



CAP WIRELESS, INC. TEST REPORT

FOR THE

30 WATT 900 MHZ POWER AMPLIFIER, PS009900

**FCC PART 90, PART 15 SUBPART B SECTIONS 15.107 & 15.109 CLASS B
AND RSS-131 ISSUE 7**

TESTING

DATE OF ISSUE: JANUARY 2, 2008

PREPARED FOR:

CAP Wireless, Inc.
3235 Grande Vista Drive
Newberry Park, CA 91320

P.O. No.: 07471SF
W.O. No.: 87064

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: December 3-13, 2007

Report No.: FC08-002

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ADMINISTRATIVE INFORMATION

DATE OF TEST: December 3-13, 2007

DATE OF RECEIPT: December 3, 2007

REPRESENTATIVE: Scott Behan

MANUFACTURER:

CAP Wireless, Inc.
3235 Grande Vista Drive
Newberry Park, CA 91320

TEST LOCATION:

CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

FREQUENCY RANGE TESTED: 10 kHz-10 GHz

TEST METHOD: FCC Part 90, ANSI C63.4 (2003), RSS GEN Issue 2 and RSS-131 Issue 7

PURPOSE OF TEST: To perform the testing of the 30 Watt 900 MHz Power Amplifier, PS009900 with the requirements for FCC Part 90, Part 15 Subpart B Sections 15.107 & 15.109 Class B and RSS-131 devices.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Eddie Wong, EMC Engineer

SUMMARY OF RESULTS

Test	Specification/Method	Results
Conducted Emissions	FCC Part 15 Subpart B Section 15.107 Class B	Pass
Radiated Emissions	FCC Part 15 Subpart B Section 15.109 Class B	Pass
Antenna Power	FCC Part 15 Subpart B Section 15.111	Pass
RF Power Output	FCC Part 90.635(b)	Pass
Input and Output Plots	FCC 2.1049(I)	Pass
Spurious Emissions at Antenna Terminal	FCC Part 90.669(a)	Pass
Field Strength of Spurious Radiation	FCC Part 90.669(a)	Pass
Block Edge Plots		Pass
Passband Gain and Bandwidth	RSS-131	Pass
99% Bandwidth	RSS-131	Pass

CONDITIONS DURING TESTING

Modification: Installed an onboard bandpass filter.



EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

30 Watt 900 MHz Power Amplifier

Manuf: CAP Wireless, Inc.
Model: PS009900
Serial: 00107
FCC ID: pending

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

RLINK Radio Controller & Data Modem

Manuf: Safetran
Model: A53105
Serial: 2965

900 MHz Radio

Manuf: MDS
Model: MDS 9710
Serial: 1703264

Laptop

Manuf: Dell
Model: Latitude D620
Serial: 25600292785

Power Supply

Manuf: Topward
Model: 6306D
Serial: 988614



TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

FCC 2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

FCC 2.1033 (c)(4) TYPE OF EMISSIONS

F1D.

FCC 2.1033 (c)(5) FREQUENCY RANGE

896.8875 MHz – 897.9875MHz Transmitter, 935.5MHz – 937MHz Receiver

FCC 2.1033 (c)(6) OPERATING POWER

30 Watts.

FCC 2.1033 (c)(7) MAXIMUM POWER RATING

100 Watts.

FCC 2.1033 (c)(8) DC VOLTAGES

The necessary information is contained in a separate document.

FCC 2.1033 (c)(9) TUNE-UP PROCEDURE

The necessary information is contained in a separate document.

FCC 2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

FCC 2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

FCC 2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

FCC 2.1033 (c)(13) MODULATION INFORMATION

GMSK and FSK.

FCC 15.107 – AC CONDUCTED EMISSIONS

ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **CAP Wireless, Inc.**
 Specification: **FCC 15.107 Class B COND [AVE]**
 Work Order #: **87064** Date: **12/4/2007**
 Test Type: **Conducted Emissions** Time: **11:17:05**
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence #: **4**
 Manufacturer: CAP Wireless, Inc. Tested By: **E. Wong**
 Model: **PS009900** **110V 60Hz**
 S/N: **00107**

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
LISN	1104	11/10/2006	11/10/2008	00847
6dB Attenuator	None	11/21/2006	11/21/2008	P05611
150kHz HPF	G7755	01/30/2006	01/30/2008	02610
Conducted Emission Cable	Cable #21	05/09/2006	05/09/2008	P04358
Cable				

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Data modem	Safetran	A53105	2965
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with a Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The pass thru path is enabled to allow the EUT to be configured in passive receiver mode. Frequency Range: 935.5-937MHz. Support Radio head receiver Frequency = 935.9875MHz. 12V (support power supply 110/60), 20°C, 26% relative humidity.

Transducer Legend:

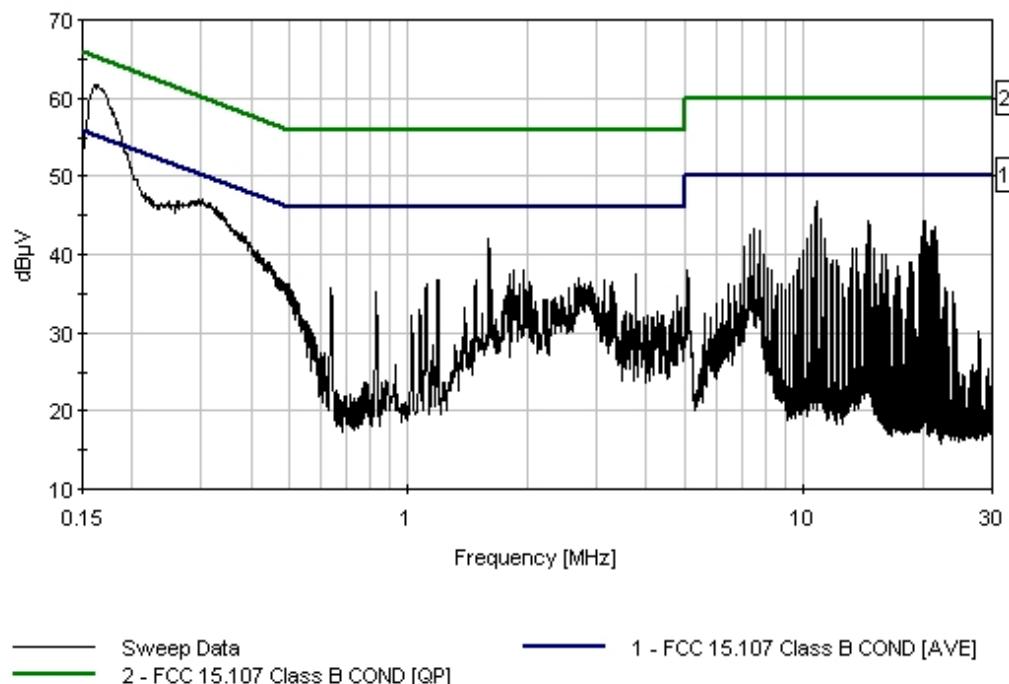
T1=150kHz HPF Asset 02610	T2=6dB Attenuator P05611
T3=Cable #21 Conducted Site A 050908	T4=(L1) Insertion Loss 00847 EMCO 3816/2NM

Measurement Data:

#	Freq MHz	Reading listed by margin.					Test Lead: Black				
		Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	10.842M	39.6	+0.1	+6.2	+0.3	+0.5	+0.0	46.7	50.0	-3.3	Black
2	10.643M	39.0	+0.1	+6.2	+0.3	+0.5	+0.0	46.1	50.0	-3.9	Black
3	1.600M	35.6	+0.1	+6.1	+0.1	+0.1	+0.0	42.0	46.0	-4.0	Black

4	11.058M	37.5	+0.1	+6.2	+0.3	+0.5	+0.0	44.6	50.0	-5.4	Black
5	20.022M	36.4	+0.3	+6.1	+0.4	+1.2	+0.0	44.4	50.0	-5.6	Black
6	20.229M	36.4	+0.3	+6.1	+0.4	+1.2	+0.0	44.4	50.0	-5.6	Black
7	14.607M	36.7	+0.2	+6.1	+0.4	+0.8	+0.0	44.2	50.0	-5.8	Black
8	10.427M	36.7	+0.1	+6.2	+0.3	+0.4	+0.0	43.7	50.0	-6.3	Black
9	14.806M	36.2	+0.2	+6.1	+0.4	+0.8	+0.0	43.7	50.0	-6.3	Black
10	21.481M	35.3	+0.3	+6.1	+0.4	+1.4	+0.0	43.5	50.0	-6.5	Black
11	7.508M	36.5	+0.1	+6.2	+0.3	+0.3	+0.0	43.4	50.0	-6.6	Black
12	7.716M	36.2	+0.1	+6.2	+0.3	+0.3	+0.0	43.1	50.0	-6.9	Black
13	21.067M	35.0	+0.3	+6.1	+0.4	+1.3	+0.0	43.1	50.0	-6.9	Black
14	21.274M	35.0	+0.3	+6.1	+0.4	+1.3	+0.0	43.1	50.0	-6.9	Black
15	161.635k Ave	17.5	+0.6	+6.2	+0.1	+0.1	+0.0	24.5	55.4	-30.9	Black
^	161.635k	54.8	+0.6	+6.2	+0.1	+0.1	+0.0	61.8	55.4	+6.4	Black

CKC Laboratories, Inc. Date: 12/4/2007 Time: 11:17:05 CAP Wireless, Inc. WO#: 87064
FCC 15.107 Class B COND [AVE] Test Lead: Black 110V 60Hz Sequence#: 4





Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **CAP Wireless, Inc.**
 Specification: **FCC 15.107 Class B COND [AVE]**
 Work Order #: **87064** Date: **12/4/2007**
 Test Type: **Conducted Emissions** Time: **11:23:57**
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence #: **5**
 Manufacturer: CAP Wireless, Inc. Tested By: **E. Wong**
 Model: **PS009900** **110V 60Hz**
 S/N: **00107**

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
LISN	1104	11/10/2006	11/10/2008	00847
6dB Attenuator	None	11/21/2006	11/21/2008	P05611
150kHz HPF	G7755	01/30/2006	01/30/2008	02610
Conducted Emission Cable	#21	05/09/2006	05/09/2008	P04358
Cable				

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Safetran		A53105	2965
Data modem			
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with a Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The pass thru path is enabled to allow the EUT to be configured in passive receiver mode. Frequency Range: 935.5-937MHz. Support Radio head receiver Frequency = 935.9875MHz. 12 VDC (support power supply 110/60), 20°C, 26% relative humidity.

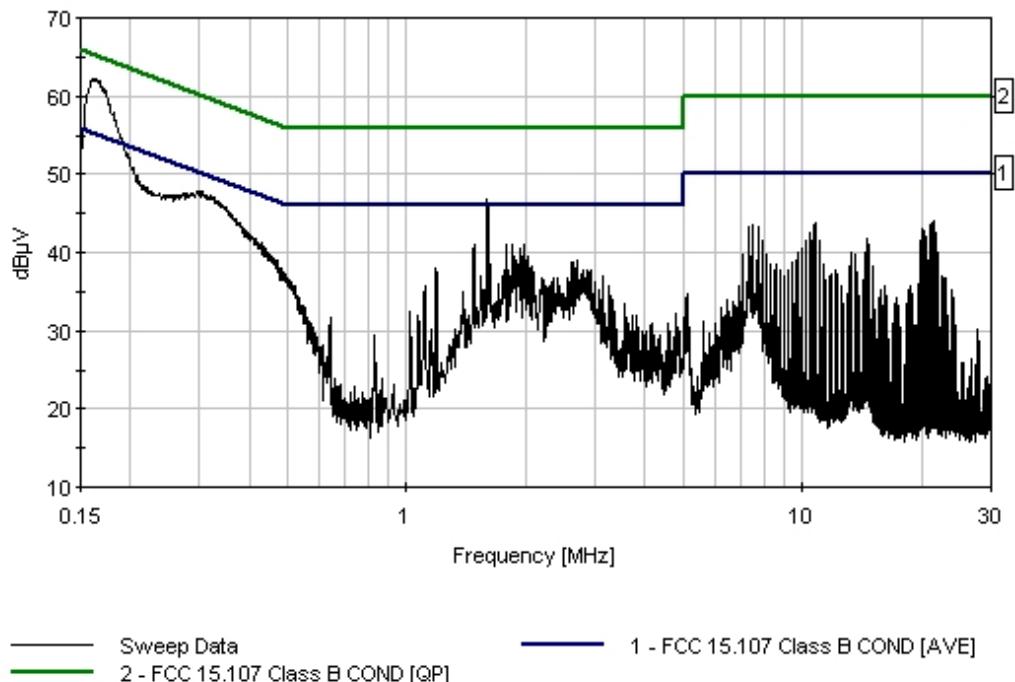
Transducer Legend:

T1=150kHz HPF Asset 02610	T2=6dB Attenuator P05611
T3=Cable #21 Conducted Site A 050908	T4=(L2) Insertion Loss 00847 EMCO 3816/2NM

Measurement Data:		Reading listed by margin.						Test Lead: White			
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	1.600M Ave	37.0	+0.1	+6.1	+0.1	+0.1	+0.0	43.4	46.0	-2.6	White
^	1.600M	40.5	+0.1	+6.1	+0.1	+0.1	+0.0	46.9	46.0	+0.9	White
3	1.855M	34.7	+0.1	+6.1	+0.1	+0.1	+0.0	41.1	46.0	-4.9	White
4	1.481M	34.7	+0.1	+6.1	+0.0	+0.1	+0.0	41.0	46.0	-5.0	White

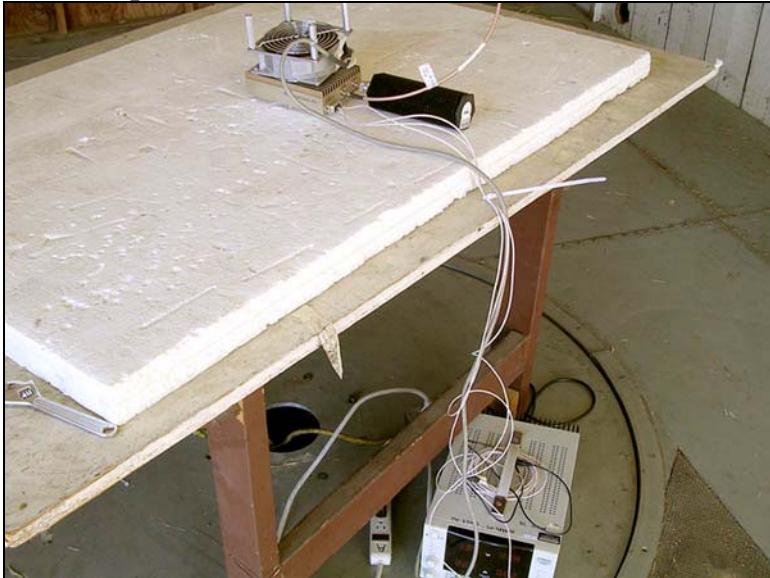
5	1.796M	34.6	+0.1	+6.1	+0.1	+0.1	+0.0	41.0	46.0	-5.0	White
6	1.979M	34.6	+0.1	+6.1	+0.1	+0.1	+0.0	41.0	46.0	-5.0	White
7	1.936M	34.1	+0.1	+6.1	+0.1	+0.1	+0.0	40.5	46.0	-5.5	White
8	21.472M	35.9	+0.3	+6.1	+0.4	+1.4	+0.0	44.1	50.0	-5.9	White
9	10.842M	36.6	+0.1	+6.2	+0.3	+0.5	+0.0	43.7	50.0	-6.3	White
10	21.265M	35.6	+0.3	+6.1	+0.4	+1.3	+0.0	43.7	50.0	-6.3	White
11	1.877M	33.2	+0.1	+6.1	+0.1	+0.1	+0.0	39.6	46.0	-6.4	White
12	1.957M	33.2	+0.1	+6.1	+0.1	+0.1	+0.0	39.6	46.0	-6.4	White
13	7.508M	36.7	+0.1	+6.2	+0.3	+0.3	+0.0	43.6	50.0	-6.4	White
14	21.058M	35.4	+0.3	+6.1	+0.4	+1.3	+0.0	43.5	50.0	-6.5	White
15	163.816k Ave	17.4	+0.5	+6.2	+0.1	+0.2	+0.0	24.4	55.3	-30.9	White
^	163.816k	55.2	+0.5	+6.2	+0.1	+0.2	+0.0	62.2	55.3	+6.9	White
17	305.621k Ave	10.3	+0.2	+6.2	+0.1	+0.1	+0.0	16.9	50.1	-33.2	White
^	305.621k	41.2	+0.2	+6.2	+0.1	+0.1	+0.0	47.8	50.1	-2.3	White

CKC Laboratories, Inc. Date: 12/4/2007 Time: 11:23:57 CAP Wireless, Inc. WO#: 87064
FCC 15.107 Class B COND [AVE] Test Lead: White 110V 60Hz Sequence#: 5



FCC 15.109 – RADIATED EMISSIONS

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **CAP Wireless, Inc.**
 Specification: **FCC 15.109 Class B**
 Work Order #: **87064** Date: **12/4/2007**
 Test Type: **Radiated Scan** Time: **08:35:37**
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence#: **3**
 Manufacturer: CAP Wireless, Inc. Tested By: E. Wong
 Model: PS009900
 S/N: 00107

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
Bilog Antenna	2451	02/02/2006	02/02/2008	01995
Pre amp to SA Cable	Cable #10	05/16/2007	05/16/2009	P05050
Cable	Cable15	01/05/2007	01/05/2009	P05198
Pre Amp	1937A02548	06/01/2006	06/01/2008	00309
Horn Antenna	6246	06/29/2006	06/29/2008	00849
Microwave Pre-amp	3123A00281	07/19/2006	07/19/2008	00786
2'-40GHz cable	NA	09/18/2007	09/18/2009	P2948
Heliax Antenna Cable	P5565	09/18/2006	09/18/2008	P05565

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Data modem	Safetran	A53105	2965
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with a Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The pass thru path is enabled to allow the EUT to be configured in passive receiver mode. Frequency Range: 935.5-937MHz. Support Radio head receiver Frequency = 935.9875MHz. 12 VDC (support power supply 110/60), 20°C, 26% relative humidity. Frequency range of measurement = 30MHz- 10 GHz. Frequency 30 MHz- 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz-10,000 MHz RBW=1 MHz, VBW=1 MHz. **No emission found. Recorded data represent noise floor level.**

Transducer Legend:

T1=Preamp 8447D 060108	T2=Bilog AN01995 020208 Chase
T3=Cable #10 051609	T4=Cable #15, Site A, 010509
T5=Pre amp 1- 26GHz 071908	T6=54' Heliax Cable 091808 P05565
T7=Hi Freq 40GHz 2ft-ANP02948-091809	T8=Horn 00849_062908

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	Reading listed by margin.				Dist	Corr	Spec	Margin	Polar
			T1 T5 MHz	T2 T6 dB	T3 T7 dB	T4 T8 dB					
1	4530.000M	35.1	+0.0	+0.0	+0.0	+0.0	Table	dB μ V/m	54.0	-18.6	Vert
			-37.7	+5.0	+0.5	+32.5					
2	1400.000M	41.5	+0.0	+0.0	+0.0	+0.0	+0.0	29.6	54.0	-24.4	Horiz
			-39.5	+2.4	+0.3	+24.9					
3	327.300M	25.1	-27.6	+13.9	+0.3	+3.4	+0.0	15.1	46.0	-30.9	Horiz
			+0.0	+0.0	+0.0	+0.0					
4	308.550M	24.7	-27.6	+13.4	+0.2	+3.3	+0.0	14.0	46.0	-32.0	Vert
			+0.0	+0.0	+0.0	+0.0					

FCC 15.111 – ANTENNA POWER

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **CAP Wireless, Inc.**
 Specification: **FCC15.111 Antenna Power Conduction limits for Receiver**
 Work Order #: **87064** Date: 12/4/2007
 Test Type: **Conducted Emissions** Time: 11:42:08
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence#: 6
 Manufacturer: CAP Wireless, Inc Tested By: E. Wong
 Model: PS009900 110V 60Hz
 S/N: 00107

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
3'-40GHz cable	NA	09/18/2007	09/18/2009	P02945

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Data modem	Safetran	A53105	2965
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with a Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The pass thru path is enabled to allow the EUT to be configured in passive receiver mode. Emission profile is evaluated at the antenna port. Frequency Range: 935.5-937 MHz. Support Radio head receiver Frequency = 935.9875MHz. 12 VDC (support power supply 110/60), 20°C, 26% relative humidity. **No emission found. Recorded data represent noise floor level.**

Transducer Legend:

T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809

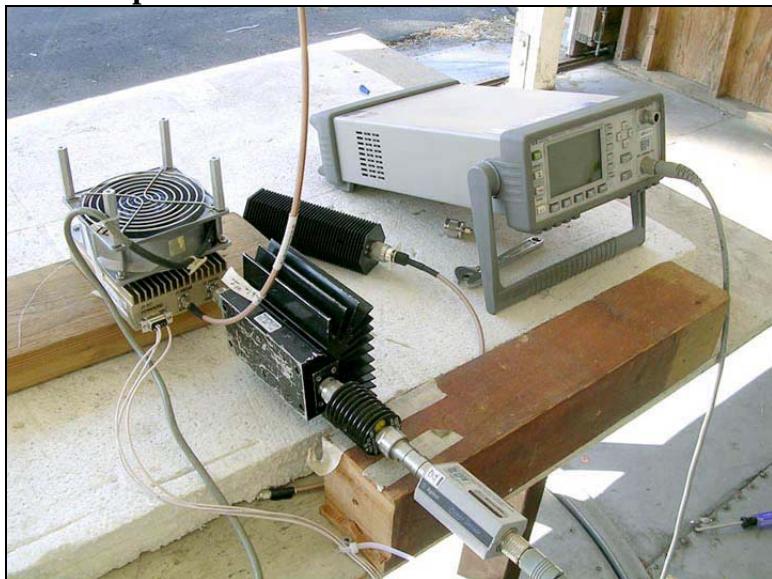
Measurement Data:		Reading listed by margin.					Test Lead: Antenna Terminal				
#	Freq MHz	Rdng dB μ V	T1 dB	dB	dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant	
1	5380.000M	11.7	+0.8			+0.0	12.5	50.0	-37.5	Anten	

FCC 2.1033(c)(14)/2.1046/90.635(b) - RF POWER OUTPUT

Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
RF Power meter	02778	HP	EPM-441A	GB37170458	012706	012708
Power Sensor	02777	HP	E4412A	MY41499662	012706	012708

Test Setup Photos



Test Data

The EUT is a RF amplifier. The manufacturer does not provide an antenna for sale with the product, hence EIRP is not measured nor calculated. The end user of this product is to exercise proper engineering judgment to select the appropriate antenna to comply with the EIRP limitation set forth by FCC 90.635(b)

The EUT is placed on the wooden table with a Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The RF output power of the EUT was measured at the antenna port, the measured conducted output power meets the rated output power of the product.

Modification: Installed an onboard bandpass filter.

Frequency	Power (dBm)	Power (Watt)
896.8875 MHz	44.7	30W
897.9875 MHz	44.7	30W

FCC 2.1033(c)(14)/2.1049(i)- INPUT AND OUTPUT PLOTS

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
3'-40GHz cable	NA	09/18/2007	09/18/2009	P02945

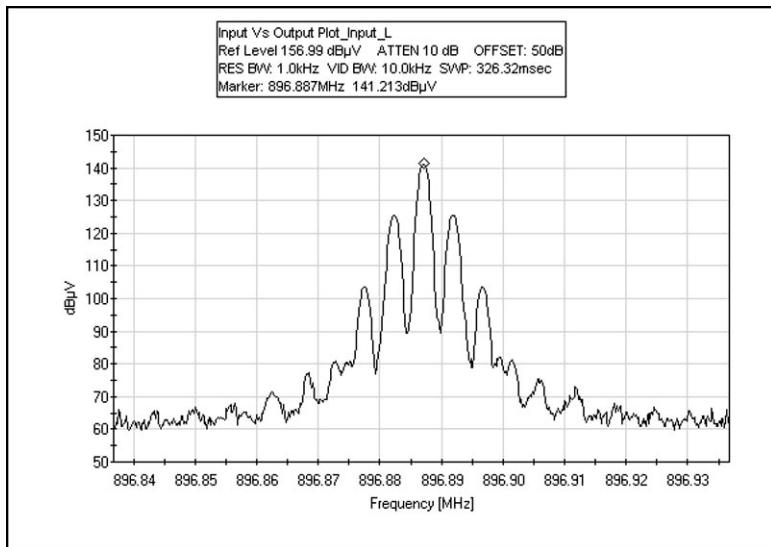
Test Conditions: The EUT is placed on the wooden table with Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The EUT is placed in transmit mode via the remote controller and the remote radio head sends RF signal to the EUT. The output waveform profile is evaluated at the antenna port. The input waveform profile is evaluated at the RF input port.

Test Setup Photos

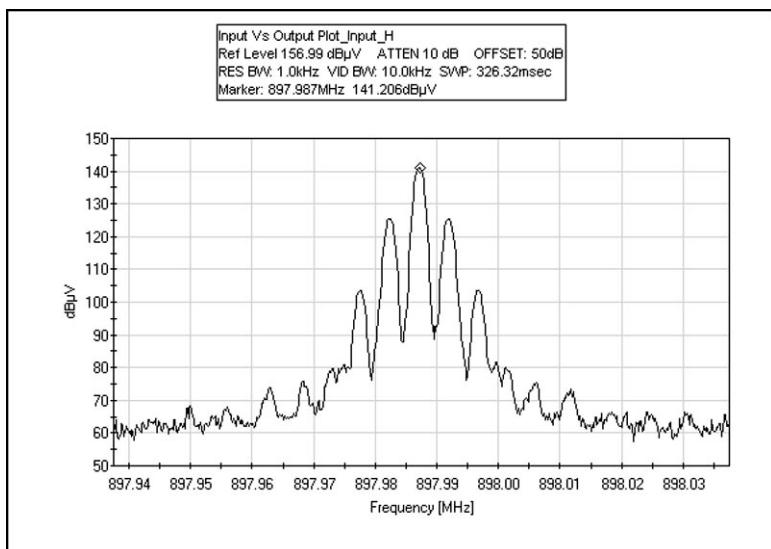


Test Plots

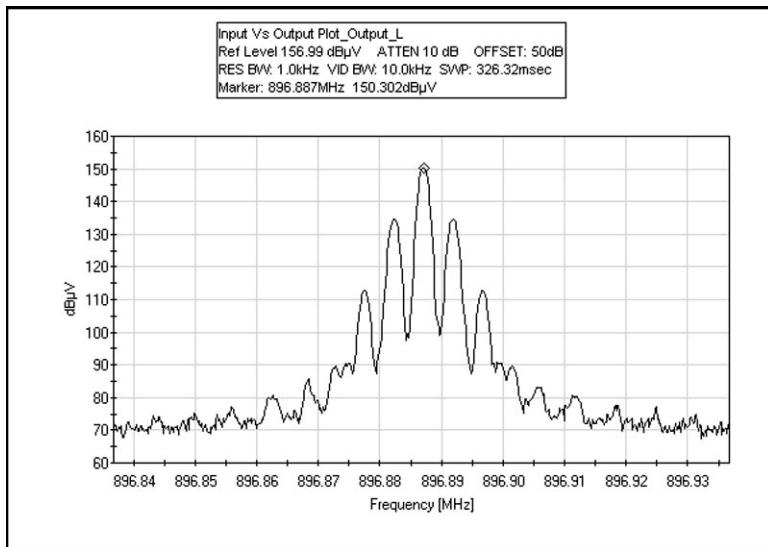
INPUT PLOT - LOW CHANNEL



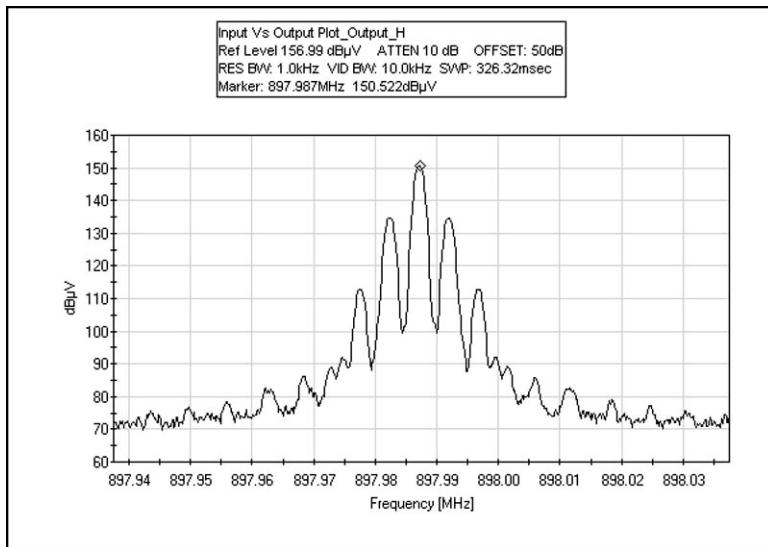
INPUT PLOT - HIGH CHANNEL



OUTPUT PLOT - LOW CHANNEL

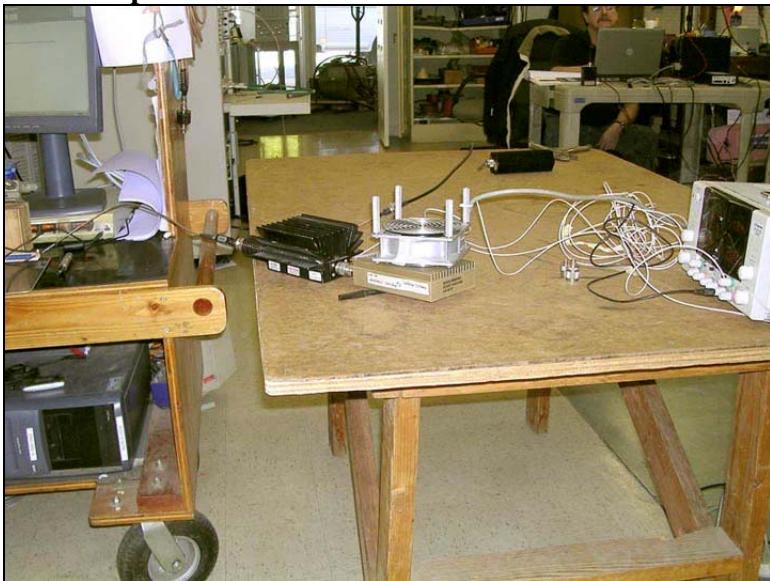


OUTPUT PLOT - HIGH CHANNEL



FCC 2.1033(c)(14)/2.1051/90.669(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Test Setup Photos



Test Data

Limit line for Spurious Conducted Emission

$$\text{Required Attenuation} = \mathbf{43+10 \log P \text{ dB}}$$

$$\text{Limit line (dBuV)} = V_{\text{dBuV}} - \text{Attenuation}$$

$$\begin{aligned} V_{\text{dBuV}} &= 20 \log \frac{V}{1 \times 10^{-6}} \\ &= 20(\log V - \log 1 \times 10^{-6}) \\ &= 20 \log V - 20 \log 1 \times 10^{-6} \\ &= 20 \log V - 20(-6) \\ &= 20 \log V + 120 \end{aligned}$$

$$\begin{aligned} \text{Attenuation} &= 43 + 10 \log P \\ &= 43 + 10 \log \frac{V^2}{R} \\ &= 43 + 10(\log V^2 - \log R) \\ &= 43 + 10(2 \log V - \log R) \\ &= 43 + 20 \log V - 10 \log R \end{aligned}$$

$$\begin{aligned} \text{Limit line} &= V_{\text{dBuV}} - \text{Attenuation} \\ &= 20 \log V + 120 - (43 + 20 \log V - 10 \log R) \\ &= 20 \log V + 120 - 43 - 20 \log V + 10 \log R \\ &= 20 \log V + 120 - 43 - 20 \log V + 10 \log R \\ &= 120 - 43 + 10 \log 50 \quad \text{Note : } R = 50 \Omega \\ &= 120 - 43 + 16.897 \\ &= 94 \text{ dBuV} \quad \text{at any power level} \end{aligned}$$

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112
 Customer: **CAP Wireless, Inc.**
 Specification: **FCC90.669 (a) Conducted Spurious emission**
 Work Order #: **87064** Date: 12/13/2007
 Test Type: **Conducted Emissions** Time: 15:10:24
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence#: 7
 Manufacturer: CAP Wireless, Inc
 Model: PS009900
 S/N: 00107
 Tested By: E. Wong
 110V 60Hz

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
1.0 GHz HPF	1	03/07/2006	03/07/2008	02749
3'-40GHz cable	NA	09/18/2007	09/18/2009	P02945

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Data modem	Safetran	A53105	2965
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The EUT is placed in transmit mode via the remote controller and the remote radio head sends RF signal to the EUT. The emission profile is evaluated at the antenna port. Frequency Range: 896.8875-897.9875MHz. Frequency = 896.8875MHz. Power = 30 Watts. 12 VDC (support power supply 110/60), 20°C, 26% relative humidity. Frequency range of measurement = 9 kHz - 10 GHz. Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz - 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz - 10,000 MHz RBW=1 MHz, VBW=1 MHz. Modification: Installed an onboard bandpass filter.

Transducer Legend:

T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809	T2=Filter 1GHz HP AN02749
--	---------------------------

Measurement Data:				Reading listed by margin.								Test Lead: Antenna Terminal			
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar	Ant				
1	940.091M	88.9	+0.3	+0.0		+0.0	89.2	94.0	-4.8	Anten					
2	853.682M	81.9	+0.3	+0.0		+0.0	82.2	94.0	-11.8	Anten					
3	1793.748M	81.2	+0.4	+0.3		+0.0	81.9	94.0	-12.1	Anten					
4	944.016M	80.8	+0.3	+0.0		+0.0	81.1	94.0	-12.9	Anten					
5	2690.900M	67.2	+0.5	+0.4		+0.0	68.1	94.0	-25.9	Anten					



Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **CAP Wireless, Inc.**
 Specification: **FCC90.669 Bandedge Plot**
 Work Order #: **87064** Date: 12/13/2007
 Test Type: **Conducted Emissions** Time: 15:18:16
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence #: 8
 Manufacturer: CAP Wireless, Inc. Tested By: E. Wong
 Model: PS009900 110V 60Hz
 S/N: 00107

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
1.0 GHz HPF	1	03/07/2006	03/07/2008	02749
3'-40GHz cable	NA	09/18/2007	09/18/2009	P02945

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Data modem	Safetran	A53105	2965
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The EUT is placed in transmit mode via the remote controller and the remote radio head sends RF signal to the EUT. The emission profile is evaluated at the antenna port. Frequency Range : 896.8875-897.9875MHz. Frequency = 897.9875 MHz. Power = 30 Watts. 12 VDC (support power supply 110/60), 20°C, 26% relative humidity. Frequency range of measurement = 9 kHz - 10 GHz. Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz - 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz - 10,000 MHz RBW=1 MHz, VBW=1 MHz. Modification: Installed an onboard bandpass filter.

Transducer Legend:

T1=Hi Freq_40GHz_3ft CAB-ANP02945-091809	T2=Filter 1GHz HP AN02749
--	---------------------------

Measurement Data:				Reading listed by margin.							Test Lead: Antenna Terminal			
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar	Ant			
1	942.279M	89.5	+0.3	+0.0		+0.0	89.8	94.0	-4.2	Anten				
2	853.686M	81.9	+0.3	+0.0		+0.0	82.2	94.0	-11.8	Anten				
3	1795.980M	77.7	+0.4	+0.0		+0.0	78.1	94.0	-15.9	Anten				
4	2693.918M	66.9	+0.5	+0.4		+0.0	67.8	94.0	-26.2	Anten				

FCC 2.1033(c)(14)/2.1053/90.669(a) - FIELD STRENGTH OF SPURIOUS RADIATION

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **CAP Wireless, Inc.**
 Specification: **90.669(a) Radiated Spurious Emission**
 Work Order #: **87064** Date: **12/4/2007**
 Test Type: **Radiated Scan** Time: **09:45:17**
 Equipment: **30 Watt 900 MHz Power Amplifier** Sequence#: **1**
 Manufacturer: CAP Wireless, Inc. Tested By: **E. Wong**
 Model: **PS009900**
 S/N: **00107**

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
Bilog Antenna	2451	02/02/2006	02/02/2008	01995
Pre amp to SA Cable	Cable #10	05/16/2007	05/16/2009	P05050
Cable	Cable15	01/05/2007	01/05/2009	P05198
Pre Amp	1937A02548	06/01/2006	06/01/2008	00309
Horn Antenna	6246	06/29/2006	06/29/2008	00849
Microwave Pre-amp	3123A00281	07/19/2006	07/19/2008	00786
2'-40GHz cable	NA	09/18/2007	09/18/2009	P2948
Heliax Antenna Cable	P5565	09/18/2006	09/18/2008	P05565
Loop Antenna	2014	06/14/2006	06/14/2008	00314
1.0 GHz HPF	1	03/07/2006	03/07/2008	02749

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
30 Watt 900 MHz Power Amplifier*	CAP Wireless, Inc	PS009900	00107

Support Devices:

Function	Manufacturer	Model #	S/N
RLINK Radio Controller & Data modem	Safetran	A53105	2965
900 MHz Radio	MDS	MDS 9710	1703264
Laptop	Dell	Latitude D620	25600292785
Power Supply	Topward	6306D	988614

Test Conditions / Notes:

The EUT is placed on the wooden table with Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The EUT is placed in transmit mode via the remote controller and the remote radio head sends RF signal to the EUT. Frequency Range: 896.8875-897.9875MHz. Frequency = 896.8875MHz and 897.9875MHz. Power = 30 Watts. 12 VDC (support power supply 110/60), 20°C, 26% relative humidity. Frequency range of measurement = 9 kHz - 10 GHz. Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz - 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz - 10,000 MHz RBW=1 MHz, VBW=1 MHz. Modification: Installed an onboard bandpass filter.

Operating Frequency: 896.8875 MHz - 897.9875 MHz

Channels: Low, Mid and High

Highest Measured Output Power: 44.77 EIRP(dBm)= 30 EIRP(Watts)

Distance: 3 meters

Limit: 43+10Log(P) 57.77 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
2,690.67	-36.4	Horiz	81.17
2,690.70	-39.7	Vert	84.47
3,587.52	-44.7	Vert	89.47
3,587.50	-48.9	Horiz	93.67
4,484.47	-51.6	Horiz	96.37
1,793.84	-53.4	Vert	98.17
4,484.45	-54.7	Vert	99.47
2,693.90	-36.4	Horiz	81.17
2,693.90	-41.9	Vert	86.67
3,591.87	-47.9	Vert	92.67
3,591.87	-48.8	Horiz	93.57
4,489.83	-51.2	Horiz	95.97
4,489.83	-54.5	Vert	99.27
1,795.93	-55	Vert	99.77
1,795.93	-58.3	Horiz	103.07

BANDEDGE

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
3'-40GHz cable	NA	09/18/2007	09/18/2009	P02945

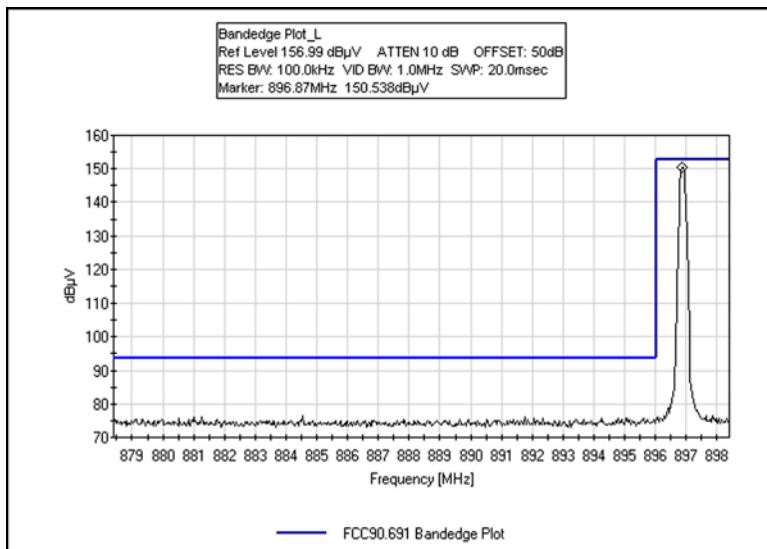
Test Conditions: The EUT is placed on the wooden table with Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The EUT is placed in transmit mode via the remote controller and the remote radio head sends RF signal to the EUT. The emission profile is evaluated at the antenna port.

Test Setup Photos

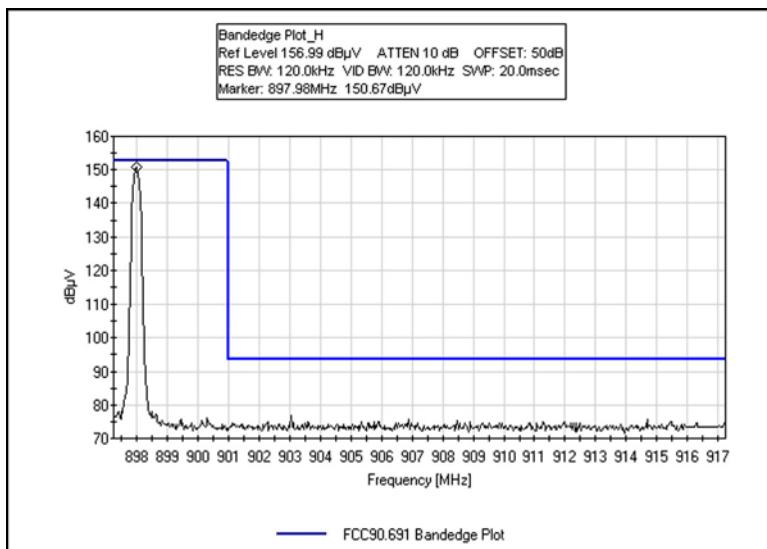


Test Plots

BANDEDGE - LOW CHANNEL



BANDEDGE - HIGH CHANNEL



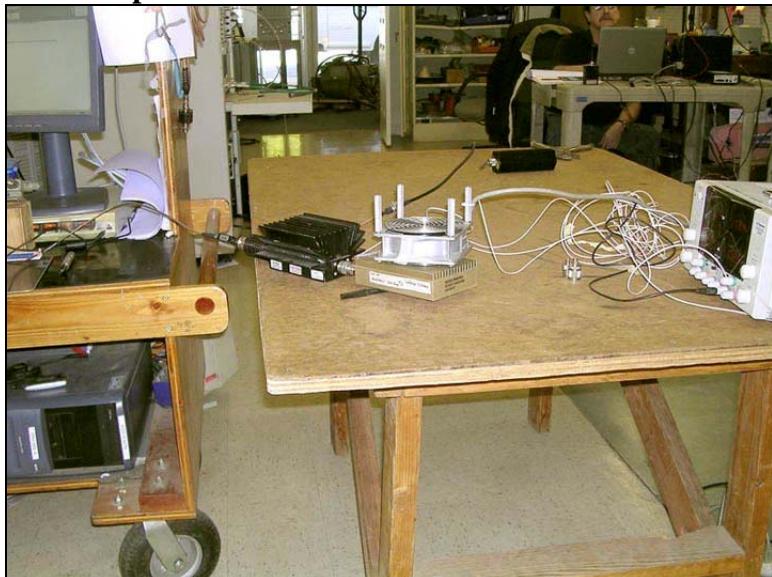
RSS-131 99% BANDWIDTH

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
3'-40GHz cable	NA	09/18/2007	09/18/2009	P02945

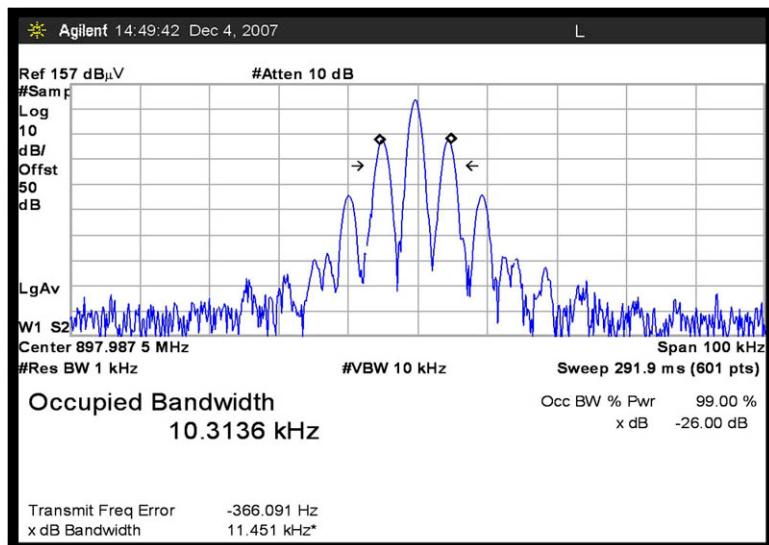
Test Conditions: The EUT is placed on the wooden table with Styrofoam surface. J1 is connected to a remote radio head, J2 is connected to a RF load and J3 is connected to remote controller. The EUT is placed in transmit mode via the remote controller and the remote radio head sends RF signal to the EUT. The output waveform profile is evaluated at the antenna port.

Test Setup Photos

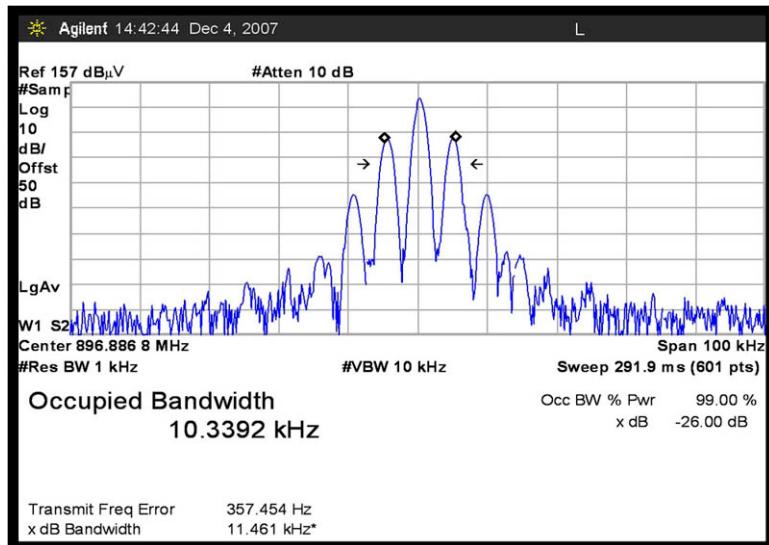


Test Plots

RSS-131 99% BANDWIDTH - LOW CHANNEL



RSS-131 99% BANDWIDTH - HIGH CHANNEL

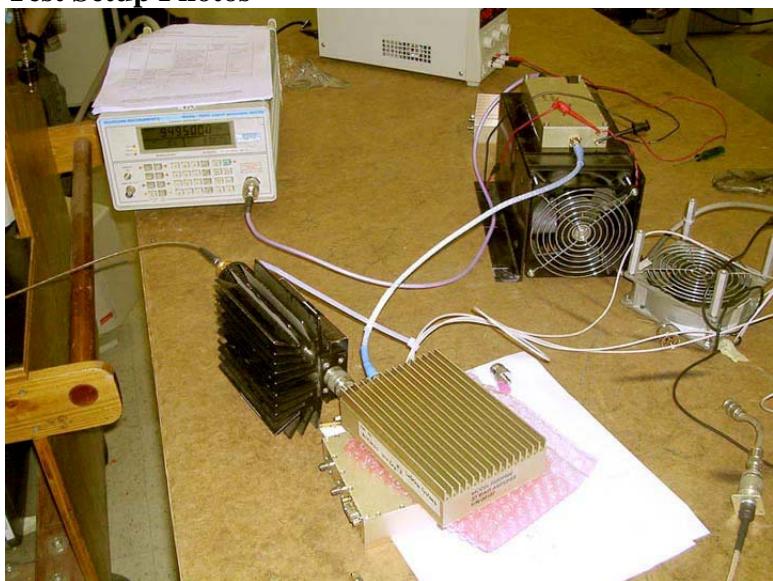


RSS-131 PASSBAND GAIN AND BANDWIDTH

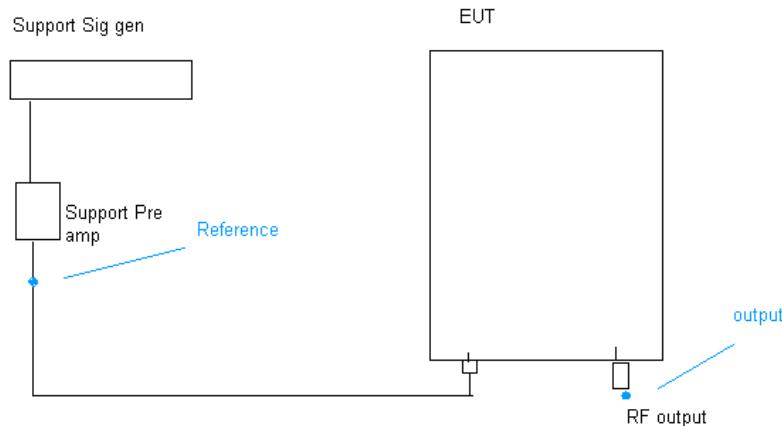
Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	010307	010309
Signal Generator 500MHz- 1GHz)	02227	Marconi	2024	112282/515	081807	081809
Signal Generator (1- 1.2 GHz)	02351	Marconi	2022D	119158/054	071206	071208

Test Setup Photos



Setup



Test Data

Measured gain = Output – Reference (dB)

The nominal bandwidth and nominal pass band gain (dB) of the RF enhancer or translator shall be stated by the manufacturer or equipment certification applicant and indicated in the test report.

