

## N-Channel JFETs

<b>2N4117A</b>	<b>PN4117A</b>	<b>SST4117</b>
<b>2N4118A</b>	<b>PN4118A</b>	<b>SST4118</b>
<b>2N4119A</b>	<b>PN4119A</b>	<b>SST4119</b>

<b>PRODUCT SUMMARY</b>				
Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	$g_{fs}$ Min ( $\mu$ S)	$I_{DSS}$ Min ( $\mu$ A)
4117	-0.6 to -1.8	-40	70	30
4118	-1 to -3	-40	80	80
4119	-2 to -6	-40	100	200

### 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

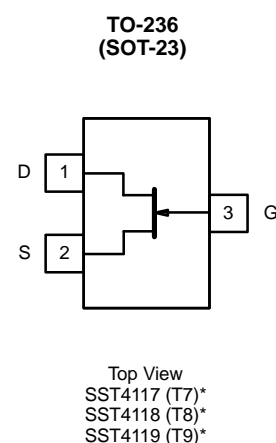
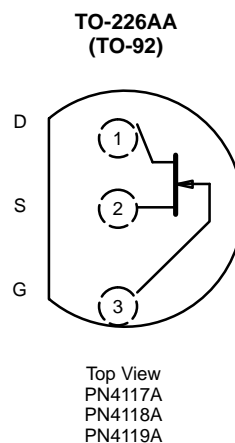
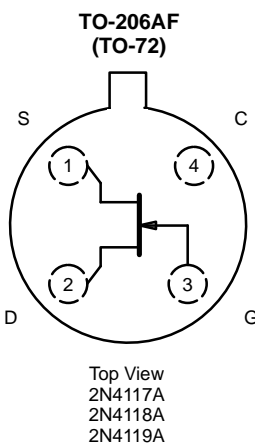
### APPLICATIONS

- 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-reel for automated assembly (see Packaging Information).



\*Marking Code for TO-236

For applications information see AN105.



### ABSOLUTE MAXIMUM RATINGS

Gate-Source/Gate-Drain Voltage	-40V
Forward Gate Current	50 mA
Storage Temperature :	(2N Prefix) -65 to 175°C
	(PN, SST Prefix) -55 to 150°C
Operating Junction Temperature :	(2N Prefix) -55 to 175°C
	(PN, SST Prefix) -55 to 150°C

Lead Temperature ( <sup>1</sup> / <sub>16</sub> " from case for 10 sec.)	300°C
Power Dissipation (case 25°C) :	(2N Prefix) <sup>a</sup> 300 mW
	(PN, SST Prefix) <sup>b</sup> 350 mW

