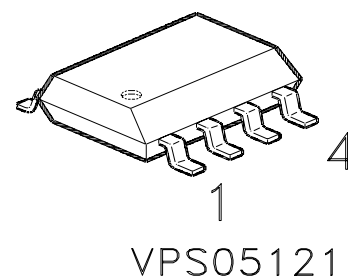
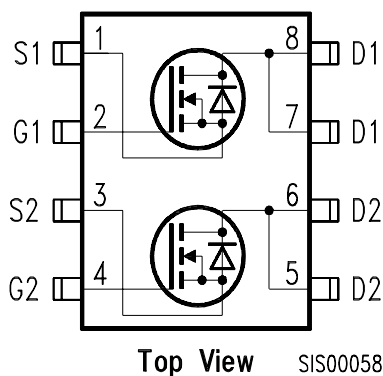


SIPMOS® Small-Signal Transistor

- Dual N-channel
- Enhancement mode
- Logic Level
- Avalanche rated
- $V_{GS(th)} = 1.2 \dots 2.0 \text{ V}$



Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking	Ordering Code
BSO 615N	60 V	2.6 A	0.15 Ω	P-DSO-8		Q 67000-S. . .

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

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current, <i>one channel active</i> $T_A = 25^\circ\text{C}$	I_D	2.6	A
Pulsed drain current, <i>one channel active</i> $T_A = 25^\circ\text{C}$	I_{Dpuls}	10.4	
Avalanche energy, single pulse $I_D = 2.6 \text{ A}$, $V_{DD} = 25 \text{ V}$, $R_{GS} = 25 \Omega$ $L = 10 \text{ mH}$, $T_j = 25^\circ\text{C}$	E_{AS}	60	mJ
Avalanche current, repetitive, limited by $T_{j(max)}$	I_{AR}	2.6	A
Avalanche energy, periodic limited by $T_{j(max)}$	E_{AR}	2	mJ
Reverse diode dv/dt $I_S = 2.6 \text{ A}$, $V_{DS} = 40 \text{ V}$, $di/dt = 200 \text{ A}/\mu\text{s}$ $T_{jmax} = 150^\circ\text{C}$	dv/dt	6	KV/ μs
Gate source voltage	V_{GS}	± 14	V
Power dissipation, <i>one channel active</i> $T_A = 25^\circ\text{C}$	P_{tot}	2	W
Chip or operating temperature	T_j	-55 ... + 150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 ... + 150	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Thermal resistance, junction-soldering point ¹⁾²⁾	R_{thJS}	-	-	tbd	K/W
Thermal resistance, chip to ambient ¹⁾²⁾	R_{thJA}	-	-	≤ 62.5	

1) Device on 50mm * 50mm * 1.5mm epoxy PCB FR4 with 6 cm² copper area around the heat slug footprint(one layer, 70 μ m copper).
PCB is vertical without blown air.

2) one channel active

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Drain- source breakdown voltage $V_{GS} = 0\text{ V}$, $I_D = 0.25\text{ mA}$, $T_j = 25^\circ\text{C}$	$V_{(BR)DSS}$	60	-	-	V
Gate threshold voltage $V_{GS} = V_{DS}$, $I_D = 20\text{ }\mu\text{A}$	$V_{GS(th)}$	1.2	1.6	2	
Zero gate voltage drain current $V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = -40^\circ\text{C}$ $V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = 25^\circ\text{C}$ $V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = 150^\circ\text{C}$	I_{DSS}	- - -	- 0.1 -	0.1 1 100	μA
Gate-source leakage current $V_{GS} = 20\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	-	10	100	
Drain-Source on-state resistance $V_{GS} = 4.5\text{ V}$, $I_D = 2.6\text{ A}$	$R_{DS(on)}$	-	0.12	0.15	Ω

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, $I_D = 2.6 \text{ A}$	g_{fs}	2.4	5.6	-	S
Input capacitance $V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	C_{iss}	-	300	380	pF
Output capacitance $V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	C_{oss}	-	90	120	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	C_{rss}	-	50	65	
Turn-on delay time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$ $R_G = 16.3 \Omega$	$t_{d(on)}$	-	12	20	ns
Rise time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$ $R_G = 16.3 \Omega$	t_r	-	15	25	
Turn-off delay time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$ $R_G = 16.3 \Omega$	$t_{d(off)}$	-	20	30	
Fall time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$ $R_G = 16.3 \Omega$	t_f	-	15	25	
Gate charge at threshold $V_{DD} = 40 \text{ V}$, $I_D \geq 0.1 \text{ A}$, V_{GS} 0 to 1 V	$Q_{g(th)}$	-	0.4	0.6	nC
Gate Charge at 5.0 V $V_{DD} = 40 \text{ V}$, $I_D = 2.6 \text{ A}$, V_{GS} 0 to 5 V	$Q_{g(5)}$	-	7	10	
Gate Charge total $V_{DD} = 40 \text{ V}$, $I_D = 2.6 \text{ A}$, V_{GS} 0 to 10 V	$Q_{g(total)}$	-	14	20	
Gate plateau voltage $V_{DS} = 40 \text{ V}$, $I_D = 2.6 \text{ A}$	$V_{(plateau)}$	-	3.6	-	V

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

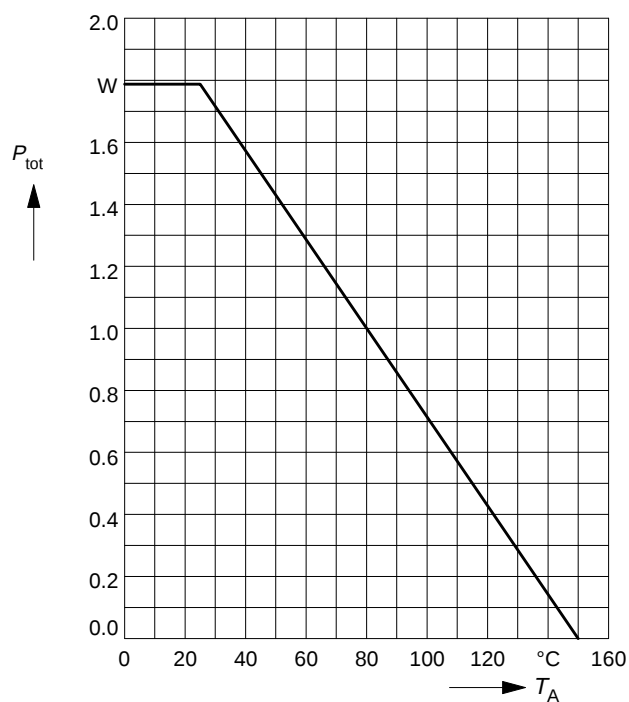
Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Reverse Diode

Inverse diode continuous forward current $T_A = 25^\circ\text{C}$	I_S	-	-	2.6	A
Inverse diode direct current, pulsed $T_A = 25^\circ\text{C}$	I_{SM}	-	-	10.4	
Inverse diode forward voltage $V_{GS} = 0\text{ V}$, $I_F = 5.2\text{ A}$	V_{SD}	-	0.95	1.2	V
Reverse recovery time $V_R = 30\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	50	75	ns
Reverse recovery charge $V_R = 30\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	0.1	0.15	μC

Power dissipation

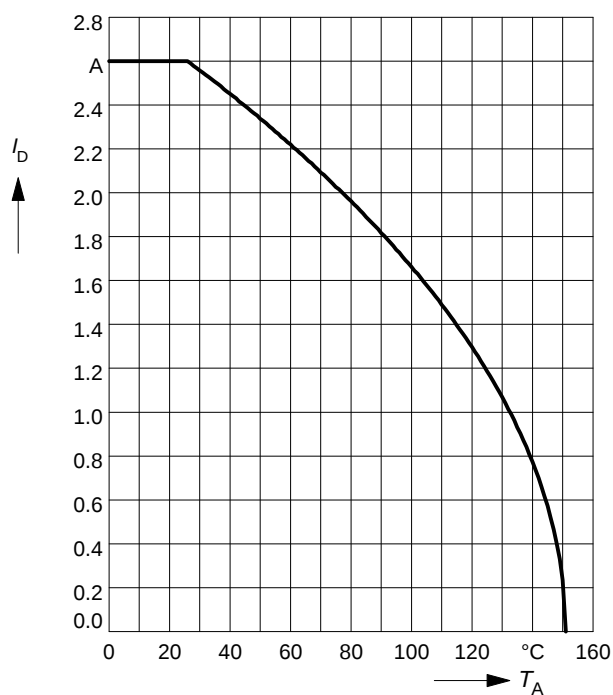
$$P_{\text{tot}} = f(T_A)$$



Drain current

$$I_D = f(T_A)$$

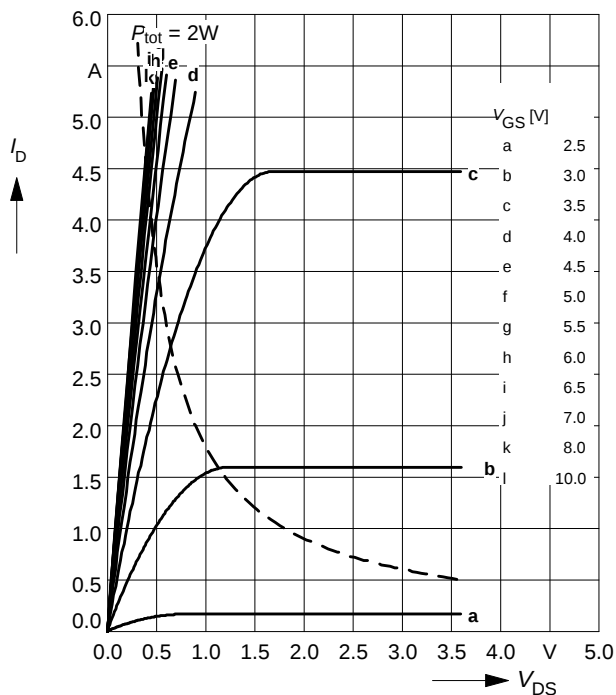
parameter: $V_{GS} \geq 4 \text{ V}$



Typ. output characteristics

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

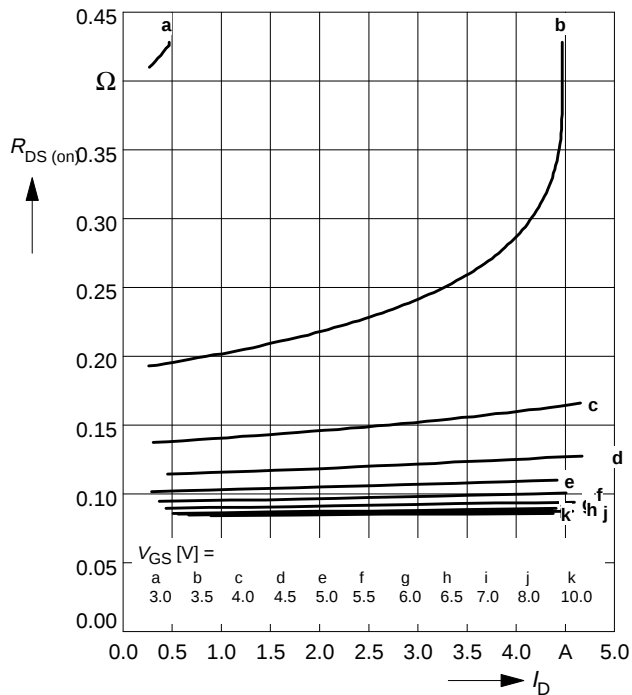
parameter: $t_p = 80 \mu s$, $T_j = 25^\circ C$



Typ. drain-source on-resistance

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

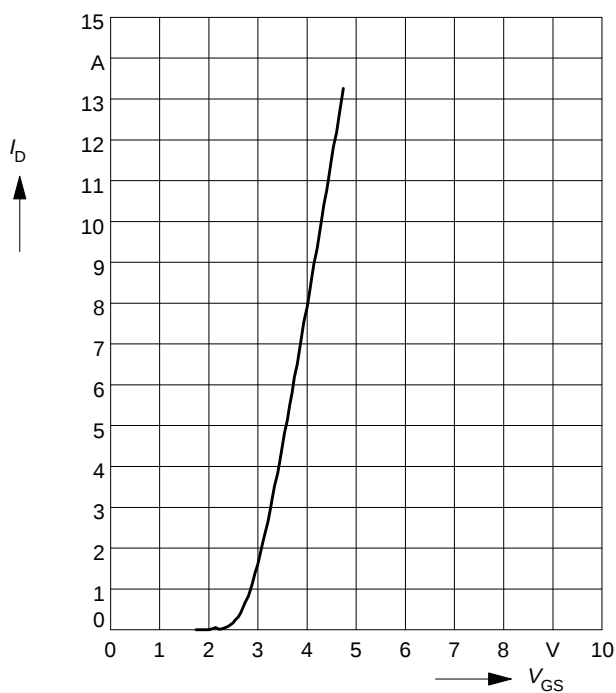
parameter: $t_p = 80 \mu s$, $T_j = 25^\circ C$



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

parameter: $t_p = 80 \mu s$

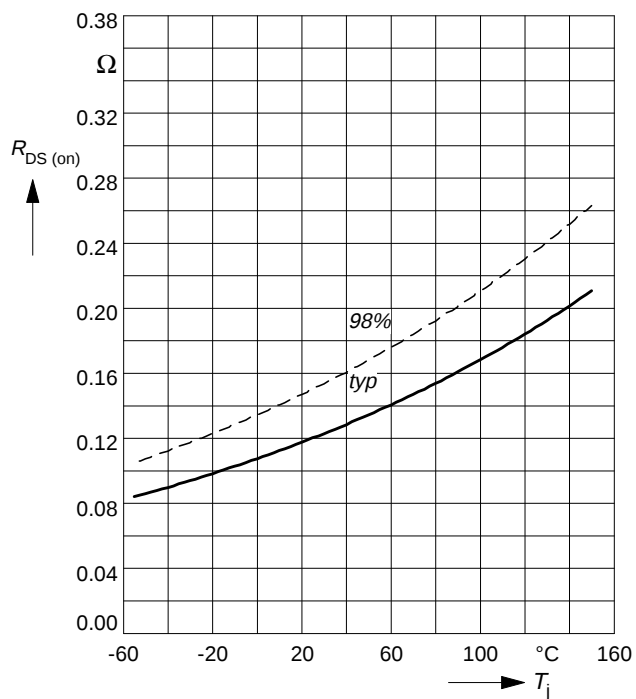
$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$



Drain-source on-resistance

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

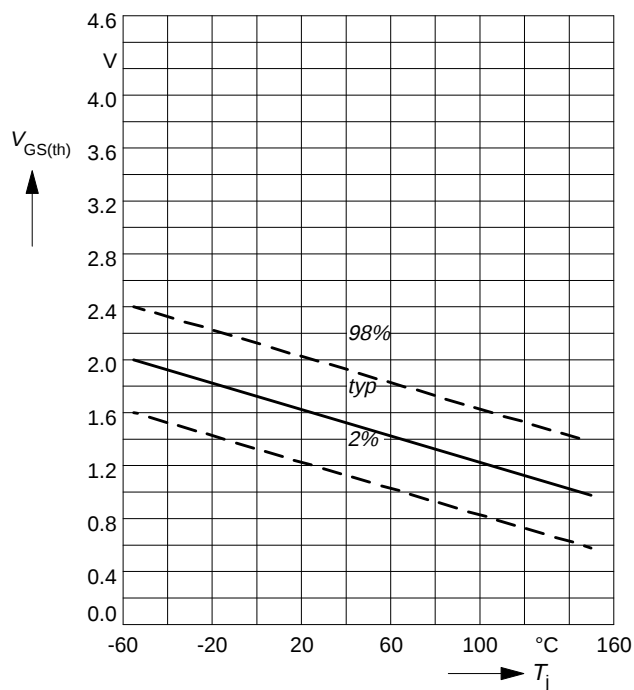
parameter: $I_D = 2.6 \text{ A}$, $V_{GS} = 4.5 \text{ V}$



Gate threshold voltage

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

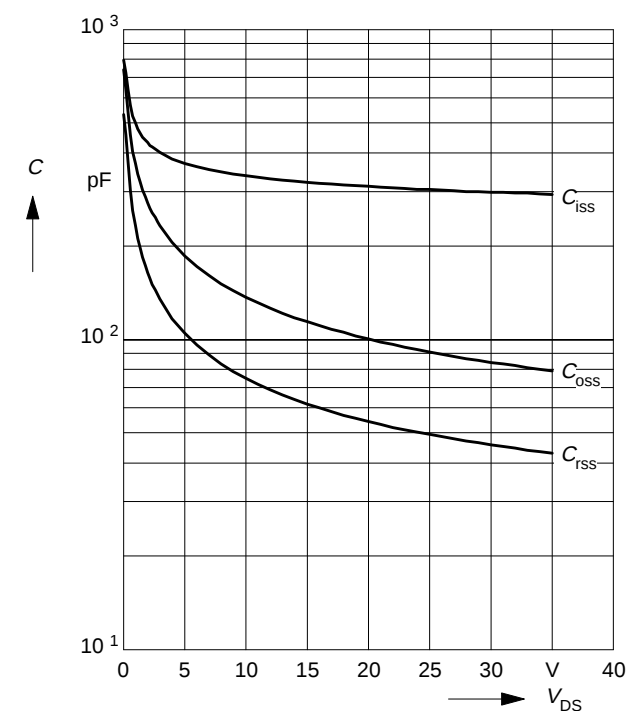
parameter: $V_{GS} = V_{DS}$, $I_D = 20 \mu\text{A}$



