



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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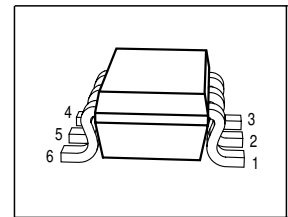
OptiMOS®-P Small-Signal-Transistor Feature

- P-Channel
- Enhancement mode
- Super Logic Level (2.5 V rated)
- 150°C operating temperature
- Avalanche rated
- dv/dt rated
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101
- Halogen free according to IEC 61249-2-21

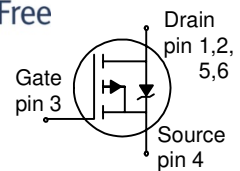
Product Summary

V_{DS}	-20	V
$R_{DS(on)}$	67	mΩ
I_D	-4.7	A

P-TSOP6-6



Halogen-Free



Type	Package	Tape and reel	Marking
BSL211SP	P-TSOP6-6	H6327: 3000pcs/r.	sPB

Maximum Ratings, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current $T_A=25\text{ °C}$ $T_A=70\text{ °C}$	I_D	-4.7 -3.8	A
Pulsed drain current $T_A=25\text{ °C}$	$I_D \text{ puls}$	-18.8	
Avalanche energy, single pulse $I_D=-4.7\text{ A}$, $V_{DD}=-10\text{ V}$, $R_{GS}=25\text{ }\Omega$	E_{AS}	26	mJ
Reverse diode dv/dt $I_S=-4.7\text{ A}$, $V_{DS}=-16\text{ V}$, $di/dt=200\text{ A}/\mu\text{s}$, $T_{jmax}=150\text{ °C}$	dv/dt	-6	kV/ μs
Gate source voltage	V_{GS}	± 12	V
Power dissipation $T_A=25\text{ °C}$	P_{tot}	2	W
Operating and storage temperature	T_j, T_{stg}	-55... +150	°C
IEC climatic category; DIN IEC 68-1		55/150/56	
ESD Class JESD22-A114-HBM		Class 0	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point	R_{thJS}	-	-	50	K/W
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	-	230	
@ 6 cm ² cooling area ¹⁾		-	-	62.5	

Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage $V_{GS}=0V, I_D=-250\mu A$	$V_{(BR)DSS}$	-20	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D=-25\mu A$	$V_{GS(th)}$	-0.6	-0.9	-1.2	
Zero gate voltage drain current $V_{DS}=-20V, V_{GS}=0, T_j=25^\circ C$ $V_{DS}=-20V, V_{GS}=0, T_j=150^\circ C$	I_{DSS}	-	-0.1	-1	μA
Gate-source leakage current $V_{GS}=-12V, V_{DS}=0$	I_{GSS}	-	-10	-100	
Drain-source on-state resistance $V_{GS}=-2.5V, I_D=-3.7A$	$R_{DS(on)}$	-	94	110	m Ω
Drain-source on-state resistance $V_{GS}=-4.5, I_D=-4.7A$	$R_{DS(on)}$	-	54	67	

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; $t \leq 5$ sec.

Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, 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}$ $I_D = -3.8\text{A}$	6.2	12.4	-	S
Input capacitance	C_{iss}	$V_{GS} = 0, V_{DS} = -15\text{V},$ $f = 1\text{MHz}$	-	654	-	pF
Output capacitance	C_{oss}		-	241	-	
Reverse transfer capacitance	C_{rss}		-	197	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -10\text{V}, V_{GS} = -4.5\text{V},$ $I_D = -1\text{A}, R_G = 6\Omega$	-	8.7	13	ns
Rise time	t_r		-	13.9	21	
Turn-off delay time	$t_{d(off)}$		-	25	37.3	
Fall time	t_f		-	23.3	35	

