

# J/SST/U308 Series

## 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 <sub>GS(off)</sub> (V)	V <sub>(BR)GSS</sub> Min (V)	g <sub>fs</sub> Min (mS)	I <sub>DSS</sub> 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

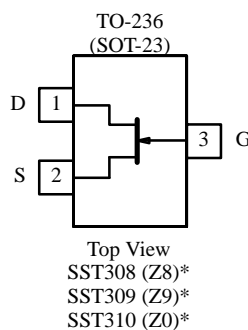
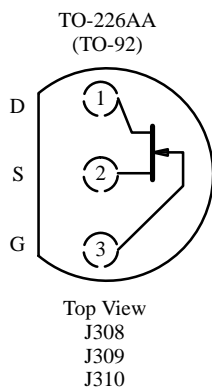
### Description

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.

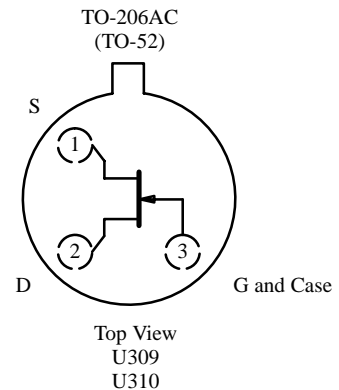
Low-cost J series TO-226AA (TO-92) packaging supports automated assembly with tape-and-reel options. The SST series TO-236 (SOT-23) package provides

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.



\*Marking Code for TO-236



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.

# J/SST/U308 Series

## 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>DG</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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# J/SST/U308 Series

## 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		
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					pA	
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					
			$f = 450 MHz$	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

