英飞凌小信号晶体管

PG-SOT23-3



特性

- N沟道
- 增强模式
- 逻辑电平
- d*v*/d*t* 额定
- 无铅引脚镀层；符合 RoHS 标准
- 符合 IEC61249-2-21 标准的无卤素

产品验证

符合 JEDEC JESD47, JESD22 和 J-STD-020 相关测试的工业应用要求。

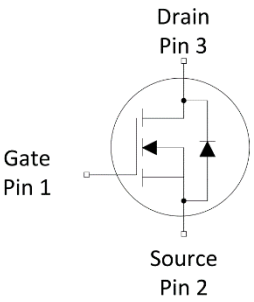


表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on),max}$	3.5	Ω
I_D	0.23	A
ESD Sensitivity, JESD22-A114 (HBM)	Class 0 (<250V)	

Part number	Package	Marking	Related links
BSS138I	PG-SOT23-3	KI	-

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 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 11
商标 12
免责声明 12

1 最大额定值

除非另有规定，T_A =25 °C

表 2 最大额定值

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	-	-	0.23	A	T_A=25 °C
				0.18		T_A=70 °C
Pulsed drain current	$I_{D,pulse}$	-	-	0.92	A	T_A=25 °C
Reverse diode d*v*/d*t*	d*v*/d*t*	-	-	6	kV /µs	I_D=0.23 A, V_{DS}=48 V, d*i*/d*t*=200 A /µs, $T_{j,max}$=150 °C
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	0.36	W	T_A=25 °C
Operating and storage temperature	T_j, T_{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

2 热特性

表 3 热特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Thermal resistance, junction - minimal footprint	R_{thJA}	-	-	350	K/W	-

3 电气特性

除非另有规定，T_j = 25°C

表 4 静态特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	-	-	V	V_{GS}= 0 V, I_D=250 µA
Gate threshold voltage	$V_{GS(th)}$	0.6	1.0	1.4	V	V_{GS}=V_{DS}, I_D=26 µA
Drain-source leakage current	$I_{D\ (off)}$	-	-	0.1	µA	V_{DS}=60 V, V_{GS}=0 V, T_j=25 °C
				5		V_{DS}=60 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	1	10	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	3.3	4.0	Ω	V_{GS}=4.5 V, I_D=0.03 A
			3.5	6.0		V_{GS}=4.5 V, I_D=0.19 A
			2.2	3.5		V_{GS}=10 V, I_D=0.23 A
Transconductance	g_{fs}	0.1	0.2	-	S	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=0.18 A

表 5 动态特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	32	-	pF	V_{GS}=0 V, V_{DS}=25 V, f=1 MHz
Output capacitance	C_{oss}		7.2			
Reverse transfer capacitance	C_{rss}		2.8			
Turn-on delay time	$t_{d(on)}$	-	2.3	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=0.23 A, R_G=6 Ω
Rise time	t_r		3.0			
Turn-off delay time	$t_{d(off)}$		6.7			
Fall time	t_f		8.2			

表 6　　栅极电荷特性

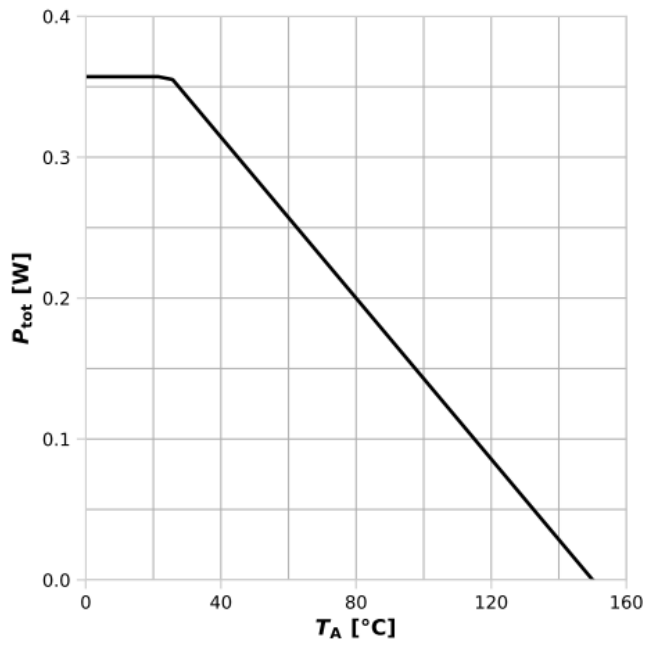
Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	0.10	-	nC	V_{DD}=48 V, I_D=0.23 A, V_{GS}=0 to 10 V
Gate to drain charge	Q_{gd}		0.3		nC	
Gate charge total	Q_g		1.0		nC	
Gate plateau voltage	$V_{plateau}$		3.3		V	

