

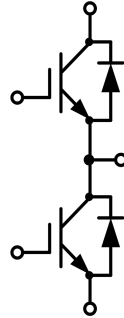
## 62mm Half Bridge IGBT Module

### 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:

- 变频器
- UPS
- 伺服
- 逆变器



$V_{CES} = 1200V$ ,  $I_{C\ nom} = 200A$  /  $I_{CRM} = 400A$

## 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	$T_{vj} = 25^{\circ}C$	$V_{CES}$	1200	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}C$ , $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	200	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	$I_{CRM}$	400	A
栅极-发射极电压 Gate emitter voltage		$V_{GE}$	$\pm 20$	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	$V_{GE} = 15V$ , $I_C = 200A$ $V_{GE} = 15V$ , $I_C = 200A$ $V_{GE} = 15V$ , $I_C = 200A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	$V_{CESat}$	1.84 2.10 2.15	2.20	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 7.6mA$ , $V_{GE} = V_{CE}$	$T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	5.3	5.9	6.5
栅电荷 Gate charge	$V_{GE} = -15V \dots +15V$		$Q_G$	1.58		$\mu C$
内部栅极电阻 Internal gate resistor			$R_{Gint}$	3.65		$\Omega$
输入电容 Input capacitance	$f = 1MHz$ , $V_{CE} = 25\ V$ , $V_{GE} = 0\ V$	$T_{vj} = 25^{\circ}C$	$C_{ies}$	17.33		nF

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反向传输电容 Reverse transfer capacitance	$f=1\text{MHz}, V_{CE}=25\text{V}, V_{GE}=0\text{V}$	$T_{vj}=25^\circ\text{C}$	$C_{res}$		0.70		nF
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}$	$T_{vj}=25^\circ\text{C}$	$I_{CES}$			1	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE}=0\text{V}, V_{GE}=20\text{V}$	$T_{vj}=25^\circ\text{C}$	$I_{GES}$			200	nA
开通延迟时间 Turn-on delay time	$I_C=200\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=2.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$t_{d\ on}$		211 227 225		ns
上升时间 Rise time	$I_C=200\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=2.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$t_r$		102 104 112		
关断延迟时间 Turn-off delay time	$I_C=200\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=2.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$t_{d\ off}$		361 417 433		
下降时间 Fall time	$I_C=200\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=2.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$t_f$		99 134 185		
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=200\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=2.5\Omega$ $di/dt=1500\text{A}/\mu\text{s}(T_{vj}=150^\circ\text{C})$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$E_{on}$		19.97 26.44 27.89		mJ
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	$I_C=200\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=2.5\Omega$ $du/dt=4500\text{V}/\mu\text{s}(T_{vj}=150^\circ\text{C})$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$E_{off}$		13.08 17.99 18.75		
短路数据 SC data	$V_{GE}\leq 15\text{V}, V_{ce}=800\text{V}$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt \quad t_p\leq 10\mu\text{s}, T_{vj}=150^\circ\text{C}$		$I_{SC}$		1264		A
在开关状态下温度 Temperature under switching conditions			$T_{vj\ op}$	-40		150	$^\circ\text{C}$

## 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	$T_{vj}=25^\circ\text{C}$	$V_{RRM}$	1200	V
连续正向直流电流 Continuous DC forward current		$I_F$	200	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1\text{ms}$	$I_{FRM}$	400	A
$I^2t$ 值 $I^2t$ -value	$t_p=10\text{ms}, \sin 180^\circ, T_j=125^\circ\text{C}$	$I^2t$	10937	$\text{A}^2\text{S}$

### 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	

正向电压 Forward voltage	$I_F=200A, V_{GE}=0V$ $I_F=200A, V_{GE}=0V$ $I_F=200A, V_{GE}=0V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$V_F$		2.42 2.55 2.43	2.90	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=200A,$ $-di_F/dt=1500A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$I_{RM}$		90 115 128		A
恢复电荷 Recovered charge	$I_F=200A,$ $-di_F/dt=1500A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$Q_r$		9.19 19.91 24.39		$\mu C$
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=200A,$ $-di_F/dt=1500A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$E_{rec}$		3.15 7.56 9.32		mJ
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-40		150	$^{\circ}C$

