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

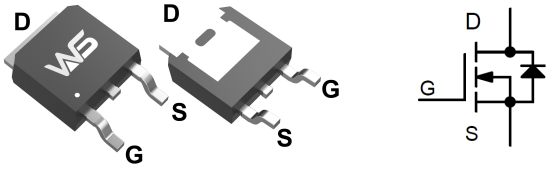
Product Summery

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℃unless otherwise noted)

Symbol	Parameter		Max.	Units
VDSS	Drain-Source Voltage		30	V
VGSS	Gate-Source Voltage		±20	V
ID	Continuous Drain Current, V_{GS} @ 10V	TC=25℃	100	A
	Continuous Drain Current, V_{GS} @ 10V	TC=100℃	59	A
IDM	Pulsed Drain Current note1		360	A
EAS	Single Pulsed Avalanche Energy note2		95	mJ
IAS	Avalanche Current		19.5	A
P_D	Total Power Dissipation4	TC=25℃	68	W
RθJA	Thermal Resistance Junction-ambient 1	(Steady State)	62	℃/W
	Thermal Resistance Junction-Ambient 1	(t ≤10s)	25	℃/W
RθJC	Thermal Resistance, Junction to Case		2.2	℃/W
TJ, TSTG	Operating and Storage Temperature Range		-55 to +175	℃

Electrical Characteristics (T_J=25℃, 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
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃, ID=1mA	---	0.028	---	V/℃
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1.0	1.6	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS} =10V, I_D =30A	-	3.6	4.5	mΩ
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS} =4.5V, I_D =20A	-	6.7	9.5	mΩ
IDSS	Zero Gate Voltage Drain Current	V_{DS} =30V, V_{GS} = 0V,	-	-	1.0	μA
IGSS	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
Coss	Output Capacitance		-	326	-	pF
Crss	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
td(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
td(off)	Turn-off Delay Time		-	59	-	ns
t_f	Turn-off Fall Time		-	34	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=20A,dI/dt=100A/μs	-	15	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	4	-	nC

Notes:

1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2、The test condition is, VDD =15V, VG =10V, RG =25Ω, L=0.5mH, IAS =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℃ junction temperature

