SIPMOS® Small-Signal-Transistor

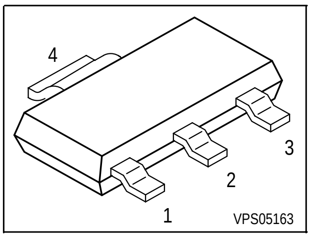
Features

- 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	$R_{DS(on)}$	0.8	Ω
Continuous drain current	I_D	-1.17	A

Pin 1	Pin2/4	PIN 3
G	D	S



Type	Package	Tape and Reel Information	Marking	Packaging
BSP315P	PG-SOT223	H6327: 1000 pcs/reel	BSP315P	Non dry

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

Parameter	Symbol	Value	Unit
Continuous drain current T_A = 25 °C T_A = 70 °C	I_D	 -1.17 -0.94	A
Pulsed drain current T_A = 25 °C	$I_{D\ puls}$	-4.68	
Avalanche energy, single pulse I_D = -1.17 A , V_{DD} = -25 V, R_{GS} = 25 Ω	E_{AS}	24	mJ
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	0.18	
Reverse diode d*v*/d*t* I_S = -1.17 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}	1.8	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 (Pin 4)	R_{thJS}	-	-	25	K/W
SMD version, device on PCB:	R_{thJA}				K/W
@ min. footprint		-	-	115	
@ 6 cm^2 cooling area [1]		-	-	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 V, I_D = -250 µA	$V_{(BR)DSS}$	-60	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D = -160 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} = -4.5 V, I_D = -0.89 A	$R_{DS(on)}$	-	0.8	1.4	Ω
Drain-Source on-state resistance V_{GS} = -10 V, I_D = -1.17 A	$R_{DS(on)}$	-	0.5	0.8	Ω

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[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	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \leq 2 * I_D * R_{DS(on)max}$, I_D = -0.89 A	g_{fs}	0.7	1.4	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	C_{iss}	-	130	160	pF
Output capacitance V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	C_{oss}	-	40	50	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	C_{rss}	-	17	21	
Turn-on delay time V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -0.89 A, R_G = 18 Ω	$t_{d(on)}$	-	24	36	ns
Rise time V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -0.89 A, R_G = 18 Ω	t_r	-	9	14	
Turn-off delay time V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -0.89 A, R_G = 18 Ω	$t_{d(off)}$	-	32	48	
Fall time V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -0.89 A, R_G = 18 Ω	t_f	-	19	28	

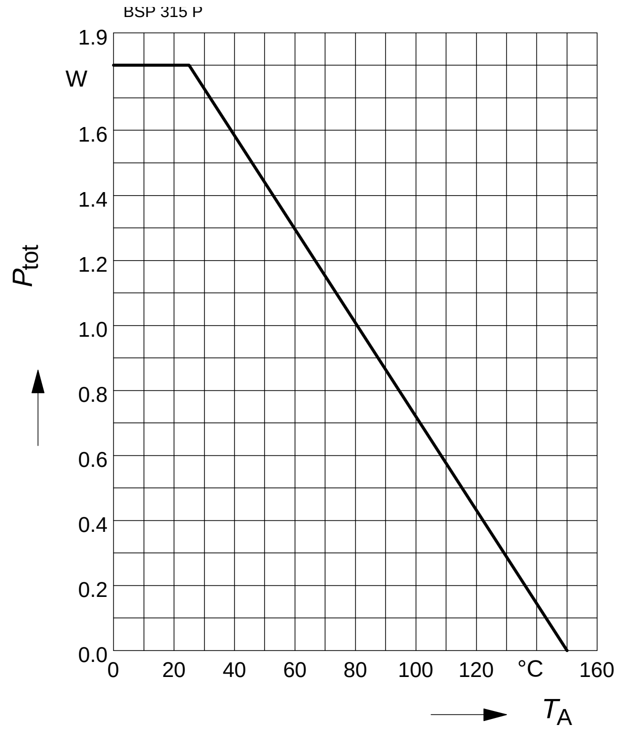
Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Gate to source charge V_{DD} = -48 V, I_D = -1.17 A	Q_{gs}	-	0.7	1.1	nC
Gate to drain charge V_{DD} = -48 V, I_D = -1.17 A	Q_{gd}	-	1.8	2.6	
Gate charge total V_{DD} = -48 V, I_D = -1.17 A, V_{GS} = 0 to -10 V	Q_g	-	5.2	7.8	
Gate plateau voltage V_{DD} = -48 V, I_D = -1.17 A	$V_{(plateau)}$	-	-3.14	-	V

