

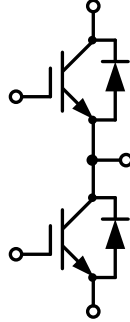
## 62mm Half Bridge IGBT Module

### 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:

- 高压变频器
- UPS
- 伺服
- 逆变器



$V_{CES} = 1700V$ ,  $I_{C\ nom} = 400A$  /  $I_{CRM} = 800A$

## 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	$T_C = 80^{\circ}C$ , $T_{vj\ max} = 150^{\circ}C$	$I_{C\ nom}$	400	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	$I_{CRM}$	800	A
栅极-发射极电压 Gate emitter voltage		$V_{GE}$	$\pm 20$	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	$V_{GE} = 15V$ , $I_C = 400A$ $V_{GE} = 15V$ , $I_C = 400A$ $V_{GE} = 15V$ , $I_C = 400A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	$V_{CESat}$	2.08 2.49 2.57	2.50	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 18mA$ , $V_{GE} = V_{CE}$	$T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	5.2	5.85	6.4
内部栅极电阻 Internal gate resistor			$R_{Gint}$	1.6		$\Omega$
输入电容 Input capacitance	$f = 1MHz$ , $V_{CE} = 25\ V$ , $V_{GE} = 0\ V$	$T_{vj} = 25^{\circ}C$	$C_{ies}$	33.93		nF
反向传输电容 Reverse transfer capacitance			$C_{res}$	1.27		

Reverse transfer capacitance						
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=1700V, V_{GE}=0V$	$T_{vj}=25^{\circ}C$	$I_{CES}$		1	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE}=0V, V_{GE}=20V$	$T_{vj}=25^{\circ}C$	$I_{GES}$		400	nA
开通延迟时间 Turn-on delay time	$I_C=400A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=1\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$t_{don}$		231 242	ns
上升时间 Rise time	$I_C=400A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=1\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$t_r$		92 105	
关断延迟时间 Turn-off delay time	$I_C=400A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=1\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$t_{doff}$		474 531	
下降时间 Fall time	$I_C=400A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=1\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$t_f$		211 306	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=400A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=1\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$E_{on}$		74.95 104.30	
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	$I_C=400A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=1\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$E_{off}$		61.39 77.19	
短路数据 SC data	$V_{GE}\leq 15V, V_{ce}=1000V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt \quad t_p\leq 10\mu s, T_{vj}=125^{\circ}C$		$I_{sc}$		2200	A
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{thJC}$		0.06	K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-40	125	$^{\circ}C$

## 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	$T_{vj}=25^{\circ}C$	$V_{RRM}$	1700	V
连续正向直流电流 Continuous DC forward current		$I_F$	400	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1ms$	$I_{FRM}$	800	A
$I^2t$ 值 $I^2t$ -value	$t_p=10ms, \sin 180^{\circ}, T_j=125^{\circ}C$	$I^2t$	44000	$A^2s$

## 特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=400A, V_{GE}=0V$ $T_{vj}=25^{\circ}C$ $I_F=400A, V_{GE}=0V$ $T_{vj}=125^{\circ}C$ $I_F=400A, V_{GE}=0V$ $T_{vj}=150^{\circ}C$	$V_F$		2.09 2.33 2.29	2.6	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=400A$ $-di_F/dt=3059A/\mu s(T_{vj}=125^{\circ}C)$ $V_R=900V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$I_{RM}$		282 307		A
恢复电荷 Recovered charge	$I_F=400A$ $-di_F/dt=3059A/\mu s(T_{vj}=125^{\circ}C)$ $V_R=900V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$Q_F$		55.24 91.88		$\mu C$
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=400A$ $-di_F/dt=3059A/\mu s(T_{vj}=125^{\circ}C)$ $V_R=900V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$	$E_{rec}$		30.70 52.99		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	$R_{thJC}$			0.11	K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj op}$	-40		125	$^{\circ}C$

