


DATE: 05 February 2007

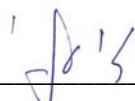
**I.T.L. (PRODUCT TESTING) LTD.
FCC EMC/Radio Test Report
for
Mobile Access Networks**

Equipment under test:

**In-Building Distribution System
2000-CELL-PCSE**

Written by: 
D. Shidlow, Documentation

Approved by: 
E. Pitt, Test Engineer

Approved by: 
I. Raz, EMC Laboratory Manager

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This report relates only to items tested.



**Measurement/Technical Report for
Mobile Access Networks
In-Building Distribution System**

2000-CELL-PCSE

FCC ID:OJFMA2K-CELL-PCSE

05 February 2007

This report concerns: Original Grant Class II change: X

Class B verification Class A verification Class I change

Equipment type: PCS Licensed Transmitter

Request Issue of Grant:
 x Immediately upon completion of review

Limits used:
CISPR 22 Parts 22; 24 x

Measurement procedure used is ANSI C63.4-2003.

Substitution Method used as in ANSI/TIA-603-B: 2002

Application for Certification prepared by:	Applicant for this device: (different from "prepared by")
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1. General Information

1.1 Administrative Information

Manufacturer: Mobile Access Networks

Manufacturer's Address: Ofek 1 Center,Bldg.B
Northern Industrial Zone
Lod, 71293
Israel
Tel: +972-8-918-3888
Fax: +972-8-918-3844

Manufacturer's Representative: Shai Rachamim

Equipment Under Test (E.U.T): In-Building Distribution System

Equipment Model No.: 2000-CELL-PCSE

Equipment Serial No.: 0665328

Date of Receipt of E.U.T: 29.01.07

Start of Test: 29.01.07

End of Test: 31.01.07

Test Laboratory Location: I.T.L (Product Testing) Ltd.
Kfar Bin Nun,
ISRAEL 99780

Test Specifications: FCC Part 22 Sub-part H
FCC Part 24 Sub-part E
FCC Part 15, sub-part B

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

See details Original Grant application.

The changes to the original product are:

Using WCDMA modulation instead of CDMA modulation.

PCB has been flattened.

Reduced 2 coaxial cables.

Reduced power detectors.

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing August 22, 2006).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 Measurement Uncertainty

Radiated Emission

The Open Site complies with the ± 4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

2. Product Labeling

See details in original application.

3. System Test Configuration

3.1 *Justification*

See details in original application.

Peak Output Power, Occupied Bandwidth, Band Edges, Out of Band at Antenna Terminal, and Radiated Emission per FCC Part 15 Sub-part B, were re-tested according to correspondence with Timco (See Appendix B).

3.2 *EUT Exercise Software*

See details in original application.

3.3 *Special Accessories*

See details in original application.

3.4 *Equipment Modifications*

See details in original application.

3.5 Configuration of Tested System

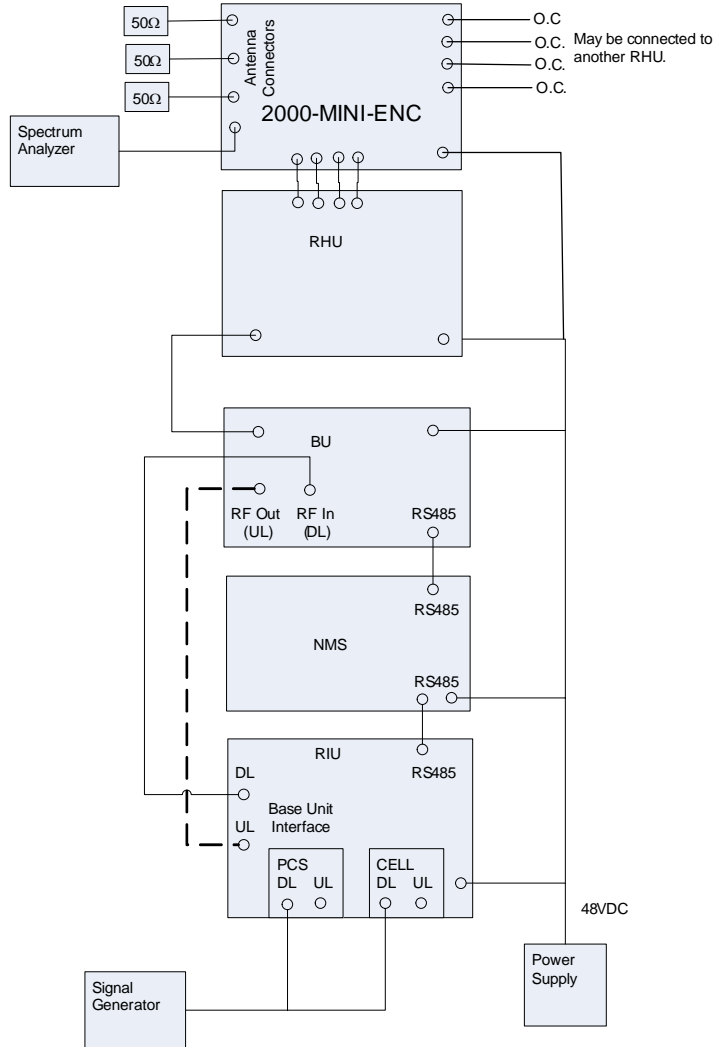


Figure 1. Tests Set-up

4. Block Diagram

4.1 *Schematic Block/Connection Diagram*

See original application.

4.2 *Theory of Operation*

See original application.

5. Peak Output Power (CELL)

5.1 Test procedure

Maximum ERP must not exceed 7 Watts (38.45 dBm). Antenna gain is 5 dBi. Therefore the peak output power must not exceed 33.45 dBm.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through a 24 dB external attenuator and an appropriate coaxial cable. The E.U.T. RF output was WCDMA modulated. Special attention was taken to prevent Spectrum Analyzer RF input overload. The Spectrum Analyzer was set to 3.0 MHz resolution BW. The output power level was measured at 871.50, 881.50, and 891.50 MHz.

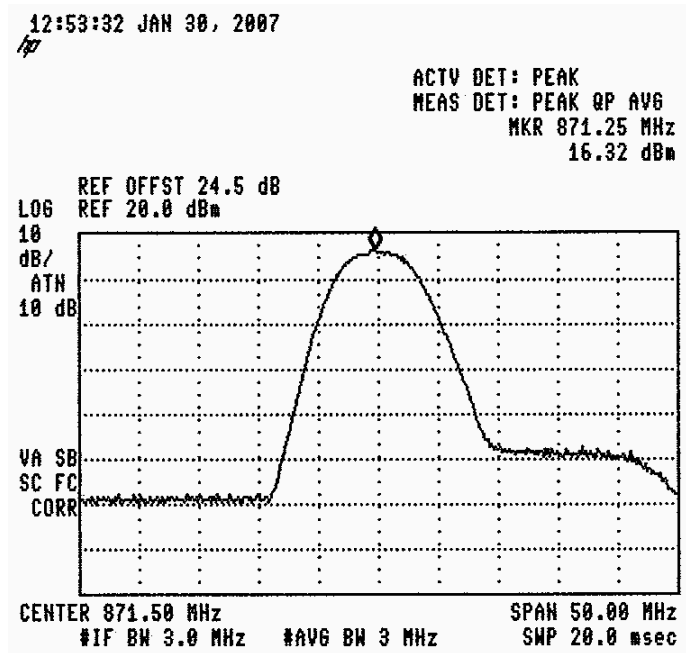


Figure 2.— 871.50 MHz

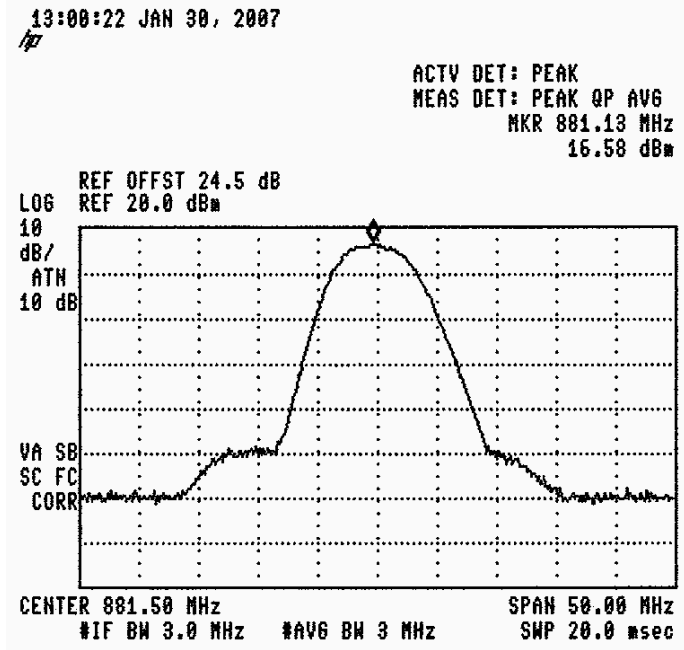


Figure 3.— 881.50 MHz

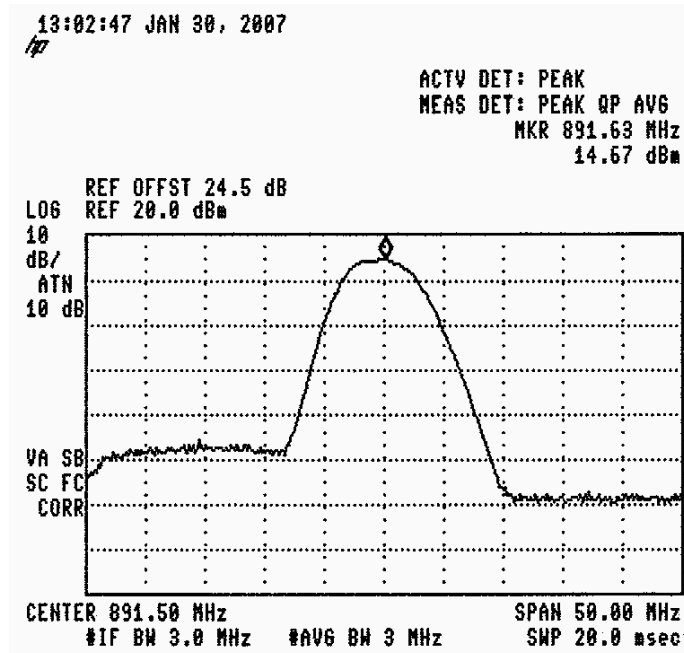


Figure 4.— 891.50 MHz

5.3 Test Equipment Used.

Peak Output Power

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 6 Test Equipment Used

6. Occupied Bandwidth (CELL)

6.1 Test Procedure

The E.U.T. was set to the applicable test frequency with WCDMA modulation. The E.U.T. antenna terminal was connected to the spectrum analyzer through a 24 dB external attenuator and appropriate coaxial cable. The spectrum analyzer was set to 100 kHz resolution B.W.

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limit, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

The occupied bandwidth of the E.U.T. at the points of 20 dB below maximum peak power was measured and recorded.

Occupied bandwidth measured was repeated in the input terminal of the E.U.T.

