

General Description

The WSR140N08 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.

Product Summary

BV_{DSS}	$R_{DS(on)}$	I_D
80V	4.8mΩ	140A

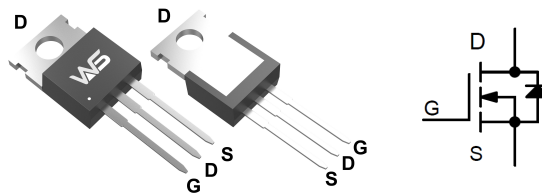
Applications

Power Management for Inverter Systems.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

TO-220FB-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		80	V
V _{GSS}	Gate-Source Voltage		±25	
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	140	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	T _C =25°C	551**	A
I _D	Continuous Drain Current	T _C =25°C	140	A
		T _C =100°C	91	
P _D	Maximum Power Dissipation	T _C =25°C	250	W
		T _C =100°C	125	
R _{θJC}	Thermal Resistance-Junction to Case		0.61	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	
Avalanche Ratings				
E _{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	762***	mJ

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

** Drain current is limited by junction temperature

*** $V_D=64\text{V}$

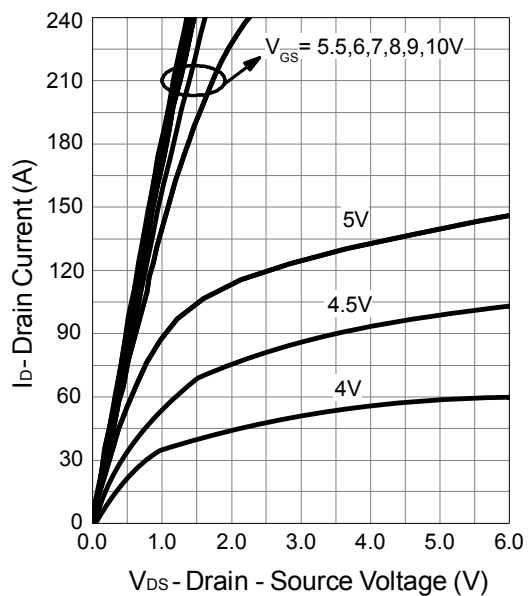
Electrical Characteristics (T_C = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	80	-	-	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	3.0	4.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)*}	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =70A	-	4.8	6.0	mΩ
Diode Characteristics						
V _{SD} *	Diode Forward Voltage	I _{SD} =70 A, V _{GS} =0V	-	0.8	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =70A, dI _{SD} /dt=100A/μs	-	30	-	ns
Q _{rr}	Reverse Recovery Charge		-	52	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	1.6	-	Ω
C _{iSS}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz	-	4687	-	pF
C _{oSS}	Output Capacitance		-	665	-	
C _{rSS}	Reverse Transfer Capacitance		-	235	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =40V, R _G =6 Ω, I _{DS} =70A, V _{GS} =10V,	-	26	-	ns
T _r	Turn-on Rise Time		-	17	-	
t _{d(OFF)}	Turn-off Delay Time		-	41	-	
T _f	Turn-off Fall Time		-	53	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =64V, V _{GS} =10V, I _{DS} =70A	-	115	-	nC
Q _{gs}	Gate-Source Charge		-	15	-	
Q _{gd}	Gate-Drain Charge		-	44	-	

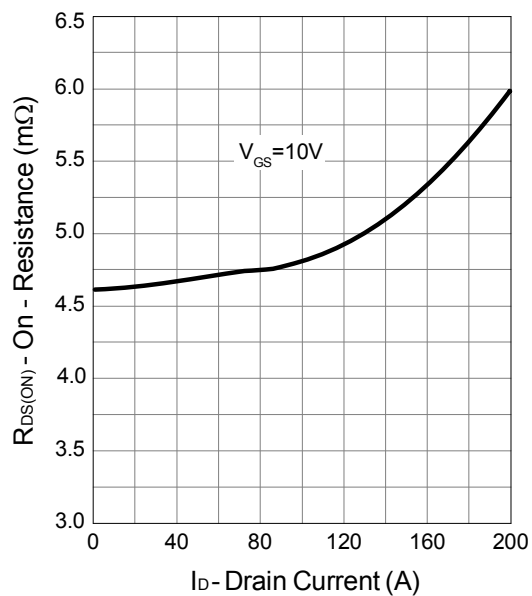
Note * : Pulse test ; pulse width ≤ 300μs, duty cycle ≤ 2%.

