



**100V N-Channel MOSFETs**

**General Description**

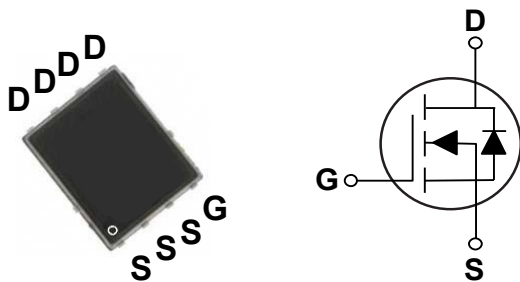
These N-Channel enhancement mode power field effect transistors are using SGT MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

<b>BV<sub>DSS</sub></b>	<b>R<sub>DS(ON)</sub></b>	<b>I<sub>D</sub></b>
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 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	$\pm 20$	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)	7.5	mJ
$P_D$	Power Dissipation ( $T_C=25^\circ C$ )	72	W
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		NM020	

**Thermal Characteristics**

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.74	$^\circ C/W$

**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	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V$	---	---	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

**On Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=8A$	---	---	20	m $\Omega$
		$V_{GS}=4.5V, I_D=6A$	---	---	26	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.5	2.5	V

**Dynamic and switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$Q_g$	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=8A$	---	19.8	---	nC
$Q_{gs}$	Gate-Source Charge		---	2.4	---	
$Q_{gd}$	Gate-Drain Charge		---	5.3	---	
$V_{(plateau)}$	Gate Plateau Voltage	$V_{DS}=50V, I_D=8A$	---	3.37	---	V
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=50V, V_{GS}=10V, R_G=2.2\Omega, I_D=10A$	---	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	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	---	1190.6	---	pF
$C_{OSS}$	Output Capacitance		---	194.6	---	
$C_{RSS}$	Reverse Transfer Capacitance		---	4.1	---	

**Drain-Source Diode Characteristics and Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Diode Forward Current	$V_{GS} < V_{th}$	---	---	40	A
$I_{SP}$	Pulsed Source Current	$V_G=V_D=0V$ , Force Current	---	---	120	A
$V_{SD}$	Diode Forward Voltage	$I_S=8A, V_{GS}=0V$	---	---	1.3	V

**NOTES :**

1. Repetitive rating; pulse width limited by max. junction temperature.
2.  $V_{DD}=50V, R_G=25\Omega, L=0.3\text{mH}$ , starting  $T_J=25^\circ\text{C}$ .
3. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .



Characteristics Curves

FIG. 1-Output Characteristics

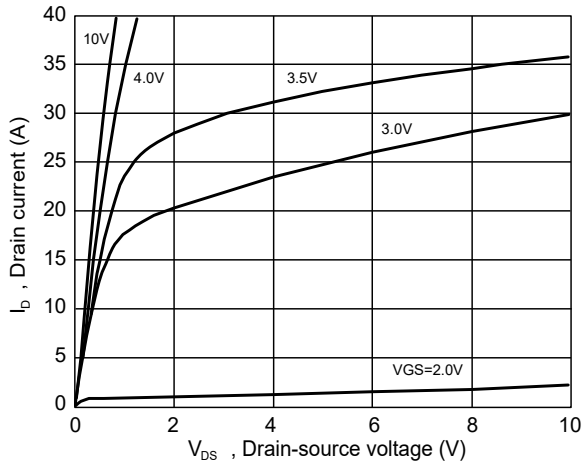


FIG. 2-Transfer Characteristics

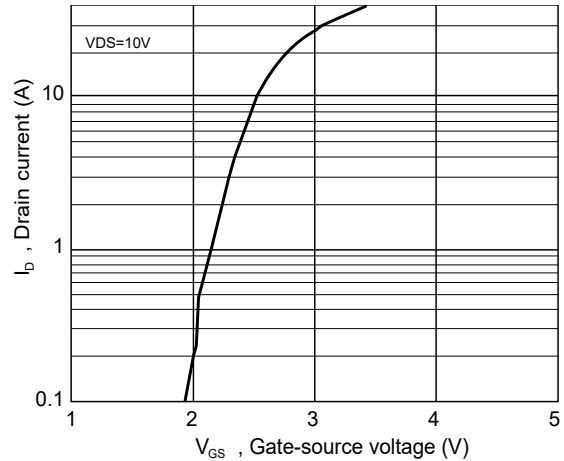


FIG. 3-Gate Charge Characteristics

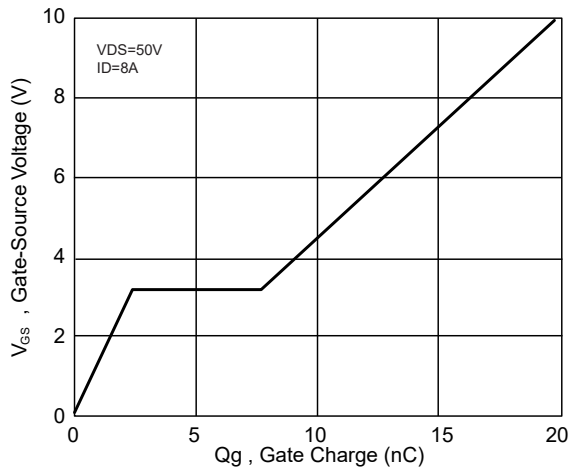


FIG. 4-Drain-Source Breakdown Voltage

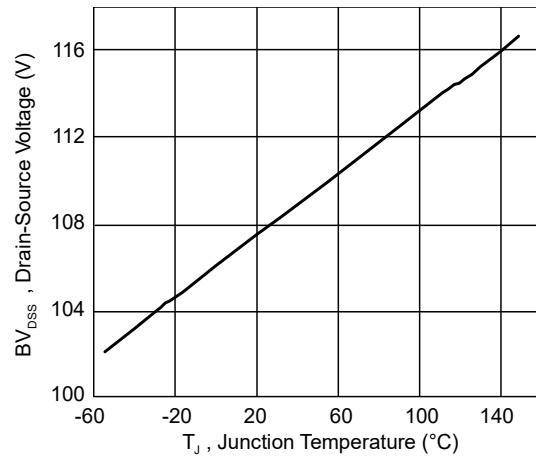


FIG. 5-Drain-Source On-State Resistance

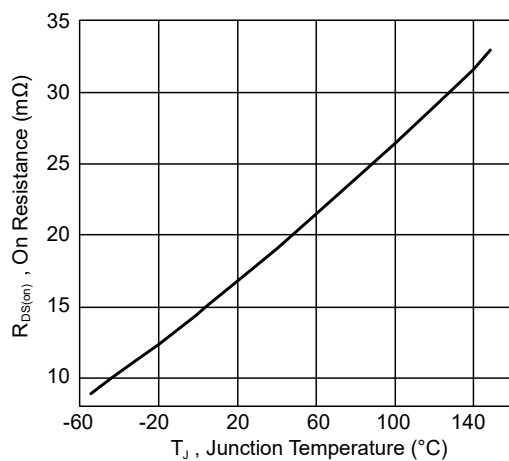
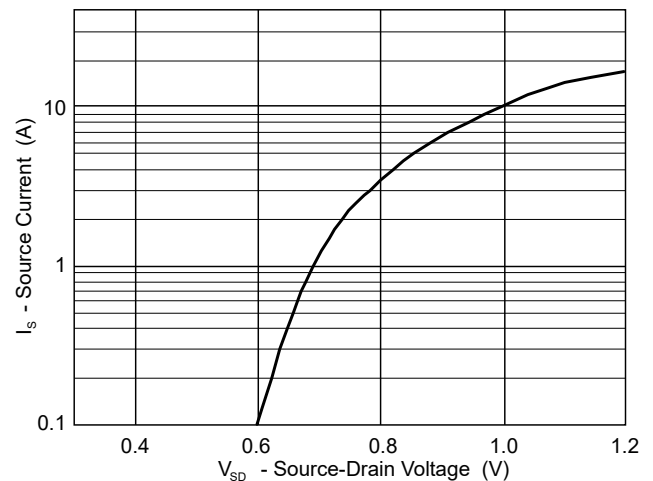


