# Power MOSFETS

## DATASHEET

## LM1A043NHV2A

N-Channel

Enhancement Mode MOSFET

Leadpower-semiconductor Corp., Ltd

sales@leadpower-semi.com

(03) 6577339　FAX：(03) 6577229

www.leadpower-semi.com

Quality Management Systems

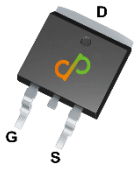
ISO 9001:2015 Certificate

# LM1A043NHV2A

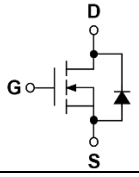
## N-Channel Enhancement Mode MOSFET

### Pin Description

TO-263-2L (TOP view)




Symbol




### Product Summary

| Symbol | N-Channel | Unit |
|---|---|---|
| $V_{DSS}$ | 100 | V |
| $R_{DS(ON)-Max}$ | 4.6 | mΩ |
| ID | 122 | A |

### Feature

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS Tested

### Applications

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit

### Ordering Information

| Orderable Part Number | Package Type | Form | Shipping | Marking |
|---|---|---|---|---|
| LM1A043NHV2A | TO-263-2L | Tape & Reel | 800 / Reel | 1A043<br>□□□□□□ |

Note：□□□□□□ = Lot Code

### Absolute Maximum Ratings ($T_J$=25°C Unless Otherwise Noted)

| Symbol | Parameter | | N-Channel | Unit |
|---|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | | 100 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±20 | |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current | $T_C$=25°C | 175 | A |
| $I_{DM}$ | Pulse Drain Current Tested | $T_C$=25°C | 380 | A |
| $I_D$ | Continuous Drain Current | $T_C$=25°C | 122① | A |
| | | $T_C$=100°C | 122① | |
| $P_D$ | Maximum Power Dissipation | $T_C$=25°C | 192 | W |
| | | $T_C$=100°C | 77 | |
| $I_D$ | Continuous Drain Current | $T_A$=25°C | 21 | A |
| | | $T_A$=70°C | 16.7 | |
| $P_D$ | Maximum Power Dissipation | $T_A$=25°C | 2.0 | W |
| | | $T_A$=70°C | 1.3 | |
| $I_{AS}$② | Avalanche Current, Single pulse | L=0.1mH | 56 | A |
| | | L=0.5mH | 30 | |
| $E_{AS}$② | Avalanche Energy, Single pulse | L=0.1mH | 156 | mJ |
| | | L=0.5mH | 225 | |

### Thermal Characteristics

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | Steady State | 0.65 | °C/W |
| $R_{\theta JA}$③ | Thermal Resistance-Junction to Ambient | Steady State | 62 | °C/W |

Note ①：Max. current is limited by bonding wire

Note ②：UIS tested and pulse width are limited by maximum junction temperature 150°C

Note ③：Surface Mounted on 1in$^2$ FR-4 board with 1oz.

## N-Channel Electrical Characteristics ($T_J$=25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Electrical Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_{DS}$=250uA | 100 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=80V, $V_{GS}$=0V | - | - | 1 | uA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_{DS}$=250uA | 2 | 3 | 4 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| $R_{DS(ON)}$④ | Drain-Source On-state Resistance | $V_{GS}$=10V, $I_{DS}$=20A | - | 3.9 | 4.6 | mΩ |
| gfs | Forward Transconductance | $V_{DS}$=5V, $I_{DS}$=10A | - | 4.18 | - | S |
| **Dynamic Characteristics** ⑤ | | | | | | |
| $R_G$ | Gate Resistance | $V_{GS}$=0V,$V_{DS}$=0V, Freq.=1MHz | - | 0.54 | - | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V, $V_{DS}$=50V, Freq.=1MHz | - | 4176 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 1190 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 36 | - | |
| $td_{(ON)}$ | Turn-on Delay Time | $V_{GS}$=10V,$V_{DS}$=25V, $I_D$=1A , $R_{GEN}$=3Ω | - | 12.85 | - | nS |
| $t_r$ | Turn-on Rise Time | | - | 6.35 | - | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | - | 34.9 | - | |
| $t_f$ | Turn-off Fall Time | | - | 65.55 | - | |
| $Q_g$ | Total Gate Charge | $V_{GS}$=10V,$V_{DS}$=50V, $I_D$=20A | - | 72.7 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 21.6 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 20.7 | - | |
| **Source-Drain Characteristics** | | | | | | |
| $V_{SD}$④ | Diode Forward Voltage | $I_{SD}$=10A, $V_{GS}$=0V | - | 0.75 | 1.1 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_F$=10A, $V_R$=50V dI$_F$/dt=100A/μs | - | 40.4 | - | nS |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 80.15 | - | nC |

Note ④：Pulse test (pulse width≤300us, duty cycle≤2%).
Note ⑤：Guaranteed by design, not subject to production testing.

