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

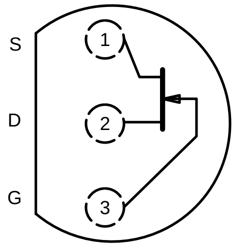
- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

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				Unit
				J304		J305		
				Min	Max	Min	Max	
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 = 1 mA	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	$\bar{e}_n$	V_{DS} = 10 V, V_{GS} = 0 V f = 100 Hz	10					nV⁄√Hz

TYPICAL HIGH-FREQUENCY SPECIFICATIONS (T_A = 25°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 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.
b. Pulse test: PW ≤300 µs, duty cycle ≤2%.

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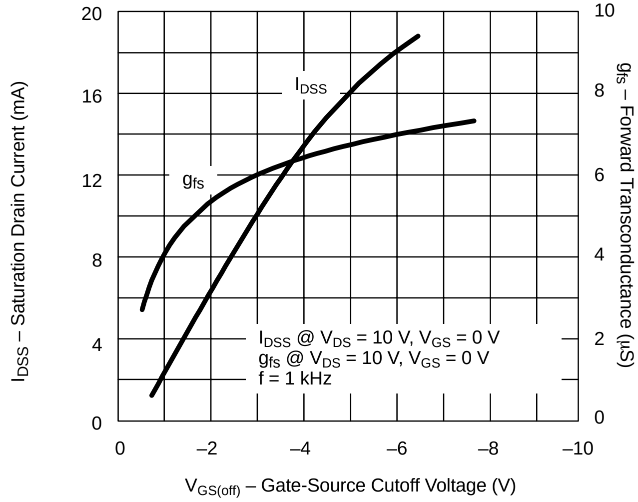
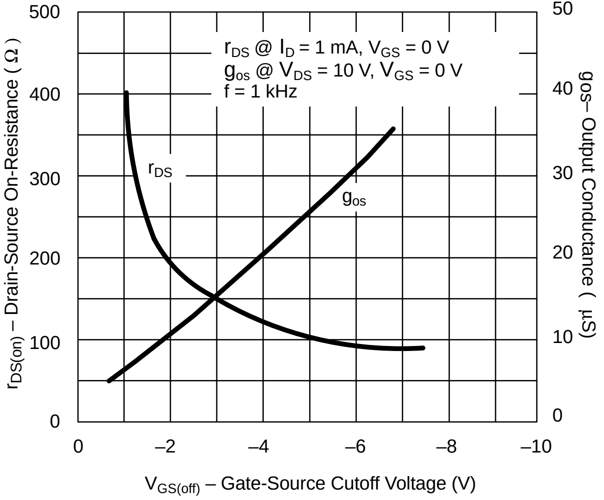
TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

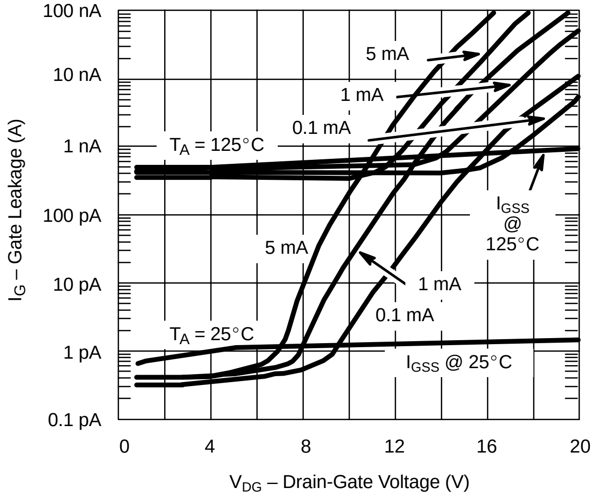
Drain Current and Transconductance vs. Gate-Source Cutoff Voltage



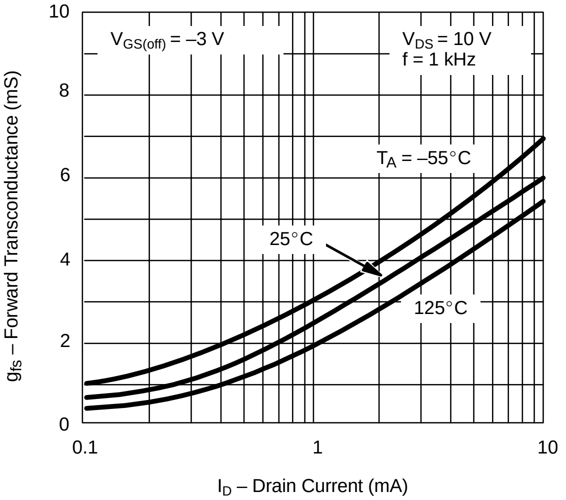
On-Resistance and Output Conductance vs. Gate-Source Cutoff Voltage



