

## N-Channel JFET

| <b>PRODUCT SUMMARY</b> |                       |                   |                    |
|------------------------|-----------------------|-------------------|--------------------|
| $V_{GS(off)}$ (V)      | $V_{(BR)GSS}$ Min (V) | $g_{fs}$ Min (mS) | $I_{DSS}$ Min (mA) |
| $\leq -8$              | -25                   | 2                 | 2                  |

### FEATURES

- Excellent High-Frequency Gain:  
Gps 11 dB @ 400 MHz
- Very Low Noise: 3 dB @ 400 MHz
- Very Low Distortion
- High ac/dc Switch Off-Isolation
- High Gain:  $A_V = 60$  @ 100  $\mu$ A

### BENEFITS

- Wideband High Gain
- Very High System Sensitivity
- High Quality of Amplification
- High-Speed Switching Capability
- High Low-Level Signal Amplification

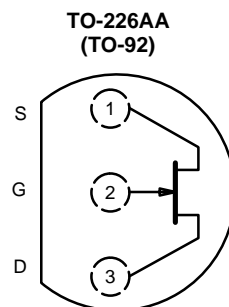
### APPLICATIONS

- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

### DESCRIPTION

The 2N3819 is a low-cost, all-purpose JFET which offers good performance at mid-to-high frequencies. It features low noise and leakage and guarantees high gain at 100 MHz.

Its TO-226AA (TO-92) package is compatible with various tape-and-reel options for automated assembly (see Packaging Information). For similar products in TO-206AF (TO-72) and TO-236 (SOT-23) packages, see the 2N4416/2N4416A/SST4416 data sheet.



### ABSOLUTE MAXIMUM RATINGS

|                                      |              |
|--------------------------------------|--------------|
| Gate-Source/Gate-Drain Voltage ..... | -25 V        |
| Forward Gate Current .....           | 10 mA        |
| Storage Temperature .....            | -55 to 150°C |
| Operating Junction Temperature ..... | -55 to 150°C |

|                                                          |        |
|----------------------------------------------------------|--------|
| Lead Temperature ( $1/16$ " from case for 10 sec.) ..... | 300°C  |
| Power Dissipation <sup>a</sup> .....                     | 350 mW |

