

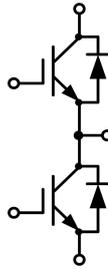
34mm Half Bridge IGBT Module

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



$V_{CES}=1200V$, $I_{C\ nom}=100A$ / $I_{CRM}=200A$

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	$T_C=100^{\circ}C$, $T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	100	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\ ms$	I_{CRM}	200	A
栅极-发射极电压 Gate emitter voltage		V_{GE}	± 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	$V_{GE}=15V$, $I_C=100A$ $V_{GE}=15V$, $I_C=100A$ $V_{GE}=15V$, $I_C=100A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_{CESat}	1.98 2.25 2.32	2.50	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 3.8mA$, $V_{GE}=V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	4.80	5.80	6.40
栅电荷 Gate charge	$V_{GE}=-15V\dots+15V$		Q_G	0.49		μC
内部栅极电阻 Internal gate resistor	$T_{vj}=25^{\circ}C$		R_{Gint}	8.24		Ω

输入电容 Input capacitance	$f=1\text{MHz}, V_{CE}=25\text{V}, V_{GE}=0\text{V}$ $T_{vj}=25^\circ\text{C}$	C_{ies}	5.80	nF
反向传输电容 Reverse transfer capacitance		C_{res}	0.25	
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}	100	nA
开通延迟时间 Turn-on delay time	$I_C=100\text{A}, V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}, R_G=6.8\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$t_{d\ on}$	182 191 207
上升时间 Rise time			t_r	41 43 40
关断延迟时间 Turn-off delay time				$t_{d\ off}$
下降时间 Fall time	t_f	61 102 114		
开通损耗能量 (每脉冲) Turn-on energy loss per pulse		E_{on}	5.05 8.22 9.19	
关断损耗能量 (每脉冲) Turn-off energy loss per pulse			E_{off}	3.31 4.94 5.62
短路数据 SC data	I_{SC}			448
在开关状态下温度 Temperature under switching conditions		$T_{vj\ op}$		-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	$T_{vj}=25^\circ\text{C}$	V_{RRM}	1200	V
连续正向直流电流 Continuous DC forward current		I_F	100	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1\text{ms}$	I_{FRM}	200	A
I^2t 值 I^2t -value	$t_p=10\text{ms}, \sin 180^\circ, T_{vj}=125^\circ\text{C}$	I^2t	1920	A^2s

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=100A, V_{GE}=0V$ $I_F=100A, V_{GE}=0V$ $I_F=100A, V_{GE}=0V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	V_F	2.38 1.91 1.79	2.60	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=100A,$ $-di_F/dt=1900A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	I_{RM}	57 92 104		A
恢复电荷 Recovered charge	$I_F=100A,$ $-di_F/dt=1900A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	Q_r	4.28 10.83 13.21		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=100A,$ $-di_F/dt=1900A/\mu s(T_{vj}=150^\circ C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	E_{rec}	1.49 3.68 4.51		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		155		g

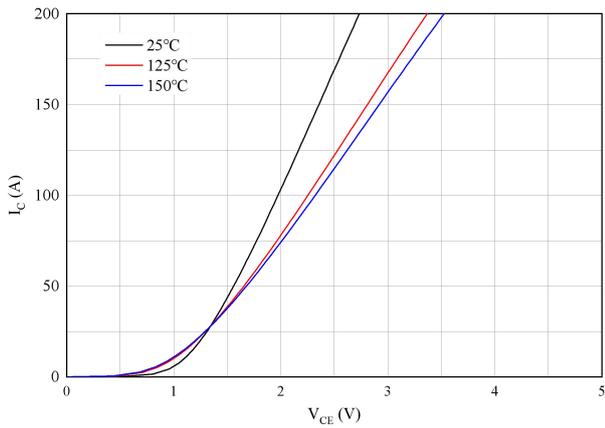


图 1. 典型输出特性 ($V_{GE}=15V$)

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

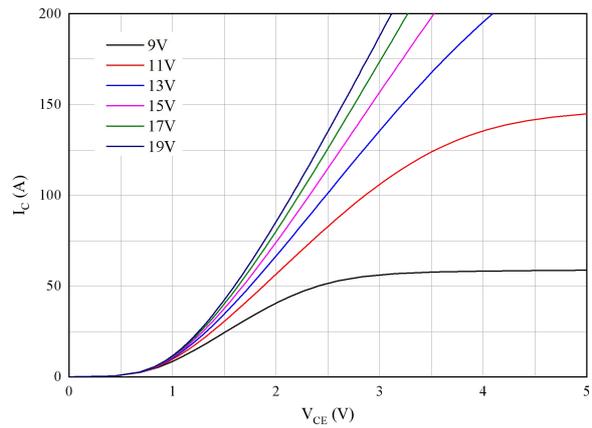


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

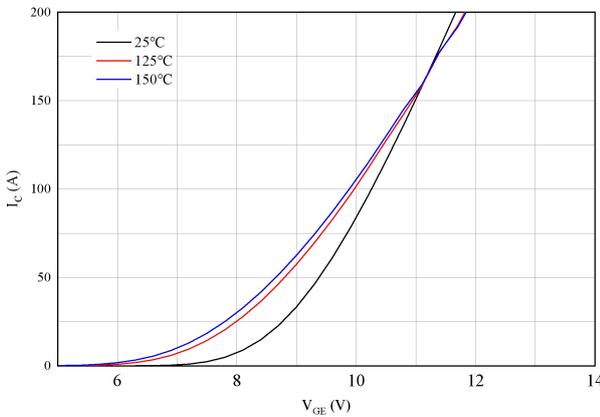


图 3. 典型传输特性($V_{CE}=20V$)

