P5MNK5P6

85V N-Channel MOSFETs

General Description

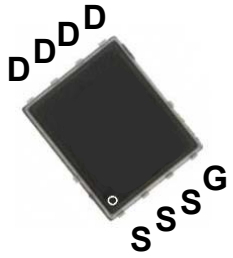
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

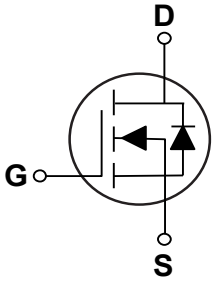
BV_{DSS}	$R_{DS(ON)}$	I_D
85 V	5.6 mΩ	100 A

Features

- $R_{DS(ON)} \leqq 5.6m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK5X6 Pin Configuration





Applications

- Battery Management System
- Power Management Switching
- Motor Drive

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25°C)	100	A
	Drain Current – Continuous (T_C=100°C)	63.3	A
I_{DM}	Drain Current – Pulsed (NOTE 1)	400	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	273.8	mJ
P_D	Power Dissipation (T_C=25°C)	107.8	W
T_J	Operating Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		NK5P6	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	60	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.16	°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	85	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=85V , V_{GS}=0V	---	---	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=20A	---	---	5.6	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	2	---	4	V
g_{fs}	Forward Transconductance	V_{DS}=5V , I_D=20A	---	57.8	---	S

Dynamic and switching Characteristics (NOTE 4)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=40V , V_{GS}=10V , I_D=20A	---	61.3	---	nC
Q_{gs}	Gate-Source Charge		---	21	---	
Q_{gd}	Gate-Drain Charge		---	11	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=40V , V_{GS}=10V , R_G=3Ω , I_D=20A	---	16.5	---	nS
T_r	Rise Time		---	51.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	37.1	---	
T_f	Fall Time		---	8.2	---	
C_{iss}	Input Capacitance	V_{DS}=40V , V_{GS}=0V , F=1MHz	---	4645	---	pF
C_{oss}	Output Capacitance		---	673	---	
C_{rss}	Reverse Transfer Capacitance		---	41	---	
R_g	Gate Resistance	V_{GS}=0V , V_{DS}=0V , F=1MHz	---	2	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage (NOTS 3)	V_{GS}=0V , I_S=20A	---	---	1.2	V

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=37A.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Guaranteed by design, not subject to production testing.

