# depletion-type n-channel dual gate MOSFET

## *designed for . . .*

**Performance Curves MCB See Section 4**

- **VHF Amplifiers**
- **IF Amplifiers**
- **Mixers**

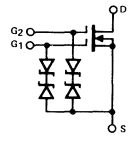
### *ABSOLUTE MAXIMUM RATINGS (25°C)

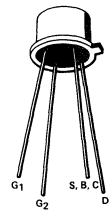
Drain-to-Gate Voltage . . . . . 20 V
Gate Current, Forward & Reverse . . . . . 1 mA
Drain-to-Source Voltage . . . . . 20 V
Drain Current, Continuous . . . . . 50 mA
Device Dissipation at $T_{CASE}$ = 25°C . . . . . 1.2 W
Device Dissipation at $T_A$ = 25°C. . . . . 330 mW
Free Air Temperature above 25°C derate linearly 2.2 mW/°C
Storage Temperature Range . . . . . -65 to +200°C
Lead Temperature 1/16" From Case for 10 Seconds . . 300°C

### BENEFITS

- High Gain
  $g_{fs}$ Typically 12 mmhos
- No Neutralization Required
  Low $C_{rss} < 0.03$ pF
- Automatic Gain Control with Second Gate

**TO-72**
**See Section 5**



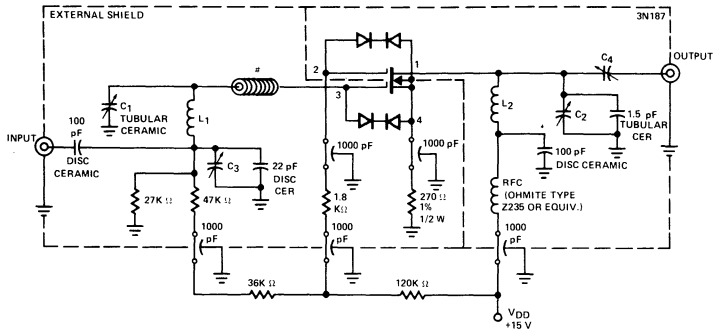

### *ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

| | | Characteristic | | Min | Typ | Max | Unit | Test Conditions | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | STATIC | $I_{G1SS}$ | Gate One to Source Leakage Current | | | ±50 | nA | $V_{G1S}$ = ±6 V, $V_{G2S}$ = $V_{DS}$ = 0 | |
| 2 | | $I_{G2SS}$ | Gate Two to Source Leakage Current | | | ±50 | | $V_{G2S}$ = ±6 V, $V_{G1S}$ = $V_{DS}$ = 0 | |
| 3 | | $I_{G1SS}$ | Gate One to Source Leakage Current | | | ±5 | μA | $V_{G1S}$ = ±6 V, $V_{G2S}$ = $V_{DS}$ = 0 | $T_A$ = 100°C |
| 4 | | $I_{G2SS}$ | Gate Two to Source Leakage Current | | | ±5 | | $V_{G2S}$ = ±6 V, $V_{G1S}$ = $V_{DS}$ = 0 | |
| 5 | | $BV_{G1SS}$ | Gate One to Source Breakdown Voltage | ±6.5 | | ±13 | V | $I_{G1}$ = ±100 μA, $V_{G2S}$ = $V_{DS}$ = 0 | |
| 6 | | $BV_{G2SS}$ | Gate Two to Source Breakdown Voltage | ±6.5 | | ±13 | | $I_{G2}$ = ±100 μA, $V_{G1S}$ = $V_{DS}$ = 0 | |
| 7 | | $V_{G1S(off)}$ | Gate One to Source Cutoff Voltage | -.5 | | -4 | | $V_{DS}$ = 15 V, $V_{G2S}$ = 4 V, $I_D$ = 50 μA | |
| 8 | | $V_{G2S(off)}$ | Gate Two to Source Cutoff Voltage | -.5 | | -4 | | $V_{DS}$ = 15 V, $V_{G1S}$ = 0, $I_D$ = 50 μA | |
| 9 | | $I_{DS}$ | Zero Gate One Voltage Drain Current | 5 | 15 | 30 | mA | $V_{DS}$ = 15 V, $V_{G2S}$ = 4 V, $V_{G1S}$ = 0 | |
| 10 | DYNAMIC | $g_{fs}$ | Common Source Forward Transconductance (Note 1) | 7 | | 18 | mmho | $V_{DS}$ = 15 V, $V_{G2S}$ = 4 V, $I_D$ = 10 mA | f = 1 kHz |
| 11 | | $C_{iss}$ | Common Source Input Capacitance | | 6 | 8.5 | pF | $V_{DS}$ = 15 V, $V_{G2S}$ = 4 V, $I_D$ = 10 mA | f = 1 MHz |
| 12 | | $C_{rss}$ | Common Source Reverse Transfer Capacitance | | .02 | .03 | | | |
| 13 | | $C_{oss}$ | Common Source Output Capacitance | | 2.5 | | | | |
| 14 | HI FREQ | $G_{ps}$ | Common Source Power Gain (Note 2) | 16 | | 22 | dB | $V_{DD}$ = 15 V, $V_{G2S}$ = 4 V, $I_D$ = 10 mA | f = 200 MHz |
| 15 | | NF | Noise Figure (Note 2) | | | 4.5 | | | |
| 16 | | $G_{ps}$ | Common Source Power Gain (Notes 3 and 4) | | 12 | | | | f = 450 MHz |
| 17 | | NF | Noise Figure (Notes 3 and 4) | | 5.5 | | | | |

