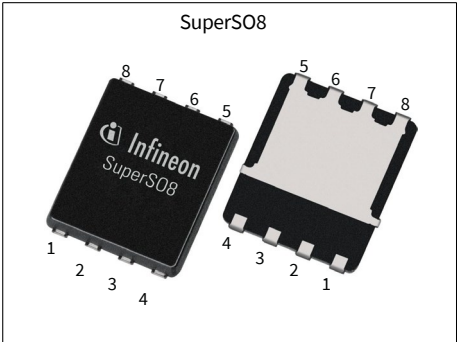


MOSFET

英飞凌高耐热80V OptiMOS™ 5 功率晶体管

特性

- 针对高性能 SMPS（例如同步整流）进行优化
- 100% 雪崩测试
- 卓越的耐热性
- N沟道
- 无铅镀层；符合RoHS标准
- 符合 IEC61249-2-21 标准的无卤素

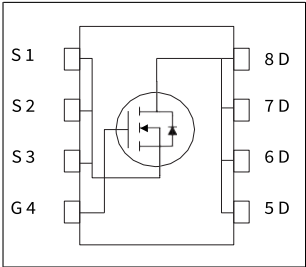


产品验证

完全符合 JEDEC 工业应用标准

表 1 主要性能参数

| Parameter        | Value | Unit |
|------------------|-------|------|
| $V_{DS}$         | 80    | V    |
| $R_{DS(on),max}$ | 3.7   | mΩ   |
| $I_D$            | 136   | A    |
| $Q_{oss}$        | 56    | nC   |
| $Q_G(0V..10V)$   | 46    | nC   |



RoHS

| Type / Ordering Code | Package    | Marking  | Related Links |
|----------------------|------------|----------|---------------|
| BSC037N08NS5T        | PG-TDSON-8 | 037N08NT | -             |

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](http://infineon.com) 参考最新的英文版本（控制文档）。

目录

描述 ..... 1

最大额定值 ..... 3

热特性 ..... 3

电气特性 ..... 4

电气特性图 ..... 6

封装外形 ..... 10

修订 记录 ..... 12

商标 ..... 12

免责声明 ..... 12

# OptiMOS™ 5 功率晶体管, 80 V

## 1 最大额定值

除非另有规定,  $T_A = 25\text{ °C}$

表 2 最大额定值

| Parameter                                    | Symbol         | Values |      |                 | Unit | Note / Test Condition                                                                                                                                                |
|----------------------------------------------|----------------|--------|------|-----------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                | Min.   | Typ. | Max.            |      |                                                                                                                                                                      |
| Continuous drain current <sup>1)</sup>       | $I_D$          | -      | -    | 136<br>96<br>22 | A    | $V_{GS}=10\text{ V}$ , $T_C=25\text{ °C}$<br>$V_{GS}=10\text{ V}$ , $T_C=100\text{ °C}$<br>$V_{GS}=10\text{ V}$ , $T_A=25\text{ °C}$ , $R_{thJA}=50\text{ K/W}^{2)}$ |
| Pulsed drain current <sup>3)</sup>           | $I_{D,pulse}$  | -      | -    | 544             | A    | $T_C=25\text{ °C}$                                                                                                                                                   |
| Avalanche energy, single pulse <sup>4)</sup> | $E_{AS}$       | -      | -    | 140             | mJ   | $I_D=50\text{ A}$ , $R_{GS}=25\text{ }\Omega$                                                                                                                        |
| Gate source voltage                          | $V_{GS}$       | -20    | -    | 20              | V    | -                                                                                                                                                                    |
| Power dissipation                            | $P_{tot}$      | -      | -    | 136<br>3.0      | W    | $T_C=25\text{ °C}$<br>$T_A=25\text{ °C}$ , $R_{thJA}=50\text{ K/W}^{2)}$                                                                                             |
| Operating and storage temperature            | $T_j, T_{stg}$ | -55    | -    | 175             | °C   | IEC climatic category; DIN<br>IEC 68-1: 55/175/56                                                                                                                    |

## 2 热特性

表3 热特性

| Parameter                                                   | Symbol     | Values |      |      | Unit | Note / Test Condition |
|-------------------------------------------------------------|------------|--------|------|------|------|-----------------------|
|                                                             |            | Min.   | Typ. | Max. |      |                       |
| Thermal resistance, junction - case, bottom                 | $R_{thJC}$ | -      | 0.7  | 1.1  | K/W  | -                     |
| Thermal resistance, junction - case, top                    | $R_{thJC}$ | -      | -    | 20   | K/W  | -                     |
| Device on PCB, 6 cm <sup>2</sup> cooling area <sup>2)</sup> | $R_{thJA}$ | -      | -    | 50   | K/W  | -                     |

<sup>1)</sup>额定值指产品仅具有数据表指定的绝对最大值, 保持外壳温度符合规定要求。其他外壳温度请参见图 2。需要根据实际环境条件降低额定值。

<sup>2)</sup>器件安装在 40 mm x 40 mm x 1.5 mm 环氧树脂印刷电路板 FR4 上, 漏极连接用铜面积为 6 cm<sup>2</sup> (一层, 70 μm 厚)。印刷电路板垂直放置在静止空气中。

