

XNG450B24KC2S 规格书

■ 特点/Features

- ◆ 低 Vcesat/ Low Vcesat
- ◆ 高可靠性和功率密度/High reliability and Power density
- ◆ 低开关损耗/Low switching loss

■ 应用领域/Applications

- ◆ UPS 系统/UPS Systems
- ◆ 风力发电机/Wind Tuebines
- ◆ 电机传动/Motor Drives



■ 关键性能和封装信息/Key Performance and Package Parameters

| Type | V _{CE} | I _C | V _{CEsat} , T _{vj} =25°C | T _{vjmax} | Package |
|---------------|-----------------|----------------|--|--------------------|---------|
| XNG450B24KC2S | 1200V | 450A | 1.85V | 175°C | C2 |

■ IGBT-逆变器/IGBT-Inverter

最大额定值/Maximum Rated Values

| 符号 symbol | 参数 Parameter | 条件 Condition | 值 Value | 单位 Unit |
|--------------------|--|--|------------|------------|
| V_{CES} | Collector-to-Emitter Voltage 集电极 - 发射极电压 | $T_{vj}=25^{\circ}\text{C}$ | 1200 | V |
| $I_{C\text{ nom}}$ | Continuous DC collector current 连续集电极直流电流 | $T_C = 100^{\circ}\text{C}, T_{vj\text{ max}}=175^{\circ}\text{C}$ | 450 | A |
| I_{CRM} | Repetitive peak collector current 集电极重复峰值电流 | $t_p=1\text{ms}$ | 900 | A |
| P_{total} | Total power dissipation 总功率损耗 | $T_C = 25^{\circ}\text{C}, T_{vj\text{ max}}=175^{\circ}\text{C}$ | 2400 | W |
| V_{GES} | Gate-Emitter peak voltage 栅极 - 发射极峰值电压 | | +/- 20 | V |

静态电气参数/Static Electrical Characteristic

| 符号 symbol | 参数 Parameter | 测试条件 Test Condition | 值 Value | | | 单位 Unit |
|----------------------|---|--|------------|------------|------------|---------------|
| | | | Min. 最小 | Typ. 典型 | Max. 最大 | |
| $V_{CE(\text{sat})}$ | Collector-Emitter Saturation voltage 集电极 - 发射极饱和电压 | $V_{GE}=15\text{V},$ $I_C=450\text{A}, T_{vj}=25^{\circ}\text{C}$ | — | 1.85 | — | V |
| | | $V_{GE}=15\text{V},$ $I_C=450\text{A}, T_{vj}=150^{\circ}\text{C}$ | — | 2.20 | — | V |
| $V_{GE(\text{th})}$ | Gate threshold voltage 门极开启阈值电压 | $V_{GE}=V_{CE}, I_C = 17\text{mA}$ | 5.5 | 6.0 | 6.5 | V |
| C_{iss} | Input capacitance 输入电容 | $V_{GE} = 0\text{V}$ $V_{CE}= 25\text{V}$ $T_{vj}=25^{\circ}\text{C}$ $f = 1\text{MHz}$ | — | 31 | — | nF |
| C_{oss} | Output capacitance 输出电容 | | — | 2.55 | — | nF |
| C_{rssi} | Reverse transfer capacitance 反向传输电容 | | — | 0.9 | — | nF |
| Q_g | Total gate charge 栅极电荷 | $V_{GE} = -15\text{.....}+15\text{V}$ | — | 2.36 | — | μC |
| R_g | Internal gate resistor 内部栅极电阻 | $T_{vj}=25^{\circ}\text{C}$ | — | 2.5 | — | Ω |
| I_{CES} | Collector-Emitter leakage current 集电极-发射极截止电流 | $V_{CE}=1200\text{V},$ $V_{GE} = 0\text{V}, T_{vj}=25^{\circ}\text{C}$ | - | - | 5.0 | mA |
| I_{GES} | Gate-Emitter leakage current 栅极-发射极漏电流 | $V_{CE}=0\text{V}, V_{GE}=20\text{V},$ $T_{vj}=25^{\circ}\text{C}$ | - | - | 400 | nA |

