# N-Channel JFETs

**2N5484 SST5484**
**2N5485 SST5485**
**2N5486 SST5486**

| PRODUCT SUMMARY | | | | |
|---|---|---|---|---|
| Part Number | $V_{GS(off)}$ (V) | $V_{(BR)GSS}$ Min (V) | $g_{fs}$ Min (mS) | $I_{DSS}$ Min (mA) |
| 2N/SST5484 | −0.3 to −3 | −25 | 3 | 1 |
| 2N/SST5485 | −0.5 to −4 | −25 | 3.5 | 4 |
| 2N/SST5486 | −2 to −6 | −25 | 4 | 8 |

## FEATURES

- Excellent High-Frequency Gain: Gps 13 dB (typ) @ 400 MHz – 5485/6
- Very Low Noise: 2.5 dB (typ) @ 400 MHz – 5485/6
- 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

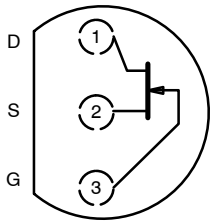
- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

## DESCRIPTION

The 2N/SST5484 series consists of n-channel JFETs designed to provide high-performance amplification, especially at high frequencies up to and beyond 400 MHz.

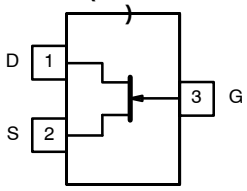
The 2N series, TO-226AA (TO-92), and SST series, TO-236 (SOT-23), packages provide low-cost options and are available with tape-and-reel to support automated assembly (see Packaging Information).

**TO-226AA (TO-92)**




Top View
2N5484
2N5485
2N5486

**TO-236 (SOT-23)**




Top View
SST5484 (H4)*
SST5485 (H5)*
SST5486 (H6)*

*Marking Code for TO-236

For applications information see AN102 and AN105.

## ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage . . . . . –25 V
Gate Current . . . . . 10 mA
Lead Temperature . . . . . 300°C
Storage Temperature . . . . . –65 to 150°C
Operating Junction Temperature . . . . . –55 to 150°C
Power Dissipation[a] . . . . . 350 mW

