



## NTE451 Silicon N-Channel JFET Transistor VHF/UHF Amplifier

### **Absolute Maximum Ratings:**

|                                                               |                                     |
|---------------------------------------------------------------|-------------------------------------|
| Drain–Gate Voltage, $V_{DG}$                                  | 25V                                 |
| Reverse Gate–Source Voltage, $V_{GSR}$                        | 25V                                 |
| Drain Current, $I_D$                                          | 30mA                                |
| Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ | 350mW                               |
| Derate Above $25^\circ\text{C}$                               | 2.8mW/ $^\circ\text{C}$             |
| Operating Junction Temperature Range, $T_J$                   | $-65^\circ$ to $+150^\circ\text{C}$ |
| Storage Temperature Range, $T_{stg}$                          | $-65^\circ$ to $+150^\circ\text{C}$ |

### **Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

| Parameter                                           | Symbol              | Test Conditions                                                    | Min  | Typ | Max  | Unit            |
|-----------------------------------------------------|---------------------|--------------------------------------------------------------------|------|-----|------|-----------------|
| <b>OFF Characteristics</b>                          |                     |                                                                    |      |     |      |                 |
| Gate–Source Breakdown Voltage                       | $V_{(BR)GSS}$       | $I_G = -1\mu\text{A}$ , $V_{DS} = 0$                               | –25  | –   | –    | V               |
| Gate Reverse Current                                | $I_{GSS}$           | $V_{GS} = -20\text{V}$ , $V_{DS} = 0$                              | –    | –   | –1.0 | nA              |
|                                                     |                     | $V_{GS} = -20\text{V}$ , $V_{DS} = 0$ , $T_A = +100^\circ\text{C}$ | –    | –   | –0.2 | nA              |
| Gate–Source Cutoff Voltage                          | $V_{GS(off)}$       | $I_D = 10\text{nA}$ , $V_{DS} = 15\text{V}$                        | –0.5 | –   | –4.0 | V               |
| <b>ON Characteristics</b>                           |                     |                                                                    |      |     |      |                 |
| Zero–Gate–Voltage Drain Current                     | $I_{DSS}$           | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$                               | 4    | –   | 20   | mA              |
| <b>Small Signal Characteristics Characteristics</b> |                     |                                                                    |      |     |      |                 |
| Forward Transfer Admittance                         | $ y_{fs} $          | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 1\text{kHz}$           | 3500 | –   | 7000 | $\mu\text{mho}$ |
| Input Admittance                                    | $\text{Re}(y_{is})$ | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 400\text{MHz}$         | –    | –   | 1000 | $\mu\text{mho}$ |
| Output Admittance                                   | $ y_{os} $          | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 1\text{kHz}$           | –    | –   | 60   | $\mu\text{mho}$ |
| Output Conductance                                  | $\text{Re}(y_{os})$ | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 400\text{MHz}$         | –    | –   | 100  | $\mu\text{mho}$ |
| Forward Transconductance                            | $g_{fs}$            | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 400\text{MHz}$         | 3000 | –   | –    | $\mu\text{mho}$ |
| Input Capacitance                                   | $C_{iss}$           | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 1\text{MHz}$           | –    | –   | 5    | pF              |
| Reverse Transfer Capacitance                        | $C_{rss}$           | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 1\text{MHz}$           | –    | –   | 1    | pF              |
| Output Capacitance                                  | $C_{oss}$           | $V_{DS} = 15\text{V}$ , $V_{GS} = 0$ , $f = 1\text{MHz}$           | –    | –   | 2    | pF              |

**Electrical Characteristics Cont'd):** ( $T_A = +25^{\circ}\text{C}$  unless otherwise specified)

| Parameter                         | Symbol   | Test Conditions                                                      | Min                 | Typ | Max | Unit  |
|-----------------------------------|----------|----------------------------------------------------------------------|---------------------|-----|-----|-------|
| <b>Functional Characteristics</b> |          |                                                                      |                     |     |     |       |
| Noise Figure                      | NF       | $V_{DS} = 15\text{V}, I_D = 4\text{mA}, R_G \approx 1\text{k}\Omega$ | $f = 100\text{MHz}$ | –   | –   | 2 dB  |
|                                   |          |                                                                      | $f = 400\text{MHz}$ | –   | –   | 4 dB  |
| Common Source Power Gain          | $G_{ps}$ | $V_{DS} = 15\text{V}, I_D = 4\text{mA}$                              | $f = 100\text{MHz}$ | 18  | –   | 30 dB |
|                                   |          |                                                                      | $f = 400\text{MHz}$ | 10  | –   | 20 dB |

