WSD100N06GDN56

N-Ch MOSFET

General Description

The WSD100N06GDN56 is the SGT MOSFET with extreme high cell density,which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications .

The WSD100N06GDN56 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

Features

- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS + Rg Tested
- Reliable and Rugged
- Moisture Sensitivity Level MSL1 (per JED EC J-STD-020D)

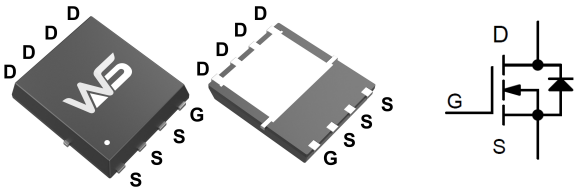
Product Summery

B_{VDSS}	R_{DSON}	I_D
60V	3.0mΩ	100A

Applications

- Secondary Side Synchronous Rectification
- DC-DC Converter
- Motor Control
- Load Switching

DFN5x6A-8_EP Pin Configuration



Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D[1,6]	Continuous Drain Current	T_C=25°C	100	A
		T_C=100°C	65	
I_{DM}[2]	Pulsed Drain Current	T_C=25°C	240	A
P_D	Maximum Power Dissipation	T_C=25°C	83	W
		T_C=100°C	50	
I_{AS}	Avalanche Current, Single pulse		45	A
E_{AS}[3]	Single Pulse Avalanche Energy		101	mJ
T_J	Maximum Junction Temperature		150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
$R_{\theta JA}$[1]	Thermal Resistance Junction to ambient	Steady State	55	℃/W
$R_{\theta JC}$[1]	Thermal Resistance-Junction to Case	Steady State	1.5	℃/W

Electrical Characteristics @T_A=25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 48 V, V_{GS} = 0V			1	μA
		T_J=85°C			30	
I_{GSS}	Gate Leakage Current	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
$V_{GS(TH)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_{DS} = 250μA	1.2	1.8	2.5	V
$R_{DS(on)}$[2]	Drain-Source On-state Resistance	V_{GS} = 10V, I_D = 20A		3.0	3.6	mΩ
		V_{GS} = 4.5V, I_D = 15A		4.4	5.4	mΩ
Switching						
Qg	Total Gate Charge	V_{DS}=30V V_{GS}=10V I_D=20A		58		nC
Qgs	Gate-Sour Charge			16		nC
Qgd	Gate-Drain Charge			4.0		nC
td (on)	Turn-on Delay Time	V_{GEN}=10V V_{DD}=30V I_D=20A R_G=Ω		18		ns
tr	Turn-on Rise Time			8		ns
td(off)	Turn-off Delay Time			50		ns
tf	Turn-off Fall Time			11		ns
Rg	Gat resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		0.7		Ω
Dynamic						
Ciss	In Capacitance	V_{GS}=0V V_{DS}=30V f=1MHz		3458		pF
Coss	Out Capacitance			1522		pF
Crss	Reverse Transfer Capacitance			22		pF
Drain-Source Diode Characteristics and Maximum Ratings						
I_S[1,5]	Continuous Source Current	V_G=V_D=0V , Force Current			55	A
I_{SM}	Pulsed Source Current3				240	A
V_{SD} [2]	Diode Forward Voltage	I_{SD} = 1A , V_{GS}=0V		0.8	1.3	V
trr	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs		27		ns
Qrr	Reverse Recovery Charge			33		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 V_{DD}=50V,V_{GS}=10V,L=0.1mH,I_{AS}=40A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
6.The maximum current rating is package limited.

