

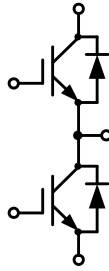
34mm Half Bridge IGBT Module

电气特性:

- 1700V 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



$V_{CES}=1700V$, $I_{C\ nom}=75A$ / $I_{CRM}=150A$

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}	1700	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}	600	W
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	$V_{GE}=15V$, $I_C=75A$ $V_{GE}=15V$, $I_C=75A$ $V_{GE}=15V$, $I_C=75A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_{CEsat}	1.77 2.02 2.09	2.30	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 2.6mA$, $V_{GE}=V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	4.90 5.50	6.10	
栅电荷 Gate charge	$V_{GE}=-15V\dots+15V$		Q_G	0.62		μC
内部栅极电阻			R_{Gint}	8.50		Ω

Internal gate resistor						
输入电容 Input capacitance	f=1MHz, V _{CE} =25 V, V _{GE} =0 V	T _{vj} =25°C	C _{ies}	8.67	nF	
反向传输电容 Reverse transfer capacitance			C _{res}	0.28		
集电极-发射极截止电流 Collector-emitter cut-off current	V _{CE} =1700V, V _{GE} = 0 V	T _{vj} =25°C	I _{CES}		1	mA
栅极-发射极漏电流 Gate-emitter leakage current	V _{CE} =0 V, V _{GE} = 20 V	T _{vj} =25°C	I _{GES}		100	nA
开通延迟时间 Turn-on delay time	I _C =75A, V _{CE} =900 V V _{GE} =±15 V, R _G =2Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _{d on}		157	
					171	
					171	
上升时间 Rise time	I _C =75A, V _{CE} =900 V V _{GE} =±15 V, R _G =2Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _r		36	ns
					41	
					44	
关断延迟时间 Turn-off delay time	I _C =75A, V _{CE} =900 V V _{GE} =±15 V, R _G =2Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _{d off}		302	
					347	
					364	
下降时间 Fall time	I _C =75A, V _{CE} =900 V V _{GE} =±15 V, R _G =2Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _f		401	
					158	
					154	
开通损耗能量（每脉冲） Turn-on energy loss per pulse	I _C =75A, V _{CE} =900 V V _{GE} =±15 V, R _G =2Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	E _{on}		11.73	mJ
					16.25	
					17.55	
关断损耗能量（每脉冲） Turn-off energy loss per pulse	I _C =75A, V _{CE} =900 V V _{GE} =±15 V, R _G =2Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	E _{off}		13.82	
					16.61	
					16.75	
短路数据 SC data	V _{GE} ≤15V, V _{CC} =900V V _{CEmax} =V _{CES} -L _{sCE} ·di/dt tp≤10us, T _{vj} =150°C		I _{SC}		477	A
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R _{thJC}		0.25	K/W
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°C	V _{RRM}	1700	V
连续正向直流电流 Continuous DC forward current		I _F	75	A
正向重复峰值电流 Repetitive peak forward current	t _p =1ms	I _{FRM}	150	A
I ² t 值 I ² t-value	t _p =10ms, sin180° , T _j =150°C	I ² t	1100	A ² s

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=75A, V_{GE}=0V$ $I_F=75A, V_{GE}=0V$ $I_F=75A, V_{GE}=0V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_F	1.81 1.89 1.87	2.30	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=75A,$ $-di_F/dt=1428A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=900V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	I_{RM}	64 72 77		A
恢复电荷 Recovered charge	$I_F=75A,$ $-di_F/dt=1428A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=900V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	Q_r	12.30 19.50 23.20		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=75A,$ $-di_F/dt=1428A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=900V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{rec}	6.51 10.74 12.98		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}		0.46	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 ₂ O 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		152		g

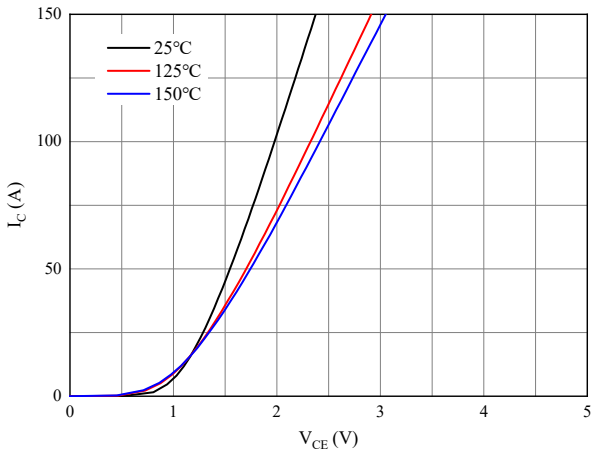


图 1. 典型输出特性 ($V_{GE}=15V$)

