P5MNC2P4

30V N-Channel MOSFETs

BV_{DSS}	$R_{DS(ON)}$	I_D
30V	2.4 mΩ	150 A

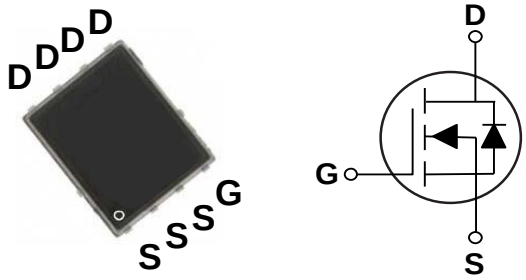
General Description

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.

Features

- 30V, 150A, $R_{DS(ON)}$=2.4mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Networking
- Load Switch
- LED applications

Absolute Maximum Ratings T_C=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)	150	A
	Drain Current - Continuous (T_C=100°C)	95	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	600	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	288	mJ
IAS	Single Pulse Avalanche Current (NOTE 2)	76	A
P_D	Power Dissipation (T_C=25°C)	122	W
	Power Dissipation - Derate above 25°C	0.98	W/°C
T_J	Operating Junction Temperature Range	-50 to 150	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		NC2P4	

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	---	1.02	°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	30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=24V , 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=30A	---	1.95	2.4	mΩ
		V_{GS}=4.5V , I_D=20A	---	2.6	3.3	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.2	1.6	2.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	28	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge (NOTE 3、4)	V_{DS}=15V , V_{GS}=10V , I_D=30A	---	56.4	110	nC
Q_{gs}	Gate-Source Charge (NOTE 3、4)		---	13.8	27	
Q_{gd}	Gate-Drain Charge (NOTE 3、4)		---	6.4	13	
$T_{d(on)}$	Turn-On Delay Time (NOTE 3、4)	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω , I_D=1A	---	18.7	37	ns
T_r	Rise Time (NOTE 3、4)		---	25.4	50	
$T_{d(off)}$	Turn-Off Delay Time (NOTE 3、4)		---	64	120	
T_f	Fall Time (NOTE 3、4)		---	22.6	45	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , F=1MHz	---	3800	7600	pF
C_{oss}	Output Capacitance		---	565	1100	
C_{rss}	Reverse Transfer Capacitance		---	320	640	
Rg	Gate resistance	V_{GS}=0V , V_{DS}=0V , F=1MHz	---	2.1	---	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	---	---	150	A
I_{SM}	Pulsed Source Current		---	---	300	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=76A, R_G=25Ω, Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Characteristics Curves

