## 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.

## Product Summery

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

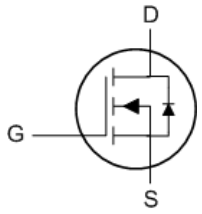
## Applications

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

## Features

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

## DFN5X6-8 Pin Configuration


## Absolute Maximum Ratings ($T_A$=25°C Unless Otherwise Noted)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 75 | V |
| $V_{GS}$ | Gate-Source Voltage | ±25 | V |
| $T_J$ | Maximum Junction Temperature | 150 | °C |
| $I_D$ | Storage Temperature Range | -55 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current,$T_C$=25°C | 50 | A |
| $I_D$ | Continuous Drain Current, $V_{GS}$=10V,$T_C$=25°C | 100 | A |
| | Continuous Drain Current, $V_{GS}$=10V,$T_C$=100°C | 73 | A |
| $I_{DM}$ | Pulsed Drain Current ,$T_C$=25°C | 400 | A |
| $P_D$ | Maximum Power Dissipation,$T_C$=25°C | 155 | W |
| | Maximum Power Dissipation,$T_C$=100°C | 62 | W |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient ,t =10s` | 20 | °C |
| | Thermal Resistance-Junction to Ambient ,Steady State | 60 | °C |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 0.8 | °C |
| $I_{AS}$ | Avalanche Current, Single pulse,L=0.5mH | 30 | A |
| $E_{AS}$ | Avalanche Energy, Single pulse,L=0.5mH | 225 | mJ |

## Electrical Characteristics ($T_J$=25 ℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 75 | --- | --- | V |
| $\triangle BV_{DSS}/\triangle T_J$ | $BV_{DSS}$ Temperature Coefficient | Reference to 25℃ , $I_D$=1mA | --- | 0.043 | --- | V/℃ |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=10V , $I_D$=25A | --- | 5.3 | 6.4 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 2.0 | 3.0 | 4.0 | V |
| $\triangle V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | -6.94 | --- | mV/℃ |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=48V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 2 | uA |
| | | $V_{DS}$=48V , $V_{GS}$=0V , $T_J$=55℃ | --- | --- | 10 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=5V , $I_D$=20A | --- | 50 | --- | S |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 1.0 | 2 | Ω |
| $Q_g$ | Total Gate Charge (10V) | $V_{DS}$=20V , $V_{GS}$=10V , $I_D$=40A | --- | 65 | 85 | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 20 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 17 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=30V , $V_{GEN}$=10V , $R_G$=1Ω, $I_D$=1A ,RL=15Ω. | --- | 27 | 49 | ns |
| $T_r$ | Rise Time | | --- | 14 | 26 | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 60 | 108 | |
| $T_f$ | Fall Time | | --- | 37 | 67 | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=20V , $V_{GS}$=0V , f=1MHz | --- | 3500 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 395 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 195 | --- | |

## Guaranteed Avalanche Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| EAS | Single Pulse Avalanche Energy[5] | $V_{DD}$=25V , L=0.5mH , $I_{AS}$=30A | 198 | --- | --- | mJ |

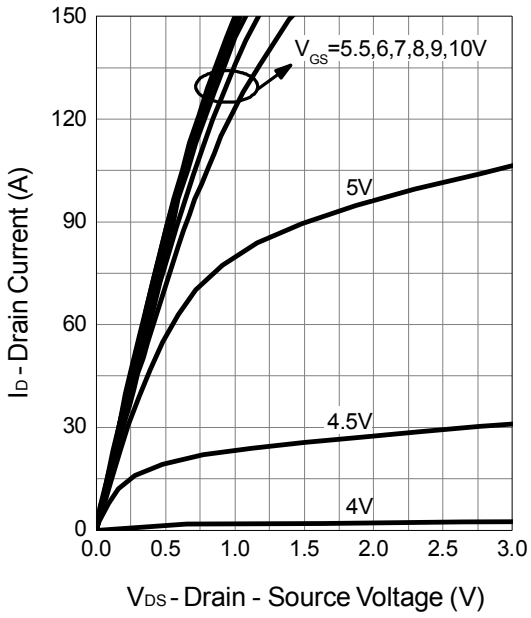
## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current[1,6] | $V_G$=$V_D$=0V , Force Current | --- | --- | 50 | A |
| $I_{SM}$ | Pulsed Source Current[2,6] | | --- | --- | 100 | A |
| $V_{SD}$ | Diode Forward Voltage[2] | $V_{GS}$=0V , $I_S$=20A , $T_J$=25℃ | --- | --- | 1.4 | V |

