

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)
U421	-0.4 to -2	-40	0.3	-0.25	10
U423	-0.4 to -2	-40	0.3	-0.25	25

FEATURES

- Monolithic Design
- High Slew Rate
- Low Offset/Drift Voltage
- Low Gate Leakage: 0.2 pA
- Low Noise
- High CMRR: 102 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 Signals

APPLICATIONS

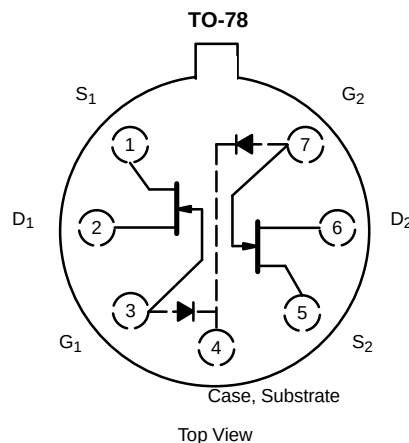
- Ultralow Input Current Differential Amps
- High-Speed Comparators
- Impedance Converters

DESCRIPTION

The U421/423 are monolithic dual n-channel JFETs designed to provide very high input impedance for differential amplification and impedance matching. Among its many unique features, this series offers operating gate current specified at -250 fA.

The hermetic TO-78 package is available with full military processing (see Military Information).

For similar products see the low-noise U/SST401 series and high-gain 2N5911/5912 data sheets.



ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage -40 V
 Gate-Gate Voltage ± 40 V
 Gate Current 10 mA
 Lead Temperature (l_{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 300 mW
 Total^b 500 mW

Notes

- Derate 2.4 mW/°C above 25 °C
- Derate 4 mW/°C above 25 °C



SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Specific Test Conditions	Typ ^a	Limits				Unit
				U421		U423		
				Min	Max	Min	Max	
Static								
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = −1 μA, V _{DS} = 0 V	−60	−40		−40		V
Gate-Gate Breakdown Voltage	V _{(BR)G1 − G2}	I _G = ±1 μA, I _D = 0, I _S = 0	± 55	± 40		± 40		
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 nA	−1.2	−0.4	−2	−0.4	−2	
Saturation Drain Current	I _{DSS}	V _{DS} = 10 V, V _{GS} = 0 V	400	60	1000	60	1000	μA
Gate Reverse Current	I _{GSS}	V _{GS} = −20 V, V _{DS} = 0 V	−0.6		−1		−1	pA
		T _A = 125°C	−0.3		−1		−1	nA
Gate Operating Current	I _G	V _{DG} = 10 V, I _D = 5 mA	−0.2		−0.25		−0.25	pA
		T _A = 125°C	−150		−250		−250	
Drain-Source On-Resistance	r _{DS(on)}	V _{GS} = 0 V, I _D = 10 μA	2000					Ω
Gate-Source Voltage	V _{GS}	V _{DG} = 10 V, I _D = 5 mA	−0.8		−1.8		−1.8	V
Gate-Source Forward Voltage	V _{GS(F)}	I _G = 1 mA , V _{DS} = 0 V	0.7					
Dynamic								
Common-Source Forward Transconductance	g _{fs}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 kHz	0.6	0.3	1.5	0.3	1.5	mS
Common-Source Output Conductance	g _{os}		4		10		10	μS
Common-Source Forward Transconductance	g _{fs}	V _{DS} = 10 V, I _D = 10 mA , f = 1 kHz	0.2	0.12	0.35	0.12	0.35	mS
Common-Source Output Conductance	g _{os}		0.4		3		3	μS
Common-Source Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	1.4		3		3	pF
Common-Source Reverse Transfer Capacitance	C _{rss}		0.7		1.5		1.5	
Equivalent Input Noise Voltage	e _n	V _{DS} = 10 V, I _D = 10 mA , f = 10 Hz	30		70		70	nV/√Hz
Noise Figure	NF		R _G = 10 MΩ			1		1
Matching								
Differential Gate-Source Voltage	V _{GS1} − V _{GS2}	V _{DG} = 10 V, I _D = 10 mA			10		25	mV
Gate-Source Voltage Differential Change with Temperature	$\frac{\Delta V_{GS1} - V_{GS2} }{\Delta T}$	V _{DG} = 10 V, I _D = 10 mA T _A = −55 to 125°C			10		40	μV/°C
Common Mode Rejection Ratio	CMRR	V _{DG} = 10 to 20 V, I _D = 10 mA	102	90		80		dB

