General Description

The WSD6068DN56 is the highest performance trench Dual N-Ch MOSFET with extreme high cell density,which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications .

The WSD6068DN56 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

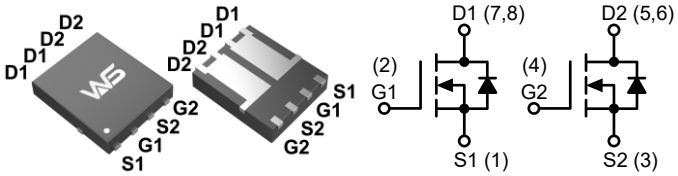
Product Summery

BV_{DSS}	R_{DSON}	I_D
60V	12mΩ	25A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Fast switching
- Load Switch

DFN5X6-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_c=25°C	25	A
I_D	Continuous Drain Current	T_c=25°C	25	A
		T_c=70°C	18.5	
I_{DM} [b]	Pulse Drain Current Tested	T_c=25°C	95	A
P_D	Maximum Power Dissipation	T_c=25°C	37	W
		T_c=70°C	25	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State	5	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	t ≤ 10s	25	°C/W
		Steady State [b]	90	
I_{AS} [d]	Avalanche Current, Single pulse	L=0.5mH	9	A
E_{AS} [d]	Avalanche Energy, Single pulse	L=0.5mH	20	mJ

Note a：Max. continuous current is limited by bonding wire.
Note b：Pulse width limited by max. junction temperature.
Note c：Surface mounted on 1in^2 pad area, steady state t = 999s.
Note d：UIS tested and pulse width limited by maximum junction temperature 175°C (initial temperature T_j=25°C).

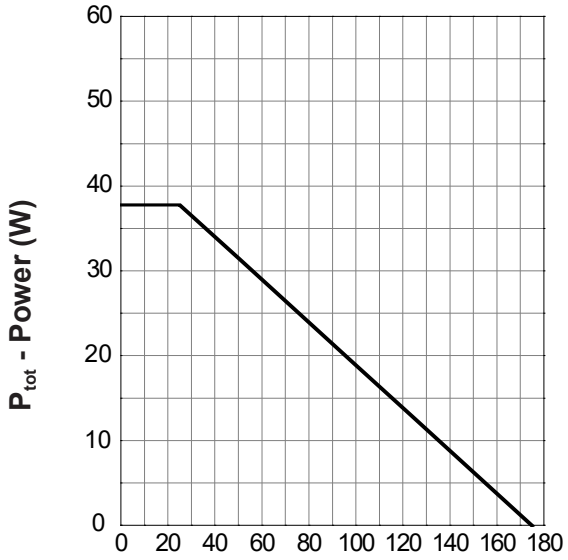
Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=48V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.2	1.8	3.1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [3]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=10A	-	12	16	mΩ
		V_{GS}=4.5V, I_{DS}=7A	-	15	22	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V	-	0.75	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs	-	26	-	ns
Q_{rr}	Reverse Recovery Charge		-	30	-	nC
Dynamic Characteristics [3,4]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	0.9	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, F=1.0MHz Ω	-	440	570	pF
C_{oss}	Output Capacitance		-	198	-	
C_{rss}	Reverse Transfer Capacitance		-	57	-	
$t_{d(ON)}$	Turn-on Delay Time	VDD=30V, I_{DS}=1A, V_{GEN}=10V, R_G=3.3Ω.	-	10	-	ns
t_r	Turn-on Rise Time		-	14.5	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	19	-	
t_f	Turn-off Fall Time		-	28	-	
Gate Charge Characteristics [3,4]						
Q_g	Total Gate Charge	V_{DS}=30V, V_{GS}=10V, I_{DS}=20A	-	8.6	-	nC
Q_{gs}	Gate-Source Charge		-	2.7	-	
Q_{gd}	Gate-Drain Charge		-	6.3	-	

