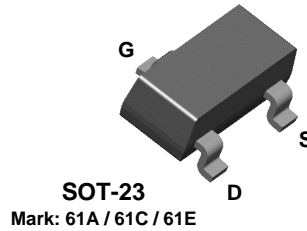
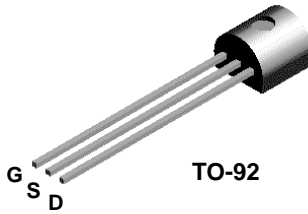


**PN4117  
PN4118  
PN4119**

**MMBF4117  
MMBF4118  
MMBF4119**



NOTE: Source & Drain  
are interchangeable

## N-Channel Switch

This device is designed for low current DC and audio applications. These devices provide excellent performance as input stages for sub-picoamp instrumentation or any high impedance signal sources. Sourced from Process 53.

### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>DG</sub>	Drain-Gate Voltage	40	V
V <sub>GS</sub>	Gate-Source Voltage	- 40	V
I <sub>GF</sub>	Forward Gate Current	50	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**NOTES:**

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		PN4117-4119	*MMBF4117-4119	
P <sub>D</sub>	Total Device Dissipation	350	225	mW
	Derate above 25°C	2.8	1.8	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	125		°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	357	556	°C/W

\*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

## N-Channel Switch

(continued)

### Electrical Characteristics TA = 25°C unless otherwise noted

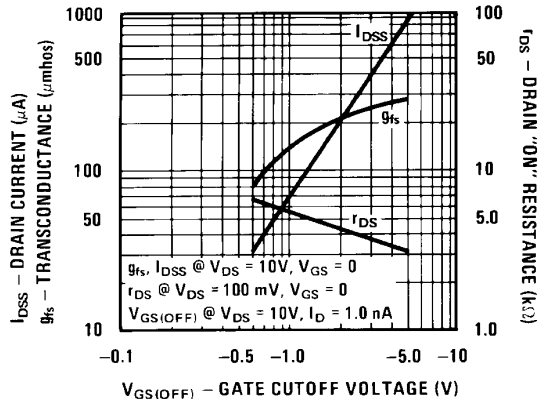
Symbol	Parameter	Test Conditions	Min	Max	Units	
<b>OFF CHARACTERISTICS</b>						
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -1.0 \mu A, V_{DS} = 0$	-40		V	
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -20 V, V_{DS} = 0$		-10	pA	
		$V_{GS} = -20 V, V_{DS} = 0, T_A = 150^\circ C$		-25	nA	
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = -10 V, I_D = 1.0 nA$	<b>4117</b>	-0.6	-1.8	V
			<b>4118</b>	-1.0	-3.0	V
			<b>4119</b>	-2.0	-6.0	V
<b>ON CHARACTERISTICS</b>						
$I_{DSS}$	Zero-Gate Voltage Drain Current*	$V_{DS} = 10 V, V_{GS} = 0$	<b>4117</b>	30	90	$\mu A$
			<b>4118</b>	80	240	$\mu A$
			<b>4119</b>	200	600	$\mu A$
<b>SMALL-SIGNAL CHARACTERISTICS</b>						
$g_{fs}$	Common-Source Forward Transconductance	$V_{DS} = 10 V, V_{GS} = 0, f = 1.0 kHz$	<b>4117</b>	70	210	$\mu mhos$
			<b>4118</b>	80	250	$\mu mhos$
			<b>4119</b>	100	330	$\mu mhos$
$g_{oss}$	Common-Source Output Conductance	$V_{DS} = 10 V, V_{GS} = 0, f = 1.0 kHz$	<b>4117</b>		3.0	$\mu mhos$
			<b>4118</b>		5.0	$\mu mhos$
			<b>4119</b>		10	$\mu mhos$
$Re(y_{fs})$	Common-Source Forward Transconductance	$V_{DS} = 10 V, V_{GS} = 0, f = 30 MHz$	<b>4117</b>	60		$\mu mhos$
			<b>4118</b>	70		$\mu mhos$
			<b>4119</b>	90		$\mu mhos$
$C_{iss}$	Input Capacitance	$V_{DS} = 10 V, V_{GS} = 0, f = 1.0 kHz$		3.0	pF	
$C_{rss}$	Reverse Transfer Capacitance	$V_{DS} = 10 V, V_{GS} = 0, f = 1.0 MHz,$		1.5	pF	

