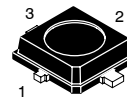


# Silicon Lateral FET, N-Channel Enhancement-Mode MOSFET

Designed for use in medium voltage, moderate power amplifiers such as portable analog and digital cellular radios and PC RF modems.

- Typical CW RF Performance @ 849 MHz:  $V_{DD} = 12.5$  Volts,  $I_{DQ} = 300$  mA,  $P_{out} = 38$  dBm  
     Power Gain — 10.5 dB  
     Drain Efficiency — 55%
- Capable of Handling 10:1 VSWR, @ 12.5 Vdc, 849 MHz, 38 dBm
- RoHS Compliant
- In Tape and Reel. T1 Suffix = 1,000 Units per 12 mm, 7 inch Reel

**MRF9582NT1**
**849 MHz, 38 dBm, 12.5 V  
HIGH FREQUENCY  
POWER TRANSISTOR  
LDMOS FET**

**CASE 449-02, STYLE 1  
PLD-1**
**Table 1. Maximum Ratings**

| Rating                                              | Symbol    | Value      | Unit             |
|-----------------------------------------------------|-----------|------------|------------------|
| Drain-Source Voltage                                | $V_{DSS}$ | 17         | Vdc              |
| Drain-Gate Voltage ( $R_{GS} = 1.0$ M $\Omega$ )    | $V_{DGO}$ | 17         | Vdc              |
| Gate-Source Voltage                                 | $V_{GS}$  | 4.0        | Vdc              |
| Drain Current - Continuous                          | $I_D$     | 1.5        | Adc              |
| Total Device Dissipation @ $T_C = 85^\circ\text{C}$ | $P_D$     | 10.5       | W                |
| Storage Temperature Range                           | $T_{stg}$ | -65 to 150 | $^\circ\text{C}$ |
| Operating Junction Temperature                      | $T_J$     | 150        | $^\circ\text{C}$ |

**Table 2. Thermal Characteristics**

| Characteristic                       | Symbol          | Value | Unit               |
|--------------------------------------|-----------------|-------|--------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 6     | $^\circ\text{C/W}$ |

**Table 3. Moisture Sensitivity Level**

| Test Methodology                      | Rating | Package Peak Temperature | Unit             |
|---------------------------------------|--------|--------------------------|------------------|
| Per JESD 22-A113, IPC/JEDEC J-STD-020 | 1      | 260                      | $^\circ\text{C}$ |

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

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

| Characteristic                                                                                      | Symbol        | Min  | Typ   | Max | Unit     |
|-----------------------------------------------------------------------------------------------------|---------------|------|-------|-----|----------|
| <b>Off Characteristics</b>                                                                          |               |      |       |     |          |
| Drain-Source Breakdown Voltage ( $V_{GS} = 0$ , $I_D = 100\text{ nAdc}$ )                           | $V_{(BR)DSS}$ | —    | 45    | —   | Vdc      |
| Drain-Source Leakage Current ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ )                          | $I_{DSS}$     | —    | —     | 100 | nAdc     |
| Gate-Source Leakage Current ( $V_{GS} = 5\text{ Vdc}$ , $V_{DS} = 0$ )                              | $I_{GSS}$     | —    | —     | 100 | nAdc     |
| <b>On Characteristics</b>                                                                           |               |      |       |     |          |
| Gate Threshold Voltage                                                                              | $V_{GS}$      | —    | 2.4   | —   | Vdc      |
| Resistance Drain-Source ( $V_{GS} = 5\text{ Vdc}$ , $I_D = 300\text{ mA}$ )                         | $R_{DS(on)}$  | 0.05 | 0.5   | 0.8 | $\Omega$ |
| <b>Dynamic Characteristics</b>                                                                      |               |      |       |     |          |
| Input Capacitance ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0\text{ MHz}$ )              | $C_{iss}$     | —    | 30.77 | —   | pF       |
| Output Capacitance ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0\text{ MHz}$ )             | $C_{oss}$     | —    | 15.6  | —   | pF       |
| Feedback Capacitance ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0\text{ MHz}$ )           | $C_{rss}$     | —    | 0.82  | —   | pF       |
| <b>Typical Characteristics</b>                                                                      |               |      |       |     |          |
| Power Gain ( $V_{DD} = 12.5\text{ Vdc}$ , $P_{in} = 27.5\text{ dBm}$ , $f = 849\text{ MHz}$ )       | $G_{ps}$      | —    | 10.5  | —   | dB       |
| Drain Efficiency ( $V_{DD} = 12.5\text{ Vdc}$ , $P_{in} = 27.5\text{ dBm}$ , $f = 849\text{ MHz}$ ) | $\eta_D$      | —    | 55    | —   | %        |
| Output Power                                                                                        | $P_{out}$     | —    | 38    | —   | dBm      |

