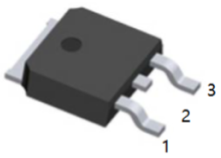
100V N-Channel MOSFET

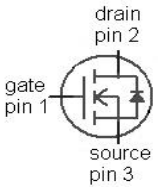
Features

- N-channel, normal level
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Ideal for high-frequency switching and synchronous rectification
- V_{DS}=100V
- I_D (at V_{GS}=10V)=80A
- $R_{DS(ON)}$ (at V_{GS}=10V) < 8.2mΩ



1.G 2.D 3.S

TO-252(DPAK) top view



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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_C=25 °C[2)]	80	A
		T_C=100 °C	58	
Pulsed drain current[2)]	$I_{D,pulse}$	T_C=25 °C	320	
Avalanche energy, single pulse	E_{AS}	I_D=73 A, R_{GS}=25 Ω	110	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25 °C	125	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 175	°C
IEC climatic category; DIN IEC 68-1			55/175/56	

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

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal resistance, junction - case	R_{thJC}				1.2	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint			62	
		6 cm² cooling area[3)]			50	
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=75 µA	2	2.7	3.5	
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}=100 V, V_{GS}=0 V, T_j=125 °C		10	100	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V		1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=73 A, TO 220, TO 262		7.4	8.6	mΩ
		V_{GS}=10 V, I_D=73 A, TO263		7.2	8.3	
		V_{GS}=10 V, I_D=73 A, TO 252		7	8.2	
		V_{GS}=6 V, I_D=36 A, TO 220, TO 262		9.3	15.4	
		V_{GS}=6 V, I_D=36 A, TO 263		9.0	15.1	
		V_{GS}=6 V, I_D=36 A, TO 252		8.9	15	
Gate resistance	R_G			1		Ω
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=80 A	45	89		S

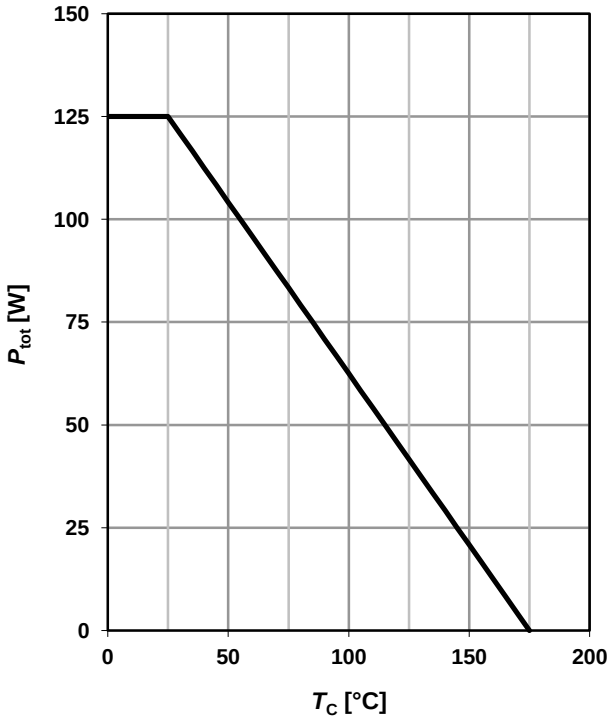
[3)] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz		2990	3980	pF
Output capacitance	C_{oss}			523	696	
Reverse transfer capacitance	C_{rss}			21		
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=73 A, $R_{G,ext}$=1.6 Ω		18		ns
Rise time	t_r			42		
Turn-off delay time	$t_{d(off)}$			31		
Fall time	t_f			8		
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=73 A, V_{GS}=0 to 10 V		15		nC
Gate to drain charge	Q_{gd}			8		
Switching charge	Q_{sw}			14		
Gate charge total	Q_g			42	55	
Gate plateau voltage	$V_{plateau}$			4.9		V
Output charge	Q_{oss}	V_{DD}=50 V, V_{GS}=0 V		55	73	nC
Diode continous forward current	I_S	T_C=25 °C			80	A
Diode pulse current	$I_{S,pulse}$				320	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=80 A, T_j=25 °C		1.0	1.2	V
Reverse recovery time	t_{rr}	V_R=50 V, I_F=73 A, di_F/dt=100 A/µs		71		ns
Reverse recovery charge	Q_{rr}			123		nC

