

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_{DSON}	I_D
80V	4.8mΩ	140A

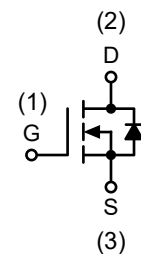
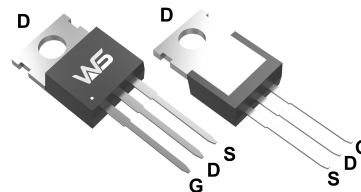
Applications

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-220-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	80	V
V_{GSS}	Gate-Source Voltage	± 25	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 140	A
Mounted on Large Heat Sink			
I_{DM}	Pulsed Drain Current *	$T_C=25^\circ\text{C}$ 551**	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 140	A
		$T_C=100^\circ\text{C}$ 91	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 250	W
		$T_C=100^\circ\text{C}$ 125	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.61	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	
Avalanche Ratings			
E_{AS}	Avalanche Energy, Single Pulsed	$L=0.5\text{mH}$ 762***	mJ

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

** Drain current is limited by junction temperature

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

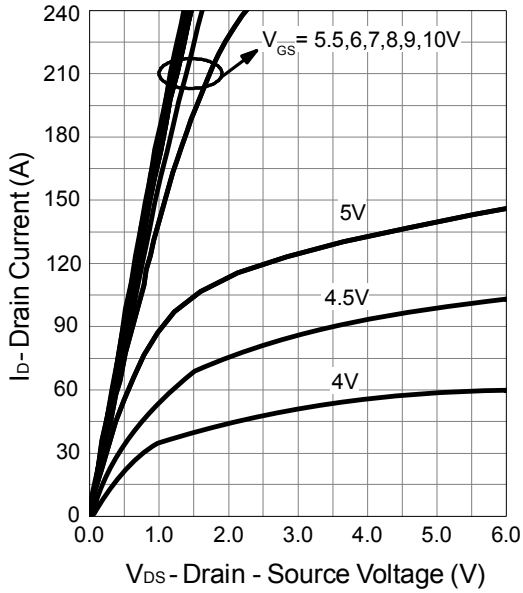
Electrical Characteristics ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$	-	-	1	μA
			-	-	10	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2.0	3.0	4.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(ON)}^*$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=70A$	-	4.8	6.0	m Ω
Diode Characteristics						
V_{SD}^*	Diode Forward Voltage	$I_{SD}=70A, V_{GS}=0V$	-	0.8	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=70A, di_{SD}/dt=100A/\mu s$	-	30	-	ns
Q_{rr}	Reverse Recovery Charge		-	52	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	-	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	$V_{DD}=40V, R_G=6\Omega,$ $I_{DS}=70A, V_{GS}=10V,$	-	17	-	ns
T_r	Turn-on Rise Time		-	26	-	
$t_{d(OFF)}$	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	-	

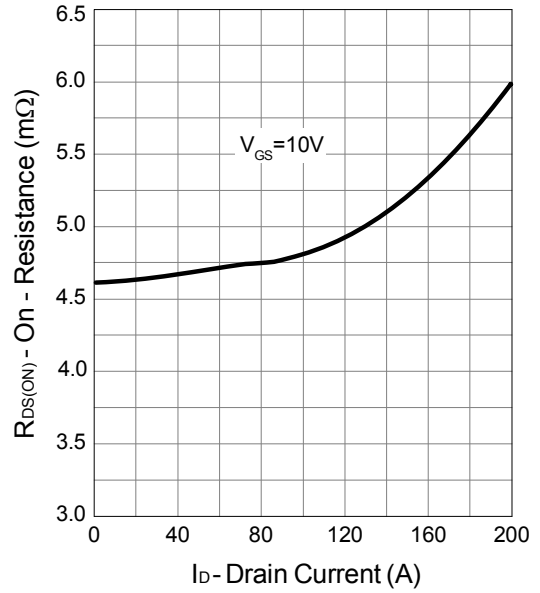
Note * : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Operating Characteristics

