General Description

The WSF50N10G is the highest performance SGT N-Ch MOSFET to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

100V	13.8mΩ	40A

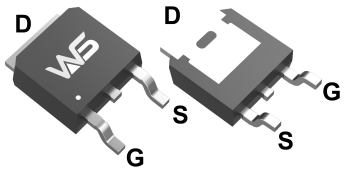
Applications

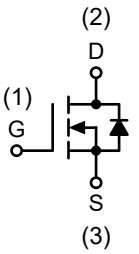
- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC

Features

- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

TO-252-2 Pin Configuration





Absolute Maximum Ratings (TC=25 ℃,

Symbol	Parameter		Rating	nits
VDS	Drain source voltage		100	V
VGS	Gate source voltage		±20	V
ID	Continuous drain current1)	TC=25 ℃	40	A
ID, pulse	Pulsed drain current2)	TC=25 ℃	120	A
P_D	Power dissipation3)	TC=25 ℃	71	W
EAS	Single pulsed avalanche energy5)		57	mJ
Tstg，Tj	Operation and storage temperature		-55 to 150	℃
RθJC	Thermal resistance, junction-case		1.76	℃/W
RθJA	Thermal resistance, junction-ambient4)		62	°C/W

℃,

BVDSS	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100	107	-	V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	1.5	2.5	V
RDS(ON)	Drain-source on-state resistance	V_{GS}=10 V, I_D=10 A	-	13.8	20.0	mΩ
RDS(ON)	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=7 A	-	17.4	26.0	mΩ
IGSS	Gate-source leakage current	V_{GS}=±20 V	-	-	±100	nA
IDSS	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V	-	-	1	uA
Ciss	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz	-	1003.9	-	pF
Coss	Output capacitance		-	185.4	-	pF
Crss	Reverse transfer capacitance		-	9.8	-	pF
td(on)	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=10 Ω, I_D=5 A	-	16.6	-	ns
t_r	Rise time		-	3.8	-	ns
td(off)	Turn-off delay time		-	75.5	-	ns
t_f	Fall time		-	46	-	ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50V, V_{GS}=10V	-	16.2	-	nc
Q_{gs}	Gate-source charge		-	2.8	-	nc
Qgd	Gate-drain charge		-	4.1	-	nc
Vplateau	Gate plateau voltage		-	3	-	V
I_S	Diode forward current	VGS<Vth	-	30	-	A
ISP	Pulsed source current		-	90	-	A
trr	Reverse recovery time	I_S=1A, di/dt=100 A/μs	49	-	-	ns
Q_{rr}	Reverse recovery charge		61.8	-	-	nc
Irrm	Peak reverse recovery current		2.4	-	-	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、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 Ta=25 °C.

5、V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_j=25 °C.

