P3MND017

40V Dual N-Channel MOSFETs

BV_{DSS}	$R_{DS(ON)}$	I_D
40 V	17 mΩ	16 A

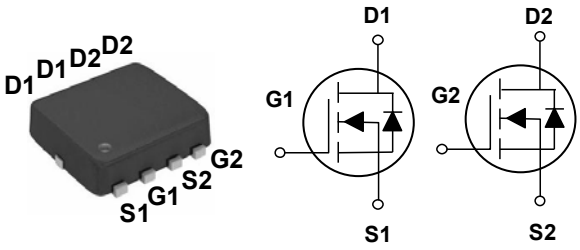
General Description

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.

Features

- $R_{DS(ON)} \leqq 17m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK3X3 Dual Pin Configuration



Applications

- Load Switch
- PWM Application
- Power Management

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_A=25°C)	16	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	64	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	4.9	mJ
P_D	Power Dissipation (T_A=25°C)	2	W
T_J	Operating Junction Temperature Range	-55 to 150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		ND017	

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	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=32V , 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=7A	---	---	17	mΩ
		V_{GS}=4.5V , I_D=5A	---	---	22	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.0	---	2.5	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=32V , V_{GS}=10V , I_D=3A	---	10.8	---	nC
Q_{gs}	Gate-Source Charge		---	1.6	---	
Q_{gd}	Gate-Drain Charge		---	3.3	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω , I_D=1A	---	3.8	---	nS
T_r	Rise Time		---	10.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	22.2	---	
T_f	Fall Time		---	6.6	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	724	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	109	---	

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	---	---	16	A
I_{SM}	Pulsed Source Current		---	---	32	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. V_{DD}=25V, V_G=10V, L=0.1mH, I_{AS}=9.9A, R_G=25Ω, T_J=25°C.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Characteristics Curves

