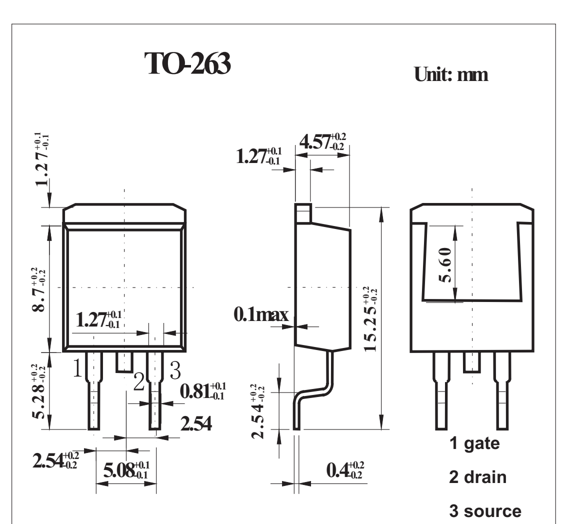
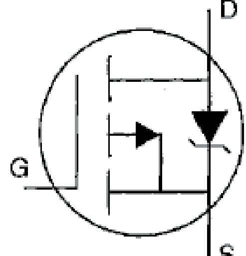
# HEXFET®Power MOSFET

# KRF9640S




## Features

- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- P-Channel
- Fast Switching
- Ease of Paralleling




## Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Continuous Drain Current, $V_{GS}$ @ -10V,Tc = 25℃ | $I_D$ | -11 | A |
| Continuous Drain Current, $V_{GS}$ @ -10V,Tc = 100℃ | $I_D$ | -6.8 | |
| Pulsed Drain Current*1 | $I_{DM}$ | -44 | |
| Power Dissipation Tc = 25℃ | $P_D$ | 125 | W |
| Power Dissipation (PCB Mount) Ta = 25℃ *3 | | 3 | |
| Linear Derating Factor | | 1 | W/℃ |
| Linear Derating Factor (PCB Mount) *3 | | 0.025 | |
| Gate-to-Source Voltage | $V_{GS}$ | ±20 | V |
| Single Pulse Avalanche Energy *4 | $E_{AS}$ | 700 | mJ |
| Avalanche Current | $I_{AR}$ | -11 | A |
| Repetitive Avalanche Energy | $E_{AR}$ | 13 | mJ |
| Peak Diode Recovery dv/dt *2 | dv/dt | -5 | V/ns |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 to + 150 | ℃ |
| Junction-to-Case | $R_{\theta JC}$ | 1 | ℃/W |
| Junction-to-Ambient ( PCB Mounted) *3 | $R_{\theta JA}$ | 40 | ℃/W |
| Junction-to-Ambient | $R_{\theta JA}$ | 62 | ℃/W |

*1Repetitive rating; pulse width limited by max. junction temperature.

*2 $I_{SD} \leqslant$ -11A, di/dt $\leqslant$ 150A/μs, $V_{DD} \leqslant V_{(BR)DSS}$,$T_J \leqslant$ 150℃

* 3 When mounted on 1" square PCB

*4 $V_{DD}$=-50V,startin $T_J$=25℃,L=8.7mH,$R_G$=25Ω,$I_{AS}$=-11A

# KRF9640S

■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Testconditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =- 250 μ A | -200 | | | V |
| Breakdown Voltage Temp. Coefficient | $\triangle V_{(BR)DSS}/\triangle T_J$ | $I_D$ = -1mA,Reference to 25℃ | | -0.20 | | V/℃ |
| Static Drain-to-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = -10V, $I_D$ = -6.6A*1 | | | 0.5 | Ω |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -250 μ A | -2.0 | | -4.0 | V |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$ = -50V, $I_D$ = -6.6A*1 | 4.1 | | | S |
| Drain-to-Source Leakage Current | $I_{DSS}$ | $V_{DS}$ = -200V, $V_{GS}$ = 0V | | | -100 | μ A |
| | | $V_{DS}$ = -160V, $V_{GS}$ = 0V, $T_J$ = 125℃ | | | -500 | |
| Gate-to-Source Forward Leakage | $I_{GSS}$ | $V_{GS}$ = 20V | | | -100 | nA |
| Gate-to-Source Reverse Leakage | | $V_{GS}$ = -20V | | | 100 | |
| Total Gate Charge | $Q_g$ | $I_D$ = -11A | | | 44 | nC |
| Gate-to-Source Charge | $Q_{gs}$ | $V_{DS}$ = -160V | | | 7.1 | |
| Gate-to-Drain ("Miller") Charge | $Q_{gd}$ | $V_{GS}$ = -10V,*1 | | | 27 | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = -100V | | 14 | | ns |
| Rise Time | $t_r$ | $I_D$ = -11A | | 43 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | $R_G$ =9.1 Ω | | 39 | | |
| Fall Time | $t_f$ | $R_D$ =8.6 Ω *1 | | 38 | | |
| Intermal Drain Inductance | $L_D$ | Between lead, 6 mm (0.25in.) from package and center of die contact | | 4.5 | | nH |
| Internal Source Inductance | $L_S$ | | | 7.5 | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V | | 1200 | | pF |
| Output Capacitance | $C_{oss}$ | $V_{DS}$ = -25V | | 370 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | f = 1.0MHz | | 81 | | |
| Continuous Source Current（Body Diode) | $I_S$ | MOSFET symbol showing the integral reverse p-n junction diode. | | | -11 | A |
| Pulsed Source Current （Body Diode) *2 | $I_{SM}$ | | | | -44 | |
| Diode Forward Voltage | $V_{SD}$ | $T_J$ = 25℃, $I_S$ = -1.1A, $V_{GS}$ = 0V*1 | | | -5.0 | V |
| Reverse Recovery Time | $t_{rr}$ | $T_J$ = 25℃, $I_F$ = -1.1A | | 250 | 300 | ns |
| Reverse RecoveryCharge | $Q_{rr}$ | $d_i/d_t$ = 100A/ μ s*1 | | 2.9 | 3.6 | μ C |
| Forward Turn-On Time | $t_{on}$ | Intrinsic turn-on time is negligible (turn-on is dominated by $L_S$+$L_D$) | | | | |

*1 Pulse width ⩽ 300 μ s; duty cycle ⩽ 2%.

*2 Repetitive rating; pulse width limited bymax