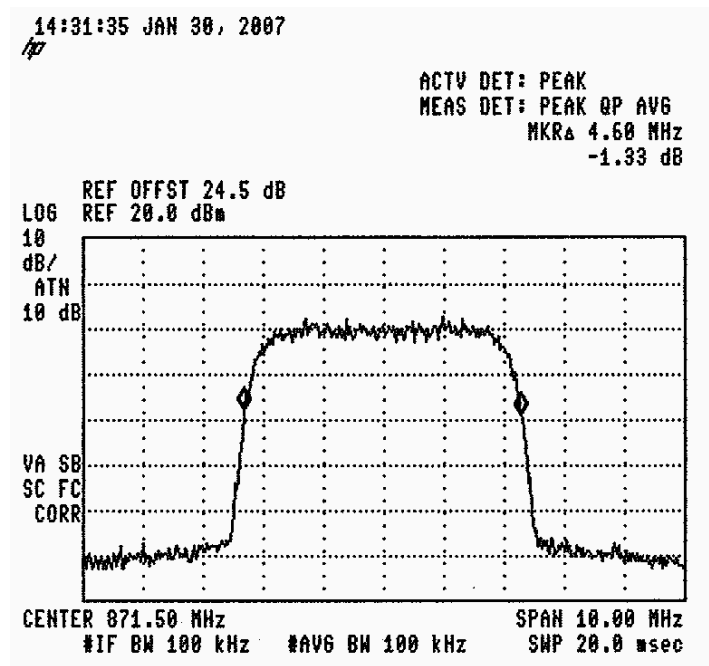


Figure 7.— 871.50 Input

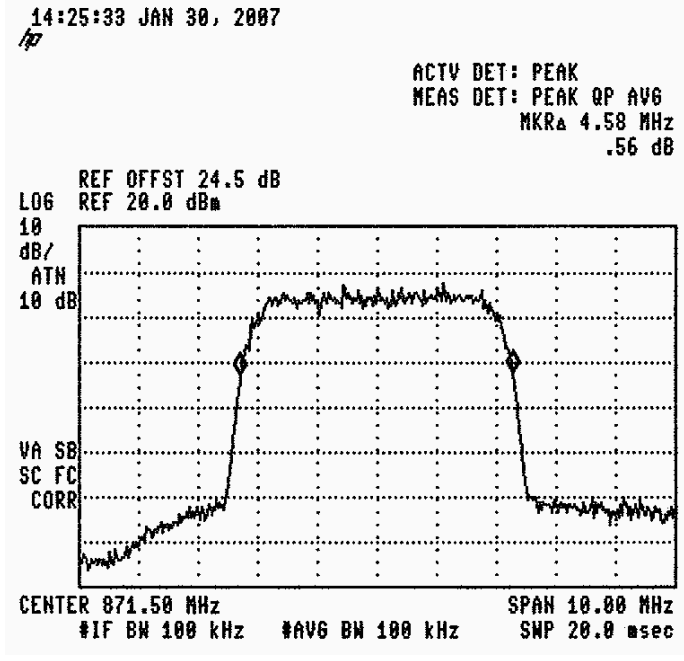


Figure 8.— 871.50 Output

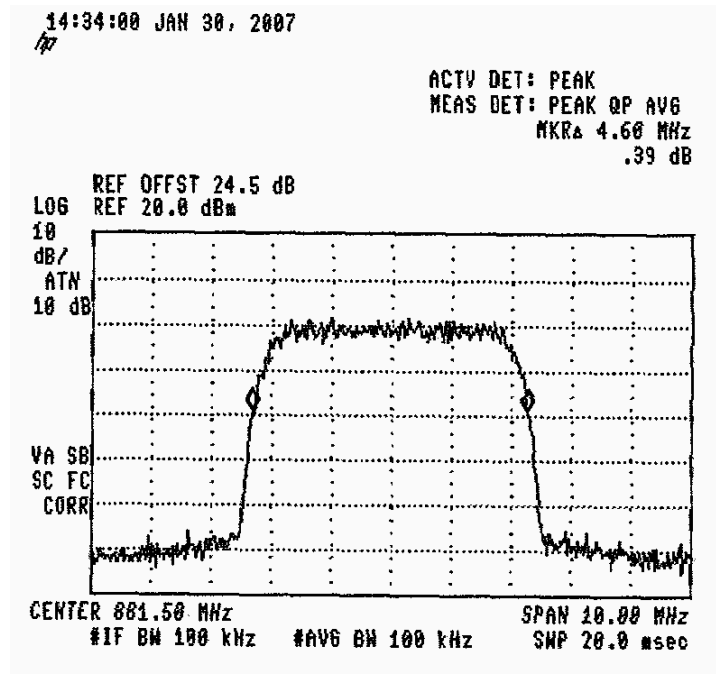


Figure 9.— 881.50 Input

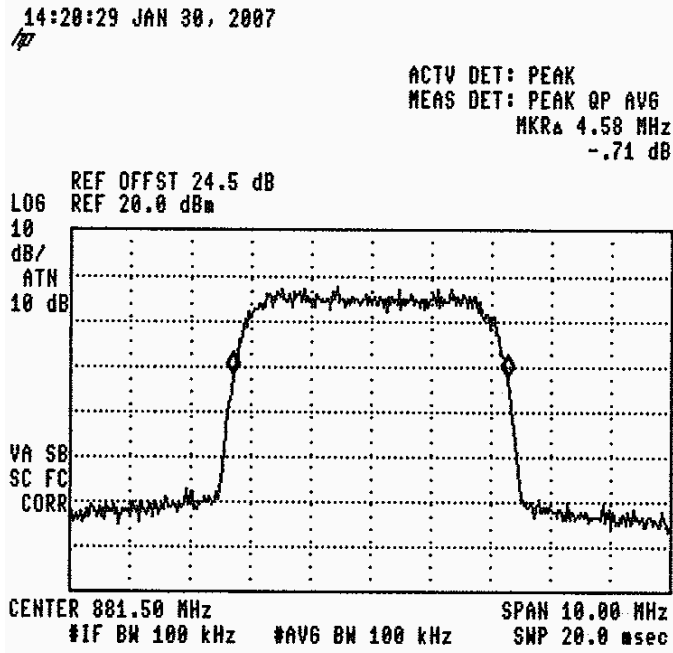


Figure 10.— 881.50 Output

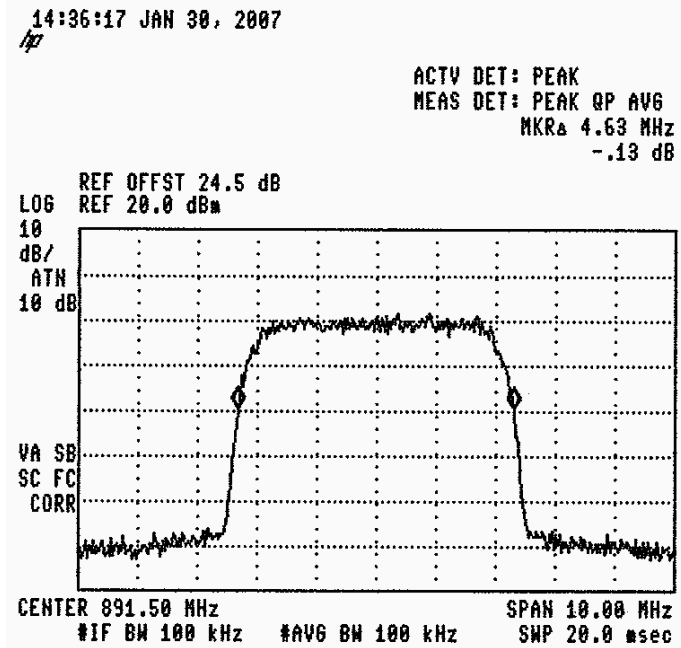


Figure 11.— 891.50 Input

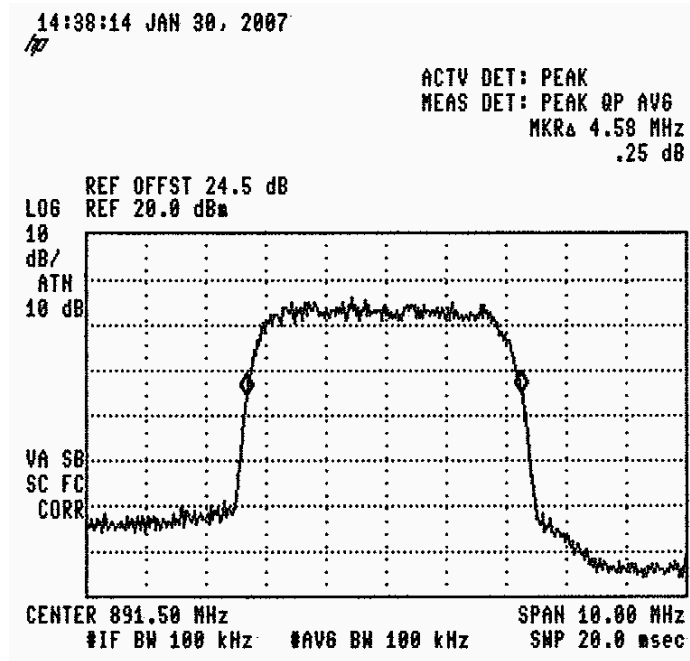


Figure 12.— 891.50 Output

6.2 Results Table

E.U.T. Description: In-Building Distribution System
 Model No.: 2000-CELL-PCSE
 Serial Number: 0665328
 Specification: FCC Part 2, Section 1049

	Operating Frequency	Reading (MHz)
Input	871.50	4.60
Output	871.50	4.58
Input	881.50	4.60
Output	881.50	4.58
Input	891.50	4.63
Output	891.50	4.58

Figure 13 Occupied Bandwidth

TEST PERSONNEL:

Tester Signature: *E. Pitt*

Date: 06.02.07

Typed/Printed Name: E. Pitt

6.3 Test Equipment Used.

Occupied Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 14 Test Equipment Used

7. Out of Band Emissions at Antenna Terminals (CELL)

7.1 Test Specification

FCC Part 22, Sub-part H, Section 917; FCC Parts 2.1051; 2.1057

7.2 Test procedure

The power of any emission outside of the authorized operating frequency ranges (869-894 MHz) must be attenuated below the transmitting power (P) by a factor of at least $43 + \log(P)$ dB, yielding -13dBm .

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (24.5 dB).

The spectrum analyzer was set to 100 kHz resolution B.W., except for the frequency range 100 kHz – 5.0 MHz where the resolution B.W. was set to 10 kHz.