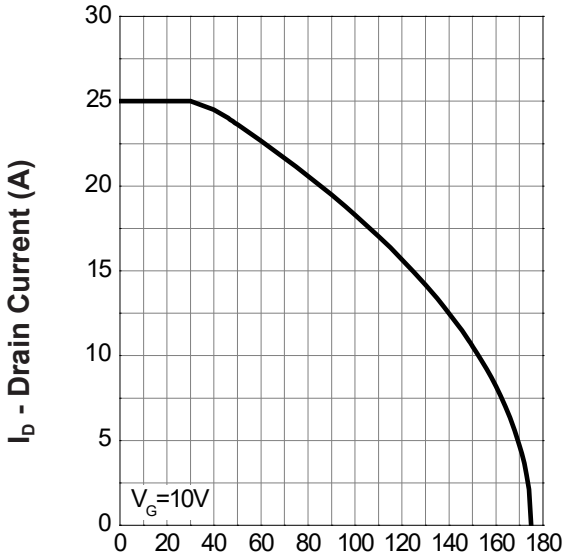
Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=30V,V_{GS}=10V,L=0.5mH,I_{AS}=9A.,R_G=25Ω Starting T_J=25
3. The data tested by pulsed , pulse width<=300us , duty cycle<=2%.
4. Essentially independent of operating temperature.

