Subject: **Application for an Initial Grant of Equipment Authorization under FCC ID: AS5ONEBTS-26, Covering the New RRH2X60-850 Product.**

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EXHIBIT 9: TEST REPORT

INTRODUCTION:

The exhibits presented in this test report demonstrate that Alcatel-Lucent's new -48V WCDMA **RRH2X60-850** twin Remote Radio Head product, which will be deployed in combination with the **9396 d2U** Digital Baseband Unit (BBU), 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, 2011. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2011. It also demonstrates compliance with the spurious emissions limitations specified in ETSI TS 125 141 V7.15.0 (2010-02): Universal Mobile Telecommunications System (UMTS); Base Station Conformance Testing (FDD), (3GPP TS 25.141, Version 7.15.0, Release 7). This standard was the guideline used in the design of this product.

The -48V WCDMA **RRH2X60-850** twin Remote Radio Head product consists of the principle RF components: (1) Transceiver (TRX), (2) Power Amplifier Unit (PAU), and (3) 25 MHz bandwidth transmit/receive filters covering the cellular frequency spectrum: 869-894 MHz.

As a Transceiver System, all conducted RF characteristics and emissions measurements were performed at the transmit antenna terminal (downlink), using a production product. All testing was performed by Global Product Compliance Laboratory (GPCL), Murray Hill, NJ.

APPLICABLE FCC RULES AND INDUSTRY STANDARDS:

Part 2.1046	RF Power Output
Part 2.1047	Modulation Characteristics
Part 2.1049	Occupied Bandwidth
Part 2.1051	Spurious Emissions at the Antenna Terminals.
Part 2.1053	Field Strength of Spurious Radiation
Part 2.1055	Measurements required: Frequency stability.
Part 2.1057	Frequency Spectrum to be Investigated
Part 22.917	Emission Limitations for Cellular Equipment
ETSI	TS 125 141 V7.15.0 (2010-02): Universal Mobile Telecommunications System (UMTS); Base Station (BS) Conformance Testing (FDD), (3GPP TS 25.141, Version 7.15.0, Release 7).
ETSI	TS 125 104 V8.3.0 (2008-06): Universal Mobile Telecommunications System (UMTS); Base Station (BS) Radio Transmission and Reception (FDD), (3GPP TS 25.104, Version 8.3.0, Release 8).

PART 2.1046 MEASUREMENTS REQUIRED: RF POWER OUTPUT

The rated RF power at the downlink (DL) antenna terminal is **60 Watts (+47.8 dBm)** total composite power for each of 2 DL transmit antenna terminals (RF paths) designated as Tx1 and Tx2. The fundamental frequencies can be either a single 60 W carrier per Tx1 and Tx2, or 2 carriers at 30W/C per Tx1 and Tx2. The RF power measured at the antenna terminal for each configuration, across the 25 MHz 869-894 MHz frequency band is tabulated below.

The carrier channel frequencies used represent the lowest settable, mid band and the highest settable frequencies for both single carriers at 60W , and for 2 adjacent carriers at 30W/C operation. These are tabulated below.

The 850 MHz Single Carrier Test Frequencies at 60W (+47. 8 dBm) are:

Cellular Freq Band	UMTS 850 Carrier	UARFCN Channel Number	Carrier Center Frequency
A" - A	Lowest Settable to the 869 MHz Band Edge	1007	871.5 MHz
A	Highest Settable in A-Band	1037	877.5 MHz
B - B'	Lowest Settable in B-Band & Spectrum Mid-Band	1062	882.5 MHz
B'	Highest Settable to the 894 MHz Band Edge	1107	891.5 MHz

The 850MHz Two Carrier Test Frequencies at 30W/C (+44.8 dBm/C) are:

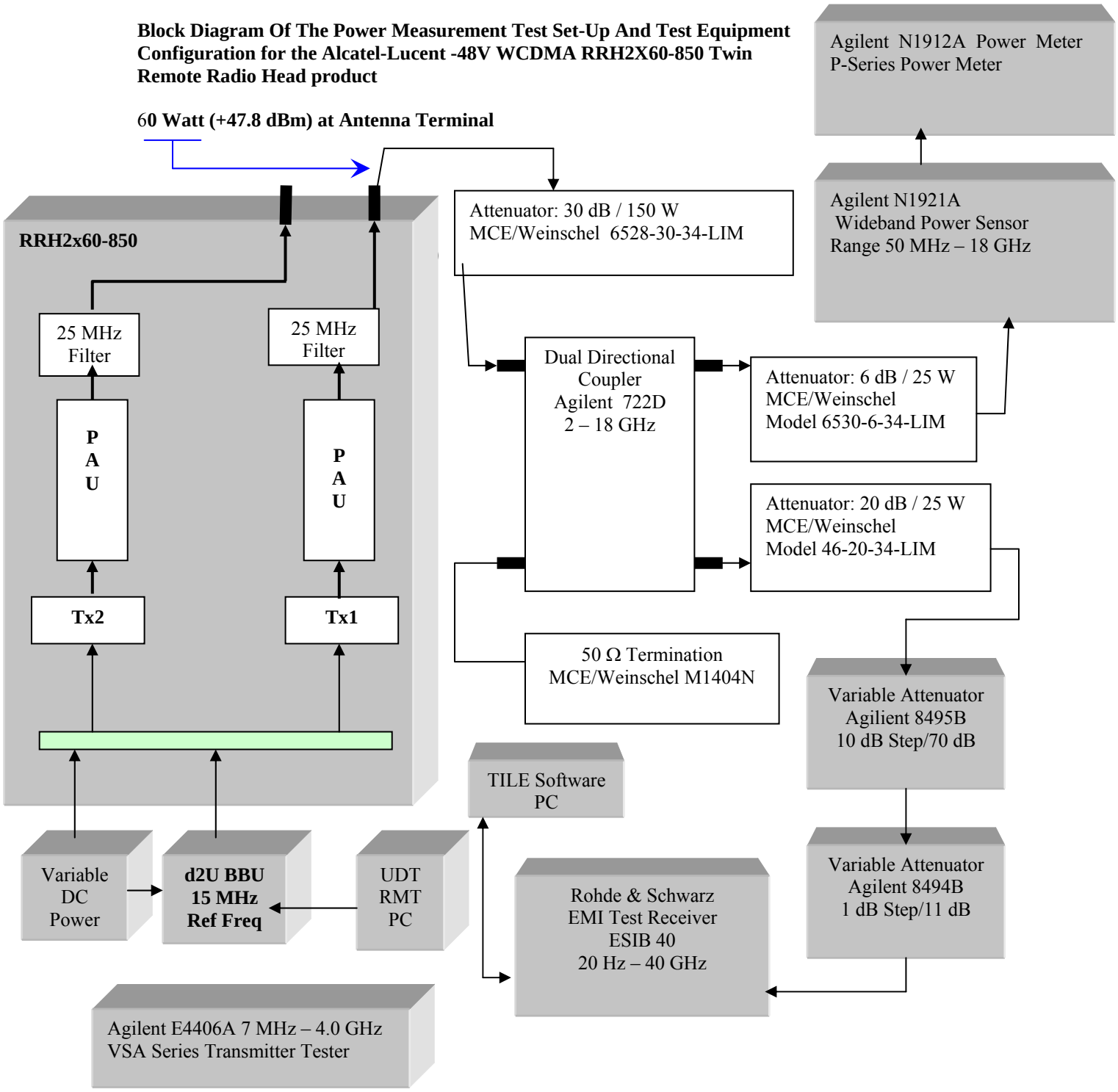
Frequency Block	UMTS 850 Carrier	UARFCN DL Channel No.	Carrier Center Frequency
A + A	Lowest Settable to the 869 MHz Band Edge	1007 + 1032	871.5 + 876.5 MHz
A + B	Mid Band	1037 + 1062	877.5 + 882.5 MHz
B + B'	Highest Settable to the 894 MHz Band Edge	1082 + 1107	886.5 + 891.5 MHz

Note: UARFCN = UTRA Absolute Radio Frequency Channel Number

Results: The -48V WCDMA **RRH2X60-850** twin Remote Radio Head product 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 -48V WCDMA RRH2X60-850 Twin Remote Radio Head product

60 Watt (+47.8 dBm) at Antenna Terminal



PART 2.1047 MEASUREMENTS REQUIRED: MODULATION CHARACTERISTICS

The modulation accuracy was measured at the Equipment Antenna Terminal (EAC) for each of the *single carrier* test frequencies and power levels previously cited, i.e., the lowest and highest settable carrier frequencies for the A-Block and the B-Block. The data is tabulated below. However, for brevity, only the highest (891.5 MHz) settable carrier frequency will be displayed and is representative of all measurements.

In accordance with ETSI TS 25.141, the Error Vector Magnitude (EVM) was measured for two test modulation (TM) schemes:

1) **TM1-64** with 68 active channels: 64 voice + 4 control (QPSK). **Limit: EVM RMS < 17.5 %**

2) **TM 5-44** with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). **Limit: EVM RMS < 12.5 %.**

In each test, the power level was set to Pmax: 60W (47.8 dBm). 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:

Tx1 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm)

Cellular Freq Band	UMTS 850 Carrier 60W (47.8 dBm) TM1-64 (QPSK)	UARFCN Channel Number	Carrier Center Frequency	Modulation Accuracy Average < 17.5 %	Modulation Accuracy Peak Hold < 17.5 %
A" - A	Lowest Settable to the 869 MHz Band Edge	1007	871.5 MHz	7.23 %	7.32 %
A	Highest Settable in A-Band	1037	877.5 MHz	4.68 %	5.53 %
B - B'	Lowest Settable in B-Band & Spectrum Mid-Band	1062	882.5 MHz	4.76 %	5.90 %
B'	Highest Settable to the 894 MHz Band Edge	1107	891.5 MHz	7.55 %	8.27 %

Tx1 @ TM5-44 (16QAM) - Single Carrier at 60W (47.8 dBm)

Cellular Freq Band	UMTS 850 Carrier 80W (49.0 dBm) TM1-64 (QPSK)	UARFCN Channel Number	Carrier Center Frequency	Modulation Accuracy Average < 17.5 %	Modulation Accuracy Peak Hold < 17.5 %
A" - A	Lowest Settable to the 869 MHz Band Edge	1007	871.5 MHz	7.05 %	7.50 %
A	Highest Settable in A-Band	1037	877.5 MHz	2.89 %	3.75 %
B - B'	Lowest Settable in B-Band & Spectrum Mid-Band	1062	882.5 MHz	3.21 %	3.95 %
B'	Highest Settable to the 894 MHz Band Edge	1107	891.5 MHz	6.60 %	6.91 %

Tx2 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm)

Cellular Freq Band	UMTS 850 Carrier 60W (47.8 dBm) TM5-44 (16QAM)	UARFCN Channel Number	Carrier Center Frequency	Modulation Accuracy Average < 12.5 %	Modulation Accuracy Peak Hold < 12.5 %
A" - A	Lowest Settable to the 869 MHz Band Edge	1007	871.5 MHz	7.77 %	7.82 %
A	Highest Settable in A-Band	1037	877.5 MHz	6.42 %	6.48 %
B - B'	Lowest Settable in B-Band & Spectrum Mid-Band	1062	882.5 MHz	6.33 %	6.39 %
B'	Highest Settable to the 894 MHz Band Edge	1107	891.5 MHz	8.70 %	8.74 %

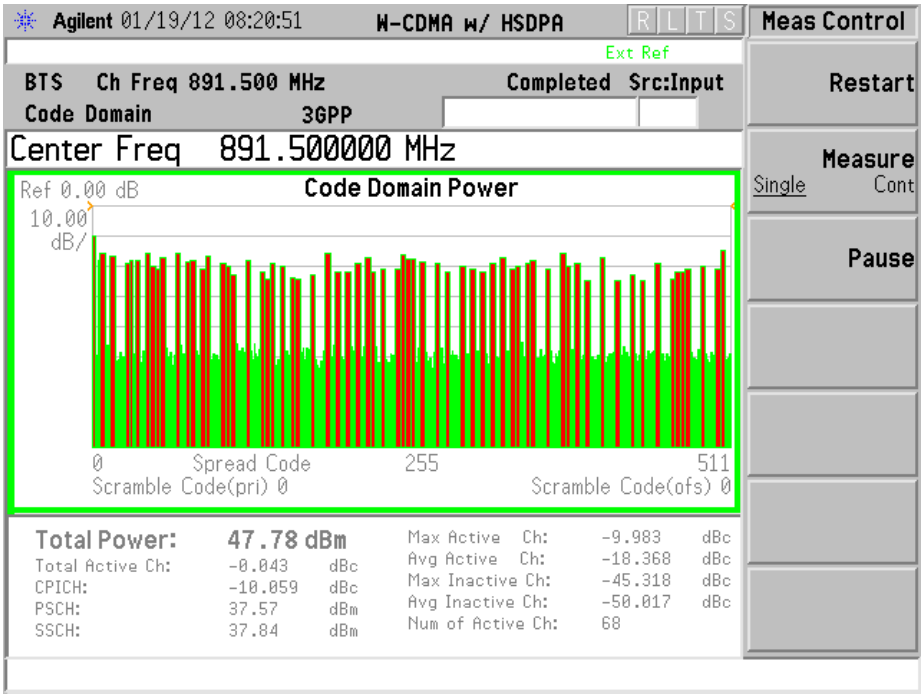
Minimum Standard Requirement: The minimum standard requirement is that the RMS Error Vector Magnitude (EVM) shall be less than 17.5% for TM1-64 (QPSK) and less than 12.5% for TM5-44 (16QAM).

