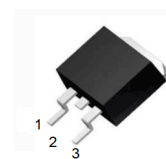
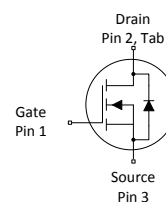


Features

- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- 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 $V_{GS}=10V$) < 6.2m Ω



TO - 263



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

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current	I_D			80 73	A	$T_C=25\text{ }^{\circ}\text{C}^{(1)}$ $T_C=100\text{ }^{\circ}\text{C}$
Pulsed drain current ⁽¹⁾	$I_{D,pulse}$			320	A	$T_C=25\text{ }^{\circ}\text{C}$
Avalanche energy, single pulse	E_{AS}			160	mJ	$I_D=80\text{ A}$, $R_{GS}=25\text{ }\Omega$
Gate source voltage	V_{GS}	-20		20	V	
Power dissipation	P_{tot}			150	W	$T_C=25\text{ }^{\circ}\text{C}$
Operating and storage temperature	T_j, T_{stg}	-55		175	$^{\circ}\text{C}$	

Thermal characteristics

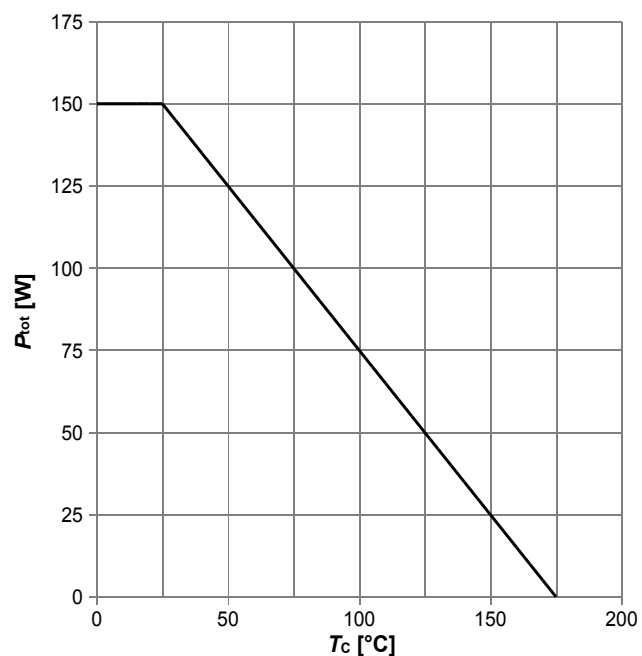
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}			1	K/W	
Thermal resistance, junction - ambient, minimal footprint	R_{thJA}			62	K/W	
Thermal resistance, junction - ambient, 6 cm ² cooling area ²⁾	R_{thJA}			40	K/W	
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	100			V	$V_{GS}=0\text{ V}$, $I_D=1\text{ mA}$
Gate threshold voltage	$V_{GS(th)}$	2	2.7	3.5	V	$V_{DS}=V_{GS}$, $I_D=90\text{ }\mu\text{A}$
Zero gate voltage drain current	I_{DSS}		0.1 10	1 100	μA	$V_{DS}=100\text{ V}$, $V_{GS}=0\text{ V}$, $T_J=25\text{ }^\circ\text{C}$ $V_{DS}=100\text{ V}$, $V_{GS}=0\text{ V}$, $T_J=125\text{ }^\circ\text{C}$
Gate-source leakage current	I_{GSS}		1	100	nA	$V_{GS}=20\text{ V}$, $V_{DS}=0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$		5.9 7.3	6.5 12.4	m Ω	$V_{GS}=10\text{ V}$, $I_D=80\text{ A}$ $V_{GS}=6\text{ V}$, $I_D=40\text{ A}$
Gate resistance ¹⁾	R_G		1.6	2.4	Ω	
Transconductance	g_{fs}	50	99		S	$ V_{DS} >2 I_D R_{DS(on)max}$, $I_D=80\text{ A}$
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}		3690	4910	pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=1\text{ MHz}$
Output capacitance	C_{oss}		646	859	pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=1\text{ MHz}$
Reverse transfer capacitance	C_{rss}		25	44	pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=1\text{ MHz}$
Turn-on delay time	$t_{d(on)}$		19		ns	$V_{DD}=50\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=80\text{ A}$, $R_{G,ext}=1.6\text{ }\Omega$
Rise time	t_r		37		ns	$V_{DD}=50\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=80\text{ A}$, $R_{G,ext}=1.6\text{ }\Omega$
Turn-off delay time	$t_{d(off)}$		37		ns	$V_{DD}=50\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=80\text{ A}$, $R_{G,ext}=1.6\text{ }\Omega$
Fall time	t_f		9		ns	$V_{DD}=50\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=80\text{ A}$, $R_{G,ext}=1.6\text{ }\Omega$
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}		18		nC	$V_{DD}=50\text{ V}$, $I_D=80\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate to drain charge ¹⁾	Q_{gd}		10	15	nC	$V_{DD}=50\text{ V}$, $I_D=80\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Switching charge	Q_{sw}		16		nC	$V_{DD}=50\text{ V}$, $I_D=80\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate charge total	Q_g		51	64	nC	$V_{DD}=50\text{ V}$, $I_D=80\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate plateau voltage	$V_{plateau}$		4.9		V	$V_{DD}=50\text{ V}$, $I_D=80\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Output charge ¹⁾	Q_{oss}		68	91	nC	$V_{DD}=50\text{ V}$, $V_{GS}=0\text{ V}$

Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S			80	A	$T_C=25\text{ }^{\circ}\text{C}$
Diode pulse current	$I_{S,pulse}$			320	A	$T_C=25\text{ }^{\circ}\text{C}$
Diode forward voltage	V_{SD}		1	1.2	V	$V_{GS}=0\text{ V}$, $I_F=80\text{ A}$, $T_J=25\text{ }^{\circ}\text{C}$
Reverse recovery time ¹⁾	t_{rr}		73	146	ns	$V_R=50\text{ V}$, $I_F=I_S$, $di_F/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge ¹⁾	Q_{rr}		139	278	nC	$V_R=50\text{ V}$, $I_F=I_S$, $di_F/dt=100\text{ A}/\mu\text{s}$

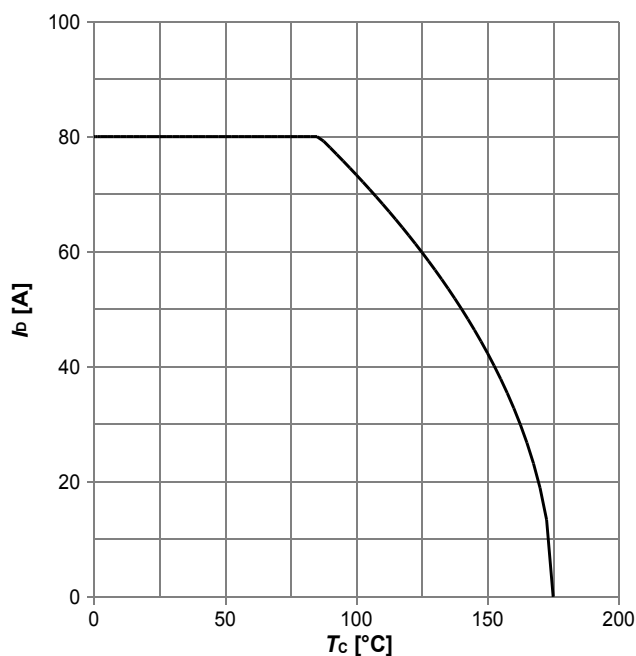
Electrical characteristics diagrams

Diagram 1: Power dissipation



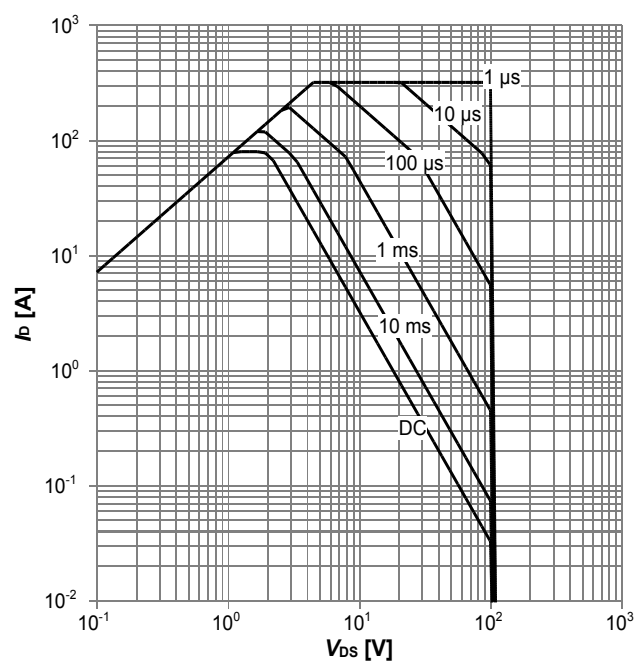
$$P_{tot}=f(T_c)$$

Diagram 2: Drain current



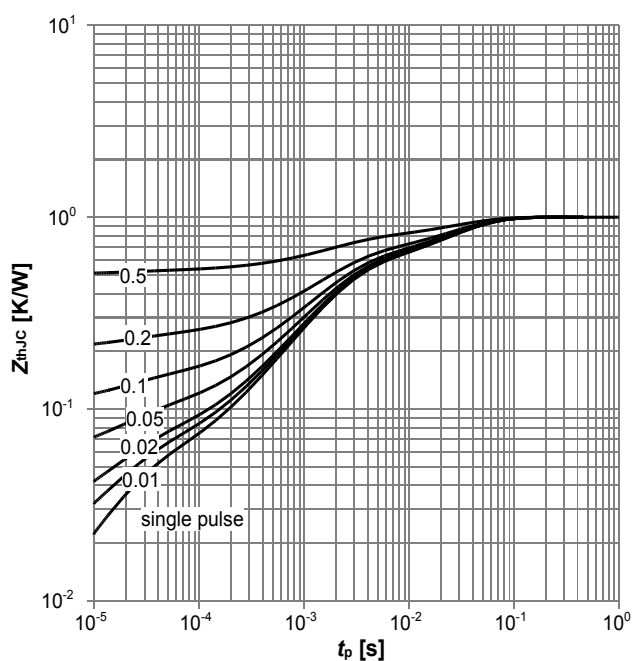
$$I_D=f(T_c); V_{GS} \geq 10 \text{ V}$$

Diagram 3: Safe operating area



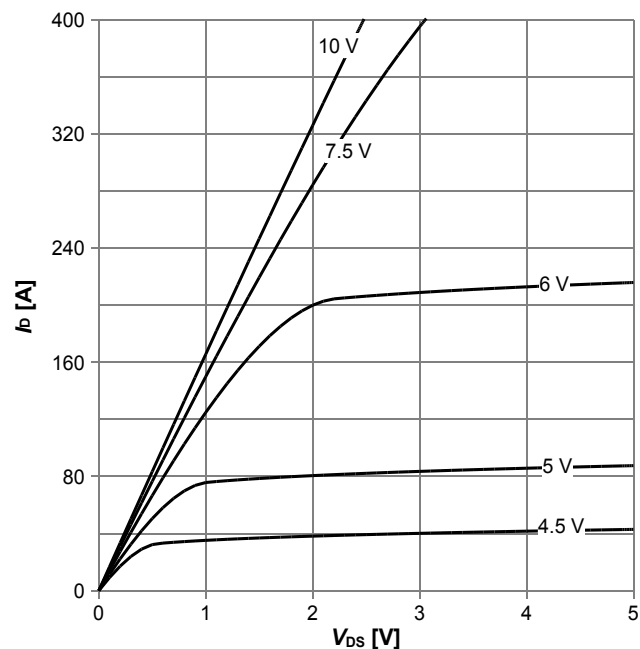
$$I_D=f(V_{DS}); T_c=25^\circ\text{C}; D=0; \text{parameter: } t_p$$

