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)	$\lvert V_{GS1} - V_{GS2} \rvert$ 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

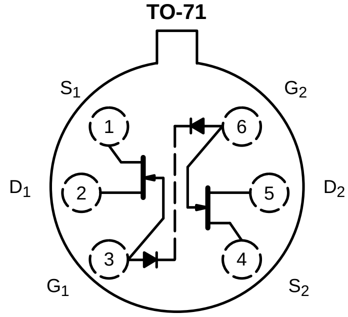
APPLICATIONS

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

DESCRIPTION

The 2N5545/5546/5547JANTX/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).

TO-71



Top View

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[a] . . . . 250 mW
Total[b] . . . . 500 mW

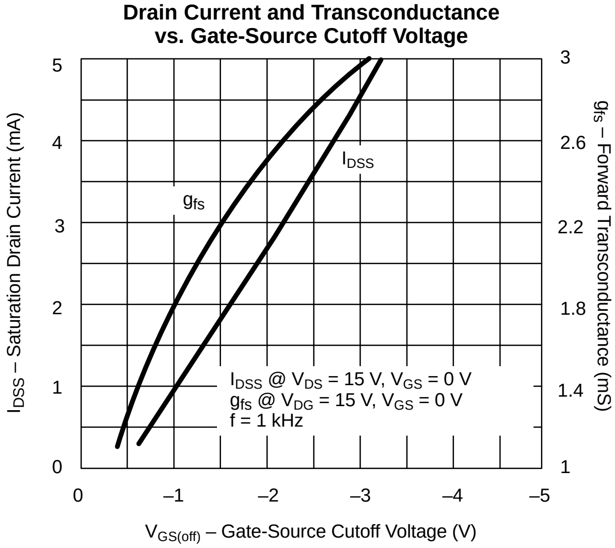
Notes
a. Derate 2 mW/°C above 25°C
b. Derate 4 mW/°C above 25°C

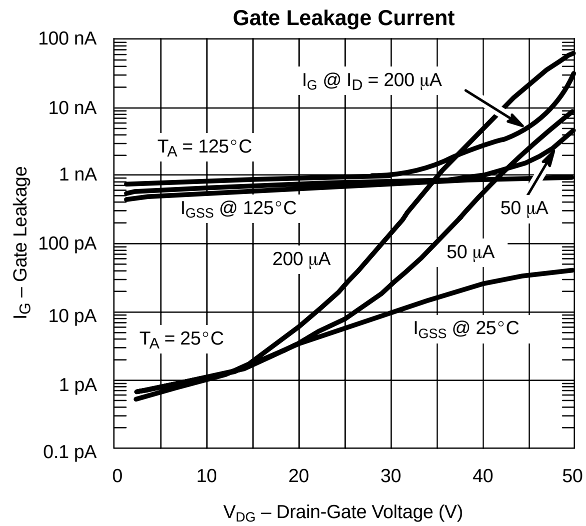
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

