S9MNB022

20V Dual N-Channel MOSFETs

Pb RoHS

General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
20 V	22 mΩ	6 A

Features

- 20V, 6A, $R_{DS(ON)}$=22mΩ@V_{GS}=4.5V
- Improved dv/dt capability
- Fast switching
- Green Device Available

TSSOP-8 Pin Configuration
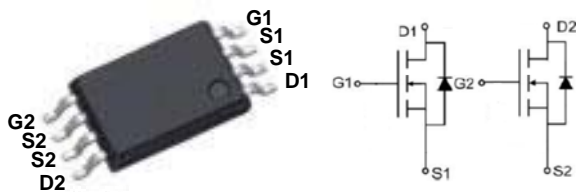
Applications

- MB / VGA / Vcore
- Portable Equipment
- Battery Powered System
- LCD Display inverter
- Load Switch

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current - Continuous (T_C=25°C)	6	A
	Drain Current - Continuous (T_C=70°C)	4.8	
I_{DM}	Drain Current - Pulsed	20	A
I_S	Continuous Source Current (Diode Conduction)	1.6	A
P_D	Maximum Power Dissipation (T_A=25°C)	1.07	W
	Maximum Power Dissipation (T_A=70°C)	0.68	
T_J	Operating Junction Temperature Range	-50 to 150	^{o}C
T_{STG}	Storage Temperature Range	-50 to 150	^{o}C
Marking Code		NB022	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	117	^{o}C/W

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N Channel Electrical Characteristics (T$_J$=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=250uA	20	---	---	V
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=16V , V$_{GS}$=0V	---	---	1	uA
		V$_{DS}$=16V , V$_{GS}$=0V , T$_J$=85°C	---	---	10	uA
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±12V , V$_{DS}$=0V	---	---	±30	uA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R$_{DS(ON)}$	Static Drain-Source On-Resistance (NOTE 2)	V$_{GS}$=4.5V , I$_D$=6A	---	19	22	mΩ
		V$_{GS}$=2.5V , I$_D$=3.2A	---	23	28	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$=250uA	0.5	---	1.2	V
gfs	Forward Trans conductance	V$_{DS}$=5V , I$_D$=3.6A	---	10	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q$_g$	Total Gate Charge	V$_{DS}$=10V , V$_{GS}$=4.5V , I$_D$=1A	---	8.2	---	nC
Q$_{gs}$	Gate-Source Charge		---	1.2	---	
Q$_{gd}$	Gate-Drain Charge		---	1	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DS}$=10V , V$_{GS}$=4.5V , R$_G$=1Ω , I$_D$=5A	---	10	16	nS
T$_r$	Rise Time		---	16	25	
T$_{d(off)}$	Turn-Off Delay Time		---	31	45	
T$_f$	Fall Time		---	10	16	
C$_{iss}$	Input Capacitance	V$_{DS}$=10V , V$_{GS}$=0V , F=1MHz	---	850	---	pF
C$_{oss}$	Output Capacitance		---	120	---	
C$_{rss}$	Reverse Transfer Capacitance		---	60	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V$_{SD}$	Diode Forward Voltage	I$_S$=1.6A	---	0.85	1.2	V
	Maximum Body-Diode Continuous Current		---	---	6	A

Characteristics Curves

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current and Gate Voltage

Capacitance

Gate Charge

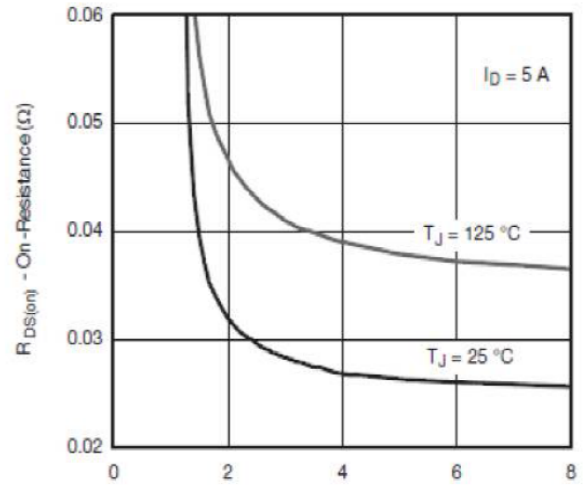**On-Resistance vs. Junction Temperature**