Notes
a. Derate 2.8 mW/°C above 25°C

## SPECIFICATIONS FOR 2N SERIES ($T_A$ = 25°C UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Test Conditions | | Typ[a] | Limits 2N5484 Min | 2N5484 Max | 2N5485 Min | 2N5485 Max | 2N5486 Min | 2N5486 Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | $V_{GS(off)}$ | $V_{DS}$ = 15 V, $I_D$ = 10 nA | | | –0.3 | –3 | –0.5 | –4 | –2 | –6 | |
| Saturation Drain Current[b] | $I_{DSS}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V | | | 1 | 5 | 4 | 10 | 8 | 20 | mA |
| Gate Reverse Current | $I_{GSS}$ | $V_{GS}$ = –20 V, $V_{DS}$ = 0 V | | –0.002 | | –1 | | –1 | | –1 | nA |
| | | | $T_A$ = 100°C | –0.2 | | –200 | | –200 | | –200 | |
| Gate Operating Current[c] | $I_G$ | $V_{DG}$ = 10 V, $I_D$ = 1 mA | | –20 | | | | | | | pA |
| Gate-Source Forward Voltage[c] | $V_{GS(F)}$ | $I_G$ = 10 mA , $V_{DS}$ = 0 V | | 0.8 | | | | | | | V |
| **Dynamic** | | | | | | | | | | | |
| Common-Source Forward Transconductance[NO TAG] | $g_{fs}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 1 kHz | | | 3 | 6 | 3.5 | 7 | 4 | 8 | mS |
| Common-Source Output Conductance[NO TAG] | $g_{os}$ | | | | | 50 | | 60 | | 75 | μS |
| Common-Source Input Capacitance | $C_{iss}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 1 MHz | | 2.2 | | 5 | | 5 | | 5 | pF |
| Common-Source Reverse Transfer Capacitance | $C_{rss}$ | | | 0.7 | | 1 | | 1 | | 1 | |
| Common-Source Output Capacitance | $C_{oss}$ | | | 1 | | 2 | | 2 | | 2 | |
| Equivalent Input Noise Voltage[c] | $\overline{e}_n$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 100 Hz | | 10 | | | | | | | nV/√Hz |
| **High-Frequency** | | | | | | | | | | | |
| Common-Source Transconductance[d] | $Y_{fs(RE)}$ | $V_{DS}$ = 15 V $V_{GS}$ = 0 V | f = 100 MHz | 5.5 | 2.5 | | | | | | mS |
| | | | f = 400 MHz | 5.5 | | | 3 | | 3.5 | | |
| Common-Source Output Conductance[d] | $Y_{os(RE)}$ | | f = 100 MHz | 45 | | 75 | | | | | μS |
| | | | f = 400 MHz | 65 | | | | 100 | | 100 | |
| Common-Source Input Conductance[d] | $Y_{is(RE)}$ | | f = 100 MHz | 0.05 | | 0.1 | | | | | mS |
| | | | f = 400 MHz | 0.8 | | | | 1 | | 1 | |
| Common-Source Power Gain[d] | $G_{ps}$ | $V_{DS}$ = 15 V, $I_D$ = 1 mA f = 100 MHz | | 20 | 16 | 25 | | | | | dB |
| | | $V_{DS}$ = 15 V $I_D$ = 4 mA | f = 100 MHz | 21 | | | 18 | 30 | 18 | 30 | |
| | | | f = 400 MHz | 13 | | | 10 | 20 | 10 | 20 | |
| Noise Figure[d] | NF | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V $R_G$ = 1 MΩ, f = 1 kHz | | 0.3 | | 2.5 | | 2.5 | | 2.5 | |
| | | $V_{DS}$ = 15 V, $I_D$ = 1 mA $R_G$ = 1 kΩ, f = 100 MHz | | 2 | | 3 | | | | | |
| | | $V_{DS}$ = 15 V $I_D$ = 4 mA $R_G$ = 1 kΩ | f = 100 MHz | 1 | | | | 2 | | 2 | |
| | | | f = 400 MHz | 2.5 | | | | 4 | | 4 | |

