

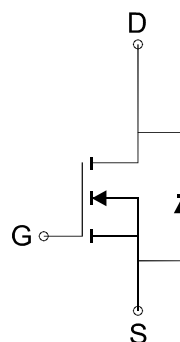
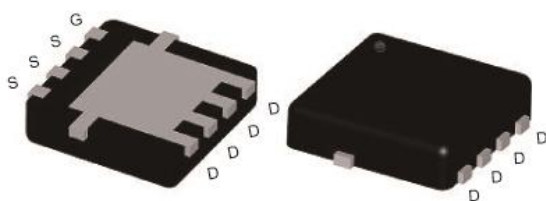
**N-Channel 30V(D-S) Enhancement MOSFET**

**GENERAL DESCRIPTION**

The ME7114S-G 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. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where Low-side switching , and low in-line power loss are needed in a very small outline surface mount package.

**PIN CONFIGURATION**

DFN(S) 3x3  
Top View



N-Channel MOSFET

**FEATURES**

- $R_{DS(ON)} \leq 7m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leq 10.5m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

**APPLICATIONS**

- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch

**Ordering Information:** ME7114S-G (Green product-Halogen free)

**Absolute Maximum Ratings** ( $T_A=25^\circ\text{C}$  Unless Otherwise Noted)

| Parameter                                          |                     | Symbol           | Maximum Ratings |     |     |     | Unit |
|----------------------------------------------------|---------------------|------------------|-----------------|-----|-----|-----|------|
| Drain-Source Voltage                               |                     | V <sub>DS</sub>  | 30              |     |     |     | V    |
| Gate-Source Voltage                                |                     | V <sub>GS</sub>  | ±20             |     |     |     | V    |
| Continuous Drain<br>Current(T <sub>j</sub> =150℃)* | T <sub>C</sub> =25℃ | I <sub>D</sub>   | 71              |     |     |     | A    |
|                                                    | T <sub>C</sub> =70℃ |                  | 57              |     |     |     |      |
|                                                    | T <sub>A</sub> =25℃ |                  | 18.4            |     |     |     |      |
|                                                    | T <sub>A</sub> =70℃ |                  | 14.7            |     |     |     |      |
| Pulsed Drain Current                               |                     | I <sub>DM</sub>  | 74              |     |     |     | A    |
| Maximum Power Dissipation*                         | T <sub>C</sub> =25℃ | P <sub>D</sub>   | 52              |     |     |     | W    |
|                                                    | T <sub>C</sub> =70℃ |                  | 33              |     |     |     |      |
|                                                    | T <sub>A</sub> =25℃ |                  | 3.8             |     |     |     |      |
|                                                    | T <sub>A</sub> =70℃ |                  | 2.4             |     |     |     |      |
| Operating Junction Temperature                     |                     | T <sub>J</sub>   | -55 to 150      |     |     |     | ℃    |
| Thermal Resistance-Junction to Ambient*            |                     | R <sub>θJA</sub> | Typ             | 26  | Max | 33  | ℃/W  |
| Thermal Resistance-Junction to Case*               |                     | R <sub>θJC</sub> | Typ             | 1.9 | Max | 2.4 |      |

