SECOS P5MNM020B

100V Dual N-Channel MOSFETs

General Description

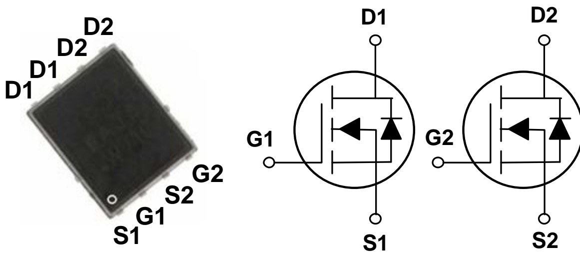
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	19 mΩ	40 A

Features

- $R_{DS(ON)} \leqq 19m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK5X6 Dual Pin Configuration



Applications

- Synchronous Rectification
- DC/DC Converter
- Power Management Switches

Absolute Maximum Ratings $T_A=25^oC$ 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 ($T_C=25^oC$)	40	A
	Drain Current - Continuous ($T_C=100^oC$)	24	
I_{DM}	Drain Current - Pulsed (NOTE 1)	160	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	64	mJ
P_D	Power Dissipation ($T_C=25^oC$)	72	W
	Power Dissipation ($T_C=70^oC$)	46	
T_J	Operating Junction Temperature Range	-55 to 150	^oC
T_{STG}	Storage Temperature Range	-55 to 150	^oC
Marking Code		NM020B	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (NOTE 3)	62	$^oC/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.74	$^oC/W$

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}=100V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=100V , V_{GS}=0V , T_J=100°C	---	---	100	
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 (NOTE 4)	V_{GS}=10V , I_D=20A	---	16	19	mΩ
		V_{GS}=4.5V , I_D=10A	---	---	24	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.0	---	2.5	V
g_{fs}	Forward Transconductance	V_{DS}=10V , I_D=2A	---	35	---	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=8A	---	19.8	---	nC
Q_{gs}	Gate-Source Charge		---	2.4	---	
Q_{gd}	Gate-Drain Charge		---	5.3	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=2.2Ω , I_D=10A	---	17.8	---	nS
T_r	Rise Time		---	3.9	---	
$T_{d(off)}$	Turn-Off Delay Time		---	33.5	---	
T_f	Fall Time		---	3.2	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , F=1MHz	---	1190	---	pF
C_{oss}	Output Capacitance		---	194.6	---	
C_{rss}	Reverse Transfer Capacitance		---	4.1	---	
R_g	Gate Resistance	V_{DS}=V_{GS}=0V , F=1MHz	---	2	---	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	---	---	40	A
I_{SM}	Pulsed Source Current		---	---	80	A
V_{SD}	Diode Forward Voltage (NOTE 4)	V_{GS}= 0V , I_S=1A	---	---	1.2	V

NOTES：

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃
2. V_{DD}=25V, V_{GS}=10V , L=0.5mH , I_{AS}=16A.
3. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

