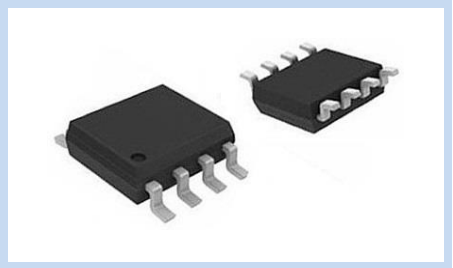
# N-Channel MOSFET
# 100V 7.0A SOP-8

MFT10N7A0S8S

MERITEK

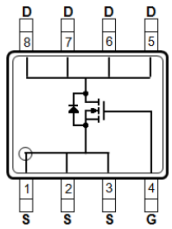
## FEATURE



- $R_{DS(ON)}$<25mΩ, $V_{GS}$=10V, $I_D$=7.0A
- $R_{DS(ON)}$<28.5mΩ, $V_{GS}$=4.5V, $I_D$=5.0A
- High density cell design for ultra low on-resistance
- Advanced Trench Process Technology
- Lead free in compliance with EU RoHS

## MECHANICAL DATA

- Case: SOP-8 package
- Terminal: Solderable per MIL-STD-750, Method 2026



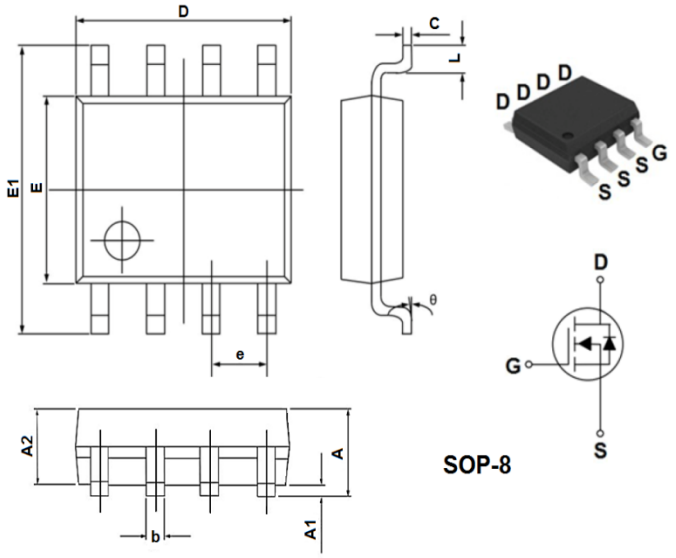

RoHS

## MAXIMUM RATINGS (TA=25°C unless otherwise noted)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Drain Current – Continuous | $T_C$=25°C | $I_D$ | 7.0 | A |
| | $T_C$=70°C | | 5.6 | A |
| Drain Current – Pulsed | | $I_{DM}$ | 28 | A |
| Power Dissipation | $T_C$=25°C | $P_D$ | 2.5 | W |
| | $T_C$=70°C | | 1.6 | W |
| Single Pulse Avalanche Energy | | $E_{AS}$ | 8.5 | mJ |
| Operating Junction and Storage Temperature Range | | $T_J$ ,$T_{STG}$ | -55 to 150 | °C |
| Thermal Resistance Junction to Ambient, t≦10s | | $R_{\theta JA}$ | 50 | °C/W |

## DIMENSIONS AND PIN LAYOUT

| Item | Min. (mm) | Max. (mm) |
|---|---|---|
| A | 1.35 | 1.75 |
| A1 | 0.10 | 0.25 |
| A2 | 1.30 | 1.50 |
| b | 0.31 | 0.51 |
| c | 0.17 | 0.25 |
| D | 4.80 | 5.00 |
| E | 3.80 | 4.00 |
| E1 | 5.80 | 6.20 |
| e | 1.27 BSC | |
| L | 0.40 | 1.27 |
| θ | 0° | 8° |




SOP-8

# N-Channel MOSFET
# 100V 7.0A SOP-8

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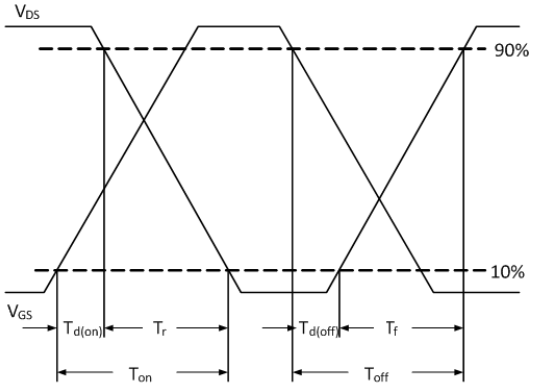
## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

