

N-Channel JFETs

PRODUCT SUMMARY				
Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	g_{fs} Min (mS)	I_{DSS} Min (mA)
J304	-2 to -6	-30	4.5	5
J305	-0.5 to -3	-30	3	1

FEATURES

- Excellent High Frequency Gain: J304, G_{ps} 11 dB (typ) @ 400 MHz
- Very Low Noise: 3.8 dB (typ) @ 400 MHz
- Very Low Distortion
- High ac/dc Switch Off-Isolation
- High Gain: $A_V = 60$ @ 100 μ A

BENEFITS

- Wideband High Gain
- Very High System Sensitivity
- High Quality of Amplification
- High-Speed Switching Capability
- High Low-Level Signal Amplification

APPLICATIONS

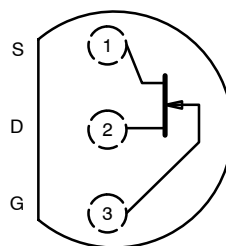
- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

DESCRIPTION

The J304/305 n-channel JFETs provide high-performance amplification, especially at high-frequency. These products are available in tape and reel for automated assembly (see Package Information).

For similar products in TO-236 (SOT-23) packages, see the 2N/SST5484 series data sheet, or in TO-206AF (TO-72) packages, see the 2N/SST4416 series data sheet.

**TO-226AA
(TO-92)**



Top View

ABSOLUTE MAXIMUM RATINGS

Gate-Source/Gate-Drain Voltage	-30 V
Forward Gate Current	10 mA
Storage Temperature	-55 to 150°C
Operating Junction Temperature	-55 to 150°C

Lead Temperature ($1/16$ " from case for 10 sec.)	300°C
Power Dissipation ^a	350 mW

Notes
a. Derate 2.8 mW/°C above 25°C

SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Conditions	Typ ^a	Limits				Unit
				J304		J305		
				Min	Max	Min	Max	
Static								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1\ \mu\text{A}$, $V_{DS} = 0\ \text{V}$	-35	-30		-30		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 15\ \text{V}$, $I_D = 1\ \text{nA}$		-2	-6	-0.5	-3	V
Saturation Drain Current ^b	I_{DSS}	$V_{DS} = 15\ \text{V}$, $V_{GS} = 0\ \text{V}$		5	15	1	8	mA
Gate Reverse Current	I_{GSS}	$V_{GS} = -20\ \text{V}$, $V_{DS} = 0\ \text{V}$			-100		-100	pA
			$T_A = 100^\circ\text{C}$	-0.2				nA
Gate Operating Current ^b	I_G	$V_{DG} = 10\ \text{V}$, $I_D = 1\ \text{mA}$	-20					pA
Drain Cutoff Current	$I_{D(off)}$	$V_{DS} = 10\ \text{V}$, $V_{GS} = -6\ \text{V}$	2					
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 0\ \text{V}$, $I_D = 300\ \mu\text{A}$	200					Ω
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 1\ \text{mA}$, $V_{DS} = 0\ \text{V}$	0.7					V
Dynamic								
Common-Source Forward Transconductance	g_{fs}	$V_{DS} = 15\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{kHz}$		4.5	7.5	3		mS
Common-Source Output Conductance	g_{os}					50		50
Common-Source Input Capacitance	C_{iss}	$V_{DS} = 15\ \text{V}$, $V_{GS} = 0\ \text{V}$ $f = 1\ \text{MHz}$	2.2					pF
Common-Source Reverse Transfer Capacitance	C_{rss}		0.7					
Common-Source Output Capacitance	C_{oss}		1					
Equivalent Input Noise Voltage	\bar{e}_n	$V_{DS} = 10\ \text{V}$, $V_{GS} = 0\ \text{V}$ $f = 100\ \text{Hz}$	10					nV/ $\sqrt{\text{Hz}}$

