

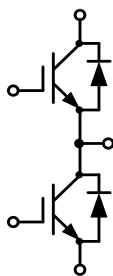
62mm Half Bridge IGBT Module

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


 $V_{CES}=1200V, I_{C\ nom}=300A / I_{CRM}=600A$
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	$T_C=100^{\circ}C, T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	300	A
集电极重复峰值电流 Repetitive peak collector current	$t_p=1\ ms$	I_{CRM}	600	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C, T_{vj\ max} = 175^{\circ}C$	P_{tot}	1600	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	$V_{GE}=15V, I_C=300A$ $V_{GE}=15V, I_C=300A$ $V_{GE}=15V, I_C=300A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_{CESat}	2.25 2.75 2.85	2.75	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 8mA, V_{GE} = V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.20 5.80	6.40	
栅电荷 Gate charge	$V_{GE}=-15V...+15V$		Q_G	1.42		μC
内部栅极电阻			R_{Gint}	1.72		Ω

Internal gate resistor						
输入电容 Input capacitance	f=1 MHz, V _{CE} =25 V, V _{GE} =0 V	T _{vj} =25°C	C _{ies}	22.51	nF	
反向传输电容 Reverse transfer capacitance			C _{res}	0.8		
集电极-发射极截止电流 Collector-emitter cut-off current	V _{CE} =1200V, 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 =300A, V _{CE} =600 V V _{GE} =±15 V, R _G =3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _{d on}	122		
		T _{vj} =125°C		131		
		T _{vj} =150°C		138		
上升时间 Rise time	I _C =300A, V _{CE} =600 V V _{GE} =±15 V, R _G =3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _r	61	ns	
		T _{vj} =125°C		65		
		T _{vj} =150°C		67		
关断延迟时间 Turn-off delay time	I _C =300A, V _{CE} =600 V V _{GE} =±15 V, R _G =3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _{d off}	267		
		T _{vj} =125°C		295		
		T _{vj} =150°C		305		
下降时间 Fall time	I _C =300A, V _{CE} =600 V V _{GE} =±15 V, R _G =3Ω (电感负载) / (inductive load)	T _{vj} =25°C	t _f	99		
		T _{vj} =125°C		109		
		T _{vj} =150°C		113		
开通损耗能量（每脉冲） Turn-on energy loss per pulse	I _C =300A, V _{CE} =600 V V _{GE} =±15 V, R _G =3Ω di/dt=3619A/μs (T _{vj} = 150°C) (电感负载) / (inductive load)	T _{vj} =25°C	E _{on}	18.81	mJ	
		T _{vj} =125°C		32.26		
		T _{vj} =150°C		34.56		
关断损耗能量（每脉冲） Turn-off energy loss per pulse	I _C =300A, V _{CE} =600 V V _{GE} =±15 V, R _G =3Ω dv/dt=7289V/μs (T _{vj} = 150°C) (电感负载) / (inductive load)	T _{vj} =25°C	E _{off}	16.74		
		T _{vj} =125°C		21.40		
		T _{vj} =150°C		22.21		
短路数据 SC data	V _{GE} ≤15V, V _{CC} =800V V _{CEmax} =V _{CES} -L _{sCE} ·di/dt t _p ≤10us, T _{vj} =150°C		I _{SC}	1012	A	
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R _{thJC}	0.093	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}	1200	V
连续正向直流电流 Continuous DC forward current		I _F	300	A
正向重复峰值电流 Repetitive peak forward current	t _p =1ms	I _{FRM}	600	A
I ² t 值	t _p =10ms, sin180°, T _j =125°C	I ² t	19000	A ² S

