

# N-Channel JFET Monolithic Dual



## SST5912

### FEATURES

- High Gain .....  $g_{fs} > 6 \text{ mS}$
- Low Leakage .....  $I_G < 1 \text{ pA typical}$
- Low Noise
- Surface Mount Package

### APPLICATIONS

- Differential Wideband Amplifier
- VHF/UHF Amplifiers
- Test and Measurement

### DESCRIPTION

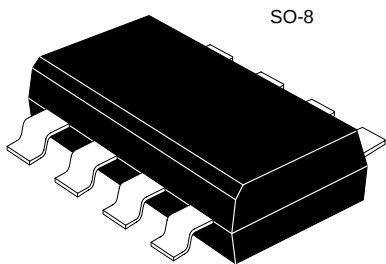
The SST5912 is a High Speed N-Channel Monolithic JFET pair encapsulated in a surface mount plastic SO-8 package. The device is designed for high gain (typically  $> 6000 \text{ mmhos}$ ), low leakage ( $< 1 \text{ pA}$  typically) and low noise. The SST5912 is an excellent choice for differential wideband amplifiers, VHF/UHF amplifiers and test and measurement.

### ORDERING INFORMATION

| Part    | Package              | Temperature Range                               |
|---------|----------------------|-------------------------------------------------|
| SST5912 | Plastic SO-8 Package | $-55^{\circ}\text{C}$ to $+150^{\circ}\text{C}$ |

NOTE: For Sorted Chips in Carriers, See 2N5911 Series

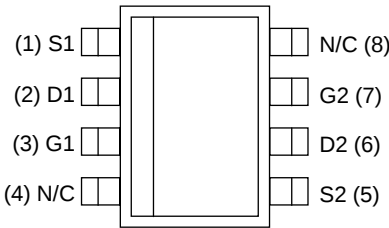
### PIN CONFIGURATION



SO-8

CJ1

TOP VIEW



### PRODUCT MARKING

| PRODUCT MARKING |         |
|-----------------|---------|
| SST5912         | SST5912 |

**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^{\circ}\text{C}$  unless otherwise noted)

| Parameter/Test Condition                          | Symbol    | Limit      | Unit                   |
|---------------------------------------------------|-----------|------------|------------------------|
| Gate-Drain Voltage                                | $V_{GD}$  | -25        | V                      |
| Gate-Source Voltage                               | $V_{GS}$  | -25        | V                      |
| Forward Gate Current                              | $I_G$     | 50         | mA                     |
| Power Dissipation (per side)                      | $P_D$     | 300        | mW                     |
| (total)                                           |           | 500        | mW                     |
| Power Derating (per side)                         |           | 2.4        | mW/ $^{\circ}\text{C}$ |
| (total)                                           |           | 4          | mW/ $^{\circ}\text{C}$ |
| Operating Junction Temperature                    | $T_J$     | -55 to 150 | $^{\circ}\text{C}$     |
| Storage Temperature                               | $T_{stg}$ | -65 to 150 | $^{\circ}\text{C}$     |
| Lead Temperature (1/16" from case for 10 seconds) | $T_L$     | 300        | $^{\circ}\text{C}$     |

