OptiMOS™-5 Power-Transistor

AEC Qualified

RoHS

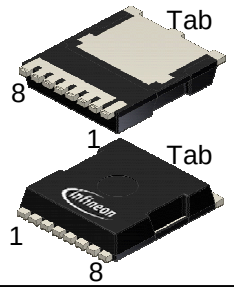
Product Summary

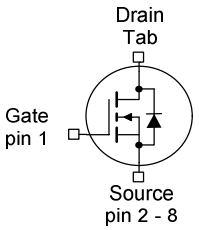
V_{DS}	100	V
$R_{DS(on)}$	3.5	mΩ
I_D	150	A

Features

- N-channel - Enhancement mode
- AEC-Q101 qualified
- MSL1 up to 260°C peak reflow
- 175°C operating temperature
- Green product (RoHS compliant)
- Ultra low Rds(on)
- 100% Avalanche tested

PG-HSOF-8-1





Type	Package	Marking
IAUT150N10S5N035	PG-HSOF-8-1	5N10035

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_C=25°C, V_{GS}=10V	150	A
		T_C=100 °C, V_{GS}=10 V[1)]	95	
Pulsed drain current[1)]	$I_{D,pulse}$	T_C=25 °C	600	
Avalanche energy, single pulse[1)]	E_{AS}	I_D=75 A	210	mJ
Avalanche current, single pulse	I_{AS}	-	120	A
Gate source voltage	V_{GS}	-	±20	V
Power dissipation	P_{tot}	T_C=25 °C	166	W
Operating and storage temperature	T_j, T_{stg}	-	-55 ... +175	°C
IEC climatic category; DIN IEC 68-1	-	-	55/175/56	

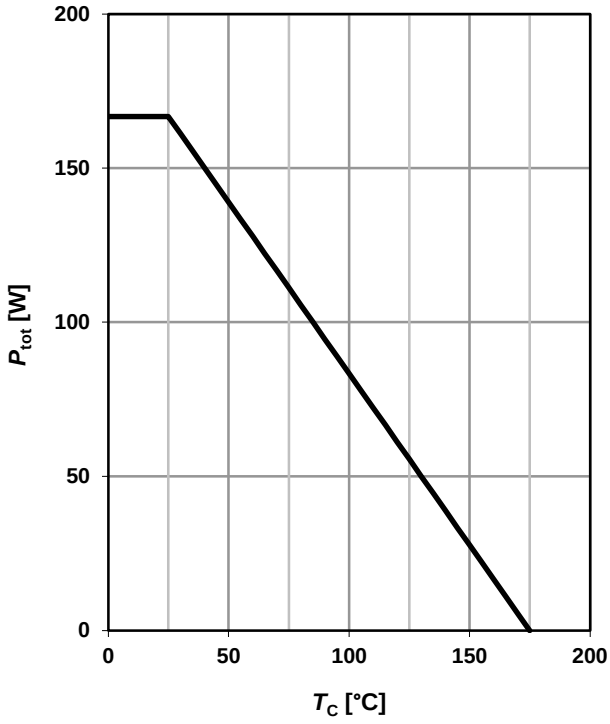
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics[1]						
Thermal resistance, junction - case	R_{thJC}	-	-	-	0.9	K/W
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=1 mA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=110 µA	2.2	3.0	3.8	
Zero gate voltage drain current	I_{DSS}	V_{DS}=100 V, V_{GS}=0 V, T_j=25 °C	-	0.1	1	µA
		V_{DS}=50 V, V_{GS}=0 V, T_j=85 °C[2]	-	1	20	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=6 V, I_D=40 A	-	3.7	5.0	mΩ
		V_{GS}=10 V, I_D=75 A	-	3.0	3.5	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[1)]						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz	-	4700	6110	pF
Output capacitance	C_{oss}		-	780	1014	
Reverse transfer capacitance	C_{rss}		-	34	52	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=50 A, $R_{G,ext}$=3.5 Ω	-	12	-	ns
Rise time	t_r		-	7	-	
Turn-off delay time	$t_{d(off)}$		-	23	-	
Fall time	t_f		-	26	-	
Gate Charge Characteristics[1)]						
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=100 A, V_{GS}=0 to 10 V	-	23	30	nC
Gate to drain charge	Q_{gd}		-	15	23	
Gate charge total	Q_g		-	67	87	
Gate plateau voltage	$V_{plateau}$		-	5.2	-	V
Reverse Diode						
Diode continous forward current[1)]	I_S	T_C=25 °C	-	-	150	A
Diode pulse current[1)]	$I_{S,pulse}$		-	-	600	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=75 A, T_j=25 °C	-	0.9	1.3	V
Reverse recovery time[1)]	t_{rr}	V_R=50 V, I_F=50A, di_F/dt=100 A/µs	-	63	-	ns
Reverse recovery charge[1)]	Q_{rr}		-	120	-	nC

