SIPMOS® Small-Signal-Transistor

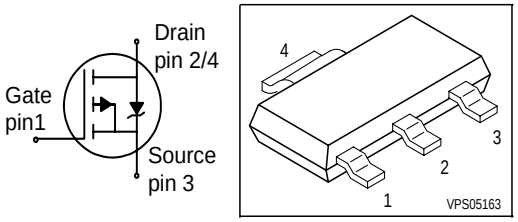
Feature

- P-Channel
- Enhancement mode
- Logic Level
- d*v*/d*t* rated

Product Summary

V_{DS}	-250	V
$R_{DS(on)}$	12	Ω
I_D	-0.26	A

SOT-223



Type	Package	Ordering Code	Tape and Reel Information	Marking
BSP 92 P	SOT-223	Q67042-S4169	-	BSP92P

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current	I_D		A
T_A=25°C		-0.26	
T_A=70°C		-0.23	
Pulsed drain current	$I_{D\ puls}$	-1.04	
T_A=25°C			
Reverse diode d*v*/d*t*	d*v*/d*t*	6	kV/µs
I_S=-0.26A, V_{DS}=-200V, d*i*/d*t*=-200A/µs, T_{jmax}=150°C			
Gate source voltage	V_{GS}	±20	V
Power dissipation	P_{tot}	1.8	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	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point (Pin 4)	R_{thJS}	-	15	25	K/W
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	80	115	
@ 6 cm^2 cooling area [1)]		-	48	70	

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, I_D=-250µA	$V_{(BR)DSS}$	-250	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D=-130µA	$V_{GS(th)}$	-1	-1.5	-2	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS}=-250V, V_{GS}=0, T_j=25°C		-	-0.1	-0.2	
V_{DS}=-250V, V_{GS}=0, T_j=150°C		-	-10	-100	
Gate-source leakage current V_{GS}=-20V, V_{DS}=0	I_{GSS}	-	-10	-100	nA
Drain-source on-state resistance V_{GS}=-2.8V, I_D=-0.025A	$R_{DS(on)}$	-	10	20	Ω
Drain-source on-state resistance V_{GS}=-4.5V, I_D=-0.23A	$R_{DS(on)}$	-	8.2	15	
Drain-source on-state resistance V_{GS}=-10V, I_D=-0.26A	$R_{DS(on)}$	-	7.5	12	

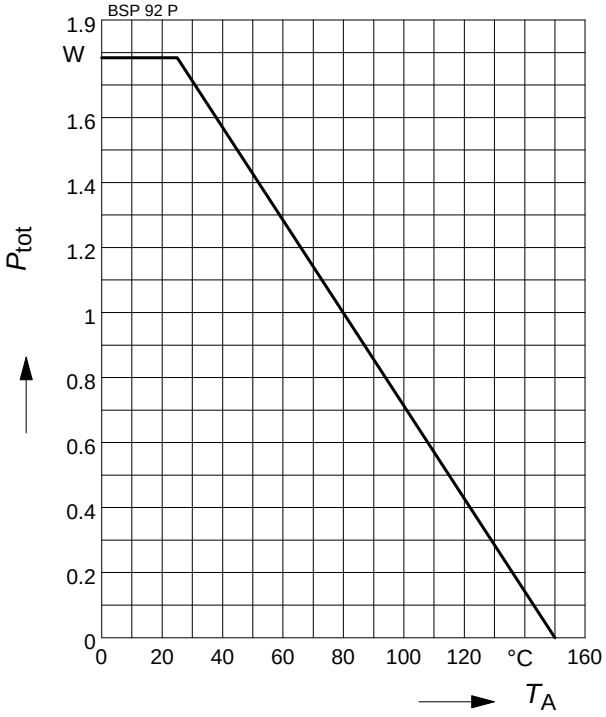
[1]Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70 µm thick) copper area for drain connection. PCB is vertical without blown air.