Gate Charge Characteristics

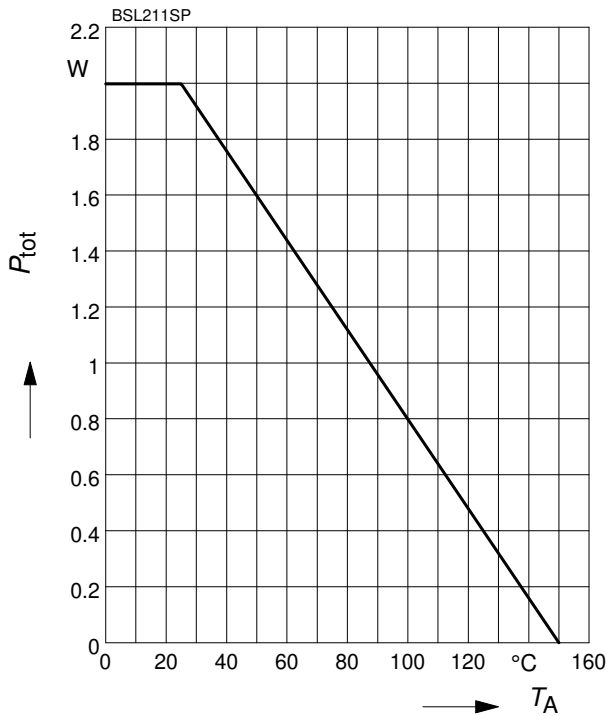
Gate to source charge	Q_{gs}	$V_{DD} = -10\text{V}, I_D = -4.7\text{A}$	-	-1.3	-2	nC
Gate to drain charge	Q_{gd}		-	-4.7	-7	
Gate charge total	Q_g	$V_{DD} = -10\text{V}, I_D = -4.7\text{A},$ $V_{GS} = 0 \text{ to } -4.5\text{V}$	-	-8.3	-12.4	
Gate plateau voltage	$V_{(plateau)}$	$V_{DD} = -10\text{V}, I_D = -4.7\text{A}$	-	-2	-	V

Reverse Diode

Inverse diode continuous forward current	I_S	$T_A = 25\text{ }^\circ\text{C}$	-	-	-2	A
Inverse diode direct current, pulsed	I_{SM}		-	-	-18.8	
Inverse diode forward voltage	V_{SD}	$V_{GS} = 0, I_F = I_D $	-	-0.94	-1.4	V
Reverse recovery time	t_{rr}	$V_R = -10\text{V}, I_F = I_D ,$ $di_F/dt = 100\text{A}/\mu\text{s}$	-	20.6	25.8	ns
Reverse recovery charge	Q_{rr}		-	6.3	7.9	

