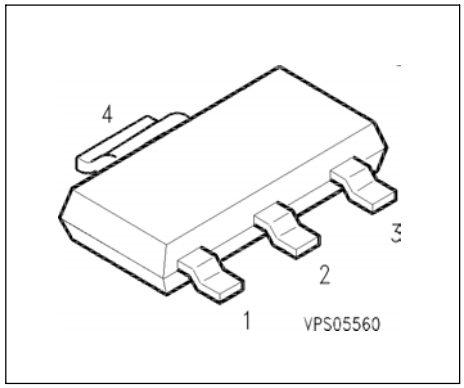
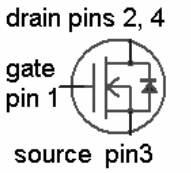
SIPMOS ® Small-Signal Transistor

- N channel
- Enhancement mode
- Avalanche rated
- $V_{GS(th)}$= 2.0... 4.0 V
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101





Pin 1	Pin 2	Pin 3	Pin 4
G	D	S	D

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSP300	800 V	0.19 A	20 Ω	PG-SOT223	BSP300

Type	RoHS compliant	Tape and Reel Information	Packaging
BSP300	Yes	L6327	Dry

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current T_A = 25 °C	I_D	0.19	A
DC drain current, pulsed T_A = 25 °C	I_{Dpuls}	0.76	
Avalanche energy, single pulse I_D = 0.8 A, V_{DD} = 50 V, R_{GS} = 25 Ω L = 105 mH, T_j = 25 °C	E_{AS}	36	mJ
Gate source voltage	V_{GS}	± 20	V
Power dissipation T_A = 25 °C	P_{tot}	1.8	W
ESD Class JESD22-A114-HBM		Class 1a	

Maximum Ratings

Parameter	Symbol	Values	Unit
Chip or operating temperature	T_j	-55 ... + 150	°C
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip to ambient air 1)	R_{thJA}	≤ 70	K/W
Thermal resistance, junction-soldering point 1)	R_{thJS}	≤ 14	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

1) Transistor on epoxy pcb 40 mm x 40 mm x 1,5 mm with 6 cm^2 copper area for drain connection

Electrical Characteristics, at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain- source breakdown voltage V_{GS} = 0 V, I_D = 0.25 mA, T_j = 25 °C	$V_{(BR)DSS}$	800	-	-	V
Gate threshold voltage V_{GS}=V_{DS}, I_D = 1 mA	$V_{GS(th)}$	2	3	4	
Zero gate voltage drain current V_{DS} = 800 V, V_{GS} = 0 V, T_j = 25 °C V_{DS} = 800 V, V_{GS} = 0 V, T_j = 125 °C	I_{DSS}	- -	0.1 10	1 100	µA
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0 V	I_{GSS}	-	10	100	nA
Drain-Source on-state resistance V_{GS} = 10 V, I_D = 0.19 A	$R_{DS(on)}$	-	15	20	Ω

Electrical Characteristics, at T_j = 25°C, unless otherwise specified

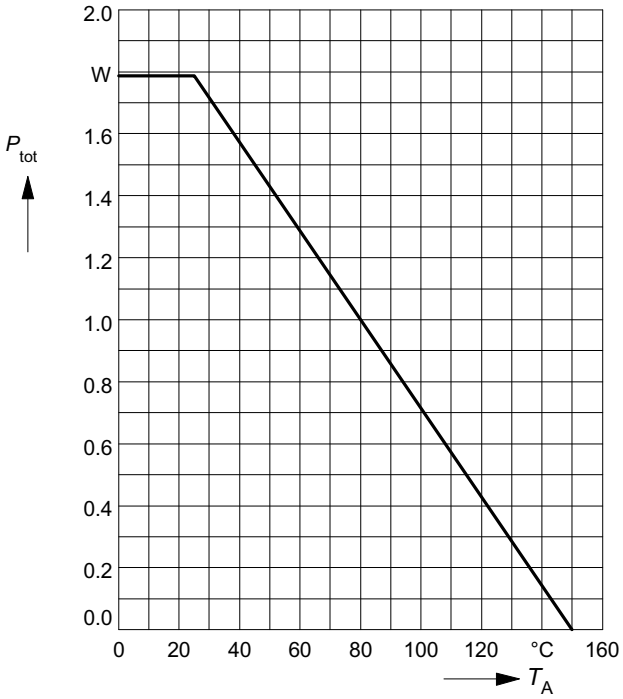
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 0.19 A	g_{fs}	0.06	0.27	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	170	230	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	20	30	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	10	15	
Turn-on delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.25 A R_{GS} = 50 Ω	$t_{d(on)}$	-	7	11	ns
Rise time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.25 A R_{GS} = 50 Ω	t_r	-	16	24	
Turn-off delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.25 A R_{GS} = 50 Ω	$t_{d(off)}$	-	27	36	
Fall time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.25 A R_{GS} = 50 Ω	t_f	-	21	28	