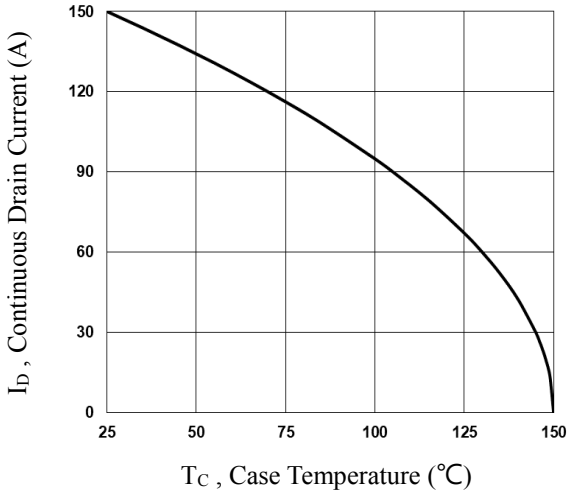


Fig.1 Continuous Drain Current vs. T_C

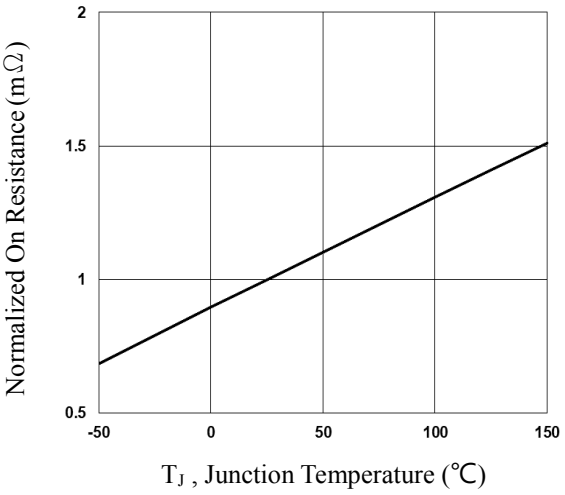


Fig.2 Normalized RDSON vs. T_J

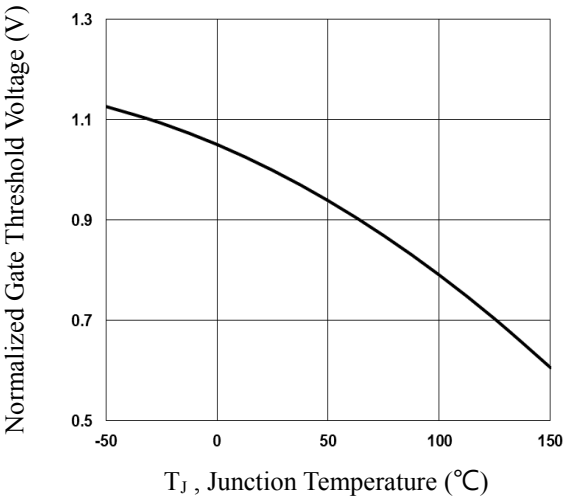


Fig.3 Normalized V_{th} vs. T_J

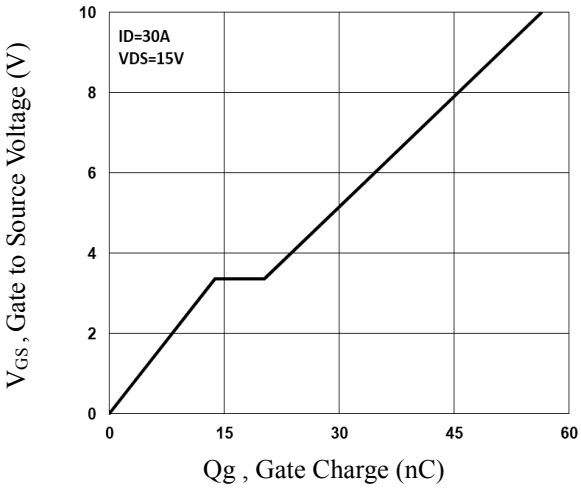


Fig.4 Gate Charge Characteristics

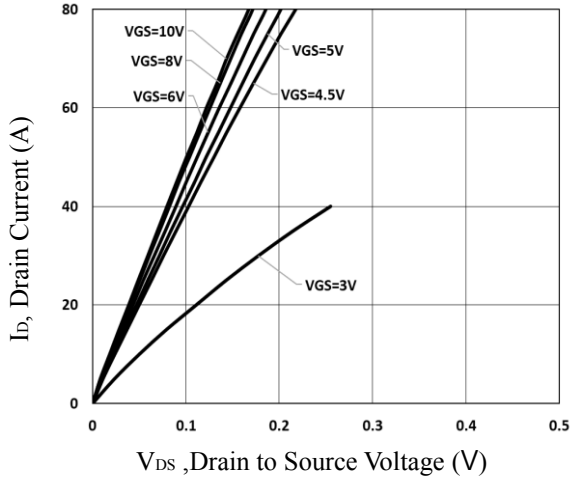


