

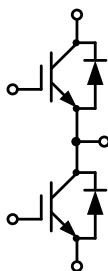
## 34mm Half Bridge IGBT Module

## 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


 $V_{CES}=1200V, I_{C\ nom}=75A / I_{CRM}=150A$ 
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	$T_C=100^{\circ}C, T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	75	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\ ms$	$I_{CRM}$	150	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C, T_{vj\ max} = 175^{\circ}C$	$P_{tot}$	395	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	$V_{GE}=15V, I_C=75A$ $V_{GE}=15V, I_C=75A$ $V_{GE}=15V, I_C=75A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$V_{CESat}$	1.98 2.45 2.56	2.50	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 2.6mA, V_{GE} = V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.10 5.70	6.30	
栅电荷 Gate charge	$V_{GE}=-15V...+15V$		$Q_G$	0.36		$\mu C$
内部栅极电阻			$R_{Gint}$	6.00		$\Omega$

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>	4.49	nF		
反向传输电容 Reverse transfer capacitance						
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>	1	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>	100	nA		
开通延迟时间 Turn-on delay time	I <sub>C</sub> =75A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =10Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C T <sub>vj</sub> =125°C T <sub>vj</sub> =150°C	t <sub>d on</sub>	97		
上升时间 Rise time				47		
下降时间 Fall time				119		
关断延迟时间 Turn-off delay time	I <sub>C</sub> =75A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =10Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C T <sub>vj</sub> =125°C T <sub>vj</sub> =150°C	t <sub>d off</sub>	242		
上升时间 Rise time				58		
下降时间 Fall time				63		
开通损耗能量（每脉冲） Turn-on energy loss per pulse	I <sub>C</sub> =75A, V <sub>CE</sub> =600 V V <sub>GE</sub> =±15 V, R <sub>G</sub> =10Ω (电感负载) / (inductive load)	T <sub>vj</sub> =25°C T <sub>vj</sub> =125°C T <sub>vj</sub> =150°C	E <sub>on</sub>	6.72		mJ
关断损耗能量（每脉冲） Turn-off energy loss per pulse				10.62		
结-外壳热阻 Thermal resistance, junction to case				11.89		
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>	60	A
正向重复峰值电流 Repetitive peak forward current	t <sub>p</sub> =1ms	I <sub>FRM</sub>	120	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	1200	A <sup>2</sup> s

## 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=60A, V_{GE}=0V$ $I_F=60A, V_{GE}=0V$ $I_F=60A, V_{GE}=0V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$V_F$	1.90 1.62 1.54	2.40	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=60A,$ $-di_F/dt=900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$I_{RM}$	29 43 48		A
恢复电荷 Recovered charge	$I_F=60A,$ $-di_F/dt=900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$Q_r$	5.46 11.68 13.88		$\mu C$
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=60A,$ $-di_F/dt=900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$E_{rec}$	2.07 4.26 5.06		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		$R_{thJC}$		0.58	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 <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		155		g

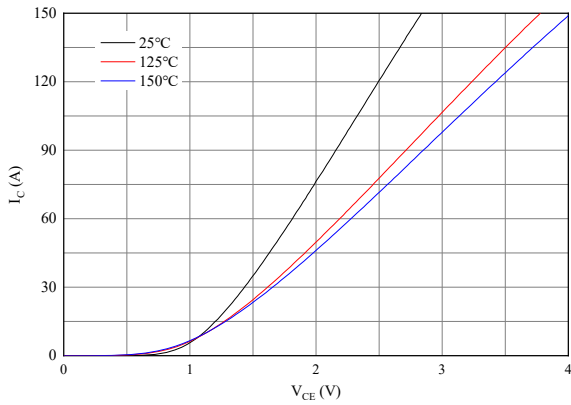


图 1. 典型输出特性 ( $V_{GE}=15V$ )

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

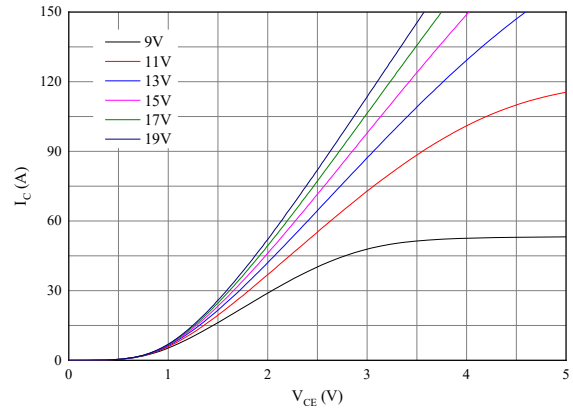


图 2. 典型输出特性 ( $T_{vj}=150^{\circ}C$ )

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

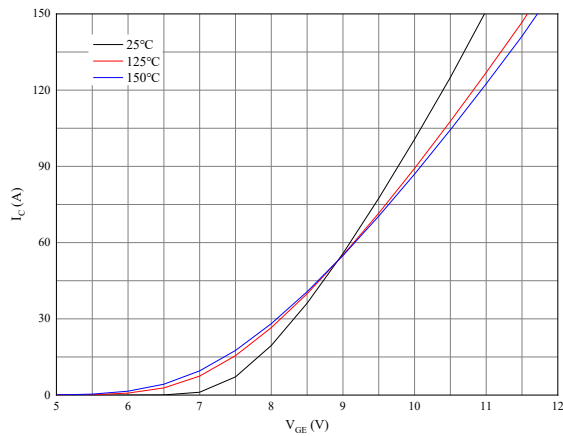


图 3. 典型传输特性 ( $V_{CE}=20V$ )

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

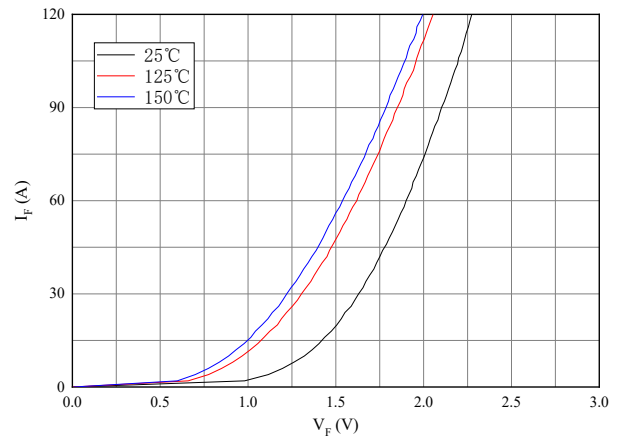


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

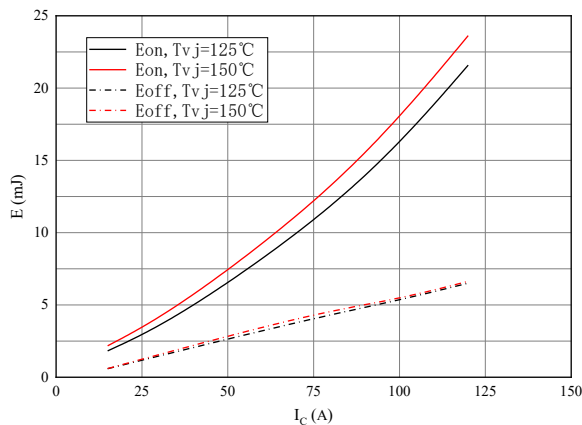


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT

$V_{GE}=\pm 15V, R_{Gon}=10\Omega, R_{Goff}=10\Omega, V_{CE}=600V$

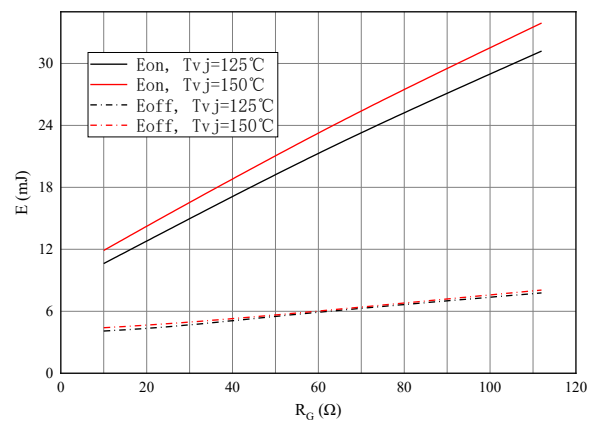


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT

$V_{GE}=\pm 15V, I_C=75A, V_{CE}=600V$

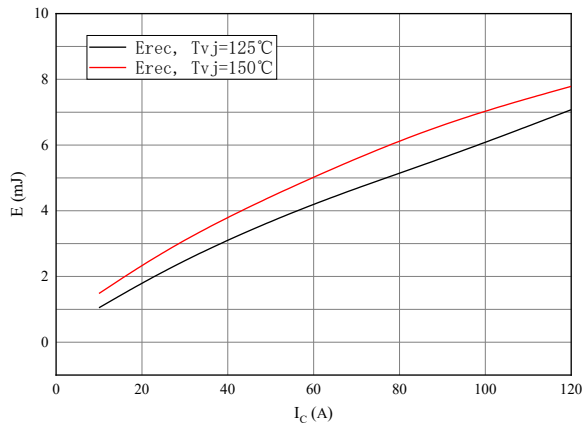


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode  
RGon=10Ω, VCE=600V

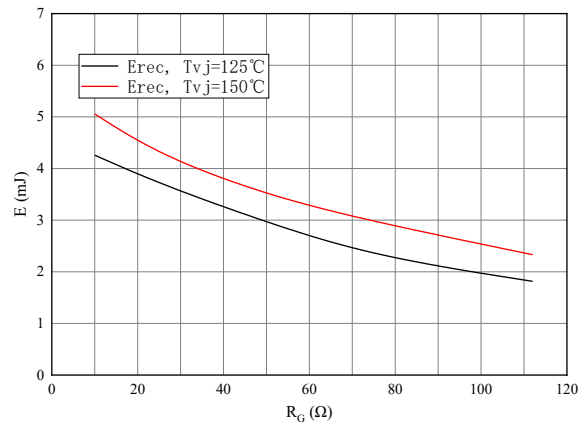


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode  
IF=60A, VCE=600V

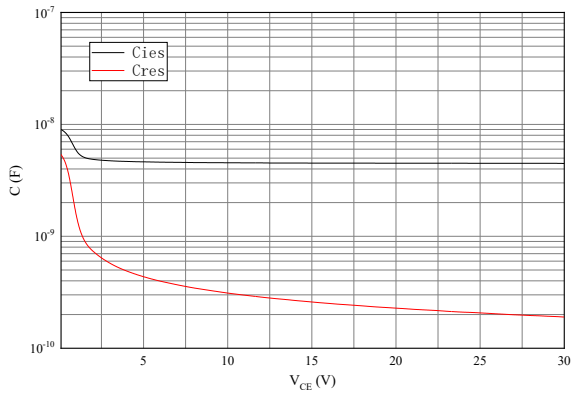
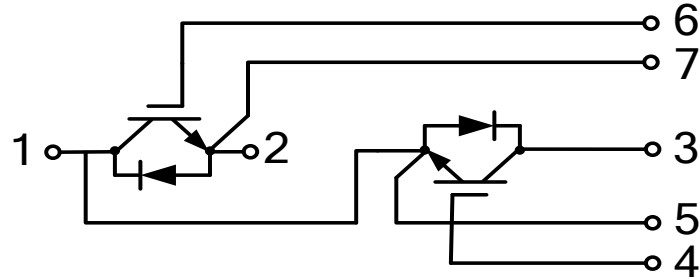


图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

