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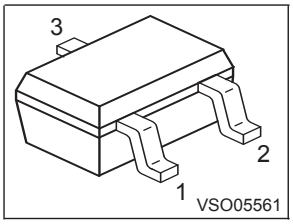
SIPMOS® Small-Signal-Transistor

Features

- P-Channel
- Enhancement mode
- Avalanche rated
- Logic Level
- d*v*/d*t* rated
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101
- Halogen-free according to IEC61249-2-21

Product Summary

Drain source voltage	V_{DS}	-60	V
Drain-source on-state resistance	$R_{DS(on)}$	8	Ω
Continuous drain current	I_D	-0.15	A



Type	Package	Tape and Reel	Marking	Pin 1	PIN 2	PIN 3
BSS84PW	PG-SOT-323	L6327:3000pcs/r.	YBs	G	S	D

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

Parameter	Symbol	Value	Unit
Continuous drain current T_A = 25 °C	I_D	-0.15	A
Pulsed drain current T_A = 25 °C	$I_{D\ puls}$	-0.6	
Avalanche energy, single pulse I_D = -0.15 A , V_{DD} = -25 V, R_{GS} = 25 Ω	E_{AS}	2.61	mJ
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	0.03	
Reverse diode d*v*/d*t* I_S = -0.15 A, V_{DS} = -48 V, d*i*/d*t* = 200 A/µs, T_{jmax} = 150 °C	d*v*/d*t*	6	kV/µs
Gate source voltage	V_{GS}	±20	V
Power dissipation T_A = 25 °C	P_{tot}	0.3	W
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 3)	R_{thJS}	-	-	110	K/W
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	-	420	
@ 6 cm^2 cooling area [1)]		-	-	350	

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 = -250 µA	$V_{(BR)DSS}$	-60	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D = -20 µA	$V_{GS(th)}$	-1	-1.5	-2	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS} = -60 V, V_{GS} = 0 V, T_j = 25 °C		-	-0.1	-1	
V_{DS} = -60 V, V_{GS} = 0 V, T_j = 125 °C		-	-10	-100	
Gate-source leakage current V_{GS} = -20 V, V_{DS} = 0 V	I_{GSS}	-	-10	-100	nA
Drain-source on-state resistance V_{GS} = -2.7 V, I_D = -0.01 A	$R_{DS(on)}$	-	10.5	25	Ω
Drain-source on-state resistance V_{GS} = -4.5 V, I_D = -0.12 A	$R_{DS(on)}$	-	6.9	12	
Drain-source on-state resistance V_{GS} = -10 V, I_D = -0.15 A	$R_{DS(on)}$	-	4.6	8	

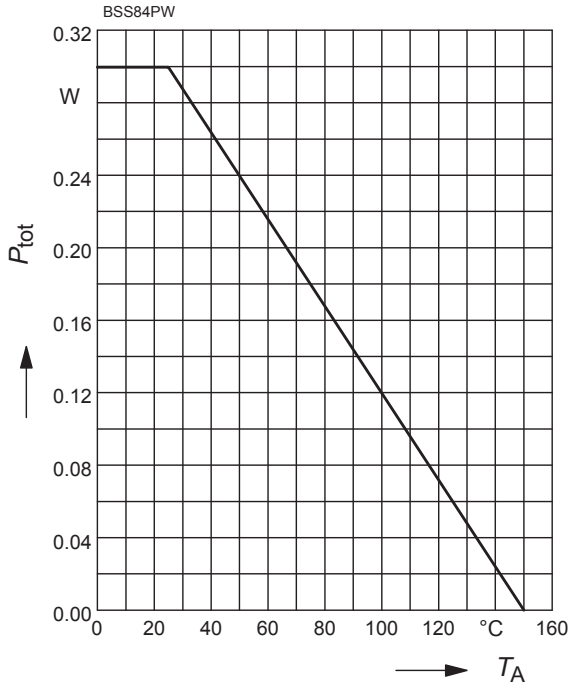
[1]Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical without blown air.