Fig.5 Typical Output Characteristics

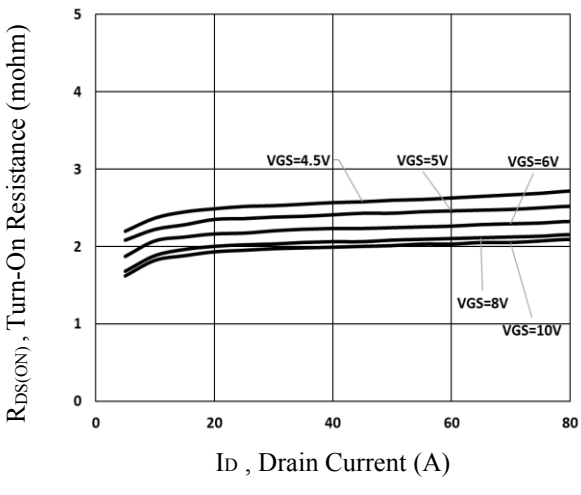


Fig.6 Turn-On Resistance vs. I_D

Characteristics Curves

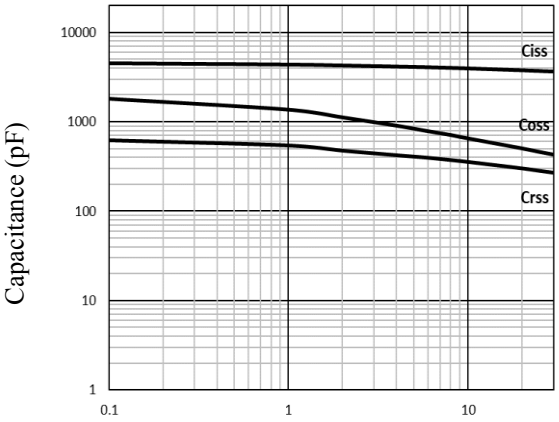


Fig.7 Capacitance Characteristics

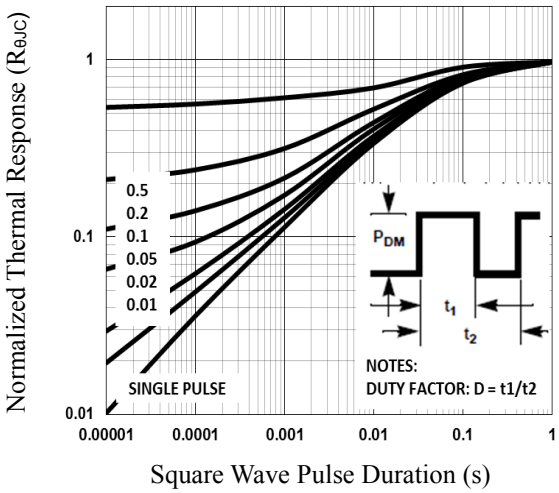


Fig.8 Normalized Transient Impedance

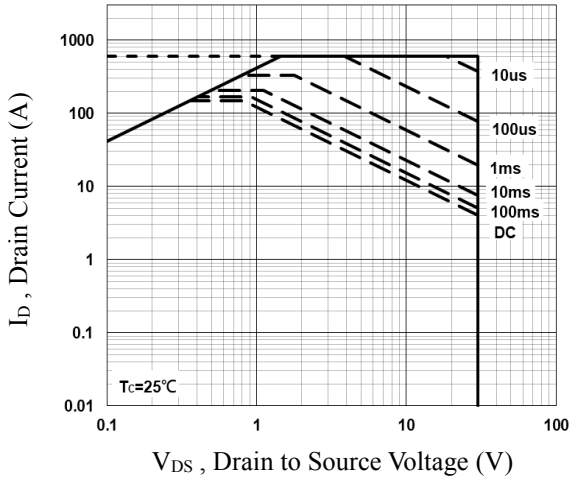


