

# ANTREX Electronics

## Electronic Components Sourcing Information

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### Product Reference Information

|                      |                           |
|----------------------|---------------------------|
| <b>Part Number:</b>  | MRF5S9070NR5              |
| <b>Manufacturer:</b> | NXP USA Inc.              |
| <b>Package:</b>      | Please confirm with sales |
| <b>Availability:</b> | Please confirm with sales |

#### Product Page:

<https://antrexco.com/product/details/nxp-usa-inc/mrf5s9070nr5.html>

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#### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

# RF Power Field Effect Transistor

## N-Channel Enhancement-Mode Lateral MOSFET

Designed for broadband commercial and industrial applications with frequencies up to 1000 MHz. The high gain and broadband performance of this device make it ideal for large-signal, common-source amplifier applications in 26 volt base station equipment.

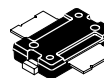
- Typical Single-Carrier N-CDMA Performance @ 880 MHz,  $V_{DD} = 26$  Volts,  $I_{DQ} = 600$  mA,  $P_{out} = 14$  Watts Avg., IS-95 CDMA (Pilot, Sync, Paging, Traffic Codes 8 Through 13)  
Power Gain — 17.8 dB  
Drain Efficiency — 30%  
ACPR @ 750 kHz Offset — -47 dBc in 30 kHz Bandwidth
- Capable of Handling 10:1 VSWR, @ 26 Vdc, 880 MHz, 70 Watts CW Output Power

### Features

- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Integrated ESD Protection
- 200°C Capable Plastic Package
- N Suffix Indicates Lead-Free Terminations. RoHS Compliant.
- In Tape and Reel. R1 Suffix = 500 Units per 24 mm, 13 inch Reel.

**MRF5S9070NR1**

**880 MHz, 70 W, 26 V  
SINGLE N-CDMA  
LATERAL N-CHANNEL  
BROADBAND  
RF POWER MOSFET**



**CASE 1265-09, STYLE 1  
TO-270-2  
PLASTIC**

**Table 1. Maximum Ratings**

| Rating                                                                                 | Symbol    | Value        | Unit                     |
|----------------------------------------------------------------------------------------|-----------|--------------|--------------------------|
| Drain-Source Voltage                                                                   | $V_{DSS}$ | - 0.5, +68   | Vdc                      |
| Gate-Source Voltage                                                                    | $V_{GS}$  | - 0.5, +15   | Vdc                      |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$     | 219<br>1.25  | W<br>W/ $^\circ\text{C}$ |
| Storage Temperature Range                                                              | $T_{stg}$ | - 65 to +150 | $^\circ\text{C}$         |
| Operating Junction Temperature                                                         | $T_J$     | 200          | $^\circ\text{C}$         |

**Table 2. Thermal Characteristics**

| Characteristic                                                                                                                         | Symbol          | Value (1,2)  | Unit                      |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|---------------------------|
| Thermal Resistance, Junction to Case<br>Case Temperature $80^\circ\text{C}$ , 70 W CW<br>Case Temperature $78^\circ\text{C}$ , 14 W CW | $R_{\theta JC}$ | 0.80<br>0.93 | $^\circ\text{C}/\text{W}$ |

**Table 3. ESD Protection Characteristics**

| Test Methodology                      | Class        |
|---------------------------------------|--------------|
| Human Body Model (per JESD22-A114)    | 2 (Minimum)  |
| Machine Model (per EIA/JESD22-A115)   | A (Minimum)  |
| Charge Device Model (per JESD22-C101) | IV (Minimum) |

**Table 4. Moisture Sensitivity Level**

| Test Methodology                     | Rating | Package Peak Temperature | Unit             |
|--------------------------------------|--------|--------------------------|------------------|
| Per JESD22-A113, IPC/JEDEC J-STD-020 | 3      | 260                      | $^\circ\text{C}$ |