Characteristics Curves

FIG. 1 - Drain Current

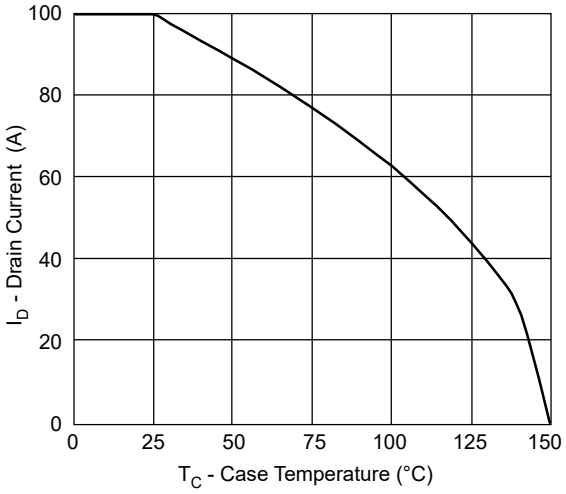


FIG. 2 - Gate Threshold Voltage

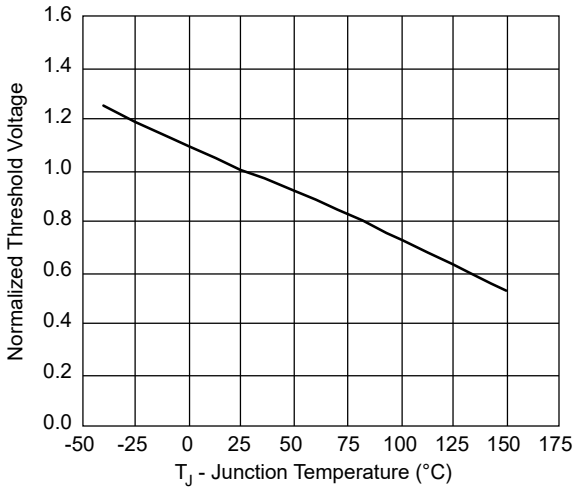


FIG. 3 - Source-Drain Diode Forward

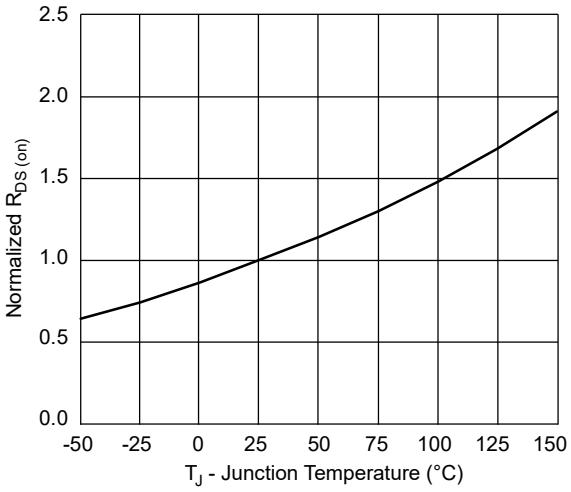


FIG. 4 - Gate Charge Characteristics

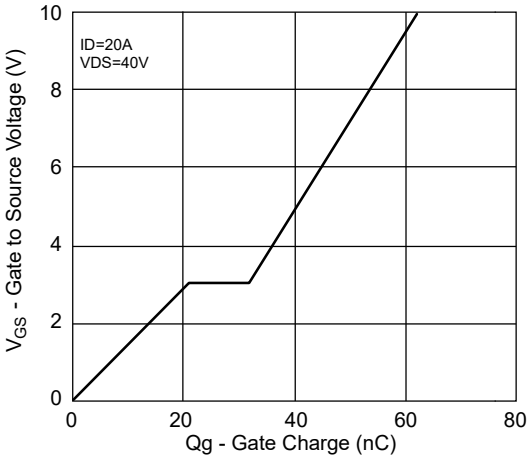


FIG. 5 - Safe Operating Area

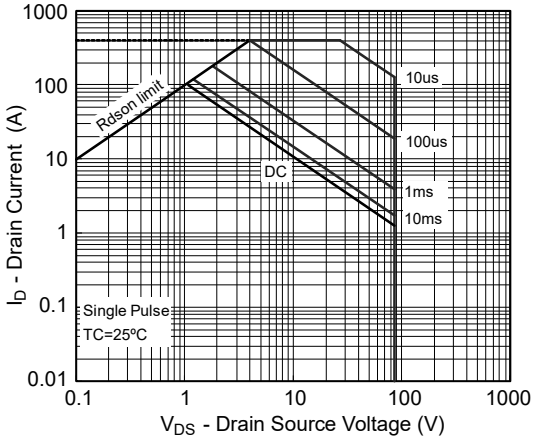
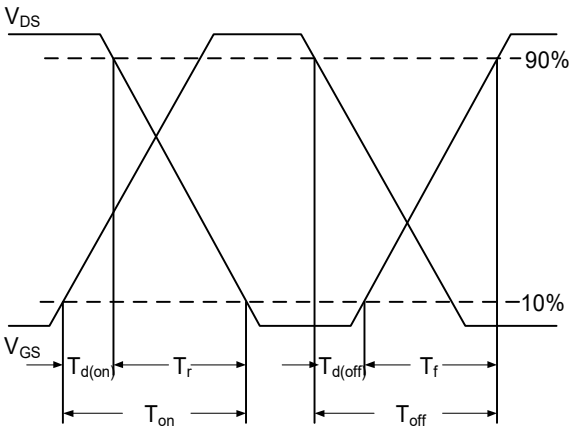
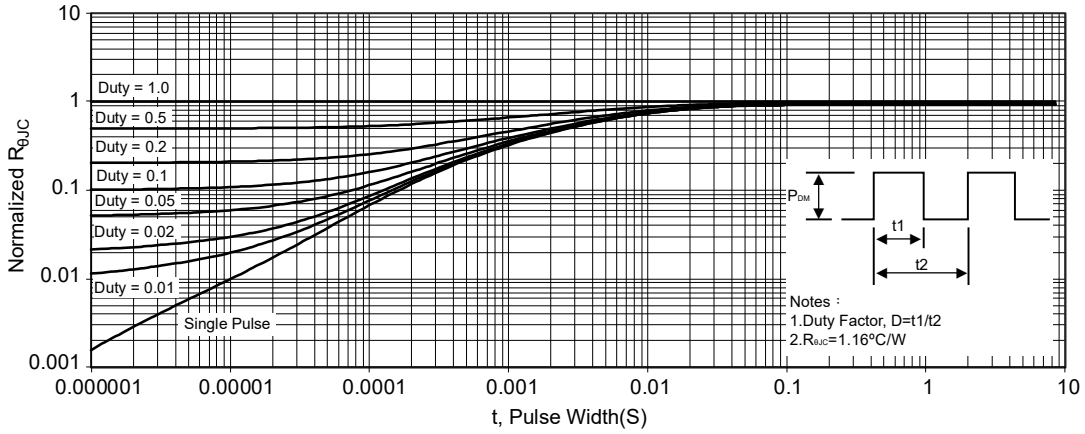


