

N-Channel JFETs

| | |
|-------------|---------------|
| J108 | SST108 |
| J109 | SST109 |
| J110 | SST110 |

| PRODUCT SUMMARY | | | | |
|-----------------|--------------------------|-----------------------------|------------------------------|--------------------------|
| Part Number | V _{GS(off)} (V) | r _{DS(on)} Max (Ω) | I _{D(off)} Typ (pA) | t _{ON} Typ (ns) |
| J/SST108 | -3 to -10 | 8 | 20 | 4 |
| J/SST109 | -2 to -6 | 12 | 20 | 4 |
| J/SST110 | -0.5 to -4 | 18 | 20 | 4 |

FEATURES

- Low On-Resistance: J108 <8 Ω
- Fast Switching—t_{ON}: 4 ns
- Low Leakage: 20 pA
- Low Capacitance: 11 pF
- Low Insertion Loss

BENEFITS

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

APPLICATIONS

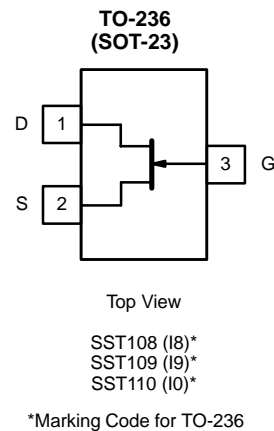
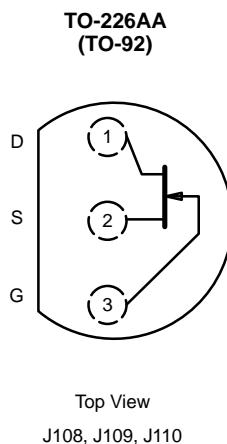
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

DESCRIPTION

The J/SST108 series is designed with high-performance analog switching applications in mind. It features low on-resistance, good off-isolation, and fast switching.

The SST108 series is comprised of surface-mount devices featuring the lowest r_{DS(on)} of any TO-236 (SOT-23) JFET device.

The TO-226AA (TO-92) plastic package provides a low-cost option. Both the J and SST series are available in tape-and-reel for automated assembly (see Packaging Information). For similar products packaged in TO-206AC (TO-52), see the 2N5432/5433/5434 data sheet.



