



# Monolithic N-Channel JFET Duals

PRODUCT SUMMARY					
Part Number	V <sub>GS(off)</sub> (V)	V <sub>(BR)GSS</sub> Min (V)	g <sub>fs</sub> Min (mS)	I <sub>G</sub> Max (pA)	V <sub>GS1</sub> - V <sub>GS2</sub>   Max (mV)
2N5545	-0.5 to -4.5	-50	1.5	-50	5
2N5546	-0.5 to -4.5	-50	1.5	-50	10
2N5547	-0.5 to -4.5	-50	1.5	-50	15

### FEATURES

- Monolithic Design
- High Slew Rate
- Low Offset/Drift Voltage
- Low Gate Leakage: 3 pA
- Low Noise
- High CMRR: 100 dB

### BENEFITS

- Tight Differential Match vs. Current
- 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

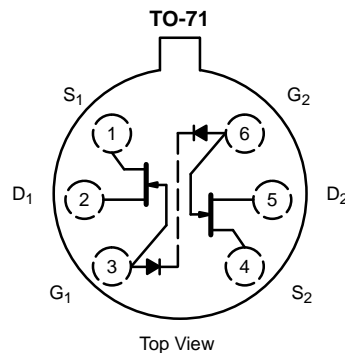
### APPLICATIONS

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

### DESCRIPTION

The 2N5545/5546/5547 JANTX/JANTXV are monolithic dual n-channel JFETs designed to provide high input impedance (I<sub>G</sub> < 50 pA) for general-purpose differential amplifiers. The

2N5545 features minimum system error and calibration (5 mV offset maximum).



### ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage	-50 V
Gate Current	30 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 <sup>a</sup>	250 mW
	Total <sup>b</sup>	500 mW

- Notes
- Derate 2 mW/°C above 25°C
  - Derate 4 mW/°C above 25°C



SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)										
Parameter	Symbol	Test Conditions	Typ <sup>a</sup>	Limits						Unit
				2N5545		2N5546		2N5547		
				Min	Max	Min	Max	Min	Max	
<b>Static</b>										
Gate-Source Breakdown Voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> = -1 μA, V <sub>DS</sub> = 0 V	-57	-50		-50		-50		V
Gate-Source Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 0.5 nA	-2	-0.5	-4.5	-0.5	-4.5	-0.5	-4.5	V
Saturation Drain Current <sup>b</sup>	I <sub>DSS</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V	3	0.5	8	0.5	8	0.5	8	mA
Gate Reverse Current	I <sub>GSS</sub>	V <sub>GS</sub> = -30 V, V <sub>DS</sub> = 0 V	-10		-100		-100		-100	pA
		T <sub>A</sub> = 150 °C	-20		-150		-150		-150	nA
Gate Operating Current	I <sub>G</sub>	V <sub>DG</sub> = 15 V, I <sub>D</sub> = 200 μA	-3		-50		-50		-50	pA
Gate-Source Forward Voltage	V <sub>GS(F)</sub>	I <sub>G</sub> = 1 mA, V <sub>DS</sub> = 0 V	0.7							V
<b>Dynamic</b>										
Common-Source Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V f = 1 kHz	2.5	1.5	6.0	1.5	6.0	1.5	6.0	mS
Common-Source Output Conductance <sup>b</sup>	g <sub>os</sub>		2		25		25		25	μS
Common-Source Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V f = 1 MHz	3.5		6		6		6	pF
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>		1.3		2		2		2	
Equivalent Input Noise Voltage	$\bar{e}_n$	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 200 μA f = 10 Hz	20		180		200			nV/ √Hz
Noise Figure	NF	R <sub>G</sub> = 1 MΩ	0.1		3.5		5			dB
<b>Matching</b>										
Differential Gate-Source Voltage	V <sub>GS1</sub> - V <sub>GS2</sub>	V <sub>DG</sub> = 15 V, I <sub>D</sub> = 50 μA			5		10		15	mV
		V <sub>DG</sub> = 15 V, I <sub>D</sub> = 200 μA			5		10		15	
Gate-Source Voltage Differential Change with Temperature	$\frac{\Delta V_{GS1} - V_{GS2} }{\Delta T}$	V <sub>DG</sub> = 15 V, I <sub>D</sub> = 200 μA T <sub>A</sub> = -55 to 125 °C			10		20		40	μV/ °C
Saturation Drain Current Ratio <sup>c</sup>	$\frac{I_{DSS1}}{I_{DSS2}}$	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V	0.98	0.95	1	0.9	1	0.9	1	
Transconductance Ratio <sup>c</sup>	$\frac{g_{fs1}}{g_{fs2}}$	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 200 μA f = 1 kHz	0.99	0.97	1	0.95	1	0.9	1	
Differential Output Conductance	g <sub>os1</sub> - g <sub>os2</sub>	V <sub>DG</sub> = 15 V, V <sub>GS</sub> = 0 V f = 1 kHz	0.1		1		2		3	μS
Differential Gate Current	I <sub>G1</sub> - I <sub>G2</sub>	V <sub>DG</sub> = 15 V, I <sub>D</sub> = 200 μA T <sub>A</sub> = 125 °C	1		5		5		5	nA

