

## General Description

The WSD75100DN56 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 WSD75100DN56 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## Features

- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

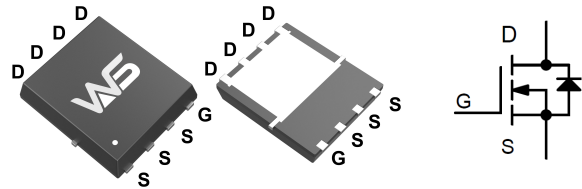
## Product Summary

$BV_{DSS}$	$R_{DSON}$	$I_D$
75V	5.3mΩ	100A

## Applications

- DC-DC converter switching for Networkong
- General purpose switching

## DFN5X6-8 Pin Configuration



## Absolute Maximum Ratings (T<sub>A</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	75	V
V <sub>GS</sub>	Gate-Source Voltage	±25	V
T <sub>J</sub>	Maximum Junction Temperature	150	°C
I <sub>D</sub>	Storage Temperature Range	-55 to 150	°C
I <sub>S</sub>	Diode Continuous Forward Current, T <sub>C</sub> =25°C	50	A
I <sub>D</sub>	Continuous Drain Current, V <sub>GS</sub> =10V, T <sub>C</sub> =25°C	100	A
	Continuous Drain Current, V <sub>GS</sub> =10V, T <sub>C</sub> =100°C	73	A
I <sub>DM</sub>	Pulsed Drain Current, T <sub>C</sub> =25°C	400	A
P <sub>D</sub>	Maximum Power Dissipation, T <sub>C</sub> =25°C	155	W
	Maximum Power Dissipation, T <sub>C</sub> =100°C	62	W
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient, t = 10s	20	°C
	Thermal Resistance-Junction to Ambient, Steady State	60	°C
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	0.8	°C
I <sub>AS</sub>	Avalanche Current, Single pulse, L=0.5mH	30	A
E <sub>AS</sub>	Avalanche Energy, Single pulse, L=0.5mH	225	mJ

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	75	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.043	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =25A	---	5.3	6.4	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	3.0	4.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-6.94	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	2	uA
		V <sub>DS</sub> =48V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	10	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =20A	---	50	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	1.0	2	Ω
Q <sub>g</sub>	Total Gate Charge (10V)	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =40A	---	65	85	nC
Q <sub>gs</sub>	Gate-Source Charge		---	20	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	17	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =30V, V <sub>GEN</sub> =10V, R <sub>G</sub> =1Ω, I <sub>D</sub> =1A, RL=15Ω.	---	27	49	ns
T <sub>r</sub>	Rise Time		---	14	26	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	60	108	
T <sub>f</sub>	Fall Time		---	37	67	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz	3450	3500	4550	pF
C <sub>oss</sub>	Output Capacitance		245	395	652	
C <sub>rss</sub>	Reverse Transfer Capacitance		100	195	250	

**Guaranteed Avalanche Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy <sup>5</sup>	V <sub>DD</sub> =25V, L=0.5mH, I <sub>AS</sub> =30A	198	---	---	mJ

**Diode Characteristics**

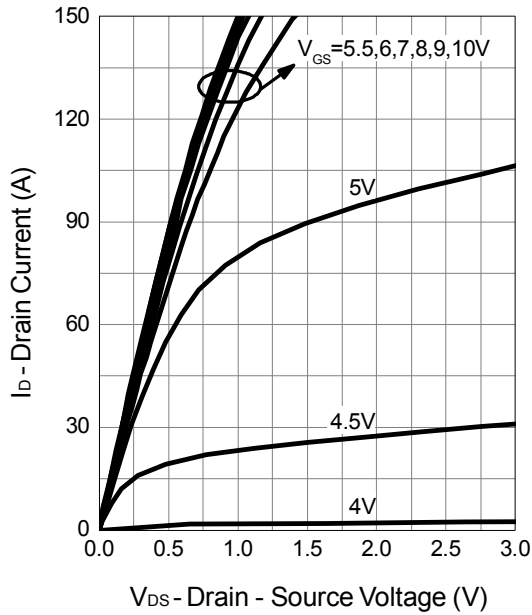
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,6</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	50	A
I <sub>SM</sub>	Pulsed Source Current <sup>2,6</sup>		---	---	100	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A, T <sub>J</sub> =25°C	---	---	1.4	V

