

## N-Channel JFETs

<b>J308</b>	<b>SST308</b>	<b>U309</b>
<b>J309</b>	<b>SST309</b>	<b>U310</b>
<b>J310</b>	<b>SST310</b>	

### Product Summary

Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	$g_m$ Min (mS)	$I_{DSS}$ Min (mA)
J308	-1 to -6.5	-25	8	12
J309	-1 to -4	-25	10	12
J310	-2 to -6.5	-25	8	24
SST308	-1 to -6.5	-25	8	12
SST309	-1 to -4	-25	10	12
SST310	-2 to -6.5	-25	8	24
U309	-1 to -4	-25	10	12
U310	-2.5 to -6	-25	10	24

### Features

- Excellent High Frequency Gain: Gps 11.5 dB @ 450 MHz
- Very Low Noise: 2.7 dB @ 450 MHz
- Very Low Distortion
- High ac/dc Switch Off-Isolation

### Benefits

- Wideband High Gain
- Very High System Sensitivity
- High Quality of Amplification
- High-Speed Switching Capability
- High Low-Level Signal Amplification

### Applications

- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

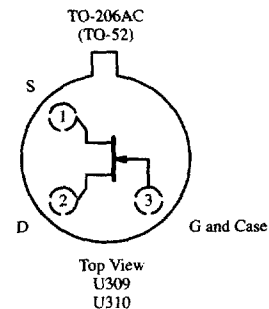
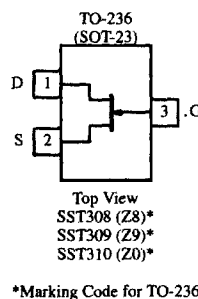
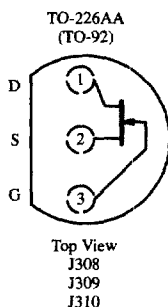
### Description

The J/SST/U308 series offers superb amplification characteristics. Of special interest is its high-frequency performance. Even at 450 MHz, this series offers high power gain at low noise.

Low-cost J series TO-226AA (TO-92) packaging supports automated assembly with tape-and-reel options. The SST series TO-236 (SOT-23) package

provides surface-mount capabilities and is available with tape-and-reel options. The U series hermetically-sealed TO-206AC (TO-52) package supports full military processing. (See Military and Packaging Information for further details.)

For similar dual products packaged in the TO-78, see the U430/431 data sheet.



Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70237. Applications information may also be obtained via FaxBack, request document #70597.

## Absolute Maximum Ratings

Gate-Drain, Gate-Source Voltage	.....	-25 V	Operating Junction Temperature	.....	-55 to 150°C
Gate Current :	(J/SST Prefixes)	10 mA	Power Dissipation :	(J/SST Prefixes) <sup>a</sup>	350 mW
	(U Prefix)	20 mA		(U Prefix) <sup>b</sup>	500 mW
Lead Temperature (1/16" from case for 10 sec.)	.....	300°C	Notes		
Storage Temperature :	(J/SST Prefixes)	-55 to 150°C	a.	Derate 2.8 mW/°C above 25°C	
	(U Prefix)	-65 to 175°C	b.	Derate 4 mW/°C above 25°C	

