

### 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>

### Product Summary

Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	$g_{fs}$ Min (mS)	$I_{DSS}$ 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

PN/SST4119A, For applications information see AN105, page 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

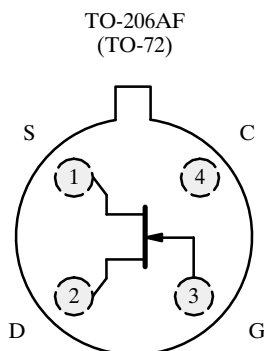
### Applications

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

### Description

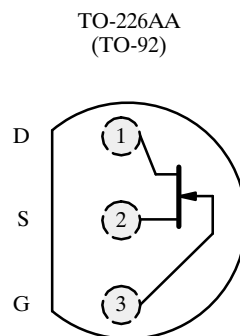
The 2N/PN/SST4117A series of n-channel JFETs provide ultra-high input impedance. These devices are specified with a 1-pA limit and typically operate at 0.2 pA. This makes them perfect choices for use as high-impedance sensitive front-end amplifiers.

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-reel for automated assembly (see Packaging Information).



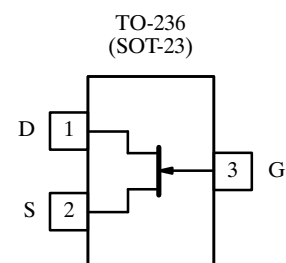
Top View

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

# TEMIC

## Siliconix

### 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 ( $1/16''$  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<sup>a</sup>

