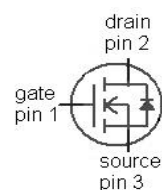
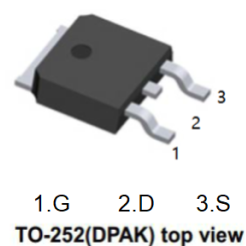


Features

- 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 $V_{GS}=10V$) < 8.2m Ω



Maximum ratings, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_C=25\text{ °C}^{2)}$	80	A
		$T_C=100\text{ °C}$	58	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_C=25\text{ °C}$	320	
Avalanche energy, single pulse	E_{AS}	$I_D=73\text{ A}, R_{GS}=25\ \Omega$	110	mJ
Gate source voltage	V_{GS}		± 20	V
Power dissipation	P_{tot}	$T_C=25\text{ °C}$	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 $T_j=25\text{ }^\circ\text{C}$, 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 cm ² cooling area ³⁾			50	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=1\text{ mA}$	100			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=75\text{ }\mu\text{A}$	2	2.7	3.5	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=100\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^\circ\text{C}$		0.1	1	μA
		$V_{DS}=100\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ }^\circ\text{C}$		10	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$		1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=73\text{ A}, \text{TO } 220, \text{TO } 262$		7.4	8.6	m Ω
		$V_{GS}=10\text{ V}, I_D=73\text{ A}, \text{TO } 263$		7.2	8.3	
		$V_{GS}=10\text{ V}, I_D=73\text{ A}, \text{TO } 252$		7	8.2	
		$V_{GS}=6\text{ V}, I_D=36\text{ A}, \text{TO } 220, \text{TO } 262$		9.3	15.4	
		$V_{GS}=6\text{ V}, I_D=36\text{ A}, \text{TO } 263$		9.0	15.1	
		$V_{GS}=6\text{ V}, I_D=36\text{ A}, \text{TO } 252$		8.9	15	
Gate resistance	R_G			1		Ω
Transconductance	g_{fs}	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=80\text{ A}$	45	89		S

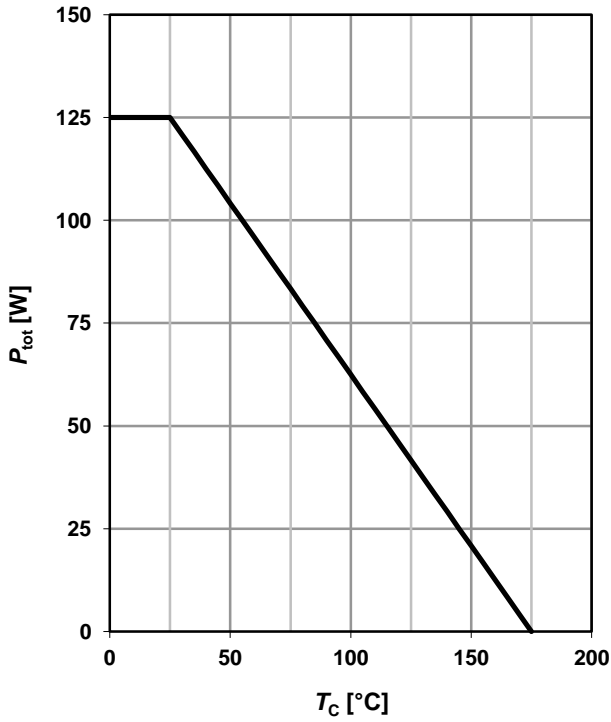
³⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical in still air.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=50\text{ V}, f=1\text{ MHz}$		2990	3980	pF
Output capacitance	C_{oss}			523	696	
Reverse transfer capacitance	C_{rss}			21		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50\text{ V}, V_{GS}=10\text{ V}, I_D=73\text{ A}, R_{G,ext}=1.6\ \Omega$		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}	$V_{DD}=50\text{ V}, I_D=73\text{ A}, V_{GS}=0\text{ to }10\text{ V}$		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		
Output charge	Q_{oss}	$V_{DD}=50\text{ V}, V_{GS}=0\text{ V}$		55	73	nC
Diode continuous forward current	I_S	$T_C=25\text{ }^\circ\text{C}$			80	A
Diode pulse current	$I_{S,pulse}$				320	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=80\text{ A}, T_j=25\text{ }^\circ\text{C}$		1.0	1.2	V
Reverse recovery time	t_{rr}	$V_R=50\text{ V}, I_F=73\text{ A}, di_F/dt=100\text{ A}/\mu\text{s}$		71		ns
Reverse recovery charge	Q_{rr}				123	nC