**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 <sub>2</sub> O <sub>3</sub>			
储存温度 Storage temperature		$T_{stg}$	-40		125	$^{\circ}C$
模块安装的扭矩 Mounting torque for modul mounting		M	3.0		6.0	Nm
重量 Weight		W		324		g

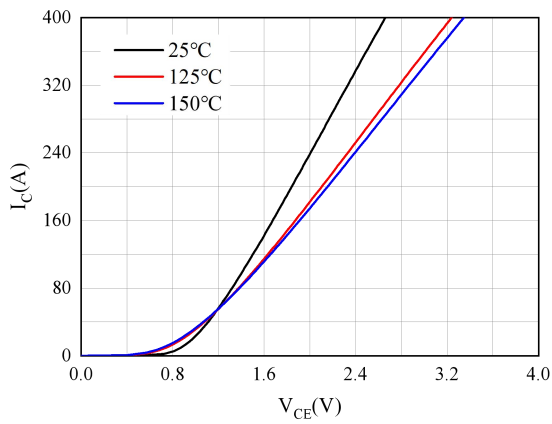


图 1. 典型输出特性 ( $V_{GE}=15V$ )

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

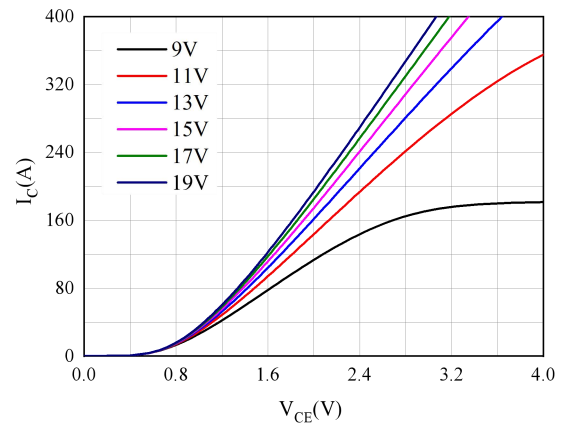


图 2. 典型输出特性 ( $T_{vj}=150^{\circ}C$ )

Figure 2. Typical output characteristics ( $T_{vj}=150^{\circ}C$ )

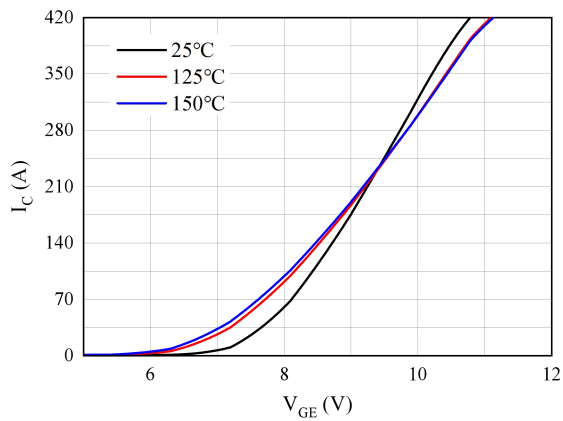


图 3. 典型传输特性( $V_{CE}=20V$ )

