General Description

The WSR80N10D use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switchingand excellent avalanche characteristics. This device is specially designed to get better ruggedness and suitable to use in.

Product Summery

BVDSS	RDSON	ID
100V	9mΩ	60A

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

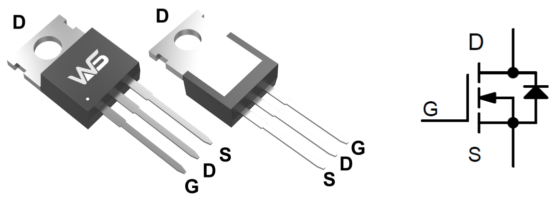
Synchronous-rectification applications

Features

Low RDS(on) & FOM Extremely low switching loss

Excellent stability and uniformity or Invertors

TO-220AB Pin Configuration



Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Symbol	Parameter		Value	Unit
V_{DS}	Drain source voltage		100	V
V_{GS}	Gate source voltage		±20	V
I_D	Continuous drain current[1]	TC=25 ℃	60	A
$I_{D,\ pulse}$	Pulsed drain current[2]	TC=25 ℃	180	A
P_D	Power dissipation[3]	TC=25 ℃	107	W
E_{AS}	Single pulsed avalanche energy[4]		183.8	mJ
T_{stg} , T_j	Operation and storage temperature		-55 to 150	℃
$R_{\theta JC}$	Thermal resistance, junction-case		1.17	°C/W
$R_{\theta JA}$	Thermal resistance, junction-ambient[4]		62	°C/W

Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100	-	-	V
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.5	-	2.5	V
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=10 V, I_D=20 A	-	9	10.0	mΩ
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=12 A	-	12	14.0	mΩ
I_{GSS}	Gate-source leakage current	V_{GS}=20 V	-	-	100	nA
		V_{GS}=-20 V	-	-	-100	
I_{DSS}	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V	-	-	1	uA
R_G	Gate resistance	f= 1 MHz, Open drain	-	5.5	-	Ω
C_{iss}	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, ƒ=100 kHz V_{GS}=10 V,	-	1999	-	pF
C_{oss}	Output capacitance		-	322	-	pF
C_{rss}	Reverse transfer capacitance		-	7.1	-	pF
$t_{d(on)}$	Turn-on delay time		-	22.1	-	ns
t_r	Rise time	V_{DS}=50 V,	-	5.2	-	ns
$t_{d(off)}$	Turn-off delay time	R_G=2 Ω,	-	44	-	ns
t_f	Fall time	I_D=25 A I_D=25 A, V_{DS}=50 V, V_{GS}=10 V V_{GS}<V_{th}	-	8.4	-	ns
Q_g	Total gate charge		-	28.9	-	nC
Q_{gs}	Gate-source charge		-	6	-	nC
Q_{gd}	Gate-drain charge		-	6.8	-	nC
$V_{plateau}$	Gate plateau voltage		-	3.7	-	V
I_S	Diode forward current		-	-	60	A
I_{SP}	Pulsed source current		-	-	180	A
V_{SD}	Diode forward voltage	I_S=20 A, V_{GS}=0 V	-	-	1.3	V
t_{rr}	Reverse recovery time	I_S=25 A, di/dt=100 A/μs	-	102.9	-	ns
Q_{rr}	Reverse recovery charge		-	379	-	nC
I_{rrm}	Peak reverse recovery current		-	6.4	-	A

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_j=25 °C.
5) The value of $R_{θJA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 °C.

