

**WSD3028DN** 

N-Ch MOSFET

## **General Description**

The WSD3028DN 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 WSD3028DN 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

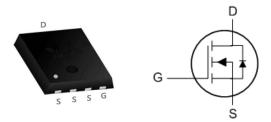
## **Product Summery**

BVDSS	RDSON	ID
30V	25mΩ	19A

#### Applications

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

### DFN3.3X3.3-8L Pin Configuration



Symbol	Parameter Rating		Units
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25℃	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	25	A
I <sub>D</sub> @T <sub>C</sub> =100℃	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	18	A
I <sub>D</sub> @T <sub>A</sub> =25℃	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	19	A
I <sub>D</sub> @T <sub>A</sub> =70℃	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	15	А
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	40	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	21	mJ
I <sub>AS</sub>	Avalanche Current	15	A
P <sub>D</sub> @T <sub>C</sub> =25℃	Total Power Dissipation <sup>4</sup>	5	W
P <sub>D</sub> @T <sub>A</sub> =25℃	Total Power Dissipation <sup>4</sup>	2.5	W
T <sub>STG</sub>	Storage Temperature Range -55 to 150		°C
TJ	Operating Junction Temperature Range -55 to 150		°C

## **Thermal Data**

Symbol	Parameter	Тур.	Max.	Unit
R <sub>eja</sub>	Thermal Resistance Junction-Ambient <sup>1</sup>		50	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>		4	°C/W

## **Absolute Maximum Ratings**



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

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	30			V
$\triangle BV_{DSS} / \triangle T_{J}$	BVDSS Temperature Coefficient	Reference to $25^{\circ}$ C , I <sub>D</sub> =1mA		0.0232		V/℃
Б	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V , I <sub>D</sub> =12A		22	25	
R <sub>DS(ON)</sub>		V <sub>GS</sub> =4.5V , I <sub>D</sub> =8A		32	35	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage		1.2	1.6	2.5	V
$ riangle V_{GS(th)}$	V <sub>GS(th)</sub> Temperature Coefficient	$V_{GS} = V_{DS}$ , $I_D = 2500A$		-6.08		mV/℃
	Drain Source Lookage Current	$V_{\text{DS}}\text{=}24V$ , $V_{\text{GS}}\text{=}0V$ , $T_{\text{J}}\text{=}25^\circ\!\mathrm{C}$			1	– uA
I <sub>DSS</sub>	Drain-Source Leakage Current	$V_{\text{DS}}\text{=}24\text{V}$ , $V_{\text{GS}}\text{=}0\text{V}$ , $T_{\text{J}}\text{=}55^\circ\!\mathrm{C}$			5	
I <sub>GSS</sub>	Gate-Source Leakage Current	$V_{GS}=\pm20V$ , $V_{DS}=0V$			±100	nA
gfs	Forward Transconductance	V <sub>DS</sub> =10V , I <sub>D</sub> =6A		6.5		S
Rg	Gate Resistance	V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz		2.5	3.3	Ω
Qg	Total Gate Charge (4.5V)			4.1		
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =15V , V <sub>GS</sub> =4.5V , I <sub>D</sub> =6A		1		nC
Q <sub>gd</sub>	Gate-Drain Charge			2.1		
T <sub>d(on)</sub>	Turn-On Delay Time			2		
Tr	Rise Time	V <sub>DD</sub> =15V , V <sub>GEN</sub> =10V , R <sub>G</sub> =6Ω I <sub>D</sub> =1A ,RL=15Ω		4		
T <sub>d(off)</sub>	Turn-Off Delay Time			15.8		ns
T <sub>f</sub>	Fall Time			4		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , f=1MHz		360		
C <sub>oss</sub>	Output Capacitance			55		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			46		

# **Guaranteed Avalanche Characteristics**

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
EAS	Single Pulse Avalanche Energy⁵	V <sub>DD</sub> =25V , L=0.1mH , I <sub>AS</sub> =23A	21			mJ

## **Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Is	Continuous Source Current <sup>1,6</sup>				5	А
I <sub>SM</sub>	Pulsed Source Current <sup>2,6</sup>	$V_G=V_D=0V$ , Force Current			22	А
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	$V_{GS}$ =0V , $I_{S}$ =1A , $T_{J}$ =25 $^{\circ}\mathrm{C}$			1	V
t <sub>rr</sub>	Reverse Recovery Time			16.5		nS
Qrr	Reverse Recovery Charge	l⊧=20A,dl/dt=100A/µs,TJ=25℃		10		nC

Note :

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, t<10sec.

