2N5911/5912

Matched N-Channel JFET Pairs

Product Summary

Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	g_{fs} Min (mS)	I_G Typ (pA)	$\|V_{GS1} - V_{GS2}\|$ Max (mV)
2N5911	–1 to –5	–25	5	–1	10
2N5912	–1 to –5	–25	5	–1	15

Features

- Two-Chip Design
- High Slew Rate
- Low Offset/Drift Voltage
- Low Gate Leakage: 1 pA
- Low Noise
- High CMRR: 85 dB

Benefits

- Minimum Parasitics Ensuring Maximum High-Frequency Performance
- Improved Op Amp Speed, Settling Time Accuracy
- Minimum Input Error/Trimming Requirement
- Insignificant Signal Loss/Error Voltage
- High System Sensitivity
- Minimum Error with Large Input Signal

Applications

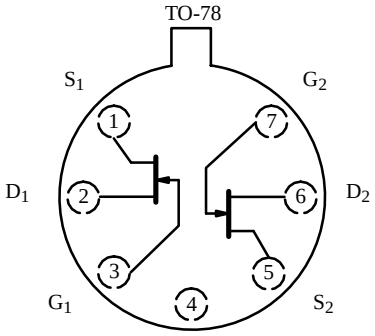
- Wideband Differential Amps
- High-Speed, Temp-Compensated, Single-Ended Input Amps
- High Speed Comparators
- Impedance Converters

Description

The 2N5911/5912 are matched pairs of JFETs mounted in a TO-78 package. This two-chip design reduces parasitics and gives better performance at high frequencies while ensuring extremely tight matching.

The hermetically-sealed TO-78 package is available with full military screening per MIL-S-19500 (see Military Information).

For similar products see the SO-8 packaged SST440/SST441, the TO-71 packaged U440/U441, the low-noise SST/U401 series, and the low-leakage U421/423 data sheets.



Absolute Maximum Ratings

Gate-Drain, Gate-Source Voltage . . . . . –25 V
Gate-Gate Voltage . . . . . ±80 V
Gate Current . . . . . 50 mA
Lead Temperature ($^1/_{16}$" from case for 10 sec.) . . . . . 300°C
Storage Temperature . . . . . –65 to 200°C
Operating Junction Temperature . . . . . –55 to 150°C

Power Dissipation :
Per Side[a] . . . . . 367 mW
Total[b] . . . . . 500 mW

Notes
a. Derate 3 mW/°C above 25°C
b. Derate 4 mW/°C above 25°C

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70255. Applications information may also be obtained via FaxBack, request document #70595.

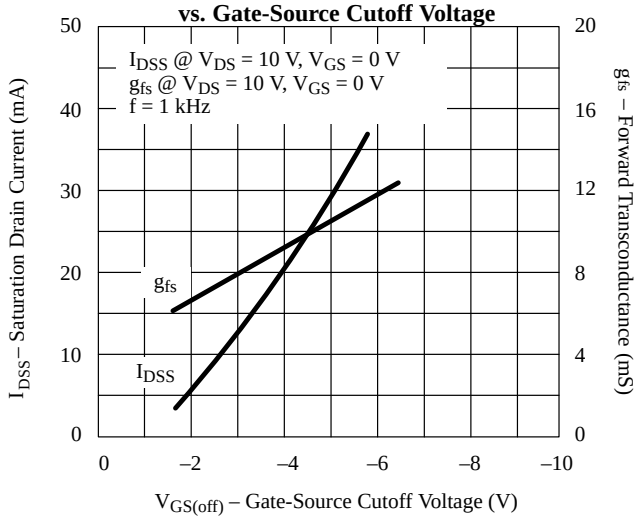
Specifications[a]