⁴⁾ See figure 16 for gate charge parameter definition

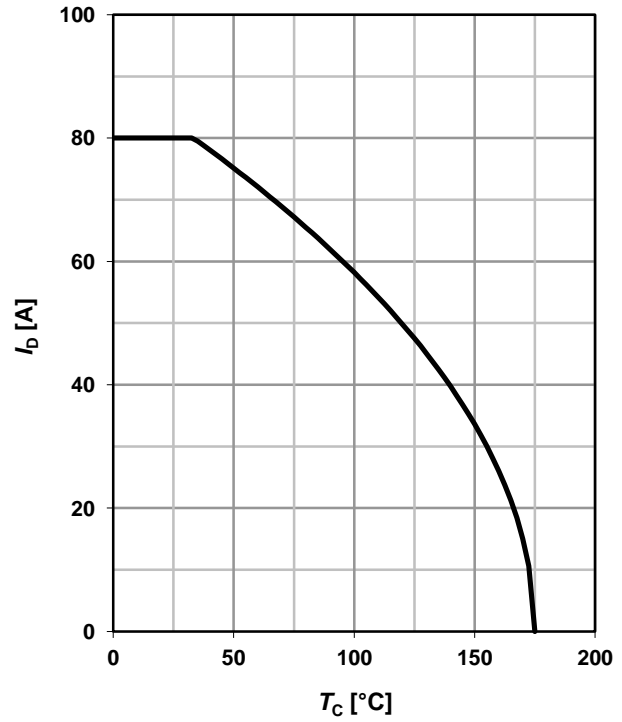
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

