

Final datasheet

英飞凌 CoolSiC™ 混合分立器件：CoolSiC™ 1200 V SiC MOSFET G2，与软恢复、快速恢复的发射极控制 7 二极管共同封装，用于反接保护

特性

- $T_{vj} = 25\text{ °C}$  时  $V_{DSS} = 1200\text{ V}$
- $T_c = 100\text{ °C}$  时  $I_{Dc} = 31\text{ A}$
- $R_{DS(on)} = 36\text{ m}\Omega$  ( $V_{GS} = 18\text{ V}$ 、 $T_{vj} = 25\text{ °C}$  时)
- 反接保护二极管， $T_c = 100\text{ °C}$  时  $I_F = 56\text{ A}$
- 开关损耗非常低
- 针对太阳能应用中的 MPPT 升压转换器进行了优化
- 基准栅极阈值电压， $V_{GS(th)} = 4.2\text{ V}$
- 具有抗寄生导通能力，可应用 0 V 关断栅极电压
- 软恢复、低  $Q_{rr}$  二极管， $T_c = 175\text{ °C}$  时  $V_F = 1.6\text{ V}$
- 合适的英飞凌栅极驱动器可在 <https://www.infineon.com/gdfinder> 找到

潜在应用

- 组串式逆变器

产品验证

- 符合 JEDEC47/20/22 相关测试的工业应用要求

描述

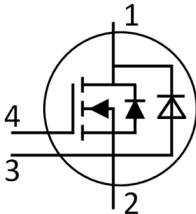
引脚定义：

- 1 – 漏极
- 2 – 源极
- 3 – 开尔文检测触点
- 4 – 栅极

注：源极引脚和检测引脚不可互换，互换可能会导致故障（仅适用于 4 引脚，TO263-7L 封装）



- Halogen-free
- Green
- Lead-free
- RoHS



| Type           | Package        | Marking   |
|----------------|----------------|-----------|
| IMY120R036CM2H | PG-TO247-4-U10 | 12M2HC036 |

本数据手册的原文使用英文撰写。为方便起见，英飞凌提供了译文；由于翻译过程中可能使用了自动化工具，英飞凌不保证译文的准确性。为确认准确性，请务必访问 [infineon.com](https://www.infineon.com) 参考最新的英文版本（控制文档）。



目录

|   |               |    |
|---|---------------|----|
|   | 描述 .....      | 1  |
|   | 特性 .....      | 1  |
|   | 潜在应用 .....    | 1  |
|   | 产品验证 .....    | 1  |
|   | 目录 .....      | 2  |
| 1 | 封装 .....      | 3  |
| 2 | MOSFET .....  | 3  |
| 3 | 反接保护二极管 ..... | 5  |
| 4 | 特性图 .....     | 7  |
| 5 | 封装外形 .....    | 15 |
| 6 | 测试条件 .....    | 16 |
|   | 修订记录 .....    | 17 |
|   | 免责声明 .....    | 18 |

1 封装

## 1 封装

表 1 特征值

| Parameter                                                           | Symbol        | Note or test condition                                | Values |      |      | Unit |
|---------------------------------------------------------------------|---------------|-------------------------------------------------------|--------|------|------|------|
|                                                                     |               |                                                       | Min.   | Typ. | Max. |      |
| Storage temperature                                                 | $T_{stg}$     |                                                       | -55    |      | 150  | °C   |
| Soldering temperature                                               | $T_{sold}$    | Wave soldering 1.6 mm (0.063 in.) from case for 10 s  |        |      | 260  | °C   |
| Thermal resistance, junction-ambient                                | $R_{th(j-a)}$ |                                                       |        |      | 62   | K/W  |
| MOSFET thermal resistance, junction-case                            | $R_{th(j-c)}$ |                                                       |        | 0.67 | 0.87 | K/W  |
| Reverse-polarity protection diode thermal resistance, junction-case | $R_{th(j-c)}$ |                                                       |        | 0.45 | 0.6  | K/W  |
| Comparative Tracking Index                                          | $CTI$         | IEC 60112 (material group 1 according to IEC 60664-1) | 600    |      |      | V    |

## 2 MOSFET

表 2 最大额定值

| Parameter                                                                    | Symbol    | Note or test condition                         |                       | Values   | Unit |
|------------------------------------------------------------------------------|-----------|------------------------------------------------|-----------------------|----------|------|
| Drain-source voltage                                                         | $V_{DS}$  | $T_{vj} \geq 25\text{ °C}$                     |                       | 1200     | V    |
| Continuous DC drain current for $R_{th(j-c,max)}$ , limited by $T_{vj(max)}$ | $I_{DDC}$ | $V_{GS} = 18\text{ V}$                         | $T_c = 25\text{ °C}$  | 44       | A    |
|                                                                              |           |                                                | $T_c = 100\text{ °C}$ | 31       |      |
| Peak drain current, $t_p$ limited by $T_{vj(max)}$ <sup>1)</sup>             | $I_{DM}$  | $V_{GS} = 18\text{ V}$                         |                       | 155      | A    |
| Gate-source voltage, max. transient voltage <sup>2)</sup>                    | $V_{GS}$  | $t_p \leq 0.5\text{ }\mu\text{s}$ , $D < 0.01$ |                       | -10...25 | V    |
| Gate-source voltage, max. static voltage                                     | $V_{GS}$  |                                                |                       | -7...23  | V    |
| Power dissipation, limited by $T_{vj(max)}$                                  | $P_{tot}$ |                                                | $T_c = 25\text{ °C}$  | 171      | W    |
|                                                                              |           |                                                | $T_c = 100\text{ °C}$ | 86       |      |

1) 已通过设计验证

2) 应用设计中的最大栅源电压应符合IPC-9592B的规定。

表 3 推荐值

| Parameter                         | Symbol        | Note or test condition | Values  | Unit |
|-----------------------------------|---------------|------------------------|---------|------|
| Recommended turn-on gate voltage  | $V_{GS(on)}$  |                        | 15...18 | V    |
| Recommended turn-off gate voltage | $V_{GS(off)}$ |                        | -5...0  | V    |

表 4 特征值

| Parameter                                    | Symbol       | Note or test condition                                                                                                                               |                                                                        | Values |      |      | Unit |
|----------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------|------|------|------|
|                                              |              |                                                                                                                                                      |                                                                        | Min.   | Typ. | Max. |      |
| Drain-source on-state resistance             | $R_{DS(on)}$ | $I_D = 18.2 \text{ A}$                                                                                                                               | $T_{vj} = 25 \text{ }^\circ\text{C}$ ,<br>$V_{GS(on)} = 18 \text{ V}$  |        | 36   | 45   | mΩ   |
|                                              |              |                                                                                                                                                      | $T_{vj} = 150 \text{ }^\circ\text{C}$ ,<br>$V_{GS(on)} = 18 \text{ V}$ |        | 77   |      |      |
|                                              |              |                                                                                                                                                      | $T_{vj} = 175 \text{ }^\circ\text{C}$ ,<br>$V_{GS(on)} = 18 \text{ V}$ |        | 89   |      |      |
|                                              |              |                                                                                                                                                      | $T_{vj} = 25 \text{ }^\circ\text{C}$ ,<br>$V_{GS(on)} = 15 \text{ V}$  |        | 47   |      |      |
| Gate-source threshold voltage                | $V_{GS(th)}$ | $I_D = 5.7 \text{ mA}$ , $V_{DS} = V_{GS}$<br>(tested after 1 ms pulse at $V_{GS} = 20 \text{ V}$ )                                                  | $T_{vj} = 25 \text{ }^\circ\text{C}$                                   | 3.5    | 4.2  | 5.1  | V    |
|                                              |              |                                                                                                                                                      | $T_{vj} = 175 \text{ }^\circ\text{C}$                                  |        | 3.2  |      |      |
| Zero gate-voltage drain current              | $I_{DSS}$    | $V_{DS} = 1200 \text{ V}$ , $V_{GS} = 0 \text{ V}$                                                                                                   | $T_{vj} = 25 \text{ }^\circ\text{C}$                                   |        |      | 170  | μA   |
|                                              |              |                                                                                                                                                      | $T_{vj} = 175 \text{ }^\circ\text{C}$                                  |        | 673  |      |      |
| Gate leakage current                         | $I_{GSS}$    | $V_{DS} = 0 \text{ V}$                                                                                                                               | $V_{GS} = 23 \text{ V}$                                                |        |      | 120  | nA   |
|                                              |              |                                                                                                                                                      | $V_{GS} = -10 \text{ V}$                                               |        |      | -120 |      |
| Forward transconductance                     | $g_{fs}$     | $I_D = 18.2 \text{ A}$ , $V_{DS} = 20 \text{ V}$                                                                                                     |                                                                        |        | 13.9 |      | S    |
| Internal gate resistance                     | $R_{G,int}$  | $f = 1 \text{ MHz}$ , $V_{AC} = 25 \text{ mV}$                                                                                                       |                                                                        |        | 1.8  |      | Ω    |
| Input capacitance                            | $C_{iss}$    | $V_{DS} = 800 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 100 \text{ kHz}$ , $V_{AC} = 25 \text{ mV}$                                                 |                                                                        |        | 1460 |      | pF   |
| Output capacitance                           | $C_{oss}$    | $V_{DS} = 800 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 100 \text{ kHz}$ , $V_{AC} = 25 \text{ mV}$                                                 |                                                                        |        | 76   |      | pF   |
| Reverse transfer capacitance                 | $C_{rss}$    | $V_{DS} = 800 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 100 \text{ kHz}$ , $V_{AC} = 25 \text{ mV}$                                                 |                                                                        |        | 3.9  |      | pF   |
| $C_{oss}$ stored energy                      | $E_{oss}$    | Calculated based on $C_{oss} = f(V_{DD})$                                                                                                            |                                                                        |        | 31   |      | μJ   |
| Output charge                                | $Q_{oss}$    | Calculated based on $C_{oss} = f(V_{DD})$                                                                                                            |                                                                        |        | 110  |      | nC   |
| Effective output capacitance, energy related | $C_{o(er)}$  | $V_{DS} = 0 \dots 800 \text{ V}$ , $V_{GS} = 0 \text{ V}$ ,<br>Calculated based on $E_{oss}$                                                         |                                                                        |        | 97   |      | pF   |
| Effective output capacitance, time related   | $C_{o(tr)}$  | $I_D = \text{constant}$ , $V_{DS} = 0 \dots 800 \text{ V}$ , $V_{GS} = 0 \text{ V}$ ,<br>Calculated based on $Q_{oss}$                               |                                                                        |        | 137  |      | pF   |
| Total gate charge                            | $Q_G$        | $V_{DD} = 800 \text{ V}$ , $I_D = 18.2 \text{ A}$ , $V_{GS} = 0/18 \text{ V}$ , turn-on pulse                                                        |                                                                        |        | 37   |      | nC   |
| Plateau gate charge                          | $Q_{GS(pl)}$ | $V_{DD} = 800 \text{ V}$ , $I_D = 18.2 \text{ A}$ , $V_{GS} = 0/18 \text{ V}$ , turn-on pulse                                                        |                                                                        |        | 8.5  |      | nC   |
| Gate-drain charge                            | $Q_{GD}$     | $V_{DD} = 800 \text{ V}$ , $I_D = 18.2 \text{ A}$ , $V_{GS} = 0/18 \text{ V}$ , turn-on pulse                                                        |                                                                        |        | 8.2  |      | nC   |
| Turn-on delay time                           | $t_{d(on)}$  | $V_{DD} = 800 \text{ V}$ , $I_D = 18.2 \text{ A}$ ,<br>$V_{GS} = 0/18 \text{ V}$ ,<br>$R_{G,ext} = 2.8 \text{ } \Omega$ , $L_\sigma = 12 \text{ nH}$ | $T_{vj} = 25 \text{ }^\circ\text{C}$                                   |        | 10.6 |      | ns   |
|                                              |              |                                                                                                                                                      | $T_{vj} = 175 \text{ }^\circ\text{C}$                                  |        | 11.2 |      |      |

