# 2N/SST5484 Series

## 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

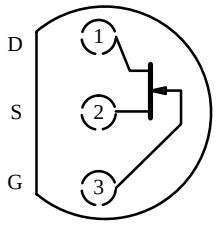
- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

## 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.

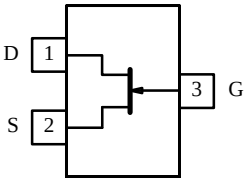
The 2N series, TO-226AA (TO-92), and SST series, TO-236 (SOT-23), packages provide low-cost options and are available with tape-and-reel to support automated assembly (see Packaging Information).

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

## 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

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70246. Applications information may also be obtained via FaxBack, request document #70595 and #70598.

## Specifications[a] for 2N Series

| Parameter | Symbol | Test Conditions | | Typ[b] | 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[c] | $I_{DSS}$ | $V_{DS}$ = 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[d] | $I_G$ | $V_{DG}$ = 10 V, $I_D$ = 1 mA | | –20 | | | | | | | pA |
| Gate-Source Forward Voltage[d] | $V_{GS(F)}$ | $I_G$ = 10 mA , $V_{DS}$ = 0 V | | 0.8 | | | | | | | V |
| **Dynamic** | | | | | | | | | | | |
| Common-Source Forward Transconductance[c] | $g_{fs}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 1 kHz | | | 3 | 6 | 3.5 | 7 | 4 | 8 | mS |
| Common-Source Output Conductance[c] | $g_{os}$ | | | | | 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[d] | $\bar{e}_n$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V f = 100 Hz | | 10 | | | | | | | nV/√Hz |
| **High-Frequency** | | | | | | | | | | | |
| Common-Source Transconductance | $Y_{fs(RE)}$ | $V_{DS}$ = 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 | $Y_{os(RE)}$ | | f = 100 MHz | 45 | | 75 | | | | | µS |
| | | | f = 400 MHz | 65 | | | | 100 | | 100 | |
| Common-Source Input Conductance | $Y_{is(RE)}$ | | f = 100 MHz | 0.05 | | 0.1 | | | | | mS |
| | | | f = 400 MHz | 0.8 | | | | 1 | | 1 | |
| Common-Source Power Gain | $G_{ps}$ | $V_{DS}$ = 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 | 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[a] for SST Series

| 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[c] | $I_{DSS}$ | $V_{DS}$ = 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[d] | $I_G$ | $V_{DG}$ = 10 V, $I_D$ = 1 mA | –20 | | | | | | | pA |
| Gate-Source Forward Voltage[d] | $V_{GS(F)}$ | $I_G$ = 10 mA , $V_{DS}$ = 0 V | 0.8 | | | | | | | V |
| **Dynamic** | | | | | | | | | | |
| Common-Source Forward Transconductance[c] | $g_{fs}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V, f = 1 kHz | | 3 | 6 | 3.5 | 7 | 4 | 8 | mS |
| Common-Source Output Conductance[c] | $g_{os}$ | | | | 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[d] | $\bar{e}_n$ | $V_{DS}$ = 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 | | | | | | | |
| | | $V_{DS}$ = 15 V, $I_D$ = 4 mA, 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 | | | | | | | |
| | | $V_{DS}$ = 15 V, $I_D$ = 4 mA, $R_G$ = 1 kΩ, f = 400 MHz | 2.5 | | | | | | | |

Notes
a. $T_A$ = 25°C unless otherwise noted.
b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 3%.
d. This parameter not registered with JEDEC.

