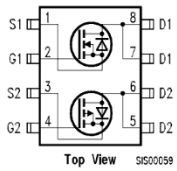
英飞凌SIPMOS®小信号晶体管

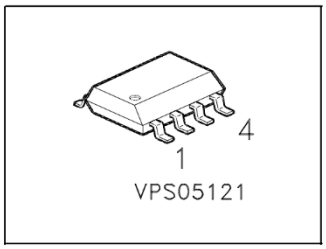
产品概述

		N	P	
Drain source voltage	V_{DS}	60	-60	V
Drain-Source on-state resistance	$R_{DS(on)}$	0.11	0.3	Ω
Continuous drain current	I_D	3.1	-2	A

特性

- 双 N 沟道和 P 沟道
- 增强模式
- 逻辑电平
- 雪崩额定
- 无铅镀层；符合 RoHS 标准





Type	Package	Marking
BSO 615 C	PG-DSO-8	615C

除非另有规定，否则均为 T_j =25 °C的**最大额定值。**

Parameter	Symbol	Value		Unit
		N	P	
Continuous drain current	I_D			A
T_A = 25 °C		3.1	-2	
T_A = 70 °C		2.5	-1.6	
Pulsed drain current	$I_{D\ puls}$	12.4	-8	
T_A = 25 °C				
Avalanche energy, single pulse	E_{AS}			mJ
I_D = 3.1 A, V_{DD} = 25 V, R_{GS} = 25 Ω		47	-	
I_D = -2 A, V_{DD} = -25 V, R_{GS} = 25 Ω		-	70	
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	0.2	0.2	
Reverse diode dv/dt, T_{jmax} = 150 °C	dv/dt			kV/µs
I_S = 3.1 A, V_{DS} = 48 V, di/dt = 200 A/µs		6	-	
I_S = -2 A, V_{DS} = -48 V, di/dt = -200 A/µs		-	6	
Gate source voltage	V_{GS}	±20	±20	V
Power dissipation	P_{tot}	2	2	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		

本数据手册的原文使用英文撰写。为方便起见，英飞凌提供了译文；由于翻译过程中可能使用了自动化工具，英飞凌不保证译文的准确性。为确认准确性，请务必访问 infineon.com 参考最新的英文版本（控制文档）。

Thermal Characteristics

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Thermal resistance, junction - soldering point	N	R_{thJS}	-	-	40	K/W
(Pin 4)	P		-	-	40	
SMD version, device on PCB:		R_{thJA}				
@ min. footprint; t ≤ 10 sec.	N		-	-	110	
@ 6 cm² cooling area [1]; t ≤ 10 sec.	N		-	-	62.5	
@ min. footprint; t ≤ 10 sec.	P		-	-	110	
@ 6 cm² cooling area [1]; t ≤ 10 sec.	P		-	-	62.5	
除非另有说明，T_j=25°C 的**静态特性**。						
Drain- source breakdown voltage		$V_{(BR)DSS}$				V
V_{GS} = 0 V, I_D = 250 µA	N		60	-	-	
V_{GS} = 0 V, I_D = -250 µA	P		-60	-	-	
Gate threshold voltage, V_{GS} = V_{DS}		$V_{GS(th)}$				
I_D = 20 µA	N		1.2	1.6	2.0	
I_D = -450 µA	P		-1	-1.5	-2.0	
Zero gate voltage drain current		I_{DSS}				µA
V_{DS} = 60 V, V_{GS} = 0 V, T_j = 25 °C	N		-	0.1	1	
V_{DS} = 60 V, V_{GS} = 0 V, T_j = 125 °C	N		-	10	100	
V_{DS} = -60 V, V_{GS} = 0 V, T_j = 25 °C	P		-	-0.1	-1	
V_{DS} = -60 V, V_{GS} = 0 V, T_j = 125 °C	P		-	-10	-100	
Gate-source leakage current		I_{GSS}				nA
V_{GS} = 20 V, V_{DS} = 0 V	N		-	10	100	
V_{GS} = -20 V, V_{DS} = 0 V	P		-	-10	-100	
Drain-source on-state resistance		$R_{DS(on)}$				Ω
V_{GS} = 4.5 V, I_D = 2.7 A	N		-	0.1	0.15	
V_{GS} = -4.5 V, I_D = -1.7 A	P		-	0.27	0.45	
Drain-source on-state resistance		$R_{DS(on)}$				
V_{GS} = 10 V, I_D = 3.1 A	N		-	0.07	0.11	
V_{GS} = -10 V , I_D = -2 A	P		-	0.19	0.3	

1 器件安装在 40 mm x 40 mm x 1.5 mm环氧树脂 PCB FR4 上，漏极连接用铜面积为 6 cm²（一层，70 µm厚）。印刷电路板垂直放置在静止空气中。

除非另有规定，否则均为 T_j=25 ℃的**电气特性。**

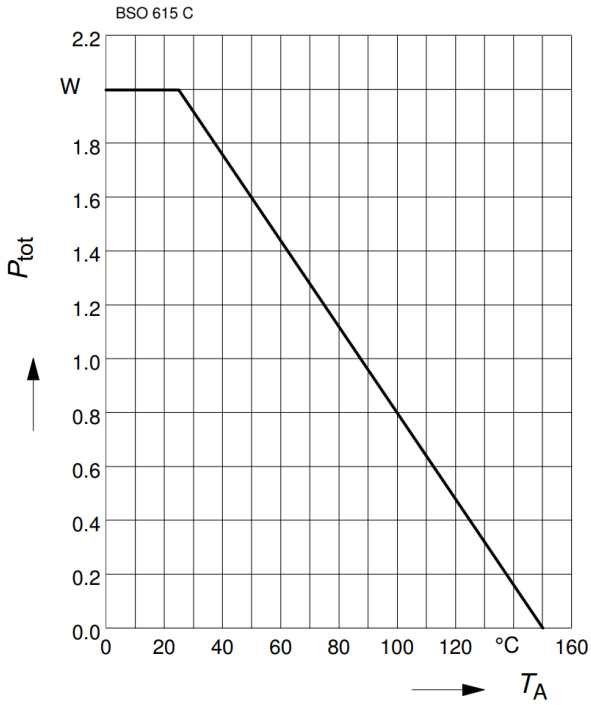
Parameter		Symbol	Values			Unit
			min.	typ.	max.	
Characteristics						
Transconductance		g_{fs}				S
V_{DS}≥2 * I_D * $R_{DS(on)max}$, I_D = 2.7 A	N		2.25	5.5	-	
VV_{DS}≥2 * I_D * $R_{DS(on)max}$, I_D = -1.7 A	P		1.2	2.4	-	
Input capacitance		C_{iss}				pF
V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	N		-	300	380	
V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	P		-	365	460	
Output capacitance		C_{oss}				
V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	N		-	90	120	
V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	P		-	105	135	
Reverse transfer capacitance		C_{rss}				
V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	N		-	50	65	
V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	P		-	40	50	
Turn-on delay time		$t_{d(on)}$				ns
V_{DD} = 30 V, V_{GS} = 4.5 V, I_D = 2.7 A , R_G = 16 Ω	N		-	16	24	
V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -1.7 A , R_G = 13 Ω	P		-	24	36	
Rise time		t_r				
V_{DD} = 30 V, V_{GS} = 4.5 V, I_D = 2.7 A, R_G = 16 Ω	N		-	75	115	
V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -1.7 A, R_G = 13 Ω	P		-	105	160	
Turn-off delay time		$t_{d(off)}$				
V_{DD} = 30 V, V_{GS} = 4.5 V, I_D = 2.7 A, R_G = 16 Ω	N		-	25	40	
V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -1.7 A, R_G = 13 Ω	P		-	125	190	
Fall time		t_f				
V_{DD} = 30 V, V_{GS} = 4.5 V, I_D = 2.7 A, R_G = 16 Ω	N		-	18	27	
V_{DD} = -30 V, V_{GS} = -4.5 V, I_D = -1.7 A, R_G = 13 Ω	P		-	90	135	

