



N-Channel JFETs

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

PRODUCT SUMMARY

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

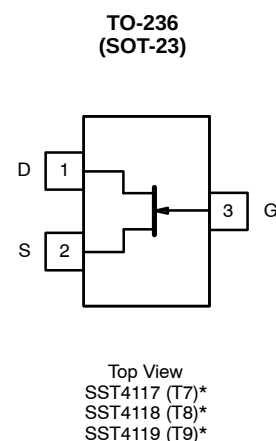
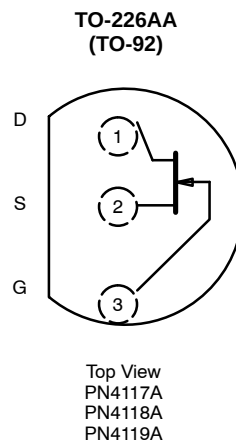
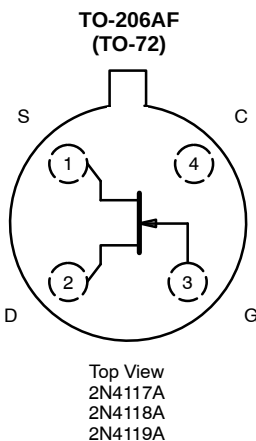
APPLICATIONS

- 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).



*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 ($1/16$ " from case for 10 sec.) 300°C
 Power Dissipation (case 25°C) :
 (2N Prefix)^a 300 mW
 (PN, SST Prefix)^b 350 mW