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

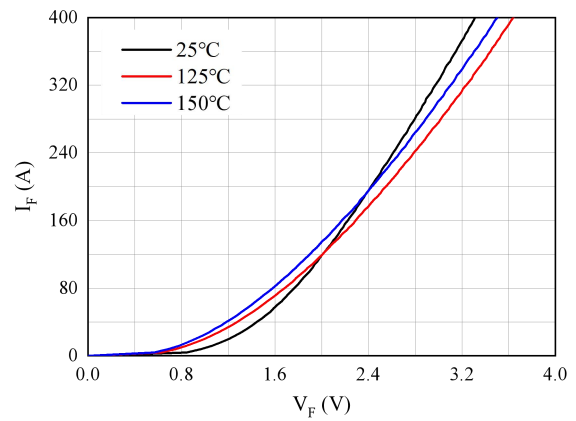


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

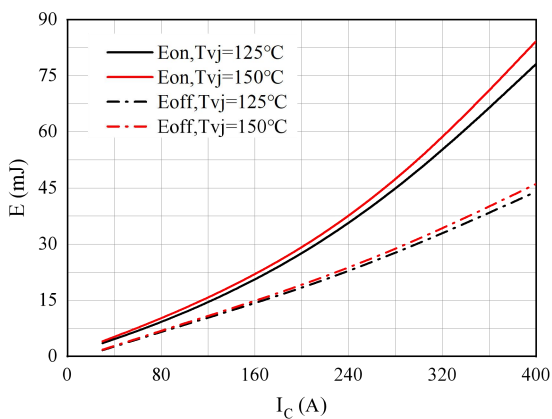


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT  
 $V_{GE}=\pm 15V, R_{Gon}=2.5\Omega, R_{Goff}=2.5\Omega, V_{CE}=600V$

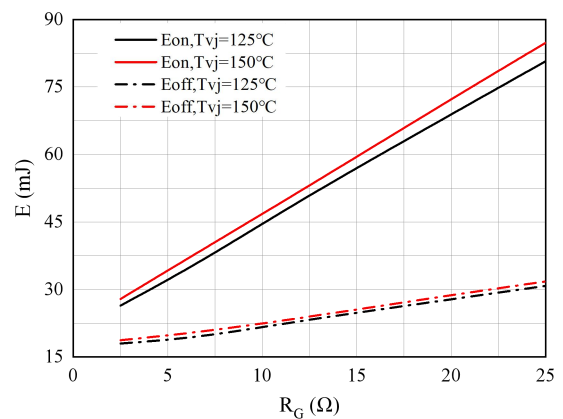


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT  
 $V_{GE}=\pm 15V, I_C=200A, V_{CE}=600V$

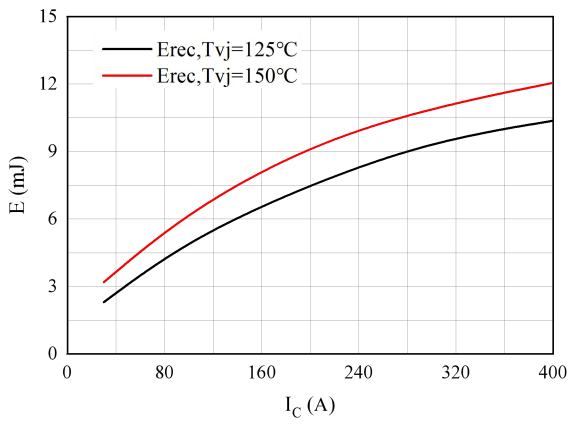


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode  
 $R_{Gon}=2.5\Omega, V_{CE}=600V$

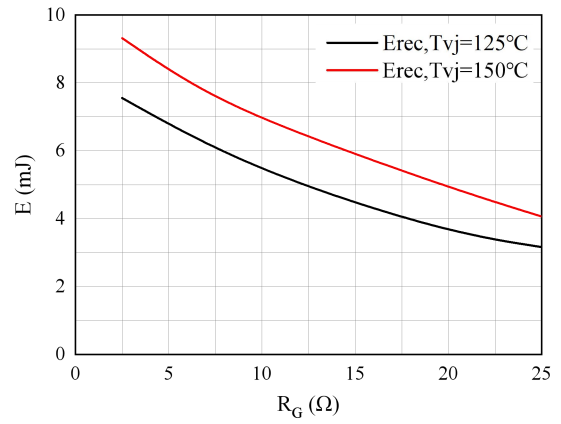


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode  
 $I_F=200A, V_{CE}=600V$

