



100V N-Channel MOSFETs

General Description

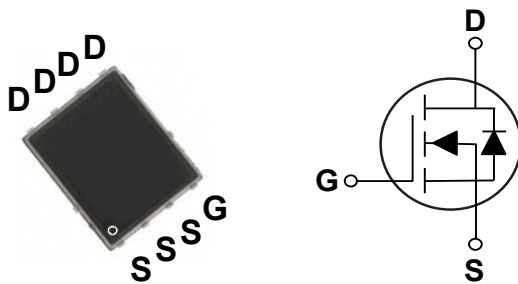
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

| | | |
|-------------------------|---------------------------|----------------------|
| BV_{DSS} | R_{DS(ON)} | I_D |
| 100 V | 15 mΩ | 41 A |

Features

- $R_{DS(ON)} \leq 15m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Motor Drivers
- DC DC Converter

Absolute Maximum Ratings $T_J=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$) | 41 | A |
| I_{DM} | Drain Current – Pulsed ($T_C=25^\circ\text{C}$) (NOTE 1) | 71 | A |
| IAS | Single Pulse Avalanche Energy (L=0.1mH) | 18 | A |
| EAS | Single Pulse Avalanche Energy (L=0.1mH) | 16.2 | mJ |
| P_D | Power Dissipation ($T_C=25^\circ\text{C}$) | 46 | W |
| T_J | Operating Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| Marking Code | | NM015 | |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|--|--------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 50 | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | 2.7 | $^\circ\text{C/W}$ |



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 =10A | --- | --- | 15 | mΩ |
| | | V _{GS} =4.5V, I _D =8A | --- | --- | 25 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 1 | --- | 3 | V |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =20A | --- | 22.8 | --- | S |

Dynamic and switching Characteristics (NOTE 3)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|------------------------------|--|------|------|------|------|
| Q _g | Total Gate Charge | V _{DS} =50V, V _{GS} =10V, I _D =12A | --- | 22.5 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 5.29 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 5.28 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DS} =50V, V _{GS} =10V, R _{GEN} =3Ω, I _D =1A | --- | 8.6 | --- | nS |
| T _r | Rise Time | | --- | 3.6 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 22.6 | --- | |
| T _f | Fall Time | | --- | 67.2 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =50V, V _{GS} =0V, F=1MHz | --- | 1227 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 382 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 30 | --- | |
| R _g | Gate Resistance | V _{GS} =0V, V _{DS} =0V, F=1MHz | --- | 0.9 | --- | Ω |

Drain-Source Diode Characteristics and Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------------|--|------|------|------|------|
| V _{SD} | Diode Forward Voltage (NOTE 2) | V _{GS} =0V, I _S =20A | --- | --- | 1.1 | V |

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing.