(表格续下页.....)

表 4 (续) 特征值

| Parameter                      | Symbol       | Note or test condition                                                                                                                    |                          | Values |      |      | Unit               |
|--------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|------|------|--------------------|
|                                |              |                                                                                                                                           |                          | Min.   | Typ. | Max. |                    |
| Rise time                      | $t_r$        | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$  | $T_{vj} = 25\text{ °C}$  |        | 8    |      | ns                 |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 8    |      |                    |
| Turn-off delay time            | $t_{d(off)}$ | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$  | $T_{vj} = 25\text{ °C}$  |        | 18   |      | ns                 |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 19.6 |      |                    |
| Fall time                      | $t_f$        | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$  | $T_{vj} = 25\text{ °C}$  |        | 12   |      | ns                 |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 12.8 |      |                    |
| Turn-on energy                 | $E_{on}$     | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$  | $T_{vj} = 25\text{ °C}$  |        | 155  |      | $\mu\text{J}$      |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 156  |      |                    |
| Turn-off energy                | $E_{off}$    | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$  | $T_{vj} = 25\text{ °C}$  |        | 31   |      | $\mu\text{J}$      |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 32   |      |                    |
| Total switching energy         | $E_{tot}$    | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$  | $T_{vj} = 25\text{ °C}$  |        | 186  |      | $\mu\text{J}$      |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 188  |      |                    |
| Turn-on energy at -5 V         | $E_{on}$     | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = -5/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$ | $T_{vj} = 25\text{ °C}$  |        | 131  |      | $\mu\text{J}$      |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 144  |      |                    |
| Turn-off energy at -5 V        | $E_{off}$    | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = -5/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$ | $T_{vj} = 25\text{ °C}$  |        | 31   |      | $\mu\text{J}$      |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 33   |      |                    |
| Total switching energy at -5 V | $E_{tot}$    | $V_{DD} = 800\text{ V}$ , $I_D = 18.2\text{ A}$ ,<br>$V_{GS} = -5/18\text{ V}$ ,<br>$R_{G,ext} = 2.8\ \Omega$ , $L_\sigma = 12\text{ nH}$ | $T_{vj} = 25\text{ °C}$  |        | 162  |      | $\mu\text{J}$      |
|                                |              |                                                                                                                                           | $T_{vj} = 175\text{ °C}$ |        | 177  |      |                    |
| Virtual junction temperature   | $T_{vj}$     |                                                                                                                                           |                          | -40    |      | 175  | $^{\circ}\text{C}$ |

注：特征参数在 $T_{vj} = 25^{\circ}\text{C}$ 下测定，除非另有说明。

动态测试电路见图F，第2个器件为SiC肖特基二极管IDWD20G120C5。

### 3 反接保护二极管

表 5 最大额定值

| Parameter                                     | Symbol | Note or test condition |                       | Values | Unit |
|-----------------------------------------------|--------|------------------------|-----------------------|--------|------|
| Diode forward current, limited by $T_{vjmax}$ | $I_F$  | limited by bondwire    | $T_c = 25\text{ °C}$  | 85     | A    |
|                                               |        |                        | $T_c = 100\text{ °C}$ | 56     |      |

(表格续下页.....)

表 5 (续) 最大额定值

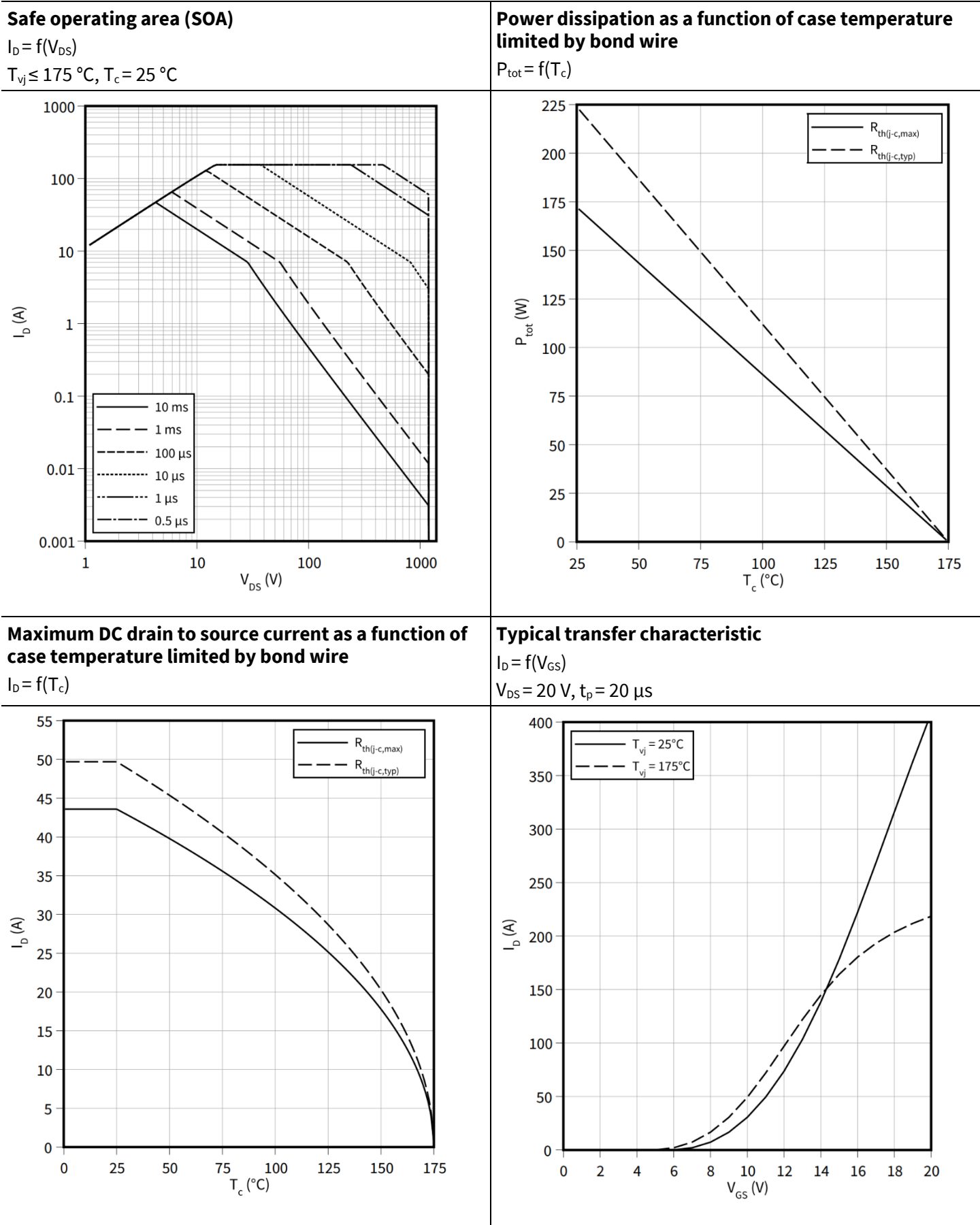
| Parameter                                          | Symbol       | Note or test condition |                       | Values | Unit |
|----------------------------------------------------|--------------|------------------------|-----------------------|--------|------|
| Diode pulsed current, $t_p$ limited by $T_{vjmax}$ | $I_{Fpulse}$ |                        |                       | 150    | A    |
| Power dissipation                                  | $P_{tot}$    |                        | $T_c = 25\text{ °C}$  | 250    | W    |
|                                                    |              |                        | $T_c = 100\text{ °C}$ | 125    |      |

