General Description

The WSF15N10G uses advanced SGTMOS technology to provide low $R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness and suitable to use in Synchronous rectification applications

Product Summery

BVDSS	RDSON	ID
100V	75mΩ	15A

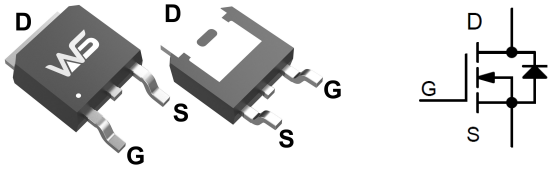
Applications

- Fast Switching
- DC-DC Power System
- Load Switch

Features

- advanced SGTMOS technology
- Low gate charge
- Low $R_{DS(ON)}$

TO-252 Pin Configuration



Absolute Maximum Ratings at Tj=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[1)]	15	A
$I_{D, pulse}$	Pulsed Drain Current[2)]	45	A
E_{AS}	Single Pulse Avalanche Energy[4)]	5.5	mJ
P_D	Total Power Dissipation[3)]	36	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [5)]	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	3.5	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.098	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=5A	---	50	75	mΩ
		V_{GS}=4.5V , I_D=2A	---	60	90	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	28.8	---	Ω
Q_g	Total Gate Charge (10V)	V_{GS}=10 V , V_{DS}=50 V, I_D=5 A	---	6.5	---	nC
Q_{gs}	Gate-Source Charge		---	1.4	---	
Q_{gd}	Gate-Drain Charge		---	1.4	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=5 A	---	14	---	ns
T_r	Rise Time		---	3.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	36	---	
T_f	Fall Time		---	14	---	
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=25 V, f=100 KHz	---	310	---	pF
C_{oss}	Output Capacitance		---	80	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous diode current[1]	V_G=V_D=0V , Force Current	---	---	15	A
I_{SP}	Pulsed diode current[2]		---	---	45	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=5A , T_J=25℃	---	---	1.3	V
t_{rr}	Reverse Recovery Time	I_F=5A , dI/dt=100A/μs , T_J=25℃	---	36	---	nS
Q_{rr}	Reverse Recovery Charge		---	37	---	nC

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 $R_{\theta JA}$ 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 °C.