<sup>3)</sup>详细信息请参见图 3

<sup>4)</sup>详细信息请参见图 13

## OptiMOS™ 5 功率晶体管, 80 V

### 3 电气特性

除非另有规定,  $T_j = 25\text{ °C}$

**表4 静态特性**

| Parameter                        | Symbol        | Values |            |            | Unit          | Note / Test Condition                                                                                                               |
|----------------------------------|---------------|--------|------------|------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                                  |               | Min.   | Typ.       | Max.       |               |                                                                                                                                     |
| Drain-source breakdown voltage   | $V_{(BR)DSS}$ | 80     | -          | -          | V             | $V_{GS}=0\text{ V}$ , $I_D=1\text{ mA}$                                                                                             |
| Gate threshold voltage           | $V_{GS(th)}$  | 2.2    | 3          | 3.8        | V             | $V_{DS}=V_{GS}$ , $I_D=72\text{ }\mu\text{A}$                                                                                       |
| Zero gate voltage drain current  | $I_{DSS}$     | -      | 0.1<br>10  | 1<br>100   | $\mu\text{A}$ | $V_{DS}=80\text{ V}$ , $V_{GS}=0\text{ V}$ , $T_j=25\text{ °C}$<br>$V_{DS}=80\text{ V}$ , $V_{GS}=0\text{ V}$ , $T_j=125\text{ °C}$ |
| Gate-source leakage current      | $I_{GSS}$     | -      | 10         | 100        | nA            | $V_{GS}=20\text{ V}$ , $V_{DS}=0\text{ V}$                                                                                          |
| Drain-source on-state resistance | $R_{DS(on)}$  | -      | 3.2<br>4.4 | 3.7<br>5.3 | m $\Omega$    | $V_{GS}=10\text{ V}$ , $I_D=50\text{ A}$<br>$V_{GS}=6\text{ V}$ , $I_D=25\text{ A}$                                                 |
| Gate resistance <sup>1)</sup>    | $R_G$         | -      | 1.3        | 2.0        | $\Omega$      | -                                                                                                                                   |
| Transconductance                 | $g_{fs}$      | 47     | 94         | -          | S             | $ V_{DS}  > 2 I_D R_{DS(on)max}$ , $I_D=50\text{ A}$                                                                                |

**表5 动态特性**

| Parameter                                  | Symbol       | Values |      |      | Unit | Note / Test Condition                                                                            |
|--------------------------------------------|--------------|--------|------|------|------|--------------------------------------------------------------------------------------------------|
|                                            |              | Min.   | Typ. | Max. |      |                                                                                                  |
| Input capacitance <sup>1)</sup>            | $C_{iss}$    | -      | 3200 | 4200 | pF   | $V_{GS}=0\text{ V}$ , $V_{DS}=40\text{ V}$ , $f=1\text{ MHz}$                                    |
| Output capacitance <sup>1)</sup>           | $C_{oss}$    | -      | 530  | 690  | pF   | $V_{GS}=0\text{ V}$ , $V_{DS}=40\text{ V}$ , $f=1\text{ MHz}$                                    |
| Reverse transfer capacitance <sup>1)</sup> | $C_{rss}$    | -      | 25   | 44   | pF   | $V_{GS}=0\text{ V}$ , $V_{DS}=40\text{ V}$ , $f=1\text{ MHz}$                                    |
| Turn-on delay time                         | $t_{d(on)}$  | -      | 14   | -    | ns   | $V_{DD}=40\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=50\text{ A}$ ,<br>$R_{G,ext}=3\text{ }\Omega$ |
| Rise time                                  | $t_r$        | -      | 10   | -    | ns   | $V_{DD}=40\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=50\text{ A}$ ,<br>$R_{G,ext}=3\text{ }\Omega$ |
| Turn-off delay time                        | $t_{d(off)}$ | -      | 26   | -    | ns   | $V_{DD}=40\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=50\text{ A}$ ,<br>$R_{G,ext}=3\text{ }\Omega$ |
| Fall time                                  | $t_f$        | -      | 7    | -    | ns   | $V_{DD}=40\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=50\text{ A}$ ,<br>$R_{G,ext}=3\text{ }\Omega$ |

**表6 栅极电荷特性<sup>2)</sup>**

| Parameter                          | Symbol        | Values |      |      | Unit | Note / Test Condition                                                       |
|------------------------------------|---------------|--------|------|------|------|-----------------------------------------------------------------------------|
|                                    |               | Min.   | Typ. | Max. |      |                                                                             |
| Gate to source charge              | $Q_{gs}$      | -      | 15   | -    | nC   | $V_{DD}=40\text{ V}$ , $I_D=50\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$ |
| Gate charge at threshold           | $Q_{g(th)}$   | -      | 9.0  | -    | nC   | $V_{DD}=40\text{ V}$ , $I_D=50\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$ |
| Gate to drain charge <sup>1)</sup> | $Q_{gd}$      | -      | 10   | 15   | nC   | $V_{DD}=40\text{ V}$ , $I_D=50\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$ |
| Switching charge                   | $Q_{sw}$      | -      | 16   | -    | nC   | $V_{DD}=40\text{ V}$ , $I_D=50\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$ |
| Gate charge total <sup>1)</sup>    | $Q_g$         | -      | 46   | 58   | nC   | $V_{DD}=40\text{ V}$ , $I_D=50\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$ |
| Gate plateau voltage               | $V_{plateau}$ | -      | 4.8  | -    | V    | $V_{DD}=40\text{ V}$ , $I_D=50\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$ |
| Gate charge total, sync. FET       | $Q_{g(sync)}$ | -      | 40   | -    | nC   | $V_{DS}=0.1\text{ V}$ , $V_{GS}=0\text{ to }10\text{ V}$                    |
| Output charge <sup>1)</sup>        | $Q_{oss}$     | -      | 56   | 74   | nC   | $V_{DD}=40\text{ V}$ , $V_{GS}=0\text{ V}$                                  |

<sup>1)</sup>由设计标定, 不受制于生产测试。

<sup>2)</sup>参数定义请参见“栅极充电波形”

