

N-Channel 60V (D-S) MOSFET

GENERAL DESCRIPTION

The ME2308S 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 high-side switching and low in-line power loss are needed in a very small outline surface mount package.

FEATURES

- $R_{DS(ON)} \leq 100m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leq 130m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

APPLICATIONS

- Power Management in Note book
- Portable Equipment
- DC/DC Converter
- Load Switch
- LCD Display inverter

PIN CONFIGURATION



Ordering Information: ME2308S (Pb-free)

ME23008S-G (Green product)

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

| Parameter | Symbol | Maximum | Unit |
|--|-----------------|------------|------|
| Drain-Source Voltage | V_{DSS} | 60 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current (Tj=150°C)* | I_D | TA=25°C | 2.6 |
| | | TA=70°C | 2.1 |
| Pulsed Drain Current | I_{DM} | 10 | A |
| Maximum Power Dissipation* | P_D | TA=25°C | 1.04 |
| | | TA=70°C | 0.67 |
| Operating Junction & Storage Temperature Range | T_J | -55 to 150 | °C |
| Thermal Resistance-Junction to Ambient* | $R_{\theta JA}$ | 110 | °C/W |

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

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

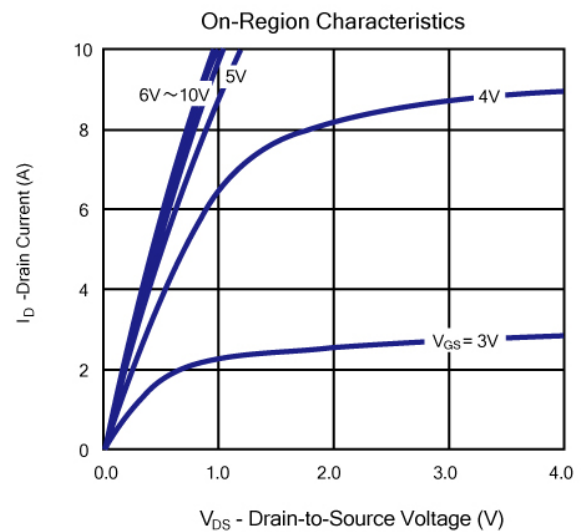
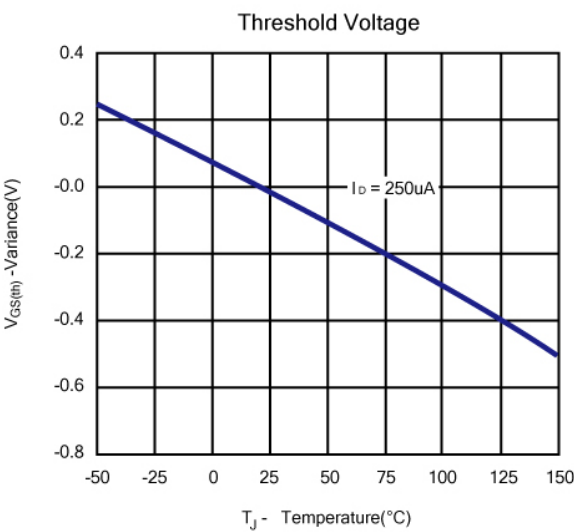
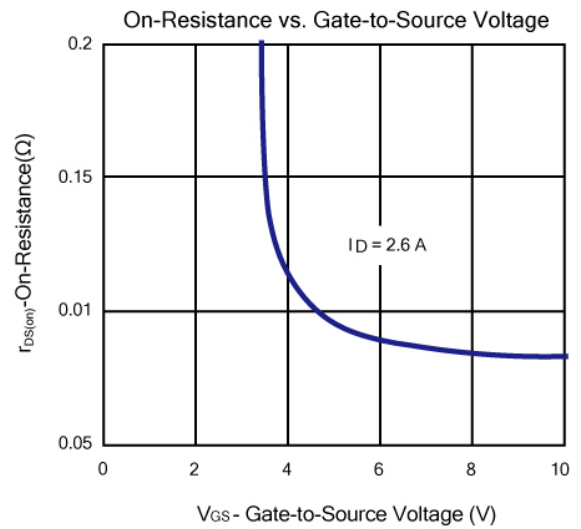
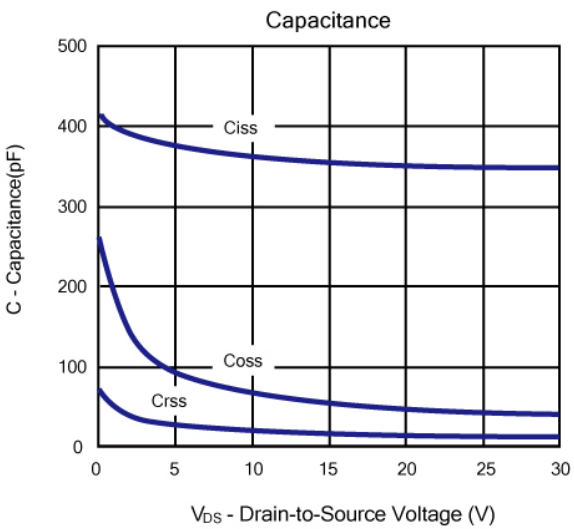
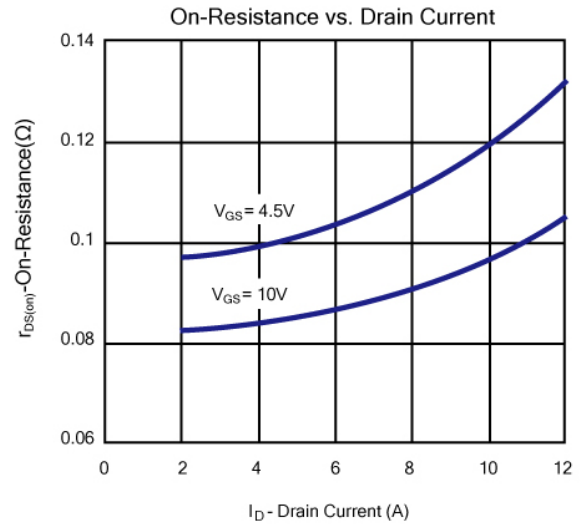
