

General Description

The WSL220N08 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 WSL220N08 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

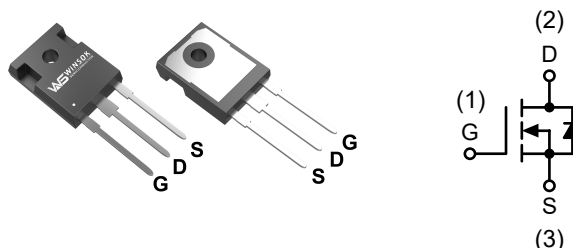
Product Summary

BVDSS	RDSON	ID
85V	4.0mΩ	210A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System

TO-247-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		85	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	210	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	T _C =25°C	850**	A
I _D	Continuous Drain Current	T _C =25°C	210	A
		T _C =100°C	150	
P _D	Maximum Power Dissipation	T _C =25°C	300	W
		T _C =100°C	178	
R _{θJC}	Thermal Resistance-Junction to Case		0.5	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		63.5	
Avalanche Ratings				
E _{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	1800***	mJ

Note : * Repetitive rating ; pulse width limited by junction temperature

** Drain current is limited by junction temperature

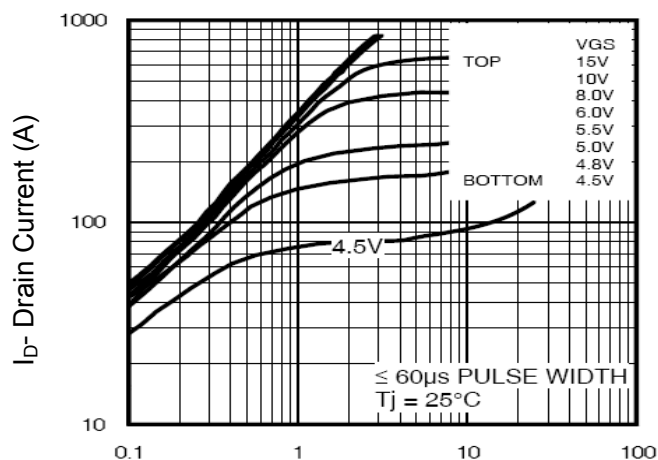
*** VD=64V

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

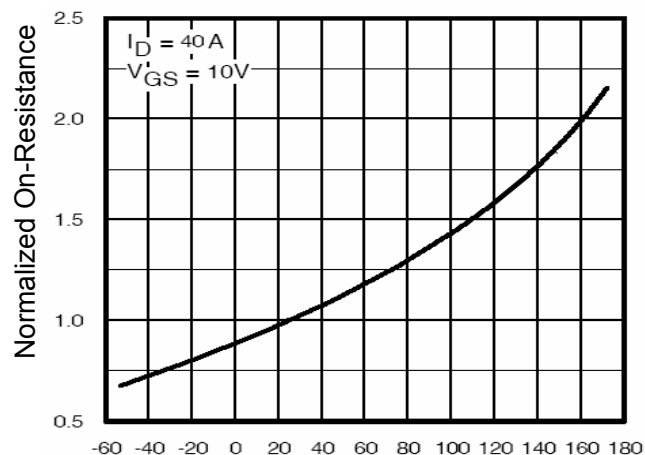
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	85	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V T _J =85°C	-	-	1 10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2.0	3.2	4.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V	-	-	±200	nA
R _{DS(ON)} *	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =100A	-	4.0	4.9	mΩ
Diode Characteristics						
V _{SD} *	Diode Forward Voltage	I _{SD} =100A, V _{GS} =0V	-	0.8	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =100A, dI _{SD} /dt=100A/μs	-	110	-	ns
Q _{rr}	Reverse Recovery Charge		-	300	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	3.3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz	-	7600	-	pF
C _{oss}	Output Capacitance		-	720	-	
C _{rss}	Reverse Transfer Capacitance		-	346	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =40V, R _G =6 Ω, I _{DS} =100A, V _{GS} =10V,	-	23	-	ns
T _r	Turn-on Rise Time		-	124	-	
t _{d(OFF)}	Turn-off Delay Time		-	78	-	
T _f	Turn-off Fall Time		-	84	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =64V, V _{GS} =10V, I _{DS} =100A	-	140	-	nC
Q _{gs}	Gate-Source Charge		-	40	-	
Q _{gd}	Gate-Drain Charge		-	57	-	

