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MEASUREMENT REPORT FCC Part 27 WiMAX/TD-LTE

Applicant Name:
Samsung Electronics Co., Ltd.
416 Maetan 3-Dong, Yeongtong-gu
Suwon-si, Gyeonggi-do
443-742, Republic of Korea

Date of Testing:
09/28 - 11/06/2012
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1210191526.A3L

FCC ID:	A3LSLS-BD104Q1
APPLICANT:	SAMSUNG ELECTRONICS CO., LTD.

Application Type: Certification
Model(s): SLS-BD104Q1
EUT Type: Base Station
FCC Classification: Licensed Non-Broadcast Transmitter (TNB)
FCC Rule Part(s): §2; §27 Subpart M
Test Procedure(s): ANSI/TIA-603-C-2004, KDB 971168, KDB 662911
Test Device Serial No.: *identical prototype* [S/N: N/A]

Mode	Tx Frequency (MHz)	Emission Designator	Modulation	Avg. Conducted	
				Max. Summed Power (W)	Max. Summed Power (dBm)
WiMAX	2506 - 2680	19M2G7W	QPSK	44.881	46.52
WiMAX	2506 - 2680	19M2W7W	16QAM	44.675	46.50
WiMAX	2506 - 2680	19M2W7W	64QAM	44.572	46.49
TD-LTE	2506 - 2680	18M0G7W	QPSK	21.980	43.42
TD-LTE	2506 - 2680	18M0W7W	16QAM	21.779	43.38
TD-LTE	2506 - 2680	18M0W7W	64QAM	21.879	43.40

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.



Randy Ortanez
President



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MEASUREMENT REPORT

FCC Part 27



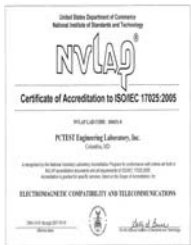
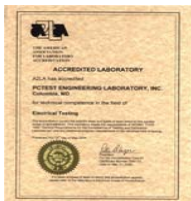
§2.1033 General Information



APPLICANT: Samsung Electronics Co., Ltd.
APPLICANT ADDRESS: 416 Maetan 3-Dong, Yeongtong-gu
 Suwon-si, Gyeonggi-do
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21046 USA
FCC RULE PART(S): §2; §27(M)
BASE MODEL: SLS-BD104Q1
FCC ID: A3LSLS-BD104Q1
FCC CLASSIFICATION: Licensed Non-Broadcast Transmitter (TNB)
MODE: WiMAX / TD-LTE
FREQUENCY TOLERANCE: Emission must remain in band
Test Device Serial No.: N/A Production Pre-Production Engineering
DATE(S) OF TEST: 09/28 - 11/06/2012
TEST REPORT S/N: 0Y1210191526.A3L

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab. located in Columbia, MD 21046, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



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1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on February 15, 2012.

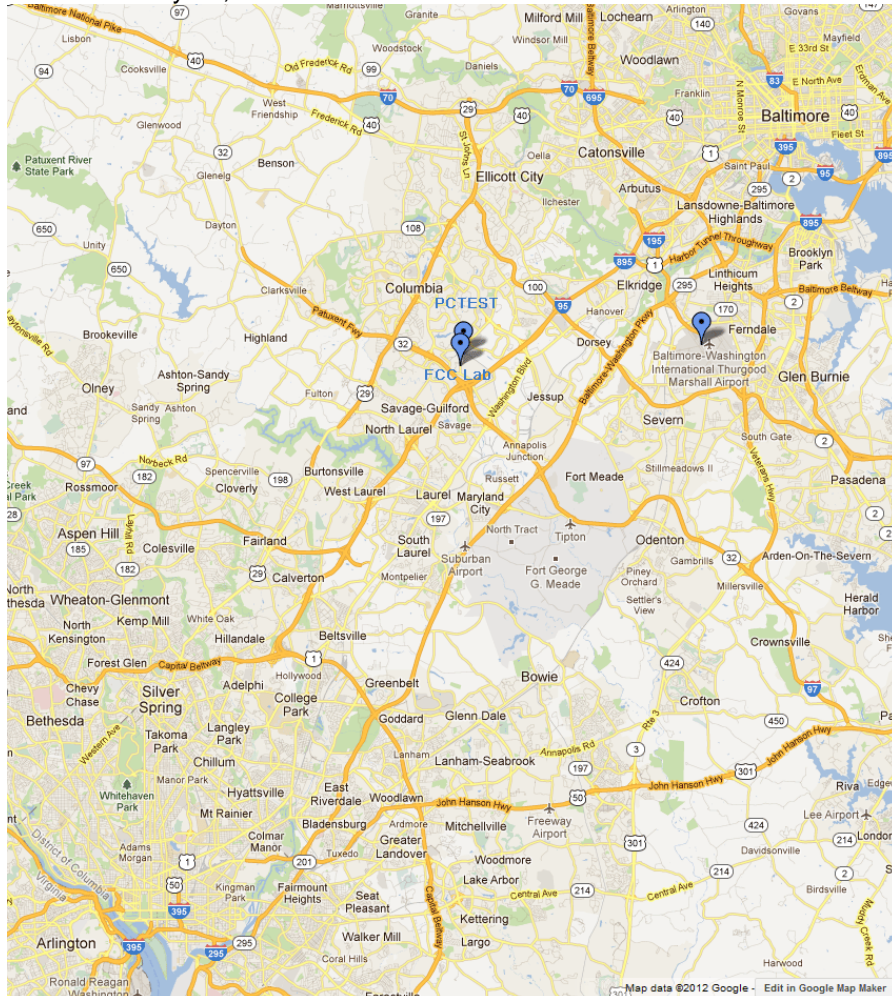




Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Base Station FCC ID: A3LSLS-BD104Q1**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitter.

The Samsung "Flexible Radio Access System" is a system comprised of a Remote Radio Head (the EUT) unit that employs 4 separate outputs (RF Port 0 – RF Port 3) capable of transmitting in WiMAX and TD-LTE modes and is controlled by a DU unit via fiber optic cables. The system supports transmission in QPSK, 16-QAM, and 64-QAM modulations. In TD-LTE mode, each of the four ports transmits a single 20MHz TDD carrier at 10 Watts each. In WiMAX mode, each of the four ports transmits a 20MHz dual-carrier TDD transmission comprised of two 10MHz TDD carriers at 5 Watts each. "Mixed mode" operation is also a supported mode in this system in which two of the ports operate in WiMAX mode and the other two ports operate in TD-LTE mode. This device is also capable of transmitting 4x4 MIMO in WiMAX mode and 2x2 MIMO in TD-LTE mode.

Both the RRH and the DU units are powered by separate 48VDC power supplies. A laptop PC was used to send commands to the DU that operate the RRH unit. The RRH was set to transmit at full power through test software installed in a laptop computer. Each of the three available types of modulations (QPSK, 16-QAM, 64-QAM) was tested to determine the configuration producing the worst case emissions. An external trigger was used along with the spectrum analyzers' gating function so that all measurements were made during the transmitters' "on" period. The output from each port was measured individually while the outputs of the other three ports were terminated in 50Ω.

2.2 Device Capabilities

This device contains the following capabilities:



WiMAX (Two 10MHz single carriers for 20MHz total BW), TD-LTE (20MHz BW)

2.3 Test Configuration

The **Samsung Base Station FCC ID: A3LSLS-BD104Q1** was tested per the guidance of ANSI/TIA-603-C-2004, KDB 971168, and KDB 662911. See Section 3.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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3.0 DESCRIPTION OF TESTS

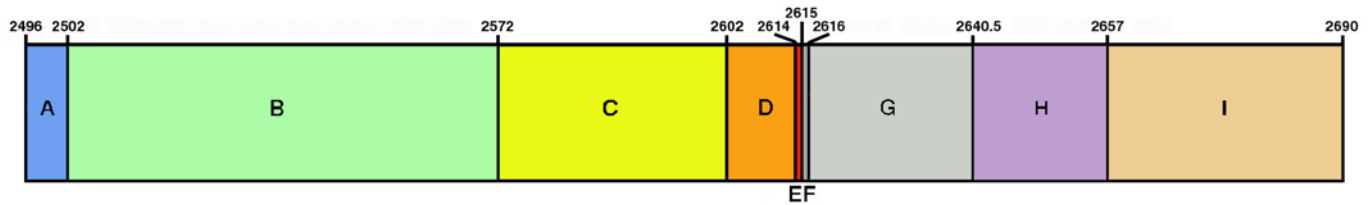
3.1 Evaluation Procedure

The measurement procedures described in the “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-C-2004), “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168), and “Emissions Testing of Transmitters with Multiple Outputs in the Same Band” (KDB 6629111) were used in the measurement of the measurement of the **Samsung Base Station FCC ID: A3LSLS-BD104Q1**.

Deviation from Measurement Procedure.....None

3.2 EBS/BRS - Frequency Blocks

§27.5(i)



BLOCK A: 2496MHz – 2502MHz (BRS)

BLOCK B: 2502MHz – 2572MHz (EBS)

BLOCK C: 2572MHz – 2602MHz (EBS)

BLOCK D: 2602MHz – 2614MHz (BRS)

BLOCK E: 2614MHz – 2615MHz (BRS)

BLOCK F: 2615MHz – 2616MHz (EBS)

BLOCK G: 2616MHz – 2640.5MHz (BRS)

BLOCK H: 2640.5MHz – 2657MHz (EBS)

BLOCK A: 2657MHz – 2690MHz (BRS)

3.3 Occupied Bandwidth Emission Limits



§2.1049

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. The spectrum analyzers’ “occupied bandwidth” measurement function was used to record the occupied bandwidth in accordance with KDB 971168.

