P5MNC7P5

30V N-Channel MOSFETs

BV_{DSS}	$R_{DS(ON)}$	I_D
30 V	7.5 mΩ	55 A

General Description

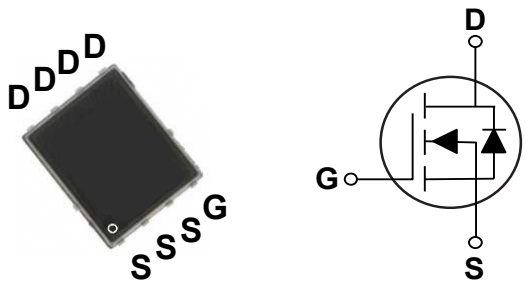
The P5MNC7P5 uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge.

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

Features

- $R_{DS(ON)} \leqq 7.5m\Omega @ V_{GS}=10V$
- Low Input Capacitance
- Low On-Resistance
- Low Miller Charge
- Low Input / Output Leakage

PPAK5X6 Pin Configuration



Applications

- MB / VGA / Vcore
- Load Switch
- SMPS 2nd SR
- POL Application

Absolute Maximum Ratings T_A=25°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°C)	55	A
	Drain Current – Continuous (T_C=100°C)	36	A
I_{DM}	Drain Current – Pulsed (NOTE 1)	115	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	45	mJ
IAS	Avalanche Current	30	A
P_D	Power Dissipation (T_C=25°C) (NOTE 3)	46	W
	Power Dissipation (T_A=25°C) (NOTE 3)	2	W
T_J	Operating Junction Temperature Range	-55 to 150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		NC7P5	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (Steady State)	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case (Steady State)	---	3.2	°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}=24V , 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	---	---	7.5	mΩ
		V_{GS}=4.5V , I_D=10A	---	---	12	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.2	---	2.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=8A	---	12	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}=15V , V_{GS}=4.5V , I_D=15A	---	9.8	---	nC
Q_{gs}	Gate-Source Charge		---	3.8	---	
Q_{gd}	Gate-Drain Charge		---	4.7	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=15V , V_{GS}=10V , R_{GEM}=3.3Ω , I_D=15A	---	4.7	---	nS
T_r	Rise Time		---	12.3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	27.2	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , F=1MHz	---	1260	---	pF
C_{oss}	Output Capacitance		---	150	---	
C_{rss}	Reverse Transfer Capacitance		---	102	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (NOTE 4)	V_G=V_D=0V , Force Current	---	---	55	A
I_{SM}	Pulsed Source Current (NOTE 1、4)		---	---	110	A
V_{SD}	Diode Forward Voltage (NOTE 1)	V_{GS}=0V , I_S=1A	---	---	1	V

NOTES：

1. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
2. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=30A.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Characteristics Curves