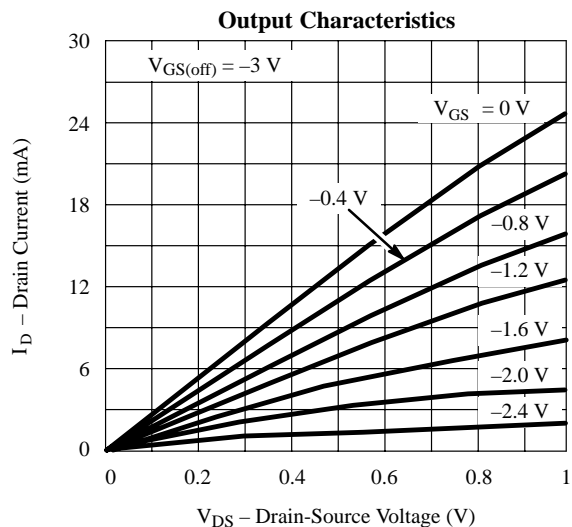
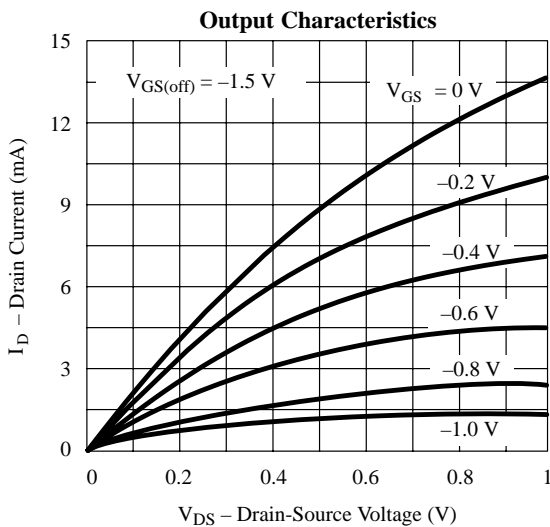
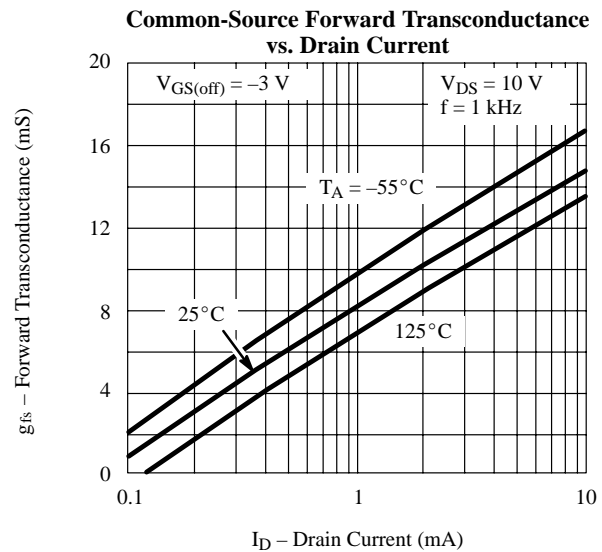
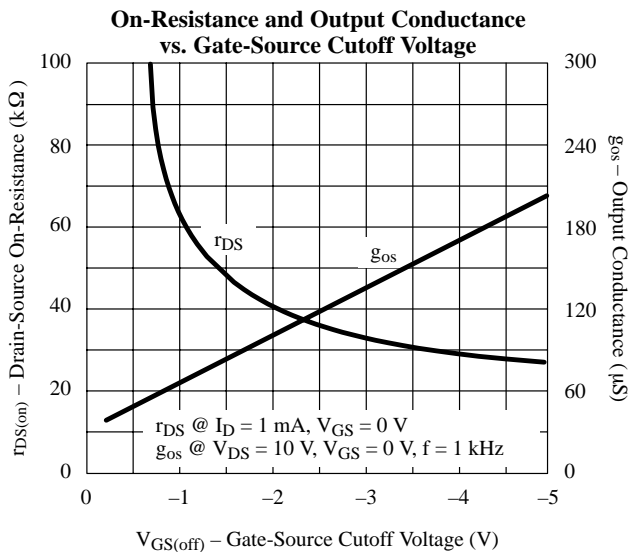