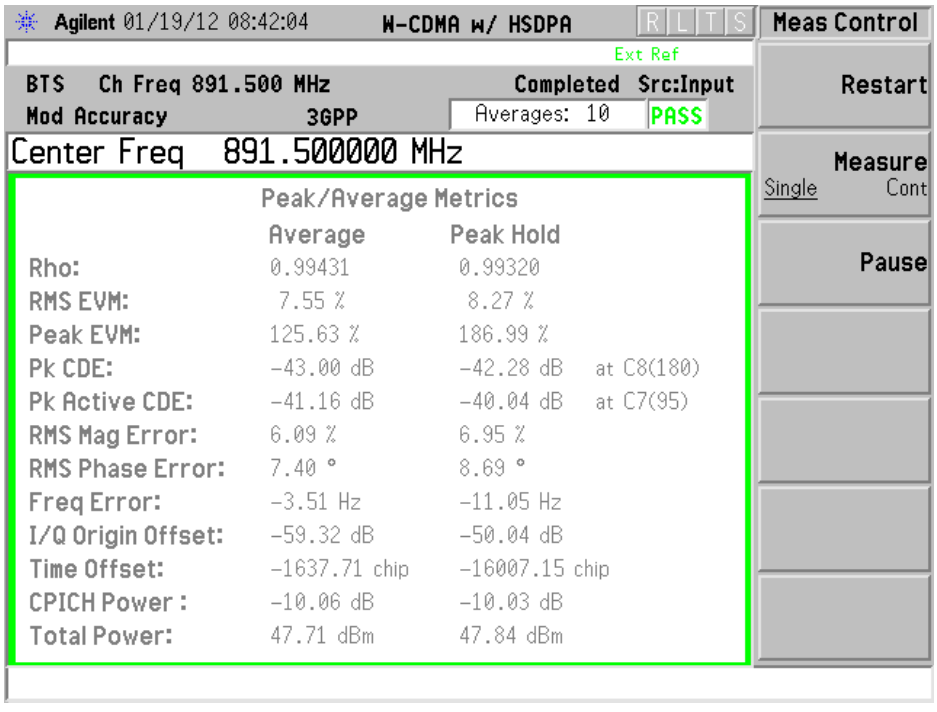
Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement, with exception that the ESIB-40 EMI Test Receiver is replaced by Agilent E4406A VSA Series Transmitter Tester, 7 MHz – 4.0 GHz

RESULTS: The -48V WCDMA **RRH2X60-850** Twin Remote Radio Head product demonstrated full compliance with the modulation accuracy requirements specified in ETSI TS 25.141. All channels measured were less than the 12.5% RMS limitation. The plots for each channel are recorded and stored on file. For brevity, only the highest carrier frequencies will be displayed in this exhibit, since they are representative for all.

Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Limit: EVM RMS < 17.5 %

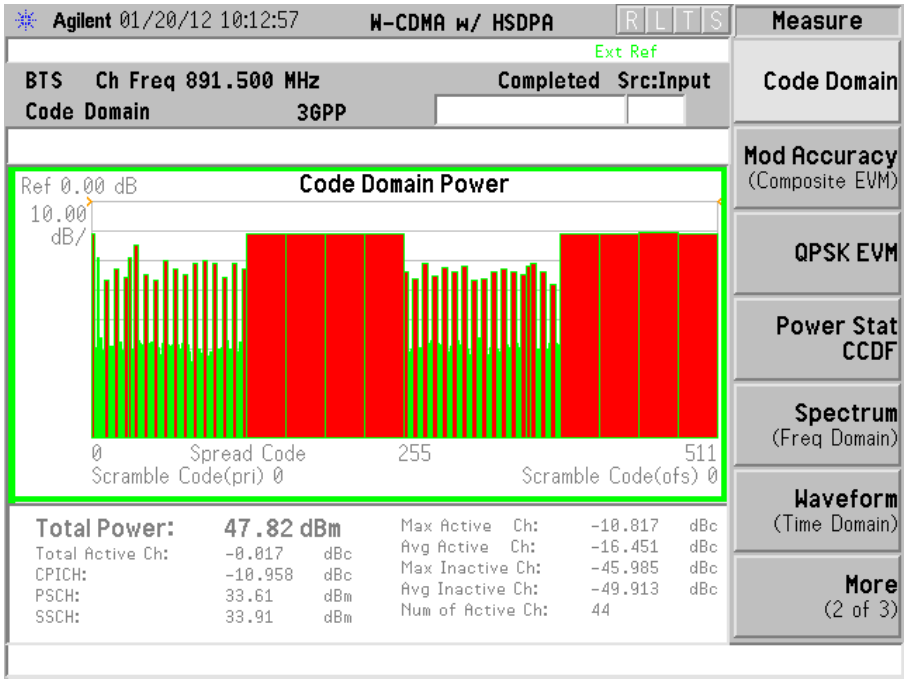
Tx1 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

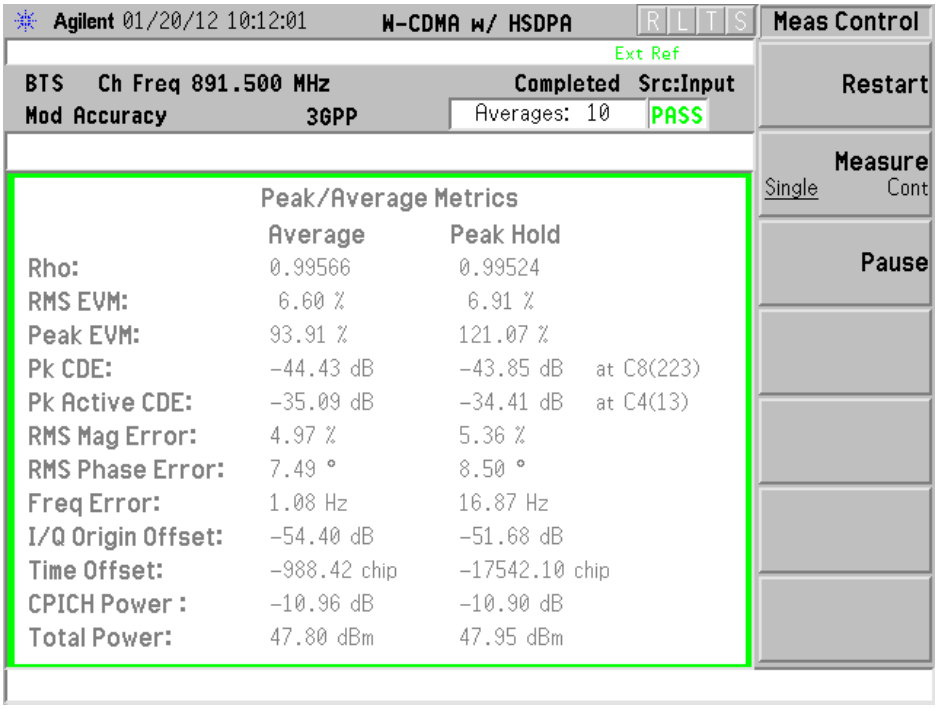




Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Limit: EVM RMS < 12.5 %.

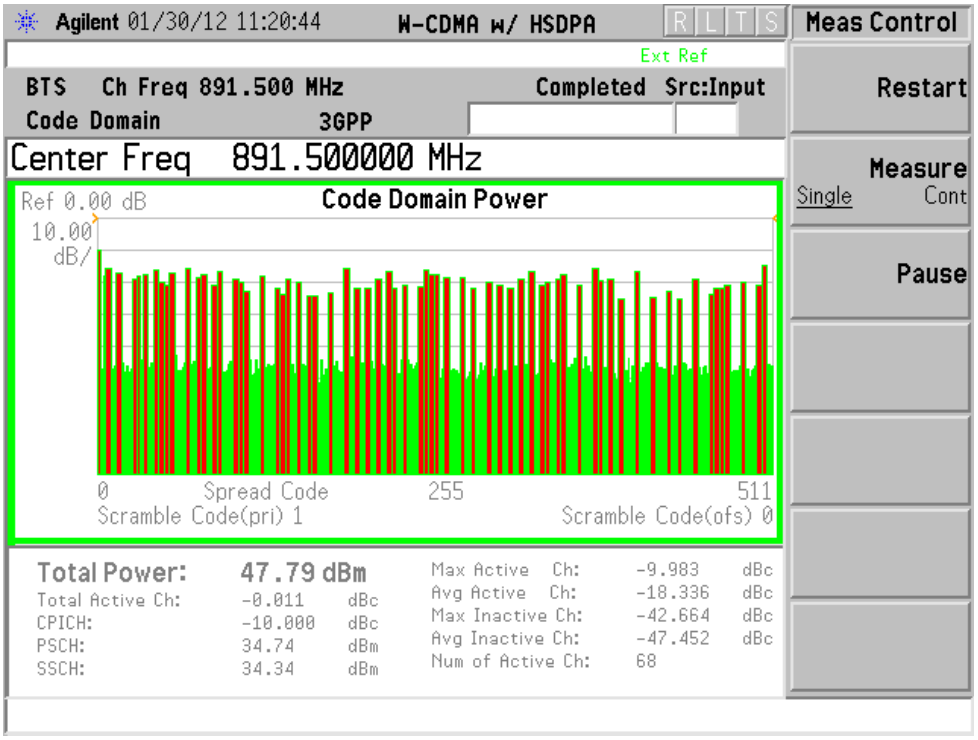
Tx1 @ TM5-44 (16QAM) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

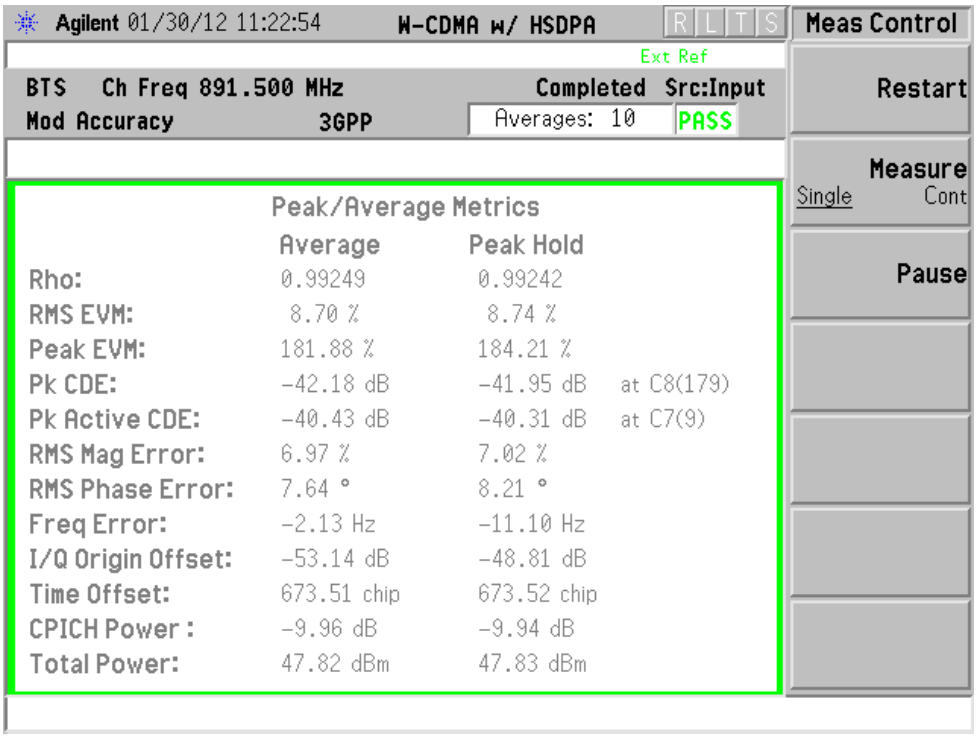




Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Limit: EVM RMS < 17.5 %

Tx2 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz





PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH - Method 1

The occupied bandwidth was measured at the Equipment Antenna Terminal (EAC) for the previously cited Single-Carrier and Two-Carrier frequencies. The configurations and power levels evaluated were:

1) Tx1 @ 60W single carrier at TM1-64
2) Tx1 @ 60W single carrier at TM5-44
3) Tx2 @ 60W single carrier at TM1-64
4) Tx1 @ 30W/C: two adjacent carriers at TM1-64
5) Tx1 @ 30W/C: two adjacent carriers at TM5-44

Compliance was demonstrated for the ETSI TS 25.141 emission masks, using both the TM1-64 and TM5-44 test modulations, for the above configurations as indicated.

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 7MHz-4.0 GHz. 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 22.917. This measurement was performed for both a single-carrier and for two-carrier operation.

Method 1: The carrier 99% power bandwidth was measured at the Equipment Antenna Terminal (EAC) for each of the single carrier configurations above at 60W (47.8 dBm) for both TM1-64 (QPSK) and TM5-44 (16QAM) test modulations.

Tx1 @ 60W (47.8 dBm)

Cellular Freq Band	UMTS 850 MHz Carrier 60W (47.8 dBm)	UARFCN Channel Number	Carrier Center Frequency	Measured Carrier 99% Power Bandwidth TM1-64	Measured Carrier 99% Power Bandwidth TM5-44
A" - A	Lowest Settable to the 869 MHz Band Edge	1007	871.5 MHz	4.1463 MHz	4.1398 MHz
A	Highest Settable in A-Band	1037	877.5 MHz	4.1531 MHz	4.1912 MHz
B - B'	Lowest Settable in B-Band & Spectrum Mid-Band	1062	882.5 MHz	4.1451 MHz	4.1607 MHz
B'	Highest Settable to the 894 MHz Band Edge	1107	891.5 MHz	4.1704 MHz	4.1685 MHz

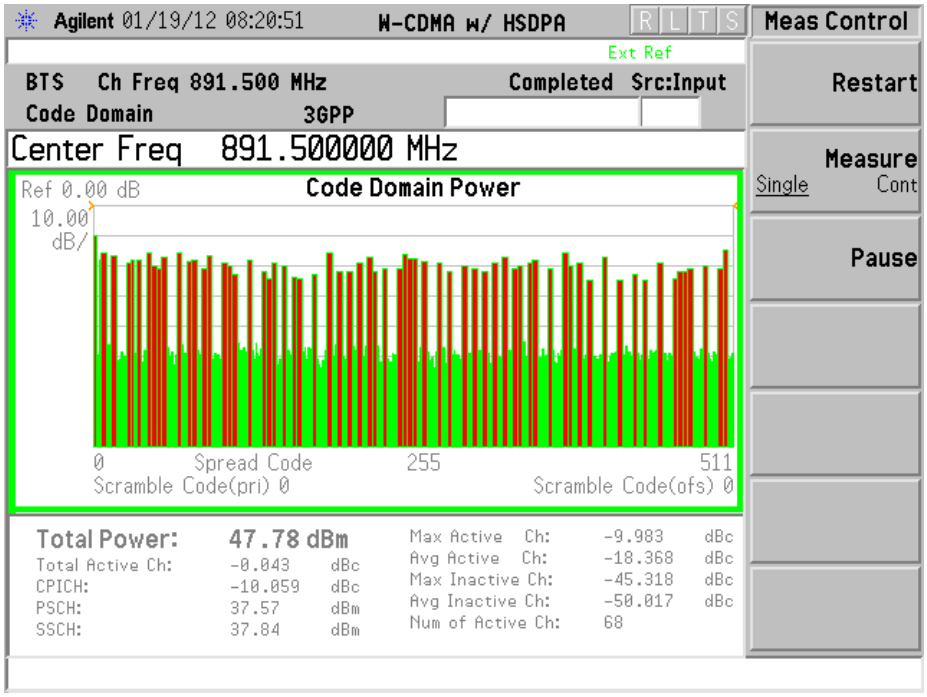
Tx2 @ 60W (49.0 dBm)