1 Power dissipation

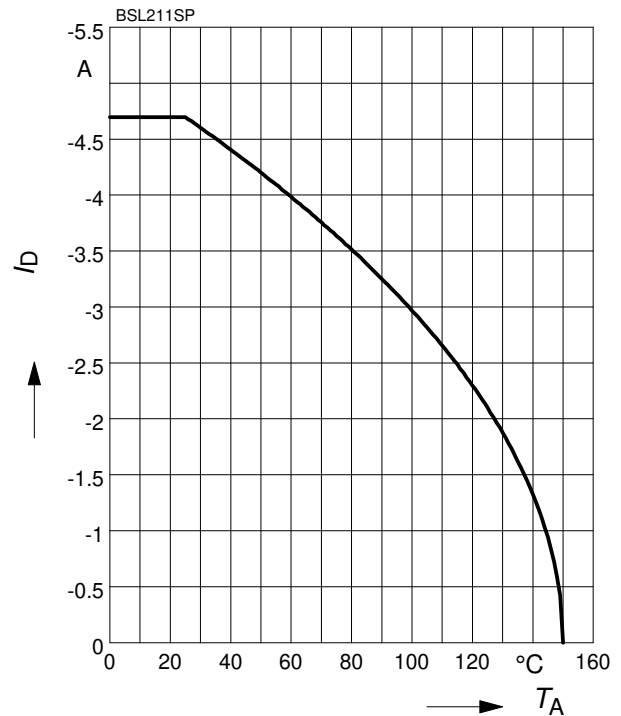
$$P_{tot} = f(T_A)$$



2 Drain current

$$I_D = f(T_A)$$

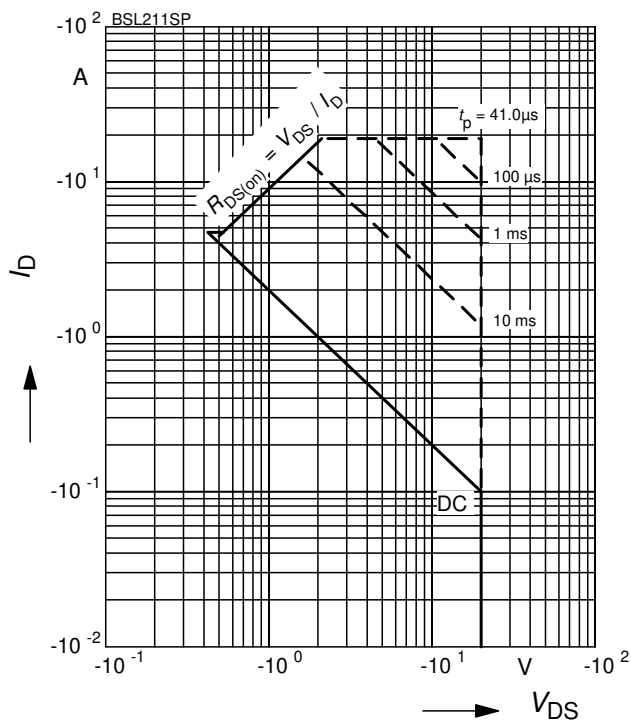
parameter: $|V_{GS}| \geq 4.5 \text{ V}$