*JEDEC registered data

**MCB**

**NOTES:**
1. Pulse test pulsewidth = 300 μs, duty cycle ≤ 3%.
2. See Figure 1.
3. See Figure 2.
4. Non-JEDEC registered data.




**200 MHz Power Gain and Noise Figure Test Circuit**
**Figure 1**

$C_1$ – 1.8 – 8.7 pF variable air capacitor: E.F. Johnson Type 160-104, or equivalent.

$C_2$ – 1.5 – 5 pF variable air capacitor: E.F. Johnson Type 160-102, or equivalent.

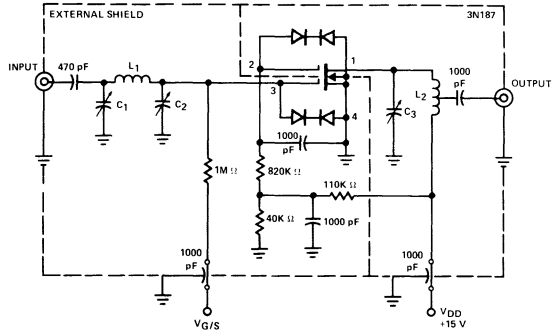
$C_3$ – 1 – 10 pF piston-type variable air capacitor: JFD Type VAM-010; Johanson Type 4335, or equivalent.

$C_4$ – 0.8 – 4.5 pF piston type variable air capacitor: Erie 560-013 or equivalent.

$L_1$ – 4 turns silver-plated 0.02-in. thick, 0.075-0.085-in. wide, copper ribbon. Internal diameter of winding = 0.25 in., winding length approx. 0.08 in.

$L_2$ – 4 1/2 turns silver-plated 0.02-in. thick, 0.085-0.095-in. wide, 5/16-in. ID. Coil = .90 in. long.

# – Ferrite bead (4); Pyroferric Co. "Carbonyl J" 0.09 in. OD; 0.03 in. ID; 0.063 in. thickness.




**450 MHz Power Gain and Noise Figure Test Circuit**
**Figure 2**

$C_1$ – 2 – 20 pF piston-type variable air capacitor; E.F. Johnson Type MVM 020.

$C_2$ – 1 – 10 pF piston-type variable air capacitor; E.F. Johnson Type VAM-010; Johanson Type 4335.

$C_3$ – 1 – 10 pF piston-type variable air capacitor; E.F. Johnson Type VAM-010; Johanson Type 4335.

$L_1$ – 1/2 turns No. 18 AWG.

$L_2$ – 1" No. 16 AWG tapped 1/4" from cold end.