

General Description

The WSR160N20 is the highest performance trench N-Channel MOSFET with extreme high cell density, which provide excellent RDSON 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

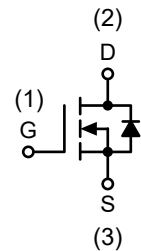
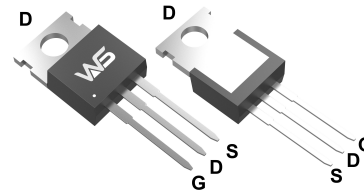
Product Summary

BV _{DSS}	R _{DSON}	I _D
200V	7.2mΩ	160A

Applications

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

TO-220-3L Pin Configuration



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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 =250uA	200	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A	---	7.2	9.4	mΩ
		V _{GS} =8.0V, I _D =20A	---	7.3	10	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =160V, V _{GS} =0V, T _J =25°C	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±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 =2Ω, R _G =3.9Ω, 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	---	

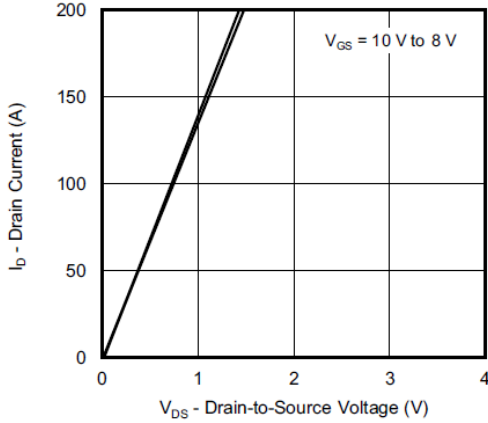
Diode Characteristics

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°C	---	---	1.2	V

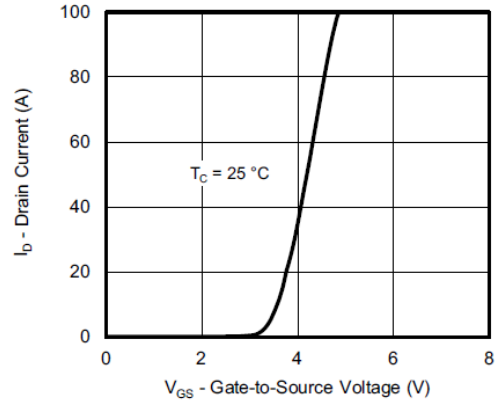
Note :

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_{amb}=25°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 t_{le} ≤ 10s junction to ambient thermal resistance rating.
4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

