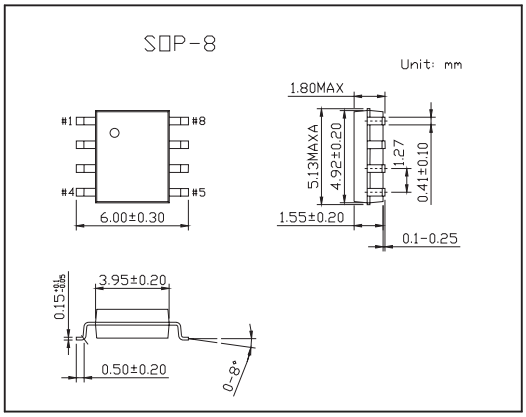
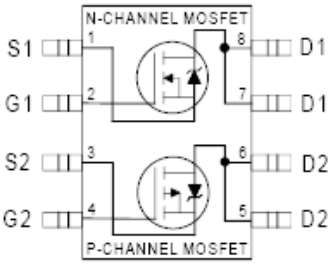
# HEXFET®Power MOSFET

# KRF7317




## ■ Features

- Generation V Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Fully Avalanche Rated




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | N-Channel | P-Channel | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | -20 | V |
| Continuous Drain Current Ta = 25℃ | $I_D$ | 6.6 | -5.3 | A |
| Continuous Drain Current Ta = 70℃ | $I_D$ | 5.3 | -4.3 | |
| Pulsed Drain Current | $I_{DM}$ | 26 | -21 | |
| Continuous Source Current (Diode Conduction) | $I_S$ | 2.5 | -2.5 | |
| Power Dissipation @Ta= 25℃ *2 | $P_D$ | 2.0 | | W |
| Power Dissipation @Ta= 70℃ *2 | | 1.3 | | |
| Single Pulse Avalanche Energy | $E_{AS}$ | 100 | 150 | mJ |
| Avalanche Current | $I_{AR}$ | 4.1 | -2.9 | A |
| Repetitive Avalanche Energy | $E_{AR}$ | 0.20 | | mJ |
| Peak Diode Recovery dv/dt *1 | dv/dt | 5.0 | -5 | V/ ns |
| Gate-to-Source Voltage | $V_{GS}$ | ±12 | | V |
| Junction and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to + 150 | | ℃ |
| Maximum Junction-to-Ambient *2 | $R_{\theta JA}$ | 62.5 | | ℃/W |

*1 N-Channel $I_{SD} \leqslant$ 4.1A, $di/dt \leqslant$ 92A/μs, $V_{DD} \leqslant V_{(BR)DSS}$, $T_J \leqslant$ 150℃

P-Channel $I_{SD} \leqslant$ -2.9A, $di/dt \leqslant$ -77A/μs, $V_{DD} \leqslant V_{(BR)DSS}$, $T_J \leqslant$ 150℃

*2 Surface mounted on FR-4 board, t ≤ 10sec.

