



Subject: **Application for Class II Permissive Change, under FCC ID: AS5ONEBTS-25, to Expand PA Usage to Multi-PA and Multi-Carrier.**

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April 12, 2013

EXHIBIT 9: TEST REPORT

INTRODUCTION:

The subject of this application is the 60W power amplifier. The exhibits presented in this test report demonstrate that the Alcatel-Lucent UMTS/WCDMA **1900MHz High Efficiency RF Power Amplifier (HEPAM)**, deployed in the **9391 OneBTS Macrocells**, 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 24, Subpart E – Broadband PCS; Section 24.238 - Emission limitations for Broadband PCS equipment; effective October 1, 2010. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2012. 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 the MCR1900 transceiver system

The HEPAM was previously authorized, under FCC ID: AS5ONEBTS-25, for single PA and single carrier operation. This Class II Permissive Change requests authorization for expanded multi-PA and multi-carrier usage: one, two and three PA interconnected in parallel to allow one, two and three contiguous carrier operation without exceeding 60W RF power per PA.

Number of Parallel Power Amplifiers	1xHEPAM	2xHEPAM	3xHEPAM
RF Power per Amplifier	60W	60W	60W
Number of Carriers	Power per Carrier	Power per Carrier	Power per Carrier
1C	60W	100W	NA
2C	30W/C	60W/C	90W/C
3C	20W/C	40W/C	60W/C

As a Transceiver System, all conducted RF characteristics and emissions measurements were performed at the transmit antenna terminal (downlink), using a production equipment frame. All testing was performed by Global Product Compliance Laboratory (GPCL), Murray Hill, NJ. As a Class II Permissive Change, only the characteristics that could be affected by the Change need be evaluated. This report 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 specific test procedures that are both required for and are applicable to this Class II certification are listed below. Note that Frequency Stability measurements need not be repeated.

Rule Part	Test	Results
Part 2.1046	RF Power Output	Complies
Part 2.1047	Modulation Characteristics	Complies
Part 2.1049	Occupied Bandwidth	Complies
Part 2.1051	Spurious Emissions at the Antenna Terminals.	Complies
Part 2.1053	Field Strength of Spurious Radiation	Complies
Part 2.1057	Frequency Spectrum to be Investigated	MPC
Part 24	Personal Communications Services; Subpart E – Broadband PCS	MPC
Part 24.238	Emission Limitations for Broadband PCS Equipment	Complies

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).

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.

PART 2.1046 MEASUREMENTS REQUIRED: RF POWER OUTPUT

For each configuration cited, the RF power was measured and did not exceed 60W (47.8 dBm) per PA.. The total composite power is: 1xPA @ 60W, 2xPA @ 120W, and 3xPA @ 180W. The RF power was measured and confirmed for each carrier and PA configuration setting. The carrier channel frequencies used were the lowest settable and the highest settable of each 15MHz frequency block (A, B & C), plus mid-band for the 5MHz frequency blocks (D, E & F).

**UTRA/FDD Band II
UARFCN definition (additional channels)
Single Carrier Test Frequencies**

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency
A1	Lowest Settable Channel	12	1932.5 MHz
A3	Highest Settable Channel	62	1942.5 MHz
D	Block Center	87	1947.5 MHz
B1	Lowest Settable Channel	112	1952.5 MHz
B3	Highest Settable Channel	162	1962.5 MHz
E	Block Center	187	1967.5 MHz
F	Block Center	212	1972.5 MHz
C3	Lowest Settable Channel	237	1977.5 MHz
C5	Highest Settable Channel	287	1987.5 MHz

Two Contiguous Carrier Test Frequencies

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency
A1 + A2	Lowest Settable	12 + 32	1932.5 + 1937.5 MHz
B2 + B3	Mid Band	137 + 162	1957.5 + 1962.5 MHz
C4 + C5	Highest Settable	262 + 287	1982.5 + 1987.5 MHz

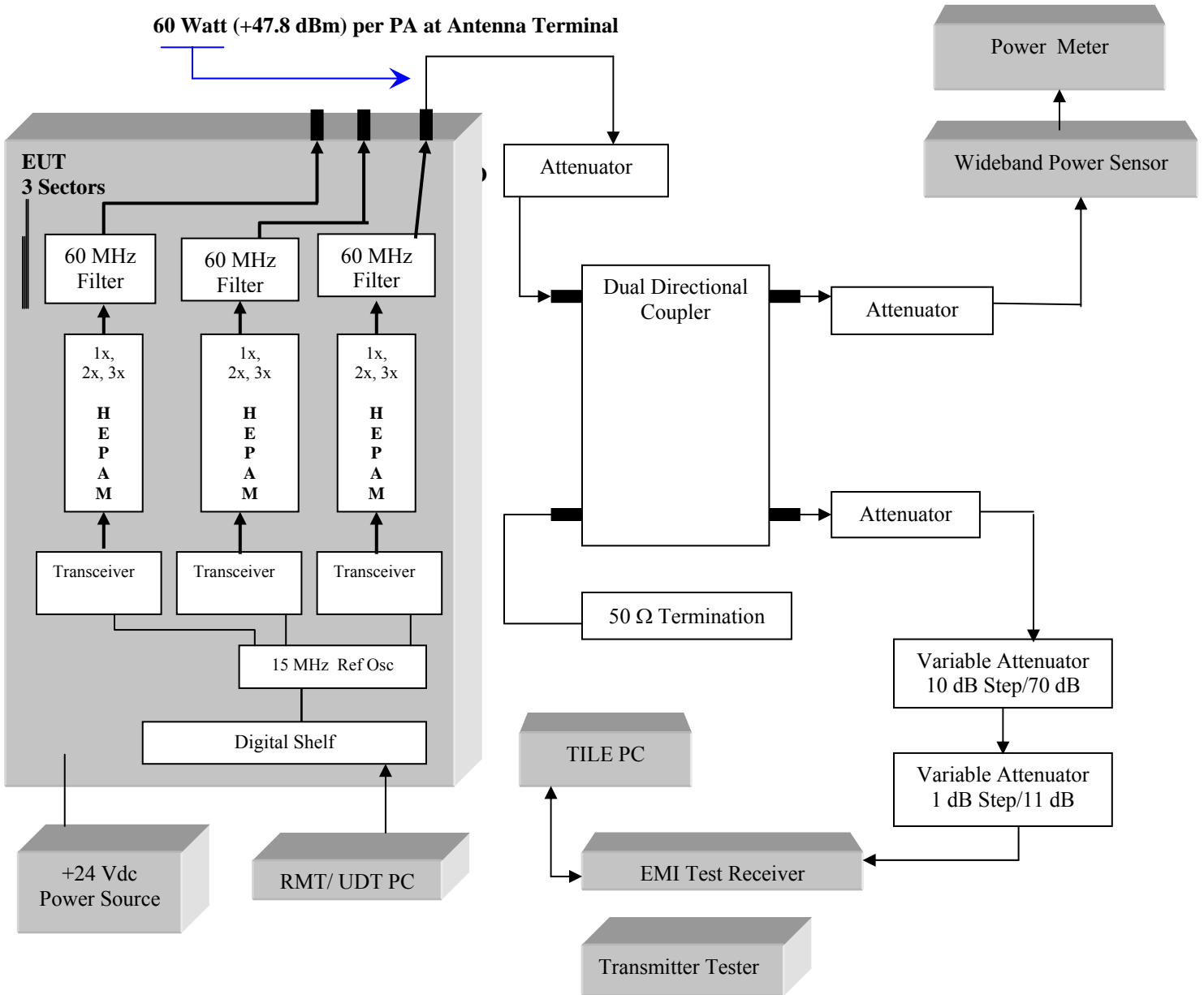
Three Contiguous Carrier Test Frequencies

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency
A1 + A2 + A3	Lowest Settable	12 + 32 + 62	1932.5 + 1937.5 + 1942.5 MHz
B1 + B2 + B3	Mid Band	112 + 137 + 162	1952.5 + 1957.5 + 1962.5 MHz
C3 + C4 + C5	Highest Settable	237 + 262 + 287	1977.5 + 1982.5 + 1987.5 MHz

Note: UARFCN = UTRA Absolute Radio Frequency Channel Number

Results: Complies - The UMTS 1900 MHz HEPAM is compliant with the manufacturer’s rated power level at the transmit antenna terminal for the above listed carrier frequencies.

Block Diagram Of The Antenna Terminal Measurement Test Set-Up



PART 2.1047 MEASUREMENTS REQUIRED: MODULATION CHARACTERISTICS

Modulation characteristics are a property of the transceiver, which is unchanged from the initial filing. The modulation accuracy was measured at the Equipment Antenna Terminal (EAC) for each of the *single carrier* test frequencies and power level previously cited. A Transmitter Tester, 7 MHz – 4 GHz, was used to measure composite modulation accuracy for the Peak/Average Metrics for the RMS EVM.

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

- 1) **TM1-64** (QPSK) with 68 active channels: 64 voice + 4 control. **Limit: EVM RMS < 17.5 %**
- 2) **TM 5-44** (16QAM) with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control. **Limit: EVM RMS < 12.5 %.**

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 EMI Test Receiver is replaced by a Transmitter Tester.

RESULTS: Complies - Full compliance is demonstrated with the modulation accuracy requirements specified in ETSI TS 25.141. All channels measured were less than the 12.5% RMS EVM limitation. The plots for each channel are recorded and stored on file.

PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH – 99% POWER BANDWIDTH

The occupied bandwidth was measured at the Equipment Antenna Terminal (EAC) for the 1xHEPAM, 2xHEPAM and 3xHEPAM multi-PA configurations previously cited in the INTRODUCTION and for the carrier frequencies cited under the PART 2.1046 section.

Compliance was demonstrated by two methods for both the TM1-64 and TM5-44 test modulations:

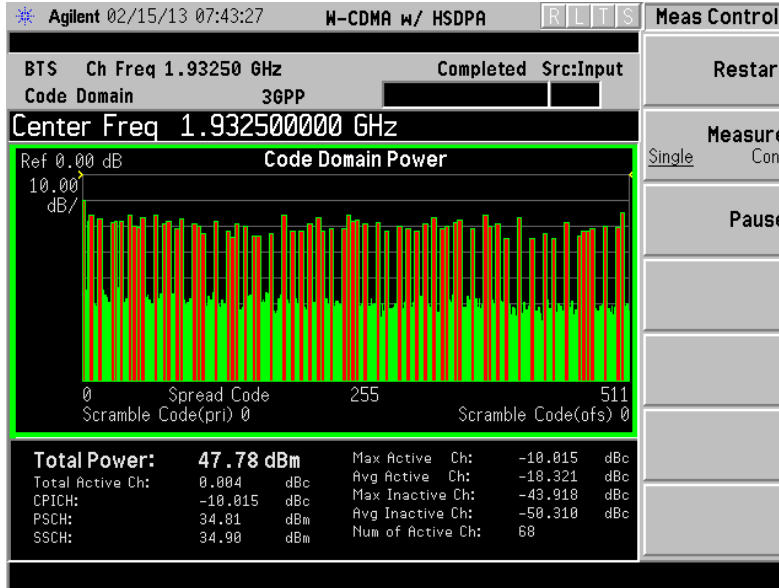
1. The carrier 99% Power Bandwidth, which confirmed the necessary bandwidth declared in the emission designator, using a Transmitter Tester 7MHz-4.0 GHz.
2. ETSI TS 25.141 emission mask limitation, using an EMI Test Receiver, to demonstrate compliance with both the emission mask requirements and with Part 24.238.