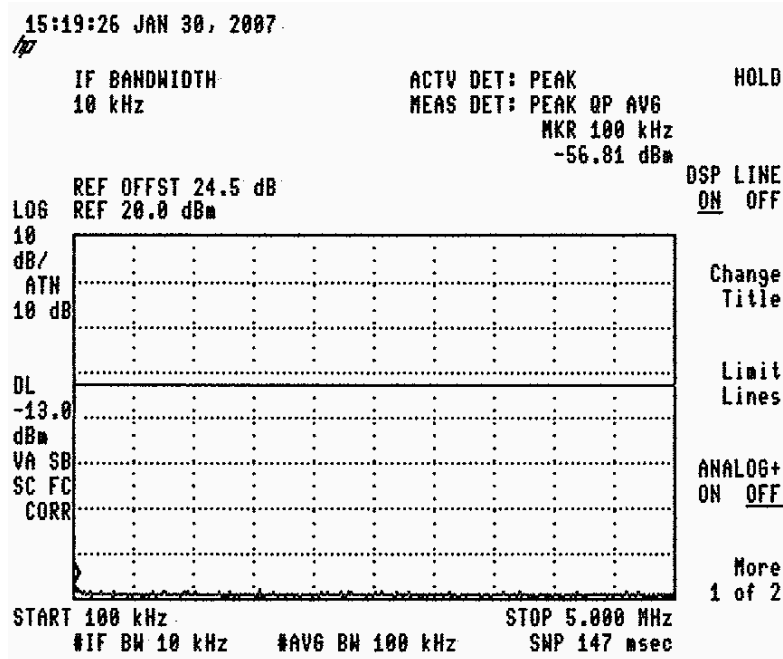


Figure 15.— 871.50 MHz

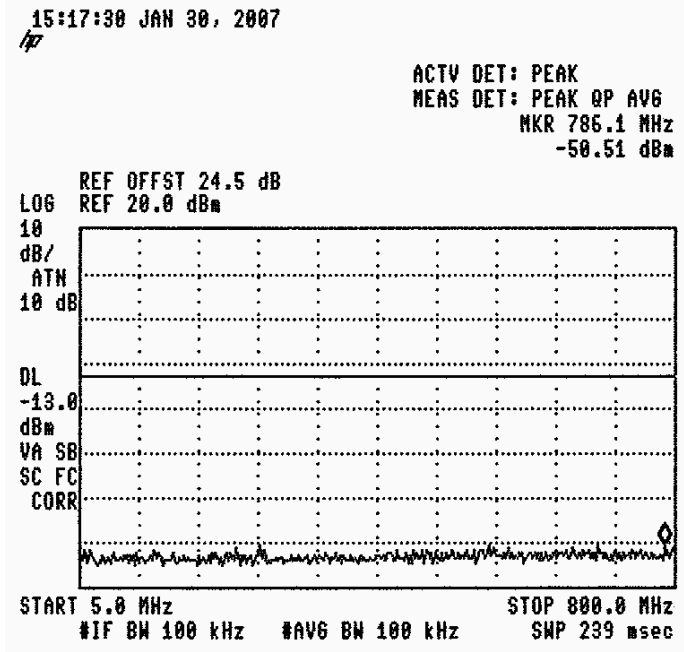


Figure 16.— 871.50 MHz

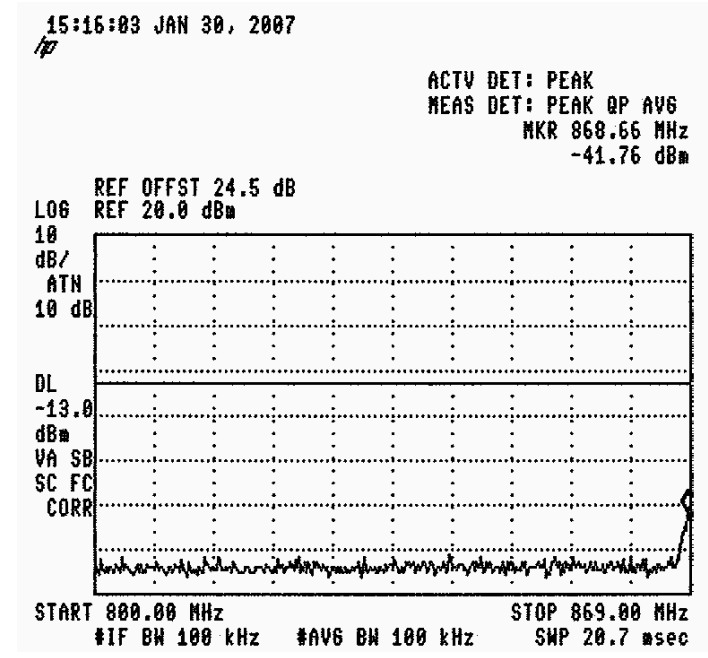


Figure 17.— 871.50 MHz

15:09:10 JAN 30, 2007

IP

ACTV DET: PEAK
 MEAS DET: PEAK QP AVG
 MKR 871.50 MHz
 3.15 dBm

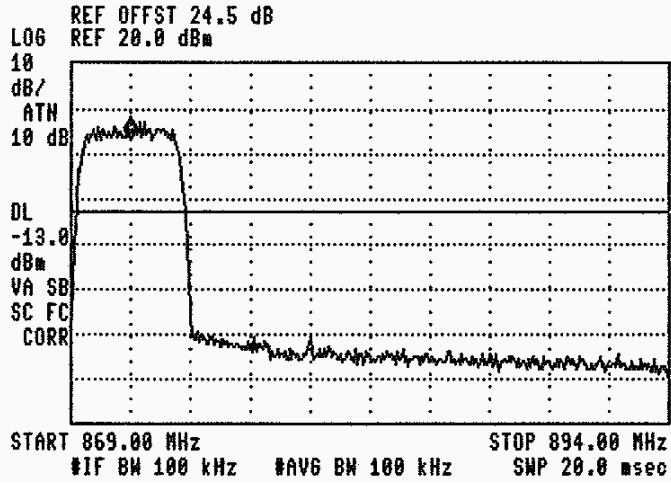


Figure 18.— 871.50 MHz

15:21:18 JAN 30, 2007

IP

ACTV DET: PEAK
 MEAS DET: PEAK QP AVG
 MKR 1.942 GHz
 -45.71 dBm

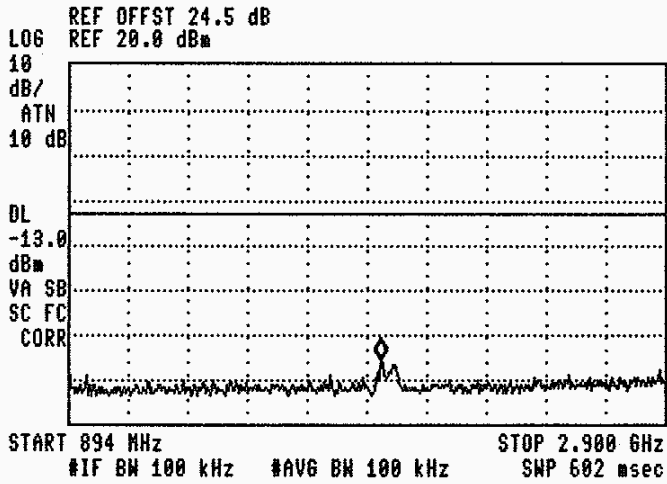


Figure 19.— 871.50 MHz

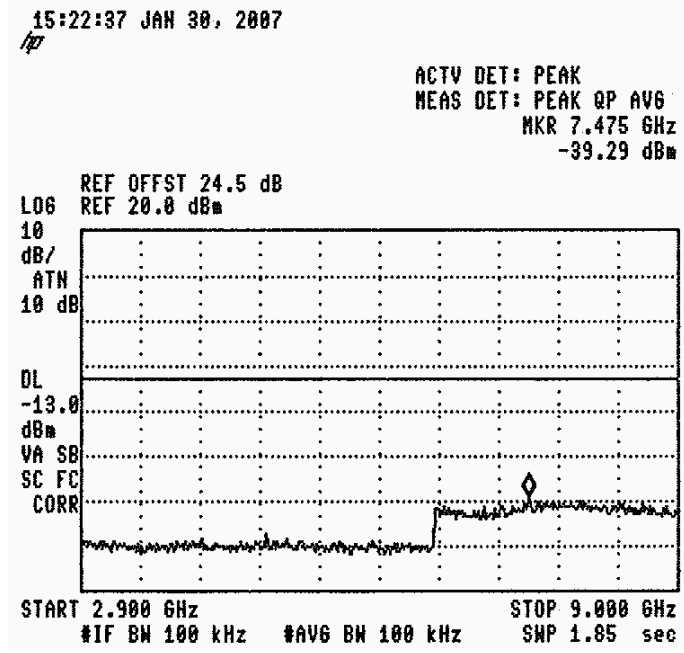


Figure 20.— 871.50 MHz

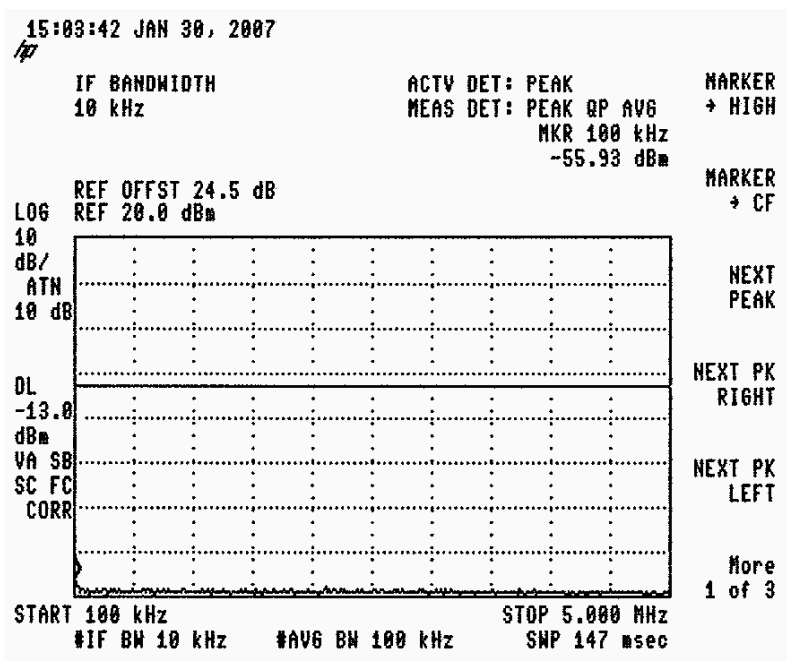


Figure 21.— 891.50 MHz

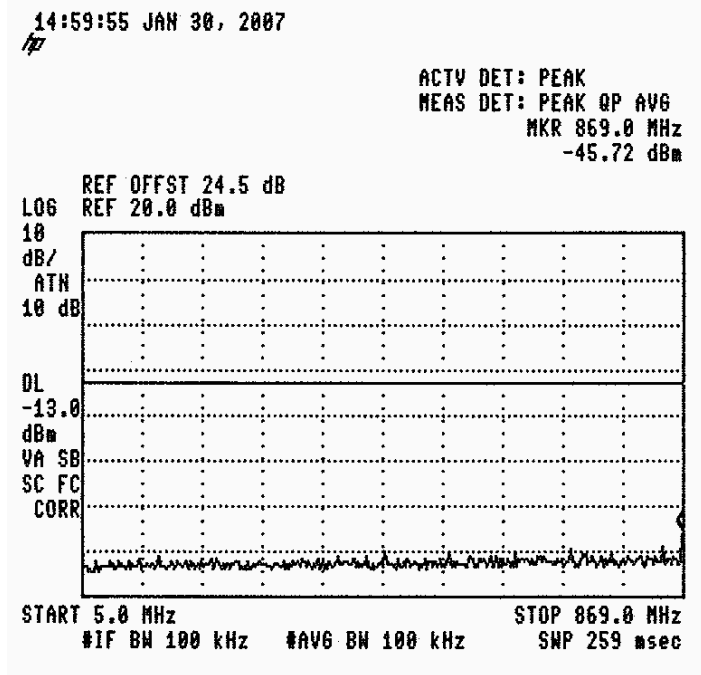


Figure 22.— 891.50 MHz

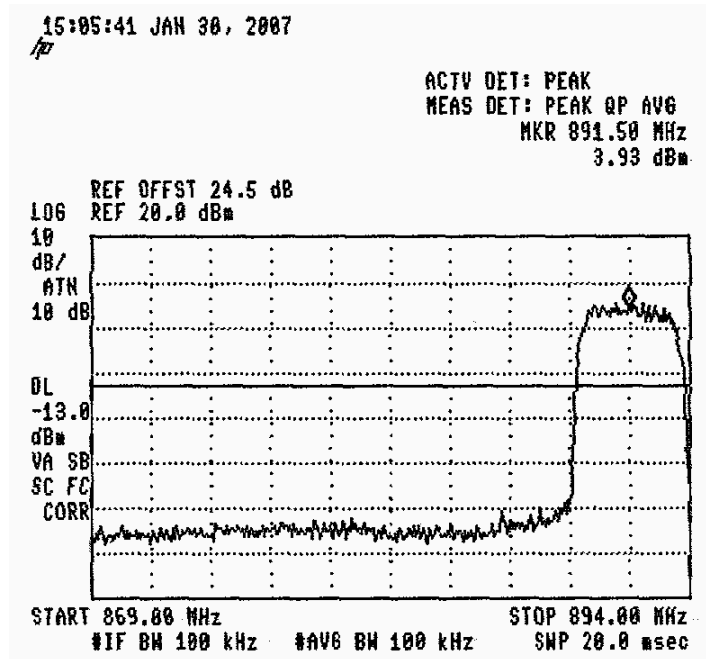


Figure 23.— 891.50 MHz

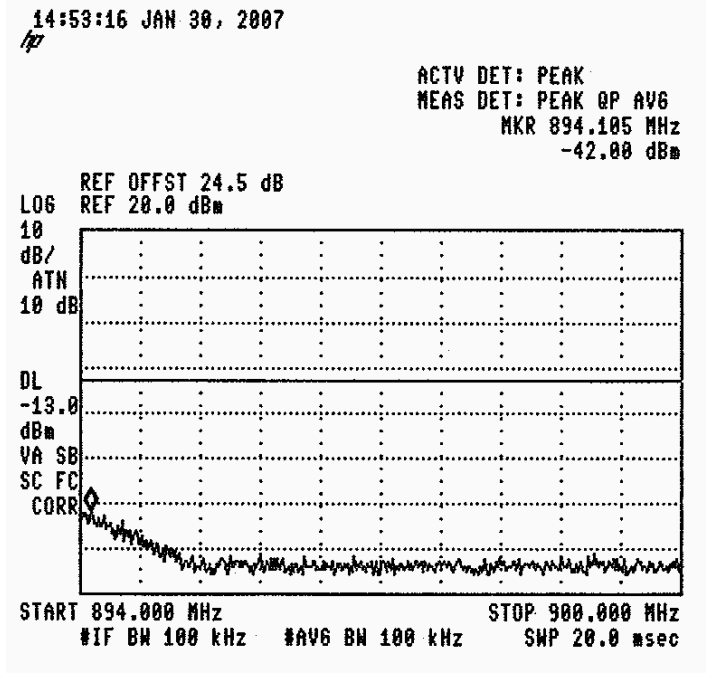


Figure 24.— 891.50 MHz

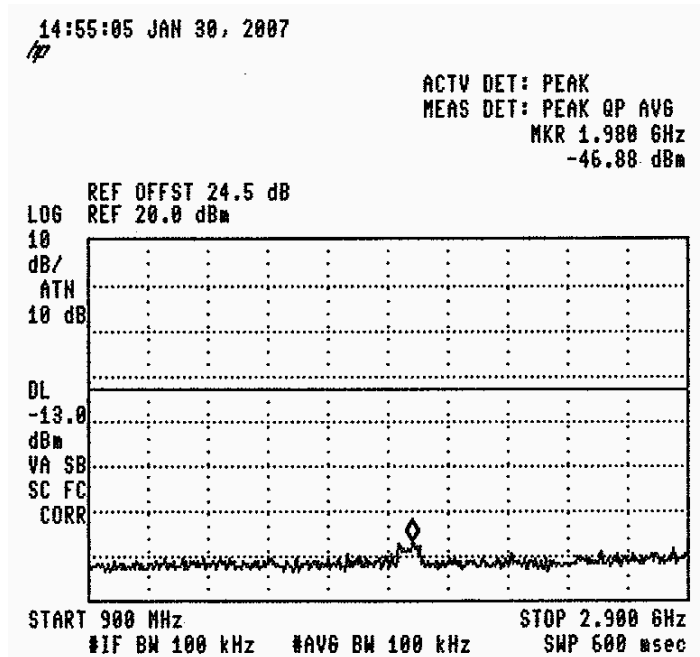


Figure 25.— 891.50 MHz

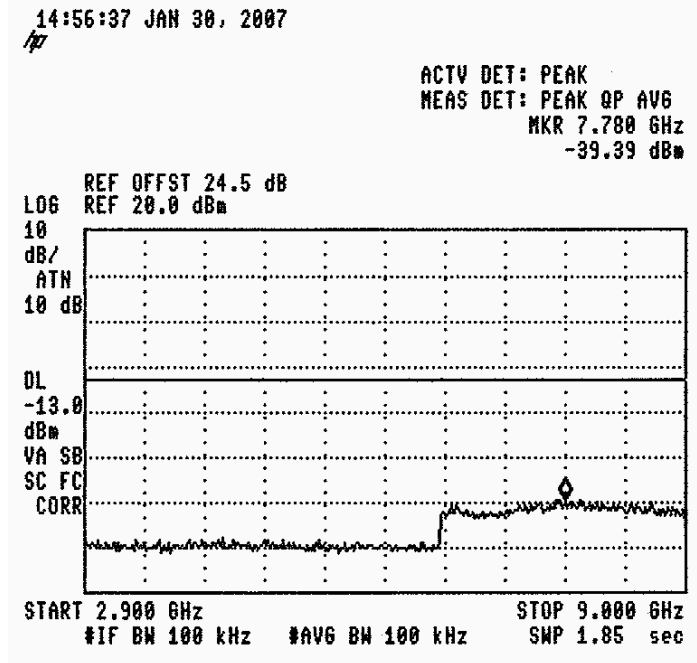


Figure 26.— 891.50 MHz

7.3 Results table

E.U.T. Description: In-Building Distribution System
 Model No.: 2000-CELL-PCSE
 Serial Number: 0665328
 Specification: FCC Part 22, Sub-part H, Section 917; Part 2 Sections 1051; 1057

Operation Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
871.50	-39.3	-13.0	-26.3
891.50	-39.4	-13.0	-26.4

Figure 27 Out of Band Emission Results

JUDGEMENT: Passed by 26.3 dB

TEST PERSONNEL:

Tester Signature: *E. Pitt*

Date: 06.02.07

Typed/Printed Name: E. Pitt

7.4 Test Equipment Used.

Out of Band Emission at Antenna Terminals

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 28 Test Equipment Used

8. Band Edge Spectrum (CELL)

8.1 Test Specification

FCC Part 22, Sub-part H, Section 917; FCC Parts 2.1051; 2.1057

8.2 Test procedure

Enclosed are spectrum analyzer plots for the lowest operation frequency (871.5 MHz) and the highest operation frequency (891.5 MHz) in which the E.U.T. is planned to be used.