3.4 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, §27.53(m)(2)(6)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater for Part 27. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency

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and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

3.5 Radiated Spurious and Harmonic Emissions

§2.1053, §27.53(m)(2)(6)

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.



The equipment under test was transmitting while its 4 antenna ports were terminated in 50Ω and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Time Domain Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168. An external trigger from the DU supplied to the spectrum analyzer to ensure that emissions were measured during the "on" time of the transmitter.

Per the guidance of ANSI/TIA-603-C-2004, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$ specified in 27.53(m).

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3.6 Frequency Stability / Temperature Variation

§2.1055, §27.54



Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for this DC powered equipment.

Specification – For Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A sufficient stabilization period at each temperature shall be used prior to each frequency requirement.

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4.0 TEST EQUIPMENT CALIBRATION DATA



Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/10/2012	Annual	7/10/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	2/13/2012	Annual	2/13/2013	N/A
Agilent	8447D	Broadband Amplifier	5/8/2012	Annual	5/8/2013	1937A03348
Agilent	E8267C	Vector Signal Generator	10/10/2011	Biennial	10/10/2013	US42340152
Agilent	N9020A	MXA Signal Analyzer	10/9/2012	Annual	10/9/2013	US46470561
Espec	ESX-2CA	Environmental Chamber	4/4/2012	Annual	4/4/2013	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Biennial	7/22/2013	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	Biennial	5/30/2014	135427
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	10/1/2010	Biennial	10/1/2012	128337
Mini-Circuits	VHF-3100+	High Pass Filter	1/15/2012	Annual	1/15/2013	30841
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	6/26/2012	Annual	6/26/2013	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/30/2012	Annual	5/30/2013	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	12/15/2011	Annual	12/15/2012	100342
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

Table 4-1. Test Equipment

Notes

- The Agilent MXA signal analyzer was within its calibration period while it was used to perform testing for the EUT.
- The ETS Lindgren quad ridge horn antenna was not used after its calibration due date.

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5.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 9M62G7W

WiMAX BW = 9.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

16-QAM / 64-QAM Modulation

Emission Designator = 9M45W7W

WiMAX BW = 9.45 MHz

D = Amplitude/Angle Modulated



7 = Quantized/Digital Info

W = Combination (Audio/Data)

Spurious Radiated Emission – WiMAX Band

Example: Middle Channel WiMAX Mode 2nd Harmonic (5200 MHz)

The receive analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 3.2 dB at 5200 MHz. So 4.9 dB is added to the signal generator reading of -30.00 dBm yielding -25.1 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm $- (-25.1) = 50.6$ dBc.

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6.0 TEST RESULTS

6.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSLS-BD104Q1
 FCC Classification: Licensed Non-Broadcast Transmitter (TNB)
 Mode(s): WiMAX / TD-LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)					
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 27.53(m)(2)(6)	Band Edge / Conducted Spurious Emissions	< 43 + 10log ₁₀ (P[Watts]) for all out of band emissions		PASS	Section 7.0
2.1046	Transmitter Conducted Output Power Measurements	N/A		PASS	Section 6.2
2.1053, 27.53(m)(2)(6)	Undesirable Emissions	< 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions	RADIATED	PASS	Section 6.4
2.1055, 27.54	Frequency Stability	Fundamental emissions must stay within the allotted band		PASS	Section 6.6

Table 6-1. Summary of Test Results

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.2 Transmitter Conducted Output Power

§2.1046

The conducted measurement system was comprised of a 30dB attenuator and a 6dB attenuator connected in series and an RF cable. The losses of the RF cable were loaded as a correction table into the spectrum analyzer to account for RF losses at all frequencies. The conducted power measurements found in this section are for single port transmission. All MIMO cases are covered in Section 6.3.



WiMAX Transmission Mode

The RRH unit was connected to the spectrum analyzer one port at a time. The RRH was set to transmit on each of the four available ports at maximum power through a laptop PC connected to the DU. The DU was also used as an external trigger that was connected to the analyzer so that power measurements were performed only during the times in which the EUT was transmitting. The record the power measurements the spectrum analyzers' "Channel Power" function was used with the following settings:

- Channel Integration BW = 20MHz
- Detector = Average (RMS)
- RBW = 470kHz (auto setting)
- VBW = 5MHz (auto setting)
- Span = 50MHz
- Sweep time = 1ms
- Trace points = 1001
- 100 trace average sweeps
- Gating enabled with an external source trigger from the DU

RF Port	Frequency [MHz]	QPSK	16-QAM	64-QAM
		Average Power [dBm]	Average Power [dBm]	Average Power [dBm]
0	2506.00	40.41	40.46	40.41
	2593.00	40.02	40.03	40.07
	2680.00	40.40	40.34	40.43
1	2506.00	40.18	40.41	40.19
	2593.00	40.14	40.13	40.09
	2680.00	40.27	40.27	40.27
2	2506.00	40.50	40.43	40.47
	2593.00	40.29	40.26	40.26
	2680.00	40.34	40.48	40.39
3	2506.00	40.18	40.13	40.15
	2593.00	40.26	40.30	40.21
	2680.00	40.31	40.33	40.27

Table 6-2. WiMAX Conducted Output Power

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TD-LTE Transmission Mode

The RRH unit was connected to the spectrum analyzer one port at a time. Due to hardware restrictions, the RRH was set to transmit on two ports at a time (i.e. Ports 0 and 1 first and then Ports 2 and 3) at maximum power through a laptop PC connected to the DU. The DU was also used as an external trigger that was connected to the analyzer so that power measurements were performed only during the times in which the EUT was transmitting. The record the power measurements the spectrum analyzers' "Channel Power" function was used with the following settings:

- Channel Integration BW = 20MHz
- Detector = Average (RMS)
- RBW = 470kHz (auto setting)
- VBW = 5MHz (auto setting)
- Span = 50MHz
- Sweep time = 1ms
- Trace points = 1001
- 100 trace average sweeps
- Gating enabled with an external source trigger from the DU

RF Port	Frequency [MHz]	QPSK	16-QAM	64-QAM
		Average Power [dBm]	Average Power [dBm]	Average Power [dBm]
0	2506.00	40.36	40.29	40.33
	2593.00	40.08	40.03	40.05
	2680.00	40.36	40.34	40.39
1	2506.00	40.17	40.15	40.13
	2593.00	40.23	40.19	40.07
	2680.00	40.35	40.30	40.33
2	2506.00	40.41	40.37	40.37
	2593.00	40.33	40.25	40.26
	2680.00	40.33	40.37	40.34
3	2506.00	40.21	40.13	40.20
	2593.00	40.17	40.20	40.17
	2680.00	40.39	40.27	40.28

Table 6-3. TD-LTE Conducted Output Power

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.3 Mixed Mode and MIMO Operation



Mixed Mode (WiMAX + TD-LTE) Transmission Mode

The EUT is also capable of operating in “mixed mode” where two of the ports operate in WiMAX mode and the other two ports operate in TD-LTE mode. The output power from the two WiMAX ports and the two TD-LTE ports was measured following the guidance of KDB 662911 (Emissions Testing of Transmitters with Multiple Outputs in the Same Band). This KDB outlines a procedure for power measurements performed by adding $10\log_{10}(N)$ to the maximum single port output power, where N is the number of ports used to transmit in the mode of interest. Since only two ports can operate on any one mode at a time in “mixed mode”, a factor of $10\log_{10}(2) = 3.01\text{dB}$ is added to the highest individual port conducted power in WiMAX and TD-LTE modes to determine the maximum “mixed mode” conducted power.

Table 6-4 below addresses the conducted output power for the scenario in which the RRH transmits in WiMAX mode from ports 0 and 1 and transmits in TD-LTE mode from ports 2 and 3.

RF Port	Mode	Frequency [MHz]	QPSK	16-QAM	64-QAM
			Average Power [dBm]	Average Power [dBm]	Average Power [dBm]
0	WiMAX	2506.00	43.42	43.47	43.42
		2593.00	43.03	43.04	43.08
		2680.00	43.41	43.35	43.44
1	WiMAX	2506.00	43.19	43.42	43.20
		2593.00	43.15	43.14	43.10
		2680.00	43.28	43.28	43.28
2	TD-LTE	2506.00	43.42	43.38	43.38
		2593.00	43.34	43.26	43.27
		2680.00	43.34	43.38	43.35
3	TD-LTE	2506.00	43.22	43.14	43.21
		2593.00	43.18	43.21	43.18
		2680.00	43.40	43.28	43.29

Table 6-4. Mixed Mode Conducted Output Power



FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Mixed Mode (WiMAX + TD-LTE) Transmission Mode (Cont'd)

Table 6-5 below addresses the conducted output power for the scenario in which the RRH transmits in TD-LTE mode from ports 0 and 1 and transmits in WiMAX mode from ports 2 and 3.

