

## 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

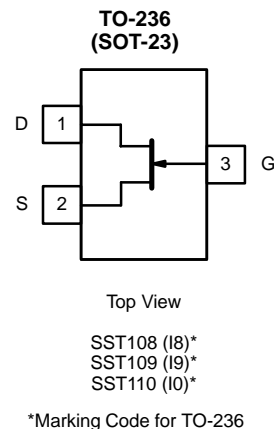
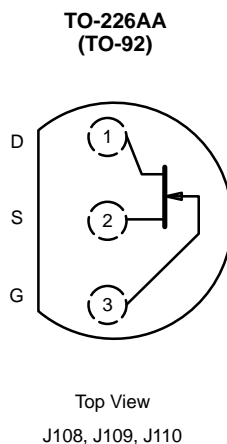
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

### 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 ( $1/16''$  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 ( $T_A = 25^\circ\text{C}$ 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	$V_{(BR)GSS}$	$I_G = -1 \mu\text{A}, V_{DS} = 0 \text{V}$	-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 <sup>b</sup>	$I_{DSS}$	$V_{DS} = 15 \text{V}, V_{GS} = 0 \text{V}$		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	$\Omega$
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 1 \text{mA}, V_{DS} = 0 \text{V}$	0.7							V
<b>Dynamic</b>										
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	$\Omega$
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/ $\sqrt{\text{Hz}}$
<b>Switching</b>										
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

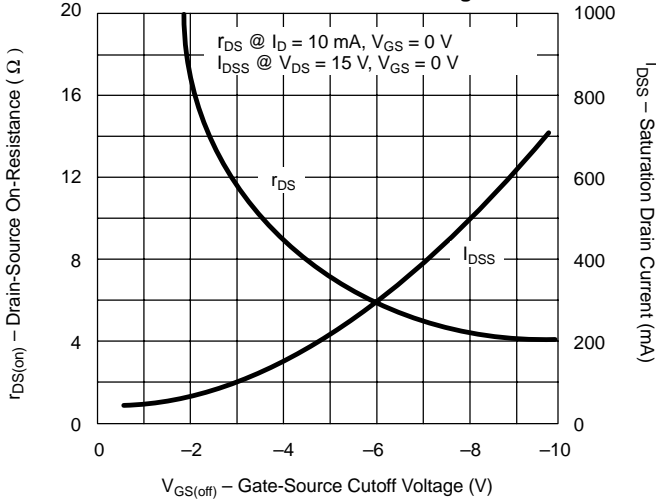
- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.  
 b. Pulse test:  $PW \leq 300 \mu\text{s}$  duty cycle  $\leq 3\%$ .

NIP

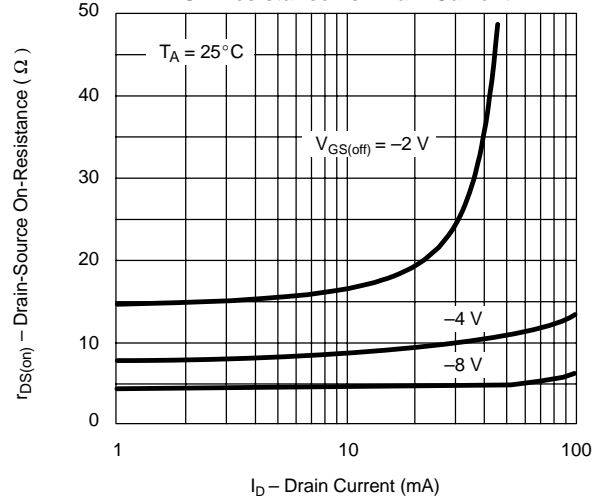


**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)**

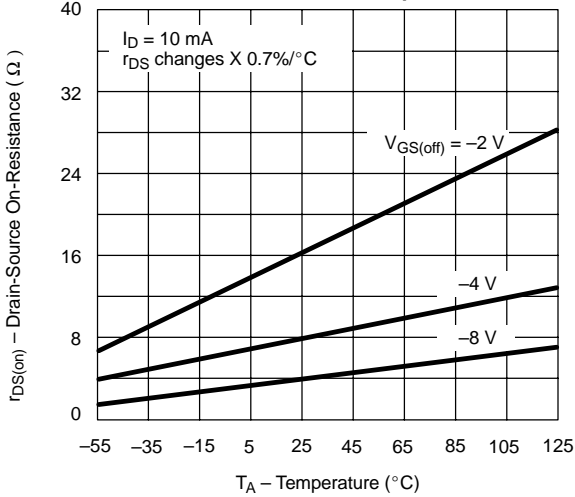
**On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage**



