

General Description

The WSR160N20 is the highest performance trench N-Channel MOSFET with extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the device is suitable for use as a Battery protection or in other Switching application.

The WSR160N20 meet the RoHS and GreenProduct 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

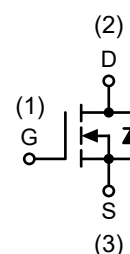
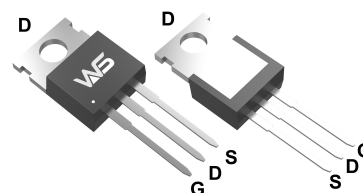
Product Summary

BV _{DSS}	R _{DS(on)}	I _D
200V	7.2mΩ	160A

Applications

- DC/DC converter
- DC/AC inverter
- Solar micro inverter

TO-220-3L Pin Configuration



5 V_{GS} i_D H_{FE} A_U j a i a F_U h_g g_{AV} A_{MG} » Ô_{AV} | ^ • • A_U c_o i , ã ^ A_p [c_o a_D

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	200	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ³	160	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ³	78	A
I _{DM}	Pulsed Drain Current ² T _C =25°C	492	A
P _D @T _C =25°C	Total Power Dissipation	329	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Resistance Ratings

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance Junction-Case	---	0.38	°C/W

Electrical Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	---	7.2	9.4	$m\Omega$
		$V_{GS}=8.0V, I_D=20A$	---	7.3	10	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	3.0	4.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=160V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Q_g	Total Gate Charge	$V_{DS}=100V, V_{GS}=10V, I_D=50A$	---	174	---	nC
Q_{gs}	Gate-Source Charge		---	58	---	
Q_{gd}	Gate-Drain Charge		---	26	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=100V, I_D=50A, R_L=2\Omega, R_G=3.9\Omega, V_{GS}=10V$	---	34	---	ns
T_r	Rise Time		---	110	---	
$T_{d(off)}$	Turn-Off Delay Time		---	112	---	
T_f	Fall Time		---	112	---	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	---	11678	---	pF
C_{oss}	Output Capacitance		---	475	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	

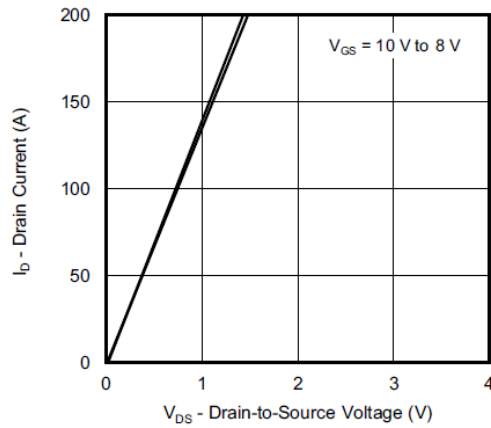
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	123	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=30A, T_J=25^\circ C$	---	---	1.2	V

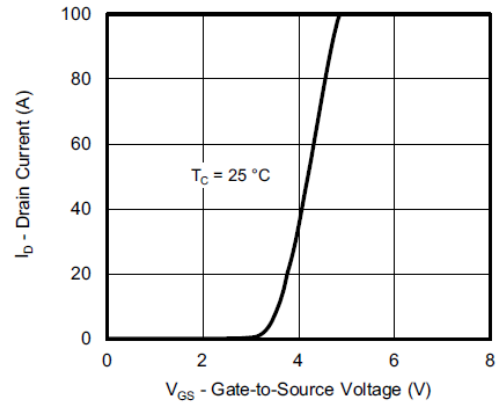
Note :

1. The value of R_{thJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_{\infty}=25^\circ C$. The value in any given application depends on the user's specific board design.
2. Repetitive rating, pulse width limited by junction temperature.
3. The current rating is based on the $\leq 10s$ junction to ambient thermal resistance rating.
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

