

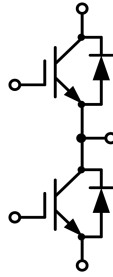
62mm Half Bridge IGBT Module

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}	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	$V_{GE}=15V, I_C=300A$ $V_{GE}=15V, I_C=300A$ $V_{GE}=15V, I_C=300A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_{CESat}	2.10 2.50 2.58	2.65	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 8mA, V_{GE} = V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.50 6.10	6.70	
栅电荷 Gate charge	$V_{GE}=-15V...+15V$		Q_G	1.52		μC
内部栅极电阻 Internal gate resistor	$T_{vj}=25^{\circ}C$		R_{Gint}	3.48		Ω

输入电容 Input capacitance	f=1 MHz, V _{CE} =25 V, V _{GE} =0 V T _{vj} =25°C	C _{ies}	27.38	nF
反向传输电容 Reverse transfer capacitance		C _{res}	0.21	
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 T _{vj} =25°C V _{GE} =±15 V, R _G =3.3Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _{d on}	350 362 363	ns
上升时间 Rise time	I _C =300A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =3.3Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _r	87 99 96	
关断延迟时间 Turn-off delay time	I _C =300A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =3.3Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _{d off}	227 272 281	
下降时间 Fall time	I _C =300A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =3.3Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _f	60 94 96	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	I _C =300A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =3.3Ω T _{vj} =125°C di/dt =2477A/μs (T _{vj} = T _{vj} =150°C) (电感负载) / (inductive load)	E _{on}	25.31 40.84 45.26	mJ
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	I _C =300A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =3.3Ω T _{vj} =125°C dv/dt=8706V/μs (T _{vj} = T _{vj} =150°C) (电感负载) / (inductive load)	E _{off}	9.88 14.3 15,87	
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}	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 I ² t-value	t _p =10ms, sin180°, T _j =125°C	I ² t	34000	A ² S

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=300A$ $I_F=300A$ $I_F=300A$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_F		2.08 1.74 1.66	2.55 V
反向恢复峰值电流 Peak reverse recovery current	$I_F=300A$, $-di_F/dt=2477A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	I_{RM}		122 224 243	A
恢复电荷 Recovered charge	$I_F=300A$, $-di_F/dt=2477A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	Q_f		18.96 50.12 60.12	μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=300A$, $-di_F/dt=2477A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{rec}		7.05 17.91 21.72	mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}			0.23 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
端子连接扭矩 Terminal Connection Torque		M	2.5		5.0	Nm
重量 Weight		W		313		g

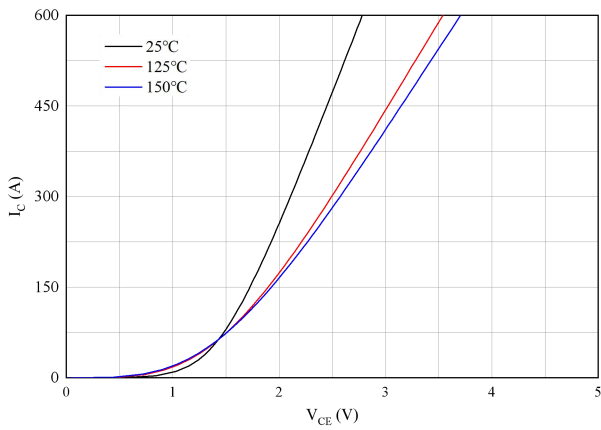


图 1. 典型输出特性 ($V_{GE}=15V$)