[4] See figure 16 for gate charge parameter definition

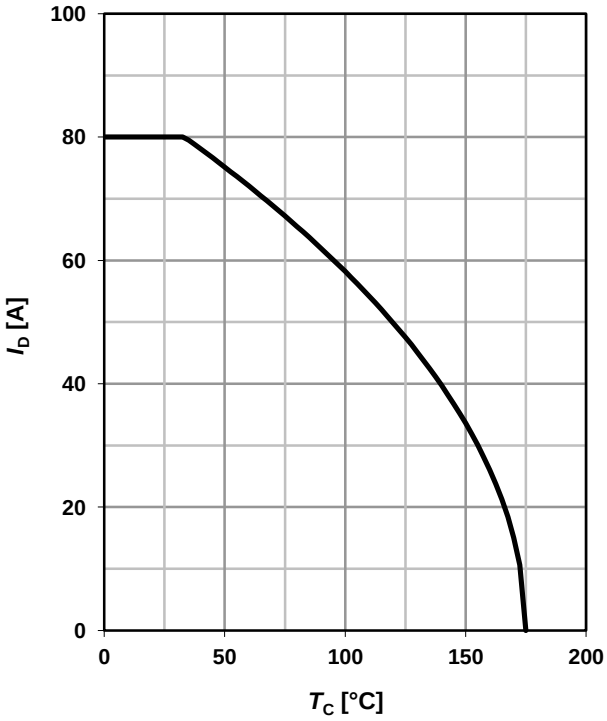
1 Power dissipation

P_{tot}=f(T_C)



