GOODWORK

9N20

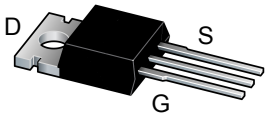
N-Channel Enhancement Mode MOSFET

Application

Battery protection

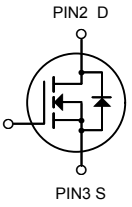
Load switch

Uninterruptible power supply



Description

The 9N20 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching applicat



General Features

V_{DS} = 200V I_D =9A

$R_{DS(ON)}$ < 270mΩ @ V_{GS}=10V

Package Marking and Ordering Information

Product ID	Pack	Marking
9N20	TO-220	9N20

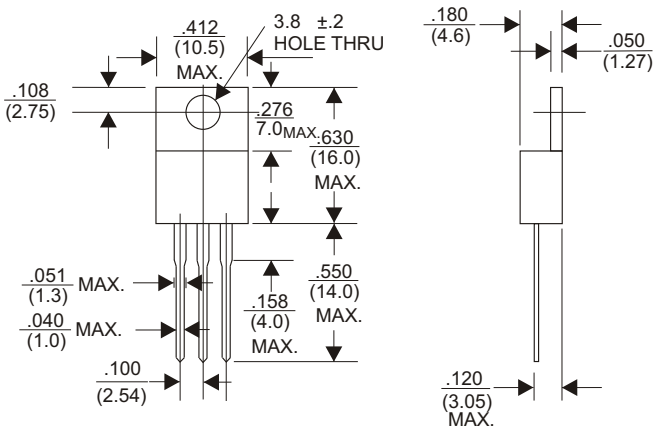
VOLTAGE RANGE

45 to 200 Volts

CURRENT

10.0 Amperes

TO-220



Dimensions in inches and (millimeters)

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	9	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	5.2	A
I_{DM}	Pulsed Drain Current[2]	10	A
EAS	Single Pulse Avalanche Energy[3]	2.45	mJ
I_{AS}	Avalanche Current	7	A
P_D@T_C=25℃	Total Power Dissipation[4]	60	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State)[1]	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.5	℃/W

