

J/SST/U308 Series

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

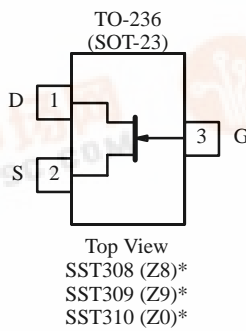
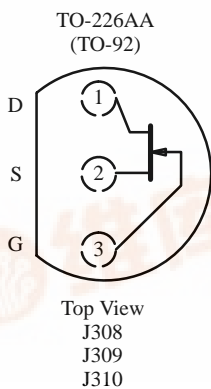
Description

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.

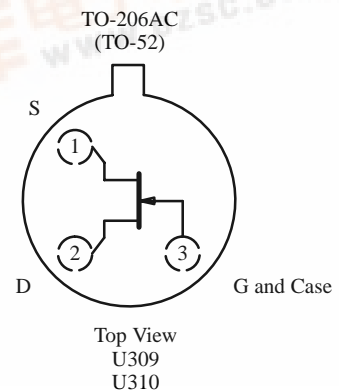
Low-cost J series TO-226AA (TO-92) packaging supports automated assembly with tape-and-reel options. The SST series TO-236 (SOT-23) package provides

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.



*Marking Code for TO-236



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) ^a	350 mW
	(U Prefix)	20 mA		(U Prefix) ^b	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^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
			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	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						dB	
			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						dB		
		f = 450 MHz	2.7								

Notes

- T_A = 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_{pg}) measured at optimum input noise match.

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J/SST/U308 Series

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	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-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}	$V_{DS} = 10 V$ $I_D = 10 mA$	$f = 105 MHz$	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

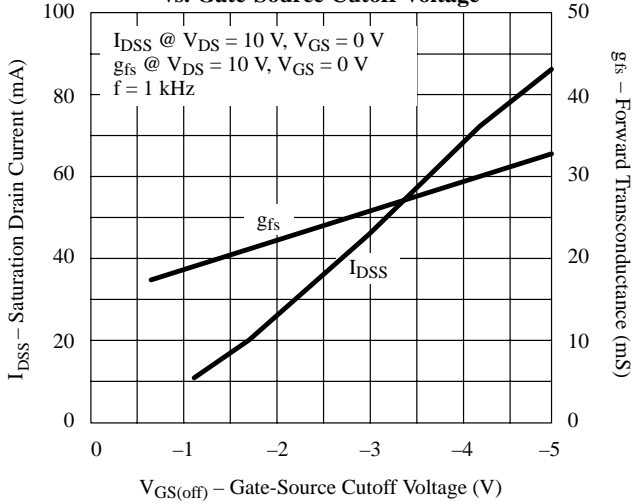
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- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 3\%$.
- Gain (G_{pg}) measured at optimum input noise match.

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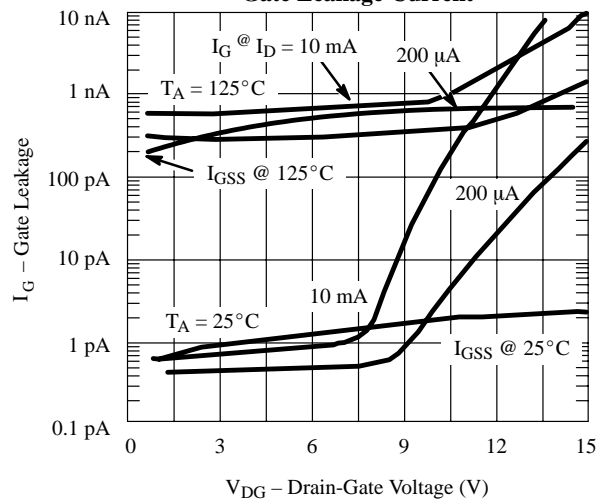
J/SST/U308 Series