Electrical Characteristics, at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Inverse diode continuous forward current T_A = 25 °C	I_S	-	-	0.19	A
Inverse diode direct current,pulsed T_A = 25 °C	I_{SM}	-	-	0.76	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 0.38 A, T_j = 25 °C	V_{SD}	-	1	1.4	V
Reverse recovery time V_R = 30 V, I_F=I_S = 0 , di_F/dt = 100 A/µs	t_{rr}	-	95	-	ns
Reverse recovery charge V_R = 30 V, I_F=I_S = 0 , di_F/dt = 100 A/µs	Q_{rr}	-	0.25	-	µC

Power dissipation

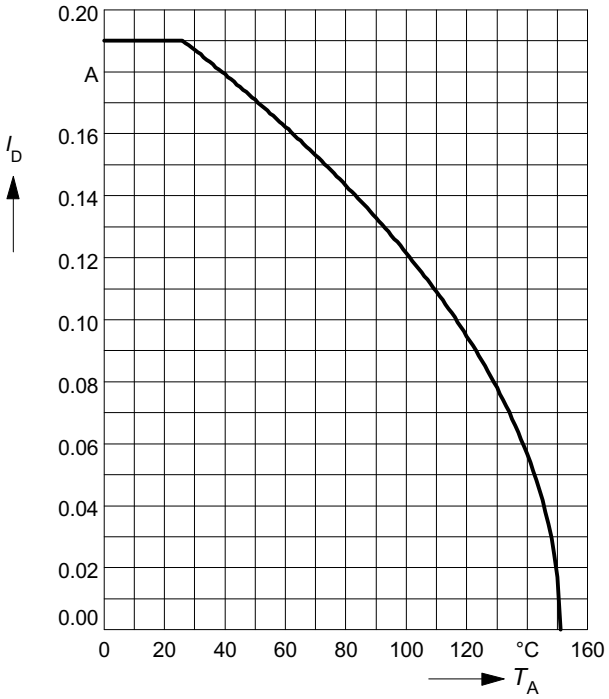
$P_{tot} = f(T_A)$



Drain current

$I_D = f(T_A)$

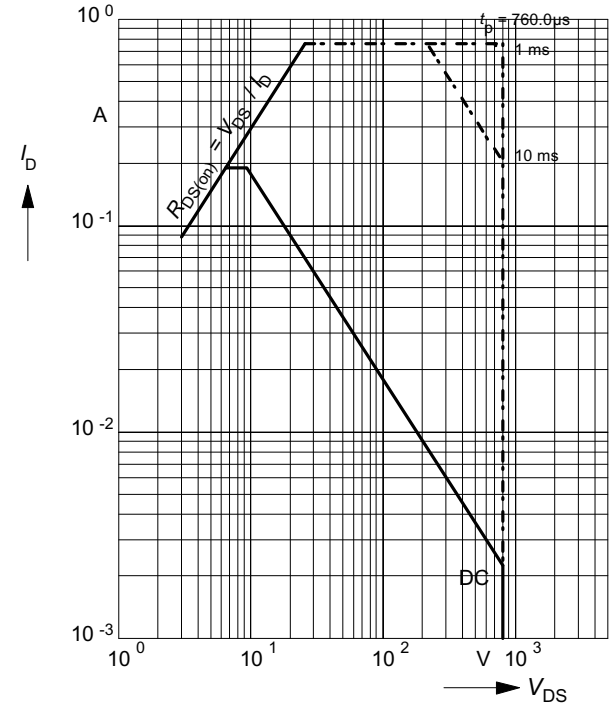
parameter: $V_{GS} \geq 10$ V



Safe operating area

$I_D = f(V_{DS})$

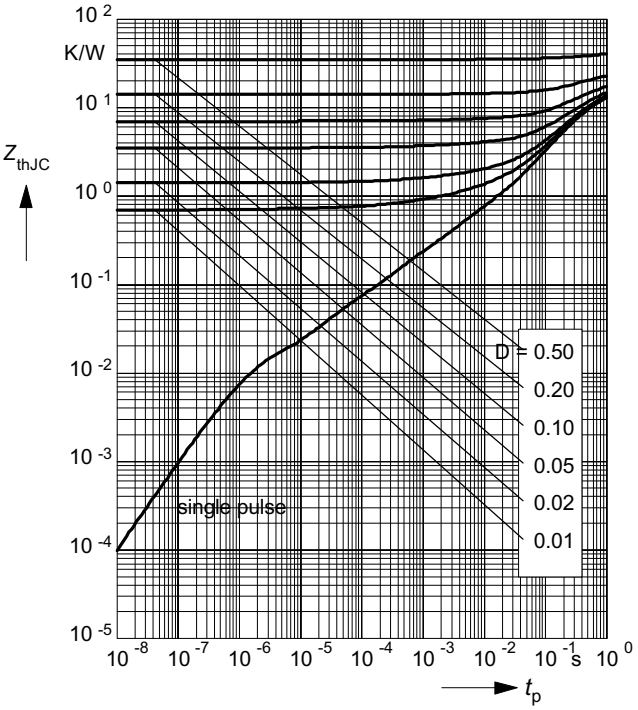
parameter: $D = 0.01$, $T_C = 25$°C



Transient thermal impedance

$Z_{th\,JA} = f(t_p)$

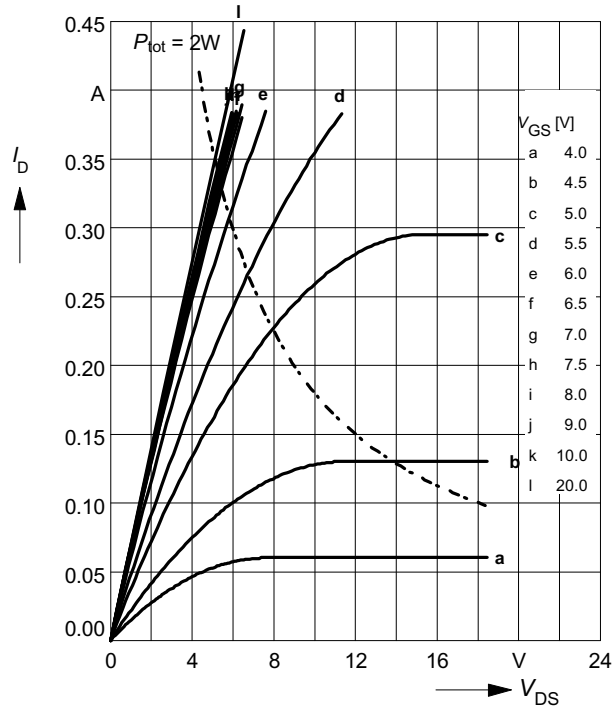
parameter: $D = t_p / T$



Typ. output characteristics

$I_D = f(V_{DS})$

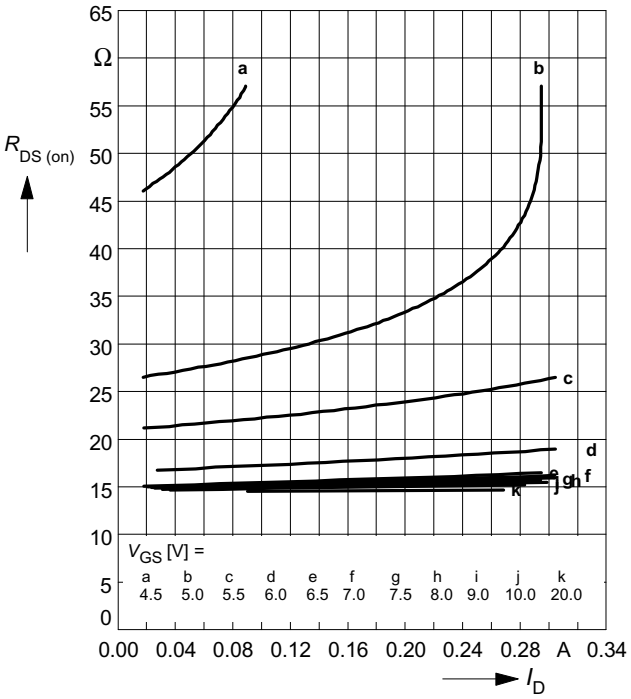