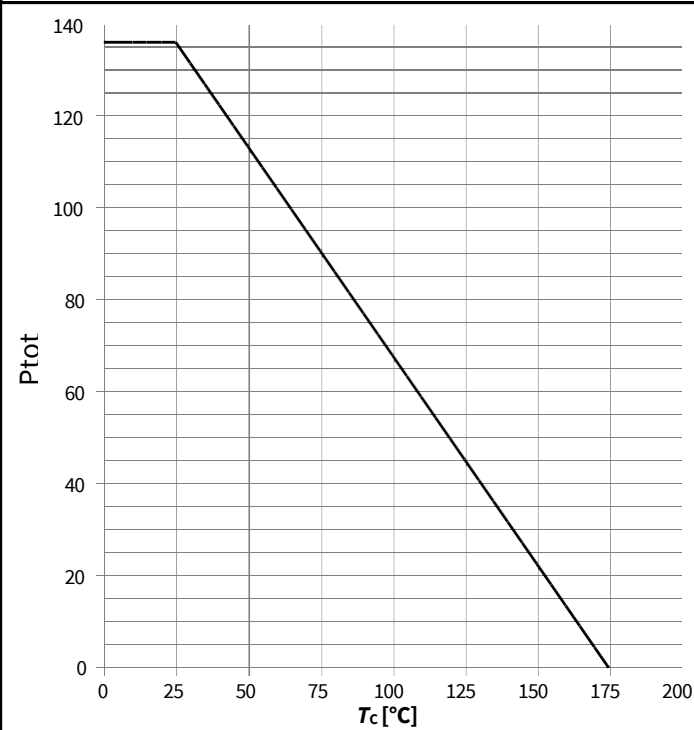
表 7 反向二极管

| Parameter                             | Symbol        | Values |      |      | Unit | Note / Test Condition                                                      |
|---------------------------------------|---------------|--------|------|------|------|----------------------------------------------------------------------------|
|                                       |               | Min.   | Typ. | Max. |      |                                                                            |
| Diode continuous forward current      | $I_S$         | -      | -    | 124  | A    | $T_C=25\text{ °C}$                                                         |
| Diode pulse current                   | $I_{S,pulse}$ | -      | -    | 544  | A    | $T_C=25\text{ °C}$                                                         |
| Diode forward voltage                 | $V_{SD}$      | -      | 0.9  | 1.1  | V    | $V_{GS}=0\text{ V}$ , $I_F=50\text{ A}$ , $T_J=25\text{ °C}$               |
| Reverse recovery time <sup>1)</sup>   | $t_{rr}$      | -      | 41   | 83   | ns   | $V_R=40\text{ V}$ , $I_F=50\text{ A}$ , $di_F/dt=100\text{ A}/\mu\text{s}$ |
| Reverse recovery charge <sup>1)</sup> | $Q_{rr}$      | -      | 36   | 72   | nC   | $V_R=40\text{ V}$ , $I_F=50\text{ A}$ , $di_F/dt=100\text{ A}/\mu\text{s}$ |

