

## 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>	

<b>PRODUCT SUMMARY</b>				
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

### 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

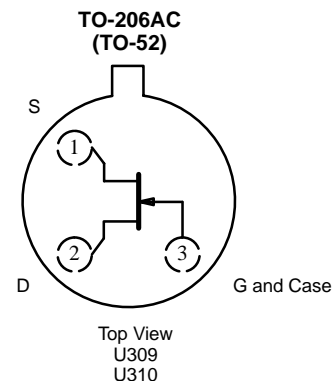
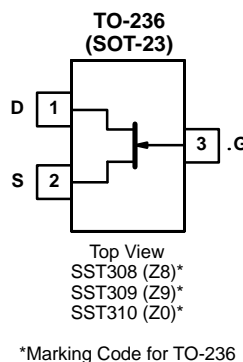
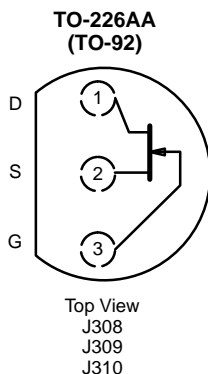
### DESCRIPTION

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.



For applications information see AN104.

### 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) <sup>a</sup> .....	350 mW
	(U Prefix) <sup>b</sup> .....	500 mW

**Notes**

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

SPECIFICATIONS FOR J/SST308, J/SST309 AND J/SST310 (T <sub>A</sub> = 25°C UNLESS NOTED)											
Parameter	Symbol	Test Conditions	Typ <sup>a</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	V	
Saturation Drain Current <sup>b</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
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>		SST	4							
			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>c</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**

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
- c. Gain (G<sub>pg</sub>) measured at optimum input noise match.