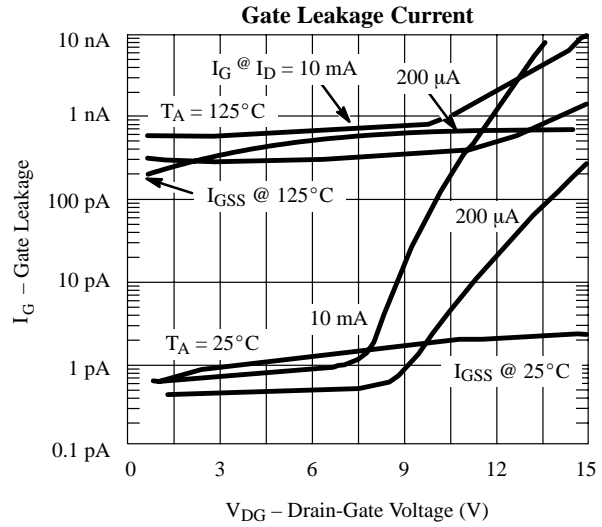
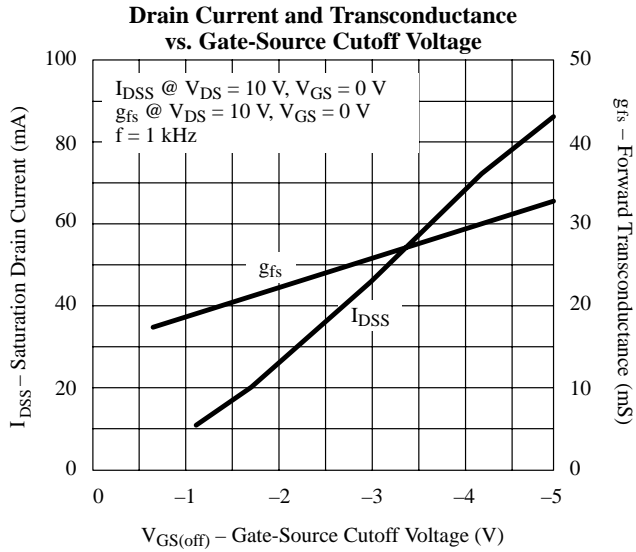
### Notes

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- 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.

