



100V Dual N-Channel MOSFETs

General Description

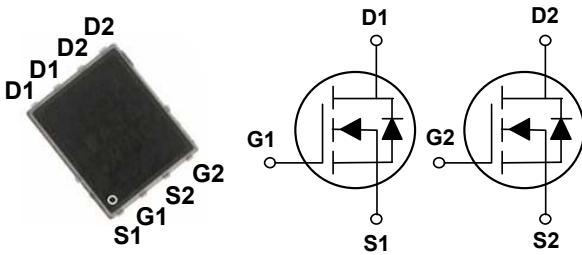
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	20 mΩ	40 A

Features

- $R_{DS(ON)} \leq 20m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK5X6 Dual Pin Configuration



Applications

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ C$)	40	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	120	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	57	mJ
P_D	Power Dissipation ($T_C=25^\circ C$)	71	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		NM020A	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	25	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.76	$^\circ C/W$



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Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu\text{A}$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=10A$	---	---	20	m Ω
		$V_{GS}=4.5V, I_D=7A$	---	---	25	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	1.2	---	2.5	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=5A$	---	16.2	---	nC
Q_{gs}	Gate-Source Charge		---	2.8	---	
Q_{gd}	Gate-Drain Charge		---	4.1	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=50V, V_{GS}=10V, R_G=10\Omega, I_D=5A$	---	16.6	---	nS
T_r	Rise Time		---	3.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	75.5	---	
T_f	Fall Time		---	46	---	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=100\text{kHz}$	---	1003.9	---	pF
C_{oss}	Output Capacitance		---	185.4	---	
C_{rss}	Reverse Transfer Capacitance		---	9.8	---	

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

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, R_G=25\Omega, L=0.3\text{mH}$.
3. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.