**Notes**

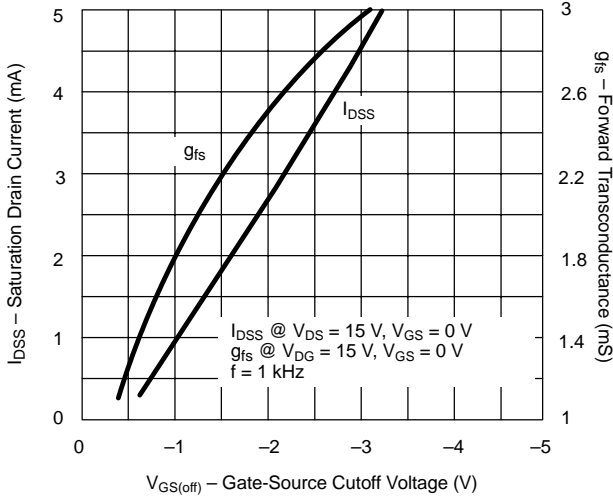
- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
- c. Assumes smaller value in the numerator.

NQP

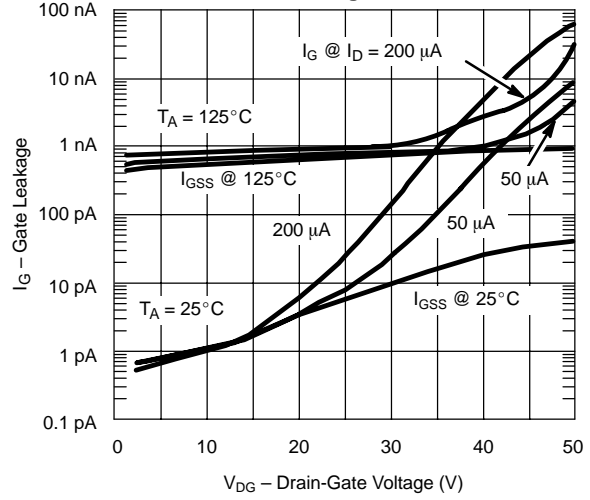


**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

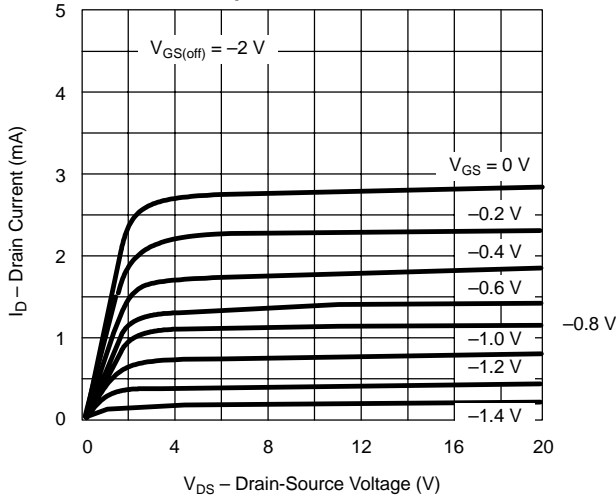
**Drain Current and Transconductance vs. Gate-Source Cutoff Voltage**



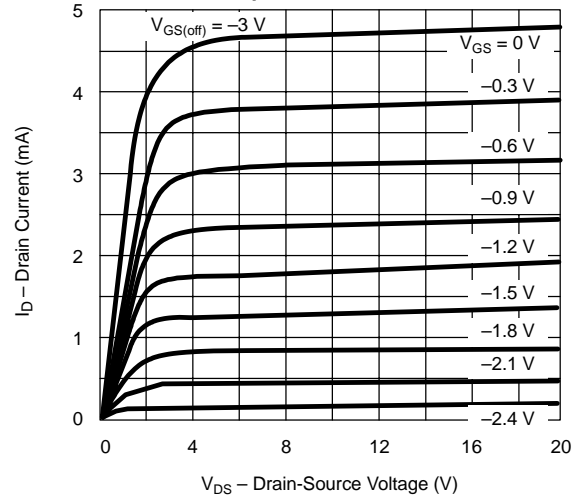
**Gate Leakage Current**



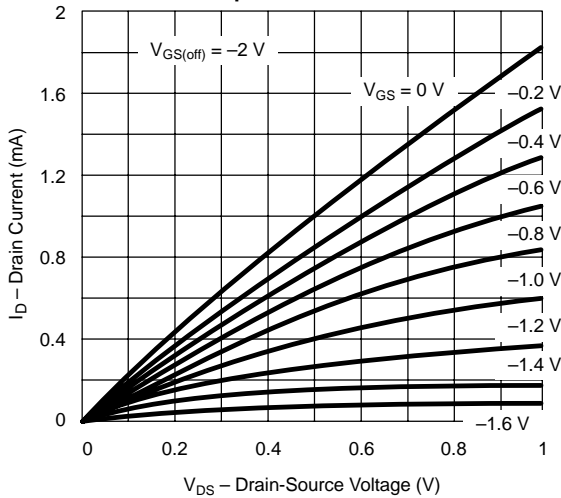
**Output Characteristics**



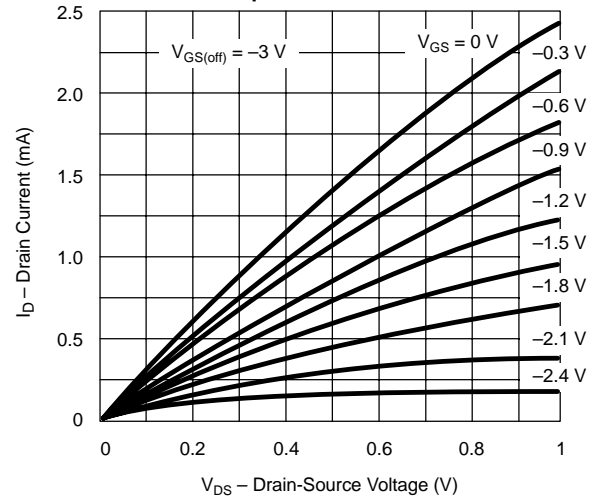
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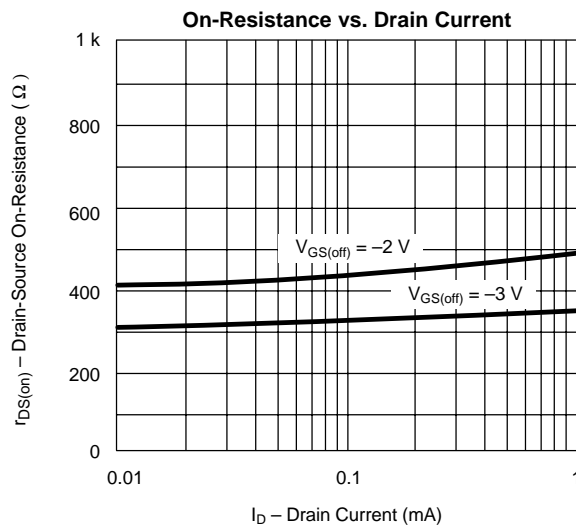
