

**N-Channel 30V (D-S) MOSFET, ESD Protected**

**GENERAL DESCRIPTION**

The ME7804-G 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 high-side switching, and low in-line power loss are needed in a very small outline surface mount package.

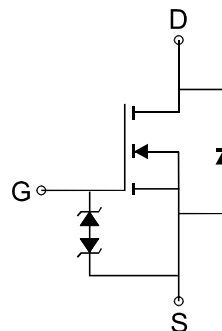
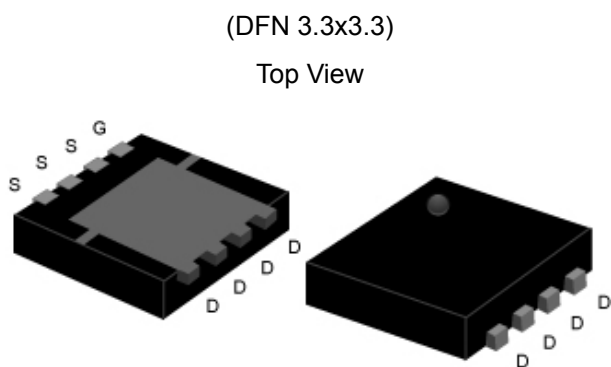
**FEATURES**

- $R_{DS(ON)} \leq 16m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leq 25m\Omega @ V_{GS}=4.5V$

**APPLICATIONS**

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

**PIN CONFIGURATION**

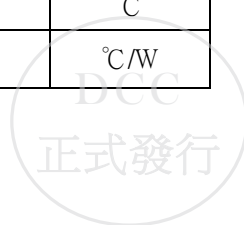


Ordering Information: ME7804S-G (Green product-Halogen free)

**Absolute Maximum Ratings (T<sub>j</sub>=25°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 Current                | I <sub>D</sub>   | T <sub>A</sub> =25°C | 12.2 |
|   |                  | T <sub>A</sub> =70°C | 9.7  |
| Pulsed Drain Current                    | I <sub>DM</sub>  | 50                   | A    |
| Maximum Power Dissipation               | P <sub>D</sub>   | T <sub>A</sub> =25°C | 3.8  |
|   |                  | T <sub>A</sub> =70°C | 2.4  |
| Operating Junction Temperature          | T <sub>J</sub>   | 150                  | °C   |
| Storage Temperature Range               | T <sub>STG</sub> | -55 to 150           | °C   |
| Thermal Resistance-Junction to Ambient* | R <sub>θJA</sub> | 33                   | °C/W |

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



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Electrical Characteristics (TA=25°C Unless Otherwise Specified)