表 7　　反向二极管

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode continous forward current	I_S	-	-	0.23	A	T_A=25 °C
Diode pulse current	$I_{S,pulse}$			0.92		
Diode forward voltage	V_{SD}	-	0.83	1.2	V	V_{GS}=0 V, I_F=0.23 A, T_j=25 °C
Reverse recovery time	t_{rr}	-	9.1	14.5	ns	V_R=30 V, I_F=0.23 A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}		3.3	5	nC	

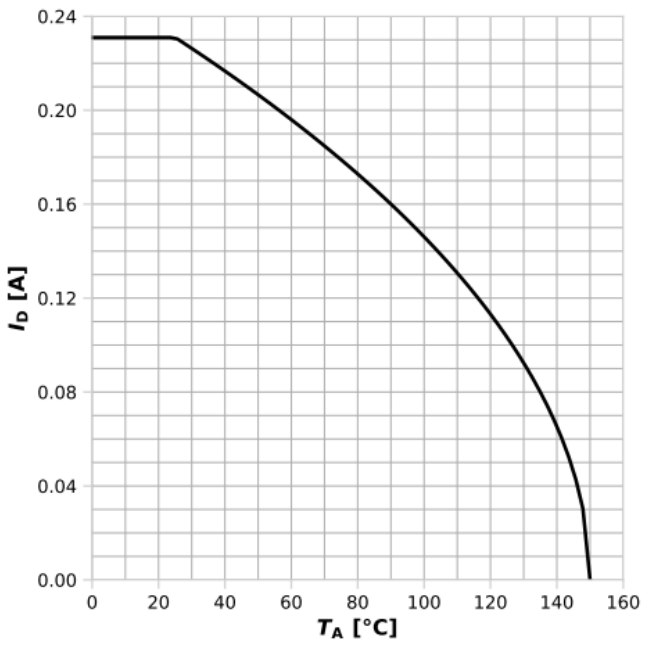
4 电气特性图

Diagram 1: Power dissipation



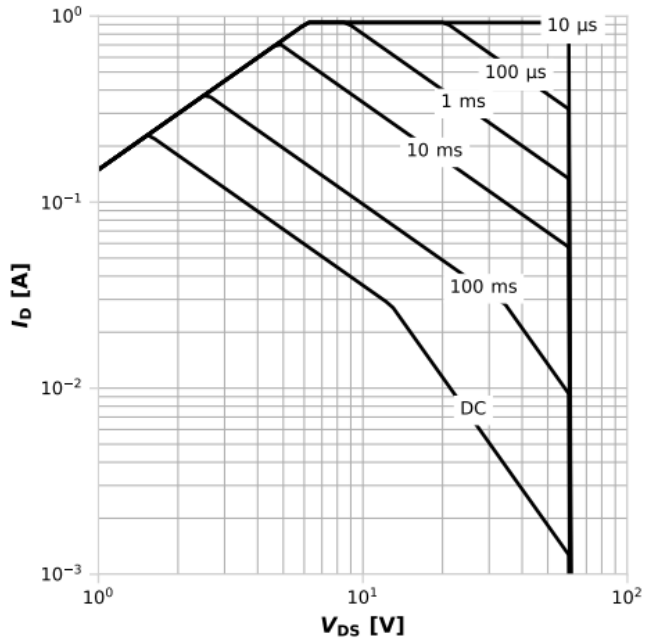
P_{tot}=f(T_A)

