

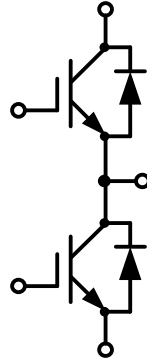
## 62mm Half Bridge IGBT Module

### 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



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

## 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	$T_{vj}=25^{\circ}C$	$V_{CES}$	1200	V
连续集电极直流电流 Continuous DC collector current	$T_C=100^{\circ}C$ , $T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	300	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\ ms$	$I_{CRM}$	600	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$ , $T_{vj\ max} = 175^{\circ}C$	$P_{tot}$	1500	W
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	$V_{GE}=15V$ , $I_C=300A$ $V_{GE}=15V$ , $I_C=300A$ $V_{GE}=15V$ , $I_C=300A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$V_{CEsat}$	2.00 2.45 2.60	2.50	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C=11.5mA$ , $V_{GE}=V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.30	5.90	6.50
栅电荷 Gate charge	$V_{GE}=-15V\dots+15V$		$Q_G$	1.60		$\mu C$
内部栅极电阻			$R_{Gint}$	1.70		$\Omega$

Internal gate resistor						
输入电容 Input capacitance	f=1MHz, V <sub>CE</sub> =25 V, V <sub>GE</sub> =0 V	T <sub>vj</sub> =25°C	C <sub>ies</sub>	27.50		nF
反向传输电容 Reverse transfer capacitance			C <sub>res</sub>	0.85		nF
集电极-发射极截止电流 Collector-emitter cut-off current	V <sub>CE</sub> =1200V, V <sub>GE</sub> = 0 V	T <sub>vj</sub> =25°C	I <sub>CES</sub>		2	mA
栅极-发射极漏电流 Gate-emitter leakage current	V <sub>CE</sub> =0 V, V <sub>GE</sub> = 20 V	T <sub>vj</sub> =25°C	I <sub>GES</sub>		200	nA
开通延迟时间 Turn-on delay time	I <sub>C</sub> =300A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =1.8Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C	t <sub>d on</sub>		150	
		T <sub>vj</sub> =125°C			180	
		T <sub>vj</sub> =150°C			185	
上升时间 Rise time	I <sub>C</sub> =300A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =1.8Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C	t <sub>r</sub>		45	
		T <sub>vj</sub> =125°C			50	
		T <sub>vj</sub> =150°C			52	
关断延迟时间 Turn-off delay time	I <sub>C</sub> =300A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =1.8Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C	t <sub>d off</sub>		280	ns
		T <sub>vj</sub> =125°C			340	
		T <sub>vj</sub> =150°C			350	
下降时间 Fall time	I <sub>C</sub> =300A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =1.8Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C	t <sub>f</sub>		190	
		T <sub>vj</sub> =125°C			250	
		T <sub>vj</sub> =150°C			270	
开通损耗能量（每脉冲） Turn-on energy loss per pulse	I <sub>C</sub> =300A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =1.8Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C	E <sub>on</sub>		12.00	mJ
		T <sub>vj</sub> =125°C			25.80	
		T <sub>vj</sub> =150°C			30.20	
关断损耗能量（每脉冲） Turn-off energy loss per pulse	I <sub>C</sub> =300A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =1.8Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C	E <sub>off</sub>		24.00	
		T <sub>vj</sub> =125°C			33.30	
		T <sub>vj</sub> =150°C			35.80	
短路数据 SC data	V <sub>GE</sub> ≤15V, V <sub>ce</sub> =800V V <sub>CEmax</sub> =V <sub>CES</sub> -L <sub>sCE</sub> ·di/dt t <sub>p</sub> ≤10us, T <sub>vj</sub> =150°C		I <sub>SC</sub>		927	A
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R <sub>thJC</sub>		0.1	K/W
在开关状态下温度 Temperature under switching conditions			T <sub>vj op</sub>	-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 <sub>vj</sub> =25°C	V <sub>RRM</sub>	1200	V
连续正向直流电流 Continuous DC forward current		I <sub>F</sub>	300	A
正向重复峰值电流 Repetitive peak forward current	t <sub>p</sub> =1ms	I <sub>FRM</sub>	600	A
I <sup>2</sup> t 值 I <sup>2</sup> t-value	t <sub>p</sub> =10ms, sin180°, T <sub>j</sub> =125°C	I <sup>2</sup> t	19000	A <sup>2</sup> s

## 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=300A, V_{GE}=0V$ $I_F=300A, V_{GE}=0V$ $I_F=300A, V_{GE}=0V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$V_F$	2.25 2.35 2.25	2.75	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=300A,$ $-di_F/dt=4870A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$I_{RM}$	215 239 256		A
恢复电荷 Recovered charge	$I_F=300A,$ $-di_F/dt=4870A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$Q_r$	15.40 36.40 47.60		$\mu C$
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=300A,$ $-di_F/dt=4870A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$E_{rec}$	6.80 14.30 18.30		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		$R_{thJC}$		0.15	K/W
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			$Al_2O_3$			
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		315		g

