

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

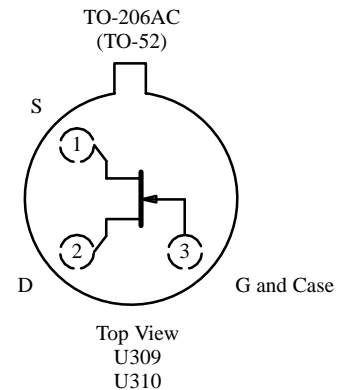
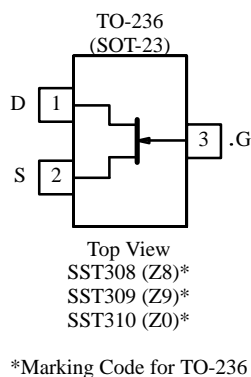
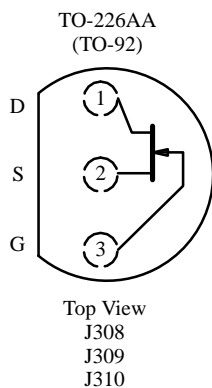
Description

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.



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
 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 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		
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		−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	
Common-Source Reverse Transfer Capacitance	C _{rss}		SST	4								
			J	1.9		2.5		2.5		2.5		
			SST	1.9								
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	
Common-Gate Output Conductance	g _{og}		f = 450 MHz	13								
			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.

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Specifications^a for U309 and U310

