

General Description

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

The WSD100N06GDN56 meet the RoHS and Green Product requirement 100% E_{AS} 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 JEDEC J-STD-020D)

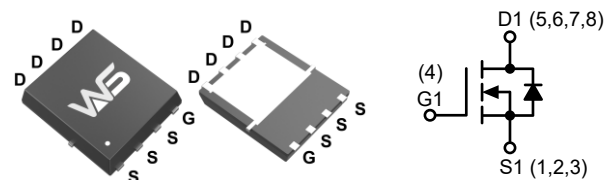
Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
60V	3.0m Ω	100A

Applications

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

DFN5X6-8L Pin Configuration



Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		± 20	
$I_D^{1,6}$	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	100	A
		$T_C=100^{\circ}\text{C}$	65	
I_{DM}^2	Pulsed Drain Current	$T_C=25^{\circ}\text{C}$	240	W
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	83	
		$T_C=100^{\circ}\text{C}$	50	
I_{AS}	Avalanche Current, Single pulse		45	A
E_{AS}^3	Single Pulse Avalanche Energy		101	mJ
T_{STG}	Storage Temperature Range		-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range		150	

Thermal Data

Symbol	Parameter		Rating	Units
$R_{\theta JA}^1$	Thermal Resistance Junction to ambient	Steady State	55	$^{\circ}\text{C/W}$
$R_{\theta JC}^1$	Thermal Resistance-Junction to Case	Steady State	1.5	

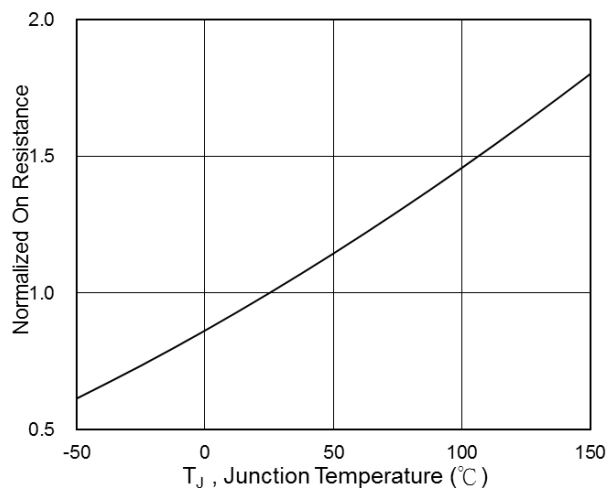
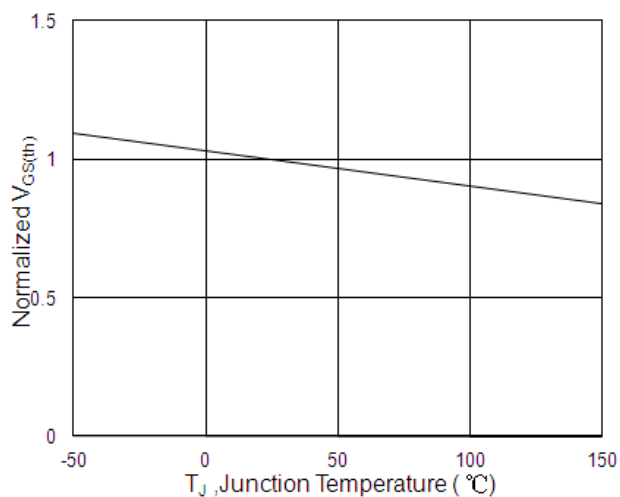
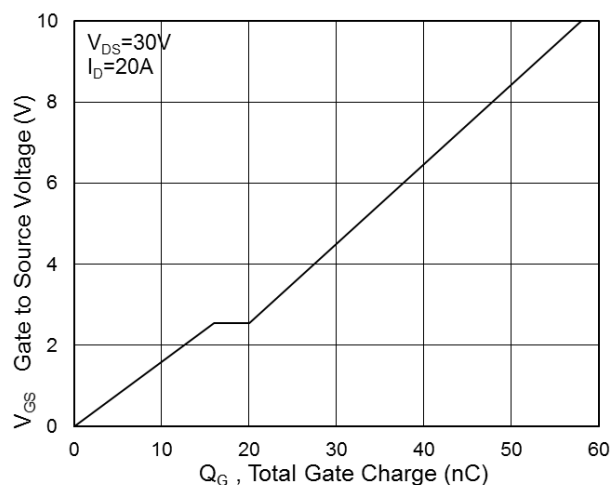
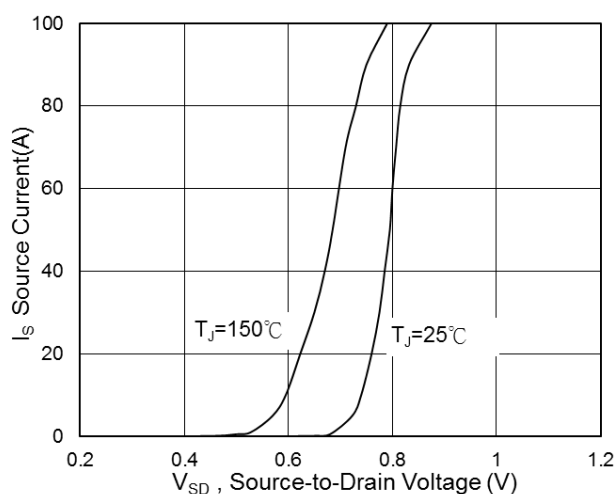
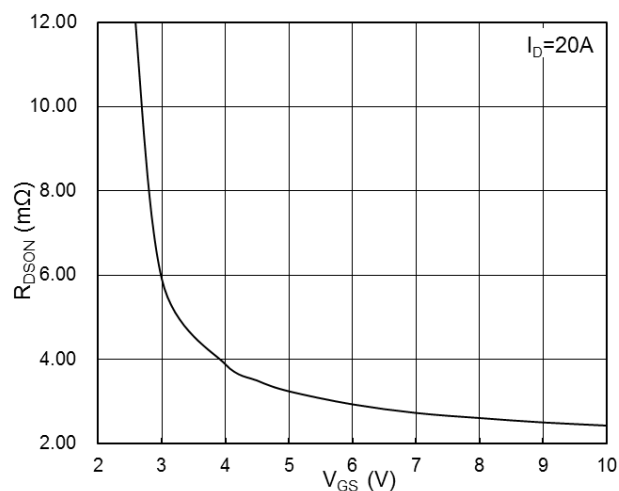
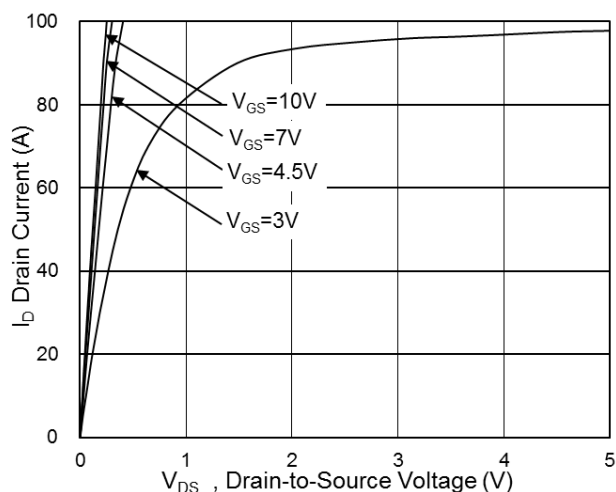
Electrical Characteristics ($T_A=25^{\circ}\text{C}$, Unless Otherwise Noted)

