

N-Channel JFETs

J111 SST111
J112 SST112
J113 SST113

| PRODUCT SUMMARY | | | | |
|-----------------|--------------------------|-----------------------------|------------------------------|--------------------------|
| Part Number | V _{GS(off)} (V) | r _{DS(on)} Max (Ω) | I _{D(off)} Typ (pA) | t _{ON} Typ (ns) |
| J/SST111 | -3 to -10 | 30 | 5 | 4 |
| J/SST112 | -1 to -5 | 50 | 5 | 4 |
| J/SST113 | ≤ -3 | 100 | 5 | 4 |

FEATURES

- Low On-Resistance: 111 < 30 Ω
- Fast Switching—t_{ON}: 4 ns
- Low Leakage: 5 pA
- Low Capacitance: 3 pF
- Low Insertion Loss

BENEFITS

- Low Error Voltage
- High-Speed Analog Circuit Performance
- Negligible “Off-Error,” Excellent Accuracy
- Good Frequency Response, Low Glitches
- Eliminates Additional Buffering

APPLICATIONS

- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

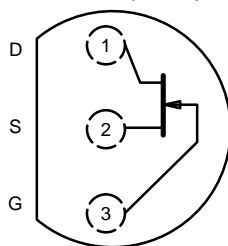
DESCRIPTION

The J/SST111 series consists of all-purpose analog switches designed to support a wide range of applications. The J/SST113 are useful in a high-gain amplifier mode.

For similar products in TO-206AA(TO-18) packaging, see the 2N/PN/SST4391 series, 2N4856A/4857A/4858A, and 2N5564/5565/5566 (duals) data sheets.

The J series, TO-226AA (TO-92) plastic package, provides low cost, while the SST series, TO236 (SOT-23) package, provides surface-mount capability. Both the J and SST series are available in tape-and-reel for automated assembly (see Packaging Information).

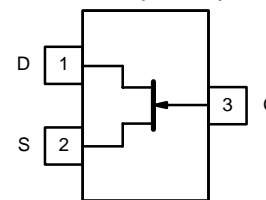
TO-226AA (TO-92)



Top View

J111
J112
J113

TO-236 (SOT-23)



Top View

SST111 (C1)*
SST112 (C2)*
SST113 (C3)*

*Marking Code for TO-236

ABSOLUTE MAXIMUM RATINGS

| | |
|---|---------------|
| Gate-Drain, Gate-Source Voltage | -35 V |
| Gate Current | 50 mA |
| Lead Temperature (1/16" from case for 10 seconds) | 300 °C |
| Storage Temperature | -55 to 150 °C |
| Operating Junction Temperature | -55 to 150 °C |

| | |
|--------------------------------|--------|
| Power Dissipation ^a | |
| (TO-236) | 350 mW |
| (TO-226AA) | 360 mW |

Notes
a. Derate 2.8 mW/°C above 25 °C

For applications information see AN105.



| SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED) | | | | | | | | | | |
|--|----------------------|---|------------------|----------|-----|----------|-----|----------|-----|------------|
| Parameter | Symbol | Test Conditions | Typ ^a | Limits | | | | | | Unit |
| | | | | J/SST111 | | J/SST112 | | J/SST113 | | |
| | | | | Min | Max | Min | Max | Min | Max | |
| Static | | | | | | | | | | |
| Gate-Source Breakdown Voltage | V _{(BR)GSS} | I _G = -1 μA, V _{DS} = 0 V | -55 | -35 | | -35 | | -35 | | V |
| Gate-Source Cutoff Voltage | V _{GS(off)} | V _{DS} = 5 V, I _D = 1 μA | | -3 | -10 | -1 | -5 | | -3 | |
| Saturation Drain Current ^b | I _{DSS} | V _{DS} = 15 V, V _{GS} = 0 V | | 20 | | 5 | | 2 | | mA |
| Gate Reverse Current | I _{GSS} | V _{GS} = -15 V, V _{DS} = 0 V | -0.005 | | -1 | | -1 | | -1 | nA |
| | | T _A = 125 °C | -3 | | | | | | | |
| Gate Operating Current | I _G | V _{DG} = 15 V, I _D = 10 mA | -5 | | | | | | | pA |
| Drain Cutoff Current | I _{D(off)} | V _{DS} = 5 V, V _{GS} = -10 V | 0.005 | | 1 | | 1 | | 1 | nA |
| | | T _A = 125 °C | 3 | | | | | | | |
| Drain-Source On-Resistance | r _{DS(on)} | V _{GS} = 0 V, V _{DS} = 0.1 V | | | 30 | | 50 | | 100 | Ω |
| Gate-Source Forward Voltage | V _{GS(F)} | I _G = 1 mA, V _{DS} = 0 V | 0.7 | | | | | | | V |
| Dynamic | | | | | | | | | | |
| Common-Source Forward Transconductance | g _{fs} | V _{DS} = 20 V, I _D = 1 mA f = 1 kHz | 6 | | | | | | | mS |
| Common-Source Output Conductance | g _{os} | | 25 | | | | | | | μS |
| Drain-Source On-Resistance | r _{ds(on)} | V _{GS} = 0 V, I _D = 0 mA f = 1 kHz | | | 30 | | 50 | | 100 | Ω |
| Common-Source Input Capacitance | C _{iss} | V _{DS} = 0 V, V _{GS} = -10 V f = 1 MHz | 7 | | 12 | | 12 | | 12 | pF |
| Common-Source Reverse Transfer Capacitance | C _{rss} | | 3 | | 5 | | 5 | | 5 | |
| Equivalent Input Noise Voltage | e _n | V _{DG} = 10 V, I _D = 1 mA f = 1 kHz | 3 | | | | | | | nV/ √Hz |
| Switching | | | | | | | | | | |
| Turn-On Time | t _{d(on)} | V _{DD} = 10 V, V _{GS(H)} = 0 V See Switching Circuit | 2 | | | | | | | ns |
| | t _r | | 2 | | | | | | | |
| Turn-Off Time | t _{d(off)} | | 6 | | | | | | | |
| | t _f | | 15 | | | | | | | |

Notes

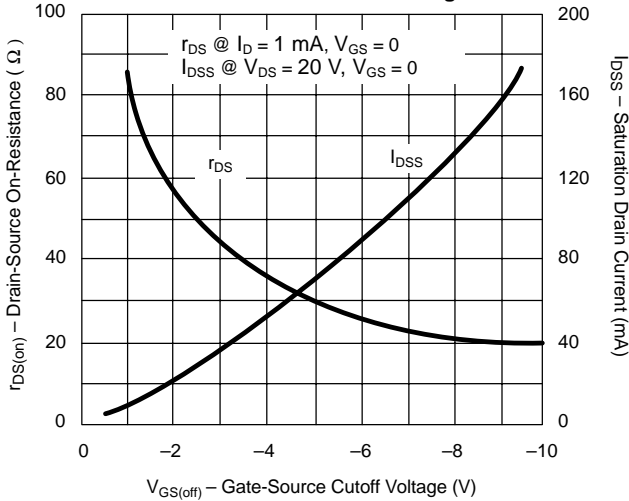
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.