Notes  
a. Derate 2.8 mW/°C above 25°C

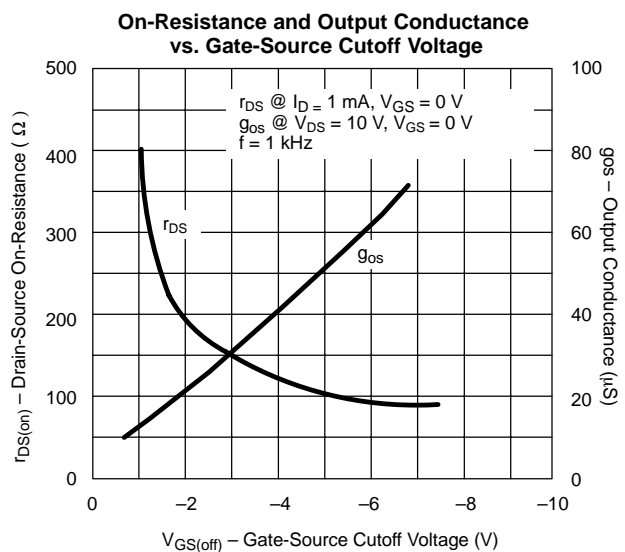
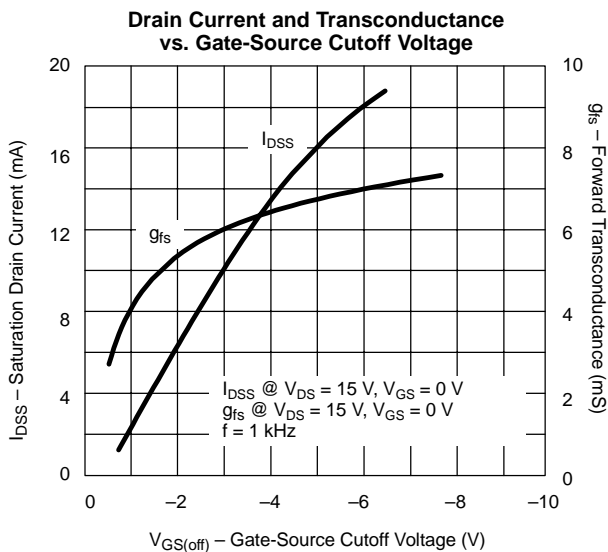
| SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED) |                      |                                                           |             |                  |      |            |    |
|----------------------------------------------------------------|----------------------|-----------------------------------------------------------|-------------|------------------|------|------------|----|
| Parameter                                                      | Symbol               | Test Conditions                                           | Limits      |                  |      | Unit       |    |
|                                                                |                      |                                                           | Min         | Typ <sup>a</sup> | Max  |            |    |
| <b>Static</b>                                                  |                      |                                                           |             |                  |      |            |    |
| Gate-Source Breakdown Voltage                                  | V <sub>(BR)GSS</sub> | I <sub>G</sub> = -1 μA, V <sub>DS</sub> = 0 V             | -25         | -35              |      | V          |    |
| Gate-Source Cutoff Voltage                                     | V <sub>GS(off)</sub> | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 2 nA             |             | -3               | -8   |            |    |
| Saturation Drain Current <sup>b</sup>                          | I <sub>DSS</sub>     | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V             | 2           | 10               | 20   | mA         |    |
| Gate Reverse Current                                           | I <sub>GSS</sub>     | V <sub>GS</sub> = -15 V, V <sub>DS</sub> = 0 V            |             | -0.002           | -2   | nA         |    |
|                                                                |                      | T <sub>A</sub> = 100 °C                                   |             | -0.002           | -2   | μA         |    |
| Gate Operating Current <sup>c</sup>                            | I <sub>G</sub>       | V <sub>DG</sub> = 10 V, I <sub>D</sub> = 1 mA             |             | -20              |      | pA         |    |
| Drain Cutoff Current                                           | I <sub>D(off)</sub>  | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = -8 V            |             | 2                |      |            |    |
| Drain-Source On-Resistance                                     | r <sub>DS(on)</sub>  | V <sub>GS</sub> = 0 V, I <sub>D</sub> = 1 mA              |             | 150              |      | Ω          |    |
| Gate-Source Voltage                                            | V <sub>GS</sub>      | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 200 μA           | -0.5        | -2.5             | -7.5 | V          |    |
| Gate-Source Forward Voltage                                    | V <sub>GS(F)</sub>   | I <sub>G</sub> = 1 mA, V <sub>DS</sub> = 0 V              |             | 0.7              |      |            |    |
| <b>Dynamic</b>                                                 |                      |                                                           |             |                  |      |            |    |
| Common-Source Forward Transconductance <sup>c</sup>            | g <sub>fs</sub>      | V <sub>DS</sub> = 15 V<br>V <sub>GS</sub> = 0 V           | f = 1 kHz   | 2                | 5.5  | 6.5        | mS |
|                                                                |                      |                                                           | f = 100 MHz | 1.6              | 5.5  |            |    |
| Common-Source Output Conductance <sup>c</sup>                  | g <sub>os</sub>      |                                                           | f = 1 kHz   |                  | 25   | 50         | μS |
| Common-Source Input Capacitance                                | C <sub>iss</sub>     | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz  |             | 2.2              | 8    | pF         |    |
| Common-Source Reverse Transfer Capacitance                     | C <sub>rss</sub>     |                                                           |             | 0.7              | 4    |            |    |
| Equivalent Input Noise Voltage <sup>c</sup>                    | $\bar{e}_n$          | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 100 Hz |             | 6                |      | nV/<br>√Hz |    |

Notes

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs, duty cycle ≤ 2%.
- c. This parameter not registered with JEDEC.