Diagram 4: Max. transient thermal impedance



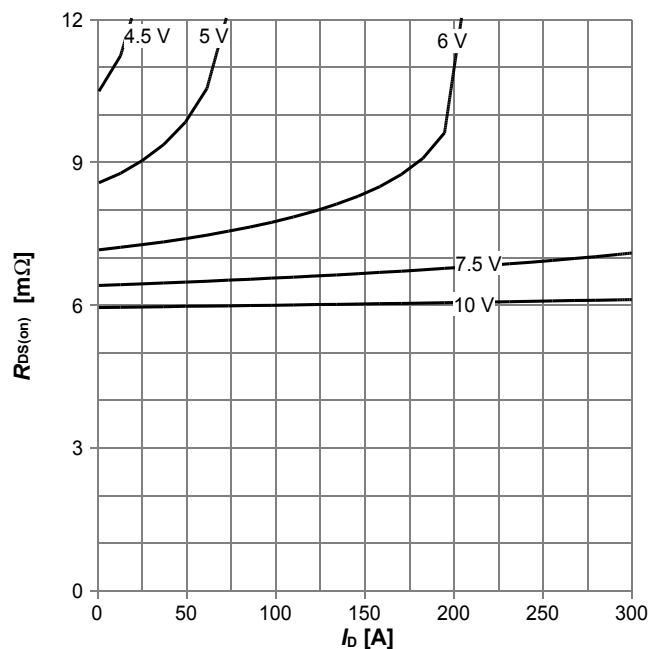
$$Z_{thJC}=f(t_p); \text{parameter: } D=t_p/T$$

Diagram 5: Typ. output characteristics



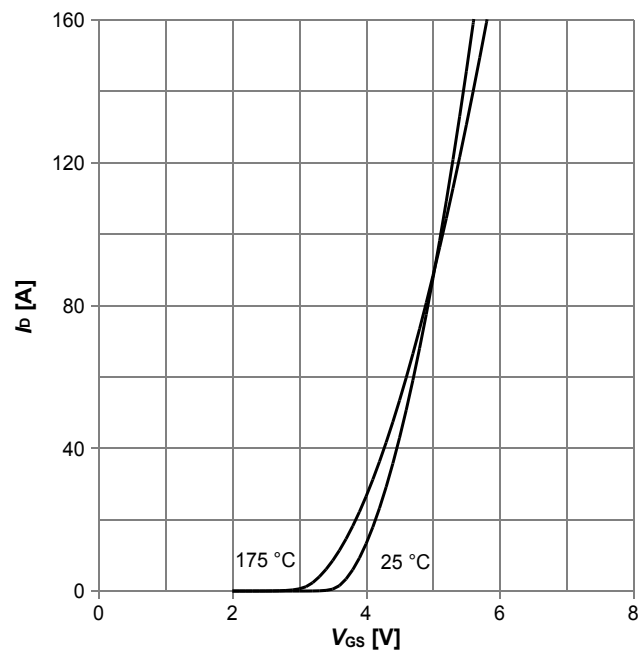
$I_D = f(V_{DS})$; $T_J = 25^\circ\text{C}$; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