Notes

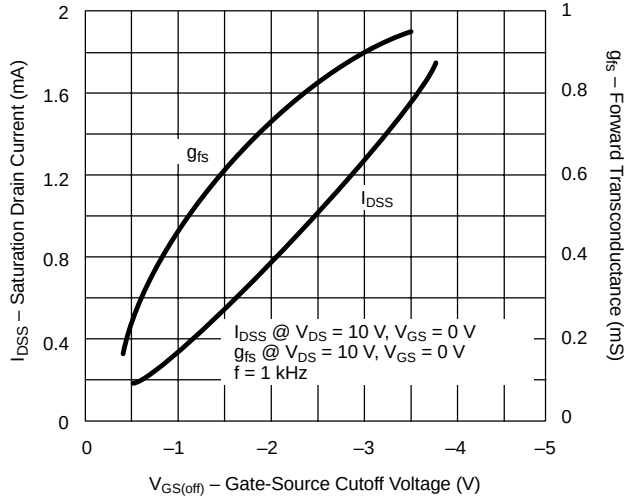
a. Typical values are for DESIGN AID ONLY, not guaranteed or subject to production testing.

NNT

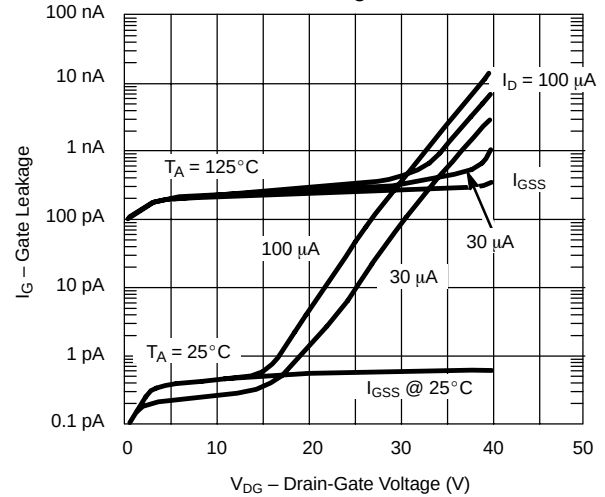


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

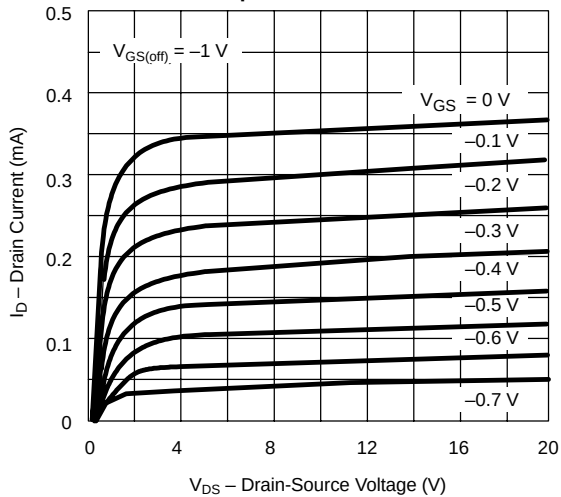
**Drain Current and Transconductance
vs. Gate-Source Cutoff Voltage**



