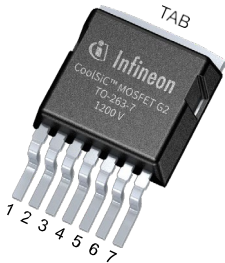


最终数据手册

英飞凌工业用CoolSiC™ 1200 V SiC MOSFET G2：碳化硅 MOSFET

特性

- $T_{vj} = 25^{\circ}\text{C}$ 时 $V_{DSS} = 1200\text{ V}$
- $I_{DDC} = 144\text{ A}$  at  $T_C = 100^{\circ}\text{C}$
- $R_{DS(on)} = 7.7\text{ m}\Omega$  at  $V_{GS} = 18\text{ V}$ ,  $T_{vj} = 25^{\circ}\text{C}$
- 开关损耗非常低
- 过载运行最高结温可达  $T_{vj} = 200^{\circ}\text{C}$
- 短路耐受时间  $2\text{ }\mu\text{s}$
- 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  $0\text{ V}$  关断栅极电压
- 坚固的体二极管, 适用于硬换向
- 英飞凌.XT 互连技术, 实现、行业领先的热性能
- 合适的英飞凌栅极驱动器可在 <https://www.infineon.com/gdfinder> 找到



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

潜在应用

- 电动汽车充电桩
- 在线式UPS/工业UPS
- 组串式逆变器
- 通用驱动器 (GPD)

产品验证

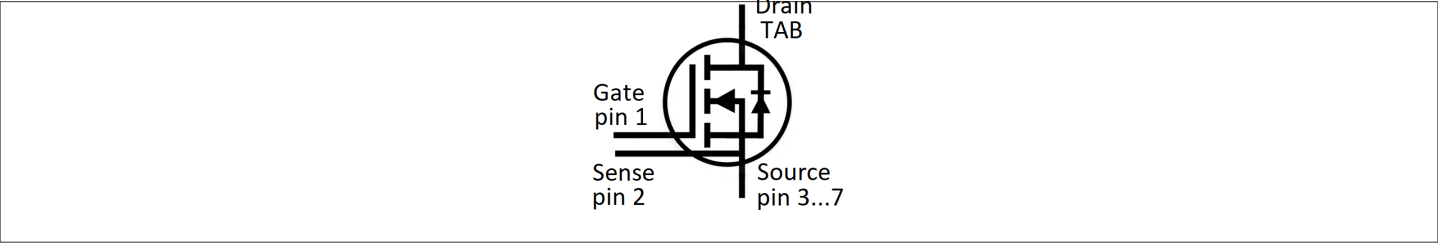
- 符合JEDEC47/20/22相关测试的工业应用要求

描述

引脚定义：

- 引脚 1 - 栅极
- 引脚 2 - 开尔文检测
- 引脚...7 - 源极
- Tab - 漏极

注：源极和开尔文传感触点引脚不可互换，互换可能会导致故障（仅适用于 4 pin及TO263-7L封装）



| Type           | Package        | Marking  |
|----------------|----------------|----------|
| IMBG120R008M2H | PG-TO263-7-U01 | 12M2H008 |

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

|   |                    |    |
|---|--------------------|----|
|   | 说明 .....           | 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 | 体二极管 (MOSFET)..... | 6  |
| 4 | 特征图 .....          | 8  |
| 5 | 封装布局 .....         | 14 |
| 6 | 测试条件 .....         | 15 |
|   | 修订记录 .....         | 16 |
|   | 免责声明 .....         | 17 |

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                               | $T_{sold}$    | reflow soldering (MSL1 according to JEDEC J-STD-020) |        |      | 260  | °C   |
| Thermal resistance, junction-ambient                | $R_{th(j-a)}$ |                                                      |        |      | 62   | K/W  |
| MOSFET/body diode thermal resistance, junction-case | $R_{th(j-c)}$ |                                                      |        | 0.14 | 0.19 | K/W  |

## 2 MOSFET

表2 最大额定值

| Parameter                                                                    | Symbol    | Note or test condition                                                                                                   |                       | Values   | Unit          |
|------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------|-----------------------|----------|---------------|
| Drain-source voltage                                                         | $V_{DSS}$ | $T_{vj} \geq 25\text{ °C}$                                                                                               |                       | 1200     | V             |
| Continuous DC drain current for $R_{th(j-c,max)}$ , limited by $T_{vj(max)}$ | $I_{DDC}$ | $V_{GS} = 18\text{ V}$                                                                                                   | $T_c = 25\text{ °C}$  | 189      | A             |
|                                                                              |           |                                                                                                                          | $T_c = 100\text{ °C}$ | 144      |               |
| Peak drain current, $t_p$ limited by $T_{vj(max)}$ <sup>1)</sup>             | $I_{DM}$  | $V_{GS} = 18\text{ V}$                                                                                                   |                       | 432      | A             |
| Gate-source voltage, max. transient voltage                                  | $V_{GS}$  | $t_p \leq 0.5\text{ }\mu\text{s}$ , $D < 0.01$                                                                           |                       | -10...25 | V             |
| Gate-source voltage, max. static voltage <sup>2)</sup>                       | $V_{GS}$  |                                                                                                                          |                       | -7...23  | V             |
| Avalanche energy, single pulse                                               | $E_{AS}$  | $I_D = 89.9\text{ A}$ , $V_{DD} = 50\text{ V}$ , $L = 0.3\text{ mH}$                                                     |                       | 1129     | mJ            |
| Avalanche energy, repetitive                                                 | $E_{AR}$  | $I_D = 89.9\text{ A}$ , $V_{DD} = 50\text{ V}$ , $L = 1.4\text{ }\mu\text{H}$                                            |                       | 5.64     | mJ            |
| Short-circuit withstand time                                                 | $t_{SC}$  | $V_{DD} \leq 800\text{ V}$ , $V_{DS,peak} < 1200\text{ V}$ , $V_{GS(on)} = 15\text{ V}$ , $T_{vj(start)} = 25\text{ °C}$ |                       | 2        | $\mu\text{s}$ |
| Power dissipation, limited by $T_{vj(max)}$                                  | $P_{tot}$ |                                                                                                                          | $T_c = 25\text{ °C}$  | 800      | W             |
|                                                                              |           |                                                                                                                          | $T_c = 100\text{ °C}$ | 400      |               |

