TEMIC

Siliconix

J/SST111 Series

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

J/SST111, For applications information see AN105, page 22.

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

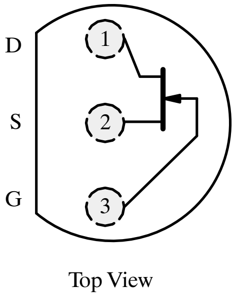
Description

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.

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).

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.

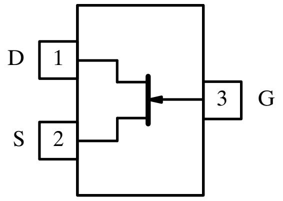
TO-226AA (TO-92)



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

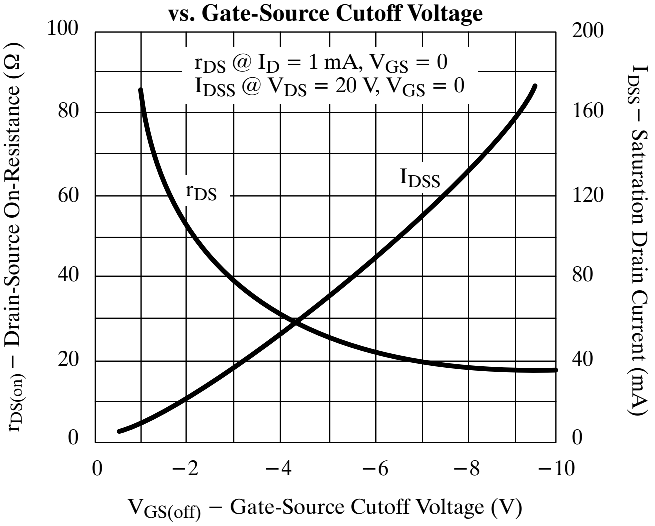
Notes
a. Derate 2.8 mW/°C above 25°C

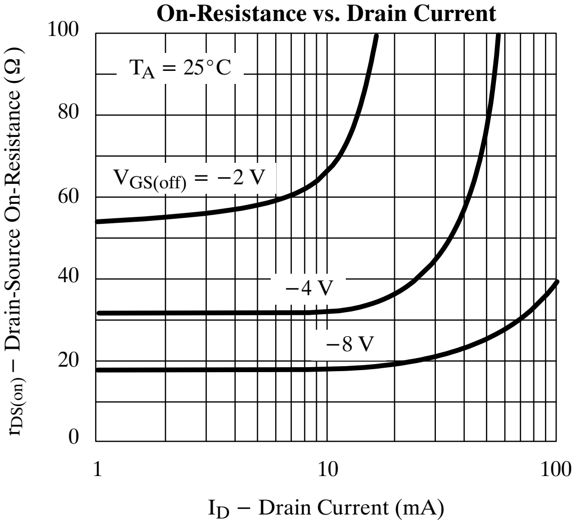
Specifications[a]

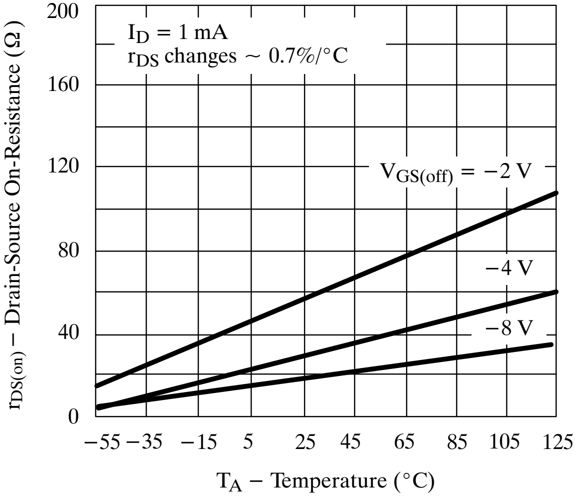
Parameter	Symbol	Test Conditions	Typ[b]	Limits						Unit
				J/SST111		J/SST112		J/SST113		
				Min	Max	Min	Max	Min	Max	
Static										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1\ \mu A$, $V_{DS} = 0$ V	−55	−35		−35		−35		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 5$ V, $I_D = 1\ \mu A$		−3	−10	−1	−5		−3	
Saturation Drain Current[c]	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	$\bar{e}_n$	$V_{DG} = 10$ V, $I_D = 1$ mA f = 1 kHz	3							nV/ $\sqrt{Hz}$
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							