Cellular Freq Band	UMTS 850 MHz Carrier 80W (49.0 dBm)	UARFCN Channel Number	Carrier Center Frequency	Measured Carrier 99% Power Bandwidth TM1-64
A" - A	Lowest Settable to the 869 MHz Band Edge	1007	871.5 MHz	4.1982 MHz
A	Highest Settable in A-Band	1037	877.5 MHz	4.1759 MHz
B - B'	Lowest Settable in B-Band & Spectrum Mid-Band	1062	882.5 MHz	4.1780 MHz
B'	Highest Settable to the 894 MHz Band Edge	1107	891.5 MHz	4.1345 MHz

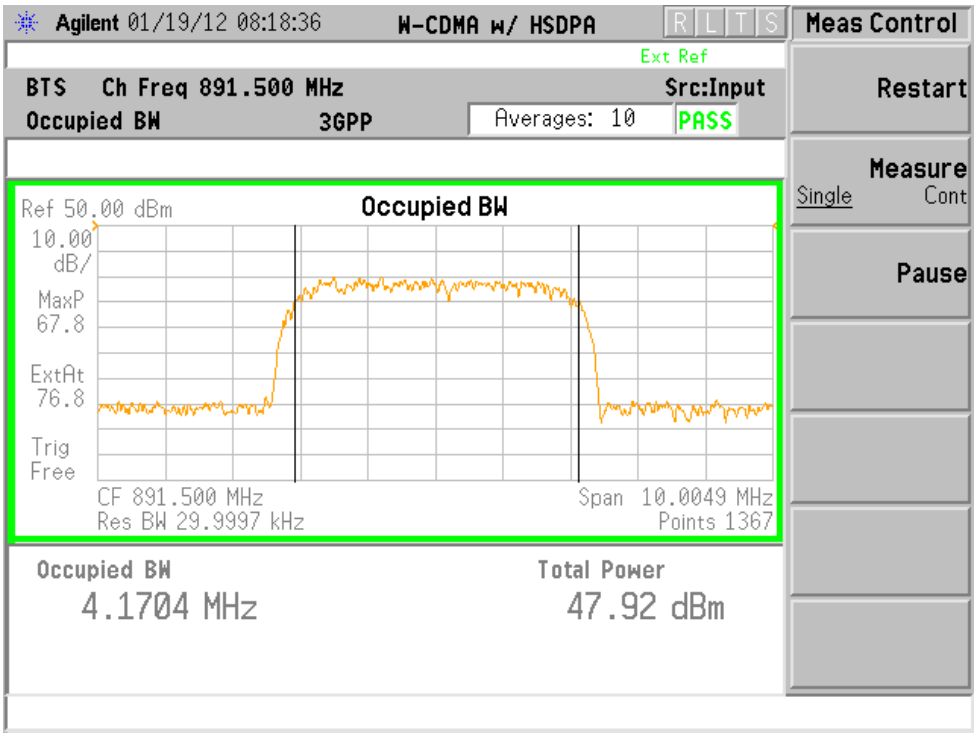
Results: The 99% occupied bandwidth measurement confirms that the carrier's emission designator to be 4M20F9W. The plots for each channel are recorded and stored on file. For brevity, only the highest carrier frequencies will be displayed in this exhibit, since they are representative for all.

Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK).

Tx1 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

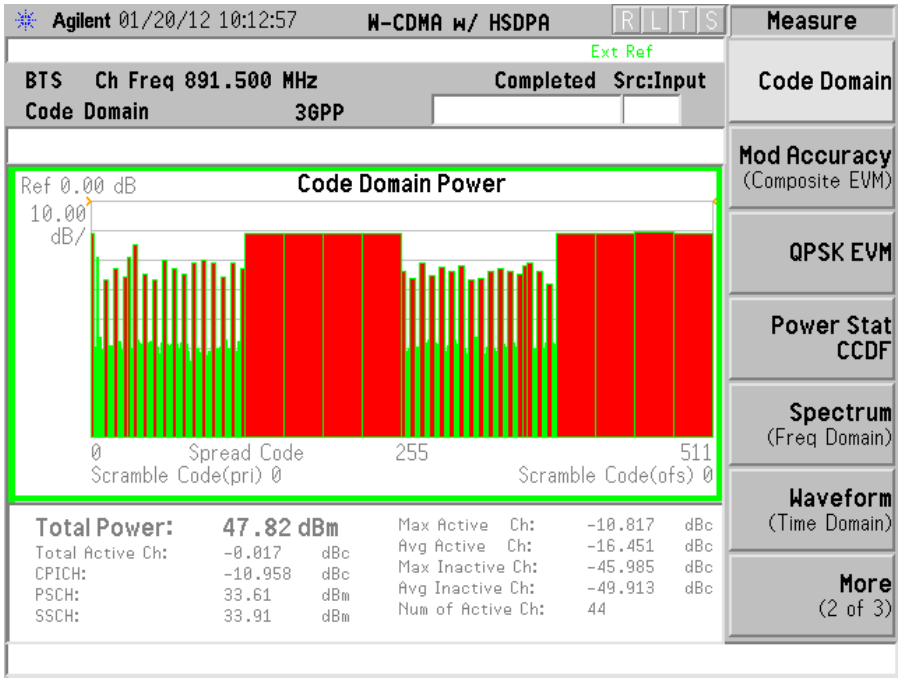


99% Occupied Bandwidth

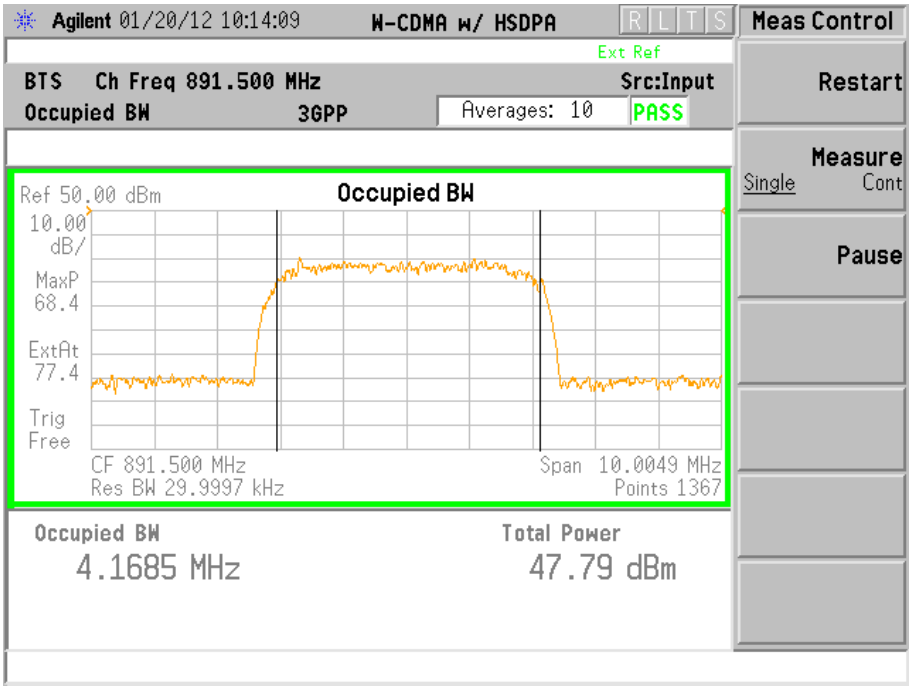


Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM).

Tx1 @ TM5-44 (16QAM) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

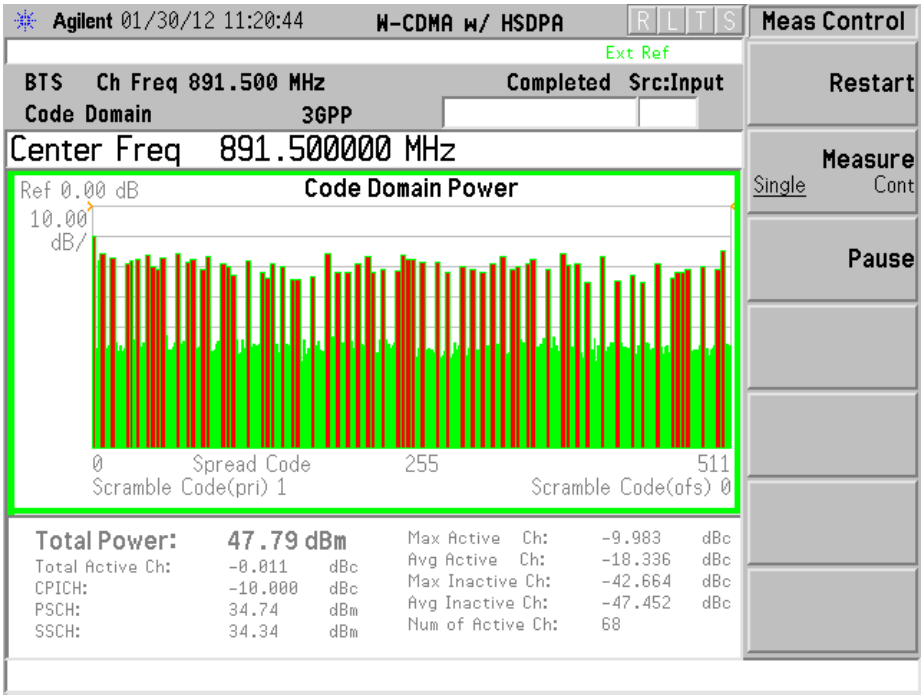


99% Occupied Bandwidth

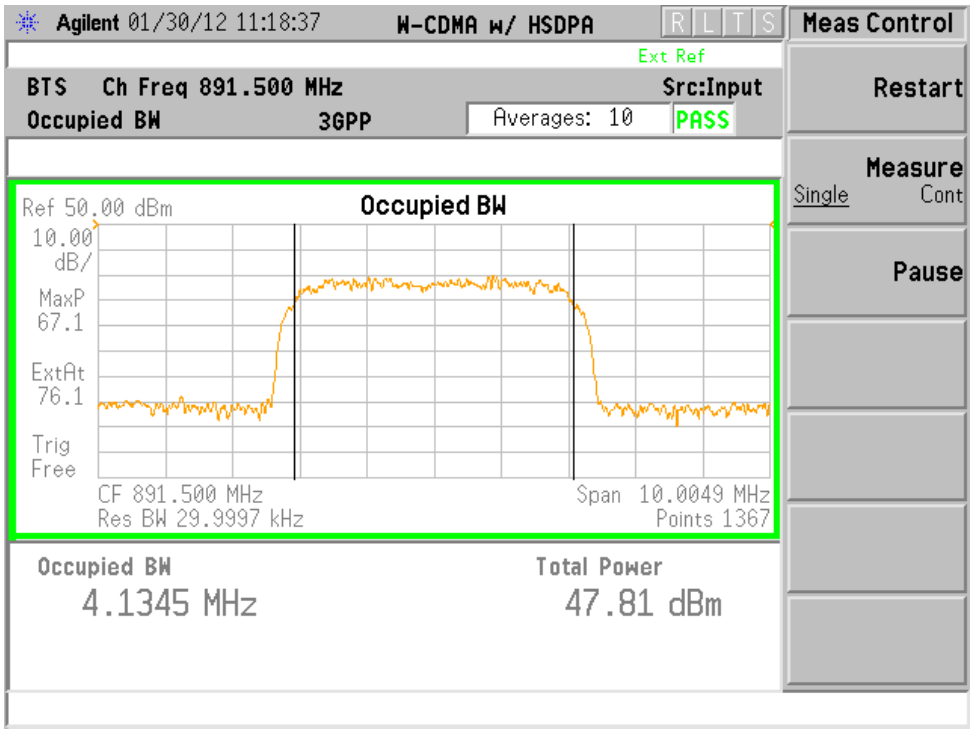


Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK).

Tx2 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz



99% Occupied Bandwidth



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH - Method 2

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

Compliance with the ETSI TS 25.141 occupied bandwidth emission mask requirements and with Part 22.917 was demonstrated using a Rohde & Schwarz ESIB-40 EMI Test Receiver, in combination with the Total Integrated Laboratory Environment (TILE) EMI test software, by ETS-Lindgren. The occupied bandwidth/emission mask compliance measurements were performed for both a single-carrier and for two-carrier operation, with both TM1-64 and TM5-44 ETSI test modulations.

Measurements were performed at the Equipment Antenna Terminal (EAC) for the following configurations:

1) Tx1 @ 60W single carrier at TM1-64
2) Tx1 @ 60W single carrier at TM5-44
3) Tx2 @ 60W single carrier at TM1-64
4) Tx1 @ 30W/C: two adjacent carriers at TM1-64
5) Tx1 @ 30W/C: two adjacent carriers at TM5-44

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 by –22.218 dB, in accordance with the equation:

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

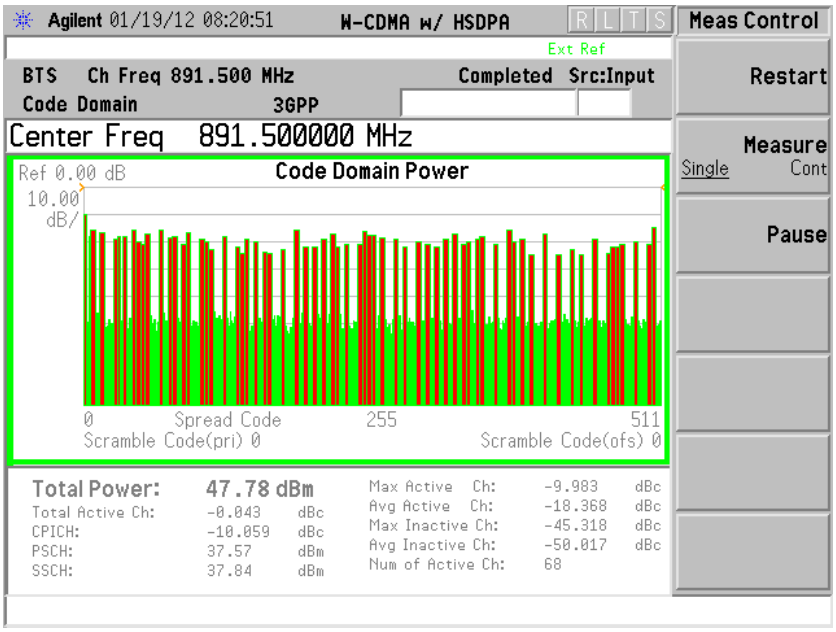
The plots for each channel measured are recorded and stored on file. For brevity, only the highest single-carrier (891.5 MHz) and two-carrier (886.5 + 891.5 MHz) frequencies will be displayed in this exhibit, as done previously.

