

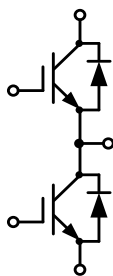
62mm Half Bridge IGBT Module

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}	1400	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}	2.15 2.65 2.90	2.65	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 8mA$, $V_{GE}= V_{CE}$	$T_{vj}=25^{\circ}C$	$V_{GE(th)}$	5.10 5.70	6.30	
栅电荷 Gate charge	$V_{GE}=-15V\dots+15V$		Q_G	1.56		μC
内部栅极电阻			R_{Gint}	1.74		Ω

Internal gate resistor						
输入电容 Input capacitance	$f=1\text{ MHz}, V_{CE}=25\text{ V}, V_{GE}=0\text{ V}$	$T_{vj}=25^{\circ}\text{C}$	C_{ies}	22.46	nF	
反向传输电容 Reverse transfer capacitance			C_{res}	0.84		
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=1200\text{ V}, V_{GE}=0\text{ V}$	$T_{vj}=25^{\circ}\text{C}$	I_{CES}		2	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE}=0\text{ V}, V_{GE}=20\text{ V}$	$T_{vj}=25^{\circ}\text{C}$	I_{GES}		200	nA
开通延迟时间 Turn-on delay time	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}, R_G=3\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}\text{C}$	t_{don}		225	
上升时间 Rise time		$T_{vj}=125^{\circ}\text{C}$			230	
		$T_{vj}=150^{\circ}\text{C}$			231	
关断延迟时间 Turn-off delay time	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}, R_G=3\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}\text{C}$	t_{doff}		268	ns
		$T_{vj}=125^{\circ}\text{C}$			305	
		$T_{vj}=150^{\circ}\text{C}$			317	
下降时间 Fall time	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}, R_G=3\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}\text{C}$	t_f		105	
		$T_{vj}=125^{\circ}\text{C}$			147	
		$T_{vj}=150^{\circ}\text{C}$			156	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}, R_G=3\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}\text{C}$	E_{on}		7.53	mJ
关断损耗能量 (每脉冲) Turn-off energy loss per pulse		$T_{vj}=125^{\circ}\text{C}$			9.90	
		$T_{vj}=150^{\circ}\text{C}$			11.03	
短路数据 SC data	$V_{GE}\leq 15\text{ V}, V_{CC}=800\text{ V}$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt$ $t_p\leq 10\mu\text{s}, T_{vj}=150^{\circ}\text{C}$		I_{SC}		897	A
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}		0.064	K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-40	150	$^{\circ}\text{C}$

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	$T_{vj}=25^{\circ}\text{C}$	V_{RRM}	1200	V
连续正向直流电流 Continuous DC forward current		I_F	160	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1\text{ ms}$	I_{FRM}	320	A
I^2t 值	$t_p=10\text{ ms}, \sin 180^{\circ}, T_j=125^{\circ}\text{C}$	I^2t	8500	A^2s

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 =160A I _F =160A I _F =160A	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	V _F		1.56 1.87 2.09	2.10 V
反向恢复峰值电流 Peak reverse recovery current	I _F =160A, -di _F /dt=3397A/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}		38 42 42	A
恢复电荷 Recovered charge	I _F =160A, -di _F /dt=3397A/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		1.64 1.71 1.75	μC
反向恢复损耗（每脉冲） Reverse recovered energy	I _F =160A, -di _F /dt=3397A/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}		0.37 0.55 0.56	mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R _{thJC}			0.10 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				g

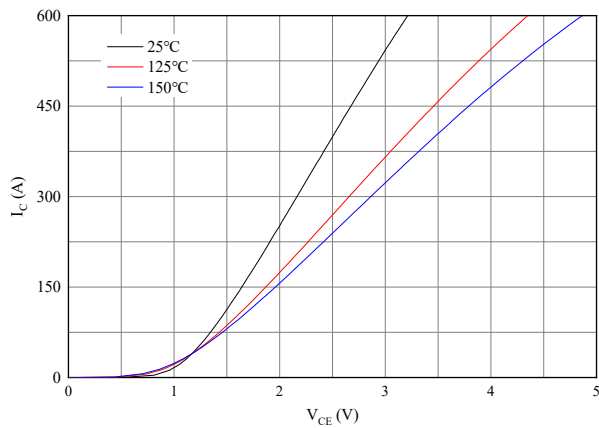


图 1. 典型输出特性 ($V_{GE}=15V$)