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

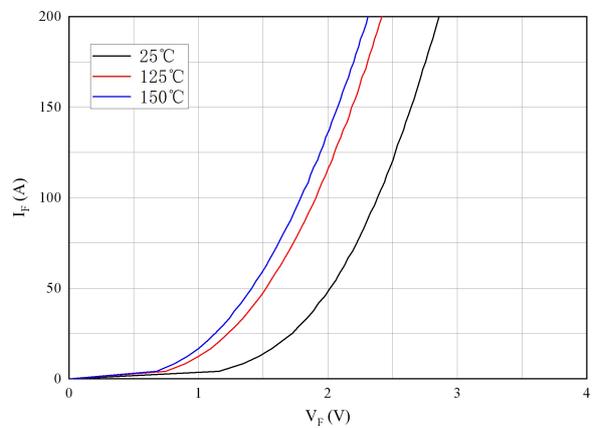


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

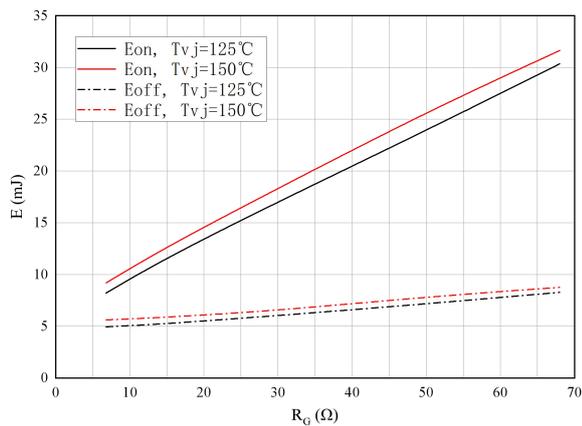


图 5. 开关损耗 逆变器

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

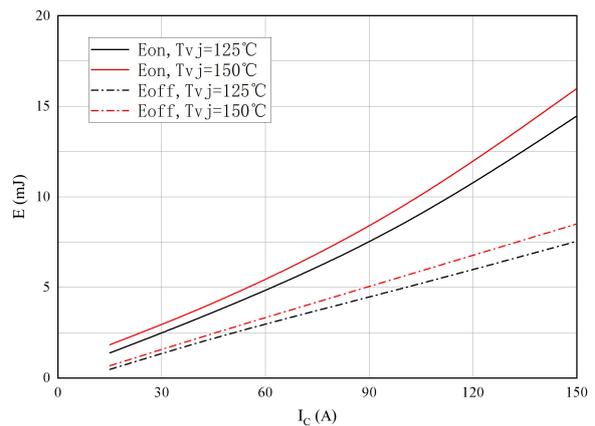


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT
 $V_{GE}=\pm 15V, I_C=100A, V_{CE}=600V$