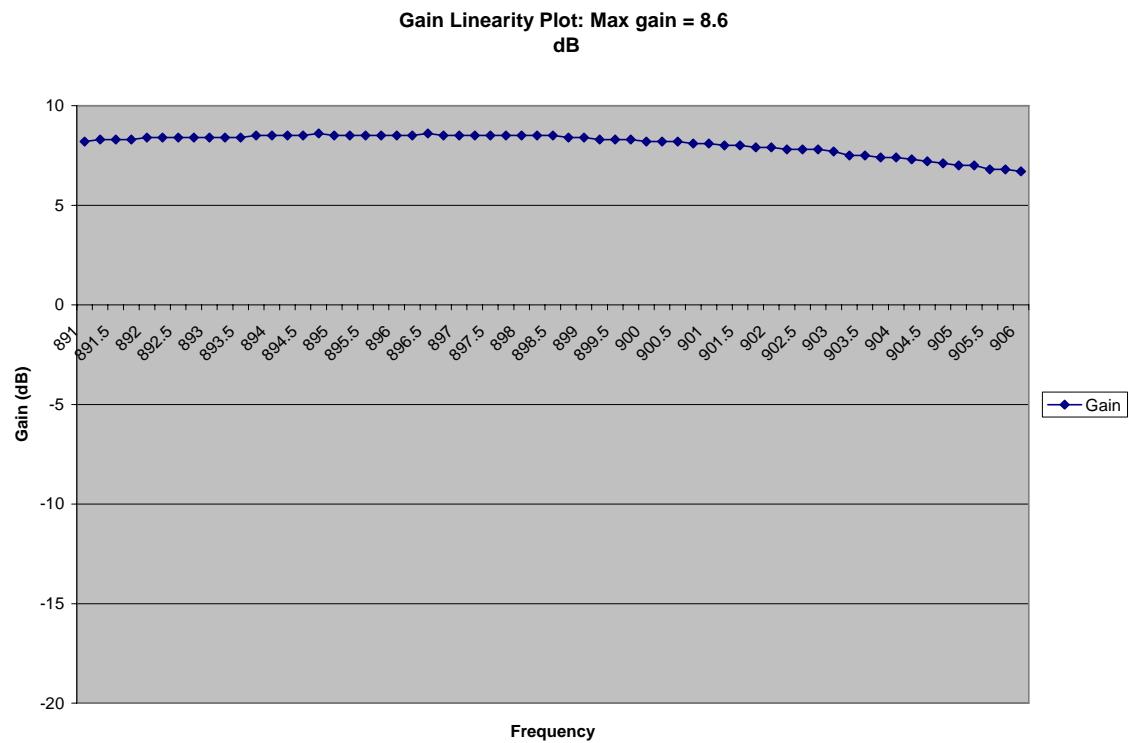
Manufacturer stated gain = 8 dB

A support signal generator is connected to CKC's test computer via GPIB. CKC's test software capable of setting the output frequency and amplitude of the support signal generator is used to control the signal generator.

The software which is also capable of collecting data when used with a spectrum analyzer, measures the frequency and amplitude of the RF signal.

A base line RF level at the Reference point was measured. Then the EUT was activated and RF level at the RF output port was measured. The gain is computed as the difference between the signal level at the RF output and the baseline measurement.

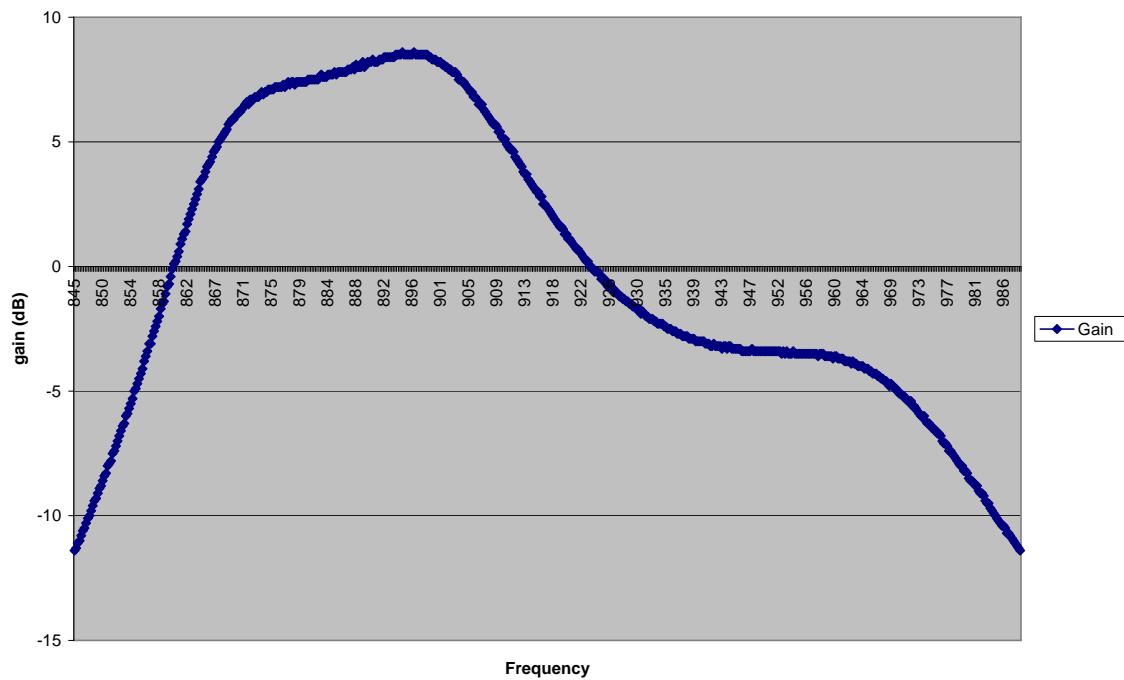
The internal control is adjusted to the nominal gain for which equipment certification is sought.



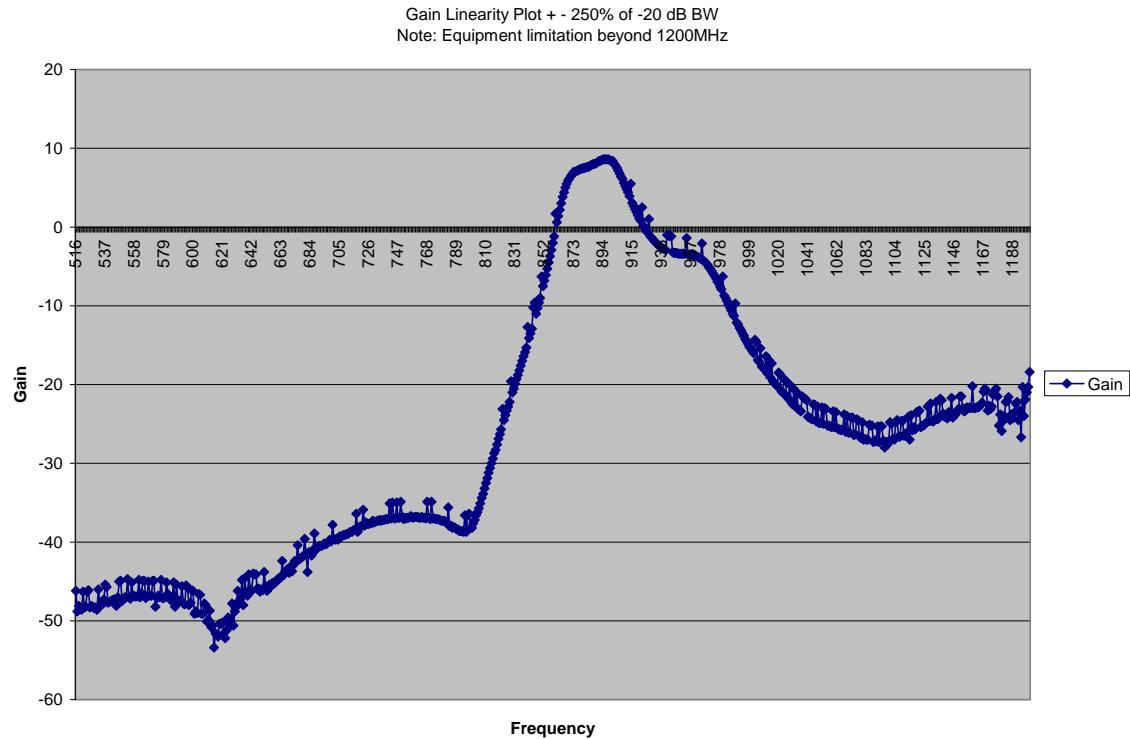
Maximum measured gain = 8.6 dB, which is within + - 1 dB of the manufacturer declared maximum gain of 8 dB.

1

Gain Linearity Plot:-20dB gain BW=153 MHz



Measured 20 dB Bandwidth is 153 MHz.



The gain-versus-frequency response of the amplifier from the mid band F_o of the pass band up to at least $f_o + - 250\%$ of the 20dB Bandwidth.

Note: Low resolution plots, support pre amplifier limitation beyond 1200 MHz

Minimum standard:

The pass band gain response shall not exceed the nominal gain by more than 1 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer.

Outside of the 20dB bandwidth the gain shall not exceed that at the 20dB point.