Parameter	Symbol	Test Conditions	Typ[b]	Limits 2N5911 Min	Limits 2N5911 Max	Limits 2N5912 Min	Limits 2N5912 Max	Unit
Static								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = –1 µA, V_{DS} = 0 V	–35	–25		–25		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 10 V, I_D = 1 nA	–3.5	–1	–5	–1	–5	V
Saturation Drain Current[c]	I_{DSS}	V_{DS} = 10 V, V_{GS} = 0 V	15	7	40	7	40	mA
Gate Reverse Current	I_{GSS}	V_{GS} = –15 V, V_{DS} = 0 V	–1		–100		–100	pA
		T_A = 150°C	–2		–250		–250	nA
Gate Operating Current	I_G	V_{DG} = 10 V, I_D = 5 mA	–1		–100		–100	pA
		T_A = 125°C	–0.3		–100		–100	nA
Gate-Source Voltage	V_{GS}	V_{DG} = 10 V, I_G = 5 mA	–1.5	–0.3	–4	–0.3	–4	V
Gate-Source Forward Voltage[d]	$V_{GS(F)}$	I_G = 1 mA, V_{DS} = 0 V	0.7					V
Dynamic								
Common-Source Forward Transconductance	g_{fs}	V_{DG} = 10 V, I_D = 5 mA f = 1 kHz	6	5	10	5	10	mS
Common-Source Output Conductance	g_{os}		70		100		100	µS
Common-Source Forward Transconductance	g_{fs}	V_{DG} = 10 V, I_D = 5 mA f = 100 MHz	5.8	5	10	5	10	mS
Common-Source Output Conductance	g_{os}		90		150		150	µS
Common-Source Input Capacitance	C_{iss}	V_{DG} = 10 V, I_D = 5 mA f = 1 MHz	3		5		5	pF
Common-Source Reverse Transfer Capacitance	C_{rss}		1		1.2		1.2	pF
Equivalent Input Noise Voltage	$\bar{e}_n$	V_{DG} = 10 V, I_D = 5 mA f = 10 kHz	4		20		20	$\frac{nV}{\sqrt{Hz}}$
Noise Figure	NF	R_G = 100 kΩ	0.1		1		1	dB
Matching								
Differential Gate-Source Voltage	$\lvert V_{GS1} - V_{GS2} \rvert$	V_{DG} = 10 V, I_D = 5 mA	4		10		15	mV
Gate-Source Voltage Differential Change with Temperature	$\frac{\Delta \lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$	V_{DG} = 10 V, I_D = 5 mA T_A = –55 to 125°C	15		20		40	µV/°C
Saturation Drain Current Ratio	$\frac{I_{DSS1}}{I_{DSS2}}$	V_{DS} = 10 V, V_{GS} = 0 V	0.98	0.95	1	0.95	1	
Transconductance Ratio	$\frac{g_{fs1}}{g_{fs2}}$	V_{DS} = 10 V, I_D = 5 mA f = 1 kHz	0.98	0.95	1	0.95	1	
Differential Gate Current	$\lvert I_{G1} - I_{G2} \rvert$	V_{DG} = 10 V, I_D = 5 mA, T_A = 125°C	0.005		20		20	nA
Common Mode Rejection Ratio[d]	CMRR	V_{DG} = 5 to 10 V, I_D = 5 mA	85					dB

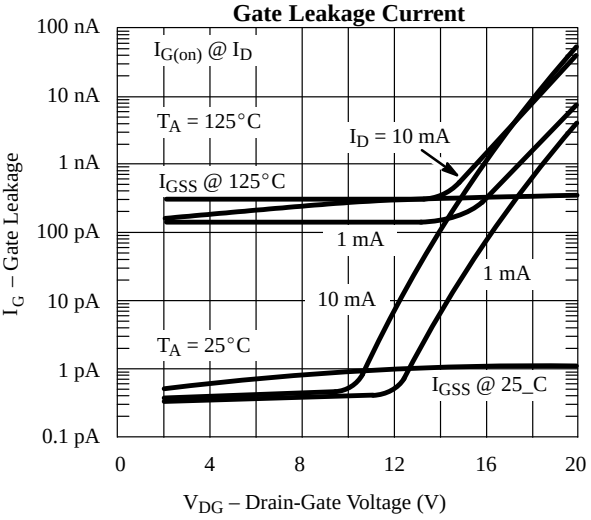
Notes
a. T_A = 25°C unless otherwise noted. NZF
b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 3%.
d. This parameter not registered with JEDEC.