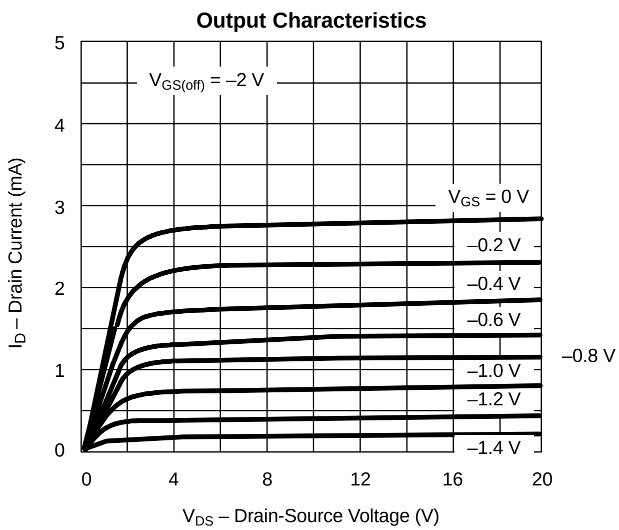
Parameter	Symbol	Test Conditions	Typ[a]	Limits 2N5545 Min	2N5545 Max	2N5546 Min	2N5546 Max	2N5547 Min	2N5547 Max	Unit
Static										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = –1 µA, V_{DS} = 0 V	–57	–50		–50		–50		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 15 V, I_D = 0.5 nA	–2	–0.5	–4.5	–0.5	–4.5	–0.5	–4.5	V
Saturation Drain Current[b]	I_{DSS}	V_{DS} = 15 V, V_{GS} = 0 V	3	0.5	8	0.5	8	0.5	8	mA
Gate Reverse Current	I_{GSS}	V_{GS} = –30 V, V_{DS} = 0 V	–10		–100		–100		–100	pA
		T_A = 150°C	–20		–150		–150		–150	nA
Gate Operating Current	I_G	V_{DG} = 15 V, I_D = 200 µA	–3		–50		–50		–50	pA
Gate-Source Forward Voltage	$V_{GS(F)}$	I_G = 1 mA , V_{DS} = 0 V	0.7							V
Dynamic										
Common-Source Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 kHz	2.5	1.5	6.0	1.5	6.0	1.5	6.0	mS
Common-Source Output Conductance[b]	g_{os}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 kHz	2		25		25		25	µS
Common-Source Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz	3.5		6		6		6	pF
Common-Source Reverse Transfer Capacitance	C_{rss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz	1.3		2		2		2	pF
Equivalent Input Noise Voltage	$\bar{e}_n$	V_{DS} = 15 V, I_D = 200 µA, f = 10 Hz	20		180		200			$nV/\sqrt{Hz}$
Noise Figure	NF	R_G = 1 MΩ	0.1		3.5		5			dB
Matching										
Differential Gate-Source Voltage	$\lvert V_{G7S1} - V_{GS2} \rvert$	V_{DG} = 15 V, I_D = 50 µA			5		10		15	mV
		V_{DG} = 15 V, I_D = 200 µA			5		10		15	mV
Gate-Source Voltage Differential Change with Temperature	$\frac{\Delta \lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$	V_{DG} = 15 V, I_D = 200 µA, T_A = –55 to 125°C			10		20		40	µV/°C
Saturation Drain Current Ratio[c]	$\frac{I_{DSS1}}{I_{DSS2}}$	V_{DS} = 15 V, V_{GS} = 0 V	0.98	0.95	1	0.9	1	0.9	1	
Transconductance Ratio[c]	$\frac{g_{fs1}}{g_{fs2}}$	V_{DS} = 15 V, I_D = 200 µA, f = 1 kHz	0.99	0.97	1	0.95	1	0.9	1	
Differential Output Conductance	$\lvert g_{os1} - g_{os2} \rvert$	V_{DG} = 15 V, V_{GS} = 0 V, f = 1 kHz	0.1		1		2		3	µS
Differential Gate Current	$\lvert I_{G1} - I_{G2} \rvert$	V_{DG} = 15 V, I_D = 200 µA, T_A = 125°C	1		5		5		5	nA

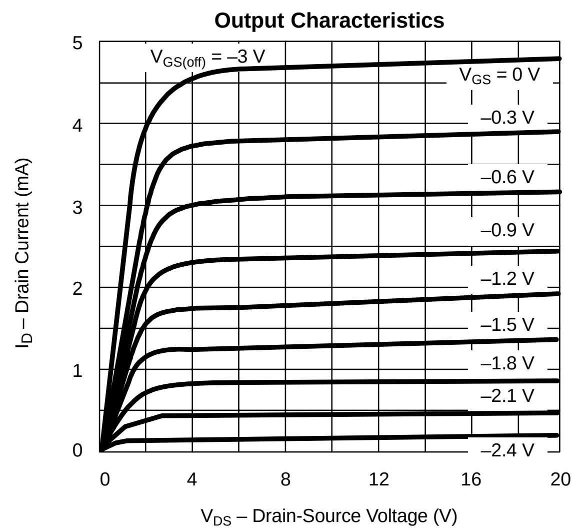
Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing. NQP
b. Pulse test: PW ≤300 µs duty cycle ≤3%.
c. Assumes smaller value in the numerator.