Typical Operating Characteristics

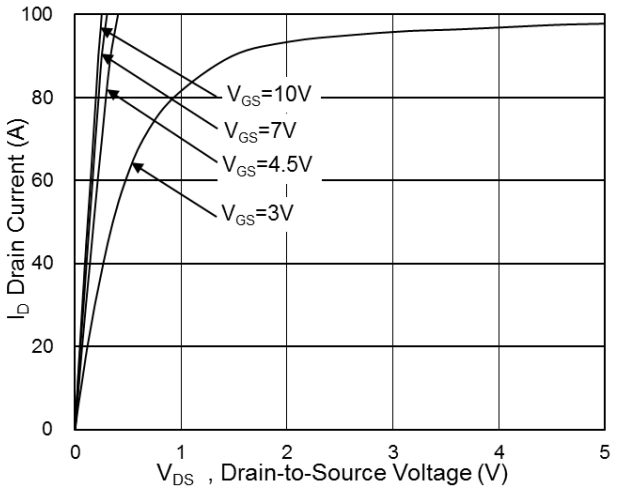


Fig.1 Typical Output Characteristics

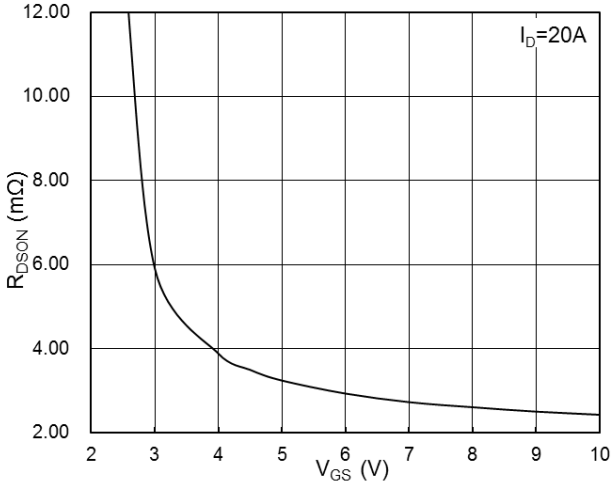


Fig.2 On-Resistance vs G-S Voltage

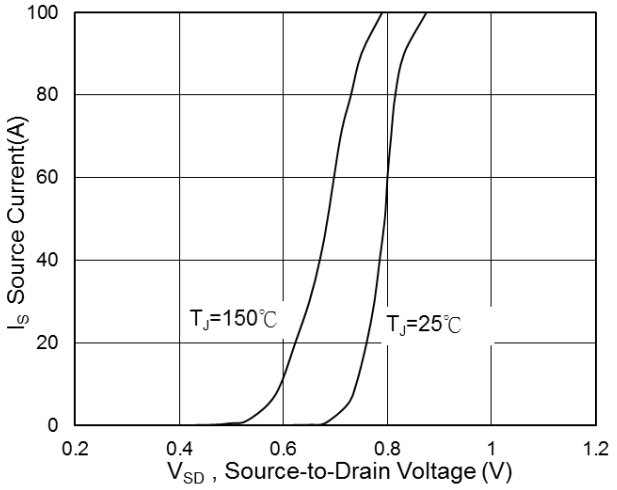


Fig.3 Diode Forward Voltage vs. Current