\*The device mounted on 1in<sup>2</sup> FR4 board with 2 oz copper

**N-Channel 30V(D-S) Enhancement MOSFET**
**Electrical Characteristics** (TA=25°C Unless Otherwise Specified)

| Symbol         | Parameter                                     | Limit                                       | Min | Typ  | Max  | Unit    |
|----------------|-----------------------------------------------|---------------------------------------------|-----|------|------|---------|
| <b>STATIC</b>  |                                               |                                             |     |      |      |         |
| V(BR)DSS       | Drain-Source Breakdown Voltage                | VGS=0V, ID=250 $\mu$ A                      | 30  |      |      | V       |
| VGS(th)        | Gate Threshold Voltage                        | VDS=VGS, ID=250 $\mu$ A                     | 1.0 |      | 3.0  | V       |
| IGSS           | Gate Leakage Current                          | VDS=0V, VGS=±20V                            |     |      | ±100 | nA      |
| IDSS           | Zero Gate Voltage Drain Current               | VDS=30V, VGS=0V                             |     |      | 1    | $\mu$ A |
| RDS(ON)        | Drain-Source On-State Resistance <sup>a</sup> | VGS=10V, ID=13A                             |     | 5.8  | 7    | mΩ      |
|                |                                               | VGS=4.5V, ID=10A                            |     | 8.5  | 10.5 |         |
| VSD            | Diode Forward Voltage                         | IS=2.8A, VGS=0V                             |     | 0.75 | 1.1  | V       |
| <b>DYNAMIC</b> |                                               |                                             |     |      |      |         |
| Qg             | Total Gate Charge                             | VDS=15V, VGS=10V, ID=13A                    |     | 37   |      | nC      |
| Qg             | Total Gate Charge                             | VDS=15V, VGS=4.5V, ID=13A                   |     | 18   |      |         |
| Qgs            | Gate-Source Charge                            |                                             |     | 7.7  |      |         |
| Qgd            | Gate-Drain Charge                             |                                             |     | 8.8  |      |         |
| Ciss           | Input Capacitance                             | VDS=15V, VGS=0V,<br>F=1MHz                  |     | 1690 |      | pF      |
| Coss           | Output Capacitance                            |                                             |     | 260  |      |         |
| Crss           | Reverse Transfer Capacitance                  |                                             |     | 84   |      |         |
| Rg             | Gate-Resistance                               | VDS=0V, VGS=0V, F=1MHz                      |     | 0.9  |      | Ω       |
| td(on)         | Turn-On Delay Time                            | VDS=15V, RL=15Ω<br>ID=1A, VGEN=10V<br>RG=6Ω |     | 20   |      | ns      |
| tr             | Turn-On Rise Time                             |                                             |     | 16   |      |         |
| td(off)        | Turn-Off Delay Time                           |                                             |     | 63   |      |         |
| tf             | Turn-Off Fall Time                            |                                             |     | 11   |      |         |

