

# RF Power Field Effect Transistors

## N-Channel Enhancement-Mode Lateral MOSFETs

RF Power transistors designed for applications operating at frequencies between 960 and 1215 MHz. These devices are suitable for use in pulse applications.

- Typical Pulse Performance:  $V_{DD} = 50$  Volts,  $I_{DQ} = 200$  mA,  
Pulse Width = 128  $\mu$ sec, Duty Cycle = 10%

| Application | $P_{out}$<br>(W) | f<br>(MHz) | $G_{ps}$<br>(dB) | $\eta_D$<br>(%) |
|-------------|------------------|------------|------------------|-----------------|
| Narrowband  | 500 Peak         | 1030       | 19.7             | 62.0            |
| Broadband   | 500 Peak         | 960-1215   | 18.5             | 57.0            |

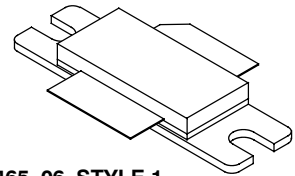
- Capable of Handling 10:1 VSWR, @ 50 Vdc, 1030 MHz, 500 Watts Peak Power

### Features

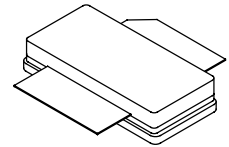
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Internally Matched for Ease of Use
- Qualified Up to a Maximum of 50  $V_{DD}$  Operation
- Integrated ESD Protection
- Greater Negative Gate-Source Voltage Range for Improved Class C Operation
- In Tape and Reel. R3 Suffix = 250 Units per 56 mm, 13 inch Reel. For R5 Tape and Reel option, see p. 14.

**MRF6V12500HR3**  
**MRF6V12500HSR3**

**960-1215 MHz, 500 W, 50 V**  
**PULSE**  
**LATERAL N-CHANNEL**  
**RF POWER MOSFETs**



**CASE 465-06, STYLE 1**  
**NI-780**  
**MRF6V12500HR3**



**CASE 465A-06, STYLE 1**  
**NI-780S**  
**MRF6V12500HSR3**

**Table 1. Maximum Ratings**

| Rating                               | Symbol    | Value       | Unit |
|--------------------------------------|-----------|-------------|------|
| Drain-Source Voltage                 | $V_{DSS}$ | -0.5, +110  | Vdc  |
| Gate-Source Voltage                  | $V_{GS}$  | -6.0, +10   | Vdc  |
| Storage Temperature Range            | $T_{stg}$ | -65 to +150 | °C   |
| Case Operating Temperature           | $T_C$     | 150         | °C   |
| Operating Junction Temperature (1,2) | $T_J$     | 225         | °C   |

**Table 2. Thermal Characteristics**

| Characteristic                                                                                                       | Symbol          | Value (2,3) | Unit |
|----------------------------------------------------------------------------------------------------------------------|-----------------|-------------|------|
| Thermal Impedance, Junction to Case<br>Case Temperature 80°C, 500 W Pulse, 128 $\mu$ sec Pulse Width, 10% Duty Cycle | $Z_{\theta JC}$ | 0.044       | °C/W |

- Continuous use at maximum temperature will affect MTTF.
- MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.
- Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf>. Select Documentation/Application Notes - AN1955.

**Table 3. ESD Protection Characteristics**

| Test Methodology                      | Class             |
|---------------------------------------|-------------------|
| Human Body Model (per JESD22-A114)    | 2, passes 2600 V  |
| Machine Model (per EIA/JESD22-A115)   | B, passes 200 V   |
| Charge Device Model (per JESD22-C101) | IV, passes 2000 V |

**Table 4. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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

**Off Characteristics**

|                                                                                                   |               |     |   |     |                 |
|---------------------------------------------------------------------------------------------------|---------------|-----|---|-----|-----------------|
| Gate-Source Leakage Current<br>( $V_{GS} = 5\text{ Vdc}$ , $V_{DS} = 0\text{ Vdc}$ )              | $I_{GSS}$     | —   | — | 10  | $\mu\text{Adc}$ |
| Drain-Source Breakdown Voltage<br>( $V_{GS} = 0\text{ Vdc}$ , $I_D = 200\text{ mA}$ )             | $V_{(BR)DSS}$ | 110 | — | —   | Vdc             |
| Zero Gate Voltage Drain Leakage Current<br>( $V_{DS} = 50\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ ) | $I_{DSS}$     | —   | — | 20  | $\mu\text{Adc}$ |
| Zero Gate Voltage Drain Leakage Current<br>( $V_{DS} = 90\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ ) | $I_{DSS}$     | —   | — | 200 | $\mu\text{Adc}$ |

**On Characteristics**

|                                                                                                               |              |     |      |     |     |
|---------------------------------------------------------------------------------------------------------------|--------------|-----|------|-----|-----|
| Gate Threshold Voltage<br>( $V_{DS} = 10\text{ Vdc}$ , $I_D = 1.32\text{ mA}$ )                               | $V_{GS(th)}$ | 0.9 | 1.7  | 2.4 | Vdc |
| Gate Quiescent Voltage<br>( $V_{DD} = 50\text{ Vdc}$ , $I_D = 200\text{ mAdc}$ , Measured in Functional Test) | $V_{GS(Q)}$  | 1.7 | 2.4  | 3.2 | Vdc |
| Drain-Source On-Voltage<br>( $V_{GS} = 10\text{ Vdc}$ , $I_D = 3.26\text{ Adc}$ )                             | $V_{DS(on)}$ | —   | 0.25 | —   | Vdc |

**Dynamic Characteristics <sup>(1)</sup>**

|                                                                                                                       |           |   |      |   |    |
|-----------------------------------------------------------------------------------------------------------------------|-----------|---|------|---|----|
| Reverse Transfer Capacitance<br>( $V_{DS} = 50\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ ) | $C_{rss}$ | — | 0.2  | — | pF |
| Output Capacitance<br>( $V_{DS} = 50\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )           | $C_{oss}$ | — | 697  | — | pF |
| Input Capacitance<br>( $V_{DS} = 50\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz)            | $C_{iss}$ | — | 1391 | — | pF |

