EXHIBIT 13: TEST REPORT

Applicant:	**Alcatel-Lucent USA Inc.**
Equipment:	**UMTS 9341 RRH 40W 1721MHz**
FCC ID:	**AS5ONEBTS-19**
Rule Part:	**Part 27, Subpart C – Technical Standards**
Frequency Range:	**Downlink: 2110 - 2155 MHz**
	Uplink: 1710-1755 MHz
Power:	**40 Watts Total Composite**
Frequency Tolerance:	**± 0.05 ppm**
Emission Designator:	**4M10F9W**
Carrier Count:	**1 at 40 W, or 2 at 20 W/C, or 3 at 13.3 W/C**

Michael P. Farina
Alcatel-Lucent USA Inc.
67 Whippany Road
Whippany, NJ 07981

November 4, 2008

67 Whippany Road
Whippany, NJ 07981

Michael P. Farina
Telephone: 973-386-4344
mpfarina@alcatel-lucent.com

Subject: **Application for Certification under FCC ID: AS5ONEBTS-19, Covering the *UMTS 9341 RRH 40W 1721 MHz System*, Operating in the Advanced Wireless Services Band (AWS) 2110-2155 MHz.**

.

November 4 , 2008

TEST REPORT

INTRODUCTION

The exhibits presented in this test report demonstrate that the Alcatel-Lucent Advanced Wireless Services Band (AWS) Remote Radio Head base station *UMTS 9341 RRH 40W 1721 MHz System*, is in full compliance with all requirements of the Rules of the Commission as specified in the Code of Federal Regulations (CFR), Title 47 – Telecommunication; Part 27 - Miscellaneous Wireless Communications Services, Subpart C – Technical Standards; Section 27.53 - Emission Limitations, effective October 1, 2007. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2007. This equipment also demonstrates compliance with the spurious emissions limitations specified in ETSI TS 125 141 V7.4.0 (2006-06): Universal Mobile Telecommunications System (UMTS); Base Station Conformance Testing (FDD), (3GPP TS 25.141, Version 7.4.0, Release 7). This standard was the guideline used in the design of the Distributed Base Station transceiver system. The objective of this application is to obtain initial FCC authorization, under FCC ID: AS5ONEBTS-19, for operation in the Universal Mobile Telecommunications System (UMTS) with **1)** a single 5 MHz emission bandwidth carrier (4M10F9W) set to a maximum power level at the antenna terminal of 40 Watts (3-second average) , **2)** with two carriers set to 20 Watts per carrier, and **3)** with three carriers set to 13.3 Watts per carrier, with the total composite power at 40 Watts (3-second average).

Alcatel-Lucent's wireless *UMTS 9341 RRH 40W 1721 MHz System* is the subject of this application for authorization by the Federal Communications Commission under the new FCC ID: AS5ONEBTS-19. Alcatel-Lucent's Universal Mobile Telecommunications System (UMTS) Distributed Base Station System, *UMTS 9341 RRH 40W 1721 MHz System,* is designed to operate in the North America Region (NAR) Advanced Wireless Services Band (AWS) Frequency Spectrum 2110-2155 MHz, with bandwidth of 45 MHz. The Distributed Base Station (DBS) can be configured **1)** for single carrier (1S1C) operation at 40 Watts (+46.0 dBm) , **2)** for two carrier (1S2C) operation at 20 Watts (+43.0 dBm) per carrier, and **3)** for three carrier (1S3C) operation at 13.3 Watts (+41.2 dBm) per carrier with a total composite power of 40 Watts. The RF power rating is based the 3-second average, employing the Aggregate Overload Control (AOC) algorithm. Enhanced Digital Pre-Distortion (EDPD) and Closed Loop Gain Control (CLGC) are features that are enabled for each carrier. The carrier power level and frequency are remotely controlled by software. The single UMTS carrier has a 5 MHz bandwidth, with an emission designator at 4M10F9W, based on measurement of the Necessary Bandwidth. UMTS modulation capability demonstrated includes **1)** ETSI TS 25.141 Test Model 1-64 (TM1-64) with up to 68 active channels, consisting of 64 voice + 4 control, and **2)** TM5-44 with up to 44 active channels, which include 8 High Speed Downlink Packet Access (HSDPA) channels.

The *UMTS 9341 RRH 60W 1900 MHz System*, subject of this certification, is comprised of two separate modules interconnected by fiber optic cable: 1) the digital Base Band Unit (BBU), and 2) the RF Remote Radio Head (RRH). They have the flexibility of being installed either in close proximity to or remotely located from each other. The BBU has the capability of controlling up to 3 remotely located RRH units, via fiber optic cable, and incorporates the digital channel cards, reference oscillator module, T1/E1 and alarm interface, and the RF-to-Optical and Optical-to-RF conversion circuitry. The 1900 MHz RRH incorporates the Future Technology Radio (FTR1900), power amplifier (PA) and passive filter with single transmit (Tx) and diversity receive functionality (Rx0, Rx1). This system complies both with the Federal Communication Commission (FCC) Rules and Regulations (47 CFR Part 24), and with the European Telecommunications Standards Institute (ETSI) 3rd Generation Partnership Project (3GPP) Technical Specifications TS 25.104 and TS 25.141.

As a Transceiver System, all conducted RF characteristics and emissions measurements were performed at the transmit antenna terminal, using a production equipment frame. All testing was performed in the Alcatel-Lucent, Whippany, NJ, compliance laboratory by F. E. Chetwynd and M. P. Farina during the period October 10 – 27, 2008; in adherence to a test plan generated by M. P. Farina, in accordance with Alcatel-Lucent's ISO/TL9000 Registration. All measurement instrumentation utilized were also calibrated in compliance with Alcatel-Lucent's ISO/TL9000 Registration. The Whippany 3 & 10 Meter Open Area Test Site (OATS) is authorized by the Federal Communications Commission (FCC) under Registration Number: 90770, in compliance with the requirements of Section 2.948 of the Rules of the Commission.

Frequency stability measurements were performed by N.Hussain, Alcatel-Lucent, Swindon, United Kingdom, under the direction of M. P. Farina, and in adherence to the previously cited ISO/TL9000 test plan.

This report fully documents all required tests and the test results, sufficient to show full compliance with the Rules of the Commission.

APPLICABLE FCC RULES AND INDUSTRY STANDARDS:

The exhibits presented in this test report demonstrate that Alcatel-Lucent's Advanced Wireless Services Band (AWS) equipment *UMTS 9341 RRH 40W 1721 MHz System* is in full compliance with all requirements of the Rules of the Commission, as specified in the Code of Federal Regulations (CFR), Title 47 – Telecommunication; Part 27, Subpart C – Technical Standards; Section 27.53 - Emission Limitations for AWS Equipment; effective October 1, 2007. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2007. It also demonstrates compliance with the spurious emission limitations specified in TSI TS 125 141 V7.4.0 (2006-06): Universal Mobile Telecommunications System (UMTS); Base Station Conformance Testing (FDD), (3GPP TS 25.141, Version 7.4.0, Release 7). The specific test procedures that are both required for and are applicable to the UMTS Distributed Base Station Transceiver System are:

Part 2.1046	RF Power Output	**Pages 4 – 5**
Part 2.1047	Modulation Characteristics	**Pages 6-8**
Part 2.1049	Occupied Bandwidth - Single Carrier	**Pages 9-19**
Part 2.1049	Occupied Bandwidth - Two Carriers	**Pages 20-23**
Part 2.1049	Occupied Bandwidth - Three Carriers	**Pages 24-26**
Part 2.1051	Spurious Emissions at the Antenna Terminals (1C, 2C, 3C)	**Pages 27-39**
Part 2.1053	Field Strength of Spurious Radiation	**Pages 40**
Part 2.1055	Frequency Stability	**Pages 41-43**
Part 2.1057	Frequency Spectrum to be Investigated	
Part 27	Miscellaneous Wireless Communications Services, Subpart C – Technical Standards	
Part 27.53	Emission Limitations for AWS	

ETSI	TS 125 141 V7.4.0 (2006-06): Universal Mobile Telecommunications System (UMTS); Base Station (BS) Conformance Testing (FDD), (3GPP TS 25.141, Version 7.4.0, Release 7).

ETSI TS 125 104 V7.4.0 (2006-06): Universal Mobile Telecommunications System (UMTS); Base Station (BS) Radio Transmission and Reception (FDD), (3GPP TS 25.104, Version 7.4.0, Release 7).

ANSI C63.4-2003 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic in the Range of 9 kHz to 40 GHz; January 30, 2004

PART 2.1046 MEASUREMENTS REQUIRED: RF POWER OUTPUT

The *UMTS 9341 RRH 40W 1721 MHz System*, Distributed Base Station Transceiver System, subject of this application for certification, is designed to provide a maximum RF power level, per single 5 MHz carrier emission bandwidth, of 40 Watts (+46.0 dBm) at the Equipment Antenna Terminal (EAC). The RF power rating is based the 3-second average, employing the Aggregate Overload Control (AOC) algorithm. Enhanced Digital Pre-Distortion (EDPD) and Closed Loop Gain Control (CLGC) are features that are enabled for each carrier. This System is designed to operate in a 45 MHz bandwidth, over the Advanced Wireless Services Band (AWS) frequency spectrum: Downlink 2110 - 2155 MHz and Uplink 1710 -1755 MHz. This system is also designed to transmit **1)** 2 carriers at 20 Watts (+43.0 dBm) per carrier, and **2)** 3 carriers at 13.3 Watts (+41.2 dBm), for a total composite power at 40 Watts.

All conducted emission measurements are performed at the EAC, with measurements being made at the lowest and the highest settable carrier frequencies in Advanced Wireless Services Band (AWS) frequency Blocks A, B and F and at the center frequency of Blocks C, D and E. These 9 carrier channels were used throughout this test procedure, as tabulated below. Each time the carrier is set to each of the channels, and to each of 2 ETSI Test Modulation schemes, the power level is adjusted, by software control, to +46.0 dBm (40 Watts at 3-second average) before performing each emission measurement.

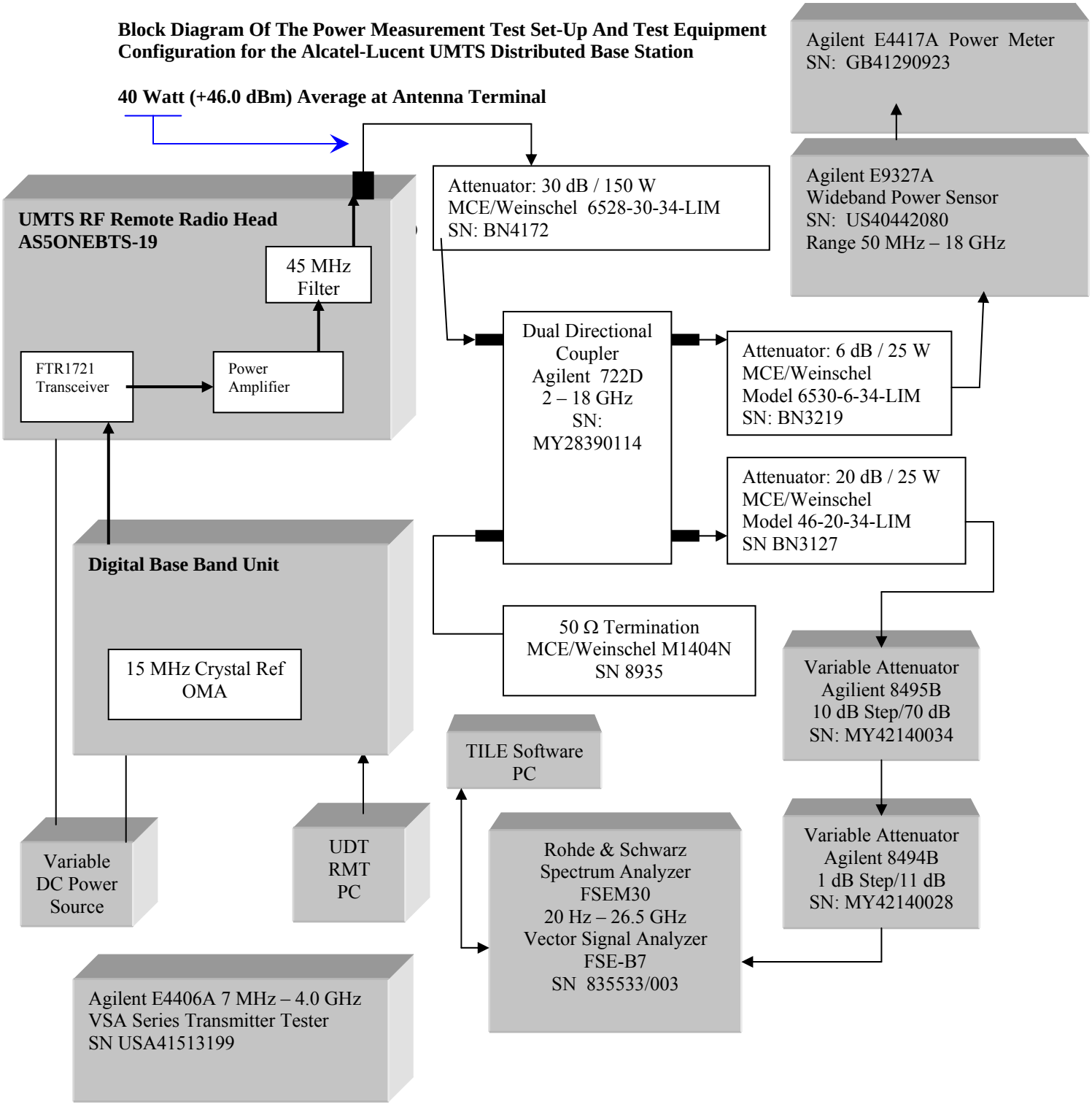
AWS Frequency	AWS Frequency Block	UARFCN Channel Number	Carrier Center Frequency Downlink	Measured Power Level with Single Carrier
A1	Lowest Settable Channel	1887	2112.5 MHz	+ 46.0 dBm
A2	Highest Settable Channel	1912	2117.5 MHz	+ 46.0 dBm
B1	Lowest Settable Channel	1937	2122.5 MHz	+ 46.0 dBm
B2	Highest Settable Channel	1962	2127.5 MHz	+ 46.0 dBm
C	Block Center	1987	2132.5 MHz	+ 46.0 dBm
D	Block Center	2012	2137.5 MHz	+ 46.0 dBm
E	Block Center	2037	2142.5 MHz	+ 46.0 dBm
F1	Lowest Settable Channel	2062	2147.5 MHz	+ 46.0 dBm
F2	Highest Settable Channel	2087	2152.5 MHz	+ 46.0 dBm

Note: UARFCN = UTRA Absolute Radio Frequency Channel Number

Results: The 5 MHz *UMTS 9341 RRH 40W 1721 MHz System*, Transceiver System, is compliant with the manufacturer's rated power level at the transmit antenna terminal for the above listed carrier frequencies.

Block Diagram Of The Power Measurement Test Set-Up And Test Equipment Configuration for the Alcatel-Lucent UMTS Distributed Base Station

40 Watt (+46.0 dBm) Average at Antenna Terminal



PART 2.1047 MEASUREMENTS REQUIRED: MODULATION CHARACTERISTICS

The modulation accuracy was measured at the Equipment Antenna Terminal (EAC) for the lowest settable, the mid-band and the highest settable carriers over the spectrum 2110 - 2155 MHz, as previously cited. In accordance with ETSI TS 25.141, the Error Vector Magnitude (EVM) was measured for a single modulation scheme:

Test Model 5-44 modulation with 44 active channels that include 8 HSDPA channels. TM5-44 with 44 active channels (16QAM) and the power level set to Pmax (+46.0 dBm). The Error Vector Magnitude limit is EVM < 12.5% for 16QAM.

TM5-44: with 44 Active Channels, Including 8 HSDPA (High Speed Downlink Packet Access)
ETSI TS 25.141 Rel 7, Table 6.6A : Test Model 5 Active Channels

Type	Number of Channels	Fraction of Power (%)
P-CCPCH+SCH	1	7.9
Primary CPICH	1	7.9
PICH	1	1.3
S-CCPCH containing PCH (SF=256)	1	1.3
DPCH (SF=128)	30	14
HS-SCCH	2	4
HS-PDSCH (16 QAM)	8	63.6

Minimum Standard Requirement: The minimum standard requirement is that the RMS Error Vector Magnitude (EVM) average shall be less than 12.5% for TM5-44.

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement, with exception that the FSEM30 Spectrum Analyzer is replaced by:
1) Agilent E4406A VSA Series Transmitter Tester, 7 MHz – 4.0 GHz, SN US41513199
2) The VSA measurement set up was for Composite Modulation Accuracy with 10 sweeps per test.