I ² t-value				
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特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	I _F =300A I _F =300A I _F =300A	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	V _F	2.15 2.27 2.19	2.65	V
反向恢复峰值电流 Peak reverse recovery current	I _F =300A, -di _F /dt=3061A/μs(T _{vj} =150°C) V _R =600V, V _{GE} =-15V	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	I _{RM}	121 134 147		A
恢复电荷 Recovered charge	I _F =300A, -di _F /dt=3061A/μs(T _{vj} =150°C) V _R =600V, V _{GE} =-15V	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	Q _r	15.87 30.40 39.55		μC
反向恢复损耗（每脉冲） Reverse recovered energy	I _F =300A, -di _F /dt=3061A/μs(T _{vj} =150°C) V _R =600V, V _{GE} =-15V	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	E _{rec}	4.95 9.75 13.32		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R _{thJC}		0.15	K/W
在开关状态下温度 Temperature under switching conditions			T _{vj op}	-40	150	°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	°C
模块安装的扭矩 Mounting torque for modul mounting		M	3.0		6.0	Nm
重量 Weight		W		324		g

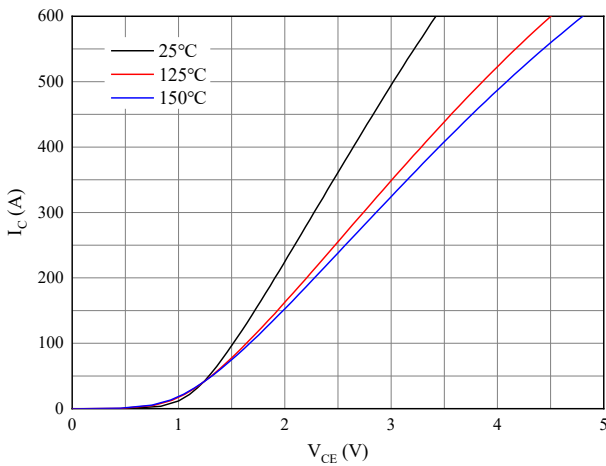


图 1. 典型输出特性 ($V_{GE}=15V$)

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

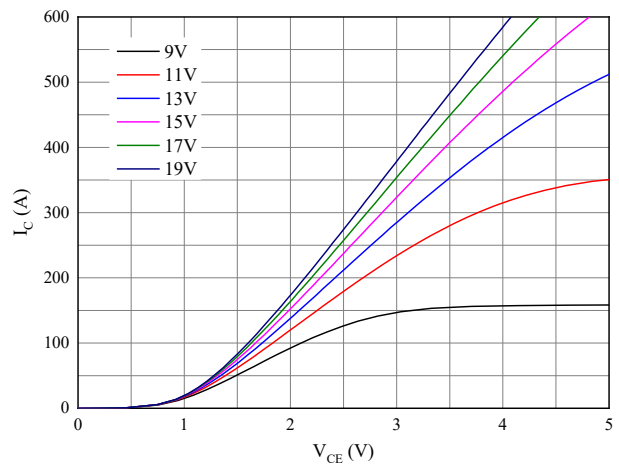


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

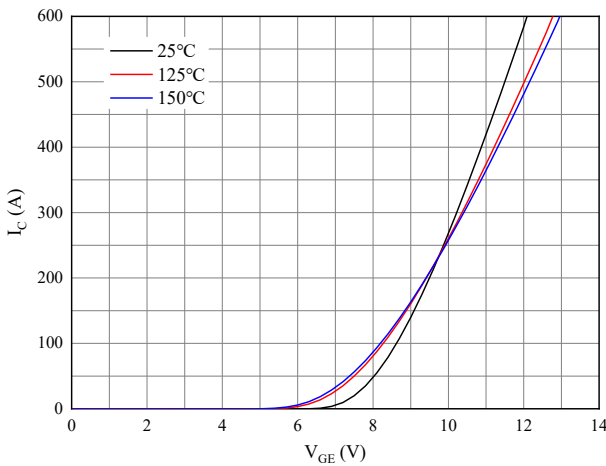


图 3. 典型传输特性 ($V_{CE}=20V$)

