HCT. CO., LTD.
CERTIFICATION DIVISION
105-1, JANGAM-RI, MAJANG-MYEON, ICHEON-SI, KYUNGGI-DO, KOREA
TEL : +82 31 645 6300 FAX : +82 31 645 6401

CERTIFICATE OF COMPLIANCE (ERM EVALUATION)

Manufacture: Advanced RF Technologies, Inc

3116 West VANOWEN STREET, BURBANK, CA 91505 U.S.A

Date of Issue:
January 19, 2012
Location:
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea
Test Report No.: HCTR1201FR22
HCT FRN: 0005866421
IC Recognition No.: 5944A-3

FCC ID:	**S2O-SDR-B**
IC :	**6416A-SDRB**
APPLICANT:	**Advanced RF Technologies, Inc**
EUT Type:	**Software Define Modular Repeater**
Model:	**SDR-B**
Frequency Ranges:	**DL / UL : 2502 MHz ~ 2690 MHz**
Conducted Output Power:	**DL : 29.99 dBm** **UL : 30.07 dBm**
FCC Rules Part(s):	**CFR 47, Part 27**
IC Rule Part(s):	**RSS-Gen (December 2010) , RSS-131 (July 2003)**

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 27 of the FCC Rules under normal use and maintenance.

Chang Seok Choi

Report prepared by
:Chang Seok Choi
Test engineer of RF Team

Sang Jun Lee

Approved by
: Sang Jun Lee
Manager of RF Team

CONTENTS

1. CLIENT INFORMATION

The EUT has been tested by request of

Company	Advanced RF Technologies, Inc 3116 WEST VANOWEN STREET, BURBANK, CA 91505 U.S.A
Contact Point	Attention: Ms. Julie Song Tel. : 800-313-9345

■ **FCC ID:**	**S2O-SDR-B**
■ **IC:**	**6416A-SDRB**
■ **APPLICANT:**	**Advanced RF Technologies, Inc**
■ **EUT Type:**	**Software Define Modular Repeater**
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■ **Frequency Ranges:**	**DL / UL : 2502 MHz ~ 2690 MHz**
■ **Conducted Output Power:**	**DL : 29.99 dBm** **UL : 30.07 dBm**
■ **Antenna Gain(s):**	**3 dBi**
■ **FCC Rules Part(s):**	**CFR Title 47 Part 27 Sub Part C**
■ **IC Rules Part(s):**	**RSS-Gen (December 2010) , RSS-131 (July 2003)**
■ **Place of Tests:**	**105-1, Jangam-ri , Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA. (IC Recognition No. : 5944A-3)**

2. TEST SPECIFICATIONS

Description	Reference (FCC)	Reference (IC)	Results
RF Power Output	§2.1046; §27.50	RSS-GEN, Section 4.8 RSS-131, Section 4.3	Compliant
Occupied Bandwidth	§2.1049	RSS-131, Section 4.2 RSS-GEN, Section 4.6.1	Compliant
Spurious Emissions at Antenna Terminals	§2.1053, §27.53	RSS-131, Section 4.4 RSS-GEN, Section 4.9	Compliant
Radiated Spurious Emissions	§2.1053, §27.53	RSS-131, Section 4.4 RSS-GEN, Section 4.9	Compliant
Frequency Stability	§2.1055	RSS-131, Section 4.5 RSS-GEN, Section 4.7	Compliant
Receiver Spurious	-	RSS-131, Section 4.4 RSS-GEN, Section 4.10	Compliant

3. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	**+ 15 ℃ to + 35 ℃**
Relative humidity:	**30 % to 60 %**
Air pressure	**860 mbar to 1 060 mbar**

4. TEST EQUIPMENT

Manufacturer	Model / Equipment	Cal Interval	Calibration Due	Serial No.
Agilent	E4438C /Signal Generator	Annual	11/08/2012	MY42082646
Agilent	N5182A /Signal Generator	Annual	08/23/2012	MY50141649
Agilent	E4416A /Power Meter	Annual	11/07/2012	GB41291412
Agilent	E9327A/ Power Sensor	Annual	05/02/2012	MY4442009
Korea Eng	KR-1005L/ Temperature and Humidity Chamber	Annual	11/07/2012	KRAC05063-3CH
Agilent	N9020A /Signal Analyzer	Annual	06/10/2012	MY51110020
Agilent	8498A /ATTENUATOR	Annual	11/07/2012	51162
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
MITEQ	AMF-6D-001180-35-20P/AMP	Annual	12/26/2012	990893
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	VULB 9168/TRILOG Antenna	Biennial	02/09/2013	9168-200

5. RF OUTPUT POWER

Test Requirements:

§ 2.1046 Measurements required: RF power output:

§ 2.1046 (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8).The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

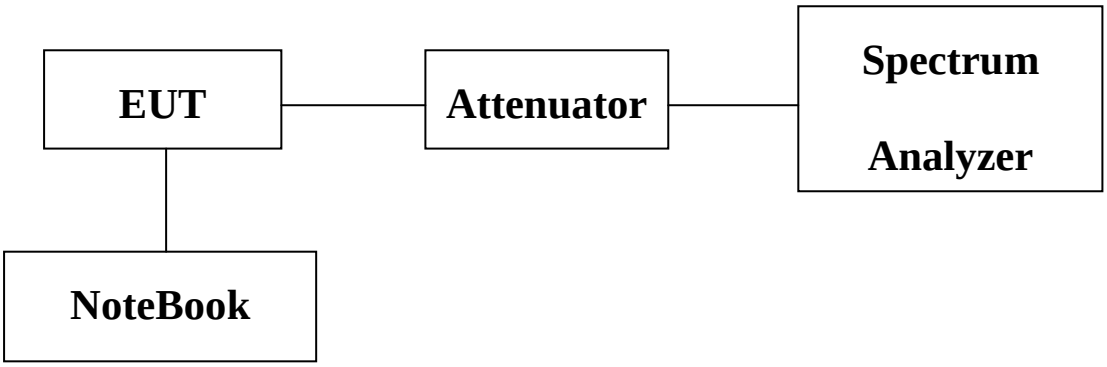
§ 2.1046 (b) For single sideband, independent sideband, and single channel, controlled carrier radiotelephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.

§ 2.1046 (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§ 27.50 Power limits and duty cycle. (h) The following power limits shall apply in the BRS and EBS:(1) *Main, booster and base stations.* (i) The maximum EIRP of a main, booster or base station shall not exceed 33 dBW + 10log(X/Y) dBW, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.

Test Procedures:

As required by 47 CFR 2.1046, RF power output measurements were made at the RF output terminals using an attenuator and spectrum analyzer or power meter. This test was performed in all applicable modulations.



Block Diagram 1. RF Power Output Test Setup

Test Results:

Input Signal	Modulation	Level (dBm)
WiMax	QPSK, 16QAM, 64QAM	-59.5
TD-LTE	QPSK, 16QAM, 64QAM	-58.7

[Downlink]

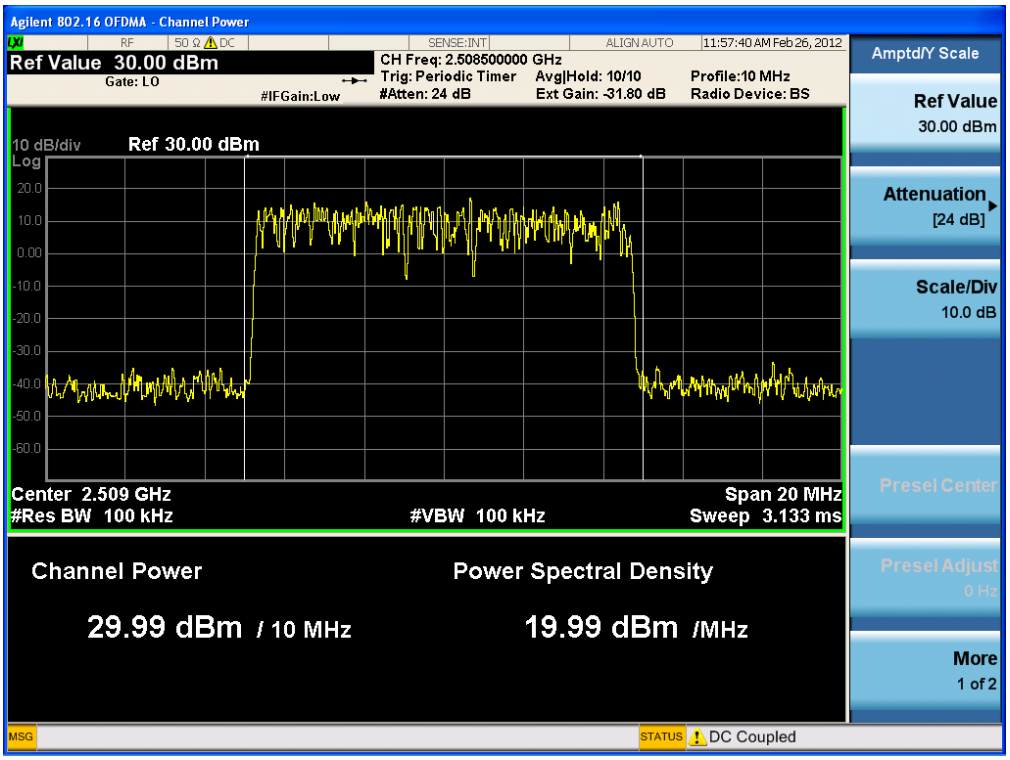
Channel	Frequency (MHz)	Output Power (dBm)	
		WiMax	LTE
Low	2508.5	29.99	29.93
Middle	2640.5	29.80	29.98
High	2683.5	29.99	29.99

[Uplink]

Channel	Frequency (MHz)	Output Power (dBm)	
		WiMax	LTE
Low	2508.5	29.96	29.95
Middle	2640.5	29.84	30.07
High	2683.5	29.96	29.99

Plots of RF Output Power

[WiMax Downlink Low]



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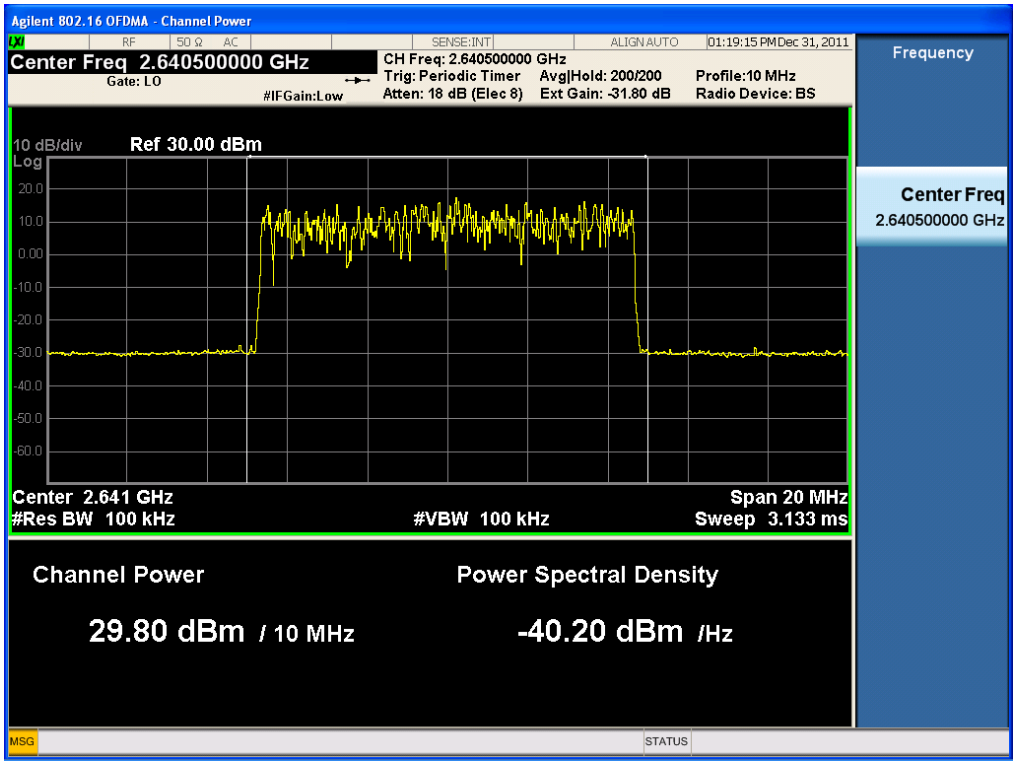

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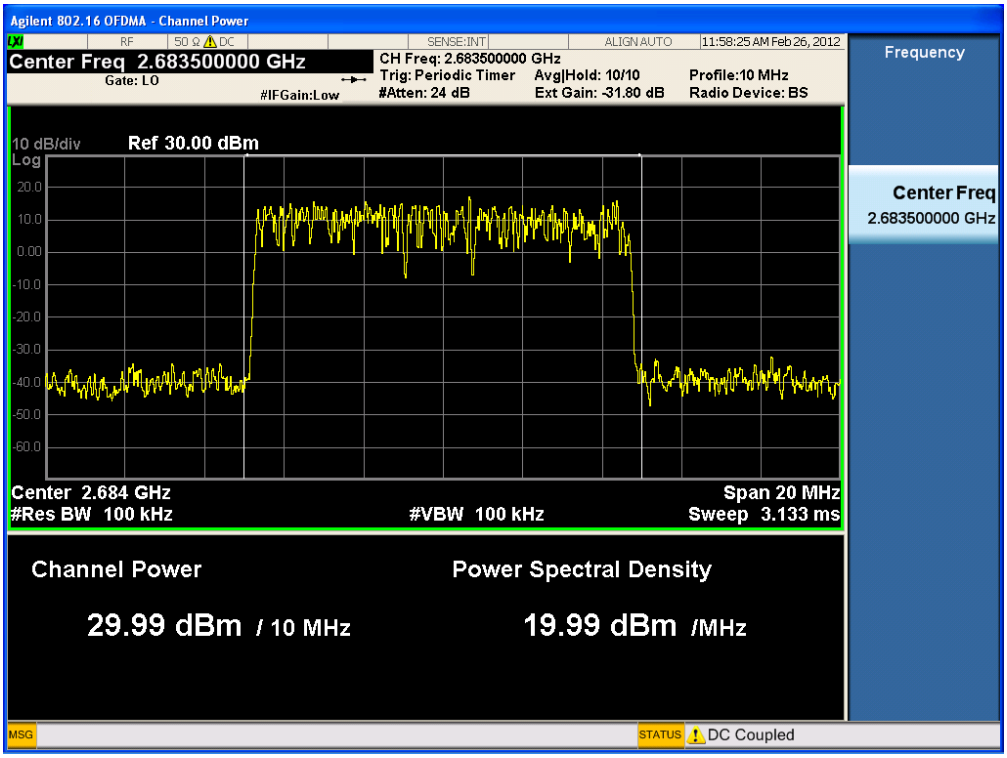

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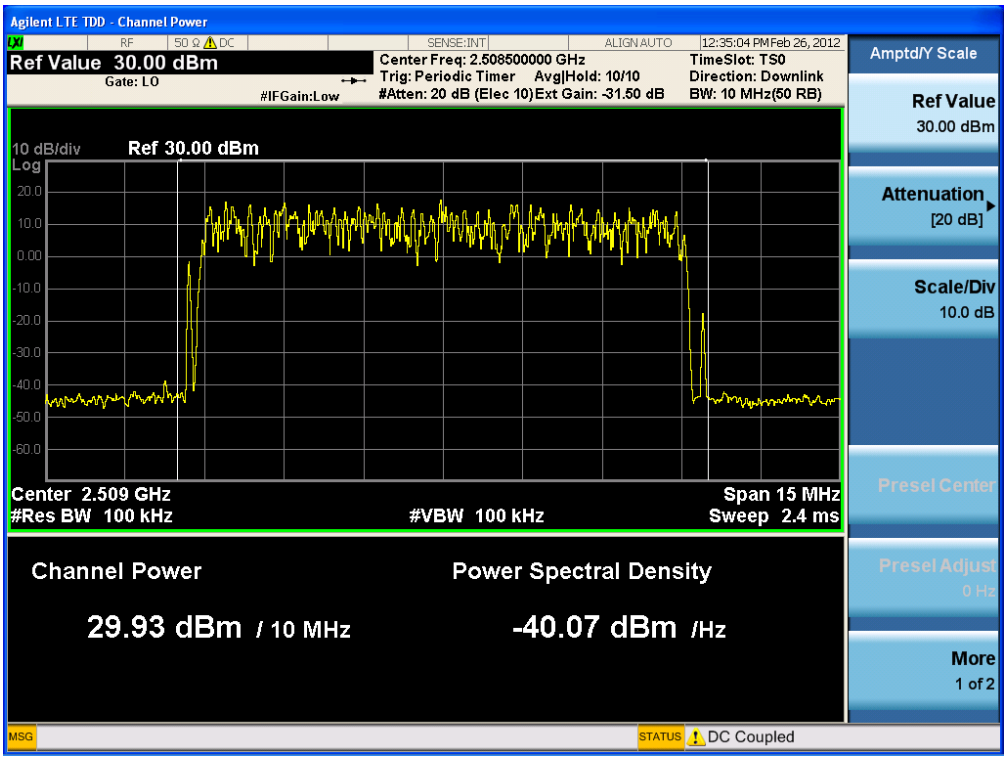

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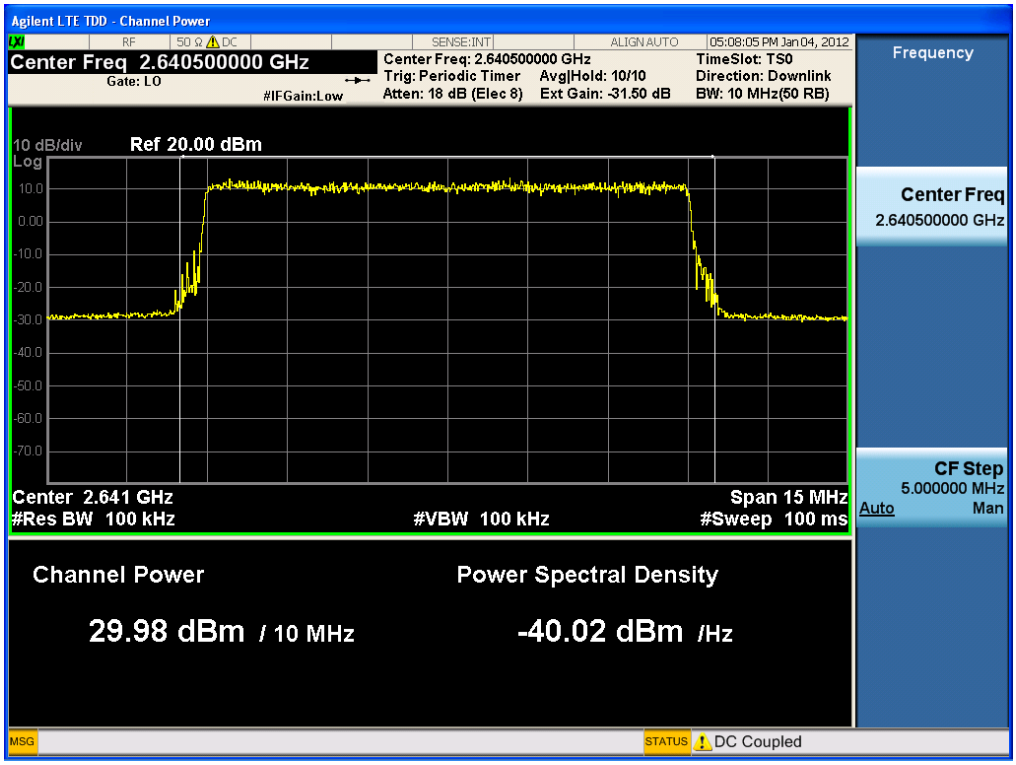

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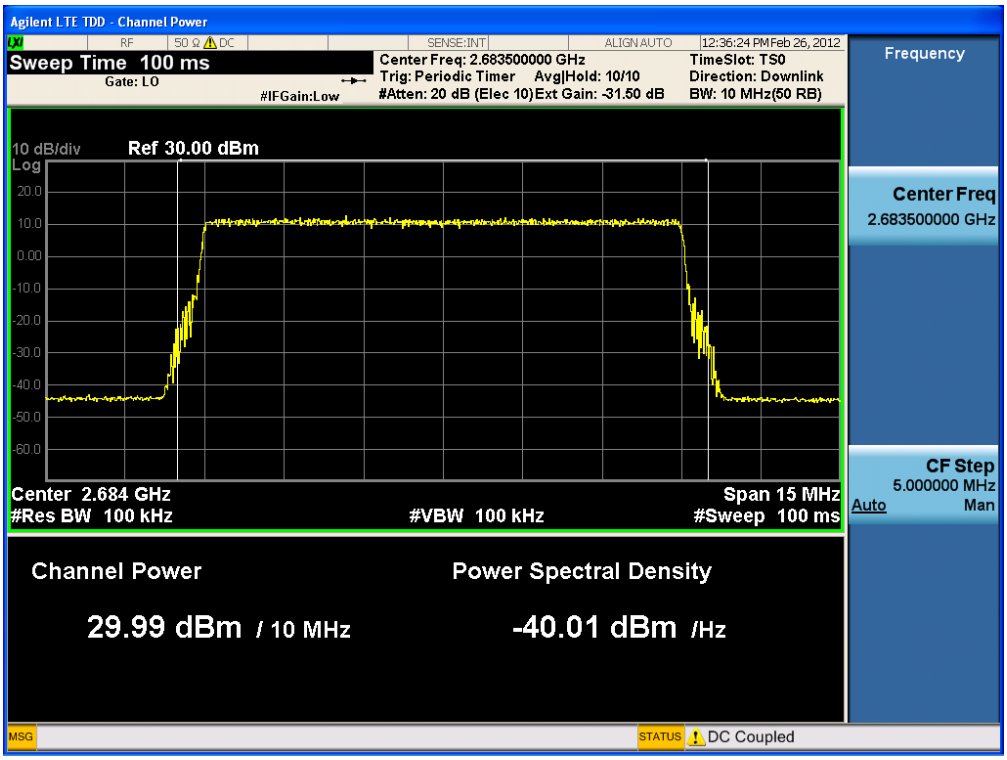

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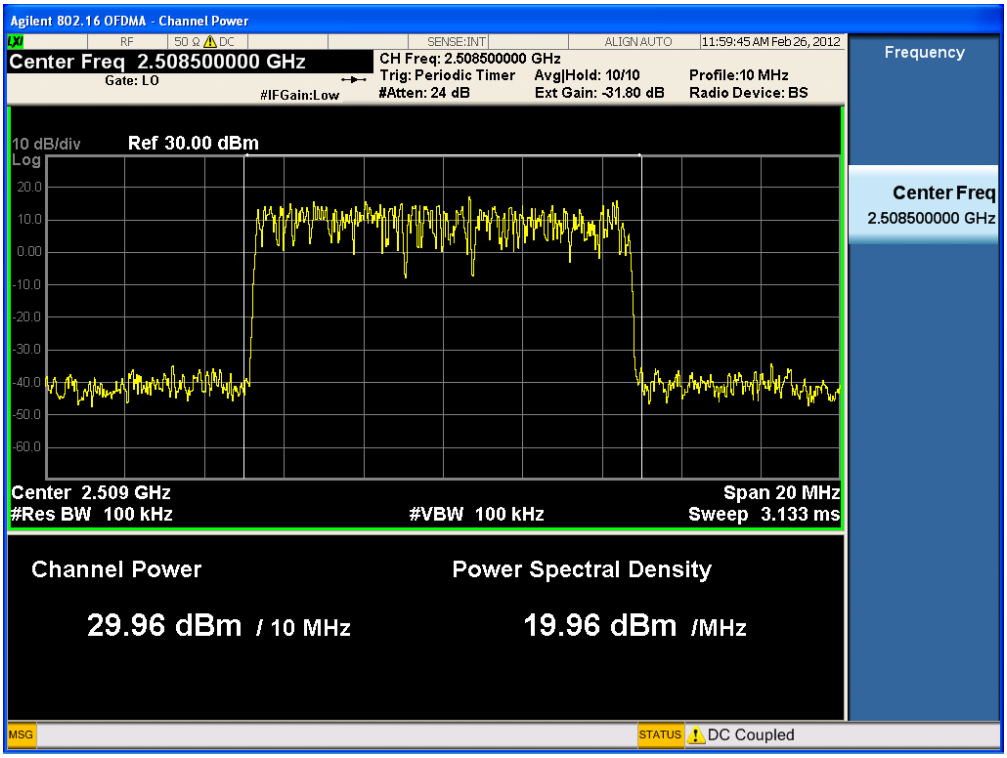

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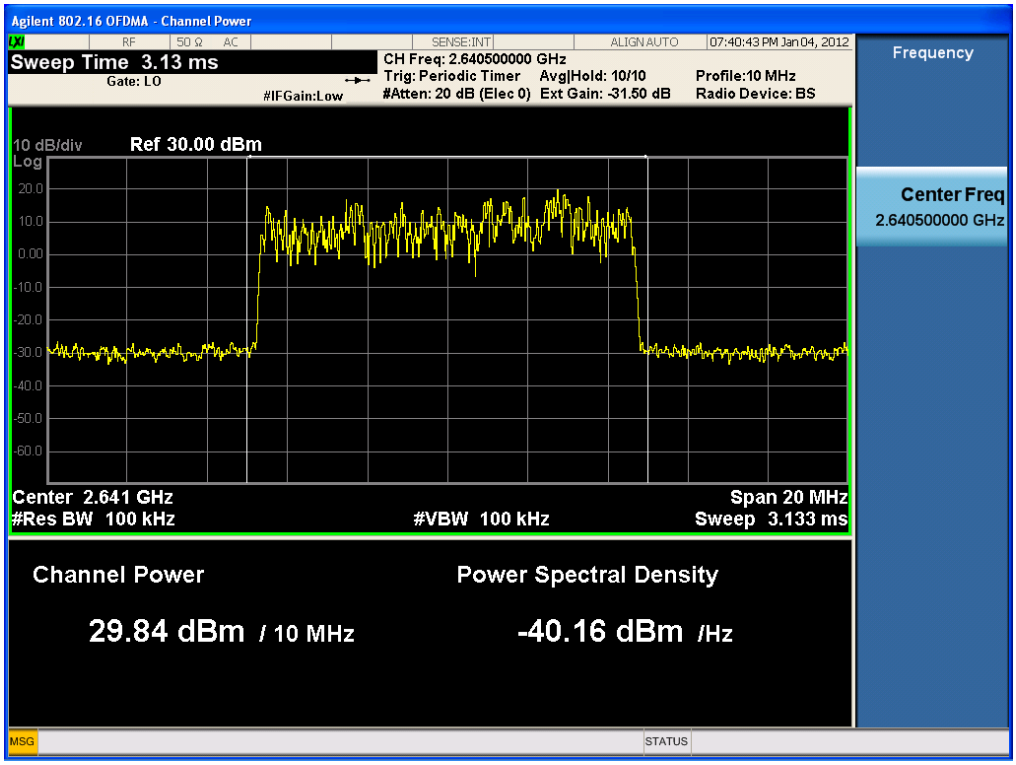

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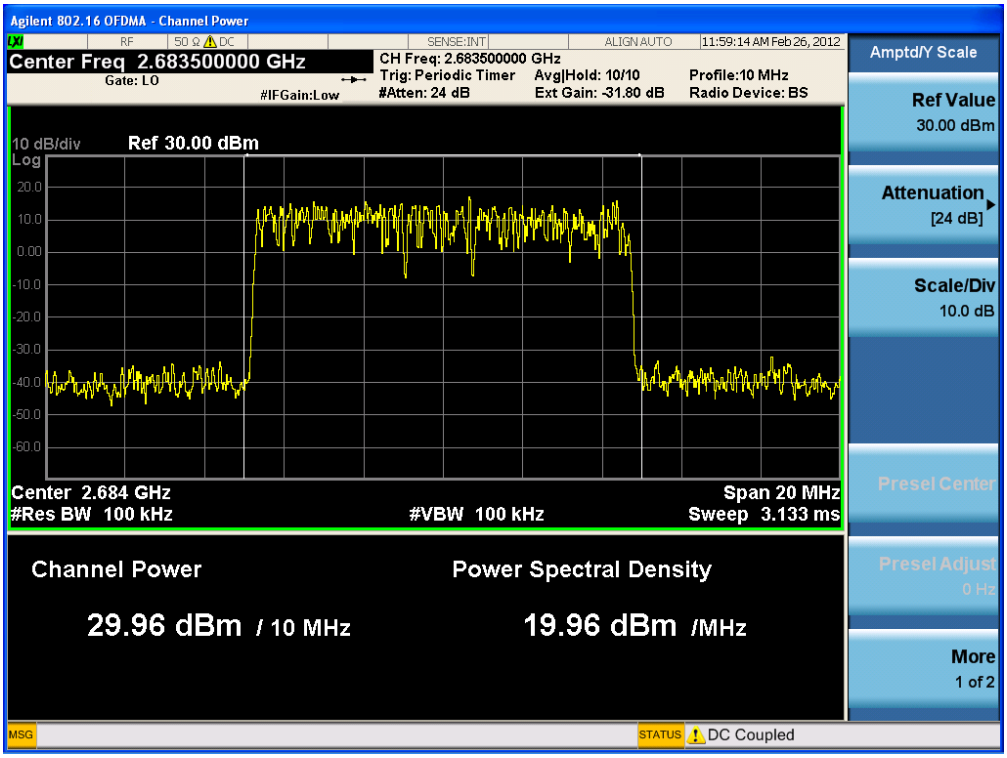