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

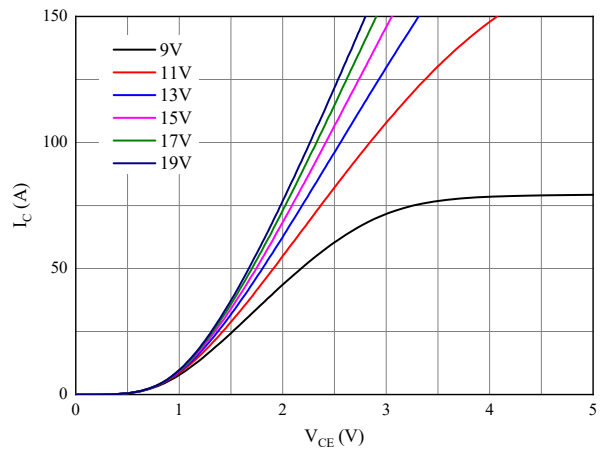


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

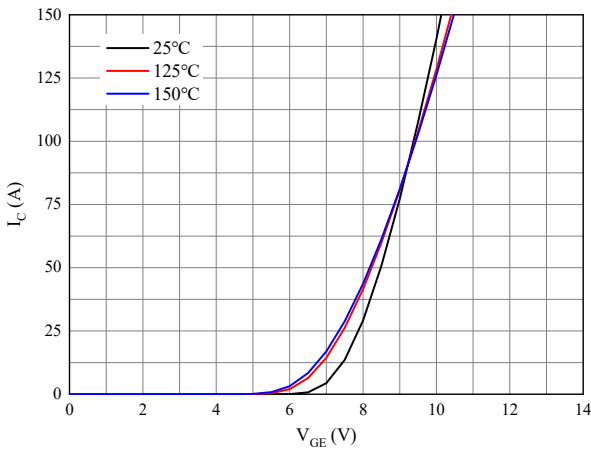


图 3. 典型传输特性 ($V_{CE}=20V$)

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

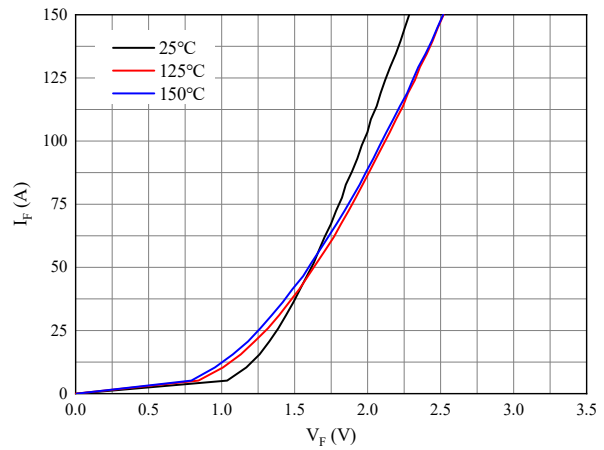


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

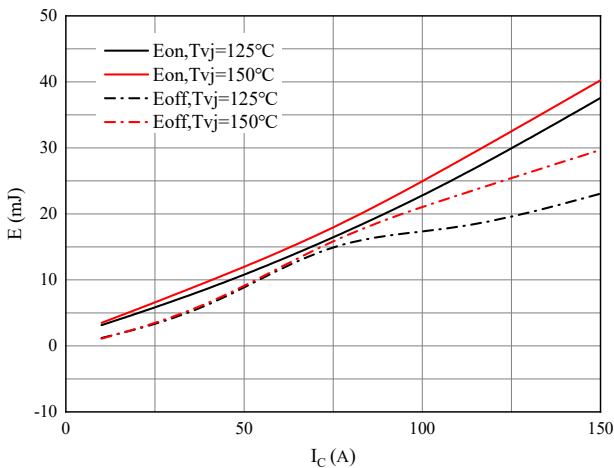


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT
 $V_{GE}=\pm 15V, R_{Gon}=2\Omega, R_{Goff}=2\Omega, V_{CE}=900V$