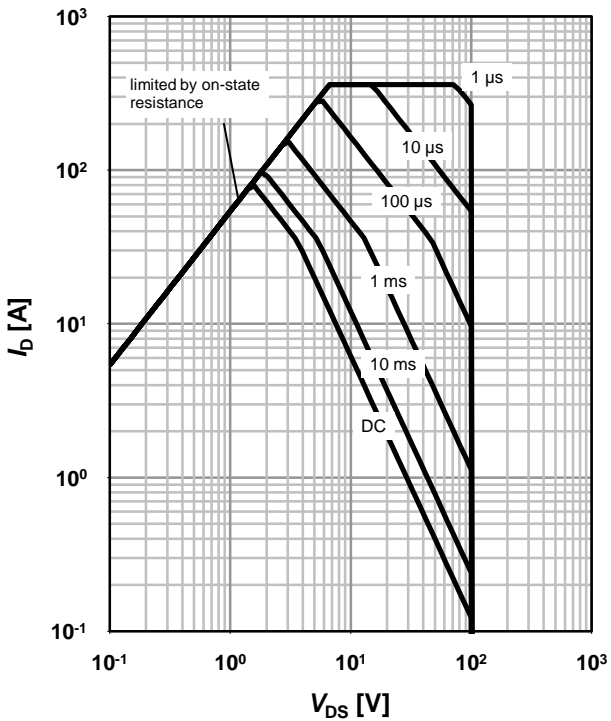
$I_D=f(T_C); V_{GS} \geq 10V$



3 Safe operating area

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

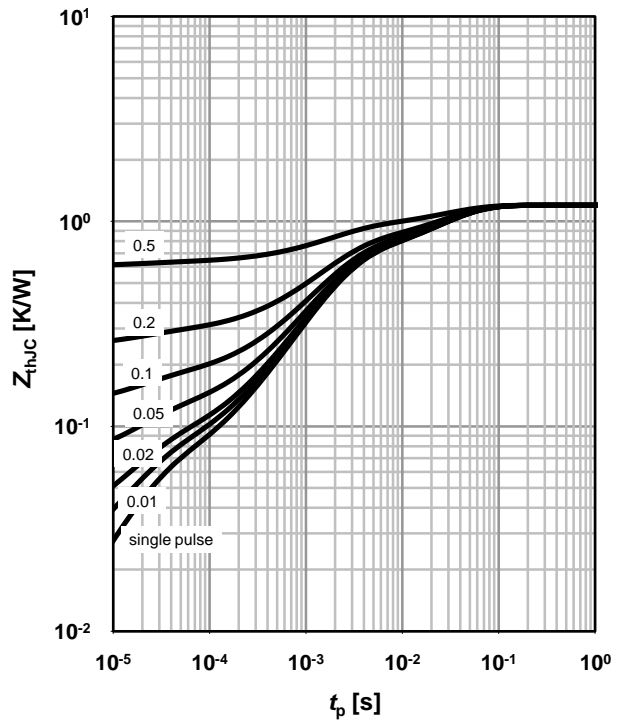
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

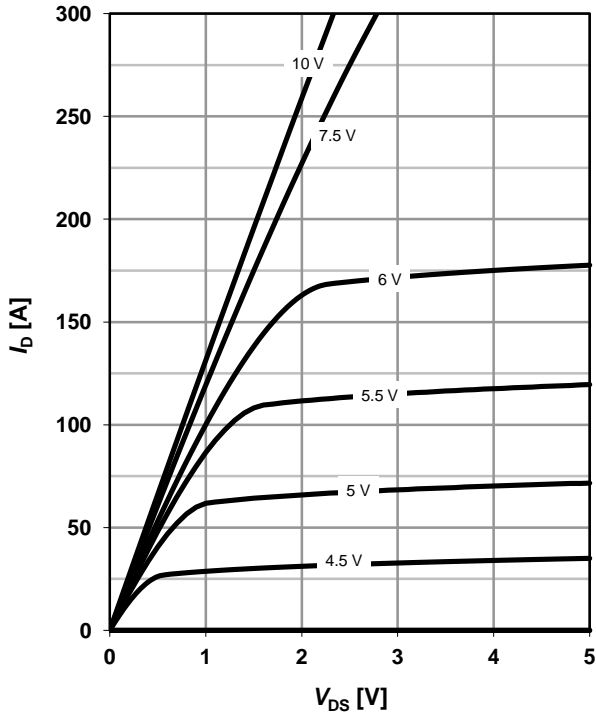
parameter: $D=t_p/T$



5 Typ. output characteristics

$I_D=f(V_{DS}); T_j=25\text{ }^\circ\text{C}$

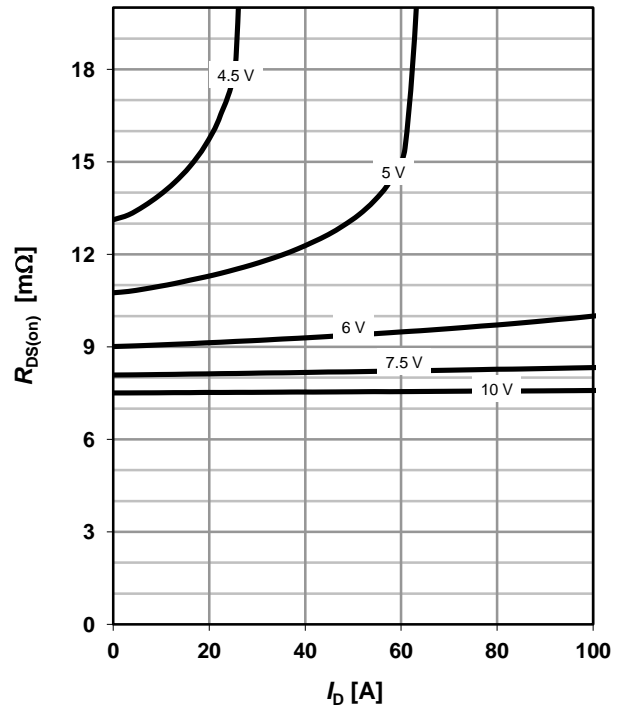
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}=f(I_D); T_j=25\text{ }^\circ\text{C}$