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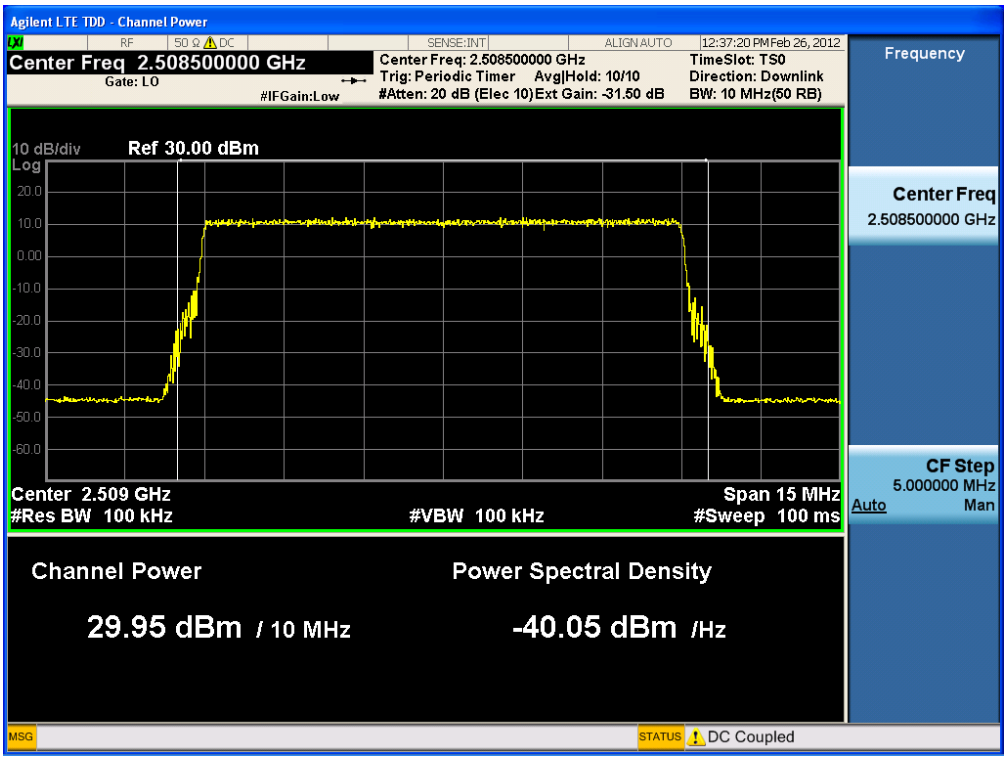

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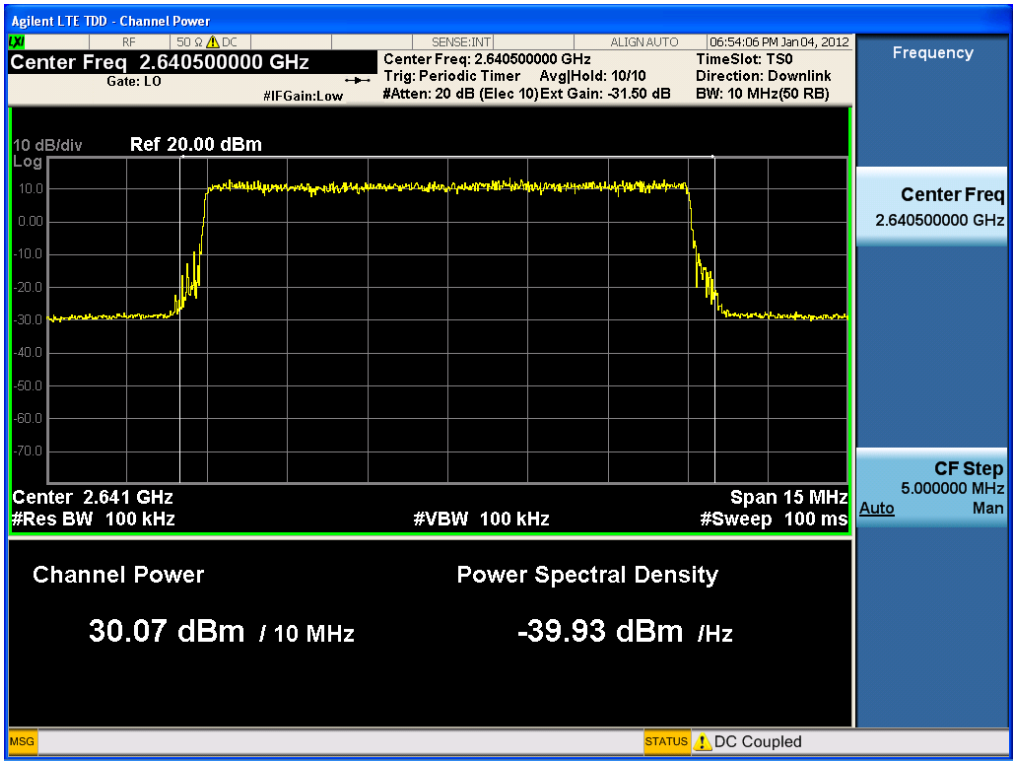

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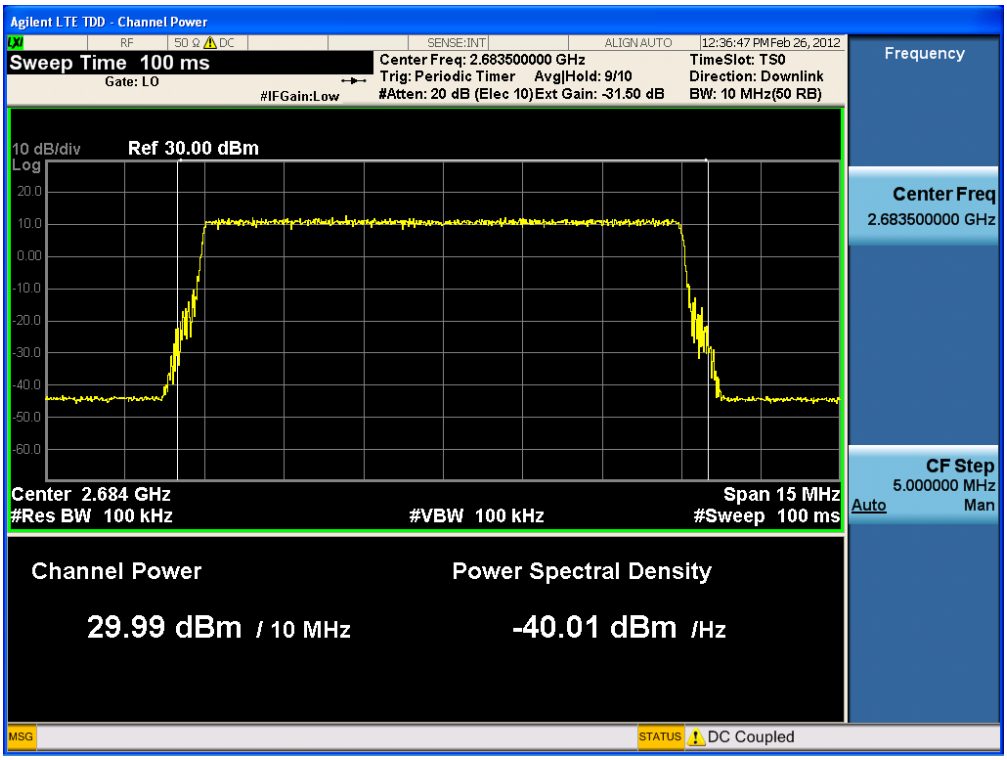


6. OCCUPIED BANDWIDTH

Test Requirement(s): § 2.1049 Measurements required: Occupied bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the specified conditions of § 2.1049 (a) through (i) as applicable.

Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made with a Spectrum Analyzer connected to the RF ports for both Uplink and Downlink
The modulation characteristics of signal generator's carrier was measured first at a maximum RF level prescribed by the OEM. The signal generator was then connected to either the Uplink or Downlink input at the appropriate RF level. The resulting modulated signal through the EUT was measured and compared against the original signal.

Test Results: The EUT complies with the requirements of this section.

Input Signal	Modulation	Level (dBm)
WiMax	QPSK, 16QAM, 64QAM	-59.5
TD-LTE	QPSK, 16QAM, 64QAM	-58.7

[Downlink Output]

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		WiMax	LTE
Low	2508.5	9.1900	8.9340
Middle	2640.5	9.1992	8.9517
High	2683.5	9.1906	8.9350

[Downlink Input]

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		WiMax	LTE
Low	2508.5	9.2966	9.0471
Middle	2640.5	9.0960	8.9265
High	2683.5	9.2667	9.0622

[Uplink Output]

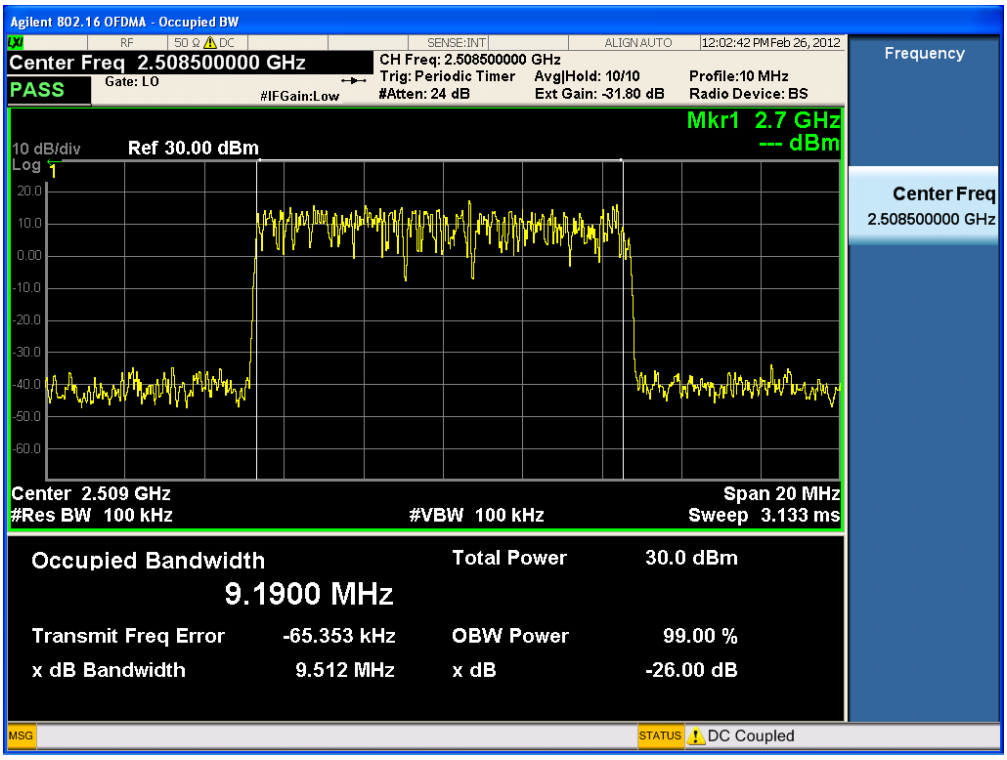
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		WiMax	LTE
Low	2508.5	9.19	8.9354
Middle	2640.5	9.0917	8.9522
High	2683.5	9.1905	8.9350

[Uplink Input]

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		WiMax	LTE
Low	2508.5	9.2926	9.0384
Middle	2640.5	9.1000	8.9259
High	2683.5	9.2845	9.0428

Plots of Occupied Bandwidth

[Output WiMax Downlink Low]



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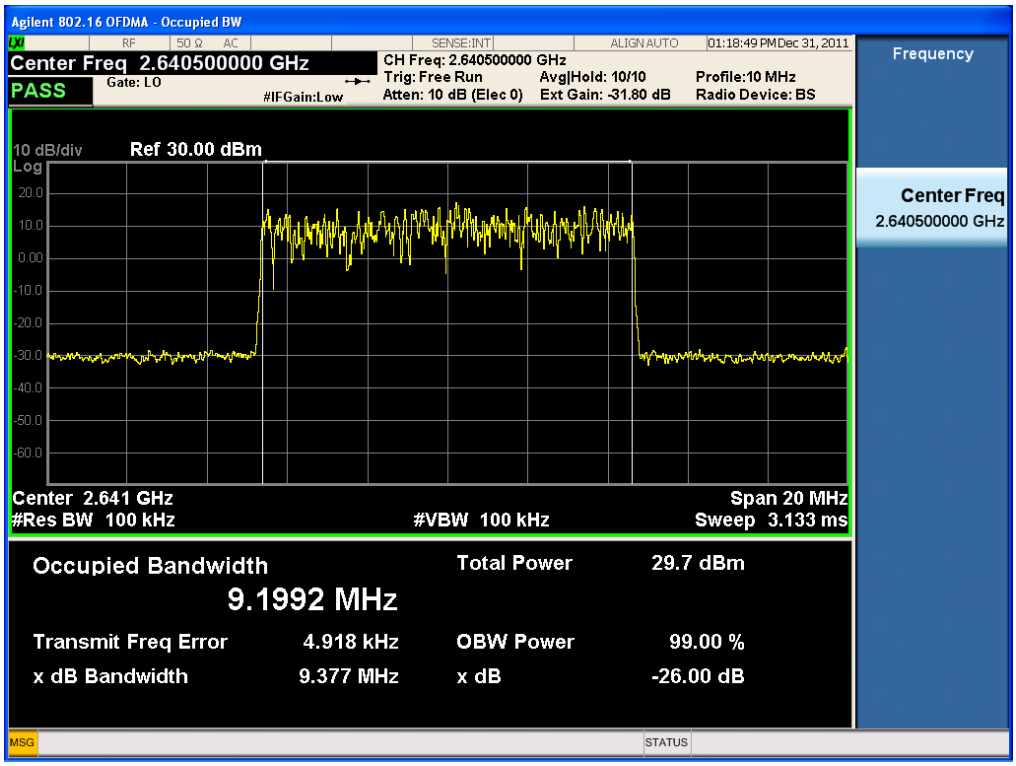
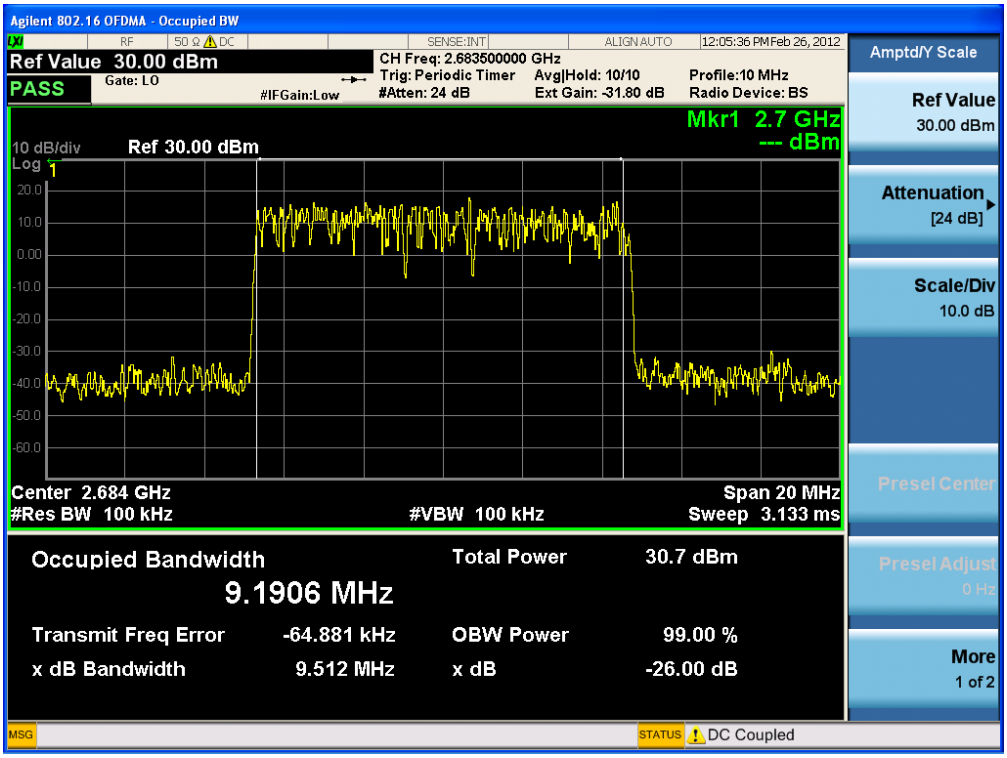


[Output WiMax Downlink High]



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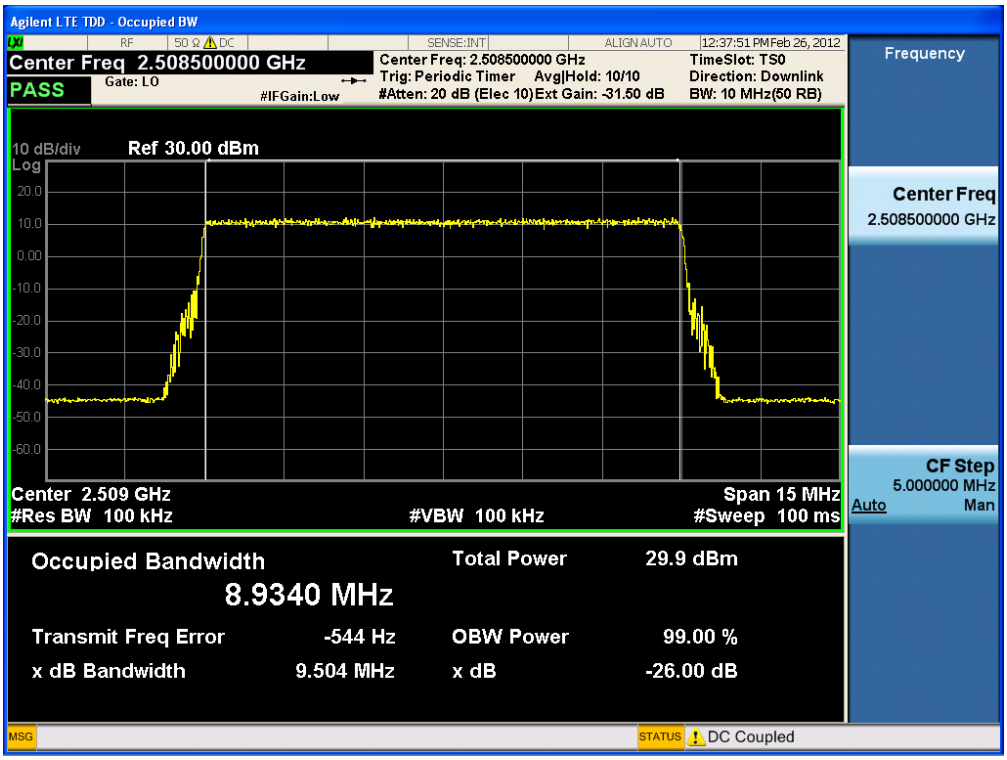

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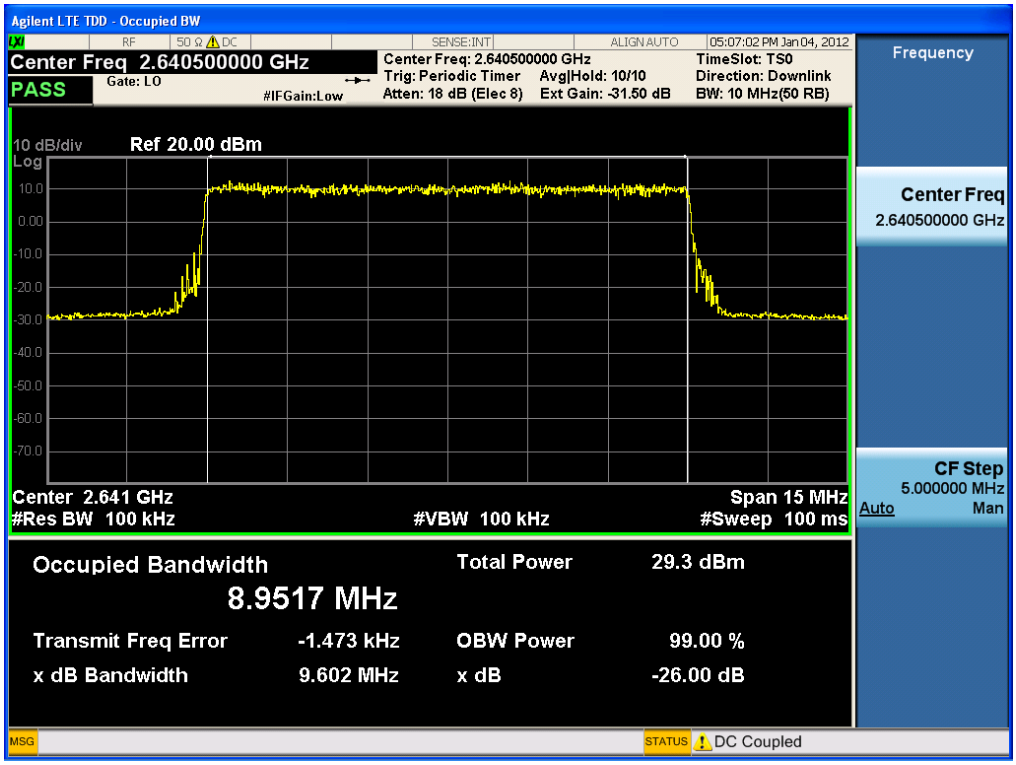

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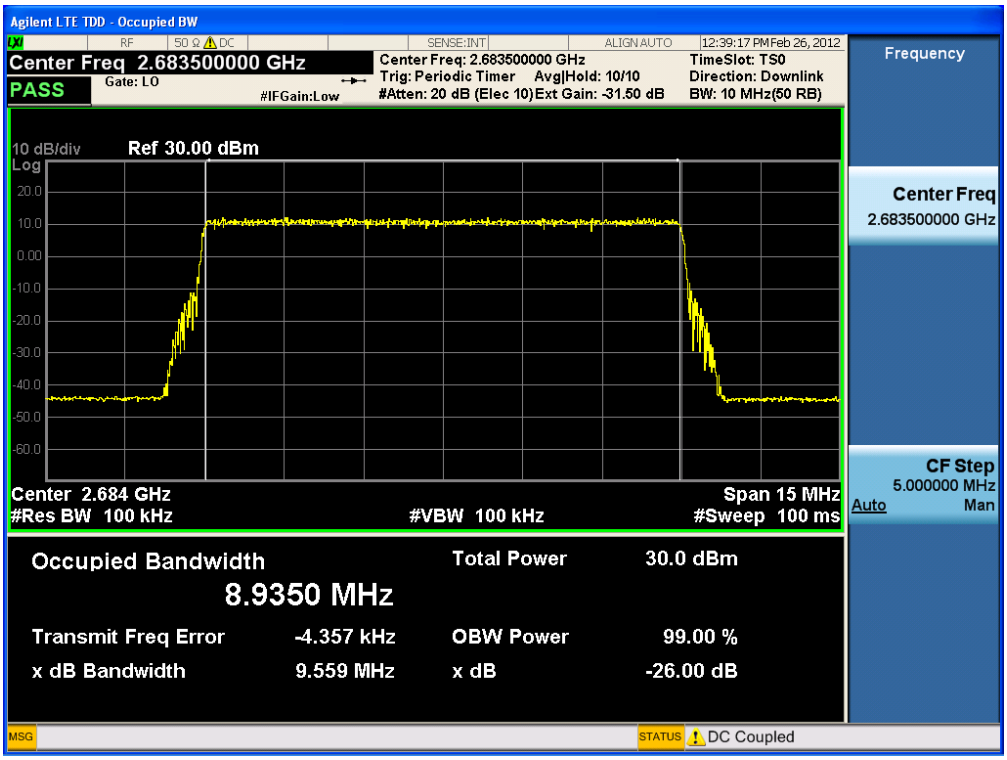

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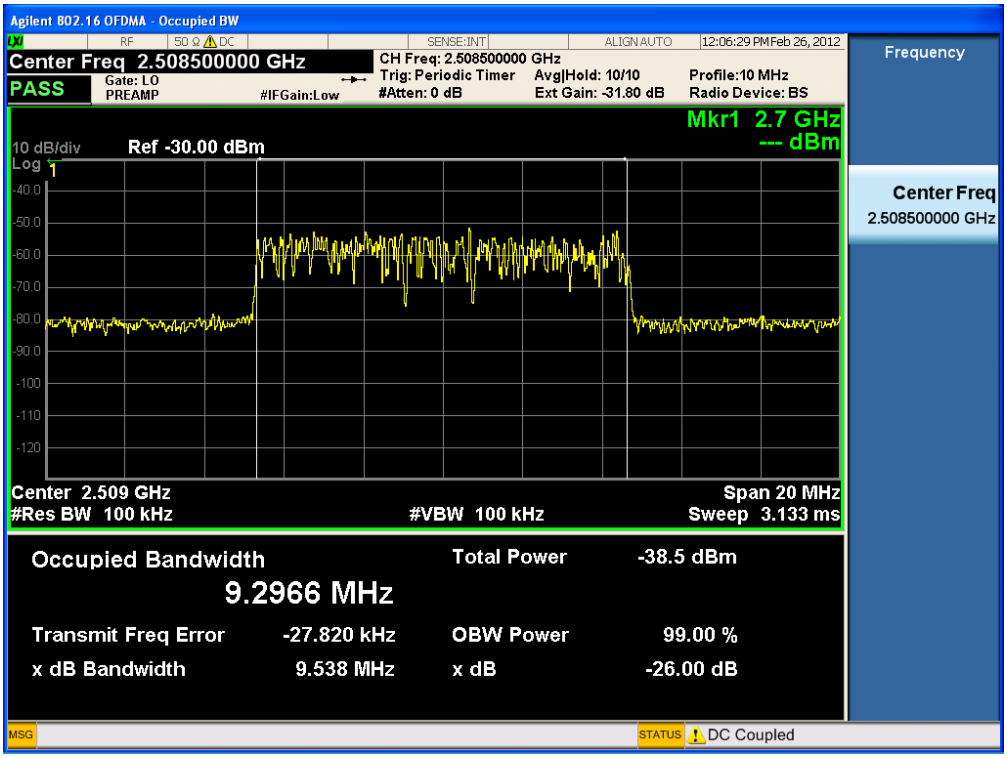

