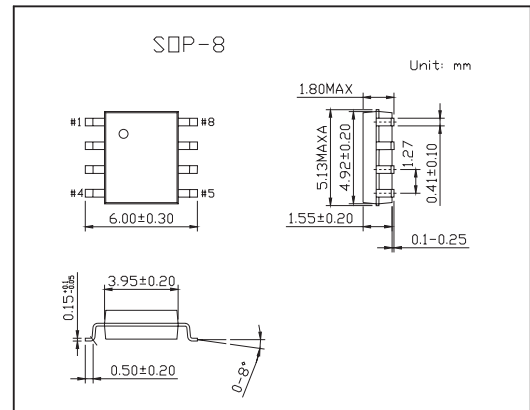
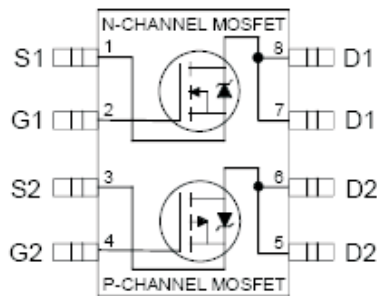


HEXFET<sup>®</sup> Power MOSFET

## KRF7309

## ■ Features

- Generation V Technology
- Ultra Low On-Resistance
- Dual N and P Channel Mosfet
- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Fast Switching

■ Absolute Maximum Ratings  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	N-Channel	P-Channel	Unit
10 Sec. Pulse Drain Current, $V_{GS} @ 10V$ $T_a = 25^\circ\text{C}$	$I_D$	4.7	-3.5	A
Continuous Drain Current $V_{GS} @ 10V$ $T_a = 25^\circ\text{C}$	$I_D$	4.0	-3.0	
Continuous Drain Current $V_{GS} @ 10V$ $T_a = 70^\circ\text{C}$	$I_D$	3.2	-2.4	
Pulsed Drain Current *1	$I_{DM}$	16	-12	
Power Dissipation @ $T_a = 25^\circ\text{C}$ *3	$P_D$	1.4		W
Linear Derating Factor (PCB Mount)*4		0.011		W/ $^\circ\text{C}$
Peak Diode Recovery dv/dt *2	dv/dt	6.9	-6.0	V/ ns
Gate-to-Source Voltage	$V_{GS}$	±20		V
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to + 150		$^\circ\text{C}$
Junction-to-Amb. (PCB Mount, steady state)*4	$R_{\theta JA}$	90		$^\circ\text{C}/\text{W}$

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

\*2 N-Channel  $I_{SD} \leq 2.4A$ ,  $di/dt \leq 73A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 150^\circ\text{C}$

P-Channel  $I_{SD} \leq -1.8A$ ,  $di/dt \leq 90A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 150^\circ\text{C}$

\*3 Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$ .

\*4 When mounted on 1" square PCB (FR-4 or G-10 Material).

## KRF7309

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250 μA	N-Ch	30		V
		V <sub>GS</sub> = 0V, I <sub>D</sub> = -250 μA	P-Ch	-30		
Breakdown Voltage Temp. Coefficient	ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	I <sub>D</sub> = 1mA, Reference to 25°C	N-Ch		0.032	V/°C
		I <sub>D</sub> = -1mA, Reference to 25°C	P-Ch		-0.037	
Static Drain-to-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.4A*1	N-Ch		0.050	Ω
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2.0A*1			0.080	
		V <sub>GS</sub> = -10V, I <sub>D</sub> = -1.8A*1	P-Ch		0.10	
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.5A*1			0.16	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	N-Ch	1.0		V
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	P-Ch	-1.0		
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 2.4A*1	N-Ch	5.2		S
		V <sub>DS</sub> = -24V, I <sub>D</sub> = -1.8A*1	P-Ch	2.5		
Drain-to-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V	N-Ch		1.0	μA
		V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V	P-Ch		-1.0	
		V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C	N-Ch		25	
		V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C	P-Ch		-25	
Gate-to-Source Forward Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V	N-Ch		±100	nA
			P-Ch		±100	
Total Gate Charge	Q <sub>g</sub>	N-Channel I <sub>D</sub> = 2.6A, V <sub>DS</sub> = 16V, V <sub>GS</sub> = 4.5V	N-Ch		25	nC
Gate-to-Source Charge	Q <sub>gs</sub>		P-Channel	N-Ch		
		P-Ch			2.9	
Gate-to-Drain ("Miller") Charge	Q <sub>gd</sub>	I <sub>D</sub> = -2.2A, V <sub>DS</sub> = -16V, V <sub>GS</sub> = -4.5V	N-Ch		7.9	nC
			P-Ch		9.0	
Turn-On Delay Time	t <sub>d(on)</sub>	N-Channel V <sub>DD</sub> = 10V, I <sub>D</sub> = 2.6A, R <sub>G</sub> = 6.0 Ω	N-Ch		6.8	ns
Rise Time	t <sub>r</sub>		P-Channel R <sub>D</sub> = 3.8 Ω	N-Ch		
		P-Ch			17	
Turn-Off Delay Time	t <sub>d(off)</sub>	V <sub>DD</sub> = -10V, I <sub>D</sub> = -2.2A, R <sub>G</sub> = 6.0 Ω R <sub>D</sub> = 4.5 Ω	N-Ch		22	
			P-Ch		25	
Fall Time	t <sub>f</sub>		N-Ch		7.7	
			P-Ch		18	
Internal Drain Inductance	L <sub>D</sub>	Between lead tip and center of die contact	N-Ch		4.0	
			P-Ch		4.0	
Internal Source Inductance	L <sub>S</sub>		N-Ch		6.0	nH
			P-Ch		6.0	
Input Capacitance	C <sub>iss</sub>	N-Channel V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1.0MHz	N-Ch		520	pF
			P-Ch		440	
Output Capacitance	C <sub>oss</sub>	P-Channel	N-Ch		180	
			P-Ch		200	
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -15V, f = 1.0MHz	N-Ch		72	
			P-Ch		93	

## KRF7309

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	Is		N-Ch		1.8	A
			P-Ch		-1.8	
Pulsed Source Current (Body Diode) *2	ISM		N-Ch		16	
			P-Ch		-12	
Diode Forward Voltage	VSD	TJ = 25°C, Is = 1.8A, VGS = 0V*1	N-Ch		1.0	V
		TJ = 25°C, Is = -1.8A, VGS = 0V*1	P-Ch		-1.0	
Reverse Recovery Time	trr	N-Channel TJ = 25°C, IF = 2.6A, di/dt = 100A/μs*1	N-Ch	47	71	ns
			P-Ch	53	80	
Reverse RecoveryCharge	Qrr	P-Channel TJ=25°C, IF=-2.2A, di/dt=-100A/μs*1	N-Ch	56	84	nC
			P-Ch	66	99	
Forward Turn-On Time	ton	Intrinsic turn-on time is negligible (turn-on is dominated by Ls+Ld)	N-Ch			
			P-Ch			

\*1 Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$ .

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