# 2N4867 SERIES

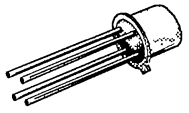
N-Channel JFETs

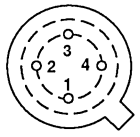
The 2N4867 Series of n-channel JFETs is designed for sensitive amplifier stages at low to mid frequencies. For applications requiring the lowest possible noise, the 2N4867A Series features $\bar{e}_n$ of 10 nV/$\sqrt{Hz}$ @ 10 Hz. Additionally, this series features low cut-off voltages to accommodate low-level power supplies and low leakage for improved system accuracy. Specifically the 2N4867 and 2N4868 are ideal for low current, low battery operation. With 1 dB max. noise figure at 1 kHz, system sensitivity will be excellent. Finally, the 2N4867 Series' TO-72 package is hermetically sealed and suitable for military processing. (See Section 1.)

For further design information please consult the typical performance curves NPA which are located in Section 7.

| PART NUMBER | $V_{GS(OFF)}$ MAX (V) | $V_{(BR)GSS}$ MIN (V) | $g_{fs}$ MIN (mS) | $I_{DSS}$ MAX (mA) |
|---|---|---|---|---|
| 2N4867 | -2 | -40 | 0.7 | 1.2 |
| 2N4868 | -3 | -40 | 1 | 3 |
| 2N4869 | -5 | -40 | 1.3 | 7.5 |
| 2N4867A | -2 | -40 | 0.7 | 1.2 |
| 2N4868A | -3 | -40 | 1 | 3 |
| 2N4869A | -5 | -40 | 1.3 | 7.5 |

TO-72 BOTTOM VIEW






1 SOURCE
2 DRAIN
3 GATE
4 CASE

## SIMILAR PRODUCTS

- TO-18, See 2N4338 Series
- TO-92, See J201 Series
- SOT-23, See SST201 Series
- Chips, Order 2N486XCHP

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted)

| PARAMETERS/TEST CONDITIONS | SYMBOL | LIMIT | UNITS |
|---|---|---|---|
| Gate-Drain Voltage | $V_{GD}$ | -40 | V |
| Gate-Source Voltage | $V_{GS}$ | -40 | |
| Gate Current | $I_G$ | 50 | mA |
| Power Dissipation | $P_D$ | 300 | mW |
| Power Derating | | 1.7 | mW/°C |
| Operating Junction Temperature | $T_J$ | -55 to 150 | °C |
| Storage Temperature | $T_{stg}$ | -65 to 200 | |
| Lead Temperature (1/16" from case for 10 seconds) | $T_L$ | 300 | |

Siliconix incorporated

| ELECTRICAL CHARACTERISTICS[1] | | | | LIMITS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2N4867 | | 2N4868 | | 2N4869 | | |
| PARAMETER | SYMBOL | TEST CONDITIONS | | TYP[2] | MIN | MAX | MIN | MAX | MIN | MAX | UNIT |
| **STATIC** | | | | | | | | | | | |
| Gate-Source Breakdown Voltage | $V_{(BR)GSS}$ | $I_G$ = -1 µA, $V_{DS}$ = 0 V | | -57 | -40 | | -40 | | -40 | | V |
| Gate-Source Cutoff Voltage | $V_{GS(OFF)}$ | $V_{DS}$ = 20 V, $I_D$ = 1 µA | | | -0.7 | -2 | -1 | -3 | -1.8 | -5 | |
| Saturation Drain Current[3] | $I_{DSS}$ | $V_{DS}$ = 20 V, $V_{GS}$ = 0 V | | | 0.4 | 1.2 | 1 | 3 | 2.5 | 7.5 | mA |
| Gate Reverse Current | $I_{GSS}$ | $V_{GS}$ = -30 V, $V_{DS}$ = 0 V | | -2 | | -250 | | -250 | | -250 | pA |
| | | | $T_A$ = 150°C | -4 | | -250 | | -250 | | -250 | nA |
| Gate Operating Current[4] | $I_G$ | $V_{DG}$ = 15 V, $I_D$ = 0.1 mA | | -2 | | | | | | | pA |
| Drain Cutoff Current[4] | $I_{D(OFF)}$ | $V_{DS}$ = 15 V, $V_{GS}$ = -6 V | | 2 | | | | | | | |
| Gate-Source Forward Voltage[4] | $V_{GS(F)}$ | $I_G$ = 1 mA, $V_{DS}$ = 0 V | | 0.7 | | | | | | | V |
| **DYNAMIC** | | | | | | | | | | | |
| Common-Source Forward Transconductance | $g_{fs}$ | $V_{DS}$ = 20 V, $V_{GS}$ = 0 V, f = 1 kHz | | | 0.7 | 2 | 1 | 3 | 1.3 | 4 | mS |
| Common-Source Output Conductance | $g_{os}$ | | | | | 1.5 | | 4 | | 10 | µS |
| Common-Source Input Capacitance | $C_{iss}$ | $V_{DS}$ = 20 V, $V_{GS}$ = 0 V, f = 1 MHz | | 4.5 | | 25 | | 25 | | 25 | pF |
| Common-Source Reverse Transfer Capacitance | $C_{rss}$ | | | 1.3 | | 5 | | 5 | | 5 | |
| Equivalent Input Noise Voltage | $\bar{e}_n$ | $V_{DS}$ = 10 V, $V_{GS}$ = 0 V | f = 10 Hz | 14 | | 20 | | 20 | | 20 | $nV/\sqrt{Hz}$ |
| | | | f = 1 kHz | 6 | | 10 | | 10 | | 10 | |
| Noise Figure | NF | $V_{DS}$ = 10 V, $V_{GS}$ = 0 V, f = 1 kHz, $R_G$ = 20 kΩ | | 0.5 | | 1 | | 1 | | 1 | dB |

NOTES:
1. $T_A$ = 25 °C unless otherwise noted.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = 300 µs, duty cycle ≤ 3%.
4. This parameter not registered with JEDEC.

| ELECTRICAL CHARACTERISTICS[1] | | | | LIMITS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2N4867A | | 2N4868A | | 2N4869A | | |
| PARAMETER | SYMBOL | TEST CONDITIONS | TYP[2] | MIN | MAX | MIN | MAX | MIN | MAX | UNIT |
| **STATIC** | | | | | | | | | | |
| Gate-Source Breakdown Voltage | $V_{(BR)GSS}$ | $I_G$ = -1 µA, $V_{DS}$ = 0 V | -57 | -40 | | -40 | | -40 | | V |
| Gate-Source Cutoff Voltage | $V_{GS(OFF)}$ | $V_{DS}$ = 20 V, $I_D$ = 1 µA | | -0.7 | -2 | -1 | -3 | -1.8 | -5 | V |
| Saturation Drain Current[3] | $I_{DSS}$ | $V_{DS}$ = 20 V, $V_{GS}$ = 0 V | | 0.4 | 1.2 | 1 | 3 | 2.5 | 7.5 | mA |
| Gate Reverse Current | $I_{GSS}$ | $V_{GS}$ = -30 V, $V_{DS}$ = 0 V | -2 | | -250 | | -250 | | -250 | pA |
| | | $T_A$ = 150°C | -4 | | -250 | | -250 | | -250 | nA |
| Gate Operating Current[4] | $I_G$ | $V_{DG}$ = 15 V, $I_D$ = 0.1 mA | -2 | | | | | | | pA |
| Drain Cutoff Current[4] | $I_{D(OFF)}$ | $V_{DS}$ = 15 V, $V_{GS}$ = -6 V | 2 | | | | | | | pA |
| Gate-Source Forward Voltage[4] | $V_{GS(F)}$ | $I_G$ = 1 mA, $V_{DS}$ = 0 V | 0.7 | | | | | | | V |
| **DYNAMIC** | | | | | | | | | | |
| Common-Source Forward Transconductance | $g_{fs}$ | $V_{DS}$ = 20 V, $V_{GS}$ = 0 V, f = 1 kHz | | 0.7 | 2 | 1 | 3 | 1.3 | 4 | mS |
| Common-Source Output Conductance | $g_{os}$ | | | | 1.5 | | 4 | | 10 | µS |
| Common-Source Input Capacitance | $C_{iss}$ | $V_{DS}$ = 20 V, $V_{GS}$ = 0 V, f = 1 MHz | 4.5 | | 25 | | 25 | | 25 | pF |
| Common-Source Reverse Transfer Capacitance | $C_{rss}$ | | 1.3 | | 5 | | 5 | | 5 | pF |
| Equivalent Input Noise Voltage | $\bar{e}_n$ | $V_{DS}$ = 10 V, $V_{GS}$ = 0 V, f = 10 Hz | 8 | | 10 | | 10 | | 10 | $nV/\sqrt{Hz}$ |
| | | f = 1 kHz | 3.5 | | 5 | | 5 | | 5 | $nV/\sqrt{Hz}$ |
| Noise Figure | NF | $V_{DS}$ = 10 V, $V_{GS}$ = 0 V, f = 1 kHz, $R_G$ = 20 kΩ | 0.5 | | 1 | | 1 | | 1 | dB |

NOTES:
1. $T_A$ = 25 °C unless otherwise noted.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = 300 µs, duty cycle ≤ 3%.
4. This parameter not registered with JEDEC.