2N3821, 2N3822

N-Channel Silicon Junction Field-Effect Transistor

- VHF Amplifiers
- Small Signal Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2mW/°C

At 25°C free air temperature:		2N3821		2N3822		Process NJ32		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 50		– 50		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1		– 0.1	nA	V_{GS} = – 30V, V_{DS} = ØV	
			– 0.1		– 0.1	µA	V_{GS} = – 30V, V_{DS} = ØV	T_A = 150°C
Gate Source Voltage	V_{GS}	– 0.5	– 2			V	V_{DS} = 15V, I_D = 50 µA	
				– 1	– 4	V	V_{DS} = 15V, I_D = 200 µA	
						V	V_{DS} = 15V, I_D = 400 µA	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 4		– 6	V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.5	2.5	2	10	mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$					nA	V_{DS} = 15V, V_{GS} = – 8V	
						µA	V_{DS} = 15V, V_{GS} = – 8V	T_A = 150°C
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$					Ω	V_{GS} = ØV, I_D = ØV	f = 1 kHz
Common Source Forward Transconductance	g_{fs}	1500	4500	3000	6500	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$	1500		3000		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
Common Source Output Conductance	g_{os}		10		20	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		6		6	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		2		2	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		200		200	nV/√Hz	V_{DS} = 15V, V_{GS} = ØV	f = 10 Hz
Noise Figure	NF		5		5	dB	V_{DS} = 15V, V_{GS} = ØV R_G = 1MΩ	f = 10 Hz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N3823, 2N3824

N-Channel Silicon Junction Field-Effect Transistor

- VHF Amplifiers
- Small Signal Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2 mW/°C

At 25°C free air temperature:		2N3823		2N3824		Process NJ32		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 30		– 50		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.5		– 0.1	nA	V_{GS} = – 30V, V_{DS} = ØV	
			– 0.5		– 0.1	µA	V_{GS} = – 30V, V_{DS} = ØV	T_A = 150°C
Gate Source Voltage	V_{GS}	– 1	– 7.5			V	V_{DS} = 15V, I_D = 400 µA	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 8			V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	4	20			mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$				0.1	nA	V_{DS} = 15V, V_{GS} = – 8V	
					0.1	µA	V_{DS} = 15V, V_{GS} = – 8V	T_A = 150°C
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$				250	Ω	V_{GS} = ØV, I_D = ØV	f = 1 kHz
Common Source Forward Transconductance	g_{fs}	3500	6500			µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$	3200				µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
Common Source Output Conductance	g_{os}		35			µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		6		6	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		2		3	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		200			nV/√Hz	V_{DS} = 15V, V_{GS} = ØV	f = 10 Hz
Noise Figure	NF		6			dB	V_{DS} = 15V, V_{GS} = ØV R_G = 1MΩ	f = 10 Hz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

2N3954, 2N3955, 2N3956

N-Channel Dual Silicon Junction Field-Effect Transistor

- Low and Medium Frequency Differential Amplifiers
- High Input Impedance Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Gate Current	50 mA
Total Device Power Dissipation (each side)	250 mW
@ 85°C Case Temperature (both sides)	500 mW
Power Derating (both sides)	4.3 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		2N3954		2N3955		2N3956		Process NJ16		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 50		– 50		– 50		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100		– 100	pA	V_{GS} = – 30V, V_{DS} = ØV	
			– 500		– 500		– 500	nA	V_{GS} = – 30V, V_{DS} = ØV	T_A = 125°C
Gate Operating Current	I_G		– 50		– 50		– 50	pA	V_{DS} = 20V, I_D = 200 µA	
			– 250		– 250		– 250	nA	V_{DS} = 20V, I_D = 200 µA	T_A = 125°C
Gate Source Voltage	V_{GS}		– 4.2		– 4.2		– 4.2	V	V_{DS} = 20V, I_D = 50 µA	
		– 0.5	– 4	– 0.5	– 4	– 0.5	– 4	V	V_{DS} = 20V, I_D = 200 µA	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1	– 4.5	– 1	– 4.5	– 1	– 4.5	V	V_{DS} = – 20V, I_G = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$		2		2		2	V	V_{DS} = ØV, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.5	5	0.5	5	0.5	5	mA	V_{DS} = 20V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	1000	3000	1000	3000	1000	3000	µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
		1000		1000		1000		µS	V_{DS} = 20V, V_{GS} = ØV	f = 200 MHz
Common Source Output Capacitance	g_{os}		35		35		35	µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4		4		4	pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Drain Gate Capacitance	C_{dgo}		1.5		1.5		1.5	pF	V_{dg} = 10V, I_S = ØA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.2		1.2	pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Noise Figure	NF		0.5		0.5		0.5	dB	V_{DS} = 20V, V_{GS} = ØV, R_g = 10 MΩ	f = 100 Hz
Differential Gate Current	$\lvert I_{G1} - I_{G2} \rvert$		10		10		10	nA	V_{DS} = 20V, I_D = 200µA	T_A = 125°C
Saturation Drain Current Ratio	I_{DSS1}/I_{DSS2}	0.95	1	0.95	1	0.95	1		V_{DS} = 20V, V_{GS} = ØV	
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$		5		10		15	mV	V_{DS} = 20V, I_D = 200µA	
Differential Gate Source Voltage with Temperature	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		0.8		2		4	mV/°C	V_{DS} = 20V, I_D = 200µA	T_A = 25°C to = – 55°C
			1		2.5		5	mV/°C	V_{DS} = 20V, I_D = 200µA	T_A = 25°C to = +125°C
Transconductance Ratio	g_{fs1}/g_{fs2}	0.97	1	0.97	1	0.97	1		V_{DS} = 20V, I_D = 200µA	f = 1 kHz

TO-71 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source, 2 Drain, 3 Gate,
5 Source, 6 Drain, 7 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N3957, 2N3958

N-Channel Dual Silicon Junction Field-Effect Transistor

- Low and Medium Frequency Differential Amplifiers
- High Input Impedance Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Gate Current	50 mA
Total Device Power Dissipation (each side)	250 mW
@ 85°C Case Temperature (both sides)	500 mW
Power Derating (both sides)	4.3 mW/°C

At 25°C free air temperature:		2N3957		2N3958		Process NJ16		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 50		– 50		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100	pA	V_{GS} = – 30 V, V_{DS} = ØV	
			– 500		– 500	nA	V_{GS} = – 30 V, V_{DS} = ØV	T_A = 125°C
Gate Operating Current	I_G		– 50		– 50	pA	V_{DS} = 20 V, I_D = 200 µA	
			– 250		– 250	nA	V_{DS} = 20 V, I_D = 200 µA	T_A = 125°C
Gate Source Voltage	V_{GS}		– 4.2		– 4.2	V	V_{DS} = 20 V, I_D = 50 µA	
		– 0.5	– 4	– 0.5	– 4	V	V_{DS} = 20 V, I_D = 200 µA	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1	– 4.5	– 1	– 4.5	V	V_{DS} = 20 V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$		2		2	V	V_{DS} = Ø, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.5	5	0.5	5	mA	V_{DS} = 20 V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	1000	3000	1000	3000	µS	V_{DS} = 20 V, V_{GS} = ØV	f = 1 kHz
		1000		1000		µS	V_{DS} = 20 V, V_{GS} = ØV	f = 200 MHz
Common Source Output Conductance	g_{os}		35		35	µS	V_{DS} = 20 V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4		4	pF	V_{DS} = 20 V, V_{GS} = ØV	f = 1 MHz
Drain Gate Capacitance	C_{dgo}		1.5		1.5	pF	V_{DS} = 10 V, I_S = ØA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.2	pF	V_{DS} = 20 V, V_{GS} = ØV	f = 1 MHz
Noise Figure	NF		0.5		0.5	dB	V_{DS} = 20 V, V_{GS} = ØV R_G = 10 MΩ	f = 100 Hz
Differential Gate Current	$\lvert I_{G1} - I_{G2} \rvert$		10		10	nA	V_{DS} = 20 V, I_D = 200 µA	T_A = 125°C
Saturation Drain Current Ratio	I_{DSS1} / I_{DSS2}	0.9	1	0.85	1		V_{DS} = 20 V, V_{GS} = ØV	
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$		20		25	mV	V_{DS} = 20 V, I_D = 200 µA	
Differential Gate Source Voltage with Temperature	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		6		8	mV	V_{DS} = 20 V, I_D = 200 µA	T_A = 25°C to – 55°C
			7.5		10	mV	V_{DS} = 20 V, I_D = 200 µA	T_A = 25°C to 125°C
Transconductance Ratio	g_{fs1} / g_{fs2}	0.9	1	0.85	1		V_{DS} = 20 V, I_D = 200 µA	f = 1 kHz

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

TO-71 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source, 2 Drain, 3 Gate, 5 Source, 6 Drain, 7 Gate

2N3993, 2N3993A

P-Channel Silicon Junction Field-Effect Transistor

- Choppers
- High Speed Commutators

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	25 V
Continuous Forward Gate Current	– 10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2.4 mW/°C

At 25°C free air temperature:		2N3993		2N3993A		Process PJ99		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	25		25		V	I_G = 1 µA, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	4	9.5	4	9.5	V	V_{DS} = – 10V, I_D = – 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 10		– 10		mA	V_{DS} = – 10V, V_{GS} = ØV	
Drain Reverse Current	I_{DGO}		– 1.2		– 1.2	nA	V_{DG} = – 15V, I_S = ØA	
			– 1.2		– 1.2	µA	V_{DG} = – 15V, I_S = ØA	T_A = 150°C
Drain Cutoff Current	$I_{D(OFF)}$		– 1.2		– 1.2	nA	V_{DS} = – 10V, V_{GS} = 10 V	
			– 1		– 1	µA	V_{DS} = – 10V, V_{GS} = 10 V	T_A = 150°C
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$		150		150	Ω	V_{GS} = ØV, I_D = Ø A	f = 1 kHz
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$	6	12	7	12	mS	V_{DS} = – 10V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		16		12	pF	V_{DS} = – 10V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		4.5		3	pF	V_{DS} = Ø, V_{GS} = 10V	f = 1 MHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Gate, 3 Drain, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N3994, 2N3994A

P-Channel Silicon Junction Field-Effect Transistor

- Choppers
- High Speed Commutators

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source Voltage	25 V
Reverse Gate Drain Voltage	25 V
Continuous Forward Gate Current	– 10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2.4 mW/°C

At 25°C free air temperature:		2N3994		2N3994A		Process PJ99		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	25		25		V	I_G = 1 µA, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	1	5.5	1	5.5	V	V_{DS} = – 10V, I_D = – 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 2		– 2		mA	V_{DS} = – 10V, V_{GS} = ØV	
Drain Reverse Current	I_{DGO}		– 1.2		– 1.2	nA	V_{DG} = – 15V, I_S = ØA	
			– 1.2		– 1.2	µA	V_{DG} = – 15V, I_S = ØA	T_A = 150°C
Drain Cutoff Current	$I_{D(OFF)}$		– 1.2		– 1.2	nA	V_{DS} = – 10V, V_{GS} = 10V	
			– 1		– 1	µA	V_{DS} = – 10V, V_{GS} = 10V	T_A = 150°C
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$		300		300	Ω	V_{GS} = ØV, I_D = ØA	f = 1 kHz
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$	4	10	5	10	mS	V_{DS} = – 10V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		16		12	pF	V_{DS} = – 10V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		5		3.5	pF	V_{DS} = Ø, V_{GS} = 10V	f = 1 MHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Gate, 3 Drain, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

2N4117, 2N4117A, 2N4118, 2N4118A, 2N4119, 2N4119A

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- Ultra-High Input Impedance Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	300 mW
Power Derating (to 175°C)	2 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		2N4117 2N4117A		2N4118 2N4118A		2N4119 2N4119A		Process NJ01		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40		– 40		– 40		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current 2N4117, 2N4118, 2N4119	I_{GSS}		– 10		– 10		– 10	pA	V_{GS} = – 20V, V_{DS} = ØV	
2N4117A, 2N4118A, 2N4119A			– 1		– 1		– 1	pA	V_{GS} = – 20V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.6	– 1.8	– 1	– 3	– 2	– 6	V	V_{DS} = 10V, I_D = 1 nA	
Drain Saturation Current (Pulsed) 2N4117, 2N4118, 2N4119	I_{GSS}	0.03	0.09	0.08	0.24	0.2	0.6	mA	V_{DS} = 10V, V_{GS} = ØV	
2N4117A, 2N4118A, 2N4119A		0.015	0.09	0.08	0.24	0.2	0.6	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	70	210	80	250	100	330	µS	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		3		5		10	µS	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		3		3		3	pF	V_{DS} = 10V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.5		1.5		1.5	pF	V_{DS} = 10V, V_{GS} = ØV	f = 1 MHz

TO-72 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N4220, 2N4220A, 2N4221, 2N4221A, 2N4222, 2N4222A