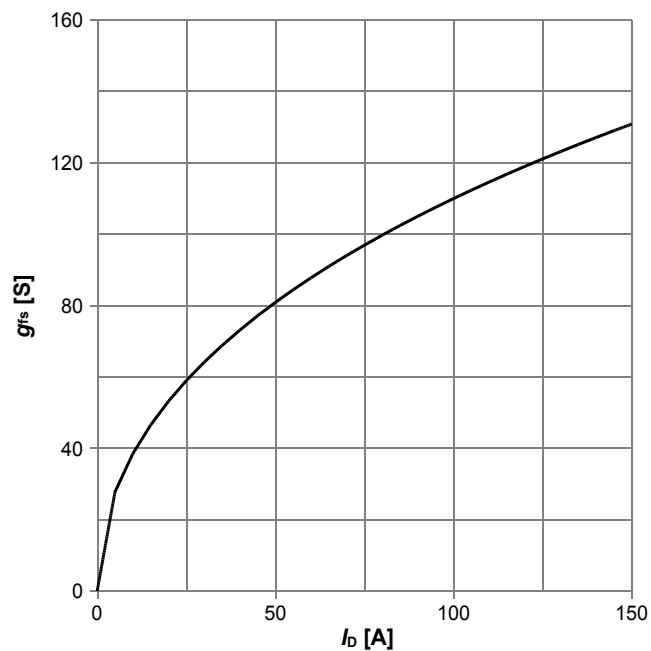
$R_{DS(on)} = f(I_D)$; $T_J = 25^\circ\text{C}$; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



