

PrimePACK™3 模块 采用第四代沟槽栅/场终止IGBT4和增大的第四代发射极控制二极管  
PrimePACK™3 module with Trench/Fieldstop IGBT4, enlarged Emitter Controlled 4 diode

初步数据 / Preliminary Data



$V_{CES} = 1200V$   
 $I_{C\ nom} = 1400A / I_{CRM} = 2800A$

典型应用

- 斩波应用

Typical Applications

- Chopper Applications

电气特性

- 提高工作结温  $T_{vj\ op}$
- 高直流电压稳定性
- 高短路能力，自限制短路电流
- $V_{CESat}$  带正温度系数
- 低  $V_{CESat}$

Electrical Features

- Extended Operation Temperature  $T_{vj\ op}$
- High DC Stability
- High Short Circuit Capability, Self Limiting Short Circuit Current
- $V_{CESat}$  with positive Temperature Coefficient
- Low  $V_{CESat}$

机械特性

- 4 kV 交流 1分钟 绝缘
- 封装的 CTI > 400
- 高爬电距离和电气间隙
- 高功率循环和温度循环能力
- 高功率密度
- 低热阻衬底

Mechanical Features

- 4 kV AC 1min Insulation
- Package with CTI > 400
- High Creepage and Clearance Distances
- High Power and Thermal Cycling Capability
- High Power Density
- Substrate for Low Thermal Resistance

Module Label Code

Barcode Code 128



DMX - Code



Content of the Code

| Content of the Code        | Digit   |
|----------------------------|---------|
| Module Serial Number       | 1 - 5   |
| Module Material Number     | 6 - 11  |
| Production Order Number    | 12 - 19 |
| Datecode (Production Year) | 20 - 21 |
| Datecode (Production Week) | 22 - 23 |

|                 |                                 |                      |
|-----------------|---------------------------------|----------------------|
| prepared by: AC | date of publication: 2013-11-05 |                      |
| approved by: MS | revision: 2.2                   | UL approved (E83335) |

初步数据  
Preliminary Data

IGBT, 斩波器 / IGBT-Chopper  
最大额定值 / Maximum Rated Values

|                                                |                                                               |                   |       |    |
|------------------------------------------------|---------------------------------------------------------------|-------------------|-------|----|
| 集电极 - 发射极电压<br>Collector-emitter voltage       | $T_{vj} = 25^{\circ}\text{C}$                                 | $V_{CES}$         | 1200  | V  |
| 连续集电极直流电流<br>Continuous DC collector current   | $T_C = 100^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$ | $I_{C\text{nom}}$ | 1400  | A  |
| 集电极重复峰值电流<br>Repetitive peak collector current | $t_P = 1\text{ms}$                                            | $I_{CRM}$         | 2800  | A  |
| 总功率损耗<br>Total power dissipation               | $T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$  | $P_{\text{tot}}$  | 7,70  | kW |
| 栅极 - 发射极峰值电压<br>Gate-emitter peak voltage      |                                                               | $V_{GES}$         | +/-20 | V  |