N-Channel Silicon Junction Field-Effect Transistor

- Mixers
- Oscillators
- VHF Amplifiers
- Small Signal Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 30 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating (to 150 °C)	2 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		2N4220 2N4220A NJ16 Min	2N4220 2N4220A NJ16 Max	2N4221 2N4221A NJ16 Min	2N4221 2N4221A NJ16 Max	2N4222 2N4222A NJ32 Min	2N4222 2N4222A NJ32 Max	Process Unit	Process Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 30		– 30		– 30		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1		– 0.1		– 0.1	nA	V_{GS} = – 15V, V_{DS} = ØV	
			– 0.1		– 0.1		– 0.1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Voltage	V_{GS}	– 0.5 (50)	– 2.5 (50)	– 1 (200)	– 5 (200)	– 2 (500)	– 6 (500)	V µA	V_{DS} = 15V, I_D = ( )	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 4		– 6		– 8	V	V_{DS} = 15V, I_D = 0.1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.5	3	2	6	5	15	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	1000	4000	2000	5000	2500	6000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$	750		750		750		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
Common Source Output Conductance	g_{os}		10		20		40	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		6		6		6	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		2		2		2	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Noise Figure **2N4220A, 2N4221A, 2N4222A**	NF		2.5		2.5		2.5	dB	V_{DS} = 15V, V_{GS} = ØV R_G = 1 MΩ	f = 100 MHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

2N4338, 2N4339

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- Small Signal Amplifiers
- Voltage-Controlled Resistors
- Current Limiters & Regulators

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	300 mW
Power Derating (to 175°C)	2mW/°C

At 25°C free air temperature:		2N4339		2N4339		Process NJ16		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 50		– 50		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100	pA	V_{GS} = – 30V, V_{DS} = ØV	
			– 100		– 100	nA	V_{GS} = – 30V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.3	– 1	– 0.6	– 1.8	V	V_{DS} = 15V, I_D = 0.1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.2	0.6	0.5	1.5	mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		0.05 (– 5)		0.05 (– 5)	nA V	V_{DS} = 15V, V_{GS} = ( )	
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$		2500		1700	Ω	V_{GS} = ØV, I_D = Ø A	f = 1 kHz
Common Source Forward Transconductance	g_{fs}	600	1800	800	2400	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		5		15	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		7		7	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		3		3	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Noise Figure	NF		1		1	dB	V_{DS} = 15V, V_{GS} = ØV R_G = 1 MΩ, BW = 200 Hz	f = 1 kHz

TO-18 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N4340, 2N4341

N-Channel Silicon Junction Field-Effect Transistor

- Small Signal Amplifiers
- Current Regulators
- Voltage-Controlled Resistors

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	300 mW
Power Derating (to 175°C)	2mW/°C

At 25°C free air temperature:		2N4340		2N4341		Process NJ16		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 50		– 50		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100	pA	V_{GS} = – 30 V, V_{DS} = ØV	
			– 100		– 100	nA	V_{GS} = – 30 V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1	– 3	– 2	– 6	V	V_{DS} = 15 V, I_D = 0.1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	1.2	3.6	3	9	mA	V_{DS} = 15 V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		0.05 (– 5)		0.07 (– 10)	nA V	V_{DS} = 15 V, V_{GS} = ( )	

Dynamic Electrical Characteristics

Drain Source ON Resistance	$r_{ds(on)}$		1500		800	Ω	V_{GS} = ØV, I_D = Ø A	f = 1 kHz
Common Source Forward Transconductance	g_{fs}	1300	3000	2000	4000	µS	V_{DS} = 15 V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		30		60	µS	V_{DS} = 15 V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		7		7	pF	V_{DS} = 15 V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		3		3	pF	V_{DS} = 15 V, V_{GS} = ØV	f = 1 MHz
Noise Figure	NF		1		1	dB	V_{DS} = 15 V, V_{GS} = ØV R_G = 1 MΩ, BW = 200 Hz	f = 1 kHz

TO-18 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

Surface Mount
SMP4340, SMP4341

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

2N4391, 2N4392, 2N4393

N-Channel Silicon Junction Field-Effect Transistor

- Low On Resistance Analog Switches
- Choppers
- Commutators

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	1.8 W
Power Derating	12 mW/°C

At 25°C free air temperature Static Electrical Characteristics		2N4391		2N4392		2N4393		Process NJ132		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40		– 40		– 40		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100		– 100	pA	V_{GS} = – 20V, V_{DS} = ØV	
			– 200		– 200		– 200	nA	V_{GS} = – 20V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4	– 10	– 2	– 5	– 0.5	– 3	V	V_{DS} = – 20V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$		1		1		1	V	I_G = 1 mA, V_{DS} = ØV	
Drain Saturation Current (Pulsed)	I_{DSS}	50	150	25	75	5	30	mA	V_{DS} = 20V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$						100	pA	V_{DS} = 20V, V_{GS} = – 5V	
							200	nA	V_{DS} = 20V, V_{GS} = – 5V	T_A = 150°C
					100			pA	V_{DS} = 20V, V_{GS} = – 7V	
					200			nA	V_{DS} = 20V, V_{GS} = – 7V	T_A = 150°C
			100					pA	V_{DS} = 20V, V_{GS} = – 12V	
			200					nA	V_{DS} = 20V, V_{GS} = – 12V	T_A = 150°C
Drain Source ON Voltage	$V_{DS(ON)}$						0.4	V	V_{GS} = ØV, I_D = 3 mA	
					0.4			V	V_{GS} = ØV, I_D = 6 mA	
			0.4					V	V_{GS} = ØV, I_D = 12 mA	
Static Drain Source ON Resistance	$r_{DS(ON)}$		30		60		100	Ω	V_{GS} = ØV, I_D = 1 mA	
Dynamic Electrical Characteristics										
Drain Source ON Resistance	$r_{ds(on)}$		30		60		100	Ω	V_{GS} = ØV, I_D = ØA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		14		14		14	pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Reverse Transfer Capacitance	C_{rss}						3.5	pF	V_{DS} = ØV, V_{GS} = – 5V	f = 1 kHz
					3.5			pF	V_{DS} = ØV, V_{GS} = – 7V	f = 1 kHz
			3.5					pF	V_{DS} = ØV, V_{GS} = – 12V	f = 1 kHz
Switching Characteristics										
Turn ON Delay Time	$t_{d(on)}$		15		15		15	ns	V_{DD} = 10V, $V_{GS(ON)}$ = ØV	
Rise Time	t_r		5		5		5	ns		
Turn OFF Delay Time	$t_{d(off)}$		20		35		50	ns		
Fall Time	t_f		15		20		30	ns		

	2N4391	2N4392	2N4393	
$I_{D(ON)}$	12	6	3	mA
$V_{GS(OFF)}$	– 12	– 7	– 5	V

TO-18 Package
See Section G for Outline Dimensions

Surface Mount
SMP4391, SMP4392, SMP4393

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N4416, 2N4416A

N-Channel Silicon Junction Field-Effect Transistor

- Mixers
- VHF Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	2N4416	– 30 V	2N4416A	– 35 V
Gate Current		10 mA		10 mA
Continuous Device Dissipation		300 mW		300 mW
Power Derating		2 mW°C		2 mW/°C

At 25°C free air temperature:		2N4416		2N4416A		Process NJ26		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 30		– 35		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1		– 0.1	nA	V_{GS} = – 20V, V_{DS} = ØV	
			– 0.1		– 0.1	µA	V_{GS} = – 20V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 6	– 2.5	– 6	V	V_{DS} = 15V, I_D = 1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	15	5	15	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	4500	7500	4500	7500	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
		4000		4000		µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Output Conductance	g_{os}		50		50	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
			75		75	µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			100		100	µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Input Capacitance	C_{iss}		4		4	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Output Capacitance	C_{oss}		2		2	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		0.8		0.8	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Input Conductance	g_{is}		100		100	µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			1000		1000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Input Susceptance	b_{is}		2500		2500	µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			10000		10000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Output Susceptance	b_{os}		1000		1000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			4000		4000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Power Gain	G_{ps}	18		18		dB	V_{DS} = 15V, I_D = 5mA	f = 100 MHz
		10		10		dB	V_{DS} = 15V, I_D = 5mA	f = 400 MHz
Noise Figure	NF		2		2	dB	V_{DS} = 15V, I_D = 5mA, R_G = 1kΩ	f = 100 MHz
			4		4	dB		f = 400 MHz

TO-72 Package
See Section G for Outline Dimensions

Surface Mount
SMP4416, SMP4416A

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

Note: rf parameters guaranteed, but not 100% tested.

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N4856, 2N4857, 2N4858, 2N4859, 2N4860, 2N4861

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

	2N4856, 2N4857, 2N4858	2N4859, 2N4860, 2N4861
Reverse Gate Source Voltage	– 40 V	– 30 V
Reverse Gate Drain Voltage	– 40 V	– 30 V
Continuous Device Dissipation	1.8 W	1.8 W
Power Derating	10 mW/°C	10 mW/°C
Continuous Forward Gate Current	50 mA	50 mA

At 25°C free air temperature: Static Electrical Characteristics		2N4856 2N4859		2N4857 2N4860		2N4858 2N4861		Process NJ132		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage **2N4856, 2N4857, 2N4858**	$V_{(BR)GSS}$		– 40		– 40		– 40	V	I_G = – 1 µA, V_{DS} = ØV	
2N4859, 2N4860, 2N4861			– 30		– 30		– 30	V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current **2N4856, 2N4857, 2N4858**	I_{GSS}		– 250		– 250		– 250	pA	V_{GS} = – 20V, V_{DS} = ØV	
			– 500		– 500		– 500	nA	V_{GS} = – 20V, V_{DS} = ØV	T_A = 150°C
Gate Reverse Current **2N4859, 2N4860, 2N4861**	I_{GSS}		– 250		– 250		– 250	pA	V_{GS} = – 15V, V_{DS} = ØV	
			– 500		– 500		– 500	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4	– 10	– 2	– 6	– 0.8	– 4	V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	50		20	100	8	80	mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		250		250		250	pA	V_{DS} = 15V, V_{GS} = – 10V	
			500		500		500	nA	V_{DS} = 15V, V_{GS} = – 10V	T_A = 150°C
Drain Source ON Voltage	$V_{DS(ON)}$		0.75 (20)		0.5 (10)		0.5 (5)	V (mA)	V_{GS} = ØV, I_D = ( )	
Dynamic Electrical Characteristics										
Common Source ON Resistance	$r_{ds(on)}$		25		40		60	Ω	V_{GS} = ØV, I_D = Ø A	f = 1 kHz
Common Source Input Capacitance	C_{iss}		18		18		18	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		8		8		8	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Switching Characteristics										
Turn ON Delay Time	$t_{d(on)}$		6 (20) [–10]		6 (10) [– 6]		10 (5) [– 4]	ns (mA) [V]	V_{DD} = 10V, V_{GS} = ØV $I_{D(ON)}$ = ( ) $V_{GS(OFF)}$ = [ ] **(2N4856, 2N4859)** R_L = 465Ω **(2N4857, 2N4860)** R_L = 953Ω **(2N4858, 2N4861)** R_L = 1910Ω	
Rise Time	t_r		3 (20) [–10]		4 (10) [– 6]		10 (5) [– 4]	ns (mA) [V]		
Turn OFF Delay Time	$t_{d(off)}$		25 (20) [–10]		50 (10) [– 6]		100 (5) [– 4]	ns (mA) [V]		

TO-18 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source, 2 Drain, 3 Gate &Case

Surface Mount
SMP4856, SMP4857, SMP4858, SMP4859, SMP4860, SMP4861

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N4856A, 2N4857A, 2N4858A, 2N4859A, 2N4860A, 2N4861A

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

	2N4856A, 2N4857A, 2N4858A	2N4859A, 2N4860A, 2N4861A
Reverse Gate Source Voltage	– 40 V	– 30 V
Reverse Gate Drain Voltage	– 40 V	– 30 V
Continuous Device Dissipation	1.8 W	1.8 W
Continuous Forward Gate Current	50 mA	50 mA
Power Derating	10 mA/°C	10 mA/°C

At 25°C free air temperature:		2N4856A 2N4859A		2N4857A 2N4860A		2N4858A 2N4861A		Process NJ132		
Static Electrical Characteristics		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage **2N4856A, 2N4857A, 2N4858A**	$V_{(BR)GSS}$		– 40		– 40		– 40	V	I_G = – 1 µA, V_{DS} = ØV	
Gate Source Breakdown Voltage **2N4859A, 2N4860A, 2N4861A**	$V_{(BR)GSS}$		– 30		– 30		– 30	V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current **2N4856A, 2N4857A, 2N4858A**	I_{GSS}		– 250		– 250		– 250	pA	V_{GS} = – 20V, V_{DS} = ØV	
			– 500		– 500		– 500	nA	V_{GS} = – 20V, V_{DS} = ØV	T_A = 150°C
Gate Reverse Current **2N4859A, 2N4860A, 2N4861A**	I_{GSS}		– 250		– 250		– 250	pA	V_{GS} = – 15V, V_{DS} = ØV	
			– 500		– 500		– 500	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4	– 10	– 2	– 6	– 0.8	– 4	V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	50		20	100	8	80	mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		250		250		250	pA	V_{DS} = 15V, V_{GS} = – 10V	
			500		500		500	nA	V_{DS} = 15V, V_{GS} = – 10V	T_A = 150°C
Drain Source ON Voltage	$V_{DS(ON)}$		0.75 (20)		0.5 (10)		0.5 (5)	V (mA)	V_{GS} = ØV, I_D = ( )	
Dynamic Electrical Characteristics										
Common Source ON Resistance	$r_{ds(on)}$		25		40		60	Ω	V_{GS} = ØV, I_D = Ø A	f = 1 kHz
Common Source Input Capacitance	C_{iss}		10		10		10	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		4		3.5		3.5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Switching Characteristics										
Turn ON Delay Time	$t_{d(on)}$		5 (20) [–10]		6 (10) [– 6]		8 (5) [– 4]	ns (mA) [V]	V_{DD} = 10V, V_{GS} = ØV $I_{D(ON)}$ = ( ) $V_{GS(OFF)}$ = [ ] **(2N4856A, 2N4859A)** R_L = 464Ω **(2N4857A, 2N4860A)** R_L = 953Ω **(2N4858A, 2N486A1)** R_L = 1910Ω	
Rise Time	t_r		3 (20) [–10]		4 (10) [– 6]		8 (5) [– 4]	ns (mA) [V]		
Turn OFF Delay Time	$t_{d(off)}$		25 (20) [–10]		40 (10) [– 6]		80 (5) [– 4]	ns (mA) [V]		

TO-18 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

Surface Mount
SMP4856A, SMP4857A, SMP4858A, SMP4859A, SMP4860A, SMP4861A

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

2N4867, 2N4867A, 2N4868, 2N4868A, 2N4869, 2N4869A

N-Channel Silicon Junction Field-Effect Transistor

- **Audio Amplifiers**

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Gate Current	50 mA
Continuous Device Power Dissipation	300mW
Power Derating	1.7 mW/°C
Storage Temperature Range	– 65°C to + 200°C

At 25°C free air temperature: Static Electrical Characteristics		2N4867 2N4867A		2N4868 2N4868A		2N4869 2N4869A		Process NJ16		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40		– 40		– 40		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.25		– 0.25		– 0.25	nA	V_{GS} = – 30V, V_{DS} = ØV	
			– 0.25		– 0.25		– 0.25	µA	V_{GS} = – 30V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.7	– 2	– 1	– 3	– 1.8	– 5	V	V_{DS} = 20V, I_D = 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.4	1.2	1	3	2.5	7.5	mA	V_{DS} = 20V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	700	2000	1000	3000	1300	4000	µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		1.5		4		10	µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		25		25		25	pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		5		5		5	pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		20		20		20	nV/√HZ	V_{DS} = 10V, V_{GS} = ØV	f = 10 Hz
			10		10		10	nV/√HZ	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
Noise Figure	NF		1		1		1	dB	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
									(2N4867, 68, 69) R_G = 20 kΩ **(2N4867A, 68A, 69A)** R_G = 5 kΩ	

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

Surface Mount
SMP4867, SMP4867A, SMP4868, SMP4868A, SMP4869, SMP4869A

www.interfet.com

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

2N5020, 2N5021

P-Channel Silicon Junction Field-Effect Transistor

- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	500 mW
Power Derating	4 mW/°C
Storage Temperature Range	– 65°C to + 200°C

At 25°C free air temperature:		2N5020		2N5021		Process PJ32		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GDO}$	25		25		V	I_G = 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		1		1	nA	V_{GS} = 15 V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	0.3	1.5	0.5	2.5	V	V_{DS} = – 15 V, I_D = 1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 0.3	– 1.2	– 1	– 3.5	mA	V_{DS} = – 15 V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	1	3.5	1.5	6	mS	V_{DS} = – 15 V, V_{GS} = ØV	
Common Source Output Conductance	g_{os}		20		20	µS	V_{DS} = – 15 V, V_{GS} = ØV	
Common Source Input Capacitance	C_{iss}		25		25	pF	V_{DS} = – 15 V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		7		7	pF	V_{DS} = – 15 V, V_{GS} = ØV	f = 1 MHz

TO-18 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source 1, 2 Gate & Case, 3 Drain

Surface Mount
SMP5020, SMP5021

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

2N5114, 2N5115, 2N5116

P-Channel Silicon Junction Field-Effect Transistor

- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Gate Current	50 mA
Continuous Device Power Dissipation	500mW
Power Derating	3 mW/°C
Storage Temperature Range	– 65°C to + 200°C

At 25°C free air temperature: Static Electrical Characteristics		2N5114		2N5115		2N5116		Process PJ99		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	30		30		30		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		500		500		500	pA	V_{GS} = 20V, V_{DS} = ØV	
			1		1		1	µA	V_{GS} = 20V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	5	10	3	6	1	4	V	V_{DS} = – 15V, I_G = – 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$		– 1		– 1		– 1	V	V_{DS} = ØV, I_G = – 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 30	– 90					mA	V_{GS} = ØV, V_{DS} = – 18V	
				– 15	– 60	– 5	– 25	mA	V_{GS} = ØV, V_{DS} = – 15V	
Drain Cutoff Current	$I_{D(OFF)}$		– 500					pA	V_{DS} = – 15V, V_{GS} = 12V	
			– 1					µA	V_{DS} = – 15V, V_{GS} = 12V	T_A = 150°C
					– 500			pA	V_{DS} = – 15V, V_{GS} = 7V	
					– 1			µA	V_{DS} = – 15V, V_{GS} = 7V	T_A = 150°C
							– 500	pA	V_{DS} = – 15V, V_{GS} = 5V	
							– 1	µA	V_{DS} = – 15V, V_{GS} = 5V	T_A = 150°C
Drain Source ON Voltage	$V_{DS(ON)}$		– 1.3					V	V_{GS} = ØV, I_D = – 15 mA	
					– 0.8			V	V_{GS} = ØV, I_D = – 7 mA	
							– 0.6	V	V_{GS} = ØV, I_D = – 3 mA	
Static Drain Source ON Resistance	$r_{DS(ON)}$		75		100		150	Ω	V_{GS} = ØV, I_D = – 1 mA	
Dynamic Electrical Characteristics										
Drain Source ON Resistance	$r_{ds(on)}$		75		100		150	Ω	V_{GS} = ØV, I_D = ØA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		25		25		27	pF	V_{DS} =– 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		7					pF	V_{DS} = ØV, V_{GS} = 12V	f = 1 MHz
					7			pF	V_{DS} = ØV, V_{GS} = 7 V	f = 1 MHz
							7	pF	V_{DS} = ØV, V_{GS} = 5V	f = 1 MHz

Switching Characteristics									2N5114	2N5115	2N5116	
Turn ON Delay Time	$t_{d(on)}$		6		10		25	ns	V_{DD}	– 10	– 6	– 6 V
Rise Time	t_r		10		20		35	ns	V_{GG}	20	12	8 V
Turn OFF Delay Time	$t_{d(off)}$		6		8		20	ns	R_L	130	910	2000 Ω
Fall Time	t_f		15		30		60	ns	R_G	100	220	390 Ω
									$I_{D(ON)}$	– 15	– 7	– 3 mA

TO-18 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source 1, 2 Gate & Case, 3 Drain

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N5397, 2N5398

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise
- High Power Gain
- High Transconductance
- Mixers
- Oscillators
- VHF Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Drain Source Voltage	25 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	1.7 mW/°C

At 25°C free air temperature:		2N5397		2N5398		Process NJ26L		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Source Forward Voltage	$V_{GS(F)}$		1		1	V	I_G = 1 mA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1		– 0.1	nA	V_{GS} = – 15V, V_{DS} = ØV	
			– 0.1		– 0.1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1	– 6	– 1	– 6	V	V_{DS} = 10V, I_D = 1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	10	30	5	40	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	5.5	9	5	10	mS	V_{DG} = 10V, I_D = 10 mA	f = 450 MHz
Common Source Forward Transfer Admittance	$\lvert Y_{fs} \rvert$	6	10	5.5	10	mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Output Conductance	$\lvert g_{os} \rvert$		0.4		0.5	mS	V_{DG} = 10V, I_D = 10 mA	f = 450 MHz
Common Source Input Admittance	$\lvert Y_{os} \rvert$		0.2		0.4	mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Input Conductance	g_{is}		2		3	mS	V_{DG} = 10V, I_D = 10 mA	f = 450 MHz
Common Source Input Capacitance	C_{iss}		5		5.5	pF	V_{DG} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.3	pF	V_{DG} = 15V, V_{GS} = ØV	f = 1 kHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

Surface Mount
SMP5397, SMP5398

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N5460, 2N5461, 2N5462

P-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- General Purpose Amplifiers

Absolute maximum ratings at 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	40 V
Continuous Forward Gate Current	– 10 mA
Continuous Device Power Dissipation	310 mW
Power Derating	2.8 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		2N5460		2N5461		2N5462		Process PJ32		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	40		40		40		V	I_G = 10µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		5		5		5	nA	V_{GS} = 20V, V_{DS} = ØV	
			1		1		1	µA	V_{GS} = 20V, V_{DS} = ØV	T_A = 100°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	0.75	6	1	7.5	1.8	9	V	V_{DS} = – 15V, I_D = – 1 µA	
Gate Source Voltage	V_{GS}	0.8	4.5					V	V_{DS} = – 15V, I_D = – 100 µA	
				0.8	4.5			V	V_{DS} = – 15V, I_D = – 200 µA	
						1.5	6	V	V_{DS} = – 15V, I_D = – 400 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 1	– 5	– 2	– 9	– 4	– 16	mA	V_{DS} = – 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Drain Source ON Resistance	$r_{ds(on)}$		2		0.8		0.4	kΩ	V_{GS} = ØV, I_D = Ø A	f = 1 kHz
Common Source Forward Transadmittance	$\lvert Y_{fs} \rvert$	1	4	1.5	5	2	6	mS	V_{DS} = – 15V, V_{GS} = Ø V	f = 1 kHz
Common Source Output Admittance	$\lvert Y_{os} \rvert$		75		75		75	µS	V_{DS} = – 15V, V_{GS} = Ø V	f = 1 kHz
Common Source Input Capacitance	C_{iss}		7		7		7	pF	V_{DS} = – 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		2		2		2	pF	V_{DS} = – 15V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		2.5		2.5		2.5	dB	V_{DS} = – 15V, V_{GS} = ØV	f = 100 Hz, BW = 1 Hz
Noise Figure	NF		115		115		115	nV/√Hz	V_{DS} = – 15V, V_{GS} = ØV, R_G = 1MΩ	f = 100 Hz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMP5460, SMP5461, SMP5462

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N5484, 2N5485, 2N5486

N-Channel Silicon Junction Field-Effect Transistor

- VHF/UHF Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source Voltage	– 25 V
Reverse Gate Drain Voltage	– 25 V
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		2N5484		2N5485		2N5486		Process NJ26		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		– 25		V	I_G = 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 1		– 1		– 1	nA	V_{GS} = – 20V, V_{DS} = ØV	
			– 0.2		– 0.2		– 0.2	µA	V_{GS} = – 20V, V_{DS} = ØV	T_A = 100°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.3	– 3	– 0.5	– 4	– 2	– 6	V	V_{DS} = 15V, I_D = 10 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	1	5	4	10	8	20	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Forward Transconductance	$R_{e(Yfs)}$	2500						µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
				3000		3500		µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Forward Transadmittance	Y_{fs}	3000	6000	3500	7000	4000	8000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Input Admittance	$R_{e(Yis)}$		100					µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
					1000		1000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Output Conductance	$R_{e(Yos)}$		75					µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
					100		100	µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Output Admittance	Y_{os}		50		60		75	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Input Capacitance	C_{iss}		5		5		5	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1		1		1	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Output Capacitance	C_{oss}		2		2		2	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMP5484, SMP5485, SMP5486

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

2N5911, 2N5912

Dual N-Channel Silicon Junction Field-Effect Transistor

- **Wideband Differential Amplifiers**

Absolute maximum ratings at T_A = 25°C

Continuous Forward Gate Current	50 mA
Total Device Power Dissipation	500 mW
Power Derating	4 mW°C
Storage Temperature Range	–65°C to + 200°C

At 25°C free air temperature:		2N5911		2N5912		Process NJ30L or NJ36D		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100	pA	V_{GS} = – 15V, V_{DS} = ØV	
			– 250		– 250	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Operating Current	I_G		– 100		– 100	pA	V_{DG} = 10V, I_D = 5 mA	
			– 100		– 100	nA	V_{DG} = 10V, I_D = 5 mA	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1	– 5	– 1	– 5	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Voltage	V_{GS}	– 0.3	– 4	– 0.3	– 4	V	V_{DS} = 10V, I_D = 5 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	7	40	7	40	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	5000	10000	5000	10000	µS	V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
		5000	10000	5000	10000	µS	V_{DG} = 10V, I_D = 5 mA	f = 100 MHz
Common Source Output Conductance	g_{os}		100		100	µS	V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
			150		150	µS	V_{DG} = 10V, I_D = 5 mA	f = 100 MHz
Common Source Input Capacitance	C_{iss}		5		5	pF	V_{DG} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.2	pF	V_{DG} = 10V, I_D = 5 mA	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		20		20	nV/√Hz	V_{DG} = 10V, I_D = 5 mA	f = 10 kHz
Noise Figure	NF		1		1	dB	V_{DG} = 10V, I_D = 5 mA R_G = 100 KΩ	f = 10 kHz
Differential Gate Current	$I_{G1} - I_{G2}$		20		20	nA	V_{DG} = 10V, I_D = 5 mA	T_A = 125°C
Saturation Drain Current Ratio	I_{DSS1} / I_{DSS2}	0.95	1	0.95	1		V_{DG} = 20V, V_{GS} = ØV	
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$		10		15	mV	V_{DG} = 10V, I_D = 5 mA	
Gate Source Voltage Differential Drift	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		20		40	mV	V_{DG} = 10V, I_D = 5 mA	T_A = 25°C, T_B = 125°C
			20		40	mV	V_{DG} = 10V, I_D = 5 mA	T_A = – 55°C, T_B = 25°C
Transconductance Ratio	g_{fs1} / g_{fs2}	0.9	1	0.85	1		V_{DG} = 10V, I_D = 5 mA	f = 1 kHz