1) 已通过设计验证。

2) 应用设计中的最大栅极源电压应符合IPC-9592B的规定。

表 3 建议值

| 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             | $R_{DS(on)}$ | $I_D = 89.9 \text{ A}$                                                                                                          |        | $T_{vj} = 25 \text{ °C}, V_{GS(on)} = 18 \text{ V}$  | 7.7  | mΩ   |
|                                              |              |                                                                                                                                 |        | $T_{vj} = 150 \text{ °C}, V_{GS(on)} = 18 \text{ V}$ | 15.7 |      |
|                                              |              |                                                                                                                                 |        | $T_{vj} = 175 \text{ °C}, V_{GS(on)} = 18 \text{ V}$ | 18.3 |      |
|                                              |              |                                                                                                                                 |        | $T_{vj} = 25 \text{ °C}, V_{GS(on)} = 15 \text{ V}$  | 9.6  |      |
| Gate-source threshold voltage                | $V_{GS(th)}$ | $I_D = 28.3 \text{ mA}, V_{DS} = V_{GS}$<br>(tested after 1 ms pulse at $V_{GS} = 20 \text{ V}$ )                               | 3.5    | $T_{vj} = 25 \text{ °C}$                             | 4.2  | V    |
|                                              |              |                                                                                                                                 |        | $T_{vj} = 175 \text{ °C}$                            | 3.2  |      |
| Zero gate-voltage drain current              | $I_{DSS}$    | $V_{DS} = 1200 \text{ V}, V_{GS} = 0 \text{ V}$                                                                                 |        | $T_{vj} = 25 \text{ °C}$                             | 780  | μA   |
|                                              |              |                                                                                                                                 |        | $T_{vj} = 175 \text{ °C}$                            | 13.2 |      |
| 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                     | $g_{fs}$     | $I_D = 89.9 \text{ A}, V_{DS} = 20 \text{ V}$                                                                                   |        | 60.3                                                 |      | S    |
| Internal gate resistance                     | $R_{G,int}$  | $f = 1 \text{ MHz}, V_{AC} = 25 \text{ mV}$                                                                                     |        | 3                                                    |      | Ω    |
| Input capacitance                            | $C_{iss}$    | $V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$                                     |        | 6380                                                 |      | pF   |
| Output capacitance                           | $C_{oss}$    | $V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$                                     |        | 279                                                  |      | pF   |
| Reverse transfer capacitance                 | $C_{rss}$    | $V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$                                     |        | 24                                                   |      | pF   |
| $C_{oss}$ stored energy                      | $E_{oss}$    | $V_{DS} = 0...800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$ , Calculated based on $C_{oss}$ |        | 117                                                  |      | μJ   |
| Output charge                                | $Q_{oss}$    | $V_{DS} = 0...800 \text{ V}, V_{GS} = 0 \text{ V}$ , Calculated based on $C_{oss}$                                              |        | 436                                                  |      | nC   |
| Effective output capacitance, energy related | $C_{o(er)}$  | $V_{DS} = 0...800 \text{ V}, V_{GS} = 0 \text{ V}$                                                                              |        | 365.6                                                |      | pF   |
| Effective output capacitance, time related   | $C_{o(tr)}$  | $I_D = \text{constant}, V_{DS} = 0...800 \text{ V}, V_{GS} = 0 \text{ V}$                                                       |        | 545                                                  |      | pF   |

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表 4（续） 特征值

| Parameter            | Symbol       | Note or test condition                                                                                                                                                                                                     | Values                               |      |      | Unit          |
|----------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|---------------|
|                      |              |                                                                                                                                                                                                                            | Min.                                 | Typ. | Max. |               |
| Total gate charge    | $Q_G$        | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ , $V_{GS} = -2/18\text{ V}$ , turn-on pulse                                                                                                                                |                                      | 195  |      | nC            |
| Plateau gate charge  | $Q_{GS(pl)}$ | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ , $V_{GS} = -2/18\text{ V}$ , turn-on pulse                                                                                                                                |                                      | 41   |      | nC            |
| Gate-to-drain charge | $Q_{GD}$     | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ , $V_{GS} = -2/18\text{ V}$ , turn-on pulse                                                                                                                                |                                      | 53   |      | nC            |
| Turn-on delay time   | $t_{d(on)}$  | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{GS(on)} = 2.3\ \Omega$ ,<br>$R_{GS(off)} = 2.3\ \Omega$ ,<br>$L_\sigma = 15\text{ nH}$ , diode: body diode at $V_{GS} = 0\text{ V}$ | $T_{vj} = 25\text{ }^\circ\text{C}$  | 16   |      | ns            |
|                      |              |                                                                                                                                                                                                                            | $T_{vj} = 175\text{ }^\circ\text{C}$ | 16   |      |               |
| Rise time            | $t_r$        | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{GS(on)} = 2.3\ \Omega$ ,<br>$R_{GS(off)} = 2.3\ \Omega$ ,<br>$L_\sigma = 15\text{ nH}$ , diode: body diode at $V_{GS} = 0\text{ V}$ | $T_{vj} = 25\text{ }^\circ\text{C}$  | 25.6 |      | ns            |
|                      |              |                                                                                                                                                                                                                            | $T_{vj} = 175\text{ }^\circ\text{C}$ | 24.6 |      |               |
| Turn-off delay time  | $t_{d(off)}$ | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{GS(on)} = 2.3\ \Omega$ ,<br>$R_{GS(off)} = 2.3\ \Omega$ ,<br>$L_\sigma = 15\text{ nH}$ , diode: body diode at $V_{GS} = 0\text{ V}$ | $T_{vj} = 25\text{ }^\circ\text{C}$  | 31   |      | ns            |
|                      |              |                                                                                                                                                                                                                            | $T_{vj} = 175\text{ }^\circ\text{C}$ | 54.2 |      |               |
| Fall time            | $t_f$        | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{GS(on)} = 2.3\ \Omega$ ,<br>$R_{GS(off)} = 2.3\ \Omega$ ,<br>$L_\sigma = 15\text{ nH}$ , diode: body diode at $V_{GS} = 0\text{ V}$ | $T_{vj} = 25\text{ }^\circ\text{C}$  | 20.9 |      | ns            |
|                      |              |                                                                                                                                                                                                                            | $T_{vj} = 175\text{ }^\circ\text{C}$ | 24.7 |      |               |
| Turn-on energy       | $E_{on}$     | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{GS(on)} = 2.3\ \Omega$ ,<br>$R_{GS(off)} = 2.3\ \Omega$ ,<br>$L_\sigma = 15\text{ nH}$ , diode: body diode at $V_{GS} = 0\text{ V}$ | $T_{vj} = 25\text{ }^\circ\text{C}$  | 1280 |      | $\mu\text{J}$ |
|                      |              |                                                                                                                                                                                                                            | $T_{vj} = 175\text{ }^\circ\text{C}$ | 2220 |      |               |
| Turn-off energy      | $E_{off}$    | $V_{DD} = 800\text{ V}$ , $I_D = 89.9\text{ A}$ ,<br>$V_{GS} = 0/18\text{ V}$ ,<br>$R_{GS(on)} = 2.3\ \Omega$ ,<br>$R_{GS(off)} = 2.3\ \Omega$ ,<br>$L_\sigma = 15\text{ nH}$ , diode: body diode at $V_{GS} = 0\text{ V}$ | $T_{vj} = 25\text{ }^\circ\text{C}$  | 810  |      | $\mu\text{J}$ |
|                      |              |                                                                                                                                                                                                                            | $T_{vj} = 175\text{ }^\circ\text{C}$ | 990  |      |               |

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表 4 (续) 特征值

| Parameter                            | Symbol                | Note or test condition                                                                                                                                                                                                                                                      |                                                | Values |      |      | Unit               |
|--------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|------|------|--------------------|
|                                      |                       |                                                                                                                                                                                                                                                                             |                                                | Min.   | Typ. | Max. |                    |
| Total switching energy <sup>1)</sup> | $E_{\text{tot}}$      | $V_{\text{DD}} = 800 \text{ V}$ , $I_{\text{D}} = 89.9 \text{ A}$ ,<br>$V_{\text{GS}} = 0/18 \text{ V}$ ,<br>$R_{\text{GS(on)}} = 2.3 \Omega$ ,<br>$R_{\text{GS(off)}} = 2.3 \Omega$ ,<br>$L_{\sigma} = 15 \text{ nH}$ , diode: body diode at $V_{\text{GS}} = 0 \text{ V}$ | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  |        | 2190 |      | $\mu\text{J}$      |
|                                      |                       |                                                                                                                                                                                                                                                                             | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ |        | 3490 |      |                    |
| Virtual junction temperature         | $T_{\text{vj}}$       |                                                                                                                                                                                                                                                                             |                                                | -55    |      | 175  | $^{\circ}\text{C}$ |
| Virtual junction temperature         | $T_{\text{vj(over)}}$ | overload, cumulative max. 100 h <sup>2)</sup>                                                                                                                                                                                                                               |                                                |        |      | 200  | $^{\circ}\text{C}$ |

1) 包括  $E_{\text{fr}}$   
2) 最多 5000 次循环。最大  $\Delta T$  限制为 100 K。

注：芯片技术的特征是高达 200 kV/ $\mu\text{s}$ 。测量的  $dV/dt$  受到测量测试设置和封装的限制。  
除非另有规定，特性均为  $T_{\text{vj}} = 25^{\circ}\text{C}$ 。