TEST RESULTS:

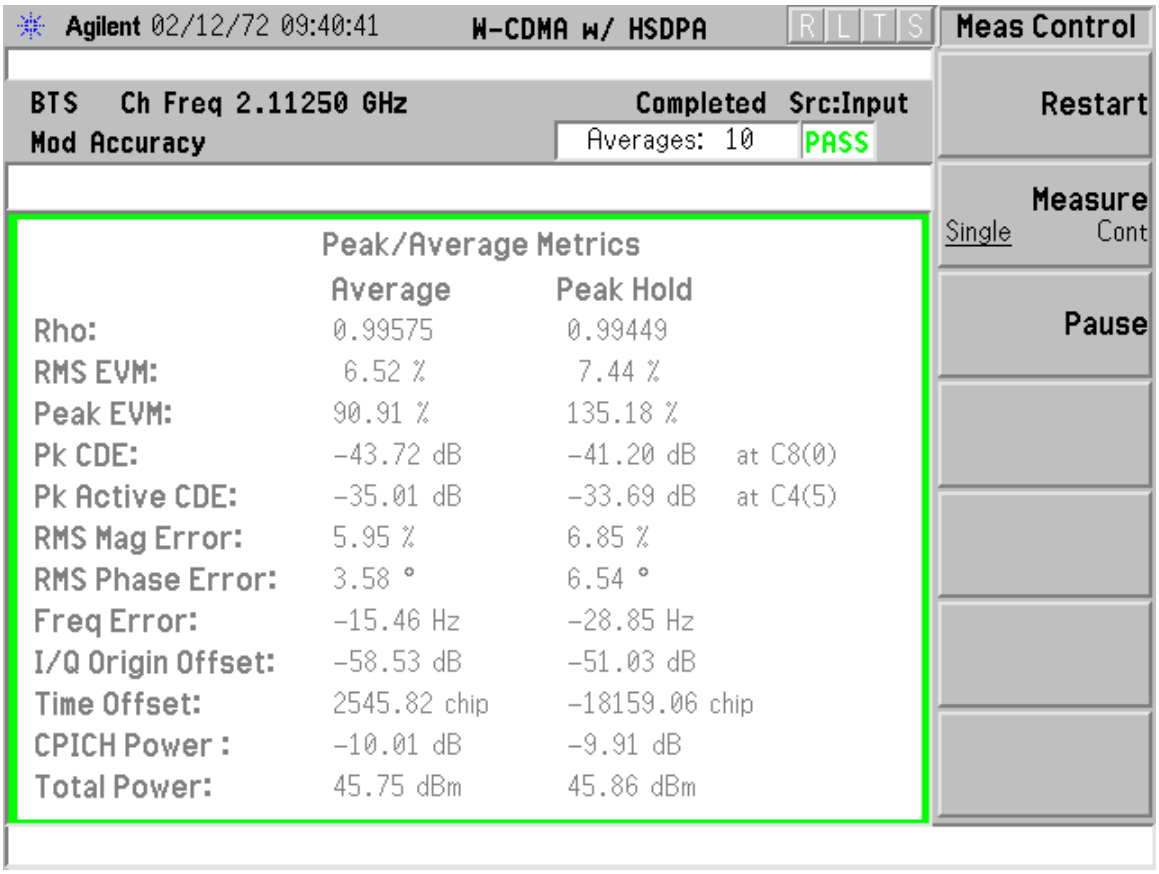
RMS Error Vector Magnitude (EVM) Measurement Summary at the Antenna Terminal:

UMTS AWS Frequency Block	Broadband AWS Frequency Block	Power Level at Antenna Terminal	UMTS 1721 Channel No.	UMTS 1721 Carrier Center Frequency MHz	RMS EVM TM5-44 <12.5 % Average	RMS EVM TM5-44 <12.5 % Peak Hold
A1	Lowest Settable	46.0 dBm	1887	2112.5	6.52 %	7.44 %
C	Mid Band	46.0 dBm	1987	2132.5	6.43 %	7.25 %
F2	Highest Settable	46.0 dBm	2087	2152.5	6.48 %	7.49 %

RESULTS: The *UMTS 9341 RRH 40W 1721 MHz System*, Transceiver System, demonstrated full compliance with the modulation accuracy requirements specified in ETSI TS 25.141. All EVM measurements were less than the 12.5% RMS limitation, respectively, as tabulated above.

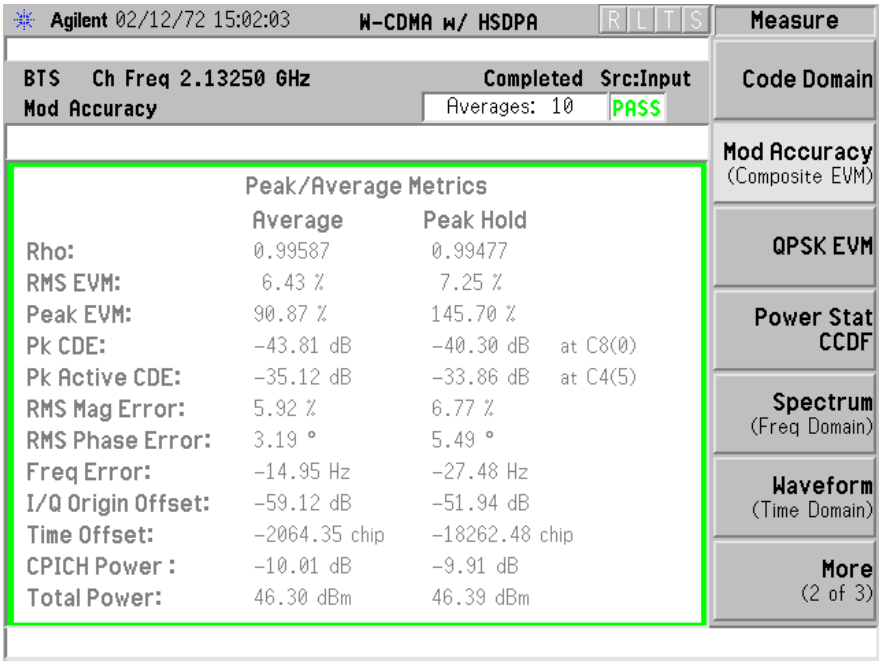
Lowest Settable Carrier - TM5-44 Modulation

TM5-44 Modulation Characteristics: UARFCN Channel Number 1887 @ 2112.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



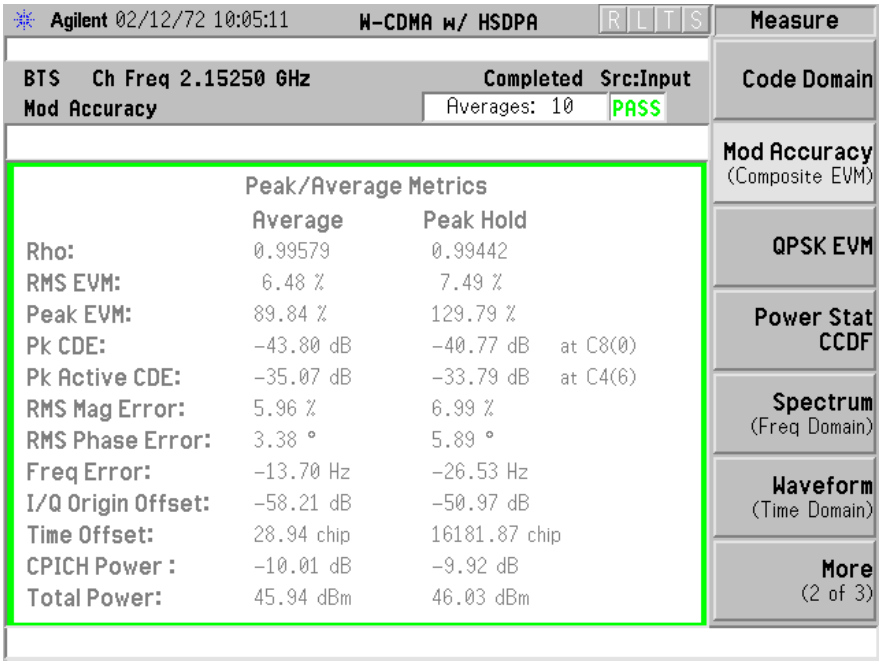
Mid-Band Carrier - TM5-44 Modulation

TM5-44 Modulation Characteristics: UARFCN Channel Number 1987 @ 2132.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



Highest Settable Carrier - TM5-44 Modulation

TM5-44 Modulation Characteristics: UARFCN Channel Number 2087 @ 2152.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH - SINGLE CARRIER

The occupied bandwidth was measured at the Equipment Antenna Terminal (EAC) for each of the nine, UMTS 1721 RRH, 5 MHz carriers. The power level, for the single carrier, was set to 40 Watts (+46.0 dBm). Two ETSI Test Modulation schemes were utilized:

1) TM1-64 with up to 68 active channels, consisting of 64 Voice + 4 Control active channels, for 9 carriers measured as previously cited, and

2) TM5-44 with up to 44 active channels, consisting of 30 Voice + 8 HSDPA + 6 Control active channels, where HSDPA = High Speed Downlink Packet Access. Since the test results were consistent from carrier to carrier between the two test modulations (TM), three carriers were sufficient for this modulation: the lowest settable, the mid-band and the highest settable.

The occupied bandwidth was measured by two methods:

1. The carrier 99% power bandwidth, which is also the necessary bandwidth, using an Agilent E4406A VSA Series Transmitter Tester (SN US41513199).

2. Emission mask limitation using a Rohde & Schwarz: Spectrum Analyzer FSEM30 (SN 835533/003), to demonstrate compliance with the ETSI TS 25.141 emission mask requirements and with Part 24.238.

Method 1: The carrier 99% power bandwidth was measured at the Equipment Antenna Terminal (EAC) with the 5 MHz carrier set to +46.0 dBm and modulated first with TM1-64 (9 carriers) and then with TM5-44 (9 carriers). The necessary bandwidth measurement results show that the carrier is within the manufacturer's rated 5 MHz bandwidth for all carriers measured, and for both modulation schemes, as tabulated below. For brevity, the data plots that are attached show the lowest settable, the mid-band and the highest settable carriers/channels for both TM1-64 and TM5-44 modulations. All measurement results are tabulated below .

UMTS PCS Carrier	Broadband PCS Frequency Block	Power Level at Antenna Terminal	UMTS1900 Channel No.	UMTS 1900 Carrier Center Frequency MHz	99% Bandwidth TM1-64	99% Bandwidth TM5-44
A1	Lowest Settable	+46.0 dBm	1887	2112.5	4.1003 MHz	4.1010 MHz
A2	Highest Settable	+46.0 dBm	1912	2117.5	4.1010 MHz	4.1025 MHz
B1	Lowest Settable	+46.0 dBm	1937	2122.5	4.1075 MHz	4.1005 MHz
B2	Highest Settable	+46.0 dBm	1962	2127.5	4.1031 MHz	4.1033 MHz
C	Center	+46.0 dBm	1987	2132.5	4.1050 MHz	4.1062 MHz
D	Center	+46.0 dBm	2012	2137.5	4.1022 MHz	4.1011 MHz
E	Center	+46.0 dBm	2037	2142.5	4.1016MHz	4.1052 MHz
F1	Lowest Settable	+46.0 dBm	2062	2147.5	4.1046 MHz	4.1061 MHz
F2	Highest Settable	+46.0 dBm	2087	2152.5	4.1002 MHz	4.1046 MHz

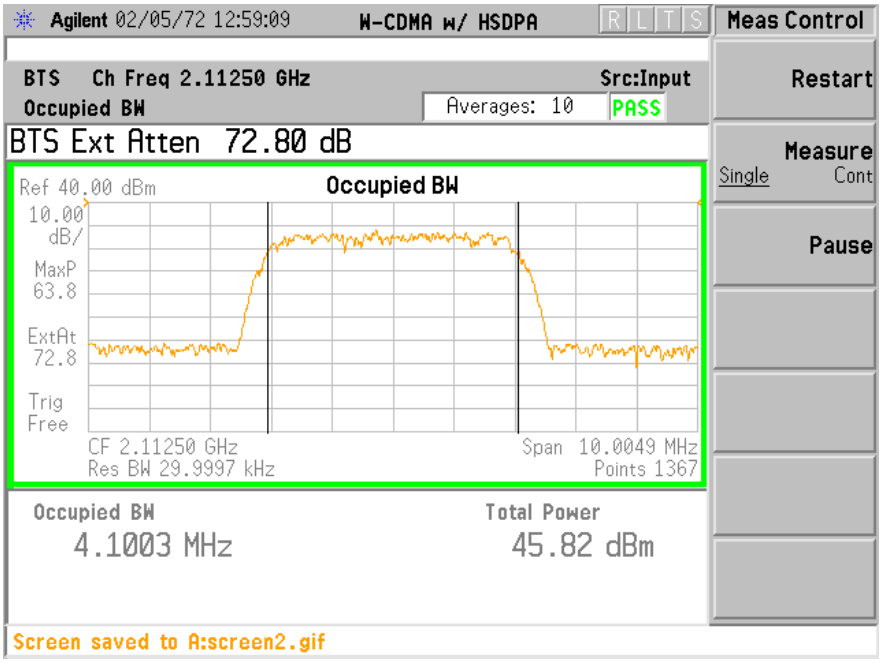
Results: For each UMTS 1721 MHz channel, and for each test modulation scheme, the carrier does not exceed 5.0 MHz emission bandwidth. The necessary bandwidth and emission designator is consistently **4M10F9W**. The data plots for the above tabulated carriers A1, C and F2 are attached for each of the two modulation schemes. The data for the remaining carriers and modulation schemes are retained as permanent records.

The average and range of the 99% power bandwidth/necessary bandwidth measurements are:

Average	4.1031
Max	4.1075
Min	4.1003

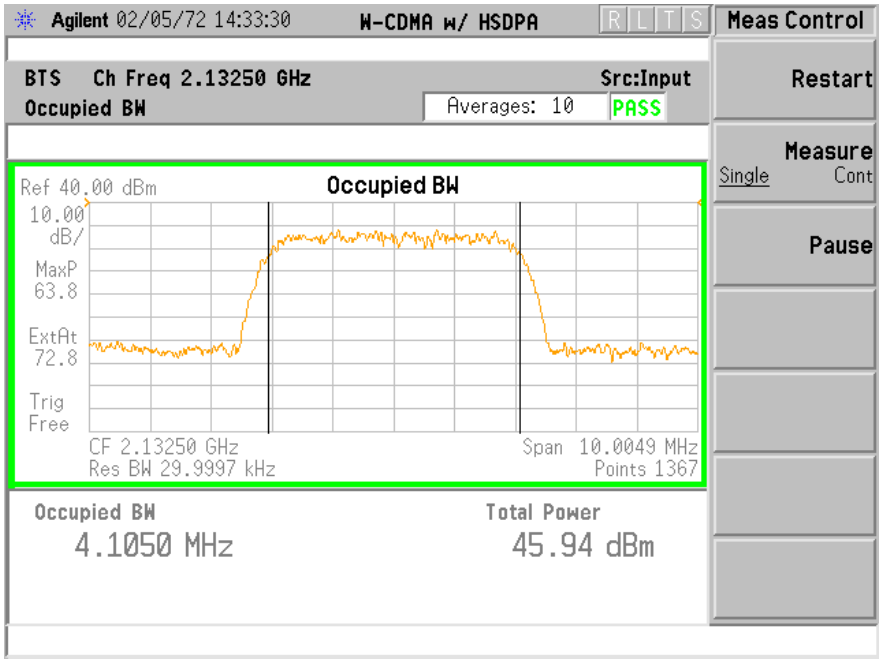
Lowest Settable Carrier - TM1-64

TM1-64 99% Bandwidth Characteristics: UARFCN Channel Number 1887 @ 2112.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



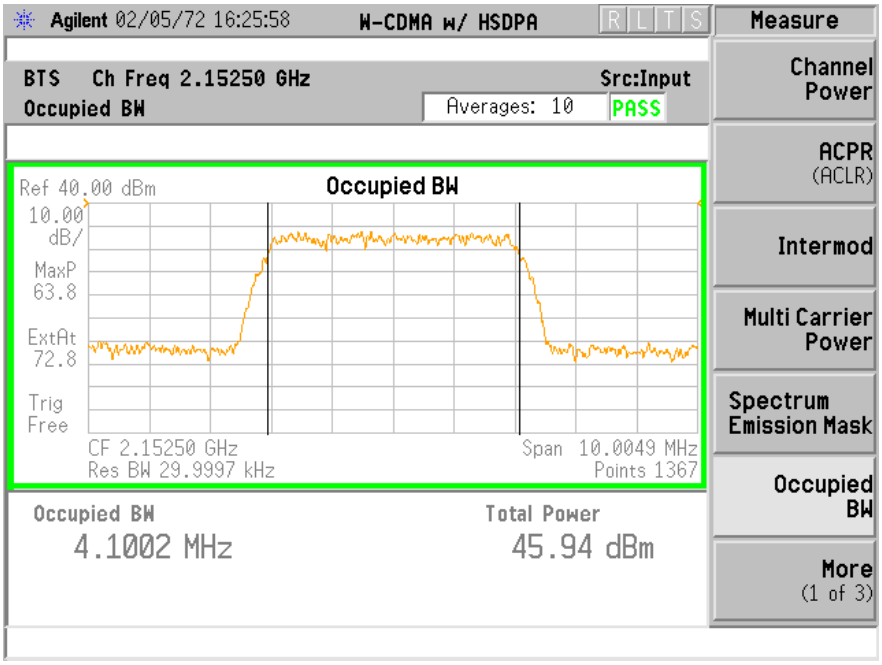
Mid-Band Carrier - TM1-64

TM1-64 99% Bandwidth Characteristics: UARFCN Channel Number 1987 @ 2132.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



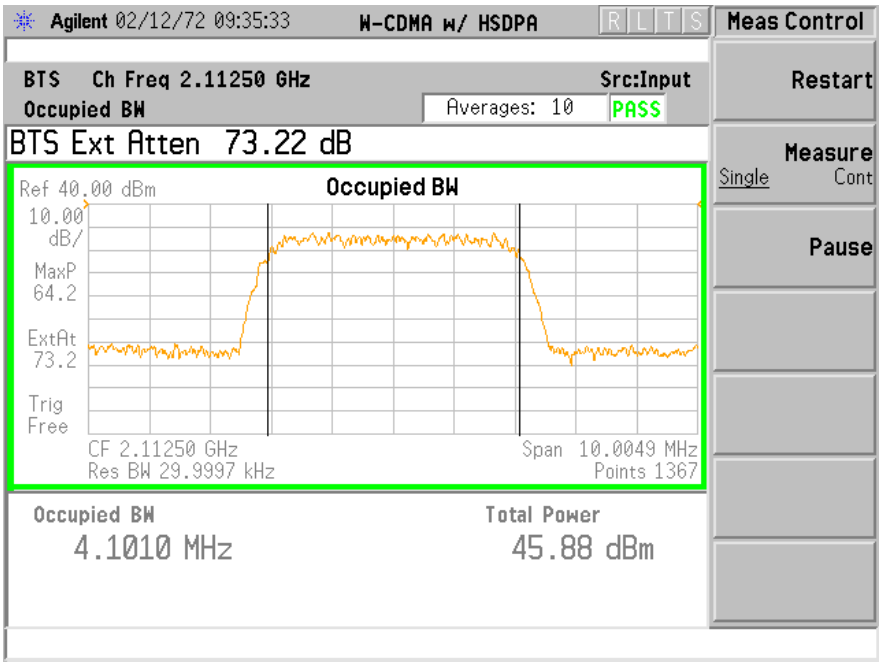
Highest Settable Carrier - TM1-64

TM1-64 99% Bandwidth Characteristics: UARFCN Channel Number 2087 @ 2152.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