## Specifications<sup>a</sup> for J/SST308, J/SST309 and J/SST310

Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits						Unit		
				J/SST308		J/SST309		J/SST310				
				Min	Max	Min	Max	Min	Max			
<b>Static</b>												
Gate-Source Breakdown Voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> = -1 μA, V <sub>DS</sub> = 0 V	-35	-25		-25		-25		V		
Gate-Source Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 nA		-1	-6.5	-1	-4	-2	-6.5			
Saturation Drain Current <sup>c</sup>	I <sub>DSS</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V		12	60	12	30	24	60	mA		
Gate Reverse Current	I <sub>GSS</sub>	V <sub>GS</sub> = -15 V, V <sub>DS</sub> = 0 V	-0.002		-1		-1		-1	nA		
		T <sub>A</sub> = 125°C	-0.001		-1		-1		-1	μA		
Gate Operating Current	I <sub>G</sub>	V <sub>DS</sub> = 9 V, I <sub>D</sub> = 10 mA	-15							pA		
Drain-Source On-Resistance	r <sub>DS(on)</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 1 mA	35							Ω		
Gate-Source Forward Voltage	V <sub>GS(F)</sub>	I <sub>G</sub> = 10 mA V <sub>DS</sub> = 0 V	J	0.7	1		1		1	V		
<b>Dynamic</b>												
Common-Source Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 10 mA f = 1 kHz		14	8		10		8	mS		
Common-Source Output Conductance	g <sub>os</sub>			110		250		250		250	μS	
Common-Source Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10 V V <sub>GS</sub> = -10 V f = 1 MHz	J	4		5		5		5	pF	
			SST	4								
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>		J	1.9		2.5		2.5		2.5		
			SST	1.9								
Equivalent Input Noise Voltage	e <sub>n</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 10 mA f = 100 Hz	6							nV/ √Hz		
<b>High Frequency</b>												
Common-Gate Forward Transconductance	g <sub>fg</sub>	V <sub>DS</sub> = 10 V I <sub>D</sub> = 10 mA	f = 105 MHz	14							mS	
			f = 450 MHz	13								
Common-Gate Output Conductance	g <sub>og</sub>		f = 105 MHz	0.16								
			f = 450 MHz	0.55								
Common-Gate Power Gain <sup>d</sup>	G <sub>pg</sub>		f = 105 MHz	16								dB
			f = 450 MHz	11.5								
Noise Figure	NF	f = 105 MHz	1.5									
		f = 450 MHz	2.7									

- Notes
- T<sub>A</sub> = 25°C unless otherwise noted.
  - Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
  - Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
  - Gain (G<sub>pg</sub>) measured at optimum input noise match.