Typical Operating Characteristics

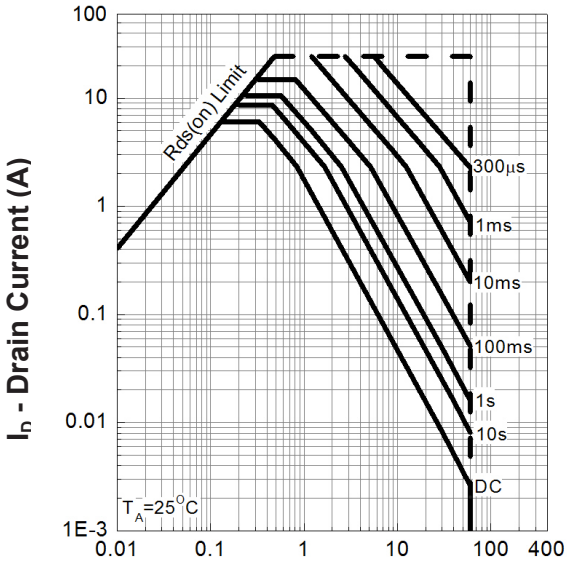
Power Dissipation



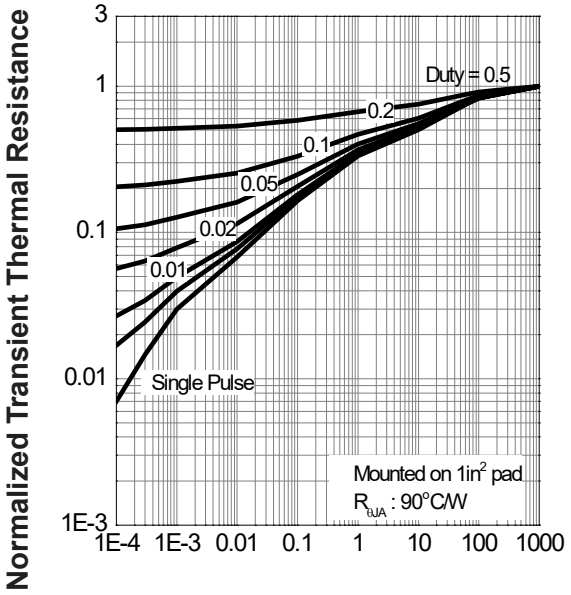
Drain Current



Safe Operation Area

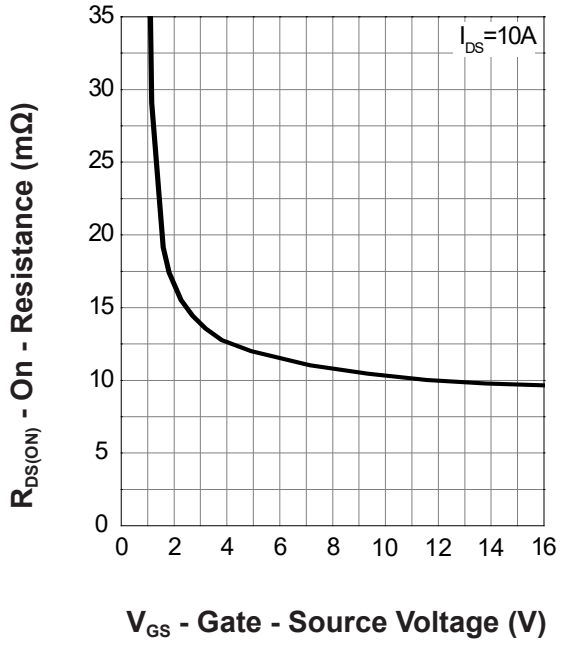


Thermal Transient Impedance

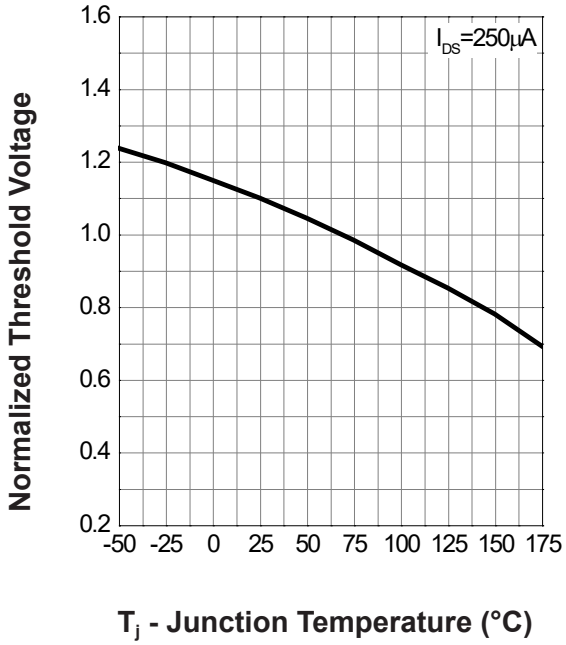


Typical Operating Characteristics(Cont.)