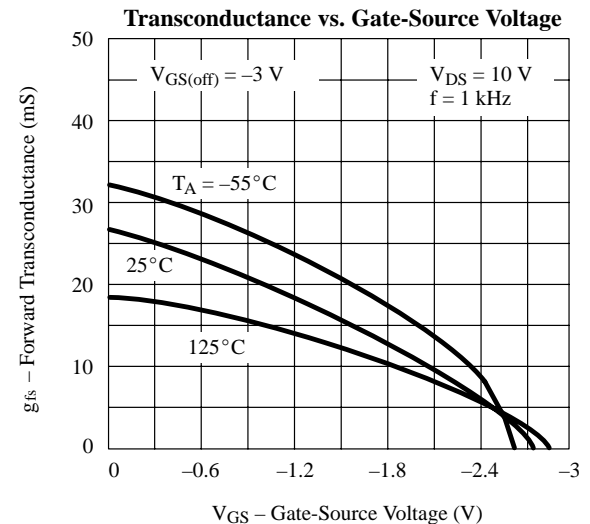
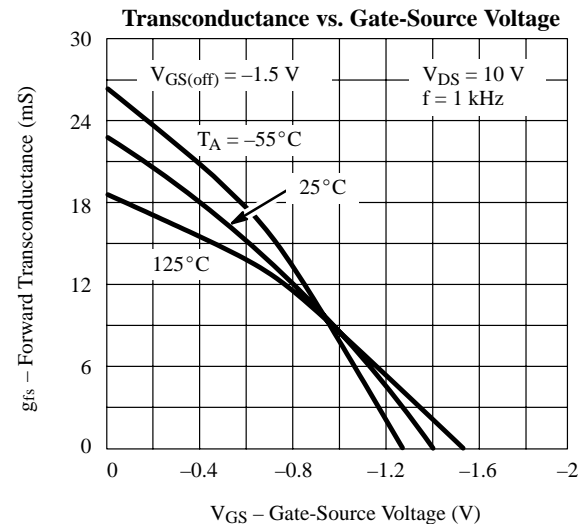
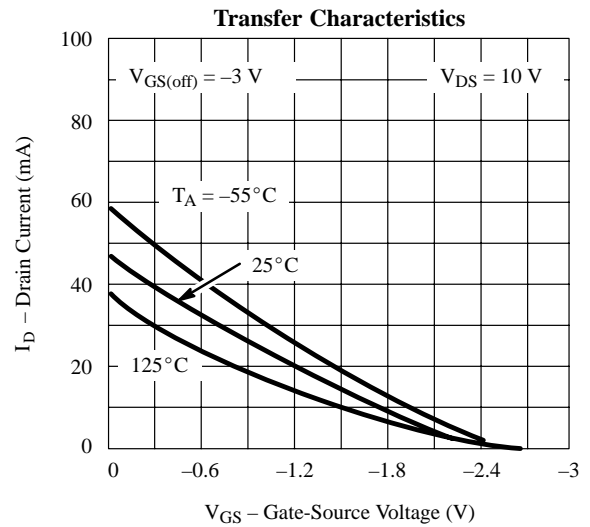
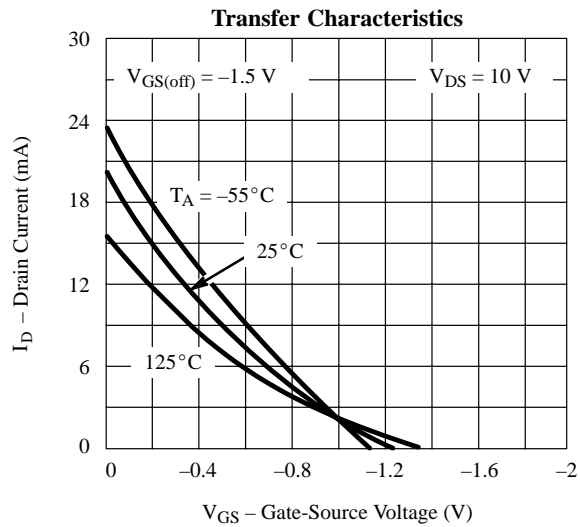
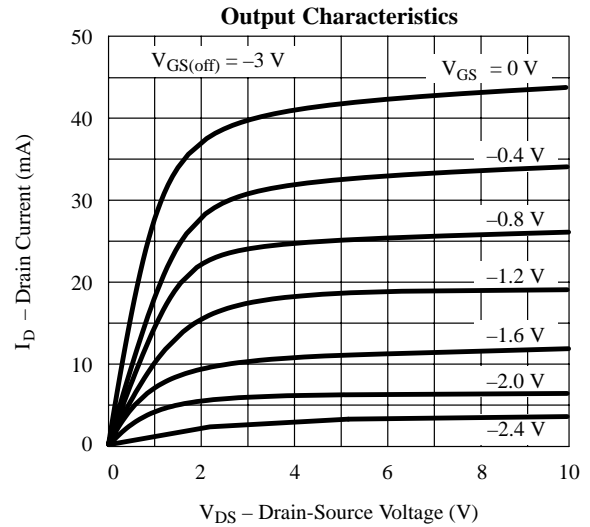
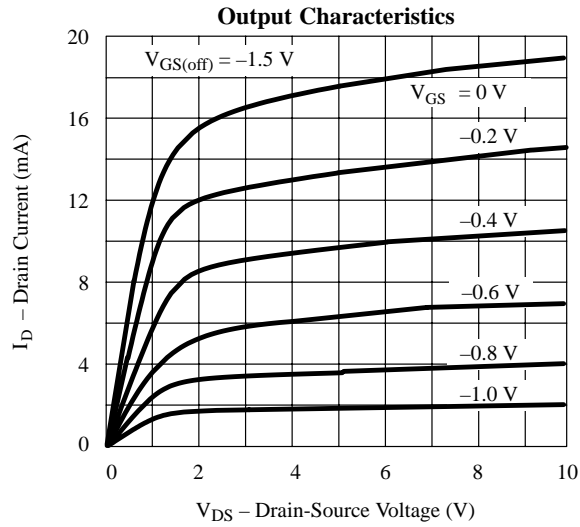
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## Typical Characteristics