ABSOLUTE MAXIMUM RATINGS

| | |
|--|--------------|
| Gate-Drain, Gate-Source Voltage | -25 V |
| Gate Current | 50 mA |
| Lead Temperature ($1/16''$ from case for 10 sec.) | 300°C |
| Storage Temperature | -55 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 ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | | | | | | | |
|---|---------------|--|------------------|----------|-----|----------|-----|----------|-----|------------------------|
| Parameter | Symbol | Test Conditions | Typ ^a | Limits | | | | | | Unit |
| | | | | J/SST108 | | J/SST109 | | J/SST110 | | |
| | | | | Min | Max | Min | Max | Min | Max | |
| Static | | | | | | | | | | |
| Gate-Source Breakdown Voltage | $V_{(BR)GSS}$ | $I_G = -1 \mu\text{A}, V_{DS} = 0 \text{V}$ | -32 | -25 | | -25 | | -25 | | V |
| Gate-Source Cutoff Voltage | $V_{GS(off)}$ | $V_{DS} = 5 \text{V}, I_D = 1 \mu\text{A}$ | | -3 | -10 | -2 | -6 | -0.5 | -4 | |
| Saturation Drain Current ^b | I_{DSS} | $V_{DS} = 15 \text{V}, V_{GS} = 0 \text{V}$ | | 80 | | 40 | | 10 | | mA |
| Gate Reverse Current | I_{GSS} | $V_{GS} = -15 \text{V}, V_{DS} = 0 \text{V}$ | -0.01 | | -3 | | -3 | | -3 | nA |
| Gate Operating Current | I_G | $V_{DG} = 10 \text{V}, I_D = 10 \text{mA}$ | -0.01 | | | | | | | |
| Drain Cutoff Current | $I_{D(off)}$ | $V_{DS} = 5 \text{V}, V_{GS} = -10 \text{V}$ | 0.02 | | 3 | | 3 | | 3 | |
| Drain-Source On-Resistance | $r_{DS(on)}$ | $V_{GS} = 0 \text{V}, V_{DS} \leq 0.1 \text{V}$ | | | 8 | | 12 | | 18 | Ω |
| Gate-Source Forward Voltage | $V_{GS(F)}$ | $I_G = 1 \text{mA}, V_{DS} = 0 \text{V}$ | 0.7 | | | | | | | V |
| Dynamic | | | | | | | | | | |
| Common-Source Forward Transconductance | g_{fs} | $V_{DS} = 5 \text{V}, I_D = 10 \text{mA}, f = 1 \text{kHz}$ | 17 | | | | | | | mS |
| Common-Source Output Conductance | g_{os} | | 0.6 | | | | | | | |
| Drain-Source On-Resistance | $r_{ds(on)}$ | $V_{GS} = 0 \text{V}, I_D = 0 \text{mA}, f = 1 \text{kHz}$ | | | 8 | | 12 | | 18 | Ω |
| Common-Source Input Capacitance | C_{iss} | $V_{DS} = 0 \text{V}$ $V_{GS} = 0 \text{V}$ $f = 1 \text{MHz}$ | SST | 60 | | | | | | pF |
| | | | J Series | 60 | | 85 | | 85 | | |
| Common-Source Reverse Transfer Capacitance | C_{rss} | $V_{DS} = 0 \text{V}$ $V_{GS} = -10 \text{V}$ $f = 1 \text{MHz}$ | SST | 11 | | | | | | |
| | | | J Series | 11 | | 15 | | 15 | | |
| Equivalent Input Noise Voltage | \bar{e}_n | $V_{DG} = 5 \text{V}, I_D = 10 \text{mA}$ $f = 1 \text{kHz}$ | 3.5 | | | | | | | nV/ $\sqrt{\text{Hz}}$ |
| Switching | | | | | | | | | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD} = 1.5 \text{V}, V_{GS(H)} = 0 \text{V}$ See Switching Diagram | 3 | | | | | | | ns |
| | t_r | | 1 | | | | | | | |
| Turn-Off Time | $t_{d(off)}$ | | 4 | | | | | | | |
| | t_f | | 18 | | | | | | | |

Notes

a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.

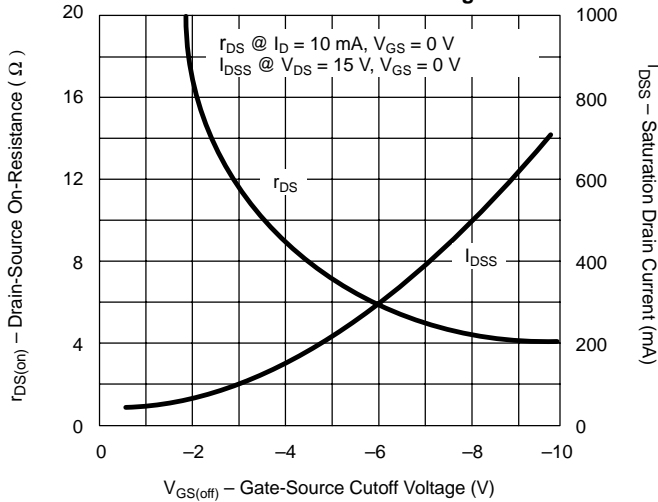
b. Pulse test: $PW \leq 300 \mu\text{s}$ duty cycle $\leq 3\%$.