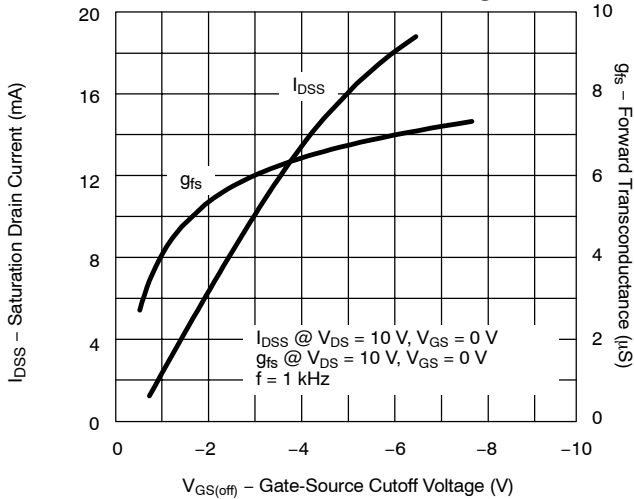
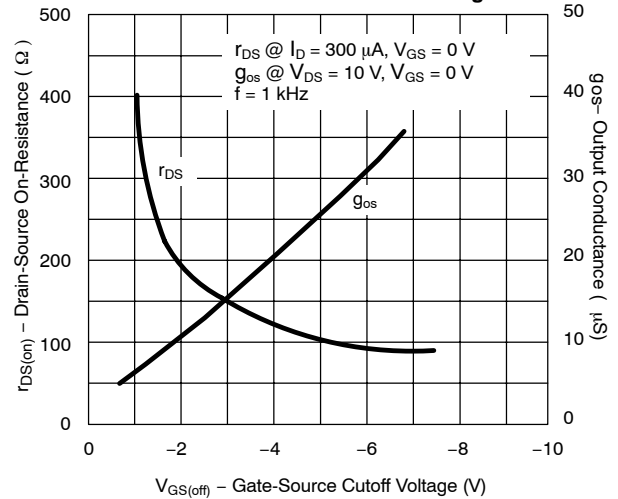
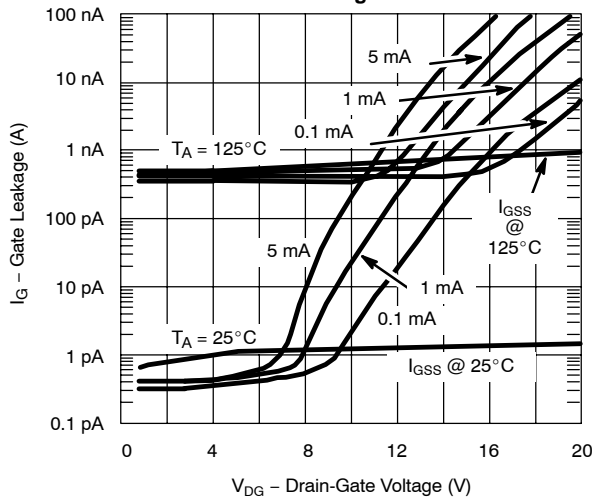
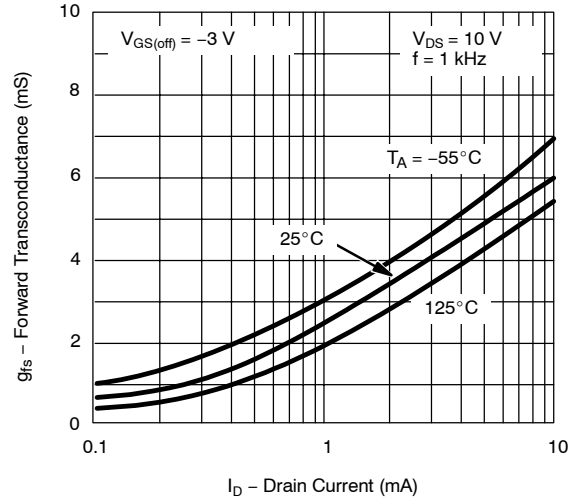
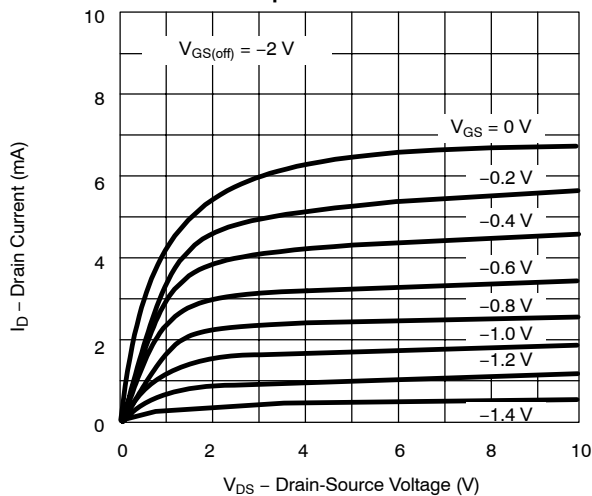
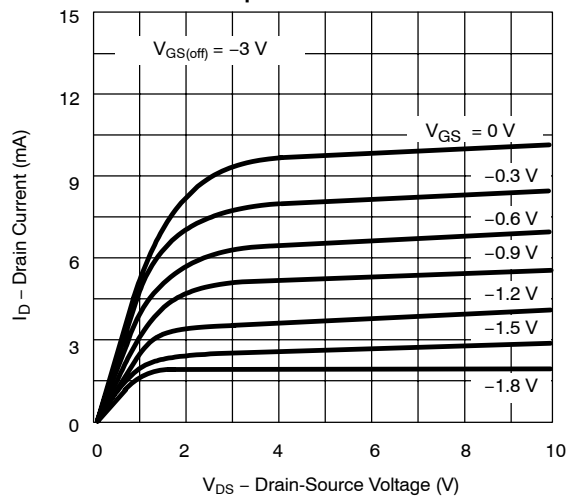
TYPICAL HIGH-FREQUENCY SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Conditions	Limits (Typ)				Unit	
			J304		J305			
			100 MHz	400 MHz	100 MHz	400 MHz		
High-Frequency								
Common-Source Input Conductance	g_{iss}	$V_{DS} = 15\ \text{V}$, $V_{GS} = 0\ \text{V}$	80	800	80			μS
Common-Source Input Susceptance	b_{iss}	$V_{DS} = 15\ \text{V}$, $V_{GS} = 0\ \text{V}$	2	7.5	2			mS
Common-Source Output Conductance	g_{oss}		60	80	60			μS
Common-Source Output Susceptance	b_{oss}		0.8	3.6	0.8			mS
Common-Source Forward Transconductance	g_{fs}		4.4	4.2	3			
Common-Source Power Gain	G_{ps}		$V_{DS} = 15\ \text{V}$, $I_D = 5\ \text{mA}$	20	11			
Noise Figure	NF	$R_G = 1\ \text{k}\Omega$	1.7	3.8				

