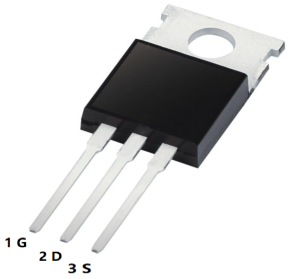
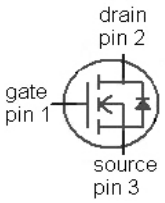
100V N-Channel MOSFET

Features

- N-channel, normal level
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Pb-free lead plating; RoHS compliant
- 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) < 7.2mΩ





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	70	
Pulsed drain current[2)]	$I_{D,pulse}$	T_C=25 °C	320	
Avalanche energy, single pulse	E_{AS}	I_D=80 A, R_{GS}=25 Ω	160	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25 °C	150	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 175	°C
IEC climatic category; DIN IEC 68-1			55/175/56	

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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	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint			62	
		6 cm^2 cooling area[3)]			40	
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=90 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=80 A		6.2	7.2	mΩ
		V_{GS}=6 V, I_D=40 A		7.6	12.7	
Gate resistance	R_G			1.6		Ω
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=80 A	50	99		S

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Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz		3690	4910	pF
Output capacitance	C_{oss}			646		
Reverse transfer capacitance	C_{rss}			25		
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=80 A, R_G=3.6 Ω		19		ns
Rise time	t_r			37		
Turn-off delay time	$t_{d(off)}$			37		
Fall time	t_f			9		
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=80 A, V_{GS}=0 to 10 V		18		nC
Gate to drain charge	Q_{gd}			10		
Switching charge	Q_{sw}			16		
Gate charge total	Q_g			51	68	
Gate plateau voltage	$V_{plateau}$			4.9		V
Output charge	Q_{oss}	V_{DD}=50 V, V_{GS}=0 V		68	91	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	1.2	V
Reverse recovery time	t_{rr}	V_R=50 V, I_F=I_S, di_F/dt=100 A/µs		73		ns
Reverse recovery charge	Q_{rr}			139		nC

[6] See figure 16 for gate charge parameter definition

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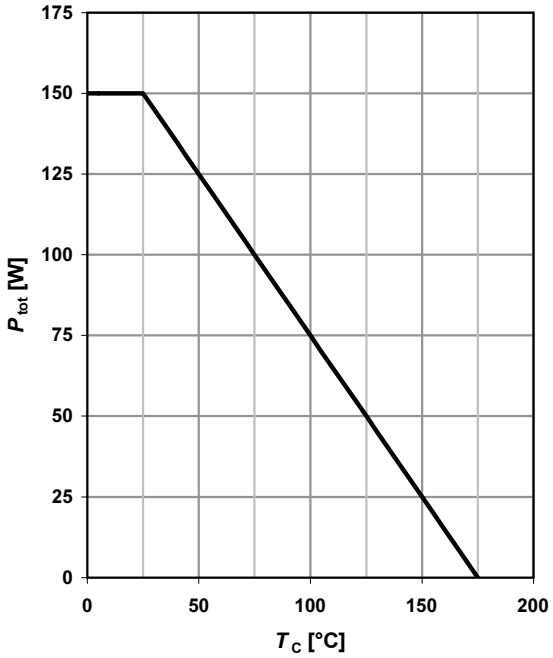
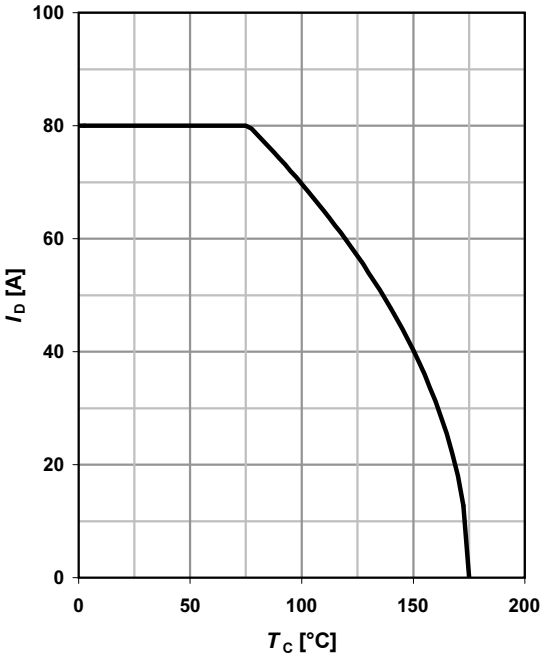
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