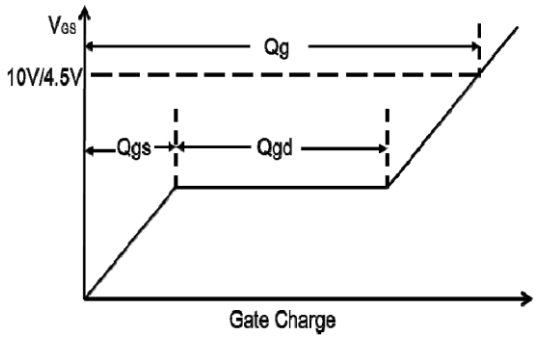
| Static Characteristics | Conditions | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | $BV_{DSS}$ | 100 | -- | -- | V |
| Gate Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=250μA | $V_{GS(th)}$ | 1.0 | 1.8 | 2.5 | V |
| Drain-Source On-Resistance | $V_{GS}$=10V, $I_D$=7.0A | $R_{DS(ON)}$ | -- | 20 | 25 | mΩ |
| Drain-Source On-Resistance | $V_{GS}$=4.5V, $I_D$=5.0A | $R_{DS(ON)}$ | -- | 22 | 28.5 | mΩ |
| Zero Gate Voltage Drain Current | $V_{DS}$=20V, $V_{GS}$=0V | $I_{DSS}$ | -- | -- | 1.0 | μA |
| Gate-Source Leakage Current | $V_{DS}$=0V, $V_{GS}$=±8V | $I_{GSS}$ | -- | -- | ±100 | μA |
| **Dynamic Characteristics** | **Conditions** | **Symbol** | **Min** | **Typ.** | **Max** | **Unit** |
| Input Capacitance | $V_{DS}$=30V, $V_{GS}$=0V, F=1.0MHz | $C_{iss}$ | -- | 1519 | -- | pF |
| Output Capacitance | | $C_{oss}$ | -- | 132 | -- | pF |
| Reverse Transfer Capacitance | | $C_{rss}$ | -- | 66 | -- | pF |
| **Switching Characteristics** | **Conditions** | **Symbol** | **Min** | **Typ.** | **Max** | **Unit** |
| Total Gate Charge | $V_{DS}$=50V, $V_{GS}$=10V, $I_D$=7.0A | $Q_g$ | -- | 31 | -- | nC |
| Gate-Source Charge | | $Q_{gs}$ | -- | 5.1 | -- | |
| Gate-Drain Charge | | $Q_{gd}$ | -- | 7.3 | | |
| Turn-On Delay Time | $V_{DD}$=50V, $V_{GS}$=10V, $R_G$=3Ω $I_D$=7.0A | $T_{d(on)}$ | -- | 11 | -- | ns |
| Turn-On Rise Time | | $T_r$ | -- | 42 | -- | |
| Turn-Off Delay Time | | $T_{d(off)}$ | -- | 40 | -- | |
| Turn-Off Fall Time | | $T_f$ | -- | 19 | -- | |
| **Drain-Source Body Diode** | **Conditions** | **Symbol** | **Min** | **Typ.** | **Max** | **Unit** |
| Drain-Source Diode Forward Current | -- | $I_S$ | -- | -- | 7.0 | A |
| Drain-Source Diode Forward Voltage | $V_{GS}$=0V, $I_S$=1.0A | $V_{SD}$ | -- | 0.7 | 1.2 | V |

Note:
1. Pulse width≤ 300μs, duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics
3. The maximum current rating is package limited.
4. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial TJ =25°C.
5. The test condition is L=0.1mH, IAS=13A, VDD=50V, VGS=10V
6. $Re_{JA}$ is the sum of the junction to case to ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1inch FR-4 with 2oz. square pad of copper.
7. Guaranteed by design, not subject to production testing.