# KRF7317

■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Testconditons | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | N-Ch | 20 | | | V |
| | | $V_{GS}$ = 0V, $I_D$ = -250μA | P-Ch | -20 | | | |
| Breakdown Voltage Temp. Coefficient | $\triangle V_{(BR)DSS}/\triangle T_J$ | $I_D$ = 1mA,Reference to 25℃ | N-Ch | | 0.027 | | V/℃ |
| | | $I_D$ = -1mA,Reference to 25℃ | P-Ch | | 0.031 | | |
| Static Drain-to-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 4.5V, $I_D$ = 6.0A*1 | N-Ch | | 0.023 | 0.029 | Ω |
| | | $V_{GS}$ = 2.7V, $I_D$ = 5.2A*1 | | | 0.030 | 0.046 | |
| | | $V_{GS}$ = -4.5V, $I_D$ = -2.9A*1 | P-Ch | | 0.049 | 0.058 | |
| | | $V_{GS}$ = -2.7V, $I_D$ = -1.5A*1 | | | 0.082 | 0.098 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | N-Ch | 0.7 | | | V |
| | | $V_{DS}$ = $V_{GS}$, $I_D$ = -250μA | P-Ch | -0.7 | | | |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$ =10V, $I_D$ = 6.0A*1 | N-Ch | | 20 | | S |
| | | $V_{DS}$ = -10V, $I_D$ = -1.5A*1 | P-Ch | | 5.9 | | |
| Drain-to-Source Leakage Current | $I_{DSS}$ | $V_{DS}$ = 16V, $V_{GS}$ = 0V | N-Ch | | | 1.0 | μA |
| | | $V_{DS}$ = -16V, $V_{GS}$ = 0V | P-Ch | | | -1.0 | |
| | | $V_{DS}$ = 16V, $V_{GS}$ = 0V, $T_J$ = 55℃ | N-Ch | | | 5.0 | |
| | | $V_{DS}$ = -16V, $V_{GS}$ = 0V, $T_J$ = 55℃ | P-Ch | | | -25 | |
| Gate-to-Source Forward Leakage | $I_{GSS}$ | $V_{GS}$ = ±12V | N-Ch | | | ±100 | nA |
| | | | P-Ch | | | ±100 | |
| Total Gate Charge | $Q_g$ | N-Channel<br>$I_D$ =6.0A,$V_{DS}$ = 10V,$V_{GS}$ =4.5V | N-Ch | | 18 | 27 | nC |
| | | | P-Ch | | 19 | 29 | |
| Gate-to-Source Charge | $Q_{gs}$ | P-Channel<br>$I_D$ = -2.9A,$V_{DS}$ = -16V,$V_{GS}$ = -4.5V | N-Ch | | 2.2 | 3.3 | |
| | | | P-Ch | | 4.0 | 6.1 | |
| Gate-to-Drain ("Miller") Charge | $Q_{gd}$ | | N-Ch | | 6.2 | 9.3 | |
| | | | P-Ch | | 7.7 | 12 | |
| Turn-On Delay Time | $t_{d(on)}$ | N-Channel<br>$V_{DD}$ = 10V,$I_D$ = 1.0A,$R_G$ = 6.0Ω<br>$R_D$ = 10Ω<br>P-Channel<br>$V_{DD}$ = -10V,$I_D$ = -2.9A,$R_G$ = 6.0Ω<br>RD = 3.4Ω | N-Ch | | 8.1 | 12 | ns |
| | | | P-Ch | | 15 | 22 | |
| Rise Time | $t_r$ | | N-Ch | | 17 | 25 | |
| | | | P-Ch | | 40 | 60 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | N-Ch | | 38 | 57 | |
| | | | P-Ch | | 42 | 63 | |
| Fall Time | $t_f$ | | N-Ch | | 31 | 47 | |
| | | | P-Ch | | 49 | 73 | |
| Input Capacitance | $C_{iss}$ | N-Channel<br>$V_{GS}$ = 0V,$V_{DS}$ = 15V,f = 1.0MHz<br>P-Channel<br>$V_{GS}$ = 0V,$V_{DS}$ = -15V,f = 1.0MHz | N-Ch | | 900 | | pF |
| | | | P-Ch | | 780 | | |
| Output Capacitance | $C_{oss}$ | | N-Ch | | 430 | | |
| | | | P-Ch | | 470 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | N-Ch | | 200 | | |
| | | | P-Ch | | 240 | | |

# KRF7317

■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Testconditons | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Continuous Source Current（Body Diode) | $I_S$ | | N-Ch | | | 2.5 | A |
| | | | P-Ch | | | -2.5 | |
| Pulsed Source Current （Body Diode) *2 | $I_{SM}$ | | N-Ch | | | 26 | |
| | | | P-Ch | | | -21 | |
| Diode Forward Voltage | $V_{SD}$ | $T_J$ = 25℃, $I_S$ = 1.7A, $V_{GS}$ = 0V*3 | N-Ch | | 0.72 | 1.0 | V |
| | | $T_J$ = 25℃, $I_S$ = -2.9A, $V_{GS}$ = 0V*3 | P-Ch | | -0.78 | -1.0 | |
| Reverse Recovery Time | $t_{rr}$ | N-Channel | N-Ch | | 52 | 77 | ns |
| | | $T_J$ = 25℃, $I_F$ =1.7A,di/dt = 100A/μs*1 | P-Ch | | 47 | 71 | |
| Reverse RecoveryCharge | $Q_{rr}$ | P-Channel | N-Ch | | 58 | 86 | nC |
| | | $T_J$=25℃,$I_F$ =-2.9A,di/dt=-100A/μs*1 | P-Ch | | 49 | 73 | |

*1 Pulse width ≤ 300μs; duty cycle ≤ 2%.

*2 Repetitive rating; pulse width limited by max. junction temperature.

*3 N-Channel Starting $T_J$ = 25℃, L = 12mH $R_G$ = 25Ω, $I_{AS}$ = 4.1A.

P-Channel Starting $T_J$ = 25℃, L = 35mH $R_G$ = 25Ω, $I_{AS}$ = -2.9A.