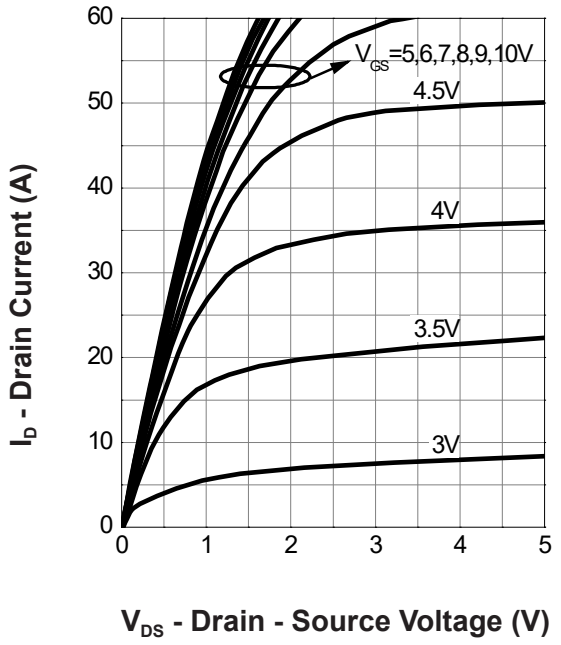
Gate-Source On Resistance



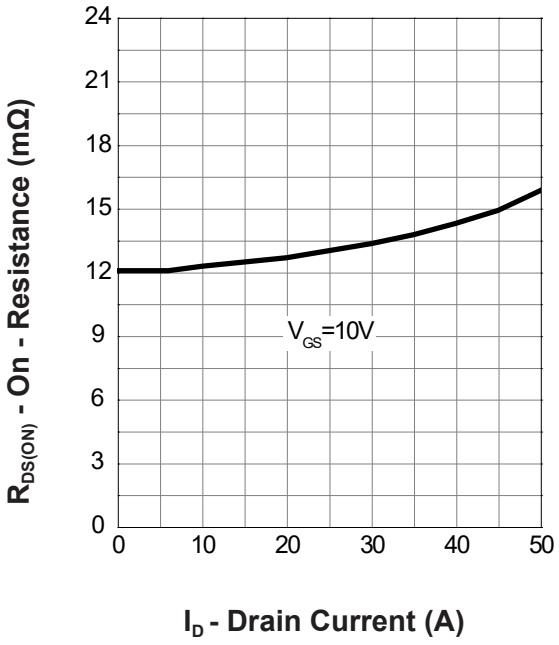
Gate Threshold Voltage



Output Characteristics

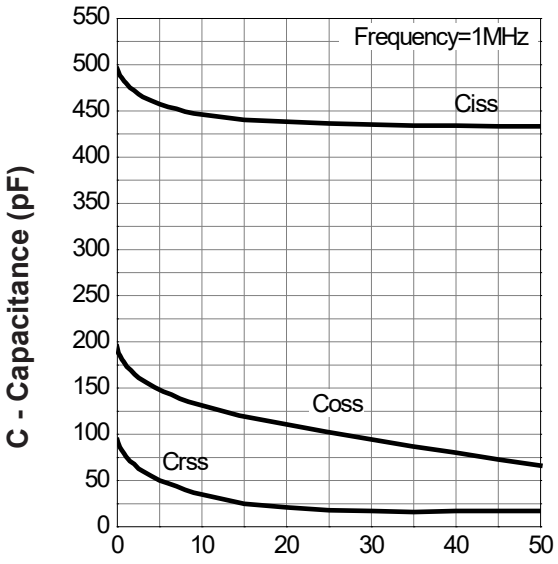


Drain-Source On Resistance

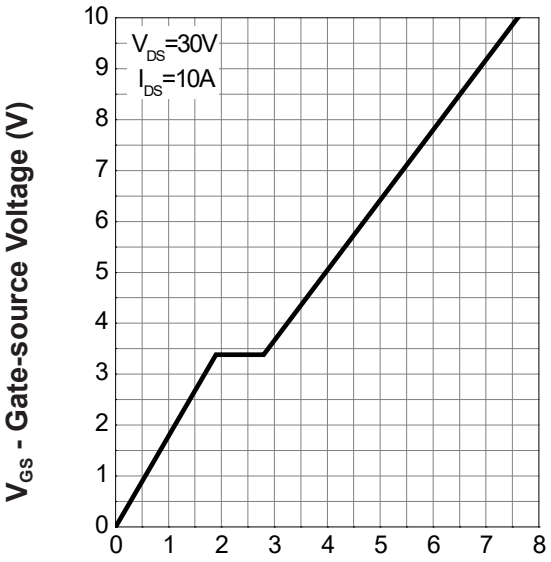


Typical Operating Characteristics(Cont.)