**Switching Time Waveform**

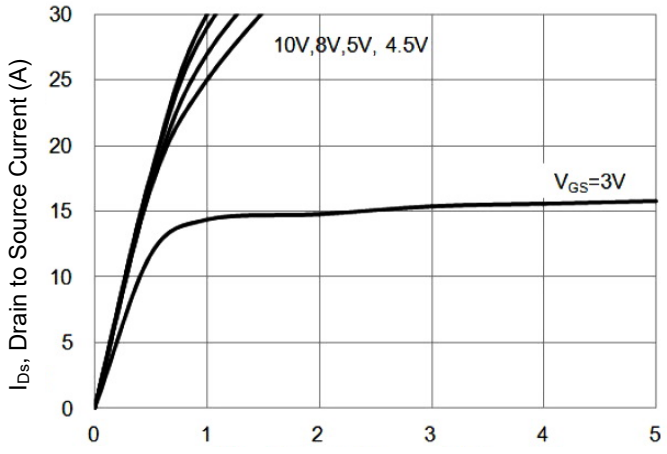



**Gate Charge Waveform**

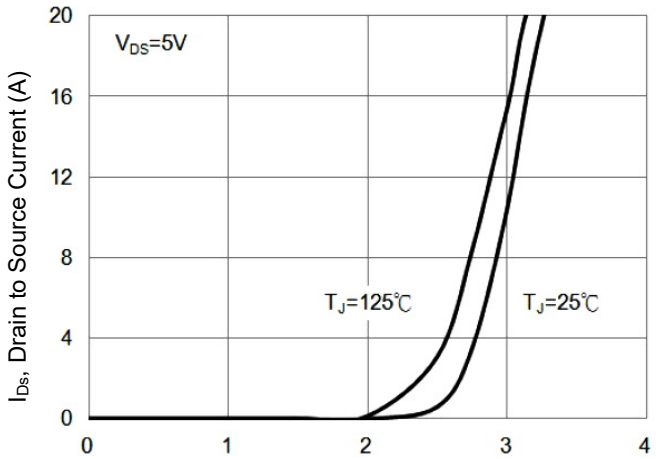


## CHARACTERISTIC CURVES

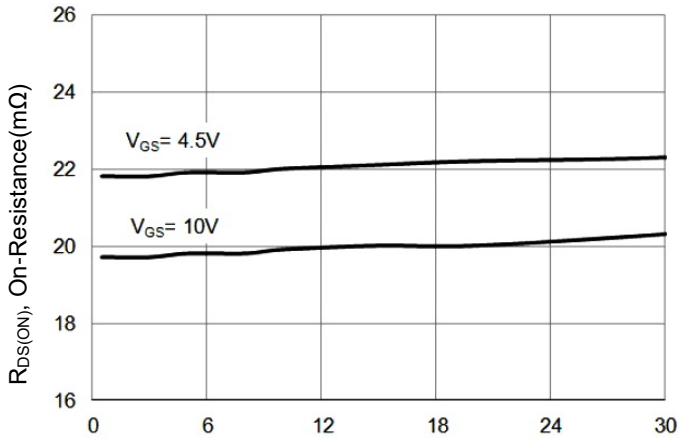
**On-Region Characteristics**



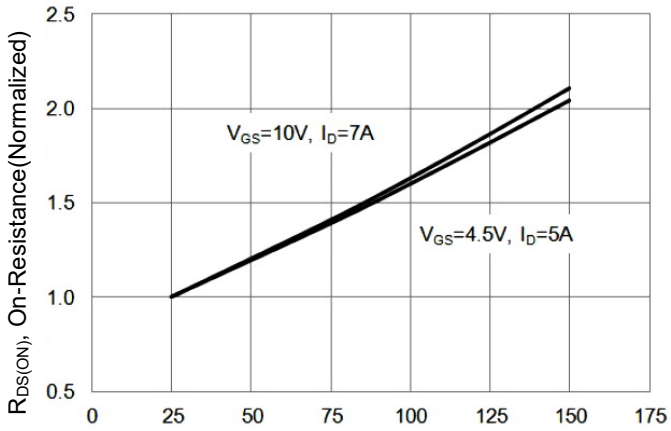

**Transfer Characteristics**



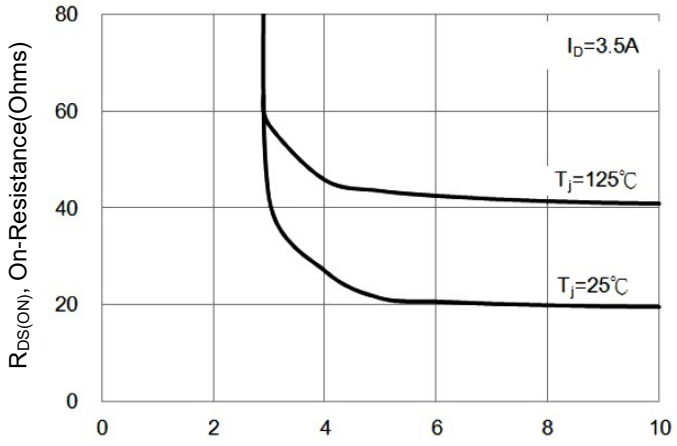

**On-Resistance Variation vs. Drain Current**



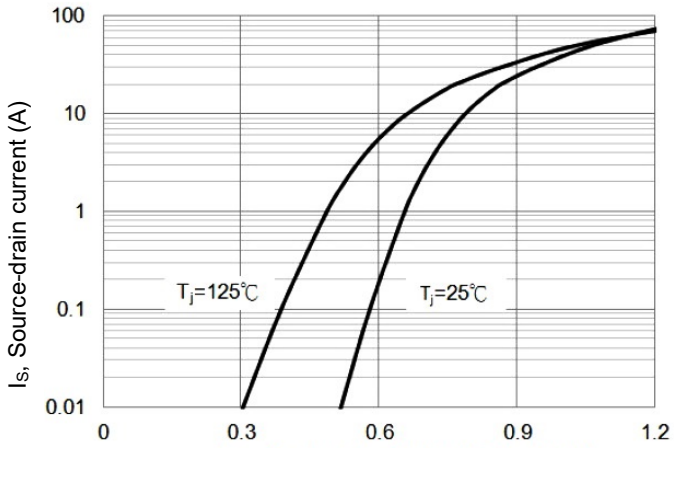

