



40V N-Channel MOSFETs

General Description

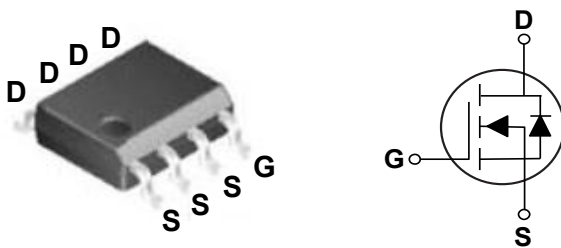
These N-Channel enhancement mode power field effect transistors are using trench MOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	R_{DS(ON)}	I_D
40 V	3.2 mΩ	22 A

Features

- $R_{DS(ON)} \leq 3.2m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

SOP-8 Pin Configuration



Applications

- Power Management Switches
- DC/DC Converter

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current - Continuous (T _A =25°C)	22	A
I _{DM}	Drain Current - Pulsed (NOTE 1)	88	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	151	mJ
IAS	Single Pulse Avalanche Current (NOTE 2)	55	A
P _D	Power Dissipation (T _A =25°C)	1.64	W
T _J	Operating Junction Temperature Range	-55 to 150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		ND3P2	

Thermal Characteristics

Symbol	Parameter	Value	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	76	°C/W
R _{θJC}	Thermal Resistance Junction to Case	41	°C/W

**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	40	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =15A	---	---	3.2	mΩ
		V _{GS} =4.5V, I _D =10A	---	---	5.2	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	---	2.2	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	---	76	---	S

Dynamic and switching Characteristics (NOTE 4)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _D =20A	---	22.5	---	nC
Q _{gs}	Gate-Source Charge		---	7.6	---	
Q _{gd}	Gate-Drain Charge		---	5.4	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =20V, V _{GS} =10V, R _G =3Ω, I _D =20A	---	9.8	---	nS
T _r	Rise Time		---	5.2	---	
T _{d(off)}	Turn-Off Delay Time		---	32	---	
T _f	Fall Time		---	6.6	---	
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, F=1MHz	---	2700	---	pF
C _{oss}	Output Capacitance		---	1050	---	
C _{rss}	Reverse Transfer Capacitance		---	45	---	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	0.7	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	22	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A	---	---	1	V

NOTES :

1. Repetitive rating : pulsed width limited by maximum junction temperature.
2. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=55A.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. This value is guaranteed by design hence it is not included in the production test.