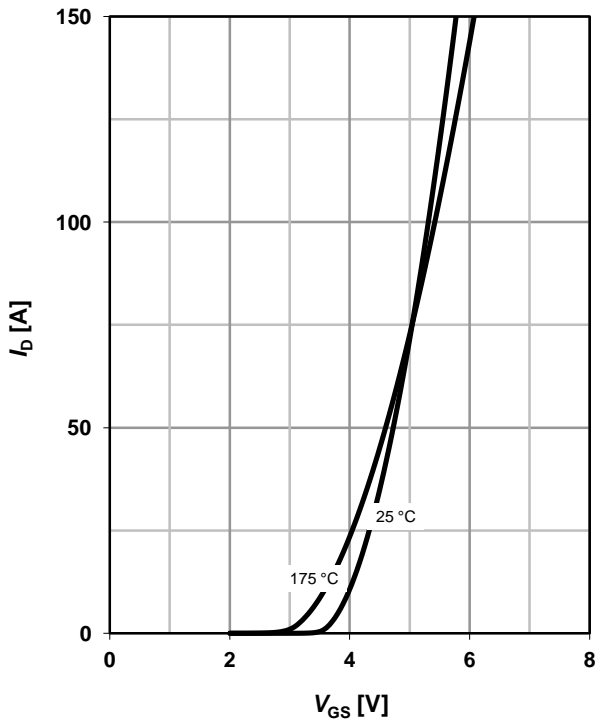
parameter: V_{GS}



7 Typ. transfer characteristics

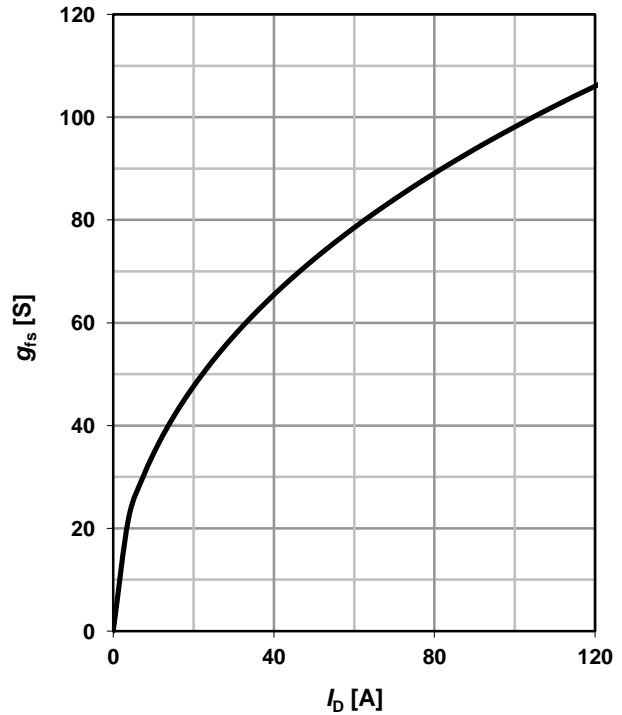
$I_D=f(V_{GS}); |V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