NZB



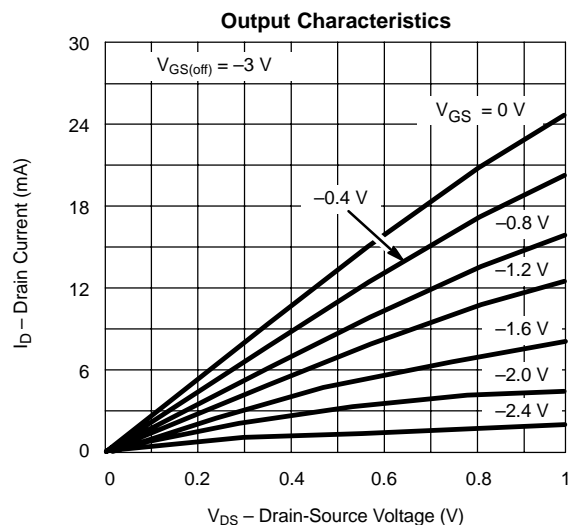
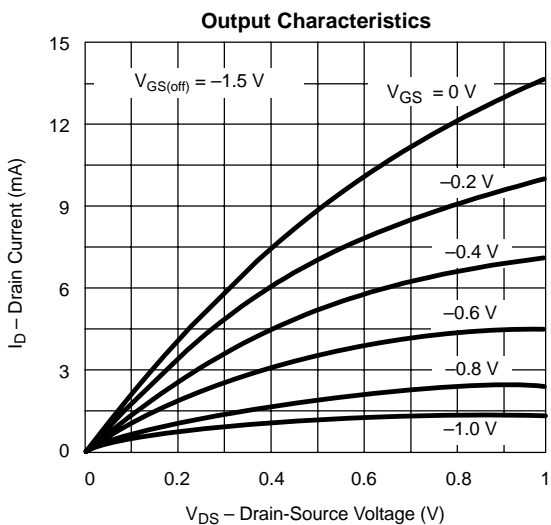
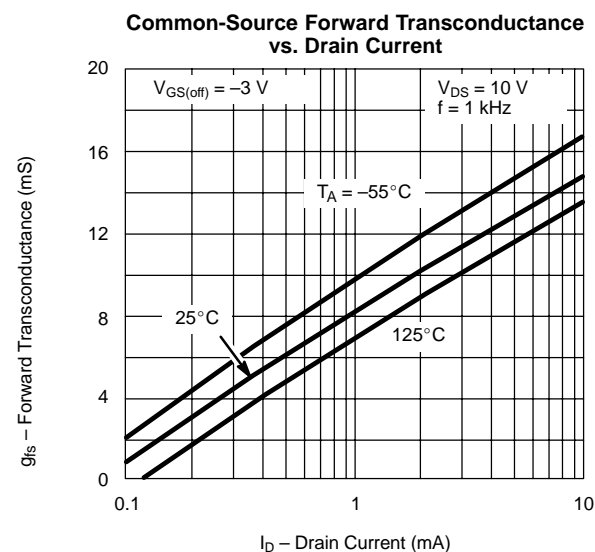
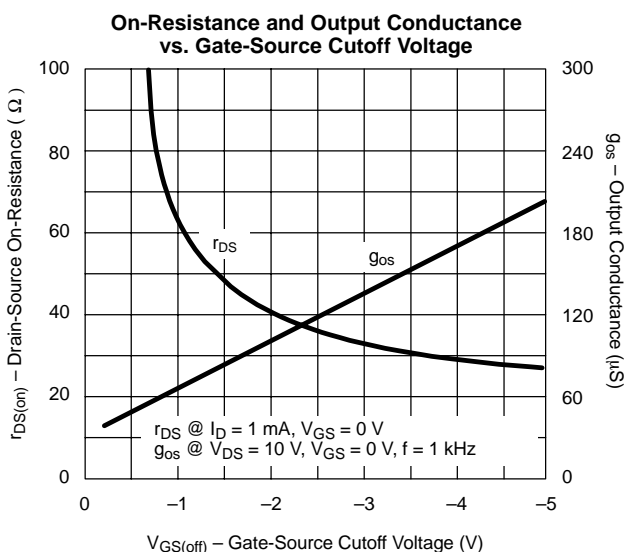
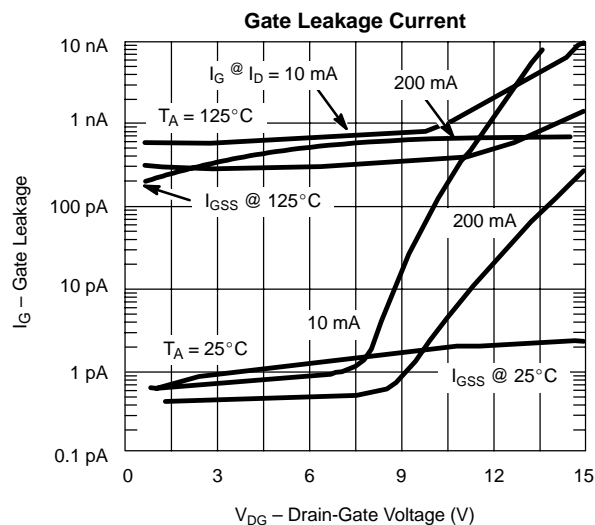
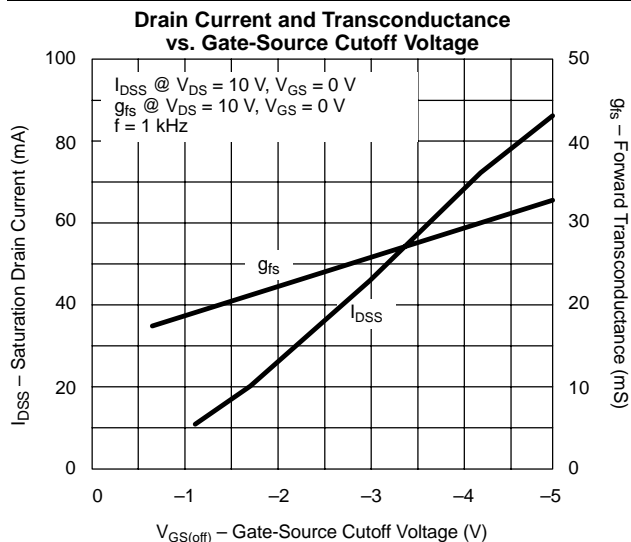
SPECIFICATIONS FOR U309 AND U310 (T <sub>A</sub> = 25 °C UNLESS NOTED)									
Parameter	Symbol	Test Conditions	Typ <sup>a</sup>	Limits				Unit	
				U309		U310			
				Min	Max	Min	Max		
<b>Static</b>									
Gate-Source Breakdown Voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> = -1 μA, V <sub>DS</sub> = 0 V	-35	-25		-25		V	
Gate-Source Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 nA		-1	-4	-2.5	-6	V	
Saturation Drain Current <sup>b</sup>	I <sub>DSS</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V		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		-0.15		-0.15	nA	
		T <sub>A</sub> = 125 °C	-0.001		-0.15		-0.15	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	0.7		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	10		10		mS	
Common-Source Output Conductance	g <sub>os</sub>		110		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	4		5		5	pF	
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>		1.9		2.5		2.5		
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>c</sup>	G <sub>pg</sub>		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