SOIC-8 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source 1, 2 Drain 1, 3 Gate 1, 4 N/C,
5 Source 2, 6 Drain 2, 7 Gate 2, 8 Omitted

TO-78 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source 1, 2 Drain 1, 3 Gate 1,
4 Case, 5 Source 2, 6 Drain 2,
7 Gate 2, 8 Omitted

Surface Mount
SMP5911, SMP5912

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N6449, 2N6450

N-Channel Silicon Junction Field-Effect Transistor

- **High Voltage**

Absolute maximum ratings at T_A = 25°C

	2N6449	2N6450
Reverse Gate Source Voltage	– 300 V	– 200 V
Reverse Gate Drain Voltage	– 300 V	– 200 V
Continuous Forward Gate Current	10 mA	10 mA
Continuous Device Power Dissipation	800 mW	800 mW
Power Derating	6.4 mW/°C	6.4 mW/°C

At 25°C free air temperature:		2N6449		2N6450		Process NJ42		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 300		– 200		V	I_G = – 10 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100			nA	V_{GS} = – 150V, V_{DS} = ØV	
					– 100	nA	V_{GS} = – 100V, V_{DS} = ØV	
			– 100			µA	V_{GS} = – 150V, V_{DS} = ØV	T_A = 150°C
					– 100	µA	V_{GS} = – 100V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2	– 15	– 2	– 15	V	V_{DS} = 30V, I_D = 4 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	2	10	2	10	mA	V_{DS} = 30V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transfer Admittance	Y_{fs}	0.5	3	0.5	3	mS	V_{DS} = 30V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	Y_{os}		100		100	µS	V_{DS} = 30V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		20		20	pF	V_{DS} = 30V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		2.5		2.5	pF	V_{DS} = 30V, V_{GS} = ØV	f = 1 MHz

TO-39 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

2N6451, 2N6452

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- Low-Noise, High Gain Amplifiers
- Low-Noise Preamplifiers

Absolute maximum ratings at T_A = 25°C

	2N6451	2N6452
Reverse Gate Source Voltage	– 20 V	– 25 V
Reverse Gate Drain Voltage	– 20 V	– 25 V
Continuous Forward Gate Current	10 mA	10 mA
Continuous Device Power Dissipation	360 mW	360 mW
Power Derating	2.88 mW/°C	2.88 mW/°C

At 25°C free air temperature:		2N6451		2N6452		Process NJ132L		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1			nA	V_{GS} = – 10V, V_{DS} = ØV	
					– 0.5	nA	V_{GS} = – 15V, V_{DS} = ØV	
			– 0.2			µA	V_{GS} = – 10V, V_{DS} = ØV	T_A = 125°C
					– 1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.5	– 3.5	– 0.5	– 3.5	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	20	5	20	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$	15	30	15	30	mS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
						mS	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Common Source Output Conductance	$\lvert Y_{os} \rvert$		50		50	µS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
						µS	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		25		25	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
						pF	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Common Source Reverse Transfer Capacitance	C_{rss}		5		5	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
						pF	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		5		10	nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 10 kHz
			3		8	nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
Noise Figure	NF		1.5		2.5	dB	V_{DS} = 10V, I_D = 5 mA R_G = 10 kΩ	f = 10 Hz

TO-72 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

2N6453, 2N6454

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- Low-Noise, High Gain Amplifiers
- Low-Noise Preamplifiers

Absolute maximum ratings at T_A = 25°C

	2N6453	2N6454
Reverse Gate Source Voltage	– 20 V	– 25 V
Reverse Gate Drain Voltage	– 20 V	– 25 V
Continuous Forward Gate Current	10 mA	10 mA
Continuous Device Power Dissipation	360 mW	360 mW
Power Derating	2.88 mW/°C	2.88 mW/°C

At 25°C free air temperature:		2N6453		2N6454		Process NJ132L		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1			nA	V_{GS} = – 10V, V_{DS} = ØV	
					– 0.5	nA	V_{GS} = – 15V, V_{DS} = ØV	
			– 0.2			µA	V_{GS} = – 10V, V_{DS} = ØV	T_A = 125°C
					– 1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.75	– 5	– 0.75	– 5	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	15	50	15	50	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transmittance	$\lvert Y_{fs} \rvert$					mS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
		20	40	20	40	mS	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Common Source Output Conductance	$\lvert Y_{os} \rvert$					µS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
			100		100	µS	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}					pF	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
			25		25	pF	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Common Source Reverse Transfer Capacitance	C_{rss}					pF	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
			5		5	pF	V_{DS} = 10V, I_D = 15 mA	f = 1 kHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		5		10	nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 10 kHz
			3		8	nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
Noise Figure	NF		1.5		2.5	dB	V_{DS} = 10V, I_D = 5 mA R_G = 10 kΩ	f = 10 Hz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

2N6550

N-Channel Silicon Junction Field-Effect Transistor

- **Low-Noise, High Gain Amplifier**

Absolute maximum ratings at T_A =25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuious Forward Gate Current	50 mA
Continuous Device Power Dissipation	400 mW
Power Derating	2.3 mW/°C
Junction Temperature (Operating & Storage)	– 65°C to +200°C

At 25°C free air temperature:		2N6550			Process NJ450L		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20			V	I_G = 10 µA, V_{DS} = ØV	
Gate Leakage Current	I_{GSS}			– 3	nA	V_{GS} = – 10V, V_{DS} = ØV	
				– 0.1	µA	V_{GS} = – 10V, V_{DS} = ØV	T_A = 85°C
Zero Gate Voltage Drain Current (Pulsed)	I_{DSS}	10	100	250	mA	V_{DS} = 10V, V_{GS} = Ø V	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.3		– 3	V	V_{DS} = 10V, I_D = 0.1 mA	
Dynamic Electrical Characteristics							
Transconductance	g_{fs}	25		150	mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Output Conductance	$\|Y_{os}\|$			150	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		30	35	pF	V_{DS} = 10V, I_D = 10 mA	f = 140 kHz
Common Source Reverse Transfer Capacitance	C_{rss}		10	20	pF	V_{DS} = 10V, V_{DS} = ØV	f = 140 kHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		1.4	2	nV/√Hz	V_{DS} = 5V, I_D = 10 mA	f = 1 kHz
			6	10	nV/√Hz	V_{DS} = 5V, I_D = 10 mA	f = 10 Hz
	$\bar{e}_N$ Total		0.4	0.6	µVrms	V_{DS} = 5V, I_D = 10 mA	f = 10 kHz to 20 kHz
Equivalent Open Circuit Input Noise Current	$\bar{i}_N$		0.1		pA/√Hz	R_S < 100 KΩ	f = 1 kHz

TO-46 Package

Dimensions in Inches (mm)

Pin Configuration

1 Drain, 2 Source, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF140, IF140A

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	375 mW
Power Derating	3 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF140		IF140A		Process NJ14AL		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1		– 0.1	nA	V_{GS} = – 15V, V_{DS} = ØV	
			– 0.2		– 0.2	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 6		– 6	V	V_{DS} = 15V, I_D = 5 nA	
Gate Source Voltage	V_{GS}		– 5	– 2.5	– 6	V	V_{DS} = 15V, I_D = 50 µA	
Gate Source Forward Voltage	$V_{GS(F)}$		1		1	V	V_{DS} = Ø, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	15	5	15	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transmittance	Y_{fs}	4.5		4.5		mS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	Y_{os}		0.05		0.05	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		3		3	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		0.6		0.6	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
		Typ		**Typ**				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	4		4		nV/√Hz	V_{DS} = 12V, V_{GS} = ØV	f = 10 Hz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IF142

N-Channel Silicon Junction Field-Effect Transistor

- **Low-Noise, High Gain Amplifier**

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	375 mW
Power Derating	3 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF142		Process NJ14AL		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 15V, V_{DS} = ØV	
			– 0.2	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		– 6	V	V_{DS} = 15V, I_D = 5 nA	
Gate Source Voltage	V_{GS}		– 5	V	V_{DS} = 15V, I_D = 50 µA	
Gate Source Forward Voltage	$V_{GS(F)}$		1	V	V_{DS} = Ø, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	15	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transmittance	Y_{fs}	3.5		mS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	Y_{os}		0.05	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		3	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		0.6	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	4		nV/√Hz	V_{DS} = 12V, V_{GS} = ØV	f = 10 Hz

TO-236AB Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF1320

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	225 mW
Power Derating	1.8 mW°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF1320		Process NJ132L		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{DS} = ØV, V_{GS} = – 10V	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	20	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	15		mS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		20	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		5	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	2.5		nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz

TO-236AB Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IF1330

N-Channel Silicon Junction Field-Effect Transistor

- **Low-Noise, High Gain Amplifier**

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	225 mW
Power Derating	1.8 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF1330		Process NJ132H		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{DS} = ØV, V_{GS} = – 10V	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	20	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	10		mS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		20	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		5	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	2.5		nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz

TO-236AB Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF1331

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	225 mW
Power Derating	1.8 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF1331		Process NJ132H		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{DS} = ØV, V_{GS} = – 10V	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5	20	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	10		mS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		20	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		5	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	2.5		nV/√Hz	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IF1801

N-Channel Silicon Junction Field-Effect Transistor

- **Low-Noise, High Gain Amplifier**

Absolute maximum ratings = T_A at 25°C

Reverse Gate Source Voltage & Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF1801		Process NJ1800DL		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 10V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 2	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	30		mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	50		mS	V_{DS} = 10V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		100	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		50	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	0.5		nV/√Hz	V_{DG} = 4V, I_D = 5 mA	f = 1 kHz

TO-52 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF3601

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifier

Absolute maximum ratings = T_A at 25°C

Reverse Gate Source Voltage & Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature: Static Electrical Characteristics		IF3601 Min	IF3601 Max	Process NJ3600L Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 10V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 2	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	30		mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics		**Typ**				
Common Source Forward Transconductance	g_{fs}	750		mS	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}	300		pF	V_{DS} = ØV, V_{GS} = – 4V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}	200		pF	V_{DS} = ØV, V_{GS} = – 4V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	0.3		nV/√Hz	V_{DG} = 3V, I_D = 5 mA	f = 100 Hz

TO-39 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IF3602

Dual N-Channel Silicon Junction Field-Effect Transistor

- **Low-Noise, High Gain Amplifier**

Absolute maximum ratings = T_A at 25°C

Reverse Gate Source Voltage & Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	4 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF3602		Process NJ3600L		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.5	nA	V_{GS} = – 10V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 3	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	30		mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics		**Typ**				
Common Source Forward Transconductance	g_{fs}	750		mS	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}	300		pF	V_{DS} = ØV, V_{GS} = – 4V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}	200		pF	V_{DS} = ØV, V_{GS} = – 4V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	0.3		nV/√Hz	V_{DG} = 3V, I_D = 5 mA	f = 100 Hz
		Max				
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$	100		mV	V_{DS} = 10V, V_{GS} = ØV	

TO-78 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Omitted,
5 Source, 6 Drain, 7 Gate, 8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF4500

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	225 mW
Power Derating	1.8 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF4500		Process NJ450L		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 30V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5		mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	15		mS	V_{DS} = 15V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		35	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		8	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	1.5		nV/√Hz	V_{DS} = 12V, V_{GS} = ØV	f = 1 kHz

TO-236AB Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IF4501

N-Channel Silicon Junction Field-Effect Transistor

- **Low-Noise, High Gain Amplifier**

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2.4 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF4501		Process NJ450L		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 10V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5		mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	15		mS	V_{DS} = 15V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		35	pF	V_{DS} = 15V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		9	pF	V_{DS} = 15V, I_D = 5 mA	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	1.5		nV/√Hz	V_{DG} = 12V, I_D = 5 mA	f = 1 kHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF4510

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	1.8 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF4510		Process NJ450H		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 15V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5		mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	15		mS	V_{DS} = 15V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		35	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		8	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	1.5		nV/√Hz	V_{DG} = 12V, V_{GS} = ØV	f = 1 kHz

TO-236AB Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IF4511

N-Channel Silicon Junction Field-Effect Transistor

- **Audio Amplifier**

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	1.8 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF4511		Process NJ450H		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 30V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 1.5	V	V_{DS} = 15V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5		mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	15		mS	V_{DS} = 15V, I_D = 5 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		35	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		8	pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	1.5		nV/√Hz	V_{DG} = 12V, V_{GS} = ØV	f = 1 kHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IF9030

N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise, High Gain Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2.4 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IF9030		Process NJ903L		
Static Electrical Characteristics		**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 0.1	nA	V_{GS} = – 10V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.35	– 2	V	V_{DS} = 10V, I_D = 0.5 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	30	300	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics						
Common Source Forward Transconductance	g_{fs}	80		mS	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		60	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		20	pF	V_{DS} = 10V, I_D = 5 mA	f = 1 MHz
		Typ				
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$	0.5		nV/√Hz	V_{DG} = 4V, I_D = 5 mA	f = 1 kHz

TO-52 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IFN421, IFN422, IFN423