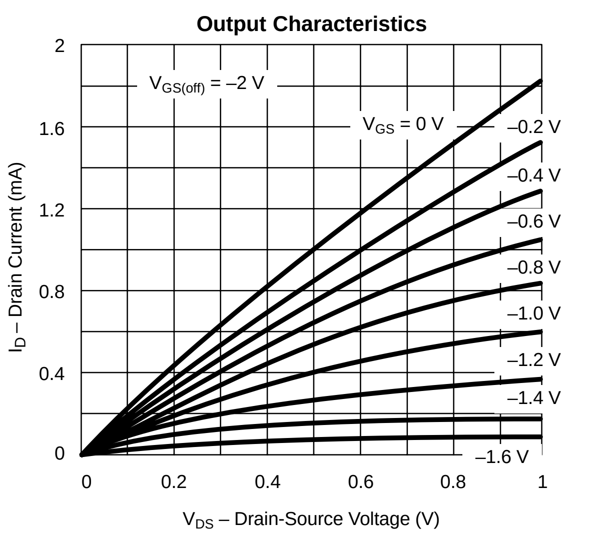
TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

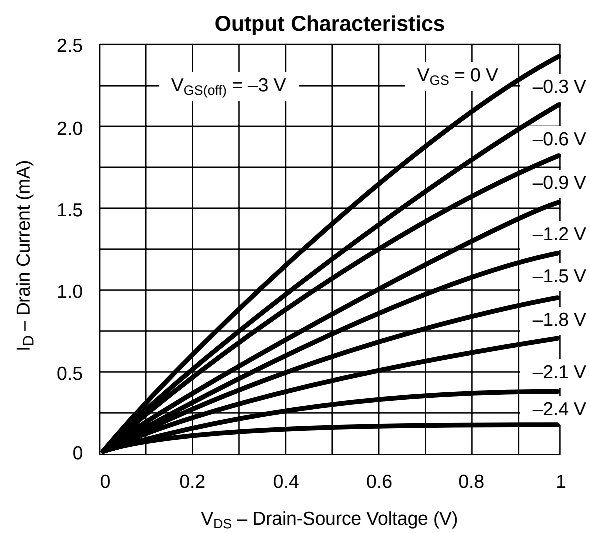












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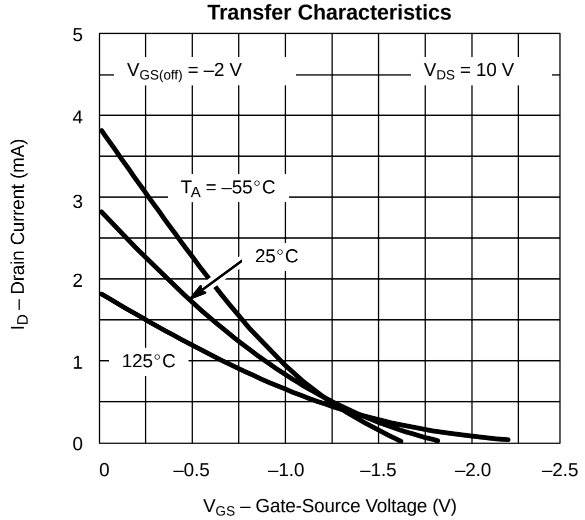
