

EXHIBIT 9: TEST REPORT



EXHIBIT 10: TEST REPORT

<b>Applicant:</b>	<b>Alcatel-Lucent USA, Inc.</b>
<b>Equipment:</b>	<b>UMTS-CDMA Transceiver System (850)</b>
<b>FCC ID:</b>	<b>AS5ONEBTS-11</b>
<b>Rule Part:</b>	<b>Part 22, Subpart H – Cellular Radiotelephone Service</b>
<b>Frequency Range:</b>	<b>869 - 894 MHz</b>
<b>Power:</b>	<b>40 Watts for a Single Power Amplifier (PA) 80 Watts for 2 Parallel Power Amplifiers (PA)</b>
<b>Frequency Tolerance:</b>	<b>± 0.05 ppm</b>
<b>Emission Designator:</b>	<b>4M10F9W</b>

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

**April 22, 2010**

**EXHIBIT 9: TEST REPORT****EXHIBIT 9: TEST REPORT****SYNOPSIS**

The test report attached to this exhibit demonstrates that the Alcatel-Lucent's Cellular Frequency UMTS-CDMA Transceiver System (850), which is designed to operate in the Alcatel-Lucent UMTS Flexent® OneBTS™ Macrocell Wireless Base Station, which can be either Single Band or Dual Band, 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 22, Subpart H – Cellular Radiotelephone Service; Section 22.917 - Emission Limitations for Cellular Equipment; effective October 1, 2009. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2009. It 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), which is the standard used as a guideline in the design of the MCR850 transceiver.

The initial FCC Grant of Equipment Authorization, under FCC ID: AS5ONEBTS-11, was issued June 22, 2005. This Grant authorized a single carrier (850 MHz) at 40 Watts (+46.0 dBm) with a single C2PAM power amplifier (PA) in the RF path. This Class II Permissive Change requests authorization for 2 C2PAM power amplifiers (PA) to operate in parallel at 40W/PA. This would provide a single carrier at 80W (+49.03 dBm) at the antenna terminal, over the Cellular Frequency Spectrum 869-894 MHz.

The UMTS-CDMA Transceiver System (850), subject of this Class II Permissive Change request consists of the principle RF components: (1) Crystal Reference Oscillator Module (OMA), (2) UMTS-CDMA Multi-Carrier CDMA Radio (MCR850), Model BNJ65, which was previously authorized by the Federal Communications Commission under FCC ID: AS5ONEBTS-08, (3) two parallel C2PAM power amplifiers (PA) per RF path, (4) 1:2 power splitters, (5) 2:1 power combiners, and (6) 25 MHz wide Dual Duplex (DDpx), low loss, transmit filters covering the cellular frequency spectrum: 869-894 MHz. These components are considered as a system due to (1) the DDpx filters providing RF feedback to the transceiver in the form of Closed Loop Gain Control (CLGC) to provide constant power over temperature, and (2) Alcatel-Lucent's proprietary Enhanced Digital Pre-Distortion (EDPD-UL) technology which enables software to communicate between the transceiver, power amplifier and the transmit filter to achieve this goal.

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 Lucent Technologies, Whippany, NJ, Compliance Laboratory by F. E. Chetwynd and M. P. Farina during the period November 3 to December 1, 2009; 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 the 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.

Since the Reference Frequency Oscillator and the frequency determining and stabilization circuitry incorporated in the MCR850 transceiver are unchanged from the initial Grant, frequency stability measurements were not repeated.

**EXHIBIT 9: TEST REPORT**



**Subject: Application for Class II Permissive Change under FCC ID: AS5ONEBTS-11, Covering the UMTS-CDMA Transceiver System (850) Operating in the Cellular Frequency Spectrum.**

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**April 22, 2010**

**EXHIBIT 9: TEST REPORT**

**INTRODUCTION:**

The exhibits presented in this test report demonstrate that the Alcatel-Lucent Cellular Frequency UMTS-CDMA Transceiver System (850), which is designed to operate in the Alcatel-Lucent UMTS Flexent® OneBTS™ Macrocell, which can be either Single Band or Dual Band, Wireless Base Station, 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 22, Subpart H – Cellular Radiotelephone Service; Section 22.917 - Emission Limitations for Cellular Equipment; effective October 1, 2009. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2009. It 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 MCR850 transceiver.

The initial FCC Grant of Equipment Authorization, under FCC ID: AS5ONEBTS-11, was issued June 22, 2005. This Grant authorized a single carrier (850 MHz) at 40 Watts (+46.0 dBm) with a single C2PAM power amplifier (PA) in the RF path. This Class II Permissive Change requests authorization for 2 C2PAM power amplifiers (PA) to operate in parallel at 40W/PA. This would provide a single carrier at 80W (+49.03 dBm) at the antenna terminal, over the Cellular Frequency Spectrum 869-894 MHz.

The UMTS-CDMA Transceiver System (850), subject of this Class II Permissive Change request consists of the principle RF components: (1) Crystal Reference Oscillator Module (OMA), (2) UMTS-CDMA Multi-Carrier CDMA Radio (MCR850), Model BNJ65, which was previously authorized by the Federal Communications Commission under FCC ID: AS5ONEBTS-08, (3) two parallel C2PAM power amplifiers (PA) per RF path, (4) 1:2 power splitters, (5) 2:1 power combiners, and (6) 25 MHz wide Dual Duplex (DDpx), low loss, transmit filters covering the cellular frequency spectrum: 869-894 MHz. These components are considered as a system due to (1) the DDpx filters providing RF feedback to the transceiver in the form of Closed Loop Gain Control (CLGC) to provide constant power over temperature, and (2) Alcatel-Lucent's proprietary Enhanced Digital Pre-Distortion (EDPD-UL) technology which enables software to communicate between the transceiver, power amplifier and the transmit filter to achieve this goal.

All conducted RF characteristics and emissions measurements were performed at the transmit antenna terminal, using a production equipment frame. Testing was performed in the Alcatel-Lucent, Whippany, NJ, Compliance Laboratory by F. E. Chetwynd and M. P. Farina during the period April 5 - 23, 2010; 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 the 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.

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Since the Reference Frequency Oscillator and the frequency determining and stabilization circuitry incorporated in the MCR850 transceiver are unchanged from the initial Grant, frequency stability measurements were not repeated.

As a Class II Permissive Change, only the characteristics that could be affected by the Change need be evaluated. 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 the Alcatel-Lucent’s Cellular Frequency, UMTS-CDMA Transceiver System (850), which is designed to operate in the Alcatel-Lucent UMTS Macrocell, which can be either Single Band or Dual Band (1900 MHz & 850 MHz), Wireless Base Station, 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 22, Subpart H – Cellular Radiotelephone Service; Section 22.917 - Emission Limitations for Cellular Equipment; effective October 1, 2009. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2009. It 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). The specific test procedures that are both required for and are applicable to the UMTS850 Transceiver System (MCR850) are:

<b>Part 2.1046</b>	RF Power Output	<b>Pages 4 – 6</b>
<b>Part 2.1047</b>	Modulation Characteristics	<b>Pages 7 – 10</b>
<b>Part 2.1049</b>	Occupied Bandwidth	<b>Pages 11 – 18</b>
<b>Part 2.1051</b>	Spurious Emissions at the Antenna Terminals.	<b>Pages 19 – 23</b>
<b>Part 2.1053</b>	Field Strength of Spurious Radiation	<b>Pages 24 – 25</b>
<b>Part 2.1055</b>	Frequency Stability	<b>Not Repeated</b>
<b>Part 2.1057</b>	Frequency Spectrum to be Investigated	
<b>Part 22</b>	Public Mobile Services; Subpart H – Cellular Radiotelephone Service	
<b>Part 22.917</b>	Emission Limitations for Cellular Equipment	

**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 C63.4-2009** 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; September 15, 2009.