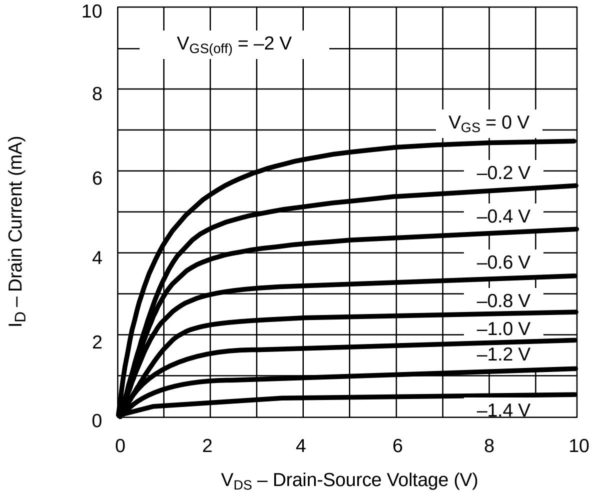
Gate Leakage Current



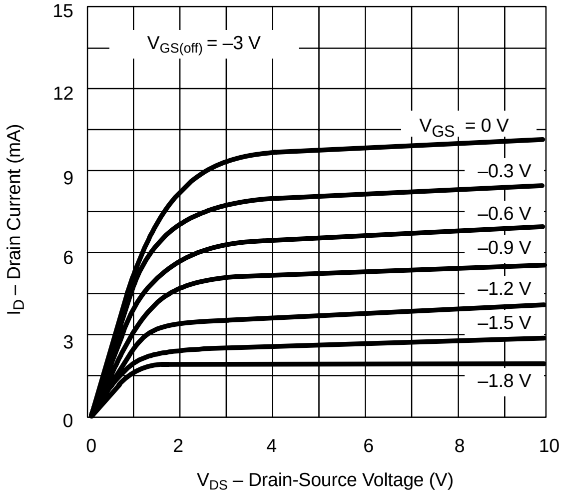
Common-Source Forward Transconductance vs. Drain Current