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

Diagram 8: Typ. forward transconductance



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

Diagram 9: Drain-source on-state resistance

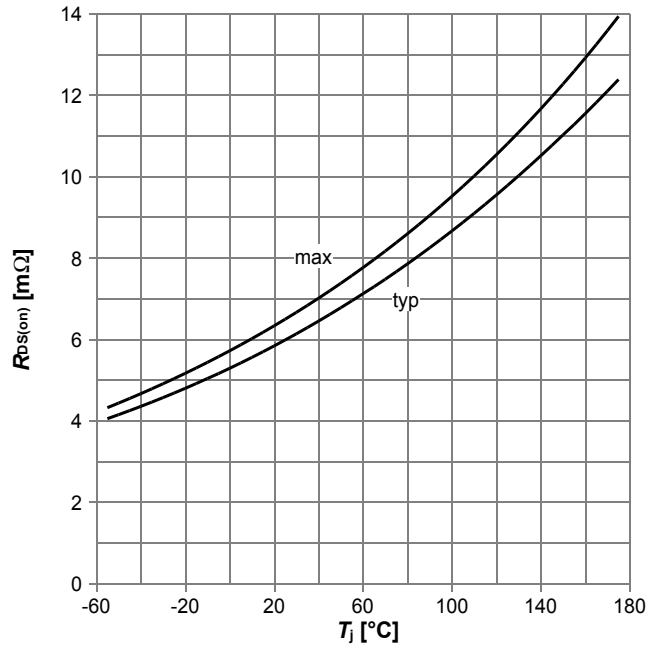


