

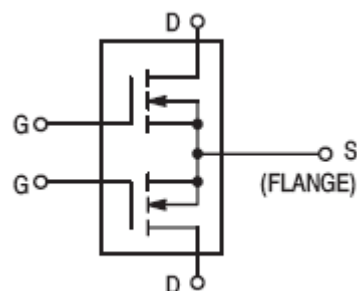
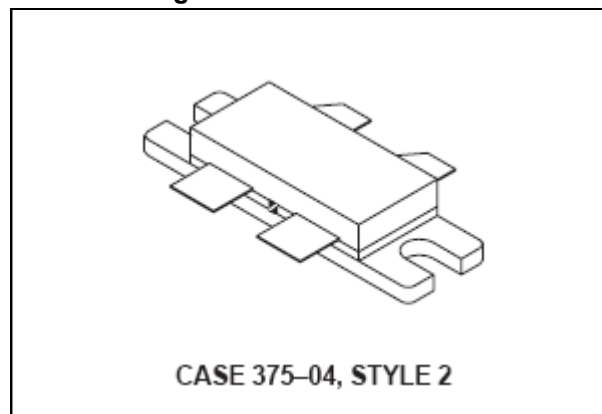
## RF Power FET 300W, 175MHz, 28V

Rev. V1

Designed for broadband commercial and military applications at frequencies to 175 MHz. The high power, high gain and broadband performance of this device is especially useful for FM broadcast or TV channel frequency band solid state transmitters and amplifiers.

- Guaranteed performance at 175MHz, 28V:  
Output power: 300W  
Gain: 12dB (14dB Typ.)  
Efficiency: 50%
- Low thermal resistance: 0.35°C/W
- Ruggedness tested at rated output power
- Nitride passivated die for enhanced reliability

### Product Image



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### MAXIMUM RATINGS

| Rating                                                                                 | Symbol    | Value       | Unit                         |
|----------------------------------------------------------------------------------------|-----------|-------------|------------------------------|
| Drain-Source Voltage                                                                   | $V_{DSS}$ | 65          | Vdc                          |
| Drain-Gate Voltage                                                                     | $V_{DGO}$ | 65          | Vdc                          |
| Gate-Source Voltage                                                                    | $V_{GS}$  | $\pm 40$    | Vdc                          |
| Drain Current — Continuous                                                             | $I_D$     | 32          | Adc                          |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$     | 500<br>2.85 | Watts<br>W/ $^\circ\text{C}$ |
| Storage Temperature Range                                                              | $T_{stg}$ | -65 to +150 | $^\circ\text{C}$             |
| Operating Junction Temperature                                                         | $T_J$     | 200         | $^\circ\text{C}$             |

### THERMAL CHARACTERISTICS

| Characteristic                       | Symbol          | Max  | Unit               |
|--------------------------------------|-----------------|------|--------------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 0.35 | $^\circ\text{C/W}$ |

**NOTE — CAUTION** — MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.

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RF Power FET  
300W, 175MHz, 28V

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**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

**OFF CHARACTERISTICS (1)**

|                                                                      |               |    |   |     |                 |
|----------------------------------------------------------------------|---------------|----|---|-----|-----------------|
| Drain–Source Breakdown Voltage<br>( $V_{GS} = 0$ , $I_D = 100$ mA)   | $V_{(BR)DSS}$ | 65 | — | —   | Vdc             |
| Zero Gate Voltage Drain Current<br>( $V_{DS} = 28$ V, $V_{GS} = 0$ ) | $I_{DSS}$     | —  | — | 5.0 | mAdc            |
| Gate–Body Leakage Current<br>( $V_{GS} = 20$ V, $V_{DS} = 0$ )       | $I_{GSS}$     | —  | — | 1.0 | $\mu\text{Adc}$ |

**ON CHARACTERISTICS (1)**

|                                                               |              |     |     |     |      |
|---------------------------------------------------------------|--------------|-----|-----|-----|------|
| Gate Threshold Voltage<br>( $V_{DS} = 10$ V, $I_D = 100$ mA)  | $V_{GS(th)}$ | 1.0 | 3.0 | 5.0 | Vdc  |
| Drain–Source On–Voltage<br>( $V_{GS} = 10$ V, $I_D = 10$ A)   | $V_{DS(on)}$ | 0.1 | 0.9 | 1.5 | Vdc  |
| Forward Transconductance<br>( $V_{DS} = 10$ V, $I_D = 5.0$ A) | $g_{fs}$     | 5.0 | 7.0 | —   | mhos |

**DYNAMIC CHARACTERISTICS (1)**

|                                                                                  |           |   |     |   |    |
|----------------------------------------------------------------------------------|-----------|---|-----|---|----|
| Input Capacitance<br>( $V_{DS} = 28$ V, $V_{GS} = 0$ , $f = 1.0$ MHz)            | $C_{iss}$ | — | 350 | — | pF |
| Output Capacitance<br>( $V_{DS} = 28$ V, $V_{GS} = 0$ , $f = 1.0$ MHz)           | $C_{oss}$ | — | 420 | — | pF |
| Reverse Transfer Capacitance<br>( $V_{DS} = 28$ V, $V_{GS} = 0$ , $f = 1.0$ MHz) | $C_{rss}$ | — | 35  | — | pF |

