

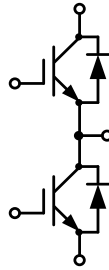
34mm Half Bridge IGBT Module

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



$V_{CES}=1200V$, $I_{C\ nom}=75A$ / $I_{CRM}=150A$

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 | $T_C=100^{\circ}C$, $T_{vj\ max}=175^{\circ}C$ | $I_{C\ nom}$ | 75 | A |
| 集电极重复峰值电流 Repetitive peak collector current | $t_p=1\ ms$ | I_{CRM} | 150 | A |
| 总功率损耗 Total power dissipation | $T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$ | P_{tot} | 395 | 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 | $V_{GE}=15V$, $I_C=75A$ $V_{GE}=15V$, $I_C=75A$ $V_{GE}=15V$, $I_C=75A$ | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | V_{CESat} | 1.98 2.45 2.56 | 2.50 | V |
| 栅极-发射极阈值电压 Gate-Emitter threshold voltage | $I_C = 2.6mA$, $V_{GE} = V_{CE}$ | $T_{vj}=25^{\circ}C$ | $V_{GE(th)}$ | 5.10 5.70 | 6.30 | |
| 栅电荷 Gate charge | $V_{GE}=-15V\dots+15V$ | | Q_G | 0.36 | | μC |
| 内部栅极电阻 Internal gate resistor | | | R_{Gint} | 6.00 | | Ω |
| 输入电容 Input capacitance | $f=1MHz$, $V_{CE}=25\ V$, $V_{GE}=0\ V$ | $T_{vj}=25^{\circ}C$ | C_{ies} | 4.49 | | nF |

| | | | | | | |
|--|---|--|------------|------|------------------------|-------------|
| 反向传输电容 Reverse transfer capacitance | | C_{res} | | 0.20 | | |
| 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} | | | 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} | | | 100 | nA |
| 开通延迟时间 Turn-on delay time | $I_C=75A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=10\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | t_{don} | | 97 107 111 | ns |
| 上升时间 Rise time | $I_C=75A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=10\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | t_r | | 47 58 63 | |
| 关断延迟时间 Turn-off delay time | $I_C=75A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=10\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | t_{doff} | | 242 280 289 | |
| 下降时间 Fall time | $I_C=75A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=10\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | t_f | | 119 142 135 | |
| 开通损耗能量 (每脉冲) Turn-on energy loss per pulse | $I_C=75A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=10\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | E_{on} | | 6.72 10.62 11.89 | mJ |
| 关断损耗能量 (每脉冲) Turn-off energy loss per pulse | $I_C=75A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=10\Omega$ (电感负载) / (inductive load) | $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$ | E_{off} | | 3.16 4.09 4.41 | |
| 结-外壳热阻 Thermal resistance, junction to case | 每个 IGBT / per IGBT | R_{thJC} | | | 0.38 | K/W |
| 在开关状态下温度 Temperature under switching conditions | | $T_{vj op}$ | -40 | | 150 | $^{\circ}C$ |

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} | 1200 | V |
| 连续正向直流电流 Continuous DC forward current | | I_F | 60 | A |
| 正向重复峰值电流 Repetitive peak forward current | $t_p=1ms$ | I_{FRM} | 120 | A |
| I^2t 值 I^2t -value | $t_p=10ms, \sin 180^{\circ}, T_j=125^{\circ}C$ | I^2t | 1200 | A^2s |

特征值 / Characteristic Values

| Parameter | Conditions | Symbol | Value | | | Unit |
|--|--|-------------|-------|------------------------|------|-------------|
| | | | Min. | Typ. | Max. | |
| 正向电压 Forward voltage | $I_F=60A, V_{GE}=0V$ $T_{vj}=25^{\circ}C$ $I_F=60A, V_{GE}=0V$ $T_{vj}=125^{\circ}C$ $I_F=60A, V_{GE}=0V$ $T_{vj}=150^{\circ}C$ | V_F | | 1.90 1.62 1.54 | 2.40 | V |
| 反向恢复峰值电流 Peak reverse recovery current | $I_F=60A,$ $-di_F/dt=900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ | I_{RM} | | 29 43 48 | | A |
| 恢复电荷 Recovered charge | $I_F=60A,$ $-di_F/dt=900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ | Q_r | | 5.46 11.68 13.88 | | μC |
| 反向恢复损耗（每脉冲） Reverse recovered energy | $I_F=60A,$ $-di_F/dt=900A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$ | E_{rec} | | 2.07 4.26 5.06 | | mJ |
| 结-外壳热阻 Thermal resistance, junction to case | 每个二极管 / per diode | R_{thJC} | | | 0.58 | 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 |
| 重量 Weight | | W | | 155 | | g |