NIP

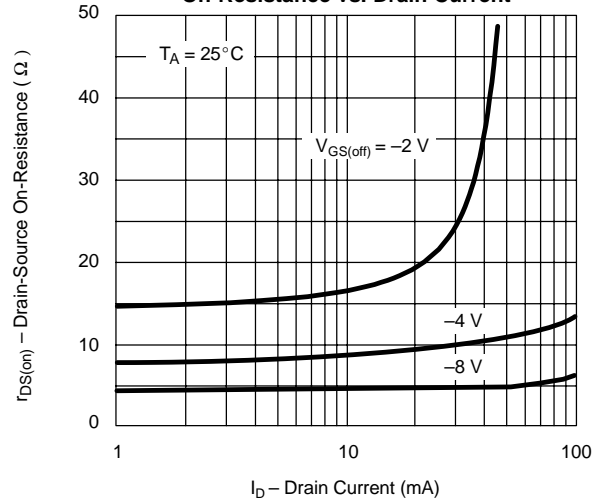


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

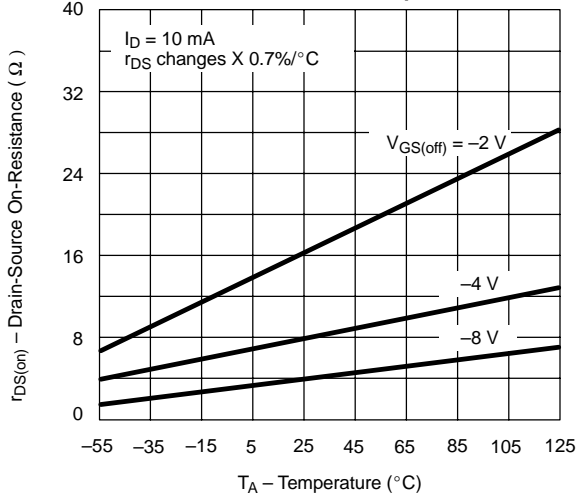
On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage



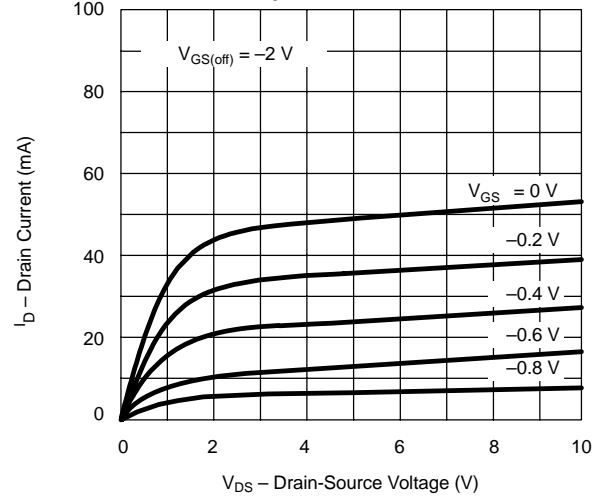
On-Resistance vs. Drain Current



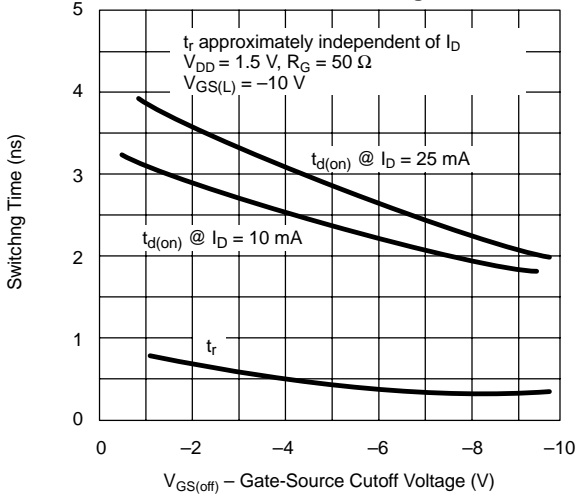
On-Resistance vs. Temperature



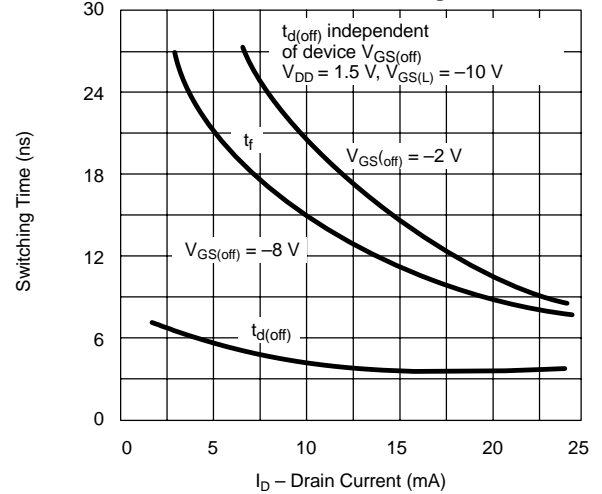
Output Characteristics



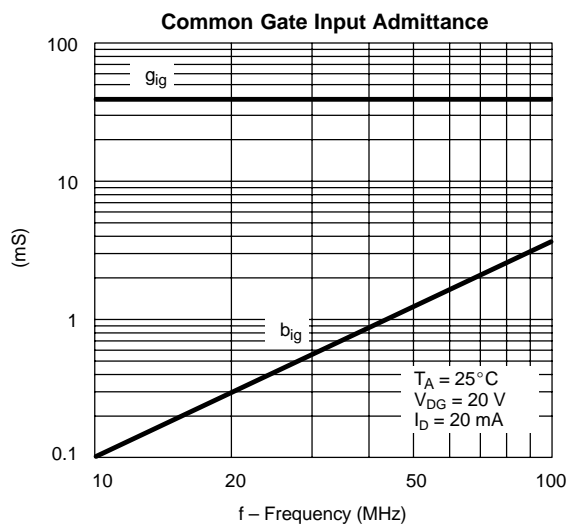