FIG. 6 - Switching Time Waveform

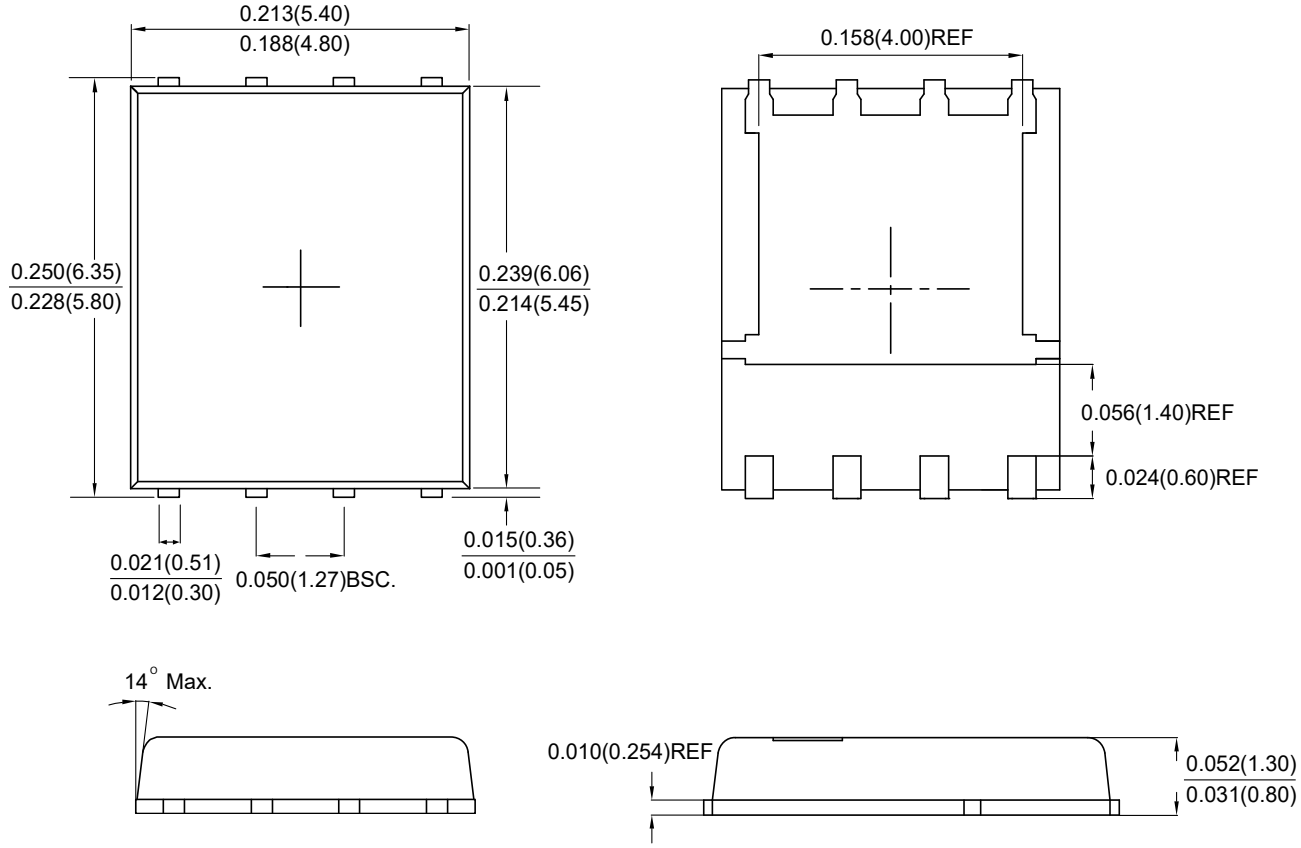


Characteristics Curves

FIG. 7 - Normalized Transient Thermal Impedance



Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)

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