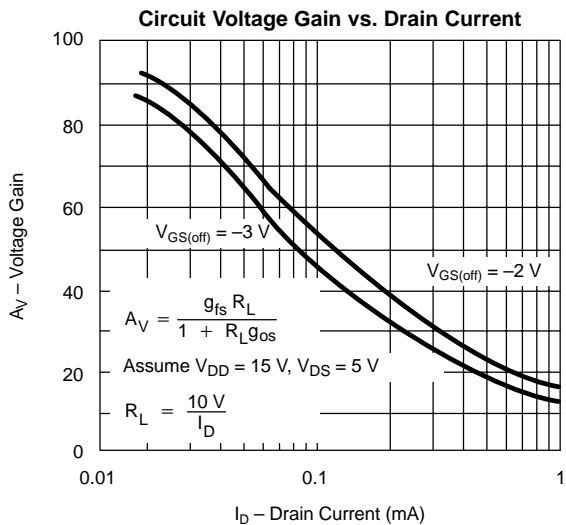
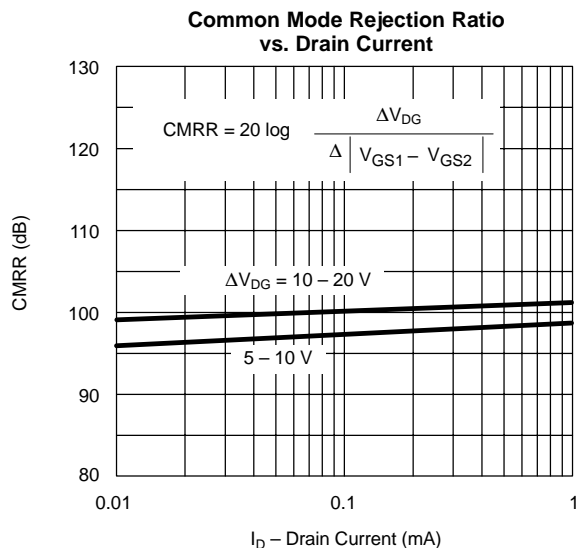
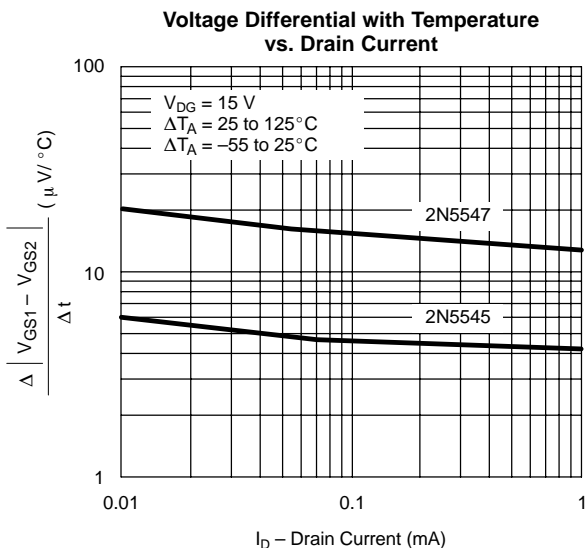
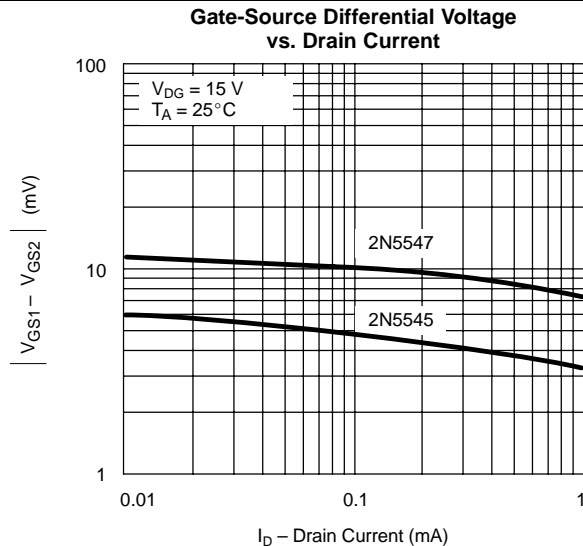
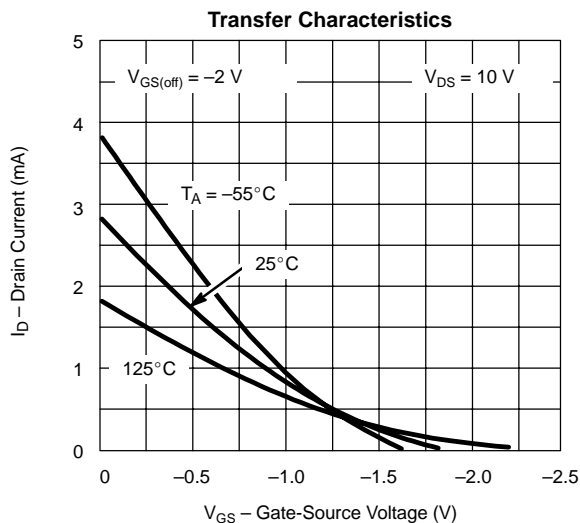


