

General Description

The WSD3070DN is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The WSD3070DN 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

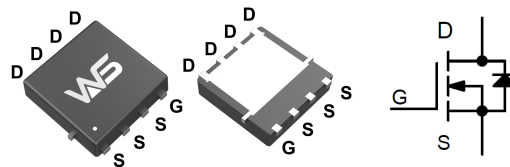
Product Summary

BVDSS	RDSON	ID
25V	2.5mΩ	70A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

DFN3.3X3.3 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	25	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	70	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	55	A
$I_D@T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	20	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	16	A
$I_{DM}@T_C=25^\circ C$	Pulsed Drain Current ²	200	A
EAS	Avalanche Energy, Single Pulse ($L=0.5mH$) ³	100	mJ
I_{AS}	Avalanche Current, Single pulse ($L=0.5mH$) ³	20	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	62.5	W
$P_D@T_A=25^\circ C$	Total Power Dissipation ⁴	1.78	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	70	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	2.5	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	25	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.028	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =20A	---	2.5	3.4	mΩ
		V _{GS} =2.5V, I _D =20A	---	3.0	4.0	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.8	1.1	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-6.16	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =40A	---	74	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	0.85	1.1	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V, V _{GS} =10V, I _{DS} =20A	---	96	134	nC
Q _{gs}	Gate-Source Charge		---	5.5	7.7	
Q _{gd}	Gate-Drain Charge		---	16	22	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	---	16.6	31	ns
T _r	Rise Time		---	12.2	24	
T _{d(off)}	Turn-Off Delay Time		---	135	244	
T _f	Fall Time		---	48	87	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	4920	---	pF
C _{oss}	Output Capacitance		---	510	---	
C _{rss}	Reverse Transfer Capacitance		---	350	---	

Diode Characteristics

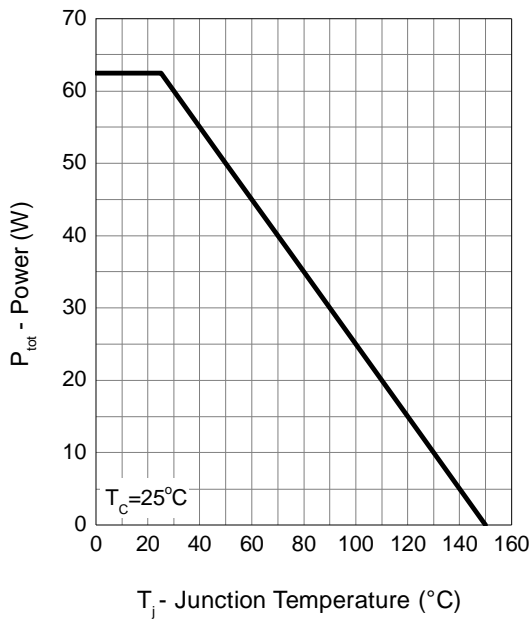
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,6}	V _G =V _D =0V, Force Current	---	---	20	A
I _{SM}	Pulsed Source Current ^{2,6}		---	---	70	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.1	V
t _{rr}	Reverse Recovery Time	I _F =40A, dI/dt=100A/μs, T _J =25°C	---	14.8	---	nS
Q _{rr}	Reverse Recovery Charge		---	3.9	---	nC

Note d : Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

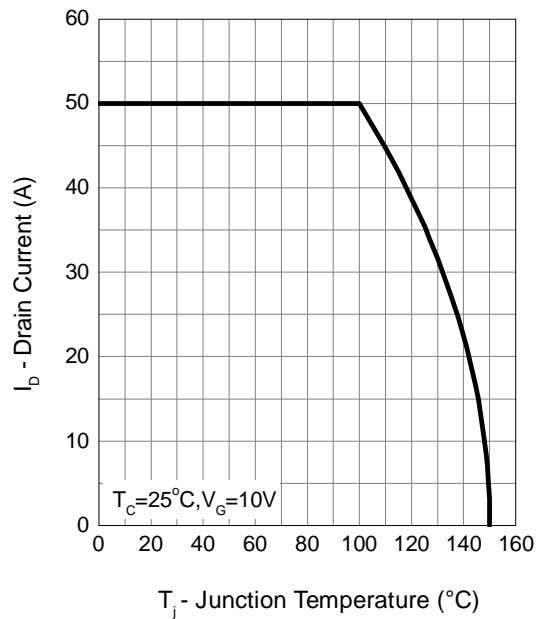
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