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7

N-Channel JFETs

## Specifications<sup>a</sup> for U309 and U310

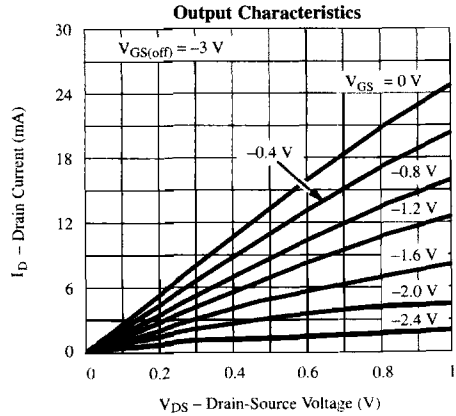
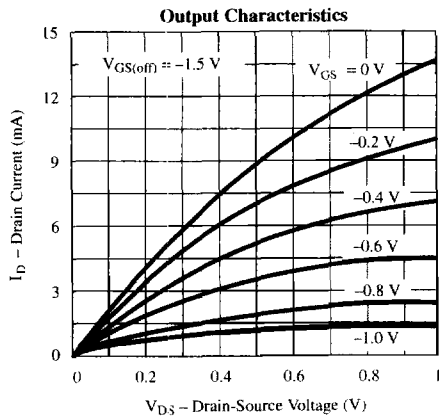
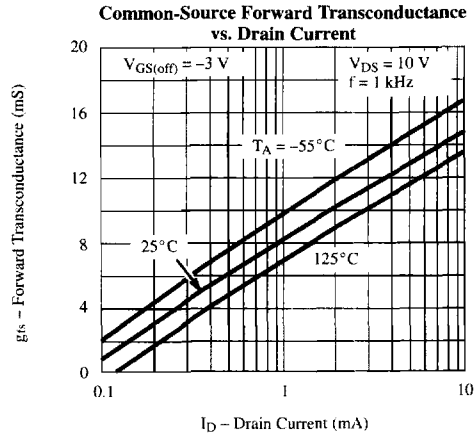
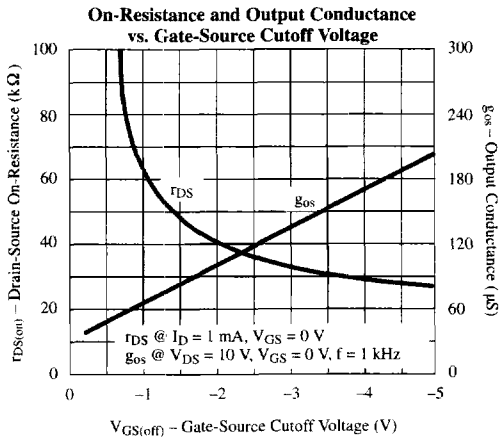
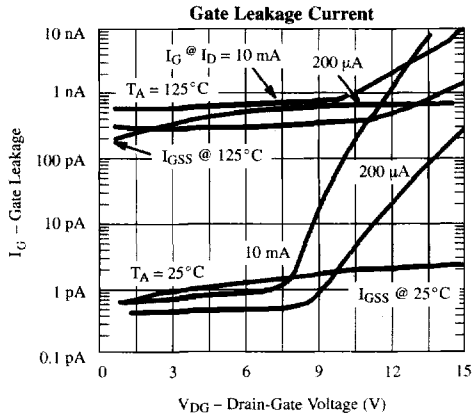
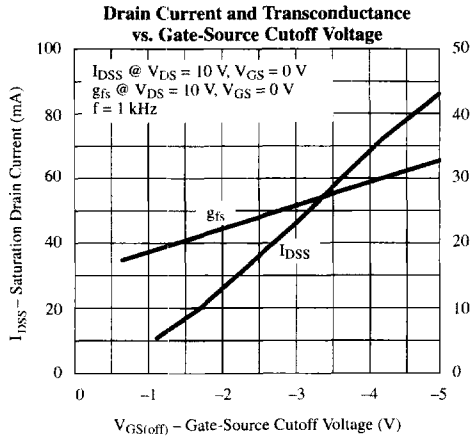
Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits				Unit
				U309		U310		
				Min	Max	Min	Max	
<b>Static</b>								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-35	-25		-25		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 10 V, I_D = 1 nA$		-1	-4	-2.5	-6	V
Saturation Drain Current <sup>c</sup>	$I_{DSS}$	$V_{DS} = 10 V, V_{GS} = 0 V$		12	30	24	60	mA
Gate Reverse Current	$I_{GSS}$	$V_{GS} = -15 V, V_{DS} = 0 V$	-0.002		-0.15		-0.15	nA
		$T_A = 125^\circ C$	-0.001		-0.15		-0.15	$\mu A$
Gate Operating Current	$I_G$	$V_{DG} = 9 V, I_D = 10 mA$	-15					$\mu A$
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 0 V, I_D = 1 mA$	35					$\Omega$
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 10 mA, V_{DS} = 0 V$	0.7		1		1	V
<b>Dynamic</b>								
Common-Source Forward Transconductance	$g_{fs}$	$V_{DS} = 10 V, I_D = 10 mA$ $f = 1 kHz$	14	10		10		mS
Common-Source Output Conductance	$g_{os}$		110		250		250	$\mu S$
Common-Source Input Capacitance	$C_{iss}$	$V_{DS} = 10 V, V_{GS} = -10 V$ $f = 1 MHz$	4		5		5	pF
Common-Source Reverse Transfer Capacitance	$C_{rss}$		1.9		2.5		2.5	
Equivalent Input Noise Voltage	$\bar{e}_n$	$V_{DS} = 10 V, I_D = 10 mA$ $f = 100 Hz$	6					$nV/\sqrt{Hz}$
<b>High Frequency</b>								
Common-Gate Forward Transconductance	$g_{fg}$	$V_{DS} = 10 V$ $I_D = 10 mA$	$f = 105 MHz$	14				mS
			$f = 450 MHz$	13				
Common-Gate Output Conductance	$g_{og}$		$f = 105 MHz$	0.16				dB
			$f = 450 MHz$	0.55				
Common-Gate Power Gain <sup>d</sup>	$G_{pg}$		$f = 105 MHz$	16	14		14	dB
			$f = 450 MHz$	11.5	10		10	
Noise Figure	NF		$f = 105 MHz$	1.5		2		2
			$f = 450 MHz$	2.7		3.5		3.5

**Notes**

- $T_A = 25^\circ C$  unless otherwise noted.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 3\%$ .
- Gain ( $G_{pg}$ ) measured at optimum input noise match.