2 Drain current

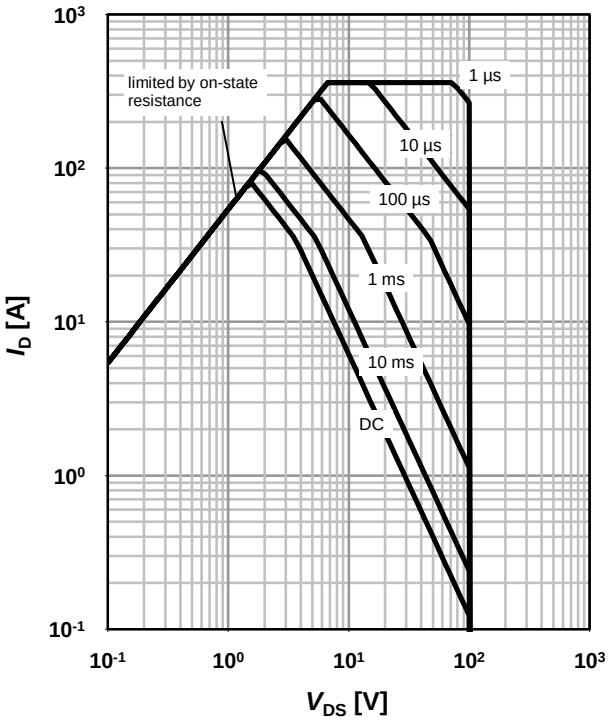
I_D=f(T_C); V_{GS}≥10 V



3 Safe operating area

I_D=f(V_{DS}); T_C=25 °C; D =0

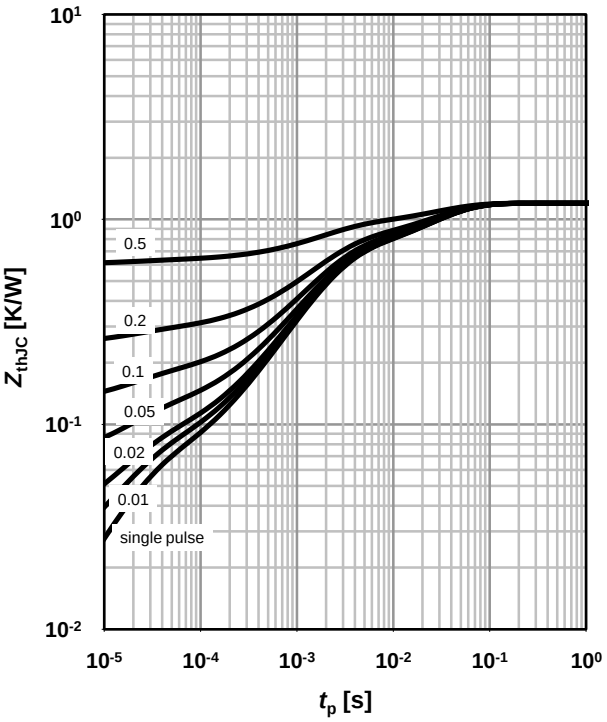
parameter: t_p



4 Max. transient thermal impedance

Z_{thJC}=f(t_p)

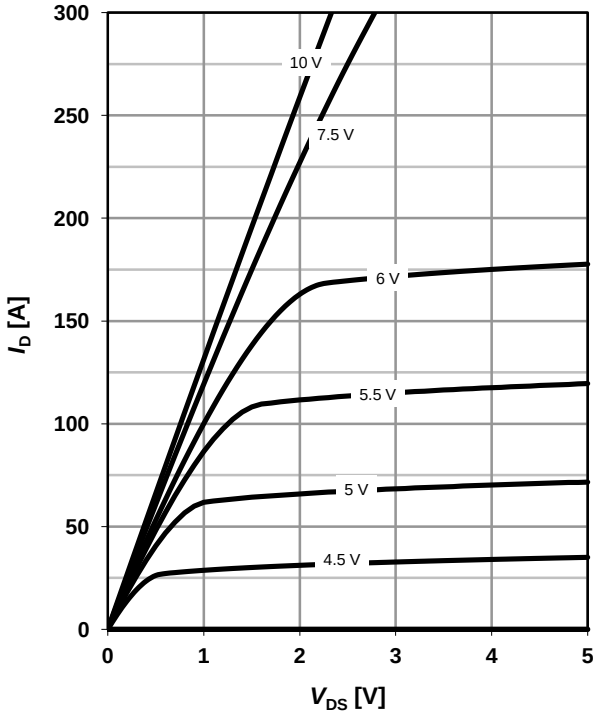
parameter: D =t_p/T



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

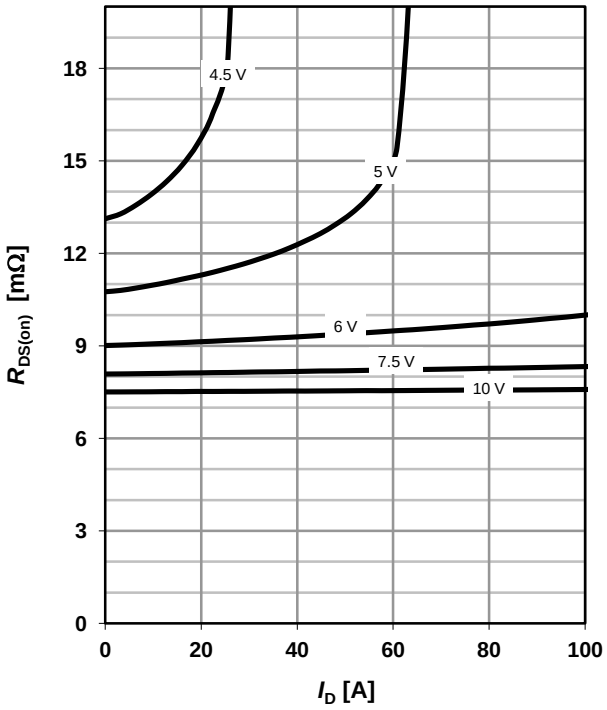
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C

