

# 2N/PN/SST4117A Series

## N-Channel JFETs

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

### Product Summary

Part Number	V <sub>GS(off)</sub> (V)	V <sub>(BR)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

### 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

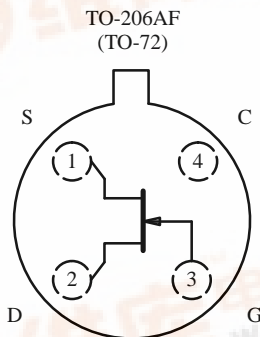
### Applications

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

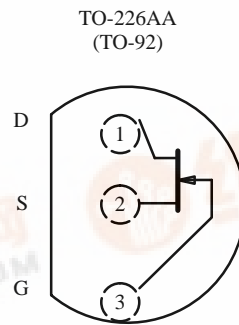
### Description

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.

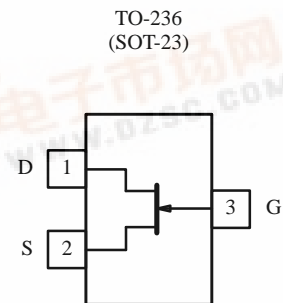
The hermetically sealed TO-206AF package allows full military processing per MIL-S-19500 (see Military Information). The TO-226A (TO-92) plastic package provides a low-cost option. The TO-236 (SOT-23) package provides surface-mount capability. Both the PN and SST series are available in tape-and-reel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



Top View  
2N4117A  
2N4118A  
2N4119A



Top View  
PN4117A  
PN4118A  
PN4119A



Top View  
SST4117 (T7)\*  
SST4118 (T8)\*  
SST4119 (T9)\*

\*Marking Code for TO-236

# 2N/PN/SST4117A Series

## Absolute Maximum Ratings

Gate-Source/Gate-Drain Voltage	.....	-40V	Lead Temperature (1/16" from case for 10 sec.)	.....	300°C
Forward Gate Current	.....	50 mA	Power Dissipation (case 25°C) :		
Storage Temperature :	(2N Prefix) .....	-65 to 175°C	(2N Prefix) <sup>a</sup> .....	300 mW	
	(PN, SST Prefix) .....	-55 to 150°C	(PN, SST Prefix) <sup>b</sup> .....	350 mW	
Operating Junction Temperature :			Notes		
	(2N Prefix) .....	-55 to 175°C	a. Derate 2 mW/°C above 25°C		
	(PN, SST Prefix) .....	-55 to 150°C	b. Derate 2.8 mW/°C above 25°C		

## Specifications<sup>a</sup>

Parameter	Symbol	Test Conditions	Typ <sup>b</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		-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	nA
		V <sub>GS</sub> = -10 V V <sub>DS</sub> = 0 V	PN	-0.2		-1		-1		-1	pA
			SST	-0.2		-10		-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		-2.5	nA
Gate Operating Current <sup>c</sup>	I <sub>G</sub>	V <sub>DG</sub> = 15 V, I <sub>D</sub> = 30 μA	-0.2							pA	
Drain Cutoff Current <sup>c</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>c</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		3	pF
			SST	1.2							
Common-Source Reverse Transfer Capacitance	C <sub>rss</sub>		2N/PN	0.3		1.5		1.5		1.5	
			SST	0.3							
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 kHz	15							nV/ √Hz	