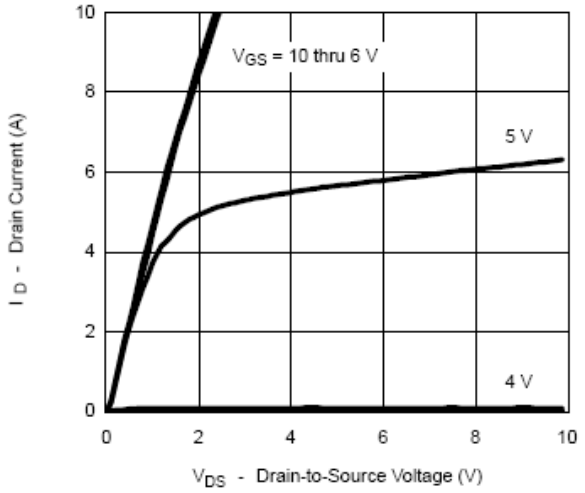
9N20

ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

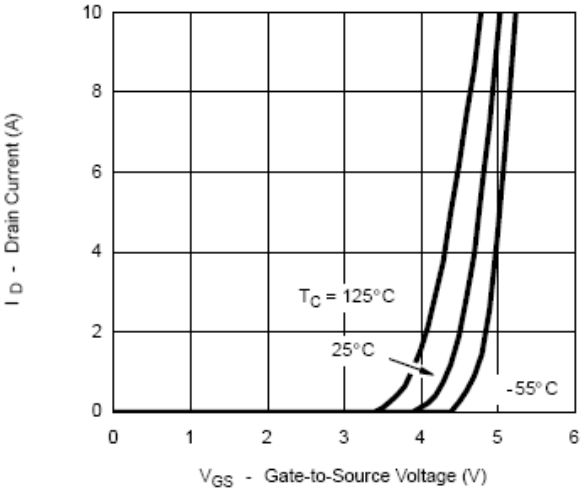
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS}=0V,I_D=250μA	200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=160V, V_{GS}=0V	-	-	1	μA
		V_{DS}=160V,V_{GS}=0V,T_J=125℃			50	
		V_{DS}=160V,V_{GS}=0V,T_J=175℃			250	
Gate-body Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2	-	4	V
On-State Drain Currenta	$I_{D(on)}$	VDS ≥5 V, VGS =10 V	10	-	-	A
Static drain-Source On-resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=5A	-	0.216	0.270	Ω
		V_{GS}=10V,I_D=5A,T_J=125℃	-	-	0.54	
		V_{GS}=10V,I_D=5A,T_J=175℃	-	-	0.71	
		V_{GS}=6V,I_D=5A	-	0.24	0.3	
Forward Transconductance	g_{fs}	V_{DS}=15V,I_D=5A	-	15	-	S
Input Capacitance	C_{ISS}	V_{DS}=25V,V_{GS}=0V,f=1MHz	-	580	-	pF
Output Capacitance	C_{OSS}		-	75	-	
Reverse Transfer Capacitance	C_{RSS}		-	30	-	
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 100V, I_D=10A R_L= 10ΩR_G= 2.5Ω,V_{GEN}=10V	-	10	15	ns
Rise Time	t_R		-	35	55	
Turn-Off Delay Time	$t_{D(OFF)}$		-	25	40	
Fall Time	t_F		-	40	60	
Total Gate Charge	Q_g	V_{DS}=100V,V_{GS}=10V I_D=10A	-	11	70	nC
Gate-source Charge	Q_{gs}		-	2.7	-	nC
Gate-drain Charge	Q_{gd}		-	4	-	nC
Reverse Recovery Time	Trr	I_F=10A dIF/dt=100A/μs	-	100	150	ns
Reverse Recovery Charge	Qrr		-	0.25	0.6	μC
Reverse Recovery Current	I_{RM}		-	5	8	A
Continuous Current	I_S		-	-	9	A
Pulsed Current	I_{SM}				10	A
Forward Voltagea	V_{SD}	I_F = 10 A, V_{GS} = 0 V		0.9	1.5	V

RATING AND CHARACTERISTIC CURVES (9N20)