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 $\leq 2\%$.

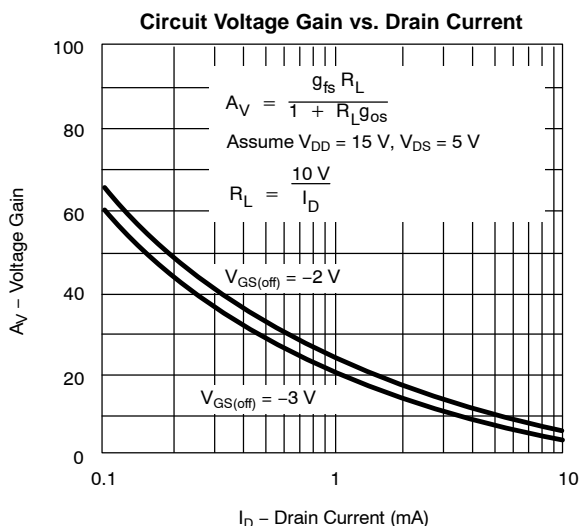
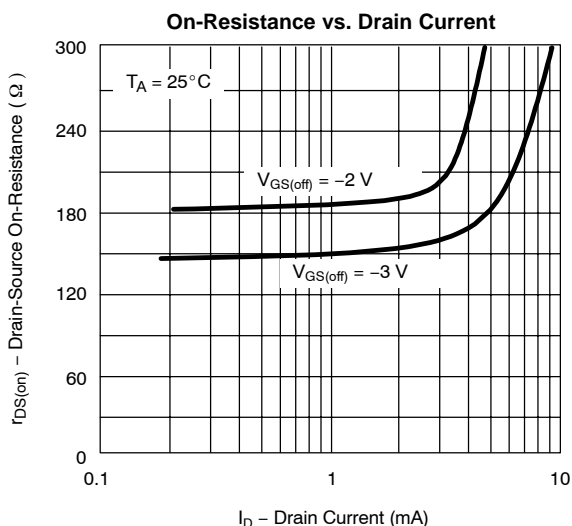
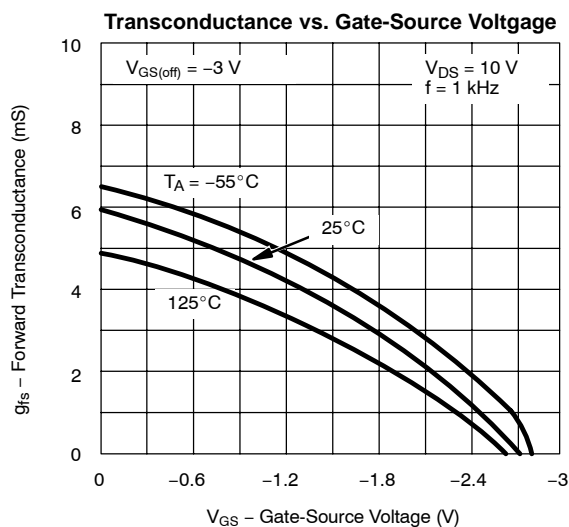
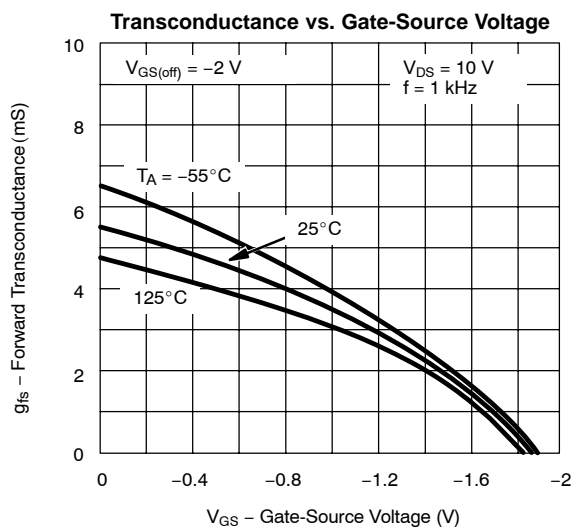
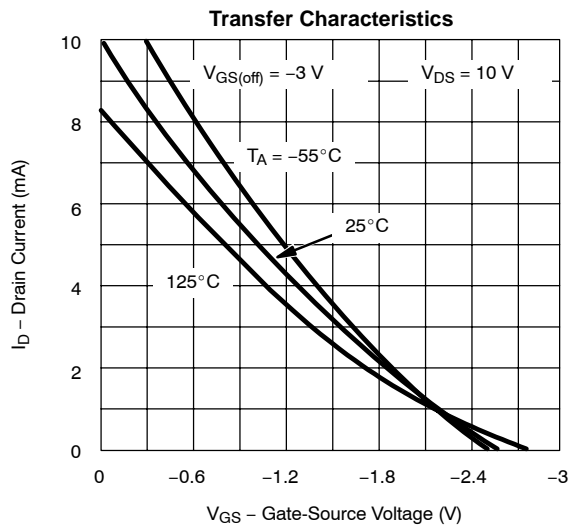
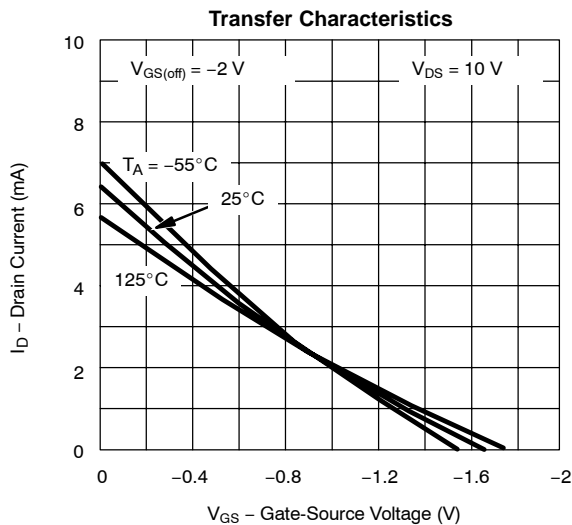
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Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)
Drain Current and Transconductance vs. Gate-Source Cutoff Voltage