**On-Resistance Variation vs. Temperature**




**On-Resistance Variation vs. $V_{GS}$**

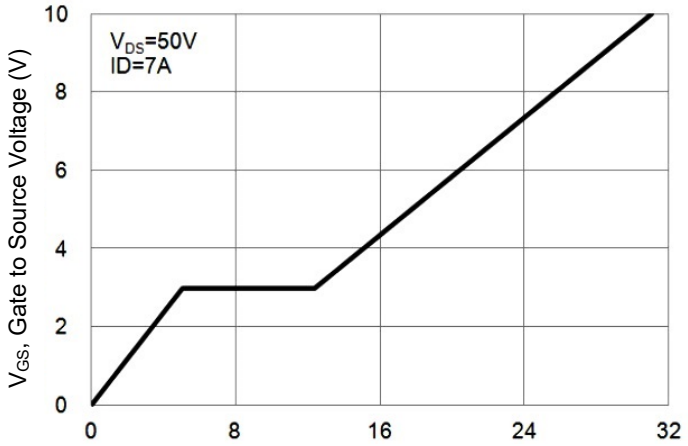



**Body Diode Characteristics**

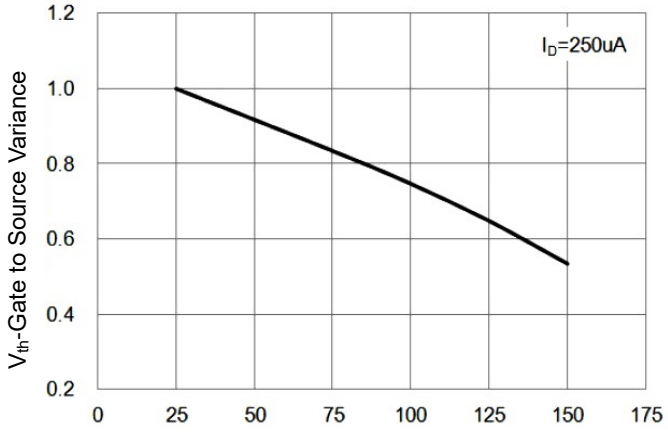


## CHARACTERISTICS CURVES (CONTINUED)

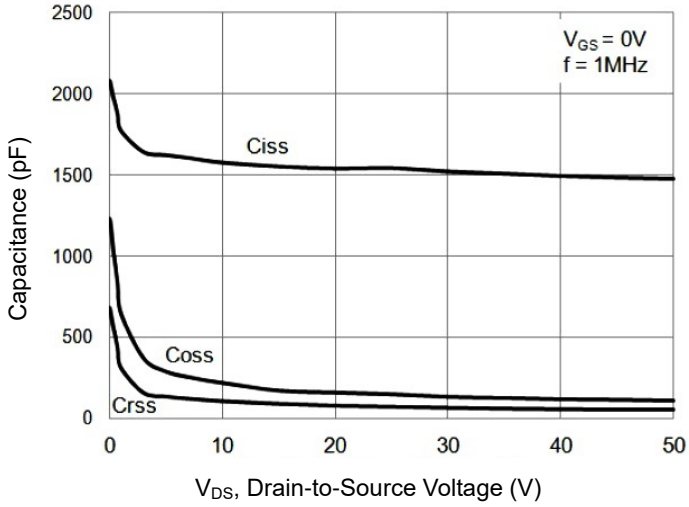
**Gate Charge Characteristics**



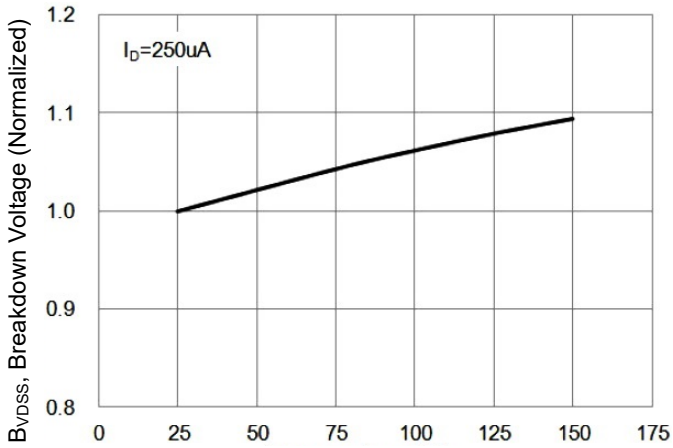

