

General Description

The WSF70N10D use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This 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

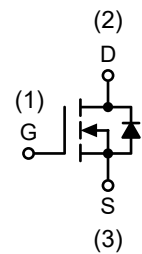
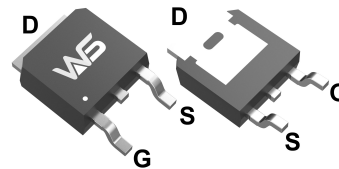
Product Summary

BVDSS	RDSON	ID
100V	9mΩ	60A

Applications

- Consumer electronic power supply Motor
- Control Synchronous-rectification Isolated DC
- Synchronous-rectification applications

TO-252-2L Pin Configuration



Absolute Maximum Ratings at T_j=25°C 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 °C 60	A
I _{D, pulse}	Pulsed drain current ²⁾	TC=25 °C 180	A
P _D	Power dissipation ³⁾	TC=25 °C 56.8	W
E _{AS}	Single pulsed avalanche energy ⁴⁾	183.8	mJ
T _{stg} , T _j	Operation and storage temperature	-55 to 150	°C
R _{th(J-c)}	Thermal resistance, junction-case	2.5	°C/W
R _{th(J-A)}	Thermal resistance, junction-ambient ⁴⁾	70	°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	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$	1.5	-	2.5	V
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS}=10\text{ V}$, $I_D=20\text{ A}$	-	9	10.0	m Ω
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS}=4.5\text{ V}$, $I_D=12\text{ A}$	-	12	14.0	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
R_G	Gate resistance	$f=1\text{ MHz}$, Open drain	-	5.5	-	Ω
C_{iss}	Input capacitance	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=100\text{ kHz}$ $V_{GS}=10\text{ V}$,	-	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		$V_{DS}=50\text{ V}$,	-	5.2	-
$t_{d(off)}$	Turn-off delay time	$R_G=2\text{ }\Omega$,	-	44	-	ns
t_f	Fall time	$I_D=25\text{ A}$ $I_D=25\text{ A}$, $V_{DS}=50\text{ V}$, $V_{GS}=10\text{ V}$ $V_{GS}<V_{th}$	-	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	$I_S=20\text{ A}$, $V_{GS}=0\text{ V}$	-	-	60	A
I_{SP}	Pulsed source current		-	-	180	A
V_{SD}	Diode forward voltage		-	-	1.3	V
t_{rr}	Reverse recovery time	$I_S=25\text{ A}$, $di/dt=100\text{ A}/\mu\text{s}$	-	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) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) $V_{DD}=50\text{ V}$, $R_G=25\text{ }\Omega$, $L=0.3\text{ mH}$, starting $T_j=25\text{ }^\circ\text{C}$.
- 5) 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 $T_a=25\text{ }^\circ\text{C}$.

