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, Gps 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 μA

BENEFITS

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

APPLICATIONS

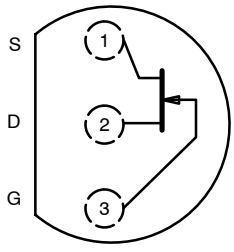
- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

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°C UNLESS OTHERWISE NOTED)

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

TYPICAL HIGH-FREQUENCY SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

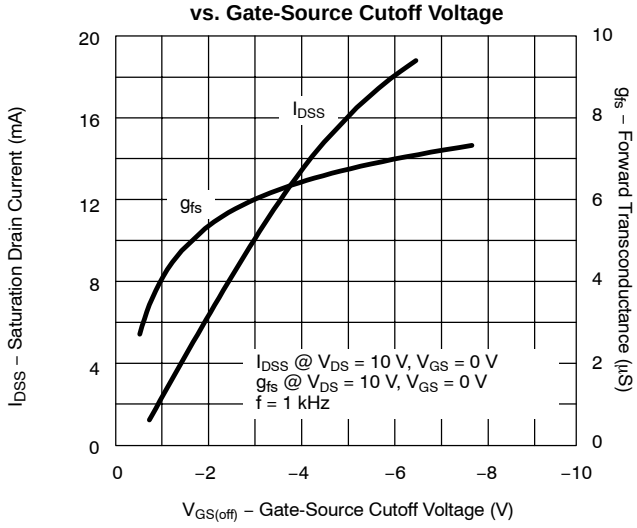
Parameter	Symbol	Test Conditions	Limits (Typ) J304 100 MHz	J304 400 MHz	J305 100 MHz	J305 400 MHz	Unit
High-Frequency							
Common-Source Input Conductance	g_{iss}	V_{DS} = 15 V, V_{GS} = 0 V	80	800	80		μS
Common-Source Input Susceptance	b_{iss}	V_{DS} = 15 V, V_{GS} = 0 V	2	7.5	2		mS
Common-Source 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 V, I_D = 5 mA	20	11			dB
Noise Figure	NF	R_G = 1 kΩ	1.7	3.8			

Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing. NH
b. Pulse test: PW ≤ 300 μs, duty cycle ≤ 2%.

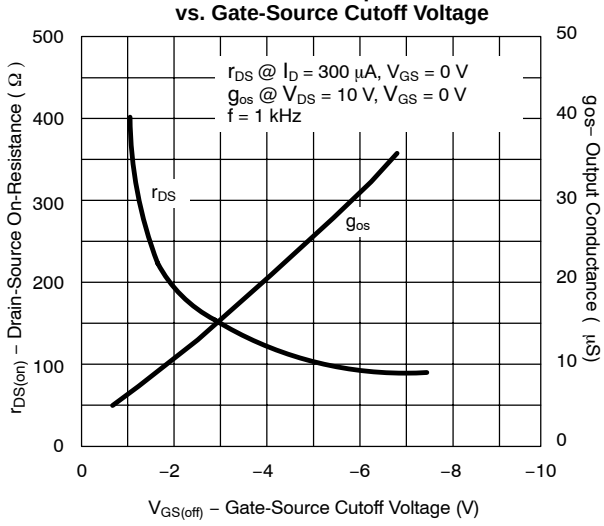
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

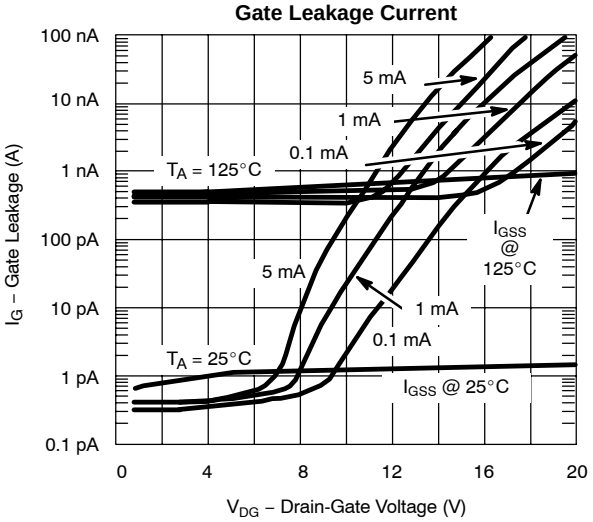
Drain Current and Transconductance vs. Gate-Source Cutoff Voltage