\*Pulse Test: Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 1.0\%$

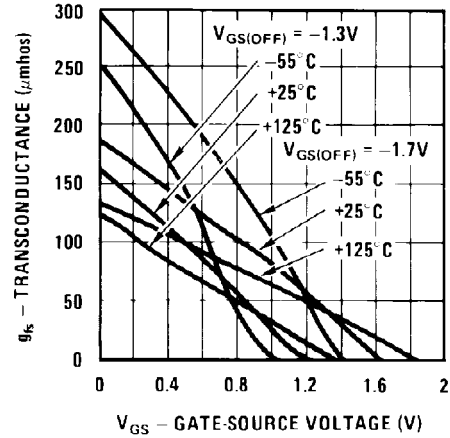
PN4117 / 4118 / 4119 / MMBF4117 / 4118 / 4119

Typical Characteristics

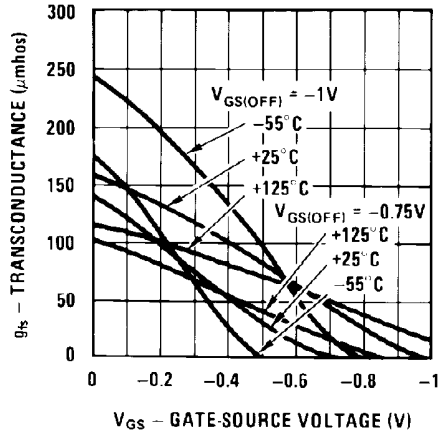
Parameter Interactions



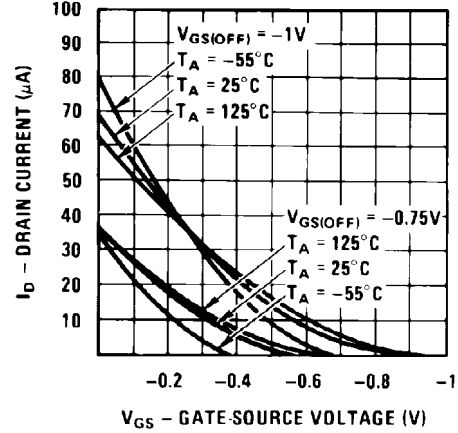
Transfer Characteristics



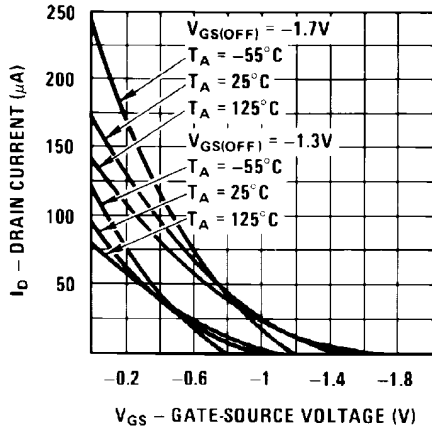
Transfer Characteristics



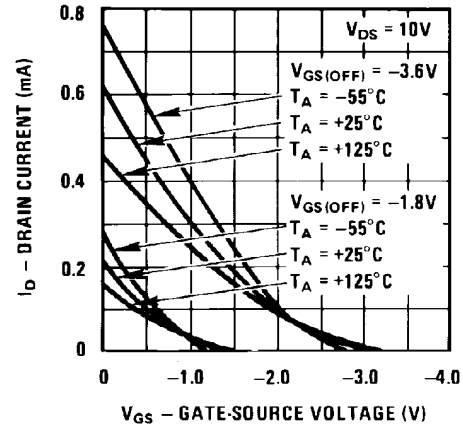
Transfer Characteristics



Transfer Characteristics



Transfer Characteristics



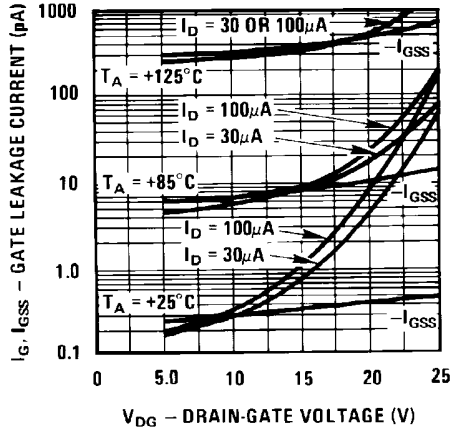
# N-Channel Switch

(continued)

