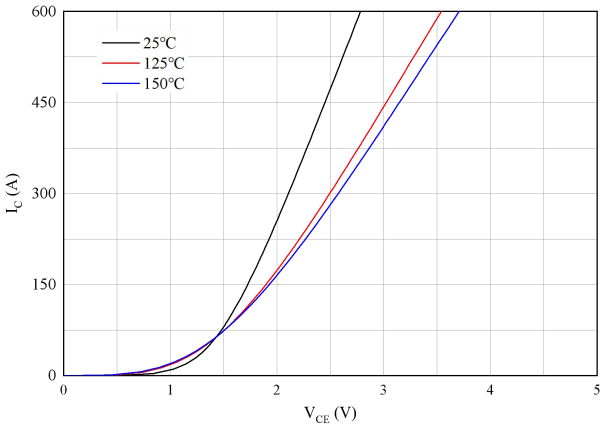


图 1. 典型输出特性 (V_{GE}=15V)

Figure 1. Typical output characteristics (V_{GE}=15V)

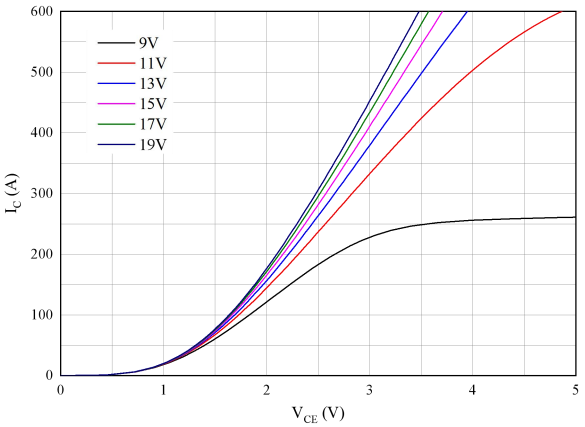


图 2. 典型输出特性 (T_{vj}=150℃)

Figure 2. Typical output characteristics (T_{vj}=150℃)

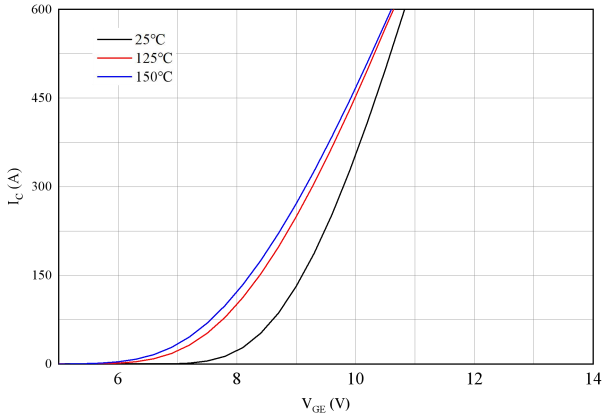


图 3. 典型传输特性(V_{CE}=20V)

Figure 3. Typical transfer characteristic(V_{CE}=20V)

