

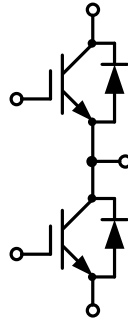
34mm Half Bridge IGBT Module

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



$V_{CES}=1200V$, $I_{C\ nom}=150A$ / $I_{CRM}=300A$

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	$T_C=100^{\circ}C$, $T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	150	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\ ms$	I_{CRM}	300	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	P_{tot}	790	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	$V_{GE}=15V$, $I_C=150A$ $V_{GE}=15V$, $I_C=150A$ $V_{GE}=15V$, $I_C=150A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_{CESat}	2.18 2.51 2.66	2.65	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}	3.80		Ω
输入电容 Input capacitance	$f=1MHz$, $V_{CE}=25\ V$, $V_{GE}=0\ V$	$T_{vj}=25^{\circ}C$	C_{ies}	11.40		nF
反向传输电容 Reverse transfer capacitance			C_{res}	0.40		

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	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=2.0\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$	t_{don}		139		ns
		$T_{vj}=125^{\circ}C$			142		
		$T_{vj}=150^{\circ}C$			143		
上升时间 Rise time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=2.0\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$	t_r		37		ns
		$T_{vj}=125^{\circ}C$			40		
		$T_{vj}=150^{\circ}C$			40		
关断延迟时间 Turn-off delay time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=2.0\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$	t_{doff}		192		ns
		$T_{vj}=125^{\circ}C$			236		
		$T_{vj}=150^{\circ}C$			237		
下降时间 Fall time	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=2.0\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$	t_f		128		ns
		$T_{vj}=125^{\circ}C$			126		
		$T_{vj}=150^{\circ}C$			143		
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=2.0\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$	E_{on}		7.90		mJ
		$T_{vj}=125^{\circ}C$			13.43		
		$T_{vj}=150^{\circ}C$			15.07		
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	$I_C=150A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=2.0\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$	E_{off}		8.40		mJ
		$T_{vj}=125^{\circ}C$			10.59		
		$T_{vj}=150^{\circ}C$			10.97		
短路数据 SC data	$V_{GE}\leq 15V, V_{CC}=800V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt \quad t_p\leq 10\mu s, T_{vj}=150^{\circ}C$		I_{SC}		518		A
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}			0.19	K/W
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	$I_F=150A, V_{GE}=0V$ $T_{vj}=25^{\circ}C$ $I_F=150A, V_{GE}=0V$ $T_{vj}=125^{\circ}C$ $I_F=150A, V_{GE}=0V$ $T_{vj}=150^{\circ}C$	V_F		2.51 1.92 1.81	3.00	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=150A,$ $-di_F/dt=2150A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	I_{RM}		42 89 100		A
恢复电荷 Recovered charge	$I_F=150A,$ $-di_F/dt=3900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	Q_r		3.10 9.50 12.60		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=150A,$ $-di_F/dt=3900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{rec}		1.10 3.30 3.95		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0.31	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_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		6.0	Nm
重量 Weight		W		158		g

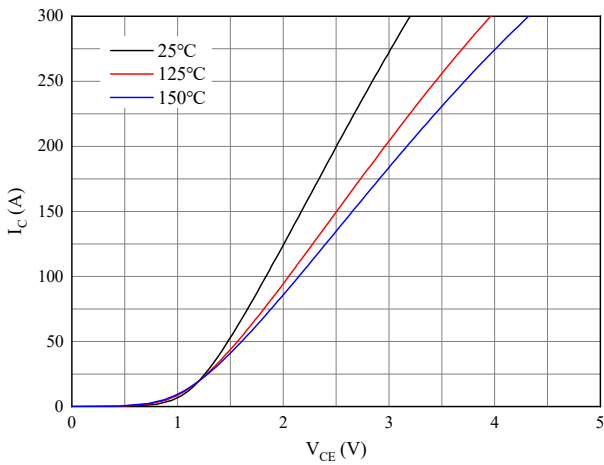


图 1. 典型输出特性 ($V_{GE}=15V$)