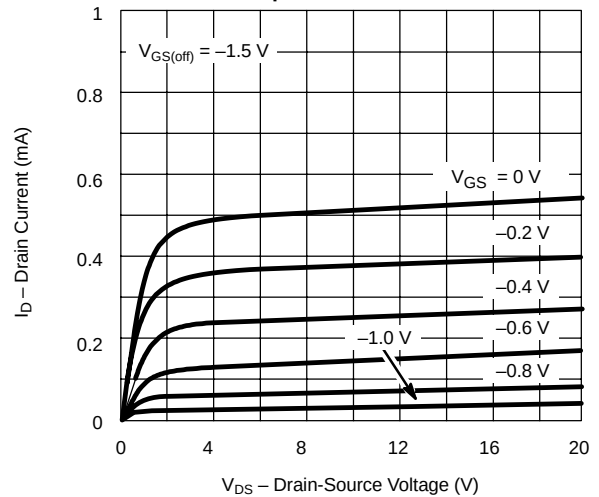
Gate Leakage Current



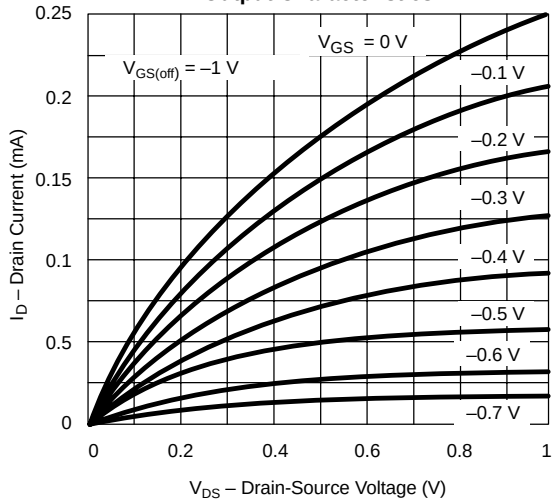
Output Characteristics



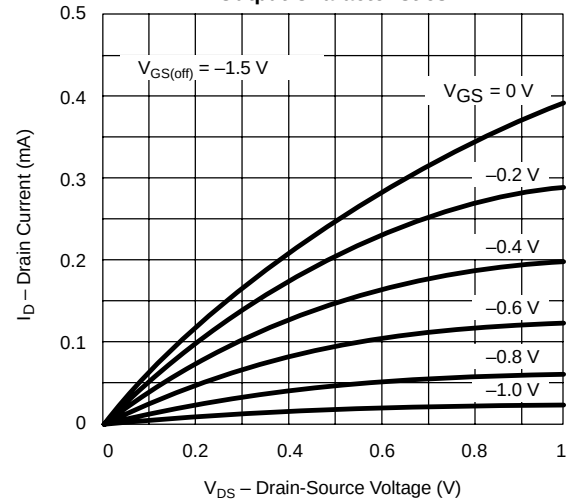
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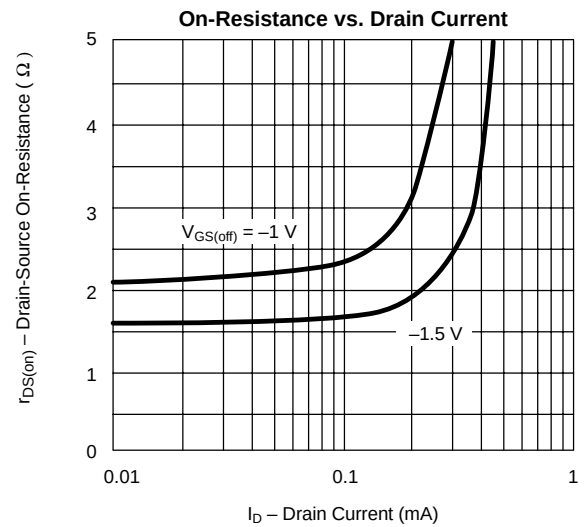
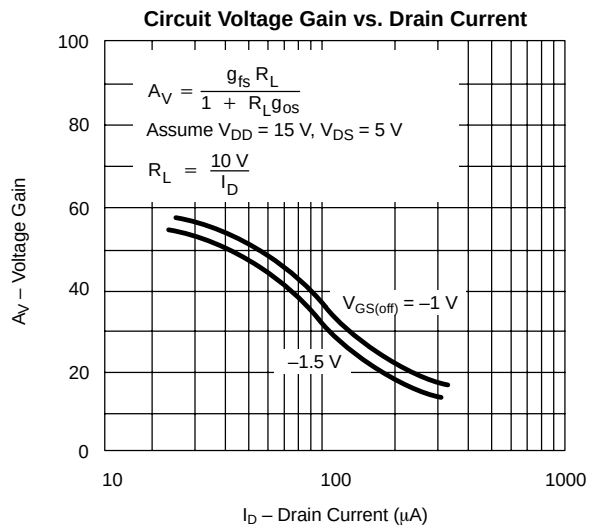
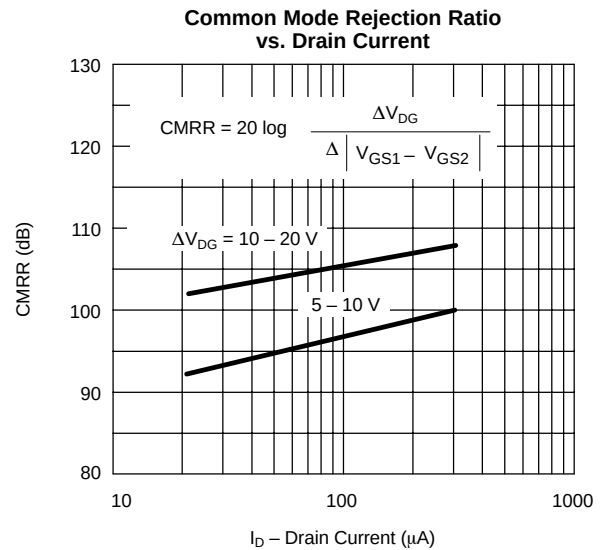
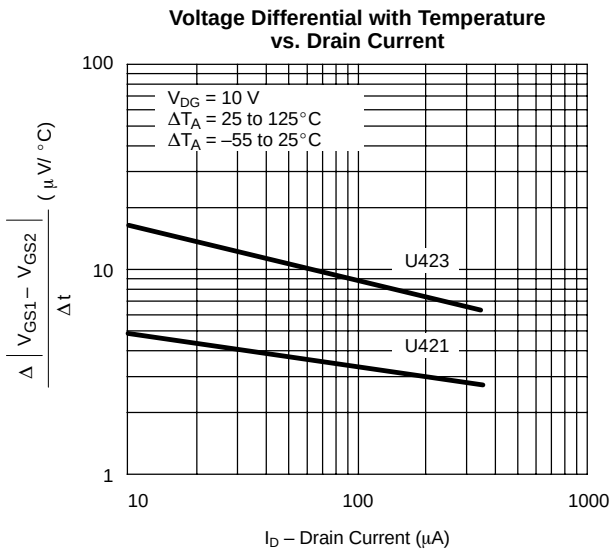
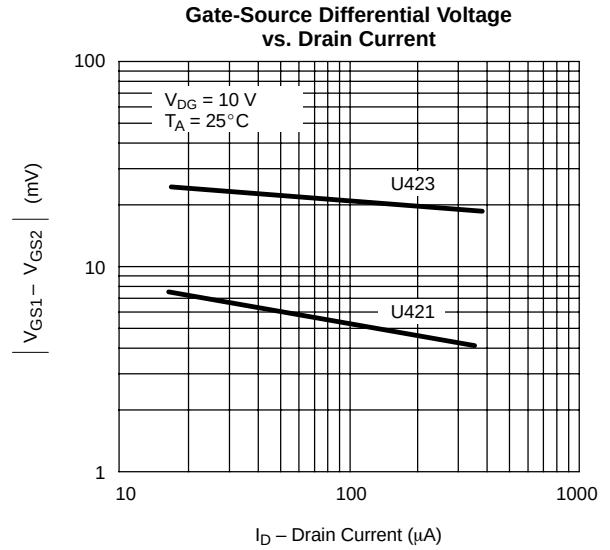
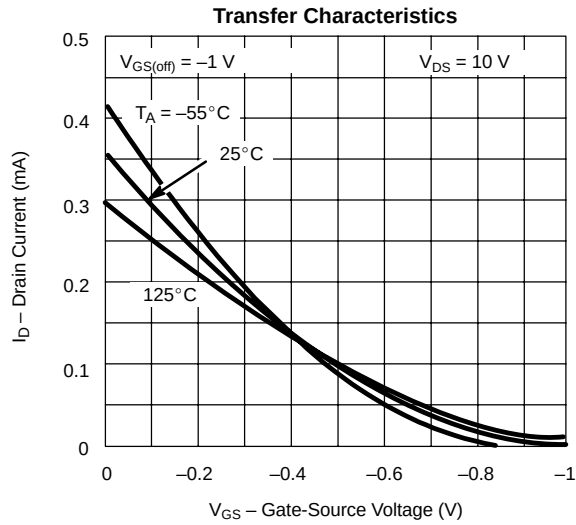


