Description

The WSD75N12GDN56 uses Super Trench technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.

Product Summery

BV_{DSS}	R_{DSON}	I_D
120V	6.0mΩ	75A

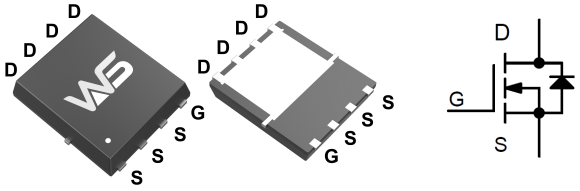
Application

- DC/DC Converter
- Load switch.

General Features

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature
- Pb-free lead plating
- 100% UIS tested

DFN5X6-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
VDSS	Drain-to-Source Voltage	120	V
V_{GS}	Gate-to-Source Voltage	±20	V
I_D	Continuous Drain Current[1] (Tc=25℃)	75	A
I_D	Continuous Drain Current[1] (Tc=70℃)	70	A
I_{DM}	Pulsed Drain Current	320	A
IAR	Single pulse avalanche current	40	A
E_{ASa}	Single pulse avalanche energy	240	mJ
P_D	Power Dissipation	125	W
TJ，Tstg	Operating Junction and Storage Temperature Range	-55 to 150	℃
T_L	Maximum Temperature for Soldering	260	℃
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.0	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	℃/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
VDSS	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	120	--	--	V
IDSS	Drain to Source Leakage Current	V_{DS} = 120V, V_{GS}= 0V	--	--	1	μA
IGSS(F)	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
IGSS(R)	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA
VGS(TH)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D = 250μA	2.5	3.0	3.5	V
RDS(ON)1	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=20A	--	6.0	6.8	mΩ
gFS	Forward Transconductance	V_{DS}=5V, I_D=50A		130	--	S
Ciss	Input Capacitance	V_{GS} = 0V V_{DS} = 50V f = 1.0MHz	--	4282	--	pF
Coss	Output Capacitance		--	429	--	pF
Crss	Reverse Transfer Capacitance		--	17	--	pF
R_g	Gate resistance		--	2.5	--	Ω
td(ON)	Turn-on Delay Time	I_D =20A V_{DS} = 50V V_{GS} = 10V R_G = 5Ω	--	20	--	ns
tr	Rise Time		--	11	--	ns
td(OFF)	Turn-Off Delay Time		--	55	--	ns
tf	Fall Time		--	28	--	ns
Q_g	Total Gate Charge	V_{GS} =0~10V V_{DS} = 50V I_D =20A	--	61.4	--	nC
Qgs	Gate Source Charge		--	17.4	--	nC
Qgd	Gate Drain Charge		--	14.1	--	nC
IS	Diode Forward Current	T_C =25 °C	--	--	100	A
ISM	Diode Pulse Current		--	--	320	A
VSD	Diode Forward Voltage	I_S=6.0A, V_{GS}=0V	--	--	1.2	V
trr	Reverse Recovery time	I_S=20A, V_{DD}=50V dI$_F$/dt=100A/μs	--	100	--	ns
Q_{rr}	Reverse Recovery Charge		--	250	--	nC

Note :

1、The data tested by surface mounted on a 1 inch 2 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=50V, L=0.3mH, Rg=25Ω, Starting TJ=25 ℃