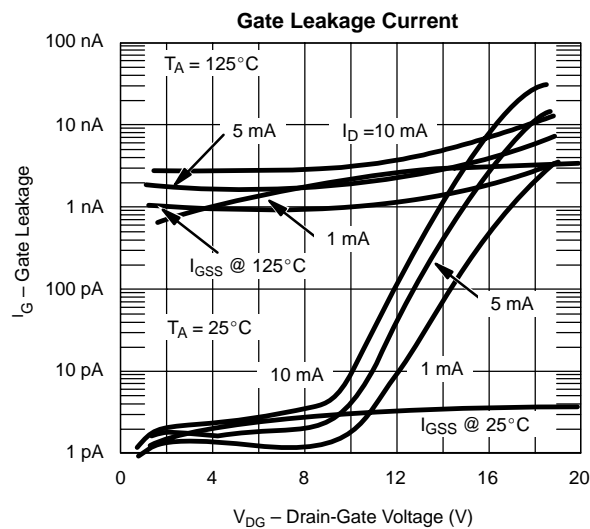
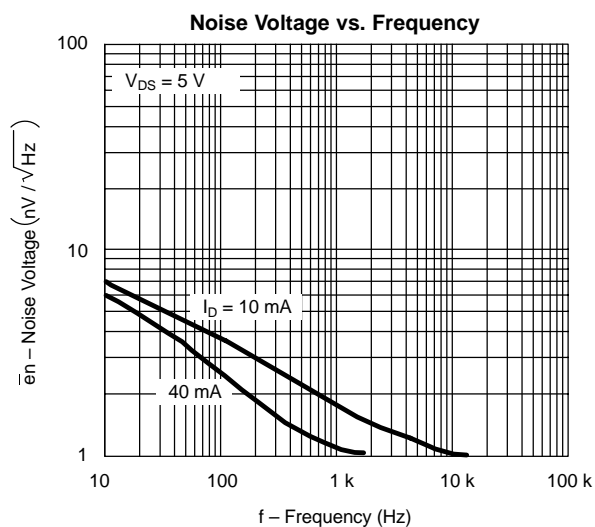
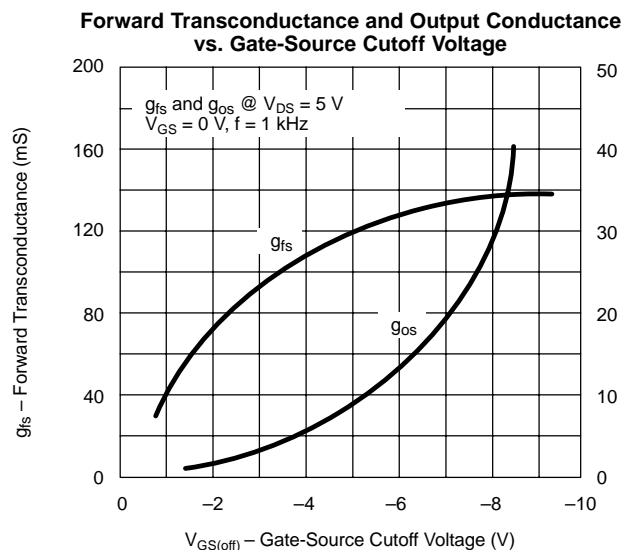
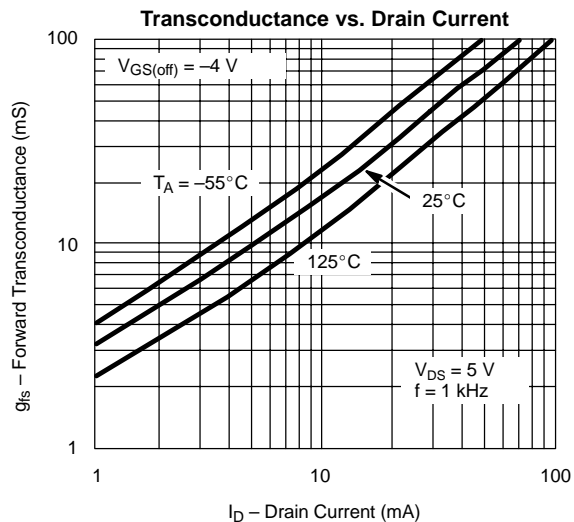
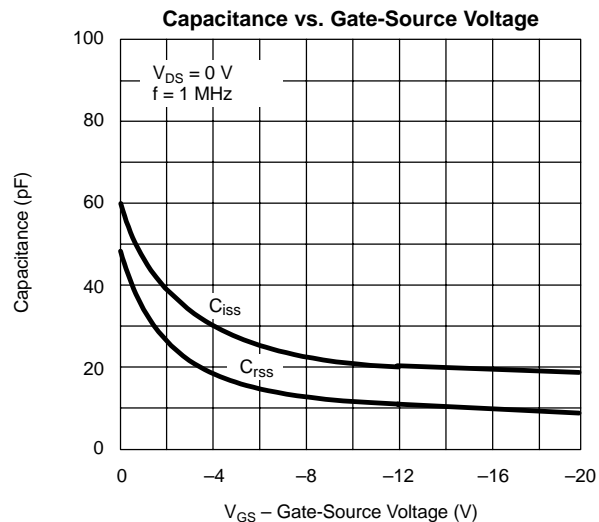
Turn-On Switching



