

## General Description

The MY3N10A is the high cell density trench N-CH MOSFET, which provides excellent  $R_{DS(ON)}$  and efficiency for most of the small power switching and load switch applications.

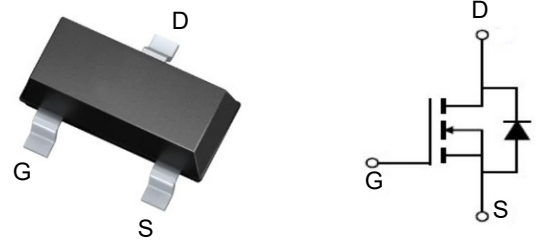


## Features

|                                  |     |            |
|----------------------------------|-----|------------|
| $V_{DSS}$                        | 100 | V          |
| $I_D$                            | 2.3 | A          |
| $R_{DS(ON)}$ (at $V_{GS}=10V$ )  | 200 | m $\Omega$ |
| $R_{DS(ON)}$ (at $V_{GS}=4.5V$ ) | 230 | m $\Omega$ |

## Application

- DC-DC Converters
- Power management functions



## Package Marking and Ordering Information

| Product ID | Pack   | Marking | Qty(PCS) |
|------------|--------|---------|----------|
| MY3N10A    | SOT-23 | MY3N10A | 3000     |

## Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                                           | Symbol          | Limit    | Unit                        |
|-----------------------------------------------------|-----------------|----------|-----------------------------|
| Drain-source Voltage                                | $V_{DS}$        | 100      | V                           |
| Gate-source Voltage                                 | $V_{GS}$        | $\pm 20$ | V                           |
| Drain Current                                       | $I_D$           | 2.3      | A                           |
| Pulsed Drain Current <sup>A</sup>                   | $I_{DM}$        | 1.2      | A                           |
| Total Power Dissipation @ $T_C=25^{\circ}\text{C}$  | $P_D$           | 1        | W                           |
| Thermal Resistance Junction-to-Ambient <sup>B</sup> | $R_{\theta JA}$ | 125      | $^{\circ}\text{C}/\text{W}$ |
| Junction and Storage Temperature Range              | $T_J, T_{STG}$  | -55~+150 | $^{\circ}\text{C}$          |

**Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted)**

| Parameter                                     | Symbol        | Test Condition                                                                  | Min. | Typ. | Max.      | Unit          |
|-----------------------------------------------|---------------|---------------------------------------------------------------------------------|------|------|-----------|---------------|
| Static Characteristics                        |               |                                                                                 |      |      |           |               |
| Drain-Source Breakdown Voltage                | $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$                                     | 100  | -    | -         | V             |
| Gate Leakage Current                          | $I_{GSS}$     | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$                                   | -    | -    | $\pm 100$ | nA            |
| Drain Cut-off Current                         | $I_{DSS}$     | $V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$                                      | -    | -    | 1         | $\mu\text{A}$ |
| Gate Threshold Voltage                        | $V_{GS(th)}$  | $V_{GS} = V_{DS}, I_D = 250\mu\text{A}$                                         | 1.1  | 1.5  | 2.5       | V             |
| Drain-Source on-state Resistance <sup>3</sup> | $R_{DS(on)}$  | $V_{GS} = 10\text{V}, I_D = 2\text{A}$                                          | -    | 200  | 280       | m $\Omega$    |
|                                               |               | $V_{GS} = 4.5\text{V}, I_D = 1.5\text{A}$                                       | -    | 230  | 310       |               |
| Dynamic Characteristics <sup>4</sup>          |               |                                                                                 |      |      |           |               |
| Input Capacitance                             | $C_{iss}$     | $V_{GS} = 0\text{V}, V_{DS} = 50\text{V},$<br>$f = 1\text{MHz}$                 | -    | 440  | -         | pF            |
| Output Capacitance                            | $C_{oss}$     |                                                                                 | -    | 14   | -         |               |
| Reverse Transfer Capacitance                  | $C_{rss}$     |                                                                                 | -    | 10   | -         |               |
| Switching Characteristics <sup>4</sup>        |               |                                                                                 |      |      |           |               |
| Total gate charge                             | $Q_g$         | $V_{GS} = 10\text{V}, V_{DS} = 50\text{V},$<br>$I_D = 2\text{A}$                | -    | 5.3  | -         | nC            |
| Gate-source charge                            | $Q_{gs}$      |                                                                                 | -    | 1.4  | -         |               |
| Gate-drain charge                             | $Q_{gd}$      |                                                                                 | -    | 1.8  | -         |               |
| Turn-on Time                                  | $t_{d(on)}$   | $V_{GS} = 10\text{V}, V_{DD} = 50\text{V},$<br>$R_G = 1\Omega, I_D = 2\text{A}$ | -    | 14   | -         | ns            |
| Rise time                                     | $t_r$         |                                                                                 | -    | 54   | -         |               |
| Turn-off Time                                 | $t_{d(off)}$  |                                                                                 | -    | 18   | -         |               |
| Fall time                                     | $t_f$         |                                                                                 | -    | 11   | -         |               |
| Source-Drain Diode characteristics            |               |                                                                                 |      |      |           |               |
| Body Diode Voltage <sup>3</sup>               | $V_{SD}$      | $I_S = 1\text{A}, V_{GS} = 0\text{V}$                                           | -    | -    | 1.2       | V             |
| Continuous Source Current                     | $I_S$         |                                                                                 | -    | -    | 2         | A             |