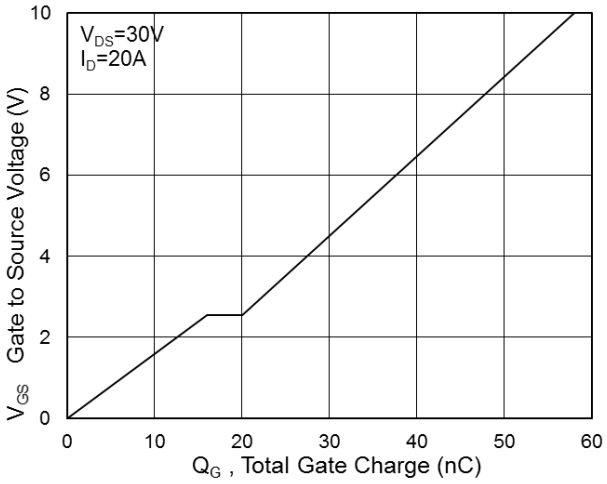


Fig.4 Gate-Charge Characteristics

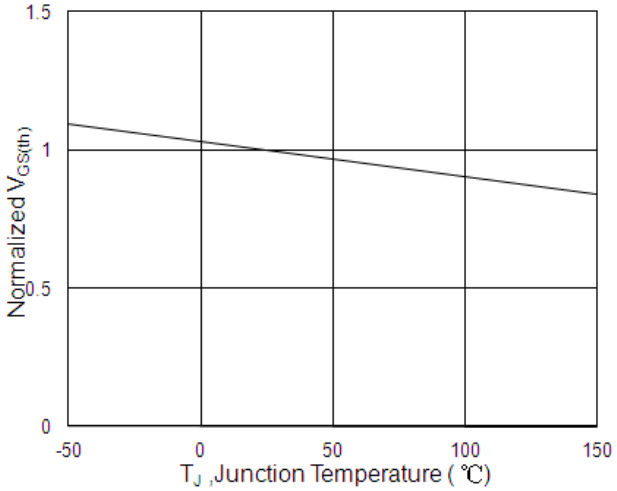


Fig.5 Normalized $V_{GS(th)}$ vs T_J

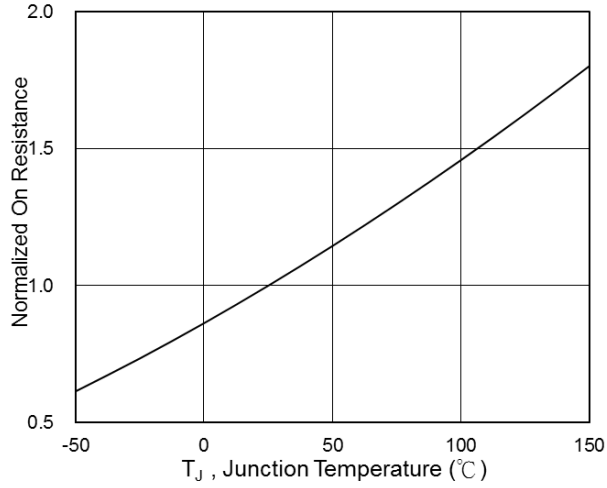


Fig.6 Normalized R_{DSON} vs T_J

Typical Operating Characteristics (Cont.)