Notes

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

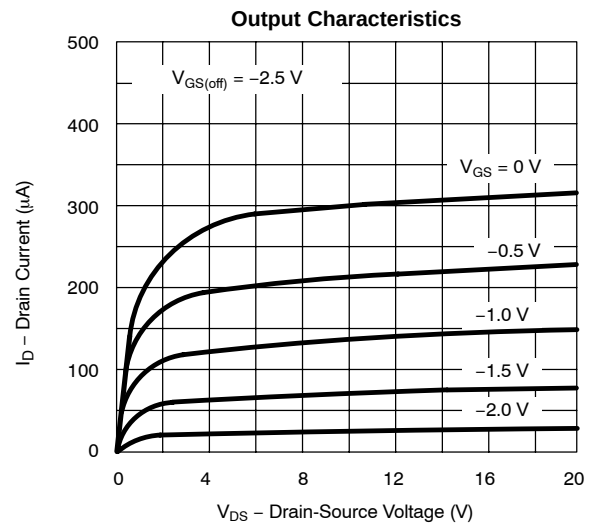
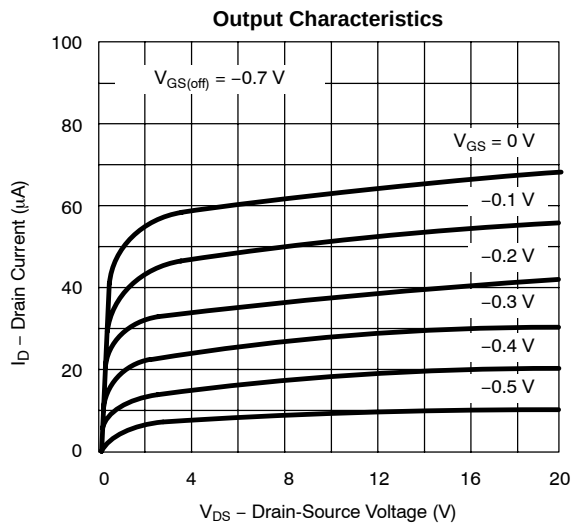
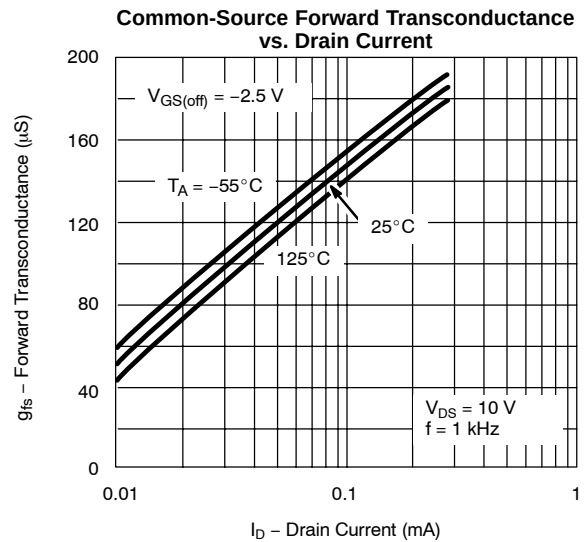
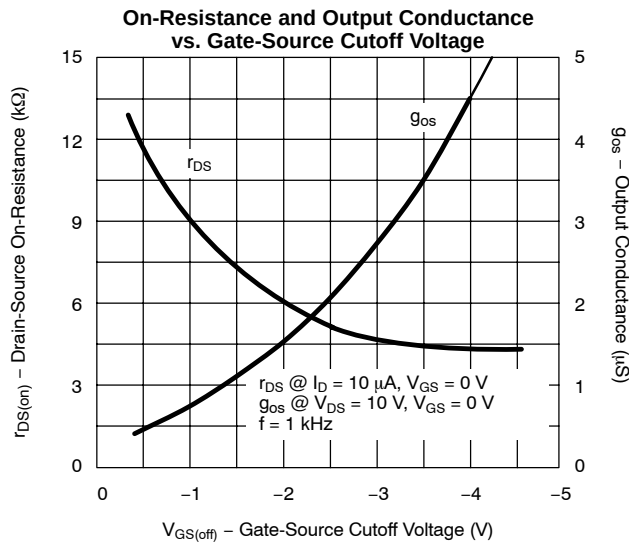
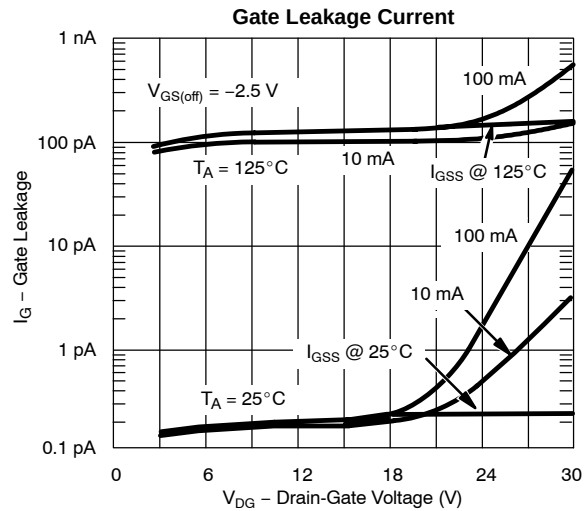
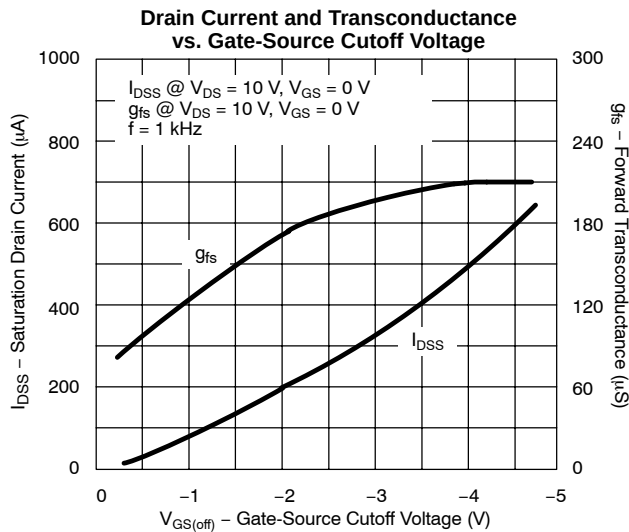
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

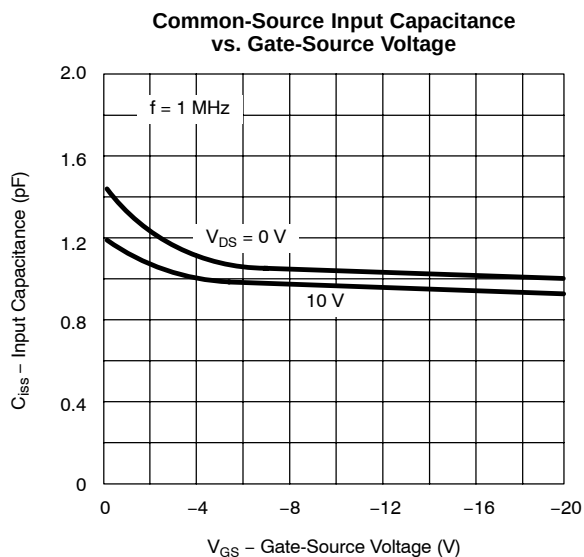
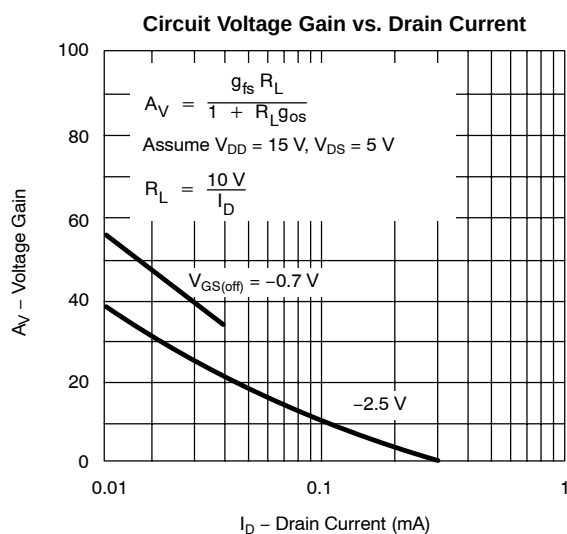
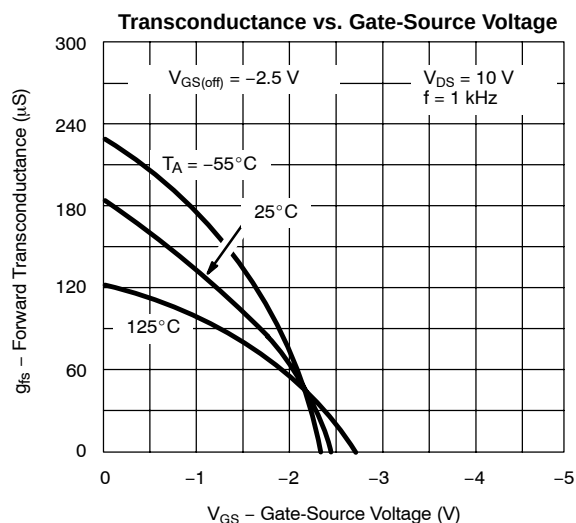
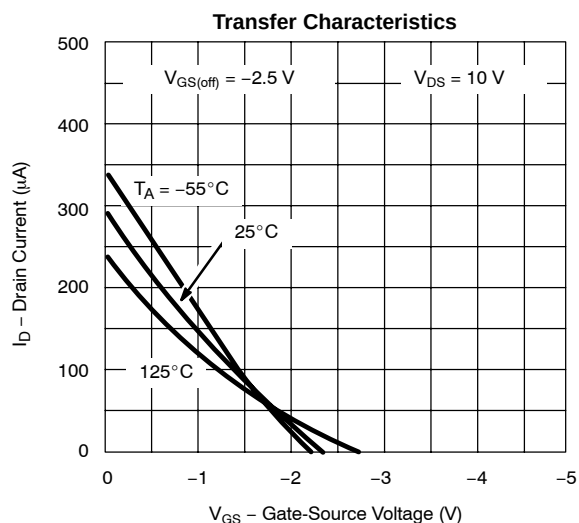
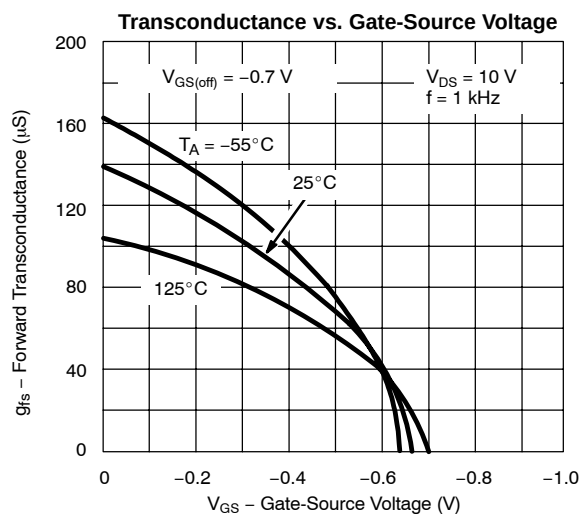
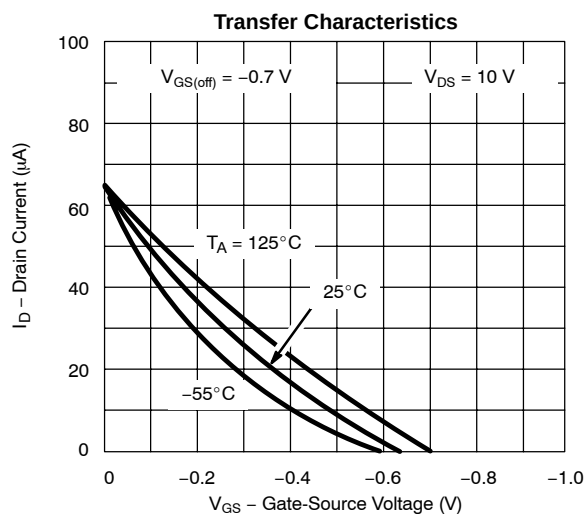
Parameter	Symbol	Test Conditions		Typ ^a	Limits						Unit
					4117		4118		4119		
					Min	Max	Min	Max	Min	Max	
Static											
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = -1 μA , V _{DS} = 0 V	-70	-40		-40		-40		V	
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 nA		-0.6	-1.8	-1	-3	-2	-6		
Saturation Drain Current	I _{DSS}	V _{DS} = 10 V, V _{GS} = 0 V		30	90	80	240	200	600	μA	
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°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
			SST	-0.2		-10		-10		-10	
		V _{GS} = -10 V V _{DS} = 0 V T _A = 100°C	PN/SST	-0.03		-2.5		-2.5		-2.5	nA
Gate Operating Current ^b	I _G	V _{DG} = 15 V, I _D = 30 μA	-0.2							pA	
Drain Cutoff Current ^b	I _{D(off)}	V _{DS} = 10 V, V _{GS} = -8 V	0.2								
Gate-Source Forward Voltage ^b	V _{GS(F)}	I _G = 1 mA , V _{DS} = 0 V	0.7							V	
Dynamic											
Common-Source Forward Transconductance	g _{fs}	V _{DS} = 10 V, V _{GS} = 0 V f = 1 kHz			70	210	80	250	100	330	μS
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		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 ^b	$\bar{e}_n$	V _{DS} = 10 V, V _{GS} = 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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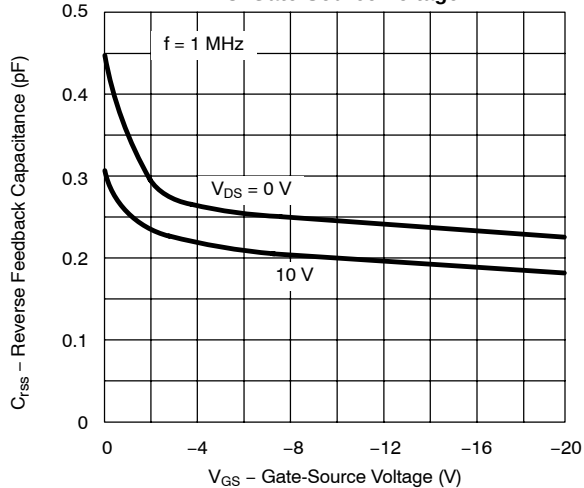
**TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)**