**Notes:**

1. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ .
2. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$ , duty cycle $\leq 2\%$
4. This value is guaranteed by design hence it is not included in the production test

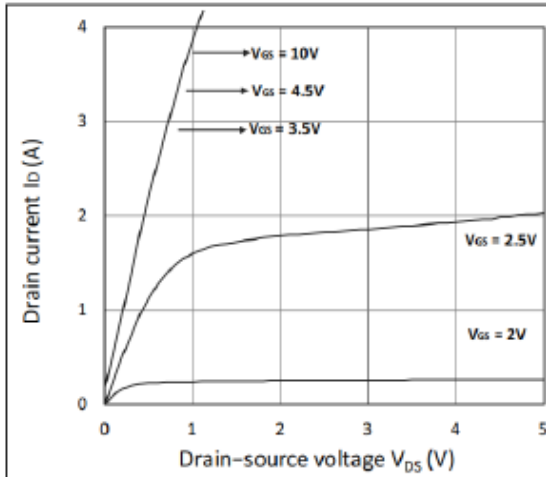


Figure 1. Output Characteristics

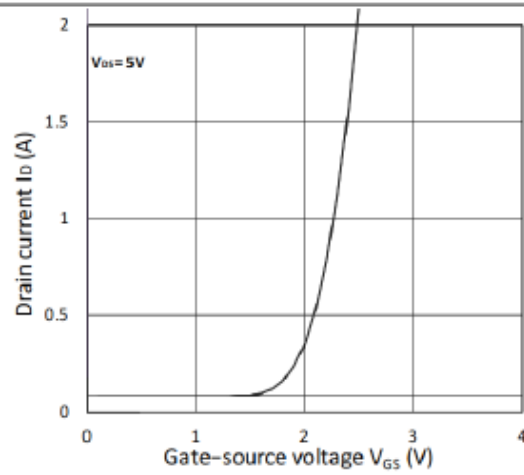


Figure 2. Transfer Characteristics

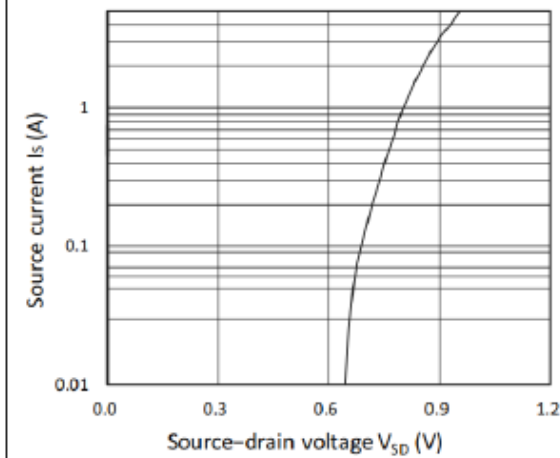


Figure 3. Forward Characteristics of Reverse

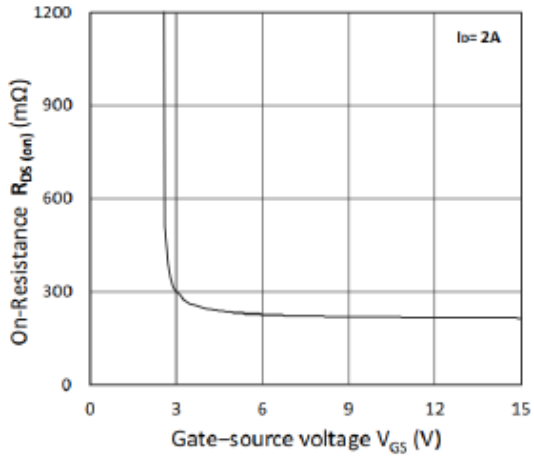


Figure 4.  $R_{DS(on)}$  vs.  $V_{GS}$