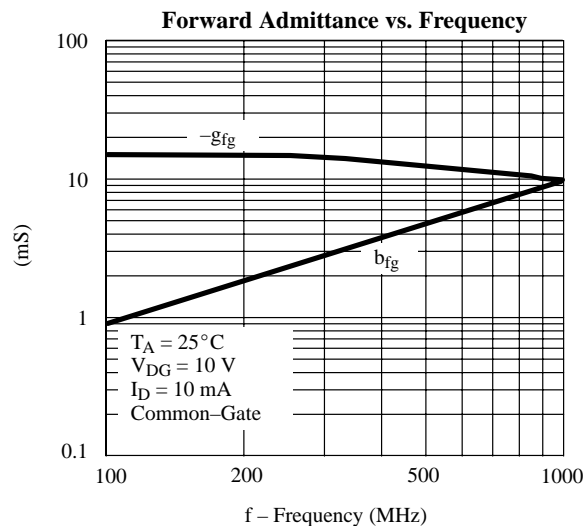
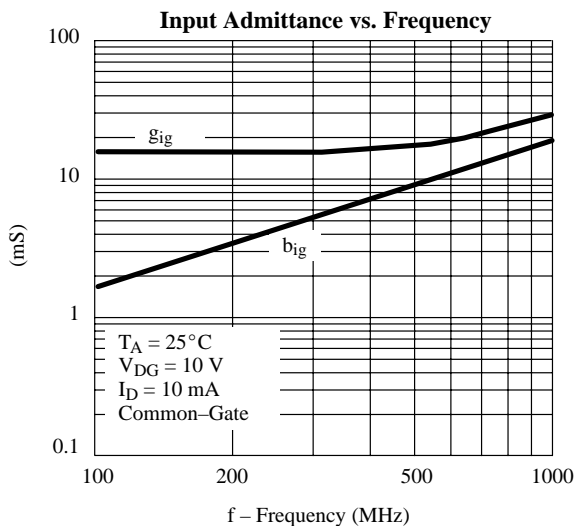
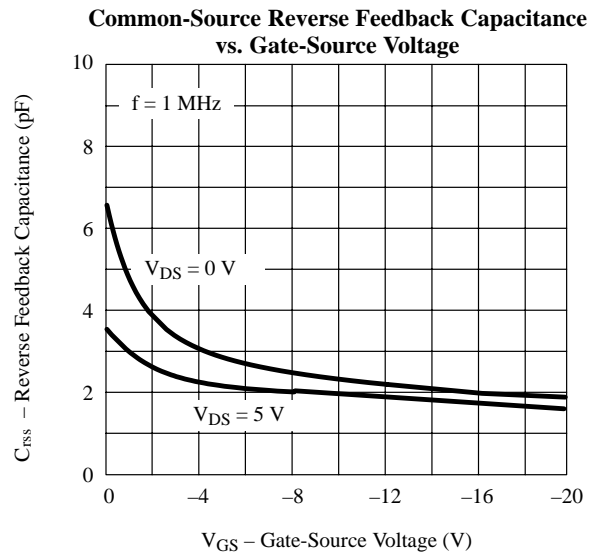
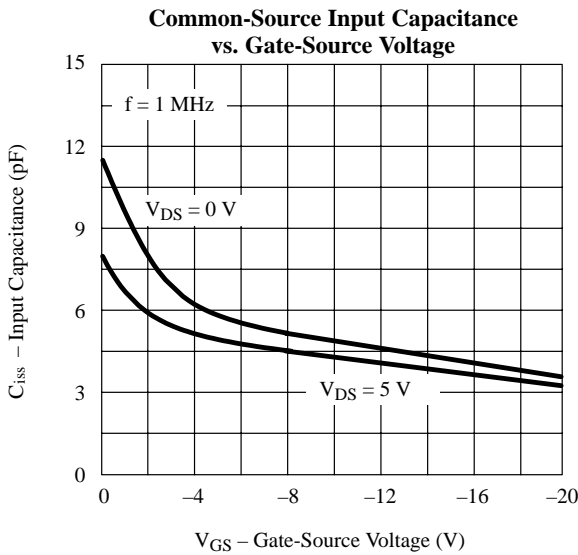
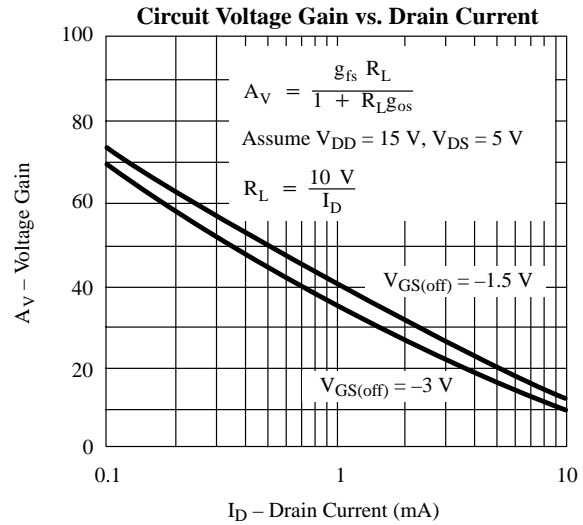
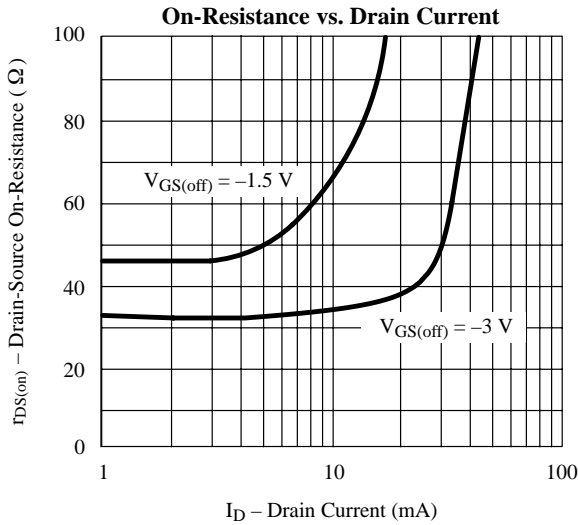


## Typical Characteristics (Cont'd)



# J/SST/U308 Series

## Typical Characteristics (Cont'd)



## Typical Characteristics (Cont'd)