## SPECIFICATIONS FOR SST SERIES ($T_A$ = 25°C UNLESS OTHERWISE NOTED)

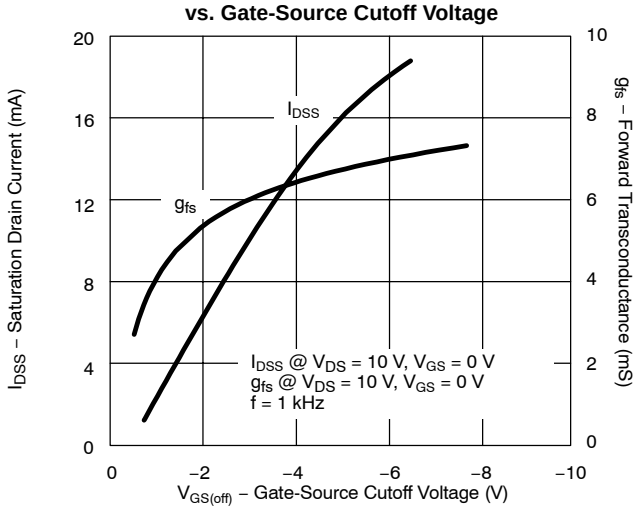
| Parameter | Symbol | Test Conditions | | Typ[b] | Limits SST5484 Min | SST5484 Max | SST5485 Min | SST5485 Max | SST5486 Min | SST5486 Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Static** | | | | | | | | | | | |
| Gate-Source Breakdown Voltage | $V_{(BR)GSS}$ | $I_G$ = −1 μA , $V_{DS}$ = 0 V | | −35 | −25 | | −25 | | −25 | | V |
| Gate-Source Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}$ = 15 V, $I_D$ = 10 nA | | | −0.3 | −3 | −0.5 | −4 | −2 | −6 | |
| Saturation Drain Current[b] | $I_{DSS}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V | | | 1 | 5 | 4 | 10 | 8 | 20 | mA |
| Gate Reverse Current | $I_{GSS}$ | $V_{GS}$ = −20 V, $V_{DS}$ = 0 V | | −0.002 | | −1 | | −1 | | −1 | nA |
| | | | $T_A$ = 100°C | −0.2 | | −200 | | −200 | | −200 | |
| Gate Operating Current[c] | $I_G$ | $V_{DG}$ = 10 V, $I_D$ = 1 mA | | −20 | | | | | | | pA |
| Gate-Source Forward Voltage[c] | $V_{GS(F)}$ | $I_G$ = 10 mA , $V_{DS}$ = 0 V | | 0.8 | | | | | | | V |
| **Dynamic** | | | | | | | | | | | |
| Common-Source Forward Transconductance[NO TAG] | $g_{fs}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 1 kHz | | | 3 | 6 | 3.5 | 7 | 4 | 8 | mS |
| Common-Source Output Conductance[NO TAG] | $g_{os}$ | | | | | 50 | | 60 | | 75 | μS |
| Common-Source Input Capacitance | $C_{iss}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 1 MHz | | 2.2 | | | | | | | pF |
| Common-Source Reverse Transfer Capacitance | $C_{rss}$ | | | 0.7 | | | | | | | |
| Common-Source Output Capacitance | $C_{oss}$ | | | 1 | | | | | | | |
| Equivalent Input Noise Voltage[c] | $\overline{e}_n$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 100 Hz | | 10 | | | | | | | $\frac{nV}{\sqrt{Hz}}$ |
| **High-Frequency** | | | | | | | | | | | |
| Common-Source Transconductance | $Y_{fs}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V | f = 100 MHz | 5.5 | | | | | | | mS |
| | | | f = 400 MHz | 5.5 | | | | | | | |
| Common-Source Output Conductance | $Y_{os}$ | | f = 100 MHz | 45 | | | | | | | μS |
| | | | f = 400 MHz | 65 | | | | | | | |
| Common-Source Input Conductance | $Y_{is}$ | | f = 100 MHz | 0.05 | | | | | | | mS |
| | | | f = 400 MHz | 0.8 | | | | | | | |
| Common-Source Power Gain | $G_{ps}$ | $V_{DS}$ = 15 V, $I_D$ = 1 mA f = 100 MHz | | 20 | | | | | | | dB |
| | | $V_{DS}$ = 15 V, $I_D$ = 4 mA | f = 100 MHz | 21 | | | | | | | |
| | | | f = 400 MHz | 13 | | | | | | | |
| Noise Figure | NF | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V $R_G$ = 1 MΩ, f = 1 kHz | | 0.3 | | | | | | | |
| | | $V_{DS}$ = 15 V, $I_D$ = 1 mA $R_G$ = 1 kΩ, f = 100 MHz | | 2 | | | | | | | |
| | | $V_{DS}$ = 15 V, $I_D$ = 4 mA, $R_G$ = 1 kΩ | f = 100 MHz | 1 | | | | | | | |
| | | | f = 400 MHz | 2.5 | | | | | | | |

Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing. NH
b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
c. This parameter not registered with JEDEC.
d. Not a production test.