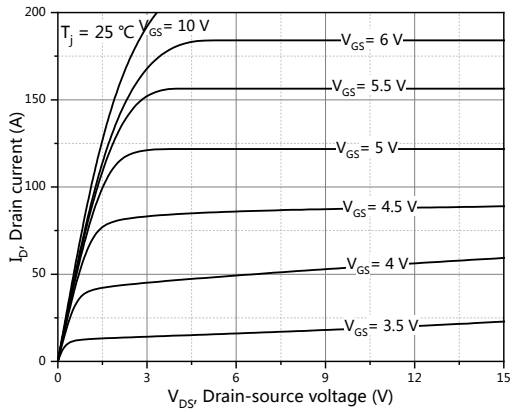


Figure 1, Typ. output characteristics

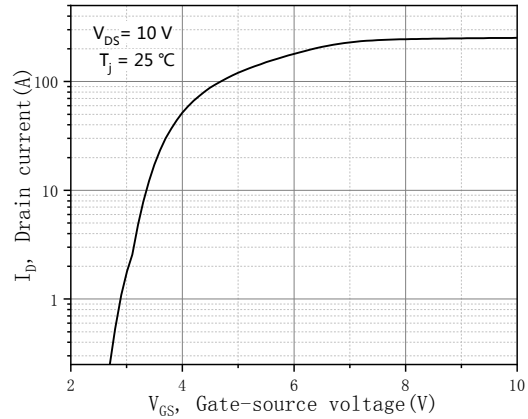


Figure 2, Typ. transfer characteristics

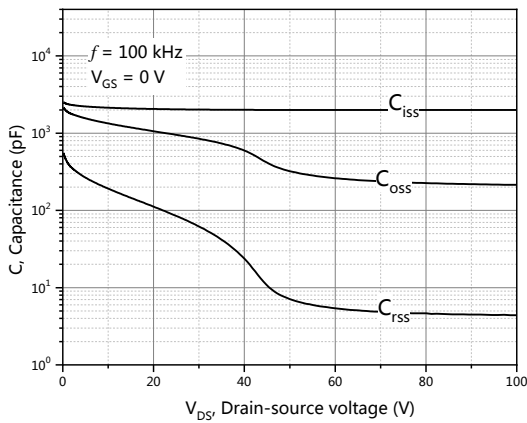


Figure 3, Typ. capacitances

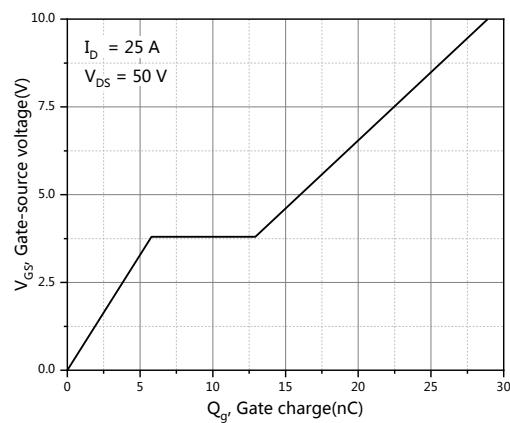


Figure 4, Typ. gate charge

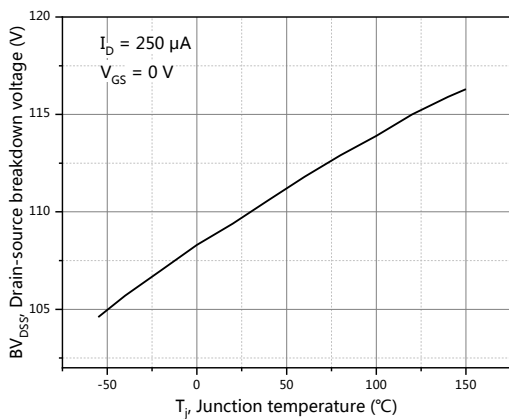


Figure 5, Drain-source breakdown voltage

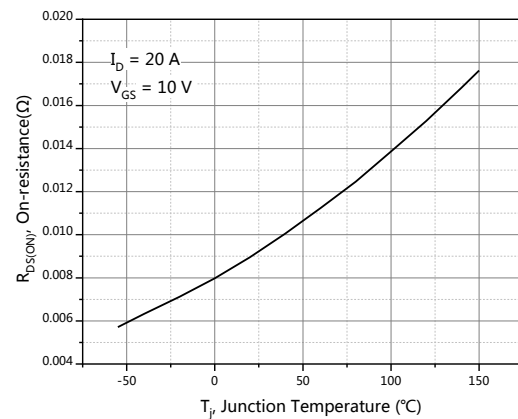


Figure 6, Drain-source on-state resistance

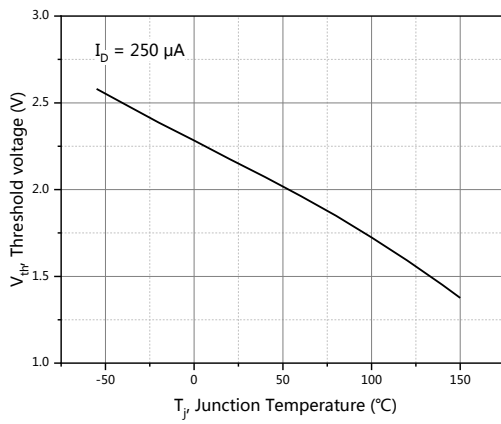


Figure 7, Threshold voltage

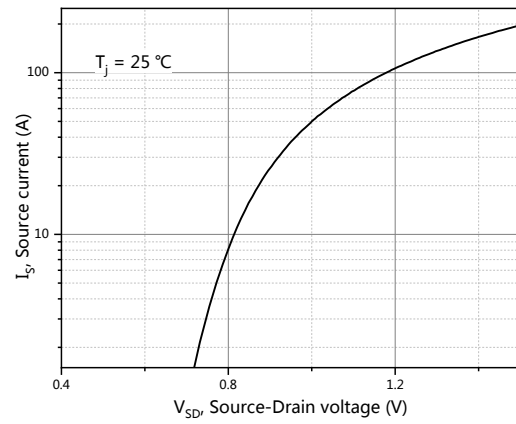