特征值 / Characteristic Values

|                                                       |                                                                                                                                                                                       |                                                                                                   | min.               | typ.                 | max. |             |                                                 |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------|----------------------|------|-------------|-------------------------------------------------|
| 集电极 - 发射极饱和电压<br>Collector-emitter saturation voltage | $I_C = 1400\text{A}, V_{GE} = 15\text{V}$<br>$I_C = 1400\text{A}, V_{GE} = 15\text{V}$<br>$I_C = 1400\text{A}, V_{GE} = 15\text{V}$                                                   | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $V_{CE\text{sat}}$ | 1,75<br>2,05<br>2,15 | 2,10 | V<br>V<br>V |                                                 |
| 栅极阈值电压<br>Gate threshold voltage                      | $I_C = 49,0\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$                                                                                                                   |                                                                                                   | $V_{GEth}$         | 5,0                  | 5,8  | 6,5         | V                                               |
| 栅极电荷<br>Gate charge                                   | $V_{GE} = -15\text{V} \dots +15\text{V}$                                                                                                                                              |                                                                                                   | $Q_G$              | 9,60                 |      |             | $\mu\text{C}$                                   |
| 内部栅极电阻<br>Internal gate resistor                      | $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                         |                                                                                                   | $R_{Gint}$         | 0,8                  |      |             | $\Omega$                                        |
| 输入电容<br>Input capacitance                             | $f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$                                                                                               |                                                                                                   | $C_{ies}$          | 82,0                 |      |             | nF                                              |
| 反向传输电容<br>Reverse transfer capacitance                | $f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$                                                                                               |                                                                                                   | $C_{res}$          | 4,60                 |      |             | nF                                              |
| 集电极-发射极截止电流<br>Collector-emitter cut-off current      | $V_{CE} = 1200\text{V}, V_{GE} = 0\text{V}, T_{vj} = 25^{\circ}\text{C}$                                                                                                              |                                                                                                   | $I_{CES}$          |                      |      | 5,0         | mA                                              |
| 栅极-发射极漏电流<br>Gate-emitter leakage current             | $V_{CE} = 0\text{V}, V_{GE} = 20\text{V}, T_{vj} = 25^{\circ}\text{C}$                                                                                                                |                                                                                                   | $I_{GES}$          |                      |      | 400         | nA                                              |
| 开通延迟时间(电感负载)<br>Turn-on delay time, inductive load    | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Gon} = 1,0\Omega$                                                                                      | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_{don}$          | 0,20<br>0,21<br>0,21 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| 上升时间(电感负载)<br>Rise time, inductive load               | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Gon} = 1,0\Omega$                                                                                      | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_r$              | 0,12<br>0,13<br>0,13 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| 关断延迟时间(电感负载)<br>Turn-off delay time, inductive load   | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Goff} = 1,0\Omega$                                                                                     | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_{doff}$         | 0,87<br>0,95<br>0,97 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| 下降时间(电感负载)<br>Fall time, inductive load               | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Goff} = 1,0\Omega$                                                                                     | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_f$              | 0,20<br>0,23<br>0,23 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| 开通损耗能量(每脉冲)<br>Turn-on energy loss per pulse          | $I_C = 1400\text{A}, V_{CE} = 600\text{V}, L_S = 30\text{nH}$<br>$V_{GE} = \pm 15\text{V}, di/dt = 8600\text{A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$<br>$R_{Gon} = 1,0\Omega$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{on}$           | 65,0<br>80,0<br>95,0 |      |             | mJ<br>mJ<br>mJ                                  |
| 关断损耗能量(每脉冲)<br>Turn-off energy loss per pulse         | $I_C = 1400\text{A}, V_{CE} = 600\text{V}, L_S = 30\text{nH}$<br>$V_{GE} = \pm 15\text{V}, du/dt = 2700\text{V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$<br>$R_{Goff} = 1,0\Omega$ | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{off}$          | 180<br>250<br>280    |      |             | mJ<br>mJ<br>mJ                                  |
| 短路数据<br>SC data                                       | $V_{GE} \leq 15\text{V}, V_{CC} = 800\text{V}$<br>$V_{CE\text{max}} = V_{CES} - L_{SCE} \cdot di/dt$<br>$t_P \leq 10\mu\text{s}, T_{vj} = 150^{\circ}\text{C}$                        |                                                                                                   | $I_{SC}$           | 5600                 |      |             | A                                               |
| 结 - 外壳热阻<br>Thermal resistance, junction to case      | 每个 IGBT / per IGBT                                                                                                                                                                    |                                                                                                   | $R_{thJC}$         |                      |      | 19,5        | K/kW                                            |
| 外壳 - 散热器热阻<br>Thermal resistance, case to heatsink    | 每个 IGBT / per IGBT<br>$\lambda_{\text{Paste}} = 1\text{W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1\text{W}/(\text{m}\cdot\text{K})$                                      |                                                                                                   | $R_{thCH}$         | 9,30                 |      |             | K/kW                                            |
| 在开关状态下温度<br>Temperature under switching conditions    |                                                                                                                                                                                       |                                                                                                   | $T_{vj\text{op}}$  | -40                  |      | 150         | $^{\circ}\text{C}$                              |

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| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.2                   |

初步数据  
Preliminary Data

Diode-斩波器 / Diode-Chopper  
最大额定值 / Maximum Rated Values

|                                             |                                                                      |           |      |                       |
|---------------------------------------------|----------------------------------------------------------------------|-----------|------|-----------------------|
| 反向重复峰值电压<br>Repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$                                        | $V_{RRM}$ | 1200 | V                     |
| 连续正向直流电流<br>Continuous DC forward current   |                                                                      | $I_F$     | 1400 | A                     |
| 正向重复峰值电流<br>Repetitive peak forward current | $t_P = 1\text{ ms}$                                                  | $I_{FRM}$ | 2800 | A                     |
| $I_{2t}$ -值<br>$I_{2t}$ - value             | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$ | $I_{2t}$  | 270  | $\text{kA}^2\text{s}$ |
|                                             | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$ |           | 260  | $\text{kA}^2\text{s}$ |

特征值 / Characteristic Values

|                                                    |                                                                                                                                        |                                                                                                   | min.        | typ.                 | max. |                                                 |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------|----------------------|------|-------------------------------------------------|
| 正向电压<br>Forward voltage                            | $I_F = 1400\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 1400\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 1400\text{ A}, V_{GE} = 0\text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $V_F$       | 1,65<br>1,55<br>1,55 | 2,15 | V<br>V<br>V                                     |
| 反向恢复峰值电流<br>Peak reverse recovery current          | $I_F = 1400\text{ A}, -di_F/dt = 8600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 600\text{ V}$                       | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $I_{RM}$    | 1000<br>1200<br>1250 |      | A<br>A<br>A                                     |
| 恢复电荷<br>Recovered charge                           | $I_F = 1400\text{ A}, -di_F/dt = 8600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 600\text{ V}$                       | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $Q_r$       | 170<br>300<br>330    |      | $\mu\text{C}$<br>$\mu\text{C}$<br>$\mu\text{C}$ |
| 反向恢复损耗 (每脉冲)<br>Reverse recovery energy            | $I_F = 1400\text{ A}, -di_F/dt = 8600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 600\text{ V}$                       | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{rec}$   | 80,0<br>140<br>160   |      | mJ<br>mJ<br>mJ                                  |
| 结 - 外壳热阻<br>Thermal resistance, junction to case   | 每个二极管 / per diode                                                                                                                      |                                                                                                   | $R_{thJC}$  |                      | 25,0 | K/kW                                            |
| 外壳 - 散热器热阻<br>Thermal resistance, case to heatsink | 每个二极管 / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$    |                                                                                                   | $R_{thCH}$  |                      | 17,0 | K/kW                                            |
| 在开关状态下温度<br>Temperature under switching conditions |                                                                                                                                        |                                                                                                   | $T_{vj op}$ | -40                  | 150  | $^{\circ}\text{C}$                              |

