

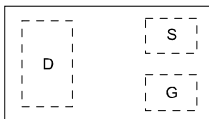
### Product Summary

- $V_{DS}$  60V
- $I_D$  340mA
- $R_{DS(ON)}$ ( at  $V_{GS}=10V$ ) <2.5ohm
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) <3.0ohm

### Application

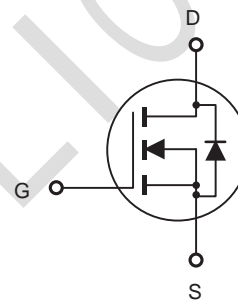
- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

### Package and Pin Configuration



DFN1006-3L

### Circuit diagram



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

| Parameter                                   | Symbol          | Value     | Unit          |
|---|-----------------|-----------|---------------|
| Drain-Source Voltage                        | $V_{DS}$        | 60        | V             |
| Gate-Source Voltage                         | $V_{GS}$        | $\pm 20$  | V             |
| Continuous Drain Current                    | $I_D$           | 0.32      | A             |
| Pulsed Drain Current                        | $I_{DM}$        | 1         | A             |
| Power Dissipation                           | $P_D$           | 0.5       | W             |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 258       | $^{\circ}C/W$ |
| Junction Temperature                        | $T_J$           | 150       | $^{\circ}C$   |
| Storage Temperature                         | $T_{STG}$       | -55~ +150 | $^{\circ}C$   |

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

| Parameter                             | Symbol       | Conditions                     | Min | Typ | Max       | Units    |
|---------------------------------------|--------------|--------------------------------|-----|-----|-----------|----------|
| <b>Static Parameter</b>               |              |                                |     |     |           |          |
| Drain-Source Breakdown Voltage        | $BV_{DSS}$   | $V_{GS}=0V, I_D=250\mu A$      | 60  |     |           | V        |
| Zero Gate Voltage Drain Current       | $I_{DSS}$    | $V_{DS}=60V, V_{GS}=0V$        |     |     | 1         | $\mu A$  |
| Gate-Body Leakage Current             | $I_{GSS1}$   | $V_{GS}= \pm 20V, V_{DS}=0V$   |     |     | $\pm 100$ | nA       |
|                                       | $I_{GSS2}$   | $V_{GS}= \pm 10V, V_{DS}=0V$   |     |     | $\pm 50$  | nA       |
| Gate Threshold Voltage                | $V_{GS(th)}$ | $V_{DS}= V_{GS}, I_D=250\mu A$ | 1   | 1.5 | 2.5       | V        |
| Static Drain-Source On-Resistance     | $R_{DS(on)}$ | $V_{GS}= 10V, I_D=300mA$       |     | 1.2 | 2.5       | $\Omega$ |
|                                       |              | $V_{GS}= 4.5V, I_D=200mA$      |     | 1.3 | 3.0       |          |
| Diode Forward Voltage                 | $V_{SD}$     | $I_S=300mA, V_{GS}=0V$         |     |     | 1.2       | V        |
| Maximum Body-Diode Continuous Current | $I_S$        |                                |     |     | 340       | mA       |

**Dynamic Parameters**

|                              |           |                                 |  |     |  |         |
|------------------------------|-----------|---------------------------------|--|-----|--|---------|
| Input Capacitance            | $C_{iss}$ | $V_{DS}=30V, V_{GS}=0V, f=1MHz$ |  | 16  |  | $\mu F$ |
| Output Capacitance           | $C_{oss}$ |                                 |  | 10  |  |         |
| Reverse Transfer Capacitance | $C_{rss}$ |                                 |  | 5.5 |  |         |

**Switching Parameters**

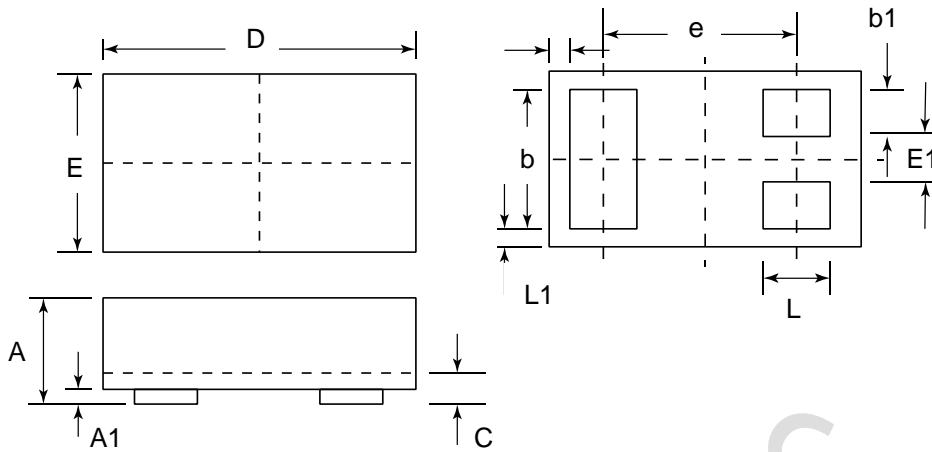
|                       |              |  |  |     |     |    |
|-----------------------|--------------|--|--|-----|-----|----|
| Total Gate Charge     | $Q_g$        | $V_{GS}=10V, V_{DS}=30V, I_D=0.3A$                   |  | 1.7 | 2.4 | nC |
| Turn-on Delay Time    | $t_{D(on)}$  | $V_{GS}=10V, V_{DD}=30V, I_D=300mA, R_{GEN}=6\Omega$ |  | 5   |     | ns |
| Turn-off Delay Time   | $t_{D(off)}$ |  |  | 17  |     |    |
| Reverse recovery Time | $t_{rr}$     | $V_{GS}=0V, I_S=300mA, V_R=25V, di_S/dt=-100A/\mu s$ |  | 30  |     | ns |

A. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

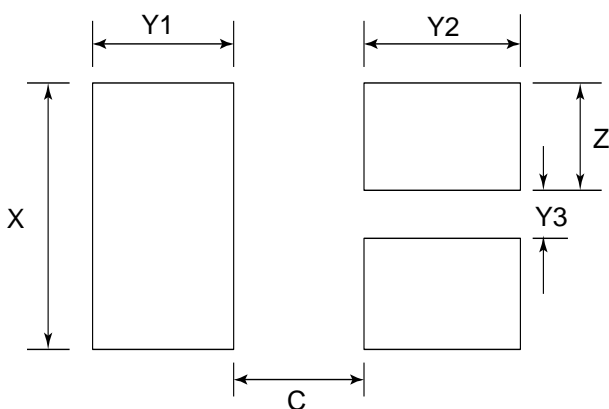
**DFN1006 3L Package Outline Drawing**

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| 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  |

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