The plots for each measurement are recorded and stored on file, covering the complete spectrum 1930 – 1990 MHz. For brevity, the lowest settable single carrier, 1932.5 MHz, for 1xHEPAM and 2xHEPAM, is displayed for each test modulation confirming the 99% Power Bandwidth. The emission mask data displays the multi-carrier operation for the highest settable carrier frequencies

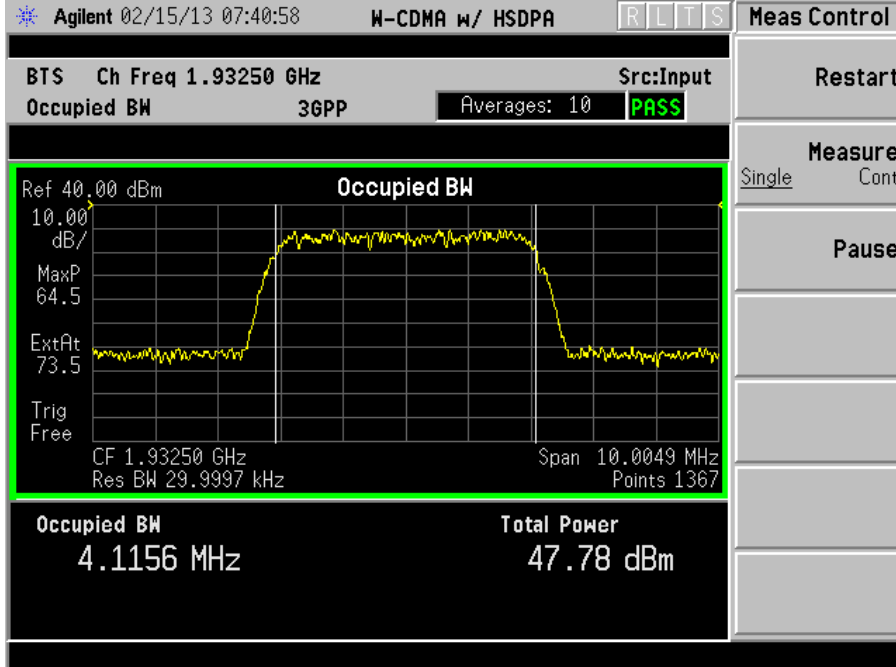
Results: Complies - The 99% occupied bandwidth measurement confirms that the carrier's emission designator remains at 4M10F9W.

99% Power Bandwidth
1xHEPAM at 60W
Single Carrier: 1932.5 MHz at 60W (47.8 dBm)
Test Modulation: TM1-64 (QPSK)

Code Domain to Confirm QPSK



99% Power Bandwidth to Confirm Necessary Bandwidth (4M10F9W)



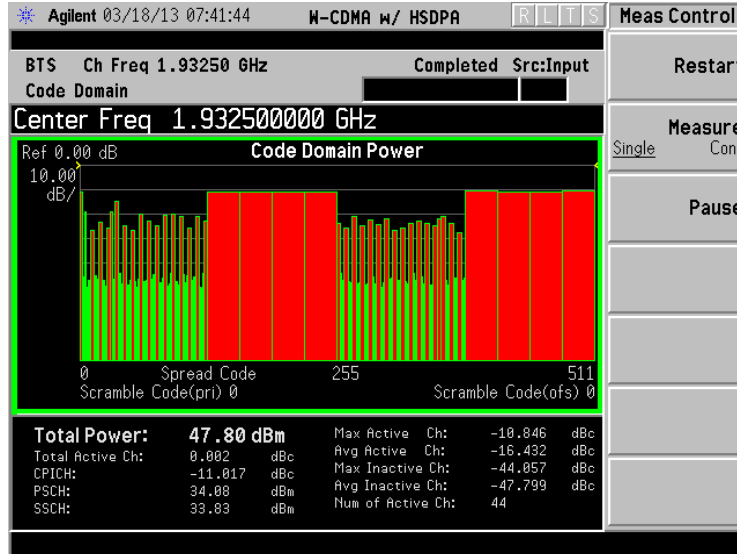
99% Power Bandwidth

1xHEPAM at 60W

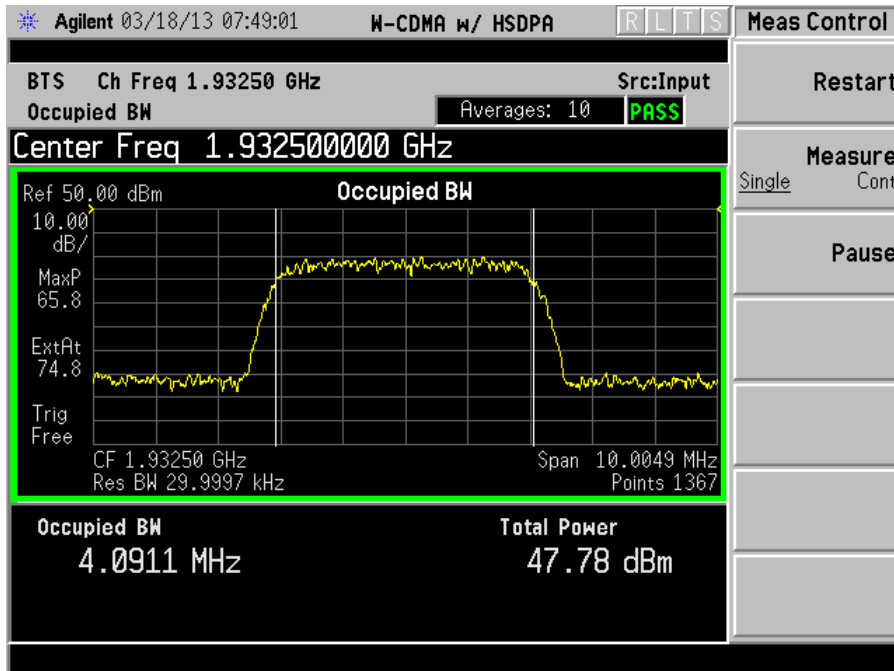
Single Carrier: 1932.5 MHz at 60W (47.8 dBm)

Test Modulation: TM5-44 (16QAM)

Code Domain to Confirm 16QAM

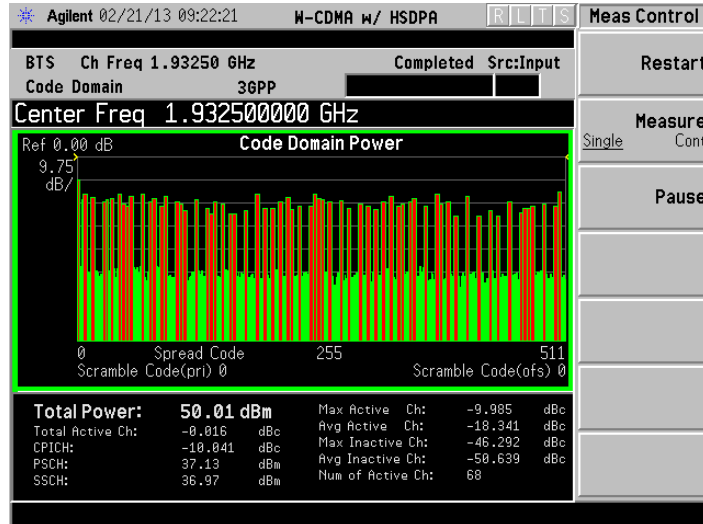


99% Power Bandwidth to Confirm Necessary Bandwidth (4M10F9W)

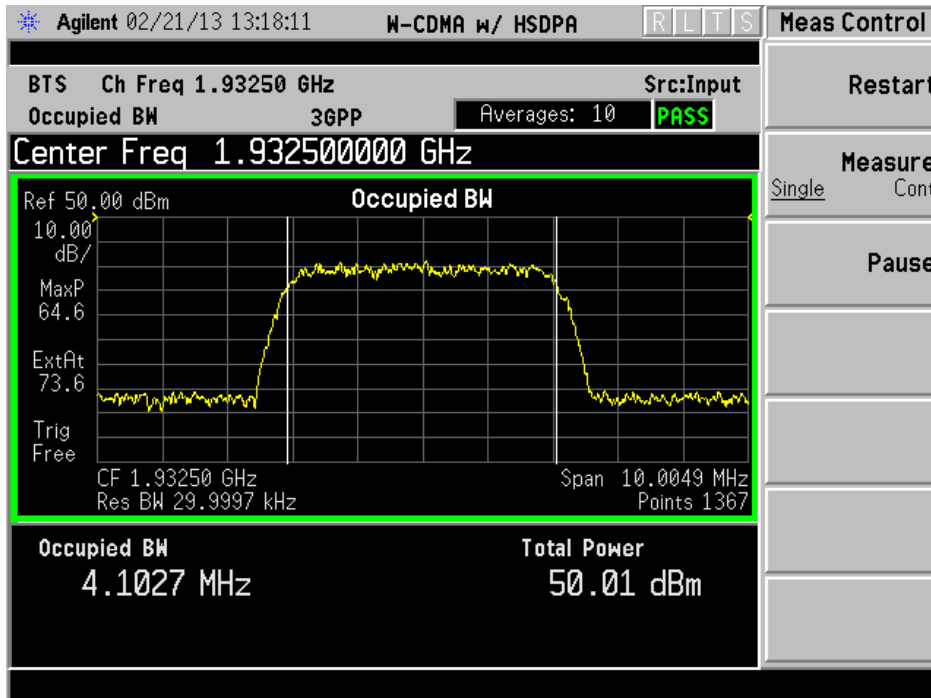


99% Power Bandwidth
2xHEPAM at 50W per PA
Single Carrier: 1932.5 MHz at 100W (50 dBm)
Test Modulation: TM1-64 (QPSK)

Code Domain to Confirm QPSK

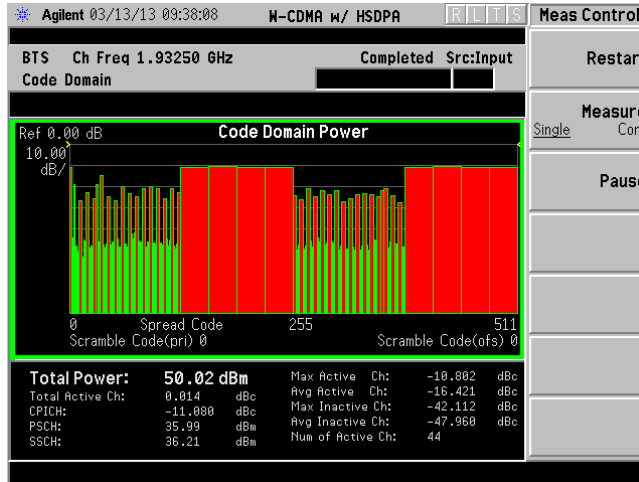


99% Power Bandwidth to Confirm Necessary Bandwidth (4M10F9W)