Note :

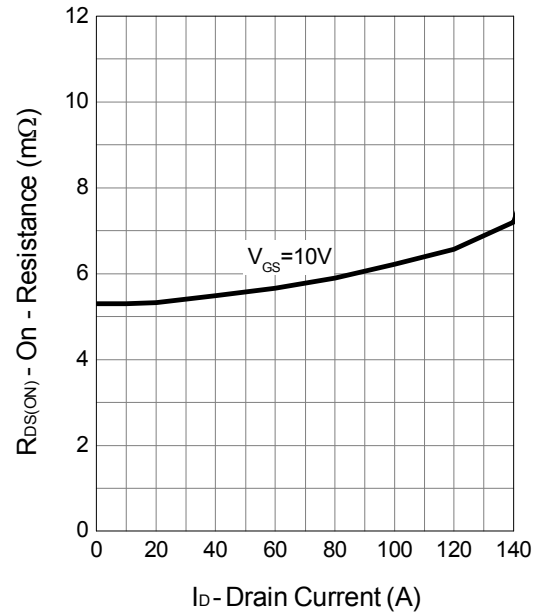
- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, t<10sec.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.5mH, I<sub>AS</sub>=30A
- The power dissipation is limited by 150°C junction temperature
- The Min. value is 100% EAS tested guarantee.
- The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.
- Package limitation current is 100A.