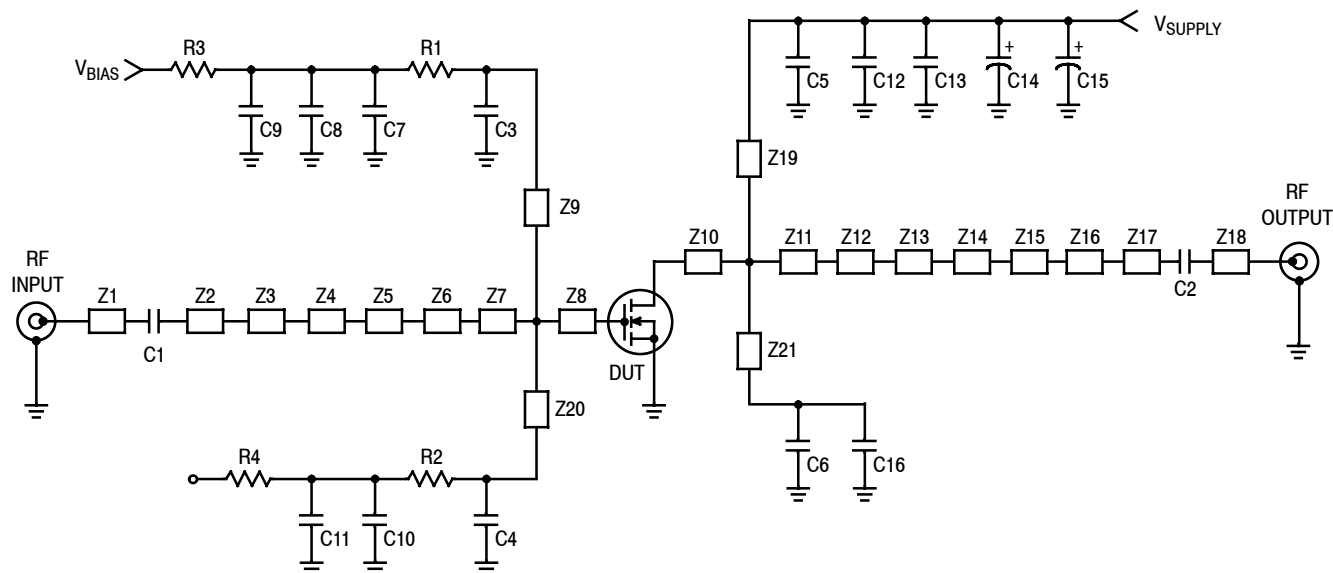
**Functional Tests** (In Freescale Narrowband Test Fixture, 50 ohm system)  $V_{DD} = 50\text{ Vdc}$ ,  $I_{DQ} = 200\text{ mA}$ ,  $P_{out} = 500\text{ W Peak}$  (50 W Avg.),  $f = 1030\text{ MHz}$ , 128  $\mu\text{sec}$  Pulse Width, 10% Duty Cycle

|                   |          |      |      |      |    |
|-------------------|----------|------|------|------|----|
| Power Gain        | $G_{ps}$ | 18.5 | 19.7 | 22.0 | dB |
| Drain Efficiency  | $\eta_D$ | 58.0 | 62.0 | —    | %  |
| Input Return Loss | IRL      | —    | -18  | -9   | dB |

**Typical Broadband Performance — 960-1215 MHz** (In Freescale 960-1215 MHz Test Fixture, 50 ohm system)  $V_{DD} = 50\text{ Vdc}$ ,  $I_{DQ} = 200\text{ mA}$ ,  $P_{out} = 500\text{ W Peak}$  (50 W Avg.),  $f = 960\text{--}1215\text{ MHz}$ , 128  $\mu\text{sec}$  Pulse Width, 10% Duty Cycle

|                  |          |   |      |   |    |
|------------------|----------|---|------|---|----|
| Power Gain       | $G_{ps}$ | — | 18.5 | — | dB |
| Drain Efficiency | $\eta_D$ | — | 57.0 | — | %  |

