N-Channel JFET

PRODUCT SUMMARY			
$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	g_{fs} Min (mS)	I_{DSS} Min (mA)
≤ –8	–25	2	2

FEATURES

- Excellent High-Frequency Gain: Gps 11 dB @ 400 MHz
- Very Low Noise: 3 dB @ 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

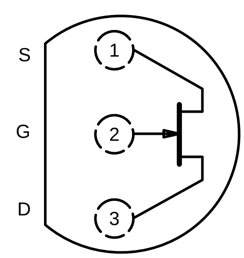
- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

DESCRIPTION

The 2N3819 is a low-cost, all-purpose JFET which offers good performance at mid-to-high frequencies. It features low noise and leakage and guarantees high gain at 100 MHz.

Its TO-226AA (TO-92) package is compatible with various tape-and-reel options for automated assembly (see Packaging Information). For similar products in TO-206AF (TO-72) and TO-236 (SOT-23) packages, see the 2N4416/2N4416A/SST4416 data sheet.

TO-226AA
(TO-92)



Top View

ABSOLUTE MAXIMUM RATINGS

Gate-Source/Gate-Drain Voltage . . . . –25 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

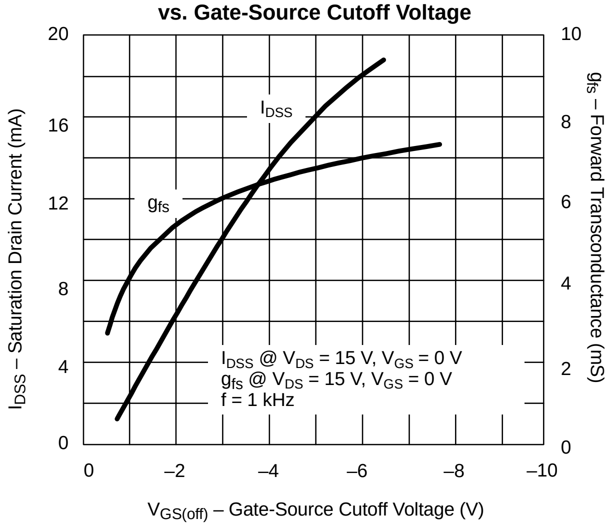
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits Min	Limits Typ[a]	Limits Max	Unit
Static						
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = –1 µA , V_{DS} = 0 V	–25	–35		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 15 V, I_D = 2 nA		–3	–8	V
Saturation Drain Current[b]	I_{DSS}	V_{DS} = 15 V, V_{GS} = 0 V	2	10	20	mA
Gate Reverse Current	I_{GSS}	V_{GS} = –15 V, V_{DS} = 0 V		–0.002	–2	nA
		T_A = 100°C		–0.002	–2	µA
Gate Operating Current[c]	I_G	V_{DG} = 10 V, I_D = 1 mA		–20		pA
Drain Cutoff Current	$I_{D(off)}$	V_{DS} = 10 V, V_{GS} = –8 V		2		pA
Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS} = 0 V, I_D = 1 mA		150		Ω
Gate-Source Voltage	V_{GS}	V_{DS} = 15 V, I_D = 200 µA	–0.5	–2.5	–7.5	V
Gate-Source Forward Voltage	$V_{GS(F)}$	I_G = 1 mA , V_{DS} = 0 V		0.7		V
Dynamic						
Common-Source Forward Transconductance[c]	g_{fs}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 kHz	2	5.5	6.5	mS
		V_{DS} = 15 V, V_{GS} = 0 V, f = 100 MHz	1.6	5.5		mS
Common-Source Output Conductance[c]	g_{os}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 kHz		25	50	µS
Common-Source Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		2.2	8	pF
Common-Source Reverse Transfer Capacitance	C_{rss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		0.7	4	pF
Equivalent Input Noise Voltage[c]	$\bar{e}_n$	V_{DS} = 10 V, V_{GS} = 0 V, f = 100 Hz		6		nV⁄√Hz

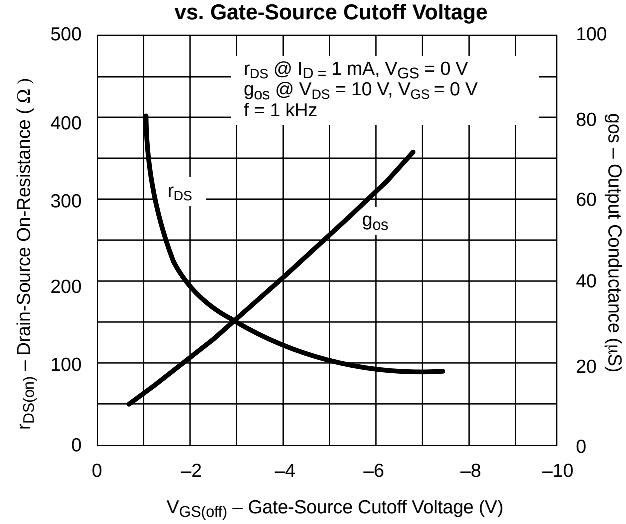
Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing. NH
b. Pulse test: PW ≤ 300 µs, duty cycle ≤ 2%.
c. This parameter not registered with JEDEC.