## 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		308		g

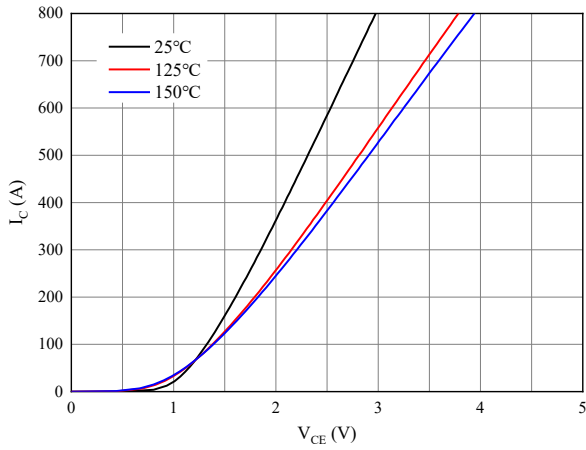


图 1. 典型输出特性 ( $V_{GE}=15V$ )

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

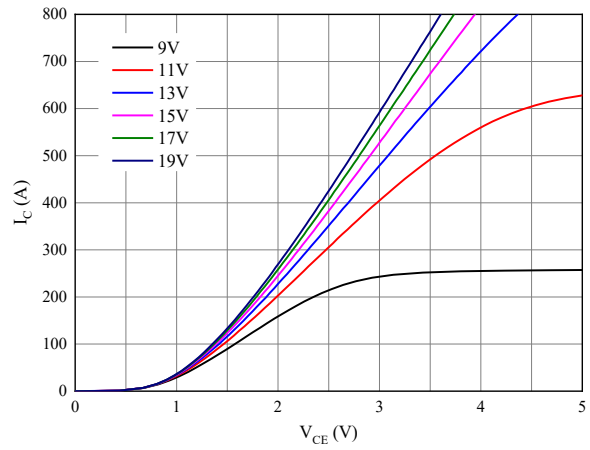


图 2. 典型输出特性 ( $T_{vj}=150^{\circ}C$ )

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

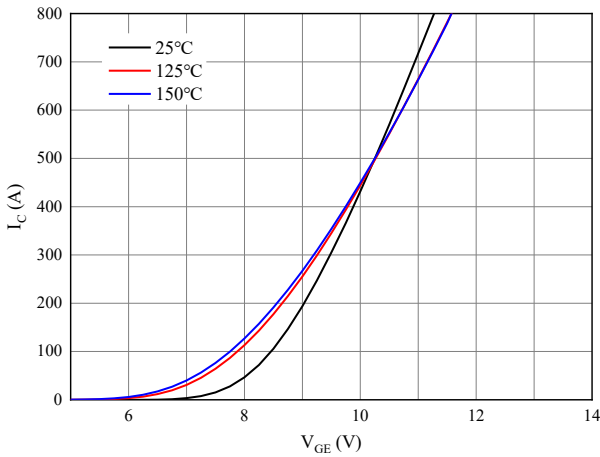


图 3. 典型传输特性( $V_{CE}=20V$ )