## N-Channel Typical Characteristics

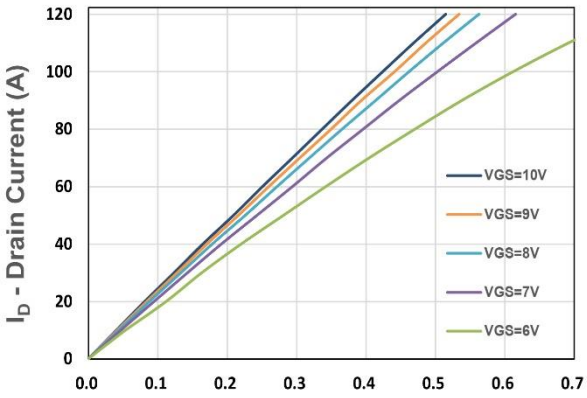



Figure 1. Output Characteristics

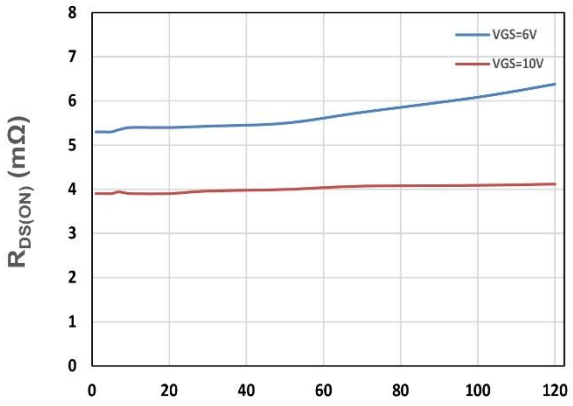



Figure 2. On-Resistance vs. ID

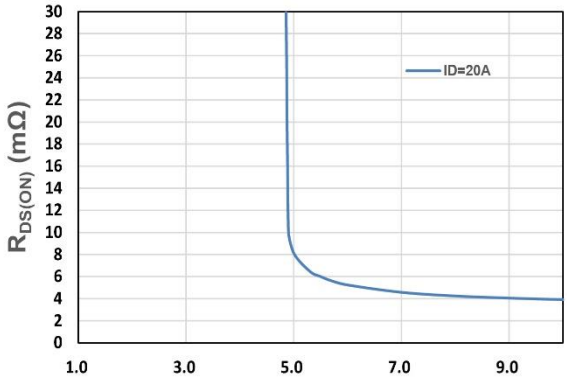



Figure 3. On-Resistance vs. VGS

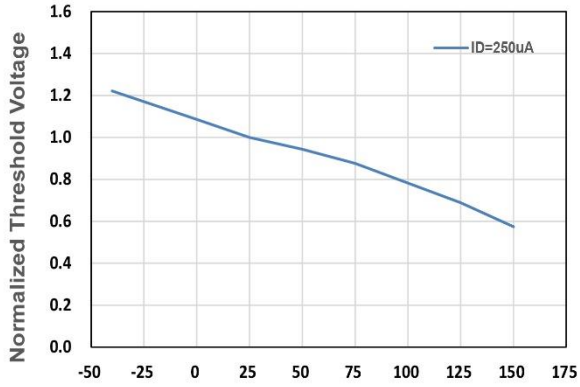



Figure 4. Gate Threshold Voltage

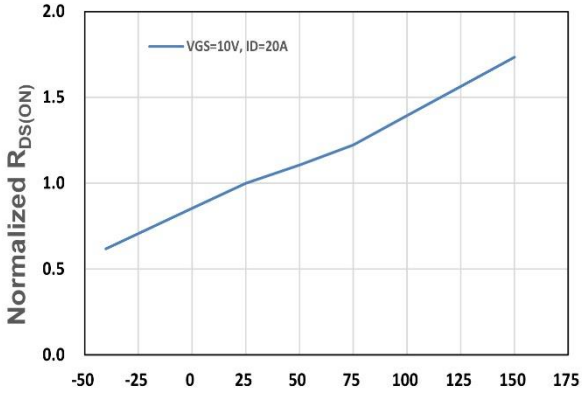



Figure 5. Drain-Source On Resistance

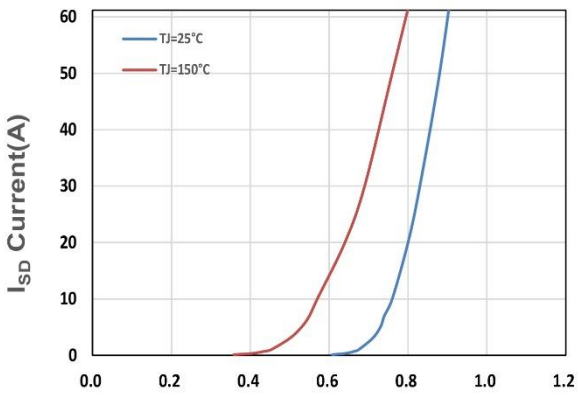



