N8MPB012

20V P-Channel MOSFETs

General Description

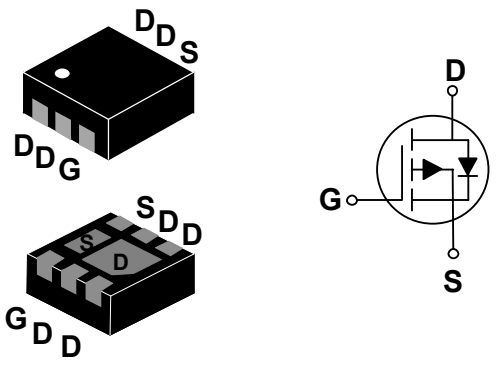
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
-20 V	12 mΩ	-11 A

Features

- $R_{DS(ON)} \leqq 12m\Omega @ V_{GS}$= -4.5V
- Fast Switching
- Green Device Available
- Improved dv/dt Capability

DFN2x2-6L Pin Configuration



Applications

- Electronic Cigarette
- Load Switch

Absolute Maximum Ratings T_C=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_A=25°C)	-11	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	-44	A
P_D	Power Dissipation (T_A=25°C)	2.01	W
T_J	Operating Junction Temperature Range	-55 to 150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62	°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	-20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= -12V , V_{GS}= 0V	---	---	-1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±8V , V_{DS}= 0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}= -4.5V , I_D= -10A	---	---	12	mΩ
		V_{GS}= -2.5V , I_D= -8A	---	---	16	
		V_{GS}= -1.8V , I_D= -4A	---	---	21	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-0.4	---	-1.0	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DD}= -6V , V_{GS}= -4.5V , I_D= -10A	---	21	---	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	
Q_{gd}	Gate-Drain Charge		---	6	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}= -6V , V_{GS}= -4.5V , R_{GEN}= 6Ω , I_D= -10A	---	30	---	nS
T_r	Rise Time		---	48	---	
$T_{d(off)}$	Turn-Off Delay Time		---	97	---	
T_f	Fall Time		---	65	---	
C_{iss}	Input Capacitance	V_{DS}= -6V , V_{GS}= 0V , F= 1MHz	---	2138	---	pF
C_{oss}	Output Capacitance		---	273	---	
C_{rss}	Reverse Transfer Capacitance		---	236	---	

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	---	---	-30	A
I_{SM}	Pulsed Source Current		---	---	-90	A
V_{SD}	Diode Forward Voltage	V_{GS}= 0V , I_S= -2A	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	I_F= -10A , di/dt=100A/us	---	16	---	nS
Q_{rr}	Reverse Recovery Charge		---	5.9	---	uC