Fig.9 Maximum Safe Operation Area

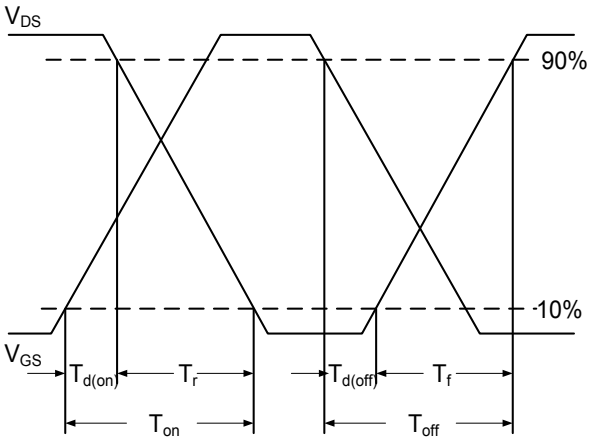


Fig.10 Switching Time Waveform

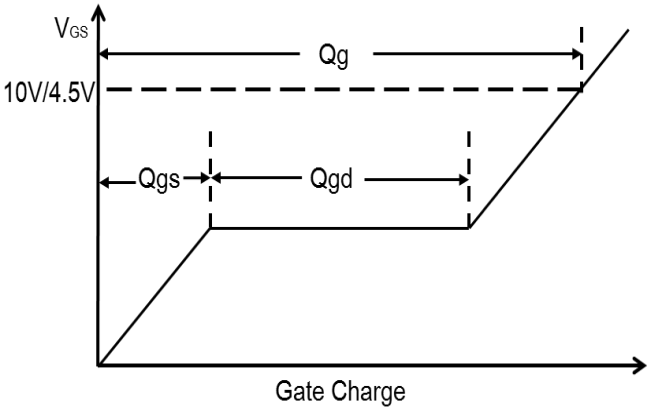
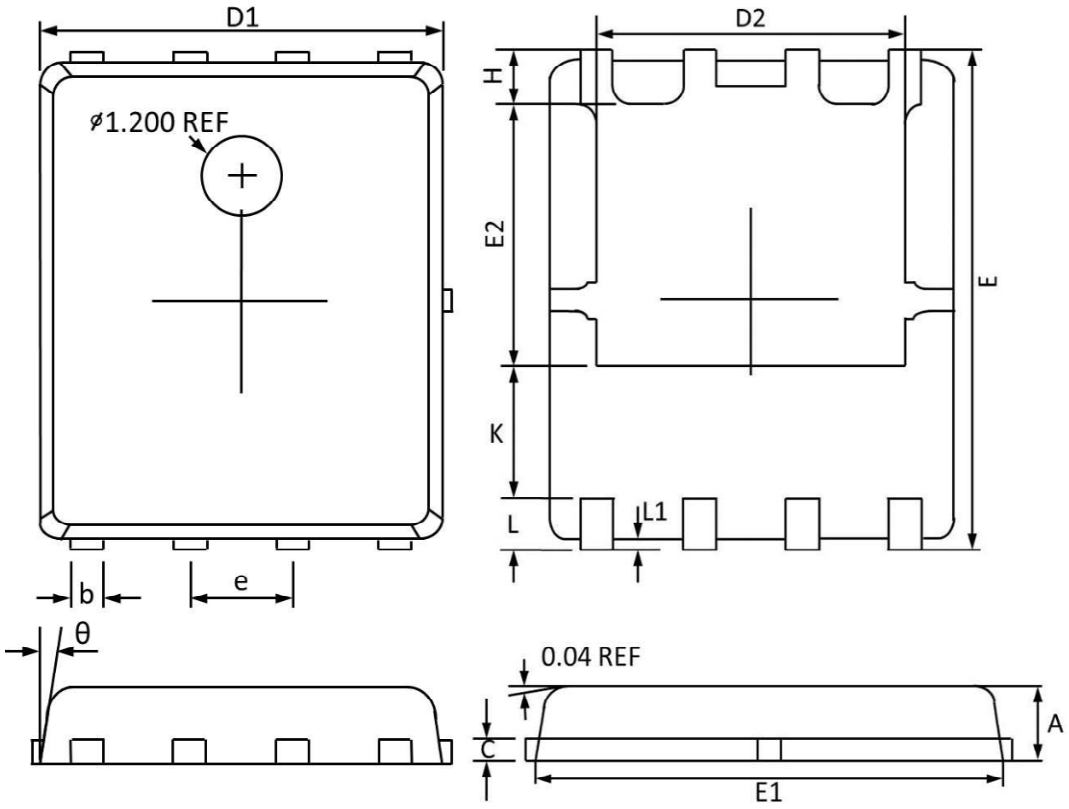


Fig.11 Gate Charge Waveform

Package Outline Dimensions

PPAK5X6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°

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