



N-Channel JFETs

J308	SST308	U309
J309	SST309	U310
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

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

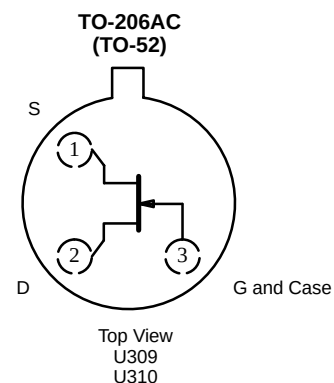
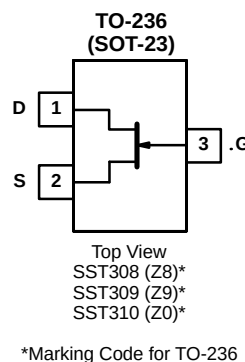
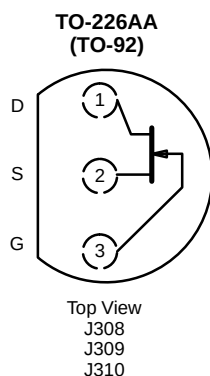
DESCRIPTION

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) ^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 FOR J/SST308, J/SST309 AND J/SST310 ($T_A = 25^\circ\text{C}$ UNLESS NOTED)

Parameter	Symbol	Test Conditions	Typ ^a	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 μA , 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	V	
Saturation Drain Current ^b	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	−0.002		−1		−1		−1	nA	
		T _A = 125°C	−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	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/ √Hz	
High Frequency											
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 ^c	G _{pg}		f = 105 MHz	16						dB	
			f = 450 MHz	11.5							
			f = 105 MHz	1.5							
Noise Figure	NF		f = 450 MHz	2.7							

Notes

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
b. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 3\%$.
c. Gain (G_{pg}) measured at optimum input noise match.

