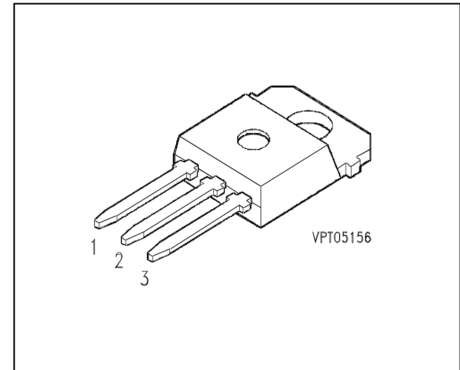
Infineon technologies

BUZ 345

SIPMOS ® Power Transistor

- N channel
- Enhancement mode
- Avalanche-rated



Pin 1	Pin 2	Pin 3
G	D	S

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Ordering Code
BUZ 345	100 V	41 A	0.045 Ω	TO-218 AA	C67078-S3121-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current T_C = 28 ˚C	I_D	 41	A
Pulsed drain current T_C = 25 ˚C	I_{Dpuls}	 164	
Avalanche current,limited by T_{jmax}	I_{AR}	41	
Avalanche energy,periodic limited by T_{jmax}	E_{AR}	18	mJ
Avalanche energy, single pulse I_D = 41 A, V_{DD} = 25 V, R_{GS} = 25 Ω L = 249.9 µH, T_j = 25 ˚C	E_{AS}	 280	
Gate source voltage	V_{GS}	± 20	V
Power dissipation T_C = 25 ˚C	P_{tot}	 150	W
Operating temperature	T_j	-55 ... + 150	˚C
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip case	R_{thJC}	≤ 0.83	K/W
Thermal resistance, chip to ambient	R_{thJA}	75	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

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, $I_D = 0.25$ mA, $T_j = 25$ °C	$V_{(BR)DSS}$	100	-	-	V
Gate threshold voltage $V_{GS} = V_{DS}$, $I_D = 1$ mA	$V_{GS(th)}$	2.1	3	4	
Zero gate voltage drain current $V_{DS} = 100$ V, $V_{GS} = 0$ V, $T_j = 25$ °C $V_{DS} = 100$ V, $V_{GS} = 0$ V, $T_j = 125$ °C	I_{DSS}	- -	0.1 10	1 100	µA
Gate-source leakage current $V_{GS} = 20$ V, $V_{DS} = 0$ V	I_{GSS}	-	10	100	nA
Drain-Source on-resistance $V_{GS} = 10$ V, $I_D = 26$ A	$R_{DS(on)}$	-	0.04	0.045	Ω

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

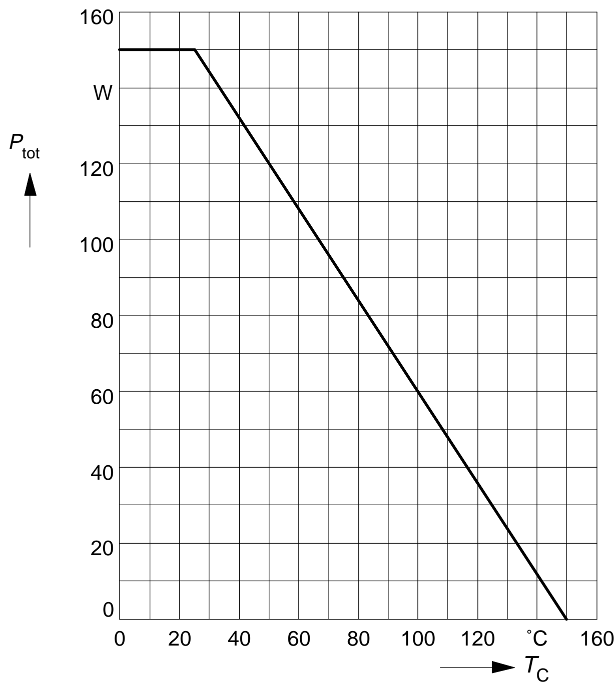
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, $I_D = 26$ A	g_{fs}	10	20	-	S
Input capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{iss}	-	1800	2700	pF
Output capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{oss}	-	560	840	
Reverse transfer capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{rss}	-	270	400	
Turn-on delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 3$ A $R_{GS} = 50\ \Omega$	$t_{d(on)}$	-	30	45	ns
Rise time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 3$ A $R_{GS} = 50\ \Omega$	t_r	-	110	165	
Turn-off delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 3$ A $R_{GS} = 50\ \Omega$	$t_{d(off)}$	-	300	390	
Fall time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 3$ A $R_{GS} = 50\ \Omega$	t_f	-	150	195	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Inverse diode continuous forward current T_C = 25 ˚C	I_S	-	-	41	A
Inverse diode direct current,pulsed T_C = 25 ˚C	I_{SM}	-	-	164	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 82 A	V_{SD}	-	1.6	1.8	V
Reverse recovery time V_R = 30 V, I_F=I_S, di_F/dt = 100 A/µs	t_{rr}	-	120	-	ns
Reverse recovery charge V_R = 30 V, I_F=I_S, di_F/dt = 100 A/µs	Q_{rr}	-	0.6	-	µC

