## Features

- AEC-Q101 Qualified
- Trench FET Power MOSFET
- Halogen Free (Note1)
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

# N-Channel MOSFET

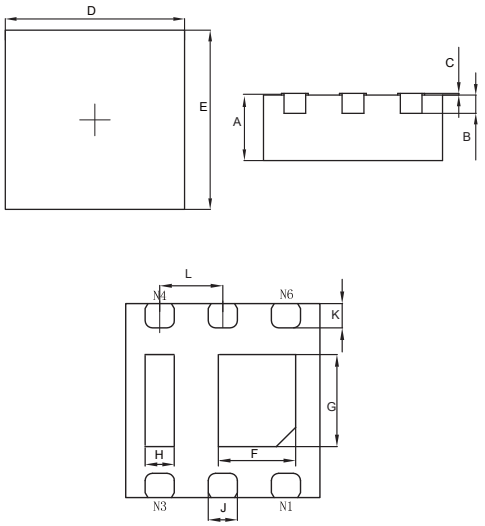
## Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 167°C/W Junction to Ambient (Note2)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 12 | V |
| Gate-Source Volltage | $V_{GS}$ | ±8 | V |
| Continuous Drain Current | $I_D$ | 15 | A |
| Pulsed Drain Current (Note3) | $I_{DM}$ | 60 | A |
| Single Pulsed Avalanche Energy(L=0.5mH) | $E_{AS}$ | 25 | mJ |

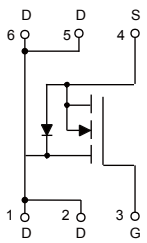
Notes:
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Surface Mounted On FR4 Board Using The Minimum Pad Size,1oz Copper.
3. Surface Mounted On FR4 Board Using 1 Square Inch Pad Size, 1oz Copper.

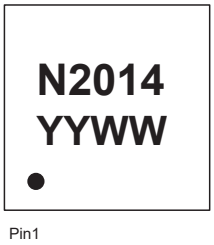
## DFN2020-6LE




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | 0.030 | 0.033 | 0.750 | 0.850 | |
| B | 0.008 | | 0.200 | | REF. |
| C | 0.000 | 0.002 | 0.000 | 0.050 | |
| D | 0.075 | 0.083 | 1.900 | 2.100 | |
| E | 0.075 | 0.083 | 1.900 | 2.100 | |
| 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. |

## Internal Structure and Marking Code




YYWW: 4 codes in total
YY is the year
WW is the cycle

## ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 12 | | | V |
| Gate-Threshold Voltage(Note 4) | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 0.40 | 0.7 | 1.1 | V |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$ =± 8V, $V_{DS}$ =0V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =12V, $V_{GS}$ =0V | | | 1 | μA |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=8V, $I_D$=5A | | 5 | 8 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=5A | | 7 | 9 | |
| | | $V_{GS}$=2.5V, $I_D$=5A | | 9 | 11 | |
| Forward Transconductance(Note 4) | $g_{FS}$ | $V_{DS}$=6V, $I_D$=5A | | 40 | | S |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=10A | | | 1.2 | V |
| **Dynamic Characteristics(Note 5)** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=10V,$V_{GS}$=0V, f=1MHz | | 1791 | | pF |
| Output Capacitance | $C_{oss}$ | | | 229 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 197 | | |
| Gate Resistance | $R_g$ | f=1MHz | | 11 | | Ω |
| **Switching Characteristics(Note 5)** | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=10V,$V_{GEN}$=8V, $I_D$=10A,$R_G$=4.5Ω,$R_L$=1Ω | | 6.5 | | ns |
| Turn-On Rise Time | $t_r$ | | | 42 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 56 | | |
| Turn-Off Fall Time | $t_f$ | | | 32 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=10V,Vgs=8V,$I_D$=10A | | 48 | | nC |
| Gate-Source Chage | $Q_{gs}$ | | | 5.2 | | |
| Gage-Drain Charge | $Q_{gd}$ | | | 4.6 | | |

