

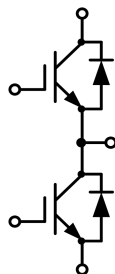
## 34mm Half Bridge IGBT Module

## 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


 $V_{CES}=1200V, I_{C\ nom}=50A / I_{CRM}=100A$ 
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	$T_C=100^{\circ}C, T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	50	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\ ms$	$I_{CRM}$	100	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	$V_{GE}=15V, I_C=50A$ $V_{GE}=15V, I_C=50A$ $V_{GE}=15V, I_C=50A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$V_{CESat}$	2.07 2.49 2.61	2.55	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 1.7mA, V_{GE}= V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.20	5.70 6.30	
栅电荷 Gate charge	$V_{GE}=-15V \dots +15V$		$Q_G$	0.25		$\mu C$
内部栅极电阻 Internal gate resistor			$R_{Gint}$	2.96		$\Omega$
输入电容 Input capacitance	$f=1MHz, V_{CE}=25\ V, V_{GE}=0\ V$	$T_{vj}=25^{\circ}C$	$C_{ies}$	3.02		nF
反向传输电容 Reverse transfer capacitance			$C_{res}$	0.13		

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	$V_{CE}=0V, V_{GE}=20V$	$T_{vj}=25^{\circ}C$	$I_{GES}$			100	nA
开通延迟时间 Turn-on delay time	$I_C=50A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=15\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_{don}$			52 49 49	ns
上升时间 Rise time	$I_C=50A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=15\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_r$			27 30 31	
关断延迟时间 Turn-off delay time	$I_C=50A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=15\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_{doff}$			192 230 240	
下降时间 Fall time	$I_C=50A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=15\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_f$			152 202 207	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=50A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=15\Omega$ $di/dt = 1189A/\mu s$ ( $T_{vj} =$ 150°C) (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$E_{on}$			3.26 5.19 5.94	
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	$I_C=50A, V_{CE}=600V$ $V_{GE} = \pm 15V, R_G=15\Omega$ $dv/dt=6036V/\mu s$ ( $T_{vj} =$ 150°C) (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$E_{off}$			2.26 3.05 3.23	
短路数据 SC data	$V_{GE}\leq 15V, V_{CC}=800V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt$ $t_p\leq 10\mu s, T_{vj}=150^{\circ}C$		$I_{SC}$			262	A
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		$I_F$	50	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1ms$	$I_{FRM}$	100	A
$I^2t$ 值 $I^2t$ -value	$t_p=10ms, \sin 180^{\circ}, T_{vj}=125^{\circ}C$	$I^2t$	490	$A^2s$

## 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=50A, V_{GE}=0V$ $I_F=50A, V_{GE}=0V$ $I_F=50A, V_{GE}=0V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$V_F$	2.11 1.84 1.75	2.50	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=50A,$ $-di_F/dt=1189A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$I_{RM}$	59 83 90		A
恢复电荷 Recovered charge	$I_F=50A,$ $-di_F/dt=1189A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$Q_r$	4.04 8.13 9.93		$\mu C$
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=50A,$ $-di_F/dt=1189A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	$E_{rec}$	1.40 2.62 3.30		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	$V_{ISOL}$	2500			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		150		g

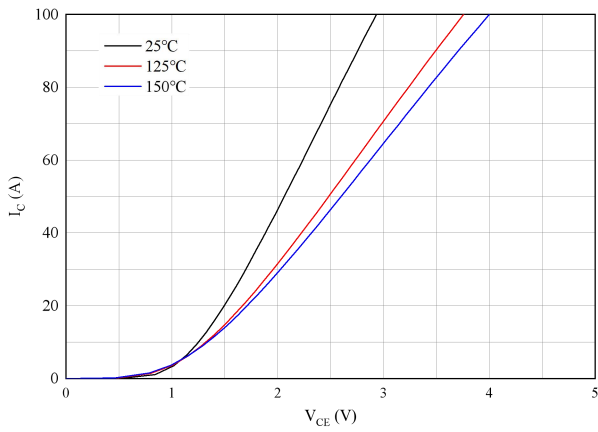


图 1. 典型输出特性 ( $V_{GE}=15V$ )

