

General Description

The WSD80100DN56 is the highest performance trench N-Ch MOSFET with extreme high cell density, which provide excellent RDSON 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.

Features

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

Product Summary

BV_{DSS}	R_{DSON}	I_D
80V	6.1mΩ	100A

Applications

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

DFN5X6-8 Pin Configuration



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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	$^\circ\text{C}$
I_D	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
I_D	Continuous Drain Current, $V_{GS}=10\text{V}, T_C=25^\circ\text{C}$	100	A
	Continuous Drain Current, $V_{GS}=10\text{V}, T_C=100^\circ\text{C}$	80	A
I_{DM}	Pulsed Drain Current, $T_C=25^\circ\text{C}$	380	A
P_D	Maximum Power Dissipation, $T_C=25^\circ\text{C}$	200	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.8	$^\circ\text{C}$
E_{AS}	Avalanche Energy, Single pulse, $L=0.5\text{mH}$	800	mJ

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	80	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.043	---	V/°C
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
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-6.94	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V, T _J =25°C	---	---	2	uA
		V _{DS} =48V, V _{GS} =0V, T _J =55°C	---	---	10	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	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, R _L =15Ω.	---	20	---	ns
T _r	Rise Time		---	19	---	
T _{d(off)}	Turn-Off Delay Time		---	70	---	
T _f	Fall Time		---	30	---	
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°C	---	---	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: T_J=25°C, V_{DD}=40V, V_G=10V, L=0.5mH, R_G=25Ω