Typical Characteristics

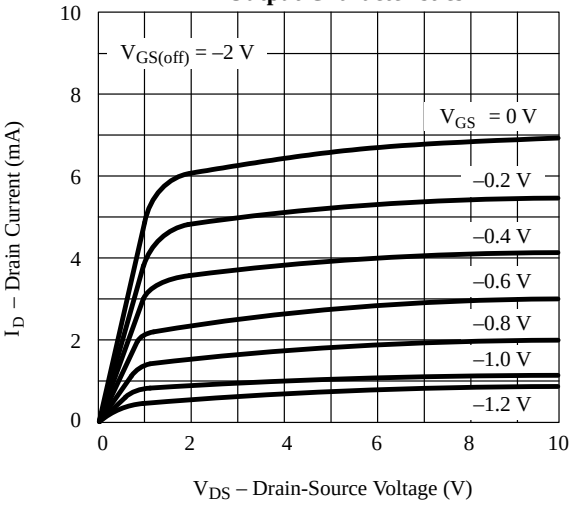
Drain Current and Transconductance vs. Gate-Source Cutoff Voltage



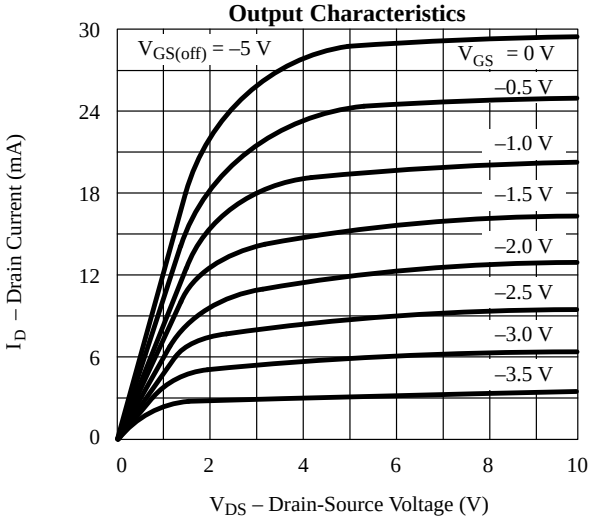
Gate Leakage Current



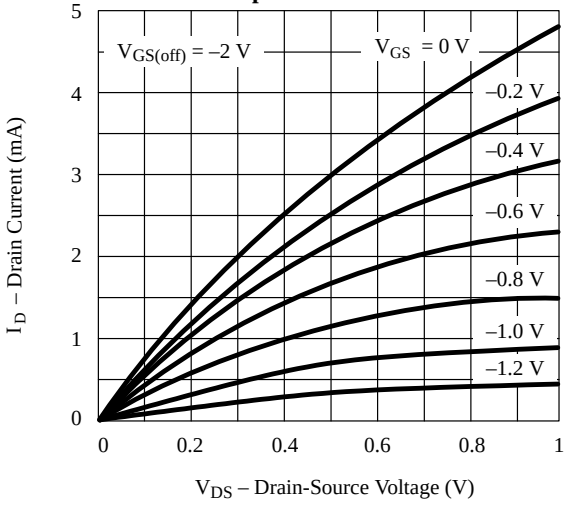