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

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Transconductance	g_{fs}	$V_{DS}\leq 2*I_D*R_{DS(on)max}$, I_D=0.15A	0.08	0.16	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz	-	15.3	19.1	pF
Output capacitance	C_{oss}		-	5.8	7.3	
Reverse transfer capacitance	C_{rss}		-	3	3.8	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-30V, V_{GS}=-4.5V, I_D=-0.12A, R_G=25Ω	-	6.7	10	ns
Rise time	t_r		-	16.2	24.3	
Turn-off delay time	$t_{d(off)}$		-	8.6	12.9	
Fall time	t_f		-	20.5	30.8	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=-48V, I_D=-0.15A	-	0.25	0.38	nC
Gate to drain charge	Q_{gd}		-	0.3	0.45	
Gate charge total	Q_g	V_{DD}=-48V, I_D=-0.15A, V_{GS}=0 to -10V	-	1	1.5	
Gate plateau voltage	$V_{(plateau)}$	V_{DD}=-48V, I_D=-0.15A	-	-3.4	-	V
Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C	-	-	-0.15	A
Inverse diode direct current, pulsed	I_{SM}		-	-	-0.6	
Inverse diode forward voltage	V_{SD}	V_{GS}=0V, I_F=-0.15A	-	-0.84	-1.12	V
Reverse recovery time	t_{rr}	V_R=-30V, I_F=I_S, di_F/dt=100A/µs	-	23.6	35.4	ns
Reverse recovery charge	Q_{rr}		-	11.6	17.4	nC

