



20V N-Channel MOSFETs

General Description

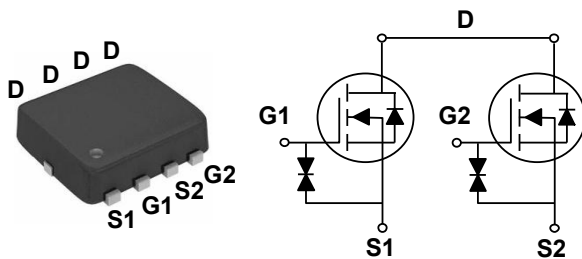
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
20 V	22 m Ω	6 A

Features

- $R_{DS(ON)} \leq 22m\Omega @ V_{GS}=4.5V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK3X3 Pin Configuration



Applications

- Networking
- Power Tool
- LED Applications
- Motor Drive

Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 8	V
I_D	Drain Current - Continuous ($T_C=25^\circ C$)	6	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	24	A
P_D	Power Dissipation ($T_C=25^\circ C$)	2	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		NB022	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	80	$^\circ C/W$



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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} =16V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±8V, V _{DS} =0V	---	---	±10	uA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =3A	---	---	22	mΩ
		V _{GS} =2.5V, I _D =3A	---	---	30	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	---	1.2	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _{DS} =3A	---	4	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =16V, V _{GS} =4.5V, I _D =6A	---	10	---	nC
Q _{gs}	Gate-Source Charge		---	2.5	---	
Q _{gd}	Gate-Drain Charge		---	3.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =10V, V _{GS} =4.5V, R _{GEM} =10Ω, I _D =3A	---	0.16	---	uS
T _r	Rise Time		---	0.5	---	
T _{d(off)}	Turn-Off Delay Time		---	2.6	---	
T _f	Fall Time		---	1.6	---	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	1200	---	pF
C _{oss}	Output Capacitance		---	260	---	
C _{rss}	Reverse Transfer Capacitance		---	250	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =6A	---	---	1.2	V