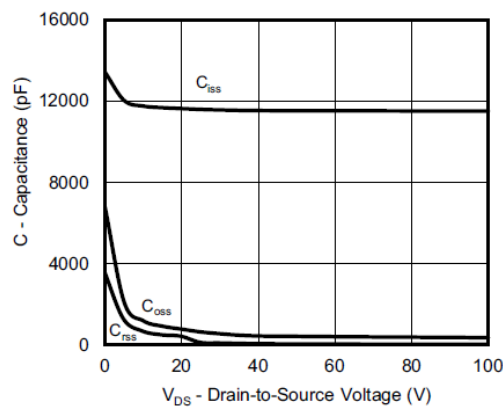
Typical Characteristics



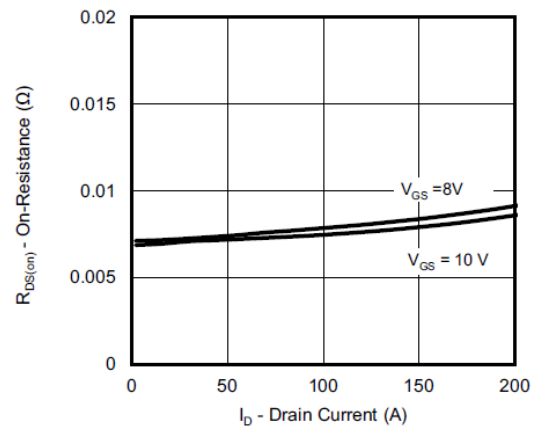
Output Characteristics



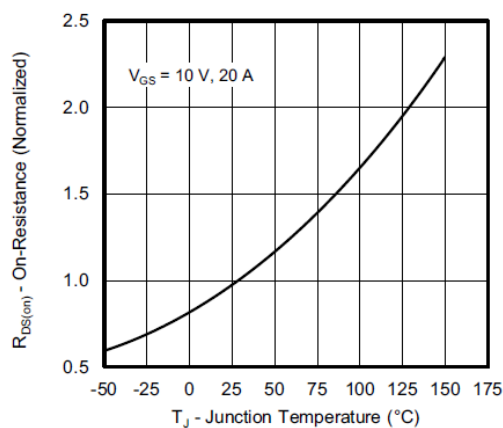
Transfer Characteristics



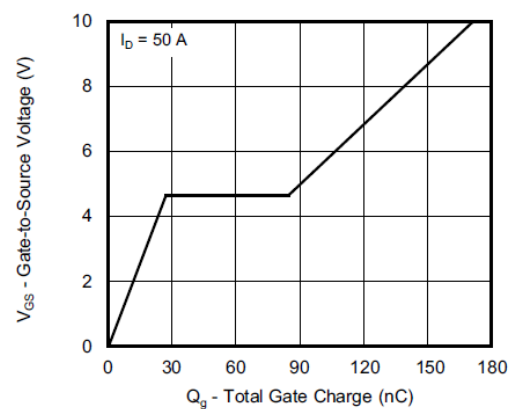
Capacitance



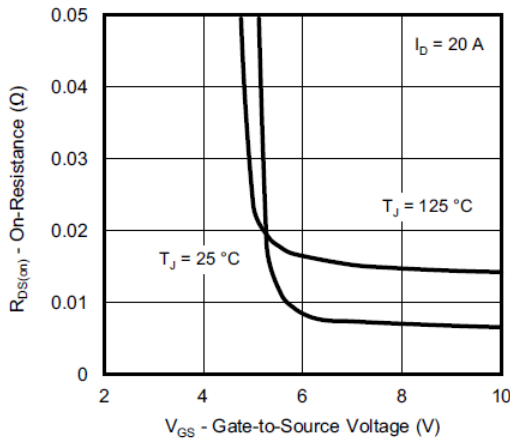
On-Resistance vs. Drain Current



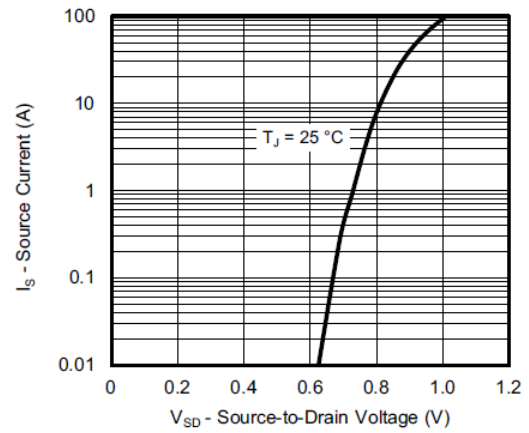
On-Resistance vs. Junction Temperature



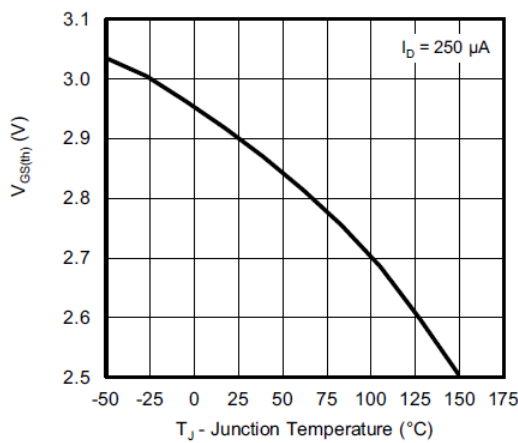
Gate Charge



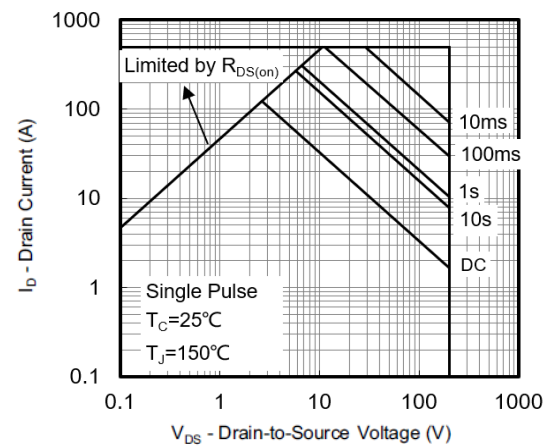
On-Resistance vs. Gate-to-Source Voltage



