



100V N-Channel MOSFETs

General Description

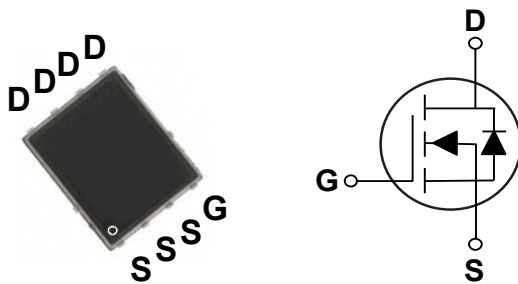
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	8 m Ω	91 A

Features

- $R_{DS(ON)} \leq 8m\Omega @ V_{GS}=10V$
- 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 $T_J=25^\circ C$ 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 ($T_C=25^\circ C$)	91	A
	Drain Current – Continuous ($T_C=100^\circ C$)	57	A
I_{DM}	Drain Current – Pulsed ($T_C=25^\circ C$) (NOTE 1)	106	A
IAS	Single Pulse Avalanche Energy (L=0.1mH) (NOTE 2)	30	A
EAS	Single Pulse Avalanche Energy (L=0.1mH) (NOTE 2)	45	mJ
P_D	Power Dissipation ($T_A=25^\circ C$)	2.5	W
T_J	Operating Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		NM8P0	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	50	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.9	$^\circ C/W$



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	---	---	8	mΩ
		V _{GS} =4.5V, I _D =10A	---	---	12.5	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	2	3	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10A	---	25.8	---	S

Dynamic and switching Characteristics (NOTE 4)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _D =20A	---	43.3	---	nC
Q _{gs}	Gate-Source Charge		---	8.1	---	
Q _{gd}	Gate-Drain Charge		---	10.8	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =30V, V _{GS} =10V, R _{GEN} =1Ω, I _D =1A	---	14.5	---	nS
T _r	Rise Time		---	8.1	---	
T _{d(off)}	Turn-Off Delay Time		---	13.5	---	
T _f	Fall Time		---	107	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	---	2111	---	pF
C _{oss}	Output Capacitance		---	579	---	
C _{rss}	Reverse Transfer Capacitance		---	38	---	
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
V _{SD}	Diode Forward Voltage (NOTS 3)	V _{GS} =0V, I _S =10A	---	---	1.1	V
t _{rr}	Reverse Recovery Time	I _F =10A, V _R =50V,	---	45.5	---	nS
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/us	---	51.1	---	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 - $R_{DS(ON)}$ vs. I_D

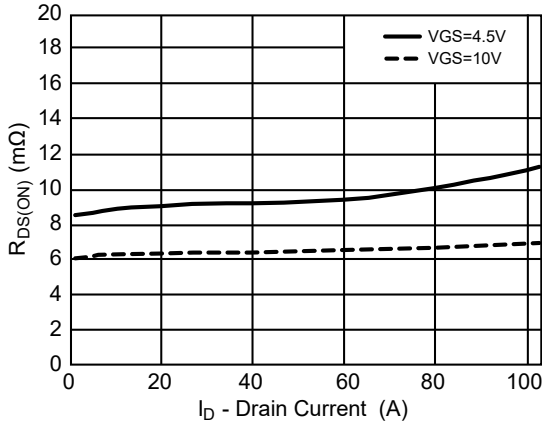


FIG. 2 - Gate Threshold Voltage

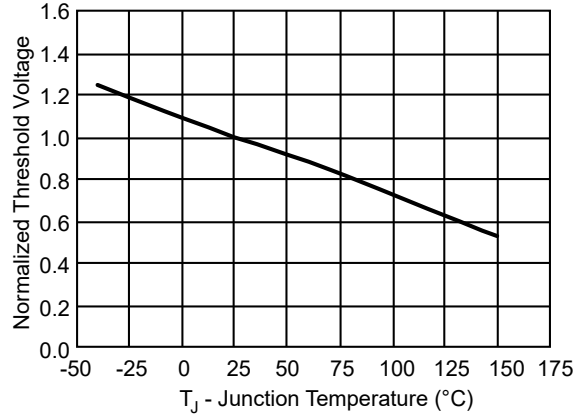


FIG. 3 - Source-Drain Diode Forward

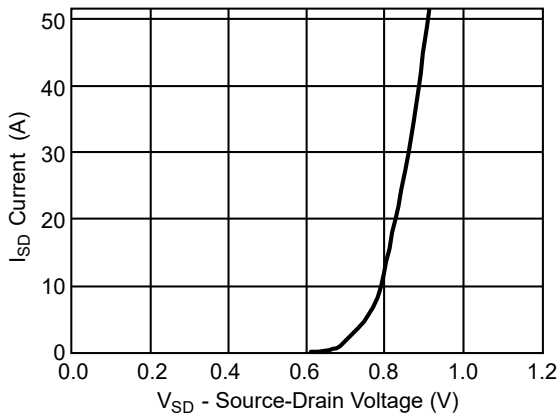


FIG. 4 - Drain Current

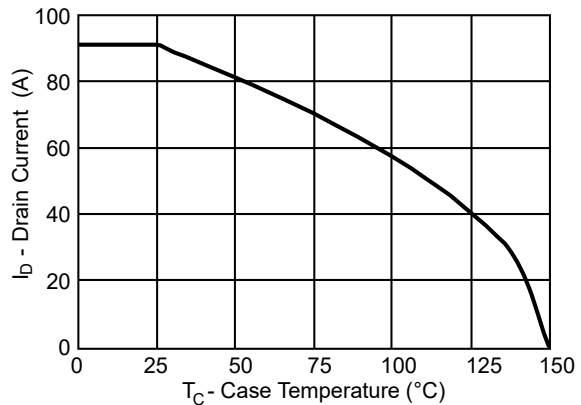


FIG. 5 - Safe Operating Area

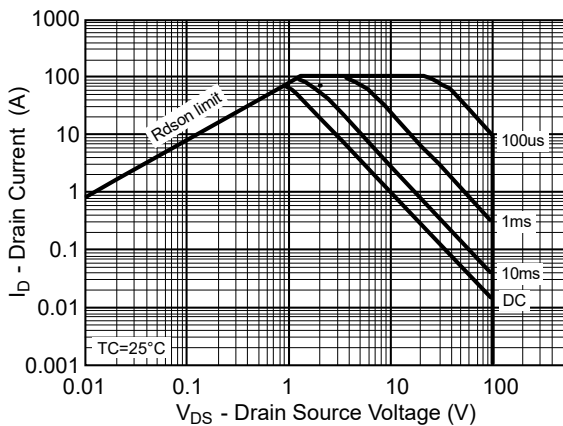