FIG.1-Typical Output Characteristics

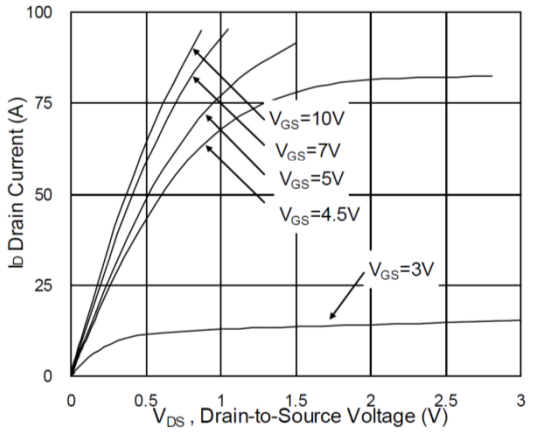


FIG.2-On-Resistance vs. G-S Voltage

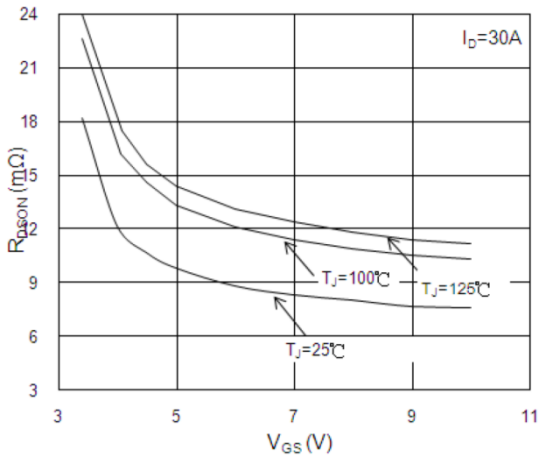


FIG.3-Source Drain Forward Characteristics

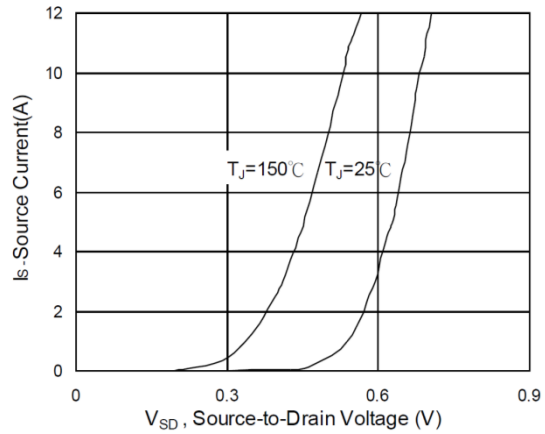


FIG.4-Gate Charge Characteristics

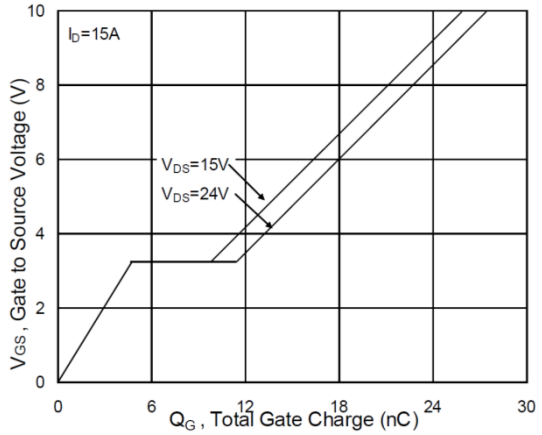


FIG.5-Normalized $V_{GS(th)}$ vs. T_J

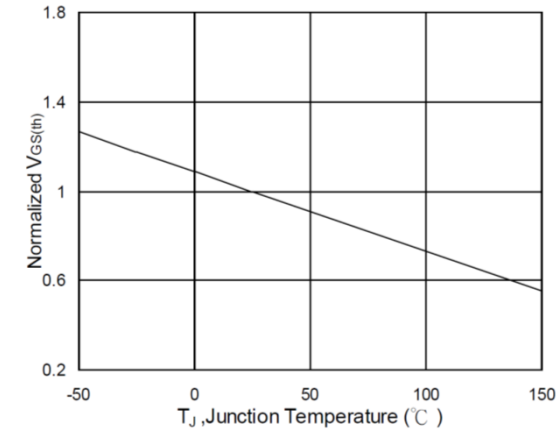
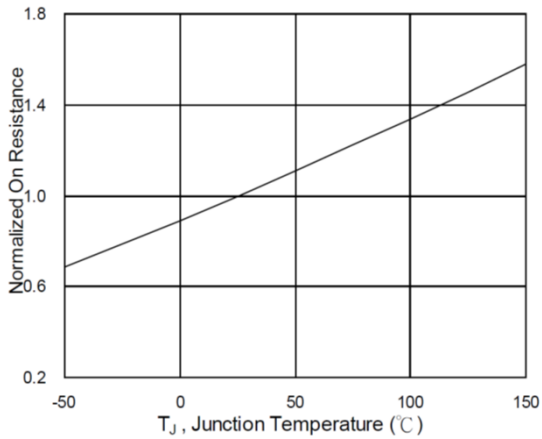