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

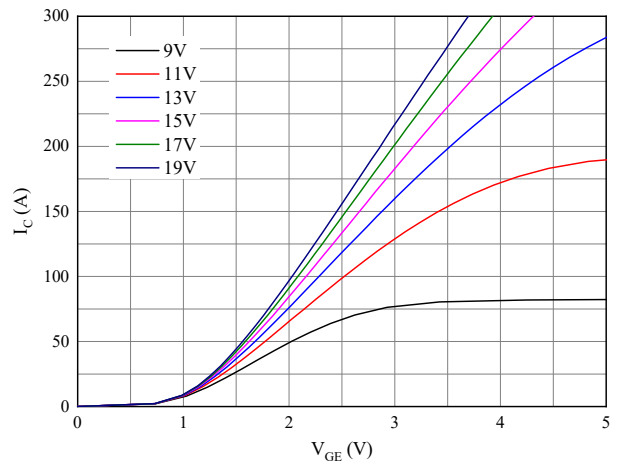


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

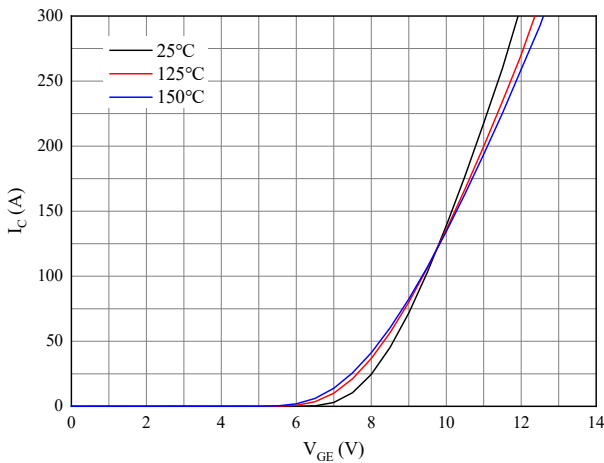


图 3. 典型传输特性 ($V_{CE}=20V$)

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

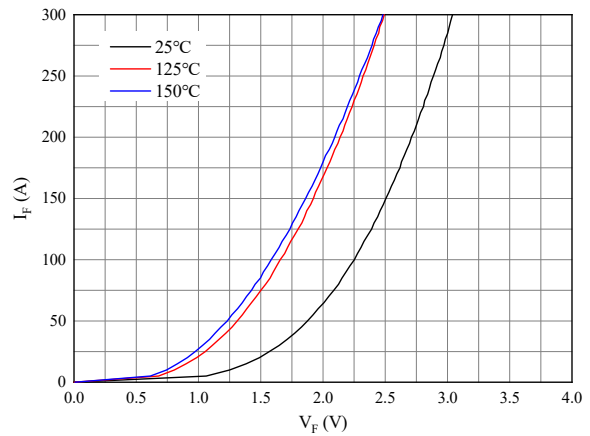


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

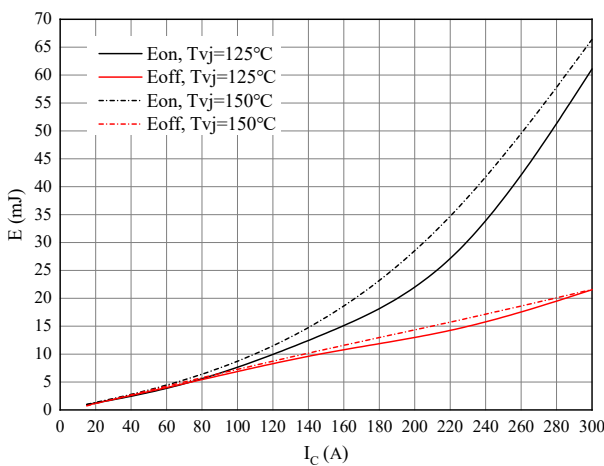


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT
 $V_{GE}=\pm 15V, R_{Gon}=2\Omega, R_{Goff}=2\Omega, V_{CE}=600V$