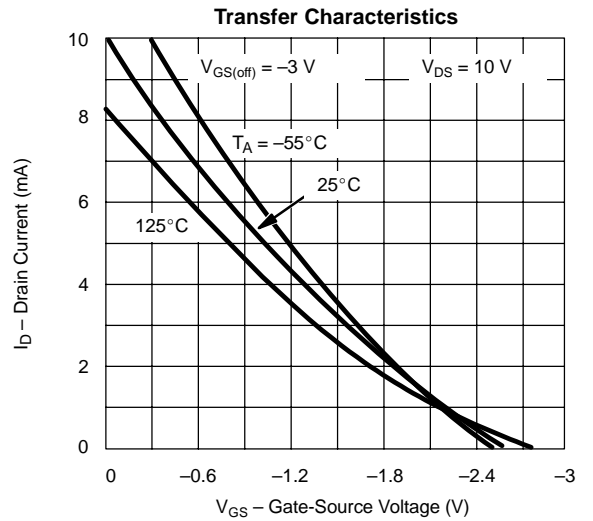
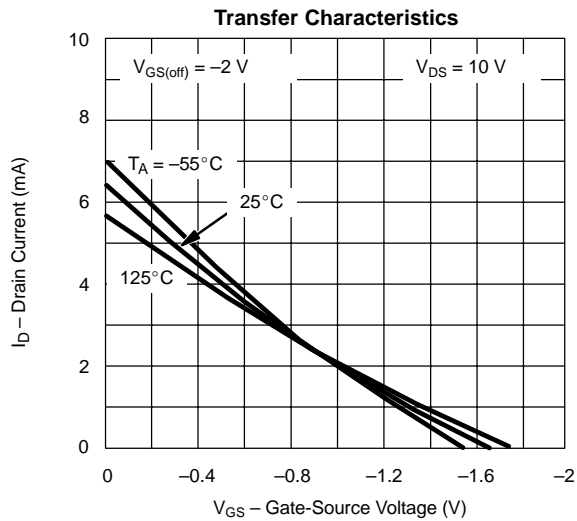
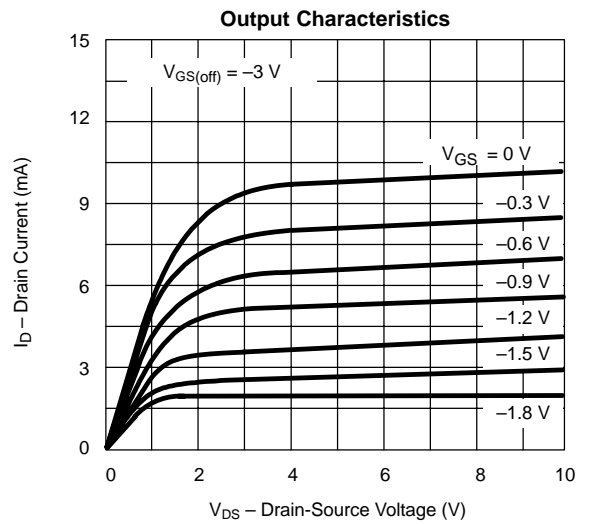
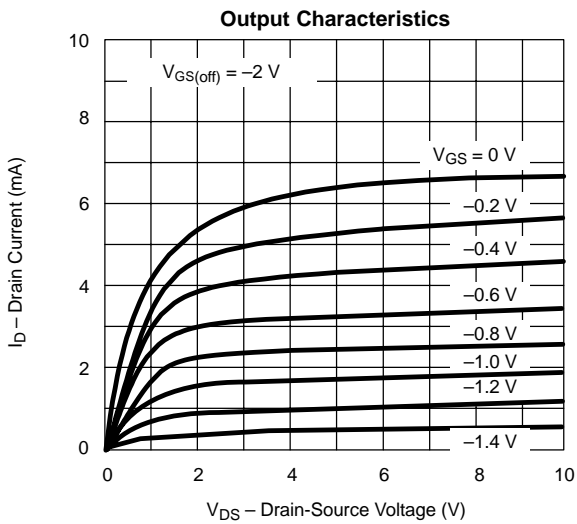
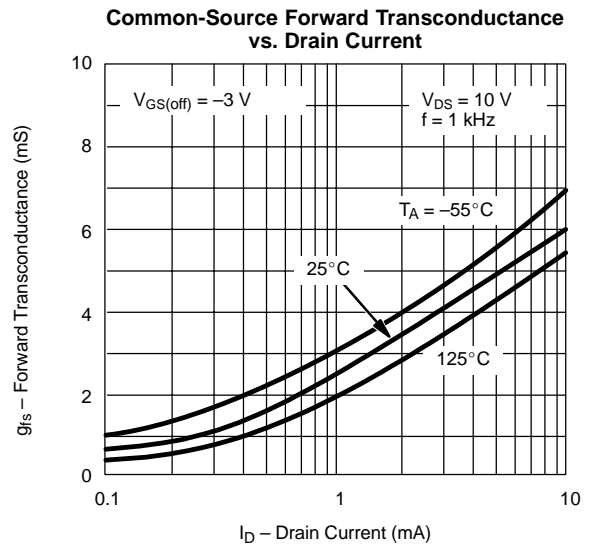
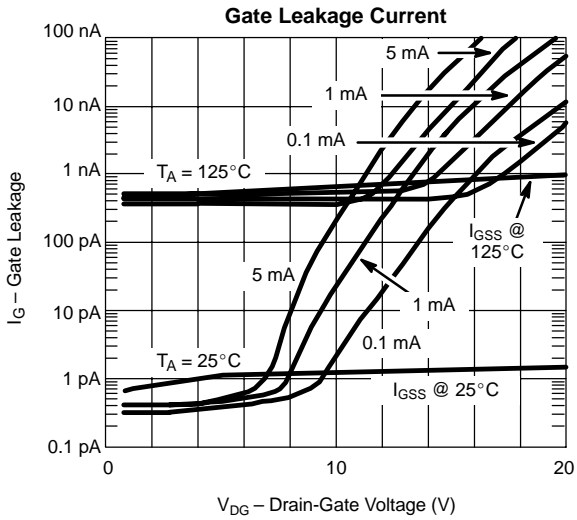
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**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)**

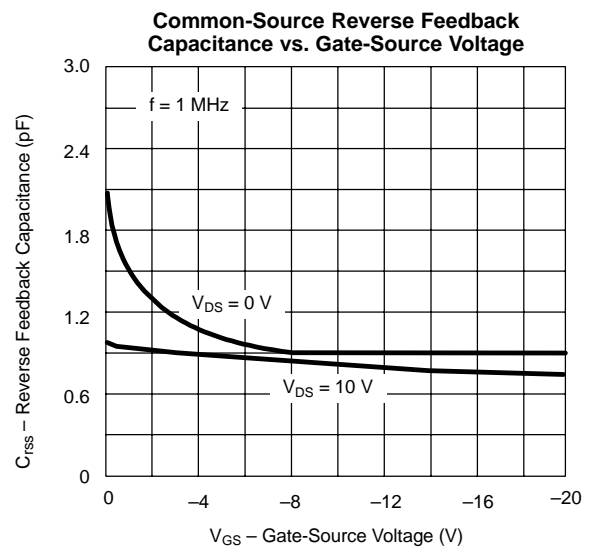
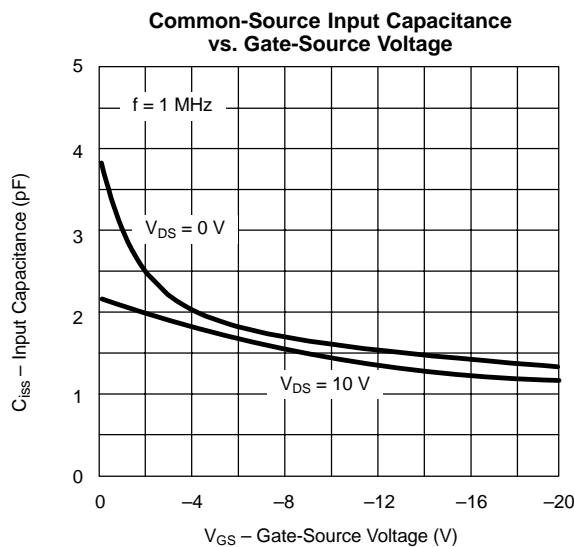
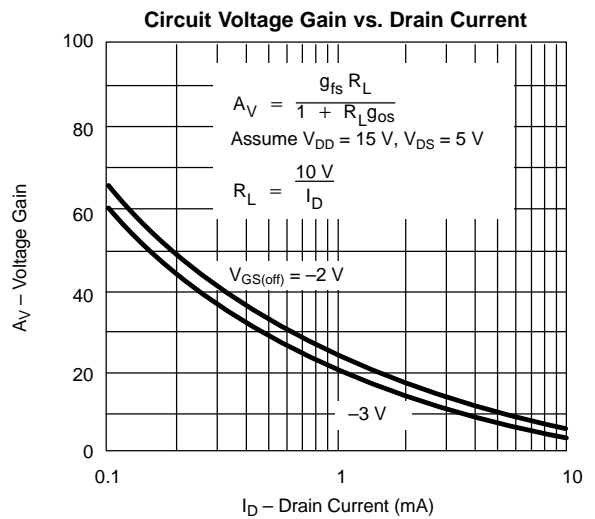
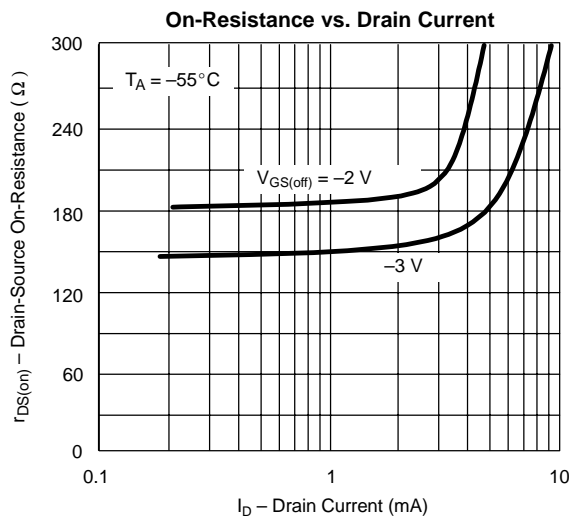
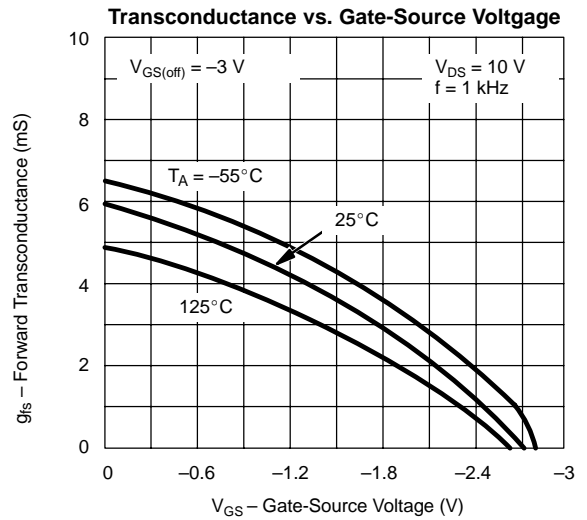
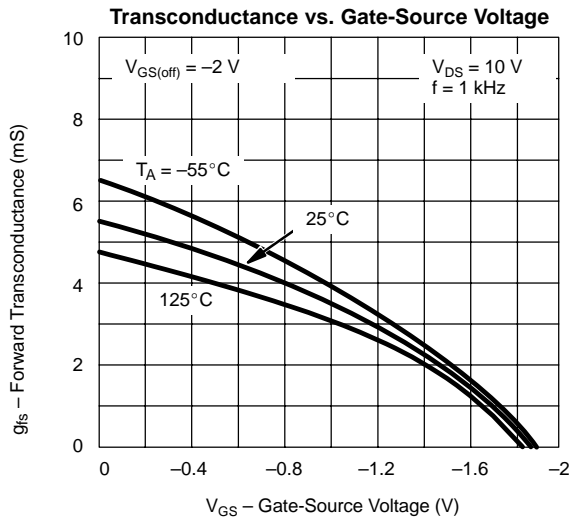




