General Description

The WSC5N20G is silicon N-channel Enhanced MOSFET, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

Product Summery

BVDSS	RDSON	ID
200V	530mΩ	5A

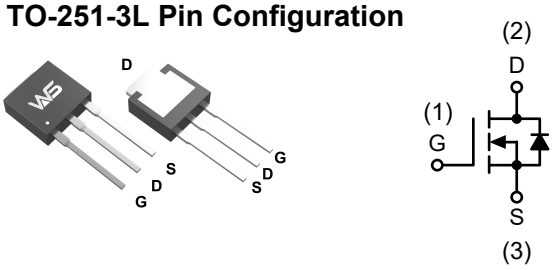
Applications

- Uninterruptible Power Supply

Features

- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

TO-251-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current	5	A
I_{DM}	Pulsed Drain Current	20	A
P_D	Total Power Dissipation	46	W
T_J,T_{STG}	Operating Junction and storage Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State)[1]	---	60	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	---	35	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	2.7	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	200	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.23	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=30A	---	530	600	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.5	3.1	4.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-6.16	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=200V , V_{GS}=0V , T_J=25℃	---	---	5	uA
		V_{DS}=160V , V_{GS}=0V , T_J=55℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA

Dynamic @ TJ = 25°C (unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
gfs	Forward Transconductance	V_{DS}=50V , I_D=2.9A	2.6	---	---	S
Q_g	Total Gate Charge (4.5V)	V_{DS}=160V , V_{GS}=10V , I_D=5A	---	18	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	
Q_{gd}	Gate-Drain Charge		---	9.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=100V , V_{GS}=10V , R_G=24Ω , I_D=5A	---	10	---	ns
T_r	Rise Time		---	19	---	
$T_{d(off)}$	Turn-Off Delay Time		---	32	---	
T_f	Fall Time		---	43	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	280	---	pF
C_{oss}	Output Capacitance		---	48	---	
C_{rss}	Reverse Transfer Capacitance		---	17	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	5	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=5A , T_J=25℃	---	---	1.2	V

Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
E_{AS}	Single Pulse Avalanche Energy	V_{GS}=10V,L=0.1mH,I_{AS}=5A	---	---	48	mJ
E_{AR}	Repetitive Avalanche Energy	V_{GS}=10V,L=0.1mH,I_{AS}=5A	---	---	4.3	mJ

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper,t<10sec.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=100V,V_{GS}=10V,L=0.1mH,I_{AS}=5A
4.The power dissipation is limited by 175℃ junction temperature
5.The Min. value is 100% EAS tested guarantee.
6.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

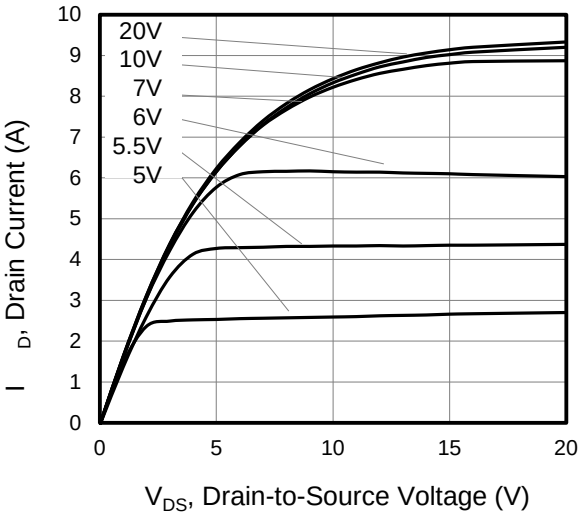


Figure 1. Output Characteristics (T_J = 25ºC)