**Threshold Voltage Variation with Temperature**



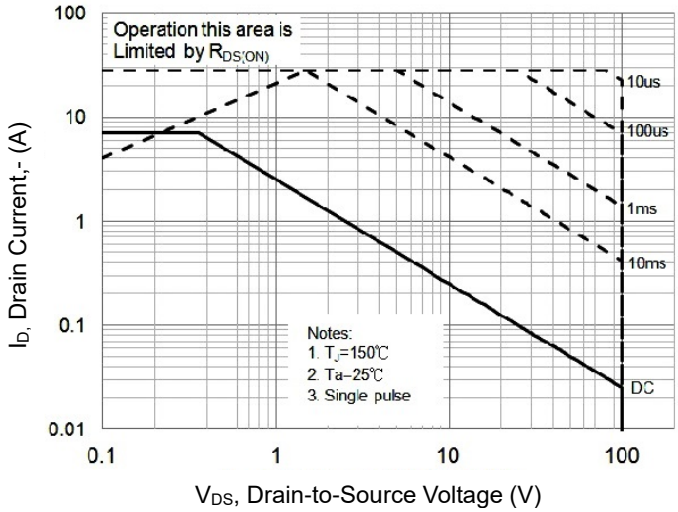

**Capacitance vs. Drain Source Voltage**




**Breakdown Voltage Variation vs. Temperature**

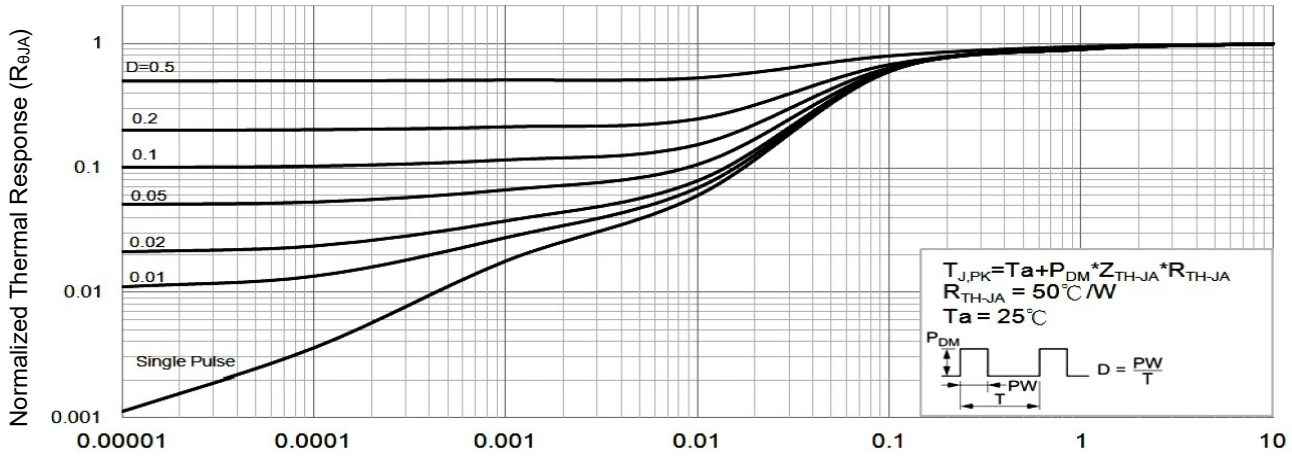



**Maximum Safe Operating Area**



## CHARACTERISTICS CURVES (CONTINUED)

**Normalized Transient Thermal Impedance vs. Pluse Width**




t, Pulse Width (Sec)

*Specifications subject to change without notice.