动态电气参数/Switching Electrical Characteristic

| 符号 symbol | 参数 Parameter | 测试条件 Test Condition | 值 Value | | | 单位 Unit |
|--------------|---|--|------------|------------|------------|--------------------|
| | | | Min. 最小 | Typ. 典型 | Max. 最大 | |
| $T_{d(on)}$ | Turn-On DelayTime 开通延迟时间 | $T_{vj}=25^{\circ}\text{C}, V_{CE}=600\text{V},$ $I_C=450\text{A}, R_g=1.0\text{ohm},$ $V_{GE}=+15\text{V}$ | - | 334 | - | ns |
| T_r | Rise Time 上升时间 | | - | 83 | - | ns |
| $T_{d(off)}$ | Turn-Off DelayTime 关断延迟时间 | | - | 514 | - | ns |
| T_f | Turn-Off Fall Time 下降时间 | | - | 96 | - | ns |
| $T_{d(on)}$ | Turn-On DelayTime 开通延迟时间 | $T_{vj}=150^{\circ}\text{C}, V_{CE}=600\text{V},$ $I_C=450\text{A}, R_g=1.0\text{ohm},$ $V_{GE}=+15\text{V}$ | - | 382 | - | ns |
| T_r | Rise Time 上升时间 | | - | 93 | - | ns |
| $T_{d(off)}$ | Turn-Off DelayTime 关断延迟时间 | | - | 574 | - | ns |
| T_f | Turn-Off Fall Time 下降时间 | | - | 125 | - | ns |
| E_{on} | Turn-on switch loss 开通损耗 | $T_{vj}=25^{\circ}\text{C}, V_{CE}=600\text{V},$ $I_C=450\text{A}, R_g=1.0\text{ohm},$ $V_{GE}=+15\text{V}$ | - | 15 | - | mJ |
| E_{off} | Turn-off switch loss 关断损耗 | | - | 39 | - | mJ |
| E_{on} | Turn-on switch loss 开通损耗 | $T_{vj}=150^{\circ}\text{C}, V_{CE}=600\text{V},$ $I_C=450\text{A}, R_g=1.0\text{ohm},$ $V_{GE}=+15\text{V}$ | - | 22 | - | mJ |
| E_{off} | Turn-off switch loss 关断损耗 | | - | 52 | - | mJ |
| I_{sc} | Short-circuit current 短路电流 | $T_{vj}=25^{\circ}\text{C}, V_{GE}=15\text{V},$ $V_{CE}=800\text{V}, t_p \leq 10\mu\text{s}$ | - | 2000 | - | A |
| R_{thJC} | Junction-Case Thermal resistance 结-外壳热阻 | - | - | - | 0.062 | K/W |
| $T_{vj op}$ | Temperature under switching 在开关状态下温度 | - | -40 | - | 150 | $^{\circ}\text{C}$ |

■ 二极管-逆变器/Diode-Inverter

最大额定值/Maximum Rated Values

| 符号 symbol | 参数 Parameter | 条件 Condition | 值 Value | 单位 Unit |
|--------------|---|---|------------|----------------------|
| V_{RRM} | Repetitive peak reverse voltage 反向重复峰值电压 | $T_{vj}=25\text{ }^{\circ}\text{C}$ | 1200 | V |
| I_F | Continuous DC forward current 连续正向直流电流 | | 450 | A |
| I_{FRM} | Repetitive peak forward current 正向重复峰值电流 | $T_p=1\text{ms}$ | 900 | A |
| I^2t | I^2t Data | $V_R=0\text{V}, T_p=10\text{ms}, T_{vj}=25\text{ }^{\circ}\text{C}$ | 51000 | A^2S |

静态电气参数/Static Electrical Characteristic

| 符号 symbol | 参数 Parameter | 测试条件 Test Condition | 值 Value | | | 单位 Unit |
|--------------|-------------------------|---|------------|------------|------------|------------|
| | | | Min. 最小 | Typ. 典型 | Max. 最大 | |
| V_F | Forward voltage 正向电压 | $I_F=450\text{A}, T_{vj}=25\text{ }^{\circ}\text{C}$ | - | 2.10 | - | V |
| | | $I_F=450\text{A}, T_{vj}=150\text{ }^{\circ}\text{C}$ | - | 2.20 | - | V |