Characteristics Curves

FIG. 1 - Drain Current

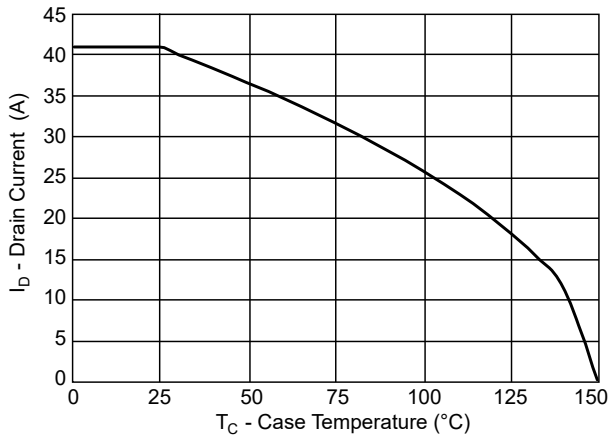


FIG. 2 - Gate Threshold Voltage

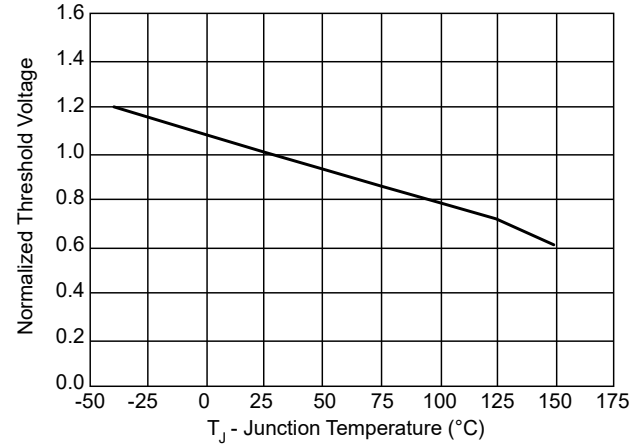


FIG. 3 - Drain-Source On-Resistance

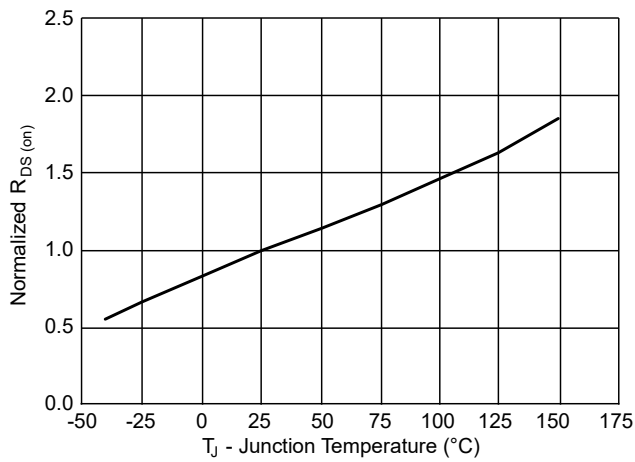


FIG. 4 - Gate Charge Characteristics

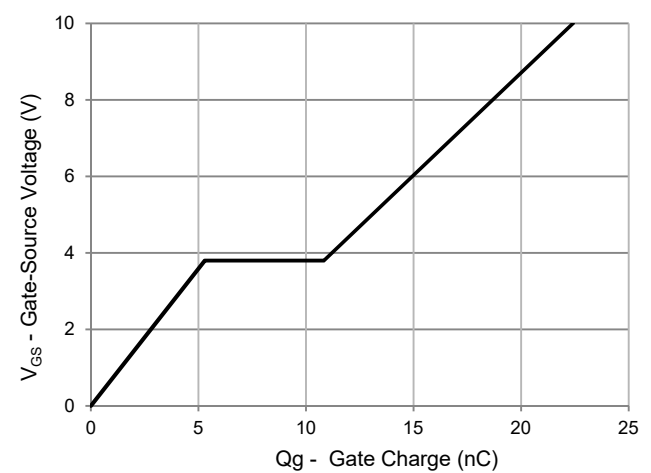


FIG. 5 - Safe Operating Area

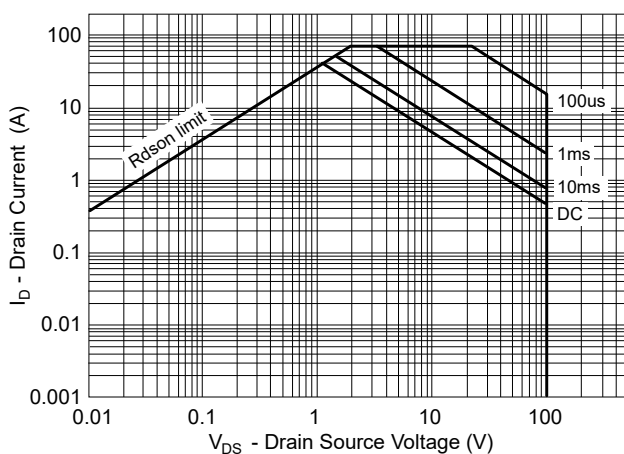
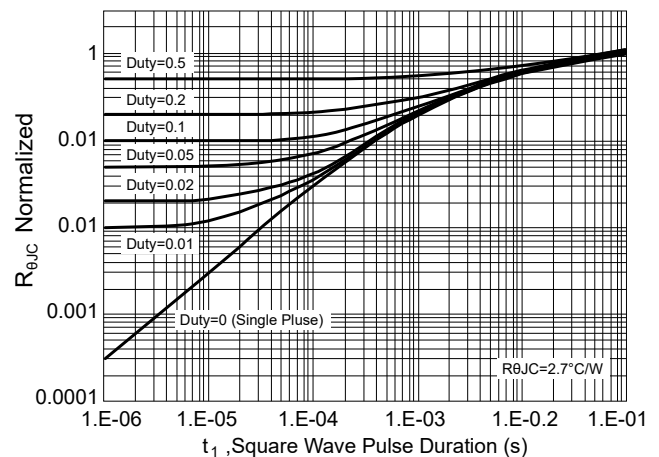