Output Characteristics



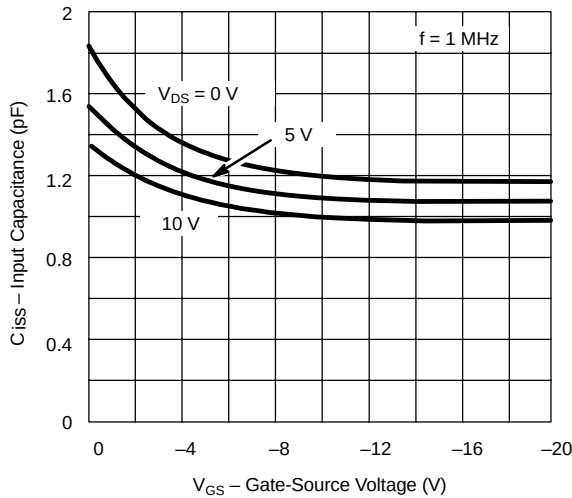
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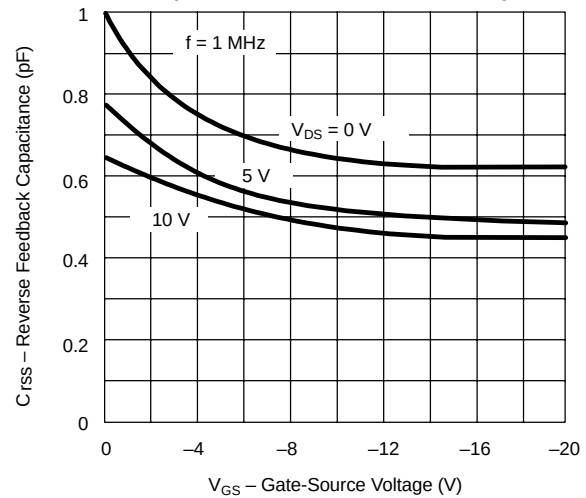
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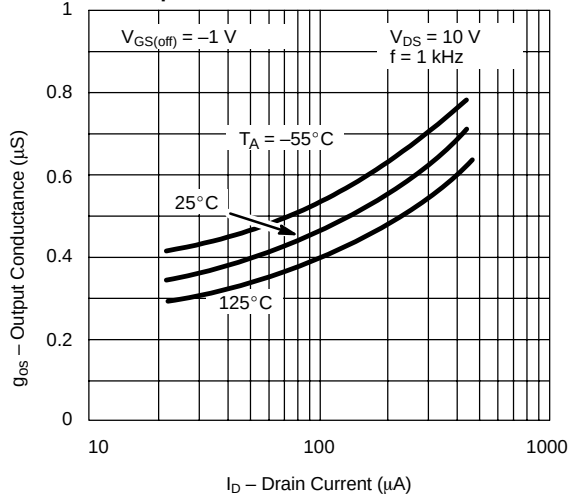
**Common-Source Input Capacitance
vs. Gate-Source Voltage**



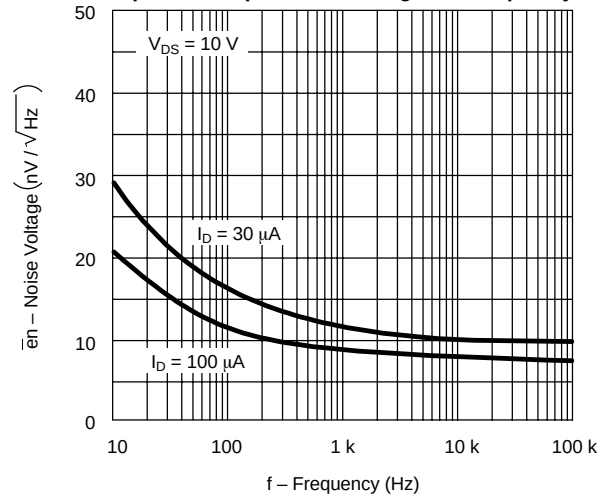
**Common-Source Reverse Feedback
Capacitance vs. Gate-Source Voltage**



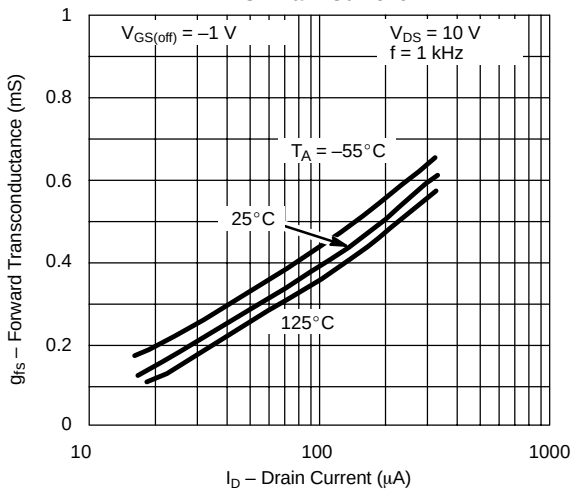
Output Conductance vs. Drain Current



Equivalent Input Noise Voltage vs. Frequency



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



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

