



DATE: 31 July 2012

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Corning MobileAccess

Equipment under test:

Remote Hub Unit

1000-CELL-PCS4E-HLN*

* See customer's declaration on page 6.

Written by:



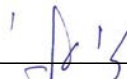
D. Shidlowsky, Documentation

Approved by:



A. Sharabi, Test Engineer

Approved by:



I. Raz, EMC Laboratory Manager

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This report relates only to items tested.



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Measurement/Technical Report for Corning MobileAccess Remote Hub Unit

FCC ID: OJFMA1K-CP-HLN

This report concerns:

Original Grant: X

Class II change:

Class I change:

Equipment type:

PCS Licensed Transmitter

Limits used:

47CFR Parts 22, 24

Measurement procedure used is ANSI C63.4-2003.

Substitution Method used as in ANSI/TIA-603-C: 2004

Application for Certification

prepared by:

Ishaishou Raz

ITL (Product Testing) Ltd.

Kfar Bin Nun

D.N. Shimshon 99780

Israel

e-mail sraz@itl.co.il

Applicant for this device:

(different from "prepared by")

Steve Blum

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1. General Information

1.1 Administrative Information

Manufacturer:	Corning MobileAccess
Manufacturer's Address:	8391 Old Courthouse Rd. Suite #300 Vienna, VA 22182 U.S.A. Tel: +1-541-758-2880 Fax: +1-703-848-0260
Manufacturer's Representative:	Steve Blum
Equipment Under Test (E.U.T):	Remote Hub Unit
Equipment Model No.:	1000-CELL-PCS4E-HLN
Equipment Serial No.:	0B42028
Date of Receipt of E.U.T:	17.07.2012
Start of Test:	17.07.2012
End of Test:	24.07.2012
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Parts 22H, 24E



CORNING | **MobileAccess**
Wireless Solutions

31 July 2012

I hereby declare that the model name of the Remote Hub Unit tested at the ITL EMC/Radio laboratory between 17 – 24 July 2012 is 1000-CELL-PCS4E-HLN.

Thank you,

Steve Blum

Steve Blum

Product Manager
Corning Mobileaccess
8391 Old Courthouse Rd Suite 300
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www.corning.com/mobileaccess



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), IC File No.: 46405-4025; Site No. IC 4025B-1.
6. TUV Product Services, England, ASLLAS No. 97201.

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**

The Wireless Network System provides coverage by routing RF signals from BTS (base transmit station) units, through optic fibers to remote areas where the signals are converted back to RF and interfaced to antennas covering the remote area. All system elements can be remotely controlled and monitored from a single location.

The system consists of the following elements:

Base Unit (BU):

Converts the RF signal received from the RIU to an optic signal that is then split and routed via optic fiber to Remote Hub Units located in remote locations.

Remote Hub Units (RHUs):

Converts the optic signal to an RF signal and feeds it to the antennas in the remote areas in order to provide the required coverage. The RHU provides coax connections to up to four antennas. The RHU filters and amplifiers the optic signal received from the BU according to the service it supports.

The E.U.T. is operated from DC.

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**

Both conducted and 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 September 3, 2009). I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 **Measurement Uncertainty**

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.96 dB

2. System Test Configuration

2.1 *Justification*

The test setup was configured to closely resemble the standard installation. The EUT consists of the BU (Base Unit) and the RHU (Remote Hub Unit). The RF source is injected into the BU, converted onto optical signal, transmitted over fiber cable to RHU, converted back to RF and transmitted to antenna ports. The RF source signals are represented in the setup by appropriate signal generators.
Both CELL and PCS channels transmitted during the testing.

2.2 *EUT Exercise Software*

The Element Management System EngGUI ver. 2.8 build 05 used for commands delivery.

These commands are used to enable / disable of RHU transmission.

RHU Embedded SW version 7.6 build 00

BU Embedded SW version 5.2 build 00

2.3 *Special Accessories*

No special accessories were needed in order to achieve compliance.

2.4 *Equipment Modifications*

No modifications were needed in order to achieve compliance.

2.5 Configuration of Tested System

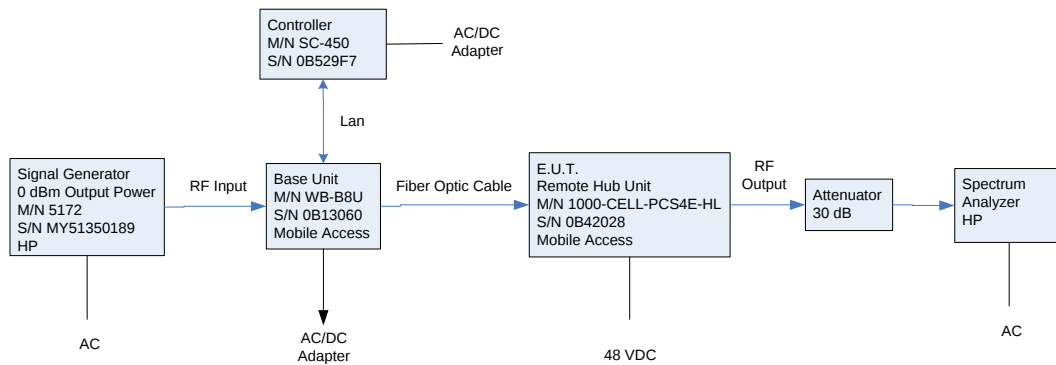


Figure 1. Conducted Tests Set-up

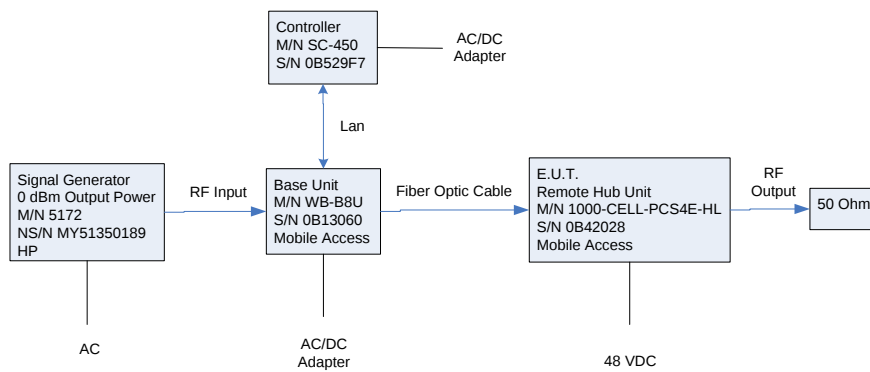


Figure 2. Radiated Tests Set-up

3. Conducted and Radiated Measurement Test Set-ups Photo

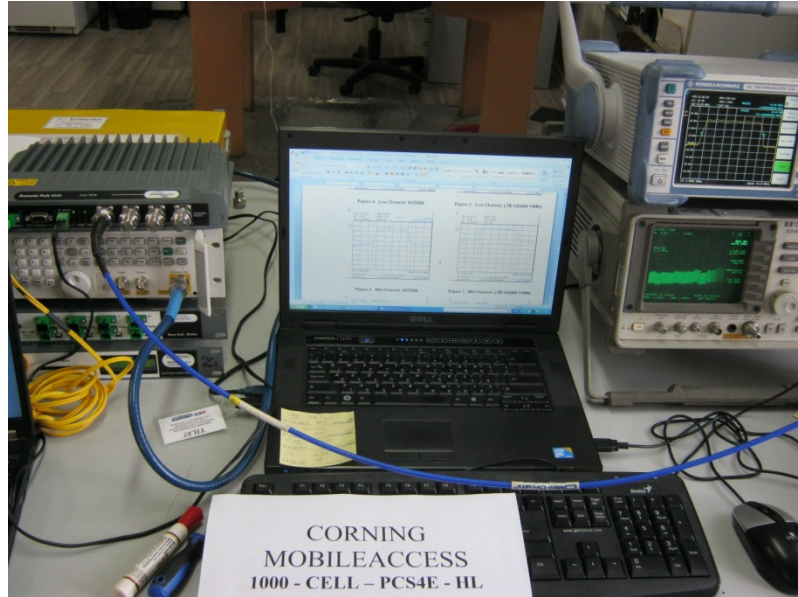


Figure 3. Conducted Emission From Antenna Ports Tests



Figure 4. Radiated Emission Test

4. Peak Output Power CELL

4.1 Test Specification

FCC Part 22.913

4.2 Test procedure

Peak Power Output must not exceed 500 Watts (57dBm).

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (1dB). The E.U.T. RF output was modulated. Special attention was taken to prevent Spectrum Analyzer RF input overload.

4.3 Test Results

Modulation	Channel	Reading (dBm)	Specification (dBm)	Margin (dB)
CDMA	870.2	22.3	57.0	-34.7
	881.0	23.5	57.0	-33.5
	892.8	21.2	57.0	-35.8
GSM	870.2	21.2	57.0	-35.8
	881.0	22.3	57.0	-34.7
	892.8	20.0	57.0	-37.0
W-CDMA	871.5	23.5	57.0	-33.5
	881.0	24.4	57.0	-32.7
	891.5	22.4	57.0	-34.6
LTE – 64QAM 10MHz BW	874.0	24.3	57.0	-32.7
	881.0	24.5	57.0	-32.5
	889.0	23.1	57.0	-33.9

Figure 5 Peak Output Power CELL Test Results Table

See additional information in Figure 6 to Figure 17.

JUDGEMENT: Passed by 32.5 dB

TEST PERSONNEL:

Tester Signature: 

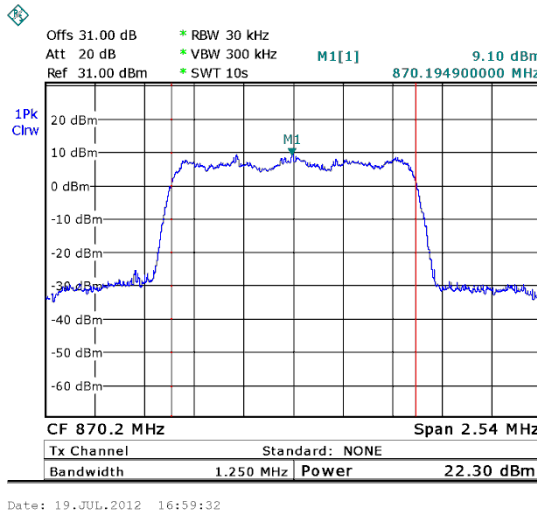
Date: 31.07.12

Typed/Printed Name: A. Sharabi



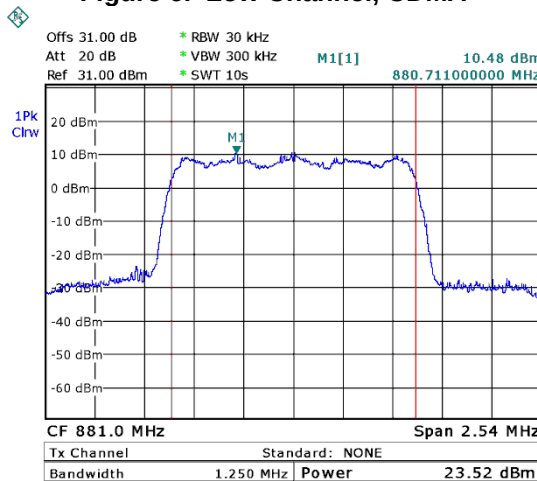
Specification:

FCC Part 22 Section 913, FCC Part 2, Section 1046



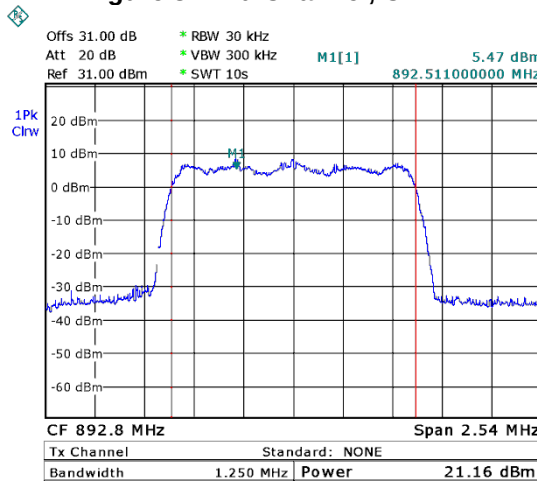
Date: 19.JUL.2012 16:59:32

Figure 6. Low Channel, CDMA



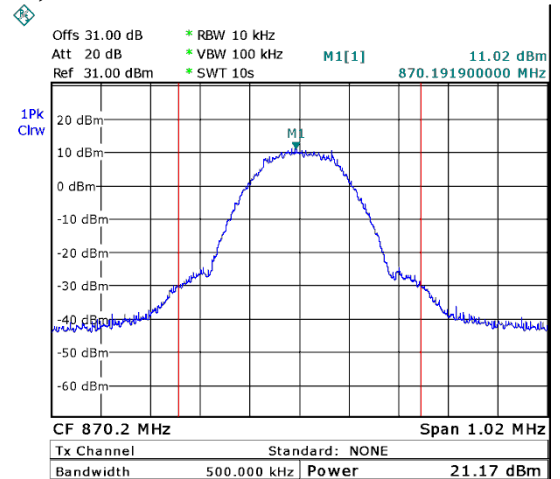
Date: 19.JUL.2012 16:59:59

Figure 8. Mid Channel, CDMA



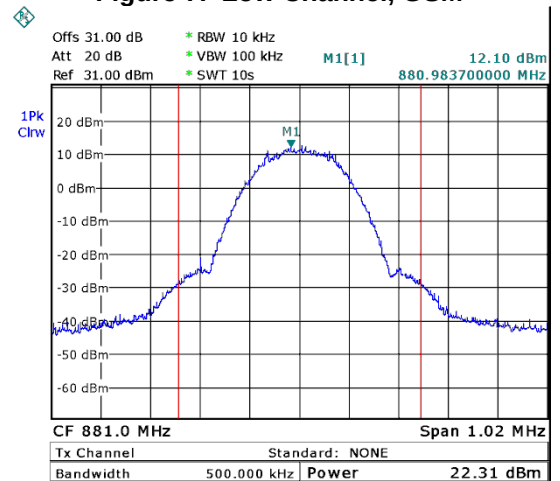
Date: 19.JUL.2012 17:00:43

Figure 10. High Channel, CDMA



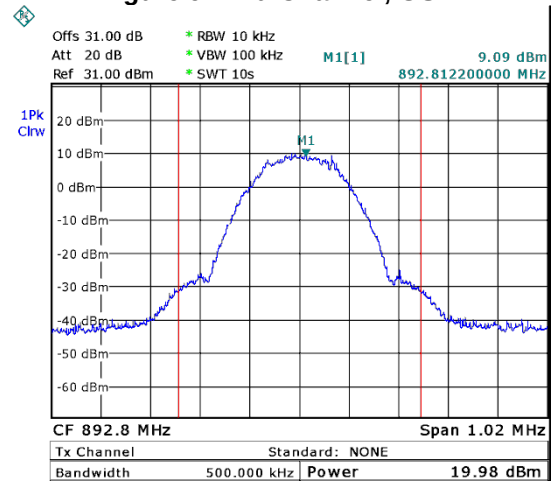
Date: 19.JUL.2012 16:54:19

Figure 7. Low Channel, GSM



Date: 19.JUL.2012 16:55:00

Figure 9. Mid Channel, GSM



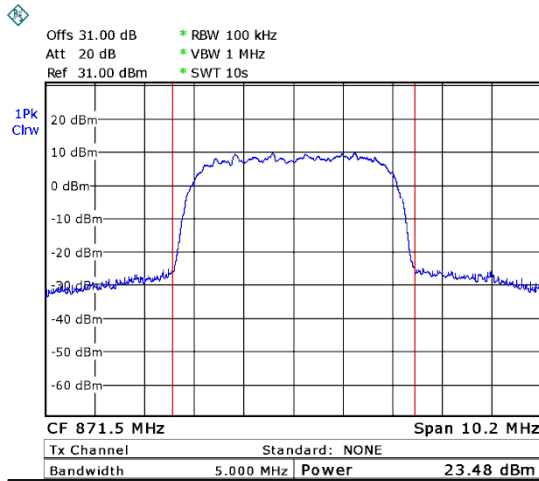
Date: 19.JUL.2012 16:55:36

Figure 11. High Channel, GSM



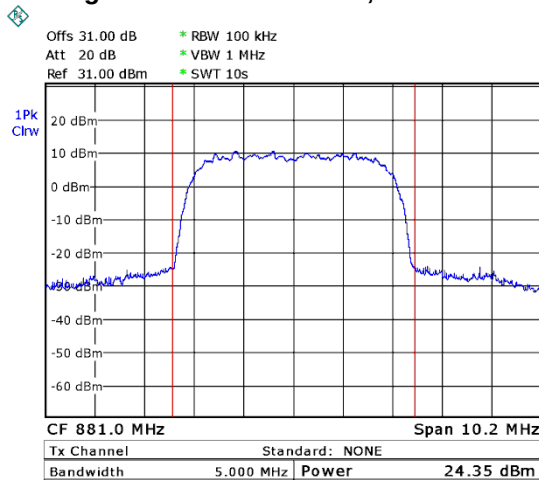
Specification:

FCC Part 22 Section 913, FCC Part 2, Section 1046



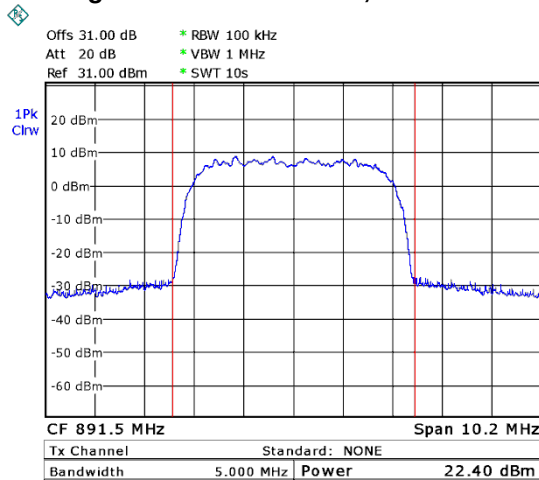
Date: 19.JUL.2012 16:50:17

Figure 12. Low Channel, WCDMA



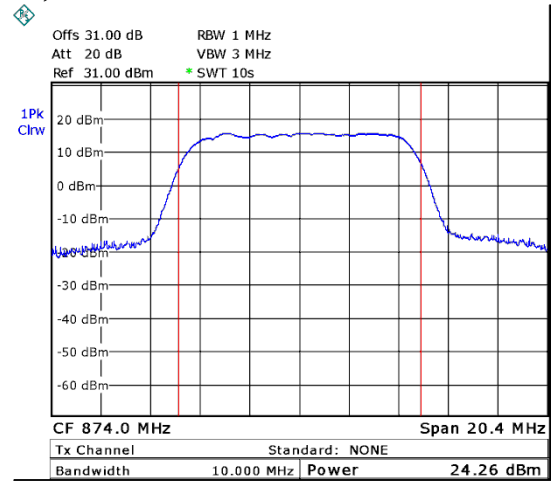
Date: 19.JUL.2012 16:50:52

Figure 14. Mid Channel, WCDMA



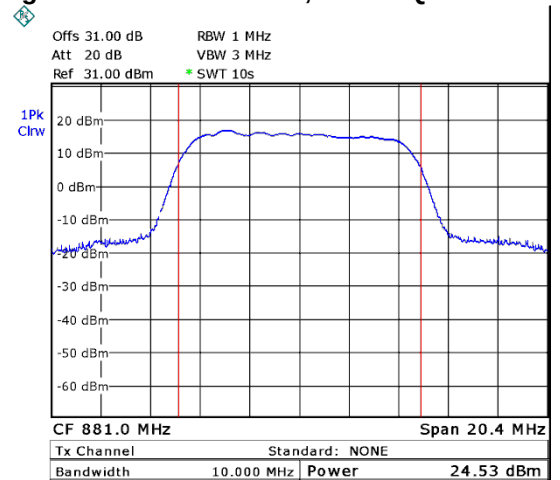
Date: 19.JUL.2012 16:51:23

Figure 16. High Channel, WCDMA



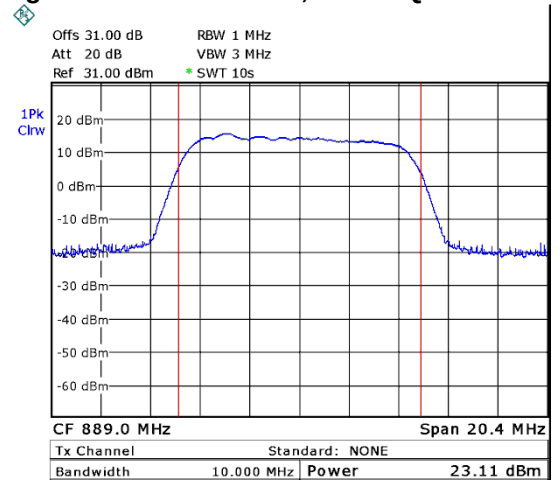
Date: 19.JUL.2012 16:46:10

Figure 13. Low Channel, LTE 64QAM 10MHz



Date: 19.JUL.2012 16:45:33

Figure 15. Mid Channel, LTE 64QAM 10MHz



Date: 19.JUL.2012 16:44:58

Figure 17. High Channel, LTE 64QAM 10MHz



4.4 Test Equipment Used, Peak Output Power CELL

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 18 Test Equipment Used



5. Occupied Bandwidth CELL

5.1 Test Specification

FCC Part 2, Section 1049

5.2 Test Procedure

The E.U.T. was set to the applicable test frequency with 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.