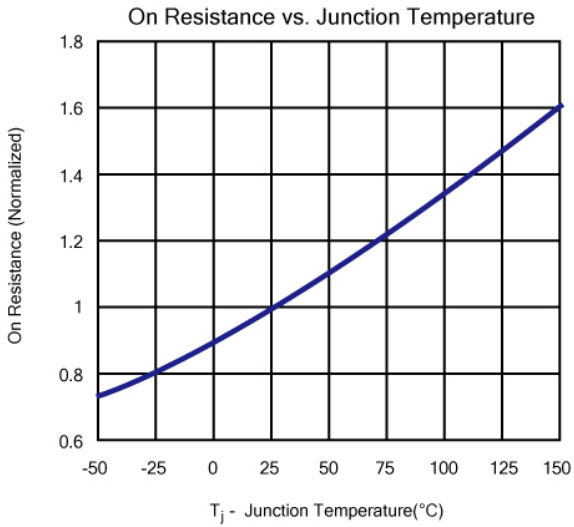
| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---------------------|---|--|-----|-----|------|------|
| STATIC | | | | | | |
| V _{DS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250 μA | 60 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250 μA | 1.0 | | 3.0 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =60V, V _{GS} =0V | | | 1 | μA |
| | | V _{DS} =60V, V _{GS} =0V | | | 10 | |
| | | T _J =55°C | | | | |
| R _{DS(ON)} | Drain-Source On-Resistance ^a | V _{GS} =10V, I _D = 2.6A | | 82 | 100 | mΩ |
| | | V _{GS} =4.5V, I _D = 2.1A | | 96 | 130 | |
| V _{SD} | Diode Forward Voltage | I _S =1A | | 0.8 | 1.2 | V |
| DYNAMIC | | | | | | |
| C _{iss} | Input capacitance | V _{DS} =30V, V _{GS} =0V, f=1.0MHz | | 350 | | pF |
| C _{oss} | Output Capacitance | | | 40 | | |
| C _{rss} | Reverse Transfer Capacitance | | | 12 | | |
| Q _g | Total Gate Charge | V _{DS} =30V, V _{GS} =10V, I _D =2.6A | | 12 | | nC |
| Q _g | Total Gate Charge | V _{DS} =30V, V _{GS} =4.5V, I _D =2.6A | | 6.5 | | |
| Q _{gs} | Gate-Source Charge | | | 2.2 | | |
| Q _{gd} | Gate-Drain Charge | | | 2.7 | | |
| R _g | Gate Resistance | f=1MHz | | 0.7 | | Ω |
| t _{d(on)} | Turn-On Delay Time | V _{DD} =20V, R _L =20Ω I _D =1A, V _{GEN} =10V R _G =1Ω | | 10 | | ns |
| t _r | Turn-On Rise Time | | | 11 | | |
| t _{d(off)} | Turn-Off Delay Time | | | 29 | | |
| t _f | Turn-Off Fall Time | | | 3 | | |