The power of any emission outside of the authorized operating frequency ranges (869-894 MHz) must be attenuated below the transmitting power (P) by a factor of at least $43 + \log(P)$ dB, yielding -13dBm .

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (24.5dB).

The spectrum analyzer was set to 100 kHz resolution B.W.

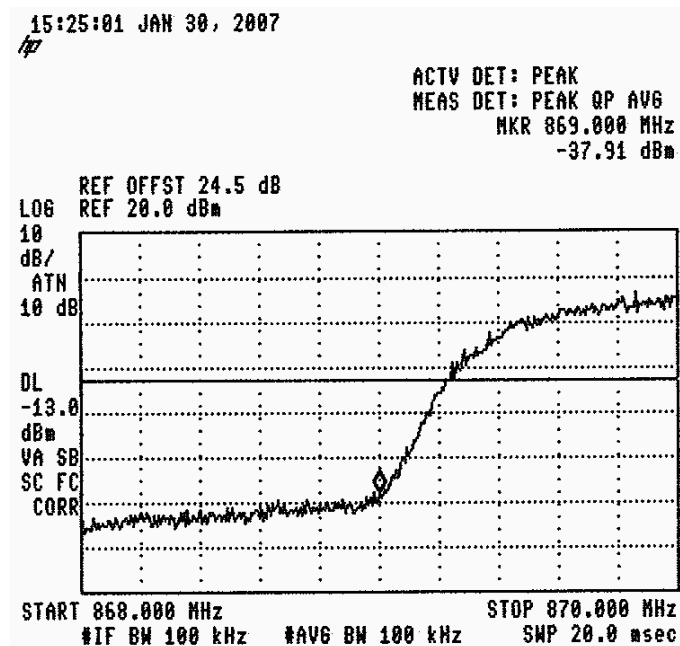


Figure 29.— 871.50 MHz

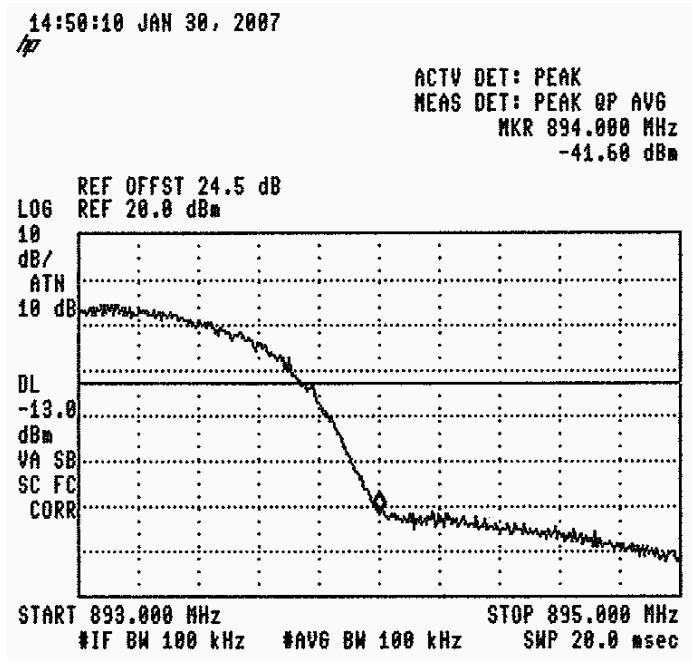


Figure 30.— 891.50 MHz

8.3 Results table

E.U.T. Description: In-Building Distribution System
 Model No.: 2000-CELL-PCSE
 Serial Number: 0665328
 Specification: FCC Part 22, Sub-part H, Section 917; Part 2 Sections 1051; 1057

Operation Frequency (MHz)	Band Edge Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
871.50	869.00	-37.91	-13.0	-24.91
891.50	894.00	-41.60	-13.0	-28.60

Figure 31 Band Edge Spectrum Results

JUDGEMENT: Passed by 24.91 dB

TEST PERSONNEL:

Tester Signature: E. Pitt

Date: 05.02.07

Typed/Printed Name: E. Pitt

8.4 Test Equipment Used.

Band Edge Spectrum

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 32 Test Equipment Used

9. Peak Output Power (PCS)

9.1 Test Specification

FCC Part 24, Sub-part E Section 232; Part 2 Section 1046

9.2 Test procedure

Maximum ERP must not exceed 2 Watts (33 dBm). Antenna gain is 6 dBi. Therefore peak output power must not exceed 27.0 dBm.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable. The E.U.T. RF output was WCDMA modulated. Special attention was taken to prevent Spectrum Analyzer RF input overload. The Spectrum Analyzer was set to 3.0 MHz resolution BW. The output power level was measured at 1932.50, 1960.00, and 1987.50 MHz.

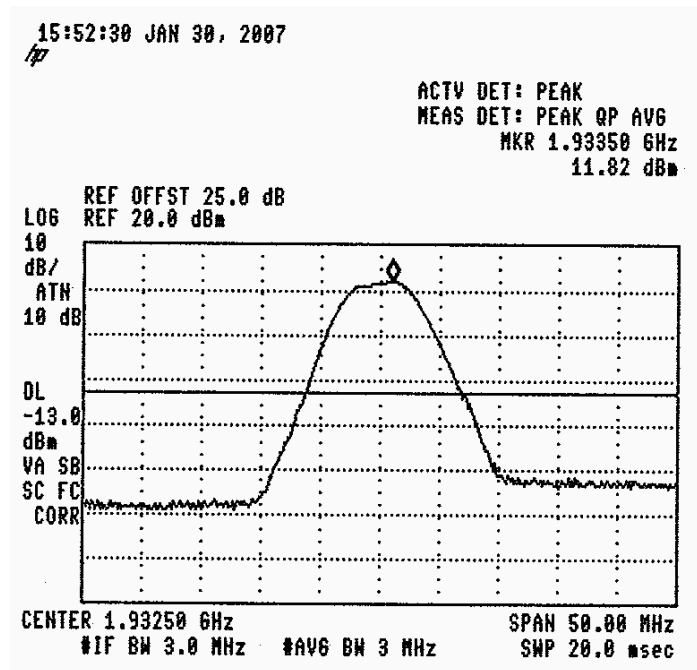


Figure 33.— 1932.50 MHz

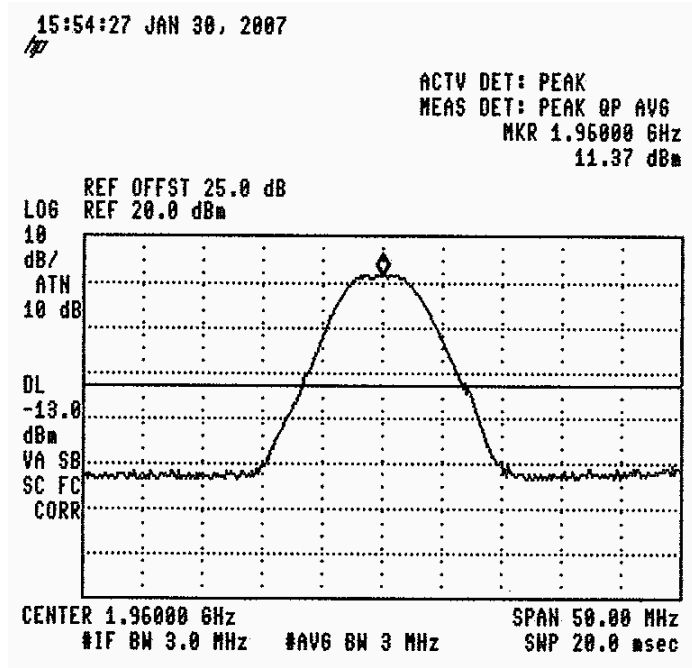


Figure 34.— 1960.00 MHz

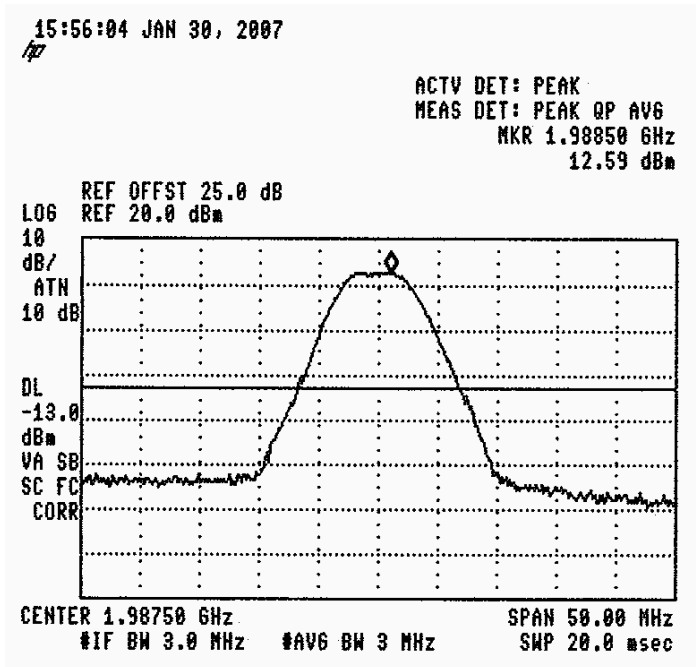


Figure 35.— 1987.50 MHz

9.4 Test Equipment Used.

Peak Output Power

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 37 Test Equipment Used

10. Occupied Bandwidth (PCS)

10.1 Test Specification

FCC Part 2, Section 1049

10.2 Test Procedure

The E.U.T. was set to the applicable test frequency with WCDMA modulation. The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (at the output test) and an appropriate coaxial cable. The spectrum analyzer was set to 100 kHz resolution B.W.

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limit, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

The occupied bandwidth of the E.U.T. at the points of 20 dB below maximum peak power was measured and recorded.

Occupied bandwidth measured was repeated in the input terminal of the E.U.T.