NCB

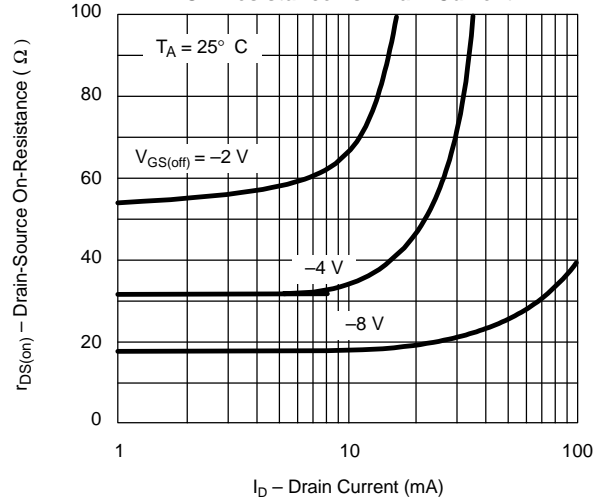


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

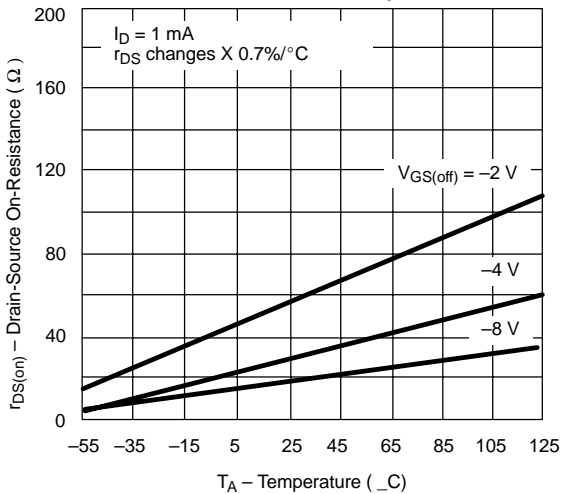
On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage



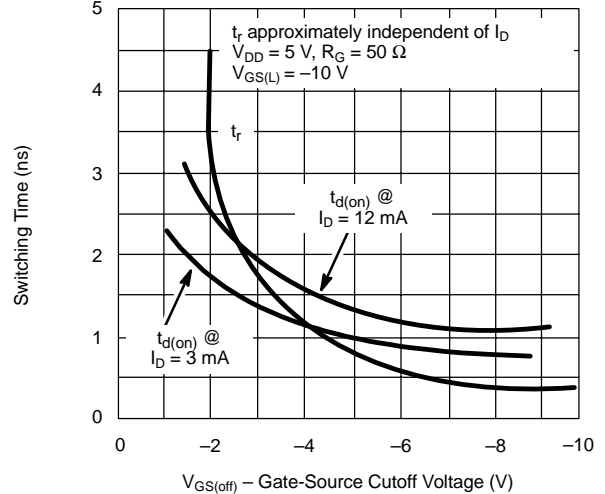
On-Resistance vs. Drain Current



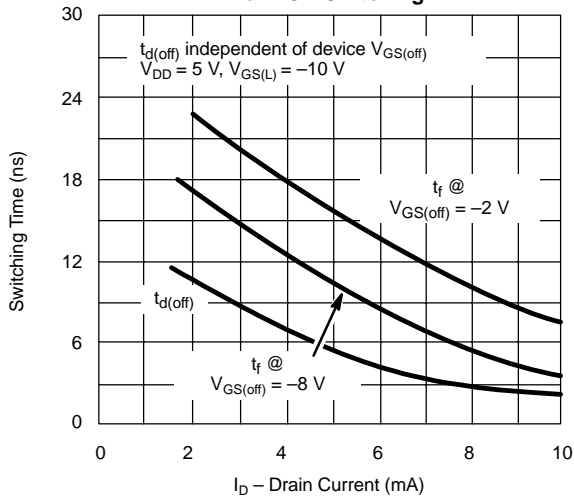
On-Resistance vs. Temperature



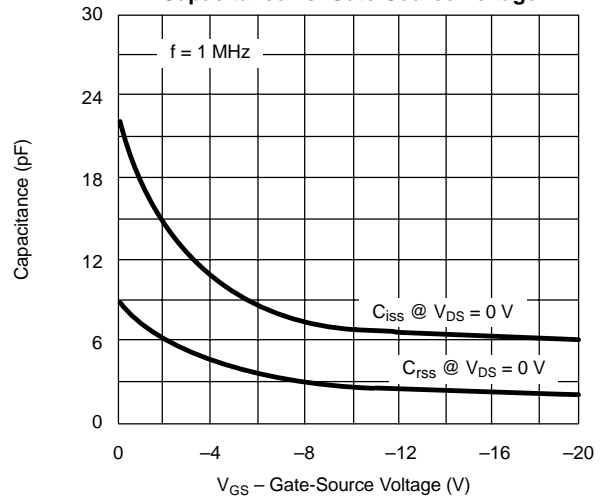
Turn-On Switching



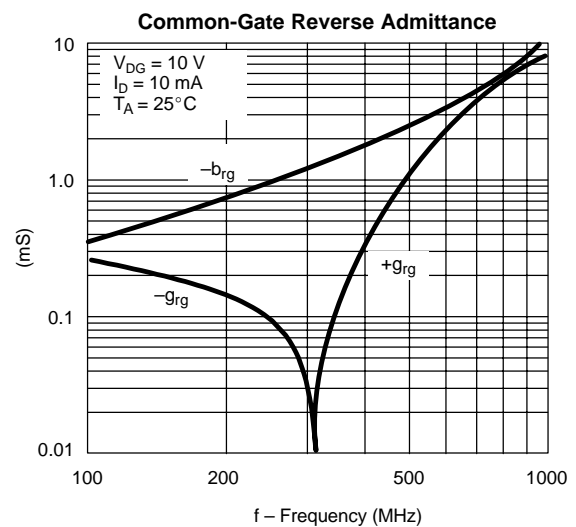