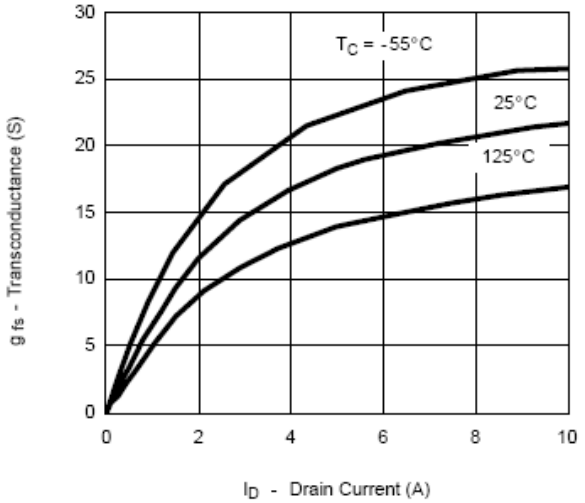
Output Characteristics



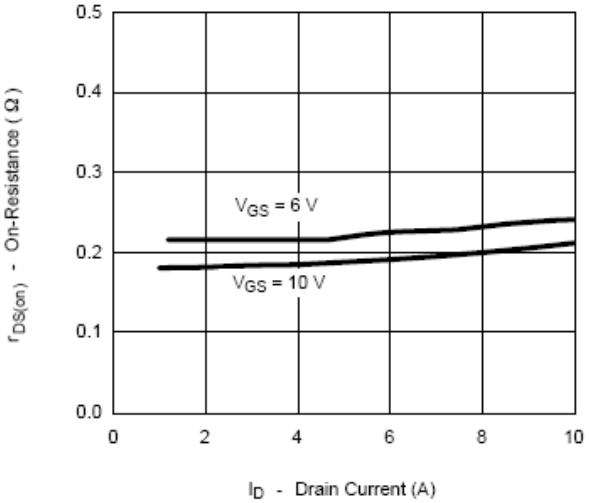
Transfer Characteristics



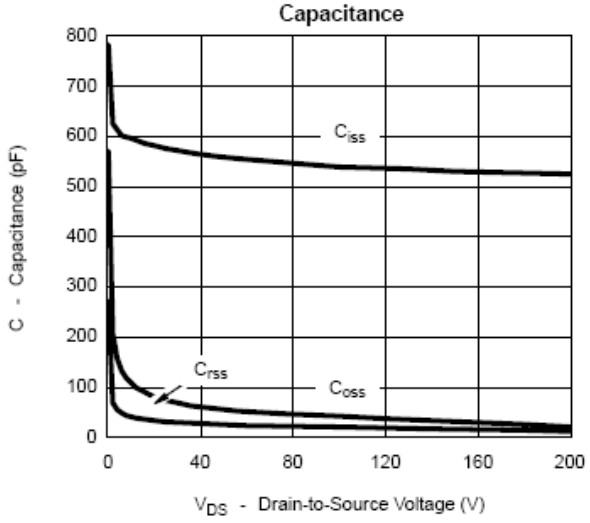
Transconductance



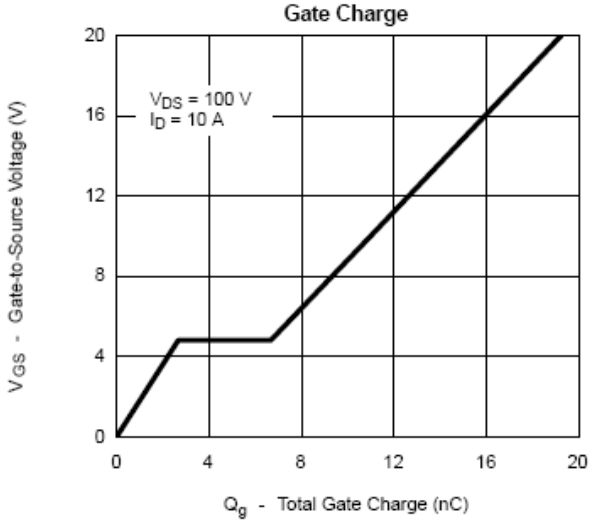
On-Resistance vs. Drain Current



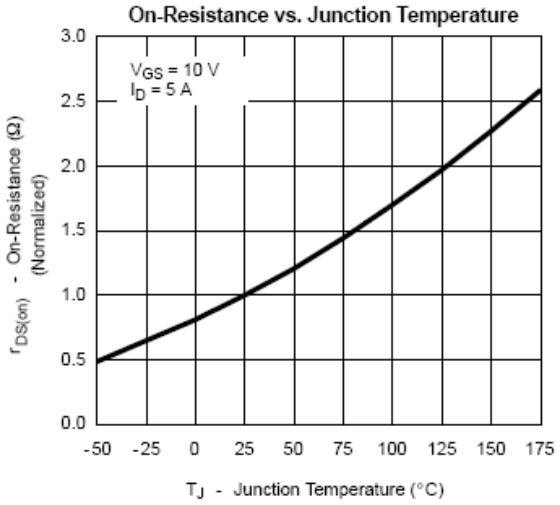
Capacitance

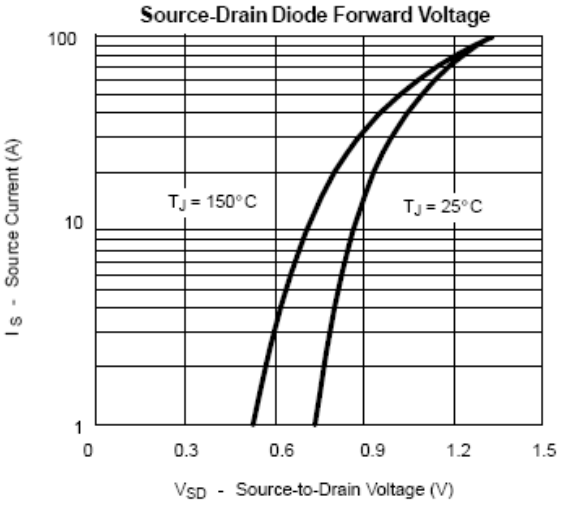


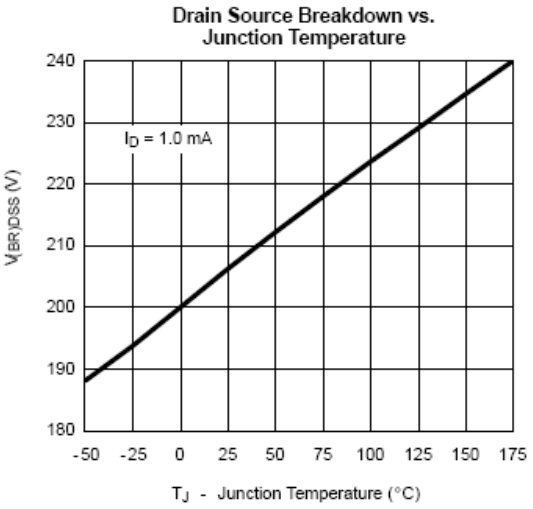
Gate Charge



RATING AND CHARACTERISTIC CURVES (9N20)







RATING AND CHARACTERISTIC CURVES (9N20)