3 Safe operating area

$$I_D = f(V_{DS})$$

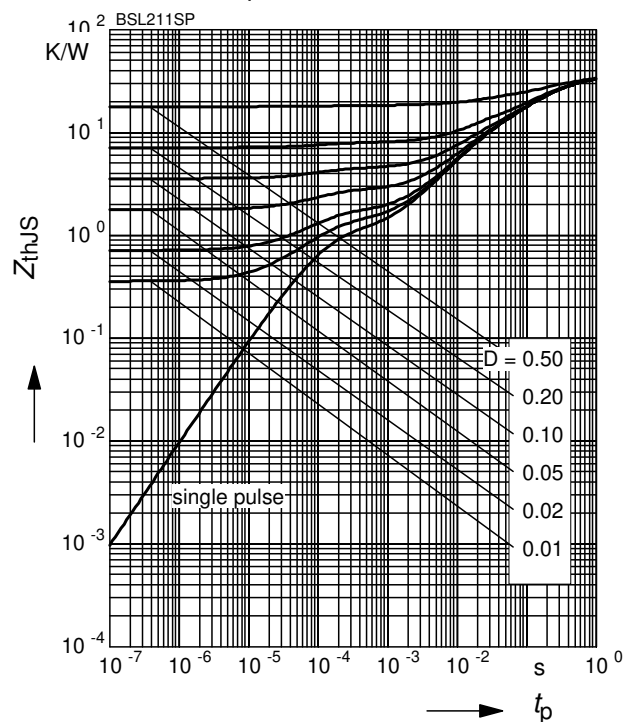
parameter: $D = 0, T_A = 25 \text{ °C}$



4 Transient thermal impedance

$$Z_{thJS} = f(t_p)$$

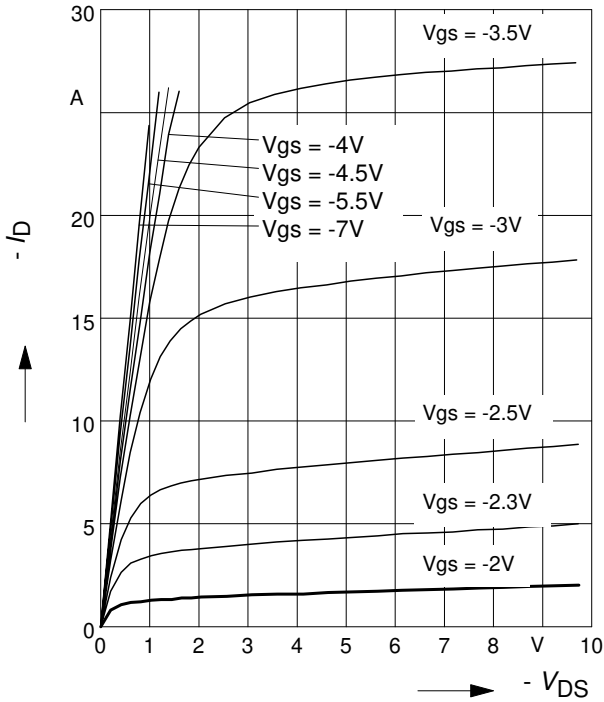
parameter: $D = t_p/T$



5 Typ. output characteristic

$I_D = f(V_{DS}); T_j = 25^\circ\text{C}$

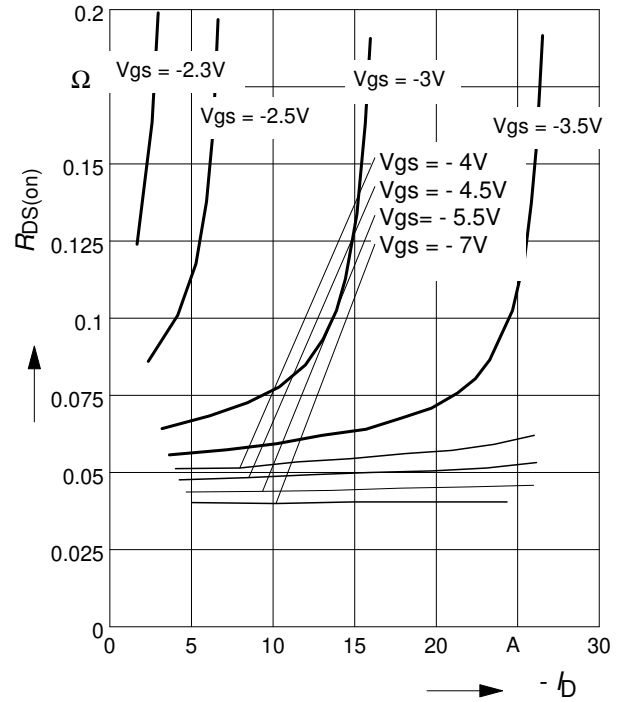
parameter: $t_p = 80 \mu\text{s}$



6 Typ. drain-source on resistance

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

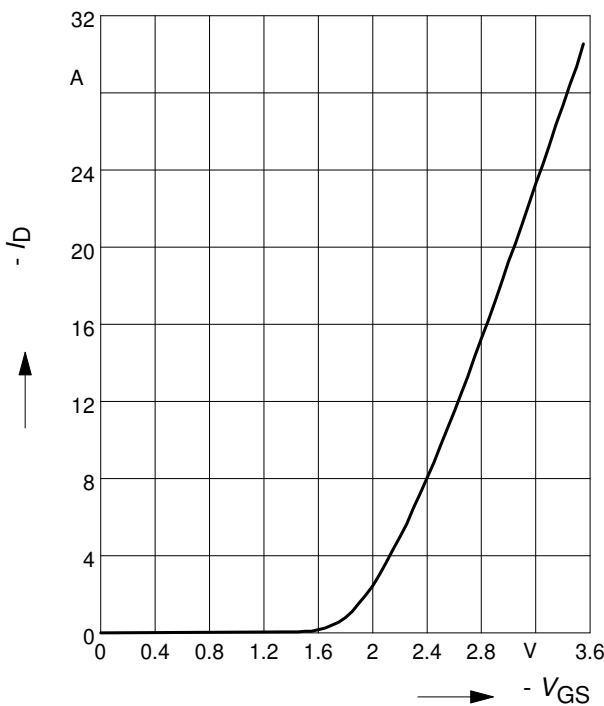
