General Description

The WSD80100DN56 is the highest performance trench 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 WSD80100DN56 meet the RoHS and Green Product requirement , 100% EAS guaranteed with full function reliability approved.

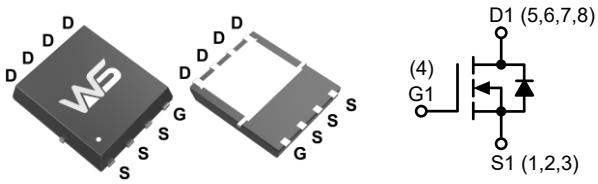
Product Summery

BV_{DSS}	R_{DSON}	I_D
80V	6.1mΩ	100A

Applications

- DC-DC converter switching for Networkong
- General purpose switching

DFN5X6-8L Pin Configuration



Features

- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	150	°C
I_D	Storage Temperature Range	-55 to 150	°C
I_D	Continuous Drain Current, V_{GS}=10V,T_C=25°C	100	A
	Continuous Drain Current, V_{GS}=10V,T_C=100°C	80	A
I_{DM}	Pulsed Drain Current ,T_C=25°C	380	A
P_D	Maximum Power Dissipation,T_C=25°C	200	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.8	°C
E_{AS}	Avalanche Energy, Single pulse,L=0.5mH	800	mJ

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	80	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.043	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=40A	---	6.1	8.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-6.94	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V , V_{GS}=0V , T_J=25℃	---	---	2	uA
		V_{DS}=48V , V_{GS}=0V , T_J=55℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	80	---	---	S
Q_g	Total Gate Charge (10V)	V_{DS}=30V , V_{GS}=10V , I_D=30A	---	125	---	nC
Q_{gs}	Gate-Source Charge		---	24	---	
Q_{gd}	Gate-Drain Charge		---	30	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=2.5Ω, I_D=2A ,RL=15Ω.	---	19	---	ns
T_r	Rise Time		---	20	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	70	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	4900	---	pF
C_{oss}	Output Capacitance		---	410	---	
C_{rss}	Reverse Transfer Capacitance		---	315	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	105	A
I_{SM}	Pulsed Source Current[2,6]		---	---	400	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=40A , T_J=25℃	---	---	1.4	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition：Tj=25℃,V_{DD}=40V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Characteristics