| Symbol              | Parameter                                     | Limit   | Min | Typ | Max | Unit |
|---------------------|---|---|-----|-----|-----|------|
| <b>STATIC</b>       |   |   |     |     |     |      |
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage                | V <sub>GS</sub> =0V, I <sub>D</sub> =250 μA   | 30  |     |     | V    |
| V <sub>GS(th)</sub> | Gate Threshold Voltage                        | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA                               | 1   |     | 3   | V    |
| I <sub>GSS</sub>    | Gate Leakage Current                          | V <sub>DS</sub> =0V, V <sub>GS</sub> =±16V  |     |     | ±10 | μA   |
| I <sub>DSS</sub>    | Zero Gate Voltage Drain Current               | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V   |     |     | 1   | μA   |
| R <sub>DS(ON)</sub> | Drain-Source On-State Resistance <sup>a</sup> | V <sub>GS</sub> =10V, I <sub>D</sub> =10A   |     | 13  | 16  | mΩ   |
|                     |   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A   |     | 19  | 25  |      |
| V <sub>SD</sub>     | Diode Forward Voltage                         | I <sub>S</sub> =9A, V <sub>GS</sub> =0V   |     | 0.8 |     | V    |
| <b>DYNAMIC</b>      |   |   |     |     |     |      |
| Q <sub>g</sub>      | Total Gate Charge                             | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =10A                         |     | 18  |     | nC   |
| Q <sub>g</sub>      | Total Gate Charge                             |   |     | 8.8 |     |      |
| Q <sub>gs</sub>     | Gate-Source Charge                            | V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A                        |     | 4.2 |     |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                             |   |     | 3.7 |     |      |
| C <sub>iss</sub>    | Input Capacitance                             | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz                                       |     | 729 |     | pF   |
| C <sub>oss</sub>    | Output Capacitance                            |   |     | 94  |     |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance                  |   |     | 29  |     |      |
| R <sub>g</sub>      | Gate Resistance                               | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz  |     | 0.9 |     | Ω    |
| t <sub>d(on)</sub>  | Turn-On Delay Time                            | V <sub>DS</sub> =25V, R <sub>L</sub> =25Ω<br>R <sub>GEN</sub> =6Ω, V <sub>GS</sub> =10V |     | 14  |     | ns   |
| t <sub>r</sub>      | Turn-On Rise Time                             |   |     | 9.5 |     |      |
| t <sub>d(off)</sub> | Turn-Off Delay Time                           |   |     | 44  |     |      |
| t <sub>f</sub>      | Turn-Off Fall Time                            |   |     | 5.7 |     |      |