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Inverse diode continuous forward current T_A = 25 °C	I_S	-	-	-1.17	A
Inverse diode direct current,pulsed T_A = 25 °C	I_{SM}	-	-	-4.68	
Inverse diode forward voltage V_{GS} = 0 V, I_F = -1.17 A	V_{SD}	-	-0.97	-1.3	V
Reverse recovery time V_R = -30 V, I_F=I_S , di_F/dt = 100 A/µs	t_{rr}	-	30.5	46	ns
Reverse recovery charge V_R = -30 V, I_F=I_S , di_F/dt = 100 A/µs	Q_{rr}	-	36	54	µC

Power Dissipation

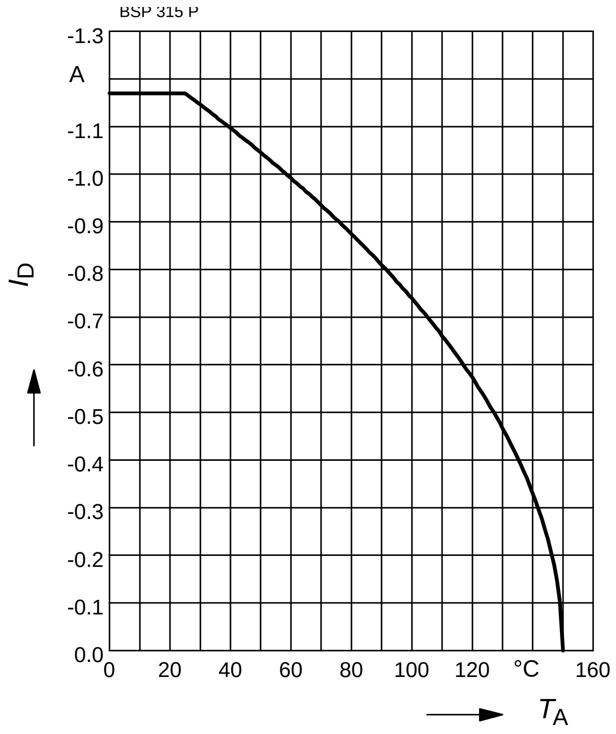
$P_{tot} = f\,(T_A)$



Drain current

$I_D = f(T_A)$

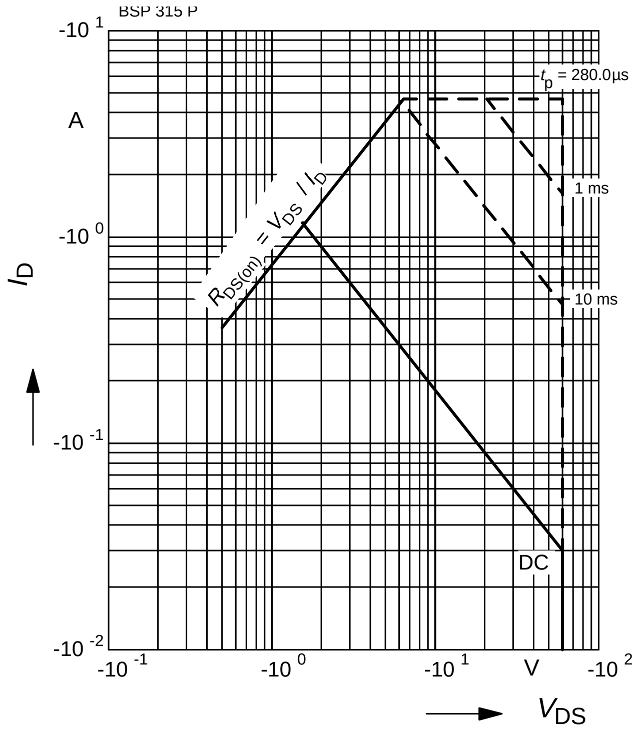
parameter : $V_{GS} \geq -10V$



Safe operating area

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

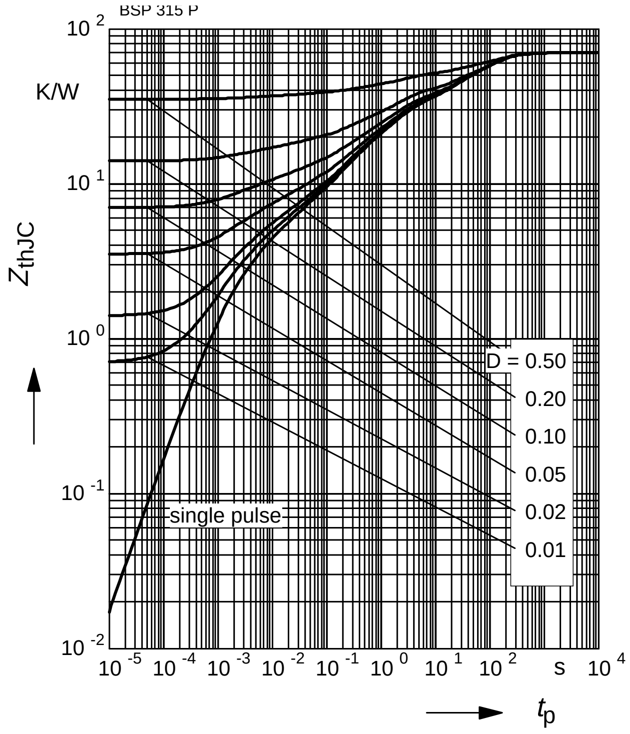
parameter : $D = 0\ ,\ T_A = 25\ °C$



Transient thermal impedance