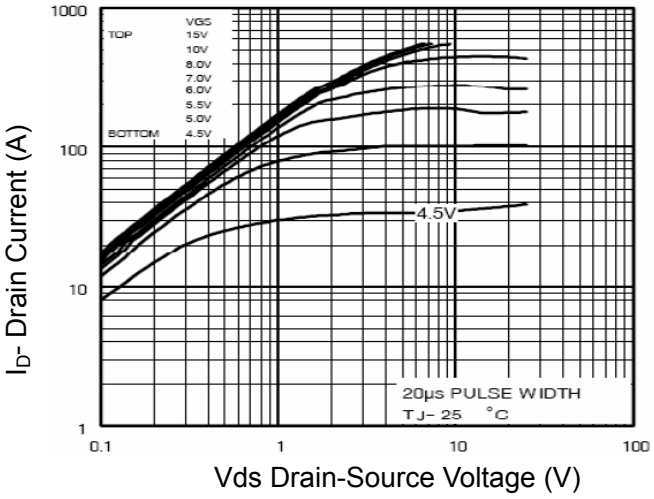


Figure 1 Output Characteristics

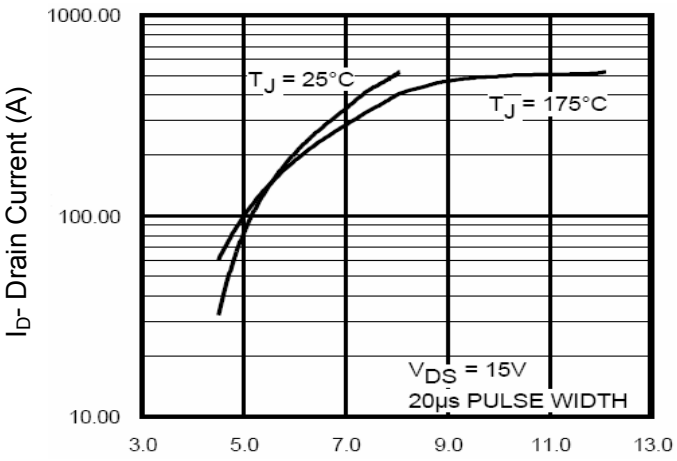


Figure 2 Transfer Characteristics

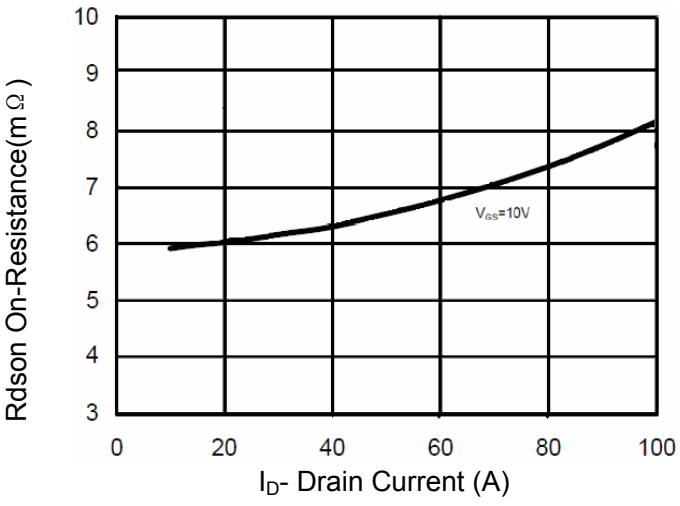


Figure 3 Rdson- Drain Current

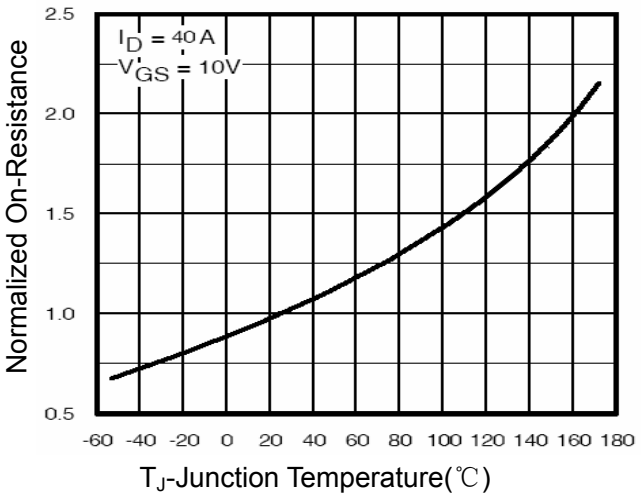


Figure 4 Rdson-JunctionTemperature

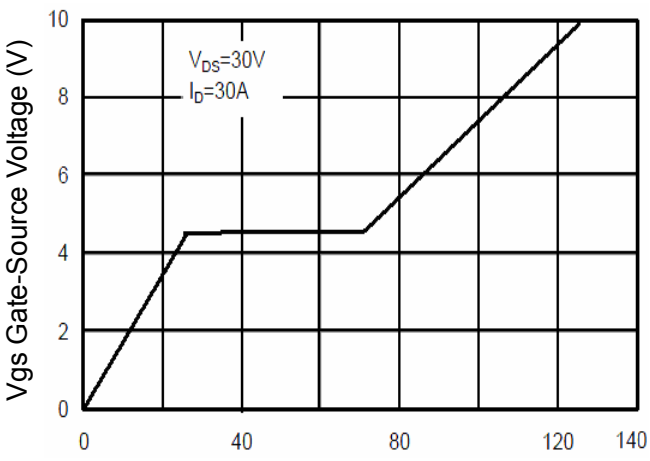