3 体二极管（MOSFET）

表5 最大额定值

| Parameter                                                                  | Symbol           | Note or test condition                           | Values | Unit |
|----------------------------------------------------------------------------|------------------|--------------------------------------------------|--------|------|
| Drain-source voltage                                                       | $V_{\text{DSS}}$ | $T_{\text{vj}} \geq 25 \text{ }^{\circ}\text{C}$ | 1200   | V    |
| Peak reverse drain current, $t_{\text{p}}$ limited by $T_{\text{vj(max)}}$ | $I_{\text{SM}}$  | $V_{\text{GS}} = 0 \text{ V}$                    | 230    | A    |

表6 特征值

| Parameter                            | Symbol           | Note or test condition                                                                                                                                                                                      |                                                | Values |      |      | Unit          |
|--------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|------|------|---------------|
|                                      |                  |                                                                                                                                                                                                             |                                                | Min.   | Typ. | Max. |               |
| Drain-source reverse voltage         | $V_{\text{SD}}$  | $I_{\text{SD}} = 89.9 \text{ A}$ , $V_{\text{GS}} = 0 \text{ V}$                                                                                                                                            | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  |        | 4.2  | 5.5  | V             |
|                                      |                  |                                                                                                                                                                                                             | $T_{\text{vj}} = 100 \text{ }^{\circ}\text{C}$ |        | 4.11 |      |               |
|                                      |                  |                                                                                                                                                                                                             | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ |        | 4.05 |      |               |
| MOSFET forward recovery charge       | $Q_{\text{fr}}$  | $V_{\text{DD}} = 800 \text{ V}$ ,<br>$I_{\text{SD}} = 89.9 \text{ A}$ , $V_{\text{GS}} = 0 \text{ V}$ ,<br>$-di_{\text{SD}}/dt = 1000 \text{ A}/\mu\text{s}$ , $Q_{\text{fr}}$ includes also $Q_{\text{C}}$ | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  |        | 0.85 |      | $\mu\text{C}$ |
|                                      |                  |                                                                                                                                                                                                             | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ |        | 1.65 |      |               |
| MOSFET peak forward recovery current | $I_{\text{frm}}$ | $V_{\text{DD}} = 800 \text{ V}$ ,<br>$I_{\text{SD}} = 89.9 \text{ A}$ , $V_{\text{GS}} = 0 \text{ V}$ ,<br>$-di_{\text{SD}}/dt = 1000 \text{ A}/\mu\text{s}$ , $Q_{\text{fr}}$ includes also $Q_{\text{C}}$ | $T_{\text{vj}} = 25 \text{ }^{\circ}\text{C}$  |        | 14   |      | A             |
|                                      |                  |                                                                                                                                                                                                             | $T_{\text{vj}} = 175 \text{ }^{\circ}\text{C}$ |        | 22.3 |      |               |

(表格续下页.....)

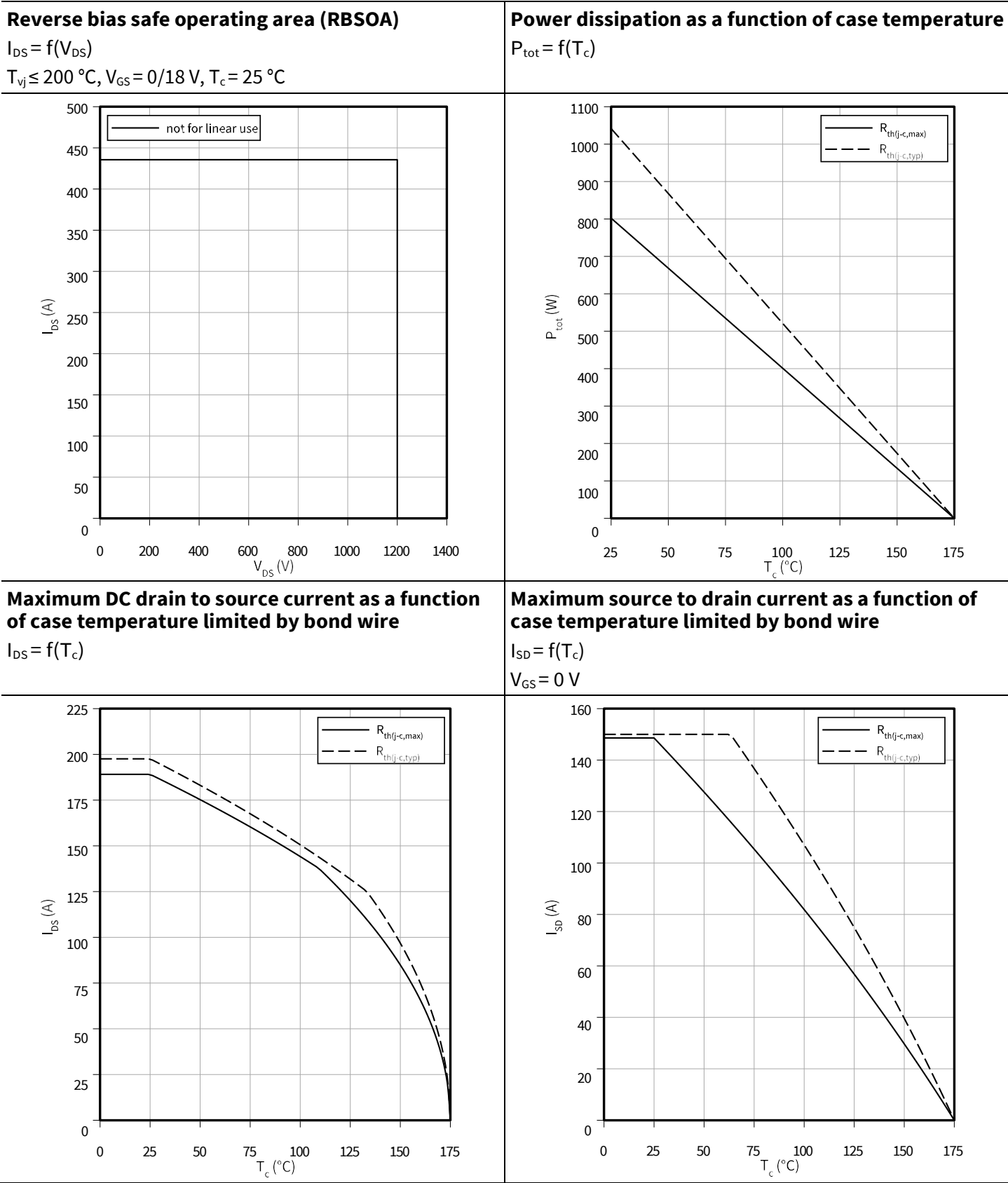


表 6 (续) 特征值

| Parameter                      | Symbol         | Note or test condition                                                                                                                                         |                                        | Values |      |      | Unit               |
|--------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------|------|------|--------------------|
|                                |                |                                                                                                                                                                |                                        | Min.   | Typ. | Max. |                    |
| MOSFET forward recovery energy | $E_{fr}$       | $V_{DD} = 800\text{ V}$ ,<br>$I_{SD} = 89.9\text{ A}$ , $V_{GS} = 0\text{ V}$ ,<br>$-di_{SD}/dt = 1000\text{ A}/\mu\text{s}$ , $Q_{fr}$<br>includes also $Q_c$ | $T_{vj} = 25\text{ }^{\circ}\text{C}$  |        | 100  |      | $\mu\text{J}$      |
|                                |                |                                                                                                                                                                | $T_{vj} = 175\text{ }^{\circ}\text{C}$ |        | 280  |      |                    |
| Virtual junction temperature   | $T_{vj}$       |                                                                                                                                                                |                                        | -55    |      | 175  | $^{\circ}\text{C}$ |
| Virtual junction temperature   | $T_{vj(over)}$ | overload, cumulative max. 100 h <sup>1)</sup>                                                                                                                  |                                        |        |      | 200  | $^{\circ}\text{C}$ |