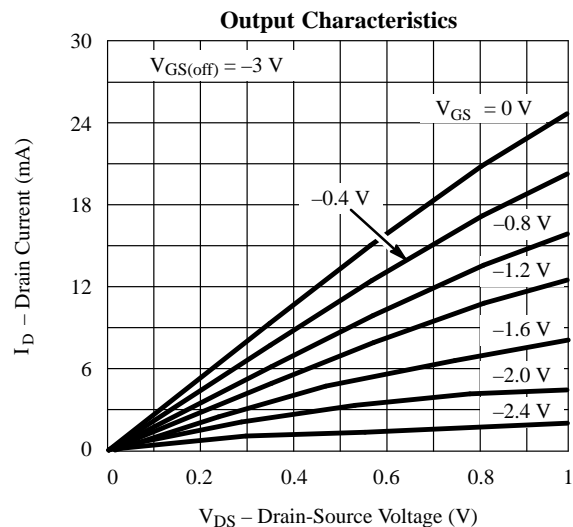
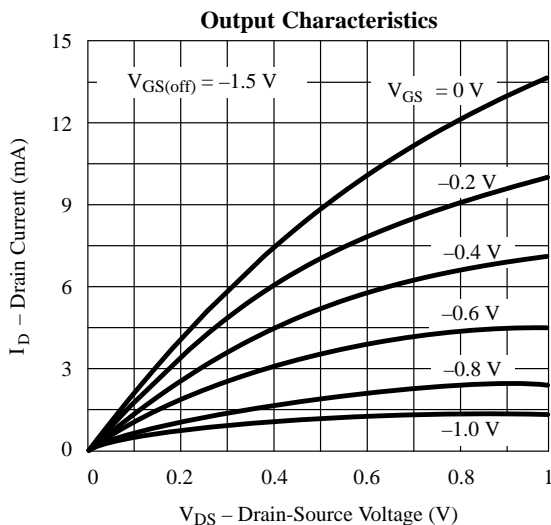
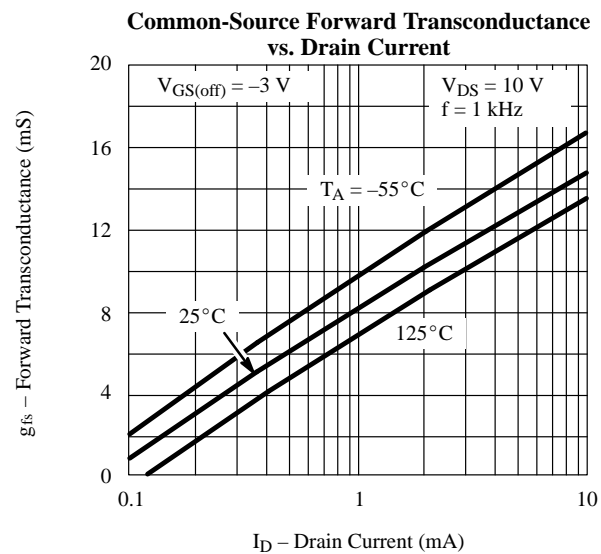
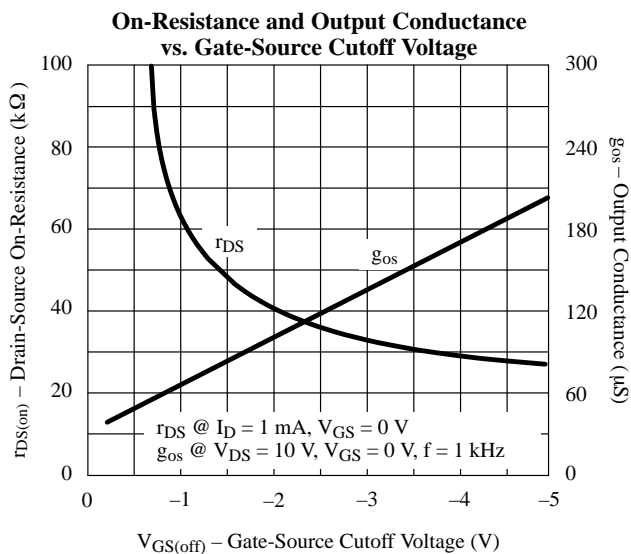
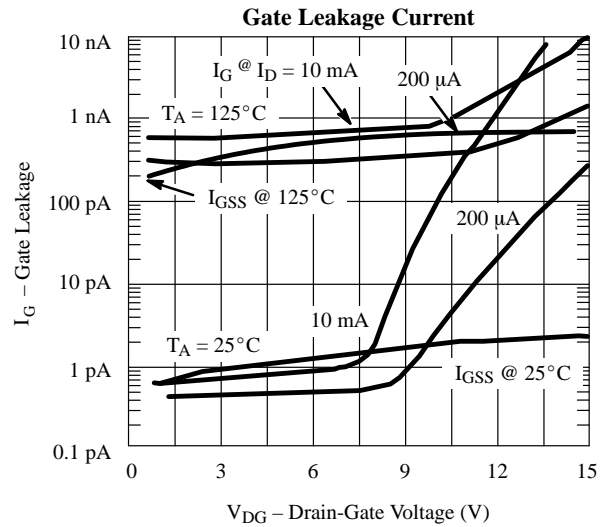
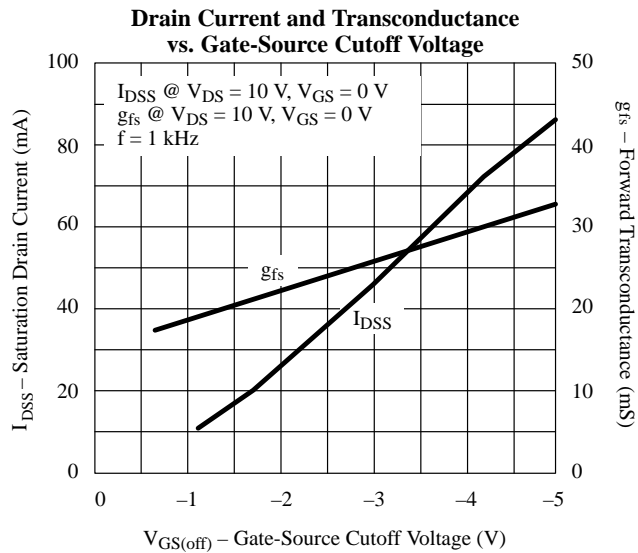
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit	
				U309		U310			
				Min	Max	Min	Max		
Static									
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = −1 μA , V _{DS} = 0 V	−35	−25		−25		V	
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 nA		−1	−4	−2.5	−6		
Saturation Drain 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	−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	\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 ^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