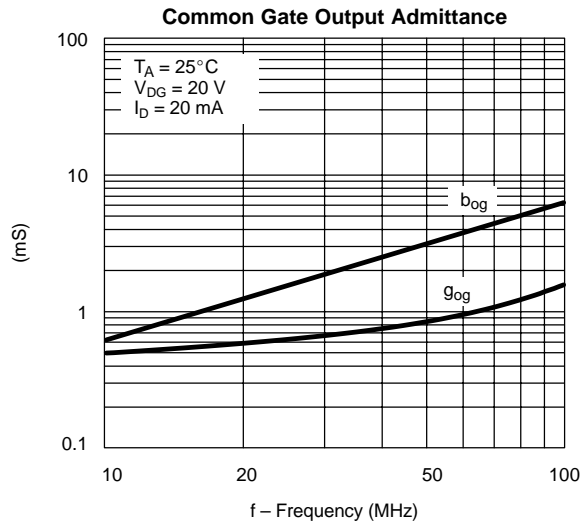
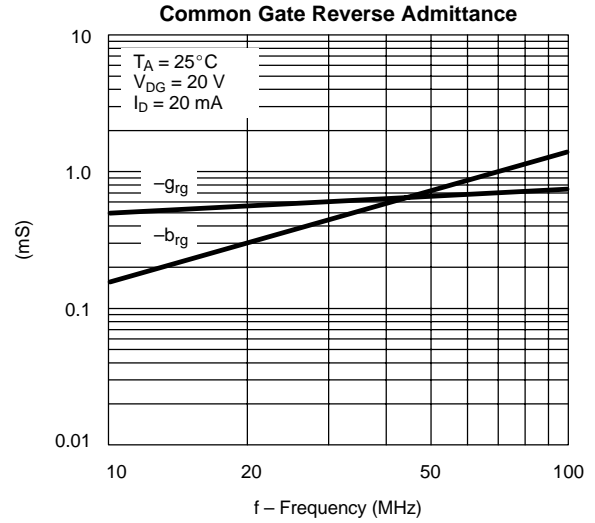
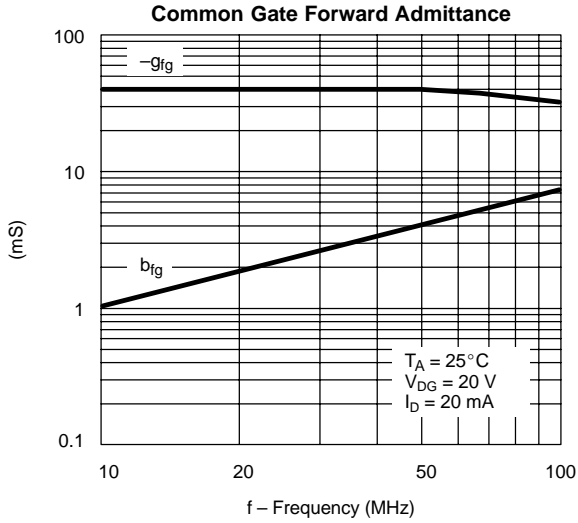
Turn-Off Switching



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



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



| SWITCHING TIME TEST CIRCUIT | | | |
|-----------------------------|----------|----------|----------|
| | J/SST108 | J/SST109 | J/SST110 |
| V _{GS(L)} | -12 V | -7 V | -5 V |
| R _L * | 150 Ω | 150 Ω | 150 Ω |
| I _{D(on)} | 10 mA | 10 mA | 10 mA |

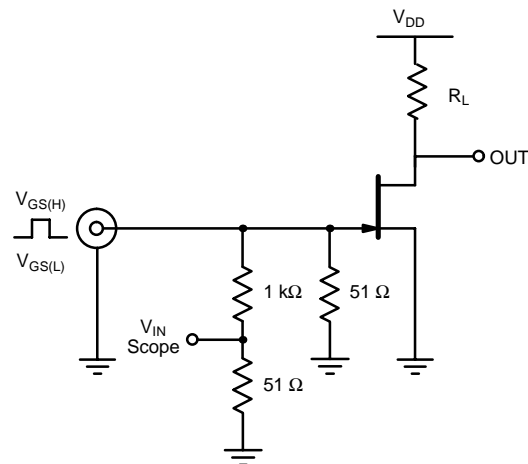
*Non-inductive

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 MΩ
 Input Capacitance 1.5 pF





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