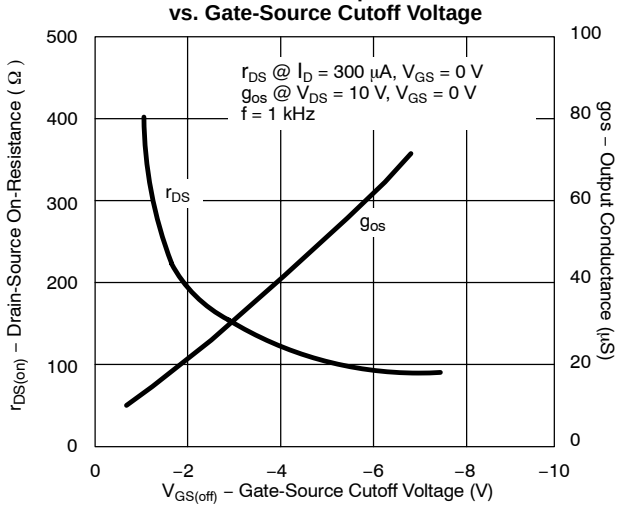
*Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

## TYPICAL CHARACTERISTICS ($T_A$ = 25°C UNLESS OTHERWISE NOTED)

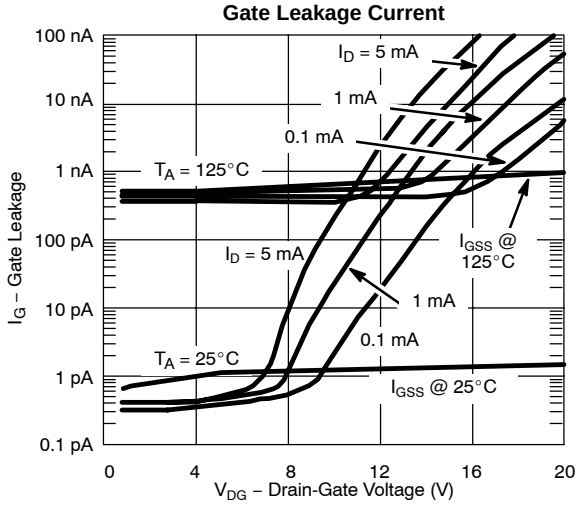
**Drain Current and Transconductance vs. Gate-Source Cutoff Voltage**