Typical Operating Characteristics

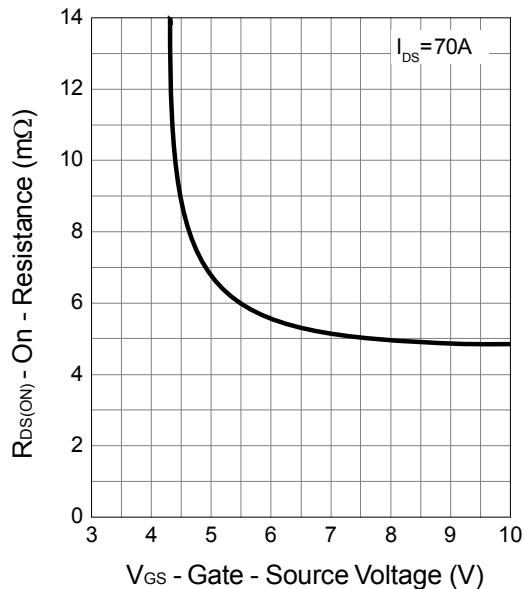
Output Characteristics



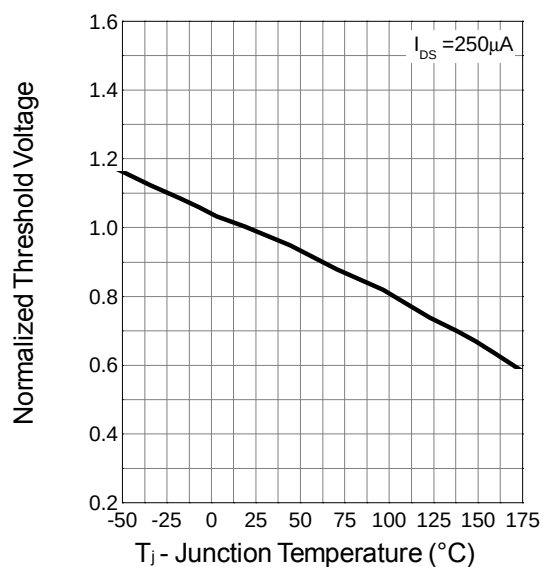
Drain-Source On Resistance



Gate-Source On Resistance

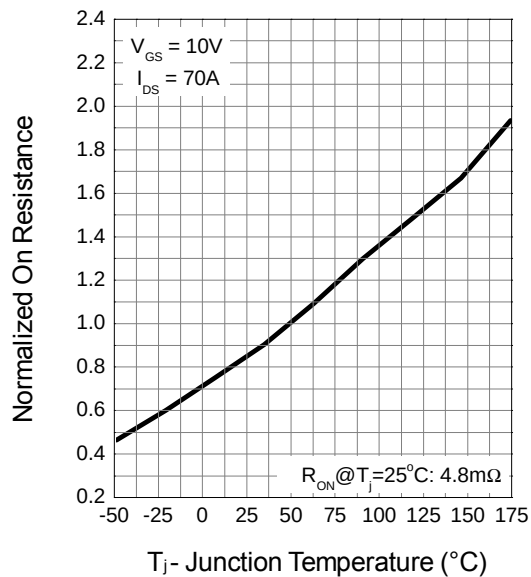


Gate Threshold Voltage

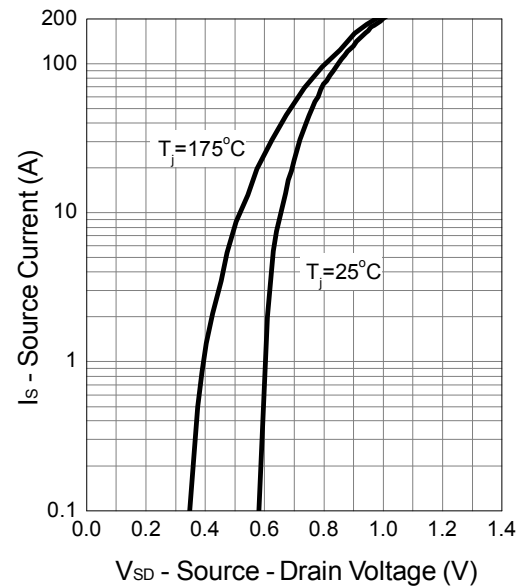


Typical Operating Characteristics (Cont.)

