

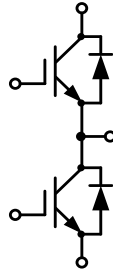
62mm Half Bridge IGBT Module

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 |
| 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 | | | R_{Gint} | 3.48 | | Ω |
| 输入电容 Input capacitance | $f=1\ MHz$, $V_{CE}=25\ V$, $V_{GE}=0\ V$ | $T_{vj}=25^{\circ}C$ | C_{ies} | 27.38 | | nF |

| | | | | | | |
|--|--|--|--------------|-----|-------------------------|-----------|
| Input capacitance | | | | | | |
| 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 | $V_{CE}=1200V, V_{GE}=0V$ | $T_{vj}=25^{\circ}C$ | I_{CES} | | 2 | 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} | | 200 | nA |
| 开通延迟时间 Turn-on delay time | $I_C=300A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=3.3\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | $t_{d\ on}$ | | 350 362 363 | ns |
| 上升时间 Rise time | $I_C=300A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=3.3\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | t_r | | 87 99 96 | |
| 关断延迟时间 Turn-off delay time | $I_C=300A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=3.3\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | $t_{d\ off}$ | | 227 272 281 | |
| 下降时间 Fall time | $I_C=300A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=3.3\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | t_f | | 60 94 96 | |
| 开通损耗能量 (每脉冲) Turn-on energy loss per pulse | $I_C=300A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=3.3\Omega$ $di/dt=2477A/\mu s$ ($T_{vj}=150^{\circ}C$) (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | E_{on} | | 25.31 40.84 45.26 | |
| 关断损耗能量 (每脉冲) Turn-off energy loss per pulse | $I_C=300A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=3.3\Omega$ $dv/dt=8706V/\mu s$ ($T_{vj}=150^{\circ}C$) (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | E_{off} | | 9.88 14.3 15,87 | mJ |
| 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 | $T_{vj}=25^{\circ}C$ | 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^2t 值 I^2t -value | $t_p=10ms, \sin 180^{\circ}, T_j=125^{\circ}C$ | I^2t | 34848 | 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 | $I_F=300A,$ $-di_F/dt=2558A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | I_{RM} | 122 224 243 | | A |
| 恢复电荷 Recovered charge | $I_F=300A,$ $-di_F/dt=2558A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | Q_r | 18.96 50.12 60.12 | | μC |
| 反向恢复损耗（每脉冲） Reverse recovered energy | $I_F=300A,$ $-di_F/dt=2558A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | E_{rec} | 7.05 17.91 21.72 | | mJ |
| 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 |
| 重量 Weight | | W | | 324 | | g |

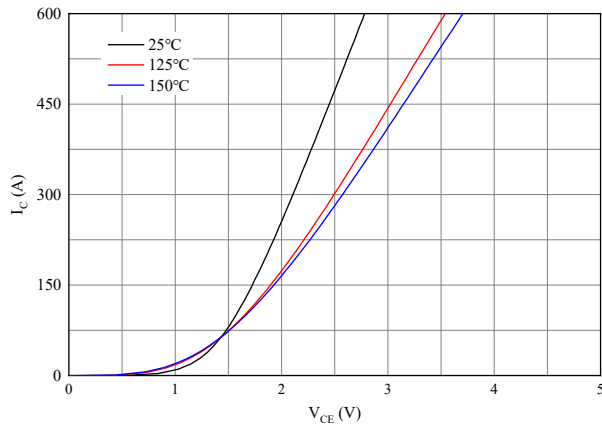


图 1. 典型输出特性 ($V_{GE}=15V$)