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Characteristics Curves

Fig.1 I_D vs. T_C

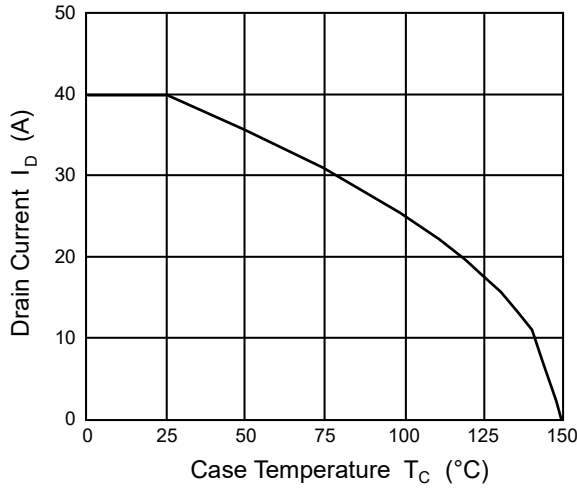


Fig.2 BV_{DSS} vs. T_J

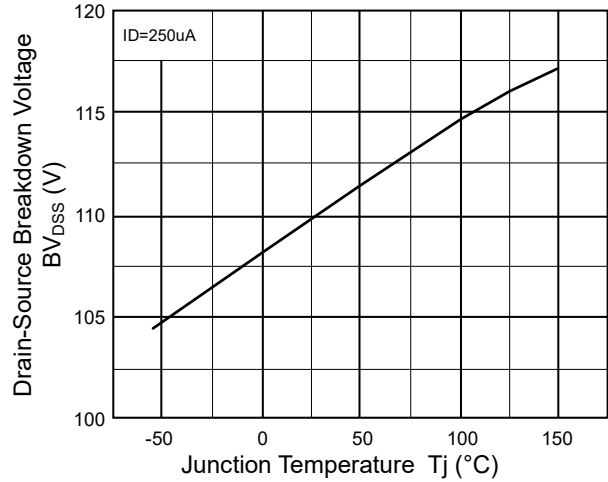


Fig.3 $R_{DS(on)}$ vs. T_J

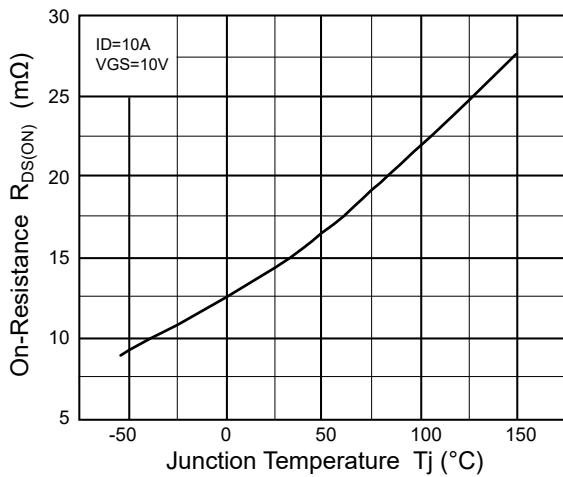


Fig.4 Gate Charge Waveform

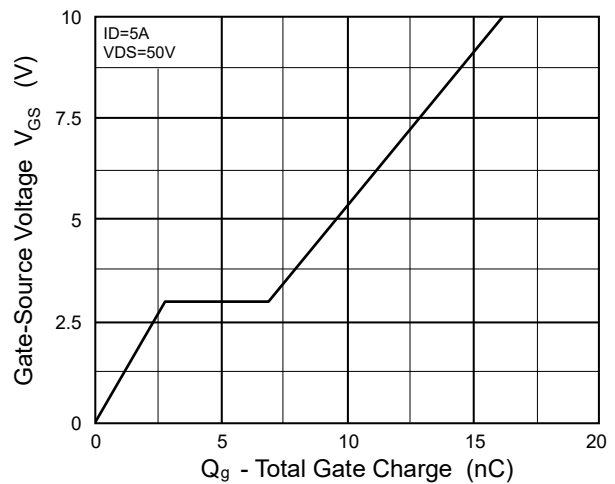


Fig.5 Safe Operation Area

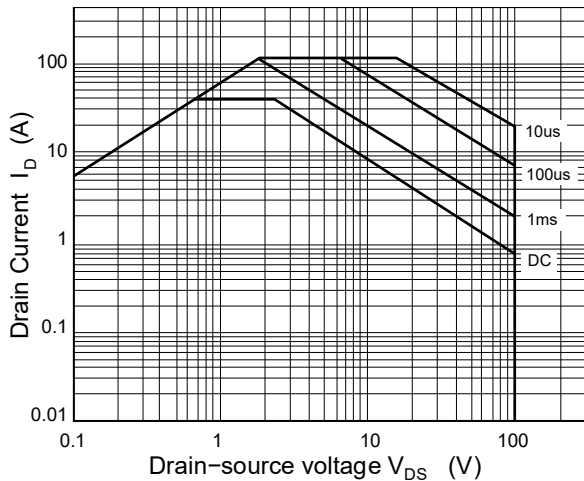
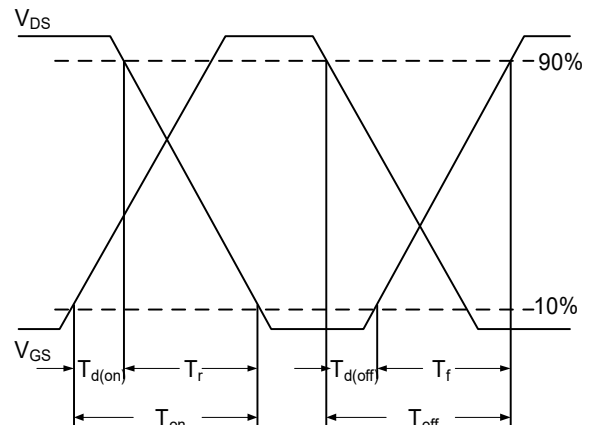


Fig.6 Switching Time Waveform



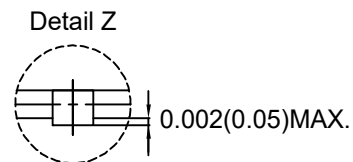
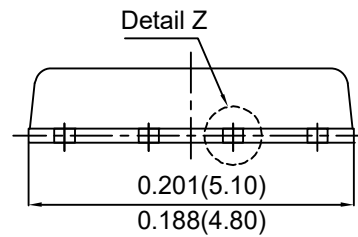
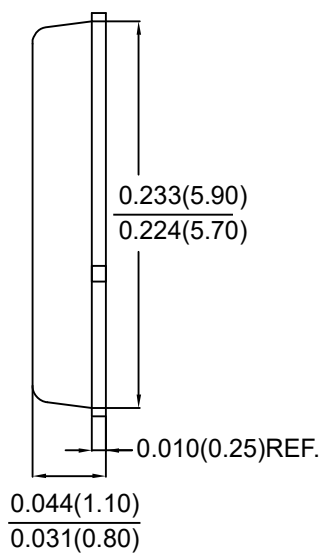
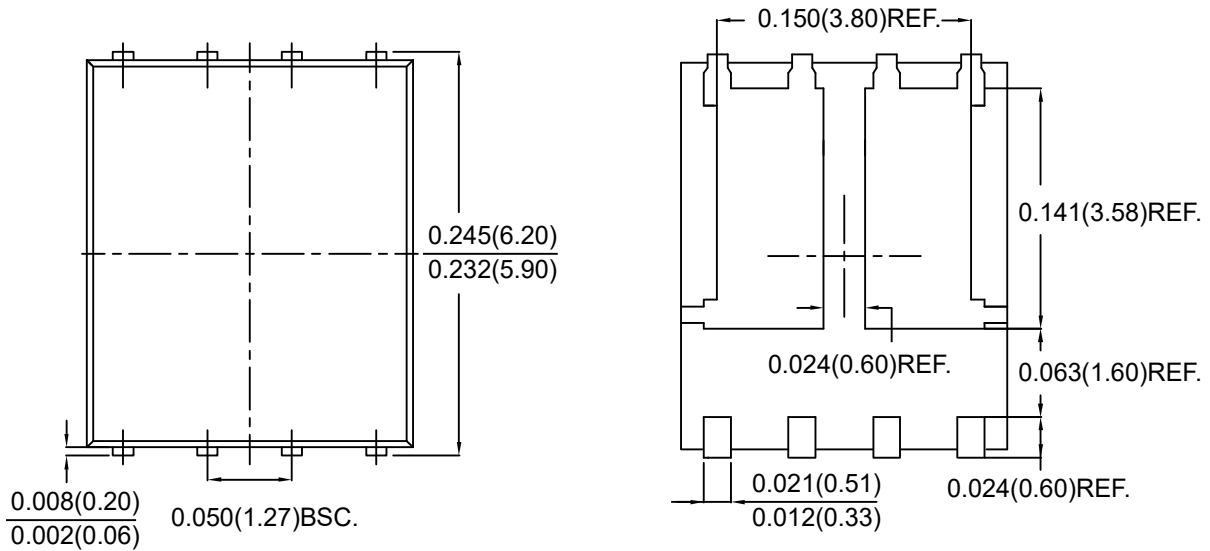


P5MNM020A



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Package Outline Dimensions



PPAK5X6 Dual

Dimensions in inches and (millimeters)



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