Power Dissipation

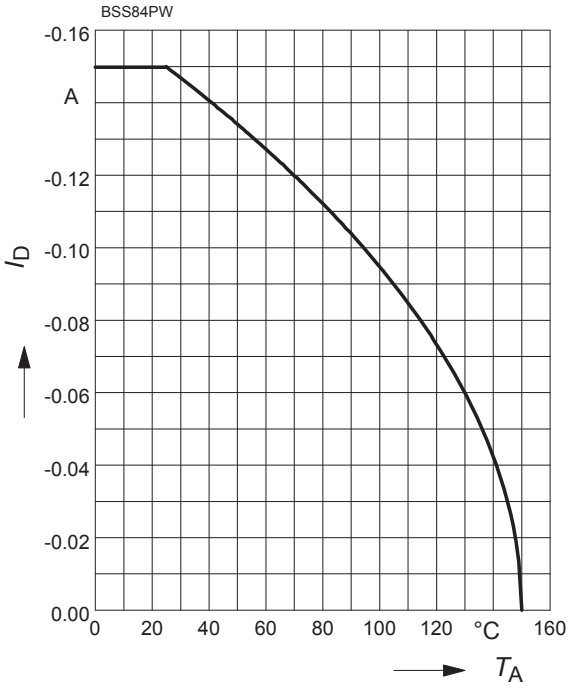
$P_{tot} = f(T_A)$



Drain current

$I_D = f(T_A)$

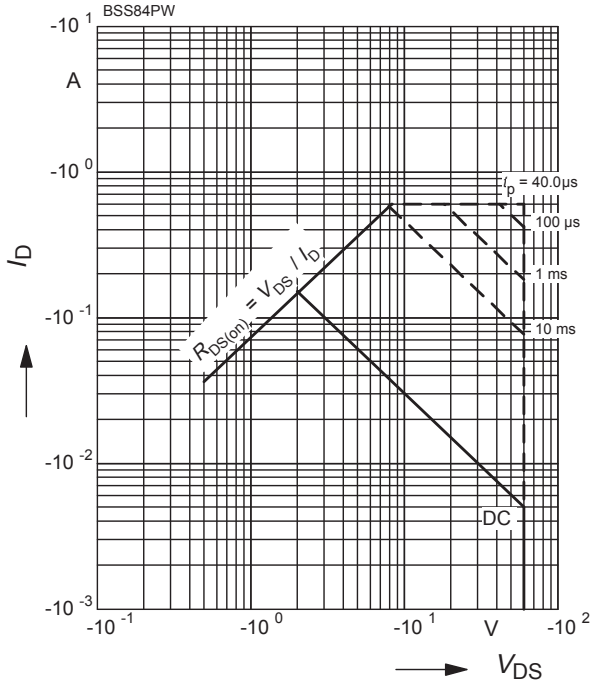
parameter: $V_{GS} \geq 10$ V



Safe operating area

$I_D = f(V_{DS})$

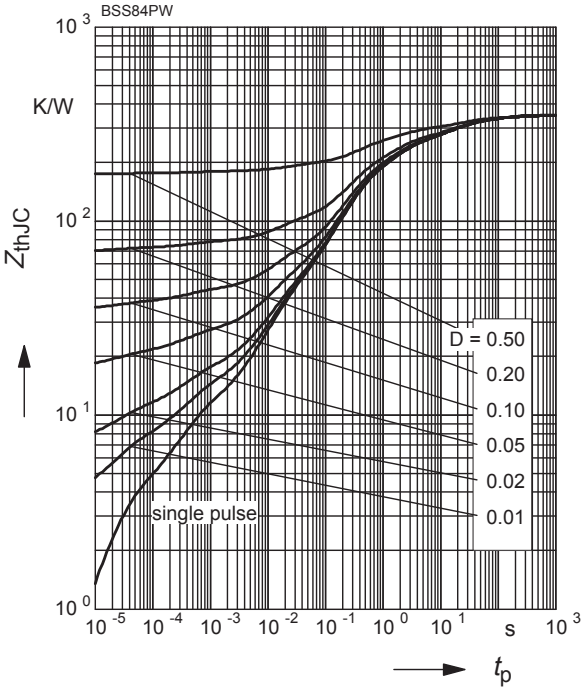
parameter : $D = 0$, $T_A = 25$ °C



Transient thermal impedance

$Z_{thJA} = f(t_p)$

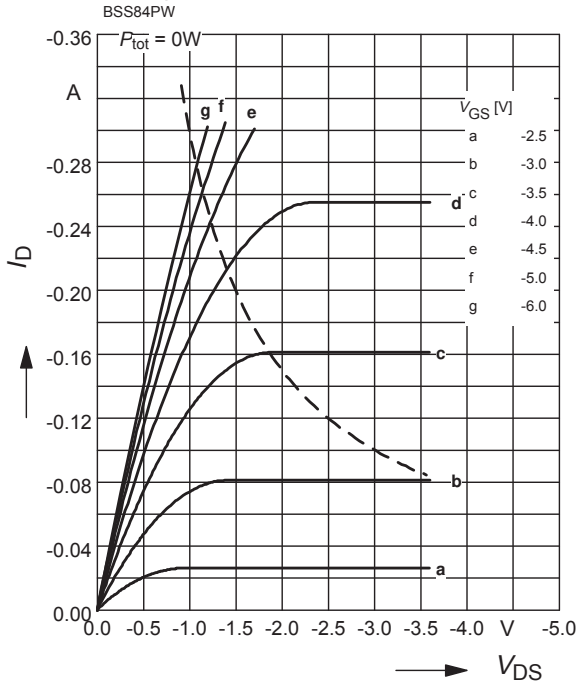
parameter : $D = t_p / T$



Typ. output characteristic