parameter: V_{GS}



7 Typ. transfer characteristics

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

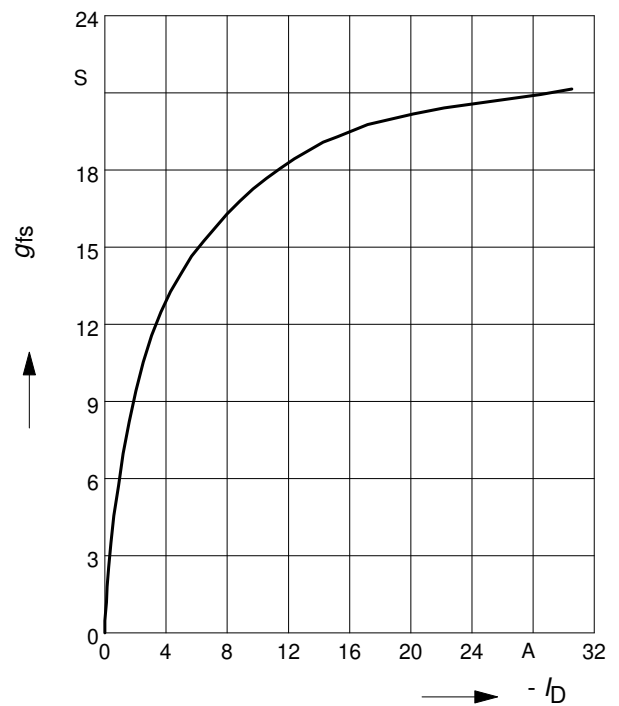
parameter: $t_p = 80 \mu\text{s}$



8 Typ. forward transconductance

$g_{fs} = f(I_D); T_j = 25^\circ\text{C}$

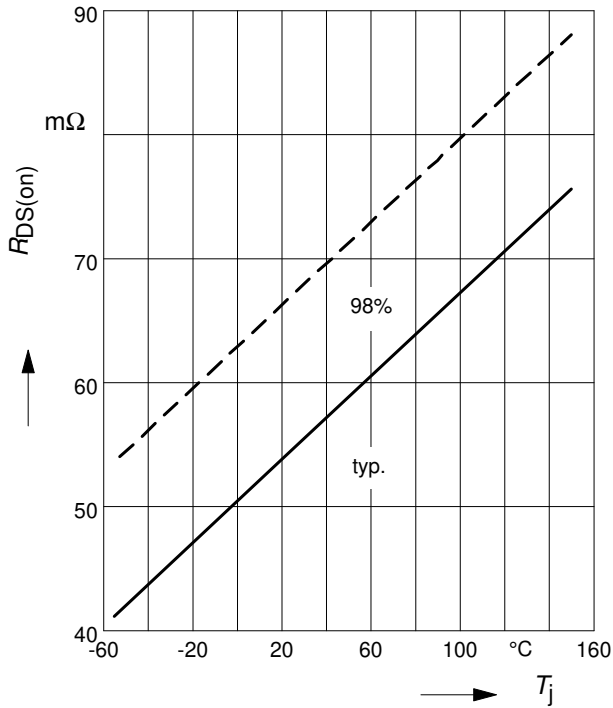
parameter: $t_p = 80 \mu\text{s}$



9 Drain-source on-resistance

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

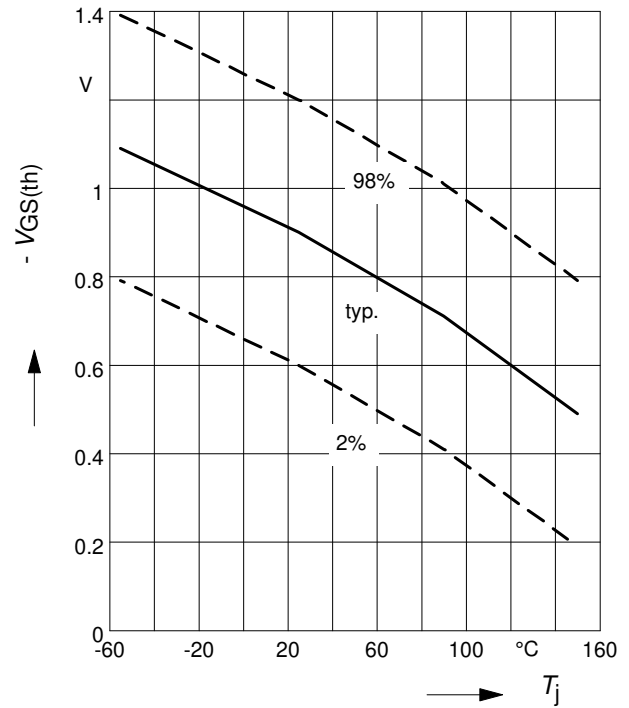
parameter: $I_D = -4.7 \text{ A}$, $V_{GS} = -4.5 \text{ V}$