表 6 特征值

| Parameter                           | Symbol    | Note or test condition                                                                                                                                      |                          | Values |      |      | Unit               |
|-------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|------|------|--------------------|
|                                     |           |                                                                                                                                                             |                          | Min.   | Typ. | Max. |                    |
| Diode forward voltage               | $V_F$     | $I_F = 50\text{ A}$                                                                                                                                         | $T_{vj} = 25\text{ °C}$  |        | 1.65 | 2.15 | V                  |
|                                     |           |                                                                                                                                                             | $T_{vj} = 175\text{ °C}$ |        | 1.6  |      |                    |
| Diode reverse recovery charge       | $Q_{rr}$  | $I_F = 18.2\text{ A}$ , $V_{DD} = 800\text{ V}$ , $R_{G,ext} = 2.8\text{ }\Omega$ , Opposite MOSFET $V_{GS} = 0/18\text{ V}$ , $Q_{rr}$ includes also $Q_c$ | $T_{vj} = 25\text{ °C}$  |        | 2.9  |      | $\mu\text{C}$      |
|                                     |           |                                                                                                                                                             | $T_{vj} = 175\text{ °C}$ |        | 7.1  |      |                    |
| Diode peak reverse recovery current | $I_{rrm}$ | $I_F = 18.2\text{ A}$ , $V_{DD} = 800\text{ V}$ , $R_{G,ext} = 2.8\text{ }\Omega$ , Opposite MOSFET $V_{GS} = 0/18\text{ V}$                                | $T_{vj} = 25\text{ °C}$  |        | 111  |      | A                  |
|                                     |           |                                                                                                                                                             | $T_{vj} = 175\text{ °C}$ |        | 159  |      |                    |
| Diode reverse recovery energy       | $E_{rec}$ | $I_F = 18.2\text{ A}$ , $V_{DD} = 800\text{ V}$ , $R_{G,ext} = 2.8\text{ }\Omega$ , Opposite MOSFET $V_{GS} = 0/18\text{ V}$ , $Q_{rr}$ includes also $Q_c$ | $T_{vj} = 25\text{ °C}$  |        | 1.6  |      | mJ                 |
|                                     |           |                                                                                                                                                             | $T_{vj} = 175\text{ °C}$ |        | 4.3  |      |                    |
| Virtual junction temperature        | $T_{vj}$  |                                                                                                                                                             |                          | -40    |      | 175  | $^{\circ}\text{C}$ |

注： 动态测试电路参见图G，第2个器件：集成反接保护功能的二极管， $V_{GS} = 0\text{ V}$ 。

4 特性图

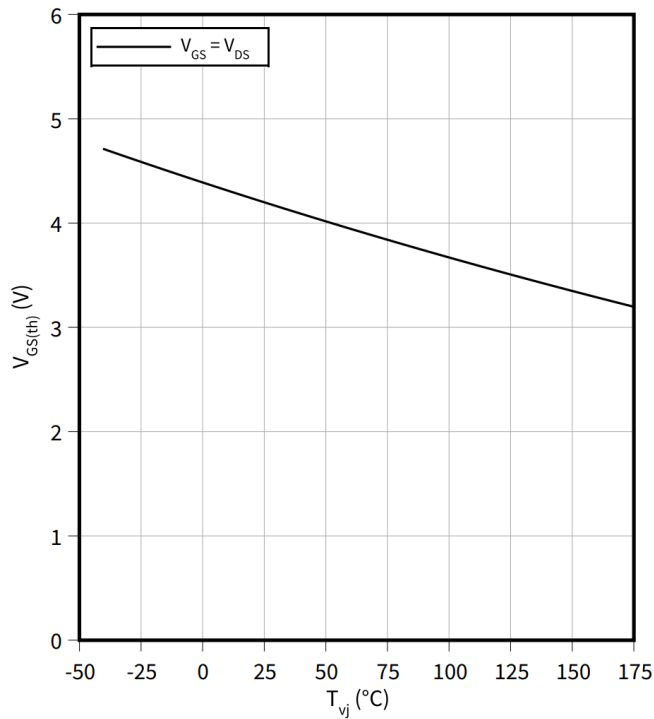


4 特性图

**Typical gate-source threshold voltage as a function of junction temperature**

$$V_{GS(th)} = f(T_{vj})$$

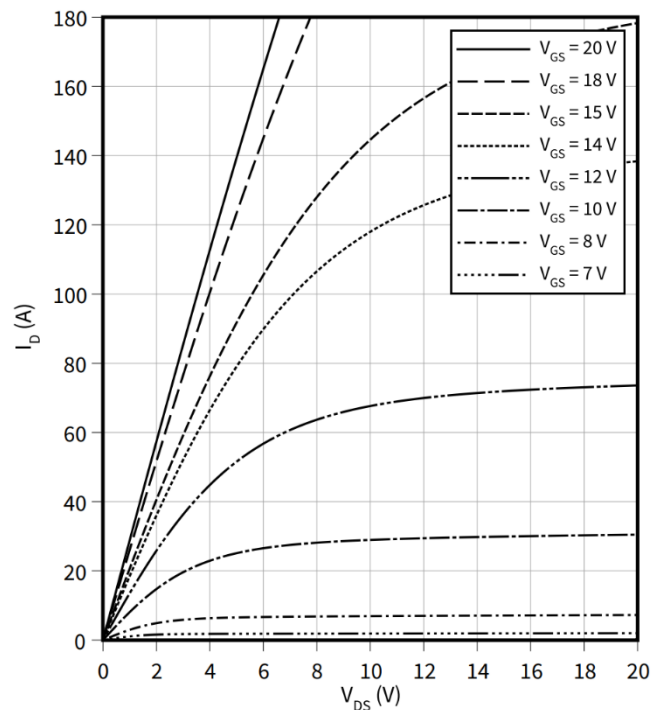
$$I_D = 5.7 \text{ mA}$$



**Typical output characteristic,  $V_{GS}$  as a parameter**

$$I_D = f(V_{DS})$$

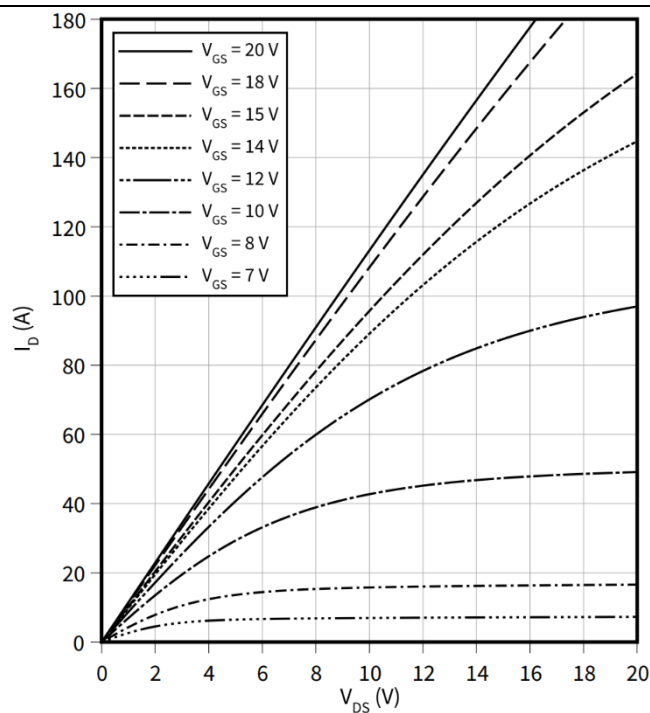
$$T_{vj} = 25 \text{ °C}, t_p = 20 \text{ } \mu\text{s}$$



**Typical output characteristic,  $V_{GS}$  as a parameter**

$$I_D = f(V_{DS})$$

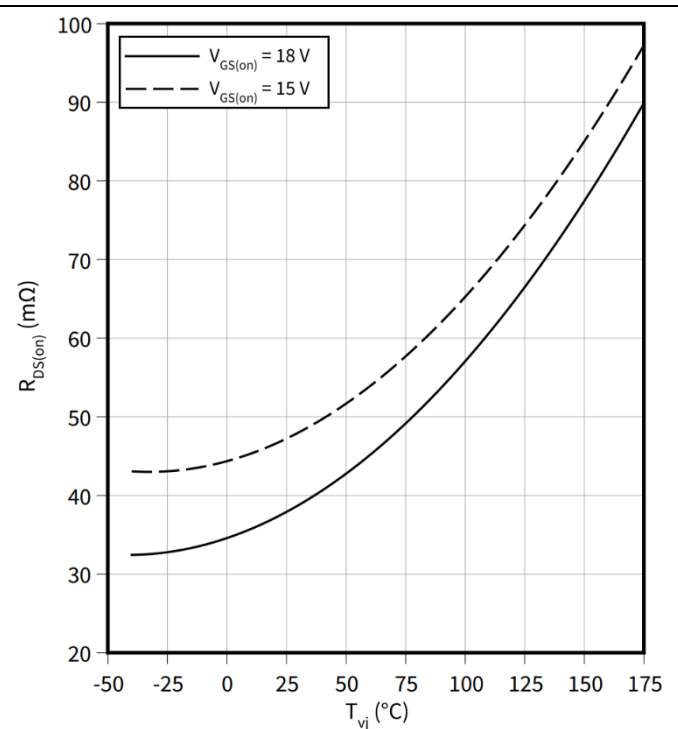
$$T_{vj} = 175 \text{ °C}, t_p = 20 \text{ } \mu\text{s}$$