除非另有规定，否则均为 T_j=25 ℃的**电气特性。**

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
Characteristics						
Gate to source charge		Q_{gs}				nC
V_{DD} = 48 V, I_D = 3.1 A	N		-	0.5	0.75	
V_{DD} = -48 V, I_D = -2 A	P		-	1.7	2.6	
Gate to drain charge		Q_{gd}				
V_{DD} = 48 V, I_D = 3.1 A	N		-	6.3	9.5	
V_{DD} = -48 V, I_D = -2 A	P		-	4.3	6.5	
Gate charge total		Q_g				
V_{DD} = 48 V, I_D = 3.1 A, V_{GS} = 0 to 10V	N		-	15	22.5	
V_{DD} = -48 V, I_D = -2 A, V_{GS} = 0 to -10V	P		-	13.5	20	
Gate plateau voltage		$V_{(plateau)}$				V
V_{DD} = 48 V, I_D = 3.1 A	N		-	3.1	-	
V_{DD} = -48 V, I_D = -2 A	P		-	-2.8	-	
Reverse Diode						
Inverse diode continuous forward current	N	I_S	-	-	3.1	A
T_A = 25 °C	P		-	-	-2	
Inverse diode direct current,pulsed	N	I_{SM}	-	-	12.4	
T_A = 25 °C	P		-	-	-8	
Inverse diode forward voltage		V_{SD}				V
V_{GS} = 0 V, I_F = I_S	N		-	0.8	1.1	
V_{GS} = 0 V, I_F = I_S	P		-	-0.8	-1.1	
Reverse recovery time		t_{rr}				ns
V_R = 30 V, I_F=I_S, di_F/dt = 100 A/µs	N		-	50	75	
V_R = -30 V, I_F=I_S , di_F/dt = -100 A/µs	P		-	85	130	
Reverse recovery charge		Q_{rr}				nC
V_R = 30 V, I_F=I_S , di_F/dt = 100 A/µs	N		-	70	105	
V_R = -30 V, I_F=I_S, di_F/dt = -100 A/µs	P		-	120	180	

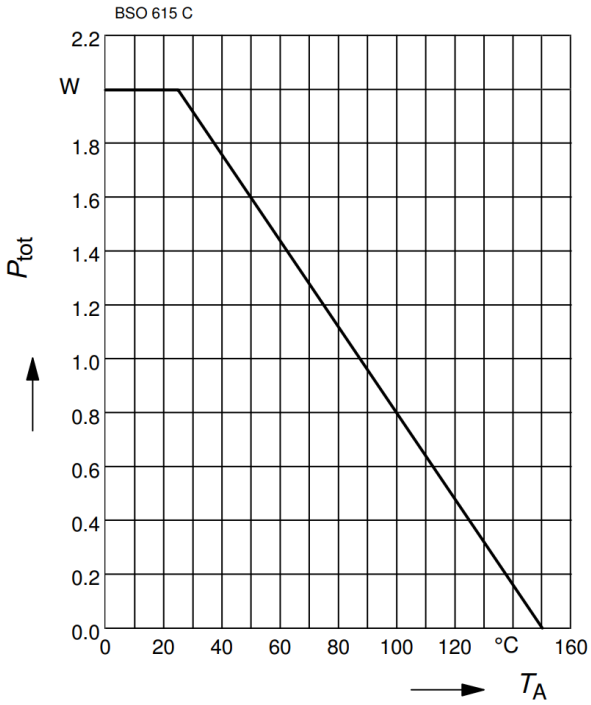
Power Dissipation (N-Ch.)

$P_{tot} = f(T_A)$



Power Dissipation (P-Ch.)

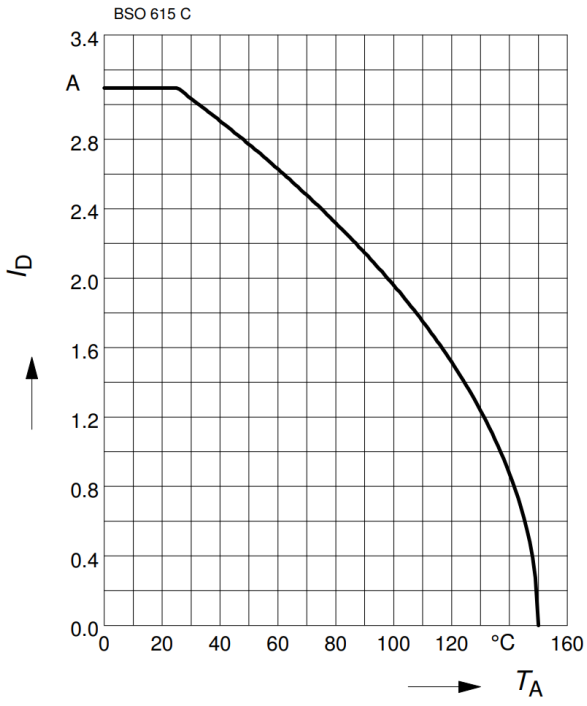
$P_{tot} = f(T_A)$



Drain current (N-Ch.)

$I_D = f(T_A)$

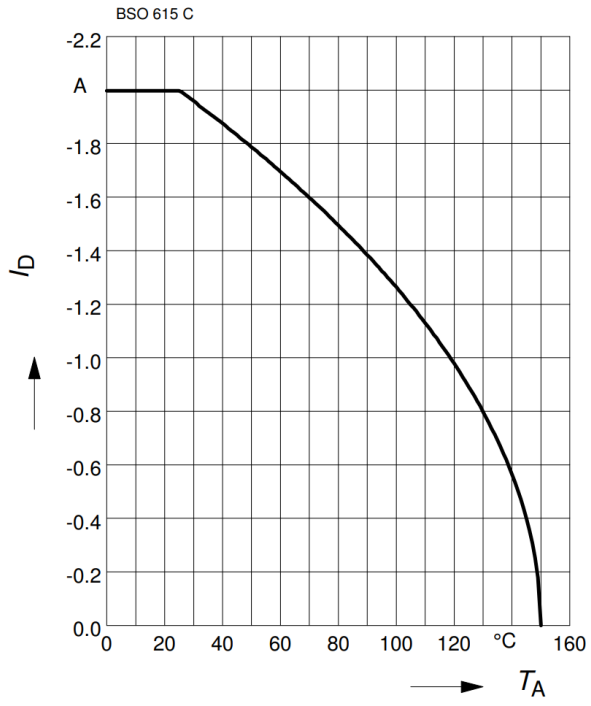
parameter: $V_{GS} \geq 10$ V



Drain current (P-Ch.)