Diagram 2: Drain current



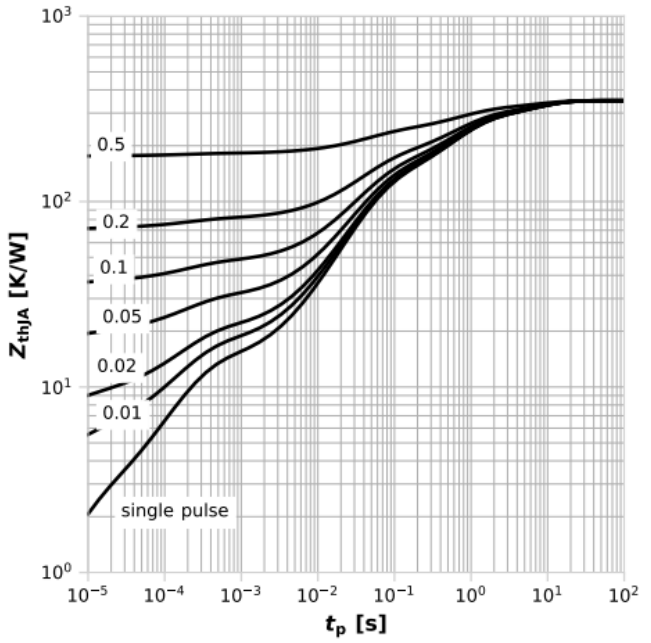
I_D=f(T_A); V_{GS}≥10 V

Diagram 3: Safe operating area



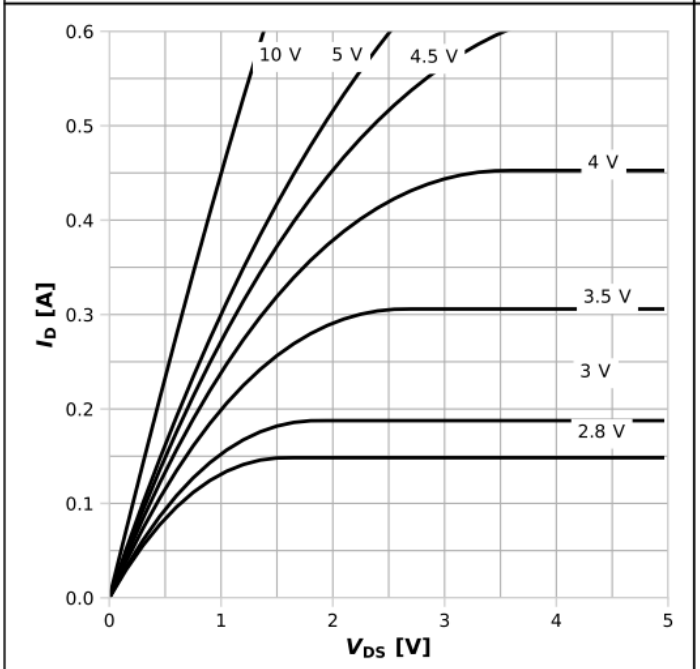
I_D=f(V_{DS}); T_A=25 °C; D=0; parameter: t_p