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

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Transconductance	g_{fs}	$\|V_{DS}\|\geq 2*\|I_D\|*R_{DS(on)max}$, I_D=-0.23A	0.29	0.57	-	S
Input capacitance	C_{iss}	V_{GS}=0, V_{DS}=-25V, f=1MHz	-	83	104	pF
Output capacitance	C_{oss}		-	13	16	
Reverse transfer capacitance	C_{rss}		-	6	8	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-125V, V_{GS}=-10V, I_D=-0.26A, R_G=6Ω	-	5	8	ns
Rise time	t_r		-	6	9	
Turn-off delay time	$t_{d(off)}$		-	67	101	
Fall time	t_f		-	33	50	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=-200V, I_D=-0.26A	-	-0.1	-0.13	nC
Gate to drain charge	Q_{gd}		-	-1.9	-2.4	
Gate charge total	Q_g	V_{DD}=-200V, I_D=-0.26A, V_{GS}=0 to -10V	-	-4.3	-5.4	
Gate plateau voltage	$V_{(plateau)}$	V_{DD}=-200V, I_D=-0.26A	-	-2.9	-3.6	V
Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C	-	-	-0.26	A
Inv. diode direct current, pulsed	I_{SM}		-	-	-1.04	
Inverse diode forward voltage	V_{SD}	V_{GS}=0, I_F=-0.26A	-	-0.83	-1.21	V
Reverse recovery time	t_{rr}	V_R=-125V, I_F=I_S, di_F/dt=100A/µs	-	51	64	ns
Reverse recovery charge	Q_{rr}		-	76	95	nC