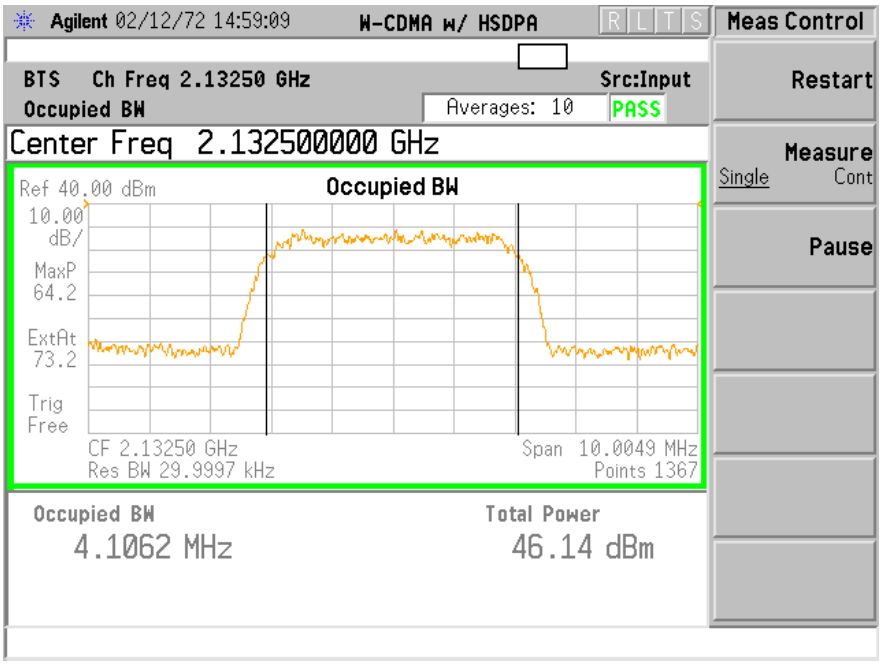
Lowest Settable Carrier - TM5-44

TM5-44 99% Bandwidth Characteristics: UARFCN Channel Number 1887 @ 2112.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



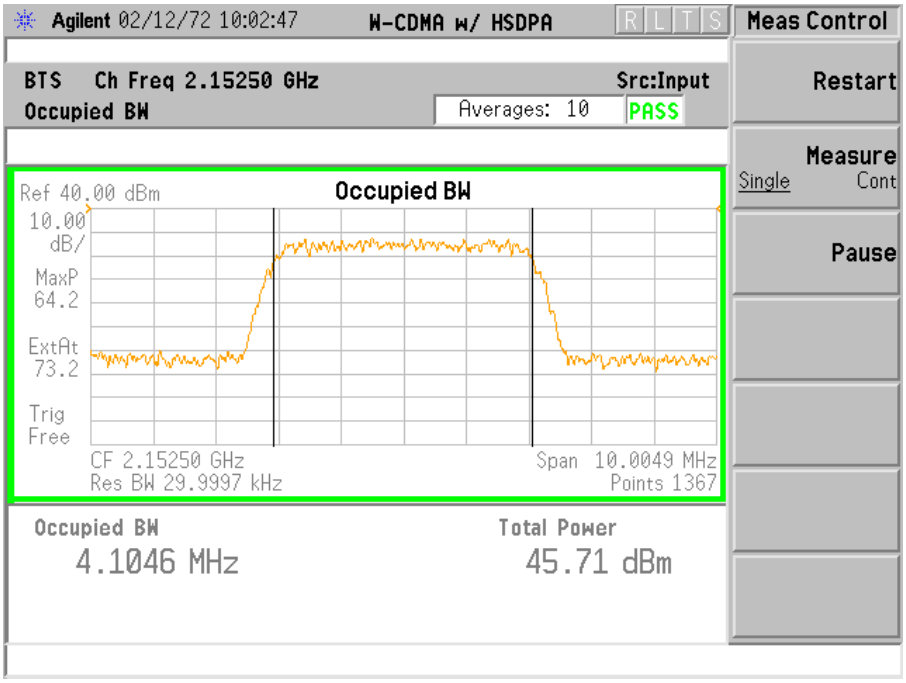
Mid-BandCarrier - TM5-44

TM5-44 99% Bandwidth Characteristics: UARFCN Channel Number 1987 @ 2132.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



Highest Settable Carrier - TM5-44

TM5-44 99% Bandwidth Characteristics: UARFCN Channel Number 2087 @ 2152.5 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH - SINGLE CARRIER

- CONTINUED -

Method 2. Emission mask limitation using a Rohde & Schwarz: Spectrum Analyzer FSEM30 (SN 835533/003) with Total Integrated Laboratory Environment (TILE) test software.

Measurement of the occupied bandwidth emission characteristics was performed at the Equipment Antenna Terminal (EAC) with the 5 MHz carrier set to +46.0 dBm for each of the 9 carriers, previously cited, for the TM1-64 modulation scheme, and to the lowest settable, mid-band and the highest settable for TM5-44. The emission mask used to demonstrate compliance was as specified in ETSI TS 25.141 for P ≥ +43 dBm. The mask attenuation values were based on a 30 kHz resolution bandwidth, which made the modulated 5 MHz carrier to be offset from +46.0 dBm by –22.218 dB, in accordance with the equation:

Carrier Offset = 10 log (30 kHz/5 MHz) = -22.218 dB

This series of measurements were performed using the EMC software:

Total Integrated Laboratory Environment (TILE),
by ETS-Lindgren

.
For TM1-64, measurements were made at the lowest settable and highest settable carriers for Blocks A, B and F; and centered for Blocks C, D and E. For TM5-44, measurements were made at the total band lowest settable, mid-band and highest settable carriers. There was no detectable results difference between the two test modulations. For brevity, attached are the data plots for the lowest settable, mid-band and highest settable carriers for both TM1-64 and TM5-44 modulations.

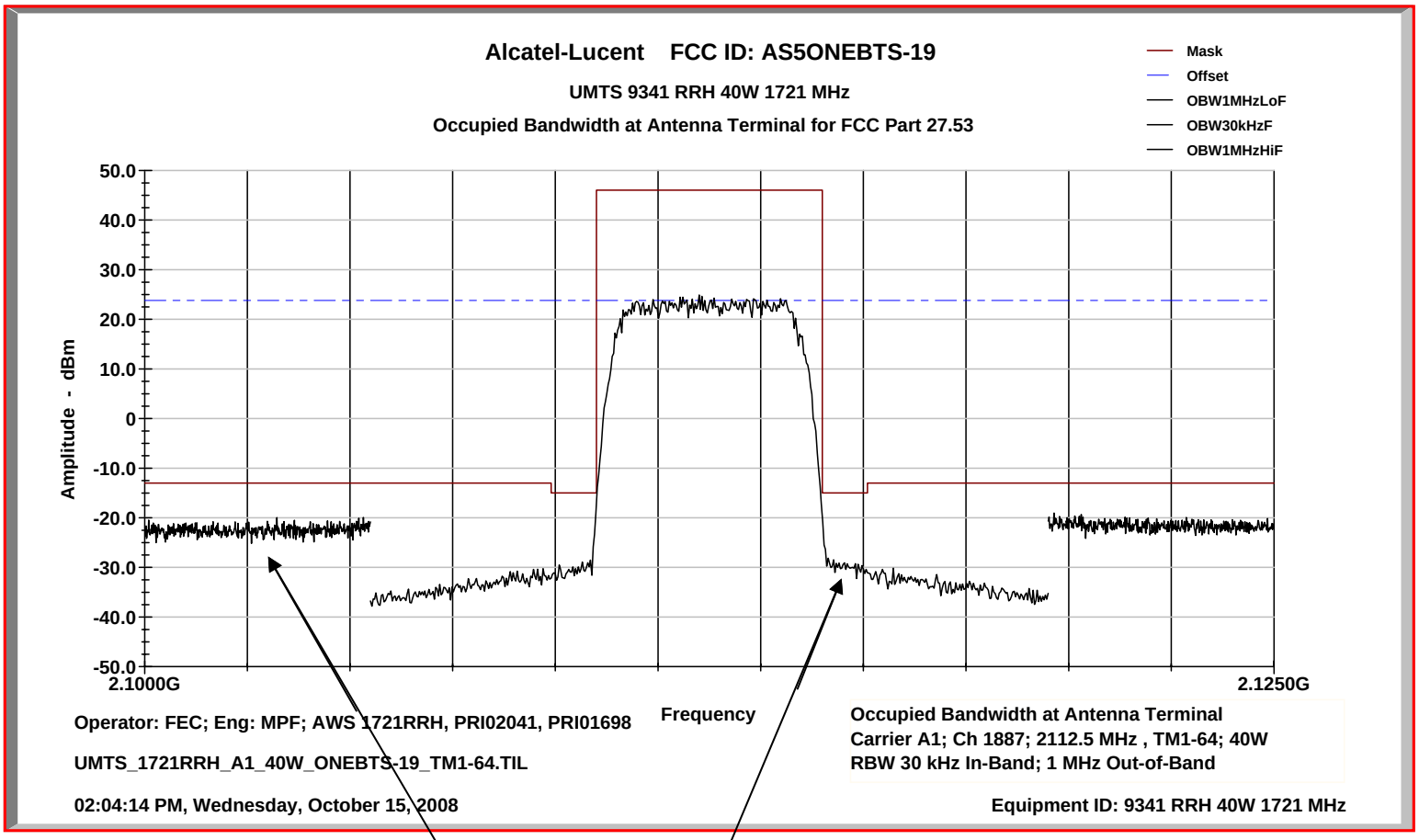
Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

RESULTS: The UARFCN 1887 (lowest settable), 1987 (mid-band), and 2087 (highest settable) channels all demonstrate compliance with the emission mask specified by ETSI TS 25.141 for both TM1-64 and TM5-44 test modulations. In each test, the carriers do not exceed the mask limitation.

The data plots are attached below for both the TM1-64 test modulation scheme and the TM5-44 modulation. All nine carriers were evaluated, however, for brevity the lowest settable, mid-band and the highest settable are attached, for each of the two modulation schemes. The remaining tests are retained as a permanent record.

Lowest Settable Carrier - TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN Channel Number 1887 @ 2112.50 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier

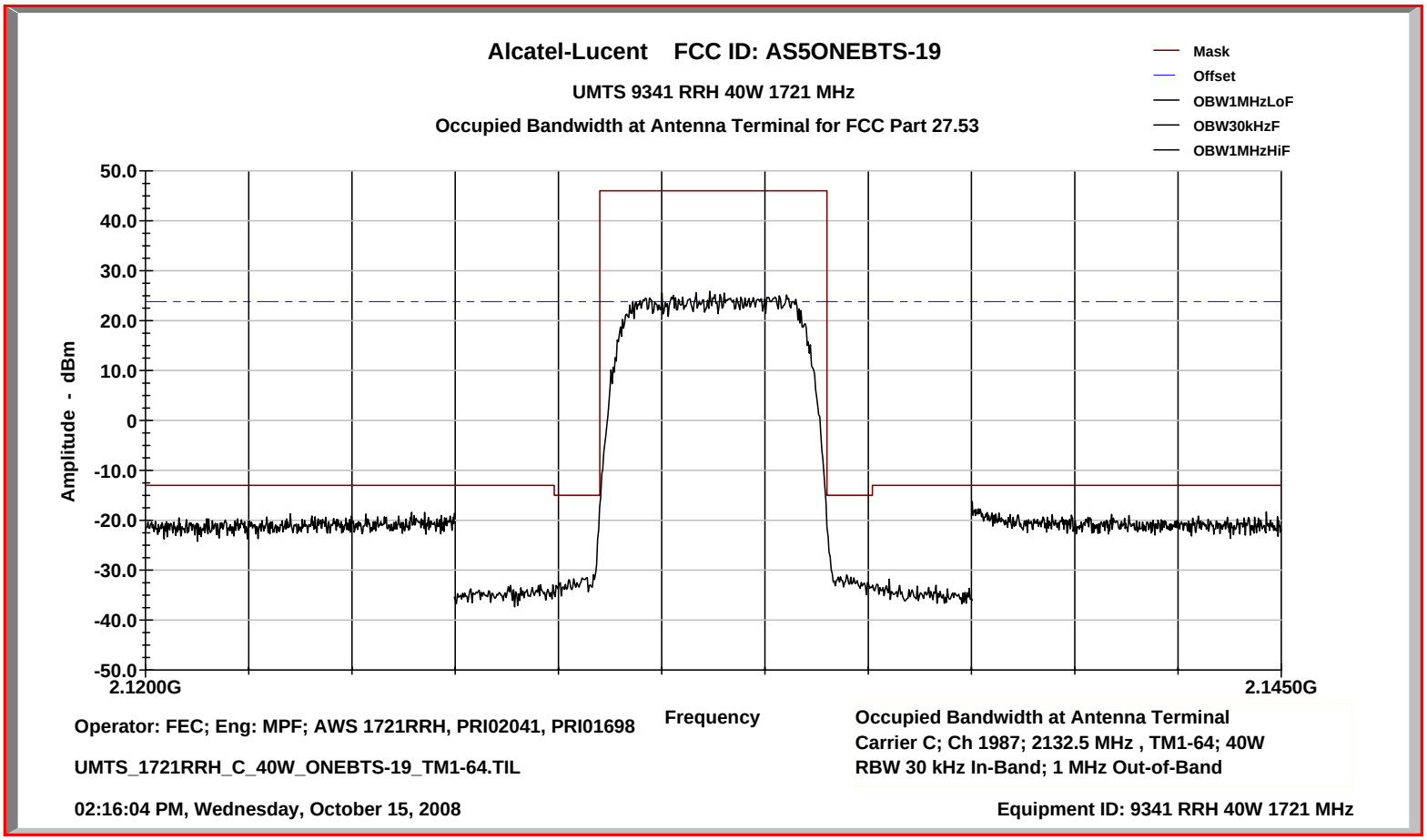


RBW = 1 MHz

RBW = 30 kHz

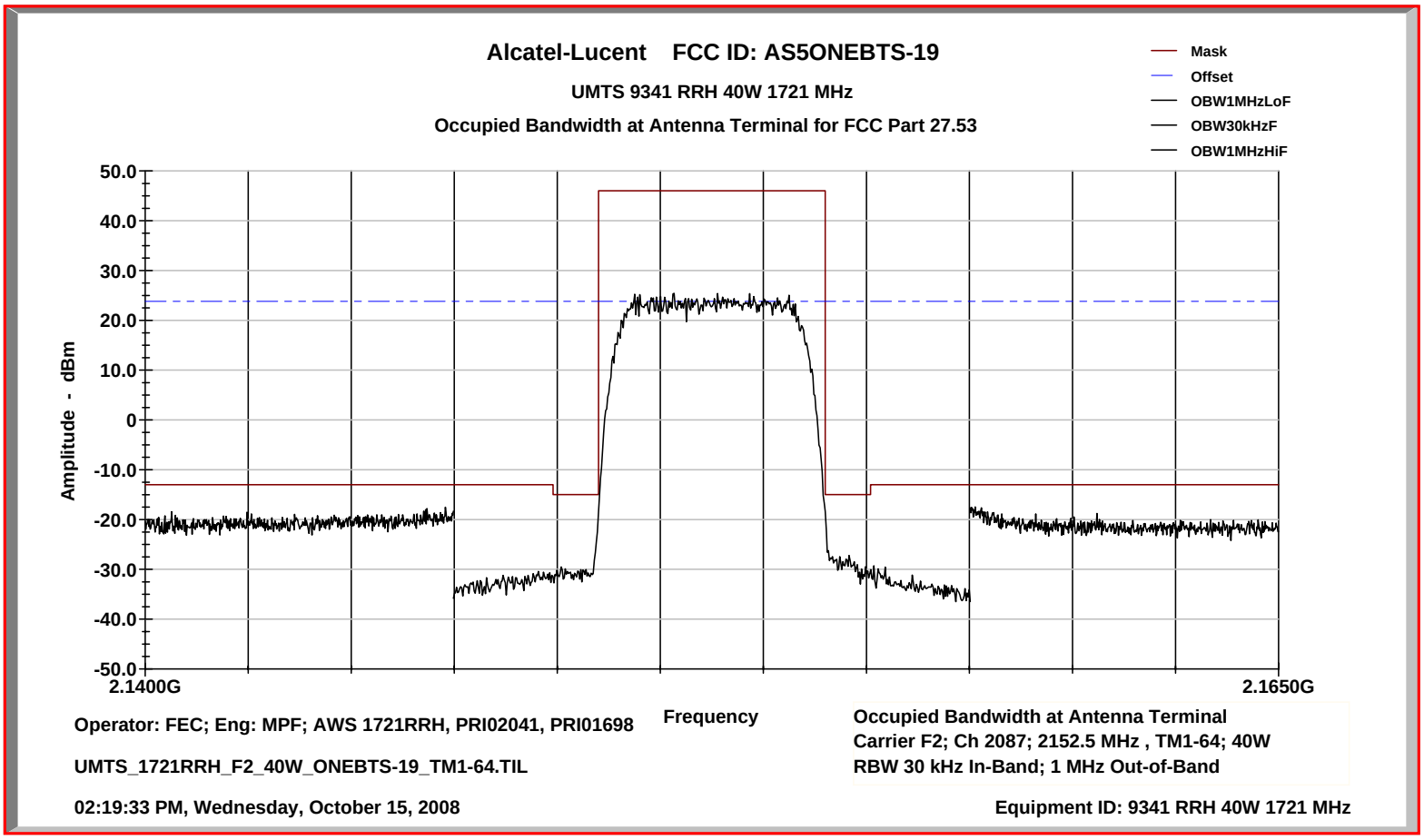
Mid-Band Carrier - TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN Channel Number 1987 @ 2132.50 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