<sup>1)</sup>由设计标定，不受制于生产测试。

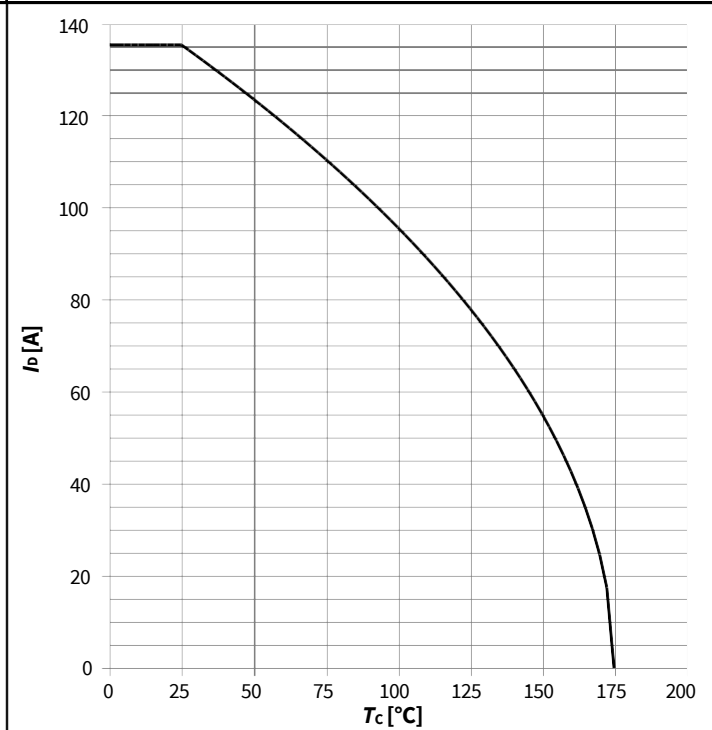
## 4 电气特性图

图 1：功率耗散



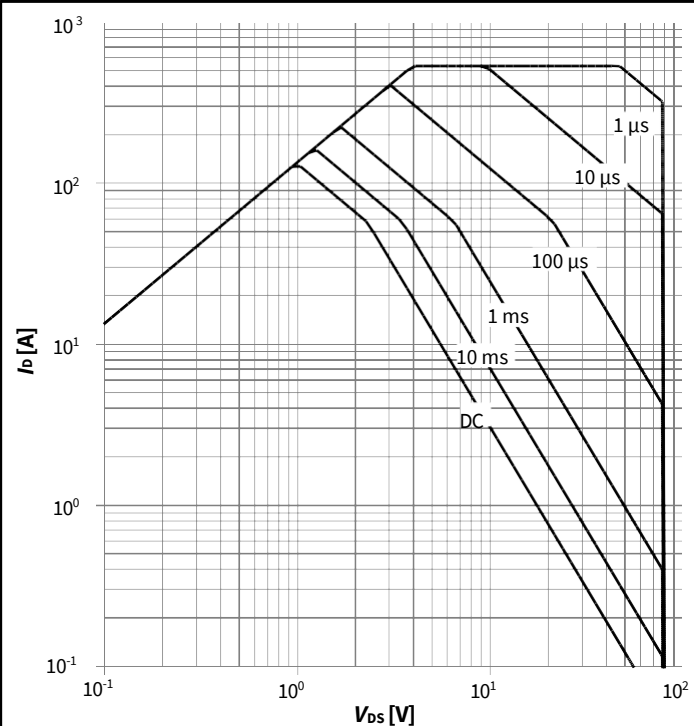
$$P_{\text{tot}} = f(T_c)$$

图 2：漏极电流



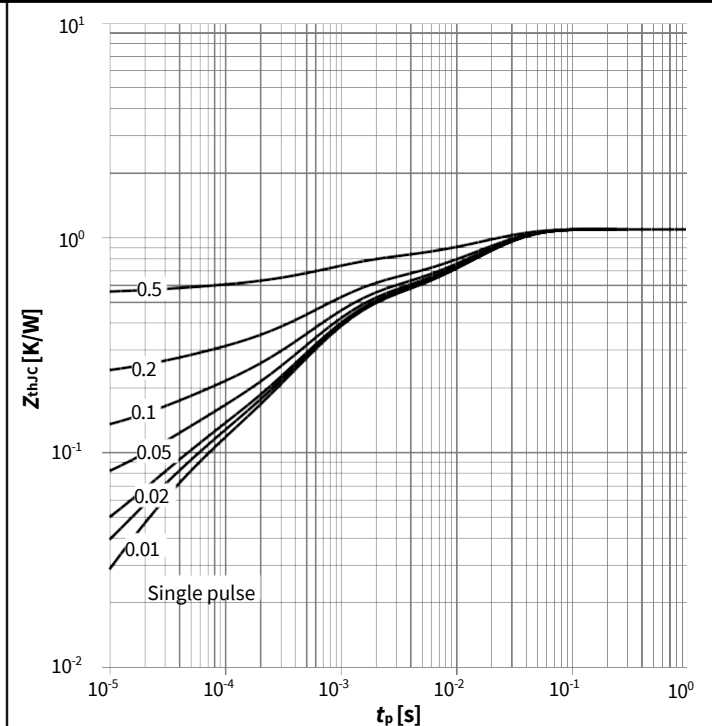
$$I_D = f(T_c); V_{GS} \geq 10 \text{ V}$$

