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# HM2318D

## N-Channel 40V(D-S) MOSFET

## GENERAL DESCRIPTION

The HM2318D is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

## FEATURES

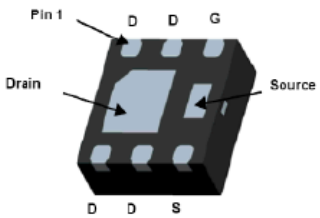
- $R_{DS(ON)}$ ≦40mΩ@$V_{GS}$=10V
- $R_{DS(ON)}$ ≦65mΩ@$V_{GS}$=4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding

## APPLICATIONS

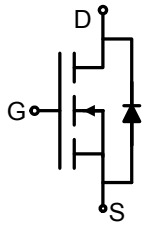
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC

**Absolute Maximum Ratings** ($T_A$=25℃ Unless Otherwise Noted)

| Parameter | Symbol | Maximum Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 40 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |




**DFN2X2-6L bottom view**




**Schematic diagram**

**N-Channel 40V(D-S) MOSFET**

**Electrical Characteristics** ($T_j$ =25℃ Unless Otherwise Specified)

| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 40 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.0 | | 3.0 | V |
| $I_{GSS}$ | Gate Body Leakage | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=40V, $V_{GS}$=0V | | | 1 | μA |
| $R_{DS(ON)}$ | Drain-Source On-Resistance | $V_{GS}$=10V, $I_D$= 6.0A | | 32 | 40 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$= 3.5A | | 50 | 65 | |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=1A | | 0.8 | 1.2 | V |
| **DYNAMIC** | | | | | | |
| Qg | Total Gate Charge | $V_{DS}$=20V, $V_{GS}$=10V, $I_D$=6A | | 16 | | nC |
| Qg | Total Gate Charge | $V_{DS}$=20V, $V_{GS}$=4.5V, $I_D$=6A | | 8.2 | | |
| Qgs | Gate-Source Charge | | | 3.6 | | |
| Qgd | Gate-Drain Charge | | | 3.9 | | |
| Ciss | Input capacitance | $V_{DS}$=20V, $V_{GS}$=0V, f=1MHz | | 560 | | pF |
| Coss | Output Capacitance | | | 70 | | |
| Crss | Reverse Transfer Capacitance | | | 22 | | |
| Rg | Gate Resistance | f =1MHz | | 0.7 | | Ω |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=20V, $R_L$ =20Ω<br>$I_D$=1A, $V_{GEN}$=10V<br>$R_G$=1Ω | | 12 | | ns |
| $t_r$ | Turn-On Rise Time | | | 12 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 37 | | |
| $t_f$ | Turn-Off Fall Time | | | 4 | | |

Notes: a. Based on epoxy or solder paste and bond wire Cu 2mil×3(S), Au 1mil ×1(G) on each die of SOT-23 package.

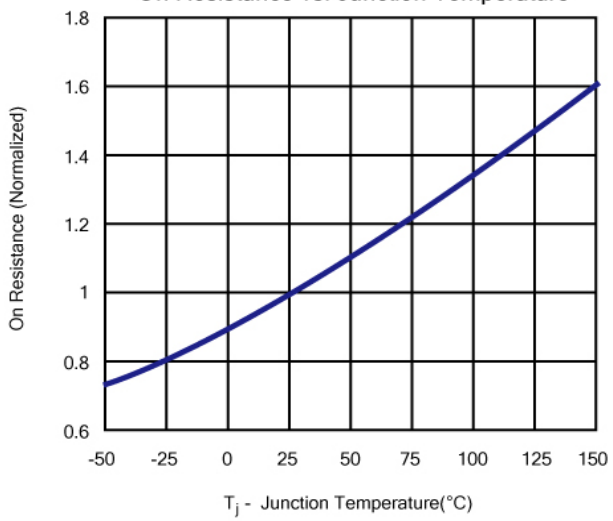
b. Pulse test; pulse width ≦ 300us, duty cycle≦ 2%.

c. H&M SEMI reserves the right to improve product design, functions and reliability without notice.