Typical Characteristics

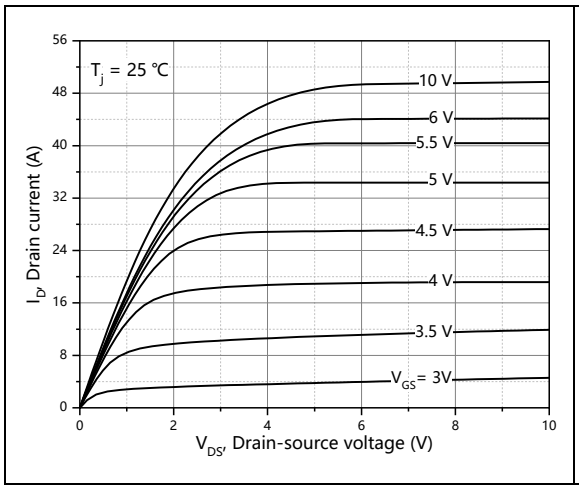


Figure 1, Typ. output characteristics

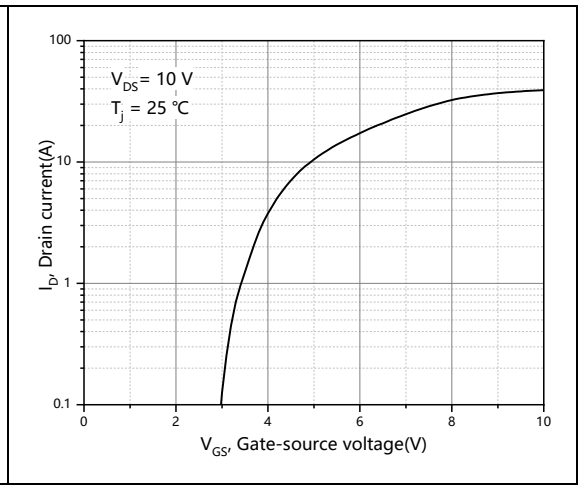


Figure 2, Typ. transfer characteristics

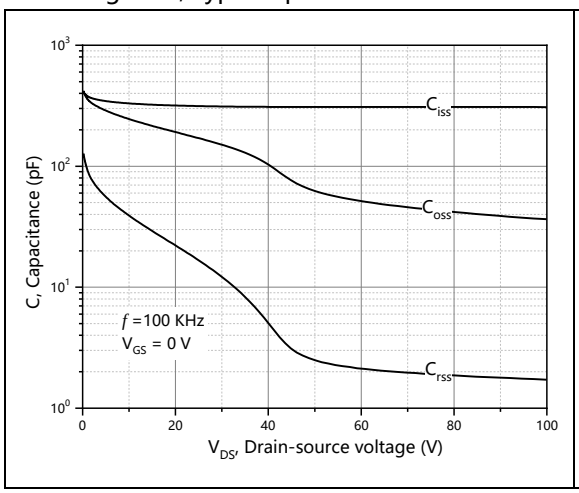


Figure 3, Typ. capacitances

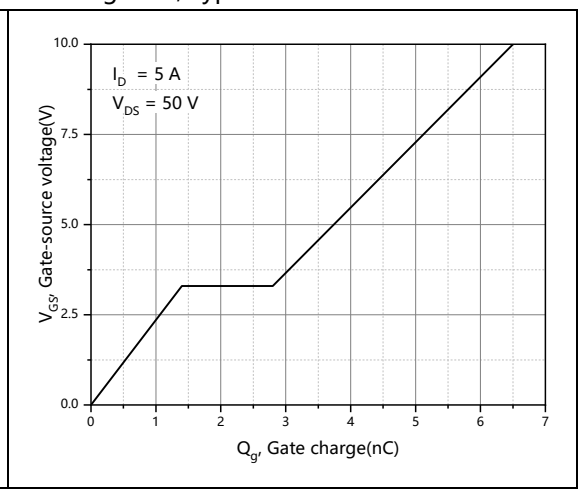


Figure 4, Typ. gate charge

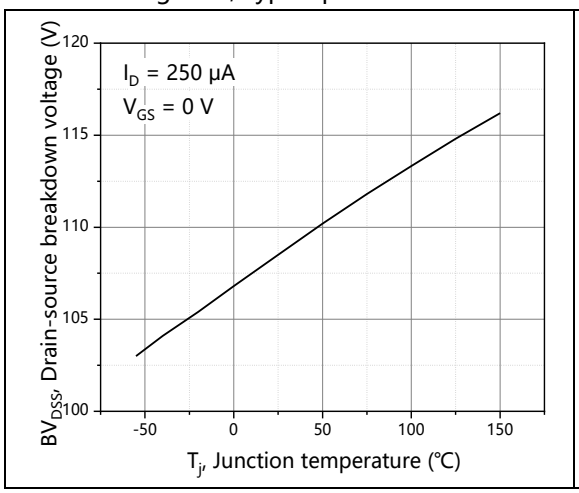


Figure 5, Drain-source breakdown voltage

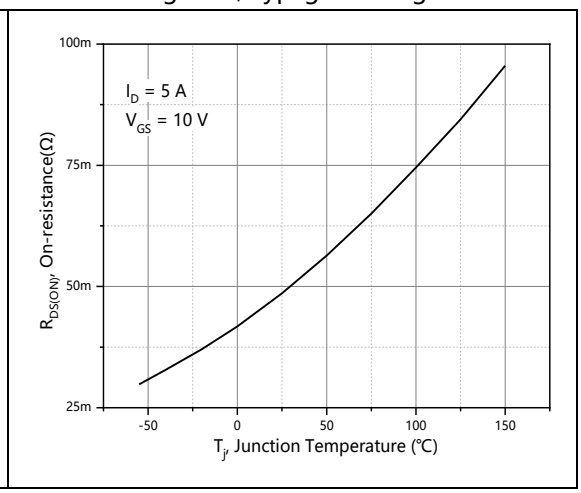


Figure 6, Drain-source on-state resistance