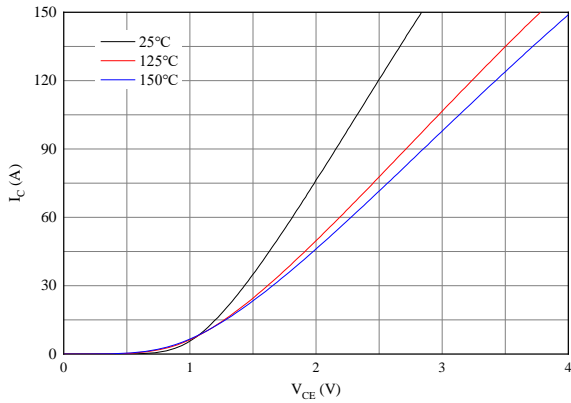


图 1. 典型输出特性 ($V_{GE}=15V$)

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

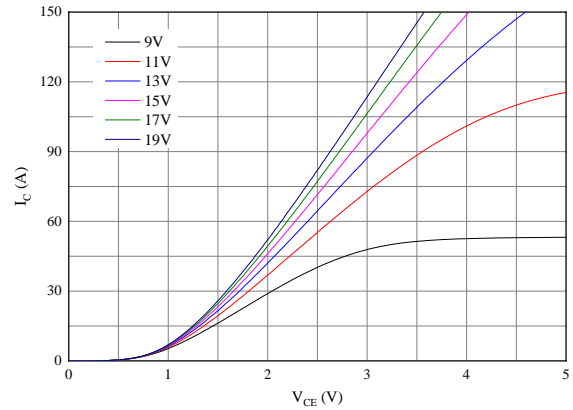


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

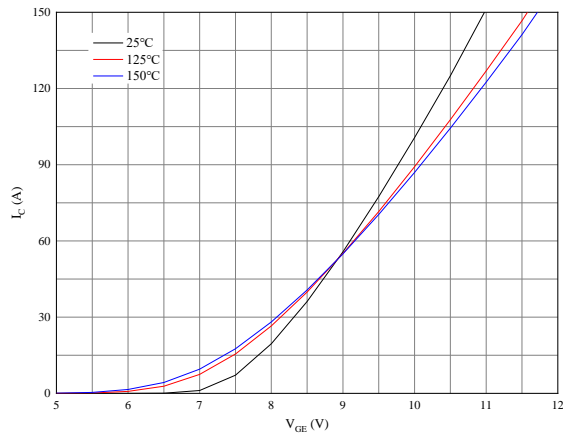


图 3. 典型传输特性 ($V_{CE}=20V$)

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

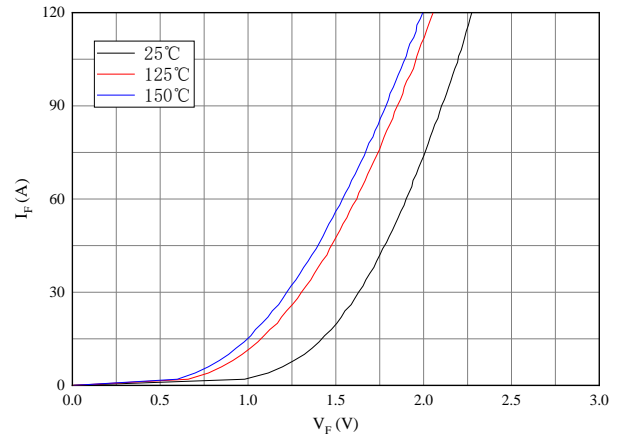


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

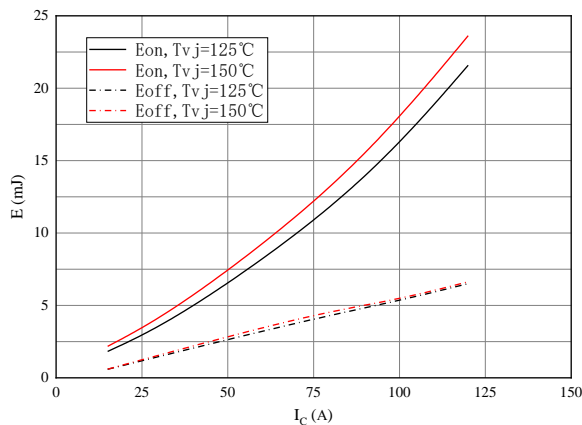


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT
 $V_{GE}=\pm 15V, R_{Gon}=10\Omega, R_{Goff}=10\Omega, V_{CE}=600V$