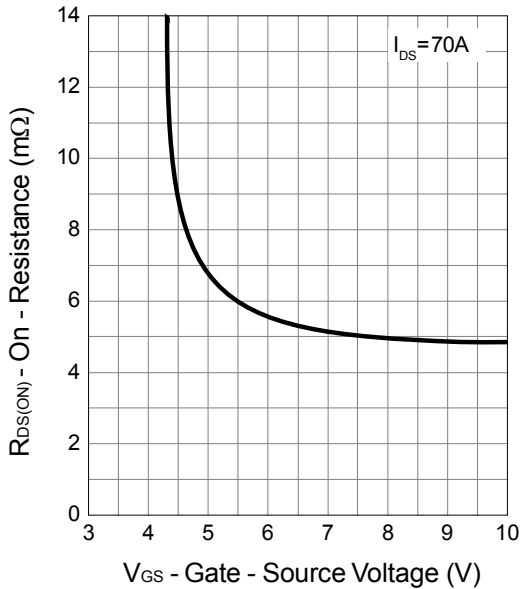
Output Characteristics



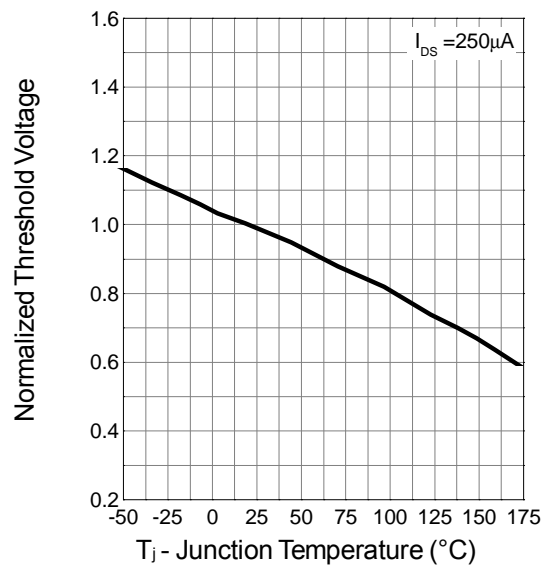
Drain-Source On Resistance



Gate-Source On Resistance

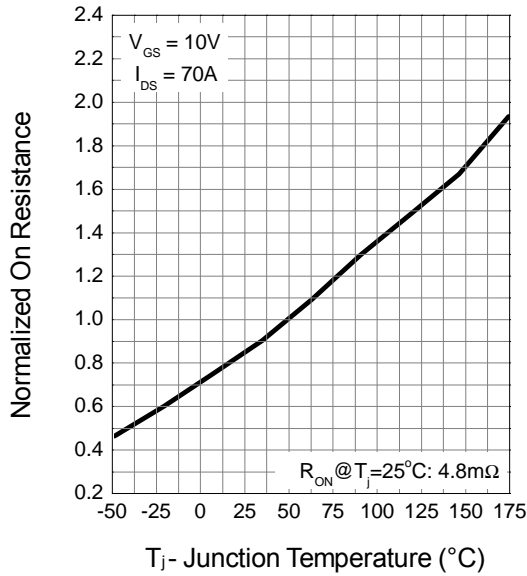


Gate Threshold Voltage

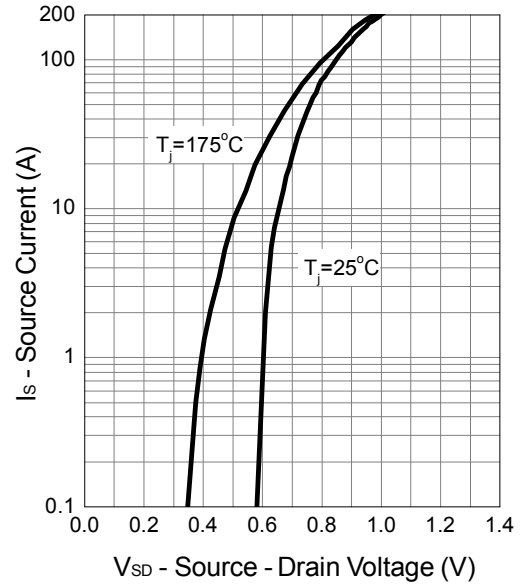


Typical Operating Characteristics (Cont.)