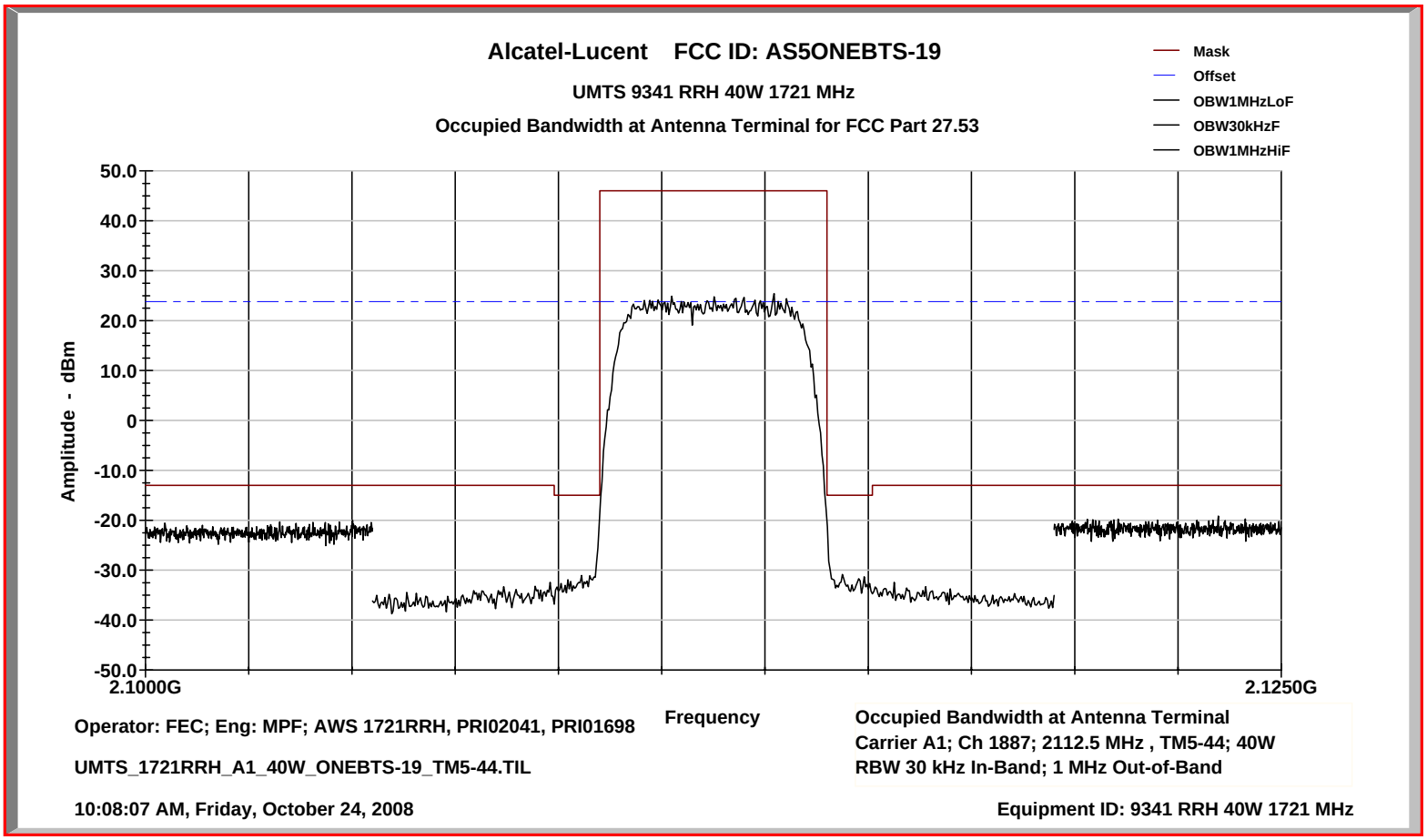
Highest Settable Carrier - TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN Channel Number 2087 @ 2152.50 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



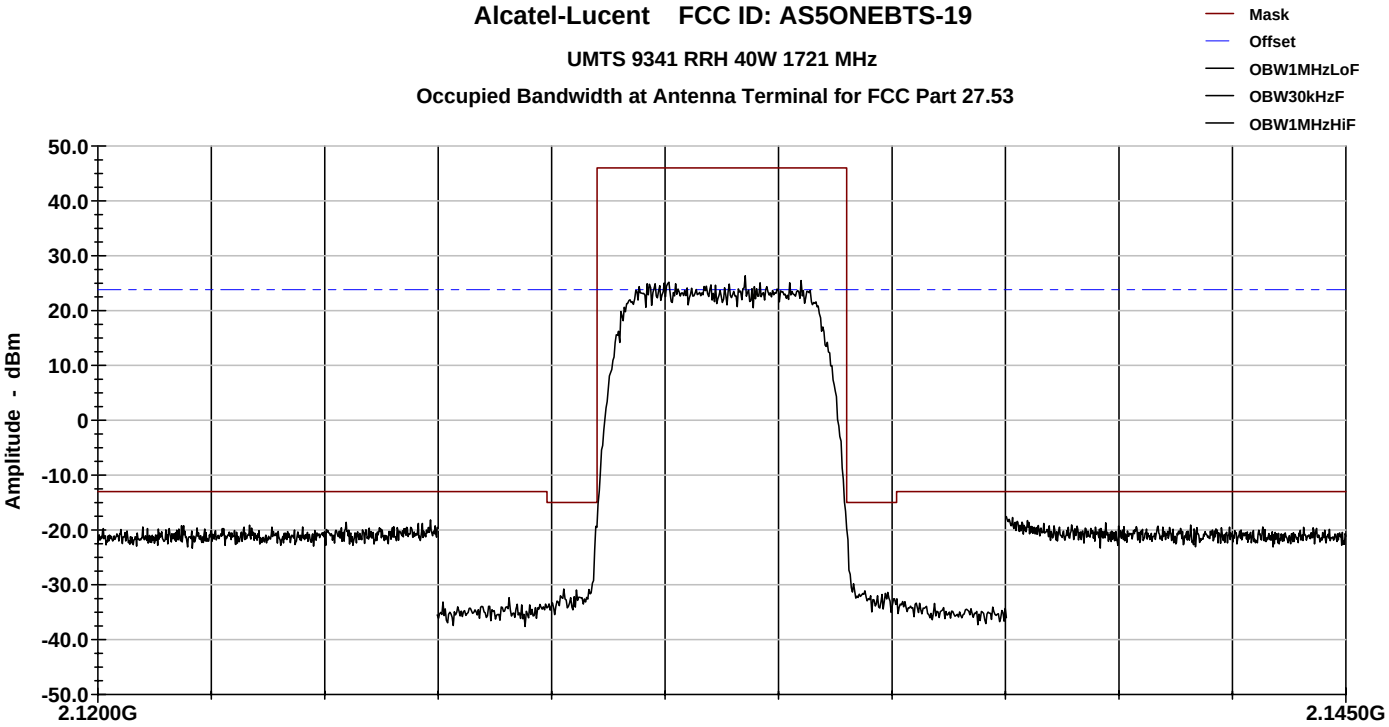
Lowest Settable Carrier - TM5-44 Test Modulation

Occupied Bandwidth Characteristics: UARFCN Channel Number 1887 @ 2112.50 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



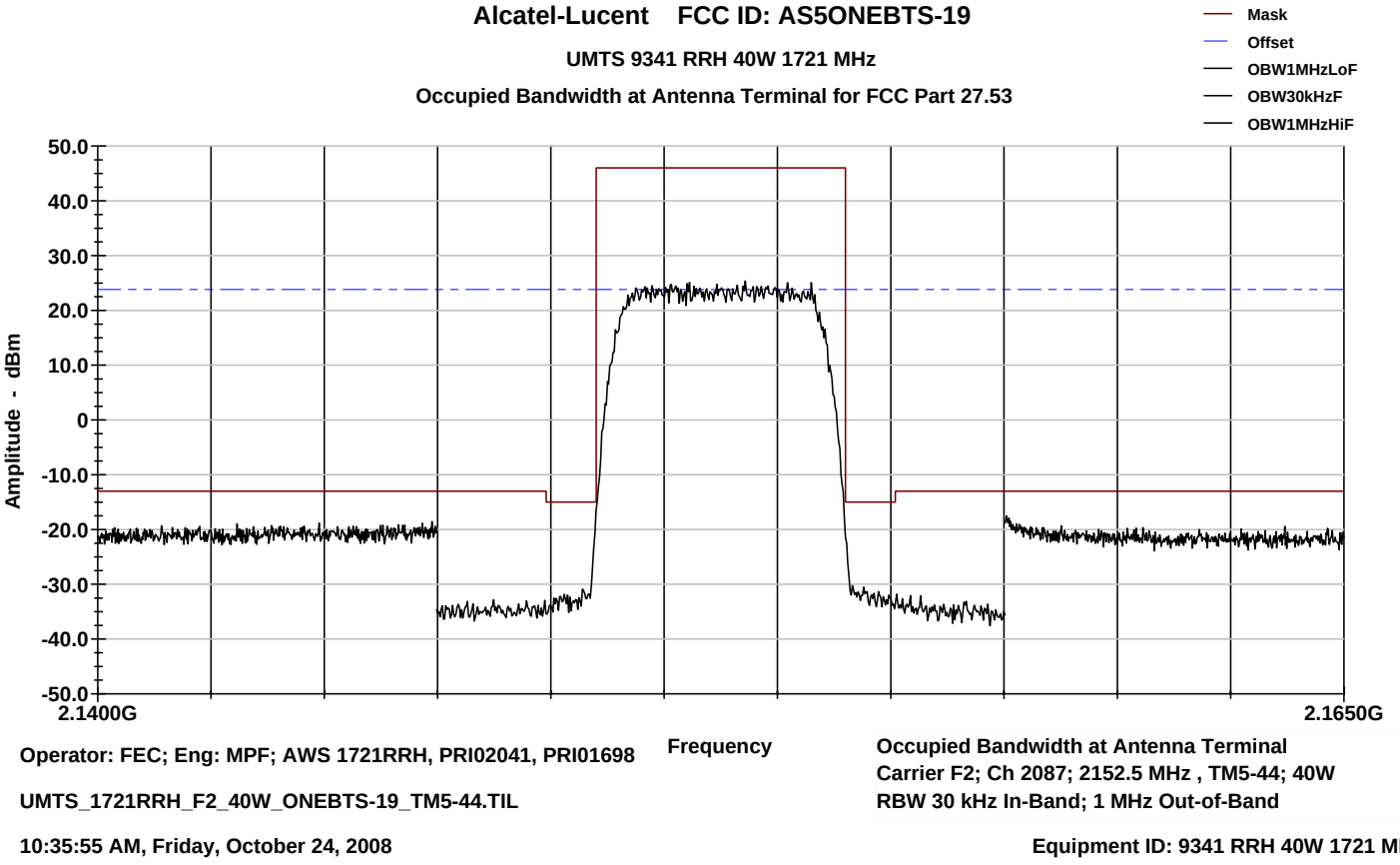
Mid-Band Carrier - TM5-44 Test Modulation

Occupied Bandwidth Characteristics: UARFCN Channel Number 1987 @ 2132.50 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



Highest Settable Carrier - TM5-44 Test Modulation

Occupied Bandwidth Characteristics: UARFCN Channel Number 2087 @ 2152.50 MHz
Tx Antenna Terminal at +46.0 dBm per single 5 MHz carrier



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH - TWO CARRIERS

- CONTINUED -

Method 2. Emission mask limitation using a Rohde & Schwarz: Spectrum Analyzer FSEM30 (SN 835533/003) with Total Integrated Laboratory Environment (TILE) test software.

In addition to single carrier operation at 40W, the *UMTS 9341 RRH 40W 1721 MHz System* can also operate with two adjacent carriers at 20W per carrier with a total composite power of 40W. As with the single carrier measurements, the 2-carrier occupied bandwidth emission characteristics was performed at the Equipment Antenna Terminal (EAC) with each carrier set to 20W/C (+43.0 dBm/Carrier) and to the TM1-64 modulation scheme. The two adjacent carriers were measured and recorded when operating in the lowest and highest settable 10 MHz bandwidth frequency blocks: A and F Blocks; and at the AWS mid-band C+D blocks. These 3 blocks represent the lowest settable, mid-band and the highest settable carrier pairs for over the AWS frequency spectrum.

The emission mask used and the carrier offset from +43.0 dBm by –22.218 dB, were as previously cited and in accordance with the following equation:

Carrier Offset = 10 log (30 kHz/5 MHz) = -22.218 dB

Attached are three data plots showing the lowest settable, mid-band and the highest settable carrier pairs covering the AWS frequency spectrum, corresponding to frequency blocks A, B and F.

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

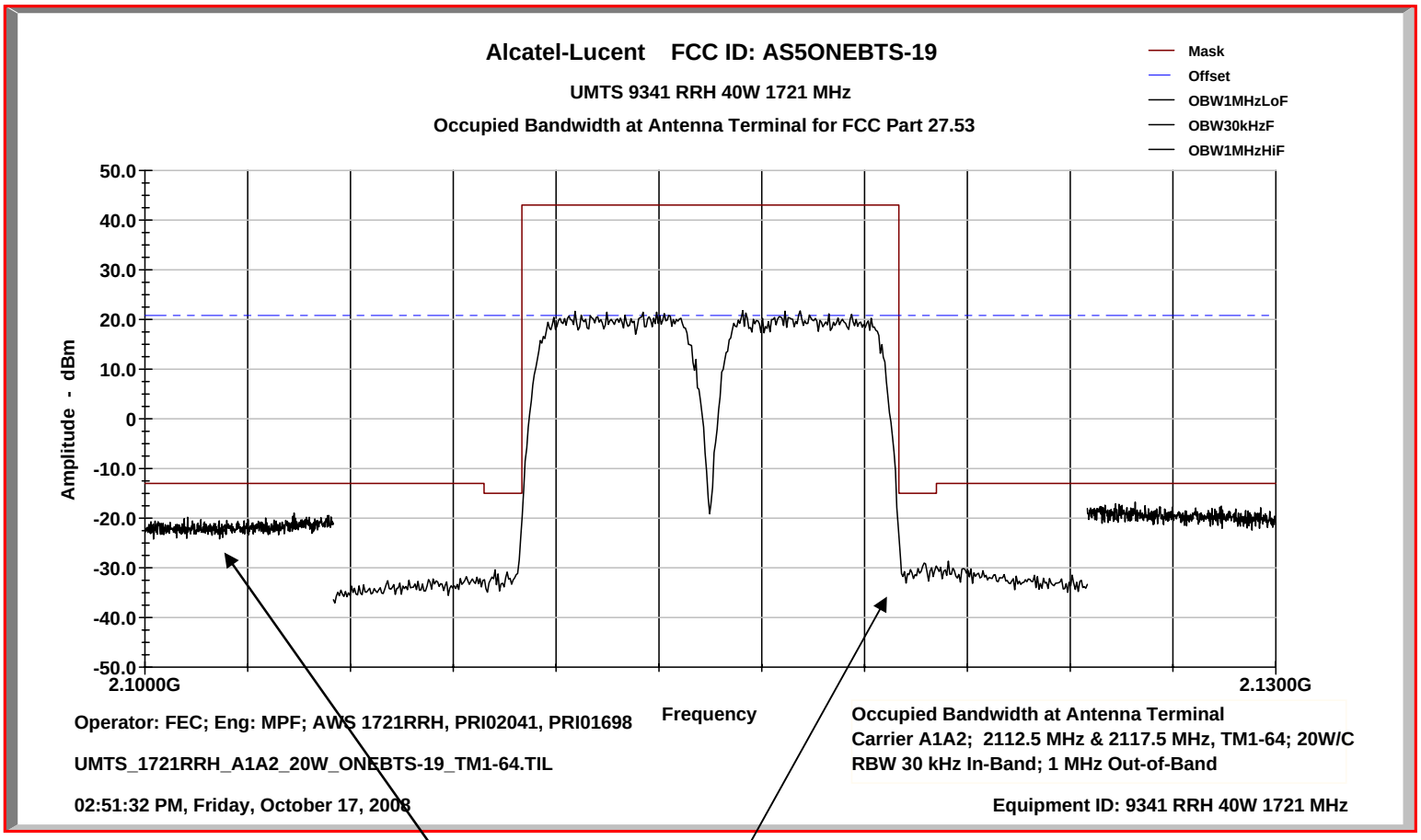
RESULTS: In all 2-carrier tests, compliance was demonstrated with the emission mask specified by ETSI TS 25.141. In each test, the carrier pairs do not exceed the mask limitation.

The data plots are attached below showing the lowest settable, the mid-band and the highest settable carrier pairs for the AWS frequency blocks A, C+D and F.

Lowest Settable Carrier Pair - A Block - TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN 1887 @ 2112.50 MHz + CN 1912 @ 2117.5 MHz
Tx Antenna Terminal at +43.0 dBm per carrier

Two Carrier A1 + A2



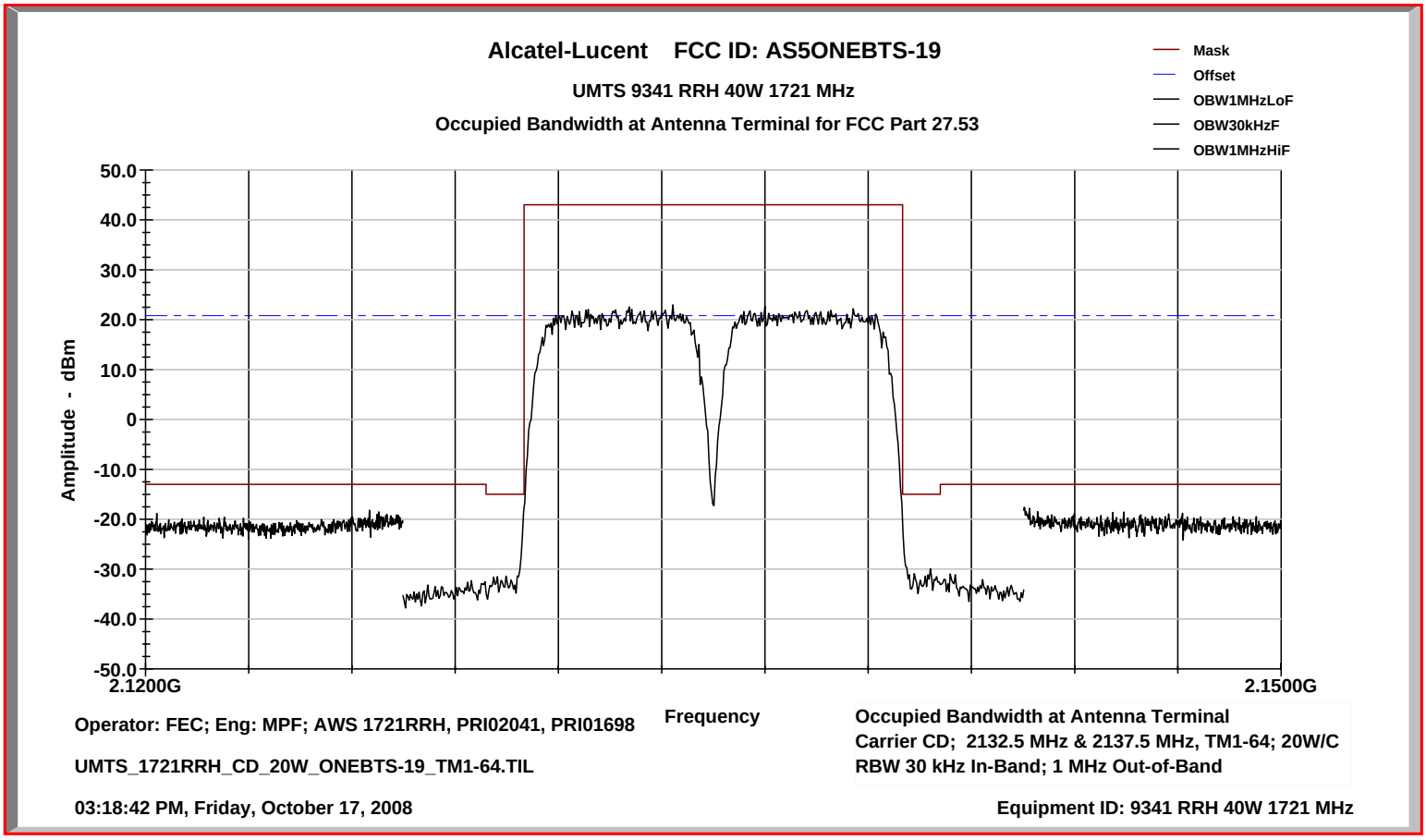
RBW = 1 MHz

BW = 30 kHz

Highest Settable Carrier Pair - A Block - TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN 1987 @ 2132.5 MHz + CN 2012 @ 2137..5 MHz
Tx Antenna Terminal at +43.0 dBm per carrier