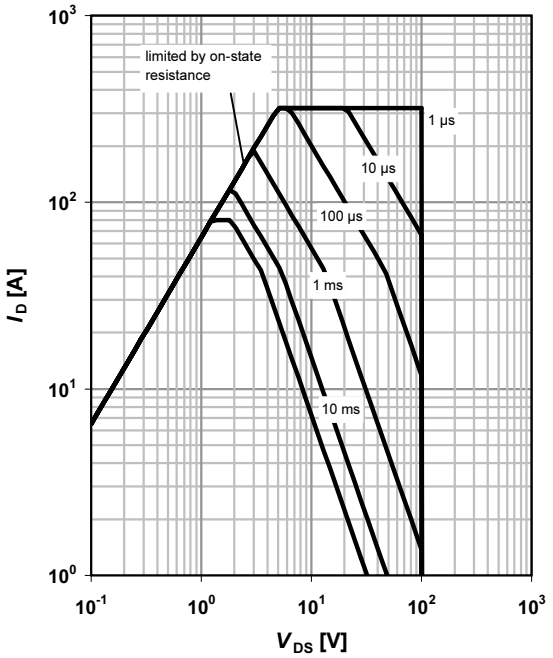
$I_D=f(T_C)$; $V_{GS}\geq 10$ V



3 Safe operating area

$I_D=f(V_{DS})$; T_C=25 °C; D=0

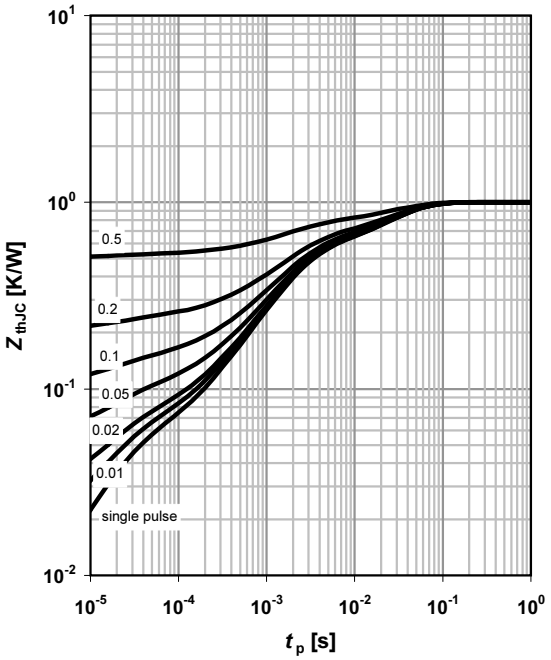
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

parameter: $D=t_p/T$



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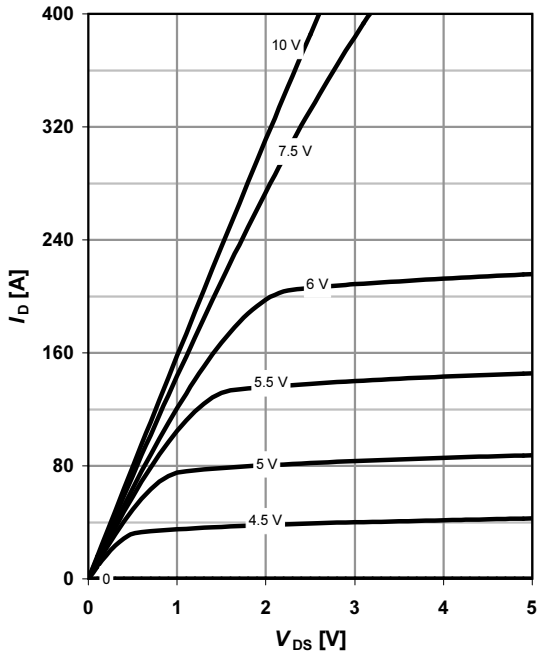
5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

