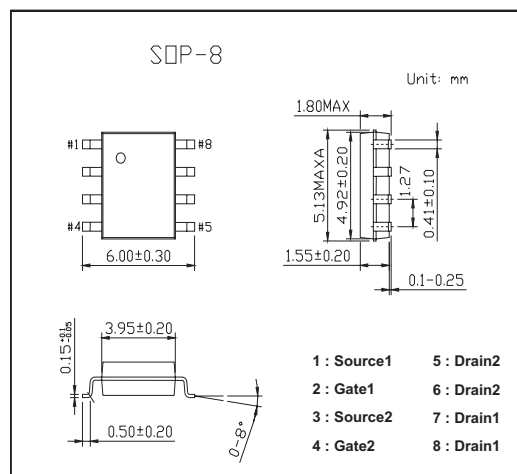
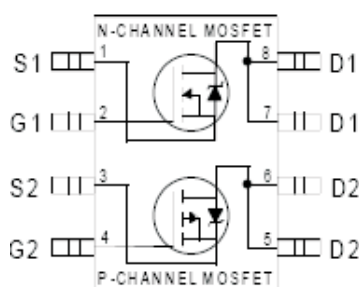


HEXFET[®] Power MOSFET

KRF9952

■ Features

- Generation V Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Very Low Gate Charge and Switching Losses
- Fully Avalanche Rated

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

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V _{DS}	30		V
Gate-to-Source Voltage	V _{GS}	± 20		V
Continuous Drain Current, V _{GS} @ 10V @ T _a = 25℃	I _D	3.5	-2.3	A
Continuous Drain Current, V _{GS} @ 10V @ T _a = 70℃	I _D	2.8	-1.8	
Pulsed Drain Current *1	I _{DM}	16	-10	
Continuous Source Current (Diode Conduction)	I _S	1.7	-1.3	A
Power Dissipation @T _a = 25℃	P _D	2		W
Power Dissipation @T _a = 70℃		1.3		
Single Pulse Avalanche Energy	E _{AS}	44	57	mJ
Avalanche Current	I _{AR}	2.0	-1.3	A
Repetitive Avalanche Energy	E _{AR}	0.25		mJ
Peak Diode Recovery dv/dt *2	dv/dt	5.0	-5	V/ns
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to + 150		℃
Maximum Junction-to-Ambient *3	R θ JA	62.5		℃/W

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

*2 N-Channel $I_{SD} \leq 2.0A$, $di/dt \leq 100A/\mu s$, $V_{BD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$

P-Channel $I_{SD} \leq -1.3A$, $di/dt \leq 84A/\mu s$, $V_{BD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$

*3 Surface mounted on FR-4 board, $t \leq 10\text{sec}$.

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■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions		Min	Typ	Max	Unit	
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250 μ A	N-Ch	30			V	
		V _{GS} = 0V, I _D = -250 μ A	P-Ch	-30				
Breakdown Voltage Temp. Coefficient	ΔV _{(BR)DSS} / ΔT _J	I _D = 1mA,Reference to 25℃	N-Ch		0.015		V/℃	
		I _D = -1mA,Reference to 25℃	P-Ch		0.015			
Static Drain-to-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D = 2.2A*1	N-Ch		0.08	0.10	Ω	
		V _{GS} = 4.5V, I _D = 1.0A*1			0.12	0.15		
Static Drain-to-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -1.0A*1	P-Ch		0.165	0.250		
		V _{GS} = -4.5V, I _D = -0.5A*1			0.290	0.400		
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μ A	N-Ch	1.0			V	
		V _{DS} = V _{GS} , I _D = -250 μ A	P-Ch	-1.0				
Forward Transconductance	g _{fs}	V _{DS} = 15V, I _D = 3.5A*1	N-Ch		12		S	
		V _{DS} = -15V, I _D = -2.3A*1	P-Ch		2.4			
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} = 24V, V _{GS} = 0V	N-Ch			2.0	μ A	
		V _{DS} = -24V, V _{GS} = 0V	P-Ch			-2.0		
		V _{DS} = 24V, V _{GS} = 0V, T _J = 125℃	N-Ch			25		
		V _{DS} = -24V, V _{GS} = 0V, T _J = 125℃	P-Ch			-25		
Gate-to-Source Forward Leakage	I _{GSS}	V _{GS} = ±20V	N-Ch P-Ch	 	 	±100	nA	
Total Gate Charge	Q _g	N-Channel I _D = 1.8A,V _{DS} = 10V,V _{GS} =10V	N-Ch P-Ch	 	6.9 6.1	14 12	nC	
Gate-to-Source Charge	Q _{gs}	P-Channel	N-Ch P-Ch	 	1.0 1.7	2.0 3.4		
Gate-to-Drain ("Miller") Charge	Q _{gd}		I _D = -2.3A,V _{DS} = -10V,V _{GS} = -10V	N-Ch P-Ch	 	1.8 1.1		3.5 2.2
Turn-On Delay Time	t _{d(on)}	N-Channel V _{DD} = 10V,I _D = 1.0A,R _G = 6.0 Ω	N-Ch P-Ch	 	6.2 9.7	12 19	ns	
Rise Time	t _r	R _D =10 Ω P-Channel	N-Ch P-Ch	 	8.8 14	18 28		
Turn-Off Delay Time	t _{d(off)}	V _{DD} = -10V,I _D = -1.0A,R _G = 6.0 Ω R _D =10 Ω	N-Ch P-Ch	 	13 20	26 40		
Fall Time	t _f		N-Ch P-Ch	 	3.0 6.9	6.0 14		
Input Capacitance	C _{iss}	N-Channel V _{GS} = 0V,V _{DS} = 15V,f = 1.0MHz	N-Ch P-Ch	 	190 190			pF
Output Capacitance	C _{oss}	P-Channel	N-Ch P-Ch	 	120 110			
Reverse Transfer Capacitance	C _{rss}	V _{GS} = 0V,V _{DS} = -15V,f = 1.0MHz	N-Ch P-Ch	 	61 54			
Continuous Source Current (Body Diode)	I _S		N-Ch P-Ch	 		1.7 -1.3	A	
Pulsed Source Current (Body Diode) *2	I _{SM}		N-Ch P-Ch	 		16 16		

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■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Diode Forward Voltage	V _{SD}	T _J = 25°C, I _S = 1.25A, V _{GS} = 0V*3		0.82	1.2	V
		T _J = 25°C, I _S = -1.25A, V _{GS} = 0V*3		-0.82	-1.2	
Reverse Recovery Time	t _{rr}	N-Channel		27	53	ns
		T _J = 25°C, I _F = 1.25A, di/dt = 100A/μs*1		27	54	
Reverse Recovery Charge	Q _{rr}	P-Channel		28	57	nC
		T _J = 25°C, I _F = -1.25A, di/dt = -100A/μs*1		31	62	

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

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

*3 N-Channel Starting T_J = 25°C, L = 22mH R_G = 25 Ω, I_{AS} = 2.0A.

P-Channel Starting T_J = 25°C, L = 67mH R_G = 25 Ω, I_{AS} = -1.3A.