Figure 5 Gate Charge

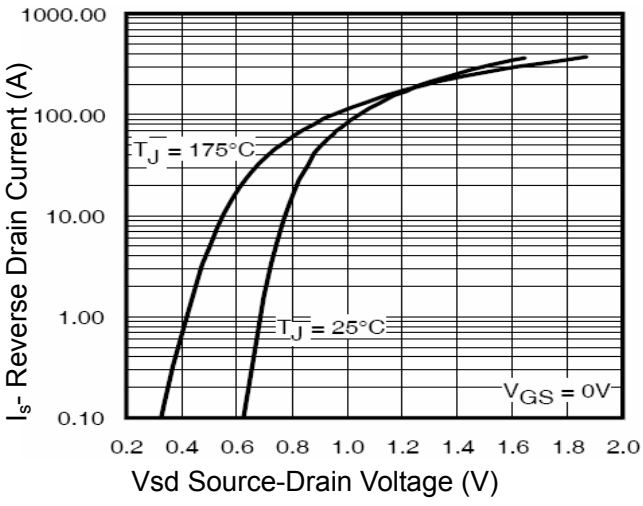


Figure 6 Source- Drain Diode Forward

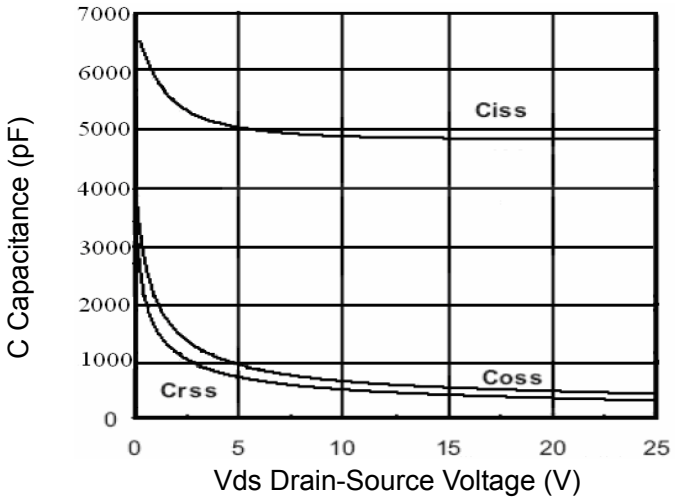


Figure 7 Capacitance vs Vds

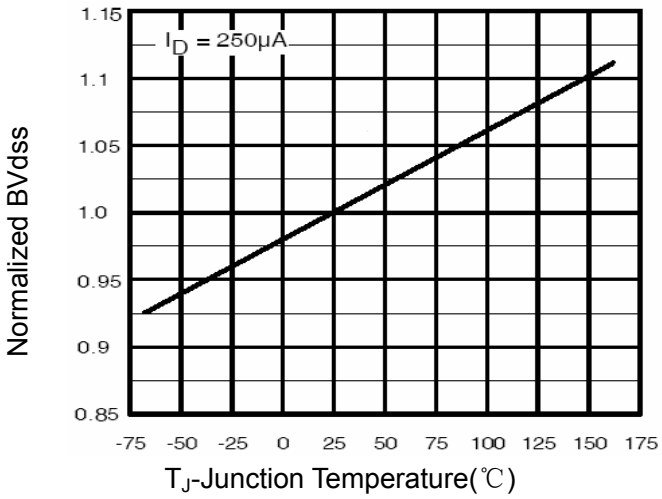


Figure 9 BV_{DSS} vs Junction Temperature

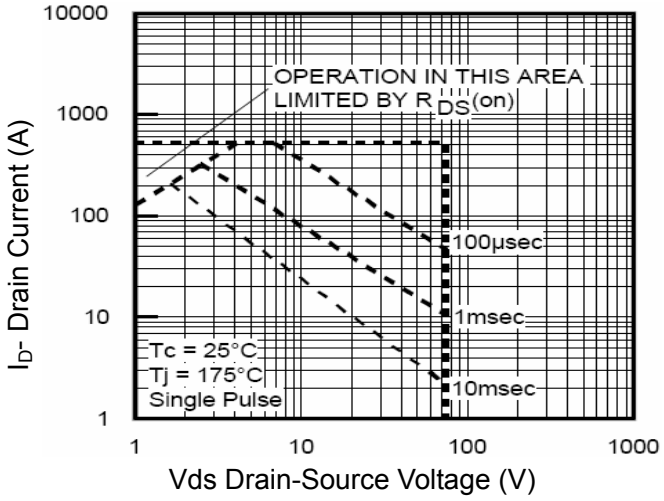


Figure 8 Safe Operation Area