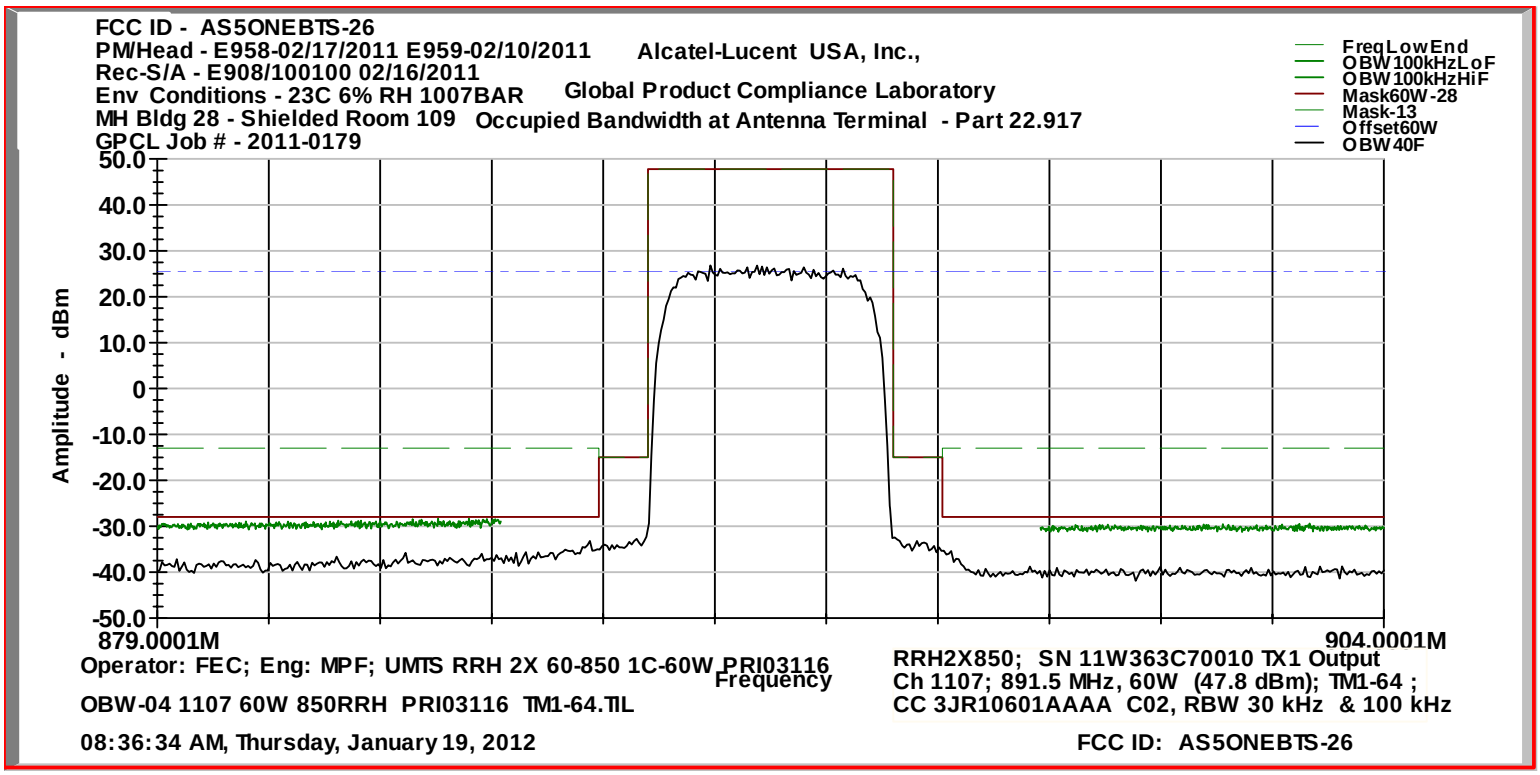
Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

RESULTS: All UARFCN channels measured demonstrate compliance with the emission mask specified by ETSI TS 25.141; the carriers do not exceed the mask limitation. The data plots attached below show characteristics consistent with all measurements. For brevity, only the highest single-carrier (891.5 MHz) and two-carrier (886.5 + 891.5 MHz) frequencies will be displayed in this exhibit.

1) Tx1 @ 60W single carrier at TM1-64

Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK) - 60W
Tx1 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

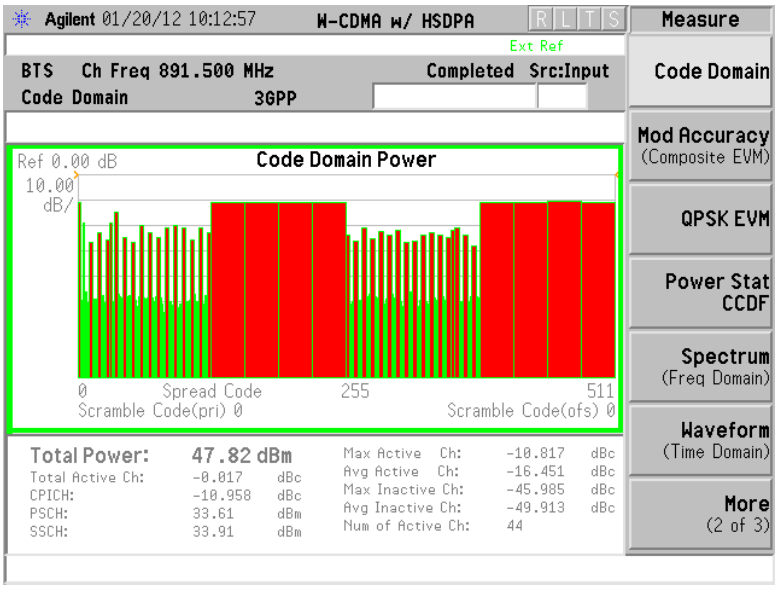


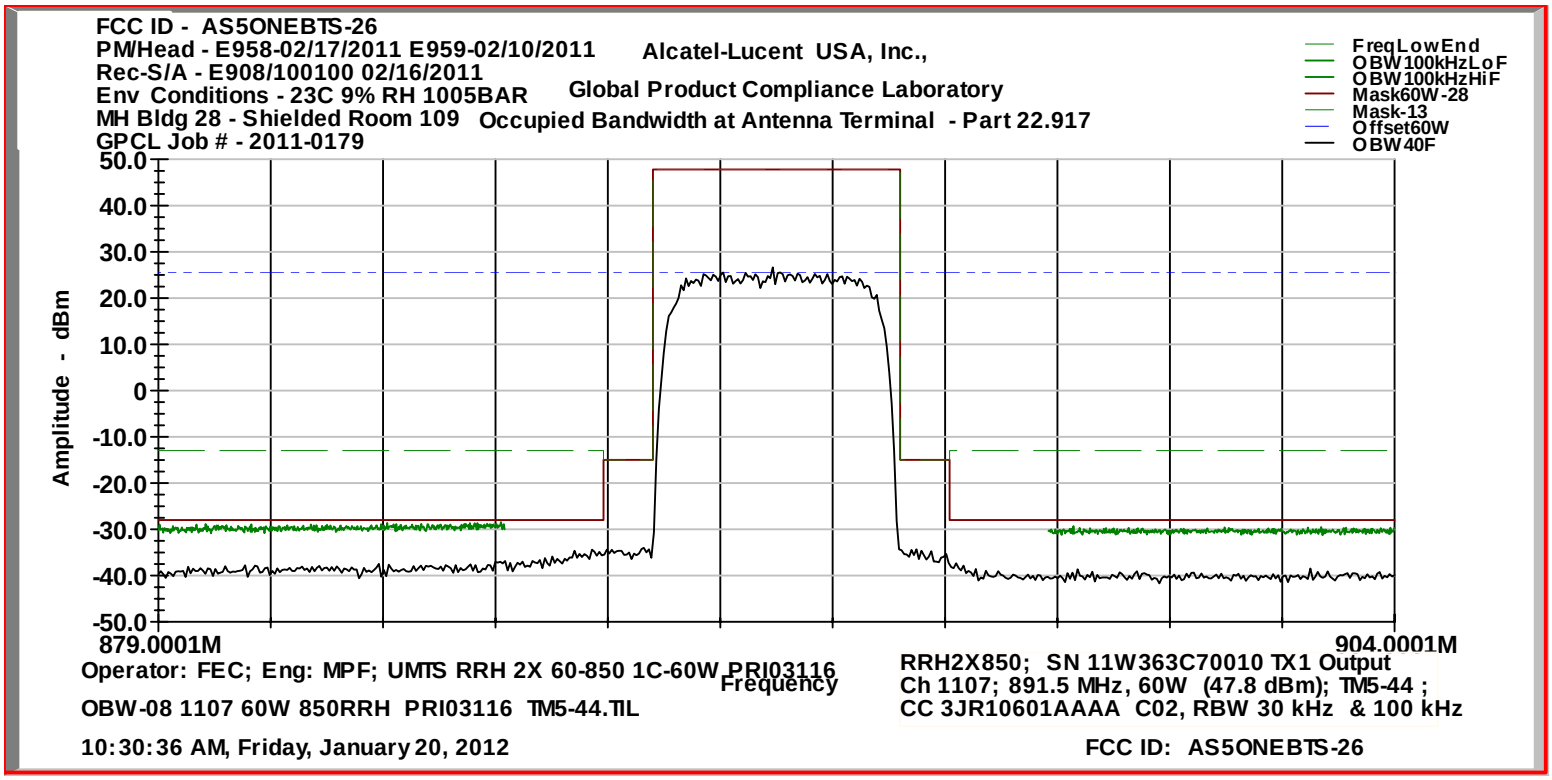


2) Tx1 @ 60W single carrier at TM5-44

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM).

Tx1 @ TM5-44 (16QAM) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

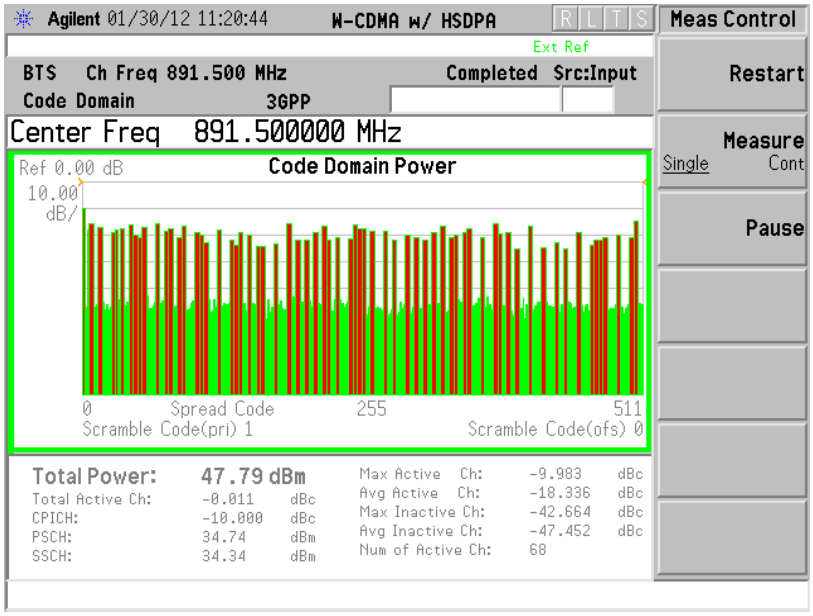


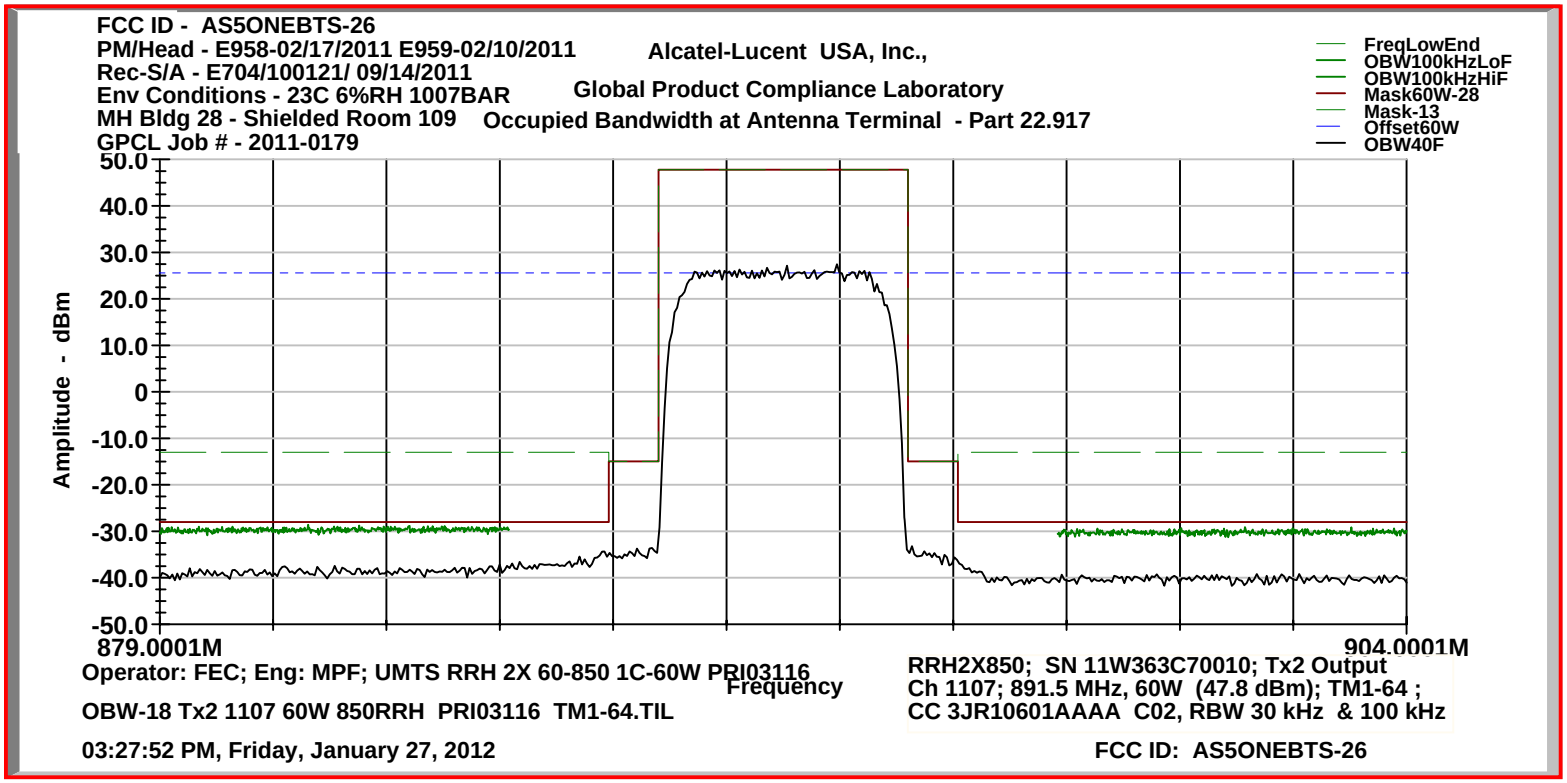


3) Tx2 @ 60W single carrier at TM1-64

Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK).