RF Port	Mode	Frequency [MHz]	QPSK	16-QAM	64-QAM
			Average Power [dBm]	Average Power [dBm]	Average Power [dBm]
0	TD-LTE	2506.00	43.37	43.30	43.34
		2593.00	43.09	43.04	43.06
		2680.00	43.37	43.35	43.40
1	TD-LTE	2506.00	43.18	43.16	43.14
		2593.00	43.24	43.20	43.08
		2680.00	43.36	43.31	43.34
2	WiMAX	2506.00	43.51	43.44	43.48
		2593.00	43.30	43.27	43.27
		2680.00	43.35	43.49	43.40
3	WiMAX	2506.00	43.19	43.14	43.16
		2593.00	43.27	43.31	43.22
		2680.00	43.32	43.34	43.28

Table 6-5. Mixed Mode Conducted Output Power

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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MIMO Transmission Mode (Summed Powers)

This unit is also capable of transmitting using MIMO. When the transmitter is set to WiMAX mode the EUT can employ simultaneous transmission using all four ports for WiMAX operation. When the transmitter is set to TD-LTE mode the EUT can employ simultaneous transmission using two ports at a time for TD-LTE (i.e. either ports 0 and 1 or ports 2 and 3 simultaneously).

To determine the summed conducted powers in WiMAX mode, a $10\log_{10}(N = 4) = 6.02\text{dB}$ correction was applied to the single port measurements since the EUT supports 4x4 MIMO in WiMAX mode. The summed WiMAX data is shown below and is what appears on the grant of authorization.

RF Port	Frequency [MHz]	QPSK	16-QAM	64-QAM
		Average Power [dBm]	Average Power [dBm]	Average Power [dBm]
0	2506.00	46.43	46.48	46.43
	2593.00	46.04	46.05	46.09
	2680.00	46.42	46.36	46.45
1	2506.00	46.20	46.43	46.21
	2593.00	46.16	46.15	46.11
	2680.00	46.29	46.29	46.29
2	2506.00	46.52	46.45	46.49
	2593.00	46.31	46.28	46.28
	2680.00	46.36	46.50	46.41
3	2506.00	46.20	46.15	46.17
	2593.00	46.28	46.32	46.23
	2680.00	46.33	46.35	46.29

Table 6-6. Summed WiMAX Conducted Powers



FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station	Page 16 of 247	

MIMO Transmission Mode (Summed Powers) (Cont'd)

To determine the summed conducted powers in TD-LTE mode, a $10\log_{10}(N = 2) = 3.01\text{dB}$ correction was applied to the single port measurements since the EUT supports 2x2 MIMO in TD-LTE mode. The summed TD-LTE data is shown below and is what appears on the grant of authorization.

RF Port	Frequency [MHz]	QPSK	16-QAM	64-QAM
		Average Power [dBm]	Average Power [dBm]	Average Power [dBm]
0	2506.00	43.37	43.30	43.34
	2593.00	43.09	43.04	43.06
	2680.00	43.37	43.35	43.40
1	2506.00	43.18	43.16	43.14
	2593.00	43.24	43.20	43.08
	2680.00	43.36	43.31	43.34
2	2506.00	43.42	43.38	43.38
	2593.00	43.34	43.26	43.27
	2680.00	43.34	43.38	43.35
3	2506.00	43.22	43.14	43.21
	2593.00	43.18	43.21	43.18
	2680.00	43.40	43.28	43.29

Table 6-7. Summed TD-LTE Conducted Powers

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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MIMO Transmission Mode

Out of band spurious emissions are investigated in this section when the EUT employs MIMO using the guidance from KDB 662911 (Emissions Testing of Transmitters with Multiple Outputs in the Same Band). A modified version of the “sum the spectra” technique outlined in KDB 662911 is used to show compliance for out of band emissions to the -13dBm limit. Rather than summing the spectra of all simultaneously transmitting ports on a point-by-point basis, the maximum emission levels from each port are summed linearly (i.e. in mW) to obtain a worst case MIMO spurious emission level. The following tables show the maximum measured levels from each port for channel edge and extended channel edge (i.e. 1MHz removed from the channel edge) emissions. The plots supporting the data shown in the following tables can be found in Sections 7.0 and 8.0.

For out of band emissions further than 20MHz away from the channel edges, all spurious emissions were found to be at or near the noise floor so the summed values are not shown since they are negligible.

WiMAX

Frequency (MHz)	Port	Lower Channel Edge			Upper Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2506	0	-18.80	-18.81	-18.82	-18.00	-18.25	-18.27
2506	1	-19.20	-19.42	-19.46	-20.06	-19.58	-19.74
2506	2	-19.08	-18.82	-18.30	-19.30	-19.39	-19.07
2506	3	-19.41	-19.44	-19.66	-19.53	-19.23	-19.54
2506	ALL	-13.10	-13.09	-13.01	-13.13	-13.06	-13.10



Table 6-8. Channel Edge Measurements for 4x4 WiMAX MIMO – Low Channel

Frequency (MHz)	Port	Lower Channel Edge			Upper Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2593	0	-20.56	-20.38	-19.27	-21.34	-21.49	-21.25
2593	1	-20.53	-20.52	-20.28	-21.35	-21.51	-21.27
2593	2	-20.89	-21.11	-21.08	-20.71	-20.44	-20.43
2593	3	-20.77	-20.78	-20.69	-20.77	-20.09	-20.55
2593	ALL	-14.66	-14.67	-14.26	-15.01	-14.82	-14.84

Table 6-9. Channel Edge Measurements for 4x4 WiMAX MIMO – Mid Channel

Frequency (MHz)	Port	Lower Channel Edge			Upper Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2680	0	-19.68	-19.72	-19.72	-21.33	-20.61	-21.01
2680	1	-20.28	-20.40	-20.28	-21.09	-21.08	-20.73
2680	2	-19.27	-19.64	-20.10	-20.34	-20.02	-20.51
2680	3	-20.75	-19.65	-19.83	-20.30	-20.25	-20.27
2680	ALL	-13.94	-13.82	-13.96	-14.72	-14.45	-14.60

Table 6-10. Channel Edge Measurements for 4x4 WiMAX MIMO – High Channel

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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MIMO Transmission Mode (Cont'd)

Frequency (MHz)	Port	Lower Extended Channel Edge			Upper Extended Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2506	0	-19.40	-19.09	-18.53	-18.06	-17.96	-17.36
2506	1	-20.88	-21.06	-21.19	-21.67	-21.75	-21.76
2506	2	-20.64	-20.87	-20.97	-21.13	-20.75	-20.88
2506	3	-21.22	-20.86	-20.79	-20.80	-20.89	-20.74
2506	ALL	-14.46	-14.37	-14.20	-14.15	-14.06	-13.80



Table 6-11. Extended Channel Edge Measurements for 4x4 WiMAX MIMO – Low Channel

Frequency (MHz)	Port	Lower Extended Channel Edge			Upper Extended Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2593	0	-20.91	-21.15	-23.72	-21.05	-21.51	-24.16
2593	1	-23.27	-23.24	-23.66	-23.04	-23.08	-23.69
2593	2	-23.52	-23.96	-23.70	-23.64	-23.87	-23.12
2593	3	-23.68	-23.77	-24.00	-22.53	-22.65	-22.55
2593	ALL	-16.66	-16.85	-17.75	-16.43	-16.67	-17.32

Table 6-12. Extended Channel Edge Measurements for 4x4 WiMAX MIMO – Mid Channel

Frequency (MHz)	Port	Lower Extended Channel Edge			Upper Extended Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2680	0	-22.64	-22.94	-22.93	-23.02	-23.12	-23.09
2680	1	-22.73	-22.48	-23.07	-22.94	-22.64	-23.10
2680	2	-22.37	-21.57	-22.09	-23.00	-22.22	-22.69
2680	3	-23.18	-23.02	-22.01	-22.80	-21.84	-21.55
2680	ALL	-16.70	-16.44	-16.48	-16.92	-16.41	-16.54

Table 6-13. Extended Channel Edge Measurements for 4x4 WiMAX MIMO – High Channel

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MIMO Transmission Mode (Cont'd)

TD-LTE

The following tables show the summed measurement data for 2x2 MIMO operation in TD-LTE mode. Since only two ports can operate simultaneously while in TD-LTE, the summed data shows that ports 0 and 1 are summed together and ports 2 and 3 are summed together to show compliance with the -13dBm limit.

Frequency (MHz)	Port	Lower Channel Edge			Upper Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2506	0	-17.89	-18.05	-17.70	-17.95	-17.84	-18.46
2506	1	-16.64	-17.35	-17.11	-16.22	-16.85	-17.30
2506	0 + 1	-14.21	-14.68	-14.38	-13.99	-14.31	-14.83
2506	2	-17.30	-17.04	-16.69	-16.96	-16.03	-17.24
2506	3	-17.49	-17.13	-17.27	-17.38	-16.43	-17.27
2506	2 + 3	-14.38	-14.07	-13.96	-14.15	-13.22	-14.24



Table 6-14. Channel Edge Measurements for 2x2 TD-LTE MIMO – Low Channel

Frequency (MHz)	Port	Lower Channel Edge			Upper Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2593	0	-17.97	-17.43	-18.14	-18.61	-17.96	-19.18
2593	1	-18.44	-19.44	-19.63	-18.26	-19.89	-20.76
2593	0 + 1	-15.19	-15.31	-15.81	-15.42	-15.81	-16.89
2593	2	-20.03	-19.53	-19.84	-19.49	-19.52	-19.38
2593	3	-17.88	-17.33	-17.09	-19.52	-19.30	-19.72
2593	2 + 3	-15.81	-15.28	-15.24	-16.49	-16.40	-16.54

Table 6-15. Channel Edge Measurements for 2x2 TD-LTE MIMO – Mid Channel

Frequency (MHz)	Port	Lower Channel Edge			Upper Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2680	0	-17.42	-17.56	-17.41	-17.57	-18.53	-18.14
2680	1	-17.91	-17.27	-17.52	-17.75	-17.99	-17.71
2680	0 + 1	-14.65	-14.40	-14.45	-14.65	-15.24	-14.91
2680	2	-18.80	-18.42	-19.11	-19.01	-19.73	-19.48
2680	3	-18.87	-17.32	-17.04	-19.37	-19.19	-18.71
2680	2 + 3	-15.82	-14.82	-14.94	-16.18	-16.44	-16.07

Table 6-16. Channel Edge Measurements for 2x2 TD-LTE MIMO – High Channel

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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MIMO Transmission Mode (Cont'd)

Frequency (MHz)	Port	Lower Extended Channel Edge			Upper Extended Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2506	0	-17.98	-17.97	-18.09	-17.01	-17.09	-17.11
2506	1	-18.65	-18.65	-18.04	-17.99	-17.20	-16.90
2506	0 + 1	-15.29	-15.29	-15.05	-14.46	-14.13	-13.99
2506	2	-18.04	-18.33	-17.92	-17.57	-17.36	-17.91
2506	3	-17.12	-18.20	-18.69	-17.92	-17.67	-17.80
2506	2 + 3	-14.55	-15.25	-15.28	-14.73	-14.50	-14.84



Table 6-17. Extended Channel Edge Measurements for 2x2 TD-LTE MIMO – Low Channel

Frequency (MHz)	Port	Lower Extended Channel Edge			Upper Extended Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2593	0	-18.43	-18.83	-18.14	-18.19	-17.60	-17.74
2593	1	-18.55	-18.44	-18.53	-17.77	-17.85	-18.45
2593	0 + 1	-15.48	-15.62	-15.32	-14.96	-14.71	-15.07
2593	2	-17.31	-17.52	-18.53	-17.78	-17.64	-17.56
2593	3	-18.24	-18.68	-18.26	-17.97	-18.09	-18.26
2593	2 + 3	-14.74	-15.05	-15.38	-14.86	-14.85	-14.89

Table 6-18. Extended Channel Edge Measurements for 2x2 TD-LTE MIMO – Mid Channel

Frequency (MHz)	Port	Lower Extended Channel Edge			Upper Extended Channel Edge		
		QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)
2680	0	-18.06	-18.30	-18.14	-18.03	-17.69	-17.93
2680	1	-17.86	-17.94	-18.18	-17.54	-18.02	-17.76
2680	0 + 1	-14.95	-15.11	-15.15	-14.77	-14.84	-14.83
2680	2	-16.93	-17.98	-18.02	-17.50	-17.79	-17.81
2680	3	-17.84	-18.21	-18.33	-17.47	-17.97	-16.94
2680	2 + 3	-14.35	-15.08	-15.16	-14.47	-14.87	-14.34

Table 6-19. Extended Channel Edge Measurements for 2x2 TD-LTE MIMO – High Channel

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6.4 WiMAX Radiated Measurements

§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2506.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1411.31	-63.54	5.76	-57.77	H	-44.77
3359.71	-60.21	7.85	-52.36	H	-39.36
5010.09	-47.66	10.11	-37.55	H	-24.55

Table 6-20. Radiated Spurious Data (WiMAX Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

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WiMAX Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2593.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1411.19	-63.22	5.76	-57.45	H	-44.45
3807.88	-58.64	8.54	-50.10	H	-37.10
5190.52	-49.05	10.25	-38.79	H	-25.79

Table 6-21. Radiated Spurious Data (WiMAX Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

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WiMAX Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2680.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1410.97	-63.81	5.76	-58.05	H	-45.05
3359.45	-60.18	7.85	-52.33	H	-39.33
5358.09	-49.99	10.43	-39.56	H	-26.56

Table 6-22. Radiated Spurious Data (WiMAX Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.5 TD-LTE Radiated Measurements
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2506.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1411.22	-50.57	5.76	-44.80	H	-31.80
3807.23	-50.92	8.54	-42.38	H	-29.38
5014.44	-47.24	10.11	-37.13	H	-24.13

Table 6-23. Radiated Spurious Data (TD-LTE Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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TD-LTE Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2593.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1411.19	-62.64	5.76	-56.87	H	-43.87
3808.36	-57.49	8.54	-48.95	H	-35.95
5192.19	-53.88	10.25	-43.63	H	-30.63

Table 6-24. Radiated Spurious Data (TD-LTE Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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TD-LTE Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2680.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1410.94	-63.12	5.76	-57.36	H	-44.36
3807.65	-58.98	8.54	-50.44	H	-37.44
5361.53	-57.10	10.44	-46.66	H	-33.66

Table 6-25. Radiated Spurious Data (TD-LTE Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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TD-LTE Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2506.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1254.70	-64.16	4.54	-59.62	H	-46.62
1386.91	-63.91	5.58	-58.33	H	-45.33
5011.72	-54.27	10.11	-44.16	H	-31.16

Table 6-26. Radiated Spurious Data (TD-LTE Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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TD-LTE Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2593.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1246.41	-64.10	4.47	-59.63	H	-46.63
1380.97	-64.04	5.54	-58.50	H	-45.50
5186.00	-58.35	10.25	-48.11	H	-35.11

Table 6-27. Radiated Spurious Data (TD-LTE Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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TD-LTE Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 2680.00 MHz
 MODULATION SIGNAL: QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1249.69	-63.75	4.50	-59.25	H	-46.25
1790.58	-59.46	4.06	-55.40	H	-42.40
5364.08	-54.18	10.44	-43.74	H	-30.74

Table 6-28. Radiated Spurious Data (TD-LTE Mode)

NOTES:

1. This device was tested under all configurations and the worst case radiated spurious emissions were found in WiMAX and TD-LTE modes using QPSK modulation.
2. This unit was tested while powered by an external 48VDC power supply.
3. The EUT was tested in all possible test configurations and its typical positioning. The data reported in the table above was measured with the EUT transmitting from all four ports in WiMAX mode.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.6 WiMAX Frequency Stability Measurements

§2.1055, §27.54

OPERATING FREQUENCY: 2,593,000,000 Hz



REFERENCE VOLTAGE: 48 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	48.00	+ 20 (Ref)	2,593,000,002	2	0.0000001
100 %		- 30	2,593,000,003	3	0.0000001
100 %		- 20	2,592,999,996	-4	-0.0000002
100 %		- 10	2,592,999,990	-10	-0.0000004
100 %		0	2,592,999,991	-9	-0.0000003
100 %		+ 10	2,593,000,005	5	0.0000002
100 %		+ 20	2,592,999,989	-11	-0.0000004
100 %		+ 30	2,593,000,010	10	0.0000004
100 %		+ 40	2,592,999,996	-4	-0.0000002
100 %		+ 50	2,592,999,992	-8	-0.0000003
115 %	55.20	+ 20	2,592,999,987	-13	-0.0000005
85 %	40.80	+ 20	2,592,999,990	-10	-0.0000004

Table 6-29. Frequency Stability Data (WiMAX Mode)

Note:

- Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edges would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.
- Frequency stability measurements were performed on Port 0 while operating at maximum power in WiMAX mode and was found to be representative of the frequency deviation behavior across all ports.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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WiMAX Frequency Stability Measurements (Cont'd)
§2.1055, §27.54