Output Characteristics



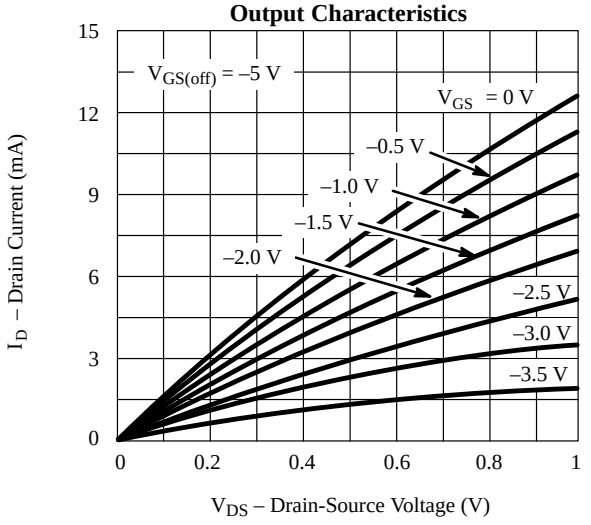
Output Characteristics



Output Characteristics

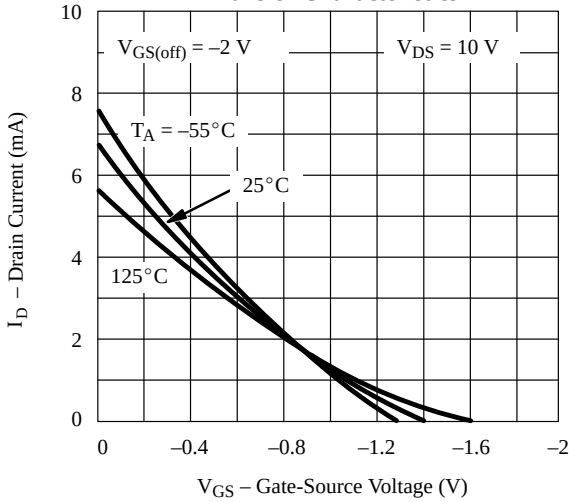


Output Characteristics

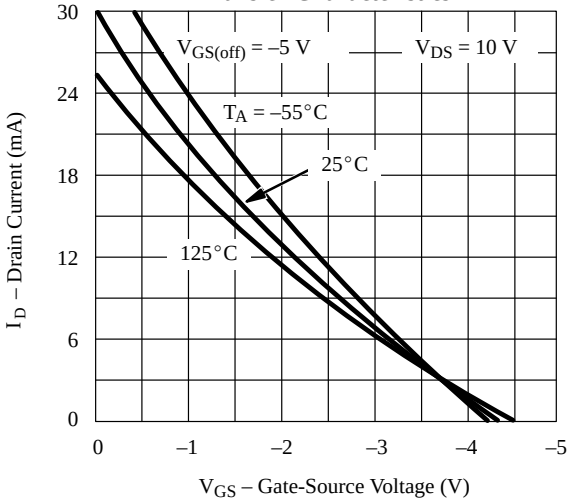


Typical Characteristics (Cont'd)

