

## General Description

The WSF30100D is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The WSF30100D meet the RoHS and Green Product requirement , 100% EAS guaranteed with full function reliability approved.

## Features

Advanced high cell density Trench technology  
 Super Low Gate Charge  
 Excellent CdV/dt effect decline  
 100% EAS Guaranteed  
 Green Device Available

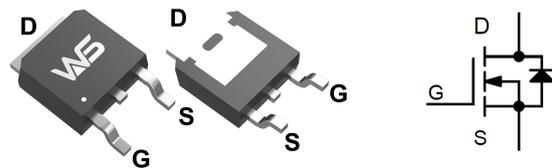
## Product Summary

BVDSS	RDSON	ID
30V	3.6mΩ	100A

## Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- Power Tool Application

## TO-252 Pin Configuration



## Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units	
VDSS	Drain-Source Voltage	30	V	
VGSS	Gate-Source Voltage	±20	V	
ID	Continuous Drain Current, V <sub>GS</sub> @ 10V	TC=25°C	100	A
	Continuous Drain Current, V <sub>GS</sub> @ 10V	TC=100°C	59	A
IDM	Pulsed Drain Current <sup>note1</sup>	360	A	
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	95	mJ	
IAS	Avalanche Current	19.5	A	
P <sub>D</sub>	Total Power Dissipation <sup>4</sup>	TC=25°C	68	W
R <sub>θJA</sub>	Thermal Resistance Junction-ambient <sup>1</sup>	(Steady State)	62	°C/W
	Thermal Resistance Junction-Ambient <sup>1</sup>	(t ≤ 10s)	25	°C/W
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	2.2	°C/W	
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +175	°C	

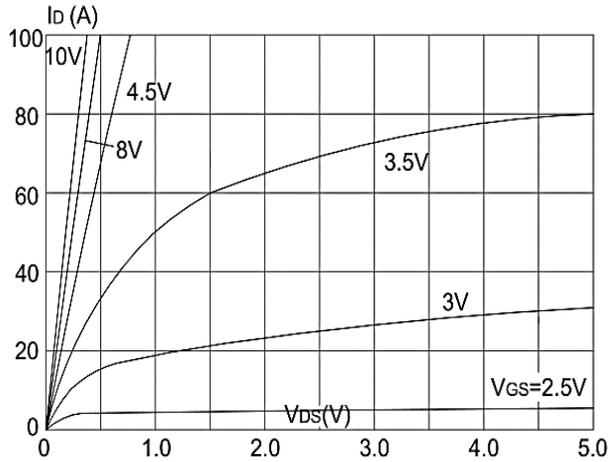
**Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)**

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	32	-	V
ΔBVDSS/ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.028	---	V/°C
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.6	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance note3	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	3.6	4.5	mΩ
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance note3	V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	-	6.7	9.5	mΩ
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f = 1.0MHz	-	2100	-	pF
C <sub>oss</sub>	Output Capacitance		-	326	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	282	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V	-	45	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	3	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	15	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =15V, I <sub>D</sub> =30A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V	-	21	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	32	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	59	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	34	-	ns
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =20A, dI/dt=100A/μs	-	15	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	4	-	nC

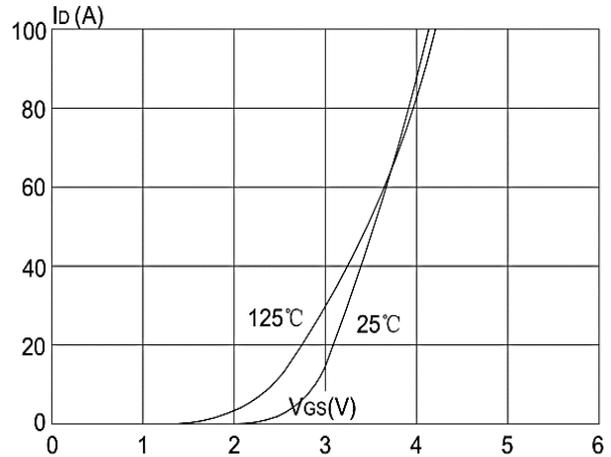
**Notes:**

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、The test condition is, V<sub>DD</sub> =15V, V<sub>G</sub> =10V, R<sub>G</sub> =25Ω, L=0.5mH, I<sub>AS</sub> =19.5A
- 3、The data tested by pulsed Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%
- 4、The power dissipation is limited by 150°C junction temperature