Typical Characteristics

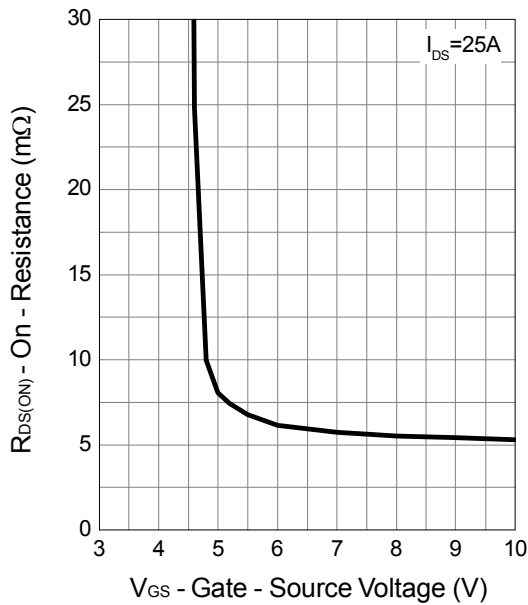
Output Characteristics



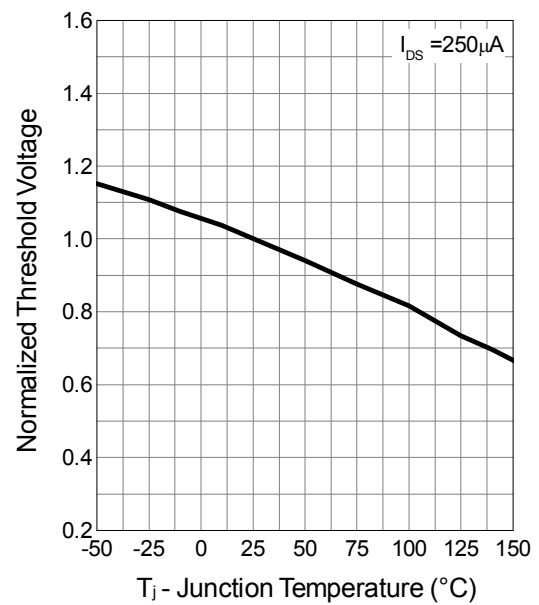
Drain-Source On Resistance



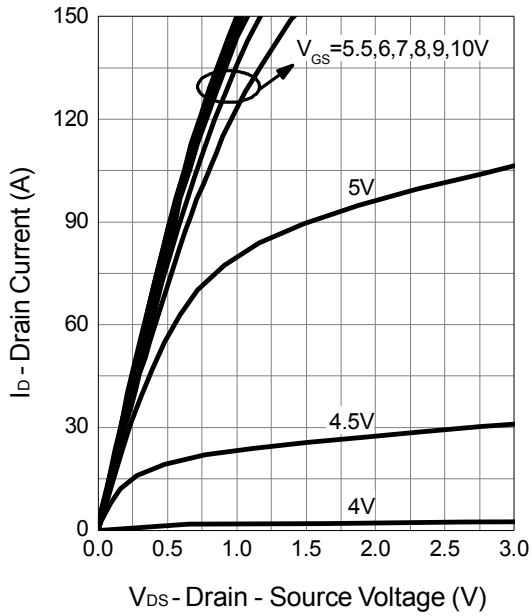
Gate-Source On Resistance



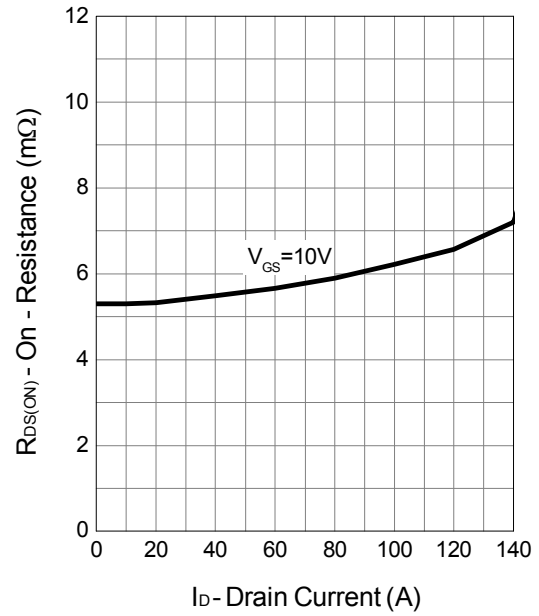
Gate Threshold Voltage



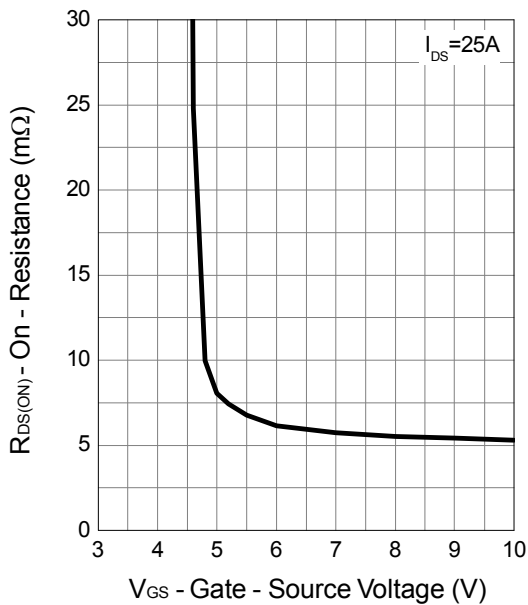
**Output Characteristics**



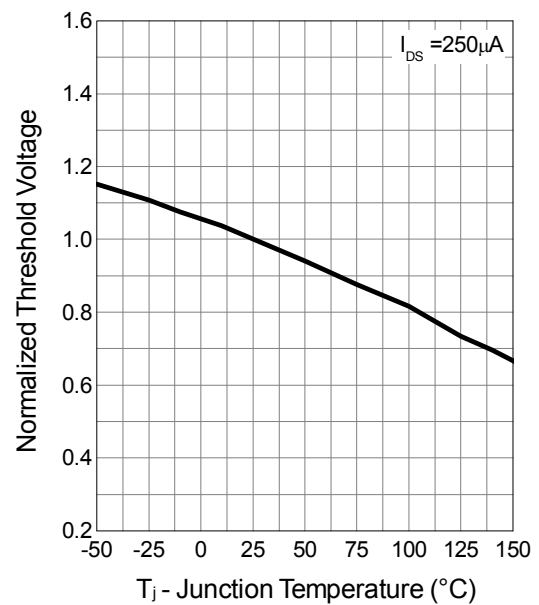
