

## N-Channel JFETs

<b>J108</b>	<b>SST108</b>
<b>J109</b>	<b>SST109</b>
<b>J110</b>	<b>SST110</b>

PRODUCT SUMMARY				
Part Number	V <sub>GS(off)</sub> (V)	r <sub>DS(on)</sub> Max (Ω)	I <sub>D(off)</sub> Typ (pA)	t <sub>ON</sub> 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<sub>ON</sub>: 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

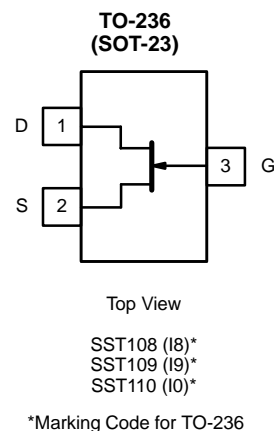
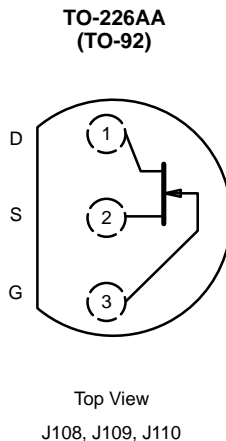
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

### 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<sub>DS(on)</sub> 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 ( <sup>1</sup> / <sub>16</sub> " from case for 10 sec.) .....	300°C
Storage Temperature .....	-55 to 150°C

Operating Junction Temperature .....	-55 to 150°C
Power Dissipation <sup>a</sup> .....	350 mW

Notes

a. Derate 2.8 mW/°C above 25°C

SPECIFICATIONS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)										
Parameter	Symbol	Test Conditions	Typ <sup>a</sup>	Limits						Unit
				J/SST108		J/SST109		J/SST110		
				Min	Max	Min	Max	Min	Max	
<b>Static</b>										
Gate-Source Breakdown Voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> = -1 μA, V <sub>DS</sub> = 0 V	-32	-25		-25		-25		V
Gate-Source Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 1 μA		-3	-10	-2	-6	-0.5	-4	
Saturation Drain Current <sup>b</sup>	I <sub>DSS</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V		80		40		10		mA
Gate Reverse Current	I <sub>GSS</sub>	V <sub>GS</sub> = -15 V, V <sub>DS</sub> = 0 V	-0.01		-3		-3		-3	nA
Gate Operating Current	I <sub>G</sub>	V <sub>DG</sub> = 10 V, I <sub>D</sub> = 10 mA	-0.01							
Drain Cutoff Current	I <sub>D(off)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = -10 V	0.02		3		3		3	
Drain-Source On-Resistance	r <sub>DS(on)</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> ≤ 0.1 V			8		12		18	Ω
Gate-Source Forward Voltage	V <sub>GS(F)</sub>	I <sub>G</sub> = 1 mA, V <sub>DS</sub> = 0 V	0.7							V
<b>Dynamic</b>										
Common-Source Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 10 mA, f = 1 kHz	17							mS
Common-Source Output Conductance	g <sub>os</sub>		0.6							
Drain-Source On-Resistance	r <sub>ds(on)</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 0 mA, f = 1 kHz			8		12		18	Ω
Common-Source Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 0 V V <sub>GS</sub> = 0 V f = 1 MHz	SST	60						pF
			J Series	60		85		85		
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> = 0 V V <sub>GS</sub> = -10 V f = 1 MHz	SST	11						
			J Series	11		15		15		
Equivalent Input Noise Voltage	e <sub>n</sub>	V <sub>DG</sub> = 5 V, I <sub>D</sub> = 10 mA f = 1 kHz	3.5							nV/ √Hz
<b>Switching</b>										
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 1.5 V, V <sub>GS(H)</sub> = 0 V See Switching Diagram	3							ns
	t <sub>r</sub>		1							
Turn-Off Time	t <sub>d(off)</sub>		4							
	t <sub>f</sub>		18							