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

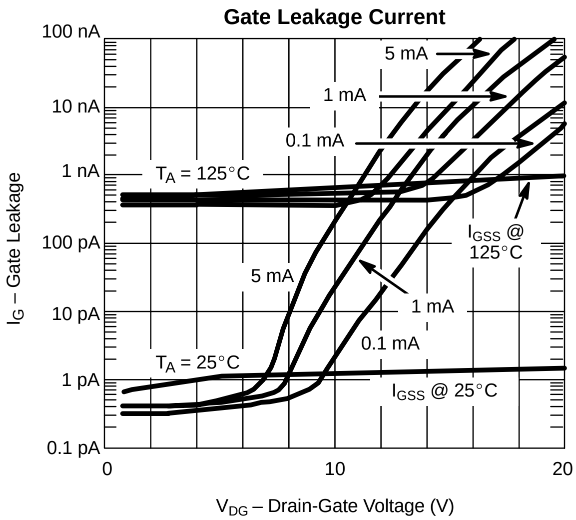
Drain Current and Transconductance vs. Gate-Source Cutoff Voltage

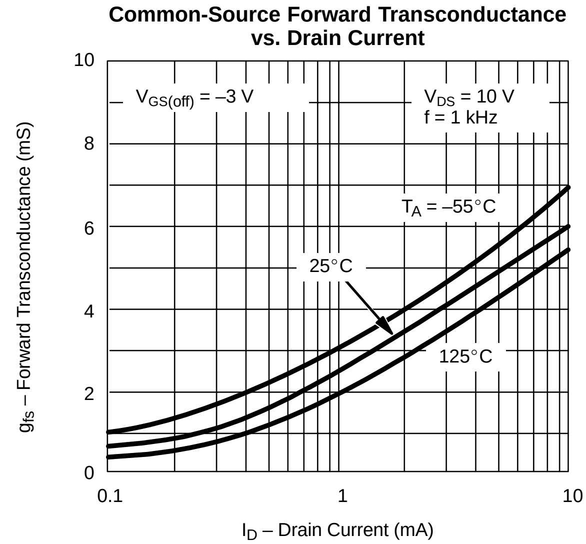


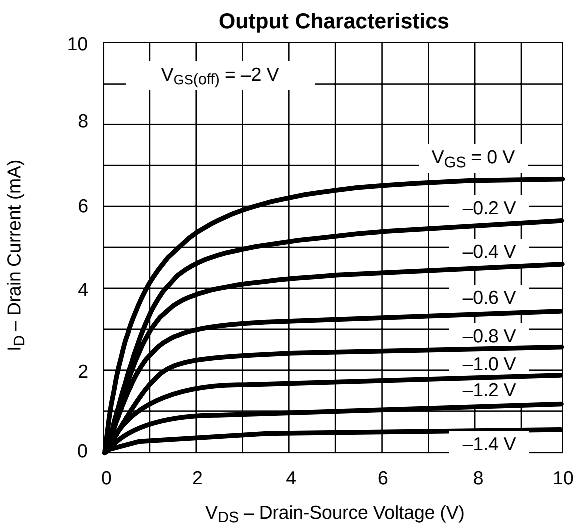
On-Resistance and Output Conductance vs. Gate-Source Cutoff Voltage