N2B

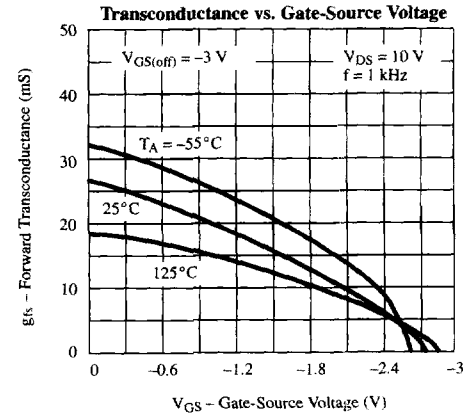
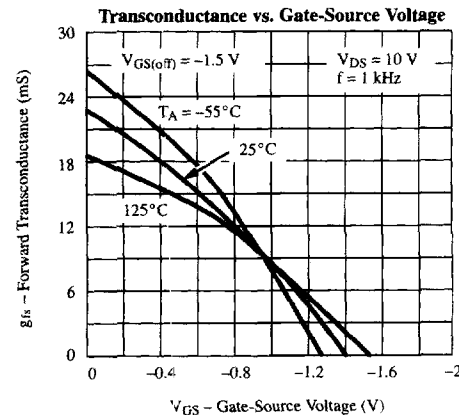
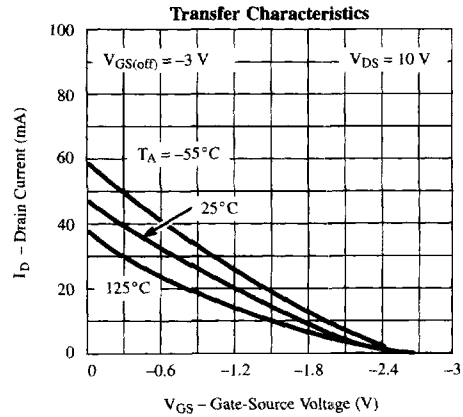
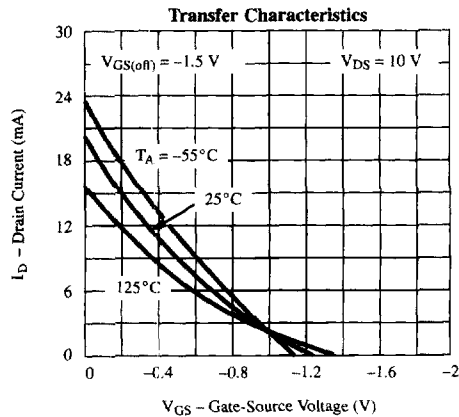
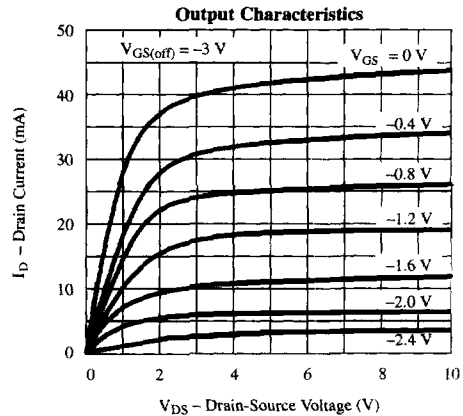
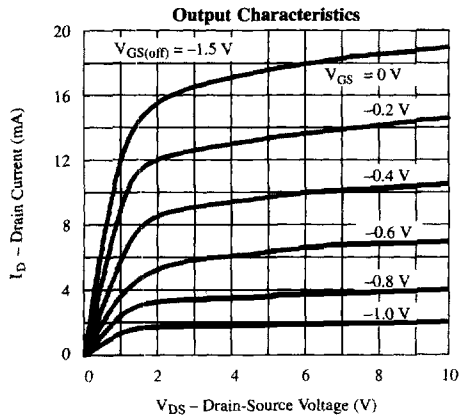
**Typical Characteristics**