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Characteristics Curves

FIG. 1-Output Characteristics

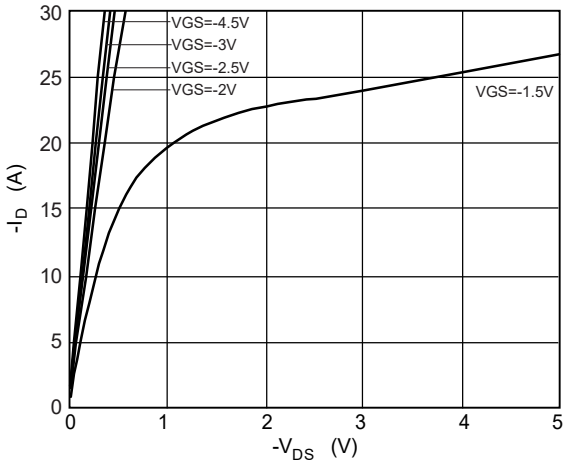


FIG. 2-Transfer Characteristics

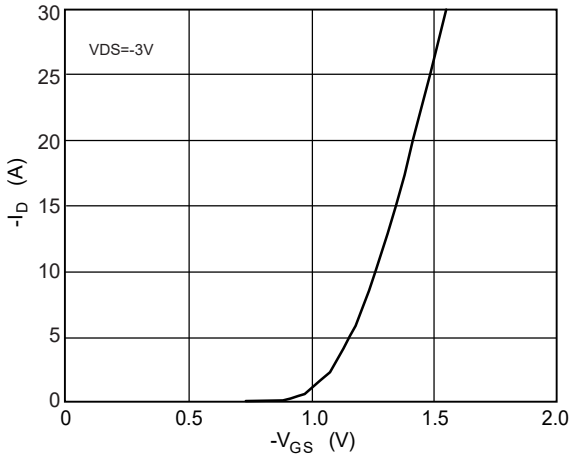


FIG. 3-$R_{DS(ON)}$ vs I_D

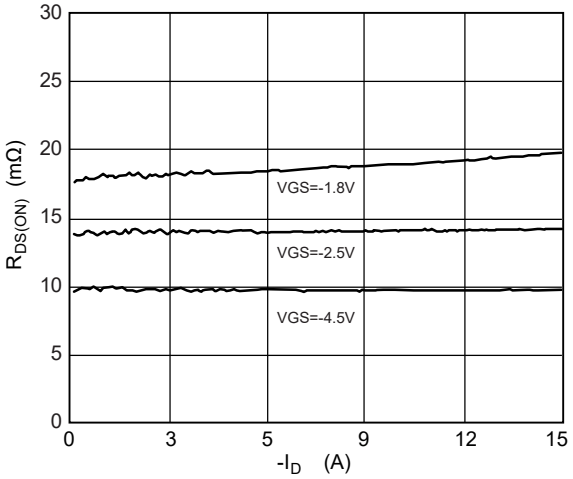


FIG. 4-$R_{DS(ON)}$ vs V_{GS}

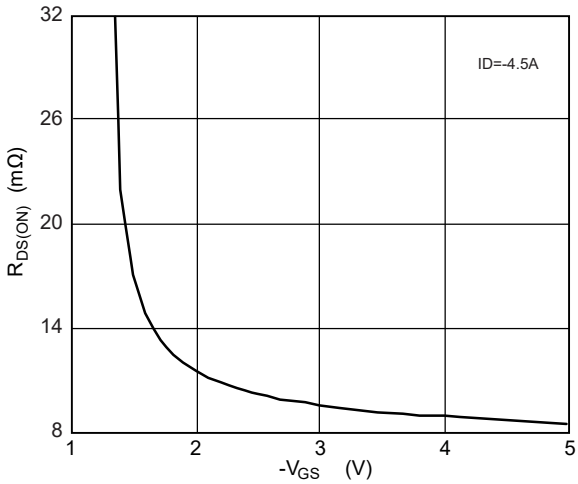


FIG. 5-I_S vs V_{SD}

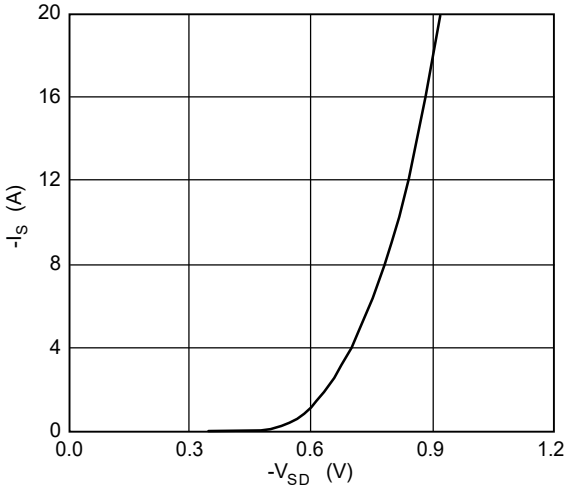
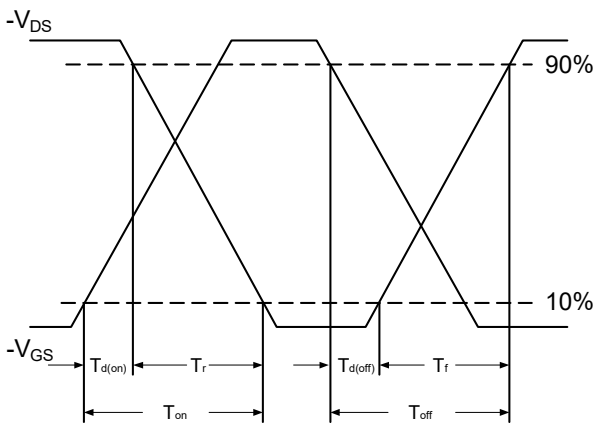
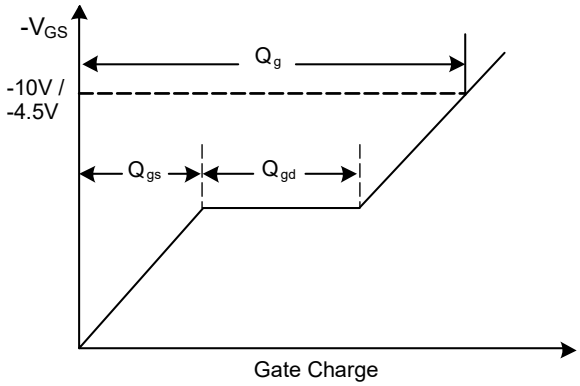


FIG. 6-Switching Time Waveform

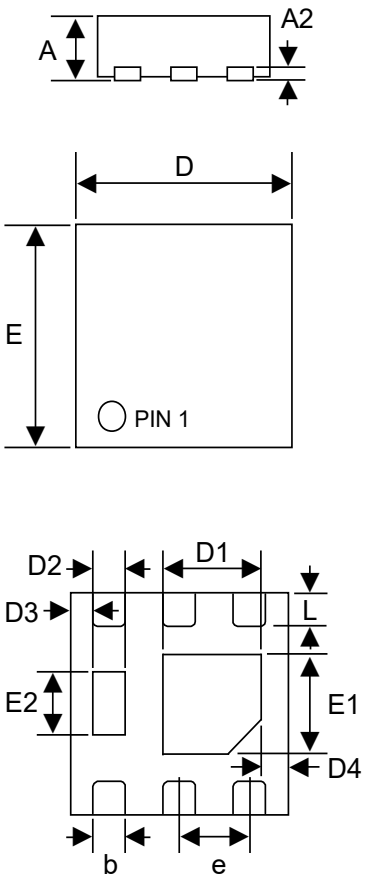


Characteristics Curves

FIG. 7-Gate Charge Waveform



Package Outline Dimensions



Symbol	Dimensions in mm		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.50	0.80	0.019	0.032
A2	0.152 REF		0.006 REF	
b	0.25	0.35	0.009	0.014
D	1.90	2.10	0.074	0.083
D1	0.80	1.20	0.031	0.048
D2	0.15	0.35	0.005	0.014
D3	0.20 BSC		0.008 BSC	
D4	0.25 BSC		0.010 BSC	
E	1.90	2.10	0.074	0.083
E1	0.80	1.30	0.031	0.052
E2	0.46	0.85	0.018	0.034
e	0.65 BSC		0.026 BSC	
L	0.20	0.35	0.007	0.014

DFN2x2-6L

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