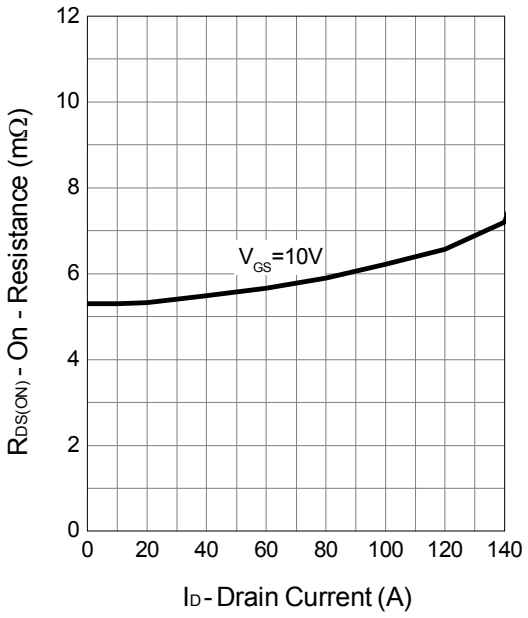
Note :
1.The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper,t<10sec .
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is $V_{DD}$=25V,$V_{GS}$=10V,L=0.5mH,$I_{AS}$=30A
4.The power dissipation is limited by 150℃ junction temperature
5.The Min. value is 100% EAS tested guarantee.
6.The data is theoretically the same as $I_D$ and $I_{DM}$ , in real applications , should be limited by total power dissipation.
7.Package limitation current is 100A.

