J/SST108 Series

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

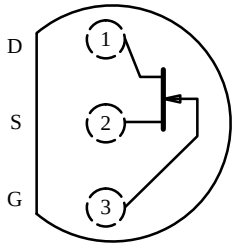
Description

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.

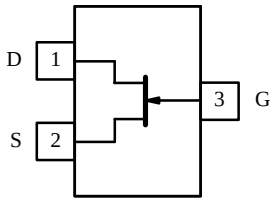
TO-226AA
(TO-92)



Top View

J108, J109, J110

TO-236
(SOT-23)



Top View

SST108 (I8)*
SST109 (I9)*
SST110 (I0)*

*Marking Code for TO-236

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70231.

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[a]

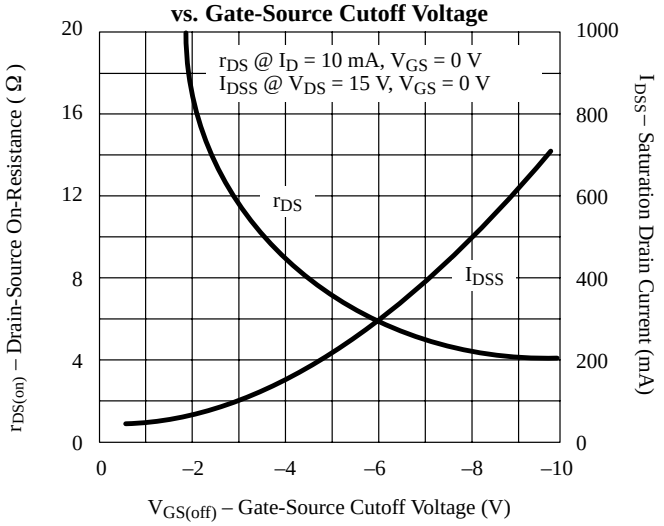
Parameter	Symbol	Test Conditions	Typ[b]	Limits J/SST108 Min	J/SST108 Max	J/SST109 Min	J/SST109 Max	J/SST110 Min	J/SST110 Max	Unit
Static										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = –1 µA , V_{DS} = 0 V	–32	–25		–25		–25		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 5 V, I_D = 1 µA		–3	–10	–2	–6	–0.5	–4	
Saturation Drain Current[c]	I_{DSS}	V_{DS} = 15 V, V_{GS} = 0 V		80		40		10		mA
Gate Reverse Current	I_{GSS}	V_{GS} = –15 V, V_{DS} = 0 V	–0.01		–3		–3		–3	nA
		T_A = 125°C	–5							
Gate Operating Current	I_G	V_{DG} = 10 V, I_D = 10 mA	–0.01							
Drain Cutoff Current	$I_{D(off)}$	V_{DS} = 5 V, V_{GS} = –10 V	0.02		3		3		3	
		T_A = 125°C	1.0							
Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS} = 0 V, V_{DS} ≤ 0.1 V			8		12		18	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} = 5 V, I_D = 10 mA, f = 1 kHz	17							mS
Common-Source Output Conductance	g_{os}		0.6							
Drain-Source On-Resistance	$r_{ds(on)}$	V_{GS} = 0 V, I_D = 0 mA , f = 1 kHz			8		12		18	Ω
Common-Source Input Capacitance	C_{iss}	V_{DS} = 0 V, V_{GS} = 0 V, f = 1 MHz — SST	60							pF
		J Series	60		85		85		85	
Common-Source Reverse Transfer Capacitance	C_{rss}	V_{DS} = 0 V, V_{GS} = –10 V, f = 1 MHz — SST	11							
		J Series	11		15		15		15	
Equivalent Input Noise Voltage	$\bar{e}_n$	V_{DG} = 5 V, I_D = 10 mA, f = 1 kHz	3.5							$nV/\sqrt{Hz}$
Switching										
Turn-On Time	$t_{d(on)}$	V_{DD} = 1.5 V, $V_{GS(H)}$ = 0 V, See Switching Diagram	3							ns
	t_r		1							
Turn-Off Time	$t_{d(off)}$		4							
	t_f		18							

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%.