$Z_{thJC} = f\,(t_p)$

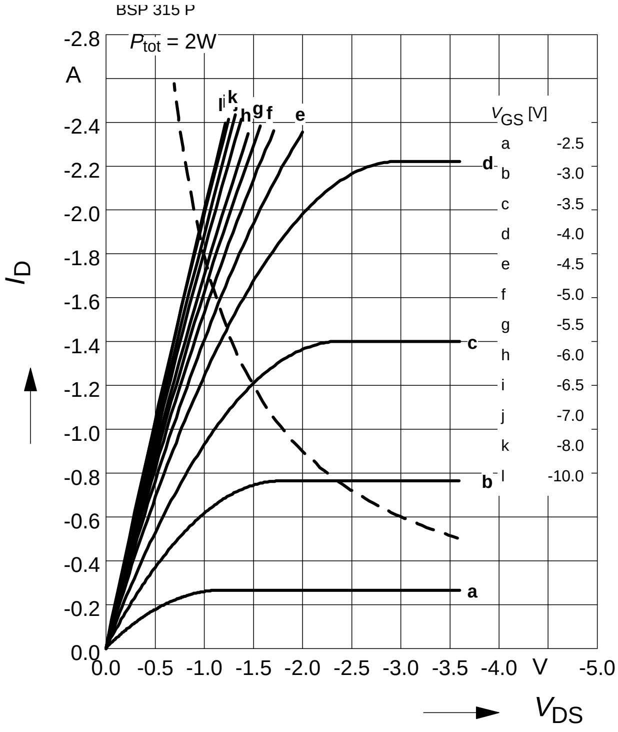
parameter : $D = t_p / T$



Typ. output characteristics

$I_D = f(V_{DS})$

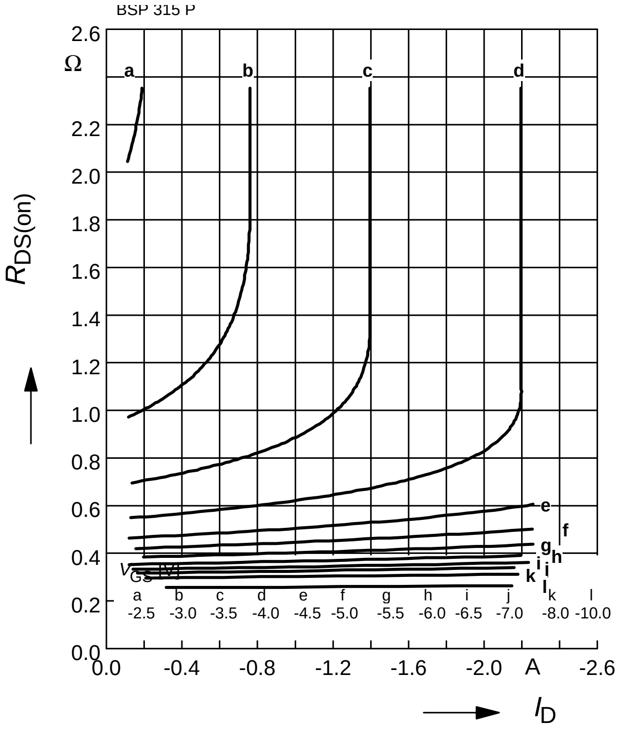
parameter: t_p = 80 µs



Typ. drain-source-on-resistance

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

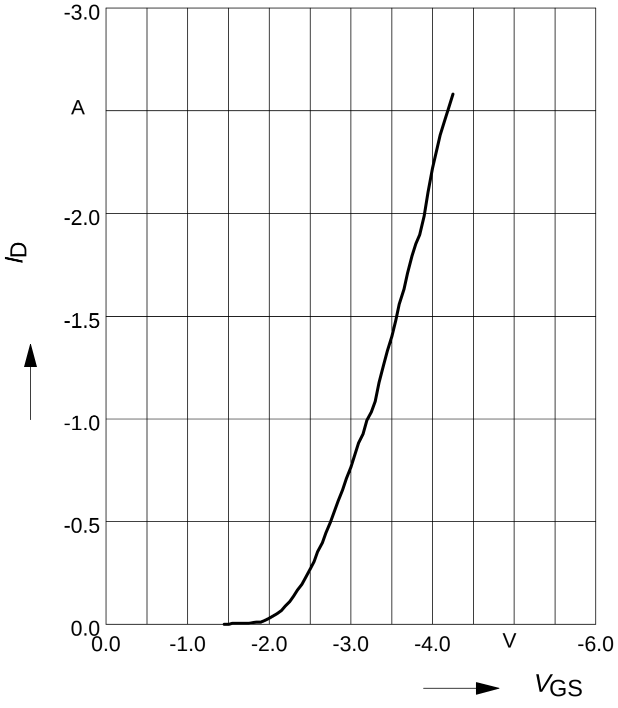
parameter: V_{GS}



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