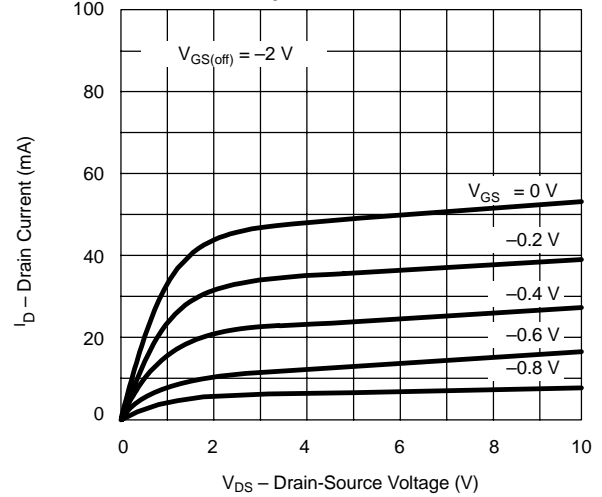
**On-Resistance vs. Drain Current**



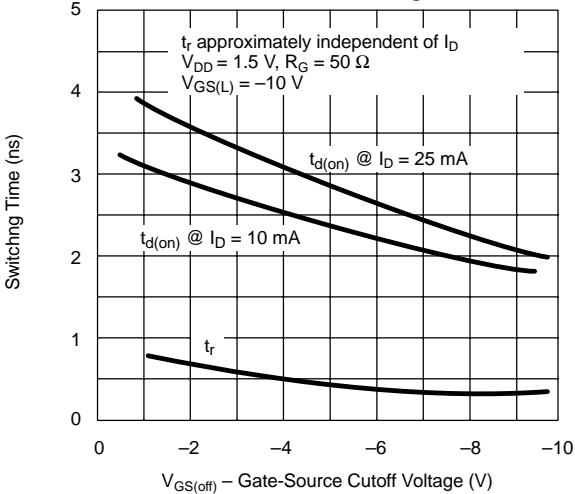
**On-Resistance vs. Temperature**



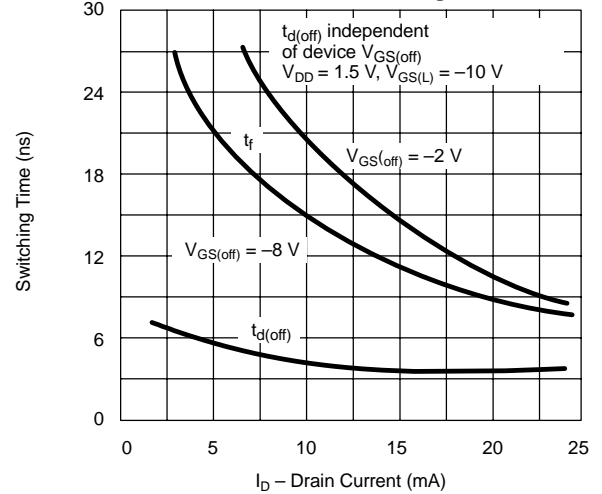
**Output Characteristics**



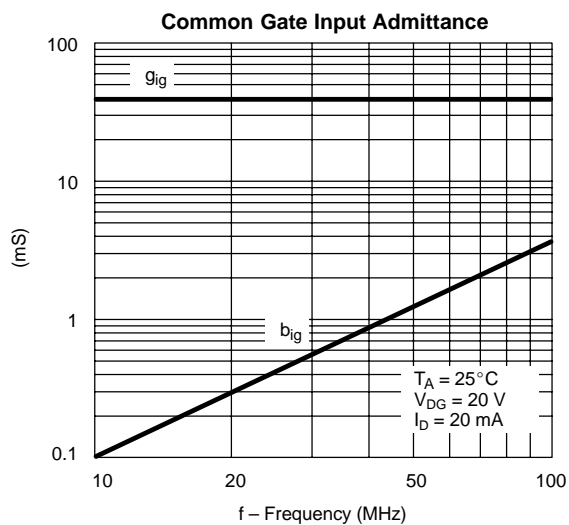
