

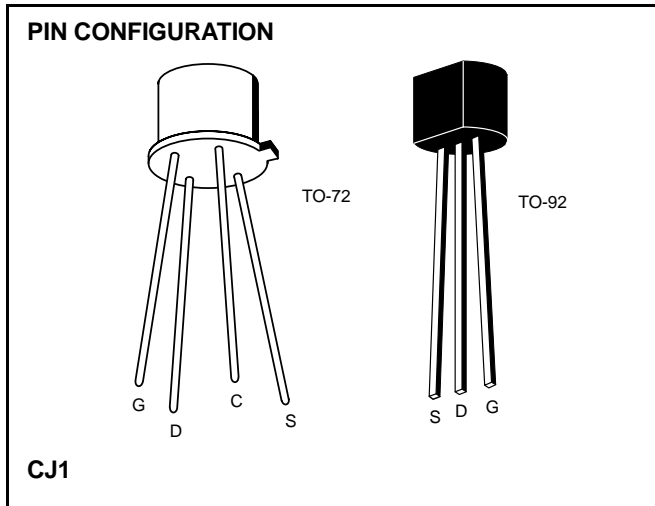
N-Channel JFET High Frequency Amplifier



2N4416 / 2N4416A / PN4416

FEATURES

- Low Noise
- Low Feedback Capacitance
- Low Output Capacitance
- High Transconductance
- High Power Gain



ABSOLUTE MAXIMUM RATINGS

(T_A = 25°C unless otherwise noted)

| | |
|-------------------------------------|-----------------|
| Gate-Source or Gate-Drain Voltage | |
| 2N4416, PN4416 | -30V |
| 2N4416A | -35V |
| Gate Current | 10mA |
| Storage Temperature Range | |
| 2N4416/2N4416A | -65°C to +200°C |
| PN4416 | -55°C to +150°C |
| Operating Temperature Range | |
| 2N4416/2N4416A | -65°C to +200°C |
| PN4416 | -55°C to +135°C |
| Lead Temperature (Soldering, 10sec) | +300°C |
| Power Dissipation | 300mW |
| Derate above 25°C | |
| 2N4416/2N4416A | 1.7mW/°C |
| PN4416 | 2.7mW/°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

| Part | Package | Temperature Range |
|---------|--------------------------|-------------------|
| 2N4416 | Hermetic TO-72 | -55°C to +135°C |
| 2N4416A | Hermetic TO-72 | -55°C to +135°C |
| PN4416 | Plastic TO-92 | -55°C to +135°C |
| X2N4416 | Sorted Chips in Carriers | -55°C to +135°C |

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

| SYMBOL | PARAMETER | | MIN | MAX | UNITS | TEST CONDITIONS | |
|---------------|---|---------------|------|------|---------------|------------------------------------|---|
| I_{GSS} | Gate Reverse Current | | | -0.1 | nA | $V_{GS} = -20\text{V}, V_{DS} = 0$ | |
| | | | | -0.1 | μA | $T_A = 150^\circ\text{C}$ | |
| BV_{GSS} | Gate-Source Breakdown Voltage | 2N4416/PN4416 | -30 | | V | $I_G = -1\mu\text{A}, V_{DS} = 0$ | |
| | | 2N4416A | -35 | | | | |
| $V_{GS(off)}$ | Gate-Source Cutoff Voltage | 2N4416/PN4416 | | -6 | | | $V_{DS} = 15\text{V}, I_D = 1\text{nA}$ |
| | | 2N4416A | -2.5 | -6 | | | |
| $V_{GS(f)}$ | Gate-Source Forward Voltage | | | 1 | V | $I_G = 1\text{mA}, V_{DS} = 0$ | |
| I_{DSS} | Drain Current at Zero Gate Voltage | | 5 | 15 | mA | $V_{DS} = 15\text{V}, V_{GS} = 0$ | f = 1kHz |
| g_{fs} | Common-Source Forward Transconductance | | 4500 | 7500 | μS | | |
| g_{os} | Common-Source Output Conductance | | | 50 | μS | | |
| C_{rss} | Common-Source Reverse Transfer Capacitance (Note 1) | | | 0.8 | pF | | f = 1MHz |
| C_{iss} | Common-Source Input Capacitance (Note 1) | | | 4 | pF | | |
| C_{oss} | Common-Source Input Capacitance (Note 1) | | | 2 | | | |

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

| SYMBOL | PARAMETER | 100MHz | | 400MHz | | UNITS | TEST CONDITIONS |
|-----------|--|--------|------|--------|--------|---------------|--|
| | | MIN | MAX | MIN | MAX | | |
| g_{iss} | Common-Source Input Conductance | | 100 | | 1000 | μS | $V_{DS} = 15\text{V}, V_{GS} = 0$ (Note 1) |
| b_{iss} | Common-Source Input Susceptance | | 2500 | | 10,000 | | |
| g_{oss} | Common-Source Output Conductance | | 75 | | 100 | | |
| b_{oss} | Common-Source Output Susceptance | | 1000 | | 4000 | | |
| g_{fs} | Common-Source Forward Transconductance | | | 4000 | | | |
| G_{ps} | Common-Source Power Gain | 18 | | 10 | | dB | $V_{DS} = 15\text{V}, I_D = 5\text{mA}$ (Note 1) |
| NF | Noise Figure (Note 1) | | 2 | | 4 | | $V_{DS} = 15\text{V}, I_D = 5\text{mA}, R_G = 1\text{k}\Omega$ |

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