$I_D = f(T_A)$

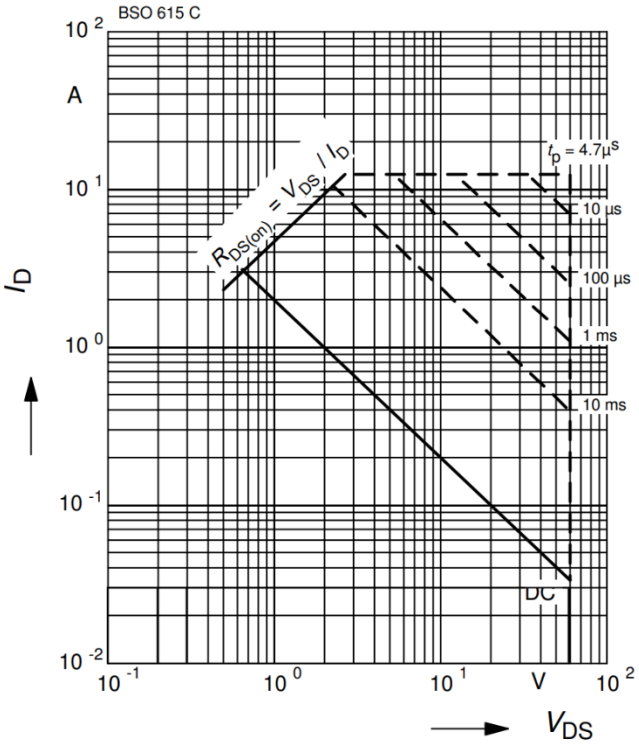
parameter: $V_{GS} \geq -10$ V



Safe operating area (N-Ch.)

I_D = f(V_{DS})

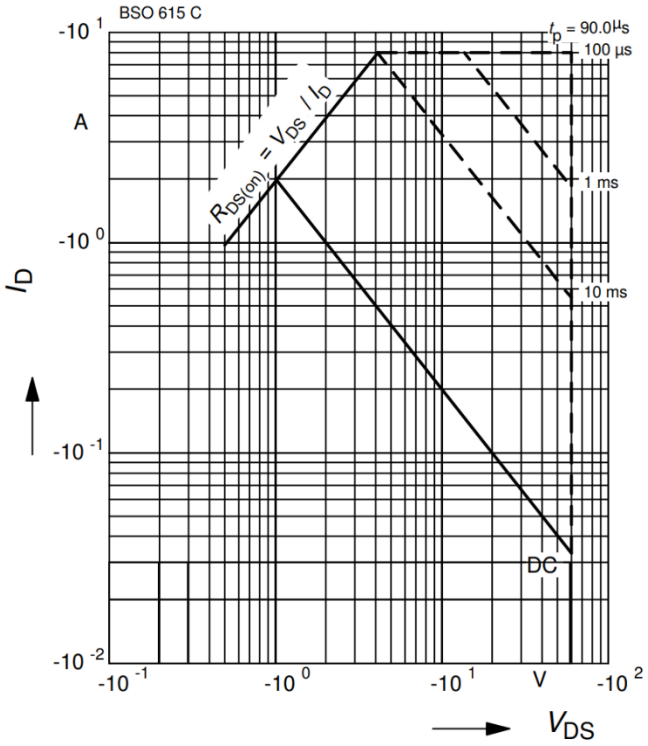
parameter : D = 0 , T_A = 25 °C



Safe operating area (P-Ch.)

I_D = f(V_{DS})

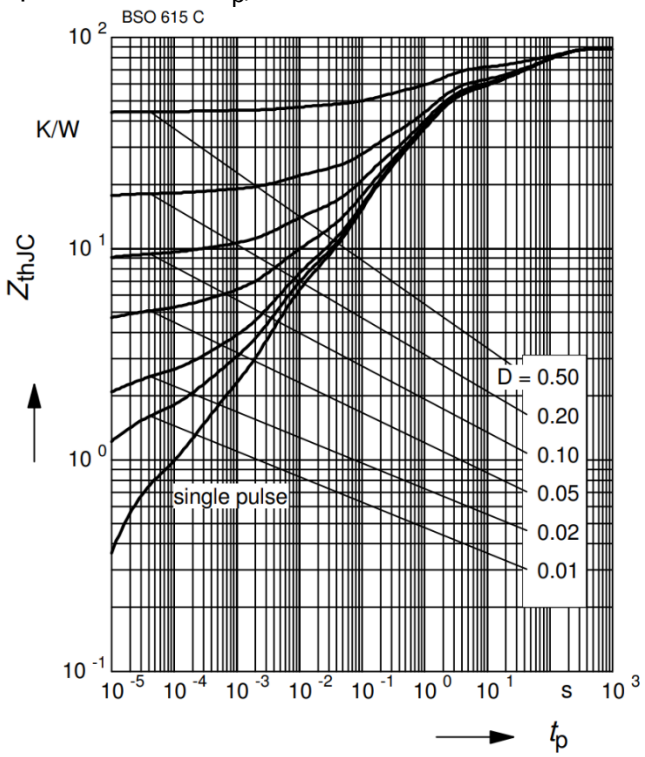
parameter : D = 0 , T_A = 25 °C



Transient thermal impedance(N-Ch.)

Z_{thJC} = f(tp)

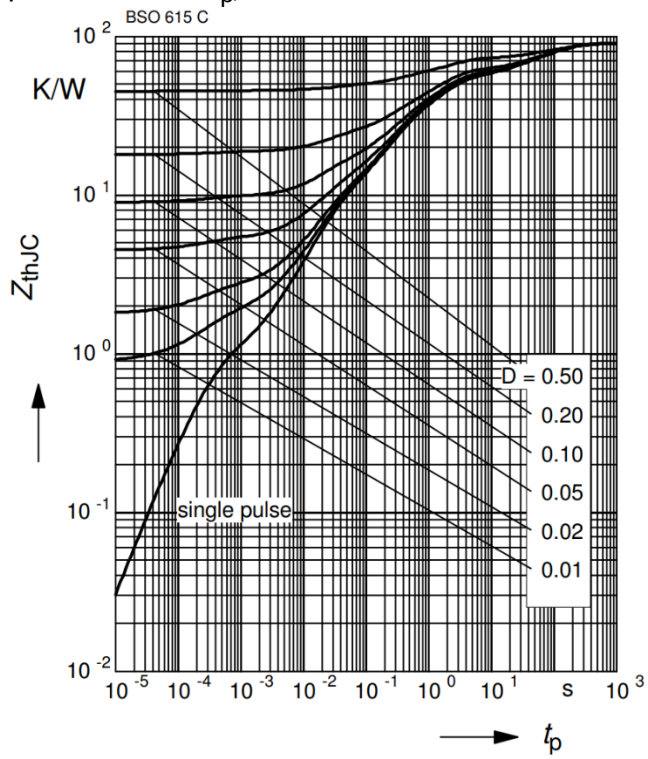
parameter: D =t_p/T



Transient thermal impedance(P-Ch.)