[1)] Defined by design. Not subject to production test.

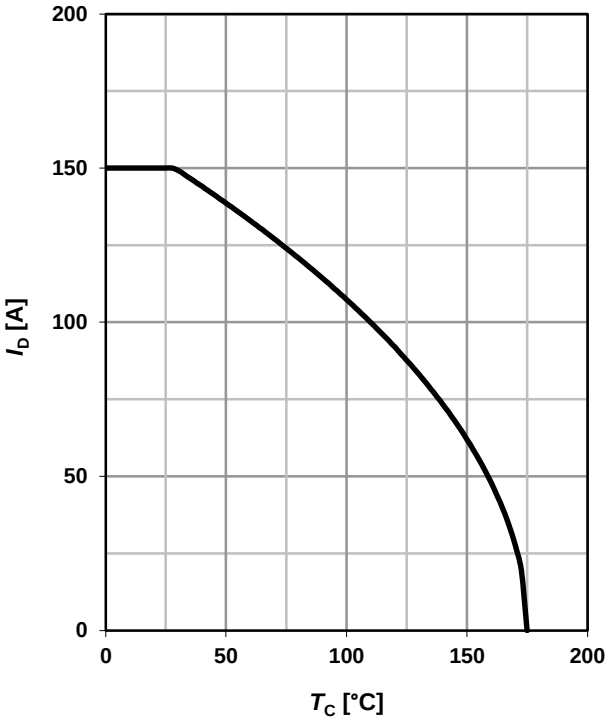
1 Power dissipation

$P_{tot} = f(T_C)$; $V_{GS} \geq 6$ V



2 Drain current

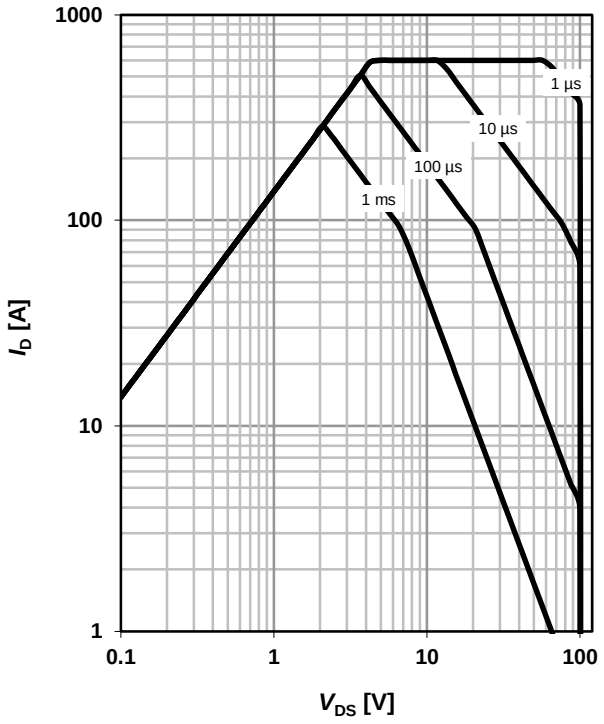
$I_D = f(T_C)$; $V_{GS} \geq 6$ V



3 Safe operating area

$I_D = f(V_{DS})$; $T_C = 25$ °C; $D = 0$

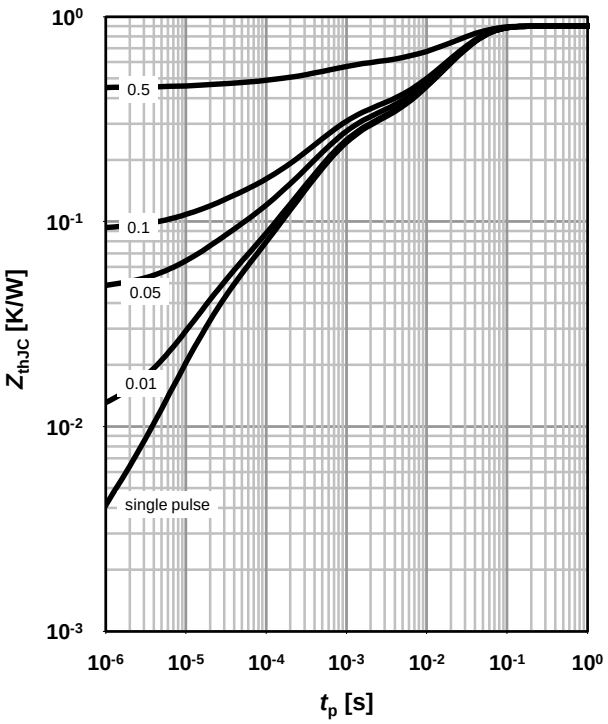
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