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

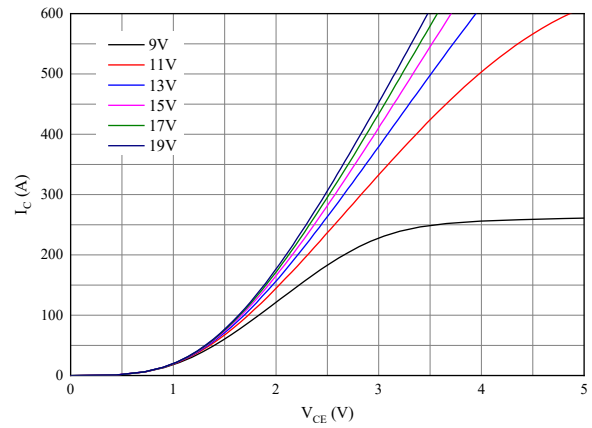


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

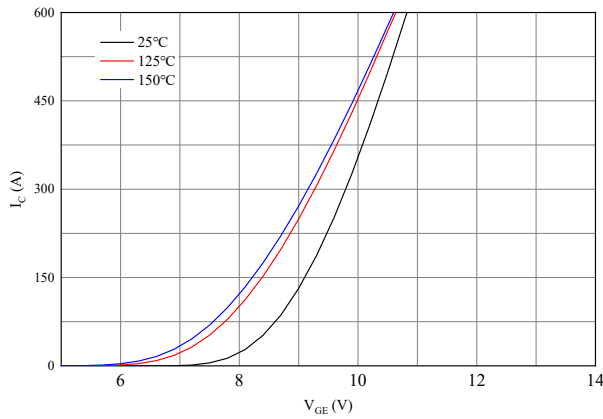


图 3. 典型传输特性 ($V_{CE}=20V$)