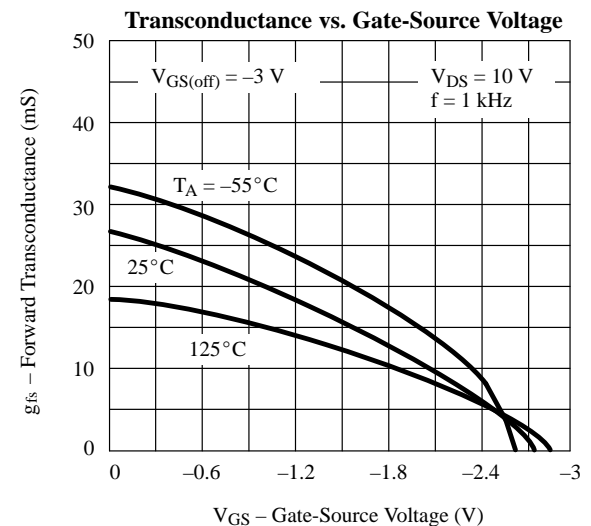
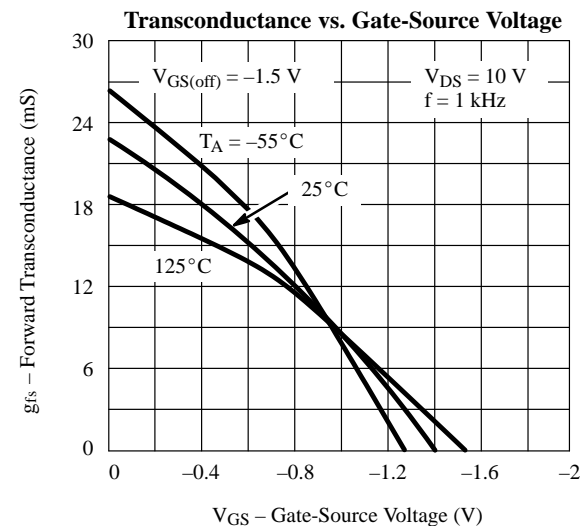
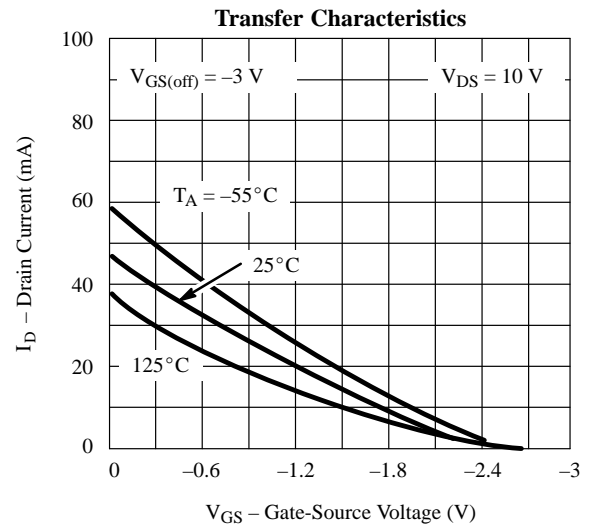
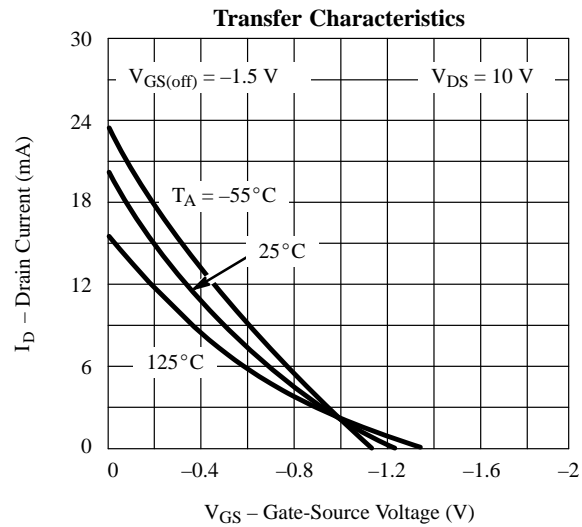
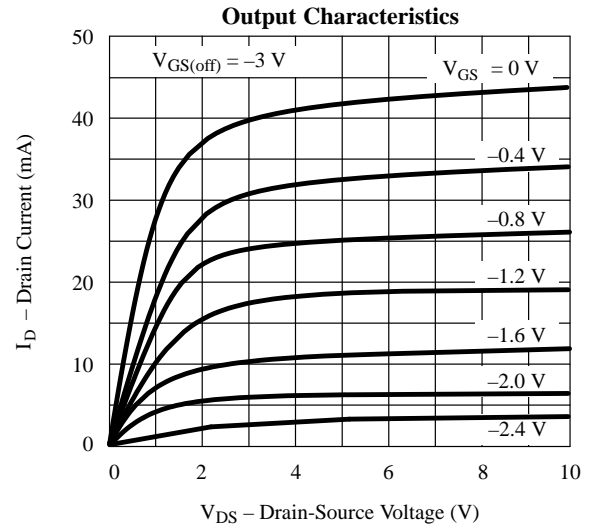
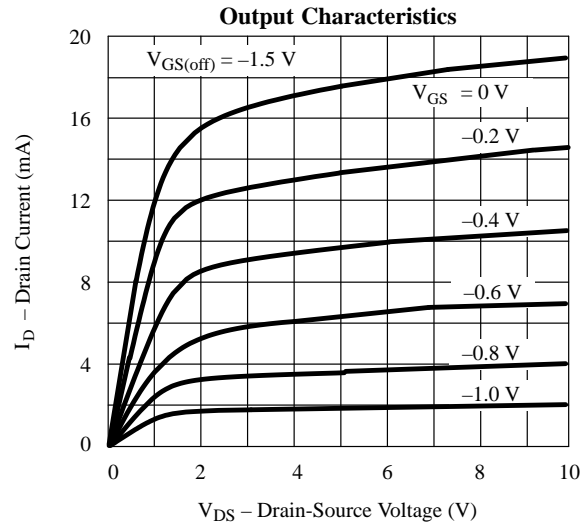