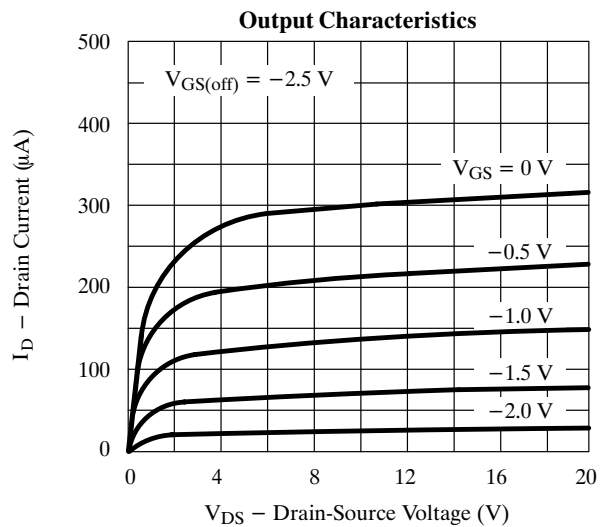
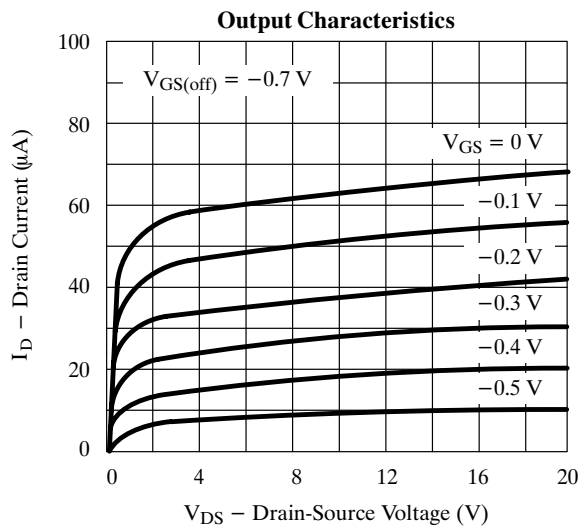
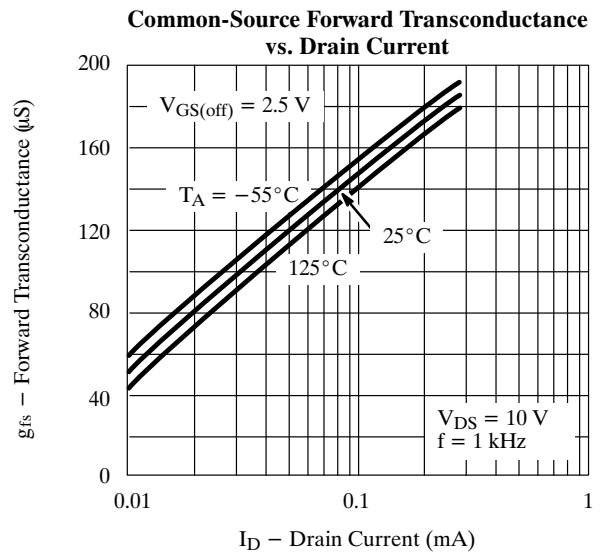
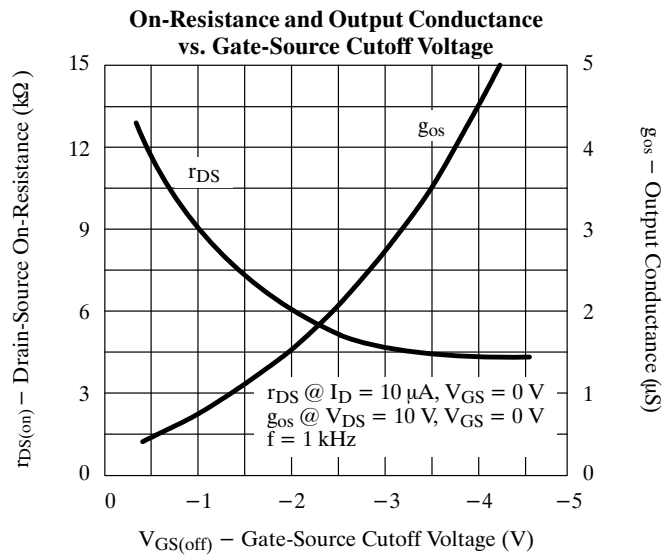
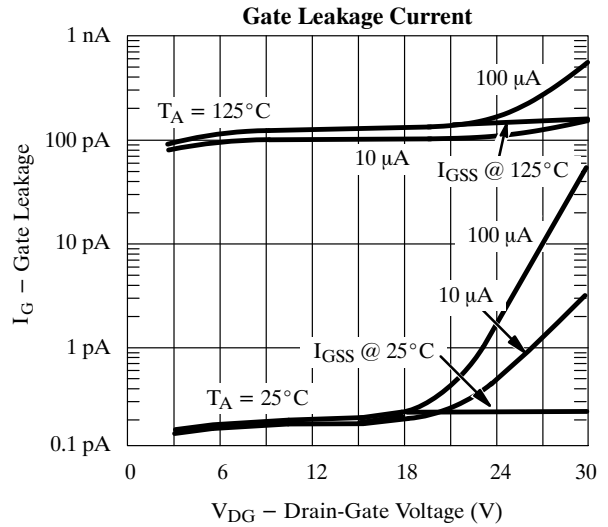
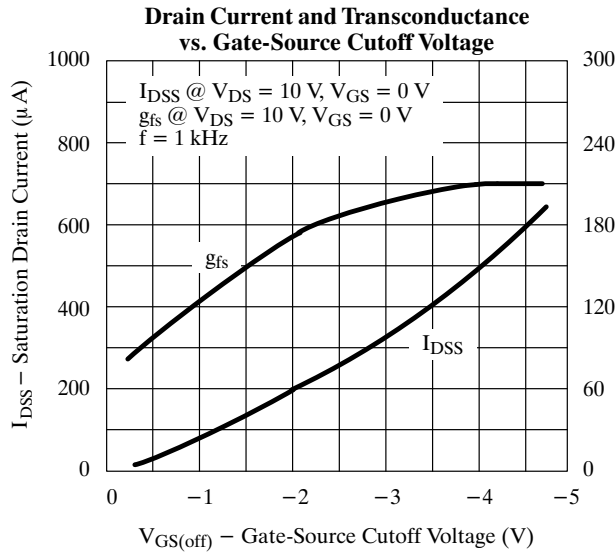
Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits						Unit	
				4117		4118		4119			
				Min	Max	Min	Max	Min	Max		
<b>Static</b>											
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-70	-40		-40		-40		V	
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 10 V, I_D = 1 nA$		-0.6	-1.8	-1	-3	-2	-6		
Saturation Drain Current	$I_{DSS}$	$V_{DS} = 10 V, V_{GS} = 0 V$		30	90	80	240	200	600	$\mu A$	
Gate Reverse Current	$I_{GSS}$	$V_{GS} = -20 V$ $V_{DS} = 0 V$	2N	-0.2		-1		-1		-1	pA
		$V_{GS} = -20 V$ $V_{DS} = 0 V$ $T_A = 150^\circ C$		-0.4		-2.5		-2.5		-2.5	nA
		$V_{GS} = -10 V$ $V_{DS} = 0 V$	PN	-0.2		-1		-1		-1	pA