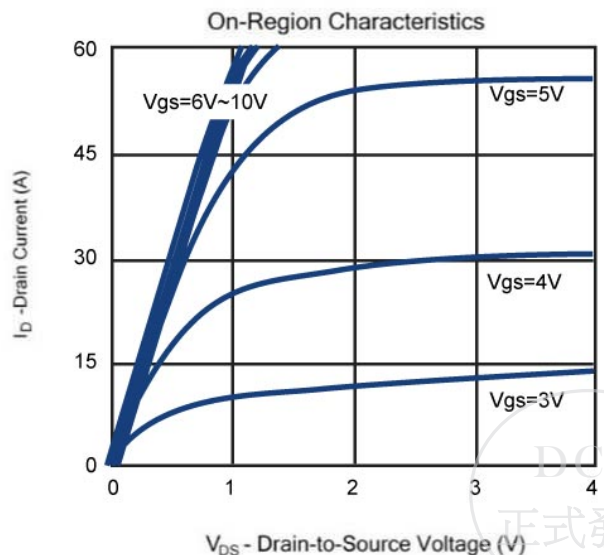
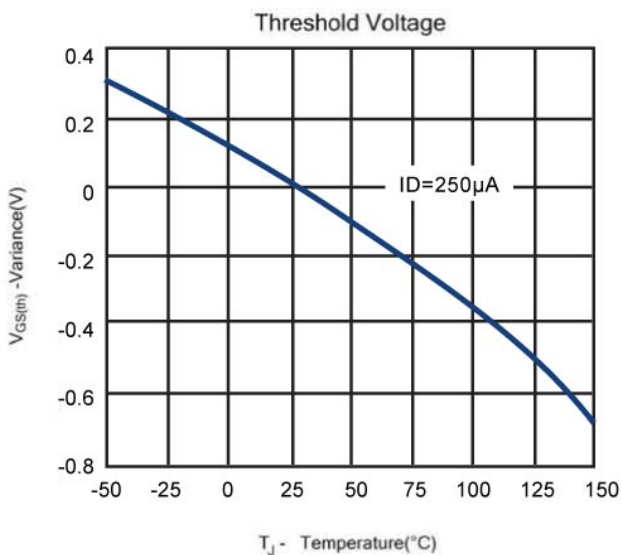
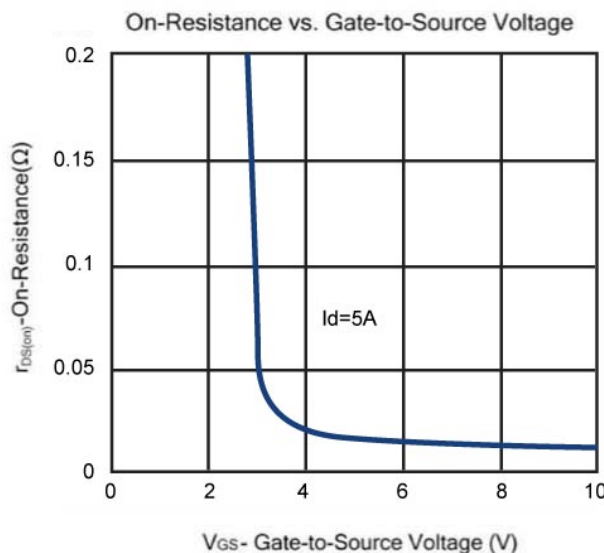
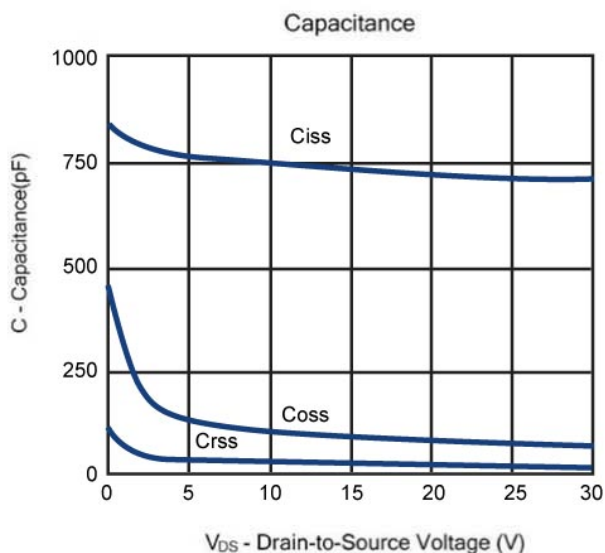
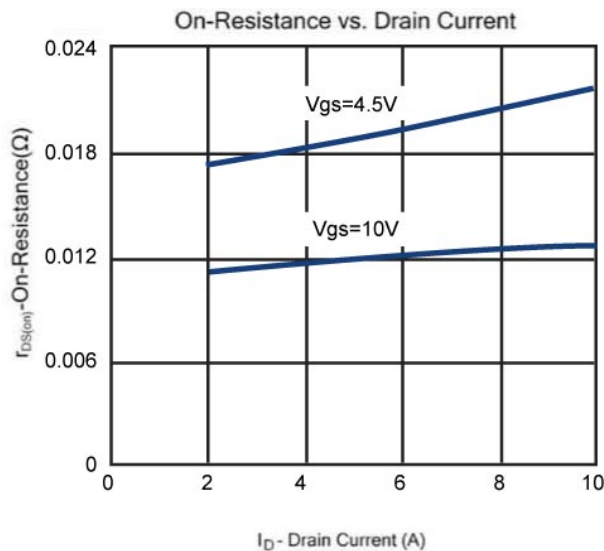
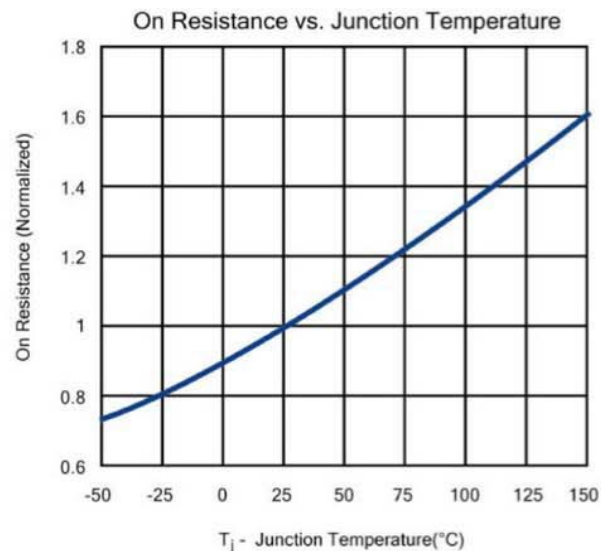
Notes: a. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Guaranteed by design, not subject to production testing.