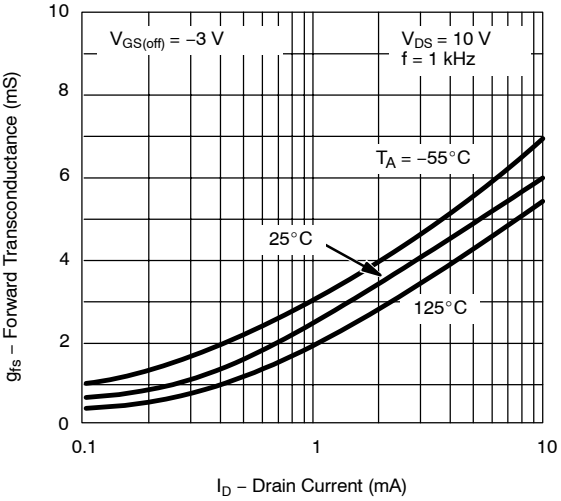
On-Resistance and Output Conductance vs. Gate-Source Cutoff Voltage



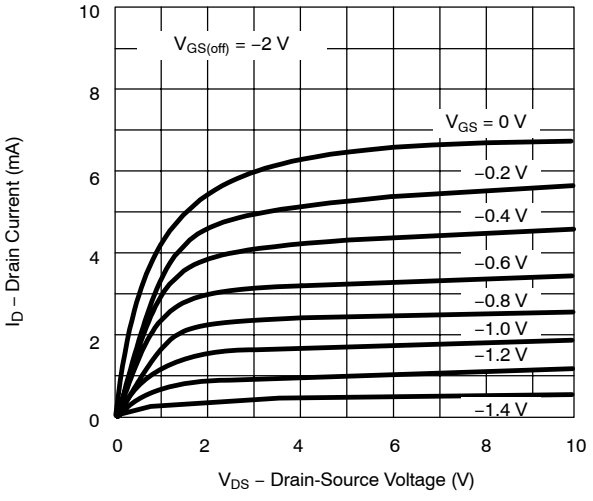
Gate Leakage Current



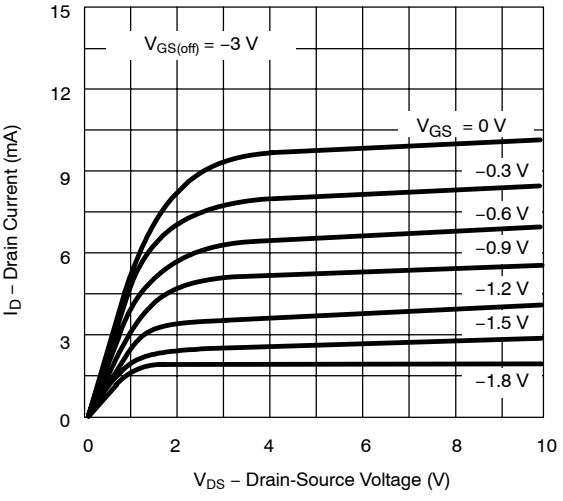
Common-Source Forward Transconductance vs. Drain Current