5.3 Test Results

Modulation		Operating Frequency (MHz)	Reading (MHz)
CDMA	Input	870.2	1.43
CDMA	Output	870.2	1.44
CDMA	Input	881.0	1.51
CDMA	Output	881.0	1.44
CDMA	Input	893.8	1.43
CDMA	Output	893.8	1.43
GSM	Input	870.2	0.42
GSM	Output	870.2	0.30
GSM	Input	881.0	0.42
GSM	Output	881.0	0.29
GSM	Input	893.8	0.42
GSM	Output	893.8	0.28
W-CDMA	Input	871.5	4.81
W-CDMA	Output	871.5	4.78
W-CDMA	Input	881.0	4.80
W-CDMA	Output	881.0	4.79
W-CDMA	Input	891.5	4.80
W-CDMA	Output	891.5	4.79
LTE -64QAM	Input	874.0	10.06
LTE -64QAM	Output	874.0	10.00
LTE -64QAM	Input	881.0	10.06
LTE -64QAM	Output	881.0	9.97
LTE -64QAM	Input	889.0	9.94
LTE -64QAM	Output	889.0	10.03

Figure 19 Occupied Bandwidth CELL Test Results Table

See additional information in Figure 20 to Figure 43.

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi



CDMA:

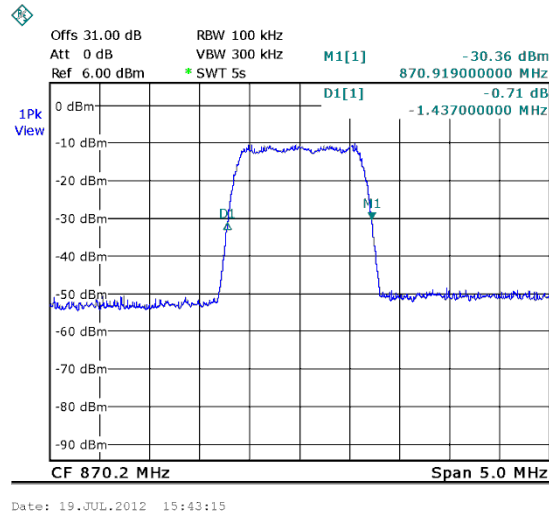


Figure 20.— Input 870.20 MHz

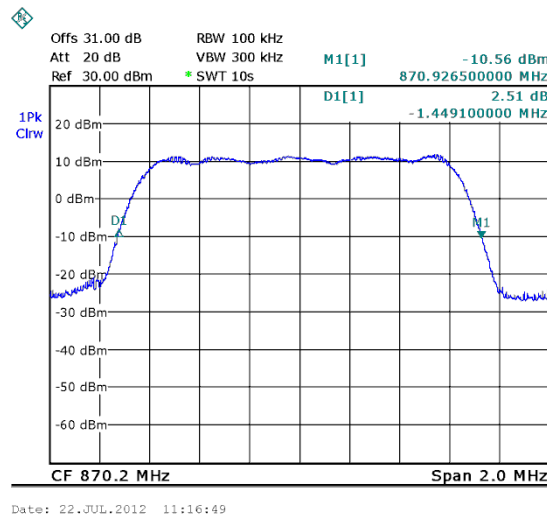


Figure 21.— Output 870.20 MHz

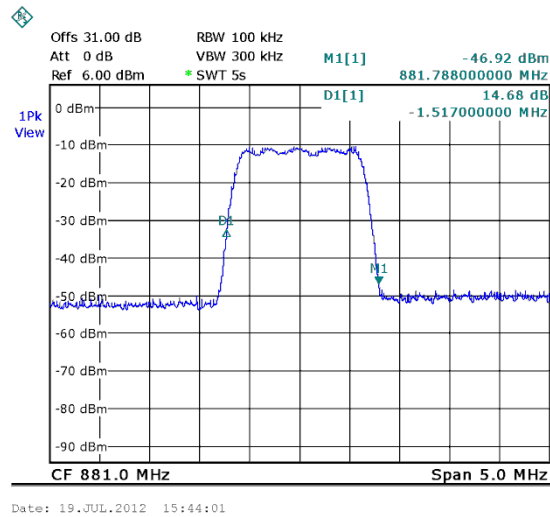


Figure 22.— Input 881.0 MHz

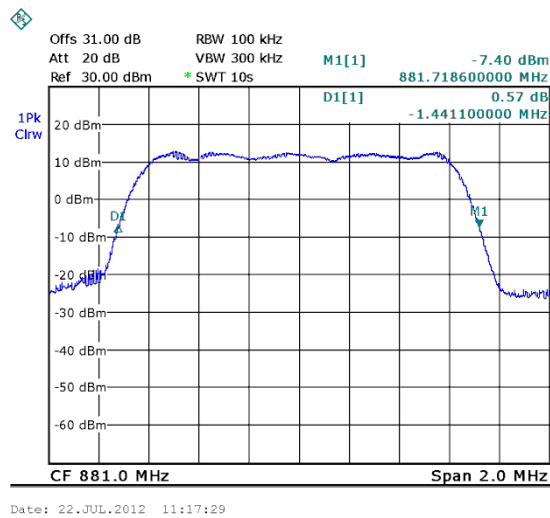


Figure 23.—Output 881.0 MHz

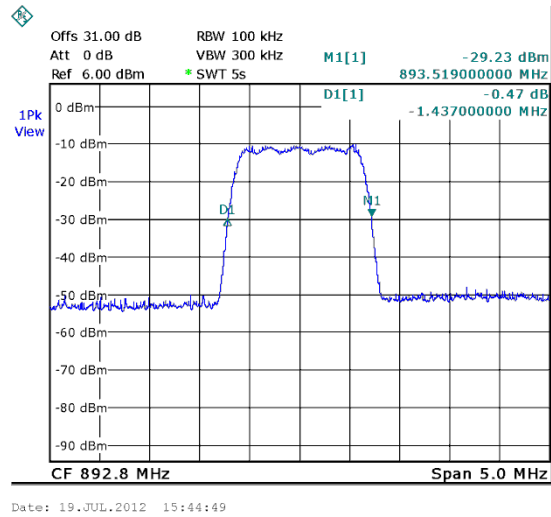


Figure 24.— Input 892.80 MHz

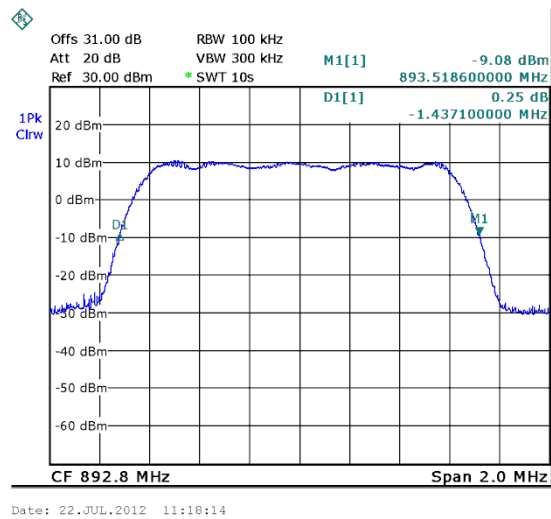


Figure 25.— Output 892.80 MHz.



GSM:

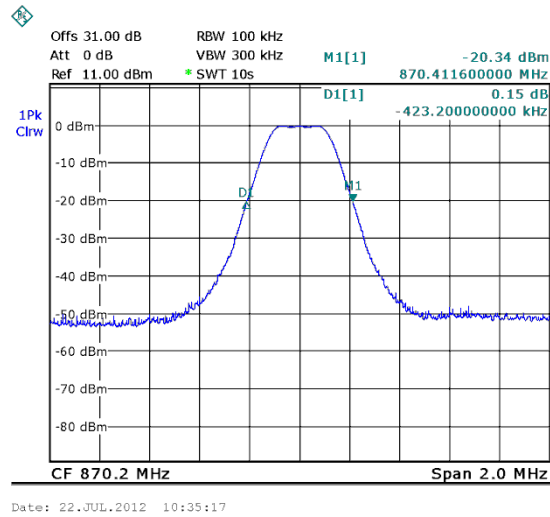


Figure 26.— Input 870.20 MHz

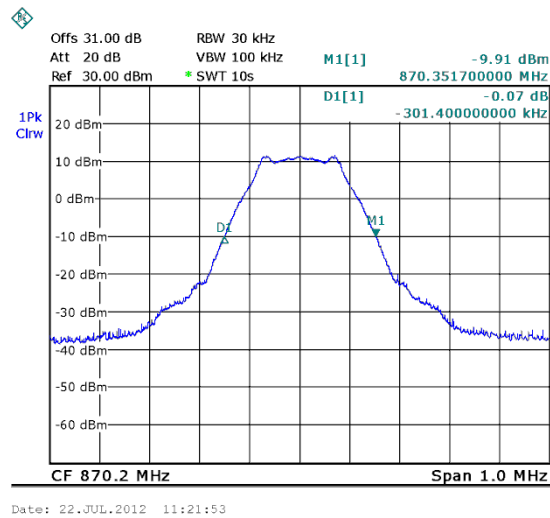


Figure 27.— Output 870.20 MHz

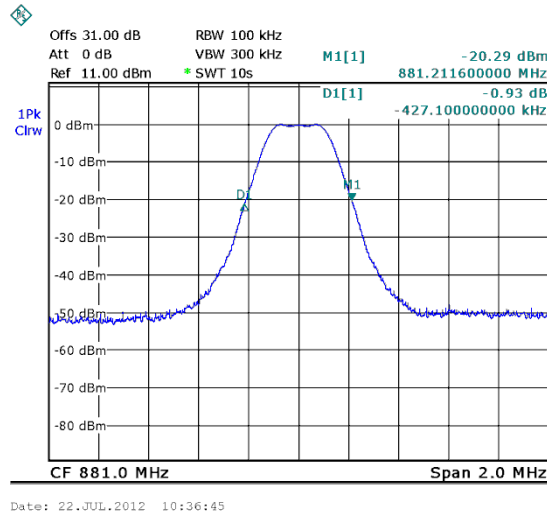


Figure 28.— Input 881.0 MHz

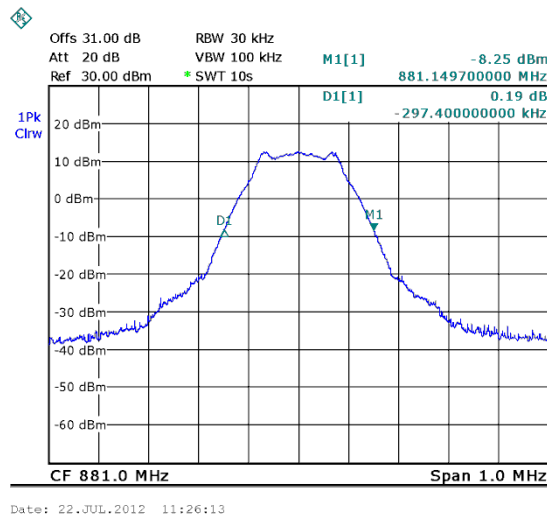


Figure 29.—Output 881.0 MHz

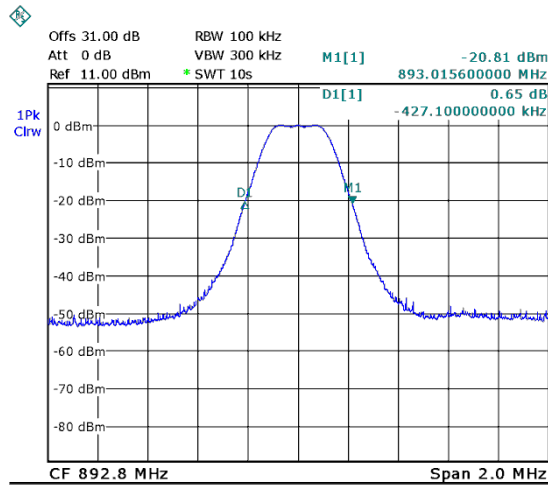


Figure 30.— Input 892.8 MHz

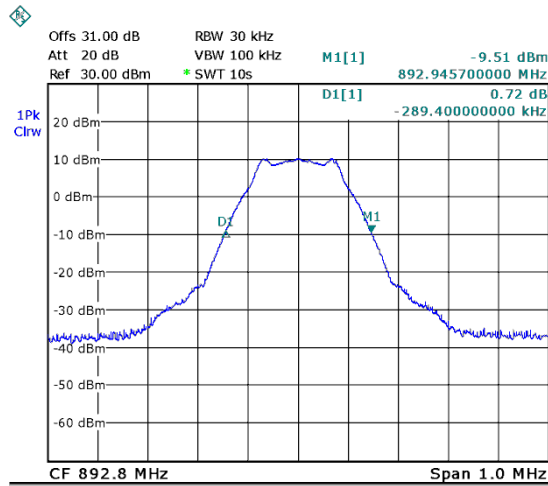


Figure 31.— Output 892.8 MHz



W-CDMA:

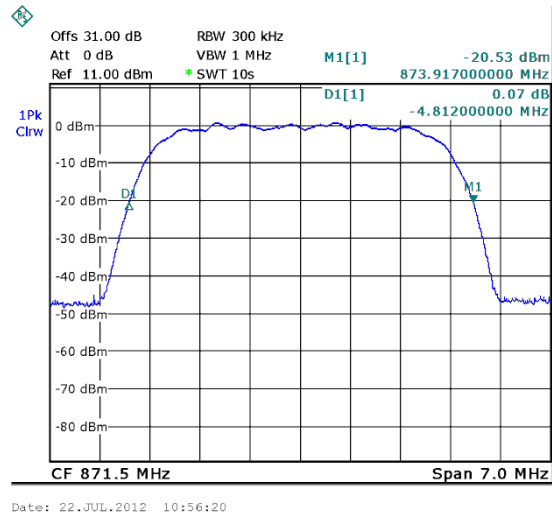


Figure 32.— Input 871.50 MHz

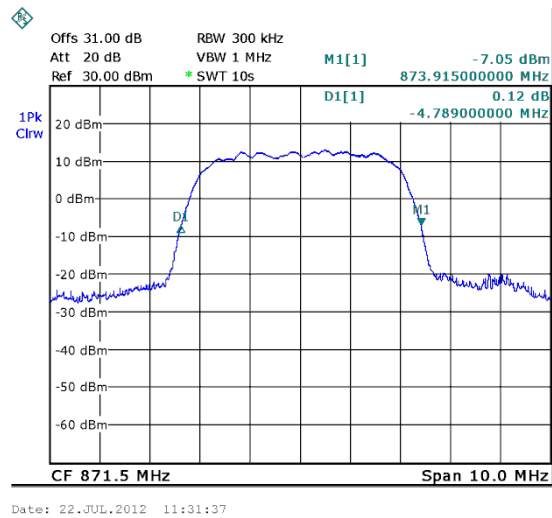


Figure 33.— Output 871.50 MHz

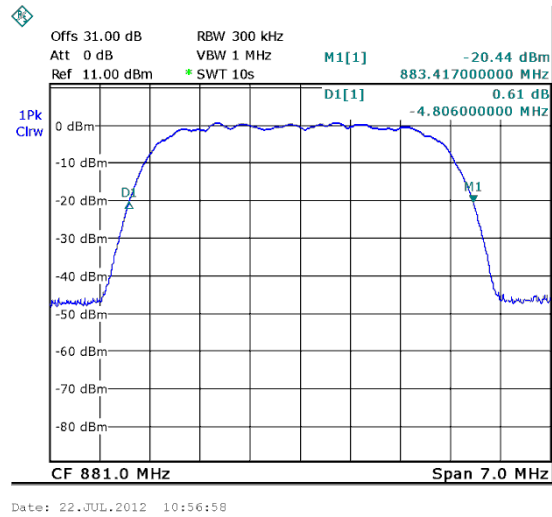


Figure 34.— Input 881.0 MHz

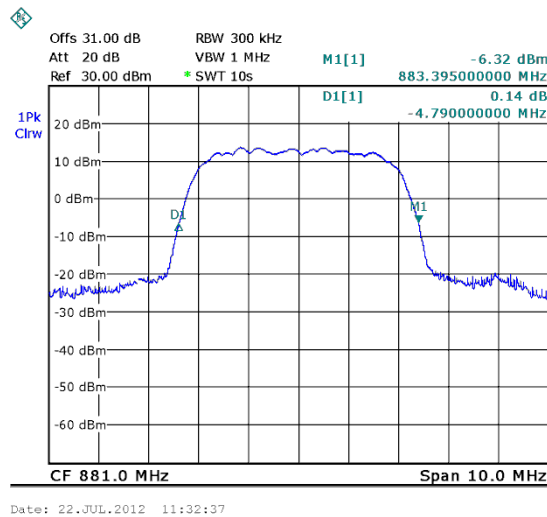


Figure 35.—Output 881.0 MHz

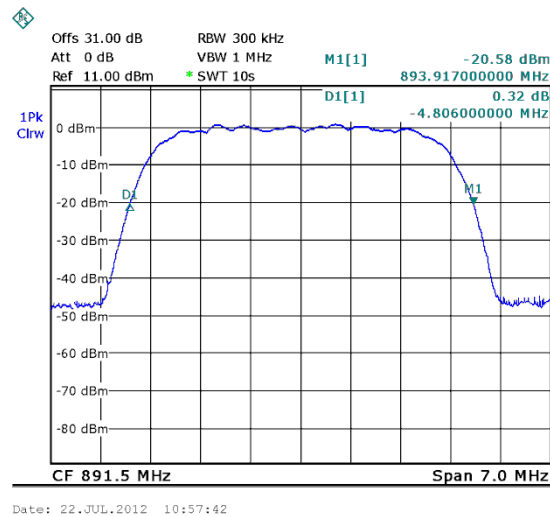


Figure 36.— Input 891.50 MHz

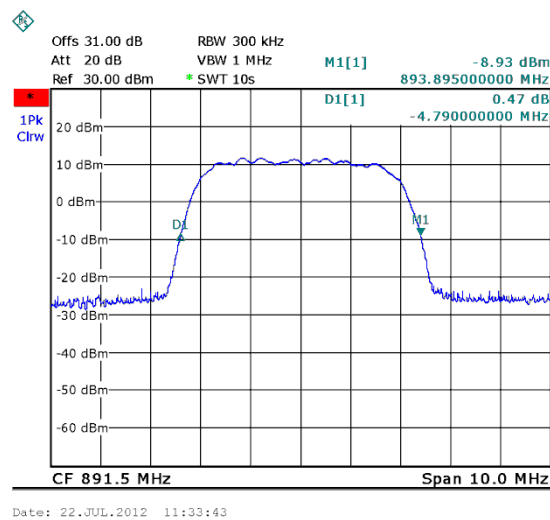


Figure 37.— Output 891.50 MHz



LTE:

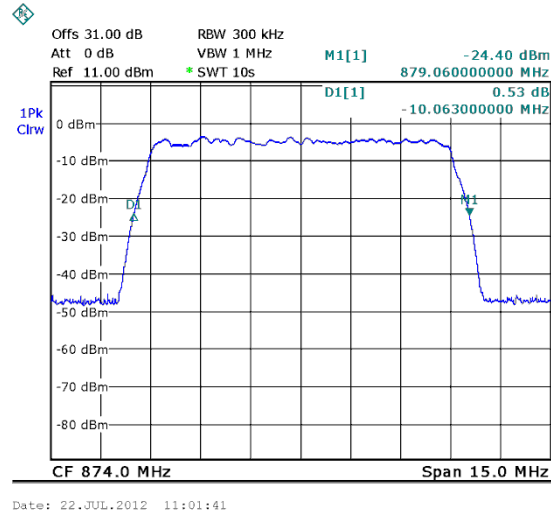


Figure 38.— Input 874.0 MHz

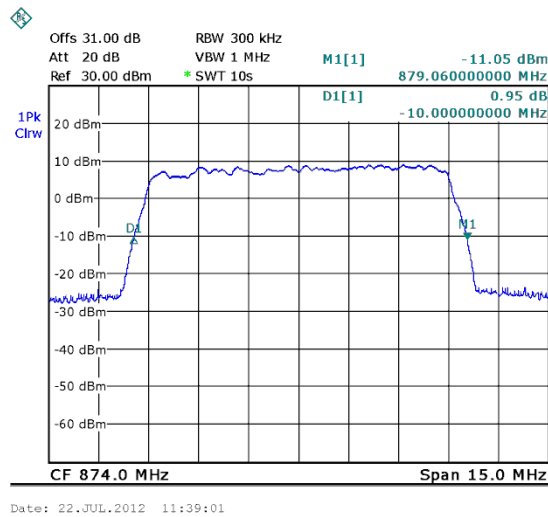


Figure 39.— Output 874.0 MHz

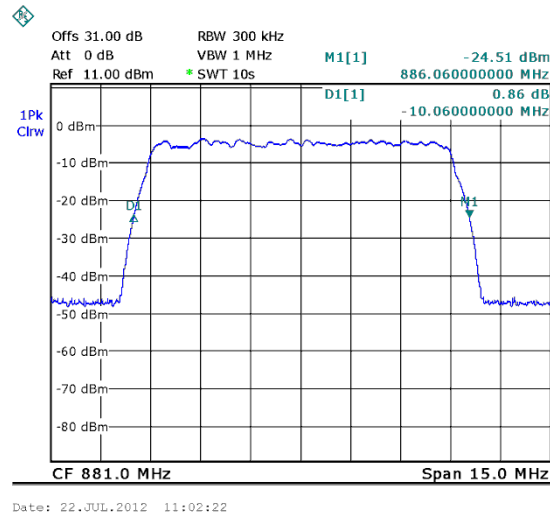


Figure 40.— Input 881.0 MHz.

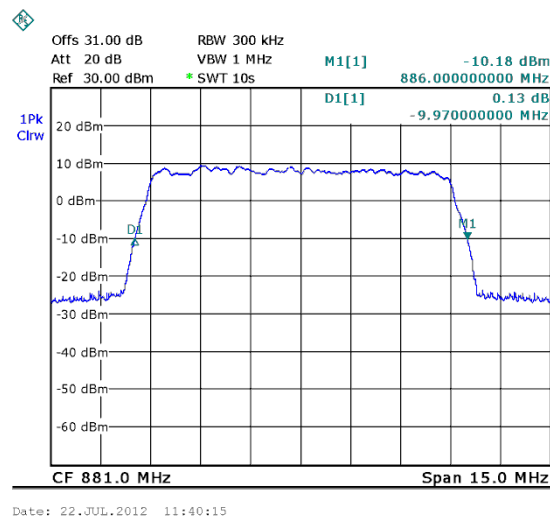


Figure 41.—Output 881.0 MHz

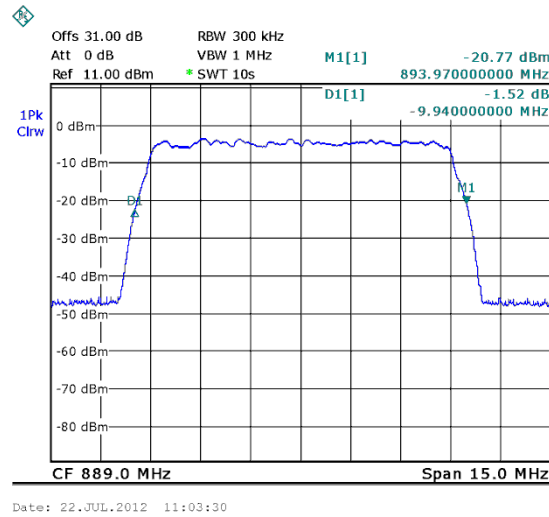


Figure 42.— Input 889.0 MHz

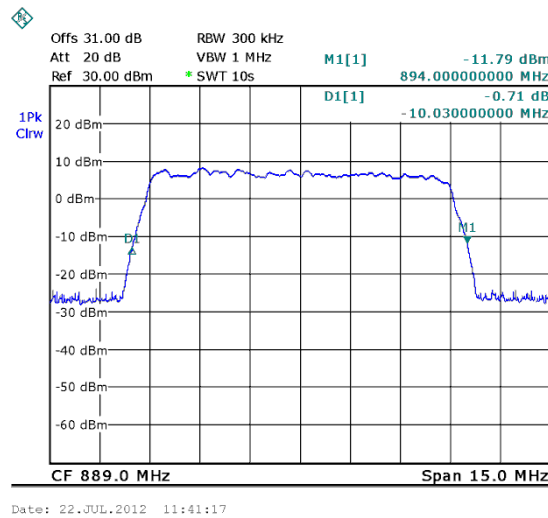


Figure 43.— Output 889.0 MHz



5.4 Test Equipment Used, Occupied Bandwidth, CELL

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 44 Test Equipment Used



6. Out of Band Emissions at Antenna Terminals CELL

6.1 Test Specification

FCC Part 22, Section 917; FCC Part 2.1051

6.2 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 (31 dB).

6.3 Test Results

The E.U.T. met the requirements of FCC Part 22, Section 22.219.
See plots in Figure 45 to Figure 56.

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi



CDMA:

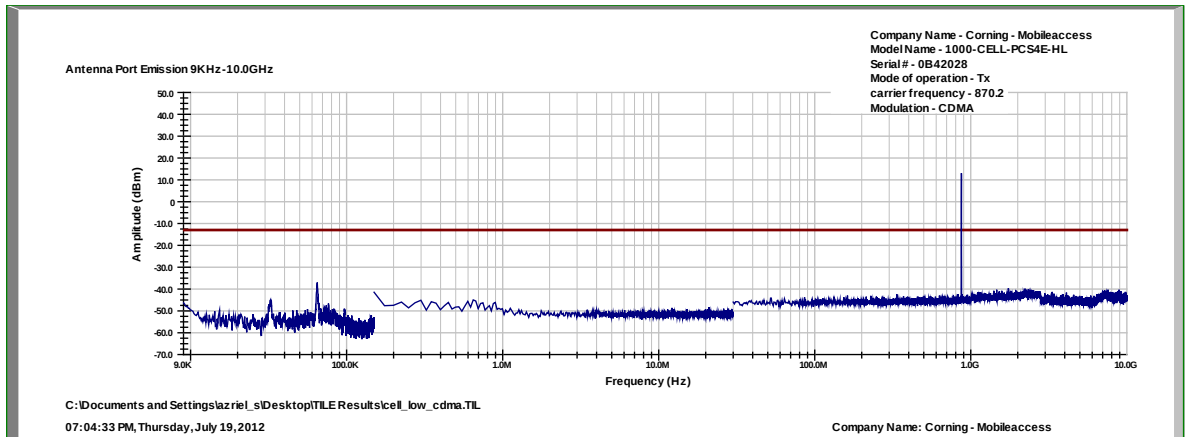


Figure 45.— 870.20 MHz

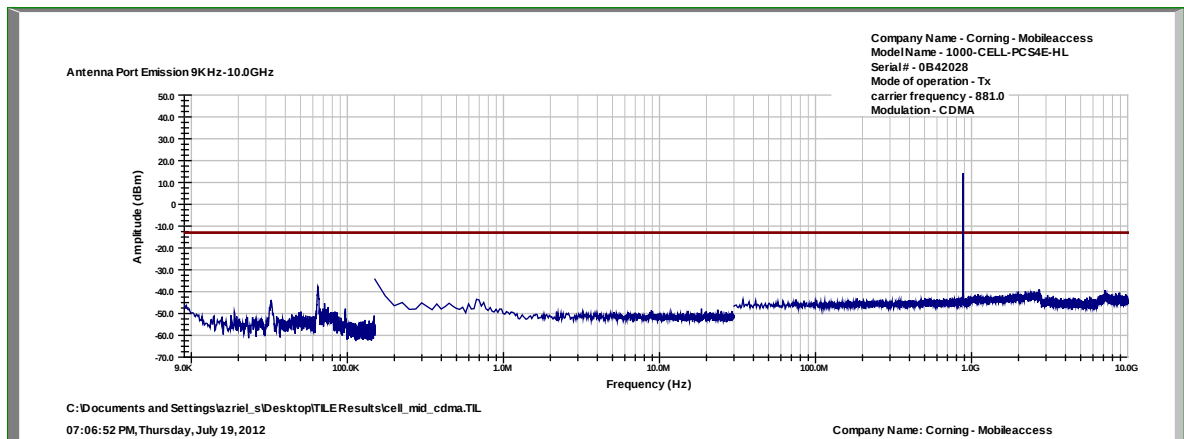


Figure 46.— 881.00 MHz

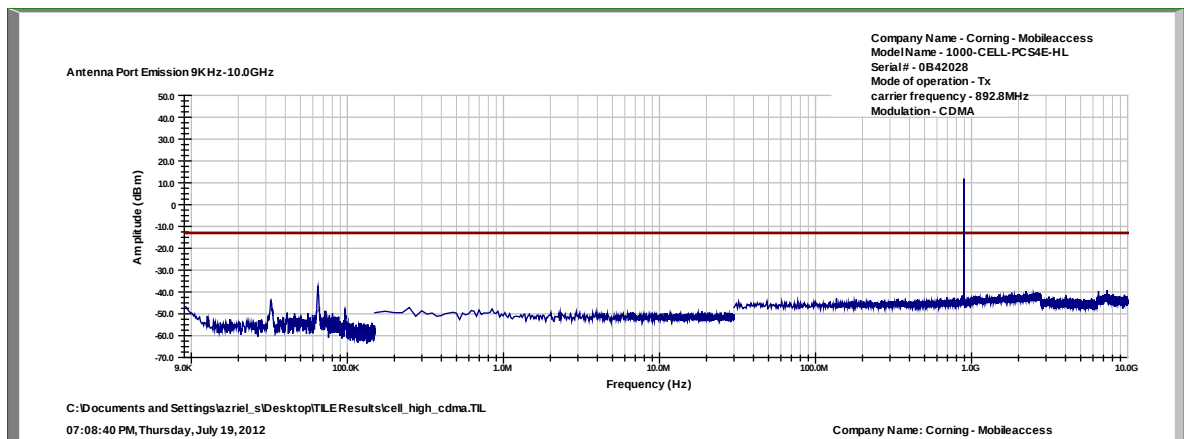


Figure 47.— 892.80 MHz



GSM:

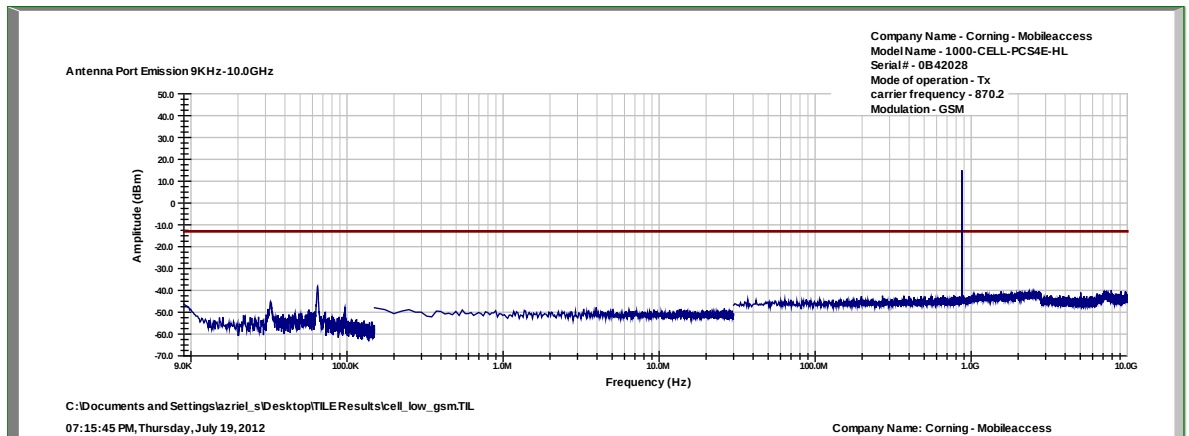


Figure 48.— 870.20 MHz

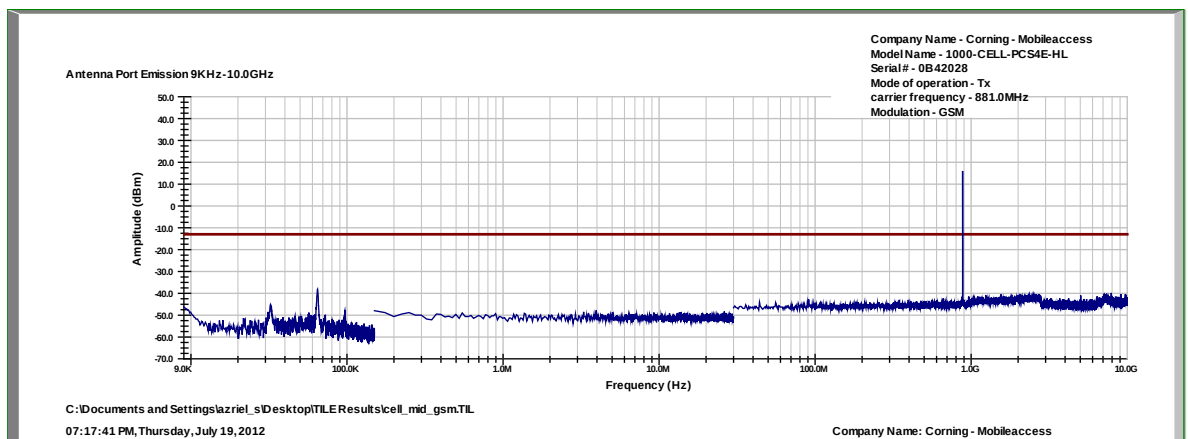


Figure 49.— 881.00 MHz

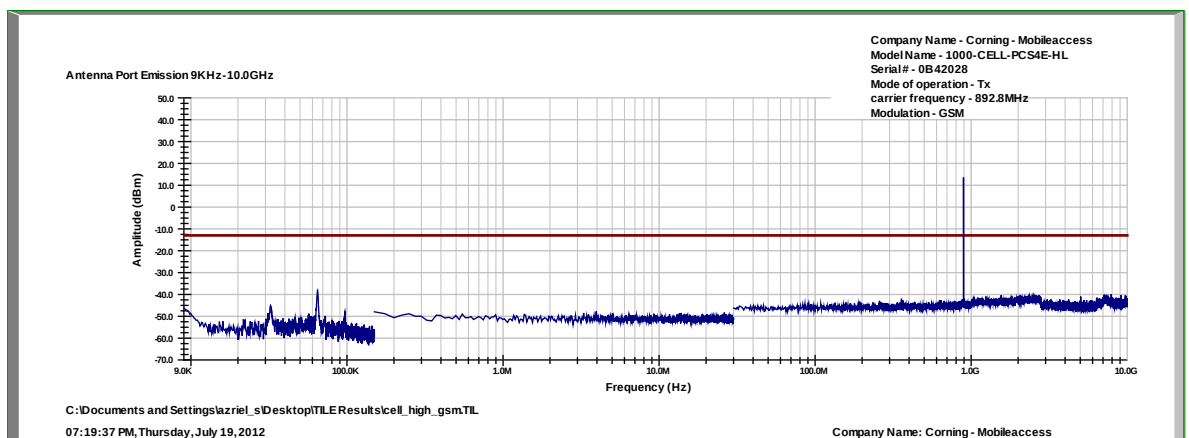


Figure 50.— 892.80 MHz



W-CDMA:

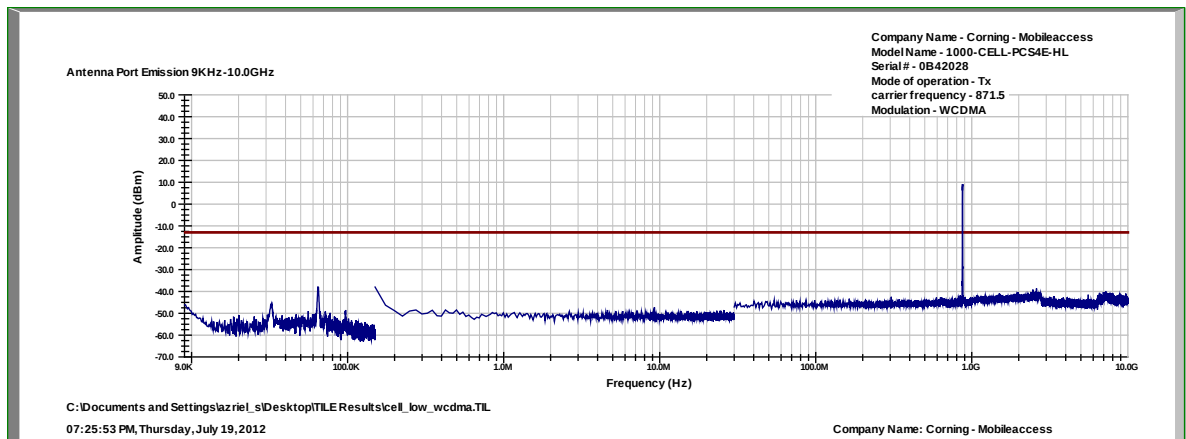


Figure 51.— 871.50 MHz

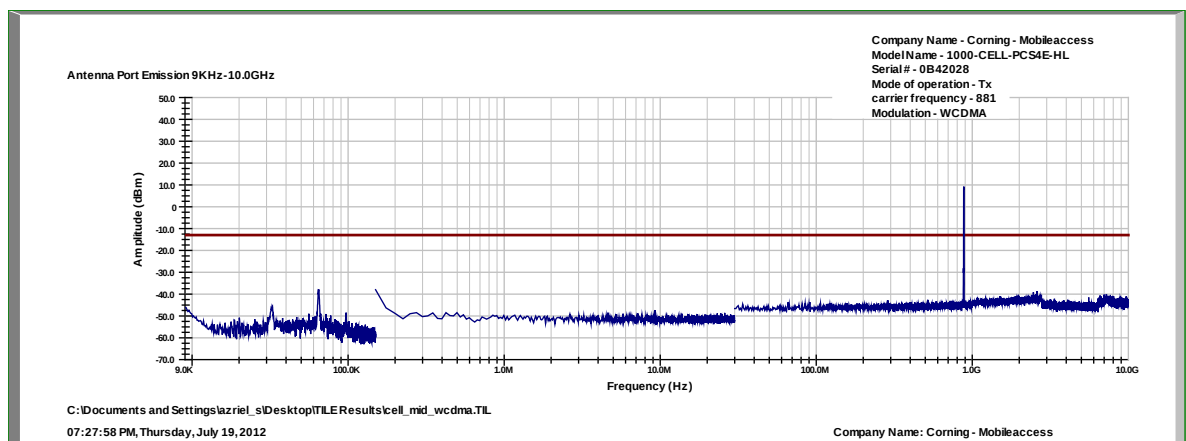


Figure 52.— 881.00 MHz

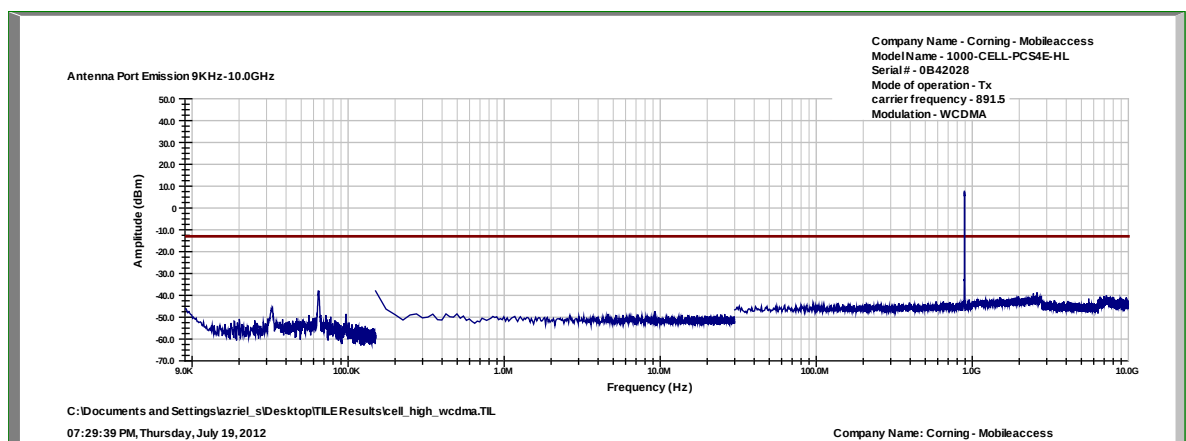


Figure 53.— 891.50 MHz



LTE – 64QAM- 10MHz BW:

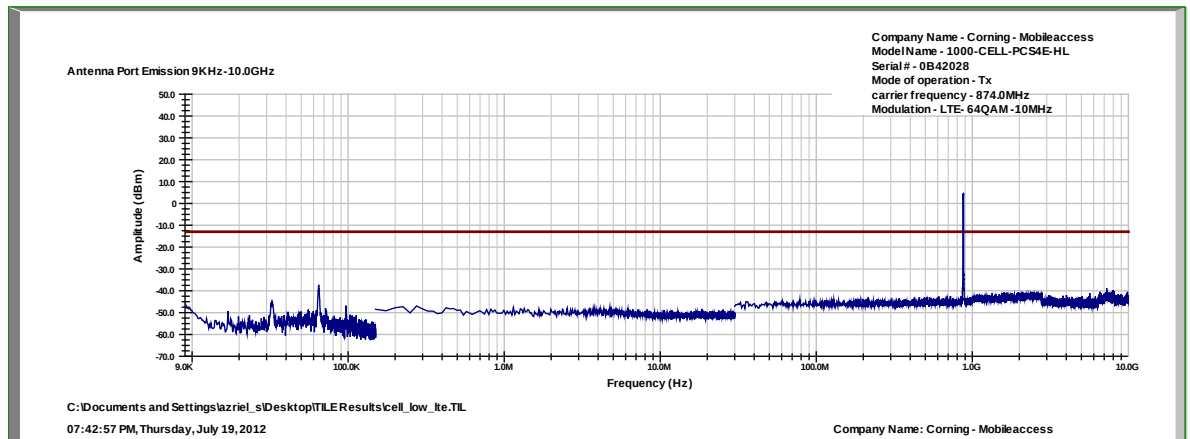


Figure 54.— 874.0 MHz

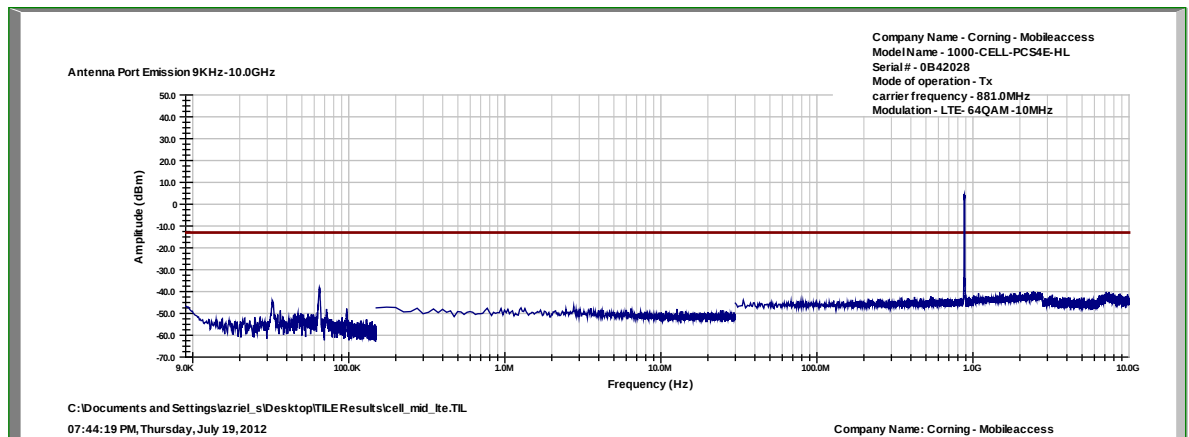


Figure 55.— 881.00 MHz

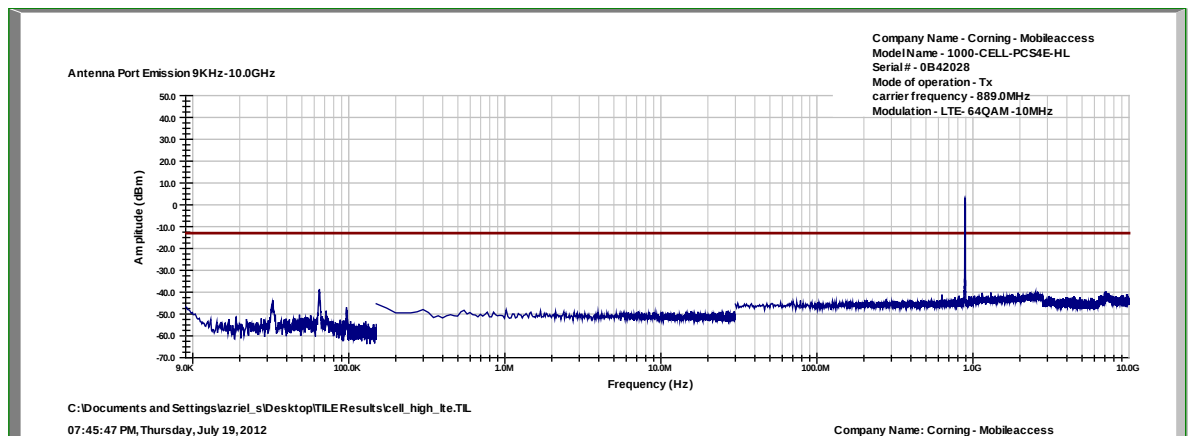


Figure 56.— 889.0 MHz



6.4 Test Equipment Used, Out of Band Emission at Antenna Terminals, CELL

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 57 Test Equipment Used

7. Band Edge Spectrum CELL

7.1 Test Specification

FCC Part 22, FCC Part 2.1051

7.2 Test procedure

For CDMA and GSM:

Enclosed are spectrum analyzer plots for the lowest operation frequency (870.20 MHz) and the highest operation frequency (892.8 MHz) in which the E.U.T. is planned to be used.

For W-CDMA and LTE:

Enclosed are spectrum analyzer plots for the lowest operation frequency (871.50 MHz/ 874.0MHz) and the highest operation frequency (891.5 MHz/ 889MHz) 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 (31 dB).

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



7.3 Test Results

Modulation	Operation Frequency (MHz)	Band Edge Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
CDMA	870.20	869.00	-25.65	-13.0	-12.65
	892.80	894.00	-32.52	-13.0	-19.50
GSM	870.20	869.00	-39.41	-13.0	-26.41
	892.80	894.00	-38.18	-13.0	-25.18
W-CDMA	871.50	869.00	-26.67	-13.0	-13.67
	891.50	894.00	-31.91	-13.0	-18.91
LTE	874.00	869.00	-21.65	-13.0	-8.65
	889.00	894.00	-21.12	-13.0	-8.12

Figure 58 Band Edge Spectrum Test Results Table CELL

See additional information in Figure 59 to Figure 66.

JUDGEMENT: Passed by 8.12 dB

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi

CDMA:

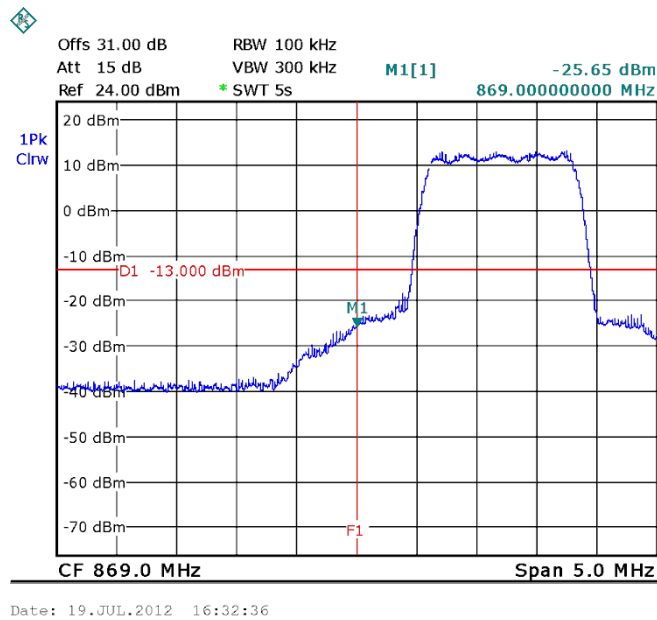


Figure 59.— 870.20 MHz

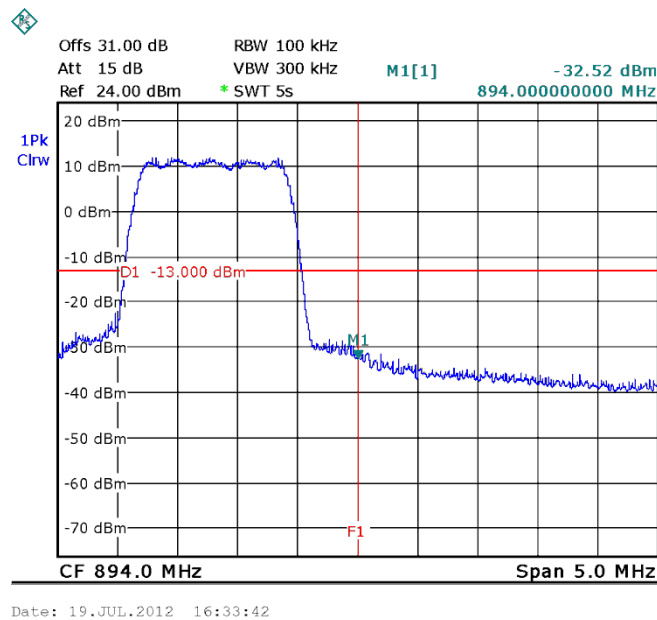


Figure 60.— 892.80 MHz

GSM:

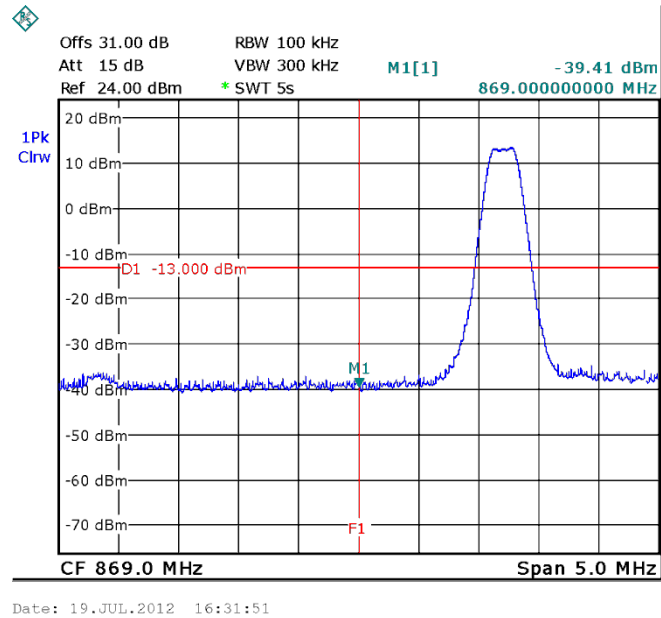


Figure 61.— 870.20 MHz

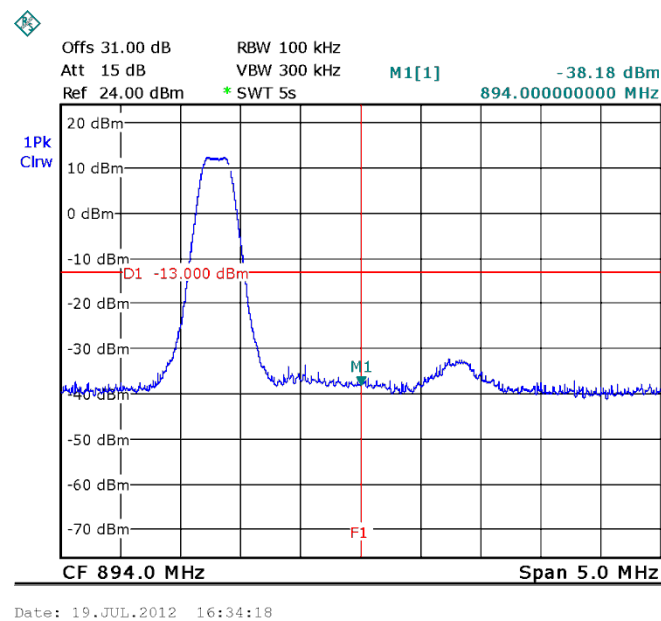


Figure 62.— 892.80 MHz



W-CDMA:

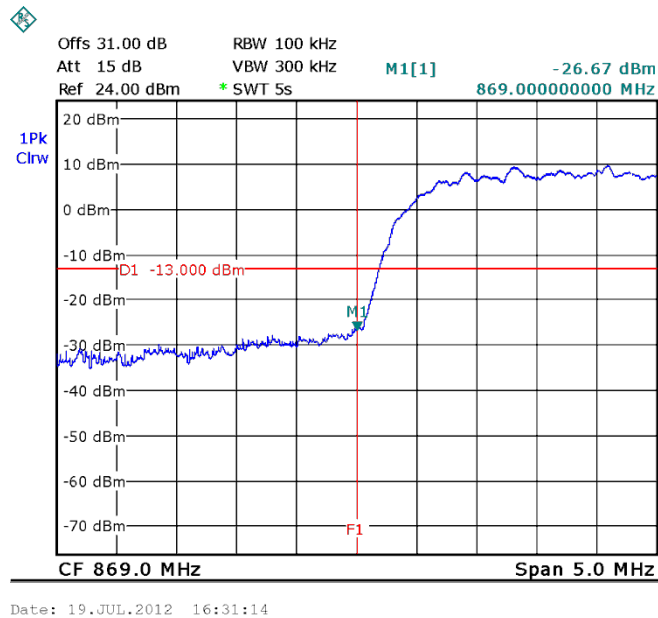


Figure 63.— 871.50 MHz

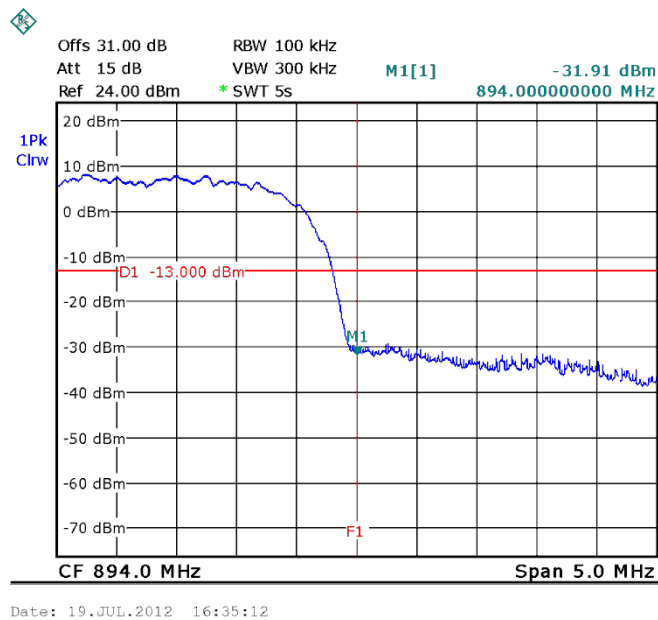


Figure 64.— 891.50 MHz



LTE:

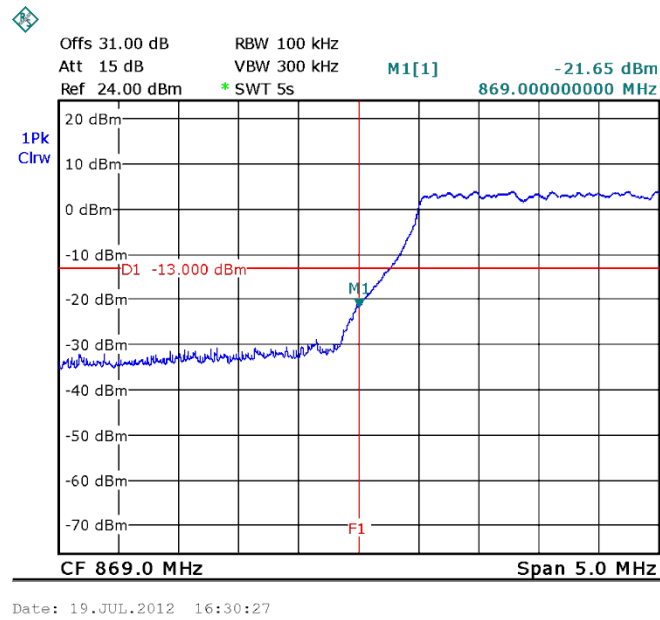


Figure 65.— 874.0 MHz

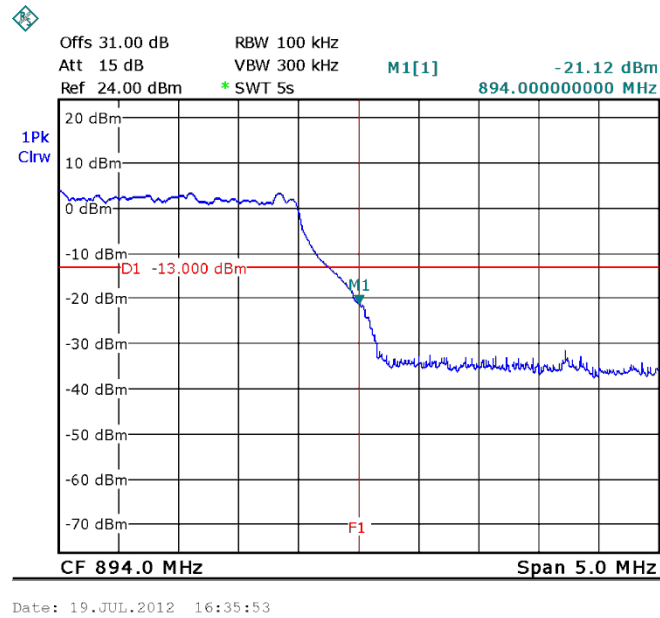


Figure 66.— 889.0 MHz



7.4 Test Equipment Used, Band Edge Spectrum, CELL

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 67 Test Equipment Used

8. Out of Band Emissions (Radiated) CELL

8.1 Test Specification

FCC Part 22, Section 917; FCC Part 2.1053

8.2 Test Procedure

The test method was based on ANSI/TIA-603-C: 2004, Section 2.2.12

Unwanted Emissions: Radiated Spurious.