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

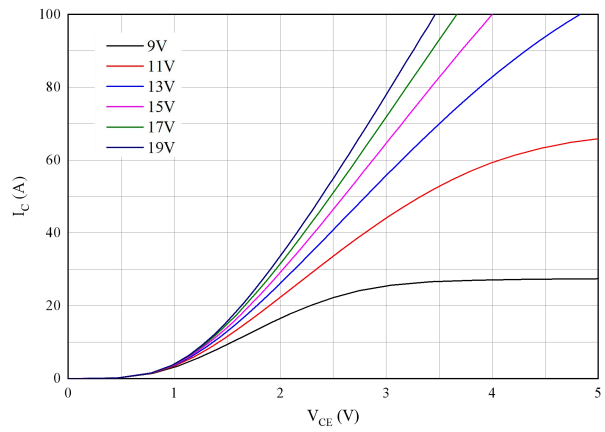


图 2. 典型输出特性 ( $T_{vj}=150^{\circ}C$ )

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

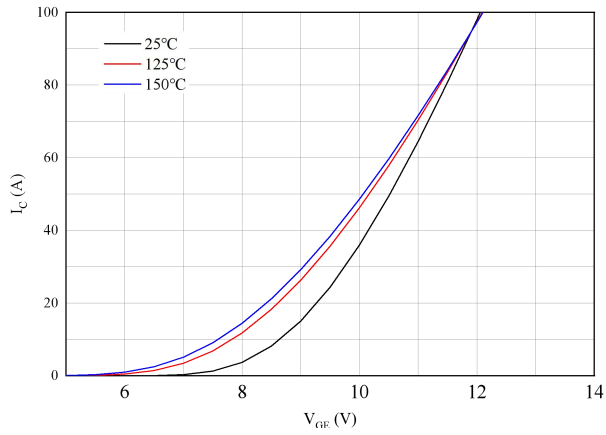


图 3. 典型传输特性 ( $V_{CE}=20V$ )

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

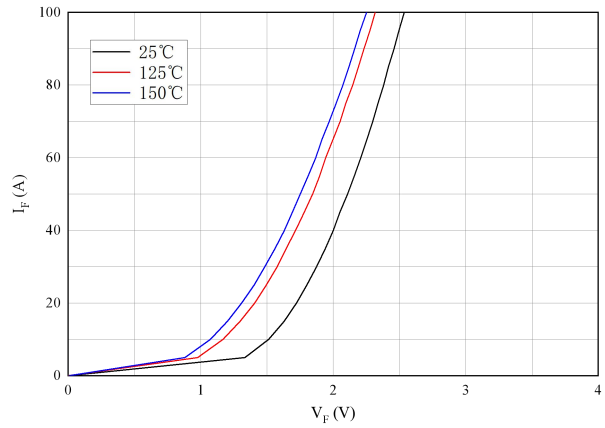


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

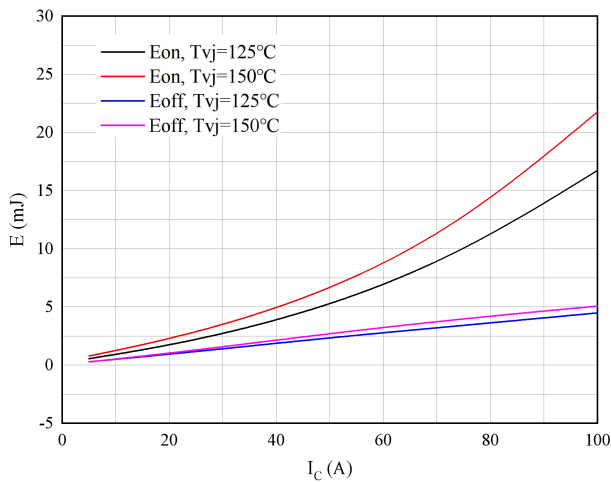


图 5. 开关损耗 逆变器

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

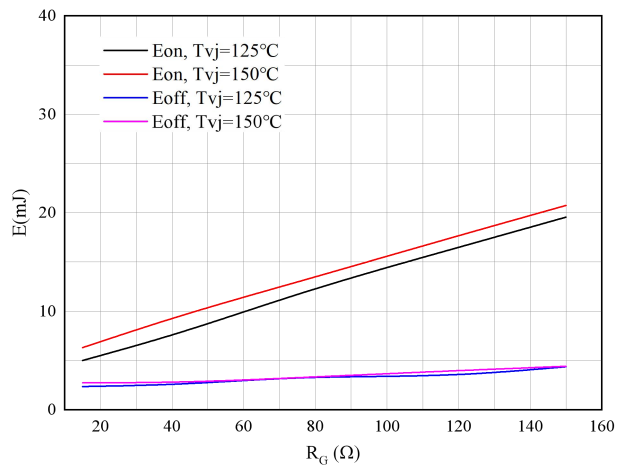


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT  
 $V_{GE}=\pm 15V, I_C=50A, V_{CE}=600V$