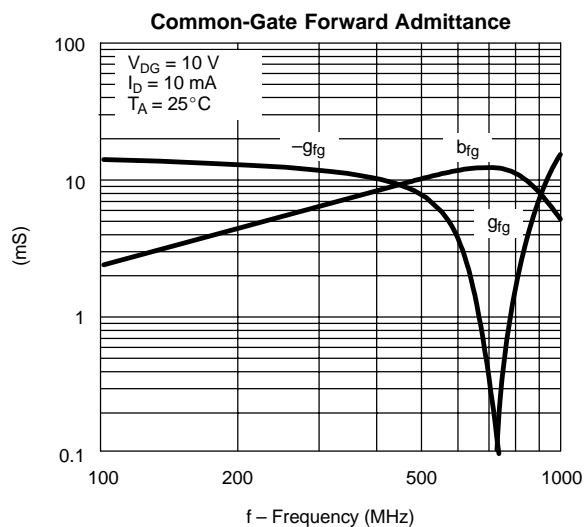
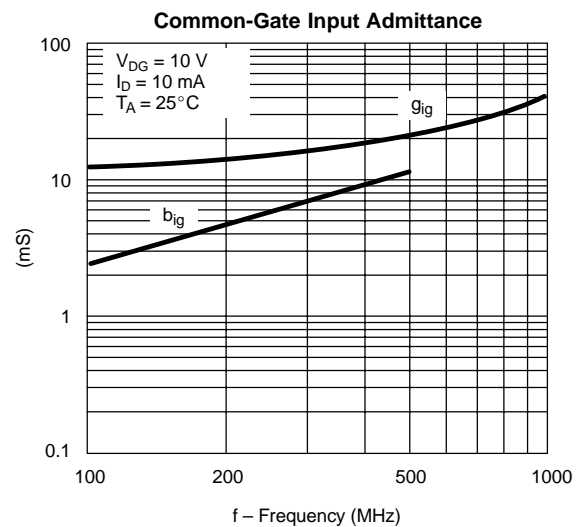
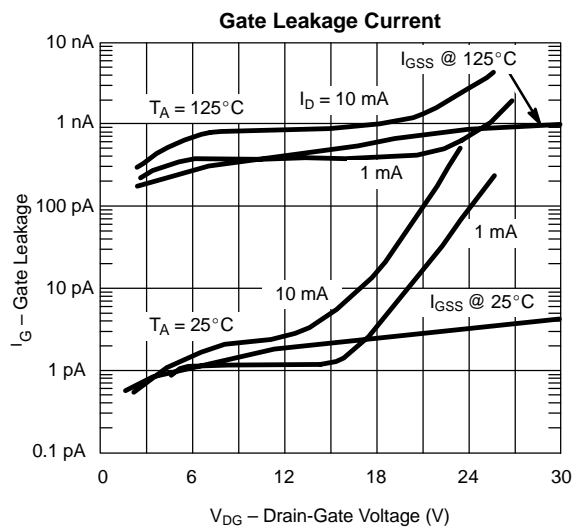
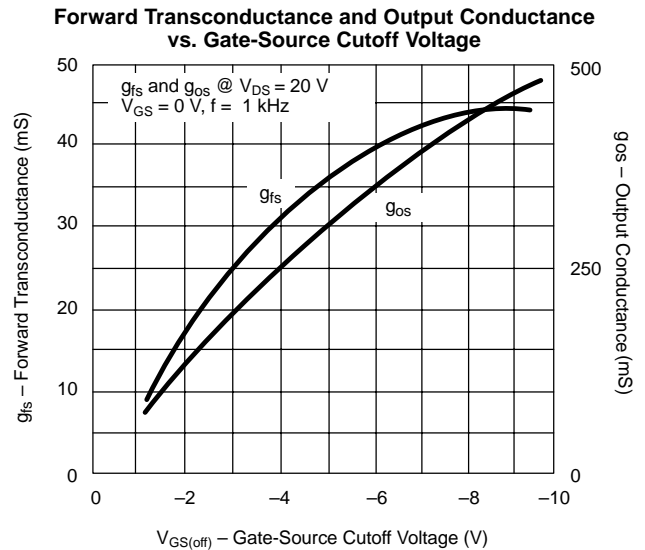
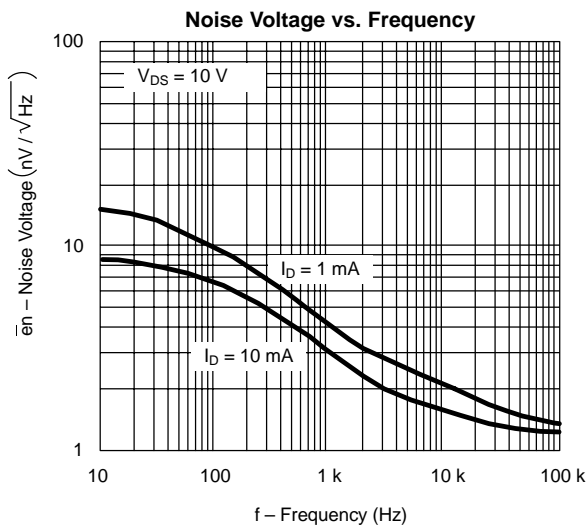
Turn-Off Switching