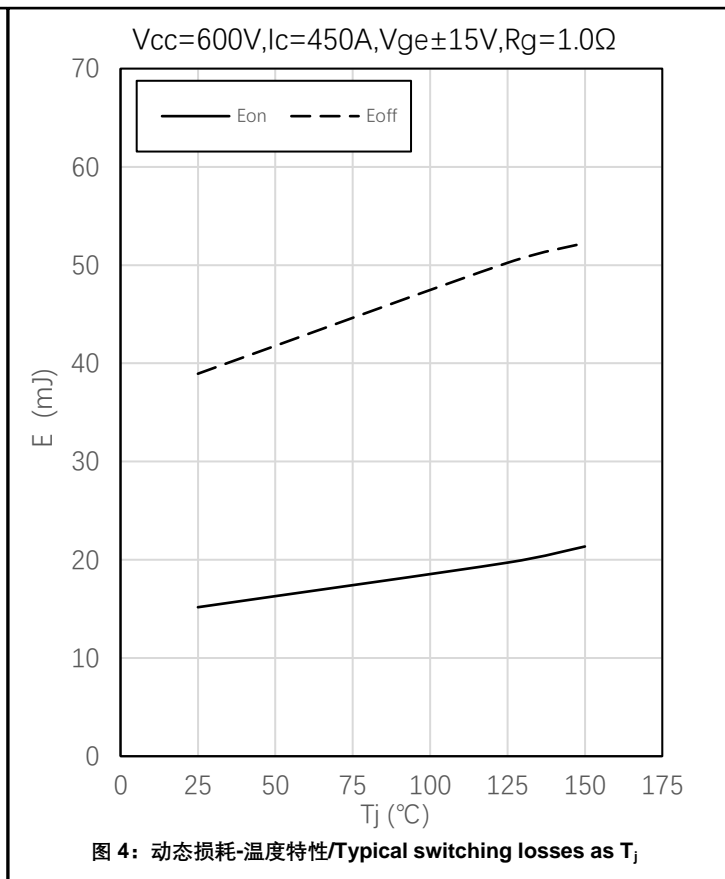
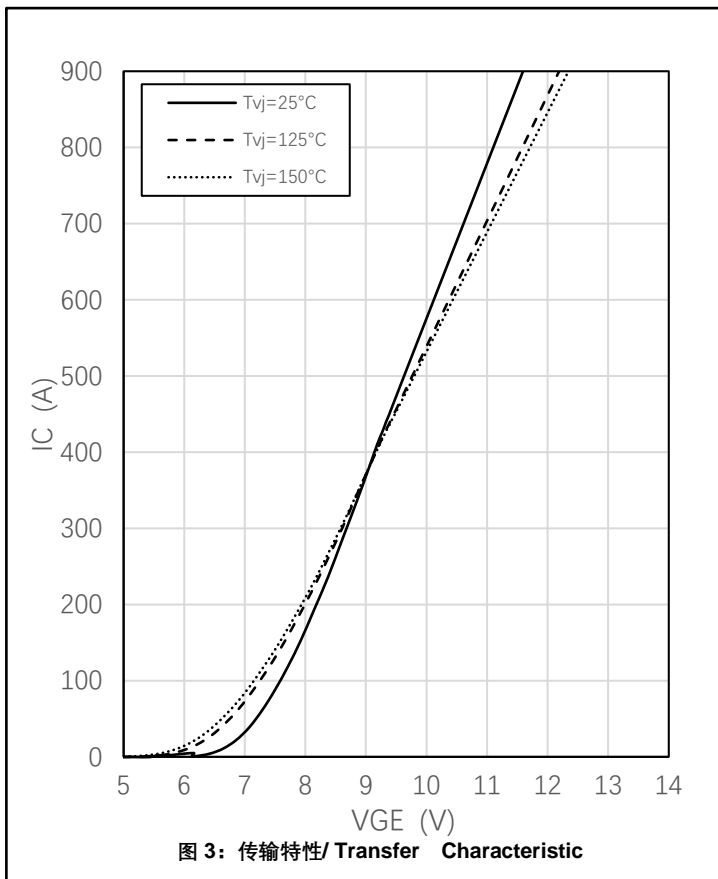
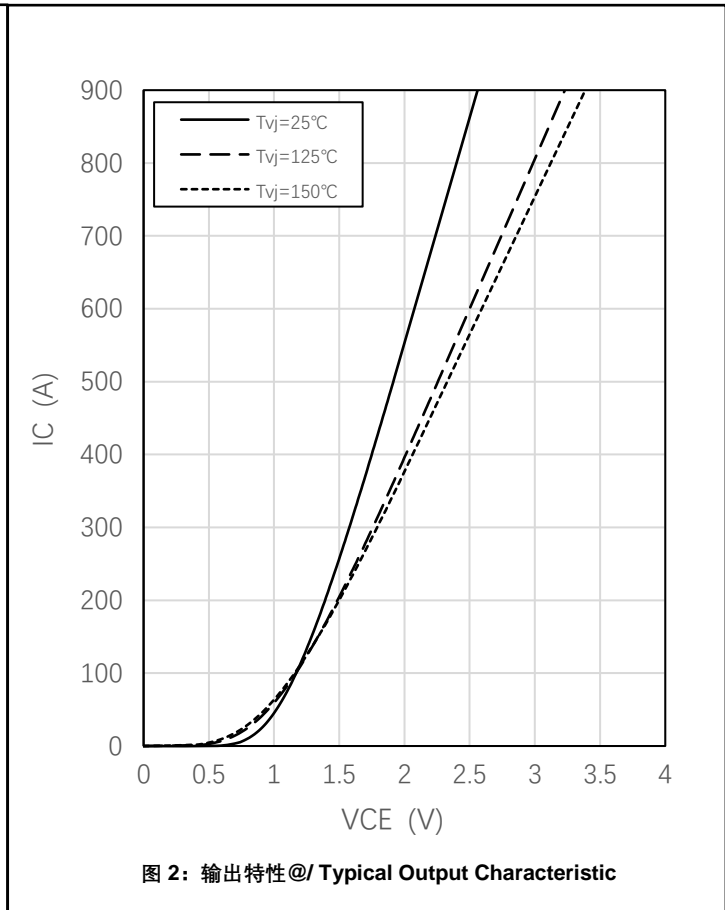
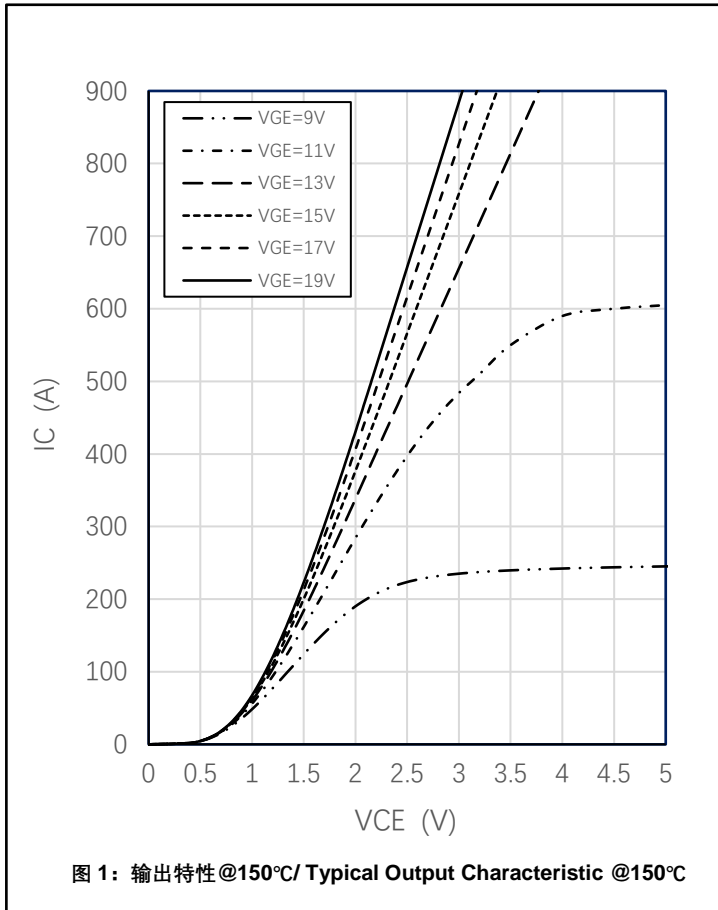
动态电气参数/Switching Electrical Characteristic