## Typical Characteristics

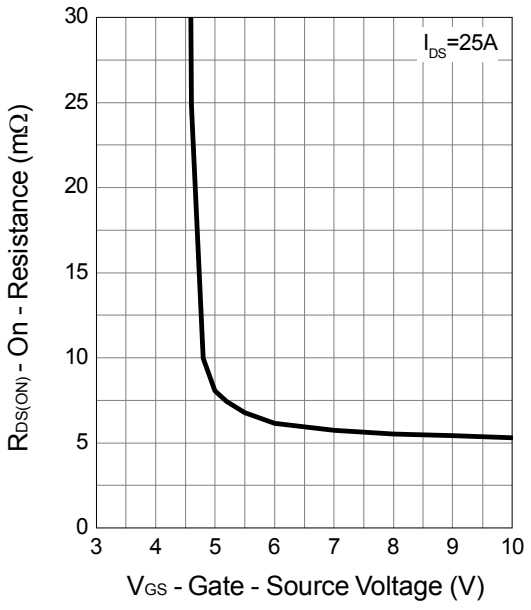
**Output Characteristics**



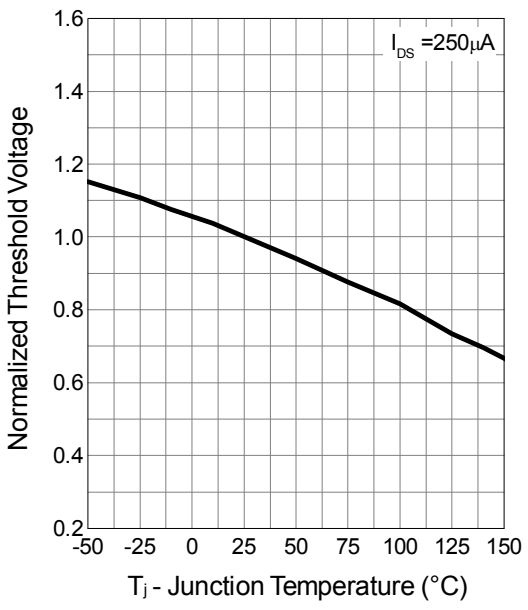

**Drain-Source On Resistance**



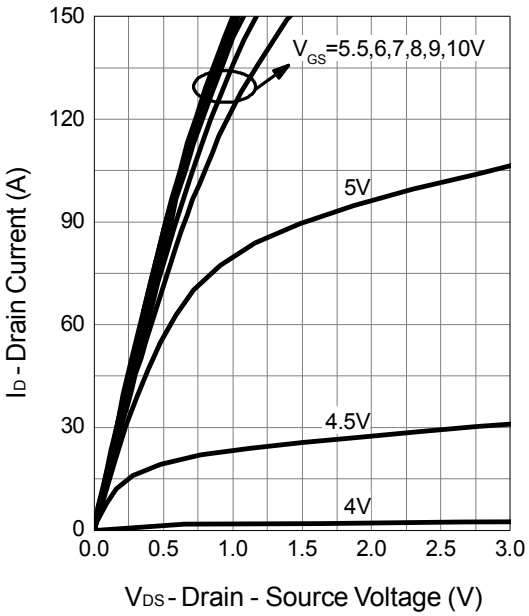

**Gate-Source On Resistance**



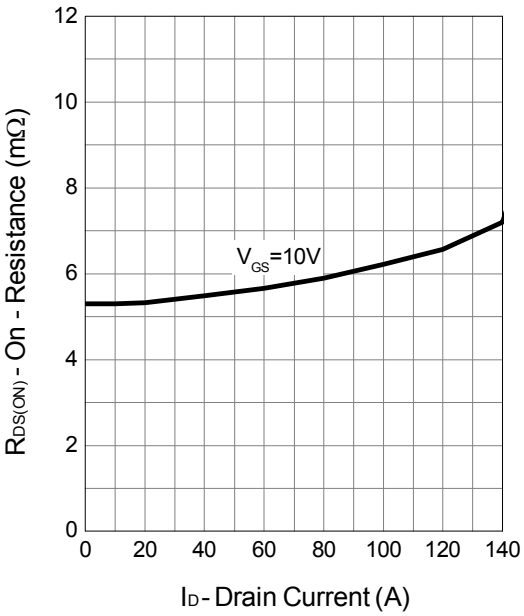

**Gate Threshold Voltage**



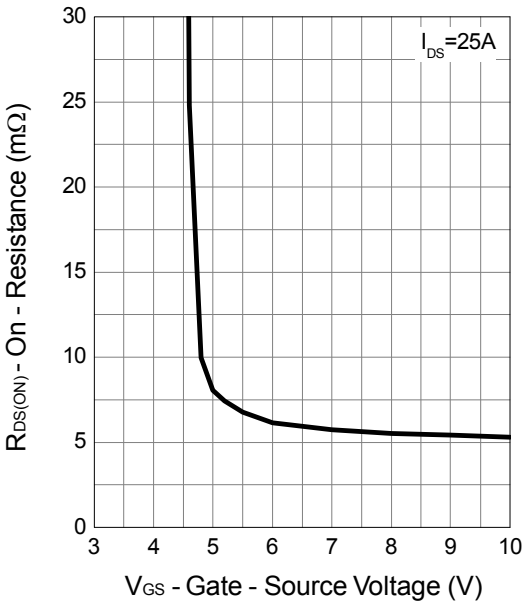
**Output Characteristics**



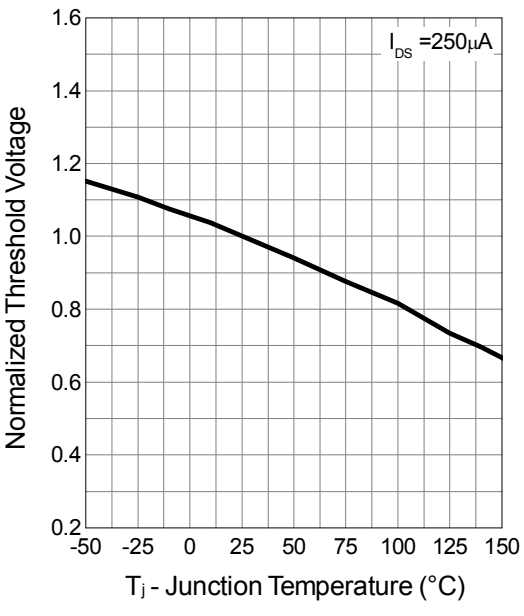

**Drain-Source On Resistance**



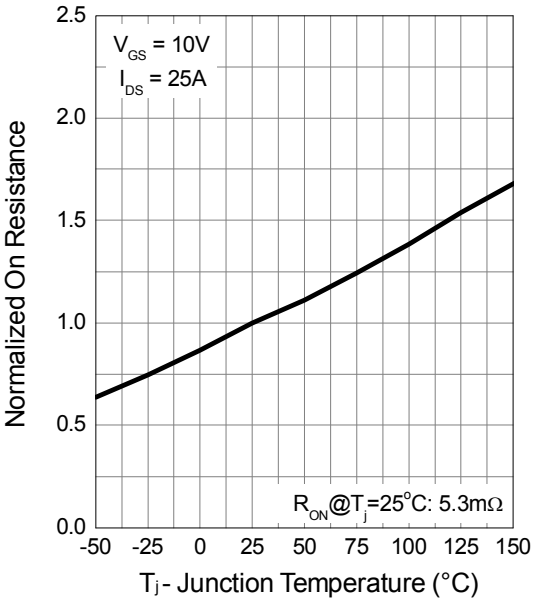

**Gate-Source On Resistance**



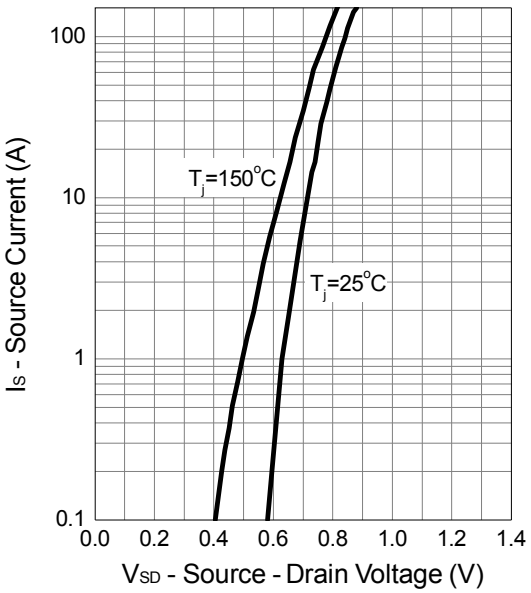

