



30V N-Channel MOSFETs

General Description

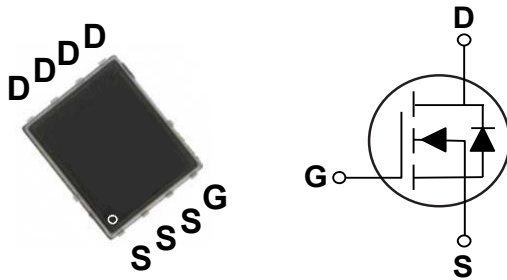
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV _{DSS}	R _{DS(ON)}	I _D
30 V	1 mΩ	254 A

Features

- R_{DS(ON)} ≤ 1mΩ@V_{GS}=10V
- Fast Switching
- Improved dv/dt Capability
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Power Load Switch
- Motor Control

Absolute Maximum Ratings T_J=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)	254	A
I _{DM}	Drain Current - Pulsed (NOTE 1)	400	A
EAS	Single Pulse Avalanche Energy (L=0.3mH)	375	mJ
IAS	Single Pulse Avalanche Current (L=0.3mH)	50	A
P _D	Power Dissipation (T _C =25°C)	96	W
T _J	Operating Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		NC1P0	

Thermal Characteristics

Symbol	Parameter	Max.	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	50	°C/W
R _{θJC}	Thermal Resistance Junction to Case	1.3	°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} =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	---	---	1	mΩ
		V _{GS} =4.5V, I _D =15A	---	---	1.4	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	---	2.0	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10A	---	54	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =20A	---	175.7	---	nC
Q _{gs}	Gate-Source Charge		---	30.6	---	
Q _{gd}	Gate-Drain Charge		---	30	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =15V, V _{GS} =10V, R _{GEN} =6Ω, I _D =1A	---	14	---	nS
T _r	Rise Time		---	24.1	---	
T _{d(off)}	Turn-Off Delay Time		---	330	---	
T _f	Fall Time		---	133.5	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, F=1MHz	---	6545	---	pF
C _{oss}	Output Capacitance		---	996	---	
C _{rss}	Reverse Transfer Capacitance		---	772	---	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	4	---	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	I _F =10A, V _R =15V,	---	36.9	---	A
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/us	---	35.6	---	A