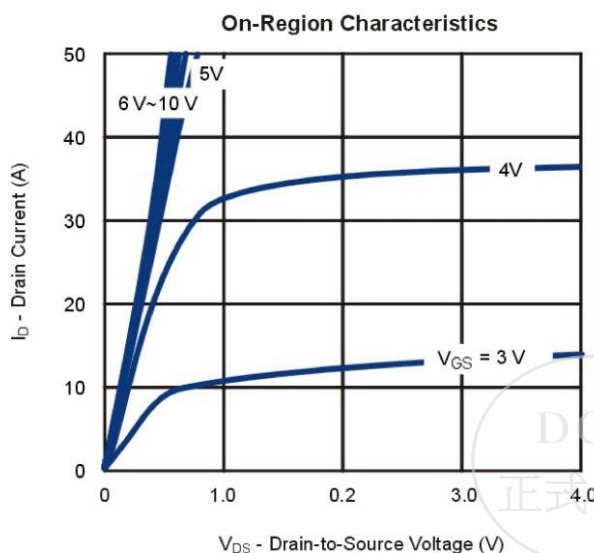
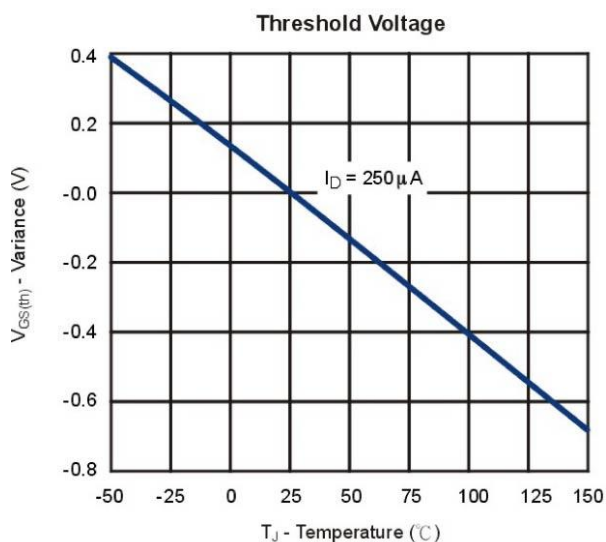
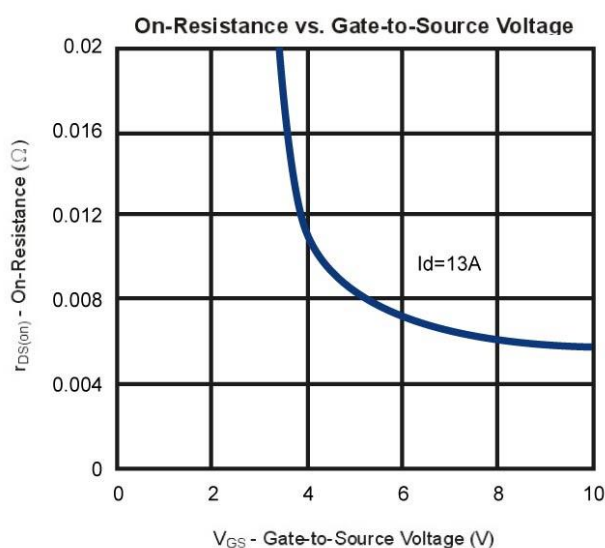
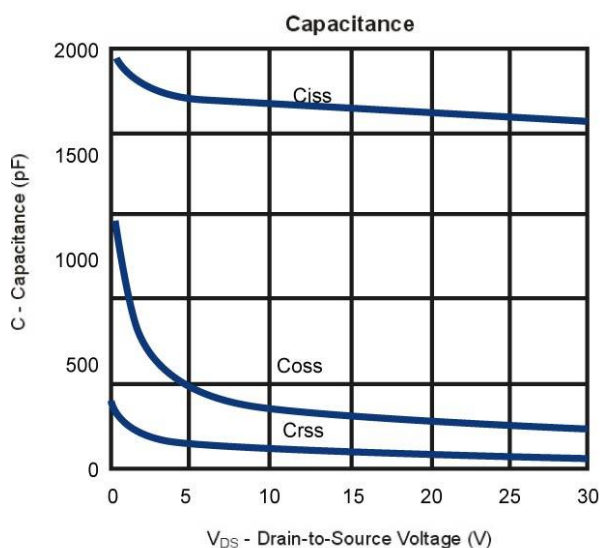
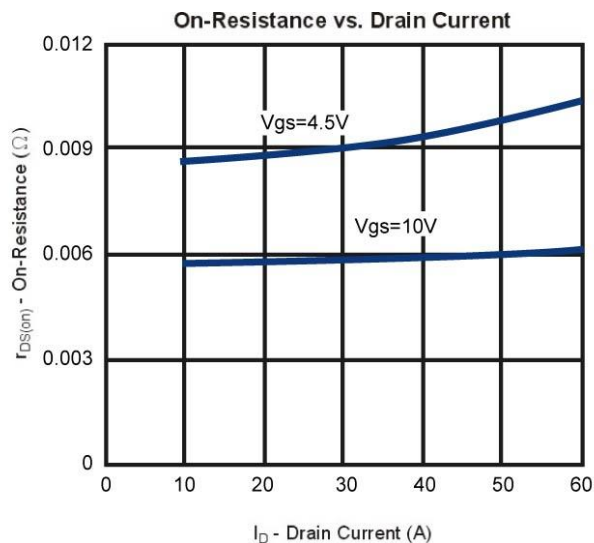
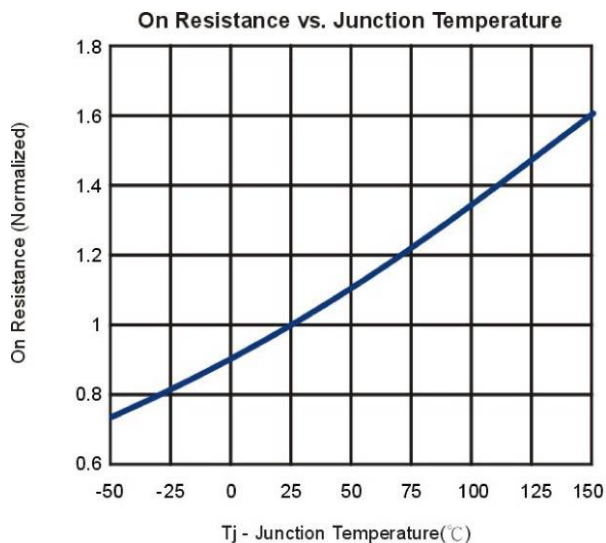
Note: a. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%

b. Matsuki Electric/ Force mos reserves the right to improve product design, functions and reliability without notice.