Typical Characteristics

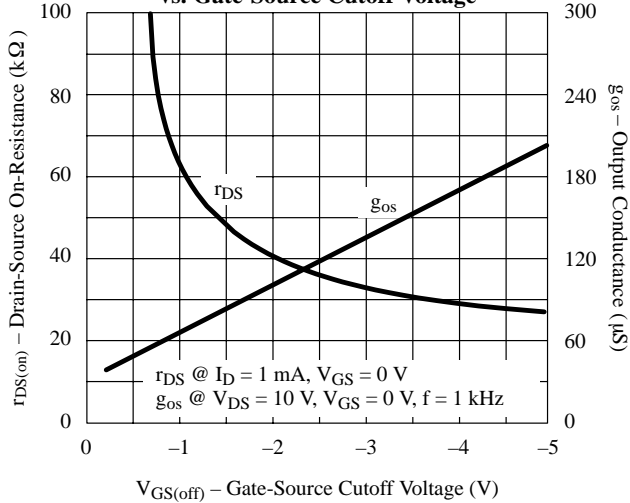
Drain Current and Transconductance vs. Gate-Source Cutoff Voltage



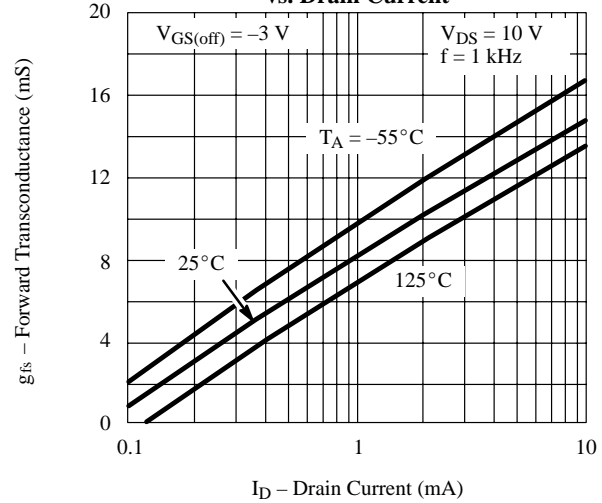
Gate Leakage Current



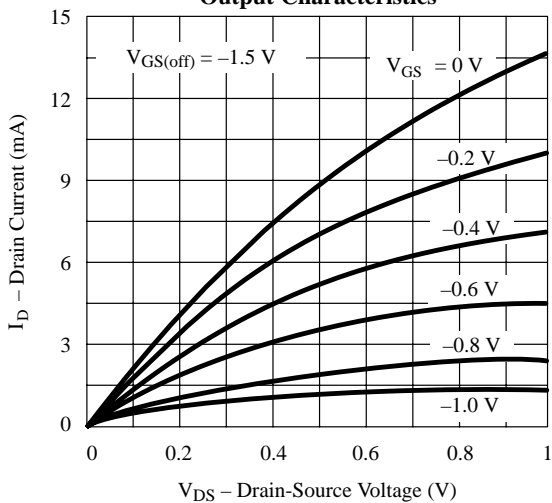
On-Resistance and Output Conductance vs. Gate-Source Cutoff Voltage



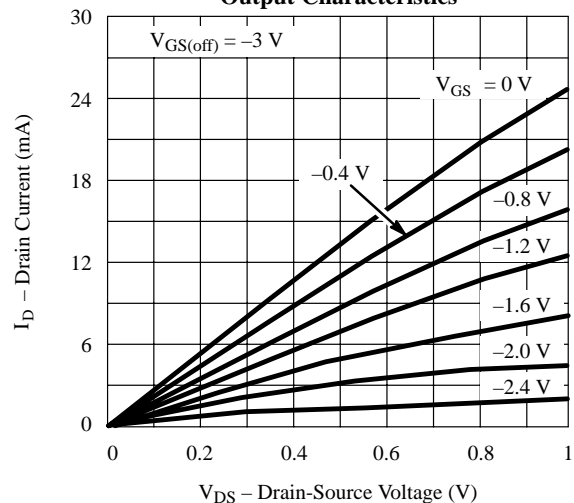
Common-Source Forward Transconductance vs. Drain Current