Output Characteristics

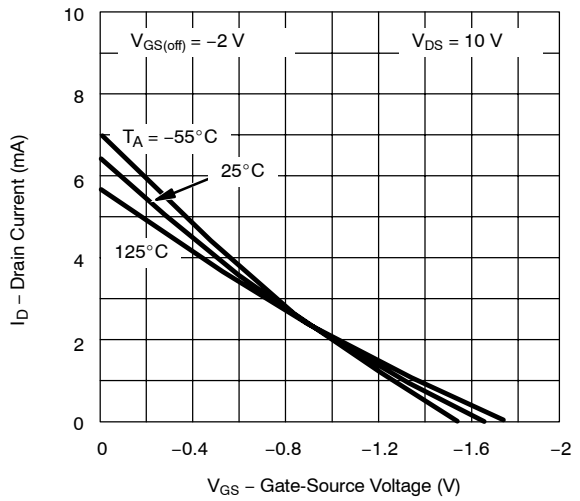


Output Characteristics



TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

Transfer Characteristics



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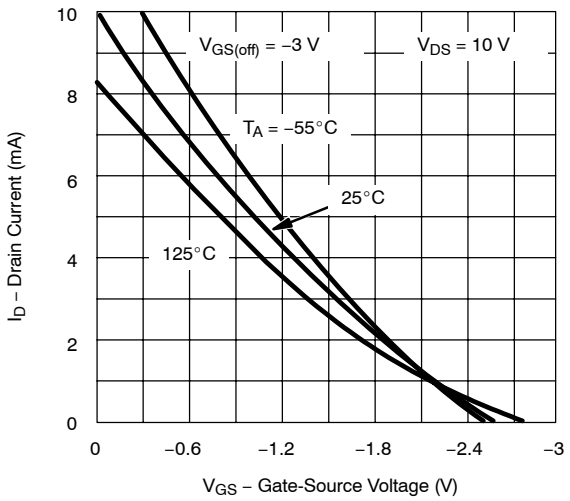
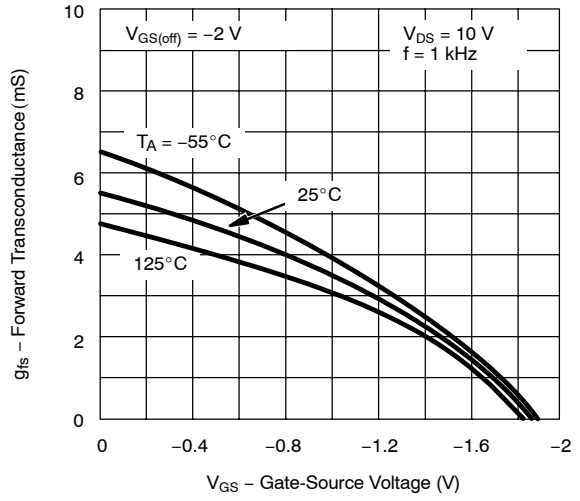
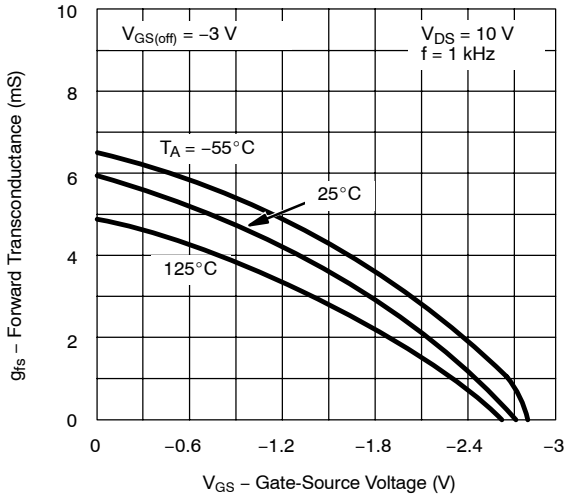


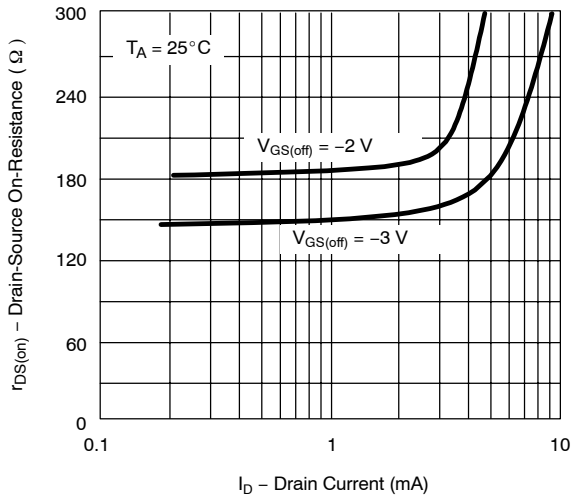
Transconductance vs. Gate-Source Voltage



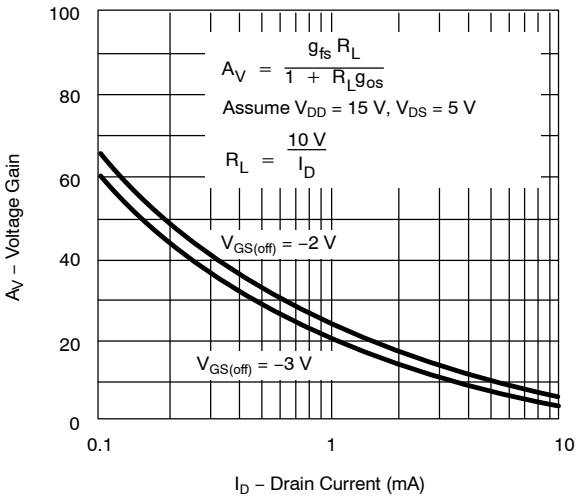
Transconductance vs. Gate-Source Voltgage