Diagram 4: Max. transient thermal impedance



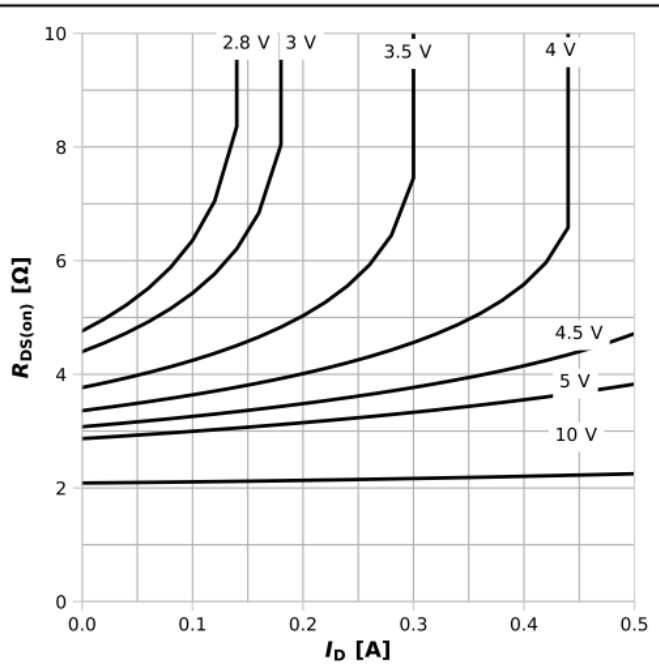
Z_{thJA}=f(t_p); parameter: D=t_p/T

Diagram 5: Typ. output characteristics



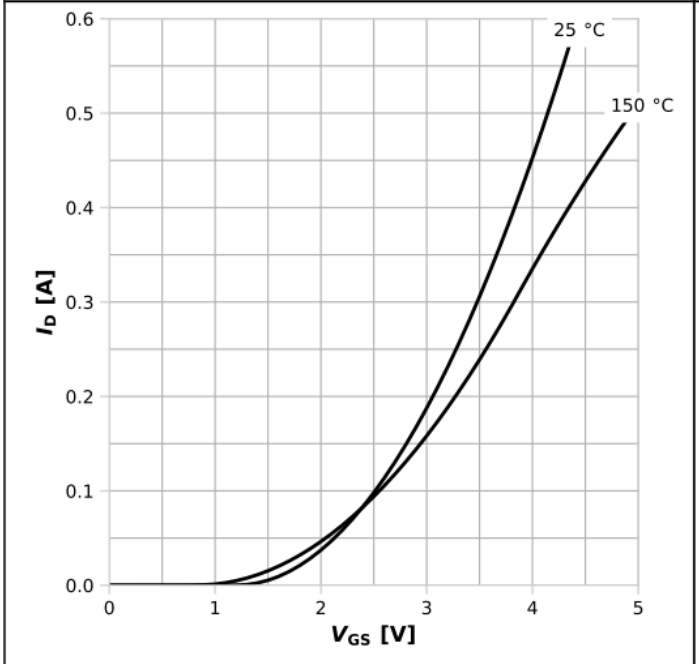
$I_D=f(V_{DS})$; $T_j=25$ °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



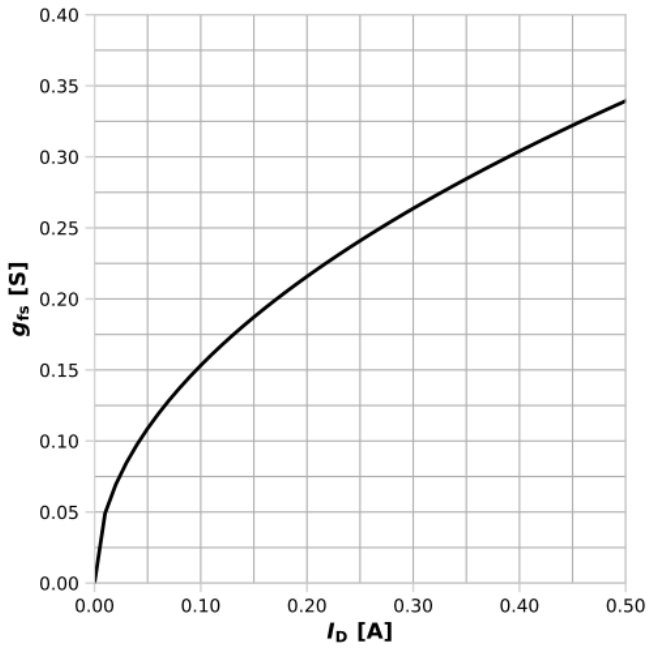
$R_{DS(on)}=f(I_D)$; $T_j=25$ °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