Dual N-Channel Silicon Junction Field-Effect Transistor

- Very High Input Impedance Differential Amplifiers
- Electrometers

Absolute maximum ratings at T_A = 25°C

Device Dissipation (Derate 3.2 mW/°C to 50°C)	400 mW
Total Device Dissipation (Derate 6 mW/°C to 150°C)	750 mW
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IFN421, IFN422, IFN423			Process NJ01		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40	– 60		V	I_G = – 1 µA, V_{DS} = ØV	
Gate to Gate Breakdown Voltage	BV_{G1G2}	±40			V	I_G = – 1 µA, I_D = ØA, I_S = ØA	
Gate Reverse Current	I_{GSS}			– 1	pA	V_{GS} = – 20V, V_{DS} = ØV	
				– 1	nA	V_{GS} = – 20V, V_{DS} = ØV	T_A = +125°C
Gate Operating Current	I_G			– 0.25	pA	V_{DS} = 10V, I_D = 30 µA	
				– 250	pA	V_{DS} = 10V, I_D = 30 µA	T_A = +125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.4		– 2	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Voltage	V_{GS}			– 1.8	V	V_{DS} = 10V, I_D = 30 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	60		1000	µA	V_{DS} = 10V, V_{GS} = Ø V	
Dynamic Electrical Characteristics							
Common Source Forward Transconductance	g_{fs}	100		1500	µS	V_{DS} = 10V, V_{GS} = Ø V	f = 1 kHz
Common Source Output Conductance	g_{os}			3	µS	V_{DS} = 10V, I_D = 30 µA	f = 1 kHz
Common Source Input Capacitance	C_{iss}			3	pF	V_{DS} = 10V, V_{GS} = Ø V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}			1.5	pF	V_{DS} = 10V, V_{GS} = Ø V	f = 1 MHz
Equivalent Circuit Input Noise Voltage	$\bar{e}_N$		20	70	nV/√Hz	V_{DS} = 10V, I_D = 30 µA	f = 10 Hz
Noise Figure	NF			1	dB	V_{DS} = 10V, I_D = 30 µA R_G = 10 MΩ	f = 10 Hz
		Max -	**IFN421**	**IFN422**	**IFN423**		
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$	10	15	25	mV	V_{DG} = 10V, I_D = 30 µA	
Differential Gate Source Voltage With Temperature	$\frac{\lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$	10	25	40	µV/°C	V_{DG} = 10V, I_D = 30 µA	T_A = – 55°C T_B = 25°C T_C = 125°C
		Min -	**IFN421**	**IFN422**	**IFN423**		
Common Mode Rejection Ratio	CMRR	90	80	80	dB	V_{DG} = 10V to 20V, I_D = 30 µA	

TO-78 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source 1, 2 Drain 1, 3 Gate 1, 4 Case,
5 Source 2, 6 Drain 2, 7 Gate 2,
8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IFN424, IFN425, IFN426

Dual N-Channel Silicon Junction Field-Effect Transistor

- Very High Impedance Differential Amplifiers
- Electrometers

Absolute maximum ratings at T_A = 25°C

Device Dissapation (Derate 3.2 mW/°C to 50°C)	400 mW
Total Device Dissipation (Derate 6 mW/°C to 150 °C)	750 mW
Storage Temperature Range	– 60 °C to 200 °C

At 25°C free air temperature:		IFN424, IFN425, IFN426			Process NJ01		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40	– 60		V	I_G = – 1 µA, V_{DS} = ØV	
Gate to Gate Breakdown Voltage	BV_{G1G2}	±40			V	I_G = – 1 µA, I_D = ØA, I_S = ØA	
Gate Reverse Current	I_{GSS}			– 3	pA	V_{GS} = – 20V, V_{DS} = ØV	
				– 3	nA	V_{GS} = – 20V, V_{DS} = ØV	T_A = +125°C
Gate Operating Current	I_G			– 0.5	pA	V_{DS} = 10V, I_D = 30 µA	
				– 500	pA	V_{DS} = 10V, I_D = 30 µA	T_A = +125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.4		– 3	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Voltage	V_{GS}			– 2.9	V	V_{DS} = 10V, I_D = 30 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	60	1800		µA	V_{DS} = 10V, V_{GS} = Ø V	
Dynamic Electrical Characteristics							
Common Source Forward Transconductance	g_{fs}	100		1500	µS	V_{DS} = 10V, V_{GS} = Ø V	f = 1 kHz
Common Source Output Conductance	g_{os}			3	µS	V_{DS} = 10V, I_D = 30 µA	f = 1 kHz
Common Source Input Capacitance	C_{iss}			3	pF	V_{DS} = 10V, V_{GS} = Ø V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}			1.5	pF	V_{DS} = 10V, V_{GS} = Ø V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		20	70	nV/√Hz	V_{DS} = 10V, I_D = 30 µA	f = 10 Hz
Noise Figure	NF			1	dB	V_{DS} = 10V, I_D = 30 µA R_G = 1 MΩ	f = 10 Hz
		Max -	**IFN424**	**IFN425**	**IFN426**		
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$	10	15	25	mV	V_{DG} = 10V, I_D = 30 µA	
Differential Gate Source Voltage With Temperature	$\frac{\lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$	10	25	40	µV/°C	V_{DG} = 10V, I_D = 30 µA	T_A = – 55°C T_B = 25°C T_C = 125°C
		Min -	**IFN424**	**IFN425**	**IFN426**		
Common Mode Rejection Ratio	CMRR	90	80	80	dB	V_{DG} = 10V to 20V, I_D = 30 µA	

TO-78 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source 1, 2 Drain 1, 3 Gate 1, 4 Case,
5 Source 2, 6 Drain 2, 7 Gate 2,
8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IFN860

Dual N-Channel Silicon Junction Field-Effect Transistor

- Low-Noise Audio Amplifier
- Equivalent to Crystalonics CD860

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 20 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	400 mW
Power Derating	2.3 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IFN860			Process NJ450L		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 20			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Leakage Voltage	I_{GSS}			3	nA	V_{GS} = – 10V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.3		– 3	V	V_{DS} = 10V, I_D = 100 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	10			mA	V_{DS} = 10V, V_{GS} = Ø V	
Differential Gate Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$			25	mV	V_{DS} = 10V, I_D = 100 µA	
Dynamic Electrical Characteristics							
Transconductance	g_m	25	40		mS	V_{DS} = 10V, I_D = – 10 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		30	35	pF	V_{DS} = 10V, I_D = – 10 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		17	20	pF	V_{DS} = 10V, I_D = – 10 mA	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$			2	nV/√Hz	V_{DG} = 3V, I_D = 10 mA	f = 1 kHz

TO-71 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate, 5 Source, 6 Drain, 7 Gate

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IFN5114, IFN5115, IFN5116

P-Channel Silicon Junction Field-Effect Transistor

- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 50 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	500 mW
Power Derating	4 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature: Static Electrical Characteristics		IFN5114		IFN5115		IFN5116		Process PJ99		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	30		30		30		V	I_G = – 1 mA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		2		2		2	nA	V_{GS} = 20V, V_{DS} = ØV	
			10		10		10	µA	V_{GS} = 20V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	5	10	3	6	1	4	V	V_{DS} = – 15V, I_G = – 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$		– 1		– 1		– 1	V	V_{DS} = ØV, I_G = – 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 30	– 90					mA	V_{DS} = – 15V, V_{GS} = 18V	
				– 15	– 60	– 5	– 25	mA	V_{DS} = – 15V, V_{GS} = 15V	
Drain Cutoff Current	$I_{D(OFF)}$		– 2		– 2		– 2	nA	V_{DS} = – 15V, V_{GS} = 12V	
			– 10		– 10		– 10	µA	V_{DS} = – 15V, V_{GS} = 7V	T_A = 150°C
Drain Source ON Voltage	$V_{DS(ON)}$		– 1.3					V	V_{GS} = ØV, I_D = – 15 mA	
					– 0.8			V	V_{GS} = ØV, I_D = – 7 mA	
							– 0.6	V	V_{GS} = ØV, I_D = – 3 mA	
Static Drain Source ON Resistance	$r_{DS(ON)}$		75		100		150	Ω	V_{GS} = ØV, I_D = – 1 mA	
Dynamic Electrical Characteristics										
Drain Source ON Resistance	$r_{ds(on)}$		75		100		150	Ω	V_{GS} = ØV, I_D = ØA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		25		25		27	pF	V_{DS} =– 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		7					pF	V_{DS} = – 10V, V_{GS} = 12V	f = 1 MHz
					7			pF	V_{DS} = – 10V, V_{GS} = 7V	f = 1 MHz
							7	pF	V_{DS} = – 10V, V_{GS} = 5V	f = 1 MHz

Switching Characteristics										IFN5114	IFN5115	IFN5116	
Turn ON Delay Time	$t_{d(on)}$		6		10		25	ns	V_{DD}	– 10	– 6	– 6	V
Rise Time	t_r		10		20		35	ns	V_{GG}	20	12	8	V
Turn OFF Delay Time	$t_{d(off)}$		6		8		20	ns	R_L	130	910	2000	Ω
Fall Time	t_f		15		30		60	ns	R_G	100	220	390	Ω
									$I_{D(ON)}$	– 15	– 7	– 3	mA

TO-18 Package
See Section G for Outline Dimensions

Surface Mount
SMP5114, SMP5115, SMP5116

Pin Configuration
1 Source 1, 2 Gate & Case, 3 Drain

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

IFN5432, IFN5433, IFN5434

N-Channel Silicon Junction Field-Effect Transistor

- Analog Low On Resistance Switches
- Choppers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	100 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2.4 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		IFN5432		IFN5433		IFN5434		Process NJ903		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		– 25		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 200		– 200		– 200	pA	V_{GS} = – 15V, V_{DS} = ØV	
			– 200		– 200		– 200	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4	– 10	– 3	– 9	– 1	– 4	V	V_{DS} = 5V, I_G = 3 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	150		100		30		mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		200		200		200	pA	V_{DS} = 5V, V_{GS} = – 10V	
			200		200		200	nA	V_{DS} = 5V, V_{GS} = – 10V	T_A = 150°C
Drain Source ON Voltage	V_{DS}		50		70		100	mV	V_{GS} = ØV, I_D = 10 mA	
Static Drain Source ON Resistance	$r_{DS(ON)}$	2	5		7		10	Ω	V_{DS} = ØV, I_D = 10 mA	
Dynamic Electrical Characteristics										
Drain Source ON Resistance	$r_{ds(on)}$		5		7		10	Ω	V_{GS} = ØV, I_D = ØA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		60		60		60	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		20		20		20	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Switching Characteristics										
Turn ON Delay Time	$t_{d(on)}$		4		4		4	ns	V_{DD} = 1.5 V, $V_{GS(ON)}$ = ØV $V_{GS(OFF)}$ = – 12V, $I_{D(ON)}$ = 10 mA **(IFN5432)** R_L = 145 Ω **(IFN5433)** R_L = 143 Ω **(IFN5433)** R_L = 140 Ω	
Rise Time	t_r		1		1		1	ns		
Turn OFF Delay Time	$t_{d(off)}$		6		6		6	ns		
Fall Time	t_f		30		30		30	ns		

TO-52 Package

Dimensions in Inches (mm)

Pin Configuration

1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IFN5564, IFN5565, IFN5566

N-Channel Dual Silicon Junction Field-Effect Transistor

- Wide Band Differential Amplifier
- Commutators

Absolute maximum ratings at T_A = 25°C.