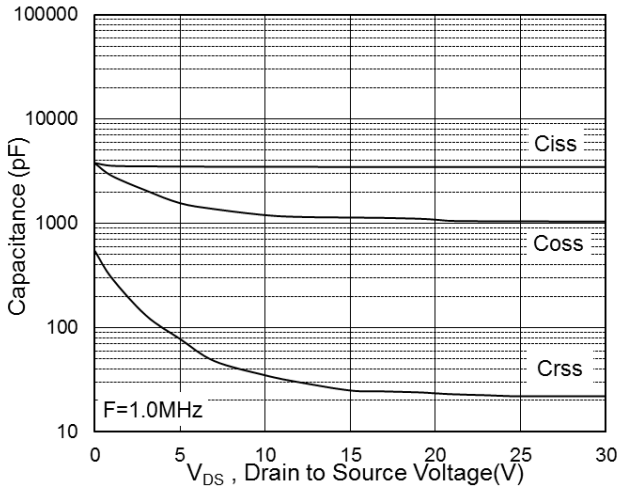


Fig.7 Capacitance

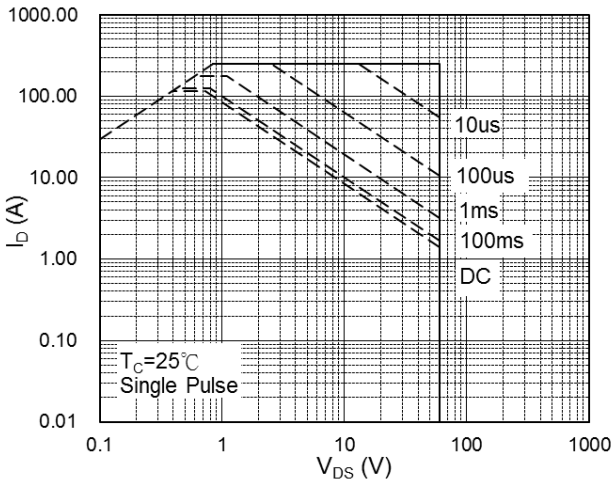


Fig.8 Safe Operating Area

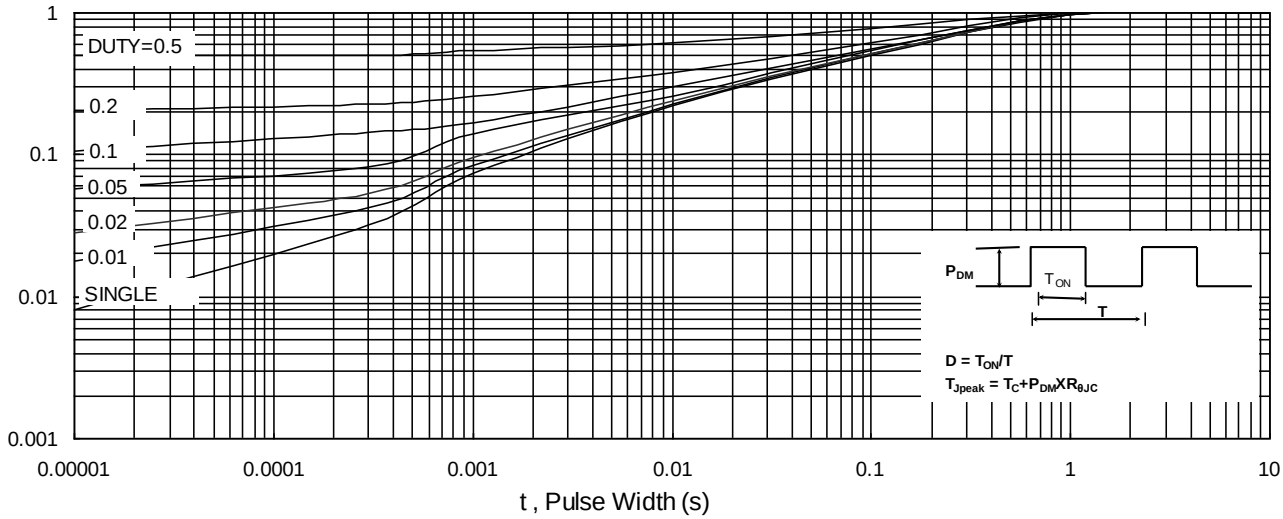


Fig.9 Normalized Maximum Transient Thermal Impedance

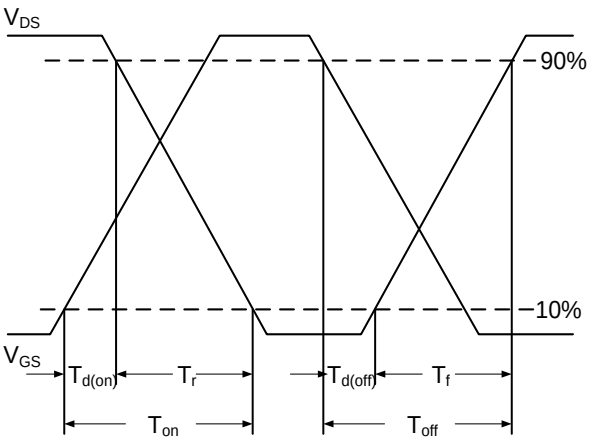


Fig.10 Switching Time Waveform

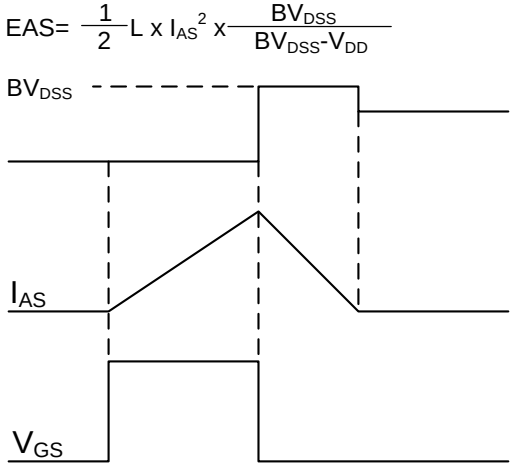


Fig.11 Unclamped Inductive Switching Waveform

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