| 符号 symbol | 参数 Parameter | 测试条件 Test Condition | 值 Value | | | 单位 Unit |
|--------------|--|--|------------|------------|------------|--------------------|
| | | | Min. 最小 | Typ. 典型 | Max. 最大 | |
| I_{RM} | Peak reverse recovery current 反向恢复峰值电流 | $I_F=450\text{A}, V_R=600\text{V}$ $T_{vj}=25\text{ }^{\circ}\text{C}$ | - | 295 | - | A |
| | | $I_F=450\text{A}, V_R=600\text{V}$ $T_{vj}=150\text{ }^{\circ}\text{C}$ | - | 378 | - | A |
| Q_r | Recovery charge 恢复电荷 | $I_F=450\text{A}, V_R=600\text{V}$ $T_{vj}=25\text{ }^{\circ}\text{C}$ | - | 30 | - | μC |
| | | $I_F=450\text{A}, V_R=600\text{V}$ $T_{vj}=150\text{ }^{\circ}\text{C}$ | - | 61 | - | μC |
| E_{rec} | Reverse recovery energy 反向恢复损耗 | $I_F=450\text{A}$ $V_R=600\text{V}$ $T_{vj}=25\text{ }^{\circ}\text{C}$ | - | 15 | - | mJ |
| | | $I_F=450\text{A}$ $V_R=600\text{V}$ $T_{vj}=150\text{ }^{\circ}\text{C}$ | - | 31 | - | mJ |
| R_{ThJC} | Junction-Case Thermal resistance 结-外壳热阻 | | - | - | 0.11 | K/W |
| $T_{VJ OP}$ | Temperature under switching 在开关状态下温度 | | -40 | - | 150 | $^{\circ}\text{C}$ |