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**PART 2.1046 MEASUREMENTS REQUIRED: RF POWER OUTPUT**

The Cellular Frequency UMTS-CDMA Transceiver System (850), subject of this application for Class II Permissive Change authorization, is designed to provide a maximum RF power level, per single 5 MHz emission bandwidth carrier at 40 Watts (+46 dBm) per C2PAM power amplifier (PA) at the Equipment Antenna Terminal (EAC). The subject of this Change Request is to add 2 40W C2PAM power amplifiers (PA) in parallel for a total single carrier power of 80 Watts (+49.0 dBm). This System is designed to operate in the cellular frequency spectrum: 869-894 MHz. A 25 MHz Wideband, Low Loss, Dual Duplex (DDpx) transmit filter is incorporated into this System for each of the 3 sectors. All conducted emission measurements are performed at the EAC.

The carrier channels used in this evaluation represent the lowest settable, mid band and the highest settable frequencies for a single carrier at 80W via 2 parallel PAs at 40W/PA. The measured power levels are tabulated below.

Each time the carrier is set to each of the channels, the power level is adjusted, by software control, to +49.03 dBm (80 Watts at 3-second average) for a single carrier before performing each emission measurement. Two ETSI Test Modulations were evaluated: TM1-64 with 68 active channels and TM5-44 for Voice + 8 HSDPA (High Speed Downlink Packet Access) channels.

Cellular Frequency Band	UMTS850 Carrier	Number of Carriers	UARFCN Channel Number	UMTS Carrier Center Frequency	Measured Power Level
A	Lowest Settable for A-Band and to 869 MHz Band Edge	1	1007	871.5 MHz	+49 dBm
B	Mid Band for B-Band	1	1062	882.5 MHz	+49 dBm
B'	Highest Settable to 894 MHz Band Edge	1	1107	891.5 MHz	+49 dBm

Note: UARFCN = UTRA Absolute Radio Frequency Channel Number

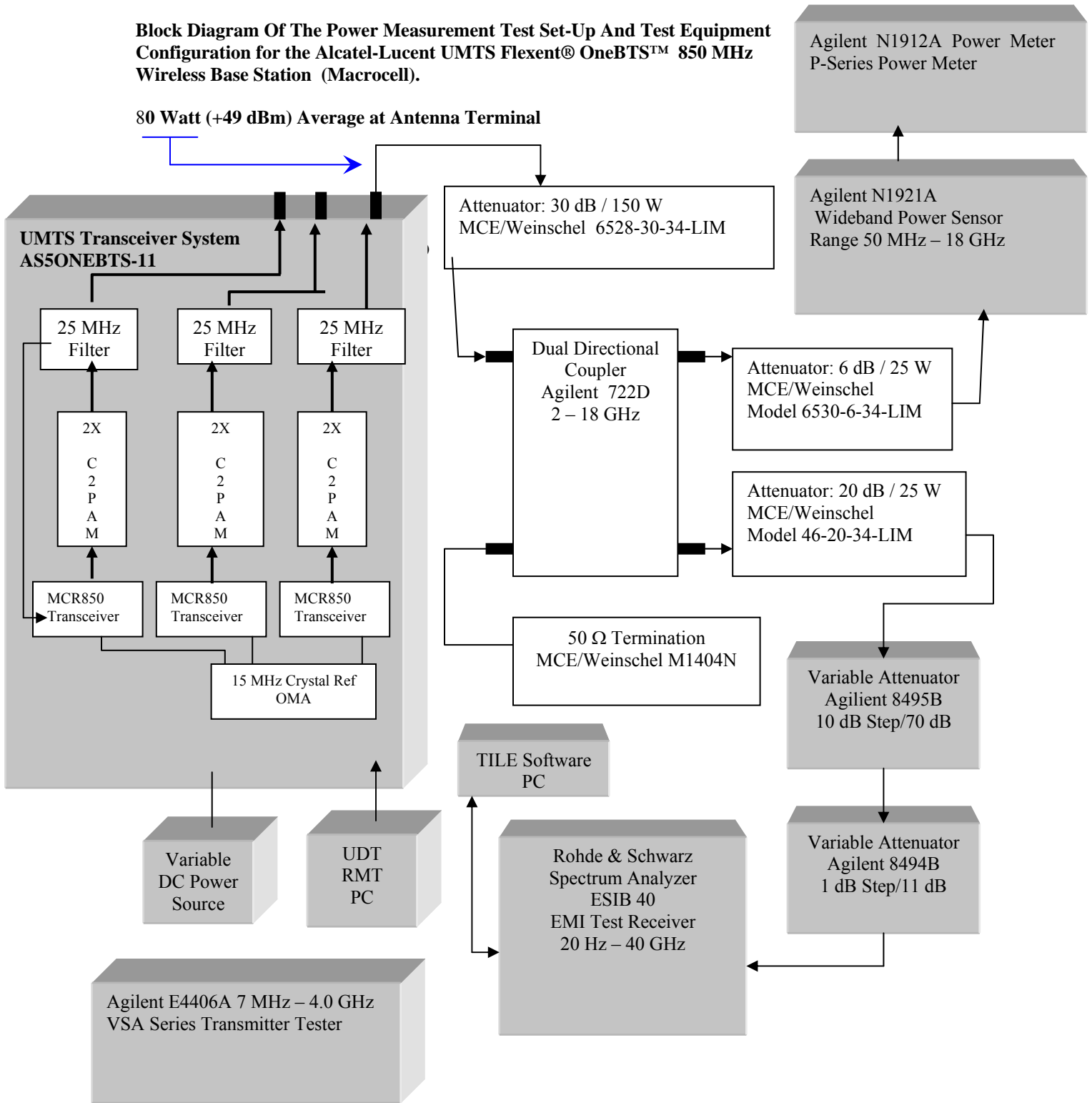
These frequencies are used for all of the conducted emission tests that follow.

**Results:** The 5 MHz UMTS 850 Transceiver System is compliant with the manufacturer’s rated power level at the transmit antenna terminal for the above listed carrier frequencies.

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**Block Diagram Of The Power Measurement Test Set-Up And Test Equipment Configuration for the Alcatel-Lucent UMTS Flexent® OneBTS™ 850 MHz Wireless Base Station (Macrocell).**

80 Watt (+49 dBm) Average at Antenna Terminal



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**PART 2.1047 MEASUREMENTS REQUIRED: MODULATION CHARACTERISTICS**

The modulation accuracy was measured at the Equipment Antenna Terminal (EAC) for each of the 3 previously cited single-carrier frequencies.. 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 (+49.03 dBm). The Error Vector Magnitude limit is EVM < 12.5% for 16QAM.

The test equipment used was an Agilent E4406A VSA Series Transmitter Tester. Modulation accuracy measurement mode was Composite EVM, using the Peak/Average Metrics.

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

Cellular Frequency Band	UMTS850 Carrier 80W (+49.03 dBm)	UARFCN Channel Number	UMTS Carrier Center Frequency	Modulation Accuracy Average	Modulation Accuracy Peak Hold
A	Lowest Settable for A-Band and to 869 MHz Band Edge	1007	871.5 MHz	7.20 % RMS	8.23 % RMS
B	Mid Band for B-Band	1062	882.5 MHz	5.62 % RMS	6.91 % RMS
B'	Highest Settable to 894 MHz Band Edge	1107	891.5 MHz	8.02 % RMS	8.92 % RMS

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

**Test Set-up and Configuration:** Same as previously used for Part 2.1046 RF Power Measurement, with exception that the ESIB 40 EMI Test Receiver is replaced by:

- 1) Agilent E4406A VSA Series Transmitter Tester, 7 MHz – 4.0 GHz

**RESULTS:** The UMTS-CDMA Transceiver System (850) demonstrated full compliance with the modulation accuracy requirements specified in ETSI TS 25.141. All 3 channels were less than the 12.5% rms limitation. The plots for each channel are included in this exhibit as shown below.