Notes

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

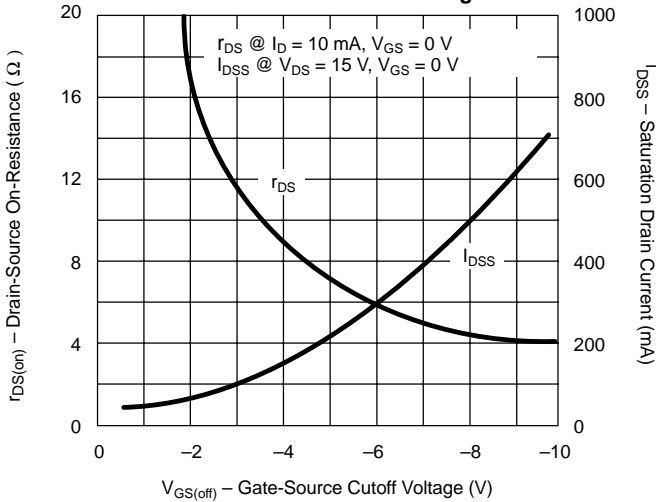
b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.

NIP

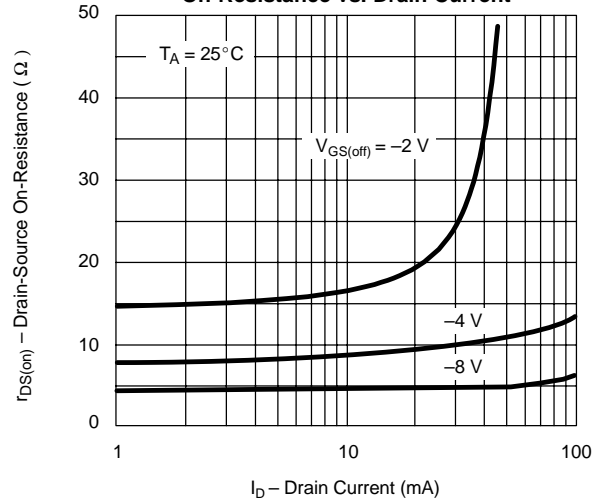


**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)**

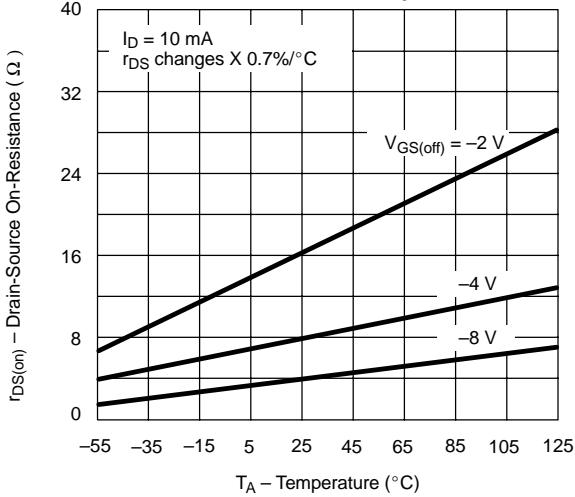
**On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage**