parameter: t_p = 80 µs , T_j = 25 °C



Typ. drain-source on-resistance

$R_{DS\ (on)} = f(I_D)$

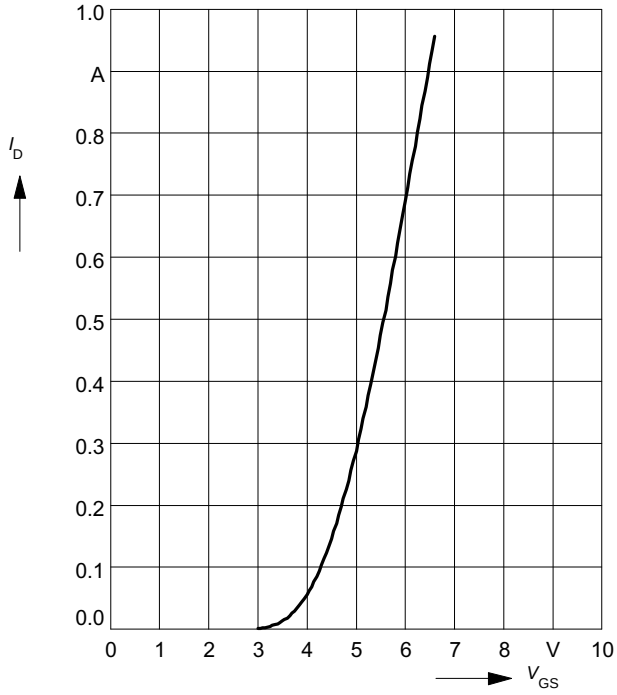
parameter: t_p = 80 µs, T_j = 25 °C



Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: t_p = 80 µs

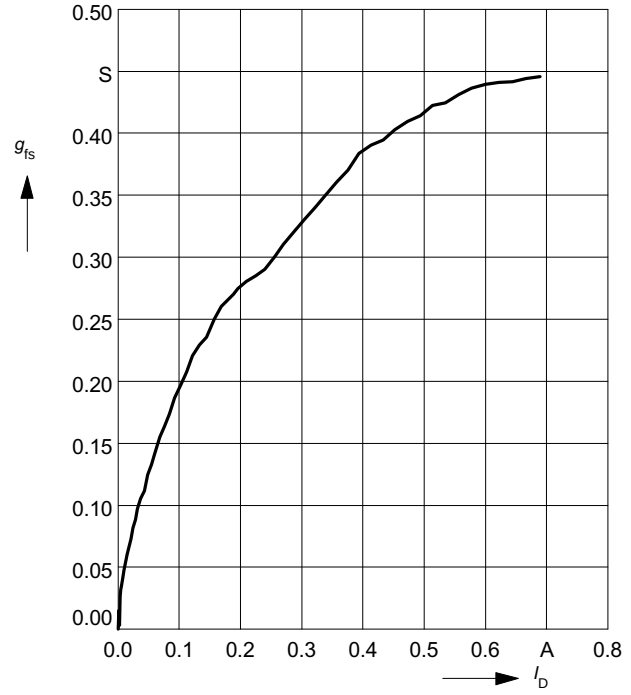
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Typ. forward transconductance $g_{fs} = f(I_D)$

parameter: t_p = 80 µs,

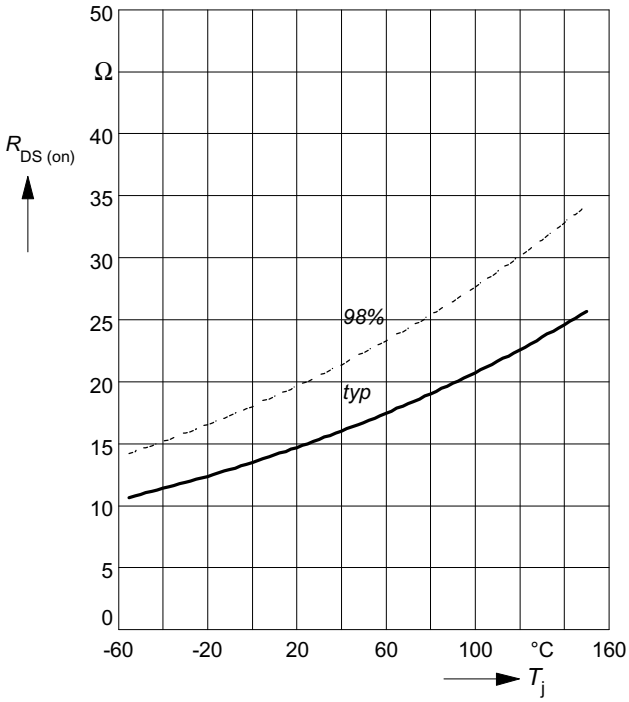
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