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

**Table 5. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Characteristic                                                                                                                                                                                                                                                                                                                                                | Symbol       | Min | Typ  | Max  | Unit            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|------|------|-----------------|
| <b>Off Characteristics</b>                                                                                                                                                                                                                                                                                                                                    |              |     |      |      |                 |
| Zero Gate Voltage Drain Leakage Current<br>( $V_{DS} = 68\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ )                                                                                                                                                                                                                                                             | $I_{DSS}$    | —   | —    | 10   | $\mu\text{Adc}$ |
| Zero Gate Voltage Drain Leakage Current<br>( $V_{DS} = 26\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ )                                                                                                                                                                                                                                                             | $I_{DSS}$    | —   | —    | 1    | $\mu\text{Adc}$ |
| Gate-Source Leakage Current<br>( $V_{GS} = 5\text{ Vdc}$ , $V_{DS} = 0\text{ Vdc}$ )                                                                                                                                                                                                                                                                          | $I_{GSS}$    | —   | —    | 1    | $\mu\text{Adc}$ |
| <b>On Characteristics</b>                                                                                                                                                                                                                                                                                                                                     |              |     |      |      |                 |
| Gate Threshold Voltage<br>( $V_{DS} = 10\text{ Vdc}$ , $I_D = 200\text{ }\mu\text{A}$ )                                                                                                                                                                                                                                                                       | $V_{GS(th)}$ | 2   | 2.7  | 4    | Vdc             |
| Gate Quiescent Voltage<br>( $V_{DS} = 26\text{ Vdc}$ , $I_D = 600\text{ mAdc}$ )                                                                                                                                                                                                                                                                              | $V_{GS(Q)}$  | —   | 3.7  | —    | Vdc             |
| Drain-Source On-Voltage<br>( $V_{GS} = 10\text{ Vdc}$ , $I_D = 1.0\text{ Adc}$ )                                                                                                                                                                                                                                                                              | $V_{DS(on)}$ | —   | 0.18 | 0.22 | Vdc             |
| Forward Transconductance<br>( $V_{DS} = 10\text{ Vdc}$ , $I_D = 4\text{ Adc}$ )                                                                                                                                                                                                                                                                               | $g_{fs}$     | —   | 4.7  | —    | S               |
| <b>Dynamic Characteristic</b>                                                                                                                                                                                                                                                                                                                                 |              |     |      |      |                 |
| Input Capacitance<br>( $V_{DS} = 26\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )                                                                                                                                                                                                                                                    | $C_{iss}$    | —   | 126  | —    | pF              |
| Output Capacitance<br>( $V_{DS} = 26\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )                                                                                                                                                                                                                                                   | $C_{oss}$    | —   | 34   | —    | pF              |
| Reverse Transfer Capacitance<br>( $V_{DS} = 26\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )                                                                                                                                                                                                                                         | $C_{rss}$    | —   | 1.37 | —    | pF              |
| <b>Functional Tests</b> (In Freescale Test Fixture, 50 ohm system) $V_{DD} = 26\text{ Vdc}$ , $I_{DQ} = 600\text{ mA}$ , $P_{out} = 14\text{ W Avg.}$ , $f = 880\text{ MHz}$ , Single-Carrier N-CDMA, 1.2288 MHz Channel Bandwidth Carrier. ACPR measured in 30 kHz Channel Bandwidth @ $\pm 750\text{ kHz}$ Offset. PAR = 9.8 dB @ 0.01% Probability on CCDF |              |     |      |      |                 |
| Power Gain                                                                                                                                                                                                                                                                                                                                                    | $G_{ps}$     | 17  | 17.8 | —    | dB              |
| Drain Efficiency                                                                                                                                                                                                                                                                                                                                              | $\eta_D$     | 29  | 30   | —    | %               |
| Adjacent Channel Power Ratio                                                                                                                                                                                                                                                                                                                                  | ACPR         | —   | -47  | -45  | dBc             |
| Input Return Loss                                                                                                                                                                                                                                                                                                                                             | IRL          | —   | -19  | -9   | dB              |
| <b>Typical GSM CW Performances</b> (In Freescale GSM Test Fixture Optimized for 921-960 MHz, 50 ohm system) $V_{DD} = 26\text{ Vdc}$ , $I_{DQ} = 400\text{ mA}$ , $P_{out} = 60\text{ W}$ , $f = 921\text{ -}960\text{ MHz}$                                                                                                                                  |              |     |      |      |                 |
| Power Gain                                                                                                                                                                                                                                                                                                                                                    | $G_{ps}$     | —   | 16.4 | —    | dB              |
| Drain Efficiency                                                                                                                                                                                                                                                                                                                                              | $\eta_D$     | —   | 62   | —    | %               |
| Input Return Loss                                                                                                                                                                                                                                                                                                                                             | IRL          | —   | -12  | —    | dB              |
| $P_{out}$ @ 1 dB Compression Point<br>( $f = 940\text{ MHz}$ )                                                                                                                                                                                                                                                                                                | P1dB         | —   | 68   | —    | W               |
| <b>Typical GSM EDGE Performances</b> (In Freescale GSM EDGE Test Fixture Optimized for 921-960 MHz, 50 ohm system) $V_{DD} = 26\text{ Vdc}$ , $I_{DQ} = 400\text{ mA}$ , $P_{out} = 25\text{ W Avg.}$ , $f = 921\text{ -}960\text{ MHz}$ , GSM EDGE Signal                                                                                                    |              |     |      |      |                 |
| Power Gain                                                                                                                                                                                                                                                                                                                                                    | $G_{ps}$     | —   | 17   | —    | dB              |
| Drain Efficiency                                                                                                                                                                                                                                                                                                                                              | $\eta_D$     | —   | 44   | —    | %               |
| Error Vector Magnitude                                                                                                                                                                                                                                                                                                                                        | EVM          | —   | 1.5  | —    | %               |
| Spectral Regrowth at 400 kHz Offset                                                                                                                                                                                                                                                                                                                           | SR1          | —   | -62  | —    | dBc             |
| Spectral Regrowth at 600 kHz Offset                                                                                                                                                                                                                                                                                                                           | SR2          | —   | -78  | —    | dBc             |

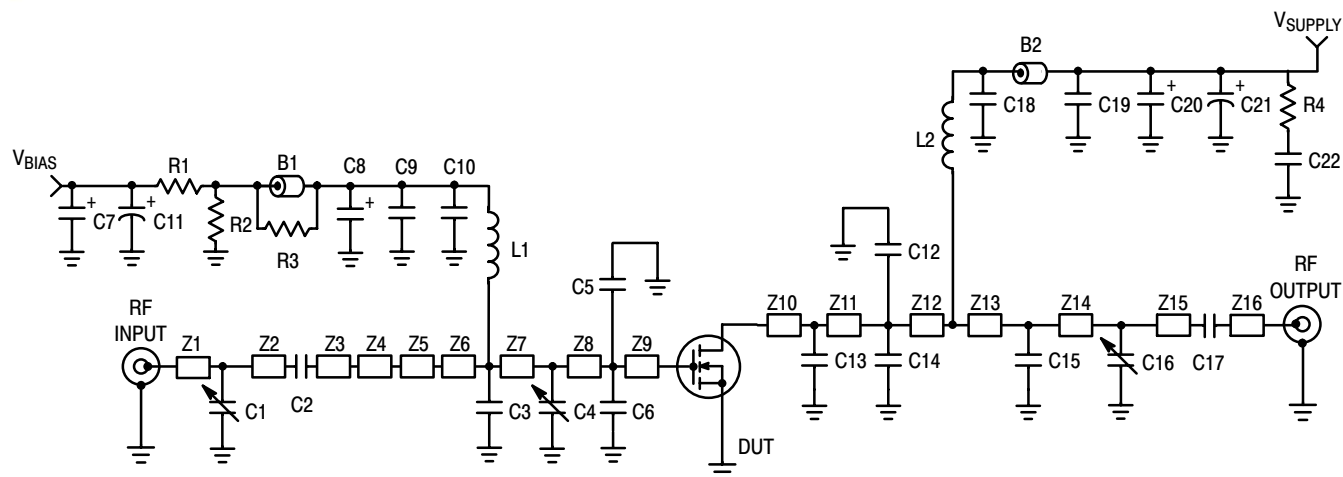
(continued)

**Table 5. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (continued)

| Characteristic                                                                                                                                                                                                              | Symbol   | Min | Typ  | Max | Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|------|-----|------|
| <b>Typical GSM CW Performances</b> (In Freescale GSM Test Fixture Optimized for 865-895 MHz, 50 ohm system) $V_{DD} = 26\text{ Vdc}$ , $I_{DQ} = 400\text{ mA}$ , $P_{out} = 60\text{ W}$ , $f = 865\text{-}895\text{ MHz}$ |          |     |      |     |      |
| Power Gain                                                                                                                                                                                                                  | $G_{ps}$ | —   | 16.4 | —   | dB   |
| Drain Efficiency                                                                                                                                                                                                            | $\eta_D$ | —   | 59   | —   | %    |
| Input Return Loss                                                                                                                                                                                                           | IRL      | —   | -15  | —   | dB   |
| $P_{out}$ @ 1 dB Compression Point<br>( $f = 880\text{ MHz}$ )                                                                                                                                                              | P1dB     | —   | 71   | —   | W    |

