

## Linear Systems replaces discontinued Siliconix U423

The U423 is a high input impedance Monolithic Dual N-Channel JFET

The U423 monolithic dual n-channel JFET is 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 U423 is a direct replacement for discontinued Siliconix U423.

The hermetically sealed TO-71 & TO-78 packages are well suited for military applications. The 8 Pin P-DIP and 8 Pin SOIC provide ease of manufacturing, and the symmetrical pinout prevents improper orientation.

(See Packaging Information).

### U423 Applications:

- Ultra Low Input Current Differential Amps
- High-Speed Comparators
- Impedance Converters

### FEATURES

HIGH INPUT IMPEDANCE	$I_G = 0.25\text{pA MAX}$
HIGH GAIN	$g_{fs} = 120\mu\text{mho MIN}$
LOW POWER OPERATION	$V_{GS(OFF)} = 2\text{V MAX}$

### ABSOLUTE MAXIMUM RATINGS

@ 25°C (unless otherwise noted)

### Maximum Temperatures

Storage Temperature	-65°C to +150°C
Operating Junction Temperature	+150°C

### Maximum Voltage and Current for Each Transistor – Note 1

$-V_{GSS}$	Gate Voltage to Drain or Source	40V
$-V_{DSO}$	Drain to Source Voltage	40V
$-I_{G(f)}$	Gate Forward Current	10mA

### Maximum Power Dissipation

Device Dissipation @ Free Air – Total 400mW @ +125°C

### MATCHING CHARACTERISTICS @ 25°C UNLESS OTHERWISE NOTED

SYMBOL	CHARACTERISTICS	VALUE	UNITS	CONDITIONS
$ \Delta V_{GS1-2}/\Delta T  \text{ max.}$	DRIFT VS. TEMPERATURE	40	$\mu\text{V}/^\circ\text{C}$	$V_{DG}=10\text{V}, I_D=30\mu\text{A}$ $T_A=-55^\circ\text{C to }+125^\circ\text{C}$
$ V_{GS1-2}  \text{ max.}$	OFFSET VOLTAGE	25	mV	$V_{DG}=10\text{V}, I_D=30\mu\text{A}$

### ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

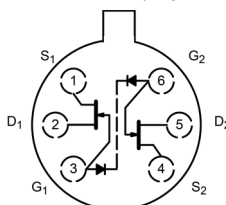
SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
$BV_{GSS}$	Breakdown Voltage	40	60	--	V	$V_{DS} = 0$ $I_G = 1\text{nA}$
$BV_{GGO}$	Gate-To-Gate Breakdown	40	--	--	V	$I_G = 1\mu\text{A}$ $I_D = 0$ $I_S = 0$
<b>TRANSCONDUCTANCE</b>						
$Y_{fss}$	Full Conduction	300	--	1500	$\mu\text{mho}$	$V_{DS} = 10\text{V}$ $V_{GS} = 0\text{V}$ $f = 1\text{kHz}$
$Y_{fs}$	Typical Operation	120	200	350	$\mu\text{mho}$	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$ $f = 1\text{kHz}$
<b>DRAIN CURRENT</b>						
$I_{DSS}$	Full Conduction	60	--	1000	$\mu\text{A}$	$V_{DS} = 10\text{V}$ $V_{GS} = 0\text{V}$
<b>GATE VOLTAGE</b>						
$V_{GS(off)}$	Pinchoff voltage	--	--	2.0	V	$V_{DS} = 10\text{V}$ $I_D = 1\text{nA}$
$V_{GS}$	Operating Range	--	--	1.8	V	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$
<b>GATE CURRENT</b>						
$I_{G \text{ max.}}$	Operating	--	--	.25	$\mu\text{A}$	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$
$-I_{G \text{ max.}}$	High Temperature	--	--	250	$\mu\text{A}$	$T_A = +125^\circ\text{C}$
$I_{GSS \text{ max.}}$	At Full Conduction	--	--	1.0	$\mu\text{A}$	$V_{DS} = 0\text{V}$ $V_{GS} = 20\text{V}$
$-I_{GSS \text{ max.}}$	High Temperature	--	--	1.0	$\mu\text{A}$	$T_A = +125^\circ\text{C}$
<b>OUTPUT CONDUCTANCE</b>						
$Y_{OSS}$	Full Conduction	--	--	10	$\mu\text{mho}$	$V_{DS} = 10\text{V}$ $V_{GS} = 0\text{V}$
$Y_{OS}$	Operating	--	0.1	3.0	$\mu\text{mho}$	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$
<b>COMMON MODE REJECTION</b>						
CMR	$-20 \log  \Delta V_{GS1-2}/\Delta V_{DS} $	--	90	--	dB	$\Delta V_{DS} = 10 \text{ to } 20\text{V}$ $I_D = 30\mu\text{A}$
	$-20 \log  \Delta V_{GS1-2}/\Delta V_{DS} $	--	90	--	dB	$\Delta V_{DS} = 5 \text{ to } 10\text{V}$ $I_D = 30\mu\text{A}$
<b>NOISE</b>						
NF	Figure	--	--	1	dB	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$ $R_G = 10\text{M}\Omega$ $f = 10\text{Hz}$
$e_n$	Voltage	--	20	70	$\text{nV}/\sqrt{\text{Hz}}$	$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$ $f = 10\text{Hz}$
		--	10	--		$V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$ $f = 1\text{kHz}$
<b>CAPACITANCE</b>						
$C_{ISS}$	Input	--	--	3.0	pF	$V_{DS} = 10\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$
$C_{RSS}$	Reverse Transfer	--	--	1.5	pF	

Note 1 – These ratings are limiting values above which the serviceability of any semiconductor may be impaired

### Available Packages:

U423 in TO-71 & TO-78  
U423 in PDIP & SOIC  
U423 available as bare die  
Please contact [Microcross](http://Microcross.com) for full package and die dimensions  
Email: [chipcomponents@microcross.com](mailto:chipcomponents@microcross.com)

TO-71 / TO-78 (Top View)



P-DIP / SOIC (Top View)