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

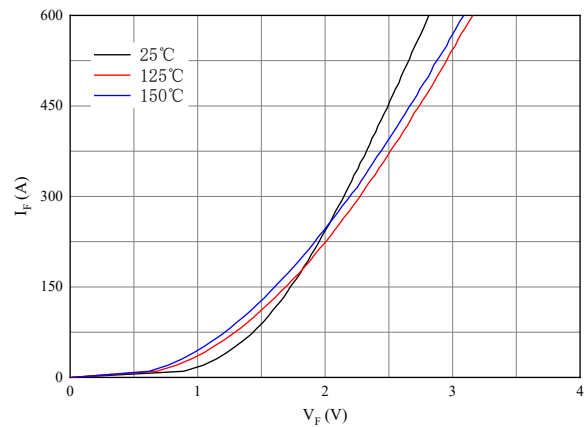


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

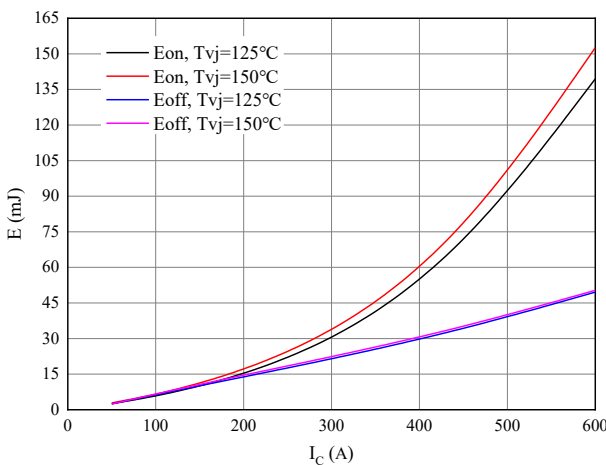


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT
 $V_{GE}=\pm 15V, R_{Gon}=3\Omega, R_{Goff}=3\Omega, V_{CE}=600V$

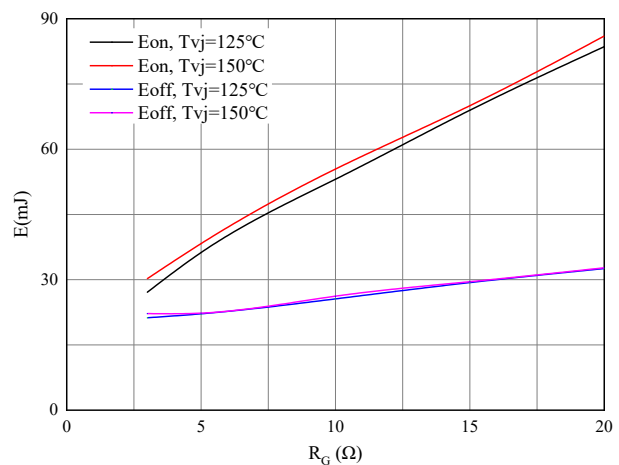


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT
 $V_{GE}=\pm 15V, I_C=300A, V_{CE}=600V$

