

General Description

The WSF12N10G use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics. his device is specially designed to get better ruggedness and suitable to use in.

Features

Low RDS(on) & FOM
Extremely low switching loss
Excellent stability and uniformity or Invertors

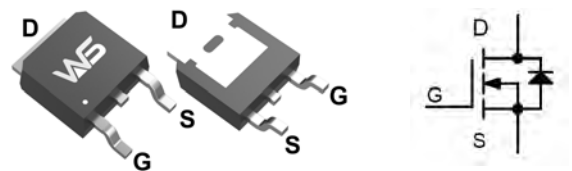
Product Summery

BVDSS	RDSON	ID
100V	125mΩ	12A

Applications

Consumer electronic power supply
Motor control
Synchronous-rectification
Isolated DC

TO-252 Pin Configuration



Absolute Maximum Ratings at Tj=25°C unless otherwise noted

Symbol	Parameter		Value	Unit
VDS	Drain source voltage		100	V
VGS	Gate source voltage		±20	V
ID	Continuous drain current1)	TC=25 °C	12	A
ID, pulse	Pulsed drain current2)	TC=25 °C	24	A
PD	Power dissipation3)	TC=25 °C	16.9	W
EAS	Single pulsed avalanche energy	Note5)	1.2	mJ
Tstg,Tj	Operation and storage temperature		-55 to 150	°C
RθJC	Thermal resistance, junction-case		7.4	°C/W
RθJA	Thermal resistance, junction-ambient	Note4)	62	°C/W

Electrical Characteristics at $T_j=25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-source breakdown voltage	$V_{GS}=0\text{ V}$, $I_D=250\text{ }\mu\text{A}$	100	111	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$	1.2	2.0	2.5	V
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS}=10\text{ V}$, $I_D=5\text{ A}$	-	105	125	m Ω
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS}=4.5\text{ V}$, $I_D=3\text{ A}$	-	115	145	m Ω
I_{GSS}	Gate-source leakage current	$V_{GS}=20\text{ V}$	-	-	100	nA
		$V_{GS}=-20\text{ V}$	-	-	-100	
I_{DSS}	Drain-source leakage current	$V_{DS}=100\text{ V}$, $V_{GS}=0\text{ V}$	-	-	1	μA
C_{iss}	Input capacitance	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=100\text{ kHz}$	-	206.1	-	pF
C_{oss}	Output capacitance		-	28.9	-	pF
C_{rss}	Reverse transfer capacitance		-	1.4	-	pF
$t_{d(on)}$	Turn-on delay time	$V_{GS}=10\text{ V}$, $V_{DS}=50\text{ V}$, $R_G=2\text{ }\Omega$, $I_D=5\text{ A}$	-	14.7	-	ns
t_r	Rise time		-	3.5	-	ns
$t_{d(off)}$	Turn-off delay time		-	20.9	-	ns
t_f	Fall time		-	2.7	-	ns
Q_g	Total gate charge	$I_D=5\text{ A}$, $V_{DS}=50\text{ V}$, $V_{GS}=10\text{ V}$	-	4.3	-	nC
Q_{gs}	Gate-source charge		-	1.5	-	nC
Q_{gd}	Gate-drain charge		-	1.1	-	nC
$V_{plateau}$	Gate plateau voltage		-	5.0	-	V
I_S	Diode forward current	$V_{GS}<V_{th}$	-	-	7	A
I_{SP}	Pulsed source current		-	-	21	
V_{SD}	Diode forward voltage	$I_S=7\text{ A}$, $V_{GS}=0\text{ V}$	-	-	1.0	V
t_{rr}	Reverse recovery time	$I_S=5\text{ A}$, $di/dt=100\text{ A}/\mu\text{s}$	-	32.1	-	ns
Q_{rr}	Reverse recovery charge		-	39.4	-	nC
I_{rrm}	Peak reverse recovery current		-	2.1	-	A

Note:

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

Electrical Characteristics Diagrams

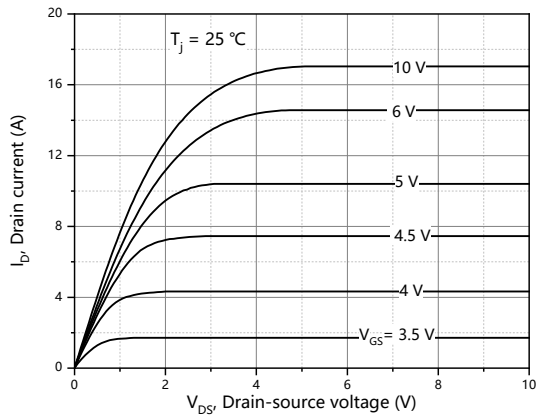


Figure 1, Typ. output characteristics

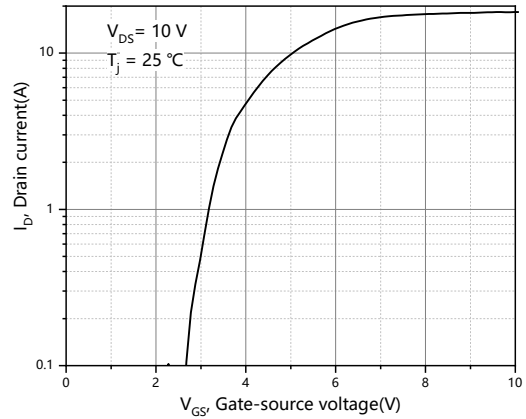


Figure 2, Typ. transfer characteristics

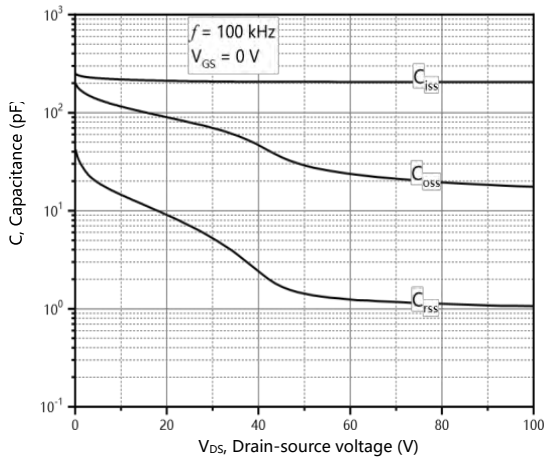


Figure 3, Typ. capacitances

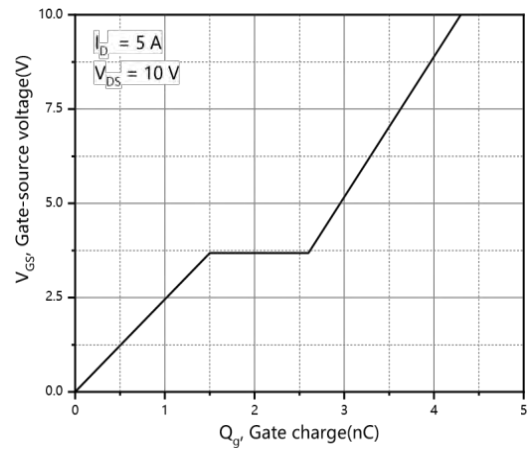


Figure 4, Typ. gate charge

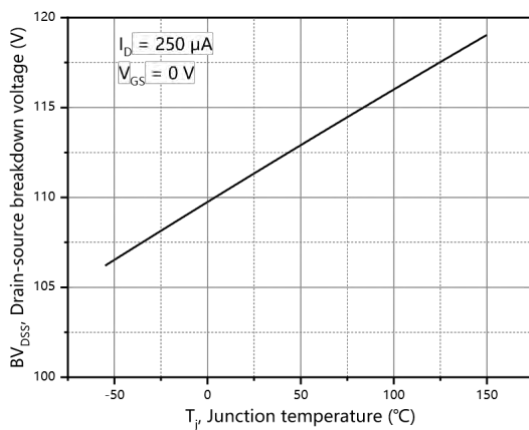


Figure 5, Drain-source breakdown voltage

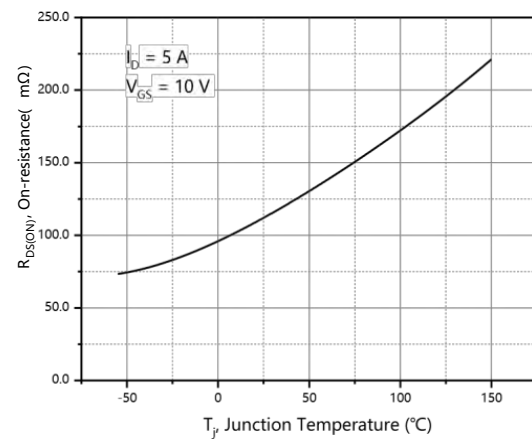


Figure 6, Drain-source on-state resistance