NZB

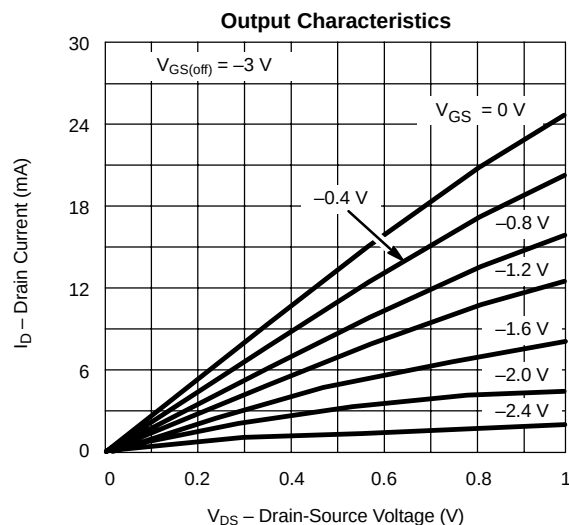
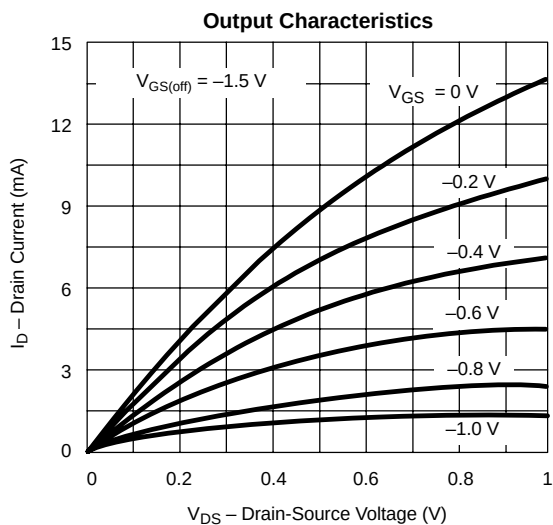
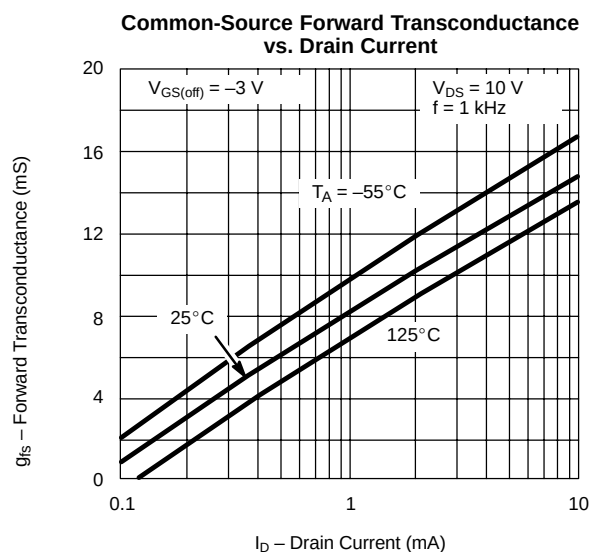
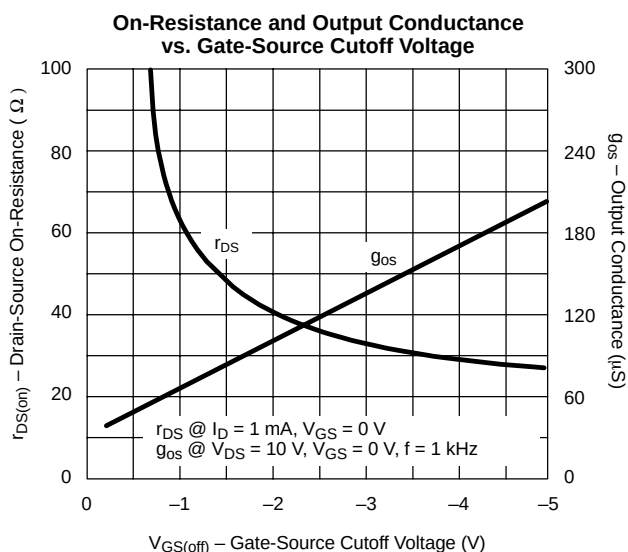
