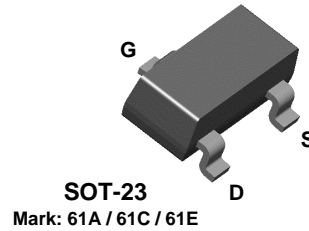
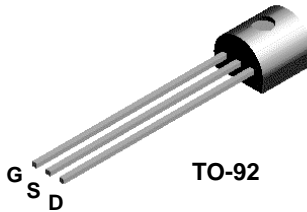


**PN4117  
PN4118  
PN4119**

**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)

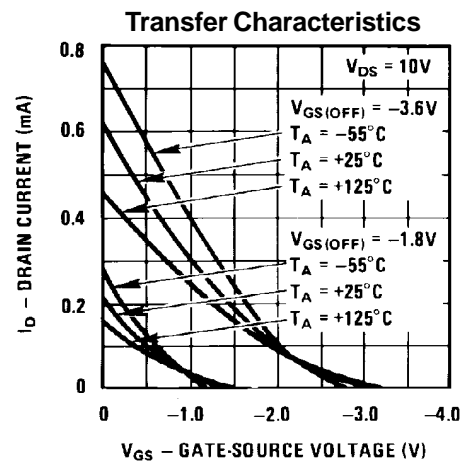
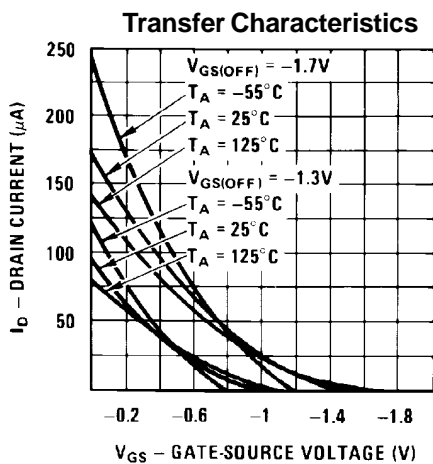
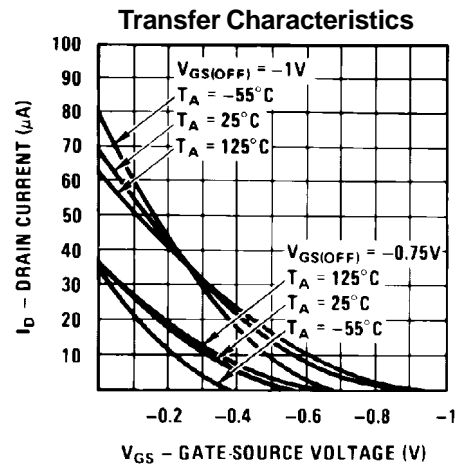
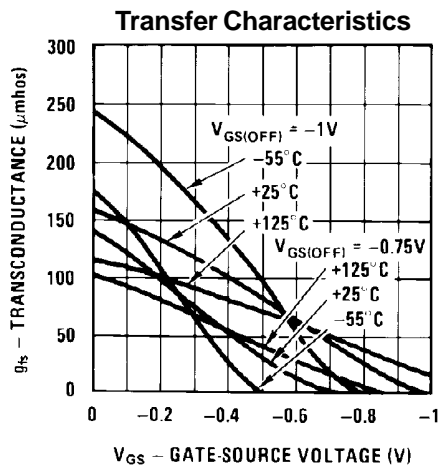
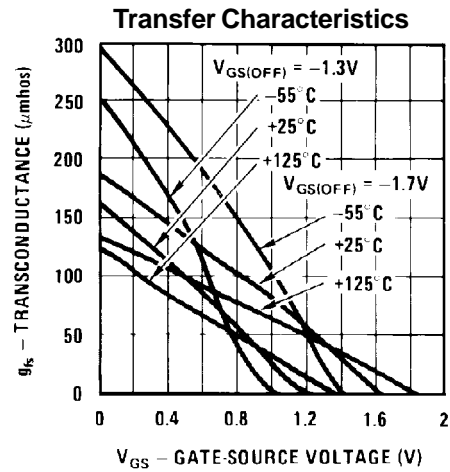
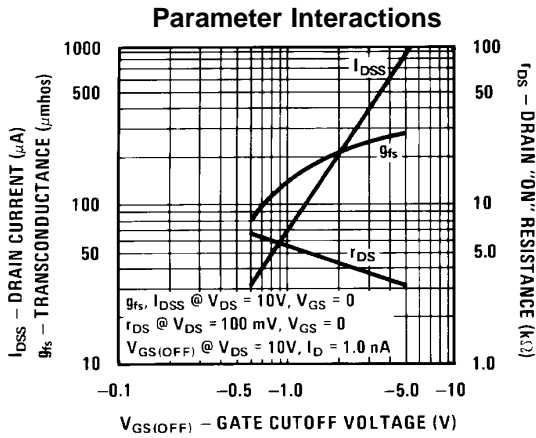
### Electrical Characteristics TA = 25°C unless otherwise noted

