P5MNK7P2

80V N-Channel MOSFETs

General Description

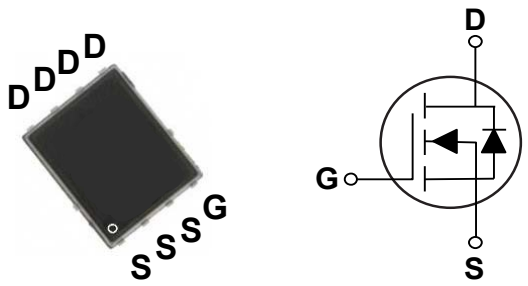
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
80 V	7.2 mΩ	80 A

Features

- $R_{DS(ON)} \leqq 7.2m\Omega @ V_{GS}=10V$
- Fast switching
- Improved dv/dt capability
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Networking
- Load Switch
- LED applications
- Quick Charger

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	+20 / -12	V
I_D	Drain Current – Continuous (T_C=25°C)	80	A
	Drain Current – Continuous (T_C=100°C)	50	A
I_{DM}	Drain Current – Pulsed (NOTE 1)	320	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	201	mJ
IAS	Single Pulse Avalanche Current (NOTE 2)	64	A
P_D	Power Dissipation (T_C=25°C)	125	W
	Power Dissipation – Derate above 25°C	1	W/°C
T_J	Storage Temperature Range	-50 to 150	°C
T_{STG}	Operating Junction Temperature Range	-50 to 150	°C
Marking Code		NK7P2	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	1	°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	80	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=64V , V_{GS}=0V , T_J=125°C	---	---	10	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	---	5.9	7.2	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	2.5	3.2	4.0	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=3A	---	10	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=40V , V_{GS}=10V , I_D=10A (NOTE 3、4)	---	40.3	60	nC
Q_{gs}	Gate-Source Charge		---	9.4	15	
Q_{gd}	Gate-Drain Charge		---	16	25	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=40V , V_{GS}=10V , R_G=6Ω , I_D=1A (NOTE 3、4)	---	14.6	30	nS
T_r	Rise Time		---	21.5	42	
$T_{d(off)}$	Turn-Off Delay Time		---	52	108	
T_f	Fall Time		---	83.5	167	
C_{iss}	Input Capacitance	V_{DS}=40V , V_{GS}=0V , F=1MHz	---	2490	4980	pF
C_{oss}	Output Capacitance		---	823	1640	
C_{rss}	Reverse Transfer Capacitance		---	44	80	
R_g	Gate resistance	V_{GS}=0V , V_{DS}=0V , F=1MHz	---	1	---	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	---	---	80	A
I_{SM}	Pulsed Source Current		---	---	160	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V
T_{rr}	Reverse Recovery Time	V_{GS}=10V , I_S=10A , di/dt=100A/us , T_J=25°C	---	50	---	nS
Q_{rr}	Reverse Recovery Charge		---	70	---	nC

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. V_{DD}=40V, V_{GS}=10V, L=0.1mH, I_{AS}=64A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Characteristics Curves

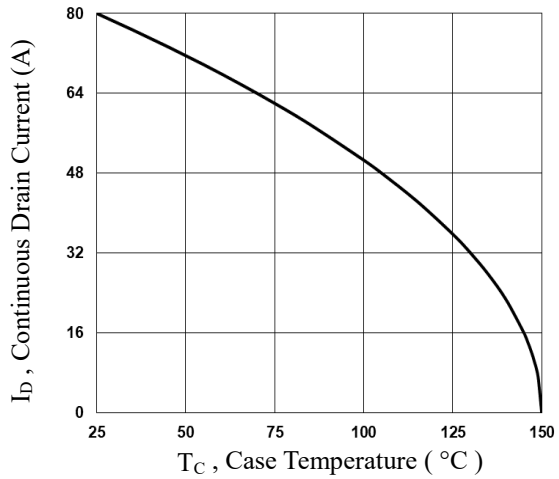


Fig.1 Continuous Drain Current vs. T_C

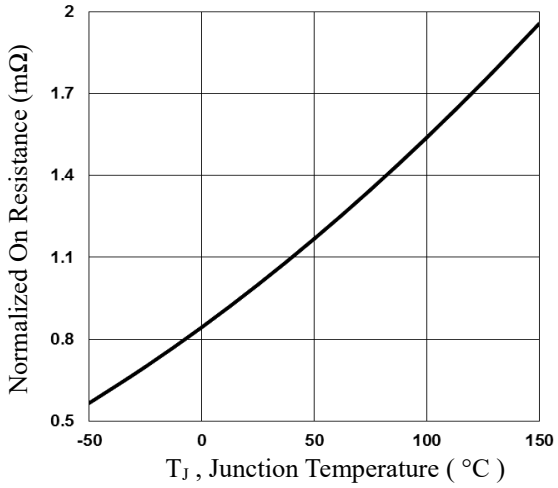


Fig.2 Normalized RDSON vs. T_J

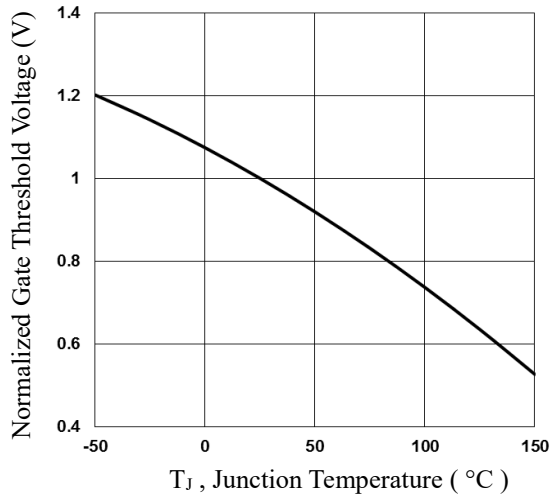


Fig.3 Normalized Vth vs. T_J

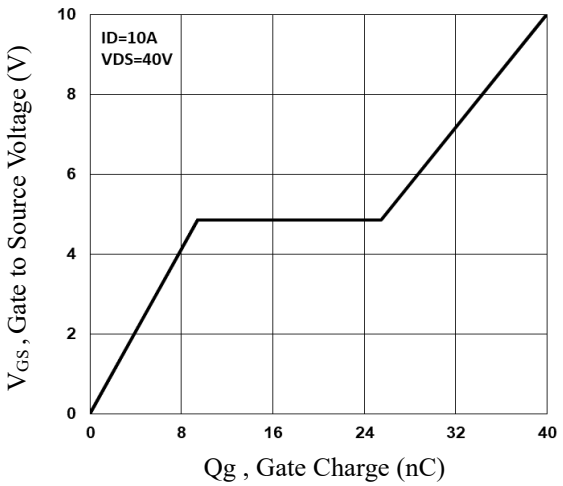


Fig.4 Gate Charge Characteristics

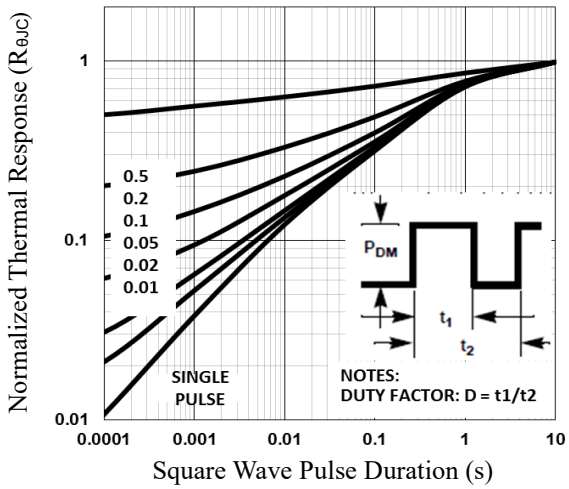


Fig.5 Normalized Transient Impedance

