



100V N-Channel MOSFETs

General Description

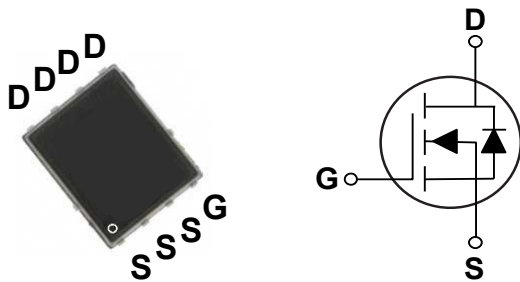
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	R_{DS(ON)}	I_D
100 V	4.4 mΩ	142 A

Features

- $R_{DS(ON)} \leq 4.4m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Power Management in DC/DC Converters
- USB Power Delivery (USB PD)

Absolute Maximum Ratings T_C=25°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°C)	142	A
	Drain Current – Continuous (T _C =100°C)	107	A
I _{DM}	Drain Current – Pulsed (NOTE 1)	400	A
EAS	Single Pulse Avalanche Energy (L=0.1mH) (NOTE 2)	162	mJ
IAS	Single Pulse Avalanche Current (L=0.1mH) (NOTE 2)	57	A
P _D	Power Dissipation (T _C =25°C)	125	W
T _J	Operating Junction Temperature Range	-55 to 150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		NM4P4	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	48	°C/W
R _{θJC}	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	100	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, 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	---	---	4.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10A	---	22	---	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 =20A	---	72.8	---	nC
Q _{gs}	Gate-Source Charge		---	21.5	---	
Q _{gd}	Gate-Drain Charge		---	20.7	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =25V, V _{GS} =10V, R _{GEN} =3Ω, I _D =1A	---	12.8	---	nS
T _r	Rise Time		---	6.3	---	
T _{d(off)}	Turn-Off Delay Time		---	40	---	
T _f	Fall Time		---	65	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	---	4175	---	pF
C _{oss}	Output Capacitance		---	1190	---	
C _{rss}	Reverse Transfer Capacitance		---	35	---	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	0.6	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =10A	---	---	1.1	V
t _{rr}	Reverse Recovery Time	V _R =50V, I _F =10A,	---	40.4	---	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	---	80.2	---	nC

NOTES :

1. Max. current is limited by bonding wire.
2. UIS tested and pulse width are limited by maximum junction temperature 150°C.
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-Source On-Resistance

