



## Monolithic N-Channel JFET Duals

PRODUCT SUMMARY					
Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	$g_{fs}$ Min (mS)	$I_G$ Max (pA)	$ V_{GS1} - V_{GS2} $ 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

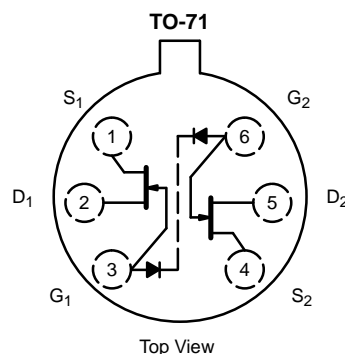
### APPLICATIONS

- 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 ( $I_G < 50$  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

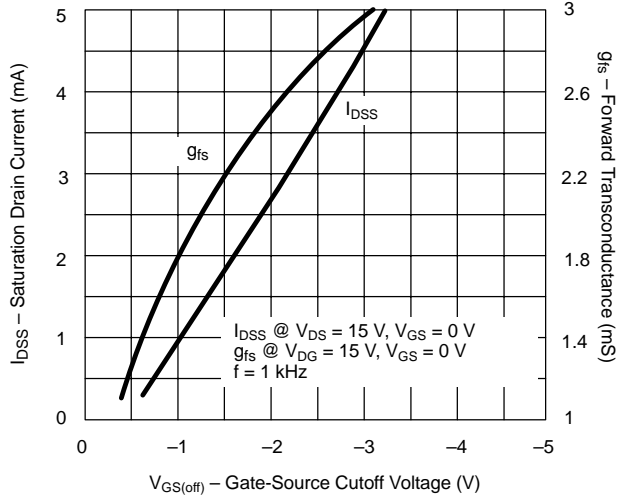
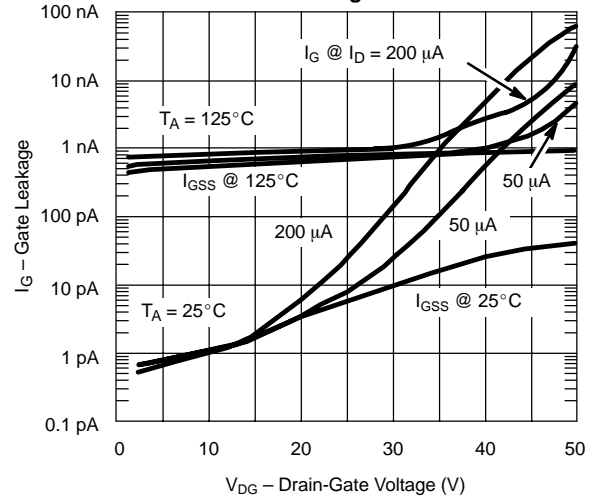
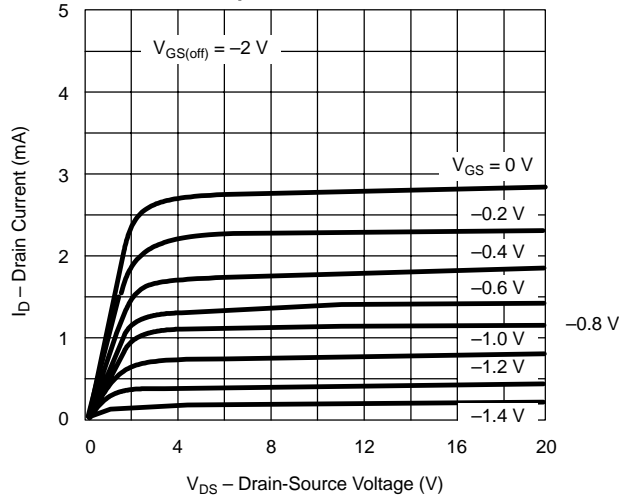
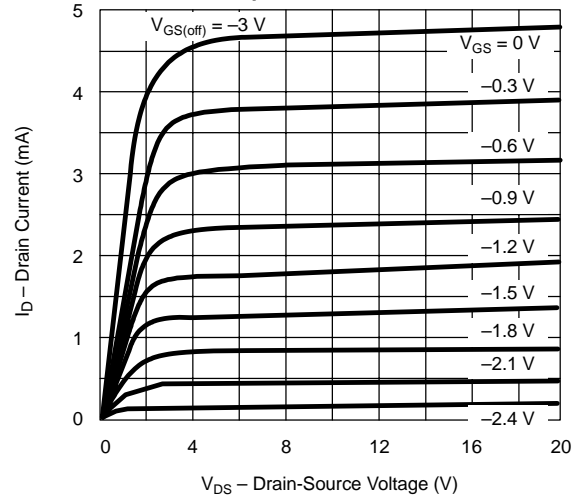
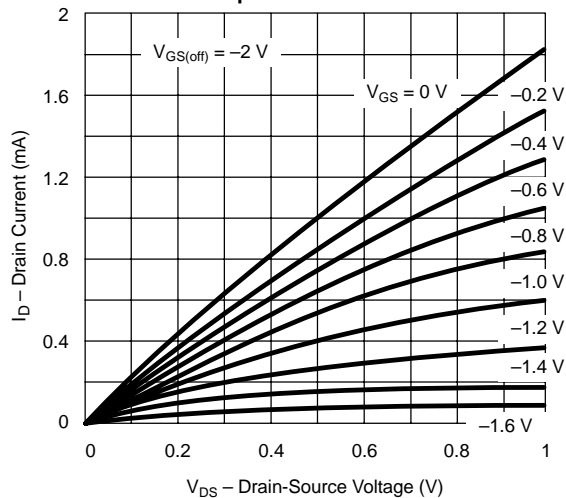
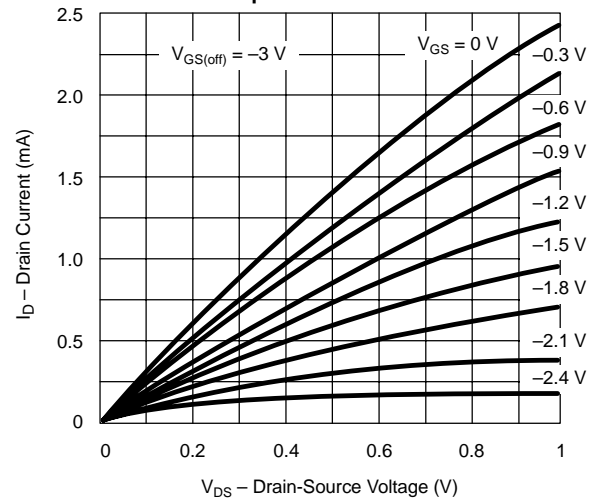
- Derate 2 mW/°C above 25°C
- Derate 4 mW/°C above 25°C