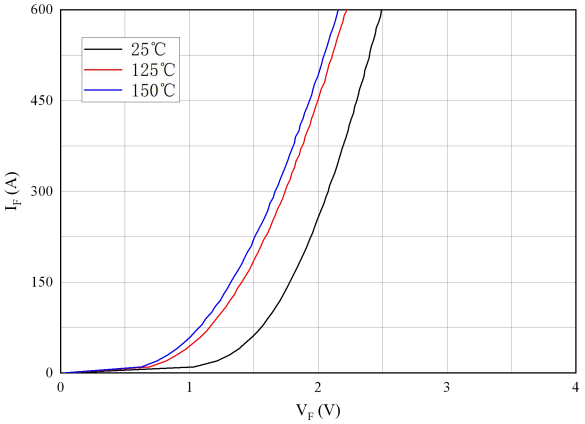


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

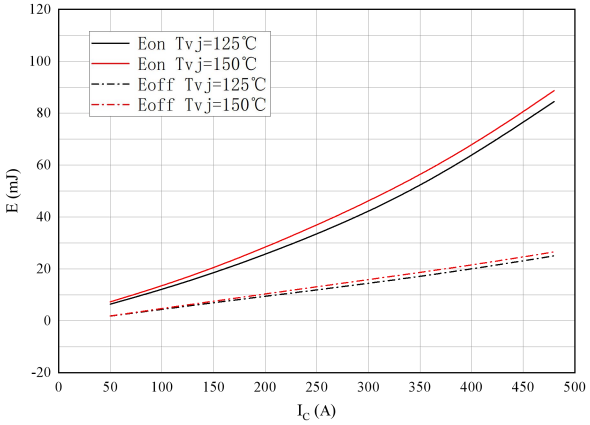


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT

VGE=±15V, RGon=3.3Ω, RGoff=3.3Ω, VCE=600V

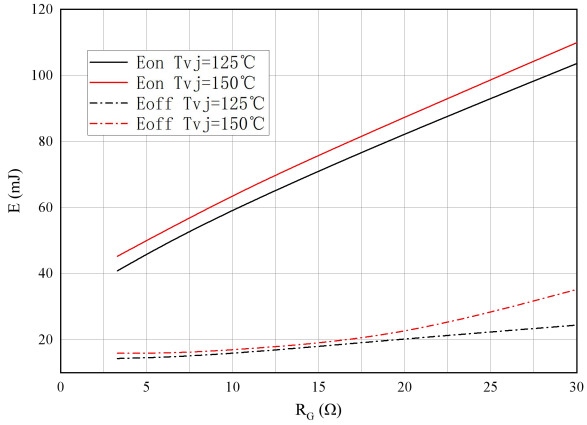


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT

VGE=±15V, IC=300A, VCE=600V

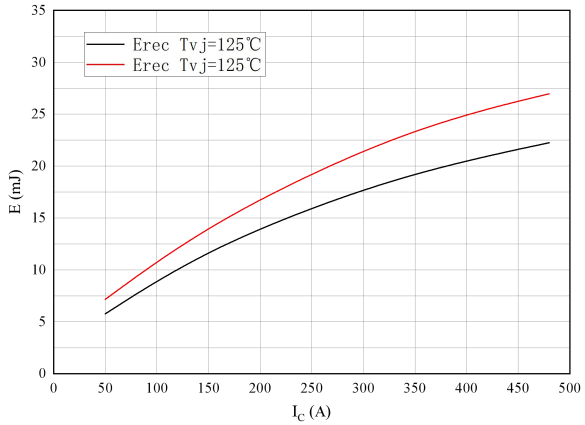


图 7. 开关损耗二极管

Figure 7. Switching losses of Diode

RGon=3.3Ω, VCE=600V

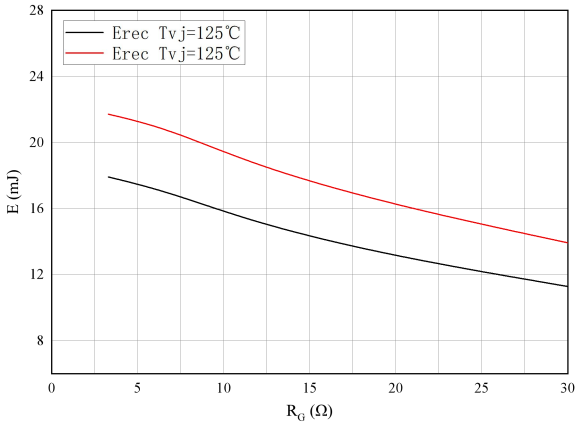


图 8. 开关损耗二极管

Figure 8. Switching losses of Diode

IF=300A, VCE=600V

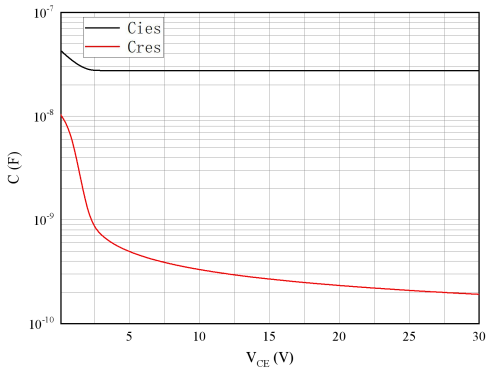
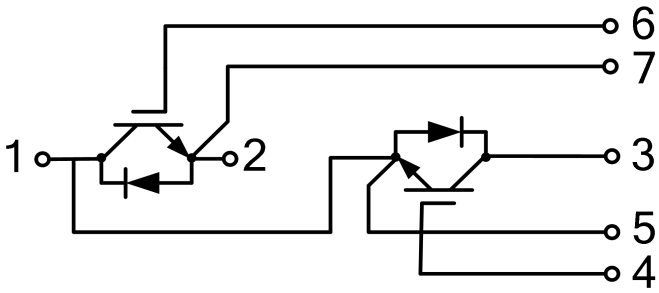


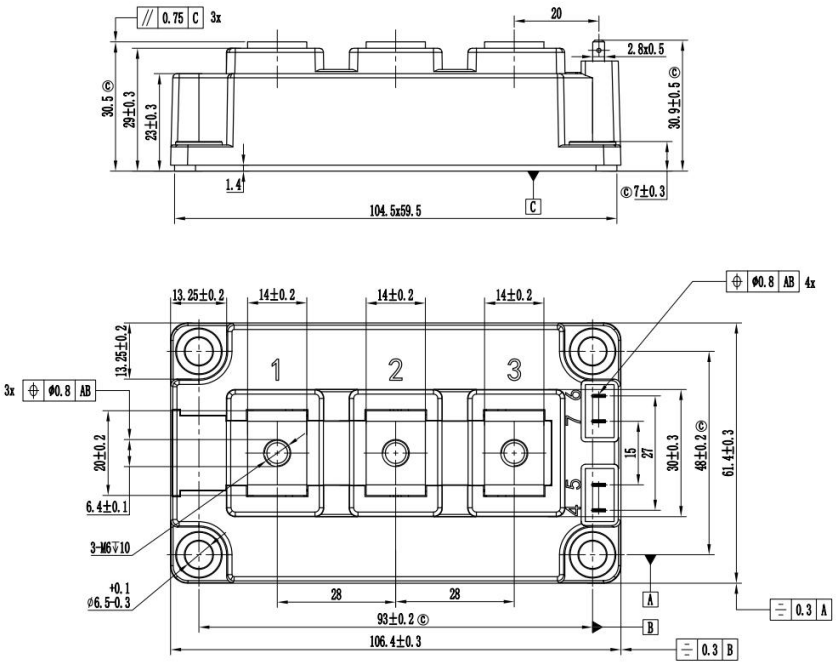
图 9. 电容特性

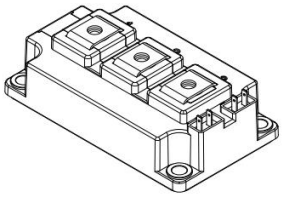
Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines





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