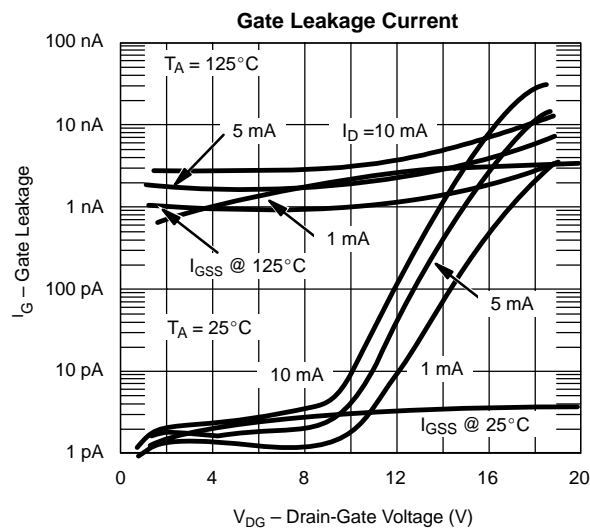
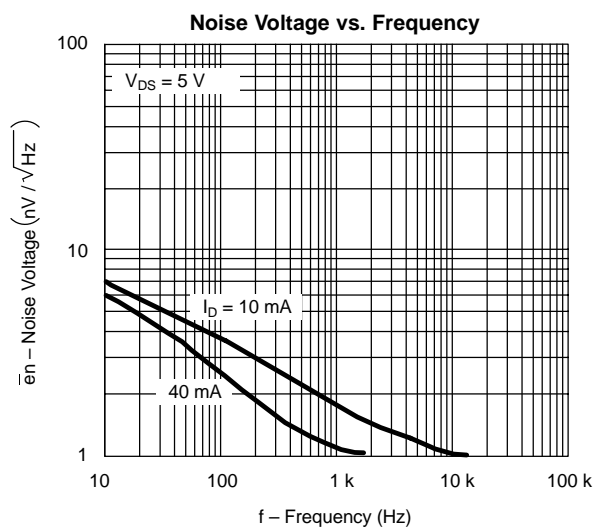
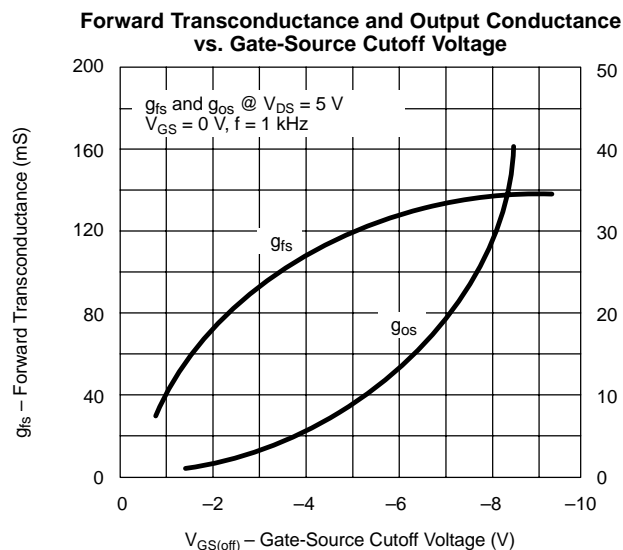
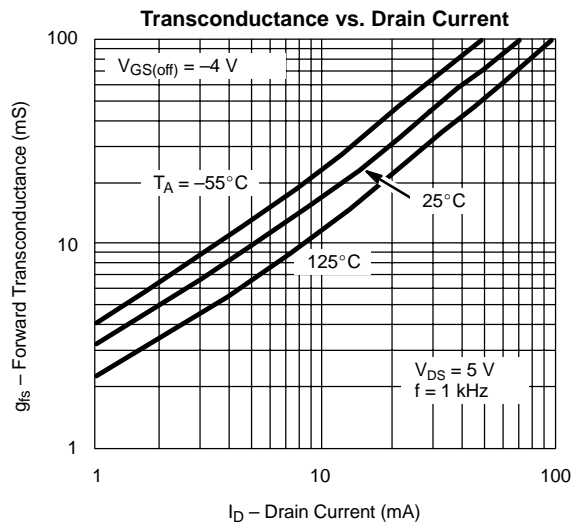
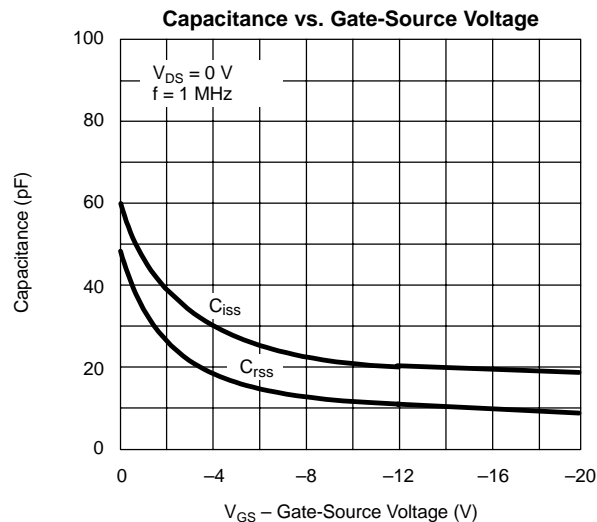
**Turn-On Switching**