Characteristics Curves

FIG. 1-Transfer Characteristics

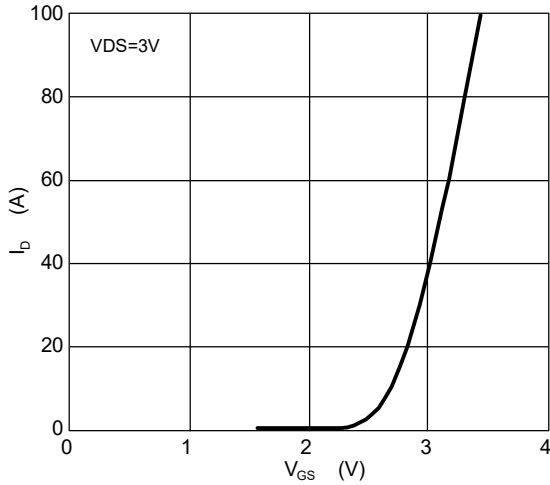


FIG. 2-Is vs Vsd

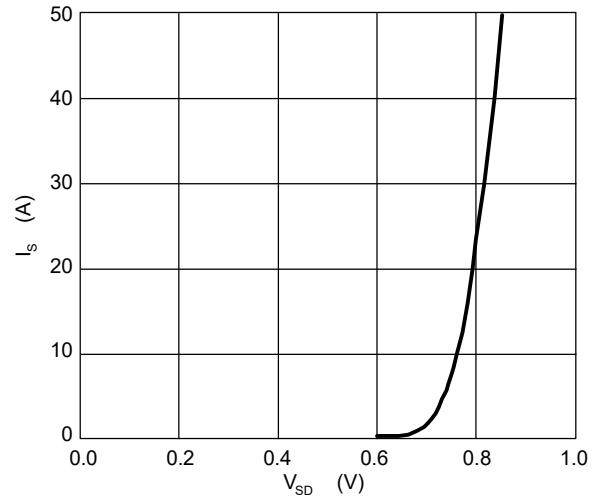


FIG. 3-RDS(on) vs Id

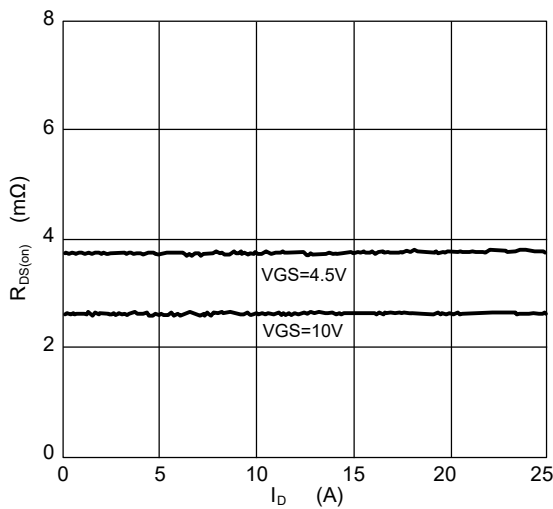


FIG. 4-Gate Charge Characteristics

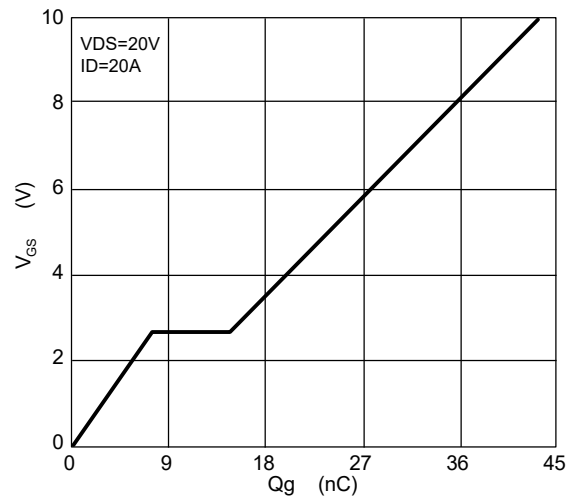


FIG. 5-Switching Time Waveform

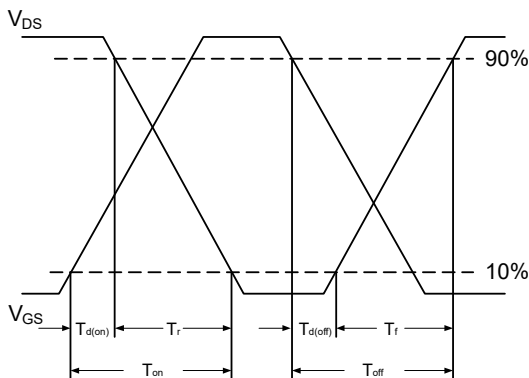
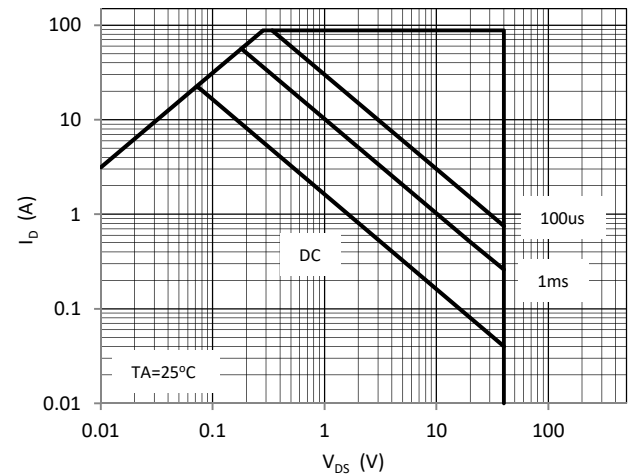


FIG. 6-Safe Operating Area



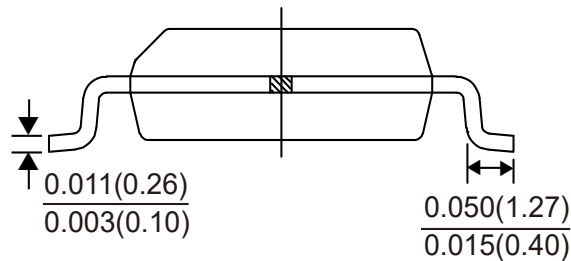
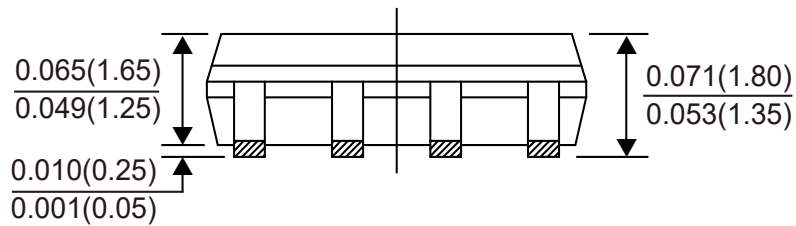
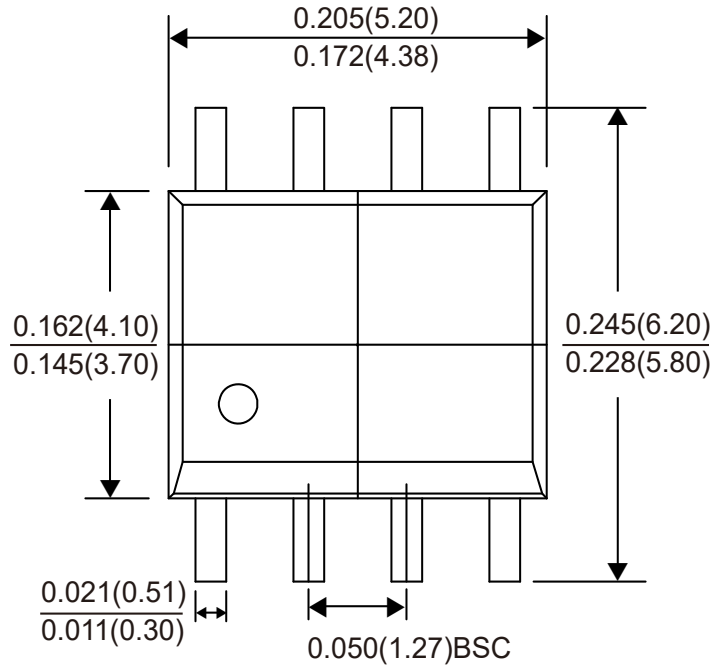


S8MND3P2



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Package Outline Dimensions



SOP-8

Dimensions in inches and (millimeters)



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