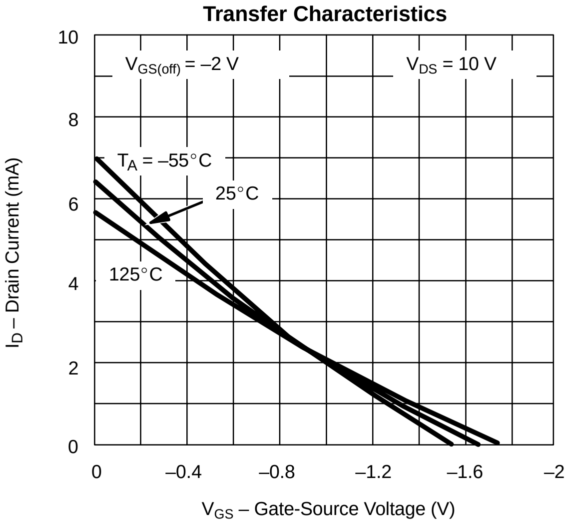
Output Characteristics

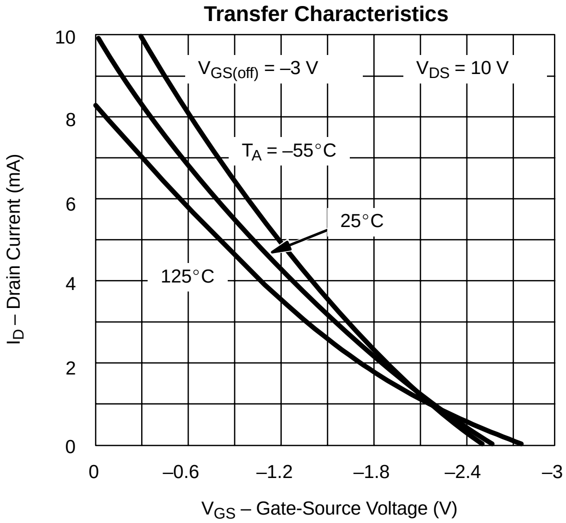


Output Characteristics



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


Transfer Characteristics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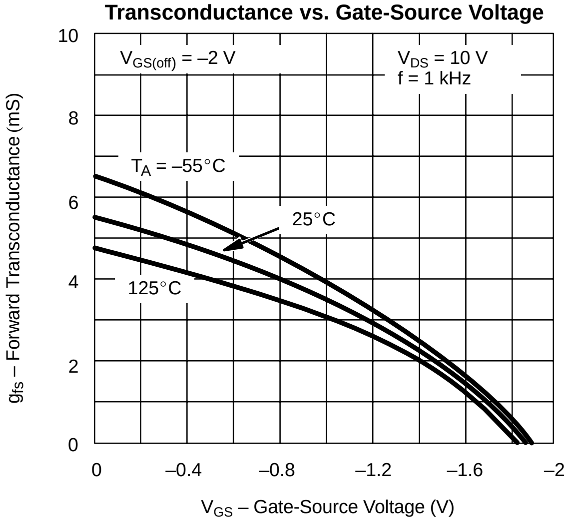
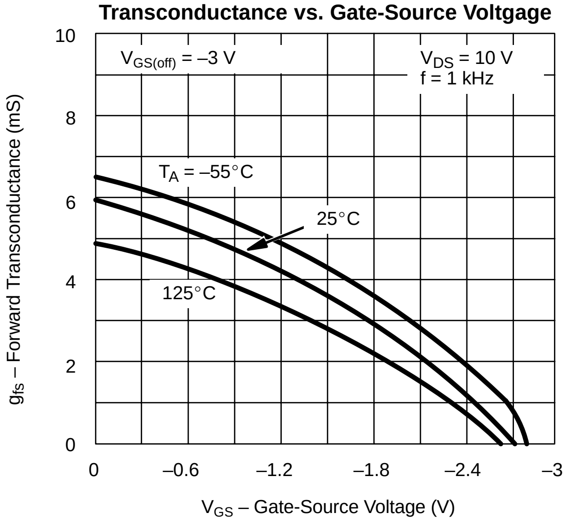
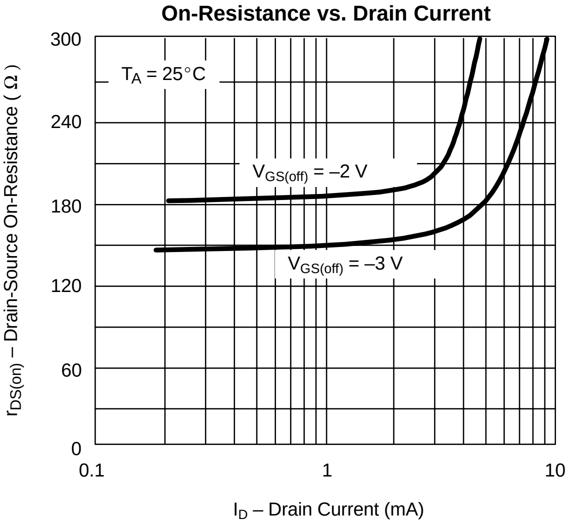
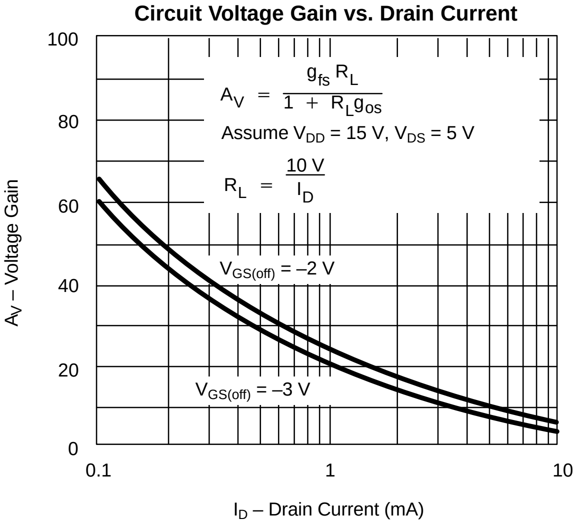