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

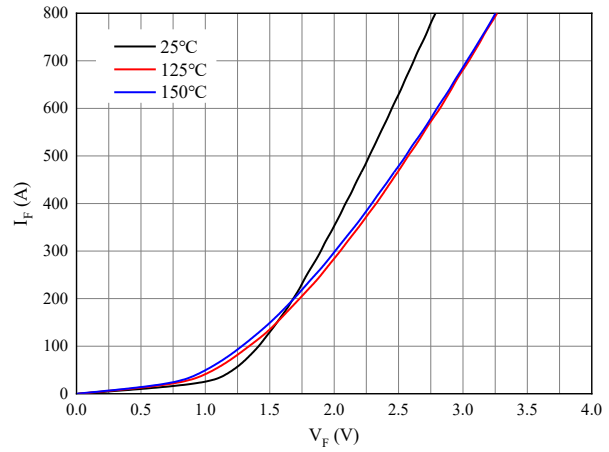


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

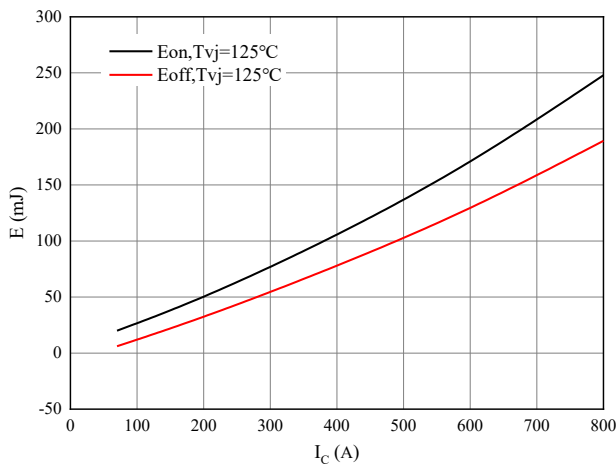


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT  
 $V_{GE}=\pm 15V, R_{Gon}=1\Omega, R_{Goff}=1\Omega, V_{CE}=900V$

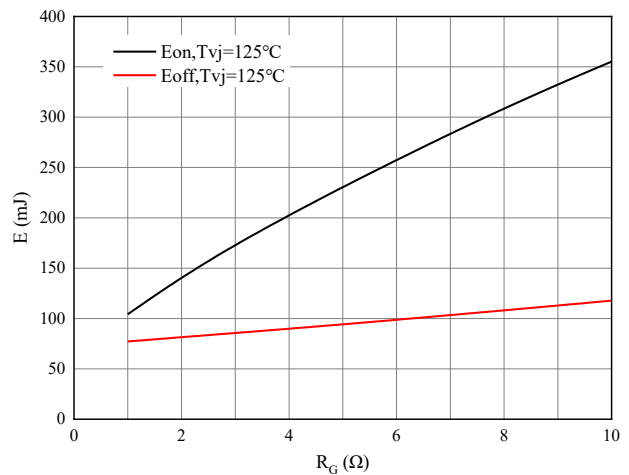


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT  
 $V_{GE}=\pm 15V, I_C=400A, V_{CE}=900V$

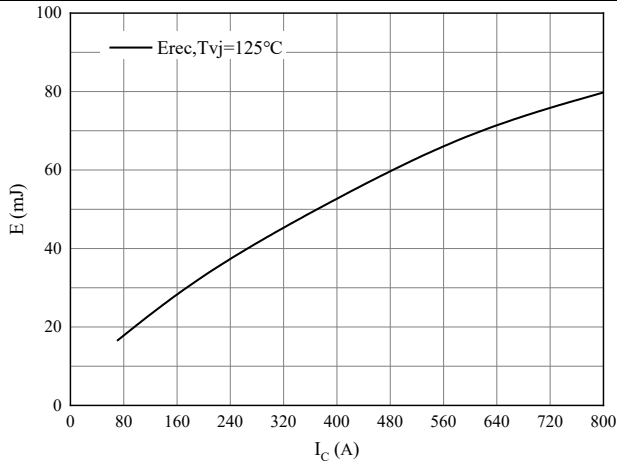


图 7. 开关损耗 二极管  
 Figure 7. Switching losses of Diode  
 $R_{Gon}=1\Omega, V_{CE}=900V$