$I_D = f(V_{DS})$; T_j=25°C

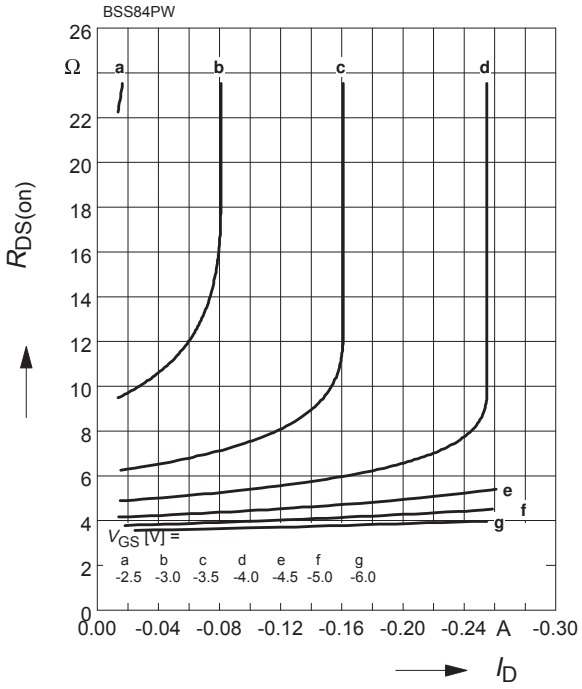
parameter: t_p = 80 µs



Typ. drain-source-on-resistance

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

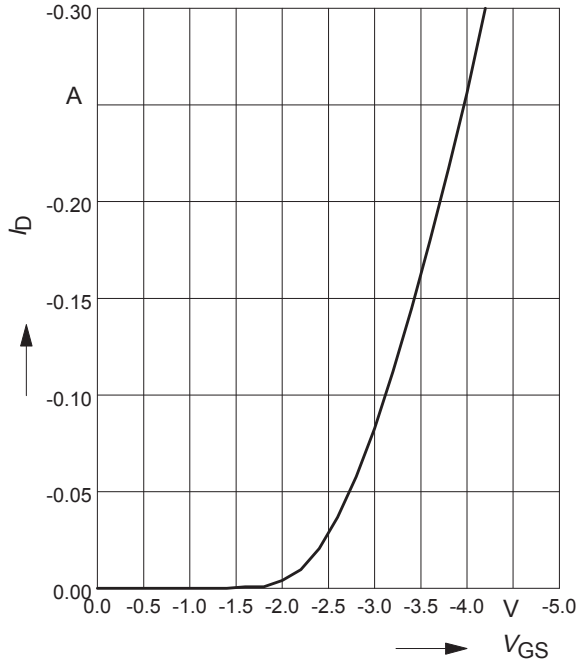
parameter: V_{GS}



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

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

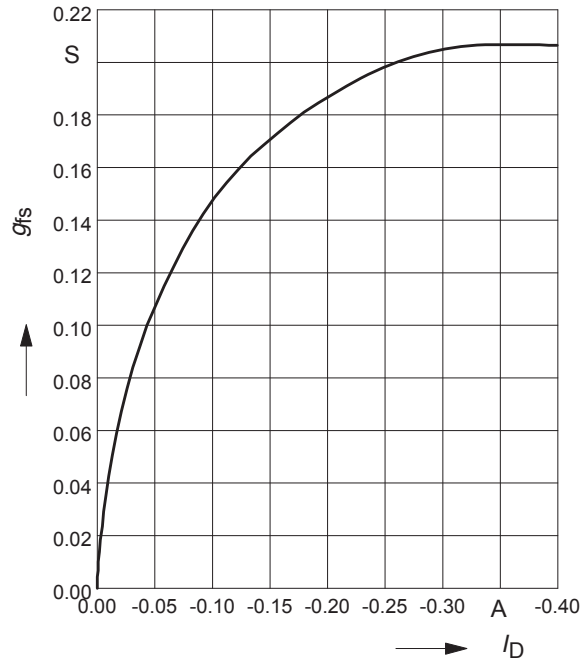
parameter: t_p = 80 µs



Typ. forward transconductance

