## Features

- Advanced Trench MOSFET Process Technology
- Ultra Low On-Resistance with Low Gate Charge
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

# P-CHANNEL MOSFET

## Maximum Ratings

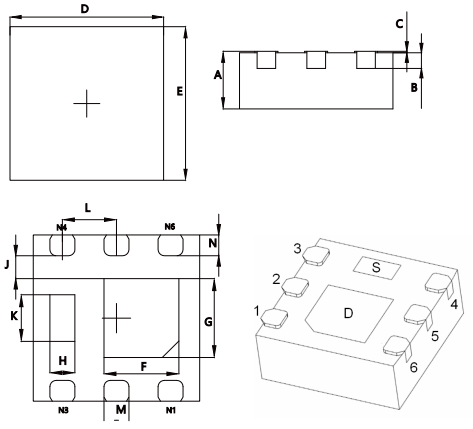
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient(Note 1)
- Thermal Resistance: 6.9°C/W Junction to Case(Note 1)

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -12 | V |
| Gate-Source Volltage | | $V_{GS}$ | ±8 | V |
| Continuous Drain Current | | $I_D$ | -16 | A |
| Pulsed Drain Current(Note 2) | | $I_{DM}$ | -65 | A |
| Total Power Dissipation | $T_A$=25°C(Note 3) | $P_D$ | 2.5 | W |
| | $T_C$=25°C(Note 4) | | 18 | |

Note 1. Surface Mounted on FR4 Board, t<10 sec.

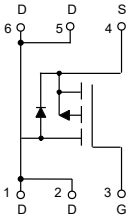
2. Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature.
3. This Test is Performed With No Heat Sink at $T_A$=25°C.
4. This Test is Performed With Infinite Heat Sink at $T_C$=25°C.

## DFN2020-6J




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| 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 | |

## Internal Structure




**Marking:1216**

## Electrical Characteristics @ 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, $I_D$=-250μA | -12 | | | V |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$ =±8V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-12V, $V_{GS}$=0V | | | -1 | μA |
| Gate-Threshold Voltage(Note 5) | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -0.4 | -0.7 | -1 | V |
| Drain-Source On-Resistance(Note 5) | $R_{DS(on)}$ | $V_{GS}$=-4.5V, $I_D$=-6.7A | | | 21 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-6.2A | | | 27 | |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=-8A | | | -1.2 | V |
| Forward tranconductance(Note 5) | $g_{FS}$ | $V_{DS}$=-10V, $I_D$=-6.7A | | 40 | | S |
| **Dynamic Characteristics(Note 6)** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-10V,$V_{GS}$=0V,f=1MHz | | 2700 | | pF |
| Output Capacitance | $C_{oss}$ | | | 680 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 590 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-6V,$V_{GS}$=-8V,$I_D$=-10A | | 60 | 100 | nC |
| | | $V_{DS}$=-6V,$V_{GS}$=-4.5V,$I_D$=-10A | | 35 | 48 | |
| Gate-Source Charge | $Q_{gs}$ | | | 5 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 10 | | |

Note 5. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.