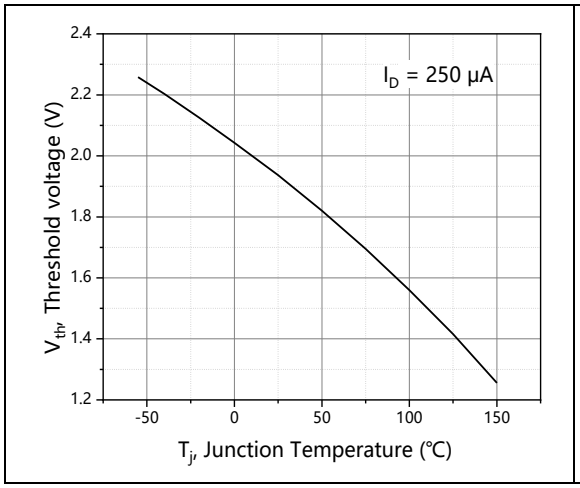


Figure 7, Threshold voltage

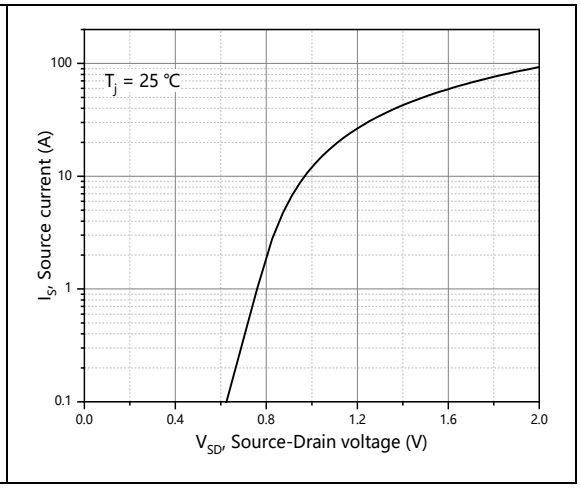


Figure 8, Forward characteristic of body diode

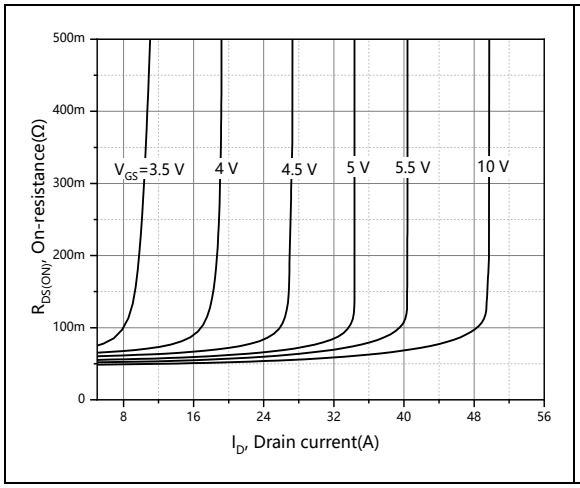


Figure 9, Drain-source on-state resistance

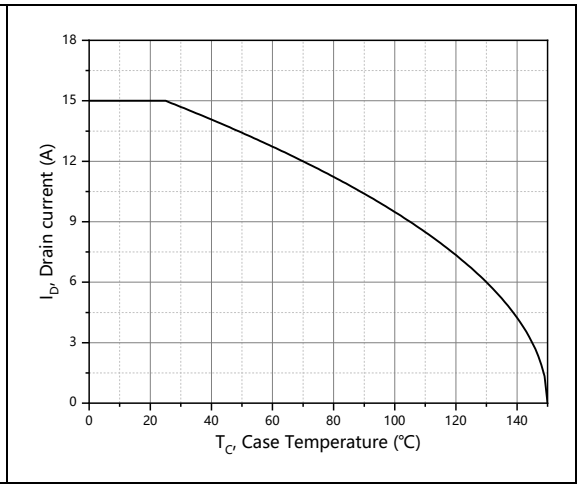


Figure 10, Drain current

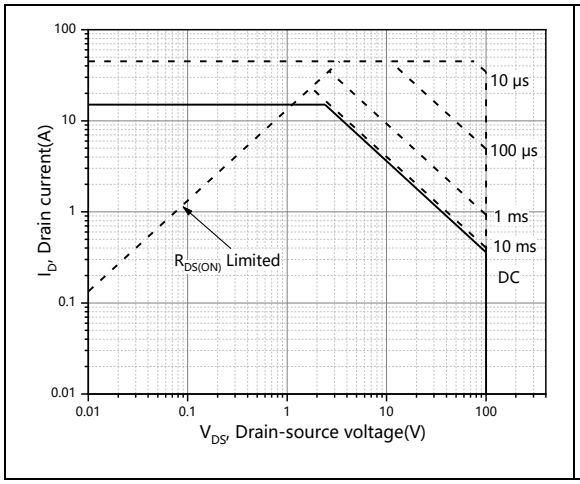


Figure 11, Safe operation area T_C=25 ℃

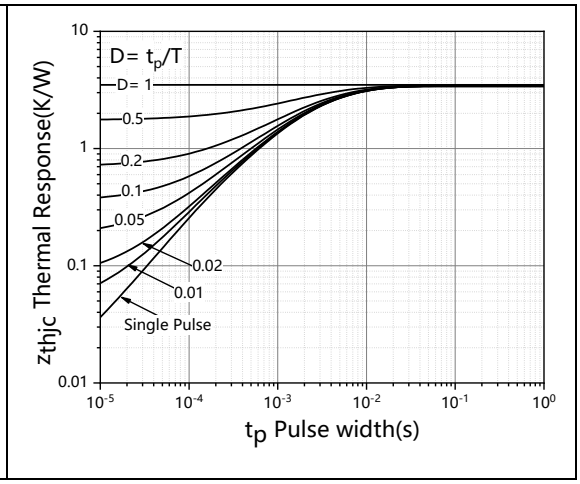


Figure 12, Max. transient thermal impedance

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