Power dissipation

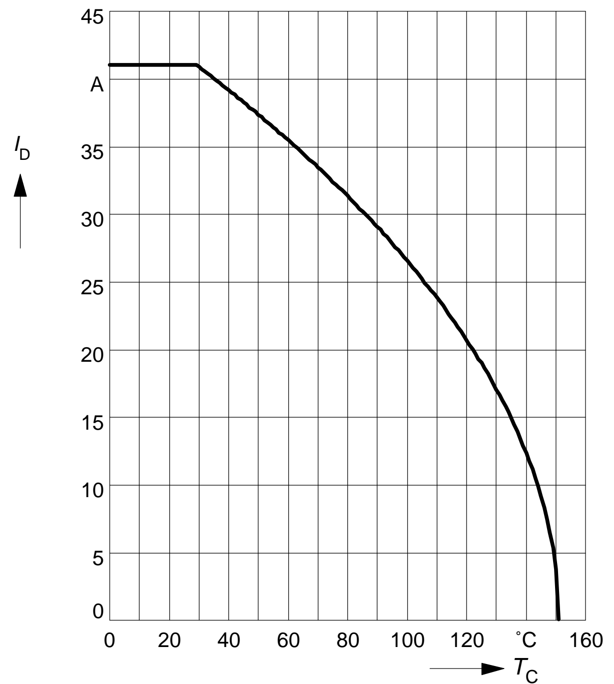
$P_{tot} = f(T_C)$



Drain current

$I_D = f(T_C)$

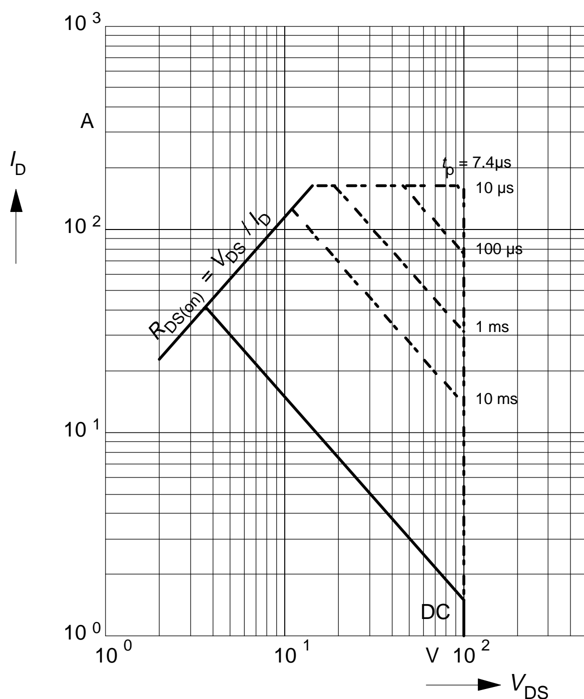
parameter: $V_{GS} \geq 10$ V



Safe operating area

$I_D = f(V_{DS})$

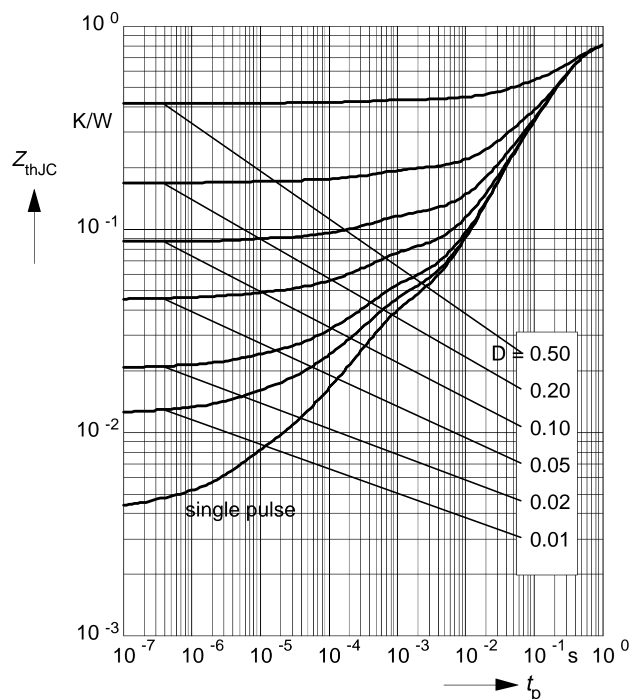
parameter: $D = 0.01$, $T_C = 25$˚C



Transient thermal impedance