Notes:

4. Pulse Test: Pulse Width≤300μs,Duty Cycle≤2%.

5. These Parameters Have No Way To Verify.

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

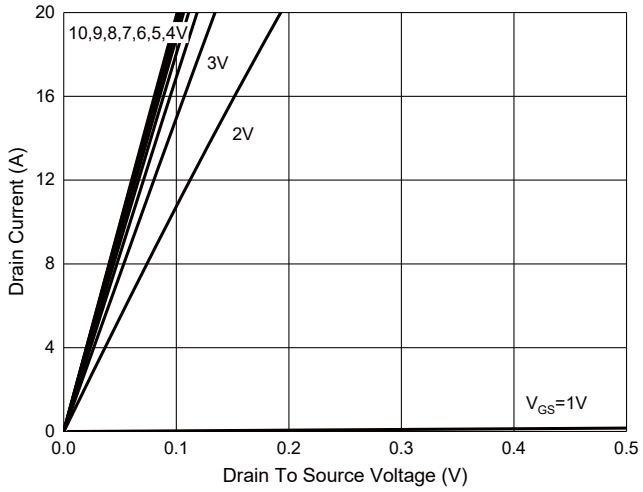



Fig. 2 - $I_S$—$V_{SD}$

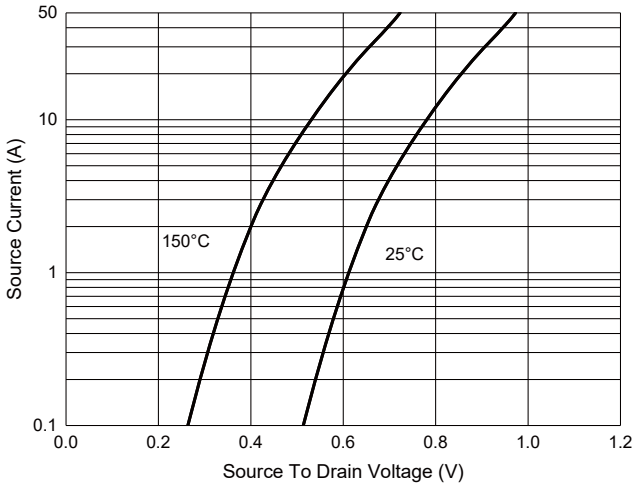



Fig. 3 - $R_{DS(ON)}$—$I_D$

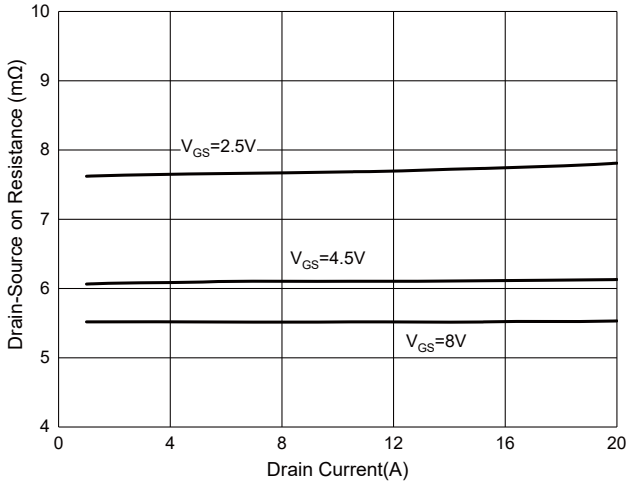



Fig. 4 - Normalized On Resistance Characteristics