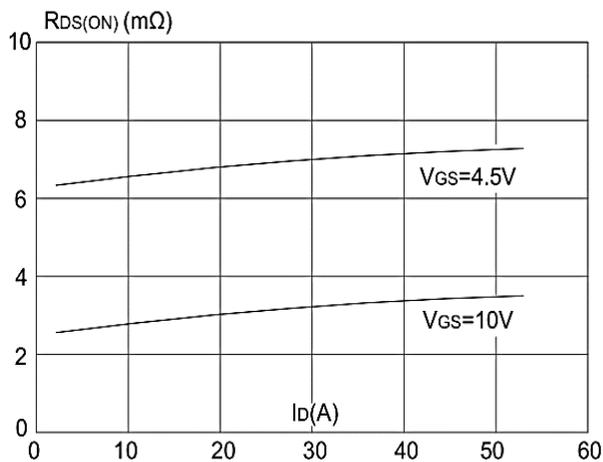
**Typical Characteristics**



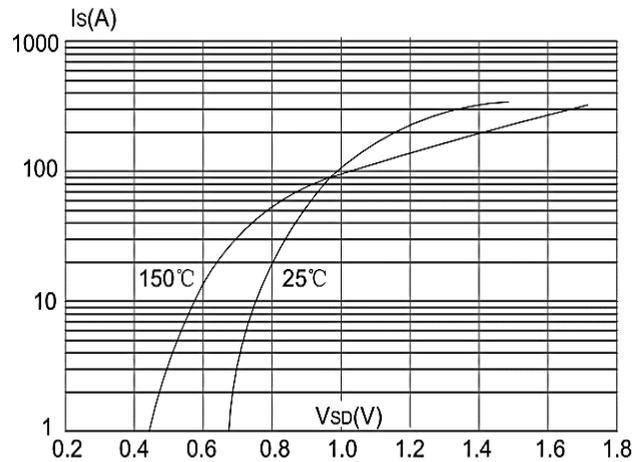
**Figure 1: Output Characteristics**



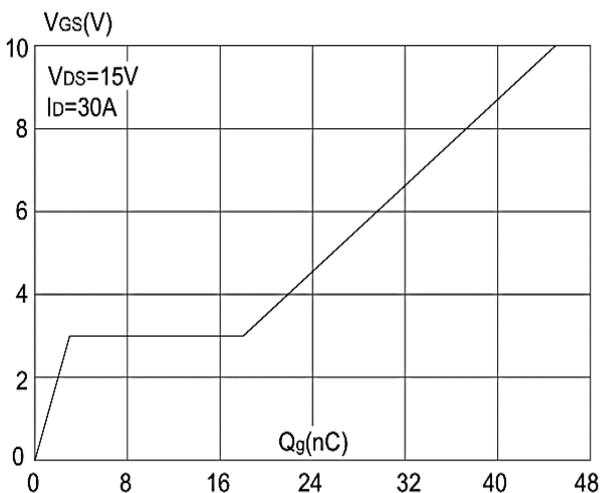
**Figure 2: Typical Transfer Characteristics**



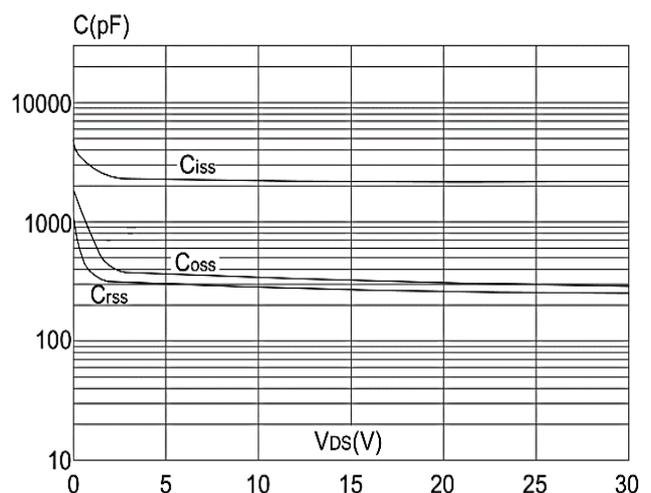
**Figure 3: On-resistance vs. Drain Current**