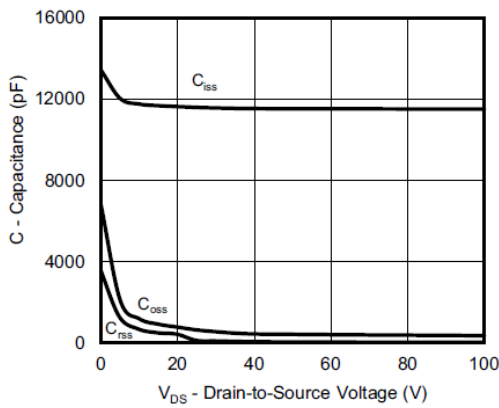
Typical Characteristics



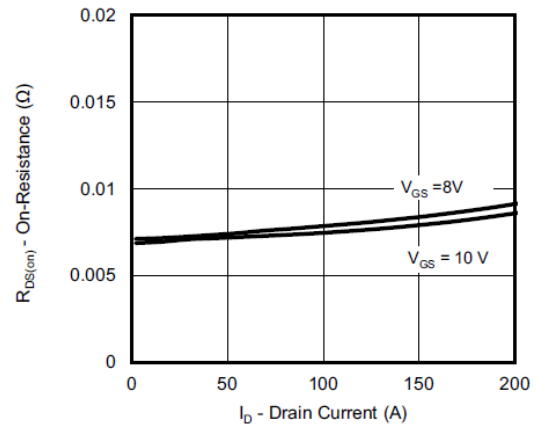
Output Characteristics



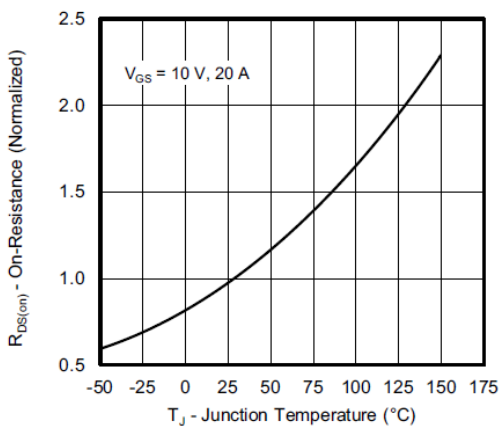
Transfer Characteristics



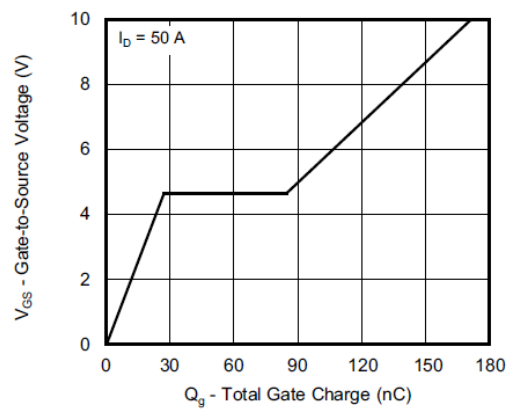
Capacitance



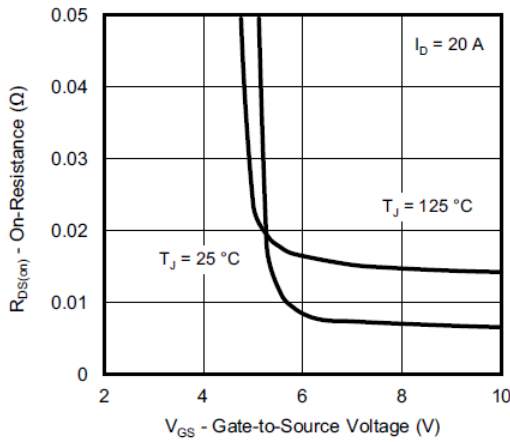
On-Resistance vs. Drain Current



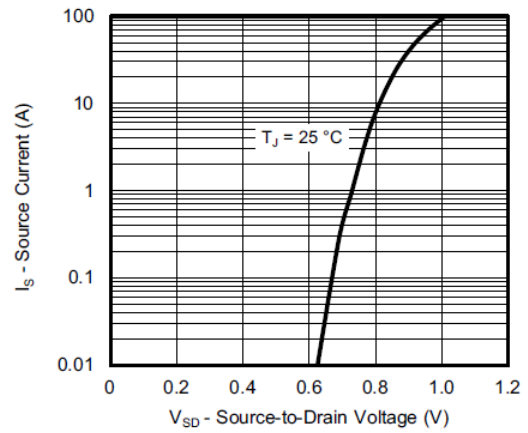
On-Resistance vs. Junction Temperature



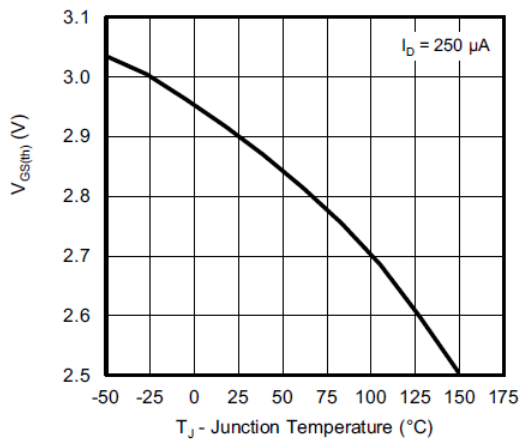
Gate Charge



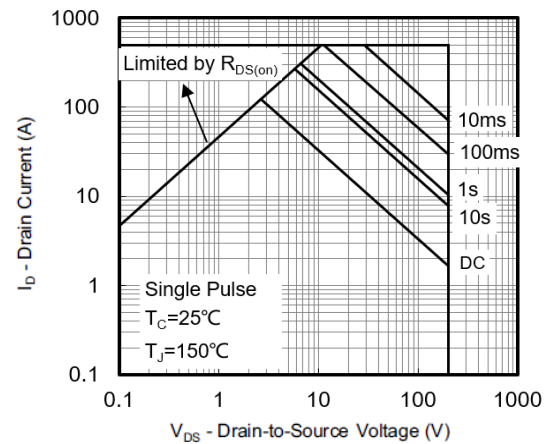
On-Resistance vs. Gate-to-Source Voltage