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Modulation Characteristics: UARFCN Channel Number 1007 @ 871.50 MHz  
 Tx Antenna Terminal at +49 dBm per single carrier

* Agilent 12/13/77 14:15:09		W-CDMA w/ HSDPA		R L T S	View/Trace																																										
BTS	Ch Freq 871.500 MHz	Completed	Src:Input	I/Q Measured Polar Graph																																											
Mod Accuracy		Averages: 10	PASS	I/Q Error																																											
<table border="1"> <thead> <tr> <th colspan="3">Peak/Average Metrics</th> </tr> <tr> <th></th> <th>Average</th> <th>Peak Hold</th> </tr> </thead> <tbody> <tr> <td>Rho:</td> <td>0.99482</td> <td>0.99326</td> </tr> <tr> <td>RMS EVM:</td> <td>7.20 %</td> <td>8.23 %</td> </tr> <tr> <td>Peak EVM:</td> <td>79.69 %</td> <td>136.20 %</td> </tr> <tr> <td>Pk CDE:</td> <td>-43.55 dB</td> <td>-41.97 dB at C8(67)</td> </tr> <tr> <td>Pk Active CDE:</td> <td>-34.27 dB</td> <td>-33.10 dB at C4(5)</td> </tr> <tr> <td>RMS Mag Error:</td> <td>6.22 %</td> <td>7.36 %</td> </tr> <tr> <td>RMS Phase Error:</td> <td>5.72 °</td> <td>8.36 °</td> </tr> <tr> <td>Freq Error:</td> <td>-1.41 Hz</td> <td>-9.60 Hz</td> </tr> <tr> <td>I/Q Origin Offset:</td> <td>-59.23 dB</td> <td>-52.37 dB</td> </tr> <tr> <td>Time Offset:</td> <td>1102.21 chip</td> <td>17822.51 chip</td> </tr> <tr> <td>CPICH Power :</td> <td>-10.07 dB</td> <td>-9.87 dB</td> </tr> <tr> <td>Total Power:</td> <td>49.02 dBm</td> <td>49.14 dBm</td> </tr> </tbody> </table>					Peak/Average Metrics				Average	Peak Hold	Rho:	0.99482	0.99326	RMS EVM:	7.20 %	8.23 %	Peak EVM:	79.69 %	136.20 %	Pk CDE:	-43.55 dB	-41.97 dB at C8(67)	Pk Active CDE:	-34.27 dB	-33.10 dB at C4(5)	RMS Mag Error:	6.22 %	7.36 %	RMS Phase Error:	5.72 °	8.36 °	Freq Error:	-1.41 Hz	-9.60 Hz	I/Q Origin Offset:	-59.23 dB	-52.37 dB	Time Offset:	1102.21 chip	17822.51 chip	CPICH Power :	-10.07 dB	-9.87 dB	Total Power:	49.02 dBm	49.14 dBm	Code Domain Power
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EXHIBIT 9: TEST REPORT

Modulation Characteristics: UARFCN Channel Number 1062 @ 882.50 MHz  
 Tx Antenna Terminal at +49 dBm single carrier

Agilent 12/13/77 15:02:45		W-CDMA w/ HSDPA		R	L	T	S	Measure																																												
BTS	Ch Freq 882.500 MHz	Completed		Src:Input		Code Domain																																														
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Modulation Characteristics: UARFCN Channel Number 1107 @ 891.50 MHz  
 Tx Antenna Terminal at +49 dBm single carrier

* Agilent 12/13/77 15:40:11		W-CDMA w/ HSDPA		R	L	T	S	Measure
BTS	Ch Freq 891.500 MHz	Completed		Src:Input				Code Domain
Mod Accuracy	Averages: 10		PASS					
								Mod Accuracy (Composite EVM)
								QPSK EVM
								Power Stat CCDF
								Spectrum (Freq Domain)
								Waveform (Time Domain)
								More (2 of 3)
<b>Peak/Average Metrics</b>								
	<b>Average</b>	<b>Peak Hold</b>						
Rho:	0.99359	0.99210						
RMS EVM:	8.02 %	8.92 %						
Peak EVM:	79.55 %	119.84 %						
Pk CDE:	-42.58 dB	-40.95 dB	at C8(55)					
Pk Active CDE:	-33.37 dB	-32.57 dB	at C4(4)					
RMS Mag Error:	6.67 %	7.61 %						
RMS Phase Error:	7.09 °	9.79 °						
Freq Error:	-0.96 Hz	-7.16 Hz						
I/Q Origin Offset:	-59.39 dB	-52.22 dB						
Time Offset:	1037.98 chip	-17156.82 chip						
CPICH Power :	-10.07 dB	-9.90 dB						
Total Power:	48.94 dBm	49.04 dBm						

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**PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH**

The occupied bandwidth was measured at the Equipment Antenna Terminal (EAC) for the previously cited Single Carrier set to 80 Watts (+49 dBm) and the modulation set to ETSI TM1-64 as previously described.

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). This measurement was for a single carrier only.
2. Emission mask limitation using a Rohde & Schwarz ESIB 40 EMI Test Receiver, to demonstrate compliance with the ETSI TS 25.141 emission mask requirements and with Part 24.238. This measurement was performed for single carrier operation.

**Method 1:** The carrier 99% power bandwidth was measured at the Equipment Antenna Terminal (EAC) with the single 5 MHz carrier set to +49 dBm and modulated with the full 68 active channels (**TM1-64**). The measurement results show that the carrier is within the manufacturer’s rated 5 MHz bandwidth for all carriers measured, as tabulated below. The actual data plots are attached to this exhibit.

Cellular Frequency Band	UMTS850 Carrier At TM1-64	Single Carrier Bandwidth	UARFCN Channel Number	UMTS Carrier Center Frequency	Measured Carrier 99% Power Bandwidth
A	Lowest Settable for A-Band and to 869 MHz Band Edge	5 MHz	1007	871.5 MHz	<b>4.1019 MHz</b>
B	Mid-Band for B-Band	5 MHz	1062	882.5 MHz	<b>4.1035 MHz</b>
B'	Highest Settable to 894 MHz Band Edge	5 MHz	1107	891.5 MHz	<b>4.1035 MHz</b>

**Results:** The 99% occupied bandwidth measurement confirms that the carrier’s emission designator remains at 4M10F9W.

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Carrier Bandwidth Characteristics: UARFCN Channel Number 1007 @ 871.50 MHz  
Tx Antenna Terminal at +49 dBm per single 5 MHz carrier