1 Power dissipation

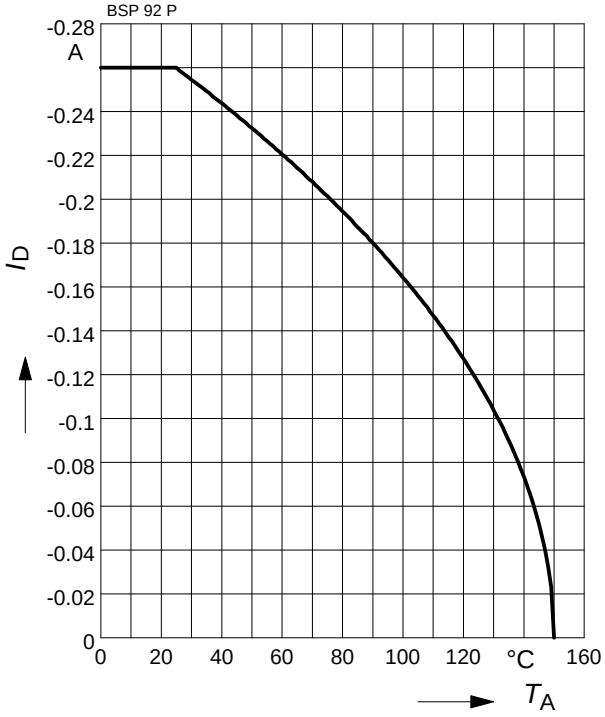
$P_{tot} = f(T_A)$



2 Drain current

$I_D = f(T_A)$

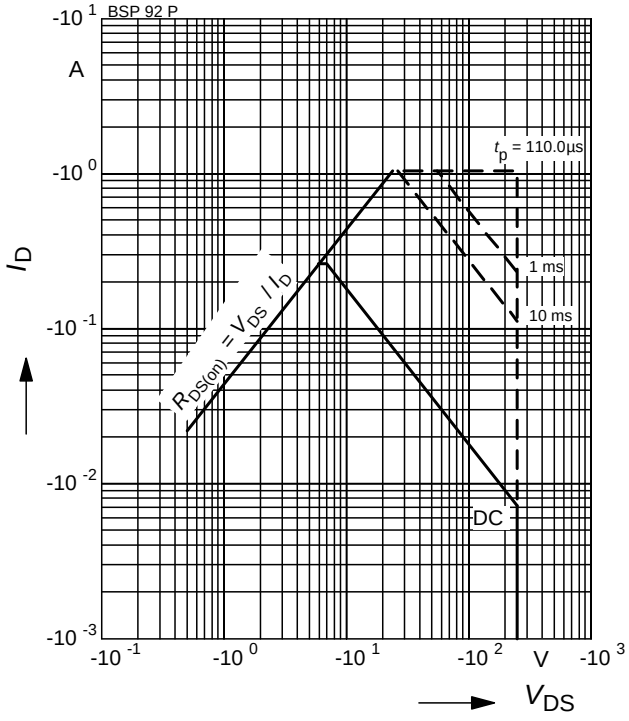
parameter: $|V_{GS}| \geq 10V$



3 Safe operating area

$I_D = f(V_{DS})$

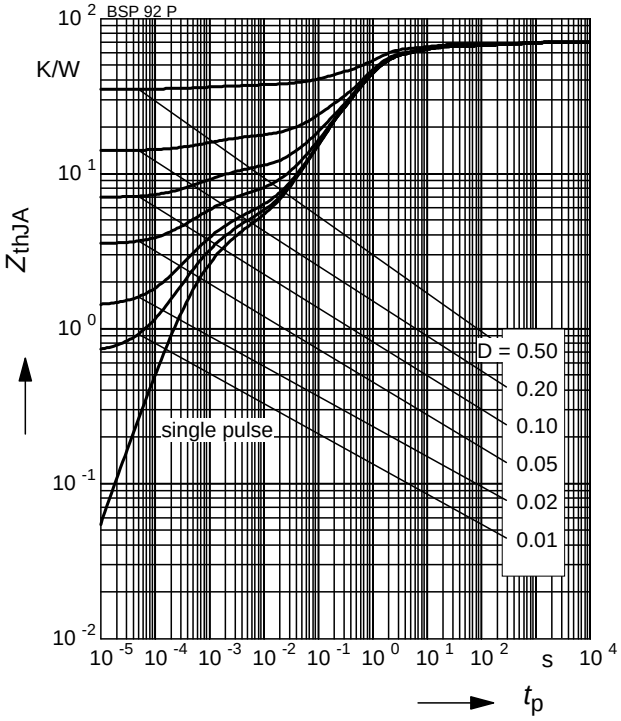
parameter : $D = 0$, $T_A = 25°C$



4 Transient thermal impedance

$Z_{thJA} = f(t_p)$

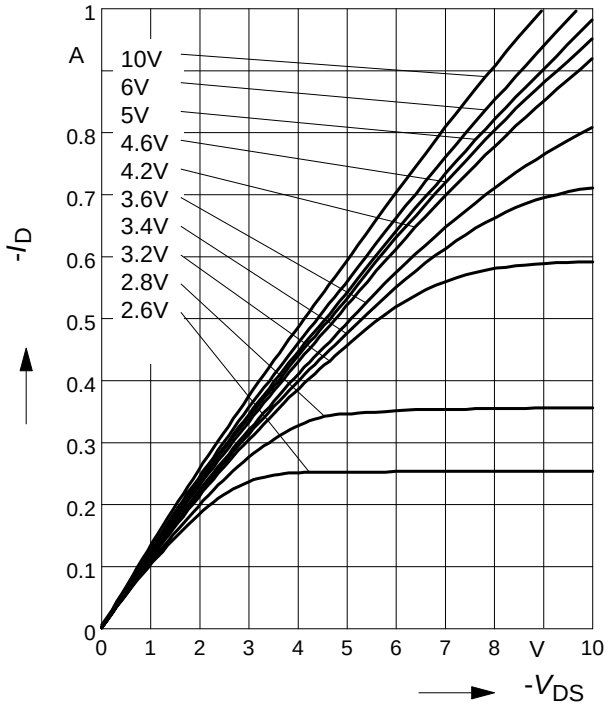
parameter : $D = t_p/T$



5 Typ. output characteristic