g_{fs} = f(I_D); T_j=25°C

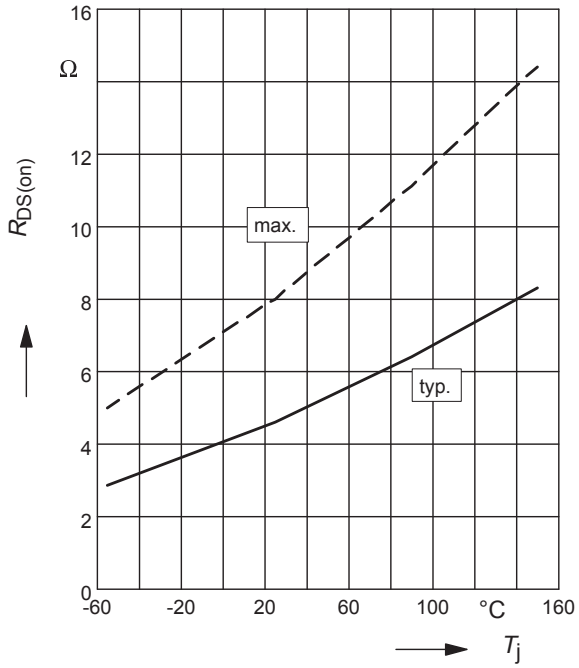
parameter: g_{fs}



Drain-source on-resistance

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

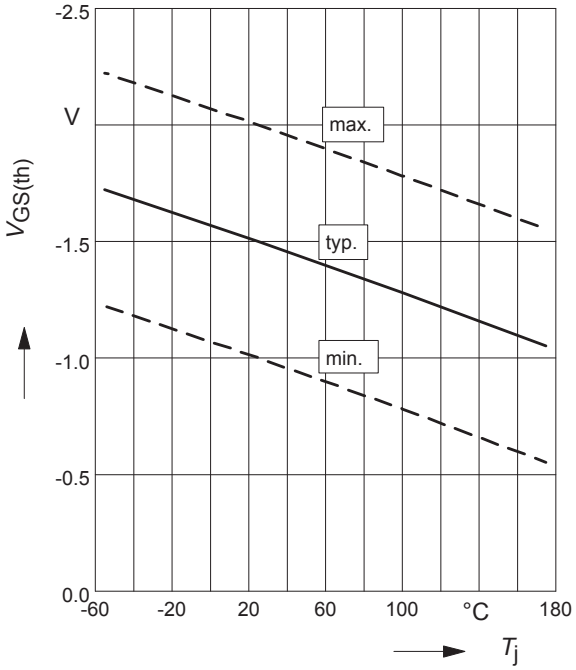
parameter: I_D = -0.17A, V_{GS} = -10 V



Gate threshold voltage

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

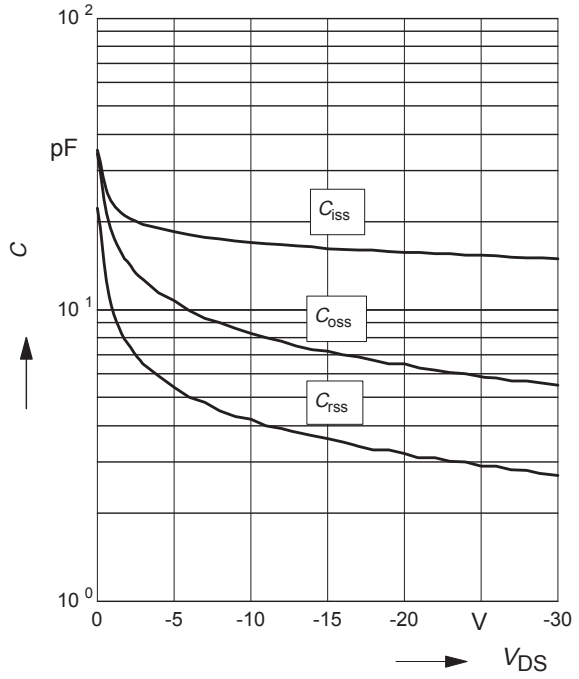
parameter: $V_{GS} = V_{DS}$, I_D = -20 µA



Typ. capacitances

C = f(VDS)