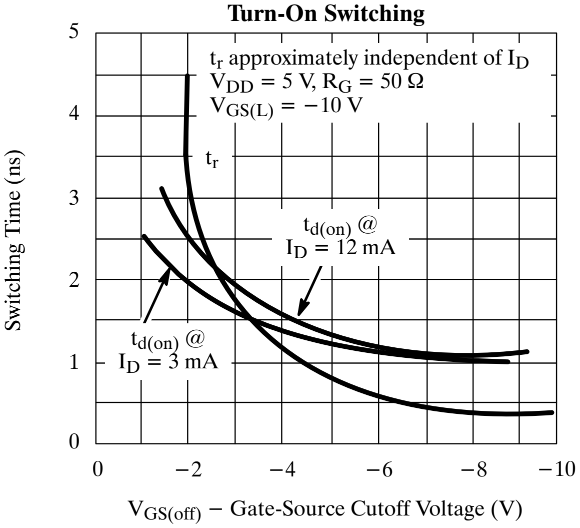
Notes
a. $T_A = 25°C$ unless otherwise noted. NCB
b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 3%.

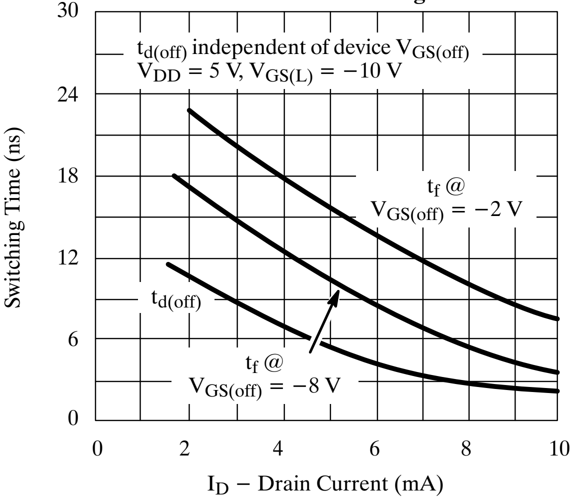
Typical Characteristics

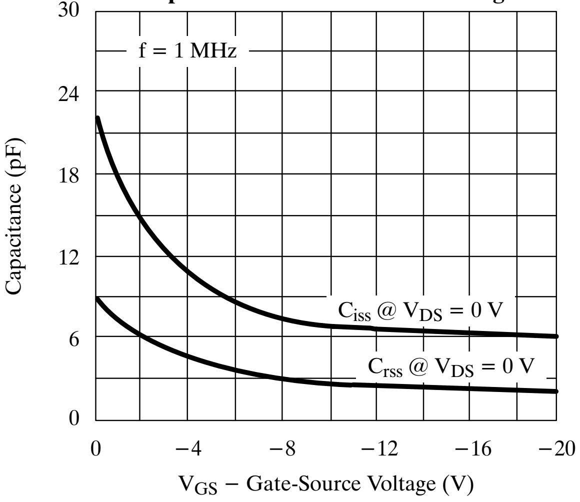

On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage


On-Resistance vs. Drain Current

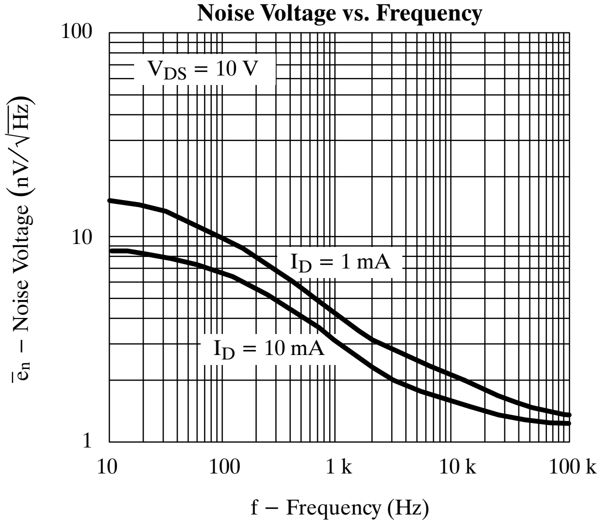