**Typical GSM EDGE Performances** (In Freescale GSM EDGE Test Fixture Optimized for 865-895 MHz, 50 ohm system)  $V_{DD} = 26\text{ Vdc}$ ,  $I_{DQ} = 400\text{ mA}$ ,  $P_{out} = 25\text{ W Avg.}$ ,  $f = 865\text{-}895\text{ MHz}$ , GSM EDGE Signal

|                                     |          |   |      |   |     |
|-------------------------------------|----------|---|------|---|-----|
| Power Gain                          | $G_{ps}$ | — | 17   | — | dB  |
| Drain Efficiency                    | $\eta_D$ | — | 41   | — | %   |
| Error Vector Magnitude              | EVM      | — | 1.35 | — | %   |
| Spectral Regrowth at 400 kHz Offset | SR1      | — | -66  | — | dBc |
| Spectral Regrowth at 600 kHz Offset | SR2      | — | -81  | — | dBc |

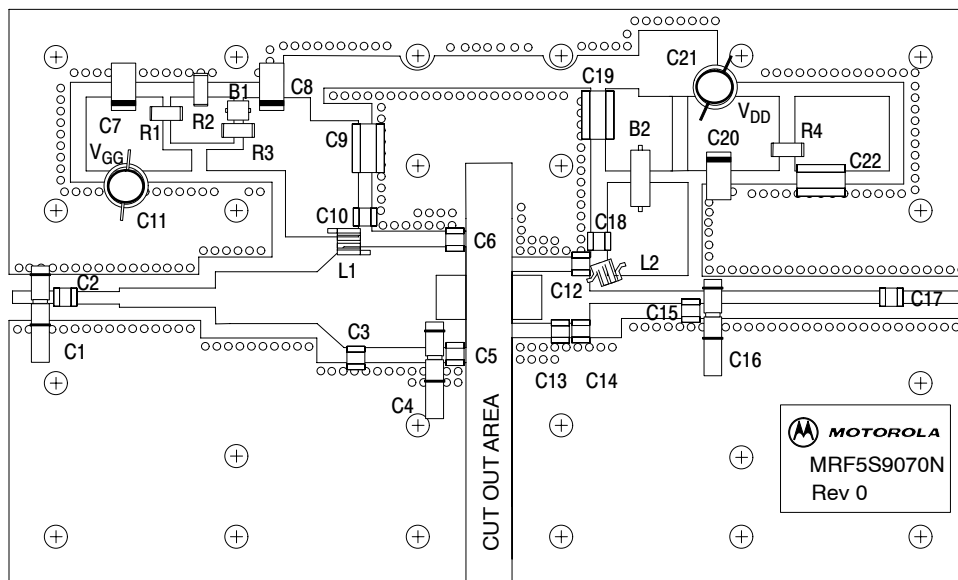


|    |                                |     |                                           |
|----|--------------------------------|-----|-------------------------------------------|
| Z1 | 0.140" x 0.060" Microstrip     | Z10 | 0.245" x 0.270" Microstrip                |
| Z2 | 0.141" x 0.060" Microstrip     | Z11 | 0.110" x 0.270" Microstrip                |
| Z3 | 0.280" x 0.060" Microstrip     | Z12 | 0.055" x 0.270" Microstrip                |
| Z4 | 0.500" x 0.100" Microstrip     | Z13 | 0.512" x 0.060" Microstrip                |
| Z5 | 0.530" x 0.270" Microstrip     | Z14 | 0.106" x 0.060" Microstrip                |
| Z6 | 0.155" x 0.270" x 0.530" Taper | Z15 | 0.930" x 0.060" Microstrip                |
| Z7 | 0.376" x 0.530" Microstrip     | Z16 | 0.365" x 0.060" Microstrip                |
| Z8 | 0.116" x 0.530" Microstrip     | PCB | Taconic RF-35, 0.030", $\epsilon_r = 3.5$ |
| Z9 | 0.055" x 0.530" Microstrip     |     |                                           |

**Figure 1. MRF5S9070NR1 Test Circuit Schematic**

**Table 6. MRF5S9070NR1 Test Circuit Component Designations and Values**

| Part         | Description                                | Part Number        | Manufacturer     |
|--------------|--------------------------------------------|--------------------|------------------|
| B1           | Small Ferrite Bead, Surface Mount          | 2743019447         | Fair-Rite        |
| B2           | Large Ferrite Bead, Surface Mount          | 2743021447         | Fair-Rite        |
| C1           | 0.6 - 6.0 pF Variable Capacitor, Gigatrim  | 272715L            | Johanson         |
| C2           | 16 pF Chip Capacitor                       | ATC100B160JT500XT  | ATC              |
| C3           | 7.5 pF Chip Capacitor                      | ATC100B7R5JT500XT  | ATC              |
| C4, C16      | 0.8 - 8.0 pF Variable Capacitors, Gigatrim | 272915L            | Johanson         |
| C5, C6       | 15 pF Chip Capacitors                      | ATC100B150JT500XT  | ATC              |
| C7, C8, C20  | 10 $\mu$ F, 35 V Tantalum Capacitors       | T491D106K035AT     | Kemet            |
| C9, C19, C22 | 0.58 $\mu$ F Chip Capacitors               | ATC700A561MT150XT  | ATC              |
| C10, C18     | 18 pF Chip Capacitors                      | ATC100B180JT500XT  | ATC              |
| C11          | 100 $\mu$ F, 50 V Electrolytic Capacitor   | 515D107M050BB6AE3  | Vishay           |
| C12, C14     | 13 pF Chip Capacitors                      | ATC100B130JT500XT  | ATC              |
| C13          | 0.7 pF Chip Capacitor                      | ATC100B0R7BT500XT  | ATC              |
| C15          | 3.9 pF Chip Capacitor                      | ATC100B3R9JT500XT  | ATC              |
| C17          | 22 pF Chip Capacitor                       | ATC100B180JT500XT  | ATC              |
| C21          | 470 $\mu$ F, 63 V Electrolytic Capacitor   | ESMG630ELL471MK20S | United Chemi-Con |
| L1, L2       | 12.5 nH Surface Mount Inductors            | A04TJL             | Coilcraft        |
| R1           | 1 k $\Omega$ , 1/4 W Chip Resistor         | CRCW12061001FKEA   | Vishay           |
| R2           | 560 k $\Omega$ , 1/4 W Chip Resistor       | CRCW12065600FKEA   | Vishay           |
| R3           | 12 $\Omega$ , 1/4 W Chip Resistor          | CRCW120612R0FKEA   | Vishay           |
| R4           | 27 $\Omega$ , 1/4 W Chip Resistor          | CRCW120627R0FKEA   | Vishay           |



Freescall has begun the transition of marking Printed Circuit Boards (PCBs) with the Freescall Semiconductor signature/logo. PCBs may have either Motorola or Freescall markings during the transition period. These changes will have no impact on form, fit or function of the current product.