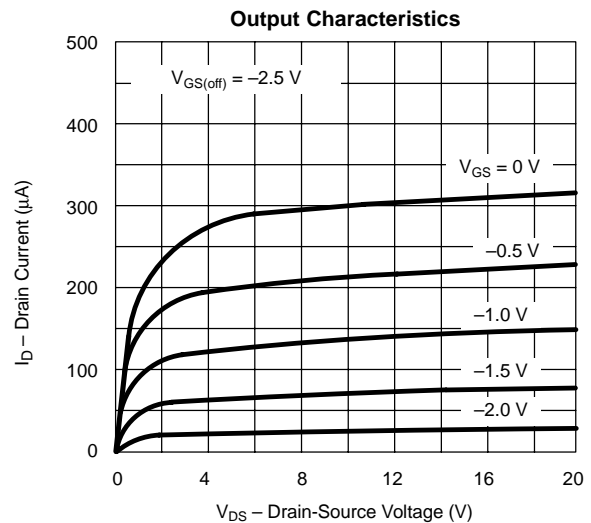
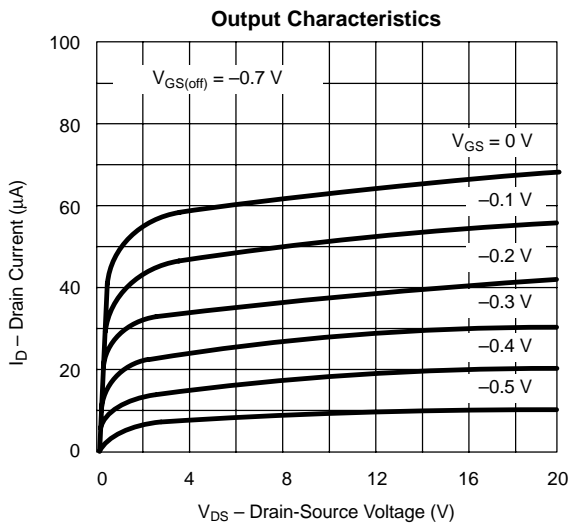
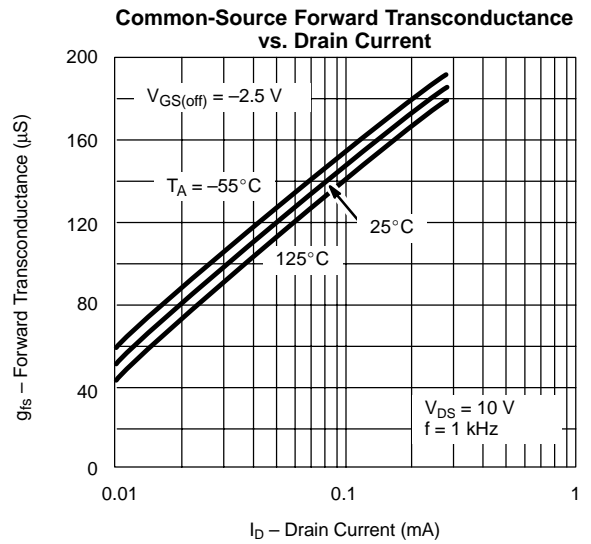
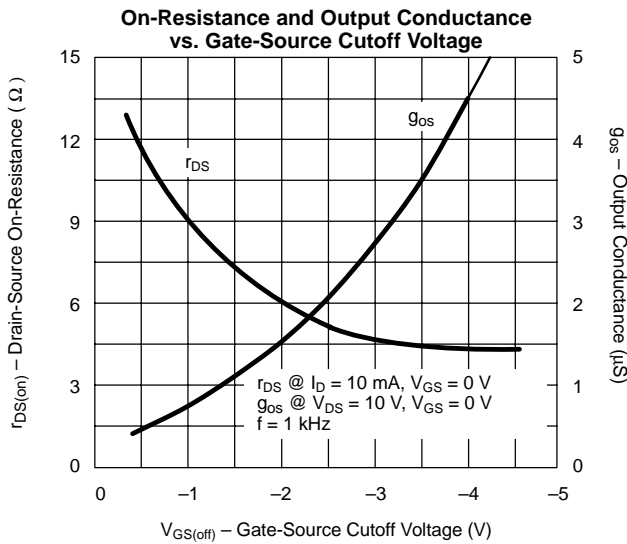
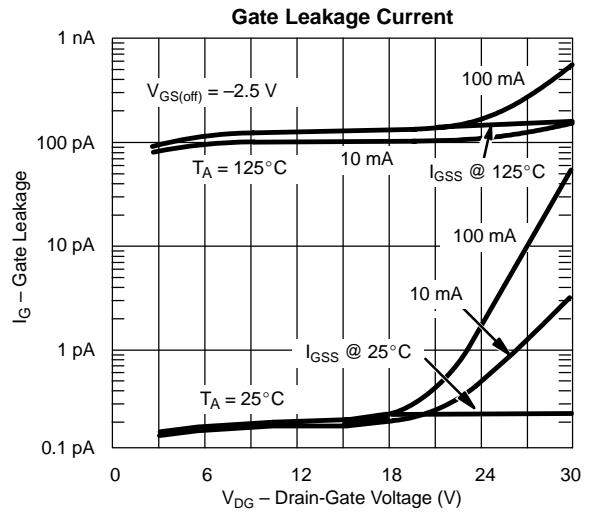
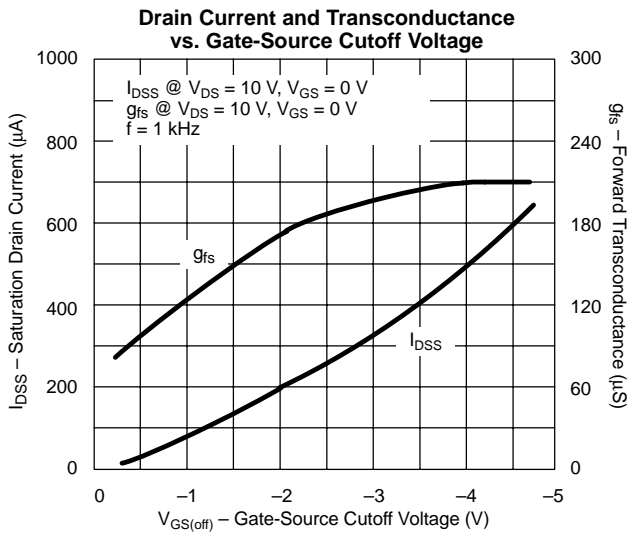
- Notes  
a. Derate 2 mW/°C above 25°C  
b. Derate 2.8 mW/°C above 25°C

