

General Description

The WSL220N08 is the highest performance trench N-ch MOSFET with extreme high cell density, which provide excellent R_{DS(on)} 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.

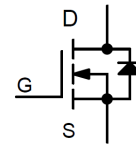
Product Summary

BVDSS	R _{DS(on)}	I _D
85V	4.9mΩ	210A

Applications

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

TO-247 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

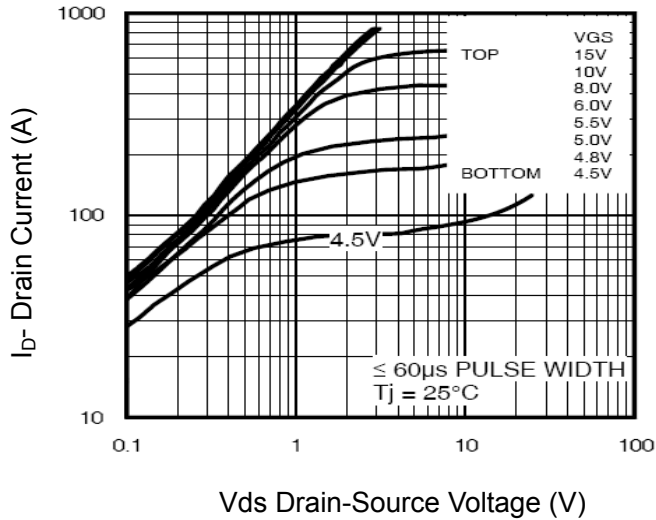
*** V_D=64V

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

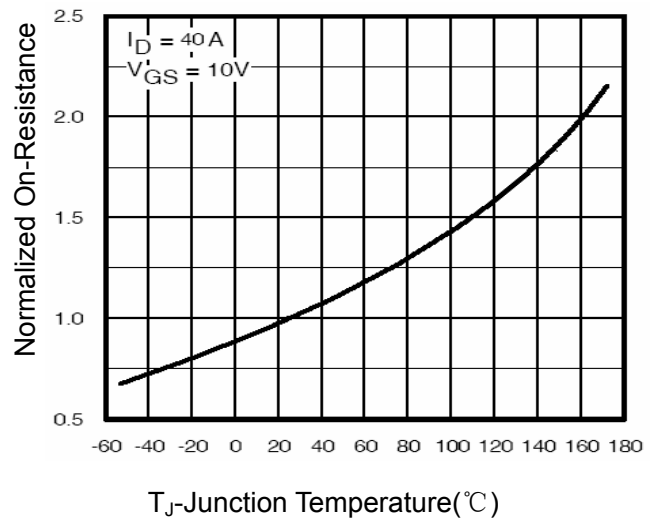
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	85	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V T _J =85°C	-	-	1	μA
			-	-	10	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =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		-	84	-	
T _f	Turn-off Fall Time		-	78	-	
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 ≤300μs, duty cycle ≤2%.