**Figure 2. MRF5S9070NR1 Test Circuit Component Layout**

## TYPICAL CHARACTERISTICS

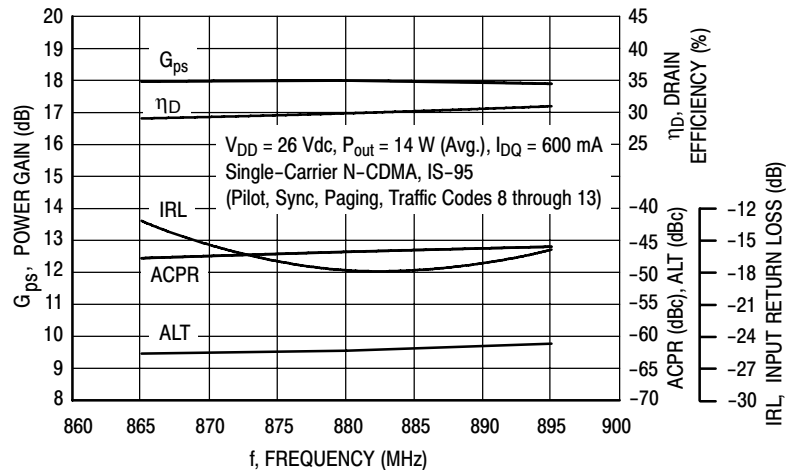


Figure 3. Class AB Broadband Performance

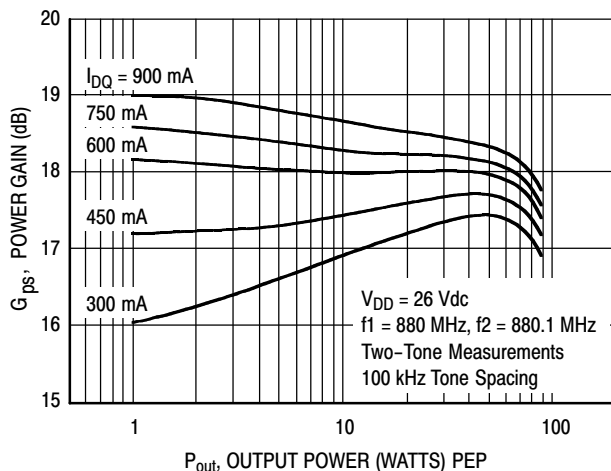


Figure 4. Two-Tone Power Gain versus Output Power

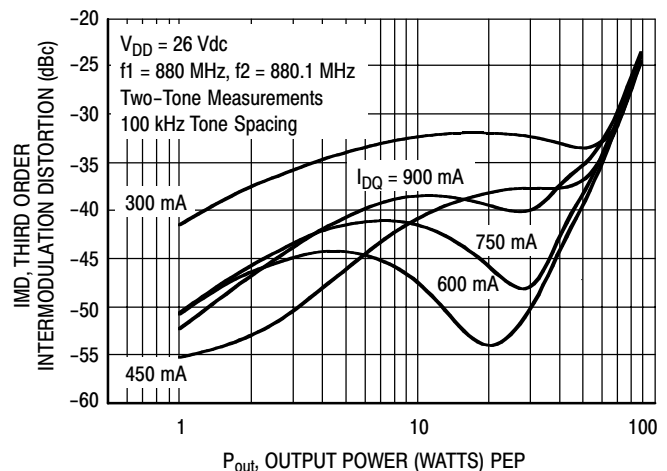


Figure 5. Third Order Intermodulation Distortion versus Output Power

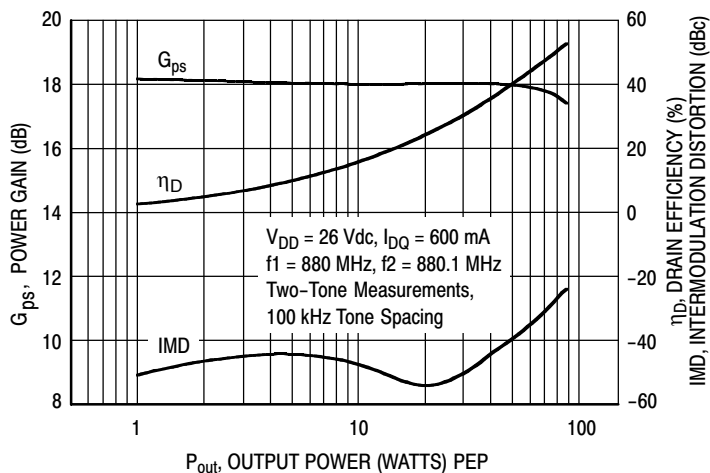


Figure 6. Power Gain, Drain Efficiency and IMD versus Output Power

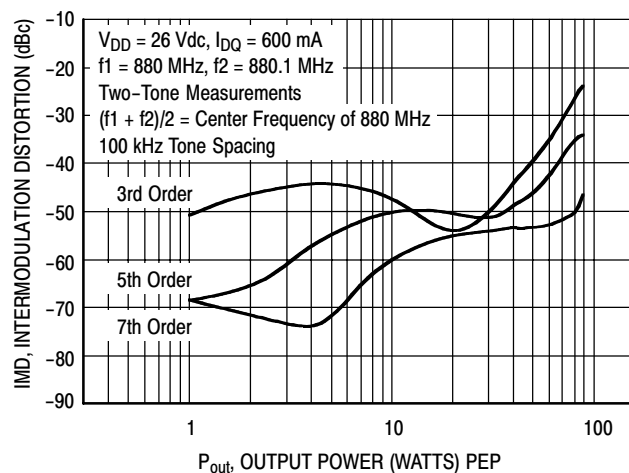
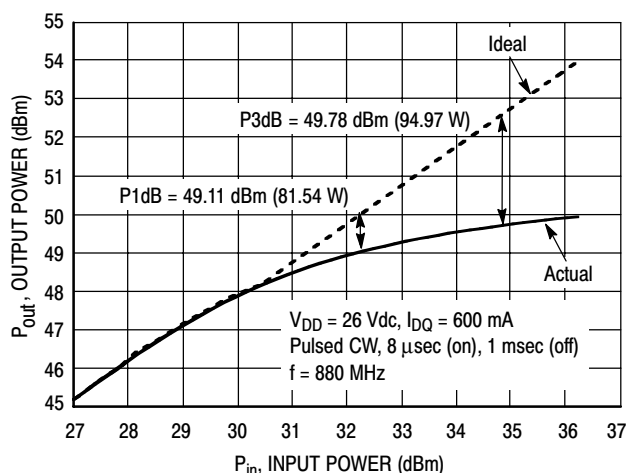
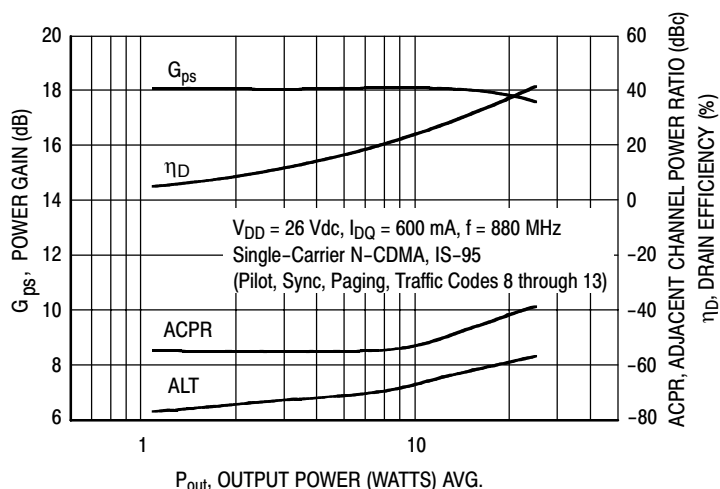