**Typical on-state resistance as a function of junction temperature**

$$R_{DS(on)} = f(T_{vj})$$

$$I_D = 18.2 \text{ A}$$

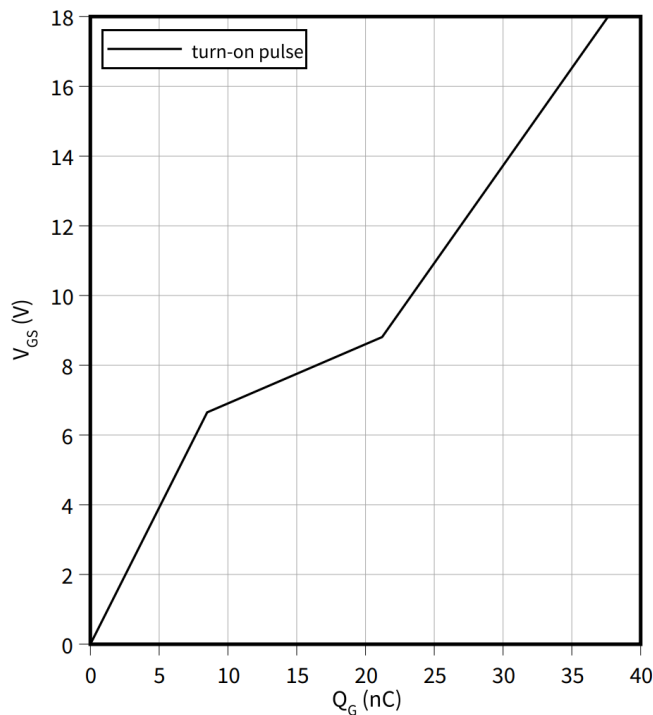


4 特性图

Typical gate charge

$$V_{GS} = f(Q_G)$$

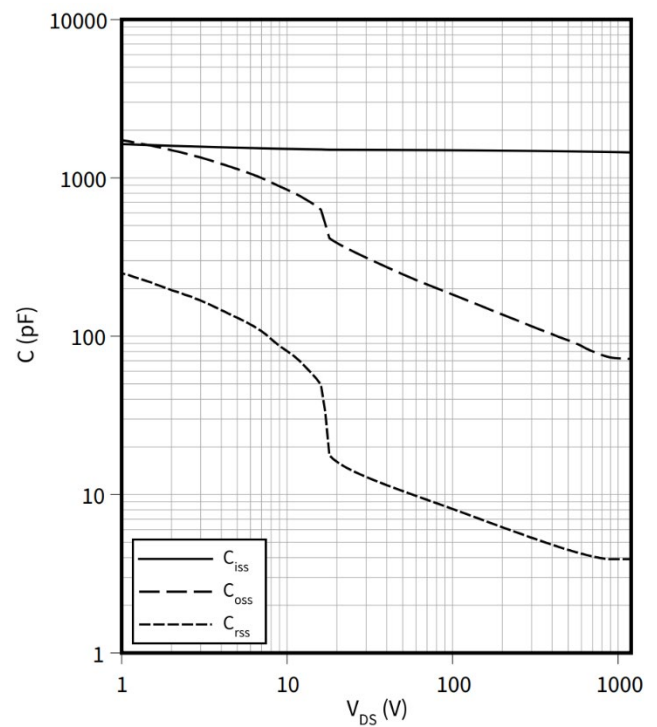
$I_D = 18.2 \text{ A}$ ,  $V_{DS} = 800 \text{ V}$



Typical capacitance as a function of drain-source voltage

$$C = f(V_{DS})$$

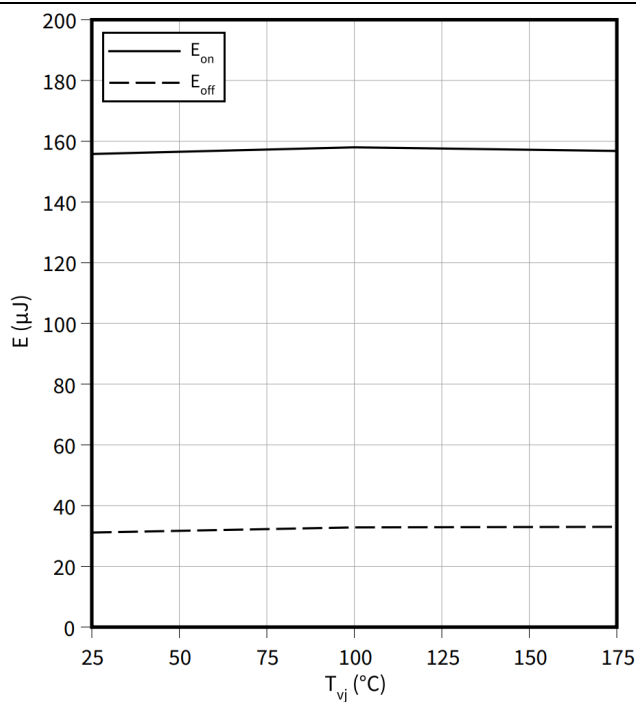
$f = 100 \text{ kHz}$ ,  $V_{GS} = 0 \text{ V}$



Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device external SiC diode

$$E = f(T_{vj})$$

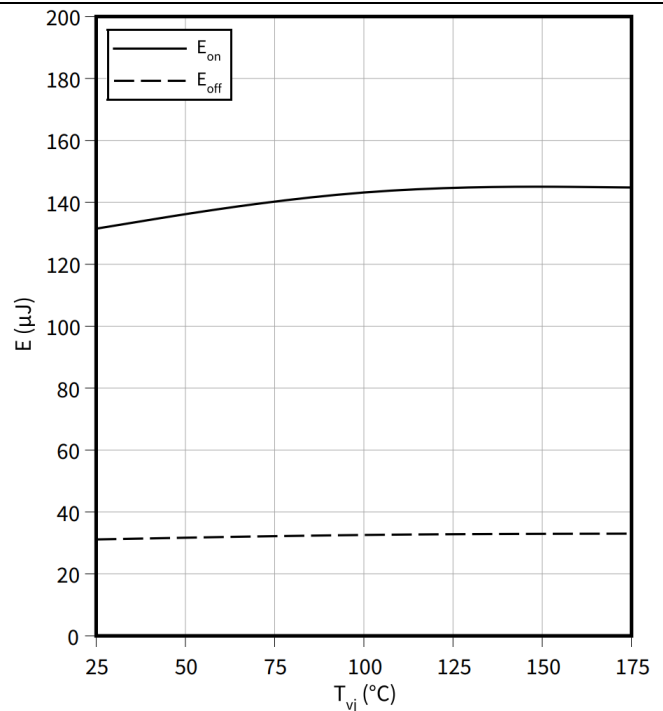
$V_{GS} = 0/18 \text{ V}$ ,  $I_D = 18.2 \text{ A}$ ,  $R_{G,ext} = 2.8 \Omega$ ,  $V_{DD} = 800 \text{ V}$



Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device external SiC diode

$$E = f(T_{vj})$$

$V_{GS} = -5/18 \text{ V}$ ,  $I_D = 18.2 \text{ A}$ ,  $R_{G,ext} = 2.8 \Omega$ ,  $V_{DD} = 800 \text{ V}$

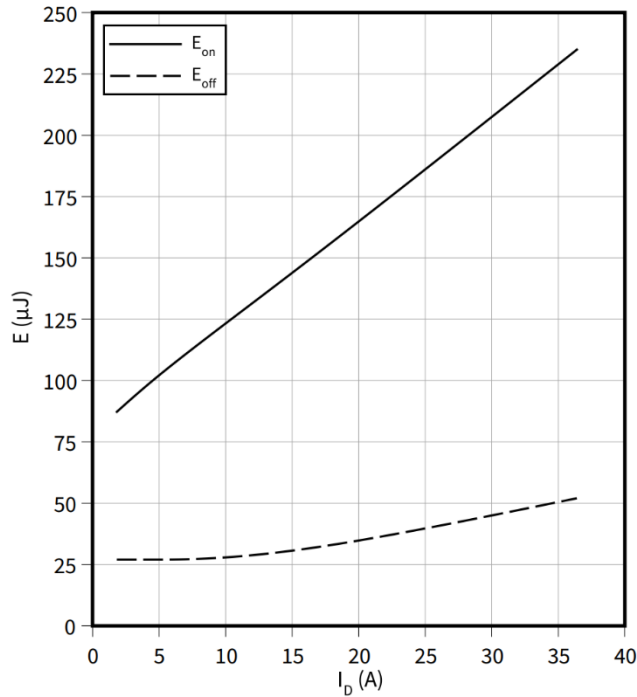


4 特性图

**Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device external SiC diode**

$$E = f(I_D)$$

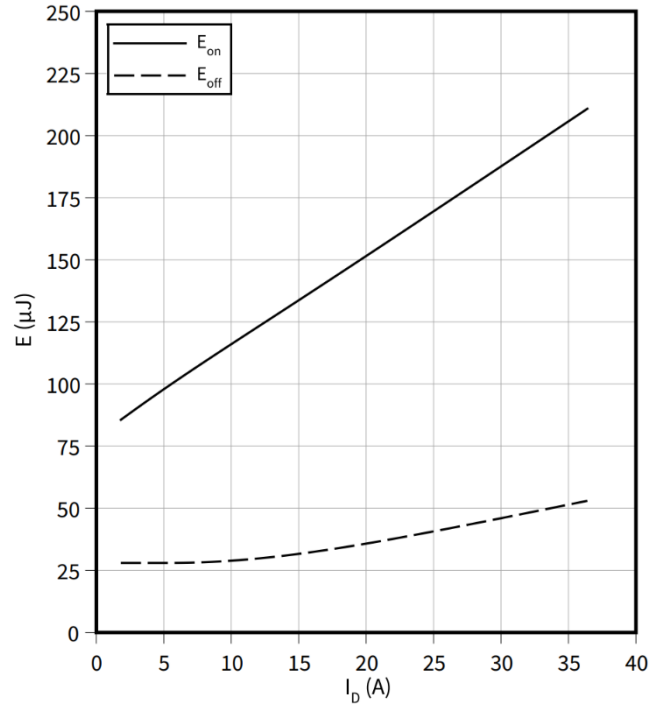
$V_{GS} = 0/18 \text{ V}$ ,  $T_{vj} = 175 \text{ °C}$ ,  $R_{G,ext} = 2.8 \text{ } \Omega$ ,  $V_{DD} = 800 \text{ V}$



**Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device external SiC diode**

$$E = f(I_D)$$

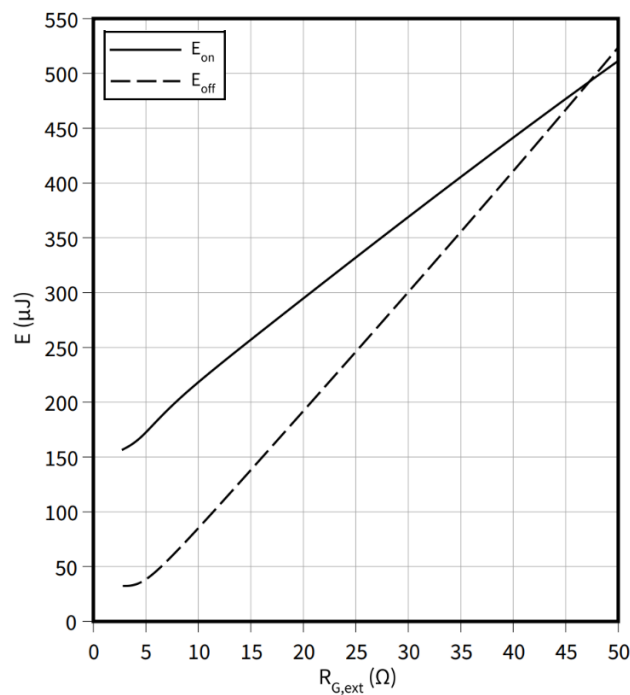
$V_{GS} = -5/18 \text{ V}$ ,  $T_{vj} = 175 \text{ °C}$ ,  $R_{G,ext} = 2.8 \text{ } \Omega$ ,  $V_{DD} = 800 \text{ V}$



**Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device external SiC diode**

$$E = f(R_{G,ext})$$

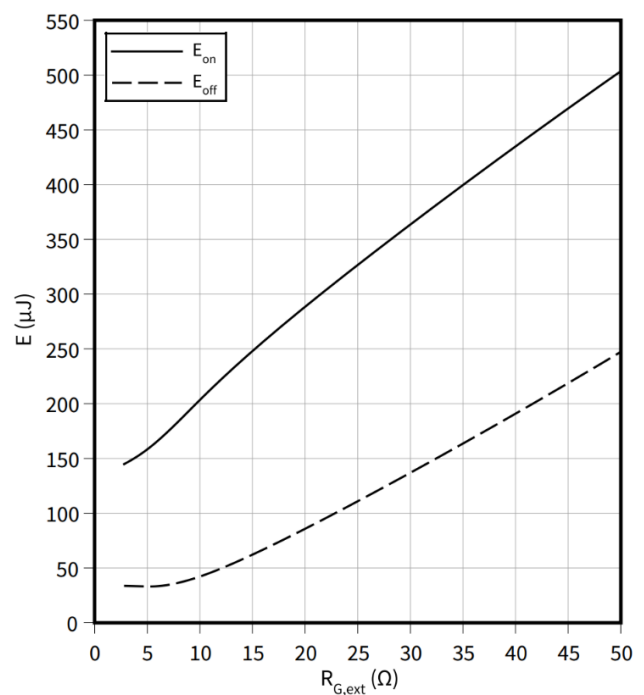
$V_{GS} = 0/18 \text{ V}$ ,  $I_D = 18.2 \text{ A}$ ,  $T_{vj} = 175 \text{ °C}$ ,  $V_{DD} = 800 \text{ V}$



**Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device external SiC diode**

$$E = f(R_{G,ext})$$

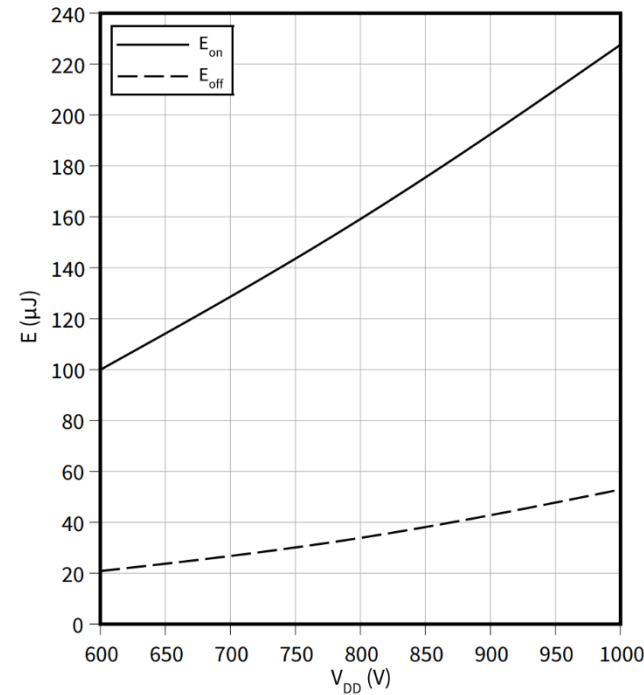
$V_{GS} = -5/18 \text{ V}$ ,  $I_D = 18.2 \text{ A}$ ,  $T_{vj} = 175 \text{ °C}$ ,  $V_{DD} = 800 \text{ V}$



4 特性图

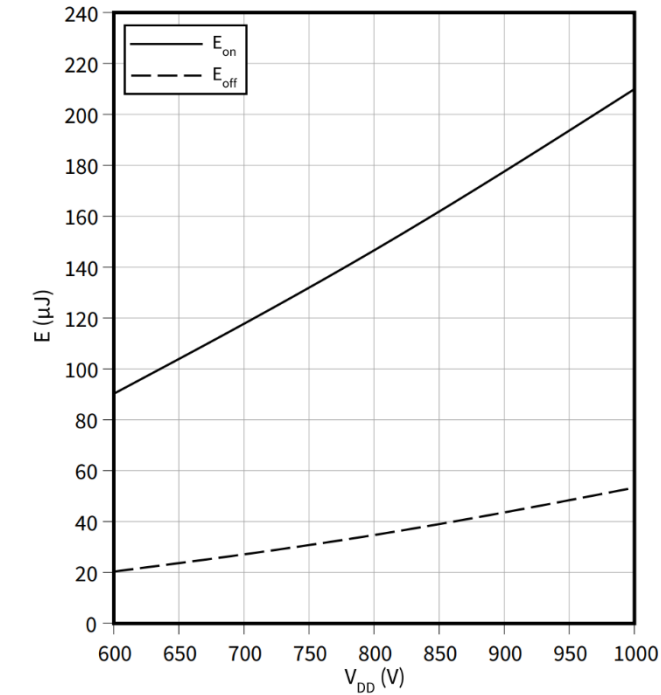
Typical switching energy as a function of DC link voltage, test circuit in Fig. F, 2nd device external SiC diode

$E = f(V_{DD})$   
 $V_{GS} = 0/18\text{ V}$ ,  $I_D = 18.2\text{ A}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.8\text{ }\Omega$



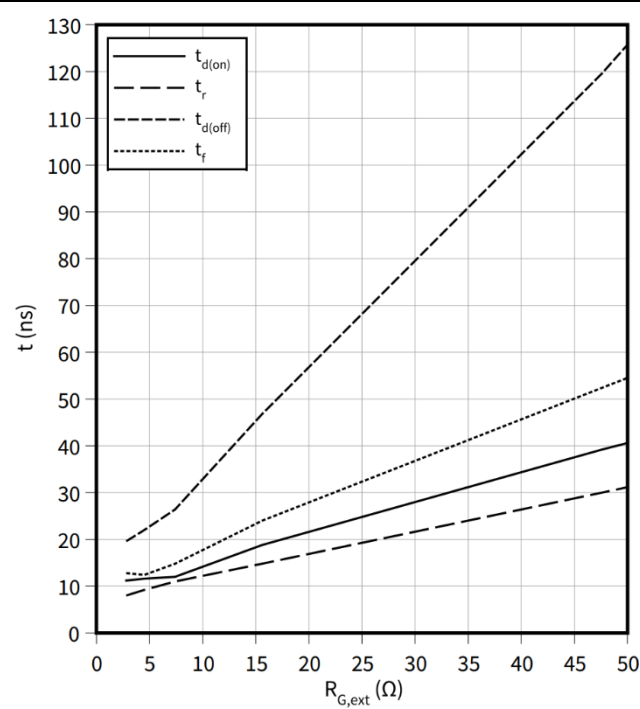
Typical switching energy as a function of DC link voltage, test circuit in Fig. F, 2nd device external SiC diode

$E = f(V_{DD})$   
 $V_{GS} = -5/18\text{ V}$ ,  $I_D = 18.2\text{ A}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.8\text{ }\Omega$



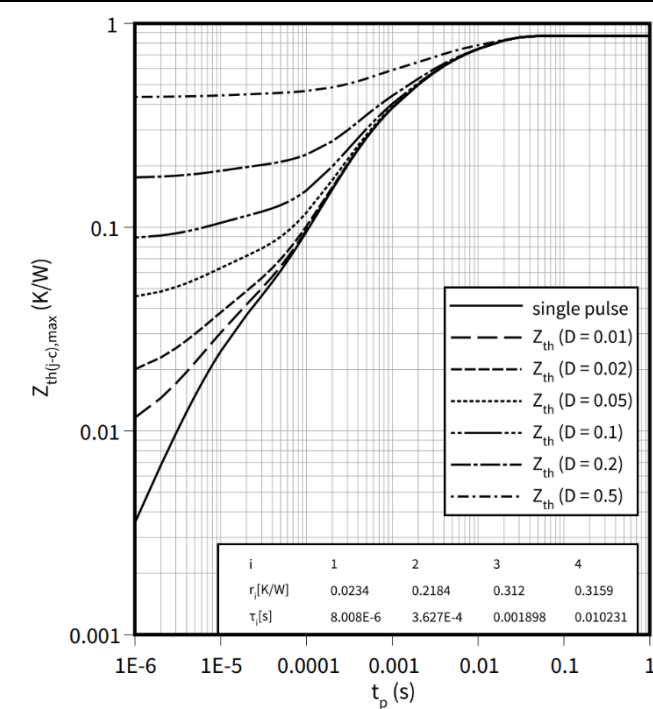
Typical switching times as a function of gate resistance, test circuit in Fig. F, 2nd device external SiC diode

$t = f(R_{G,ext})$   
 $V_{GS} = 0/18\text{ V}$ ,  $I_D = 18.2\text{ A}$ ,  $T_{vj} = 175\text{ °C}$ ,  $V_{DD} = 800\text{ V}$



Max. transient thermal impedance (MOSFET)