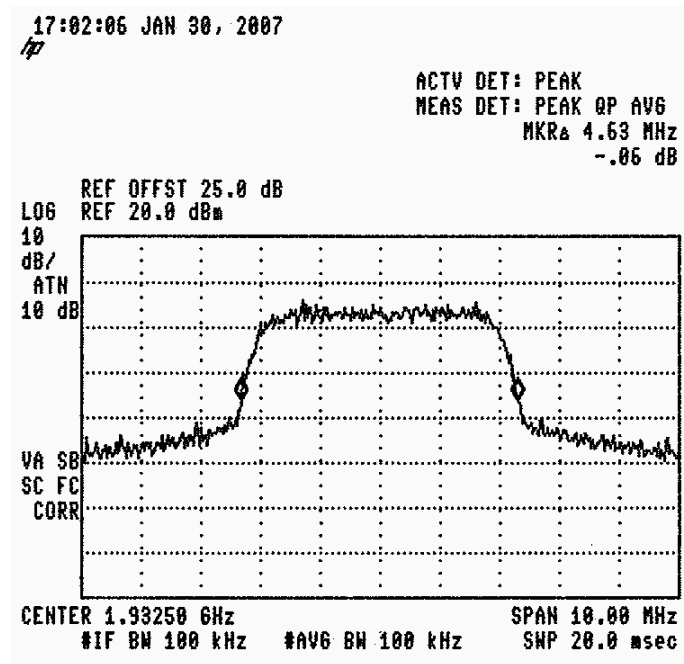


Figure 38.— Input 1932.50 MHz

17:04:21 JAN 30, 2007

17

ACTV DET: PEAK
 MEAS DET: PEAK QP AV6
 MKRΔ 4.63 MHz
 -.42 dB

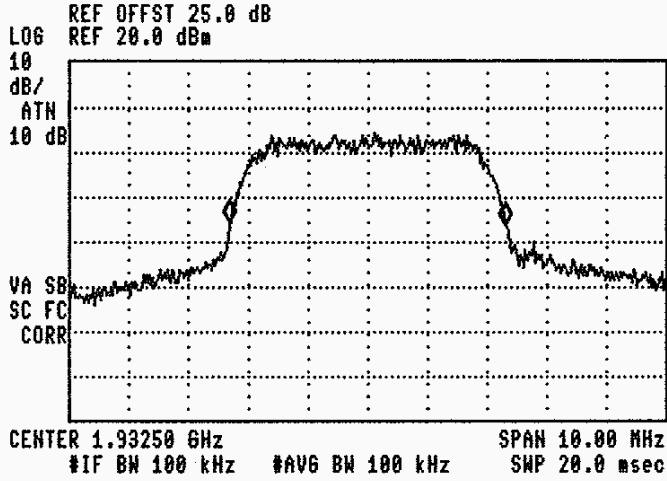


Figure 39.— Output 1932.50 MHz

16:59:34 JAN 30, 2007

17

ACTV DET: PEAK
 MEAS DET: PEAK QP AV6
 MKRΔ 4.65 MHz
 -.24 dB

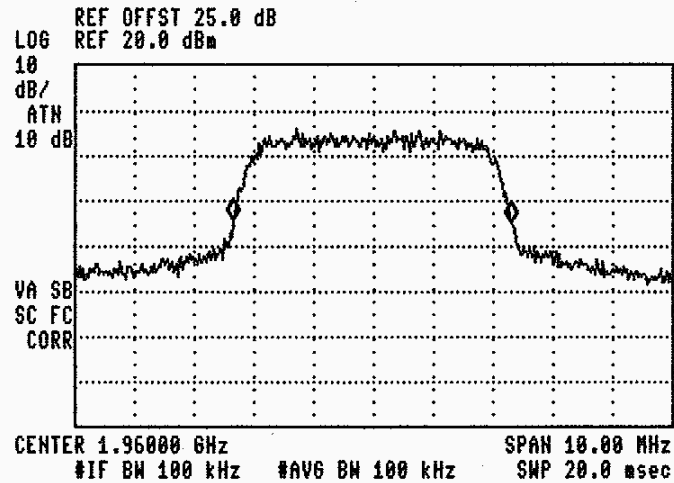


Figure 40.— Input 1960.00 MHz

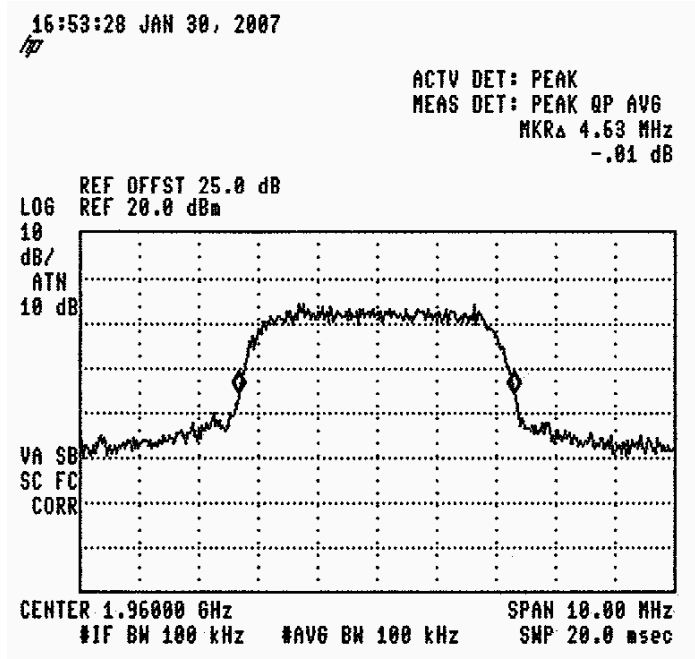


Figure 41.— Output 1960.00 MHz

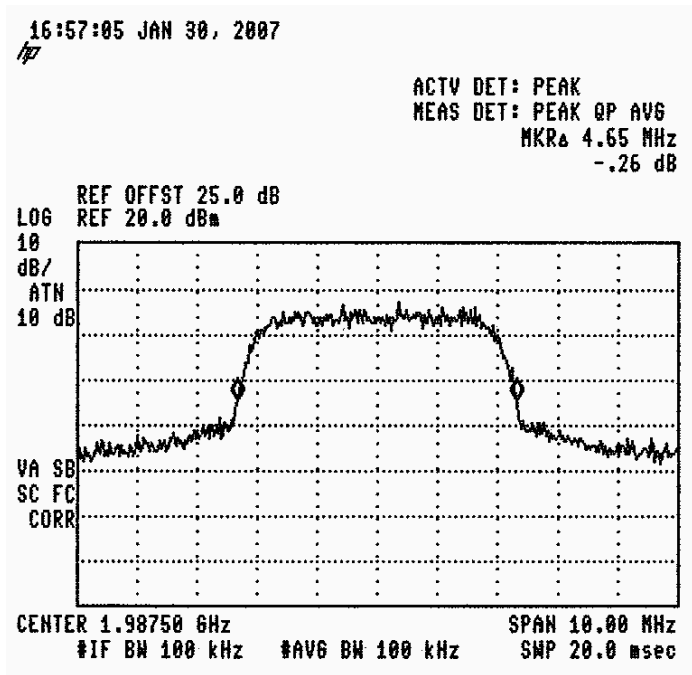


Figure 42.— Input 1987.50 MHz

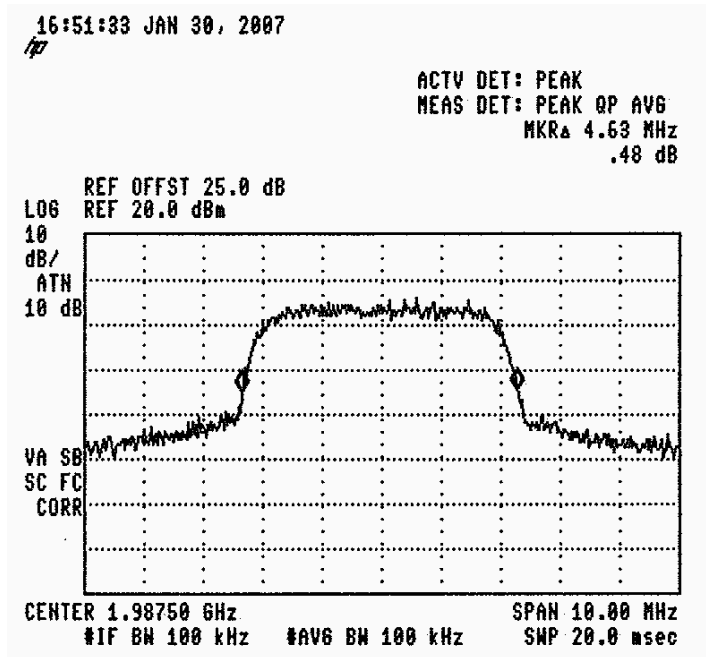


Figure 43.— Output 1987.50 MHz

10.3 Results Table

E.U.T. Description: In-Building Distribution System
 Model No.: 2000-CELL-PCSE
 Serial Number: 0665328
 Specification: FCC Part 2, Section 1049

	Operating Frequency	Reading (MHz)
Input	1932.50	4.63
Output	1932.50	4.63
Input	1960.00	4.65
Output	1960.00	4.63
Input	1987.50	4.65
Output	1987.50	4.63

Figure 44 Occupied Bandwidth

TEST PERSONNEL:

Tester Signature: E. Pitt

Date: 06.02.07

Typed/Printed Name: E. Pitt

10.4 Test Equipment Used.

Occupied Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 45 Test Equipment Used

11. Out of Band Emissions at Antenna Terminals (PCS)

11.1 Test Specification

FCC Part 24, Sub-part E, Section 238; FCC Part 2.1051

11.2 Test procedure

The power of any emission outside of the authorized operating frequency ranges (1930-1990 MHz) must be attenuated below the transmitting power (P) by a factor of at least $43 + \log(P)$ dB, yielding -13dBm .

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (25.0dB).

The spectrum analyzer was set to 1 MHz resolution B.W., except in the 1 MHz bands immediately outside, where the resolution bandwidth is 1% of the emission bandwidth, i.e. 100 kHz, and for the frequency range 100 kHz – 1.0 MHz, where the resolution B.W. was set to 10 kHz and for the frequency range 1.0 – 30 MHz, the resolution bandwidth was 100 kHz.