Figure 7. Intermodulation Distortion Products versus Output Power

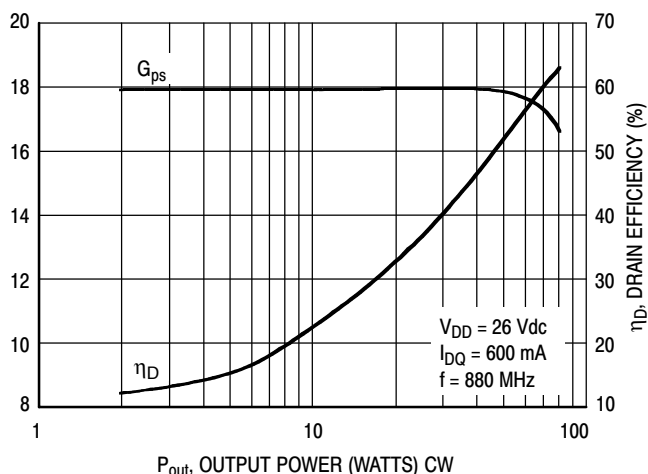
## TYPICAL CHARACTERISTICS



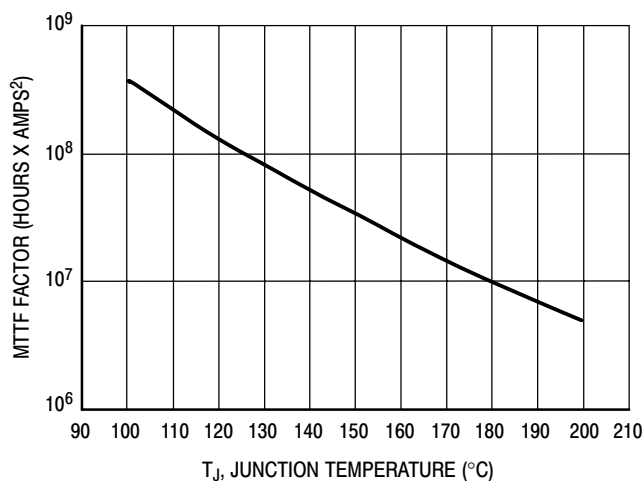
**Figure 8. Pulse CW Output Power versus Input Power**



**Figure 9. N-CDMA ACPR, Power Gain and Drain Efficiency versus Output Power**



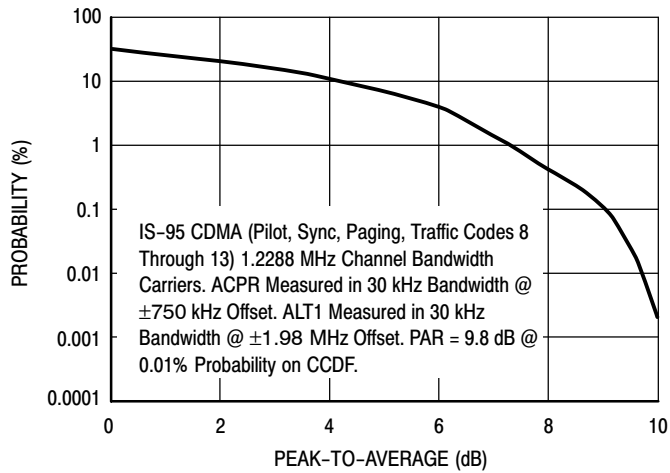
**Figure 10. Power Gain and Drain Efficiency versus CW Output Power**



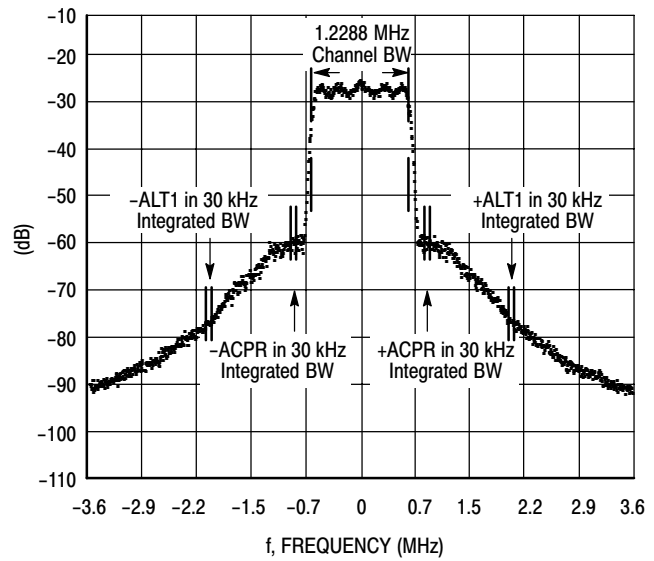
This above graph displays calculated MTTF in hours  $\times$  ampere<sup>2</sup> drain current. Life tests at elevated temperatures have correlated to better than  $\pm 10\%$  of the theoretical prediction for metal failure. Divide MTTF factor by  $I_D^2$  for MTTF in a particular application.

