P3MND8P5

40V N-Channel MOSFETs

BV_{DSS}	$R_{DS(ON)}$	I_D
40 V	8.5 mΩ	43 A

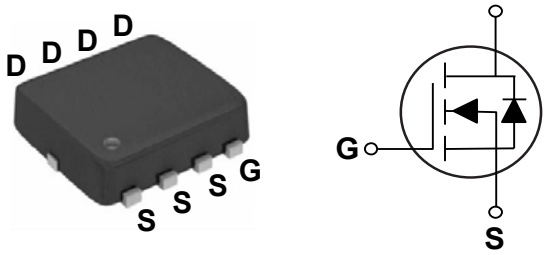
General Description

The P3MND8P5 is the high cell density trenched N-ch MOSFETs, which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications.

Features

- $R_{DS(ON)} \leqq 8.5m\Omega @ V_{GS}=10V$
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

PPAK3X3 Pin Configuration



Applications

- Notebook
- Load Switch
- LED applications

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current - Continuous (T_C=25°C)	43	A
	Drain Current - Continuous (T_C=100°C)	28	A
I_{DM}	Pulsed Drain Current (NOTE 1)	60	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	48	mJ
IAS	Avalanche Current	31	A
P_D	Power Dissipation (NOTE 3)	27.8	W
T_J	Operating Junction Temperature Range	-55 to 150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		ND8P5	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (Steady State)	---	60	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	4.5	°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}=32V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=55°C	---	---	5	
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=12A	---	6.9	8.5	mΩ
		V_{GS}=4.5V , I_D=10A	---	10.5	15	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.0	1.5	2.5	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=20V , V_{GS}=4.5V , I_D=12A	---	5.8	---	nC
Q_{gs}	Gate-Source Charge		---	3.0	---	
Q_{gd}	Gate-Drain Charge		---	1.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω , I_D=1A	---	14.3	---	nS
T_r	Rise Time		---	5.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	20	---	
T_f	Fall Time		---	11	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , F=1MHz	---	690	---	pF
C_{oss}	Output Capacitance		---	193	---	
C_{rss}	Reverse Transfer Capacitance		---	38	---	
Rg	Gate resistance	V_{GS}=0V , V_{DS}=0V , F=1MHz	---	1.7	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (NOTE 4)	V_G=V_D=0V , Force Current	---	---	20	A
V_{SD}	Diode Forward Voltage (NOTE 1)	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V

NOTES：

1. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
2. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, I_{AS}=31A, L=0.1mH.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Characteristics Curves