1. Part internally matched both on input and output.

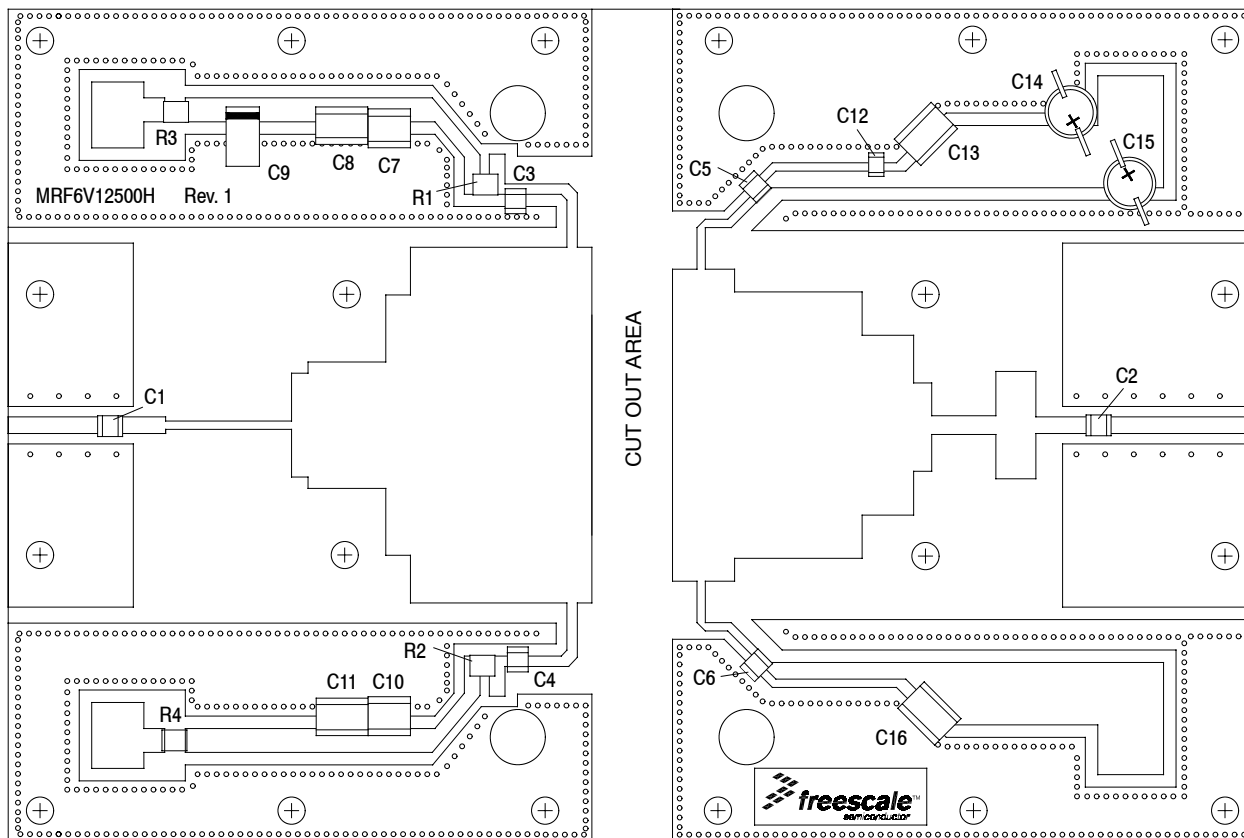


|         |                            |          |                                                            |
|---------|----------------------------|----------|------------------------------------------------------------|
| Z1      | 0.457" x 0.080" Microstrip | Z11      | 0.161" x 1.500" Microstrip                                 |
| Z2      | 0.250" x 0.080" Microstrip | Z12      | 0.613" x 1.281" Microstrip                                 |
| Z3      | 0.605" x 0.040" Microstrip | Z13      | 0.248" x 0.865" Microstrip                                 |
| Z4      | 0.080" x 0.449" Microstrip | Z14      | 0.087" x 0.425" Microstrip                                 |
| Z5      | 0.374" x 0.608" Microstrip | Z15      | 0.309" x 0.090" Microstrip                                 |
| Z6      | 0.118" x 1.252" Microstrip | Z16      | 0.193" x 0.516" Microstrip                                 |
| Z7      | 0.778" x 1.710" Microstrip | Z17      | 0.279" x 0.080" Microstrip                                 |
| Z8      | 0.095" x 1.710" Microstrip | Z18      | 0.731" x 0.080" Microstrip                                 |
| Z9, Z20 | 0.482" x 0.050" Microstrip | Z19, Z21 | 0.507" x 0.040" Microstrip                                 |
| Z10     | 0.138" x 1.500" Microstrip | PCB      | Arlon CuClad 250GX-0300-55-22, 0.030", $\epsilon_r = 2.55$ |

**Figure 1. MRF6V12500HR3(HSR3) Test Circuit Schematic**

**Table 5. MRF6V12500HR3(HSR3) Test Circuit Component Designations and Values**

| Part              | Description                               | Part Number          | Manufacturer |
|-------------------|-------------------------------------------|----------------------|--------------|
| C1, C2            | 5.1 pF Chip Capacitors                    | ATC100B5R1CT500XT    | ATC          |
| C3, C4, C5, C6    | 33 pF Chip Capacitors                     | ATC100B330JT500XT    | ATC          |
| C7, C10           | 10 $\mu$ F, 50 V Chip Capacitors          | GRM55DR61H106KA88L   | Murata       |
| C8, C11, C13, C16 | 2.2 $\mu$ F, 100 V Chip Capacitors        | 2225X7R225KT3AB      | ATC          |
| C9                | 22 $\mu$ F, 25 V Chip Capacitor           | TPSD226M025R0200     | AVX          |
| C12               | 1 $\mu$ F, 100 V Chip Capacitor           | GRM31CR72A105KA01L   | Murata       |
| C14, C15          | 470 $\mu$ F, 63 V Electrolytic Capacitors | MCGPR63V477M13X26-RH | Multicomp    |
| R1, R2            | 56 $\Omega$ , 1/4 W Chip Resistors        | CRCW120656R0FKEA     | Vishay       |
| R3, R4            | 0 $\Omega$ , 3 A Chip Resistors           | CRCW12060000Z0EA     | Vishay       |