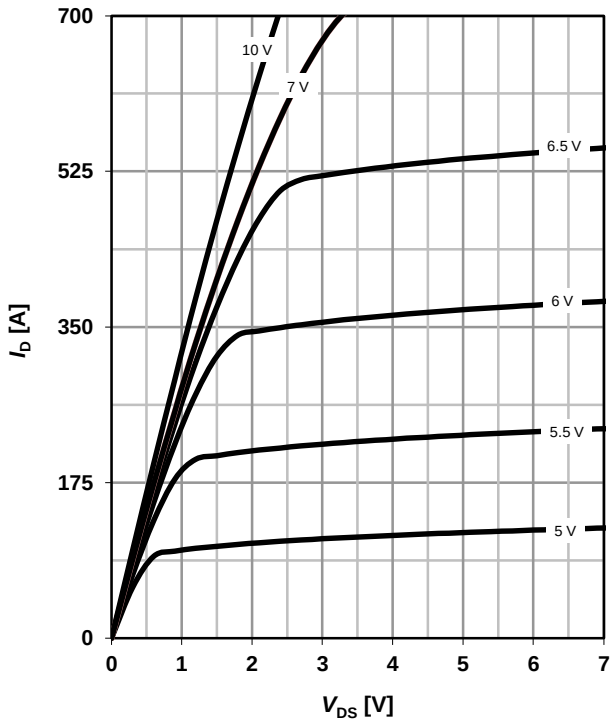
parameter: $D = t_p/T$



5 Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25$ °C

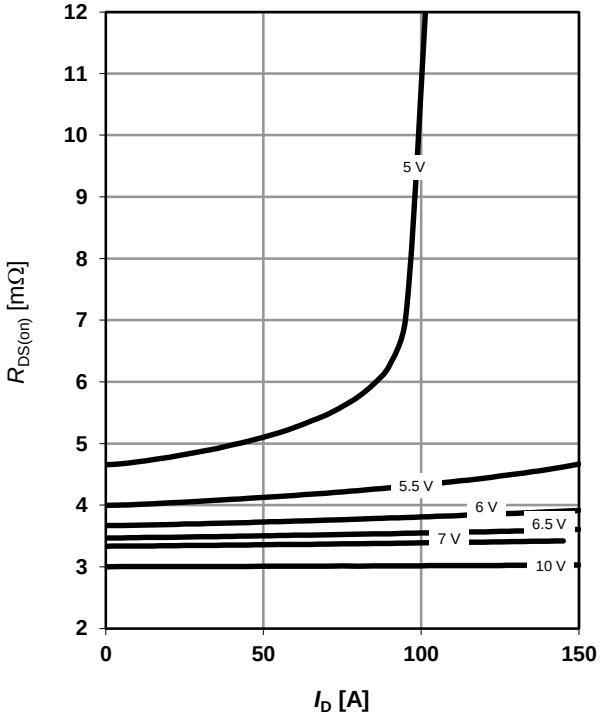
parameter: V_{GS}



6 Typ. drain-source on-state resistance

$R_{DS(on)} = f(I_D)$; $T_j = 25$ °C