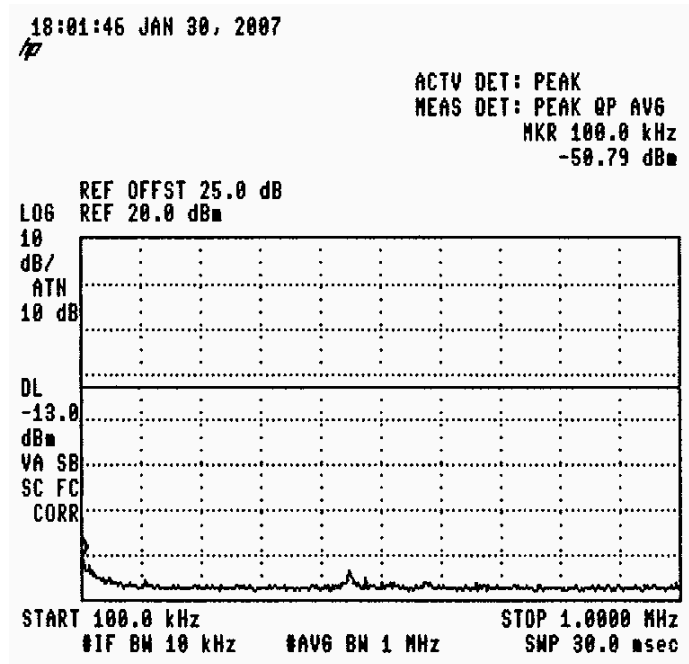


Figure 46.— 1932.50 MHz

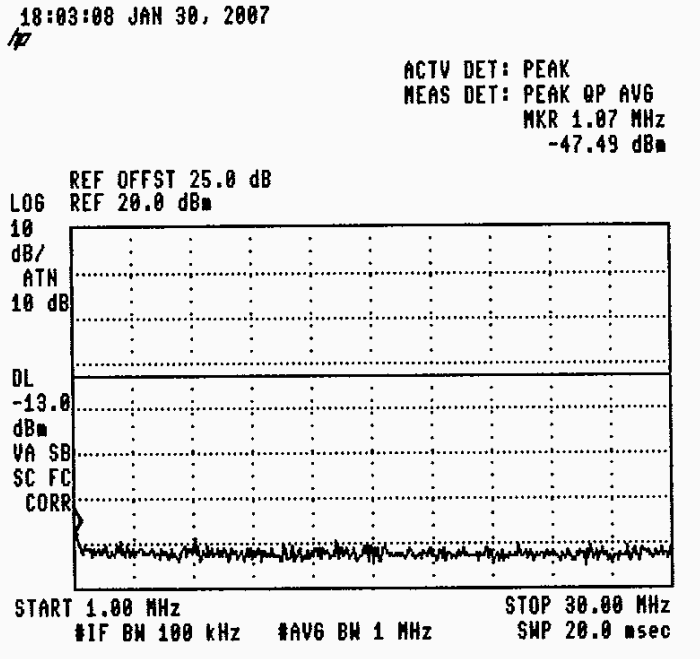


Figure 47.— 1932.50 MHz

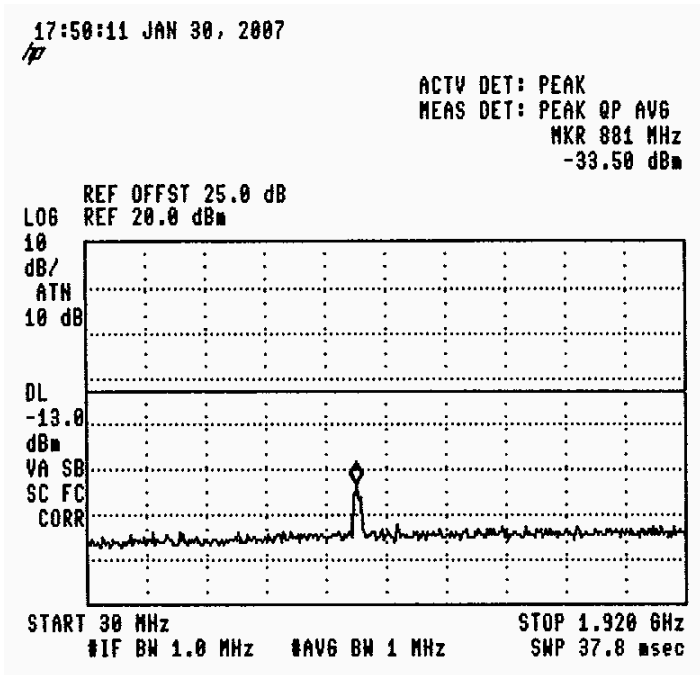


Figure 48.— 1932.50 MHz

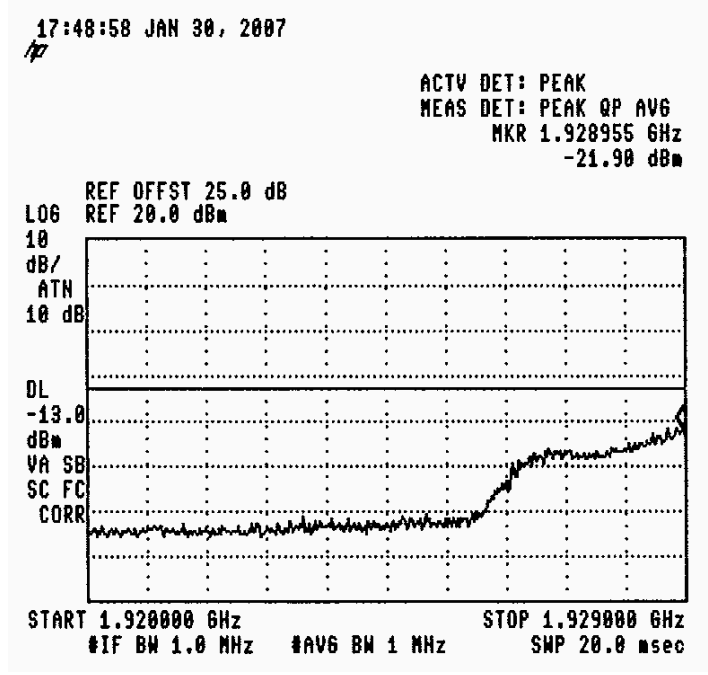


Figure 49.— 1932.50 MHz

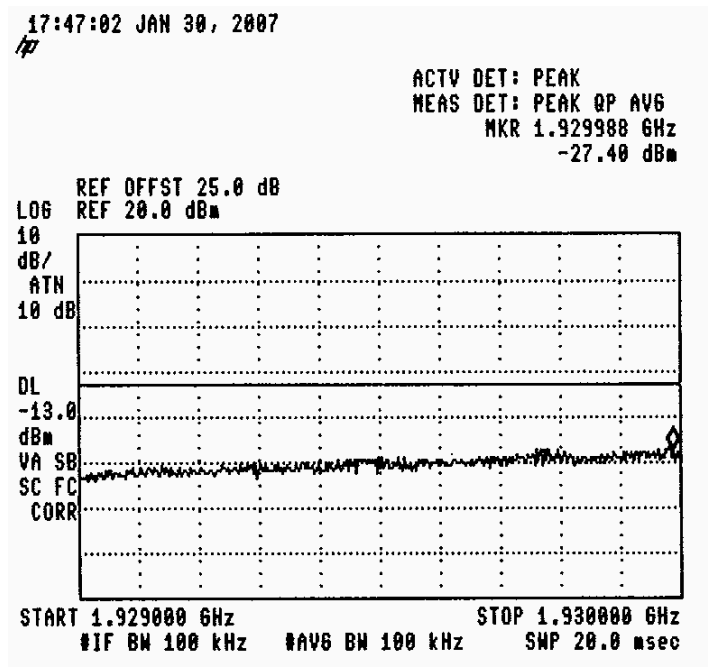


Figure 50.— 1932.50 MHz

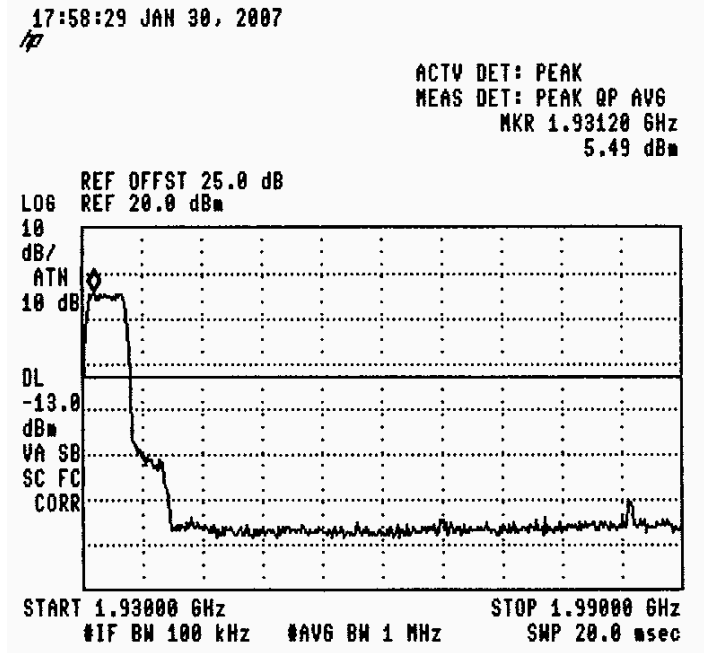


Figure 51.— 1932.50 MHz

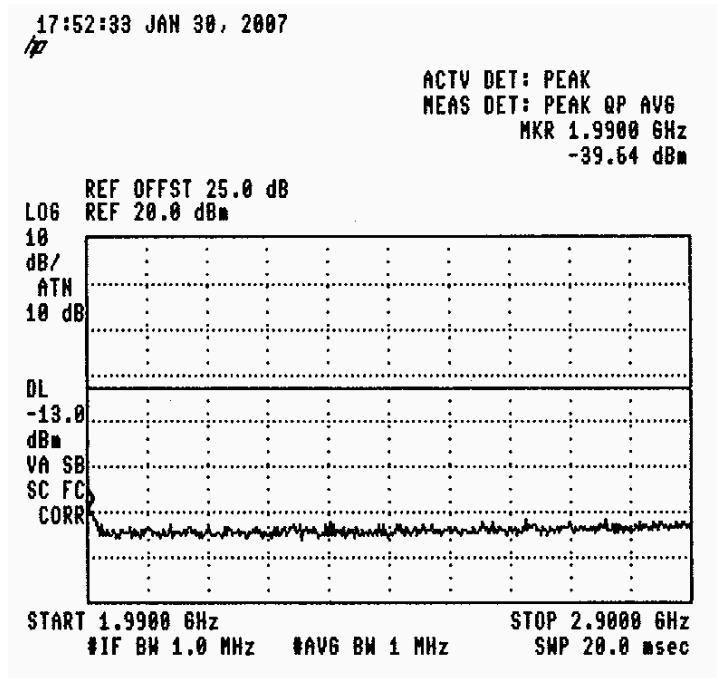


Figure 52.— 1932.50 MHz

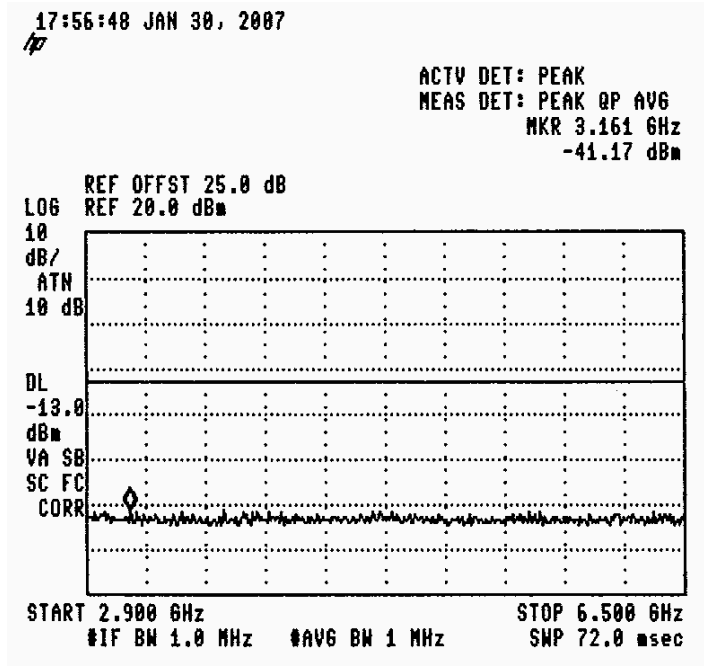


Figure 53.— 1932.50 MHz

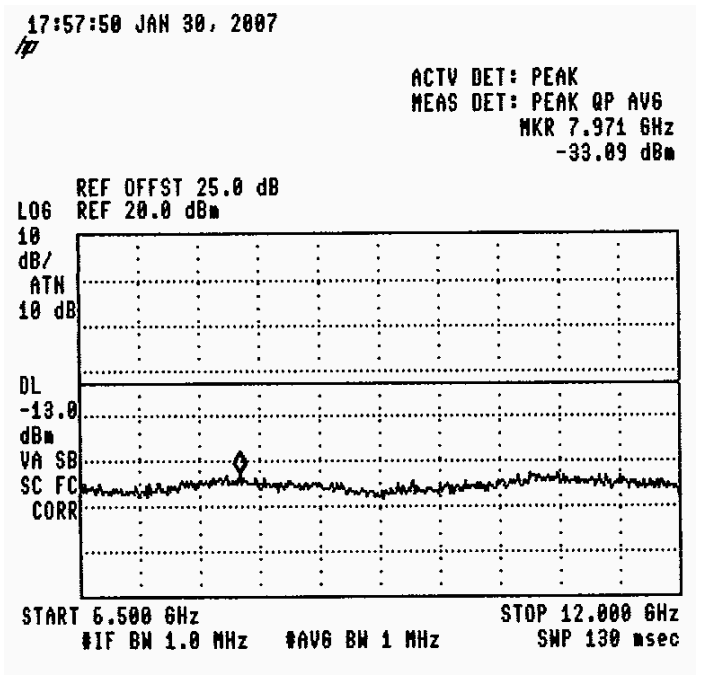


Figure 54.— 1932.50 MHz

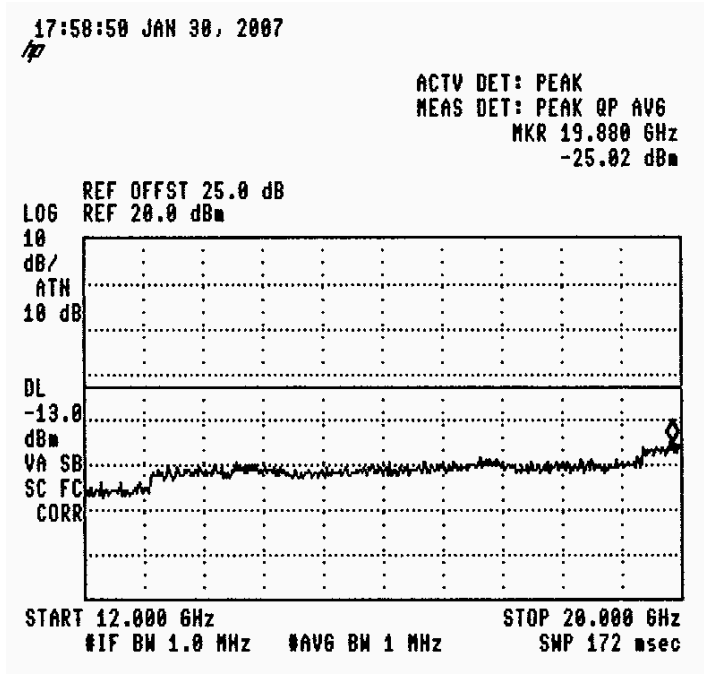


Figure 55.— 1932.50 MHz

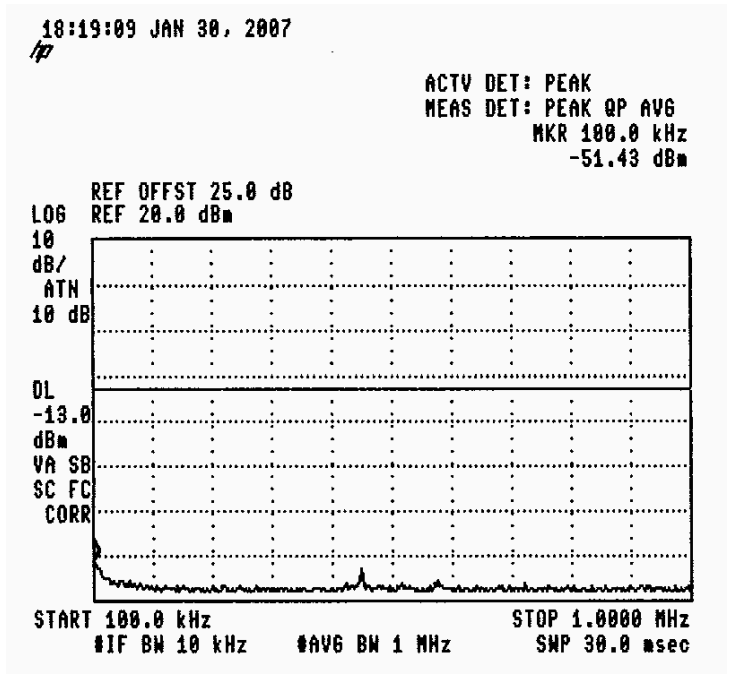


Figure 56.— 1987.50 MHz

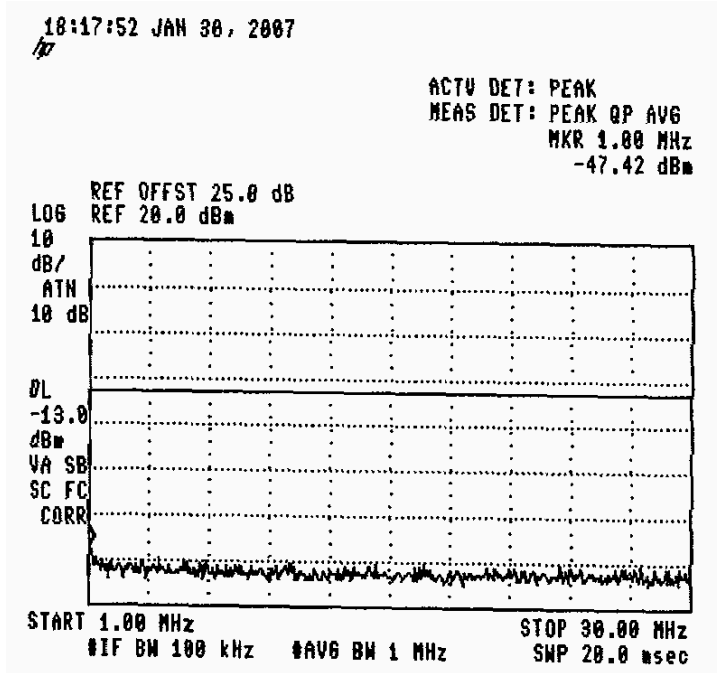


Figure 57.— 1987.50 MHz

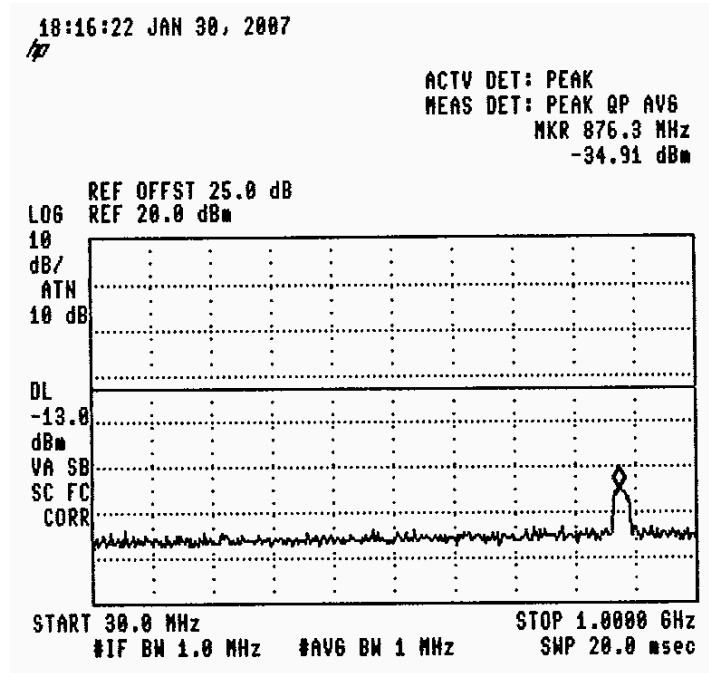


Figure 58.— 1987.50 MHz

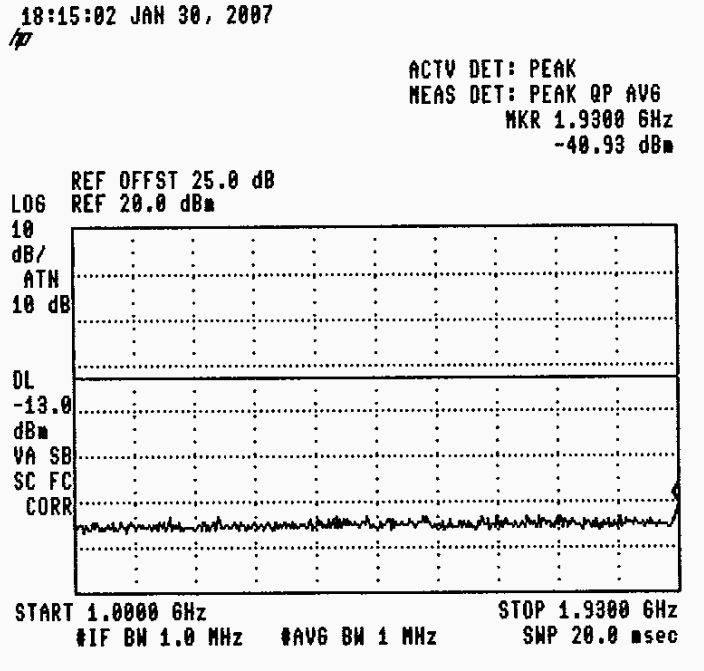


Figure 59.— 1987.50 MHz

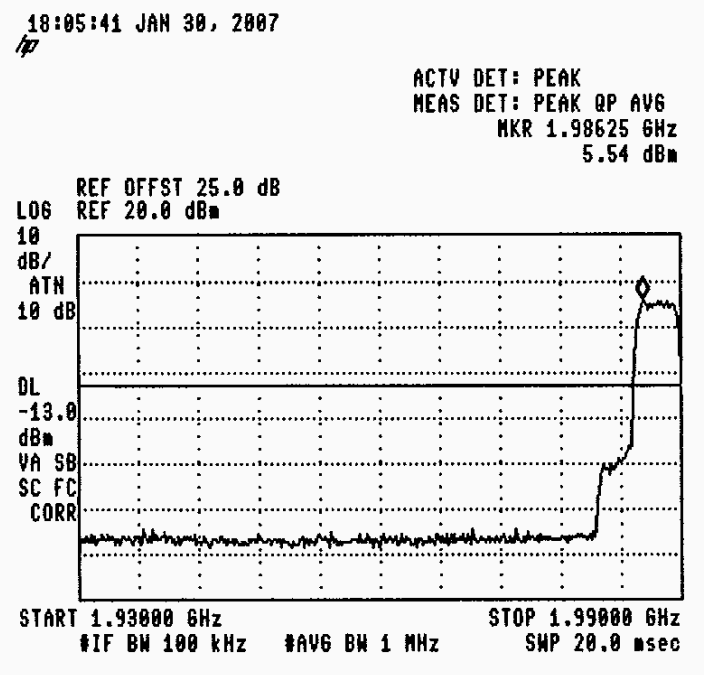


Figure 60.— 1987.50 MHz

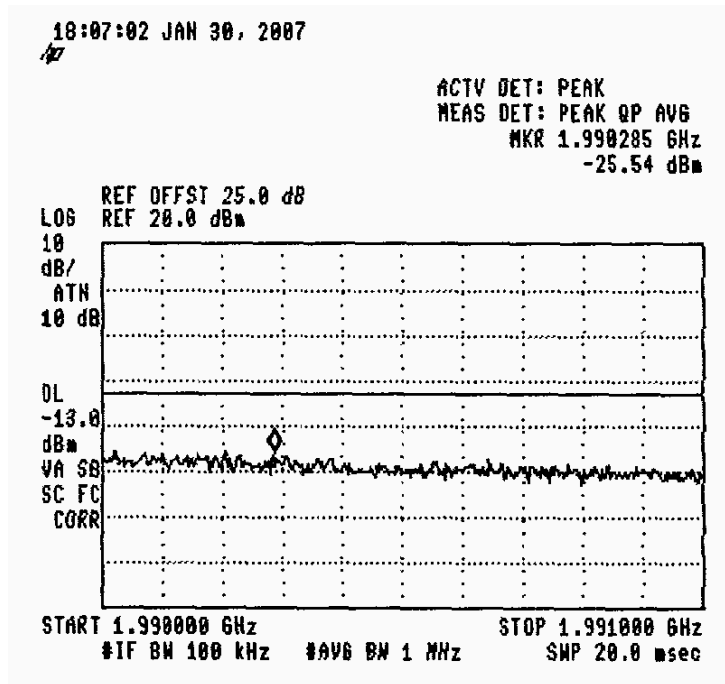


Figure 61.— 1987.50 MHz

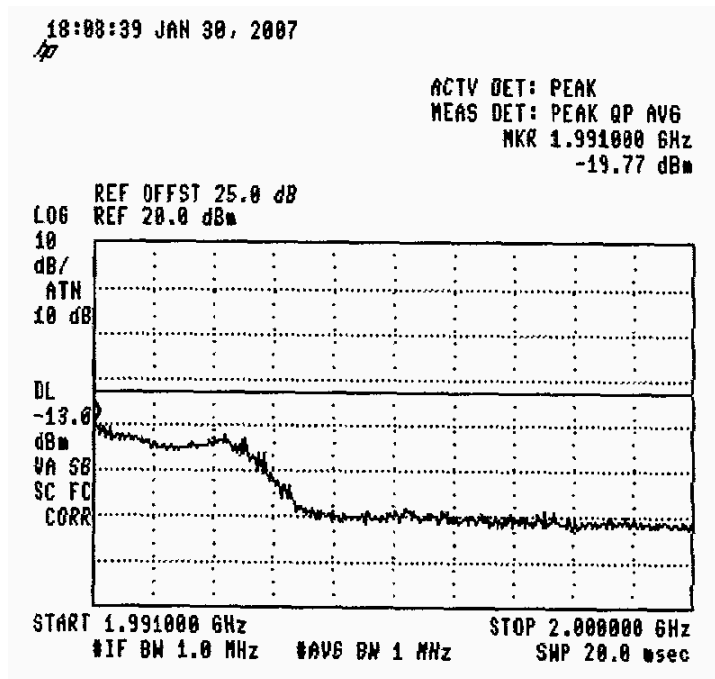