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 $43 + 10 \log (P)$ dB, yielding -13dBm .

- (a) The E.U.T. operation mode and test set-up are as described in Section 3.

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, 1.5 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-20 GHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The emissions were measured at a distance of 3 meters.

- (b) The E.U.T. was replaced by a substitution antenna (dipole 30MHz-1GHz, Horn Antenna above 1GHz) driven by a signal generator. The height was readjusted for maximum reading. The signal generator level was adjusted to obtain the same reading on the EMI receiver as in step (a).

The signals observed in step (a) were converted to radiated power using:

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{Cable Loss (dB)} + \text{Substitution Antenna Gain (dB)}$$

P_d = Dipole equivalent power (result).

P_g = Signal generator output level.



8.3 Test Results

Carrier Channel	Freq.	Antenna Pol.	Maximum Peak Level	Signal Generator RF Output	Cable Loss	Antenna Gain	Effective Radiated Power Level	Spec.	Margin
(MHz)	(MHz)		(dB μ V/m)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)
870.20	1740.40	V	49.7	-51.11	5.45	7.64	-48.92	-13.0	-35.92
870.20	1740.40	H	45.8	-54.84	5.45	7.64	-52.65	-13.0	-39.65
881.00	1762.00	V	48.7	-51.09	5.6	7.66	-49.03	-13.0	-36.06
881.00	1762.00	H	47.4	-52.65	5.6	7.66	-50.59	-13.0	-37.59
892.80	1785.60	V	49.6	-50.19	5.6	7.66	-48.13	-13.0	-35.13
892.80	1785.60	H	45.8	-54.25	5.6	7.66	-52.19	-13.0	-39.19

Figure 68 Out of Band Emissions (Radiated) Test Results Table

The E.U.T met the requirements of the FCC Part 22, Section 917;
FCC Part 2.1053 specifications.

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi



8.4 Test Equipment Used, Out of Band Emissions (Radiated), CELL

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	December 12, 2011	1 Year
RF Filter Section	HP	85420E	3705A00248	December 12, 2011	1 Year
Active Loop Antenna	Emco	6502	2950	October 19, 2011	1 year
Antenna Biconical	ARA	BCD-235/B	1041	November 12, 2011	1 Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 29, 2012	1 Year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	January 27, 2011	2 Years
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 5, 2011	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	March 5, 2012	1 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	LaserJet 2200	JPKG19982	N/A	N/A

9. Peak Output Power PCS

9.1 Test Specification

FCC Part 24, Subpart E

9.2 Test procedure

Peak Power Output must not exceed 100 Watts (50dBm).

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (1dB). The E.U.T. RF output was W-CDMA ,LTE , GSM and CDMA modulated. Special attention was taken to prevent Spectrum Analyzer RF input overload.

9.3 Test Results

Modulation	Operation Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
CDMA	1931.20	25.15	50.0	-24.85
	1960.00	29.05	50.0	-20.95
	1988.80	27.77	50.0	-22.23
GSM	1931.20	23.92	50.0	-26.08
	1960.00	27.89	50.0	-22.11
	1988.80	26.55	50.0	-23.45
W-CDMA	1932.50	26.47	50.0	-23.53
	1960.00	29.84	50.0	-20.16
	1987.50	28.70	50.0	-21.30
LTE – 64QAM – 10MHz	1935.00	27.41	50.0	-22.59
	1960.00	30.20	50.0	-19.80
	1985.00	29.22	50.0	-20.78

Figure 69 Peak Output Power Test Results Table, PCS

See additional information in Figure 70 to Figure 81

JUDGEMENT: Passed by 19.80 dB

TEST PERSONNEL:

Tester Signature: 

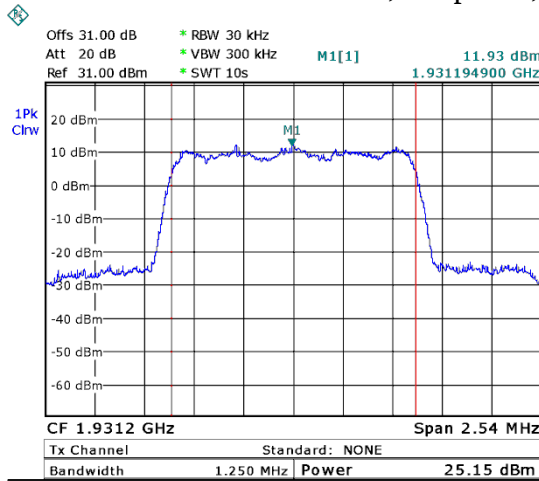
Date: 31.07.12

Typed/Printed Name: A. Sharabi



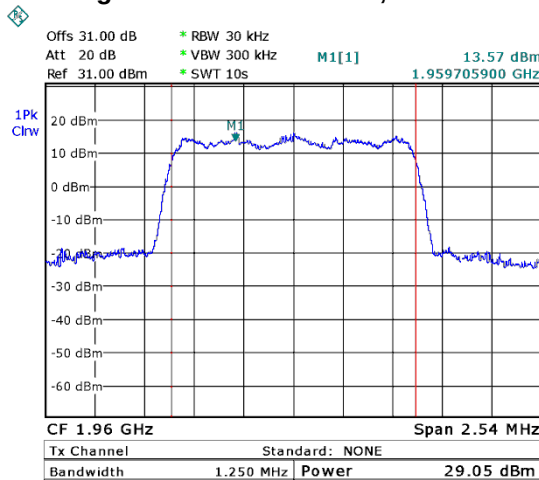
Specification:

FCC Part 24, Subpart E, Section 232, FCC Part 2, Section 1046



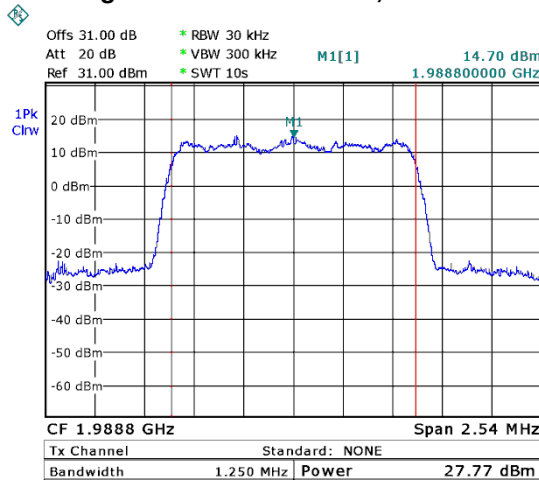
Date: 19.JUL.2012 17:01:27

Figure 70. Low Channel, CDMA



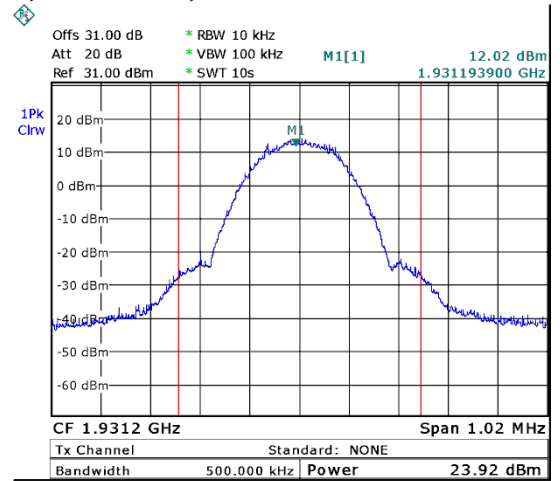
Date: 19.JUL.2012 17:06:25

Figure 72. Mid Channel, CDMA



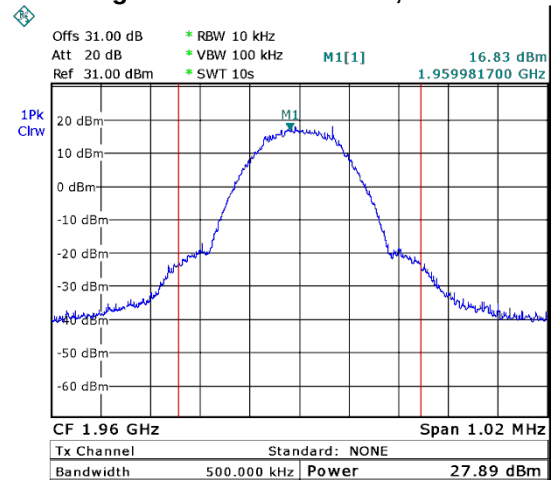
Date: 19.JUL.2012 17:05:15

Figure 74. High Channel, CDMA



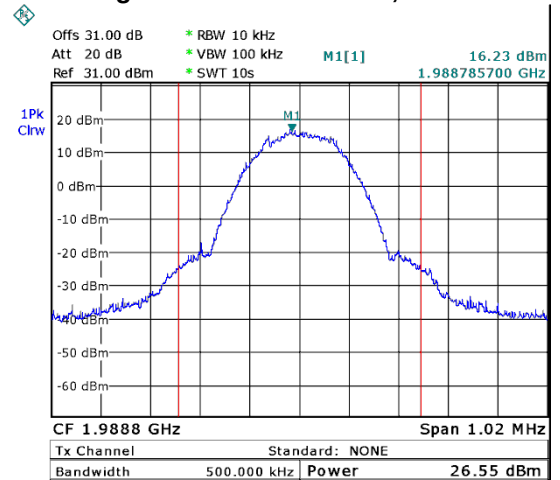
Date: 19.JUL.2012 16:56:31

Figure 71. Low Channel, GSM



Date: 19.JUL.2012 16:57:32

Figure 73. Mid Channel, GSM



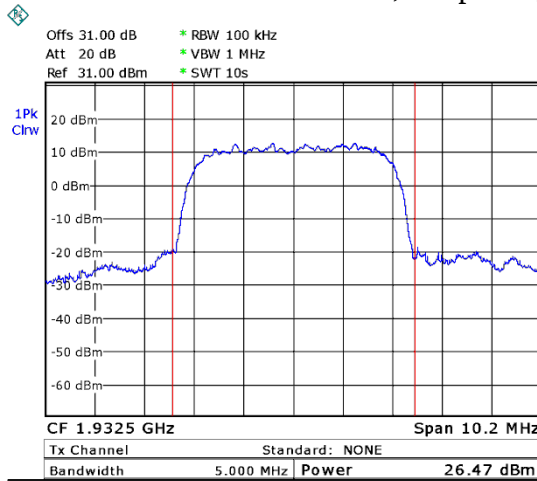
Date: 19.JUL.2012 16:58:22

Figure 75. High Channel, GSM



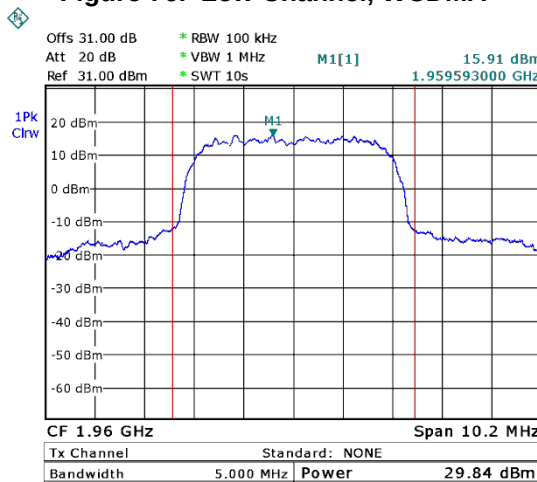
Specification:

FCC Part 24, Subpart E, Section 232, FCC Part 2, Section 1046



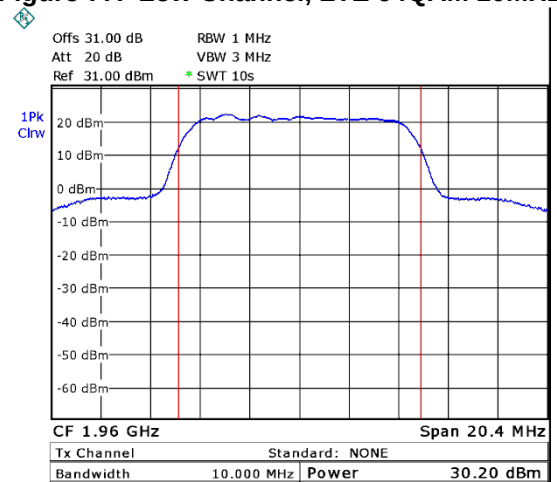
Date: 19.JUL.2012 16:51:57

Figure 76. Low Channel, WCDMA



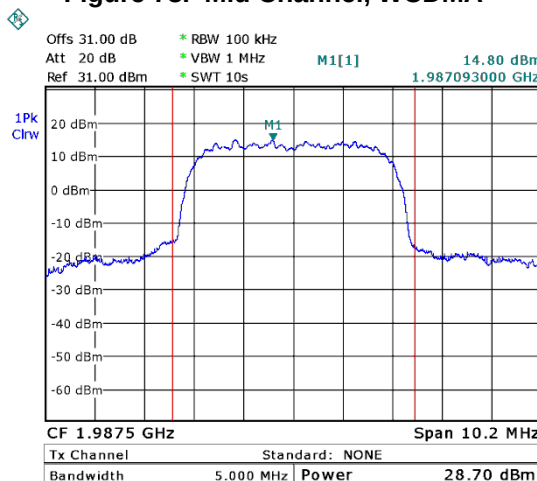
Date: 19.JUL.2012 16:46:52

Figure 77. Low Channel, LTE 64QAM 10MHz



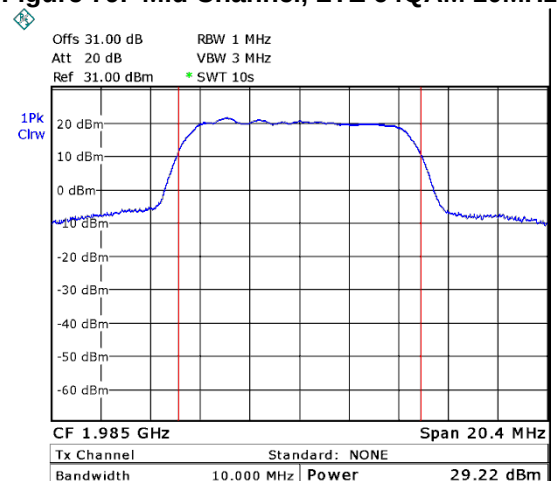
Date: 19.JUL.2012 17:07:59

Figure 78. Mid Channel, WCDMA



Date: 19.JUL.2012 16:47:27

Figure 79. Mid Channel, LTE 64QAM 10MHz



Date: 19.JUL.2012 17:09:10

Figure 80. High Channel, WCDMA

Date: 19.JUL.2012 16:48:29

Figure 81. High Channel, LTE 64QAM 10MHz



9.4 Test Equipment Used, Peak Output Power, PCS

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 82 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 CDMA, GSM and W-CDMA 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.

10.3 Results Table

Modulation		Operating Frequency (MHz)	Reading (MHz)
CDMA	Input	1931.2	1.44
	Output	1931.2	1.44
	Input	1960.0	1.44
	Output	1960.0	1.45
	Input	1988.8	1.44
	Output	1988.8	1.42
GSM	Input	1931.2	0.42
	Output	1931.2	0.30
	Input	1960.0	0.42
	Output	1960.0	0.29
	Input	1988.8	0.42
	Output	1988.8	0.29
W-CDMA	Input	1932.5	4.79
	Output	1932.5	4.79
	Input	1960.0	4.79
	Output	1960.0	4.81
	Input	1987.5	4.79
	Output	1987.5	4.81
LTE -64QAM -10MHz BW	Input	1935.0	10.03
	Output	1935.0	10.00
	Input	1960.0	10.09
	Output	1960.0	10.00
	Input	1985.0	10.03
	Output	1985.0	10.12

Figure 83 Occupied Bandwidth Test Results Table PCS

See additional information in Figure 84 to Figure 107

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi



CDMA

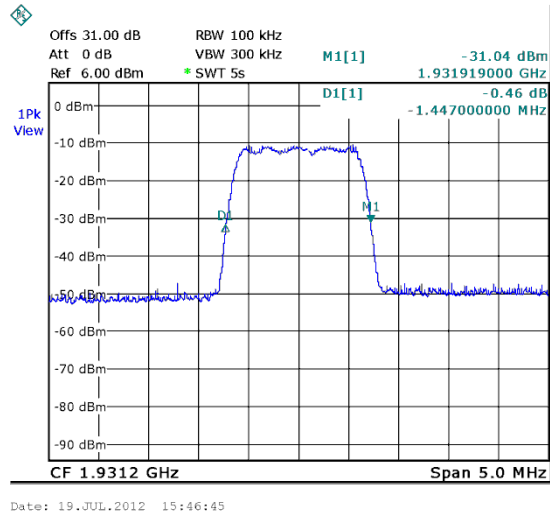


Figure 84.— Input 1931.20 MHz

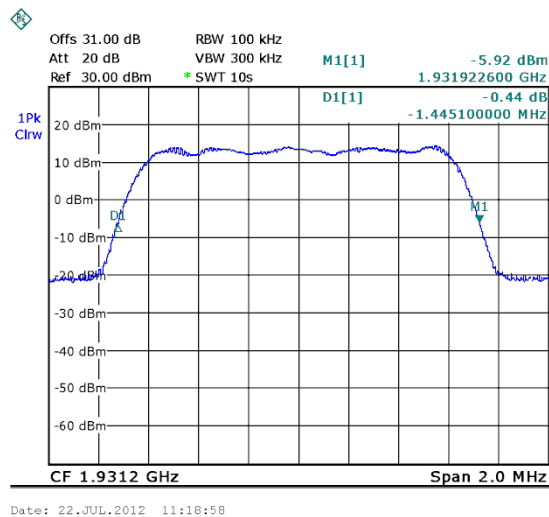


Figure 85.— Output 1931.20 MHz

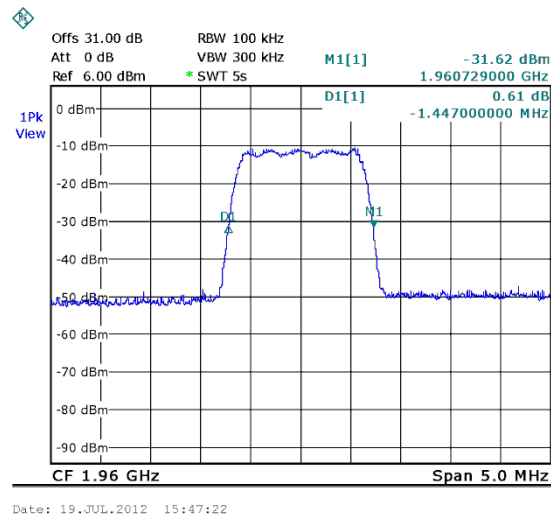


Figure 86.— Input 1960.00 MHz

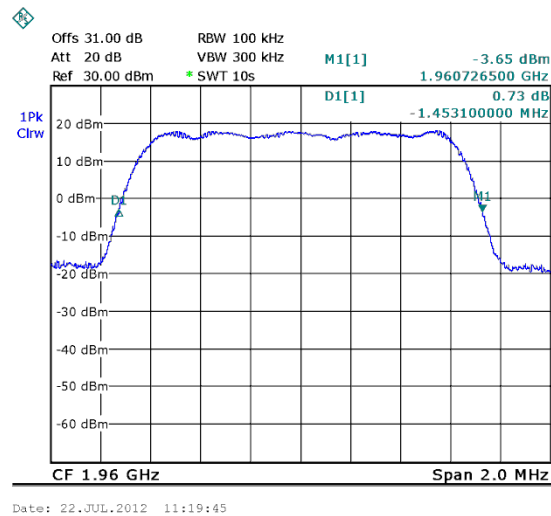


Figure 87.— Output 1960.00 MHz

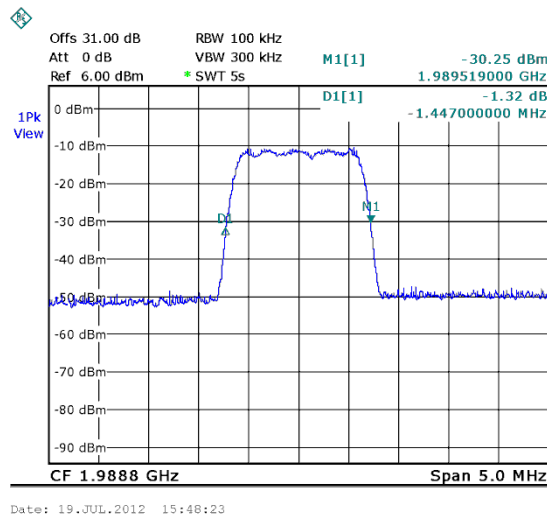


Figure 88.— Input 1988.80 MHz

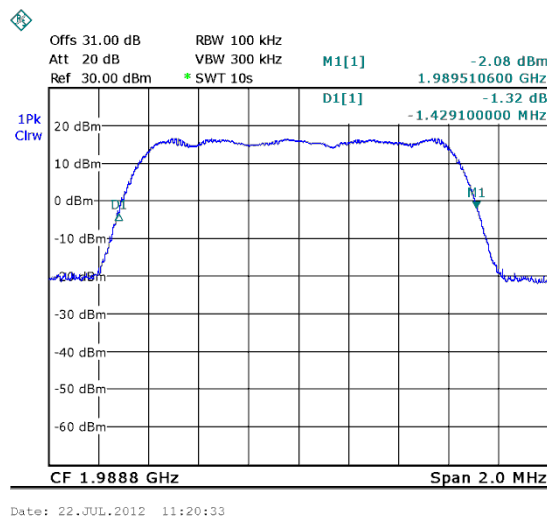


Figure 89.— Output 1988.80 MHz



GSM:

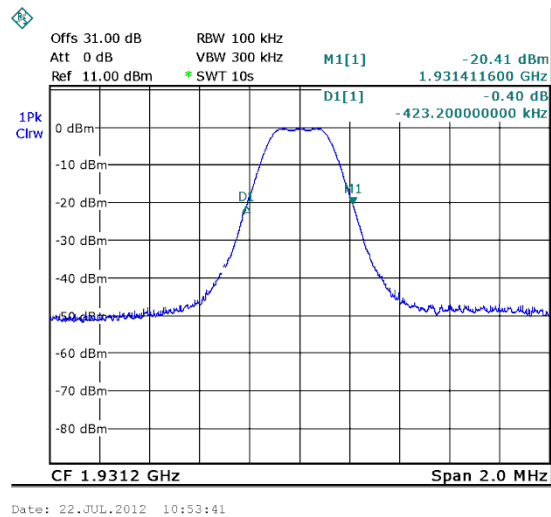


Figure 90.— Input 1931.20 MHz

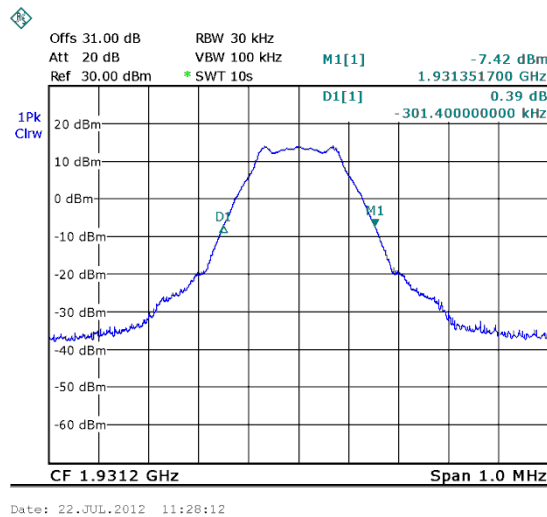


Figure 91.— Output 1931.20 MHz

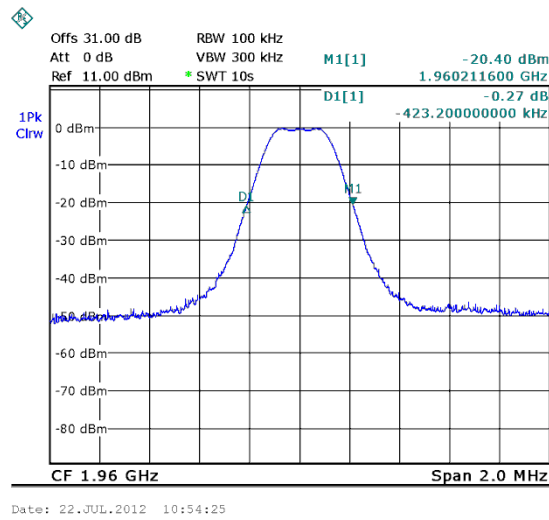


Figure 92.— Input 1960.00 MHz

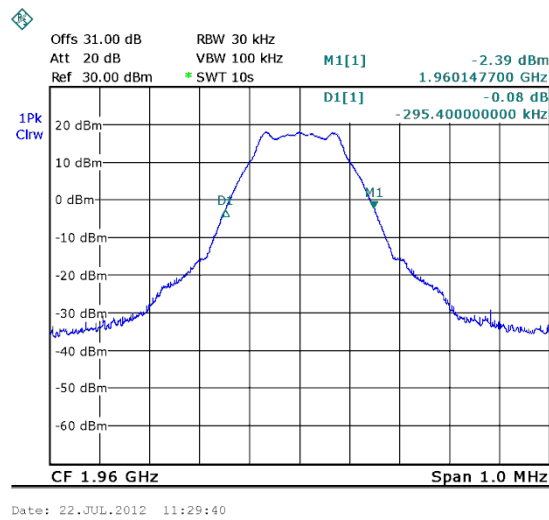


Figure 93.— Output 1960.00 MHz

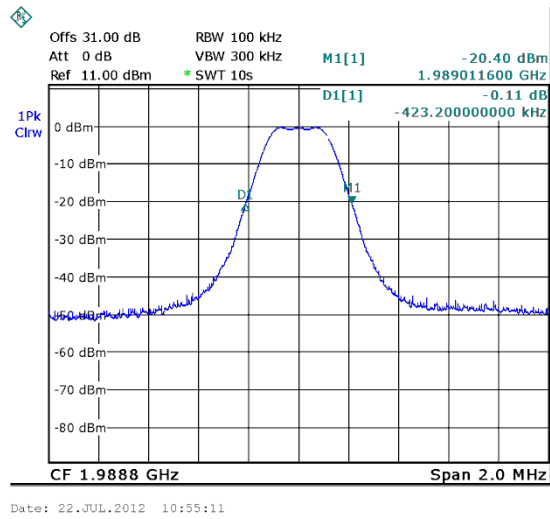


Figure 94.— Input 1988.80 MHz

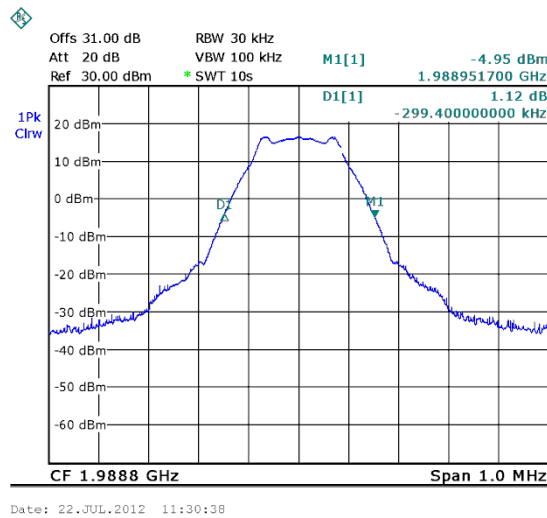


Figure 95.— Output 1988.80 MHz



W-CDMA:

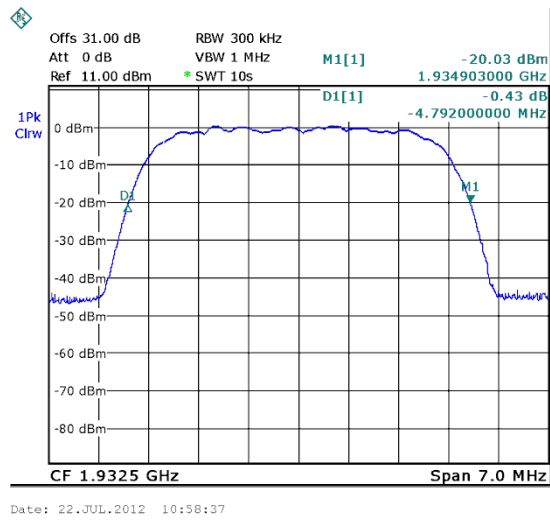


Figure 96.— Input 1932.50 MHz

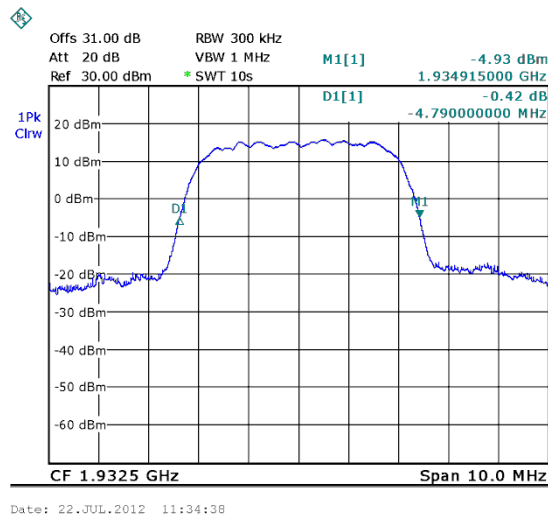


Figure 97.— Output 1932.50 MHz

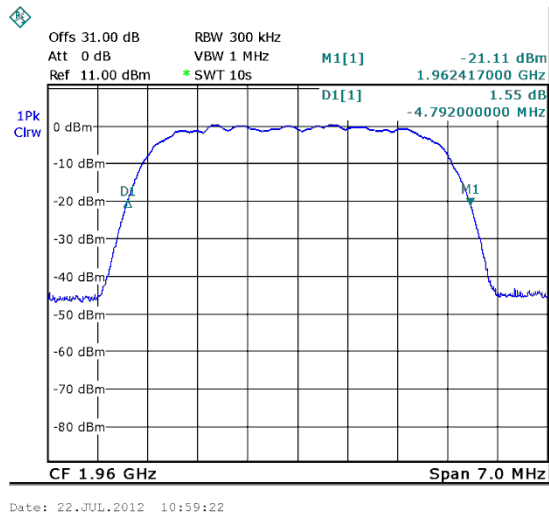


Figure 98.— Input 1960.00 MHz

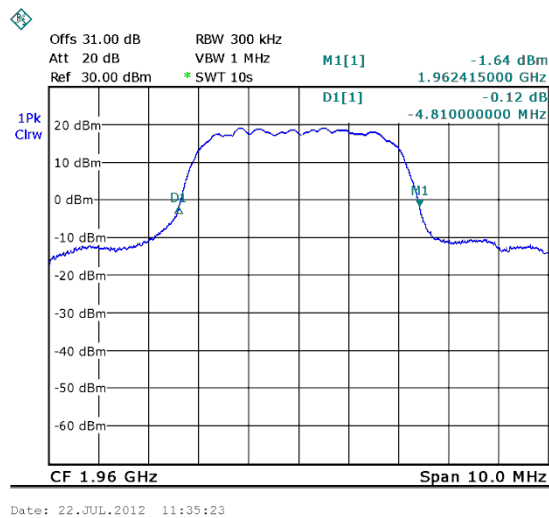


Figure 99.— Output 1960.00 MHz

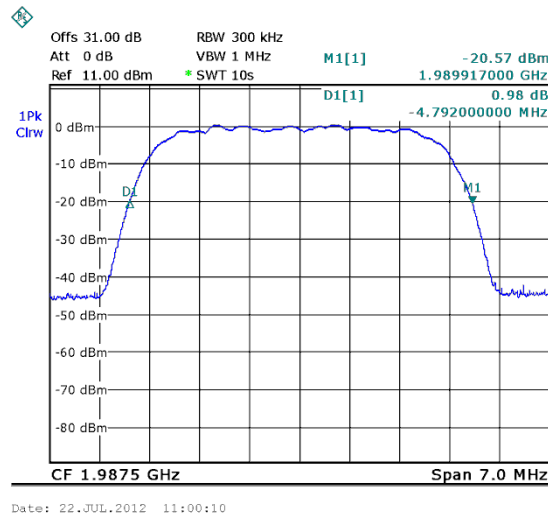


Figure 100.— Input 1987.50 MHz

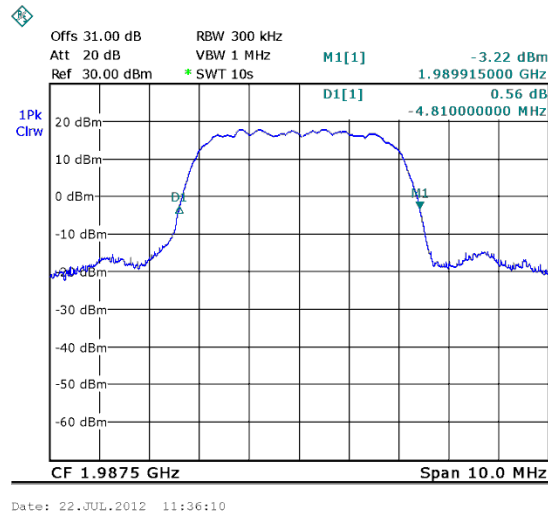


Figure 101.— Output 1987.50 MHz



LTE:

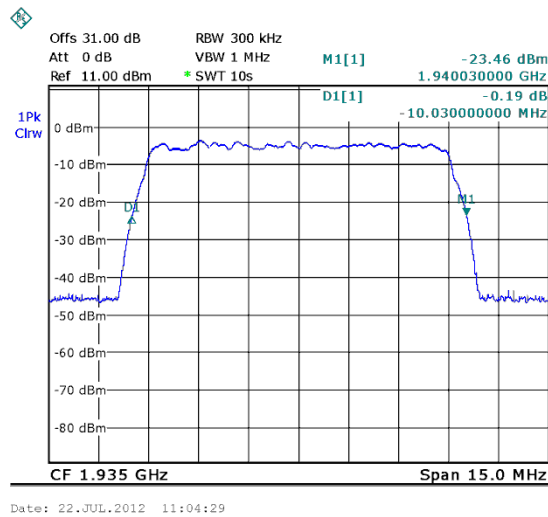


Figure 102.— Input 1935.0 MHz

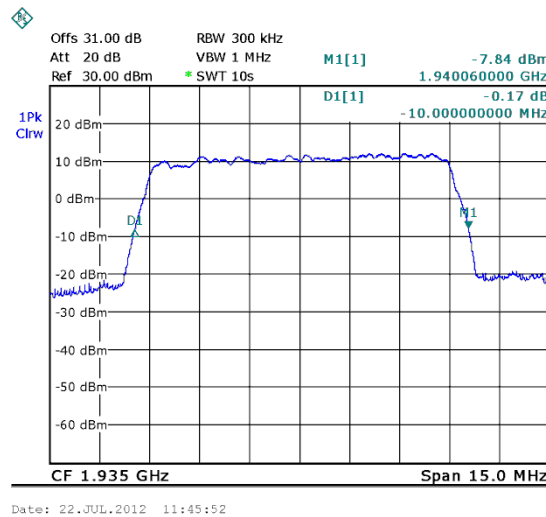


Figure 103.— Output 1935.0 MHz

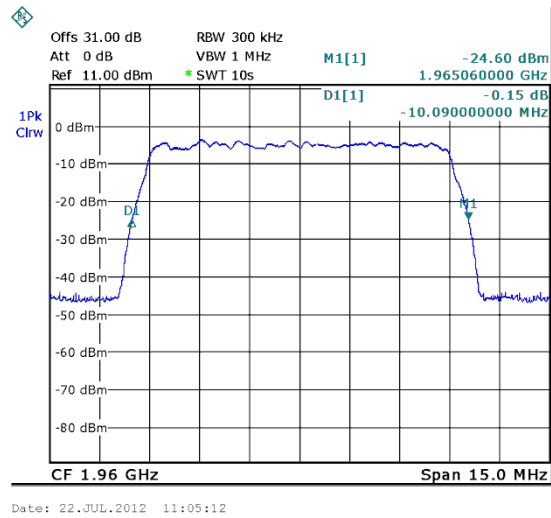


Figure 104.— Input 1960.00 MHz

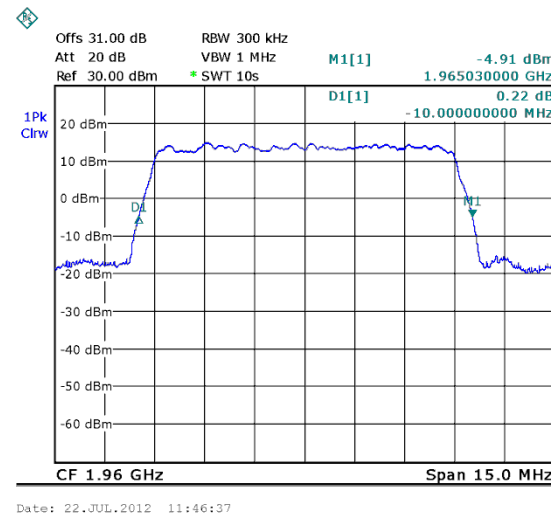


Figure 105.— Output 1960.00 MHz

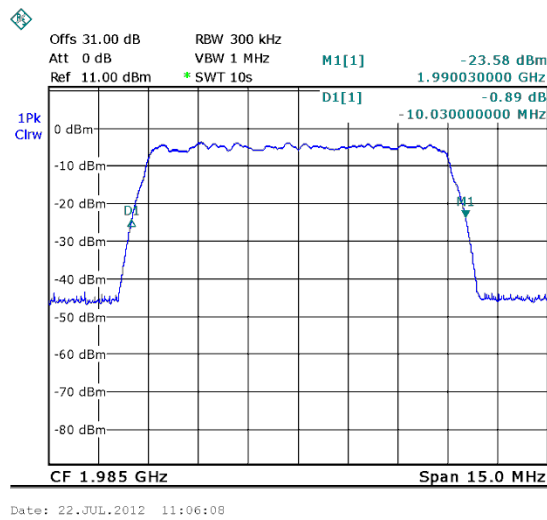


Figure 106.— Input 1985.0 MHz

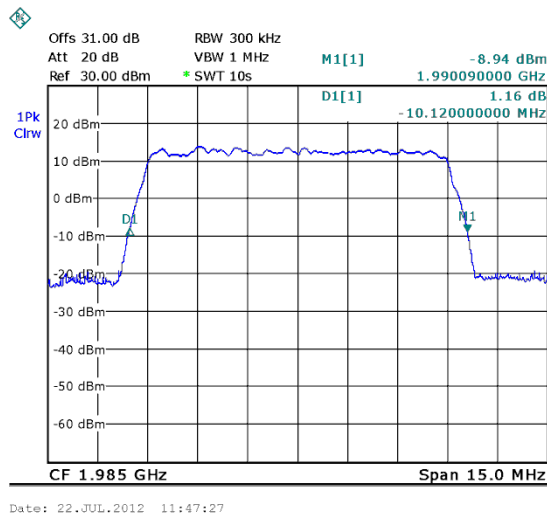


Figure 107.— Output 1985.0 MHz



10.4 Test Equipment Used, Occupied Bandwidth, PCS

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 108 Test Equipment Used



11. Out of Band Emissions at Antenna Terminals PCS

11.1 Test Specification

FCC Part 24, Subpart 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 (31 dB).

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

Signal power was +0 dBm to EUT.

11.3 Test Results

See plots in Figure 109 to Figure 120.