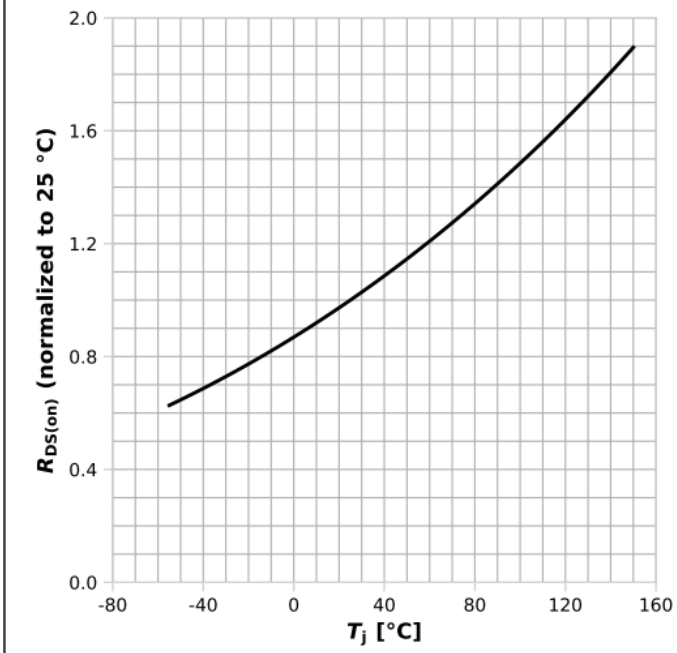
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)max}$

Diagram 8: Typ. forward transconductance



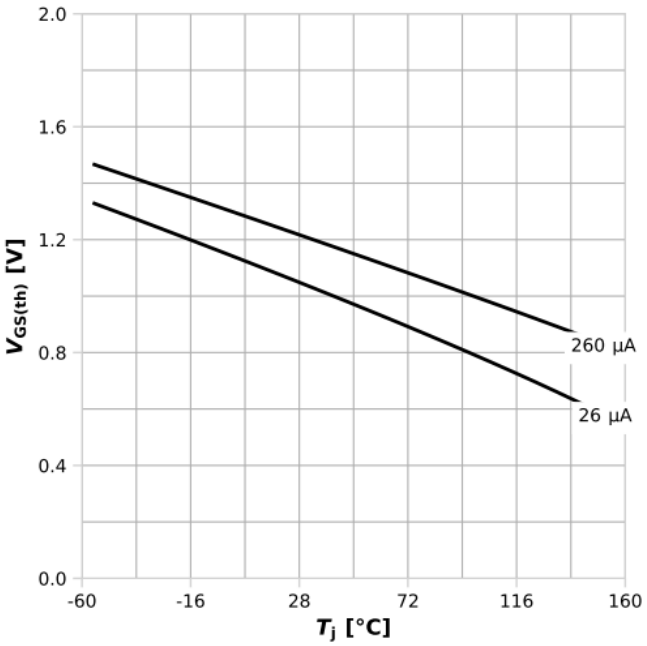
$g_{fs}=f(I_D)$; $T_j=25$ °C

Diagram 9: Drain-source on-state resistance



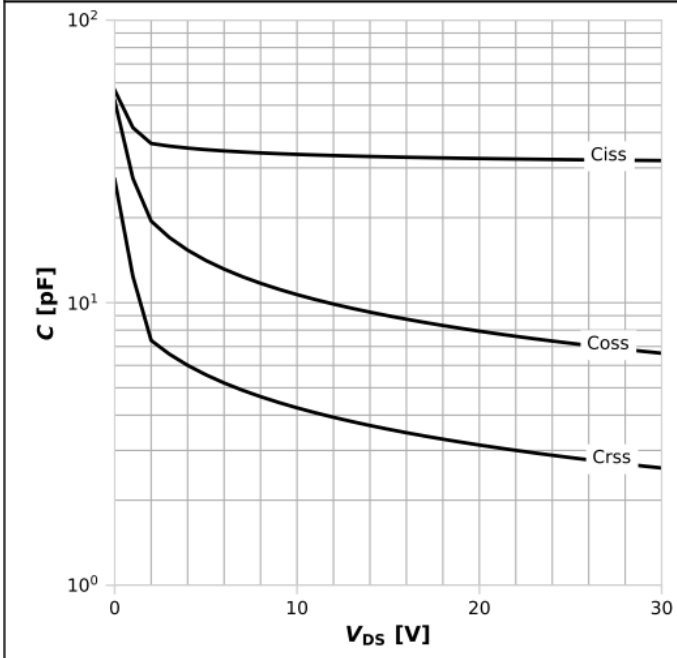
$R_{DS(on)}$=f(T_j), I_D=0.03 A, V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