图 3：安全操作区



$$I_D = f(V_{DS}); T_c = 25^\circ\text{C}; D = 0; \text{参数: } t_p$$

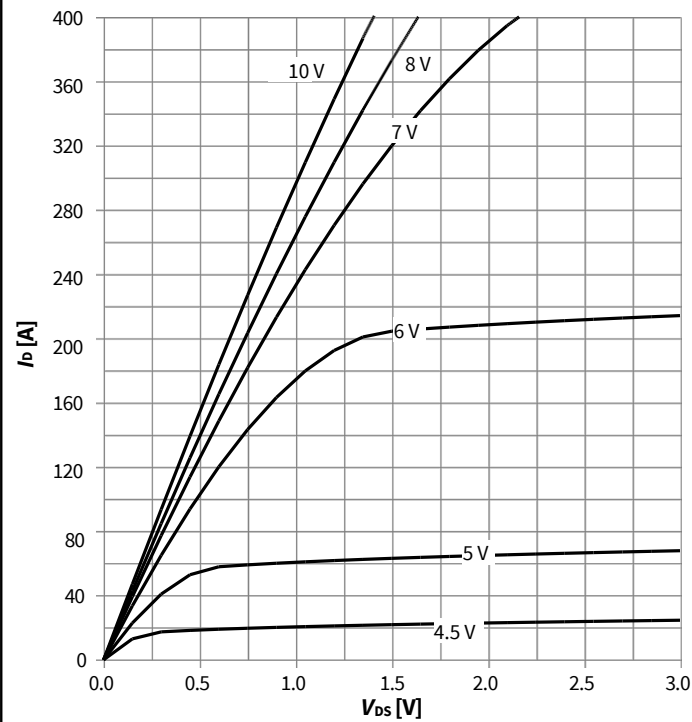
图 4：最大瞬态热阻抗



$$Z_{thJC} = f(t_p); \text{参数: } D = t_p / T$$

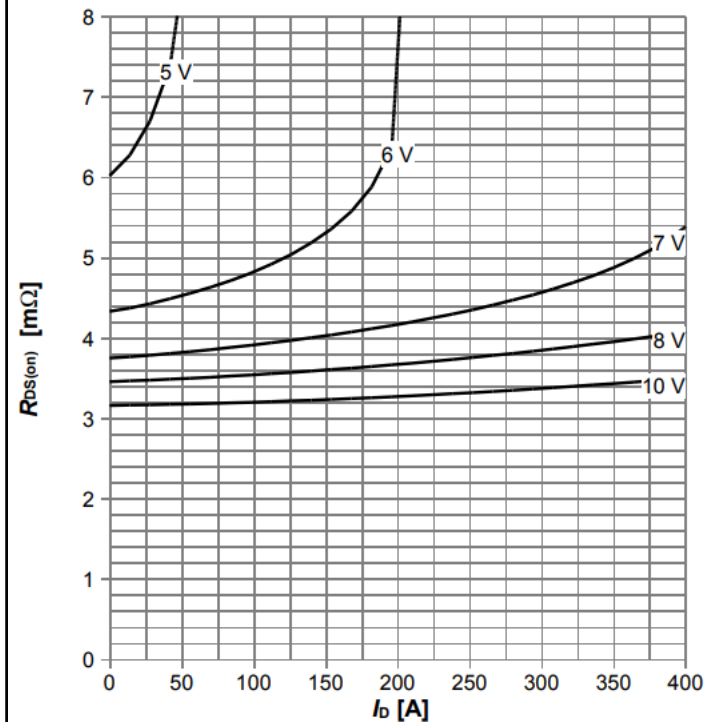
# OptiMOS™ 5 功率晶体管, 80 V

图 5: 典型输出特性



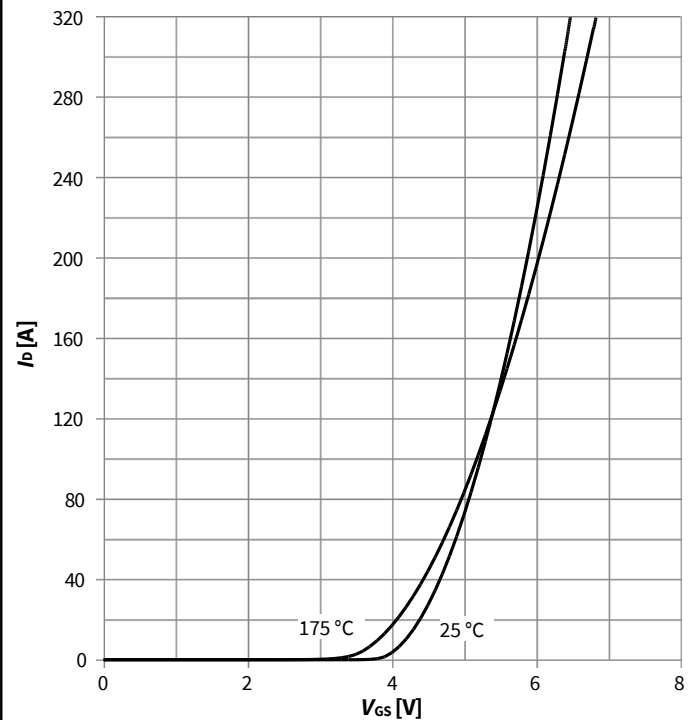
$I_D = f(V_{DS})$ ,  $T_J = 25^\circ\text{C}$ ; 参数:  $V_{GS}$

图 6: 典型漏源导通电阻



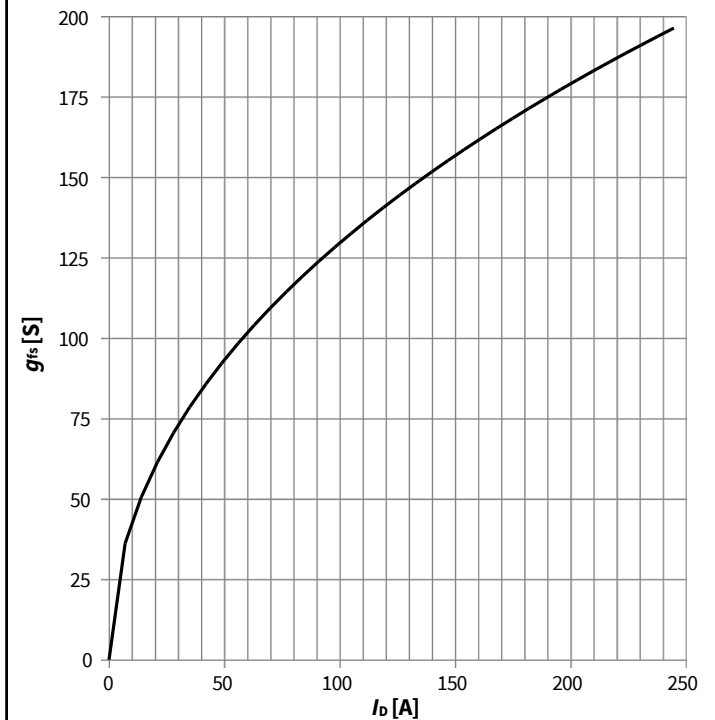
$R_{DS(on)} = f(I_D)$ ,  $T_J = 25^\circ\text{C}$ ; 参数:  $V_{GS}$