$Z_{th(j-c),max} = f(t_p)$   
 $D = t_p/T$

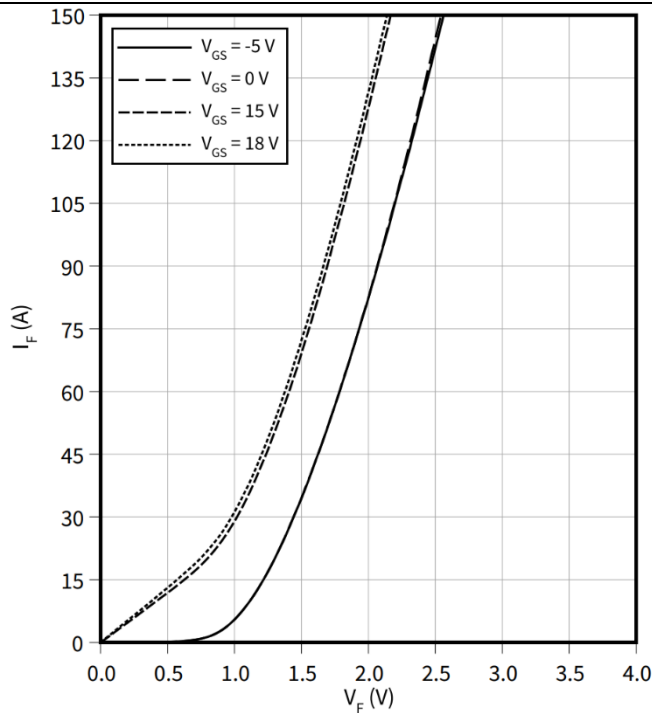


4 特性图

**Typical diode forward current as a function of forward voltage,  $V_{GS}$  as a parameter**

$$I_F = f(V_F)$$

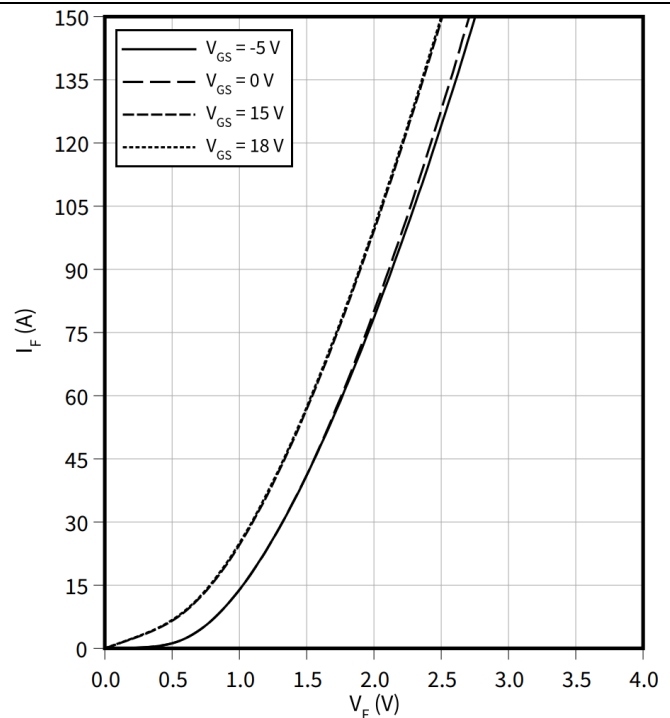
$t_p = 20 \mu s$ ,  $T_{vj} = 25^\circ C$



**Typical diode forward current as a function of forward voltage,  $V_{GS}$  as a parameter**

$$I_F = f(V_F)$$

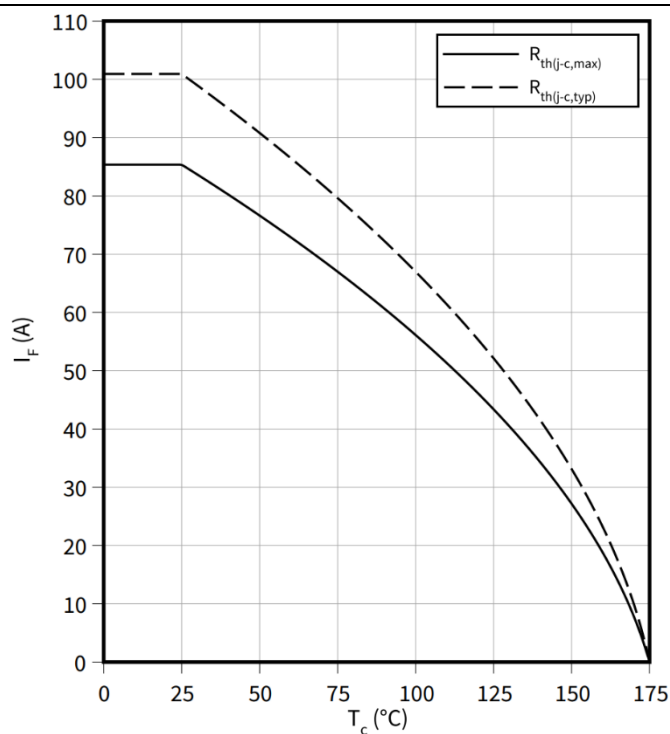
$t_p = 20 \mu s$ ,  $T_{vj} = 175^\circ C$



**Maximum diode forward current as a function of case temperature limited by bond wire**

$$I_F = f(T_c)$$

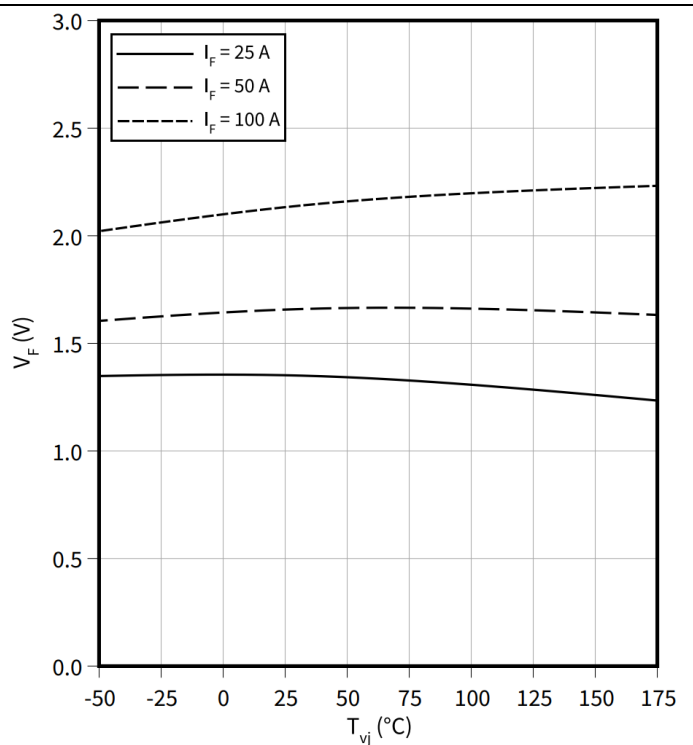
$V_{GS} = 0 V$



**Typical diode forward voltage as function of junction temperature**

$$V_F = f(T_{vj})$$

$V_{GS} = 0 V$

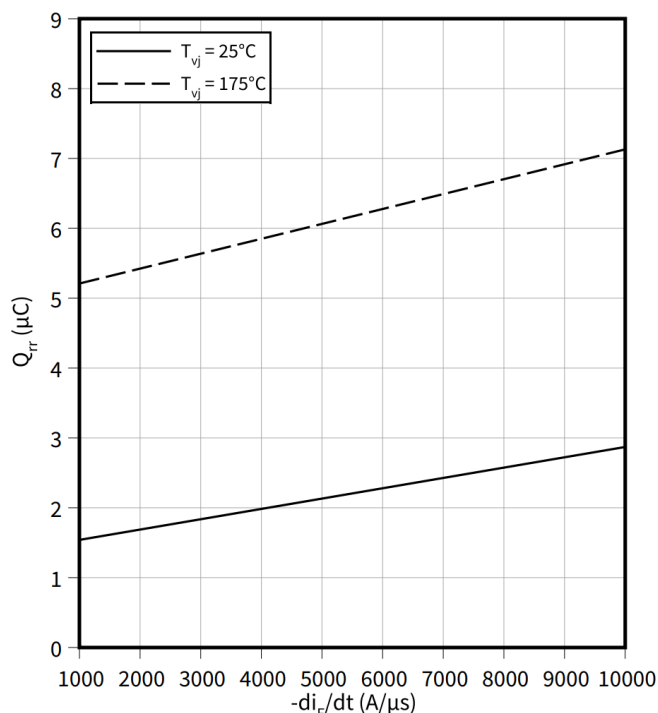


4 特性图

**Typical reverse recovery charge as function of diode current slope, test circuit in Fig. G, 2nd device reverse-polarity protection co-packed diode**

$$Q_{rr} = f(-di_F/dt)$$

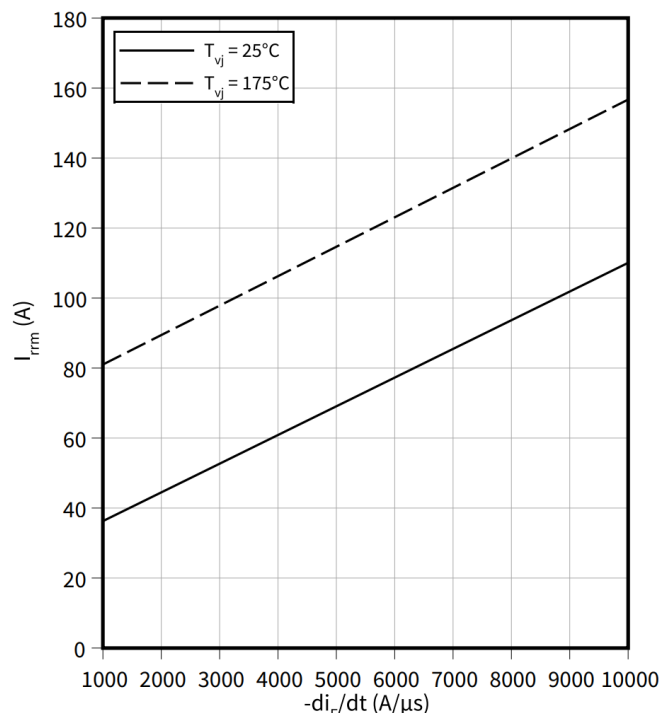
$V_{GS} = 0/18\text{ V}$ ,  $V_{DD} = 800\text{ V}$ ,  $I_F = 18.2\text{ A}$