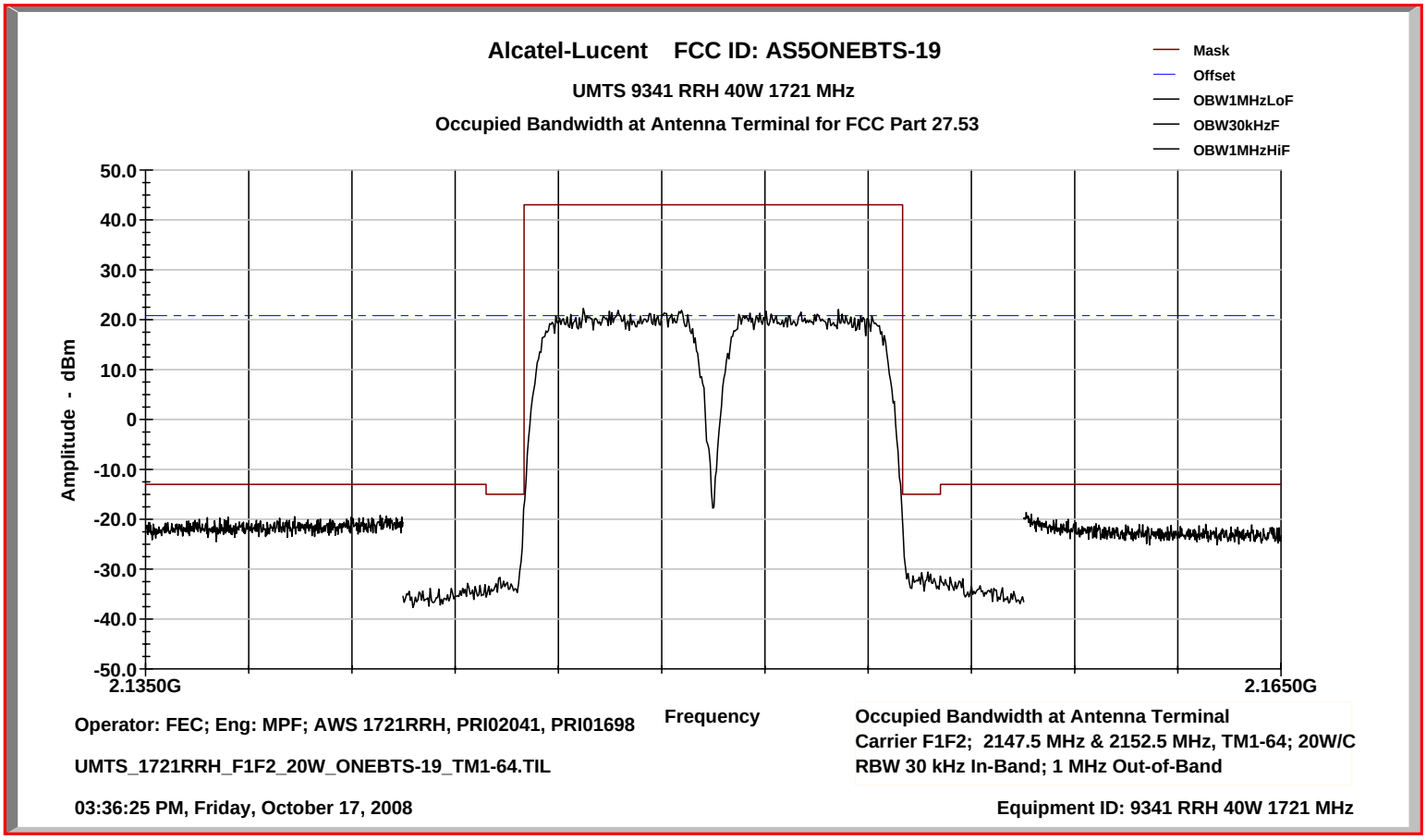
Two Carrier C + D



Highest Settable Carrier Pair - F Block - TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN 2062 @ 2147.5 MHz + CN 2087 @ 2152.5 MHz
Tx Antenna Terminal at +43.0 dBm per carrier

Two Carrier F1 + F2



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH - THREE CARRIERS

- CONTINUED -

Method 2. Emission mask limitation using a Rohde & Schwarz: Spectrum Analyzer FSEM30 (SN 835533/003) with Total Integrated Laboratory Environment (TILE) test software.

In addition to single carrier and two carrier operation at 40W total composite power, the *UMTS 9341 RRH 40W 1721 MHz System* can also operate with three adjacent carriers at 13.3 W per carrier with a total composite power of 40W. As with the single carrier measurements, the 3-carrier occupied bandwidth emission characteristics was performed at the Equipment Antenna Terminal (EAC) with each carrier set to 13.3 W/C (+41.1 dBm/Carrier) and to the TM1-64 modulation scheme. The three adjacent carriers were measured and recorded when operating in the lowest and highest settable 3 adjacent carrier combination., which are: A1+A2+B1 and E+F1+F2 Blocks.

As in the previous tests, the carrier offset from +41.1 dBm by –22.218 dB, in accordance with the following equation:

$$\text{Carrier Offset} = 10 \log (30 \text{ kHz}/5 \text{ MHz}) = -22.218 \text{ dB}$$

Attached are two data plots showing the lowest settable and the highest settable 3 adjacent carriers, covering the AWS frequency spectrum.

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

RESULTS: In all 3-carrier tests, compliance was demonstrated with the emission mask specified by ETSI TS 25.141. In each test, the carrier combinations do not exceed the mask limitation.

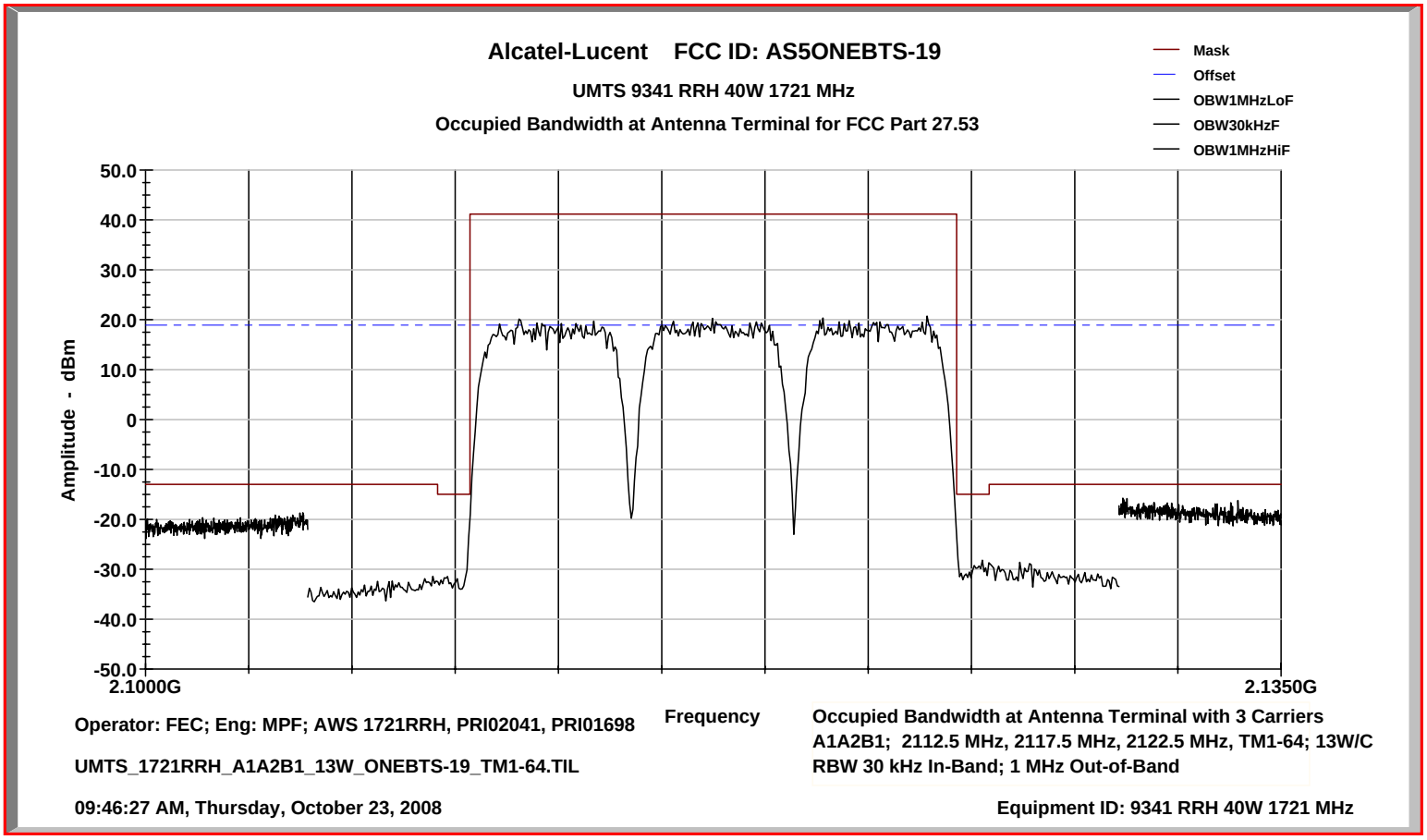
The data plots are attached below showing the lowest settable and the highest settable carrier combinations for the AWS frequency blocks A1+A2+B1 and E+F1+F2.

Lowest Settable Three Adjacent Carrier s with TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN 2037 @ 2142.5 MHz + CN 2062 @ 2147.5 MHz + CN 2087 @ 2152.5 MHz.

Tx Antenna Terminal at +41.1 dBm per carrier

Three Carriers A1+A2+B1

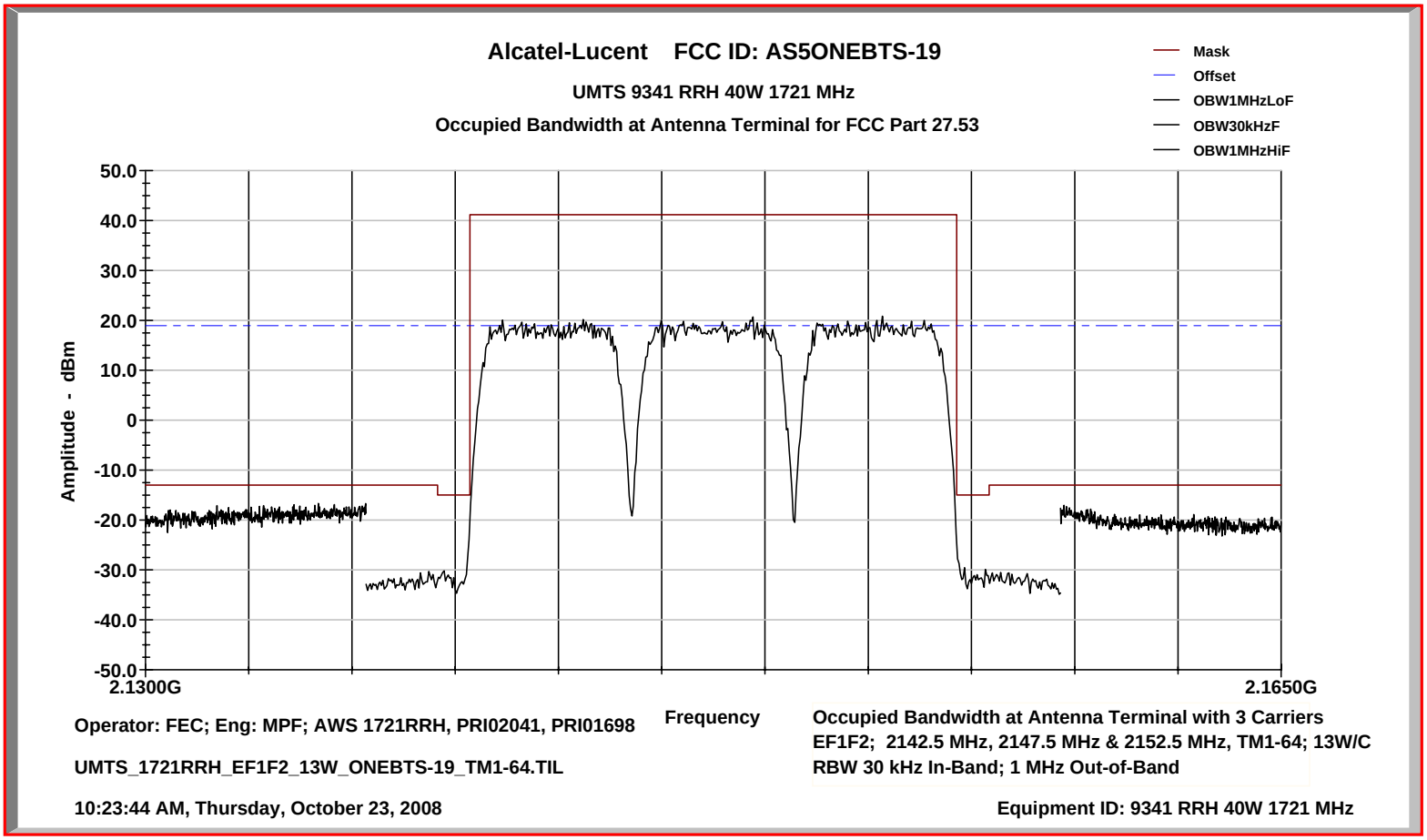


Highest Settable Three Adjacent Carrier s with TM1-64 Test Modulation

Occupied Bandwidth Characteristics: UARFCN 2037 @ 2142.5 MHz + CN 2062 @ 2147.5 MHz + CN 2087 @ 2152.5 MHz

Tx Antenna Terminal at +41.1 dBm per carrier

Three Carriers E + F1 + F2



PART 2.1051 MEASUREMENTS REQUIRED: SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS – Single Carrier

This test procedure is an extension of the occupied bandwidth measurement at the Equipment Antenna Connector (EAC) terminal, using the same carrier frequencies, power level setting procedure and modulated carrier offset procedure. In accordance with Part 2.1057(a), the required frequency spectrum to be investigated extends from the lowest RF signal generated to the 10^{th} harmonic of the carrier at the EAC terminal. The emission limits at the antenna terminal are specified in Part 27.53 (a) … the power of any emission shall be attenuated below the transmitter power (*P*) by at least 43 + 10 log (*P*) dBc. The power *P* is the average carrier power measured at the EAC (antenna) terminal in Watts. Setting the power level at EAC to 40 Watts average, produces an emission attenuation below the carrier of 59.02 dBc. Part 24.238 (b) specifies the required Resolution Bandwidth (RBW) to be 1 MHz or greater. In accordance with Part 2.1051, "the magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified"; i.e., these are not reportable. Hence, the measurement equipment must be adjusted and configured to provide an instrumentation noise floor that is at least 20 dB or more below the 43 + 10 log (*P*) dBc limit, which equates to 79.02 dBc. The pertinent test parameters are:

1. Frequency Spectrum: 30 MHz to 22 GHz
2. Resolution Bandwidth: 1 MHz or greater (Part 24.238)
3. Emission Limitation: 43 + 10 log (*P*) dBc = 43 + 10 log (40 Watts) = 59.02 dBc
4. Instrumentation Noise Floor: at least 20 dB greater than "43 + 10 log (*P*) dBc" = 79.02 dBc

Minimum Standard Requirement:

The emission limits at the antenna terminal are specified in Part 27.53 (a) … the power of any emission shall be attenuated below the transmitter power (*P*) by at least 43 + 10 log (*P*) dBc (i.e., attenuation below the unmodulated carrier). The power *P* is the average carrier power measured at the J4 antenna terminal in Watts. The measurement equipment must be adjusted and configured to provide an instrumentation noise floor that is 20 dB or more below the 43 + 10 log (*P*) dBc limit. In summary:

1. Carrier Power Level = 46.0 dBm
2. Emission Limitation = 46.0 dBm – 59.0 dBc = -13.0 dBm
3. Reportable Emission Limit = -13.0 dBm – 20 dBc = - 33.0 dBm
4. Emission power levels less than – 33.0 dBm are not reportable; i.e., at $\geq$ 79.02 dBc

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

Method of Measurement:

In order to suppress the instrumentation noise floor sufficient to detect and measure spurious signals that have power levels as low as 20 dB below the required limit, or as low as –33.0 dBm (i.e., 79.02 dBc), an EMC software package was employed to drive the spectrum analyzer, collect and compile the acquired data, perform mathematical corrections to the data by incorporating (i.e., programming) pre-measured path losses into the software, and then generate a graphical display as shown in this exhibit. The software package is: *TILE/IC (Total Integrated Laboratory Environment/Instrument Control System)*; purchased and licensed from ETS-Lindgren. The instrumentation noise floor is suppressed by the software's ability to split the spectrum being measured into many small segments, perform the mathematical corrections to each segment, and then sequentially compile all the segments into a continuous graphical display.

Part 27.53 requires that emissions over the required spectrum 30 MHz to 22 GHz be measured using an instrumentation resolution bandwidth of 1 MHz or greater. The TILE/IC software was able to sufficiently suppress the normally high noise floor by measuring the spectrum in a sequential series of short segments using a peak detector, in combination with an appropriate low-pass filter and then with an appropriate high-pass filter, installed at the input terminal of the spectrum analyzer, to prevent the carrier from over driving the spectrum analyzer. The carrier portion of the spectrum 2110 MHz – 2155 MHz, was measured without filters.