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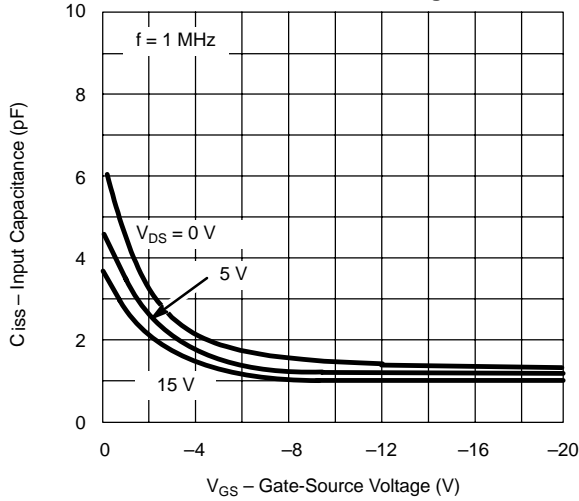
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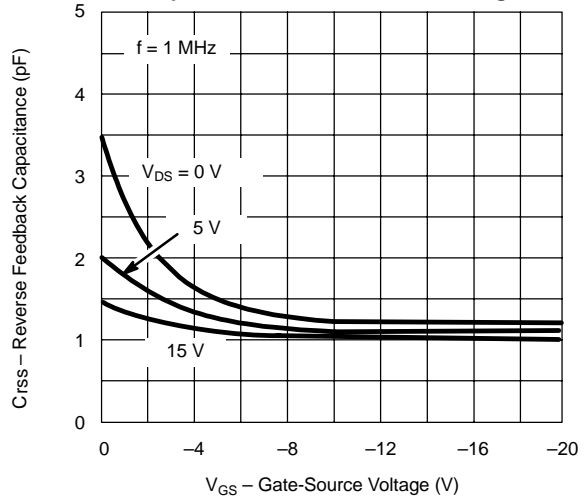