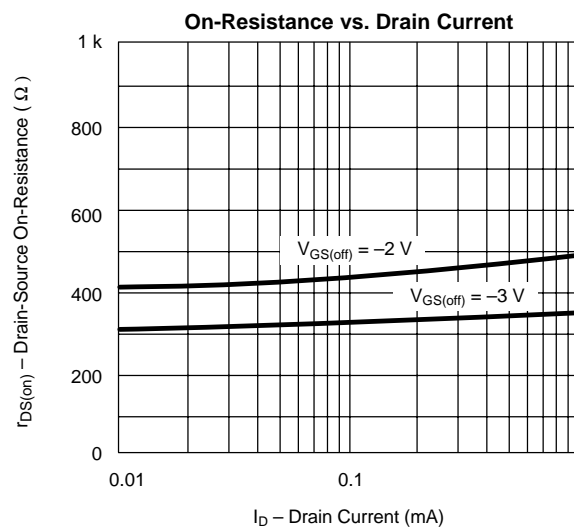
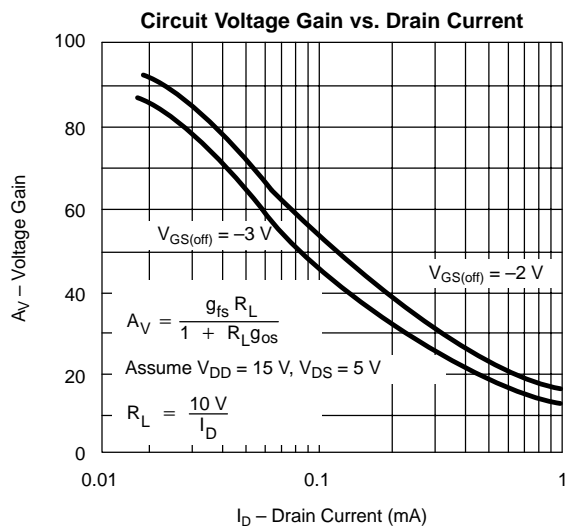
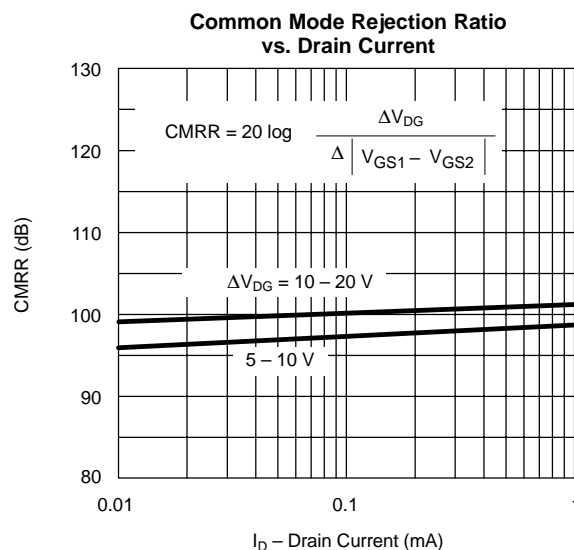
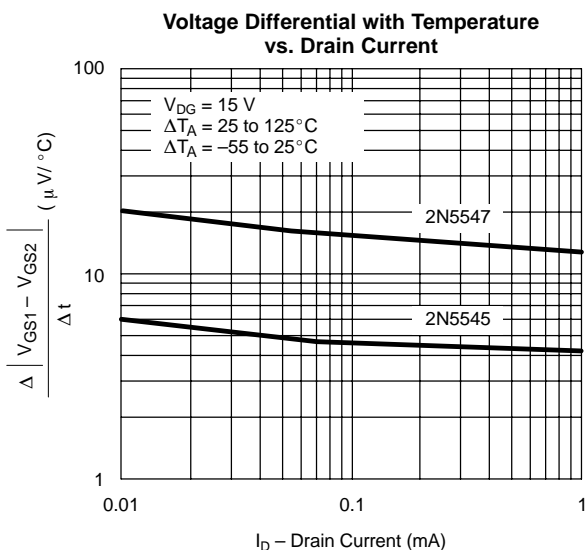
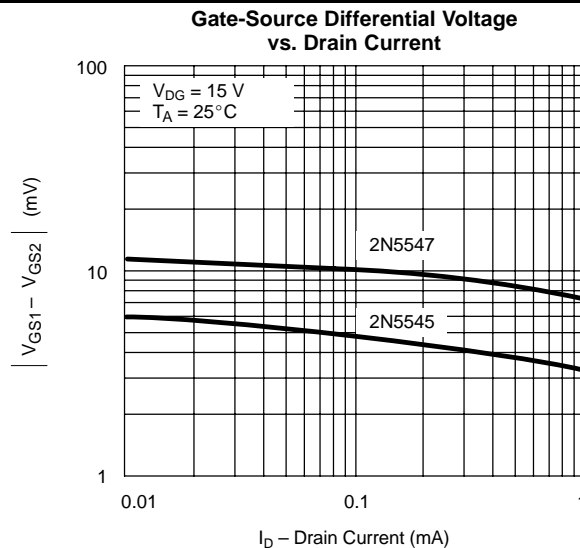
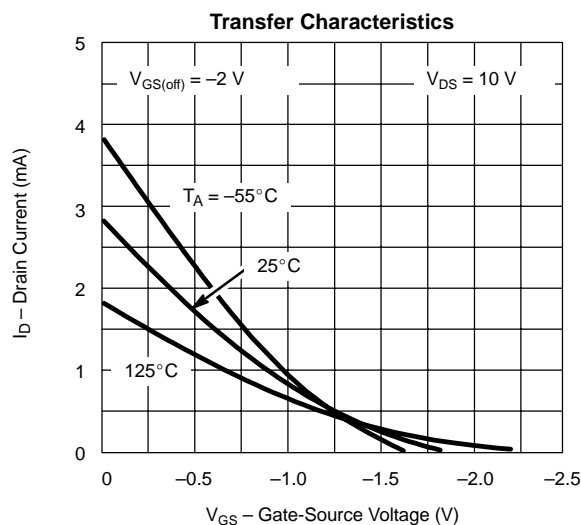
SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)										
Parameter	Symbol	Test Conditions	Typ <sup>a</sup>	Limits						Unit
				2N5545		2N5546		2N5547		
				Min	Max	Min	Max	Min	Max	
Static										
Gate-Source Breakdown Voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> = −1 μA, V <sub>DS</sub> = 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	
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
Dynamic										
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
Matching										
Differential Gate-Source Voltage	V <sub>G7S1</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