图 7: 典型转移特性



$I_D = f(V_{GS})$ ,  $|V_{DS}| > 2|I_D|R_{DS(on)max}$ ; 参数:  $T_J$

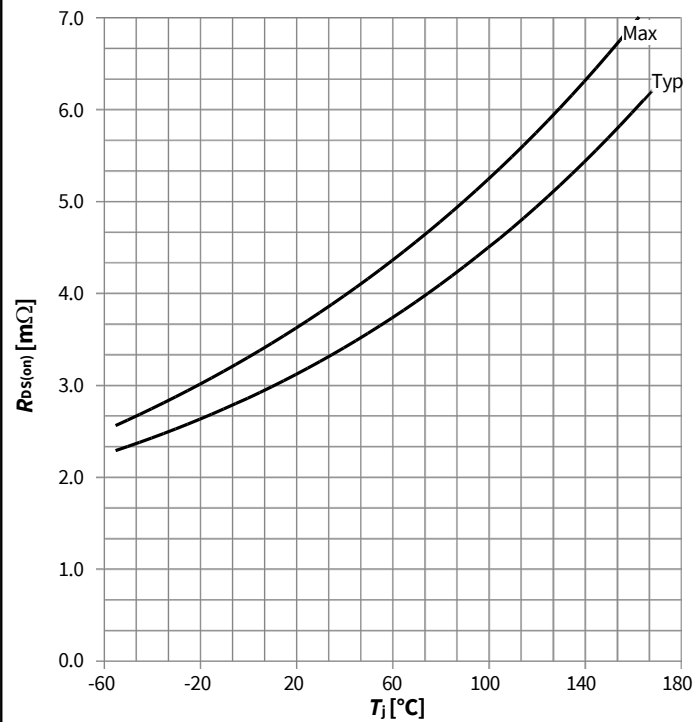
图 8: 典型正向跨导



$g_{fs} = f(I_D)$ ,  $V_{DS} = 3\text{ V}$ ,  $T_J = 25^\circ\text{C}$

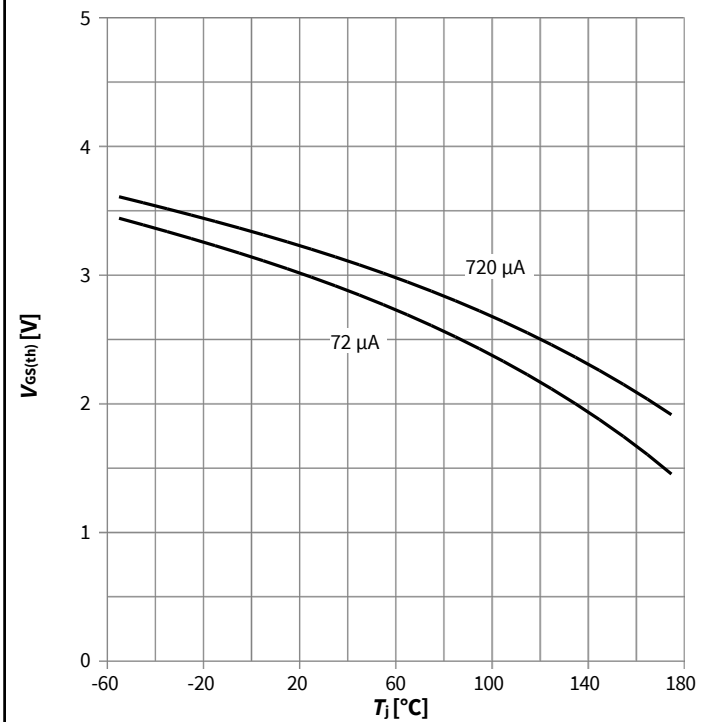
# OptiMOS™ 5 功率晶体管, 80 V

图 9: 漏源导通电阻



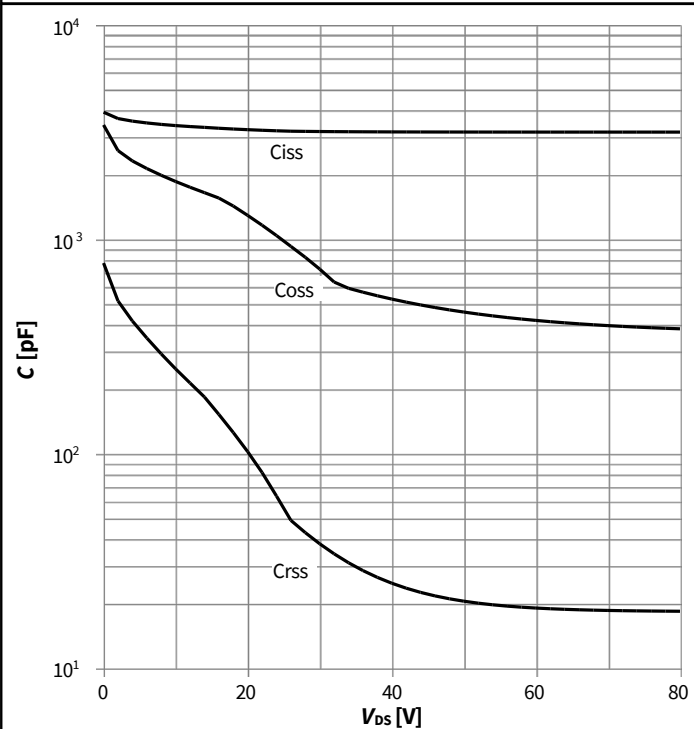
$$R_{DS(on)} = f(T_j), I_D = 50 \text{ A}, V_{GS} = 10 \text{ V}$$

图 10: 典型栅极阈值电压



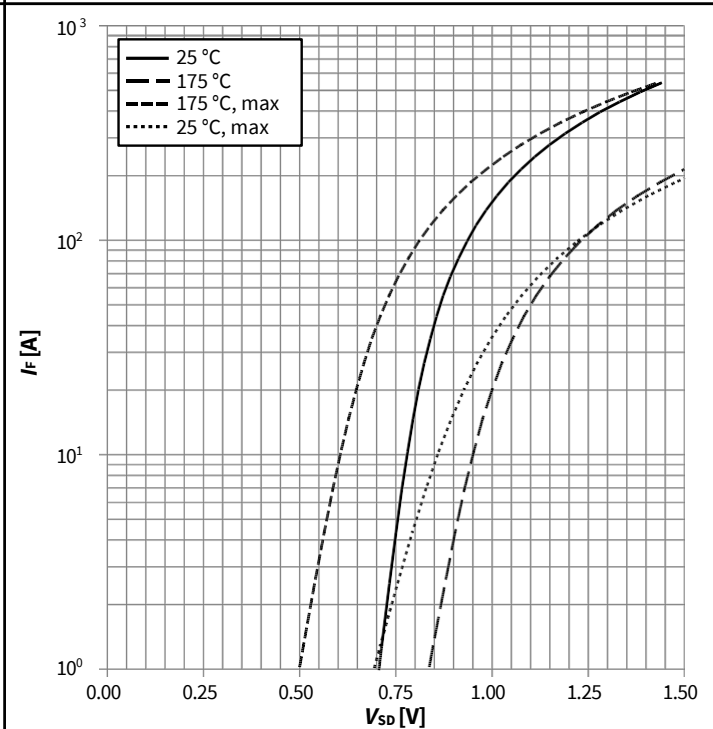
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$$

图 11: 典型电容值



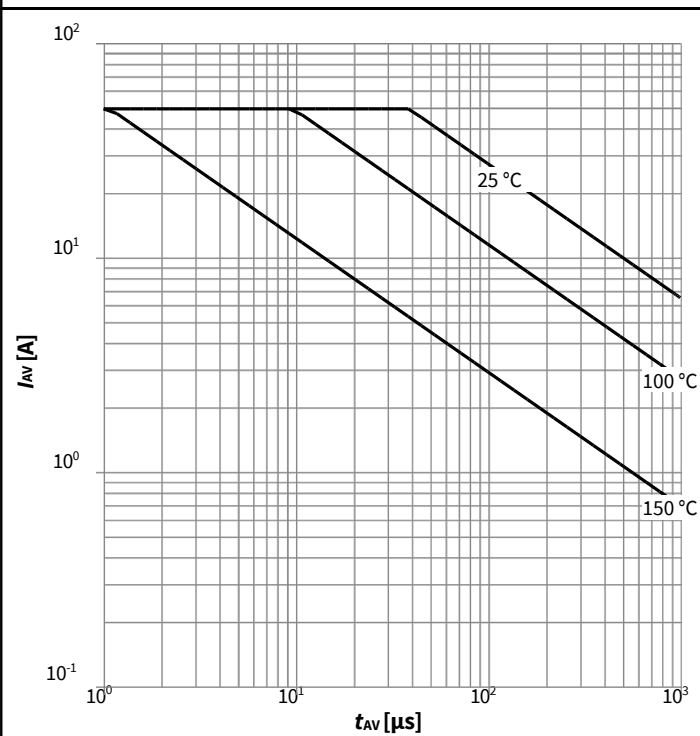
$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$$