**FUNCTIONAL TESTS (2)**

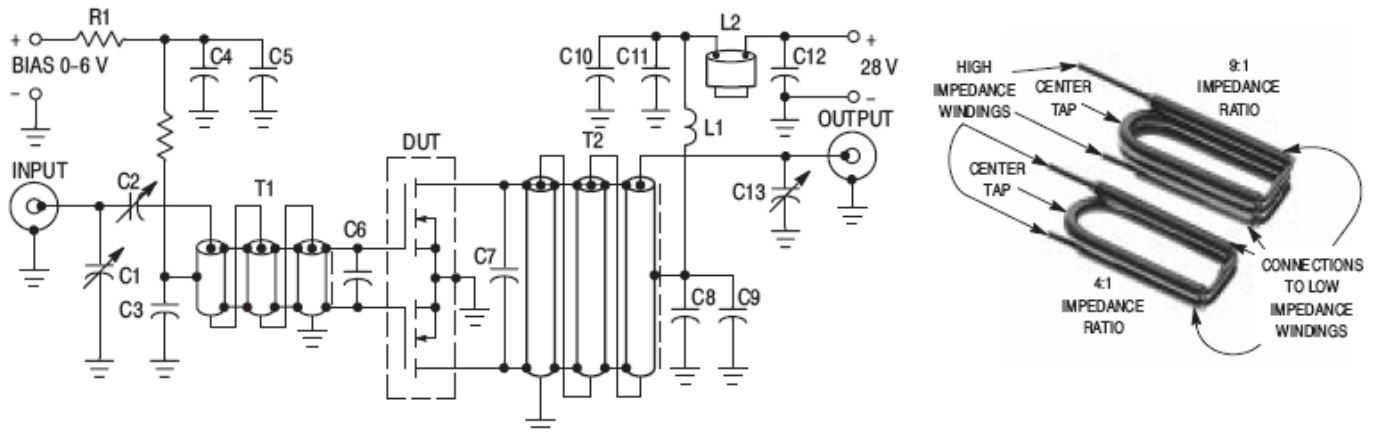
|                                                                                                                           |          |                                |    |   |    |
|---------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------|----|---|----|
| Common Source Amplifier Power Gain<br>( $V_{DD} = 28$ V, $P_{out} = 300$ W, $I_{DQ} = 500$ mA, $f = 175$ MHz)             | $G_{ps}$ | 12                             | 14 | — | dB |
| Drain Efficiency<br>( $V_{DD} = 28$ V, $P_{out} = 300$ W, $f = 175$ MHz, $I_D$ (Max) = 21.4 A)                            | $\eta$   | 45                             | 55 | — | %  |
| Load Mismatch<br>( $V_{DD} = 28$ V, $P_{out} = 300$ W, $I_{DQ} = 500$ mA, $f = 175$ MHz,<br>VSWR 5:1 at all Phase Angles) | $\psi$   | No Degradation in Output Power |    |   |    |

## NOTES:

- Each side measured separately.
- Measured in push–pull configuration.

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C1 — Arco 402, 1.5–20 pF  
C2 — Arco 406, 15–115 pF  
C3, C4, C8, C9, C10 — 1000 pF Chip  
C5, C11 — 0.1  $\mu$ F Chip  
C6 — 330 pF Chip  
C7 — 200 pF and 180 pF Chips in Parallel  
C12 — 0.47  $\mu$ F Ceramic Chip, Kemet 1215 or Equivalent  
C13 — Arco 403, 3.0–35 pF  
L1 — 10 Turns AWG #16 Enameled Wire,  
Close Wound, 1/4" I.D.  
L2 — Ferrite Beads of Suitable Material for  
1.5–2.0  $\mu$ H Total Inductance  
R1 — 100 Ohms, 1/2 W  
R2 — 1.0 kOhm, 1/2 W

Unless Otherwise Noted, All Chip Capacitors are ATC Type 100 or Equivalent.

T1 — 9:1 RF Transformer. Can be made of 15–18 Ohms  
Semirigid Co-Ax, 62–90 Mils O.D.  
T2 — 1:9 RF Transformer. Can be made of 15–18 Ohms  
Semirigid Co-Ax, 70–90 Mils O.D.

Board Material — 0.062" Fiberglass (G10),  
1 oz. Copper Clad, 2 Sides,  $\epsilon_r = 5$

NOTE: For stability, the input transformer T1 must be loaded  
with ferrite toroids or beads to increase the common  
mode inductance. For operation below 100 MHz. The  
same is required for the output transformer.

See pictures for construction details.