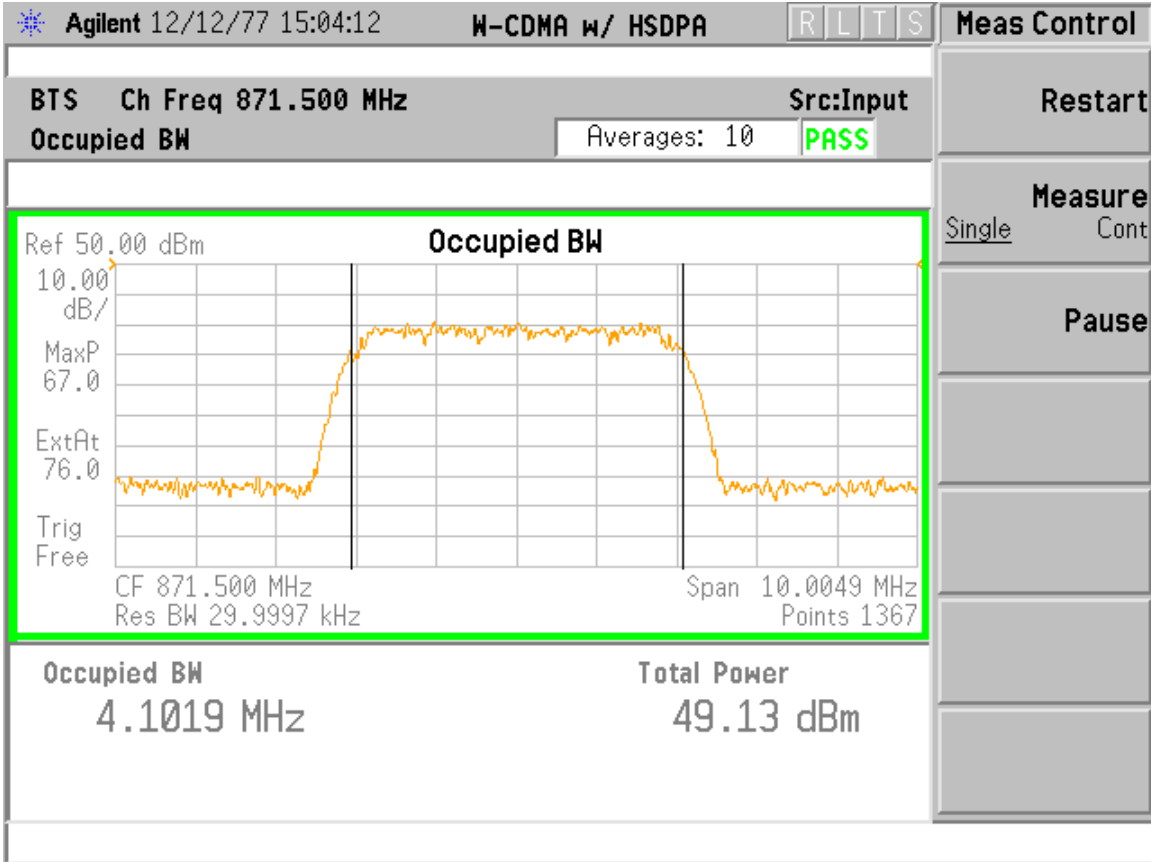


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Carrier Bandwidth Characteristics: UARFCN Channel Number 1062 @ 882.50 MHz  
Tx Antenna Terminal at +49 dBm per single 5 MHz carrier

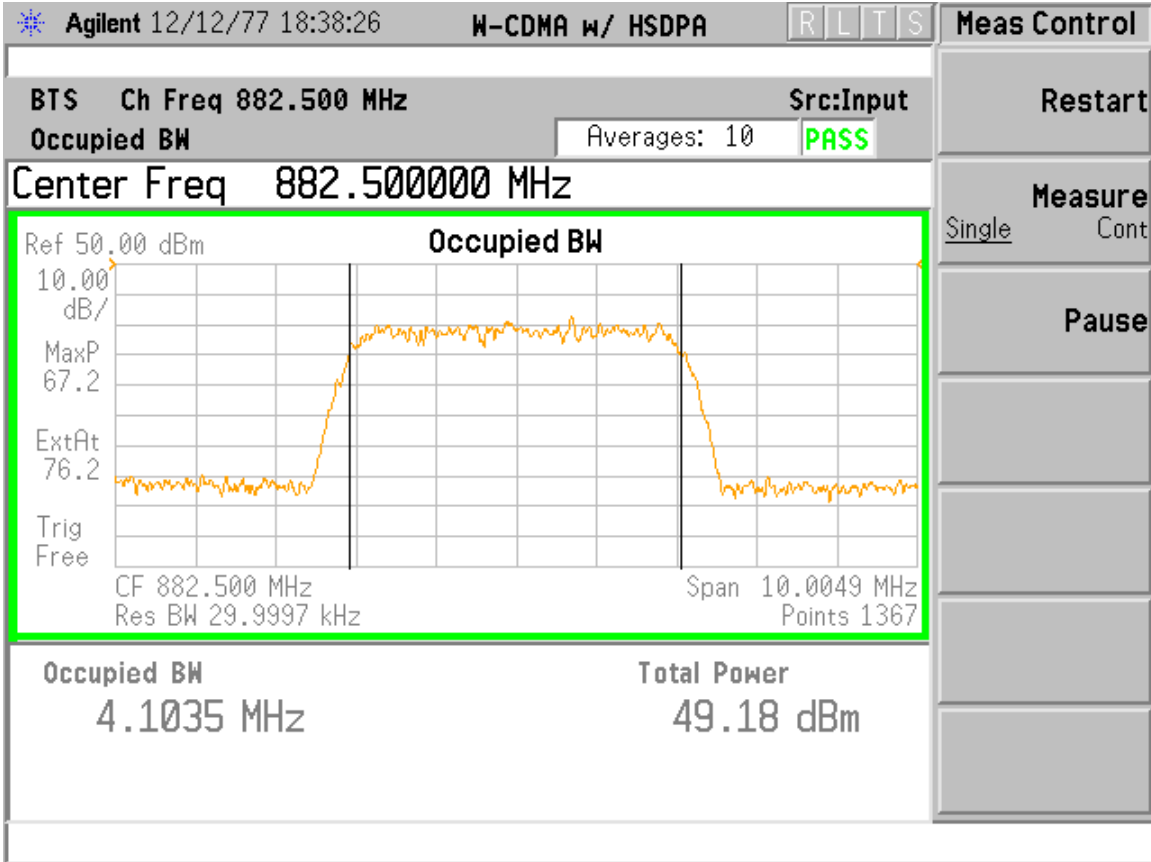
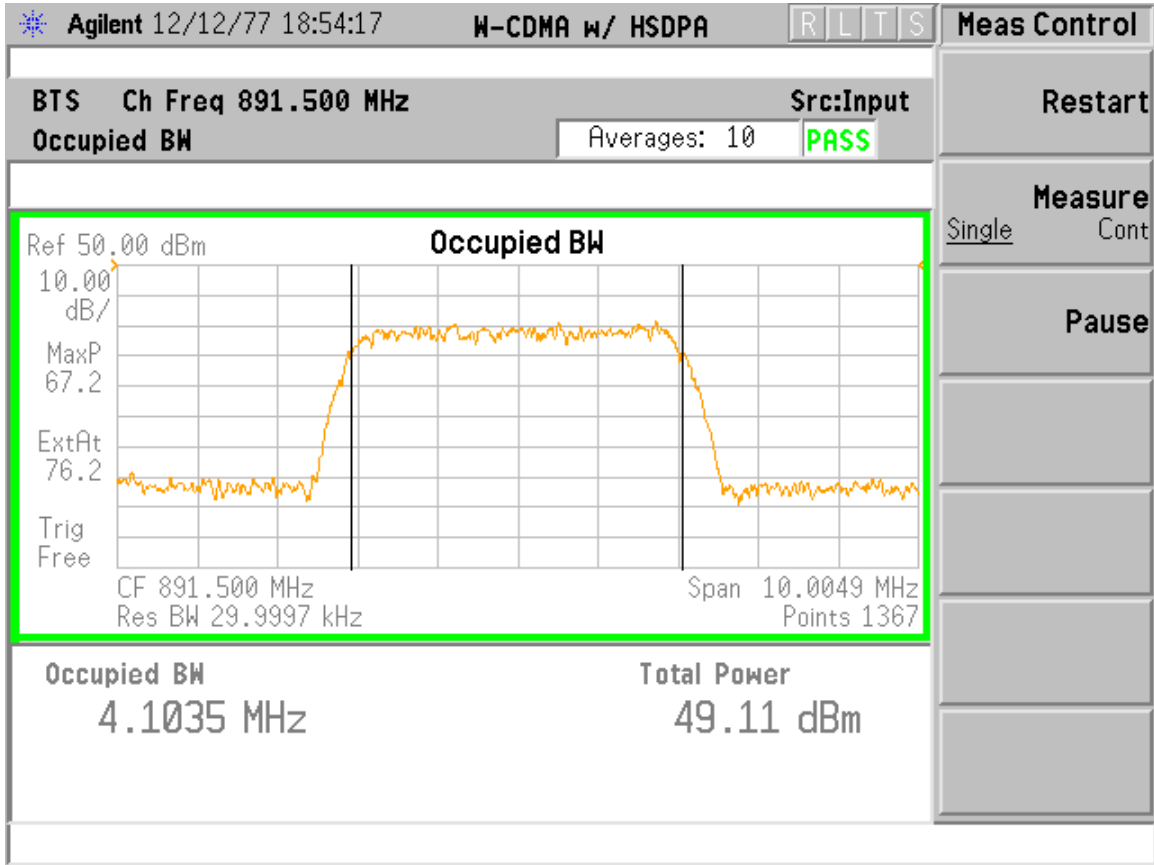