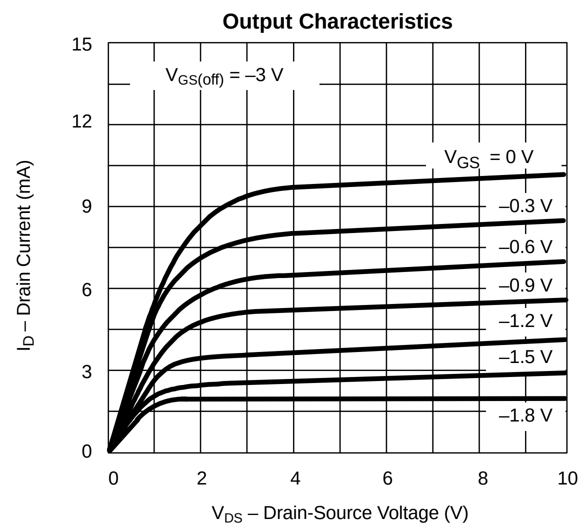


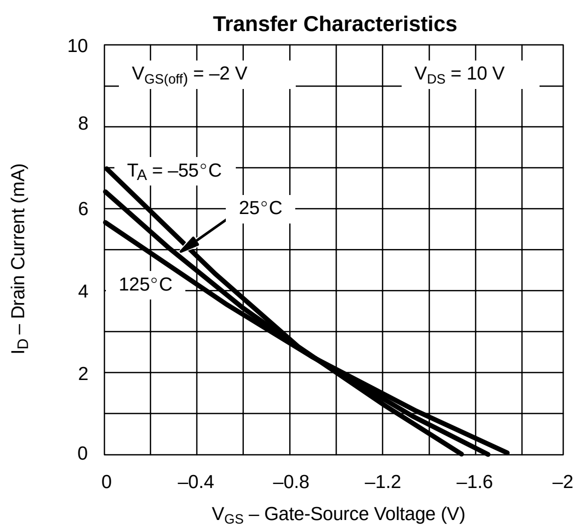
TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

