

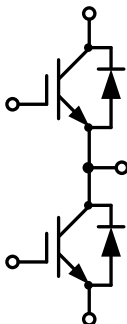
62mm Half Bridge IGBT Module

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



$V_{CES} = 1700V$, $I_{C\ nom} = 200A$ / $I_{CRM} = 400A$

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	$T_C = 100^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	200	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	400	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	P_{tot}	1250	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	$V_{GE} = 15V$, $I_C = 200A$ $V_{GE} = 15V$, $I_C = 200A$ $V_{GE} = 15V$, $I_C = 200A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	V_{CEsat}	1.93 2.22 2.39	2.50	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 8mA$, $V_{GE} = V_{CE}$	$T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	5.10 5.70	6.30	
内部栅极电阻 Internal gate resistor			R_{Gint}	2.58		Ω
栅电荷 Gate charge	$V_{GE} = -15V \dots +15V$		Q_G	1.90		μC

Gate charge						
输入电容 Input capacitance	f=1MHz, V _{CE} =25 V, V _{GE} =0 V	T _{vj} =25°C	C _{ies}	27.18	nF	
反向传输电容 Reverse transfer capacitance			C _{res}	0.80		
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}	2	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}	200	nA	
开通延迟时间 Turn-on delay time	I _C =200A, V _{CE} =900 V V _{GE} =±15 V, R _G =3.3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _{d on}	194		
		T _{vj} =125°C		212		
		T _{vj} =150°C		224		
上升时间 Rise time	I _C =200A, V _{CE} =900 V V _{GE} =±15 V, R _G =3.3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _r	51		
		T _{vj} =125°C		55		
		T _{vj} =150°C		57		
关断延迟时间 Turn-off delay time	I _C =200A, V _{CE} =900 V V _{GE} =±15 V, R _G =3.3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _{d off}	430	ns	
		T _{vj} =125°C		489		
		T _{vj} =150°C		506		
下降时间 Fall time	I _C =200A, V _{CE} =900 V V _{GE} =±15 V, R _G =3.3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _f	303		
		T _{vj} =125°C		352		
		T _{vj} =150°C		368		
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	I _C =200A, V _{CE} =900 V V _{GE} =±15 V, R _G =3.3Ω (电感负载) / (inductive load)	T _{vj} =25°C	E _{on}	31.88	mJ	
		T _{vj} =125°C		40.73		
		T _{vj} =150°C		43.77		
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	I _C =200A, V _{CE} =900 V V _{GE} =±15 V, R _G =3.3Ω (电感负载) / (inductive load)	T _{vj} =25°C	E _{off}	38.04		
		T _{vj} =125°C		46.56		
		T _{vj} =150°C		49.29		
短路数据 SC data	V _{GE} ≤15V, V _{CC} =1000V V _{CEmax} =V _{CES} -L _{sCE} ·di/dt t _p ≤10us, T _{vj} =150°C		I _{SC}	1230	A	
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R _{thJC}	0.12	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	200	A
正向重复峰值电流 Repetitive peak forward current	t _p =1ms	I _{FRM}	400	A
I ² t 值 I ² t-value	t _p =10ms, sin180°, T _j =125°C	I ² t	10000	A ² s

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=200A, V_{GE}=0V$ $I_F=200A, V_{GE}=0V$ $I_F=200A, V_{GE}=0V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	V_F	2.07 2.28 2.24	2.50	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=200A$ $-di_F/dt=2430A/\mu s(T_{vj}=150^\circ C)$ $V_R=900V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	I_{RM}	109 122 122		A
恢复电荷 Recovered charge	$I_F=200A$ $-di_F/dt=2430A/\mu s(T_{vj}=150^\circ C)$ $V_R=900V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	Q_r	22.80 38.70 39.90		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=200A$ $-di_F/dt=2430A/\mu s(T_{vj}=150^\circ C)$ $V_R=900V, V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	E_{rec}	12.70 23.07 23.26		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}		0.16	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		318		g