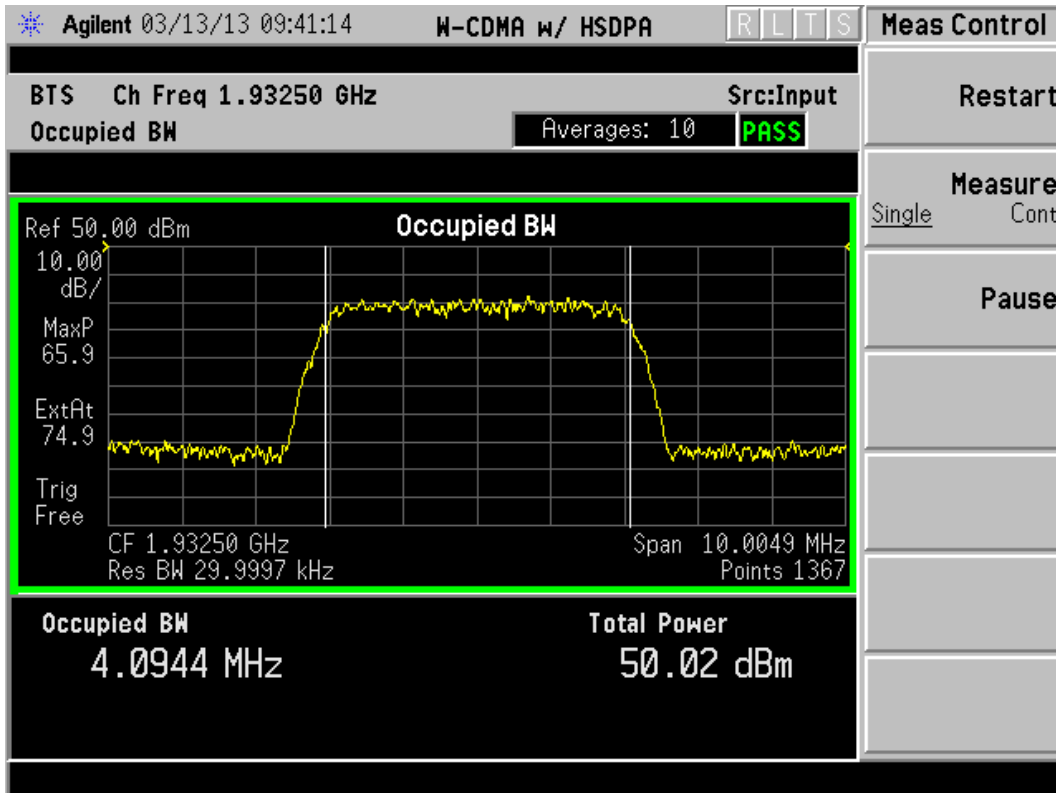


99% Power Bandwidth
2xHEPAM at 50W per PA
Single Carrier: 1932.5 MHz at 100W (50 dBm)
Test Modulation: TM5-44 (16QAM)

Code Domain to Confirm 16QAM



99% Power Bandwidth to Confirm Necessary Bandwidth (4M10F9W)



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH – EMISSION MASK

Method 2. Emission mask limitation using an EMI Test Receiver with Total Integrated Laboratory Environment (TILE) EMI test software.

Compliance with the ETSI TS 25.141 occupied bandwidth emission mask requirements and with Part 24.238 was demonstrated using an EMI Test Receiver, in combination with the Total Integrated Laboratory Environment (TILE) EMI test software, purchased and licensed from ETS-Lindgren. The occupied bandwidth emission mask compliance measurements demonstrate and confirm compliance of both multi-PA and multi-carrier operation, using both TM1-64 (QPSK) and TM5-44 (16QAM) test modulations. All measurements were performed at the Equipment Antenna Terminal (EAC) for the 1xHEPAM, 2xHEPAM and 3xHEPAM multi-PA configurations previously cited in the INTRODUCTION and for the carrier frequencies cited under the PART 2.1046 section.

The plots for each measurement are recorded and stored on file, covering the complete spectrum 1930 – 1990 MHz. For brevity, the highest settable single and contiguous carriers are displayed. Since these measurement results show no discernible distinction between TM1-64 (QPSK) and TM5-44 (16QAM), it is sufficient to display a single test modulation 16QAM.

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 (RBW), which made the modulated 5 MHz carrier to be offset by -22.218 dB, in accordance with the equation:

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

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

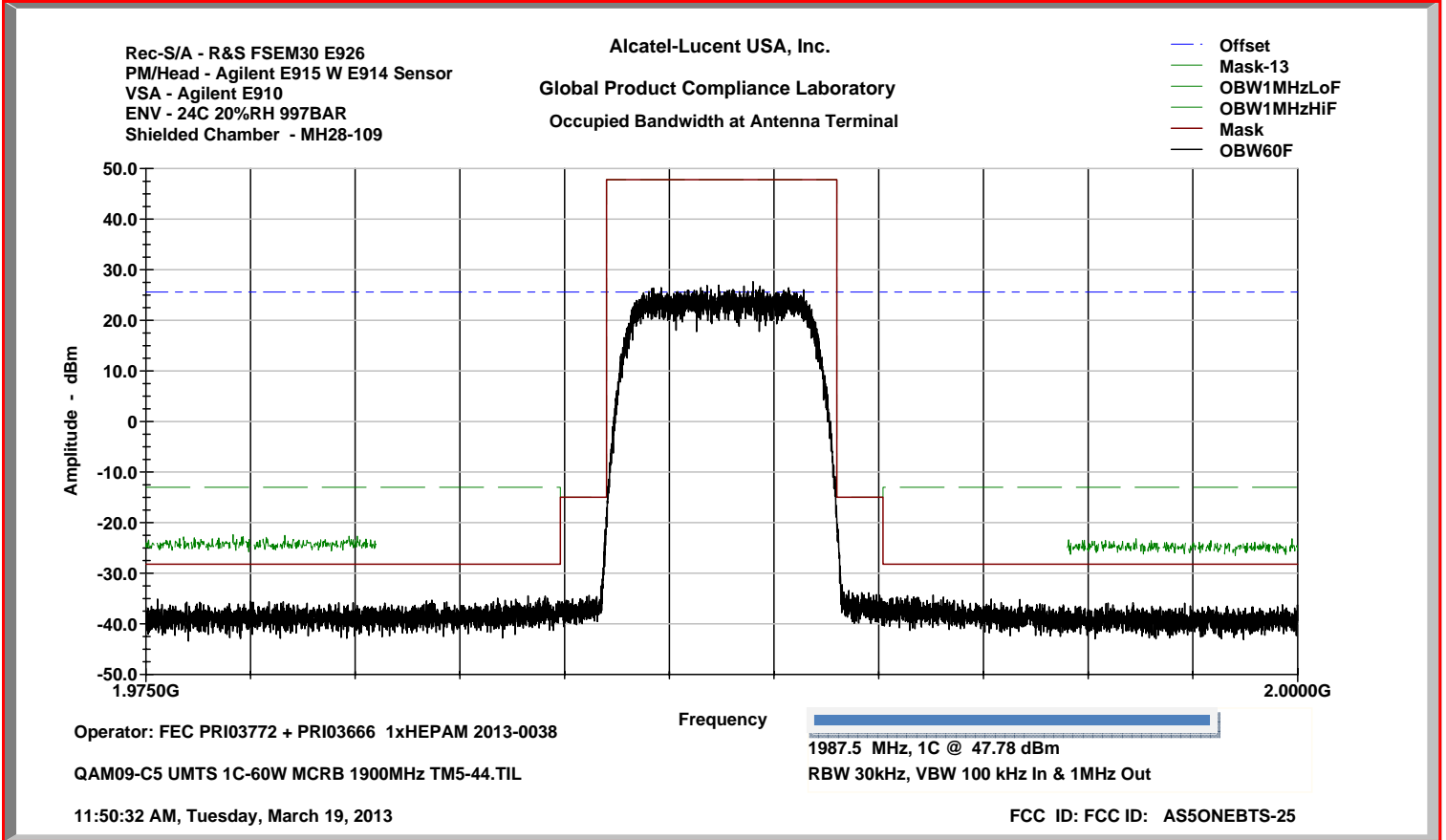
RESULTS: Complies - All UARFCN channels measured demonstrate compliance with the emission mask specified by ETSI TS 25.141; the carriers do not exceed the mask limitation. The data plots attached below show characteristics consistent with all measurements.

Occupied Bandwidth (OBW)

1xHEPAM at 60W per PA

Single Carrier (1C): 1987.5 MHz at 60W (47.8 dBm)

Test Modulation: TM5-44 (16QAM)

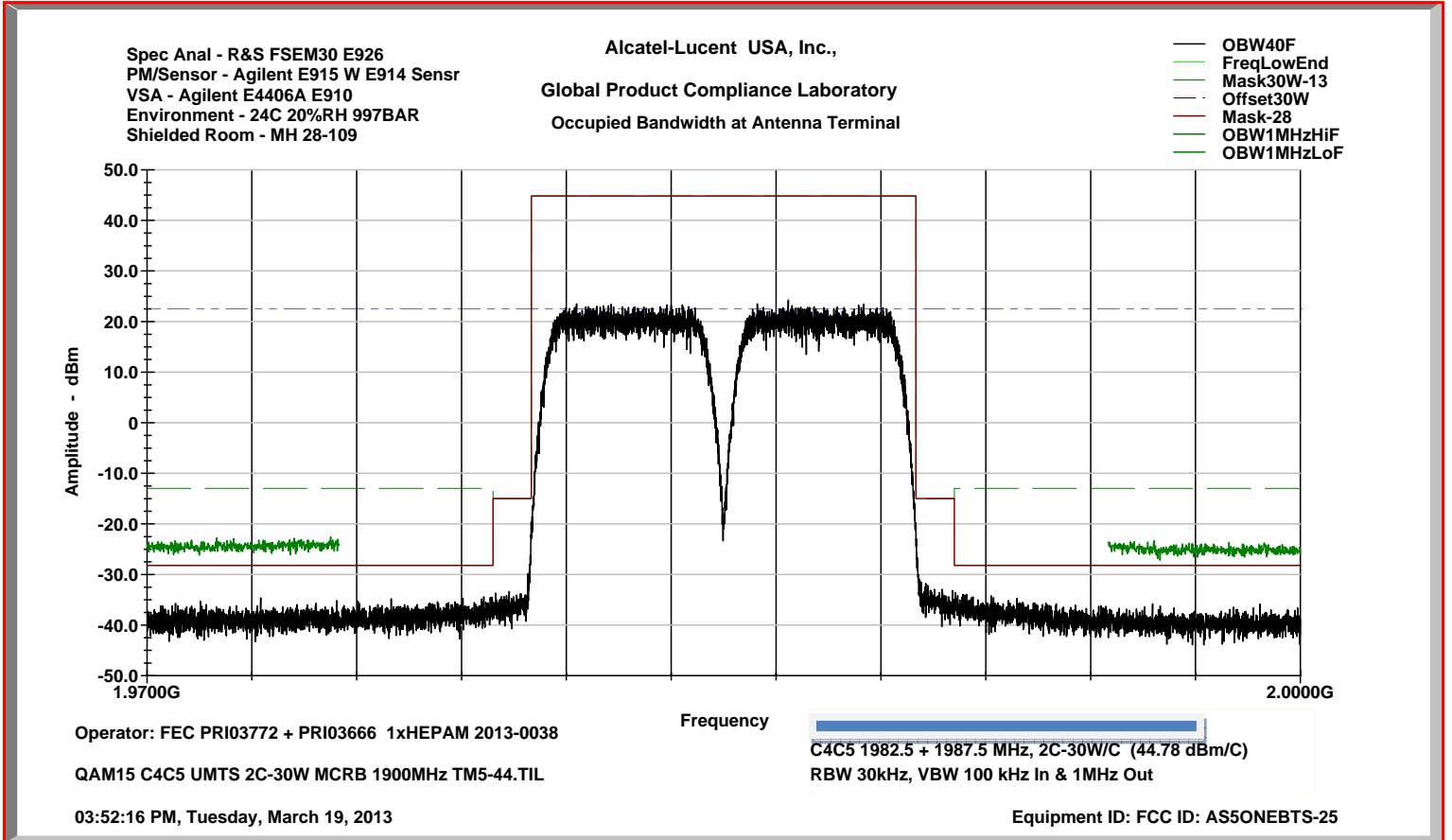


Occupied Bandwidth (OBW)