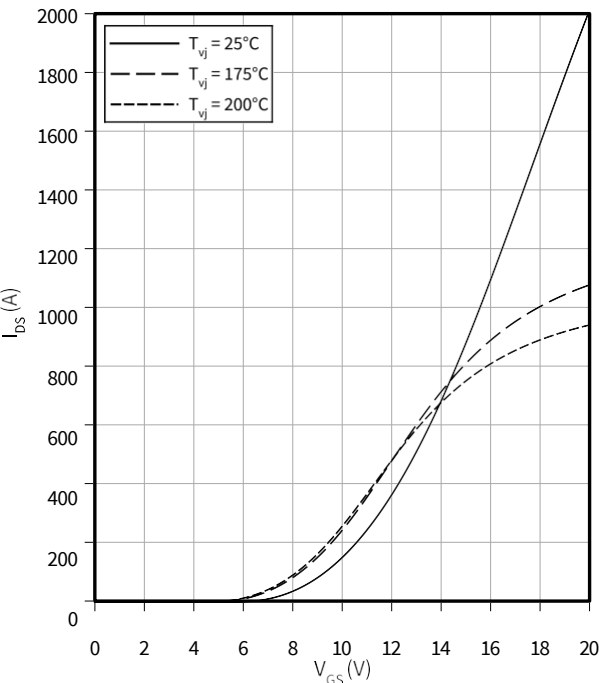
1) 最多 5000 次循环。最大Δ T 限制为 100 K。

4 特性图



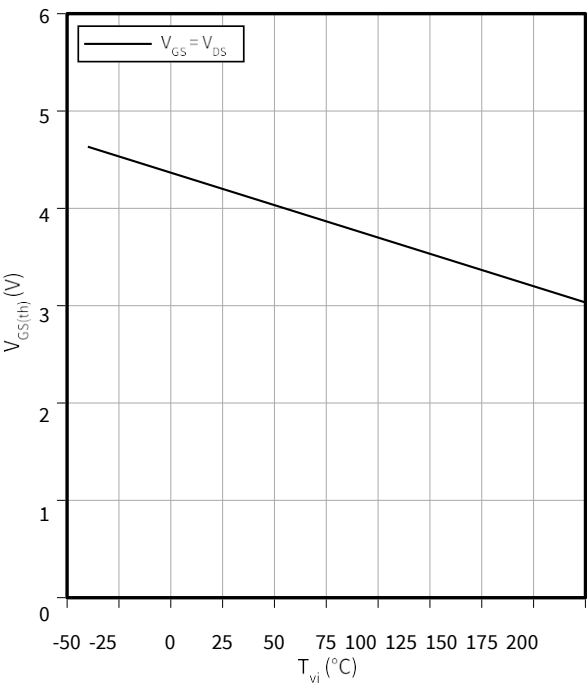
Typical transfer characteristic

$I_{DS} = f(V_{GS})$   
 $V_{DS} = 20\text{ V}$ ,  $t_p = 20\text{ }\mu\text{s}$



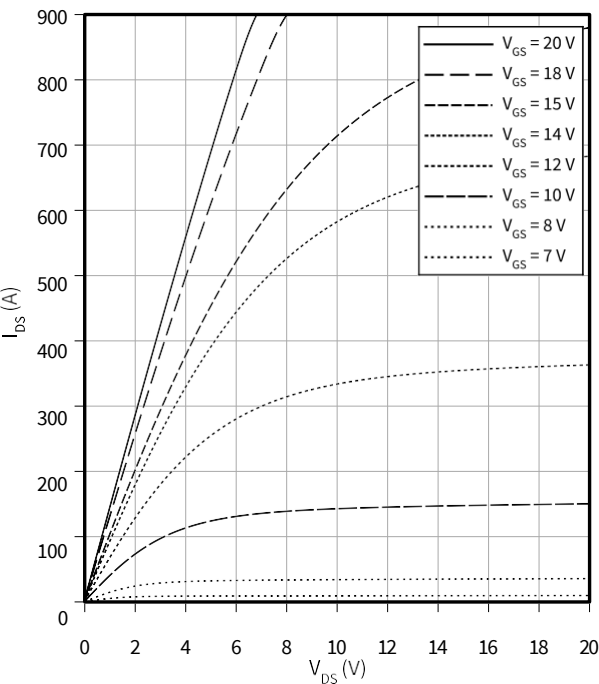
Typical gate-source threshold voltage as a function of junction temperature

$V_{GS(th)} = f(T_{vj})$   
 $I_D = 28.3\text{ mA}$



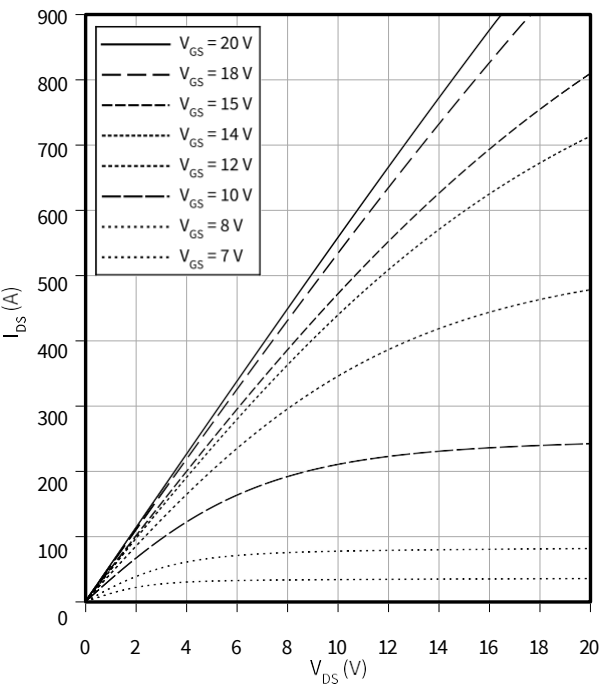
Typical output characteristic,  $V_{GS}$  as parameter

$I_{DS} = f(V_{DS})$   
 $T_{vj} = 25\text{ }^\circ\text{C}$ ,  $t_p = 20\text{ }\mu\text{s}$



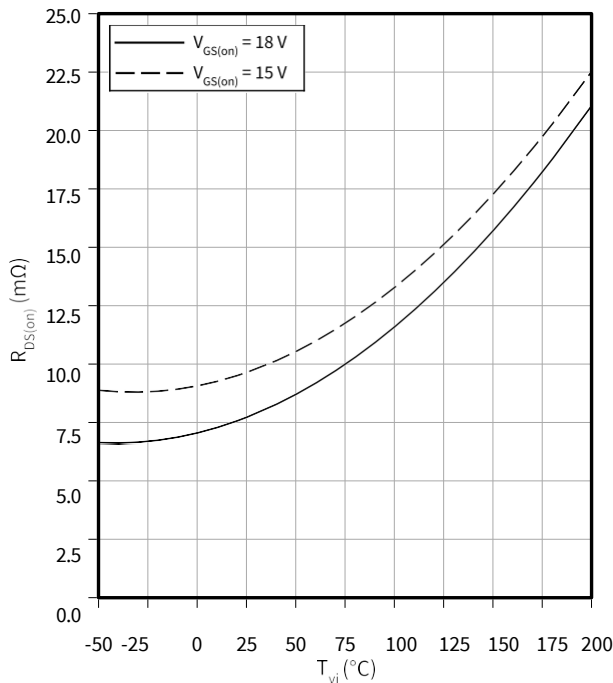
Typical output characteristic,  $V_{GS}$  as parameter

