

N-Channel JFETs

J308 SST308 U309
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J310 SST310

Product Summary

Part Number	V _{GS(off)} (V)	V _{(BR)GSS} Min (V)	g _{fs} 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

U310, For applications information see AN104, page 21.

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

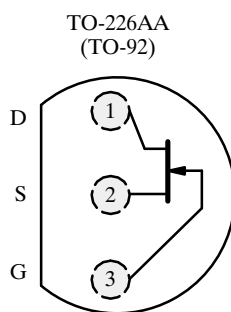
Description

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

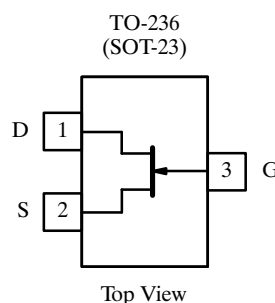
surface-mount capabilities and is available with tape-and-reel options. The U series hermetically-sealed TO-206AC (TO-52) package supports full military processing. (See Military and Packaging Information for further details.)

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



Top View

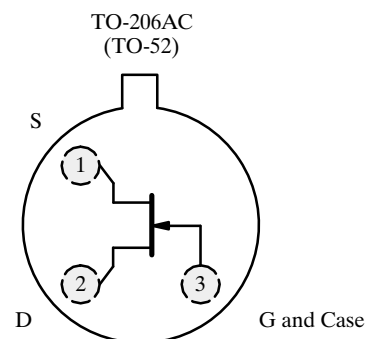
J308
J309
J310



Top View

SST308 (Z8)*
SST309 (Z9)*
SST310 (Z0)*

*Marking Code for TO-236



Top View

U309
U310

J/SST/U308 Series

TEMIC

Siliconix

Absolute Maximum Ratings

Gate-Drain, Gate-Source Voltage -25 V
 Gate Current : (J/SST Prefixes) 10 mA
 (U Prefix) 20 mA
 Lead Temperature ($1/16''$ from case for 10 sec.) 300°C
 Storage Temperature : (J/SST Prefixes) -55 to 150°C
 (U Prefix) -65 to 175°C

Operating Junction Temperature -55 to 150°C
 Power Dissipation : (J/SST Prefixes)^a 350 mW
 (U Prefix)^b 500 mW

Notes
 a. Derate 2.8 mW/°C above 25°C
 b. Derate 4 mW/°C above 25°C

Specifications^a for J/SST308, J/SST309 and J/SST310

Parameter	Symbol	Test Conditions	Typ ^b	Limits						Unit	
				J/SST308		J/SST309		J/SST310			
				Min	Max	Min	Max	Min	Max		
Static											
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-35	-25		-25		-25		V	
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 10 V, I_D = 1 nA$		-1	-6.5	-1	-4	-2	-6.5		
Saturation Drain Current ^c	I_{DSS}	$V_{DS} = 10 V, V_{GS} = 0 V$		12	60	12	30	24	60	mA	
Gate Reverse Current	I_{GSS}	$V_{GS} = -15 V, V_{DS} = 0 V$ $T_A = 125^\circ C$	-0.002		-1		-1		-1	nA	
			-0.001		-1		-1		-1	μA	
Gate Operating Current	I_G	$V_{DG} = 9 V, I_D = 10 mA$	-15							pA	
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 0 V, I_D = 1 mA$	35							Ω	
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 10 mA, V_{DS} = 0 V$	J	0.7	1	1	1	1	1	V	
Dynamic											
Common-Source Forward Transconductance	g_{fs}	$V_{DS} = 10 V, I_D = 10 mA$ $f = 1 kHz$	14	8		10		8		mS	
Common-Source Output Conductance	g_{os}		110		250		250		250		μS
Common-Source Input Capacitance	C_{iss}	$V_{DS} = 10 V$ $V_{GS} = -10 V$ $f = 1 MHz$	J	4		5		5		5	pF
			SST	4							
Common-Source Reverse Transfer Capacitance	C_{rss}		J	1.9		2.5		2.5		2.5	
			SST	1.9							
Equivalent Input Noise Voltage	\bar{e}_n	$V_{DS} = 10 V, I_D = 10 mA$ $f = 100 Hz$	6							nV/ \sqrt{Hz}	
High Frequency											
Common-Gate Forward Transconductance	g_{fg}	$V_{DS} = 10 V$ $I_D = 10 mA$	f = 105 MHz	15							mS
			f = 450 MHz	13							
Common-Gate Output Conductance	g_{og}		f = 105 MHz	0.16							
			f = 450 MHz	0.55							
Common-Gate Power Gain ^d	G_{pg}		f = 105 MHz	16							dB
			f = 450 MHz	11.5							
Noise Figure	NF		f = 105 MHz	1.5							
			f = 450 MHz	2.7							