1xHEPAM at 60W per PA

Two Carrier (2C): 1982.5 MHz + 1987.5 MHz at 30W/C (44.8 dBm/C)

Test Modulation: TM5-44 (16QAM)

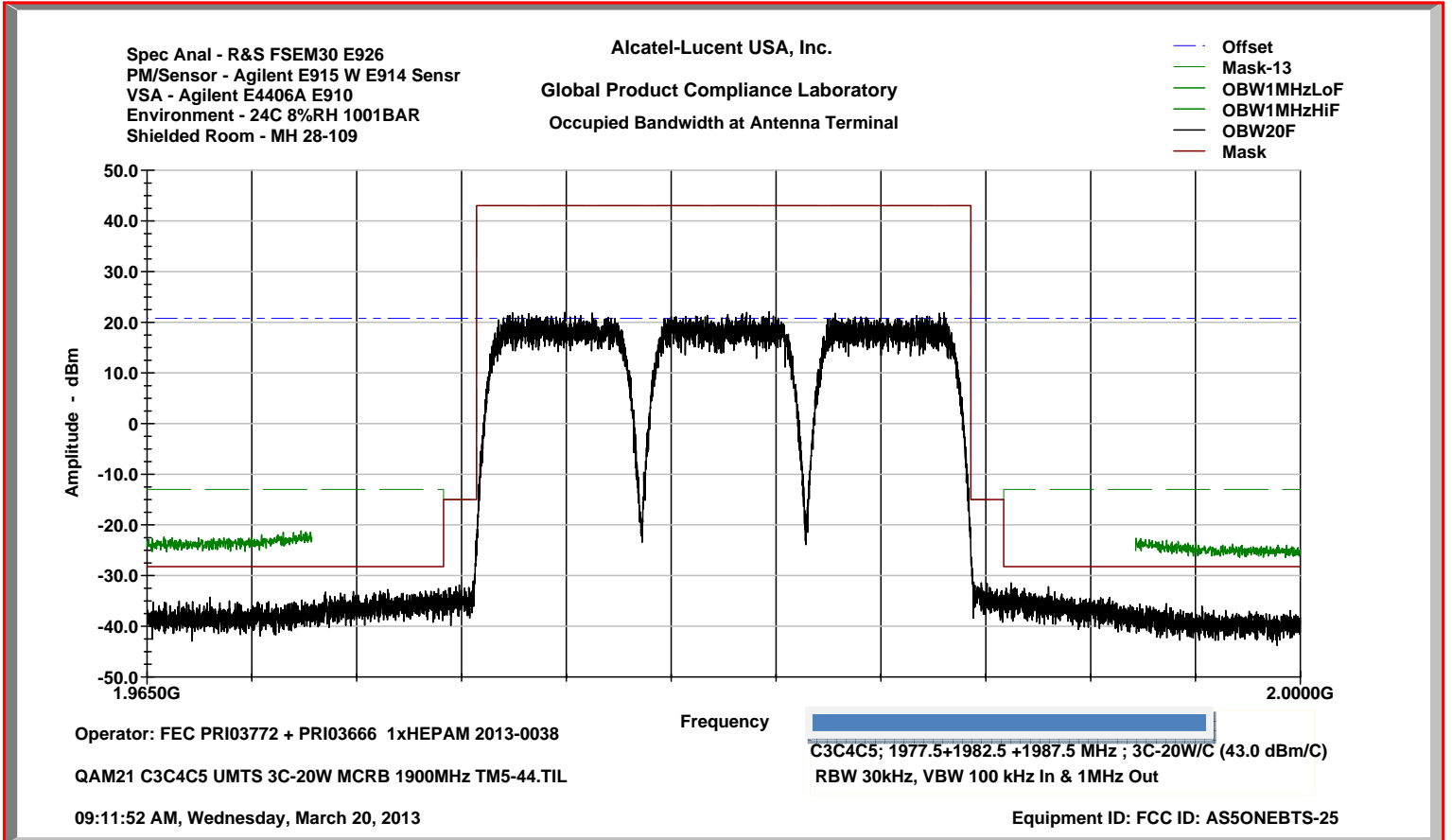


Occupied Bandwidth (OBW)

1xHEPAM at 60W per PA

Three Carrier (3C): 1977.5 MHz + 1982.5 MHz + 1987.5 MHz at 20W/C (43.0 dBm/C)

Test Modulation: TM5-44 (16QAM)

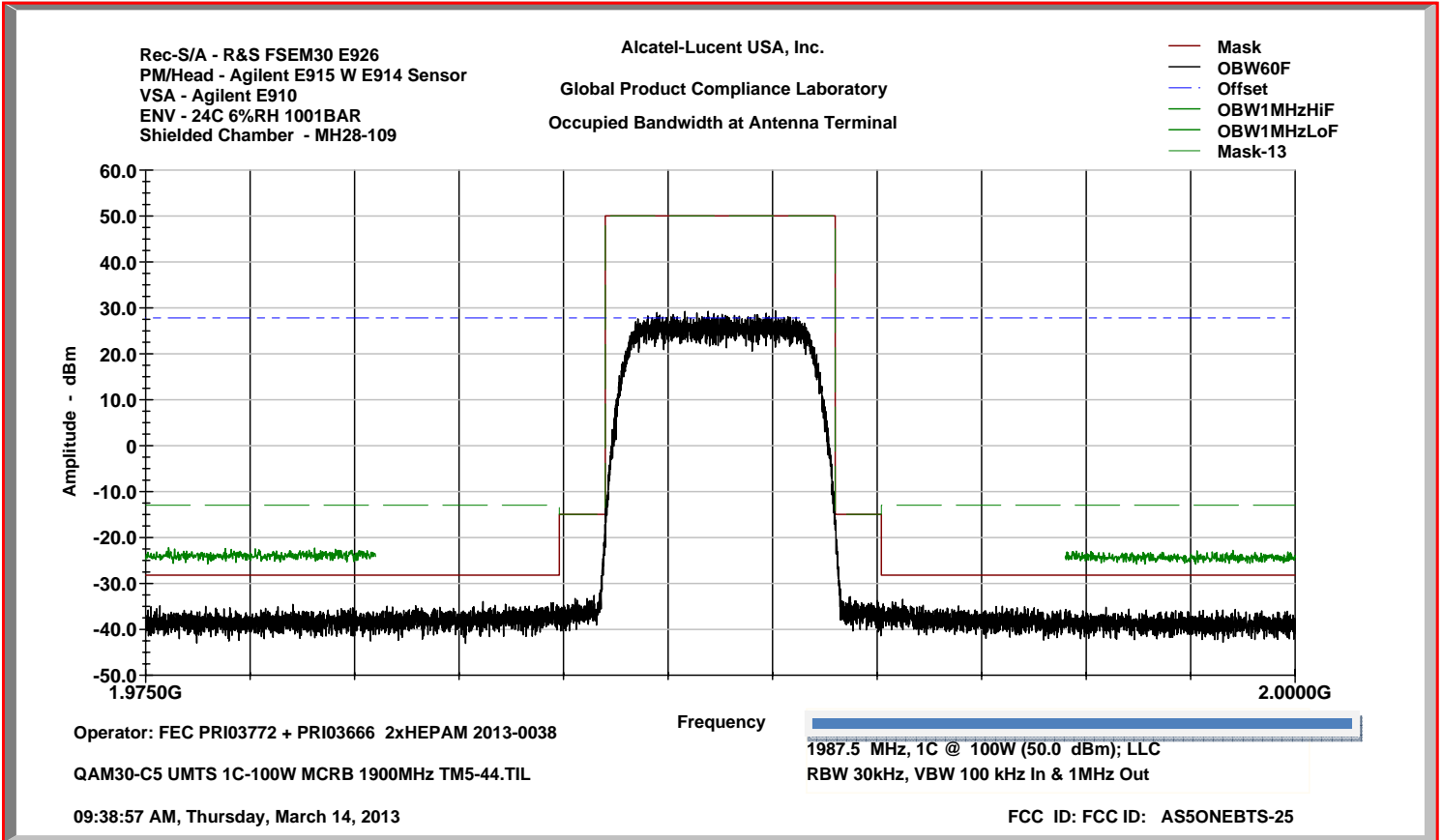


Occupied Bandwidth (OBW)

2xHEPAM at 50W per PA

Single Carrier (1C): 1987.5 MHz at 100W (50 dBm)

Test Modulation: TM5-44 (16QAM)



Occupied Bandwidth (OBW)

2xHEPAM at 60W per PA

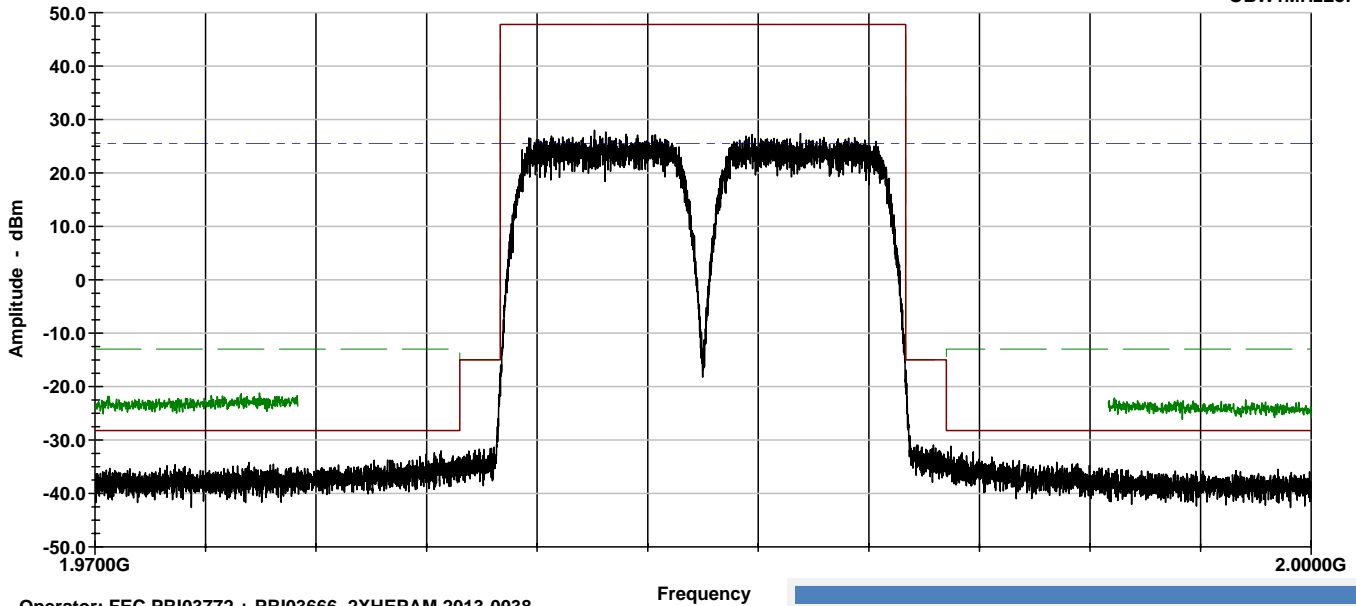
Two Carrier (2C): 1982.5 MHz + 1987.5 MHz at 60W/C (47.8 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Env Conditions - 24C 6%RH 1001BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.,
Global Product Compliance Laboratory
Occupied Bandwidth at Antenna Terminal