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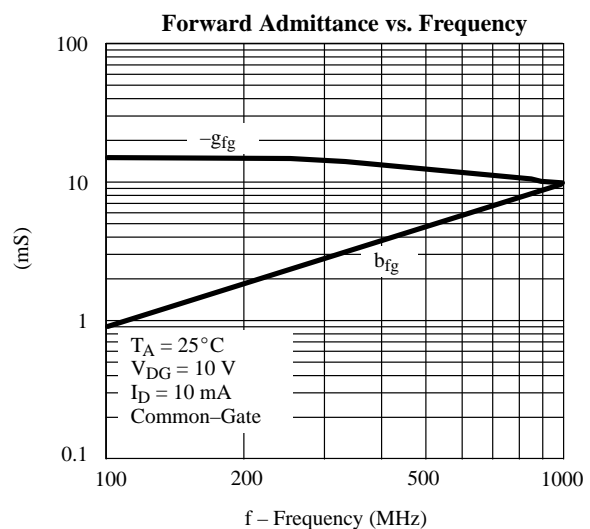
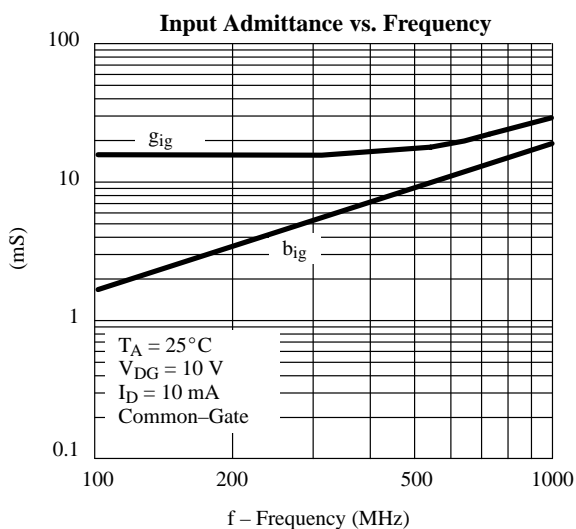
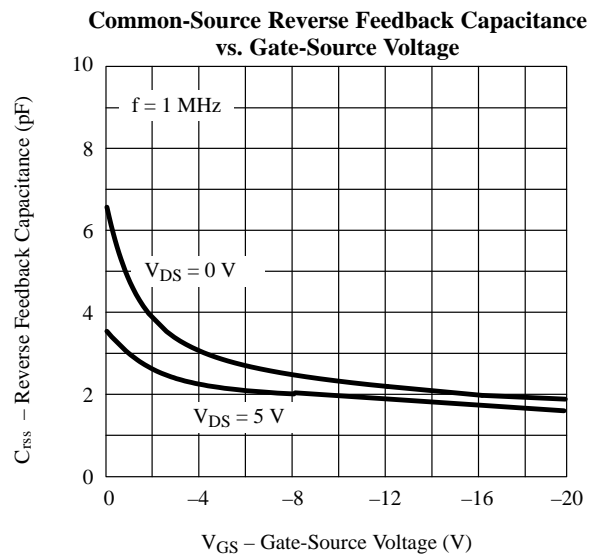
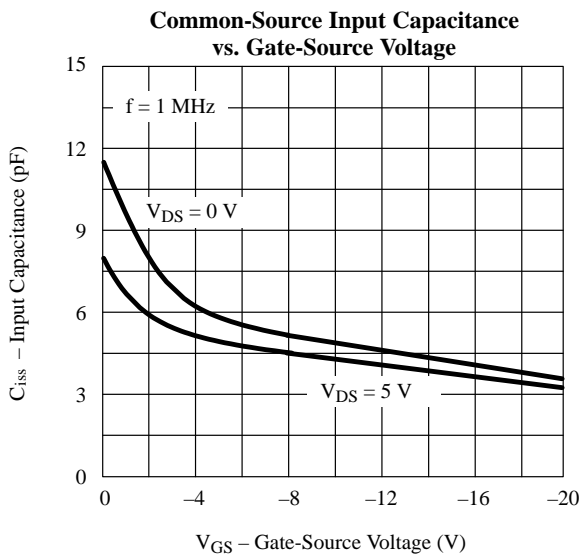