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

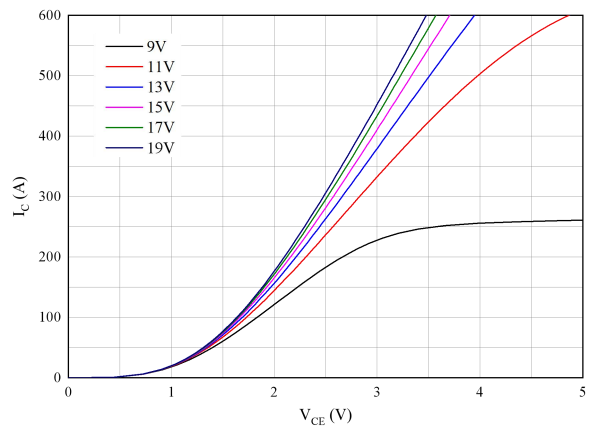


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

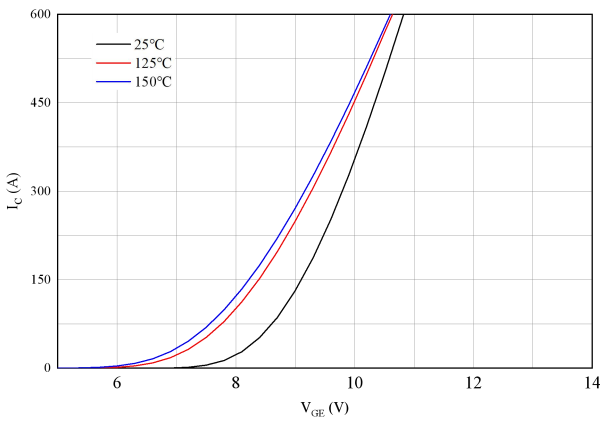


图 3. 典型传输特性 ($V_{CE}=20V$)

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

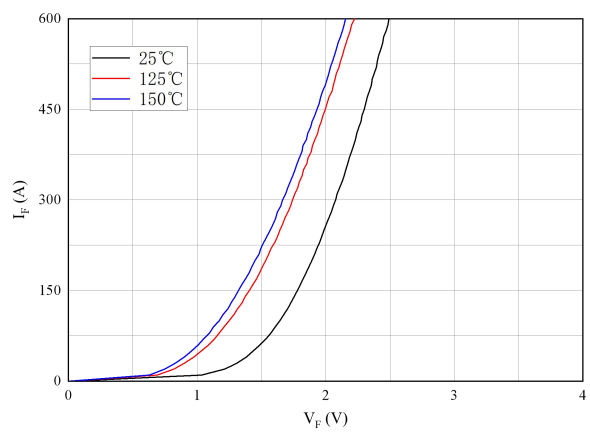


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

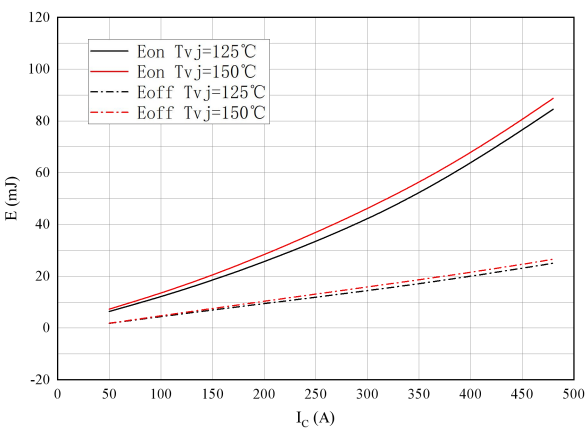


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT
 $V_{GE}=\pm 15V, R_{Gon}=3.3\Omega, R_{Goff}=3.3\Omega, V_{CE}=600V$

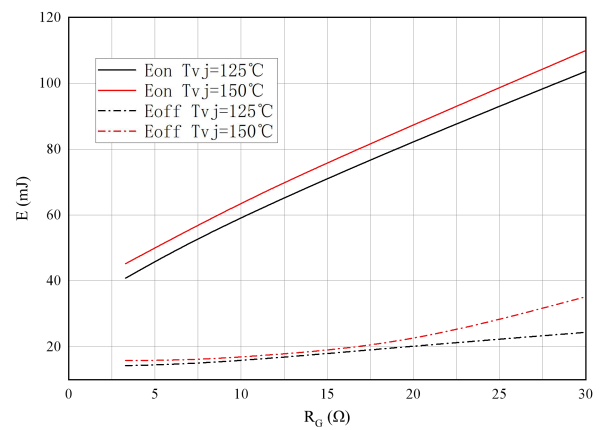


图 6. 开关损耗 逆变器

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

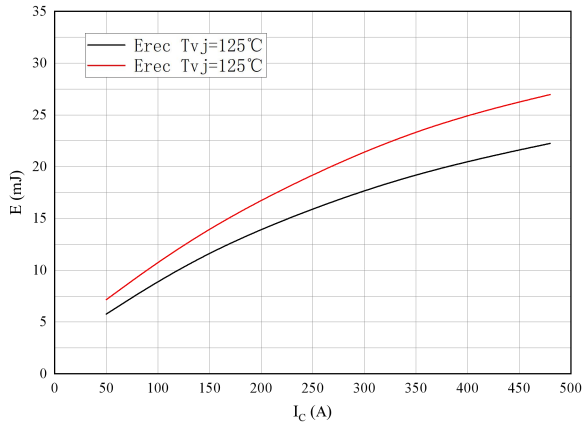


图 7. 开关损耗二极管

Figure 7. Switching losses of Diode
RGon=3.3Ω, VCE=600V

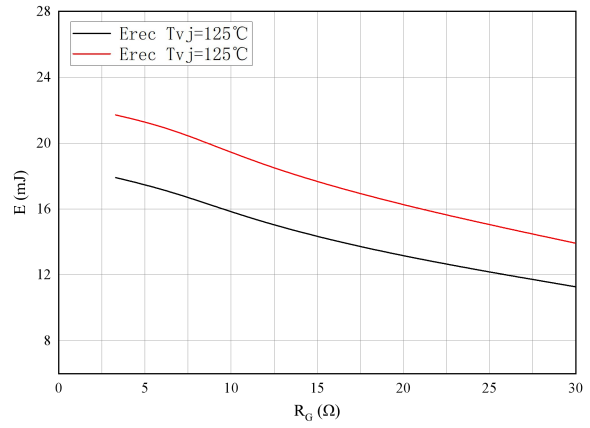


图 8. 开关损耗二极管

Figure 8. Switching losses of Diode
IF=300A, VCE=600V

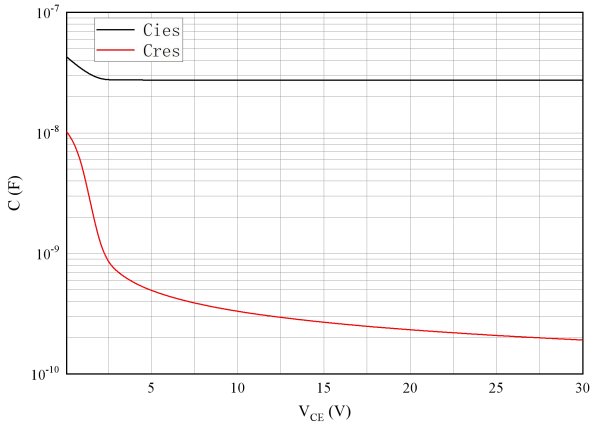


图 9. 电容特性

Figure9.Capacitance characteristic

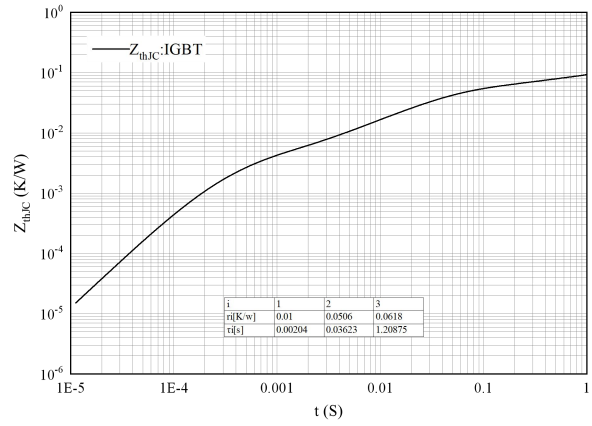