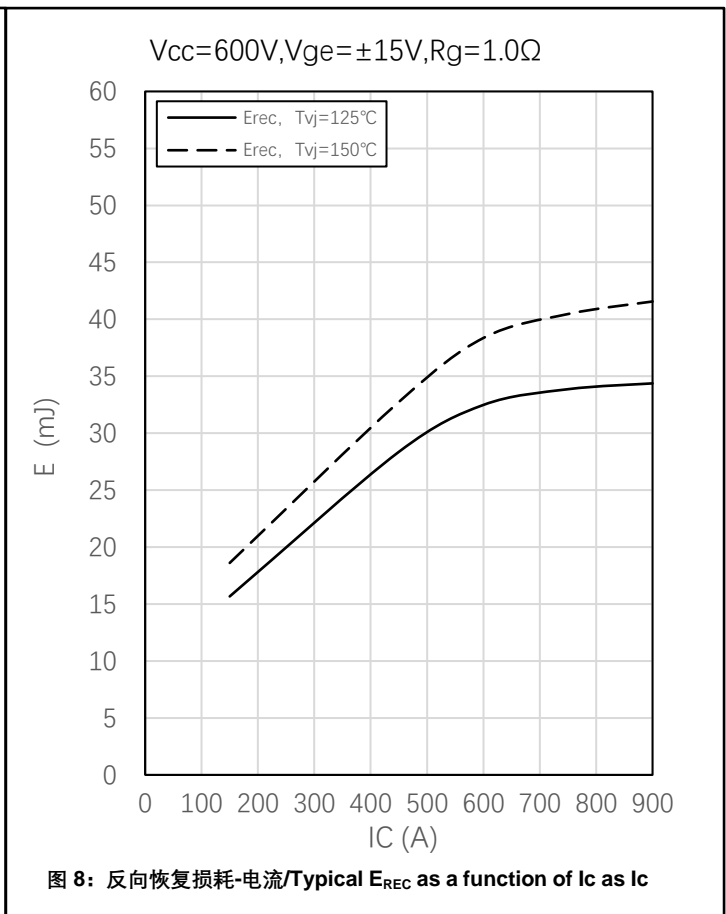
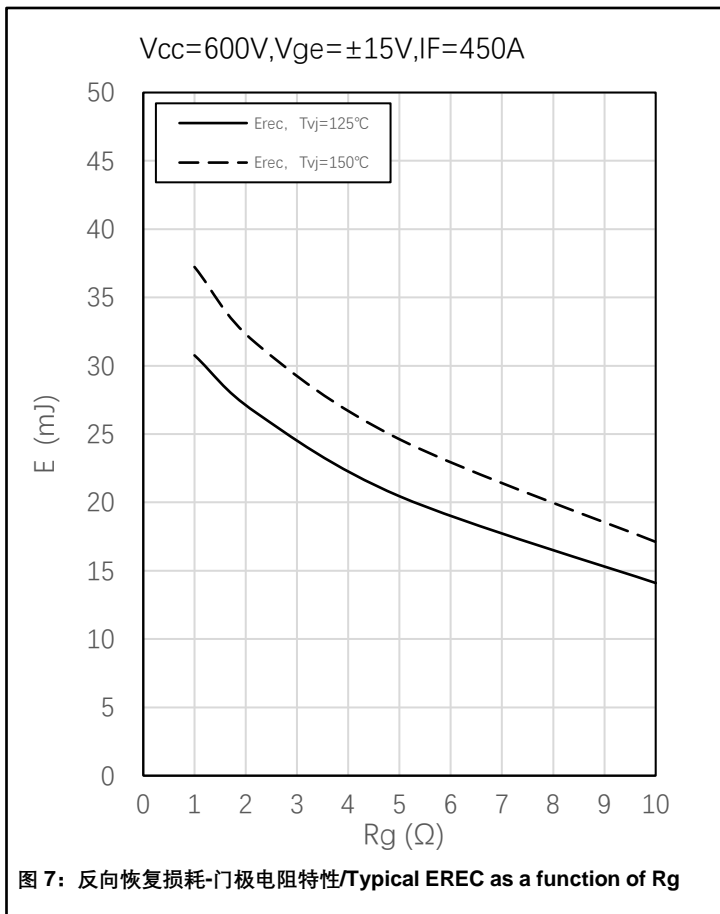
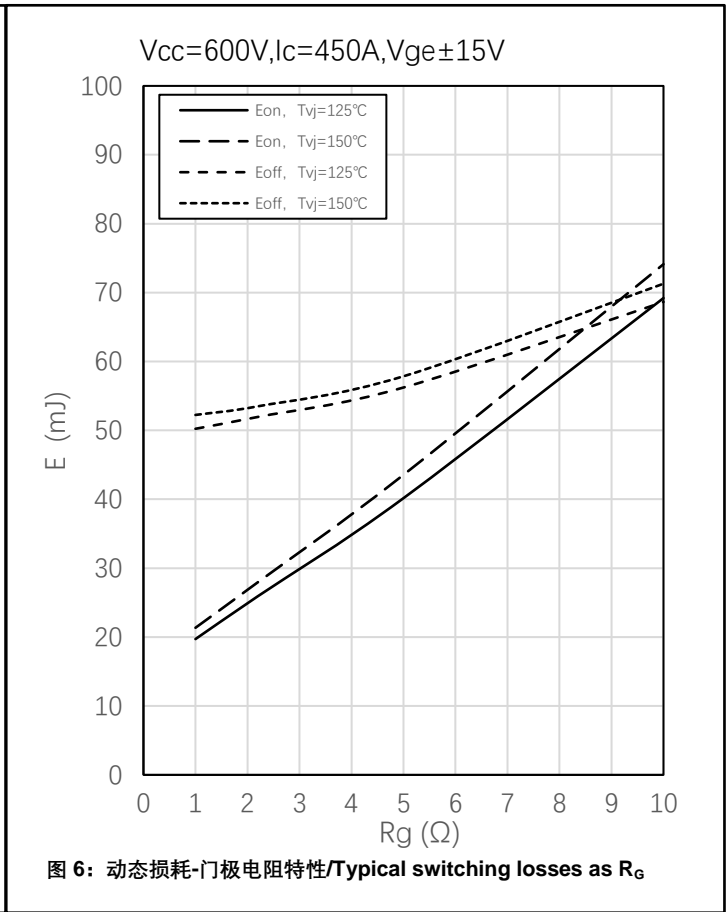
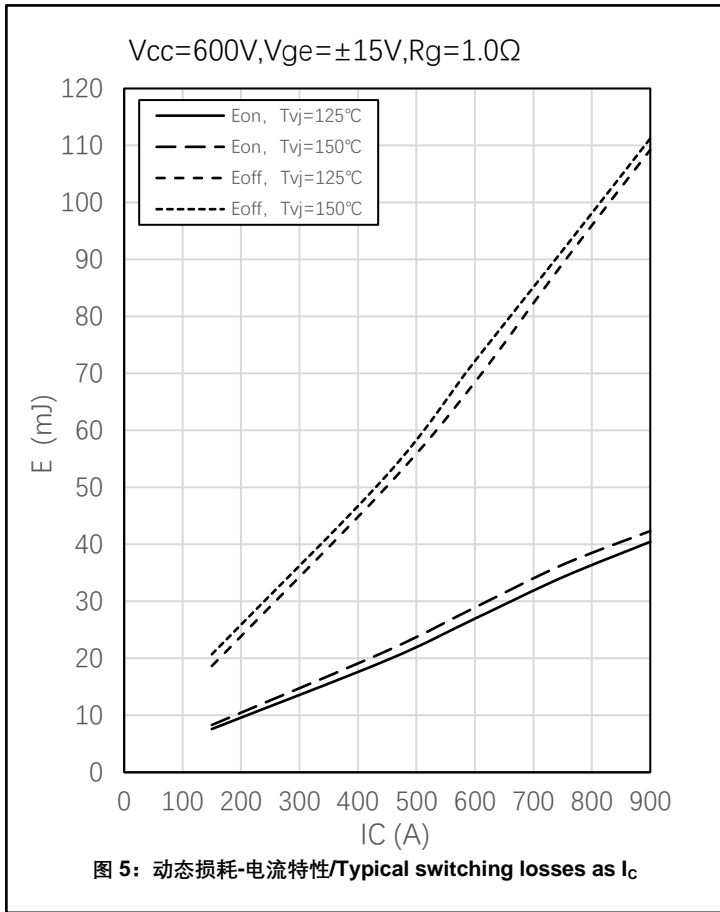
■ 模块/Module

