P3MNM014

100V N-Channel MOSFETs

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	14.4 mΩ	48 A

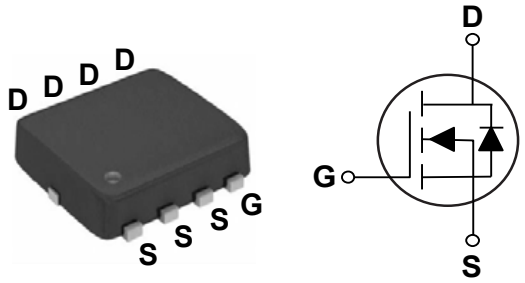
General Description

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

- $R_{DS(ON)} \leqq 14.4m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK3X3 Pin Configuration



Applications

- Networking
- Load Switch
- LED applications

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	+20 / -12	V
I_D	Drain Current - Continuous (T_C=25°C)	48	A
	Drain Current - Continuous (T_C=100°C)	30	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	61	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	16.2	mJ
IAS	Single Pulse Avalanche Current (NOTE 2)	18	A
P_D	Power Dissipation (T_C=25°C)	61	W
	Power Dissipation - Derate above 25°C	0.49	W/°C
T_J	Operating Junction Temperature Range	-50 to 150	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		NM014 , DC0982	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	2.04	°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	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25°C	---	---	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	---	---	14.4	mΩ
		V_{GS}=4.5V , I_D=10A	---	---	26	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.0	---	3.0	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=3A	---	8	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=50V , V_{GS}=10V , I_D=12A (NOTE 3、4)	---	22.5	---	nC
Q_{gs}	Gate-Source Charge		---	5.29	---	
Q_{gd}	Gate-Drain Charge		---	5.28	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3Ω , I_D=1A (NOTE 3、4)	---	8.6	---	nS
T_r	Rise Time		---	3.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	22.6	---	
T_f	Fall Time		---	67.2	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , F=1MHz	---	1227	---	pF
C_{oss}	Output Capacitance		---	382	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	
Rg	Gate resistance	V_{GS}=0V , V_{DS}=0V , F=1MHz	---	0.9	---	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	---	---	48	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V
trr	Reverse Recovery Time (NOTE 3)	I_S=10A , dI/dt=100A/us , T_J=25°C	---	43.5	---	nS
Qrr	Reverse Recovery Charge (NOTE 3)		---	59.6	---	nC

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, L=0.1mH, I_{AS}=18A, Starting 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 - Drain Current vs. T_C