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	650 mW
Power Derating	3.3 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		IFN5564		IFN5565		IFN5566		Process NJ72		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40		– 40		– 40		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Leakage Voltage	I_{GSS}		– 100		– 100		– 100	pA	V_{GS} = – 20 V, V_{DS} = ØV	
			– 200		– 200		– 200	nA		T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.5	– 3	– 0.5	– 3	– 0.5	– 3	V	V_{DS} = 15 V, I_D = 1 nA	
Gate Source Voltage	$V_{GS(f)}$		1		1		1	V	V_{DS} = ØV, I_G = 2 mA	
Saturation Current (Pulsed)	I_{DSS}	5	30	5	30	5	30	mA	V_{DS} = 15 V, V_{GS} = ØV	
Static Drain Source ON Resistance	$rDS_{(ON)}$		100		100		100	Ω	I_D = 1 mA, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	7000	12500	7000	12500	7000	12500	µhmo	V_{DG} = 15 V, I_D = 2 mA	f = 1 kHz
		7000		7000		7000		µhmo		f = 100 MHz
Common Source Output Transconductance	g_{os}		45		45		45	µhmo	V_{DS} = 15 V, I_D = 2 mA	f = 1 kHz
Common Source Input Capacitance	C_{iss}		12		12		12	pF	V_{DS} = 15 V, I_D = 2 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		3		3		3	pF	V_{DS} = 15 V, I_D = 2 mA	f = 1 MHz
Noise Figure	NF		1		1		1	dB	V_{DS} = 15 V, I_D = 2 mA, R_G = 1 MΩ	f = 10 Hz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		50		50		50	nV/√Hz	V_{DG} = 15 V, I_D = 2 mA	f = 10 Hz
Characteristics										
Saturation Drain Current Ratio (Pulsed)	$\frac{I_{DSS1}}{I_{DSS2}}$	0.95	1	0.95	1	0.95	1	– / –	V_{DG} = 15 V, V_{GS} = ØV	
Differential Gate Source Voltage	$\lvert V_{GS(1)} - V_{GS(2)} \rvert$		5		10		20	mV	V_{DS} = 15 V, I_D = 2 mA	
Gate Source Voltage Differential Drift	$\frac{\Delta \lvert V_{GS(f)} - V_{GS(f)} \rvert}{\Delta T}$		10		25		50	µV/°C	V_{DS} = 15 V,	T_A = 25°C T_B = 125°C
			10		25		50	µV/°C	I_D = 2 mA	T_A = 55°C T_B = 25°C
Transconductance Ratio (Pulsed)	$\frac{g_{fs(1)}}{g_{fs(2)}}$	0.95	1	0.9	1	0.9	1	– / –	V_{DS} = 15 V, I_D = 2 mA	

TO-71 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Omitted,
5 Source, 6 Drain, 7 Gate, 8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

IFN5911, IFN5912

N-Channel Dual Silicon Junction Field-Effect Transistor

- VHF Amplifiers
- Wideband Differential Amplifiers

Absolute maximum ratings at T_A = 25°C

Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	500 mW
Power Derating	4 mW/°C
Storage Temperature Range	– 65°C to 200°C

At 25°C free air temperature:		IFN5911		IFN5912		Process NJ30L or NJ36D		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100	pA	V_{GS} = – 15V, V_{DS} = ØV	
			– 250		– 250	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Operating Current	I_G		– 100		– 100	pA	V_{DG} = 10V, I_D = 5 mA	
			– 100		– 100	nA	V_{DG} = 10V, I_D = 5 mA	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1	– 5	– 1	– 5	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Voltage	V_{GS}	– 0.3	– 4	– 0.3	– 4	V	V_{DS} = 10V, I_D = 5 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	7	40	7	40	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	3000	10000	3000	10000	µS	V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
		3000	10000	3000	10000	µS	V_{DG} = 10V, I_D = 5 mA	f = 100 MHz
Common Source Output Conductance	g_{os}		100		100	µS	V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
			150		150	µS	V_{DG} = 10V, I_D = 5 mA	f = 100 MHz
Common Source Input Capacitance	C_{iss}		5		5	pF	V_{DG} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.2	pF	V_{DG} = 10V, I_D = 5 mA	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		20		20	nV/√Hz	V_{DG} = 10V, I_D = 5 mA	f = 10 kHz
Noise Figure	NF		1		1	dB	V_{DG} = 10V, I_D = 5 mA R_G = 100 KΩ	f = 10 Hz
Differential Gate Current	$\lvert I_{G1}\rvert - \lvert I_{G2}\rvert$		20		20	nA	V_{DG} = 10V, I_D = 5 mA	T_A = 125°C
Saturation Drain Current Ratio	I_{DSS1}/I_{DSS2}	0.95	1	0.95	1		V_{DS} = 10V, V_{GS} = ØV	
Differential Gate Source Voltage	$V_{GS1} - V_{GS2}$		10		15	mV	V_{DG} = 10V, I_D = 5 mA	
Gate Source Voltage Differential Drift	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		20		40	µV/°C	V_{DG} = 10V, I_D = 5 mA	T_A = 25°C T_B = 125°C
	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		20		40	µV/°C	V_{DG} = 10V, I_D = 5 mA	T_A = – 55°C T_B = 25°C
Transconductance Ratio	g_{fs1}/g_{fs2}	0.95	1	0.95	1		V_{DG} = 10V, I_D = 5 mA	f = 1 kHz

TO-78 Package

See Section G for Outline Dimensions

Pin Configuration

1 Source, 2 Drain, 3 Gate, 4 Case,
5 Source, 6 Drain, 7 Gate, 8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

IFN6449, IFN6450

N-Channel Silicon Junction Field-Effect Transistor

- High Voltage

Absolute maximum ratings at T_A = 25°C

	IFN6449	IFN6450
Reverse Gate Source Voltage	– 100 V	– 100 V
Reverse Gate Drain Voltage	– 300 V	– 200 V
Continuous Forward Gate Current	10 mA	10 mA
Continuous Device Power Dissipation	800 mW	800 mW
Power Derating	6.4 mW/°C	6.4 mW/°C

At 25°C free air temperature:		IFN6449		IFN6450		Process NJ42		
Static Electrical Characteristics		Min	Max	Min	Max	Unit	Test Conditions	
Gate Drain Breakdown Voltage	$V_{(BR)GDO}$	– 300		– 200		V	I_G = – 10 µA, I_S = ØA	
Gate Source Breakdown Voltage	$V_{(BR)GSO}$	– 100		– 100		V	I_G = – 10 µA, I_D = ØA	
Gate Reverse Current	I_{GSS}				– 100	nA	V_{GS} = – 80V, V_{DS} = ØV	
					– 100	µA	V_{GS} = – 80V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2	– 15	– 2	– 15	V	V_{DS} = 30V, I_D = 4 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	2	10	2	10	mA	V_{DS} = 30V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transfer Transmittance	$\lvert Y_{fs} \rvert$	0.5	3	0.5	3	mS	V_{DS} = 30V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		100		100	µS	V_{DS} = 30V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		10		10	pF	V_{DS} = 30V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		5		5	pF	V_{DS} = 30V, V_{GS} = ØV	f = 1 MHz

TO-39 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

J108, J109

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J108		J109		Process NJ450		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 3		– 3	nA	V_{GS} = – 15V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 3	– 10	– 2	– 6	V	V_{DS} = 5V, I_D = 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	80		40		mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		3		3	nA	V_{DS} = 5V, V_{GS} = – 10V	
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$		8		12	Ω	V_{GS} = Ø, V_{DS} < = 0.1V	f = 1 kHz
Drain Gate Capacitance	C_{gd}		15		15	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Source Gate Capacitance	C_{gs}		15		15	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Drain Gate + Source Gate Capacitance	C_{gd} + C_{gs}		85		85	pF	V_{DS} = V_{GS} = ØV	f = 1 MHz
Switching Characteristics		**Typ**		**Typ**				
Turn ON Delay Time	$td_{(on)}$	3		3		ns		
Rise Time	t_r	1		1		ns		
Turn OFF Delay Time	$td_{(off)}$	4		4		ns		
Fall Time	t_f	18		18		ns		

	J108	J109	
V_{DD}	1.5	1.5	V
$V_{GS(OFF)}$	– 12	– 7	V
R_L	150	150	Ω

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ108, SMPJ109

www.interfet.com

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

J110, J110A

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J110		J110A		Process NJ450		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 3		– 3	nA	V_{GS} = – 15V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.5	– 4	– 0.5	– 4	V	V_{DS} = 5V, I_D = 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	10		10		mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		3		3	nA	V_{DS} = 5V, V_{GS} = – 10V	
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$		18		25	Ω	V_{GS} = Ø, V_{DS} < = 0.1V	f = 1 kHz
Drain Gate Capacitance	C_{gd}		15		15	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Source Gate Capacitance	C_{gs}		15		15	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Drain Gate + Source Gate Capacitance	C_{gd} + C_{gs}		85		85	pF	V_{DS} = V_{GS} = ØV	f = 1 MHz

Switching Characteristics		**Typ**	**Typ**					
Turn ON Delay Time	$td_{(on)}$	4	4	ns		**J110**	**J110A**	
Rise Time	t_r	1	1	ns	V_{DD}	1.5	1.5	V
Turn OFF Delay Time	$td_{(off)}$	6	6	ns	$V_{GS(OFF)}$	– 5	– 5	V
Fall Time	t_f	30	30	ns	R_L	150	150	Ω

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ110, SMPJ110A

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J111, J112, J113

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 35 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature Static Electrical Characteristics		J111		J112		J113		Process NJ132		
		Min	Max	Min	Max	Min	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 35		– 35		– 35		V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 1		– 1		– 1	nA	V_{GS} = – 15V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 3	– 10	– 1	– 5		– 3	V	V_{DS} = 5V, I_D = 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	20		5		2		mA	V_{DS} = 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		– 1		– 1		– 1	nA	V_{DS} = 15V, V_{GS} = – 10V	
Dynamic Electrical Characteristics										
Drain Source ON Resistance	$r_{ds(on)}$		30		50		100	Ω	V_{GS} = ØV, V_{DS} = 0.1V	f = 1 kHz
Drain Gate Capacitance	C_{dg}		5		5		5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Source Gate Capacitance	C_{gs}		5		5		5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Drain Gate + Source Gate Capacitance	C_{gd} + C_{gs}		28		28		28	pF	V_{DS} = V_{GS} = ØV	f = 1 MHz

Switching Characteristics		Typ	Typ	Typ			J111	J112	J113	
Turn ON Delay Time	$t_{d(on)}$	7	7	7	ns					
Rise Time	t_r	6	6	2	ns	V_{DD}	10	10	10	V
Turn OFF Delay Time	$t_{d(off)}$	20	20	20	ns	$V_{GS(OFF)}$	– 12	– 7	– 5	V
Fall Time	t_f	15	15	15	ns	R_L	800	1600	3200	Ω

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ111, SMPJ112, SMPJ113

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J174, J175

P-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 30 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J174		J175		Process PJ99		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	30		30		V	I_G = 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		1		1	nA	V_{GS} = 20V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	5	10	3	6	V	V_{DS} = – 15V, I_D = – 10 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 20	– 125	– 7	– 70	mA	V_{DS} = – 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		– 1		– 1	nA	V_{DS} = – 15V, V_{GS} = 10V	
Dynamic Electrical Characteristics			**Max**		**Max**			
Drain Source ON Resistance	$r_{ds(on)}$		85		85	Ω	V_{GS} = Ø, V_{DS} < = 0.1V	f = 1 kHz
Dynamic Electrical Characteristics			**Typ**		**Typ**			
Drain Gate Capacitance	C_{gd}		5.5		5.5	pF	V_{DS} = ØV, V_{GS} = 10V	f = 1 MHz
Source Gate Capacitance	C_{gs}		5.5		5.5	pF	V_{DS} = ØV, V_{GS} = 10V	f = 1 MHz
Drain Gate + Source Gate Capacitance	C_{gd} + C_{gs}		32		32	pF	V_{DS} = V_{GS} = ØV	f = 1 MHz
Switching Characteristics								
Turn ON Delay Time	$td_{(on)}$		2		5	ns		
Rise Time	t_r		5		10	ns		
Turn OFF Delay Time	$td_{(off)}$		5		10	ns		
Fall Time	t_f		10		20	ns		

	J174	J175	
V_{DD}	– 10	– 6	V
$V_{GS(OFF)}$	12	8	V
R_L	560	1.2 k	Ω
$V_{GS(ON)}$	Ø	Ø	V

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Gate, 3 Source

Surface Mount
SMPJ174, SMPJ175

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J176, J177

P-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Commutators
- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 30 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J176		J177		Process PJ99		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	30		30		V	I_G = 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		1		1	nA	V_{GS} = 20V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	1	4	0.8	2.25	V	V_{DS} = – 15V, I_D = – 10 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	– 2	– 35	– 1.5	– 20	mA	V_{DS} = – 15V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		– 1		– 1	nA	V_{DS} = – 15V, V_{GS} = 10V	
Dynamic Electrical Characteristics			**Max**		**Max**			
Drain Source ON Resistance	$r_{ds(on)}$		250		300	Ω	V_{GS} = Ø, V_{DS} < = 0.1V	f = 1 kHz
Dynamic Electrical Characteristics			**Typ**		**Typ**			
Drain Gate Capacitance	C_{gd}		5.5		5.5	pF	V_{DS} = ØV, V_{GS} = 10V	f = 1 MHz
Source Gate Capacitance	C_{gs}		5.5		5.5	pF	V_{DS} = ØV, V_{GS} = 10V	f = 1 MHz
Drain Gate + Source Gate Capacitance	C_{gd} + C_{gs}		32		32	pF	V_{DS} = V_{GS} = ØV	f = 1 MHz
Switching Characteristics								
Turn ON Delay Time	$td_{(on)}$		15		20	ns		
Rise Time	t_r		20		25	ns		
Turn OFF Delay Time	$td_{(off)}$		15		20	ns		
Fall Time	t_f		20		25	ns		

	J176	J177	
V_{DD}	– 6	– 6	V
$V_{GS(OFF)}$	6	3	V
R_L	5.6 k	10 k	Ω
$V_{GS(ON)}$	Ø	Ø	V

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Gate, 3 Source

Surface Mount
SMPJ176, SMPJ177

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J201, J202

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- General Purpose Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		J201			J202			Process NJ16		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40			– 40			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 100			– 100	pA	V_{GS} = – 20V, V_{DS} = ØV	
Gate Operating Current	I_G		– 10			– 10		pA	V_{DG} = 20V, I_D = $I_{DSS(min)}$	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.3		– 1.5	– 0.8		– 4	V	V_{DS} = 20V, I_D = 10 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.2		1	0.9		4.5	mA	V_{DSS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	500			1000			µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		1			3.5		µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4			4		pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1			1		pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		5			5		nV/√Hz	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ201, SMPJ202