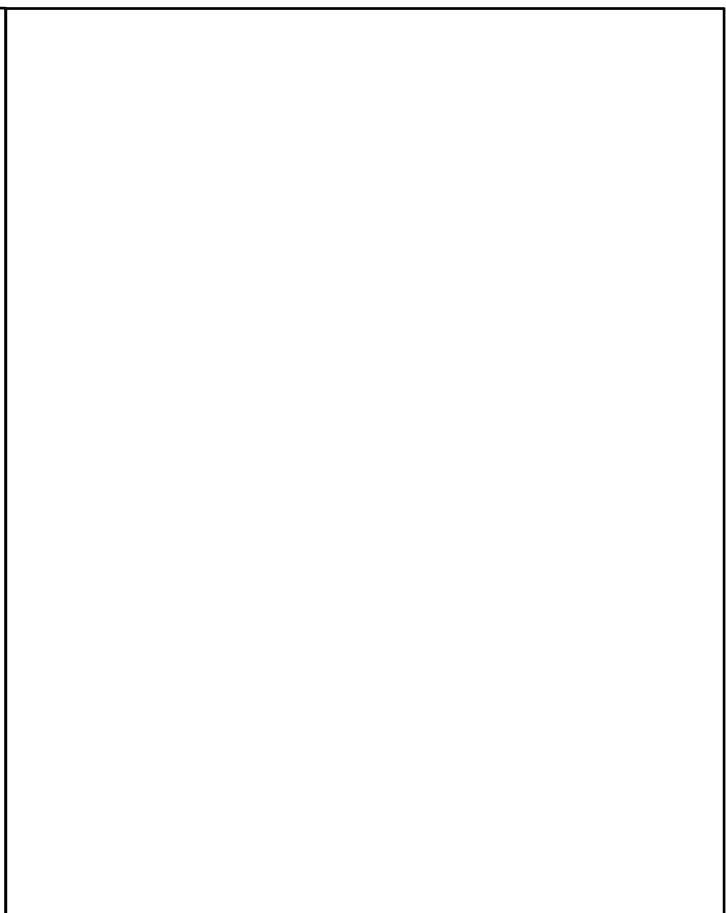
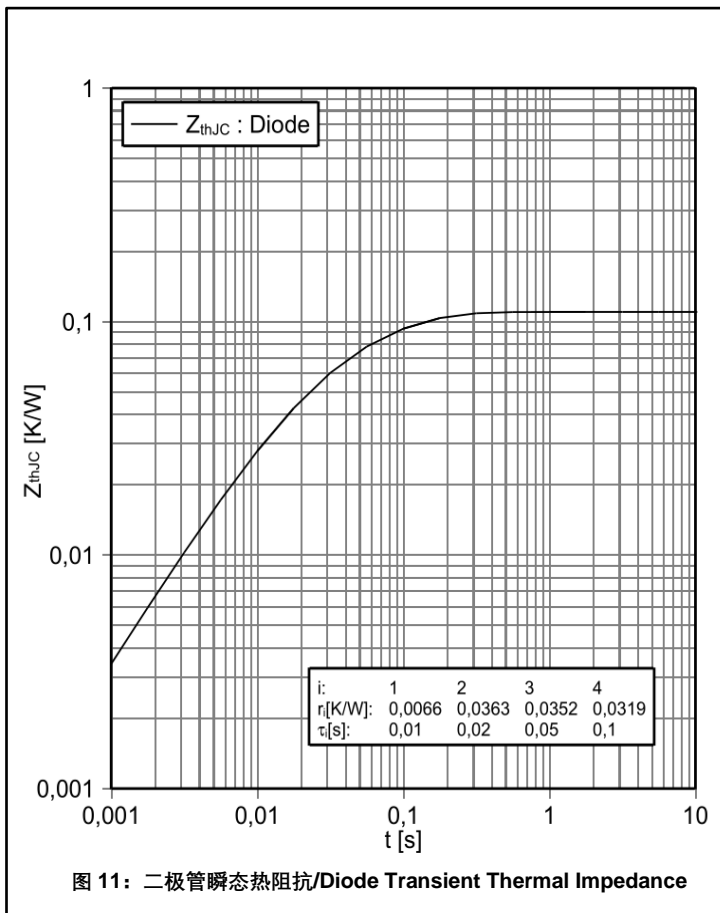
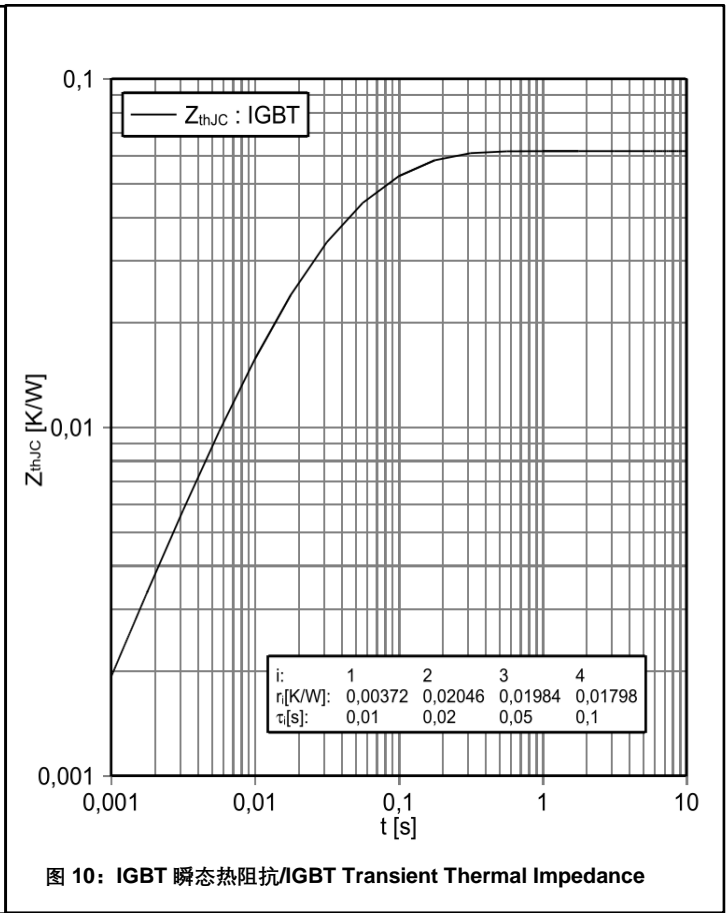
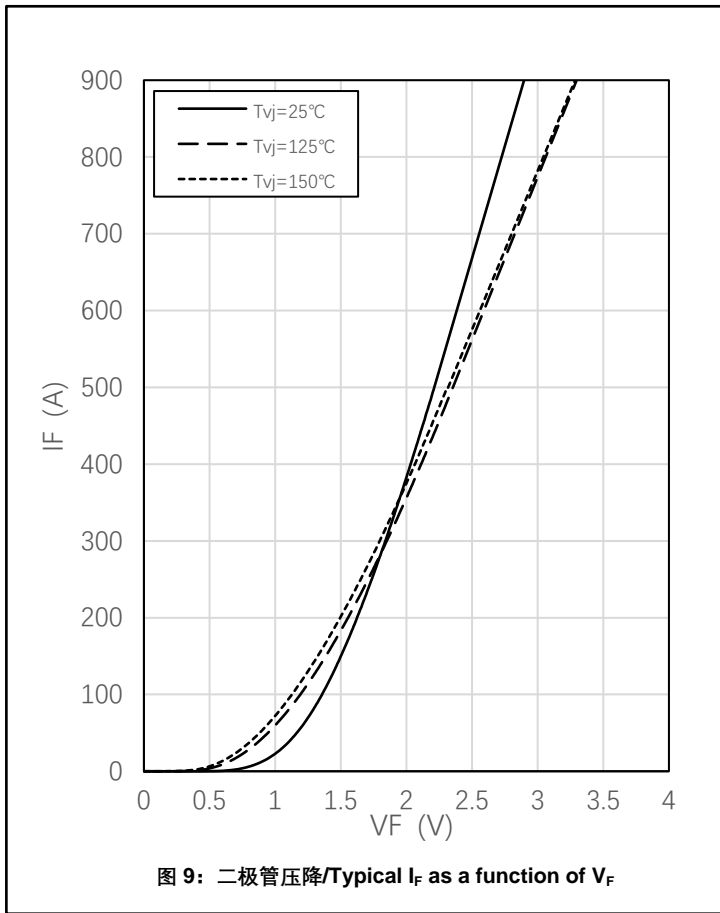
| 符号 symbol | 参数 Parameter | 测试条件 Test Condition | 值 Value | | | 单位 Unit |
|----------------------|---|---------------------------------------|------------|--------------------------------|------------|------------|
| | | | Min. 最小 | Typ. 典型 | Max. 最大 | |
| V _{ISOL} | Isolation voltage 绝缘测试电压 | RMS,f=50Hz,t=1min | - | 4.0 | - | kV |
| | Material of Base plate 模块基板材料 | | - | Cu | - | |
| | Internal Isolation 内部绝缘 | Basic insulation (class1,IEC61140) | - | Al ₂ O ₃ | - | |
| R _{thCH} | Junction to heatsink, Thermal Resistance 外壳 - 散热器热阻 | | - | 0.01 | - | K/W |
| L _{sCE} | Stray induction module 杂散电感,模块 | | - | 21 | - | nH |
| R _{CC'+EE'} | Module lead resistance 模块引线电阻,端子-芯片 | T _C = 25 °C | - | 0.8 | - | mΩ |
| T _{STG} | Storage Temperature 储存温度 | | -40 | - | +150 | °C |
| M | Mounting torque for modul mounting 模块安装的 安装扭距 | Mounting to heat sink M5 | 3.0 | - | 6.0 | Nm |
| | Terminal connection torque 端子联接扭距 | Main Terminal M6 | 2.5 | - | 5.0 | Nm |
| G | Weigh 重量 | | - | 350 | - | g |