Z_{thJC} = f(tp)

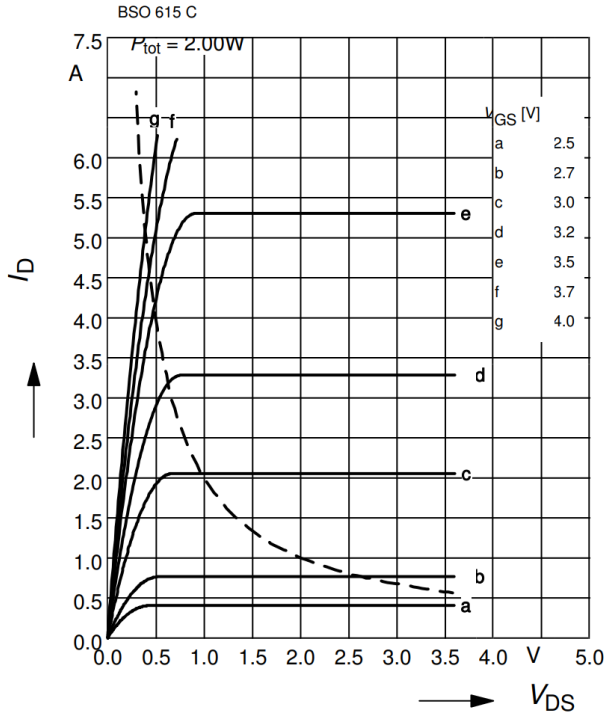
parameter: D =t_p/T



Typ. output characteristics (N-Ch.)

$I_D = f(V_{DS})$

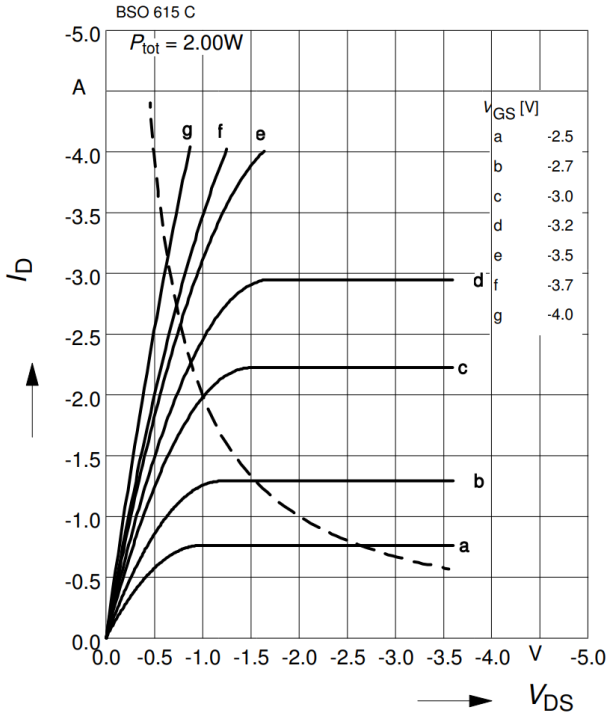
parameter: $t_p = 80$ µs



Typ. output characteristics (P-Ch.)

$I_D = f(V_{DS})$

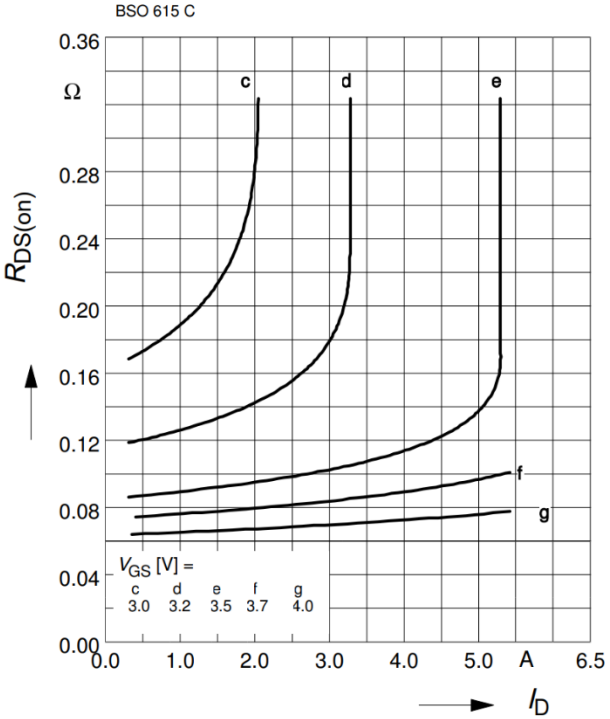
parameter: $t_p = 80$ µs



Typ. drain-source-on-resistance (N-Ch.)

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

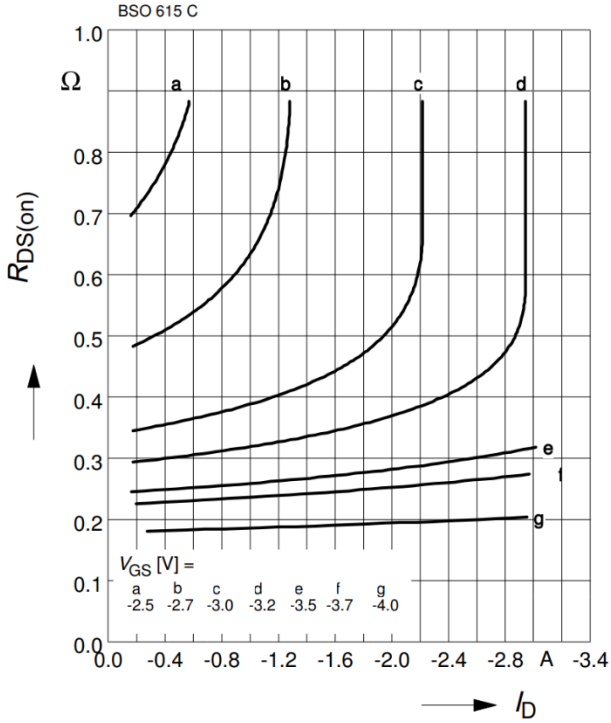
parameter: V_{GS}



Typ. drain-source-on-resistance (P-Ch.)

