

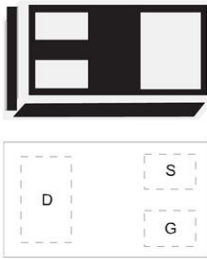
### Features

- Surface Mount Package
- N-Channel Switch with Low  $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- ESD Protected

### Application

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

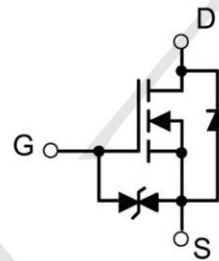
### Package and Pin Configuration



**DFN1006-3L**

Marking: N5 ρ

### Circuit diagram



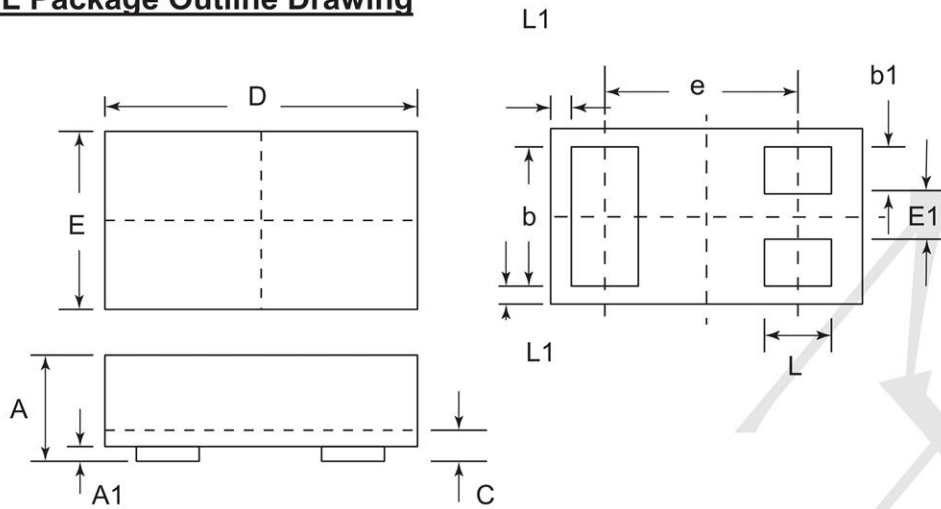
### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter  | Symbol          | Value     | Unit                      |
|--|-----------------|-----------|---------------------------|
| Drain-Source Voltage                                       | $V_{DS}$        | 20        | V                         |
| Gate-Source Voltage  | $V_{GS}$        | $\pm 10$  | V                         |
| Continuous Drain Current                                   | $I_D$           | 0.7       | A                         |
| Pulsed Drain Current ( $t=300\mu\text{s}$ ) <sup>(1)</sup> | $I_{DM}$        | 1.8       | A                         |
| Power Dissipation <sup>(2)</sup>                           | $P_D$           | 100       | mW                        |
| Thermal Resistance from Junction to Ambient                | $R_{\theta JA}$ | 833       | $^\circ\text{C}/\text{W}$ |
| Junction Temperature                                       | $T_J$           | 150       | $^\circ\text{C}$          |
| Storage Temperature  | $T_{STG}$       | -55~ +150 | $^\circ\text{C}$          |