Typical Characteristics

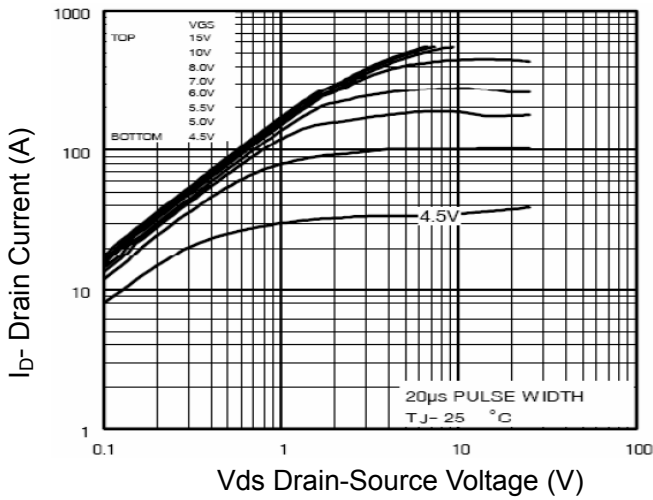


Figure 1 Output Characteristics

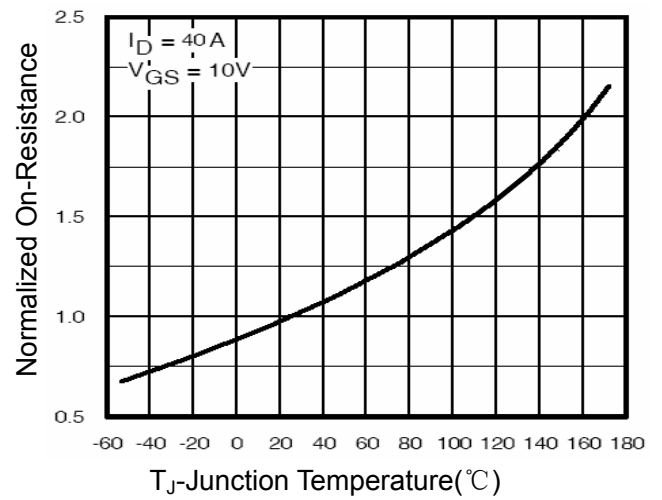


Figure 4 Rdson-Junction Temperature

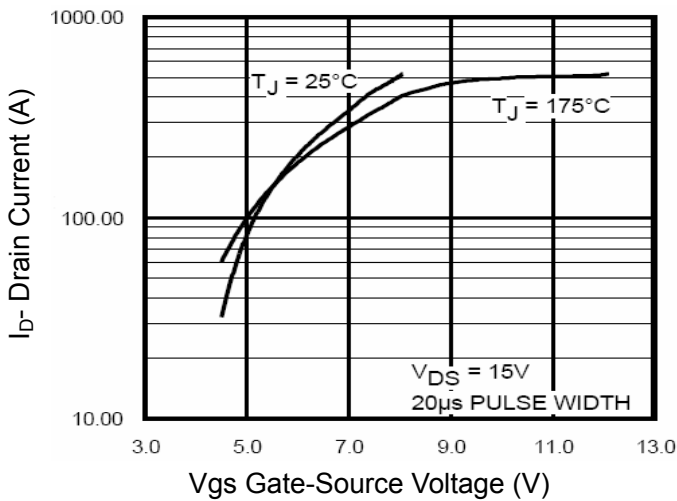


Figure 2 Transfer Characteristics

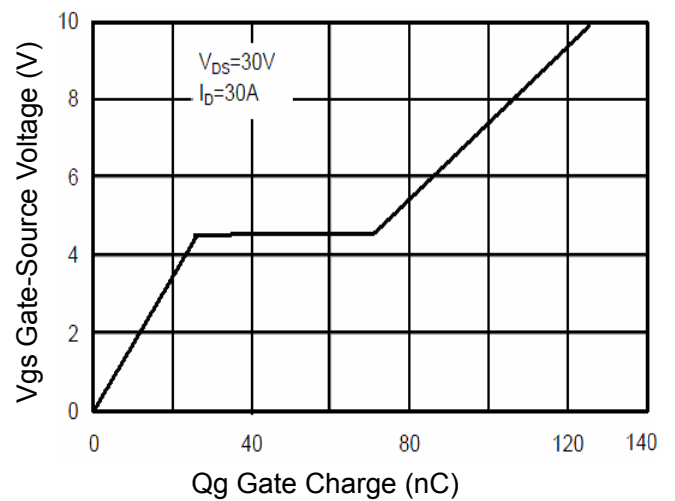


Figure 5 Gate Charge