Tx2 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

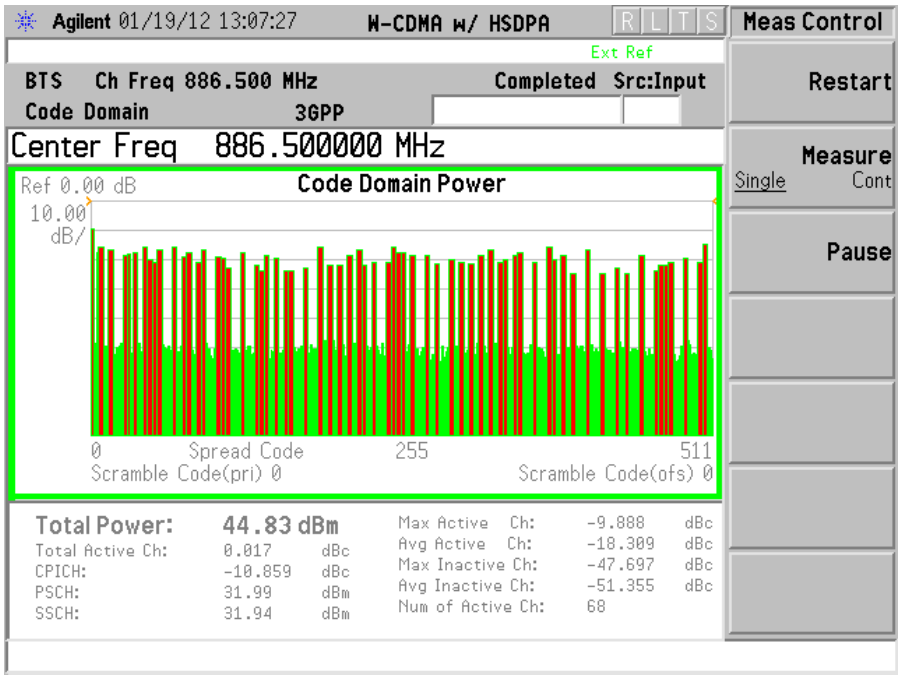


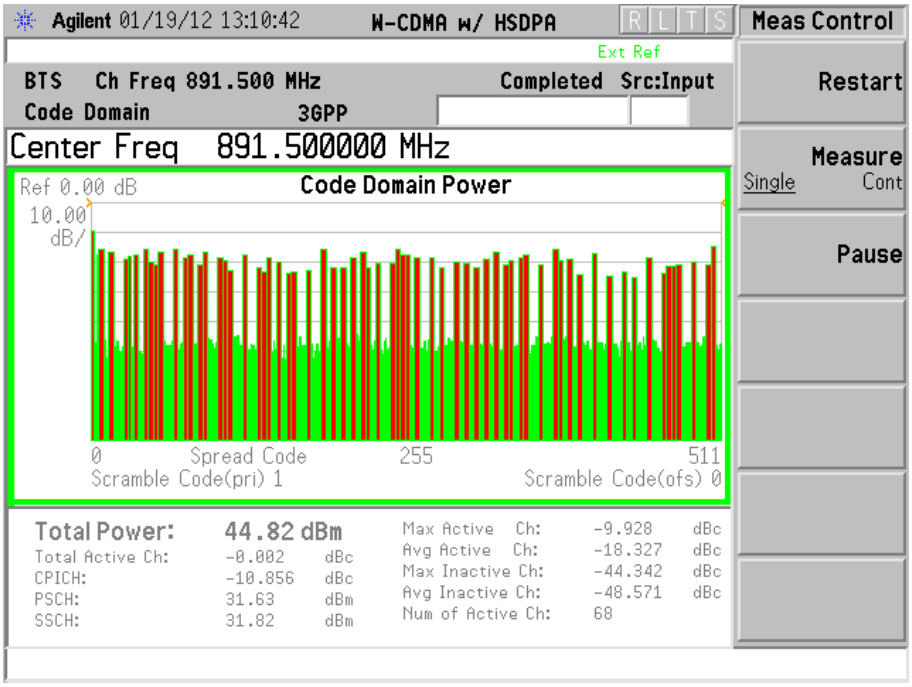


4) Tx1 @ 30W/C: two adjacent carriers at TM1-64

Test Modulation: TM1-64 with 68 Active Channels: 64 voice + 4 control (QPSK) - 30W/C with Total Composite Power 60W

TM1-64 (QPSK) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz

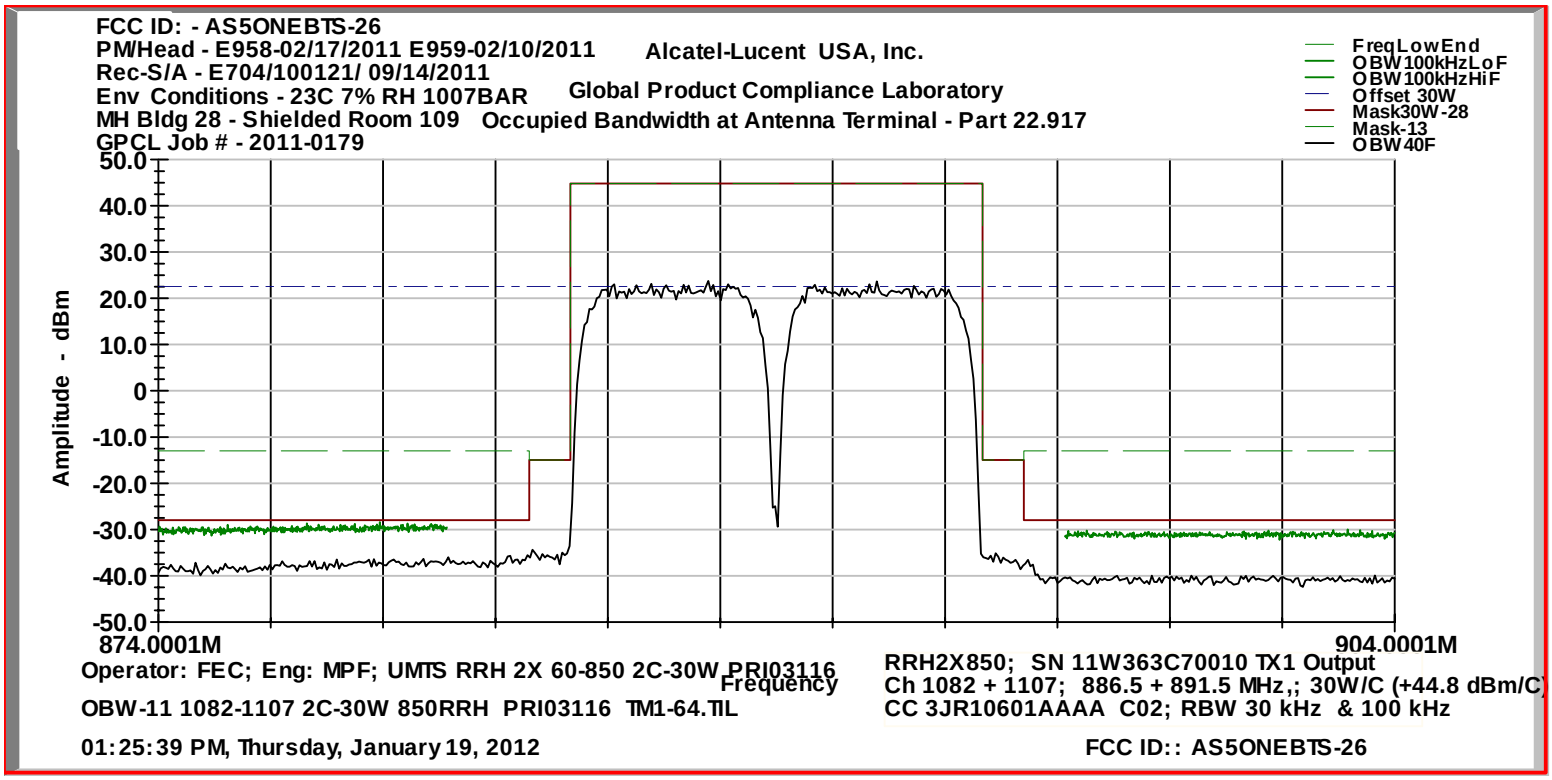




4) Tx1 @ 30W/C: two adjacent carriers at TM1-64

Test Modulation: TM1-64 with 68 Active Channels: 64 voice + 4 control (QPSK) - 30W/C with Total Composite Power 60W

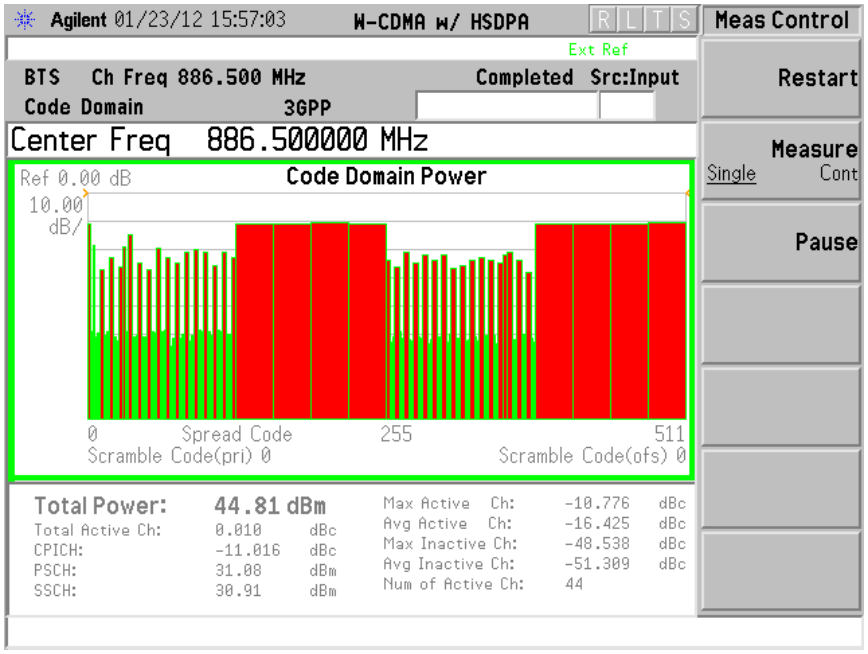
TM1-64 (QPSK) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz

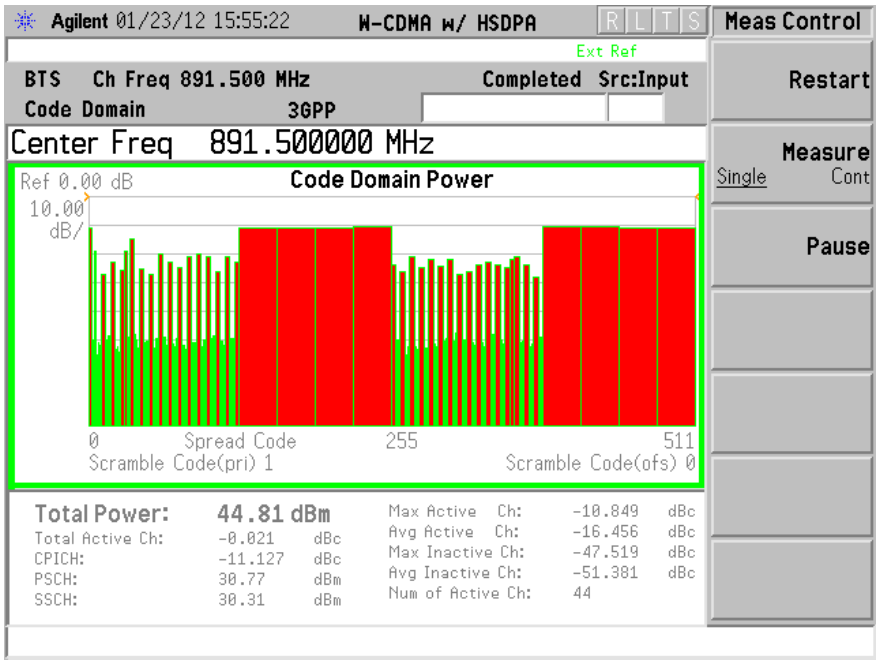


5) Tx1 @ 30W/C: two adjacent carriers at TM5-44

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM) - 30W/C with Total Composite Power 60W