反向二极管 / Diode, Reverse  
最大额定值 / Maximum Rated Values

|                                             |                                                                      |           |      |                       |
|---------------------------------------------|----------------------------------------------------------------------|-----------|------|-----------------------|
| 反向重复峰值电压<br>Repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$                                        | $V_{RRM}$ | 1200 | V                     |
| 连续正向直流电流<br>Continuous DC forward current   |                                                                      | $I_F$     | 180  | A                     |
| 正向重复峰值电流<br>Repetitive peak forward current | $t_P = 1\text{ ms}$                                                  | $I_{FRM}$ | 360  | A                     |
| $I_{2t}$ -值<br>$I_{2t}$ - value             | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$ | $I_{2t}$  | 0,23 | $\text{kA}^2\text{s}$ |

特征值 / Characteristic Values

|                                                    |                                                                                                                                     |                                                                 | min.        | typ.         | max. |                    |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------|--------------|------|--------------------|
| 正向电压<br>Forward voltage                            | $I_F = 180\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 180\text{ A}, V_{GE} = 0\text{ V}$                                              | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$ | $V_F$       | 1,65<br>1,65 | 2,15 | V<br>V             |
| 结 - 外壳热阻<br>Thermal resistance, junction to case   | 每个二极管 / per diode                                                                                                                   |                                                                 | $R_{thJC}$  |              | 225  | K/kW               |
| 外壳 - 散热器热阻<br>Thermal resistance, case to heatsink | 每个二极管 / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$ |                                                                 | $R_{thCH}$  |              | 120  | K/kW               |
| 在开关状态下温度<br>Temperature under switching conditions |                                                                                                                                     |                                                                 | $T_{vj op}$ | -40          | 150  | $^{\circ}\text{C}$ |

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|-----------------|---------------------------------|
| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.2                   |



初步数据  
Preliminary Data

负温度系数热敏电阻 / NTC-Thermistor  
特征值 / Characteristic Values

|                              |                                                                |              | min. | typ. | max. |            |
|------------------------------|----------------------------------------------------------------|--------------|------|------|------|------------|
| 额定电阻值<br>Rated resistance    | $T_C = 25^\circ\text{C}$                                       | $R_{25}$     |      | 5,00 |      | k $\Omega$ |
| R100 偏差<br>Deviation of R100 | $T_C = 100^\circ\text{C}, R_{100} = 493 \Omega$                | $\Delta R/R$ | -5   |      | 5    | %          |
| 耗散功率<br>Power dissipation    | $T_C = 25^\circ\text{C}$                                       | $P_{25}$     |      |      | 20,0 | mW         |
| B-值<br>B-value               | $R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15 \text{ K}))]$  | $B_{25/50}$  |      | 3375 |      | K          |
| B-值<br>B-value               | $R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15 \text{ K}))]$  | $B_{25/80}$  |      | 3411 |      | K          |
| B-值<br>B-value               | $R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15 \text{ K}))]$ | $B_{25/100}$ |      | 3433 |      | K          |

根据应用手册标定  
Specification according to the valid application note.