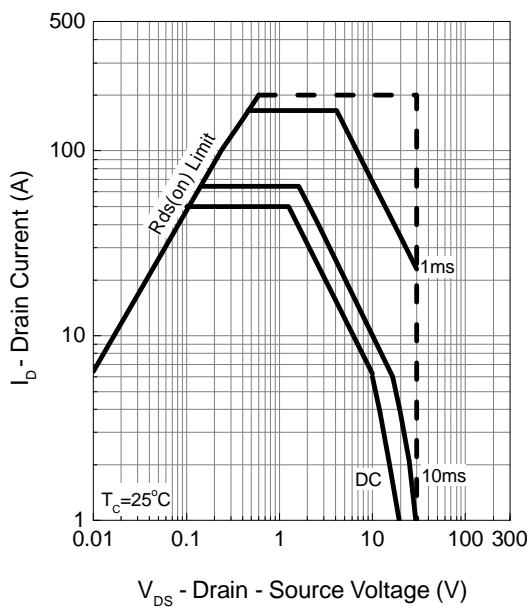
Power Dissipation



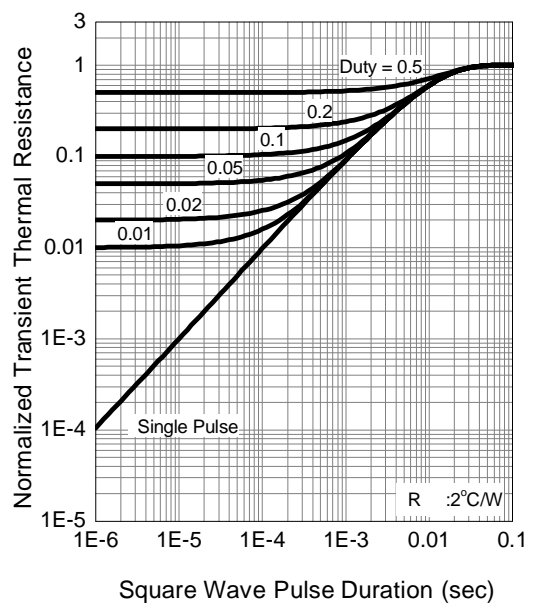
Drain Current



Safe Operation Area

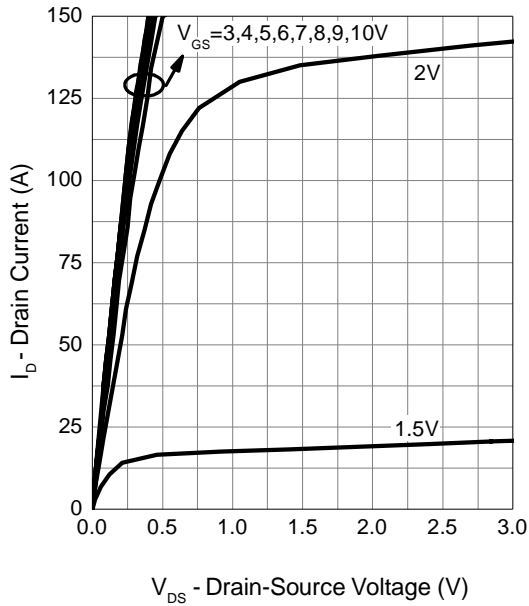


Thermal Transient Impedance

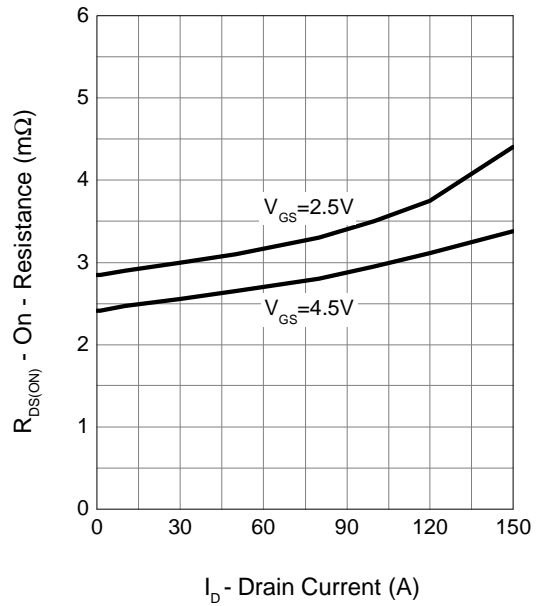


Typical Operating Characteristics (Cont.)