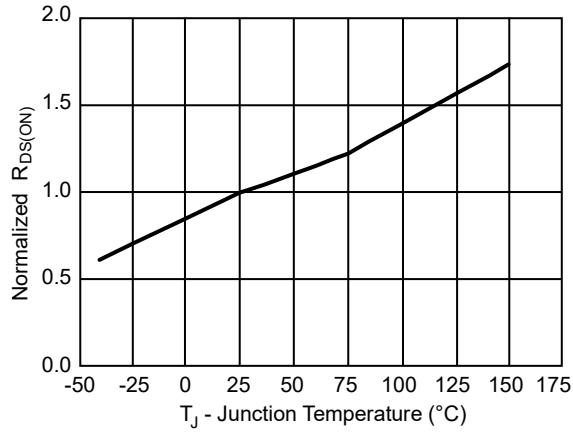


FIG. 2- Gate Threshold Voltage

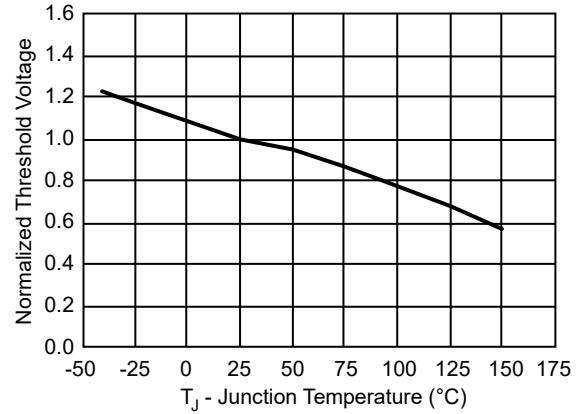


FIG. 3- Gate Charge Characteristics

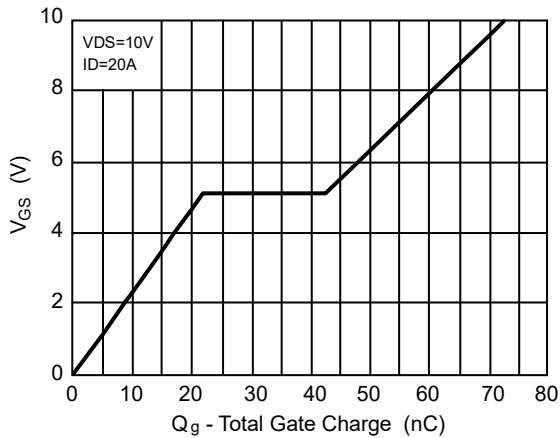


FIG. 4- Drain Current

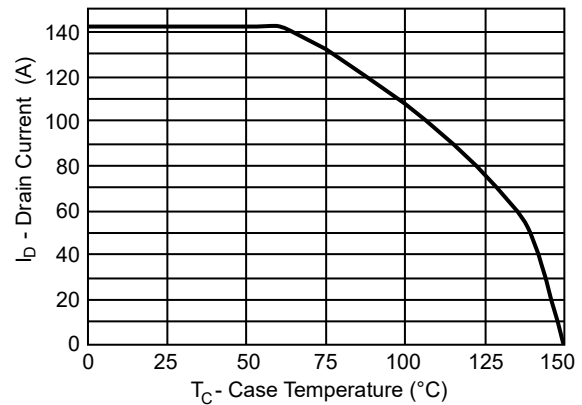


FIG. 5- Safe Operating Area

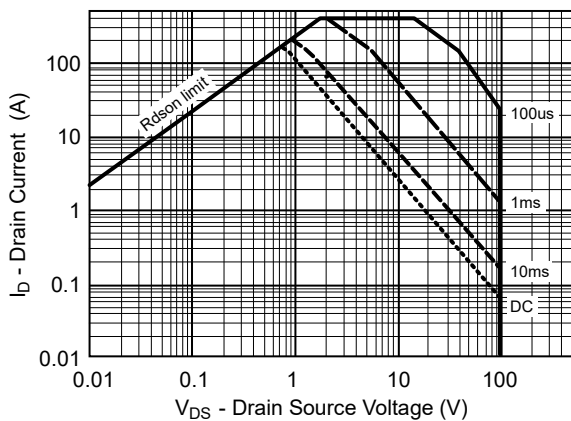
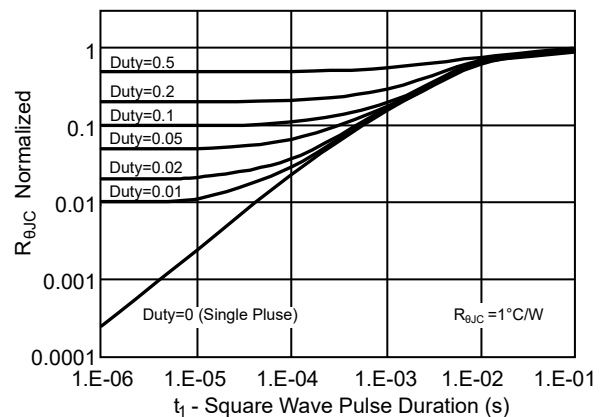