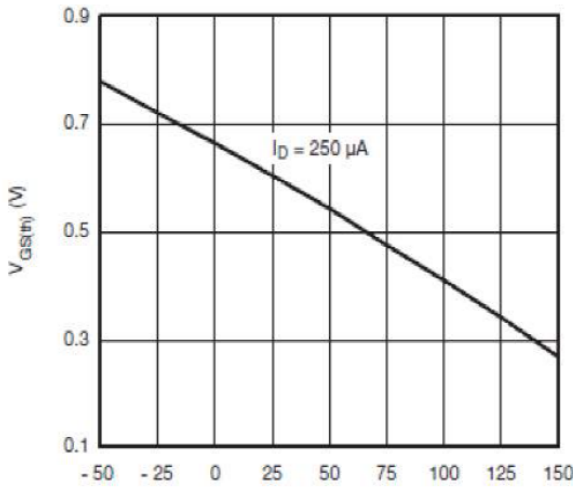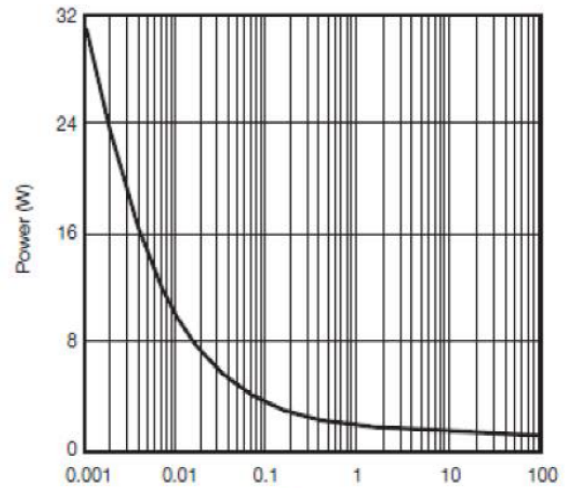# 20V Dual N-Channel MOSFETs
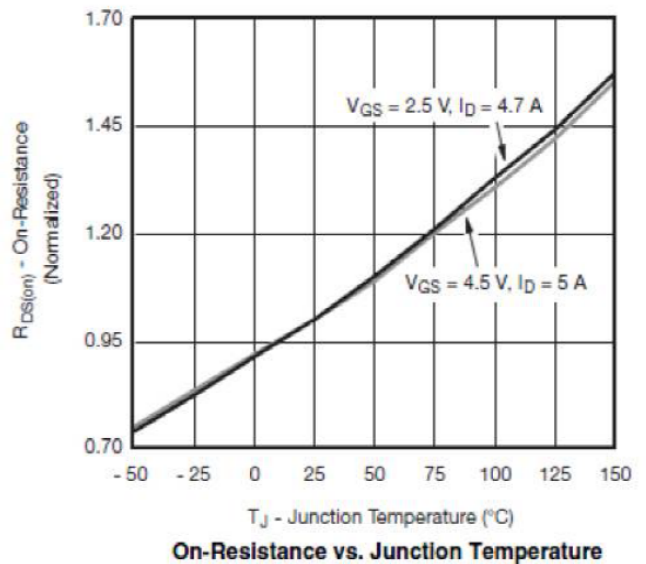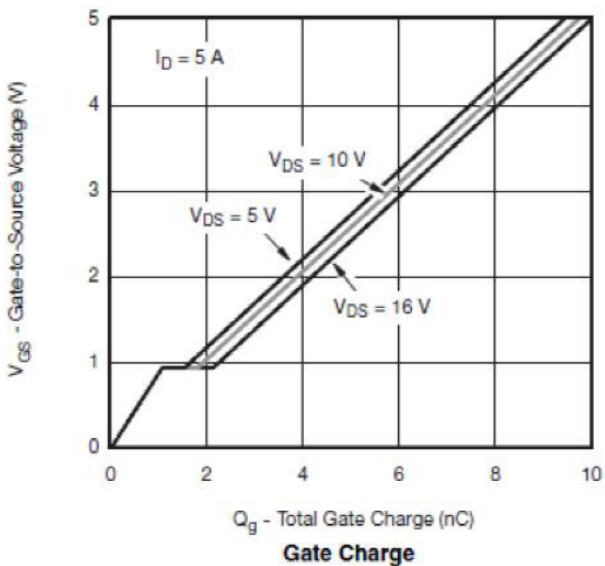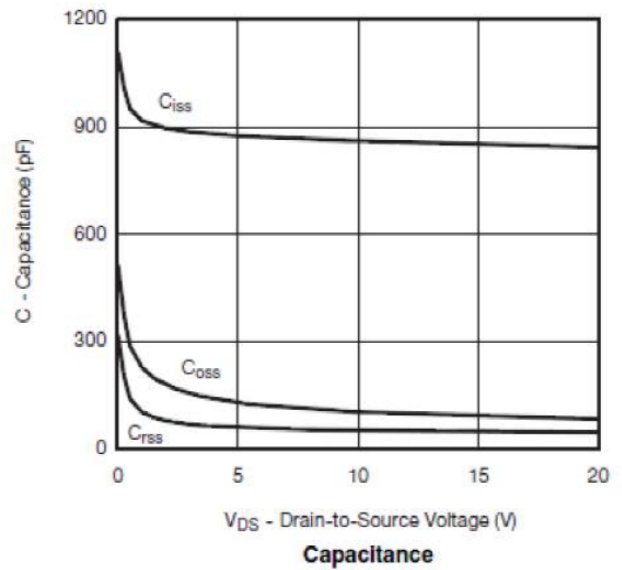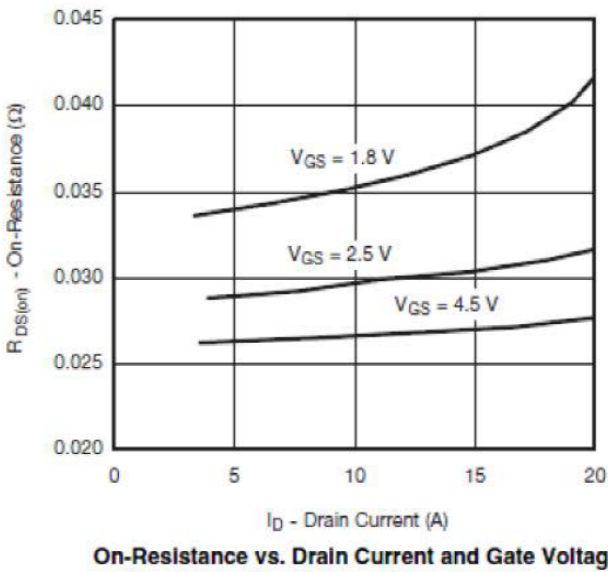