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

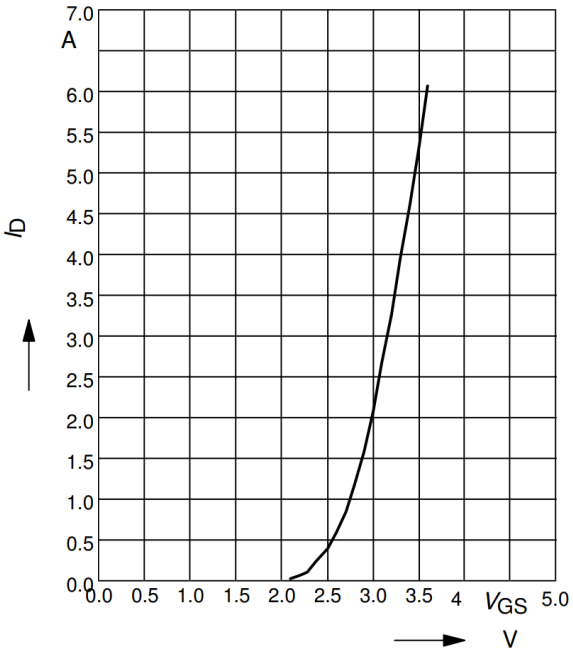
parameter: V_{GS}



Typ. transfer characteristics (N-Ch.)

Parameter: t_p = 80 µs

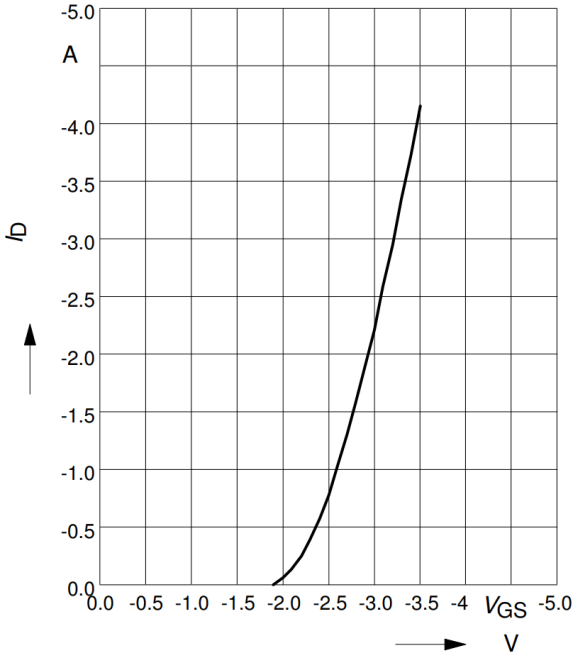
I_D = f(V_{GS}), $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Typ. transfer characteristics (P-Ch.)

parameter:t_p = 80 µs

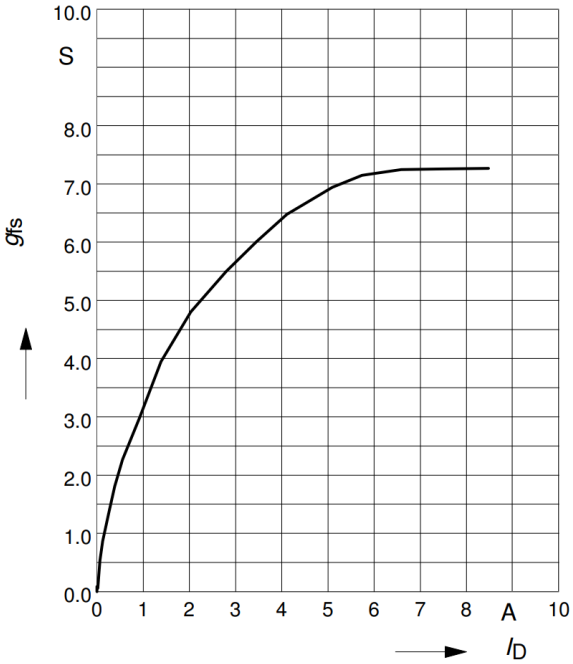
I_D = f(V_{GS}), $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Typ. forward transconductance (N-Ch.)

g_{fs} = f(I_D); T_j = 25 °C

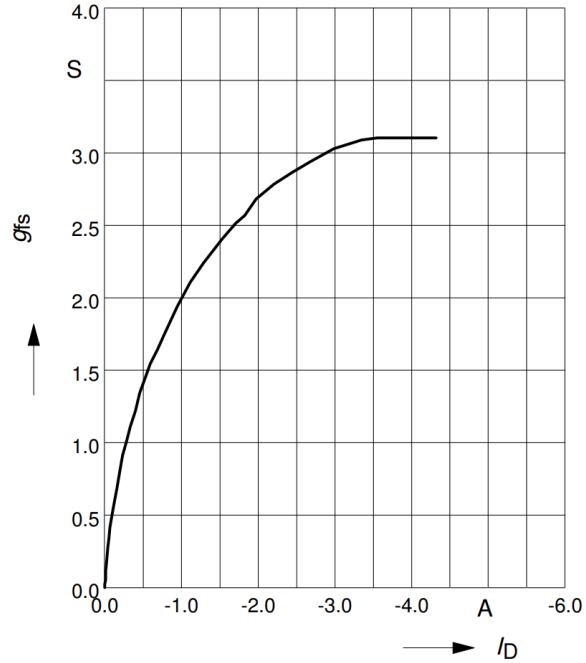
parameter: g_{fs}



Typ. forward transconductance (P-Ch.)

g_{fs} = f(I_D);T_j = 25 °C

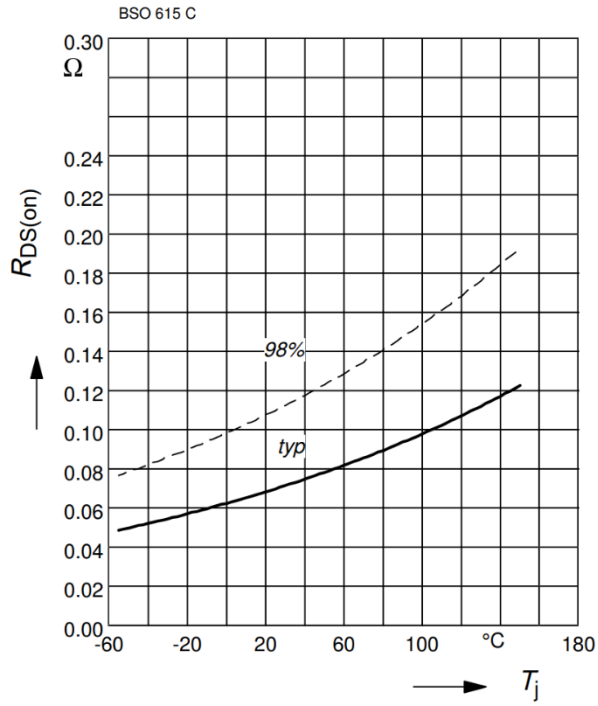
parameter: g_{fs}



Drain-source on-resistance (N-Ch.)