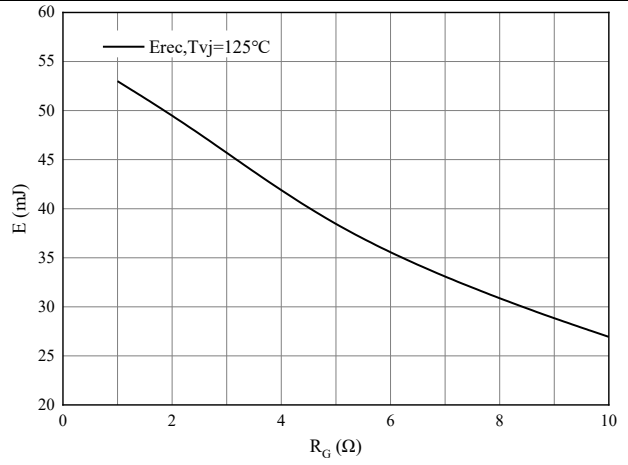


图 8. 开关损耗 二极管  
 Figure 8. Switching losses of Diode  
 $I_F=400A, V_{CE}=900V$

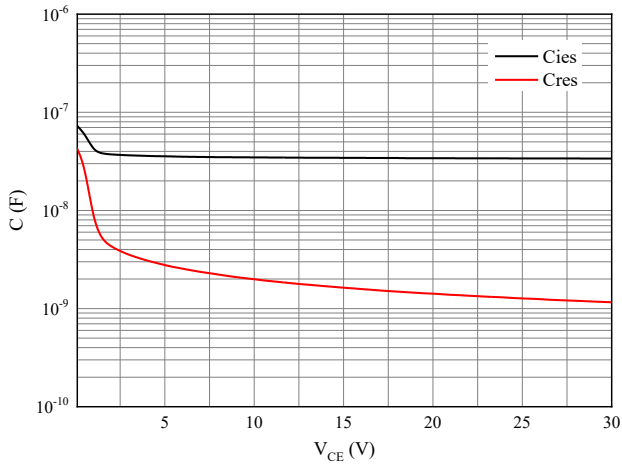
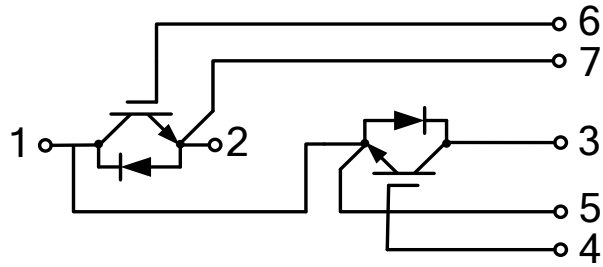
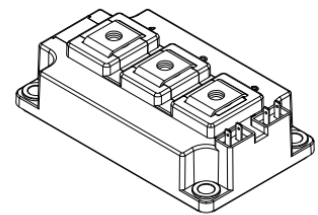
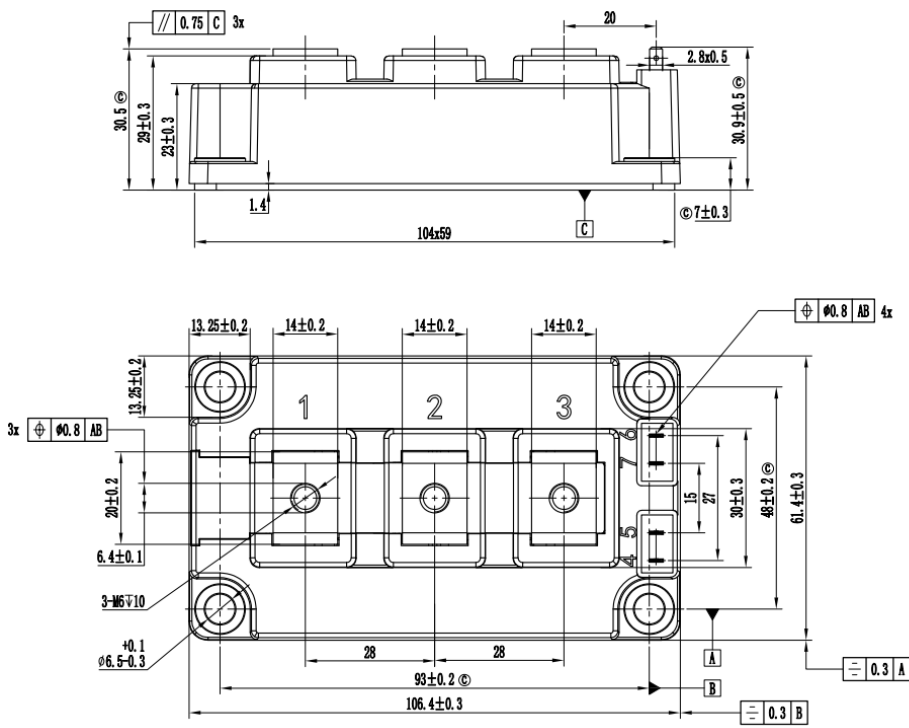


图 9. 电容特性  
 Figure 9. Capacitance characteristic

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