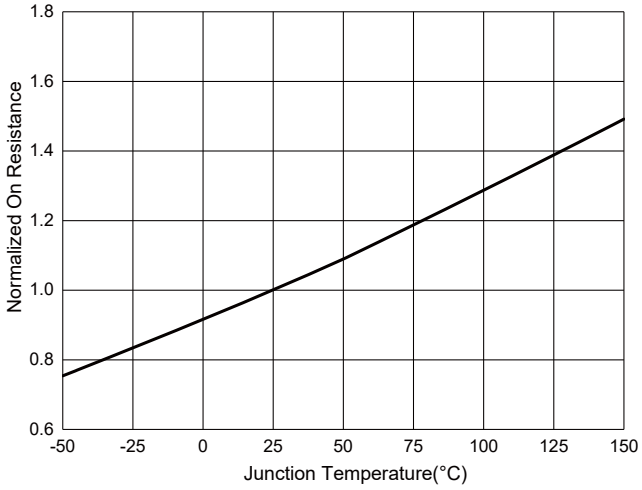



Fig. 5 - Capacitance Characteristics

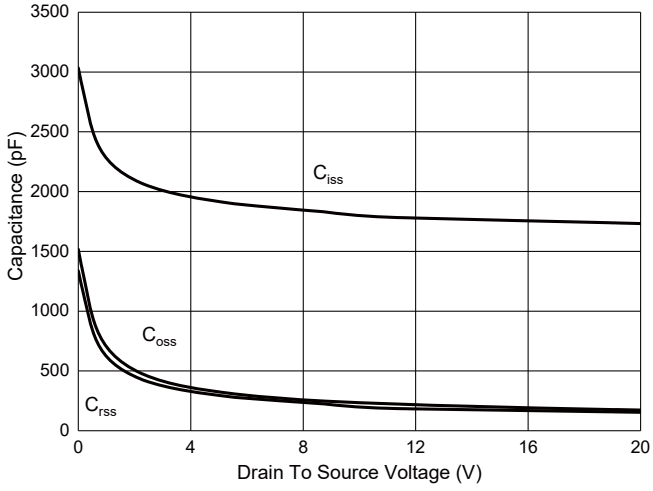
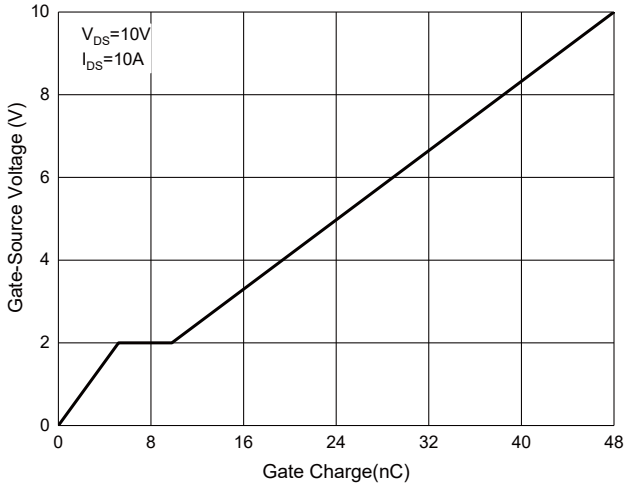
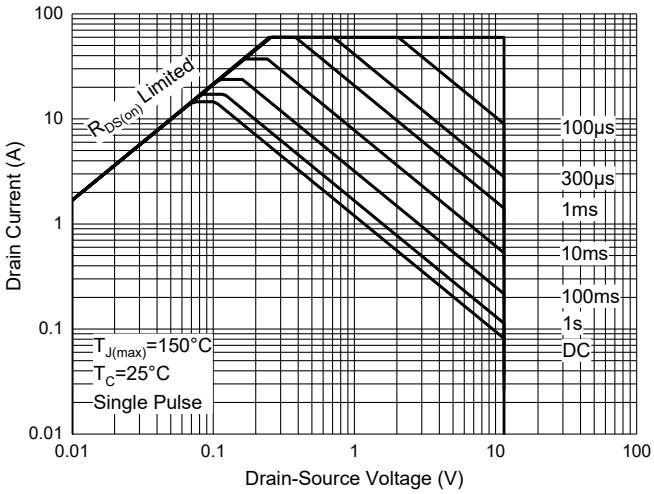



Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Safe Operation Area



## Ordering Information

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