$Z_{th\,JC} = f(t_p)$

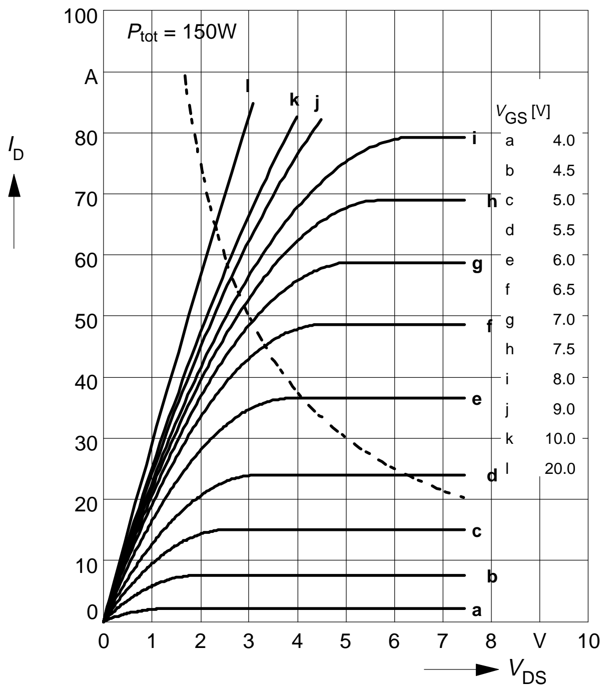
parameter: $D = t_p / T$



Typ. output characteristics

$I_D = f(V_{DS})$

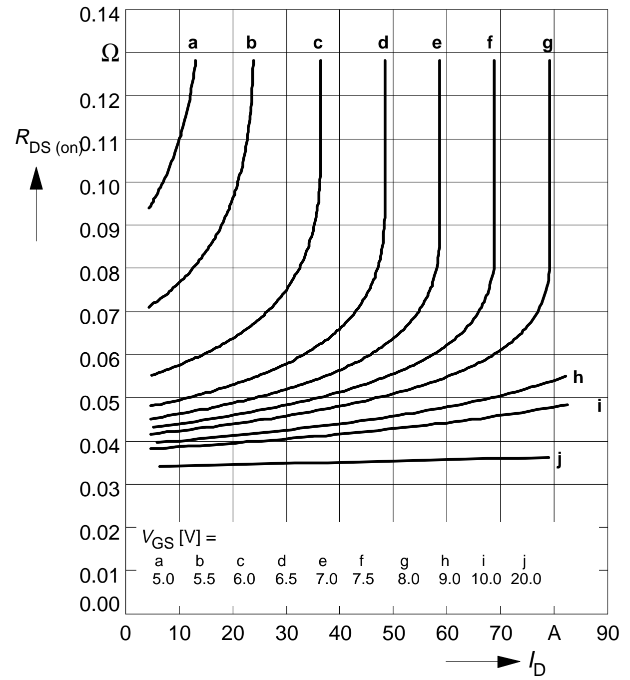
parameter: t_p = 80 µs



Typ. drain-source on-resistance

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

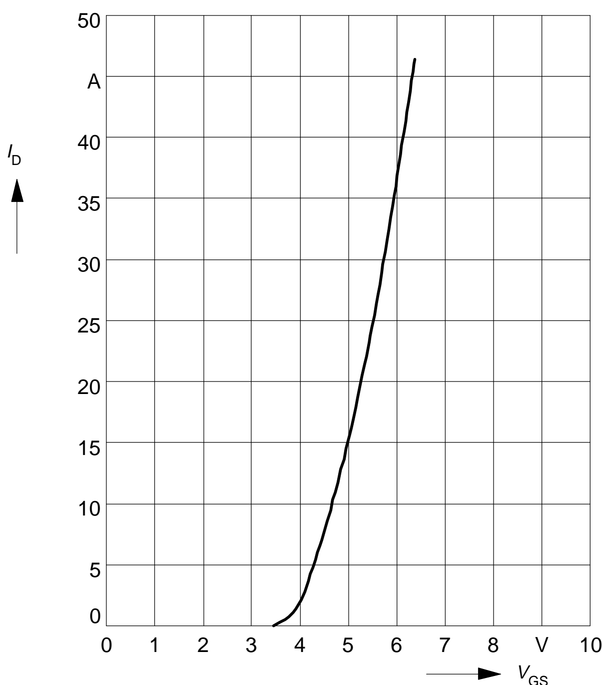
parameter: V_{GS}