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

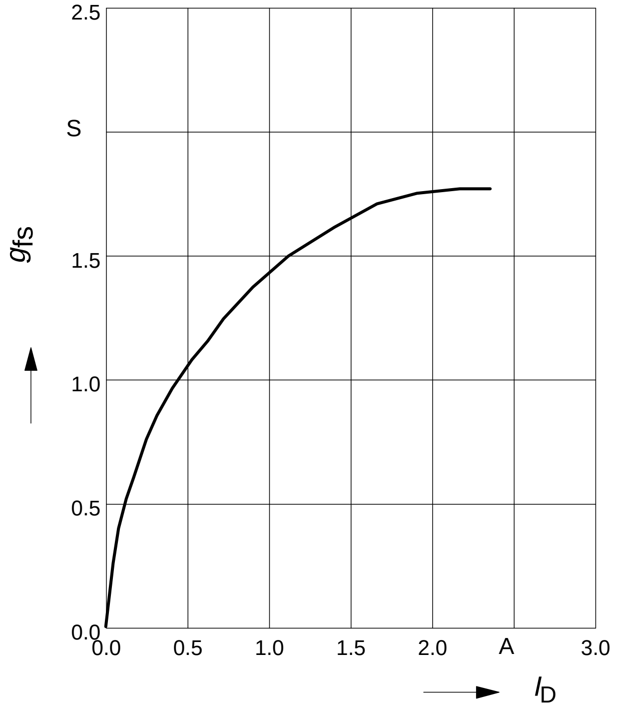
parameter: t_p = 80 µs



Typ. forward transconductance

$g_{fs} = f(I_D)$; T_j=25°C

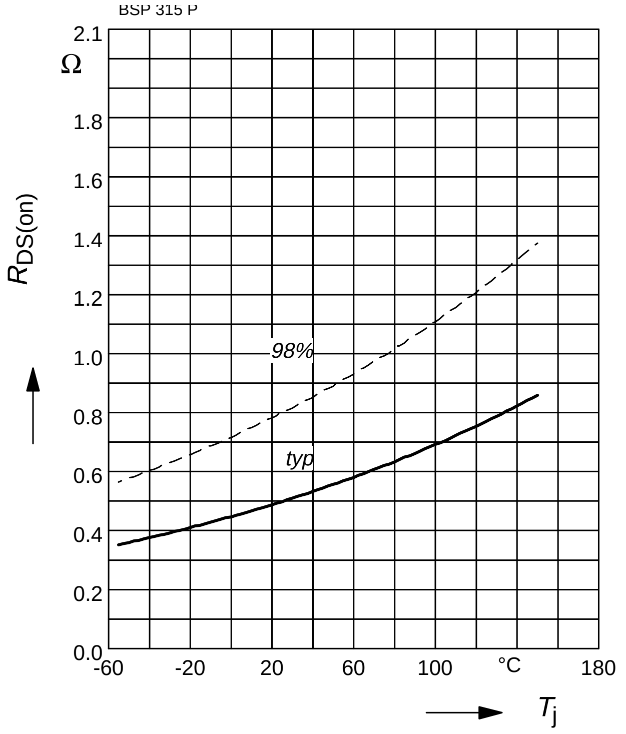
parameter: g_{fs}



Drain-source on-resistance

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

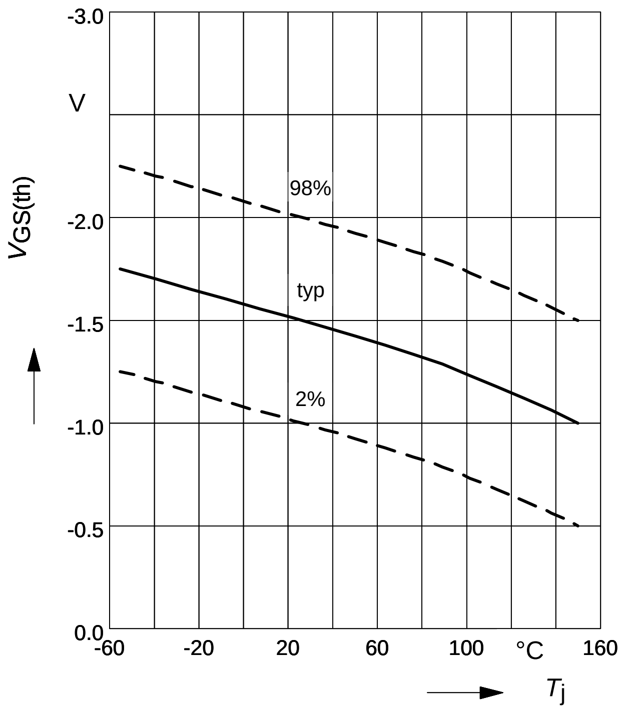
parameter: I_D = -1.17 A, V_{GS} = -10 V