SPECIFICATIONS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)										
Parameter	Symbol	Test Conditions	Typ <sup>a</sup>	Limits						Unit
				4117		4118		4119		
				Min	Max	Min	Max	Min	Max	
<b>Static</b>										
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		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	
Saturation Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V		30	90	80	240	200	600	μA
Gate Reverse Current	I <sub>GSS</sub>	V <sub>GS</sub> = -20 V V <sub>DS</sub> = 0 V	2N	-0.2		-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		nA
		V <sub>GS</sub> = -10 V V <sub>DS</sub> = 0 V	PN	-0.2		-1		-1		pA
			SST	-0.2		-10		-10		pA
		V <sub>GS</sub> = -10 V V <sub>DS</sub> = 0 V T <sub>A</sub> = 100°C	PN/SST	-0.03		-2.5		-2.5		nA
Gate Operating Current <sup>b</sup>	I <sub>G</sub>	V <sub>DG</sub> = 15 V, I <sub>D</sub> = 30 μA	-0.2							pA
Drain Cutoff Current <sup>b</sup>	I <sub>D(off)</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = -8 V	0.2							
Gate-Source Forward Voltage <sup>b</sup>	V <sub>GS(F)</sub>	I <sub>G</sub> = 1 mA, V <sub>DS</sub> = 0 V	0.7							V
<b>Dynamic</b>										
Common-Source Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V f = 1 kHz		70	210	80	250	100	330	μS
Common-Source Output Conductance	g <sub>os</sub>				3		5		10	
Common-Source Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10 V V <sub>GS</sub> = 0 V f = 1 MHz	2N/PN	1.2		3		3		pF
			SST	1.2						
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>		2N/PN	0.3		1.5		1.5		
			SST	0.3						
Equivalent Input Noise Voltage <sup>b</sup>	e <sub>n</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V f = 1 kHz	15							nV/ √Hz

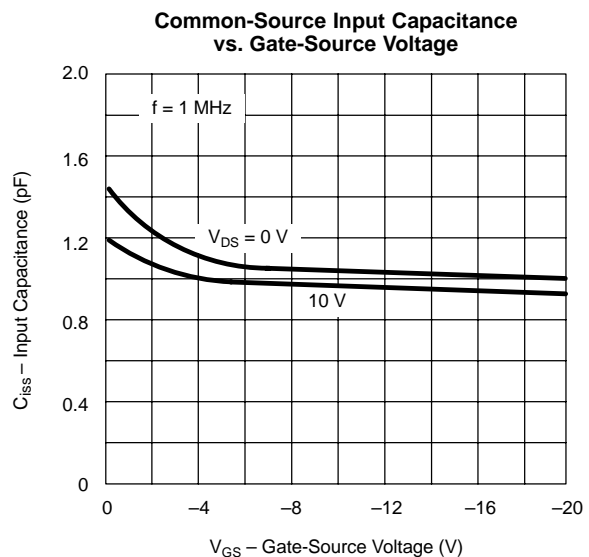
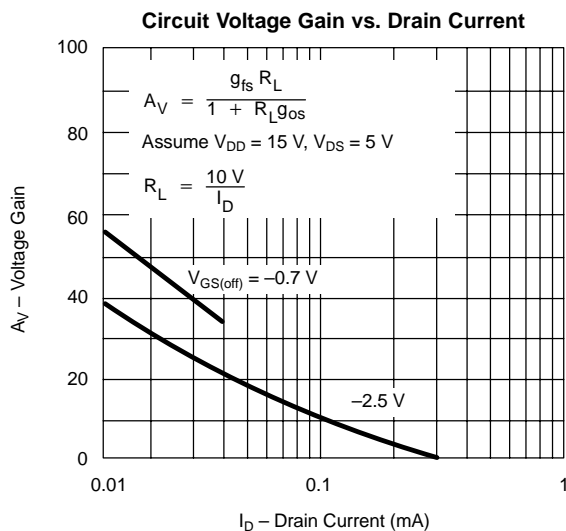
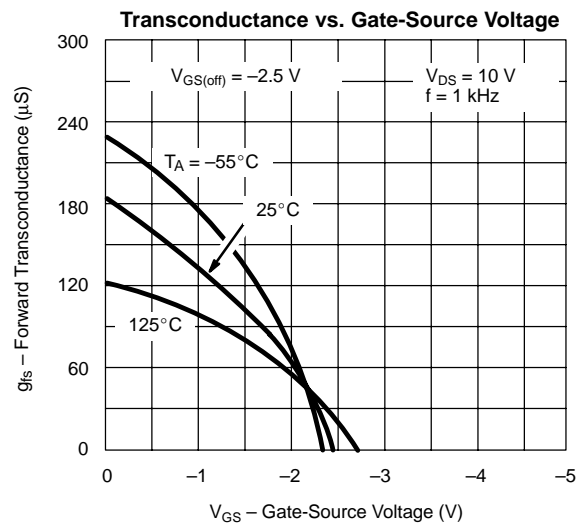
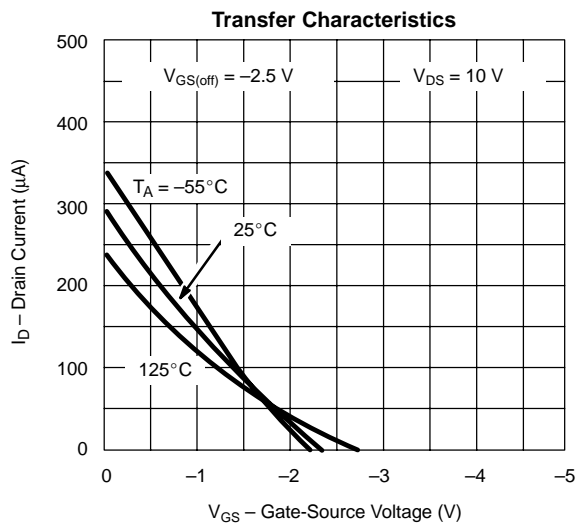
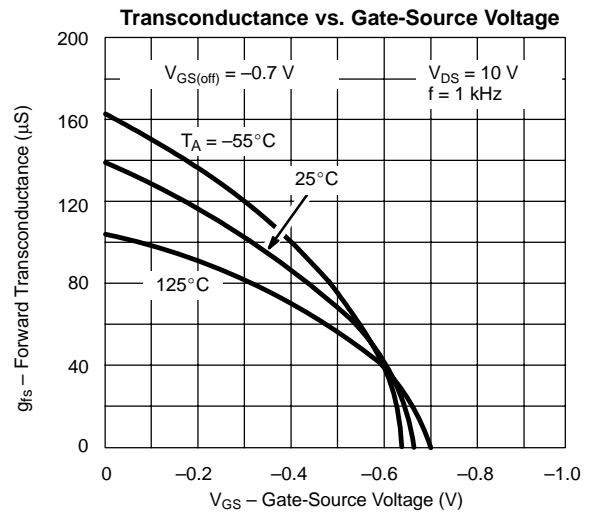
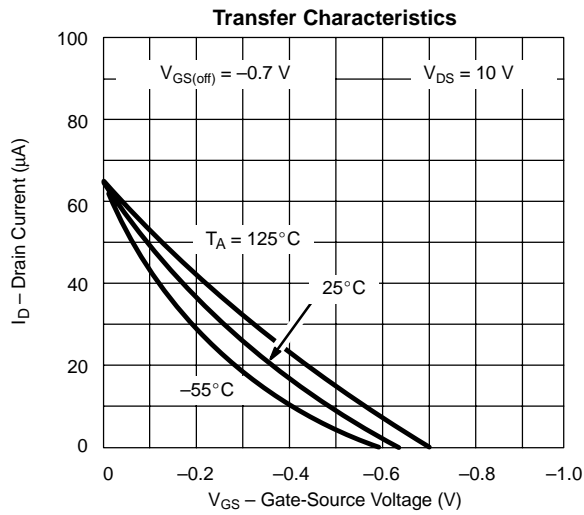
- Notes  
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.  
b. This parameter not registered with JEDEC.