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi



CDMA:

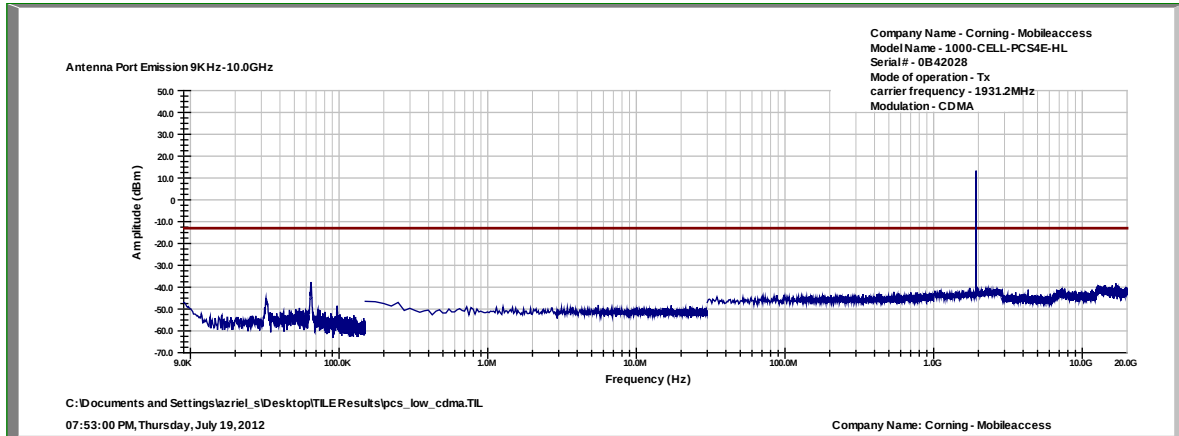


Figure 109.— 1931.20 MHz

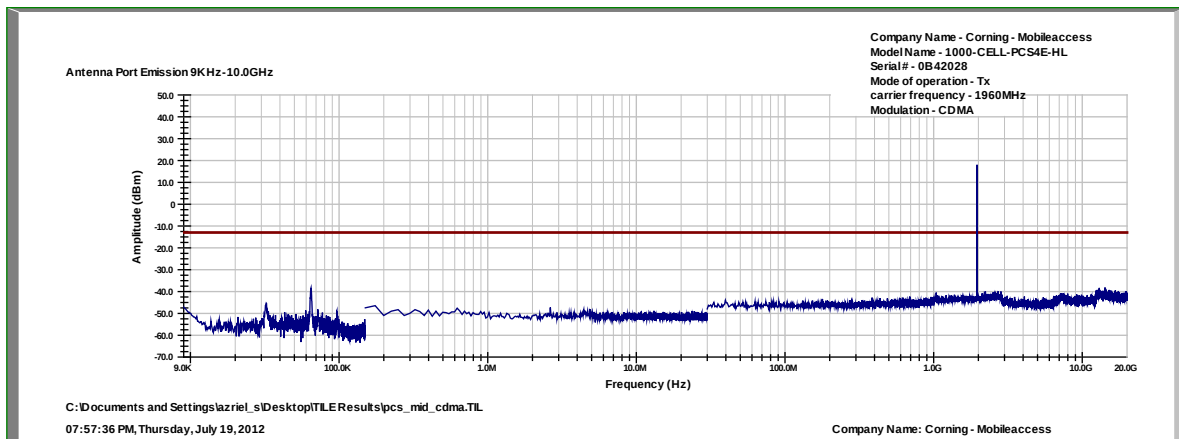


Figure 110.— 1960.00 MHz

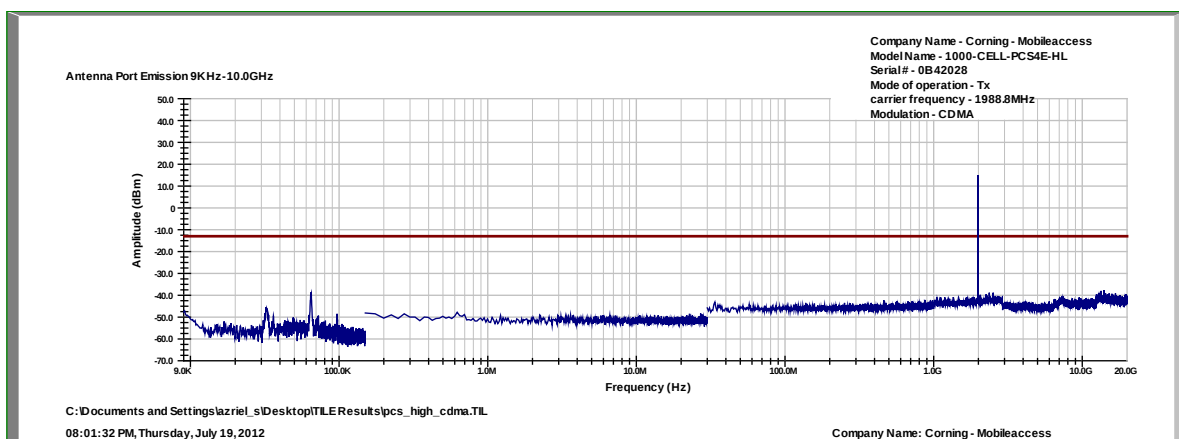


Figure 111.— 1988.80 MHz



GSM:

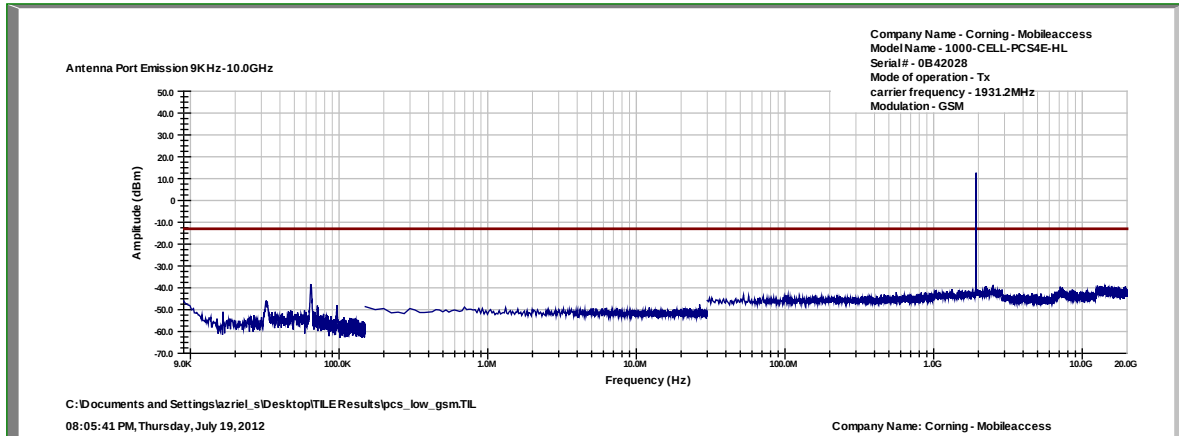


Figure 112.— 1931.20 MHz

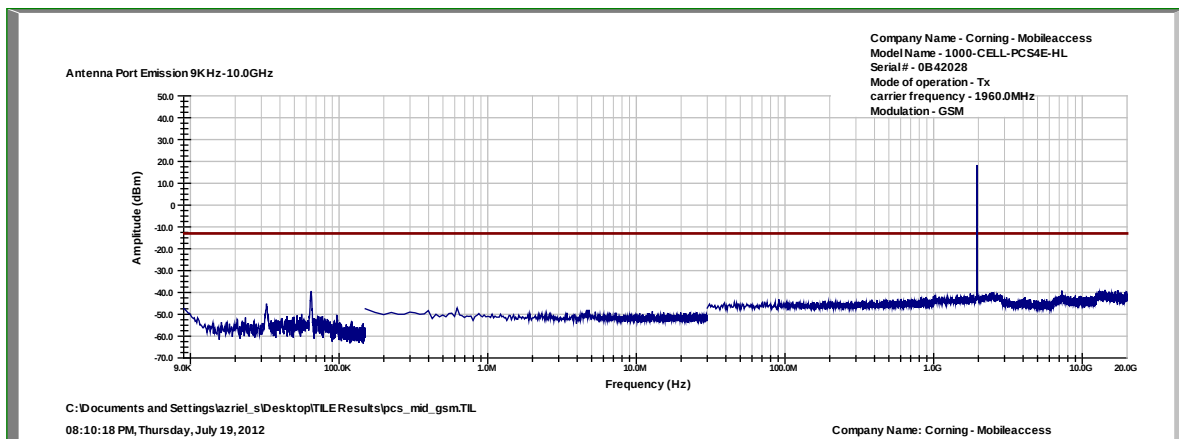


Figure 113.— 1960.00 MHz

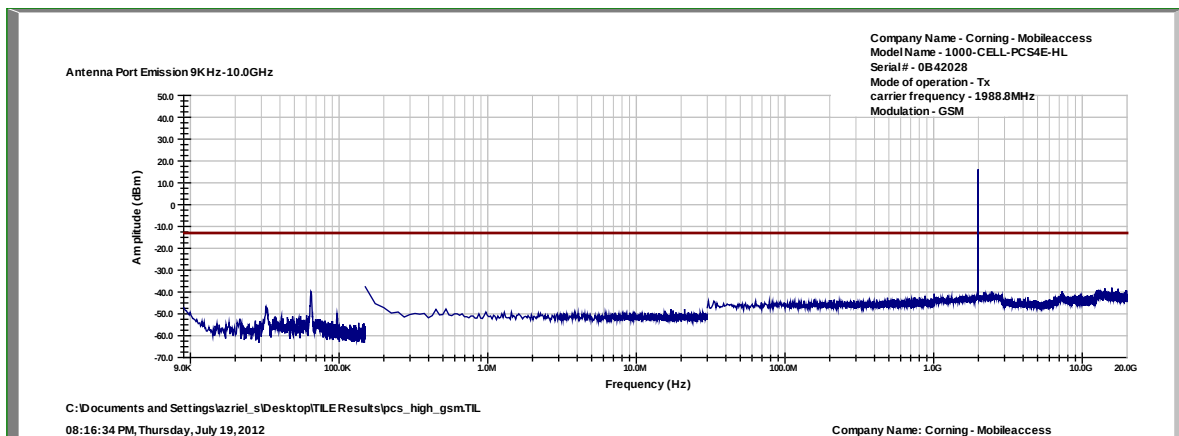


Figure 114.— 1988.80 MHz



W-CDMA:

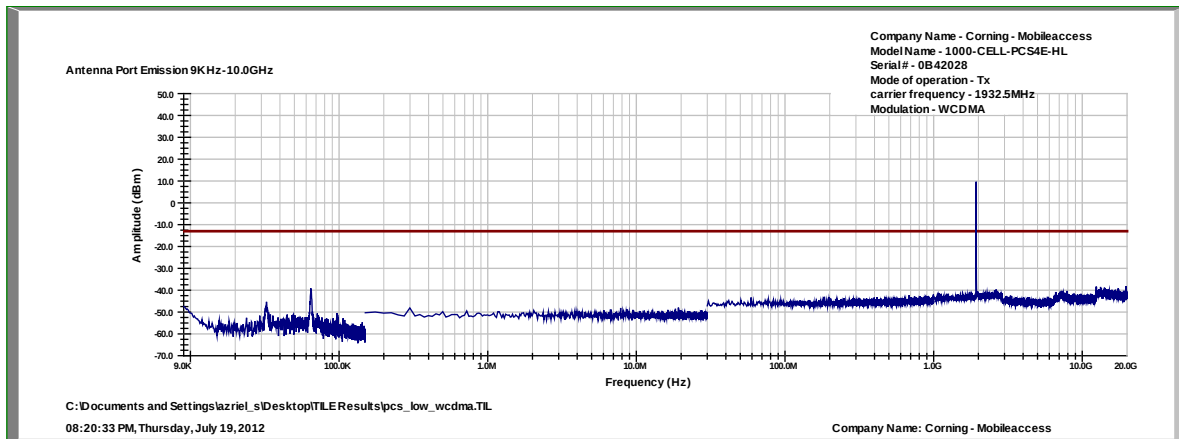


Figure 115.— 1932.50 MHz

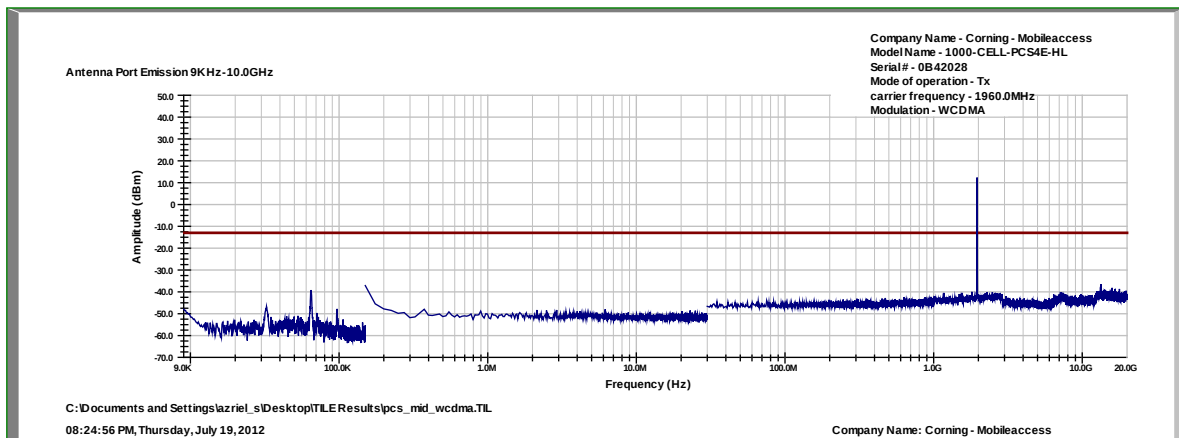


Figure 116.— 1960.00 MHz

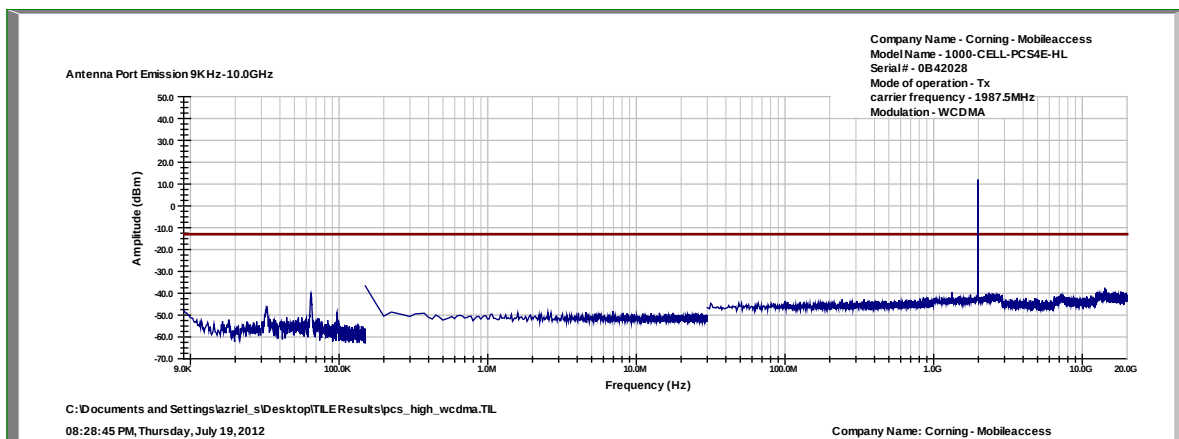


Figure 117.— 1987.50 MHz



LTE – 64QAM -10MHz BW:

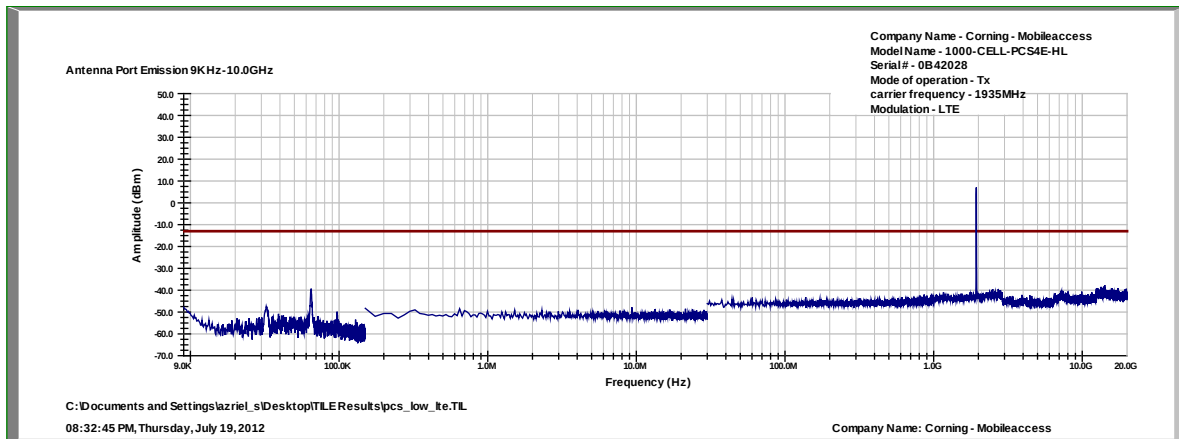


Figure 118.— 1935.00 MHz

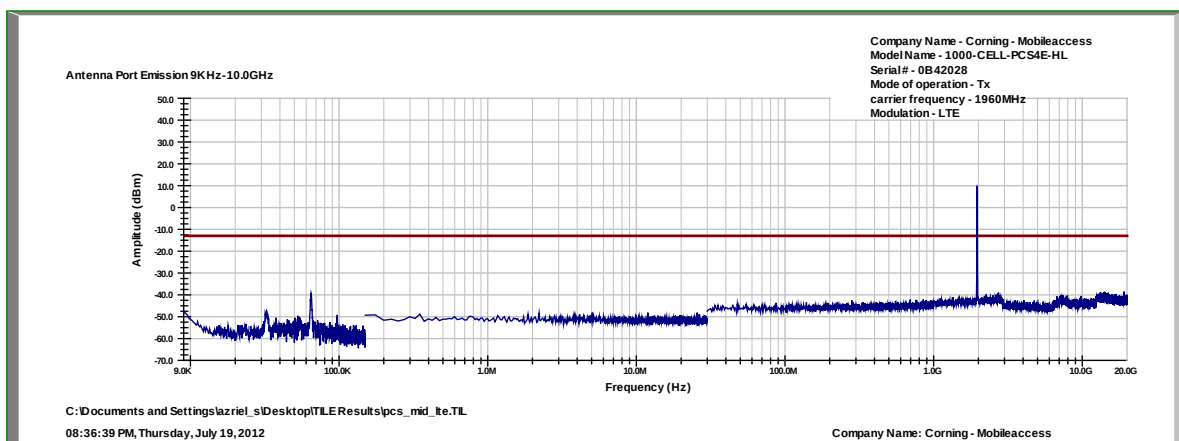


Figure 119.— 1960.00 MHz

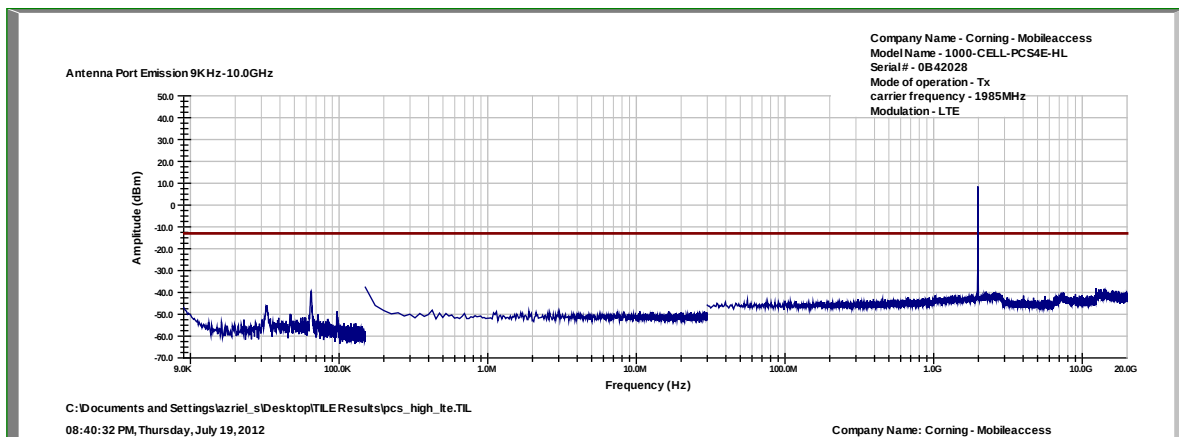


Figure 120.— 1985.00 MHz



**11.4 Test Equipment Used, Out of Band Emissions at Antenna
Terminals, PCS**

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 121 Test Equipment Used

12. Band Edge Spectrum PCS

12.1 Test Specification

FCC Part 24, Subpart E, Section 238; FCC Part 2.1051

12.2 Test procedure

For CDMA and GSM:

Enclosed are spectrum analyzer plots for the lowest operation frequency (1931.2 MHz) and the highest operation frequency (1988.8 MHz) in which the E.U.T. is planned to be used.