On-Resistance vs. Drain Current



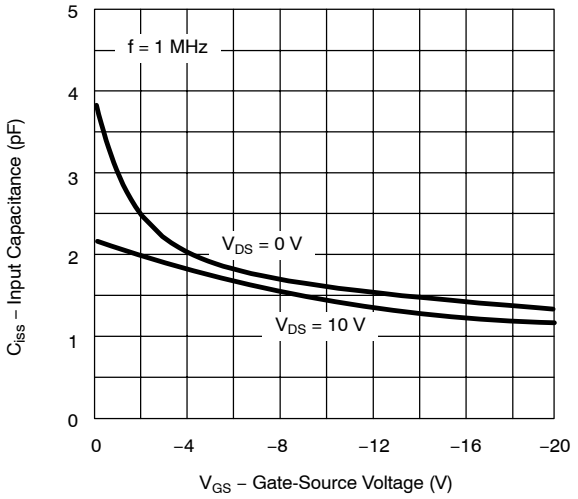
Circuit Voltage Gain vs. Drain Current



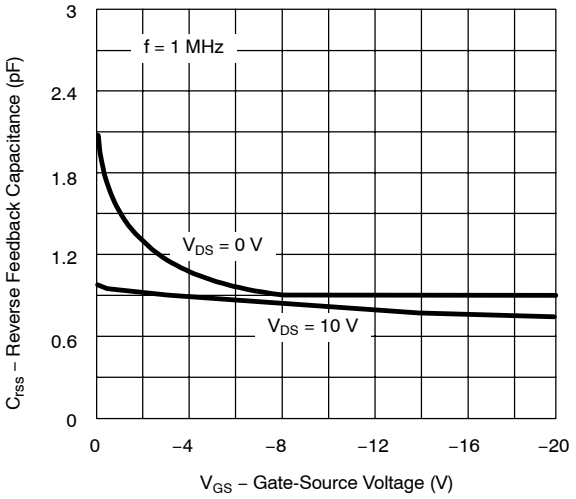
Document Number: 70236
S-50077—Rev. E, 24-Jan-05

TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

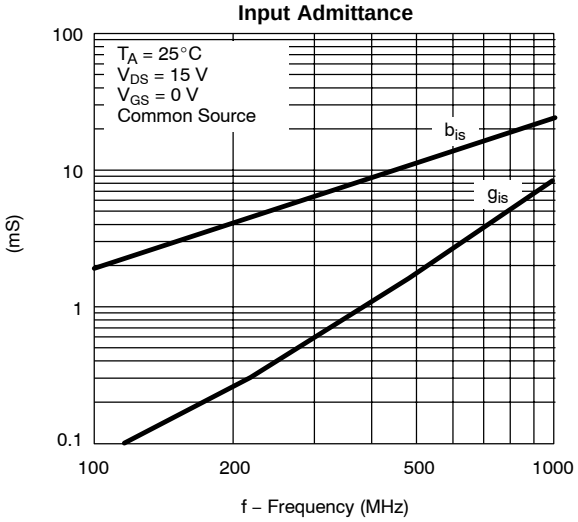
Common-Source Input Capacitance vs. Gate-Source Voltage



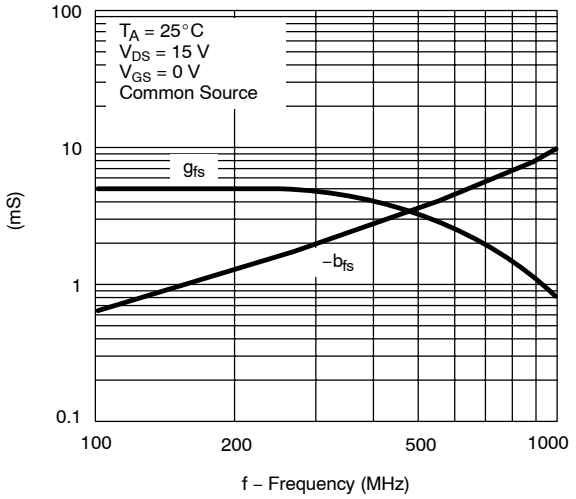
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



