



30V N-Channel MOSFETs

General Description

The P5MNC1P9 uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge.

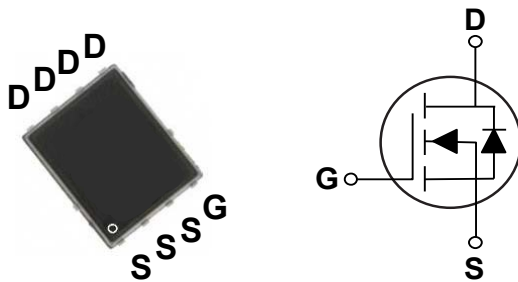
This device is suitable for use in PWM, load switching and general purpose applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
30 V	1.9 mΩ	100 A

Features

- $R_{DS(ON)} \leq 1.9m\Omega @ V_{GS}=10V$
- Low Input Capacitance
- Low On-Resistance
- Low Miller Charge
- Low Input / Output Leakage

PPAK5X6 Pin Configuration



Applications

- Lithium-Ion Secondary Batteries
- Load Switch
- DC-DC converters and Off-line UPS
- Power Tools

Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_C=25^\circ C$)	100	A
	Drain Current – Continuous ($T_C=70^\circ C$)	63	A
I_{DM}	Drain Current – Pulsed (NOTE 1)	320	A
EAS	Single Pulse Avalanche Energy (L=0.1mH)	125	mJ
IAS	Avalanche Current (L=0.1mH)	50	A
P_D	Power Dissipation ($T_C=25^\circ C$)	150	W
	Power Dissipation ($T_A=25^\circ C$)	75	W
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ C$
Marking Code		NC1P9	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (Steady State)	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case (Steady State)	---	1	$^\circ C/W$



Electrical Characteristics (T_A=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	30	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, 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 =16A	---	1.55	1.9	mΩ
		V _{GS} =4.5V, I _D =14A	---	2.2	2.5	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	---	2.5	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =16A	---	54	---	nC
Q _{gs}	Gate-Source Charge		---	18	---	
Q _{gd}	Gate-Drain Charge		---	20.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =15V, V _{GS} =10V, R _{GEM} =3.3Ω, I _D =1A	---	20	---	nS
T _r	Rise Time		---	6.5	---	
T _{d(off)}	Turn-Off Delay Time		---	122	---	
T _f	Fall Time		---	15	---	
C _{ISS}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	5910	---	pF
C _{OSS}	Output Capacitance		---	725	---	
C _{rSS}	Reverse Transfer Capacitance		---	537	---	

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	---	---	100	A
I _{SM}	Pulsed Source Current		---	---	300	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =4A	---	---	1.2	V

NOTES :

1. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.