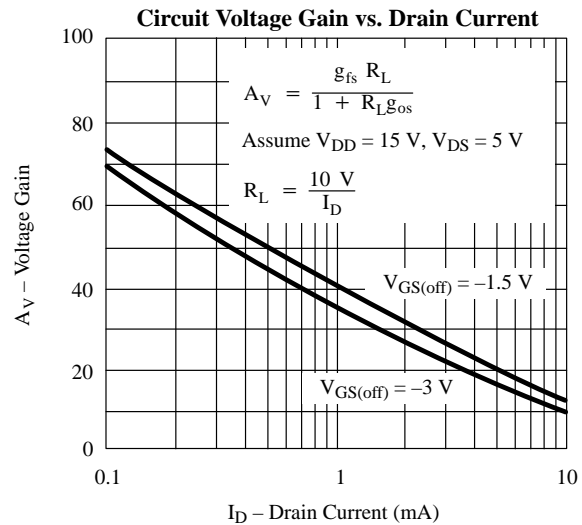
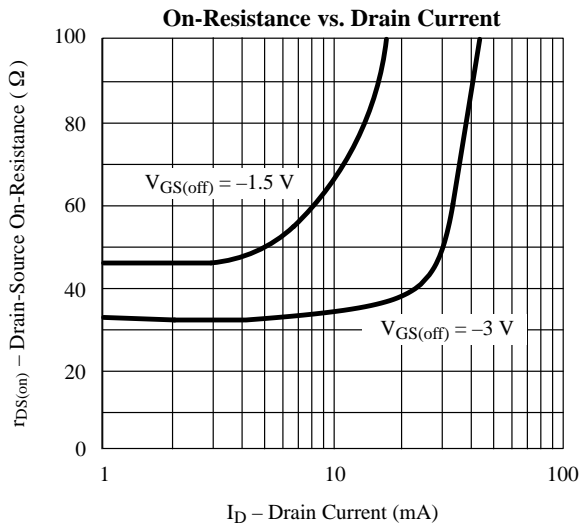
Typical Characteristics



Typical Characteristics (Cont'd)



Typical Characteristics (Cont'd)



Typical Characteristics (Cont'd)