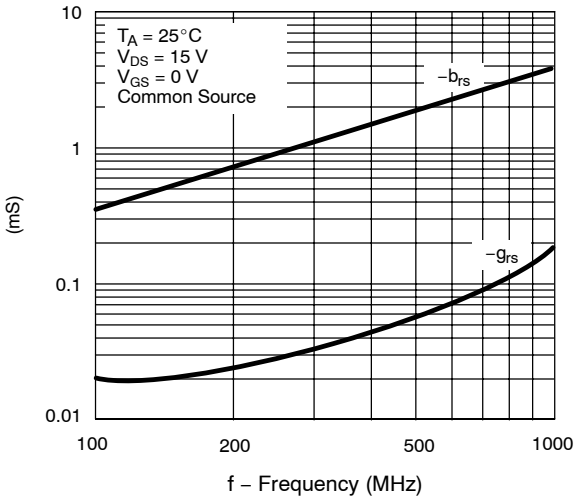
Input Admittance



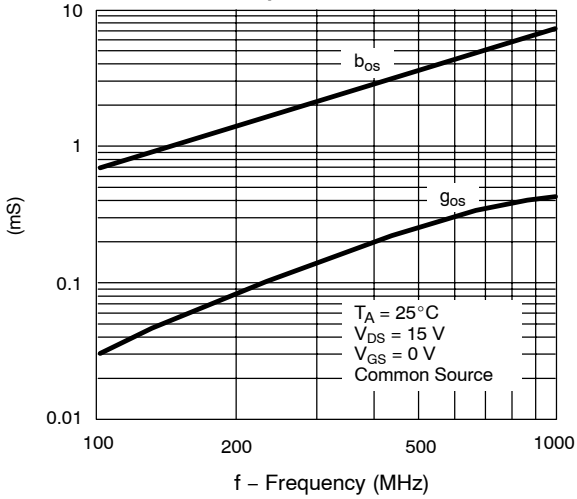
Forward Admittance



Reverse Admittance

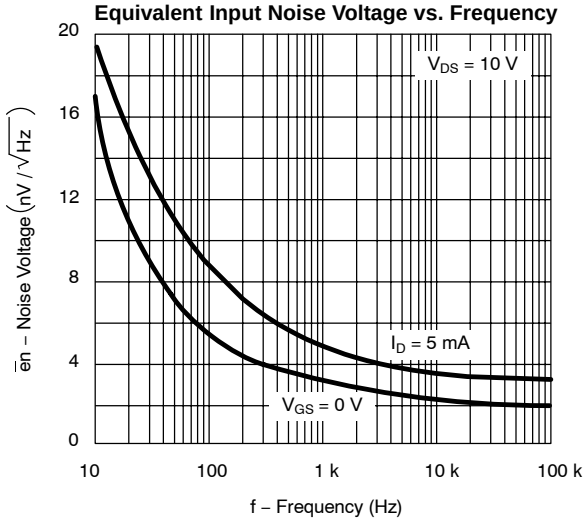


Output Admittance

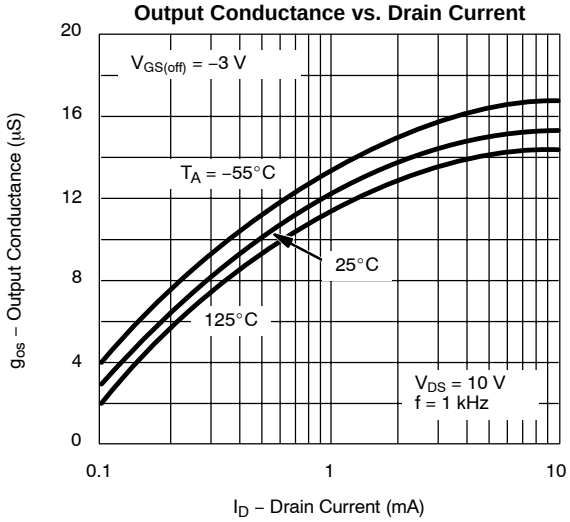


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current



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