**Figure 11. MTTF Factor versus Junction Temperature**

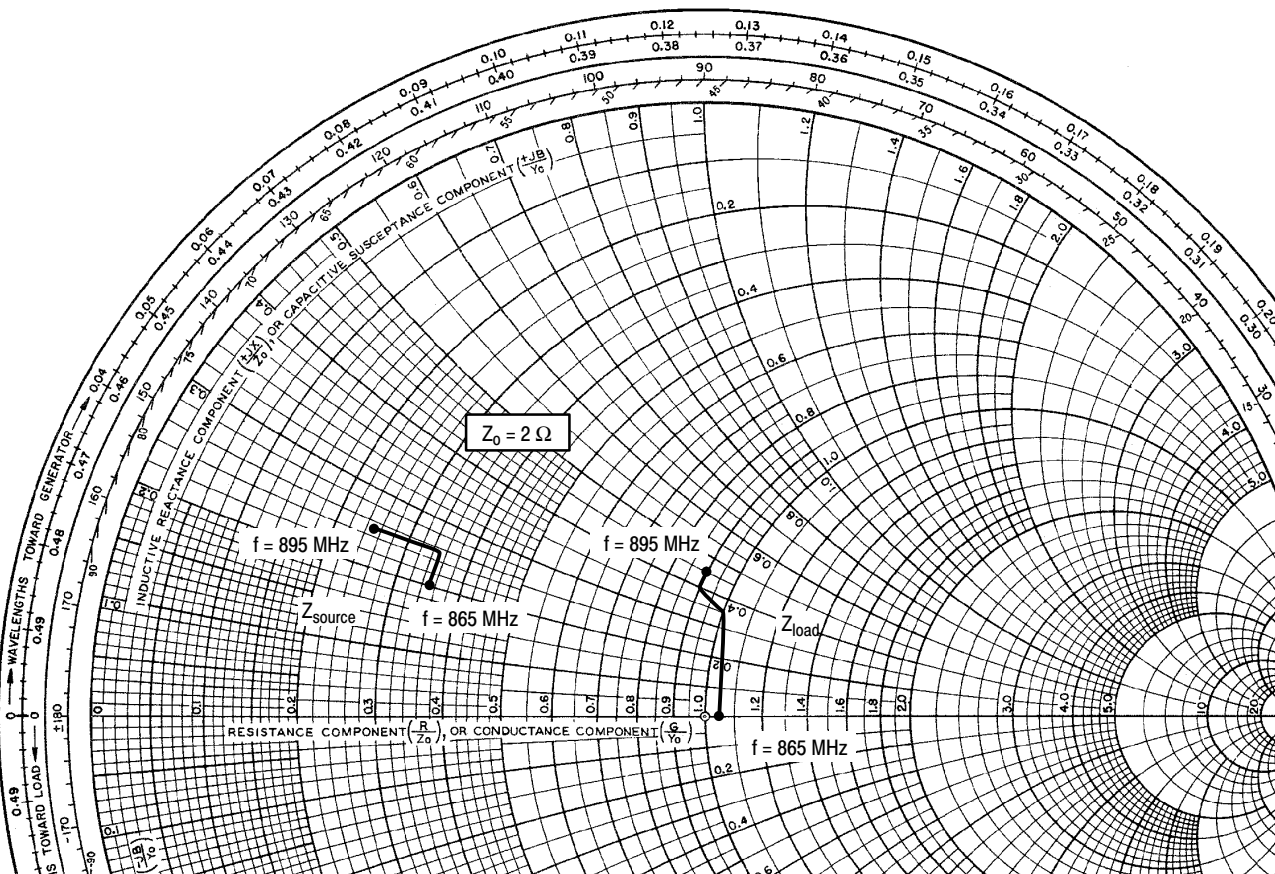
## N-CDMA TEST SIGNAL



**Figure 12. Single-Carrier CCDF N-CDMA**



**Figure 13. Single-Carrier N-CDMA Spectrum**



$V_{DD} = 26 \text{ Vdc}$ ,  $I_{DQ} = 600 \text{ mA}$ ,  $P_{out} = 14 \text{ W Avg.}$

| f<br>MHz | $Z_{source}$<br>$\Omega$ | $Z_{load}$<br>$\Omega$ |
|----------|--------------------------|------------------------|
| 865      | $0.7 + j0.4$             | $2.1 + j0.6$           |
| 875      | $0.7 + j0.5$             | $2.0 + j0.7$           |
| 885      | $0.6 + j0.5$             | $1.8 + j0.8$           |
| 895      | $0.5 + j0.5$             | $1.8 + j0.9$           |