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

parameter: t_p = 80 µs

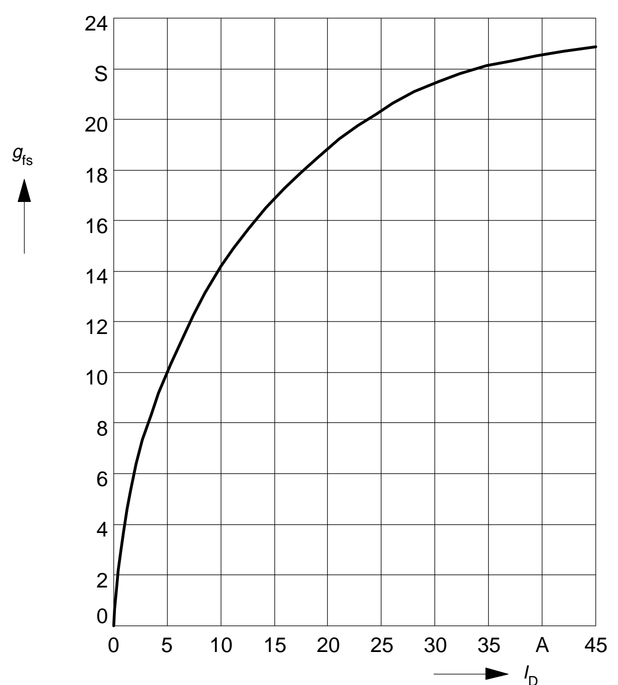
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Typ. forward transconductance $g_{fs} = f(I_D)$

parameter: t_p = 80 µs,

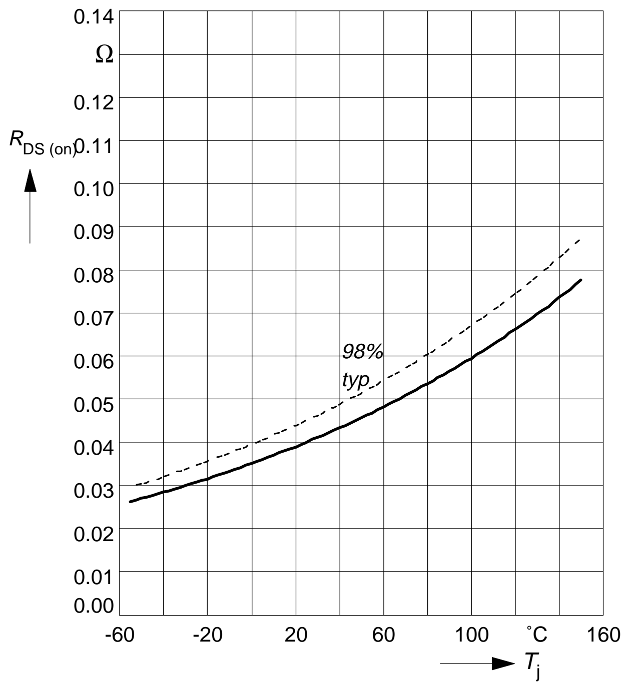
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

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

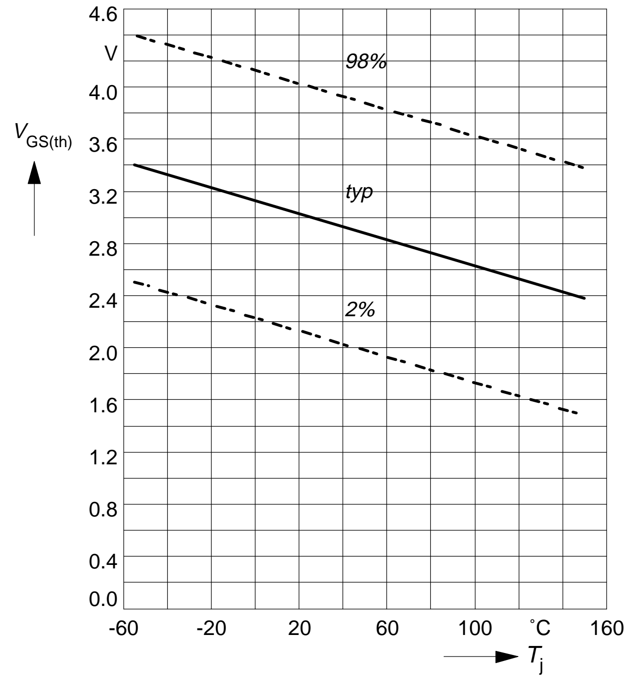
parameter: I_D = 26 A, V_{GS} = 10 V



Gate threshold voltage

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

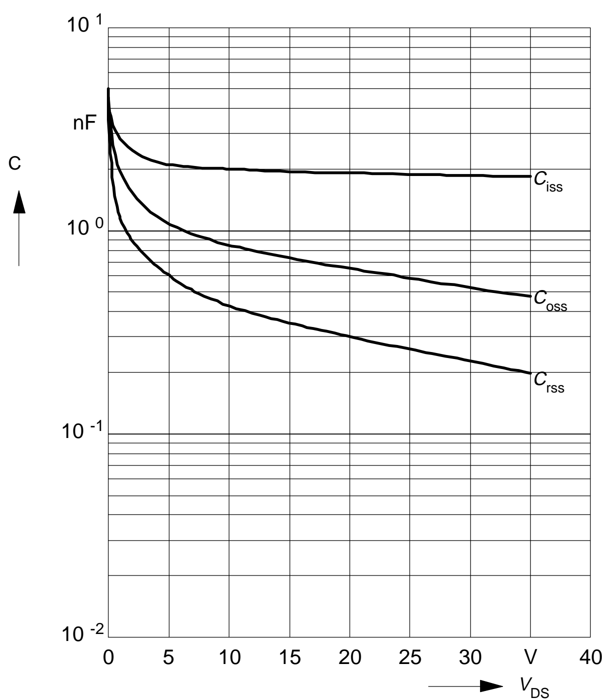
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