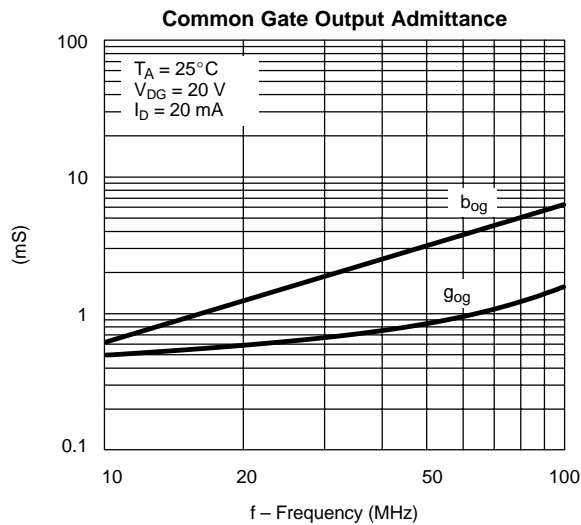
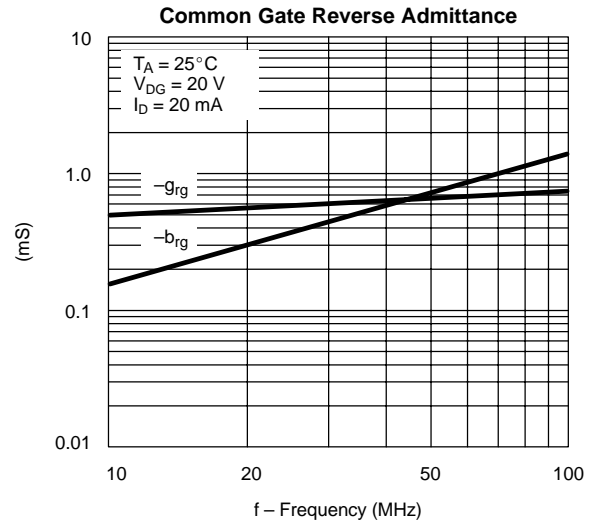
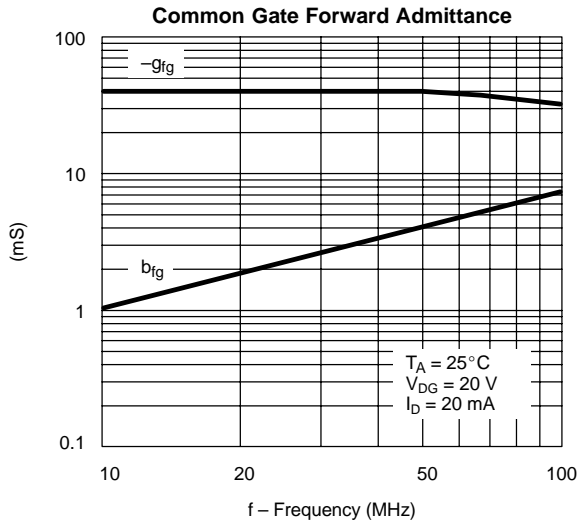
**Turn-Off Switching**



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



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



SWITCHING TIME TEST CIRCUIT			
	J/SST108	J/SST109	J/SST110
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

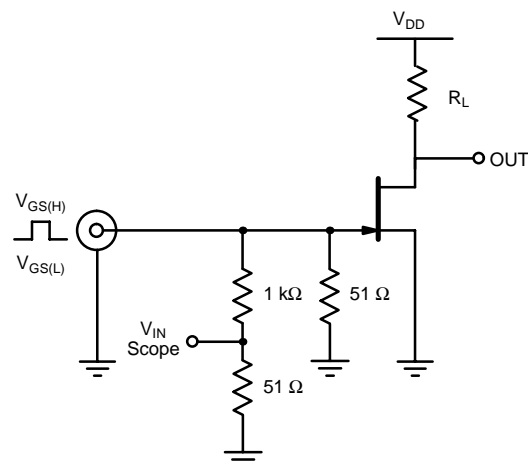
\*Non-inductive

**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





## Disclaimer

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