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

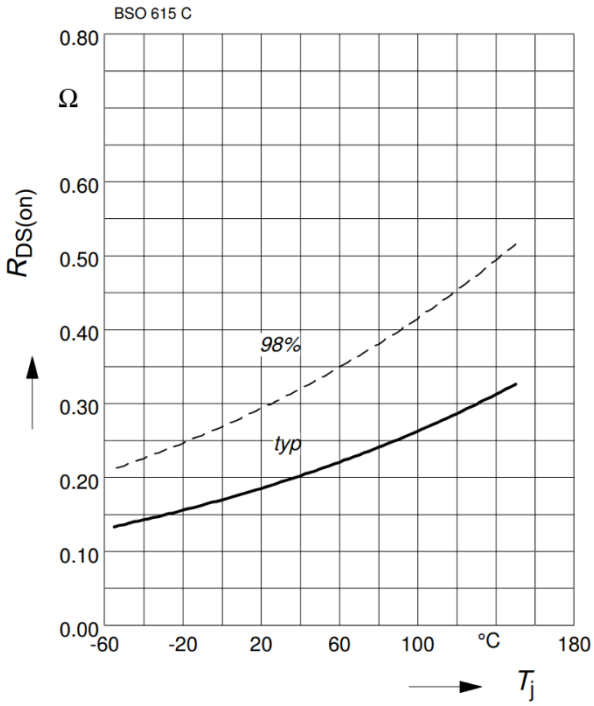
parameter : $I_D = 3.1$ A , $V_{GS} = 10$ V



Drain-source on-resistance (P-Ch.)

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

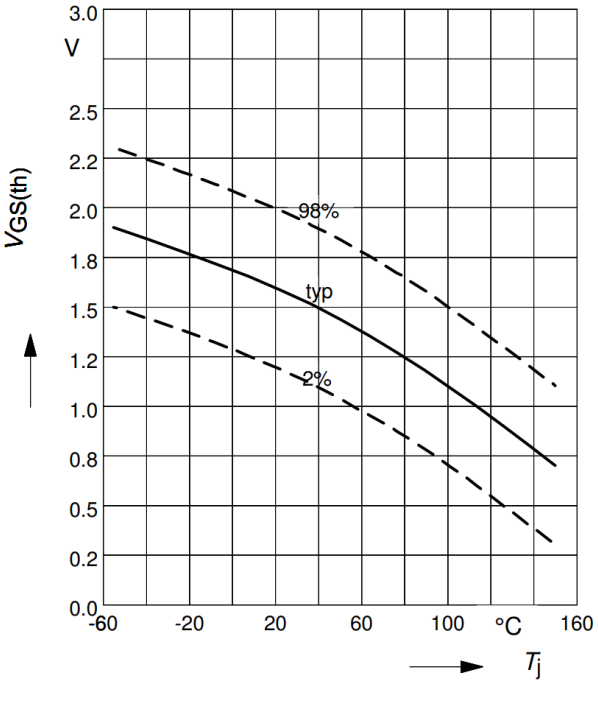
parameter : $I_D = -2$ A , $V_{GS} = -10$ V



Gate threshold voltage (N-Ch.)

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

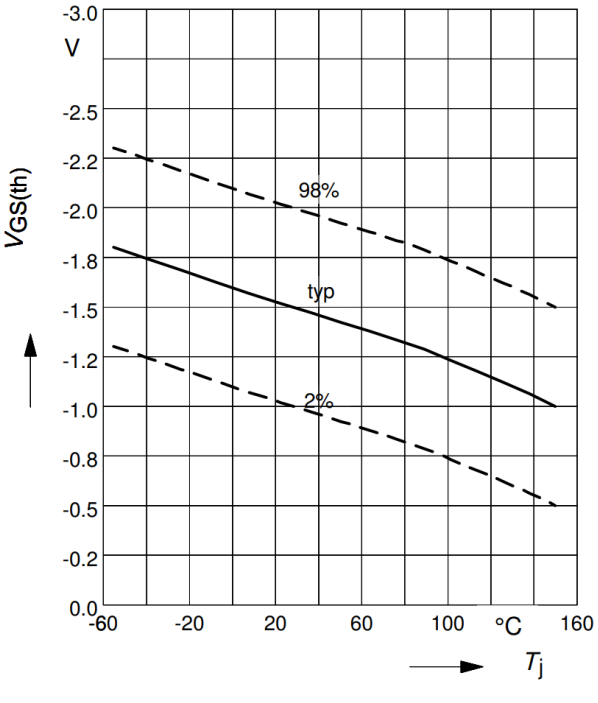
parameter: $V_{GS} = V_{DS}$, $I_D = 20$ µA



Gate threshold voltage (P-Ch.)

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

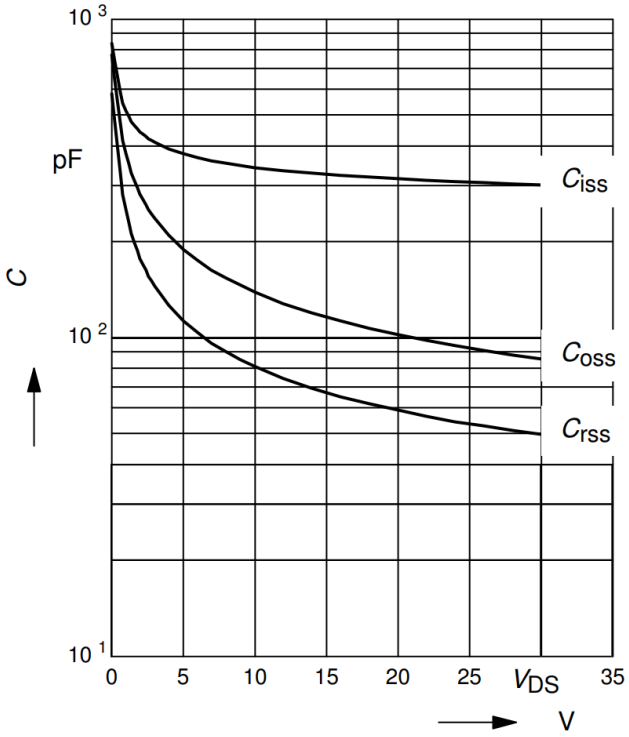
parameter: $V_{GS} = V_{DS}$, $I_D = -450$ µA



Typ. capacitances (N-Ch.)