$I_D = f(V_{DS})$

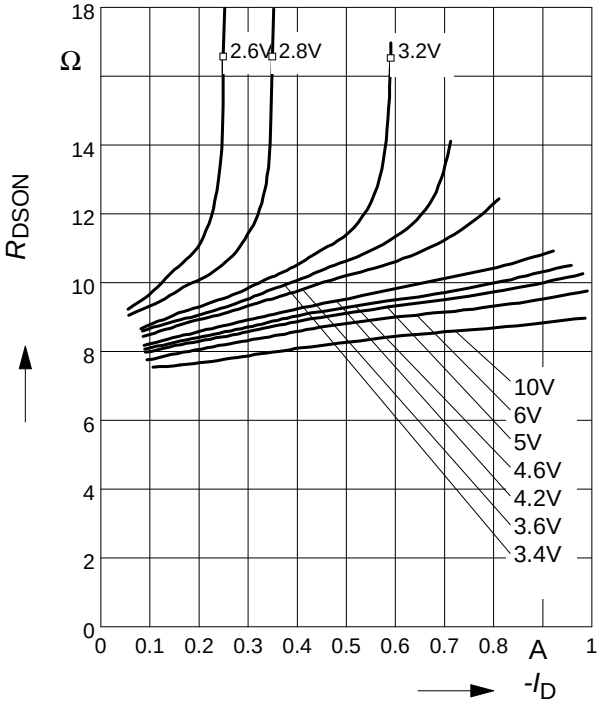
parameter: T_j =25°C, $-V_{GS}$



6 Typ. drain-source on resistance

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

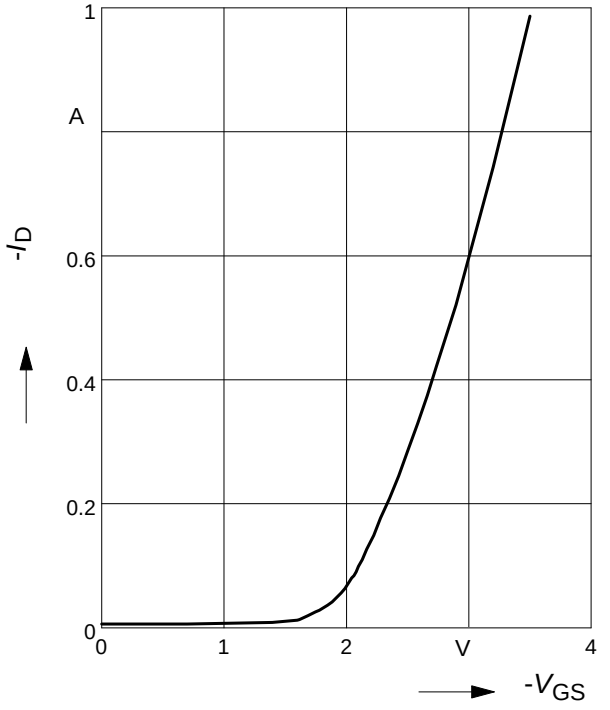
parameter: V_{GS}; T_j =25°C, $-V_{GS}$



7 Typ. transfer characteristics

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

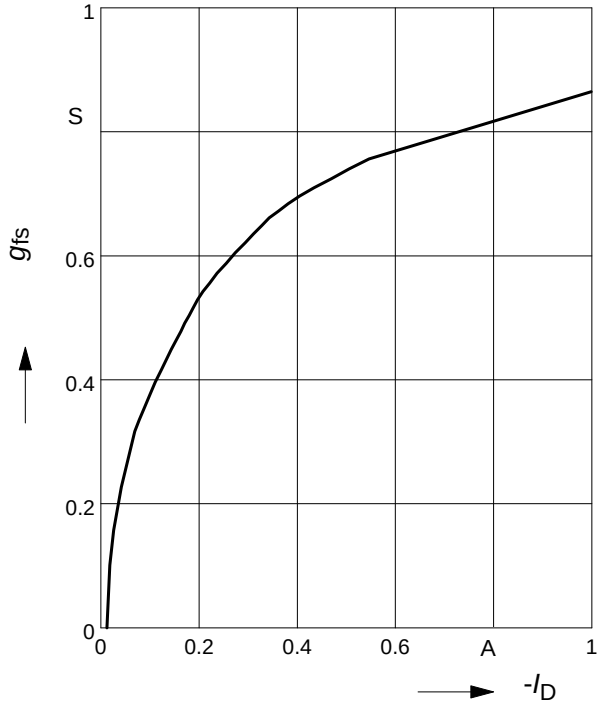
parameter: T_j = 25 °C