FIG.1-Typical Output Characteristics

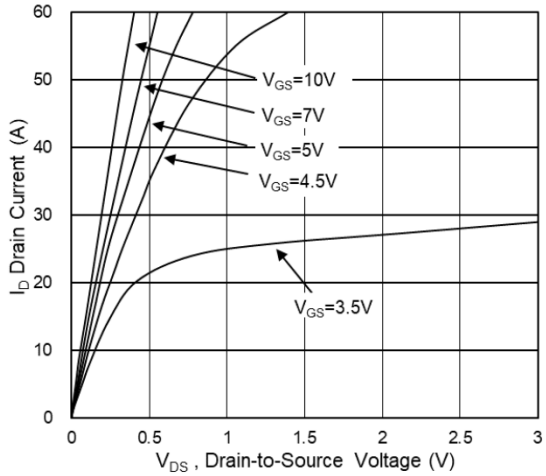


FIG.2-On-Resistance vs. G-S Voltage

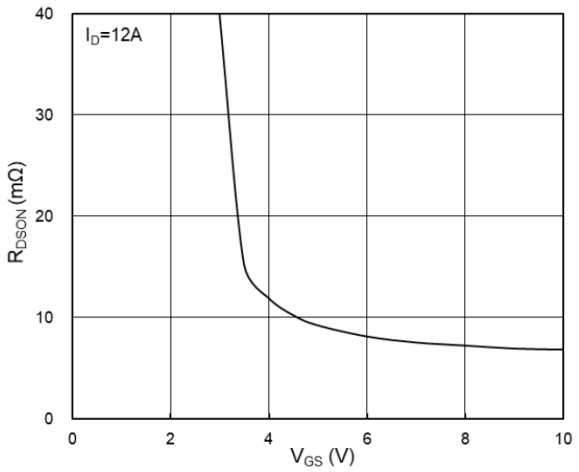


FIG.3-Source Drain Forward Characteristics

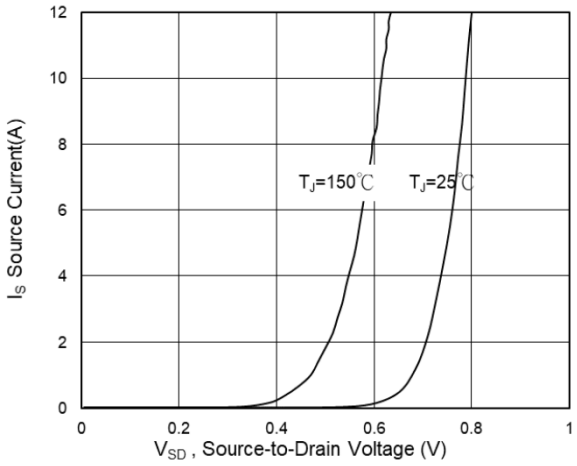


FIG.4-Gate Charge Characteristics

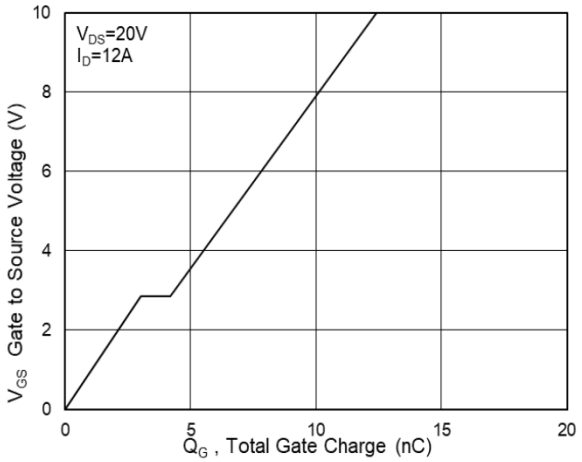


FIG.5-Normalized $V_{GS(th)}$ vs. T_J

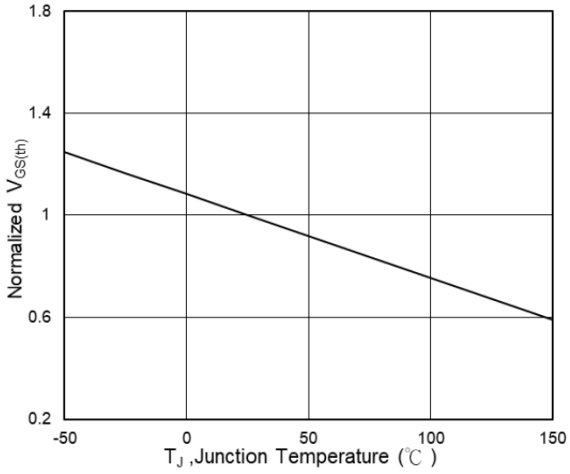
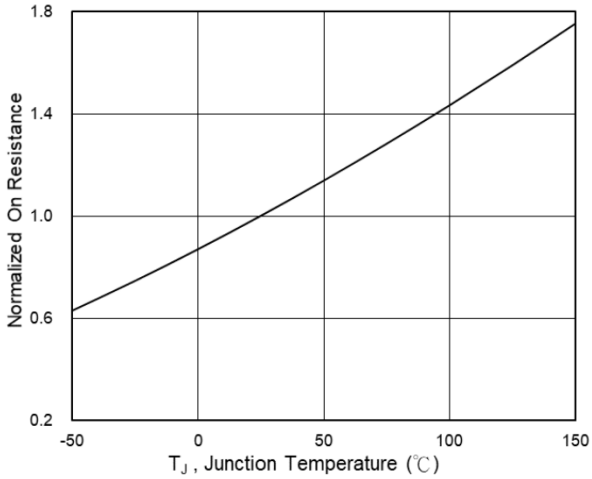