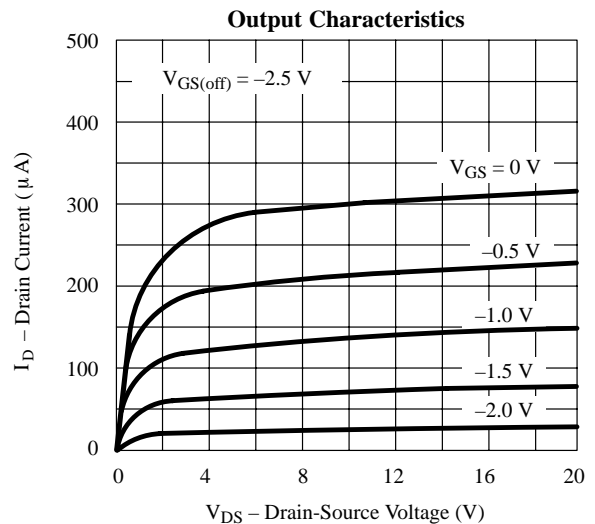
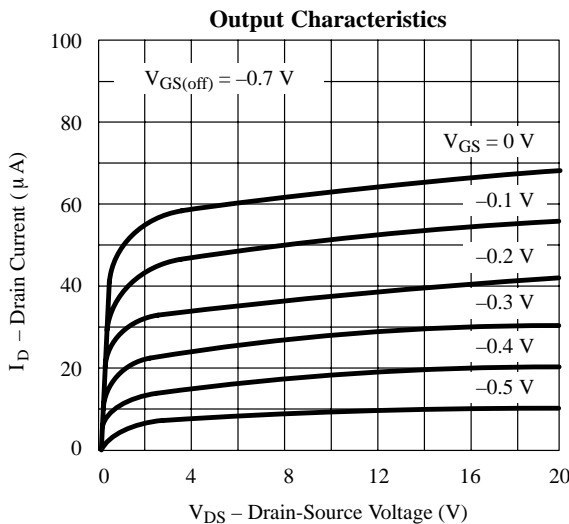
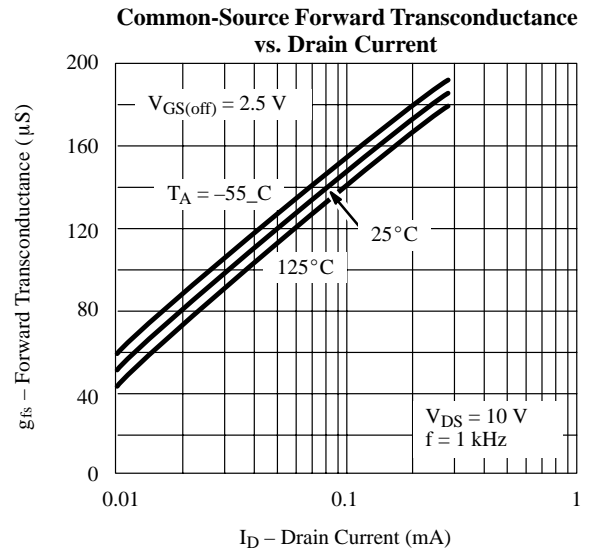