FIG. 6 - Transient Thermal Impedance



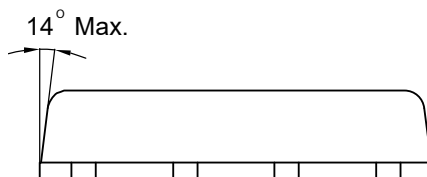
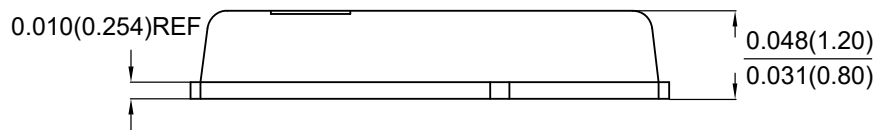
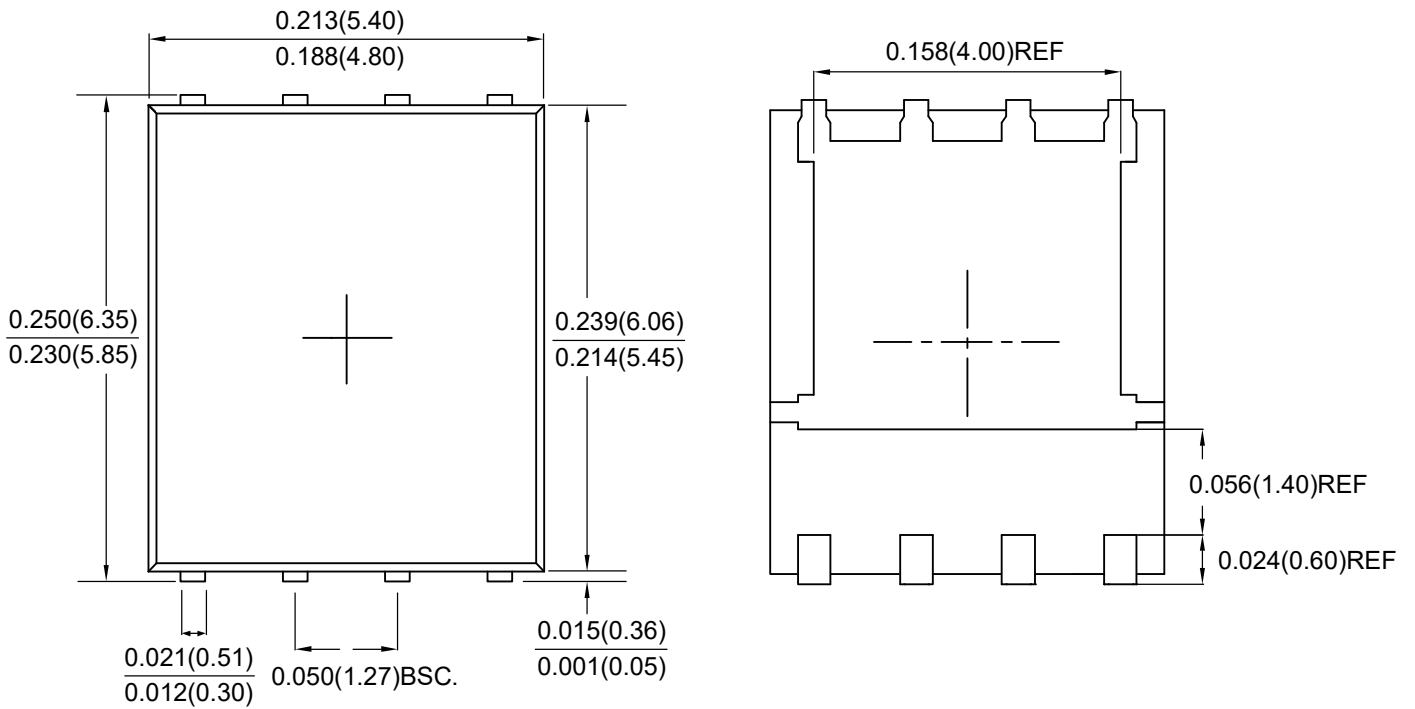


P5MNM015



100V N-Channel MOSFETs

Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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