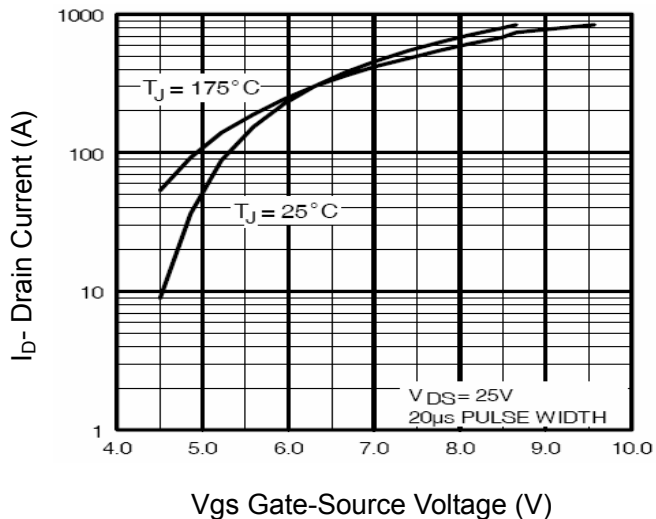
Typical Operating Characteristics



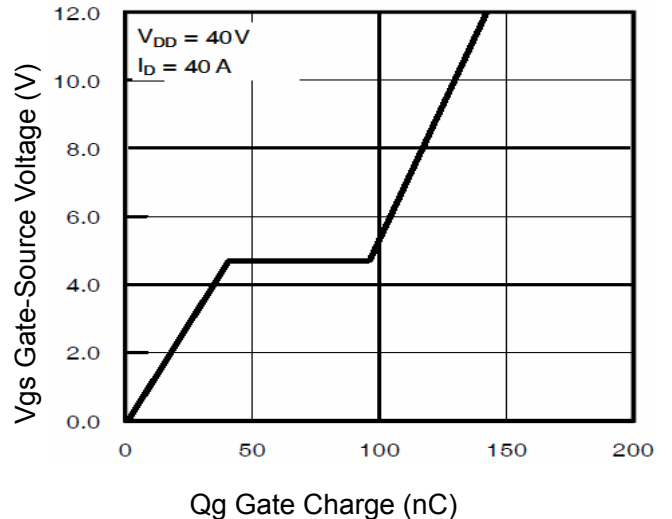
Vds Drain-Source Voltage (V)
Figure 1 Output Characteristics



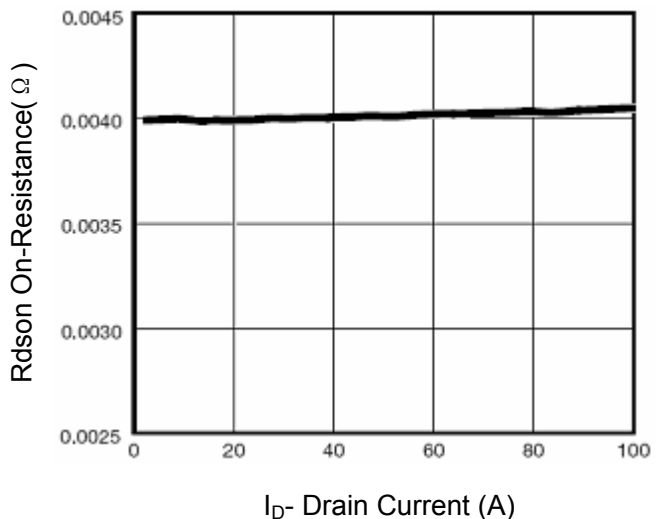
T_J -Junction Temperature($^\circ C$)
Figure 4 Rdson-Junction Temperature



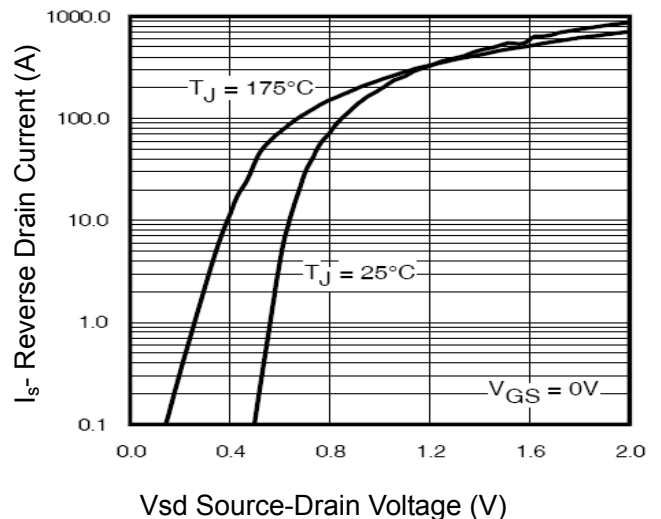
Vgs Gate-Source Voltage (V)
Figure 2 Transfer Characteristics



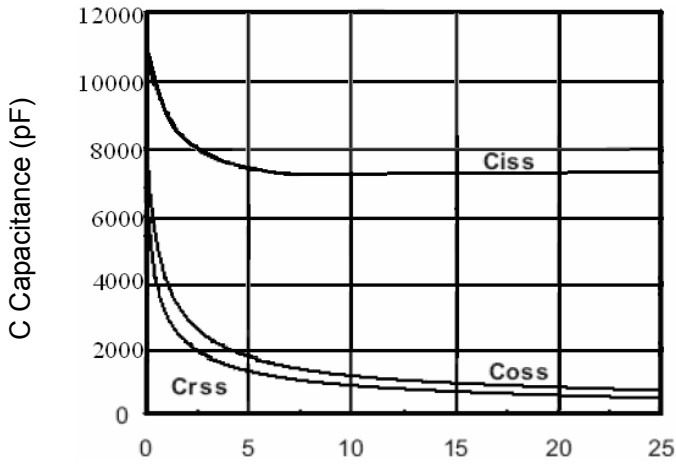
Qg Gate Charge (nC)
Figure 5 Gate Charge