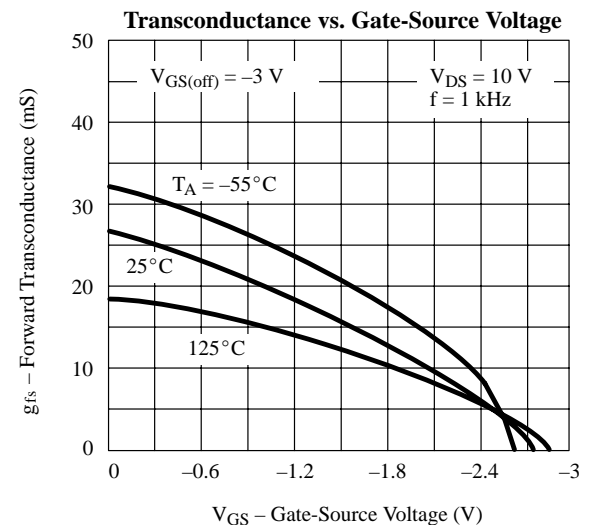
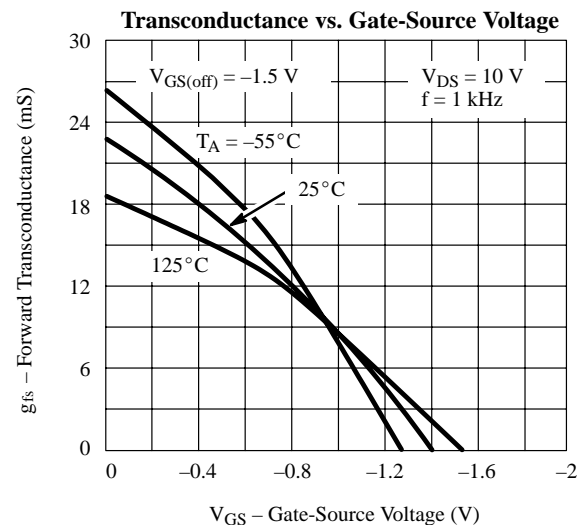
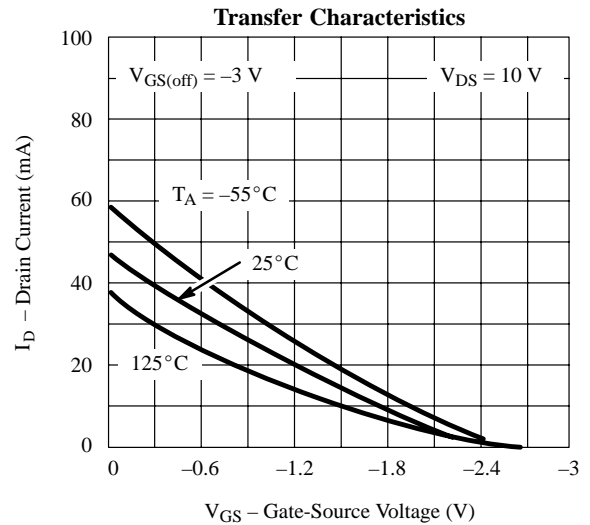
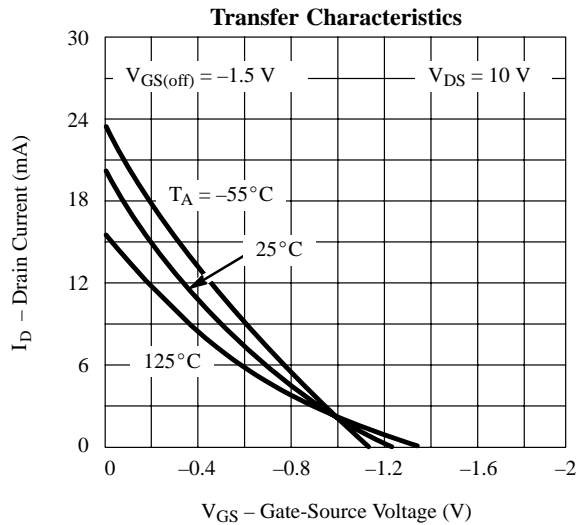
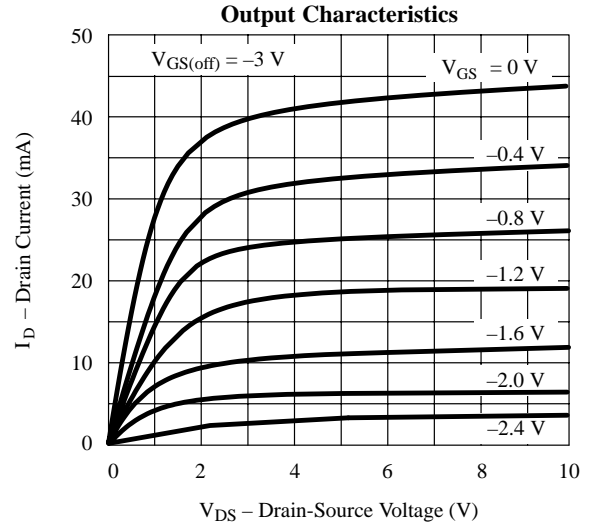
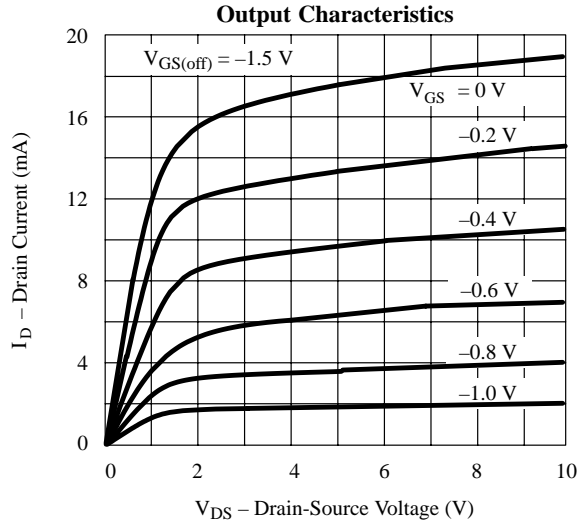
Output Characteristics



