

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

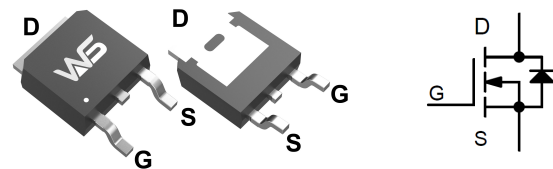
Product Summary

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_c=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, VGS @ 10V	TC=25°C	100	A
	Continuous Drain Current, VGS @ 10V	TC=100°C	59	A
IDM	Pulsed Drain Current ^{note1}		360	A
EAS	Single Pulsed Avalanche Energy ^{note2}		95	mJ
IAS	Avalanche Current		19.5	A
PD	Total Power Dissipation ⁴	TC=25°C	68	W
RθJA	Thermal Resistance Junction-ambient ¹	(Steady State)	62	°C/W
	Thermal Resistance Junction-Ambient ¹	(t ≤10s)	25	°C/W
RθJC	Thermal Resistance, Junction to Case		2.2	°C/W
TJ, TSTG	Operating and Storage Temperature Range		-55 to +175	°C

Electrical Characteristics (T_J=25°C, unless otherwise noted)

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

Notes:

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、The test condition is, V_{DD} =15V, V_G =10V, R_G =25Ω, L=0.5mH, I_{AS} =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