**Figure 2. MRF6V12500HR3(HSR3) Test Circuit Component Layout**

## TYPICAL CHARACTERISTICS

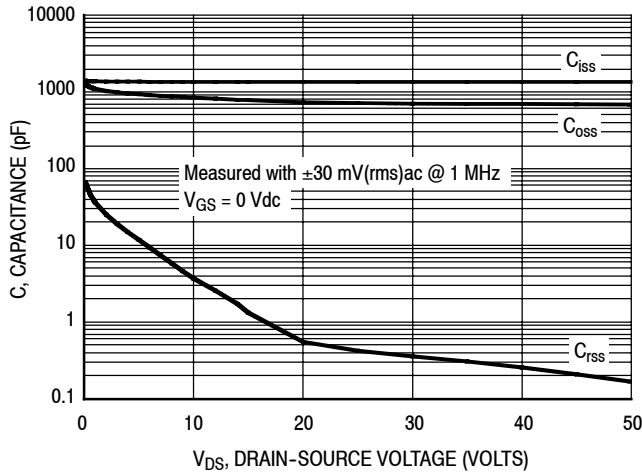


Figure 3. Capacitance versus Drain-Source Voltage

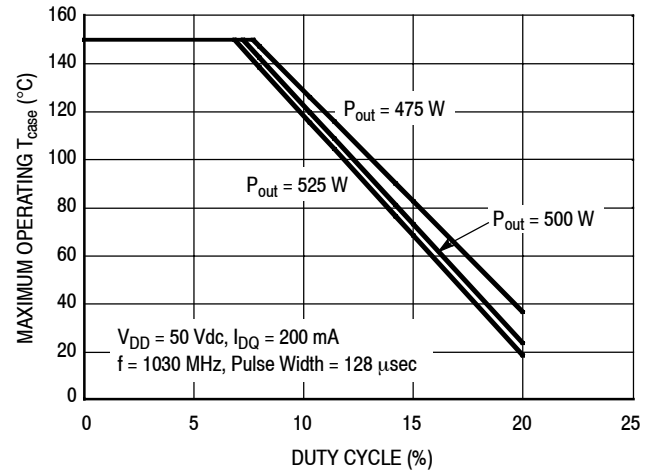


Figure 4. Safe Operating Area

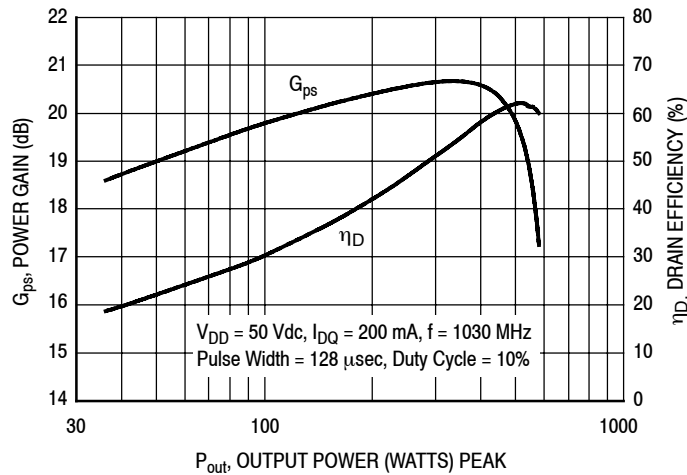


Figure 5. Power Gain and Drain Efficiency versus Output Power

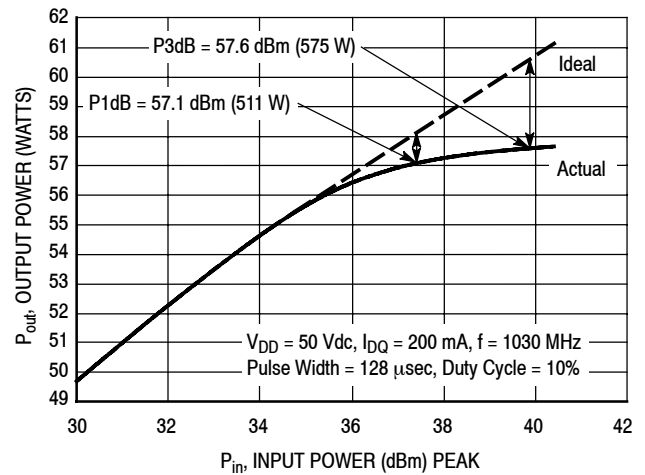


Figure 6. Output Power versus Input Power

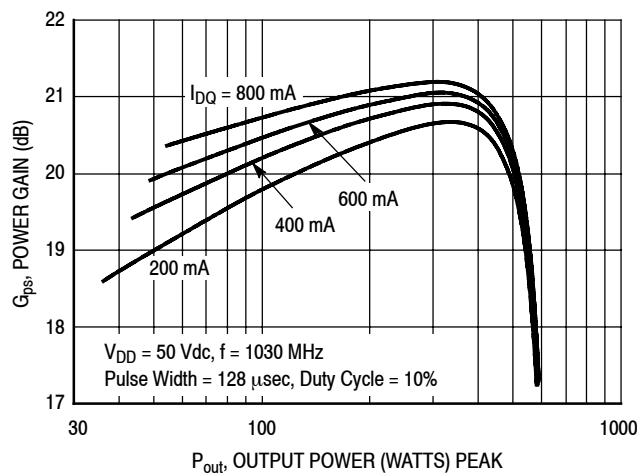


Figure 7. Power Gain versus Output Power

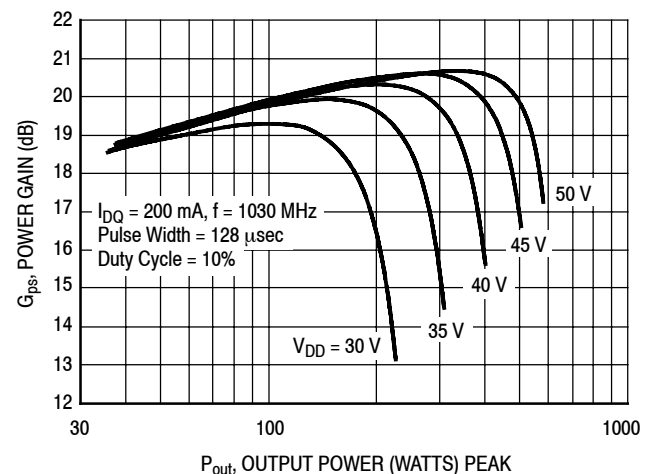


Figure 8. Power Gain versus Output Power

## TYPICAL CHARACTERISTICS

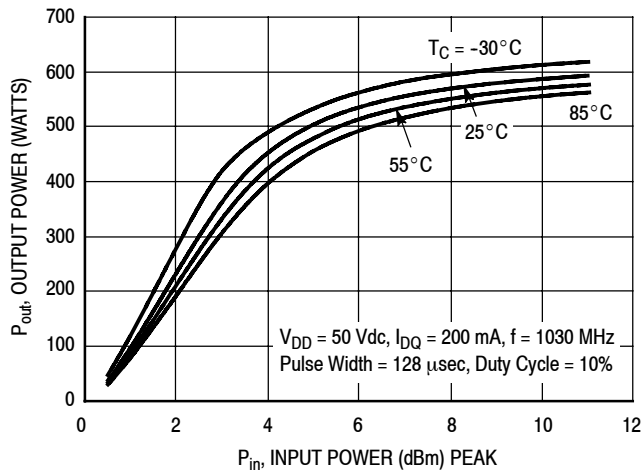


Figure 9. Output Power versus Input Power

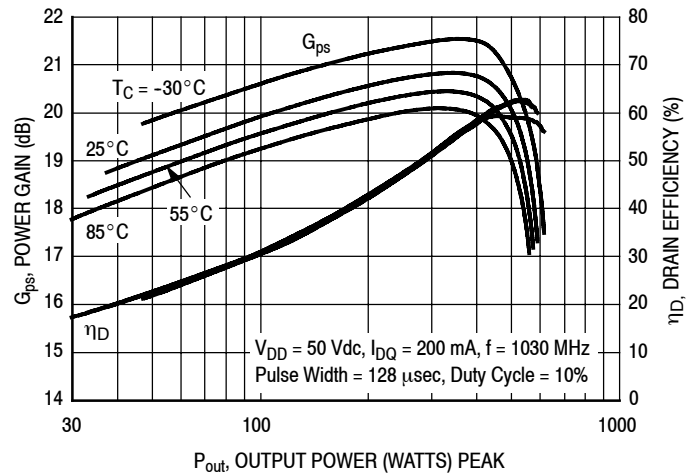
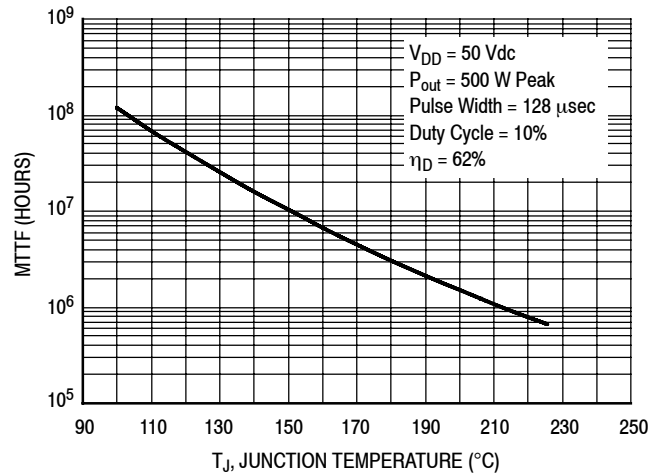


Figure 10. Power Gain and Drain Efficiency versus Output Power



MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.