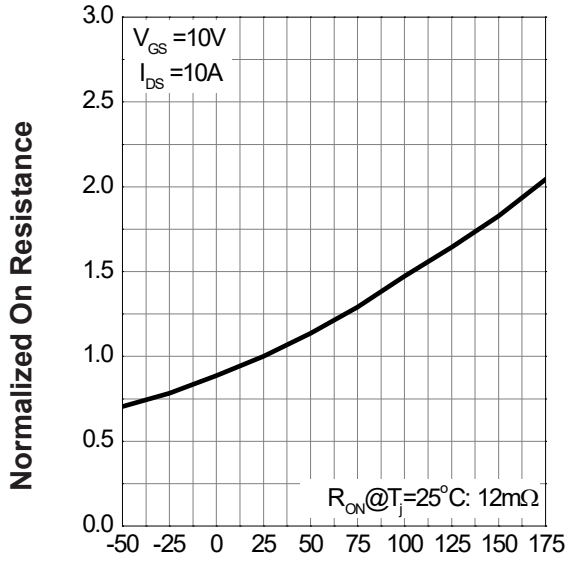
Capacitance



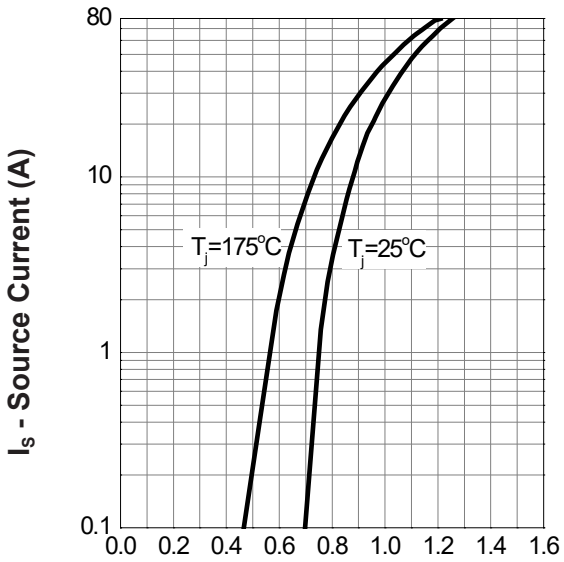
Gate Charge



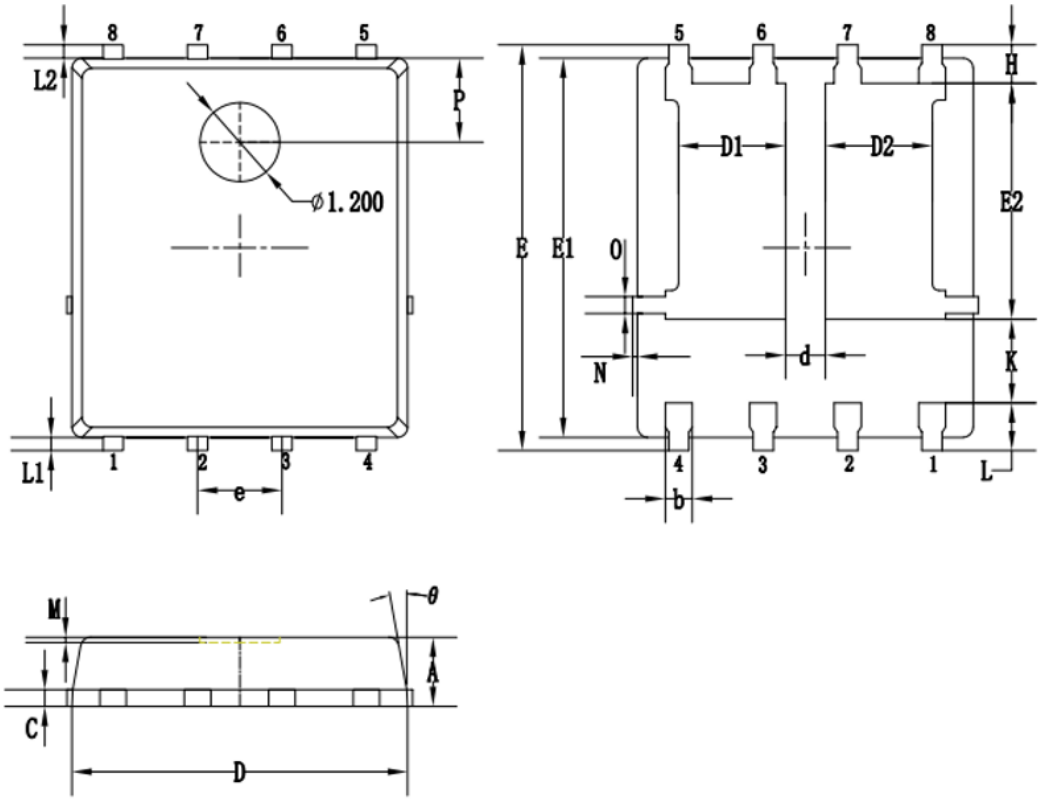
Drain-Source On Resistance



Source-Drain Diode Forward



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/D2	1.51	1.61	1.71
d	0.50	0.60	0.70
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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