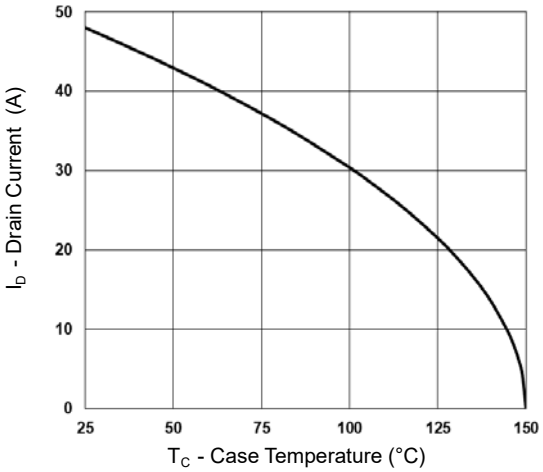


FIG. 2 - Normalized R_{DSON} vs. T_J

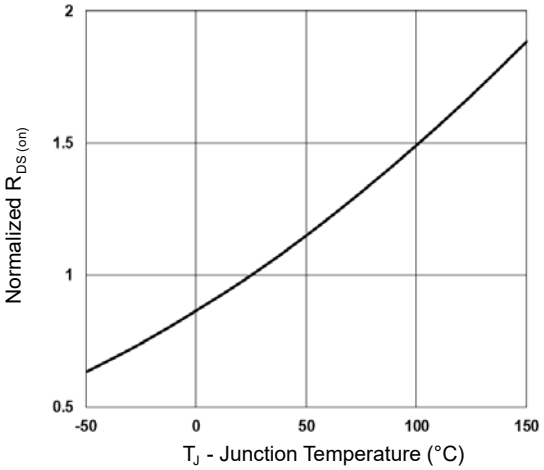


FIG. 3 - Normalized Vth vs. T_J

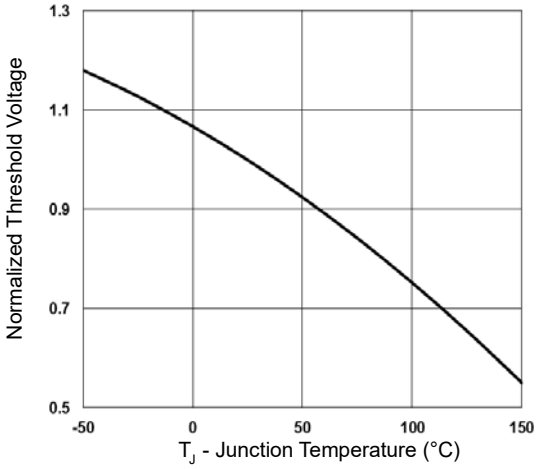


FIG. 4 - Gate Charge Characteristics

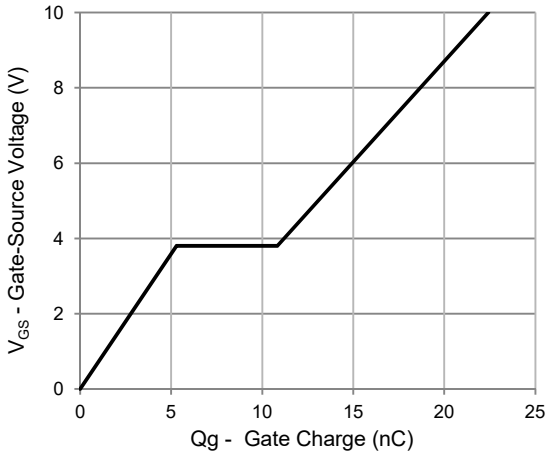


FIG. 5 - Safe Operating Area

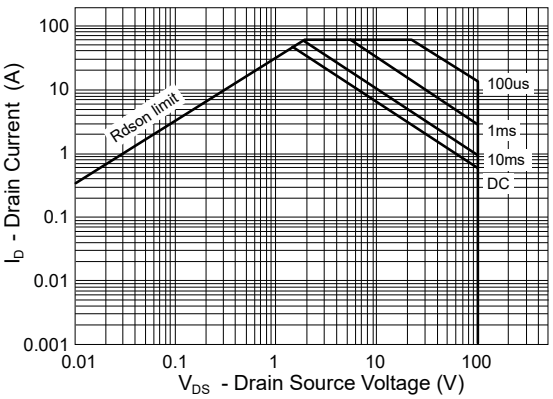
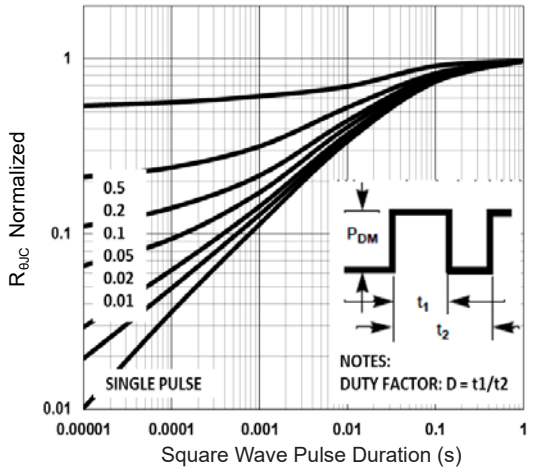