The specific EMC test filters used were manufactured by TRILITHIC, Inc., Indianapolis, IN:

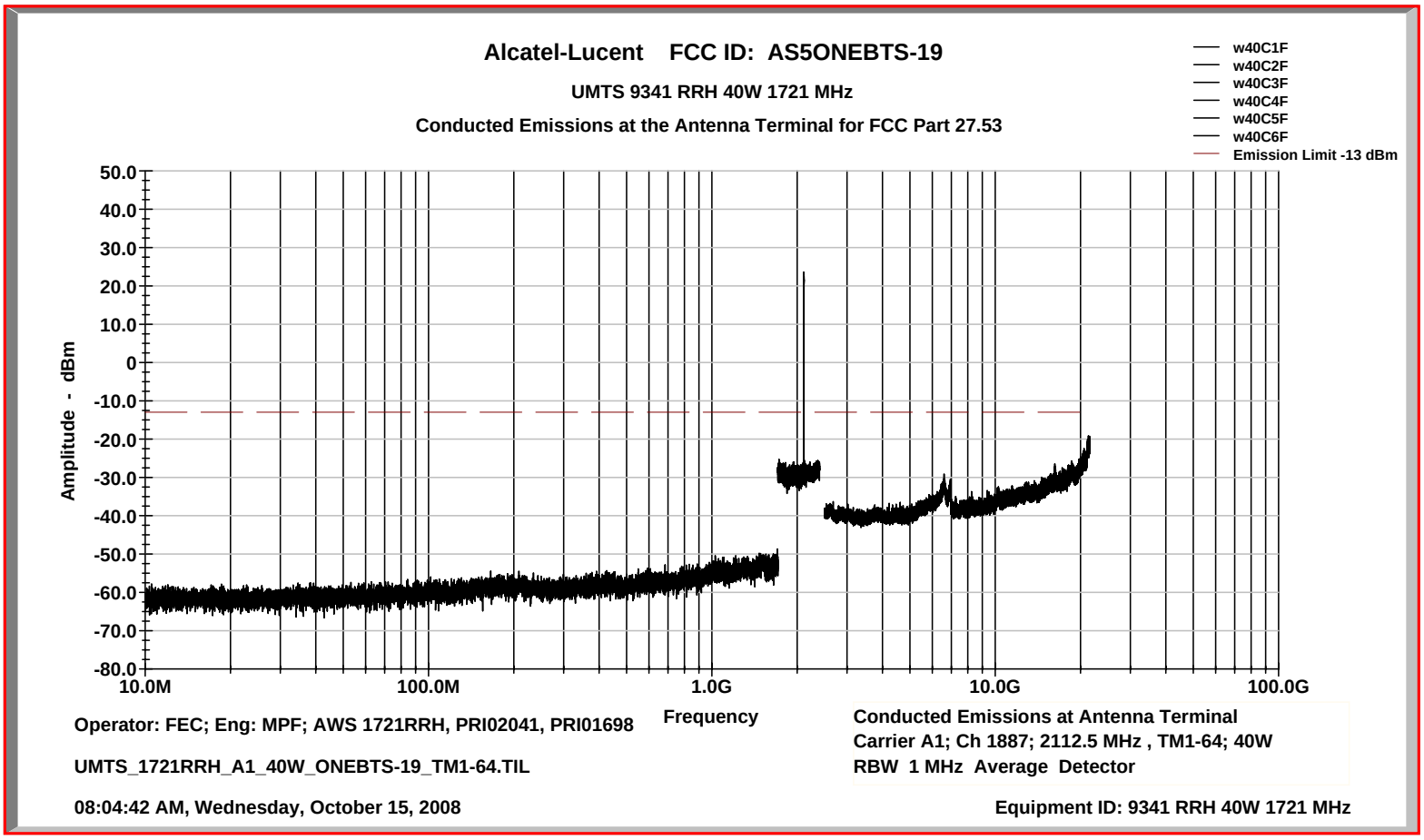
1. Low Pass Filter: Model 10LC800-3-AA; Product No. 23042
2. High Pass Filter: Model 4HC1400/8000-1-KK; Product No. 23042

This test procedure was conducted in conjunction with the previously cited occupied bandwidth tests for single carrier at 40W , for 2 adjacent carriers at 20W per carrier 3 adjacent carriers at 13.3 W per carrier, as previously cited, plus the same two test modulations: TM1-64 and TM5-44, as used for the occupied bandwidth tests.

Results: For each UMTS carrier, there were no reportable emissions for either a single carrier at 40W, for 2 adjacent carriers at 20W per carrier and 3 adjacent carriers at 13.3 W per carreir . Data plots for the lowest settable, mid-band and the highest settable single carriers with each of the two test modulations: TM1-64 and TM5-44, are attached to this exhibit. The remaining carrier tests and data plots are retained as a permanent record.

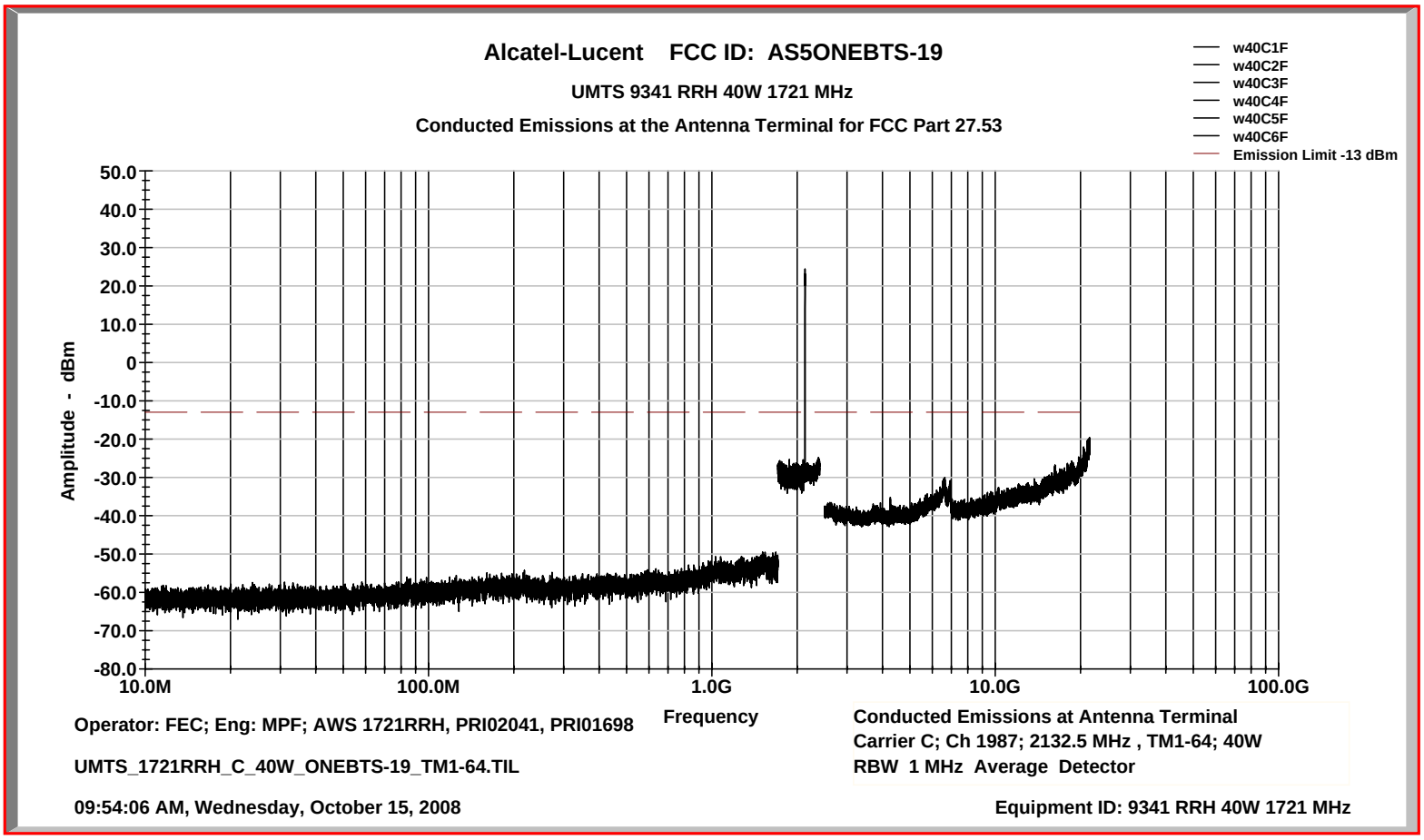
Lowest Settable Carrier - TM1-64 Test Modulation

Conducted Emissions Characteristics: UARFCN Channel Number 1887 @ 2112.50 MHz
Tx Antenna Terminal at +46.0 dBm per single carrier



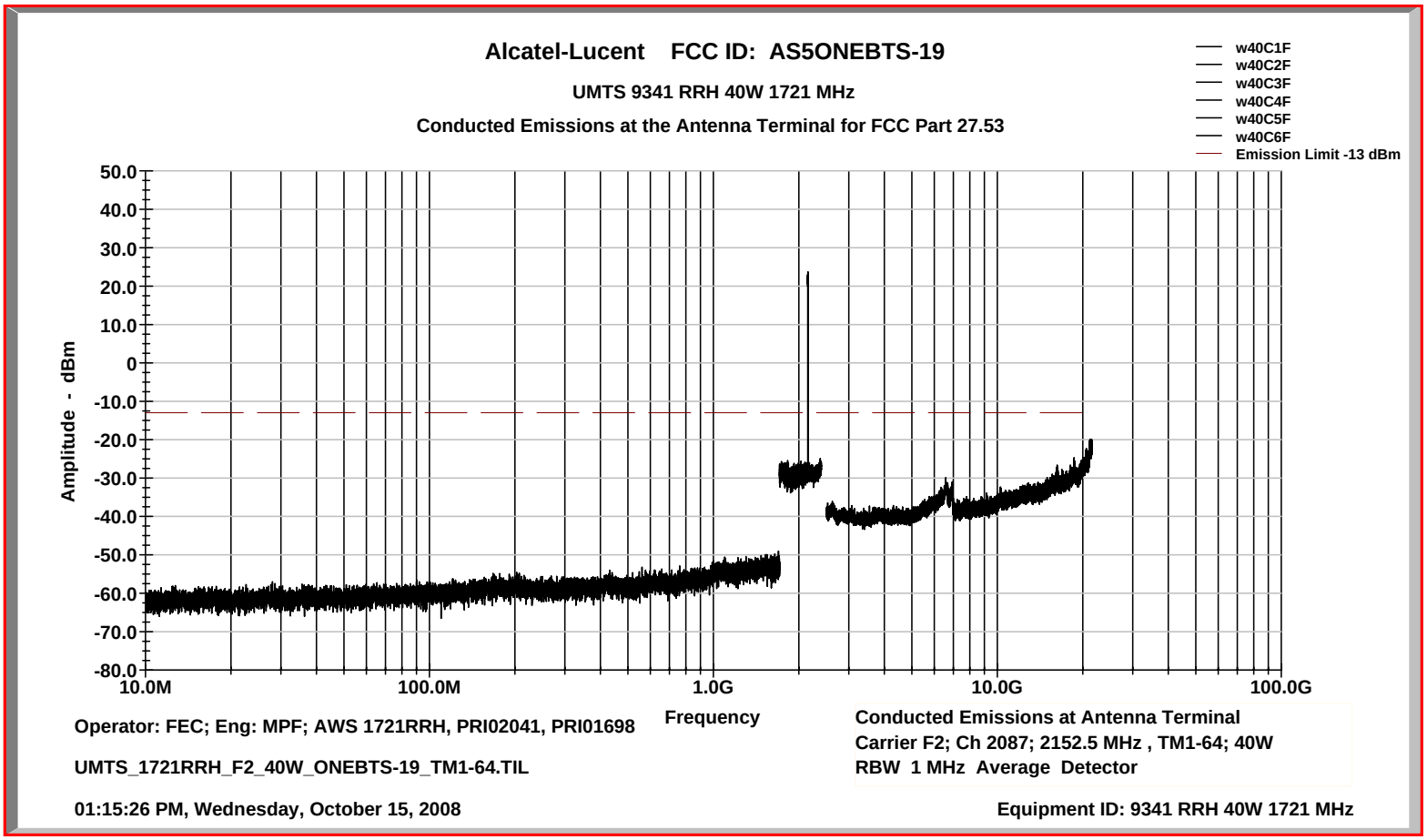
Mid-Band Carrier - TM1-64 Test Modulation

Conducted Emissions Characteristics: UARFCN Channel Number 1987 @ 2132.50 MHz
Tx Antenna Terminal at +46.0 dBm per single carrier



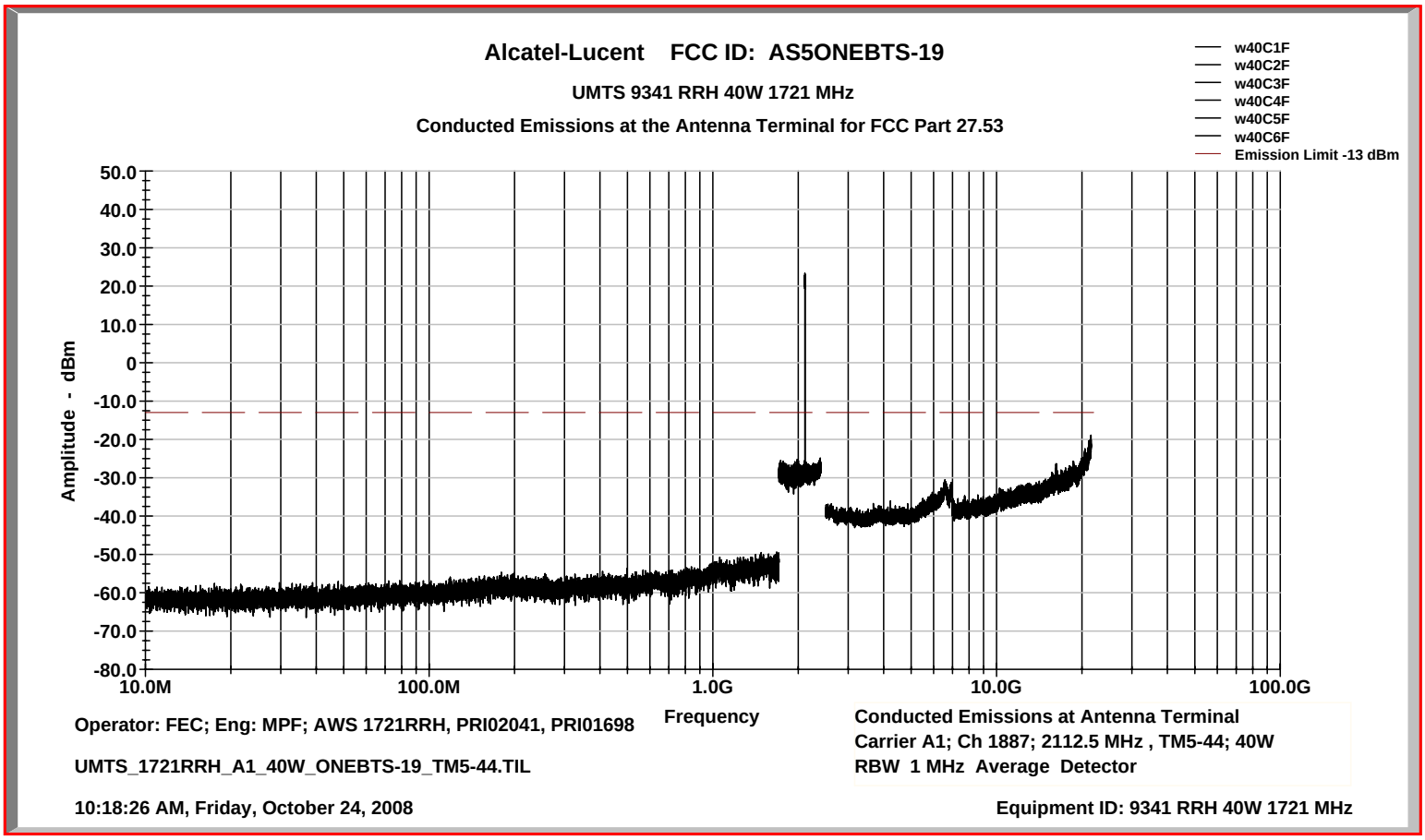
Highest Settable Carrier - TM1-64 Test Modulation

Conducted Emissions Characteristics: UARFCN Channel Number 2087 @ 2152.50 MHz
Tx Antenna Terminal at +46.0 dBm per single carrier



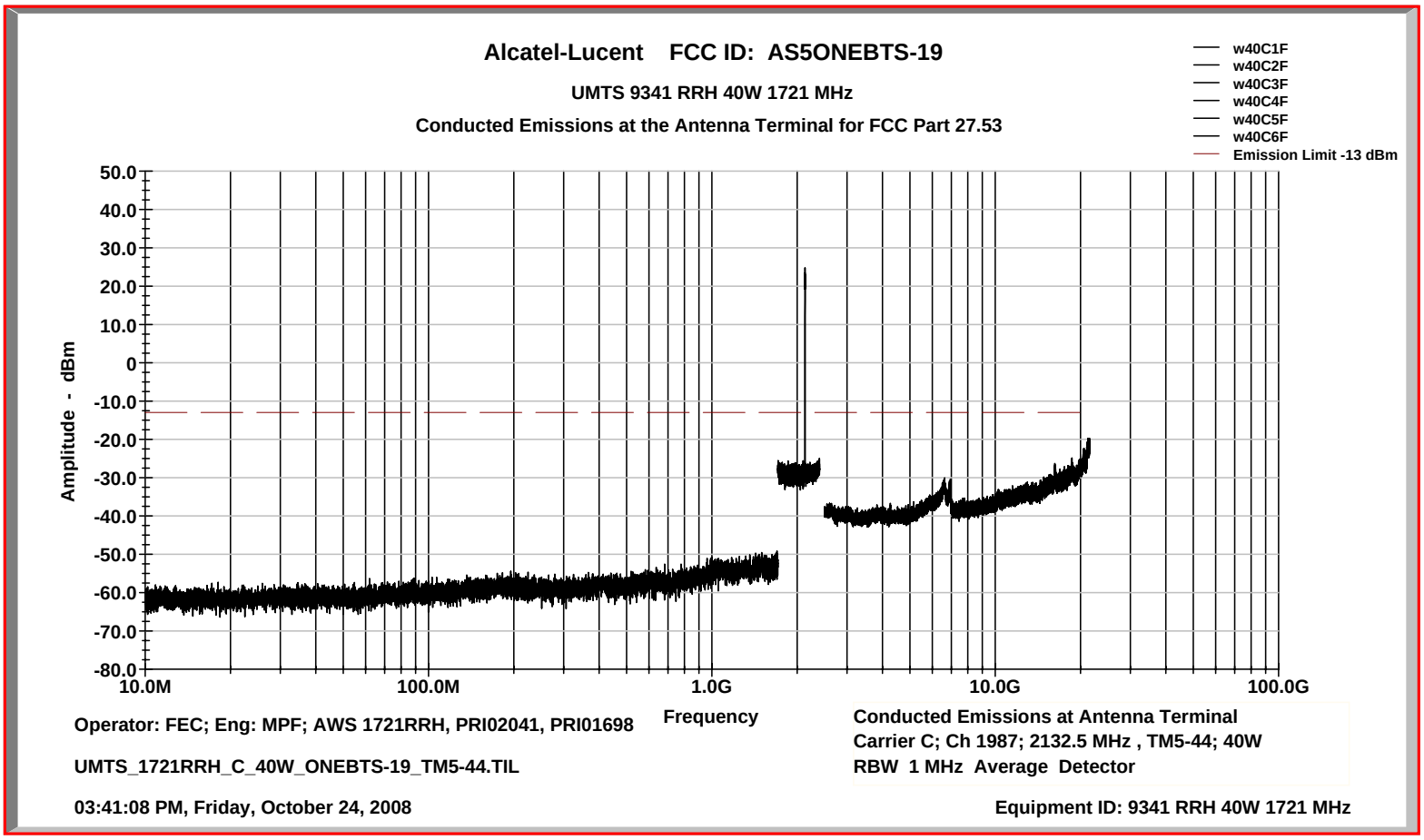
Lowest Settable Carrier - TM5-44 Test Modulation