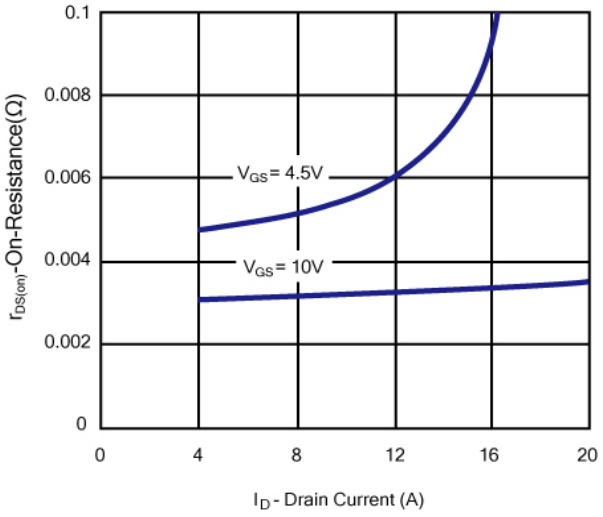
## Typical Characteristics ($T_J$ =25℃ Noted)

## N-Channel 40V(D-S) MOSFET

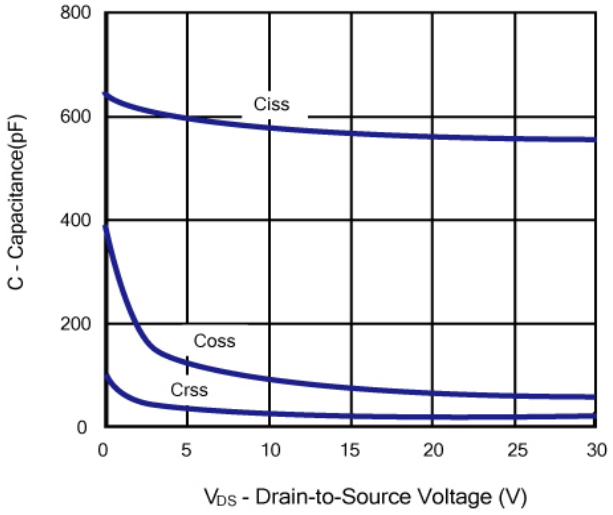
On Resistance vs. Junction Temperature



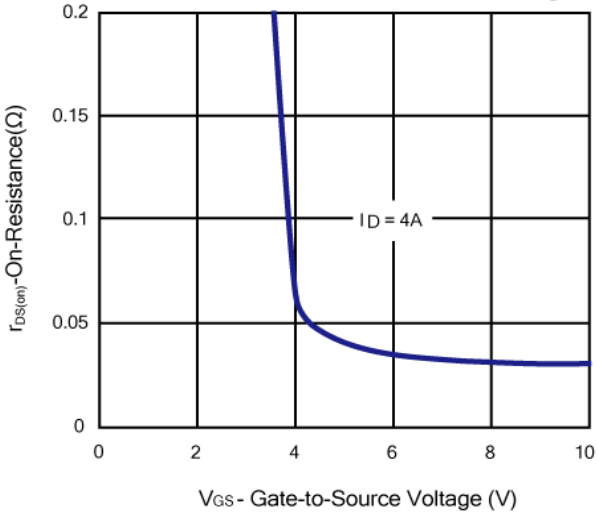

On-Resistance vs. Drain Current



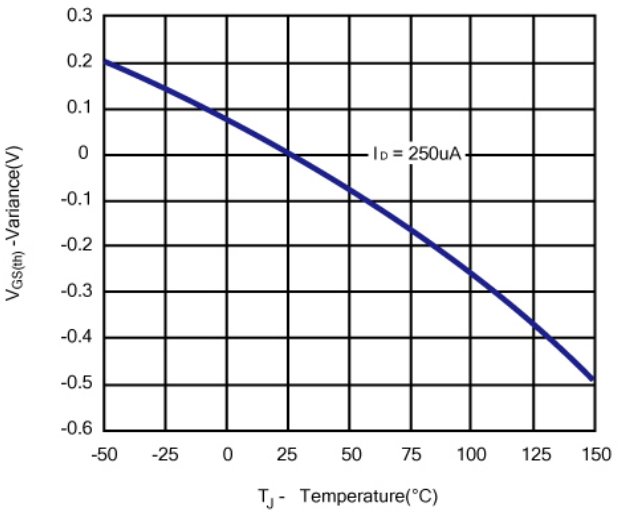

Capacitance



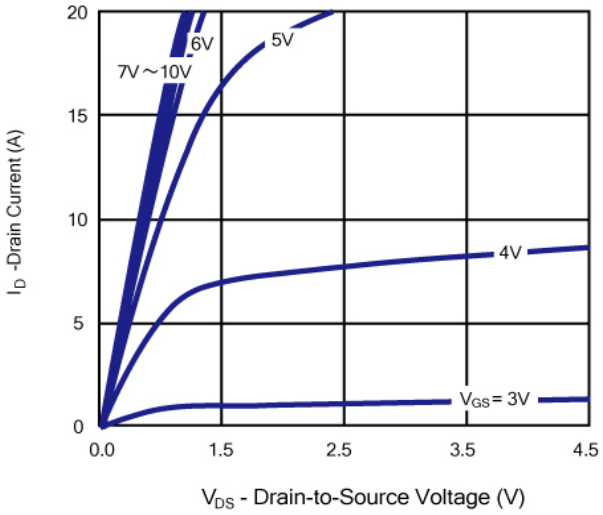

On-Resistance vs. Gate-to-Source Voltage




Threshold Voltage

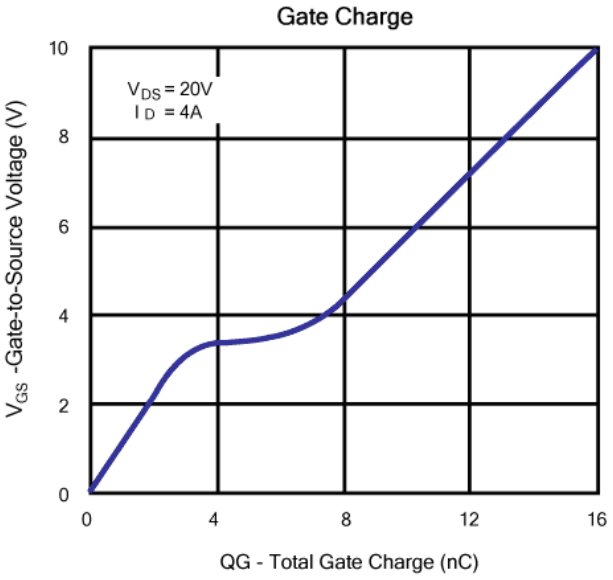


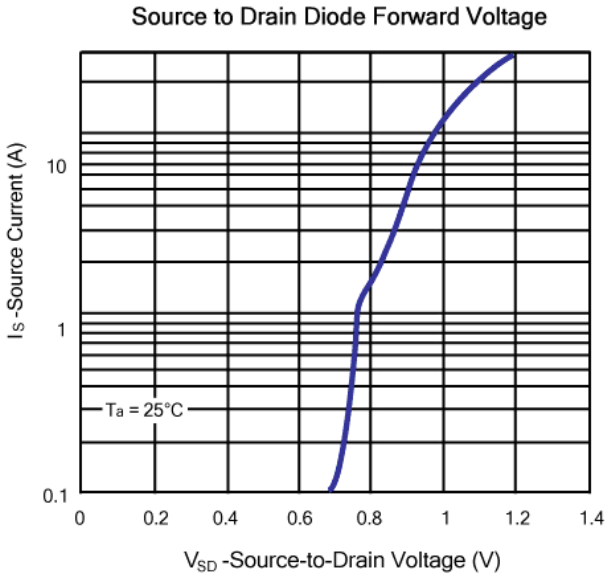

On-Region Characteristics



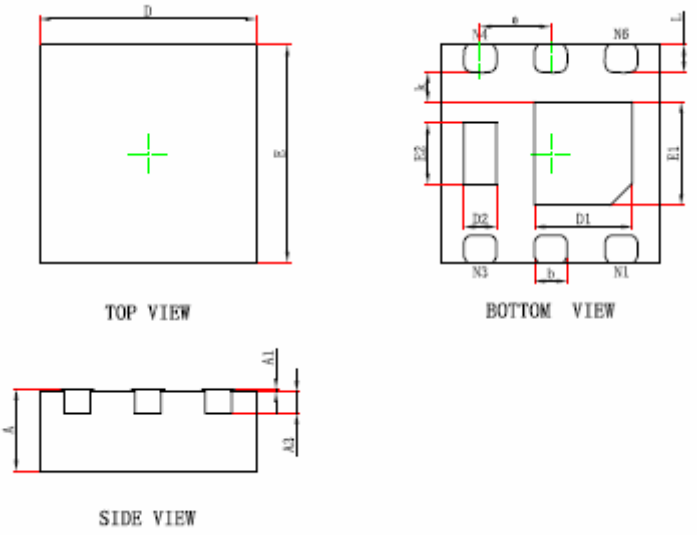
## Typical Characteristics (TJ =25℃ Noted)

## N-Channel 40V(D-S) MOSFET



## DFN2X2-6L Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A3 | 0.203REF. | | 0.008REF. | |
| D | 1.924 | 2.076 | 0.076 | 0.082 |
| E | 1.924 | 2.076 | 0.076 | 0.082 |
| D1 | 0.800 | 1.000 | 0.031 | 0.039 |
| E1 | 0.850 | 1.050 | 0.033 | 0.041 |
| D2 | 0.200 | 0.400 | 0.008 | 0.016 |
| E2 | 0.460 | 0.660 | 0.018 | 0.026 |
| k | 0.200MIN. | | 0.008MIN. | |
| b | 0.250 | 0.350 | 0.010 | 0.014 |
| e | 0.650TYP. | | 0.026TYP. | |
| L | 0.174 | 0.326 | 0.007 | 0.013 |

## Notes

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.