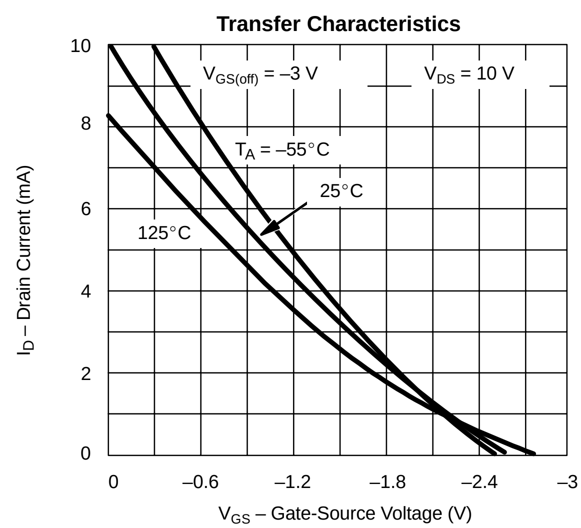






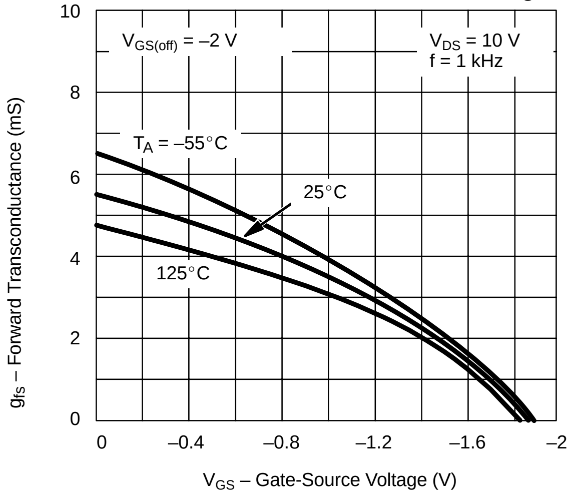




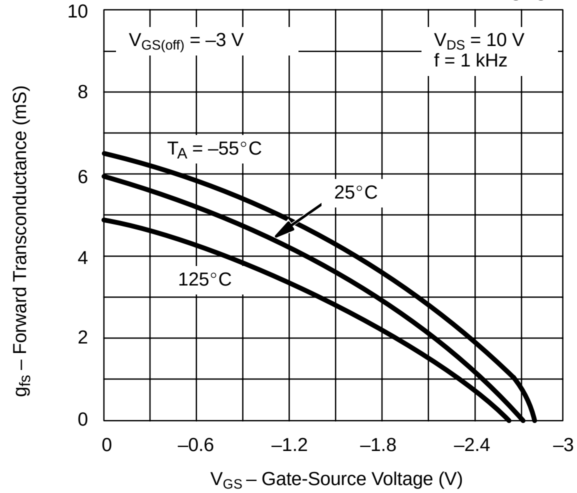


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

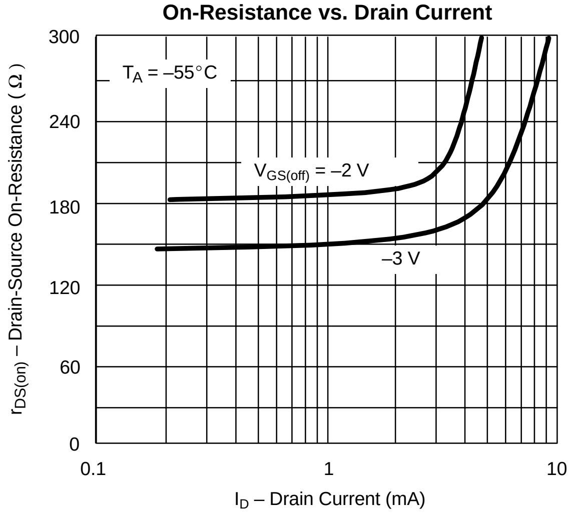
Transconductance vs. Gate-Source Voltage



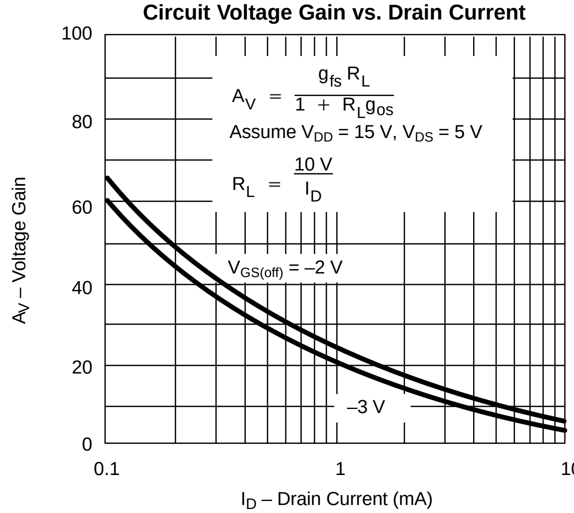
Transconductance vs. Gate-Source Voltgage



