

2N/PN/SST4117A Series  
N-Channel JFETs

Siliconix

2N4117A	PN4117A	SST4117
2N4118A	PN4118A	SST4118
2N4119A	PN4119A	SST4119

Product Summary

Part Number	V <sub>GS(on)</sub> (V)	V <sub>DR/GSS</sub> Min (V)	g <sub>fs</sub> Min (mS)	I <sub>DSS</sub> Min (μA)
4117	-0.6 to -1.8	-40	70	30
4118	-1 to -3	-40	80	80
4119	-2 to -6	-40	100	200

PN/SST4119A. For applications information see AN/03, page 12-22.

Features

- Ultra-Low Leakage: 0.2 pA
- Very Low Current/Voltage Operation
- Ultrahigh Input Impedance
- Low Noise

Benefits

- Insignificant Signal Loss/Error Voltage with High-Impedance Source
- Low Power Consumption (Battery)
- Maximum Signal Output, Low Noise
- High Sensitivity to Low-Level Signals

Applications

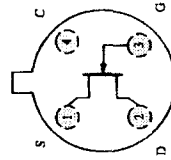
- High-Impedance Transducer Amplifiers
- Smoke Detector Input
- Infrared Detector Amplifier
- Precision Test Equipment

Description

The 2N/PN/SST4117A series of n-channel JFETs provide ultra-high input impedance. These devices are specified with a 1-pA limit and typically operate at 0.2 pA. This makes them perfect choices for use as high-impedance sensitive front-end amplifiers.

The hermetically sealed TO-206AF package allows full military processing per MIL-S-19500 (see Military Information). The TO-226A (TO-92) plastic package provides a low-cost option. The TO-236 (SOT-23) package provides surface-mount capability. Both the PN and SST series are available in tape-and-reef for automated assembly (see Packaging Information).

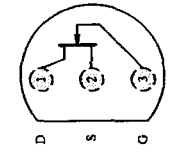
TO-206AF (TO-72)



Top View

- 2N4117A
- 2N4118A
- 2N4119A

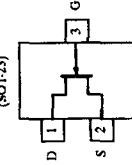
TO-226AA (TO-92)



Top View

- PN4117A
- PN4118A
- PN4119A

TO-236 (SOT-23)



Top View

- SST4117 (T)\*
- SST4118 (T)\*
- SST4119 (T)\*

\*Marking Code for TO-236

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Absolute Maximum Ratings

Gate-Source/Drain Voltage	..... -40V	Lead Temperature (1/16" from case for 10 sec.)	..... 300°C
Forward Gate Current	..... 50 mA	Power Dissipation (case 25°C)	..... 300 mW
Storage Temperature	..... -65 to 175°C	(PN, SST Prefix) <sup>a</sup>	..... 300 mW
Operating Junction Temperature	..... -55 to 150°C	(PN, SST Prefix) <sup>b</sup>	..... 300 mW
Operating Junction Temperature	..... -55 to 175°C		
	(PN, SST Prefix)		
	(PN, SST Prefix)		

Notes  
a. Derate 2 mW/°C above 25°C  
b. Derate 2.8 mW/°C above 25°C

Specifications<sup>a</sup>

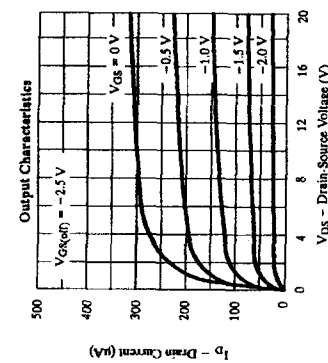
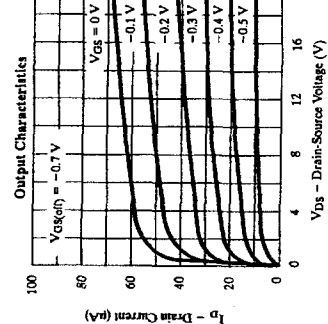
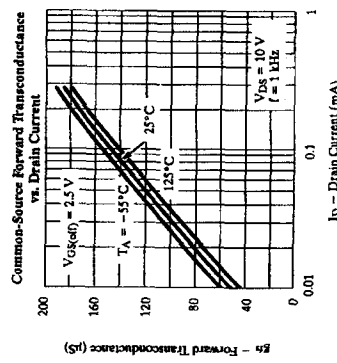
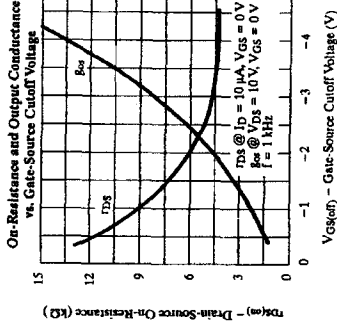
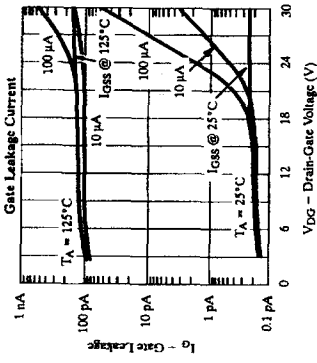
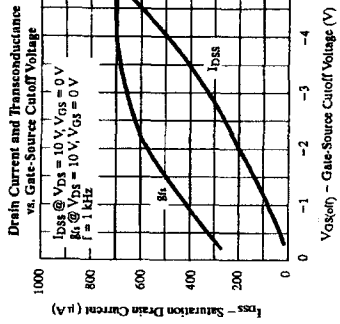
Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits								
				4117	4118	4119	Min	Max	Min	Max	Unit	
Static												
Gate-Source Breakdown Voltage	V <sub>BR/GSS</sub>	I <sub>G</sub> = -1 μA, V <sub>DS</sub> = 0 V	-70	-40	-40	-40	-40	-40	-40	-40	-40	V
Gate-Source Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 nA	-0.6	-1.8	-1	-3	-2	-6	-6	-6	-6	V
Saturation Drain Current	I <sub>DSS</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 0 V	30	90	80	240	200	600	600	600	600	μA
		V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0 V	-0.2	-1	-1	-1	-1	-1	-1	-1	-1	pA
		V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0 V, T <sub>A</sub> = 150°C	-0.4	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	nA
Gate Reverse Current	I <sub>GSS</sub>	V <sub>GS</sub> = -10 V, V <sub>DS</sub> = 0 V	-0.2	-1	-1	-1	-1	-1	-1	-1	-1	pA
		V <sub>GS</sub> = -10 V, V <sub>DS</sub> = 0 V, T <sub>A</sub> = 150°C	-0.2	-10	-10	-10	-10	-10	-10	-10	-10	pA
		V <sub>GS</sub> = -10 V, V <sub>DS</sub> = 0 V, T <sub>A</sub> = 100°C	-0.03	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	nA
Gate Operating Current <sup>c</sup>	I <sub>G</sub>	V <sub>GS</sub> = 15 V, I <sub>D</sub> = 30 μA	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	pA
Drain Cutoff Current <sup>c</sup>	I <sub>D(off)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = -8 V	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	pA
Gate-Source Forward Voltage <sup>c</sup>	V <sub>GS(F)</sub>	I <sub>G</sub> = 1 mA, V <sub>DS</sub> = 0 V	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	V
Dynamic												
Common-Source Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 1 MHz	70	210	80	250	100	330	330	330	330	μS
Common-Source Output Conductance	g <sub>os</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V	3	3	5	5	10	10	10	10	10	μS
Common-Source Input Capacitance	C <sub>in</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 1 MHz	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	pF
Common-Source Reverse Transfer Capacitance	C <sub>ru</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 1 MHz	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	pF
Equivalent Input Noise Voltage <sup>c</sup>	e <sub>n</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 1 MHz	15	15	15	15	15	15	15	15	15	nV/√Hz

Notes  
a. T<sub>A</sub> = 25°C unless otherwise noted.  
b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.  
c. This parameter not registered with JEDEC.

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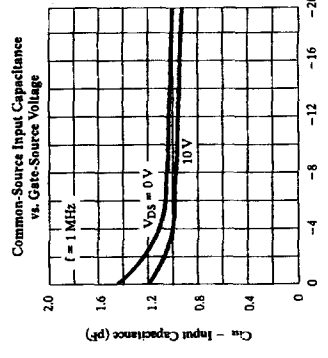
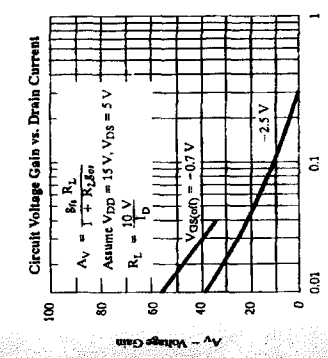
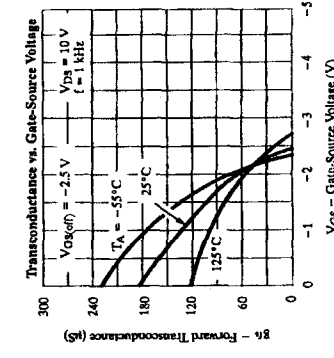
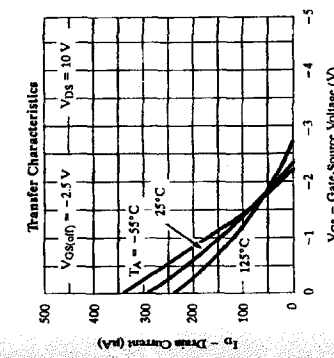
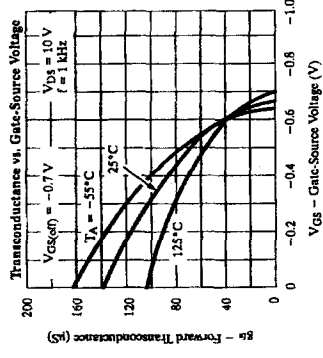
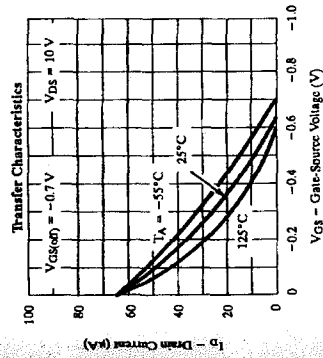
## Typical Characteristics



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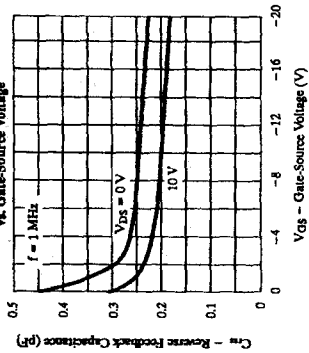
## Typical Characteristics (Cont'd)



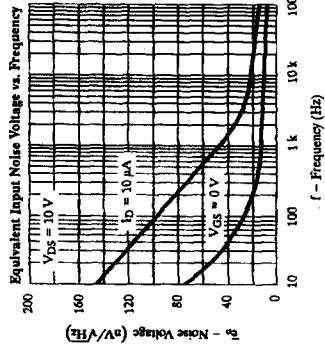
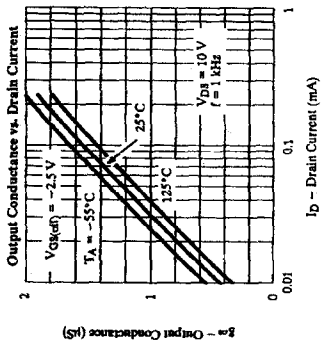
# 2N/PN/SST4117A Series

## Typical Characteristics (Cont'd)

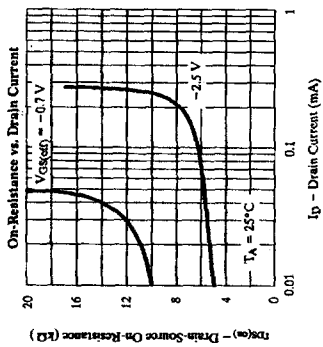
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



Output Conductance vs. Drain Current



On-Resistance vs. Drain Current



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## N-Channel J

### Product Summary

Part Number
2N4338
2N4339
2N4340
2N4341

For applications information

### Features

- Low Cutoff Voltage
- High Input Impedance
- Very Low Noise
- High Gain:  $A_v = 8$

### Description

The 2N4338/4339/4340/4341 are designed for sensing mid-frequencies. Low-level power supply system accuracy.

### Absolute M

- Gate-Source/Gate-Drain Forward Gate Current
- Storage Temperature
- Operating Junction Temperature