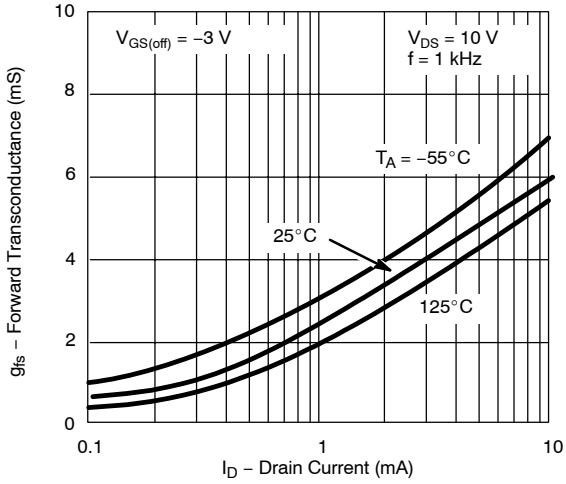

**On-Resistance and Output Conductance vs. Gate-Source Cutoff Voltage**



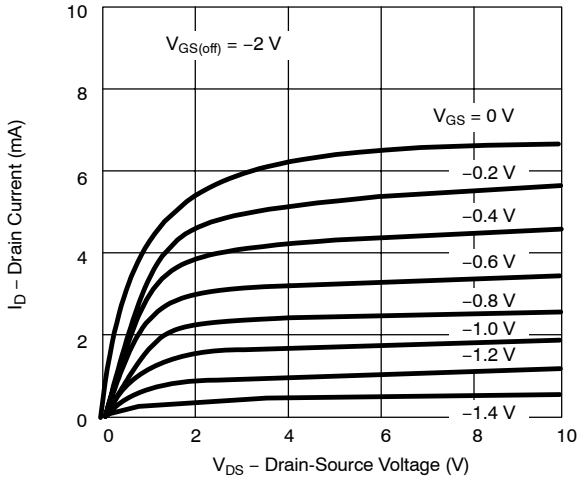

**Gate Leakage Current**



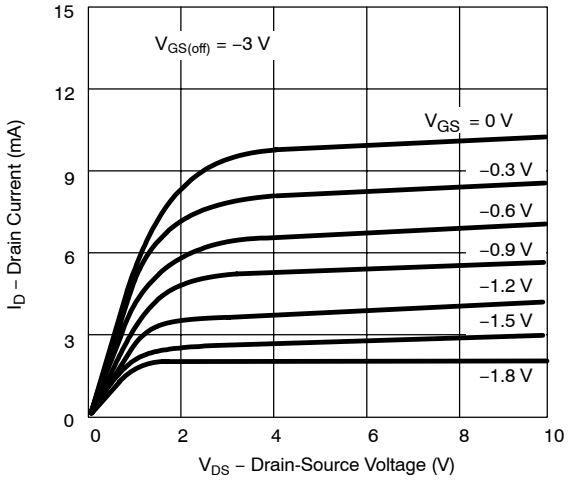

**Common-Source Forward Transconductance vs. Drain Current**




**Output Characteristics**




**Output Characteristics**

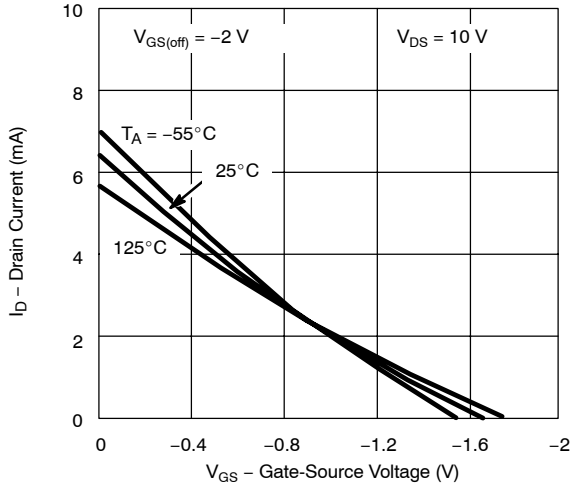




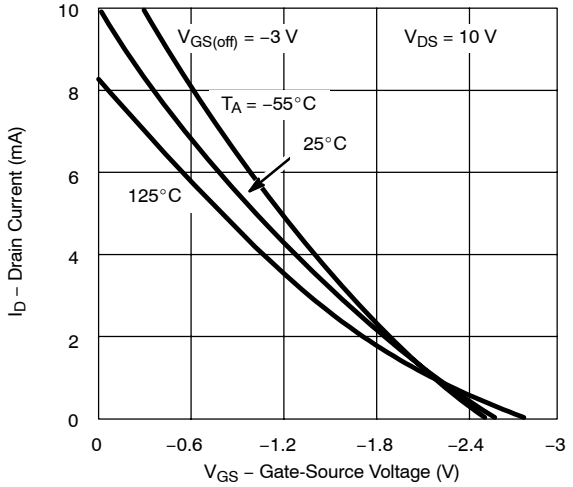

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## TYPICAL CHARACTERISTICS ($T_A$ = 25°C UNLESS OTHERWISE NOTED)