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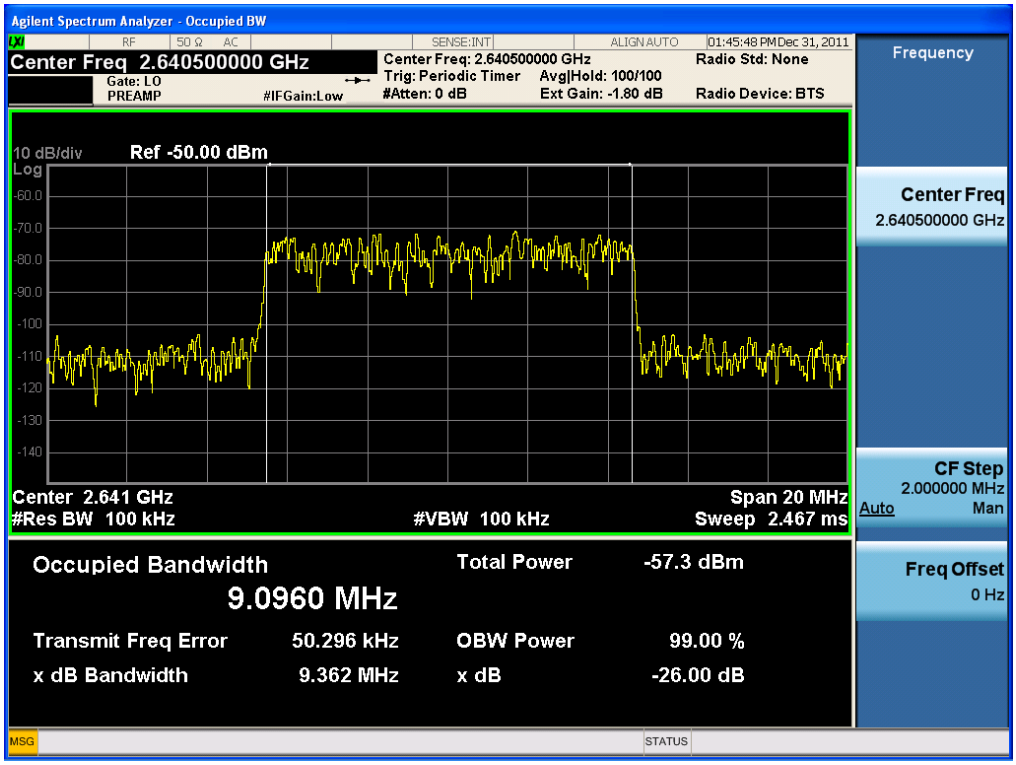

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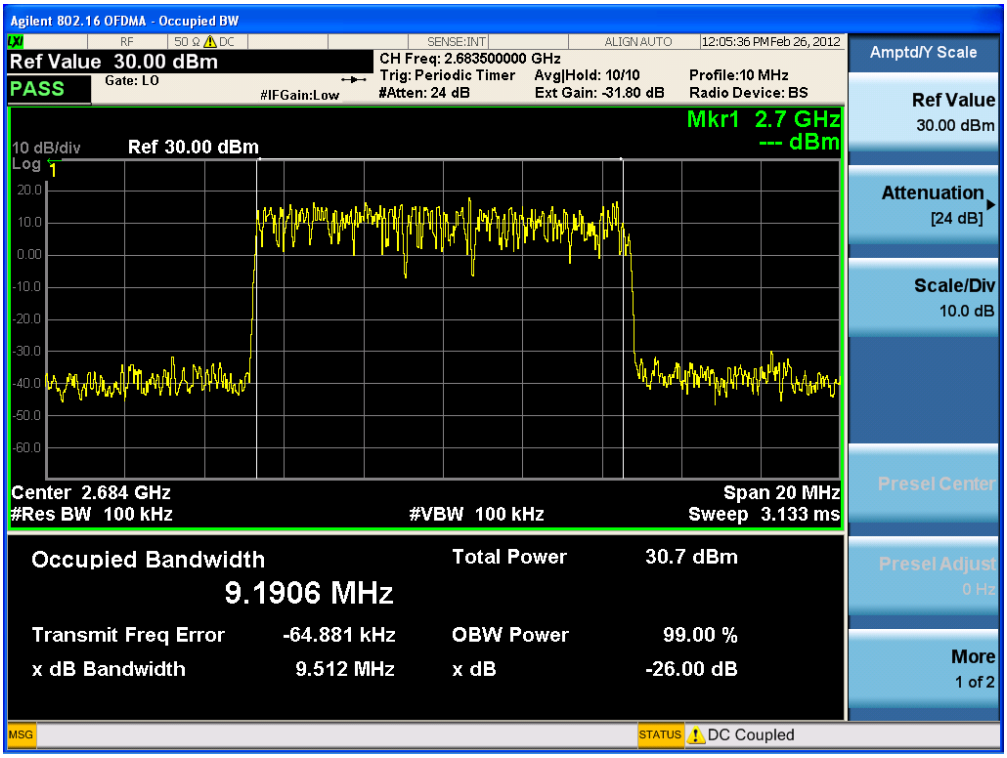

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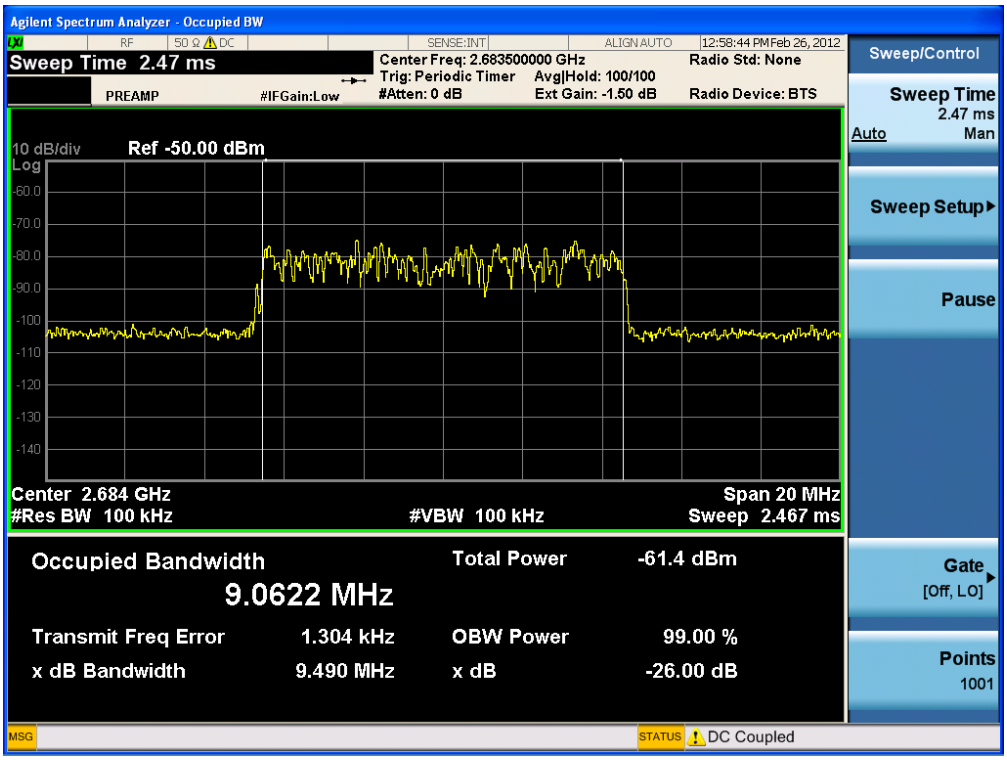

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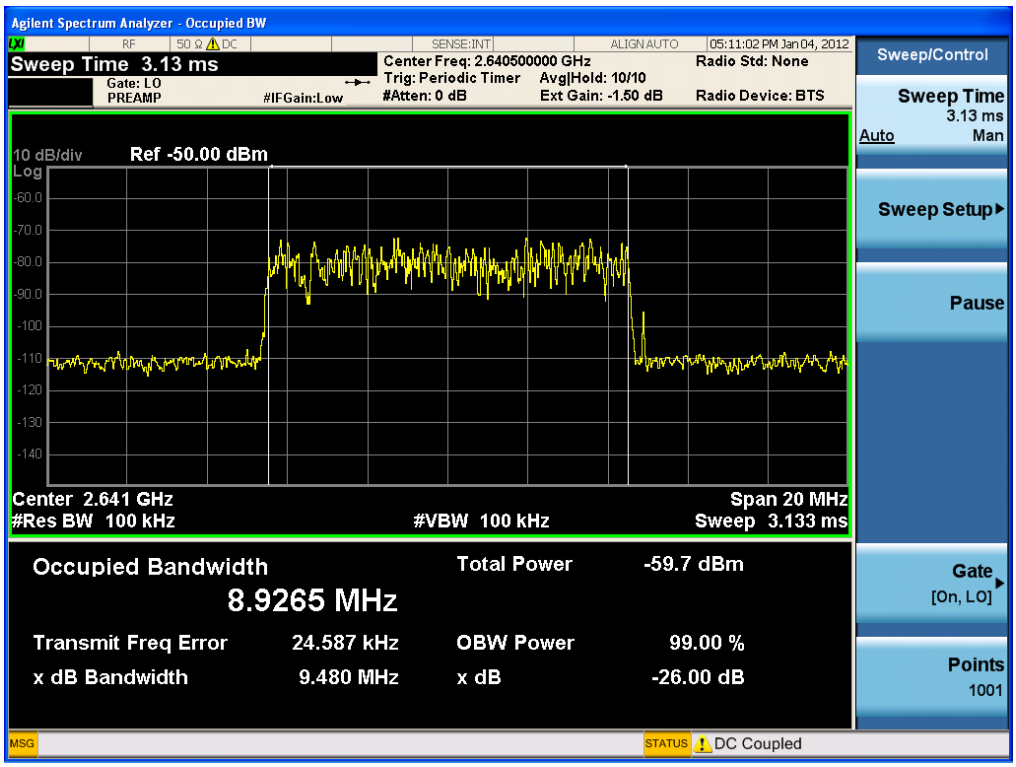

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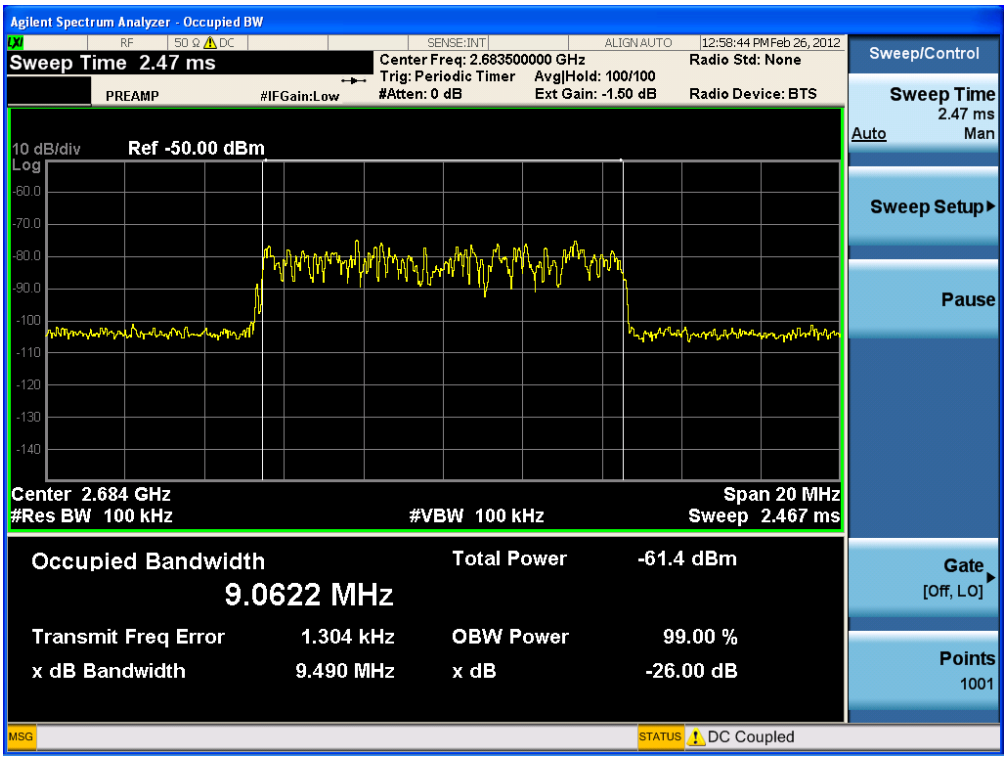

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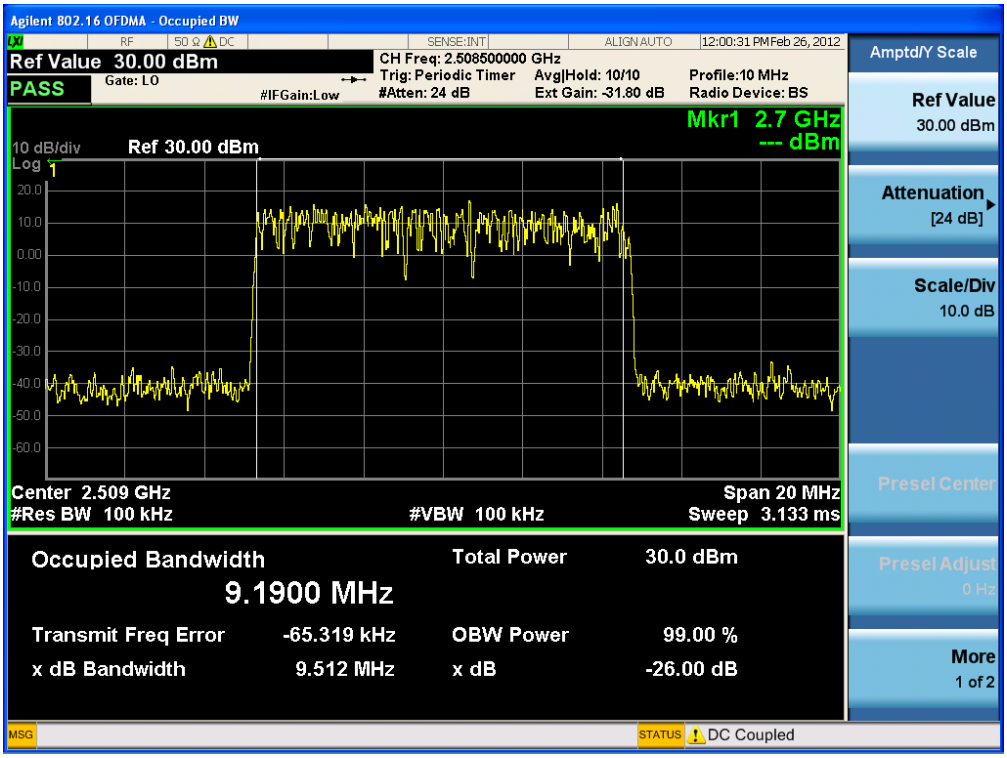

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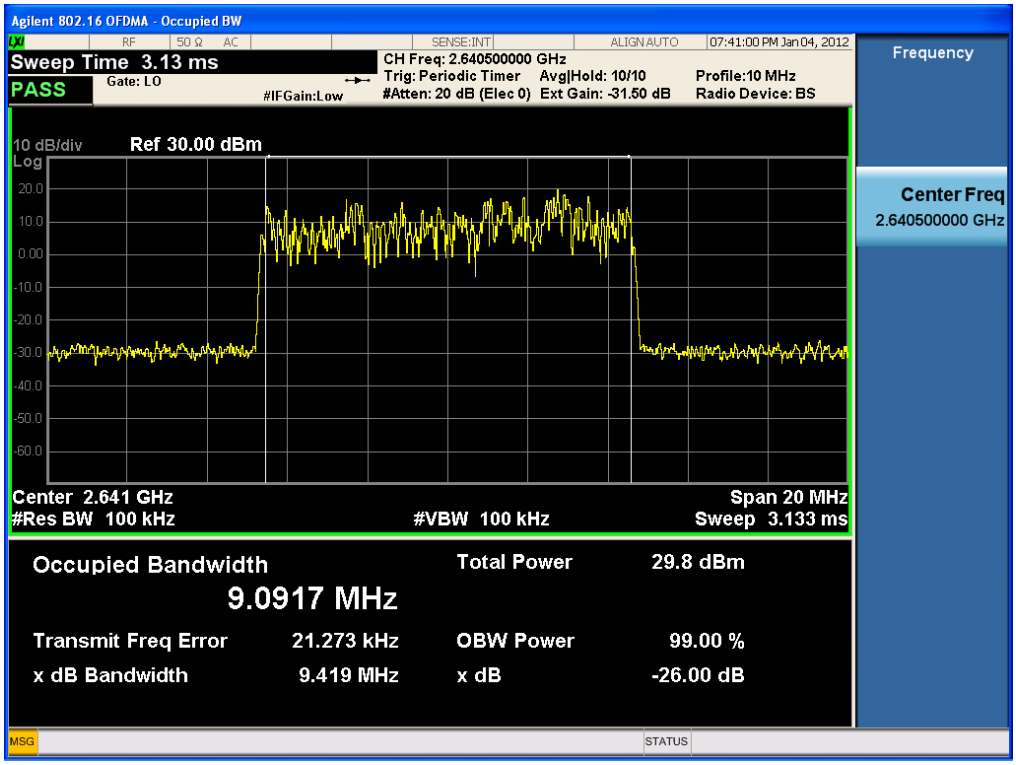

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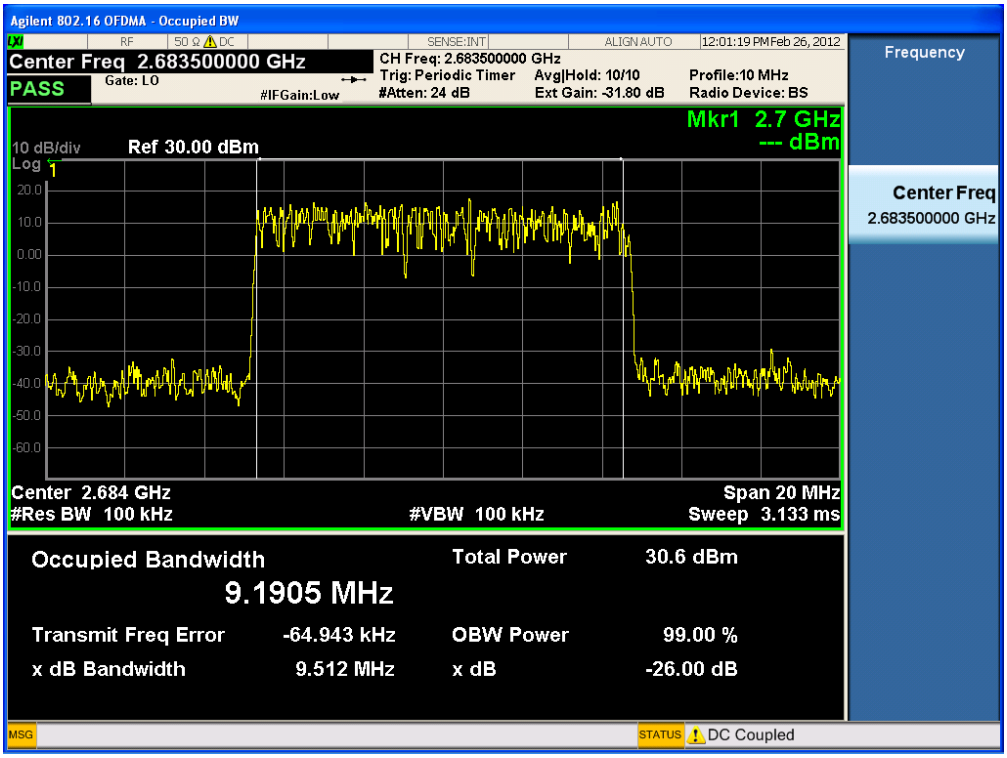

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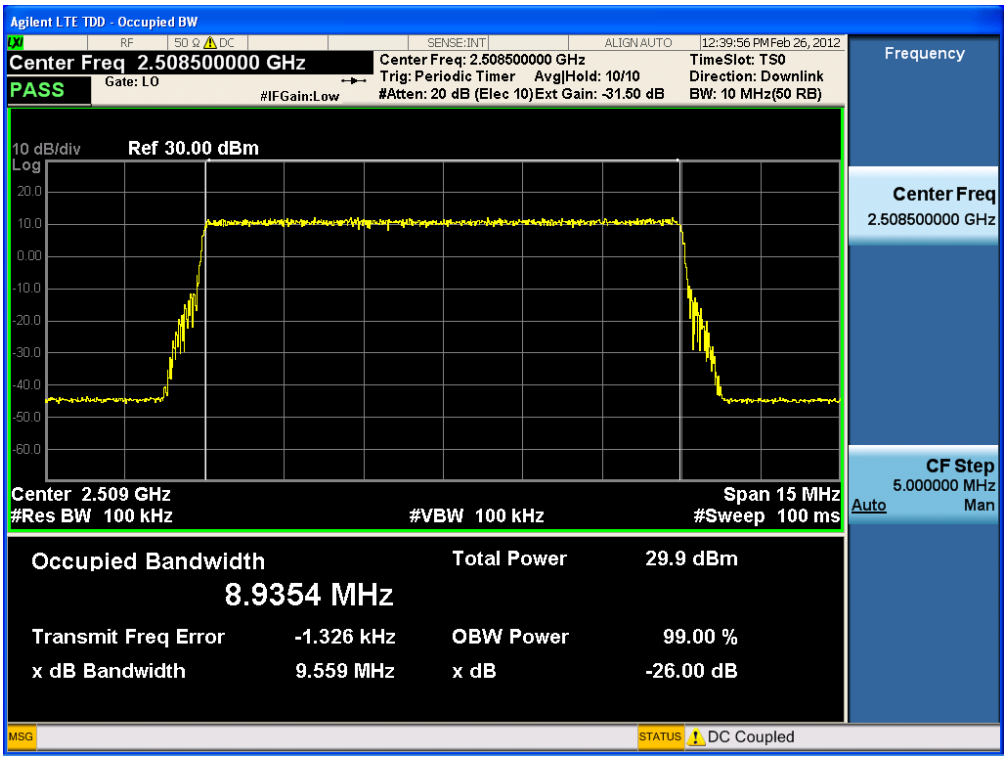

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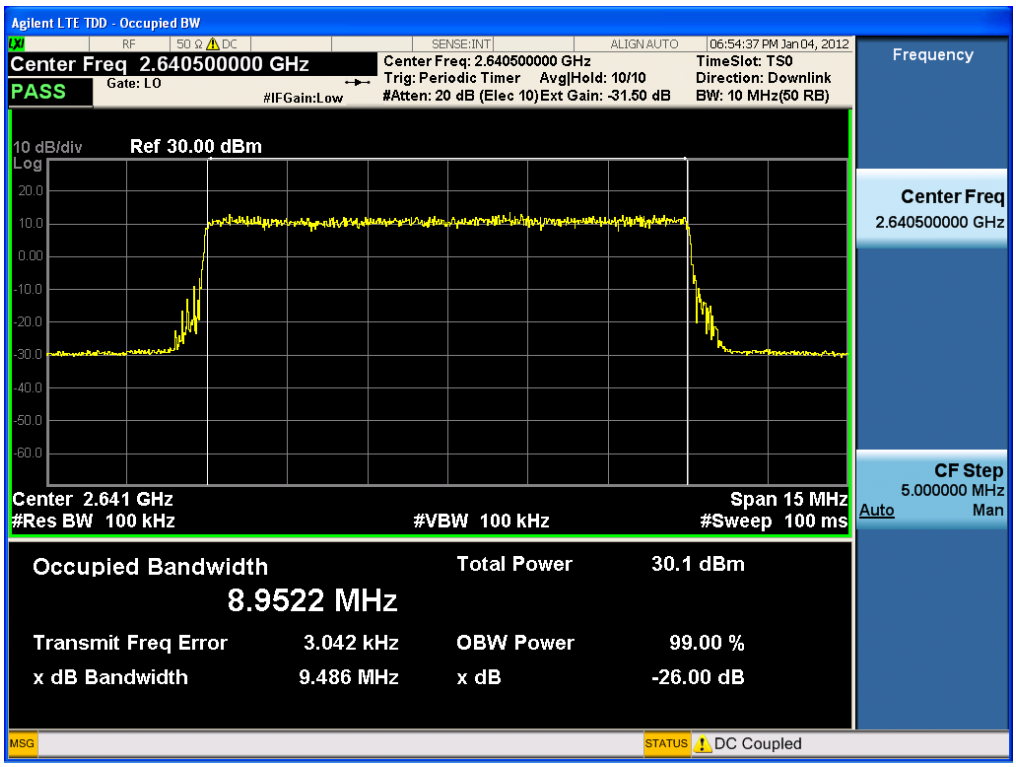

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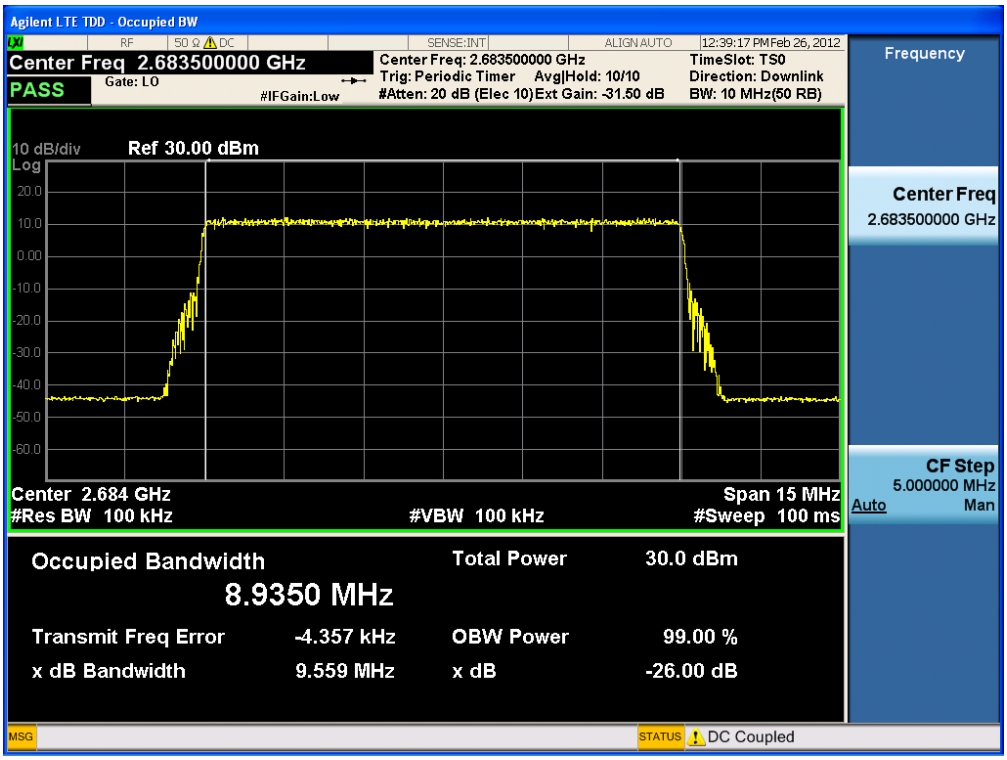

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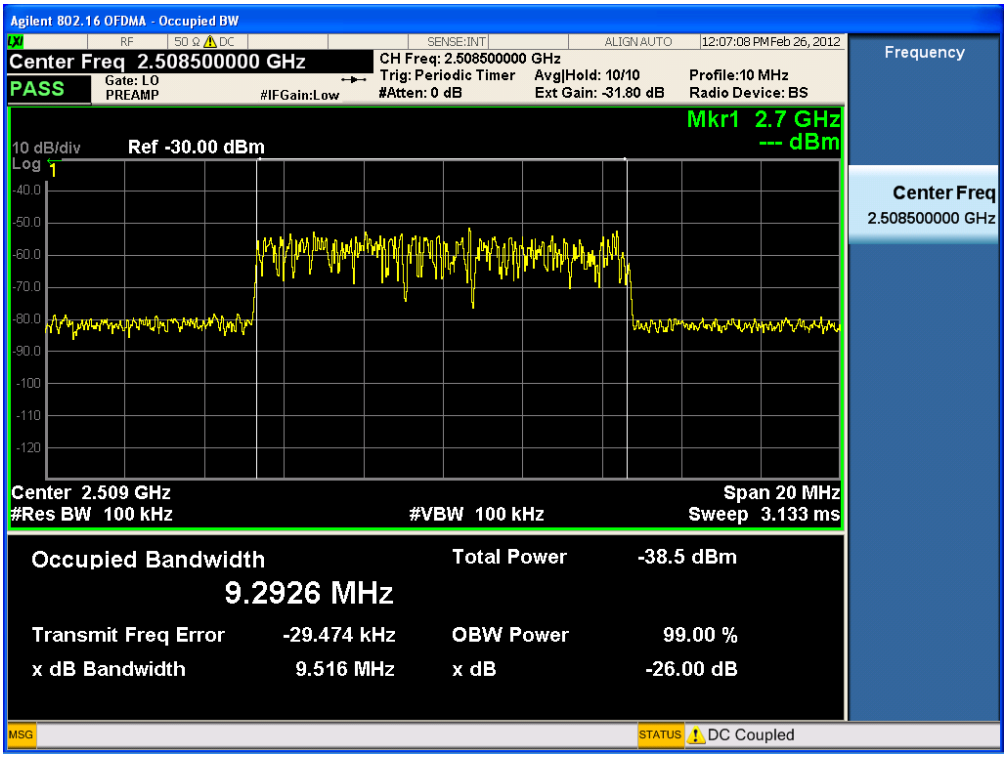