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
- c. Gain (G<sub>pg</sub>) measured at optimum input noise match.

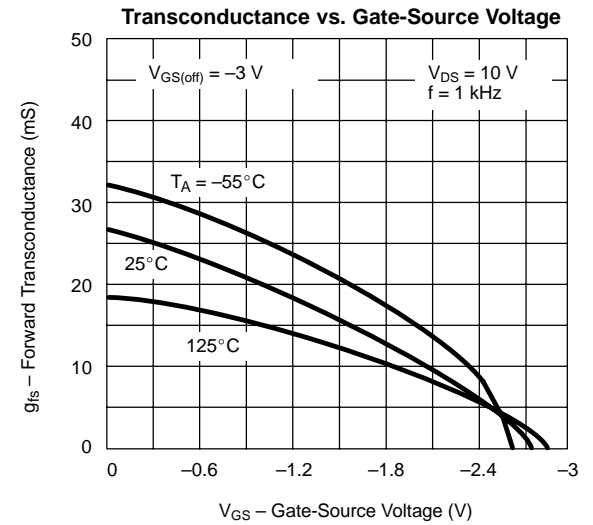
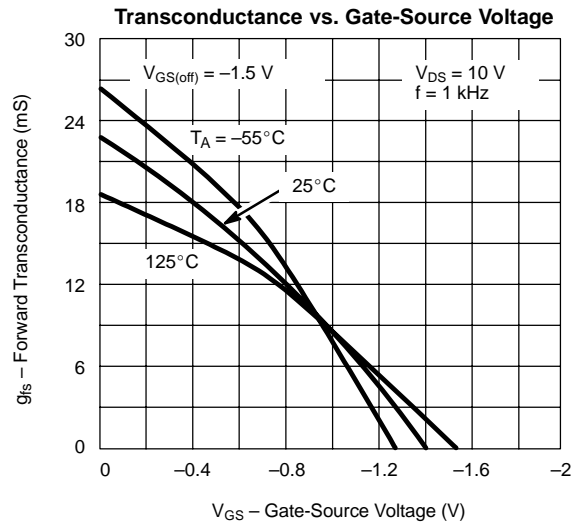
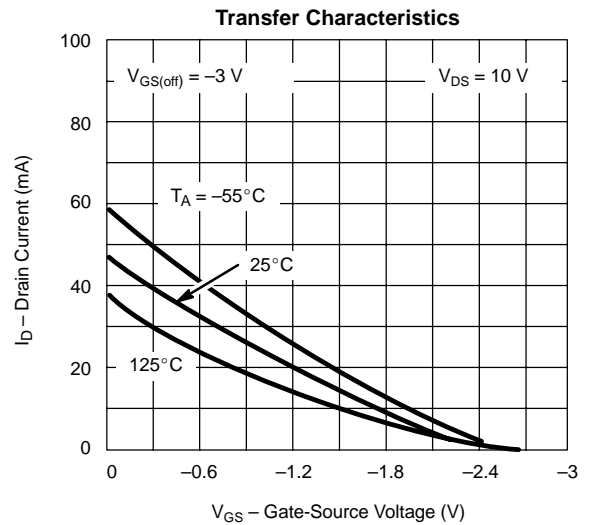
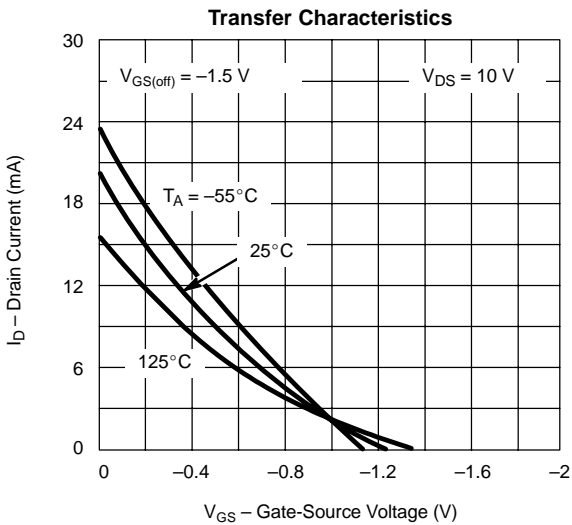
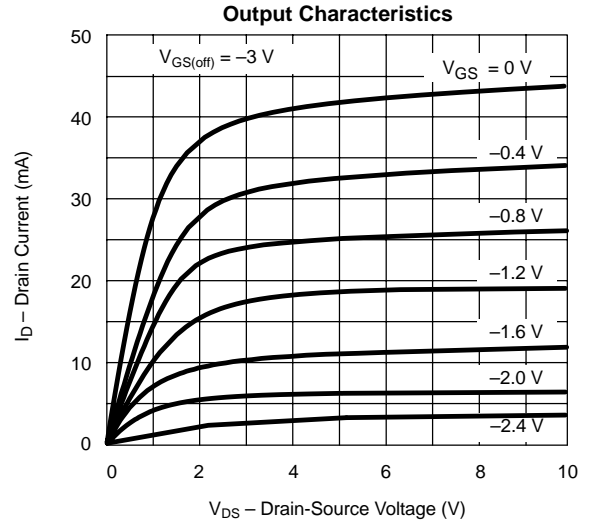
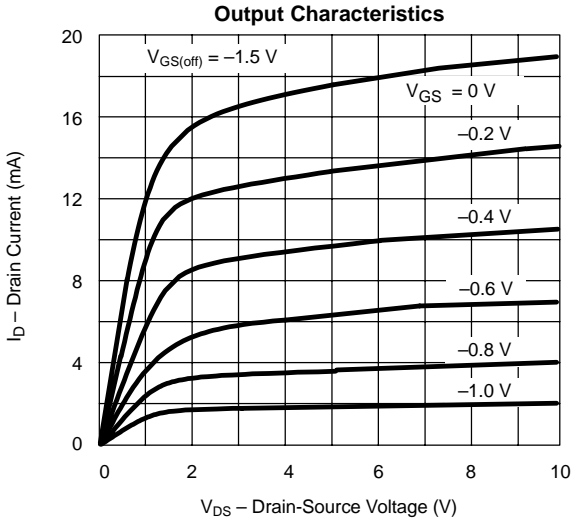
NZB

### TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

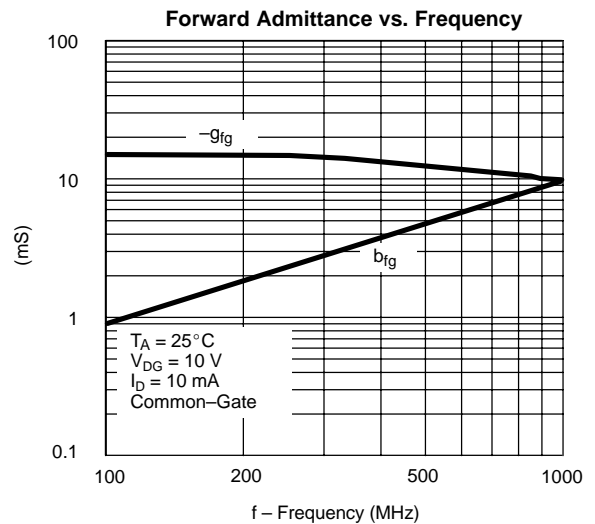
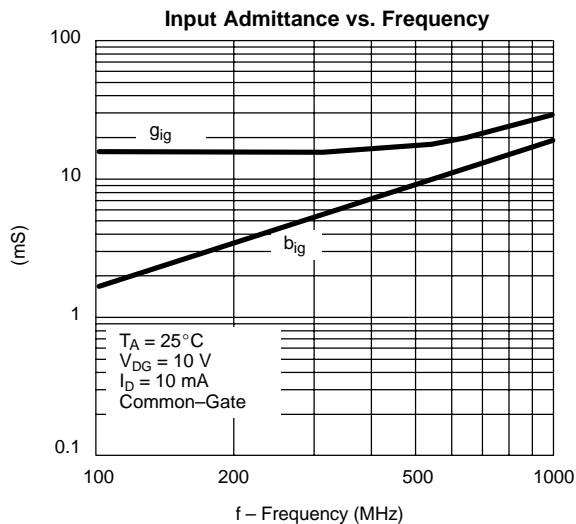
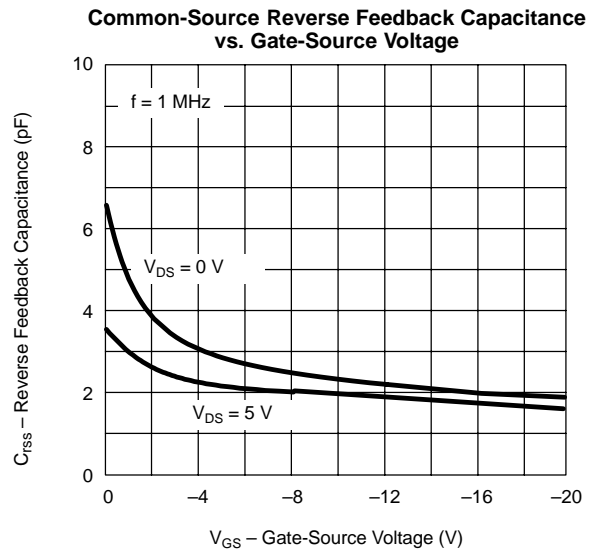
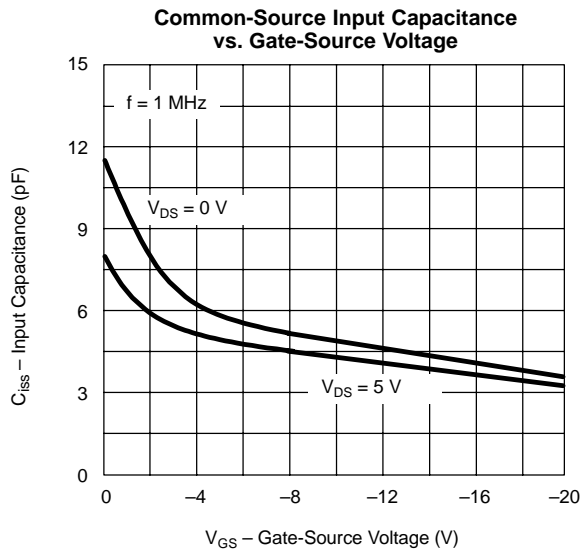
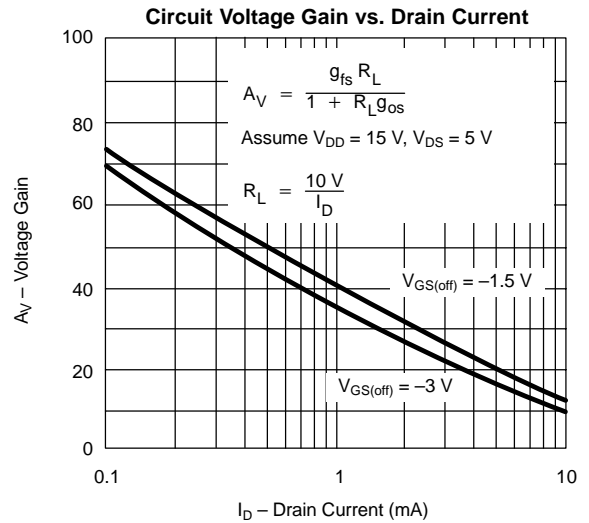
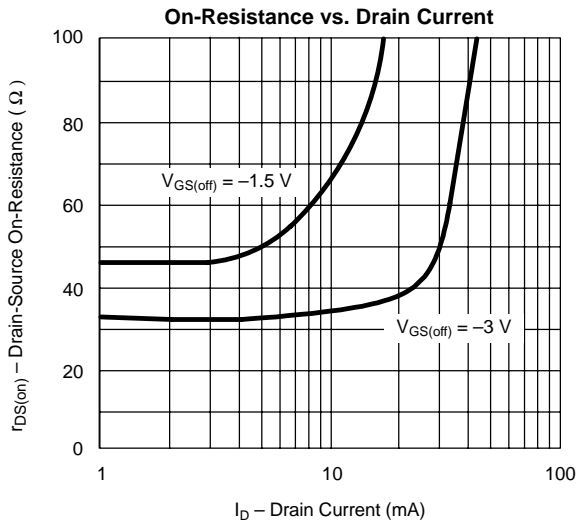




