General Description

The WSD3075DN56 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 WSD3075DN56 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

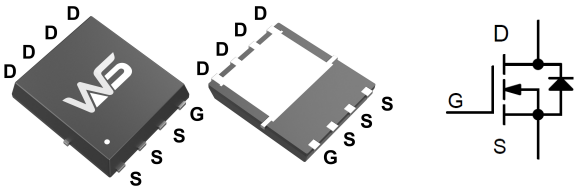
Product Summery

BVDSS	RDSON	ID
30V	6.5mΩ	75A

Applications

- Battery protection
- Load switch
- Uninterruptible power supply

DFN5X6-8 Pin Configuration



Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current, V_{GS} @ 10V(Tc=25℃)	75	A
I_D	Continuous Drain Current, V_{GS} @ 10V(Tc=100℃)	38	A
I_{DM}	Pulsed Drain Current	115	A
EAS	Single Pulse Avalanche Energy	57.8	mJ
I_{AS}	Avalanche Current	34	A
P_D	Total Power Dissipation (Tc=25℃)	46	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	2.7	℃/W

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	30	---	---	V
△BV_{DSS}/△T_J	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.027	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=10V , I_D=30A	---	6.5	8.5	mΩ
		V_{GS}=4.5V , I_D=15A	---	11	14	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.5	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.8	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	38	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.7	2.9	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=15A	---	12.6	17.6	nC
Q_{gs}	Gate-Source Charge		---	4.2	5.9	
Q_{gd}	Gate-Drain Charge		---	5.1	7.1	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3 I_D=15A	---	4.6	9.2	ns
T_r	Rise Time		---	12.2	22	
$T_{d(off)}$	Turn-Off Delay Time		---	26.6	53	
T_f	Fall Time		---	8	16	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	1317	1844	pF
C_{oss}	Output Capacitance		---	163	228	
C_{rss}	Reverse Transfer Capacitance		---	131	183	
I_S	Continuous Source Current1,5	V_G=V_D=0V , Force Current	---	---	58	A
I_{SM}	Pulsed Source Current2,5		---	---	115	A
V_{SD}	Diode Forward Voltage2	V_{GS}=0V,I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	I_F=30A,dI/dt=100A/μs,T_J=25℃	---	9.2	---	nS
Q_{rr}	Reverse Recovery Charge		---	2	---	nC

Note :