$R_{DS\ (on)} = f(T_j)$

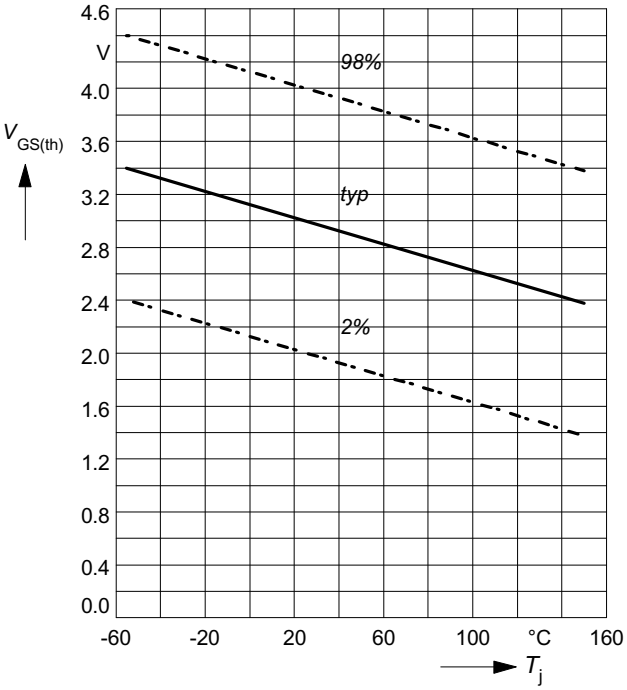
parameter: I_D = 0.19 A, V_{GS} = 10 V



Gate threshold voltage

$V_{GS\ (th)} = f(T_j)$

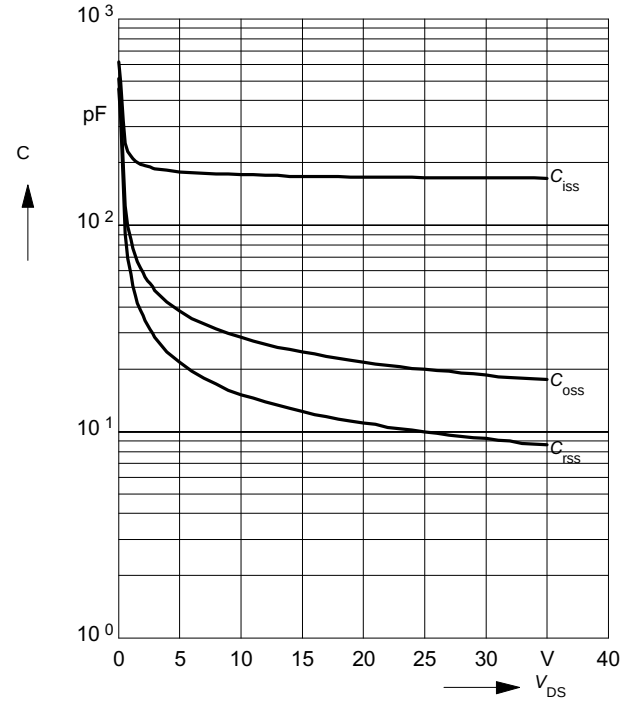
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