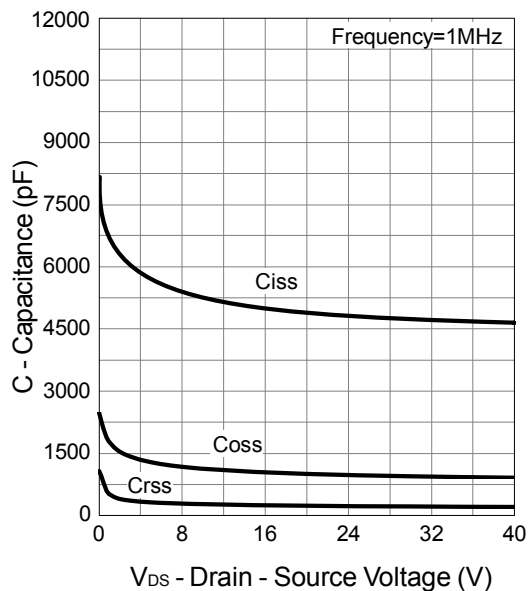
Drain-Source On Resistance



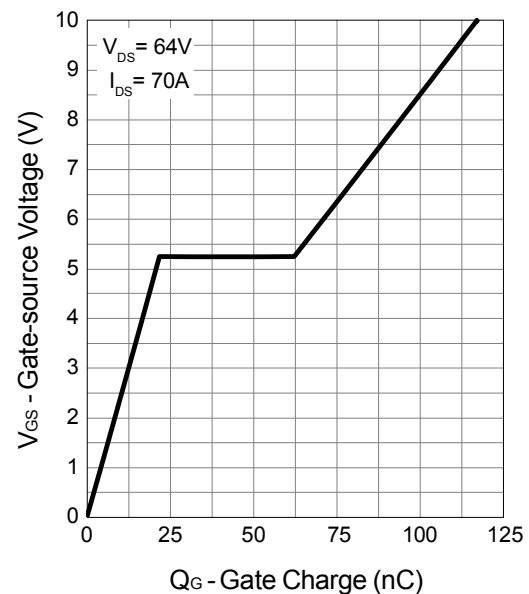
Source-Drain Diode Forward



Capacitance

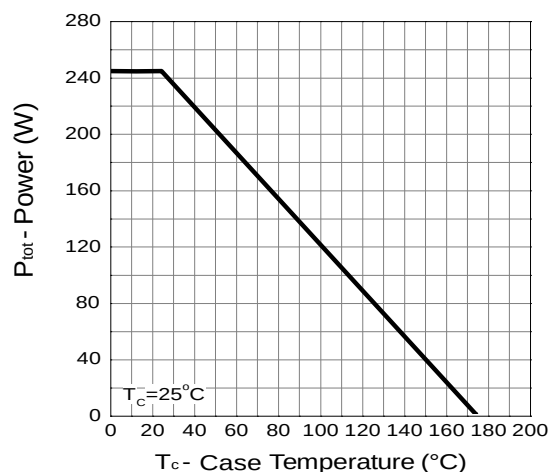


Gate Charge

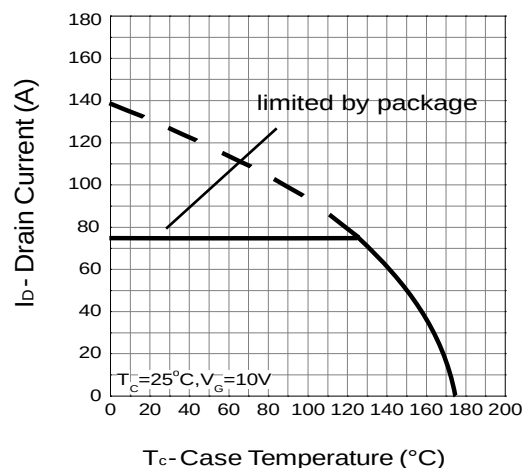