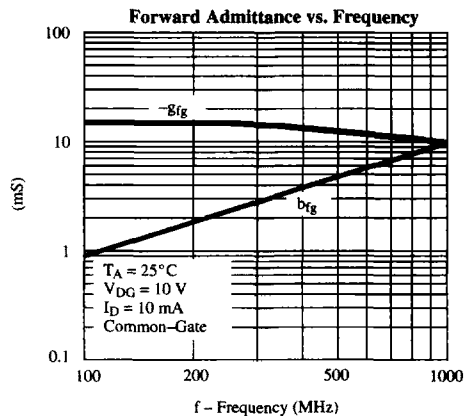
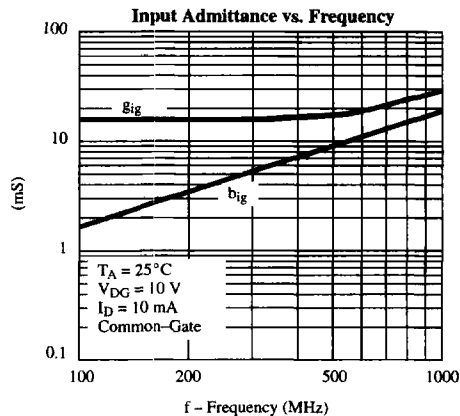
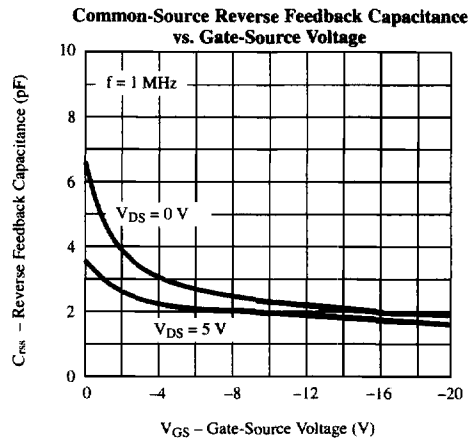
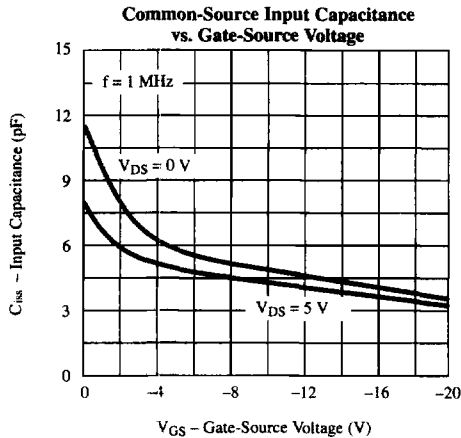
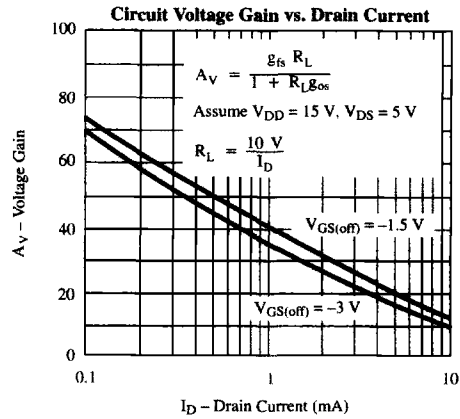
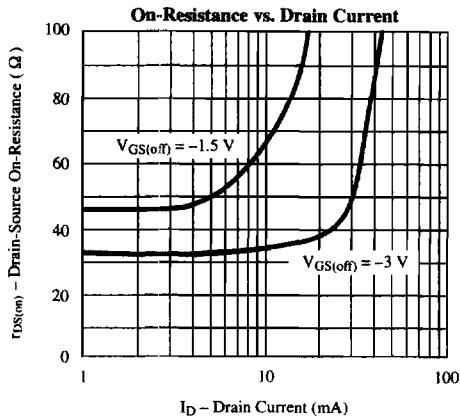
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N-Channel JFETs

## Typical Characteristics (Cont'd)



**Typical Characteristics (Cont'd)**



## Typical Characteristics (Cont'd)

