

## N-Channel JFET

| PRODUCT SUMMARY   |                       |                   |                    |
|-------------------|-----------------------|-------------------|--------------------|
| $V_{GS(off)}$ (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

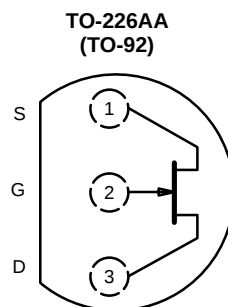
### APPLICATIONS

- 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.



Top View

### 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 ( $l_{16}$ " from case for 10 sec.) | 300°C  |
| Power Dissipation <sup>a</sup>                       | 350 mW |

#### Notes

a. Derate 2.8 mW/°C above 25°C

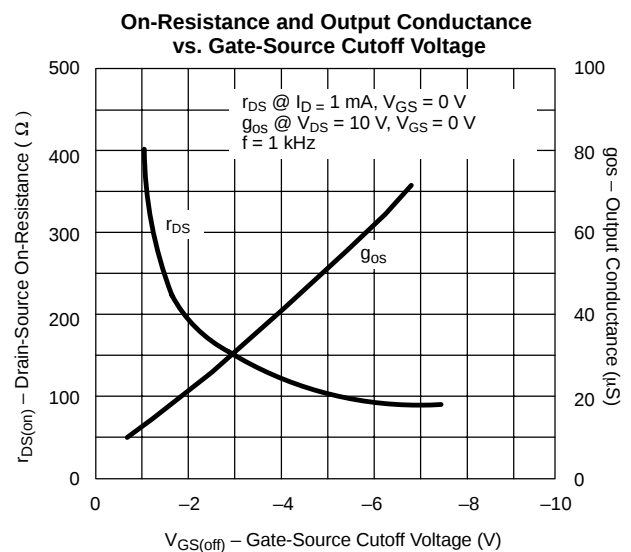
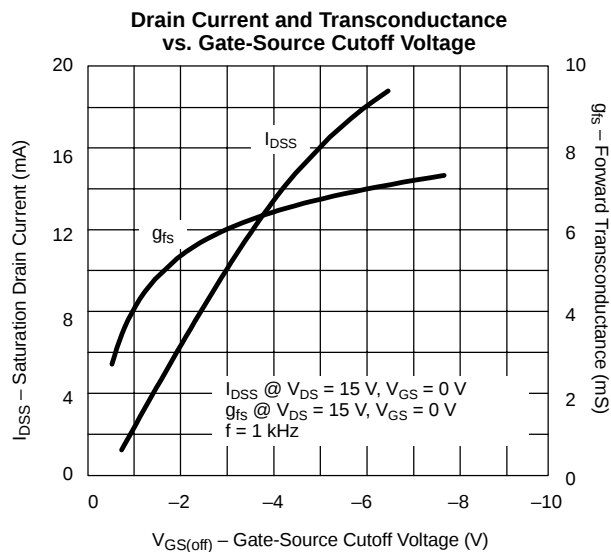
**SPECIFICATIONS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

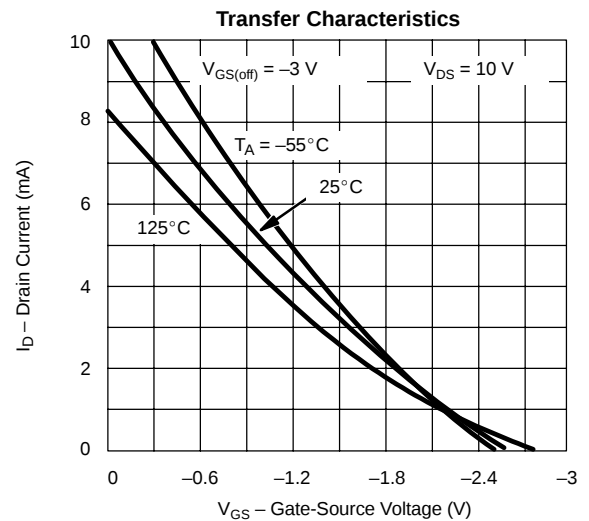
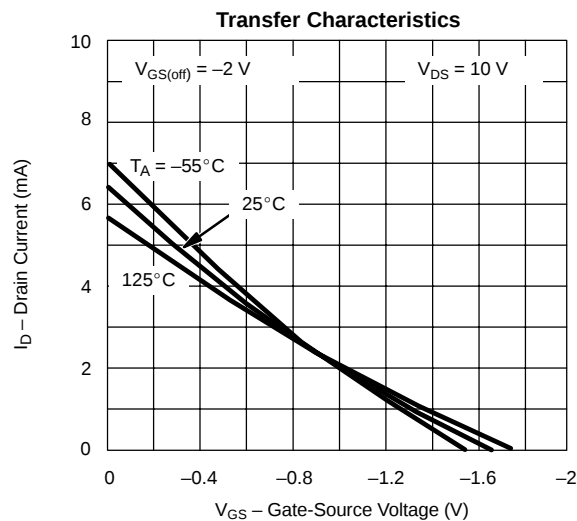
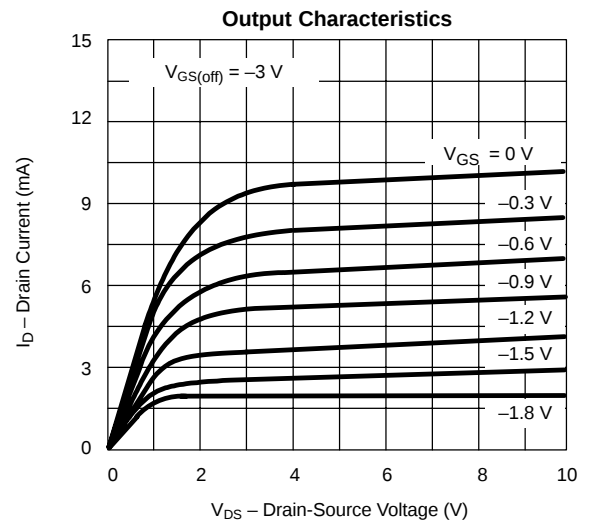
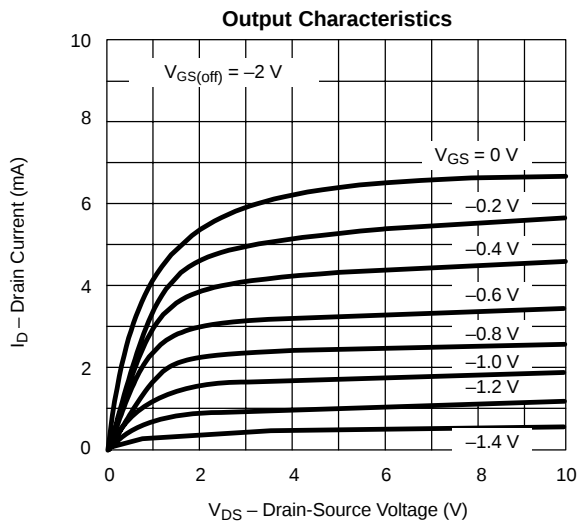
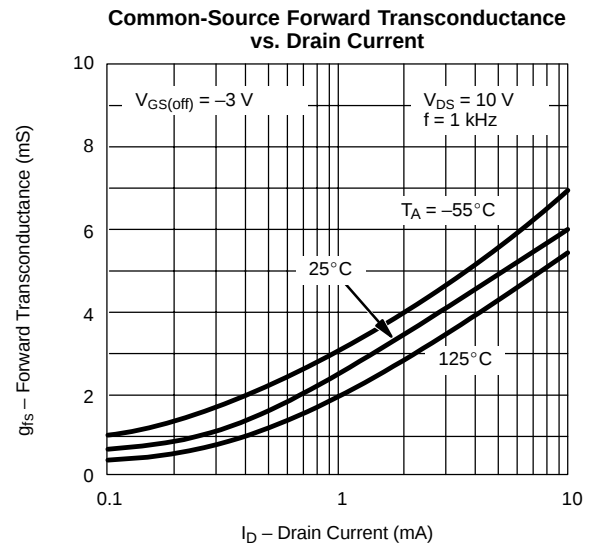
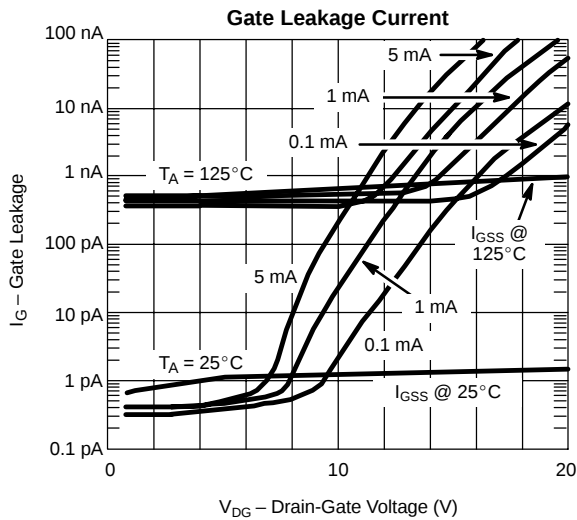
| Parameter                                           | Symbol               | Test Conditions                                           | Limits      |                  |      | Unit       |    |
|-----------------------------------------------------|----------------------|-----------------------------------------------------------|-------------|------------------|------|------------|----|
|                                                     |                      |                                                           | Min         | Typ <sup>a</sup> | Max  |            |    |
| Static                                              |                      |                                                           |             |                  |      |            |    |
| 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              |      |            |    |
| Dynamic                                             |                      |                                                           |             |                  |      |            |    |
| 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  |            |    |
|                                                     |                      |                                                           |             | f = 1 kHz        |      | 25         | 50 |
| Common-Source Output Conductance <sup>c</sup>       | g <sub>os</sub>      | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz  |             | 2.2              | 8    | pF         |    |
| Common-Source Input Capacitance                     | C <sub>iss</sub>     |                                                           |             | 0.7              | 4    |            |    |
| Common-Source Reverse Transfer Capacitance          | C <sub>rss</sub>     |                                                           |             |                  |      |            |    |
| Equivalent Input Noise Voltage <sup>c</sup>         | e <sub>n</sub>       | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 100 Hz |             | 6                |      | nV/<br>√Hz |    |

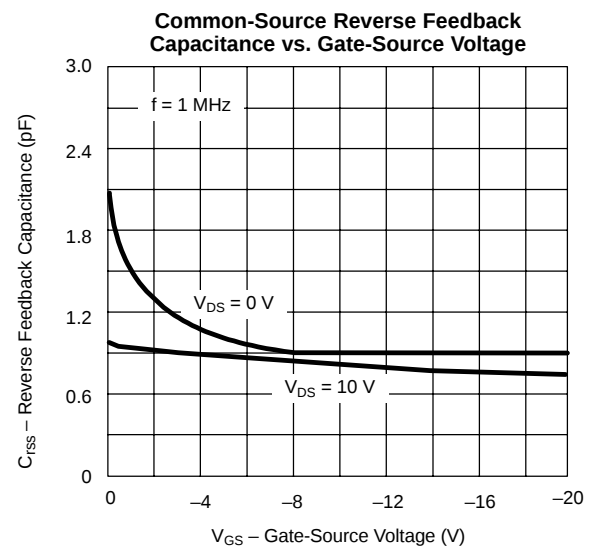
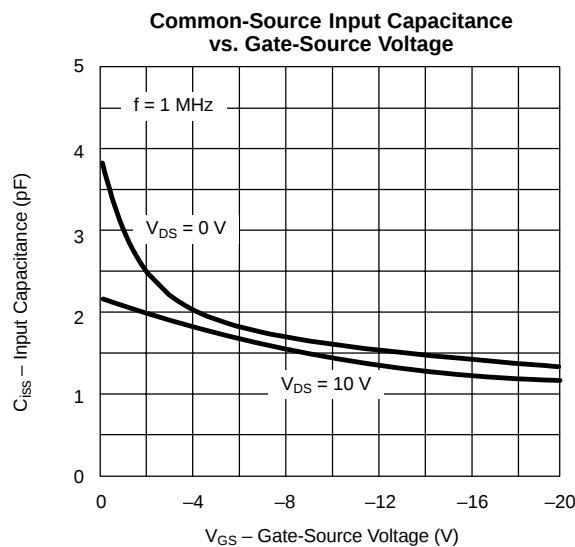
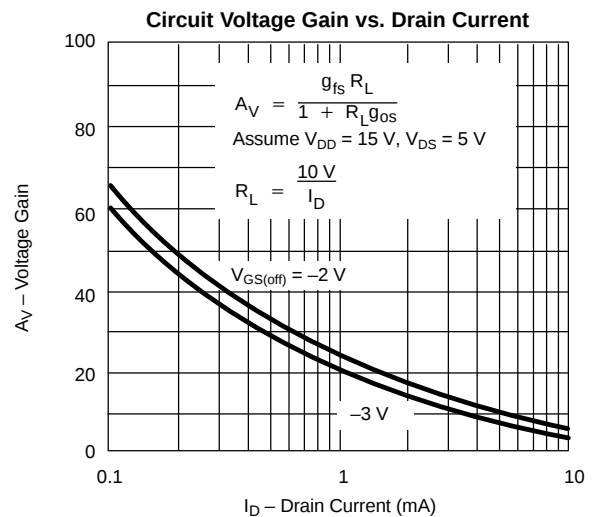
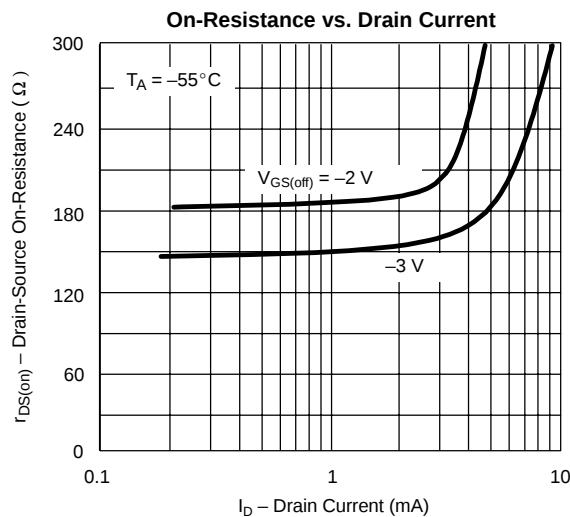
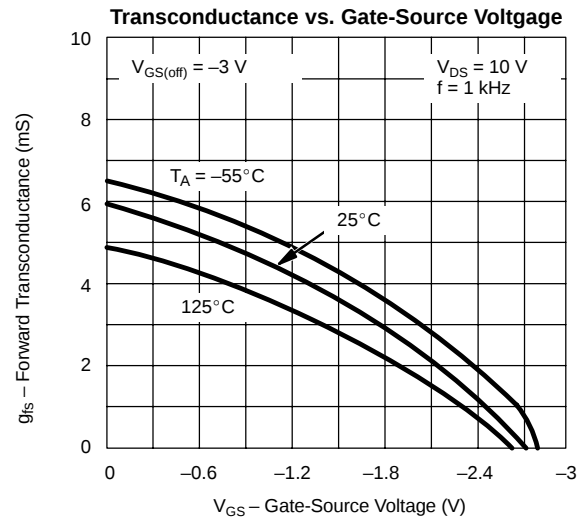
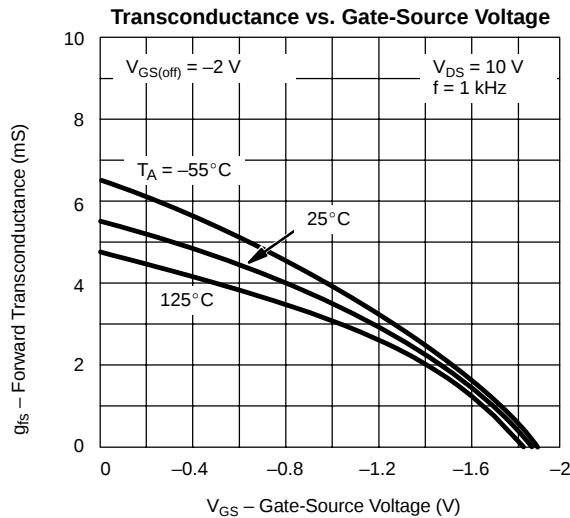
## Notes

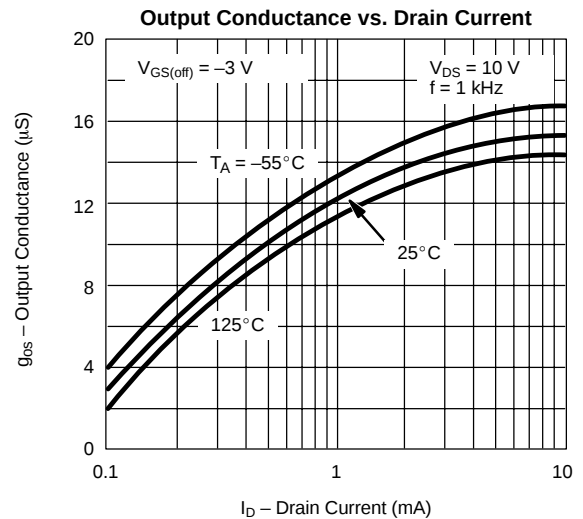
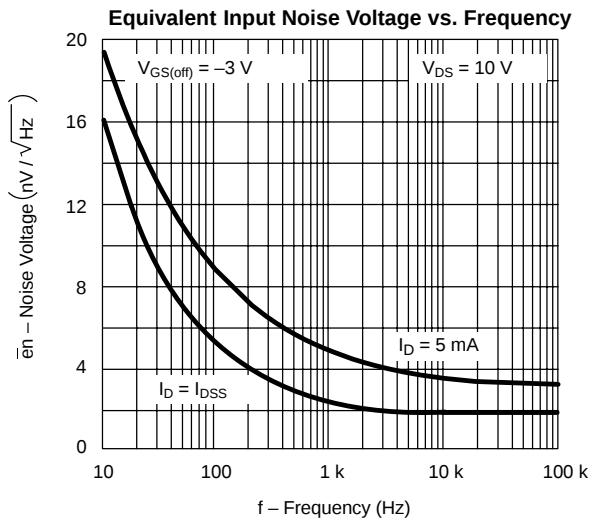
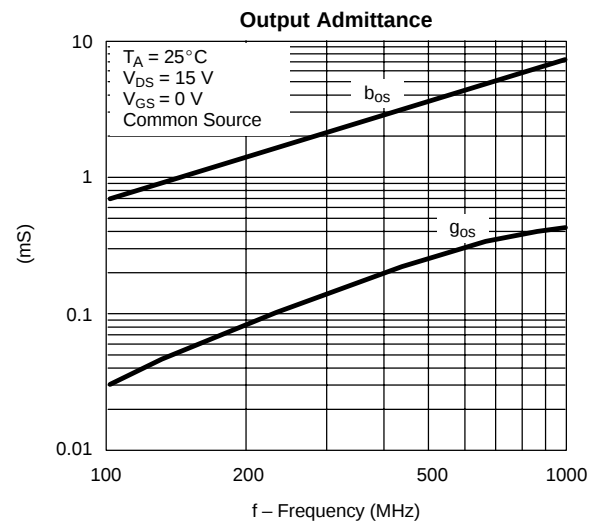
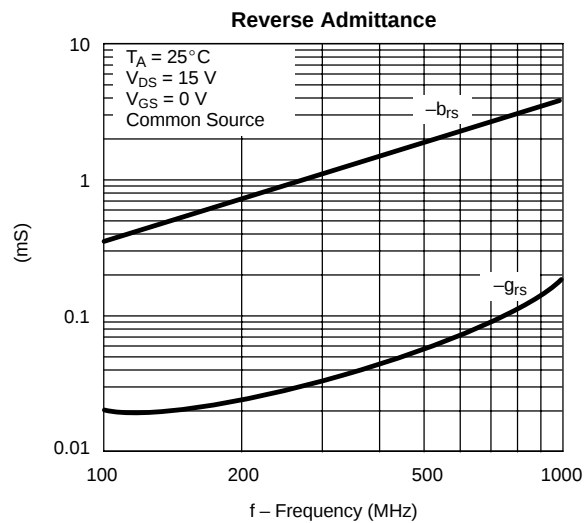
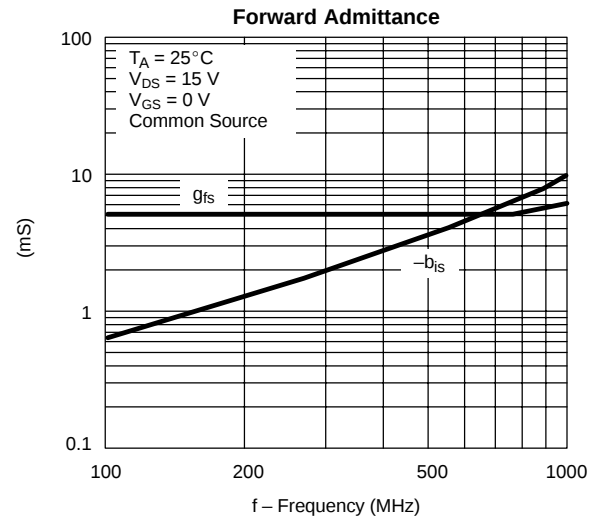
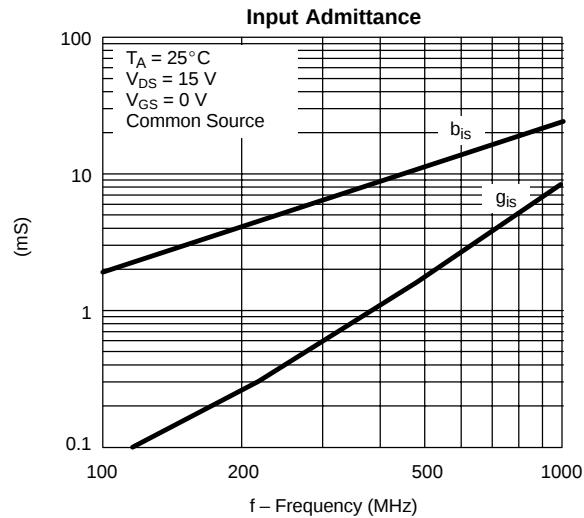
- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.  
b. Pulse test:  $PW \leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .  
c. This parameter not registered with JEDEC.

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

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