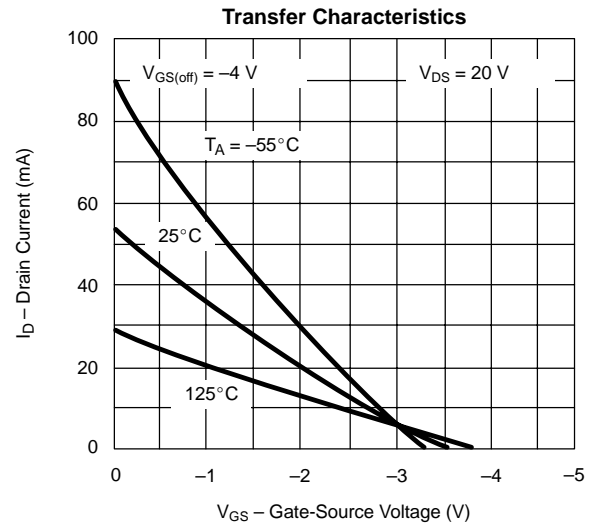
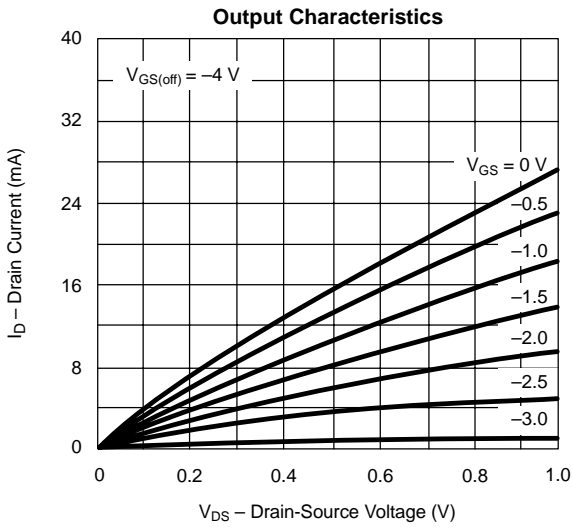
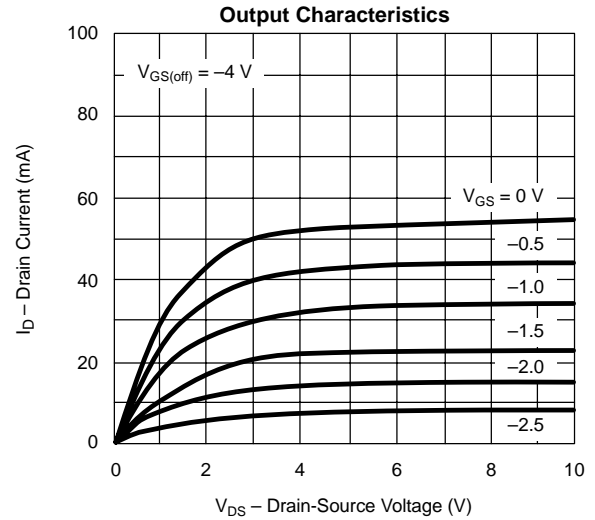
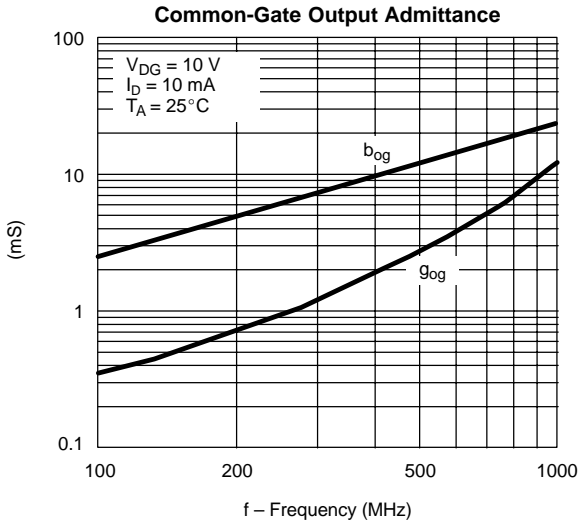
Capacitance vs. Gate-Source Voltage



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



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



| SWITCHING TIME TEST CIRCUIT | | | |
|------------------------------------|--------------|---------------|---------------|
| | J/SST111 | J/SST112 | J/SST113 |
| $V_{GS(L)}$ | -12 V | -7 V | -5 V |
| R_L^* | 800 Ω | 1600 Ω | 3200 Ω |
| $I_{D(on)}$ | 12 mA | 6 mA | 3 mA |

*Non-inductive

INPUT PULSE

Rise Time < 1 ns
 Fall Time < 1 ns
 Pulse Width 100 ns
 PRF 1 MHz

SAMPLING SCOPE

Rise Time 0.4 ns
 Input Resistance 10 M Ω
 Input Capacitance 1.5 pF

