

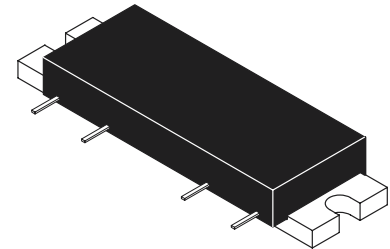
The RF Line
UMTS Band
RF Linear LDMOS Amplifier

Designed for Class AB amplifier applications in 50 ohm systems operating in the UMTS frequency band. A silicon FET design provides outstanding linearity and gain. In addition, the excellent group delay and phase linearity characteristics are ideal for digital modulation systems.

- Typical W-CDMA Performance for $V_{DD} = 28$ Volts, $V_{bias} = 8$ Volts, $I_{DQ} = 550$ mA, Channel Bandwidth = 3.84 MHz, Adjacent Channels at ± 5 MHz, ACPR Measured in 3.84 MHz Bandwidth. Peak/Avg. = 8.5 dB @ 0.01% Probability on CCDF, 3GPP Test Model 1, 64 DTCH.
- Adjacent Channel Power: -50 dBc @ 30 dBm, 5 MHz Channel Spacing
- Power Gain: 23.7 dB Min (@ $f = 2140$ MHz)
- Excellent Phase Linearity and Group Delay Characteristics
- 0.2 dB Typical Gain Flatness
- Ideal for Feedforward Base Station Applications

MHPA21010

2110–2170 MHz
10 W, 23.7 dB
RF HIGH POWER LDMOS AMPLIFIER



CASE 301AP-02, STYLE 3

MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|------------------------------------|-----------|-------------|------------------|
| DC Supply Voltage | V_{DD} | 30 | Vdc |
| RF Input Power (Single Carrier CW) | P_{in} | +20 | dBm |
| Storage Temperature Range | T_{stg} | -40 to +100 | $^\circ\text{C}$ |
| Operating Case Temperature Range | T_C | -20 to +100 | $^\circ\text{C}$ |
| Quiescent Bias Current | I_{DQ} | 750 | mA |

ELECTRICAL CHARACTERISTICS ($V_{DD} = 28$ Vdc, $V_{BIAS} \cong 8$ V Set for Supply Current of 550 mA, $T_C = 25^\circ\text{C}$, 50 Ω System)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|-------------|------|-------|-----|------|
| Supply Current | I_{DD} | — | 550 | — | mA |
| Power Gain (f = 2140 MHz) | G_p | 23.7 | 25 | — | dB |
| Gain Flatness (f = 2110–2170 MHz) | G_F | — | 0.2 | 0.6 | dB |
| Power Output @ 1 dB Comp. (f = 2140 MHz) | P_{1dB} | — | 41.5 | — | dBm |
| Input VSWR (f = 2110–2170 MHz) | $VSWR_{in}$ | — | 1.5:1 | 2:1 | |
| Noise Figure (f = 2140 MHz) | NF | — | — | 10 | dB |
| Adjacent Channel Power Rejection @ 30 dBm Avg., 3.84 MHz BW, 5 MHz Channel Spacing | ACPR | — | -55 | -50 | dBc |

TYPICAL CHARACTERISTICS

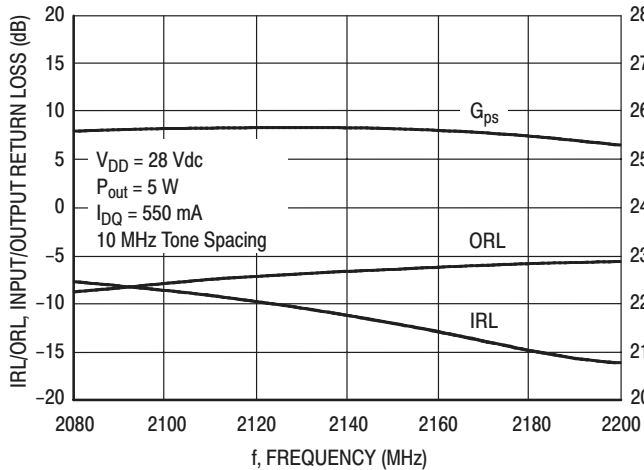


Figure 1. Two-Tone Power Gain, Input Return Loss and Output Return Loss versus Frequency

