The RF Line

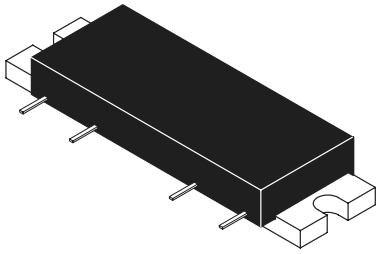
UMTS Band RF Linear LDMOS Amplifier

MHPA21010

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)
- Excellent Phase Linearity and Group Delay Characteristics
- 0.2 dB Typical Gain Flatness
- Ideal for Feedforward Base Station Applications



CASE 301AP–02, STYLE 3

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

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

TYPICAL CHARACTERISTICS

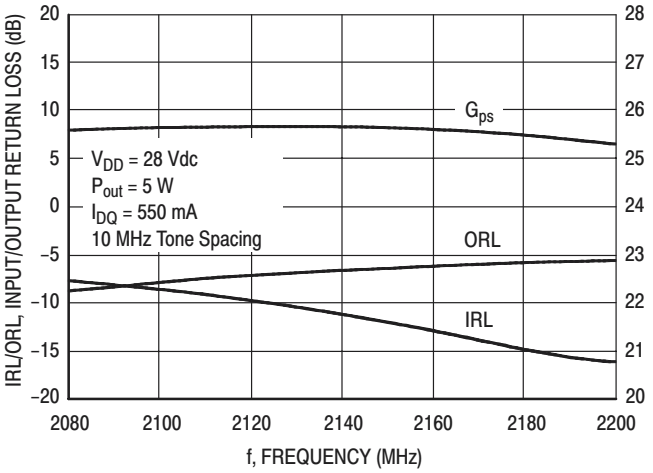


Figure 1. Two–Tone Power Gain, Input Return Loss and Output Return Loss versus Frequency