Characteristics Curves

FIG.1-Typical Output Characteristics

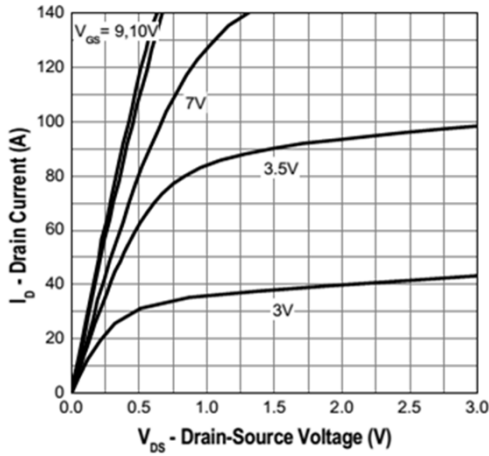


FIG.2-On-Resistance vs. G-S Voltage

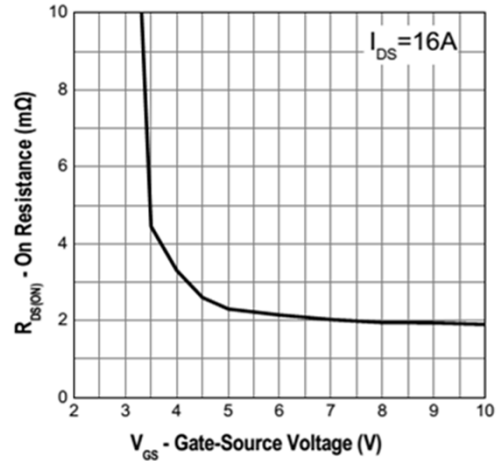


FIG.3-Source Drain Forward Characteristics

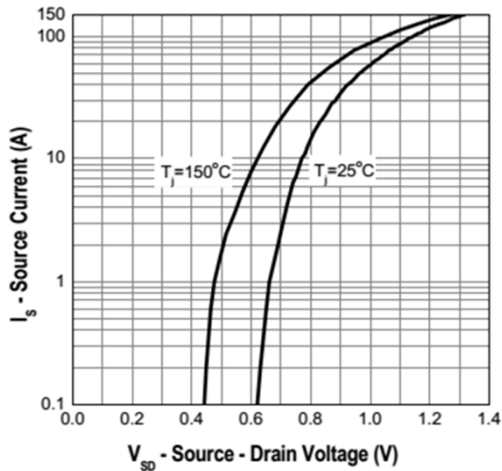


FIG.4-Gate Charge Characteristics

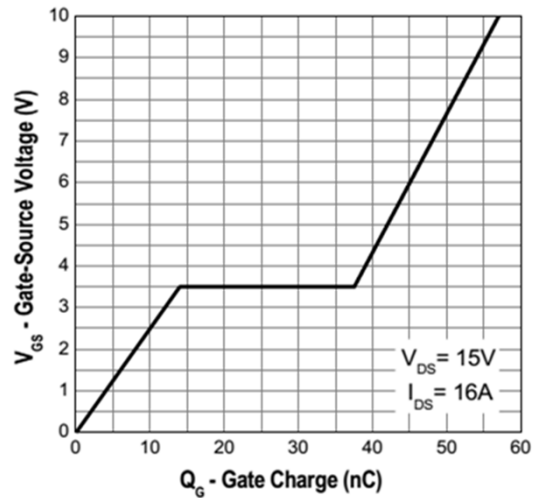


FIG.5-Normalized $V_{GS(th)}$ vs. T_J

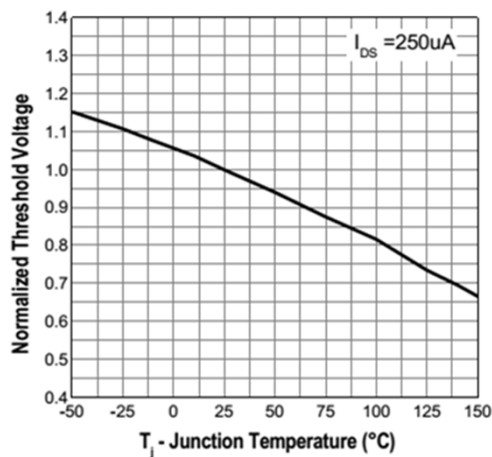
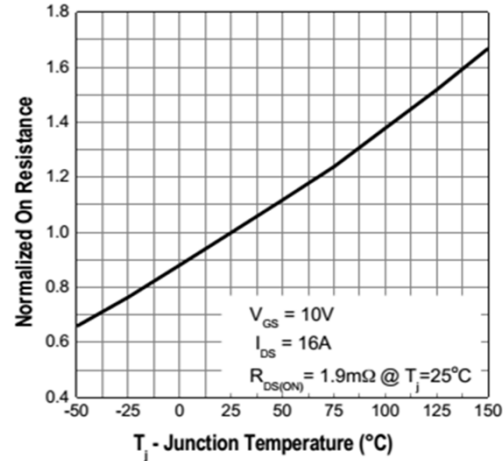