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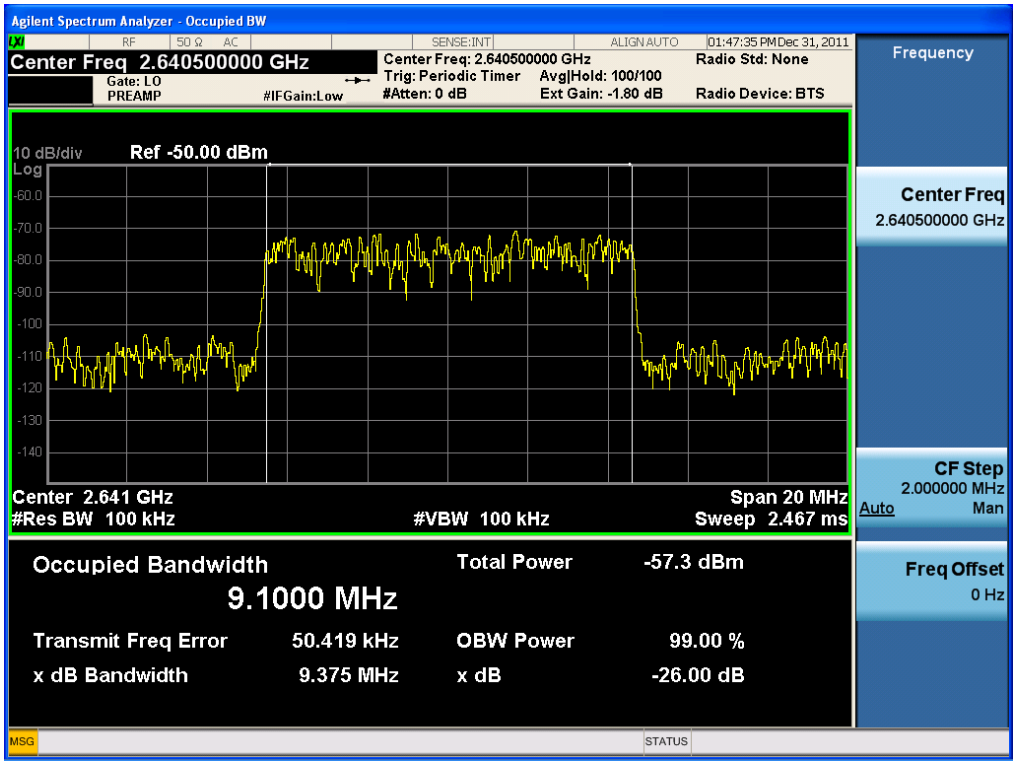

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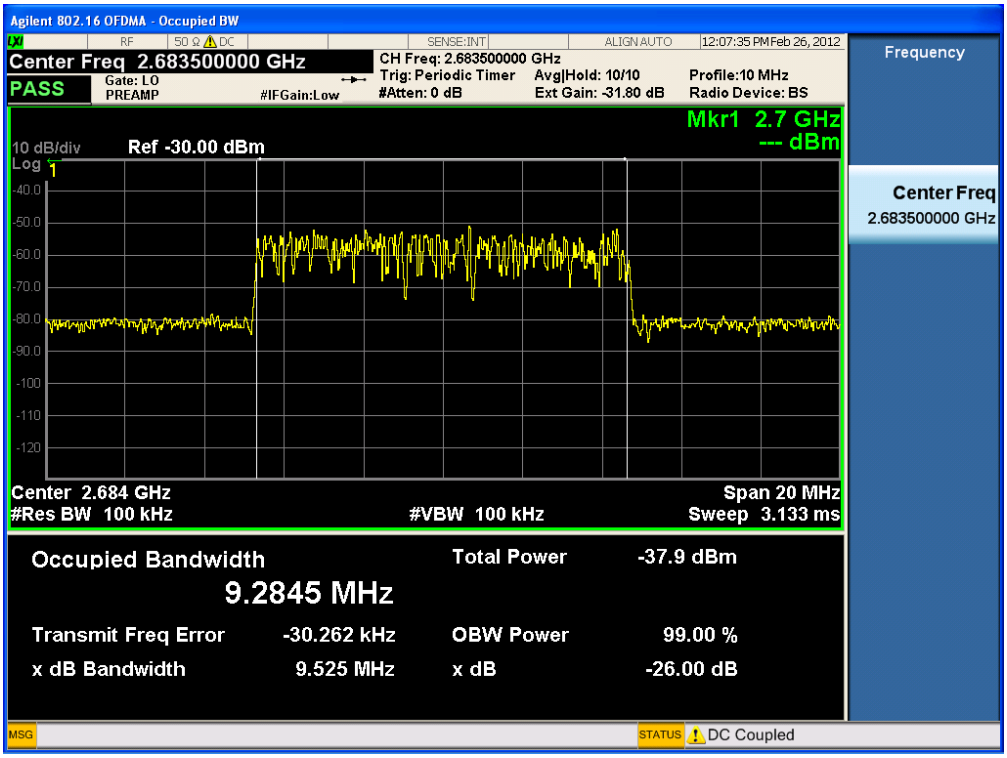

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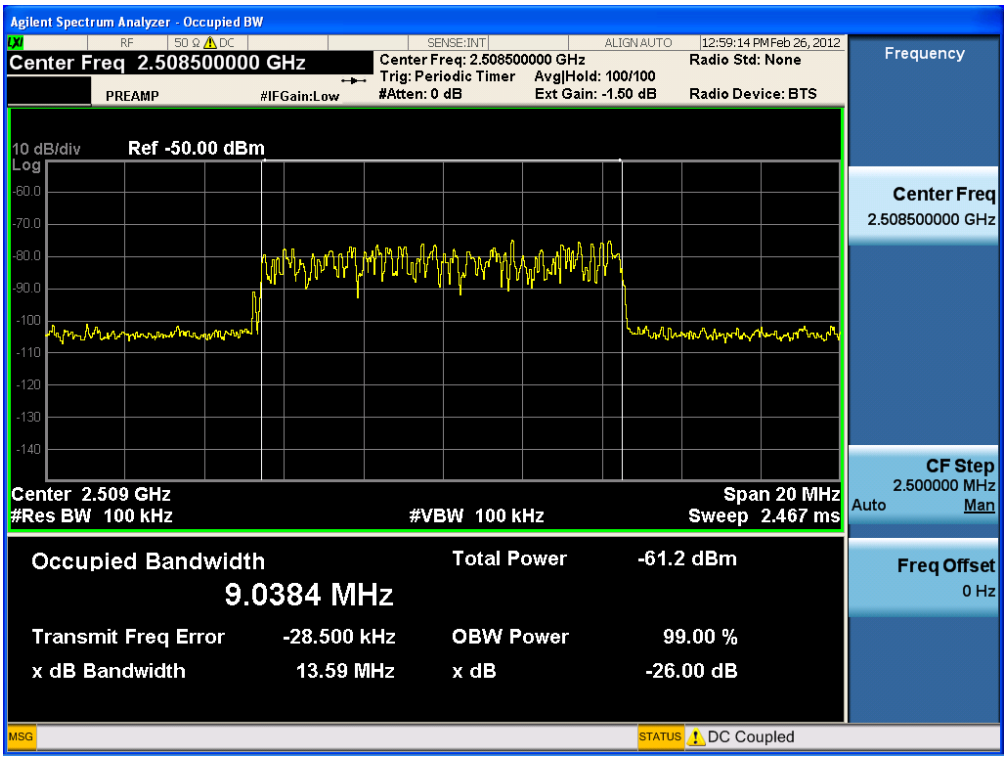

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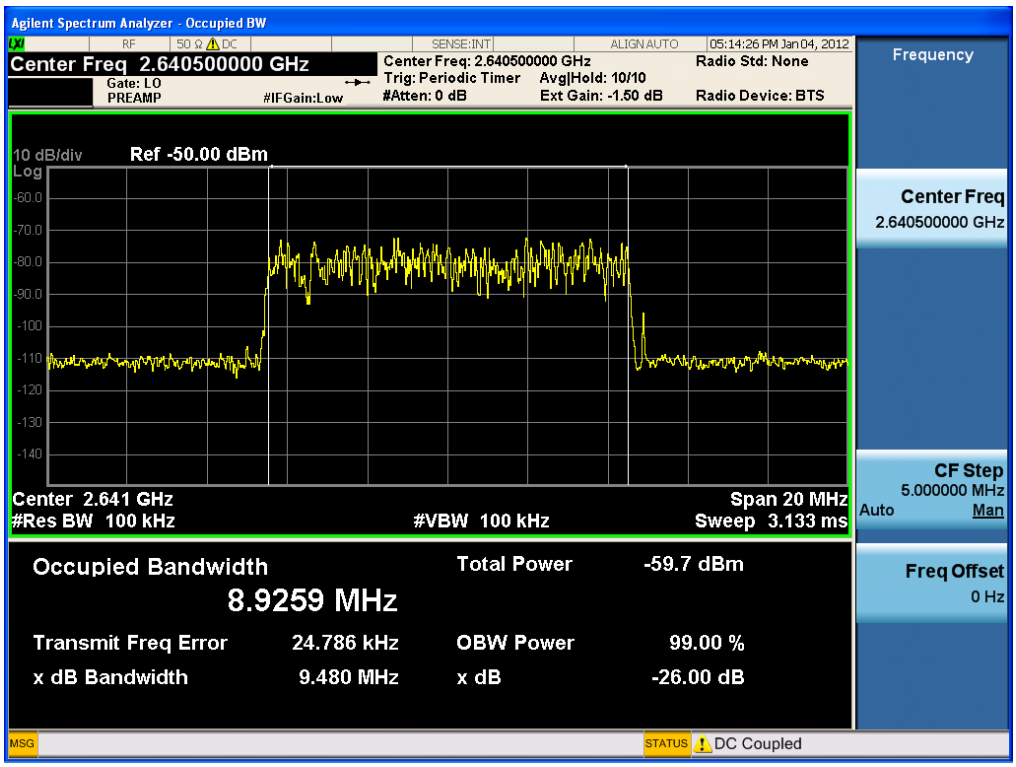

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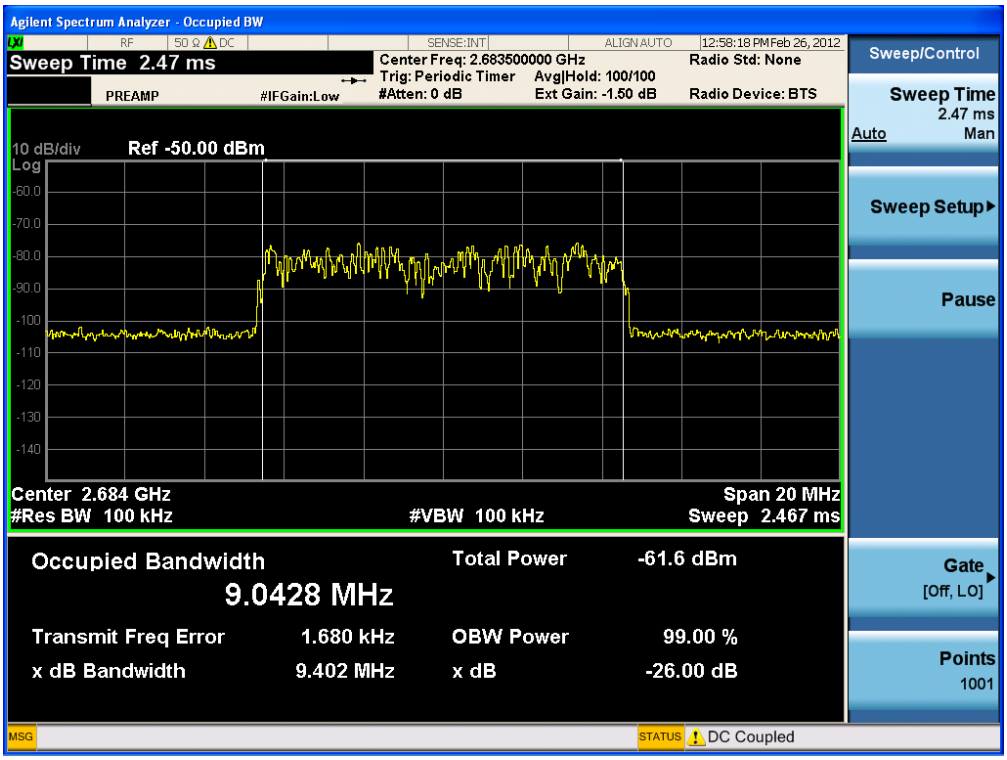


7. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

Test Requirement(s): § 2.1051 Measurements required: Spurious emissions at antenna terminals:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 27.53 Emission limits

(c) For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

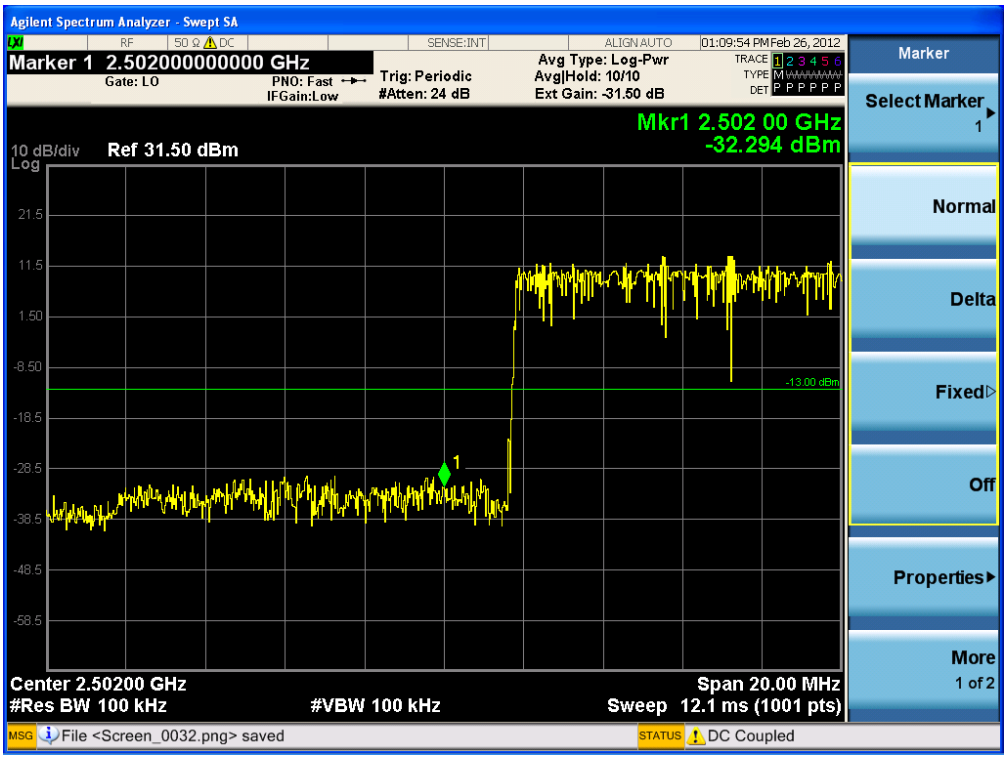
Test Procedures: A modulated carrier generated by the signal generator carrier was connected to either the Uplink or Downlink RF port at a maximum level as determined by the spectrum analyzer was connected to either the Uplink or Downlink port depending on the circuitry being measured.

The spectrum was investigated from 30 MHz to the 26.5 GHz of the carrier.

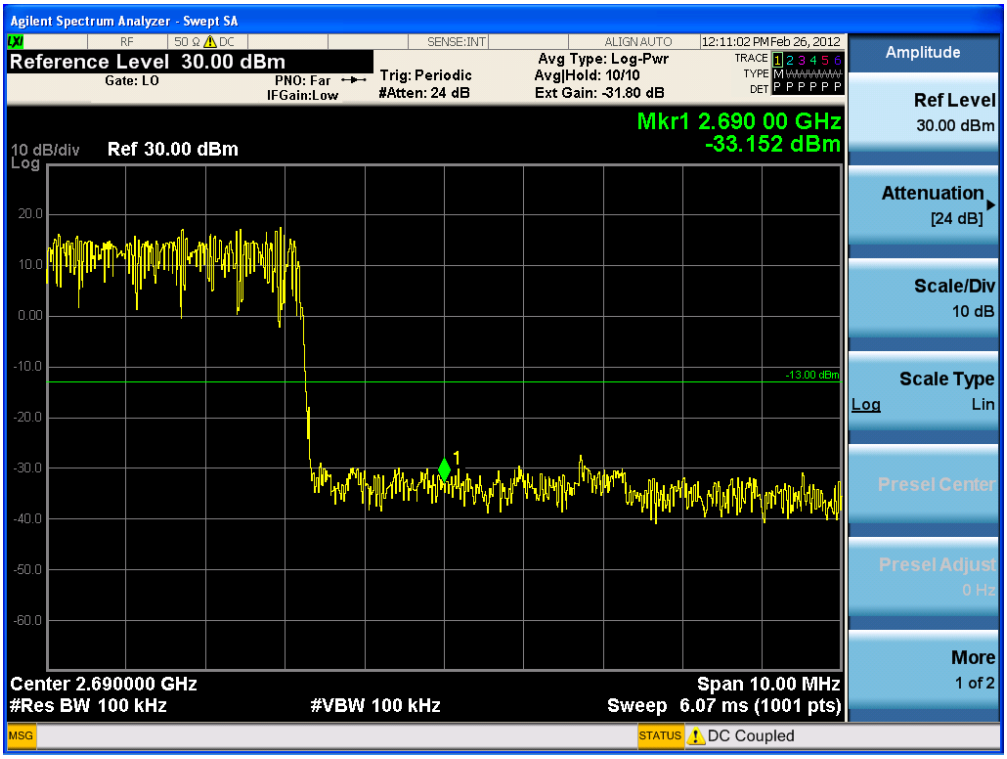
Test Results: The EUT complies with the requirements of this section. There were no detectable Spurious emissions for this EUT.

Plots of BAND EDGE

[WiMax Downlink Low]



[WiMax Downlink High]



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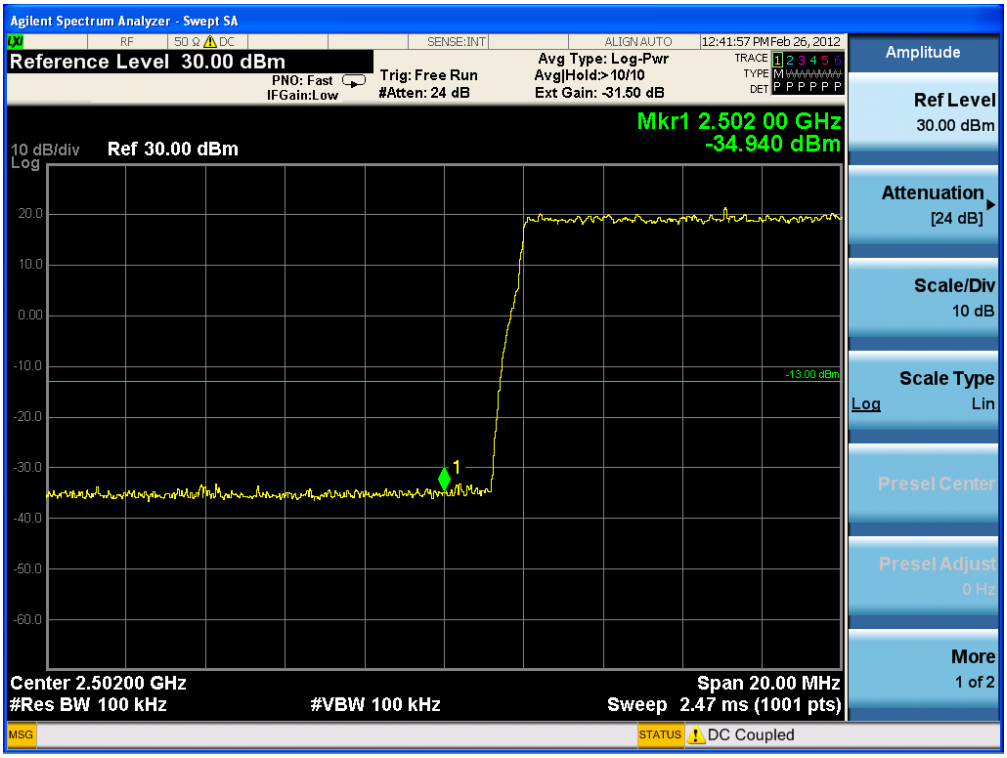

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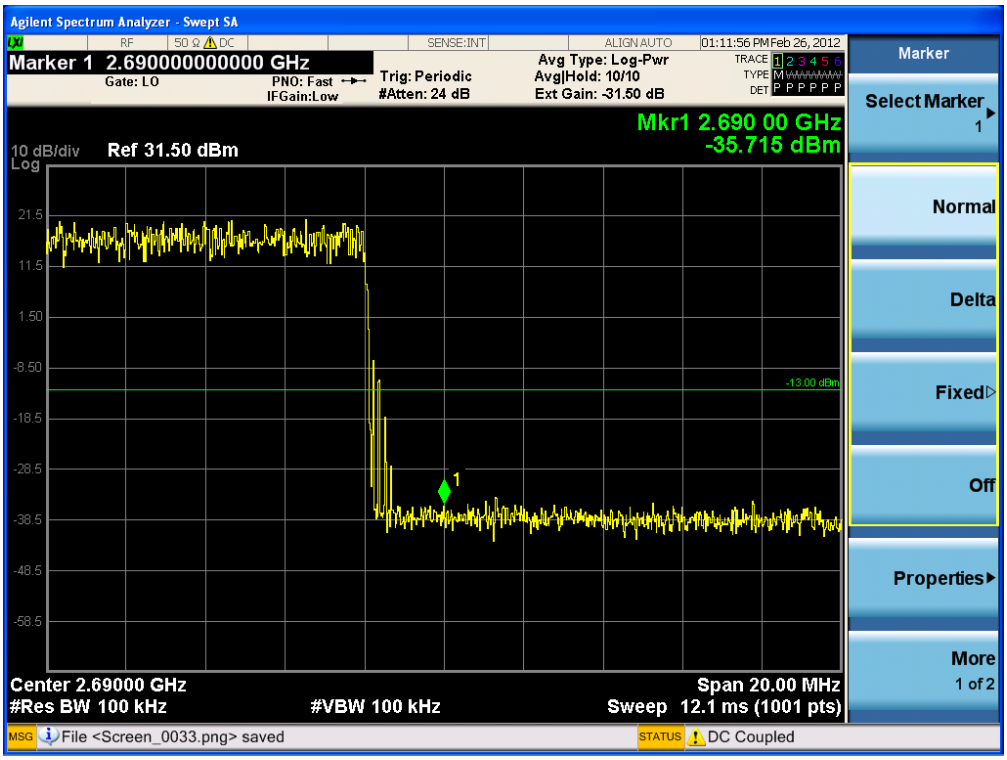
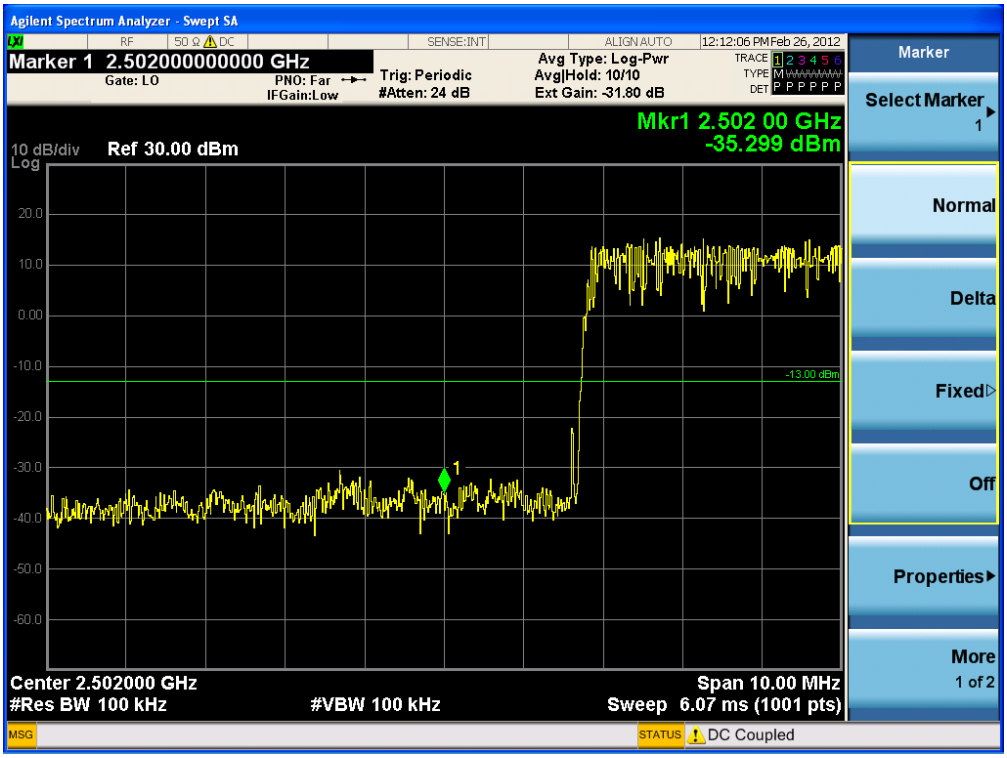


[WiMax Uplink Low]



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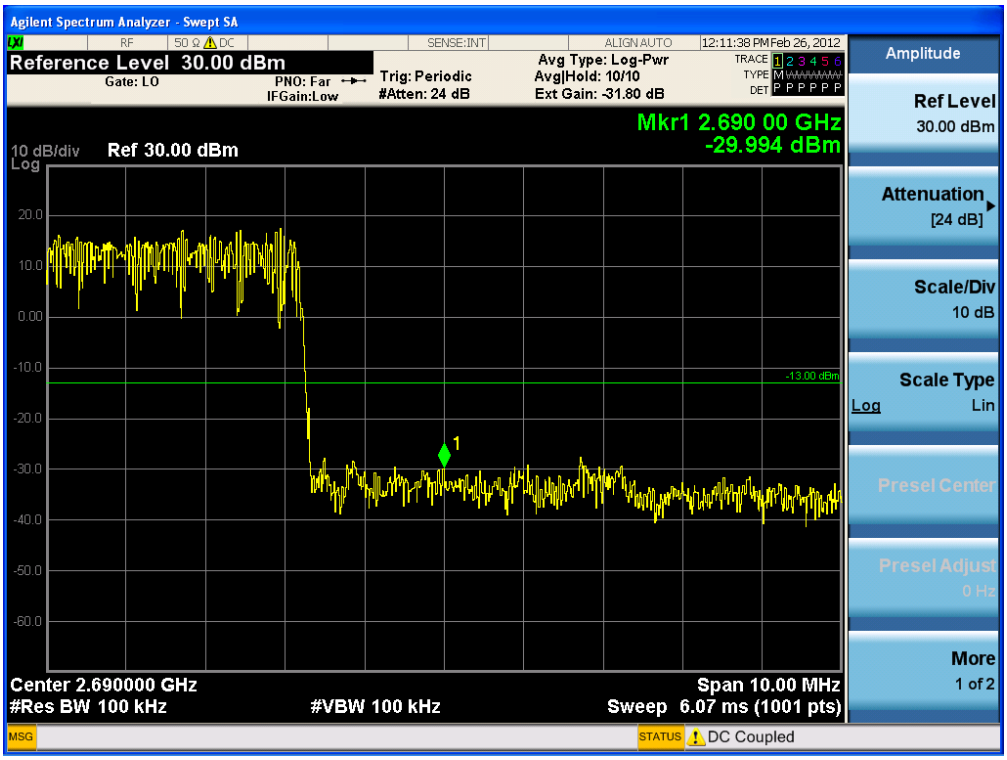