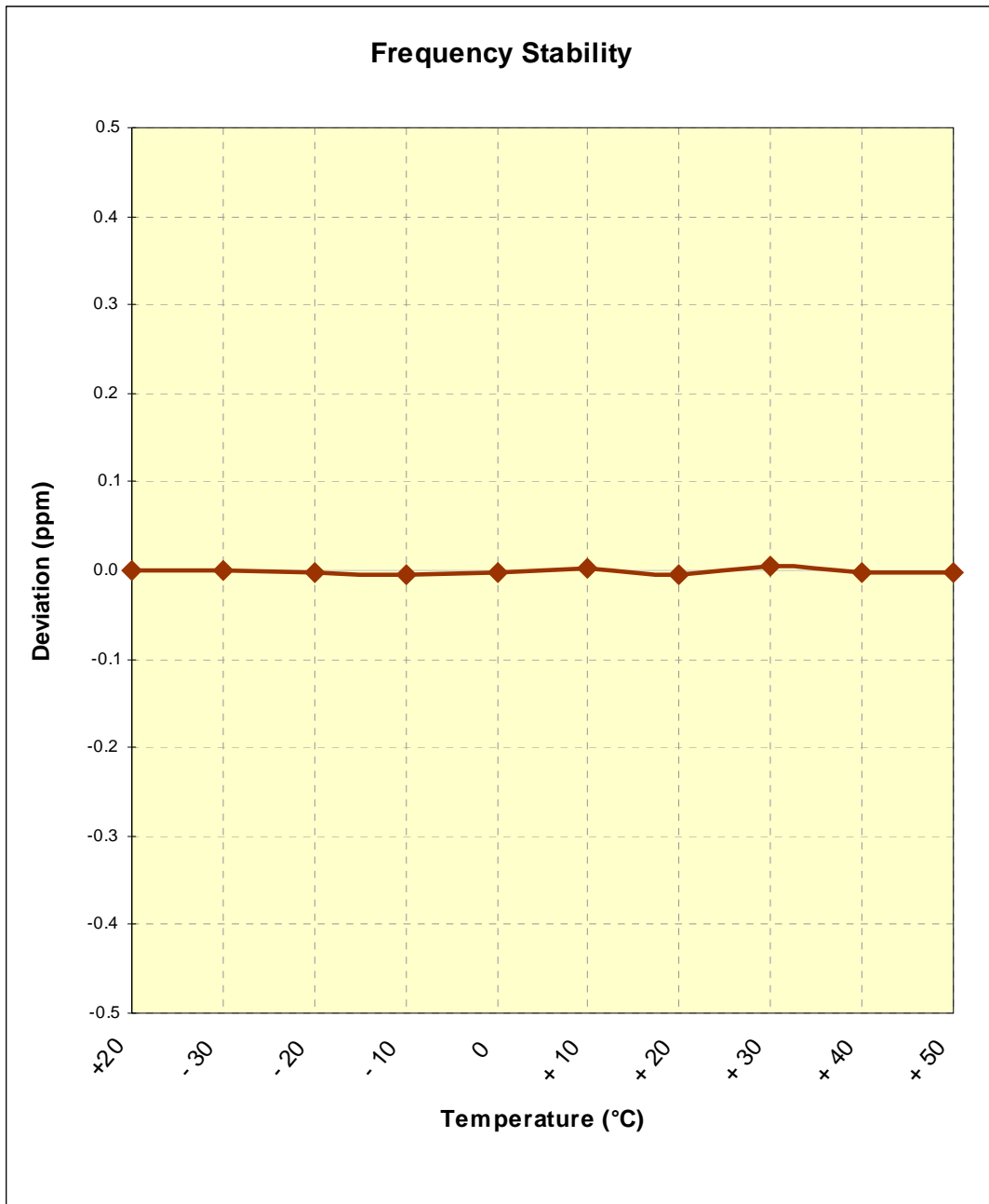




Figure 6-1. Frequency Stability Graph (WiMAX Mode)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.7 TD-LTE Frequency Stability Measurements

\$2.1055, \$27.54

OPERATING FREQUENCY: 2,593,000,000 Hz



REFERENCE VOLTAGE: 48 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	48.00	+ 20 (Ref)	2,592,999,990	-10	-0.0000004
100 %		- 30	2,593,000,002	2	0.0000001
100 %		- 20	2,593,000,013	13	0.0000005
100 %		- 10	2,593,000,005	5	0.0000002
100 %		0	2,592,999,981	-19	-0.0000007
100 %		+ 10	2,592,999,994	-6	-0.0000002
100 %		+ 20	2,592,999,995	-5	-0.0000002
100 %		+ 30	2,593,000,011	11	0.0000004
100 %		+ 40	2,593,000,009	9	0.0000003
100 %		+ 50	2,593,000,010	10	0.0000004
115 %	55.20	+ 20	2,592,999,996	-4	-0.0000002
85 %	40.80	+ 20	2,592,999,994	-6	-0.0000002

Table 6-30. Frequency Stability Data (TD-LTE Mode)

Note:

- Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edges would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.
- Frequency stability measurements were performed on Port 0 while operating at maximum power in TD-LTE mode and was found to be representative of the frequency deviation behavior across all ports.

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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TD-LTE Frequency Stability Measurements (Cont'd)
§2.1055, §27.54

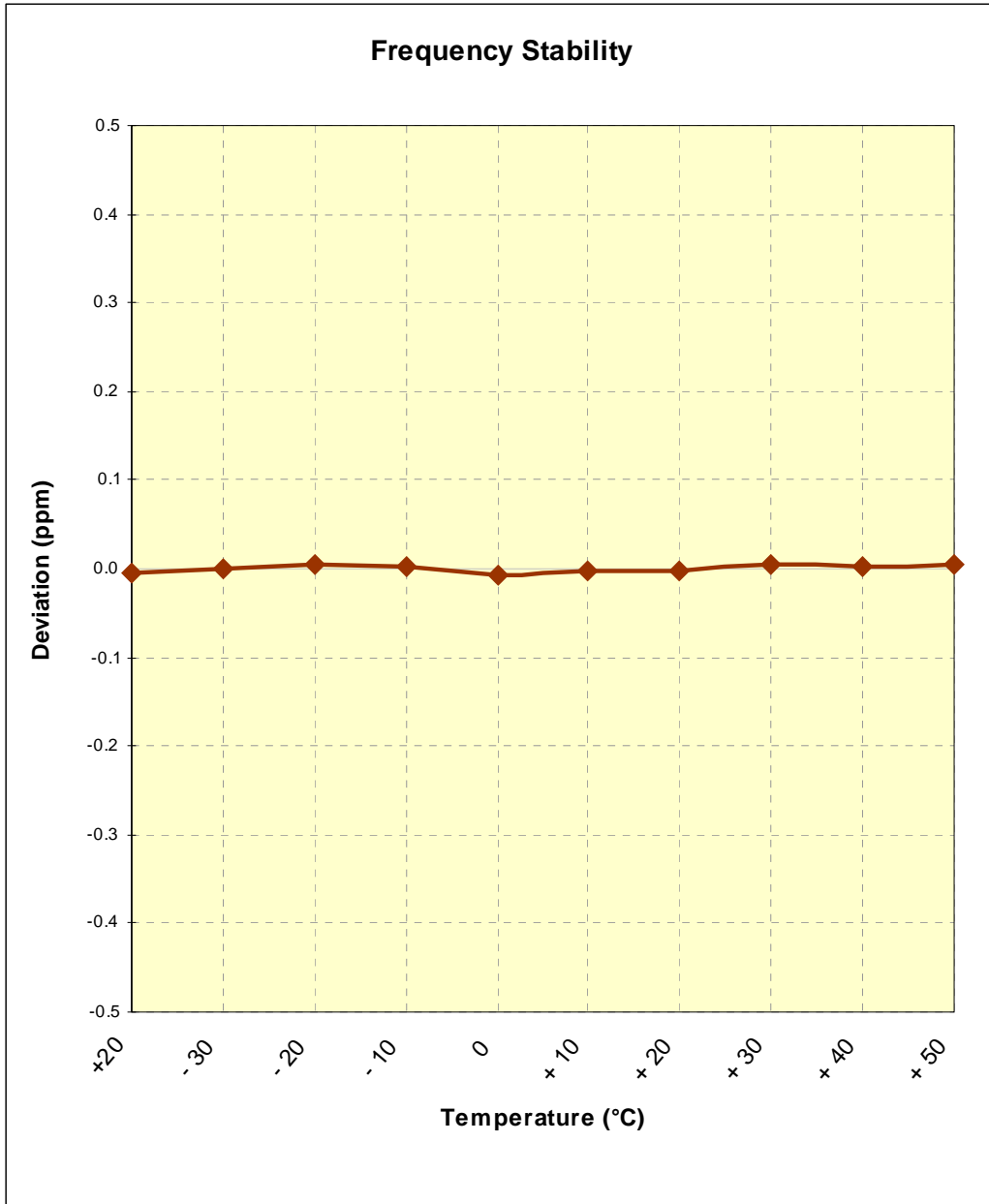




Figure 6-2. Frequency Stability Graph (TD-LTE Mode)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station	Page 34 of 247	

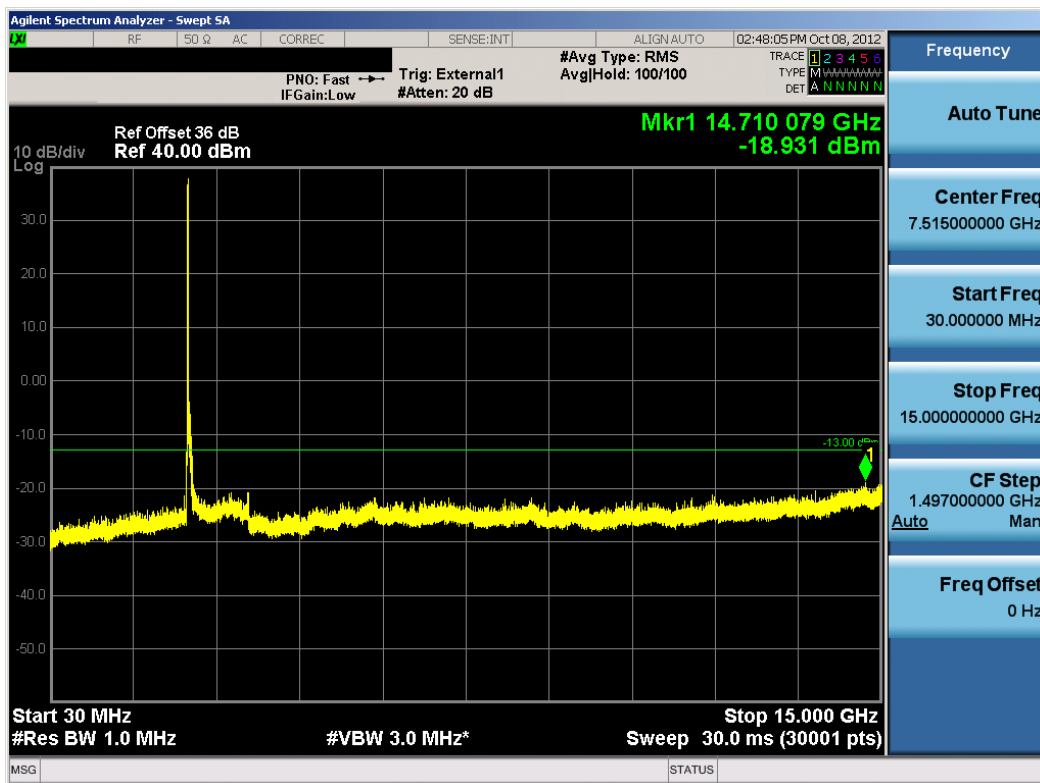
7.0 PLOT(S) OF EMISSIONS – WiMAX

All conducted plots shown in Sections 7.0 and 8.0 were captured with the EUT transmitting at maximum power from each of its 4 RF ports. The conducted measurement system was comprised of a 30dB attenuator and a 6dB attenuator connected in series and an RF cable. All plots, except for the “extended band edge” plots, use a fixed reference level offset of 36dB. The RF cable losses were measured up to 27GHz to account for the 10th harmonic of the highest transmit frequency. The losses of the RF cable were loaded as a correction table into the spectrum analyzer to account for RF losses at all frequencies.