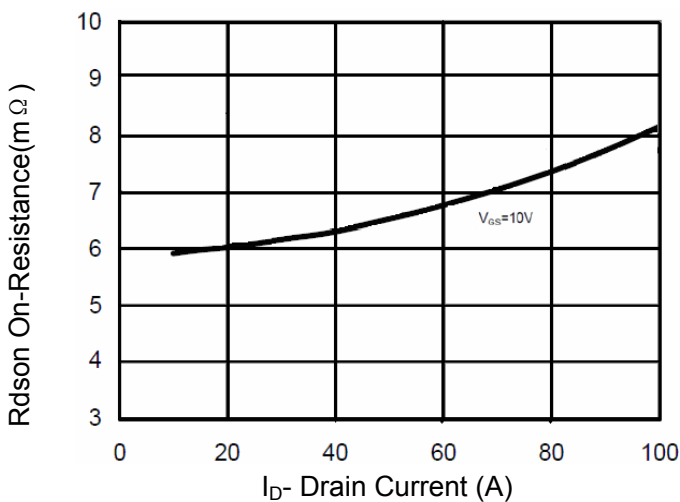


Figure 3 Rdson- Drain Current

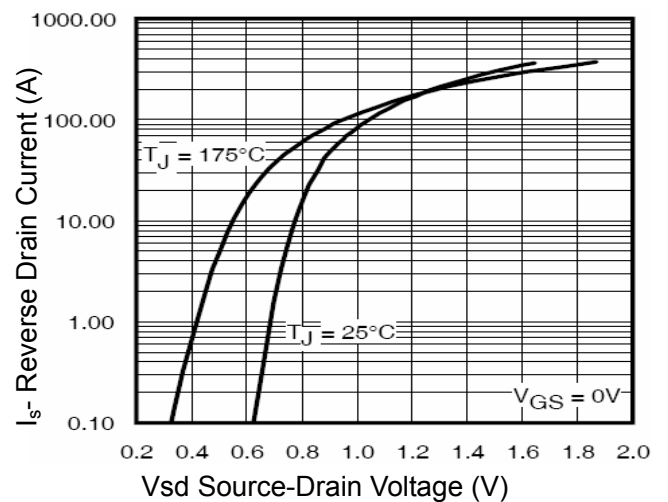


Figure 6 Source- Drain Diode Forward

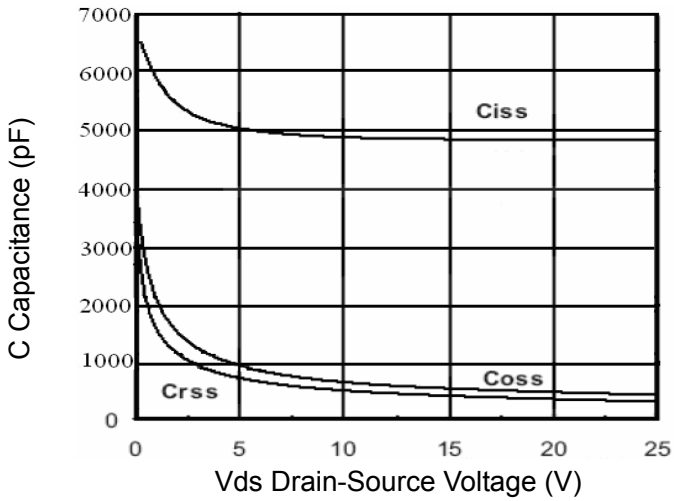


Figure 7 Capacitance vs Vds

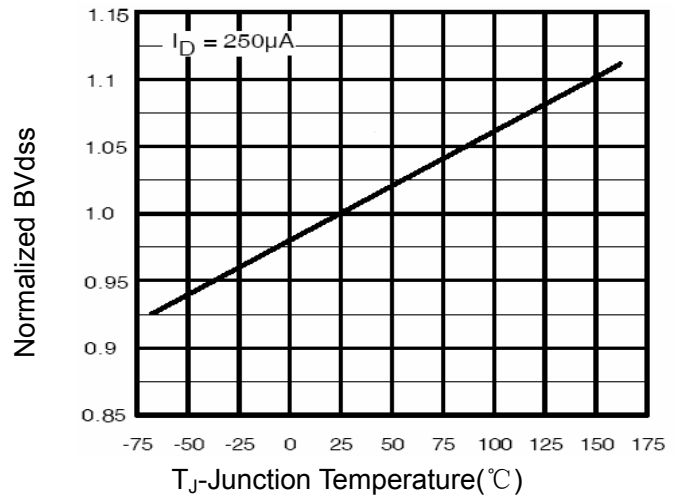


Figure 9 BV_{DSS} vs Junction Temperature