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

Typical Electrical and Thermal Characteristics

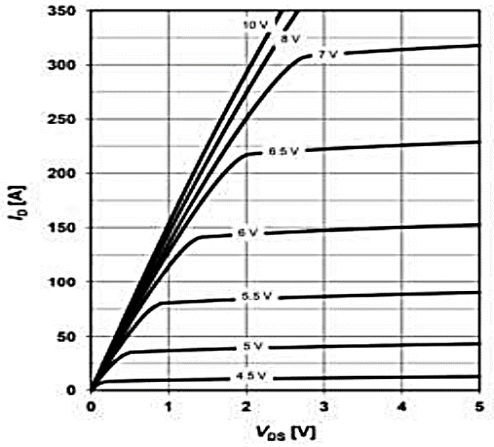


Figure1: output characteristics

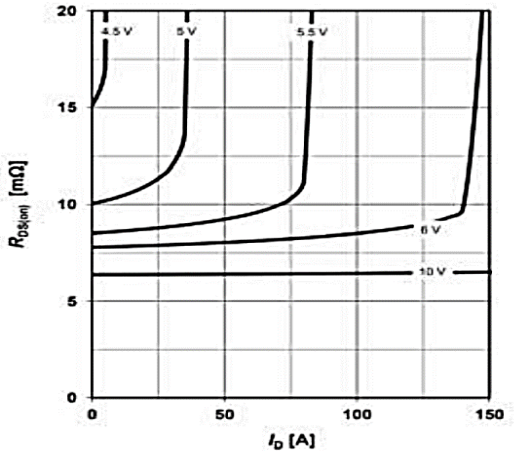


Figure2: Typcal drain-source on resistance

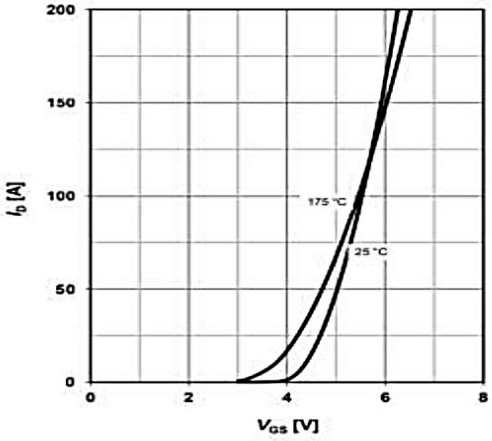


Figure3: transfer characteristics

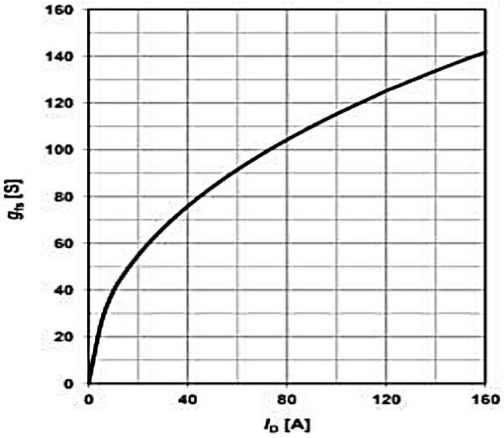


Figure4: forward transconductance

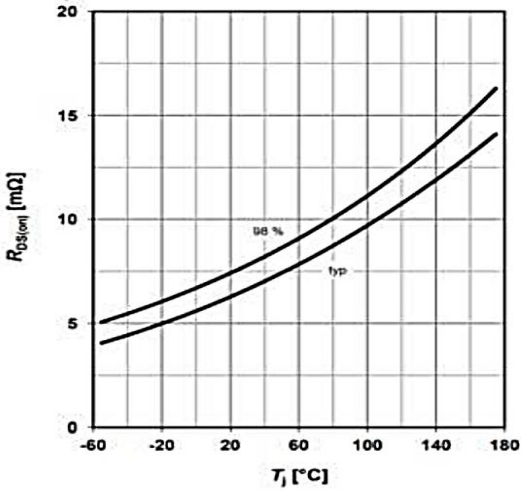


