General Description

The WSD80120DN56 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 WSD80120DN56 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

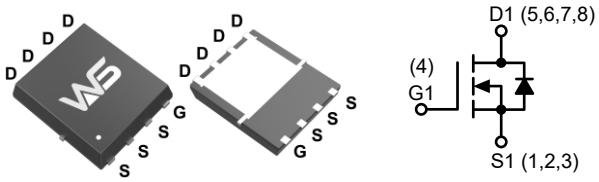
BV_{DSS}	R_{DSON}	I_D
85V	3.7mΩ	120A

Applications

High power DC/DC converters and switch mode power supply

DC Motor control and Class D Amplifier

DFN5X6-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	±25	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	120	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	96	A
I_{DM}	Pulsed Drain Current¨T_C=25°C	384	A
EAS	Avalanche Energy, Single pulse,L=0.5mH	320	mJ
I_{AS}	Avalanche Current, Single pulse,L=0.5mH	180	A
P_D@T_C=25℃	Total Power Dissipation	104	W
P_D@T_C=100℃	Total Power Dissipation	53	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	20	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	1.2	℃/W

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	85	---	---	V
△BV_{DSS}/△T_J	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.096	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V,I_D=50A	---	3.7	4.8	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.5	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=85V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=85V , V_{GS}=0V , T_J=55℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±25V , V_{DS}=0V	---	---	±100	nA
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	3.2	---	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=50V , V_{GS}=10V , I_D=10A	---	54	---	nC
Q_{gs}	Gate-Source Charge		---	17	---	
Q_{gd}	Gate-Drain Charge		---	11	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=1Ω,RL=1Ω,IDS=10A.	---	18	---	ns
T_r	Rise Time		---	21	---	
$T_{d(off)}$	Turn-Off Delay Time		---	10	---	
T_f	Fall Time		---	36	---	
C_{iss}	Input Capacitance	V_{DS}=40V , V_{GS}=0V , f=1MHz	---	3750	---	pF
C_{oss}	Output Capacitance		---	395	---	
C_{rss}	Reverse Transfer Capacitance		---	180	---	

Diode Characteristics

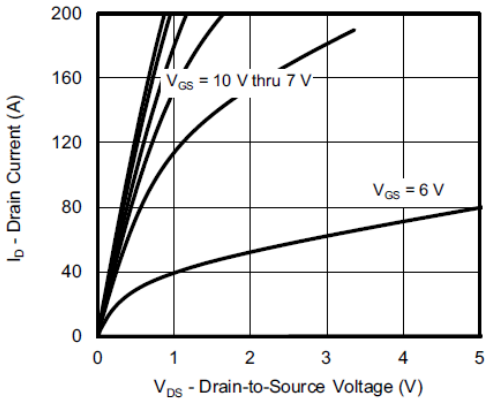
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	86.7	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=15A , T_J=25℃	---	---	1.2	V

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25℃. The value in any given application depends on the user's specific board design.

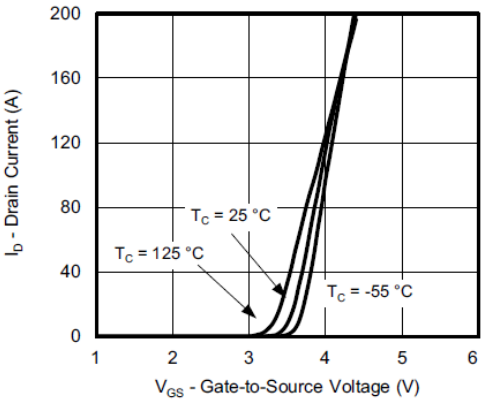
B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