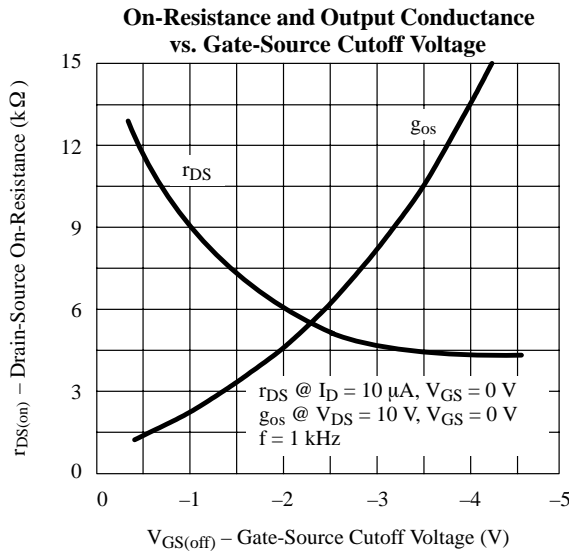
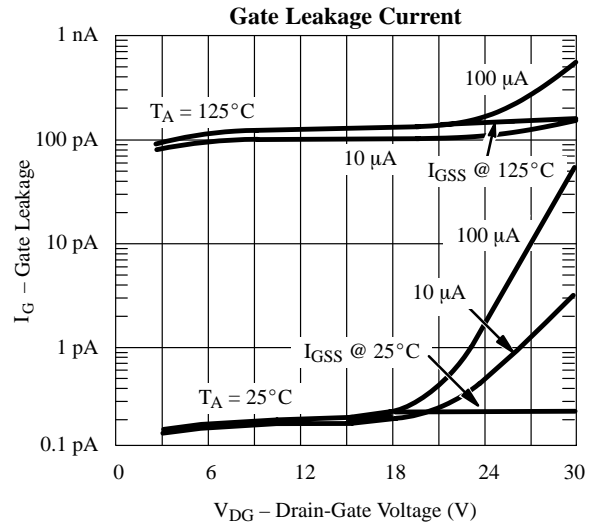
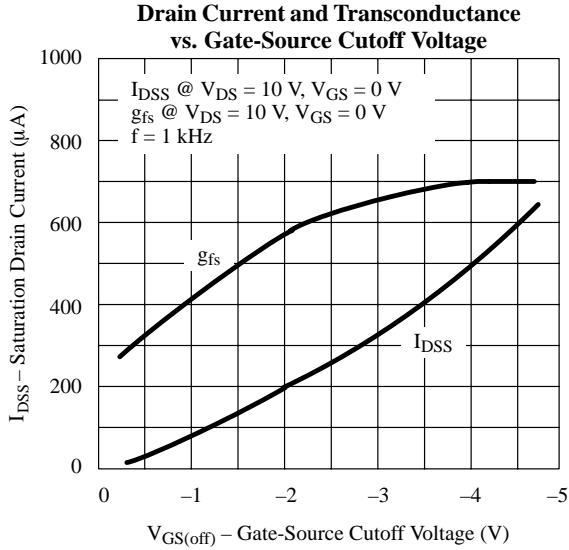
Notes