10 Gate threshold voltage

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

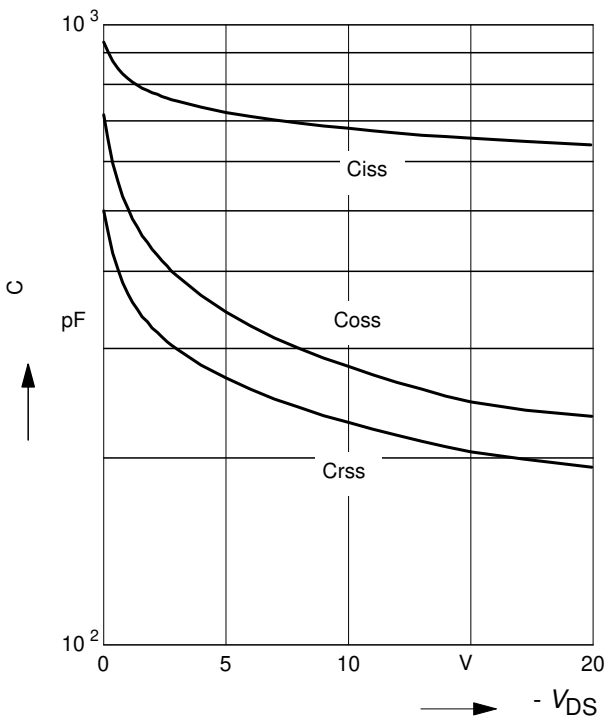
parameter: $V_{GS} = V_{DS}$, $I_D = -25 \mu\text{A}$



11 Typ. capacitances

$$C = f(V_{DS})$$

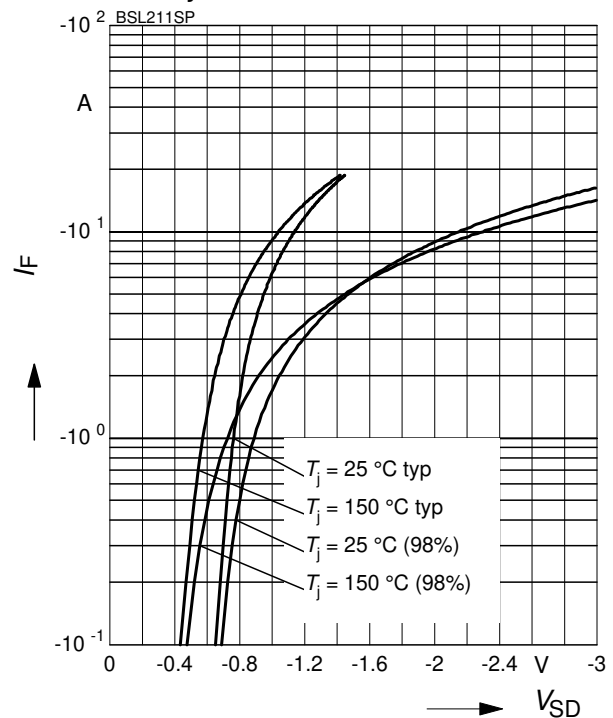
parameter: $V_{GS}=0$, $f=1 \text{ MHz}$



