

1-24-27



2N5902-2N5909

# 2N5902-2N5909

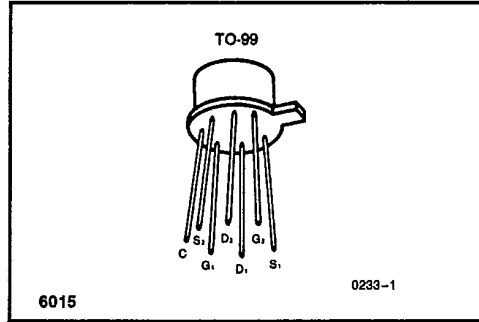
## Monolithic Dual N-Channel JFET

### General Purpose Amplifier

#### FEATURES

- Tight Tracking
- Good Matching

#### PIN CONFIGURATION



#### ABSOLUTE MAXIMUM RATINGS

( $T_A = 25^\circ\text{C}$  unless otherwise specified)  
 Gate-Drain or Gate-Source Voltage (Note 1) ..... -40V  
 Gate Current (Note 1) ..... 10mA  
 Storage Temperature Range .....  $-65^\circ\text{C}$  to  $+200^\circ\text{C}$   
 Operating Temperature Range .....  $-55^\circ\text{C}$  to  $+150^\circ\text{C}$   
 Lead Temperature (Soldering, 10sec) .....  $+300^\circ\text{C}$

|                                 | One Side              | Both Sides            |
|---------------------------------|-----------------------|-----------------------|
| Power Dissipation               | 367mW                 | 500mW                 |
| Derate above $25^\circ\text{C}$ | 3mW/ $^\circ\text{C}$ | 4mW/ $^\circ\text{C}$ |

**NOTE:** Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

#### ORDERING INFORMATION

| TO-99  |
|--------|
| 2N5902 |
| 2N5903 |
| 2N5904 |
| 2N5905 |
| 2N5906 |
| 2N5907 |
| 2N5908 |
| 2N5909 |

#### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Symbol                                     | Parameter  | Test Conditions  | 2N5902-6  |     | 2N5903-7 |     | 2N5904-8 |     | 2N5905-9 |     | Units         |                              |
|--|--|--|---|-----|----------|-----|----------|-----|----------|-----|---------------|------------------------------|
|  |  |  | Min   | Max | Min      | Max | Min      | Max | Min      | Max |               |                              |
| $ I_{G1} - I_{G2} $                        | Differential Gate Current  | $V_{DG} = 10V, I_D = 30\mu A, T_A = 125^\circ\text{C}$ | 2N5902-5  |     | 2.0      |     | 2.0      |     | 2.0      |     | nA            |                              |
|  |  |  | 2N5906-9  |     | 0.2      |     | 0.2      |     | 0.2      |     |               |                              |
| $I_{DSS1}$<br>$I_{DSS2}$                   | Saturation Drain Current Ratio   | $V_{DS} = 10V, V_{GS} = 0$                             | 0.95  | 1   | 0.95     | 1   | 0.95     | 1   | 0.95     | 1   |               |                              |
| $g_{fs1}$<br>$g_{fs2}$                     | Transconductance Ratio   | $f = 1\text{kHz}$                                      | 0.97  | 1   | 0.97     | 1   | 0.95     | 1   | 0.95     | 1   |               |                              |
| $ V_{GS1} - V_{GS2} $                      | Differential Gate-Source Voltage   |  |   | 5   |          | 5   |          | 10  |          | 15  | mV            |                              |
| $\Delta  V_{GS1} - V_{GS2} $<br>$\Delta T$ | Gate-Source Voltage Differential Drift (Measured at end points $T_A$ and $T_B$ ) | $V_{DG} = 10V, I_D = 30\mu A$                          | $T_A = 25^\circ\text{C}$<br>$T_B = 125^\circ\text{C}$ |     | 5        |     | 10       |     | 20       |     | 40            | $\mu\text{V}/^\circ\text{C}$ |
|  |  |  | $T_A = -55^\circ\text{C}$<br>$T_B = 25^\circ\text{C}$ |     | 5        |     | 10       |     | 20       |     | 40            |                              |
| $ g_{os1} - g_{os2} $                      | Differential Output Conductance  | $f = 1\text{kHz}$                                      |   | 0.2 |          | 0.2 |          | 0.2 |          | 0.2 | $\mu\text{S}$ |                              |

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NOTE: All typical values have been characterized but are not tested.

**2N5902-2N5909**

INTERNATIONAL

T-29-27

2N5902-2N5909

**ELECTRICAL CHARACTERISTICS** (Continued) ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

| Symbol        | Parameter   | Test Conditions  | 2N5902-5                       |                            | 2N5906-9 |      | Units |               |
|---------------|---|--|--------------------------------|----------------------------|----------|------|-------|---------------|
|               |   |  | Min                            | Max                        | Min      | Max  |       |               |
| $I_{GSS}$     | Gate Reverse Current                                  | $V_{GS} = -20V, V_{DS} = 0$<br>$T_A = 125^\circ\text{C}$ |                                | -5                         |          | -2   | pA    |               |
|               |   |  |                                | -10                        |          | -5   | nA    |               |
| $BV_{GSS}$    | Gate-Source Breakdown Voltage                         | $I_G = -1\mu\text{A}, V_{DS} = 0$                        | -40                            |                            | -40      |      | V     |               |
| $V_{GS(off)}$ | Gate-Source Cutoff Voltage                            | $V_{DS} = 10V, I_D = 1\text{nA}$                         | -0.6                           | -4.5                       | -0.6     | -4.5 |       |               |
| $V_{GS}$      | Gate Source Voltage                                   | $V_{DG} = 10V, I_D = 30\mu\text{A}$                      |                                | -4                         |          | -4   |       |               |
| $I_G$         | Gate Operating Current                                | $T_A = 125^\circ\text{C}$                                |                                | -3                         |          | -1   | pA    |               |
|               |   |  |                                | -3                         |          | -1   | nA    |               |
| $I_{DSS}$     | Saturation Drain Current                              | $V_{DS} = 10V, V_{GS} = 0$                               | f = 1kHz                       | 30                         | 500      | 30   | 500   | $\mu\text{A}$ |
| $g_{fs}$      | Common-Source Forward Transconductance                |  |                                | 70                         | 250      | 70   | 250   | $\mu\text{S}$ |
| $g_{os}$      | Common-Source Output Conductance                      |  |                                |                            | 5        |      | 5     |               |
| $C_{iss}$     | Common-Source Input Capacitance                       | $V_{DS} = 10V, V_{GS} = 0$<br>(Note 1)                   | f = 1MHz                       |                            | 3        |      | 3     | pF            |
| $C_{rss}$     | Common-Source Reverse Transfer Capacitance            |  |                                |                            | 1.5      |      | 1.5   |               |
| $g_{fs}$      | Common-Source Forward Transconductance                | $V_{DG} = 10V, I_D = 30\mu\text{A}$                      | f = 1kHz                       | 50                         | 150      | 50   | 150   | $\mu\text{S}$ |
| $g_{os}$      | Common-Source Output Conductance                      |  |                                |                            | 1        |      | 1     |               |
| $\bar{e}_n$   | Equivalent Short Circuit Input Noise Voltage (Note 1) |  |                                | $V_{DS} = 10V, V_{GS} = 0$ |          | 0.2  |       | 0.1           |
| NF            | Spot Noise Figure (Note 1)                            |  | f = 100Hz<br>$R_G = 10M\Omega$ |                            | 3        |      | 1     | dB            |

NOTE 1: For design reference only, not 100% tested.

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