FIG.6-Normalized R_{DSON} vs. T_J



Characteristics Curves

FIG.7-Switching Time Waveform

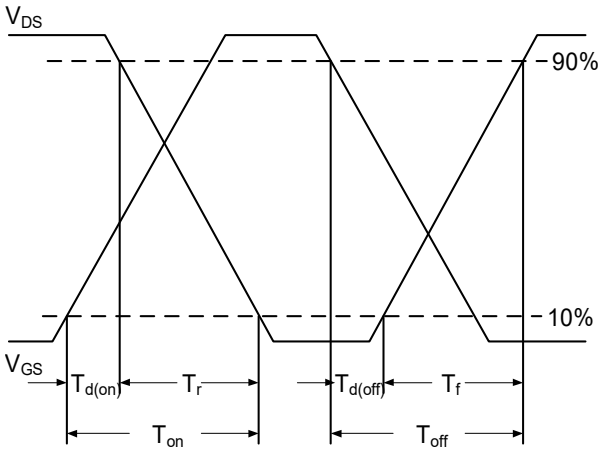
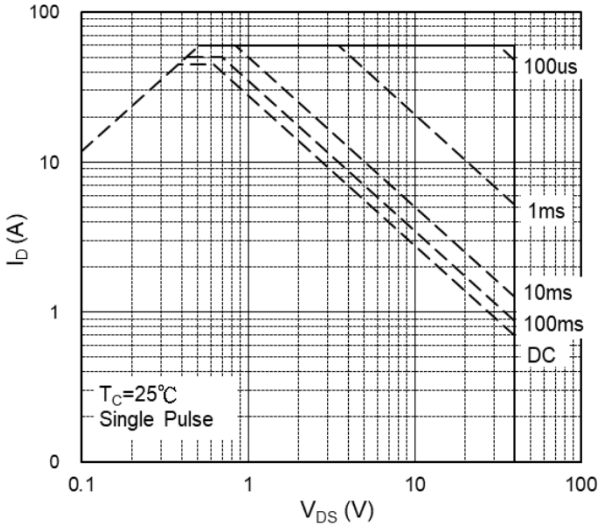
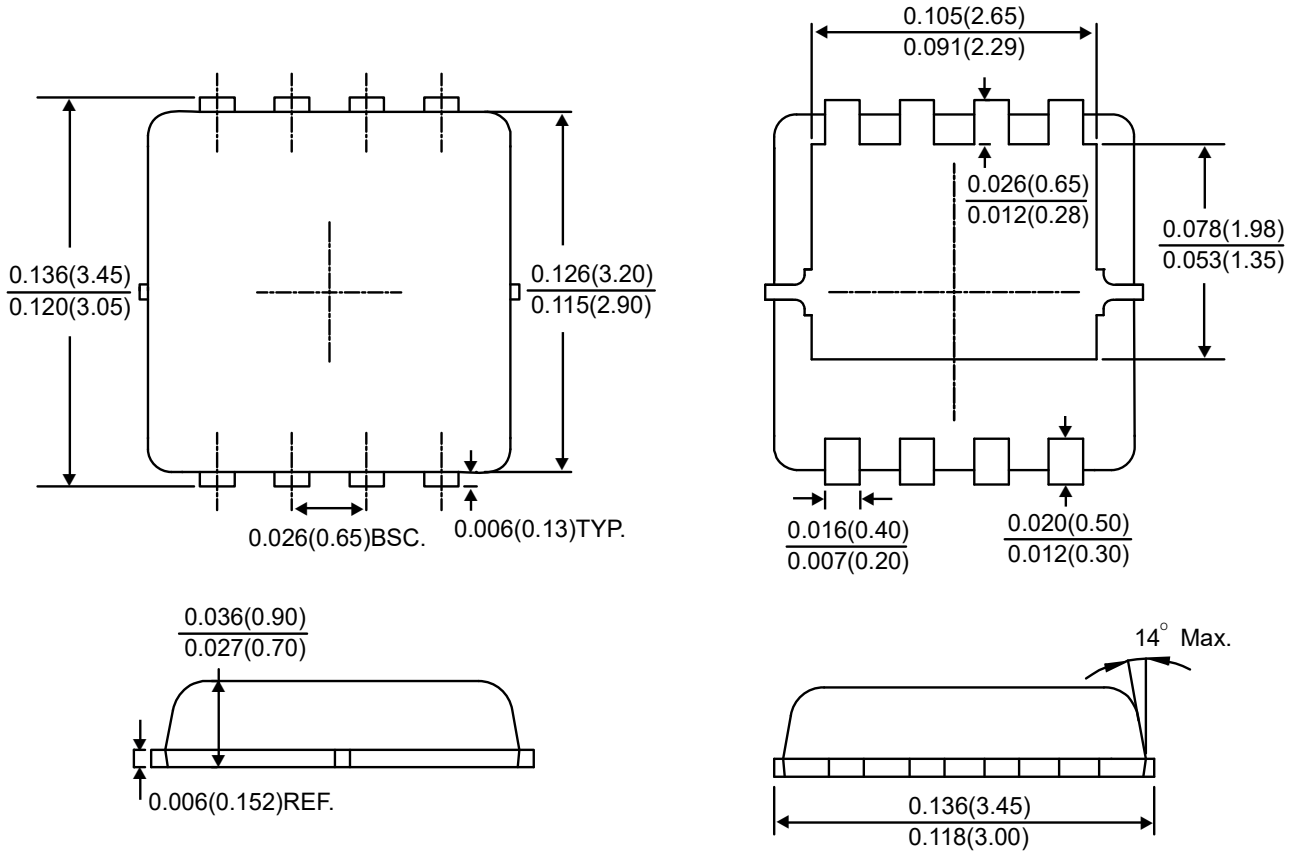


FIG.8-Safe Operating Area



Package Outline Dimensions



PPAK3X3

Dimensions in inches and (millimeters)

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