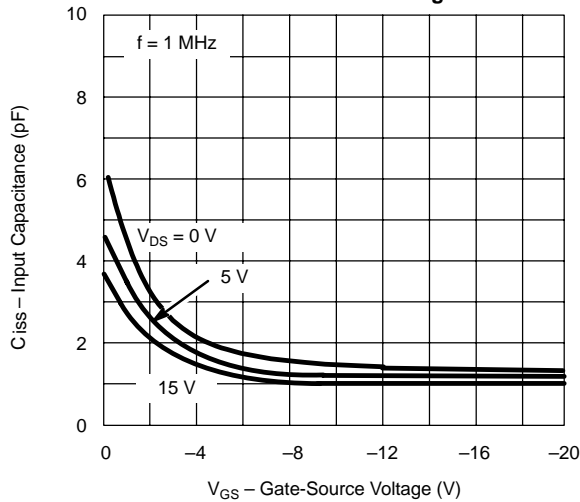
**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)****Drain Current and Transconductance vs. Gate-Source Cutoff Voltage****Gate Leakage Current****Output Characteristics****Output Characteristics****Output Characteristics****Output Characteristics**

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

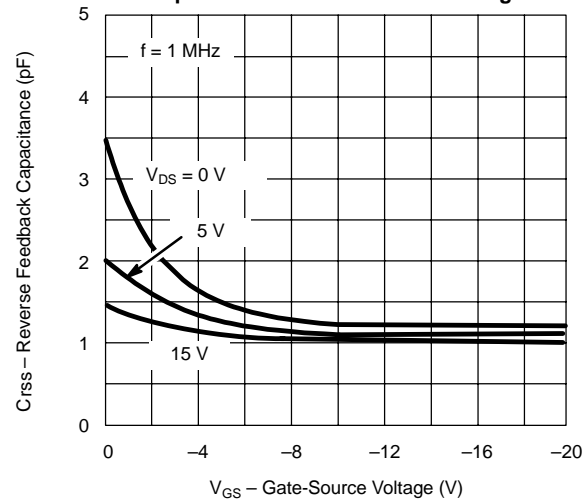


**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

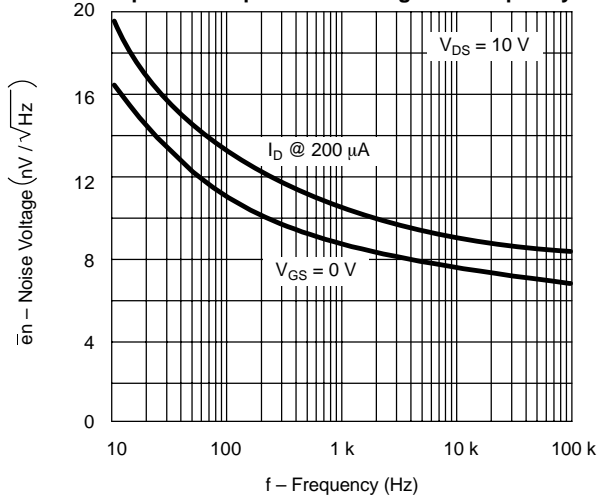
**Common-Source Input Capacitance vs. Gate-Source Voltage**



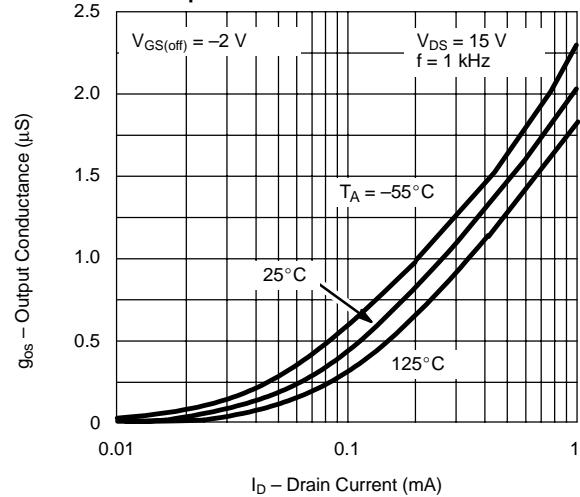
**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



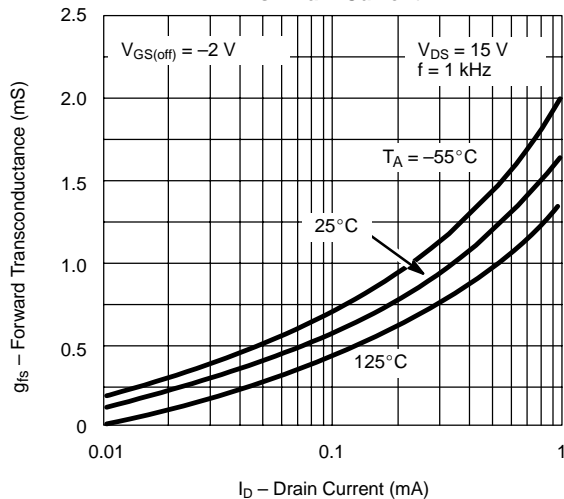
**Equivalent Input Noise Voltage vs. Frequency**



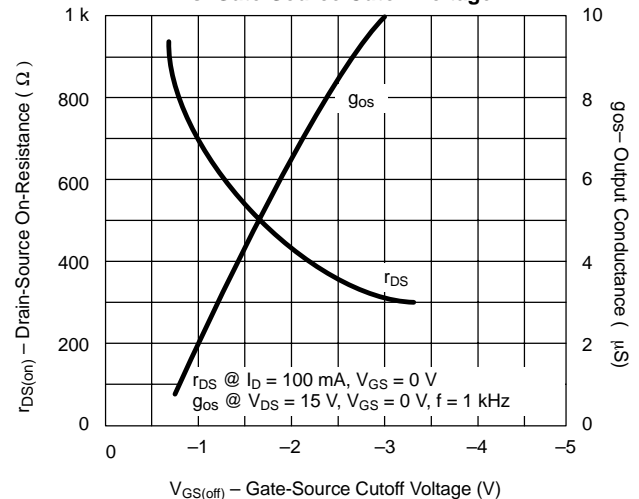
**Output Conductance vs. Drain Current**



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



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



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