Characteristics Curves

Fig.1 Typ. Output Characteristics

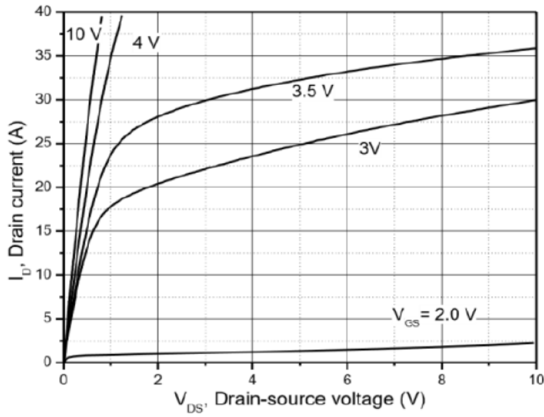


Fig.2 Typ. Transfer Characteristics

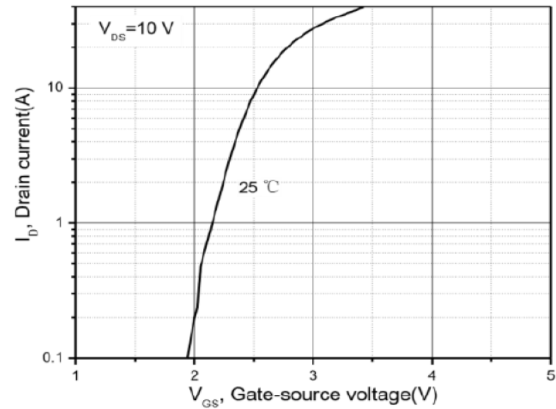


Fig.3 Typ. Capacitance

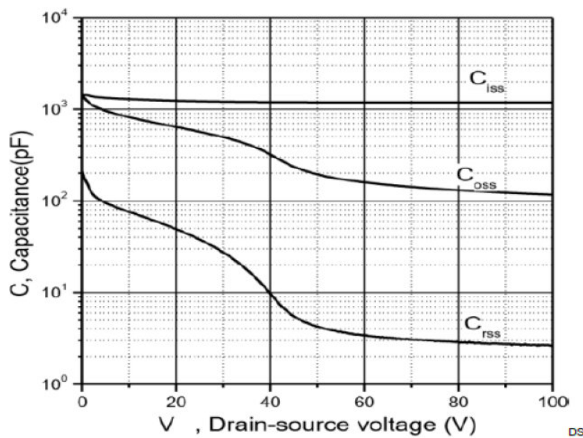


Fig.4 Typ. Gate Charge

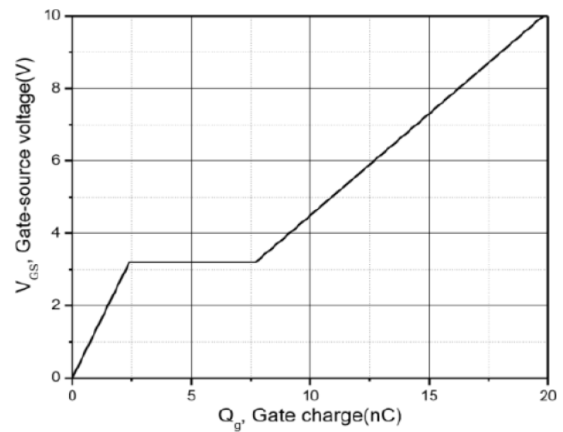


Fig.5 Drain-Source Breakdown Voltage

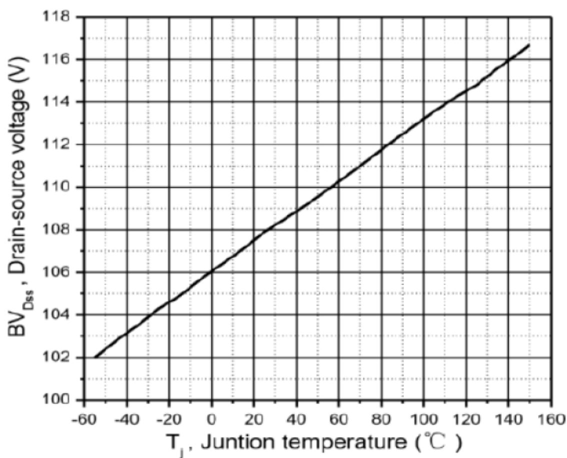
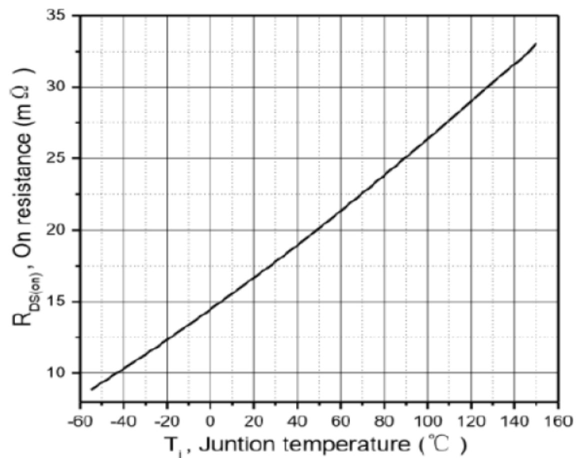