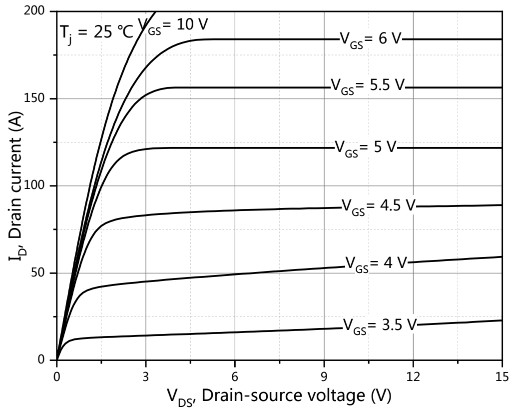


Figure 1, Typ. output characteristics

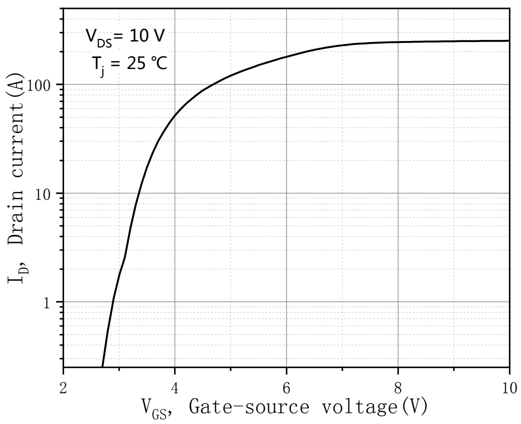


Figure 2, Typ. transfer characteristics

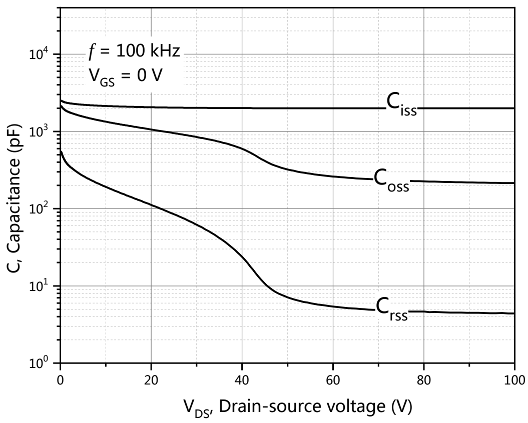


Figure 3, Typ. capacitances

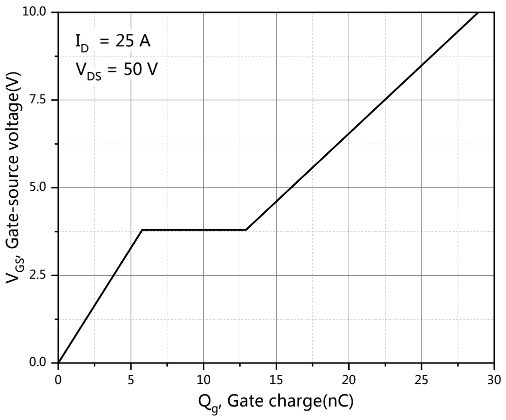


Figure 4, Typ. gate charge

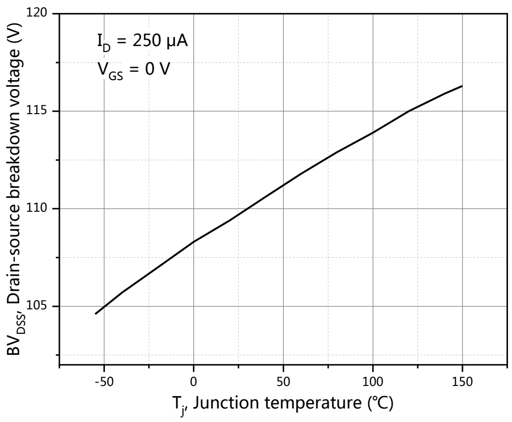


Figure 5, Drain-source breakdown voltage

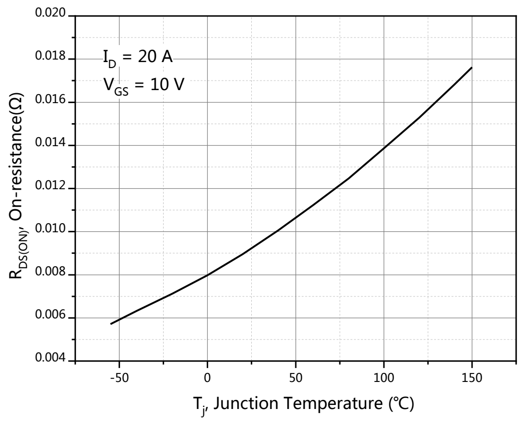


Figure 6, Drain-source on-state resistance