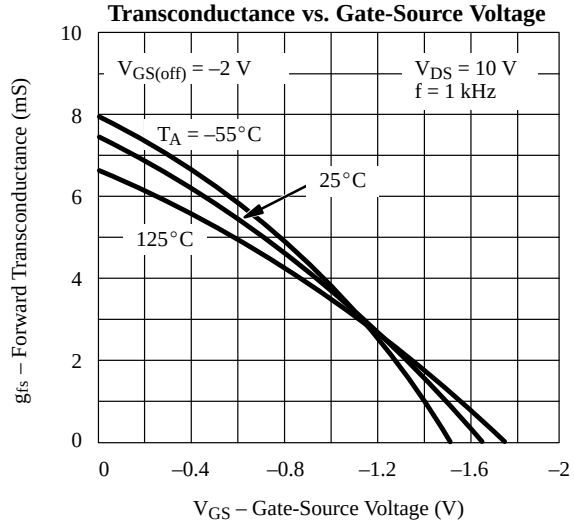
Transfer Characteristics



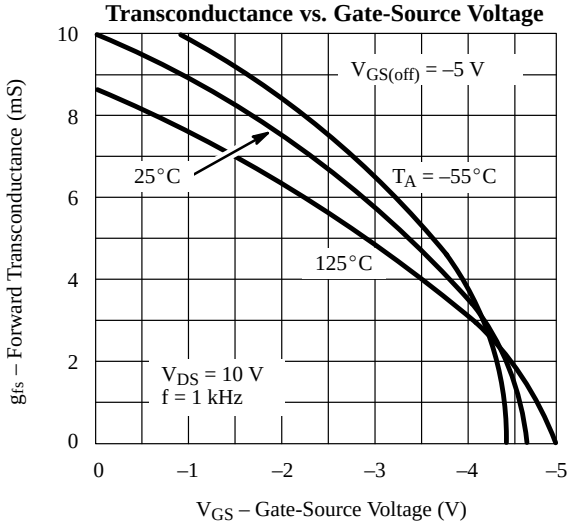
Transfer Characteristics



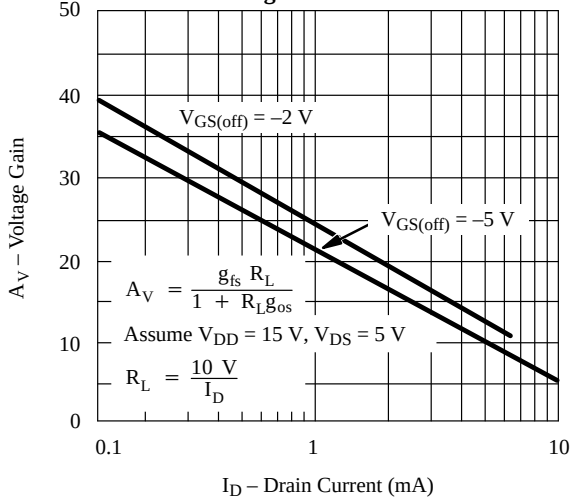
Transconductance vs. Gate-Source Voltage



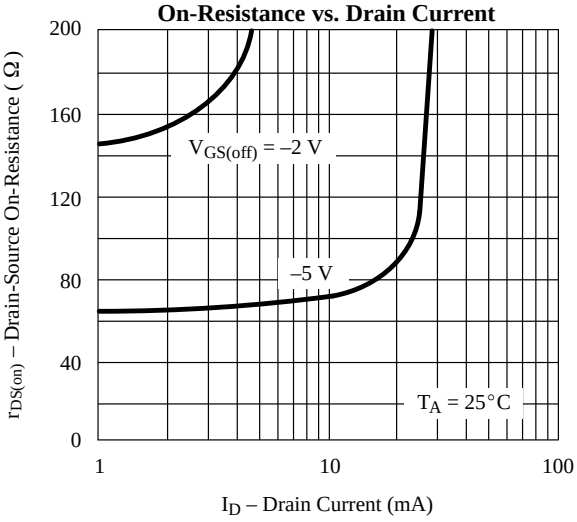
Transconductance vs. Gate-Source Voltage



Circuit Voltage Gain vs. Drain Current

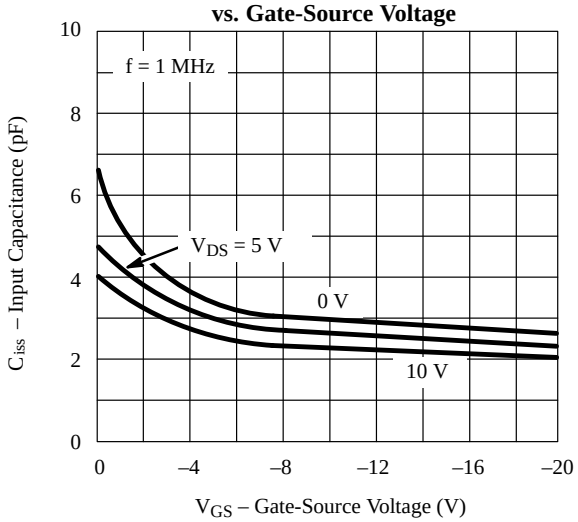


On-Resistance vs. Drain Current

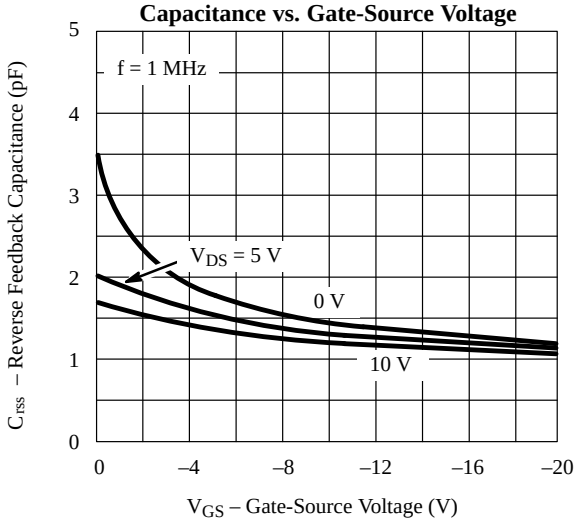


Typical Characteristics (Cont'd)