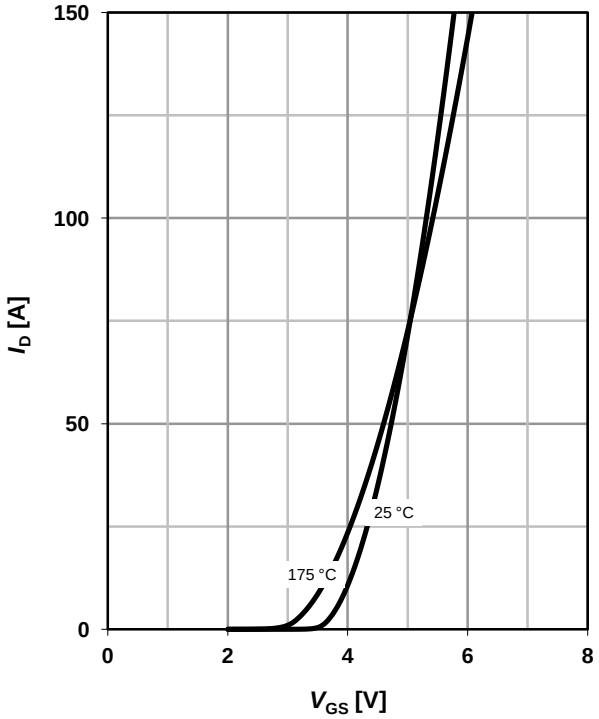
parameter: V_{GS}



7 Typ. transfer characteristics

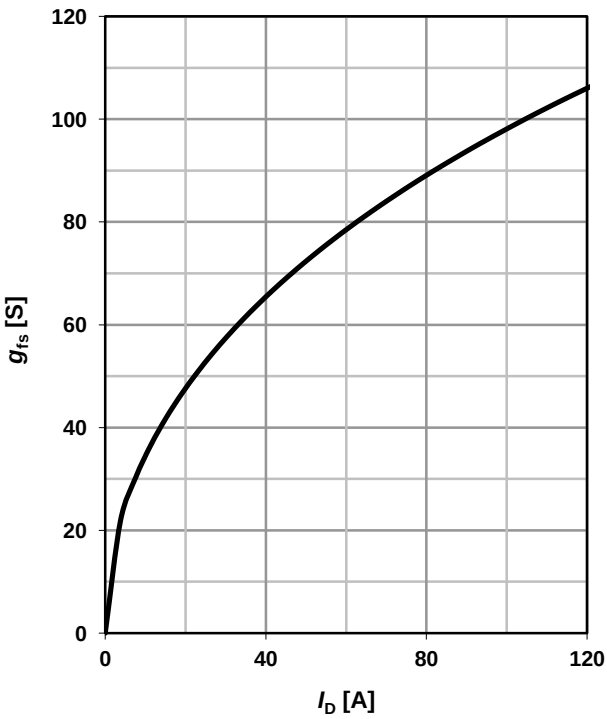
I_D=f(V_{GS}); $|V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



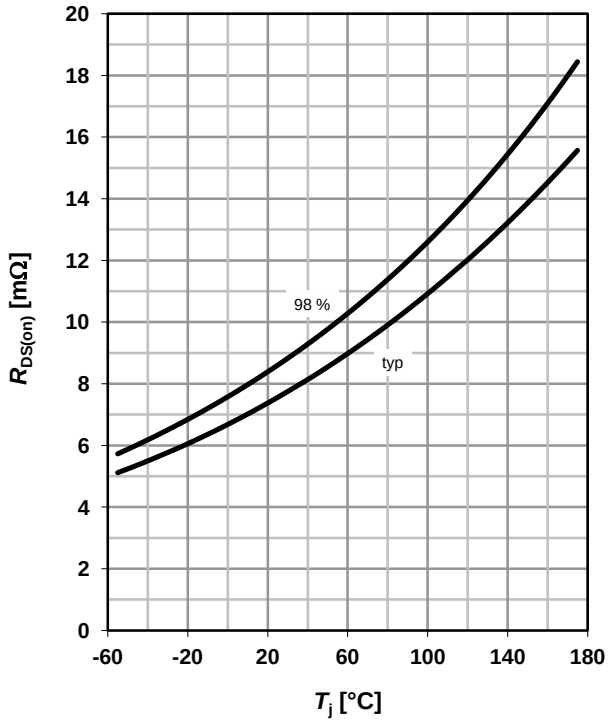
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