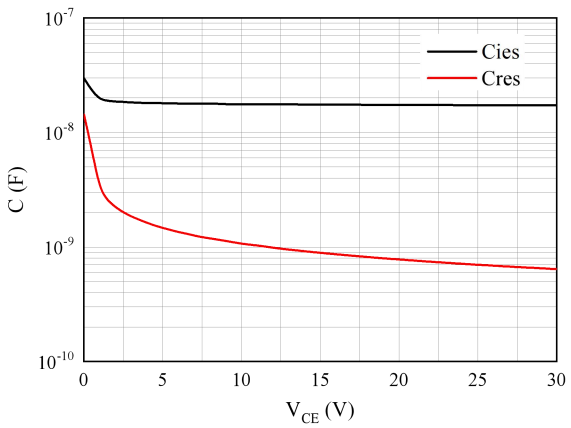
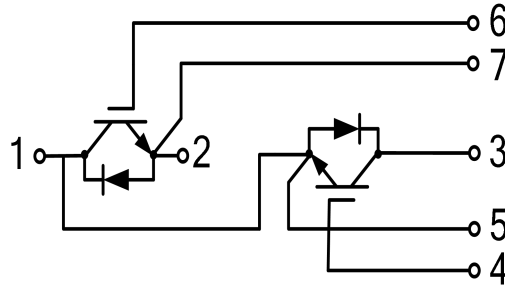


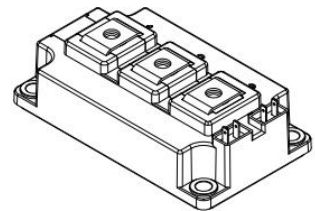
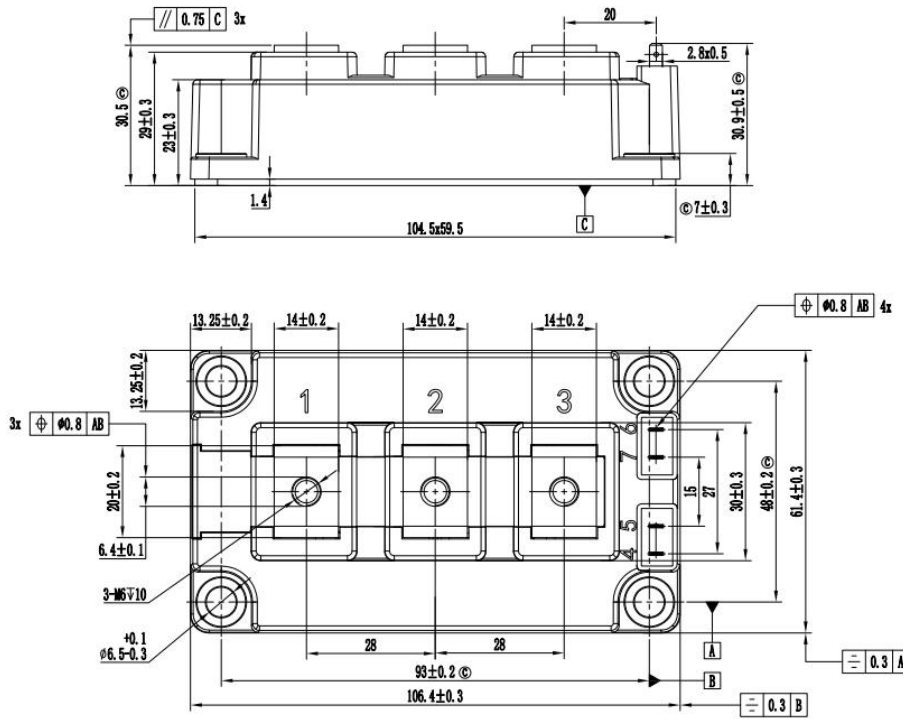
图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines



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2. 未标注公差按GB/T1804-m执行