# ME13N10A/ME13N10A-G

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

### GENERAL DESCRIPTION

The ME13N10A 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

- $R_{DS(ON)}$ ≦145mΩ@$V_{GS}$=10V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

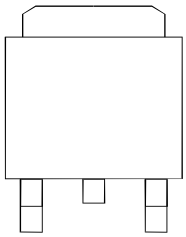
### APPLICATIONS

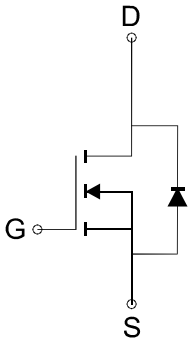
- DC/DC Converter
- Load Switch
- LCD/ LED Display inverter

### PIN CONFIGURATION

(TO-252-3L)

Top View




N-Channel MOSFET

**Ordering Information**: ME13N10A (Pb-free)

ME13N10A-G (Green product-Halogen free )

### Absolute Maximum Ratings (Tc=25℃ 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 | Tc=25℃ | $I_D$ | 11.3 | A |
| | Tc=70℃ | | 9.0 | |
| Pulsed Drain Current | | $I_{DM}$ | 45.4 | A |
| Maximum Power Dissipation | Tc=25℃ | $P_D$ | 29.9 | W |
| | Tc=70℃ | | 19.1 | |
| Operating Junction and Storage Temperature Range | | TJ, Tstg | -55 to 150 | ℃ |
| Thermal Resistance-Junction to Case* | | $R_{\theta JC}$ | 4.17 | ℃/W |

*The device mounted on 1in$^2$ FR4 board with 2 oz copper

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

**Electrical Characteristics** ($T_C$ =25℃ Unless Otherwise Specified)

| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| $V_{(BR)DSS}$ | 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-State Resistance[a] | $V_{GS}$=10V, $I_D$= 5A | | | 145 | mΩ |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=9A, $V_{GS}$=0V | | | 1.2 | V |
| **DYNAMIC** | | | | | | |
| Qg | Total Gate Charge | $V_{DS}$=30V, $V_{GS}$=10V, $I_D$=3A | | 16.4 | | nC |
| Qgs | Gate-Source Charge | | | 3.8 | | |
| Qgd | Gate-Drain Charge | | | 3.5 | | |
| Ciss | Input capacitance | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHz | | 524 | | pF |
| Coss | Output Capacitance | | | 55 | | |
| Crss | Reverse Transfer Capacitance | | | 32 | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=30V, $R_L$ =15Ω<br>$V_{GS}$=10V, $R_{GEN}$=2.5Ω | | 11.7 | | ns |
| $t_r$ | Turn-On Rise Time | | | 10.9 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 27.3 | | |
| $t_f$ | Turn-Off Fall Time | | | 2.6 | | |

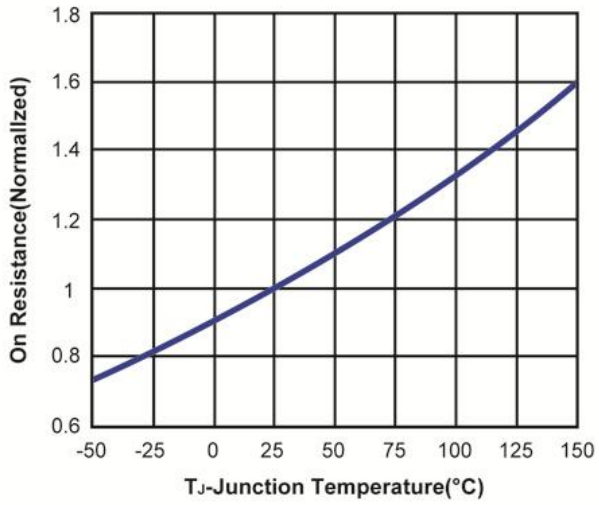
Notes: a. Pulse test: pulse width≦ 300us, duty cycle≦ 2%, Guaranteed by design, not subject to production testing.