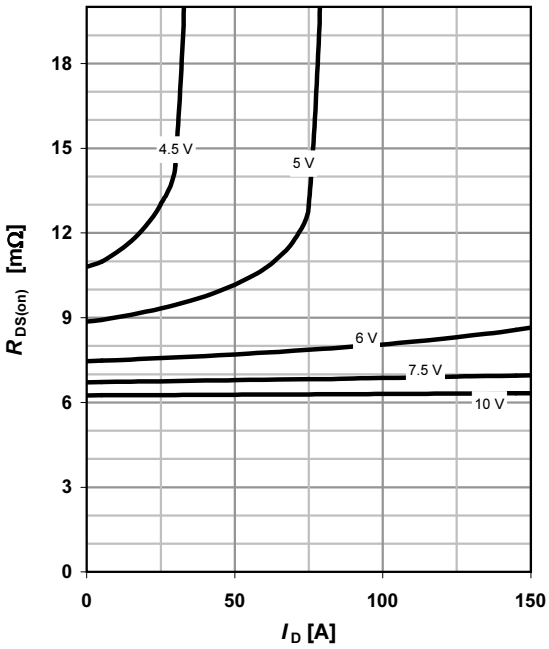
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C

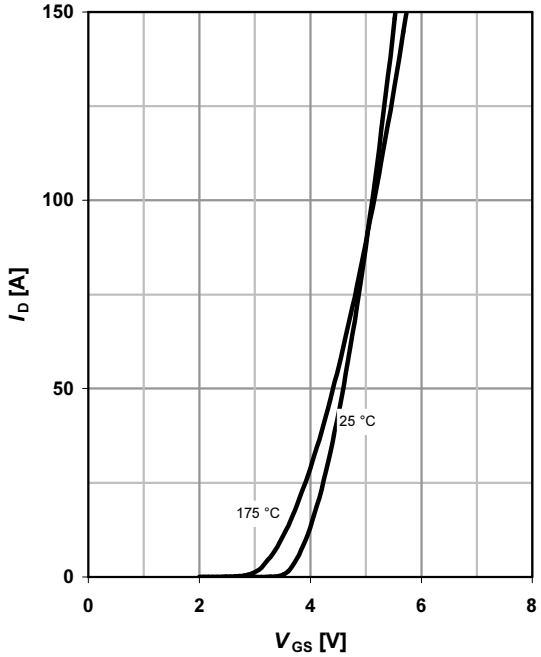
parameter: V_{GS}



7 Typ. transfer characteristics

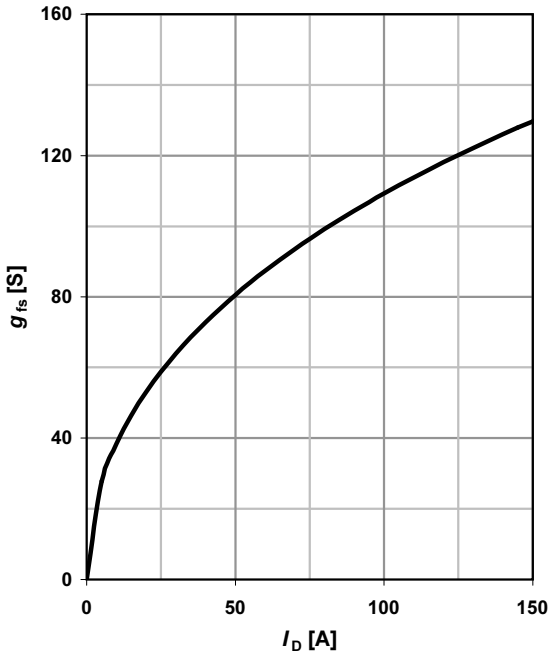
I_D=f(V_{GS}); |V_{DS}|>2|I_D|$R_{DS(on)max}$

parameter: T_j



8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



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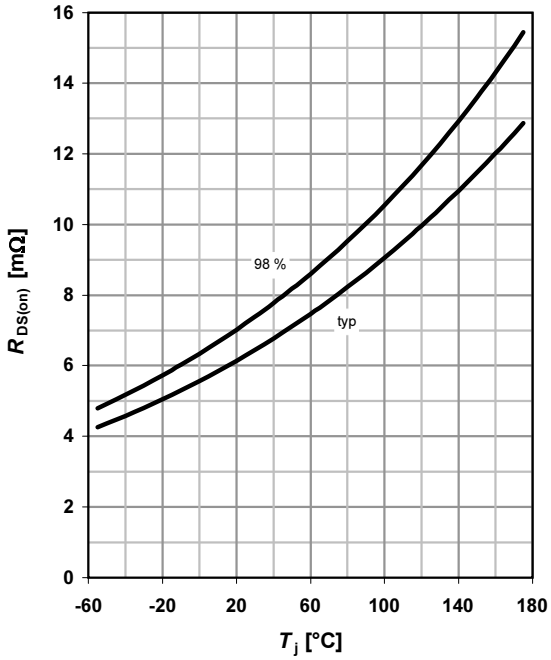
9 Drain-source on-state resistance