		$V_{GS} = -10 V$ $V_{DS} = 0 V$ $T_A = 100^\circ C$	PN/SST	-0.03		-2.5		-2.5		-2.5	nA
Gate Operating Current <sup>c</sup>	$I_G$	$V_{DG} = 15 V, I_D = 30 \mu A$	-0.2							pA	
Drain Cutoff Current <sup>c</sup>	$I_{D(off)}$	$V_{DS} = 10 V, V_{GS} = -8 V$	0.2								
Gate-Source Forward Voltage <sup>c</sup>	$V_{GS(F)}$	$I_G = 1 mA, V_{DS} = 0 V$	0.7							V	
<b>Dynamic</b>											
Common-Source Forward Transconductance	$g_{fs}$	$V_{DS} = 10 V, V_{GS} = 0 V, f = 1 kHz$		70	210	80	250	100	330	$\mu S$	
Common-Source Output Conductance	$g_{os}$				3		5		10		
Common-Source Input Capacitance	$C_{iss}$	$V_{DS} = 10 V, V_{GS} = 0 V$ $f = 1 MHz$	2N/PN	1.2		3		3		pF	
			SST	1.2							
Common-Source Reverse Transfer Capacitance	$C_{rss}$		2N/PN	0.3		1.5		1.5			1.5
			SST	0.3							
Equivalent Input Noise Voltage <sup>c</sup>	$\bar{e}_n$	$V_{DS} = 10 V, V_{GS} = 0 V, f = 1 kHz$	15							$nV/\sqrt{Hz}$	