Figure5： Drain-source on-state resistance

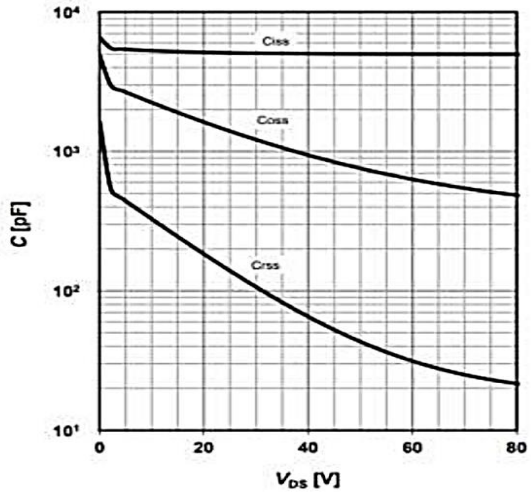


Figure6: Typ. capacitances

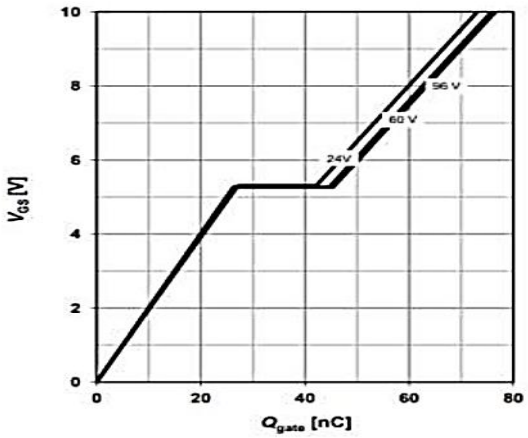


Figure7： Typ. gate charge

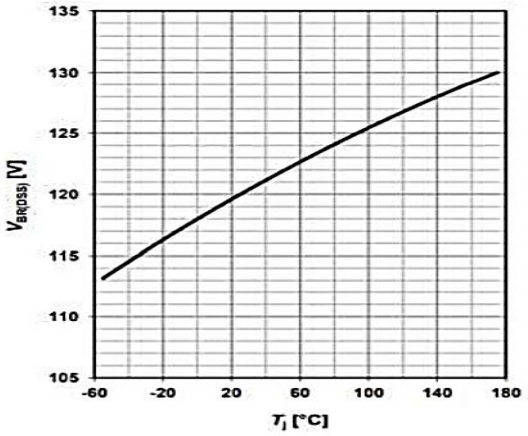


Figure8： Drain-source breakdown voltage

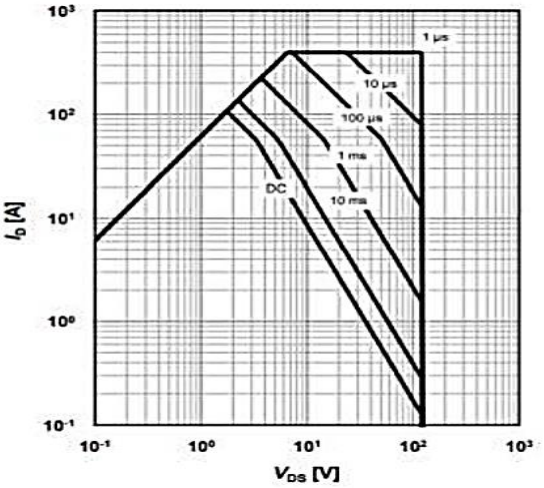


Figure9： Safe operating area

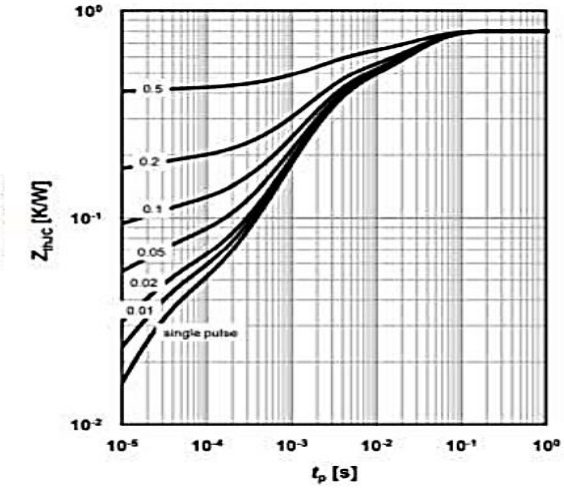


Figure10： Max. transient thermal impedance

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