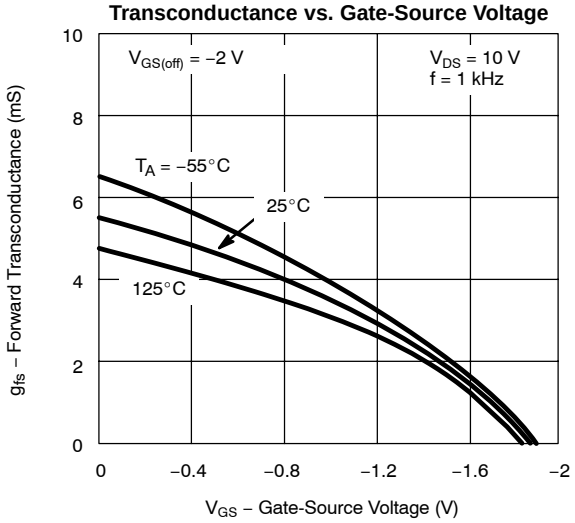
**Transfer Characteristics**



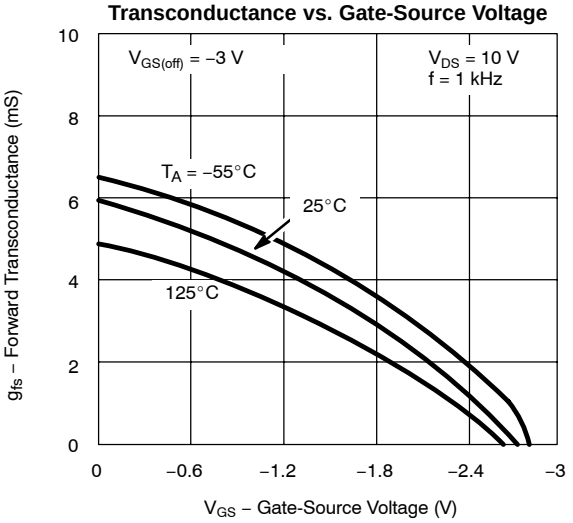

**Transfer Characteristics**



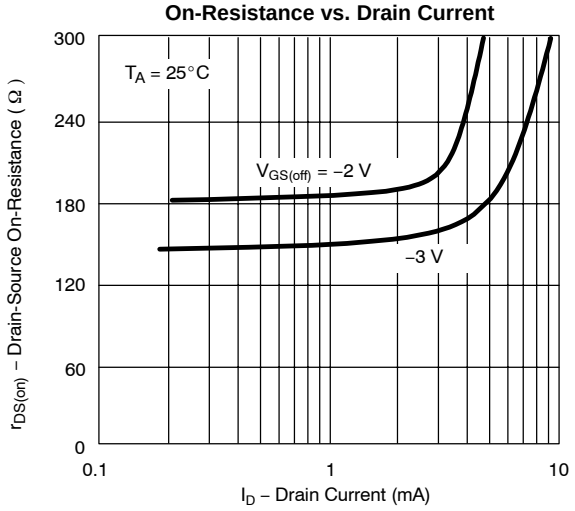

**Transconductance vs. Gate-Source Voltage**



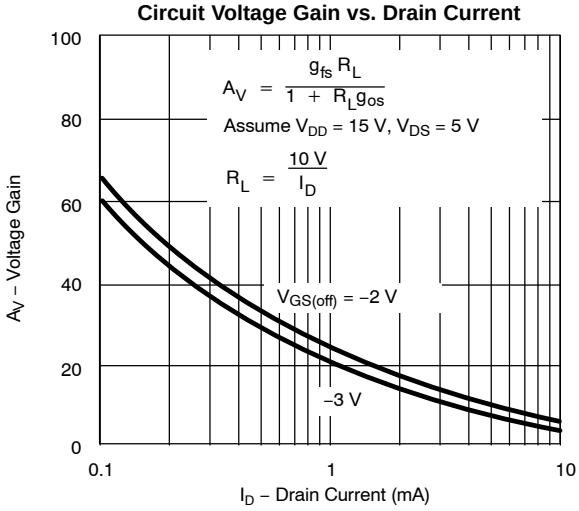

**Transconductance vs. Gate-Source Voltage**