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

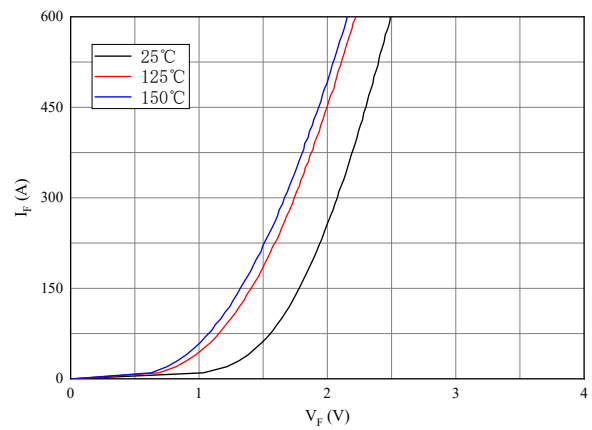


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

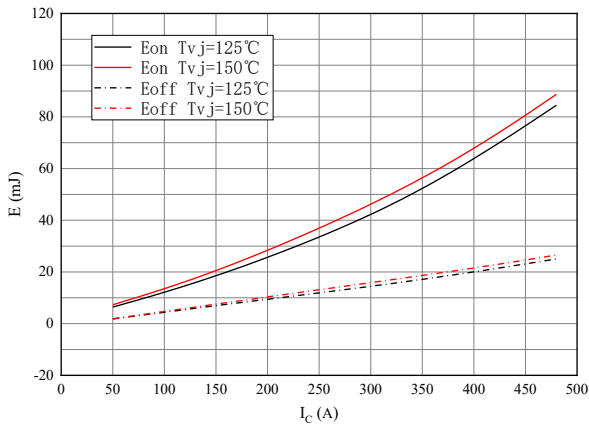


图 5. 开关损耗 逆变器

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

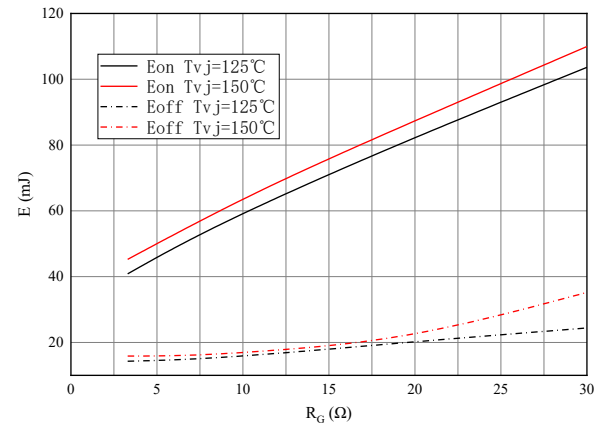


图 6. 开关损耗 逆变器

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

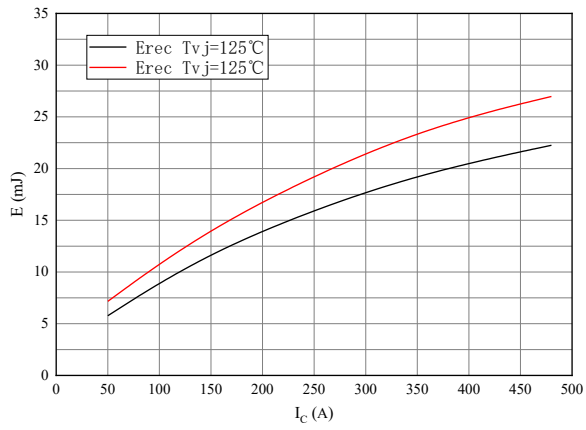


图 7. 开关损耗二极管

Figure 7. Switching losses of Diode
 $R_{Gon}=3.3\Omega, V_{CE}=600V$

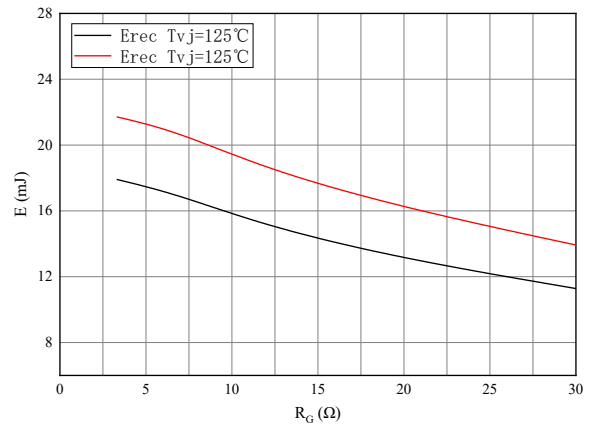


图 8. 开关损耗二极管

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

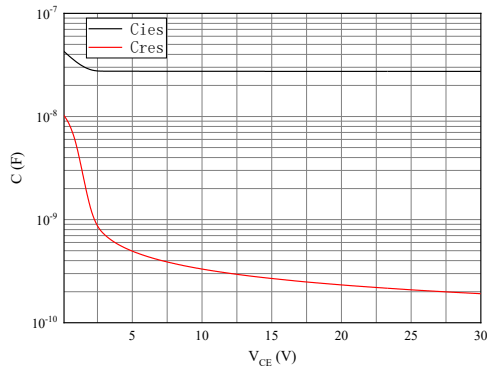
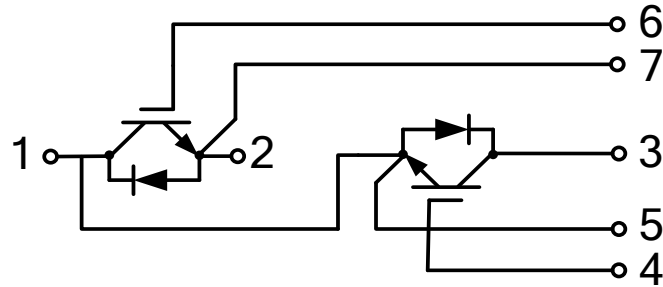


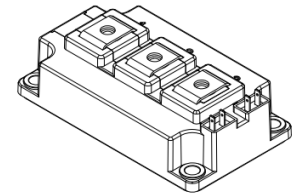
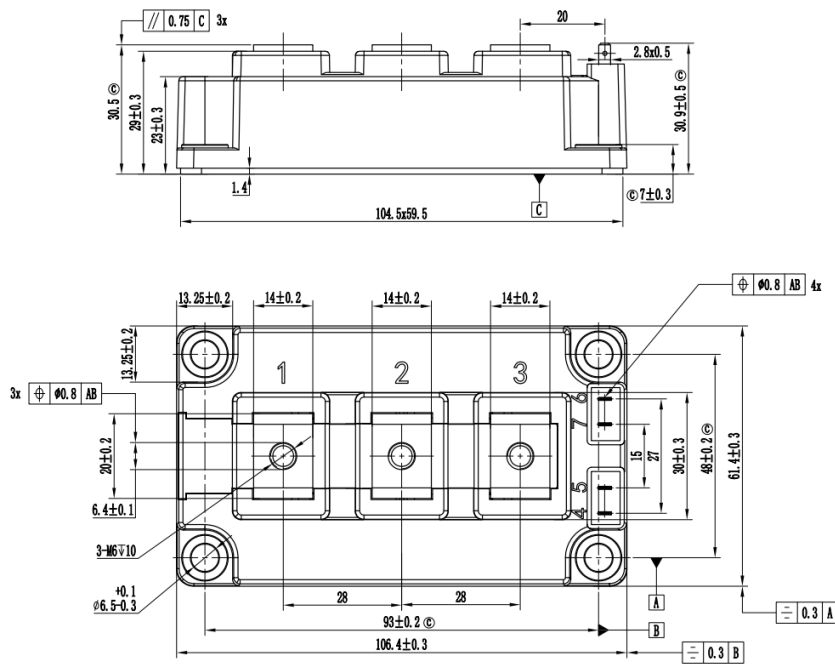
图 9. 电容特性

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