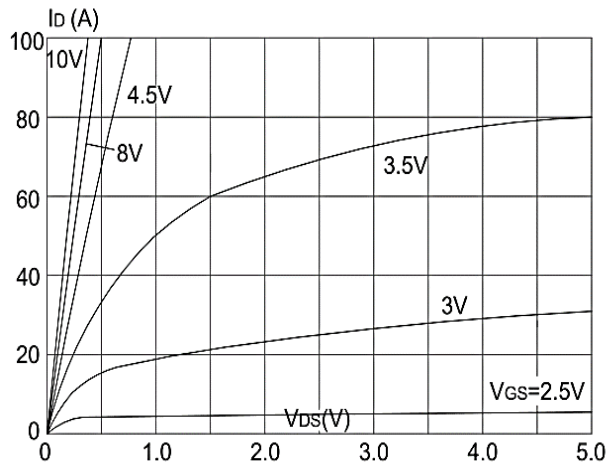


Figure1: Output Characteristics

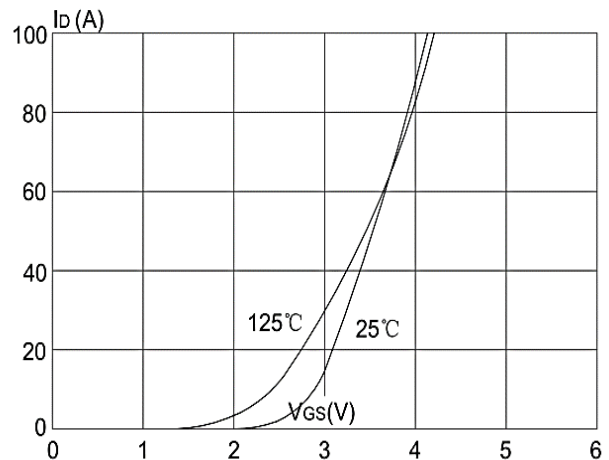


Figure 2: Typical Transfer Characteristics

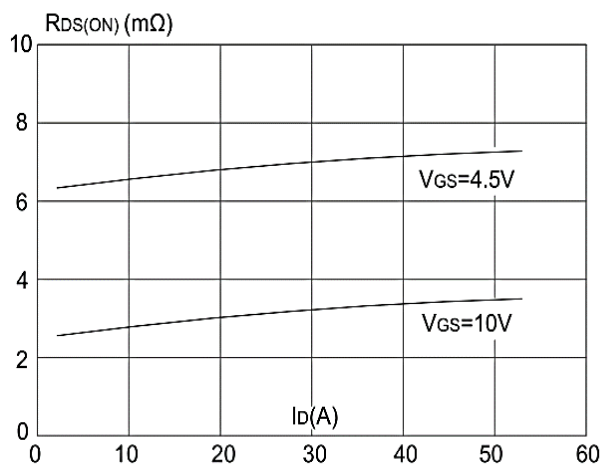


Figure 3: On-resistance vs. Drain Current

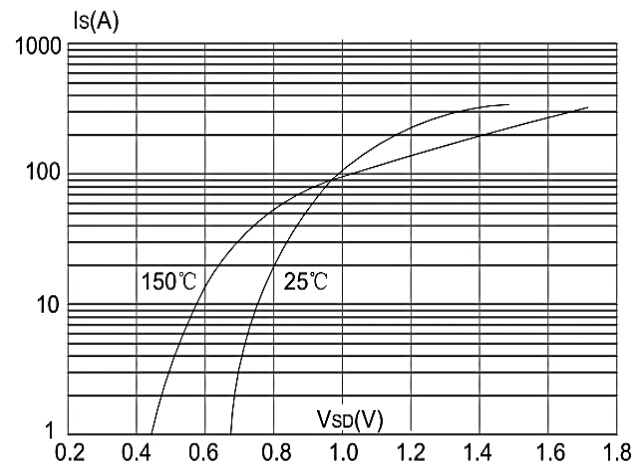


Figure 4: Body Diode Characteristics

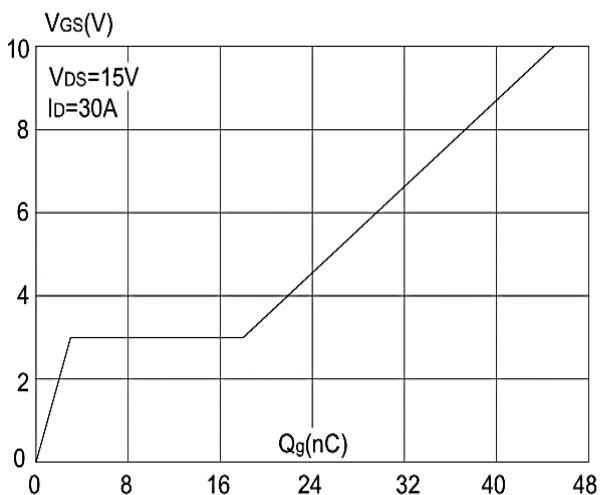


Figure 5: Gate Charge Characteristics

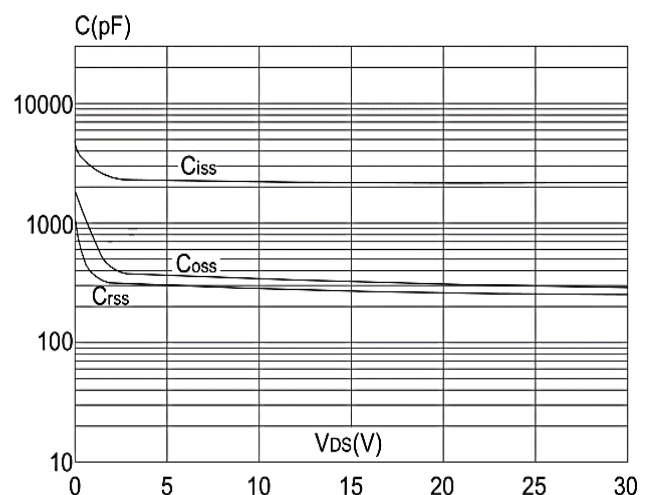


Figure 6: Capacitance Characteristics

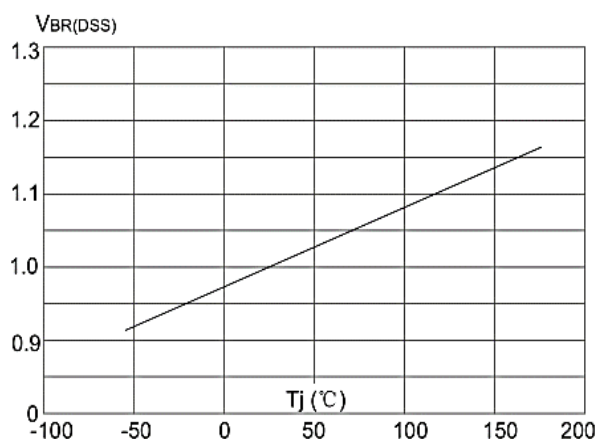