**On-Resistance vs. Drain Current**

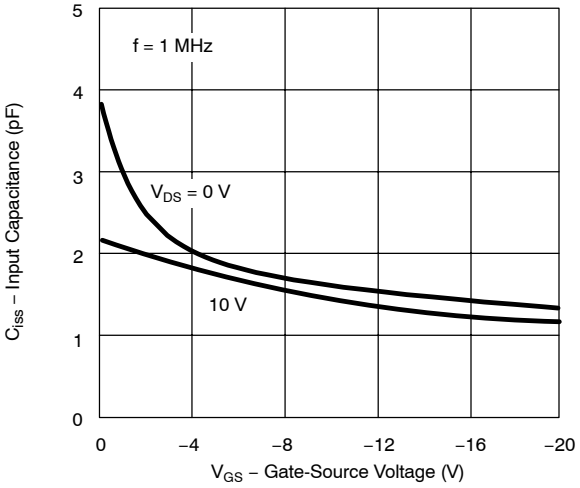



**Circuit Voltage Gain vs. Drain Current**

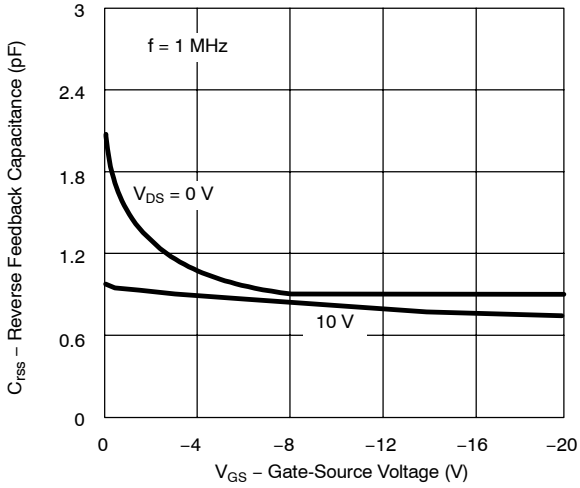


## TYPICAL CHARACTERISTICS ($T_A$ = 25°C UNLESS OTHERWISE NOTED)

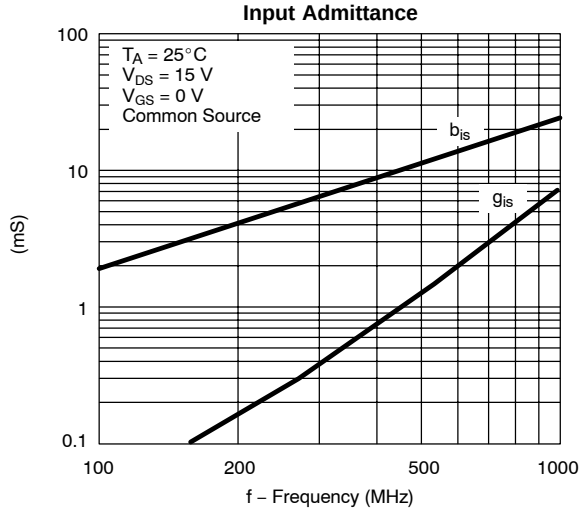
**Common-Source Input Capacitance vs. Gate-Source Voltage**



