

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

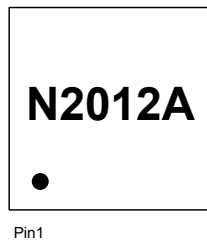
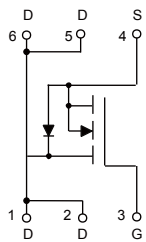
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 167°C/W Junction to Ambient^(Note 2)

| Parameter | Symbol | Rating | Unit |
|---|----------|--------|------|
| Drain -Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ±10 | V |
| Drain Current | I_D | 12 | A |
| Drain Current-Pulse ^(Note 3) | I_{DM} | 40 | A |

Note:

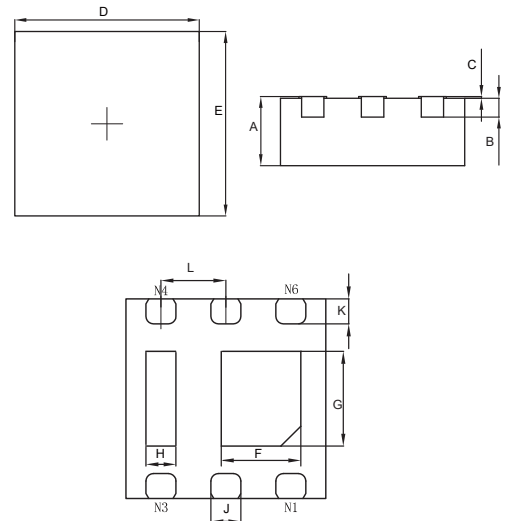
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Internal Structure and Marking Code



N-Channel MOSFET

DFN2020-6JA



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|-------|-------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.028 | 0.032 | 0.700 | 0.800 | |
| B | 0.006 | | 0.150 | | REF. |
| C | 0.000 | 0.002 | 0.000 | 0.050 | |
| D | 0.077 | 0.081 | 1.950 | 2.050 | |
| E | 0.077 | 0.081 | 1.950 | 2.050 | |
| F | 0.024 | 0.031 | 0.610 | 0.810 | |
| G | 0.028 | 0.036 | 0.710 | 0.910 | |
| H | 0.008 | 0.016 | 0.200 | 0.400 | |
| J | 0.010 | 0.014 | 0.250 | 0.350 | |
| K | 0.008 | 0.012 | 0.200 | 0.300 | |
| L | 0.026 | | 0.650 | | TYP. |

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

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---------------|--|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Gate-Threshold Voltage ^(Note 4) | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.35 | 0.7 | 1.0 | V |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS} = \pm 10V, V_{DS} = 0V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 20V, V_{GS} = 0V$ | | | 1 | μA |
| Drain-Source On-Resistance ^(Note 4) | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=5A$ | | 9.5 | 15 | m Ω |
| | | $V_{GS}=2.5V, I_D=5A$ | | 12.5 | 18 | |
| | | $V_{GS}=1.8V, I_D=5A$ | | 18 | 30 | |
| Forward Transconductance ^(Note 4) | g_{FS} | $V_{DS}=4V, I_D=9.7A$ | 20 | | | S |
| Diode Forward Voltage ^(Note 4) | V_{SD} | $V_{GS}=0V, I_S=10A$ | | | 1.2 | V |
| Dynamic Characteristics^(Note 5) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=4V, V_{GS}=0V, f=1MHz$ | | 1800 | | pF |
| Output Capacitance | C_{oss} | | | 650 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 450 | | |
| Gate Resistance | R_g | $f=1MHz$ | | 2.5 | | Ω |
| Switching Characteristics^(Note 5) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=4V, V_{GEN}=4.5V, R_L=0.4\Omega, I_D=10A, R_G=1\Omega$ | | 12 | 20 | ns |
| Turn-On Rise Time | t_r | | | 10 | 15 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 65 | 100 | |
| Turn-Off Fall Time | t_f | | | 20 | 30 | |
| Total Gate Charge | Q_g | $V_{DS}=4V, V_{GS}=5V, I_D=10A$ | | | 32 | nC |
| Gate-Source Charge | Q_{gs} | | | 2.5 | | |
| Gate-Drain Charge | Q_{gd} | | | 6.5 | | |

Note:

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

Curve Characteristics

Fig. 1 - Output Characteristics

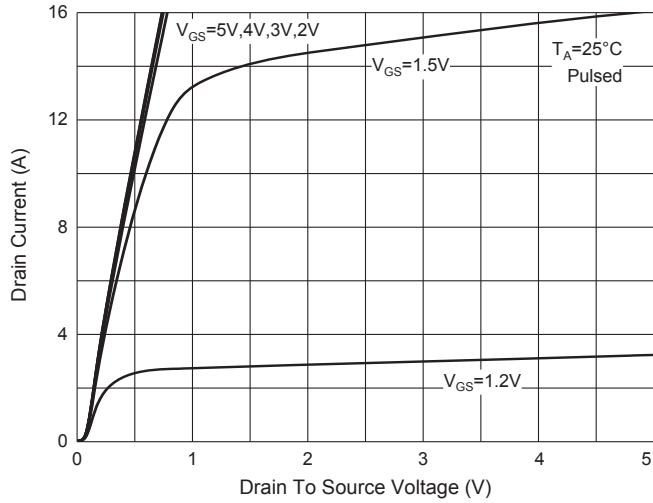


Fig. 2 - Transfer Characteristics

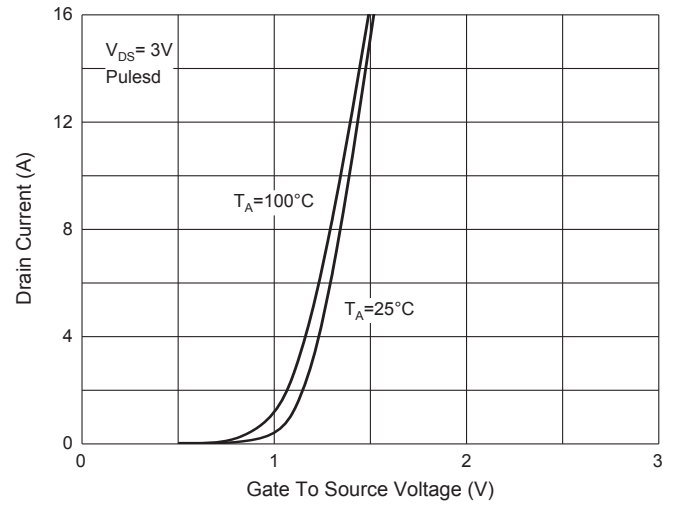


Fig. 3 - $R_{DS(ON)} - I_D$

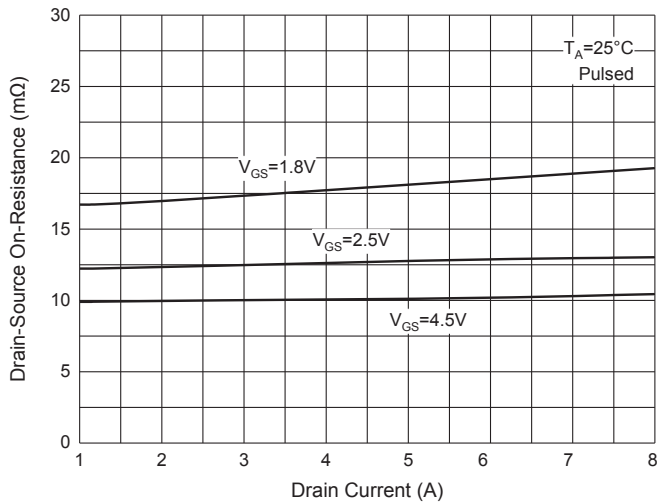


Fig. 4 - $R_{DS(ON)} - V_{GS}$

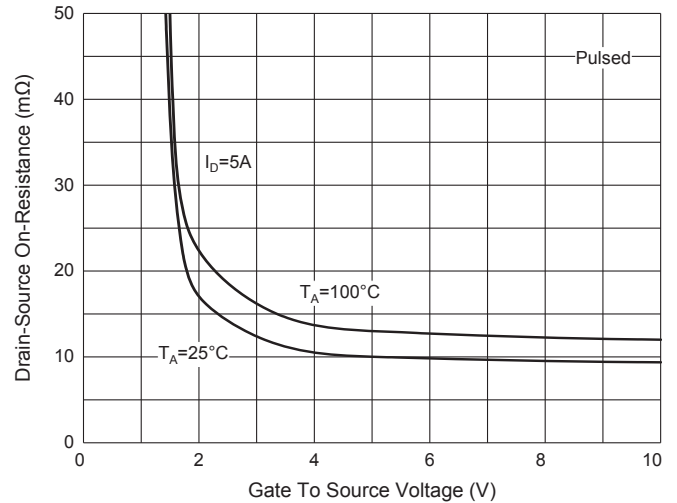


Fig. 5 - $I_S - V_{SD}$

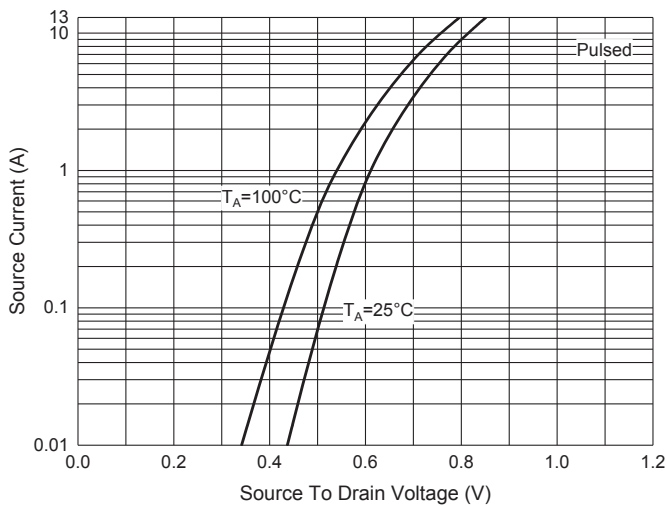
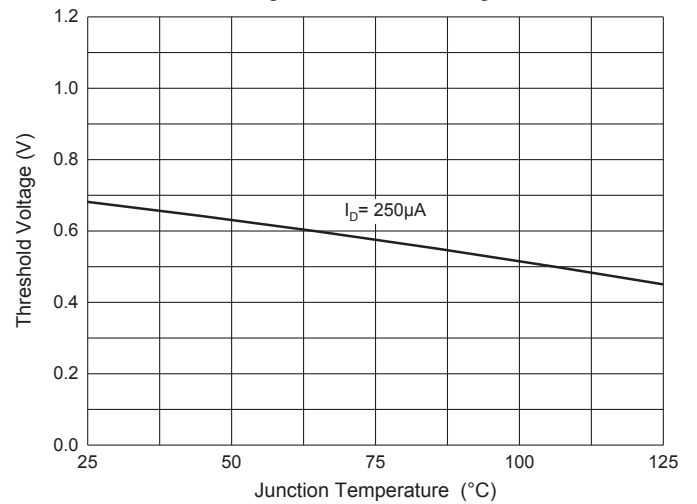


Fig. 6 - Threshold Voltage



Ordering Information

| Device | Packing |
|----------------|----------------------|
| Part Number-TP | Tape&Reel:3Kpcs/Reel |

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