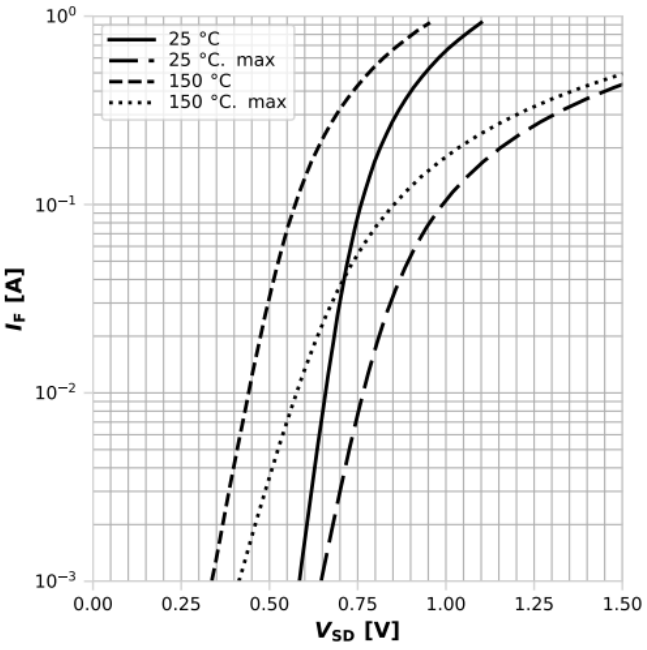
$V_{GS(th)}$=f(T_j); V_{DS}=V_{GS}; I_D=26 µA; parameter: I_D

Diagram 11: Typ. capacitances



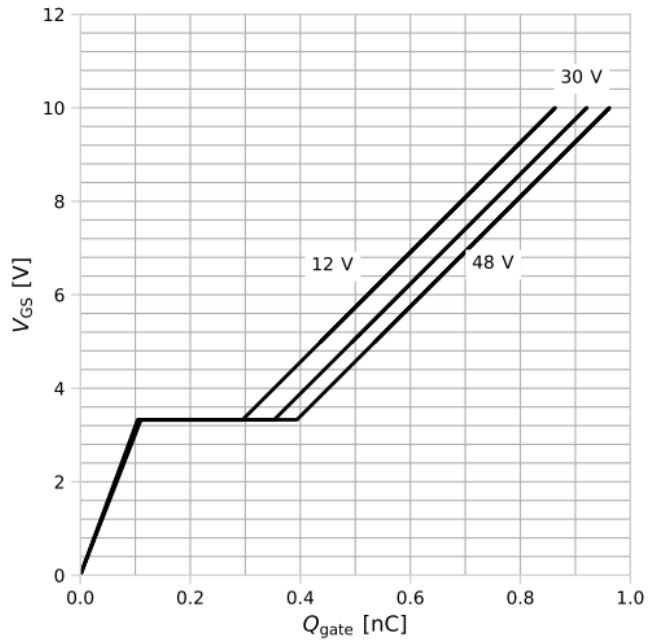
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz; T_j=25°C

Diagram 12: Forward characteristics of reverse diode



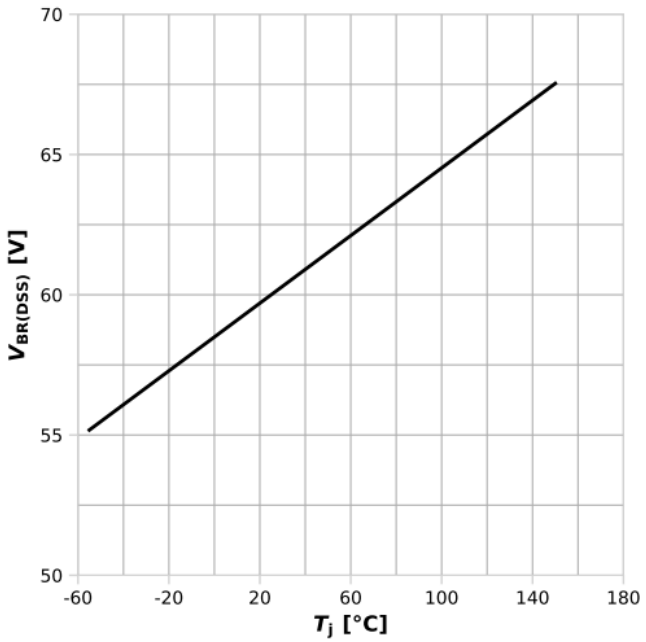
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Typ. gate charge



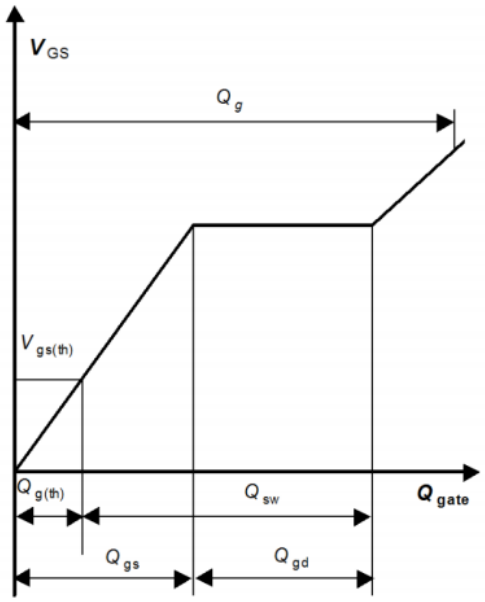
V_{GS}=f(Q_{gate}); I_D=0.23 A pulsed; parameter: V_{DD}

Diagram 14: Drain-source breakdown voltage



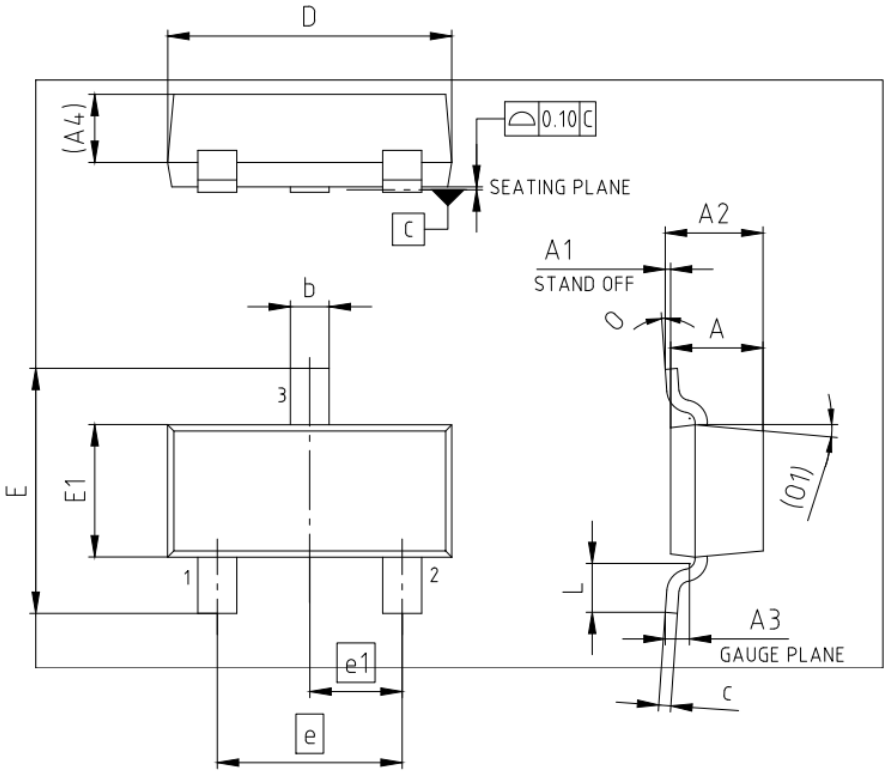
$V_{BR(DSS)}$=f(T_j), I_D=250 µA

Gate charge waveforms



-

5 封装外形



PACKAGE - GROUP NUMBER:	PG-SOT23-3-U03				
DIMENSIONS	MILLIMETERS		DIMENSIONS	MILLIMETERS	
	MIN.	MAX.		MIN.	MAX.
A	0.88	1.02	e	1.90	
A1	0.01	0.10	e1	0.95	
A2	0.89	1.12	L	0.40	0.60
A3	0.15	0.35	N	3	
A4	0.70		O	3°	8°
b	0.32	0.47	O1	6°	8°
c	0.08	0.18			
D	2.80	3.04			
E	2.40	2.64			
E1	1.32	1.40			

NOTE: ALL DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

图 1　　PG-SOT23-3 封装外形图，尺寸单位为毫米

修订记录

BSS138I

Revision 2025-09-30, Rev. 2. 3

Previous revisions

Revision	Date	Subjects (major changes since last revision)
2.0	2021-01-26	Release of final version
2.1	2021-03-17	Update technology naming
2.2	2025-03-13	Update package outline drawing
2.3	2025-09-30	Update marking

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

Published by Infineon Technologies AG, 81726 Munich, Germany
Copyright (c) 2025 Infineon Technologies AG and its affiliates.All Rights Reserved.

Important notice
Products which may also include samples and may be comprised of hardware or software or both ("Product(s)") are sold or provided and delivered by Infineon Technologies AG and its affiliates ("Infineon") subject to the terms and conditions of the frame supply contract or other written agreement(s) executed by a customer and Infineon or, in the absence of the foregoing, the applicable Sales Conditions of Infineon. General terms and conditions of a customer or deviations from applicable Sales Conditions of Infineon shall only be binding for Infineon if and to the extent Infineon has given its express written consent.

For the avoidance of doubt, Infineon disclaims all warranties of non-infringement of third-party rights and implied warranties such as warranties of fitness for a specific use/purpose or merchantability.

Infineon shall not be responsible for any information with respect to samples, the application or customer's specific use of any Product or for any examples or typical values given in this document.

The data contained in this document is exclusively intended for technically qualified and skilled customer representatives. It is the responsibility of the customer to evaluate the suitability of the Product for the intended application and the customer's specific use and to verify all relevant technical data contained in this document in the intended application and the customer's specific use. The customer is responsible for properly designing, programming, and testing the functionality and safety of the intended application, as well as complying with any legal requirements related to its use.

