

N-Channel 100-V (D-S) MOSFET

GENERAL DESCRIPTION

The MEE7816S is a N-Channel enhancement mode power field effect transistors, using Force-MOS patented Extended Trench Gate(ETG) technology. This advanced technology is especially tailored to minimize on state resistance and gate charge, and enhance avalanche capability. These devices are particularly suited for medium voltage application such as charger, adapter, notebook computer power management and other lighting dimming powered circuits, and low in-line power loss that are needed in a very small outline surface mount package.

FEATURES

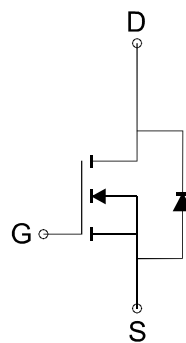
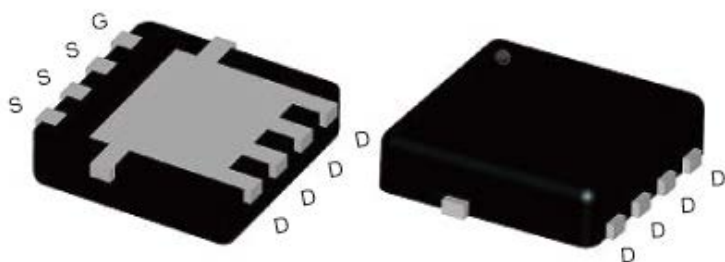
- $R_{DS(ON)} \leq 100m\Omega @ V_{GS}=10V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

APPLICATIONS

- Power Management
- Synchronous Rectification
- Load Switch

PIN CONFIGURATION

(DFN(S) 3X3)
Top View



N-Channel MOSFET

Ordering Information: MEE7816S-G (Green product-Halogen free)

Absolute Maximum Ratings (Tc=25°C Unless Otherwise Noted)

| Parameter | Symbol | Maximum Ratings | Unit |
|--|-----------------|------------------|--------------|
| Drain-Source Voltage | V_{DS} | 100 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | $T_c=25^\circ C$ | 10.2 |
| | | $T_c=70^\circ C$ | 8.2 |
| Pulsed Drain Current | I_{DM} | 41 | A |
| Maximum Power Dissipation | P_D | $T_c=25^\circ C$ | 16.7 |
| | | $T_c=70^\circ C$ | 10.7 |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to 150 | $^\circ C$ |
| Thermal Resistance-Junction to Case * | $R_{\theta JC}$ | 7.5 | $^\circ C/W$ |

* The device mounted on 1in² FR4 board with 2 oz copper



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

| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---------------------|---|--|-----|------|------|------|
| STATIC | | | | | | |
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 100 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250μA | 1 | | 3 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =100V, V _{GS} =0V | | | 1 | μA |
| R _{DS(ON)} | Drain-Source On-Resistance ^a | V _{GS} =10V, I _D = 8A | | 85 | 100 | mΩ |
| V _{SD} | Diode Forward Voltage | I _S =8A, V _{GS} =0V | | 0.9 | 1.2 | V |
| DYNAMIC | | | | | | |
| Q _g | Total Gate Charge | V _{DS} =50V, V _{GS} =10V, I _D =8A | | 15.5 | | nC |
| Q _{gs} | Gate-Source Charge | | | 2.6 | | |
| Q _{gd} | Gate-Drain Charge | | | 3.6 | | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | | 314 | | pF |
| C _{oss} | Output Capacitance | | | 119 | | |
| C _{rss} | Reverse Transfer Capacitance | | | 15 | | |
| t _{d(on)} | Turn-On Delay Time | V _{DS} =50V, R _L =50Ω, V _{GS} =10V, R _G =1Ω I _D =1A | | 8.4 | | ns |
| t _r | Turn-On Rise Time | | | 24.8 | | |
| t _{d(off)} | Turn-Off Delay Time | | | 30.7 | | |
| t _f | Turn-Off Fall Time | | | 2.5 | | |
| T _{rr} | Reverse Recovery Time | I _D =7A, V _{GS} =0V, di/dt=100A/us | | 25 | | ns |
| Q _{rr} | Reverse Recovery Charge | | | 24 | | nC |