Figure 11. MTTF versus Junction Temperature

$V_{DD} = 50 \text{ Vdc}$ ,  $I_{DQ} = 200 \text{ mA}$ ,  $P_{out} = 500 \text{ W Peak}$

| f<br>MHz | $Z_{source}$<br>$\Omega$ | $Z_{load}$<br>$\Omega$ |
|----------|--------------------------|------------------------|
| 1030     | $1.36 - j1.27$           | $2.50 - j0.17$         |

$Z_{source}$  = Test circuit impedance as measured from gate to ground.

$Z_{load}$  = Test circuit impedance as measured from drain to ground.

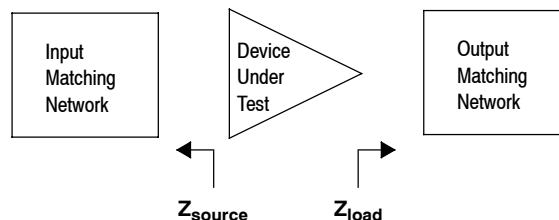
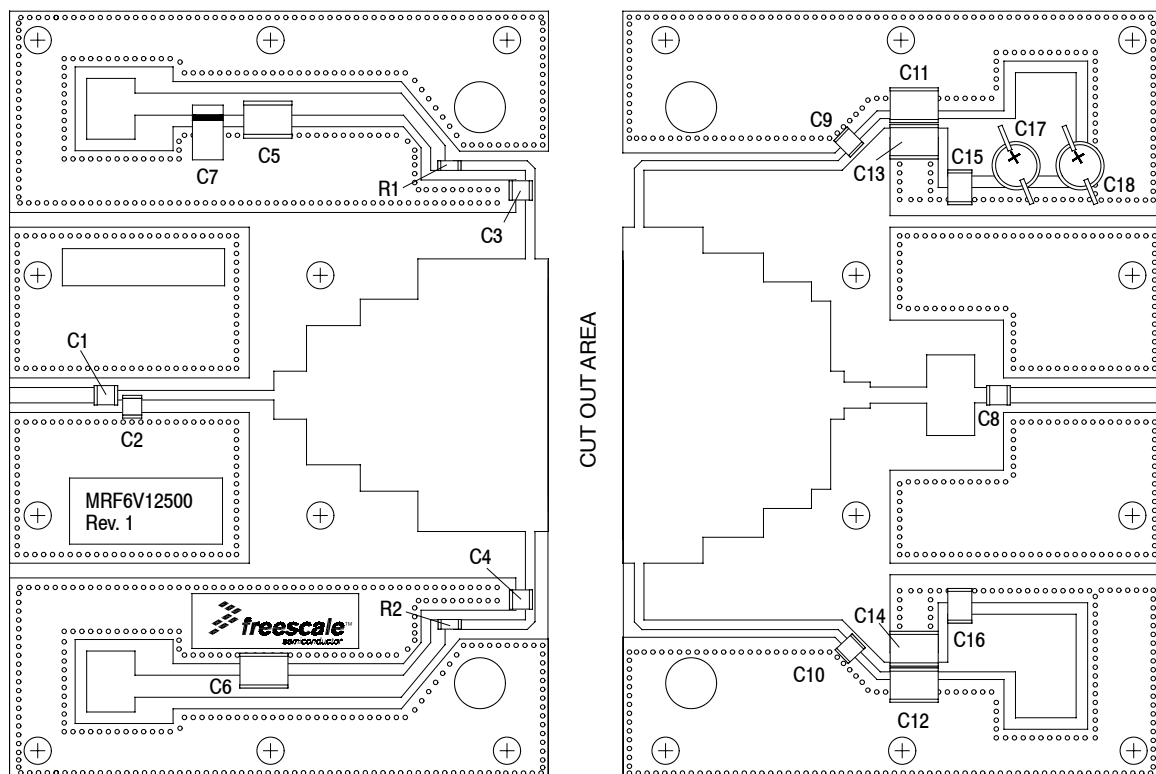


Figure 12. Series Equivalent Source and Load Impedance

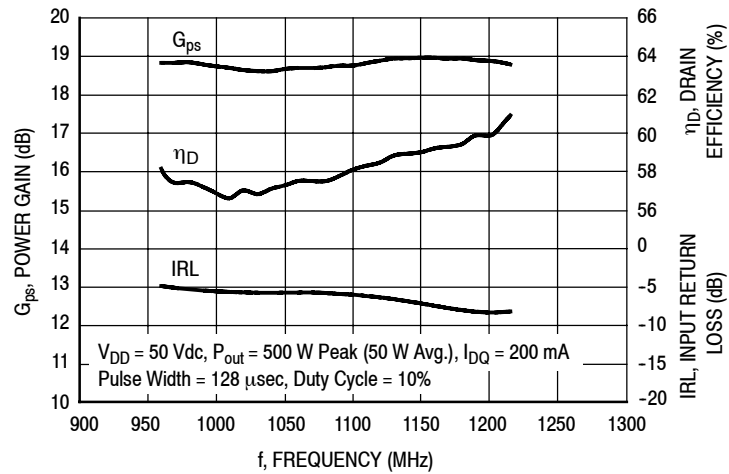


**Figure 13. MRF6V12500H(HS) Test Circuit Component Layout — 960-1215 MHz**

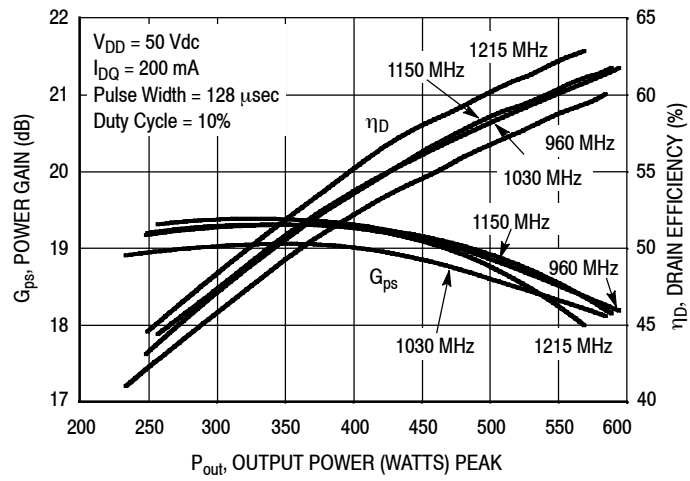
**Table 6. MRF6V12500H(HS) Test Circuit Component Designations and Values — 960-1215 MHz**