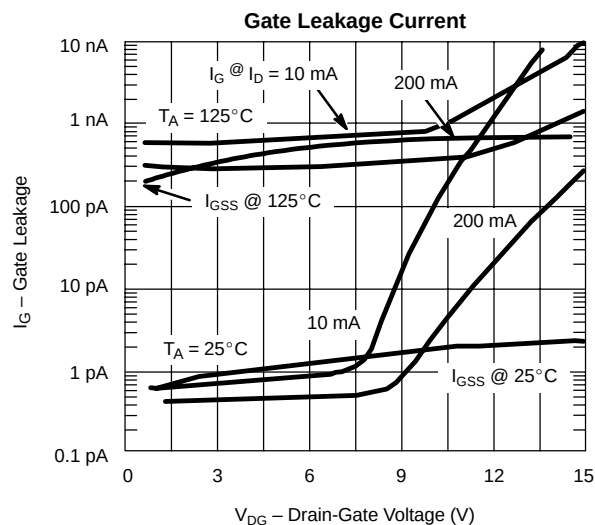
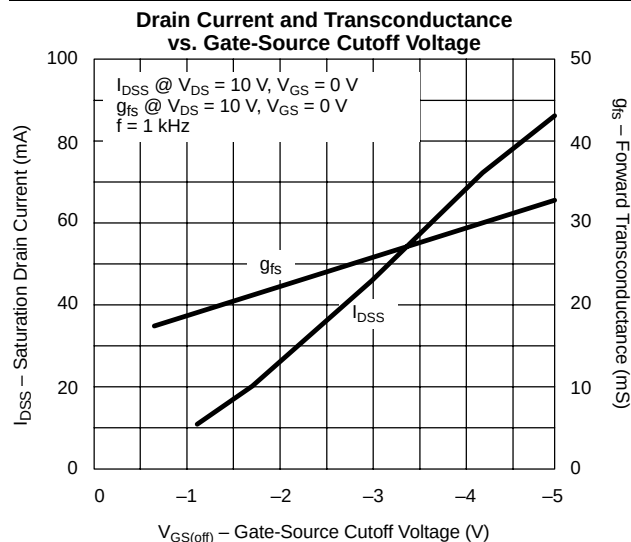
**SPECIFICATIONS FOR U309 AND U310 ($T_A = 25^\circ\text{C}$ UNLESS NOTED)**