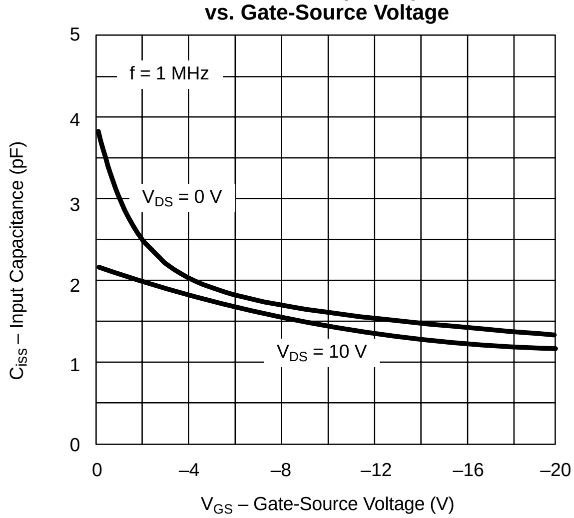
On-Resistance vs. Drain Current



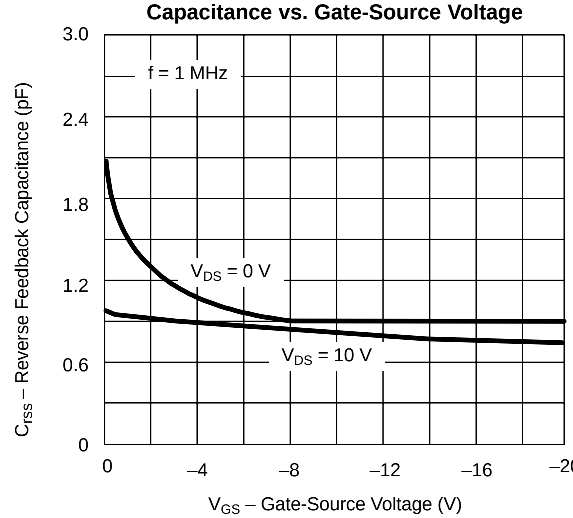
Circuit Voltage Gain vs. Drain Current



Common-Source Input Capacitance vs. Gate-Source Voltage

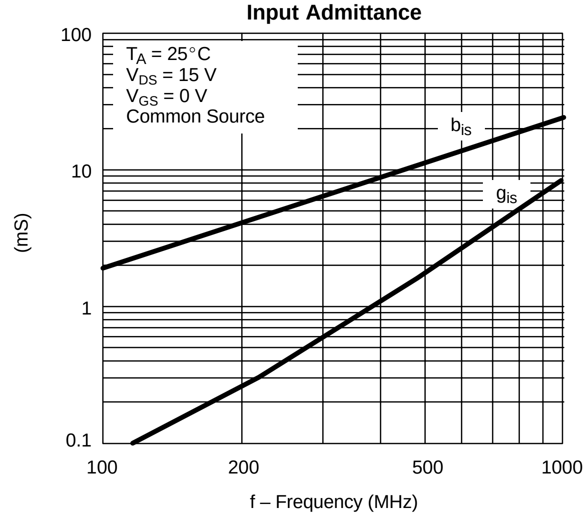


Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage

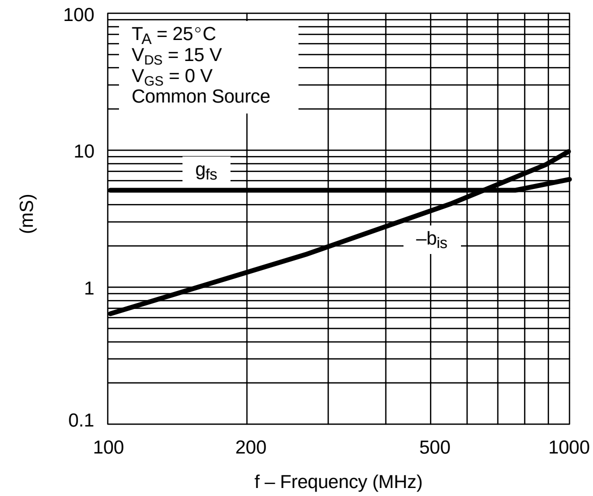


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

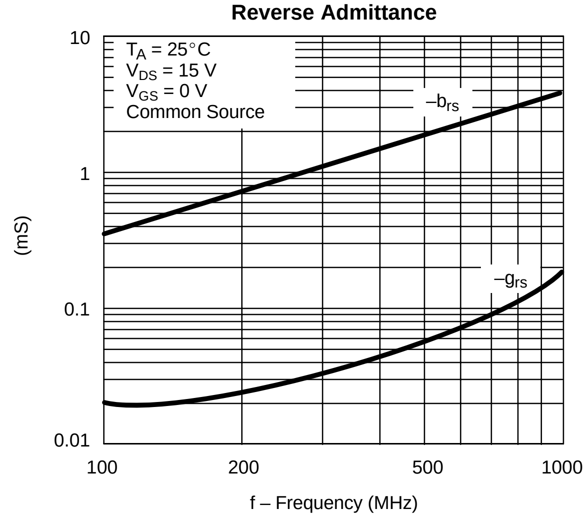
Input Admittance



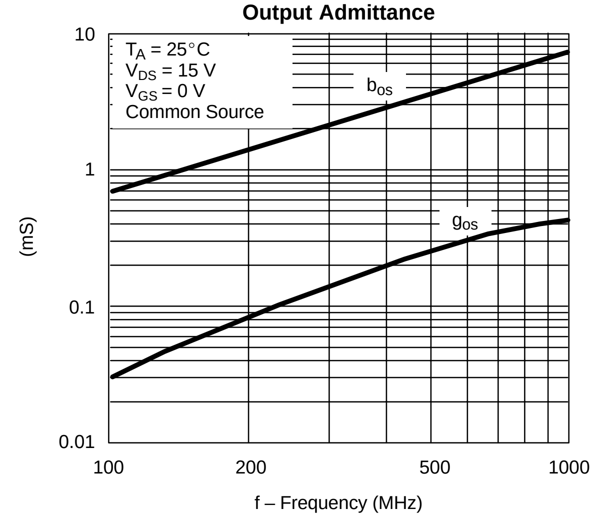
Forward Admittance



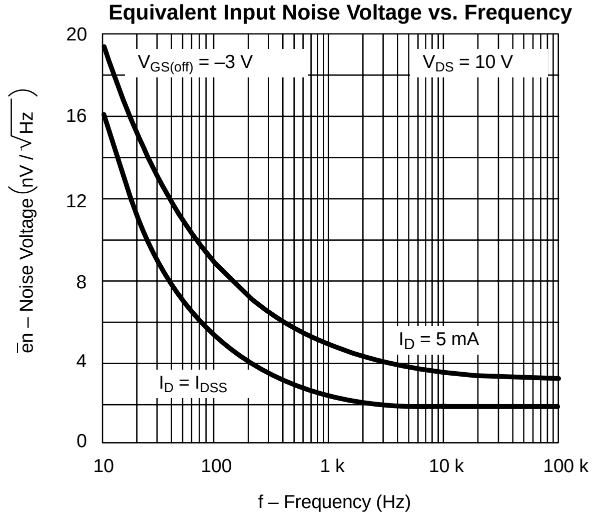
Reverse Admittance



Output Admittance



Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current