9 Drain-source on-state resistance

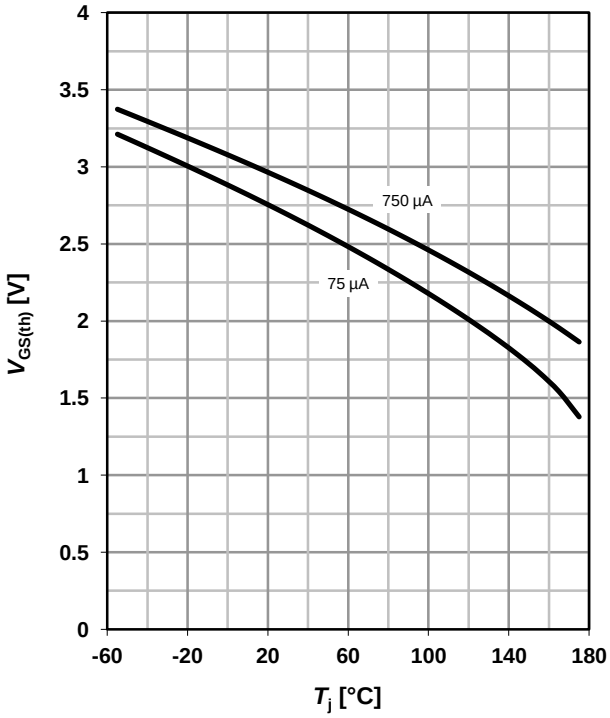
$R_{DS(on)}$=f(T_j); I_D=73 A; V_{GS}=10 V; TO 220



10 Typ. gate threshold voltage

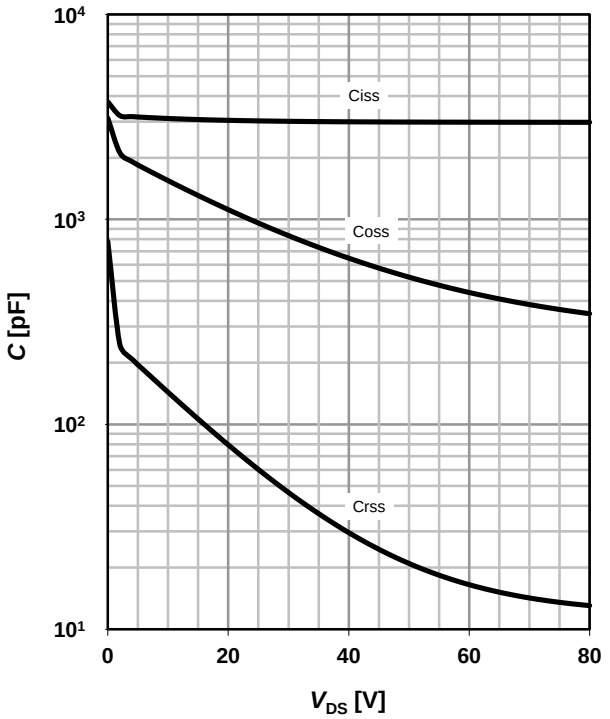
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}

parameter: I_D



11 Typ. capacitances

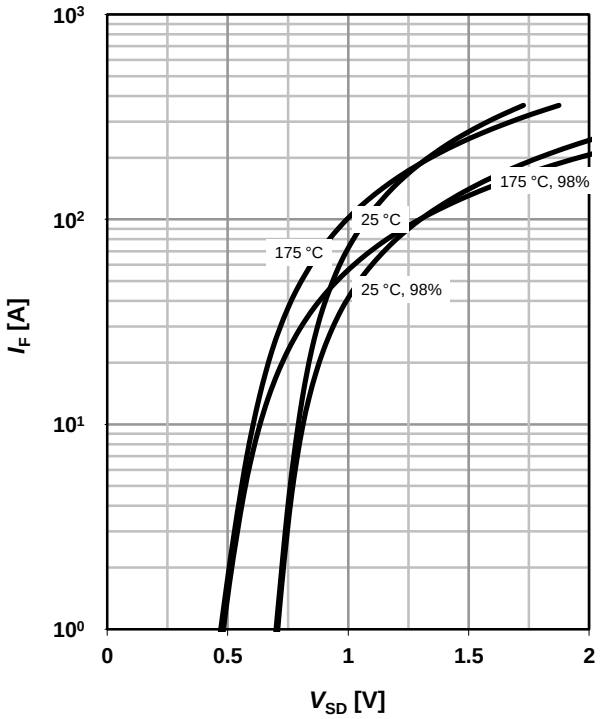
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