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Carrier Bandwidth Characteristics: UARFCN Channel Number 1107 @ 891.50 MHz  
Tx Antenna Terminal at +49 dBm per single 5 MHz carrier



**EXHIBIT 9: TEST REPORT**

**Method 2. Emission mask limitation** using a Rohde & Schwarz: ESIB 40 EMI Receiver with Total Integrated Laboratory Environment (TILE) test software.

Measurement of the occupied bandwidth emission characteristics was performed at the Equipment Antenna Terminal (EAC) for the following configurations:

1. Single Carrier at 80W (+49 dBm) and TM1-64 Test Modulation

The same UARFCN channels as previously cited were repeated. The emission mask used to demonstrate compliance was as specified in ETSI TS 25.141 for  $P \geq +43$  dBm. The mask attenuation values were based on a 30 kHz resolution bandwidth, which made the modulated 5 MHz carrier to be offset from +49dBm by -22.2 dB, in accordance with the equation:

$$\text{Carrier Offset} = 10 \log (30 \text{ kHz}/5 \text{ MHz}) = -22.2 \text{ dB}$$

This series of measurements were performed using the EMC software:

Total Integrated Laboratory Environment (TILE) by ETS-Lindgren

The data/measurement plots for the five channels are attached below.

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

**RESULTS:** All UARFCN channels demonstrate compliance with the emission mask specified by ETSI TS 25.141; the carriers do not exceed the mask limitation.

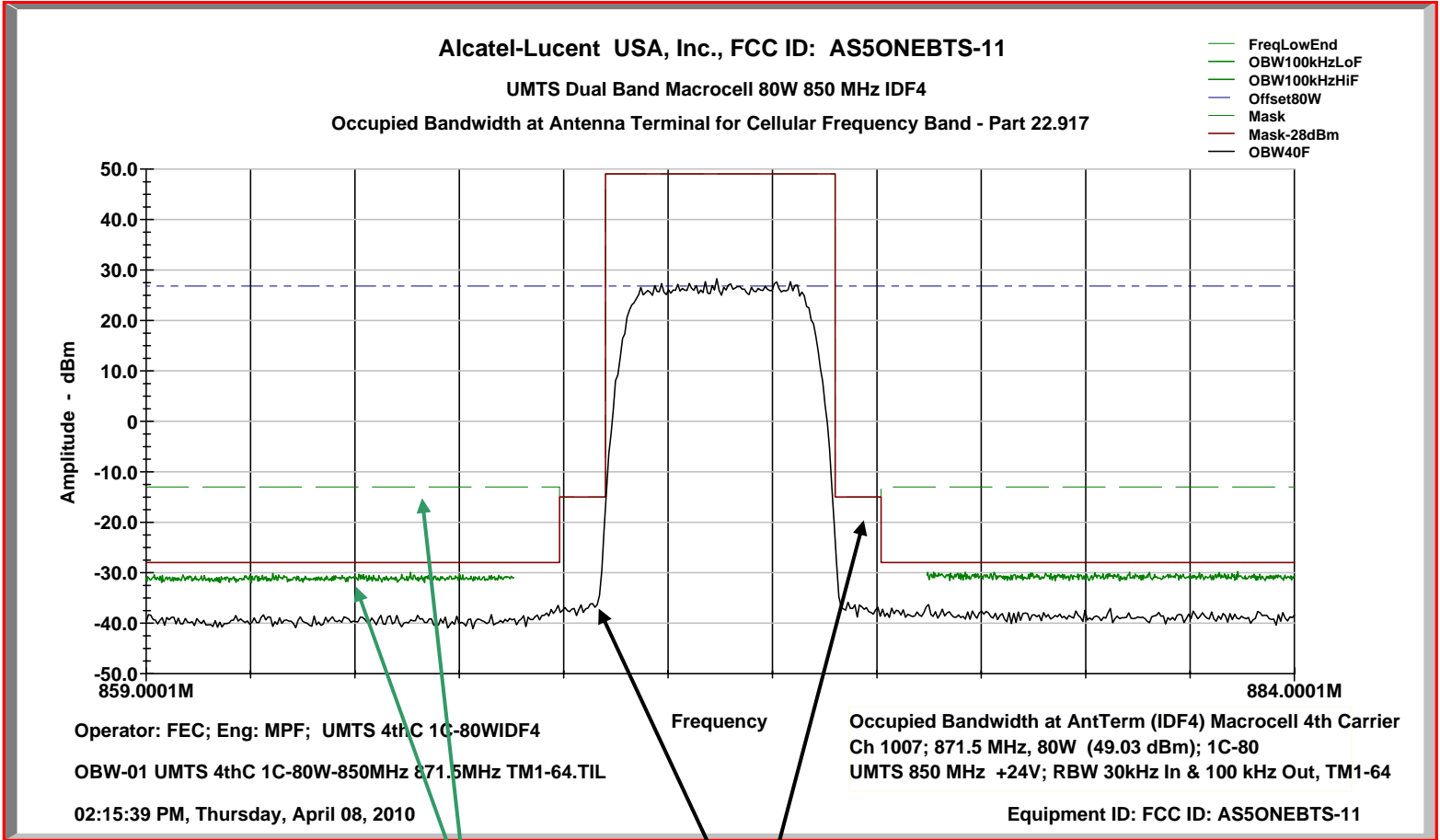
The data plots are attached below.

EXHIBIT 9: TEST REPORT

Single Carrier at 80 Watts

Occupied Bandwidth Characteristics: UARFCN Channel Number 1007 @ 871.50 MHz

Single Carrier Power at 80W (+49 dBm) and TM1-64 Test Modulation.