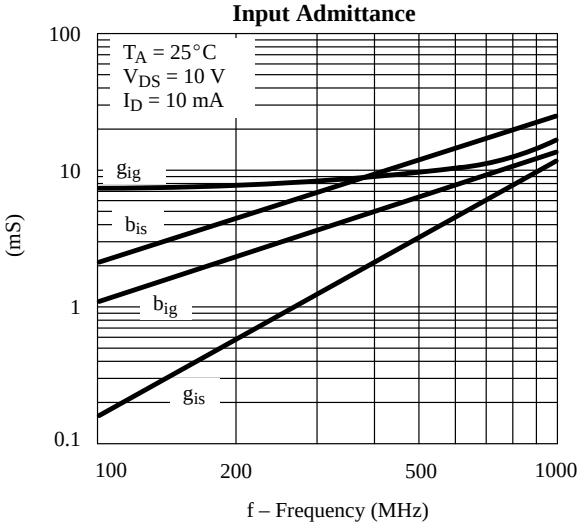
Common-Source Input Capacitance vs. Gate-Source Voltage



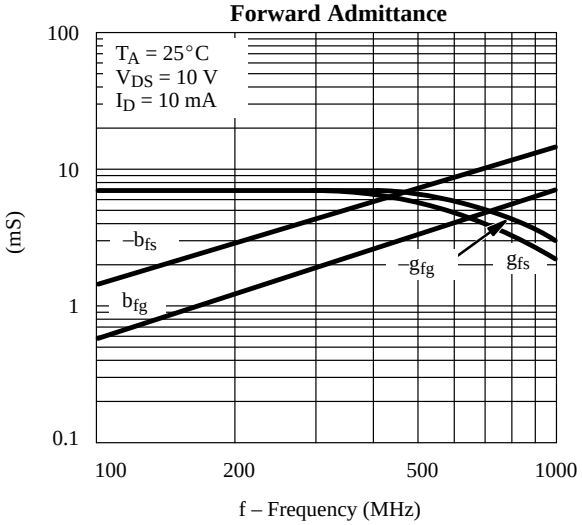
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