12 Forward character. of reverse diode

$$I_F = f(V_{SD})$$

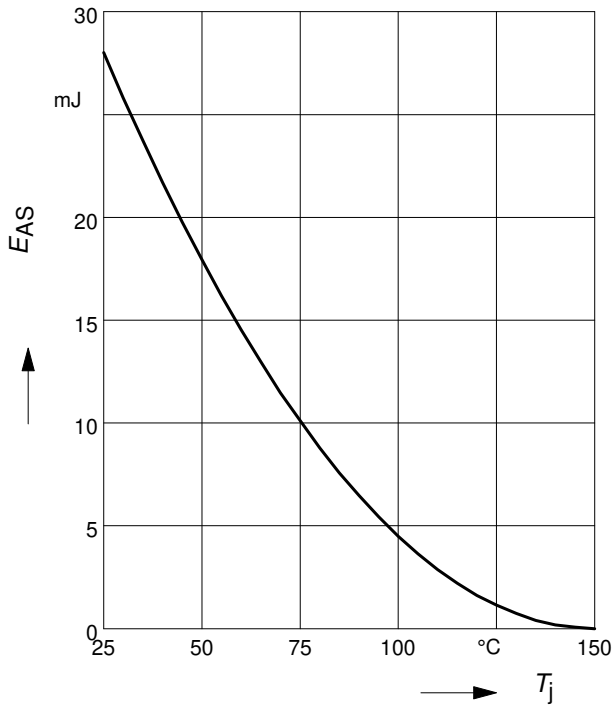
parameter: T_j , $t_p = 80 \mu\text{s}$



13 Typ. avalanche energy

$E_{AS} = f(T_j)$, par.: $I_D = -4.7\text{ A}$

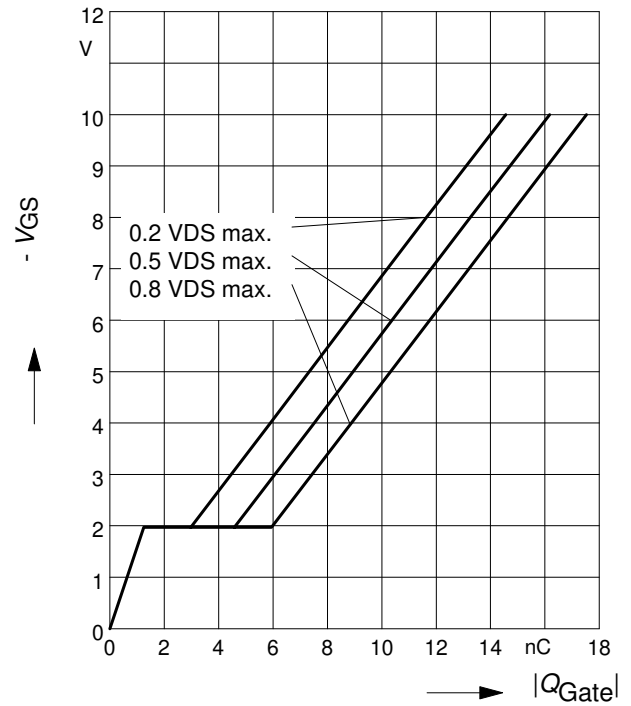
$V_{DD} = -10\text{ V}$, $R_{GS} = 25\ \Omega$



14 Typ. gate charge

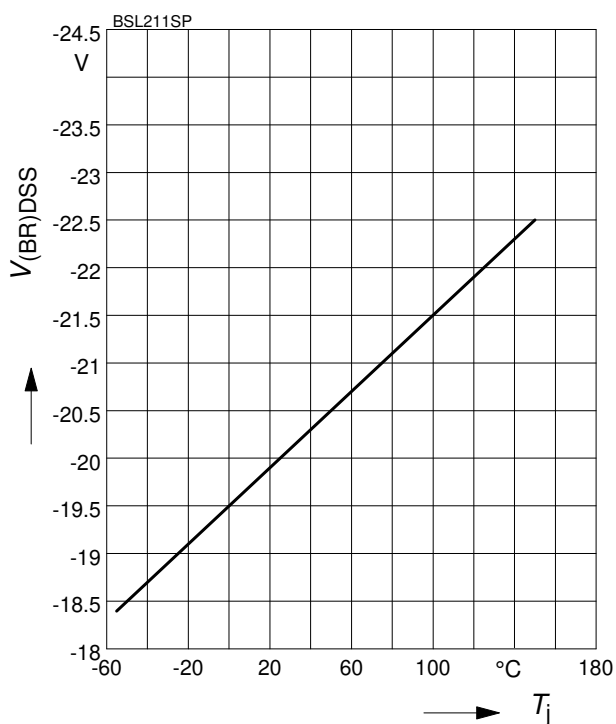
$|V_{GS}| = f(Q_{Gate})$

parameter: $I_D = -4.7\text{ A}$ pulsed



15 Drain-source breakdown voltage

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



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