Figure 62.— 1987.50 MHz

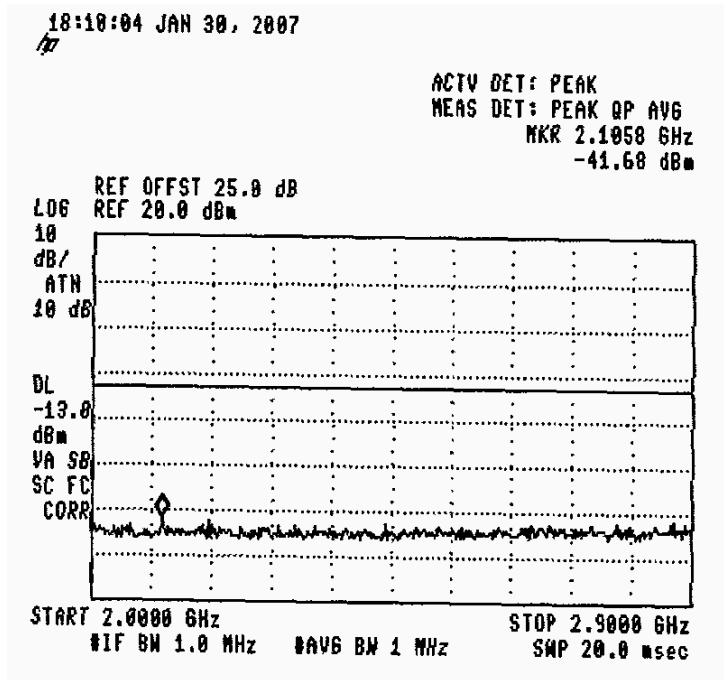


Figure 63.— 1987.50 MHz

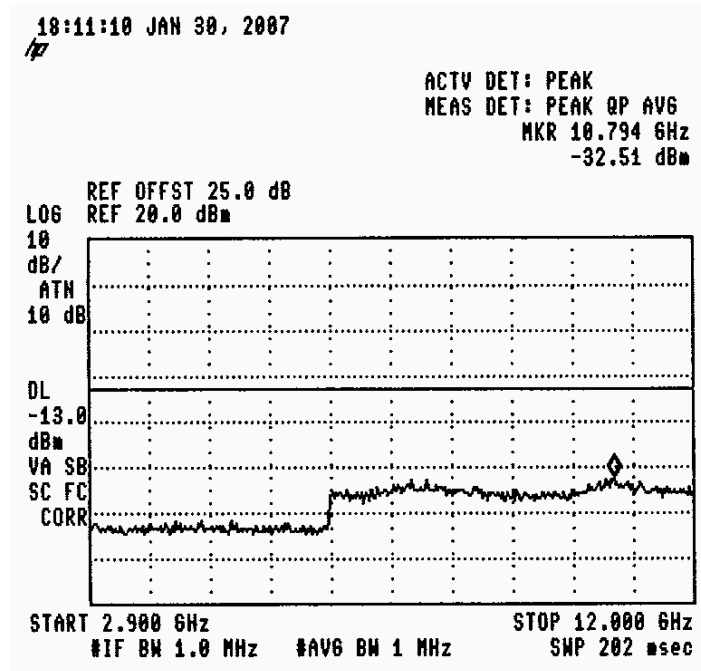


Figure 64.— 1987.50 MHz

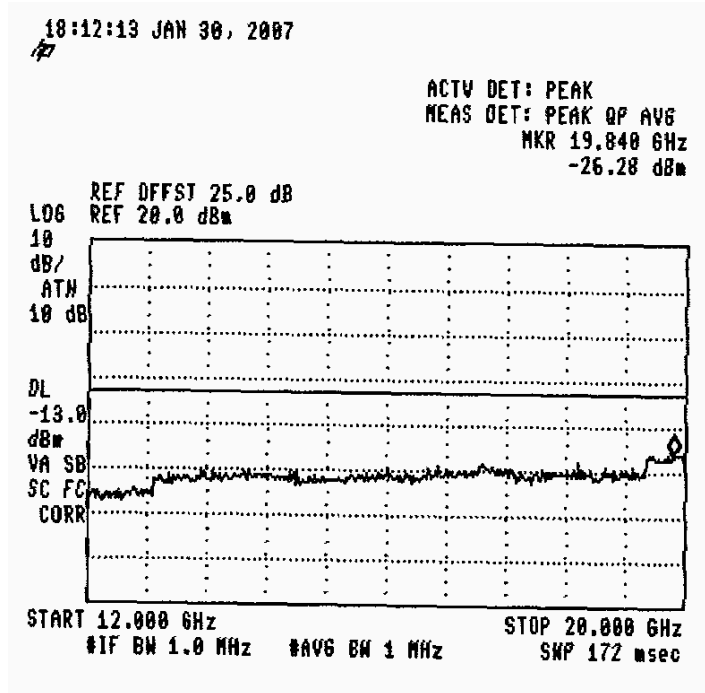


Figure 65.— 1987.50 MHz

11.3 Results table

E.U.T. Description: In-Building Distribution System
 Model No.: 2000-CELL-PCSE
 Serial Number: 0665328
 Specification: FCC Part 24, Sub-part E, Section 238; Part 2 Section 1051

Operation Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
1932.50	-21.9	-13.0	-8.9
1987.50	-19.8	-13.0	-6.8

Figure 66 Out of Band Emission Results

JUDGEMENT: Passed by 6.8 dB

TEST PERSONNEL:

Tester Signature: E. Pitt

Date: 06.02.07

Typed/Printed Name: E. Pitt

11.4 Test Equipment Used.

Out of Band Emission at Antenna Terminals

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 67 Test Equipment Used

12. Band Edge Spectrum (PCS)

12.1 Test Specification

FCC Part 24, Sub-part E, Section 238; FCC Part 2.1051

12.2 Test procedure

Enclosed are spectrum analyzer plots for the lowest operation frequency (1932.5 MHz) and the highest operation frequency (1987.5 MHz) in which the E.U.T. is planned to be used.