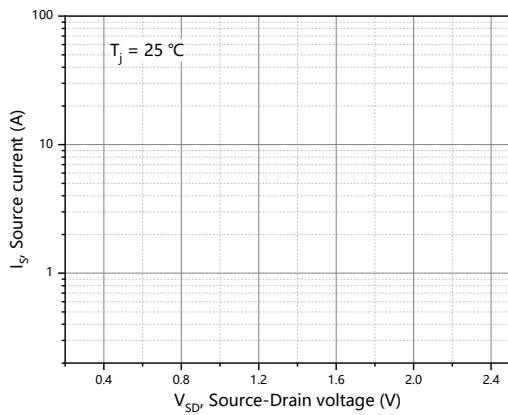


Figure 7, Forward characteristic of body diode

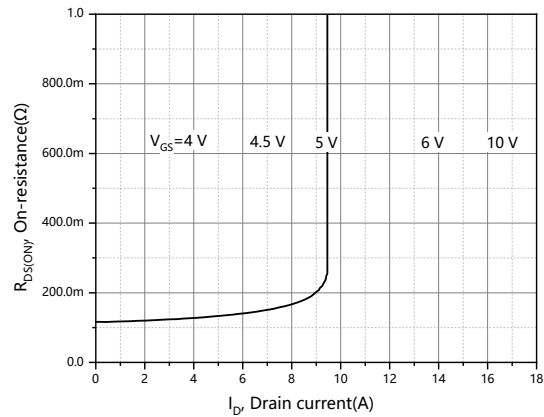


Figure 8, Drain-source on-state resistance

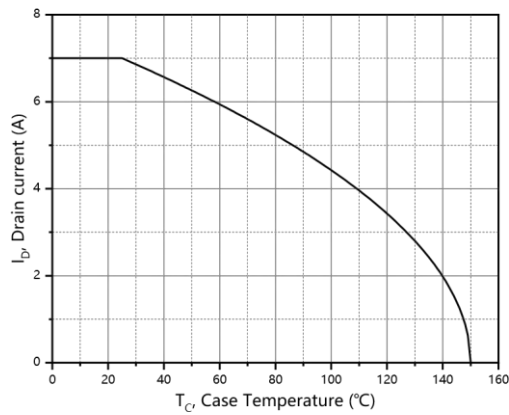


Figure 9, Drain current

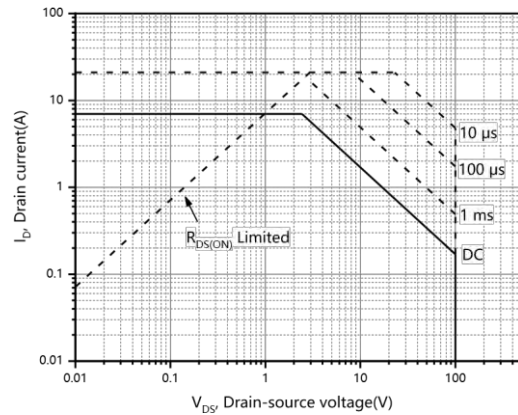


Figure 10, Safe operation area $T_C = 25\text{ }^{\circ}\text{C}$

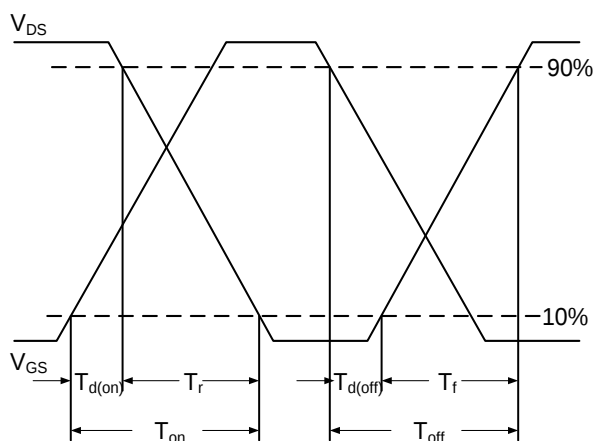


Fig.11 Switching Time Waveform

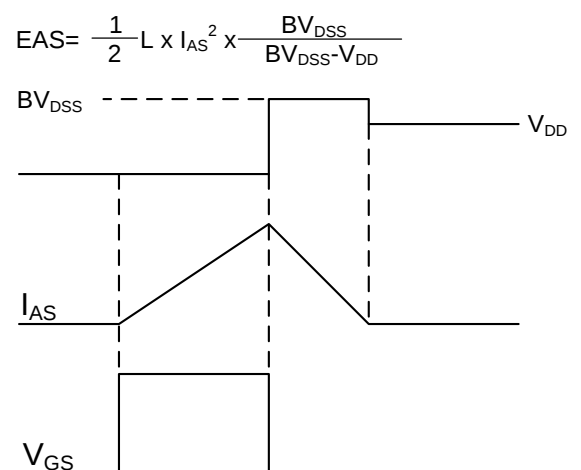


Fig.12 Unclamped Inductive Switching Waveform



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