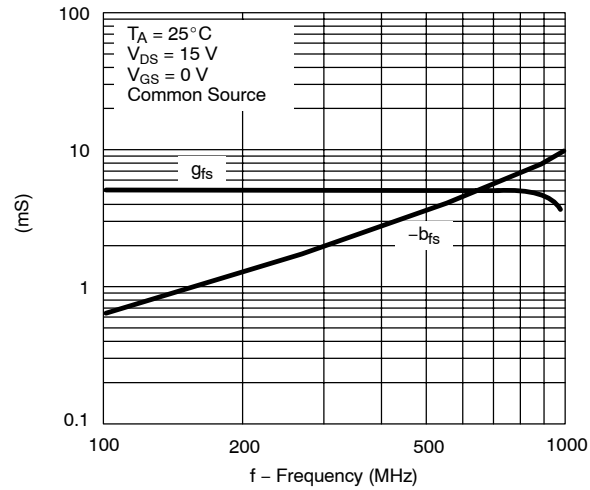

**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



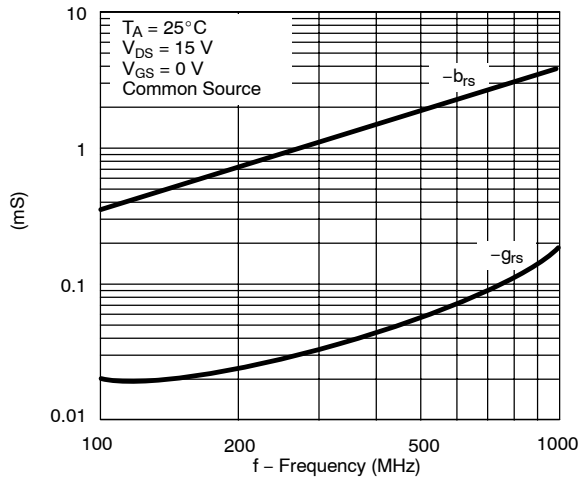

**Input Admittance**



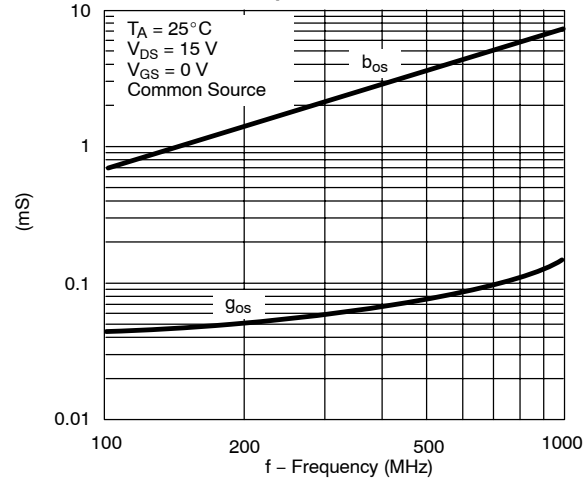

**Forward Admittance**




**Reverse Admittance**




**Output Admittance**

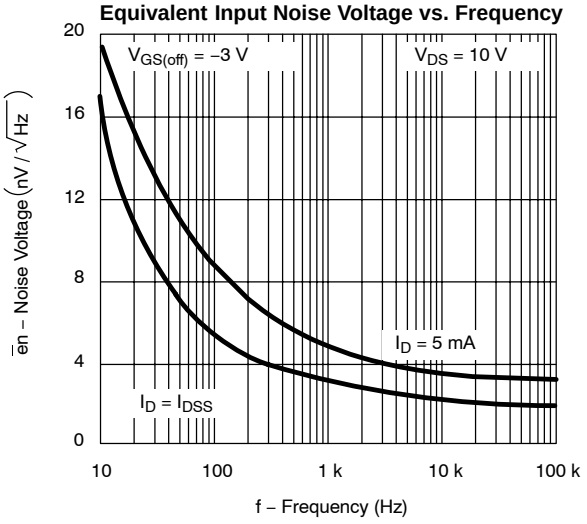




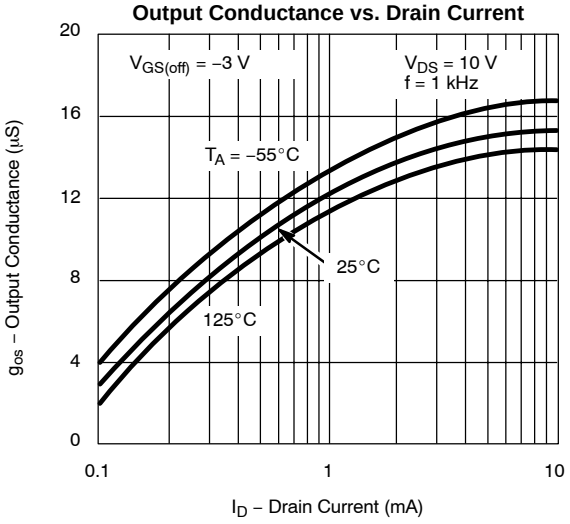

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## TYPICAL CHARACTERISTICS ($T_A$ = 25°C UNLESS OTHERWISE NOTED)

**Equivalent Input Noise Voltage vs. Frequency**




**Output Conductance vs. Drain Current**




*Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see http://www.vishay.com/ppg?70246.*