Diagram 10: Typ. gate threshold voltage

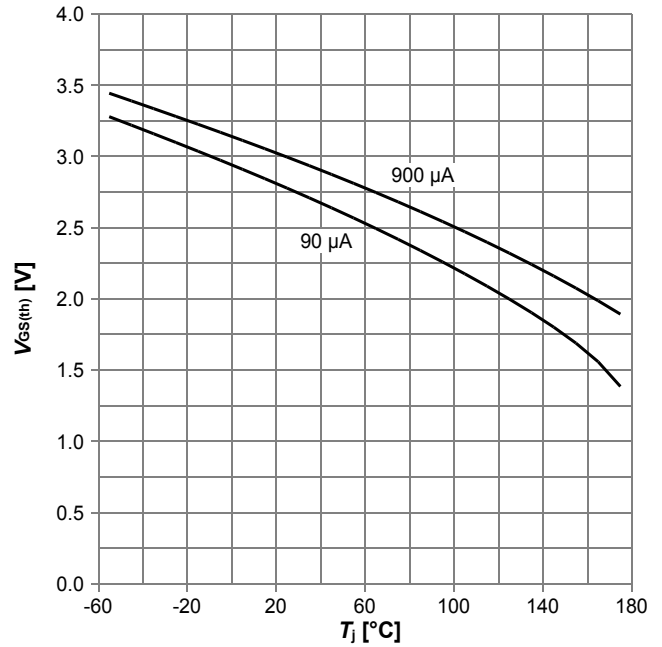


Diagram 11: Typ. capacitances

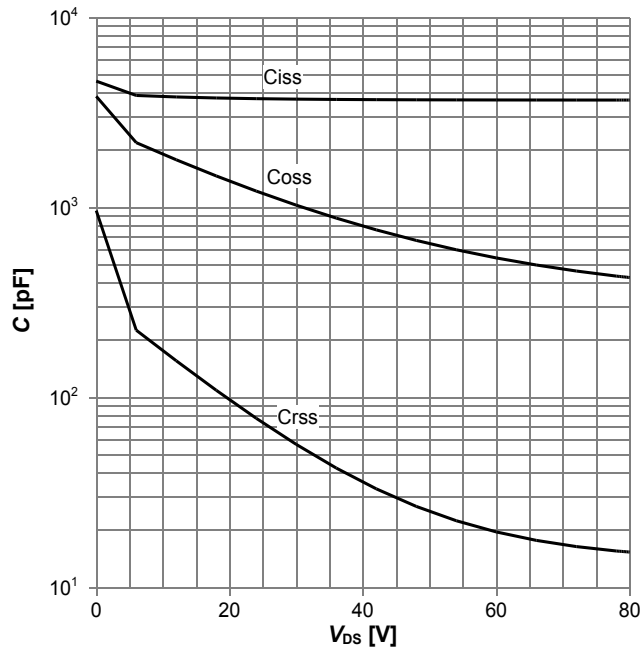


Diagram 12: Forward characteristics of reverse diode

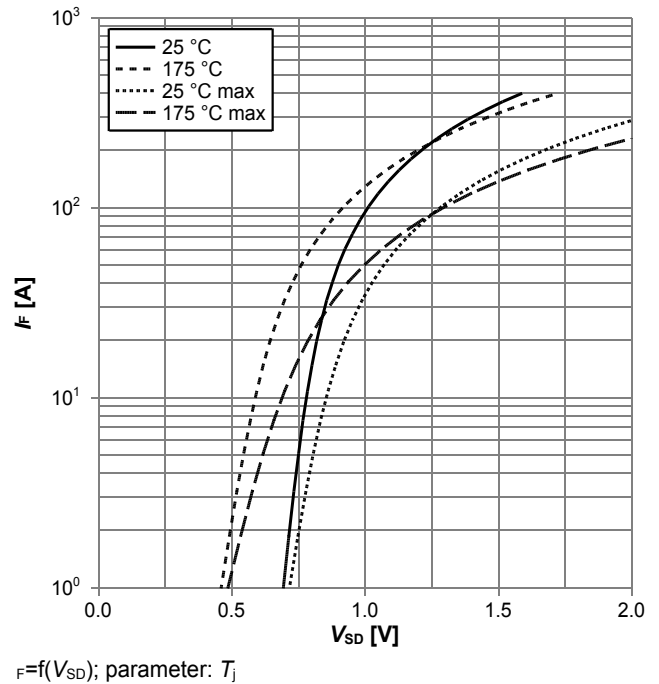