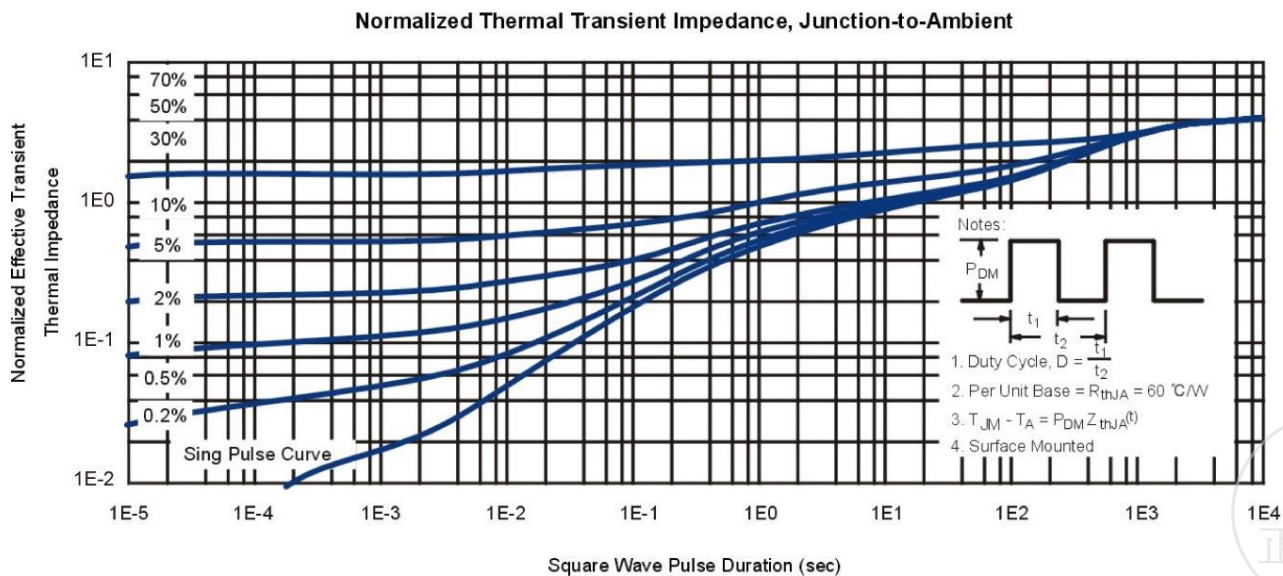
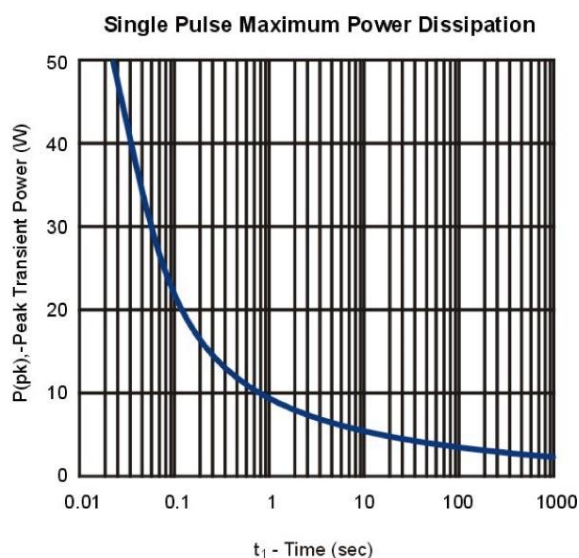
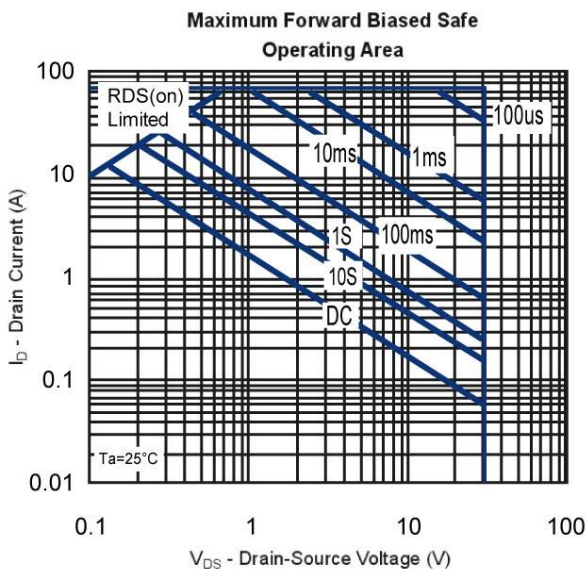
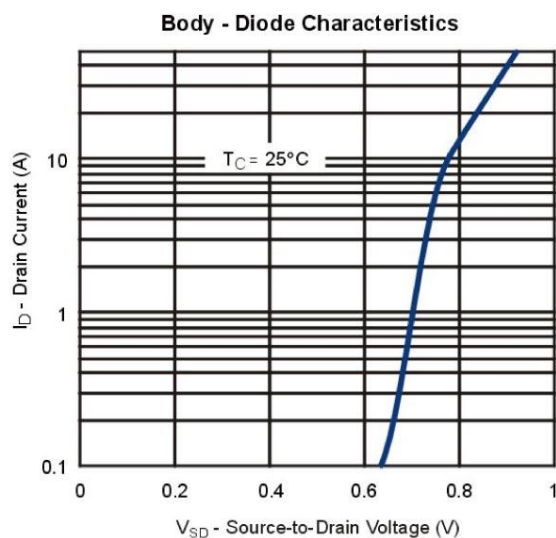
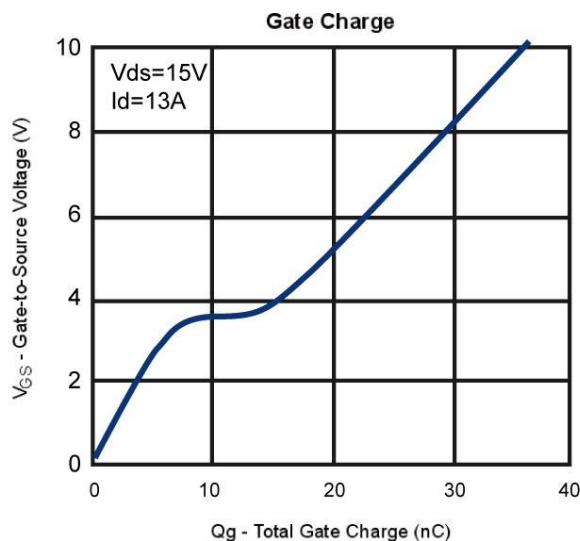
**N-Channel 30V(D-S) Enhancement MOSFET**

