Freescale Semiconductor
Technical Data

Document Number: MHPA21010N
Rev. 6, 5/2006

UMTS Band
RF Linear LDMOS Amplifier

MHPA21010N

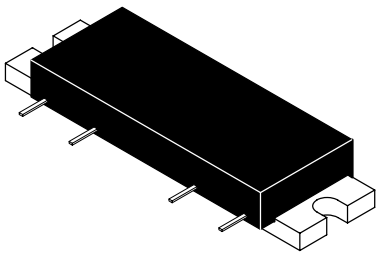
2110-2170 MHz
10 W, 23.7 dB
RF HIGH POWER LDMOS AMPLIFIER

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)
- 0.2 dB Typical Gain Flatness

Features

- Excellent Phase Linearity and Group Delay Characteristics
- Ideal for Feedforward Base Station Applications
- N Suffix Indicates Lead-Free Terminations



CASE 301AP-02, STYLE 3

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Table 1. Maximum Ratings (T_C = 25°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	°C
Operating Case Temperature Range	T_C	- 20 to +100	°C
Quiescent Bias Current	I_{DQ}	750	mA

Table 2. Electrical Characteristics (V_{DD} = 28 Vdc, V_{BIAS} ≅ 8 V Set for Supply Current of 550 mA, T_C = 25°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)	P1dB	—	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

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TYPICAL CHARACTERISTICS

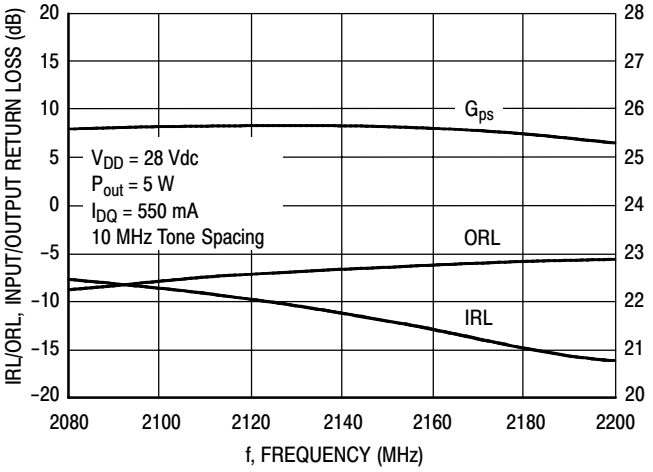

Figure 1. Two-Tone Power Gain, Input Return Loss and Output Return Loss versus Frequency