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=3

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

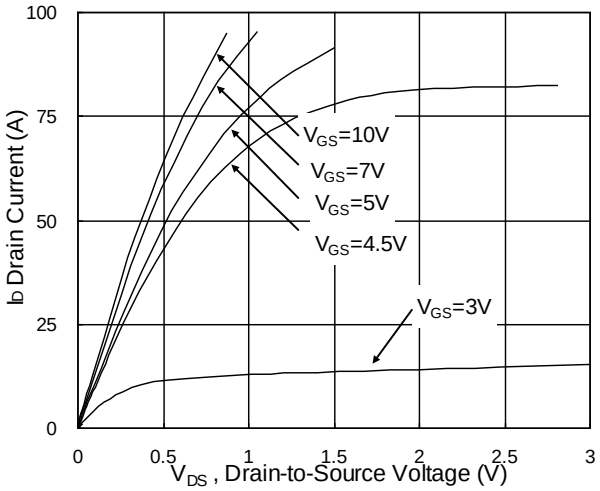


Fig.1 Typical Output Characteristics

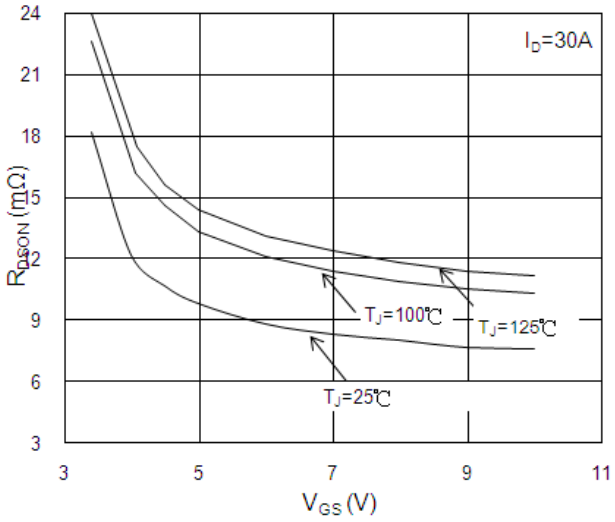


Fig.2 On-Resistance vs. Gate-Source

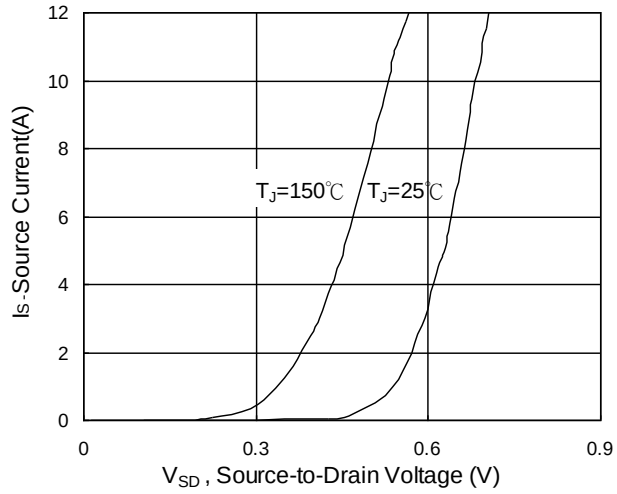


Fig.3 Forward Characteristics of reverse

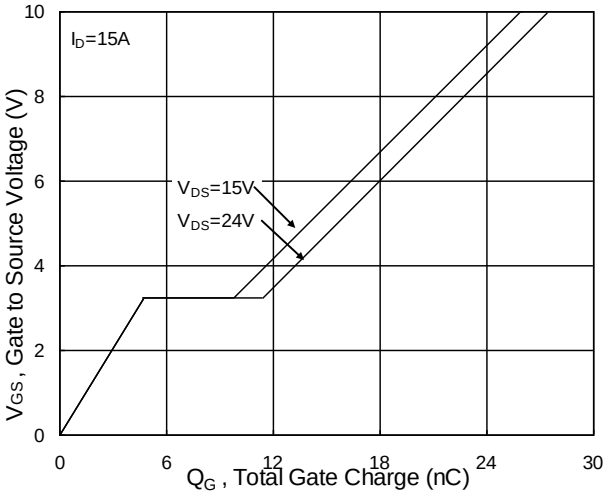


Fig.4 Gate-Charge Characteristics

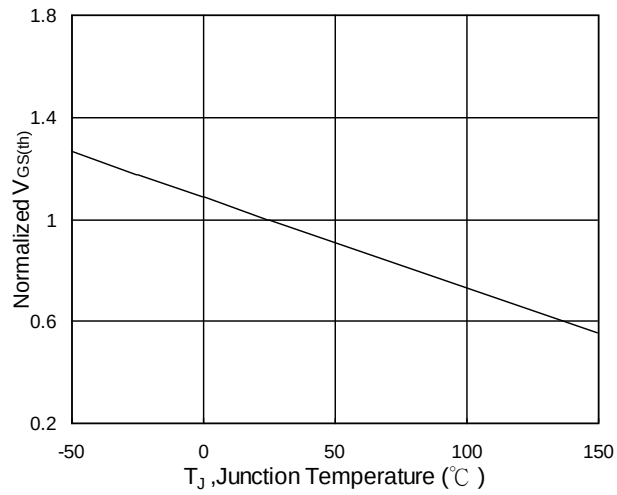


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