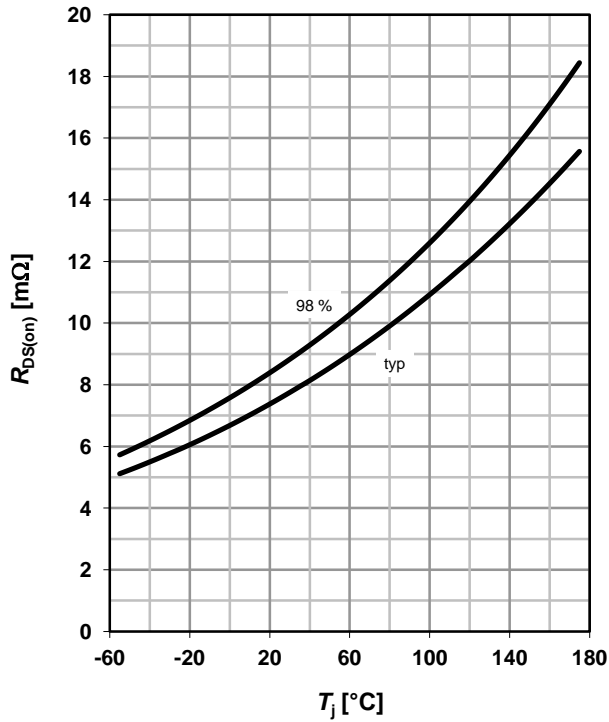
8 Typ. forward transconductance

$g_{fs}=f(I_D); T_j=25\text{ }^\circ\text{C}$



9 Drain-source on-state resistance

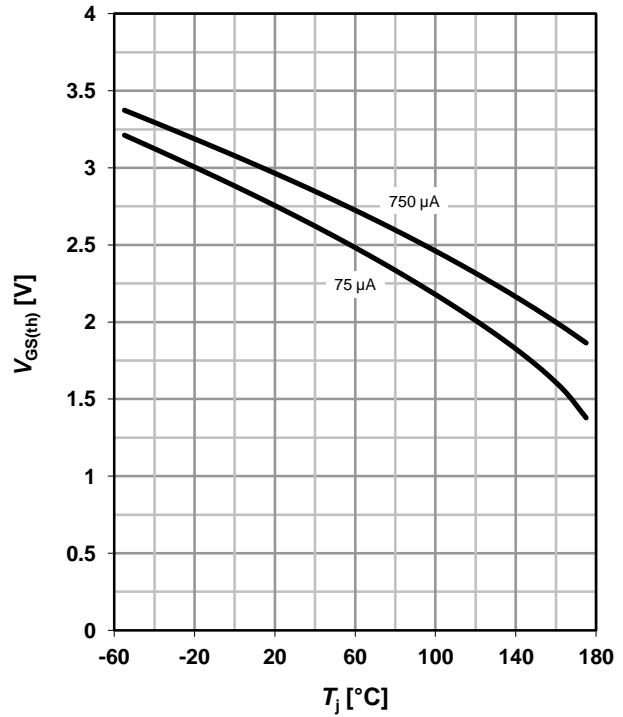
$R_{DS(on)}=f(T_j)$; $I_D=73\text{ A}$; $V_{GS}=10\text{ V}$; TO 220