On-Resistance vs. Temperature


Turn-On Switching

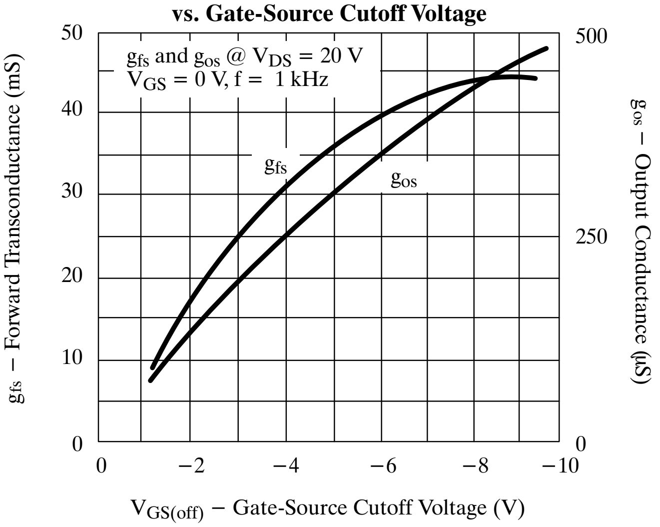

Turn-Off Switching


Capacitance vs. Gate-Source Voltage

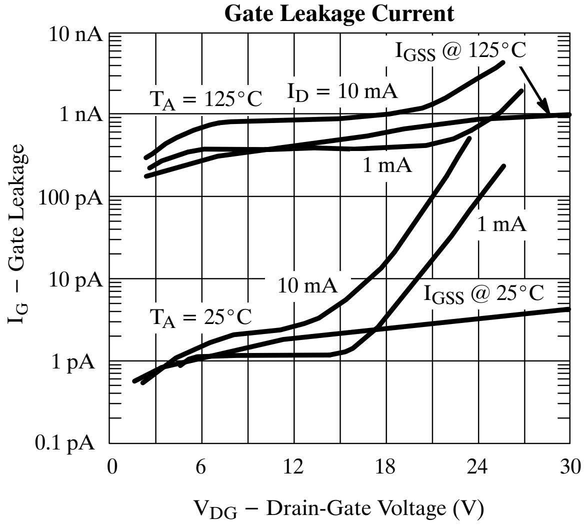
Typical Characteristics (Cont'd)



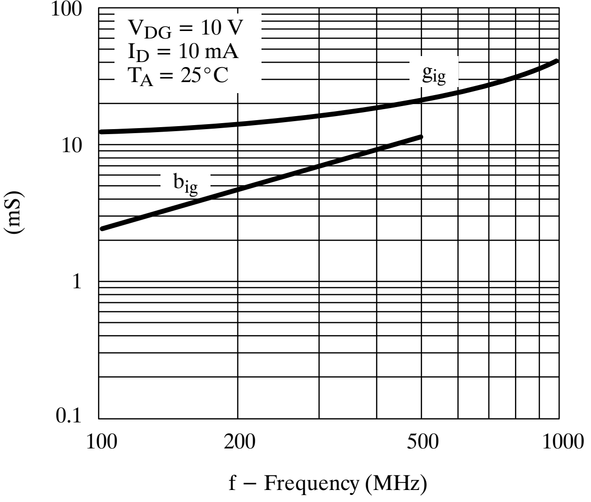
Noise Voltage vs. Frequency



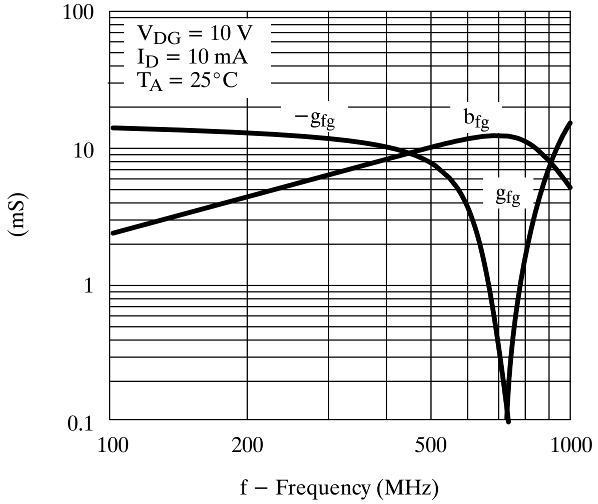
Forward Transconductance and Output Conductance vs. Gate-Source Cutoff Voltage