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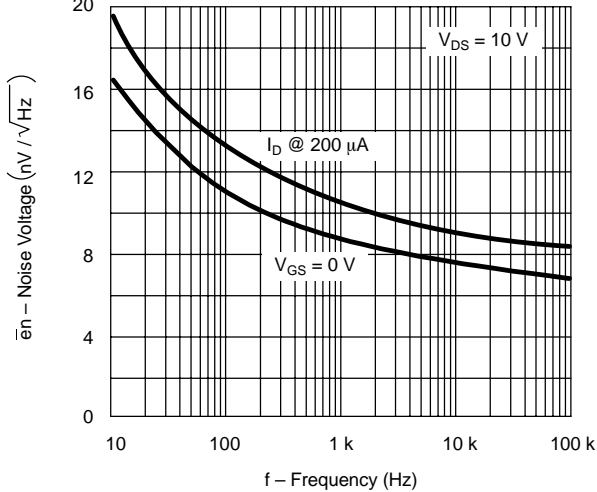
**Common-Source Input Capacitance vs. Gate-Source Voltage**



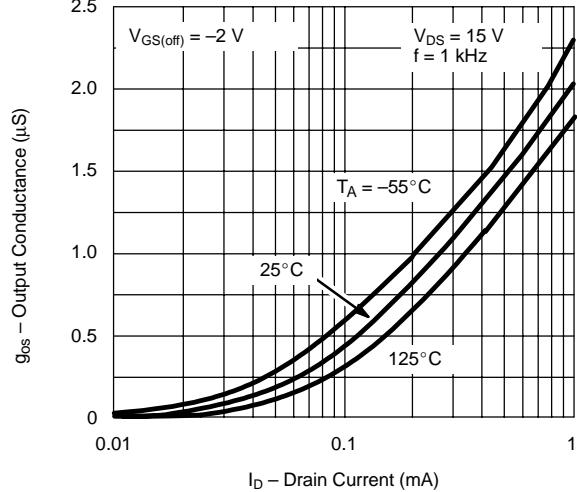
**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



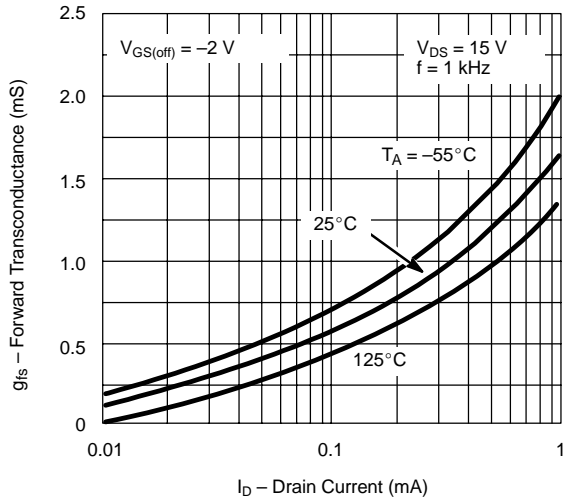
**Equivalent Input Noise Voltage vs. Frequency**



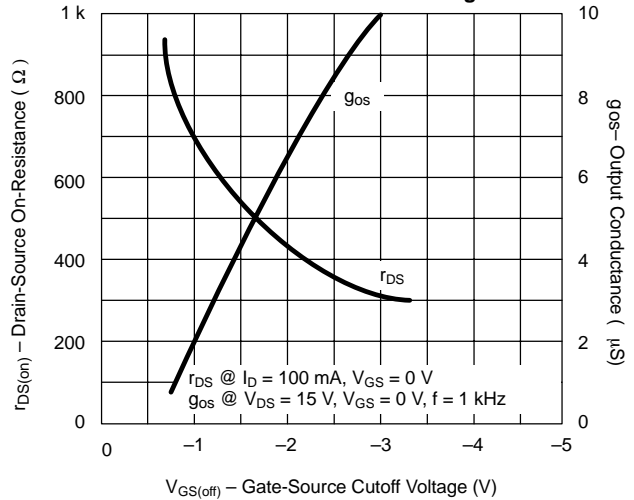
**Output Conductance vs. Drain Current**



**Common-Source Forward Transconductance vs. Drain Current**



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





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