6. Guaranteed by Design, Not Subject to Production Testing.

## Curve Characteristics

Fig. 1 - Output Characteristics

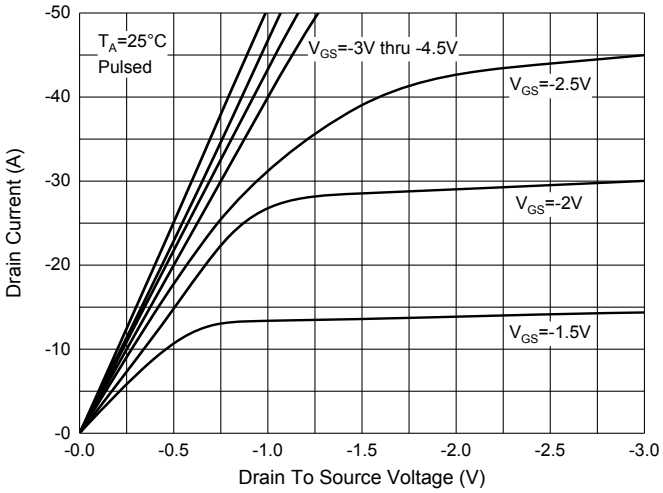



Fig. 2 - Capacitance Characteristics

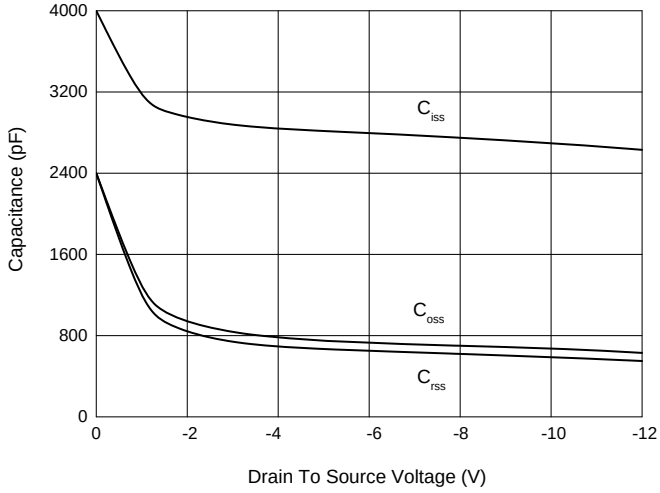



Fig. 3 - $R_{DS(ON)}$—$I_D$

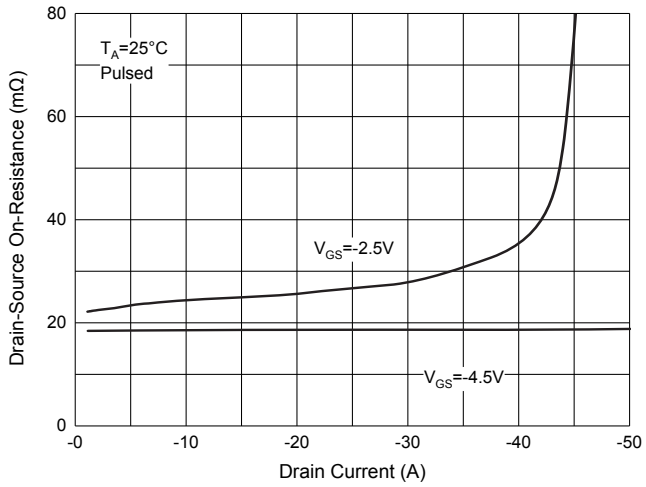



Fig. 4 - $R_{DS(ON)}$—$V_{GS}$

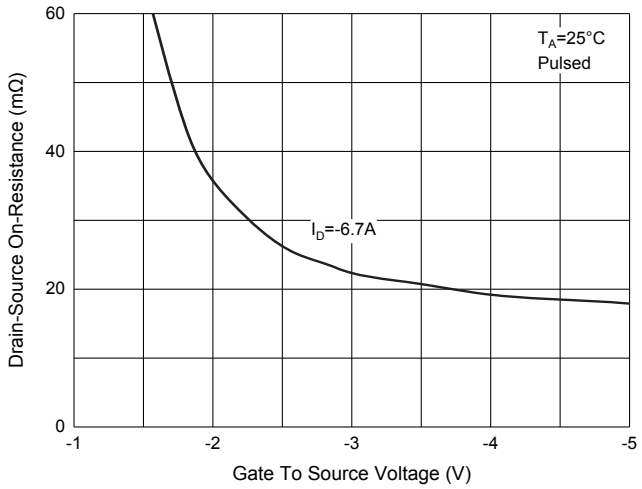



Fig. 5 - $I_S$—$V_{SD}$

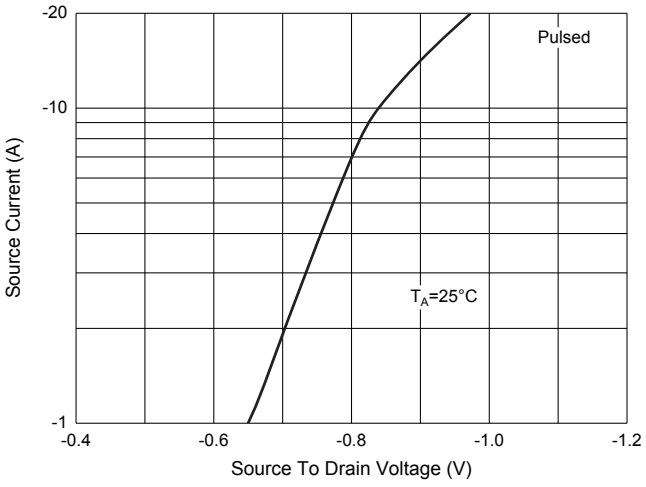
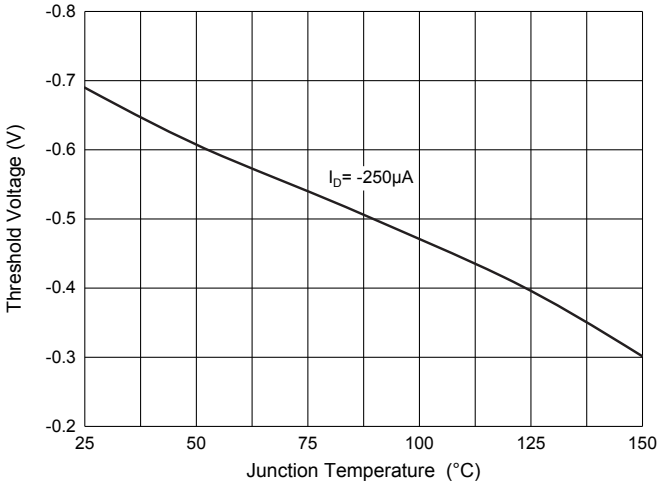



Fig. 6 - Threshold Voltage



## Ordering Information

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

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF