

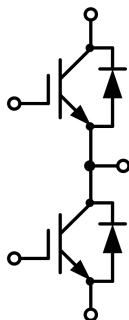
## 34mm Half Bridge IGBT Module

## 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


 $V_{CES}=1200V, I_{C\text{nom}}=150A / I_{CRM}=300A$ 
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	$T_C=100^{\circ}C, T_{vj\text{max}}=175^{\circ}C$	$I_{C\text{nom}}$	150	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\text{ms}$	$I_{CRM}$	300	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	$V_{GE}=15V, I_C=150A$ $V_{GE}=15V, I_C=150A$ $V_{GE}=15V, I_C=150A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$V_{CESat}$	1.97 2.28 2.34	2.50	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 3.8mA, V_{GE}=V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.20	5.80 6.40	
内部栅极电阻 Internal gate resistor			$R_{Gint}$	8.41		$\Omega$
输入电容 Input capacitance	$f=1MHz, V_{CE}=25V, V_{GE}=0V$	$T_{vj}=25^{\circ}C$	$C_{ies}$	13.86		nF
反向传输电容			$C_{res}$	0.1		

Reverse transfer capacitance						
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=1200V, V_{GE}=0V$	$T_{vj}=25^{\circ}C$	$I_{CES}$		1	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE}=0V, V_{GE}=20V$	$T_{vj}=25^{\circ}C$	$I_{GES}$		150	nA
开通延迟时间 Turn-on delay time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=6.8\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_{don}$		396.7 401.6 415.1	ns
上升时间 Rise time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=6.8\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_r$		71.3 73.1 75.9	
关断延迟时间 Turn-off delay time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=6.8\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_{doff}$		239.5 286.2 297.1	
下降时间 Fall time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=6.8\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_f$		86.2 131.2 141.4	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=6.8\Omega$ $di/dt = 1602A/\mu s$ ( $T_{vj} =$ $150^{\circ}C$ ) (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$E_{on}$		10.30 15.12 16.55	
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=6.8\Omega$ $dv/dt=8236V/\mu s$ ( $T_{vj} =$ $150^{\circ}C$ ) (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$E_{off}$		5.04 7.27 7.90	mJ
在开关状态下温度 Temperature under switching conditions			$T_{vjop}$	-40	150	$^{\circ}C$

## 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	$T_{vj}=25^{\circ}C$	$V_{RRM}$	1200	V
连续正向直流电流 Continuous DC forward current		$I_F$	150	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1ms$	$I_{FRM}$	300	A
$I^2t$ 值 $I^2t$ value	$t_p=10ms, \sin 180^{\circ}, T_{vj}=125^{\circ}C$	$I^2t$	4090	$A^2s$

## 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=150A, V_{GE}=0V$ $I_F=150A, V_{GE}=0V$ $I_F=150A, V_{GE}=0V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$V_F$	2.49 2.01 1.91	3.00	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=150A,$ $-di_F/dt=1776A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$I_{RM}$	67.2 105.6 118.4		A
恢复电荷 Recovered charge	$I_F=150A,$ $-di_F/dt=1776A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$Q_r$	6.81 15.16 18.34		$\mu C$
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=150A,$ $-di_F/dt=1776A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$E_{rec}$	2.39 5.14 6.26		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			$Al_2O_3$			
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		5.0	Nm
端子连接扭矩 Terminal Connection Torque		M	2.5		5.0	Nm
重量 Weight		W		158		g

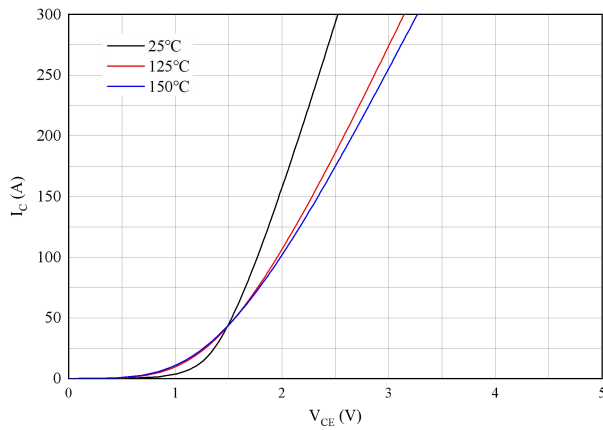


图 1. 典型输出特性 ( $V_{GE}=15V$ )

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

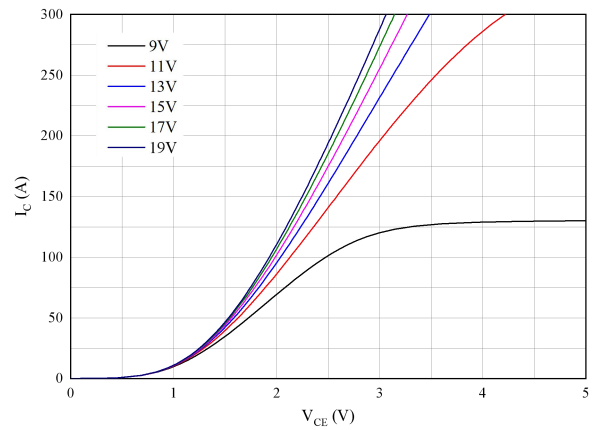


图 2. 典型输出特性 ( $T_{vj}=150^{\circ}C$ )

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

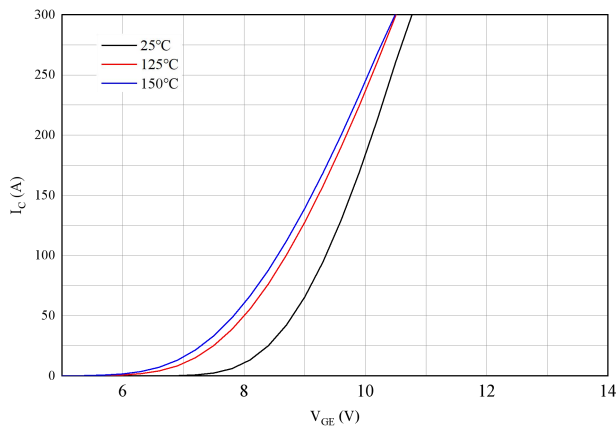


图 3. 典型传输特性 ( $V_{CE}=20V$ )

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

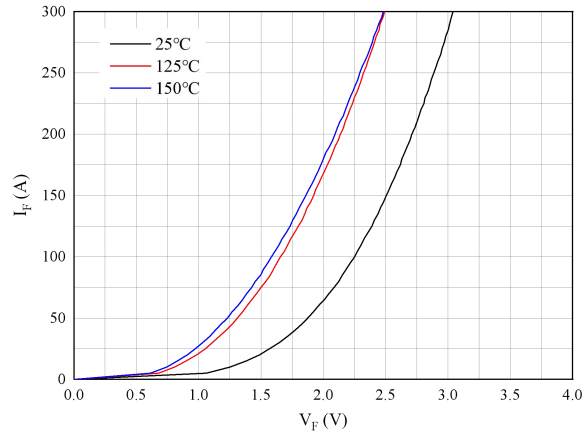


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

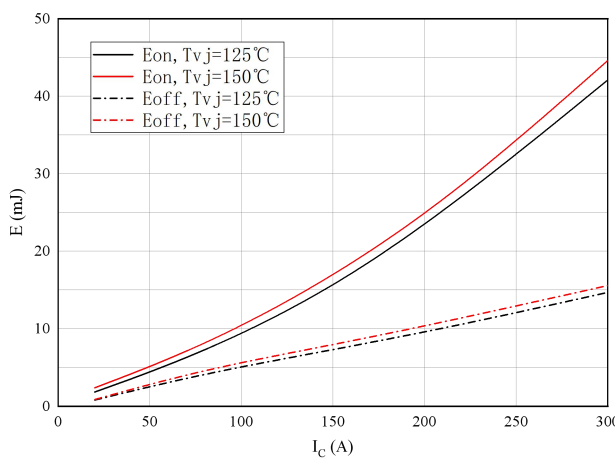


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT  
 $V_{GE}=\pm 15V, R_{Gon}=6.8\Omega, R_{Goff}=6.8\Omega, V_{CE}=600V$

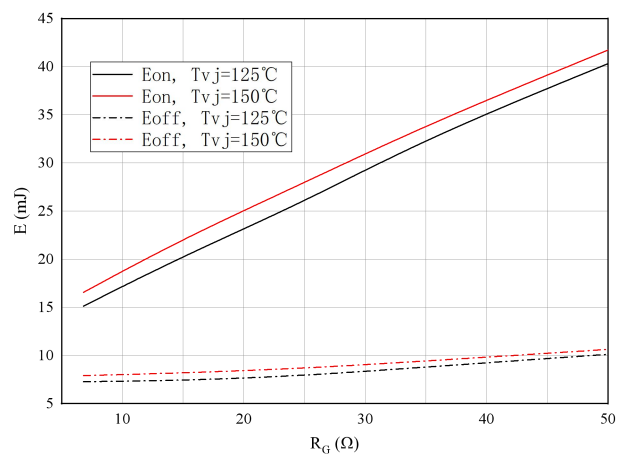


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT  
 $V_{GE}=\pm 15V, I_C=150A, V_{CE}=600V$

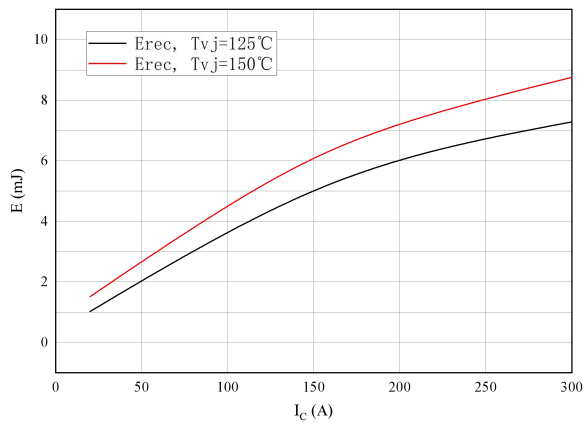


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode  
 $R_{Gon}=6.8\ \Omega$ ,  $V_{CE}=600\text{V}$

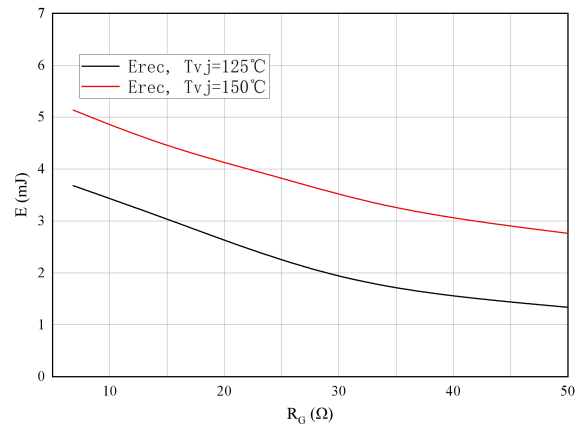


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode  
 $I_F=150\text{A}$ ,  $V_{CE}=600\text{V}$

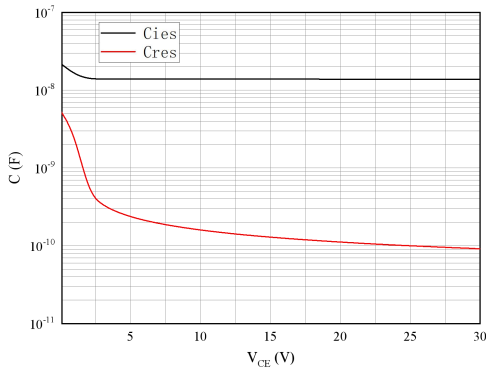
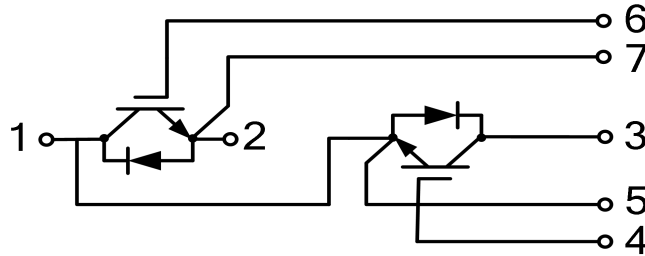


图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