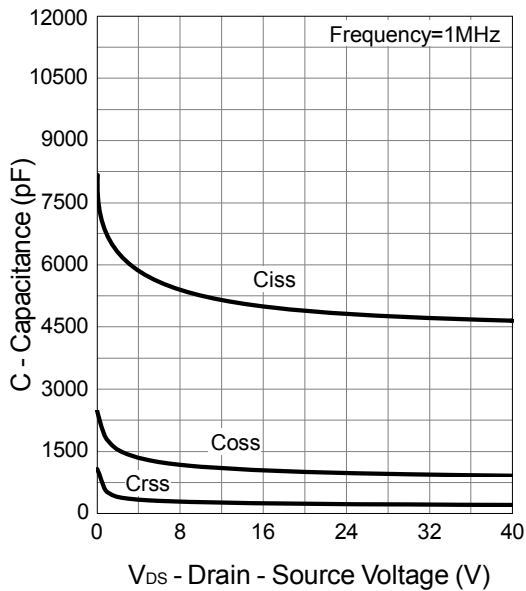
Drain-Source On Resistance



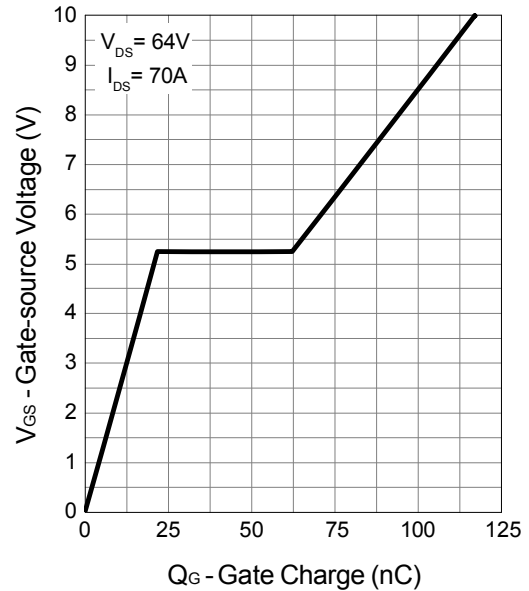
Source-Drain Diode Forward



Capacitance

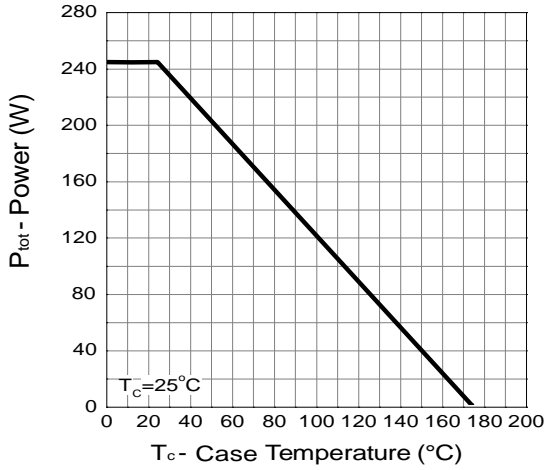


Gate Charge

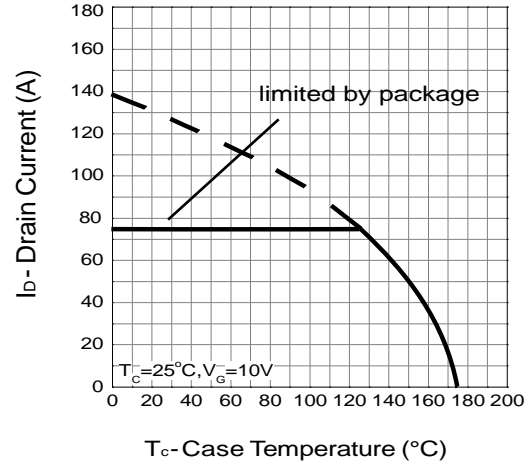


Typical Operating Characteristics (Cont.)

