

N-Channel JFETs

| | | |
|-------------|---------------|-------------|
| J308 | SST308 | U309 |
| J309 | SST309 | U310 |
| J310 | SST310 | |

| PRODUCT SUMMARY | | | | |
|------------------------|-------------------|-----------------------|-------------------|--------------------|
| Part Number | $V_{GS(off)}$ (V) | $V_{(BR)GSS}$ Min (V) | g_{fs} Min (mS) | I_{DSS} Min (mA) |
| J308 | -1 to -6.5 | -25 | 8 | 12 |
| J309 | -1 to -4 | -25 | 10 | 12 |
| J310 | -2 to -6.5 | -25 | 8 | 24 |
| SST308 | -1 to -6.5 | -25 | 8 | 12 |
| SST309 | -1 to -4 | -25 | 10 | 12 |
| SST310 | -2 to -6.5 | -25 | 8 | 24 |
| U309 | -1 to -4 | -25 | 10 | 12 |
| U310 | -2.5 to -6 | -25 | 10 | 24 |

FEATURES

- Excellent High Frequency Gain: Gps 11.5 dB @ 450 MHz
- Very Low Noise: 2.7 dB @ 450 MHz
- Very Low Distortion
- High ac/dc Switch Off-Isolation

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

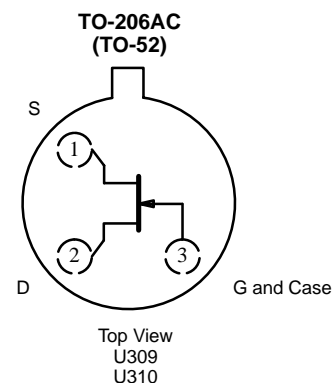
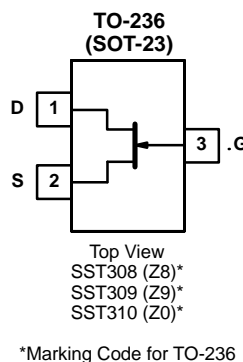
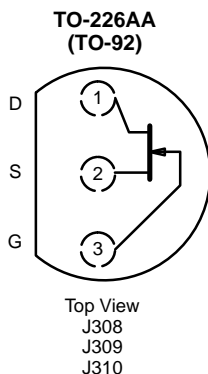
DESCRIPTION

The J/SST/U308 series offers superb amplification characteristics. Of special interest is its high-frequency performance. Even at 450 MHz, this series offers high power gain at low noise.

Low-cost J series TO-226AA (TO-92) packaging supports automated assembly with tape-and-reel options. The SST series TO-236 (SOT-23) package provides surface-mount capabilities

and is available with tape-and-reel options. The U series hermetically-sealed TO-206AC (TO-52) package supports full military processing. (See Military and Packaging Information for further details.)

For similar dual products packaged in the TO-78, see the U430/431 data sheet.



For applications information see AN104.

ABSOLUTE MAXIMUM RATINGS

| | | |
|--|------------------------|--------------|
| Gate-Drain, Gate-Source Voltage | | -25 V |
| Gate Current : | (J/SST Prefixes) | 10 mA |
| | (U Prefix) | 20 mA |
| Lead Temperature (1/16" from case for 10 sec.) | | 300°C |
| Storage Temperature : | (J/SST Prefixes) | -55 to 150°C |
| | (U Prefix) | -65 to 175°C |

| | | |
|--------------------------------|-------------------------------------|--------------|
| Operating Junction Temperature | | -55 to 150°C |
| Power Dissipation : | (J/SST Prefixes) ^a | 350 mW |
| | (U Prefix) ^b | 500 mW |