| Part             | Description                               | Part Number          | Manufacturer |
|------------------|-------------------------------------------|----------------------|--------------|
| C1               | 2.2 pF Chip Capacitor                     | ATC100B2R2JT500XT    | ATC          |
| C2               | 0.2 pF Chip Capacitor                     | ATC100B0R2BT500XT    | ATC          |
| C3, C4           | 33 pF Chip Capacitors                     | ATC100B330JT500XT    | ATC          |
| C5, C6, C11, C12 | 2.2 $\mu$ F, 100 V Chip Capacitors        | G2225X7R225KT3AB     | ATC          |
| C7               | 22 $\mu$ F, 35 V Tantalum Capacitor       | T491X226K035AT       | Kemet        |
| C8               | 8.2 pF Chip Capacitor                     | ATC100B8R2CT500XT    | ATC          |
| C9, C10          | 39 pF Chip Capacitors                     | ATC100B390JT500XT    | ATC          |
| C13, C14         | 0.022 $\mu$ F, 100 V Chip Capacitors      | C1825C223K1GAC       | Kemet        |
| C15, C16         | 0.10 $\mu$ F, 100 V Chip Capacitors       | C1812F104K1RAC       | Kemet        |
| C17, C18         | 470 $\mu$ F, 63 V Electrolytic Capacitors | MCGPR63V477M13X26-RH | Multicomp    |
| R1, R2           | 22 $\Omega$ , 1/4 W Chip Resistors        | CRCW120622R0FKEA     | Vishay       |
| PCB              | 0.030", $\epsilon_r = 2.55$               | AD255A               | Arlon        |

## TYPICAL CHARACTERISTICS — 960-1215 MHz

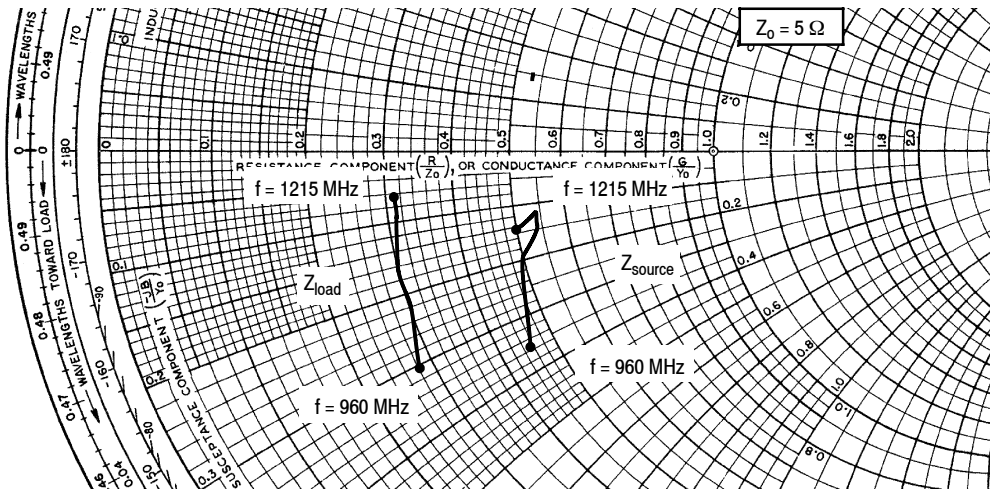


**Figure 14. Power Gain, Drain Efficiency and IRL versus Frequency**



**Figure 15. Power Gain and Drain Efficiency versus Output Power**





$V_{DD} = 50 \text{ Vdc}$ ,  $I_{DQ} = 200 \text{ mA}$ ,  $P_{\text{out}} = 500 \text{ W Peak}$

| f<br>MHz | $Z_{\text{source}}$<br>$\Omega$ | $Z_{\text{load}}$<br>$\Omega$ |
|----------|---------------------------------|-------------------------------|
| 960      | $2.25 - j1.78$                  | $1.38 - j1.53$                |
| 1030     | $2.51 - j1.02$                  | $1.48 - j1.11$                |
| 1090     | $2.69 - j0.73$                  | $1.51 - j0.78$                |
| 1150     | $2.71 - j0.65$                  | $1.53 - j0.49$                |
| 1215     | $2.48 - j0.76$                  | $1.53 - j0.33$                |

$Z_{\text{source}}$  = Test circuit impedance as measured from gate to ground.

$Z_{\text{load}}$  = Test circuit impedance as measured from drain to ground.