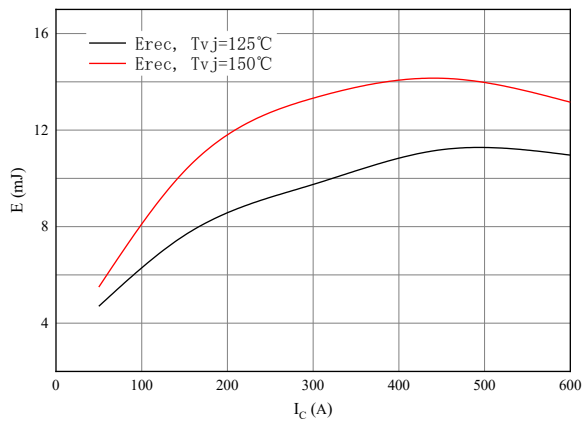


图 7. 开关损耗二极管

Figure 7. Switching losses of Diode
 $R_{Gon}=3\Omega, V_{CE}=600V$

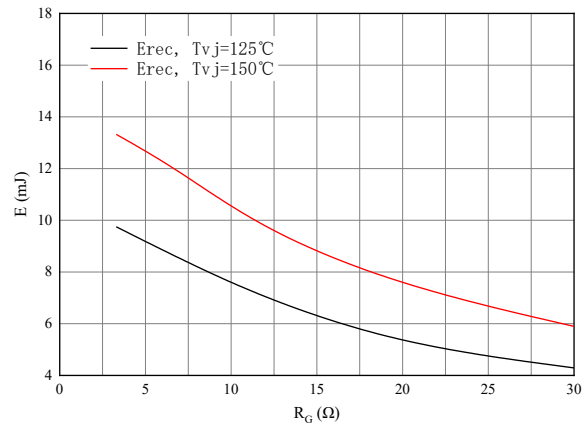


图 8. 开关损耗二极管

Figure 8. Switching losses of Diode
 $I_F=300A, V_{CE}=600V$

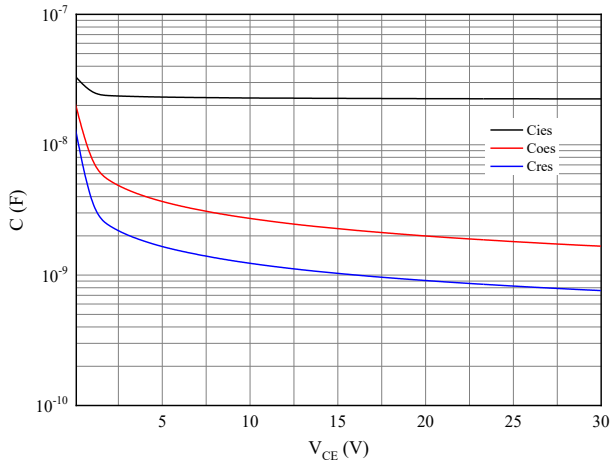
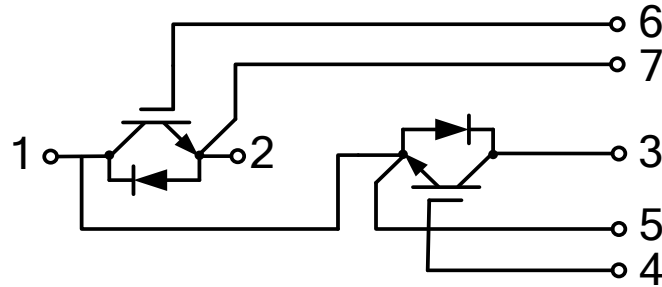


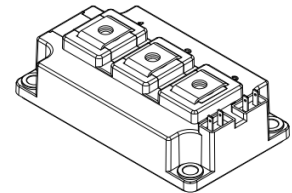
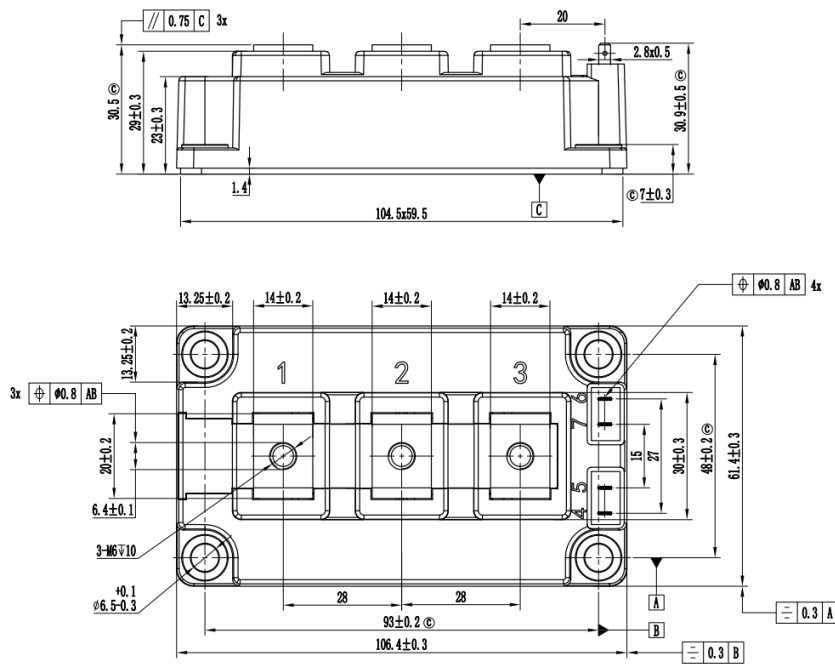
图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines



注: 1. © 尺寸为关键管控尺寸
2. 未标注公差按GB/T1804-m执行