Typical Operating Characteristics (Cont.)

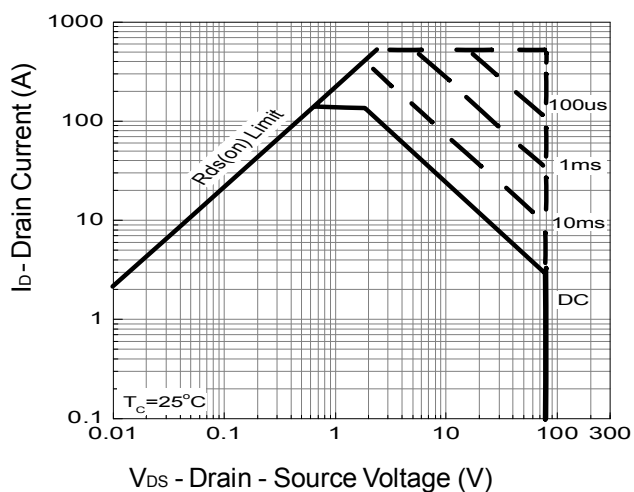
Power Dissipation



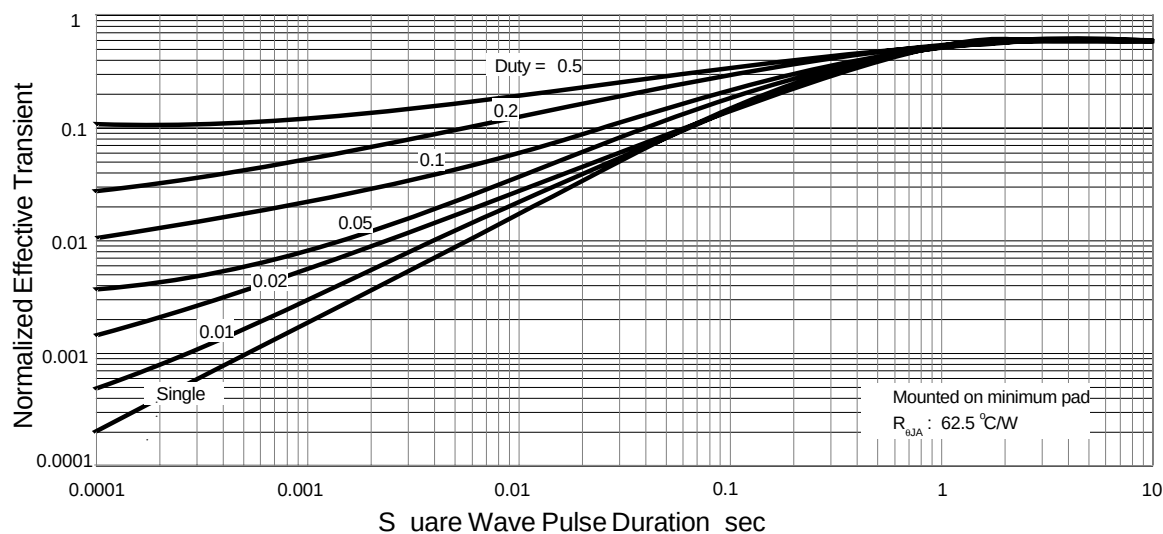
Drain Current



Safe Operation Area



Thermal Transient Impedance



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