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



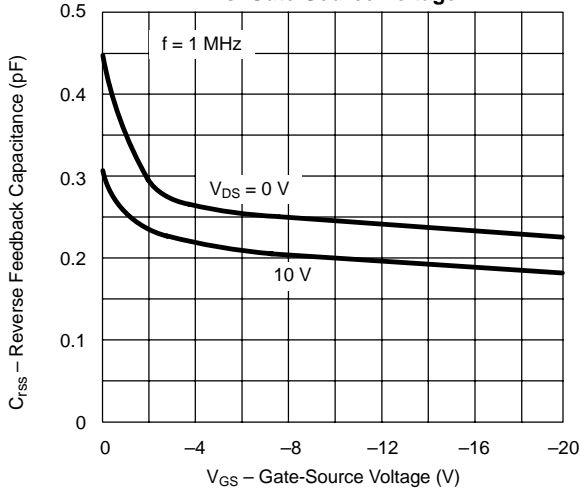
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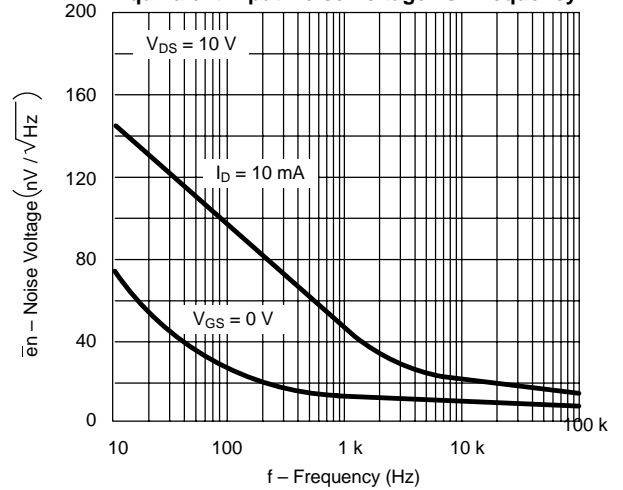


**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

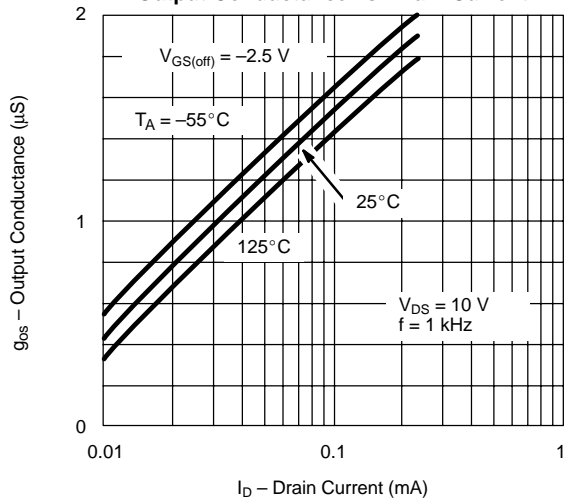
**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



**Equivalent Input Noise Voltage vs. Frequency**



**Output Conductance vs. Drain Current**



**On-Resistance vs. Drain Current**