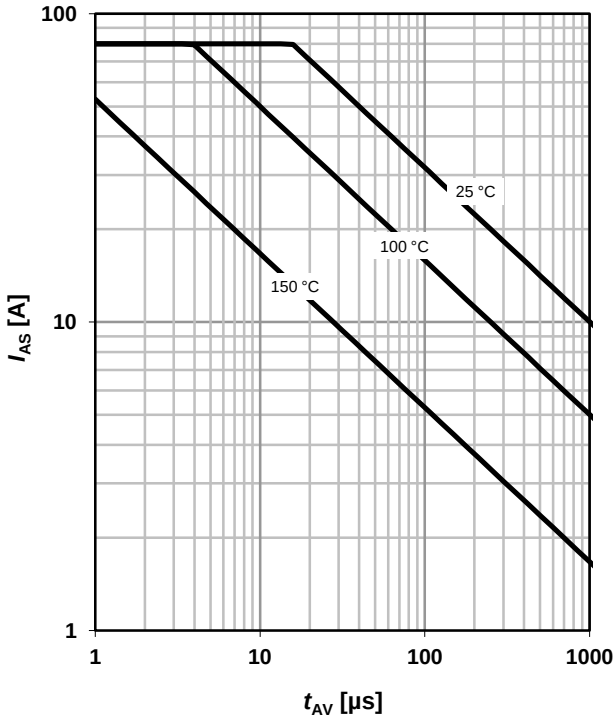
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