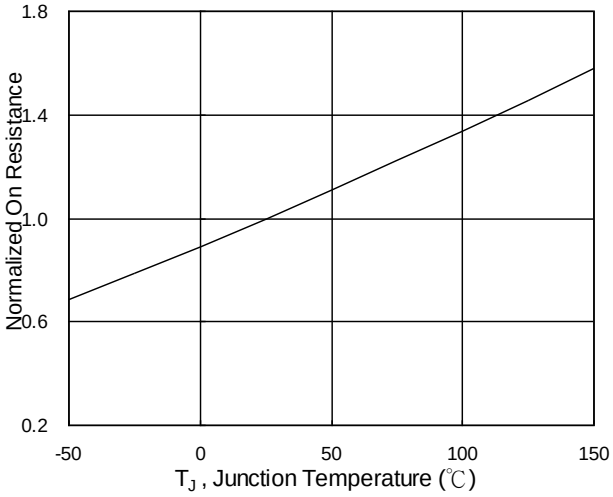


Fig.6 Normalized R_{DSON} vs. T_J

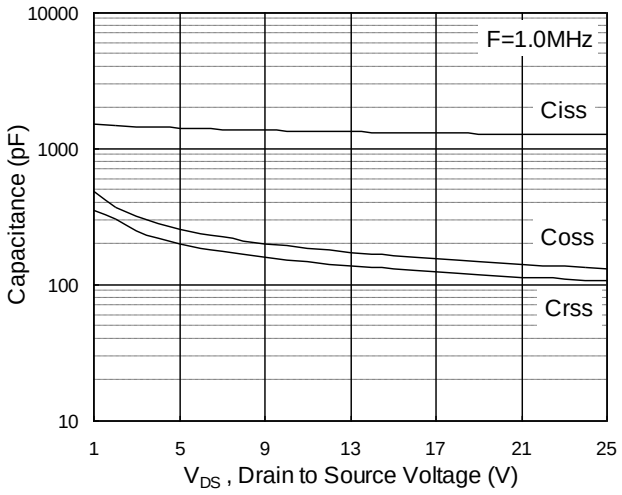


Fig.7 Capacitance

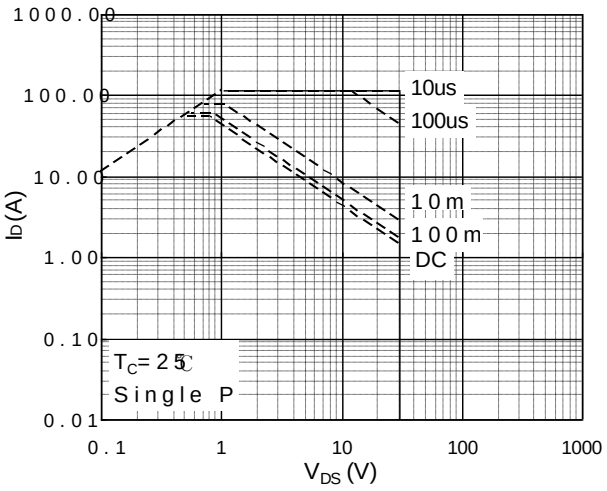


Fig.8 Safe Operating Area

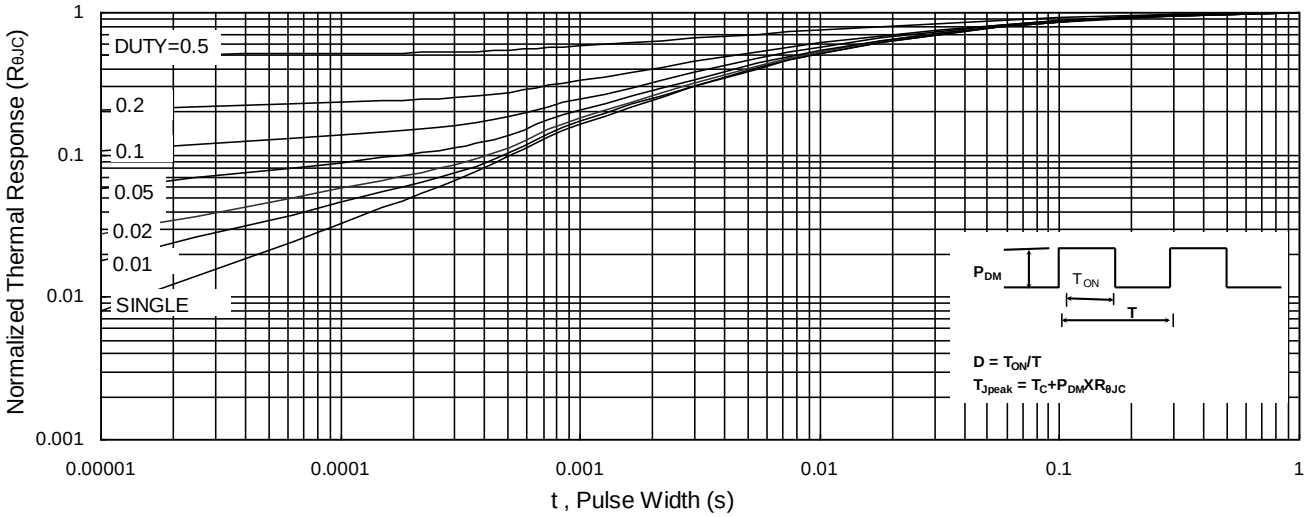


Fig.9 Normalized Maximum Transient Thermal Impedance

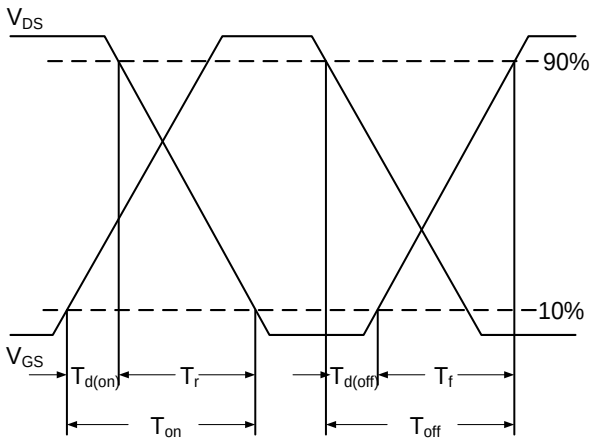


Fig.10 Switching Time Waveform

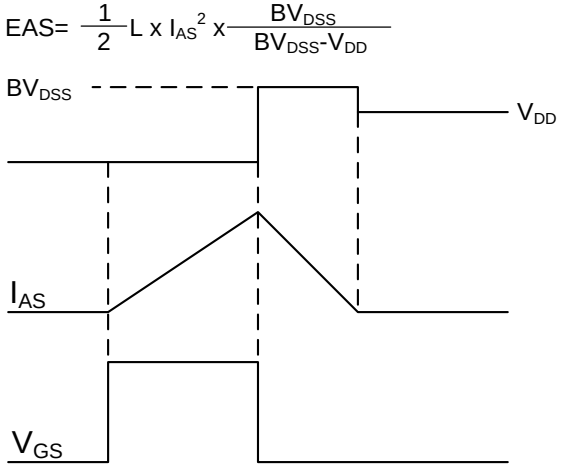


Fig.17 Unclamped Inductive Switching Waveform

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