The power of any emission outside of the authorized operating frequency ranges (1930-1990 MHz) must be attenuated below the transmitting power (P) by a factor of at least $43 + \log(P)$ dB, yielding -13dBm .

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (25.0dB).

The spectrum analyzer was set to 100 kHz resolution B.W.

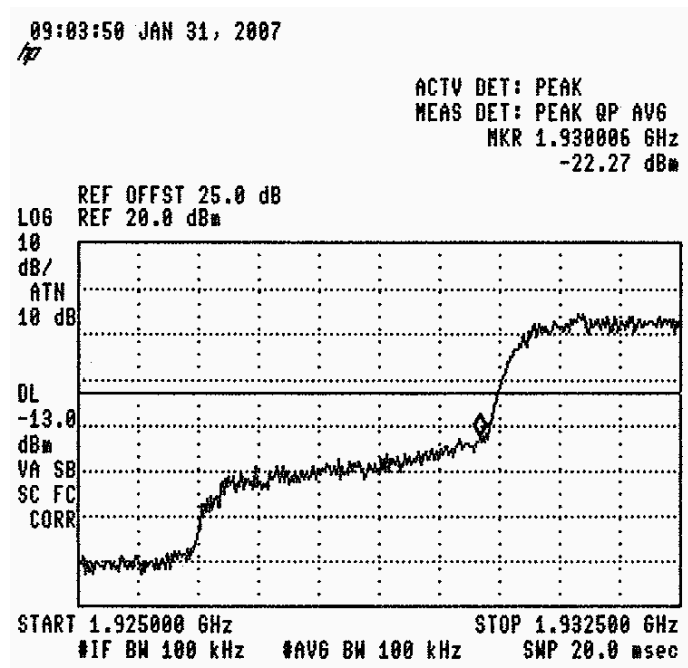


Figure 68.— 1932.50 MHz

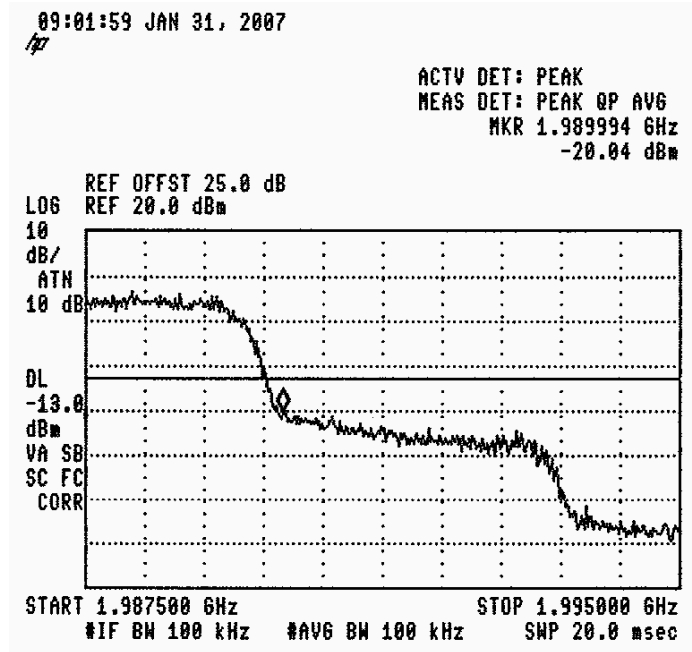


Figure 69.— 1987.50 MHz

12.3 Results table

E.U.T. Description: In-Building Distribution System
Model No.: 2000-CELL-PCSE
Serial Number: 0665328
Specification: FCC Part 24, Sub-part E, Section 238; Part 2 Section 1051

Operation Frequency (MHz)	Band Edge Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
1932.50	1930.00	-22.27	-13.0	-18.06
1987.50	1989.99	-20.04	-13.0	-7.04

Figure 70 Band Edge Spectrum Results

JUDGEMENT: Passed by 7.04 dB

TEST PERSONNEL:

Tester Signature: *E. Pitt*

Date: 06.02.07

Typed/Printed Name: E. Pitt

12.4 Test Equipment Used.

Band Edge Spectrum

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibr.	Period
Spectrum Analyzer	HP	8593EM	3536A00120	30 November 2006	1 year
Signal Generator	HP	E4432B	TE0624	10 April 2006	1 year
Power Supply	Horizon Electronics	DHR 3653D-1.0	TE1232	N/A	1 year
Cable	RHOPHASE	KPS-1500	A1675	16 December 2006	1 year
Attenuator	Macom	2082-4381-08	050	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	056	26 November 2006	1 year
Attenuator	Macom	2082-4381-08	211	26 November 2006	1 year

Figure 71 Test Equipment Used

13. Radiated Emission Per FCC Part 15 Sub-Part B Test Data

13.1 Test Specification

30-2000 MHz, FCC Part 15, Subpart B, CLASS A

13.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 4.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in *Figure 1. Tests Set-up*.

The E.U.T. highest frequency source or used frequency is 400 MHz.

The frequency range 30-2000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The emissions were measured at a distance of 3 meters.

13.3 Test Data

JUDGEMENT: Passed by 3.0 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart B, specification.

In the band 1.0 – 2.0 GHz, the emission levels were more than 20 dB below the specification limit.

The details of the highest emissions are given in *Figure 72 to Figure 75*.

Radiated Emission

E.U.T Description In-Building Distribution System
 Type 2000-CELL-PCSE
 Serial Number: 0665328

Specification: FCC Part 15, Subpart B, Class A

Antenna Polarization: Horizontal
 Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
 Detectors: Peak, Quasi-peak

Signal Number	Frequency (MHz)	Peak dBuV/m	QP dBuV/m	QP Delta L 1 (dB)	Avg dBuV/m	Av Delta L 2 (dB)	Corr (dB)
1	45.037096	34.7	33.8	-6.2			12.0
2	60.801302	32.6	27.9	-12.1			10.2
3	73.748155	33.1	30.1	-9.9			10.0
4	134.880000	37.3	33.5	-9.9			13.8
5	184.465314	40.1	36.3	-7.2			15.9
6	602.576310	38.9	33.6	-12.4			23.9

**Figure 72. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detectors: Peak, Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description In-Building Distribution System
 Type 2000-CELL-PCSE
 Serial Number: 0665328

Specification: FCC Part 15, Subpart B, Class A

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
 Detectors: Peak, Quasi-peak

Signal Number	Frequency (MHz)	Peak dBuV/m	QP dBuV/m	QP Delta L 1 (dB)	Avg dBuV/m	Av Delta L 2 (dB)	Corr (dB)
1	45.072411	41.4	37.0	-3.0			12.0
2	56.633394	36.7	30.9	-9.1			10.6
3	63.080000	38.6	30.4	-9.6			10.1
4	133.440000	31.0	26.0	-17.5			13.7
5	345.300000	39.9	33.3	-12.7			23.3
6	595.800000	40.2	34.3	-11.7			24.6

**Figure 74. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Peak, Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

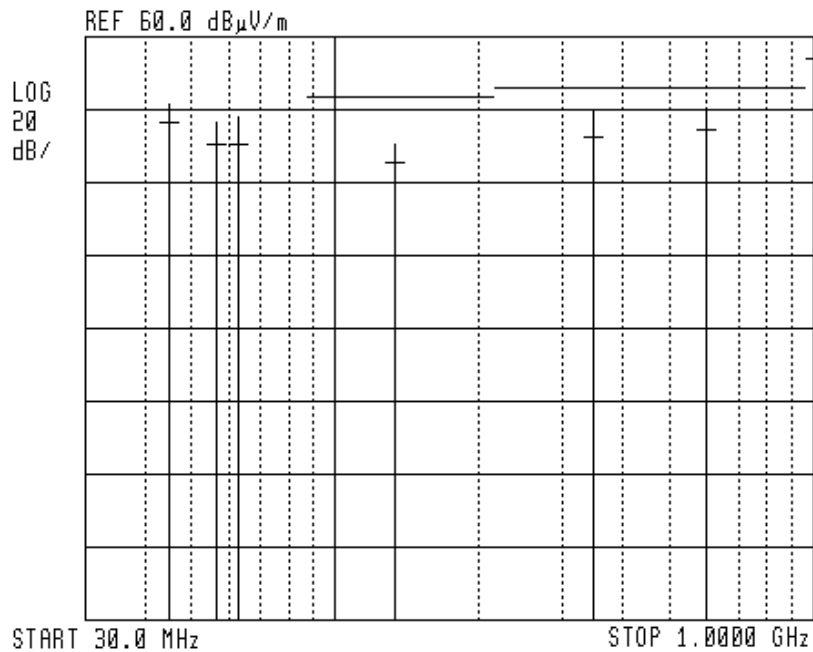
E.U.T Description In-Building Distribution System
 Type 2000-CELL-PCSE
 Serial Number: 0665328

Specification: FCC Part 15, Subpart B, Class A

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
 Detectors: Peak, Quasi-peak

17:12:16 JAN 29, 2007



**Figure 75. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB μ V/m).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

13.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 22, 2006	1 year
RF Section	HP	85420E	3705A00248	November 22, 2006	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	March 19, 2006	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 30, 2006	1 year
Antenna-Log Periodic	A.H.System	SAS-200/511	253	February 04, 2005	2 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

13.5 **Field Strength Calculation**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

- FS: Field Strength [dB μ v/m]
- RA: Receiver Amplitude [dB μ v]
- AF: Receiving Antenna Correction Factor [dB/m]
- CF: Cable Attenuation Factor [dB]

No external pre-amplifiers are used.

14. APPENDIX A - CORRECTION FACTORS

**14.1 Correction factors for CABLE
from EMI receiver
to test antenna
at 3 meter range.**

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

14.2 Correction factors for CABLE
from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

12.6 Correction factors for LOG PERIODIC ANTENNA

**Type LPD 2010/A
at 3 and 10 meter ranges.**

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range,
and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission
Test EMI Receiver".

12.7 Correction factors for LOG PERIODIC ANTENNA
Type SAS-200/511
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".

**14.8 Correction factors for BICONICAL ANTENNA
Type BCD-235/B,
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

15. Appendix B Correspondence With Timco

Date: 31.01.2007

To: EMC

Subject: RE: Permissive Change Class II for 2000-CEL-PCSE and 1000-IDEN-SMR- Mobile Access

Hi Shaik,

1. Ok

2. Ok

3.

3.1 Ok

3.2 Ok

4. It appears that you test plan is appropriate for the class permissive changes.

Regards,

Bruno

-----Original Message-----

From: Emc [mailto:emc@itl.co.il]

Sent: Tuesday, January 30, 2007 1:59 AM

To: Bruno Clavier

Subject: Permissive Change Class II for 2000-CEL-PCSE and 1000-IDEN-SMR- Mobile Access

Hi Bruno,

1. In addition to the current submitted applications for C2PC for the 1000-CELL-PCS4E and 1200-PCS-AO, there are two additional products also having FCC ID # as follows:

2000-CELL-PCSE: FCC ID OJFMA1K-CELL-PCSE

1000D-IDEN-SMR: FCC ID OJFMA1K-IDEN-SMR

for which we also would like C2PC.

2.The changes in the two additional products are:

2.1. For the 2000-CELL- PCSE:

Using WCDMA modulation instead of CDMA modulation

PCB has been flattened.

Output power, amplifiers and optics are the same (relocated). Front end hasn't changed.

Reduced 2 coaxial cables.

Reduced power detectors

2.2. For the 1000D-IDEN-SMR:

PCB has been flattened.

New PA (power output hasn't change, doesn't affect Up Link).

DC converters (partially).

3. The tests that we plan to perform are:

3.1. For the 2000-CELL-PCSE:

Peak Output Power
Occupied Bandwidth
Band Edges
Out of Band at antenna Terminal
Radiated emission per FCC Part 15 Sub-part B

3.2. For the 1000D-IDEN-SMR:

Peak Output Power
Occupied Bandwidth
Emission Mask
Spurious emission at antenna terminal/ radiated spurious
Radiated emission per FCC Part 15 Sub-part B

4. Please verify/comment

Regards

Shaik Raz

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