Fig.6 Drain-Source On-State Resistance



Characteristics Curves

Fig.7 Forward Characteristic of Body Diode

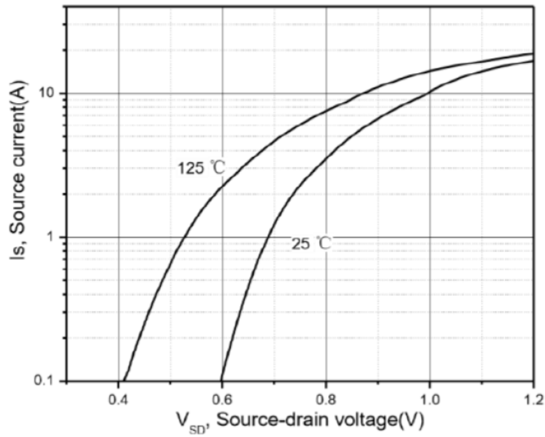


Fig.8 Drain-Source On-State Resistance

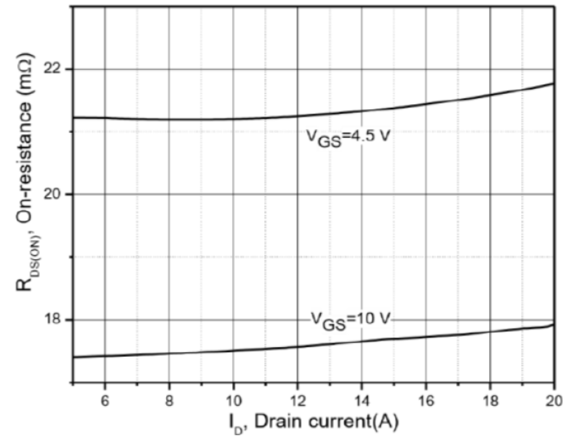
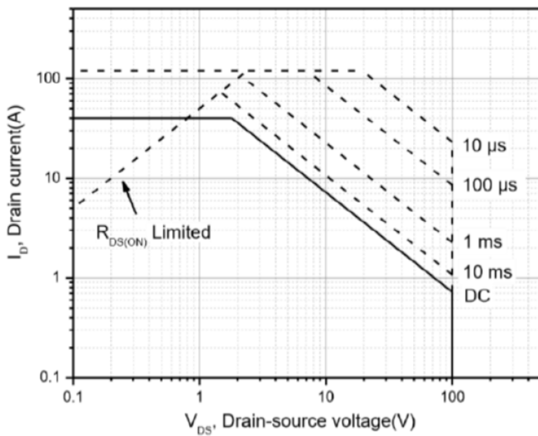
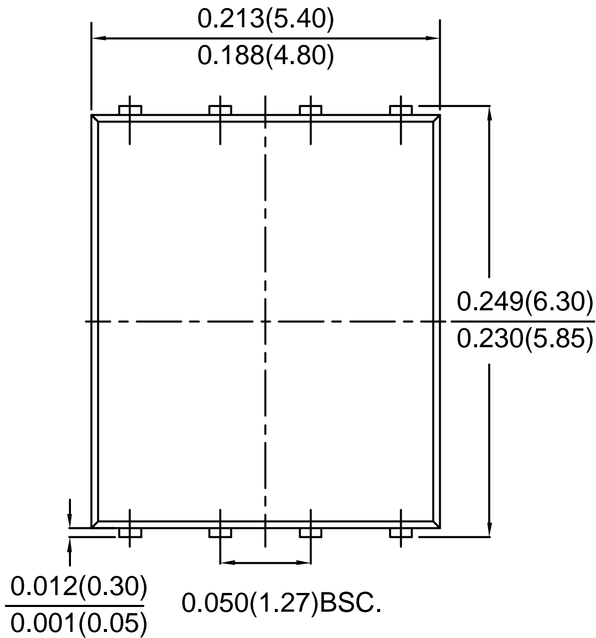
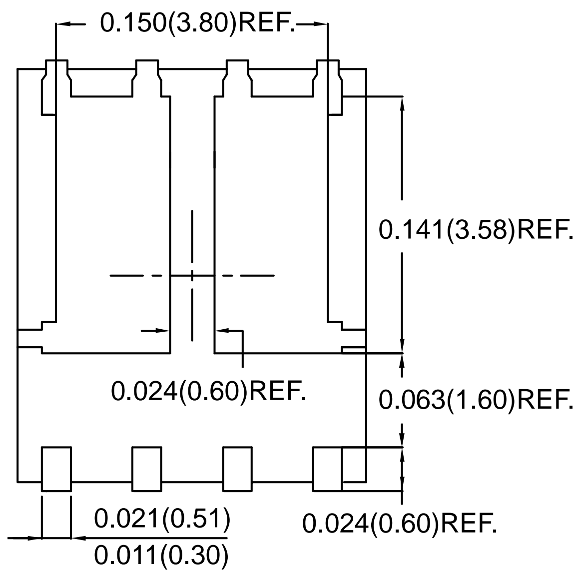


Fig.9 Safe Operating Area



Package Outline Dimensions





PPAK5X6 Dual

Dimensions in inches and (millimeters)

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