Figure 8, Forward characteristic of body diode

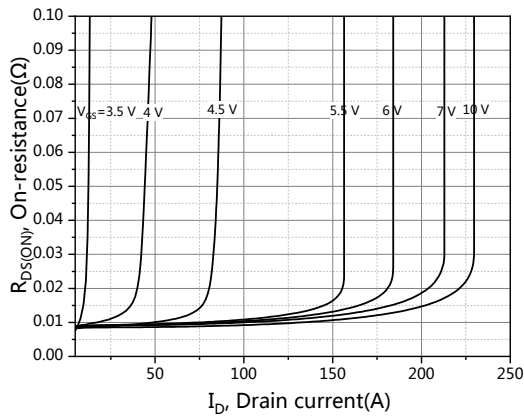


Figure 9, Drain-source on-state resistance

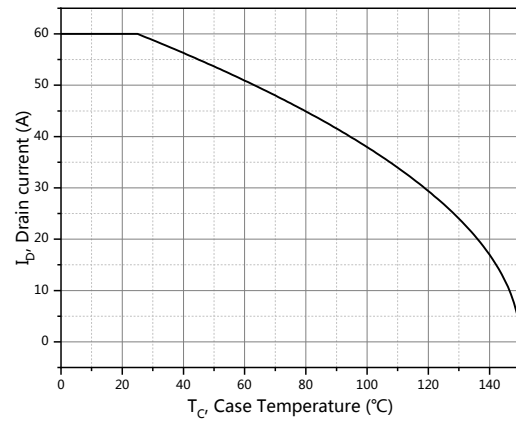


Figure 10, Drain current

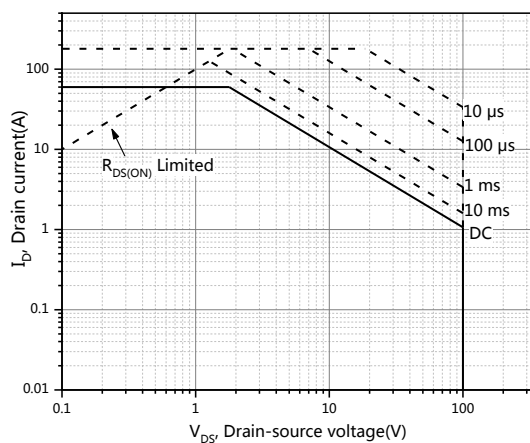
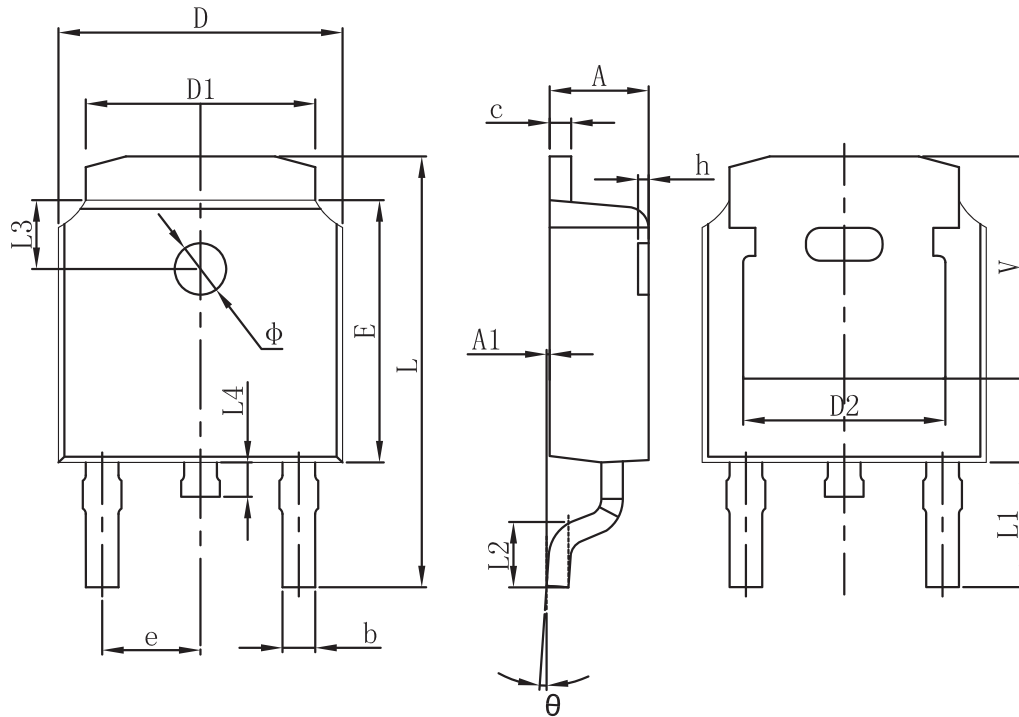


Figure 11, Safe operation area $T_C=25\text{ }^\circ\text{C}$

Packaging information



GmmVo`	8imYngiong -n Ai`imYtYrg		8imYngiong -n -nc \Yg	
	Ain"	Aal"	Ain"	Aal"
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	



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