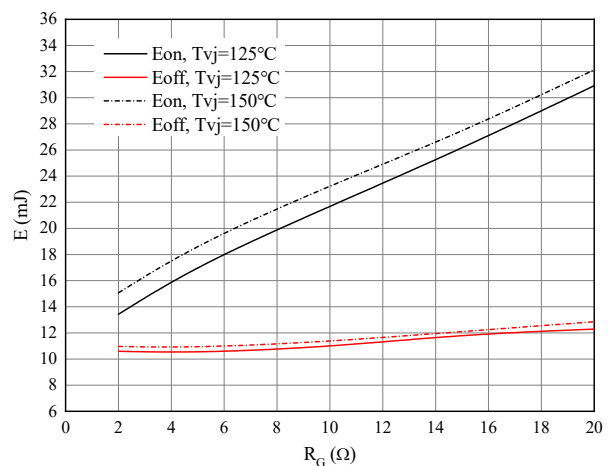


图 6. 开关损耗 逆变器

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

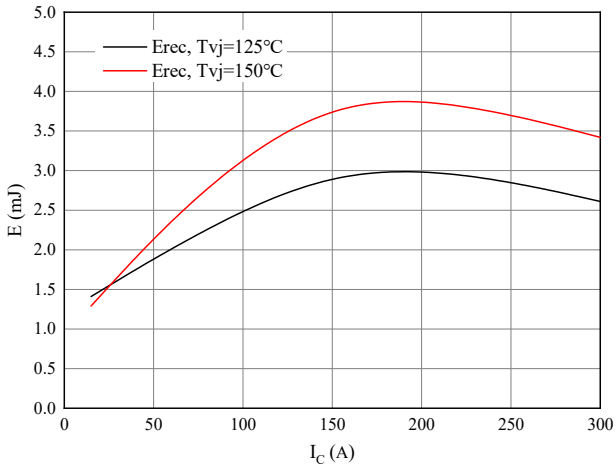


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode
R_{Gon}=2Ω, V_{CE}=600V

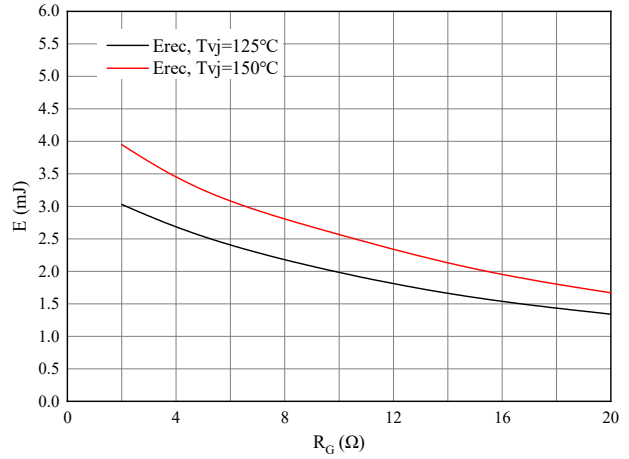


图 8. 开关损耗 二极管

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

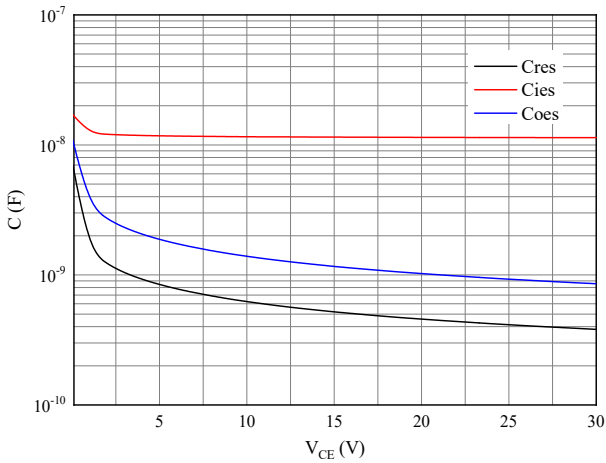
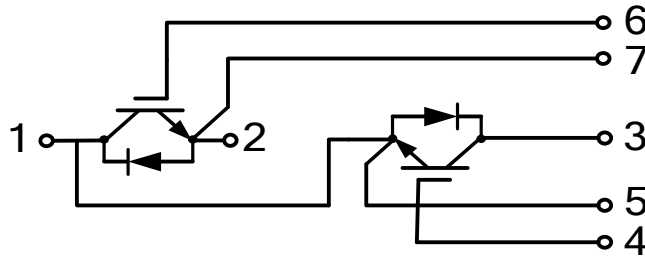


图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