#### Notes

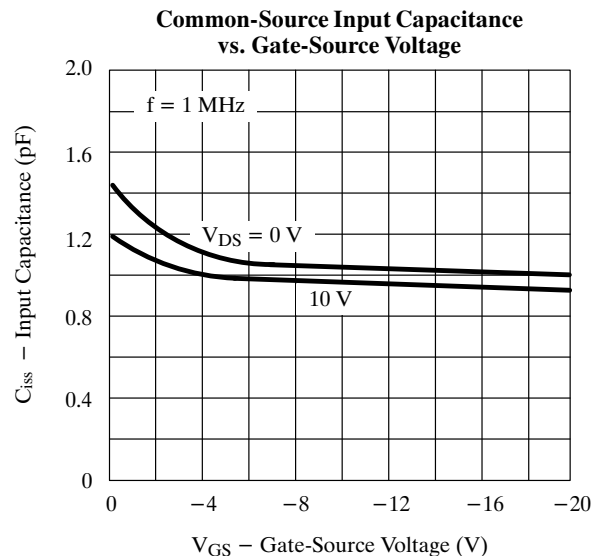
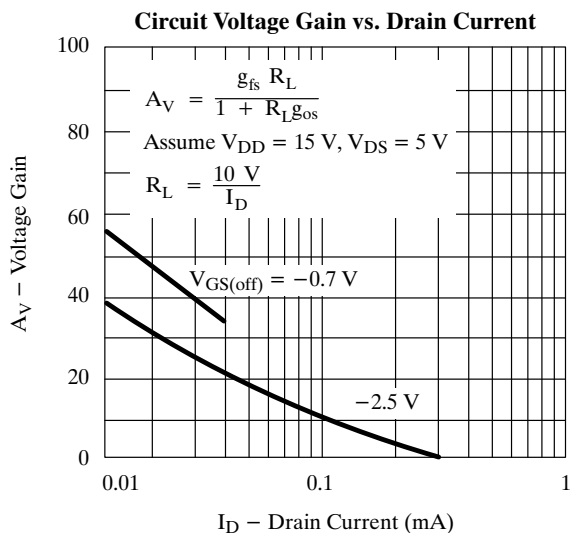
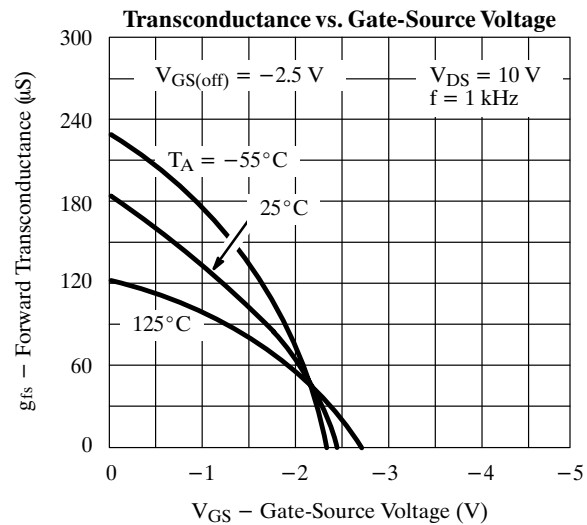
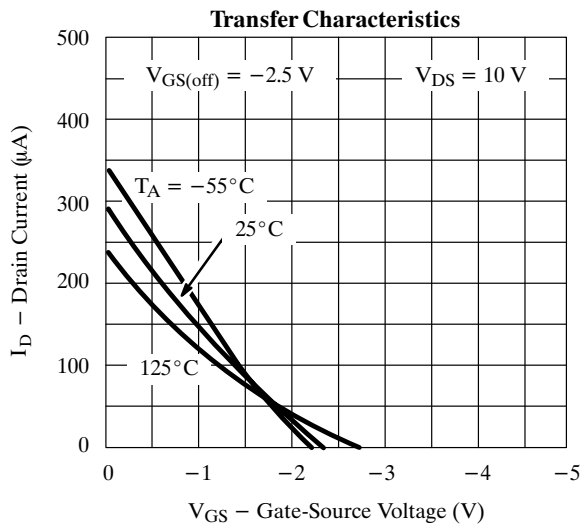
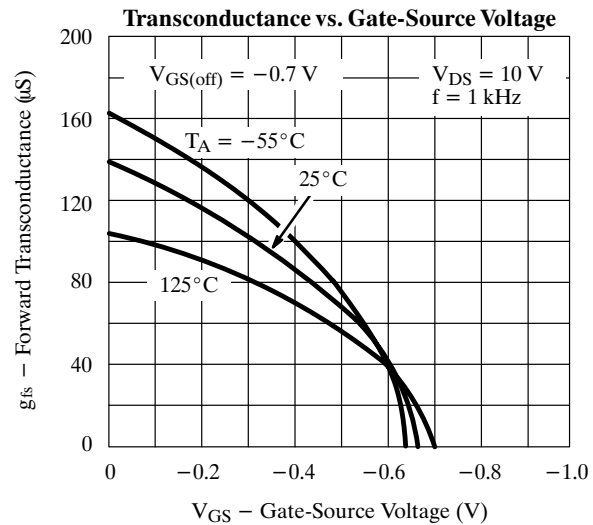
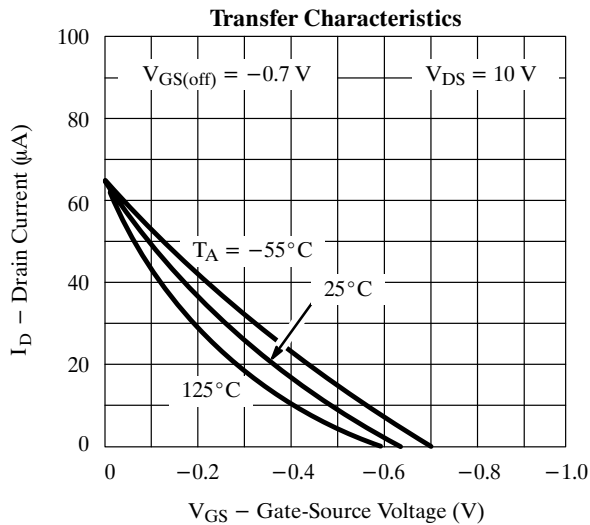
- a.  $T_A = 25^\circ C$  unless otherwise noted.  
 b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.  
 c. This parameter not registered with JEDEC.