**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**



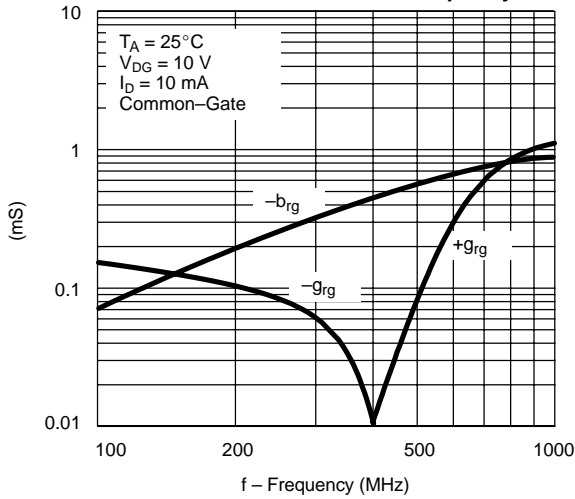
### TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)



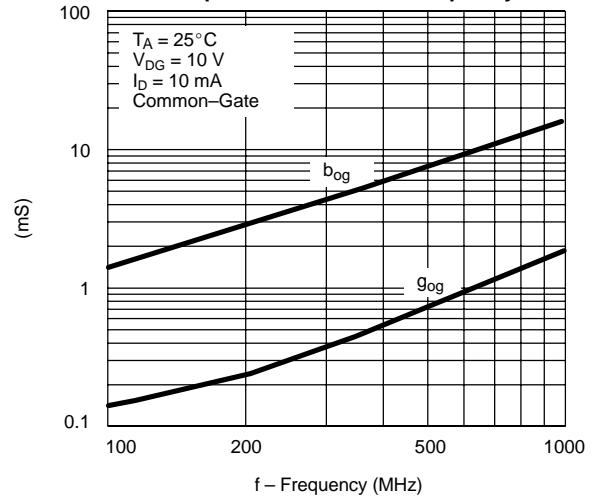


**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

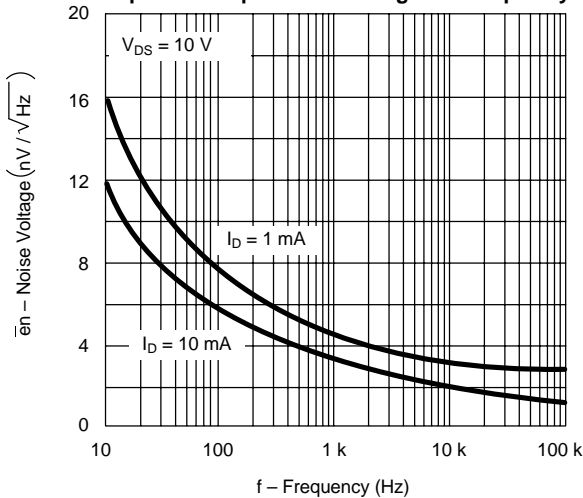
Reverse Admittance vs. Frequency



Output Admittance vs. Frequency



Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current

