

## Linear Systems replaces discontinued Siliconix U422

The U422 is a high input impedance Monolithic Dual N-Channel JFET

The U422 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 U422 is a direct replacement for discontinued Siliconix U422.

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).

### U422 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 | 25    | $\mu\text{V}/^\circ\text{C}$ | $V_{DG}=10\text{V}, I_D=30\mu\text{A}$<br>$T_A=-55^\circ\text{C to }+125^\circ\text{C}$ |
| $ V_{GS1-2}  \text{max.}$                 | OFFSET VOLTAGE        | 15    | mV                           | $V_{DG}=10\text{V}, I_D=30\mu\text{A}$  |

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

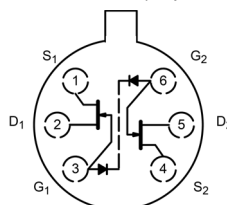
| SYMBOL                       | CHARACTERISTICS                             | MIN. | TYP. | MAX. | UNITS                        | CONDITIONS  |
|------------------------------|---|------|------|------|------------------------------|---|
| $BV_{GSS}$                   | Breakdown Voltage                           | 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>          |   |      |      |      |                              |   |
| $I_{Gmax.}$                  | Operating                                   | --   | --   | .25  | $\mu\text{A}$                | $V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$   |
| $-I_{Gmax.}$                 | High Temperature                            | --   | --   | 250  | $\mu\text{A}$                | $T_A = +125^\circ\text{C}$  |
| $I_{GSSmax.}$                | At Full Conduction                          | --   | --   | 1.0  | $\mu\text{A}$                | $V_{DS} = 0\text{V}$ $V_{GS} = 20\text{V}$  |
| $-I_{GSSmax.}$               | 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                           | $V_{DG} = 10\text{V}$ $I_D = 30\mu\text{A}$ $R_G = 10\text{M}\Omega$<br>$f = 10\text{Hz}$ |
| $e_n$                        | 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:

U422 in TO-71 & TO-78  
U422 in PDIP & SOIC  
U422 available as bare die  
Please contact [Micross](http://micross.com) for full package and die dimensions  
Email: [chipcomponents@micross.com](mailto:chipcomponents@micross.com)

TO-71 / TO-78 (Top View)



P-DIP / SOIC (Top View)