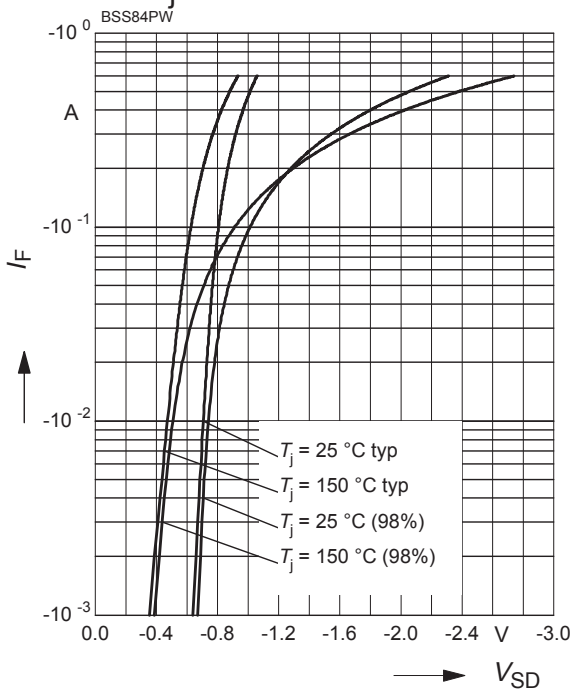
Parameter: V_{GS}=0 V, f=1 MHz



Forward characteristics of reverse diode

$I_F = f(V_{SD})$

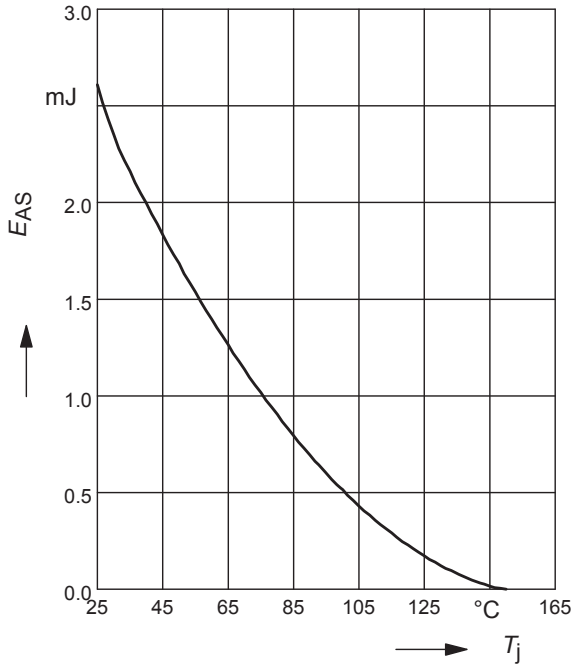
parameter: T_j , tp = 80 µs



Avalanche energy

$E_{AS} = f(T_j)$

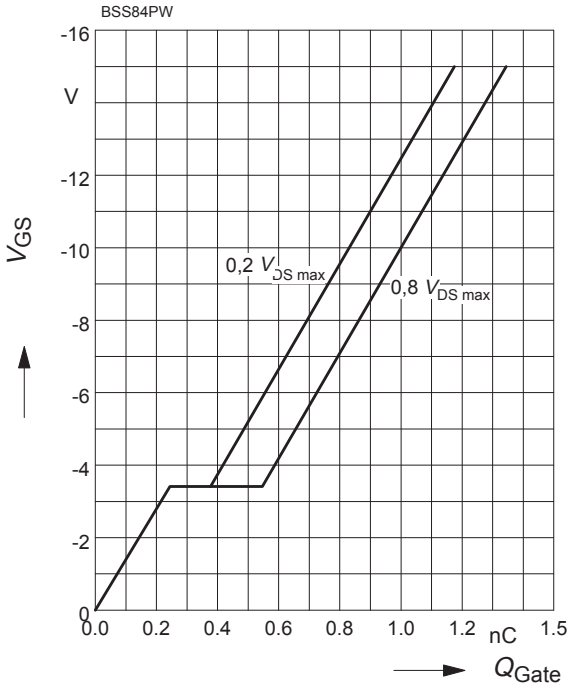
par.: I_D = -0.15 A , V_{DD} = -25 V, R_{GS} = 25 Ω



Typ. gate charge

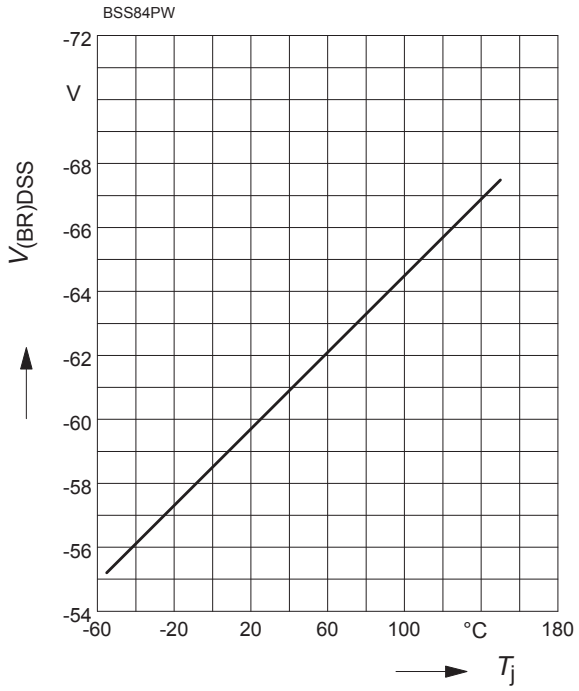
$V_{GS} = f\ (Q_{Gate})$

parameter: I_D = -0.15 A pulsed



Drain-source breakdown voltage

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



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