10 Typ. gate threshold voltage

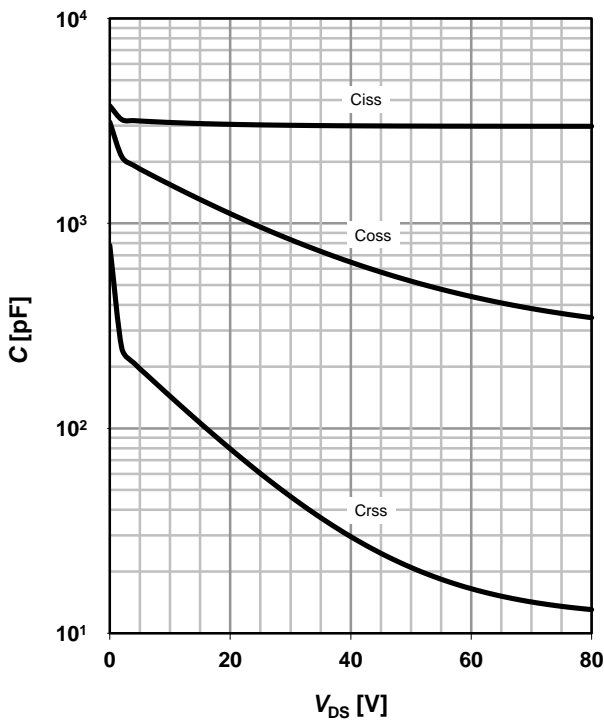
$V_{GS(th)}=f(T_j)$; $V_{GS}=V_{DS}$

parameter: I_D



11 Typ. capacitances

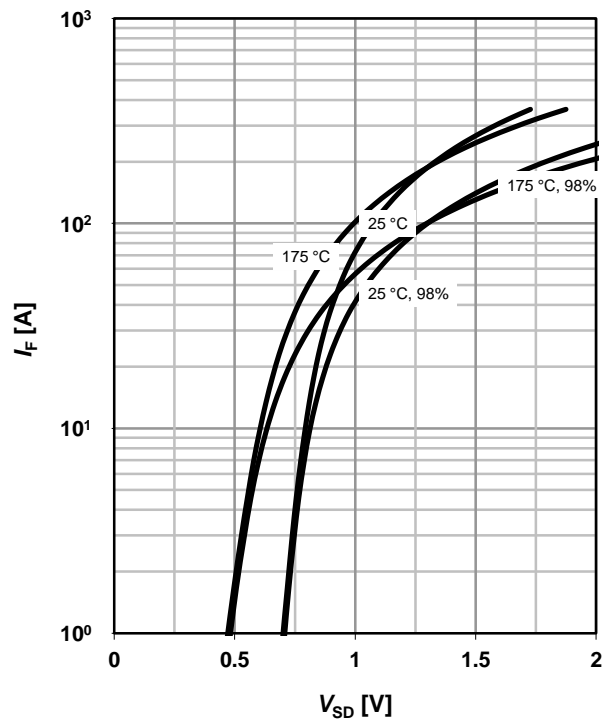
$C=f(V_{DS})$; $V_{GS}=0\text{ V}$; $f=1\text{ MHz}$