Note * : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

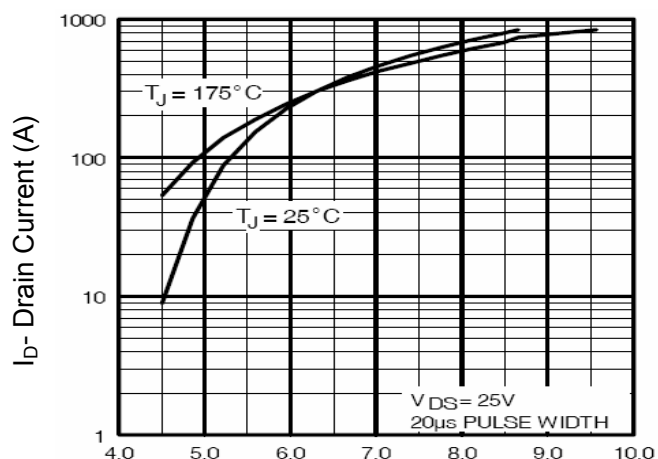
Typical Operating Characteristics



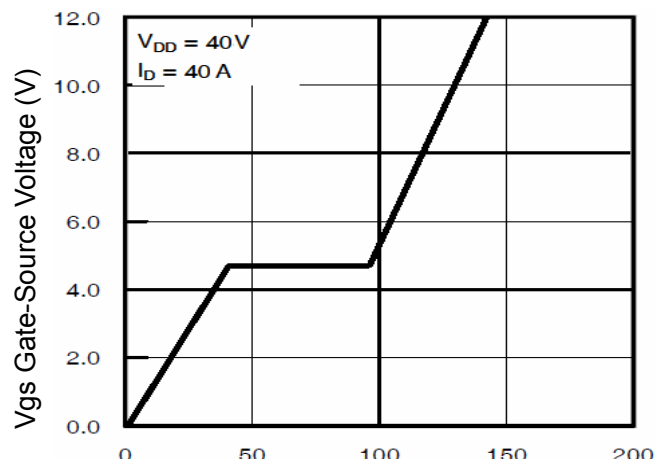
Vds Drain-Source Voltage (V)
Figure 1 Output Characteristics



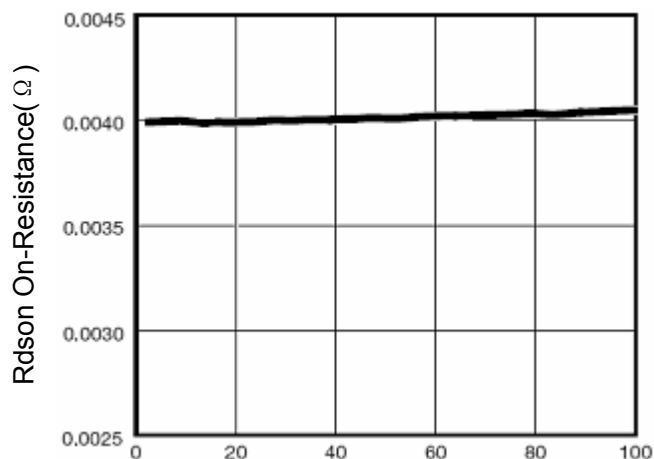
T_J -Junction Temperature($^\circ C$)
Figure 4 Rdson-Junction Temperature



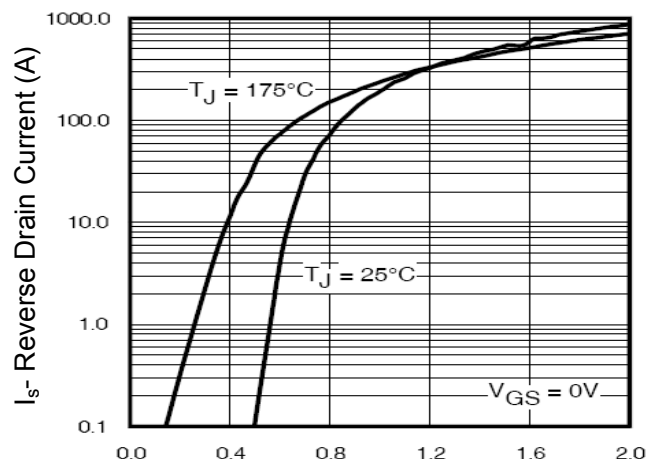
Vgs Gate-Source Voltage (V)
Figure 2 Transfer Characteristics