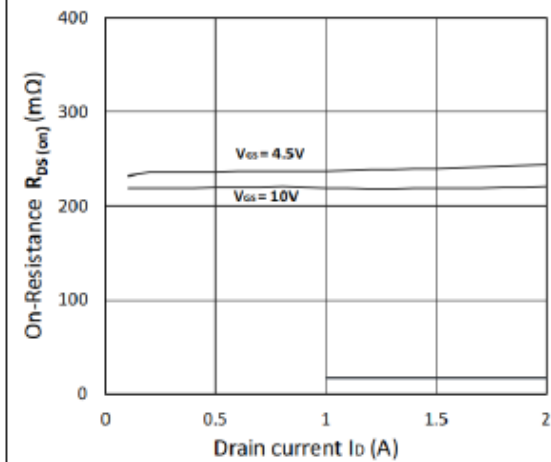


Figure 5.  $R_{DS(on)}$  vs.  $I_D$

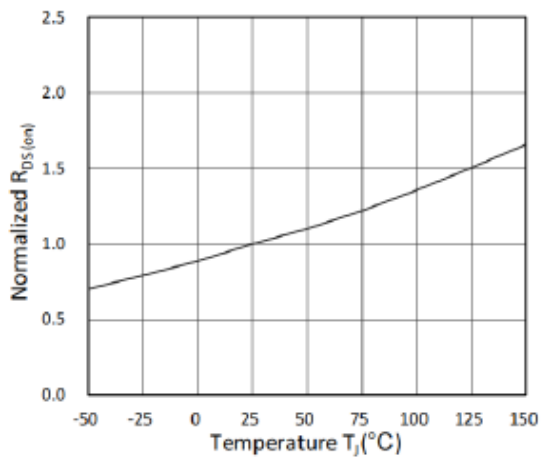


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature

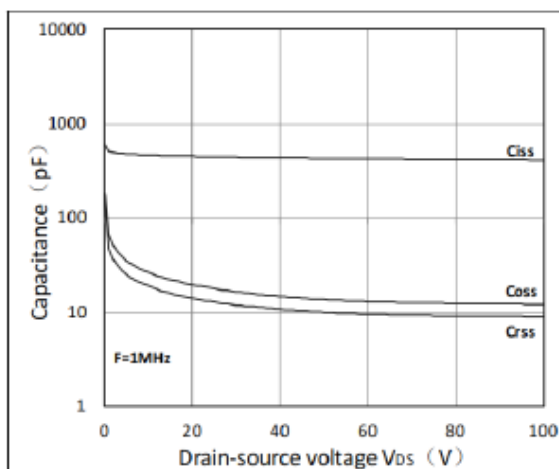


Figure 7. Capacitance Characteristics

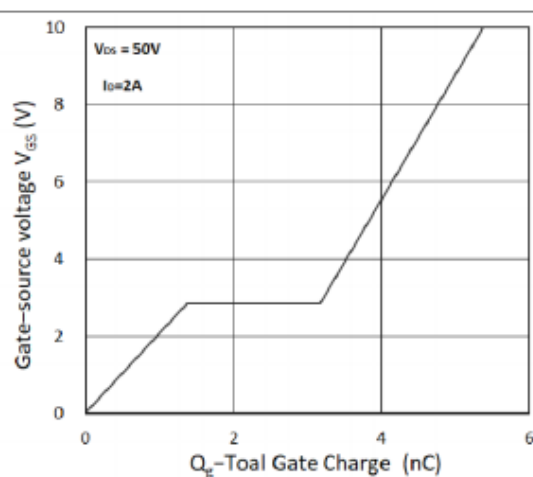
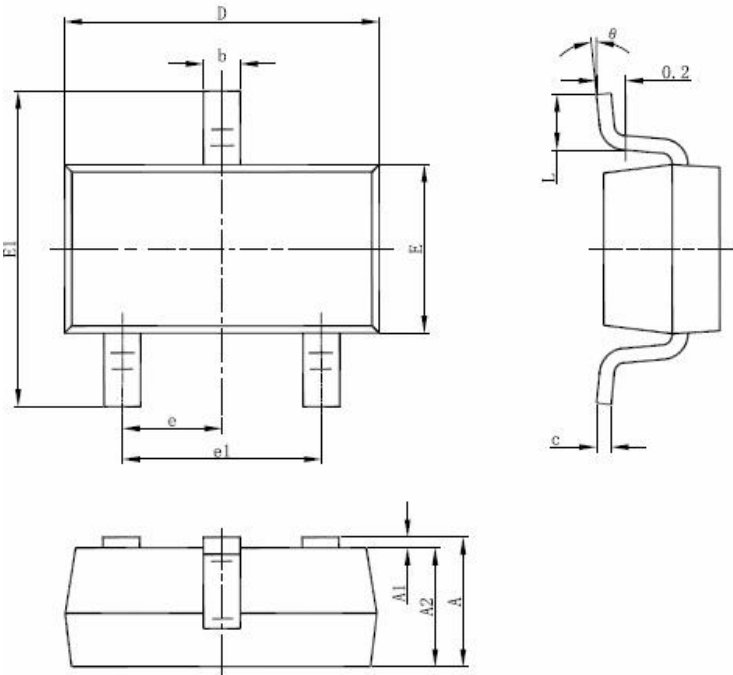


Figure 8. Gate Charge Characteristics

Package Mechanical Data-SOT-23



| Symbol | Dimensions in Millimeters |       | Dimensions in Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1     | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |