



N-Channel JFET with Built-In Self-Biased Diodes

PRODUCT SUMMARY			
$V_{GS(off)}$ (V)	$V_{(BR)DSS}$ Min (V)	g_{fs} Min (mS)	I_{DSS} Max (mA)
-0.3 to -1.2	-15	1	1.1

FEATURES

- High Gain
- Built-In Diodes
- $V_{GS(off)}$ Max -1.2 V

BENEFITS

- Full Performance from Low Voltage
- Power Supply: As Low As 1.2 V
- Low Signal Loss/System Error
- High Quality, Low Level Signal Amplification

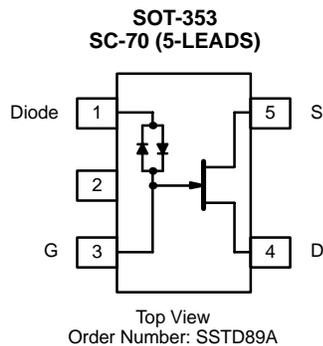
APPLICATIONS

- Hearing Aids, Mini Microphones
- High-Gain/Low-Noise Amplifiers
- Low-Current/Low-Voltage Battery Powered Amplifiers
- Infrared Detector Amplifiers
- Ultra-High Input Impedance Pre-Amplifiers

DESCRIPTION

The SSTD89A n-channel JFET features built-in self-biased diodes and is designed to provide low voltage, low noise and low cut-off voltage. It can be used with power supplies as low as 1.2 V. The SSTD89A is ideal for use in low current amplifier, hearing aid and mini-microphone applications.

The SSTD89A is available in the SC-70 (SOT-353), 5-lead package.



ABSOLUTE MAXIMUM RATINGS (ALL VOLTAGES REFERENCED TO GND = 0 V)

Gate-Drain	-15 V	Operating Temperature	-55 to 150°C
Gate-Source Voltage	-15 V	Power Dissipation ^a	
Gate Current	10 mA	SOT-353	250 mW
Storage Temperature	-55 to 150°C	Notes	
		a. Device mounted with all leads soldered or welded to PC board.	

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Min	Typ ^a	Max	Unit
Static						
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$V_{GS} = 0\text{ V}, I_G = 1\ \mu\text{A}$	-15	-21		V
Gate-Source Cut-Off Voltage	$V_{GS(off)}$	$V_{DS} = 10\text{ V}, I_D = 100\text{ nA}$	-0.3		-1.2	
Saturation Current	I_{DSS}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}$			1.1	mA
Operating Current	$I_{D(op)}$	See Figure 1	10		50	μA
Gate-Reverse Current	I_{GSS}	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$		5	100	pA
Drain Cut-Off Current ^b	$I_{D(off)}$	$V_{DS} = 15\text{ V}, V_{GS} = -5\text{ V}$		2		
Diode Forward Transconductance	V_F	$I_F = 1\text{ mA}$	0.5	0.7		V
Gate-Source Forward Voltage	$V_{GS(F)}$	$V_{DS} = 0\text{ V}, I_G = 1\text{ mA}$		0.7		
Dynamic						
Common-Source Forward Transconductance	g_{fs}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	0.7	1.5		mS
Common-Source Input Capacitance	C_{iss}	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		3.8		
Common-Source Reverse Transfer Capacitance	C_{rss}				2.1	pF
Equivalent Input Noise Voltage	e_n	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		5		NV/s qrt (Hz)

Notes

- a. For DESIGN AID ONLY, not subject to production testing.
- b. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.
- c. Switching time is essentially independent of operating temperature.

OPERATING CURRENT TEST CIRCUIT

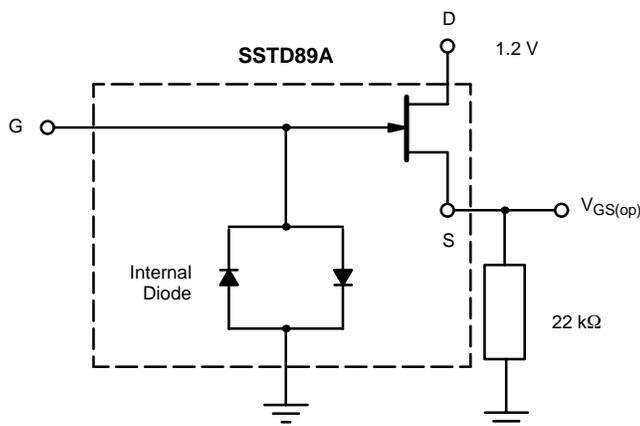
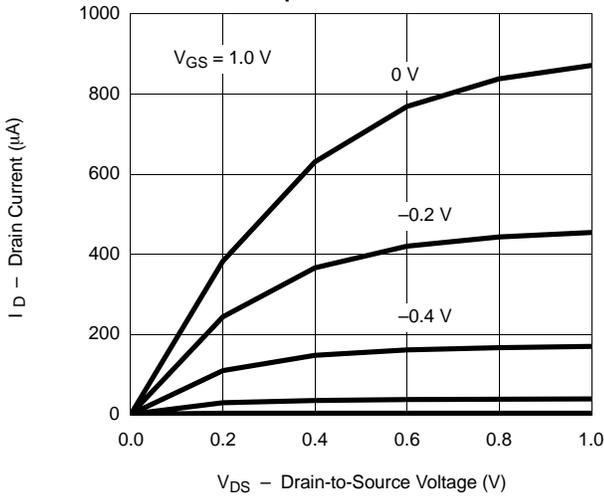


Figure 1.

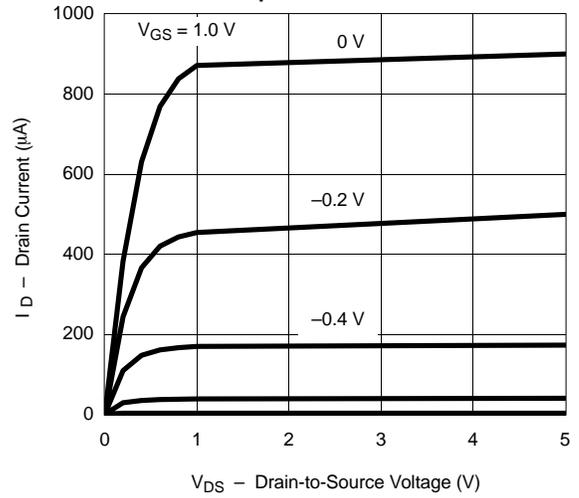


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

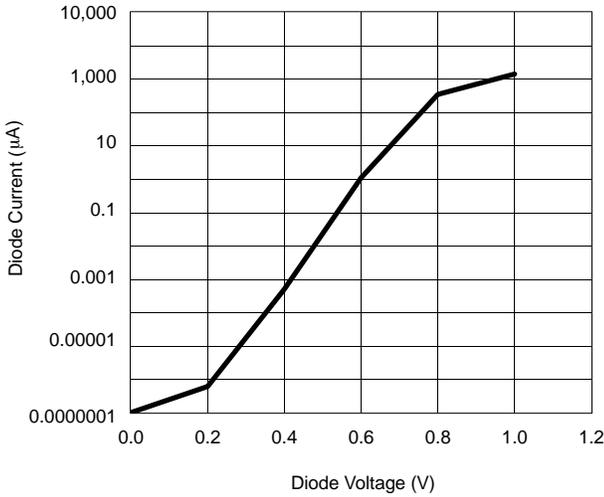
Output Characteristics



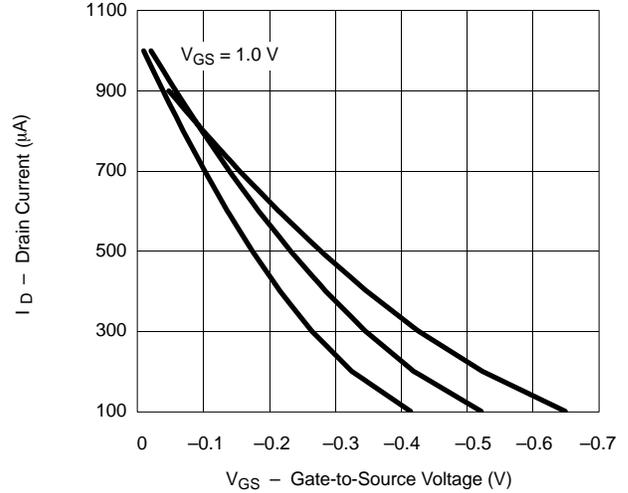
Output Characteristics



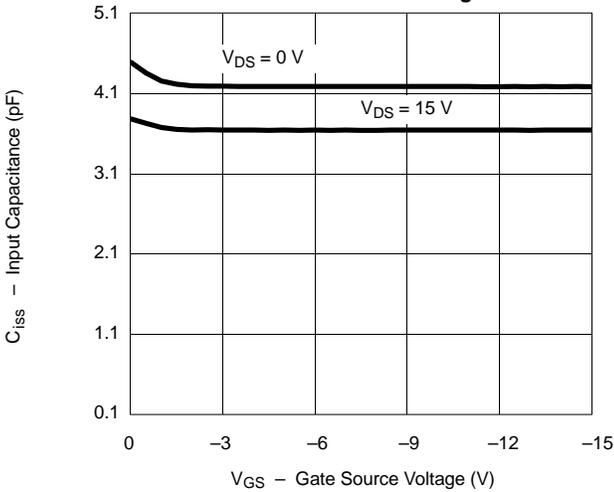
Diode Characteristics



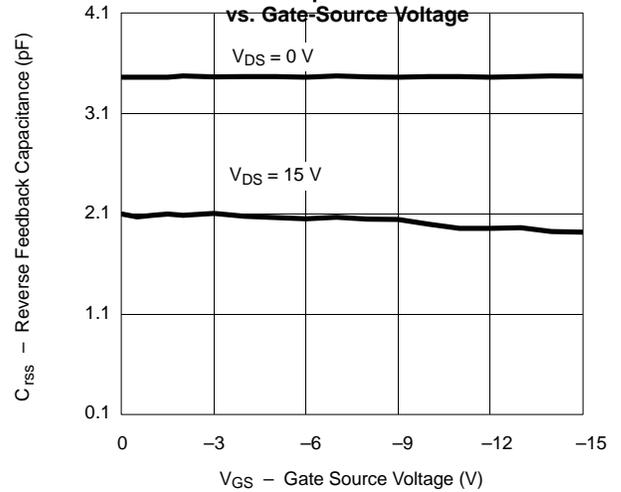
Transfer Characteristics



Common Source Input Capacitance vs. Gate-Source Voltage



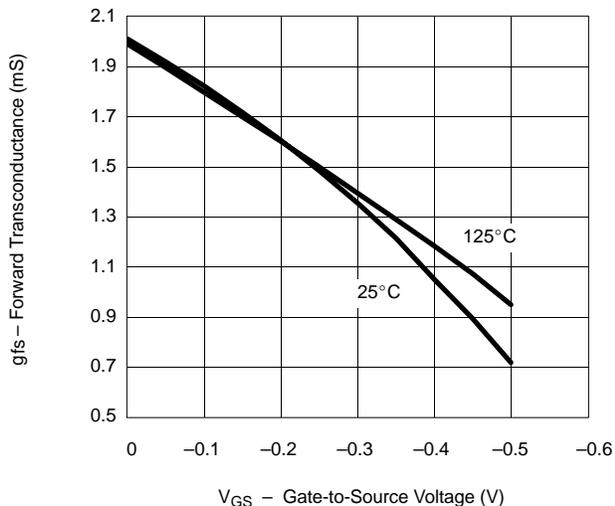