图 12: 反向二极管的正向特性



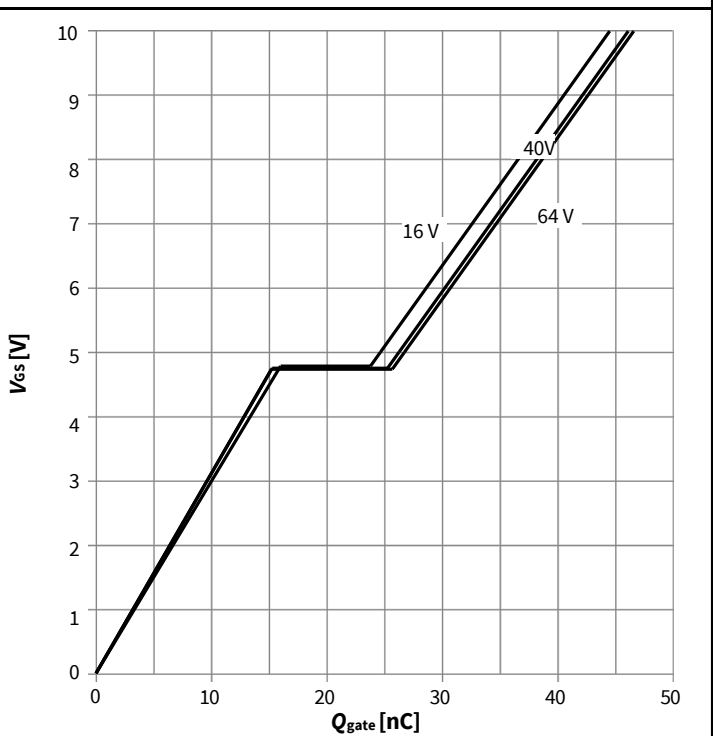
$$I_F = f(V_{SD}); \text{参数: } T_j$$

图 13: 雪崩特性



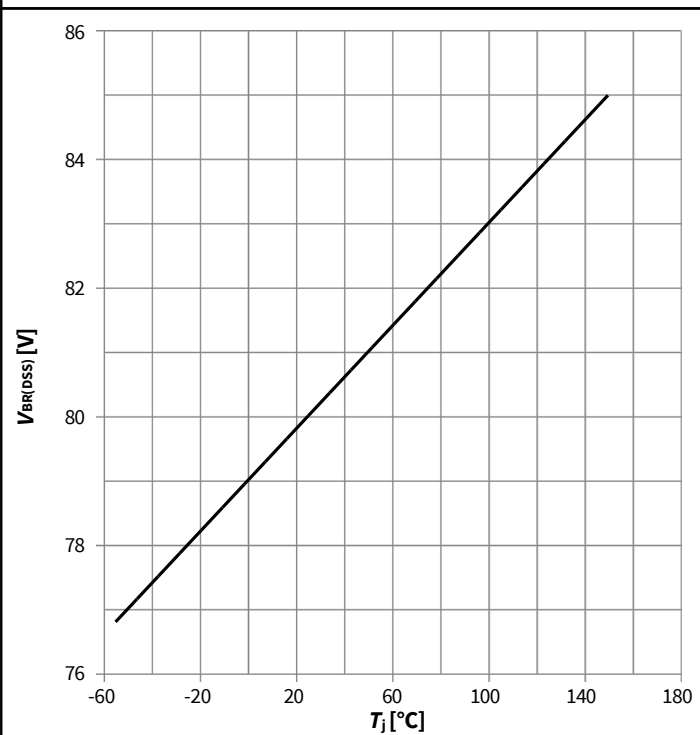
$I_{AS}=f(t_{AV}); R_{GS}=25\ \Omega$ ; 参数:  $T_{j,start}$

图 14: 典型栅极电荷



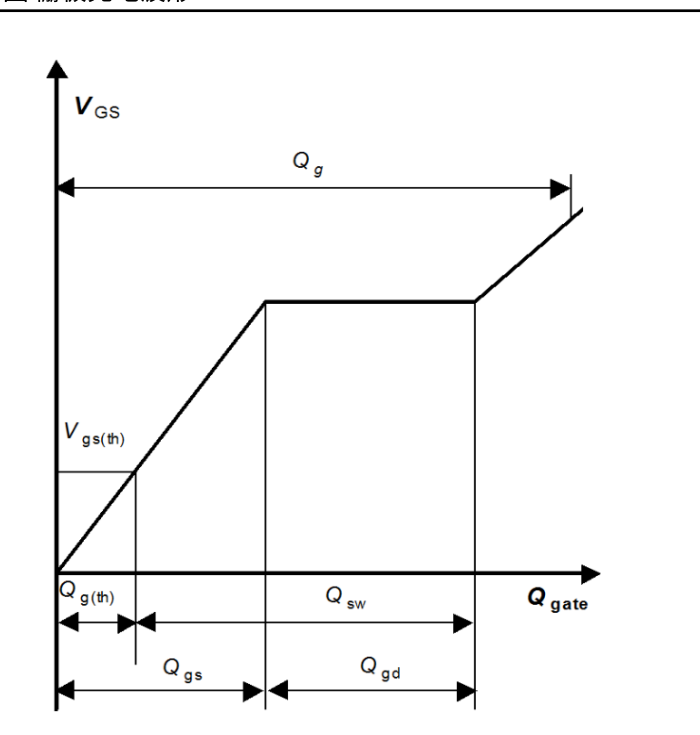
$V_{GS}=f(Q_{gate}); I_D=50\text{ A pulsed}$ ; 参数:  $V_{DD}$