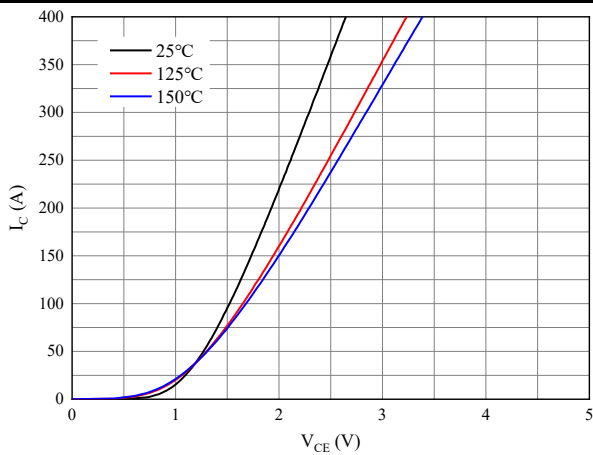


图 1. 典型输出特性 ($V_{GE}=15V$)

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

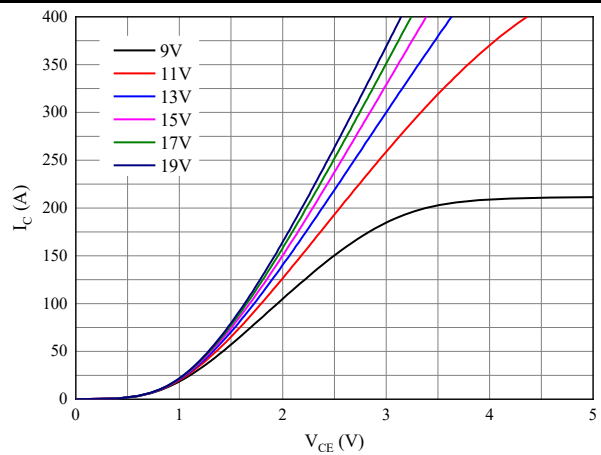


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

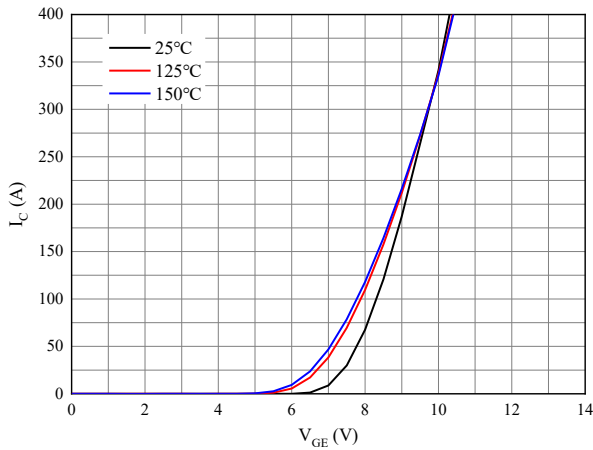


图 3. 典型传输特性 ($V_{CE}=20V$)