8 Typ. forward transconductance

$g_{fs} = f(I_D)$

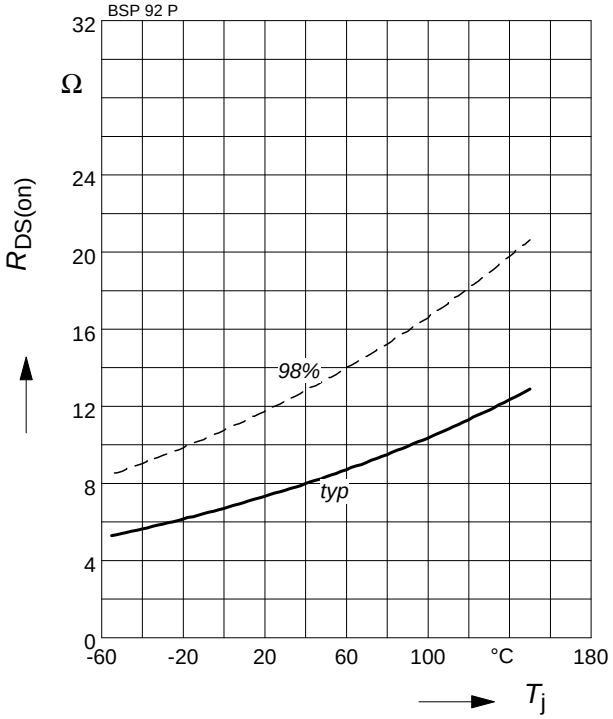
parameter: T_j =25°C



9 Drain-source on-state resistance

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

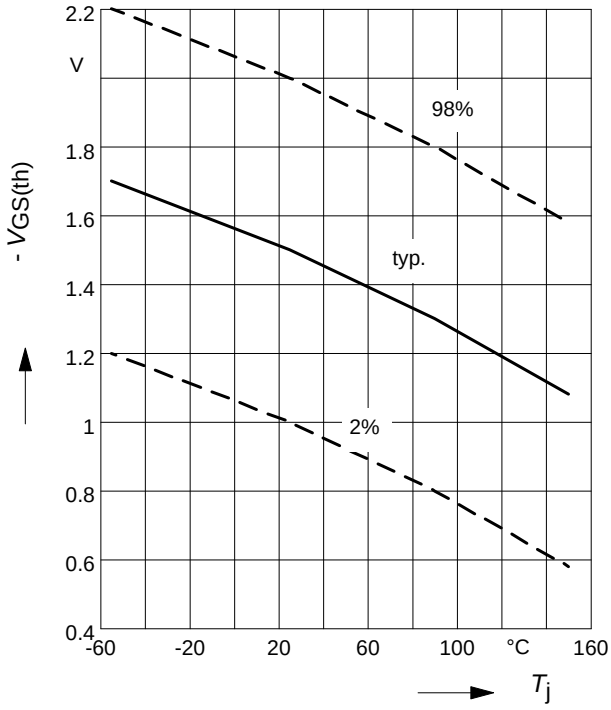
parameter : I_D = -0.26 A, V_{GS} = -10 V



10 Gate threshold voltage

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

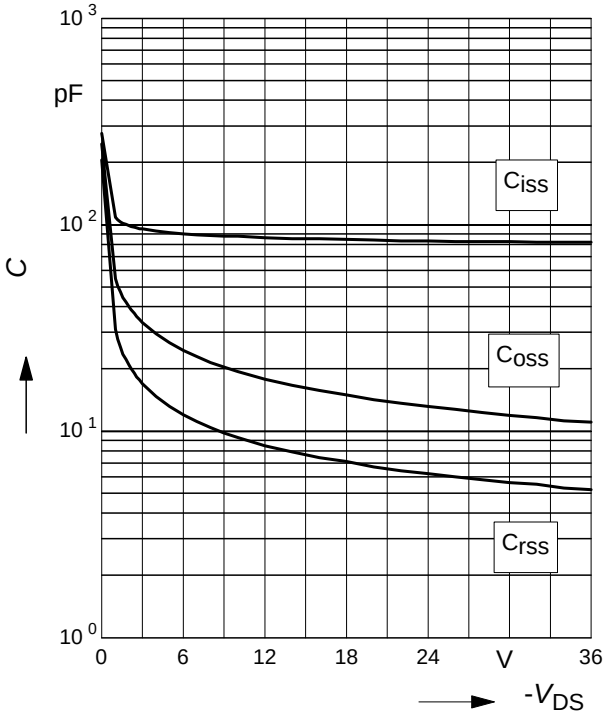
parameter: $V_{GS} = V_{DS}$; I_D = -130µA