Qg Gate Charge (nC)
Figure 5 Gate Charge



I_{DS} - Drain Current (A)
Figure 3 Rdson- Drain Current



Vsd Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward

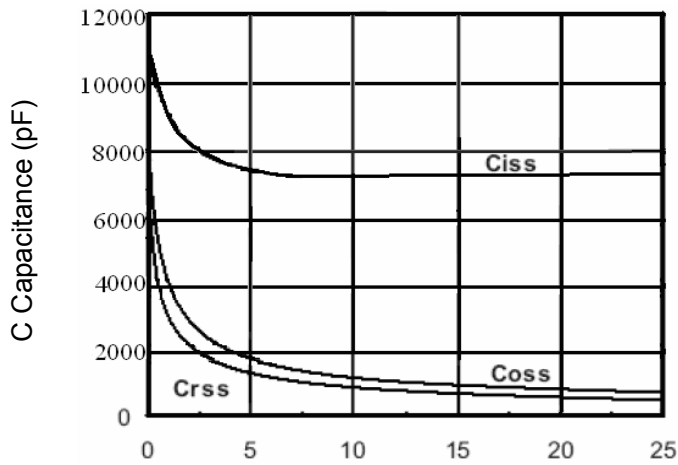


Figure 7 Capacitance vs Vds

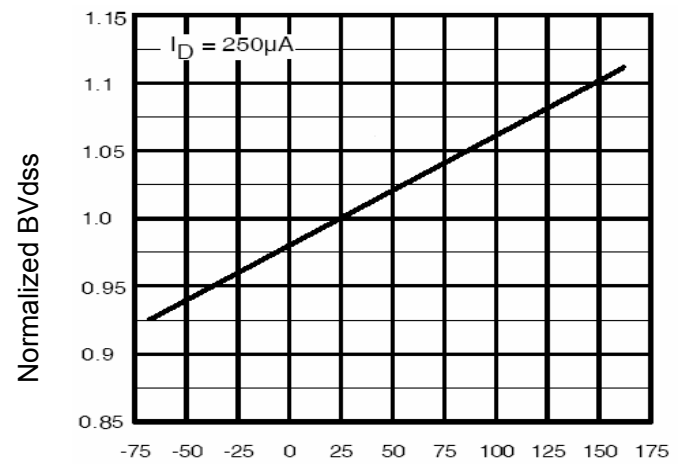


Figure 9 BV_{DSS} vs Junction Temperature

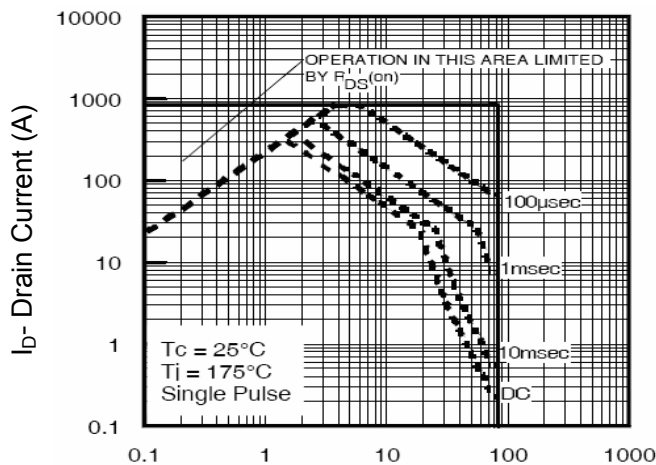


Figure 8 Safe Operation Area