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

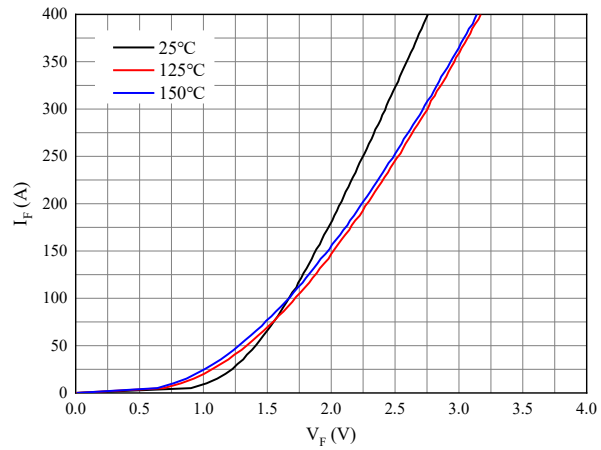


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

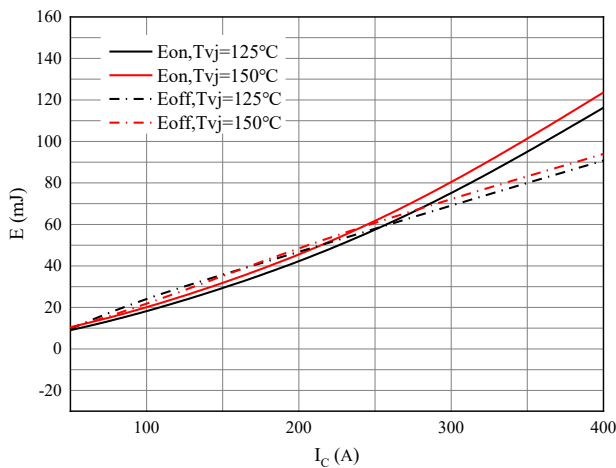


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT

$V_{GE}=\pm 15V, R_{Gon}=3.3\Omega, R_{Goff}=3.3\Omega, V_{CE}=900V$

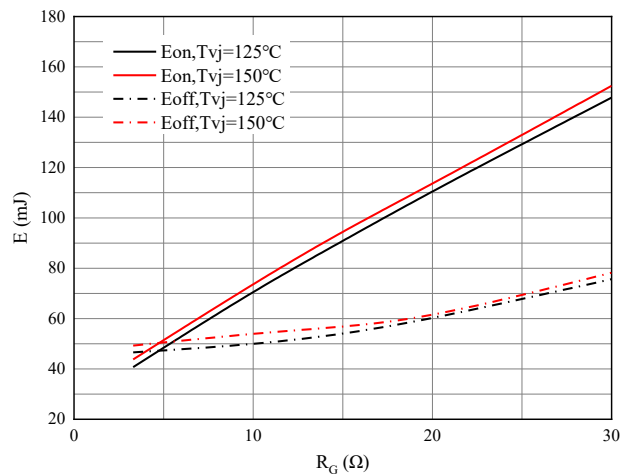


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT

$V_{GE}=\pm 15V, I_C=200A, V_{CE}=900V$

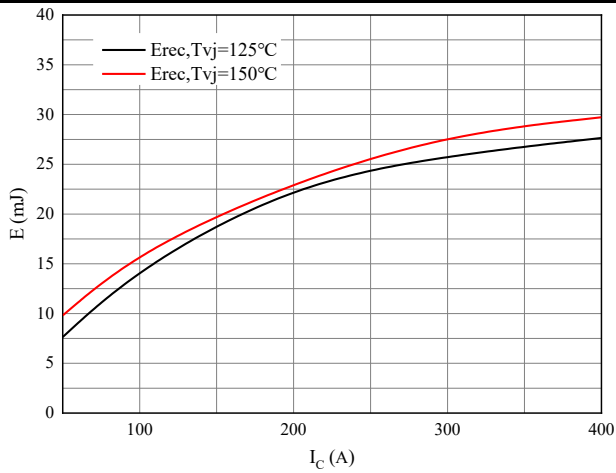


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode
 $R_{Gon}=3.3\Omega$, $V_{CE}=900V$

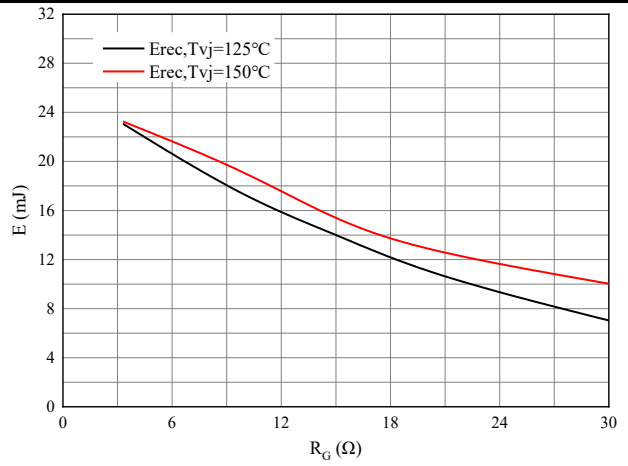


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode
 $I_F=200A$, $V_{CE}=900V$