- OBW40F
- FreqLowEnd
- Mask60W-13
- Offset60W
- Mask-28
- OBW1MHzHiF
- OBW1MHzLoF



Operator: FEC PRI03772 + PRI03666 2XHEPAM 2013-0038

QAM18- C4C5 UMTS 2C-60W MCRB 1900MHz TM5-44.TIL

02:56:17 PM, Thursday, March 14, 2013

C4C5 1982.5 + 1987.5 MHz, 2C-60W/C (47.78 dBm)/C; LLC
RBW 30kHz, VBW 100 kHz In & 1MHz Out

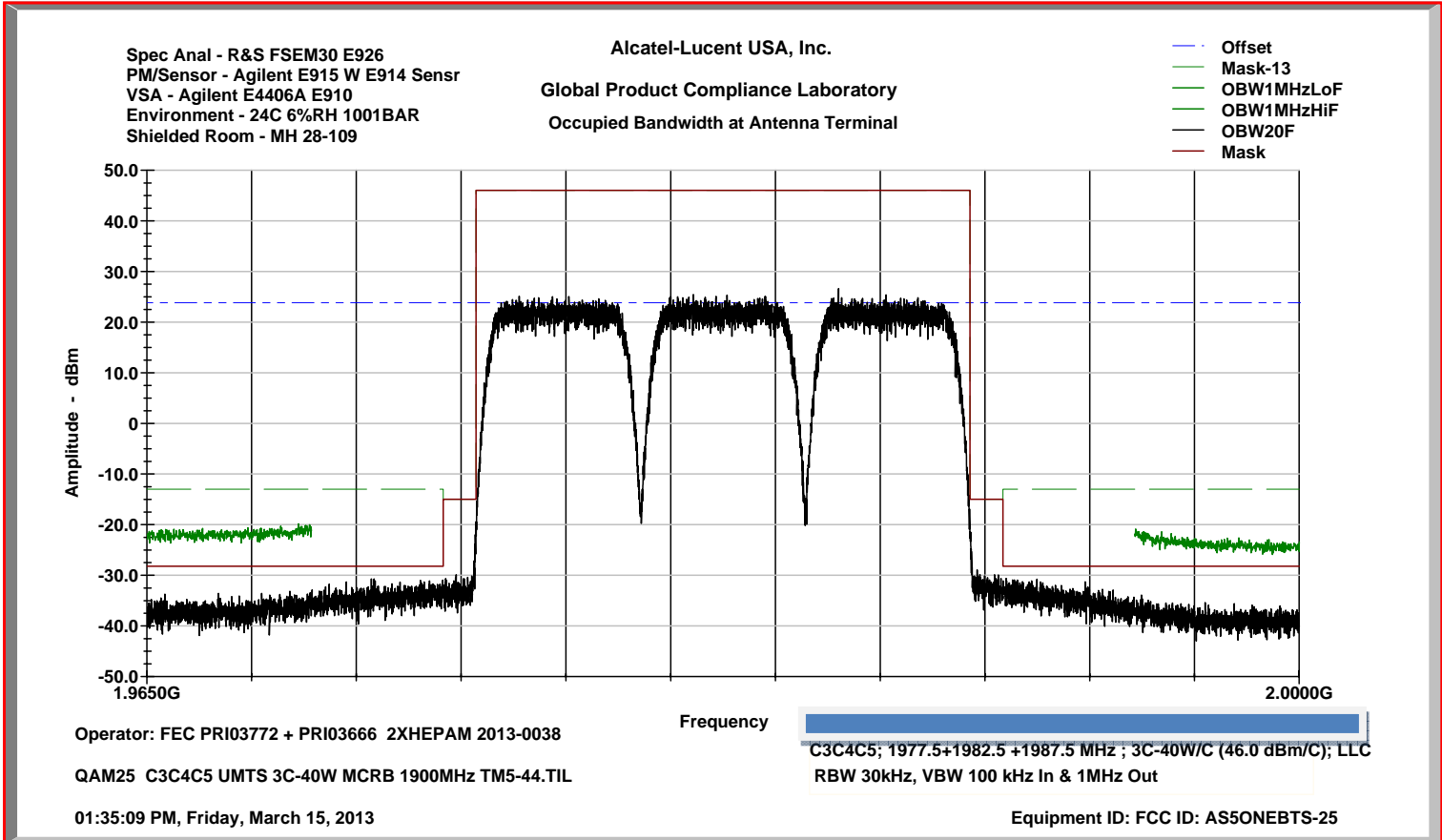
Equipment ID: FCC ID: AS50NEBTS-25

Occupied Bandwidth (OBW)

2xHEPAM at 60W per PA

Three Carrier (3C): 1977.5 MHz + 1982.5 MHz + 1987.5 MHz at 40W/C (46.0 dBm/C)

Test Modulation: TM5-44 (16QAM)



Occupied Bandwidth (OBW)

3xHEPAM at 60W per PA

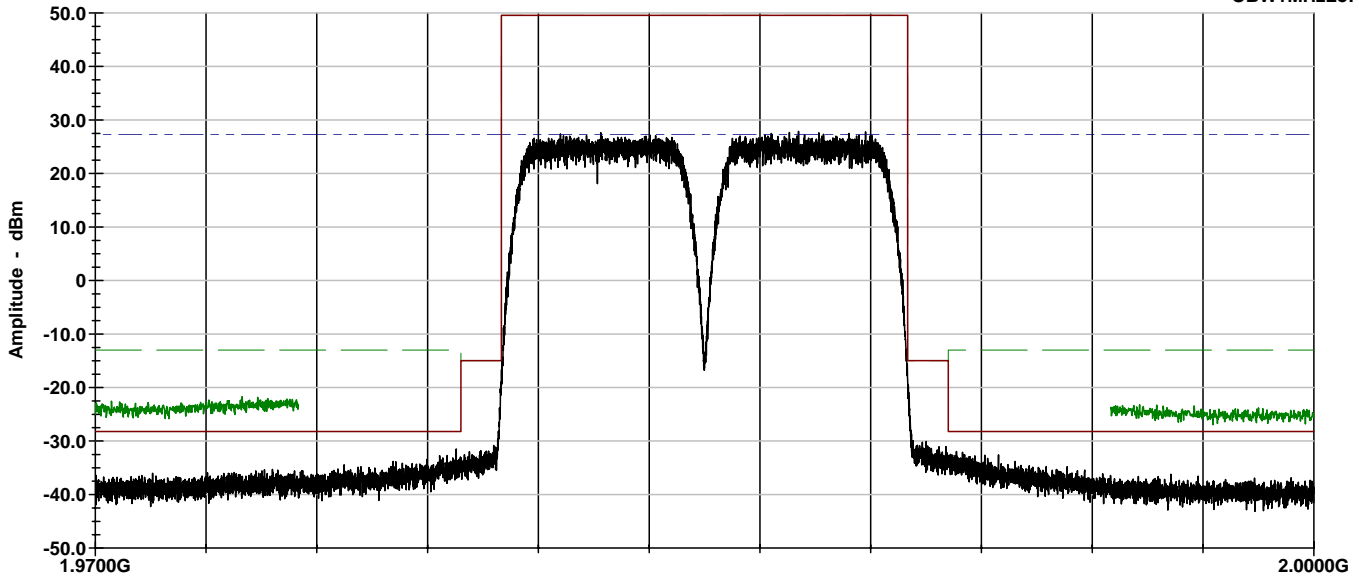
Two Carrier (2C): 1982.5 MHz + 1987.5 MHz at 90W/C (49.5 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Env Conditions - 24C 12%RH 990BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.,
Global Product Compliance Laboratory
Occupied Bandwidth at Antenna Terminal

- OBW40F
- FreqLowEnd
- Mask90W-13
- Offset90W
- Mask90W-28
- OBW1MHzHiF
- OBW1MHzLoF



Operator: FEC PRI03772 + PRI03666 3xHEPAM 2013-0038

QAM31- C4C5 UMTS 2C-90W MCRB 1900MHz TM5-44.TIL

08:36:21 AM, Monday, March 25, 2013

Frequency

1982.5 + 1987.5 MHz, 2C-90W/C (49,54 dBm)/C; LLC
RBW 30kHz, VBW 100 kHz In & 1MHz Out

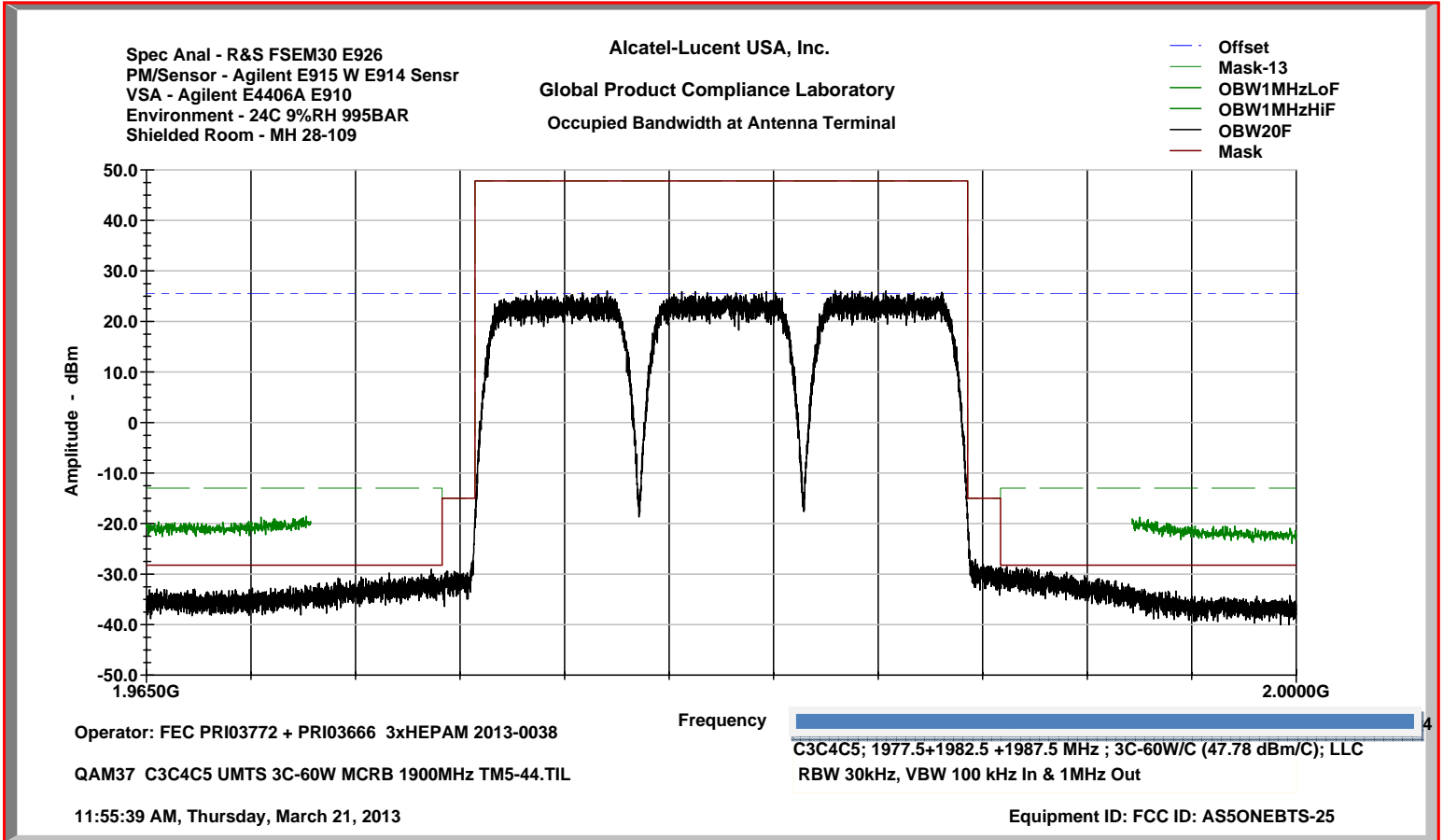
Equipment ID: FCC ID: AS50NEBTS-25

Occupied Bandwidth (OBW)

3xHEPAM at 60W per PA

Three Carrier (3C): 1977.5 MHz + 1982.5 MHz + 1987.5 MHz at 60W/C (47.8 dBm/C)

Test Modulation: TM5-44 (16QAM)



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, as in the preceding *PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH – EMISSION MASK*.