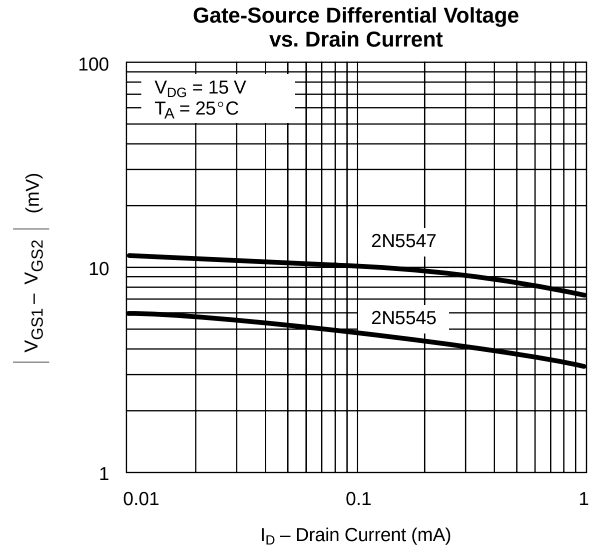
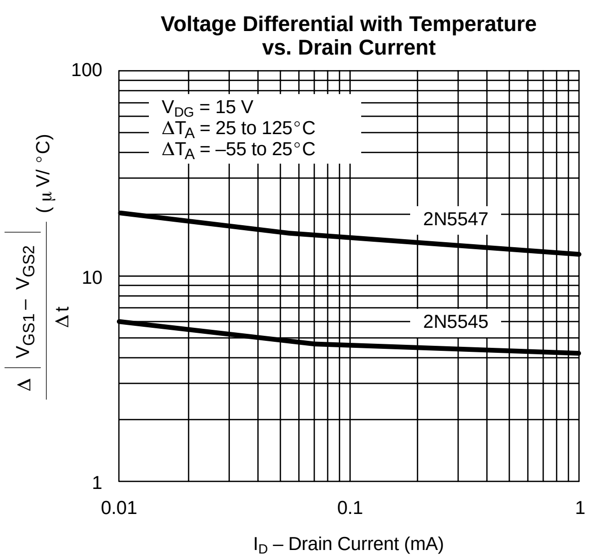
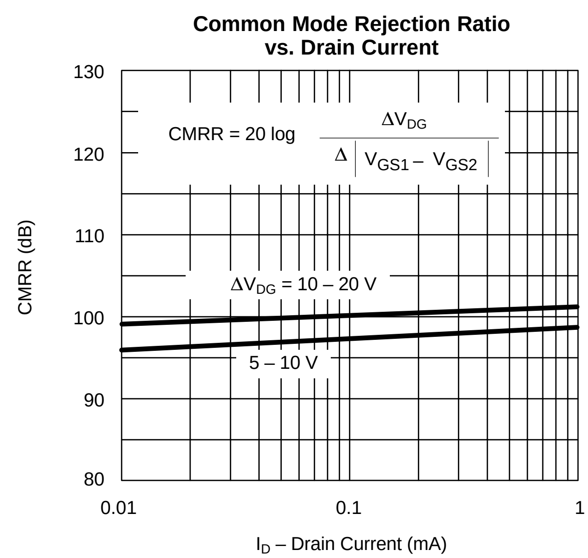
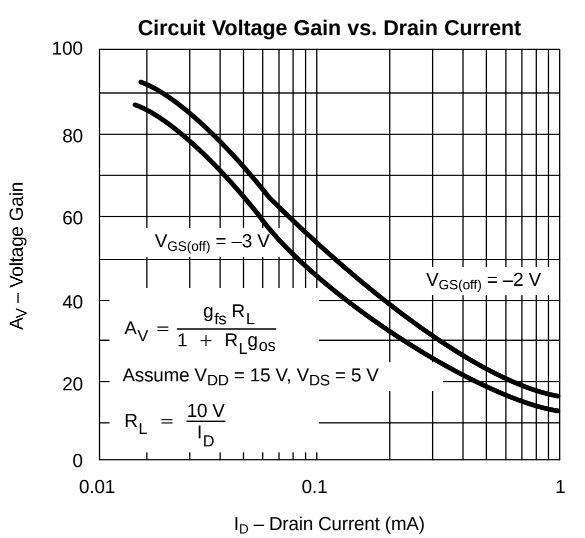
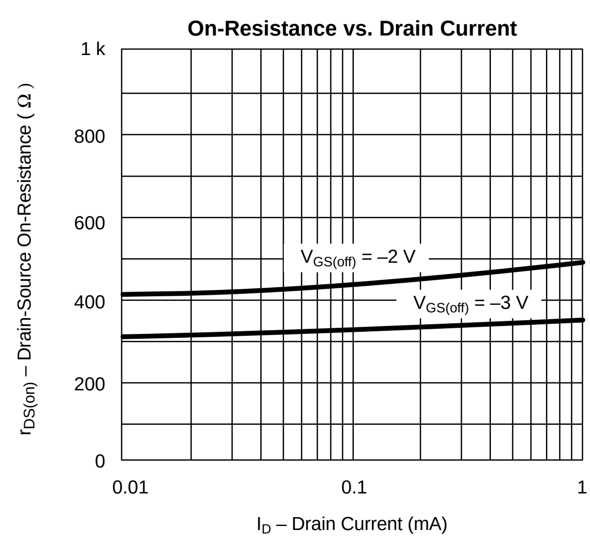