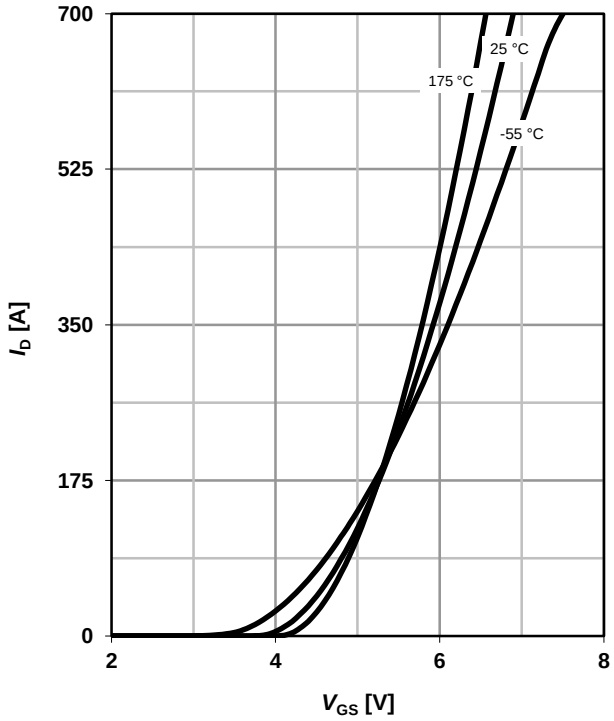
parameter: V_{GS}



7 Typ. transfer characteristics

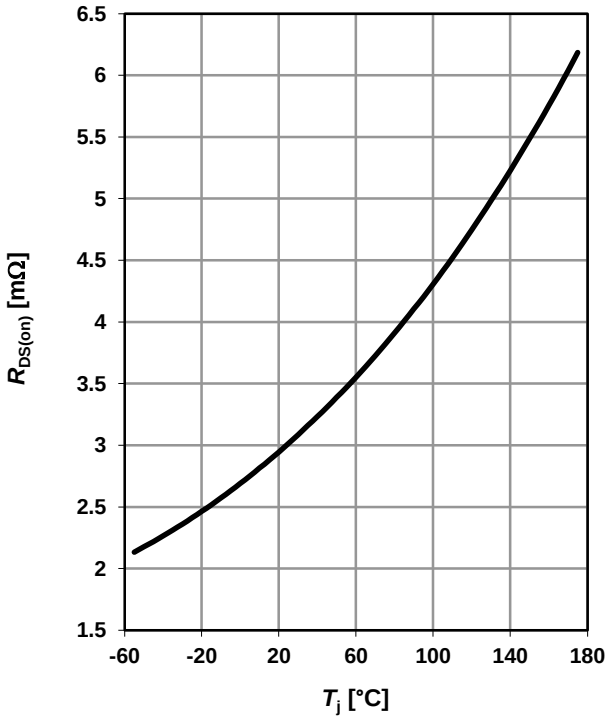
$I_D = f(V_{GS})$; $V_{DS} = 6$V

parameter: T_j



8 Typ. drain-source on-state resistance

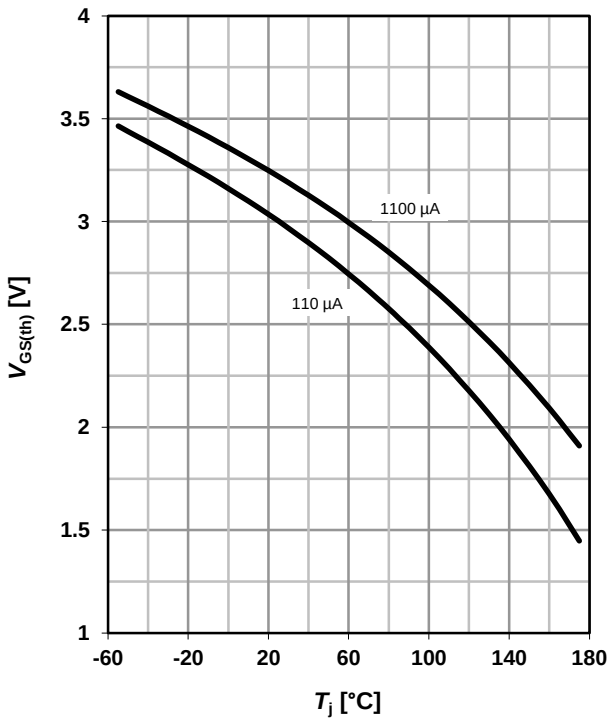