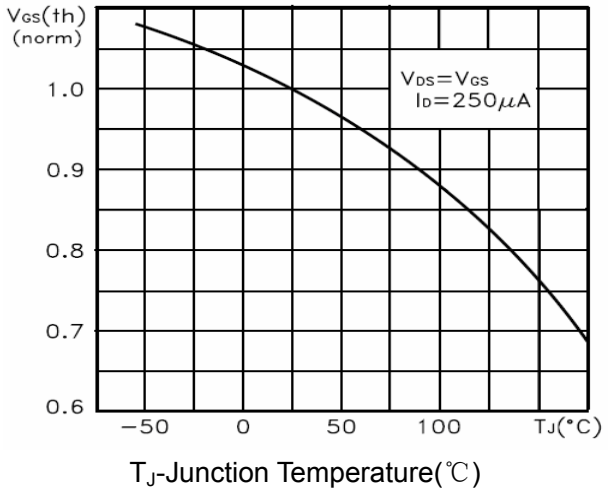


Figure 10 $V_{GS(th)}$ vs Junction Temperature

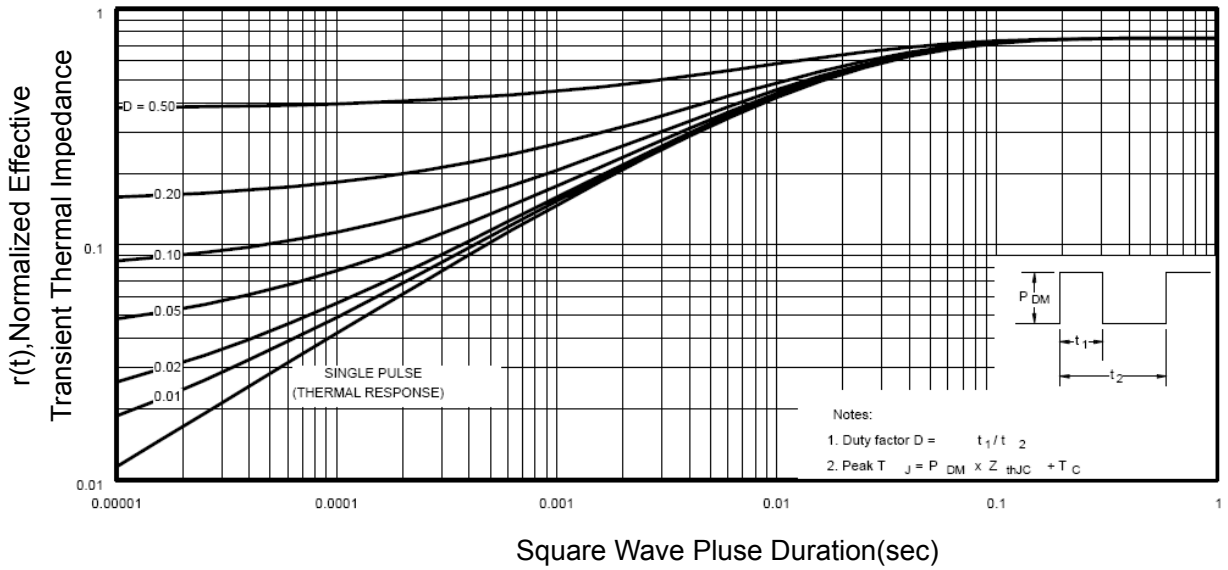
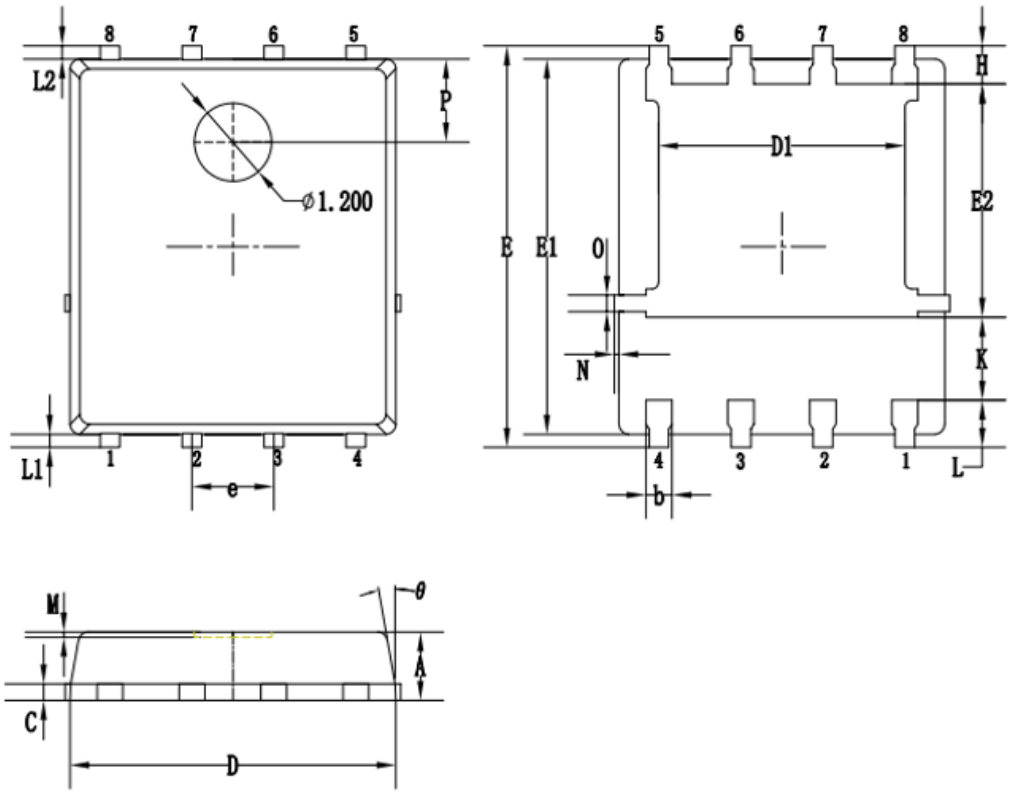


Figure 11 Normalized Maximum Transient Thermal Impedance

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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