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

Gate Leakage Current

Common-Source Forward Transconductance vs. Drain Current

Output Characteristics

Output Characteristics




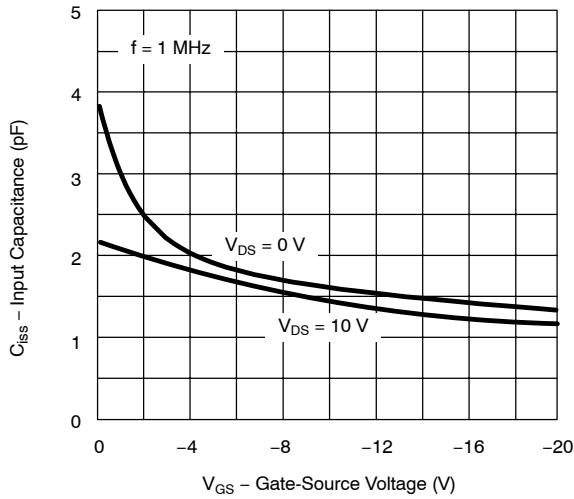
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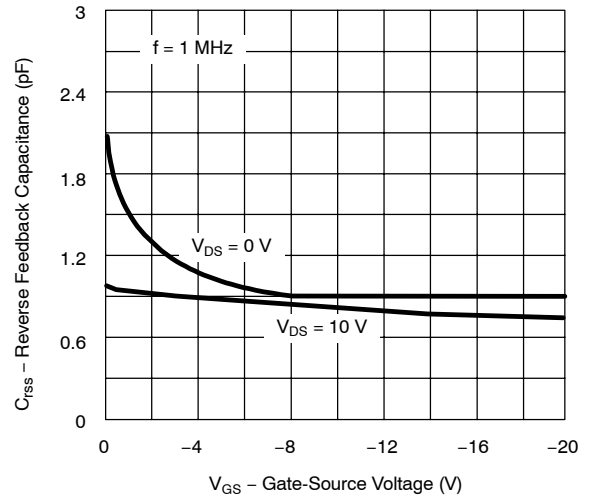


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

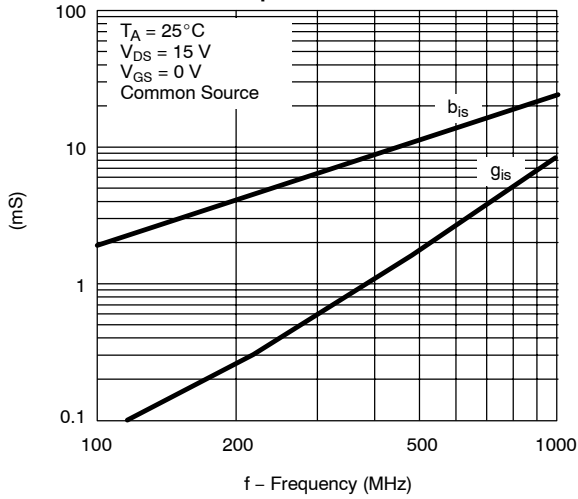
Common-Source Input Capacitance vs. Gate-Source Voltage



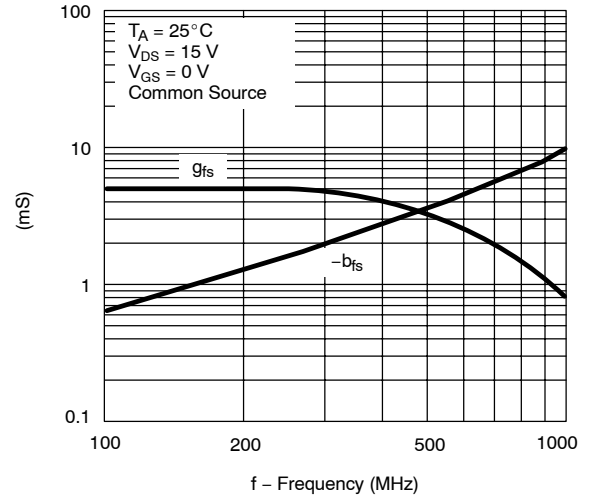
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