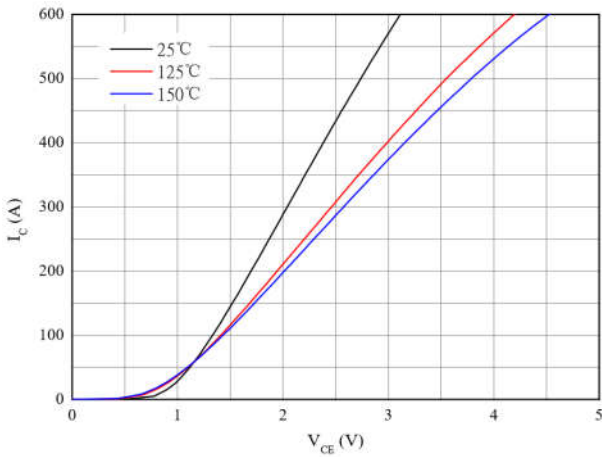


图 1. 典型输出特性 ( $V_{GE}=15V$ )

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

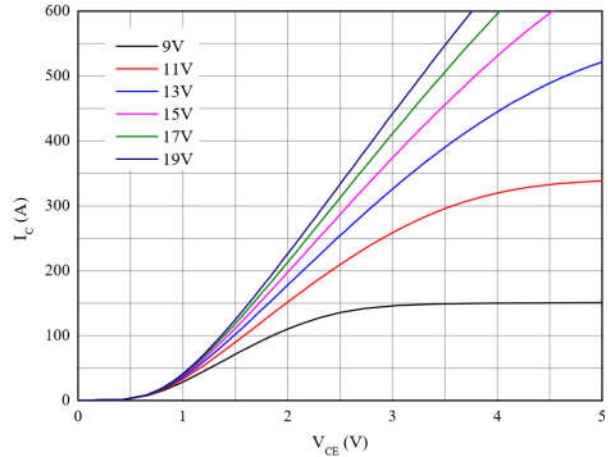


图 2. 典型输出特性 ( $T_{vj}=150^{\circ}C$ )

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

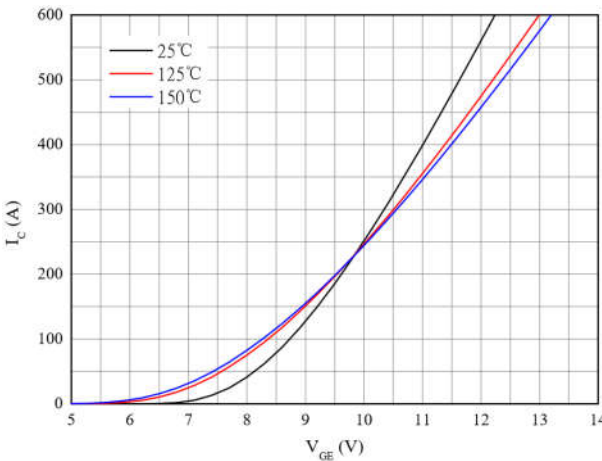


图 3. 典型传输特性 ( $V_{CE}=20V$ )

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

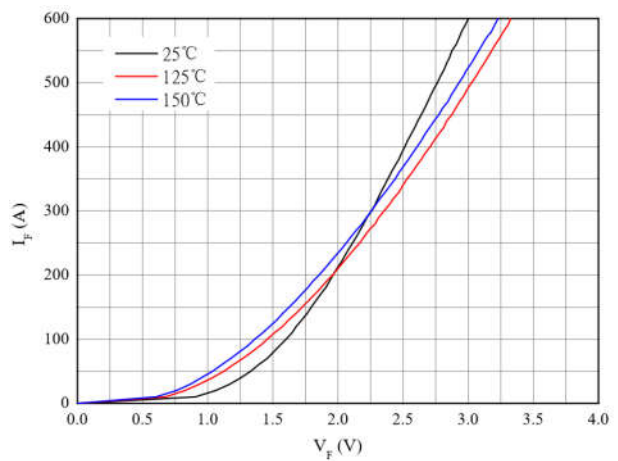


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

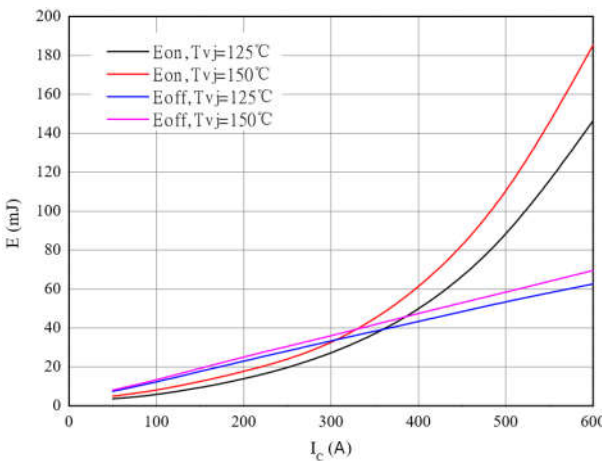


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT  
 $V_{GE}=\pm 15V, R_{Gon}=1.8\Omega, R_{Goff}=1.8\Omega, V_{CE}=600V$

