

**Features**

- TrenchFET Power MOSFET
- Epoxy meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)

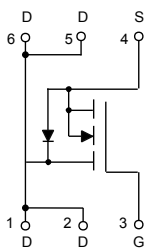
**Maximum Ratings**

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 167°C/W Junction to Ambient<sup>(Note 2)</sup>

| Parameter                                   | Symbol          | Rating | Unit |
|---|-----------------|--------|------|
| Drain -Source Voltage                       | V <sub>DS</sub> | 12     | V    |
| Gate-Source Voltage                         | V <sub>GS</sub> | ±8     | V    |
| Drain Current                               | I <sub>D</sub>  | 15     | A    |
| Drain Current-Pulse <sup>(Note 3)</sup>     | I <sub>DM</sub> | 75     | A    |
| Total Power Dissipation <sup>(Note 2)</sup> | P <sub>D</sub>  | 0.7    | W    |

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

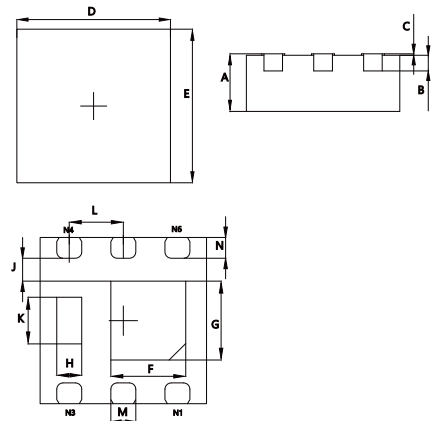
**Internal Structure**



Marking: N2014

**N-Channel MOSFET**

**DFN2020-6J**



| DIM | INCHES |       | MM    |       | NOTE |
|-----|--------|-------|-------|-------|------|
|     | MIN    | MAX   | MIN   | MAX   |      |
| A   | 0.028  | 0.032 | 0.700 | 0.800 |      |
| B   | 0.008  |       | 0.203 |       | TYP. |
| C   | 0.000  | 0.002 | 0.000 | 0.050 |      |
| D   | 0.076  | 0.082 | 1.924 | 2.076 |      |
| E   | 0.076  | 0.082 | 1.924 | 2.076 |      |
| F   | 0.031  | 0.039 | 0.800 | 1.000 |      |
| G   | 0.033  | 0.041 | 0.850 | 1.050 |      |
| H   | 0.008  | 0.016 | 0.200 | 0.400 |      |
| J   | 0.008  | ----- | 0.200 | ----- |      |
| K   | 0.018  | 0.026 | 0.460 | 0.660 |      |
| L   | 0.026  |       | 0.650 |       | TYP. |
| M   | 0.010  | 0.014 | 0.250 | 0.350 |      |
| N   | 0.007  | 0.013 | 0.174 | 0.326 |      |

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

| Parameter   | Symbol        | Test conditions                                  | Min  | Typ  | Max       | Unit       |
|---|---------------|--|------|------|-----------|------------|
| <b>Static Characteristics</b>                       |               |  |      |      |           |            |
| Drain-Source Breakdown Voltage                      | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                        | 12   |      |           | V          |
| Gate-Threshold Voltage <sup>(Note 4)</sup>          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                    | 0.50 | 0.7  | 1.1       | V          |
| Gate-Body Leakage Current                           | $I_{GSS}$     | $V_{GS} = \pm 8V, V_{DS} = 0V$                   |      |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current                     | $I_{DSS}$     | $V_{DS} = 12V, V_{GS} = 0V$                      |      |      | 1         | $\mu A$    |
| Drain-Source On-Resistance                          | $R_{DS(on)}$  | $V_{GS}=8V, I_D=5A$                              |      | 5    | 8         | m $\Omega$ |
|   |               | $V_{GS}=4.5V, I_D=5A$                            |      | 7    | 9         |            |
|   |               | $V_{GS}=2.5V, I_D=5A$                            |      | 9    | 11        |            |
| Forward Transconductance <sup>(Note 4)</sup>        | $g_{FS}$      | $V_{DS}=6V, I_D=5A$                              |      | 40   |           | S          |
| Diode Forward Voltage                               | $V_{SD}$      | $V_{GS}=0V, I_S=10A$                             |      |      | 1.2       | V          |
| <b>Dynamic Characteristics<sup>(Note 5)</sup></b>   |               |  |      |      |           |            |
| Input Capacitance                                   | $C_{iss}$     | $V_{DS}=15V, V_{GS}=0V, f=1MHz$                  |      | 1300 |           | pF         |
| Output Capacitance                                  | $C_{oss}$     |  |      | 210  |           |            |
| Reverse Transfer Capacitance                        | $C_{rss}$     |  |      | 140  |           |            |
| Gate Resistance                                     | $R_g$         | $f=1MHz$   |      | 11   |           | $\Omega$   |
| <b>Switching Characteristics<sup>(Note 5)</sup></b> |               |  |      |      |           |            |
| Turn-On Delay Time                                  | $t_{d(on)}$   | $V_{DD}=15V, V_{GS}=10V, I_D=15A, R_G=3.3\Omega$ |      | 11   |           | ns         |
| Turn-On Rise Time                                   | $t_r$         |  |      | 30   |           |            |
| Turn-Off Delay Time                                 | $t_{d(off)}$  |  |      | 24   |           |            |
| Turn-Off Fall Time                                  | $t_f$         |  |      | 6    |           |            |
| Total Gate Charge                                   | $Q_g$         | $V_{DS}=15V, V_{GS}=10V, I_D=30A$                |      | 23   |           | nC         |
| Gate-Source Charge                                  | $Q_{gs}$      |  |      | 3.3  |           |            |
| Gate-Drain Charge                                   | $Q_{gd}$      |  |      | 4.8  |           |            |

Note:

- Surface Mounted On FR4 Board Using The Minimum Pad Size, 1oz Copper.
- Surface Mounted On FR4 Board Using 1 Square Inch Pad Size, 1oz Copper.
- Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ .
- These Parameters Have No Way To Verify.