Diagram 13: Avalanche characteristics

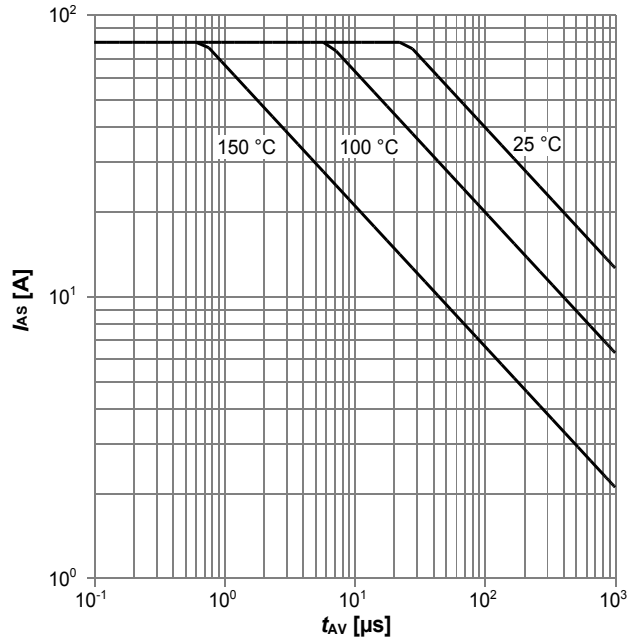


Diagram 14: Typ. gate charge

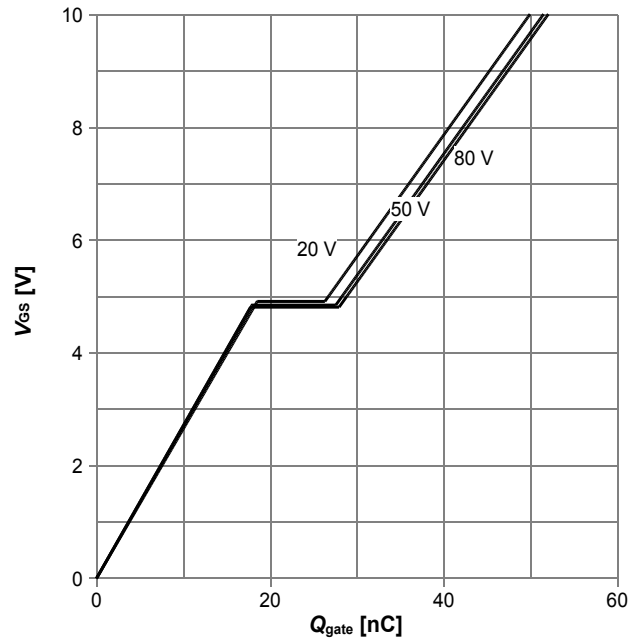
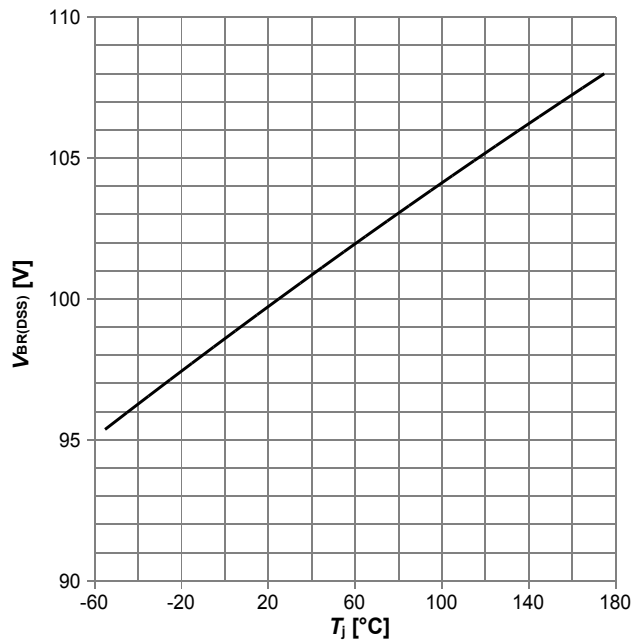
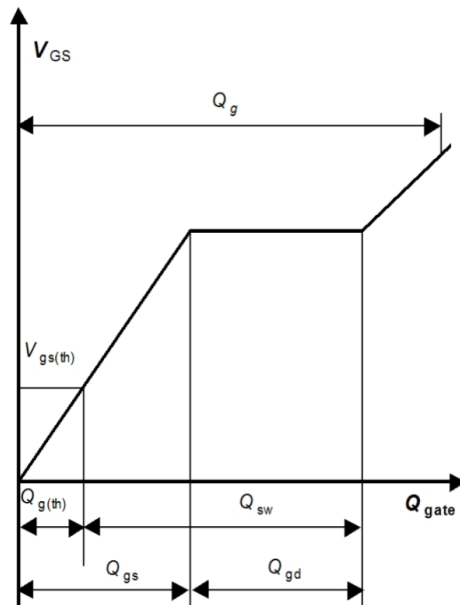