Notes

- a. Derate 2.8 mW/°C above 25°C
- b. Derate 4 mW/°C above 25°C

| SPECIFICATIONS FOR J/SST308, J/SST309 AND J/SST310 (T _A = 25°C UNLESS NOTED) | | | | | | | | | | | |
|---|----------------------|--|------------------|----------|------|----------|-----|----------|------|------------|---|
| Parameter | Symbol | Test Conditions | Typ ^a | Limits | | | | | | Unit | |
| | | | | J/SST308 | | J/SST309 | | J/SST310 | | | |
| | | | | Min | Max | Min | Max | Min | Max | | |
| Static | | | | | | | | | | | |
| Gate-Source Breakdown Voltage | V _{(BR)GSS} | I _G = -1 μA, V _{DS} = 0 V | -35 | -25 | | -25 | | -25 | | V | |
| Gate-Source Cutoff Voltage | V _{GS(off)} | V _{DS} = 10 V, I _D = 1 nA | | -1 | -6.5 | -1 | -4 | -2 | -6.5 | V | |
| Saturation Drain Current ^b | I _{DSS} | V _{DS} = 10 V, V _{GS} = 0 V | | 12 | 60 | 12 | 30 | 24 | 60 | mA | |
| Gate Reverse Current | I _{GSS} | V _{GS} = -15 V, V _{DS} = 0 V | -0.002 | | -1 | | -1 | | -1 | nA | |
| | | T _A = 125°C | -0.001 | | -1 | | -1 | | -1 | μA | |
| Gate Operating Current | I _G | V _{DG} = 9 V, I _D = 10 mA | -15 | | | | | | | pA | |
| Drain-Source On-Resistance | r _{DS(on)} | V _{GS} = 0 V, I _D = 1 mA | 35 | | | | | | | Ω | |
| Gate-Source Forward Voltage | V _{GS(F)} | I _G = 10 mA V _{DS} = 0 V | J | 0.7 | | 1 | | 1 | | 1 | V |
| Dynamic | | | | | | | | | | | |
| Common-Source Forward Transconductance | g _{fs} | V _{DS} = 10 V, I _D = 10 mA f = 1 kHz | 14 | 8 | | 10 | | 8 | | mS | |
| Common-Source Output Conductance | g _{os} | | 110 | | 250 | | 250 | | 250 | μS | |
| Common-Source Input Capacitance | C _{iss} | V _{DS} = 10 V V _{GS} = -10 V f = 1 MHz | J | 4 | | 5 | | 5 | | pF | |
| Common-Source Reverse Transfer Capacitance | C _{rss} | | SST | 4 | | | | | | | |
| | | | J | 1.9 | | 2.5 | | 2.5 | | | |
| | | | SST | 1.9 | | | | | | | |
| Equivalent Input Noise Voltage | e _n | V _{DS} = 10 V, I _D = 10 mA f = 100 Hz | 6 | | | | | | | nV/ √Hz | |
| High Frequency | | | | | | | | | | | |
| Common-Gate Forward Transconductance | g _{fg} | V _{DS} = 10 V I _D = 10 mA | f = 105 MHz | 14 | | | | | | mS | |
| | | | f = 450 MHz | 13 | | | | | | | |
| Common-Gate Output Conductance | g _{og} | | f = 105 MHz | 0.16 | | | | | | | |
| | | | f = 450 MHz | 0.55 | | | | | | | |
| Common-Gate Power Gain ^c | G _{pg} | | f = 105 MHz | 16 | | | | | dB | | |
| | | | f = 450 MHz | 11.5 | | | | | | | |
| Noise Figure | NF | | f = 105 MHz | 1.5 | | | | | | | |
| | | | f = 450 MHz | 2.7 | | | | | | | |

Notes

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
- c. Gain (G_{pg}) measured at optimum input noise match.

NZB



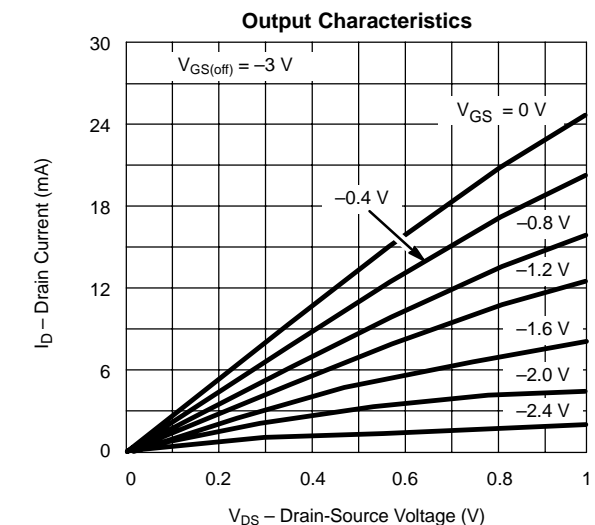
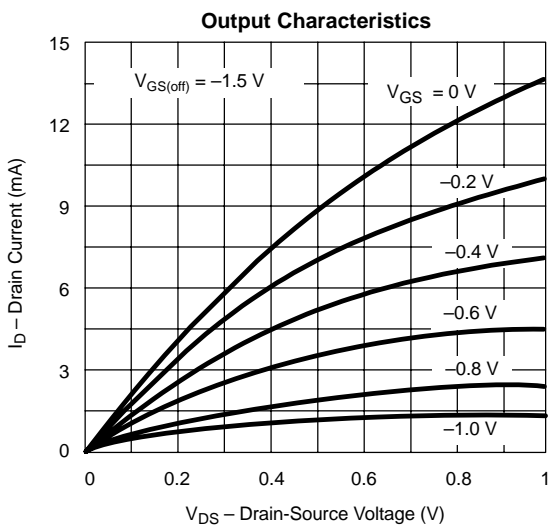
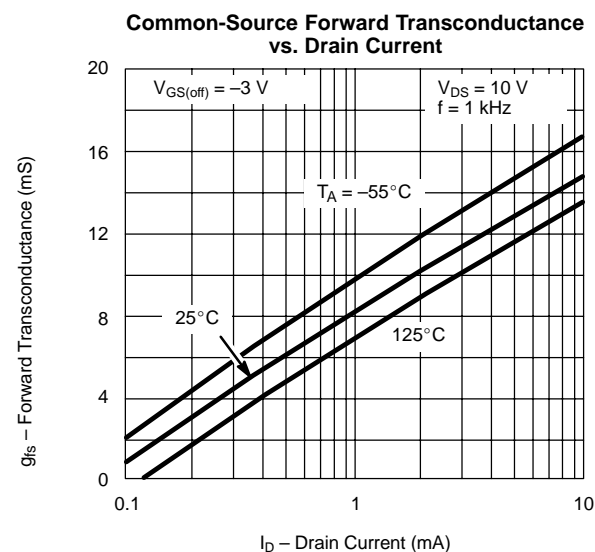
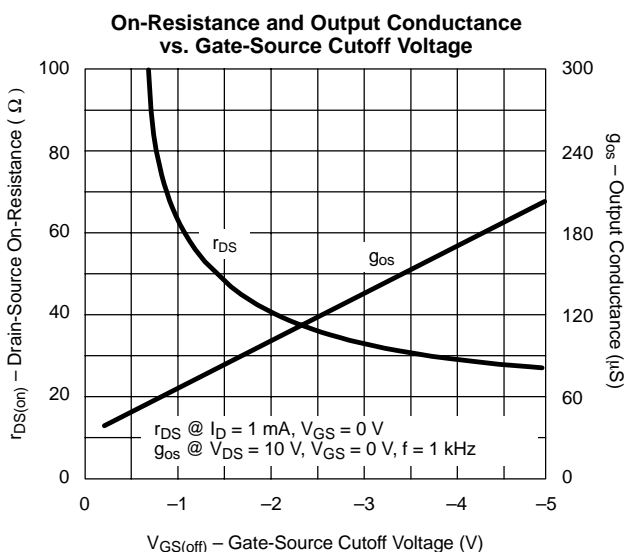
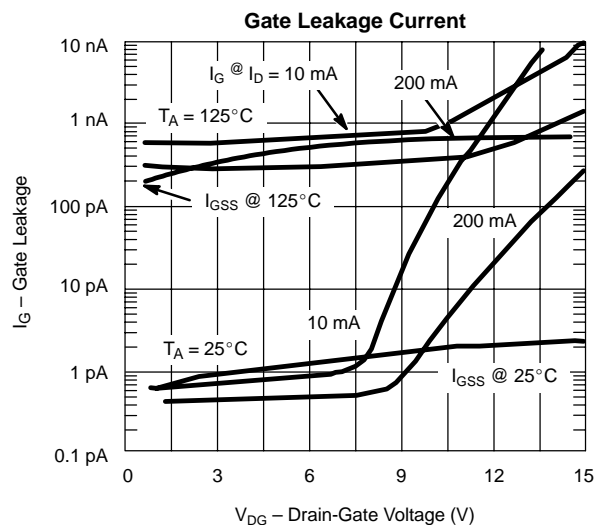
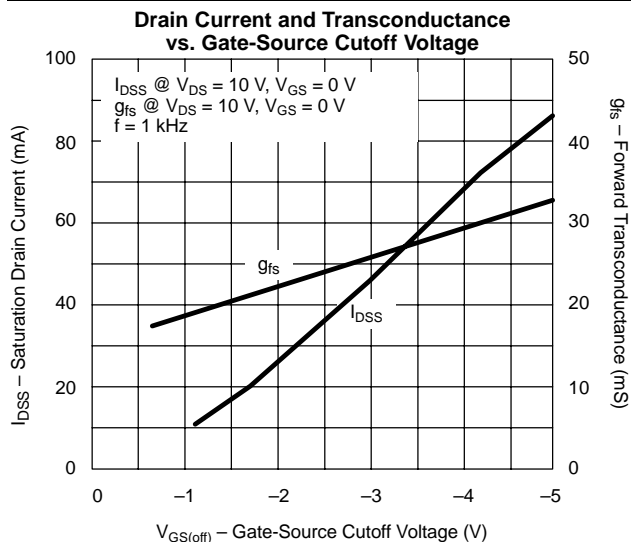
| SPECIFICATIONS FOR U309 AND U310 (T _A = 25 °C UNLESS NOTED) | | | | | | | | | |
|--|----------------------|--|------------------|--------|-------|------|-------|------------|--|
| Parameter | Symbol | Test Conditions | Typ ^a | Limits | | | | Unit | |
| | | | | U309 | | U310 | | | |
| | | | | Min | Max | Min | Max | | |
| Static | | | | | | | | | |
| Gate-Source Breakdown Voltage | V _{(BR)GSS} | I _G = -1 μA, V _{DS} = 0 V | -35 | -25 | | -25 | | V | |
| Gate-Source Cutoff Voltage | V _{GS(off)} | V _{DS} = 10 V, I _D = 1 nA | | -1 | -4 | -2.5 | -6 | V | |
| Saturation Drain Current ^b | I _{DSS} | V _{DS} = 10 V, V _{GS} = 0 V | | 12 | 30 | 24 | 60 | mA | |
| Gate Reverse Current | I _{GSS} | V _{GS} = -15 V, V _{DS} = 0 V | -0.002 | | -0.15 | | -0.15 | nA | |
| | | T _A = 125 °C | -0.001 | | -0.15 | | -0.15 | μA | |
| Gate Operating Current | I _G | V _{DG} = 9 V, I _D = 10 mA | -15 | | | | | pA | |
| Drain-Source On-Resistance | r _{DS(on)} | V _{GS} = 0 V, I _D = 1 mA | 35 | | | | | Ω | |
| Gate-Source Forward Voltage | V _{GS(F)} | I _G = 10 mA, V _{DS} = 0 V | 0.7 | | 1 | | 1 | V | |
| Dynamic | | | | | | | | | |
| Common-Source Forward Transconductance | g _{fs} | V _{DS} = 10 V, I _D = 10 mA f = 1 kHz | 14 | 10 | | 10 | | mS | |
| Common-Source Output Conductance | g _{os} | | 110 | | 250 | | 250 | μS | |
| Common-Source Input Capacitance | C _{iss} | V _{DS} = 10 V, V _{GS} = -10 V f = 1 MHz | 4 | | 5 | | 5 | pF | |
| Common-Source Reverse Transfer Capacitance | C _{rss} | | 1.9 | | 2.5 | | 2.5 | | |
| Equivalent Input Noise Voltage | e _n | V _{DS} = 10 V, I _D = 10 mA f = 100 Hz | 6 | | | | | nV/ √Hz | |
| High Frequency | | | | | | | | | |
| Common-Gate Forward Transconductance | g _{fg} | V _{DS} = 10 V I _D = 10 mA | f = 105 MHz | 14 | | | | mS | |
| | | | f = 450 MHz | 13 | | | | | |
| Common-Gate Output Conductance | g _{og} | | f = 105 MHz | 0.16 | | | | | |
| | | | f = 450 MHz | 0.55 | | | | | |
| Common-Gate Power Gain ^c | G _{pg} | | f = 105 MHz | 16 | 14 | | 14 | dB | |
| | | | f = 450 MHz | 11.5 | 10 | | 10 | | |
| Noise Figure | NF | | f = 105 MHz | 1.5 | | 2 | 2 | | |
| | | | f = 450 MHz | 2.7 | | 3.5 | 3.5 | | |

Notes

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
- c. Gain (G_{pg}) measured at optimum input noise match.

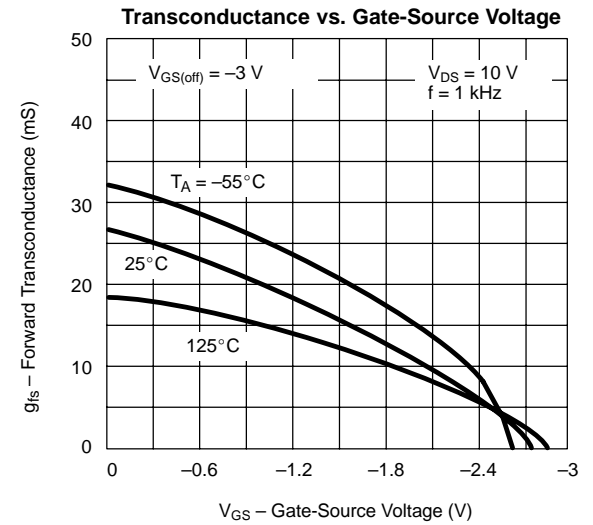
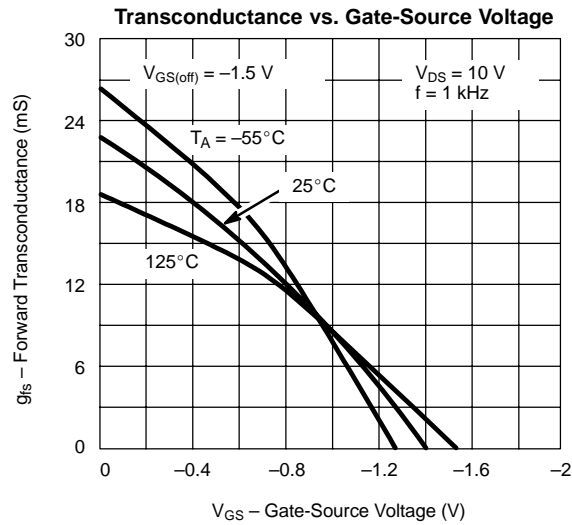
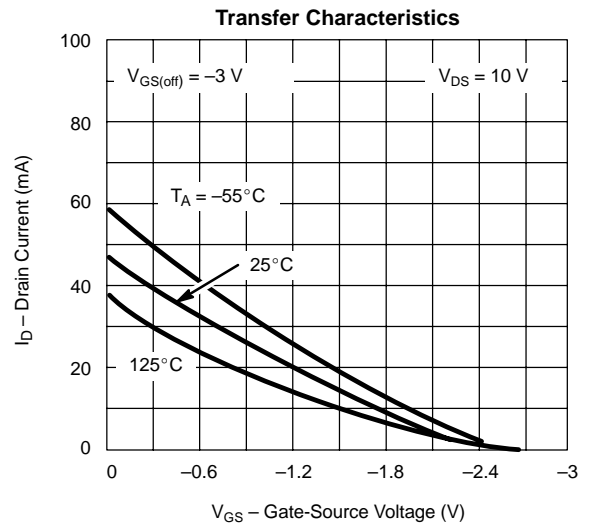
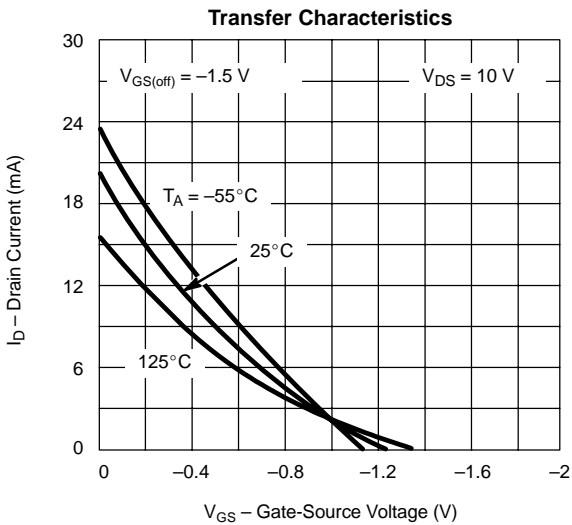
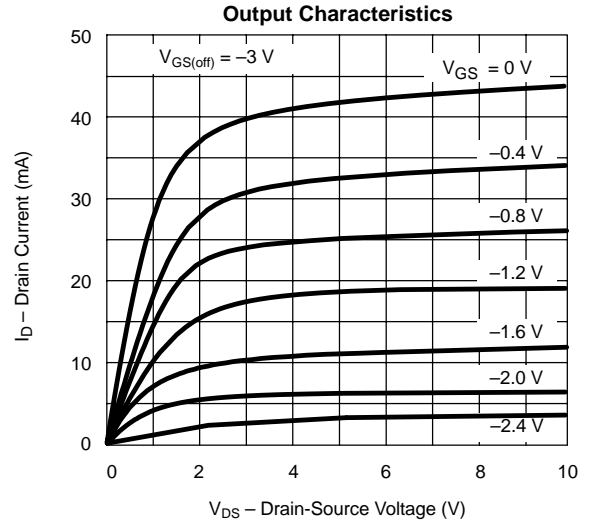
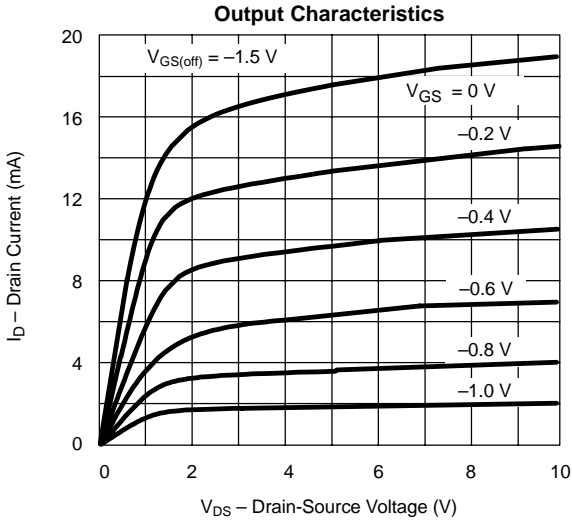
NZB

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

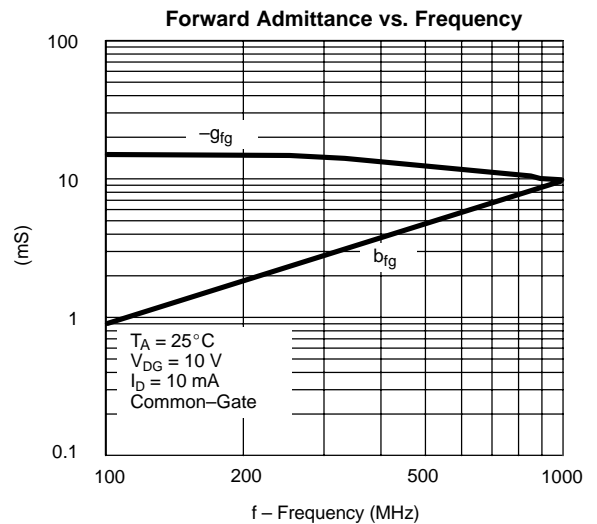
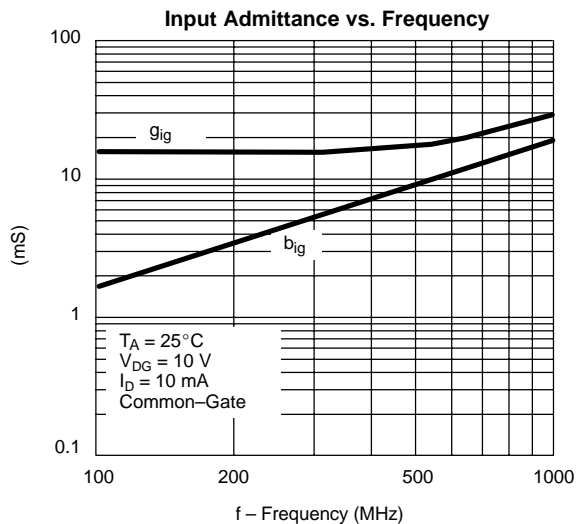
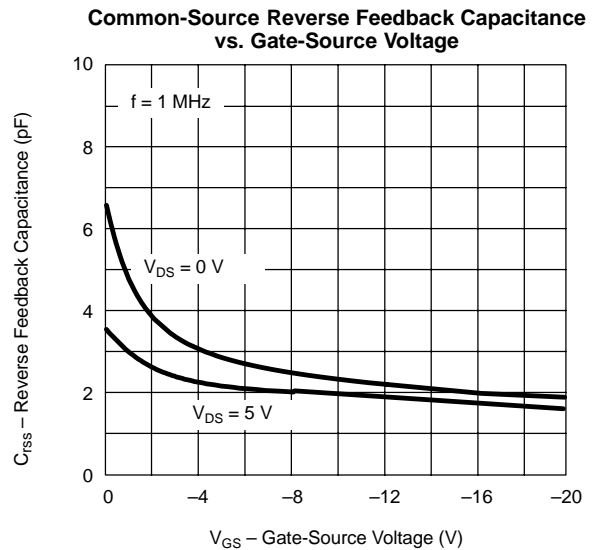
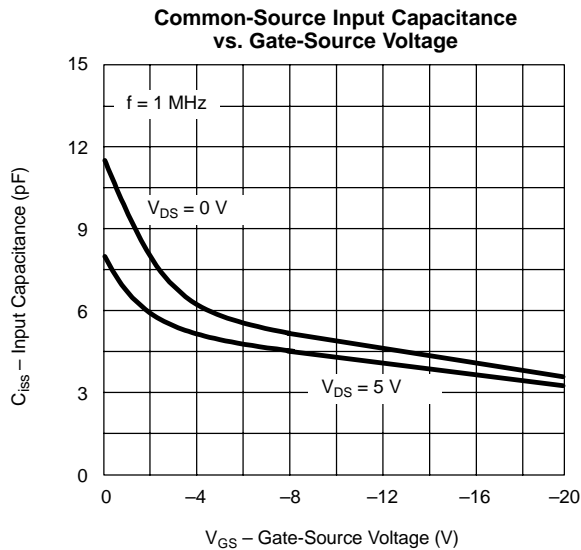
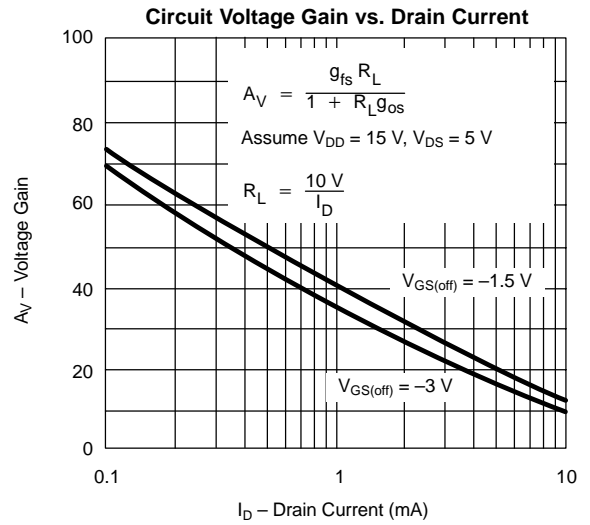
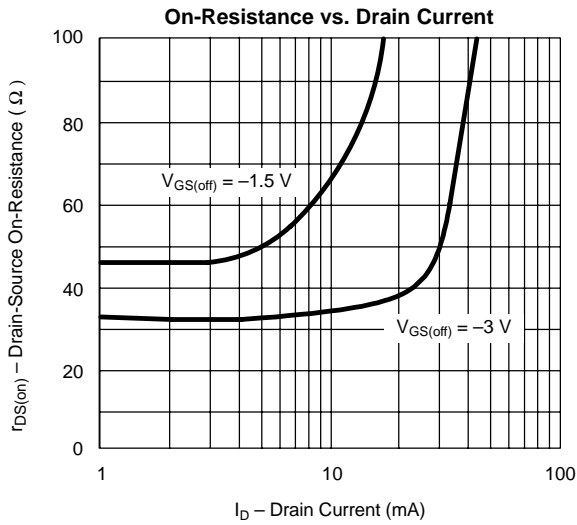




TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)



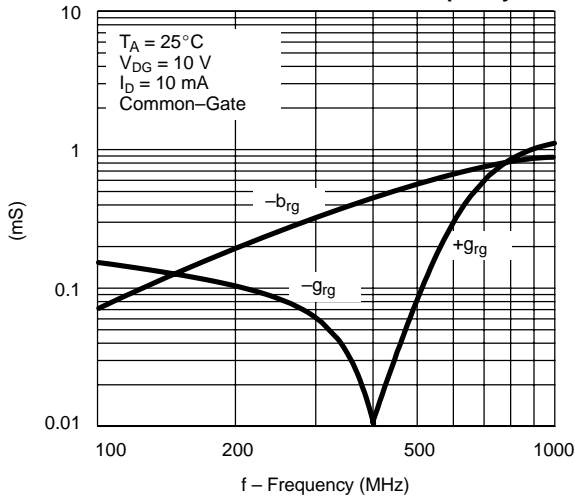
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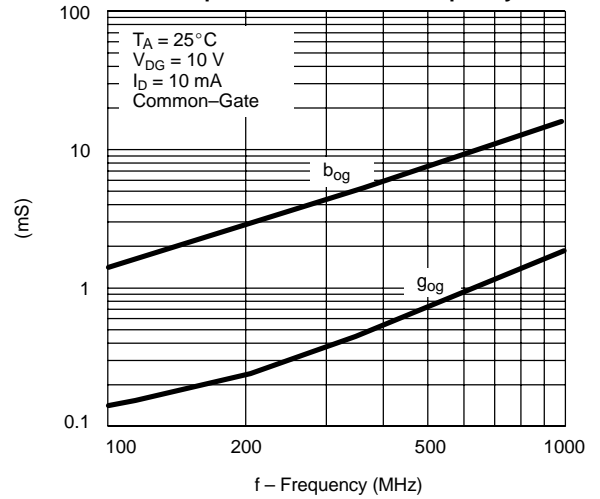


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

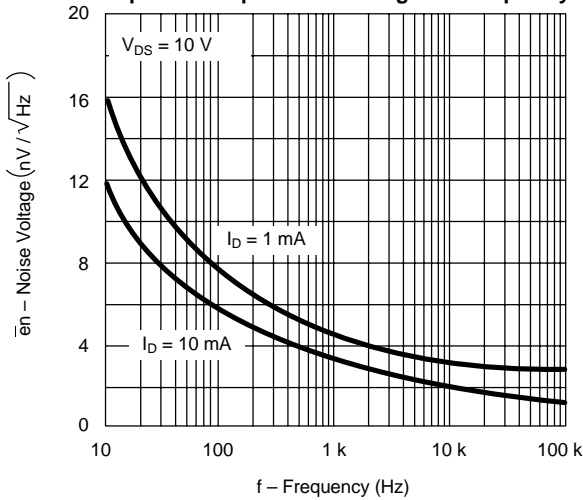
Reverse Admittance vs. Frequency



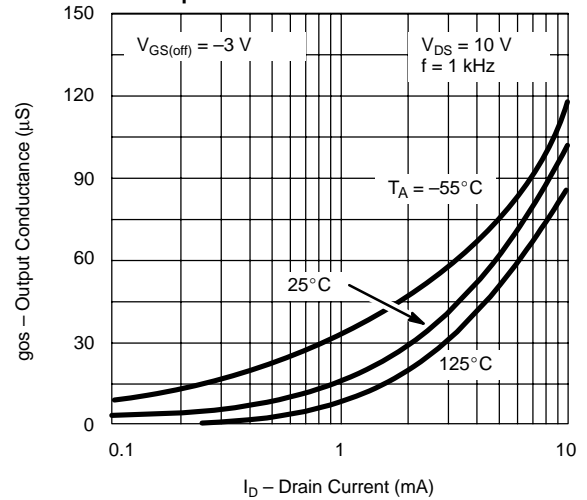
Output Admittance vs. Frequency



Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current



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