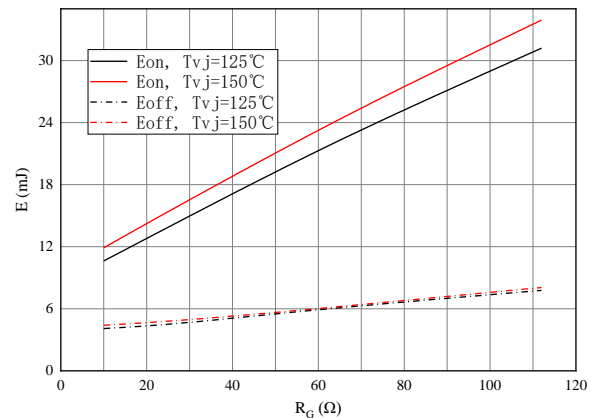


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT
 $V_{GE}=\pm 15V, I_C=75A, V_{CE}=600V$

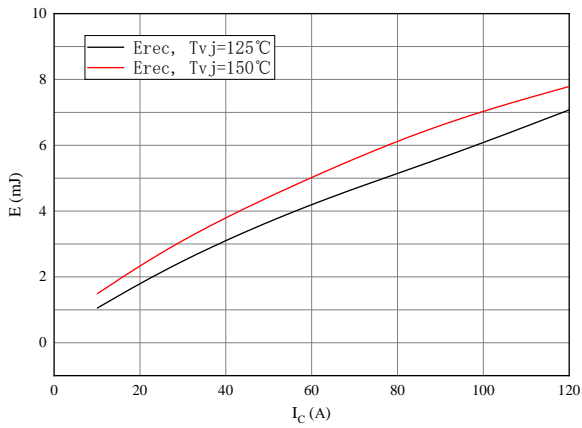


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode
 $R_{Gon}=10\Omega, V_{CE}=600V$

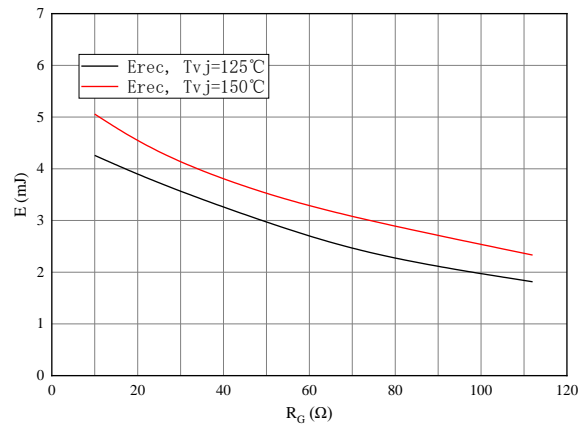


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode
 $I_F=60A, V_{CE}=600V$

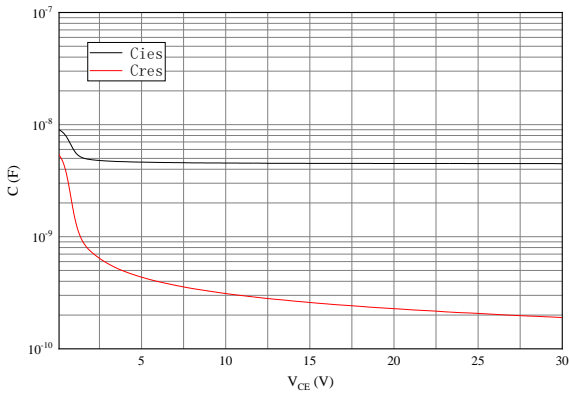
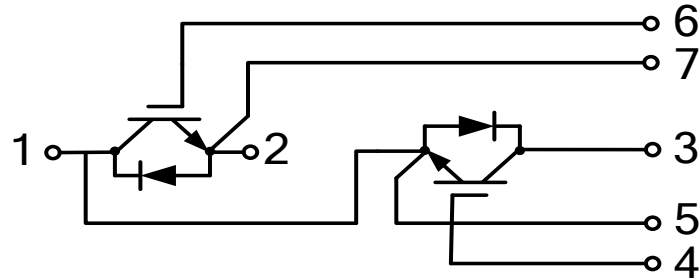


图 9. 电容特性

Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