图 15: 漏源击穿电压

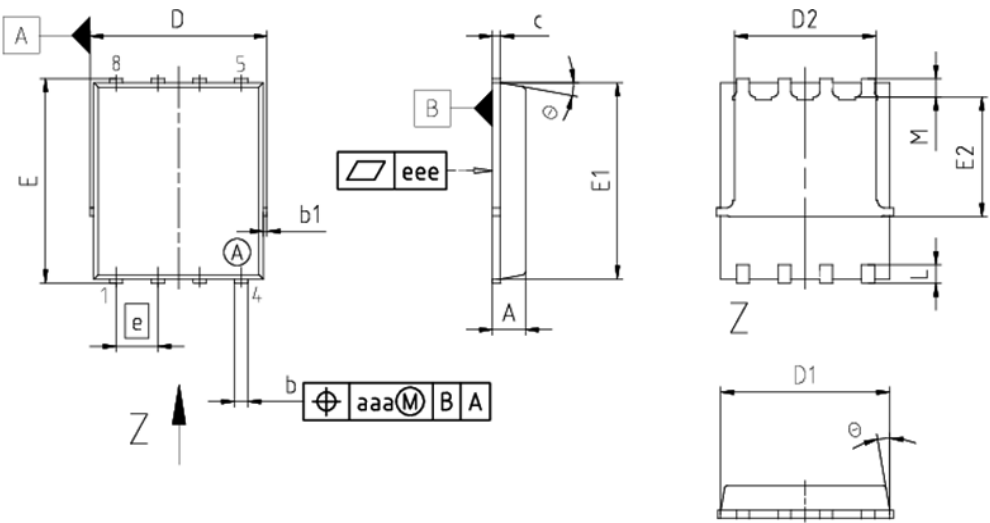


$V_{BR(DSS)}=f(T_j); I_D=1\text{ mA}$

图 栅极充电波形



# 5 封装外形



| DIM   | MILLIMETERS |      |
|-------|-------------|------|
|       | MIN         | MAX  |
| A     | 0.90        | 1.10 |
| b     | 0.31        | 0.54 |
| b1    | 0.02        | 0.22 |
| c     | 0.15        | 0.35 |
| D     | 5.15        | 5.49 |
| D1    | 4.95        | 5.35 |
| D2    | 3.70        | 4.40 |
| E     | 5.95        | 6.35 |
| E1    | 5.70        | 6.10 |
| E2    | 3.40        | 3.80 |
| e     | 1.27        |      |
| N     | 8           |      |
| L     | 0.45        | 0.71 |
| M     | 0.45        | 0.75 |
| theta | 8.5°        | 12°  |
| aaa   | 0.25        |      |
| eee   | 0.08        |      |

DOCUMENT NO.  
Z8B00003332

SCALE

4mm

EUROPEAN PROJECTION

ISSUE DATE  
10-04-2013

REVISION  
04

图 1 PG-TDSON-8 外形图，尺寸单位为毫米

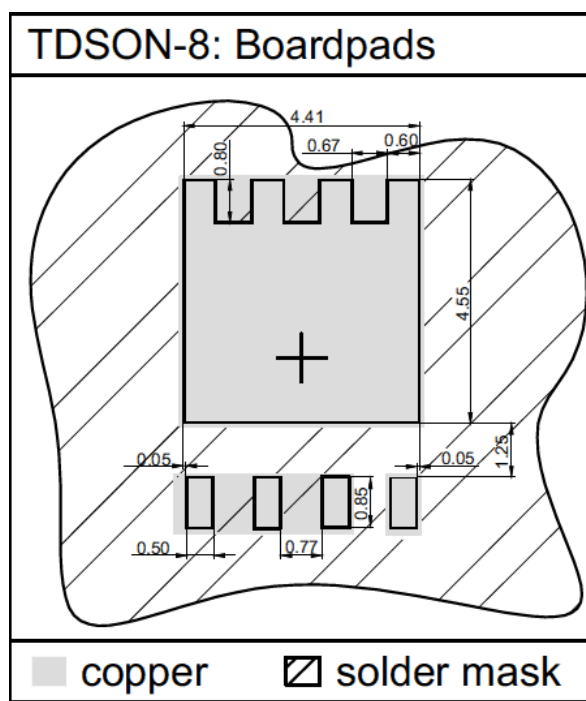


图 2 外形封装 (TDSON-8)

## 修订记录

BSC037N08NS5T

**Revision: 2020-06-17, Rev. 2.2**

### 历史修订版本

| Revision | Date       | Subjects (major changes since last revision) |
|----------|------------|----------------------------------------------|
| 2.0      | 2019-01-22 | Release of final version                     |
| 2.1      | 2019-03-05 | Update Diagrams 8 and 9                      |
| 2.2      | 2020-06-17 | Update current rating                        |

### Trademarks

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

### We Listen to Your Comments

Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to: [erratum@infineon.com](mailto:erratum@infineon.com)

### Published by

**Infineon Technologies AG 81726**

**München, Germany**

**© 2020 Infineon Technologies AG**

**All Rights Reserved.**

### Legal Disclaimer

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

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.

### Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

### Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

The Infineon Technologies component described in this Data Sheet may be used in life-support devices or systems and/or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.



## 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.

**Edition 2025-04-21**

**Published by**

**Infineon Technologies AG**

**81726 Munich, Germany**

**© 2025 Infineon Technologies AG.**

**All Rights Reserved.**

**Do you have a question about this document?**

**Email:**

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

## 重要提示

本文件所提供的任何信息绝不应被视为针对任何条件或者品质而做出的保证（质量保证）。英飞凌对于本文件中所提及的任何事例、提示或者任何特定数值及/或任何关于产品应用方面的信息均在此明确声明其不承担任何保证或者责任，包括但不限于其不侵犯任何第三方知识产权的保证均在此排除。此外，本文件所提供的任何信息均取决于客户履行本文件所载明的义务和客户遵守适用于客户产品以及与客户对于英飞凌产品的应用所相关的任何法律要求、规范和标准。

本文件所含的数据仅供经过专业技术培训的人员使用。客户自身的技术部门有义务对于产品是否适宜于其预期的应用和针对该等应用而言本文件中所提供的信息是否充分自行予以评估。

## 警告事项

由于技术所需产品可能含有危险物质。如需了解该等物质的类型，请向离您最近的英飞凌科技办公室接洽。

除非由经英飞凌科技授权代表签署的书面文件中做出另行明确批准的情况外，英飞凌科技的产品不应当被用于任何一项一旦产品失效或者产品使用的后果可被合理地预料到可能导致人身伤害的任何应用领域。