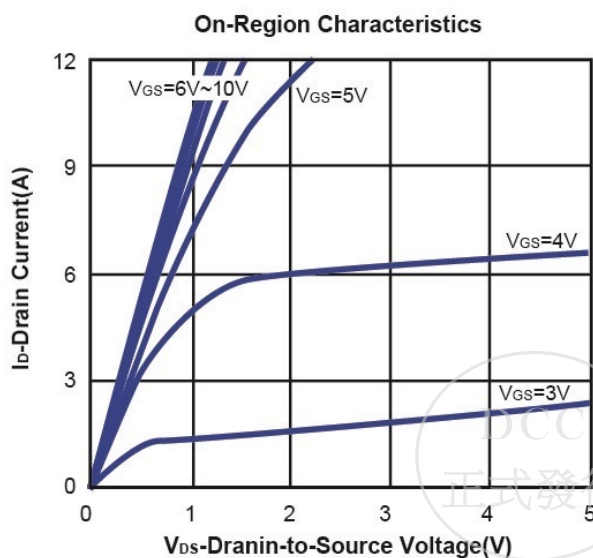
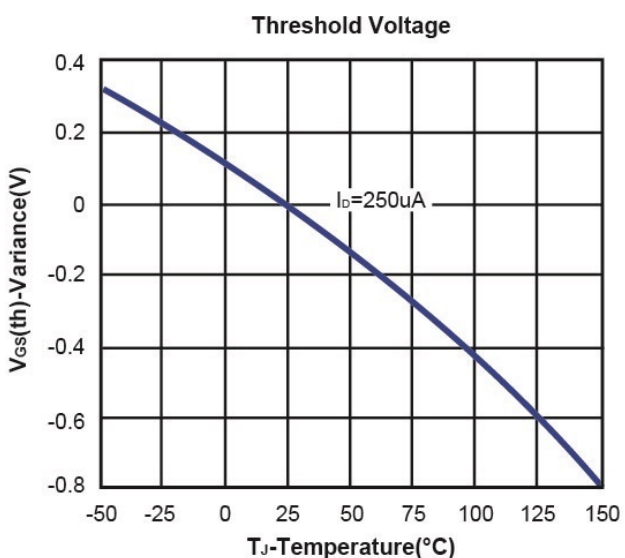
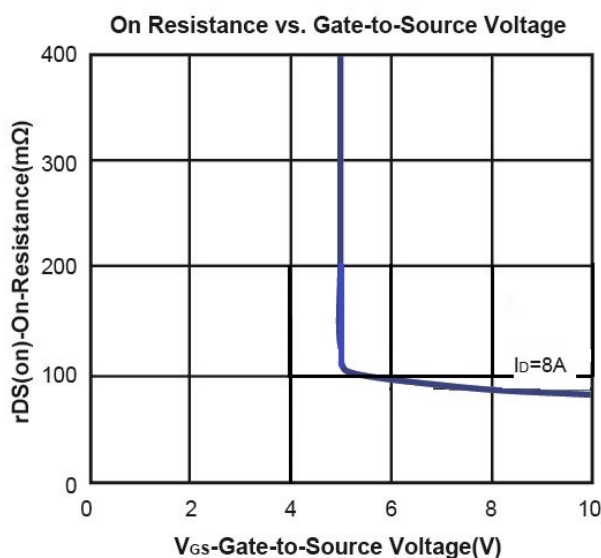
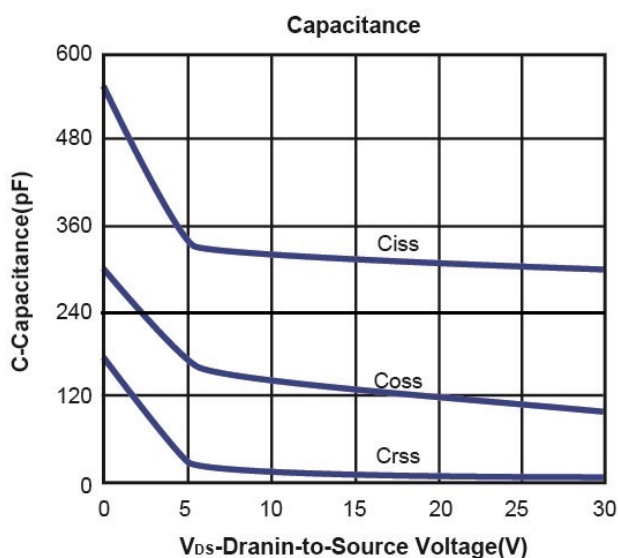