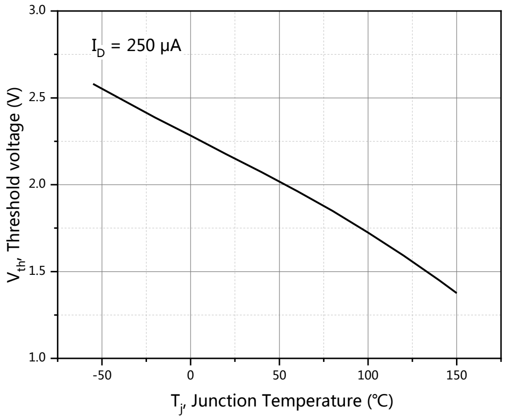


Figure 7, Threshold voltage

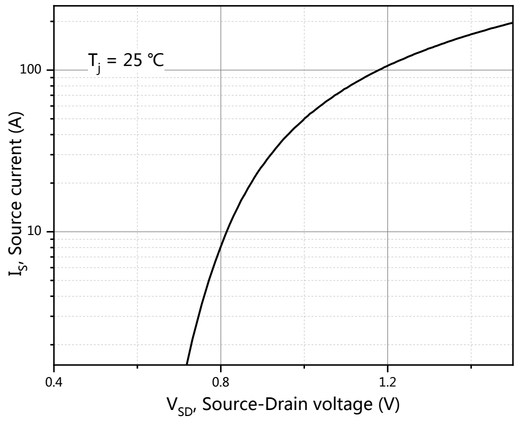


Figure 8, Forward characteristic of body diode

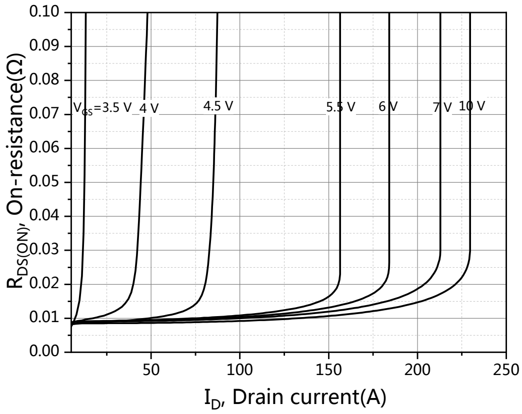


Figure 9, Drain-source on-state resistance

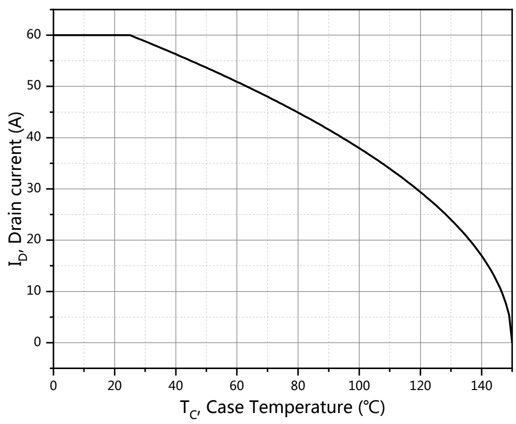


Figure 10, Drain current

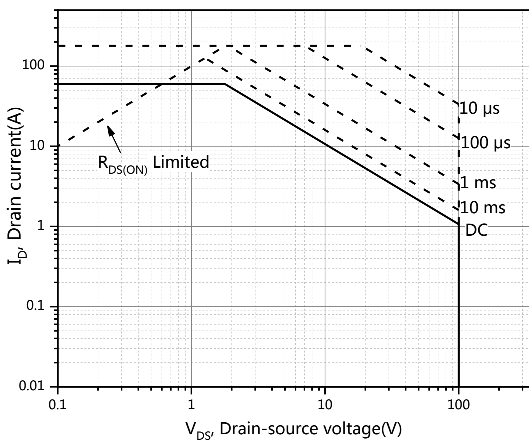


Figure 11, Safe operation area T_C=25 ℃

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