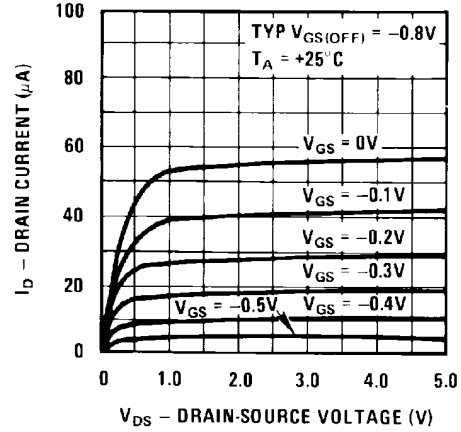
PN4117 / 4118 / 4119 / MMBF4117 / 4118 / 4119

## Typical Characteristics (continued)

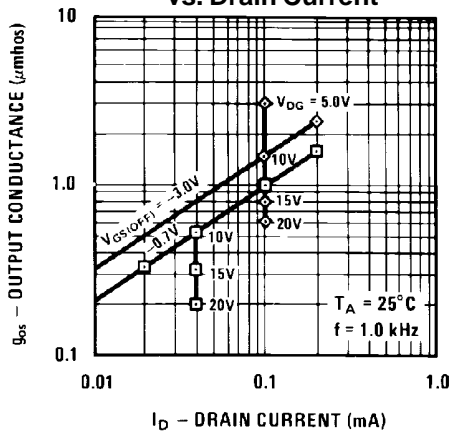
### Leakage Current vs. Voltage



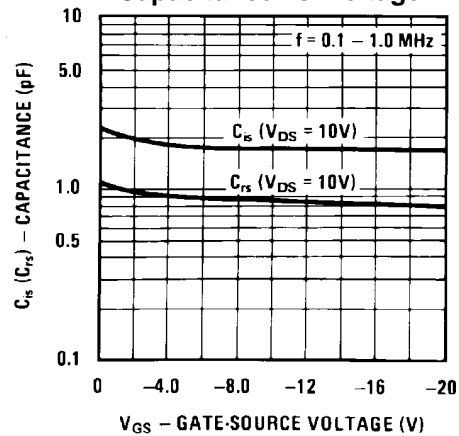
### Common Drain-Source



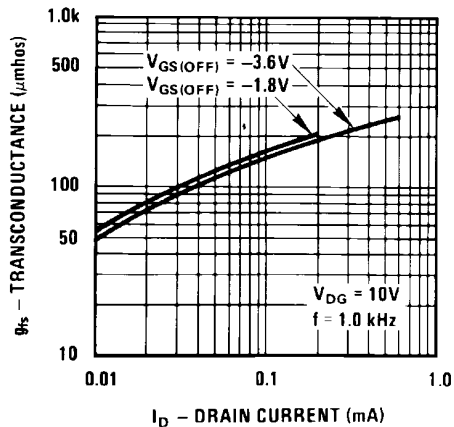
### Output Conductance vs. Drain Current



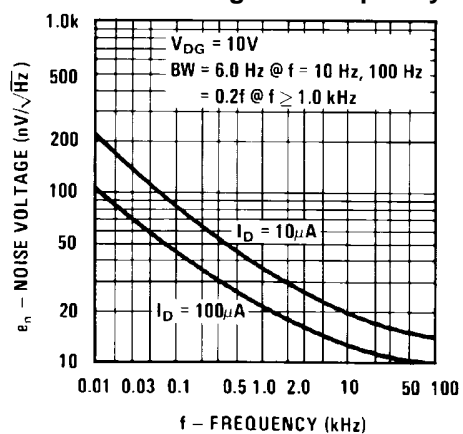
### Capacitance vs. Voltage



### Transconductance vs. Drain Current



### Noise Voltage vs. Frequency



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