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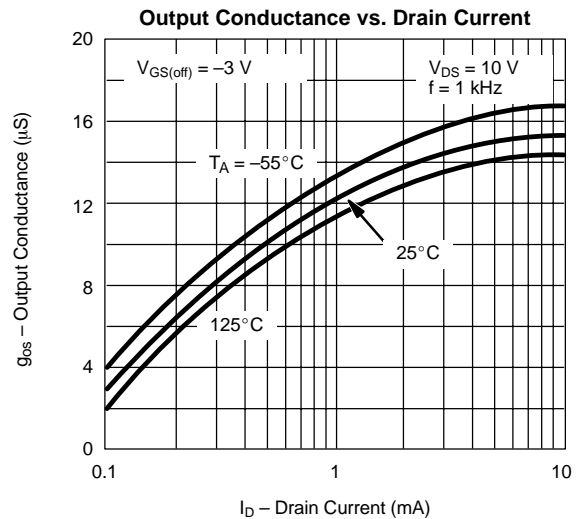
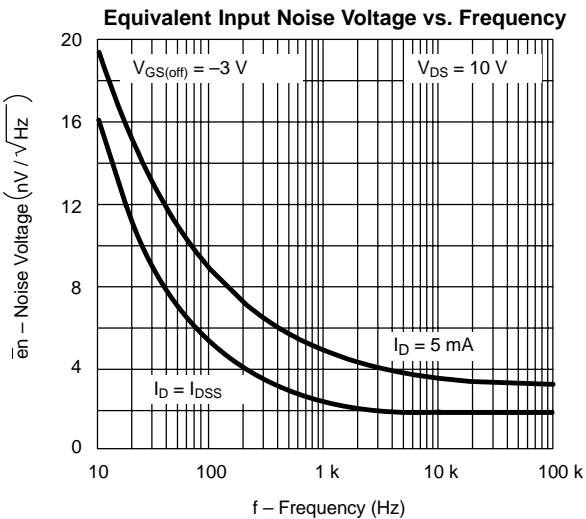
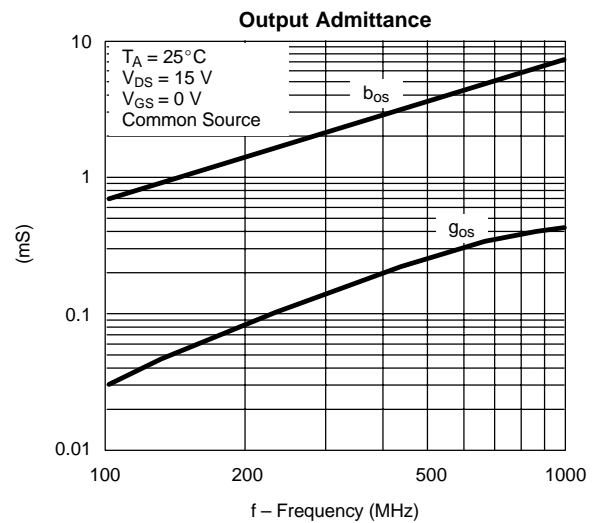
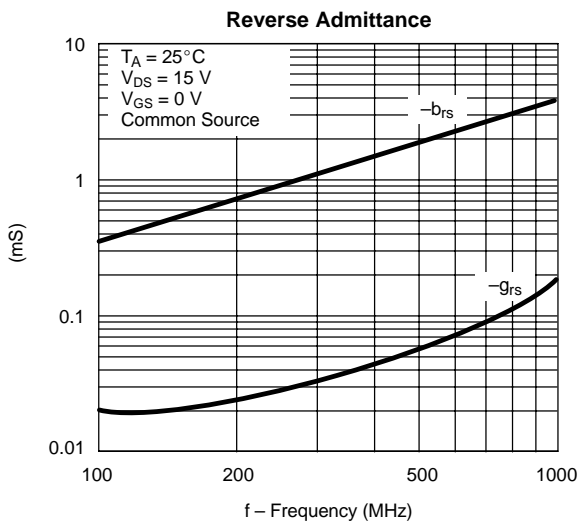
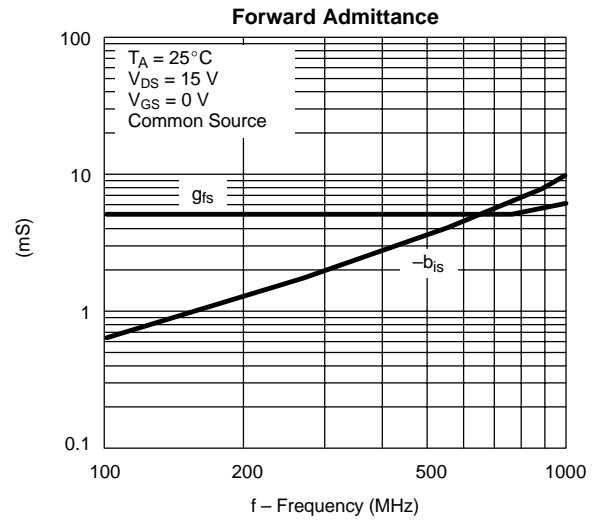
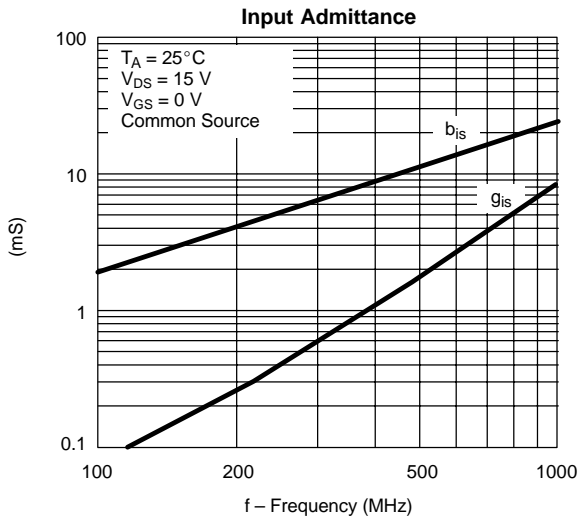


**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)**





**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**





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