模块 / Module

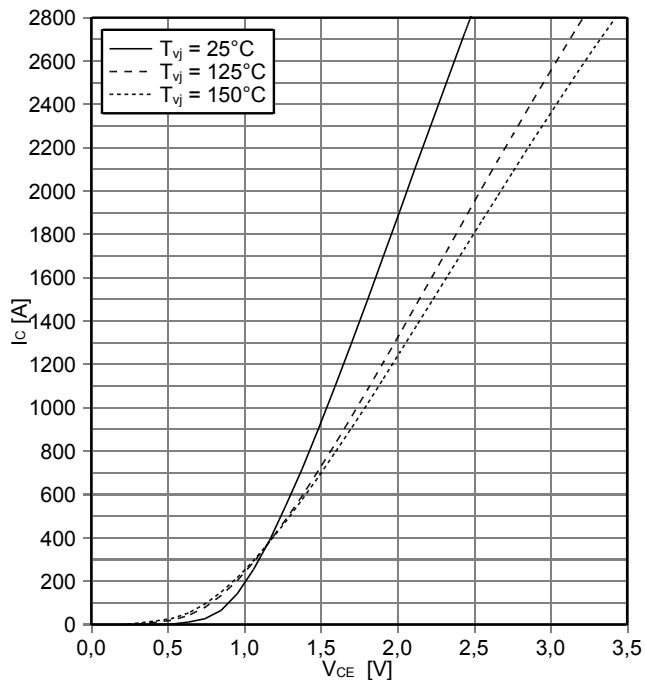
|                                                          |                                                                                                                                                                  |                           |            |                         |           |                  |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------|-------------------------|-----------|------------------|
| 绝缘测试电压<br>Isolation test voltage                         | RMS, f = 50 Hz, t = 1 min.                                                                                                                                       | $V_{\text{ISOL}}$         |            | 4,0                     |           | kV               |
| 模块基板材料<br>Material of module baseplate                   |                                                                                                                                                                  |                           |            | Cu                      |           |                  |
| 内部绝缘<br>Internal isolation                               | 基本绝缘 (class 1, IEC 61140)<br>basic insulation (class 1, IEC 61140)                                                                                               |                           |            | $\text{Al}_2\text{O}_3$ |           |                  |
| 爬电距离<br>Creepage distance                                | 端子- 散热片 / terminal to heatsink<br>端子- 端子 / terminal to terminal                                                                                                  |                           |            | 33,0<br>33,0            |           | mm               |
| 电气间隙<br>Clearance                                        | 端子- 散热片 / terminal to heatsink<br>端子- 端子 / terminal to terminal                                                                                                  |                           |            | 19,0<br>19,0            |           | mm               |
| 相对电痕指数<br>Comperative tracking index                     |                                                                                                                                                                  | CTI                       |            | > 400                   |           |                  |
| min. typ. max.                                           |                                                                                                                                                                  |                           |            |                         |           |                  |
| 杂散电感,模块<br>Stray inductance module                       |                                                                                                                                                                  | $L_{\text{SCE}}$          |            | 10                      |           | nH               |
| 模块引线电阻,端子-芯片<br>Module lead resistance, terminals - chip | $T_C = 25^\circ\text{C}$ , 每个开关 / per switch                                                                                                                     | $R_{\text{CC}+\text{EE}}$ |            | 0,20                    |           | m $\Omega$       |
| 储存温度<br>Storage temperature                              |                                                                                                                                                                  | $T_{\text{stg}}$          | -40        |                         | 150       | $^\circ\text{C}$ |
| 模块安装的安装扭矩<br>Mounting torque for modul mounting          | 螺丝 M5 根据相应的应用手册进行安装<br>Screw M5 - Mounting according to valid application note                                                                                   | M                         | 3,00       | -                       | 6,00      | Nm               |
| 端子联接扭矩<br>Terminal connection torque                     | 螺丝 M4 根据相应的应用手册进行安装<br>Screw M4 - Mounting according to valid application note<br>螺丝 M8 根据相应的应用手册进行安装<br>Screw M8 - Mounting according to valid application note | M                         | 1,8<br>8,0 | -                       | 2,1<br>10 | Nm               |
| 重量<br>Weight                                             |                                                                                                                                                                  | G                         |            | 1200                    |           | g                |

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初步数据  
Preliminary Data

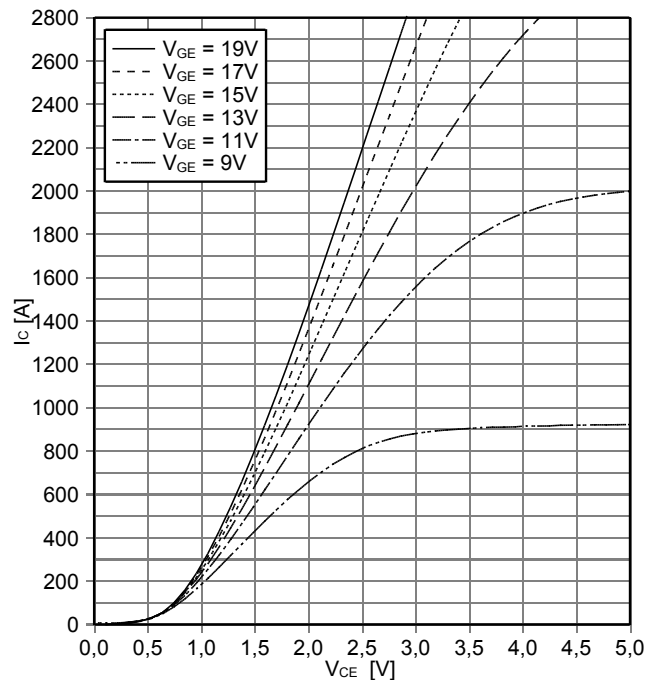
输出特性 IGBT, 斩波器 (典型)  
output characteristic IGBT-Chopper (typical)