**Drain-Source On Resistance**



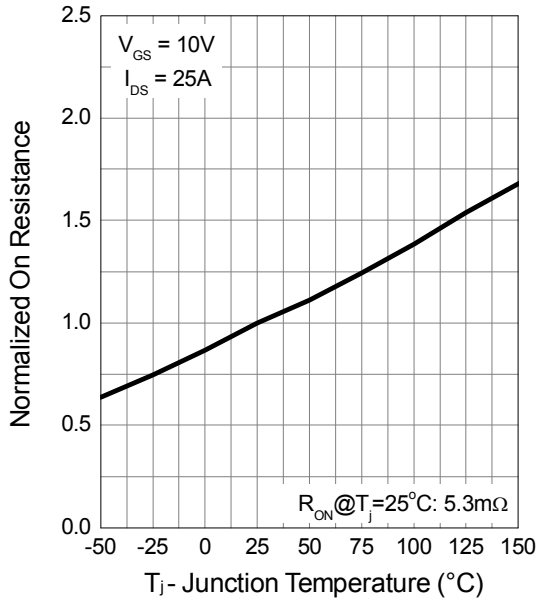
**Gate-Source On Resistance**



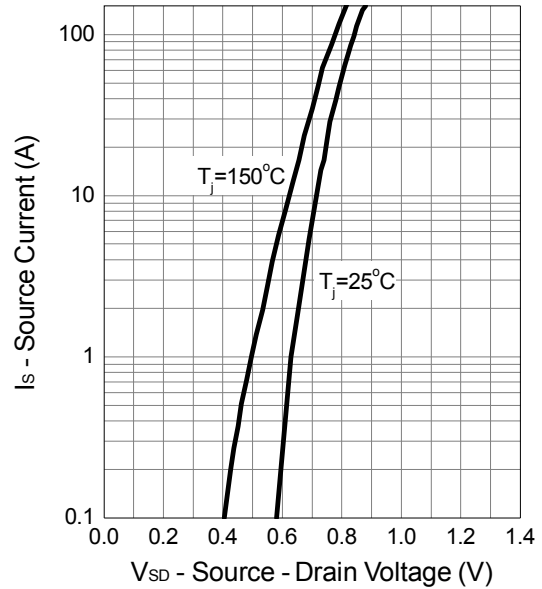
**Gate Threshold Voltage**



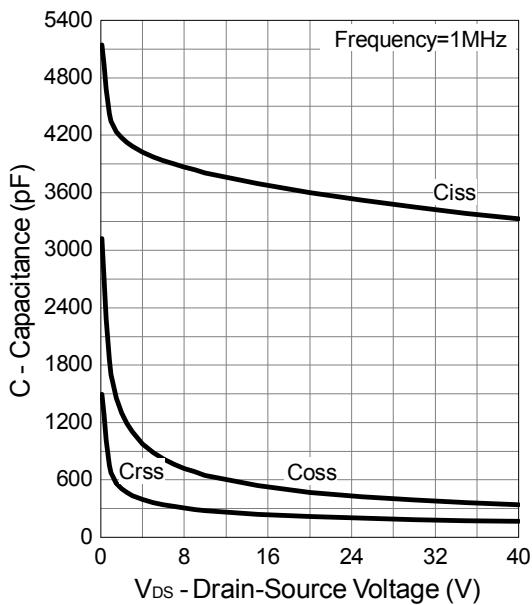
**Drain-Source On Resistance**



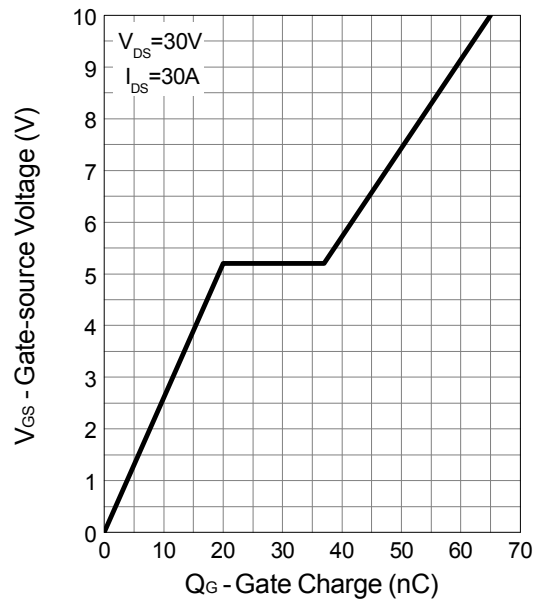
**Source-Drain Diode Forward**



**Capacitance**



**Gate Charge**





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