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

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

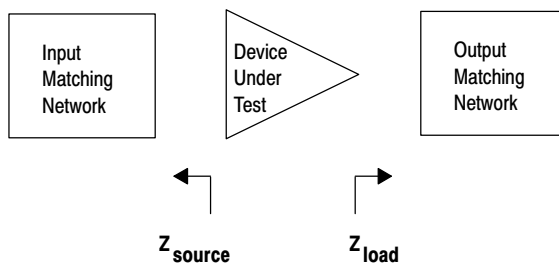
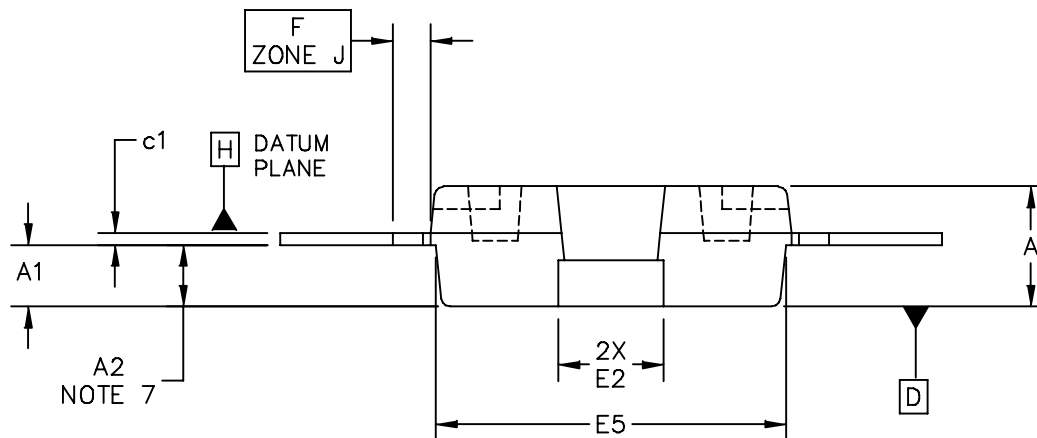
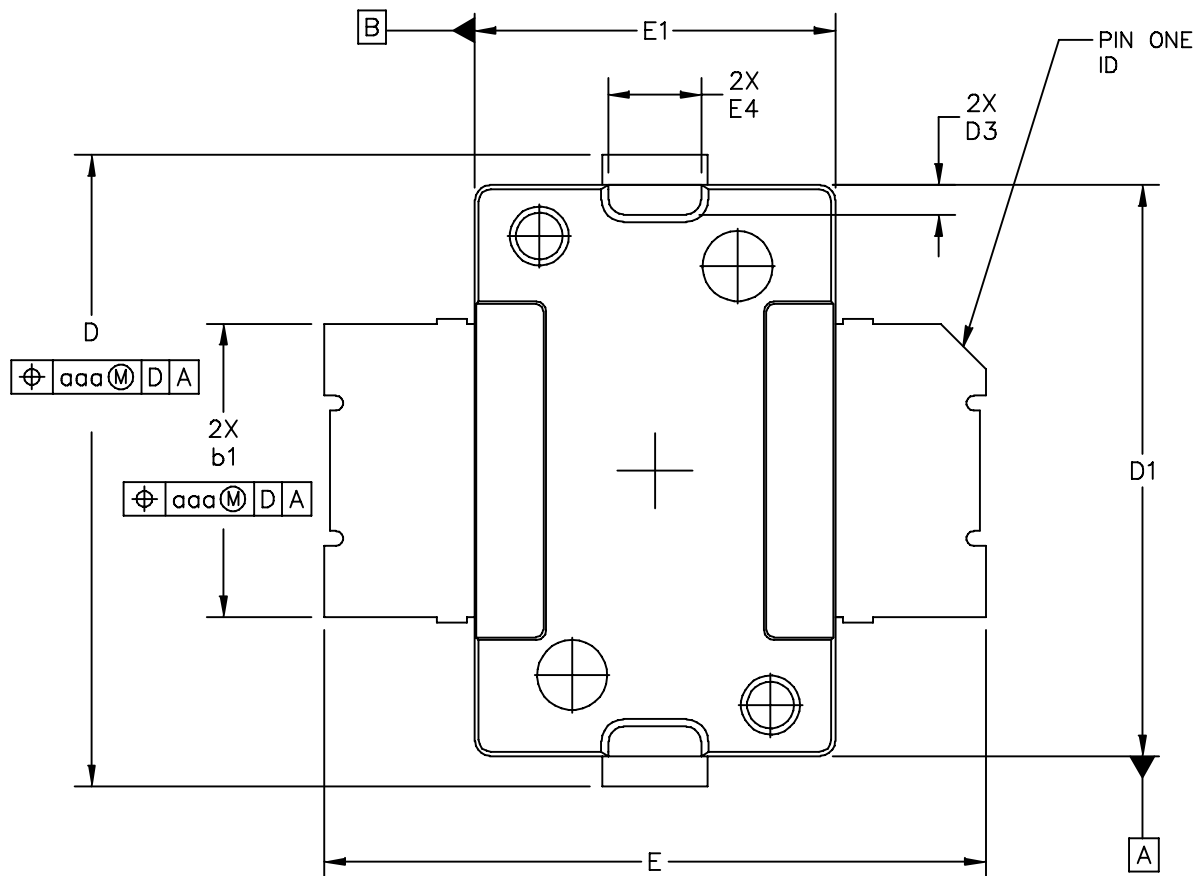
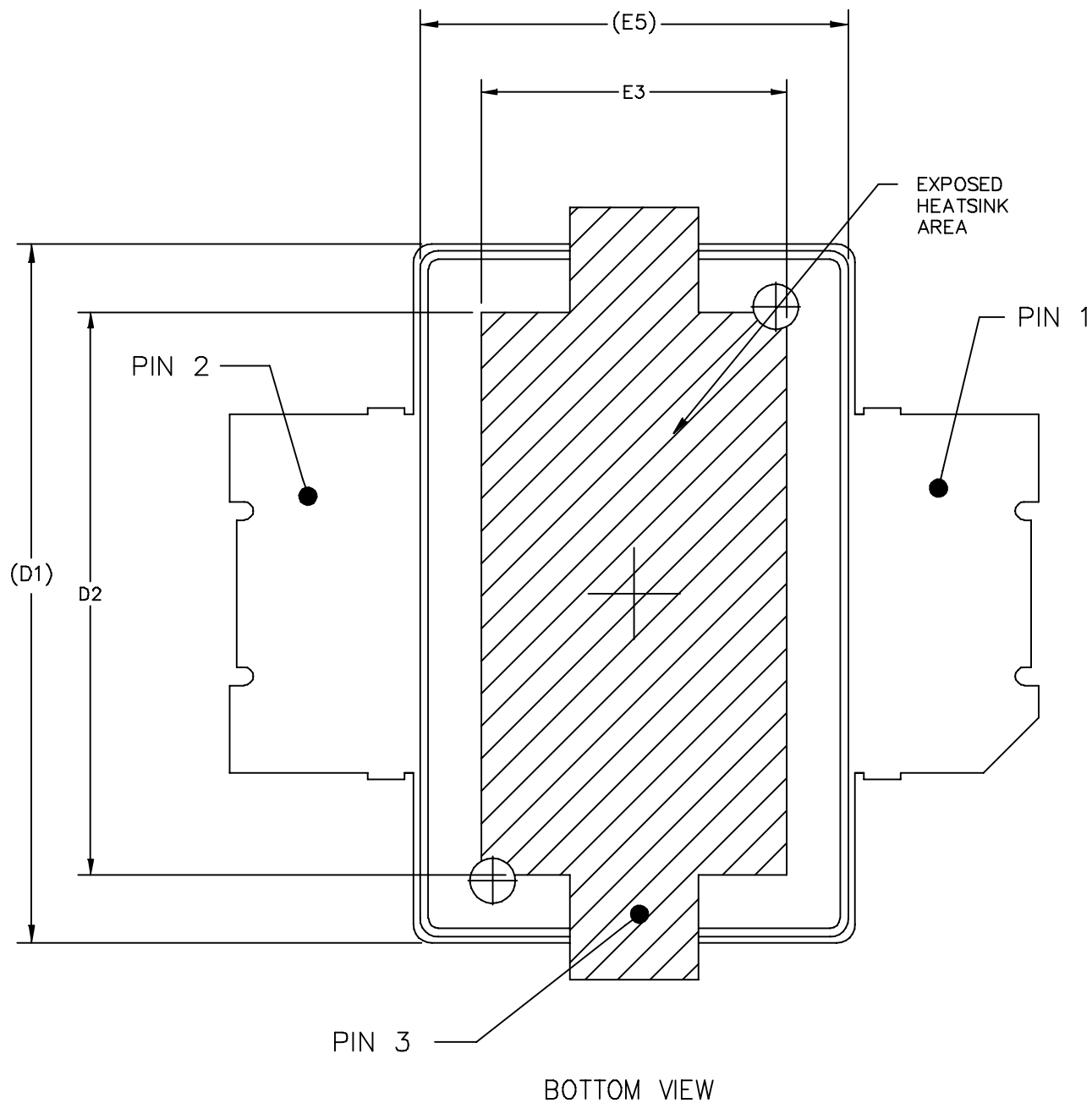