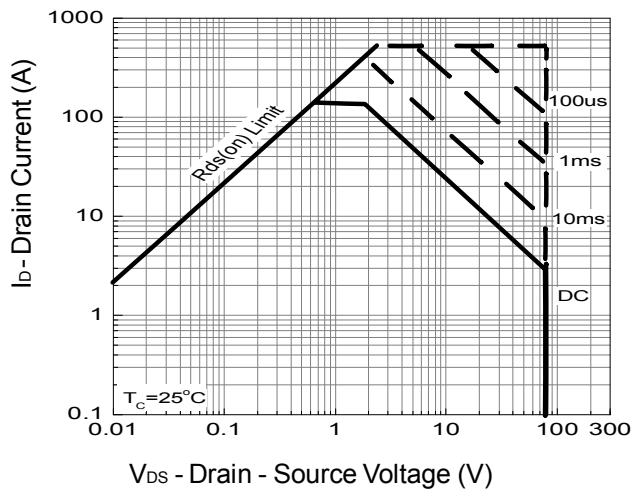
Power Dissipation



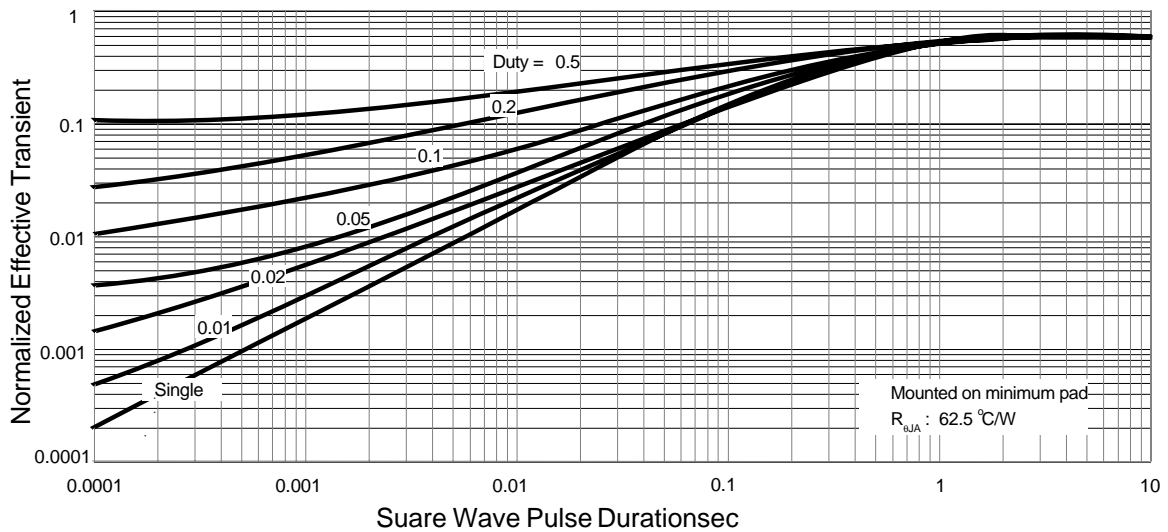
Drain Current

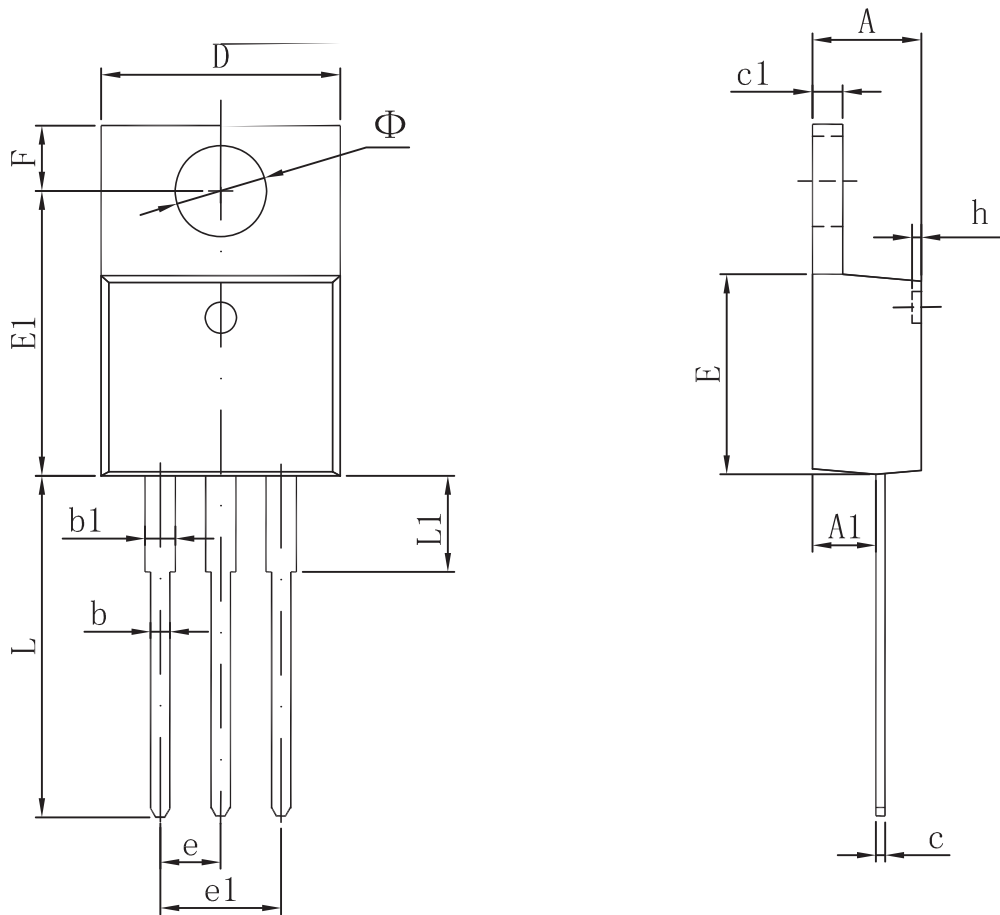


Safe Operation Area



Thermal Transient Impedance



Packaging information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155



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