Gate threshold voltage

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

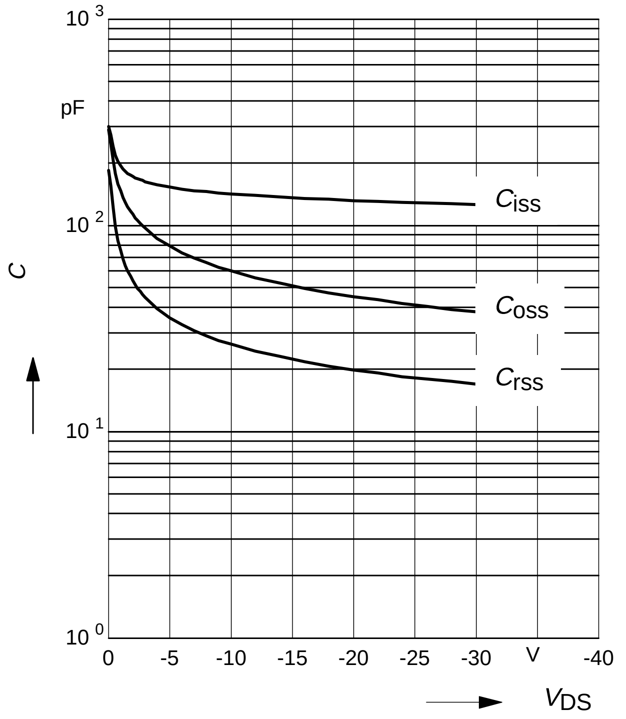
parameter: $V_{GS} = V_{DS}$, I_D = -160 µA