**Figure 1. 175 MHz Test Circuit**

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## TYPICAL CHARACTERISTICS

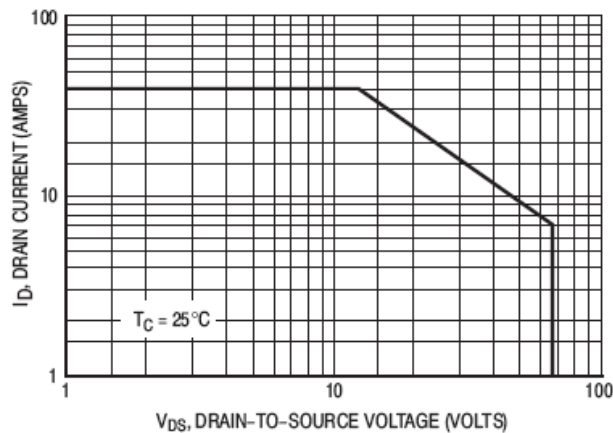


Figure 2. DC Safe Operating Area

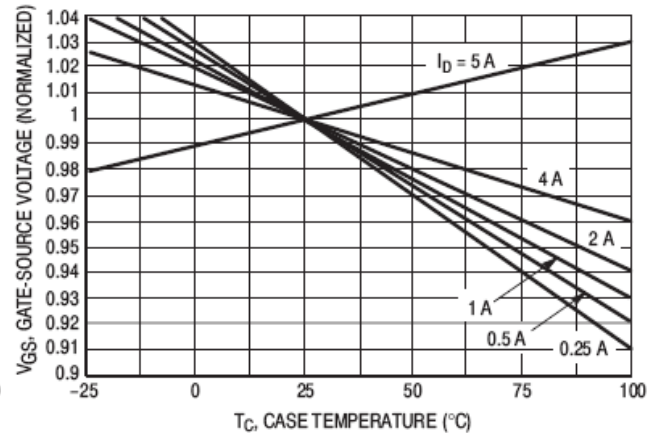
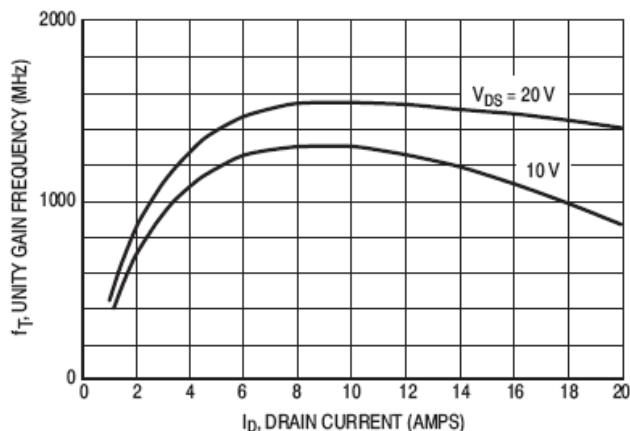
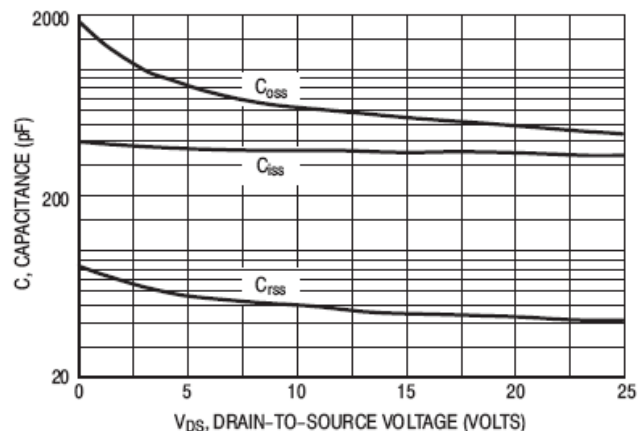


Figure 3. Gate-Source Voltage versus Case Temperature



NOTE: Data shown applies to each half of MRF141G.

Figure 4. Common Source Unity Gain Frequency versus Drain Current



NOTE: Data shown applies to each half of MRF141G.

Figure 5. Capacitance versus Drain-Source Voltage

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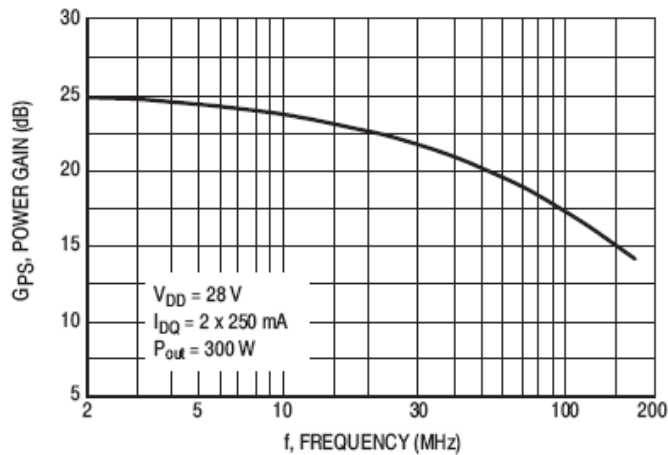


Figure 6. Power Gain versus Frequency

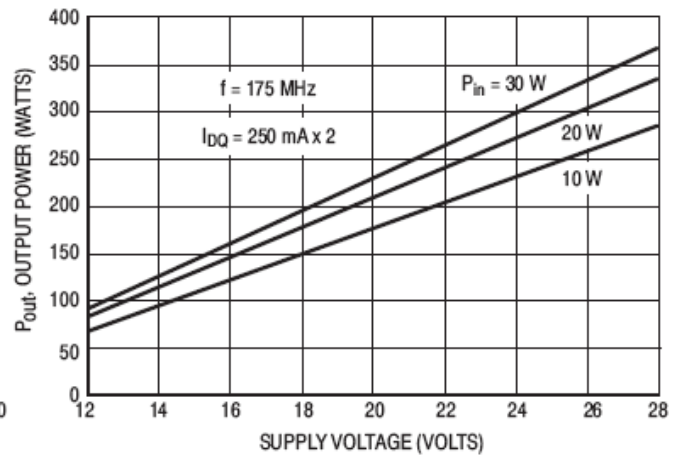


Figure 7. Output Power versus Supply Voltage

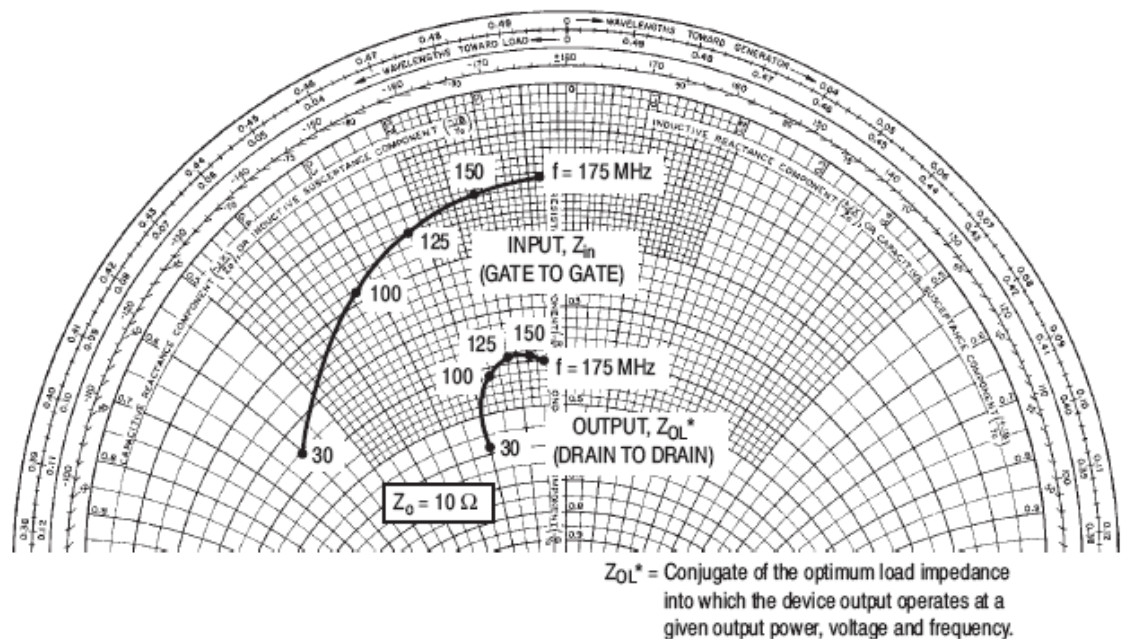


Figure 8. Input and Output Impedances

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## RF Power FET 300W, 175MHz, 28V

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NOTE: S-Parameter data represents measurements taken from one chip only.

Table 1. Common Source S-Parameters ( $V_{DS} = 24\text{ V}$ ,  $I_D = 0.57\text{ A}$ )

| f<br>MHz | S <sub>11</sub> |      | S <sub>21</sub> |    | S <sub>12</sub> |     | S <sub>22</sub> |      |
|----------|-----------------|------|-----------------|----|-----------------|-----|-----------------|------|
|          | S <sub>11</sub> | ∠φ   | S <sub>21</sub> | ∠φ | S <sub>12</sub> | ∠φ  | S <sub>22</sub> | ∠φ   |
| 30       | 0.845           | -174 | 4.88            | 78 | 0.014           | -5  | 0.939           | -174 |
| 40       | 0.867           | -174 | 3.23            | 66 | 0.013           | -14 | 0.856           | -172 |
| 50       | 0.876           | -174 | 2.62            | 62 | 0.013           | -17 | 0.868           | -175 |
| 60       | 0.883           | -174 | 2.12            | 59 | 0.012           | -15 | 0.938           | -176 |
| 70       | 0.890           | -175 | 1.85            | 58 | 0.012           | -12 | 1.036           | -177 |
| 80       | 0.899           | -175 | 1.57            | 56 | 0.011           | -10 | 1.110           | -177 |
| 90       | 0.909           | -175 | 1.36            | 50 | 0.010           | -11 | 1.190           | -176 |
| 100      | 0.920           | -176 | 1.13            | 43 | 0.009           | -13 | 1.160           | -176 |
| 110      | 0.930           | -176 | 0.95            | 37 | 0.007           | -16 | 1.100           | -177 |
| 120      | 0.938           | -176 | 0.78            | 33 | 0.007           | -11 | 1.010           | -175 |
| 130      | 0.944           | -176 | 0.67            | 31 | 0.006           | -3  | 0.954           | -176 |
| 140      | 0.948           | -177 | 0.60            | 31 | 0.006           | 10  | 0.964           | -177 |
| 150      | 0.951           | -177 | 0.56            | 32 | 0.005           | 23  | 1.023           | -178 |
| 160      | 0.954           | -178 | 0.52            | 32 | 0.005           | 31  | 1.130           | -179 |
| 170      | 0.958           | -178 | 0.48            | 29 | 0.006           | 37  | 1.190           | -178 |
| 180      | 0.962           | -178 | 0.45            | 24 | 0.006           | 39  | 1.260           | -179 |
| 190      | 0.965           | -179 | 0.40            | 17 | 0.007           | 41  | 1.200           | 180  |
| 200      | 0.968           | -179 | 0.34            | 15 | 0.008           | 49  | 1.090           | -179 |
| 210      | 0.970           | -179 | 0.30            | 15 | 0.008           | 60  | 0.980           | -178 |
| 220      | 0.972           | -180 | 0.27            | 15 | 0.008           | 68  | 0.960           | -177 |
| 230      | 0.973           | -180 | 0.25            | 17 | 0.008           | 68  | 1.045           | -179 |
| 240      | 0.974           | 180  | 0.24            | 20 | 0.009           | 67  | 1.030           | 179  |
| 250      | 0.975           | 180  | 0.24            | 19 | 0.011           | 68  | 1.100           | 179  |
| 260      | 0.977           | 179  | 0.21            | 17 | 0.012           | 69  | 1.200           | 179  |
| 270      | 0.978           | 179  | 0.22            | 13 | 0.013           | 72  | 1.210           | 177  |
| 280      | 0.979           | 179  | 0.19            | 13 | 0.012           | 72  | 1.170           | 177  |
| 290      | 0.979           | 178  | 0.17            | 1  | 0.012           | 68  | 1.040           | 180  |

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RF Power FET  
300W, 175MHz, 28V

Rev. V1

Table 1. Common Source S-Parameters ( $V_{DS} = 24\text{ V}$ ,  $I_D = 0.57\text{ A}$ ) (continued)

| f<br>MHz | $S_{11}$   |               | $S_{21}$   |               | $S_{12}$   |               | $S_{22}$   |               |
|----------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|
|          | $ S_{11} $ | $\angle \phi$ | $ S_{21} $ | $\angle \phi$ | $ S_{12} $ | $\angle \phi$ | $ S_{22} $ | $\angle \phi$ |
| 300      | 0.980      | 178           | 0.16       | 8             | 0.013      | 65            | 0.998      | 179           |
| 310      | 0.980      | 178           | 0.16       | 13            | 0.015      | 70            | 0.977      | 179           |
| 320      | 0.981      | 178           | 0.16       | 15            | 0.017      | 76            | 0.979      | 178           |
| 330      | 0.982      | 177           | 0.13       | 10            | 0.017      | 83            | 1.033      | 178           |
| 340      | 0.982      | 177           | 0.15       | 19            | 0.016      | 81            | 1.110      | 176           |
| 350      | 0.982      | 177           | 0.13       | 16            | 0.016      | 73            | 1.140      | 177           |
| 360      | 0.983      | 177           | 0.13       | 8             | 0.020      | 63            | 1.150      | 177           |
| 370      | 0.982      | 176           | 0.10       | 6             | 0.023      | 65            | 1.120      | 176           |
| 380      | 0.982      | 176           | 0.10       | 7             | 0.023      | 72            | 1.050      | 177           |
| 390      | 0.982      | 176           | 0.10       | 10            | 0.021      | 81            | 0.993      | 177           |
| 400      | 0.982      | 176           | 0.09       | 14            | 0.018      | 83            | 0.959      | 179           |
| 410      | 0.983      | 175           | 0.10       | 12            | 0.020      | 71            | 1.040      | 176           |
| 420      | 0.983      | 175           | 0.09       | 16            | 0.025      | 65            | 1.090      | 174           |
| 430      | 0.984      | 175           | 0.09       | 15            | 0.028      | 70            | 1.100      | 174           |
| 440      | 0.983      | 174           | 0.09       | 12            | 0.028      | 77            | 1.100      | 175           |
| 450      | 0.983      | 174           | 0.09       | 13            | 0.025      | 82            | 1.090      | 176           |
| 460      | 0.983      | 174           | 0.07       | 14            | 0.022      | 66            | 1.080      | 174           |
| 470      | 0.983      | 174           | 0.07       | 13            | 0.024      | 56            | 0.992      | 175           |
| 480      | 0.983      | 174           | 0.07       | 16            | 0.032      | 60            | 0.970      | 175           |
| 490      | 0.984      | 173           | 0.07       | 13            | 0.036      | 74            | 0.996      | 174           |
| 500      | 0.984      | 173           | 0.07       | 18            | 0.035      | 85            | 1.040      | 174           |