Output Characteristics

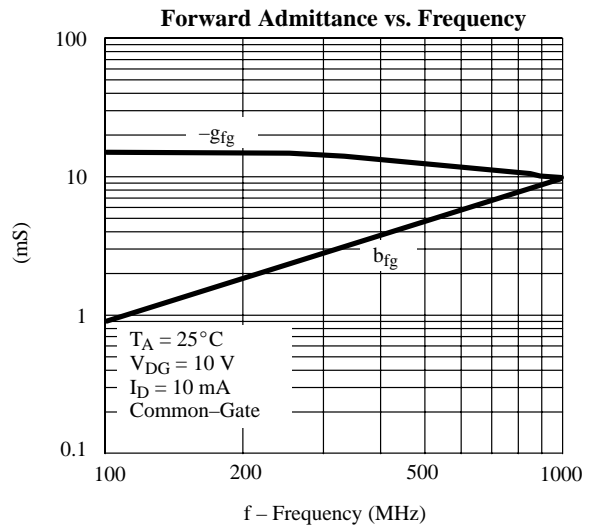
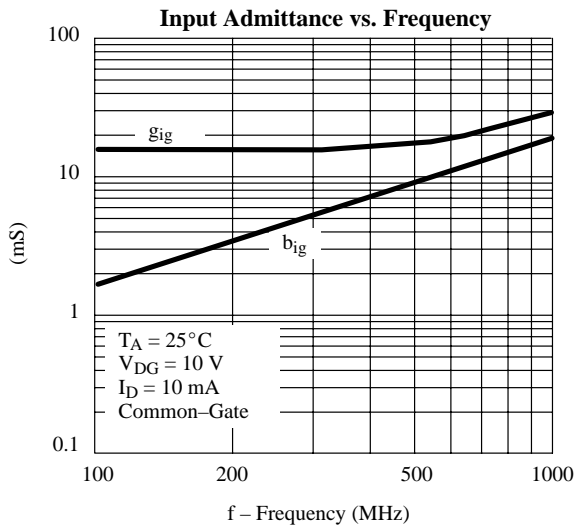
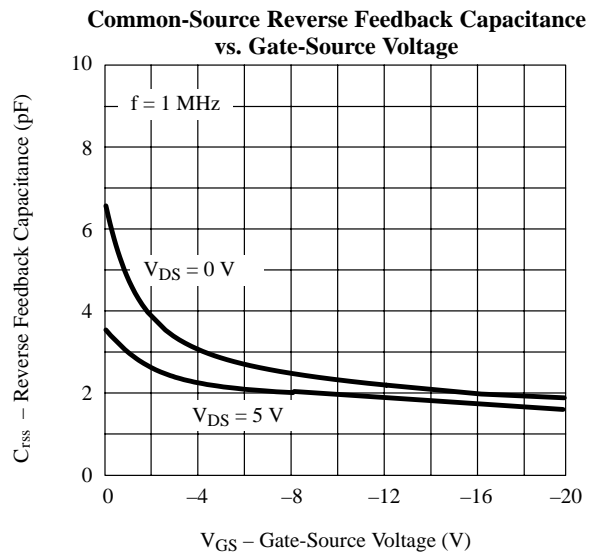
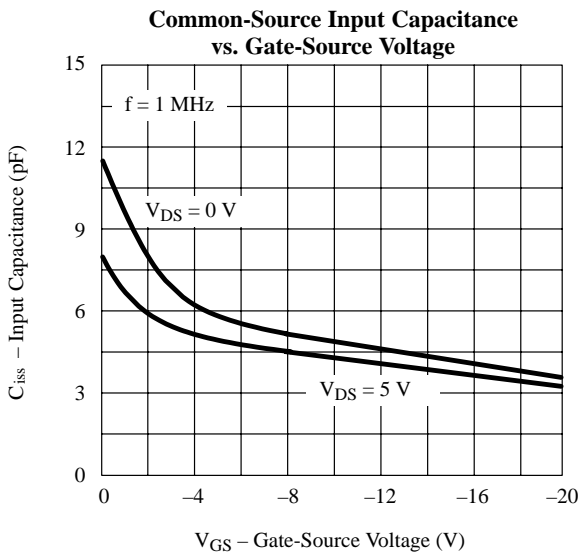