Conducted Emissions Characteristics: UARFCN Channel Number 1887 @ 2112.50 MHz
Tx Antenna Terminal at +46.0 dBm per single carrier



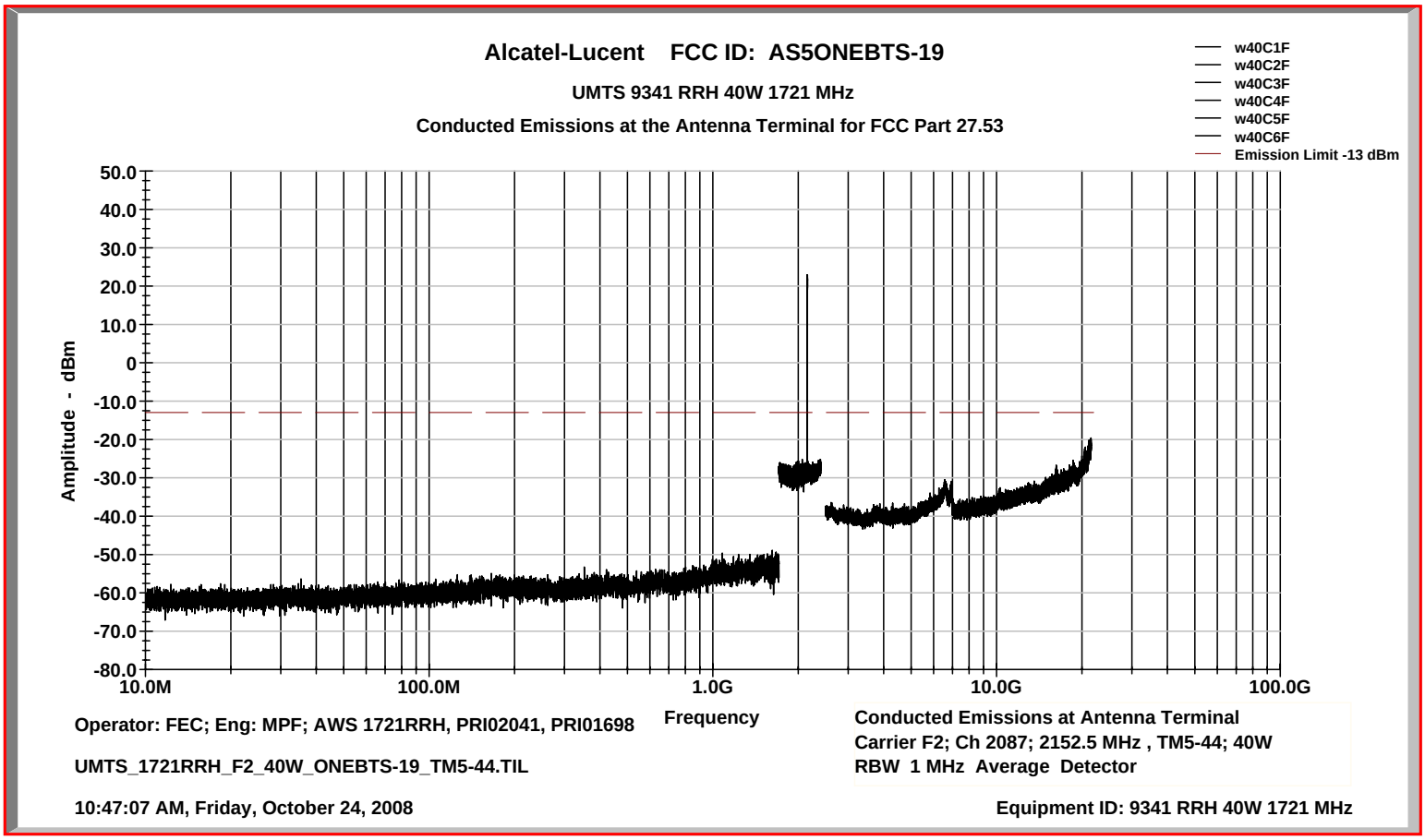
Mid-Band Carrier - TM5-44 Test Modulation

Conducted Emissions Characteristics: UARFCN Channel Number 1987 @ 2132.50 MHz
Tx Antenna Terminal at +46.0 dBm per single carrier



Highest Settable Carrier - TM5-44 Test Modulation

Conducted Emissions Characteristics: UARFCN Channel Number 2087 @ 2152.50 MHz
Tx Antenna Terminal at +46.0 dBm per single carrier

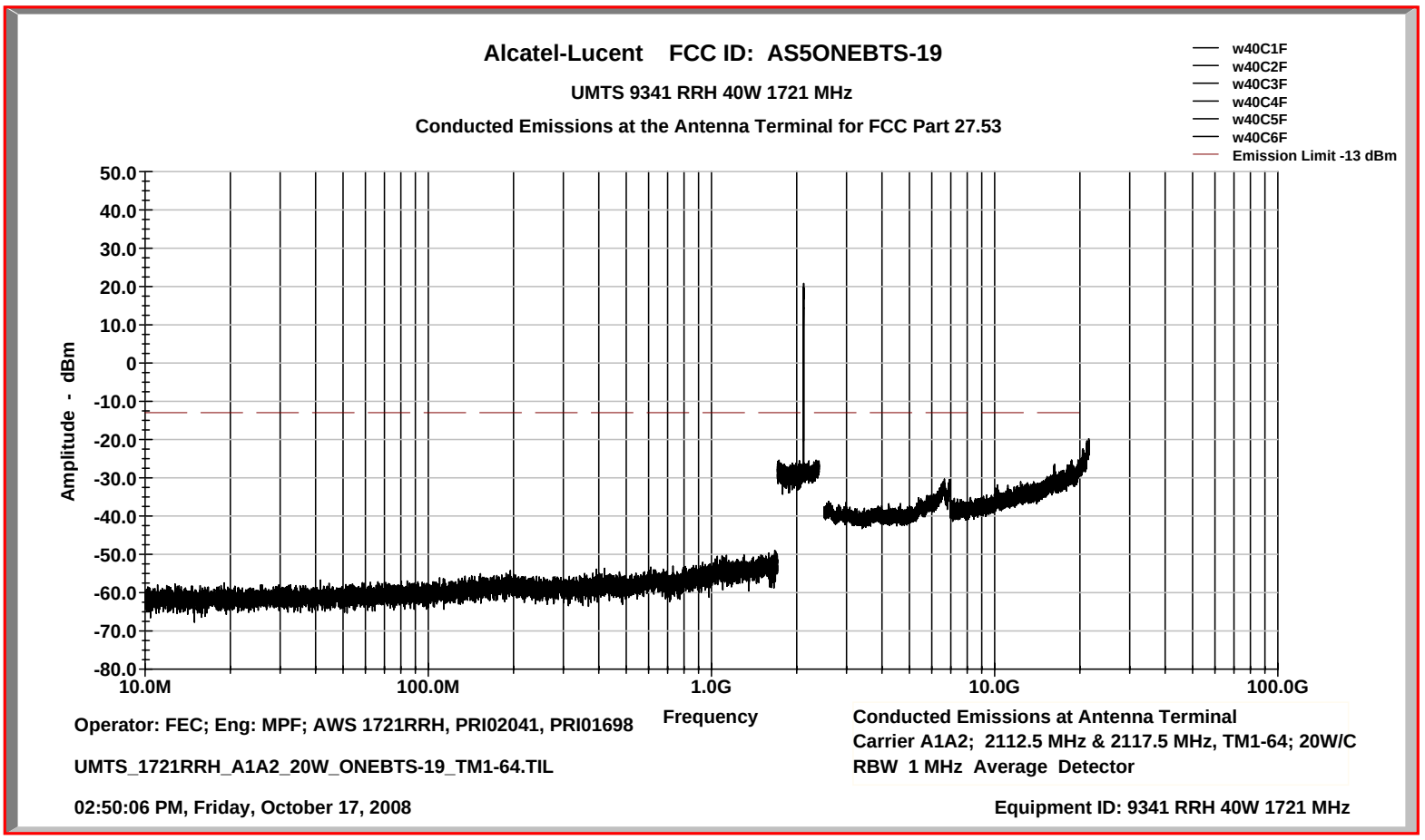


PART 2.1051 MEASUREMENTS REQUIRED: SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS – Two Carrier Operation

Lowest Settable Carrier Pair - A Block - TM1-64 Test Modulation

Conducted Emission Characteristics: UARFCN 1887 @ 2112.5 MHz + CN 1912 @ 2117.5 MHz
Tx Antenna Terminal at +43.0 dBm per carrier

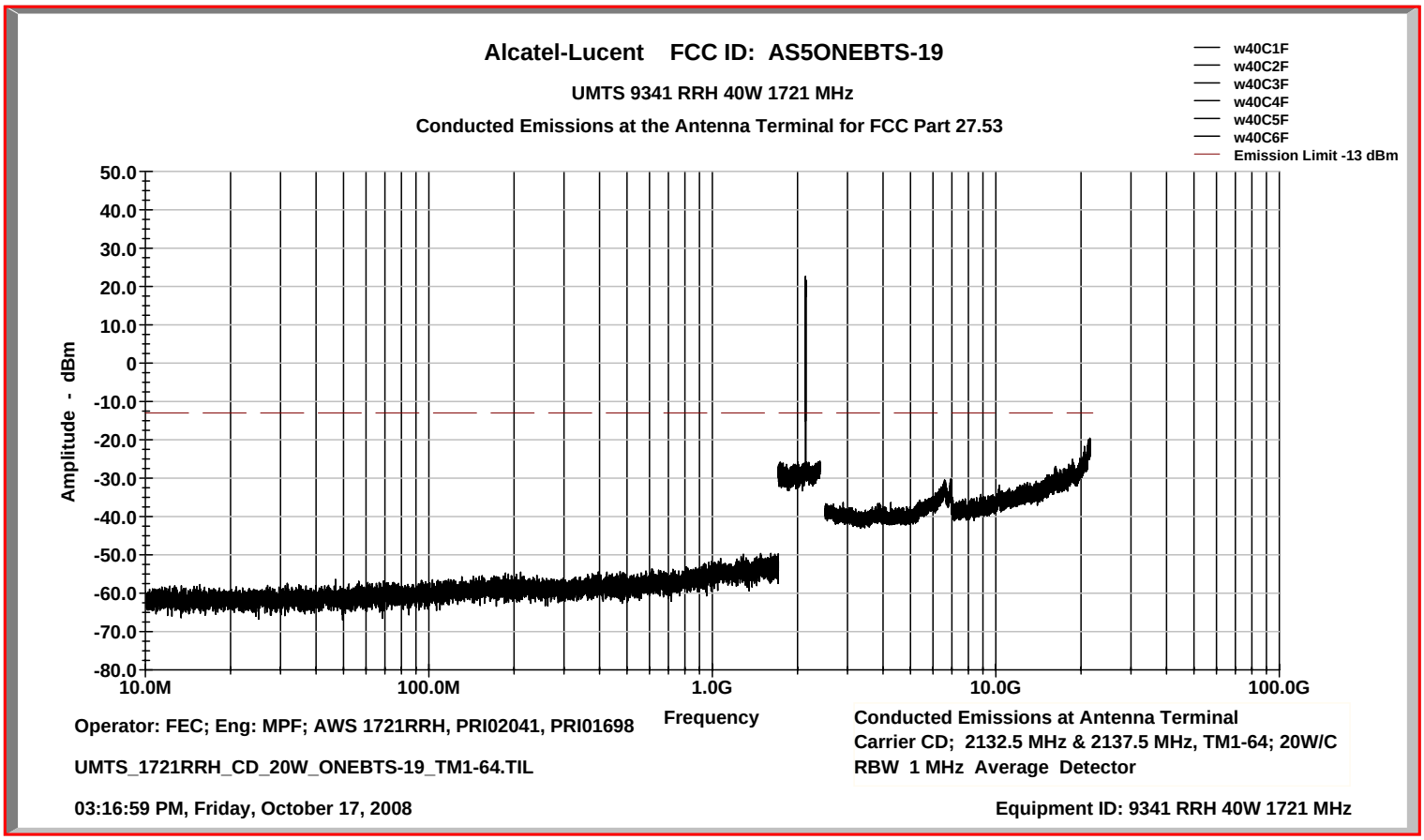
Two Carrier Operation: A1 + A2



Mid-Band Carrier - TM1-64 Test Modulation

Conducted Emission Characteristics: UARFCN Channel Number 1987 @ 2132.50 MHz + CN 2012 @ 2137.5 MHz

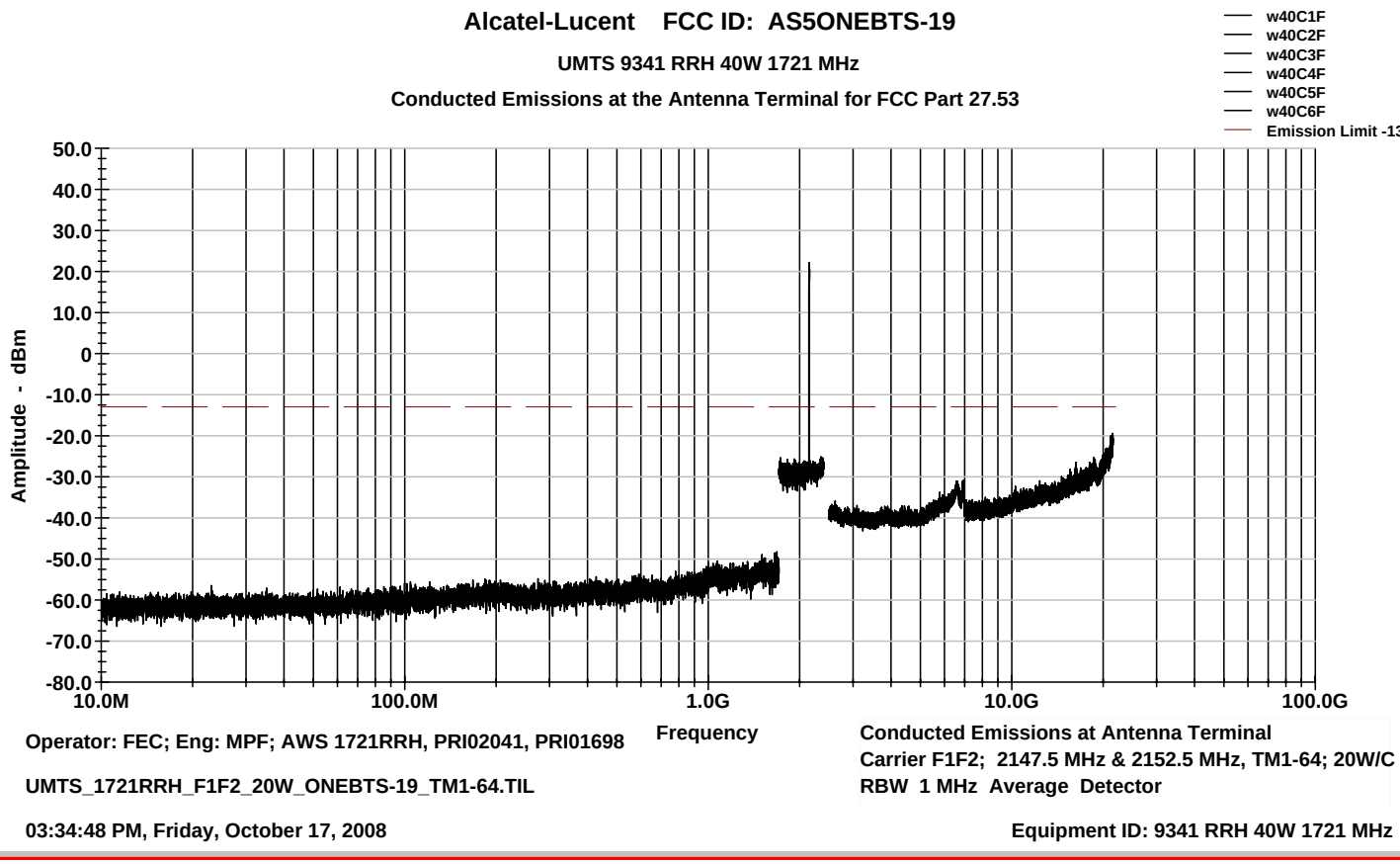
Tx Antenna Terminal at +43.0 dBm per carrier



Highest Settable Carrier Pair - F Block - TM1-64 Test Modulation

Conducted Emission Characteristics: UARFCN 2062 @ 2147.5 MHz + CN 2087 @ 2152.5 MHz
Tx Antenna Terminal at +43.0 dBm per carrier