$I_C = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



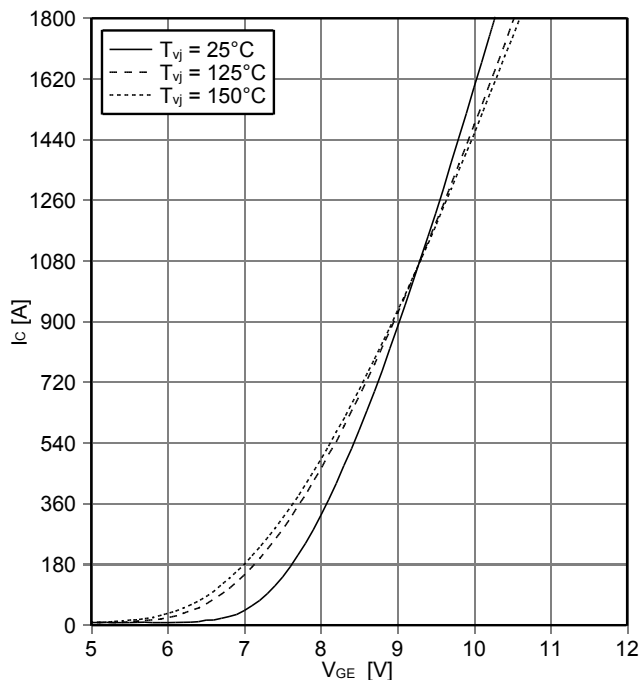
输出特性 IGBT, 斩波器 (典型)  
output characteristic IGBT-Chopper (typical)

$I_C = f(V_{CE})$   
 $T_{vj} = 150^\circ\text{C}$



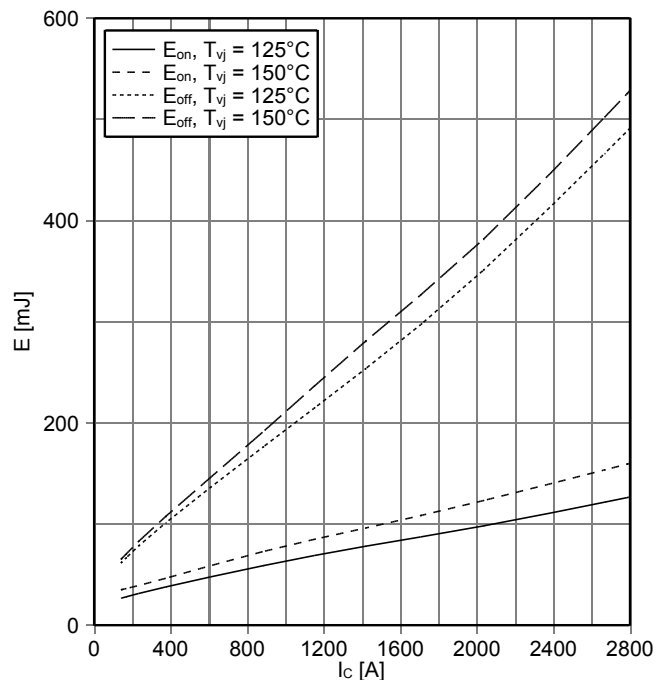
传输特性 IGBT, 斩波器 (典型)  
transfer characteristic IGBT-Chopper (typical)

$I_C = f(V_{GE})$   
 $V_{CE} = 20\text{ V}$



开关损耗 IGBT, 斩波器 (典型)  
switching losses IGBT-Chopper (typical)

$E_{on} = f(I_C), E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 1\ \Omega, R_{Goff} = 1\ \Omega, V_{CE} = 600\text{ V}$



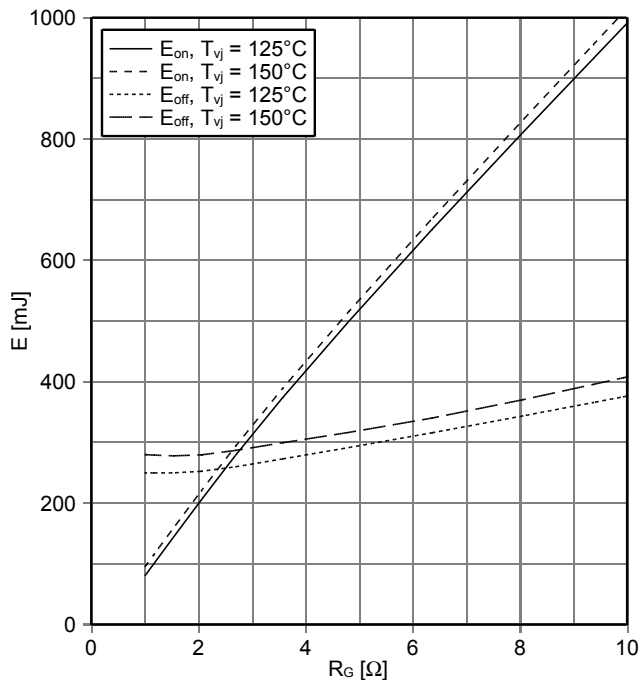
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Preliminary Data