Typ. capacitances

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

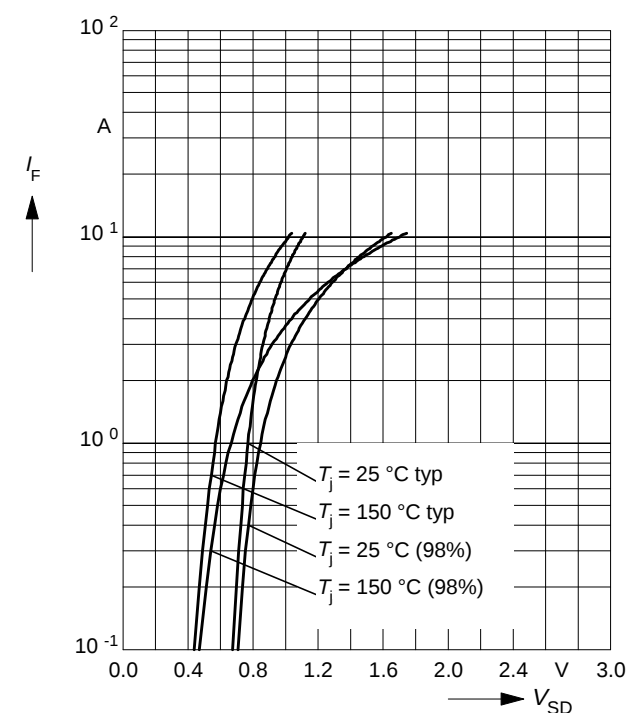
parameter: $V_{GS} = 0\text{V}$, $f = 1 \text{ MHz}$



Forward characteristics of reverse diode

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

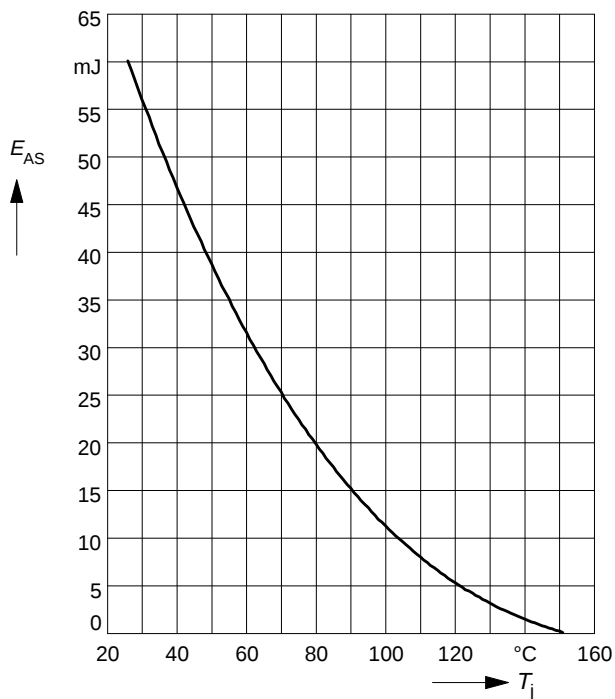
parameter: T_j , $t_p = 80 \mu\text{s}$



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

parameter: $I_D = 2.6 \text{ A}$, $V_{DD} = 25 \text{ V}$

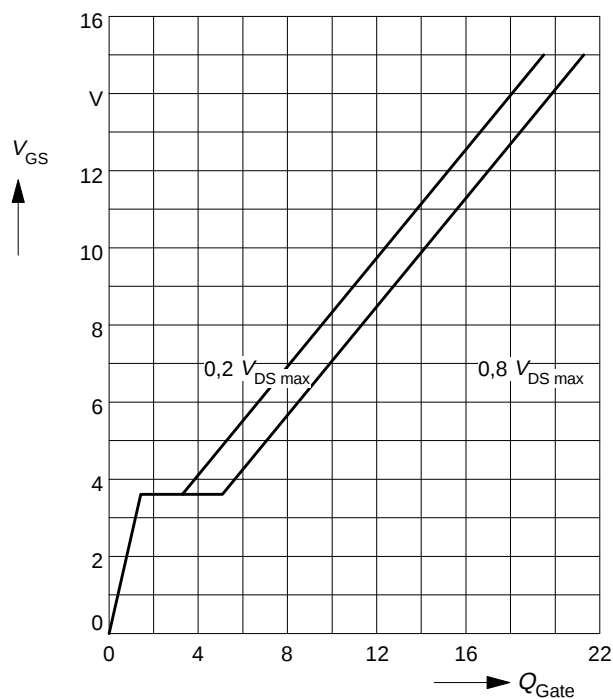
$R_{GS} = 25 \Omega$, $L = 10 \text{ mH}$



Typ. gate charge

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

parameter: $I_{D \text{ puls}} = 3 \text{ A}$



Drain-source breakdown voltage

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