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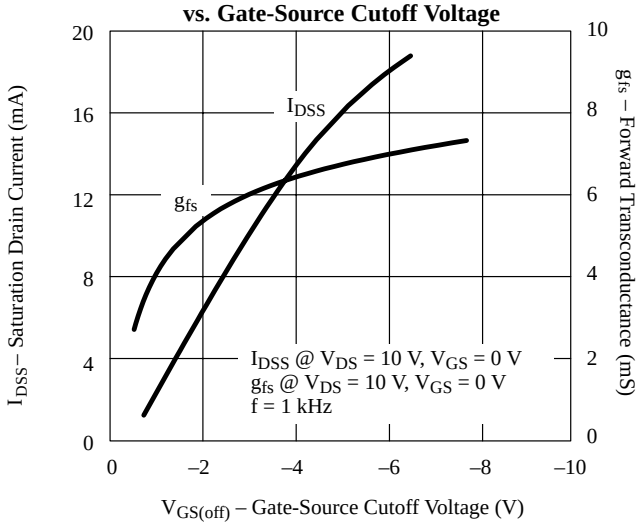
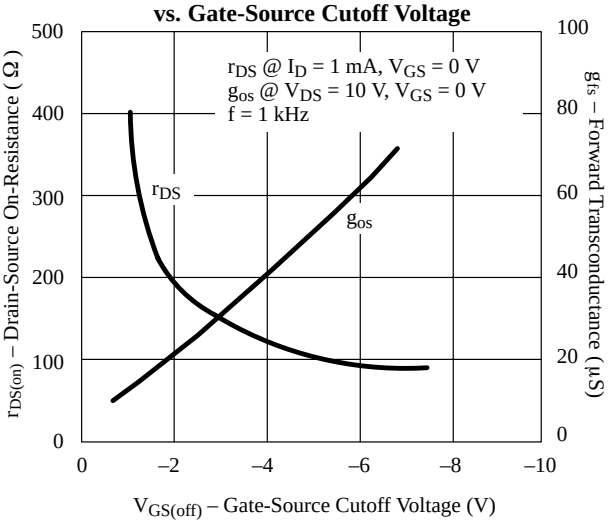
## Typical Characteristics

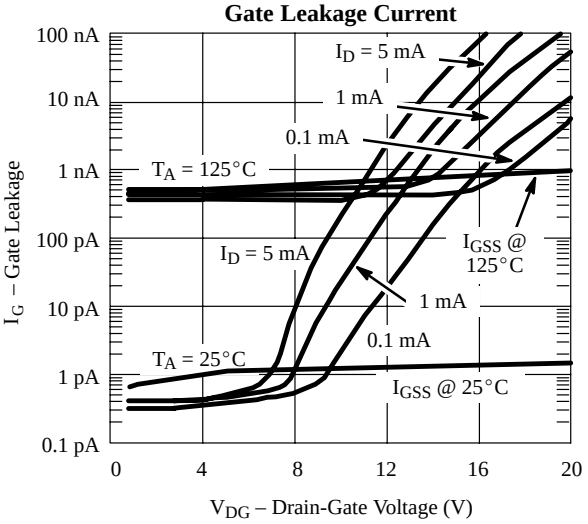
**Drain Current and Transconductance vs. Gate-Source Cutoff Voltage**