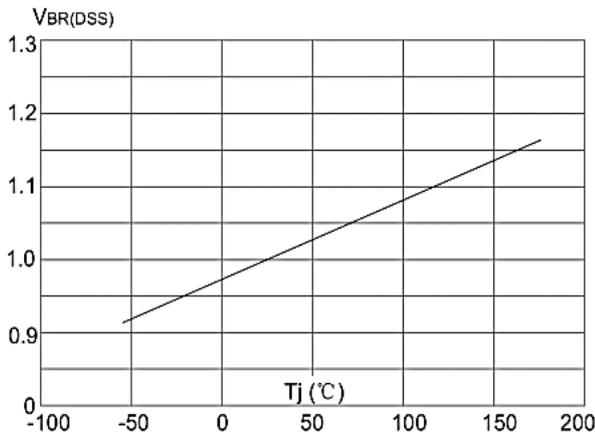
**Figure 4: Body Diode Characteristics**



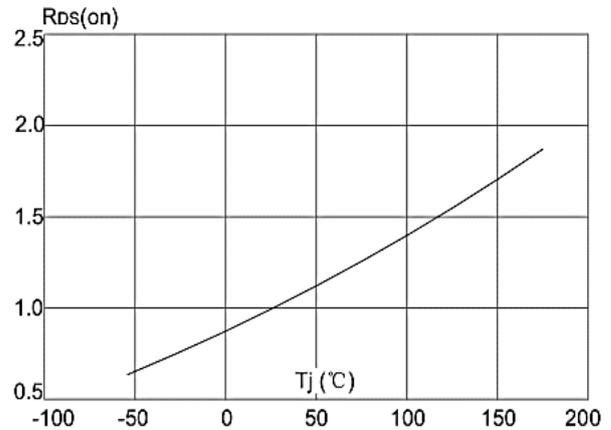
**Figure 5: Gate Charge Characteristics**



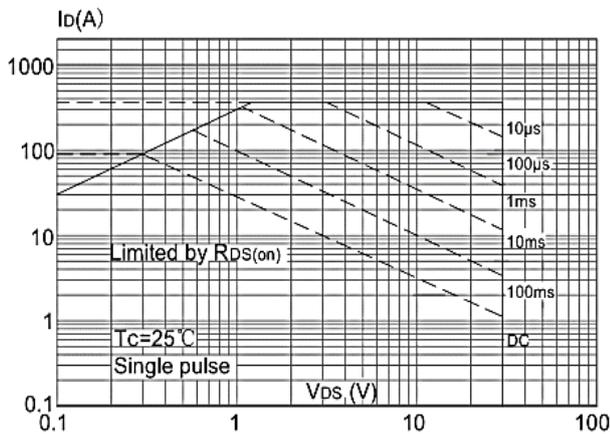
**Figure 6: Capacitance Characteristics**



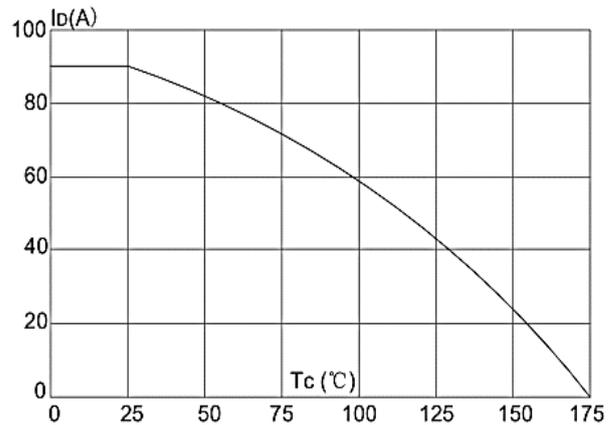
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



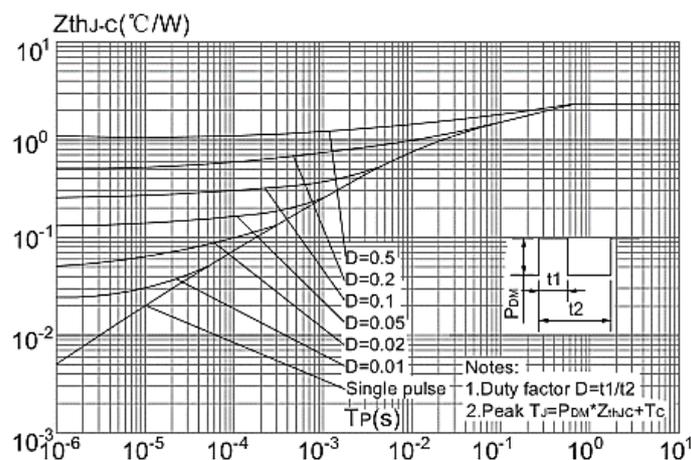
**Figure 8: Normalized on Resistance vs. Junction Temperature**



**Figure 9: Maximum Safe Operating Area vs. Case Temperature**



**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**



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