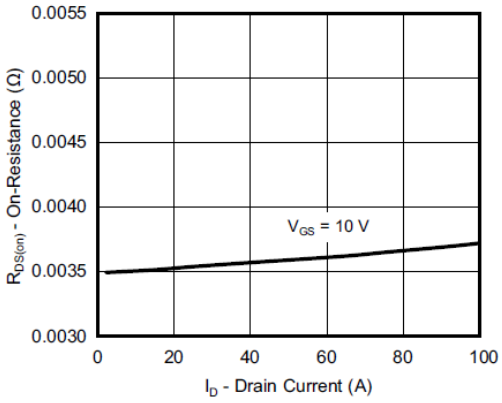
Typical Operating Characteristics



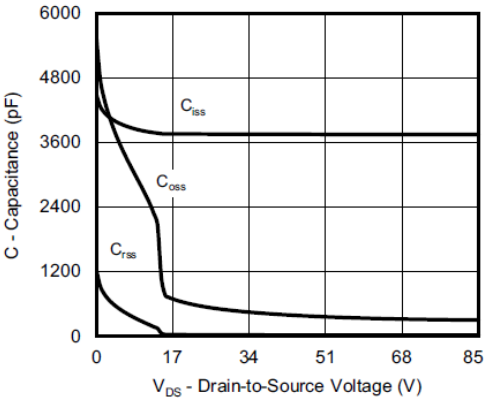
Output Characteristics



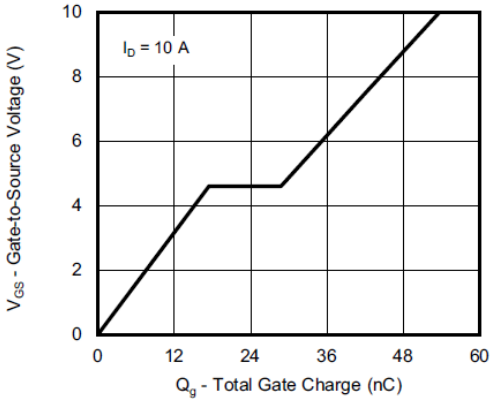
Transfer Characteristics



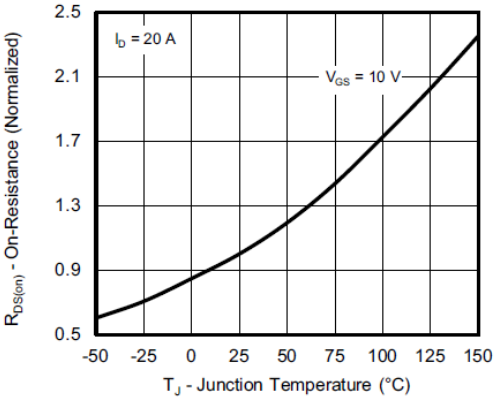
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