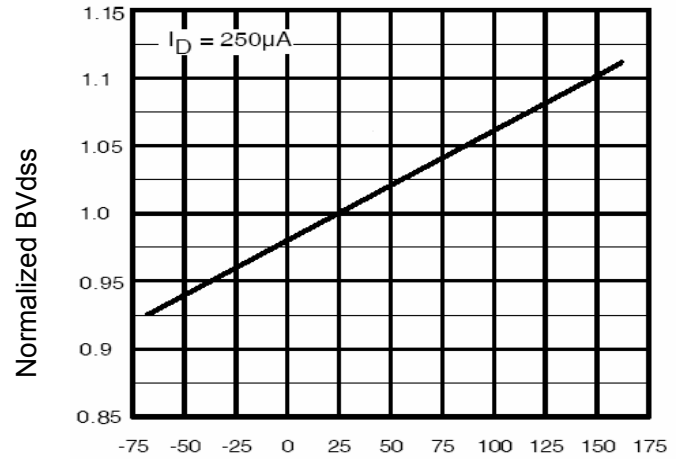
I_D - Drain Current (A)
Figure 3 Rdson- Drain Current



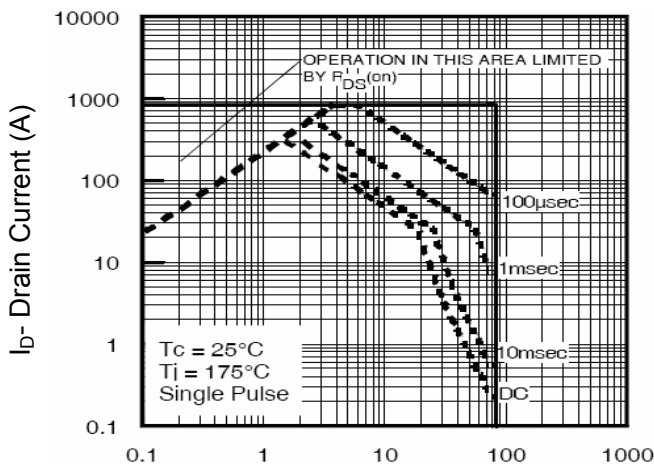
Vsd Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward



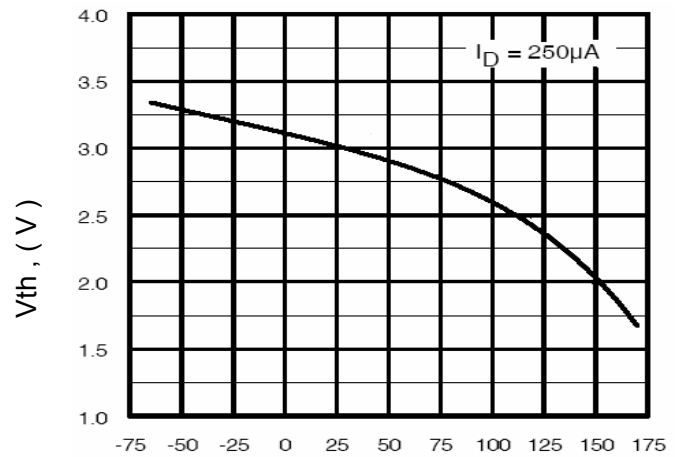
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



T_J-Junction Temperature(°C)
Figure 9 BV_{DSS} vs Junction Temperature



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 10 V_{GS(th)} vs Junction Temperature