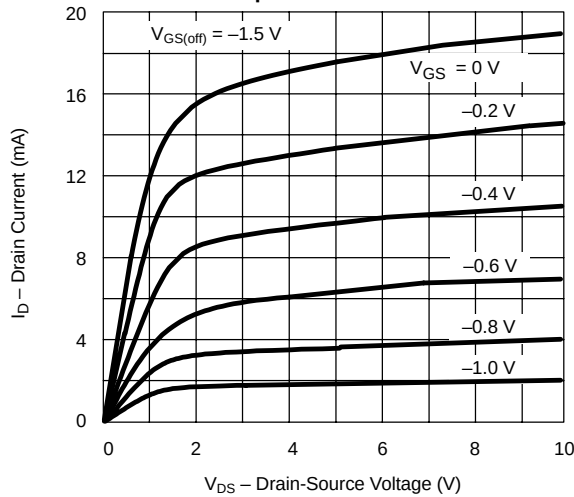
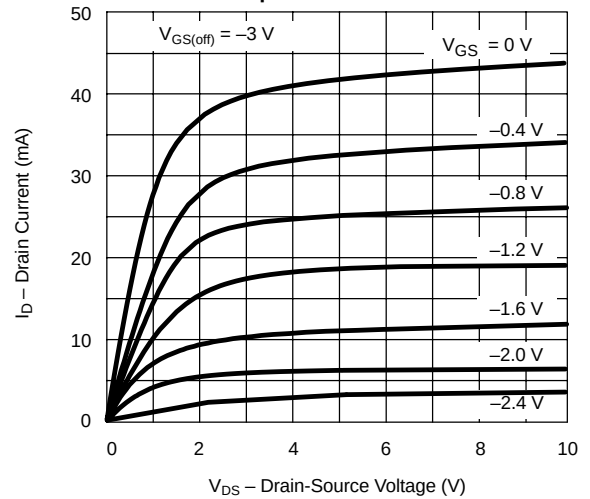
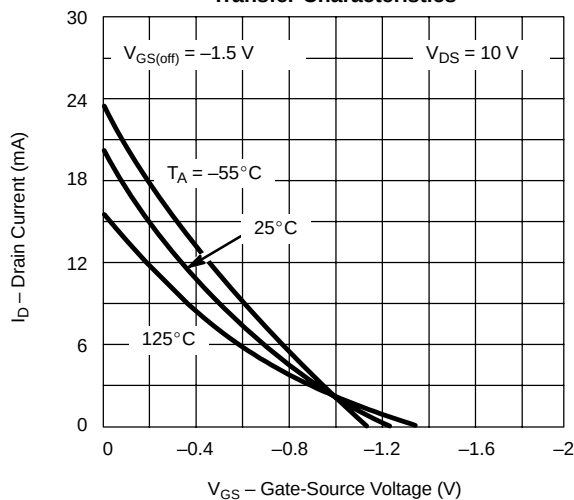
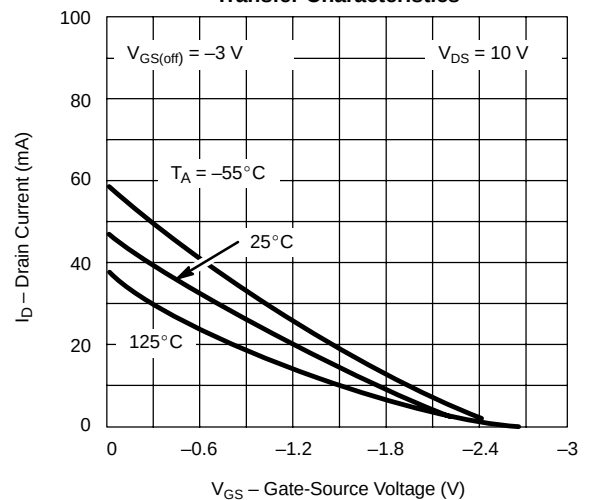
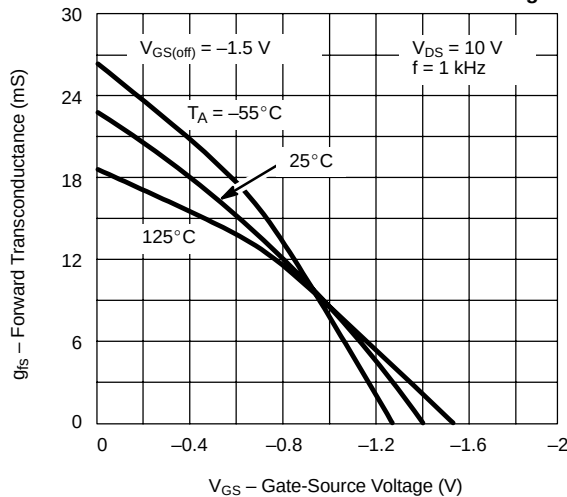
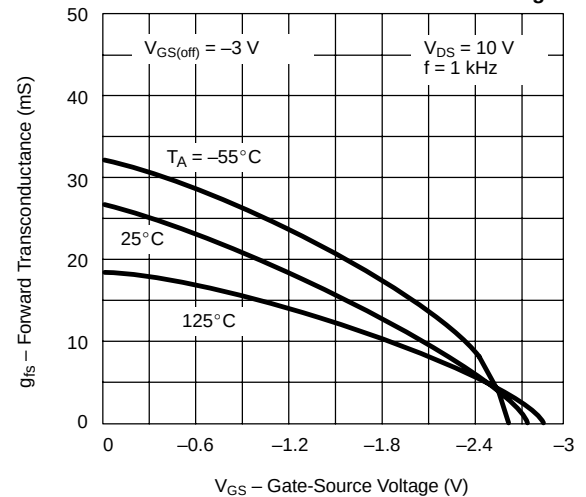
Parameter	Symbol	Test Conditions	Typ ^a	Limits				Unit
				U309		U310		
				Min	Max	Min	Max	
Static								
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = −1 μA , V _{DS} = 0 V	−35	−25		−25		V
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 nA		−1	−4	−2.5	−6	V
Saturation Drain Current ^b	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°C	−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	e _n	V _{DS} = 10 V, I _D = 10 mA f = 100 Hz	6					nV/ √Hz
High Frequency								
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 ^c	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	