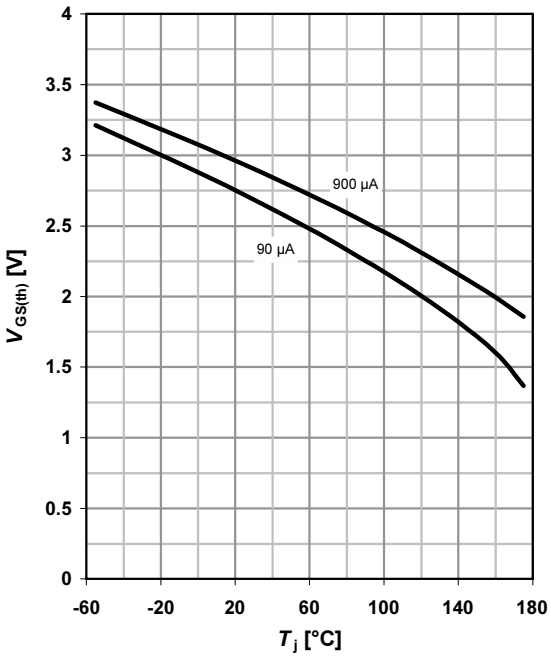
$R_{DS(on)}$=f(T_j); I_D=80 A; V_{GS}=10 V



10 Typ. gate threshold voltage

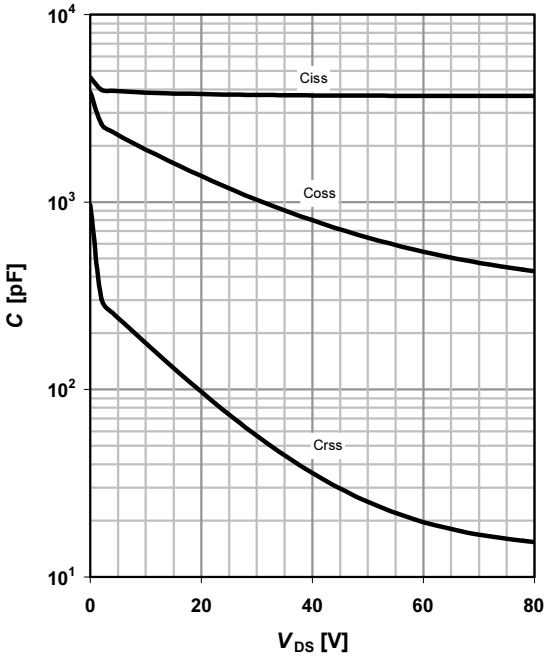
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}

parameter: I_D



11 Typ. capacitances

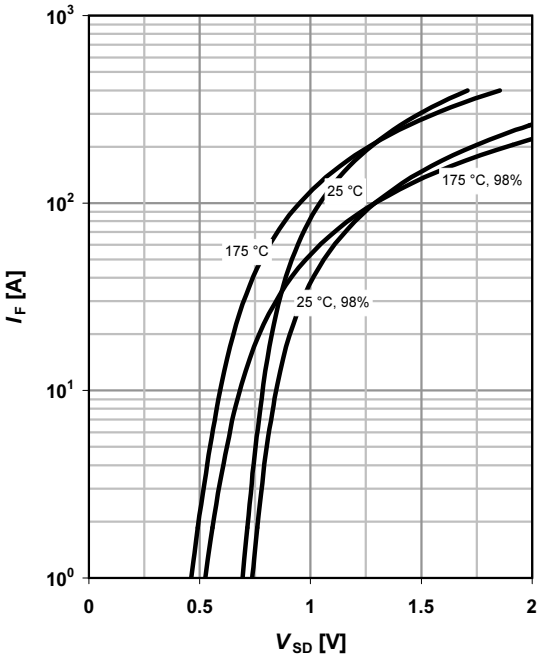
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