$I_{DS} = f(V_{DS})$   
 $T_{vj} = 175\text{ }^\circ\text{C}$ ,  $t_p = 20\text{ }\mu\text{s}$



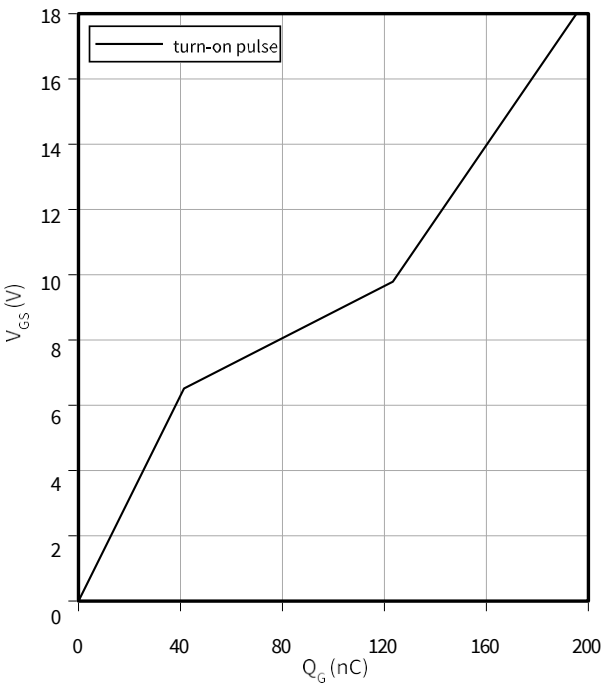
Typical on-state resistance as a function of junction temperature

$R_{DS(on)} = f(T_{vj})$   
 $I_D = 89.9\text{ A}$



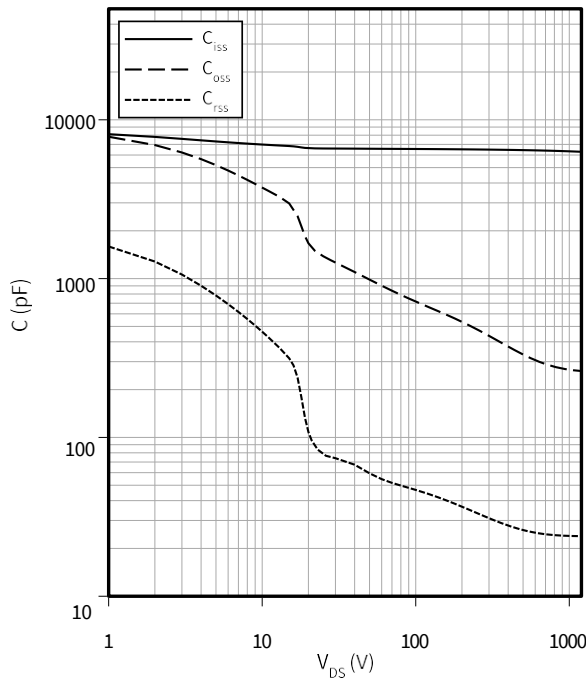
Typical gate charge

$V_{GS} = f(Q_G)$   
 $I_D = 89.9\text{ A}, V_{DS} = 800\text{ V}$



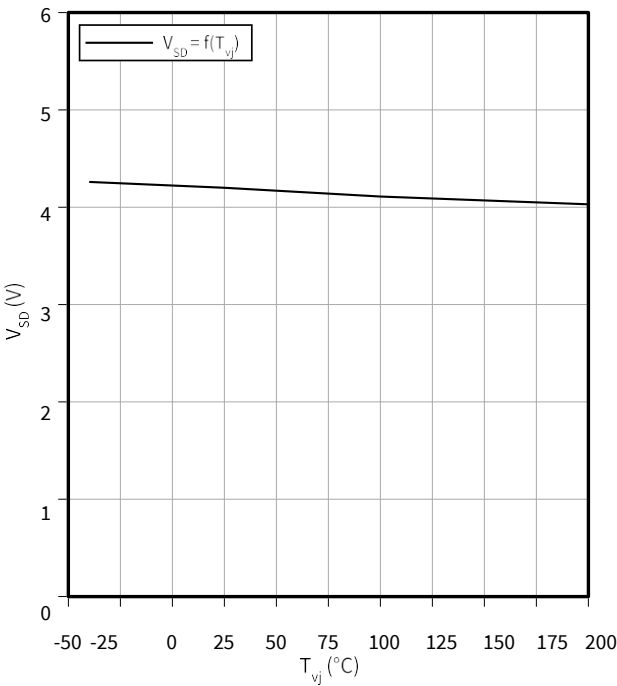
Typical capacitance as a function of drain-source voltage

$C = f(V_{DS})$   
 $f = 100\text{ kHz}, V_{GS} = 0\text{ V}$



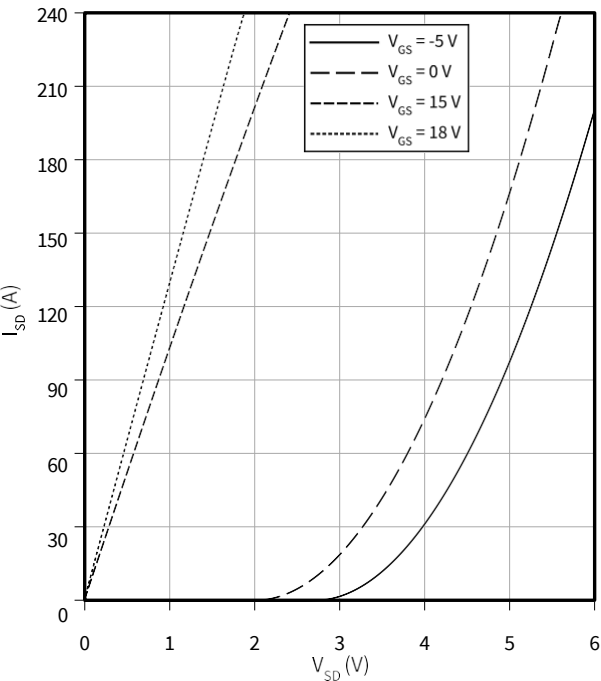
Typical reverse drain voltage as function of junction temperature

$V_{SD} = f(T_{vj})$   
 $I_{SD} = 89.9\text{ A}, V_{GS} = 0\text{ V}$



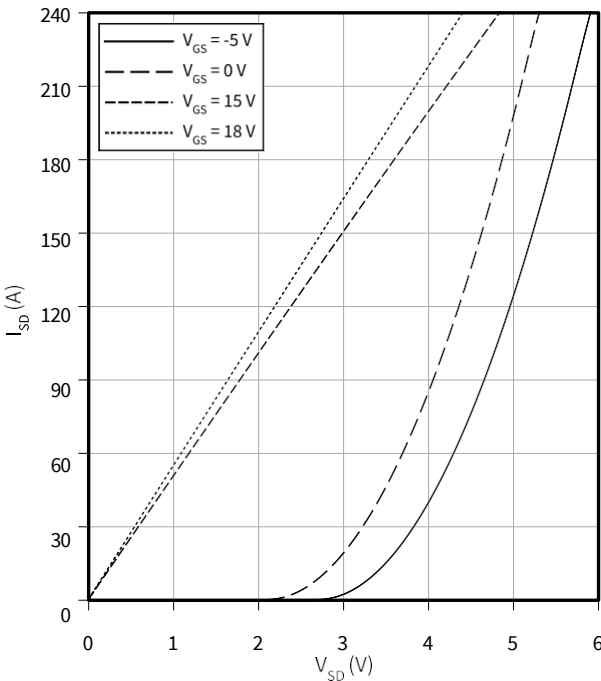
Typical reverse drain current as function of reverse drain voltage,  $V_{GS}$  as parameter