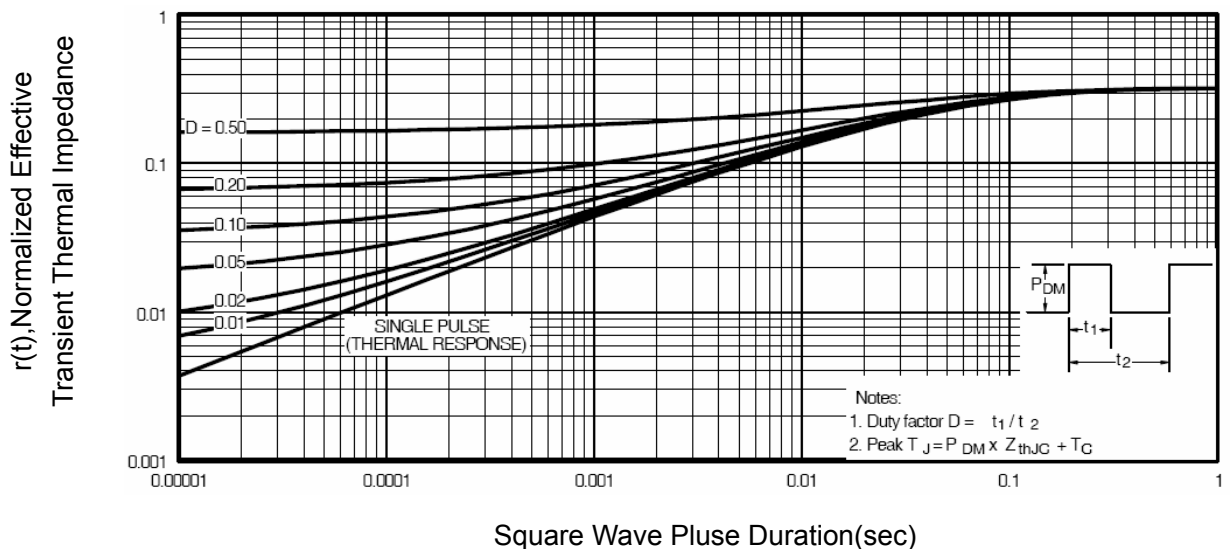
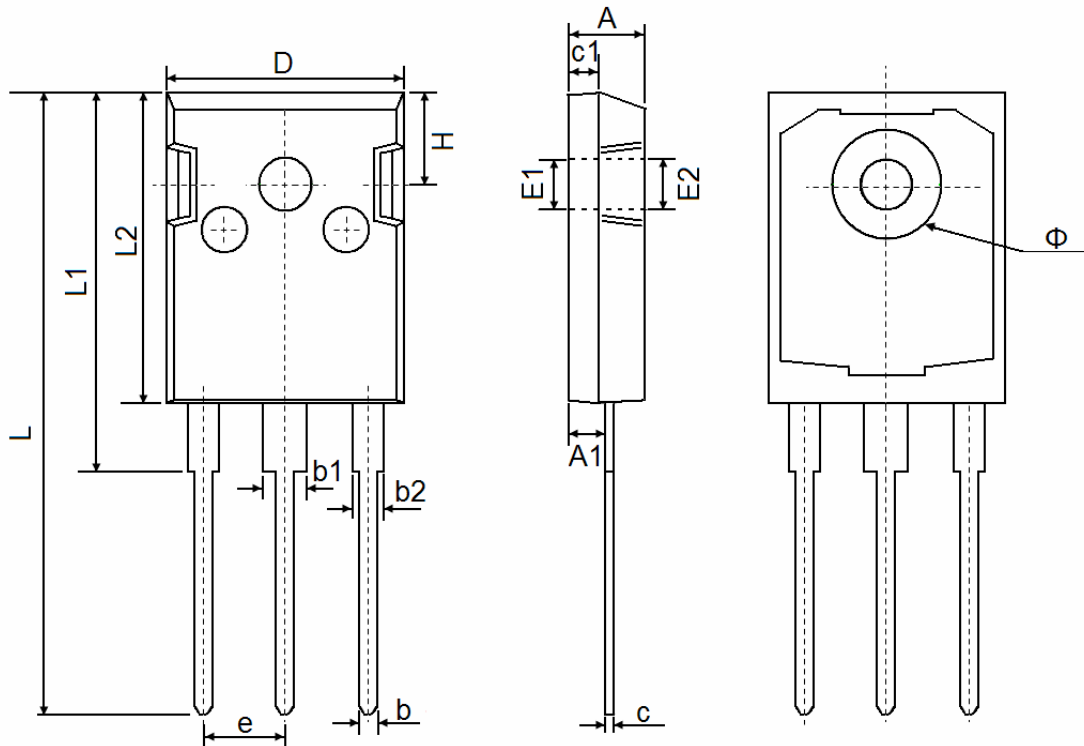


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-247 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150		
A1	2.200	2.600		
b	1.000	1.400		
b1	2.800	3.200		
b2	1.800	2.200		
c	0.500	0.700		
c1	1.900	2.100		
D	15.4 0	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.9 0	41.300	1.610	1.626
L1	24. 0	25.100	0.976	0.988
L2	20. 0	20.600	0.799	0.811
Φ	7.100	7.300		
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	



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