TM5-44 (16QAM) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz

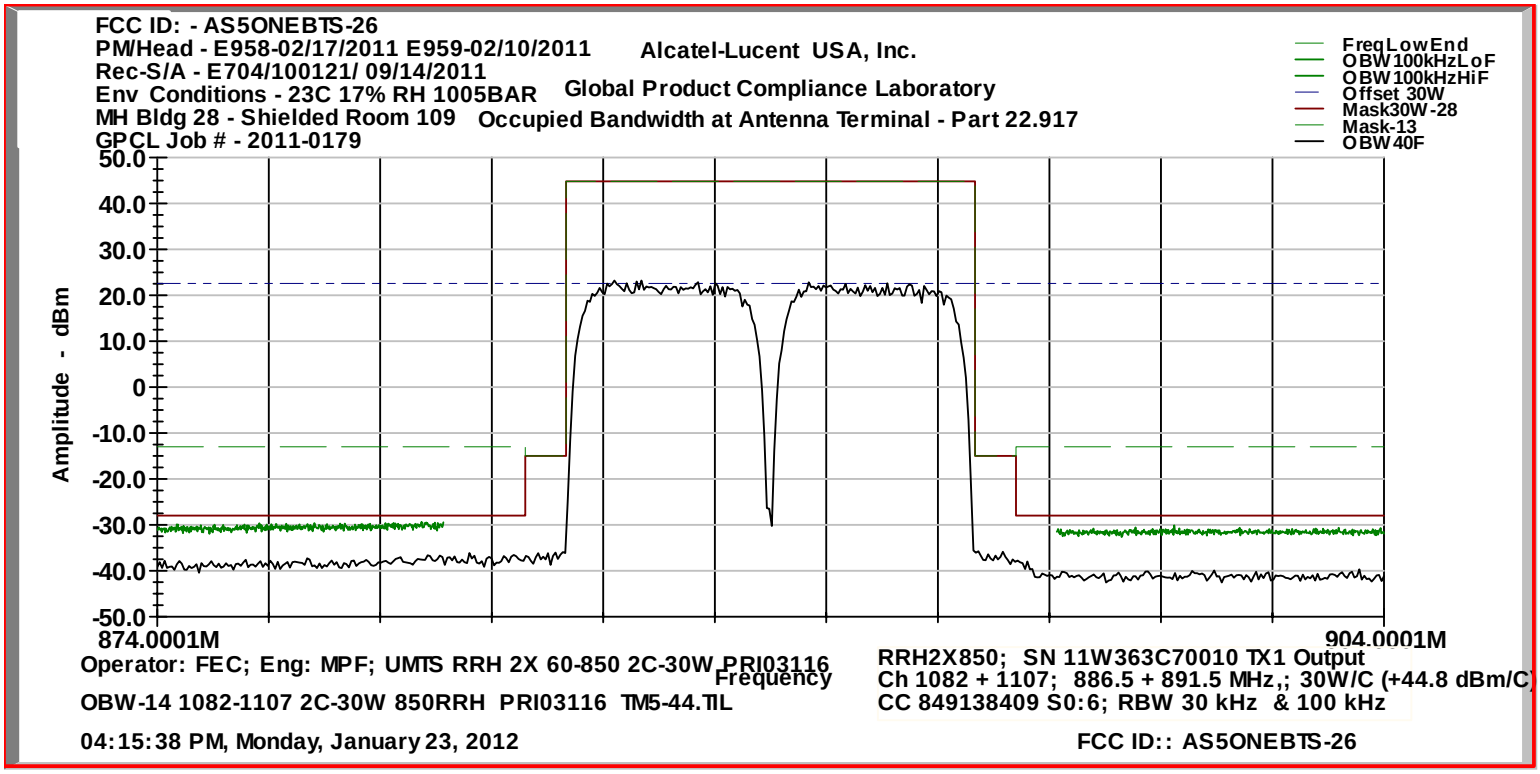




5) Tx1 @ 30W/C: two adjacent carriers at TM5-44

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM) - 30W/C with Total Composite Power 60W

TM5-44 (16QAM) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz



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, i.e., the downlink transmit antenna, using the same carrier frequencies, configurations, power level settings and test modulations.

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 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 as shown below, produces the corresponding emission attenuation below the carrier in dBc, which all equate to -13 dBm.

1) 1C at P = 60W; Required Spurious Emission Attenuation = 60.78 dBc (-13.0 dBm)
2) 2C at P = 30W/C; Required Spurious Emission Attenuation = 57.77 dBc (-13.0 dBm)

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. 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
4.	Instrumentation Noise Floor:	at least 20 dB greater than "43 + 10 log (*P*) dBc"

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

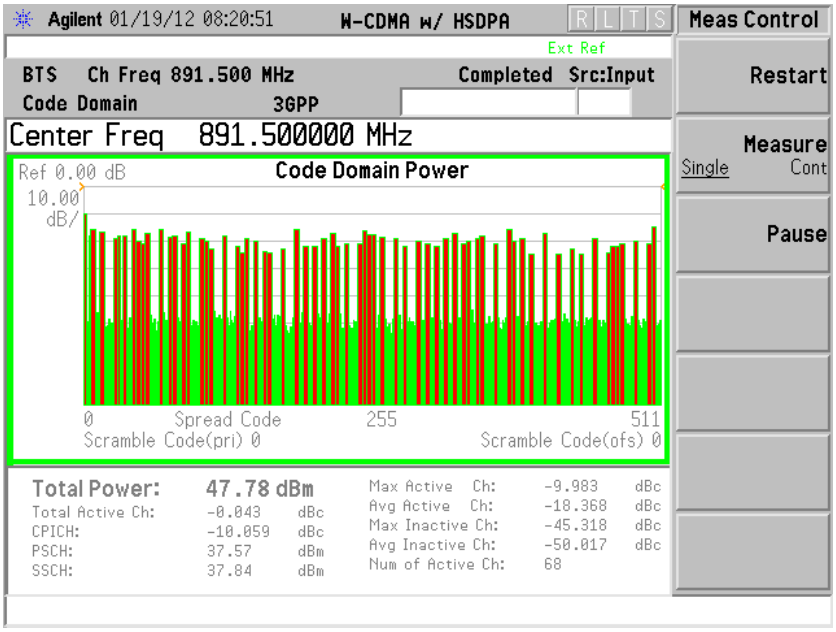
Method of Measurement:

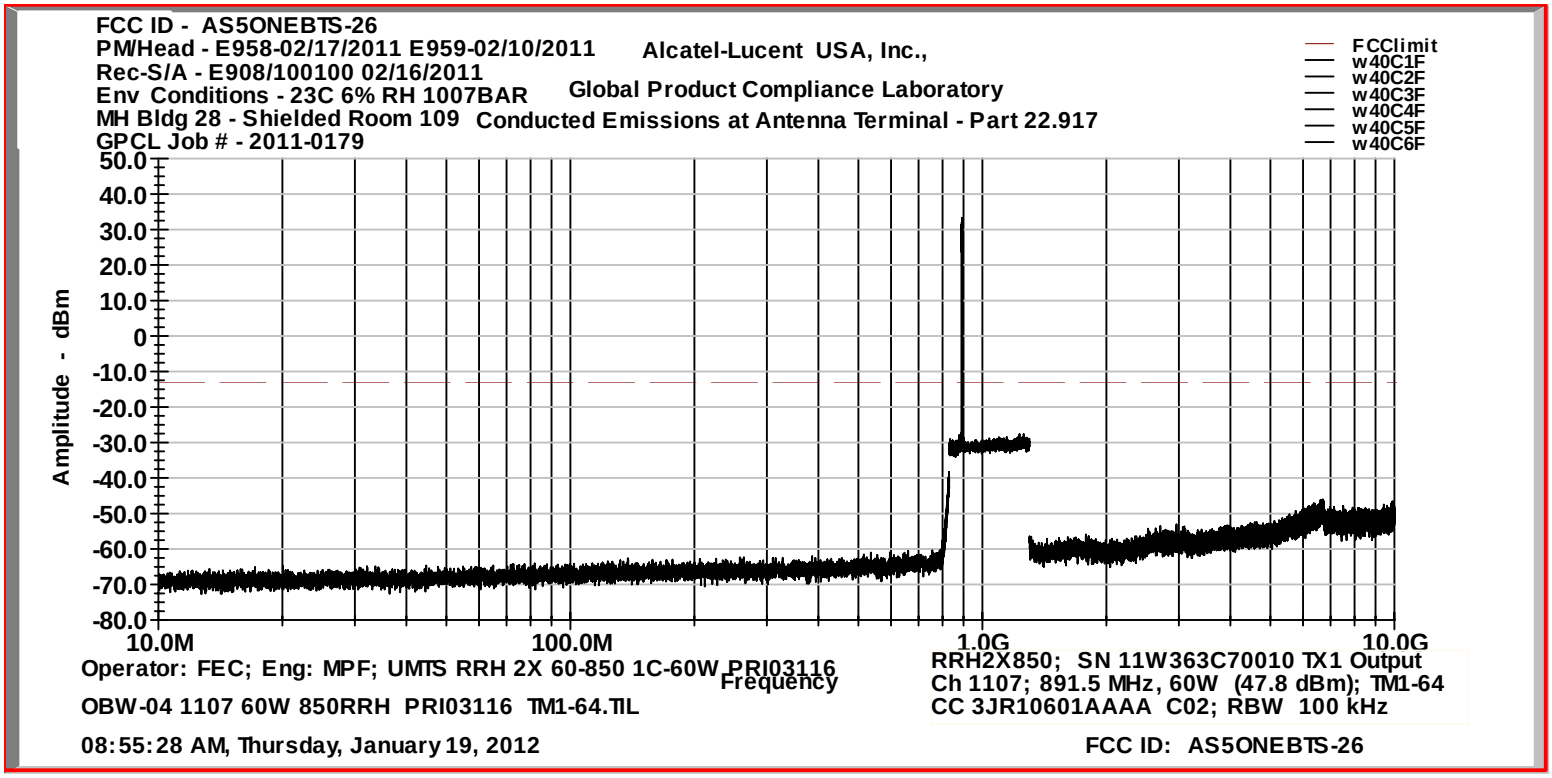
In order to suppress the instrumentation noise floor sufficient to detect and measure spurious signals that have power levels as low as 20 dB below the required limit, an EMC software package was employed to drive the spectrum analyzer, collect and compile the acquired data, perform mathematical corrections to the data by incorporating 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 TILE/IC software was able to sufficiently suppress the noise floor by measuring the spectrum in a sequential series of short segments using a peak detector, perform mathematical corrections to each segment, and then sequentially compile all the segments into a continuous graphical display. These measurements were performed in combination with an appropriate instrumentation low-pass filter and high-pass filter, installed at the input terminal of the spectrum analyzer.

Results: For each UMTS carrier, there were no reportable emissions. Data plots for each carrier, previously displayed under 2.1049, are attached to this exhibit.

1) Tx1 @ 60W single carrier at TM1-64

Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK) - 60W
Tx1 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

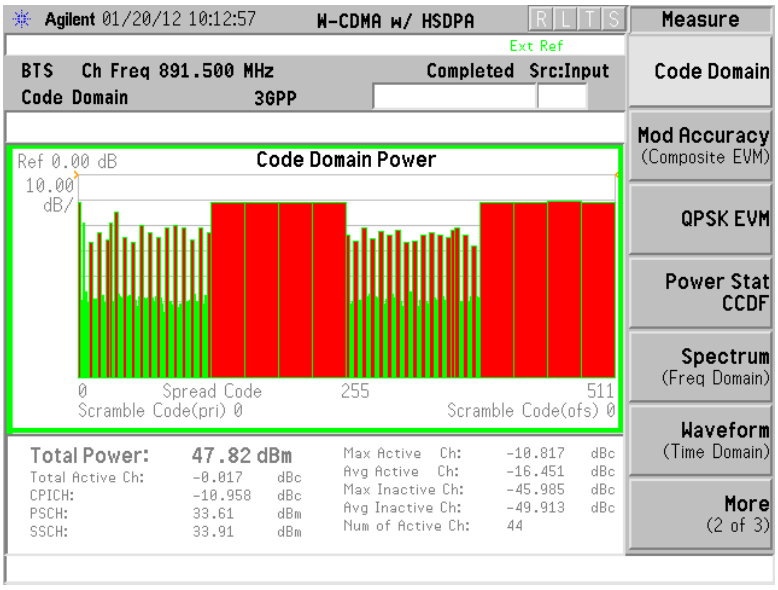


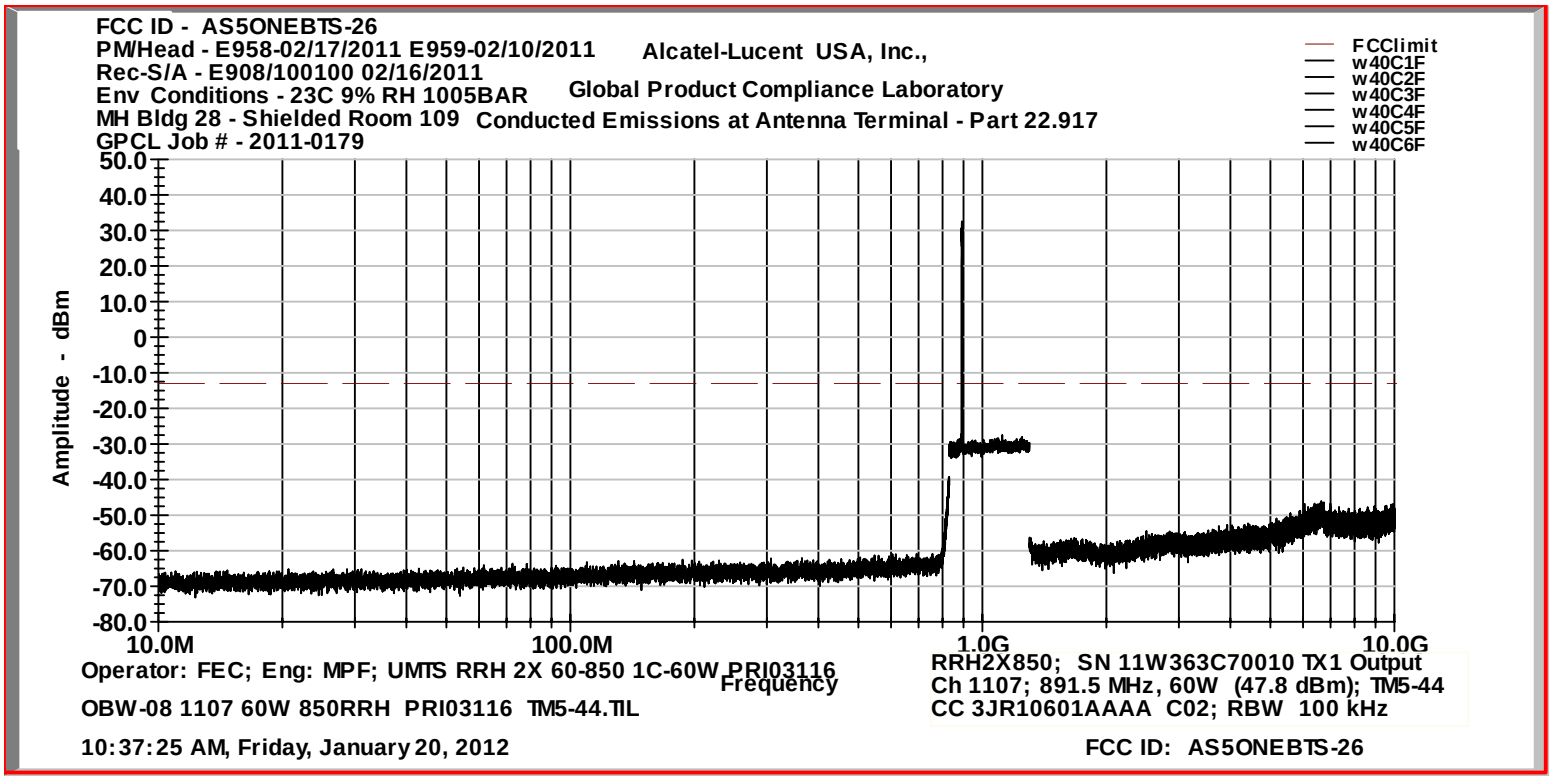


2) Tx1 @ 60W single carrier at TM5-44

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM).