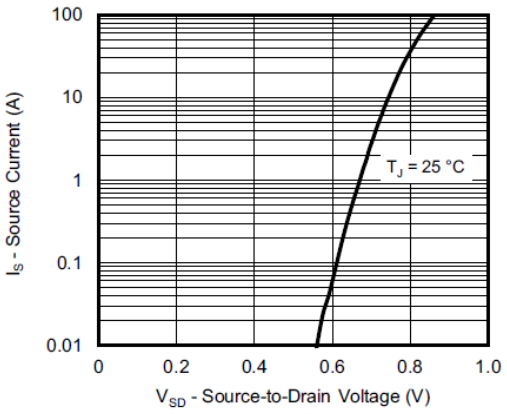


Gate Charge

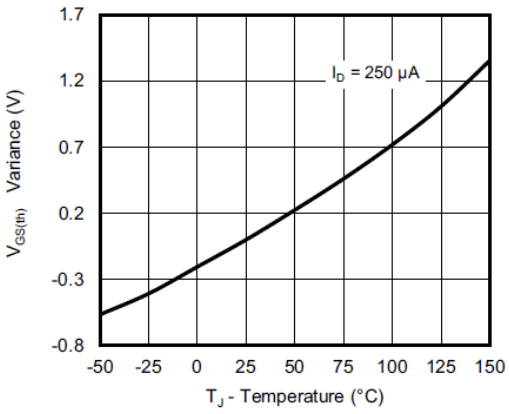


On-Resistance vs. Junction Temperature

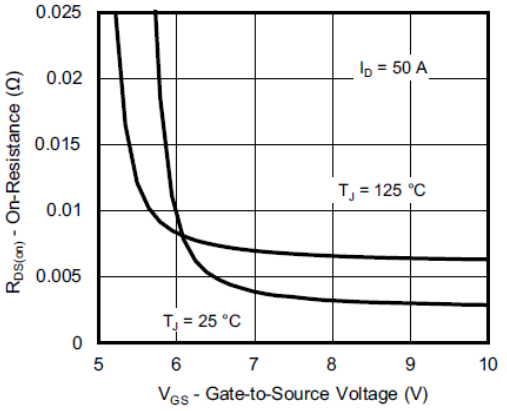
Typical Operating Characteristics



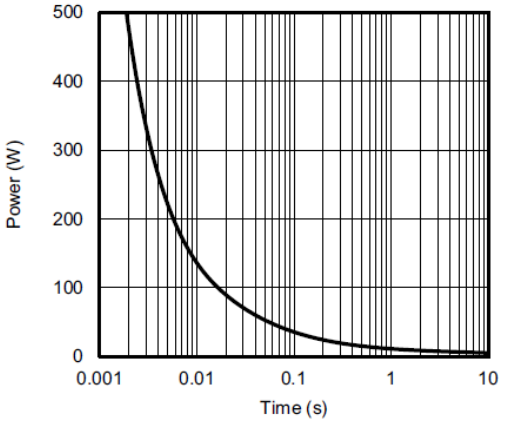
Source-Drain Diode Forward Voltage



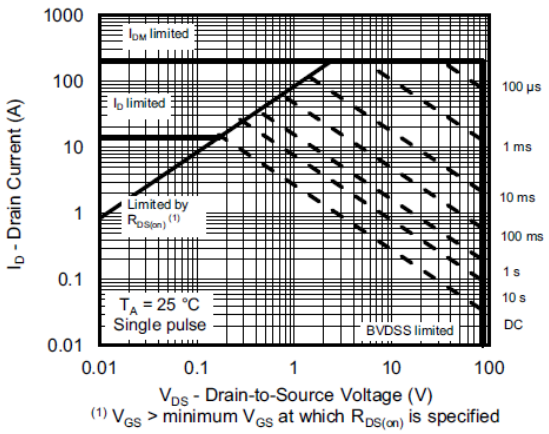
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage

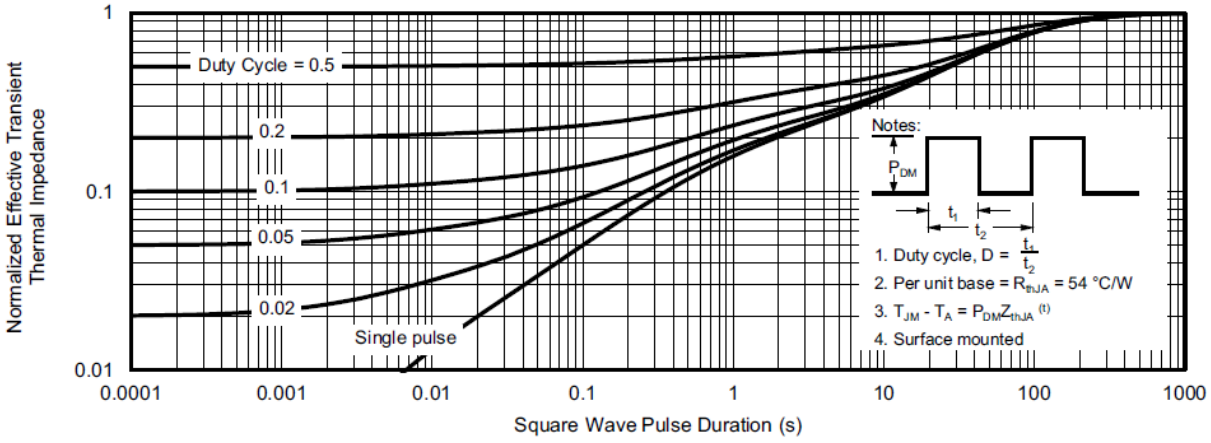


Single Pulse Power, Junction-to-Ambient

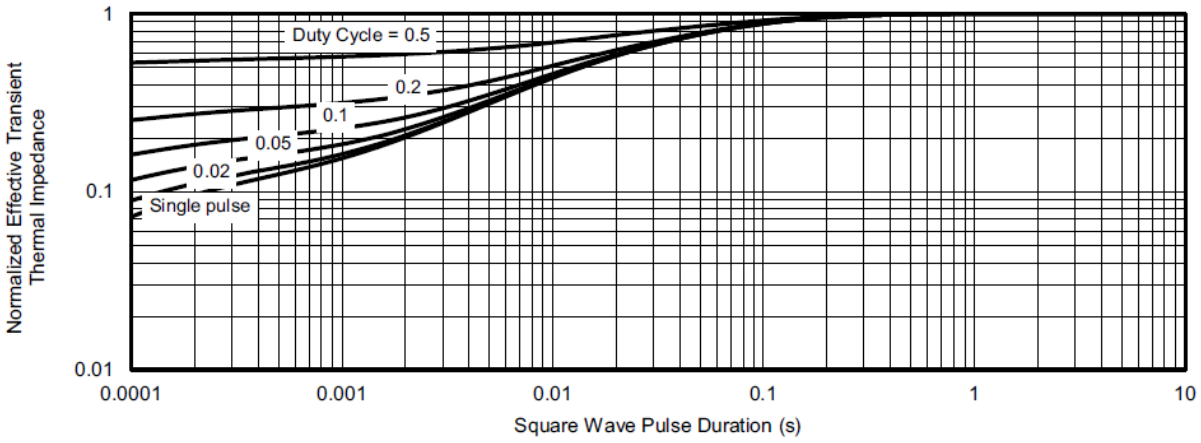


Safe Operating Area, Junction-to-Ambient

Typical Operating Characteristics

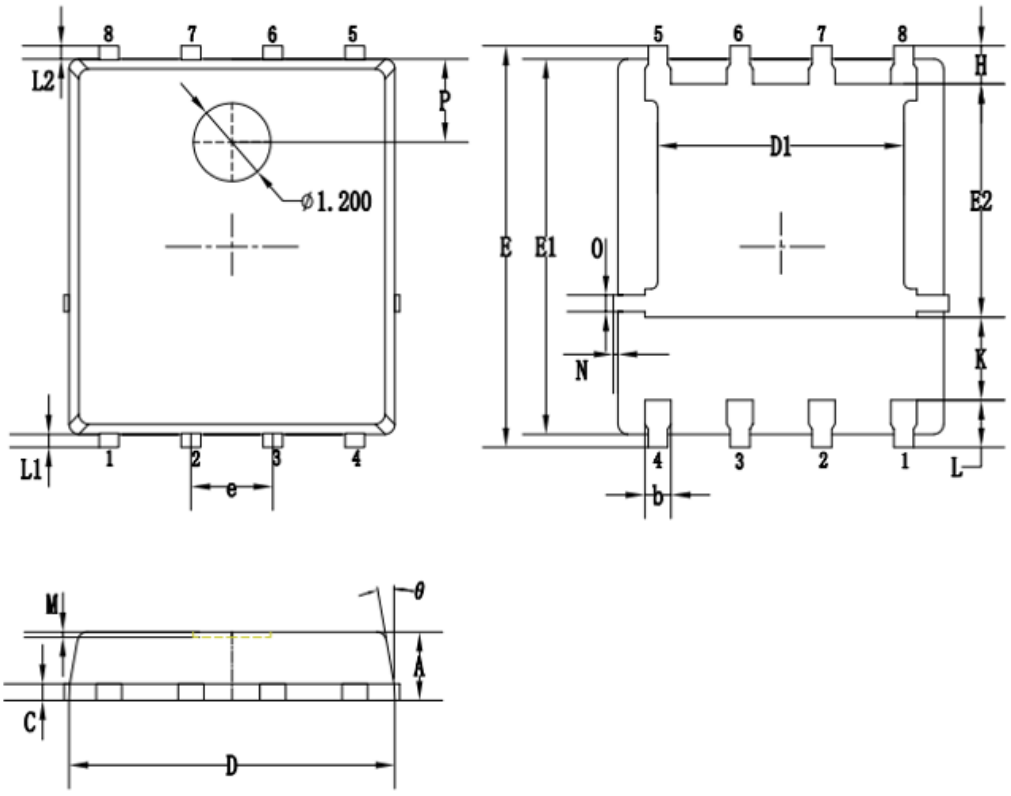


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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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