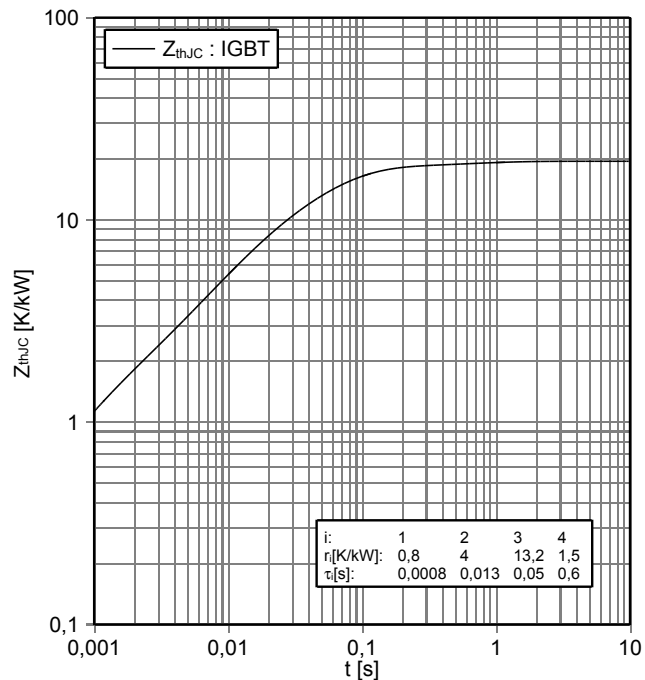
开关损耗 IGBT, 斩波器 (典型)  
switching losses IGBT-Chopper (typical)

$E_{on} = f(R_G), E_{off} = f(R_G)$   
 $V_{GE} = \pm 15 V, I_C = 1400 A, V_{CE} = 600 V$



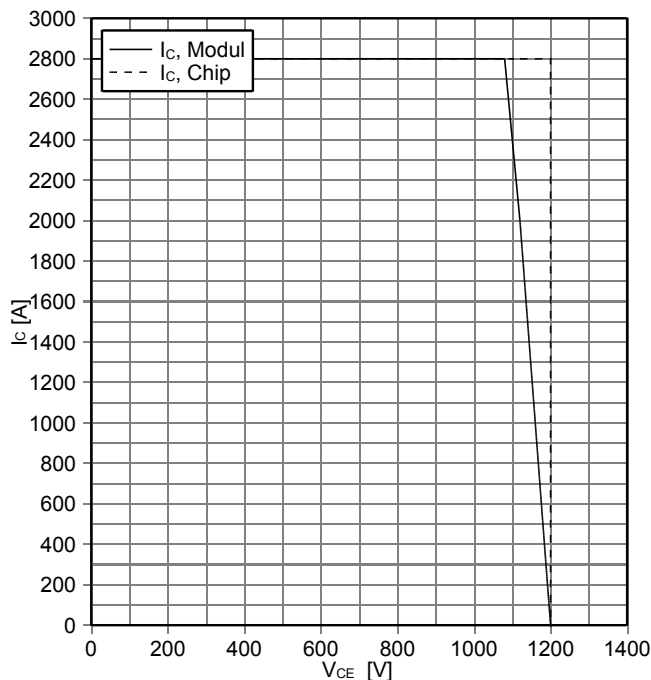
瞬态热阻抗 IGBT, 斩波器  
transient thermal impedance IGBT-Chopper

$Z_{thJC} = f(t)$



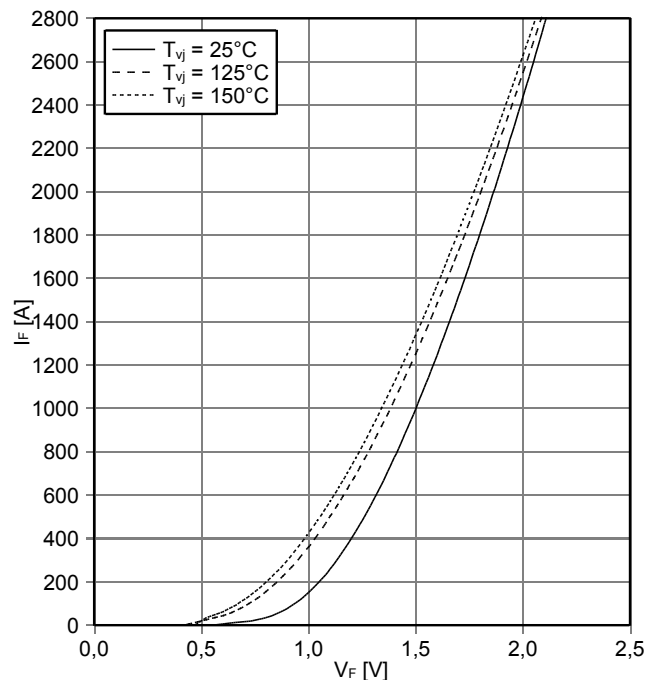
反偏安全工作区 IGBT, 斩波器 (RBSOA)  
reverse bias safe operating area IGBT-Chopper (RBSOA)

$I_C = f(V_{CE})$   
 $V_{GE} = \pm 15 V, R_{Goff} = 1 \Omega, T_{vj} = 150^\circ C$



正向偏压特性 Diode-斩波器 (典型)  
forward characteristic of Diode-Chopper (typical)