Tx1 @ TM5-44 (16QAM) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

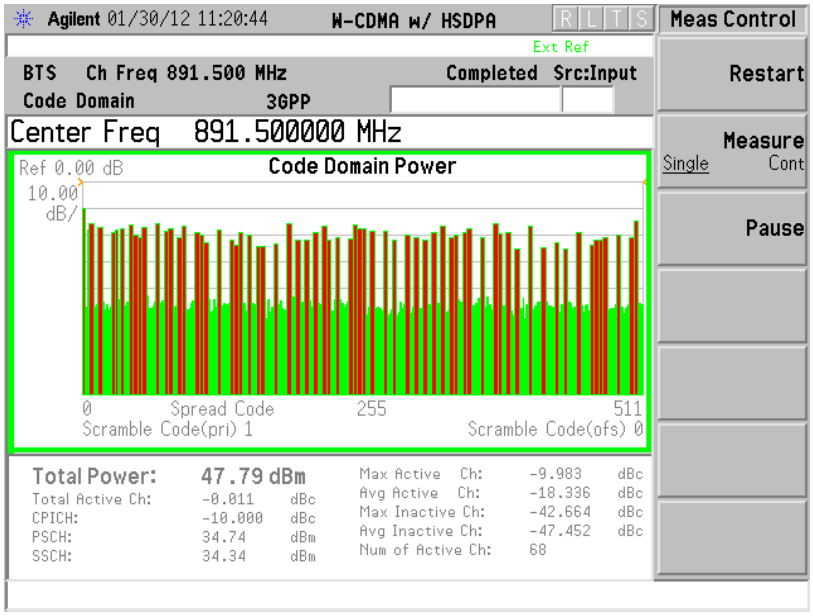


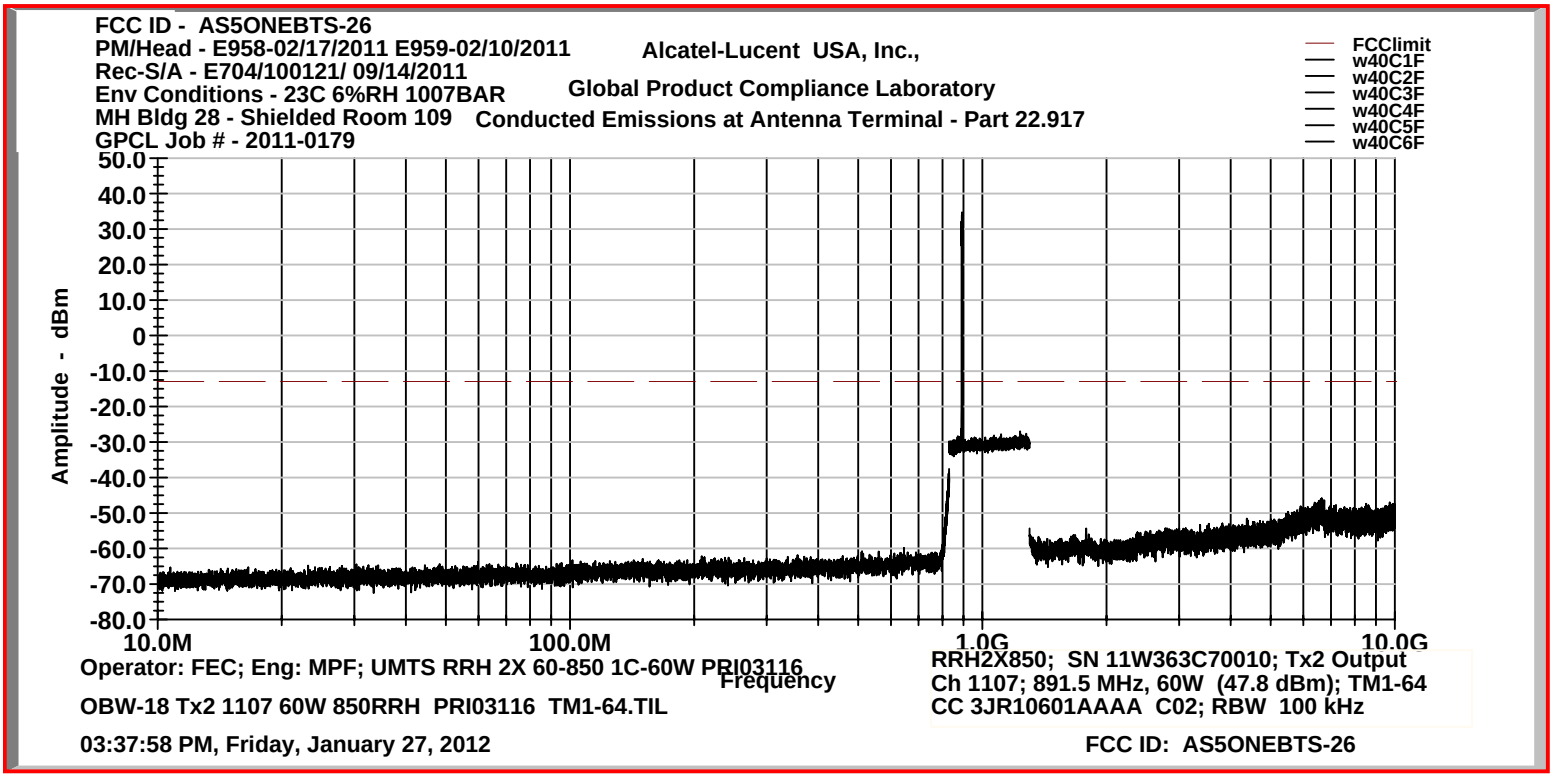


3) Tx2 @ 60W single carrier at TM1-64

Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK).

Tx2 @ TM1-64 (QPSK) - Single Carrier at 60W (47.8 dBm) - 891.5 MHz

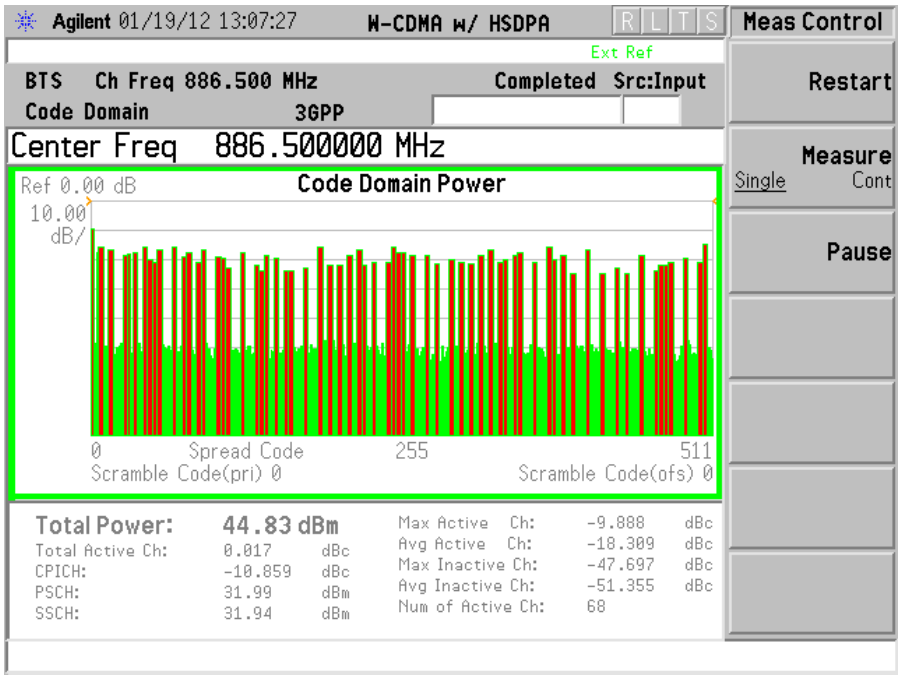


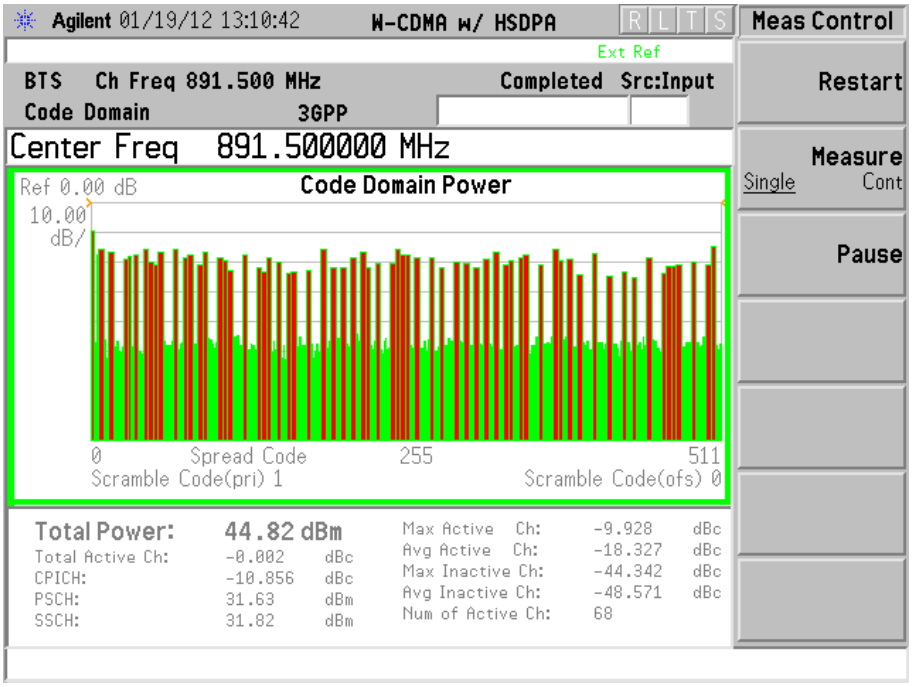


4) Tx1 @ 30W/C: two adjacent carriers at TM1-64

Test Modulation: TM1-64 with 68 Active Channels: 64 voice + 4 control (QPSK) - 30W/C with Total Composite Power 60W

TM1-64 (QPSK) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz

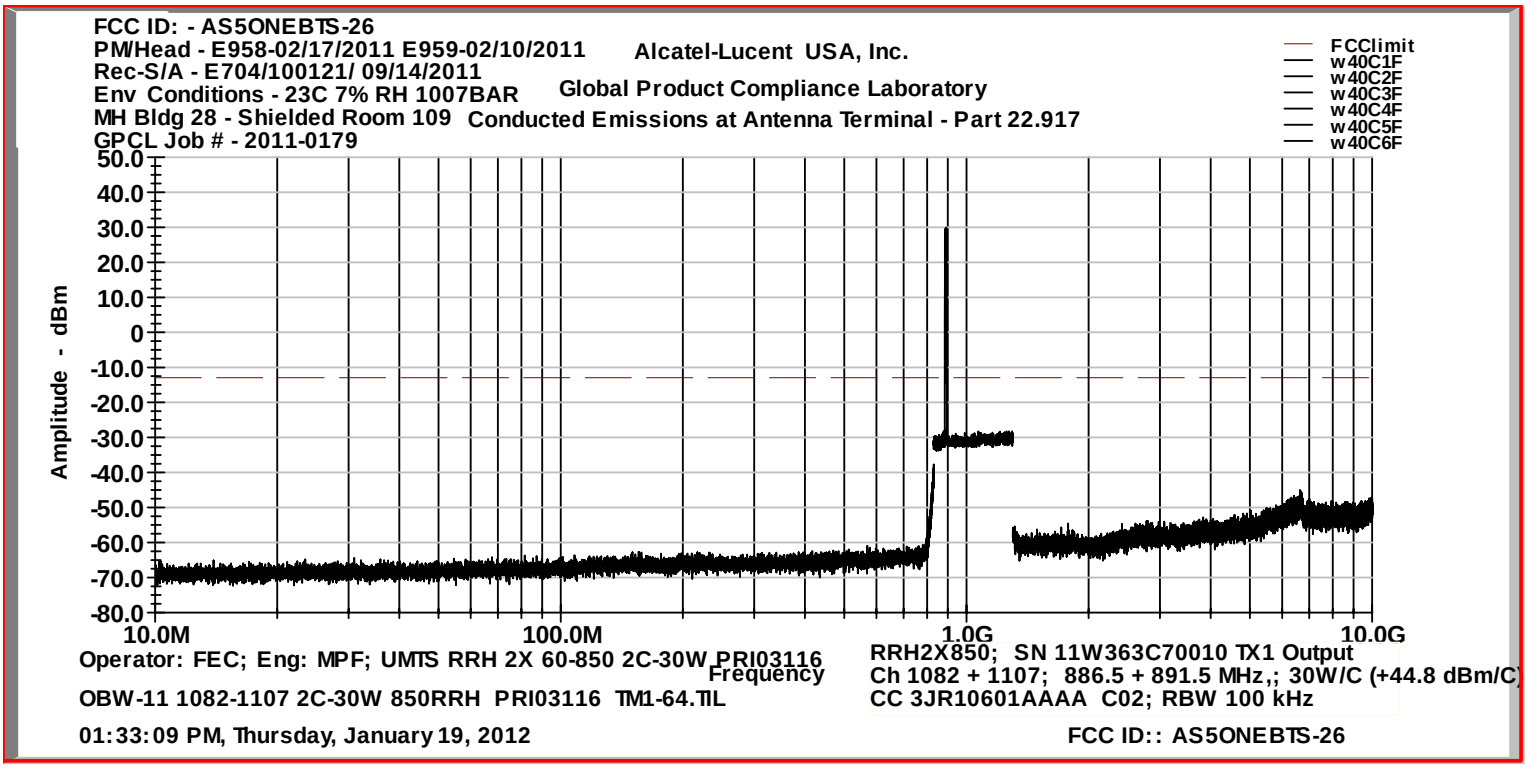




4) Tx1 @ 30W/C: two adjacent carriers at TM1-64

Test Modulation: TM1-64 with 68 Active Channels: 64 voice + 4 control (QPSK) - 30W/C with Total Composite Power 60W