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J203, J204

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- General Purpose Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J203			J204			Process NJ16		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40			– 25			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 100			– 100	pA	V_{GS} = – 20V, V_{DS} = ØV	
Gate Operating Current	I_G		– 10			– 10		pA	V_{DG} = 20V, I_D = $I_{DSS(min)}$	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2		– 10	– 0.3		– 2	V	V_{DS} = 20V, I_D = 10 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	4		20	0.2	1.2	3	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	1500			500	1500		µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		10			2.5		µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4			4		pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1			1		pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		5			10		nV/√Hz	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ203, SMPJ204

www.interfet.com

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

J210, J211

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers
- General Purpose Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		J210			J211			Process NJ26L		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			– 25			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 100			– 100	pA	V_{GS} = – 15V, V_{DS} = ØV	
Gate Operating Current	I_G		– 10			– 10		pA	V_{DS} = 20V, I_D = 1 mA	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1		– 3	– 2.5		– 4.5	V	V_{DS} = 15V, I_D = 1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	2		15	7		20	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	4000		12000	6000		12000	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}			150			200	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4			4		pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1			1		pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10			10		nV/√Hz	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ210, SMPJ211

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

J212

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifier
- General Purpose Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J212			Process NJ26L		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 100	pA	V_{GS} = – 15V, V_{DS} = ØV	
Gate Operating Current	I_G		– 10		pA	V_{DS} = 20V, I_D = 1 mA	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4		– 6	V	V_{DS} = 15V, I_D = 1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	15		40	mA	V_{DS} = 15V, V_{GS} = Ø V	
Dynamic Electrical Characteristics							
Common Source Forward Transconductance	g_{fs}	7000		12000	µS	V_{DS} = 15V, V_{GS} = Ø V	f = 1 kHz
Common Source Output Conductance	g_{os}			200	µS	V_{DS} = 15V, V_{GS} = Ø V	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4		pF	V_{DS} = 15V, V_{GS} = Ø V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1		pF	V_{DS} = 15V, V_{GS} = Ø V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10		nV/√Hz	V_{DS} = 15V, V_{GS} = Ø V	f = 1 kHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ212

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J230, J231

N-Channel Silicon Junction Field-Effect Transistor

- Audio Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		J230			J231			Process NJ16		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40			– 40			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 250			– 250	pA	V_{GS} = – 30V, V_{DS} = ØV	
Gate Operating Current	I_G		– 2			– 2		pA	V_{DS} = 20V, I_D = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 0.5		– 3	– 1.5		– 5	V	V_{DS} = 20V, I_D = 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	0.7		3	2		6	mA	V_{DS} = 20V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	1000		3500	1500		4000	µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Output Conductance	g_{os}		1.5			3		µS	V_{DS} = 20V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4			4		pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1			1		pF	V_{DS} = 20V, V_{GS} = ØV	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		8	30		8	30	nV/√Hz	V_{DS} = 10V, V_{GS} = ØV	f = 10 Hz
			2			2		nV/√Hz	V_{DS} = 10V, V_{GS} = ØV	f = 1 kHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ230, SMPJ231

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

J232

N-Channel Silicon Junction Field-Effect Transistor

- **Audio Amplifier**

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 40 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		J232			Process NJ16		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 40			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 250	pA	V_{GS} = – 30V, V_{DS} = ØV	
Gate Operating Current	I_G		– 2		pA	V_{DS} = 20V, I_D = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 3		– 6	V	V_{DS} = 20V, I_D = 1 µA	
Drain Saturation Current (Pulsed)	I_{DSS}	5		10	mA	V_{DS} = 20V, V_{GS} = Ø V	
Dynamic Electrical Characteristics							
Common Source Forward Transconductance	g_{fs}	2500		5000	µS	V_{DS} = 20V, V_{GS} = Ø V	f = 1 kHz
Common Source Output Conductance	g_{os}		5		µS	V_{DS} = 20V, V_{GS} = Ø V	f = 1 kHz
Common Source Input Capacitance	C_{iss}		4		pF	V_{DS} = 20V, V_{GS} = Ø V	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1		pF	V_{DS} = 20V, V_{GS} = Ø V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		20	30	nV/√Hz	V_{DS} = 10V, V_{GS} = Ø V	f = 10 Hz
			6		nV/√Hz	V_{DS} = 10V, V_{GS} = Ø V	f = 1 kHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ232

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J304, J305

N-Channel Silicon Junction Field-Effect Transistor

- Mixers
- Oscillators
- VHF/UHF Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 30 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		J304			J305			Process NJ26		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 30			– 30			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 100			– 100	pA	V_{GS} = – 20V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2		– 6	– 0.5		– 3	V	V_{DS} = 15V, I_D = 1 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	5		15	1		8	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	4500		7500	3000			µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
						3000		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			4200					µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Output Conductance	g_{os}			50			50	µS	V_{DS} = 15V, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		3			3		pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		0.85			0.85		pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Output Capacitance	C_{oss}		1			1		pF	V_{DS} = 15V, V_{GS} = ØV	f = 1 MHz
Common Source Output Conductance	g_{os}		60			60		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			80					µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Output Susceptance	b_{os}		800			800		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			3600					µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Input Conductance	g_{is}		80			80		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			800					µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Input Susceptance	b_{is}		2000			2000		µS	V_{DS} = 15V, V_{GS} = ØV	f = 100 MHz
			7500					µS	V_{DS} = 15V, V_{GS} = ØV	f = 400 MHz
Common Source Power Gain	G_{ps}		20					dB	V_{DS} = 15V, I_D = 5 mA	f = 100 MHz
			11					dB	V_{DS} = 15V, I_D = 5 mA	f = 400 MHz
Noise Figure	NF		1.7					dB	V_{DS} = 15V, I_D = 5 mA R_G = 1 Ω	f = 100 MHz
			3.8					dB		f = 400 MHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ304, SMPJ305

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

J308, J309

N-Channel Silicon Junction Field-Effect Transistor

- Mixers
- Oscillators
- VHF/UHF Amplifiers

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature: Static Electrical Characteristics		J308			J309			Process NJ72		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			– 25			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 1			– 1	nA	V_{GS} = – 15V, V_{DS} = ØV	
				– 1			– 1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = +125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1		– 6.5	– 1		– 4	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1			1	V	V_{DS} = ØV, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	12		60	12		30	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	g_{fs}	8000	17000		10000	17000		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Output Conductance	g_{os}			250			250	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Gate Forward Transconductance	g_{fg}		13000			13000		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Gate Output Transconductance	g_{og}		150			100		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Gate Drain Capacitance	C_{dg}		1.8	2.5		1.8	2.5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Gate Source Capacitance	C_{gs}		4	5		4	5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10			10		nV/√Hz	V_{DS} = 10V, I_D = 10 mA	f = 100 kHz
Common Source Forward Transconductance	$Re_{(Yfs)}$		12			12		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Gate Input Conductance	$Re_{(Yig)}$		14			14		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Source Input Conductance	$Re_{(Yis)}$		0.4			0.4		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Source Output Conductance	$Re_{(Gos)}$		0.15			0.15		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Gate Power Gain at Noise Match	G_{pg}		16			16		dB	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			11			11		dB	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Noise Figure	NF		1.5			1.5		dB	V_{DS} = 15V, I_D = 10 mA	f = 105 MHz
			2.7			2.7		dB	V_{DS} = 15V, I_D = 10 mA	f = 450 MHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ308, SMPJ309

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

J310

N-Channel Silicon Junction Field-Effect Transistor

- Mixer
- Oscillator
- VHF/UHF Amplifier

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source Voltage	– 25 V
Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	360 mW

At 25°C free air temperature:		J310			Process NJ72		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 1	nA	V_{GS} = – 15V, V_{DS} = ØV	
				– 1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = + 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2		– 6.5	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1	V	V_{DS} = ØV, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	24		60	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics							
Common Source Forward Transconductance	g_{fs}	8000	17000		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Output Conductance	g_{os}			250	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Gate Forward Transconductance	g_{fg}		1200		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Gate Output Transconductance	g_{og}		150		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Gate Drain Capacitance	C_{dg}		1.8	2.5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Gate Source Capacitance	C_{gs}		4	5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10		nV/√Hz	V_{DS} = 10V, I_D = 10 mA	f = 100 Hz
Common Source Forward Transconductance	Re (Y_{fs})		12		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Gate Input Conductance	Re (Y_{ig})		14		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Source Input Conductance	Re (Y_{is})		0.4		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Source Output Conductance	Re (g_{os})		0.15		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
Common Gate Power Gain at Noise Match	G_{pg}		16		dB	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			11		dB	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Noise Figure	NF		1.5		dB	V_{DS} = 15V, I_D = 10 mA	f = 105 MHz
			2.7		dB	V_{DS} = 15V, I_D = 10 mA	f = 450 MHz

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Drain, 2 Source, 3 Gate

Surface Mount
SMPJ310

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

P1086, P1087

P-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Analog Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	30 V
Continuous Forward Gate Current	50 mA
Continuous Device Power Dissipation	360 mW
Power Derating	3.27 mW/°C

At 25°C free air temperature:		P1086		P1087		Process PJ99		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	30		30		V	I_G = 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		2		2	nA	V_{GS} = 15V, V_{DS} = ØV	
Gate Source Cutoff Voltage	$V_{GS(OFF)}$		10		5	V	V_{DS} = – 15V, I_D = – 1 µA	
Saturation Drain Current (Pulsed)	I_{DSS}	– 10		– 5.0		mA	V_{DS} = – 20V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		– 10		– 10	nA	V_{DS} = – 15V, V_{GS} = 12V (P1086)	
			– 0.5		– 0.5	µA	V_{GS} = 7V (P1087)	T_A = 85°C
Drain Reverse Current	I_{DGO}		2		2	nA	V_{DG} = – 15V, I_S = ØA	
			0.1		0.1	µA	V_{DG} = – 15V, I_S = ØA	T_A = 85°C
Drain Source ON Voltage	$V_{DS(ON)}$		– 0.5		– 0.5	V	V_{GS} = ØV, I_D = – 6 mA (P1086)	
			– 0.5		– 0.5	V	V_{GS} = ØV, I_D = – 3 mA (P1087)	
Static Drain Source ON Resistance	$r_{DS(ON)}$		75		150	Ω	I_D = – 1 mA, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$		75		150	Ω	I_D = Ø, V_{GS} = ØV	f = 1 kHz
Common Source Input Capacitance	C_{iss}		45		45	pF	V_{DS} = – 15V, V_{GS} = ØV	f = 1 kHz
Common Source Reverse Transfer Capacitance	C_{rss}		10		10	pF	V_{DS} = ØV, V_{GS} = 12V (P1086)	f = 1 MHz
			10		10	pF	V_{DS} = ØV, V_{GS} = 7V (P1087)	
Switching Characteristics								
Turn ON Delay Time	$td_{(on)}$		15		15	ns	V_{DD} = – 6V, $V_{GS(ON)}$ = ØV	
Rise Time	t_r		20		75	ns		
Turn OFF Delay Time	$td_{(off)}$		15		25	ns		
Fall Time	t_f		50		100	ns		

	P1086	P1087	
$V_{GS(OFF)}$	12	7	V
$V_{D(ON)}$	– 6	– 3	MA
R_L	910	1.8K	Ω

TO-226AA Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate

Surface Mount
SMPP1086, SMPP1087

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

SMP5911, SMP5912

Dual N-Channel Silicon Junction Field-Effect Transistor

- **Wideband Differential Amplifiers**

At 25°C free air temperature:		SMP5911		SMP5912		Process NJ30L		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25		– 25		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 100		– 100	pA	V_{GS} = – 15V, V_{DS} = ØV	
			– 250		– 250	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Operating Current	I_G		– 100		– 100	pA	V_{DG} = 10V, I_D = 5 mA	
			– 100		– 100	nA	V_{DG} = 10V, I_D = 5 mA	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1.0	– 5	– 1.0	– 5	V	V_{DS} = 15V, I_D = 5 nA	
Gate Source Voltage	V_{GS}	– 0.3	– 4	– 0.3	– 4	V	V_{DS} = 15V, I_D = 5 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	7	40	7	40	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics								
Common Source Forward Transconductance	g_{fs}	3000	10000	3000	10000	µS	V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
		3000	10000	3000	10000	µS	V_{DG} = 10V, I_D = 5 mA	f = 100 MHz
Common Source Output Conductance	g_{os}		100		100	µS	V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
			150		150	µS	V_{DG} = 10V, I_D = 5 mA	f = 100 MHz
Common Source Input Capacitance	C_{iss}		5		5	pF	V_{DG} = 10V, I_D = 5 mA	f = 1 MHz
Common Source Reverse Transfer Capacitance	C_{rss}		1.2		1.2	pF	V_{DG} = 10V, I_D = 5 mA	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		20		20	nV/√Hz	V_{DG} = 10V, I_D = 5 mA	f = 10 kHz
Noise Figure	NF		1		1	dB	V_{DG} = 10V, I_D = 5 mA R_G = 100 KΩ	f = 10 kHz
Gate Source Differential Voltage	$V_{GS1} - V_{GS2}$		10		15	mV	V_{DG} = 10V, I_D = 5 mA	
Gate Differential Current	$I_{G1} - I_{G2}$		20		20	nA	V_{DG} = 10V, I_D = 5 mA	T_A = 125°C
Drain Saturation Current Ratio	I_{DSS1} / I_{DSS2}	0.95	1	0.95	1		V_{DG} = 10V, V_{GS} = ØV	
Transconductance Ratio	g_{fs1} / g_{fs2}	0.95	1	0.95	1		V_{DG} = 10V, I_D = 5 mA	f = 1 kHz
Gate Source Differential Voltage With Temperature	$\frac{\Delta V_{GS1} - V_{GS2}}{\Delta T}$		20		40	µV/°C	V_{DG} = 10V, I_D = 5 mA	T_A = 25°C
			20		40	µV/°C	V_{DG} = 10V, I_D = 5 mA	T_B = 125°C
			20		40	µV/°C	V_{DG} = 10V, I_D = 5 mA	T_A = 35°C
			20		40	µV/°C	V_{DG} = 10V, I_D = 5 mA	T_B = 25°C