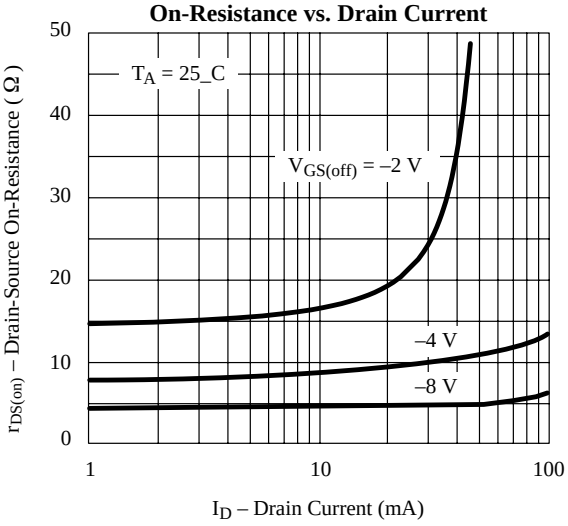
NIP

Typical Characteristics

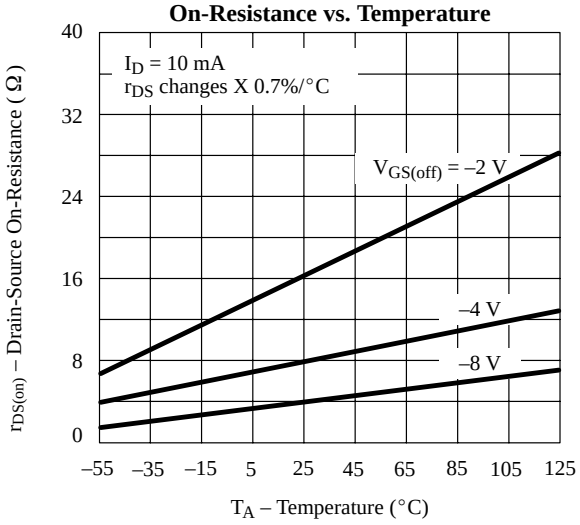
On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage



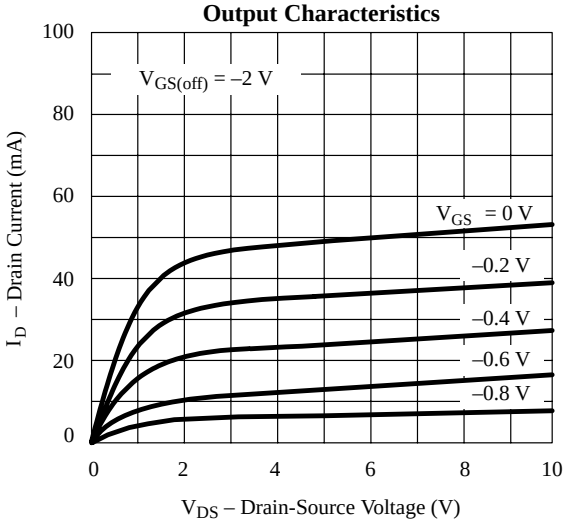
On-Resistance vs. Drain Current



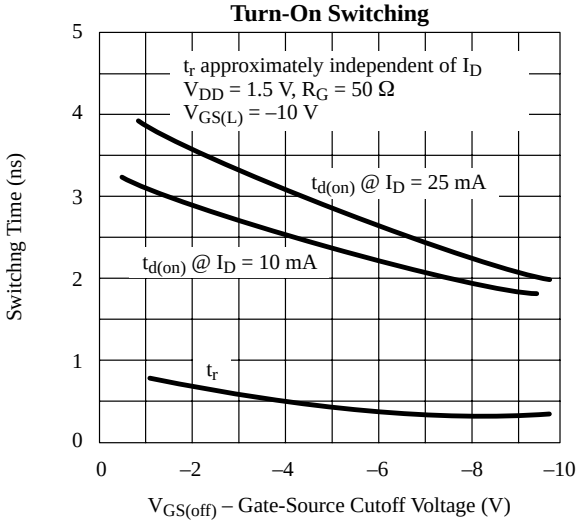
On-Resistance vs. Temperature



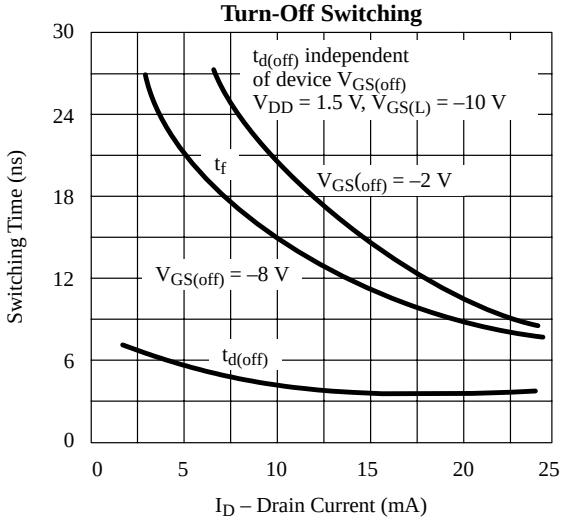
Output Characteristics



Turn-On Switching

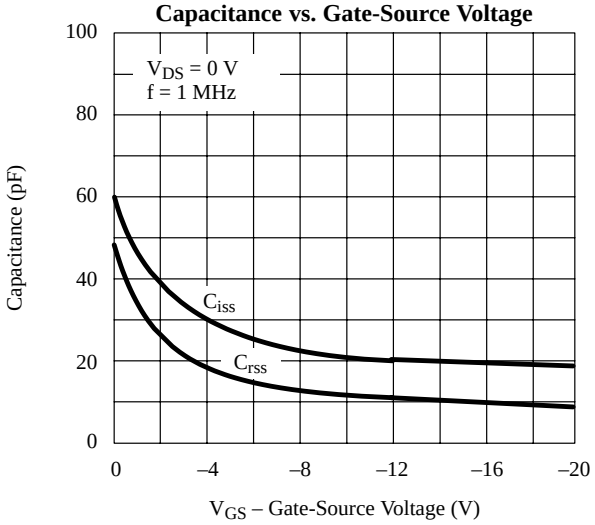


Turn-Off Switching

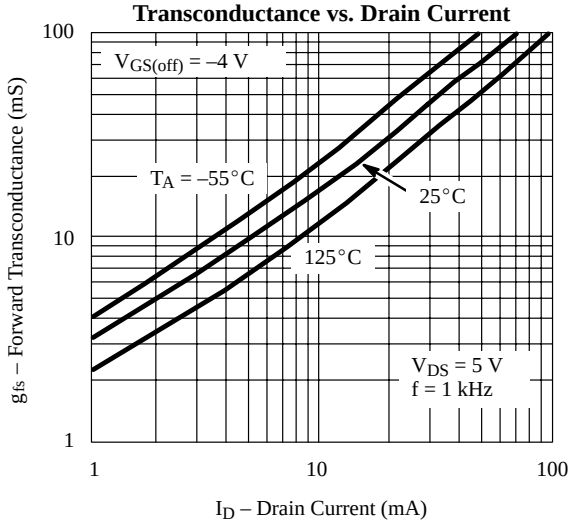


Typical Characteristics (Cont'd)

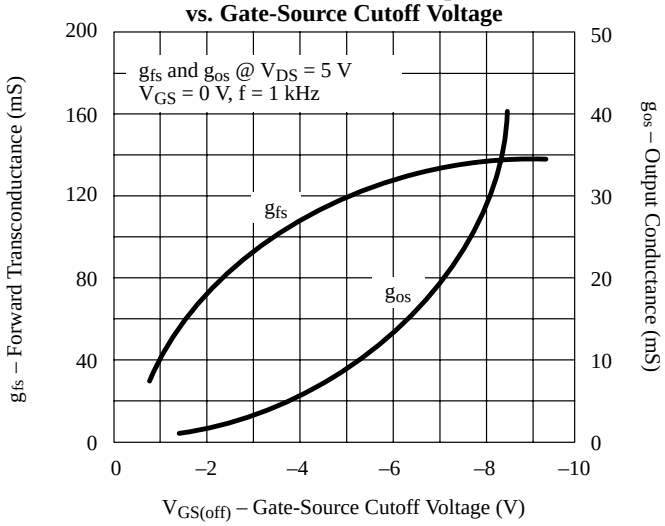
Capacitance vs. Gate-Source Voltage



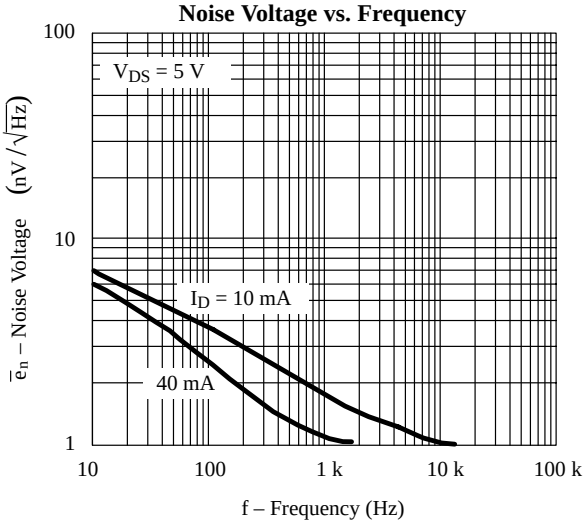
Transconductance vs. Drain Current



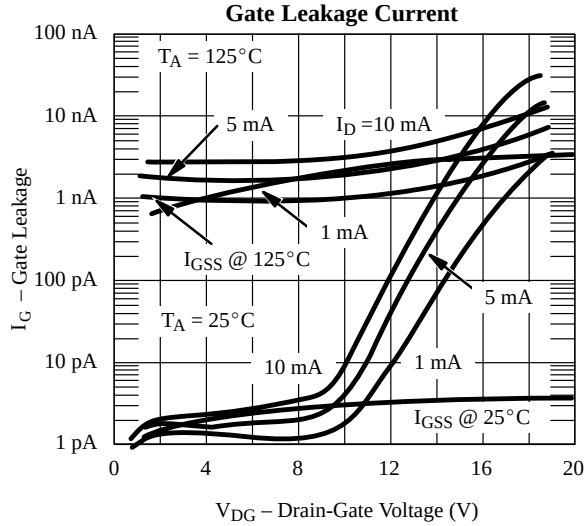
Forward Transconductance and Output Conductance vs. Gate-Source Cutoff Voltage