**Typical Characteristics (T<sub>J</sub> = 25°C Noted)**

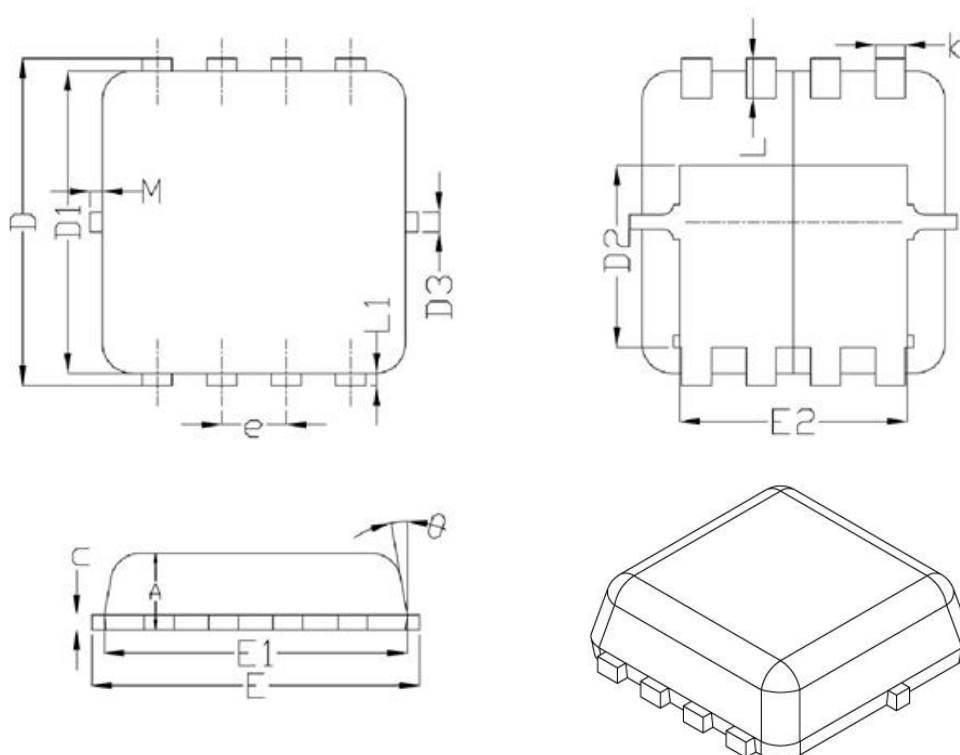


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**Typical Characteristics (T<sub>J</sub> = 25°C Noted)**



# DFN(S) 3x3 Package Outline



| SYMBOL          | DIMENSIONAL REQMTS |      |
|-----------------|--------------------|------|
|                 | MIN                | MAX  |
| A               | 0.70               | 0.90 |
| b               | 0.20               | 0.40 |
| c               | 0.08               | 0.25 |
| D               | 2.70               | 3.45 |
| D1              | 2.20               | 3.20 |
| D2              | 1.54               | 1.98 |
| D3              | 0.10               | 0.30 |
| E               | 3.15               | 3.45 |
| E1              | 2.80               | 3.30 |
| E2              | 2.25               | 2.65 |
| e               | 0.65BSC            |      |
| H               | 0.28               | 0.68 |
| L               | 0.30               | 0.50 |
| L1              | 0.06               | 0.20 |
| Θ               | ---                | 12°  |
| M               | *                  | 0.15 |
| * Not specified |                    |      |