Two Carrier F1 + F2



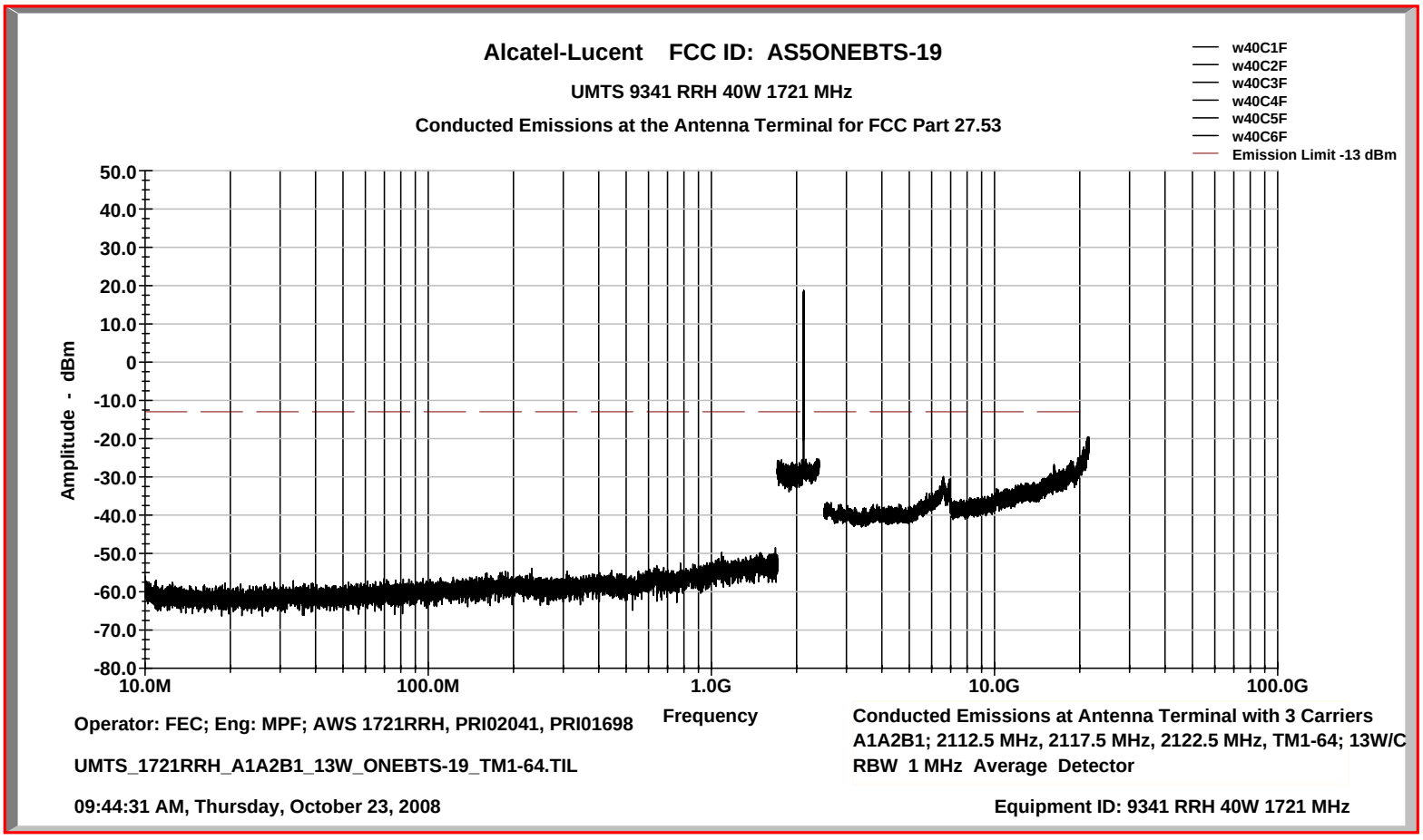
PART 2.1051 MEASUREMENTS REQUIRED: SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS – Three Carrier Operation

Lowest Settable 3 Adjacent Carriers - TM1-64 Test Modulation

Conducted Emission Characteristics: UARFCN 1887 @ 2112.5 MHz + CN 1912 @ 2117.5 MHz + CN 2087 @ 2152.5 MHz

Tx Antenna Terminal at +41.1 dBm per carrier

Three Carrier A1 + A2 + B1

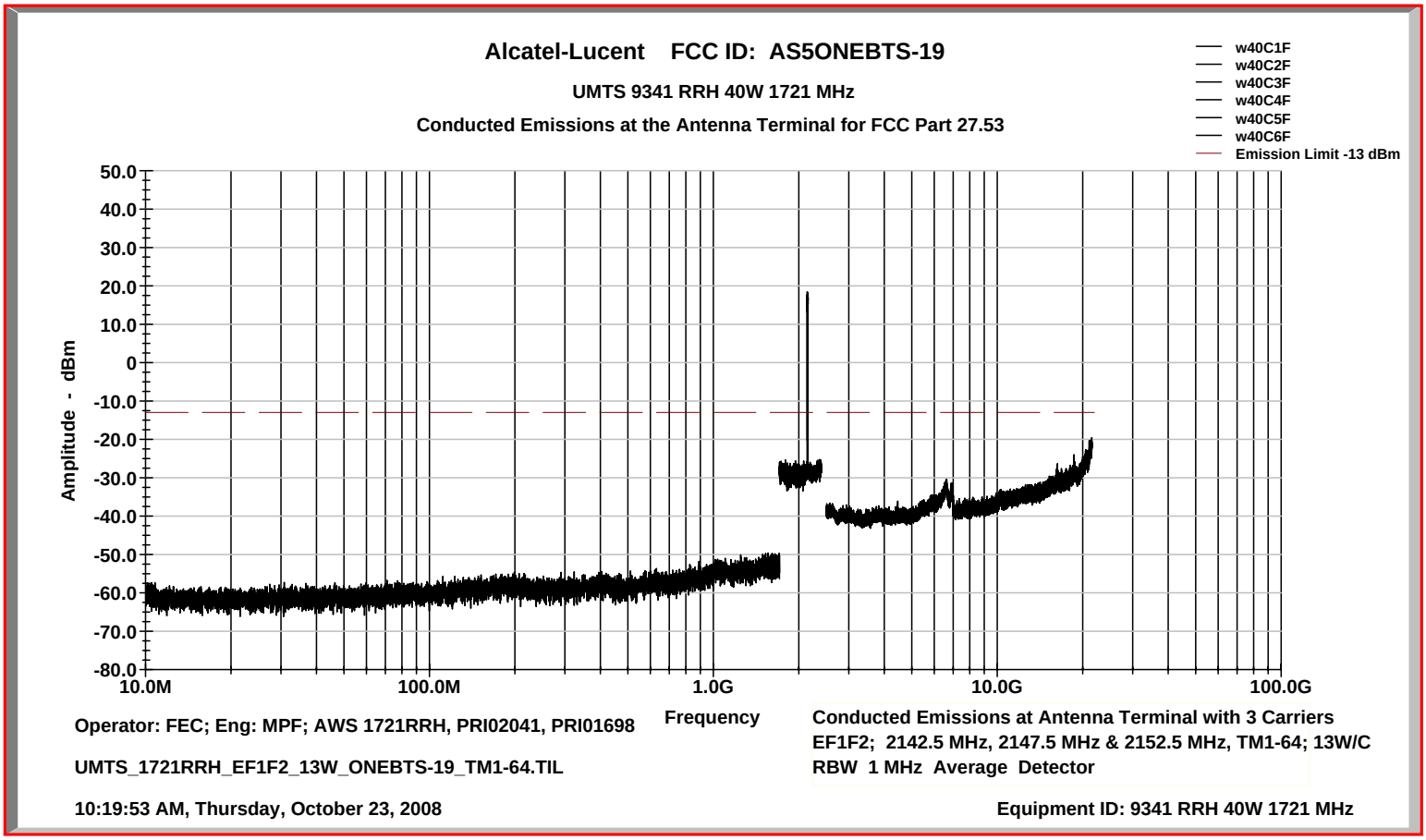


Highest Settable 3 Adjacent Carriers - TM1-64 Test Modulation

Conducted Emission Characteristics: UARFCN 2037 @ 2142.5 MHz + CN 2062 @ 2147.5 MHz + CN 2087 @ 2152.5 MHz

Tx Antenna Terminal at +41.1 dBm per carrier

Three Carrier E + F1 + F2



PART 2.1053 MEASUREMENTS REQUIRED: FIELD STRENGTH OF SPURIOUS RADIATION

This test was performed first with a single carrier at maximum rated power 40 Watts, and then followed **1)** with 2 adjacent carriers at 20W per carrier, and **2)** with 3 carriers at 13.3W per carrier, transmitting into a non-radiating dummy load. The equipment under test (EUT) is configured for 1 sector - 1 carrier (1S1C), for 1 sector - 2 carriers (1S2C), and then 1 sector - 3 carriers (1S3C) . As required, the frequency range investigated was from 30 MHz to 22 GHz (10^{th} harmonic of the carrier) as in the previous conducted spurious emissions test procedure. The single carrier tests were performed with the 40W carrier set to the lowest settable and to the highest settable carriers of AWS Blocks A, B and F, and to mid-band of Blocks C, D, and E. The 2-carrier tests were performed with the paired carriers set to 20W/C and to the lowest settable and to the highest settable carriers of AWS Blocks A, C+D and F. The test modulation was TM1-64 for all.

In compliance with the guidelines of ANSI C63.4-2003, the equipment under test (EUT) was configured as recommended for *floor standing equipment*. The EUT was installed and operated as in the *normal mode of operation* with external alarm and T1 cables connected to the EUT and routed as prescribed in ANSI C63.4-2003. Field strength measurements of radiated spurious emissions were evaluated in a 3m semi-anechoic pre-compliance chamber and verified as required at the ten meter Open Area Test Site (OATS) maintained by Alcatel-Lucent FCC Compliance Laboratory in Whippany, New Jersey. A complete description and full measurement data for the site have been placed on file with the Commission.

The spectrum from 30 MHz to the tenth harmonic of the carrier was searched for spurious radiation. Measurements were made using both horizontally and vertically polarized broadband antennas. Per FCC regulations, the comparison of out-of-band spurious emissions directly to the limit is appropriately made using the substitution method. However, when the emissions are more than 20 dB below the specification limit, the use of field strength measurements for compliance determination is acceptable and those emissions are considered not reportable (Section 2.1053 and the FCC Interpretive database for 2.1053). For this case the evaluation of acceptable radiated field strength is as follows.

The calculated emission levels were found by:

Pmeas (dBm) + Cable Loss(dB) + Antenna Factor(dB) + 107 (dBμV/dBm) -Amplifier Gain (dB)
= Field Strength (dBμV/m)

Section 27.53 and 2.1053 contains the requirements for the levels of spurious radiation as a function of the EIRP of the unmodulated carrier. The reference level for the unmodulated carrier is calculated as the field produced by an isotropic radiator excited by the transmitter output power according to the following relation taken from Reference Data for Radio Engineers, page 27-7, 6th edition, IT&T Corp.

$$E = (120\pi P)^{1/2} = [(30*P)^{1/2}] / R$$

$$20 \log (E*10^{6}) - (43 + 10 \log P) = 71.77 \text{ dB } \mu\text{V/meter}$$

Where: E = Field Intensity in Volts/ meter R = Distance in meters = 10 m
P = Transmitted Power in watts = 40 W/ Single Carrier

Results:

For this particular test, the field strength of any spurious radiation is required to be less than 71.8 dBμV/meter. Emissions equal to or less than 51.8 dBμV/meter are not reportable and may be verified using field strength measurements. Over the out-of-band spectrum investigated from 30 MHz to tenth harmonic of the carrier, no reportable spurious emissions were detected. This demonstrates that the *UMTS 9341 RRH 40W 1721 MHz System*, the subject of this application, complies with Sections 2.1053, 27.53 and 2.1057 of the Rules.

PART 2.1055 MEASUREMENTS REQUIRED: FREQUENCY STABILITY

The frequency stability was measured both at the Equipment Antenna Terminal (EAC) of the RF Remote Radio Head (RRH) and at the reference frequency output terminal of the digital Base Band Unit (BBU) for a single carrier set to 2132.5 MHz, which corresponds to mid Advanced Wireless Services Band (AWS) frequency band. Frequency stability measurements were performed by N. Hussain, Alcatel-Lucent, Swindon, United Kingdom, under the direction of M. P. Farina, and in adherence to the previously cited ISO/TL9000 test plan. The complete test report is attached, which shows the test results, test equipment configuration and photographs of the test set-up.

The procedure required by the FCC is specified in CFR 47, Part 2, Subpart J – Equipment Authorization Procedures, Section 2.1055 – Measurements Required: Frequency Stability, Effective: October 01, 2007. The requirements for base station/land station equipment, are summarized as:

Section 2.1055(a)(1): The frequency stability shall be measured with variation of ambient temperature from –30 °C to +50 °C

Section 2.1055(b): Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10 °C through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. (*Note: The term "keying" does not apply to base station/land station equipment. "Heating element" applies to "heat cartridges" if used* .) Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

Section 2.1055(d)(1): The frequency stability shall be measured with variation of primary supply voltage from 85% to 115% of the nominal value.

Frequency Stability Limitation:

The frequency stability is the measurement of the carrier center frequency deviation from its assigned value as a function of (1) temperature variation from – 30°C to + 50°C, in +10°C increments, and (2) variation of supply voltage, at the equipment frame power input terminals, from 85% to 115% of the nominal value. This is a lengthy procedure and is performed one time with a single UMTS 1721 carrier set to 2132.5 MHz. The required tolerance limit for UMTS 1721 base station/land station equipment is specified in ETSI TS 25.141 as ± 0.05 ppm.

Exception:

The FCC requires testing over the temperature range -30C to +50C, in 10C increments. This would apply to equipment installed and operated in an outdoor, non-controlled environment. Equipment installed in an indoor, controlled environment should be compliant with Telcordia, GR-63-CORE, Issue 3, March 2006 - *NEBS™ Requirements: Physical Protection*. Equipment installed and operated in an indoor, controlled environment are required to demonstrate frequency stability compliance over the temperature range -5C to +50C. This would apply to the Indoor BBU, which is the subject of this certification.

Results:

The UMTS Distributed Base Station Transceiver System (1721 MHz), subject of this application for certification under FCC ID: AS5ONEBTS-19, demonstrated full compliance with the requirements of FCC Rule Part 2.1055. The frequency stability for all measurements were well within the required ± 0.05 ppm, as shown in detail in the associated Test Report. The measurement results are summarized below.

Frequency stability testing for 1721 RRH with BBU.

TEST PARAMETERS:

a) Test Frequency: 2132.6 MHz (Middle channel)
b) P_out max: 40W (+46dBm)
c) Carrier Center Frequency 2132.6 MHz
d) Transmit Frequency Error Limit ± 106.6 Hz
e)Frequency Tolerance Limit ± 0.05 ppm (± 50.0 ppb)
f) Points of Measurement: The oscillator frequency is measured at its 10MHz output terminal on the BBU.
g) Carrier Modulation: W-CDMA.
h) Test Frequencies: A single test frequency, 2132.6 MHz
i) Carrier Power Level: Pmax –18dB = 46dBm–18dB = 28.0dBm at EAC, using TM4.
j) Temperature Range: Variation of ambient temperature from –30°C to +50°C, stabilized at increments of 10°C.

Note:
Test Model 4 (TM4), with a single active channel (code)., was used to check RF Output frequency, Trace on Max hold and part per million calculated.
On 15 MHz reading deviation from 15MHz noted and PPM calculated.

RF Remote Radio Head (RRH)

Stabilized temperature (°C)		TEST: TRANSMIT FREQUENCY ERROR Spec: F_tx ± 50ppb = 2132.6MHz ± 106.6Hz					
		Supply voltage: @85% of nominal (–48V–15%= –40.8V)		Supply voltage: @85% of nominal (–48V–15%= –40.8V)		Supply voltage: @85% of nominal (–48V–15%= –40.8V)	
Outdoor BBU	Measured Tx Freq Error (Hz)	Measured Tx Freq Error (Hz)	Measured Tx Freq Error (Hz)	Measured Tx Freq Error (Hz)	Measured Tx Freq Error (Hz)	Measured Tx Freq Error (Hz)	Deviation [Note 1] (ppb)
–30 C	30.69	30.69	30.69	30.69	30.69	30.69	4.9
–20 C	25.54	25.54	25.54	25.54	25.54	25.54	4.9
–10 C	19.37	19.37	19.37	19.37	19.37	19.37	3.7
0 C	17.67	17.67	17.67	17.67	17.67	17.67	4.4
+10 C	16.48	16.48	16.48	16.48	16.48	16.48	3.4
+20C	14.89	14.89	14.89	14.89	14.89	14.89	3.4
+30 C	–14.91	–14.91	–14.91	–14.91	–14.91	–14.91	4.2
+40 C	–18.61	–18.61	–18.61	–18.61	–18.61	–18.61	2.8
+50 C	–15.55	–15.55	–15.55	–15.55	–15.55	–15.55	1.9

Digital Base Band Unit (BBU)

Stabilized temperature (°C)		TEST: STABILITY OF 10MHz REFERENCE FREQUENCY Spec: 10MHz ± 0.05ppm = 10MHz ± 0.50Hz					
		Supply voltage: @85% of nominal (–48V–15%= –40.8V)		Supply voltage: @100% of nominal (i.e. –48. 0V)		Supply voltage: @115% of nominal (–48V+15%= –55.2V)	
Outdoor BBU	Outdoor RRH	Measured Ref freq stability (Hz)	Deviation [Note 2] (ppm)	Measured Ref freq stability (Hz)	Deviation [Note 2] (ppm)	Measured Ref freq stability (Hz)	Deviation [Note 2] (ppm)
–30 C	–30 C	0.090	0.0090	0.090	0.0090	0.090	0.0090
–20 C	–20 C	0.070	0.0070	0.070	0.0070	0.070	0.0070
–10 C	–10 C	0.040	0.0040	0.040	0.0040	0.040	0.0040
0 C	0 C	0.030	0.0030	0.030	0.0030	0.030	0.0030
+10 C	+10 C	0.040	0.0040	0.040	0.0040	0.040	0.0040
+20C	+20 C	0.010	0.0010	0.010	0.0010	0.010	0.0010
+30 C	+30 C	–0.984	0.0984	–0.981	0.0981	–0.979	0.0979
+40 C	+40 C	–0.965	0.0965	–0.968	0.0968	–0.960	0.0960
+50 C	+50 C	–0.967	0.0967	–0.967	0.0967	–0.969	0.0969