parameter: T_j



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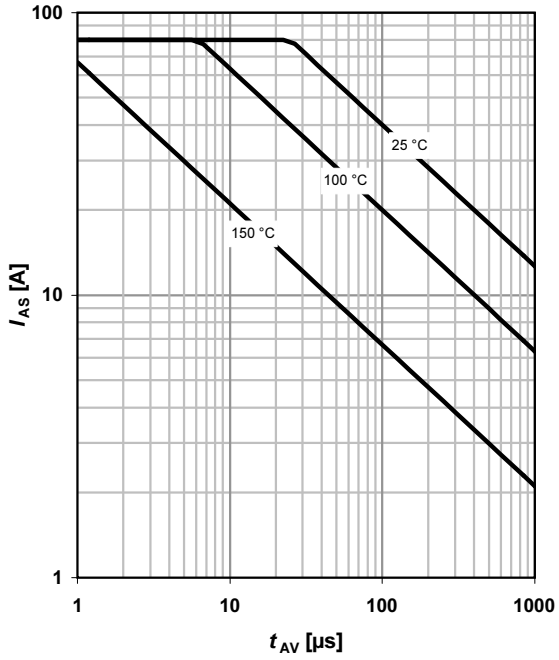
13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

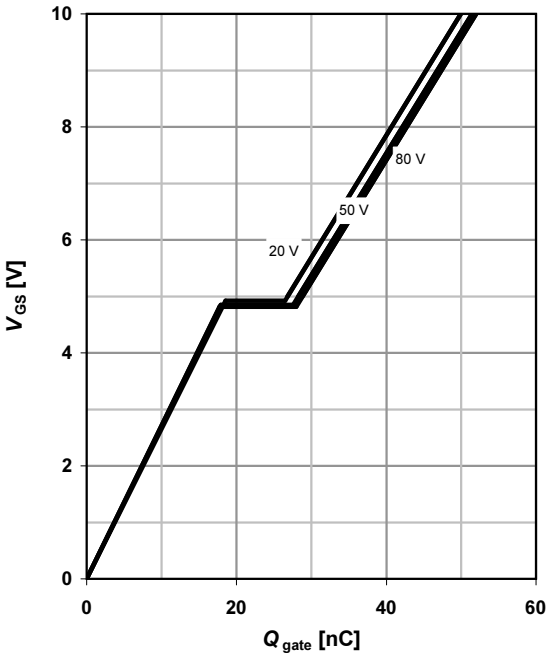
parameter: $T_{j(start)}$



14 Typ. gate charge

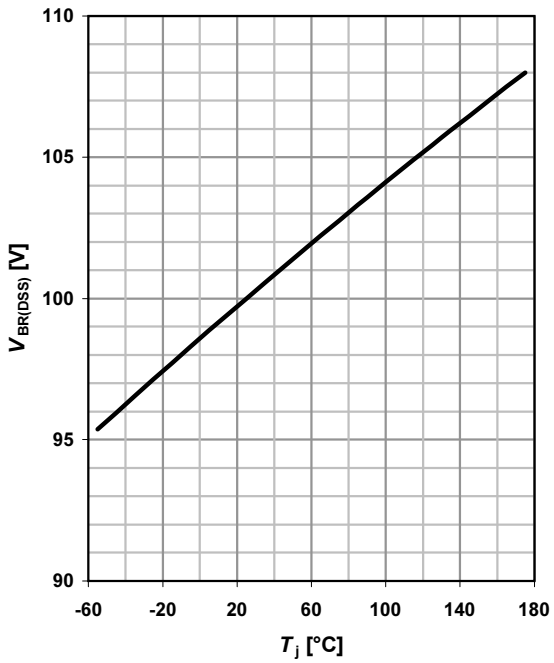
V_{GS}=f(Q_{gate}); I_D=80 A pulsed

parameter: V_{DD}

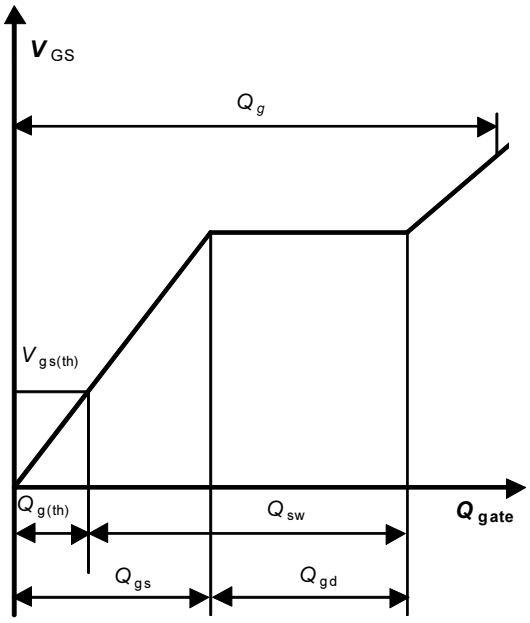


15 Drain-source breakdown voltage

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



16 Gate charge waveforms



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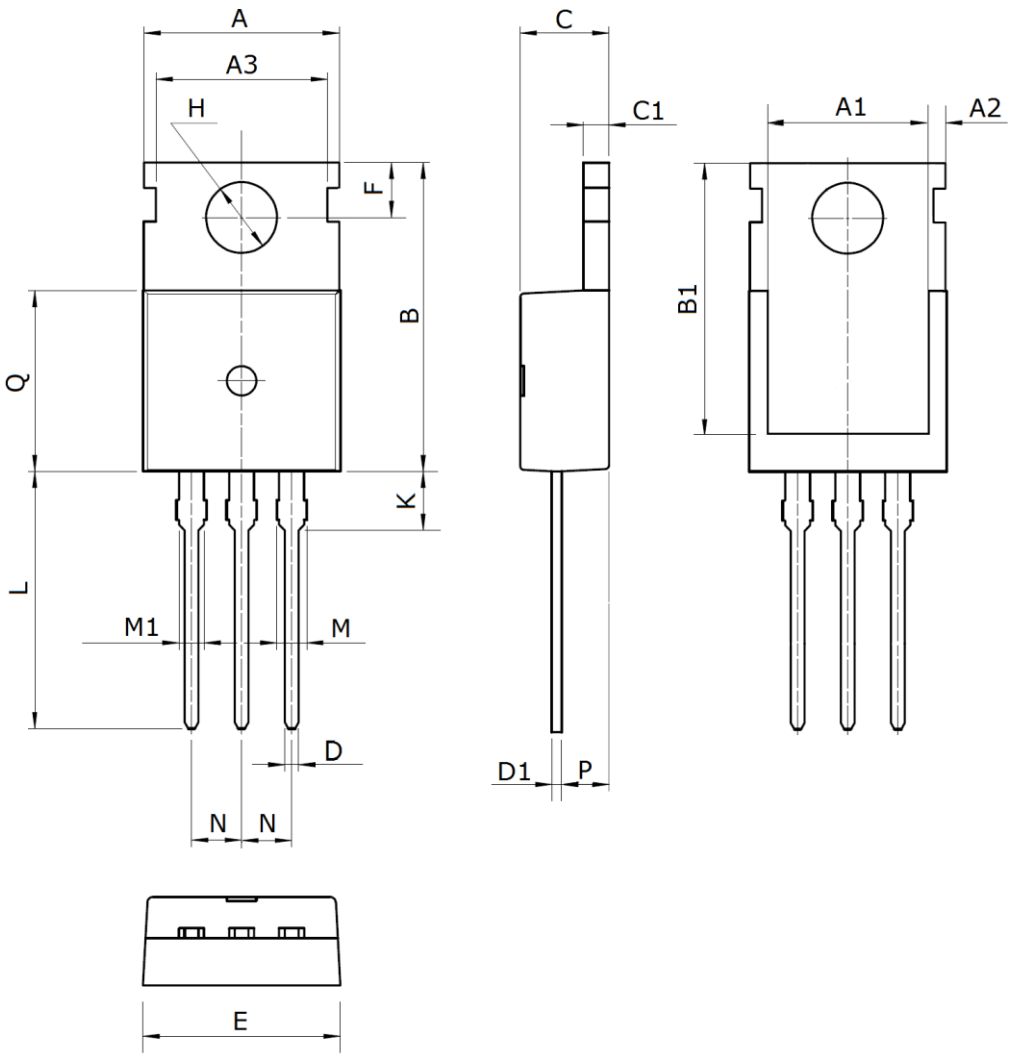
Package Mechanical Data TO-220



Symbol	Dimensions （mm）	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	10.0±0.3	C1	1.3±0.2	L	13.2±0.4
A1	8.0±0.2	D	0.8±0.2	M	1.38±0.1
A2	0.94±0.1	D1	0.5±0.1	M1	1.28±0.1
A3	8.7±0.1	E	10.0±0.3	N	2.54(typ)
B	15.6±0.4	F	2.8 ±0.1	P	2.4±0.3
B1	13.2 ±0.2	H	3.6±0.1	Q	9.15±0. 25
C	4.5±0. 2	K	3.1±0.2		

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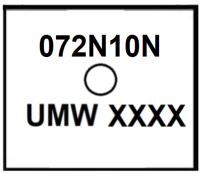
Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW IPP072N10N3G	TO-220	1000	Tube and box

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