$C = f(V_{DS})$

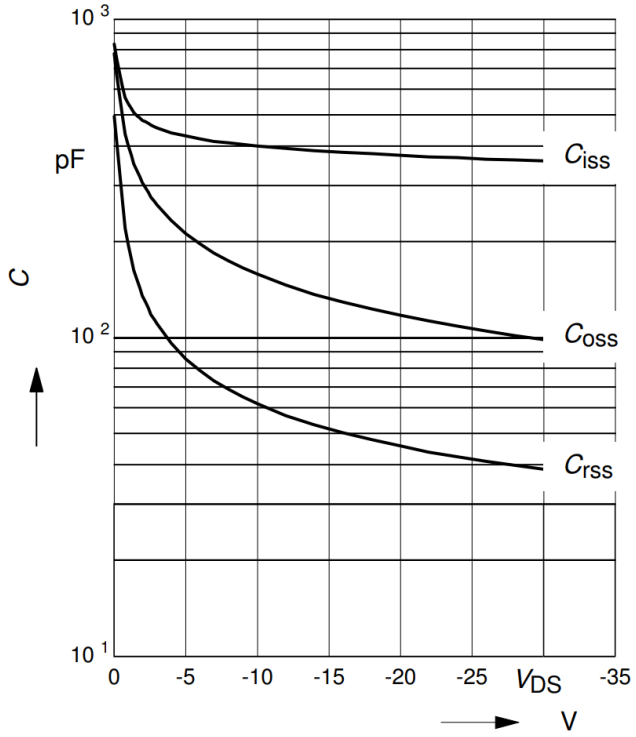
parameter: V_{GS}=0 V, f=1 MHz



Typ. capacitances (P-Ch.)

$C = f(V_{DS})$

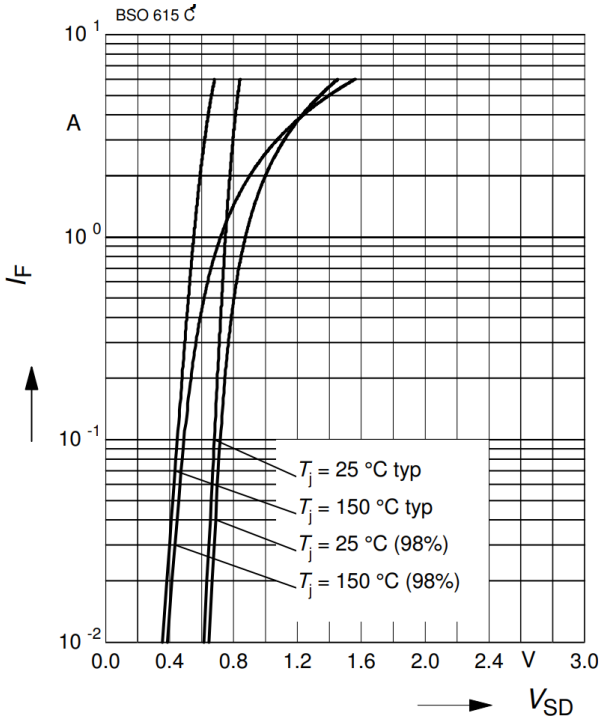
parameter: V_{GS}=0 V, f=1 MHz



Forward characteristics of reverse diode

$I_F = f(V_{SD})$, (N-Ch.)

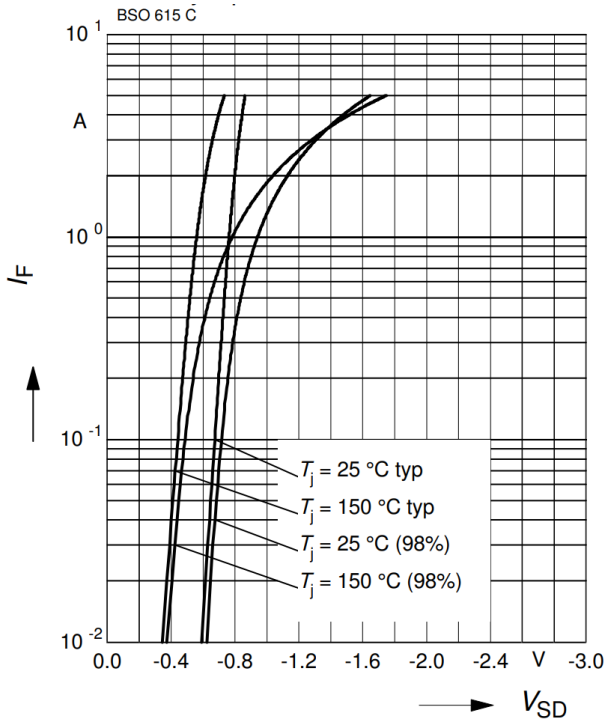
parameter: T_j , tp = 80 µs



Forward characteristics of reverse diode

$I_F = f(V_{SD})$, (P-Ch.)

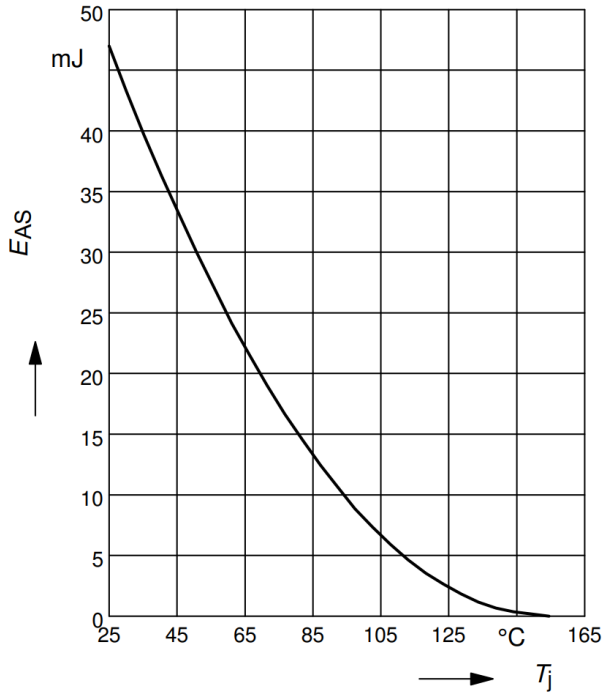
parameter: T_j , t_p = 80 µs



Avalanche Energy $E_{AS} = f(T_j)$ (N-Ch.)