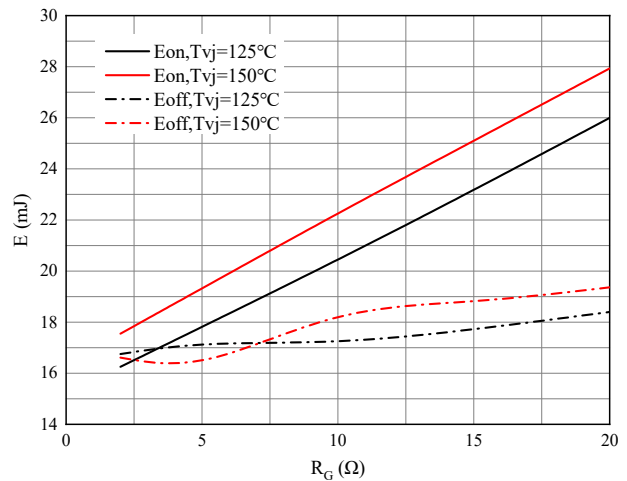


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT
 $V_{GE}=\pm 15V, I_C=75A, V_{CE}=900V$

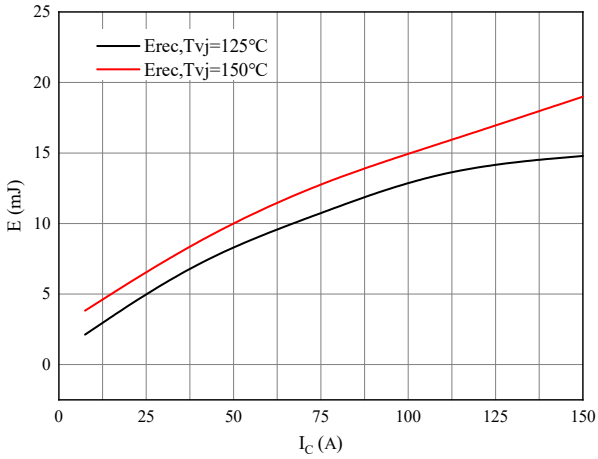


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode
R_{Gon}=2Ω, V_{CE}=900V

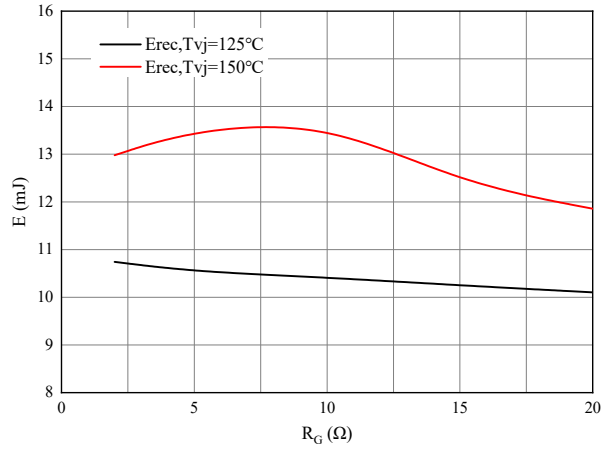


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode
I_F=75A, V_{CE}=900V

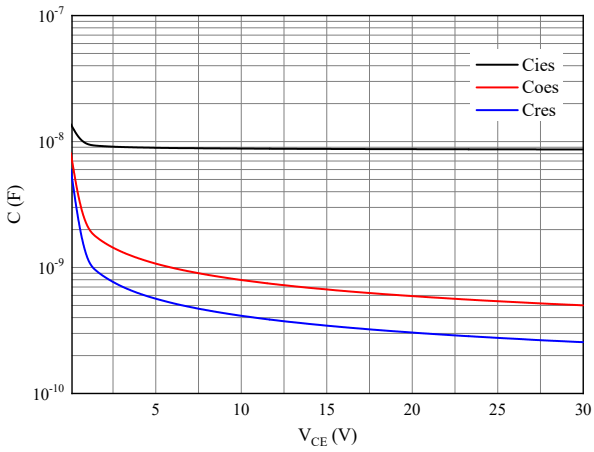


图 9. 电容特性

Figure 9. Capacitance characteristic