**Gate Threshold Voltage**



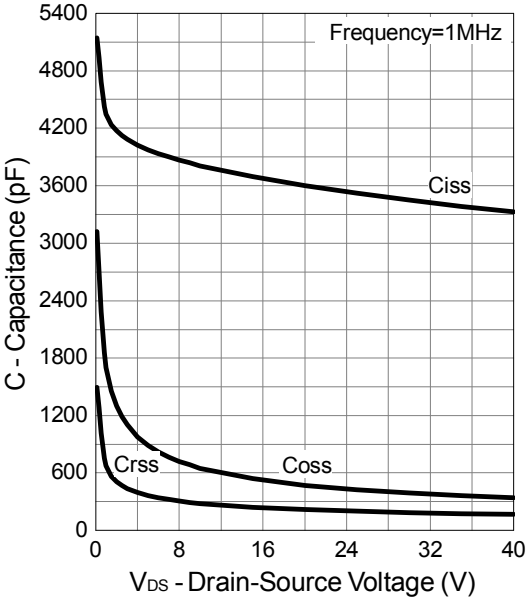
**Drain-Source On Resistance**



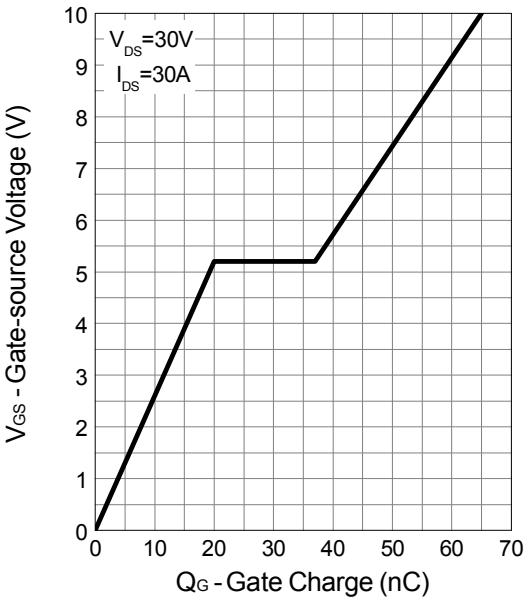

**Source-Drain Diode Forward**



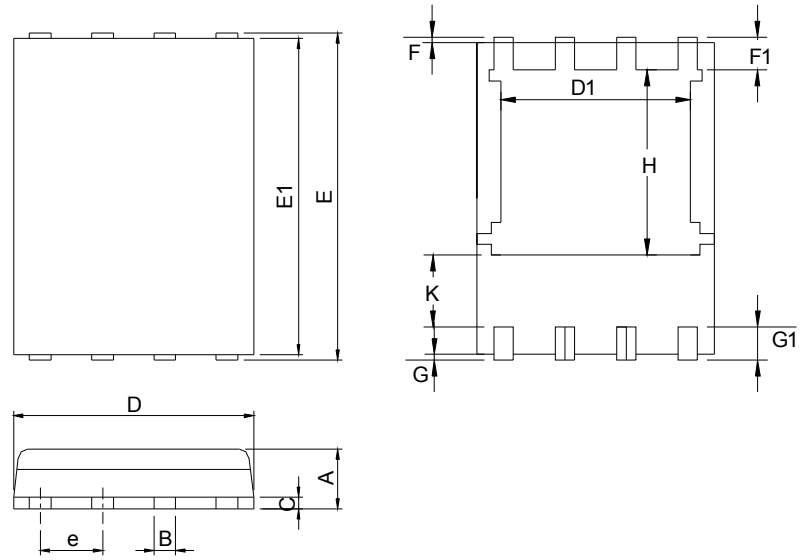

**Capacitance**




**Gate Charge**



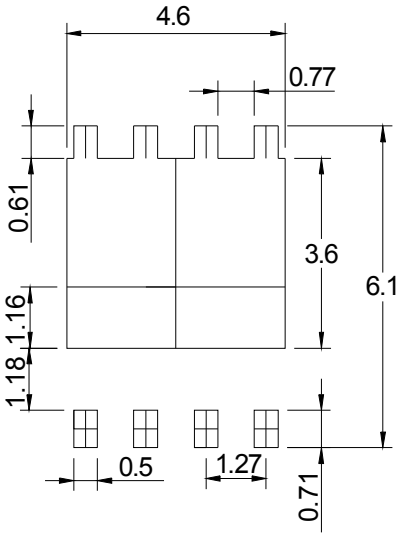
# Package Information DFN5x6-8




| SYMBOL | DFN5x6-8 | | | |
|---|---|---|---|---|
| | MILLIMETERS | | INCHES | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.90 | 1.20 | 0.035 | 0.047 |
| B | 0.3 | 0.51 | 0.012 | 0.020 |
| C | 0.19 | 0.25 | 0.007 | 0.010 |
| D | 4.80 | 5.30 | 0.189 | 0.209 |
| D1 | 4.00 | 4.40 | 0.157 | 0.173 |
| E | 5.90 | 6.20 | 0.232 | 0.244 |
| E1 | 5.50 | 5.80 | 0.217 | 0.228 |
| e | 1.27 BSC | | 0.050 BSC | |
| F | 0.05 | 0.30 | 0.002 | 0.012 |
| F1 | 0.35 | 0.75 | 0.014 | 0.030 |
| G | 0.05 | 0.30 | 0.002 | 0.012 |
| G1 | 0.35 | 0.75 | 0.014 | 0.030 |
| H | 3.34 | 3.9 | 0.131 | 0.154 |
| K | 0.762 | - | 0.03 | - |

Note : 1.Dimension D, D1,D2 and E1 do not include mold flash or protrusions.
Mold flash or protrusions shall not exceed 10 mil.

**RECOMMENDED LAND PATTERN**




UNIT: mm

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