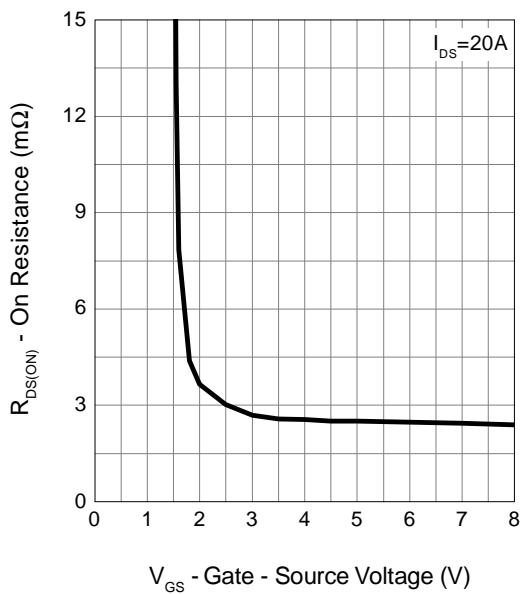
Output Characteristics



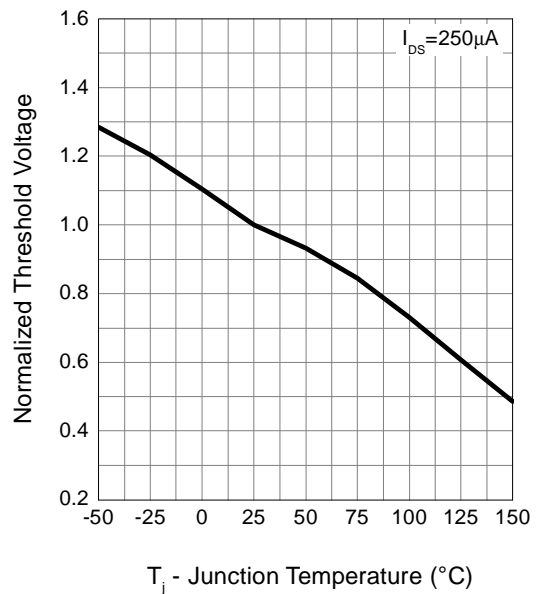
Drain-Source On Resistance



Gate-Source On Resistance

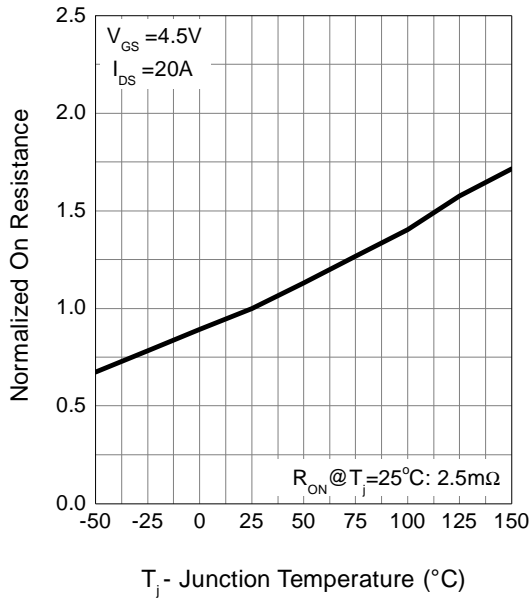


Gate Threshold Voltage

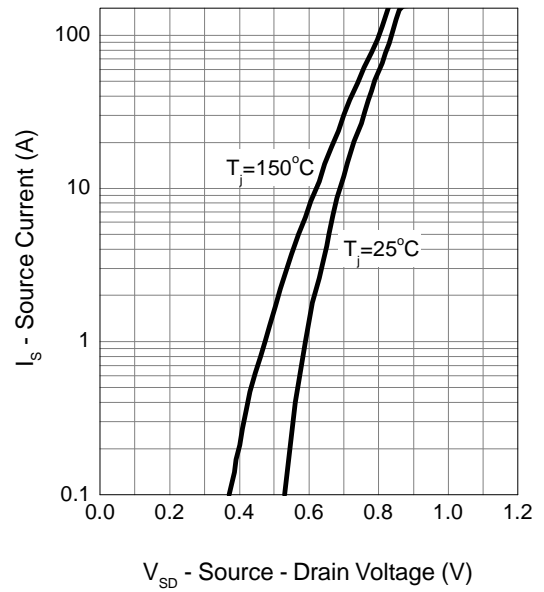