$R_{DS(on)} = f(T_j)$; $I_D = 75$ A; $V_{GS} = 10$ V



9 Typ. gate threshold voltage

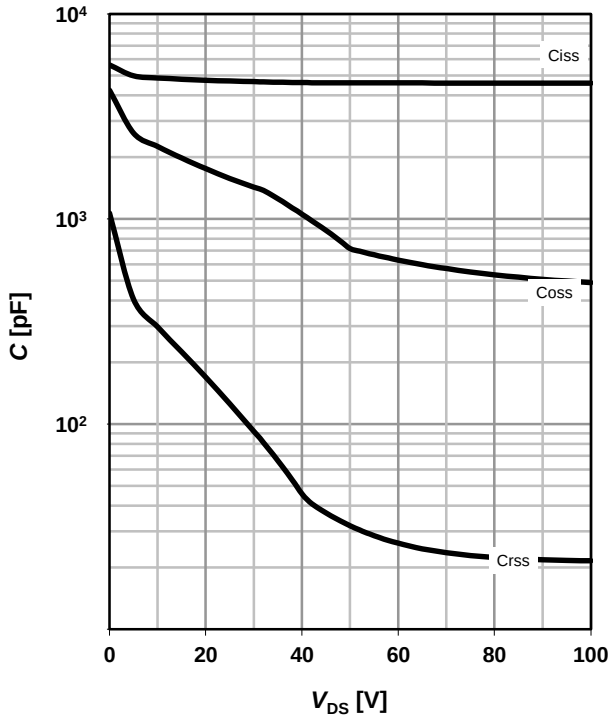
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: I_D



10 Typ. capacitances

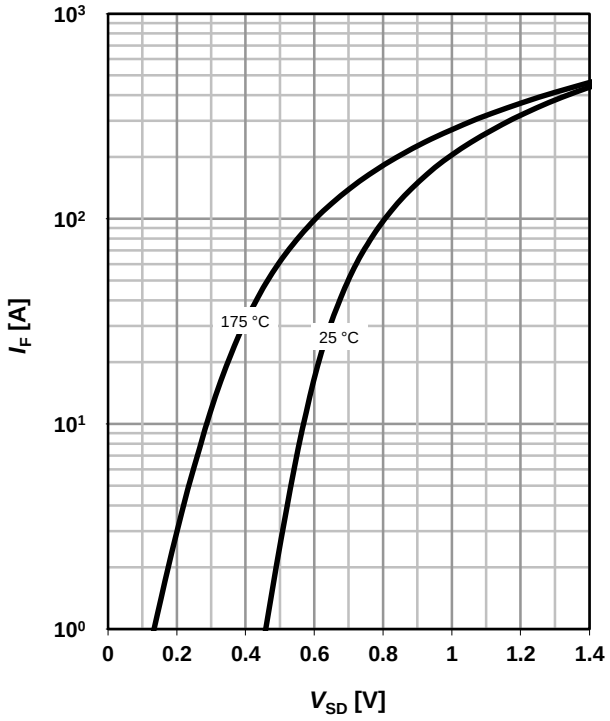
$C = f(V_{DS})$; $V_{GS} = 0$ V; f = 1 MHz