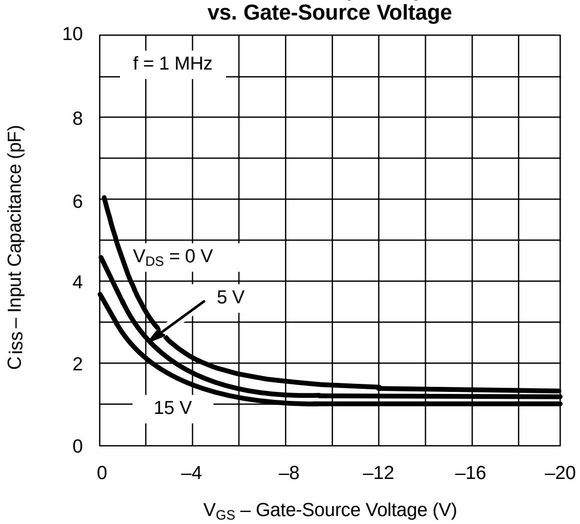




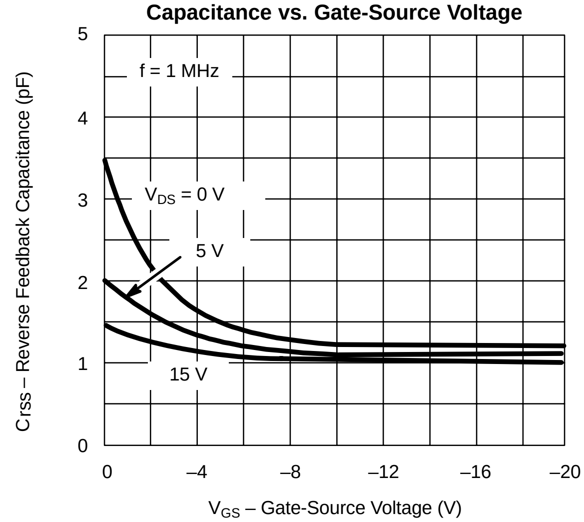


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

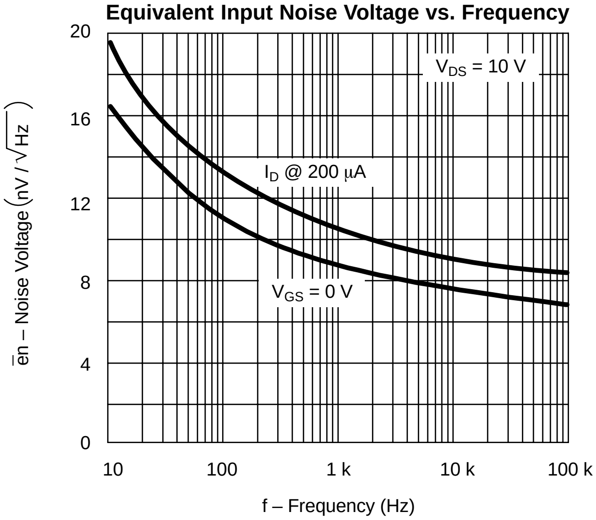
Common-Source Input Capacitance vs. Gate-Source Voltage



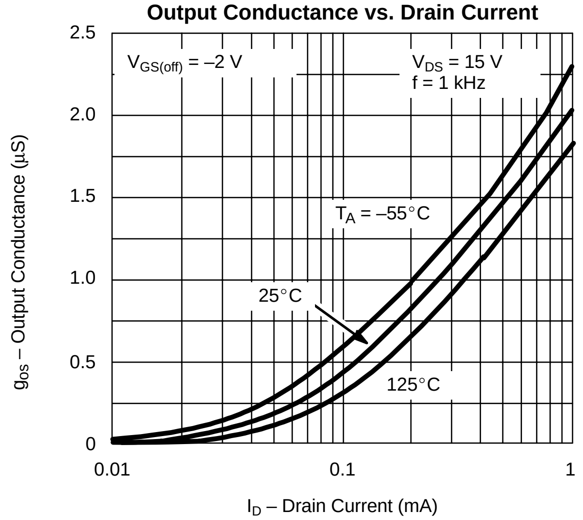
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



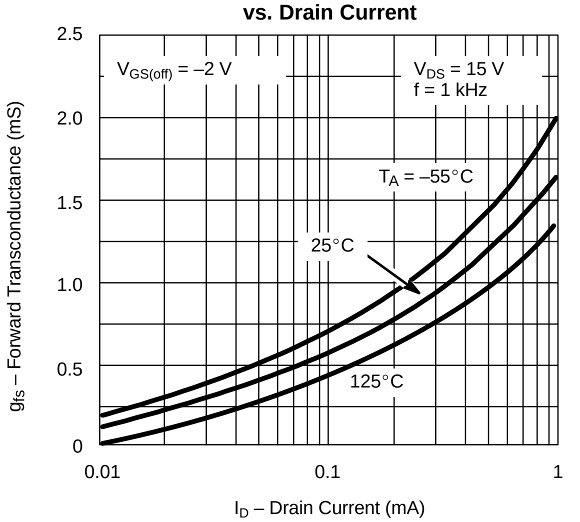
Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current



Common-Source Forward Transconductance vs. Drain Current



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