| 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    |            |

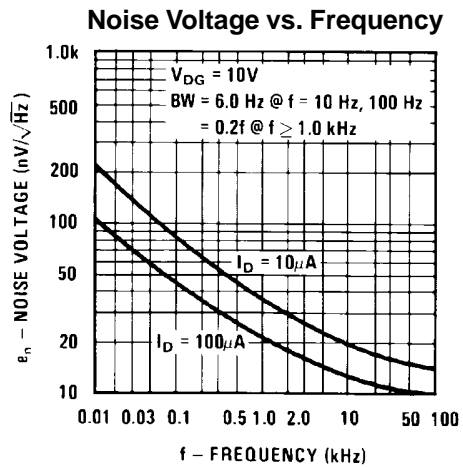
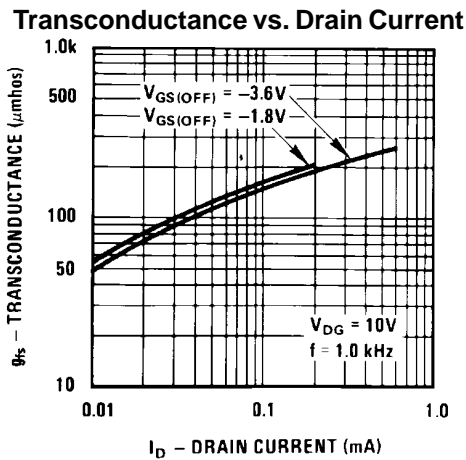
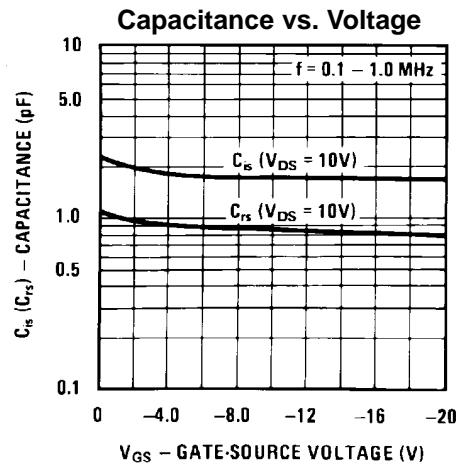
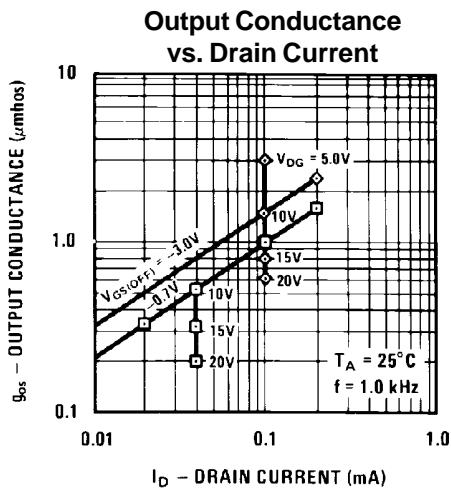
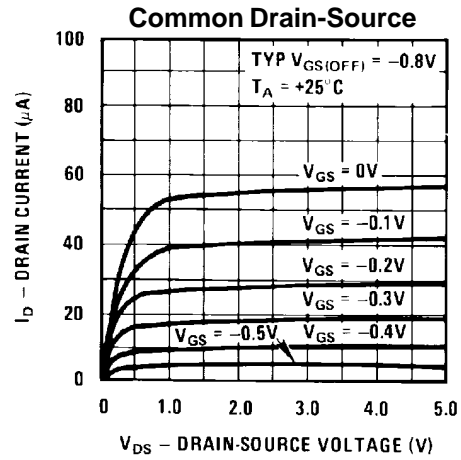
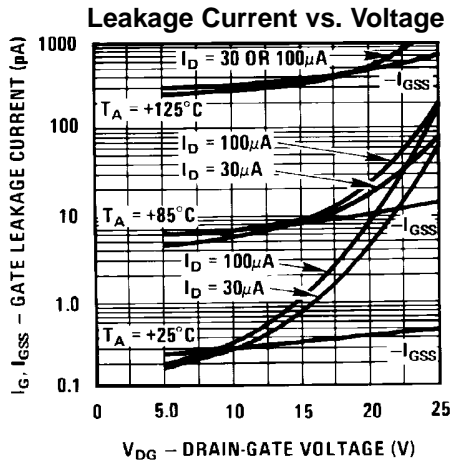
\*Pulse Test: Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 1.0\%$

PN4117 / 4118 / 4119 / MMBF4117 / 4118 / 4119

Typical Characteristics



Typical Characteristics (continued)



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