11 Typical forward diode characteristics

IF = f(V_{SD})

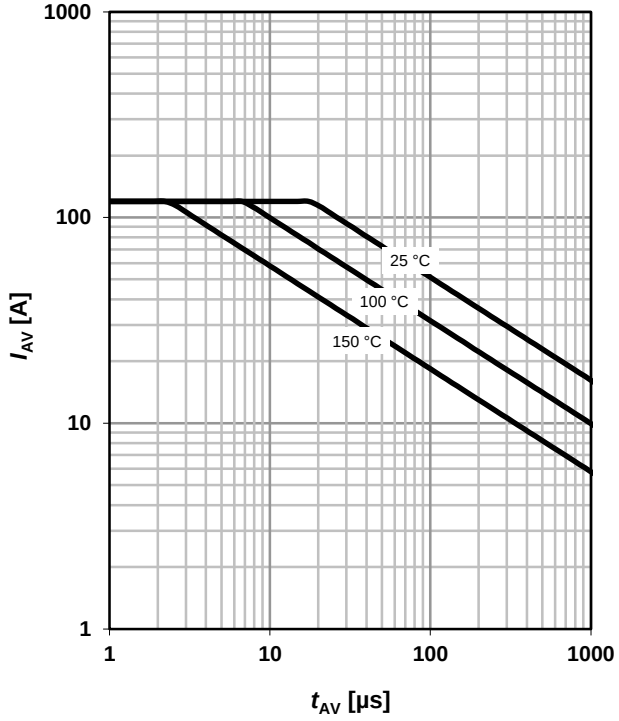
parameter: T_j



12 Typ. avalanche characteristics

$I_{AS} = f(t_{AV})$

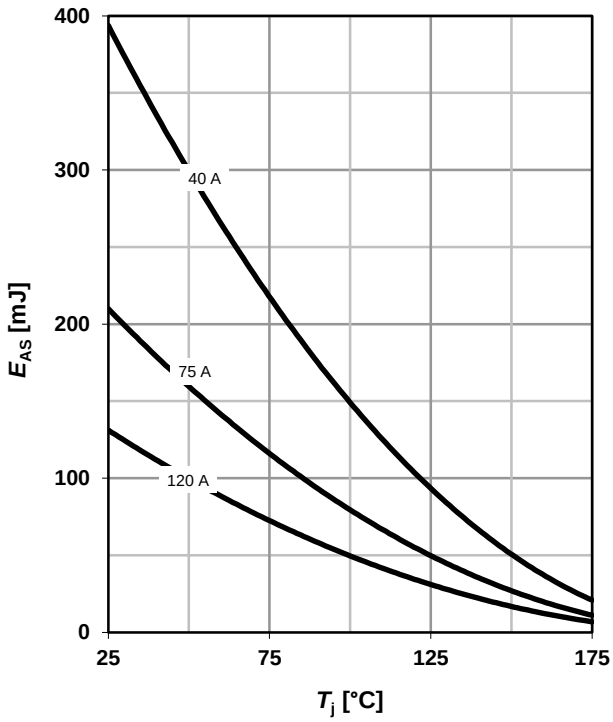
parameter: $T_{j(start)}$



13 Typical avalanche energy

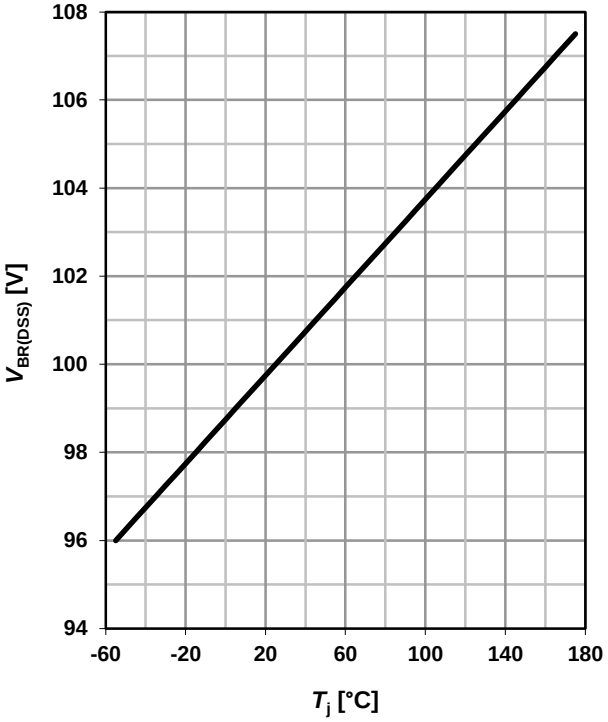
$E_{AS} = f(T_j)$

parameter: I_D



14 Drain-source breakdown voltage

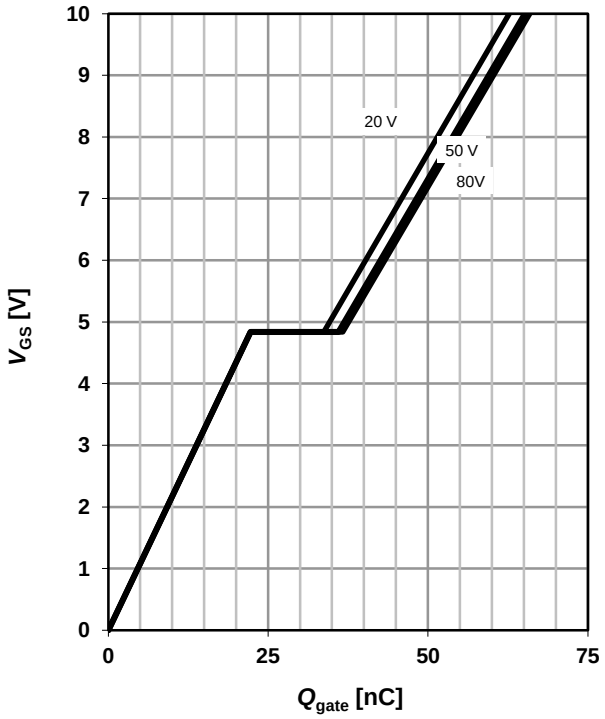