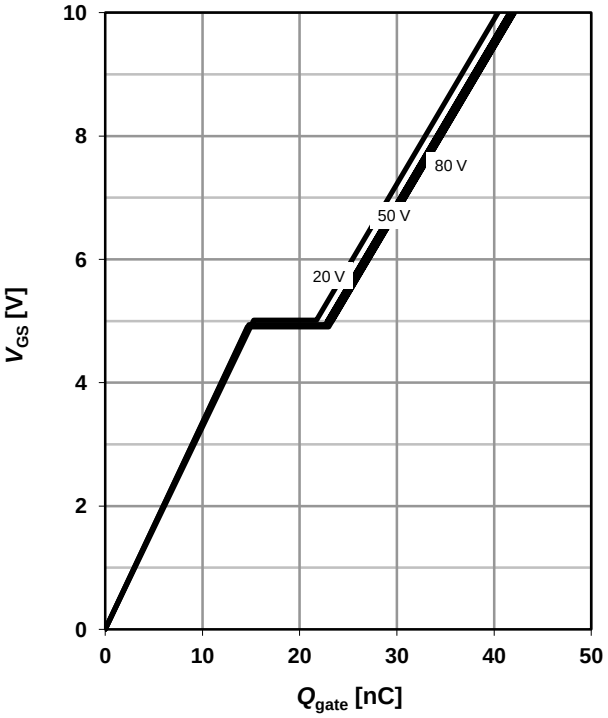
parameter: $T_{j(start)}$



14 Typ. gate charge

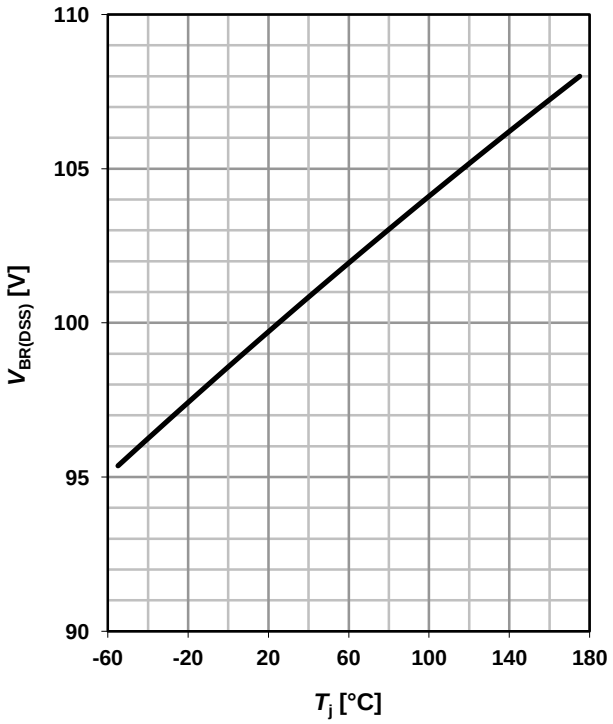
V_{GS}=f(Q_{gate}); I_D=73 A pulsed

parameter: V_{DD}

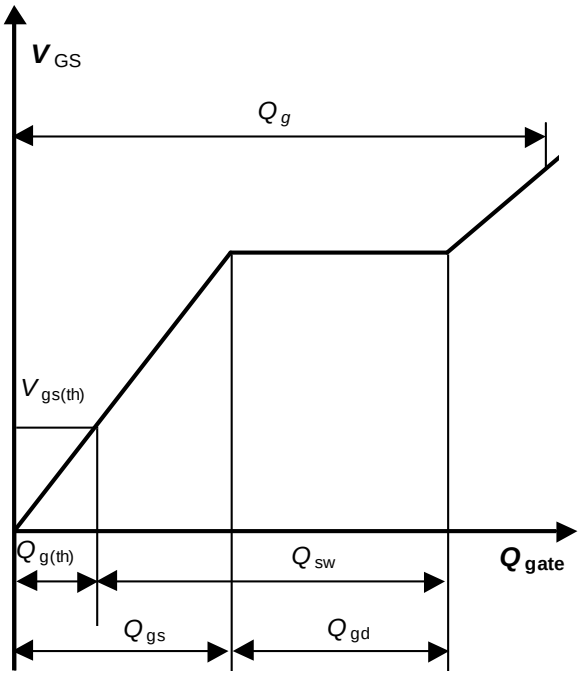


15 Drain-source breakdown voltage

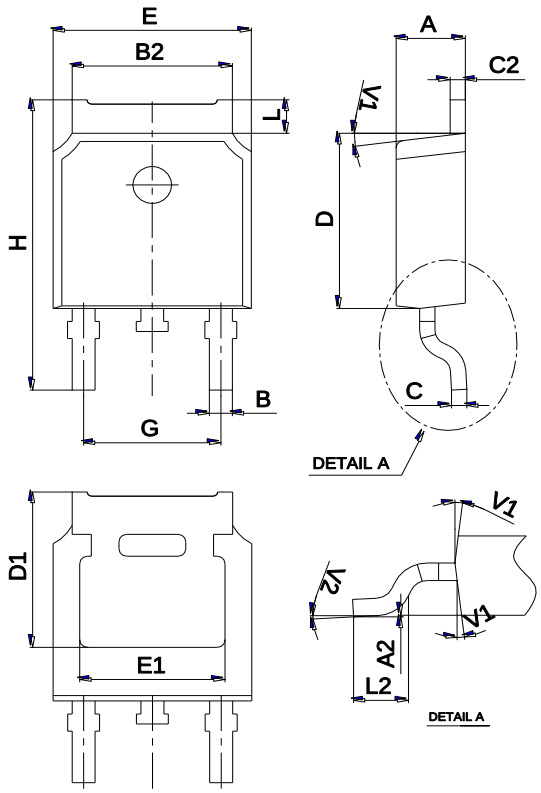
$V_{BR(DSS)}$=f(T_j); I_D=1 mA



16 Gate charge waveforms

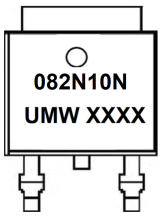


Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW IPD082N10N3G	TO-252	2500	Tape and reel

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