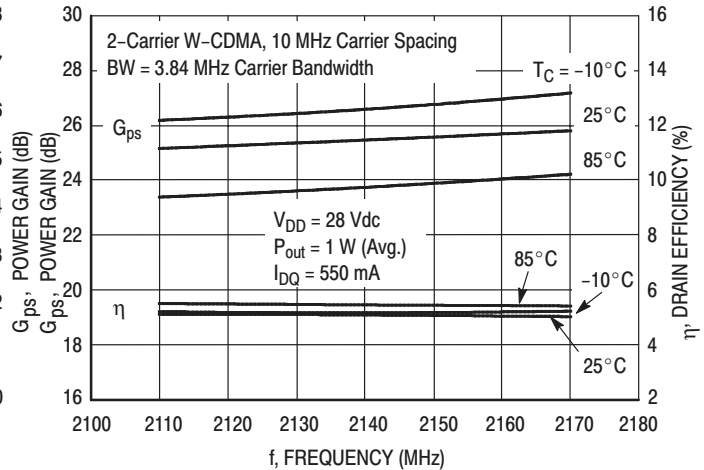


Figure 2. 2-Carrier W-CDMA Power Gain and Efficiency versus Frequency

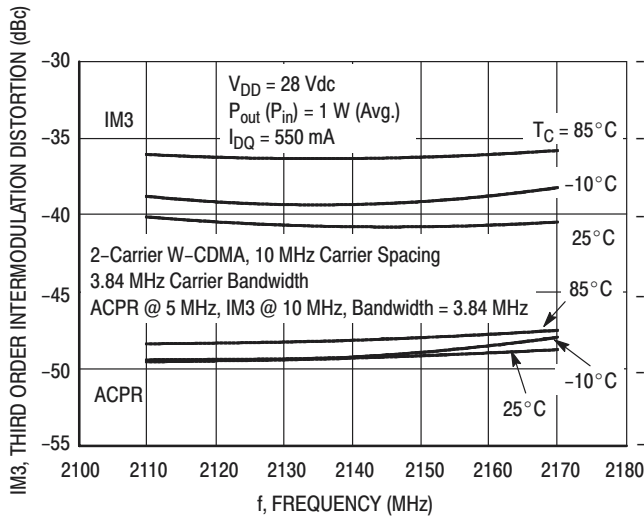


Figure 3. 2-Carrier W-CDMA IM3 and ACPR versus Frequency

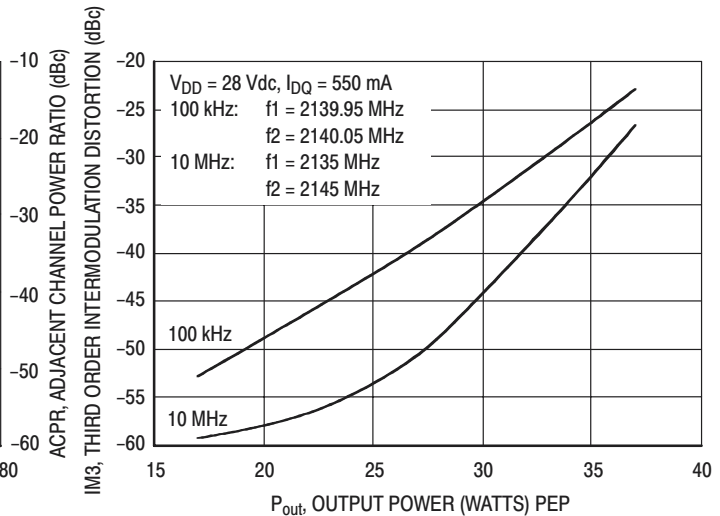


Figure 4. Two-Tone W-CDMA IM3 versus Output Power

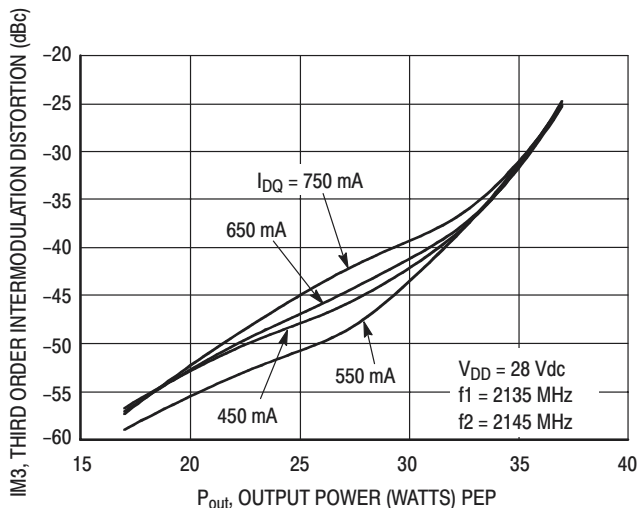


Figure 5. Third Order Intermodulation Distortion versus Output Power

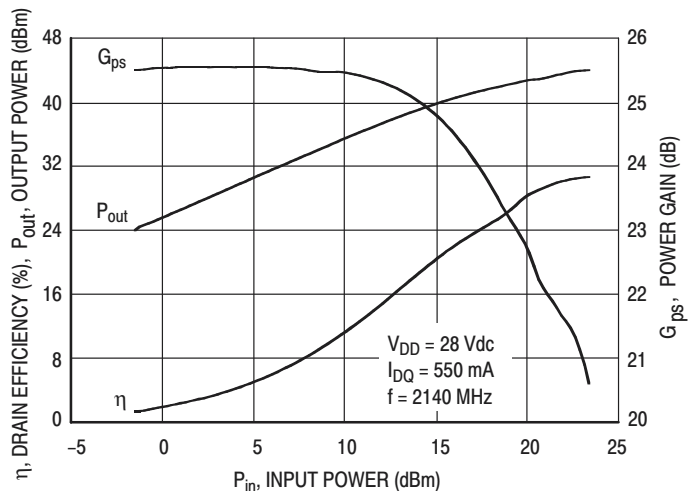


Figure 6. CW Output Power, Efficiency and Gain versus Input Power

Freescale Semiconductor, Inc.