11 Typ. capacitances

$C = f(V_{DS})$

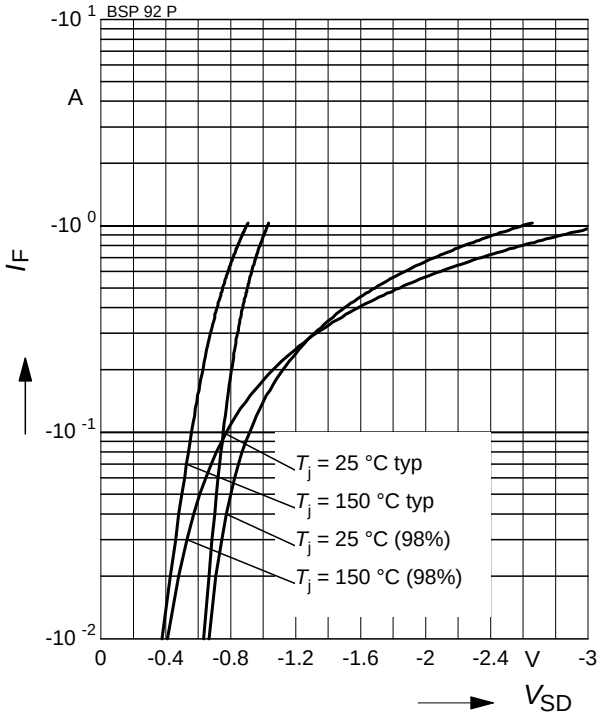
parameter: V_{GS}=0, f=1 MHz, T_j = 25 °C



12 Forward character. of reverse diode

$I_F = f(V_{SD})$

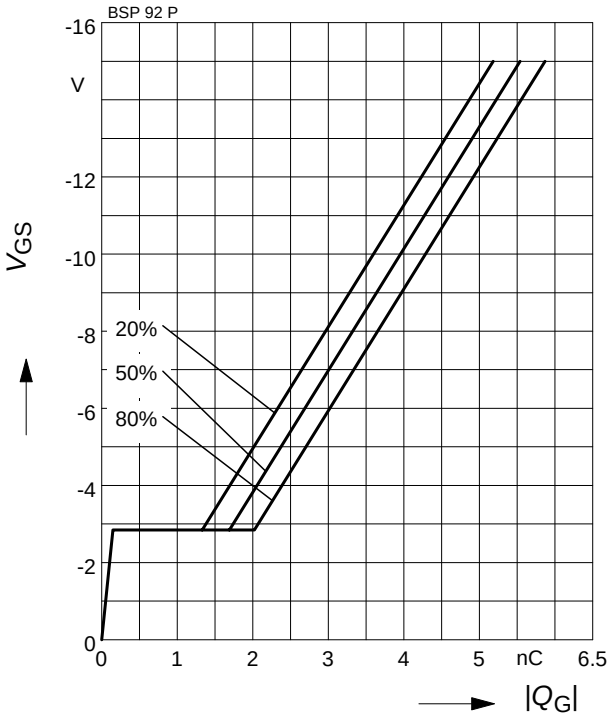
parameter: T_j



13 Typ. gate charge

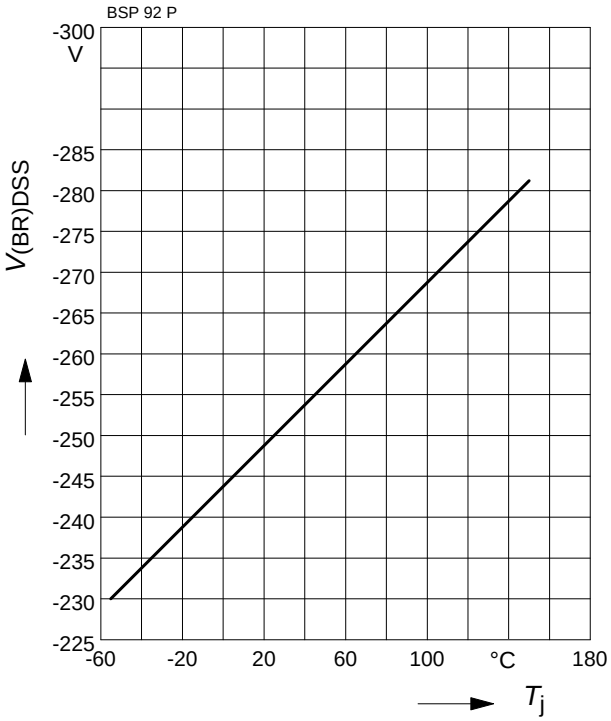
$V_{GS} = f\ (Q_{Gate})$

parameter: I_D = -0.26 A pulsed



14 Drain-source breakdown voltage

$V_{(BR)DSS} = f\ (T_j)$



Published by
Infineon Technologies AG,
Bereichs Kommunikation
St.-Martin-Strasse 53,
D-81541 München
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