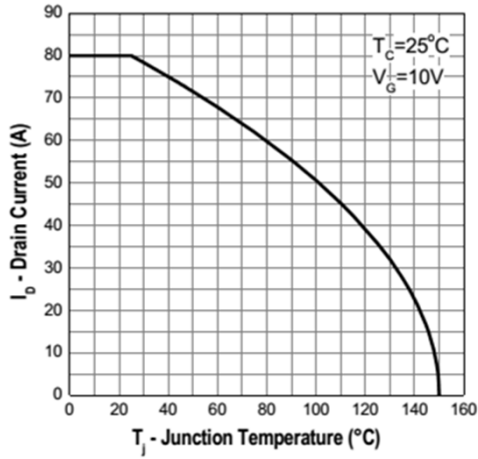
FIG.6-Normalized $R_{DS(on)}$ vs. T_J



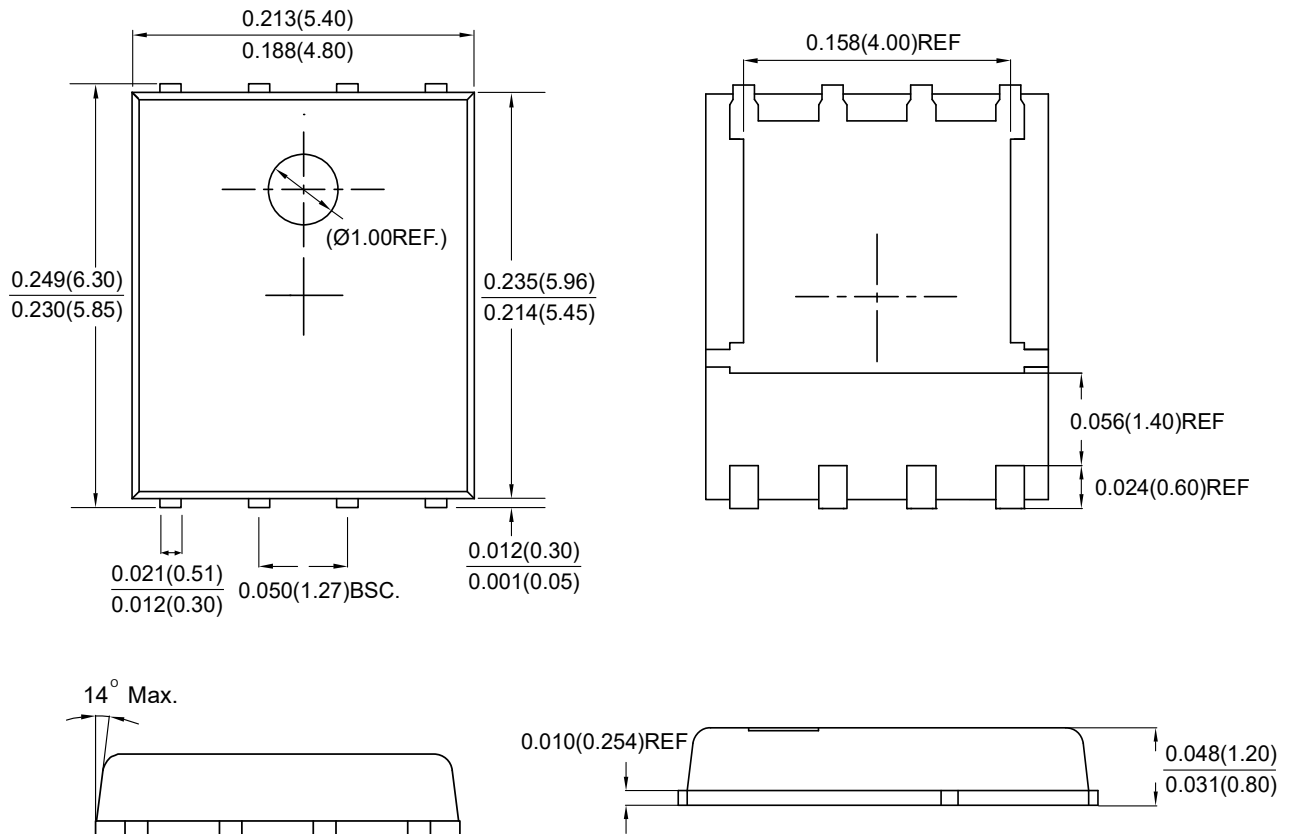


Characteristics Curves

FIG.7-Drain Current vs. T_J



Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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