FIG. 6- $R_{\theta JC}$ Transient Thermal Impedance



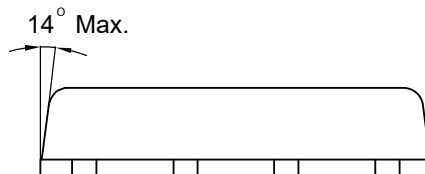
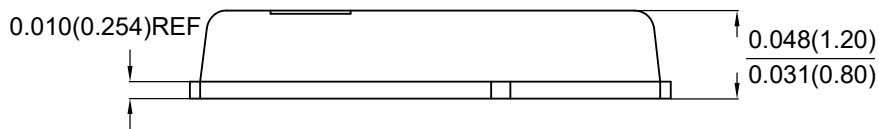
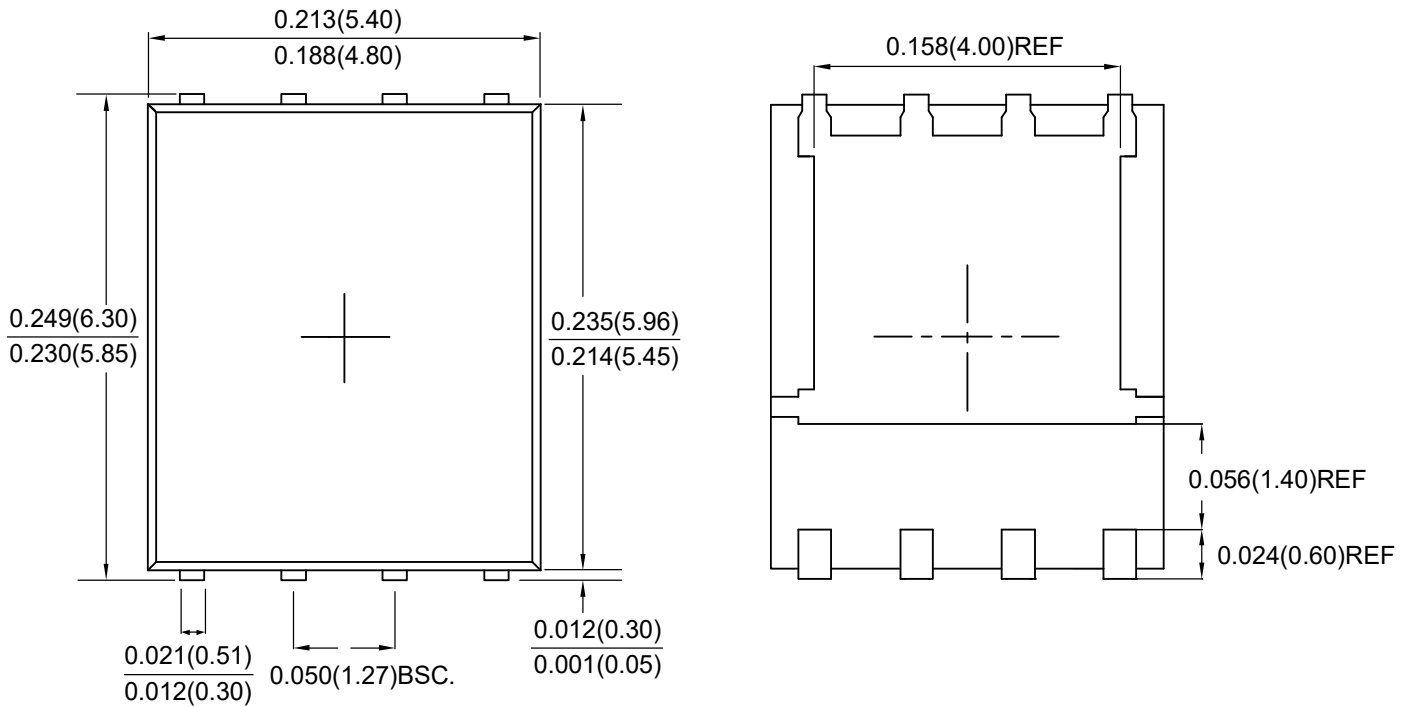


P5MNM4P4



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Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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