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

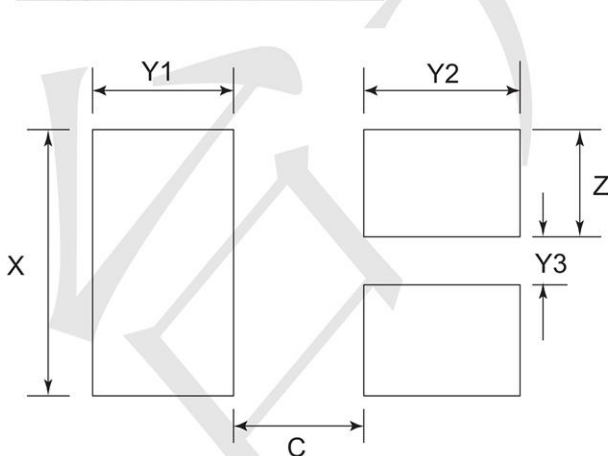
| Parameter                                      | Symbol        | Test Condition  | Min | Type | Max      | Unit       |
|--|---------------|---|-----|------|----------|------------|
| <b>Static Characteristics</b>                  |               |   |     |      |          |            |
| Drain-source breakdown voltage                 | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                   | 20  |      |          | V          |
| Zero gate voltage drain current                | $I_{DSS}$     | $V_{DS} = 20V, V_{GS} = 0V$                                     |     |      | 1        | $\mu A$    |
| Gate-body leakage current                      | $I_{GSS}$     | $V_{GS} = \pm 10V, V_{DS} = 0V$                                 |     |      | $\pm 10$ | $\mu A$    |
| Gate threshold voltage <sup>(3)</sup>          | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                               | 0.5 | 0.75 | 1.1      | V          |
| Drain-source on-resistance <sup>(3)</sup>      | $R_{DS(on)}$  | $V_{GS} = 4.5V, I_D = 500mA$                                    |     | 250  | 400      | m $\Omega$ |
|  |               | $V_{GS} = 2.5V, I_D = 500mA$                                    |     | 300  | 500      |            |
| Forward transconductance                       | $g_{FS}$      | $V_{DS} = 10V, I_D = 500mA$                                     |     |      | 1.2      | S          |
| <b>Dynamic characteristics<sup>(4)</sup></b>   |               |   |     |      |          |            |
| Input Capacitance                              | $C_{iss}$     | $V_{DS} = 16V, V_{GS} = 0V, f = 1MHz$                           |     |      | 120      | pF         |
| Output Capacitance                             | $C_{oss}$     |   |     |      | 20       |            |
| Reverse Transfer Capacitance                   | $C_{rss}$     |   |     |      | 15       |            |
| <b>Switching Characteristics<sup>(4)</sup></b> |               |   |     |      |          |            |
| Turn-on delay time                             | $t_{d(on)}$   | $V_{DD} = 10V, I_D = 500mA,$<br>$V_{GS} = 4.5V, R_G = 10\Omega$ |     | 6.7  |          | ns         |
| Turn-on rise time                              | $t_r$         |   |     | 4.8  |          |            |
| Turn-off delay time                            | $t_{d(off)}$  |   |     | 17.3 |          |            |
| Turn-off fall time                             | $t_f$         |   |     | 7.4  |          |            |
| <b>Source-Drain Diode characteristics</b>      |               |   |     |      |          |            |
| Diode Forward voltage <sup>(3)</sup>           | $V_{DS}$      | $I_S = 0.15A, V_{GS} = 0V$                                      |     |      | 1.2      | V          |

**DFN1006-3L Package Outline Drawing**



| SYM | DIMENSIONS  |      |      |            |       |       |
|-----|-------------|------|------|------------|-------|-------|
|     | MILLIMETERS |      |      | INCHES     |       |       |
|     | MIN         | NOM  | MAX  | MIN        | NOM   | MAX   |
| A   | 0.45        | 0.50 | 0.55 | 0.018      | 0.020 | 0.022 |
| A1  | 0.00        | 0.02 | 0.05 | 0.000      | 0.001 | 0.002 |
| b   | 0.45        | 0.50 | 0.55 | 0.018      | 0.020 | 0.022 |
| b1  | 0.10        | 0.15 | 0.20 | 0.004      | 0.006 | 0.008 |
| C   | 0.12        | 0.15 | 0.18 | 0.005      | 0.006 | 0.007 |
| D   | 0.95        | 1.00 | 1.05 | 0.037      | 0.039 | 0.041 |
| e   | 0.65 BSC    |      |      | 0.026 BSC  |       |       |
| E   | 0.55        | 0.60 | 0.65 | 0.022      | 0.024 | 0.026 |
| E1  | 0.15        | 0.20 | 0.25 | 0.006      | 0.008 | 0.010 |
| L   | 0.20        | 0.25 | 0.30 | 0.008      | 0.010 | 0.012 |
| L1  | 0.05 REF    |      |      | 0.0002 REF |       |       |

**Suggested Land Pattern**



| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| C   | 0.25        | 0.010  |
| X   | 0.65        | 0.024  |
| Y1  | 0.50        | 0.020  |
| Y2  | 0.50        | 0.020  |
| Y3  | 0.25        | 0.010  |
| Z   | 0.20        | 0.008  |