RBW = 100 kHz  
RBW = 30 kHz



EXHIBIT 9: TEST REPORT

Single Carrier at 80 Watts

Occupied Bandwidth Characteristics: UARFCN Channel Number 1062 @ 882.5 MHz

Single Carrier Power at 80W (+49 dBm) and TM1-64 Test Modulation

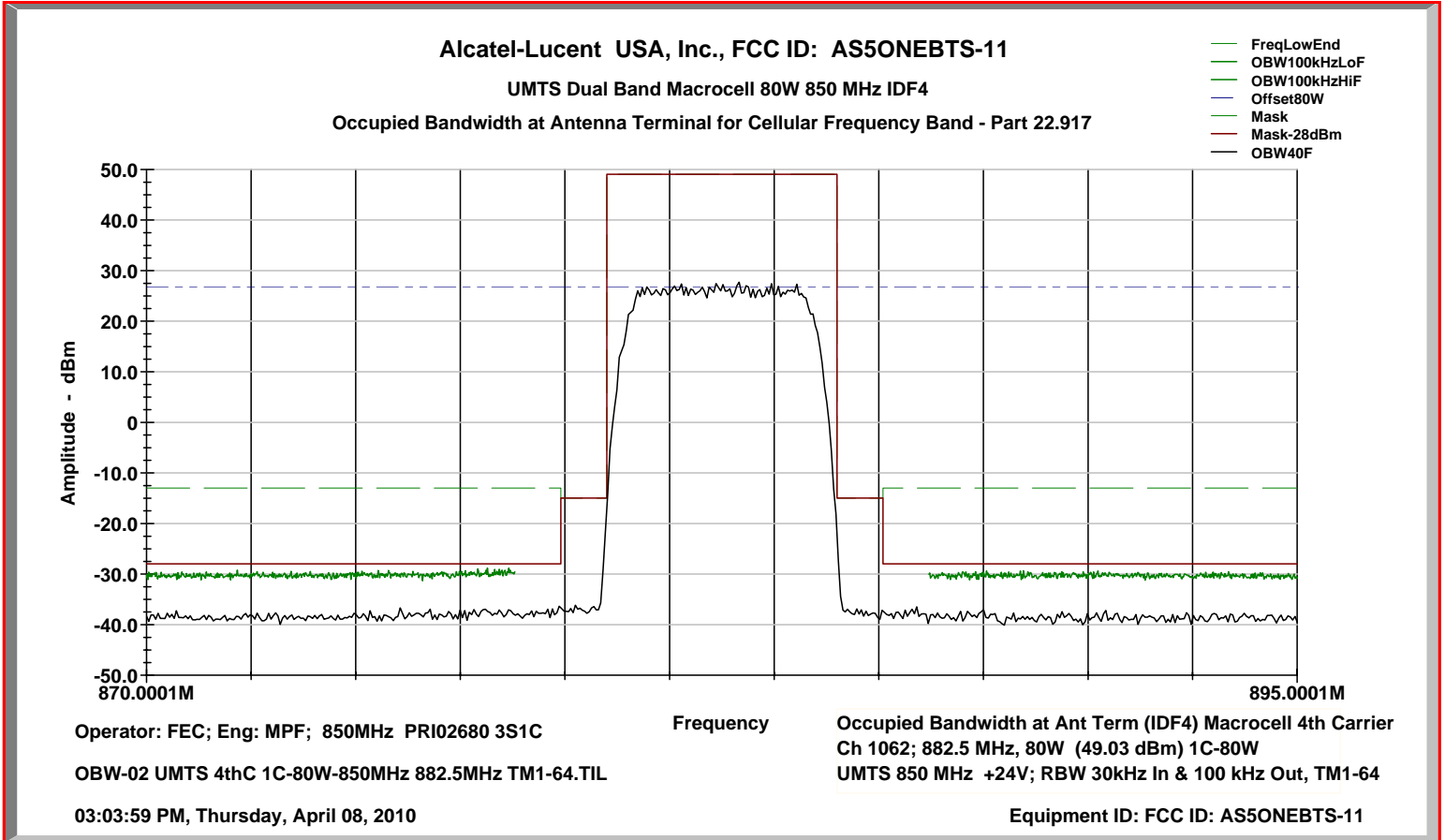
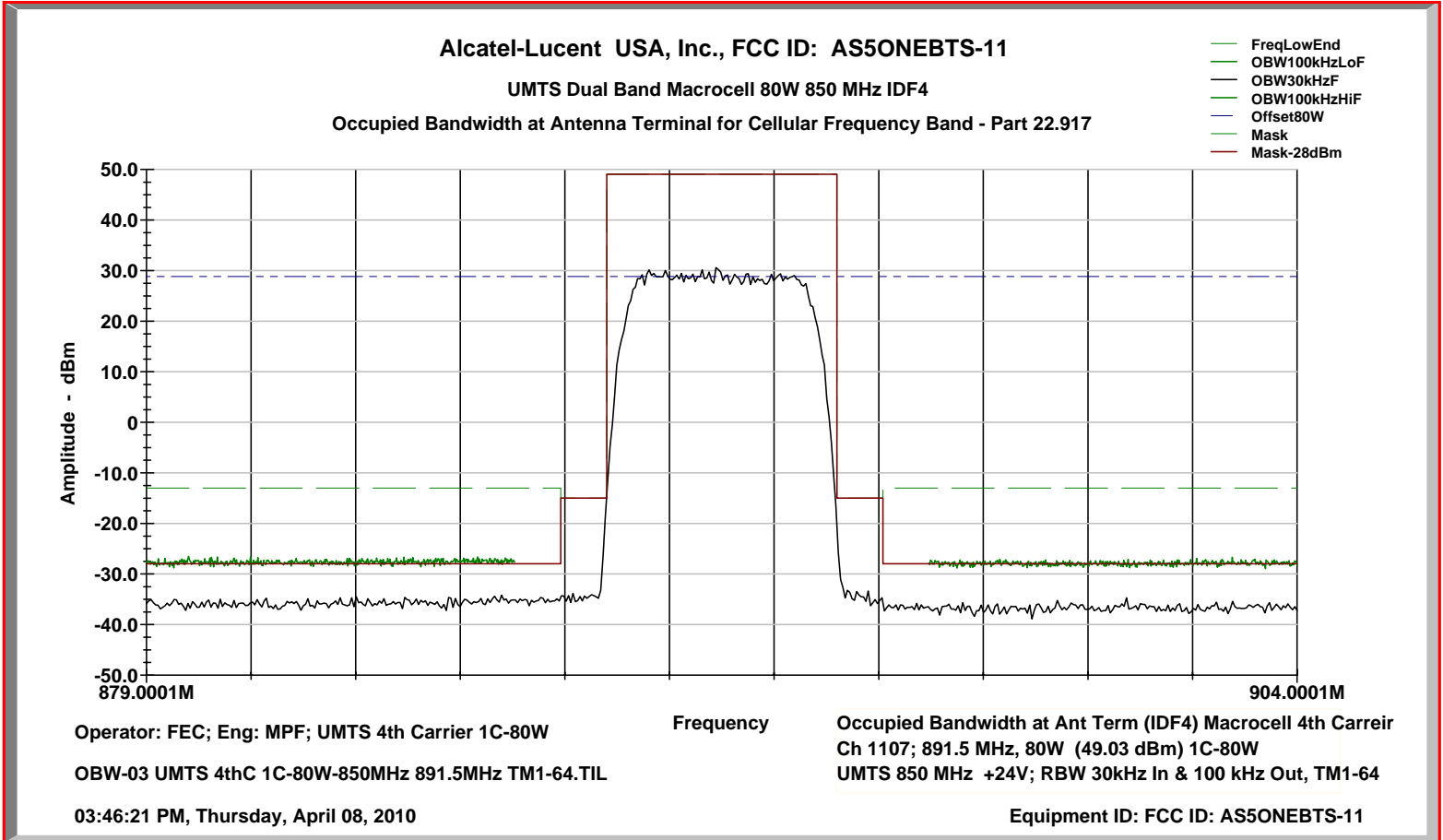


EXHIBIT 9: TEST REPORT

Single Carrier at 80 Watts

Occupied Bandwidth Characteristics: UARFCN Channel Number 1107 @ 891.5 MHz

Single Carrier Power Level at 80W (+49 dBm) and TM1-64 Test Modulation.