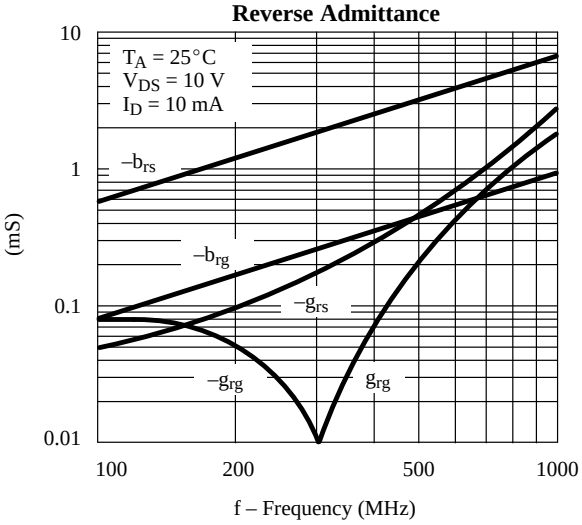
Input Admittance



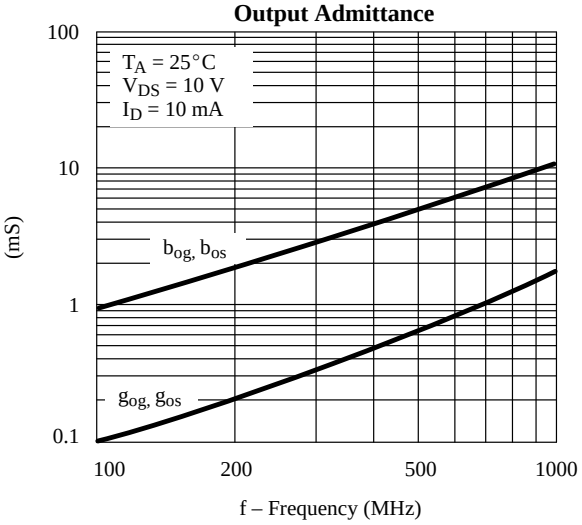
Forward Admittance



Reverse Admittance

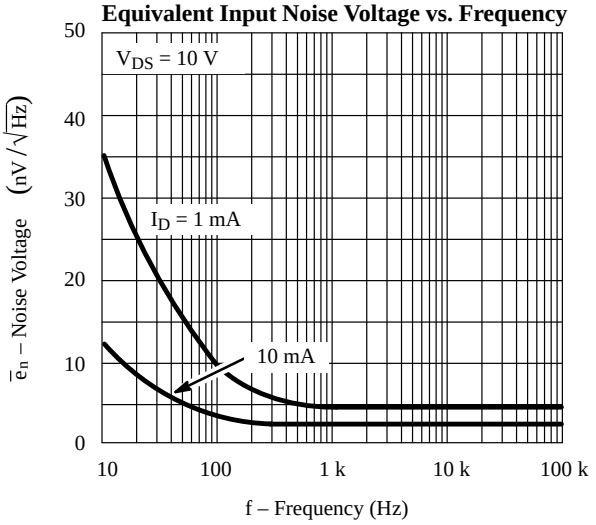


Output Admittance

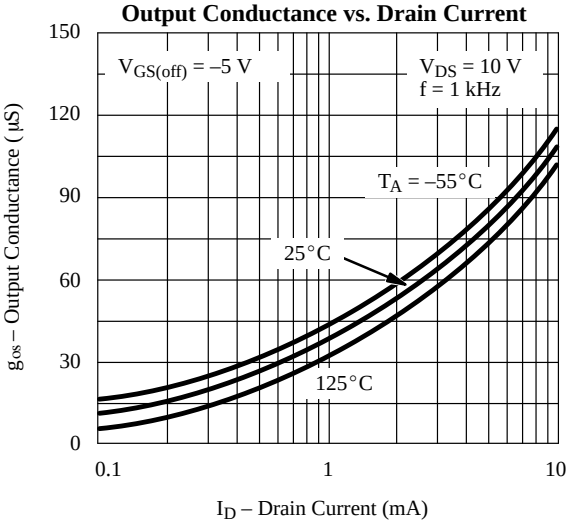


Typical Characteristics (Cont'd)

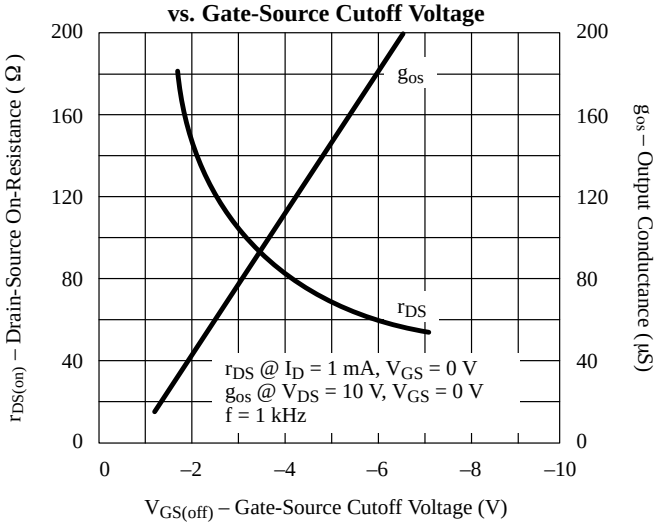
Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current



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



Common-Source Forward Transconductance vs. Drain Current