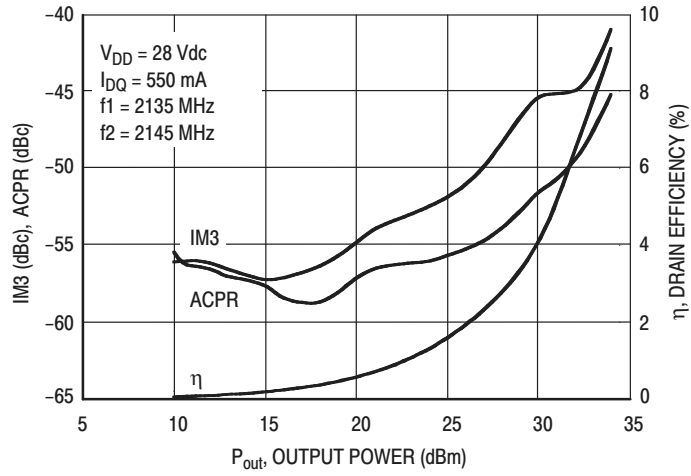
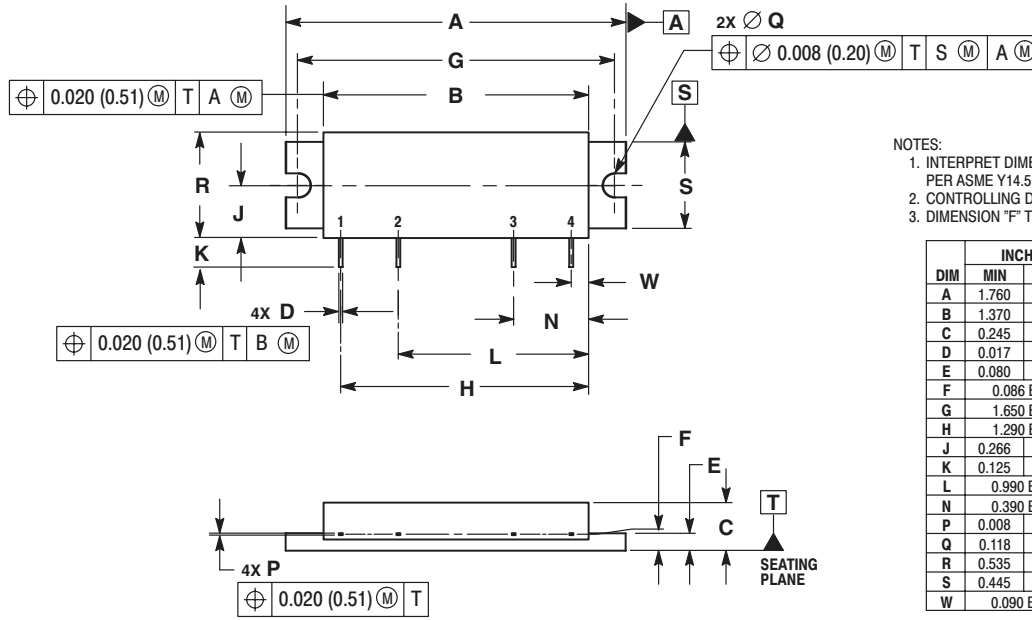


Figure 7. 2-Carrier W-CDMA ACPR, IM3 and Efficiency versus Output Power

Freescale Semiconductor, Inc.

PACKAGE DIMENSIONS



- NOTES:
1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION "F" TO CENTER OF LEADS.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.760 | 1.780 | 44.70 | 45.21 |
| B | 1.370 | 1.390 | 34.80 | 35.31 |
| C | 0.245 | 0.265 | 6.22 | 6.73 |
| D | 0.017 | 0.023 | 0.43 | 0.58 |
| E | 0.080 | 0.100 | 2.03 | 2.54 |
| F | 0.086 BSC | | 2.18 BSC | |
| G | 1.650 BSC | | 41.91 BSC | |
| H | 1.290 BSC | | 32.77 BSC | |
| J | 0.266 | 0.280 | 6.76 | 7.11 |
| K | 0.125 | 0.165 | 3.18 | 4.19 |
| L | 0.990 BSC | | 25.15 BSC | |
| N | 0.390 BSC | | 9.91 BSC | |
| P | 0.008 | 0.013 | 0.20 | 0.33 |
| Q | 0.118 | 0.132 | 3.00 | 3.35 |
| R | 0.535 | 0.555 | 13.59 | 14.10 |
| S | 0.445 | 0.465 | 11.30 | 11.81 |
| W | 0.090 BSC | | 2.29 BSC | |

STYLE 3:
 PIN 1: RF INPUT
 2: VBIAS
 3: VDD
 4: RF OUTPUT
 CASE: GROUND

CASE 301AP-02 ISSUE C

NOTE: V_{DD} (Pin 3) should always be applied before V_{BIAS} (Pin 2).

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