Common Source Reverse Feedback Capacitance vs. Gate-Source Voltage



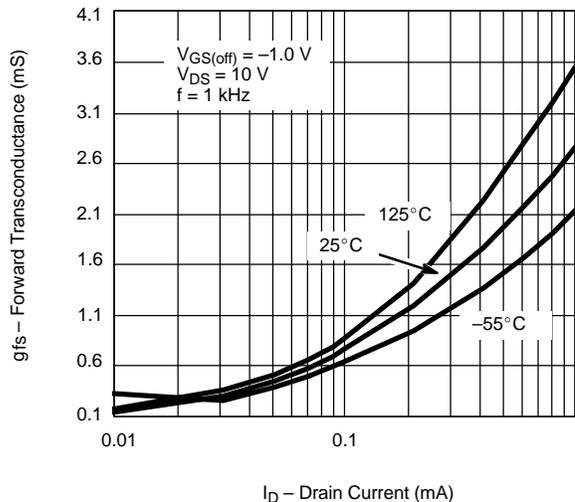


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

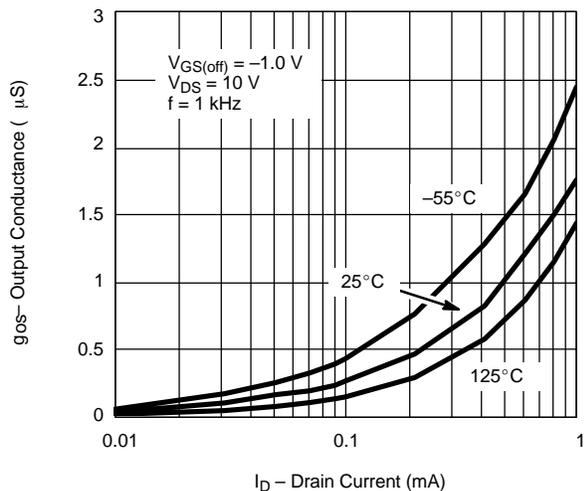
Forward Transconductance vs. Gate-Source Voltage



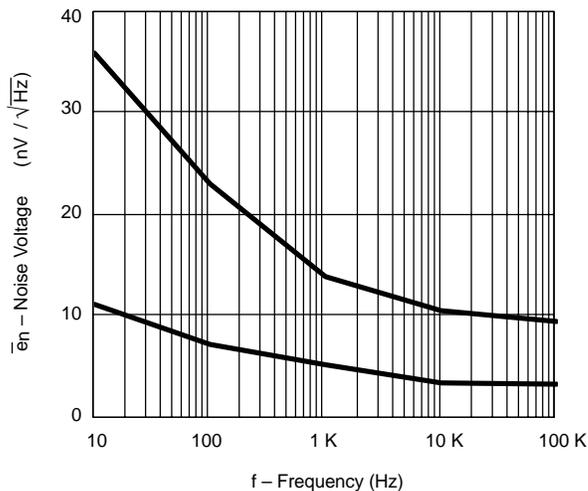
Forward Transconductance vs. Drain Current



Output Conductance vs. Drain Current



Equivalent Input Noise Voltage vs. Frequency





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