$I_F = f(V_F)$

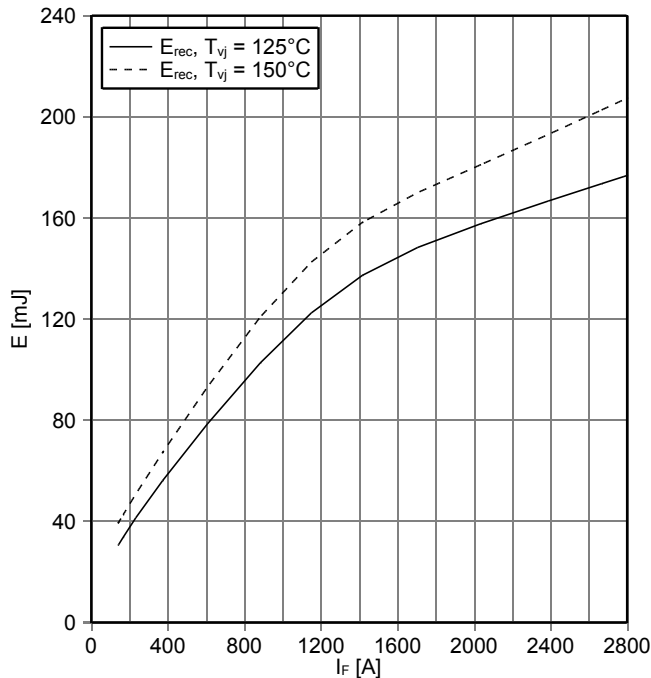


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初步数据  
Preliminary Data

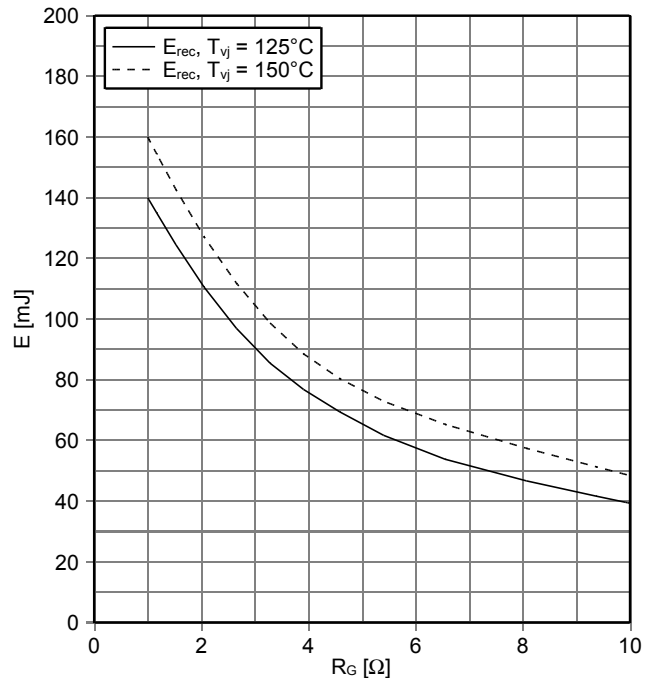
开关损耗 Diode-斩波器 (典型)  
switching losses Diode-Chopper (typical)

$E_{rec} = f(I_F)$   
 $R_{Gon} = 1 \Omega, V_{CE} = 600 V$



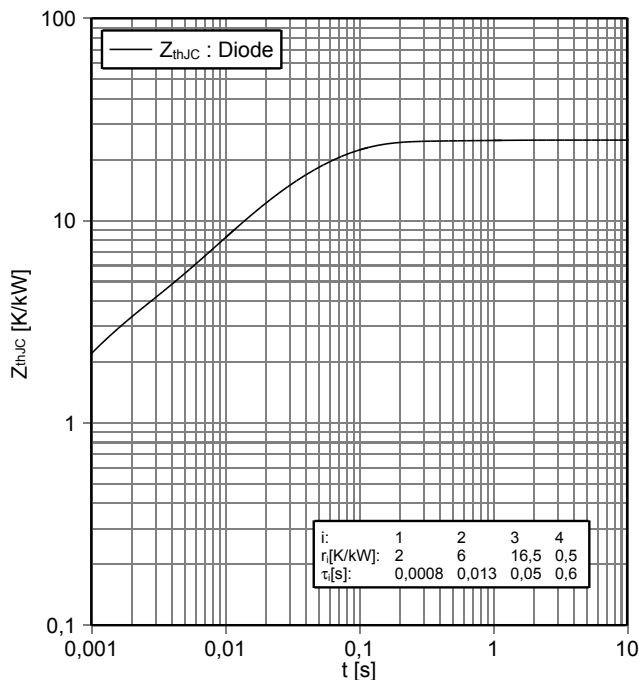
开关损耗 Diode-斩波器 (典型)  
switching losses Diode-Chopper (typical)