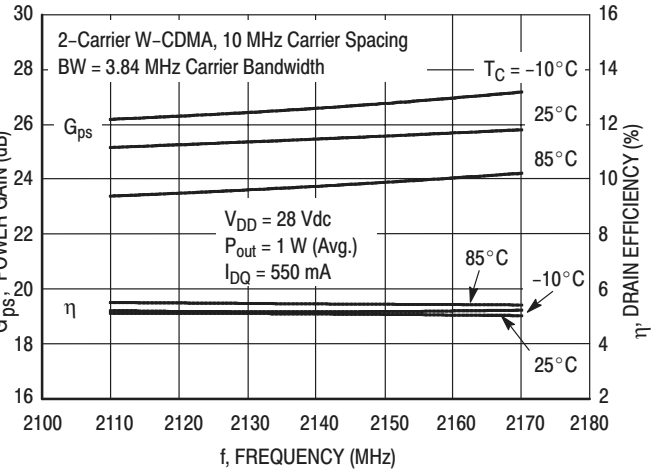


Figure 2. 2–Carrier W–CDMA Power Gain and Efficiency versus Frequency

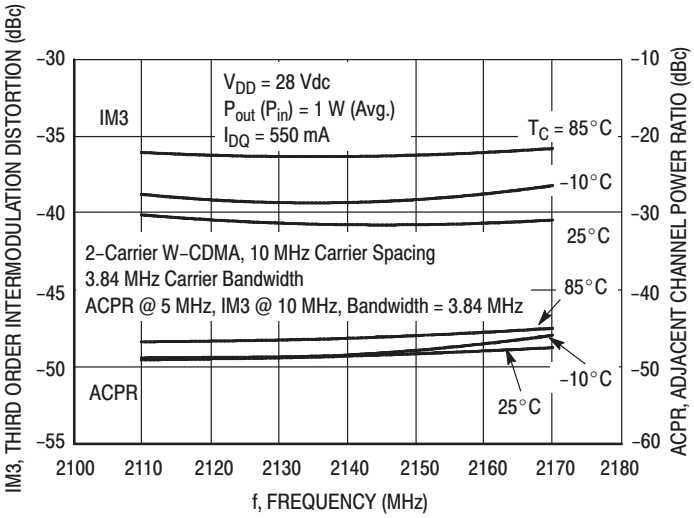


Figure 3. 2–Carrier W–CDMA IM3 and ACPR versus Frequency

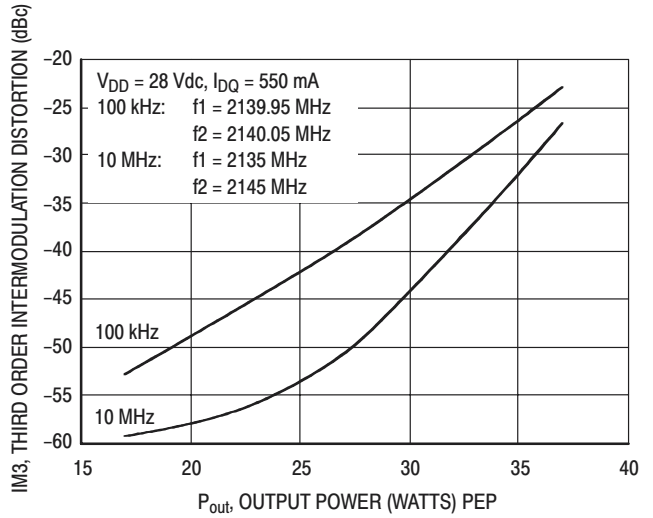


Figure 4. Two–Tone W–CDMA IM3 versus Output Power

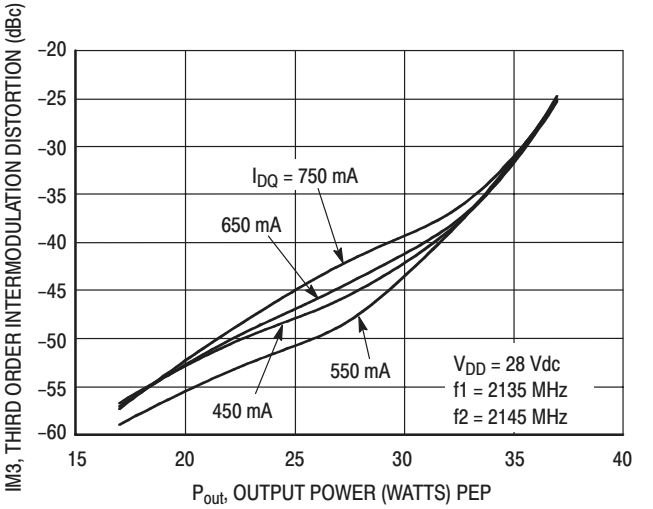


Figure 5. Third Order Intermodulation Distortion versus Output Power

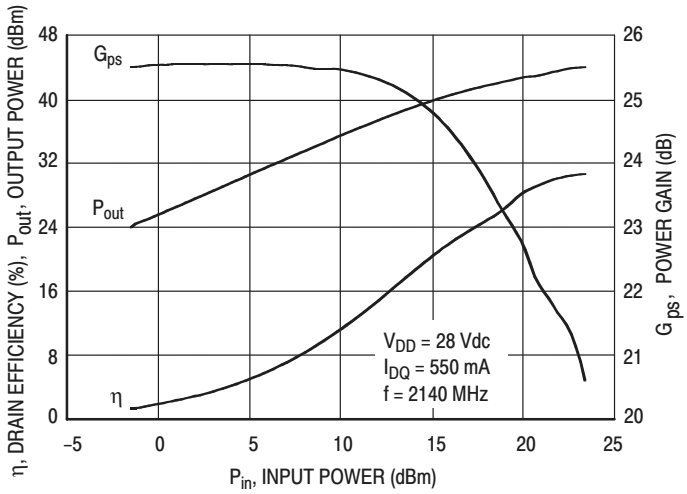


Figure 6. CW Output Power, Efficiency and Gain versus Input Power

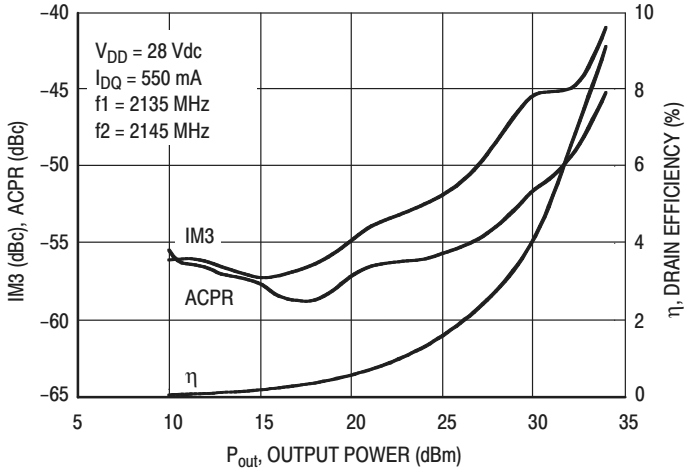
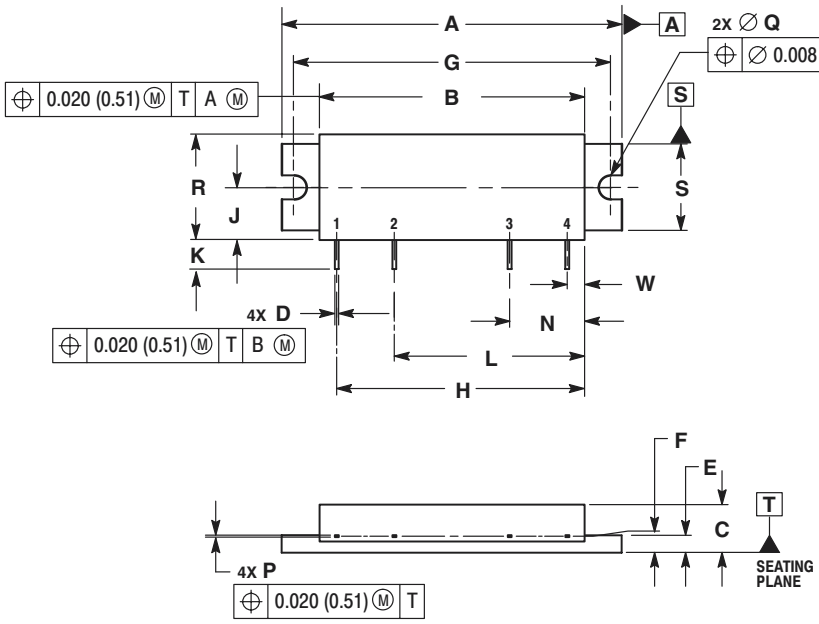


Figure 7. 2–Carrier W–CDMA ACPR, IM3 and Efficiency versus Output Power

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 C

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

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