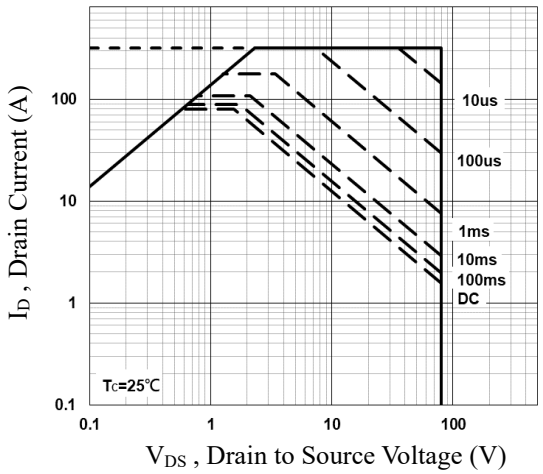


Fig.6 Maximum Safe Operation Area

Characteristics Curves

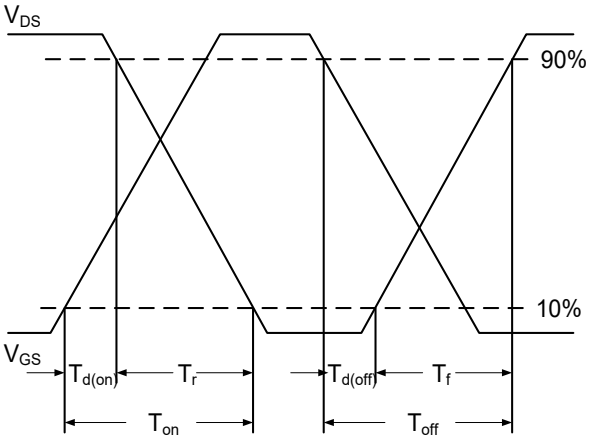


Fig.7 Switching Time Waveform

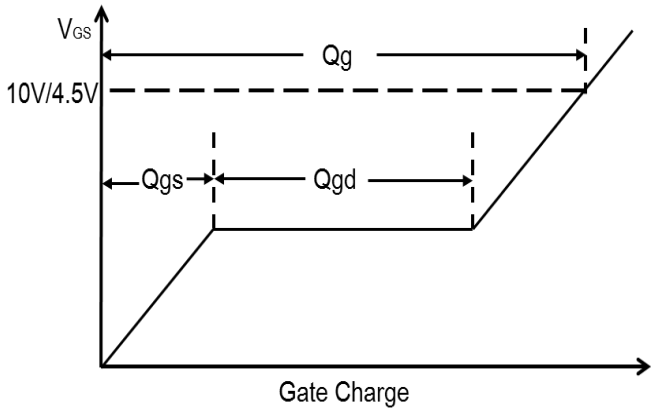
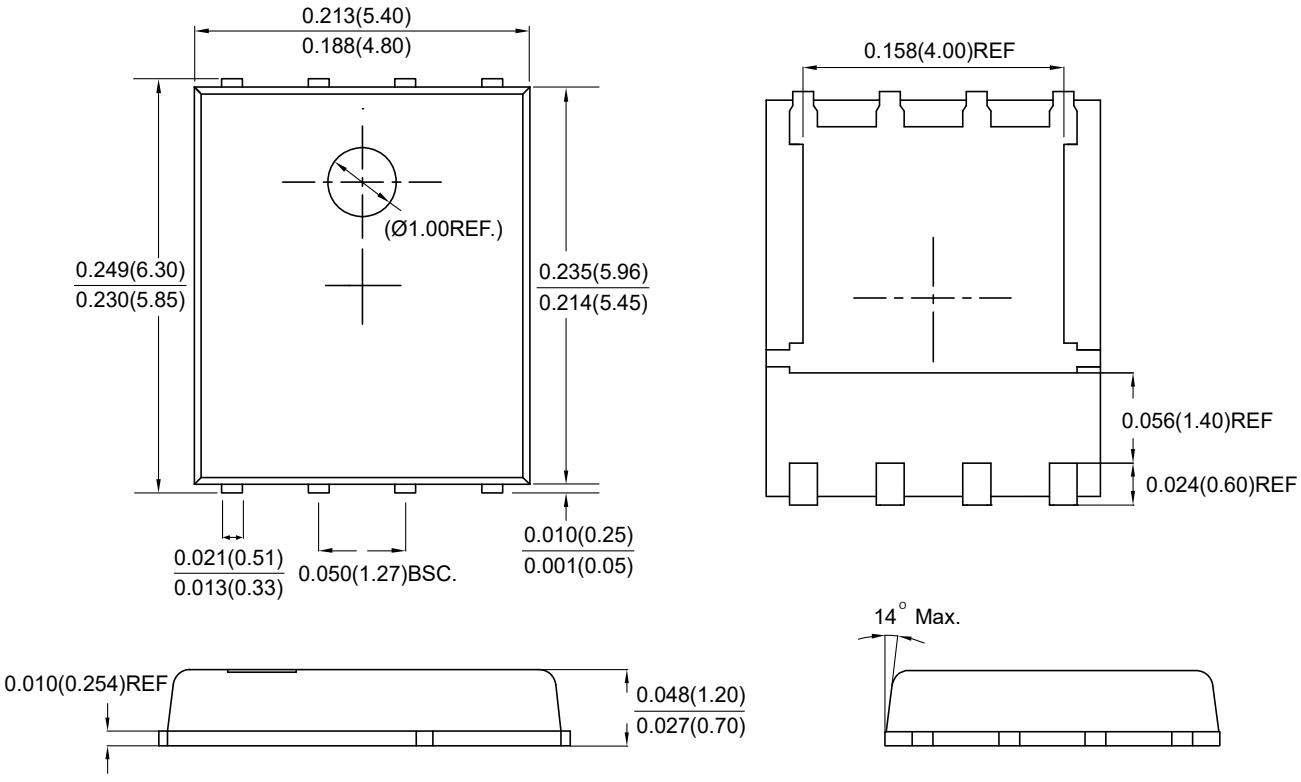


Fig.8 Gate Charge Waveform

Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)

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