In accordance with Part 2.1057(a), the required frequency spectrum to be investigated extends from the lowest RF signal generated to the 10th harmonic of the carrier at the EAC terminal. The emission limits at the antenna terminal are specified in Part 24.238 (a) *Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dBc*. The power *P* is the average carrier power measured at the EAC (antenna) terminal in Watts and produces a corresponding emission attenuation below the carrier in dBc, which all equate to -13 dBm.

Part 24.238 (b) *Measurement procedure*. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 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.

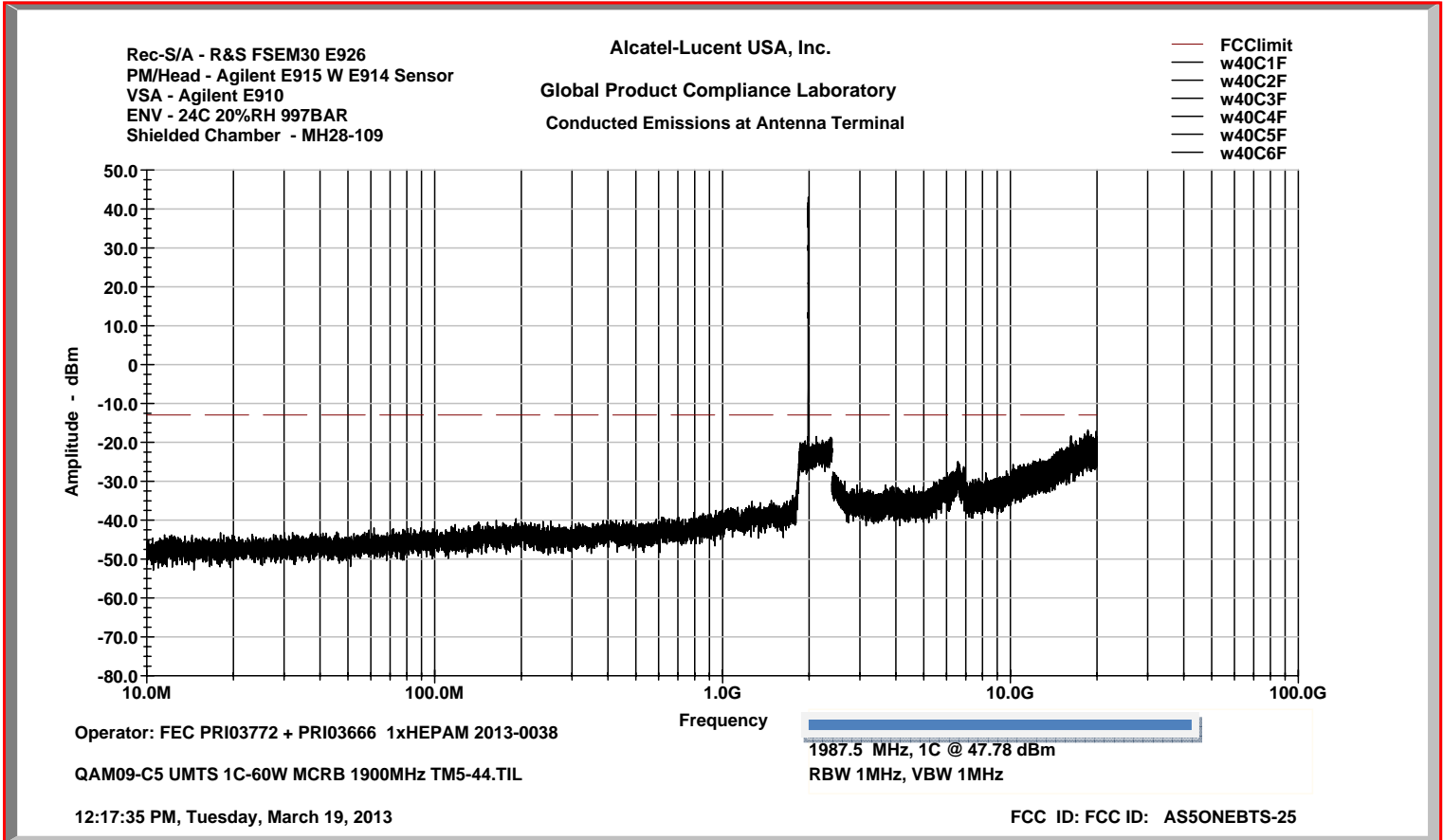
Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

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 instrumentation noise floor is suppressed by the software’s ability to split the spectrum being measured into many small segments/ranges and then sequentially compile them for the continuous graphical display.

Results: Complies - There were no reportable emissions. The plots for each measurement are recorded and stored on file, covering the complete spectrum 1930 – 1990 MHz. For brevity, the highest settable single and contiguous carriers are displayed. Since these measurement results show no discernible distinction between TM1-64 (QPSK) and TM5-44 (16QAM), it is sufficient to display a single test modulation 16QAM. The data plots attached below show characteristics consistent with all measurements.

Occupied Bandwidth (OBW)
1xHEPAM at 60W per PA
Single Carrier (1C): 1987.5 MHz at 60W (47.8 dBm)
Test Modulation: TM5-44 (16QAM)



Occupied Bandwidth (OBW)

1xHEPAM at 60W per PA

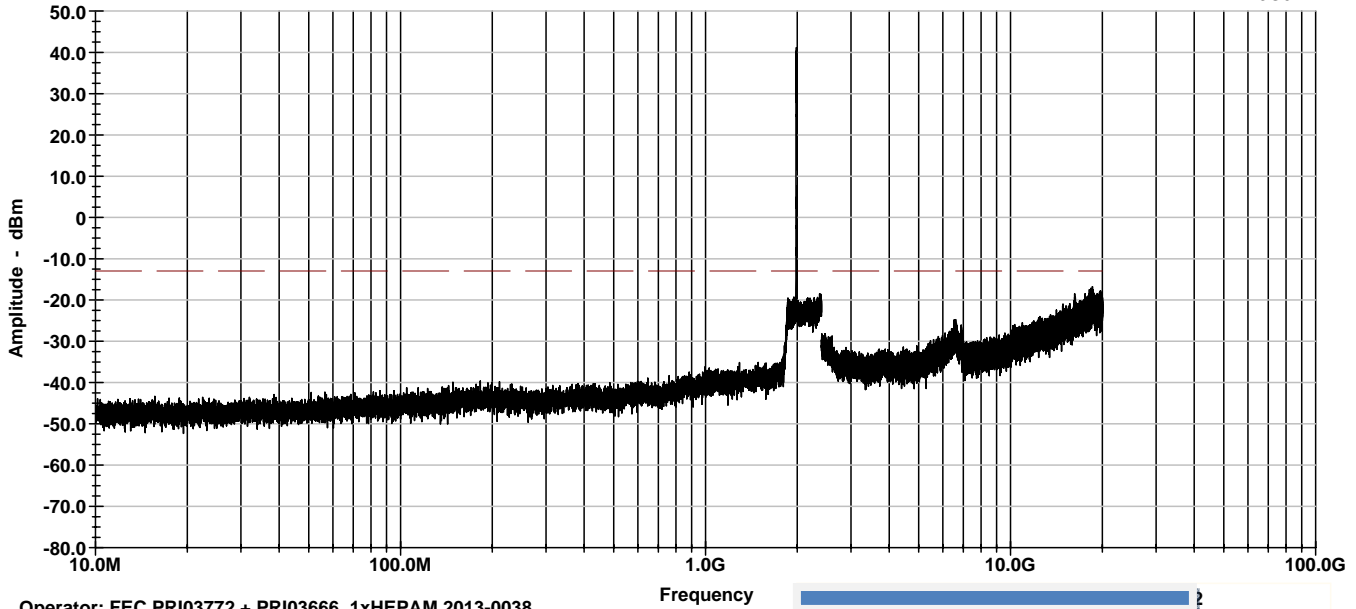
Two Carrier (2C): 1982.5 MHz + 1987.5 MHz at 30W/C (44.8 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Environment - 24C 20%RH 997BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.,
Global Product Compliance Laboratory
Conducted Emissions at Antenna Terminal

— FCClimit
— w40C1F
— w40C2F
— w40C3F
— w40C4F
— w40C5F
— w40C6F



Operator: FEC PRI03772 + PRI03666 1xHEPAM 2013-0038

QAM15 C4C5 UMTS 2C-30W MCRB 1900MHz TM5-44.TIL

04:22:24 PM, Tuesday, March 19, 2013

C4C5 1982.5 + 1987.5 MHz, 2C-30W/C (44.78 dBm/C)
RBW 1MHz, VBW 1MHz

Equipment ID: FCC ID: AS50NEBTS-25

Occupied Bandwidth (OBW)

1xHEPAM at 60W per PA

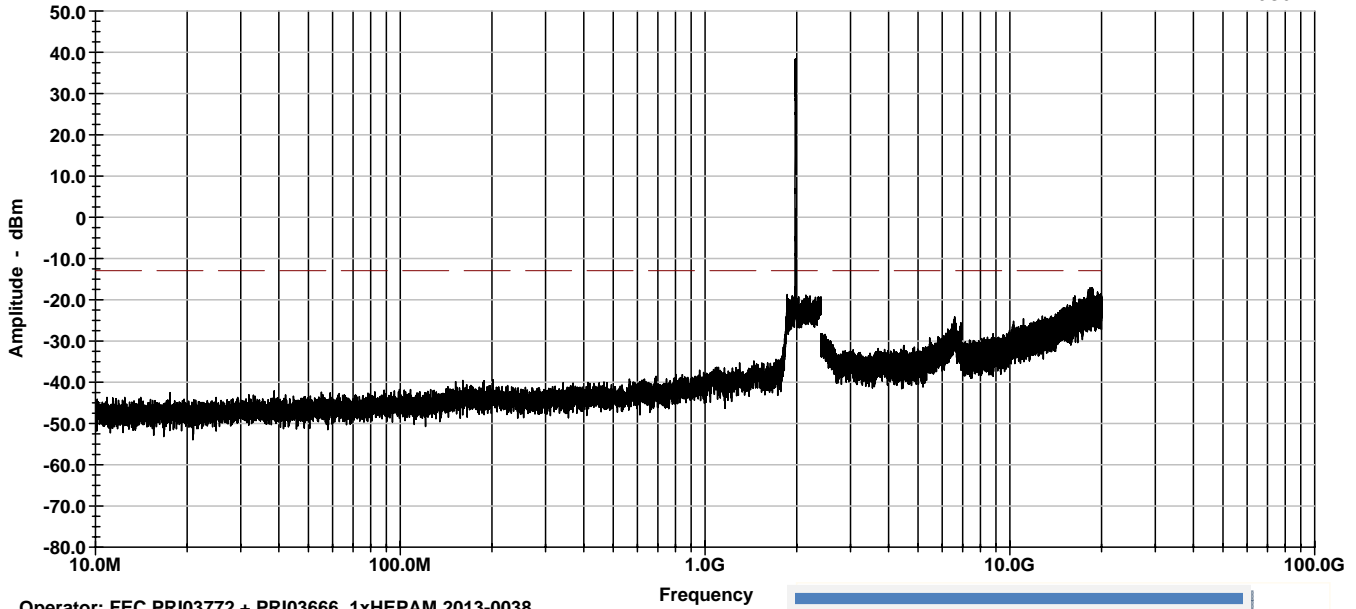
Three Carrier (3C): 1977.5 MHz + 1982.5 MHz + 1987.5 MHz at 20W/C (43.0 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Environment - 24C 8%RH 1001BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.
Global Product Compliance Laboratory
Conducted Emissions at Antenna Terminal

— FCClimit
— w40C1F
— w40C2F
— w40C3F
— w40C4F
— w40C5F
— w40C6F



Operator: FEC PRI03772 + PRI03666 1xHEPAM 2013-0038

QAM21 C3C4C5 UMTS 3C-20W MCRB 1900MHz TM5-44.TIL

09:29:52 AM, Wednesday, March 20, 2013

C3C4C5; 1977.5+1982.5 +1987.5 MHz ; 3C-20W/C (43.0 dBm/C)
RBW 1 MHz, VBW 1 MHz

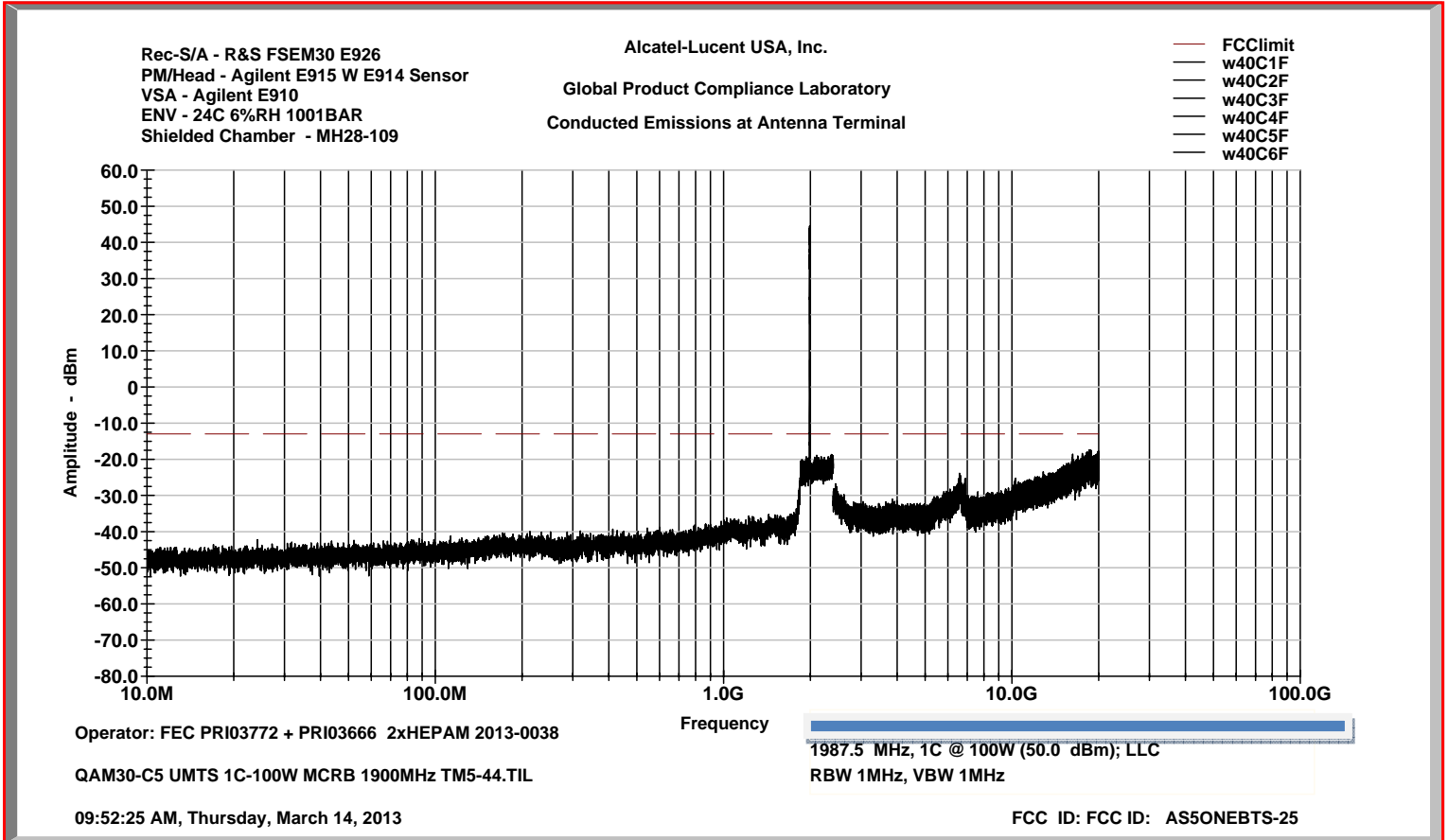
Equipment ID: FCC ID: AS50NEBTS-25

Occupied Bandwidth (OBW)

2xHEPAM at 50W per PA

Single Carrier (1C): 1987.5 MHz at 100W (50 dBm)

Test Modulation: TM5-44 (16QAM)



Occupied Bandwidth (OBW)

2xHEPAM at 60W per PA

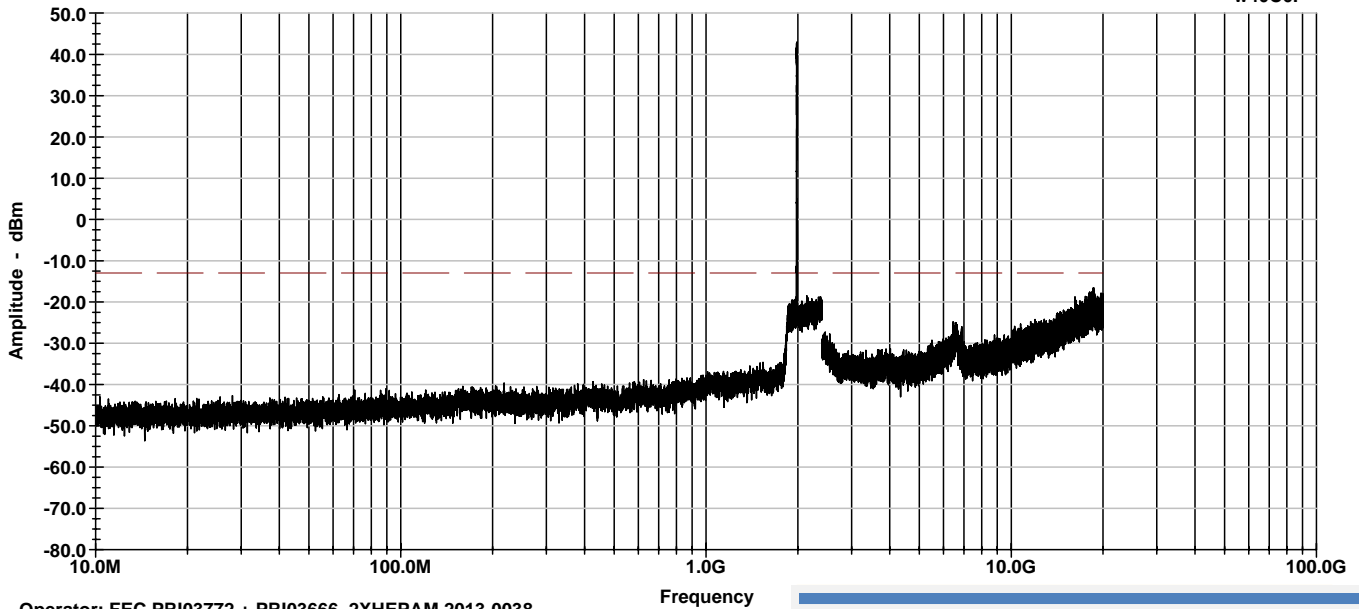
Two Carrier (2C): 1982.5 MHz + 1987.5 MHz at 60W/C (47.8 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Env Conditions - 24C 6%RH 1001BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.,
Global Product Compliance Laboratory
Conducted Emissions at Antenna Terminal