parameter: $I_D = 3.1$ A, $V_{DD} = 25$ V

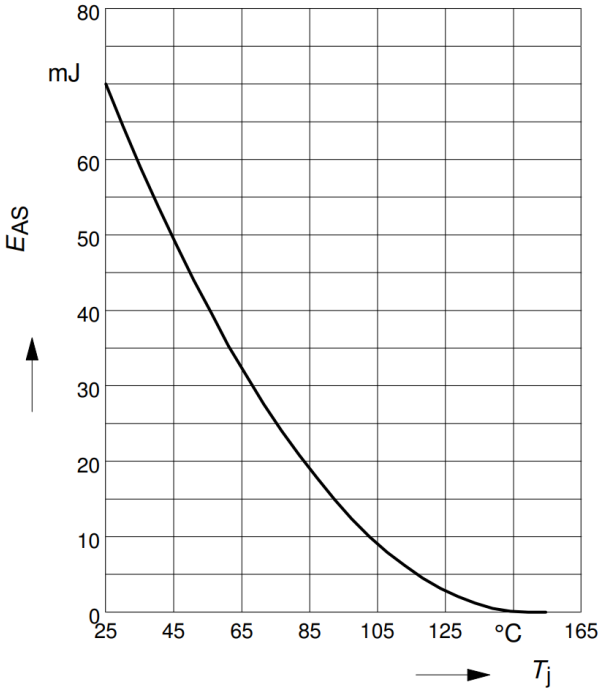
$R_{GS} = 25\ \Omega$



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

parameter: $I_D = -2$ A, $V_{DD} = -25$ V

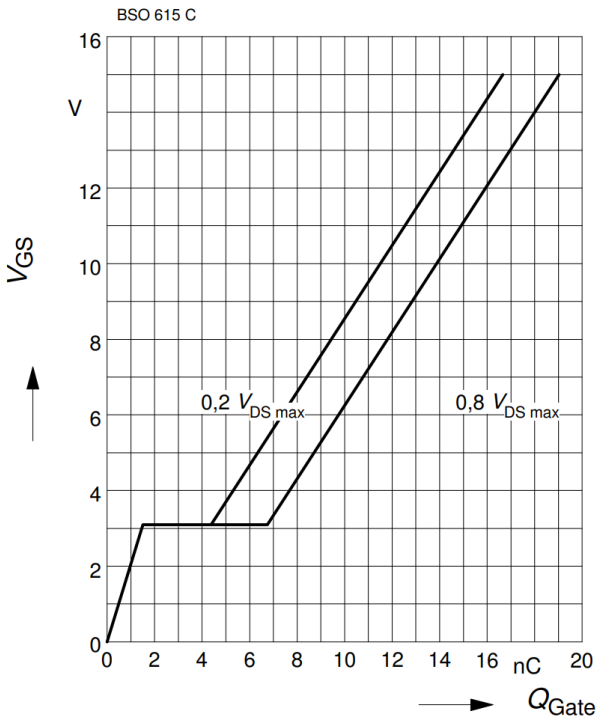
$R_{GS} = 25\ \Omega$



Typ. gate charge (N-Ch.)

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

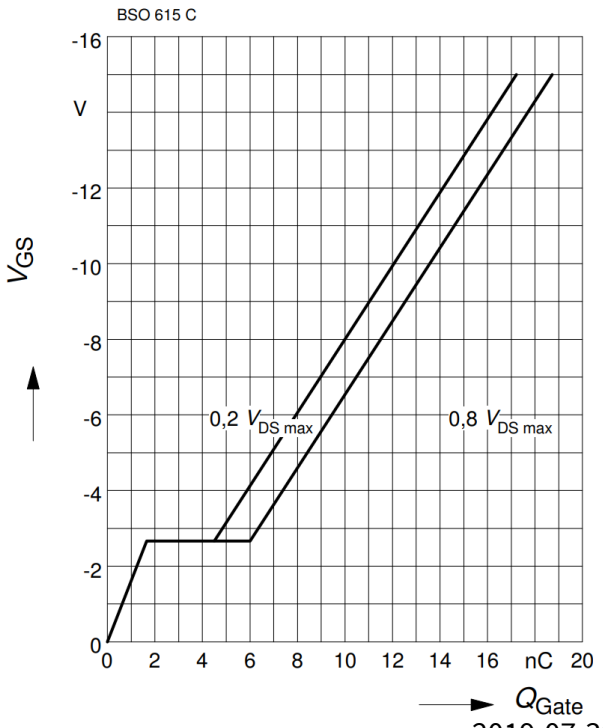
parameter: $I_D = 3.1$ A



Typ. gate charge (P-Ch.)

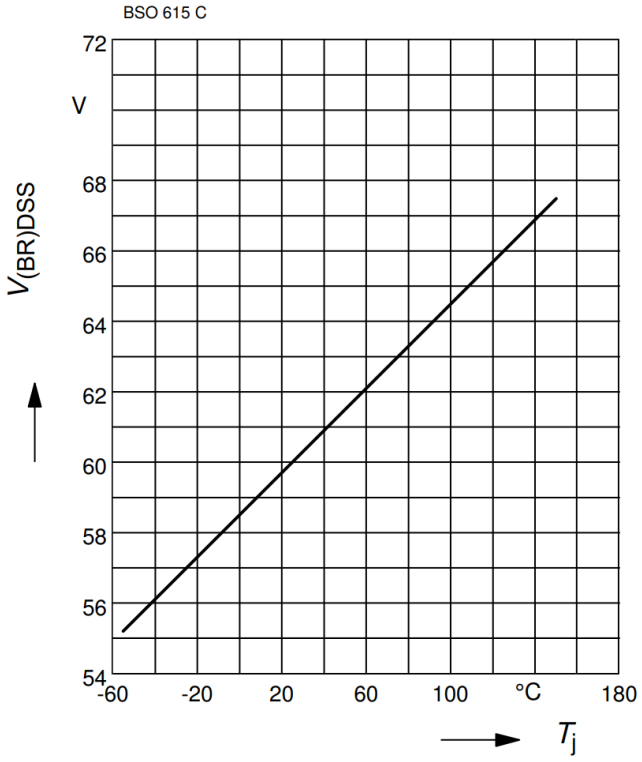
$V_{GS} = f(Q_{Gate})$

parameter: $I_D = -2$ A



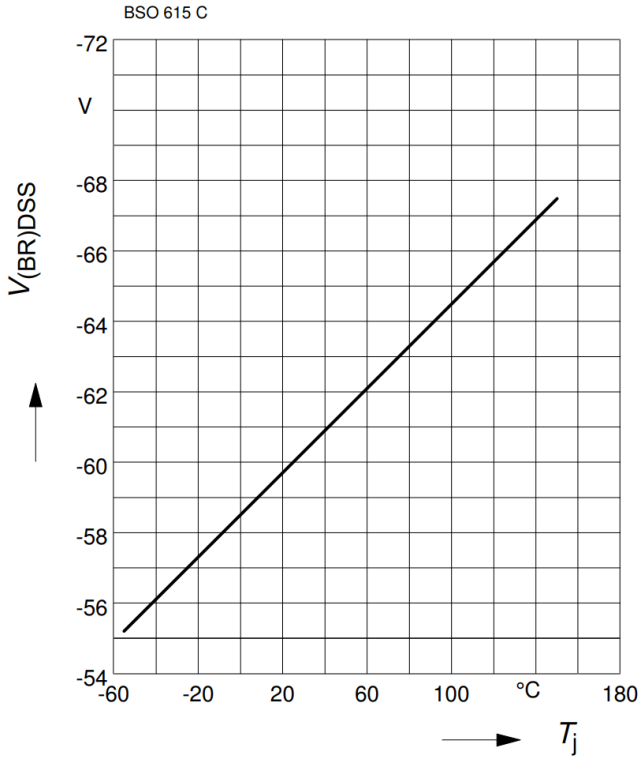
Drain-source breakdown voltage

$V_{(BR)DSS} = f(T_j)$, (N-Ch.)



Drain-source breakdown voltage

$V_{(BR)DSS} = f(T_j)$, (P-Ch.)



修订记录

BSO615C G

Revision: 2019-08-06, Rev. 2.2

历史修订版本

Revision	Date	Subjects (major changes since last revision)
2.2	2019-08-06	Update logos

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