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## Typical Characteristics

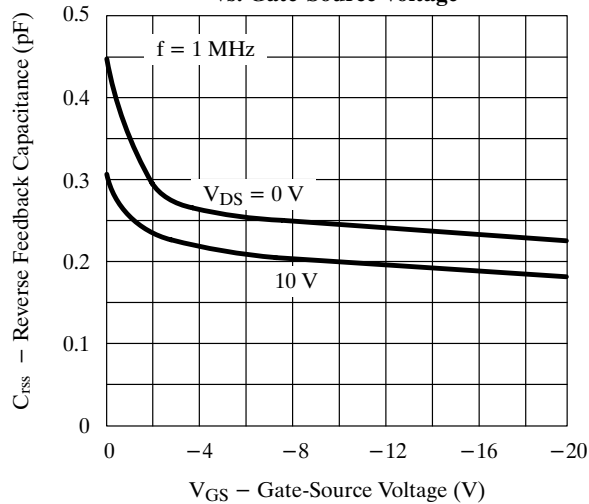


### Typical Characteristics (Cont'd)

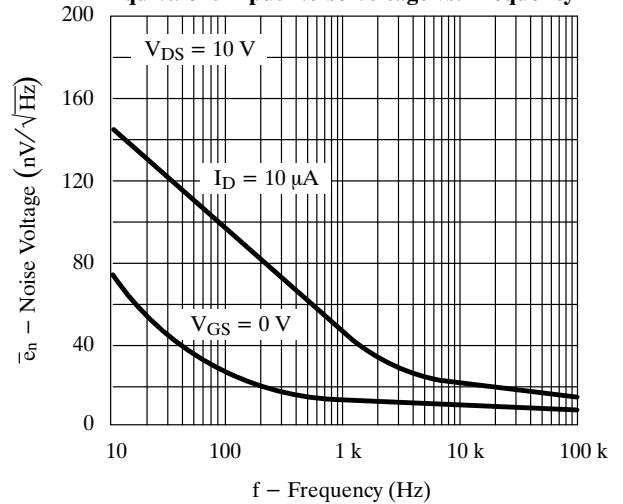


## Typical Characteristics (Cont'd)

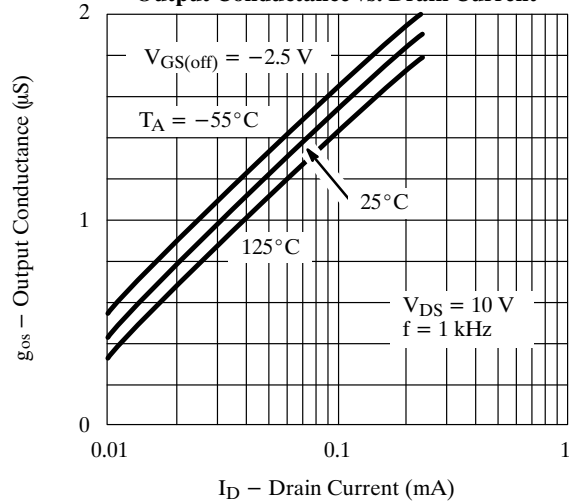
**Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage**



**Equivalent Input Noise Voltage vs. Frequency**



**Output Conductance vs. Drain Current**



**On-Resistance vs. Drain Current**