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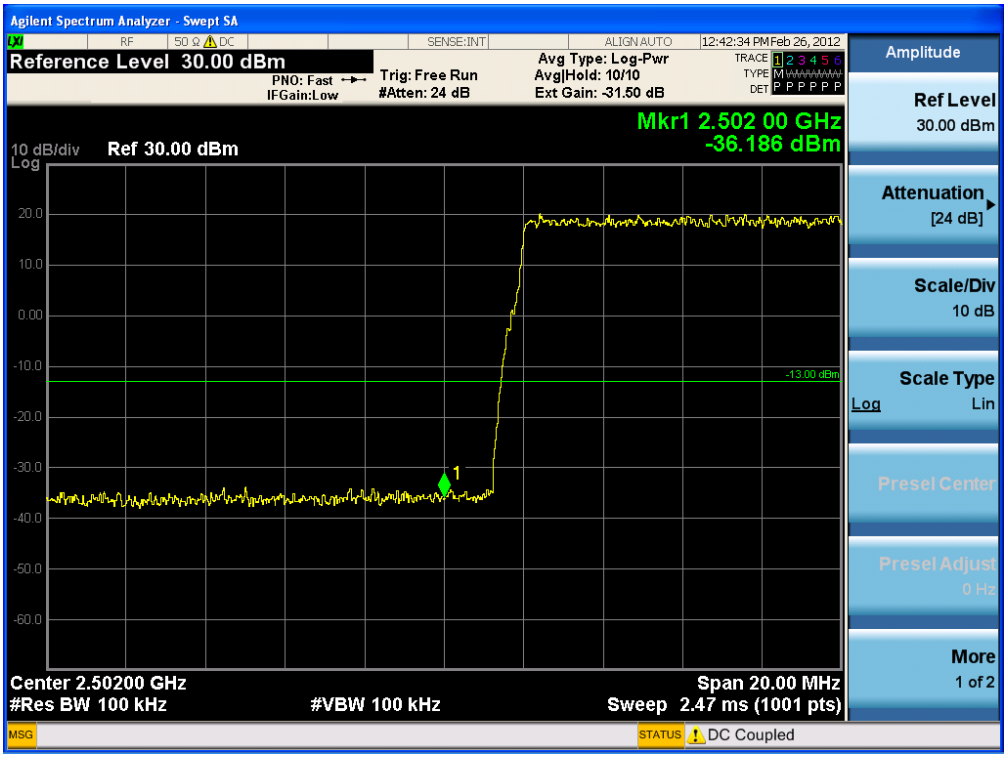

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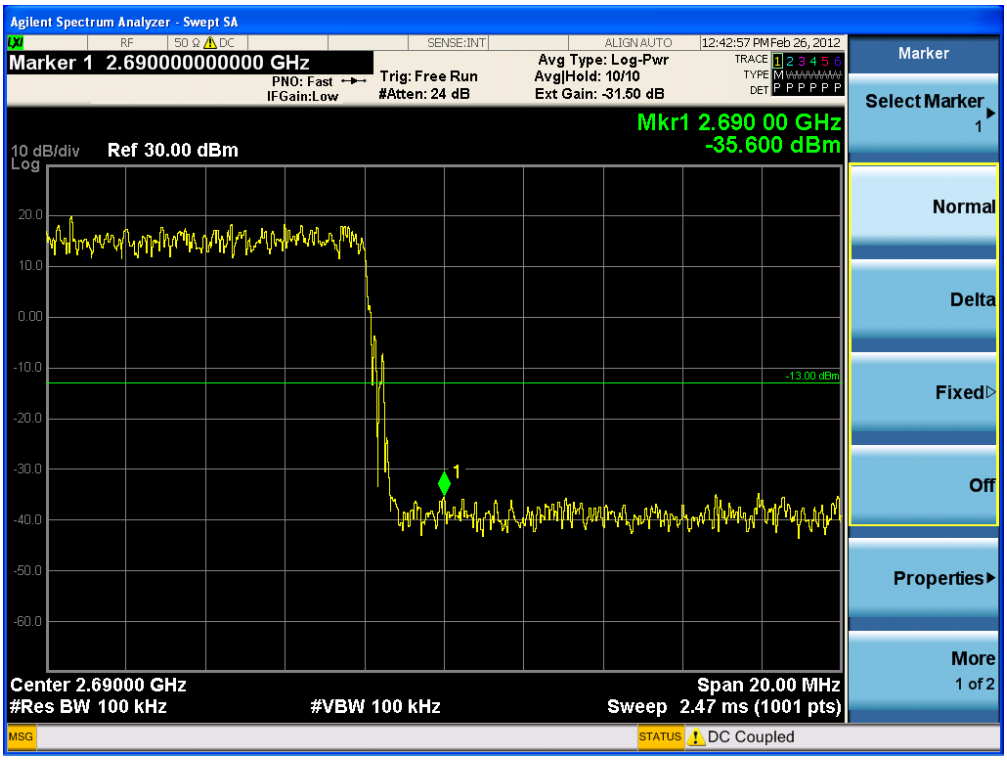
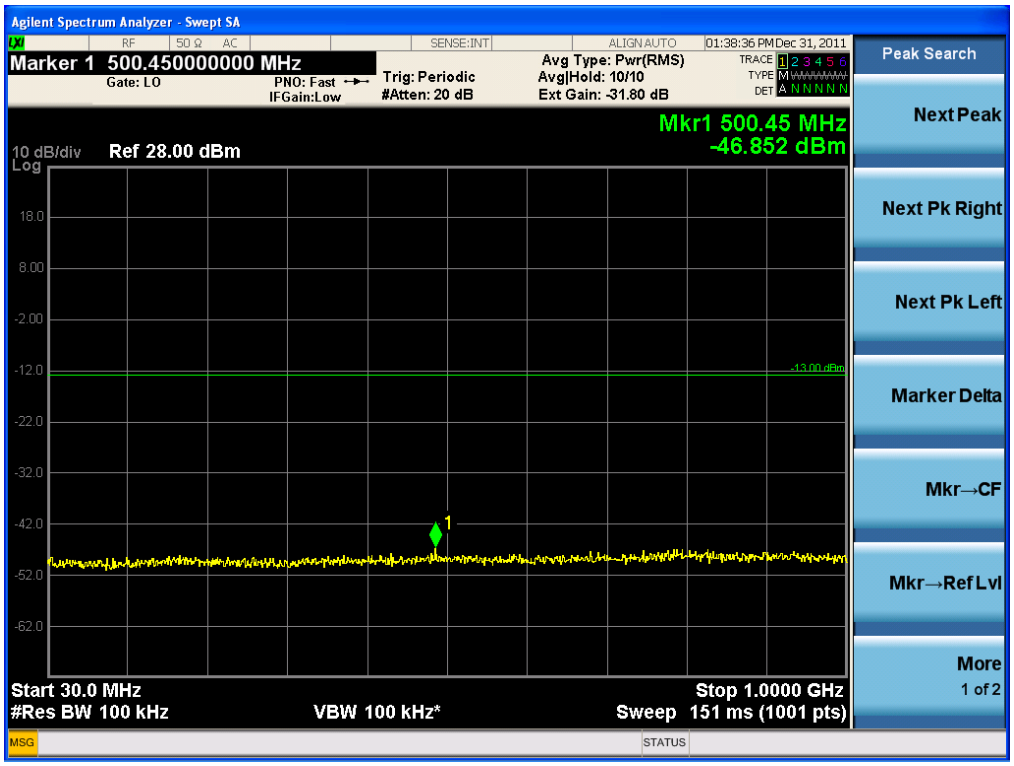


Plots of Spurious Emission

Conducted Spurious Emissions (30 MHz – 1 GHz)

[WiMax Downlink Low]



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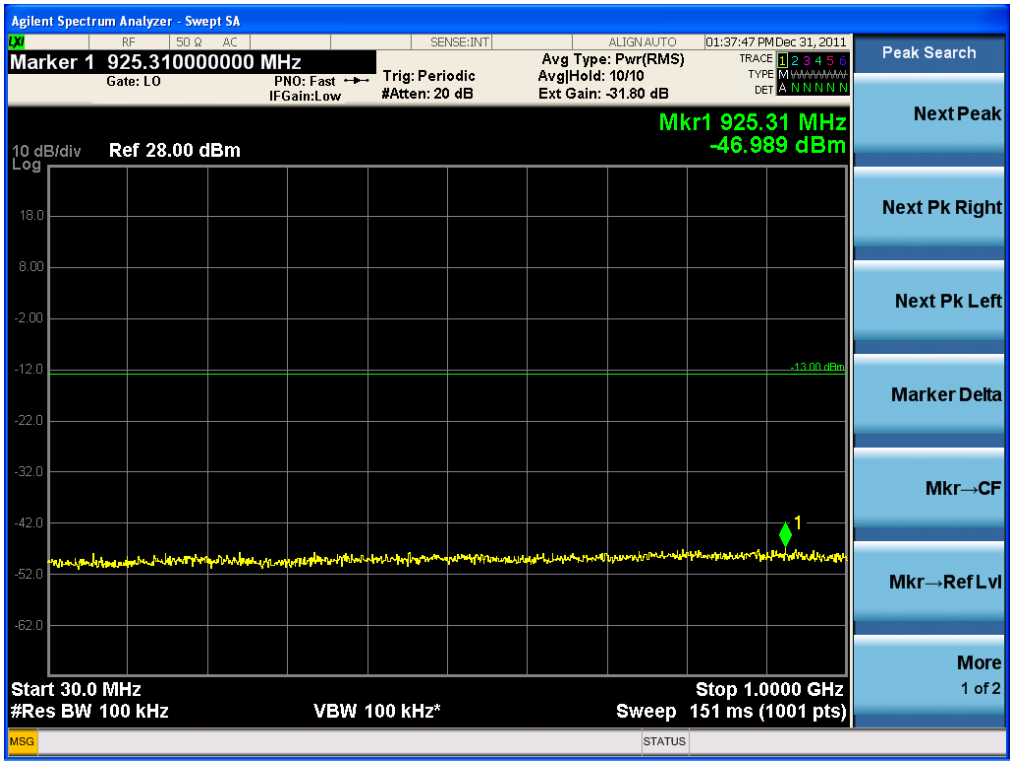

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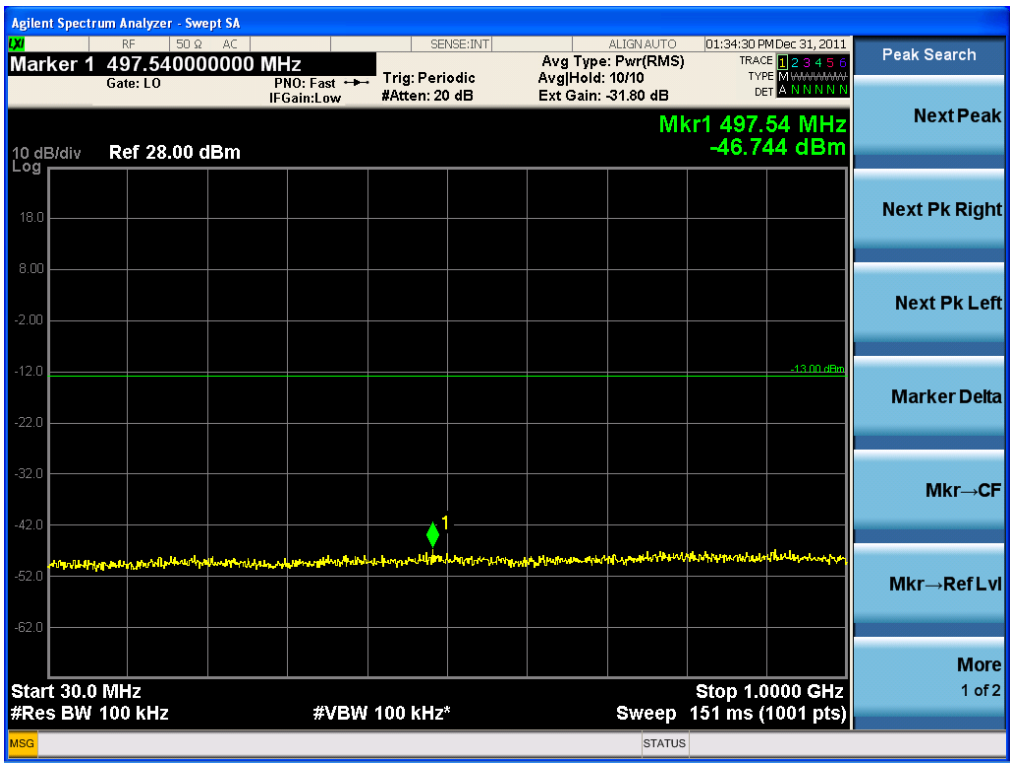

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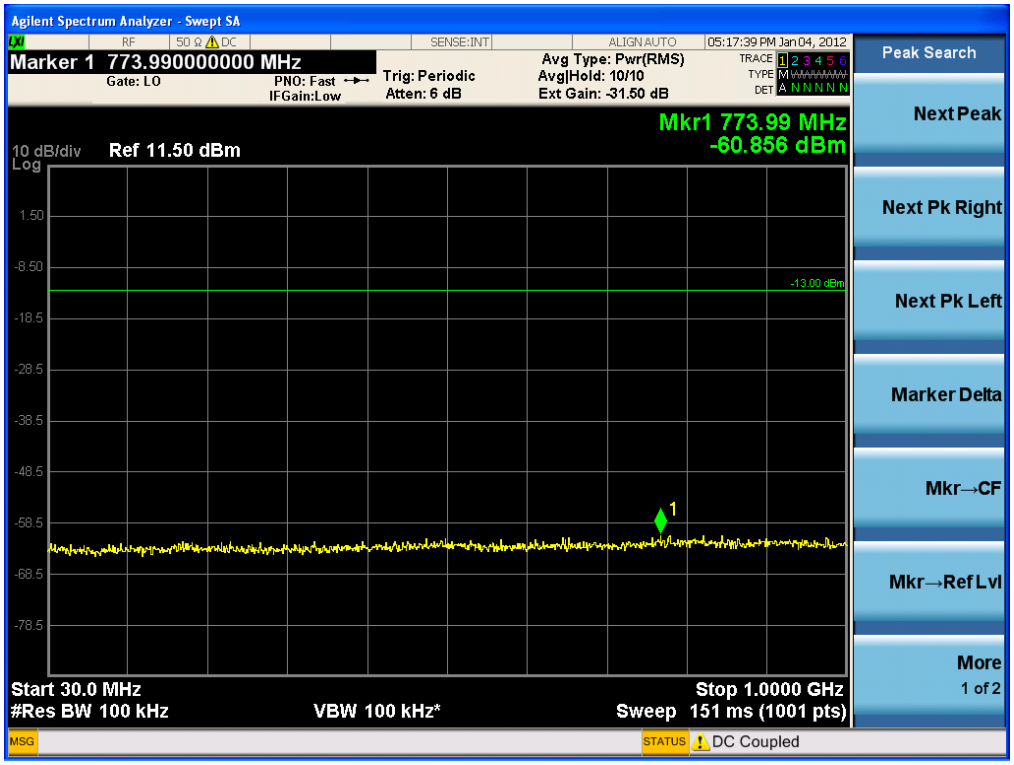

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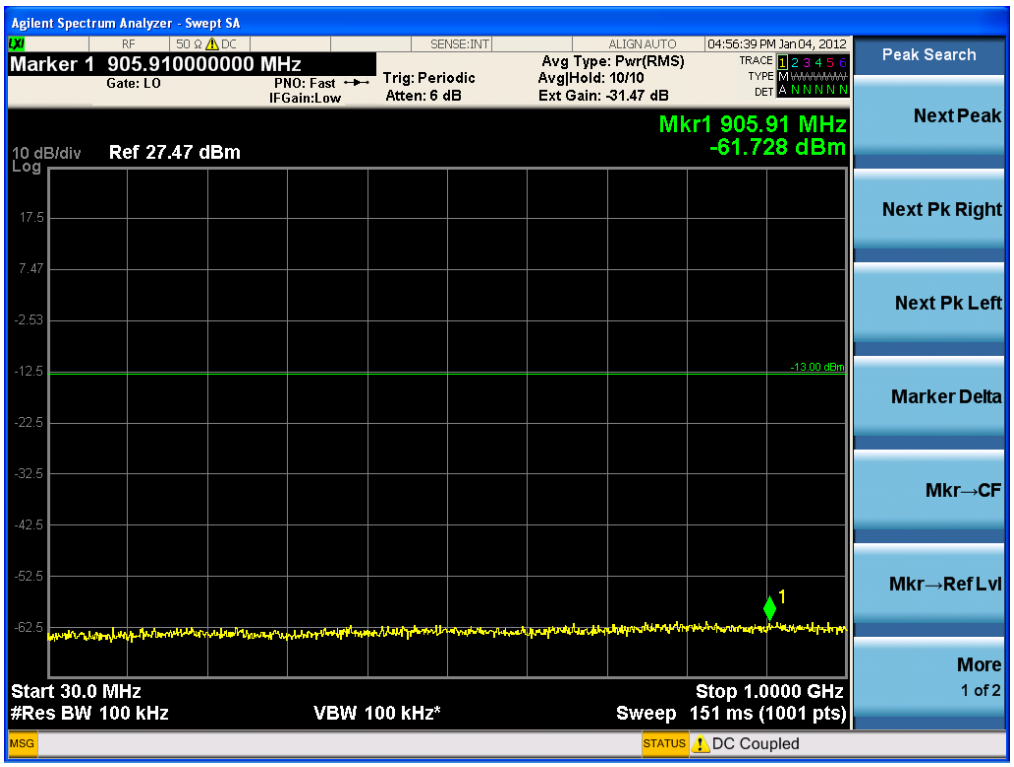

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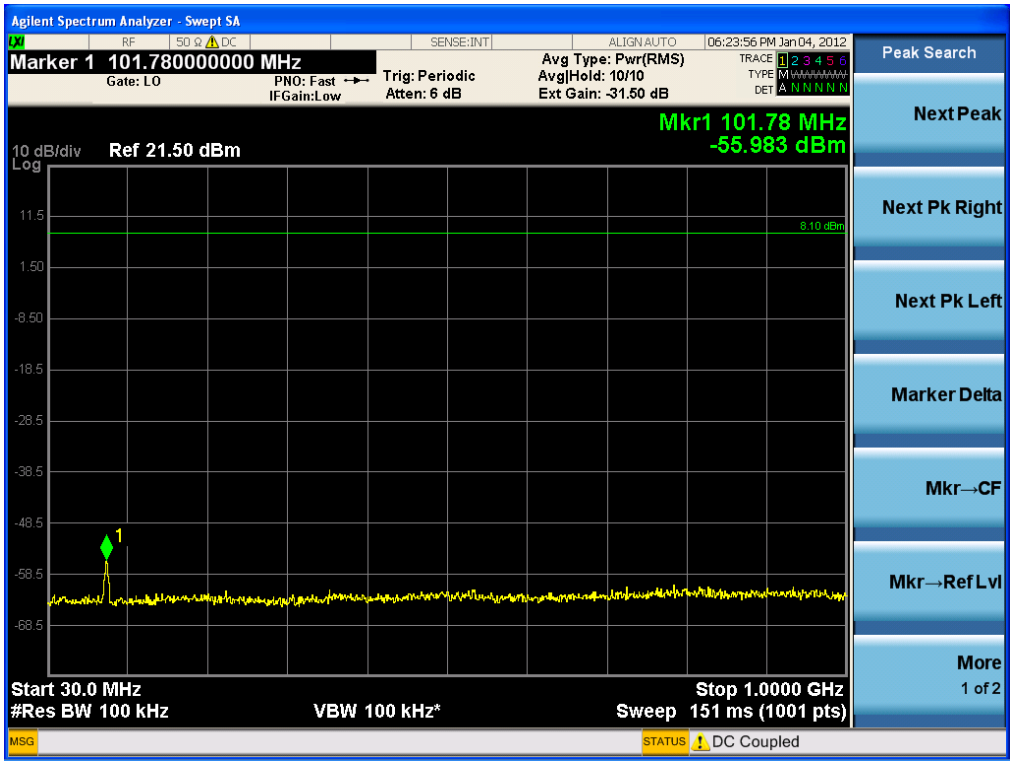

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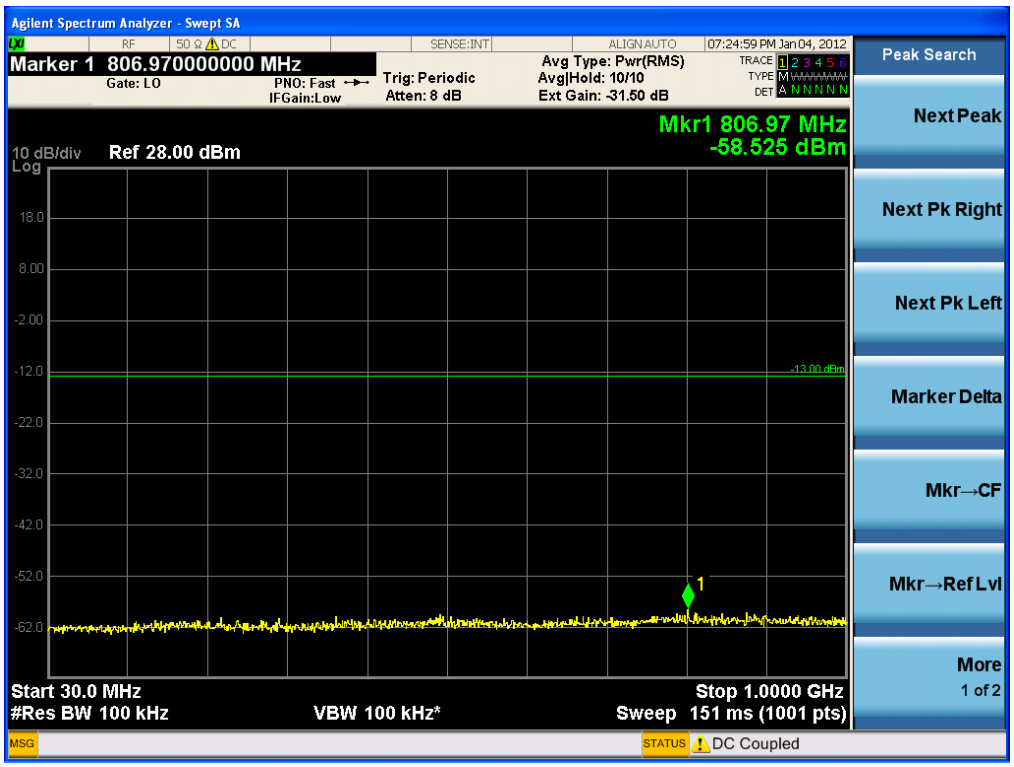

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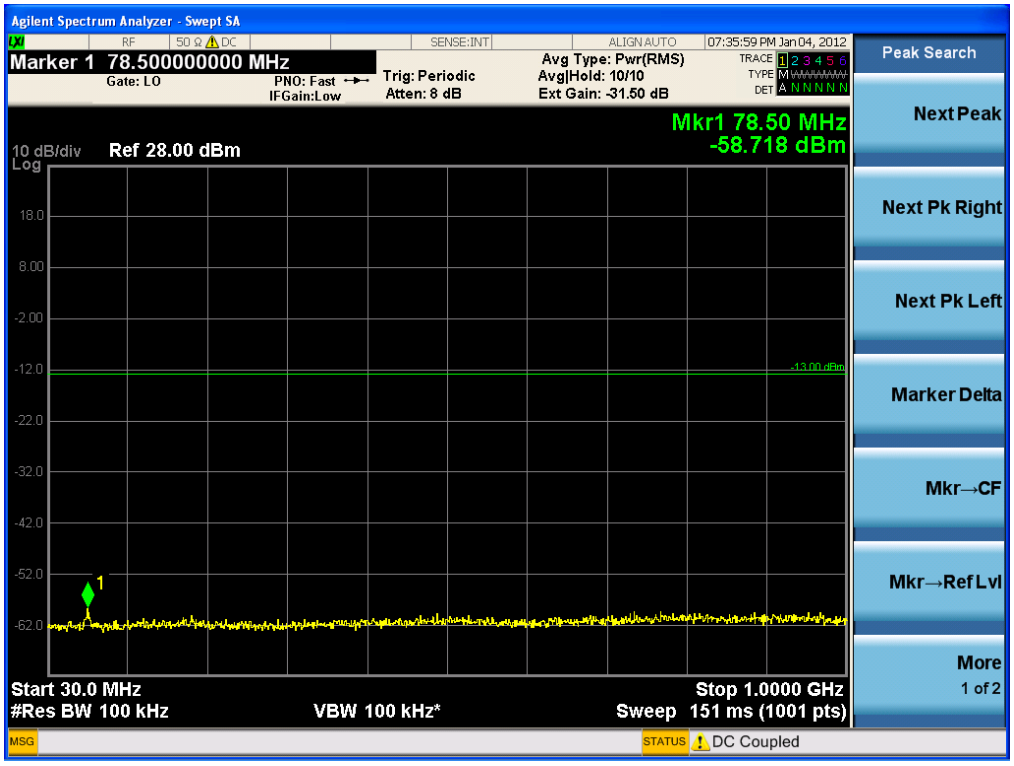

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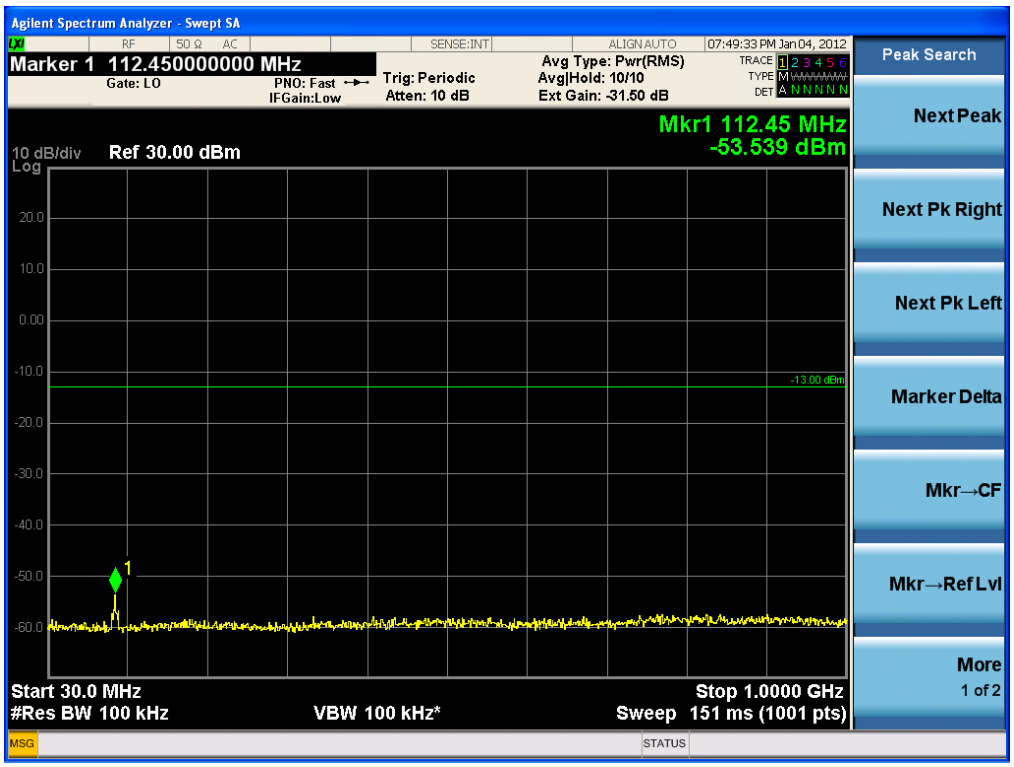

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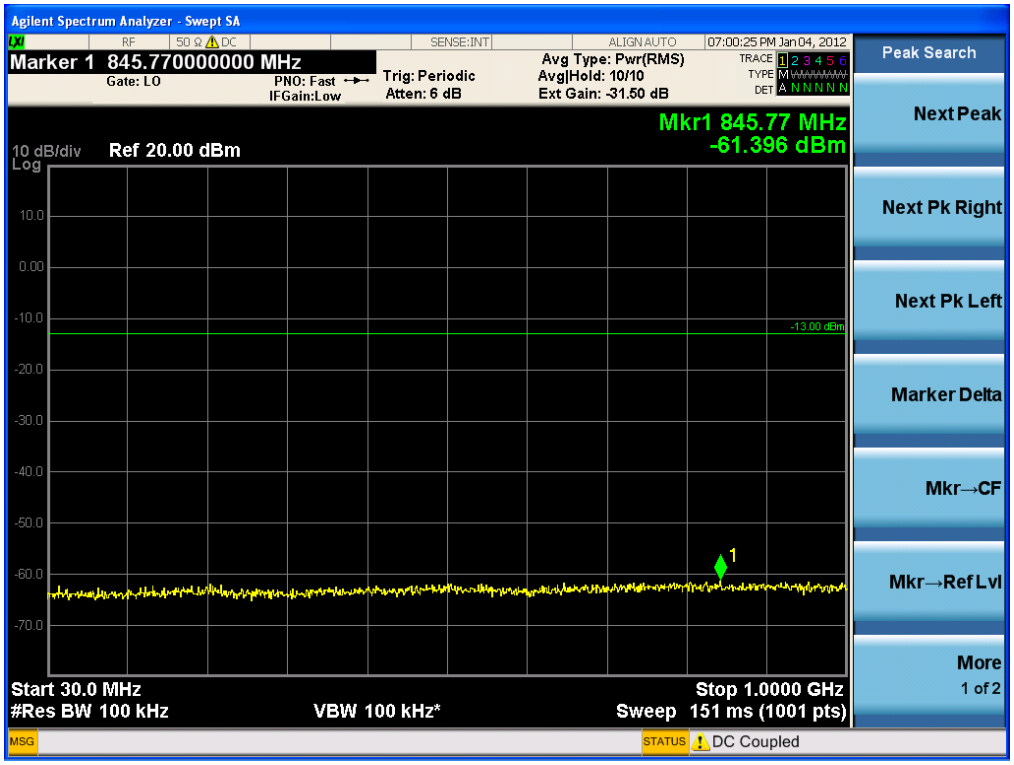