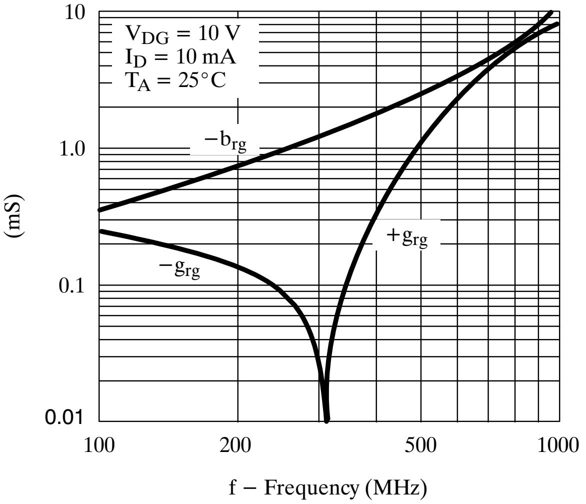
Gate Leakage Current



Common-Gate Input Admittance



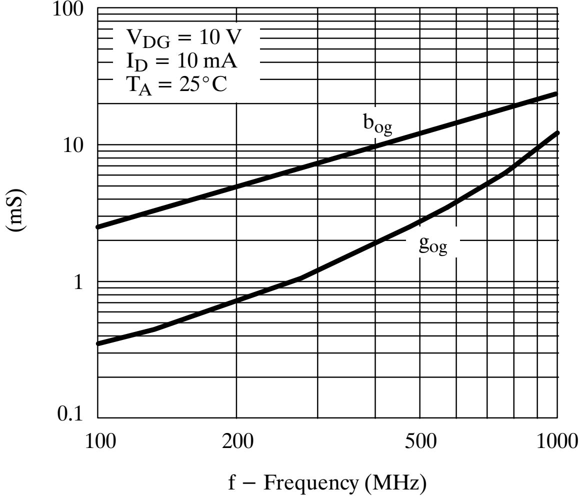
Common-Gate Forward Admittance



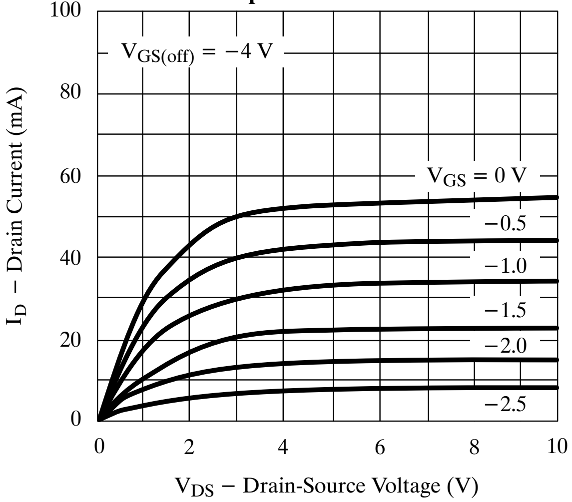
Common-Gate Reverse Admittance

Typical Characteristics (Cont'd)

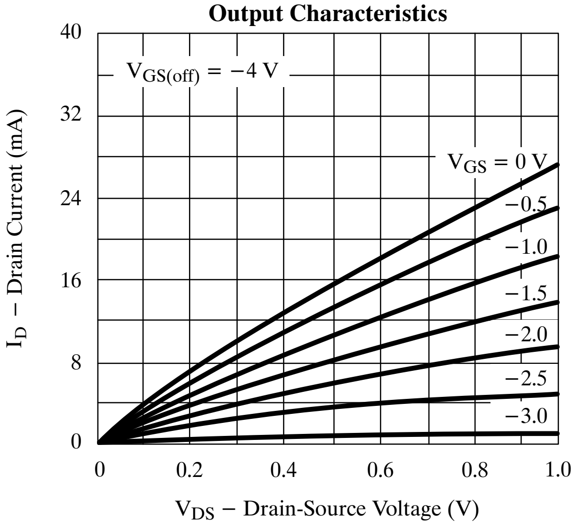
Common-Gate Output Admittance



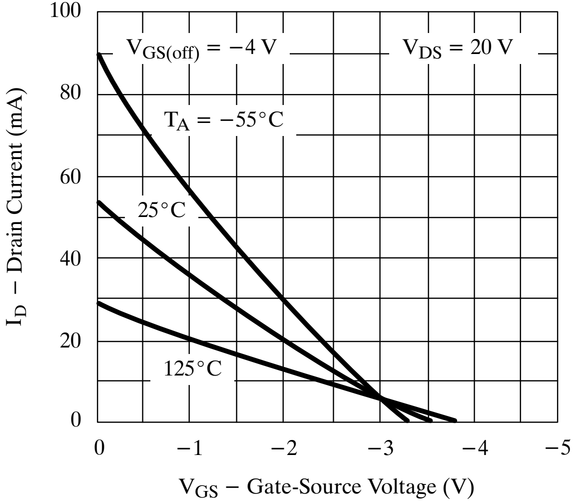
Output Characteristics



Output Characteristics



Transfer Characteristics



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 MΩ
Input Capacitance 1.5 pF