2.The data tested by pulsed , pulse width  $\,\leq\,$  300us , duty cycle  $\,\leq\,$  2%

3. The EAS data shows Max. rating . The test condition is  $V_{\text{DD}}\text{=}25V, V_{\text{GS}}\text{=}10V, L\text{=}0.1\text{mH}, I_{\text{AS}}\text{=}23A$ 

4.The power dissipation is limited by 150  $^\circ\!\!\mathbb{C}$  junction temperature

5. The Min. value is 100% EAS tested guarantee.

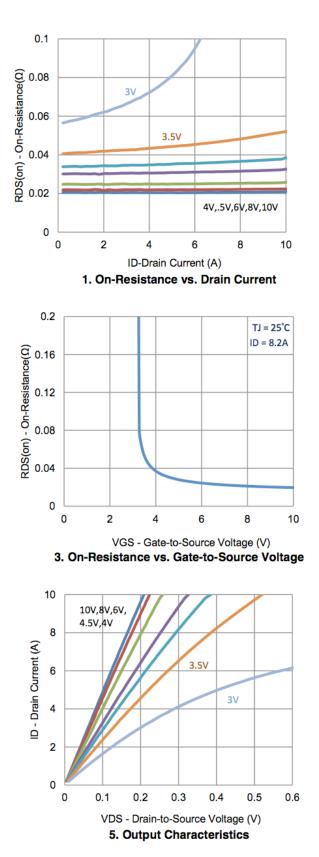
6.The data is theoretically the same as  $I_{\text{D}}$  and  $I_{\text{DM}}$  , in real applications , should be limited by total power dissipation.

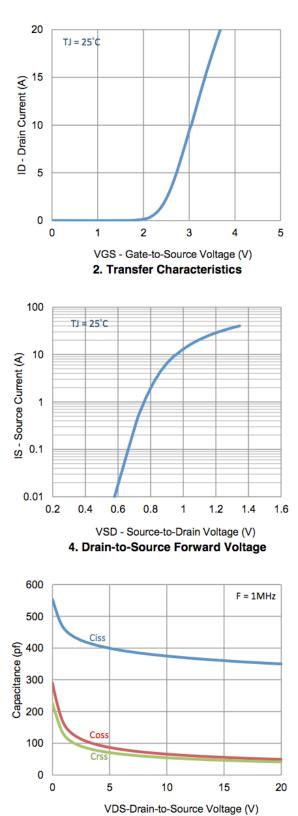


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# **Typical Characteristics**



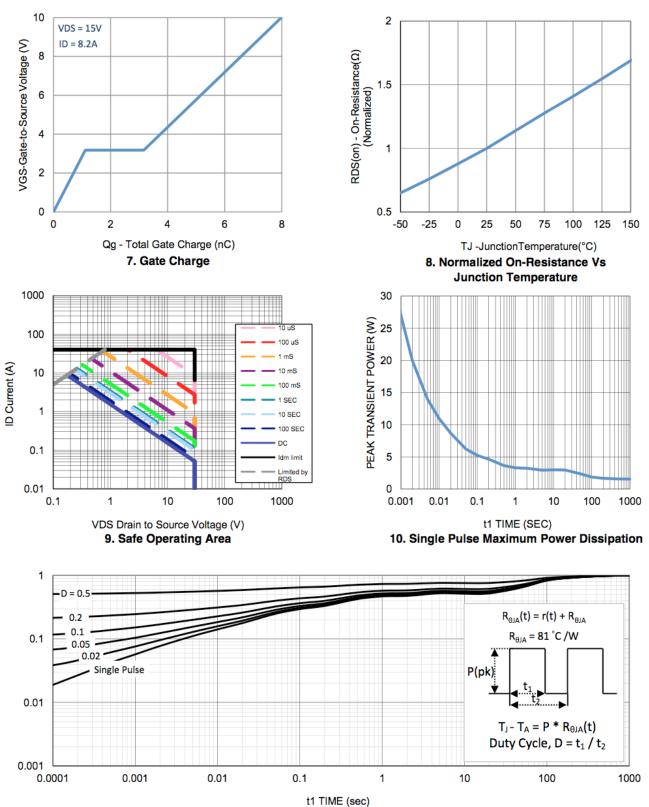


6. Capacitance



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11. Normalized Thermal Transient Junction to Ambient



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