$E_{rec} = f(R_G)$   
 $I_F = 1400 A, V_{CE} = 600 V$



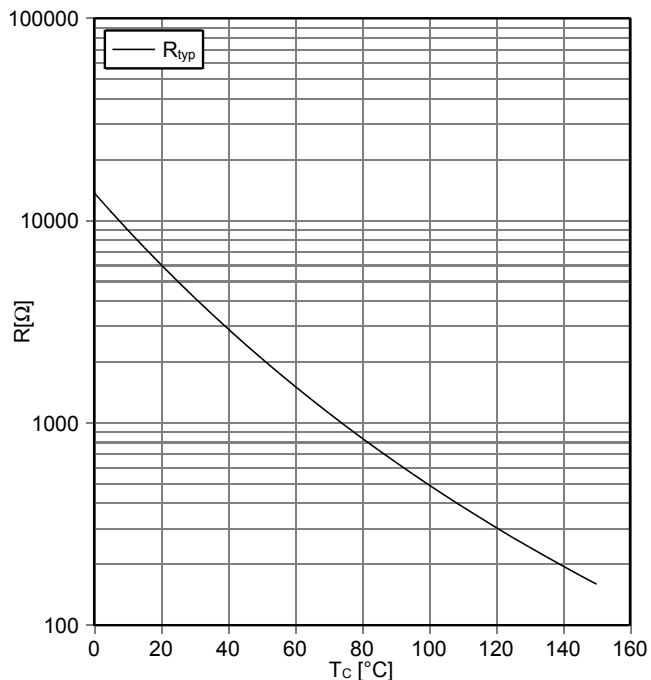
瞬态热阻抗 Diode-斩波器  
transient thermal impedance Diode-Chopper

$Z_{thJC} = f(t)$



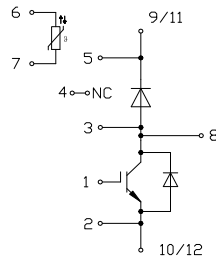
负温度系数热敏电阻 温度特性  
NTC-Thermistor-temperature characteristic (typical)

$R = f(T)$

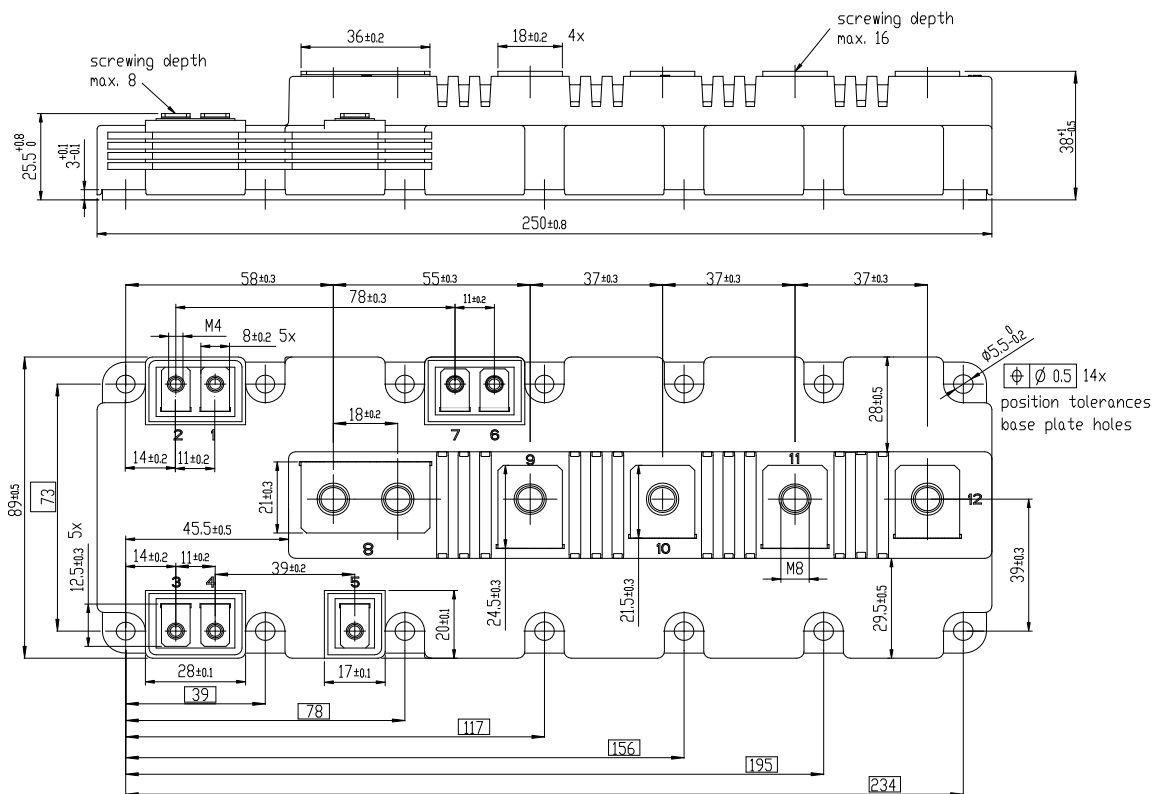


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接线图 / circuit\_diagram\_headline



封装尺寸 / package outlines



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**初步数据  
Preliminary Data**

**使用条件和条款**

**使用条件和条款**

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-建立联合的测试和出厂产品检查，我们可以根据测试的实际情况供货

如果有必要，请根据实际需要将类似的说明给你的客户

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