FIG. 6 - Normalized Transient Impedance



Characteristics Curves

FIG. 7 - Gate Charge Waveform

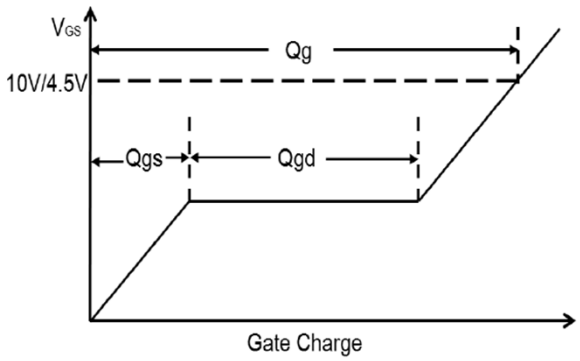
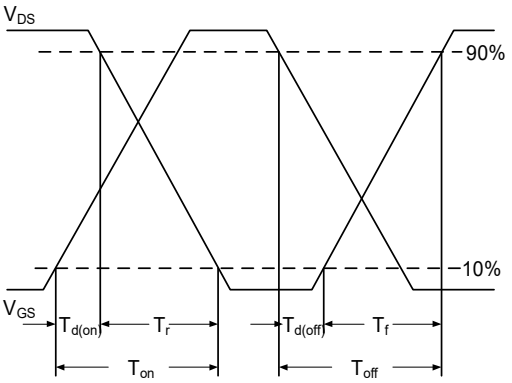
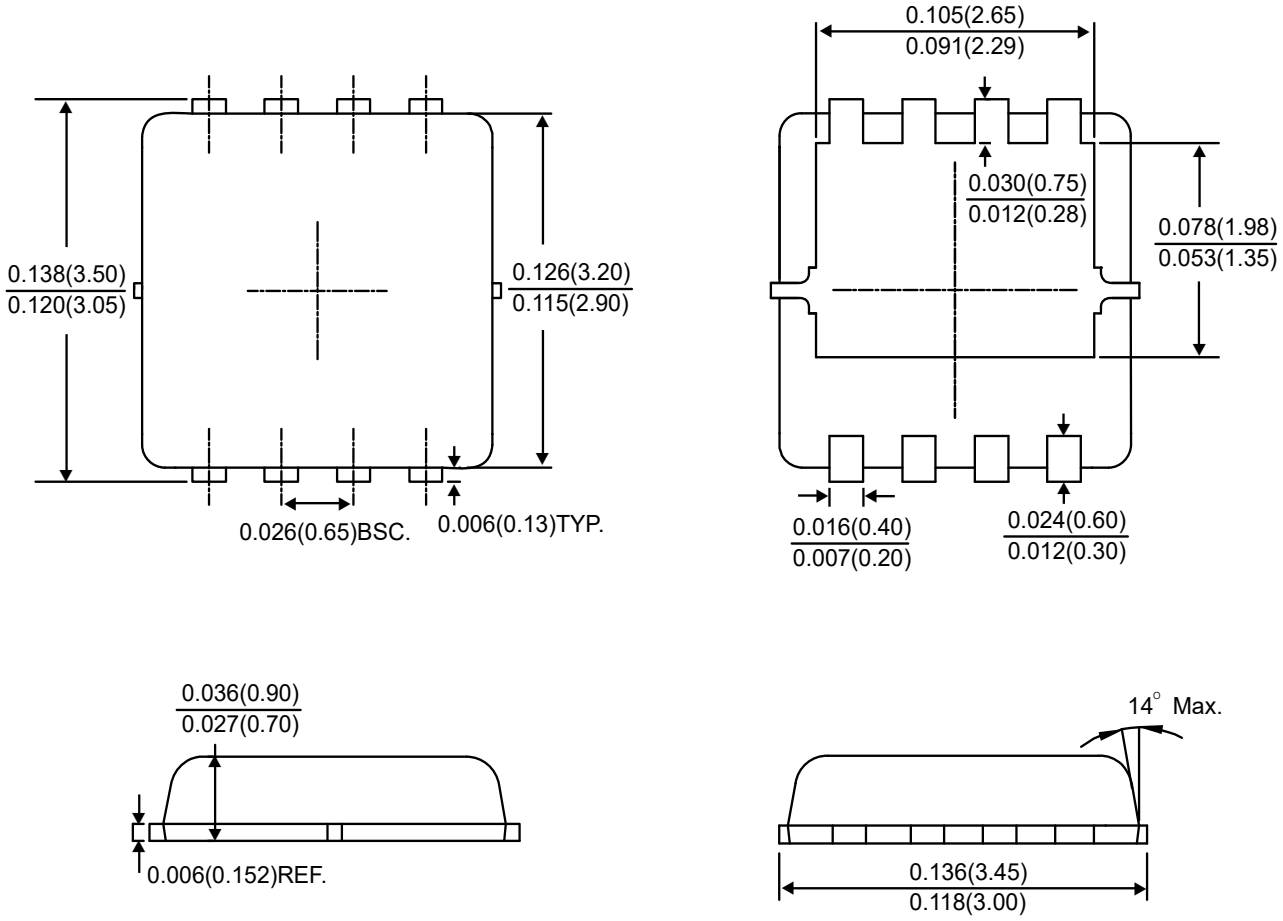


FIG. 8 - Switching Time Waveform



Package Outline Dimensions



PPAK3X3

Dimensions in inches and (millimeters)

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