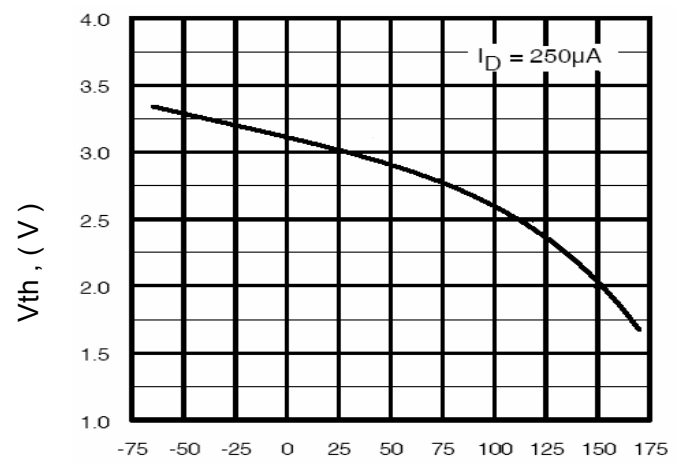


Figure 10 V_{GS(th)} vs Junction Temperature

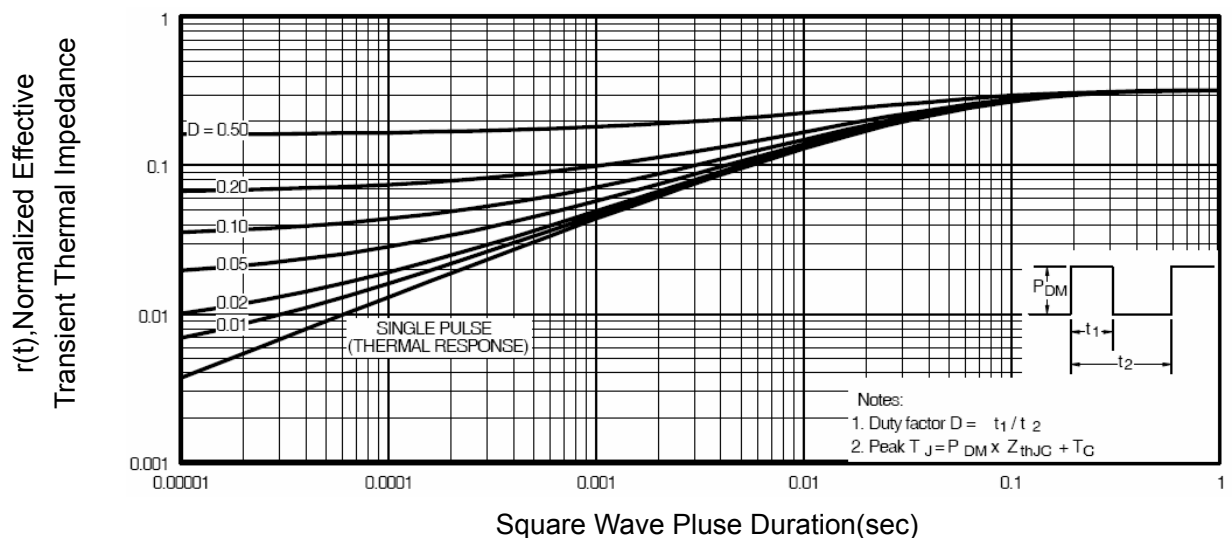
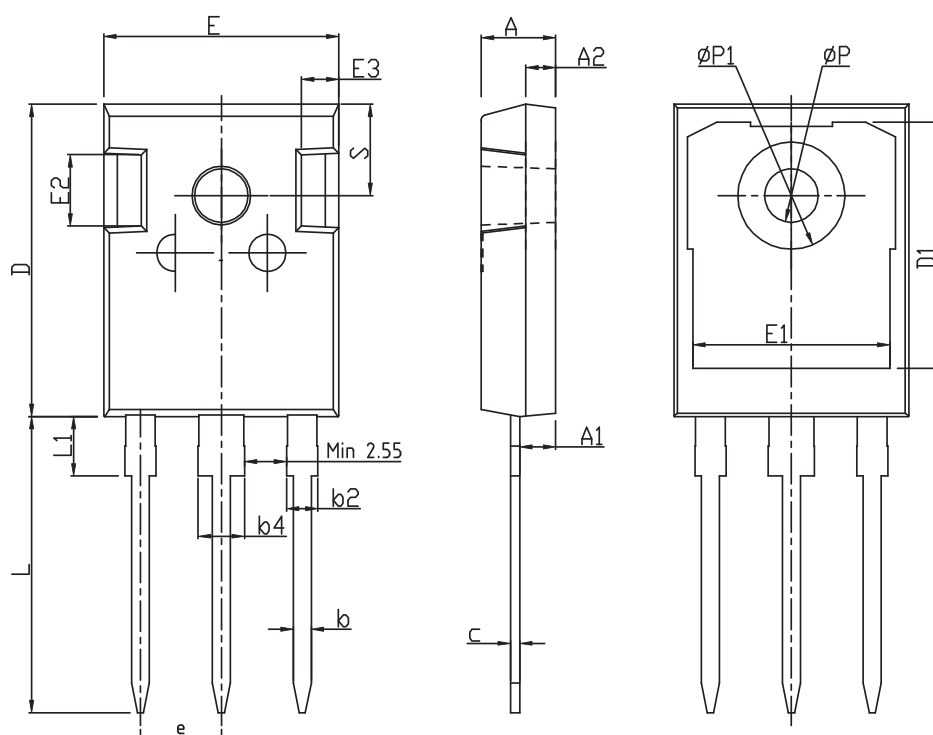


Figure 11 Normalized Maximum Transient Thermal Impedance

Packaging information


SYMBOL	MM		
	MIN	TYP	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	-	--	4.30
P	3.40	3.60	3.80
P1	-	-	7.30
S	6.15BSC		

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