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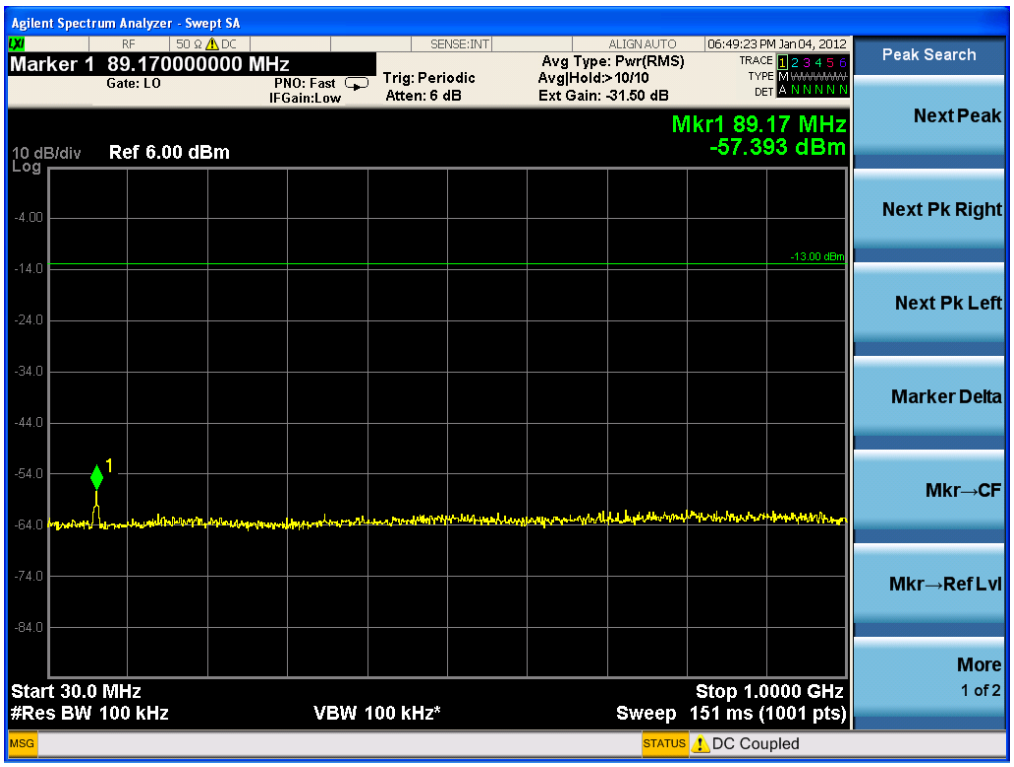

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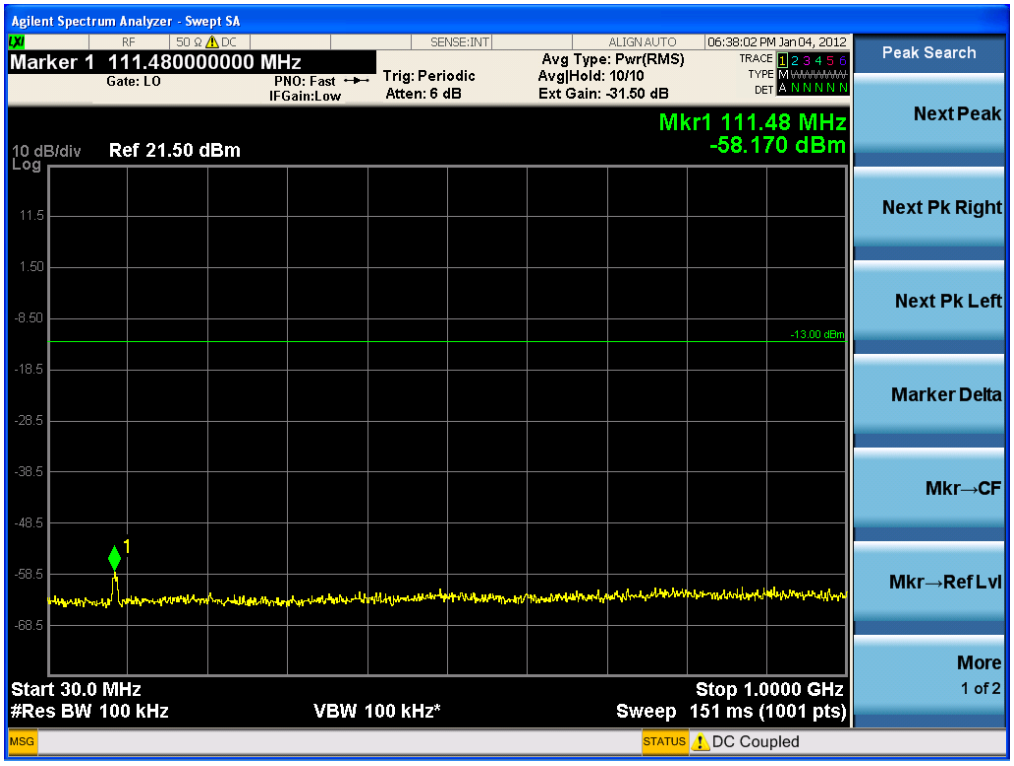
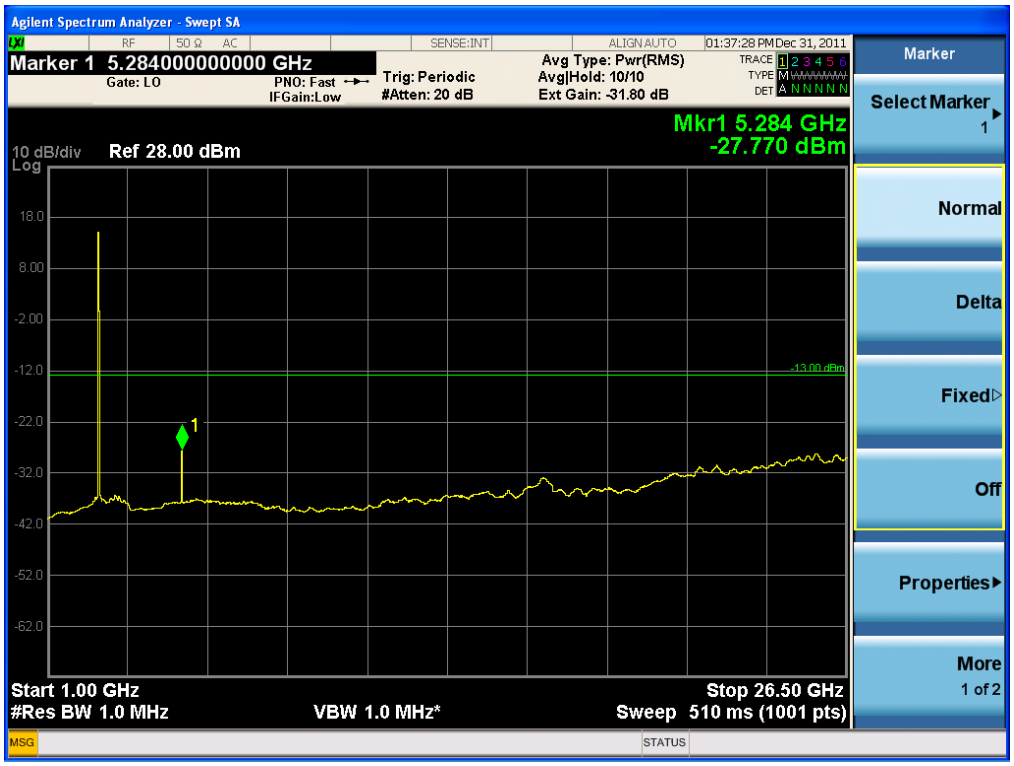


Conducted Spurious Emissions (1 GHz –26.5 GHz)

[WiMax Downlink Low]

[WiMax Downlink Middle]



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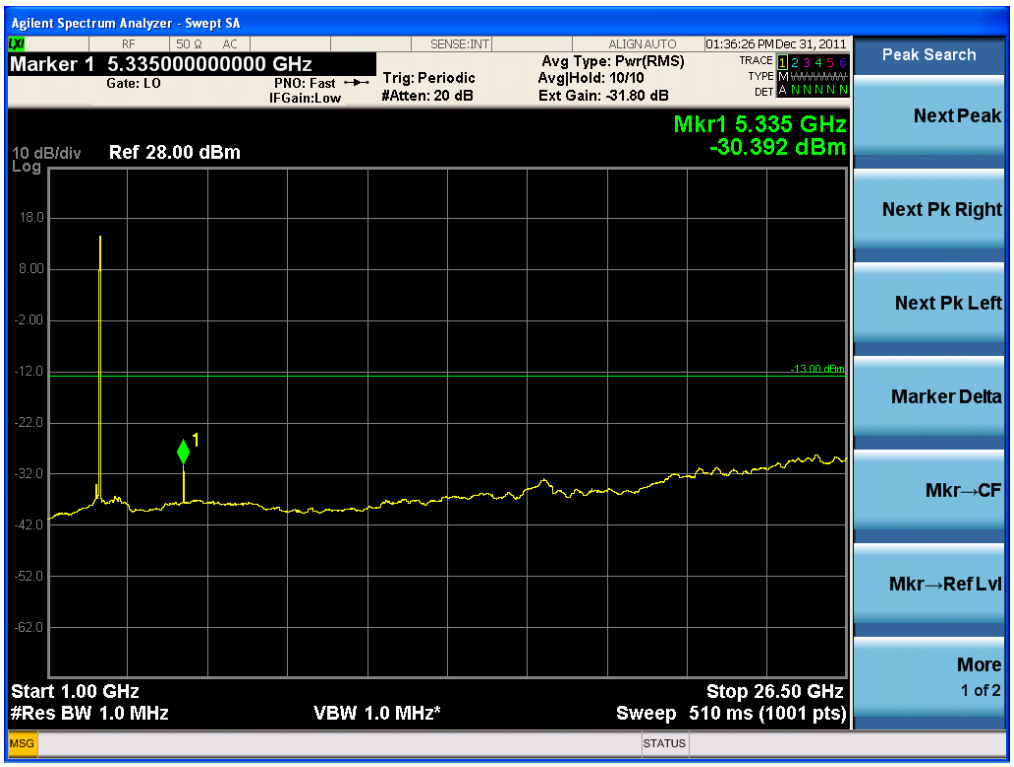

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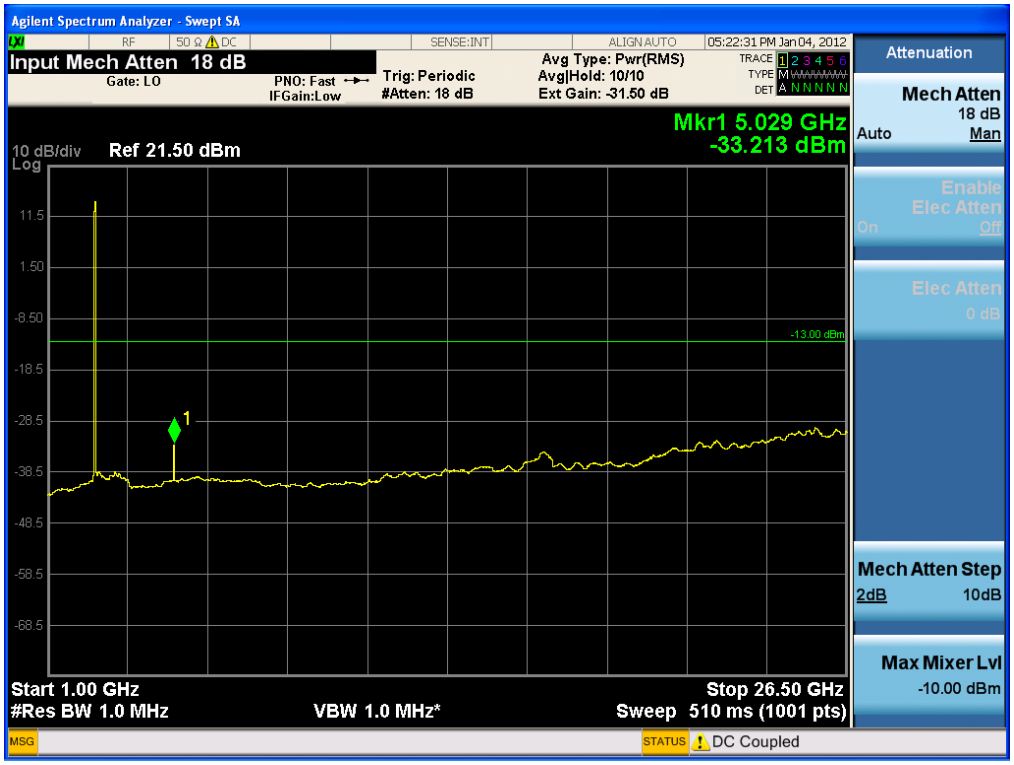

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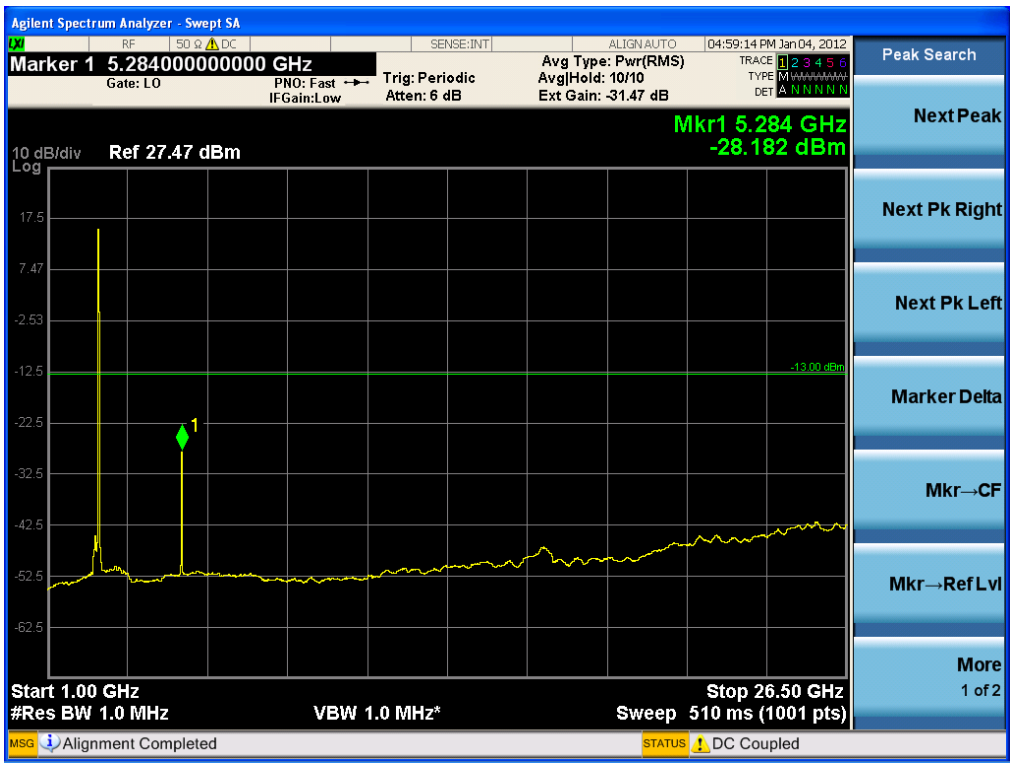

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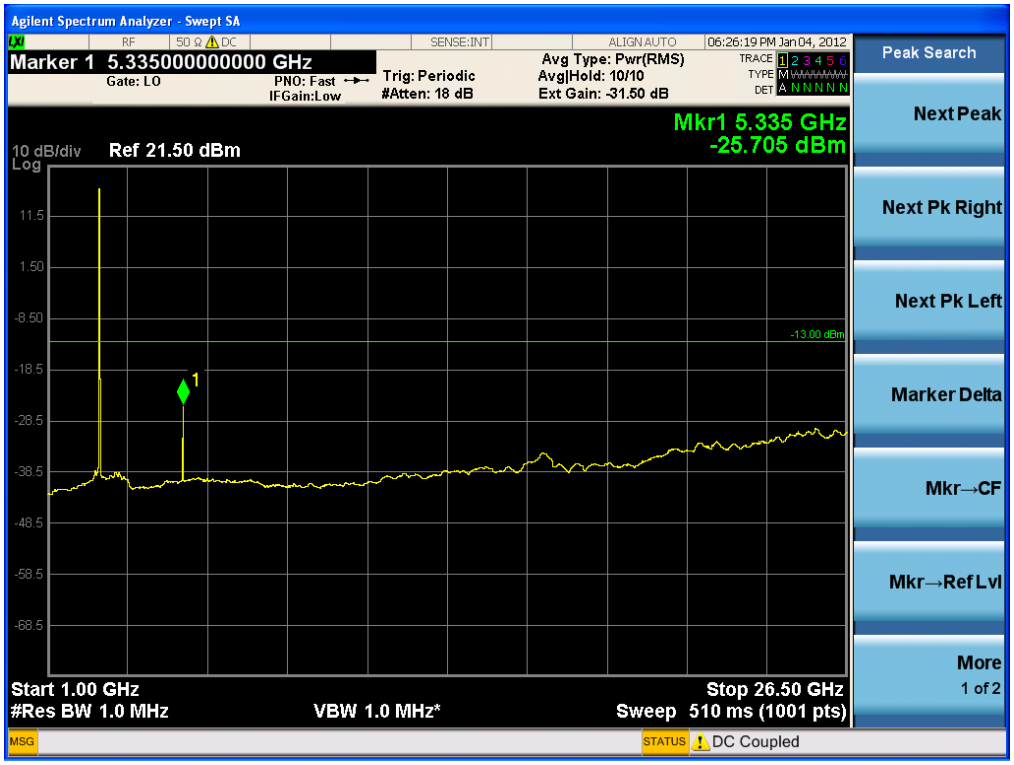

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[WiMax Uplink Middle]

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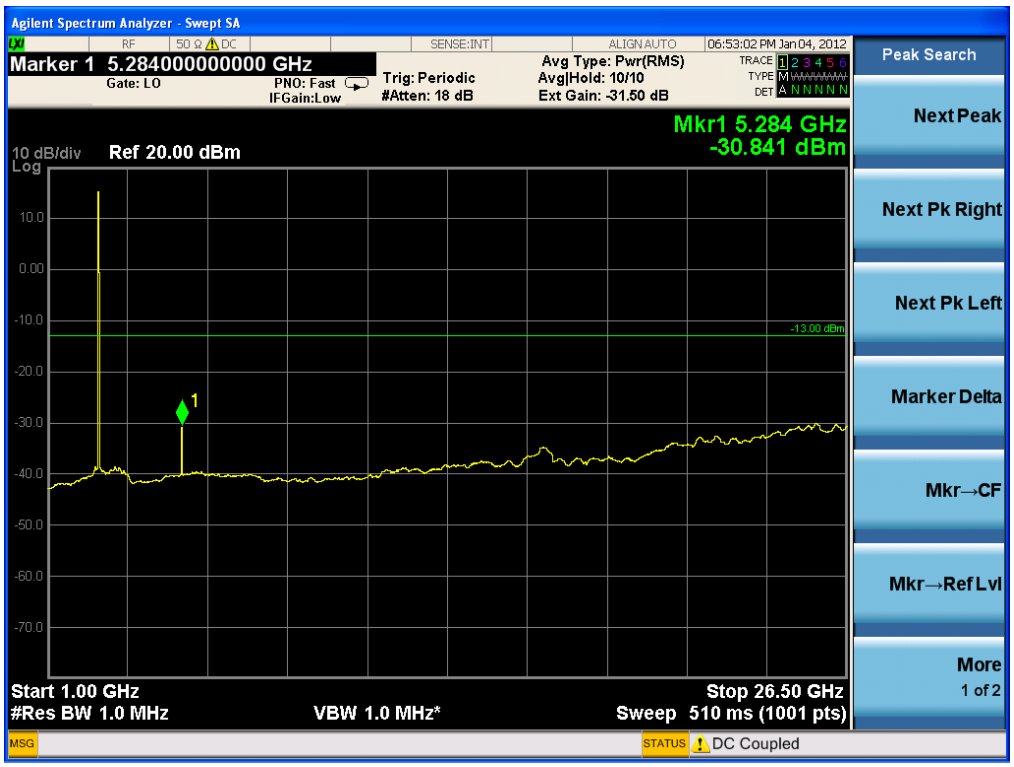

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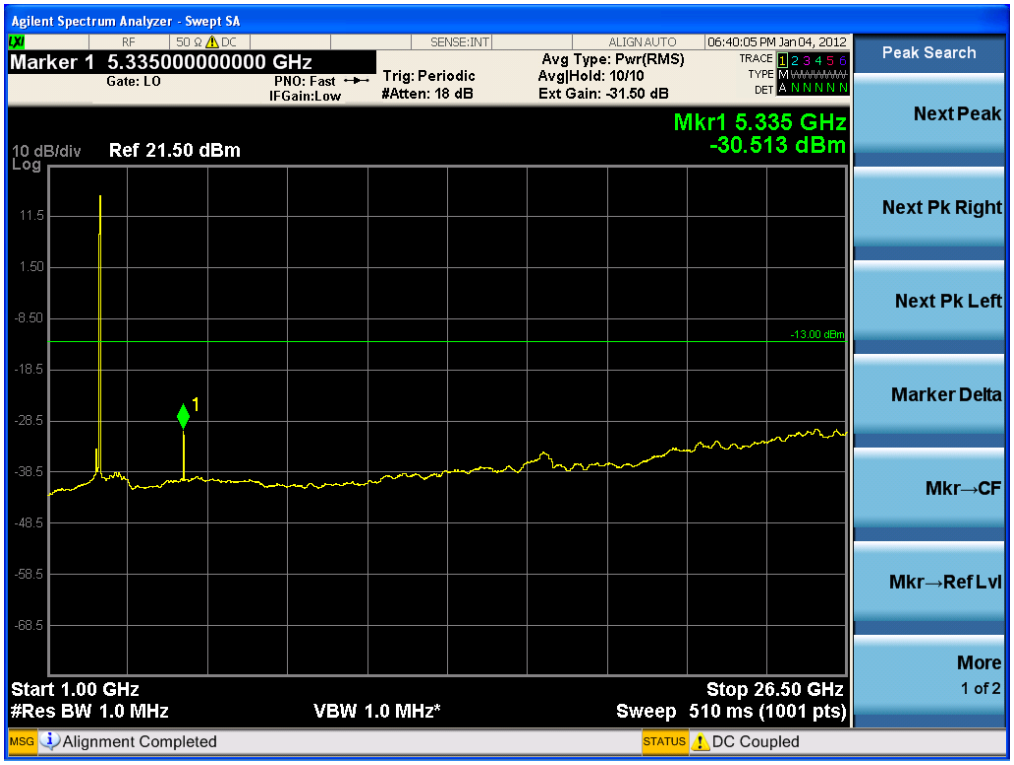
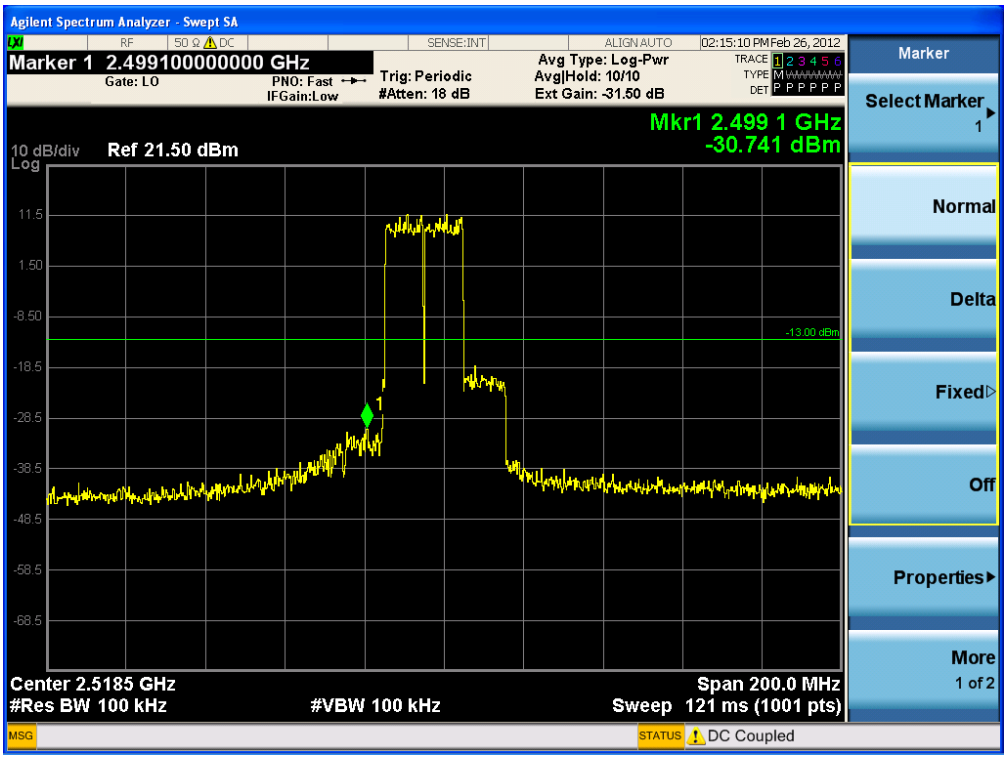


Intermodulation Spurious Emissions

[WiMax Downlink Low]



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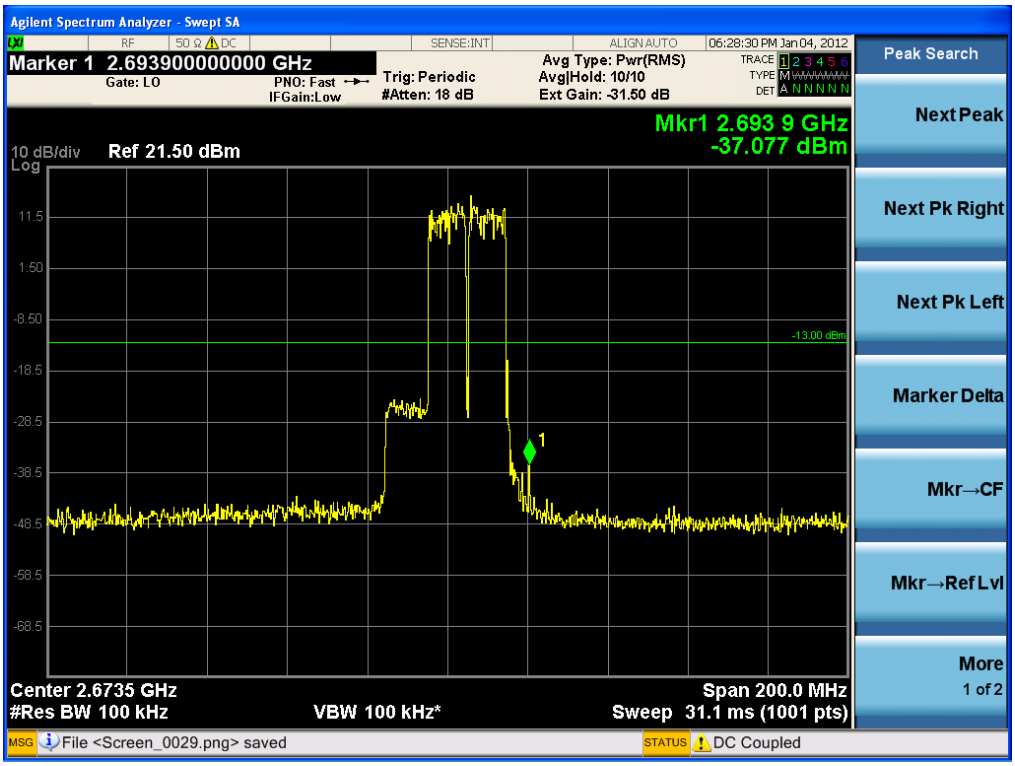