FIG. 6-Forward Characteristic of Body Diode



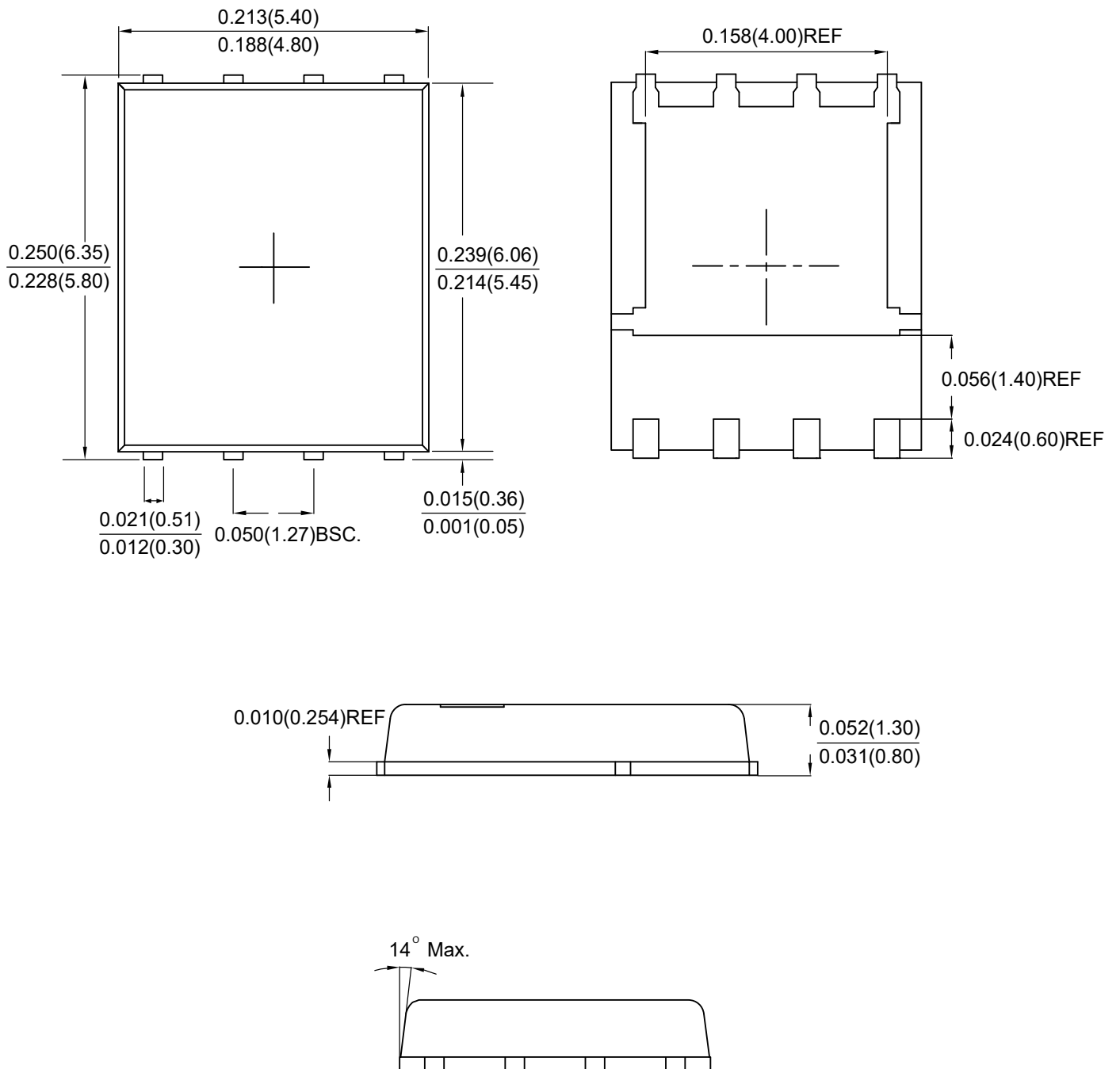


**P5MNM020**



**100V N-Channel MOSFETs**

**Package Outline Dimensions**



**PPAK5X6**

Dimensions in inches and (millimeters)



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