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

NZB

Specifications^a for U309 and U310

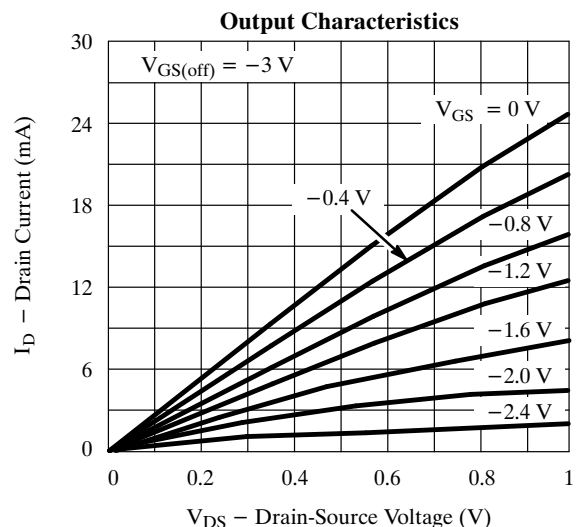
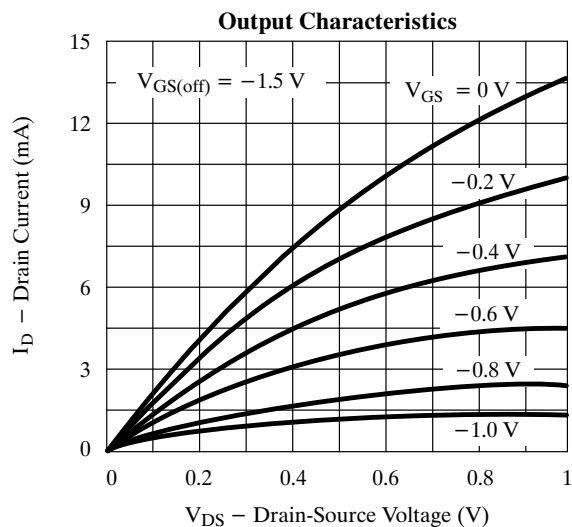
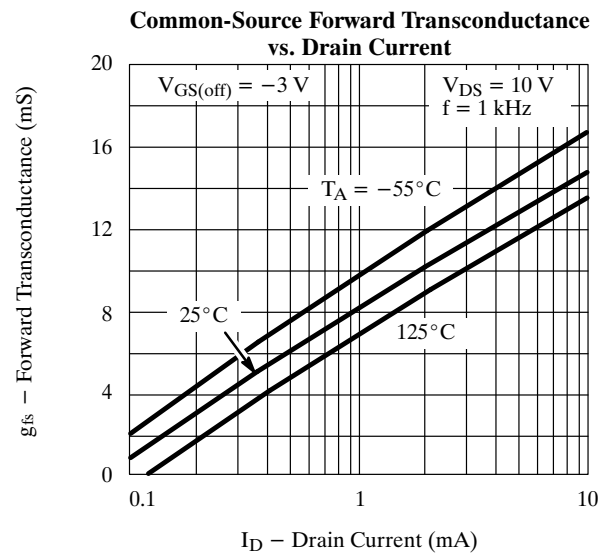
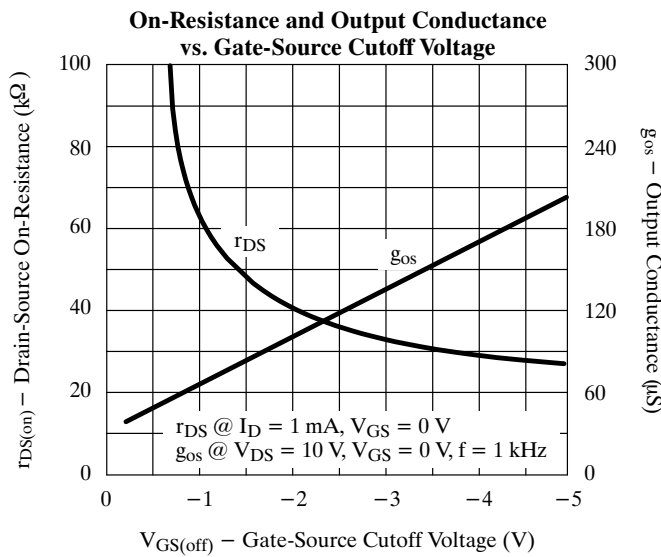
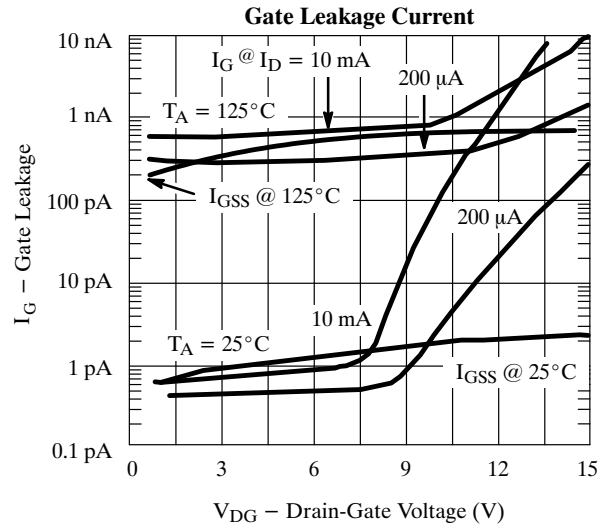
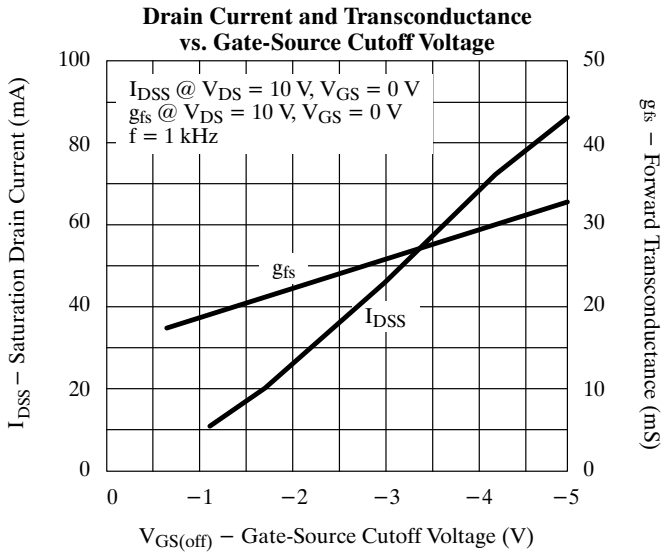
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit	
				309		310			
				Min	Max	Min	Max		
Static									
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-35	-25		-25		V	
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 10 V, I_D = 1 nA$		-1	-4	-2.5	-6		
Saturation Drain Current ^c	I_{DSS}	$V_{DS} = 10 V, V_{GS} = 0 V$		12	30	24	60	mA	
Gate Reverse Current	I_{GSS}	$V_{GS} = -15 V, V_{DS} = 0 V$ $T_A = 125^\circ C$	-0.002		-0.15		-0.15	nA	
			-0.001		-0.15		-0.15	μA	
Gate Operating Current	I_G	$V_{DG} = 9 V, I_D = 10 mA$	-15					pA	
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 0 V, I_D = 1 mA$	35					Ω	
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 10 mA, V_{DS} = 0 V$	0.7		1		1	V	
Dynamic									
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	μS	
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}	
High Frequency									
Common-Gate Forward Transconductance	g_{fg}	$V_{DS} = 10 V$ $I_D = 10 mA$	$f = 105 MHz$	15				mS	
			$f = 450 MHz$	13					
Common-Gate Output Conductance	g_{og}		$f = 105 MHz$	0.16					
			$f = 450 MHz$	0.55					
Common-Gate Power Gain ^d	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