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



Characteristics Curves

FIG. 1 - Drain Current

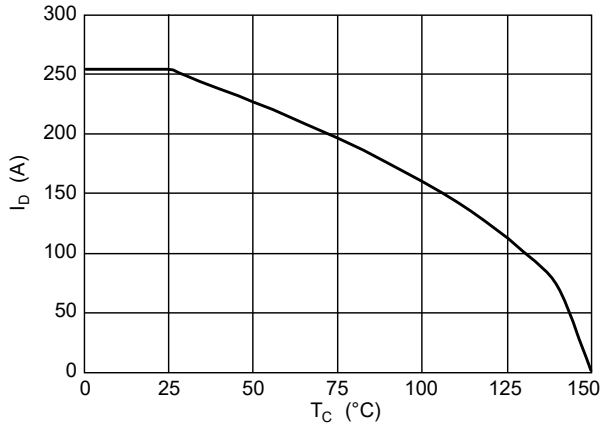


FIG. 2 - Gate Threshold Voltage

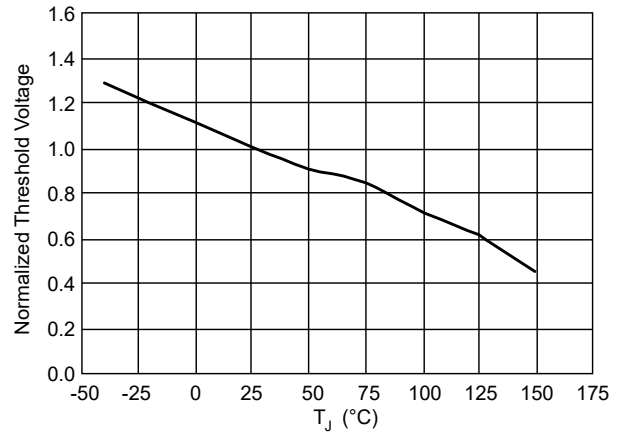


FIG. 3 - Drain-Source On-Resistance

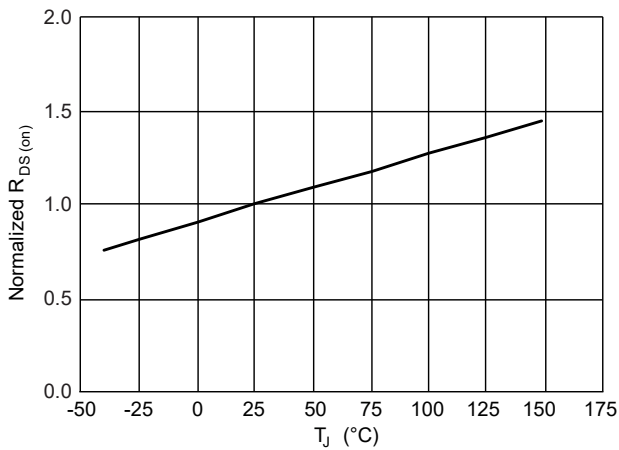


FIG. 4 - Gate Charge Characteristics

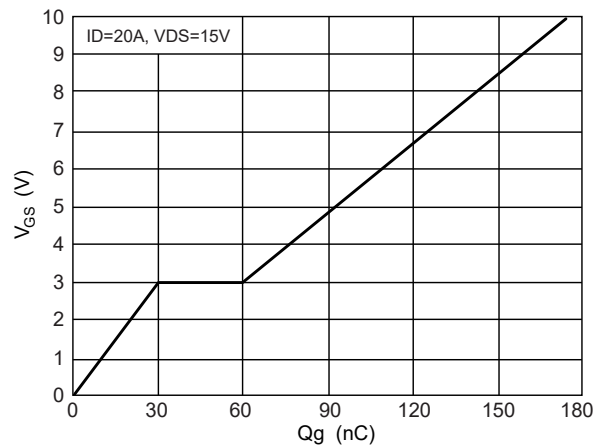


FIG. 5 - Safe Operating Area

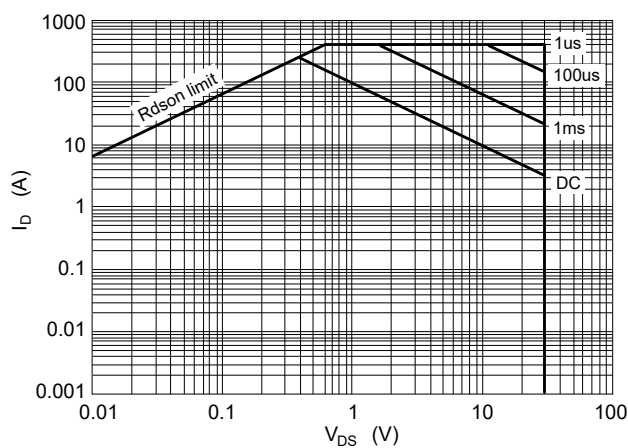
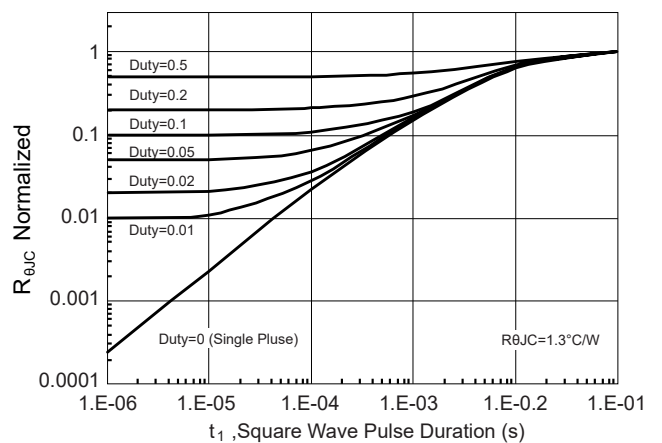