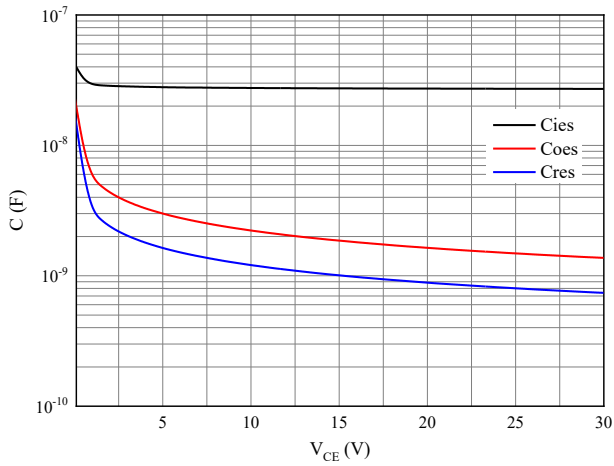
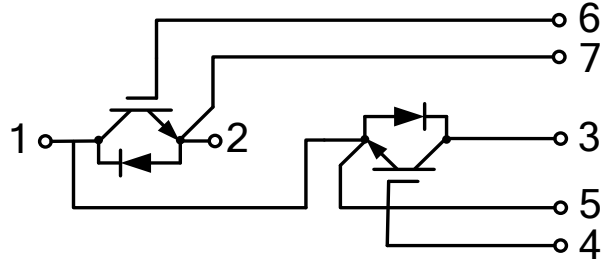


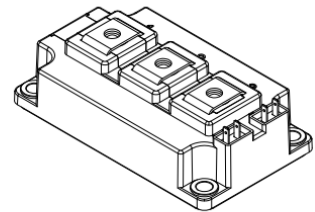
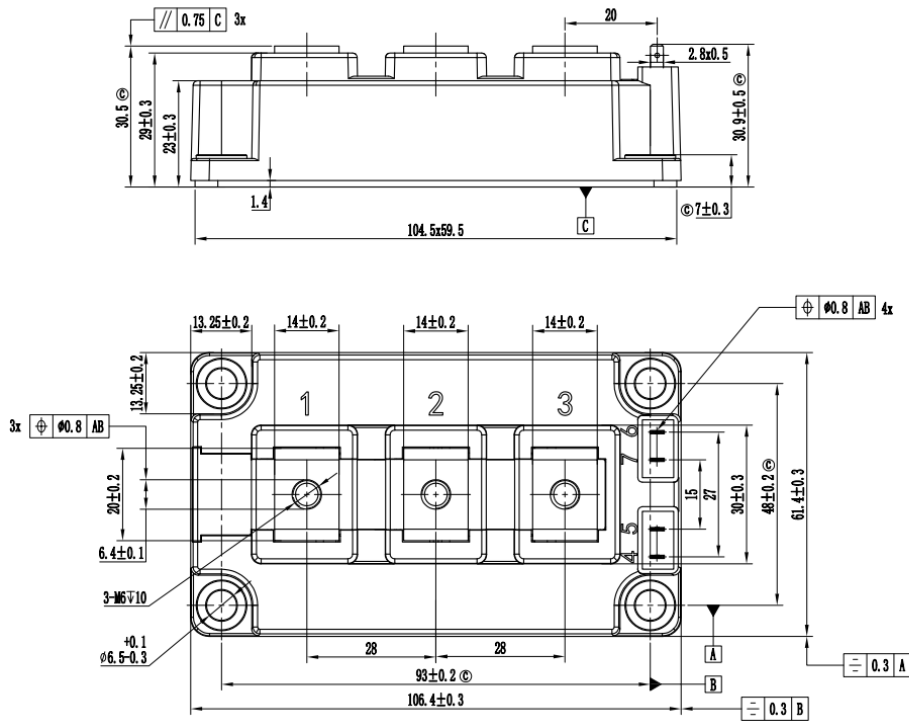
图 9. 电容特性

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