12 Forward characteristics of reverse diode

$I_F=f(V_{SD})$

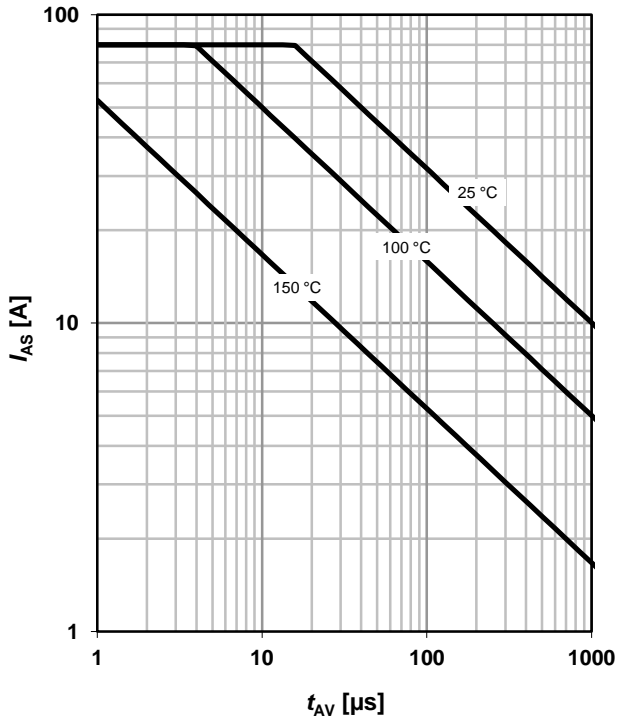
parameter: T_j



13 Avalanche characteristics

$I_{AS}=f(t_{AV}); R_{GS}=25\ \Omega$

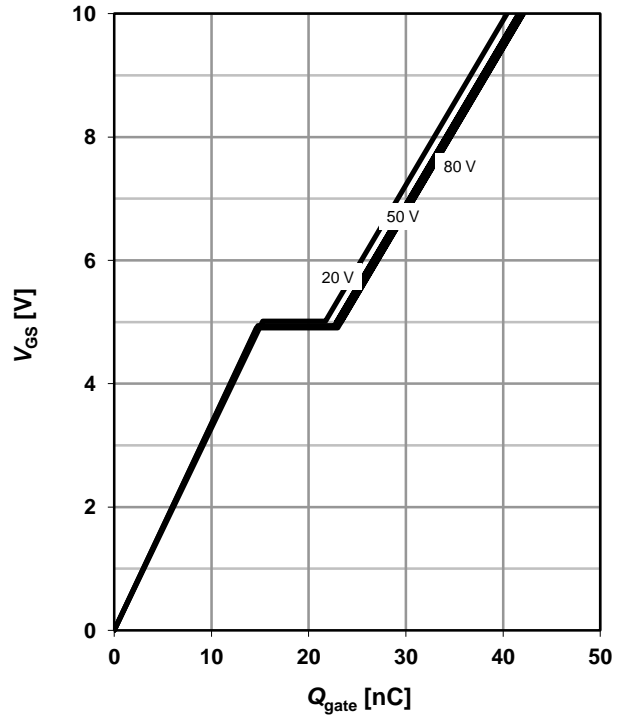
parameter: $T_{j(\text{start})}$



14 Typ. gate charge

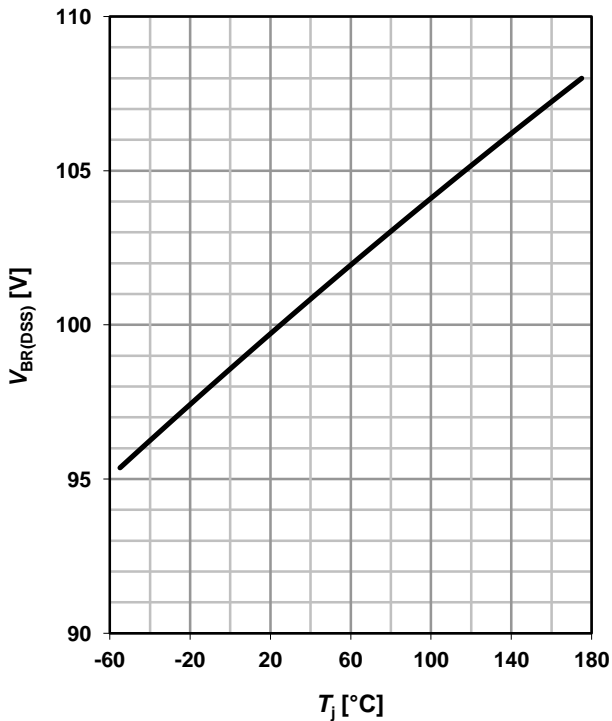
$V_{GS}=f(Q_{\text{gate}}); I_D=73\ \text{A pulsed}$

parameter: V_{DD}



15 Drain-source breakdown voltage

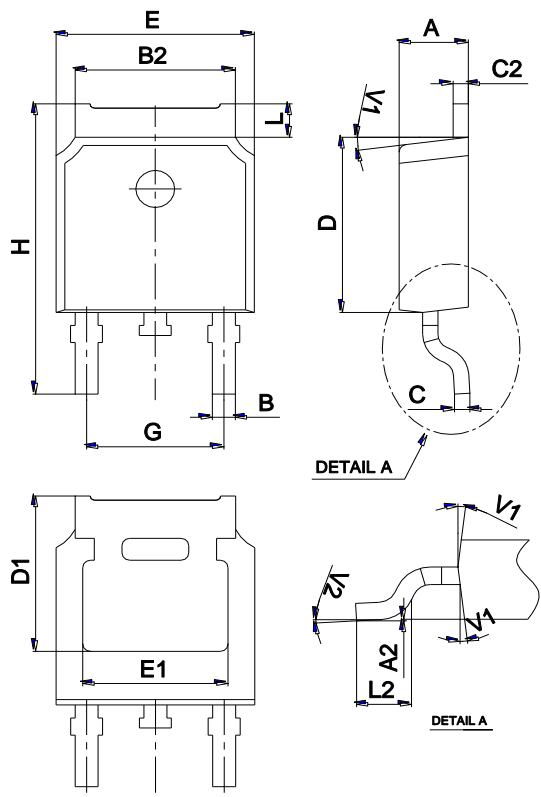
$V_{BR(DSS)}=f(T_j); I_D=1\ \text{mA}$



16 Gate charge waveforms

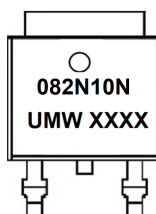


Package Mechanical Data TO-252



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