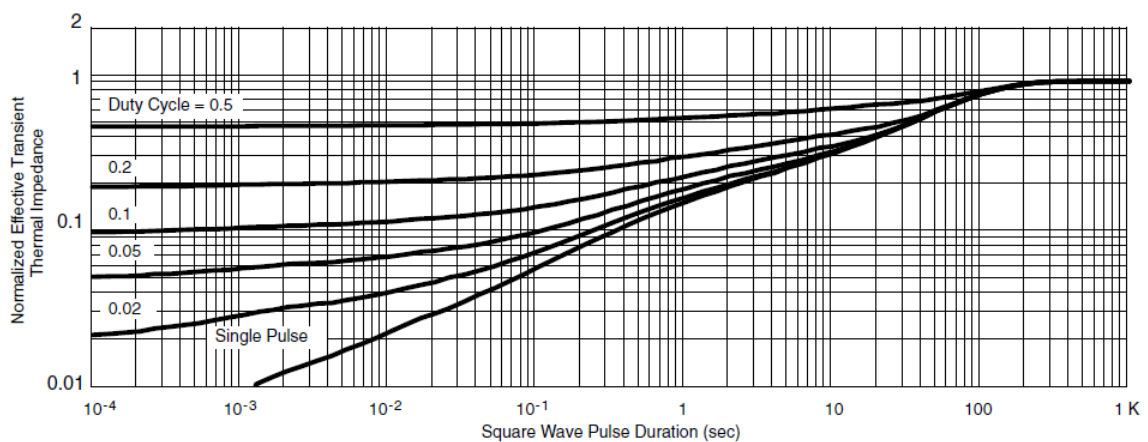
Source Drain Diode Forward Voltage



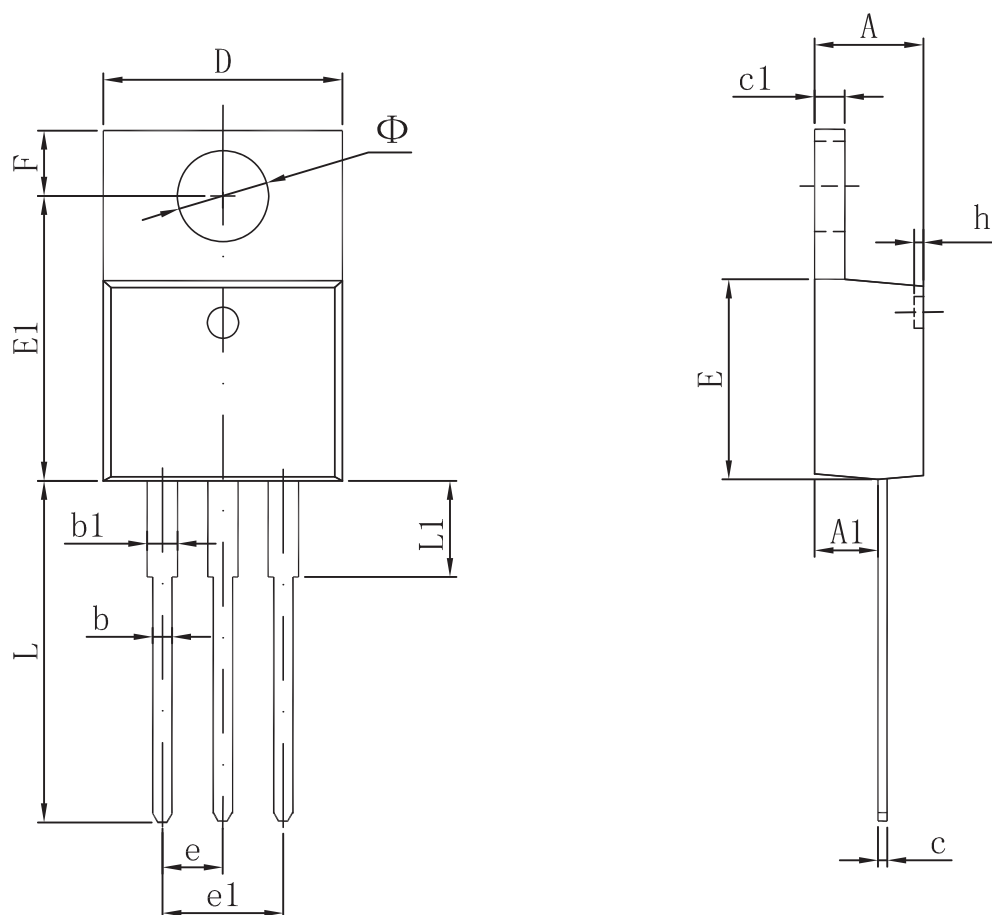
Threshold Voltage



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

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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