## TYPICAL CHARACTERISTICS

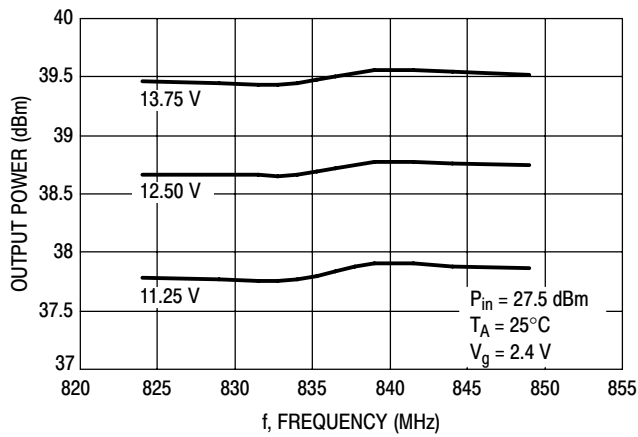


Figure 1. Output Power versus Frequency

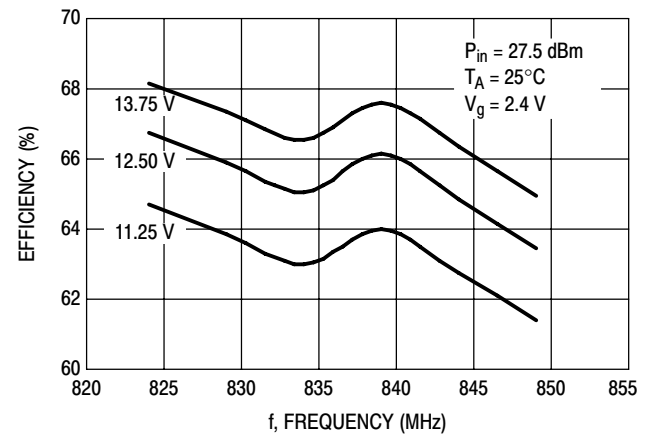


Figure 2. Efficiency versus Frequency

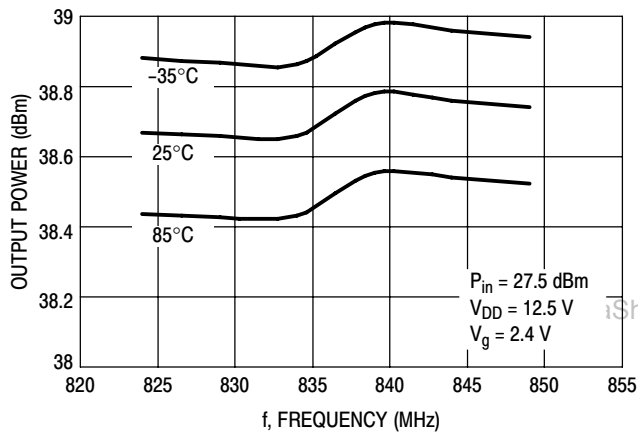


Figure 3. Output Power versus Frequency

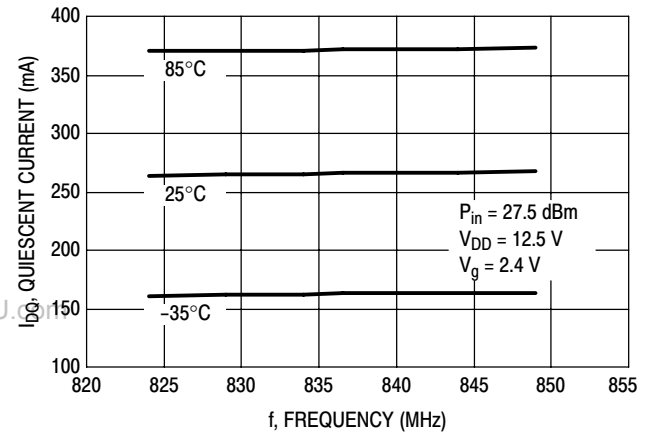
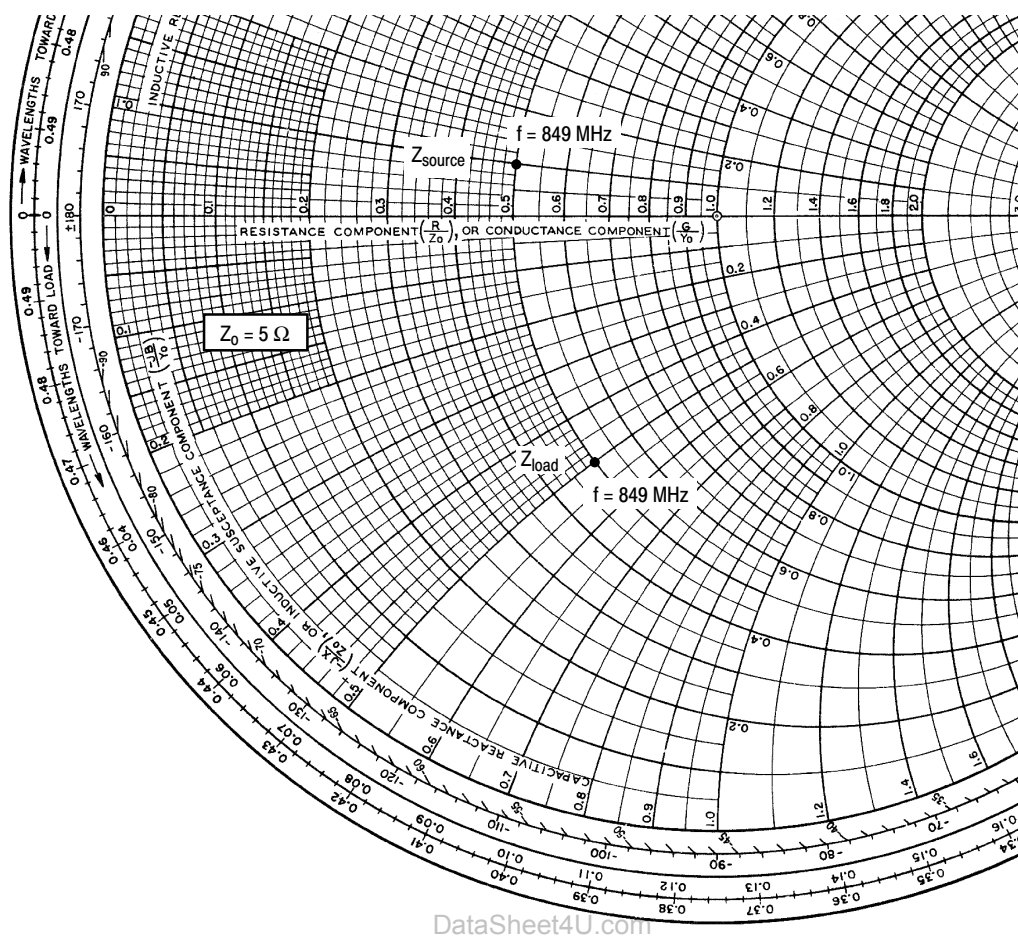


Figure 4. Quiescent Current versus Frequency



$V_{DD} = 12.5 \text{ Vdc}$ ,  $I_{DQ} = 300 \text{ mA}$ ,  $P_{out} = 38 \text{ dBm}$

| f<br>MHz | $Z_{source}$<br>$\Omega$ | $Z_{load}$<br>$\Omega$ |
|----------|--------------------------|------------------------|
| 849      | $2.5 + j0.5$             | $2.5 - j2.5$           |