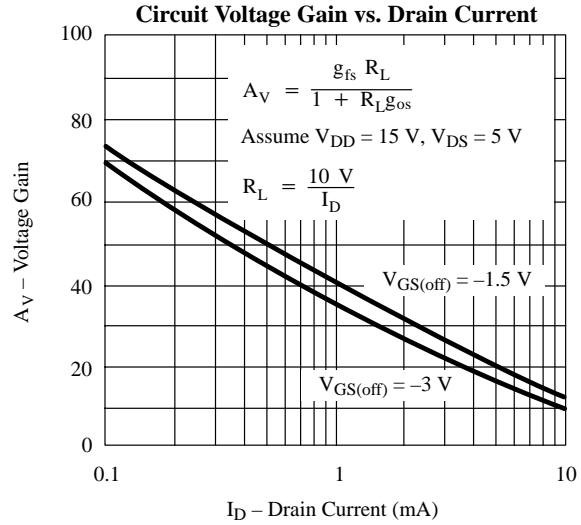
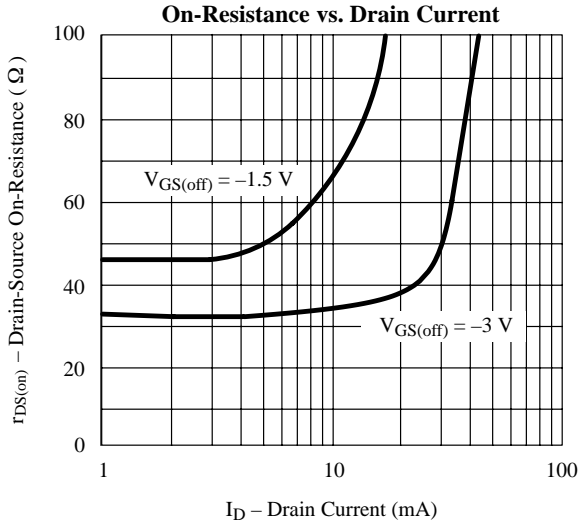


Typical Characteristics (Cont'd)



J/SST/U308 Series

Typical Characteristics (Cont'd)



J/SST/U308 Series

Typical Characteristics (Cont'd)