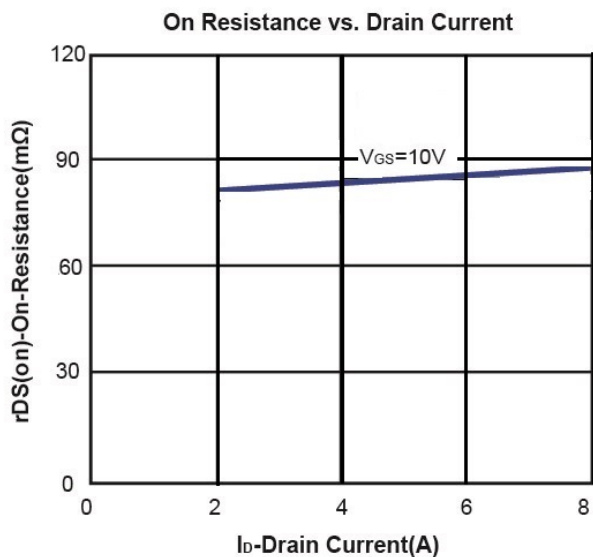
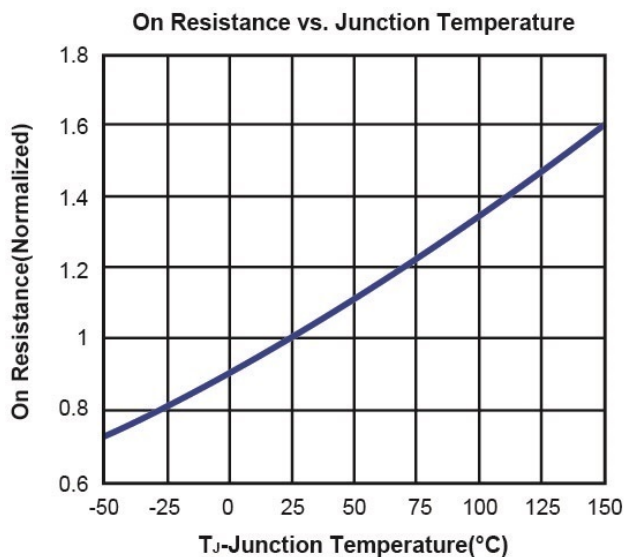
Notes: a. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Guaranteed by design, not subject to production testing.