Figure 6. Source-Drain Diode Forward

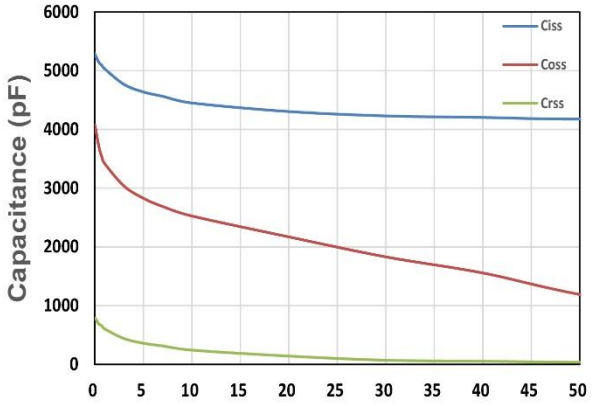



Figure 7. Capacitance

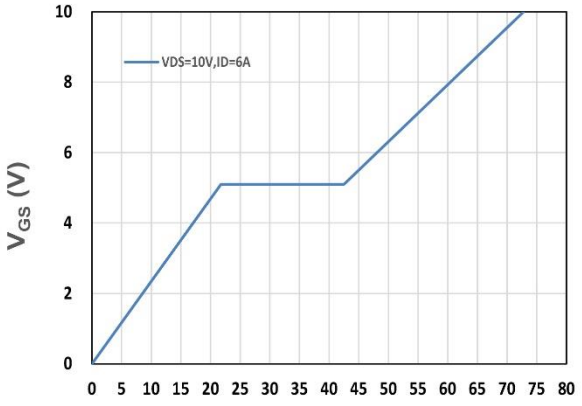



Figure 8. Gate Charge Characteristics

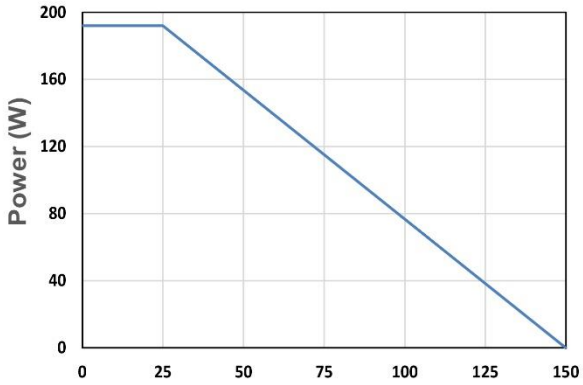



Figure 9. Power Dissipation

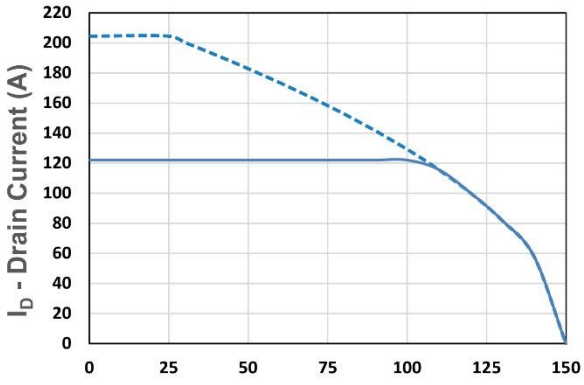



Figure 10. Drain Current

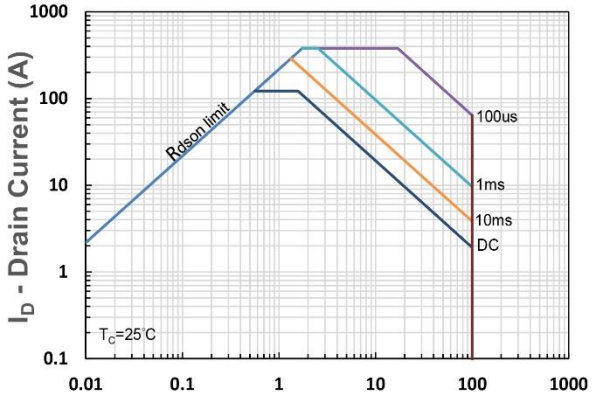



Figure 11. Safe Operating Area

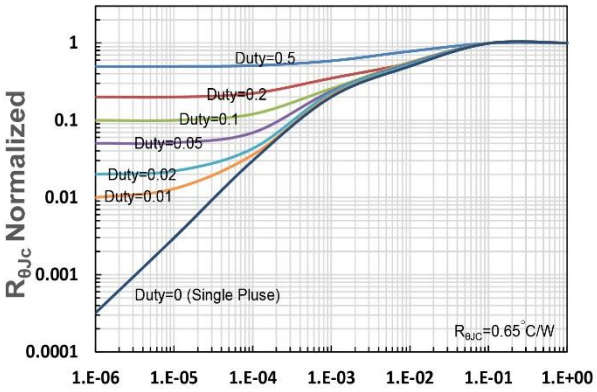



Figure 12. RθJc Transient Thermal Impedance