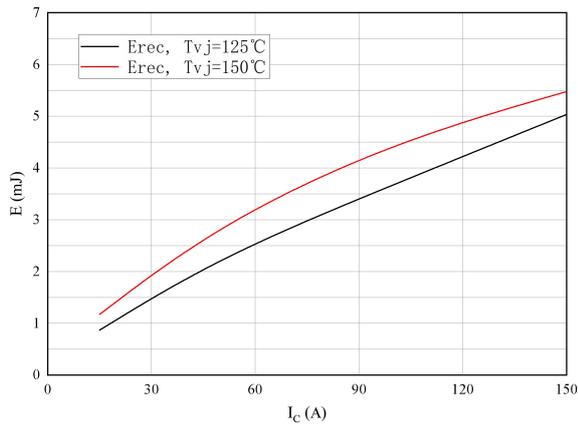


图 7. 开关损耗 二极管
 Figure 7. Switching losses of Diode
 RGon=6.8 Ω, VCE=600V

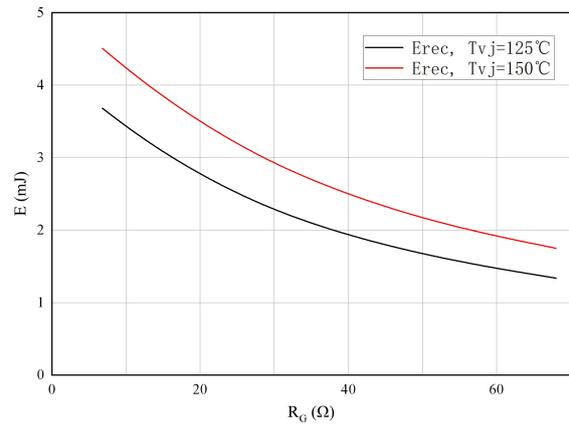


图 8. 开关损耗 二极管
 Figure 8. Switching losses of Diode
 IF=100A, VCE=600V

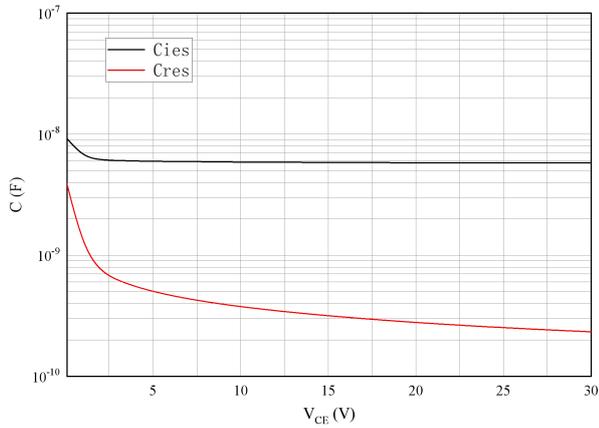
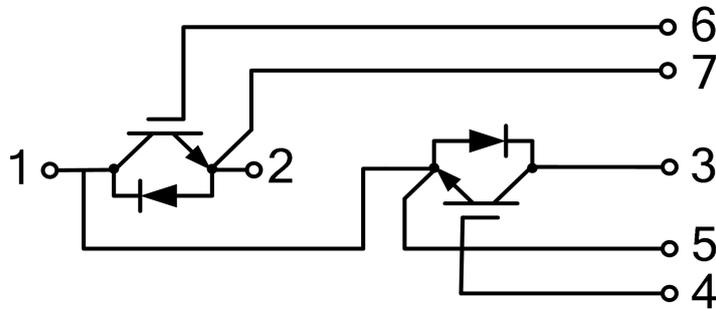
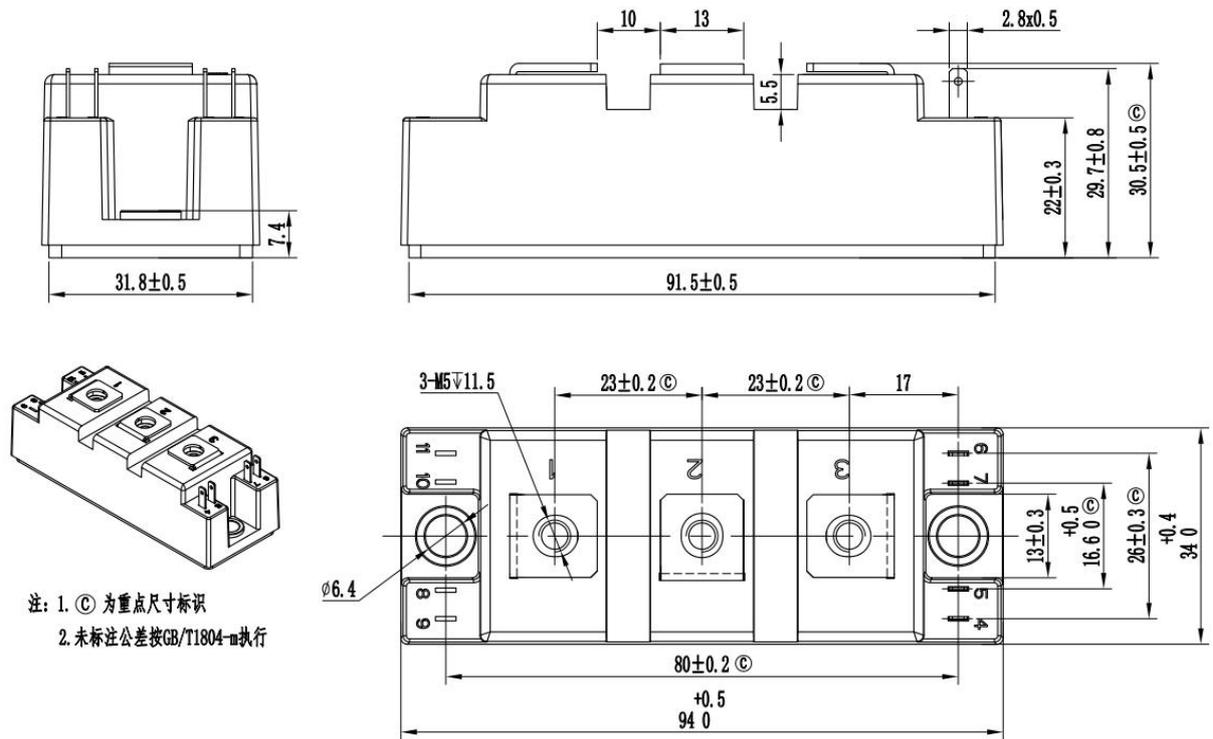


图 9. 电容特性
 Figure 9. Capacitance characteristic

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