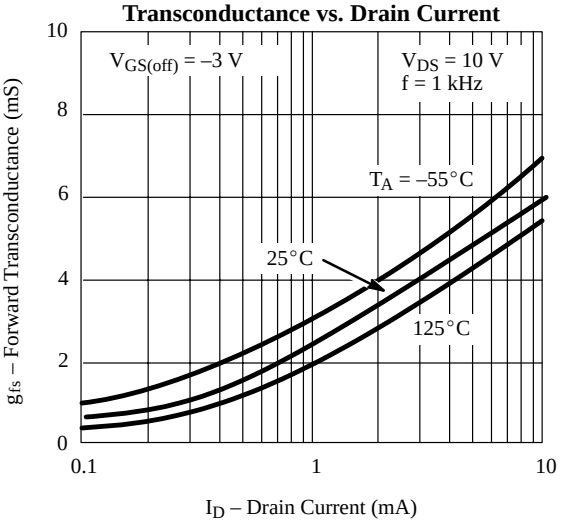

**On-Resistance and Output Conductance vs. Gate-Source Cutoff Voltage**



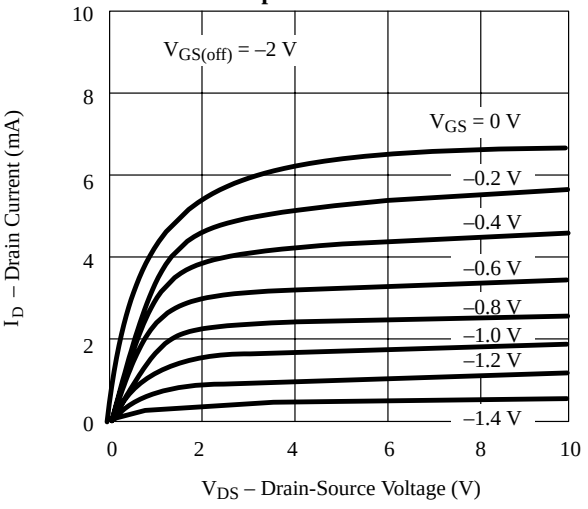

**Gate Leakage Current**



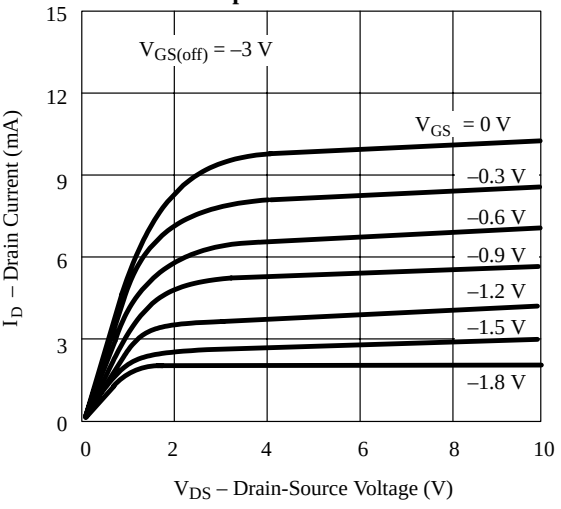

**Common-Source Forward Transconductance vs. Drain Current**




**Output Characteristics**

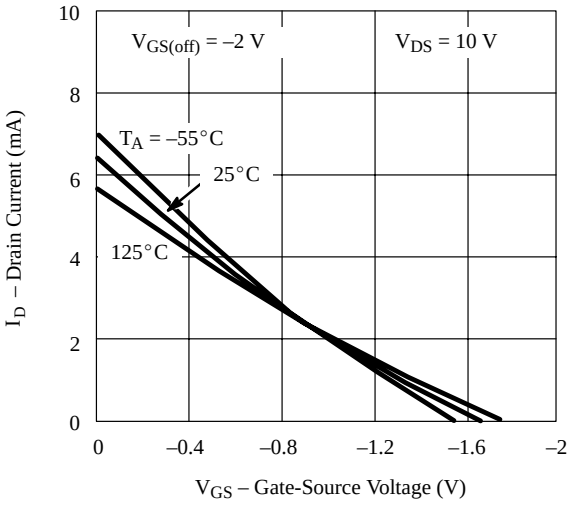