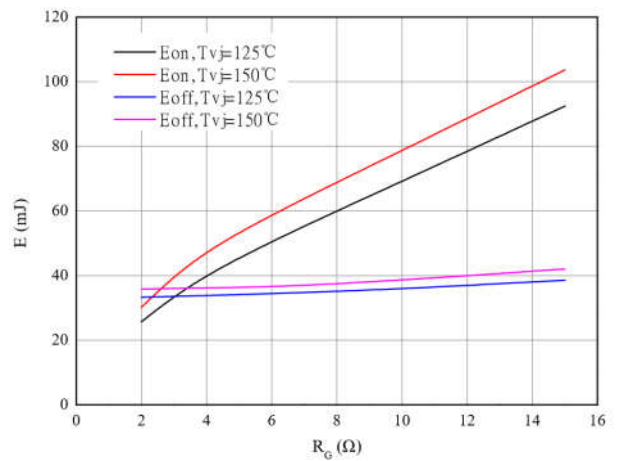


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT  
 $V_{GE}=\pm 15V, I_C=300A, V_{CE}=600V$

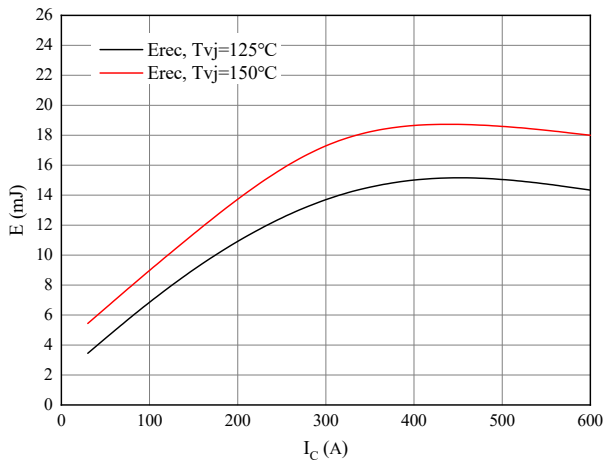


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode

$R_{Gon}=1.8\ \Omega$ ,  $V_{CE}=600\text{V}$

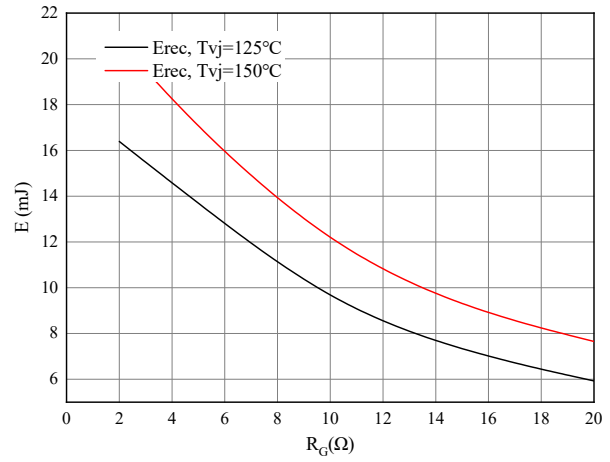


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode

$I_F=300\text{A}$ ,  $V_{CE}=600\text{V}$

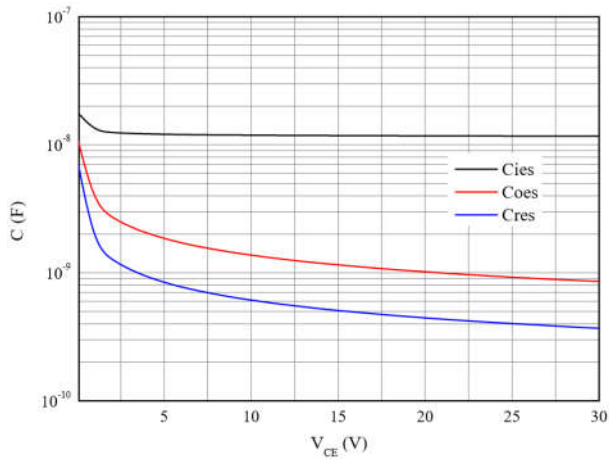
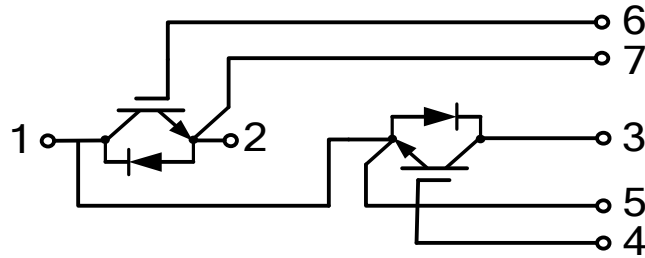


图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