— FCClimit
— w40C1F
— w40C2F
— w40C3F
— w40C4F
— w40C5F
— w40C6F



Operator: FEC PRI03772 + PRI03666 2XHEPAM 2013-0038

QAM18- C4C5 UMTS 2C-60W MCRB 1900MHz TM5-44.TIL

03:08:10 PM, Thursday, March 14, 2013

C4C5 1982.5 + 1987.5 MHz, 2C-60W/C (47.78 dBm/C) ; LLC
RBW 1MHz, VBW 1MHz

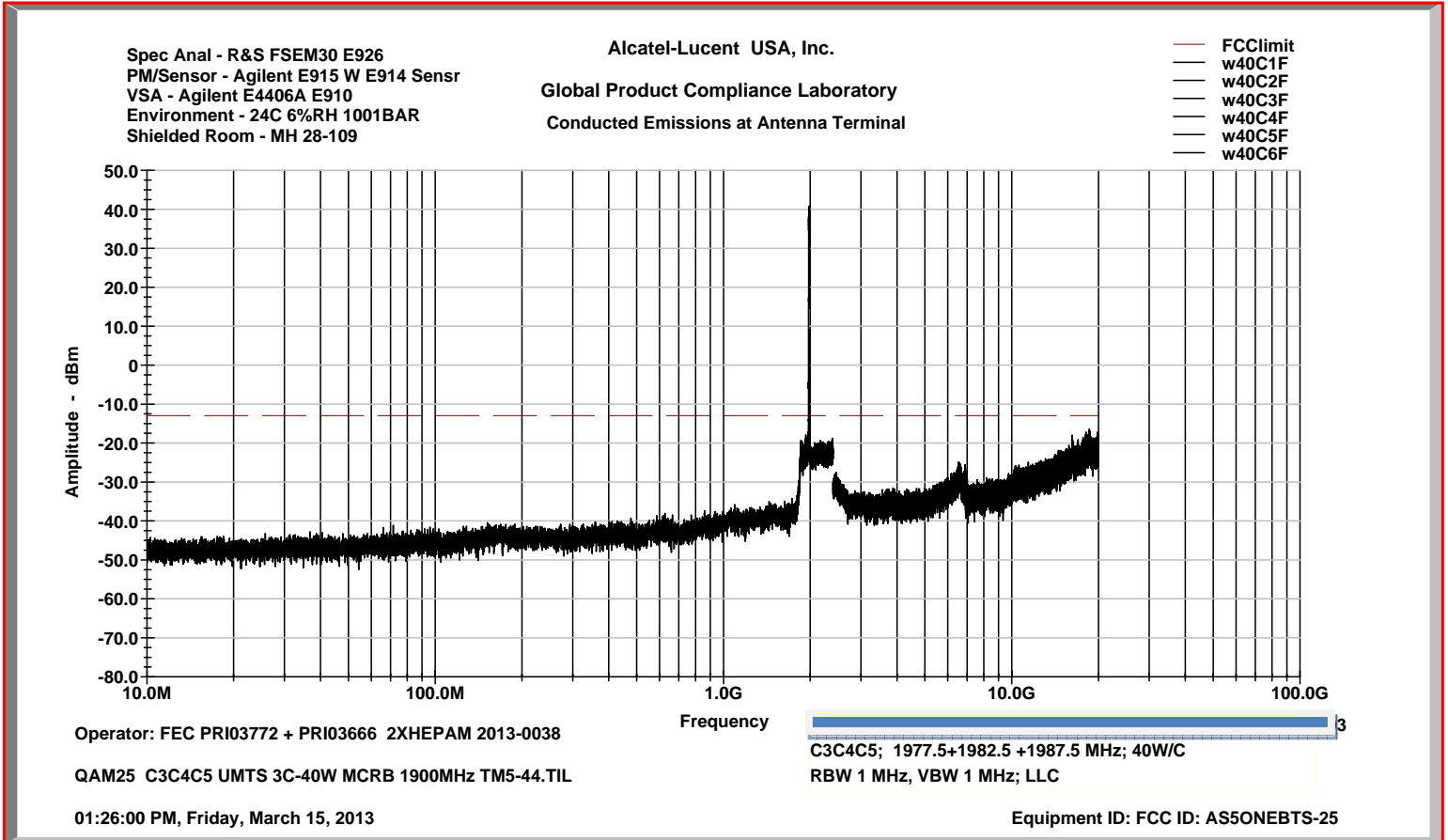
Equipment ID: FCC ID: AS5ONEBTS-25

Occupied Bandwidth (OBW)

2xHEPAM at 60W per PA

Three Carrier (3C): 1977.5 MHz + 1982.5 MHz + 1987.5 MHz at 40W/C (46.0 dBm/C)

Test Modulation: TM5-44 (16QAM)



Occupied Bandwidth (OBW)

3xHEPAM at 60W per PA

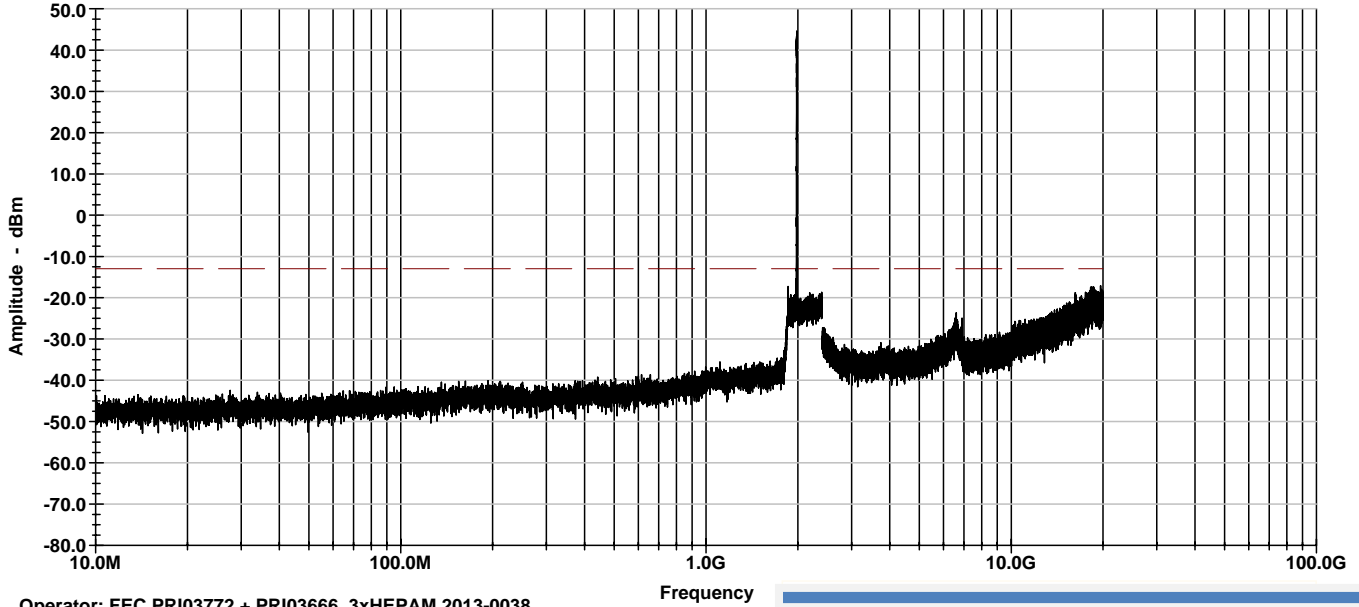
Two Carrier (2C): 1982.5 MHz + 1987.5 MHz at 90W/C (49.5 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Env Conditions - 24C 12%RH 990BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.,
Global Product Compliance Laboratory
Conducted Emissions at Antenna Terminal

- FCClimit
- w40C1F
- w40C2F
- w40C3F
- w40C4F
- w40C5F
- w40C6F



Operator: FEC PRI03772 + PRI03666 3xHEPAM 2013-0038

QAM31- C4C5 UMTS 2C-90W MCRB 1900MHz TM5-44.TIL

08:55:03 AM, Monday, March 25, 2013

1982.5 + 1987.5 MHz, 2C-90W/C (49.54 dBm/C) ; LLC
RBW 1MHz, VBW 1MHz

Equipment ID: FCC ID: AS5ONEBTS-25

Occupied Bandwidth (OBW)

3xHEPAM at 60W per PA

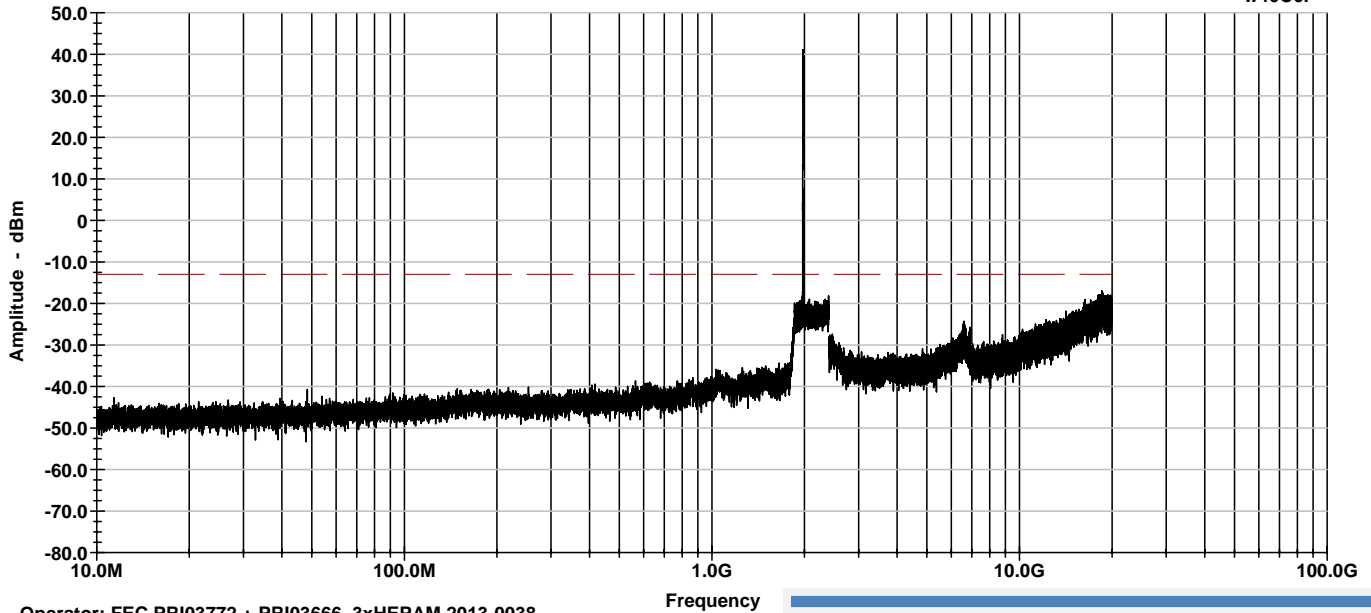
Three Carrier (3C): 1977.5 MHz + 1982.5 MHz + 1987.5 MHz at 60W/C (47.8 dBm/C)

Test Modulation: TM5-44 (16QAM)

Spec Anal - R&S FSEM30 E926
PM/Sensor - Agilent E915 W E914 Sensr
VSA - Agilent E4406A E910
Environment - 24C 9%RH 995BAR
Shielded Room - MH 28-109

Alcatel-Lucent USA, Inc.
Global Product Compliance Laboratory
Conducted Emissions at Antenna Terminal

— FCClimit
— w40C1F
— w40C2F
— w40C3F
— w40C4F
— w40C5F
— w40C6F



Operator: FEC PRI03772 + PRI03666 3xHEPAM 2013-0038

QAM37 C3C4C5 UMTS 3C-60W MCRB 1900MHz TM5-44.TIL

12:09:21 PM, Thursday, March 21, 2013

C3C4C5; 1977.5+1982.5 +1987.5 MHz; 60W/C
RBW 1 MHz, VBW 1 MHz; LLC

Equipment ID: FCC ID: AS5ONEBTS-25

PART 2.1053 MEASUREMENTS REQUIRED: FIELD STRENGTH OF SPURIOUS RADIATION

The EUT was both a fully populated and a fully operational Indoor, Dual Band, Macrocell (+24Vdc). As required, the frequency range investigated was from 30 MHz to 20 GHz (10th harmonic of the 1900 MHz carrier). A single dual band carrier configuration was sufficient as tabulated below.

RE Test Configuration
3S3C-60W/C 1900 MHz with 3xHEPAM/Sector
3S1C-60W 850 MHz with 1xHEPAM/Sector

Sector	Freq Band	No. HEPAM	Carrier Freq	RF Power
Sector #1	1900 MHz	3	1932.5 + 1937.5 + 1942.5 MHz	60 W/C
Sector #2	1900 MHz	3	1952.5 + 1957.5 + 1962.5 MHz	60 W/C
Sector #3	1900 MHz	3	1977.5 + 1982.5 + 1987.5 MHz	60 W/C
Sector #4	850 MHz	1	871.5 MHz	60 W
Sector #5	850 MHz	1	882.5 MHz	60 W
Sector #6	850 MHz	1	891.5 MHz	60 W

The equipment under test (EUT) was configured as recommended for *floor standing equipment*, following the guidelines of ANSI C63.4-2009. 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 C63.4-2009. Field strength measurements of radiated spurious emissions were evaluated in a semi-anechoic chamber, using an EUT-to-Antenna separation of 3-meters. Test software was Vasona by EMIsoft.

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:

$$\text{Pmeas (dBm)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB)} + 107 \text{ (dB}\mu\text{V/dBm)} - \text{Amplifier Gain (dB)} \\ = \text{Field Strength (dB}\mu\text{V/m)}$$

Section 24.238 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: Complies - Over the out-of-band spectrum investigated from 30 MHz to the tenth harmonic of the carrier (20 GHz), the power levels of all emissions observed were >>> 20 dB below the 82.23 dB $\mu\text{V/meter}$ limit. Therefore, there were no reportable radiated spurious emissions.