$V_{BR(DSS)} = f(T_j)$; I_{D_typ} = 1 mA

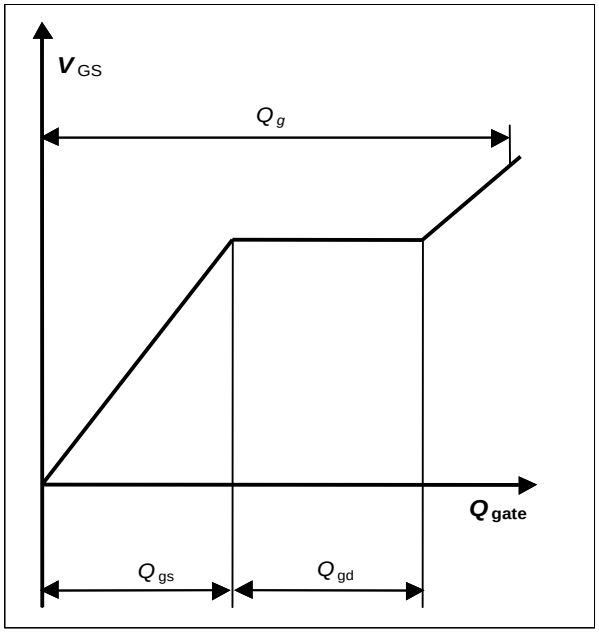


15 Typ. gate charge

$V_{GS} = f(Q_{gate})$; I_D = 100 A pulsed

parameter: V_{DD}





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Revision History

Version	Date	Changes
Version 1.0	02.10.2017	Final Data Sheet
Version 2.0	14.03.2019	Updated avalanche parameters
Version 2.1	21.09.2023	package name on page 1