**Typical reverse recovery current as function of diode current slope, test circuit in Fig. G, 2nd device reverse-polarity protection co-packed diode**

$$I_{rrm} = f(-di_F/dt)$$

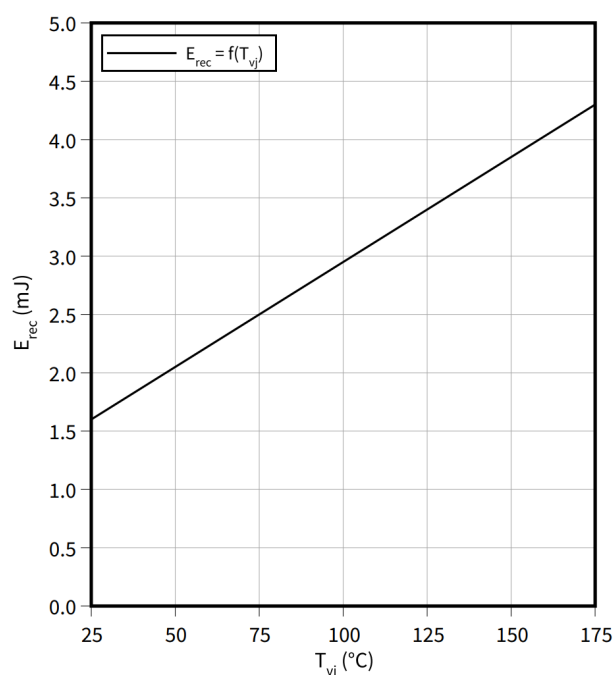
$V_{GS} = 0/18\text{ V}$ ,  $V_{DD} = 800\text{ V}$ ,  $I_F = 18.2\text{ A}$



**Typical reverse energy losses as function of junction temperature, test circuit in Fig. G, 2nd device reverse-polarity protection co-packed diode**

$$E_{rec} = f(T_{vj})$$

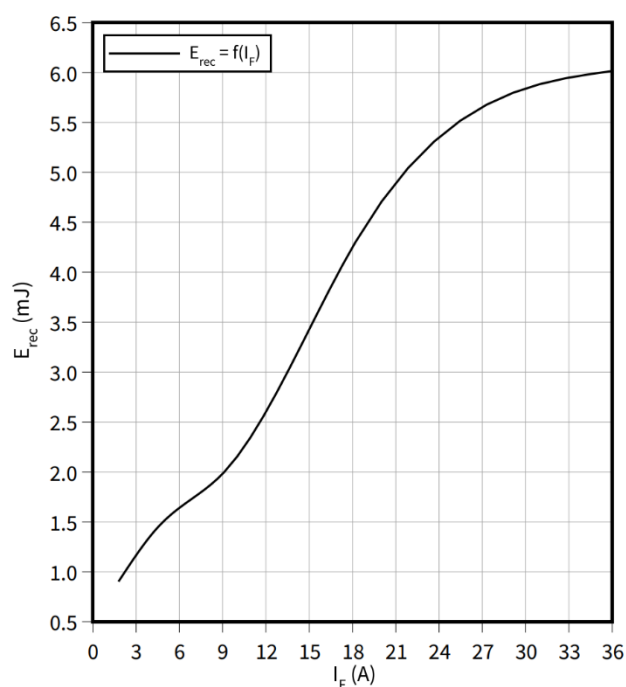
$V_{GS} = 0/18\text{ V}$ ,  $R_{G,ext} = 2.8\ \Omega$ ,  $V_{DD} = 800\text{ V}$ ,  $I_F = 18.2\text{ A}$



**Typical reverse energy losses as function of diode current, test circuit in Fig. G, 2nd device reverse-polarity protection co-packed diode**

$$E_{rec} = f(I_F)$$

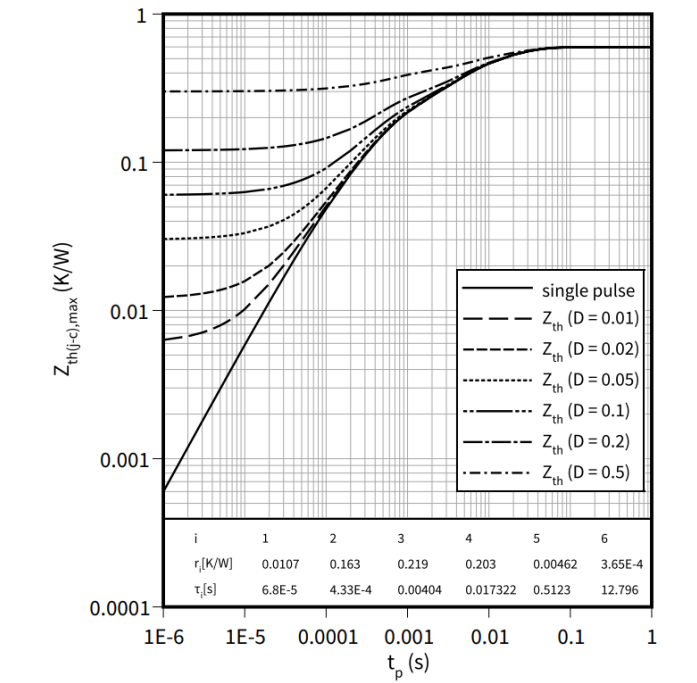
$V_{GS} = 0/18\text{ V}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.8\ \Omega$ ,  $V_{DD} = 800\text{ V}$



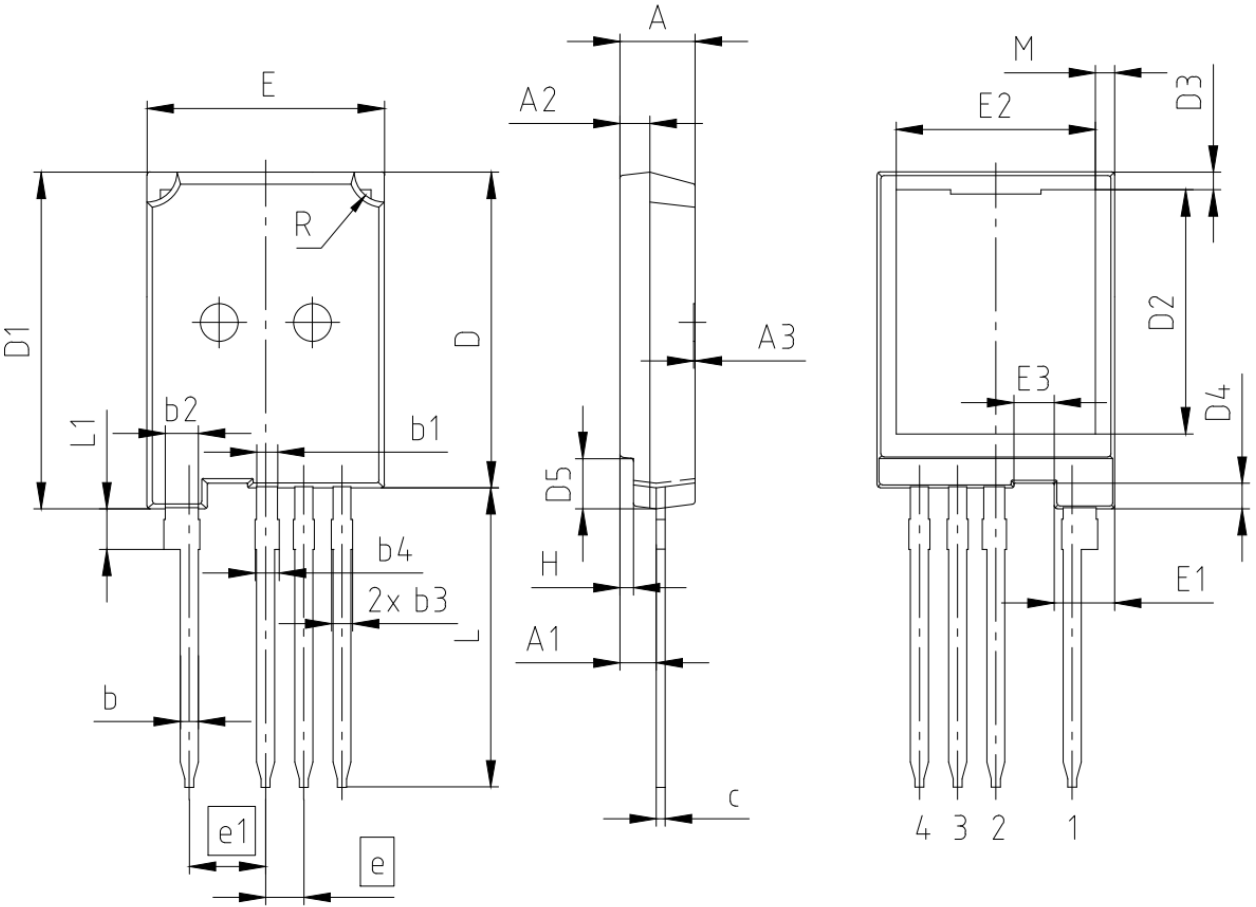
Max. transient thermal impedance (protection diode)

$$Z_{th(j-c),max} = f(t_p)$$

$$D = t_p/T$$



5 封装外形



NOTES:  
PACKAGE SURFACE ROUTE BETWEEN PIN 1 & PIN 2 WILL BE 5.1 mm MIN.  
ALL b... AND c DIMENSIONS INCLUDING PLATING EXPECT AREA OF CUTTING

| PACKAGE - GROUP NUMBER: |             | PG-TO247-4-U10 |            |             |       |
|-------------------------|-------------|----------------|------------|-------------|-------|
| DIMENSIONS              | MILLIMETERS |                | DIMENSIONS | MILLIMETERS |       |
|                         | MIN.        | MAX.           |            | MIN.        | MAX.  |
| A                       | 4.90        | 5.10           | E          | 15.70       | 15.90 |
| A1                      | 2.31        | 2.51           | E1         | 3.90        | 4.10  |
| A2                      | 1.90        | 2.10           | E2         | 13.10       | 13.50 |
| b                       | 1.16        | 1.29           | E3         | 2.58        | 2.78  |
| b1                      | 1.36        | 1.49           | e          | 2.54        |       |
| b2                      | 2.16        | 2.29           | e1         | 5.08        |       |
| b3                      | 1.16        | 1.45           | H          | 0.80        | 1.00  |
| b4                      | 1.16        | 1.65           | N          | 4           |       |
| c                       | 0.59        | 0.66           | L          | 19.80       | 20.10 |
| D                       | 20.90       | 21.10          | L1         | 2.55        | 2.85  |
| D1                      | 22.30       | 22.50          | M          | 0.97        | 1.57  |
| D2                      | 15.95       | 16.55          | R          | 1.90        | 2.10  |
| D3                      | 1.00        | 1.35           |            |             |       |
| D4                      | 1.60        | 1.80           |            |             |       |
| D5                      | 3.24        | 3.44           |            |             |       |