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



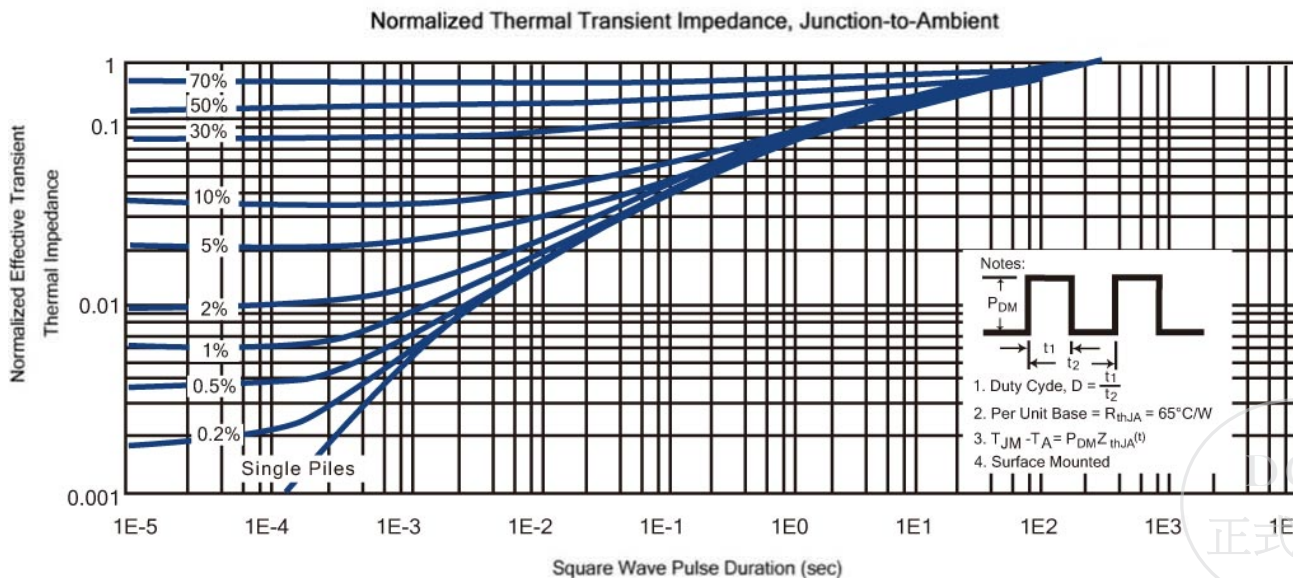
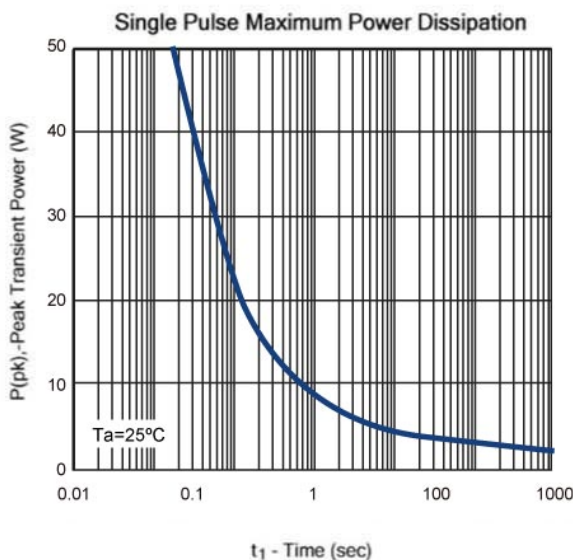
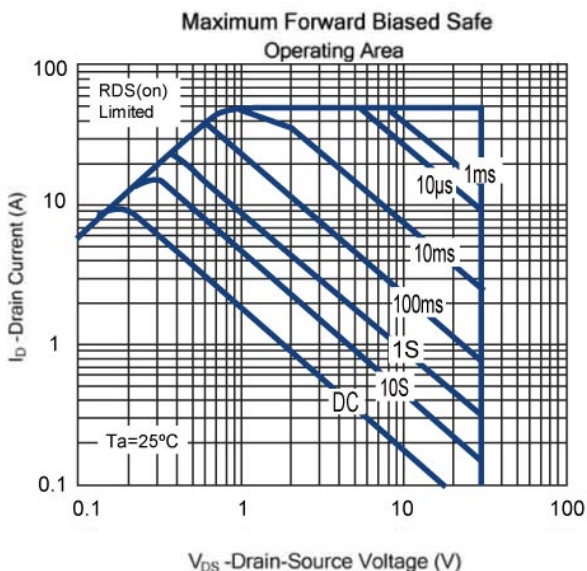