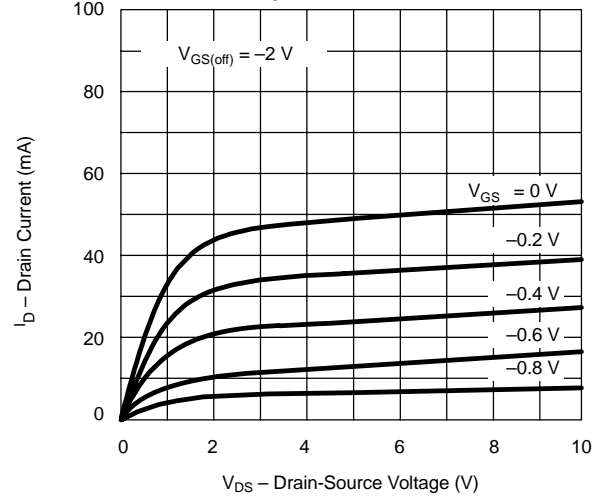
**On-Resistance vs. Drain Current**



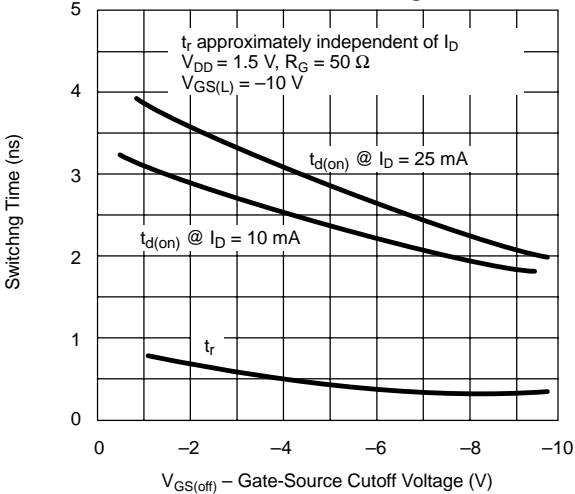
**On-Resistance vs. Temperature**



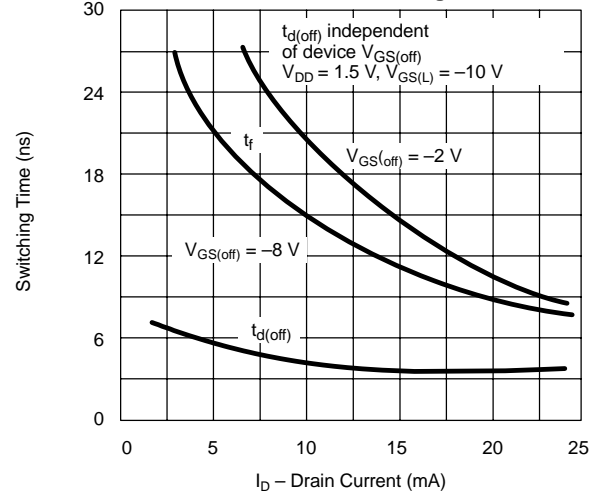
**Output Characteristics**



**Turn-On Switching**