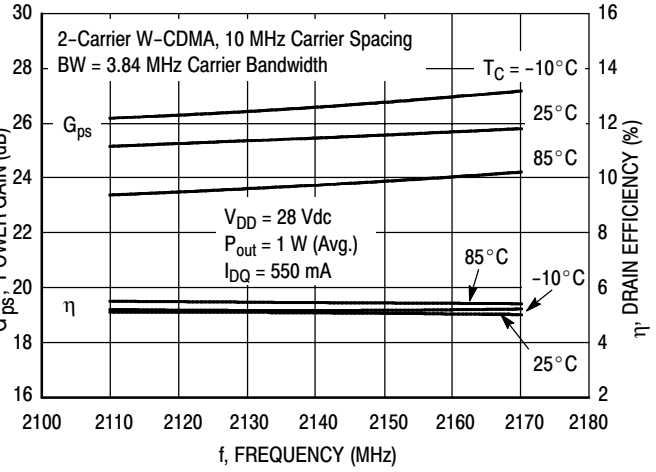

Figure 2. 2-Carrier W-CDMA Power Gain and Efficiency versus Frequency

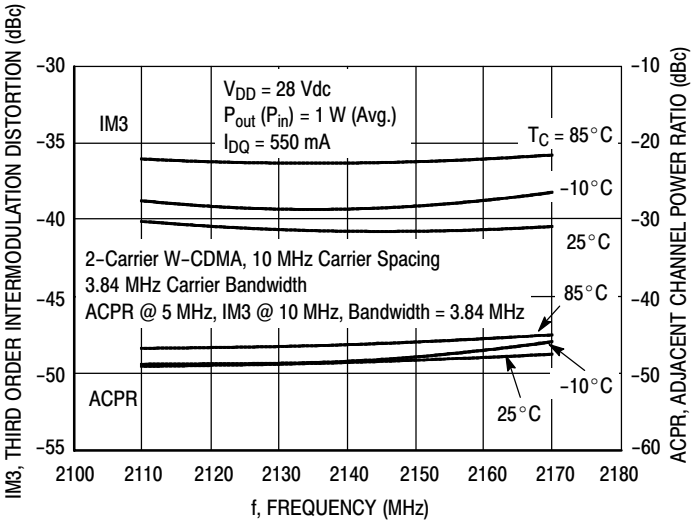

Figure 3. 2-Carrier W-CDMA IM3 and ACPR versus Frequency

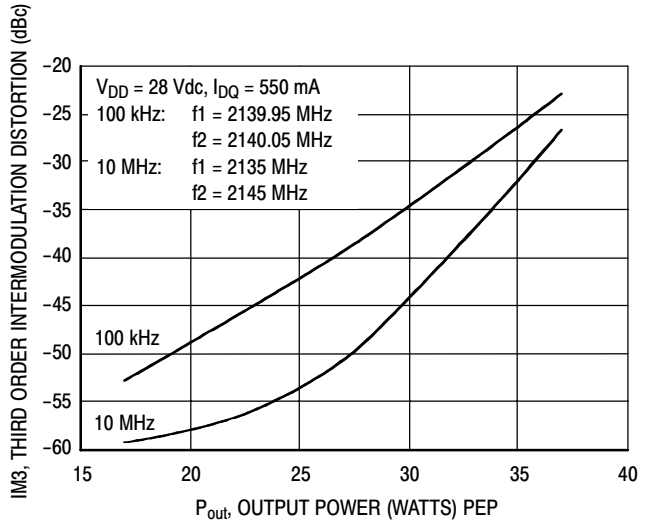

Figure 4. Two-Tone W-CDMA IM3 versus Output Power

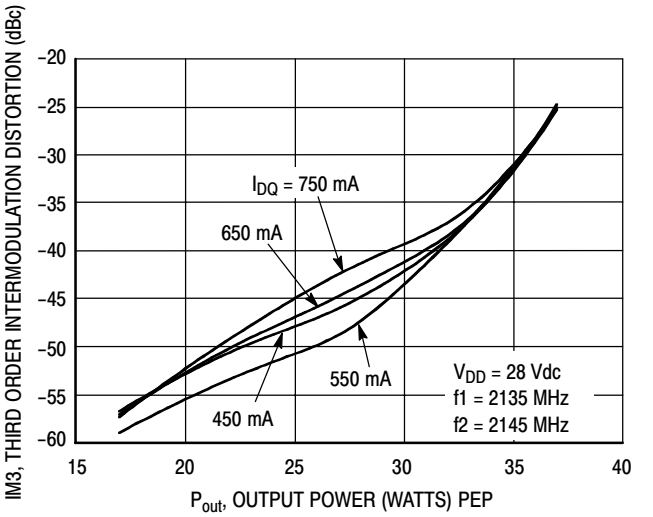

Figure 5. Third Order Intermodulation Distortion versus Output Power

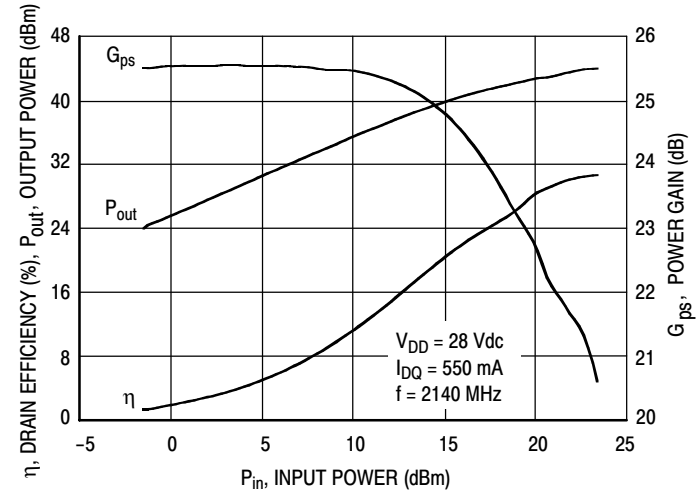

Figure 6. CW Output Power, Efficiency and Gain versus Input Power