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



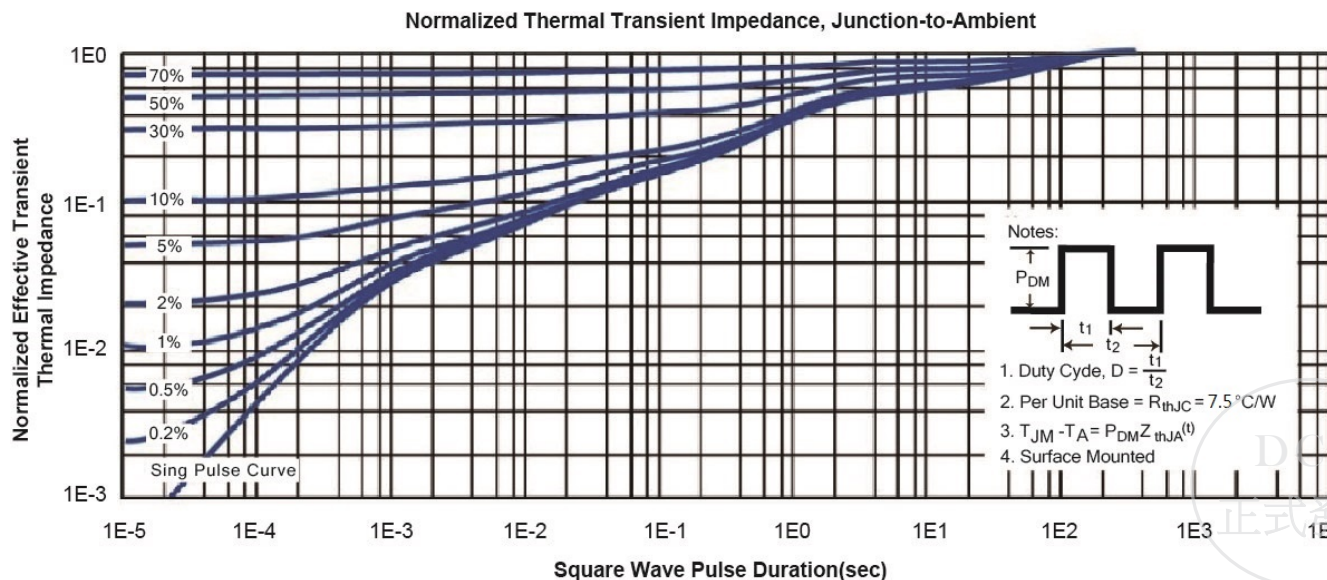
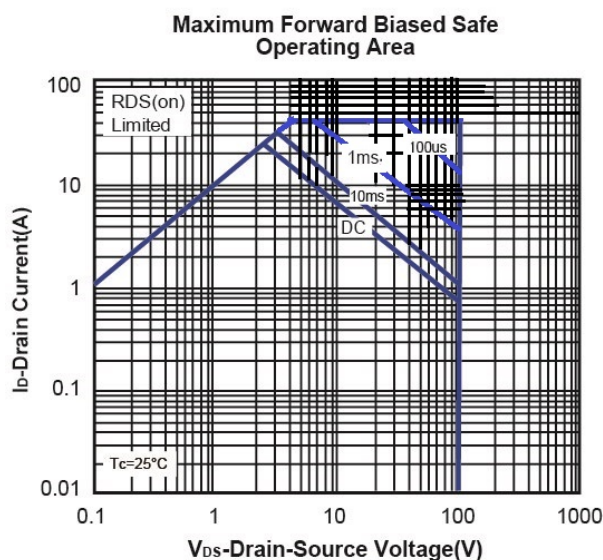
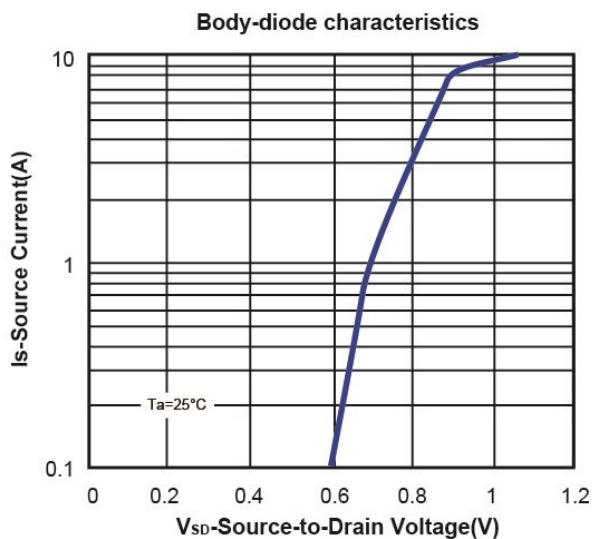
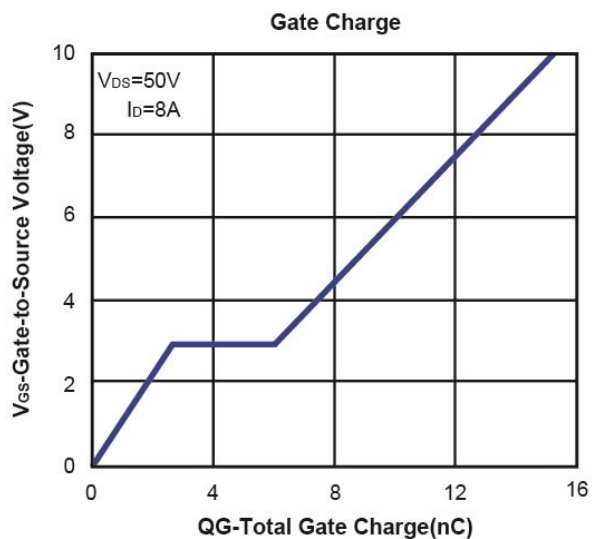
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Typical Characteristics (T_J =25°C Noted)