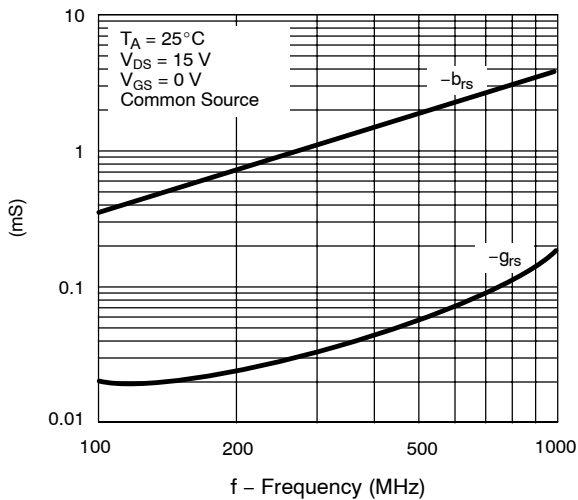
Input Admittance



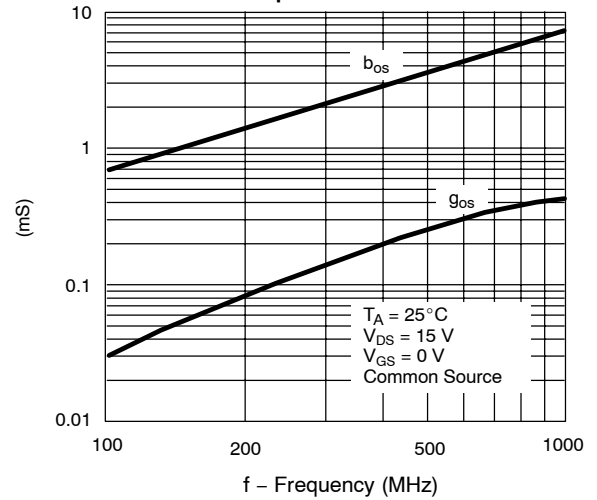
Forward Admittance



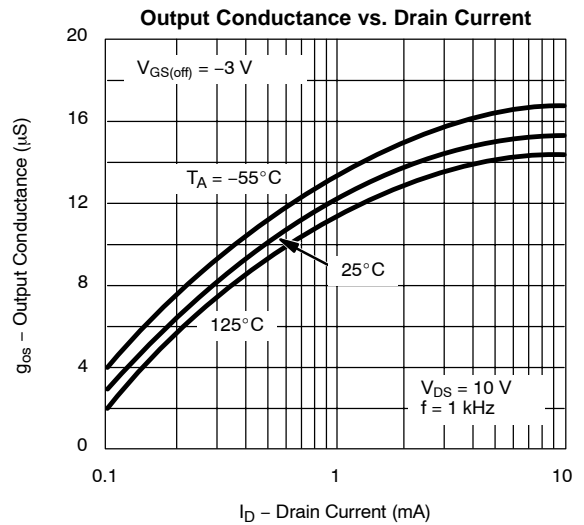
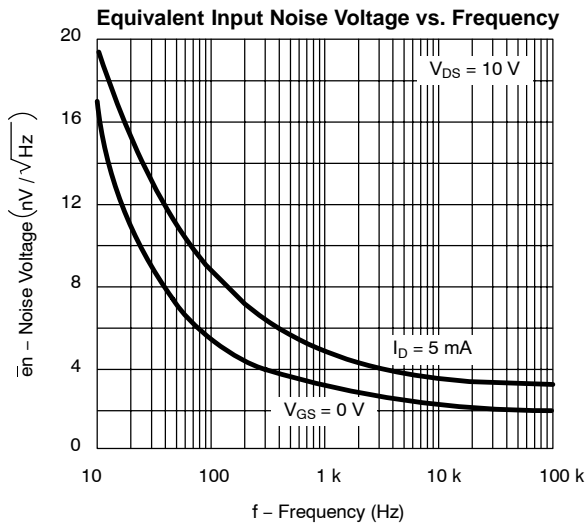
Reverse Admittance



Output Admittance



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



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