Typ. capacitances

$C = f(V_{DS})$

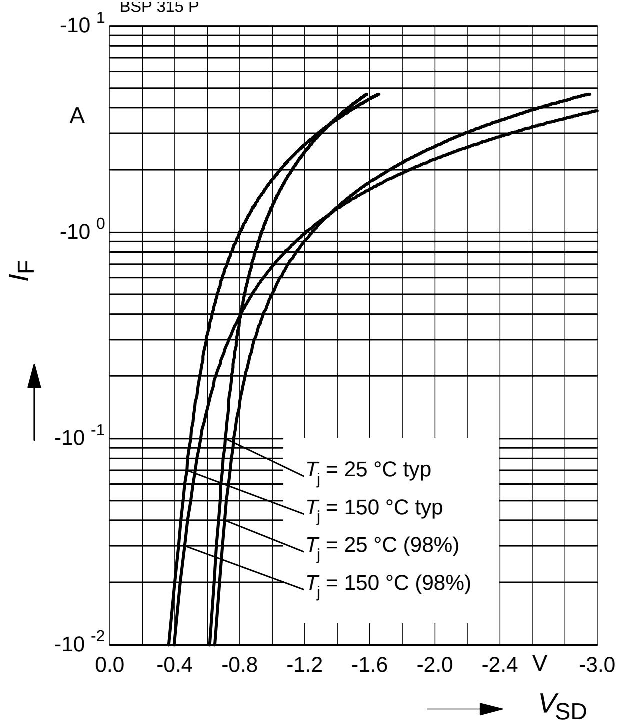
Parameter: V_{GS}=0 V, f=1 MHz



Forward characteristics of reverse diode

$I_F = f(V_{SD})$

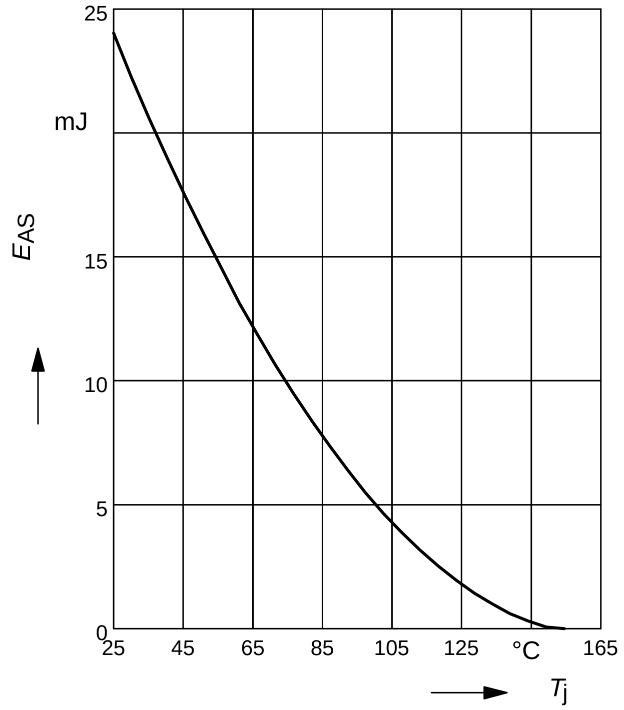
parameter: T_j , t_p = 80 µs



Avalanche Energy $E_{AS} = f(T_j)$

parameter: I_D = -1.17 A , V_{DD} = -25 V

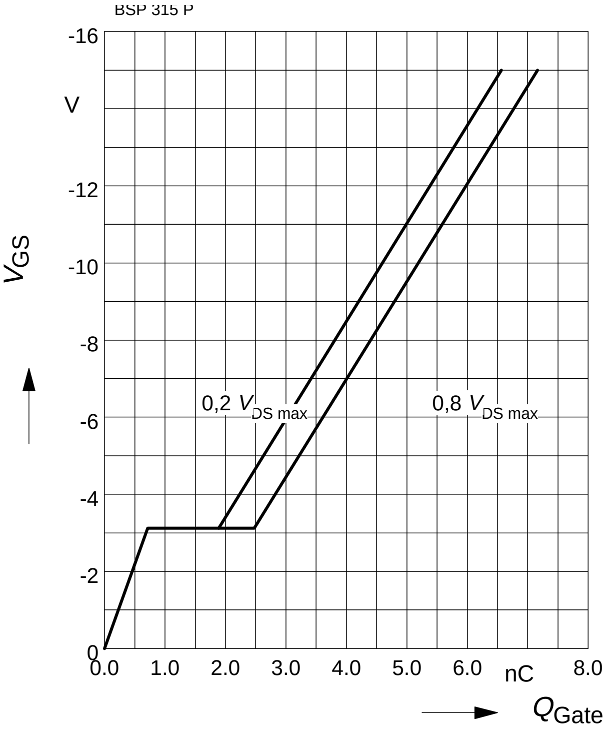
R_{GS} = 25 Ω



Typ. gate charge

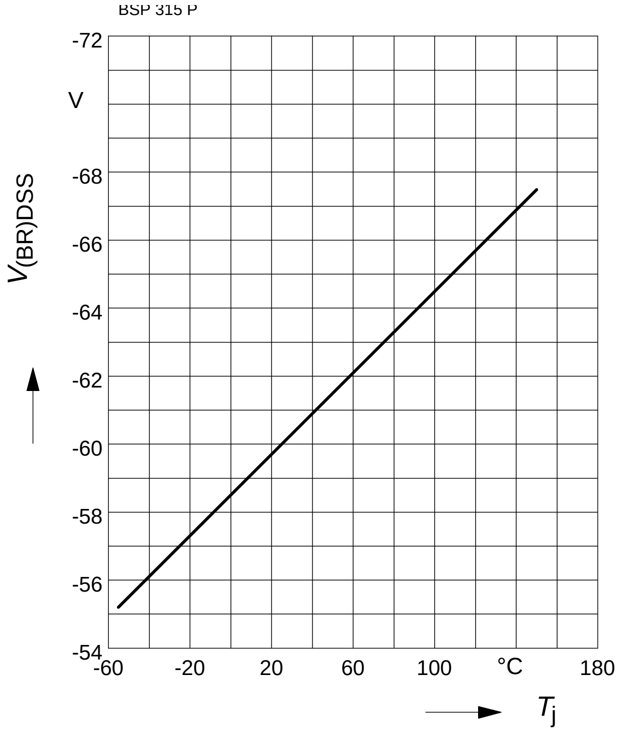
$V_{GS} = f(Q_{Gate})$

parameter: I_D = -1.17 A pulsed



Drain-source breakdown voltage

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



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- Консультации по применению компонента;
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

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