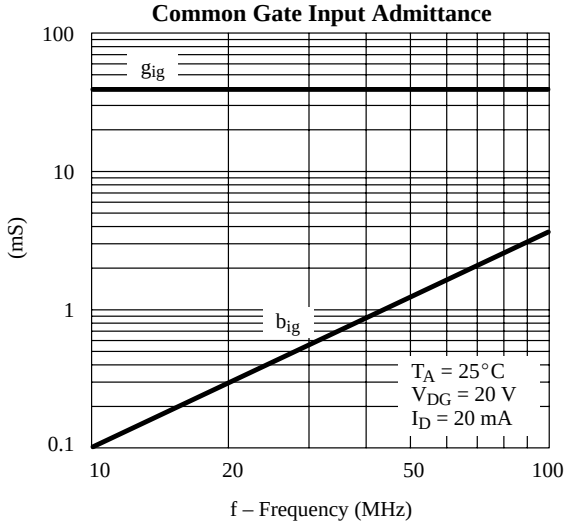
Noise Voltage vs. Frequency



Gate Leakage Current

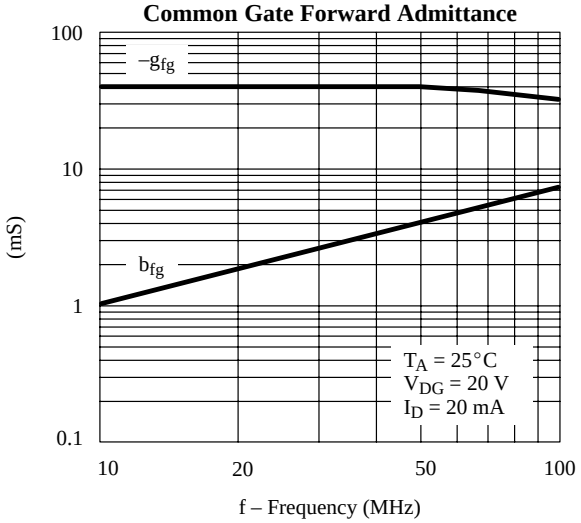


Common Gate Input Admittance

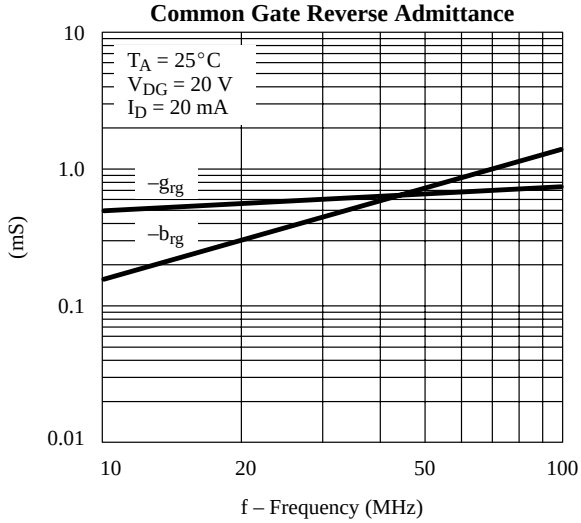


Typical Characteristics (Cont'd)

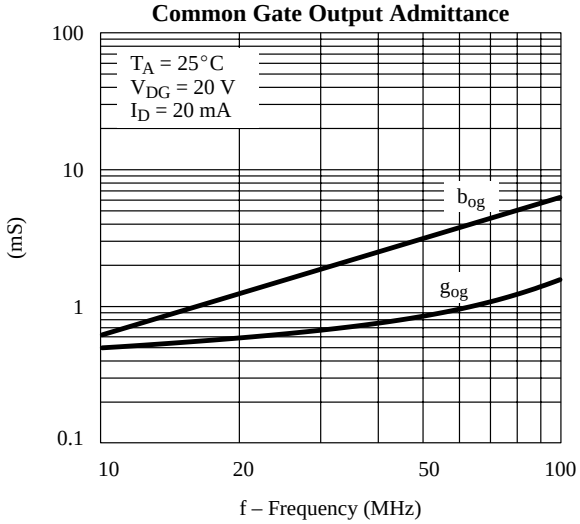
Common Gate Forward Admittance



Common Gate Reverse Admittance



Common Gate Output Admittance



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