Qvmf @e o bofp f p

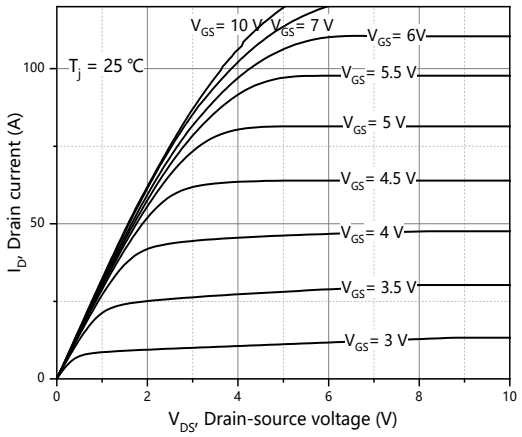


Figure 1, Typ. output characteristics

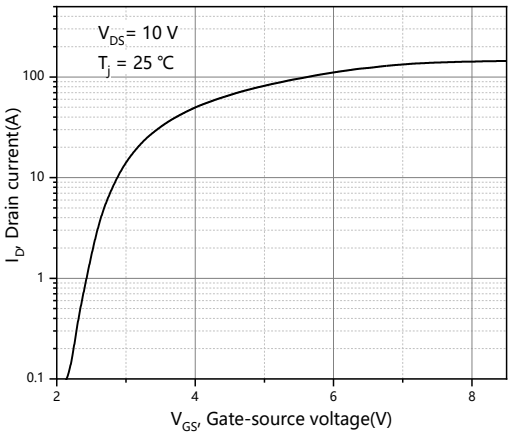


Figure 2, Typ. transfer characteristics

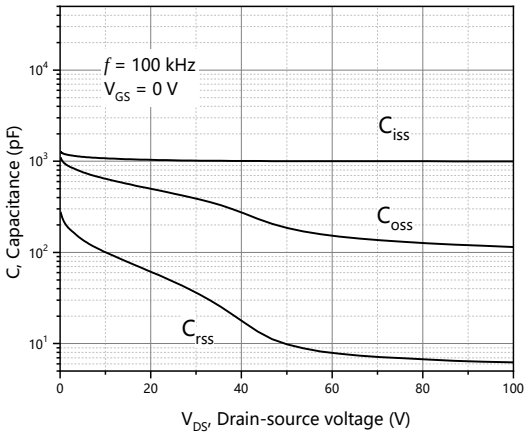


Figure 3, Typ. capacitances

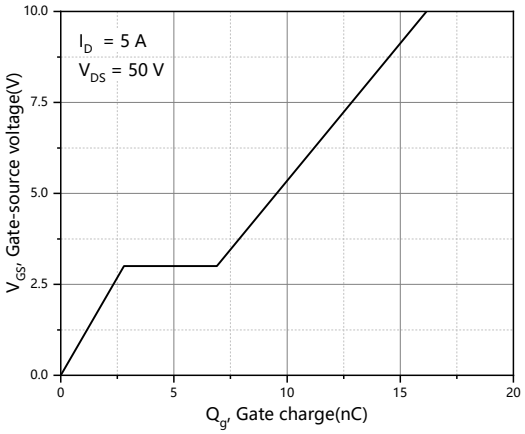


Figure 4, Typ. gate charge

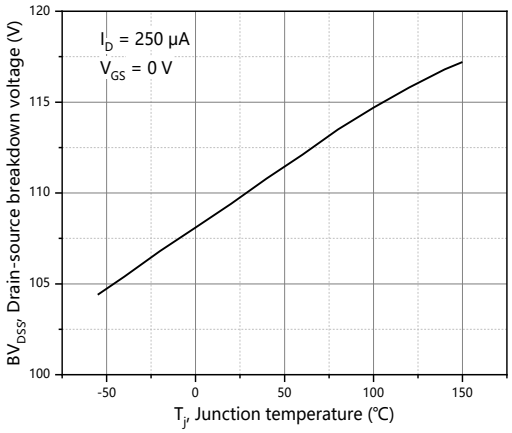


Figure 5, Drain-source breakdown voltage

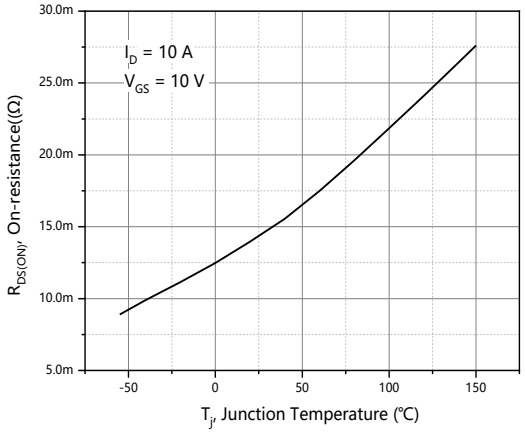


Figure 6, Drain-source on-state resistance