FIG. 1-I_D vs T_A

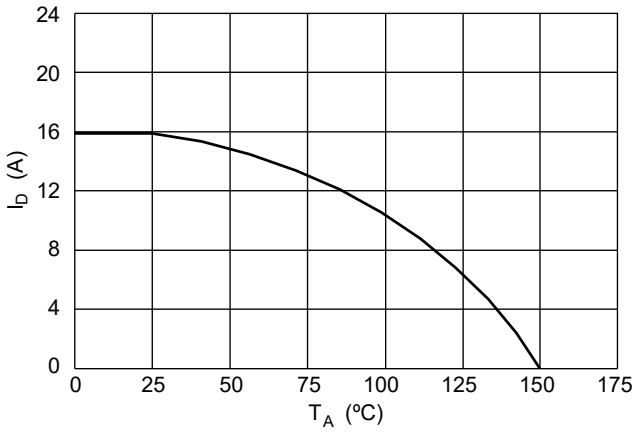


FIG. 2-Normalized $R_{DS(ON)}$ vs T_J

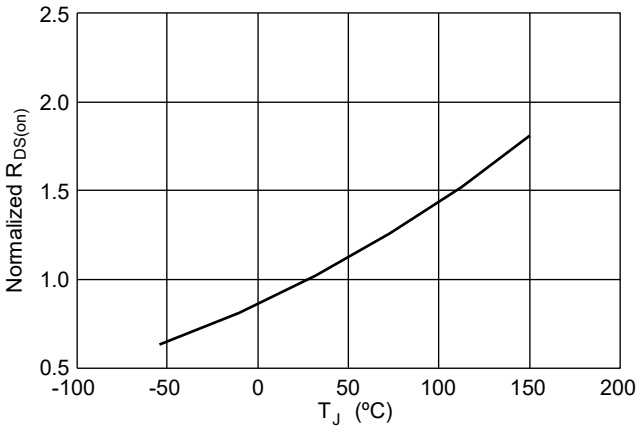


FIG. 3-Normalized BV_{DSS} vs T_J

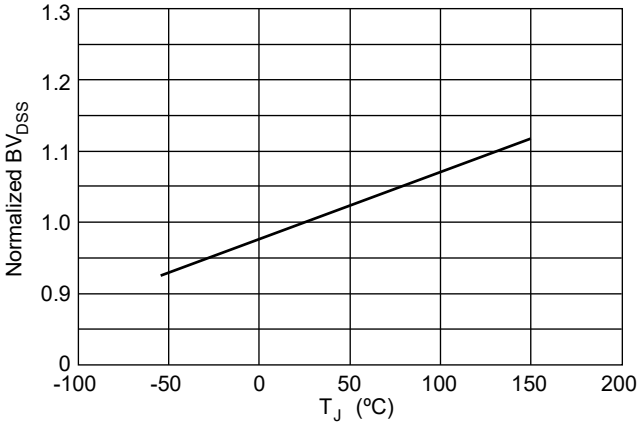


FIG. 4-Gate Charge Characteristics

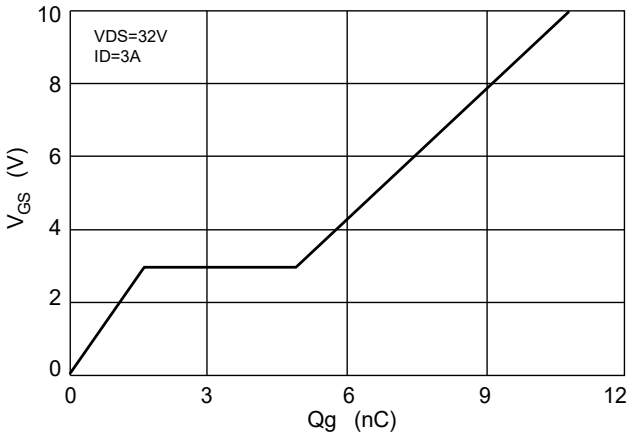


FIG. 5-Switching Time Waveform

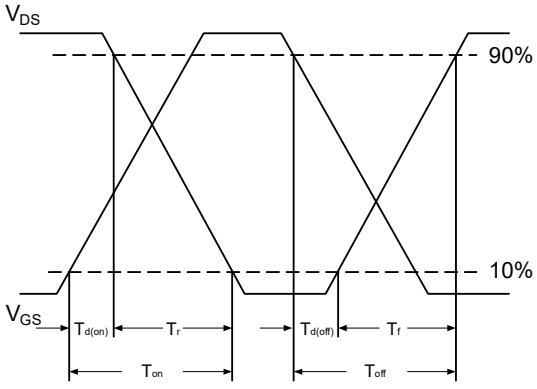
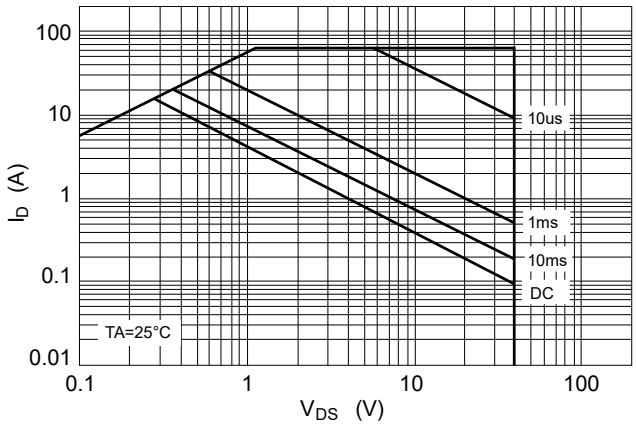
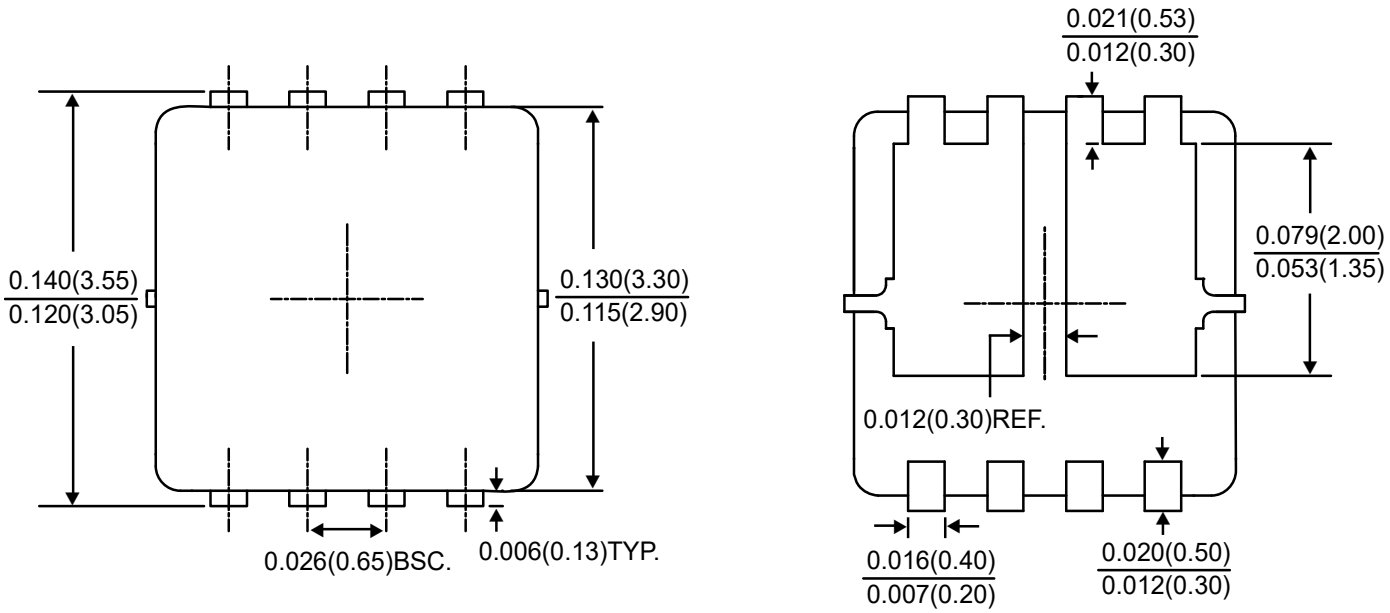
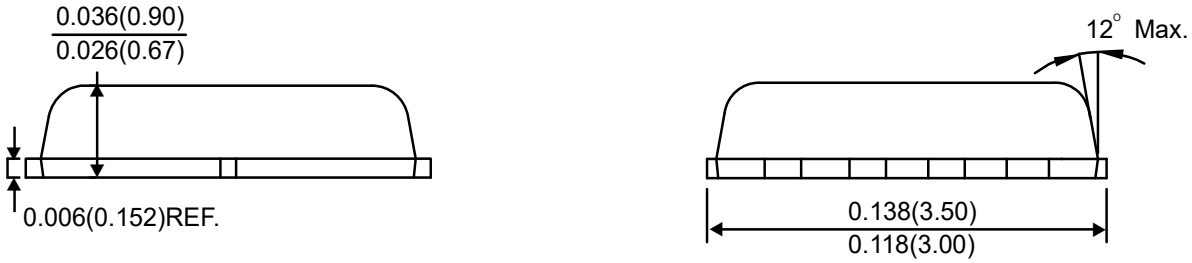


FIG. 6-Maximum Safe Operating Area



Package Outline Dimensions





PPAK3X3 Dual

Dimensions in inches and (millimeters)

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