$I_{SD} = f(V_{SD})$   
 $T_{vj} = 25\text{ °C}$ ,  $t_p = 20\text{ }\mu\text{s}$



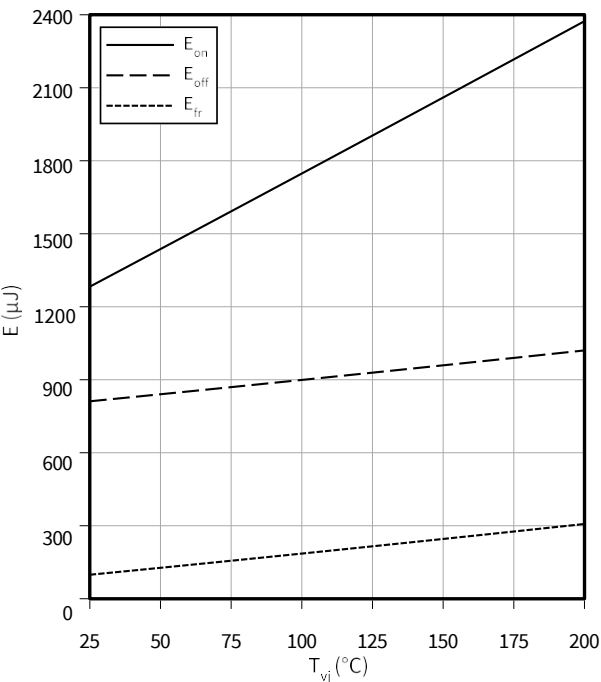
Typical reverse drain current as function of reverse drain voltage,  $V_{GS}$  as parameter

$I_{SD} = f(V_{SD})$   
 $T_{vj} = 175\text{ °C}$ ,  $t_p = 20\text{ }\mu\text{s}$



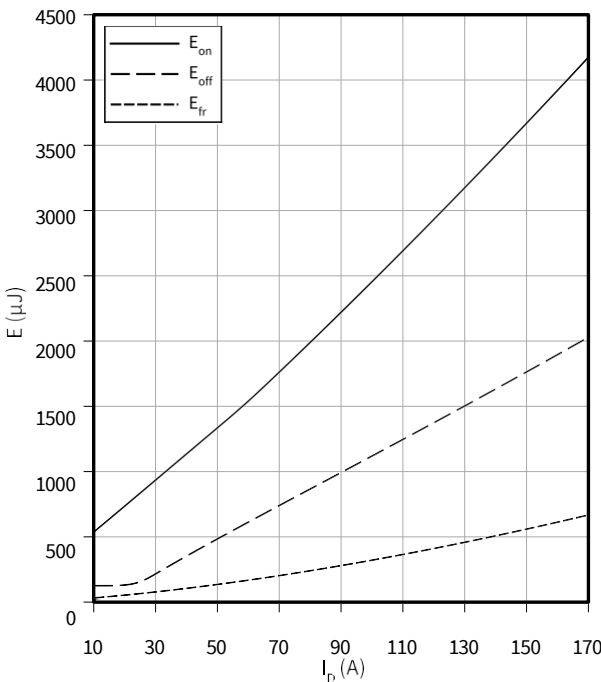
Typical switching energy as a function of junction temperature, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0\text{ V}$

$E = f(T_{vj})$   
 $V_{GS} = 0/18\text{ V}$ ,  $I_D = 89.9\text{ A}$ ,  $R_{G,ext} = 2.3\text{ }\Omega$ ,  $V_{DD} = 800\text{ V}$



Typical switching energy as a function of drain current, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0\text{ V}$

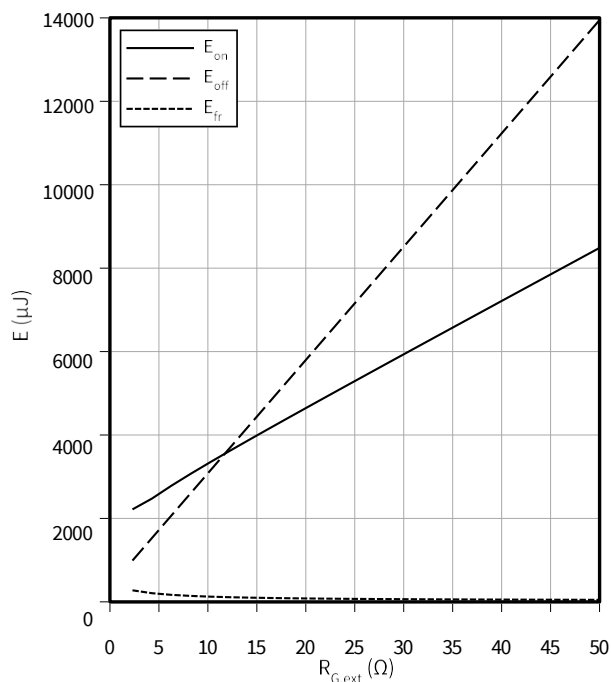
$E = f(I_D)$   
 $V_{GS} = 0/18\text{ V}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.3\text{ }\Omega$ ,  $V_{DD} = 800\text{ V}$



**Typical switching energy as a function of gate resistance, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

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

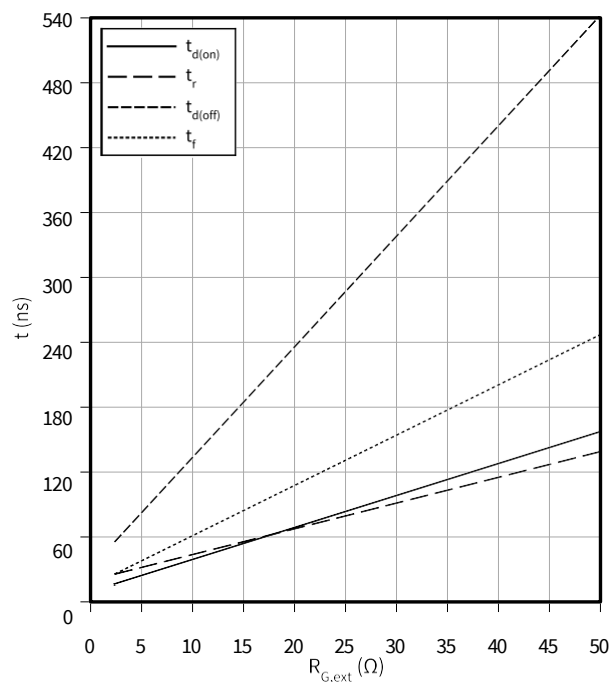
$V_{GS} = 0/18$  V,  $I_D = 89.9$  A,  $T_{vj} = 175$  °C,  $V_{DD} = 800$  V



**Typical switching times as a function of gate resistance, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

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

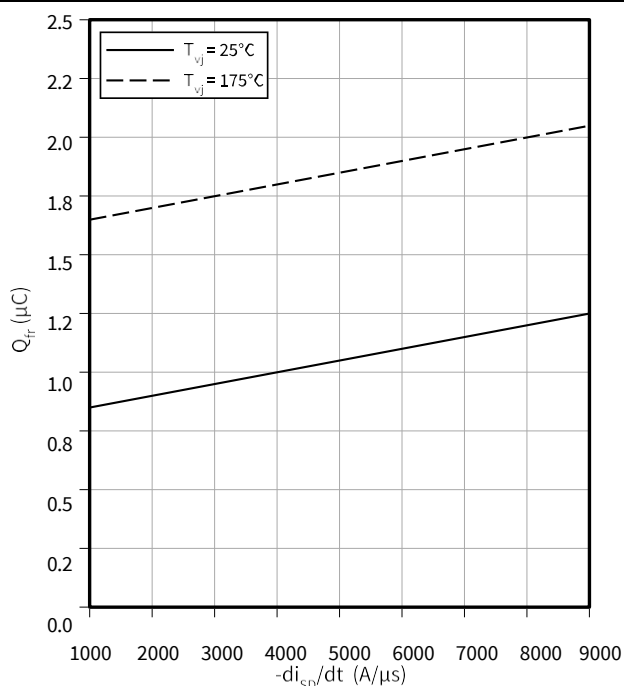
$V_{GS} = 0/18$  V,  $I_D = 89.9$  A,  $T_{vj} = 175$  °C,  $V_{DD} = 800$  V