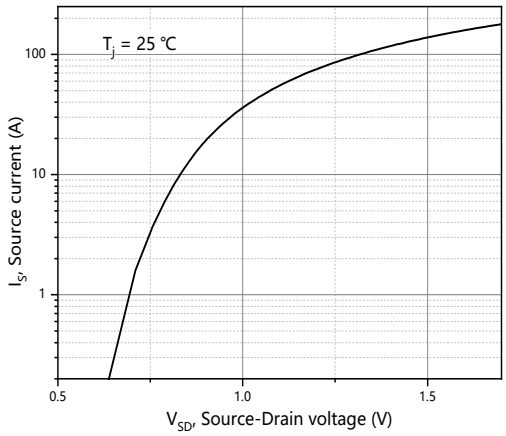


Figure 7, Forward characteristic of body diode

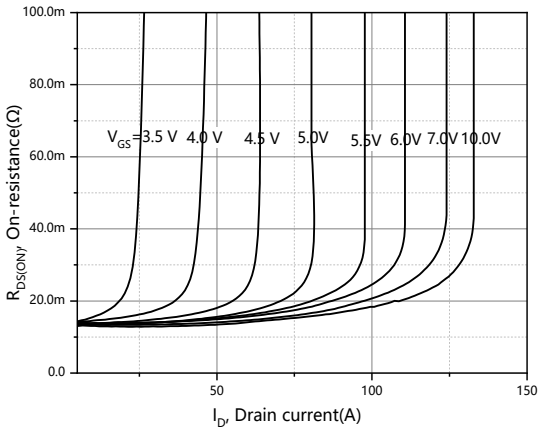


Figure 8, Drain-source on-state resistance

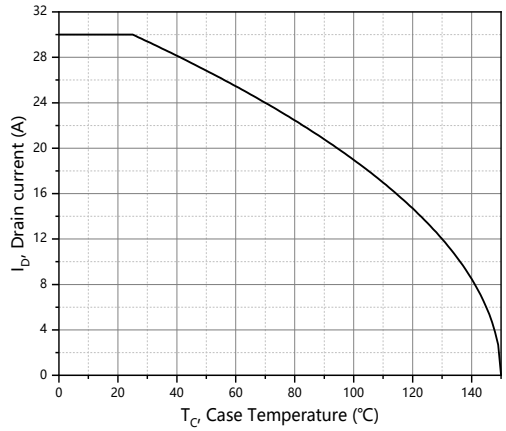


Figure 9, Drain current

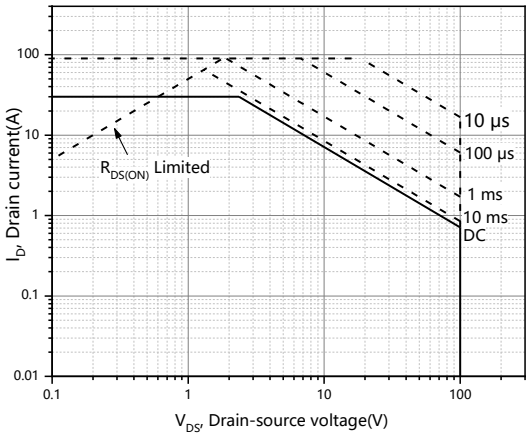
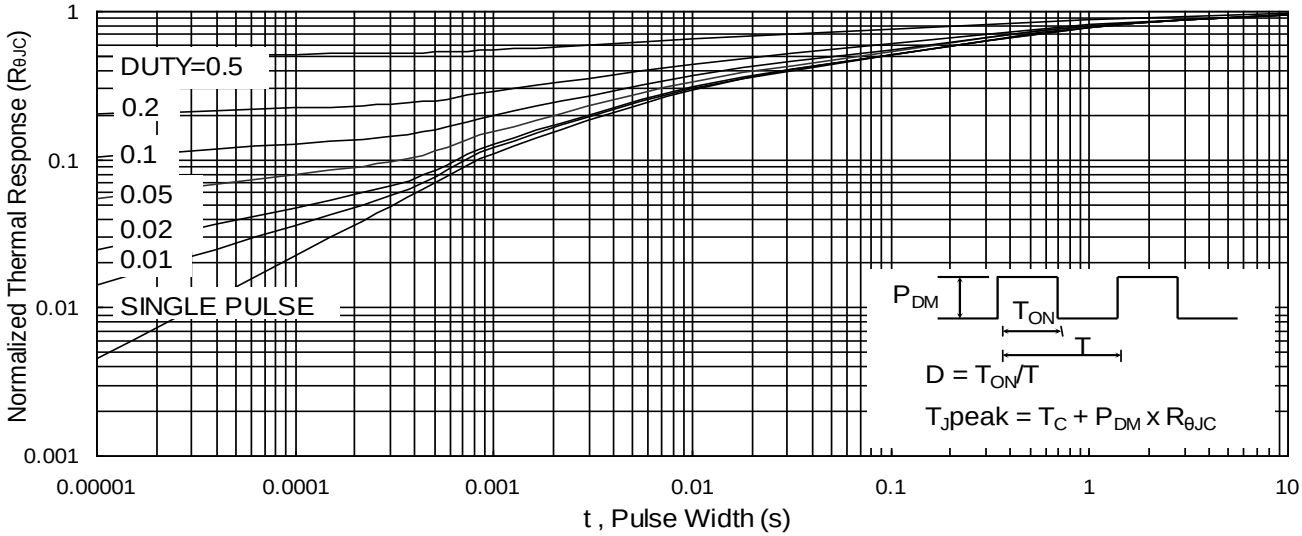


Figure 10, Safe operation area T_C=25 ℃



)LJ1R UPDOL]HG0D[LPXP7UDQVLHQW7KHUPDO,PSHGDQFH

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