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

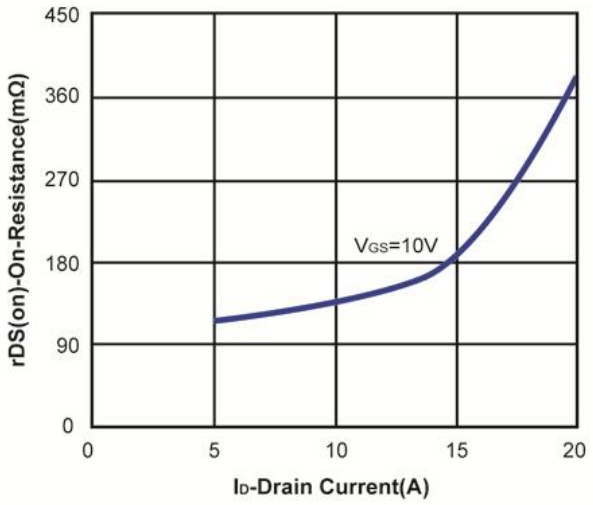
## N- Channel 100V (D-S) MOSFET

### Typical Characteristics ($T_J$ =25℃ Noted)

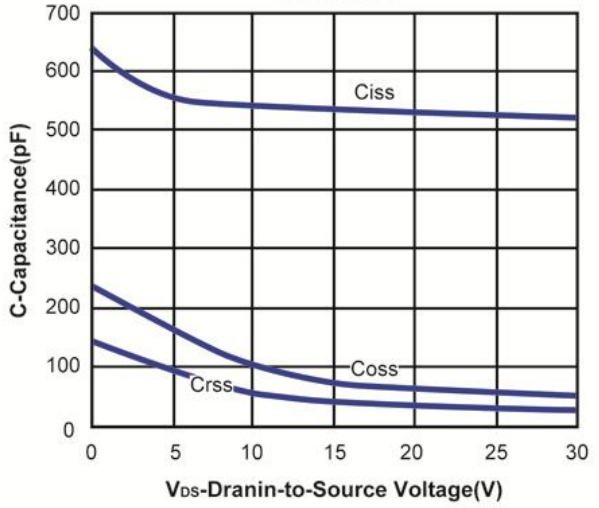
On Resistance vs. Junction Temperature



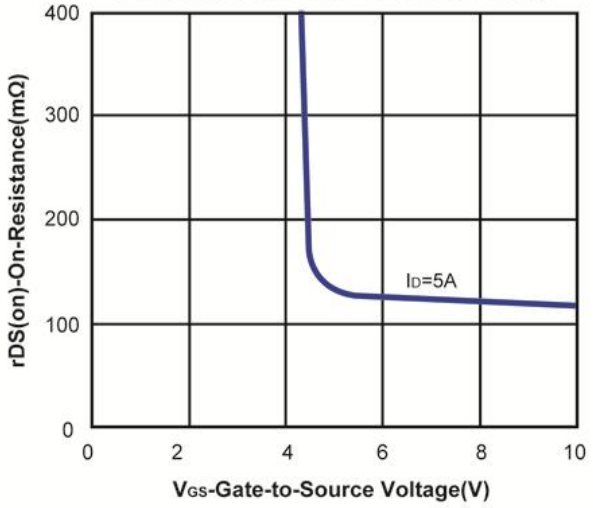

On Resistance vs. Drain Current



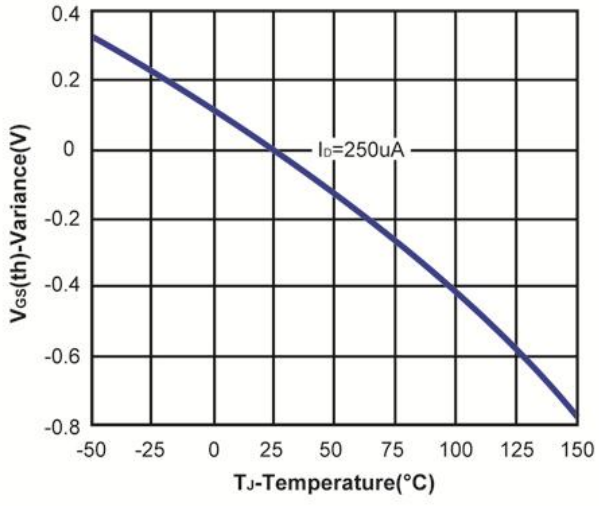

Capacitance



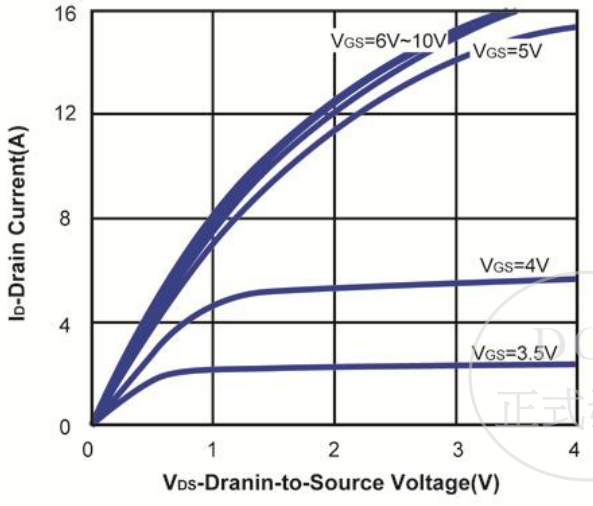