SOIC-8 Package
See Section G for Outline Dimensions

Pin Configuration
1 Source 1, 2 Drain 1, 3 Gate 1, 4 N/C,
5 Source 2, 6 Drain 2, 7 Gate 2,
8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

U290, U291

N-Channel Silicon Junction Field-Effect Transistor

- Choppers
- Low On Resistance Switches

Absolute maximum ratings at T_A = 25°C

Reverse Gate Source & Reverse Gate Drain Voltage	– 30 V
Continuous Forward Gate Current	100 mA
Continuous Device Power Dissipation	500 mW
Power Derating	4 mW/°C

At 25°C free air temperature:		U290		U291		Process NJ1800D		
Static Electrical Characteristics		**Min**	**Max**	**Min**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 30		– 30		V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}		– 1		– 1	nA	V_{GS} = – 15V, V_{DS} = ØA	
			– 1		– 1	µA	V_{GS} = – 15V, V_{DS} = ØA	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 4	– 10	– 1.5	– 4.5	V	V_{DS} = 15V, I_D = 3 nA	
Drain Saturation Current (Pulsed)	I_{DSS}	500		200		mA	V_{DS} = 10V, V_{GS} = ØV	
Drain Cutoff Current	$I_{D(OFF)}$		1		1	nA	V_{DS} = 5V, V_{GS} = – 10V	
			1		1	µA	V_{DS} = 5V, V_{GS} = – 10V	T_A = 150°C
Drain Source ON Voltage	$V_{DS(ON)}$		30		70	mV	V_{GS} = ØV, I_D = 10 mA	
Static Drain Source ON Resistance	$r_{DS(ON)}$	1	3	2	7	Ω	V_{GS} = ØV, I_D = 10 mA	
Dynamic Electrical Characteristics								
Drain Source ON Resistance	$r_{ds(on)}$	1	3	2	7	Ω	V_{GS} = ØV, I_D = Ø	f = 1 kHz
Drain Gate OFF Capacitance	C_{dgo}		30		30	pF	V_{DG} = 15V, I_S = ØV	f = 1 MHz
Source Gate OFF Capacitance	C_{sgo}		30		30	pF	V_{DG} = 15V, I_S = ØV	f = 1 MHz
Source Gate Plus Drain Gate	C_{iss}		160		160	pF	V_{DG} = ØV, V_{GS} = ØV	f = 1 MHz
Switching Characteristics								
Turn ON Delay Time	$td_{(on)}$		15		15	ns	V_{DD} = 1.5V, $I_{D(ON)}$ = 30 mA R_L = 50Ω $V_{GS(ON)}$ = ØV **(U290)** $V_{GS(OFF)}$ = – 12V **(U291)** $V_{GS(OFF)}$ = – 7V	
Rise Time	t_r		20		20	ns		
Turn OFF Delay Time	$td_{(off)}$		15		15	ns		
Fall Time	t_f		20		20	ns		

TO-52 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

U308, U309

N-Channel Silicon Junction Field-Effect Transistor

- Mixers
- Oscillators
- VHF/UHF Amplifiers

Absolute maximum ratings at T_A = 25°C.

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	20 mA
Continuous Device Power Dissipation	500 mW
Power Derating	4 mw/°C

At 25°C free air temperature: Static Electrical Characteristics		U308			U309			Process NJ72		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			– 25			V	V_{GS} = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 150			– 150	pA	V_{GS} = – 15V, V_{DS} = ØV	
				– 150			– 150	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = +125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1		– 6	– 1		– 4	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1			1	V	V_{DS} = ØV, I_G = 10 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	12		60	12		30	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Gate Forward Transconductance	G_{fs}	10	17		10	17		mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
			15			15		mS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			14			14		mS	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Common Gate Output Conductance	G_{og}			250			250	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
			0.18			0.18		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			0.32			0.32		µS	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Drain Gate Capacitance	C_{dg}			2.5			2.5	pF	V_{DS} = 10V, V_{GS} = – 10V	f = 1 MHz
Gate Source Capacitance	C_{gs}			5		5		pF	V_{DS} = 10V, V_{GS} = – 10V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10			10		nV/√Hz	V_{DS} = 10V, I_D = 10 mA	f = 100 kHz
Common Gate Power Gain	G_{pg}	14	16		14	16		dB	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
		10	11		10	11		dB	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Noise Figure	NF		1.5	2		1.5	2	dB	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			2.7	3.5		2.7	3.5	dB	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz

TO-52 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

Surface Mount
SMPJ308/J309

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

U310

N-Channel Silicon Junction Field-Effect Transistor

- Mixer
- Oscillator
- VHF/UHF Amplifier

Absolute maximum ratings at T_A = 25°C.

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	20 mA
Continuous Device Power Dissipation	500 mW
Power Derating	4 mW/°C

At 25°C free air temperature:		U310			Process NJ72L		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 150	pA	V_{GS} = – 15V, V_{DS} = ØV	
				– 150	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2.5		– 6	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1	V	V_{DS} = ØV, I_G = 10 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	24		60	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics							
Common Gate Forward Transconductance		10	17		mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
	g_{fg}		15		mS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			14		mS	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Common Gate Output Conductance				250	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
	g_{og}		0.18		µS	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			0.32		µS	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Drain Gate Capacitance	C_{dg}			2.5	pF	V_{DS} = 10V, V_{GS} = – 10V	f = 1 MHz
Gate Source Capacitance	C_{gs}			5	pF	V_{DS} = 10V, V_{GS} = – 10V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10		nV/√Hz	V_{DS} = 10V, I_D = 10 mA	f = 100 Hz
Common Gate Power Gain	G_{pg}	14	16		dB	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
		10	11		dB	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz
Noise Figure	NF		1.5	2	dB	V_{DS} = 10V, I_D = 10 mA	f = 105 MHz
			2.7	3.5	dB	V_{DS} = 10V, I_D = 10 mA	f = 450 MHz

TO-52 Package
See Section G for Outline Dimensions

Surface Mount
SMPJ310

Pin Configuration
1 Source, 2 Drain, 3 Gate & Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

U311

N-Channel Silicon Junction Field-Effect Transistor

- Mixer
- Oscillator
- VHF/UHF Amplifier

Absolute maximum ratings at T_A = 25°C.

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Continuous Forward Gate Current	10 mA
Continuous Device Power Dissipation	300 mW
Power Derating	2.4 mW/°C

At 25°C free air temperature:		U311			Process NJ72L		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 150	pA	V_{GS} = – 15V, V_{DS} = ØV	
				– 150	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1		– 6	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1	V	V_{DS} = ØV, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	20		60	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics							
Common Gate Forward Transconductance	g_{fg}	1000	17000		µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Gate Output Conductance	g_{og}			250	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Gate Drain Capacitance	C_{dg}			2.5	pF	V_{DS} = 10V, I_D = 10 mA	f = 1 MHz
Gate Source Capacitance	C_{gs}			5	pF	V_{DS} = 10V, I_D = 10 mA	f = 1 MHz

TO-72 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source, 2 Drain, 3 Gate, 4 Case

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com

U350

Hybrid Quad Silicon Junction Field-Effect Transistor Array

- Analog Multiplier
- VHF Double-Balanced Mixer

Absolute maximum ratings at T_A = 25°C.

Reverse Gate Source & Reverse Gate Drain Voltage	– 25 V
Gate Current	25 mA
Continuous Device Power Dissipation	400 mW
Power Derating	3.2 mW/°C

At 25°C free air temperature:		U350			Four Matched Process NJ72L		
Static Electrical Characteristics		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			V	I_G = – 1 µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 1	nA	V_{GS} = – 15V, V_{DS} = ØV	
				– 1	µA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 125°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 2		– 6	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1	V	V_{DS} = ØV, I_G = 1 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	24		60	mA	V_{DS} = 15V, V_{GS} = ØV	
Dynamic Electrical Characteristics							
Drain Source ON Resistance	$r_{ds(on)}$		50	90	Ω	V_{GS} = ØV, I_D = mA	f = 1 kHz
Common Source Forward Transconductance	g_{fs}	10		18	mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Common Source Output Conductance	g_{os}			150	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
Drain Gate Capacitance	C_{dgo}			2.5	pF	V_{GD} = – 10V, I_S = ØV	f = 1 MHz
Gate Source Capacitance	C_{sgo}			5	pF	V_{GS} = – 10V, I_D = ØV	f = 1 MHz
(Conversion Gain)	G_c		4		dB	V_{DS} = 20V, V_{GS} = 1/2 $V_{GS(OFF)}$ R_D = 1,700 Ω	f = 100 MHz
Noise Figure	NF		7		dB	V_{DS} = 20V, V_{GS} = 1/2 $V_{GS(OFF)}$ R_D = 1,700 Ω	f = 100 MHz
Saturation Drain Current Ratio	I_{DSS} / I_{DSS}	0.9		1		V_{DS} = 15V, V_{DS} = ØV	
Gate Source Cutoff Voltage Ratio	$V_{GS(OFF)}$ / $V_{GS(OFF)}$	0.9		1		V_{DS} = 15V, I_D = 1 nA	
Common Source Forward Transconductance	g_{fs} / g_{fs}	0.9		1		V_{DS} = 15V, I_D = 10 mA	f = 1 kHz
Differential Output Conductance	Y_{os} / Y_{os}	0.9		1		V_{DS} = 15V, I_D = 10 mA	f = 1 kHz

TO-78 Package
Dimensions in Inches (mm)

Pin Configuration
1 Gate 1 & 3, 2 Drain 1 & 4,
3 Source 1 & 2, 4 Ground & Case,
5 Source 3 & 4, 6 Drain 2 & 3,
7 Gate 2 & 4, 8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375

www.interfet.com

U430, U431

Dual N-Channel Silicon Junction Field-Effect Transistor

- Balanced Mixers
- Differential Amplifiers

Absolute maximum ratings at T_A = 25°C.

Total Device Dissipation (Derate 4 mW/°C to150°C)	500 mW
Storage Temperature Range	– 65°C to +150°C
Lead Temperature	300°C

At 25°C free air temperature: Static Electrical Characteristics		U430			U431			Process NJ72		
		Min	Typ	Max	Min	Typ	Max	Unit	Test Conditions	
Gate Source Breakdown Voltage	$V_{(BR)GSS}$	– 25			– 25			V	I_G = – 1µA, V_{DS} = ØV	
Gate Reverse Current	I_{GSS}			– 150			– 150	pA	V_{GS} = – 15V, V_{DS} = ØV	
				– 150			– 150	nA	V_{GS} = – 15V, V_{DS} = ØV	T_A = 150°C
Gate Source Cutoff Voltage	$V_{GS(OFF)}$	– 1		– 4	– 2		– 6	V	V_{DS} = 10V, I_D = 1 nA	
Gate Source Forward Voltage	$V_{GS(F)}$			1			1	V	V_{DS} = ØV, I_G = 10 mA	
Drain Saturation Current (Pulsed)	I_{DSS}	12		30	24		60	mA	V_{DS} = 10V, V_{GS} = ØV	
Dynamic Electrical Characteristics										
Common Source Forward Transconductance	G_{fs}	10	17		10	17		mS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
			12			12		mS	V_{DS} = 10V, I_D = 10 mA	f = 100 MHz
Common Source Output Conductance	G_{os}			250			250	µS	V_{DS} = 10V, I_D = 10 mA	f = 1 kHz
			0.15			0.15		µS	V_{DS} = 10V, I_D = 10 mA	f = 100 MHz
Drain Gate Capacitance	C_{dg}			5			5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Source Gate Capacitance	C_{gs}			2.5			2.5	pF	V_{DS} = ØV, V_{GS} = – 10V	f = 1 MHz
Equivalent Short Circuit Input Noise Voltage	$\bar{e}_N$		10			10		nV/√Hz	V_{DS} = 10V, I_D = 10 mA	f = 100 kHz
Power Match Source Admittance	g_{ig}		12			12			V_{DS} = 10V, I_D = 10 mA	f = 100 MHz
Conversion Gain	G_c		3			3		dB	V_{DS} = 20V, R_L = 2 kΩ V_{GS} = 1/2 $V_{GS(OFF)}$	f = 100 MHz
Saturation Drain Current Ratio	I_{DSS1}/I_{DSS2}	0.9		1	0.9		1		V_{DS} = 10V, V_G = ØV	
Gate Source Cutoff Voltage Ratio	$\frac{V_{GS(OFF)1}}{V_{GS(OFF)2}}$	0.9		1	0.9		1		V_{DS} = 10V, I_D = 1 nA	
Transconductance Ratio	g_{fs1}/g_{fs2}	0.9		1	0.9		1		V_{DS} = 10V, I_D = 10 mA	

TO-78 Package
Dimensions in Inches (mm)

Pin Configuration
1 Source 1, 2 Gate 1, Drain 1,
4 Case, 5 Drain 2, 6 Gate 2,
7 Source 2, 8 Omitted

InterFET Corporation
1000 N. Shiloh Road, Garland, TX 75042
(972) 487-1287 FAX (972) 276-3375
www.interfet.com