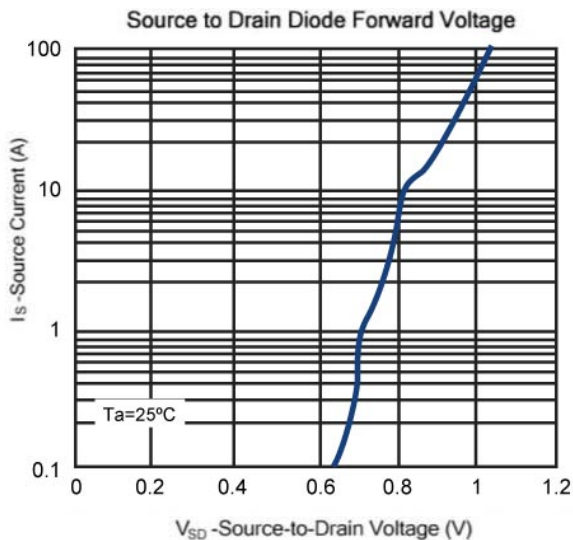
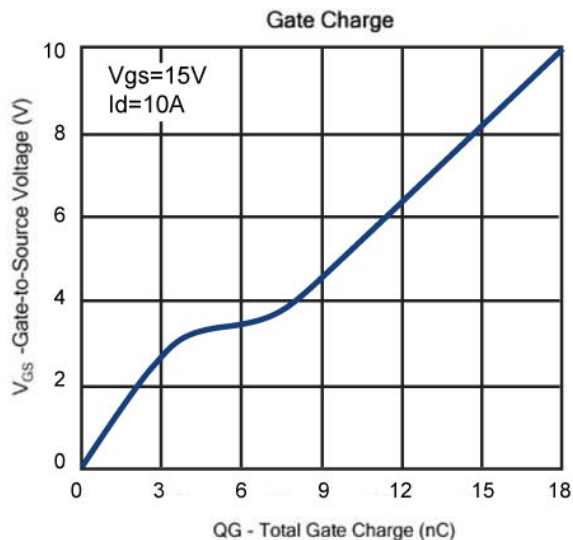
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**Typical Characteristics (T<sub>J</sub> =25°C Noted)**