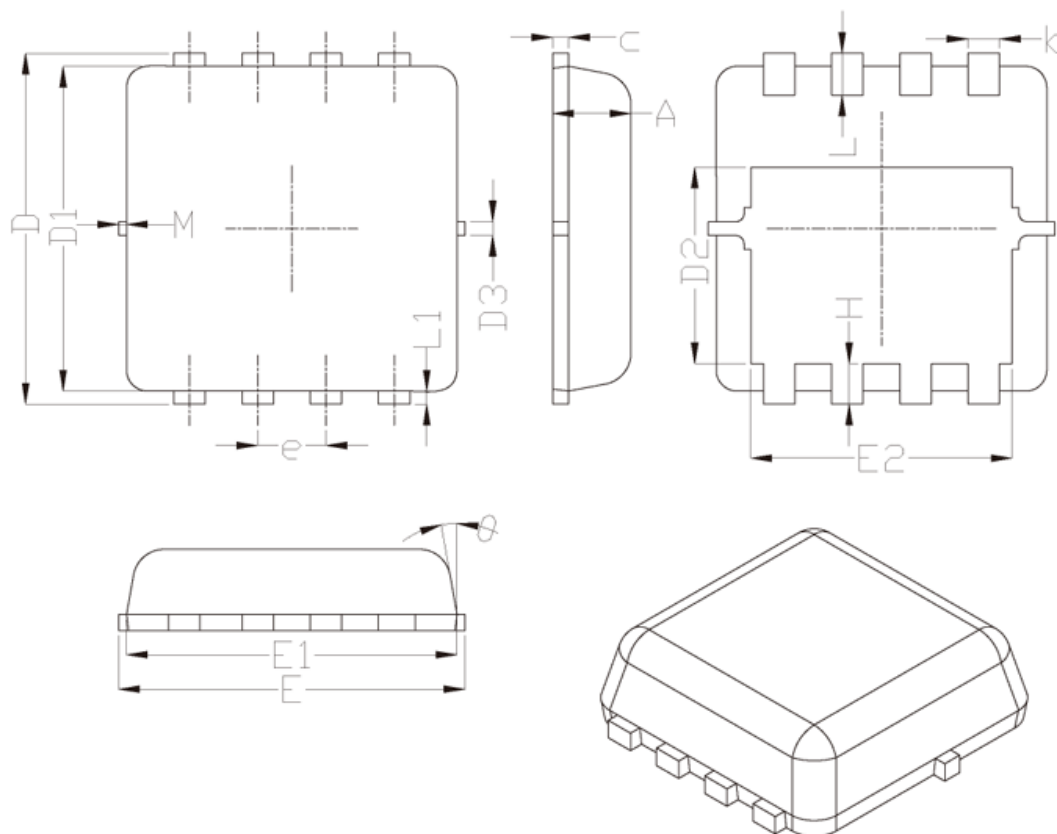


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Typical Characteristics (T_J = 25°C Noted)



DFN(S)3X3 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 | --- |
| θ | --- | 10° | 12° |
| M | * | * | 0.15 |
| * Not specified | | | |