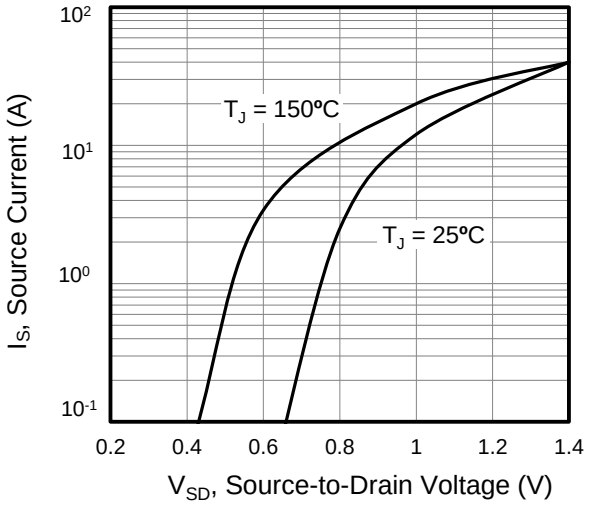


Figure 2. Body Diode Forward Voltage

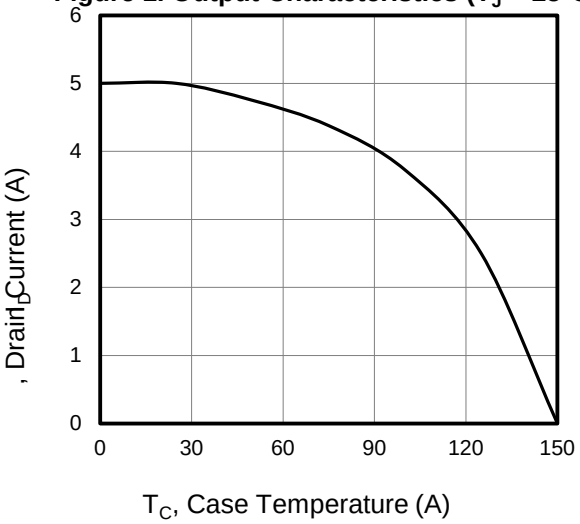


Figure 3. Drain Current vs. Temperature

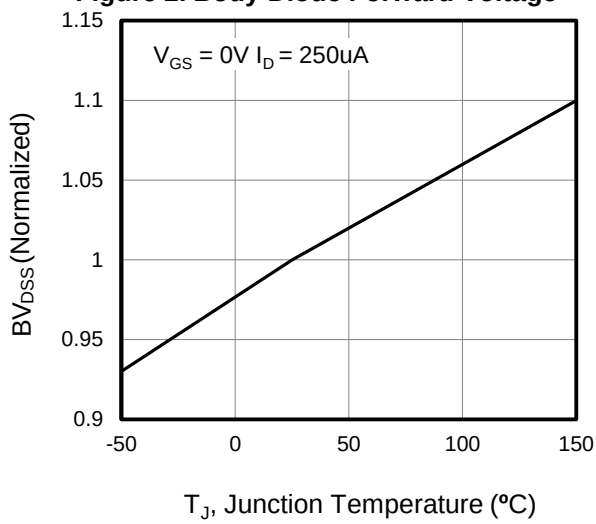


Figure 4. BV_{DSS} Variation vs. Temperature

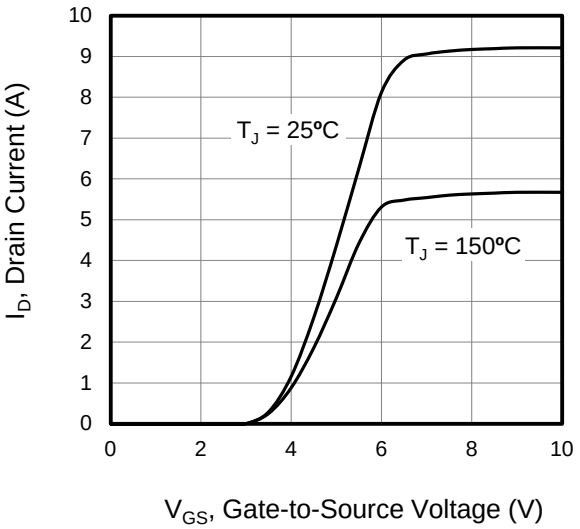


Figure 5. Transfer Characteristics

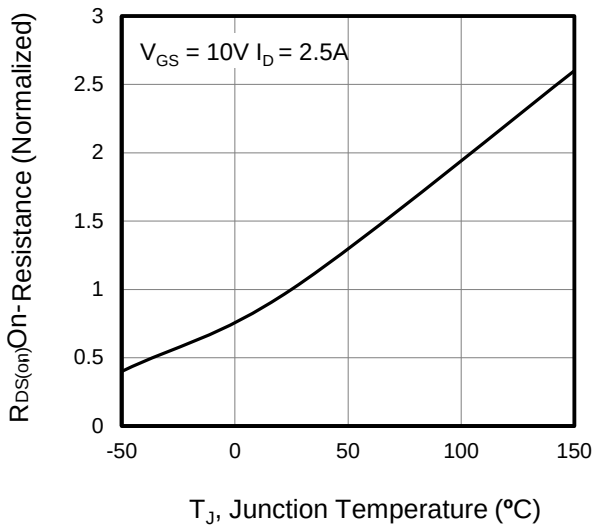