**Output Characteristics**

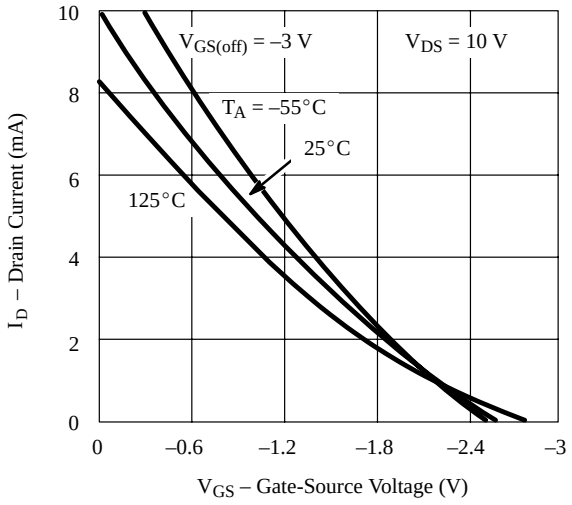


## Typical Characteristics (Cont'd)

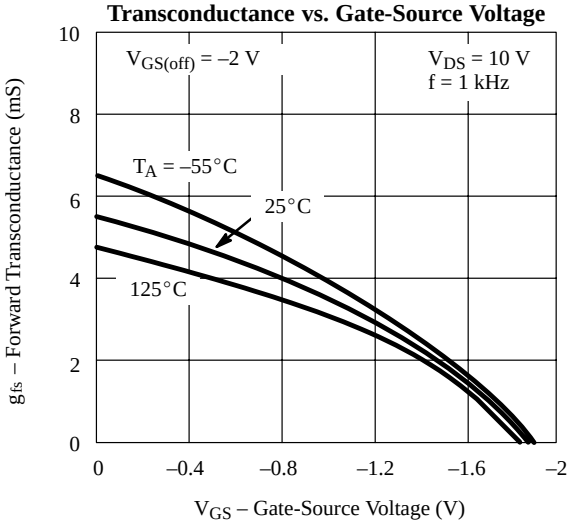
**Transfer Characteristics**



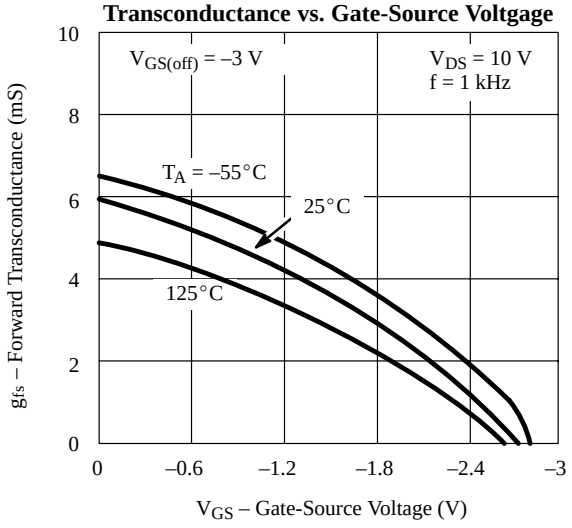

**Transfer Characteristics**



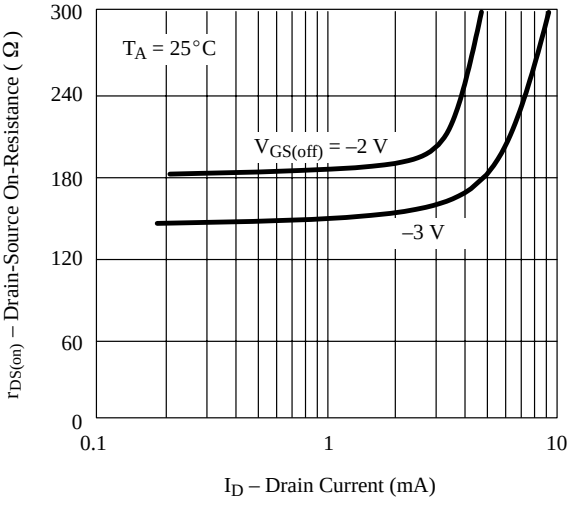

**Transconductance vs. Gate-Source Voltage**



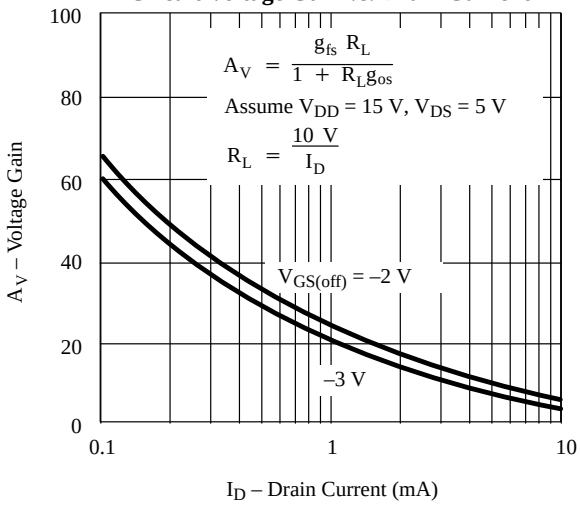