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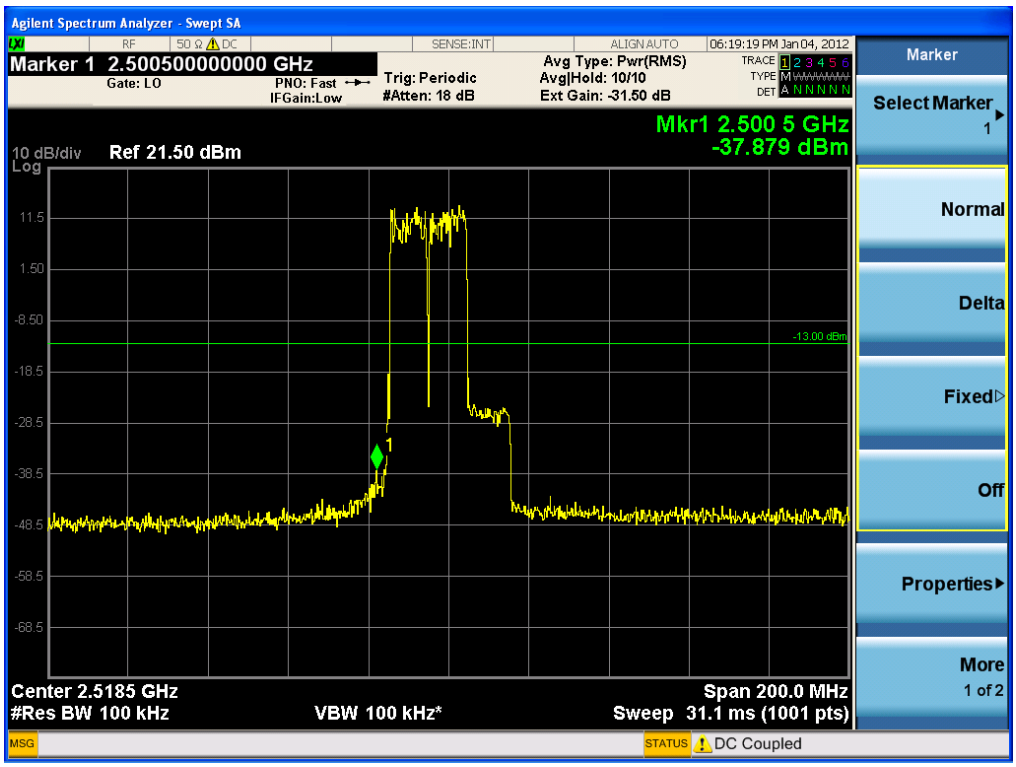

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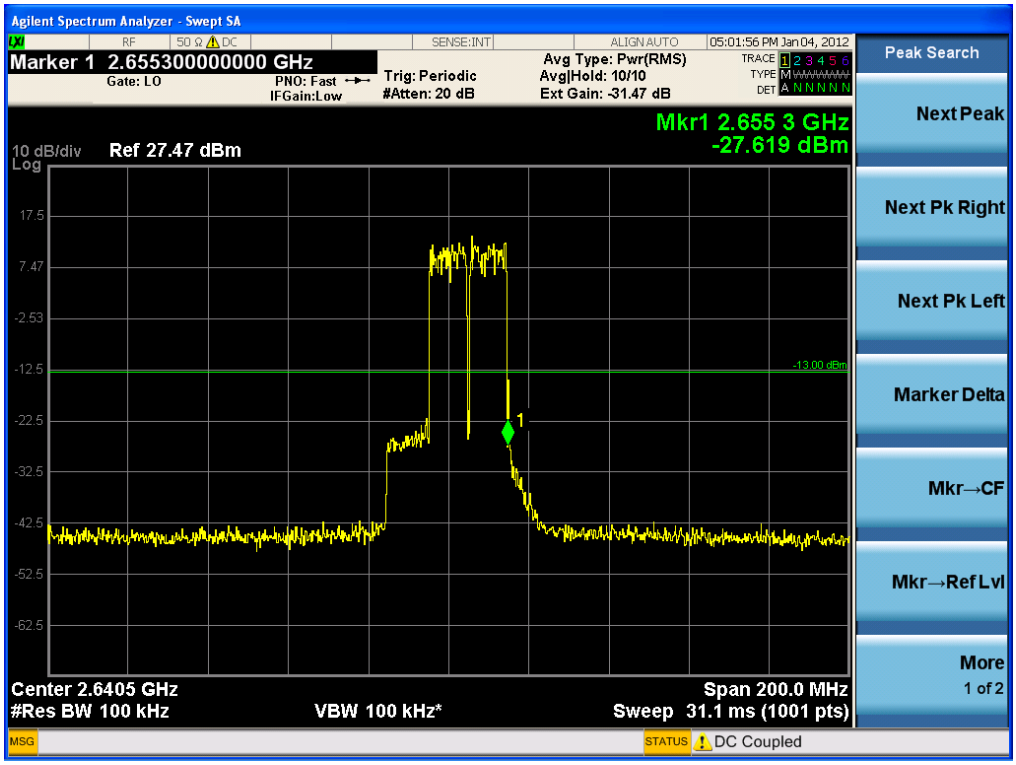

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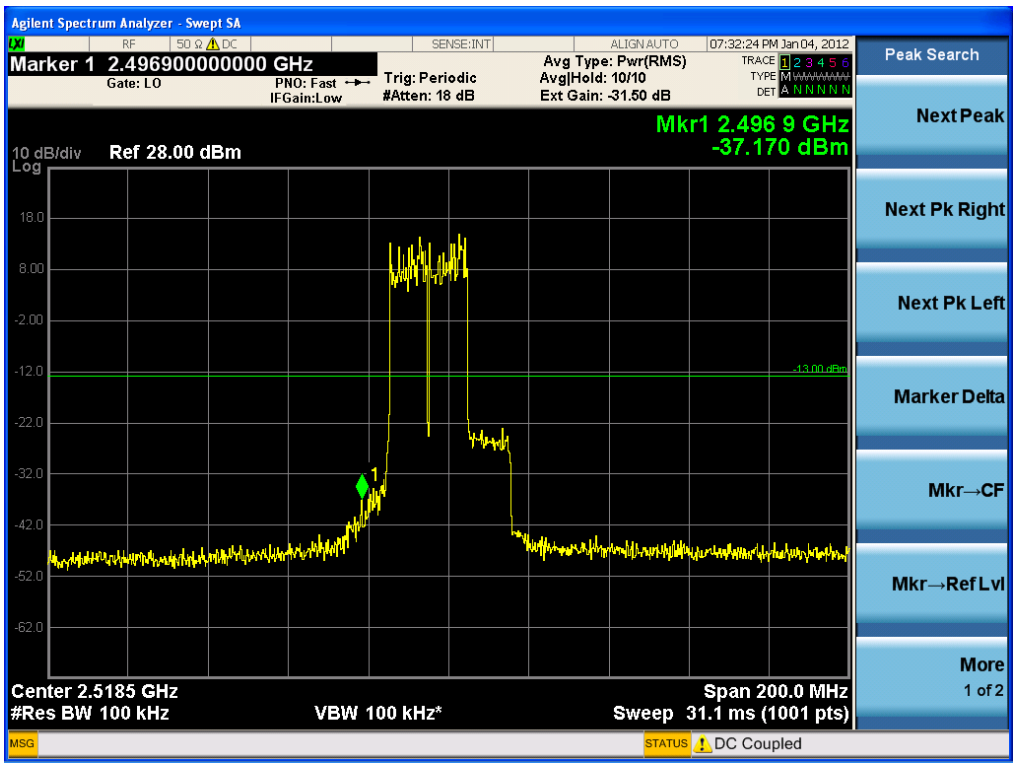

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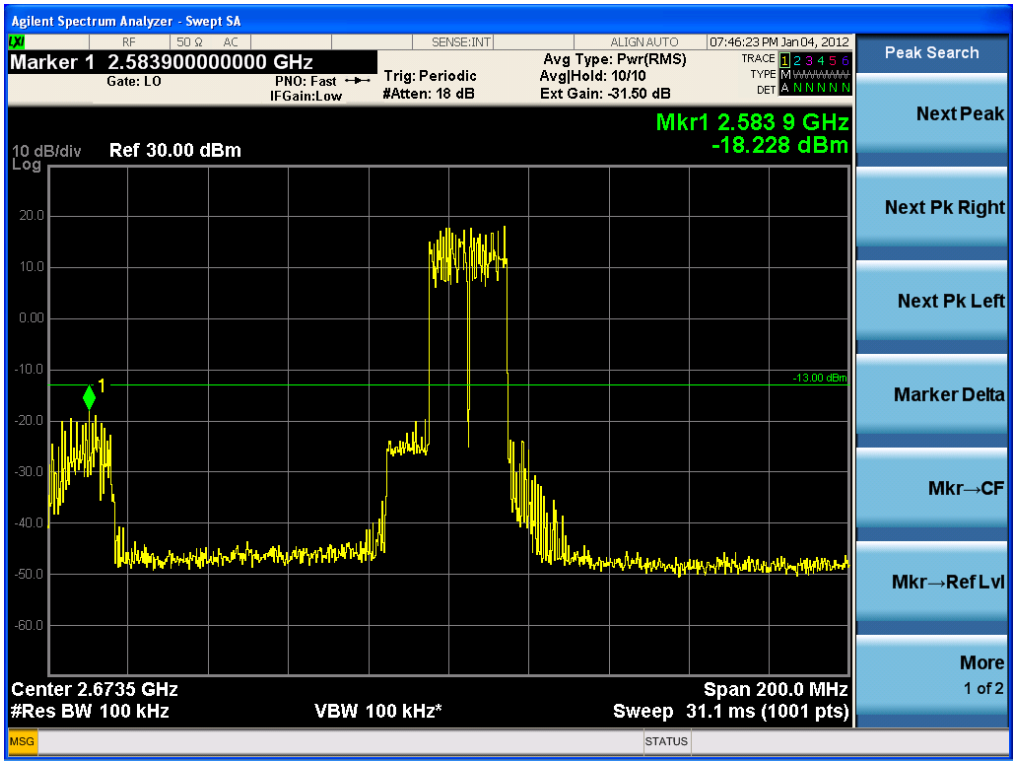

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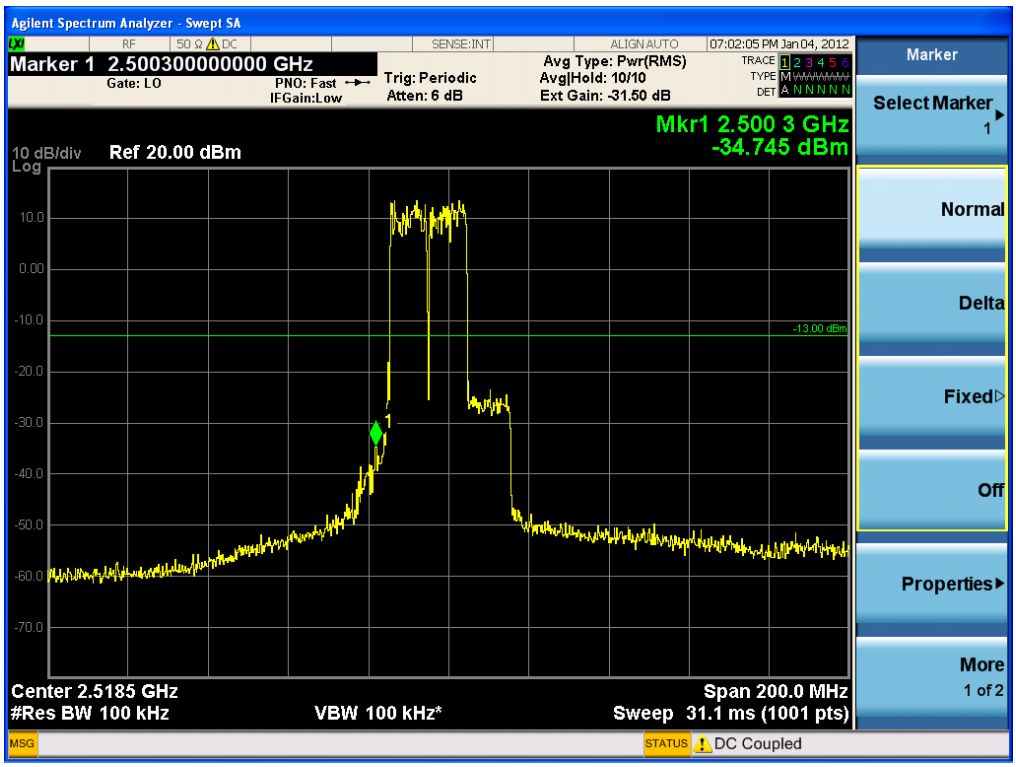

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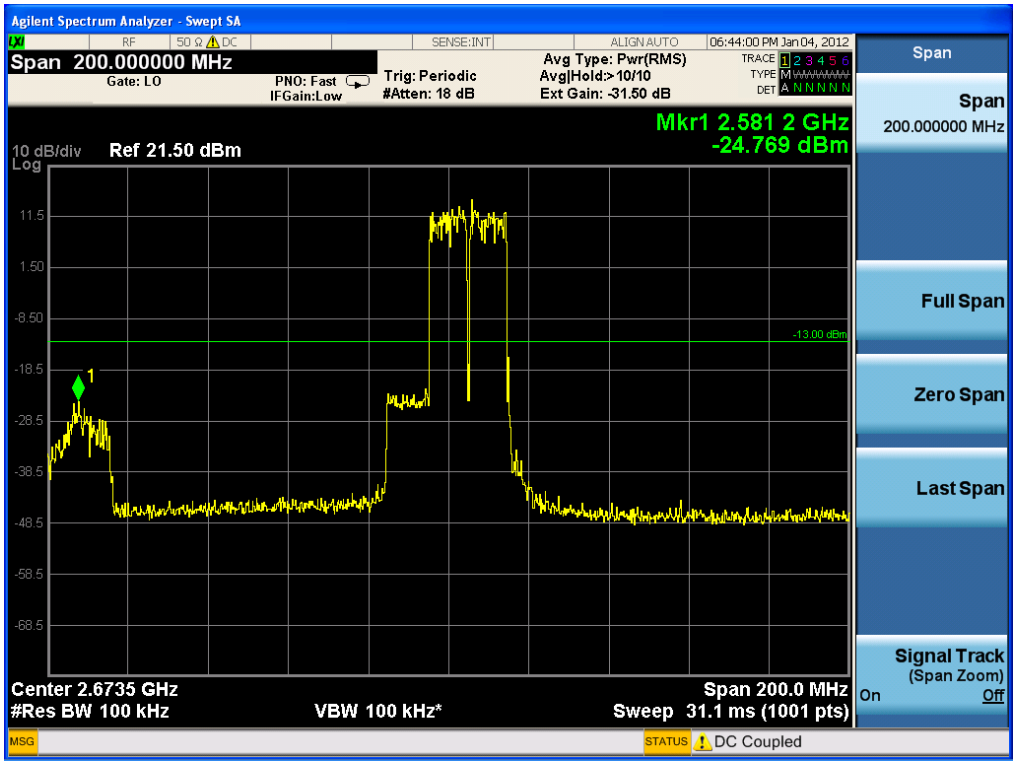
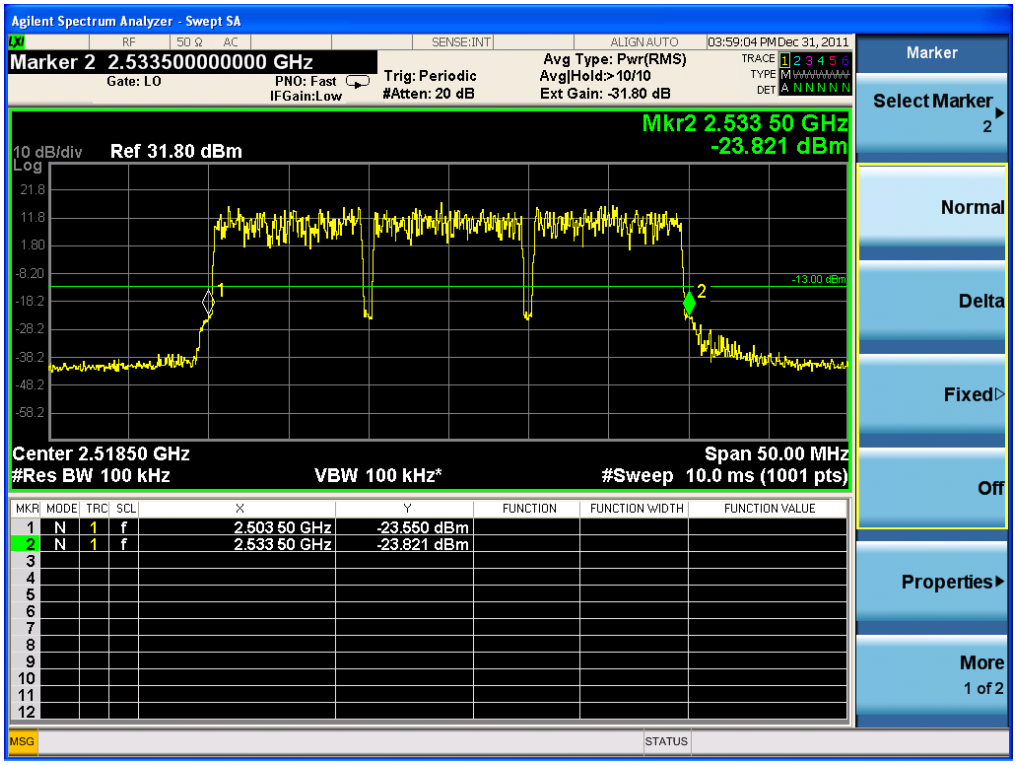


Passband Gain

[WiMax Downlink Low]



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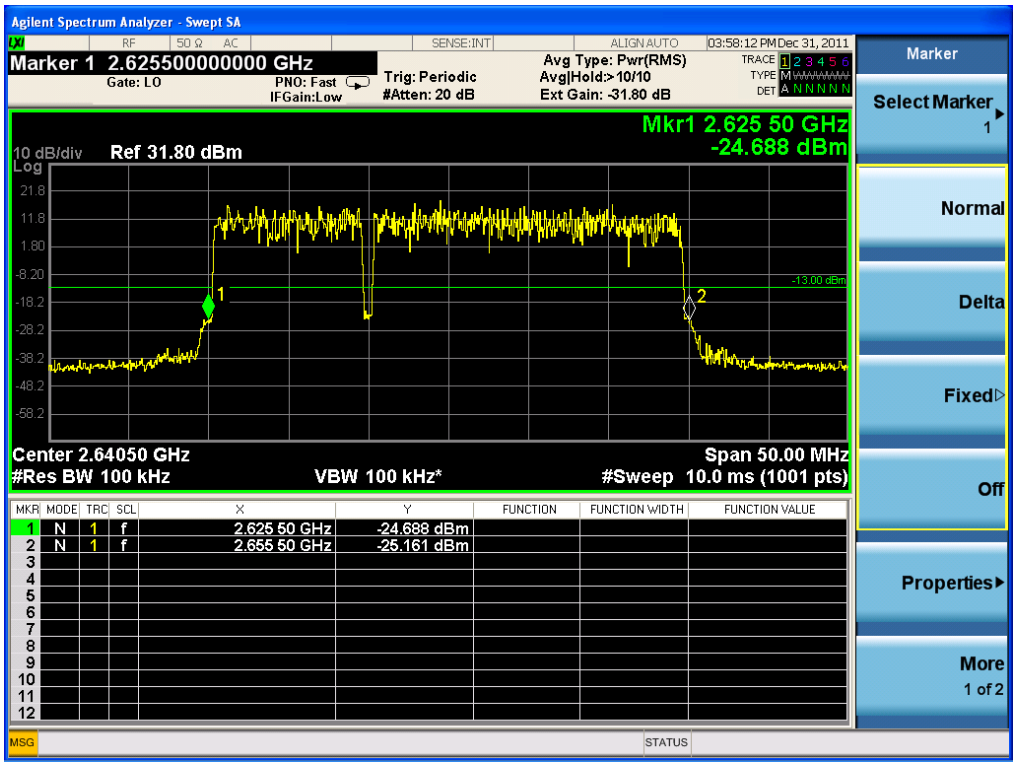

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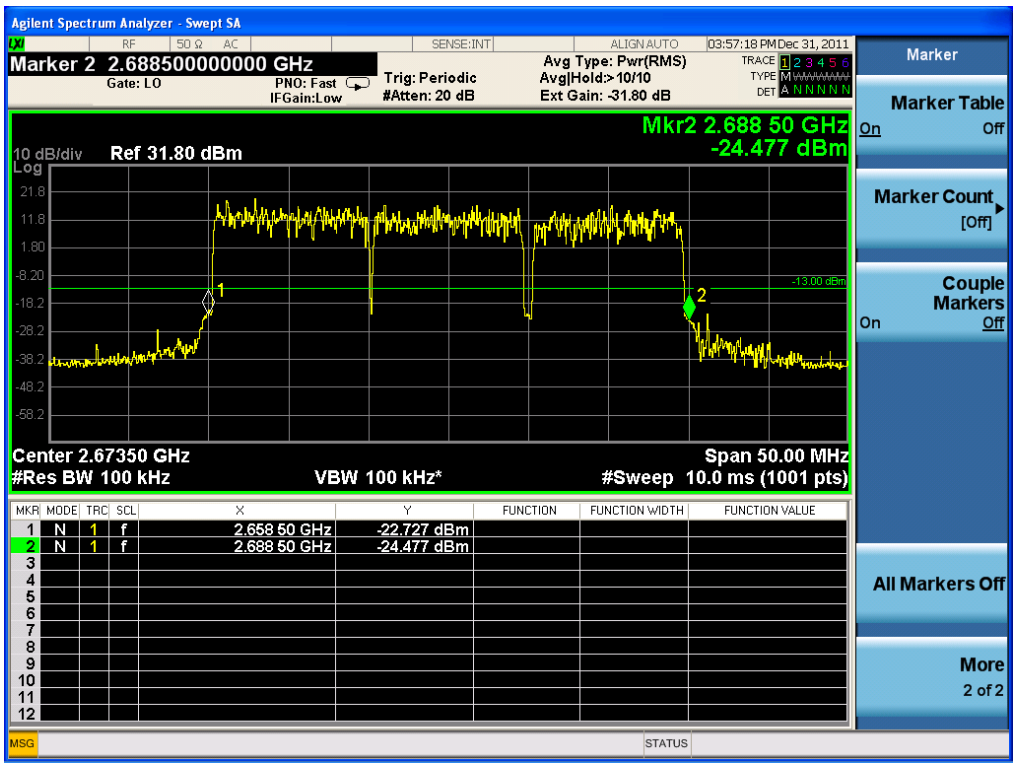

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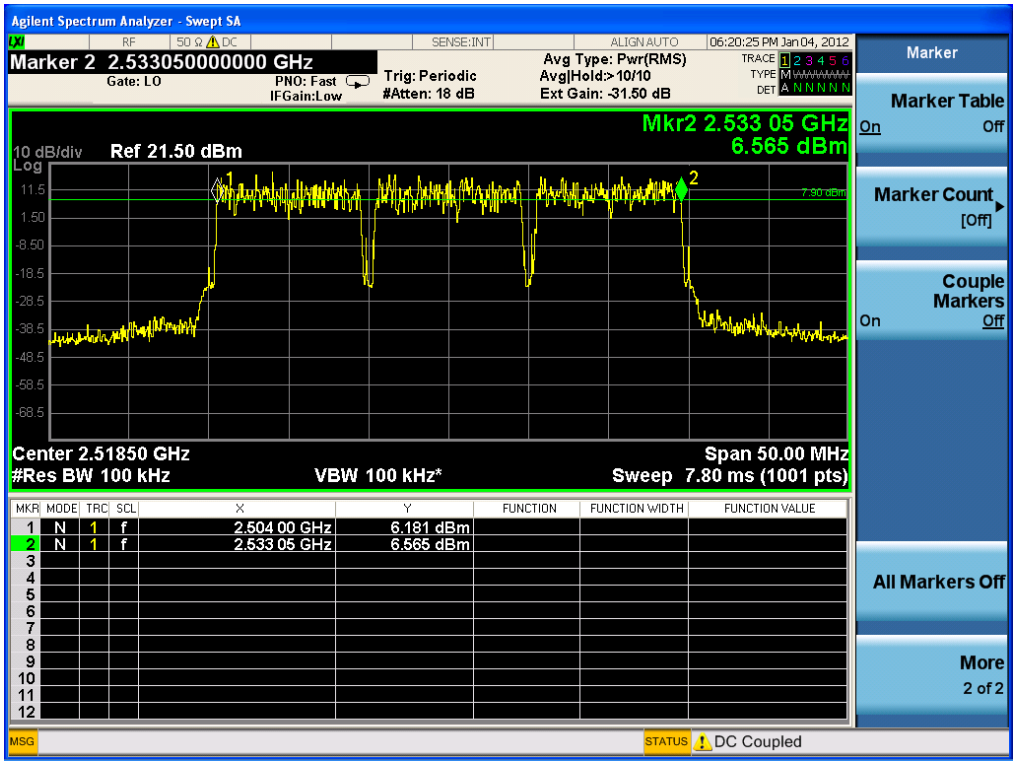
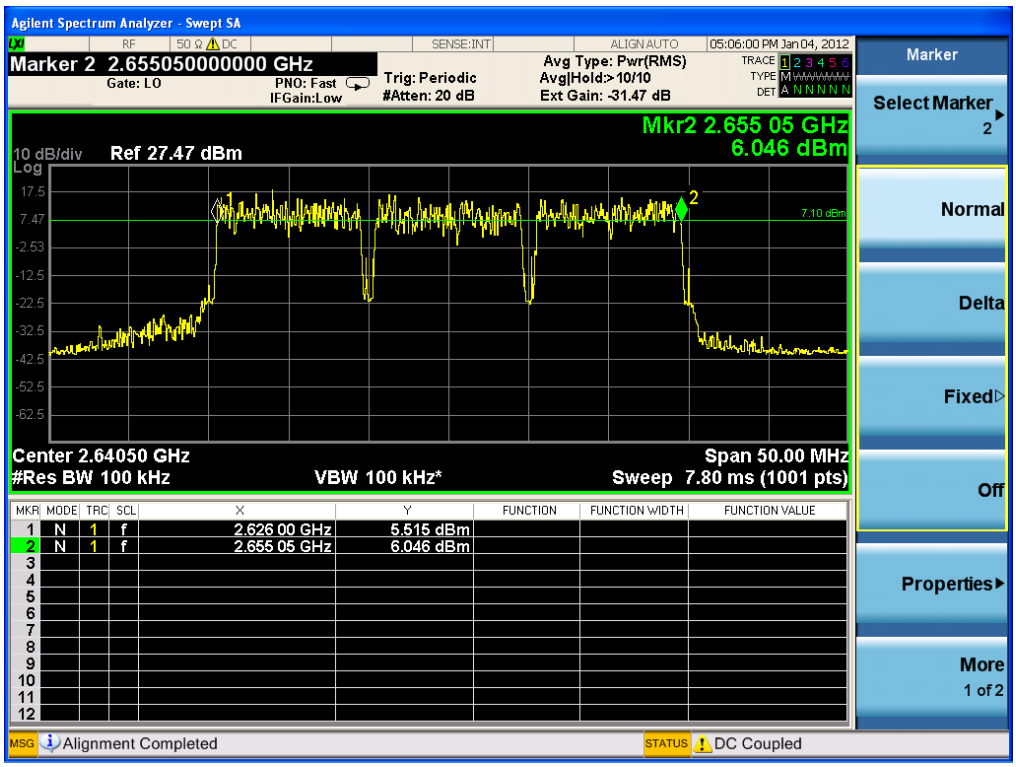


[LTE Downlink Middle]