**Typical reverse recovery charge as a function of reverse drain current slope, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

$$Q_{fr} = f(-di_{SD}/dt)$$

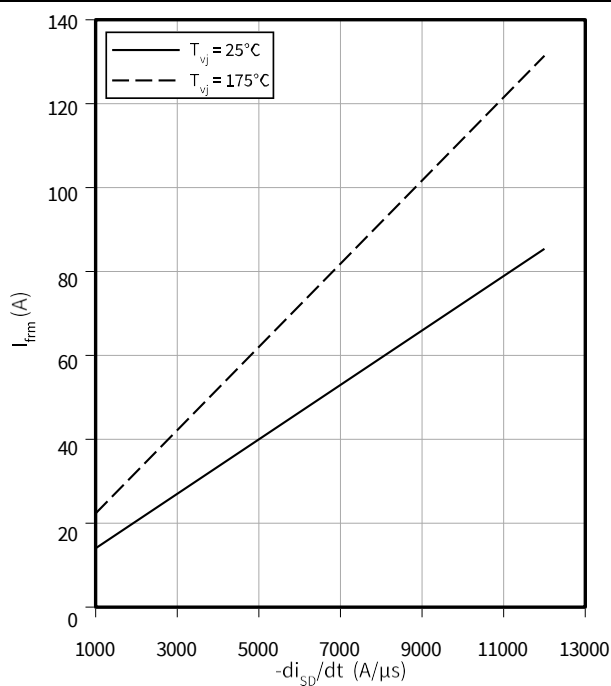
$V_{GS} = 0/18$  V,  $I_{SD} = 89.9$  A,  $V_{DD} = 800$  V



**Typical reverse recovery current as a function of reverse drain current slope, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = 0$  V**

$$I_{frm} = f(-di_{SD}/dt)$$

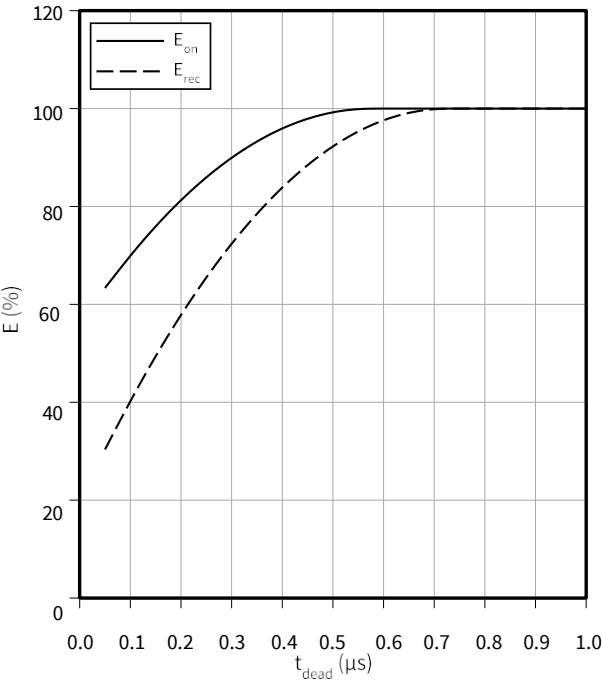
$V_{GS} = 0/18$  V,  $I_{SD} = 89.9$  A,  $V_{DD} = 800$  V



Typical switching energy as a function of dead time / blanking time, test circuit in Fig. F, 2nd device own body diode:  $V_{GS} = -5\text{ V}$

$E = f(t_{dead})$

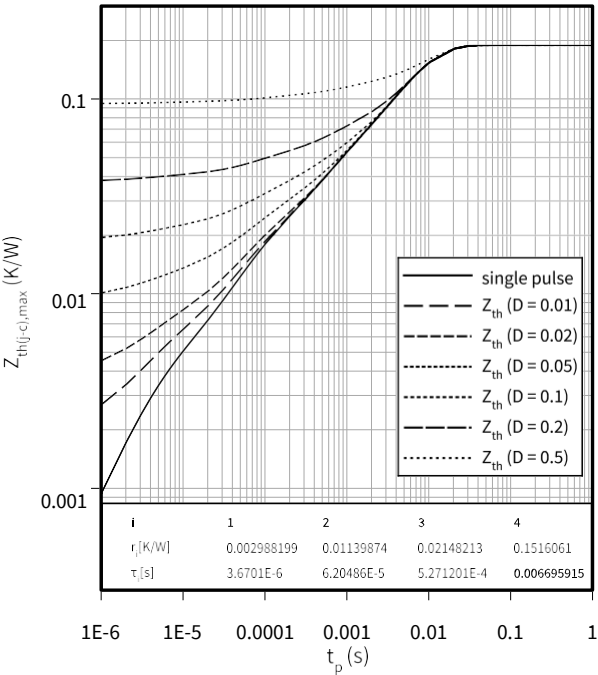
$V_{GS} = 0/18\text{ V}$ ,  $I_D = 89.9\text{ A}$ ,  $T_{vj} = 175\text{ °C}$ ,  $R_{G,ext} = 2.3\text{ }\Omega$   $V_{DD} = 800\text{ V}$



Max. transient thermal impedance (MOSFET/diode)

