

# enhancement-type n-channel MOSFET designed for . . .



- General Purpose Amplifiers
- Analog Switches
- Digital Switching

## Performance Curves MBN MBNA See Section 4

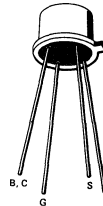
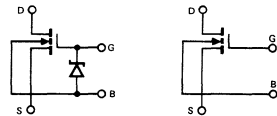
### BENEFITS

- High Input Impedance  
1 pA Maximum (M117)
- Low Insertion Loss  
 $R_{DS(on)} = 100 \Omega$  Maximum
- Rugged  
Zener Diode Input Protection

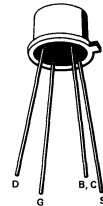
### ABSOLUTE MAXIMUM RATINGS (25°C)

|  |               |
|--|---------------|
| Drain-to-Source Voltage                                  | 30 V          |
| Gate-to-Source Voltage M116                              | 30 V          |
| Gate-to-Source Voltage M117                              | ±50 V         |
| Gate-to-Drain Voltage M116                               | 30 V          |
| Gate-to-Drain Voltage M117                               | ±50 V         |
| Drain Current  | 50 mA         |
| Gate Zener Current . . . M116                            | ±0.1 mA       |
| Storage Temperature                                      | -65 to 150°C  |
| Operating Junction Temperature                           | -55 to +125°C |
| Total Device Dissipation<br>(Derate 2.25 mW/°C to 125°C) | 225 mW        |

TO-72  
See Section 5



M116



M117

### ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

| Characteristic                                       | M116 |     | M117 |     | Unit | Test Condition  |   |
|--|------|-----|------|-----|------|---|---|
|  | Min  | Max | Min  | Max |      |   |   |
| 1   I <sub>GSS</sub> Gate-Body Leakage               |      | 100 |      | 1.0 | pA   | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = V <sub>BS</sub> = 0                   |   |
| 2   V <sub>GS(th)</sub> Gate Threshold Voltage       | 1    | 5   | 1    | 5   | V    | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 10 μA, V <sub>BS</sub> = 0 |   |
| 3   BV <sub>DSS</sub> Drain-Source Breakdown Voltage | 30   |     | 30   |     |      | I <sub>D</sub> = 1 μA, V <sub>GS</sub> = V <sub>BS</sub> = 0                    |   |
| 4   BV <sub>SDS</sub> Source-Drain Breakdown Voltage | 30   |     | 30   |     |      | I <sub>S</sub> = 1 μA, V <sub>GD</sub> = V <sub>BD</sub> = 0                    |   |
| 5   BV <sub>GBS</sub> Gate-Body Breakdown Voltage    | 30   | 60  | ±100 |     |      | I <sub>G</sub> = 10 μA, V <sub>SB</sub> = V <sub>DB</sub> = 0                   |   |
| 6   I <sub>D(off)</sub> Drain Cutoff Current         |      | 10  |      | 10  | nA   | V <sub>GS</sub> = 20 V, V <sub>GS</sub> = V <sub>BS</sub> = 0                   |   |
| 7   I <sub>S(off)</sub> Source Cutoff Current        |      | 10  |      | 10  |      | V <sub>SD</sub> = 20 V, V <sub>GD</sub> = V <sub>BD</sub> = 0                   |   |
| 8   I <sub>D(on)</sub> ON Drain Current              | 2    | 20  | 2    | 20  | mA   | V <sub>GS</sub> = V <sub>DS</sub> = +10V, V <sub>BS</sub> = 0                   |   |
| 9   r <sub>DS(on)</sub> Drain Source ON Resistance   |      | 100 |      | 100 |      | V <sub>GS</sub> = 20 V, I <sub>D</sub> = 100 μA, V <sub>BS</sub> = 0            |   |
| 10   |      | 200 |      | 200 |      | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 100 μA, V <sub>BS</sub> = 0            |   |
| 11   C <sub>iss</sub> Input Capacitance              |      | 10  |      | 8   | pF   | V <sub>GB</sub> = 0, V <sub>DB</sub> = 10 V, V <sub>BS</sub> = 0                |   |
| 12   C <sub>gs</sub> Gate-Source Capacitance         |      | 2.5 |      | 2.5 |      | f = 1 MHz   | V <sub>GB</sub> = V <sub>DB</sub> = 0       |
| 13   C <sub>gd</sub> Gate-Drain Capacitance          |      | 2.5 |      | 2.5 |      |   | Body Guarded                                |
| 14   C <sub>db</sub> Drain-Body Capacitance          |      | 7   |      | 7   |      |   | V <sub>GB</sub> = 0, V <sub>DB</sub> = 10 V |

MBN

MBNA

### NOTE:

1. Gate-oxide breakdown voltage. Permanent damage may result if voltages greater than ±100 are applied to the gate.