- 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.

NT

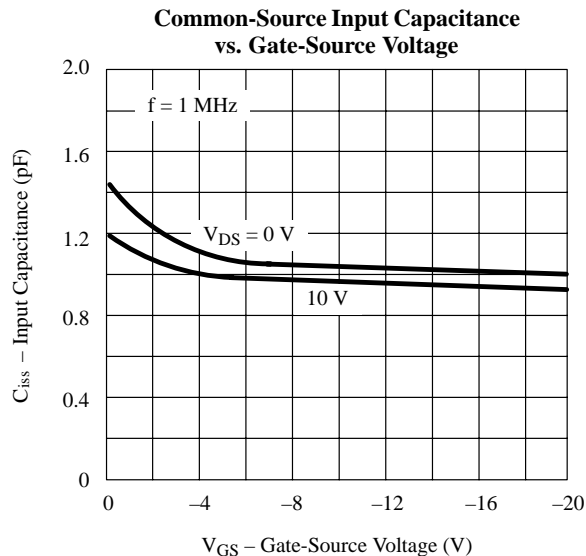
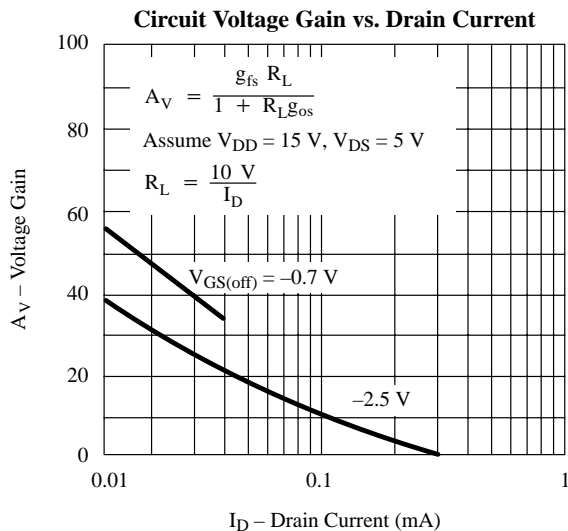
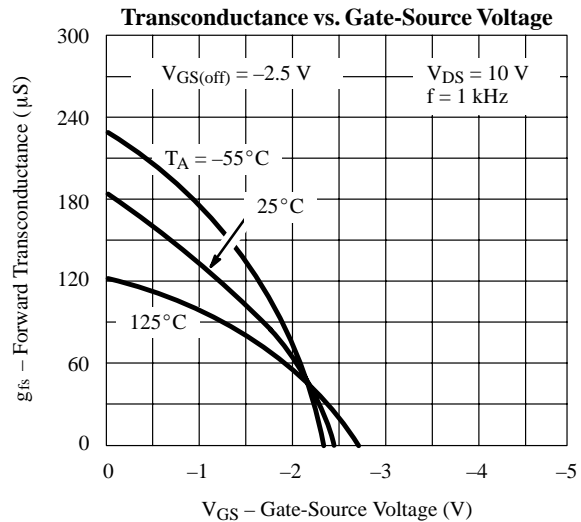
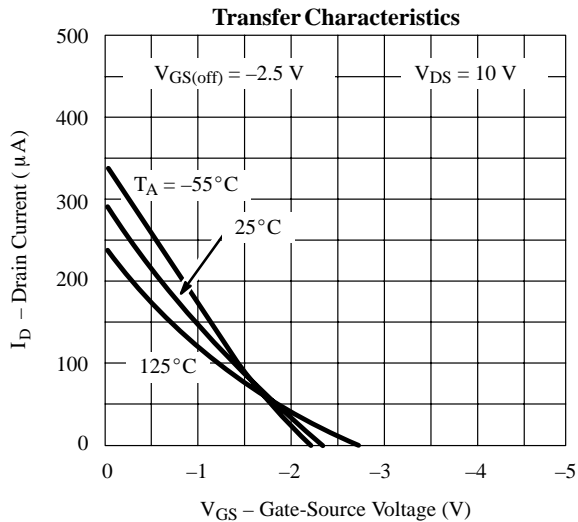
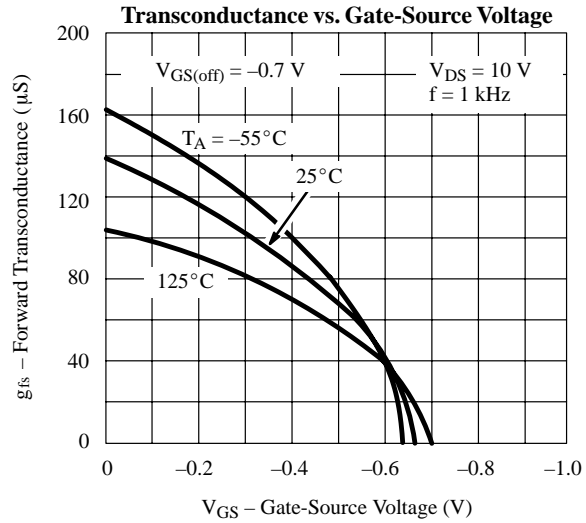
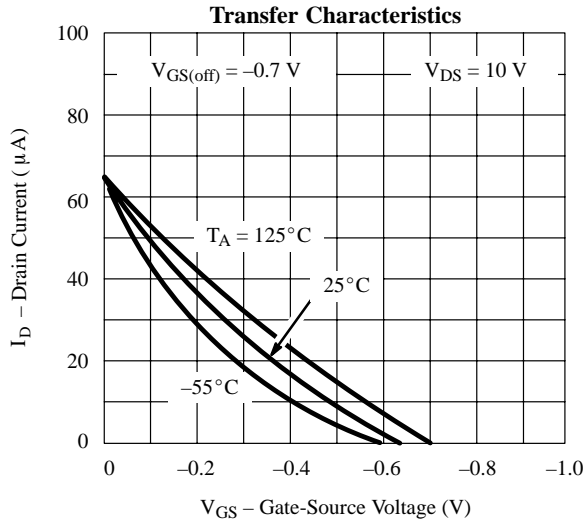
# 2N/PN/SST4117A Series