FIG. 6 - Transient Thermal Impedance





Characteristics Curves

FIG. 7 - Switching Time Waveform

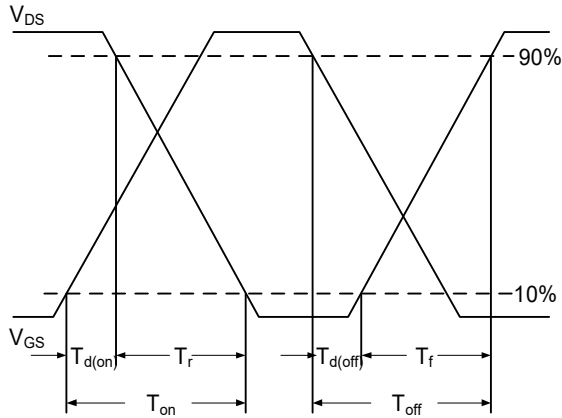
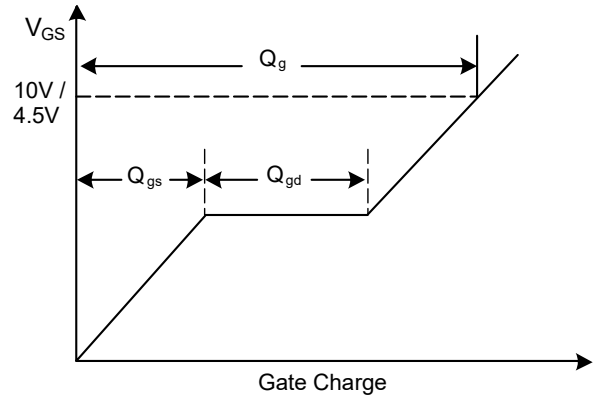
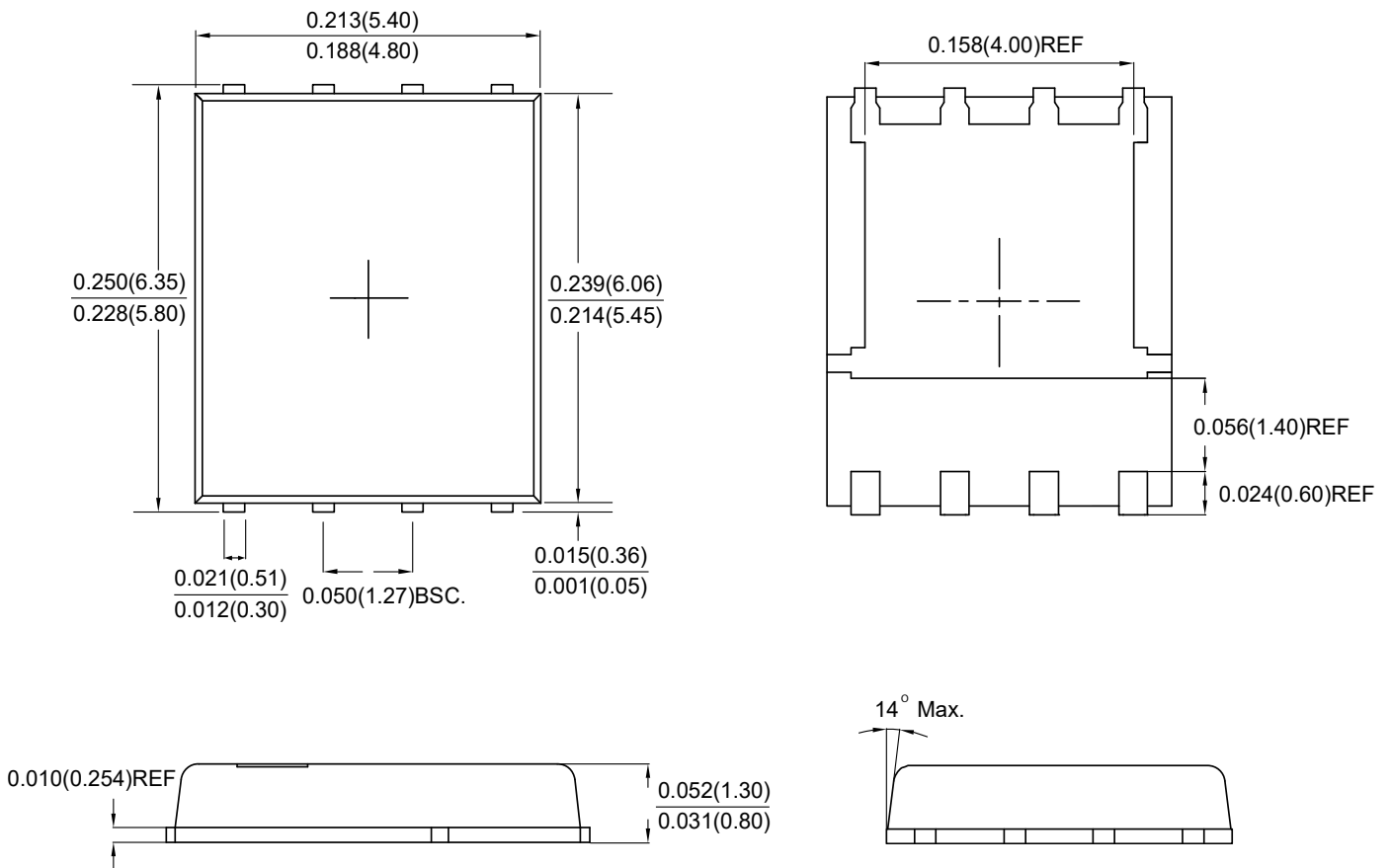


FIG. 8 - Gate Charge Waveform



Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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