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- V_{th} vs. T_J

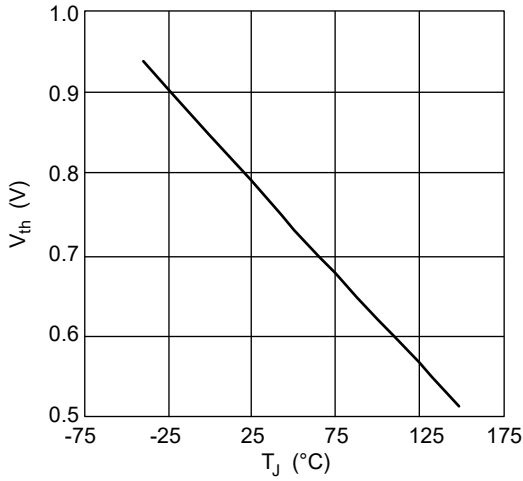


FIG. 2- BV_{DSS} vs. T_J

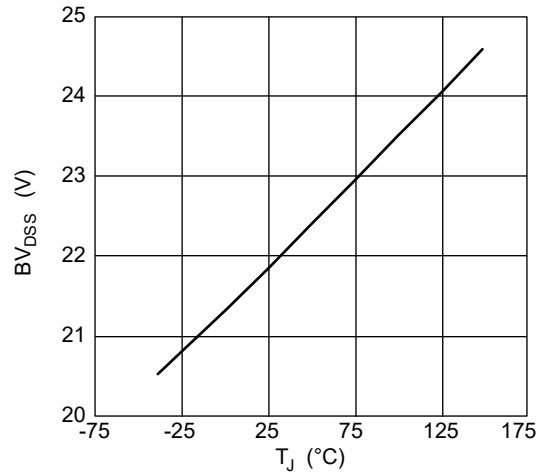


FIG. 3- $R_{DS(ON)}$ vs. I_D

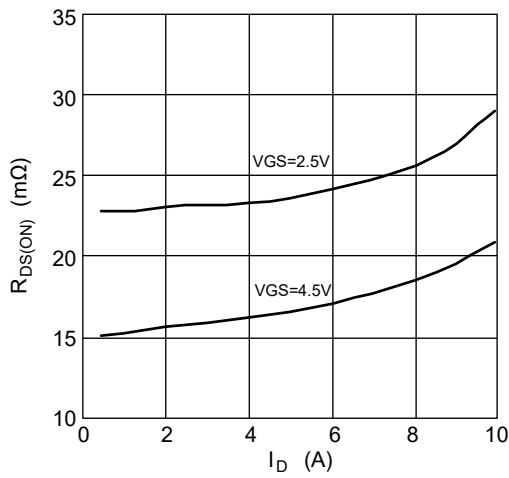


FIG. 4- Gate Charge Characteristics

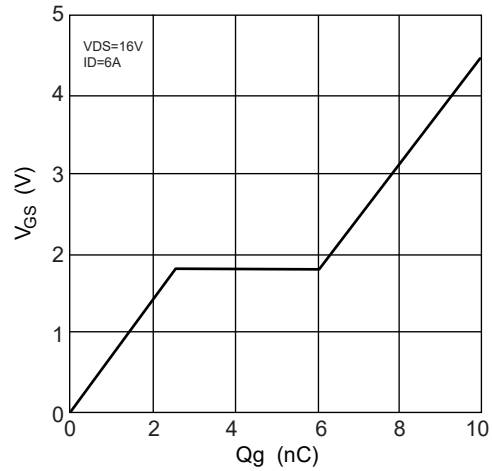
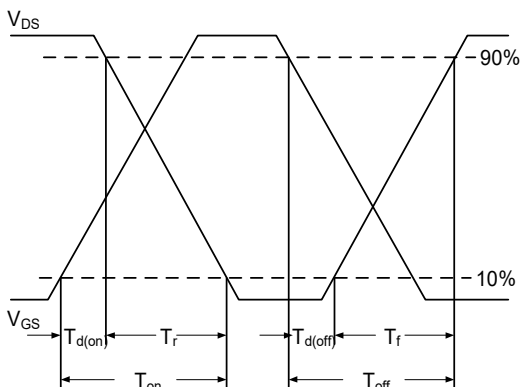
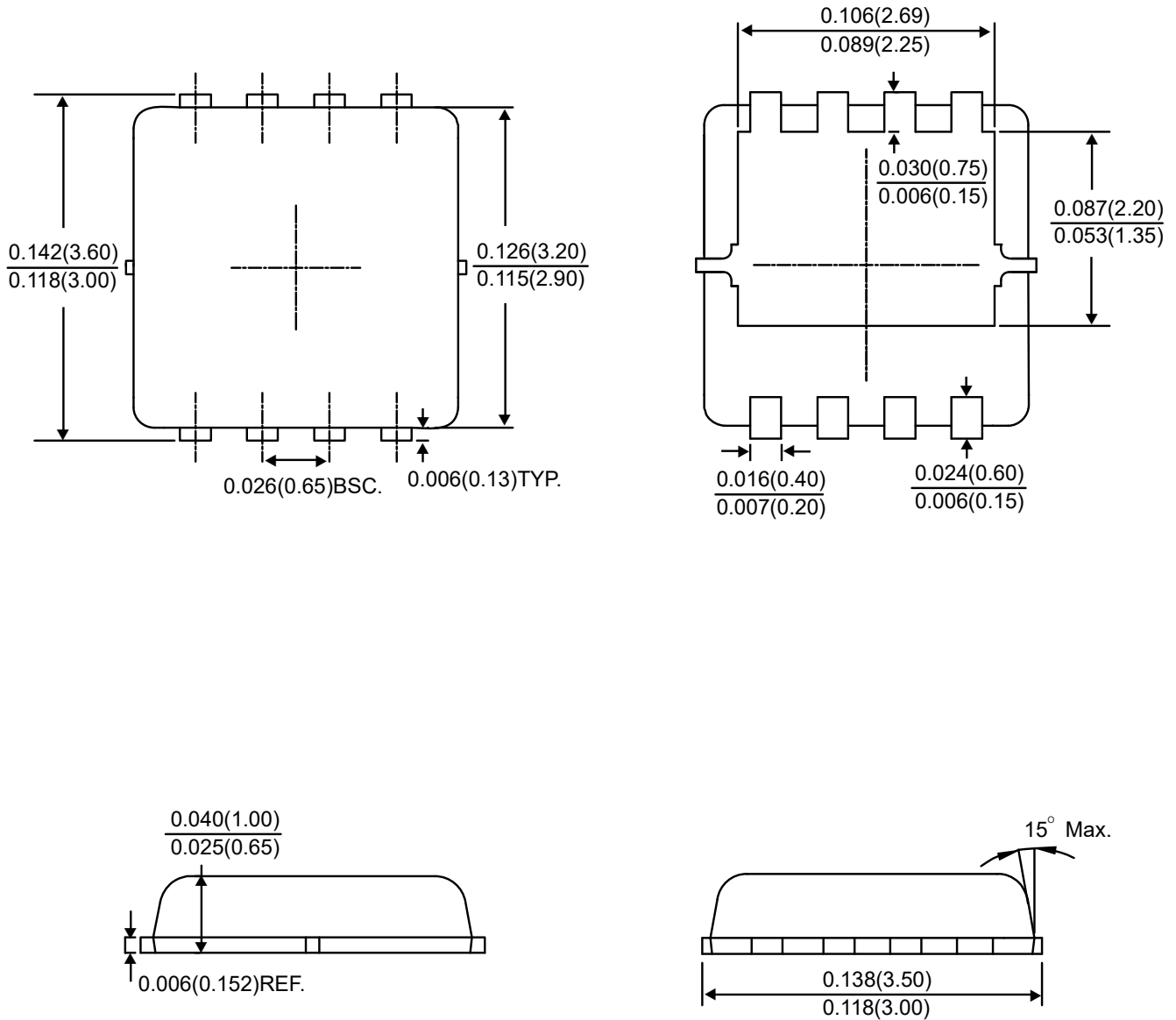


FIG. 5- Switching Time Waveform





Package Outline Dimensions



PPAK3X3

Dimensions in inches and (millimeters)



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