Diagram 15: Drain-source breakdown voltage

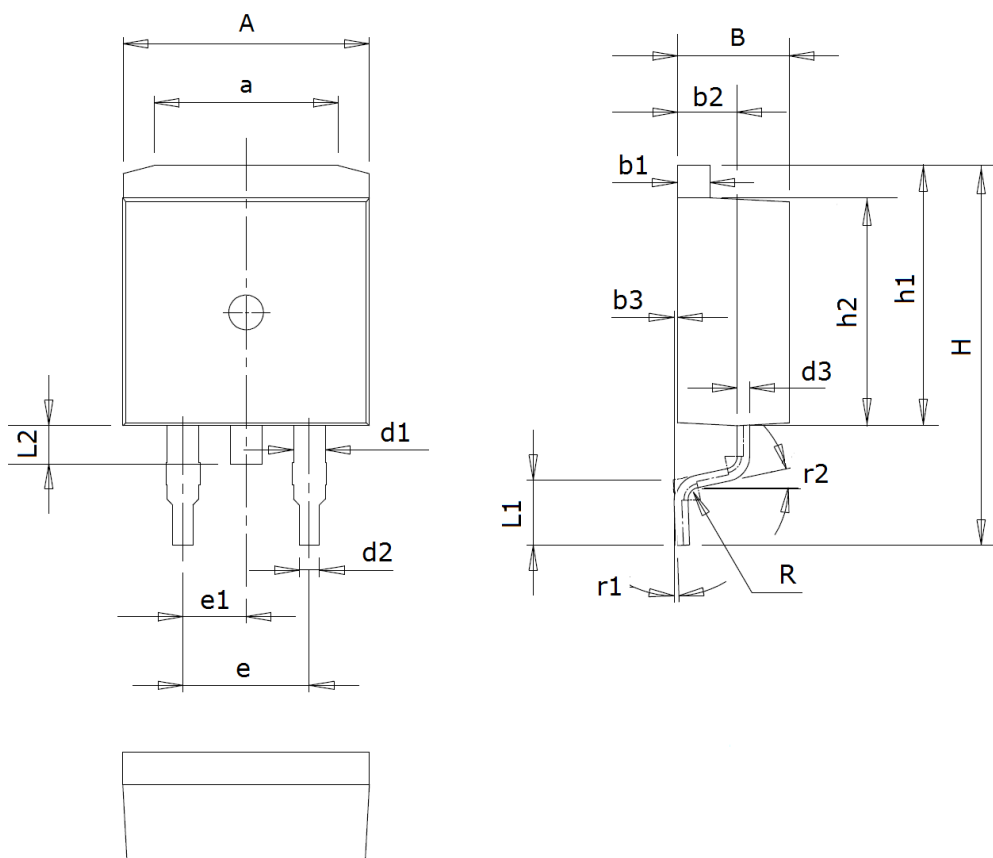


Gate charge waveforms



Package Mechanical Data

TO-263



Symbol	Dimensions (mm)	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	9.7~10.3	d2	0.7~0.9	L1	2.4~2.9
a	7.0~7.8	d3	0.4~0.6	L2	1.3~1.8
B	4.3~4.7	e	5.08 (typ)	R	0.5(typ)
b1	1.25~1.35	e1	2.54 (typ)	r1	0~8°
b2	2.2~2.6	H	14.8~15.6	r2	12° (typ)
b3	0~0.2	h1	10.2~10.7		
d1	1.2~1.4	h2	8.9~9.4		

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW IPB065N10N3G	TO-263	800	Tape and reel