■ 特征曲线/Characteristic Curve



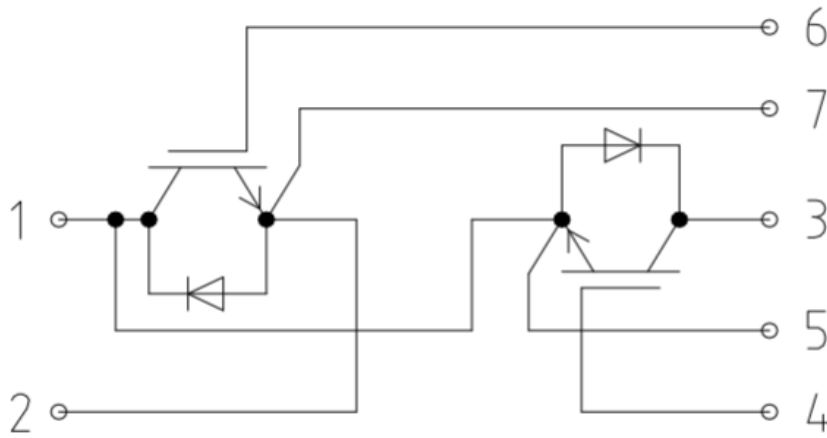
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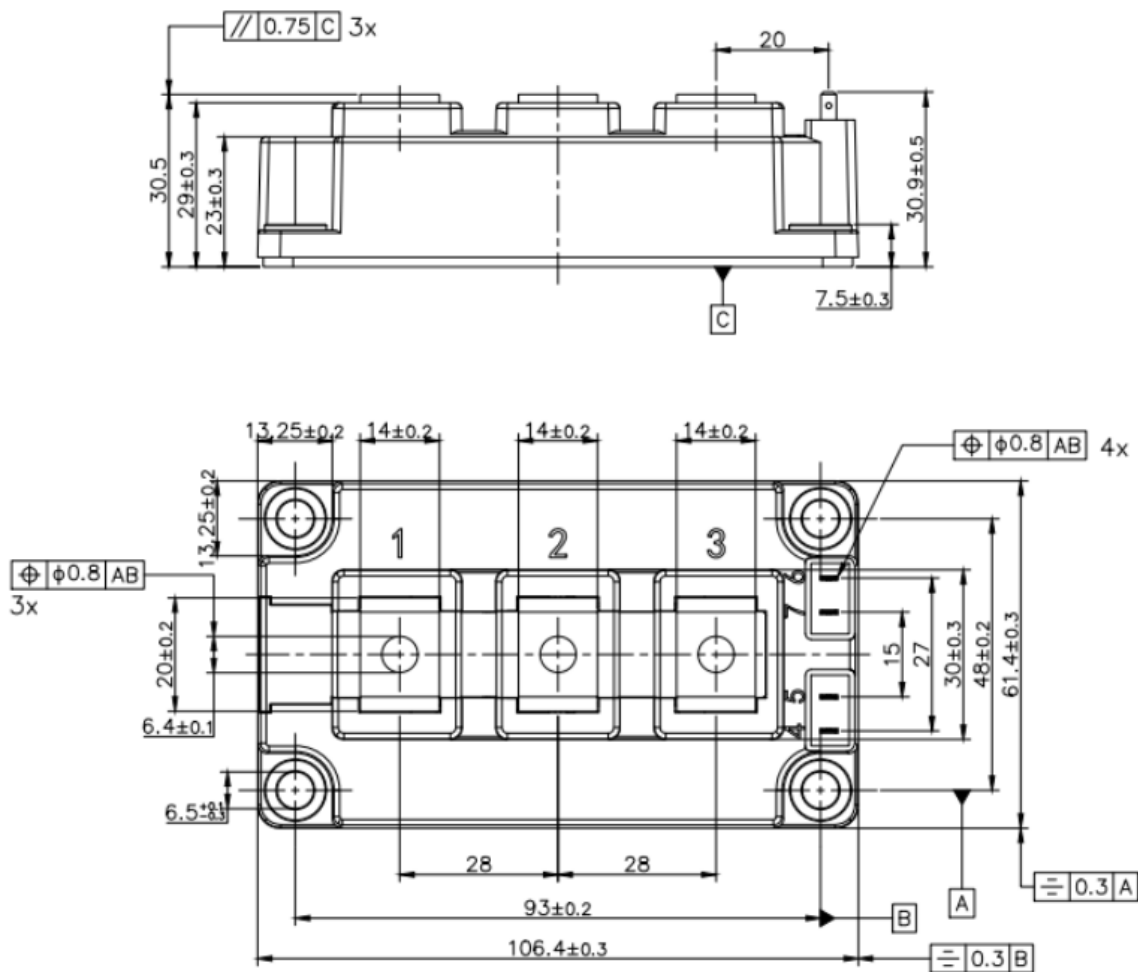


■ 外形尺寸/Mechanical Data

接线图/Circuit diagram headline



封装尺寸/Package Dimensions



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