**Transconductance vs. Gate-Source Voltgage**




**On-Resistance vs. Drain Current**

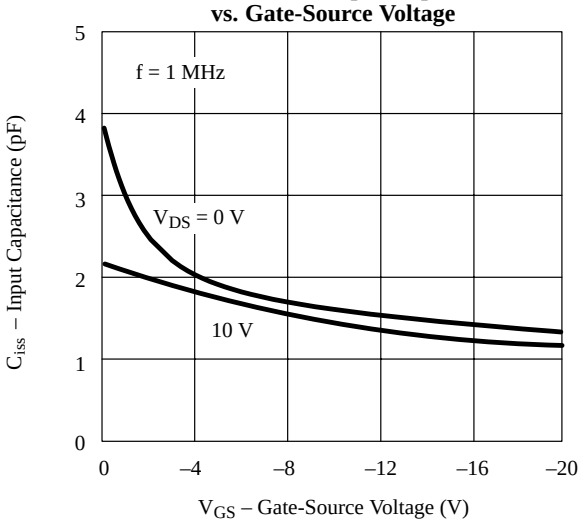



**Circuit Voltage Gain vs. Drain Current**

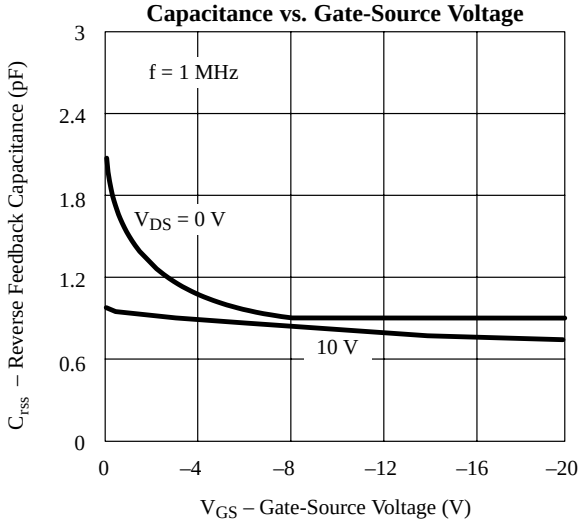


## Typical Characteristics (Cont'd)

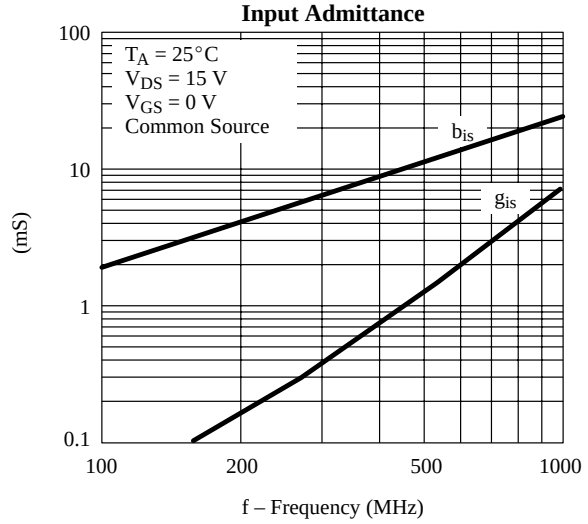
**Common-Source Input Capacitance vs. Gate-Source Voltage**