For the “extended band edge” plots, the reference level offset was set to 46dB using the same system as described above. These plots were measured using RBW = 100kHz however FCC Pt. 27.53(m) states that a 1MHz RBW must be used to show compliance with the applicable limit. The RBW was reduced to 100kHz to improve measurement accuracy by reducing the effects of the in-band energy on out-of-band spurious emissions. To account for the use of a lower RBW, an additional 10dB was added to the base reference level offset (i.e. $10\log_{10}(1\text{MHz RBW}/100\text{kHz RBW}) = 10\text{dB}$) to obtain a total offset of 46dB.

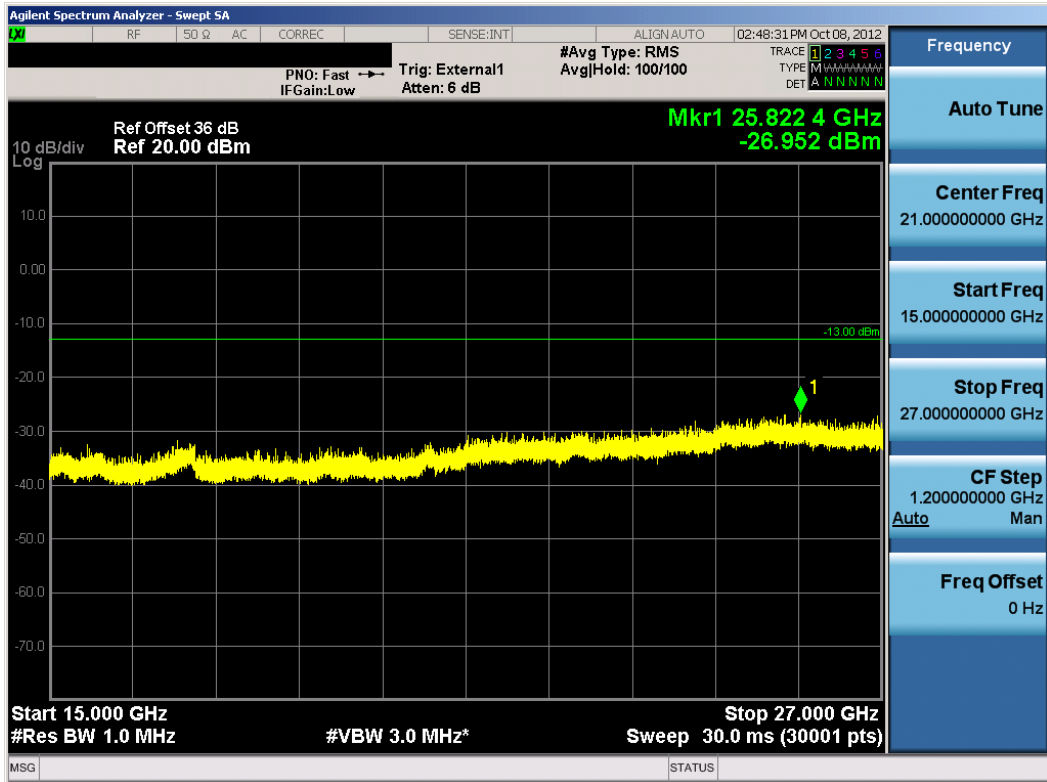
7.1 RF Port 0 (WiMAX)

QPSK Modulation

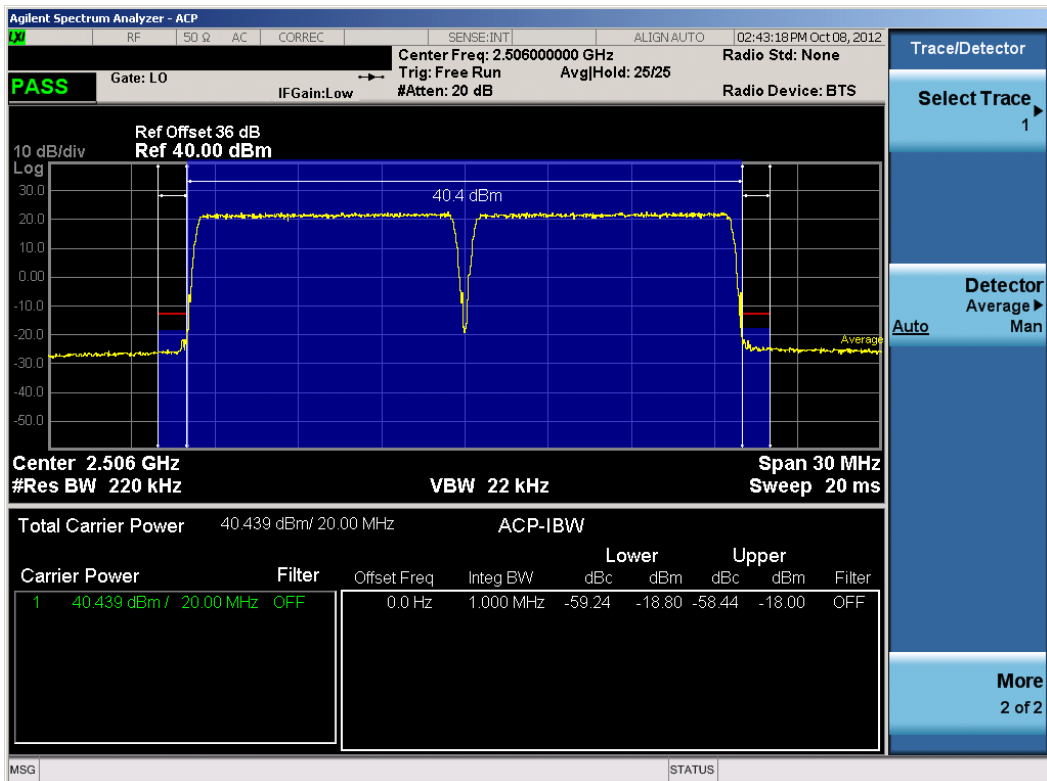


Plot 7-1. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-2. Conducted Spurious Plot (WiMAX Mode – Low Channel)