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

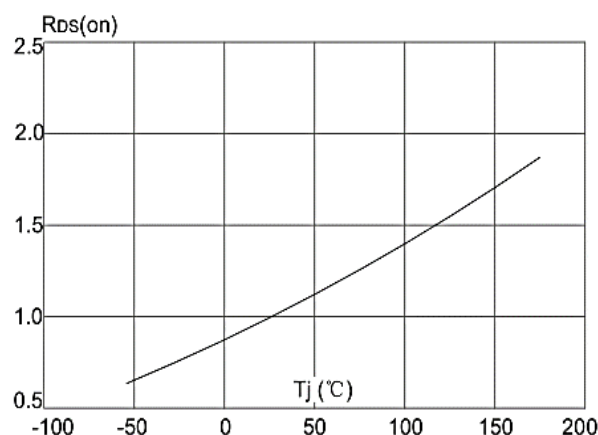


Figure 8: Normalized on Resistance vs. Junction Temperature

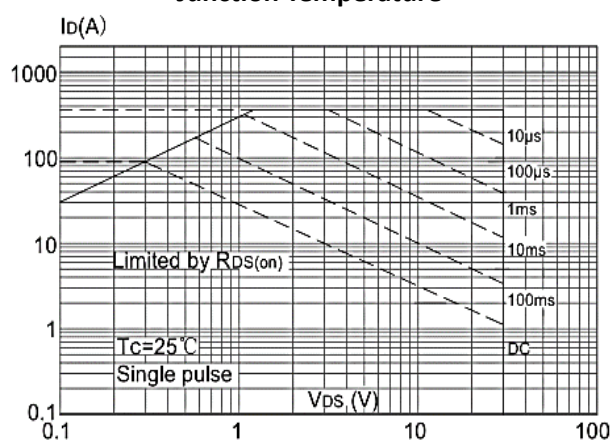


Figure 9: Maximum Safe Operating Area vs. Case Temperature

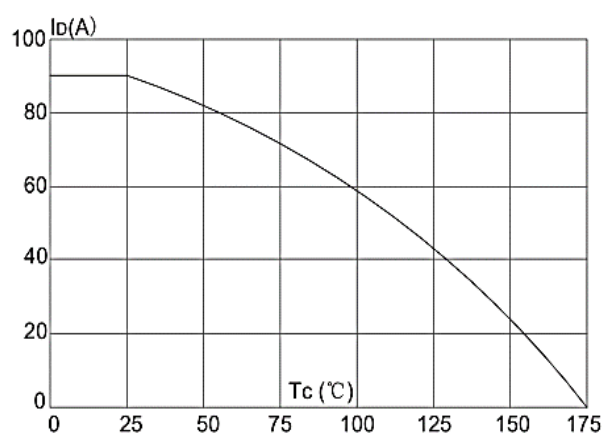


Figure 10: Maximum Continuous Drain Current

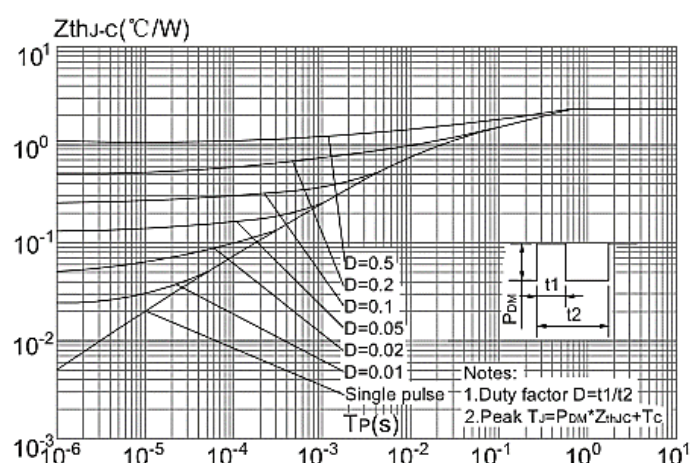


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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