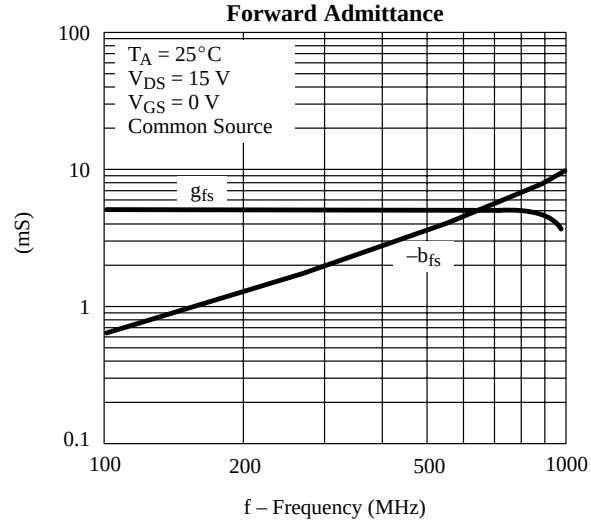

**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



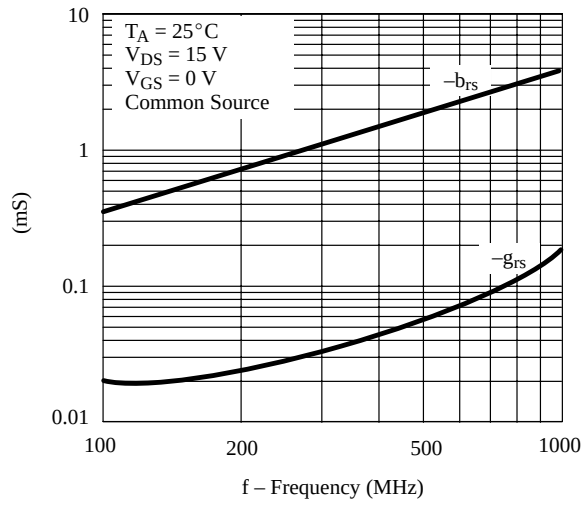

**Input Admittance**



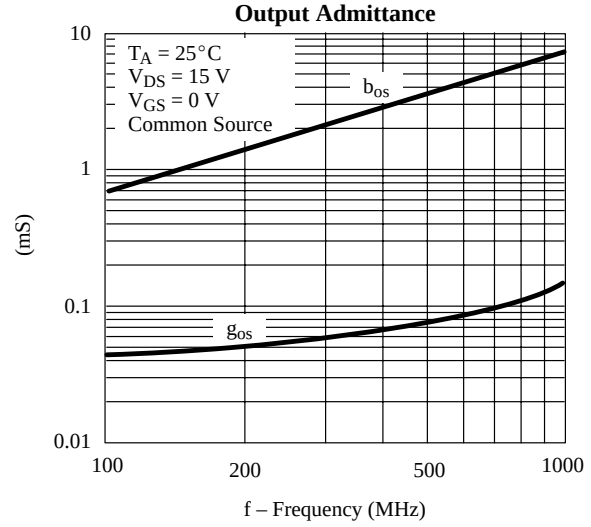

**Forward Admittance**




**Reverse Admittance**

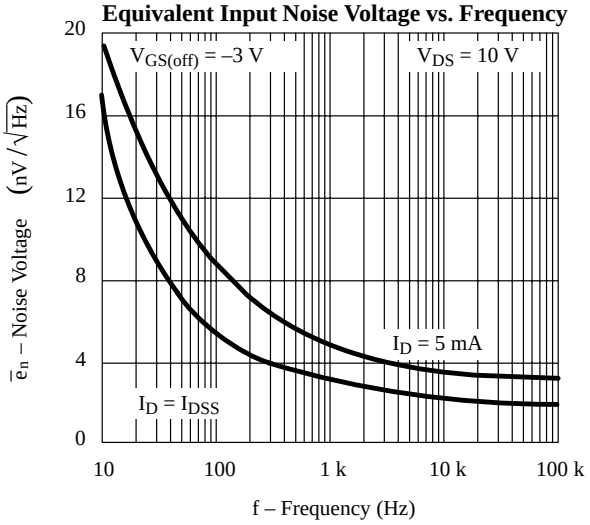



**Output Admittance**



## Typical Characteristics (Cont'd)

**Equivalent Input Noise Voltage vs. Frequency**




**Output Conductance vs. Drain Current**