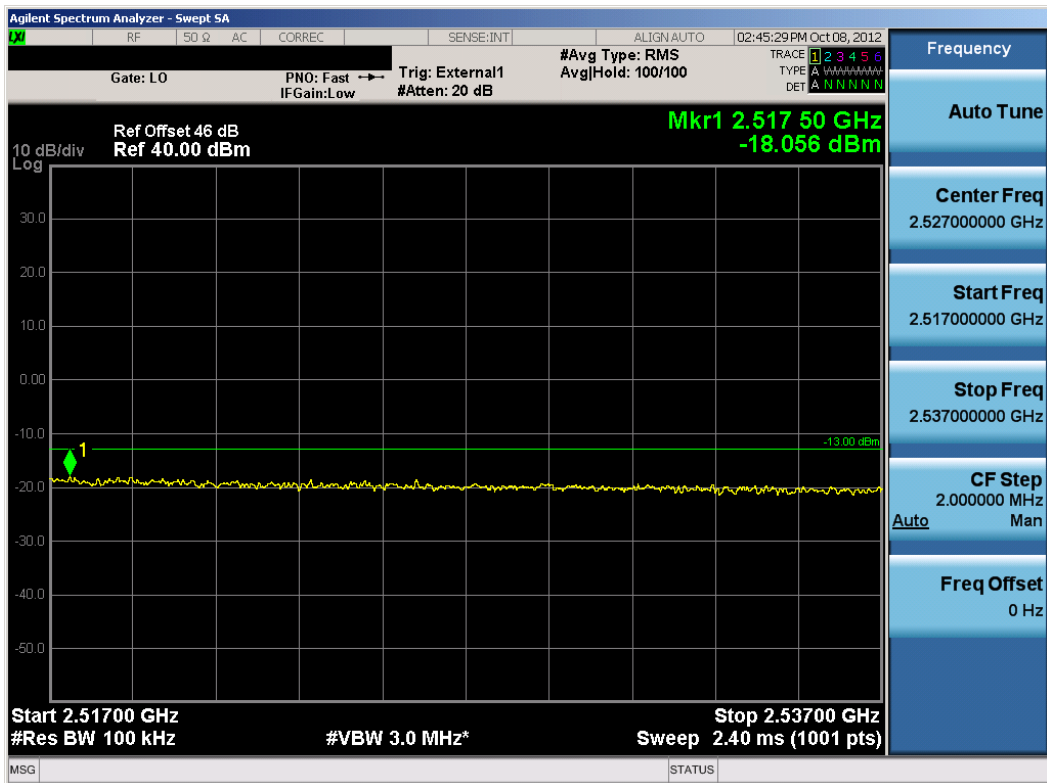


Plot 7-3. Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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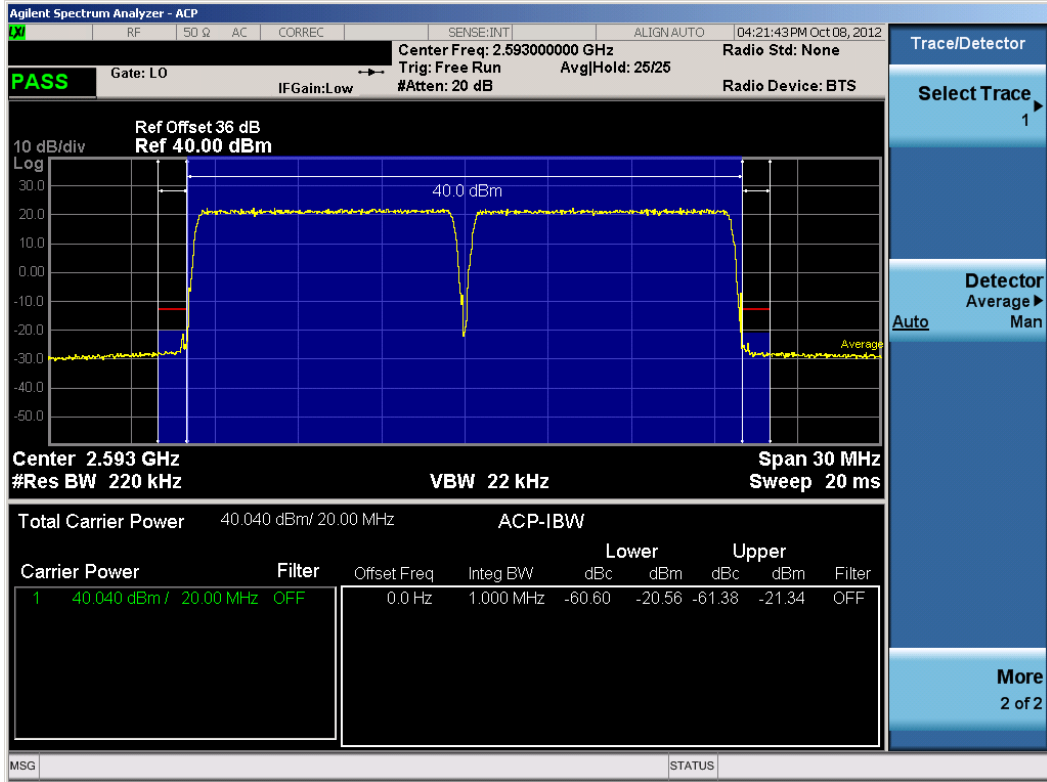


Plot 7-4. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

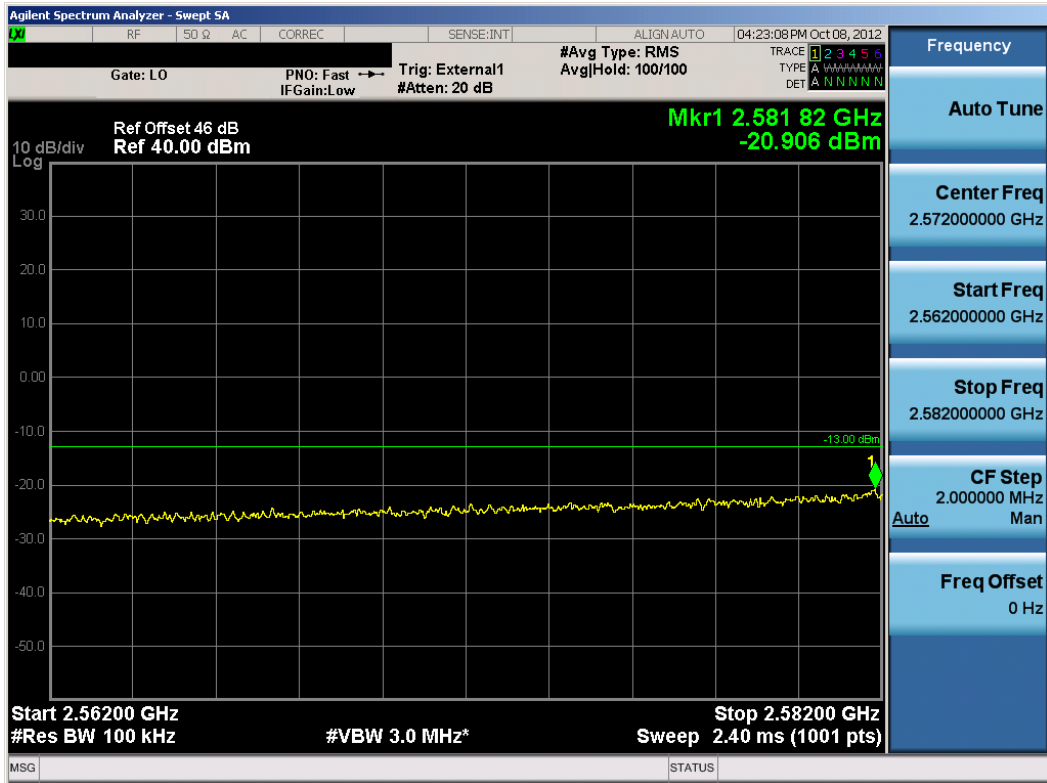


Plot 7-5. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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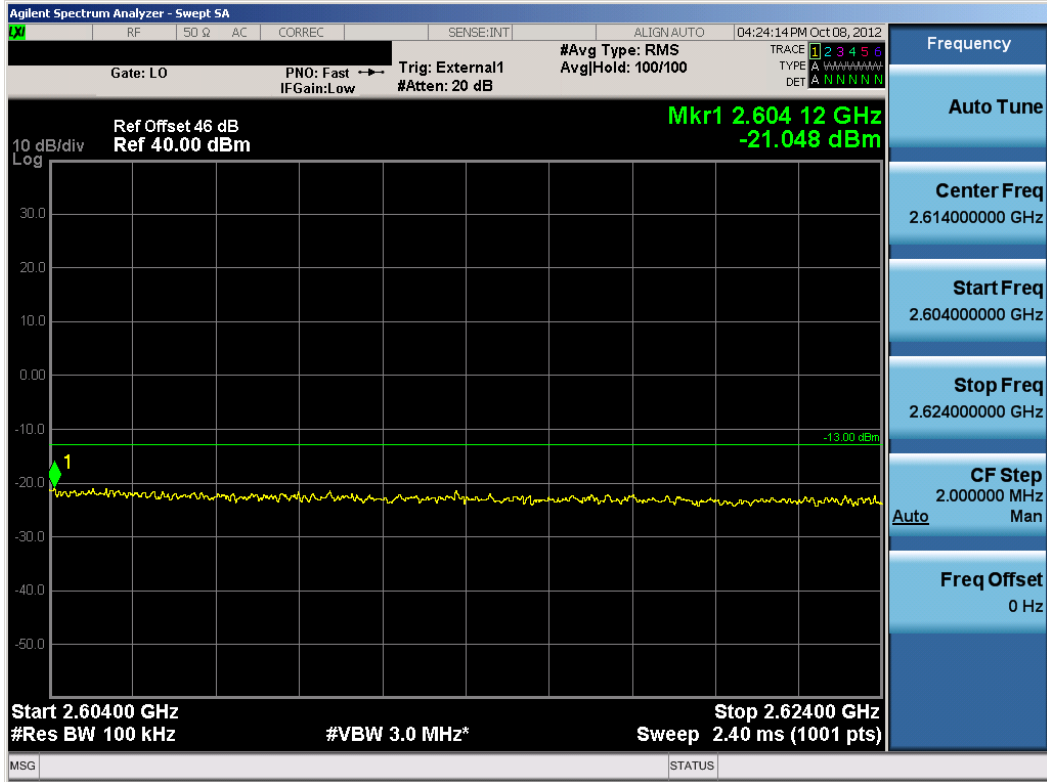


Plot 7-8. Channel Edge Plot (WiMAX Mode – Mid Channel)