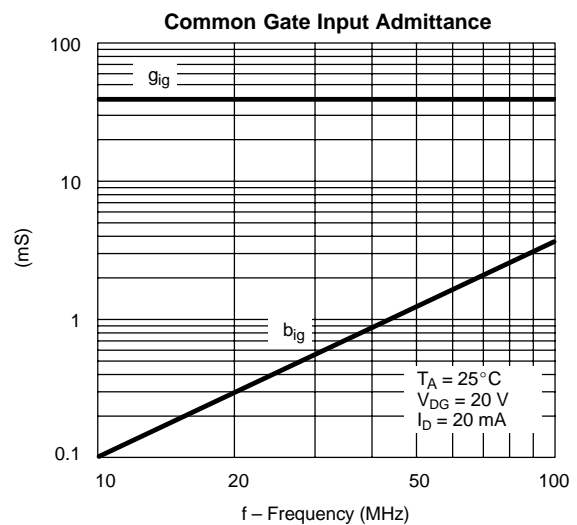
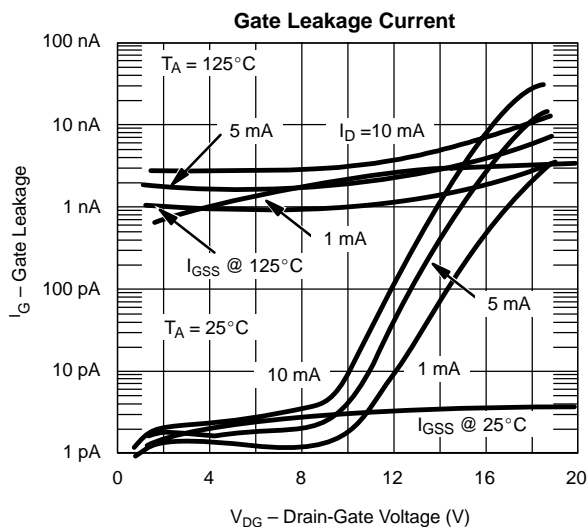
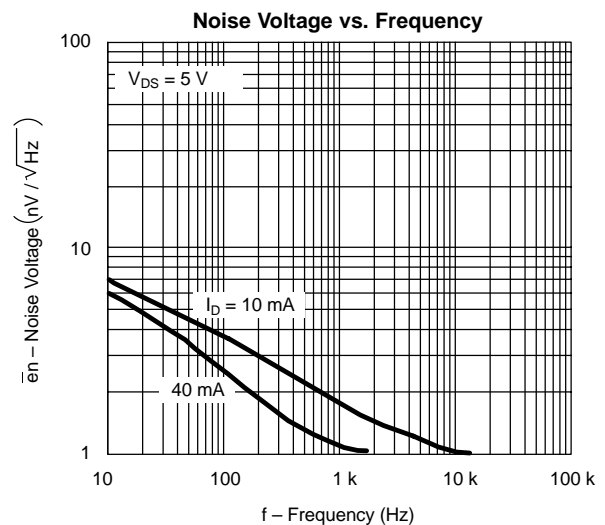
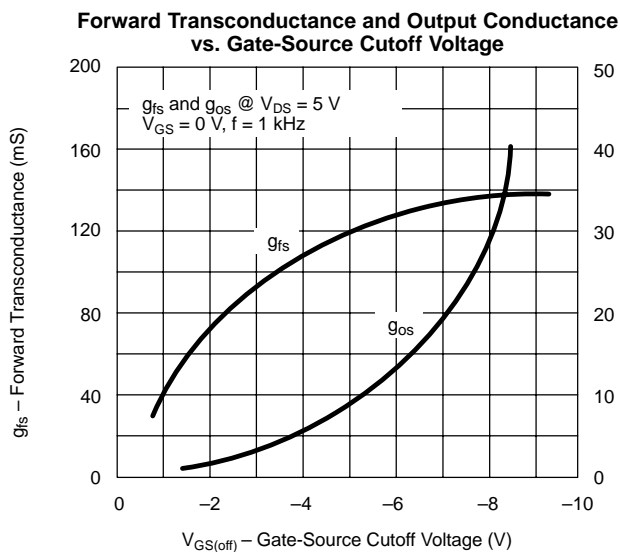
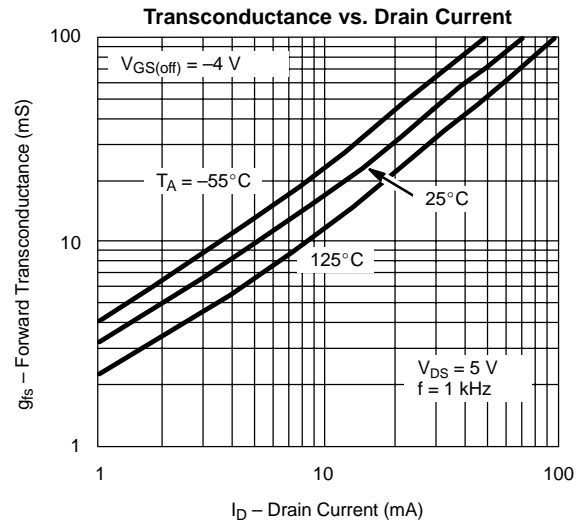
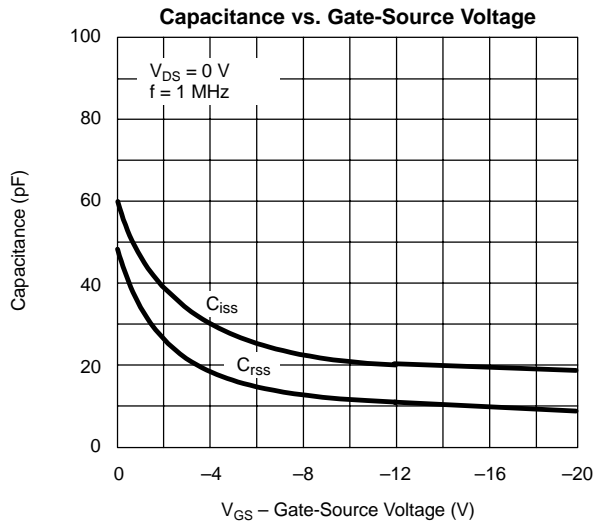