Unless otherwise explicitly approved by Infineon, Products may not be used in any application where a failure of the Products or any consequences of the use thereof can reasonably be expected to result in personal injury. However, the foregoing shall not
prevent the customer from using any Product in such fields of use that Infineon has explicitly designed and sold it for, provided that the overall responsibility for the application lies with the customer.

Infineon expressly reserves the right to use its content for commercial text and data mining (TDM) according to applicable laws, e.g. Section 44b of the German Copyright Act (UrhG).

If the Product includes security features: Because no computing device can be absolutely secure, and despite security measures implemented in the Product, Infineon does not guarantee that the Product will be free from intrusion, data theft or loss, or other breaches ("Security Breaches"), and Infineon shall have no liability arising out of any Security Breaches.

If this document includes or references software:
The software is owned by Infineon under the intellectual property laws and treaties of the United States, Germany, and other countries worldwide. All rights reserved. Therefore, you may use the software only as provided in the software license agreement accompanying the software. If no software license agreement applies, Infineon hereby grants you a personal, non-exclusive, non-transferable license (without the right to sublicense) under its intellectual property rights in the software (a) for software provided in source code form, to modify and reproduce the software solely for use with Infineon hardware products, only internally within your organization, and (b) to distribute the software in binary code form externally to end users, solely for use on Infineon hardware products. Any other use, reproduction, modification, translation, or compilation of the software is prohibited.

For further information on the Product, technology, delivery terms and conditions, and prices, please contact your nearest Infineon office or visit https://www.infineon.com.

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 **2026-09-14**

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

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，如无上述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，英飞凌不承担不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档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探勘（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。

如果本文档包含或引用软件：
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**。