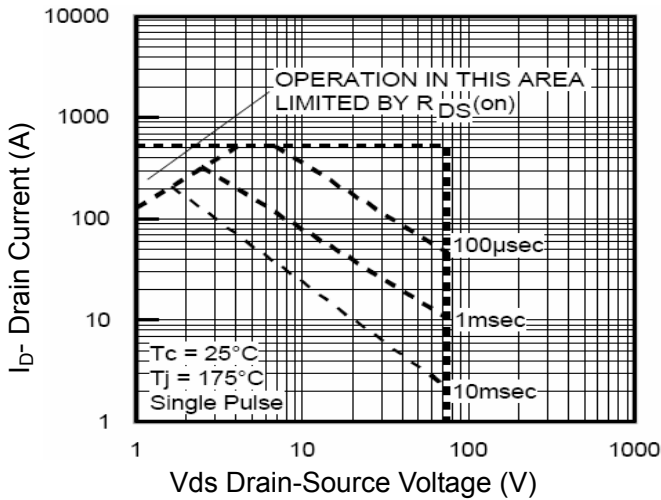


Figure 8 Safe Operation Area

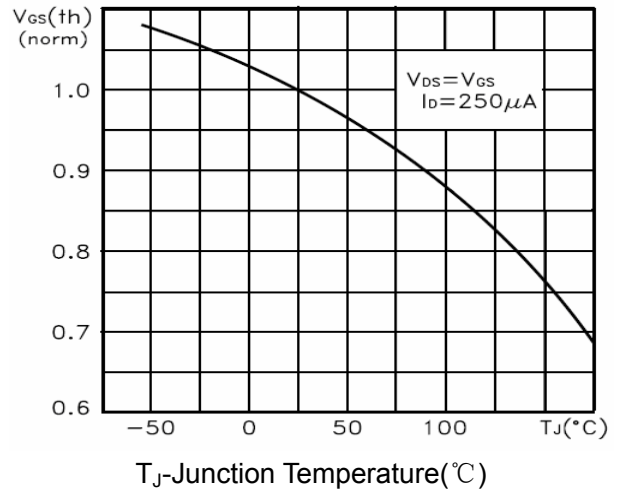


Figure 10 V_{GS(th)} vs Junction Temperature

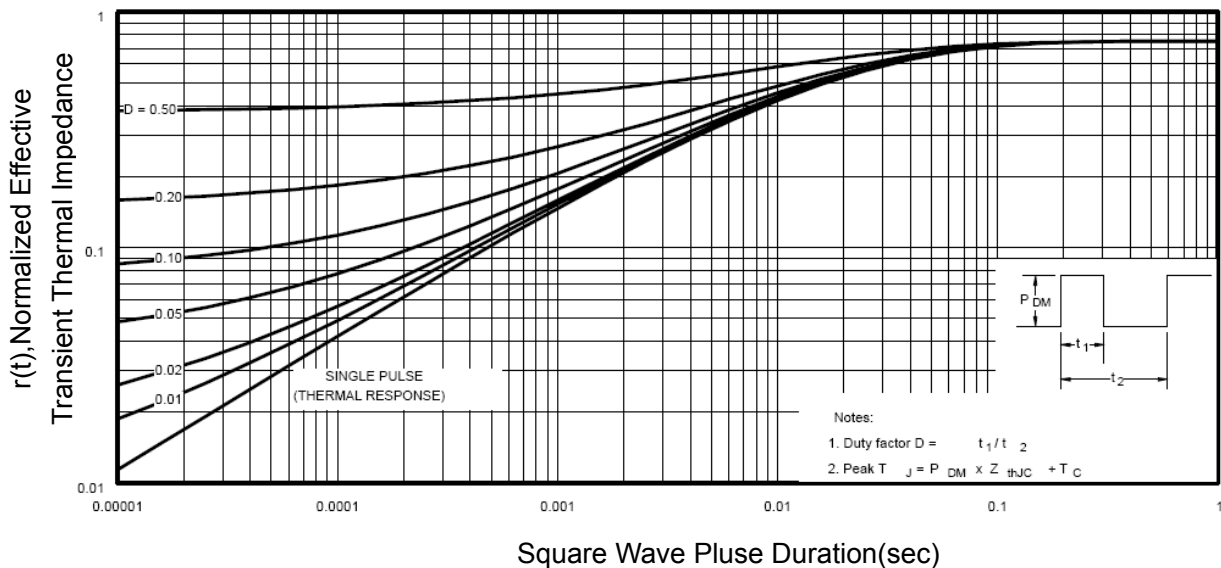


Figure 11 Normalized Maximum Transient Thermal Impedance



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