**EXHIBIT 9: TEST REPORT**

**PART 2.1051 MEASUREMENTS REQUIRED: SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS.**

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<sup>th</sup> harmonic of the carrier at the EAC terminal. The emission limits at the antenna terminal are specified in Part 22.917 (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 80 Watts average, produces an emission attenuation below the carrier of 62.0 dBc. Part 22.917 (b) specifies the required Resolution Bandwidth (RBW) to be 100 kHz 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 82.0 dBc. The pertinent test parameters are:

1. Frequency Spectrum: 10 MHz to 10 GHz
2. Resolution Bandwidth: 100 kHz or greater (Part 22.917)
3. Emission Limitation:  $43 + 10 \log (P)$  dBc =  $43 + 10 \log (80 \text{ Watts}) = 62.0$  dBc
4. Instrumentation Noise Floor: at least 20 dB greater than “ $43 + 10 \log (P)$  dBc” = 82.0 dBc

**Minimum Standard Requirement:**

The emission limits at the antenna terminal are specified in Part 22.917 (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 = 49.0 dBm
2. Emission Limitation = 49.0 dBm – 62.0 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  $\geq 82.0$  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., 82 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.

**EXHIBIT 9: TEST REPORT**

Part 22.917 requires that emissions over the required spectrum 10 MHz to 10 GHz be measured using an instrumentation resolution bandwidth of 100 kHz 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 spectrum portion 894 MHz – 1.3 GHz, in close proximity to the carrier, 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

The UARFCN channels and Test Modulations utilized are the same as used in the preceding Occupied Bandwidth tests, and all demonstrate compliance with the conducted emission limitation requirements specified by Part 22.917.

**Results:** For each UMTS carrier, there were no reportable emissions. Data plots for each carrier are attached to this exhibit.