Typ. capacitances

$C = f(V_{DS})$

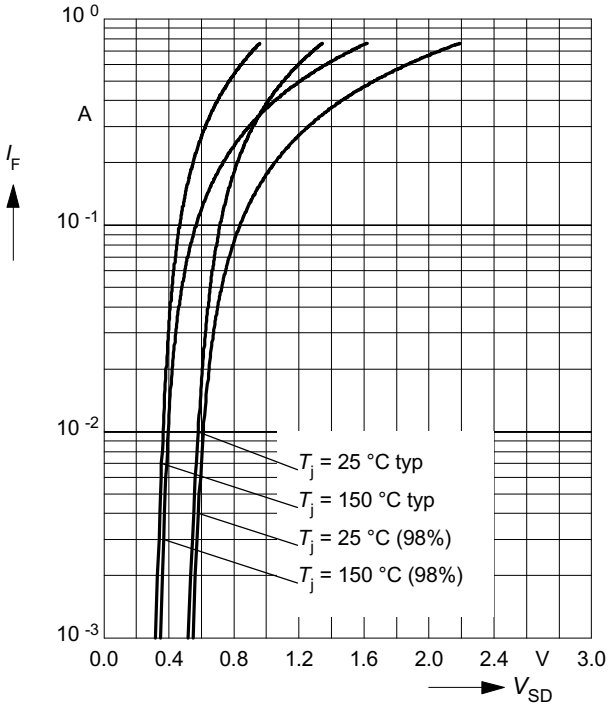
parameter: V_{GS}=0V, f = 1 MHz



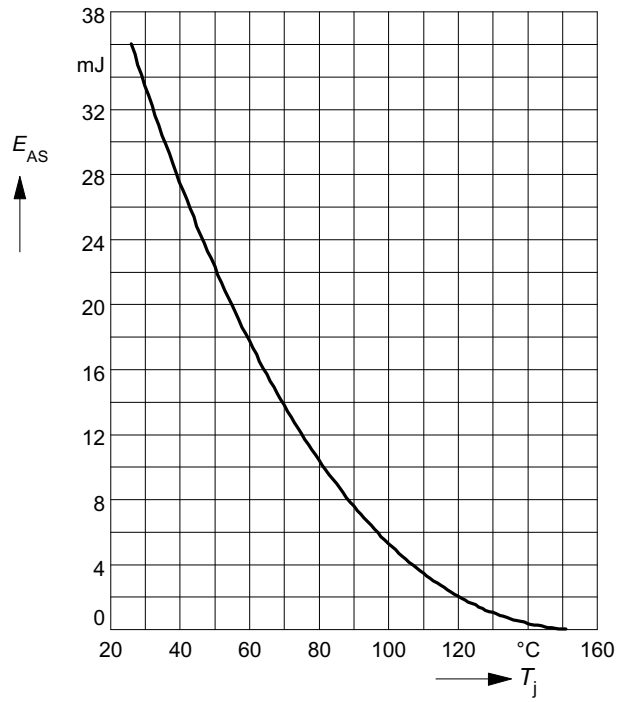
Forward characteristics of reverse diode

$I_F = f(V_{SD})$

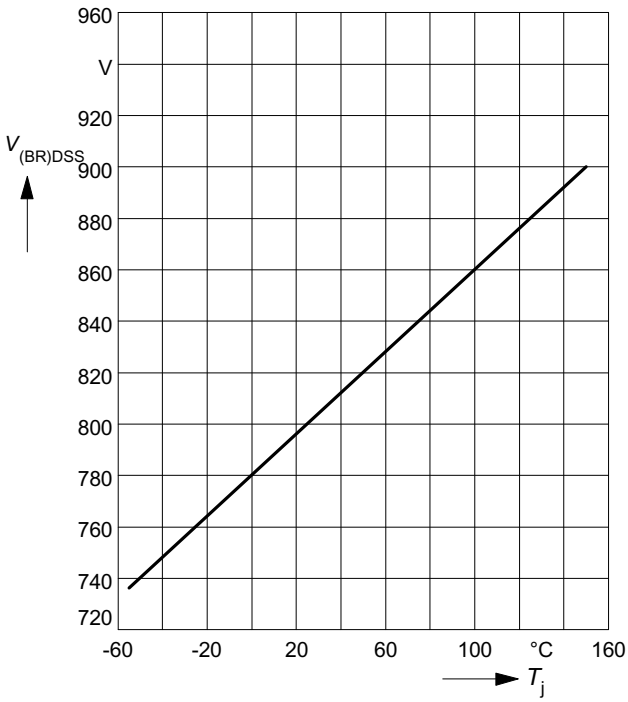
parameter: T_j, t_p = 80 µs



Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 0.8 A, V_{DD} = 50 V
R_{GS} = 25 Ω, L = 105 mH



Drain-source breakdown voltage
$V_{(BR)DSS} = f(T_j)$



Published by
Infineon Technologies AG
81726 Munich, Germany

Legal Disclaimer
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, 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.

Information
For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (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.
Infineon Technologies components may be used in life-support devices 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 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.