Typical Operating Characteristics (Cont.)

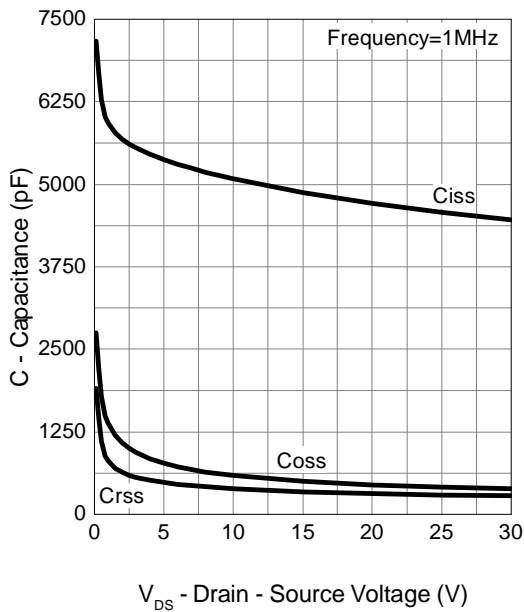
Drain-Source On Resistance



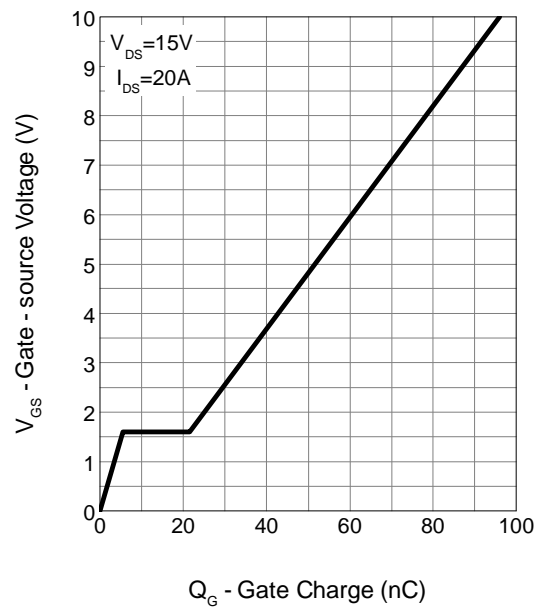
Source-Drain Diode Forward



Capacitance



Gate Charge





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