Figure 6. On-Resistance vs. Temperature

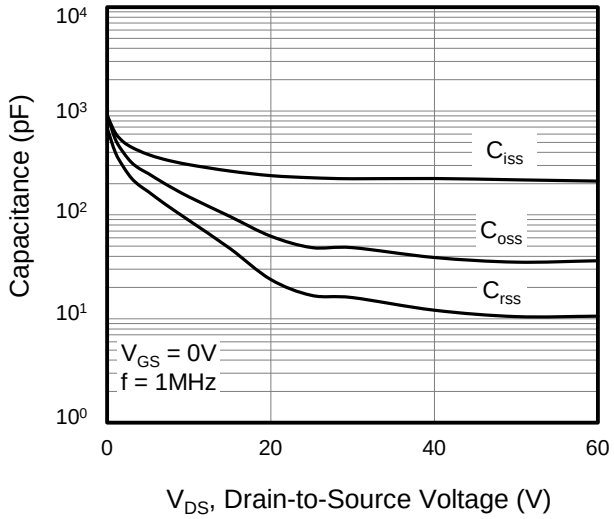


Figure 7. Capacitance

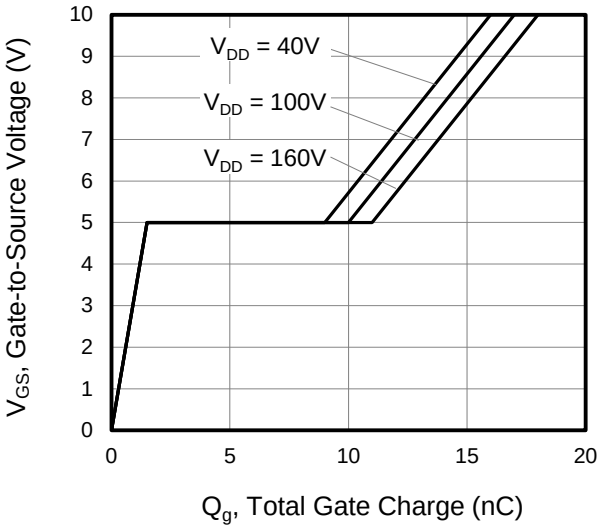


Figure 8. Gate Charge

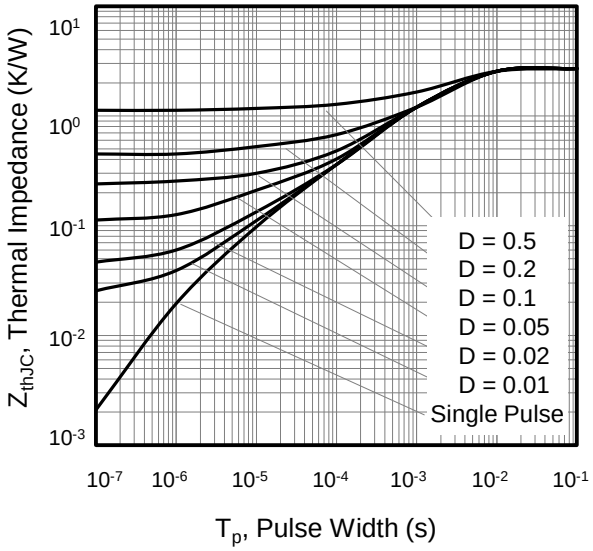
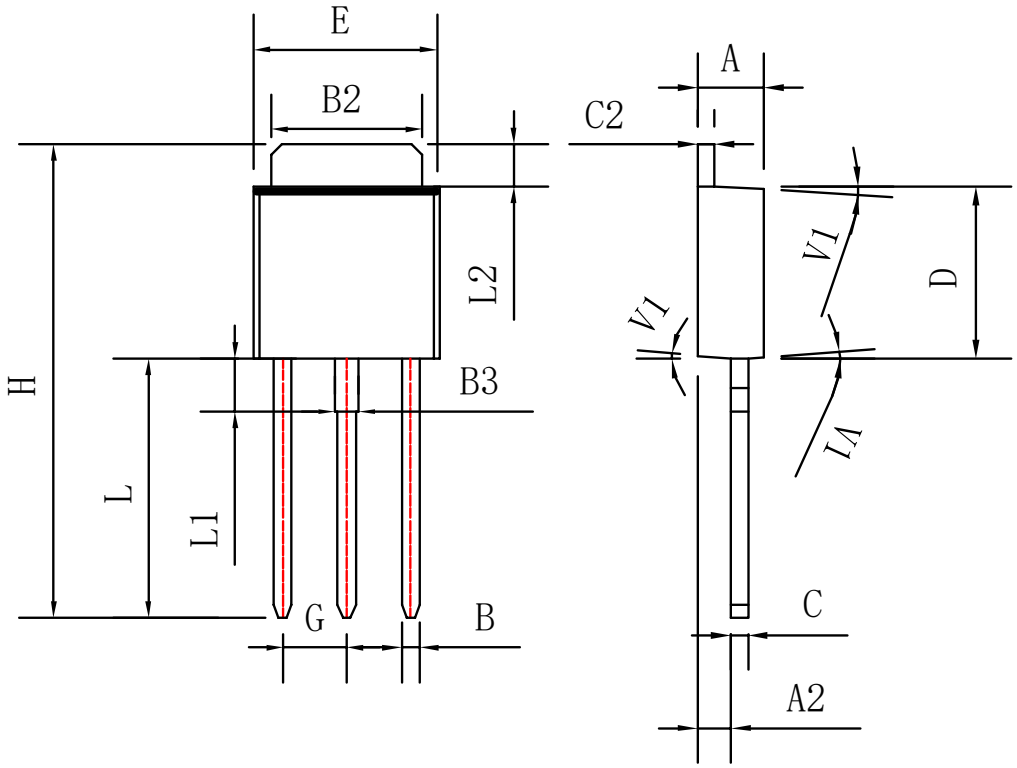


Figure 10. Transient Thermal Impedance

Packaging information



SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.20	2.40	0.086	0.095
A2	0.90	1.20	0.035	0.047
B	0.55	0.65	0.022	0.026
B2	5.10	5.40	0.200	0.213
B3	0.76	0.85	0.030	0.033
C	0.45	0.62	0.018	0.024
C2	0.48	0.62	0.019	0.024
D	6.00	6.20	0.236	0.244
E	6.40	6.70	0.252	0.264
G	2.30 TYP		0.091 TYP	
H	16.0	17.0	0.630	0.669
L	8.90	9.40	0.350	0.370
L1	1.80	1.90	0.071	0.075
L2	1.37	1.50	0.054	0.059
V1	4°		4°	

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