Typical Characteristics

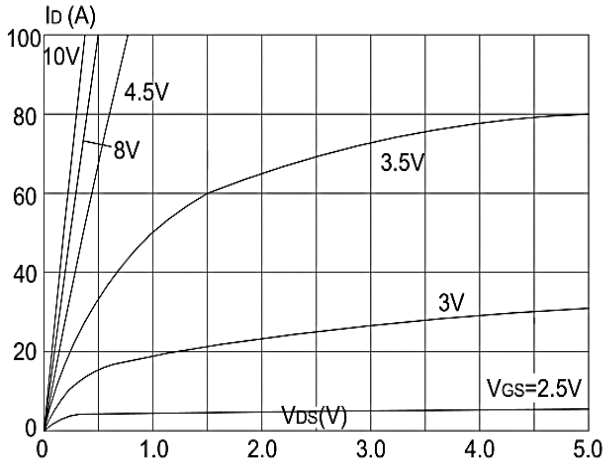


Figure1: Output Characteristics

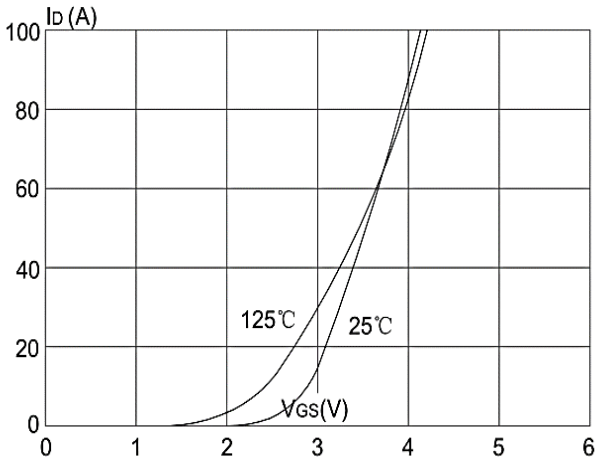


Figure 2: Typical Transfer Characteristics

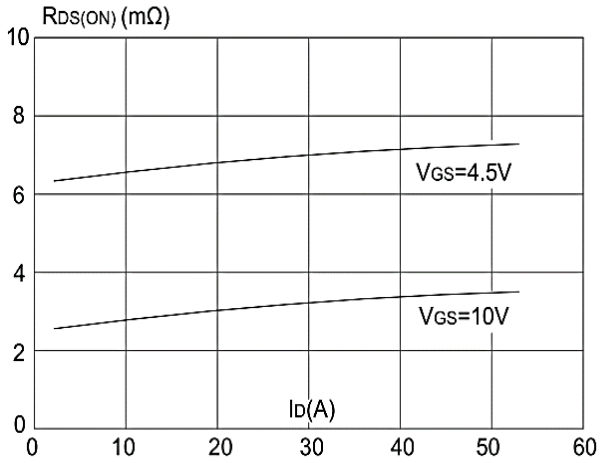


Figure 3:On-resistance vs. Drain Current

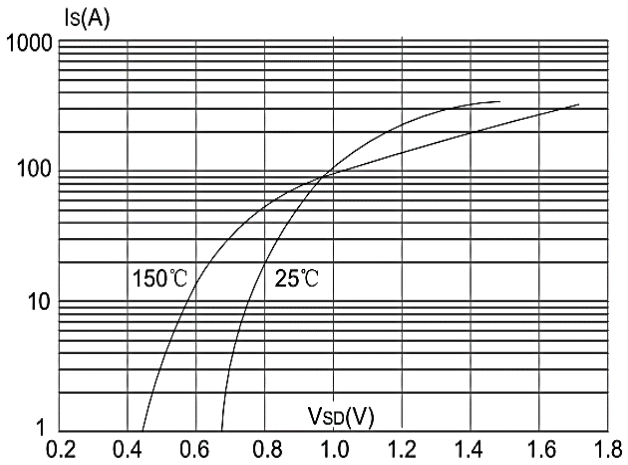


Figure 4: Body Diode Characteristics

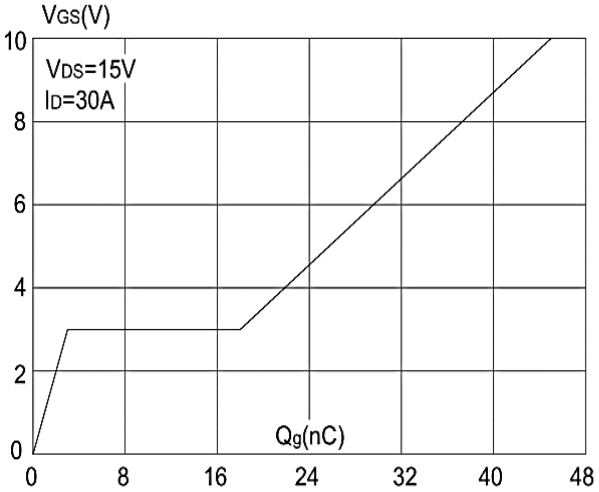


Figure 5: Gate Charge Characteristics

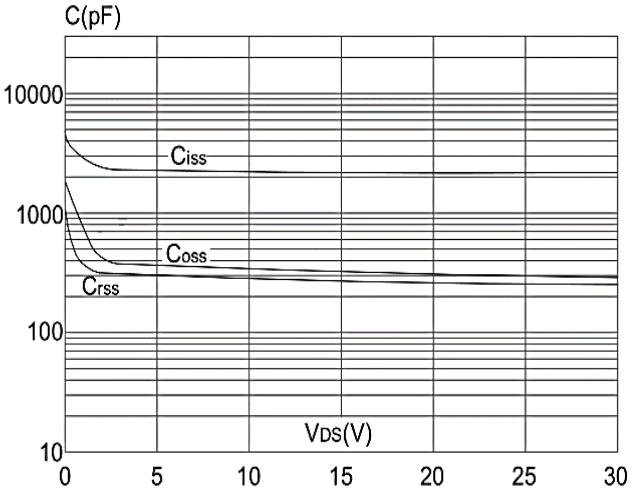


Figure 6: Capacitance Characteristics