图 10. 瞬态热阻抗 IGBT 逆变器

Figure10. Transient thermal impedance IGBT,Inverter
 $Z_{thJC}=f(t)$

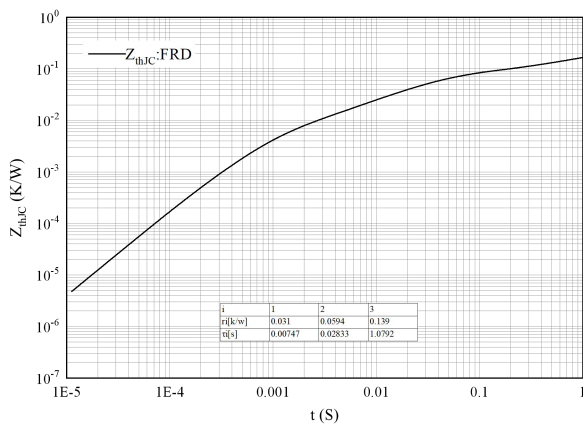
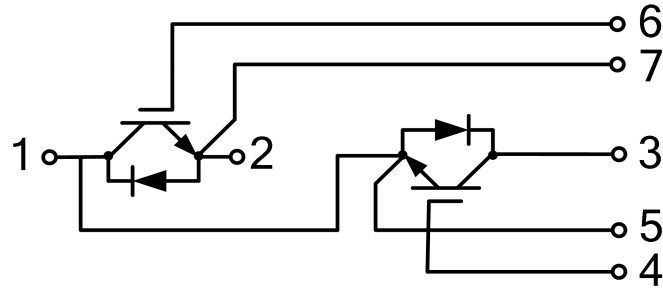


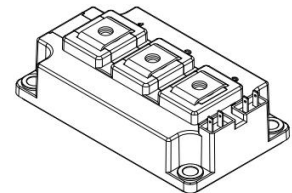
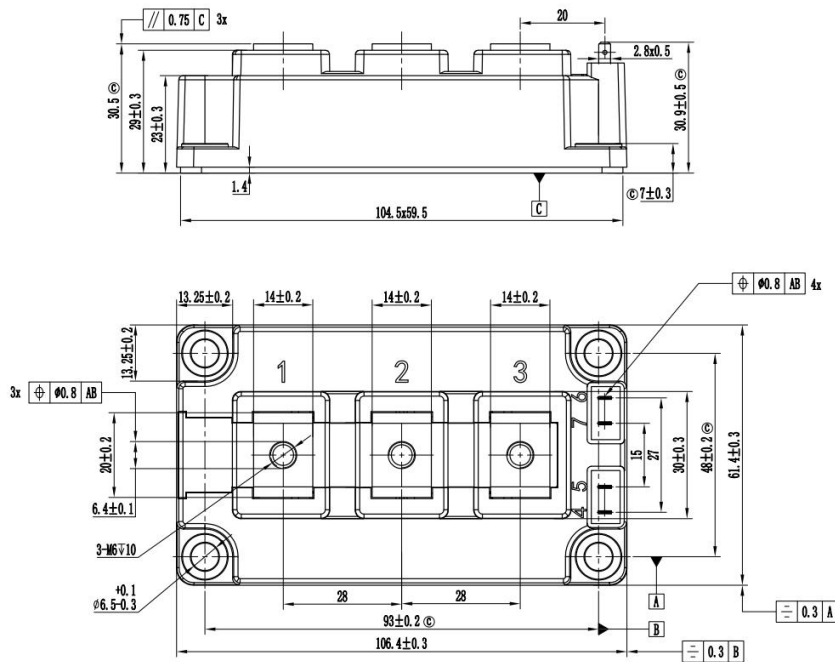
图 11. 瞬态热阻抗 FRD 逆变器

Figure11. Transient thermal impedance FRD ,Inverter
 $Z_{thJC}=f(t)$

接线图 / Circuit diagram



封装尺寸 / Package outlines



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