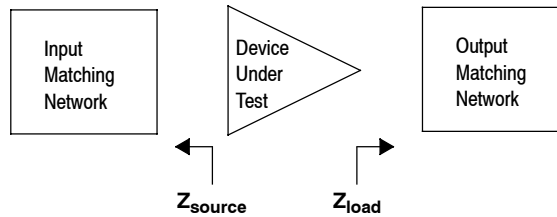
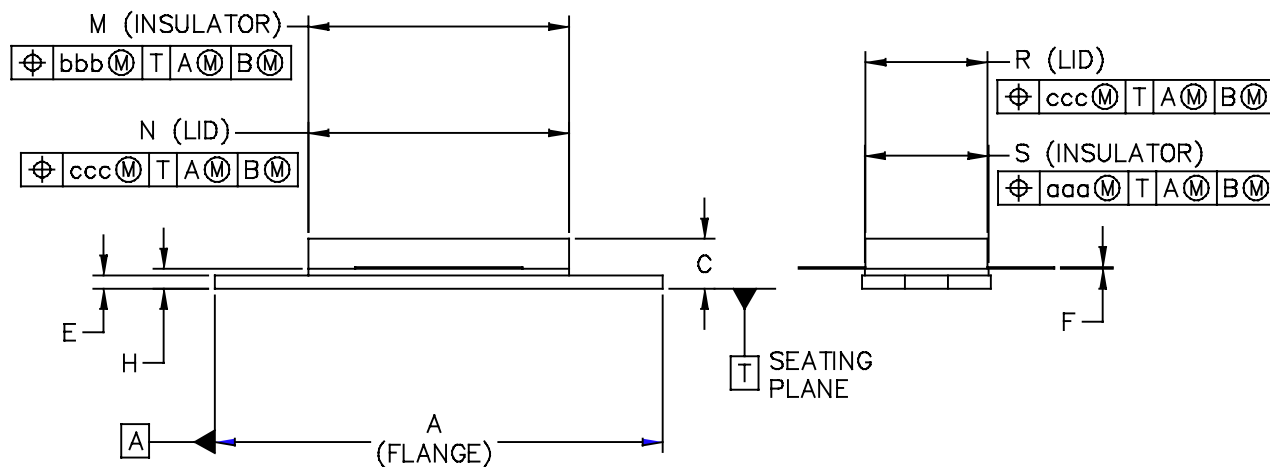
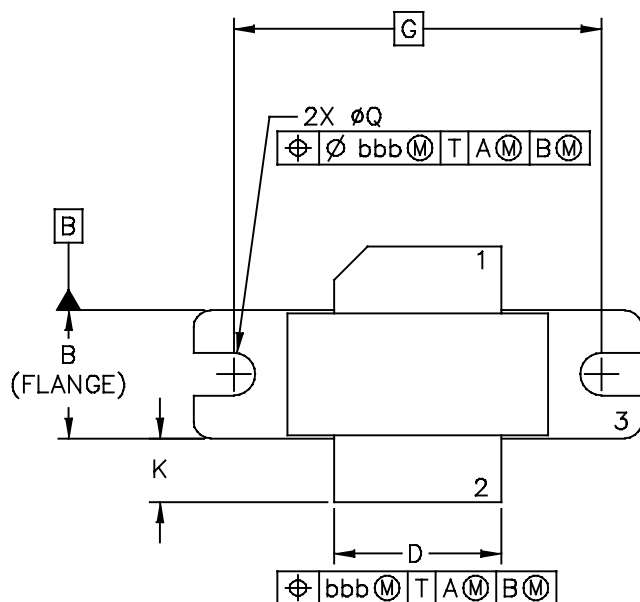


Figure 16. Series Equivalent Source and Load Impedance — 960-1215 MHz

## PACKAGE DIMENSIONS



|                                                         |                    |                            |             |
|---------------------------------------------------------|--------------------|----------------------------|-------------|
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| TITLE:<br><br>NI-780                                    |                    | DOCUMENT NO: 98ASB15607C   | REV: G      |
|                                                         |                    | CASE NUMBER: 465-06        | 31 MAR 2005 |
|                                                         |                    | STANDARD: NON-JEDEC        |             |

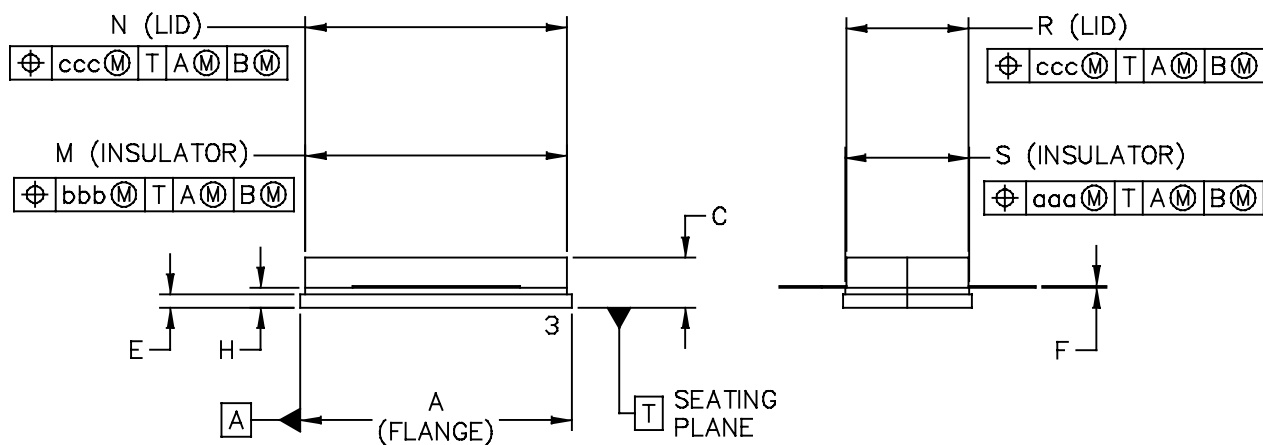
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M–1994.
2. CONTROLLING DIMENSION: INCH.
3. DELETED
4. DIMENSION H IS MEASURED .030 (.762) AWAY FROM PACKAGE BODY.

STYLE 1:

- PIN 1. DRAIN  
2. GATE  
3. SOURCE

| DIM                                                     | INCH<br>MIN      MAX | MILLIMETER<br>MIN      MAX | DIM                      | INCH<br>MIN      MAX       | MILLIMETER<br>MIN      MAX |
|---------------------------------------------------------|----------------------|----------------------------|--------------------------|----------------------------|----------------------------|
| A                                                       | 1.335 – 1.345        | 33.91 – 34.16              | R                        | .365 – .375                | 9.27 – 9.53                |
| B                                                       | .380 – .390          | 9.65 – 9.91                | S                        | .365 – .375                | 9.27 – 9.52                |
| C                                                       | .125 – .170          | 3.18 – 4.32                | aaa                      | – .005 –                   | – 0.127 –                  |
| D                                                       | .495 – .505          | 12.57 – 12.83              | bbb                      | – .010 –                   | – 0.254 –                  |
| E                                                       | .035 – .045          | 0.89 – 1.14                | ccc                      | – .015 –                   | – 0.381 –                  |
| F                                                       | .003 – .006          | 0.08 – 0.15                | –                        | – – –                      | – – –                      |
| G                                                       | 1.100 BSC            | 27.94 BSC                  | –                        | – – –                      | – – –                      |
| H                                                       | .057 – .067          | 1.45 – 1.7                 | –                        | – – –                      | – – –                      |
| K                                                       | .170 – .210          | 4.32 – 5.33                | –                        | – – –                      | – – –                      |
| M                                                       | .774 – .786          | 19.66 – 19.96              | –                        | – – –                      | – – –                      |
| N                                                       | .772 – .788          | 19.6 – 20                  | –                        | – – –                      | – – –                      |
| Q                                                       | Ø.118 – Ø.138        | Ø3 – Ø3.51                 | –                        | – – –                      | – – –                      |
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| TITLE:<br><br>NI–780                                    |                      |                            | DOCUMENT NO: 98ASB15607C |                            | REV: G                     |
|                                                         |                      |                            | CASE NUMBER: 465–06      |                            | 31 MAR 2005                |
|                                                         |                      |                            | STANDARD: NON–JEDEC      |                            |                            |



|                                                         |  |                    |                          |                            |             |
|---------------------------------------------------------|--|--------------------|--------------------------|----------------------------|-------------|
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| TITLE:<br><br>NI-780S                                   |  |                    | DOCUMENT NO: 98ASB16718C |                            | REV: H      |
|                                                         |  |                    | CASE NUMBER: 465A-06     |                            | 31 MAR 2005 |
|                                                         |  |                    | STANDARD: NON-JEDEC      |                            |             |

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M–1994.
2. CONTROLLING DIMENSION: INCH.
3. DELETED
4. DIMENSION H IS MEASURED .030 (0.762) AWAY FROM PACKAGE BODY.