**Turn-Off Switching**



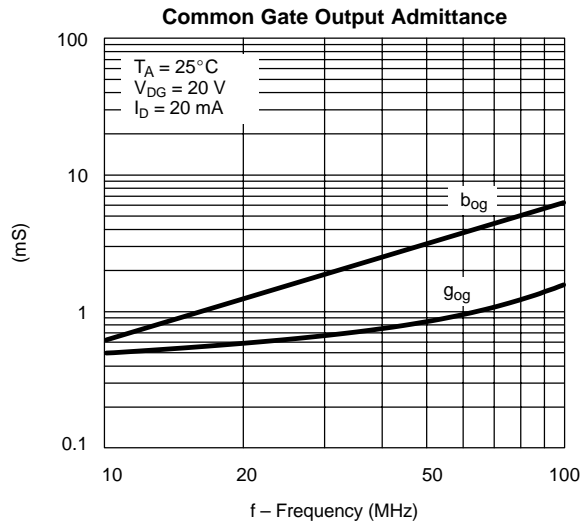
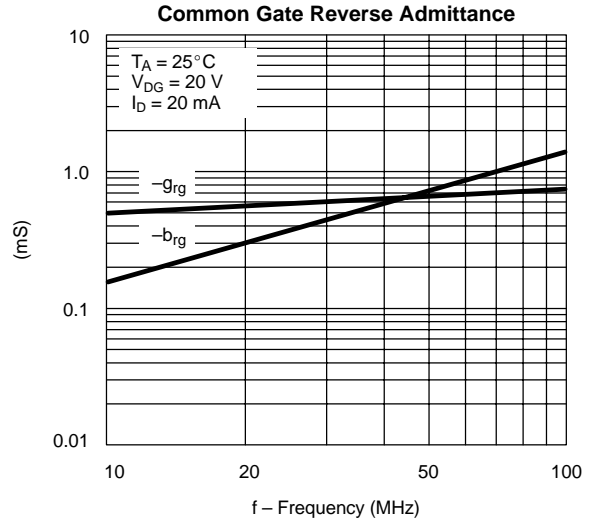
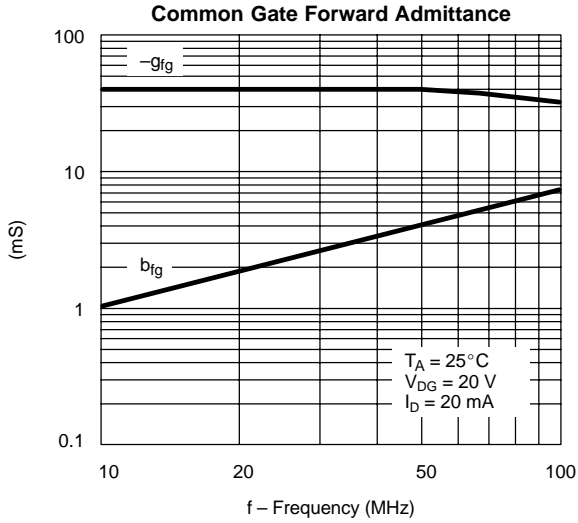


### TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)





**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)**



<b>SWITCHING TIME TEST CIRCUIT</b>			
	<b>J/SST108</b>	<b>J/SST109</b>	<b>J/SST110</b>
V <sub>GS(L)</sub>	-12 V	-7 V	-5 V
R <sub>L</sub> *	150 Ω	150 Ω	150 Ω
I <sub>D(on)</sub>	10 mA	10 mA	10 mA

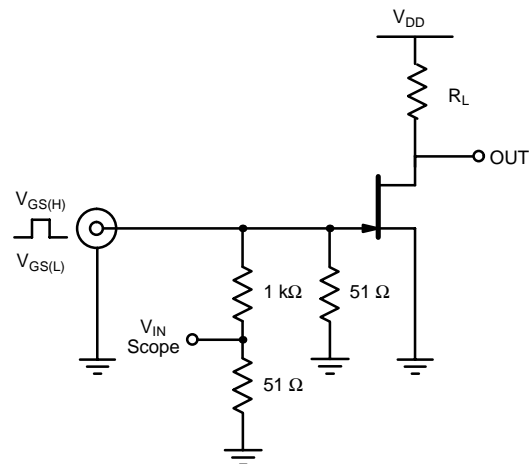
\*Non-inductive

**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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