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

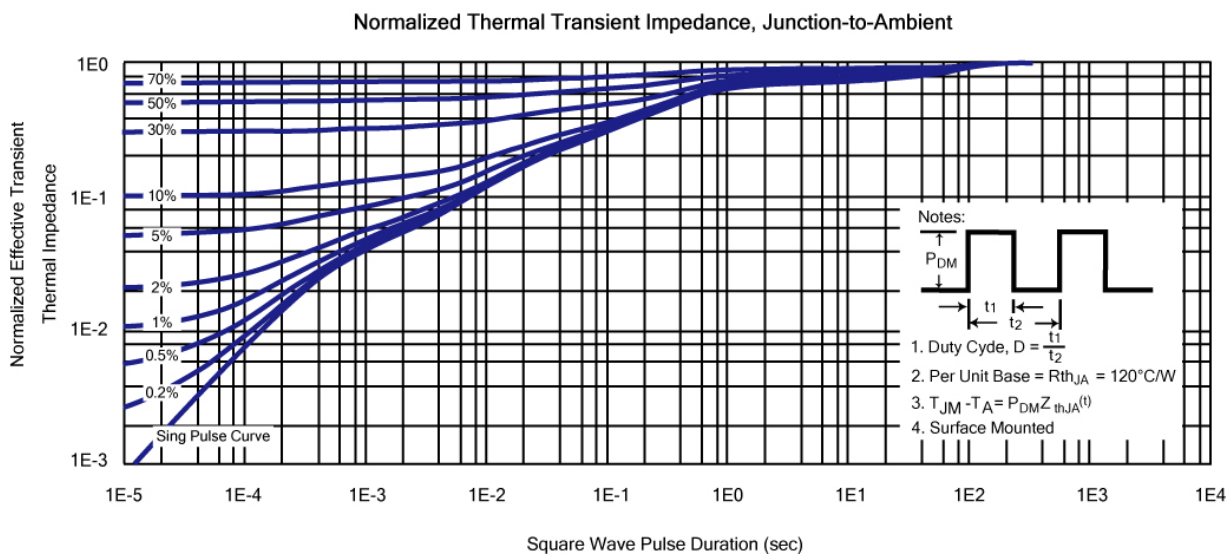
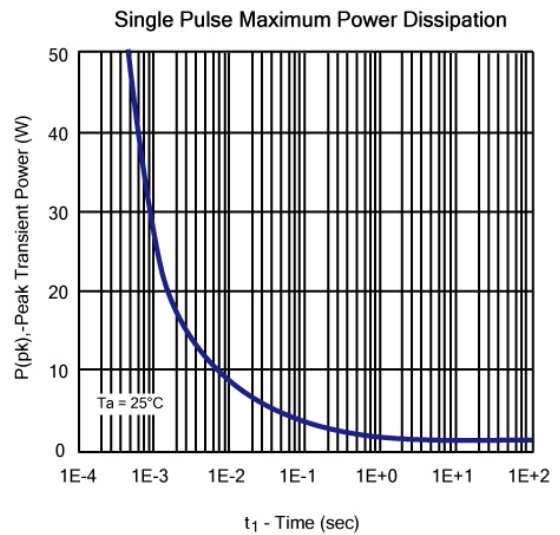
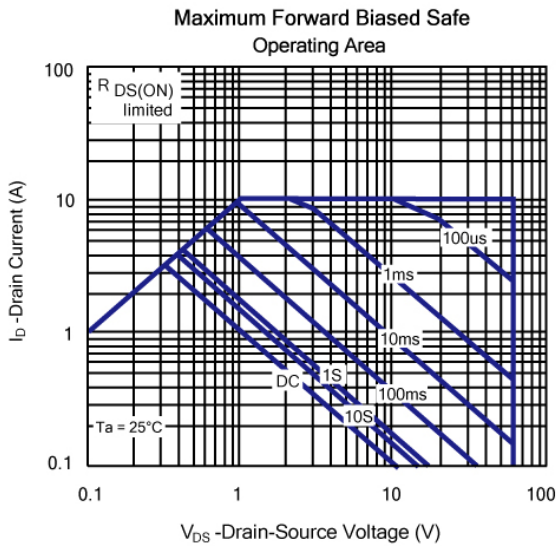
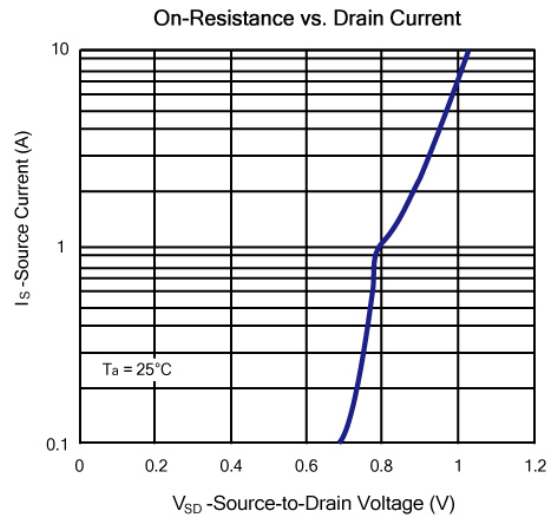
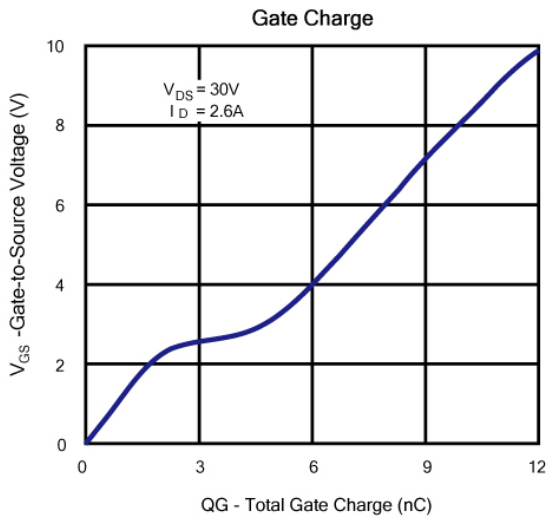
b. Matsuki reserves the right to improve product design, functions and reliability without notice.

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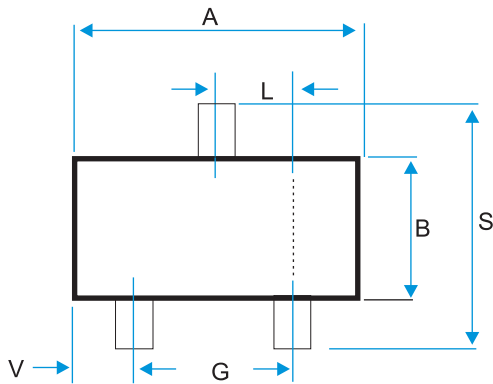
Typical Characteristics (T_J = 25°C Noted)



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SOT-23 Package Outline



| DIM | MILLIMETERS (mm) | |
|-----|------------------|------|
| | MIN | MAX |
| A | 2.800 | 3.00 |
| B | 1.200 | 1.70 |
| C | 0.900 | 1.30 |
| D | 0.350 | 0.50 |
| G | 1.780 | 2.04 |
| H | 0.010 | 0.15 |
| J | 0.085 | 0.20 |
| K | 0.300 | 0.65 |
| L | 0.890 | 1.02 |
| S | 2.100 | 3.00 |
| V | 0.450 | 0.60 |