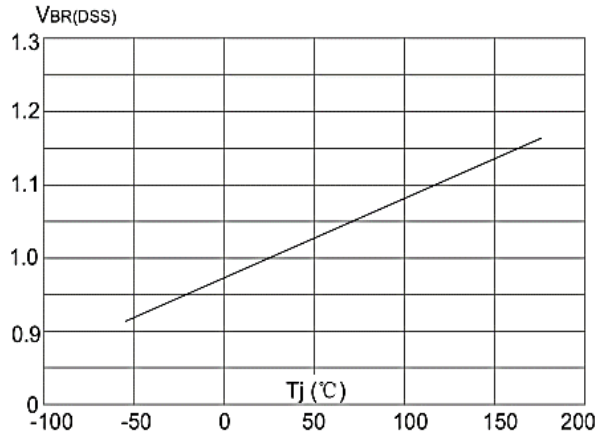


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

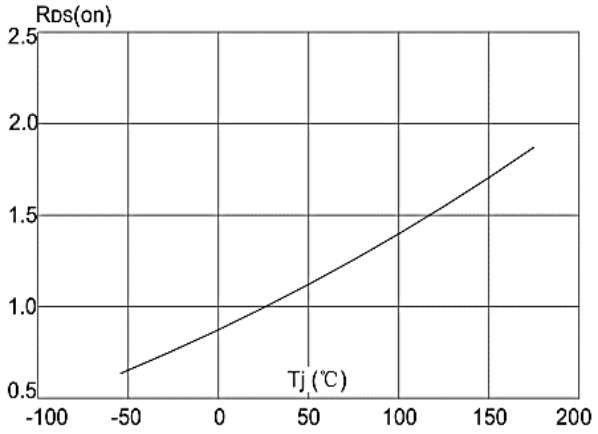


Figure 8: Normalized on Resistance vs Junction Temperature

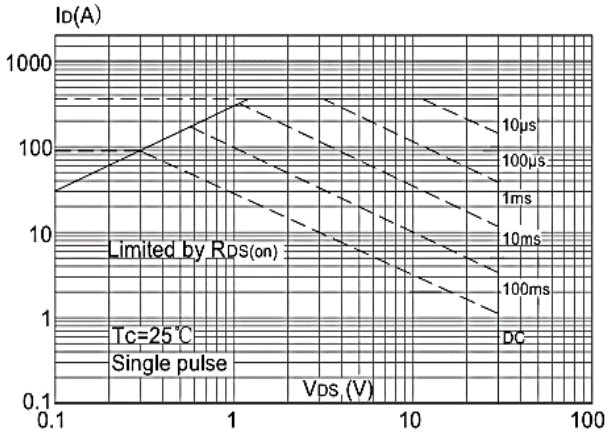


Figure 9: Maximum Safe Operating Area vs. Case Temperature

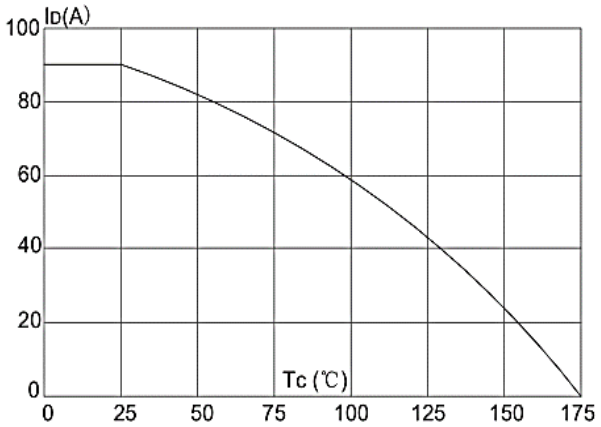


Figure 10: Maximum Continuous Drain Current

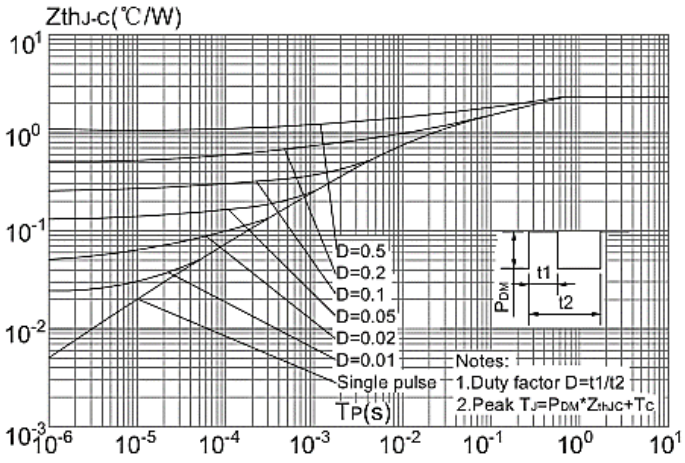


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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