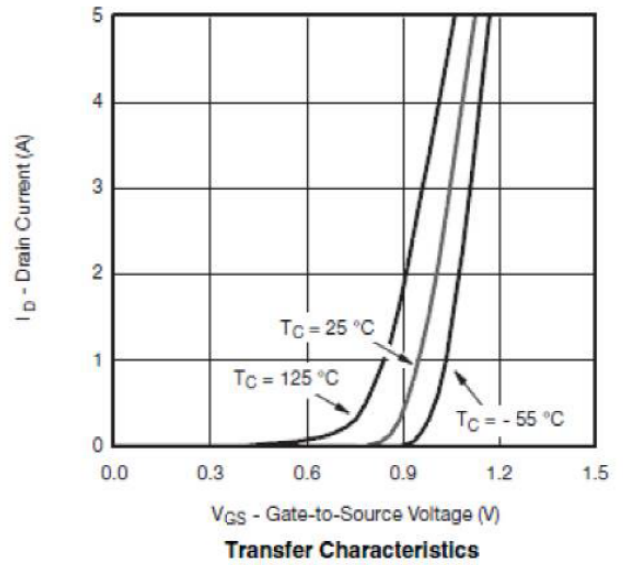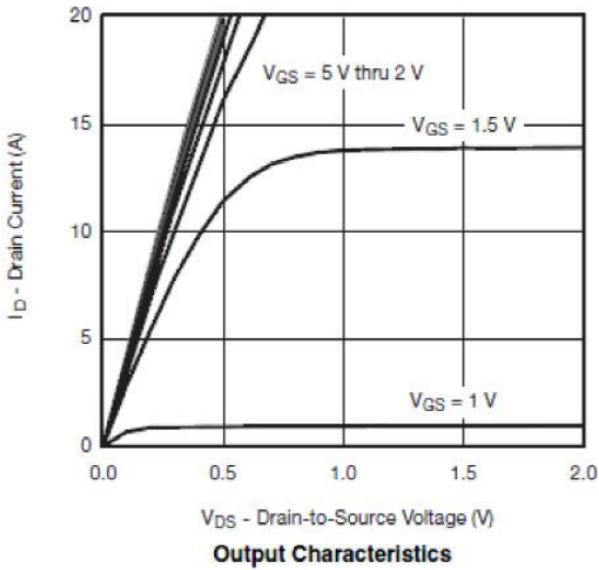
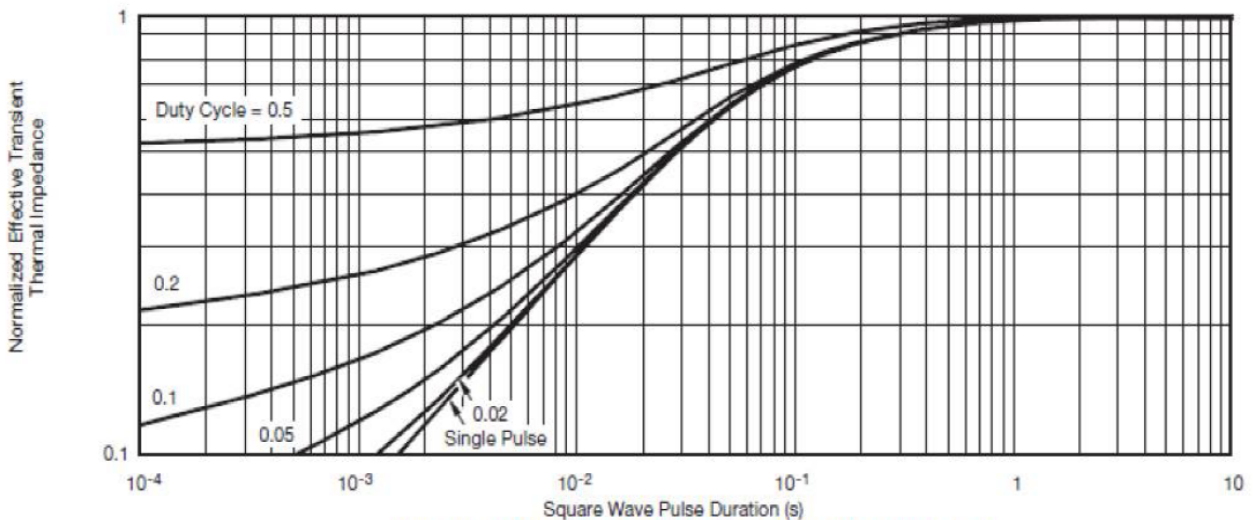**Characteristics Curves**
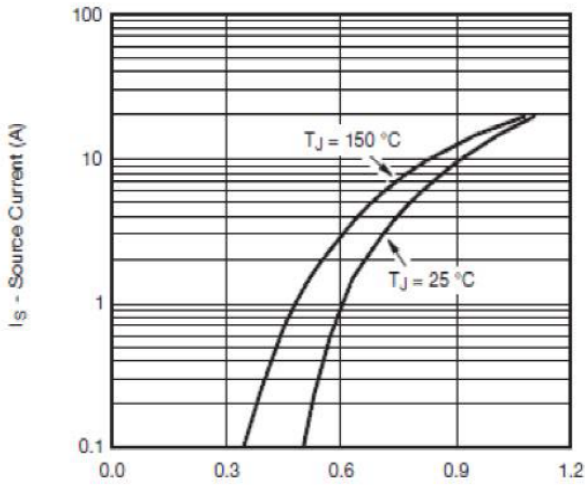
Source-Drain Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage

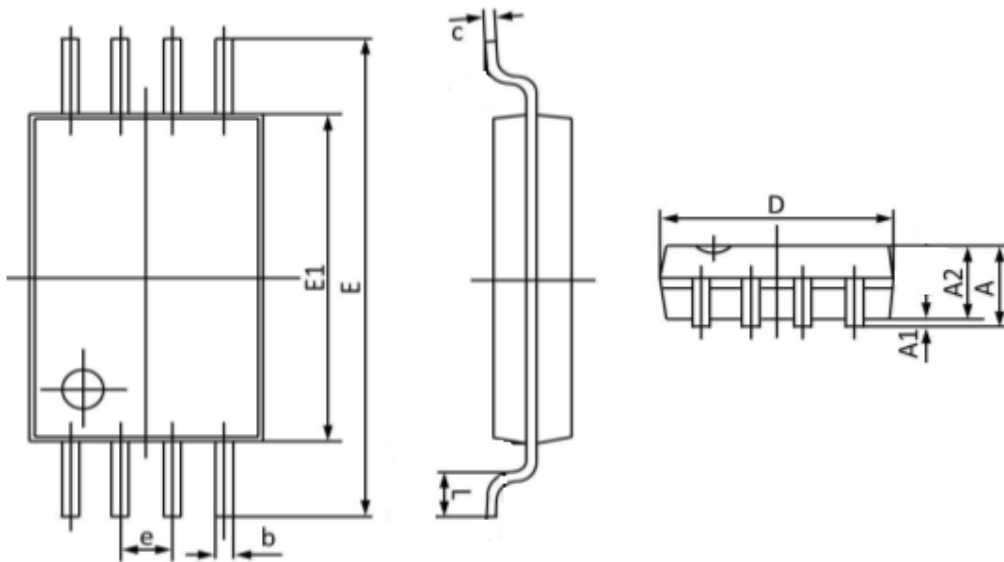**Threshold Voltage**

Single Pulse Power (Junction-to-Ambient)

Normalized Thermal Transient Impedance, Junction-to-Foot

Package Outline Dimensions

TSSOP-8

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	-	1.200	-	0.047
A1	0.020	0.150	0.001	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.011
c	0.090	0.200	0.004	0.008
D	2.900	3.100	0.114	0.122
E	6.200	6.600	0.244	0.260
E1	4.300	4.500	0.169	0.177
e	0.650(BSC)		0.025(BSC)	
L	0.450	0.750	0.018	0.029

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