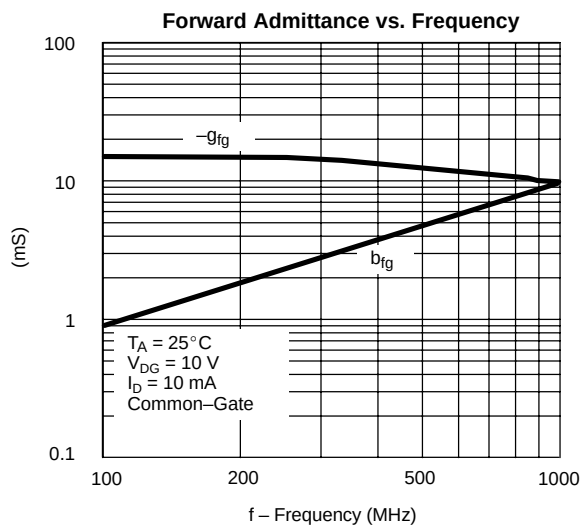
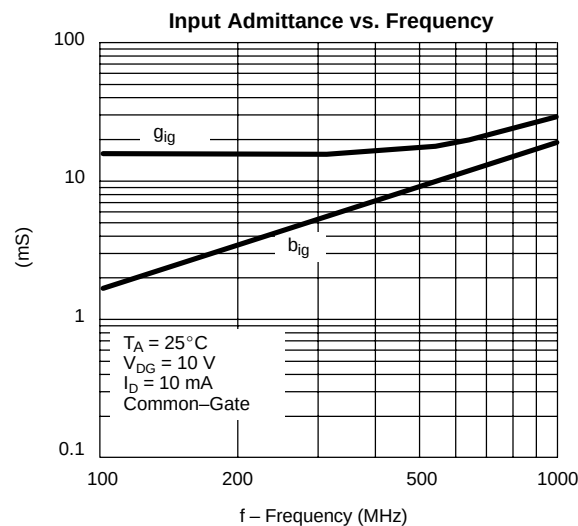
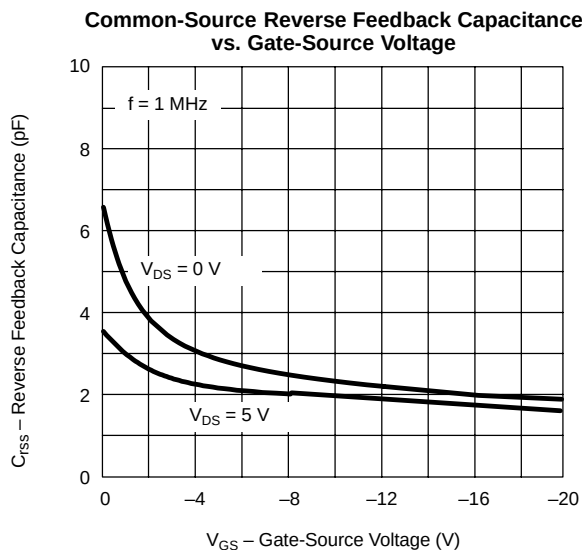
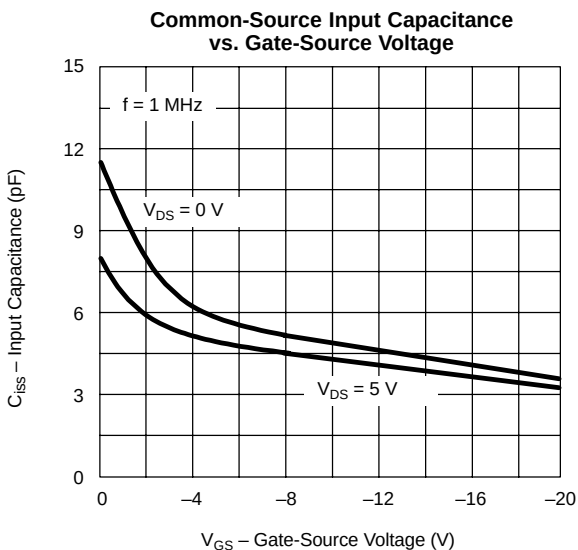
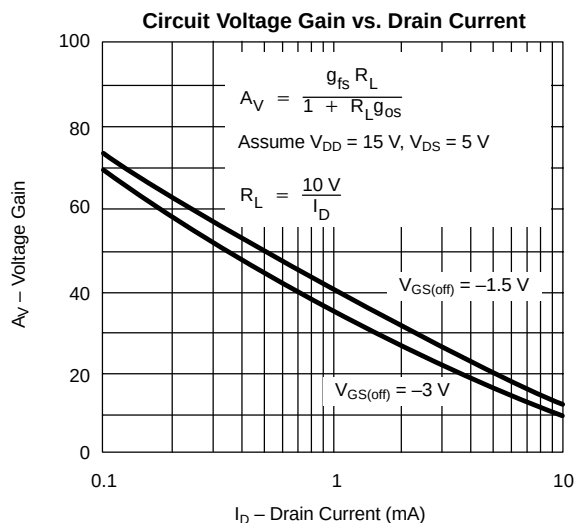
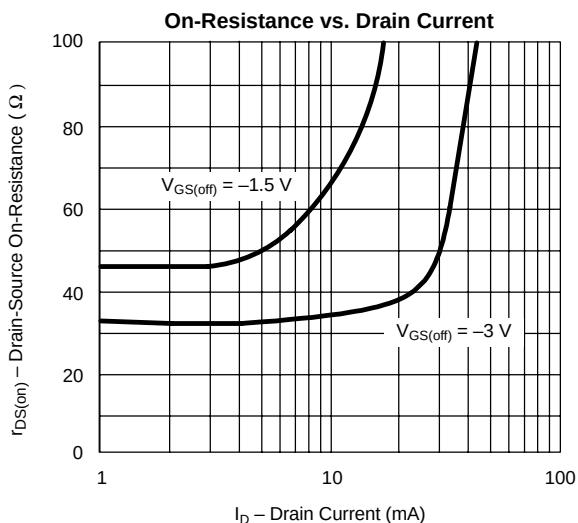
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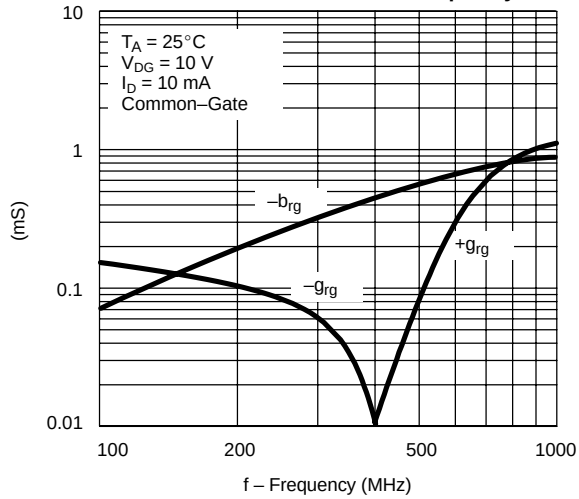
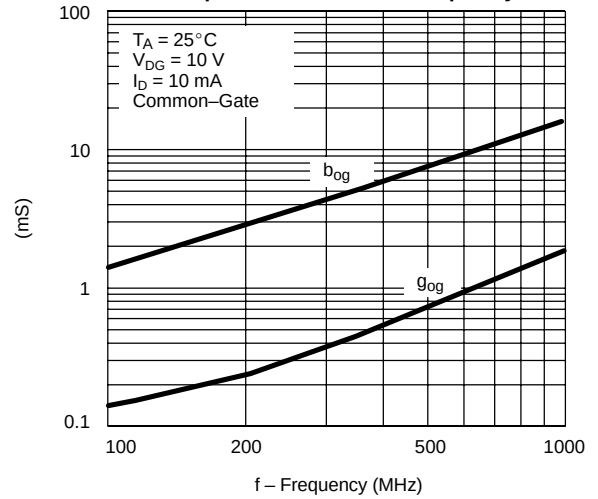
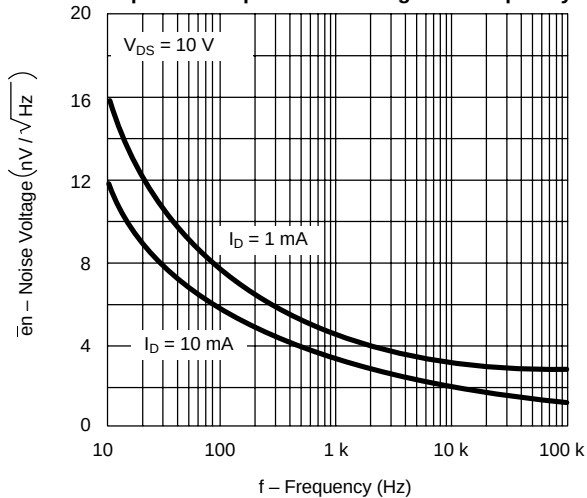
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b. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 3\%$.
c. Gain (G_{pg}) measured at optimum input noise match.

NZB

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


**TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)****Output Characteristics****Output Characteristics****Transfer Characteristics****Transfer Characteristics****Transconductance vs. Gate-Source Voltage****Transconductance vs. Gate-Source Voltage**

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**