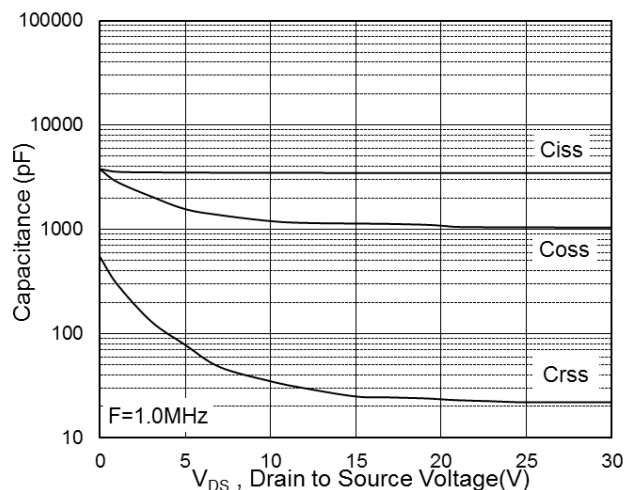
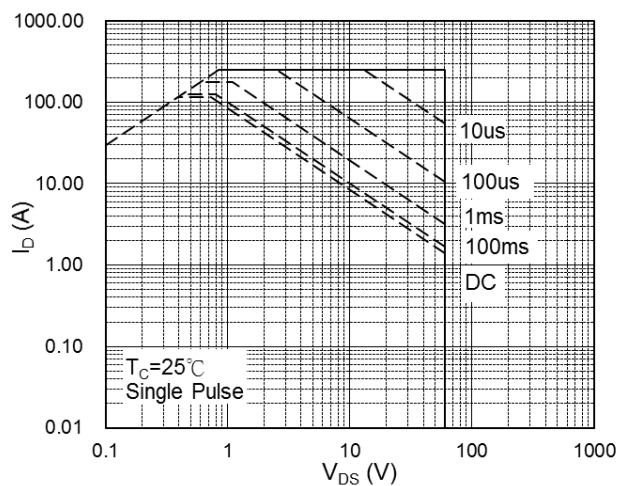
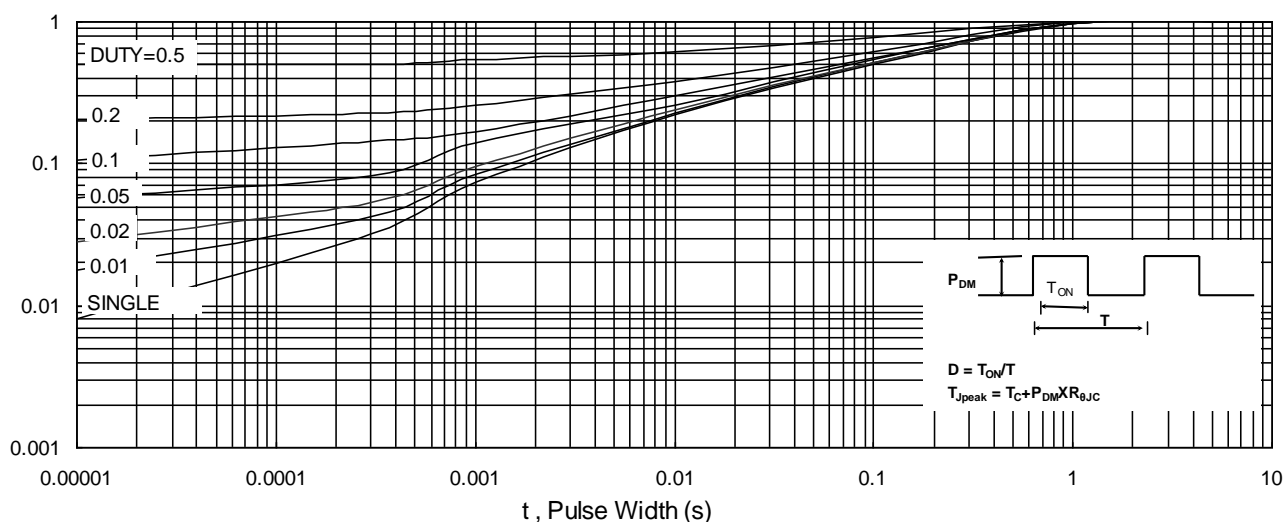
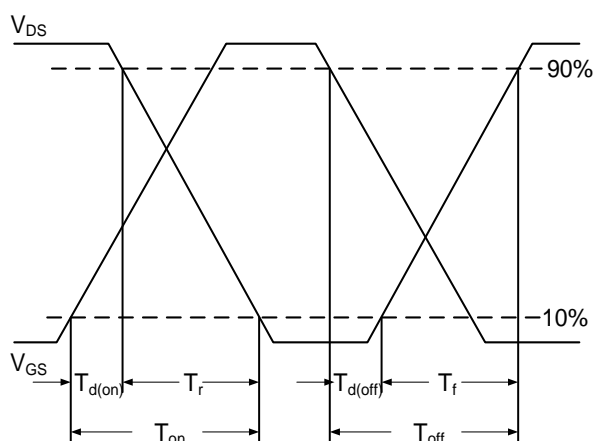
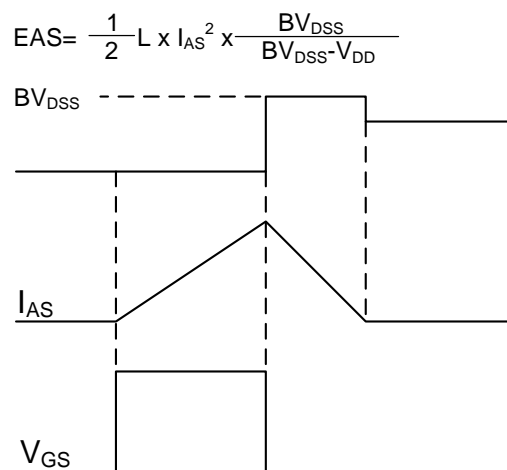
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
Static						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250μA	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V , V _{GS} =0V T _J =85°C	---	---	1.0 30	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±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 V _{GS} =4.5V , I _D =15A	---	3.0 4.4	3.6 5.4	mΩ
Switching						
Q _g	Total Gate Charge	V _{DS} =30V , V _{GS} =10V , I _D =20A	---	58	---	nC
Q _{gs}	Gate-Source Charge		---	16	---	
Q _{gd}	Gate-Drain Charge		---	4.0	---	
T _{d(on)}	Turn-on Delay Time	V _{GEN} =10V , V _{DD} =30V , I _D =20A , R _G =3Ω	---	18	---	ns
T _r	Turn-on Rise Time		---	8	---	
T _{d(off)}	Turn-off Delay Time		---	50	---	
T _f	Turn-on Fall Time		---	11	---	
R _g	Gat resistance	V _{GS} =0V , V _{DS} =0V , f=1.0MHz	---	0.7	---	Ω
Dynamic						
C _{iss}	Input Capacitance	V _{GS} =0V , V _{DS} =30V , f=1.0MHz	---	3458	---	pF
C _{oss}	Output Capacitance		---	1522	---	
C _{rss}	Reverse Transfer Capacitance		---	22	---	
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 Curren		---	---	240	
V _{SD} ²	Diode Forward Voltage	I _{SD} =1A , V _{GS} =0V	---	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A , dl _{SD} /dt=100A/μs	---	27	---	ns
Q _{rr}	Reverse Recovery Charge		---	33	---	nC