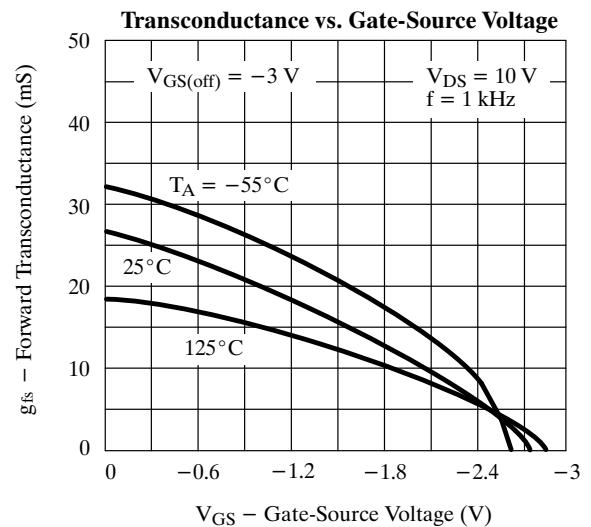
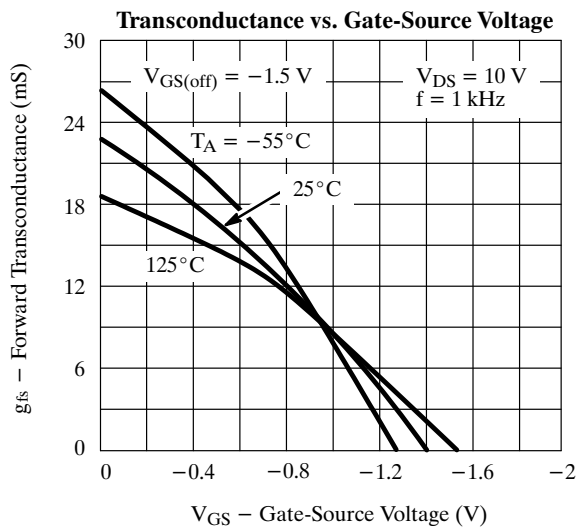
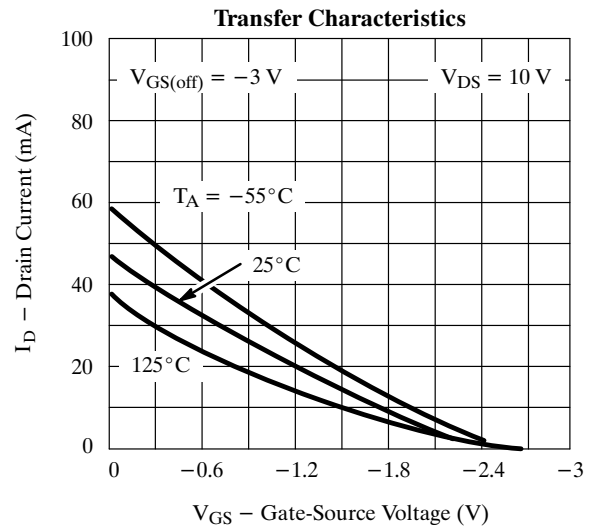
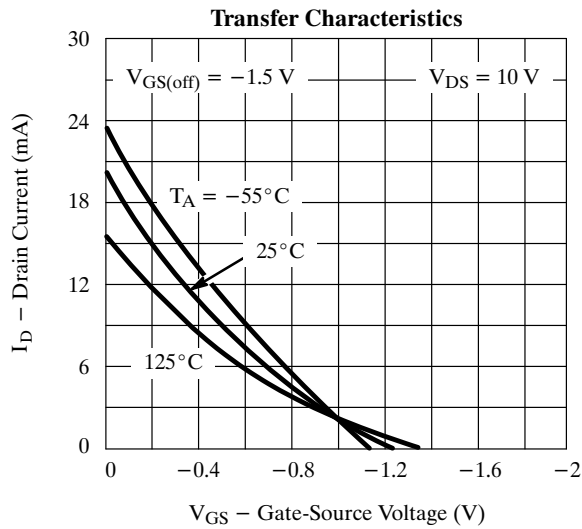
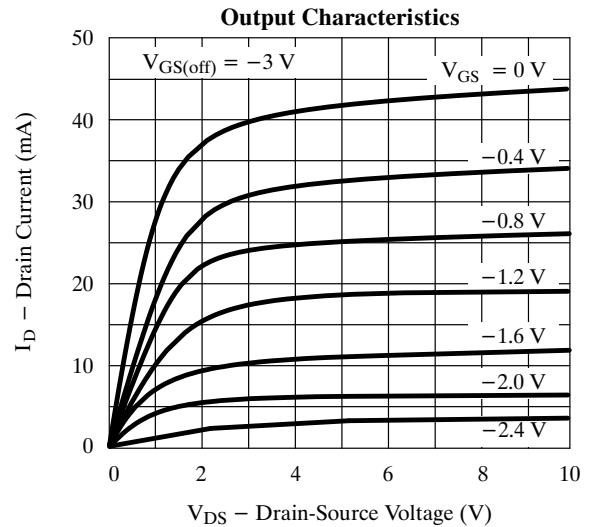
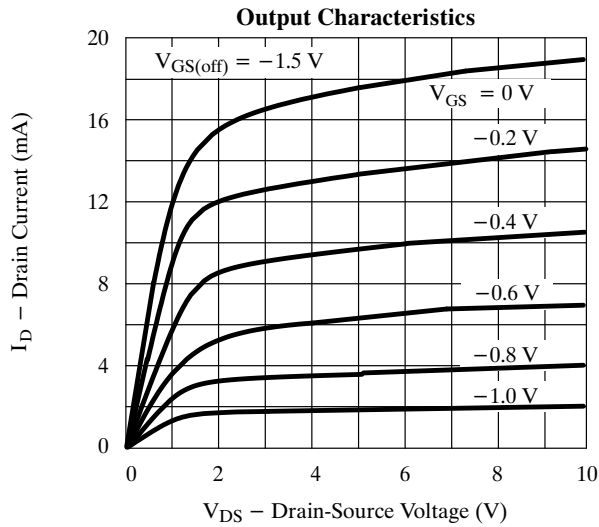
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- Gain (G_{pg}) measured at optimum input noise match.

NZB

Typical Characteristics



Typical Characteristics (Cont'd)



Typical Characteristics (Cont'd)