Figure 14. Series Equivalent Source and Load Impedance

# PACKAGE DIMENSIONS



|                                                         |  |                           |                            |
|---------------------------------------------------------|--|---------------------------|----------------------------|
| © FREESCALE SEMICONDUCTOR, INC.<br>ALL RIGHTS RESERVED. |  | MECHANICAL OUTLINE        | PRINT VERSION NOT TO SCALE |
| TITLE:<br>TO-270<br>SURFACE MOUNT                       |  | DOCUMENT NO: 98ASH98117A  | REV: K                     |
|                                                         |  | CASE NUMBER: 1265-09      | 29 JUN 2007                |
|                                                         |  | STANDARD: JEDEC TO-270 AA |                            |



|                                                         |                           |                            |             |
|---------------------------------------------------------|---------------------------|----------------------------|-------------|
| © FREESCALE SEMICONDUCTOR, INC.<br>ALL RIGHTS RESERVED. | MECHANICAL OUTLINE        | PRINT VERSION NOT TO SCALE |             |
| TITLE:<br>TO-270<br>SURFACE MOUNT                       | DOCUMENT NO: 98ASH98117A  |                            | REV: K      |
|                                                         | CASE NUMBER: 1265-09      |                            | 29 JUN 2007 |
|                                                         | STANDARD: JEDEC TO-270 AA |                            |             |

NOTES:

1. CONTROLLING DIMENSION: INCH
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
3. DATUM PLANE -H- IS LOCATED AT TOP OF LEAD AND IS COINCIDENT WITH THE LEAD WHERE THE LEAD EXITS THE PLASTIC BODY AT THE TOP OF THE PARTING LINE.
4. DIMENSIONS "D1" AND "E1" DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .006 PER SIDE. DIMENSIONS "D1" AND "E1" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -H-.
5. DIMENSION "b1" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .005 TOTAL IN EXCESS OF THE "b1" DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. DATUMS -A- AND -B- TO BE DETERMINED AT DATUM PLANE -H-.
7. DIMENSION "A2" APPLIES WITHIN ZONE "J" ONLY.
8. DIMENSIONS "D" AND "E2" DO NOT INCLUDE MOLD PROTRUSION. OVERALL LENGTH INCLUDING MOLD PROTRUSION SHOULD NOT EXCEED 0.430 INCH FOR DIMENSION "D" AND 0.080 INCH FOR DIMENSION "E2". DIMENSIONS "D" AND "E2" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -D-.

STYLE 1:

PIN 1 - DRAIN  
PIN 2 - GATE  
PIN 3 - SOURCE

| INCH                                                    |      | MILLIMETER |                    | INCH  |                           | MILLIMETER                 |             |
|---------------------------------------------------------|------|------------|--------------------|-------|---------------------------|----------------------------|-------------|
| DIM                                                     | MIN  | MAX        | MIN                | MAX   | DIM                       | MIN                        | MAX         |
| A                                                       | .078 | .082       | 1.98               | 2.08  | F                         | .025 BSC                   |             |
| A1                                                      | .039 | .043       | 0.99               | 1.09  | b1                        | .193                       | .199        |
| A2                                                      | .040 | .042       | 1.02               | 1.07  | c1                        | .007                       | .011        |
| D                                                       | .416 | .424       | 10.57              | 10.77 | aaa                       | .004                       |             |
| D1                                                      | .378 | .382       | 9.60               | 9.70  |                           |                            |             |
| D2                                                      | .290 | ----       | 7.37               | ----  |                           |                            |             |
| D3                                                      | .016 | .024       | 0.41               | 0.61  |                           |                            |             |
| E                                                       | .436 | .444       | 11.07              | 11.28 |                           |                            |             |
| E1                                                      | .238 | .242       | 6.04               | 6.15  |                           |                            |             |
| E2                                                      | .066 | .074       | 1.68               | 1.88  |                           |                            |             |
| E3                                                      | .150 | ----       | 3.81               | ----  |                           |                            |             |
| E4                                                      | .058 | .066       | 1.47               | 1.68  |                           |                            |             |
| E5                                                      | .231 | .235       | 5.87               | 5.97  |                           |                            |             |
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| TITLE:<br><br>TO-270<br>SURFACE MOUNT                   |      |            |                    |       | DOCUMENT NO: 98ASH98117A  |                            | REV: K      |
|                                                         |      |            |                    |       | CASE NUMBER: 1265-09      |                            | 29 JUN 2007 |
|                                                         |      |            |                    |       | STANDARD: JEDEC TO-270 AA |                            |             |

## PRODUCT DOCUMENTATION, TOOLS AND SOFTWARE

Refer to the following documents to aid your design process.

### Application Notes

- AN1907: Solder Reflow Attach Method for High Power RF Devices in Plastic Packages
- AN1955: Thermal Measurement Methodology of RF Power Amplifiers
- AN3263: Bolt Down Mounting Method for High Power RF Transistors and RFICs in Over-Molded Plastic Packages
- AN3789: Clamping of High Power RF Transistors and RFICs in Over-Molded Plastic Packages

### Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

### Software

- Electromigration MTTF Calculator
- RF High Power Model

For Software and Tools, 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.

## REVISION HISTORY

The following table summarizes revisions to this document.

| Revision | Date      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7        | June 2009 | <ul style="list-style-type: none"> <li>• Replaced Case Outline 1265-08 with 1265-09, Issue K, p. 1, 10-12. Corrected cross hatch pattern in bottom view and changed its dimensions (D2 and E3) to minimum value on source contact (D2 changed from Min-Max .290-.320 to .290 Min; E3 changed from Min-Max .150-.180 to .150 Min). Added JEDEC Standard Package Number.</li> <li>• Modified data sheet to reflect MSL rating change from 1 to 3 as a result of the standardization of packing process as described in Product and Process Change Notification number, PCN13516, p. 1</li> <li>• Updated Part Numbers in Table 6, Component Designations and Values, to RoHS compliant part numbers, p. 4</li> <li>• Added AN3789, Clamping of High Power RF Transistors and RFICs in Over-Molded Plastic Packages to Product Documentation, Application Notes, p. 13</li> <li>• Added Electromigration MTTF Calculator and RF High Power Model availability to Product Software, p. 13</li> </ul> |

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Tokyo 153-0064  
Japan  
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[support.japan@freescale.com](mailto:support.japan@freescale.com)

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Exchange Building 23F  
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