图 1

6 测试条件

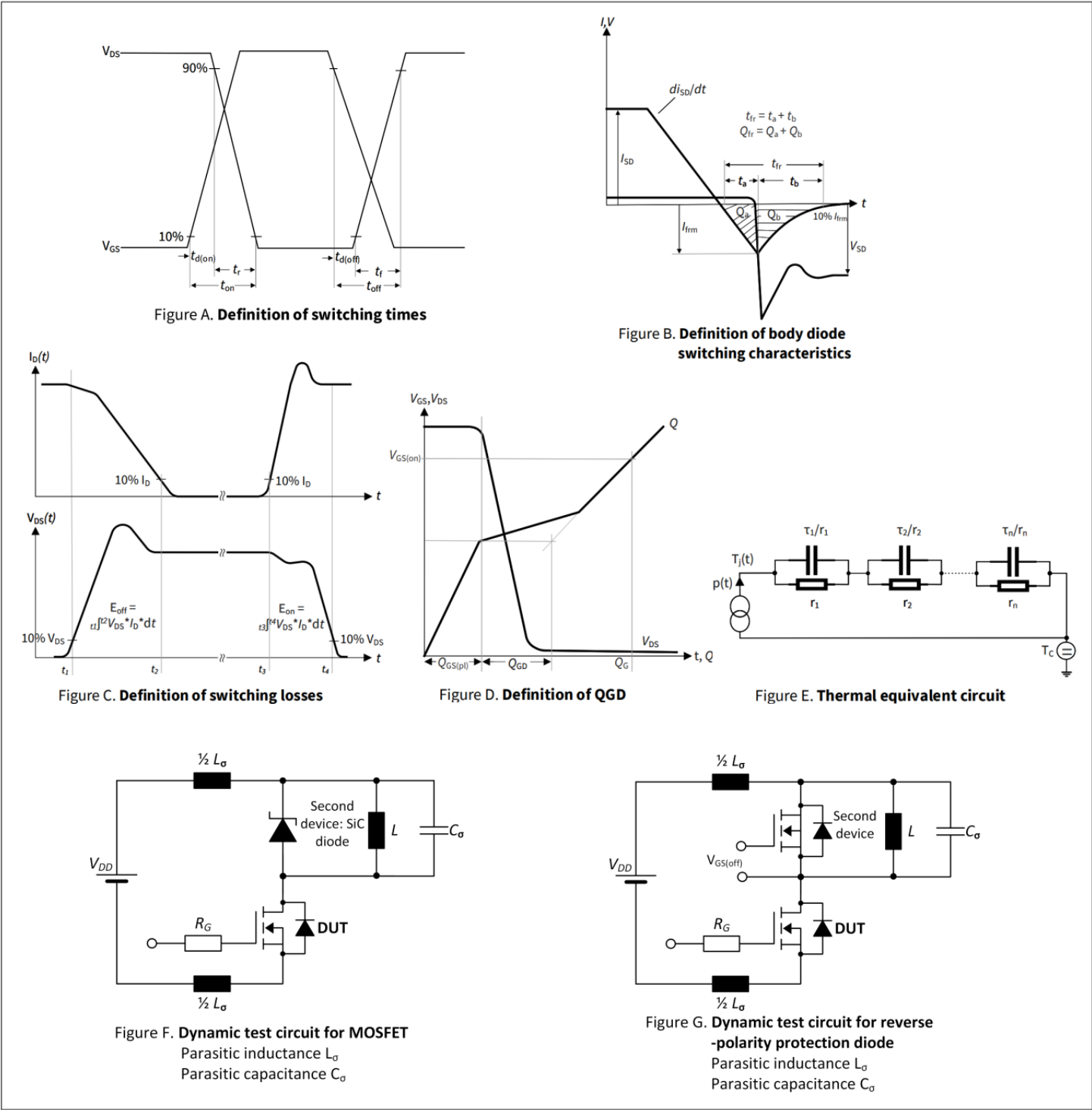


图 2



修订记录

修订记录

| Document revision | Date of release | Description of changes |
|-------------------|-----------------|------------------------|
| 0.10              | 2025-03-12      | Target datasheet       |
| 0.20              | 2025-08-08      | Preliminary datasheet  |
| 1.00              | 2025-11-20      | Final datasheet        |

## Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

**Edition 2025-11-20**

**Published by**

**Infineon Technologies AG**

**81726 Munich, Germany**

**© 2025 Infineon Technologies AG**

**All Rights Reserved.**

**Do you have a question about any aspect of this document?**

**Email: [erratum@infineon.com](mailto:erratum@infineon.com)**

**Document reference**

**IFX-ABM989-003**

## Important notice

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Please note that this product is not qualified according to the AEC Q100 or AEC Q101 documents of the Automotive Electronics Council.

## Warnings

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.



## 免责声明

请注意，本文件的原文使用英文撰写，为方便客户浏览英飞凌提供了中文译文。该中文译文仅供参考，并不可作为任何论点之依据。

由于翻译过程中可能使用了自动化程序，以及语言翻译和转换过程中的差异，最后的中文译文与最新的英文版本原文含义可能存在不尽相同之处。

因此，我们同时提供该中文译文版本的最新英文原文供您阅读，请参见 <http://www.infineon.com>

英文原文和中文译文版本之间若存有任何歧异，以最新的英文版本为准，并且仅认可英文版本为正式文件。

**您如果使用本文件，即表示您同意并理解上述说明。英飞凌不对因翻译过程中可能存在的任何不完整或不准确信息而产生的任何直接或间接损失或损害负责。英飞凌不承担中文译文版本的完整性和准确性责任。如果您不同意上述说明，请不要使用本文件。**

## Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

版本 2026-09-23

Infineon Technologies AG 出版，  
德国 Neubiberg 85579

版权 © 2026 Infineon Technologies AG  
及其关联公司。  
保留所有权利。

Do you have a question about this  
document?

Email:

[erratum@infineon.com](mailto:erratum@infineon.com)

## 重要通知

Infineon Technologies AG 及其关联公司（以下简称“英飞凌”）销售或提供和交付的产品（可能也包括样品，且可能由硬件或软件或两者组成）（以下简称“产品”），应遵守客户与英飞凌签订的框架供应合同或其他书面协议的条款和条件，如无上合同或其他书面协议，则应遵守适用的英飞凌销售条件。只有在英飞凌明确书面同意的情况下，客户的一般条款和条件或对适用的英飞凌销售条件的偏离才对英飞凌具有约束力。

为避免疑义，英飞凌不承担侵犯第三方权利的所有保证和默示保证，例如对特定用途/目的的适用性或适销性的保证。

英飞凌对与样品、应用或客户对任何产品的具体使用有关的任何信息或本文件中给出的任何示例或典型值概不负责。

本文件中包含的数据仅供具有技术资格和技能的客户代表使用。客户有责任评估产品对预期应用和客户特定用途的适用性，并在预期应用和客户特定用途中验证本文件中包含的所有相关技术数据。客户有责任正确设计、编程和测试预期应用的功能性和安全性，并遵守与其使用相关的法律要求。

除非英飞凌另行明确批准，否则产品不得用于任何因产品故障或使用产品的任何后果可合理预期会导致人身伤害的应用。但是，上述规定并不妨碍客户在英飞凌明确设计和销售的使用领域中使用任何产品，但是客户对应用负有全部责任。

英飞凌明确保留根据适用法律，如《德国版权法》（UrhG）第 44b 条，将其内容用于商业资料和数据勘探（TDM）的权利。

如果产品包含安全功能：

由于任何计算设备都不可能绝对安全，尽管产品采取了安全措施，但英飞凌不保证产品不会被入侵、数据不会被盗或遗失，或不会发生其他漏洞（以下简称“安全漏洞”），英飞凌对任何安全漏洞不承担任何责任。

如果本文件包含或引用软件：

根据美国、德国和世界其他国家的知识产权法律和条约，该软件归英飞凌所有。英飞凌保留所有权利。因此，您只能按照软件附带的软件授权协议的规定使用本软件。

如果没有适用的软件授权协议，英飞凌特此授予您个人的、非排他性的、不可转让的软件知识产权授权（无权转授权）：(a) 对于以源代码形式提供的软件，仅在贵组织内部修改和复制该软件用于英飞凌硬件产品；及 (b) 对于以二进制代码 (binary code) 形式对外向终端用户分发该软件，仅得用于英飞凌硬件产品。禁止对本软件进行任何其他使用、复制、修改、翻译或编译。有关产品、技术、交货条款和条件以及价格的详细信息，请联系离您最近的英飞凌办公室或访问 <https://www.infineon.com>。