Table 2. Common Source S-Parameters ( $V_{DS} = 28\text{ V}$ ,  $I_D = 0.65\text{ A}$ )

| f<br>MHz | $S_{11}$   |               | $S_{21}$   |               | $S_{12}$   |               | $S_{22}$   |               |
|----------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|
|          | $ S_{11} $ | $\angle \phi$ | $ S_{21} $ | $\angle \phi$ | $ S_{12} $ | $\angle \phi$ | $ S_{22} $ | $\angle \phi$ |
| 30       | 0.849      | -174          | 5.41       | 79            | 0.013      | -6            | 0.934      | -174          |
| 40       | 0.869      | -174          | 3.59       | 67            | 0.013      | -16           | 0.849      | -172          |
| 50       | 0.878      | -174          | 2.91       | 62            | 0.012      | -17           | 0.859      | -174          |
| 60       | 0.884      | -174          | 2.36       | 60            | 0.011      | -13           | 0.928      | -176          |
| 70       | 0.890      | -175          | 2.06       | 59            | 0.010      | -11           | 1.029      | -177          |
| 80       | 0.899      | -175          | 1.75       | 56            | 0.009      | -14           | 1.110      | -177          |
| 90       | 0.910      | -176          | 1.52       | 51            | 0.009      | -18           | 1.190      | -175          |
| 100      | 0.920      | -176          | 1.26       | 43            | 0.009      | -19           | 1.150      | -175          |

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RF Power FET  
300W, 175MHz, 28V

Rev. V1

Table 2. Common Source S-Parameters ( $V_{DS} = 28\text{ V}$ ,  $I_D = 0.65\text{ A}$ ) (continued)

|     |       |      |      |    |       |     |       |      |
|-----|-------|------|------|----|-------|-----|-------|------|
| 110 | 0.929 | -176 | 1.07 | 37 | 0.008 | -15 | 1.100 | -177 |
| 120 | 0.937 | -176 | 0.88 | 34 | 0.006 | -4  | 1.000 | -175 |
| 130 | 0.943 | -176 | 0.75 | 32 | 0.004 | 5   | 0.953 | -176 |
| 140 | 0.947 | -177 | 0.67 | 32 | 0.003 | 6   | 0.966 | -177 |
| 150 | 0.950 | -177 | 0.63 | 32 | 0.004 | 6   | 1.030 | -178 |
| 160 | 0.953 | -178 | 0.58 | 32 | 0.005 | 18  | 1.120 | -178 |
| 170 | 0.957 | -178 | 0.54 | 29 | 0.006 | 36  | 1.180 | -178 |
| 180 | 0.961 | -178 | 0.51 | 24 | 0.006 | 53  | 1.250 | -179 |
| 190 | 0.964 | -179 | 0.45 | 18 | 0.006 | 65  | 1.200 | 180  |
| 200 | 0.967 | -179 | 0.39 | 15 | 0.005 | 69  | 1.110 | -179 |
| 210 | 0.969 | -179 | 0.35 | 15 | 0.005 | 63  | 1.030 | -178 |
| 220 | 0.971 | -180 | 0.31 | 15 | 0.006 | 59  | 0.975 | -177 |
| 230 | 0.972 | -180 | 0.28 | 17 | 0.009 | 66  | 1.040 | -179 |
| 240 | 0.973 | 180  | 0.27 | 20 | 0.010 | 78  | 1.030 | 179  |
| 250 | 0.974 | 180  | 0.27 | 19 | 0.010 | 88  | 1.090 | 180  |
| 260 | 0.976 | 179  | 0.24 | 17 | 0.009 | 85  | 1.200 | 179  |
| 270 | 0.977 | 179  | 0.24 | 12 | 0.010 | 73  | 1.220 | 177  |
| 280 | 0.978 | 179  | 0.21 | 12 | 0.011 | 66  | 1.170 | 178  |
| 290 | 0.979 | 178  | 0.19 | 2  | 0.013 | 70  | 1.040 | 180  |
| 300 | 0.979 | 178  | 0.18 | 8  | 0.013 | 78  | 1.000 | 179  |
| 310 | 0.979 | 178  | 0.17 | 13 | 0.013 | 89  | 0.975 | 179  |
| 320 | 0.980 | 178  | 0.17 | 14 | 0.012 | 88  | 0.988 | 177  |
| 330 | 0.981 | 177  | 0.14 | 9  | 0.013 | 80  | 1.050 | 177  |
| 340 | 0.982 | 177  | 0.16 | 17 | 0.015 | 75  | 1.110 | 176  |
| 350 | 0.982 | 177  | 0.15 | 14 | 0.018 | 80  | 1.130 | 177  |
| 360 | 0.982 | 177  | 0.14 | 8  | 0.018 | 82  | 1.160 | 177  |
| 370 | 0.982 | 176  | 0.12 | 6  | 0.017 | 82  | 1.120 | 176  |
| 380 | 0.982 | 176  | 0.12 | 6  | 0.015 | 77  | 1.060 | 177  |
| 390 | 0.982 | 176  | 0.11 | 9  | 0.016 | 72  | 0.992 | 177  |
| 400 | 0.982 | 176  | 0.10 | 13 | 0.018 | 78  | 0.958 | 179  |
| 410 | 0.983 | 175  | 0.11 | 11 | 0.021 | 83  | 1.050 | 176  |

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Table 2. Common Source S-Parameters ( $V_{DS} = 28\text{ V}$ ,  $I_D = 0.65\text{ A}$ ) (continued)

| f<br>MHz | $S_{11}$   |               | $S_{21}$   |               | $S_{12}$   |               | $S_{22}$   |               |
|----------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|
|          | $ S_{11} $ | $\angle \phi$ | $ S_{21} $ | $\angle \phi$ | $ S_{12} $ | $\angle \phi$ | $ S_{22} $ | $\angle \phi$ |
| 420      | 0.983      | 175           | 0.10       | 15            | 0.021      | 87            | 1.070      | 175           |
| 430      | 0.983      | 175           | 0.10       | 14            | 0.019      | 85            | 1.090      | 175           |
| 440      | 0.983      | 174           | 0.10       | 10            | 0.018      | 76            | 1.130      | 175           |
| 450      | 0.983      | 174           | 0.10       | 9             | 0.021      | 71            | 1.130      | 176           |
| 460      | 0.982      | 174           | 0.08       | 10            | 0.024      | 70            | 1.080      | 174           |
| 470      | 0.983      | 174           | 0.08       | 11            | 0.023      | 82            | 0.996      | 175           |
| 480      | 0.983      | 174           | 0.08       | 15            | 0.021      | 90            | 0.974      | 176           |
| 490      | 0.983      | 173           | 0.08       | 12            | 0.019      | 87            | 0.971      | 175           |
| 500      | 0.983      | 173           | 0.08       | 17            | 0.021      | 78            | 1.010      | 174           |

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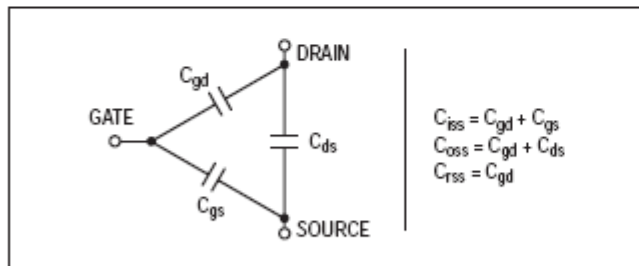
## RF POWER MOSFET CONSIDERATIONS

### MOSFET CAPACITANCES

The physical structure of a MOSFET results in capacitors between the terminals. The metal oxide gate structure determines the capacitors from gate-to-drain ( $C_{gd}$ ), and gate-to-source ( $C_{gs}$ ). The PN junction formed during the fabrication of the RF MOSFET results in a junction capacitance from drain-to-source ( $C_{ds}$ ).

These capacitances are characterized as input ( $C_{iss}$ ), output ( $C_{oss}$ ) and reverse transfer ( $C_{rss}$ ) capacitances on data sheets. The relationships between the inter-terminal capacitances and those given on data sheets are shown below. The  $C_{iss}$  can be specified in two ways:

1. Drain shorted to source and positive voltage at the gate.
2. Positive voltage of the drain in respect to source and zero volts at the gate. In the latter case the numbers are lower. However, neither method represents the actual operating conditions in RF applications.



### LINEARITY AND GAIN CHARACTERISTICS

In addition to the typical IMD and power gain data presented, Figure 5 may give the designer additional information on the capabilities of this device. The graph represents the small signal unity current gain frequency at a given drain current level. This is equivalent to  $f_T$  for bipolar transistors.

Since this test is performed at a fast sweep speed, heating of the device does not occur. Thus, in normal use, the higher temperatures may degrade these characteristics to some extent.

### DRAIN CHARACTERISTICS

One figure of merit for a FET is its static resistance in the full-on condition. This on-resistance,  $V_{DS(on)}$ , occurs in the linear region of the output characteristic and is specified under specific test conditions for gate-source voltage and drain current. For MOSFETs,  $V_{DS(on)}$  has a positive temperature coefficient and constitutes an important design consideration at high temperatures, because it contributes to the power dissipation within the device.

### GATE CHARACTERISTICS

The gate of the RF MOSFET is a polysilicon material, and is electrically isolated from the source by a layer of oxide. The input resistance is very high — on the order of  $10^9$  ohms — resulting in a leakage current of a few nanoamperes.

Gate control is achieved by applying a positive voltage slightly in excess of the gate-to-source threshold voltage,  $V_{GS(th)}$ .

**Gate Voltage Rating** — Never exceed the gate voltage rating. Exceeding the rated  $V_{GS}$  can result in permanent damage to the oxide layer in the gate region.

**Gate Termination** — The gates of these devices are essentially capacitors. Circuits that leave the gate open-circuited or floating should be avoided. These conditions can result in turn-on of the devices due to voltage build-up on the input capacitor due to leakage currents or pickup.

**Gate Protection** — These devices do not have an internal monolithic zener diode from gate-to-source. If gate protection is required, an external zener diode is recommended.

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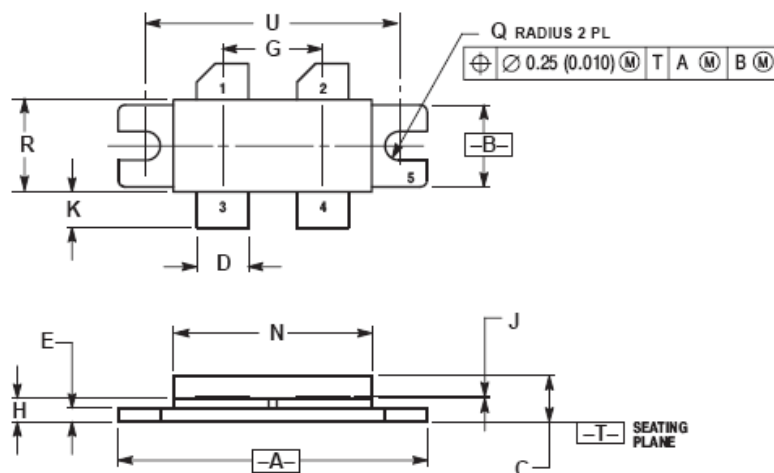
### EQUIVALENT TRANSISTOR PARAMETER TERMINOLOGY

|                     |                     |
|---------------------|---------------------|
| Collector .....     | Drain .....         |
| Emitter .....       | Source .....        |
| Base .....          | Gate .....          |
| $V_{(BR)CES}$ ..... | $V_{(BR)DSS}$ ..... |
| $V_{CBO}$ .....     | $V_{DGO}$ .....     |
| $I_C$ .....         | $I_D$ .....         |
| $I_{CES}$ .....     | $I_{DSS}$ .....     |
| $I_{EBO}$ .....     | $I_{GSS}$ .....     |
| $V_{BE(on)}$ .....  | $V_{GS(th)}$ .....  |
| $V_{CE(sat)}$ ..... | $V_{DS(on)}$ .....  |
| $C_{ib}$ .....      | $C_{iss}$ .....     |
| $C_{ob}$ .....      | $C_{oss}$ .....     |
| $h_{fe}$ .....      | $g_{fs}$ .....      |

|                                               |                                       |
|-----------------------------------------------|---------------------------------------|
| $R_{CE(sat)} = \frac{V_{CE(sat)}}{I_C}$ ..... | $r_{DS(on)} = \frac{V_{DS(on)}}{I_D}$ |
|-----------------------------------------------|---------------------------------------|

## PACKAGE DIMENSIONS



NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI  
Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 1.330     | 1.350 | 33.79       | 34.29 |
| B   | 0.370     | 0.410 | 9.40        | 10.41 |
| C   | 0.190     | 0.230 | 4.83        | 5.84  |
| D   | 0.215     | 0.235 | 5.47        | 5.96  |
| E   | 0.050     | 0.070 | 1.27        | 1.78  |
| G   | 0.430     | 0.440 | 10.92       | 11.17 |
| H   | 0.092     | 0.112 | 2.59        | 2.84  |
| J   | 0.004     | 0.006 | 0.11        | 0.15  |
| K   | 0.185     | 0.215 | 4.83        | 5.33  |
| N   | 0.845     | 0.875 | 21.46       | 22.23 |
| O   | 0.060     | 0.070 | 1.52        | 1.78  |
| R   | 0.390     | 0.410 | 9.91        | 10.41 |
| II  | 1.100 BSC |       | 27.94 BSC   |       |

STYLE 2:  
PIN 1. DRAIN  
2. DRAIN  
3. GATE  
4. GATE  
5. SOURCE

CASE 375-04  
ISSUE D