

# NT SERIES DIE N-Channel JFETs

T-31-25

The NT Series are n-channel JFETs designed to provide ultra-high input impedance. The series features  $I_{GSS}$  of  $-0.2$  pA typical. These devices, therefore, make perfect choices for use as sensitive front-end amplifiers in applications such as microphones, smoke detectors, and precision test equipment. Die are supplied with 100% visual sort to the criteria of MIL-STD-750C, Method 2072.

| NT1CHP*                                                           | NT2CHP*            | NT3CHP*            |
|-------------------------------------------------------------------|--------------------|--------------------|
| 2N4117A<br>PN4117A                                                | 2N4118A<br>PN4118A | 2N4119A<br>PN4119A |
| *Meets or exceeds specification for all part numbers listed below |                    |                    |

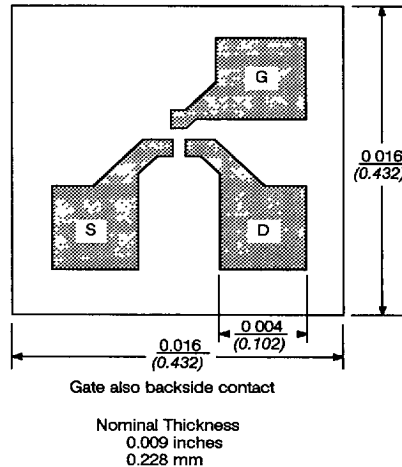
For additional design information please consult the typical performance curves NT.

## DESIGNED FOR:

- Ultra-High Input Impedance Amplifier Electrometers:
  - Infrared Detectors
  - Smoke Detectors
  - pH Meters

## FEATURES

- Low Power
- High Input Impedance  
 $I_G < 1$  pA (2N4117A)



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## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS              | SYMBOL         | LIMITS     | UNITS            |
|-----------------------------------------|----------------|------------|------------------|
| Gate-Drain Voltage                      | $V_{GD}$       | -40        | V                |
| Gate-Source Voltage                     | $V_{GS}$       | -40        |                  |
| Gate Current                            | $I_G$          | 50         | mA               |
| Operating and Storage Temperature Range | $T_J, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

## NT SERIES DIE



| SPECIFICATIONS <sup>a</sup>                |                      |                                                            | LIMITS           |        |      |        |      |        |     |            |
|--------------------------------------------|----------------------|------------------------------------------------------------|------------------|--------|------|--------|------|--------|-----|------------|
| PARAMETER                                  | SYMBOL               | TEST CONDITIONS                                            | TYP <sup>b</sup> | NT1CHP |      | NT2CHP |      | NT3CHP |     | UNIT       |
|                                            |                      |                                                            |                  | MIN    | MAX  | MIN    | MAX  | MIN    | MAX |            |
| STATIC                                     |                      |                                                            |                  |        |      |        |      |        |     |            |
| Gate-Source Breakdown Voltage              | V <sub>(BR)GSS</sub> | I <sub>G</sub> = -1 μA , V <sub>DS</sub> = 0 V             | -70              | -40    |      | -40    |      | -40    |     | V          |
| Gate-Source Cutoff Voltage                 | V <sub>GS(OFF)</sub> | V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 nA              |                  | -0.6   | -1.8 | -1     | -3   | -2     | -6  |            |
| Saturation Drain Current <sup>c</sup>      | I <sub>DSS</sub>     | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V              |                  | 0.03   | 0.09 | 0.08   | 0.24 | 0.2    | 0.6 | mA         |
| Drain Reverse Current                      | I <sub>GSS</sub>     | V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0 V             | -0.2             |        |      |        |      |        |     | pA         |
|                                            |                      | T <sub>A</sub> = 150°C                                     | -0.4             |        |      |        |      |        |     | nA         |
| Gate Operating Current                     | I <sub>G</sub>       | V <sub>DG</sub> = 15 V, I <sub>D</sub> = 30 μA             | -0.2             |        |      |        |      |        |     | pA         |
| Drain Cutoff Current                       | I <sub>D(OFF)</sub>  | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = -8 V             | 0.2              |        |      |        |      |        |     |            |
| Gate-Source Forward Voltage                | V <sub>GS(F)</sub>   | I <sub>G</sub> = 1 mA , V <sub>DS</sub> = 0 V              | 0.7              |        |      |        |      |        |     | V          |
| DYNAMIC                                    |                      |                                                            |                  |        |      |        |      |        |     |            |
| Common-Source Forward Transconductance     | g <sub>fs</sub>      | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V<br>f = 1 kHz | 150              |        |      |        |      |        |     | μS         |
| Common-Source Output Conductance           | g <sub>os</sub>      |                                                            | 1.5              |        |      |        |      |        |     |            |
| Common-Source Input Capacitance            | C <sub>iss</sub>     | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V<br>f = 1 MHz | 1.2              |        |      |        |      |        |     | pF         |
| Common-Source Reverse Transfer Capacitance | C <sub>rss</sub>     |                                                            | 0.3              |        |      |        |      |        |     |            |
| Equivalent Input Noise Voltage             | e <sub>n</sub>       | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V<br>f = 1 kHz | 15               |        |      |        |      |        |     | nV/<br>√Hz |

## NOTES:

a.  $T_A = 25^\circ C$  unless otherwise noted.

b. For design aid only, not subject to production testing.

c. Pulse test;  $PW = 300 \mu s$ , duty cycle  $\leq 3\%$ .