EXHIBIT 9: TEST REPORT

Single Carrier at 80W

Conducted Emissions Characteristics: UARFCN Channel Number 1007 @ 871.50 MHz

Single Carrier Power at 80W (+49 dBm) and TM1-64

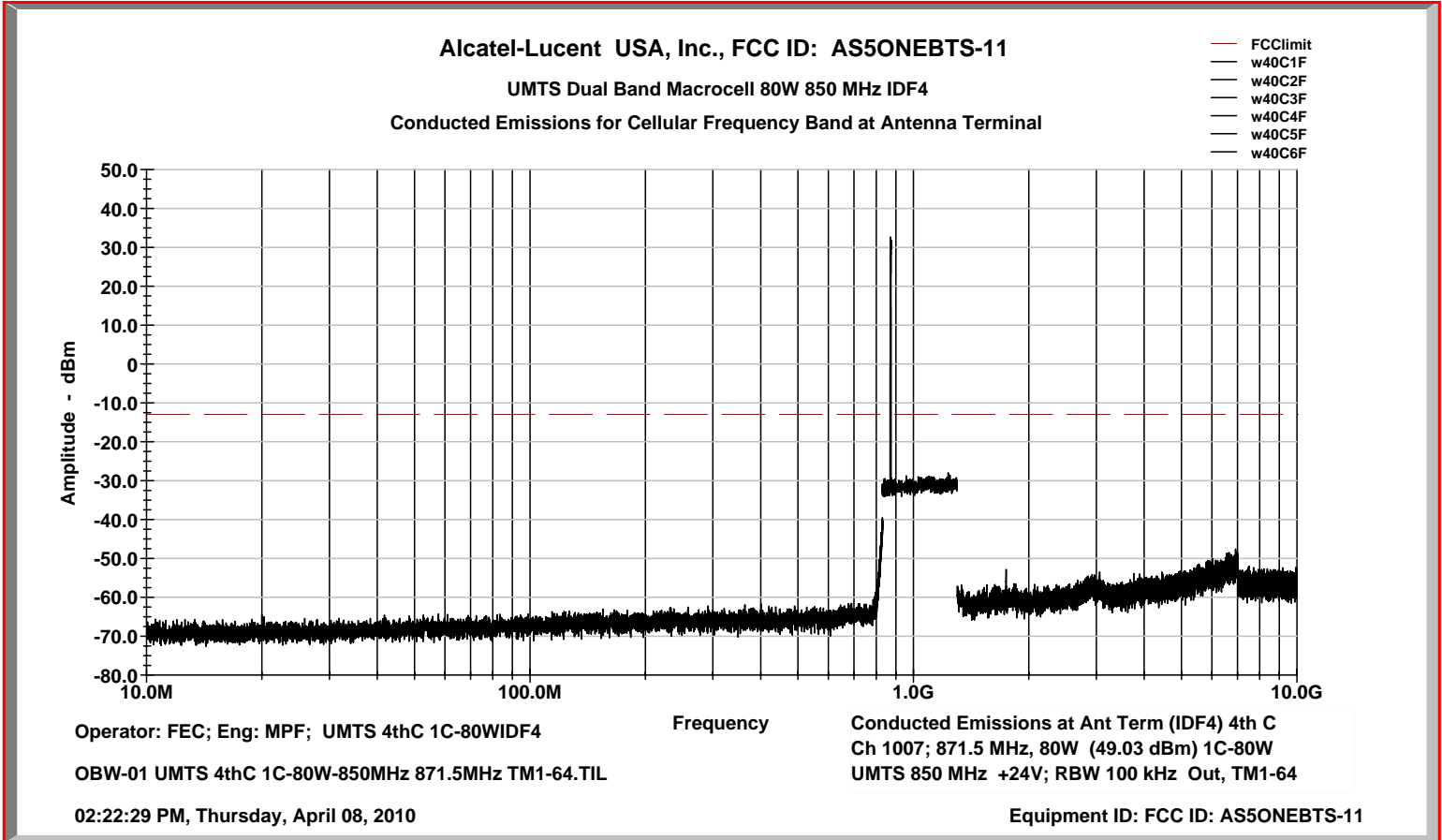


EXHIBIT 9: TEST REPORT

Single Carrier at 80W

Conducted Emissions Characteristics: UARFCN Channel Number 1062 @ 882.5 MHz

Single Carrier at 80W (+49 dBm) with TM1-64 Test Modulation

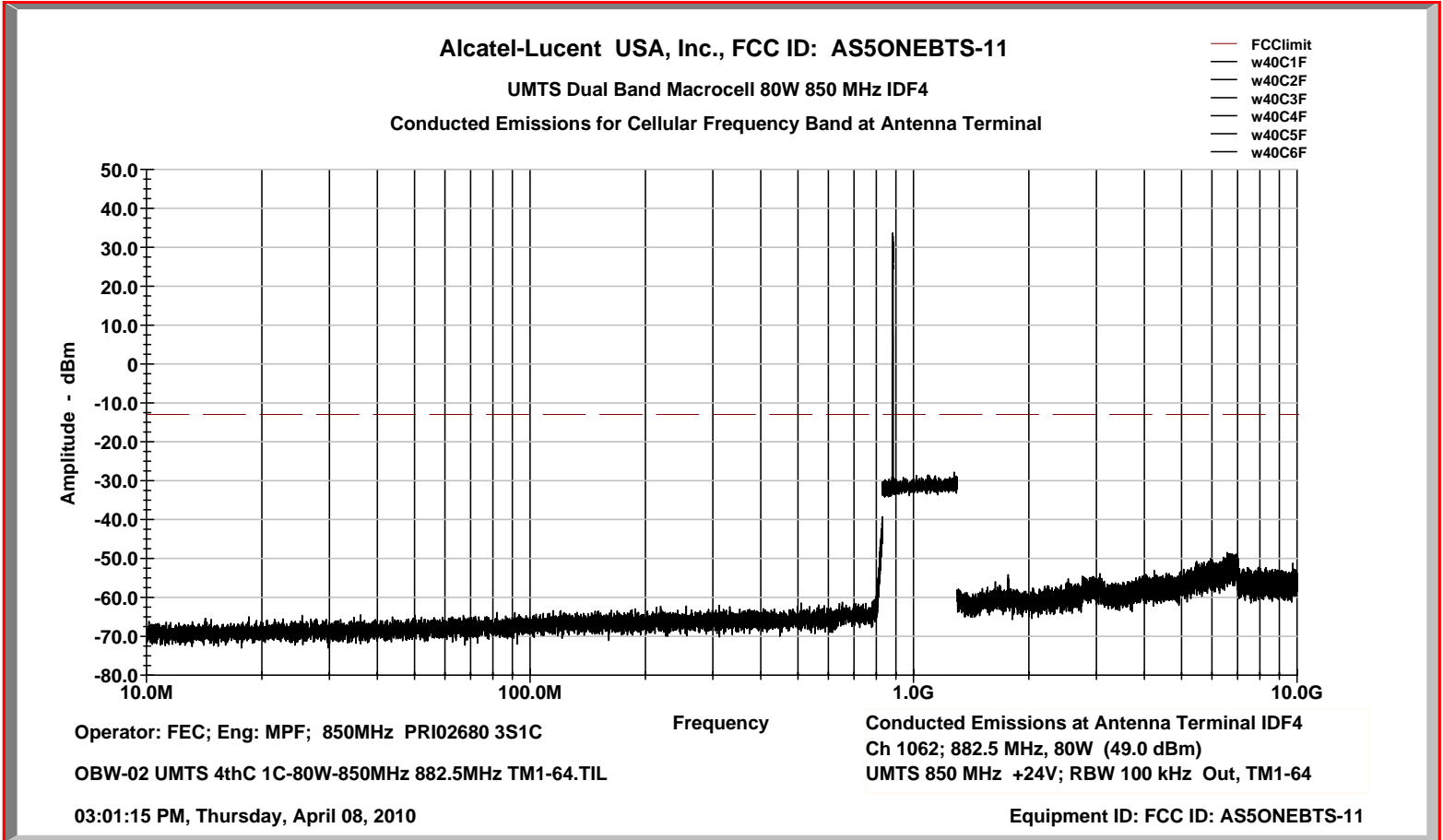
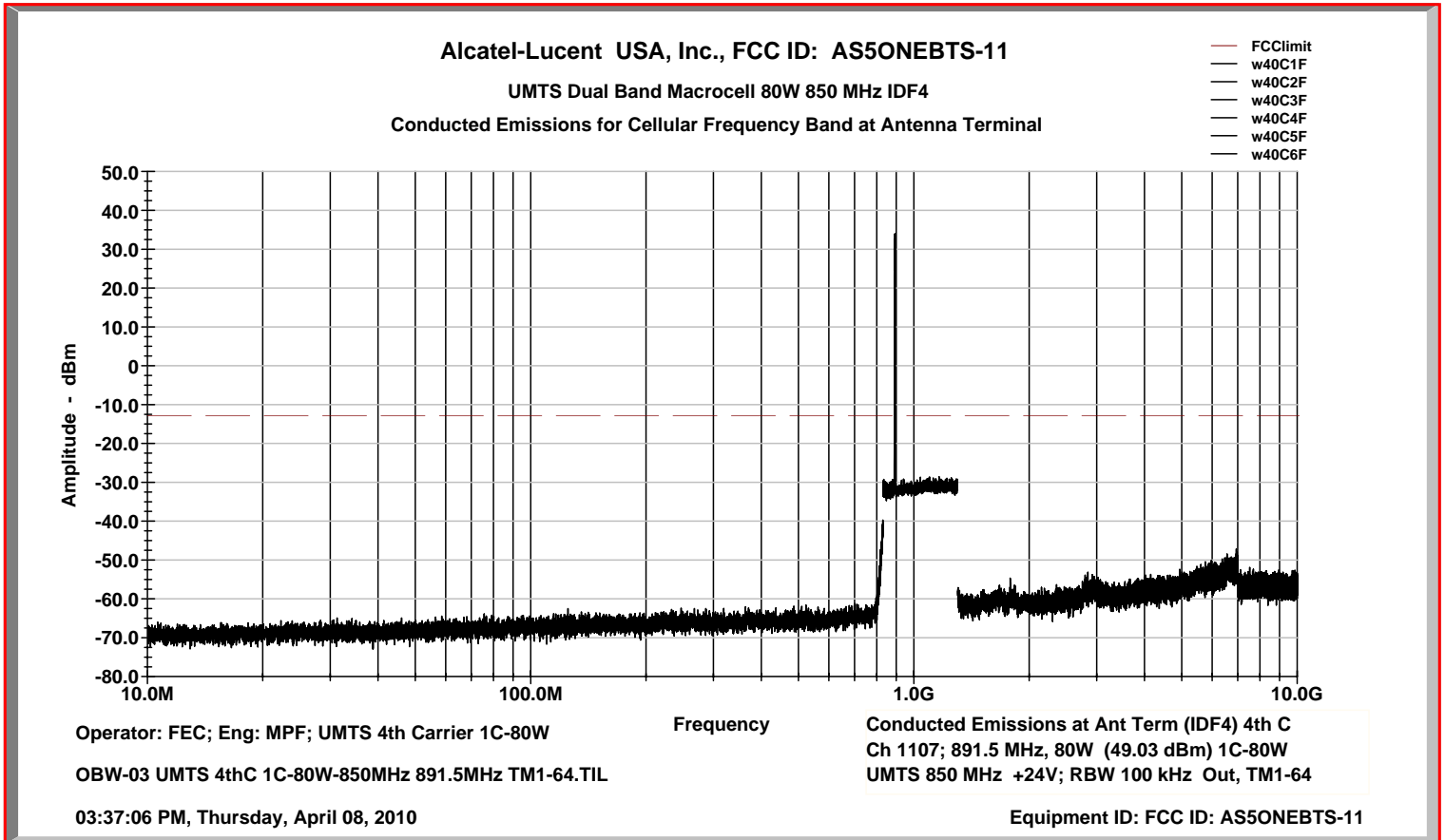


EXHIBIT 9: TEST REPORT

Single Carrier at 80 W

Conducted Emissions Characteristics: UARFCN Channel Number 1107 @ 891.50 MHz

Single Carrier at 80W (+49 dBm) and TM1-64 Test Modulation







**EXHIBIT 9: TEST REPORT**

For R = 3 meters

$$E = (120\pi P)^{1/2} = [(30 * P)^{1/2}] / R$$
$$20 \log (E * 10^6) - (43 + 10 \log P) = \mathbf{82.23 \text{ dB}\mu\text{V/meter}}$$

**Results:**

For this particular test, the field strength of any spurious radiation is required to be less than 82.2 dB $\mu$ V/meter at 3m antenna-to-EUT separation. Emissions equal to or less than 62.2 dB $\mu$ V/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-CDMA Transceiver System (850), the subject of this application for a Class II permissive Change, complies with Sections 2.1053, 22.917 and 2.1057 of the Rules.