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

| SYMBOL                               | CHARACTERISTICS                                          | TYP <sup>1</sup> | SST5912 |      | UNIT                   | TEST CONDITIONS                                                                  |                                               |
|--------------------------------------|----------------------------------------------------------|------------------|---------|------|------------------------|----------------------------------------------------------------------------------|-----------------------------------------------|
|                                      |                                                          |                  | MIN     | MAX  |                        |                                                                                  |                                               |
| STATIC                               |                                                          |                  |         |      |                        |                                                                                  |                                               |
| V <sub>(BR)GSS</sub>                 | Gate-Source Breakdown Voltage                            | -35              | -25     |      | V                      | I <sub>G</sub> = -1mA, V <sub>DS</sub> = 0V                                      |                                               |
| V <sub>GS(OFF)</sub>                 | Gate-Source Cut off Voltage                              | -3.5             | -1      | -5   |                        | V <sub>DS</sub> = 10V, I <sub>D</sub> = 1nA                                      |                                               |
| I <sub>DSS</sub>                     | Saturation Drain Current <sup>2</sup>                    | 15               | 7       | 40   | mA                     | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V                                      |                                               |
| I <sub>GSS</sub>                     | Gate Reverse Current                                     | -1               |         | -100 | pA                     | V <sub>GS</sub> = -15V, V <sub>DS</sub> = 0V                                     |                                               |
|                                      |                                                          | -0.2             |         |      | nA                     | T <sub>A</sub> = 125 <sup>o</sup> C                                              |                                               |
| I <sub>G</sub>                       | Gate Operating Current                                   | -1               |         | -100 | pA                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA                                      |                                               |
|                                      |                                                          | -0.2             |         |      | nA                     | T <sub>A</sub> = 125 <sup>o</sup> C                                              |                                               |
| V <sub>GS</sub>                      | Gate-Source Voltage                                      | -1.5             | -0.3    | -4   | V                      | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA                                      |                                               |
| V <sub>GS(F)</sub>                   | Gate-Source Forward Voltage                              | 0.7              |         |      |                        | I <sub>G</sub> = 1mA, V <sub>DS</sub> = 0V                                       |                                               |
| DYNAMIC                              |                                                          |                  |         |      |                        |                                                                                  |                                               |
| g <sub>fs</sub>                      | Common-Source Forward Transconductance                   | 6                | 5       | 10   | mS                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA                                      |                                               |
| g <sub>os</sub>                      | Common-Source Output Conductance                         | 20               |         | 100  | mS                     | f = 1kHz                                                                         |                                               |
| g <sub>fs</sub>                      | Common-Source Forward Transconductance                   | 6                | 5       | 10   | mS                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA                                      |                                               |
| g <sub>os</sub>                      | Common-Source Output Conductance                         | 30               |         | 150  | mS                     | f = 100MHz                                                                       |                                               |
| C <sub>iss</sub>                     | Common-Source Input Capacitance                          | 3.5              |         | 5    | pF                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA                                      |                                               |
| C <sub>rss</sub>                     | Common-Source Reverse Transfer Capacitance               | 1                |         | 1.2  |                        | f = 1MHz                                                                         |                                               |
| $\bar{e}_n$                          | Equivalent Input Noise Voltage                           | 4                |         | 20   | nV/ $\sqrt{\text{Hz}}$ | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA, f = 10kHz                           |                                               |
| NF                                   | Noise Figure                                             | 0.1              |         | 1    | dB                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA, f = 10kHz, R <sub>G</sub> = 100W    |                                               |
| MATCHING                             |                                                          |                  |         |      |                        |                                                                                  |                                               |
| V <sub>GS1</sub> - V <sub>GS2</sub>  | Differential Gate Source Voltage                         | 7                |         | 15   | mV                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA                                      |                                               |
| $\frac{D   V_{GS1} - V_{GS2}  }{DT}$ | Gate Source Voltage Differential Change with Temperature | 10               |         | 40   | mV/ <sup>o</sup> C     | T = -55 to 25 <sup>o</sup> C                                                     | V <sub>DG</sub> = 10V<br>I <sub>D</sub> = 5mA |
|                                      |                                                          | 10               |         | 40   |                        | T = 25 to 125 <sup>o</sup> C                                                     |                                               |
| $\frac{I_{DSS1}}{I_{DSS2}}$          | Saturation Drain Current Ratio                           | 0.98             | 0.95    | 1    |                        | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V                                      |                                               |
| $\frac{g_{fs1}}{g_{fs2}}$            | Transconductance Ratio                                   | 0.98             | 0.95    | 1    |                        | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA, f = 1kHz                            |                                               |
| I <sub>G1</sub> - I <sub>G2</sub>    | Differential Gate Current                                | 0.01             |         | 20   | nA                     | V <sub>DG</sub> = 10V, I <sub>D</sub> = 5mA, T <sub>A</sub> = 125 <sup>o</sup> C |                                               |
| CMRR                                 | Common Mode Rejection Ratio                              | 90               |         |      | dB                     | V <sub>DD</sub> = 5 to 10V, I <sub>D</sub> = 5mA                                 |                                               |

NOTES: 1. For design aid only, not subject to production testing.  
2. Pulse test; PW = 300ms, duty cycle  $\hat{a}$  3%.