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TYPICAL CHARACTERISTICS

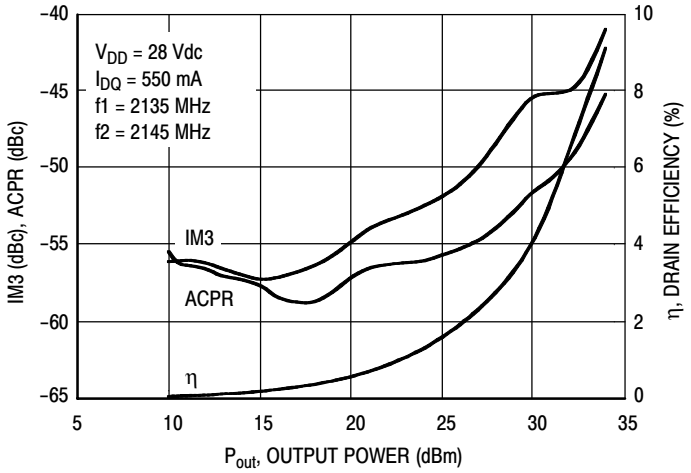

Figure 7. 2-Carrier W-CDMA ACPR, IM3 and Efficiency versus Output Power

NOTES

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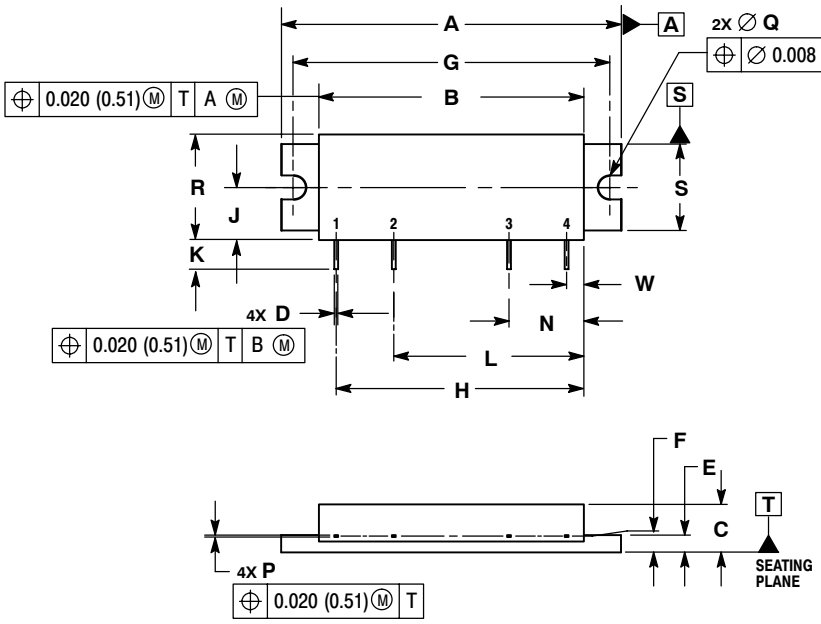
PACKAGE DIMENSIONS



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

	INCHES		MILLIMETERS	
DIM	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 E

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

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