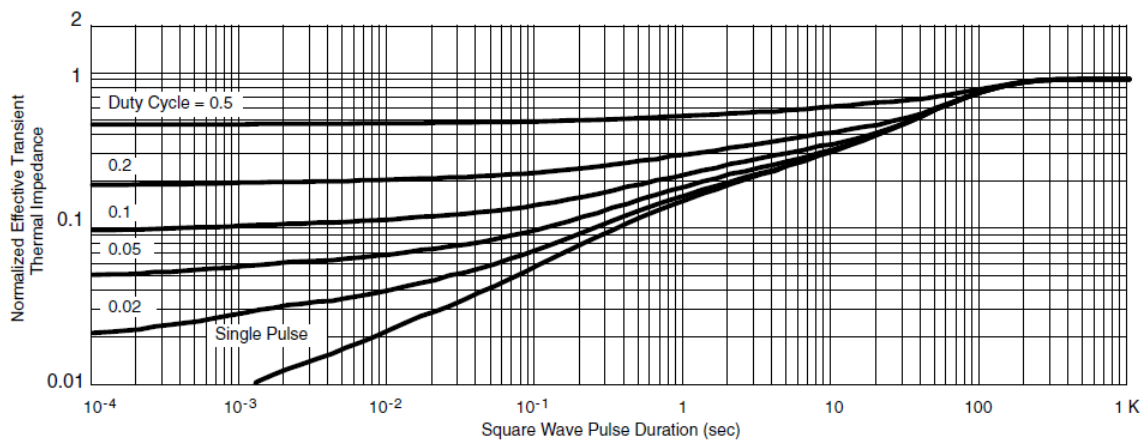
Source Drain Diode Forward Voltage



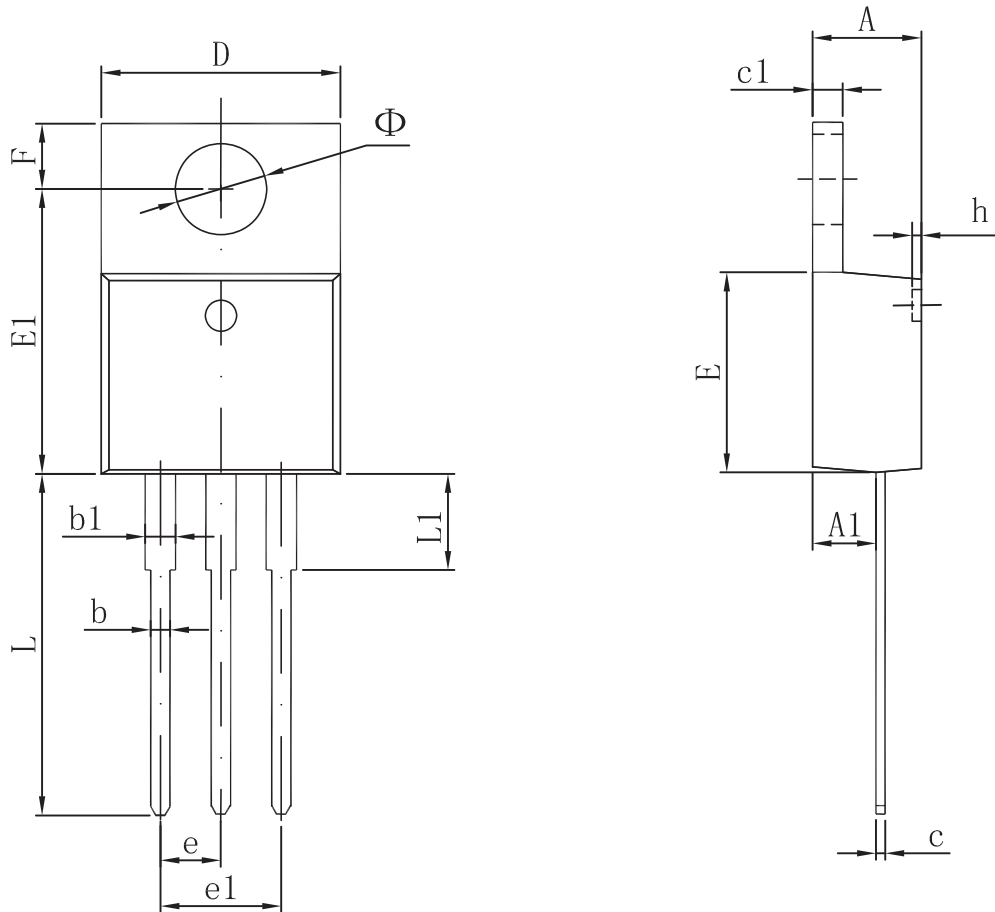
Threshold Voltage



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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