STYLE 1:

- PIN 1. DRAIN  
2. GATE  
3. SOURCE

| INCH                                                    |      |        | MILLIMETER |                    |                          | INCH |        |                            | MILLIMETER  |      |     |
|---------------------------------------------------------|------|--------|------------|--------------------|--------------------------|------|--------|----------------------------|-------------|------|-----|
| DIM                                                     | MIN  | MAX    | MIN        | MAX                | DIM                      | MIN  | MAX    | MIN                        | MAX         | MIN  | MAX |
| A                                                       | .805 | — .815 | 20.45      | — 20.7             | U                        | —    | — .040 | —                          | —           | 1.02 |     |
| B                                                       | .380 | — .390 | 9.65       | — 9.91             | Z                        | —    | — .030 | —                          | —           | 0.76 |     |
| C                                                       | .125 | — .170 | 3.18       | — 4.32             | aaa                      | —    | .005 — | —                          | 0.127       | —    |     |
| D                                                       | .495 | — .505 | 12.57      | — 12.83            | bbb                      | —    | .010 — | —                          | 0.254       | —    |     |
| E                                                       | .035 | — .045 | 0.89       | — 1.14             | ccc                      | —    | .015 — | —                          | 0.381       | —    |     |
| F                                                       | .003 | — .006 | 0.08       | — 0.15             | —                        | —    | — —    | —                          | —           | —    |     |
| H                                                       | .057 | — .067 | 1.45       | — 1.7              | —                        | —    | — —    | —                          | —           | —    |     |
| K                                                       | .170 | — .210 | 4.32       | — 5.33             | —                        | —    | — —    | —                          | —           | —    |     |
| M                                                       | .774 | — .786 | 19.61      | — 20.02            | —                        | —    | — —    | —                          | —           | —    |     |
| N                                                       | .772 | — .788 | 19.61      | — 20.02            | —                        | —    | — —    | —                          | —           | —    |     |
| R                                                       | .365 | — .375 | 9.27       | — 9.53             | —                        | —    | — —    | —                          | —           | —    |     |
| S                                                       | .365 | — .375 | 9.27       | — 9.52             | —                        | —    | — —    | —                          | —           | —    |     |
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| TITLE:<br><br>NI—780S                                   |      |        |            |                    | DOCUMENT NO: 98ASB16718C |      |        |                            | REV: H      |      |     |
|                                                         |      |        |            |                    | CASE NUMBER: 465A—06     |      |        |                            | 31 MAR 2005 |      |     |
|                                                         |      |        |            |                    | STANDARD: NON—JEDEC      |      |        |                            |             |      |     |

## PRODUCT DOCUMENTATION AND SOFTWARE

Refer to the following documents and software to aid your design process.

### Application Notes

- AN1955: Thermal Measurement Methodology of RF Power Amplifiers

### Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

### Software

- Electromigration MTTF Calculator
- RF High Power Model

For Software, do a Part Number search at <http://www.freescale.com>, and select the “Part Number” link. Go to the Software & Tools tab on the part’s Product Summary page to download the respective tool.

## R5 TAPE AND REEL OPTION

R5 Suffix = 50 Units, 56 mm Tape Width, 13 inch Reel.

The R5 tape and reel option for MRF6V12500H and MRF6V12500HS parts will be available for 2 years after release of MRF6V12500H and MRF6V12500HS. Freescale Semiconductor, Inc. reserves the right to limit the quantities that will be delivered in the R5 tape and reel option. At the end of the 2 year period customers who have purchased these devices in the R5 tape and reel option will be offered MRF6V12500H and MRF6V12500HS in the R3 tape and reel option.

## REVISION HISTORY

The following table summarizes revisions to this document.

| Revision | Date       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0        | Sept. 2009 | <ul style="list-style-type: none"><li>• Initial Release of Data Sheet</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1        | Apr. 2010  | <ul style="list-style-type: none"><li>• Operating Junction Temperature increased from 200°C to 225°C in Maximum Ratings table and related “Continuous use at maximum temperature will affect MTTF” footnote added, p. 1</li><li>• Added RF High Power Model availability to Product Software, p. 9</li></ul>                                                                                                                                                                                                                                                                                                                                                                          |
| 2        | Sept. 2010 | <ul style="list-style-type: none"><li>• Maximum Ratings table: corrected <math>V_{DSS}</math> from -0.5, +100 to -0.5, +110 Vdc, p. 2</li><li>• Added 960–1215 MHz Broadband application as follows:<ul style="list-style-type: none"><li>– Typical Performance, p. 1, 2</li><li>– Fig. 13, Test Circuit Component Layout and Table 6, Test Circuit Component Designations and Values, p. 8</li><li>– Fig. 14, Pulsed Power Gain, Drain Efficiency and IRL versus Frequency, p. 9</li><li>– Fig. 15, Power Gain and Drain Efficiency versus Output Power, p. 9</li><li>– Fig. 16, Series Equivalent Source and Load Impedance, p. 10</li></ul></li></ul>                              |
| 3        | June 2012  | <ul style="list-style-type: none"><li>• Table 3, ESD Protection Characteristics: added the device’s ESD passing level as applicable to each ESD class, p. 2</li><li>• Modified figure titles and/or graph axes labels to clarify application use, p. 5, 6, 9</li><li>• Fig. 6, Output Power versus Input Power: corrected <math>P_{out}</math>, Output Power unit of measure to watts, p. 5</li><li>• Fig. 9, Output Power versus Input Power: corrected <math>P_{out}</math>, Output Power unit of measure to watts, p. 6</li><li>• Fig. 11, MTTF versus Junction Temperature: MTTF end temperature on graph changed to match maximum operating junction temperature, p. 6</li></ul> |

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