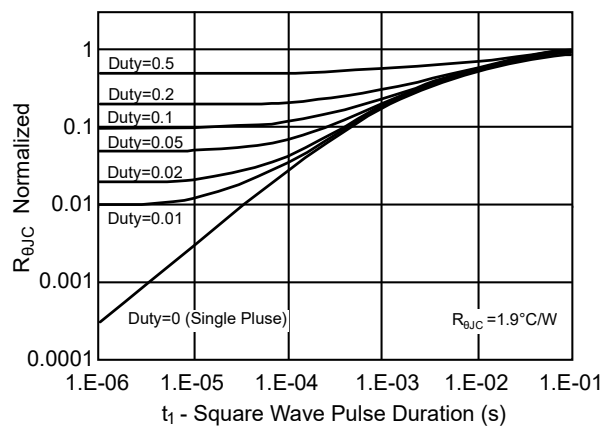
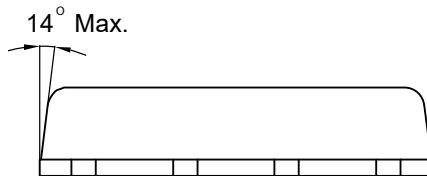
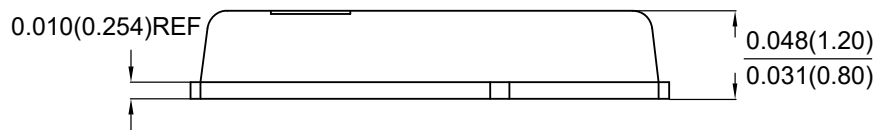
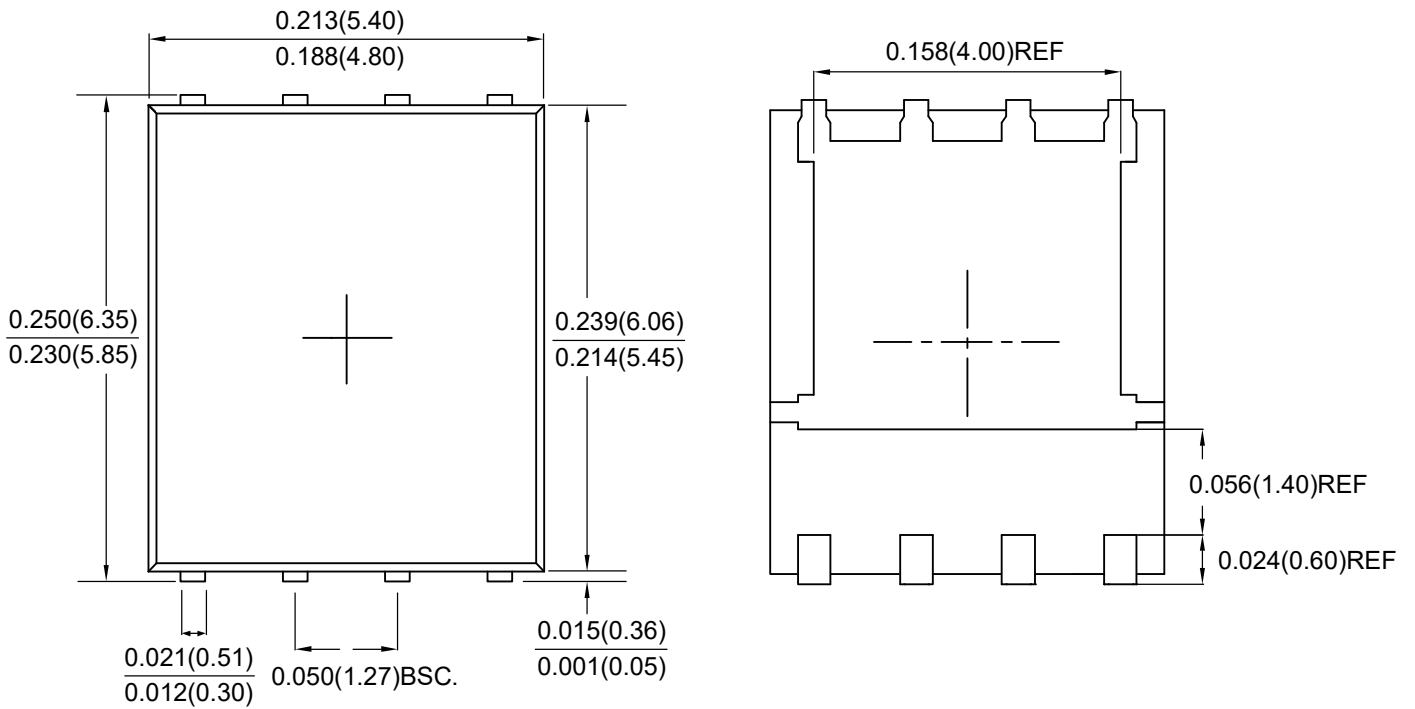


FIG. 6 - $R_{\theta JC}$ Transient Thermal Impedance





Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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