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

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

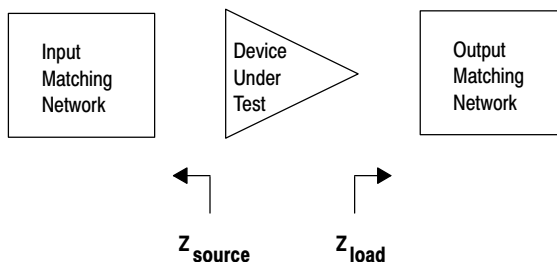


Figure 5. Series Equivalent Source and Load Impedance

# NOTES

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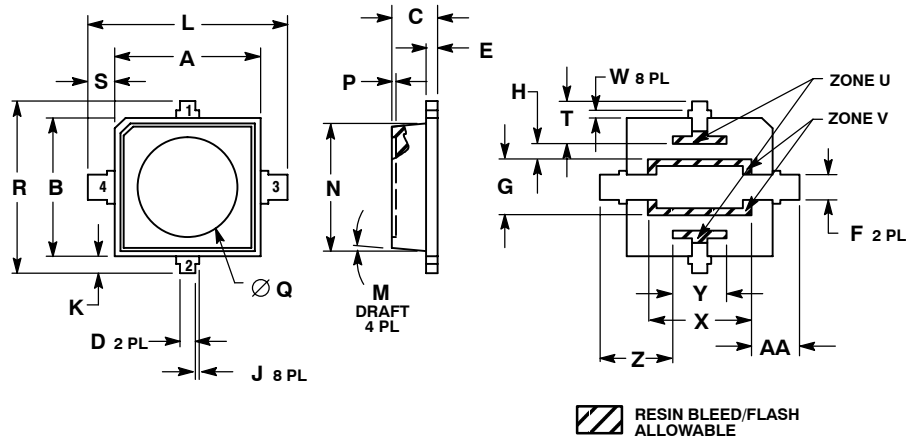
## NOTES

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## PACKAGE DIMENSIONS



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

| DIM | INCHES   |       | MILLIMETERS |      |
|-----|----------|-------|-------------|------|
|     | MIN      | MAX   | MIN         | MAX  |
| A   | 0.185    | 0.195 | 4.70        | 4.95 |
| B   | 0.175    | 0.185 | 4.44        | 4.70 |
| C   | 0.058    | 0.064 | 1.47        | 1.63 |
| D   | 0.017    | 0.023 | 0.43        | 0.58 |
| E   | 0.014    | 0.017 | 0.36        | 0.43 |
| F   | 0.027    | 0.033 | 0.69        | 0.84 |
| G   | 0.071    | 0.077 | 1.80        | 1.96 |
| H   | 0.017    | 0.023 | 0.43        | 0.58 |
| J   | 0.000    | 0.007 | 0.00        | 0.18 |
| K   | 0.018    | 0.026 | 0.46        | 0.66 |
| L   | 0.253    | 0.263 | 6.43        | 6.68 |
| M   | 5° REF   |       | 5° REF      |      |
| N   | 1.75 REF |       | 4.44 REF    |      |
| P   | 0.000    | 0.006 | 0.00        | 0.15 |
| Q   | 0.120    | 0.130 | 3.05        | 3.30 |
| R   | 0.220    | 0.230 | 5.59        | 5.84 |
| S   | 0.030    | 0.038 | 0.76        | 0.97 |
| T   | 0.050    | 0.060 | 1.27        | 1.52 |
| U   | 0.000    | 0.018 | 0.00        | 0.46 |
| V   | 0.000    | 0.014 | 0.00        | 0.36 |
| W   | 0.004    | 0.016 | 0.10        | 0.41 |
| X   | 0.131    | 0.141 | 3.33        | 3.58 |
| Y   | 0.065    | 0.075 | 1.65        | 1.90 |
| Z   | 0.089    | 0.099 | 2.26        | 2.51 |
| AA  | 0.056    | 0.066 | 1.42        | 1.67 |

- STYLE 1:
- PIN 1. DRAIN
  - GATE
  - SOURCE
  - SOURCE

**CASE 449-02  
ISSUE A**

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