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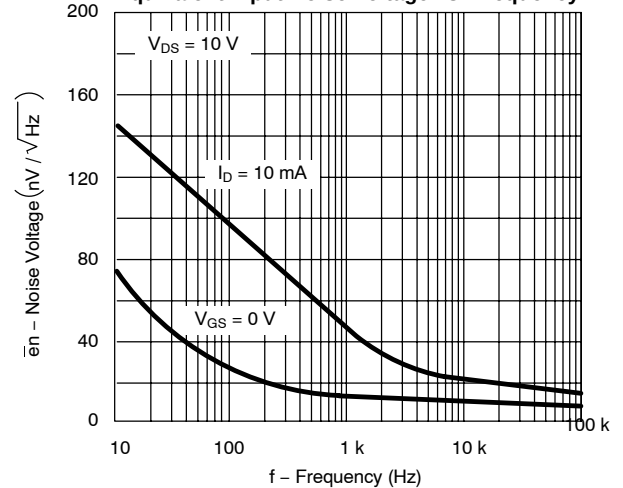


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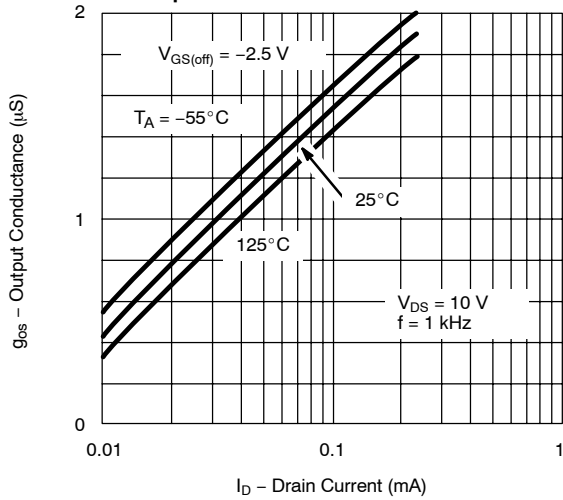
Common-Source Reverse Feedback Capacitance vs. Gate-Source Voltage



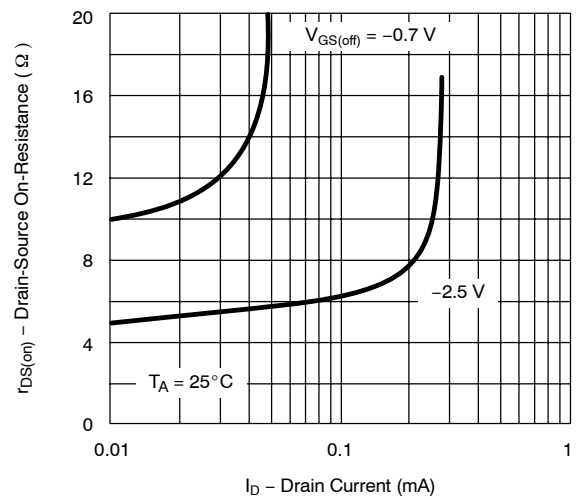
Equivalent Input Noise Voltage vs. Frequency



Output Conductance vs. Drain Current



On-Resistance vs. Drain Current





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