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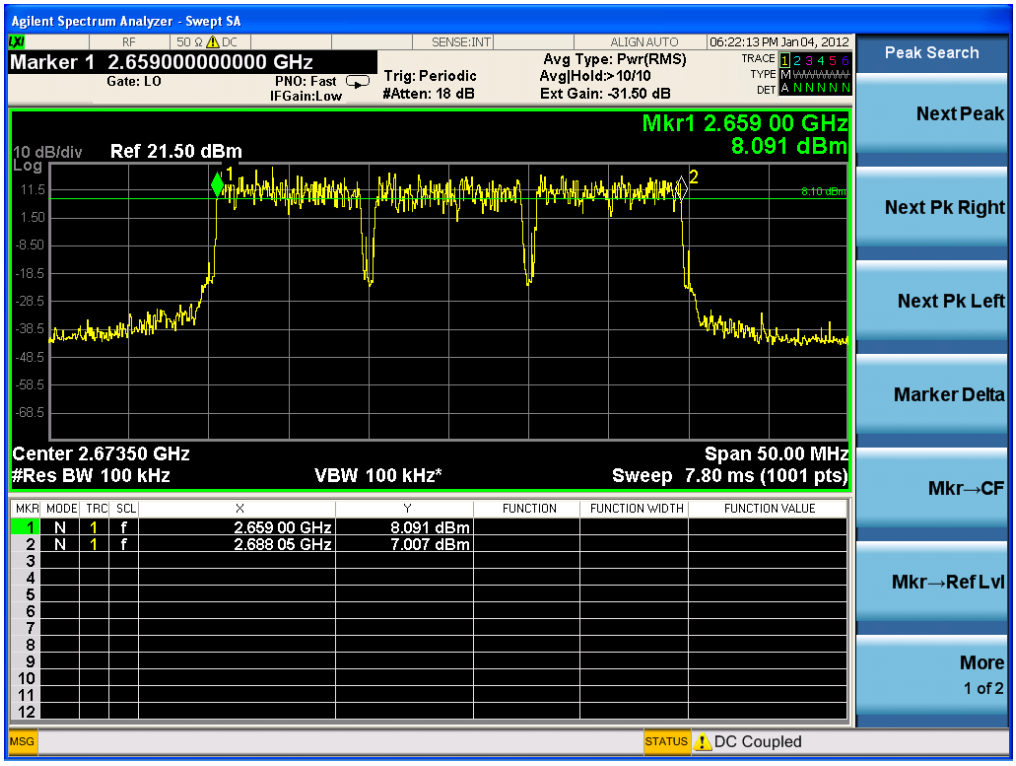

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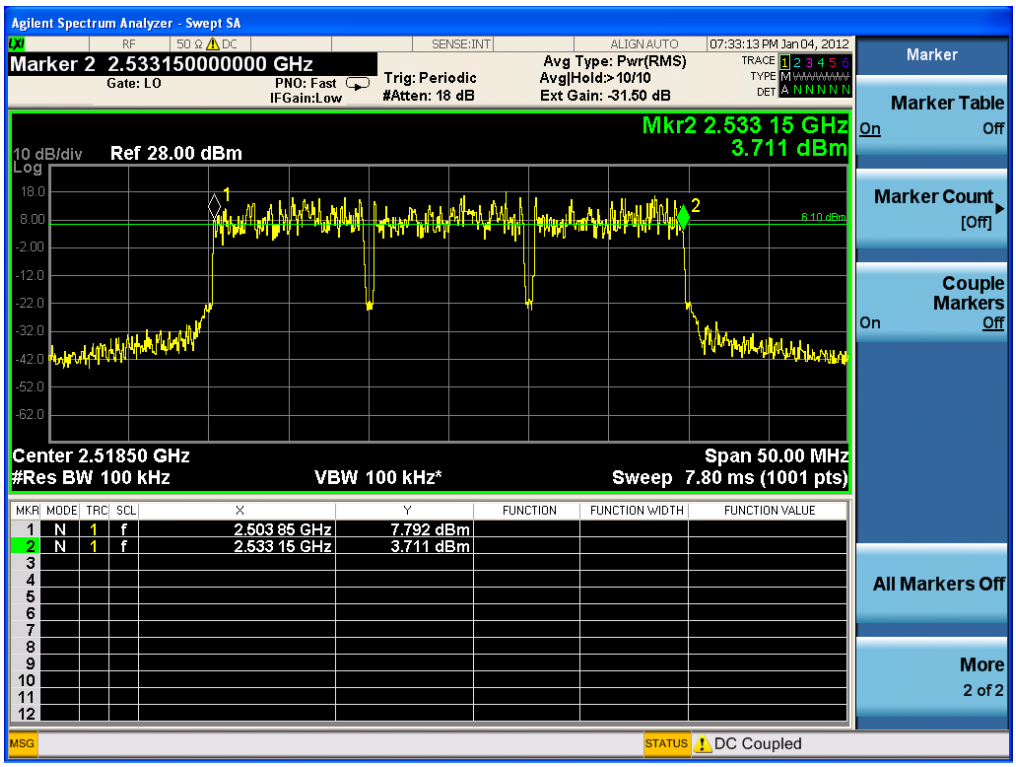

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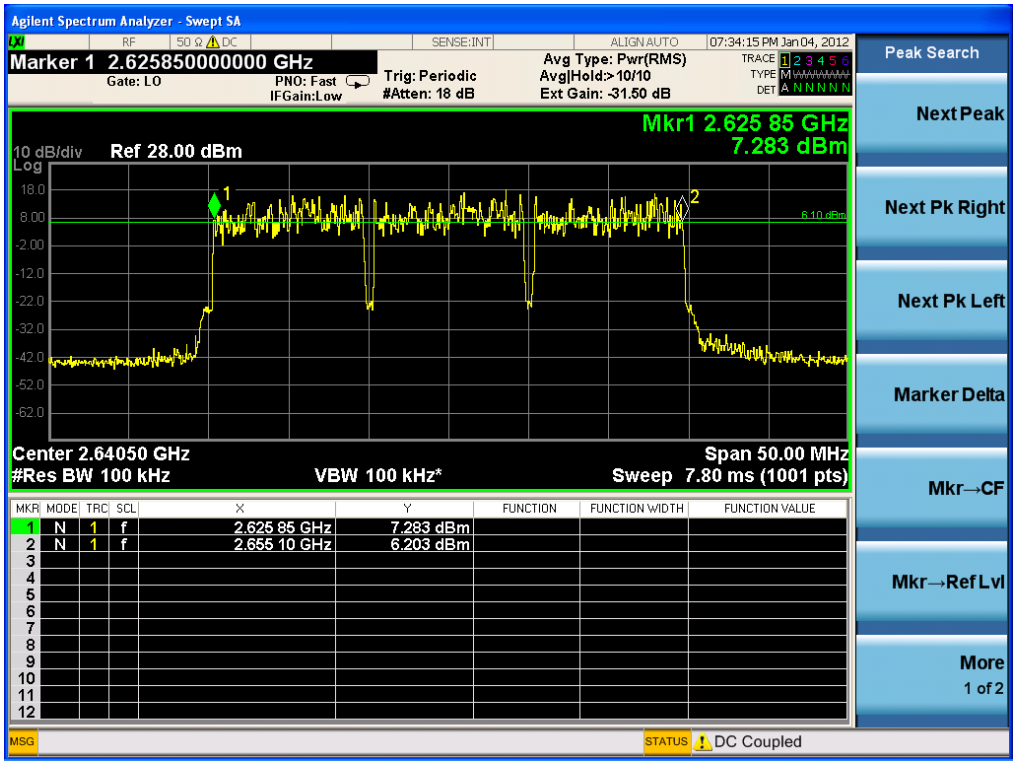

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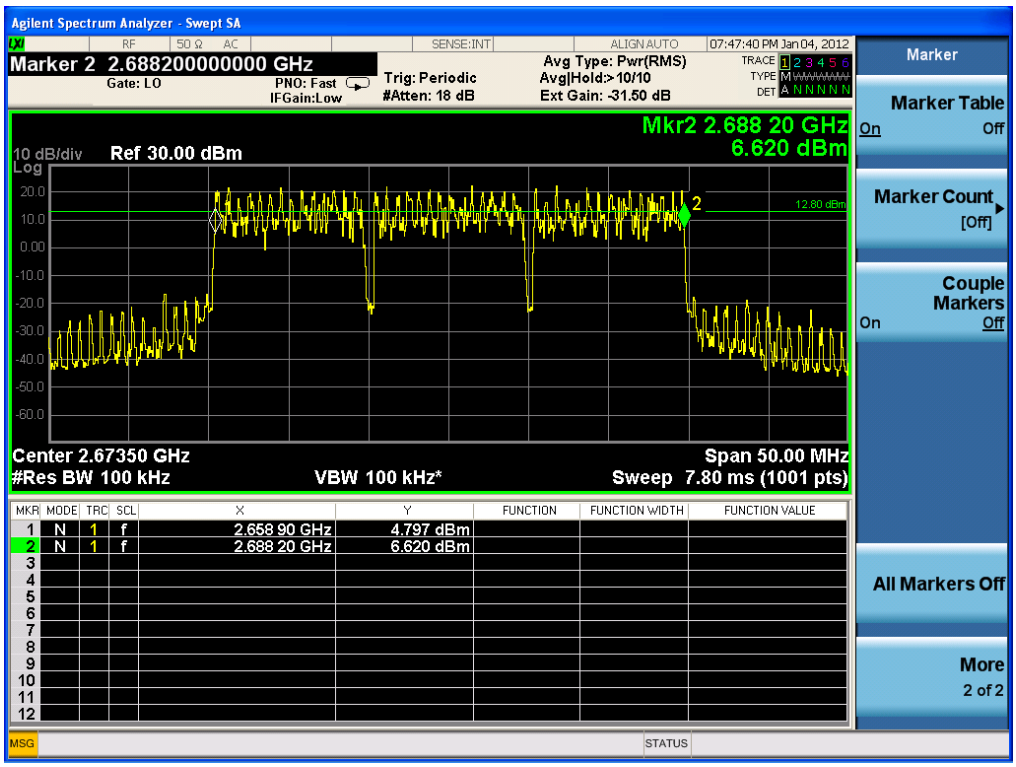

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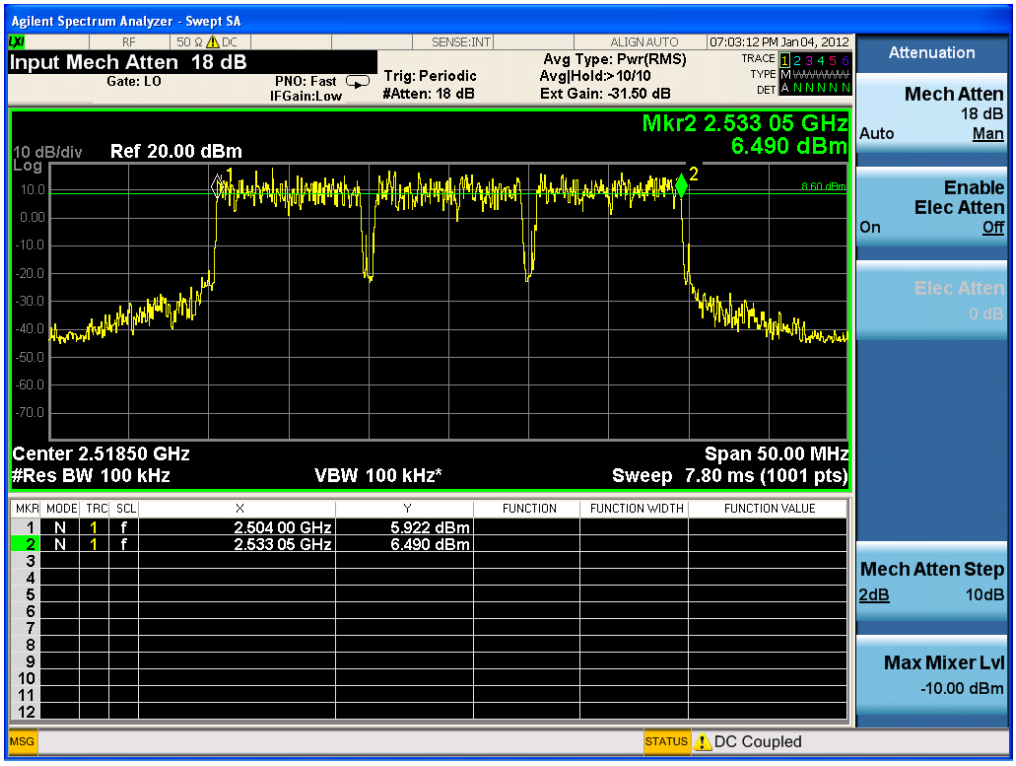

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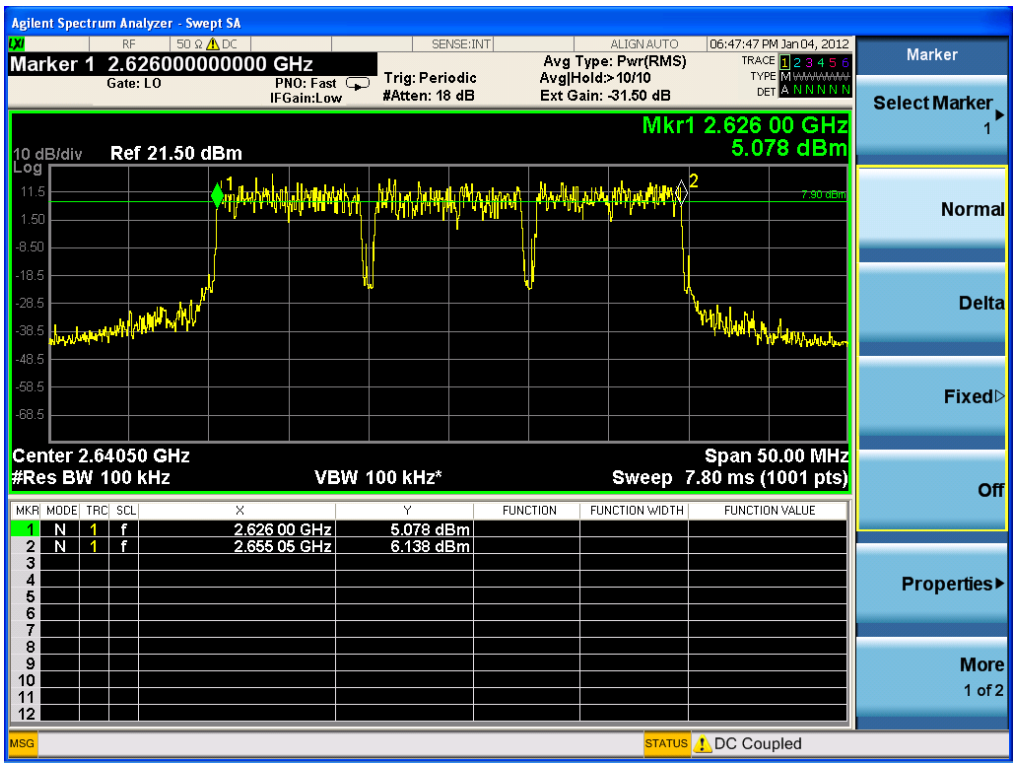

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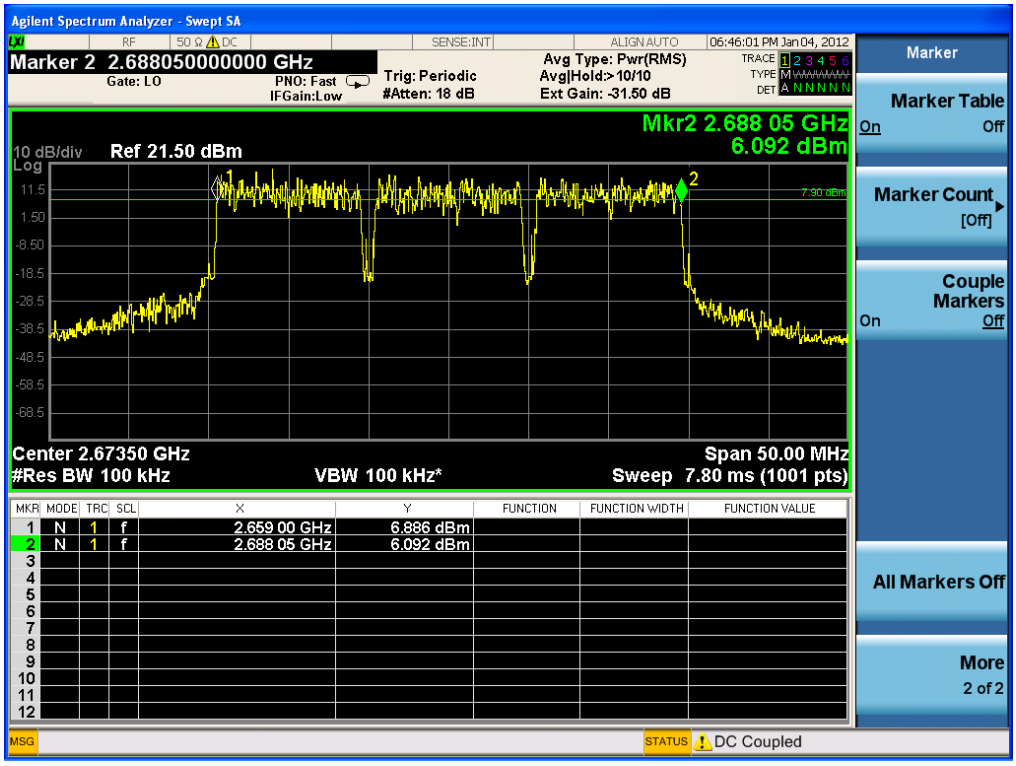

8. FIELD STRENGTH OF SPURIOUS RADIATION

Test Requirement(s): § 2.1053 Measurements required: Field strength of spurious radiation.

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be Radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to The transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

§ 27.53 Emission limit (2) For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on

channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply

Test Procedures: As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of TIA/EIA-603-A-2001 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber.

The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360

and the receiving antenna scanned from 1-3m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried. out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

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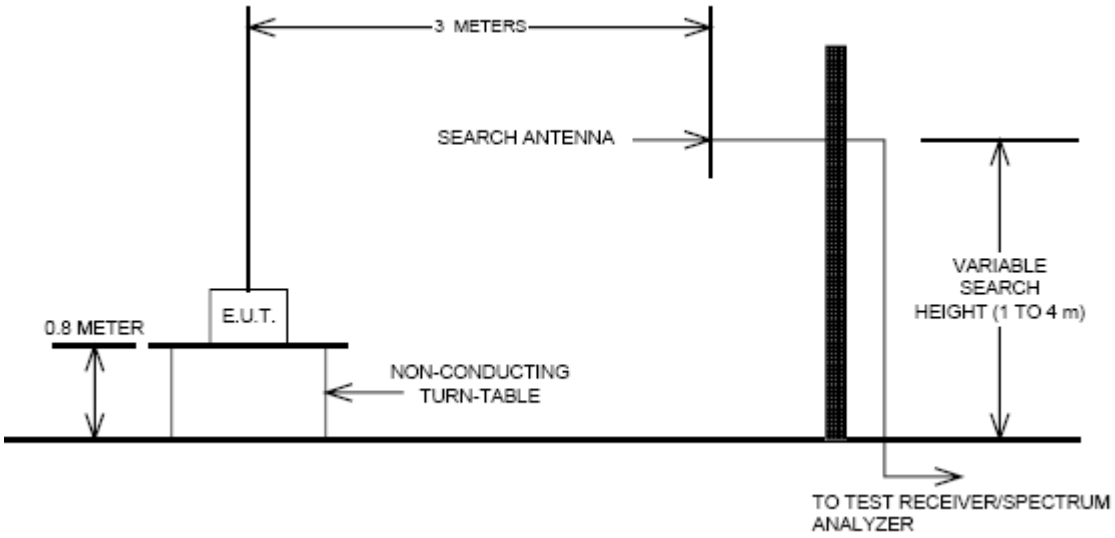
Radiated Spurious Emissions Test Setup



Test Result:

[Downlink]

Frequency (MHz)	Freq.(MHz)	Substitute Level[dBm]	Ant. Gain (dBd)	C.L	Pol.	ERP (dBm)	Margin (dB)
2640.5	2565.3	-50.31	8.24	6.55	V	-48.62	-35.62
	5283.5	-50.66	10.42	9.72	V	-49.96	-36.96

[Uplink]

Frequency (MHz)	Freq.(MHz)	Substitute Level[dBm]	Ant. Gain (dBd)	C.L	Pol.	ERP (dBm)	Margin (dB)
2508.5	5035.1	-25.44	10.17	9.58	V	-24.85	-11.85
	7555.0	-51.32	9.19	12.25	V	-34.38	-41.38
2683.5	2581.2	-29.78	8.17	6.57	V	-28.18	-15.18
	5343.8	-50.62	10.44	9.78	V	-49.96	-36.96

9. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

Test Requirement(s): §2.1055(a)(1)

Test Procedures:

As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Spectrum Analyzer.

The EUT was placed in the Environmental Chamber.

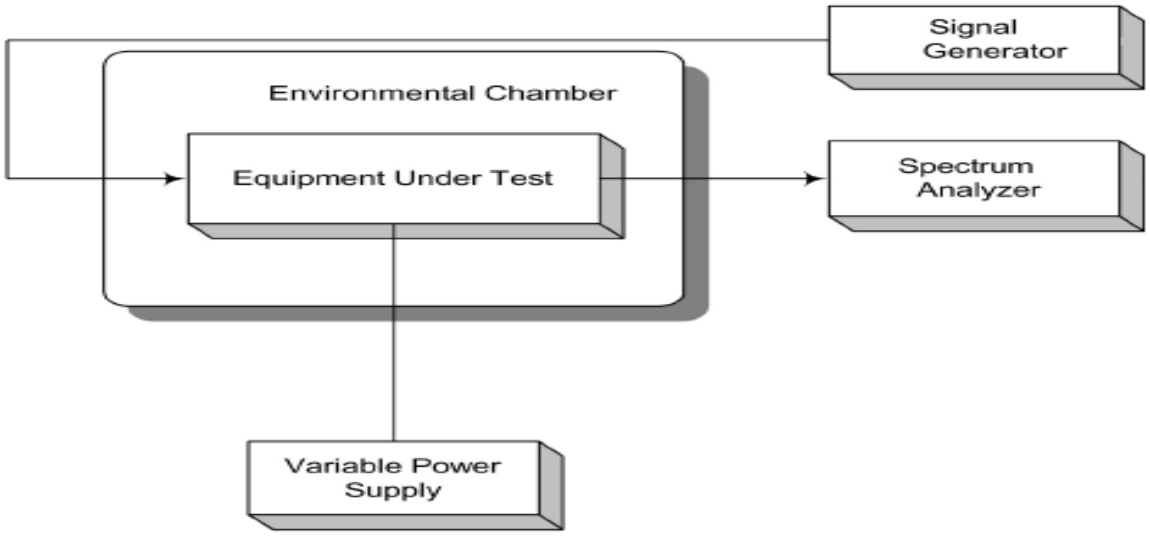
A CW signal was injected into the EUT at the appropriate RF level. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations.

The frequency drift was investigated for every 10 ℃ increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30 to 50 ℃.

Voltage supplied to EUT is 110 Vac reference temperature was done at 20℃.

The voltage was varied by ± 15 % of nominal

Test Setup:



Test Results:

The E.U.T was found in compliance for Frequency Stability and Voltage Test

Frequency Stability and Voltage Test Results

Reference: 110 Vac at 20℃ **Freq.** = 2640.5 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	2640 500 000	-0.4	0.0	0.0000
	-30	2640 499 998	-2.3	-1.9	-0.0007
	-20	2640 499 999	-1.5	-1.1	-0.0004
	-10	2640 499 999	-1.4	-1.0	-0.0004
	0	2640 499 999	-0.6	-0.2	-0.0001
	+10	2640 499 999	-0.8	-0.4	-0.0002
	+30	2640 500 001	0.7	1.1	0.0004
	+40	2640 500 001	1.4	1.8	0.0007
	+50	2640 500 001	1.1	1.5	0.0006
115%	+20	2640 499 999	-1.1	-0.7	-0.0003
85%	+20	2640 499 999	-1.4	-1.0	-0.0004

[Downlink]

Reference: 110 Vac at 20℃ **Freq.** = 2640.5 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	2640 499 998	-2.4	0.0	0.0000
	-30	2640 499 997	-3.2	-0.8	-0.0003
	-20	2640 499 997	-2.6	-0.2	-0.0001
	-10	2640 499 998	-2.3	0.1	0.0000
	0	2640 499 999	-1.1	1.3	0.0005
	+10	2640 499 998	-2.0	0.4	0.0002
	+30	2640 499 999	-1.5	0.9	0.0003
	+40	2640 499 999	-1.0	1.4	0.0005
	+50	2640 500 000	-0.4	2.0	0.0008
115%	+20	2640 499 998	-2.3	0.1	0.0000
85%	+20	2640 499 999	-1.4	1.0	0.0004

[Uplink]

10. RECEIVER SPURIOUS EMISSIONS

Test Requirement(s): RSS-GEN 4.10

The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.

If the receiver is super-regenerative, stabilize it by coupling to it an unmodulated carrier on the receiver frequency (antenna conducted measurement) or by transmitting an unmodulated carrier on the receiver frequency from an antenna in the proximity of the receiver (radiated measurement). Taking care not to overload the receiver, vary the amplitude and frequency of the stabilizing signal to obtain the highest level of the spurious emissions from the receiver.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

For emissions below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector with the same measurement bandwidth as that for CISPR quasi-peak measurements. Above 1 GHz, measurements shall be performed using an average detector and a resolution bandwidth of 300 kHz to 1 MHz.

Test Requirement(s): RSS-131 6.4

Spurious emissions of zone enhancers and translators shall be suppressed as much as possible.
Spurious emissions shall be attenuated below the rated power of the enhancer by at least:
$43 + 10 \text{ Log}_{10}(P_{rated} \text{ in watts})$, or 70 dB, whichever is less stringent.

Note: If the minimum standard is not met, check to see if the input signal generators have a high harmonic content.

Test Procedures:

The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.

If the receiver is super-regenerative, stabilize it by coupling to it an unmodulated carrier on the receiver frequency (antenna conducted measurement) or by transmitting an unmodulated carrier on the receiver frequency from an antenna in the proximity of the receiver (radiated measurement). Taking care not to overload the receiver, vary the amplitude and frequency of the stabilizing signal to obtain the highest level of the spurious emissions from the receiver.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

For emissions below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector with the same measurement bandwidth as that for CISPR quasi-peak measurements. Above 1 GHz, measurements shall be performed using an average detector and a resolution bandwidth of 300 kHz to 1 MHz.

Spurious Frequency (MHz)	Field Strength (microvolts/m) at 3 metres
30-88	100
88-216	150
216-960	200
960-1610	500
Above 1610	1000

30 MHz ~ 1 GHz

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
366.0	12.4	14.1	2.1	V	28.6	46.0	−17.4
836.5	8.7	21.7	3.3	H	33.7		−12.3

Above 1 GHz

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
No Peaks Found							

11. RF EXPOSURE STATEMENT

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
0.3 - 1.34	614	1.63	*(100)	30
1.34 - 30	824/f	2.19/f	*(180/ f²)	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	.....	.....	f/1500	30
1500 - 100.000	.....	.....	1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

2-1 Limit (DownLink)

Max Peak output Power at antenna input terminal	29.99000	dBm
Max Peak output Power at antenna input terminal	0.99770	W
Prediction distance	60.00000	cm
Prediction frequency	2683.50000	MHz
Antenna Gain(typical)	3.00000	dBi
Antenna Gain(numeric)	1.99526	-
Power density at prediction frequency (S)	0.04400	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm^2

2-2 Limit (UpLink)

Max Peak output Power at antenna input terminal	30.07000	dBm
Max Peak output Power at antenna input terminal	1.01625	W
Prediction distance	60.00000	cm
Prediction frequency	2640.50000	MHz
Antenna Gain(typical)	3.00000	dBi
Antenna Gain(numeric)	1.99526	-
Power density at prediction frequency (S)	0.04482	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm^2

3. RESULTS

The power density level at 60 cm is 0.044 mW/cm^2, which is below the uncontrolled exposure limit of 1.0 mW/cm^2 at 2683.5 MHz

The power density level at 60 cm is 0.044822 mW/cm^2, which is below the uncontrolled exposure limit of 1.0 mW/cm^2 at 2640.5 MHz

Simultaneous MPE at 60 cm is (0.044/1.0) + (0.044822/1) = 0.0890 < 1

Warning: In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, it must also have a minimum distance of 60 cm from the body during normal operation.