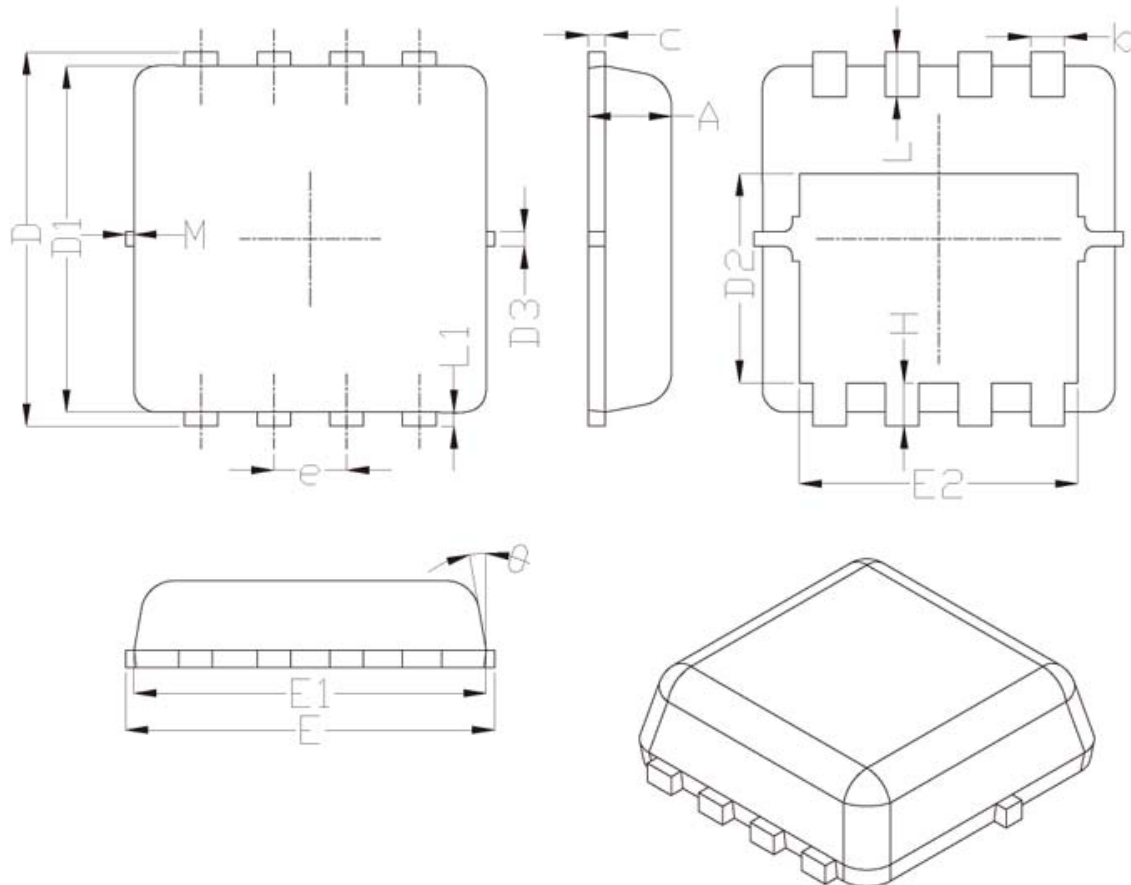


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**Typical Characteristics (T<sub>J</sub> =25°C Noted)**



**DFN(S) 3.3x3.3 Package Outline**



| SYMBOL | DIMENSIONAL REQMTS |      |      |
|--------|--------------------|------|------|
|        | MIN                | NOM  | MAX  |
| A      | 0.70               | 0.75 | 0.80 |
| b      | 0.25               | 0.30 | 0.35 |
| c      | 0.10               | 0.15 | 0.25 |
| D      | 3.25               | 3.35 | 3.45 |
| D1     | 3.00               | 3.10 | 3.20 |
| D2     | 1.78               | 1.88 | 1.98 |
| D3     | ---                | 0.13 | ---  |
| E      | 3.20               | 3.30 | 3.40 |
| E1     | 3.00               | 3.15 | 3.20 |
| E2     | 2.39               | 2.49 | 2.59 |
| e      | 0.65BSC            |      |      |
| H      | 0.30               | 0.39 | 0.50 |
| L      | 0.30               | 0.40 | 0.50 |
| L1     | ---                | 0.13 | ---  |
| Ø      | ---                | 10°  | 12°  |
| M      | *                  | *    | 0.15 |

\* Not specified