On Resistance vs. Gate-to-Source Voltage




Threshold Voltage



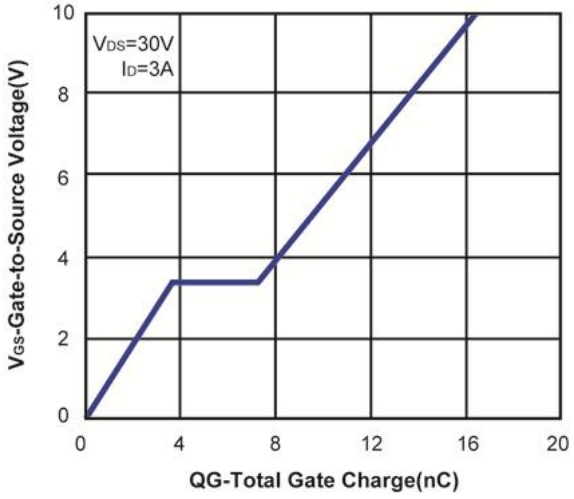

On-Region Characteristics



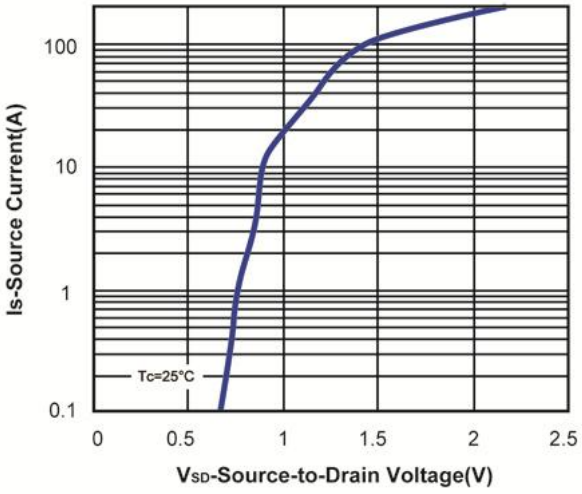
## N- Channel 100V (D-S) MOSFET

### Typical Characteristics ($T_J$ =25℃ Noted)

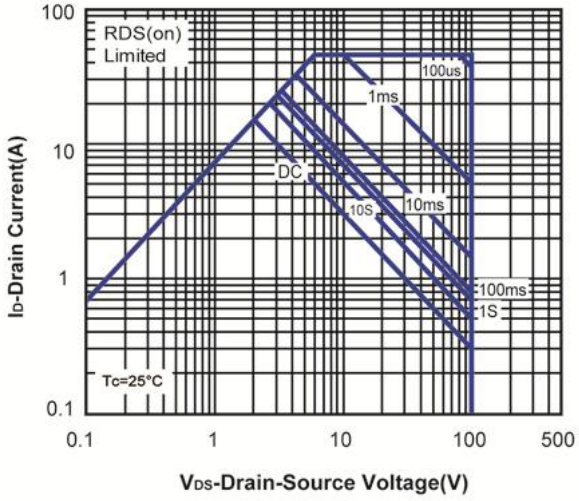
Gate Charge



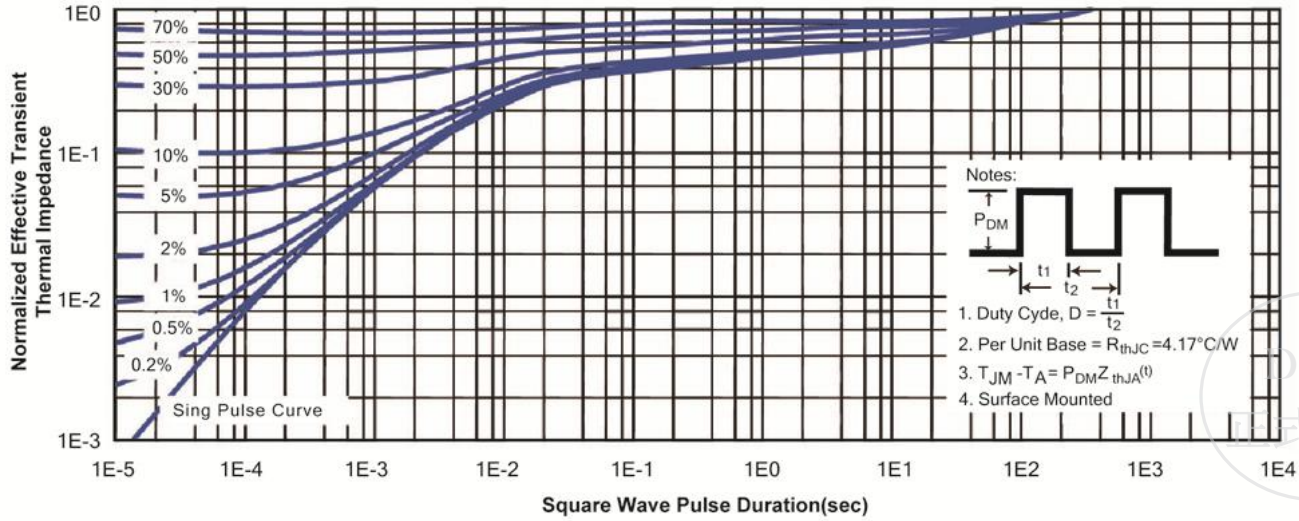

Body-diode characteristics



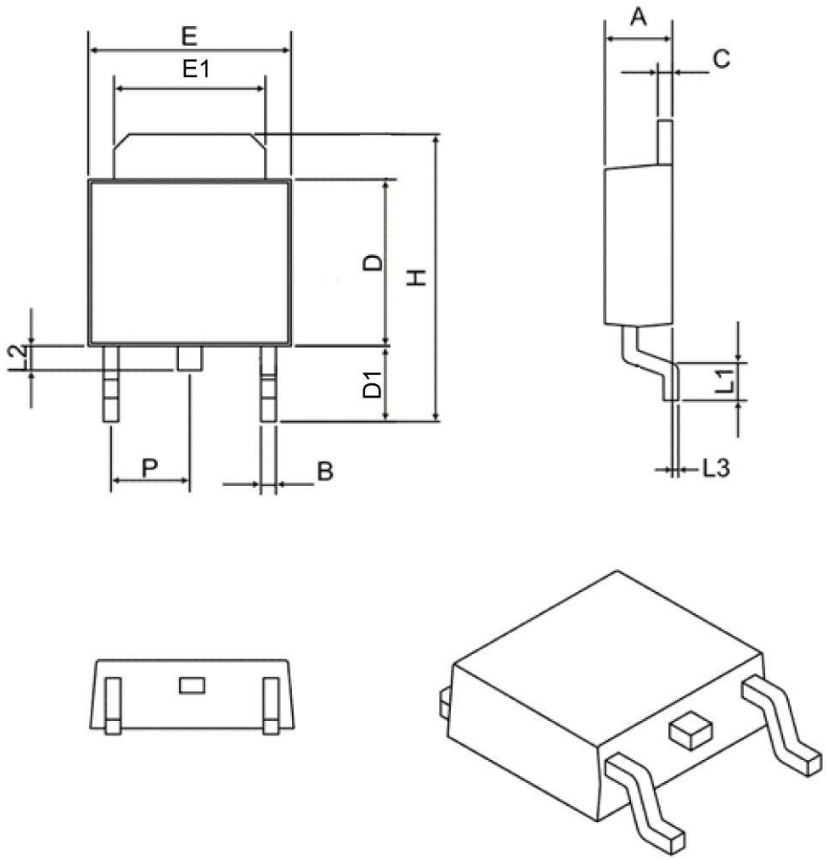

Maximum Forward Biased Safe Operating Area




Normalized Thermal Transient Impedance, Junction-to-Case



## TO252-3L Package Outline




| SYMBOL | MIN | MAX |
|---|---|---|
| **A** | 2.10 | 2.50 |
| **B** | 0.40 | 0.90 |
| **C** | 0.40 | 0.90 |
| **D** | 5.30 | 6.30 |
| **D1** | 2.20 | 2.90 |
| **E** | 6.30 | 6.75 |
| **E1** | 4.80 | 5.50 |
| **L1** | 0.90 | 1.80 |
| **L2** | 0.50 | 1.10 |
| **L3** | 0.00 | 0.20 |
| H | 8.90 | 10.40 |
| P | 2.30 BSC | |