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

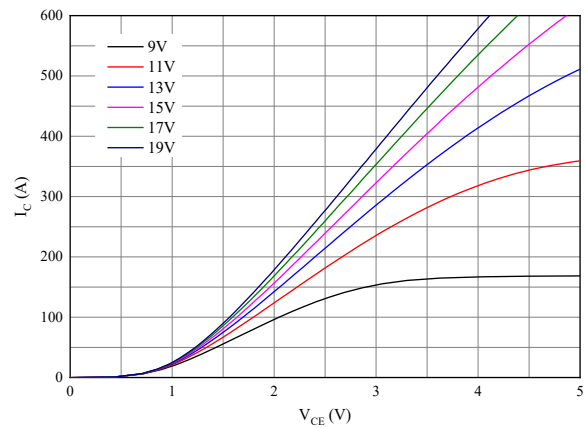


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

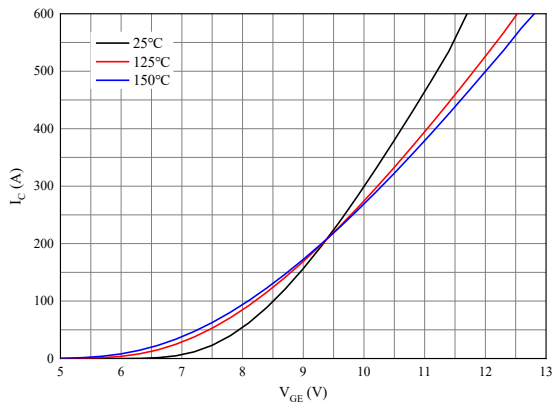


图 3. 典型传输特性 ($V_{CE}=20V$)

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

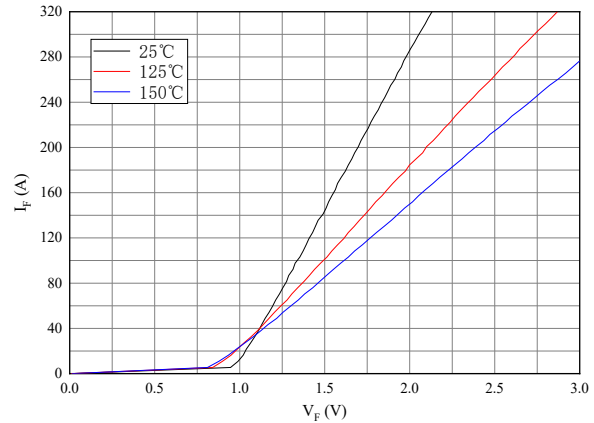


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

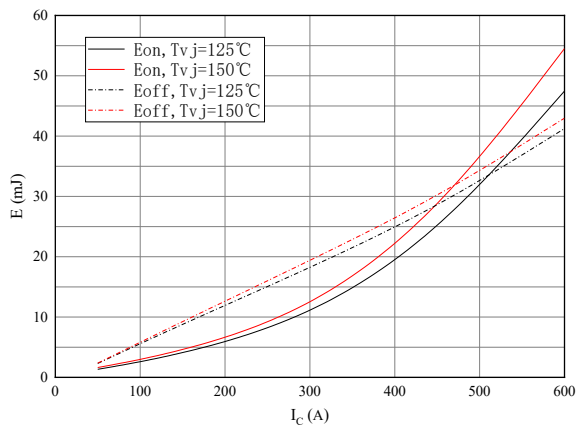


图 5. 开关损耗 逆变器

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

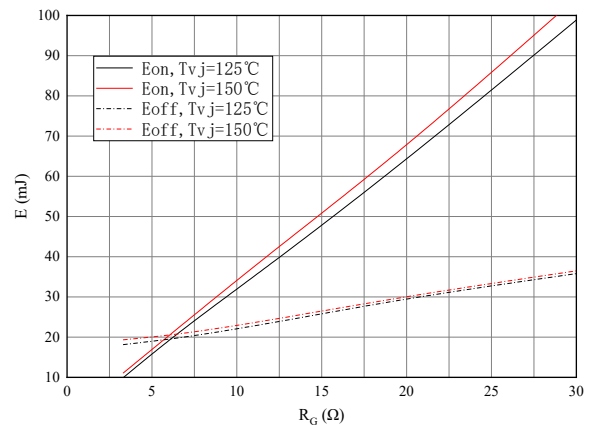


图 6. 开关损耗 逆变器

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

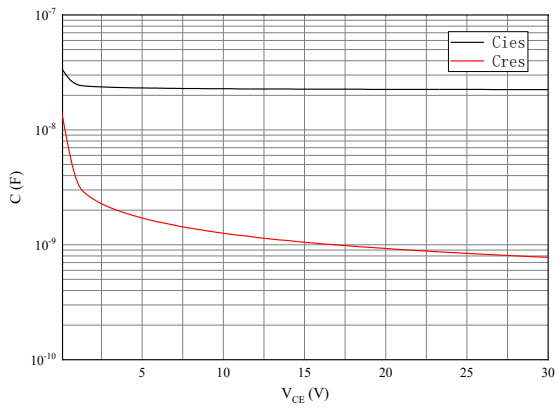
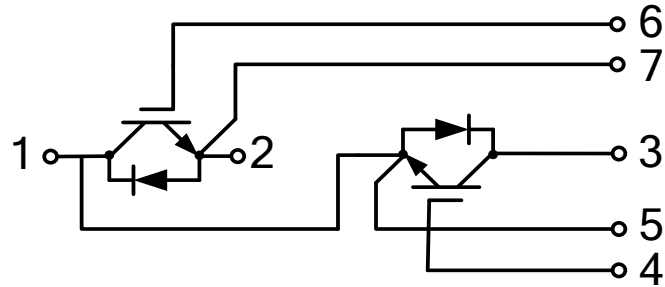


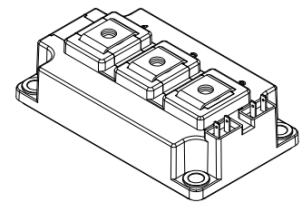
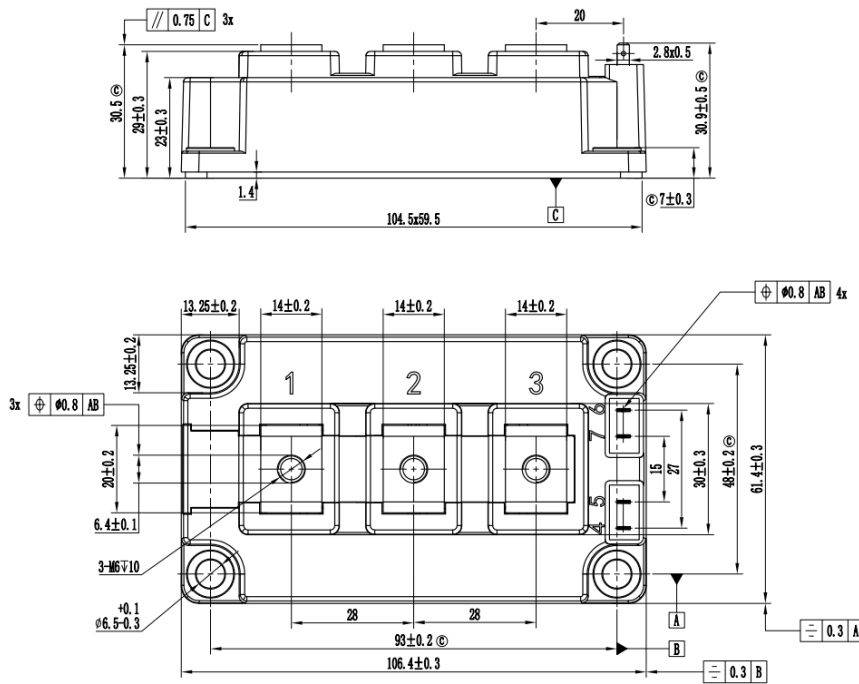
图 9. 电容特性

Figure 7. 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