## Typical Characteristics



# 2N/PN/SST4117A Series

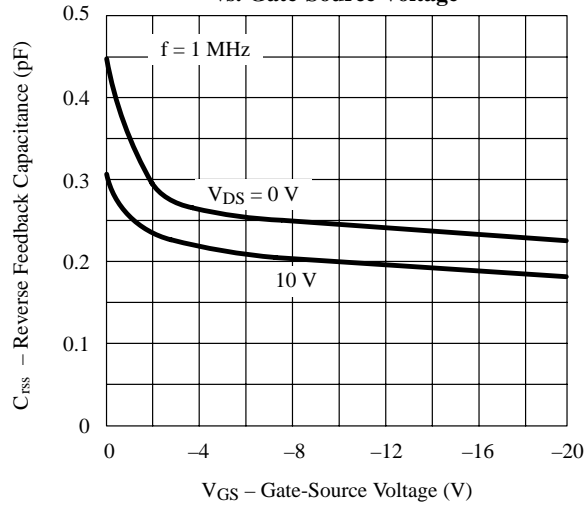
## Typical Characteristics (Cont'd)



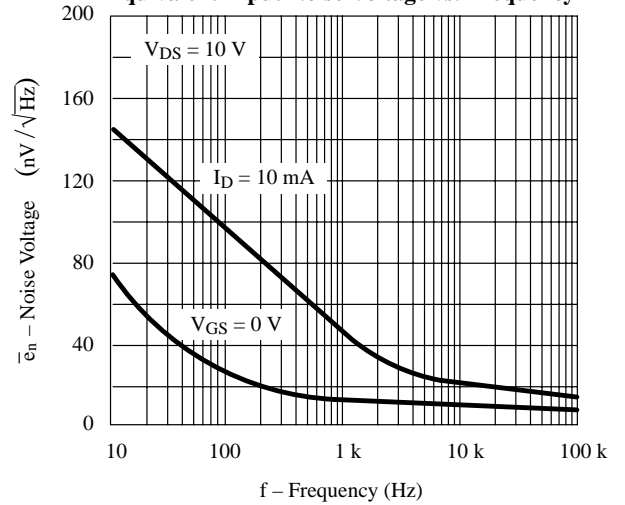
# 2N/PN/SST4117A Series

## Typical Characteristics (Cont'd)

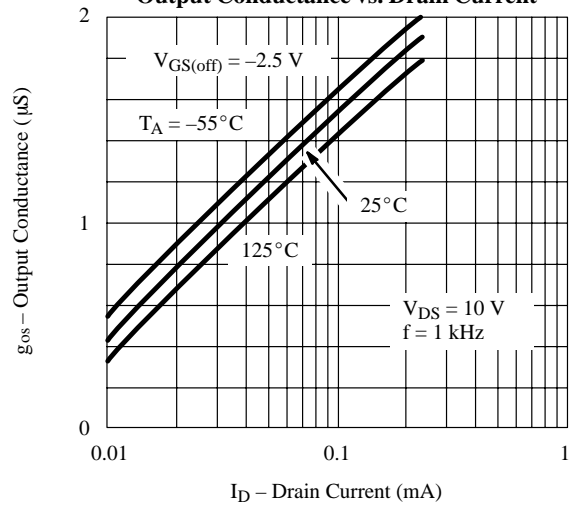
**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



**Equivalent Input Noise Voltage vs. Frequency**



**Output Conductance vs. Drain Current**



**On-Resistance vs. Drain Current**