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

$D = t_p/T$



5 封装外形

5 封装外形

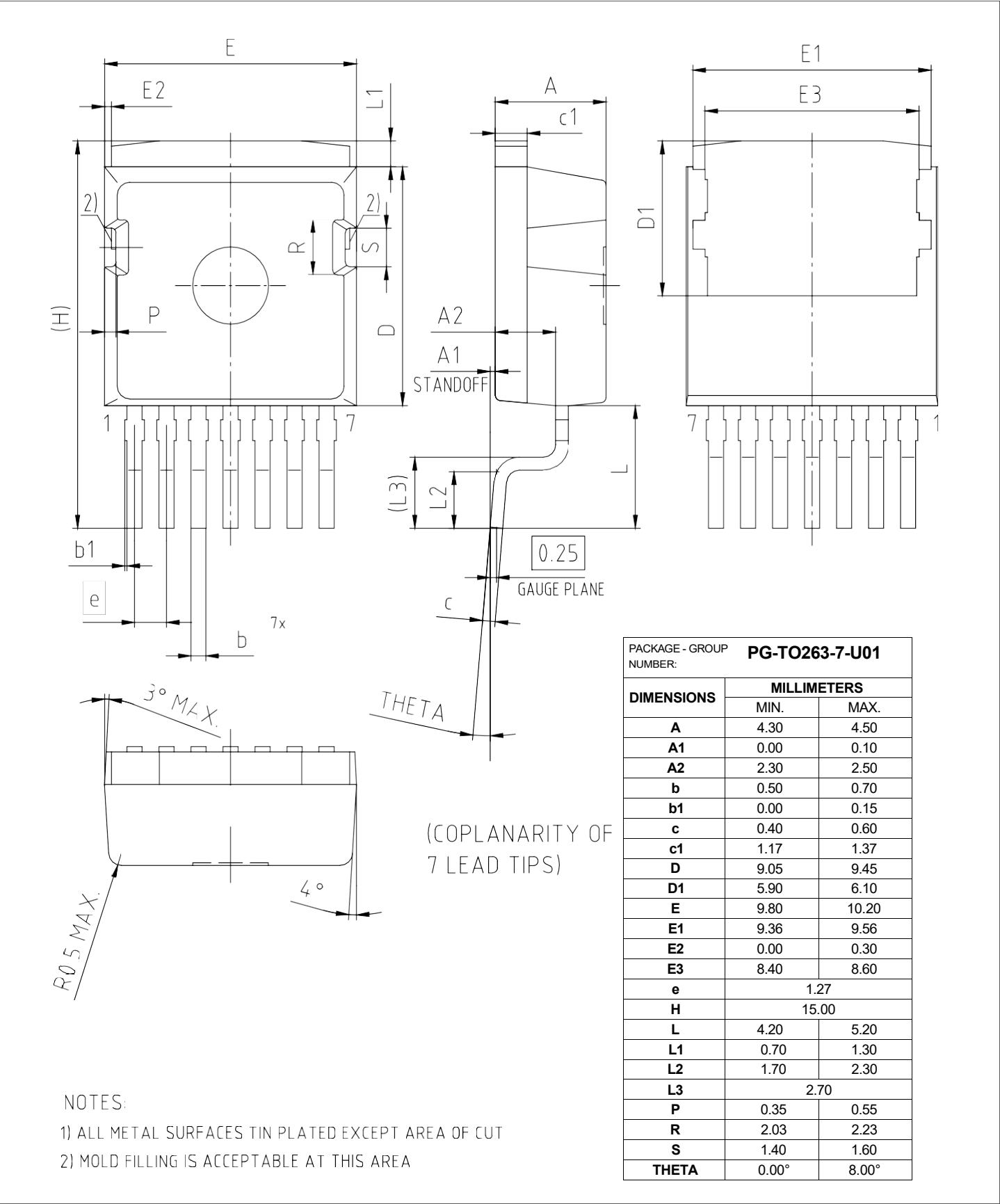


图 1

## 6 测试条件

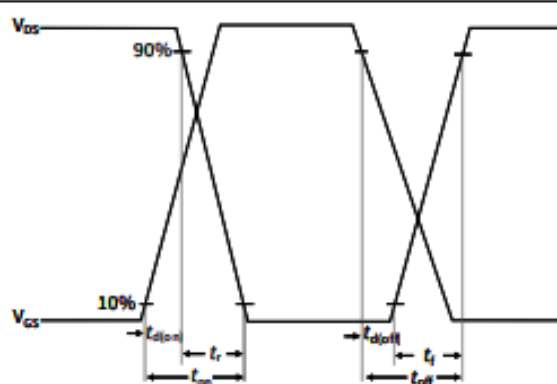


Figure A. Definition of switching times

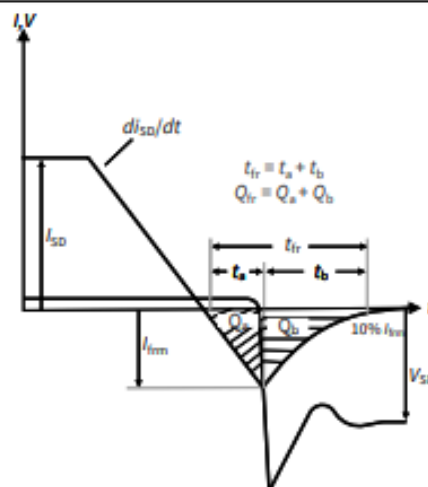


Figure B. Definition of body diode switching characteristics

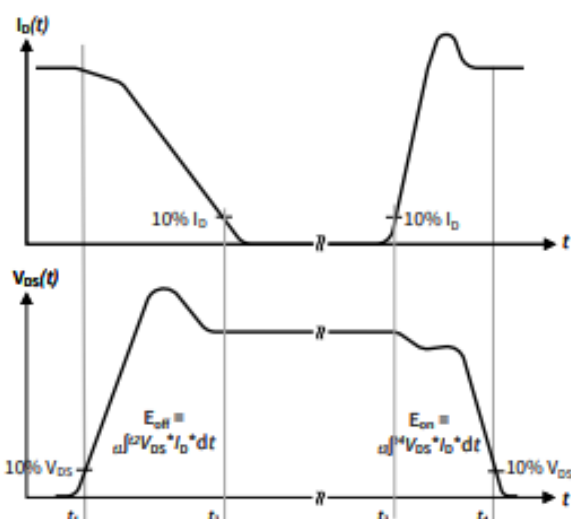


Figure C. Definition of switching losses

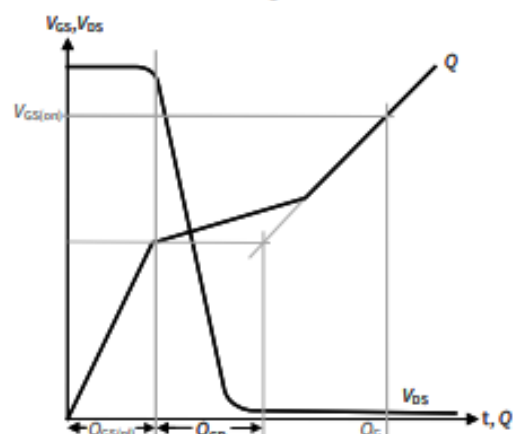


Figure D. Definition of QGD

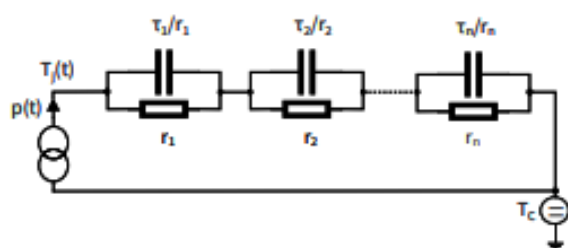


Figure E. Thermal equivalent circuit

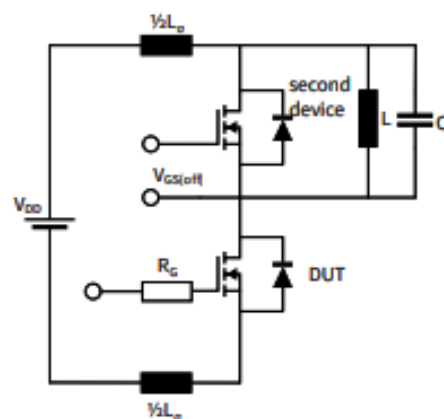


Figure F. Dynamic test circuit  
Parasitic inductance  $L_{\sigma}$ ,  
Parasitic capacitor  $C_{\sigma}$

修订记录

修订记录

| Document revision | Date of release | Description of changes                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.10              | 2023-08-08      | Preliminary datasheet                                                                                                                                                                                                                                                                                                                                                                            |
| 1.00              | 2023-09-29      | Final datasheet                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.10              | 2024-01-12      | Negative gate voltage values updated<br>Additional capacitance & charge values added<br>$E = f(t_{\text{dead}})$ graph y-axis correction to percentage values<br>Editorial changes                                                                                                                                                                                                               |
| 1.20              | 2024-07-02      | Updated „Potential applications“ Corrected package name<br>Corrected static and dynamic gate-source voltage<br>Corrected unit of L to $\mu\text{H}$ for “Avalanche energy, repetitive”<br>Corrected value of $g_{\text{fs}}$ in the Table 4<br>Corrected diagrams "Typical transfer characteristic" and "Max. transient thermal impedance (MOSFET/diode)"<br>Updated Figure D. Definition of QGD |
| 1.30              | 2024-11-08      | Corrected diagram $I_{\text{rrm}} = f(-di_{\text{sd}}/dt)$ Editorial changes                                                                                                                                                                                                                                                                                                                     |



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**Edition 2025-07-28**

**Published by**

**Infineon Technologies AG**

**81726 Munich, Germany**

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