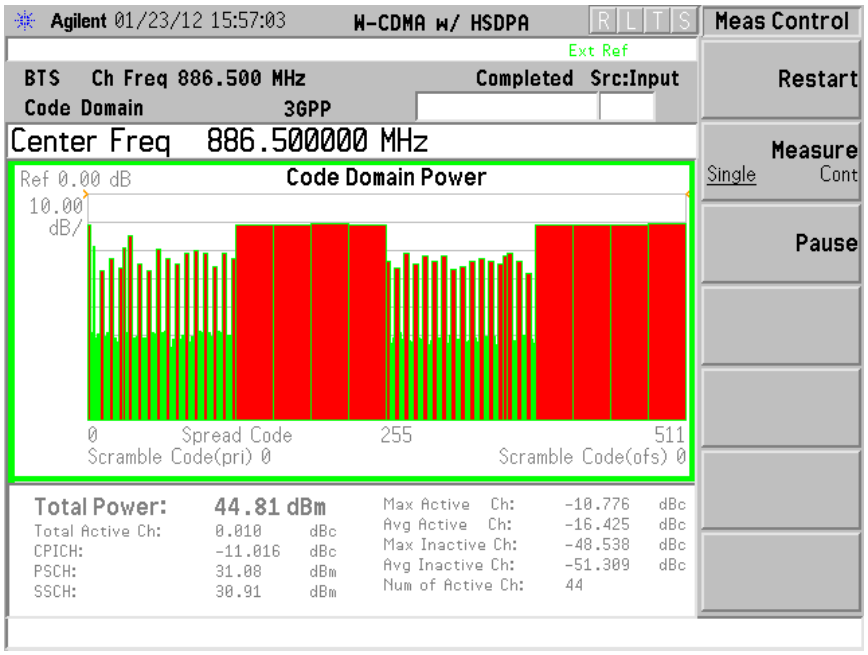
TM1-64 (QPSK) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz

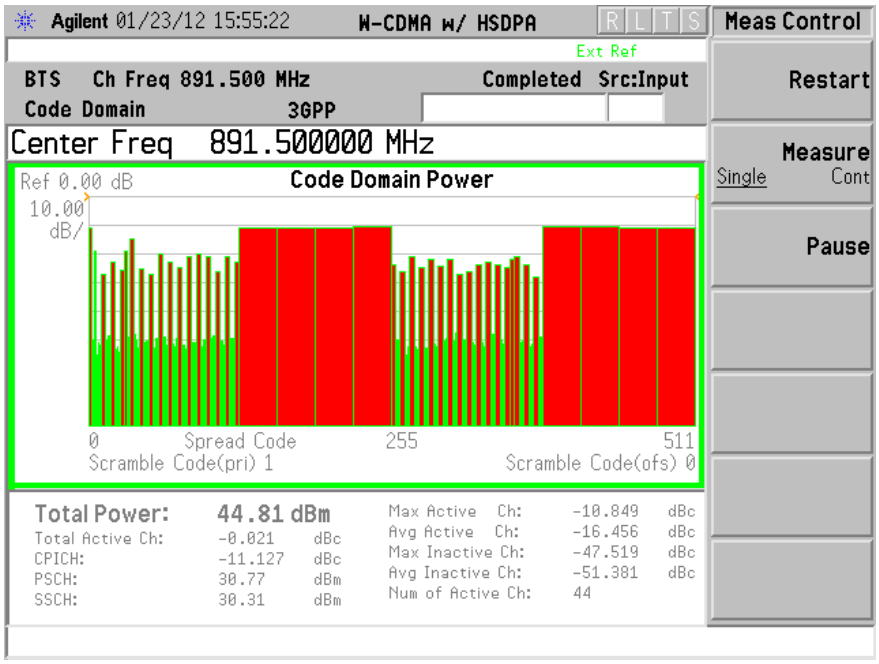


5) Tx1 @ 30W/C: two adjacent carriers at TM5-44

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM) - 30W/C with Total Composite Power 60W

TM5-44 (16QAM) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz

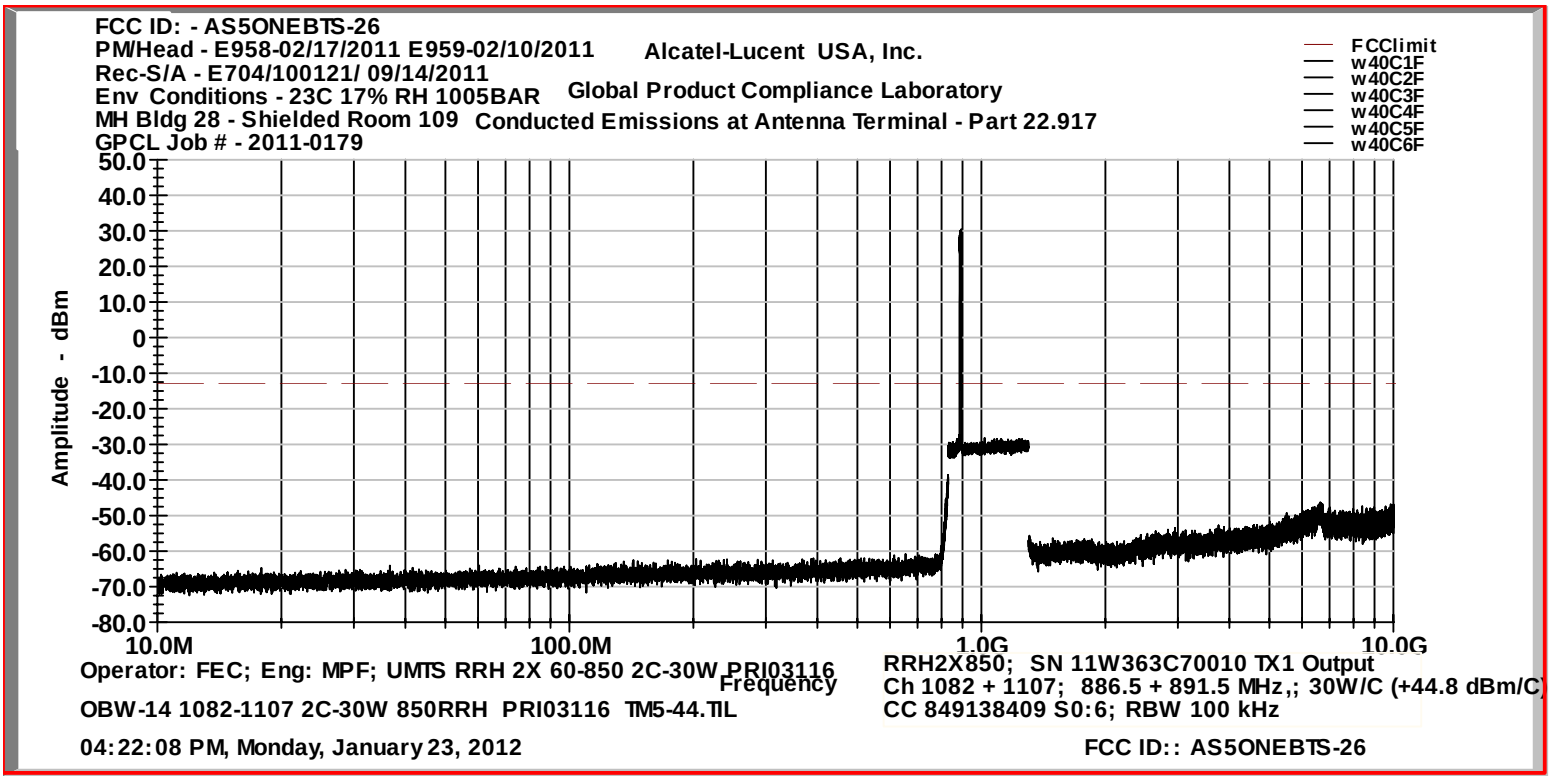




5) Tx1 @ 30W/C: two adjacent carriers at TM5-44

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM) - 30W/C with Total Composite Power 60W

TM5-44 (16QAM) - Two Adjacent Carriers at 30W/C (44.8 dBm/C) - 886.5 + 891.5 MHz



PART 2.1053 MEASUREMENTS REQUIRED: FIELD STRENGTH OF SPURIOUS RADIATION

This test was performed with a single 60W carrier at each DL Tx terminal:

Tx1 = 877.5 MHz at 60W
Tx2 = 891.5 MHz at 60W

Single test modulation was sufficient: ETSI TM1-64. As required, the frequency range investigated was from 30 MHz to 10 GHz (10^{th} harmonic of the carrier).

The equipment under test (EUT) was setup and the measurements performed following **ANSI/TIA-603-C-2004** ***Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.*** The EUT was installed and operated as in the normal mode of operation with external alarm cables connected. Field strength measurements of radiated spurious emissions were evaluated in a semi-anechoic chamber (FCC Site RN 439234), using an EUT-to-Antenna separation of 3-meters. Test software was Vasona by EMiSoft.

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 2.1057 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 22.917 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.

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

$$20 \log (E*10^{6}) - (43 + 10 \log P) = 82.23 \text{ dB}\mu\text{V/meter}$$

Where: E = Field Intensity in Volts/ meter R = Distance in meters = 3 m
P = Transmitted Power in watts = 60W

Results:

Over the out-of-band spectrum investigated from 30 MHz to the tenth harmonic of the carrier (10 GHz), the power levels of all emissions observed were >> 20 dB below the 82.23 dBμV/meter limit. Therefore, there were no reportable radiated spurious emissions.

PART 2.1055 MEASUREMENTS REQUIRED: FREQUENCY STABILITY

The frequency stability was measured at the Equipment Antenna Terminal (EAC) of the RF Remote Radio Head (RRH) for a single carrier set to 881.5 MHz, which corresponds to mid cellular frequency band. 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, 2011. 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. 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 850 carrier set to 881.5 MHz at 60W (47.8 dBm) and ETSI TS 25.141 Test Modulation TM4, which has a single active channel. The required tolerance limit for UMTS 850 base station/land station equipment is specified in ETSI TS 25.141 as ± 0.05 ppm.

Results:

The -48V WCDMA **RRH2X60-850** Twin Remote Radio Head product, subject of this application for certification under FCC ID: AS5ONEBTS-26, 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. The measurement results are summarized below for a single carrier at Tx1 and a single carrier at Tx2.

TEST: TRANSMITTED FREQUENCY ERROR - Tx1
Specification: F_tx ± 50ppb = 881.5 MHz ± 44.1 Hz

Stabilized temperature (°C)	TX 1					
	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)	
Indoor RRH	Measured Tx Freq Error (Hz)	Deviation [Note 2] (ppb)	Measured Tx Freq Error (Hz)	Deviation [Note 2] (ppb)	Measured Tx Freq Error (Hz)	Deviation [Note 2] (ppb)
–30 C	8.66	9.8	7.90	9.0	9.05	10.3
–20 C	11.30	12.8	8.80	10.0	8.51	9.6
–10 C	8.23	9.3	9.99	11.3	7.21	8.2
0 C	7.12	8.1	9.39	10.6	7.69	8.7
+10 C	8.88	10.1	4.68	5.3	9.44	10.7
+20 C	7.29	8.3	8.65	9.8	8.90	10.1
+30 C	8.71	9.9	8.78	10.0	8.86	10.0
+40 C	6.99	7.9	9.61	10.9	9.49	10.8
+50 C	7.58	8.6	6.85	7.8	7.75	8.8

TEST: TRANSMITTED FREQUENCY ERROR - Tx2
Specification: F_tx ± 50ppb = 881.5 MHz ± 44.1 Hz

Stabilized temperature (°C)	TX 2					
	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)	
Indoor RRH	Measured Tx Freq Error (Hz)	Deviation [Note 2] (ppb)	Measured Tx Freq Error (Hz)	Deviation [Note 2] (ppb)	Measured Tx Freq Error (Hz)	Deviation [Note 2] (ppb)
–30 C	8.74	9.9	7.09	8.0	8.17	9.3
–20 C	9.29	10.5	7.39	8.4	8.38	9.5
–10 C	9.16	10.4	7.06	8.0	8.4	9.5
0 C	8.16	9.3	8.98	10.2	7.56	8.6
+10 C	9.53	10.8	8.03	9.1	7.41	8.4
+20 C	8.74	9.9	7.59	8.6	7.59	8.6
+30 C	7.88	8.9	7.61	8.6	9.46	10.7
+40 C	7.55	8.6	8.18	9.3	7.87	8.9
+50 C	7.76	8.8	8.84	10.0	7.05	8.0