FIG.6-Normalized R_{DSON} vs. T_J



Characteristics Curves

FIG.7-Switching Time Waveform

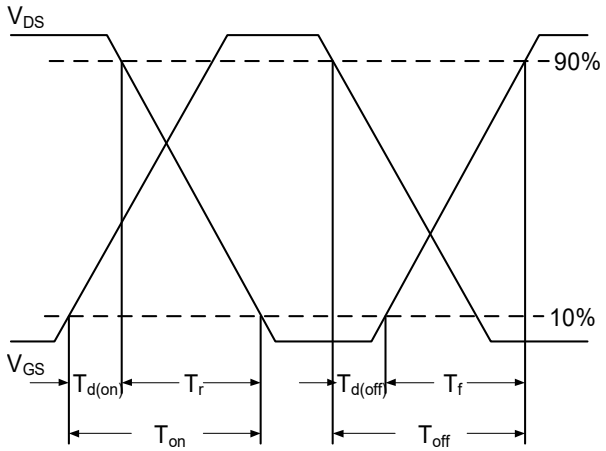
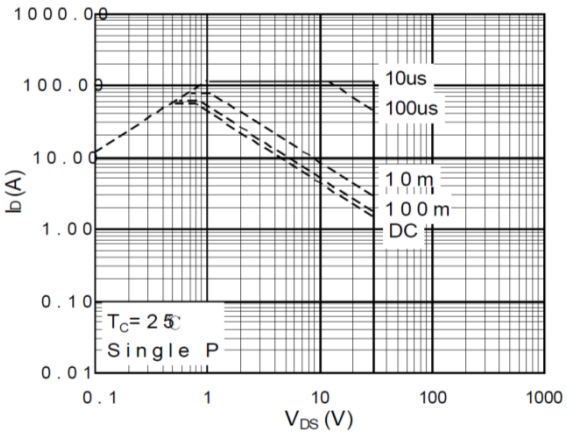
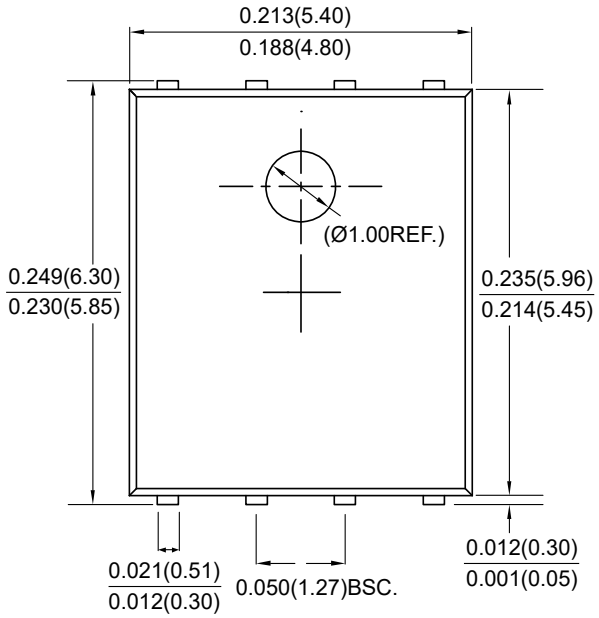
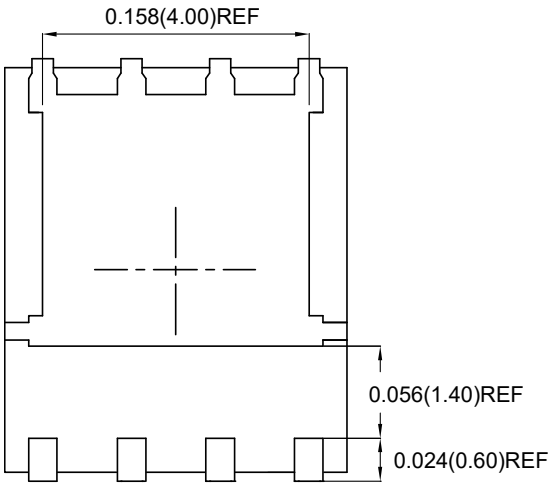


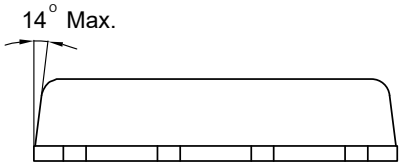
FIG.8-Safe Operating Area

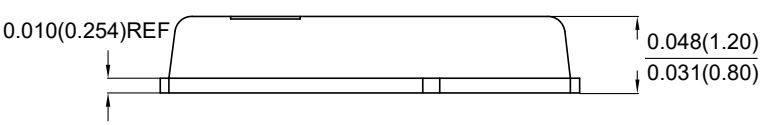


Package Outline Dimensions









PPAK5X6

Dimensions in inches and (millimeters)

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