For WCDMA and LTE:

Enclosed are spectrum analyzer plots for the lowest operation frequency (1932.5 / 1935 MHz) and the highest operation frequency (1987.5 / 1985MHz) in which the E.U.T. is planned to be used.

The power of any emission outside of the authorized operating frequency ranges (1930.00-1990.00 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 (31 dB).

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

12.3 Test Results

Modulation	Operation Frequency (MHz)	Band Edge Frequency (MHz)	Reading (dBm)	Specification (dBm)	Margin (dB)
CDMA	1931.20	1930.00	-22.6	-13.0	-9.6
	1988.80	1990.00	-21.1	-13.0	-8.1
GSM	1931.20	1930.00	-36.9	-13.0	-23.9
	1988.80	1990.00	-34.6	-13.0	-21.6
W-CDMA	1932.50	1930.00	-20.6	-13.0	-7.6
	1987.5	1990.00	-18.4	-13.0	-5.4
LTE – 64QAM 10MHz	1935.0	1930.0	-18.5	-13.0	-5.5
	1985.0	1990.0	-14.7	-13.0	-1.7

Figure 122 Band Edge Spectrum Test Results Table PCS

See additional information in Figure 123 to Figure 130

JUDGEMENT: Passed by 1.7 dB

TEST PERSONNEL:

Tester Signature: 
Typed/Printed Name: A. Sharabi

Date: 31.07.12

CDMA:

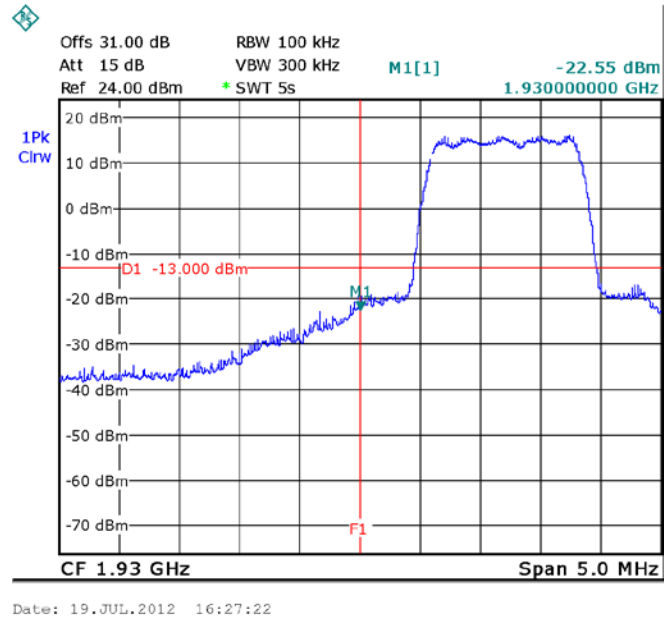


Figure 123.— 1931.20 MHz

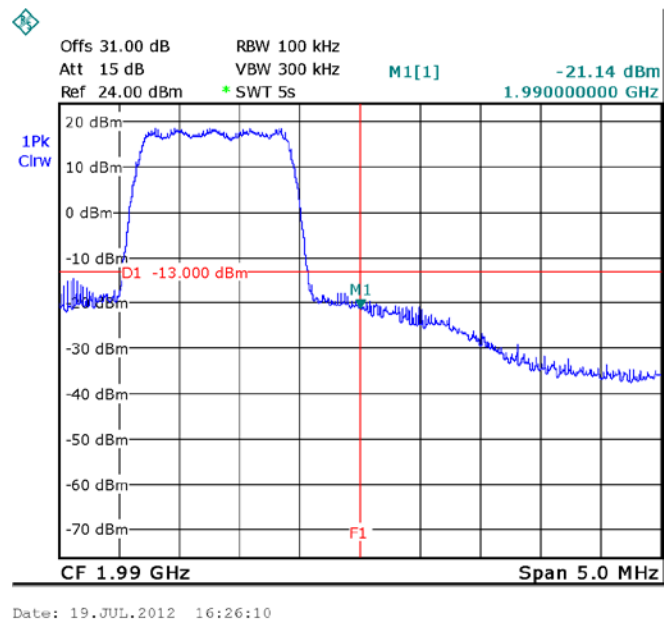


Figure 124.— 1988.80 MHz

GSM:

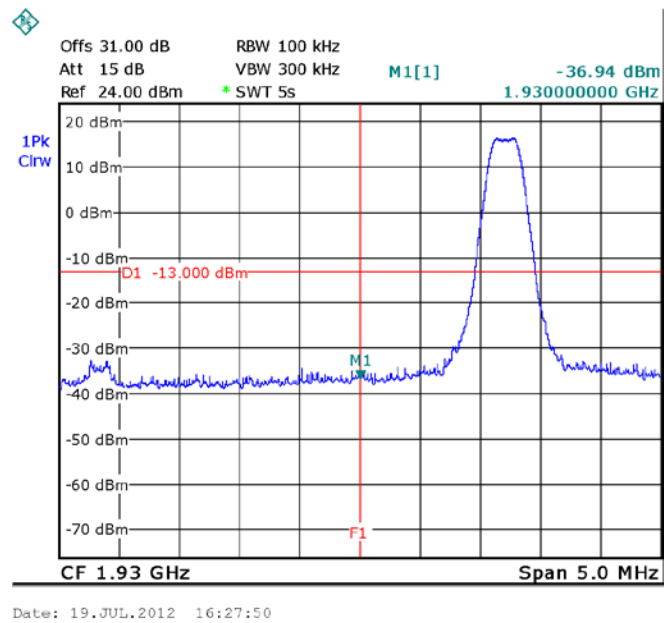


Figure 125.— 1931.20 MHz

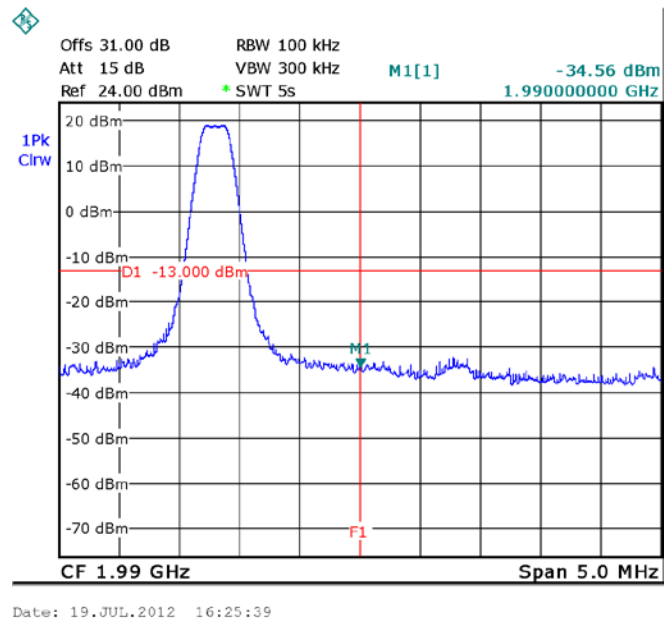


Figure 126.— 1988.80 MHz

W-CDMA:

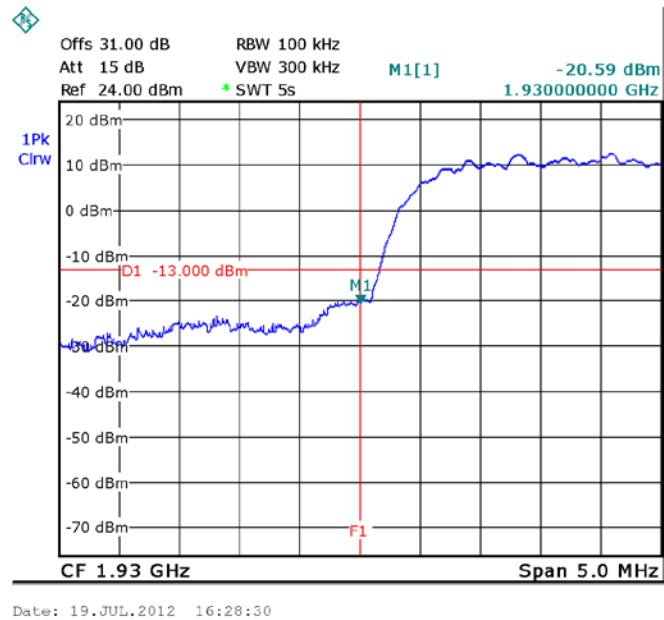


Figure 127.— 1932.50 MHz

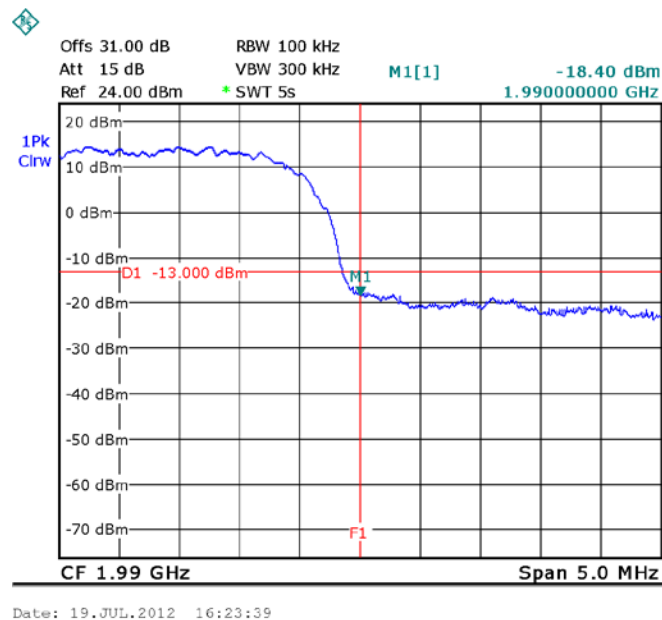


Figure 128.— 1975.50 MHz



LTE:

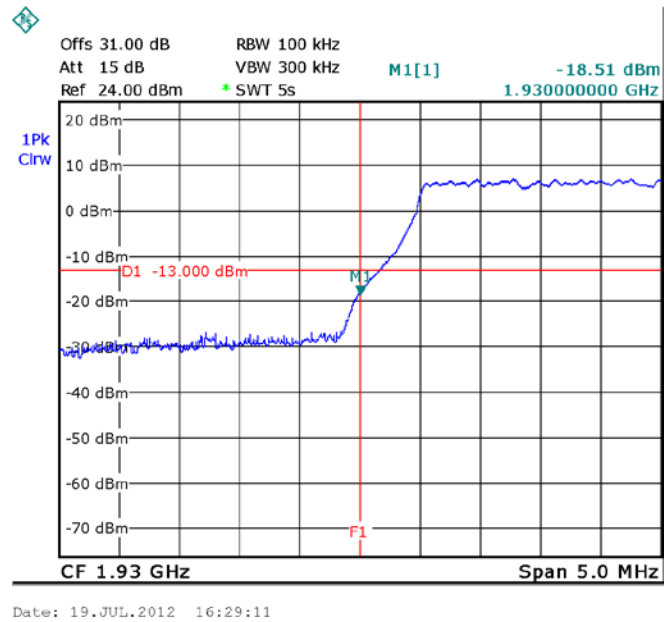


Figure 129.— 1935.0 MHz

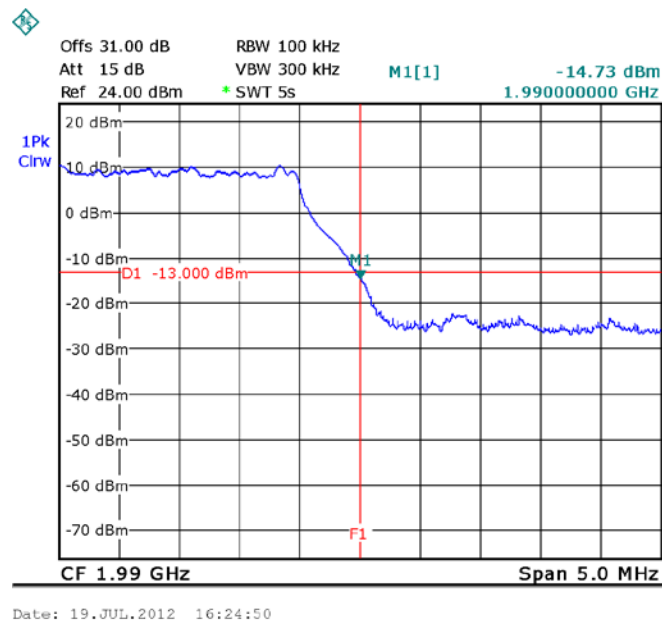


Figure 130.— 1985.0 MHz



12.4 Test Equipment Used, Band Edge Spectrum, PCS

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year

Figure 131 Test Equipment Used

13. Out of Band Emissions (Radiated) PCS

13.1 Test Specification

FCC, Part 24, Subpart E Section 238, FCC Part 2.1053

13.2 Test Procedure

The test method was based on ANSI/TIA-603-C: 2004, Section 2.2.12

Unwanted Emissions: Radiated Spurious.

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 $43 + 10 \log (P)$ dB, yielding -13dBm .

- (a) The E.U.T. operation mode and test set-up are as described in Section 3.

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, 1.5 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-20 GHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The emissions were measured at a distance of 3 meters.

- (c) The E.U.T. was replaced by a substitution antenna (dipole 30MHz-1GHz, Horn Antenna above 1GHz) driven by a signal generator. The height was readjusted for maximum reading. The signal generator level was adjusted to obtain the same reading on the EMI receiver as in step (a).

The signals observed in step (a) were converted to radiated power using:

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{Cable Loss (dB)} + \text{Substitution Antenna Gain (dB)}$$

P_d = Dipole equivalent power (result).

P_g = Signal generator output level.



13.3 Test Results

Carrier Channel (MHz)	Freq. (MHz)	Antenna Pol.	Maximum Peak Level (dBμV/m)	Signal Generator RF Output (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Effective Radiated Power Level (dBm)	Spec. (dBm)	Margin (dB)
1935.00	3862.40	V	47.8	-54.02	4.3	8.62	-49.7	-13.0	-36.7
1935.00	3862.40	H	46.7	-54.26	4.3	8.62	-49.94	-13.0	-36.9
1960.00	3920.00	V	49.4	-52.42	4.3	8.62	-48.1	-13.0	-35.1
1960.00	3920.00	H	46.5	-54.46	4.3	8.62	-50.14	-13.0	-37.1
1985.00	3970.00	V	48.9	-53.4	4.3	8.6	-49.1	-13.0	-36.1
1985.00	3970.00	H	45.5	-55.85	4.3	8.6	-51.55	-13.0	-38.6

Figure 132 Out of Band Emissions (Radiated) Test Results Table PCS

The E.U.T met the requirements of the FCC, Part 24, Subpart E, Section 238;
FCC Part 2.1053 specifications.

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi



13.4 Test Equipment Used, Out of Band Emissions (Radiated), PCS

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	December 12, 2011	1 Year
RF Filter Section	HP	85420E	3705A00248	December 12, 2011	1 Year
Active Loop Antenna	Emco	6502	2950	October 19, 2011	1 year
Antenna Biconical	ARA	BCD-235/B	1041	November 12, 2011	1 Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 23, 2012	1 Year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	January 27, 2011	2 Years
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 5, 2011	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	March 5, 2012	1 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	LaserJet 2200	JPKG19982	N/A	N/A

Figure 133 Test Equipment Used

14. Intermodulation

14.1 Test Specification

FCC Part 22, Section 917; FCC Part 2.1051

FCC Part 24, Subpart E, Section 238; FCC Part 2.1051

14.2 Test procedure

The power of any emission outside of the authorized operating frequency ranges 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 (31 dB).

The input of the repeater was connected to S.G at the following frequencies:

1960MHz, 0dBm.

881MHz, 0dBm

14.3 Test Results

The E.U.T. met the requirements of FCC Part 22, Section 22.219 and FCC Part 24, Subpart E, Section 238; FCC Part 2.1051

See additional information in Figure 134.

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 31.07.12

Typed/Printed Name: A. Sharabi

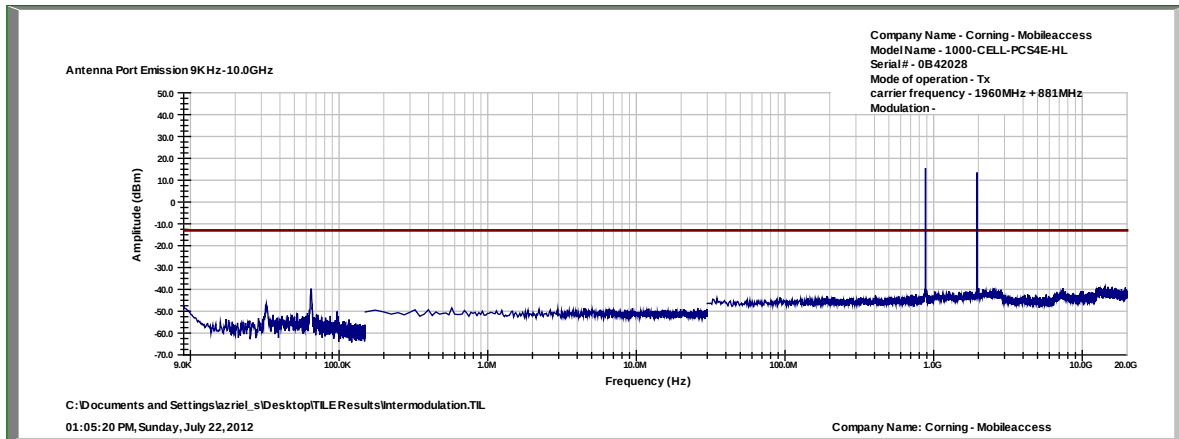


Figure 134 Intermodulation



14.4 Test Equipment Used, Radiated Intermodulation Test

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	HP	8564E	3442A00275	January 19, 2012	1 year
Spectrum Analyzer	R&S	FSL6	100194	October 30, 2011	1 year
Signal Generator	HP	N5172	MY51350189	June 04, 2012	1 year
Attenuator	Narda	30dB/5W	-	July 17, 2012	1 year
Cable	Mini-Circuits	30091	-	July 17, 2012	1 year
Signal Generator	HP	8648C	3623A04126	February 28, 2012	1 year

15. APPENDIX A - CORRECTION FACTORS

15.1 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".

15.2 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.

15.3 Correction factors for

CABLE

from spectrum analyzer
to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.
2. The cable is used for measurements above 2.9 GHz.
3. The overall length of the cable is 10 meters.

15.4 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".



15.5 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".



**15.6 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".



15.7 Correction factors for Double-Ridged Waveguide Horn

**Model: 3115, S/N 29845
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			



15.8 Correction factors for ACTIVE LOOP ANTENNA

Model 6502

S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna Factor
(MHz)	(dB)	(dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2