Transconductance vs. Gate-Source Voltage

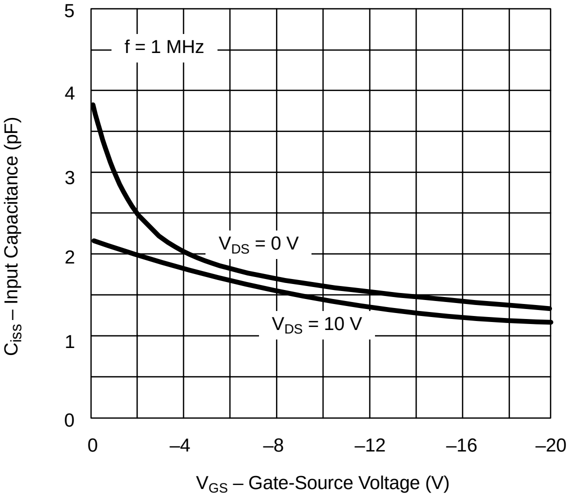

Transconductance vs. Gate-Source Voltgage


On-Resistance vs. Drain Current

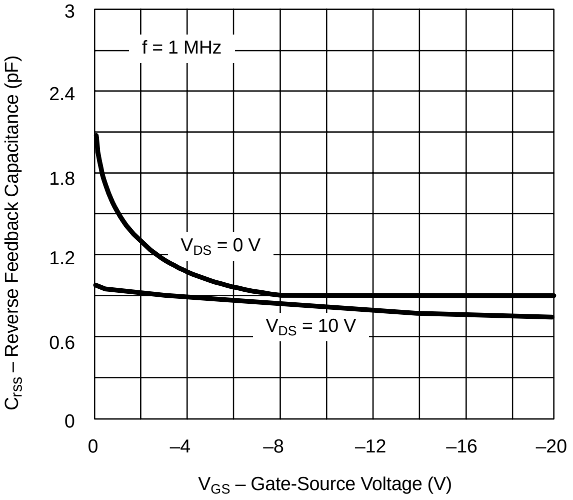

Circuit Voltage Gain vs. Drain Current

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

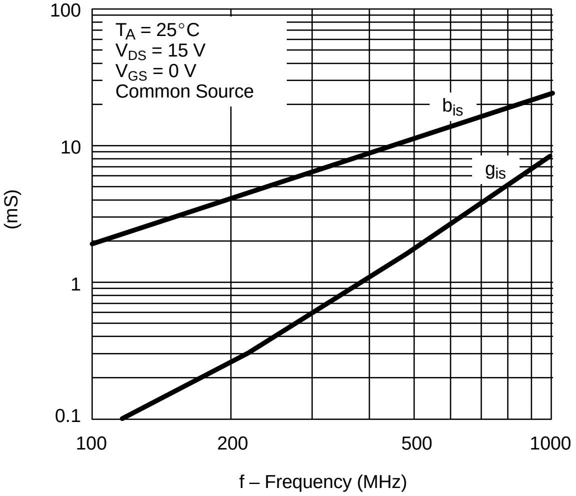
Common-Source Input Capacitance vs. Gate-Source Voltage



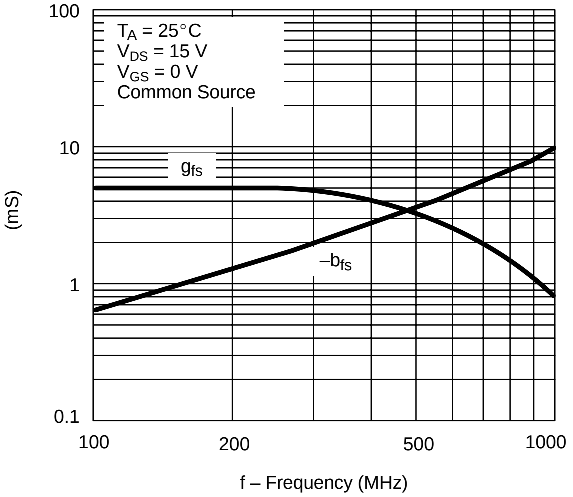
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



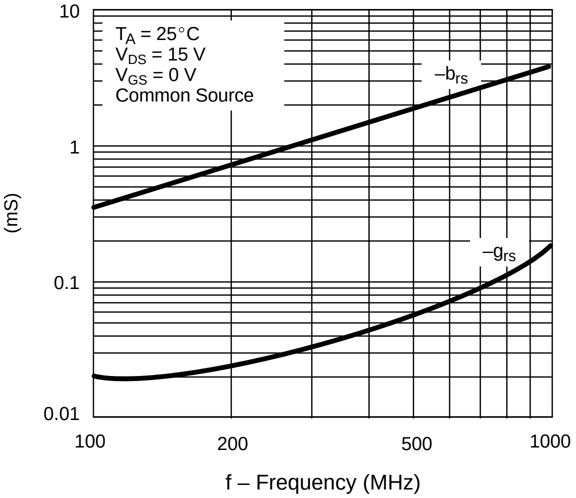
Input Admittance



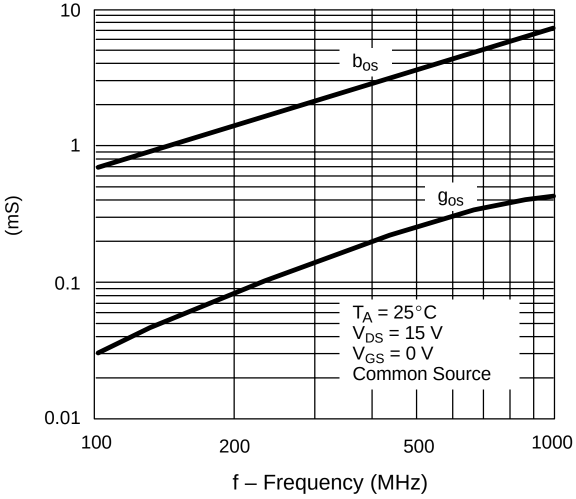
Forward Admittance



Reverse Admittance



Output Admittance



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