Note:

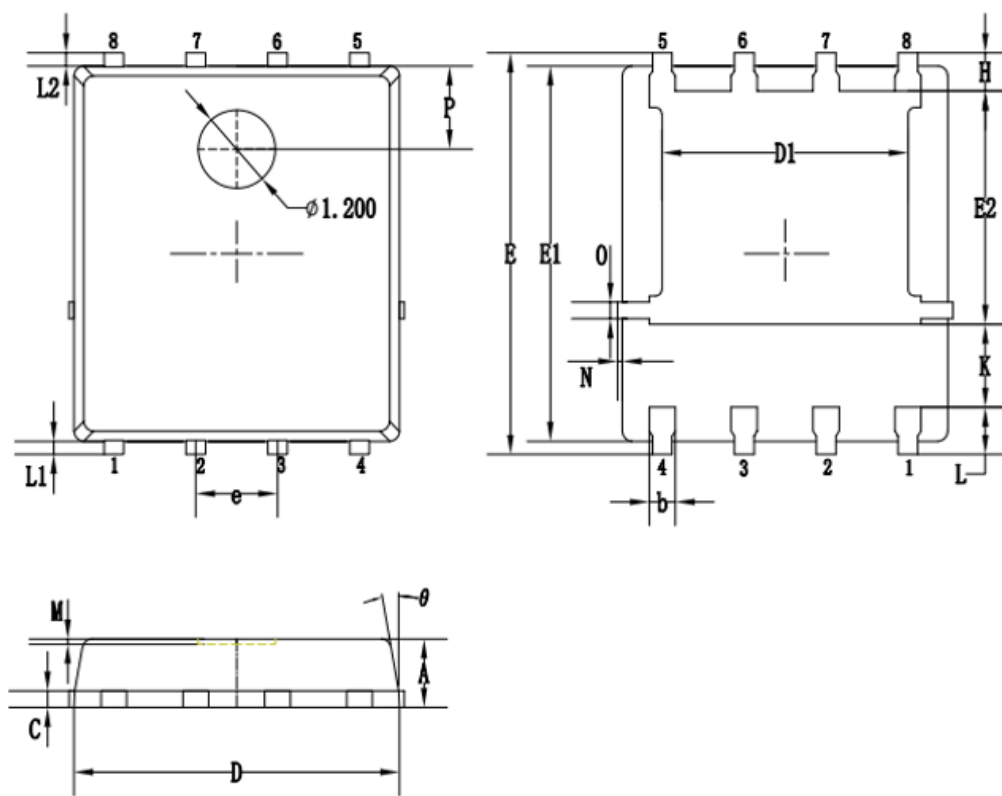
1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, $t \leq 10\text{sec}$.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. The E_{AS} data shows Max. rating . The test condition is $V_{DD}=50V$, $V_{GS}=10V$, $L=0.5\text{mH}$, $I_{AS}=40A$
4. The power dissipation is limited by 150°C 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 Characteristics



Typical 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

Packaging information



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.20
D1	3.72	3.82	3.92
E	6.00	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
θ	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		
P	1.28 REF.		

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