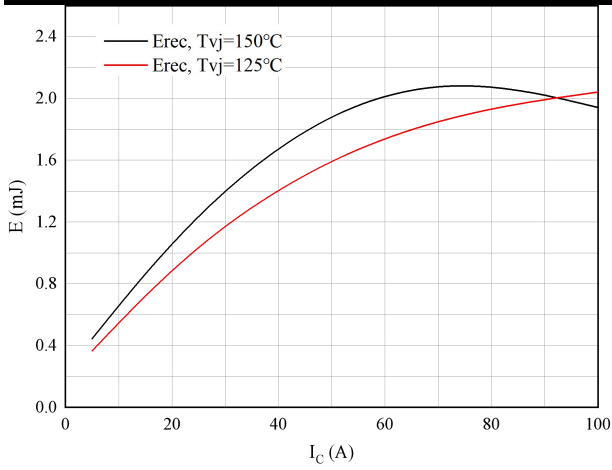


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode

$R_{Gon}=15\ \Omega$ ,  $V_{CE}=600\text{V}$

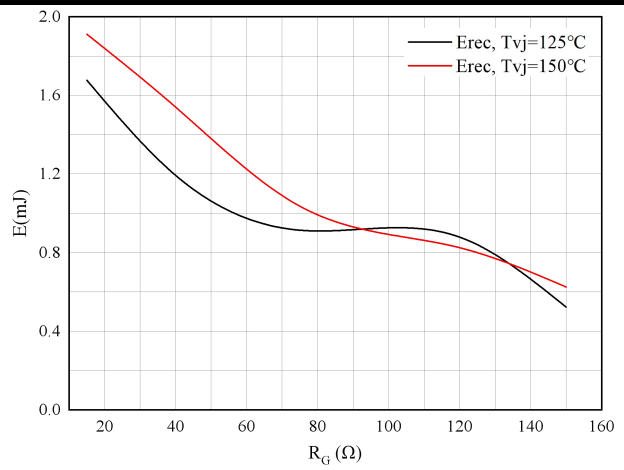


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode

$I_F=50\text{A}$ ,  $V_{CE}=600\text{V}$

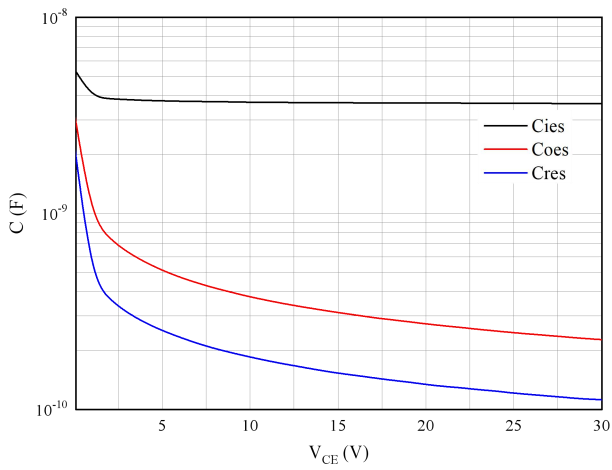
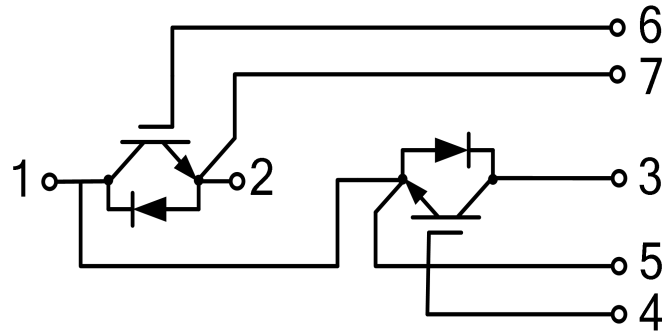


图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