Typ. capacitances

$C = f(V_{DS})$

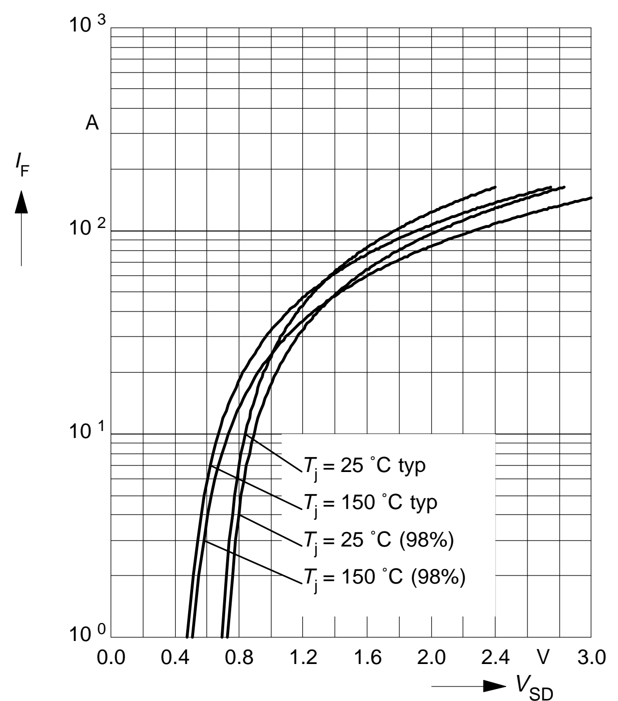
parameter: V_{GS} = 0V, f = 1MHz



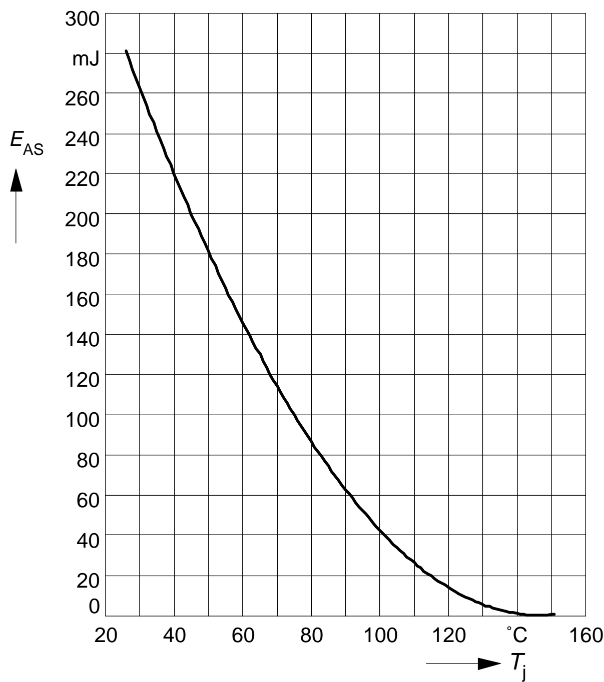
Forward characteristics of reverse diode

$I_F = f(V_{SD})$

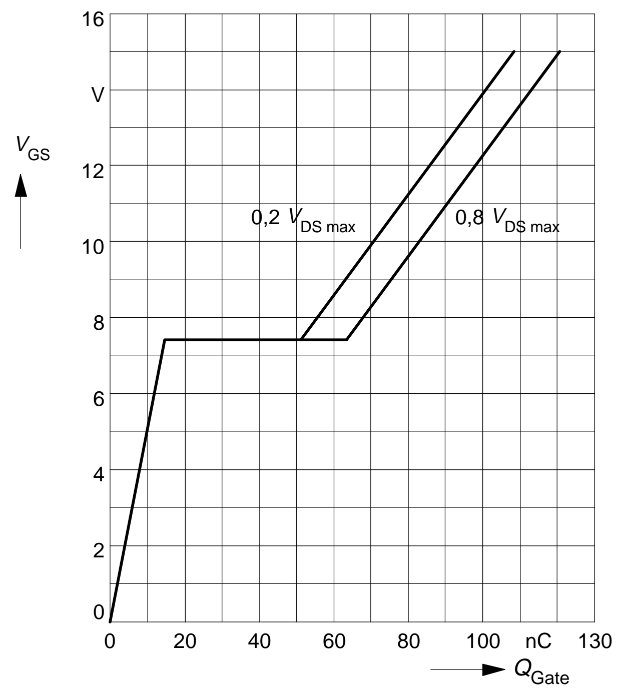
parameter: T_j, t_p = 80 µs



Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 41 A, V_{DD} = 25 V
R_{GS} = 25 Ω, L = 249.9 µH



Typ. gate charge
$V_{GS} = f(Q_{Gate})$
parameter: $I_{D\ puls}$ = 62 A



Drain-source breakdown voltage
$V_{(BR)DSS} = f(T_j)$