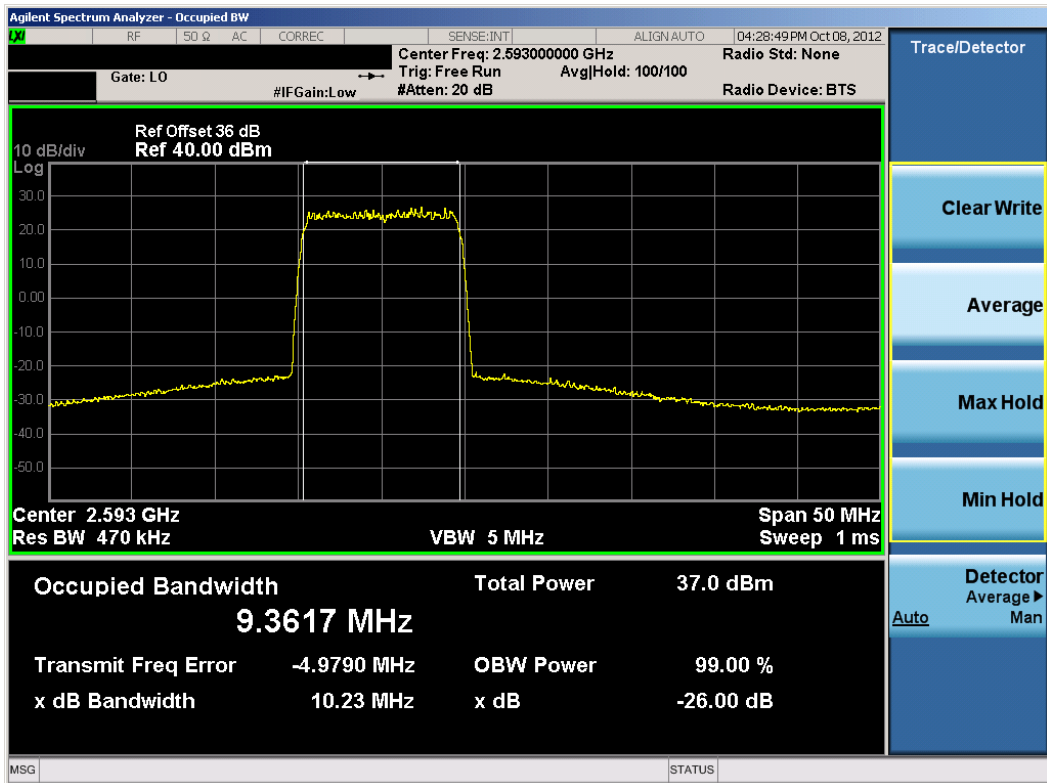


Plot 7-9. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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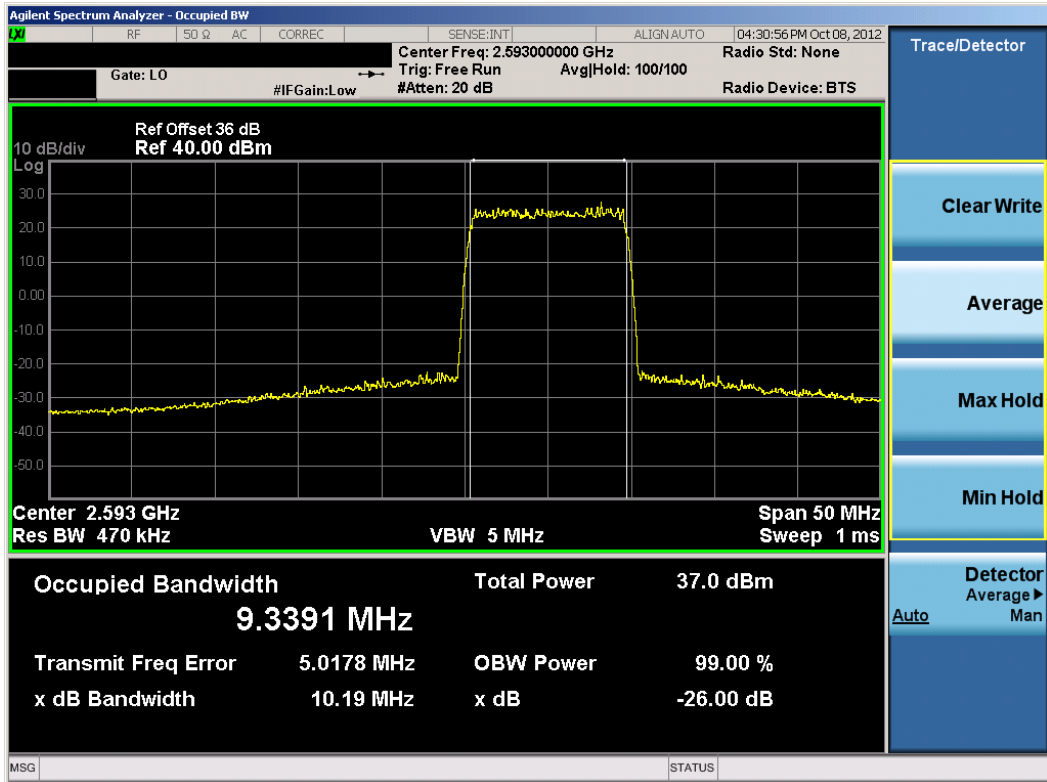


Plot 7-10. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

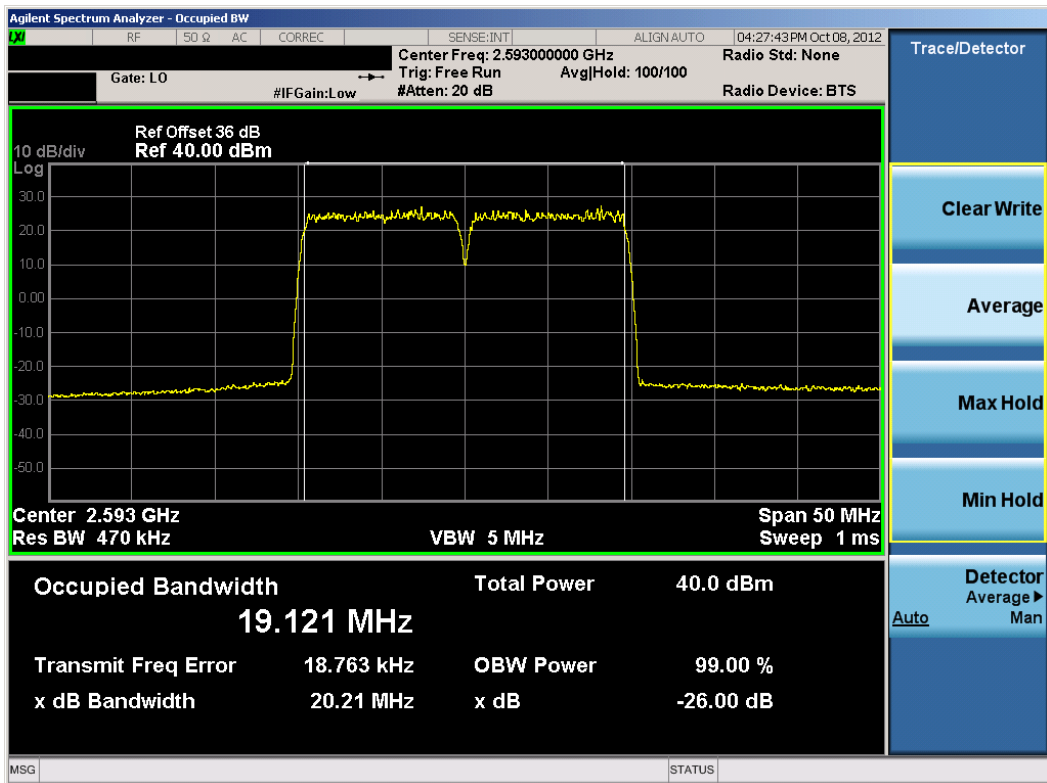


Plot 7-11. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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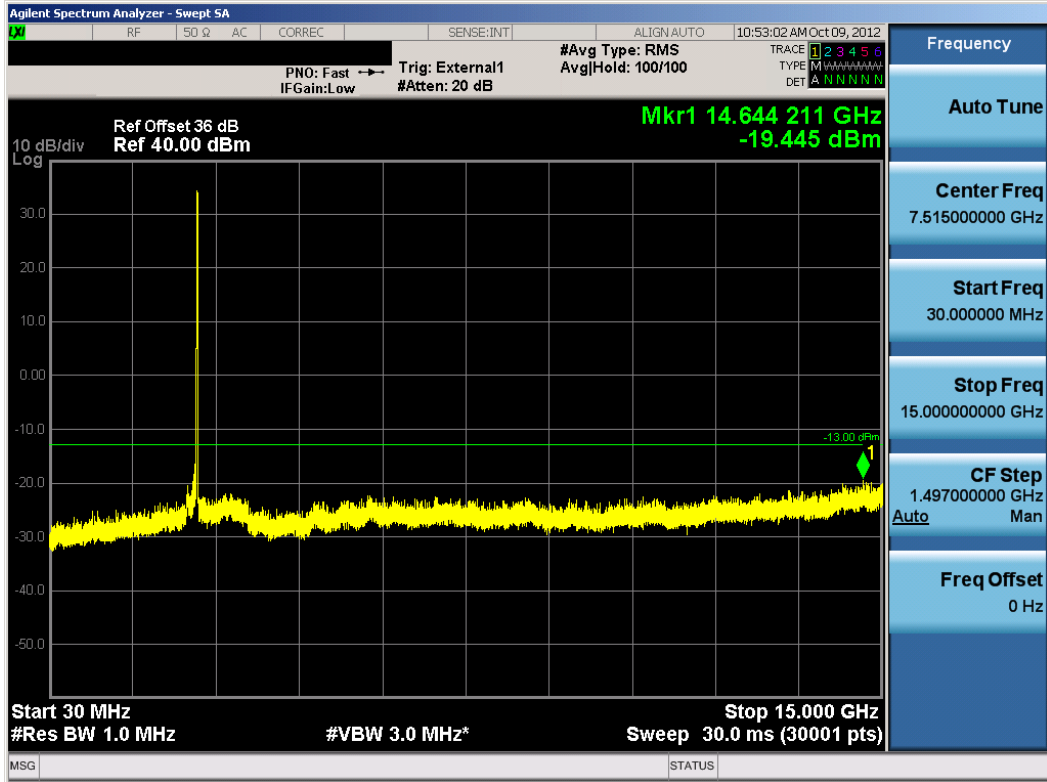


Plot 7-12. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

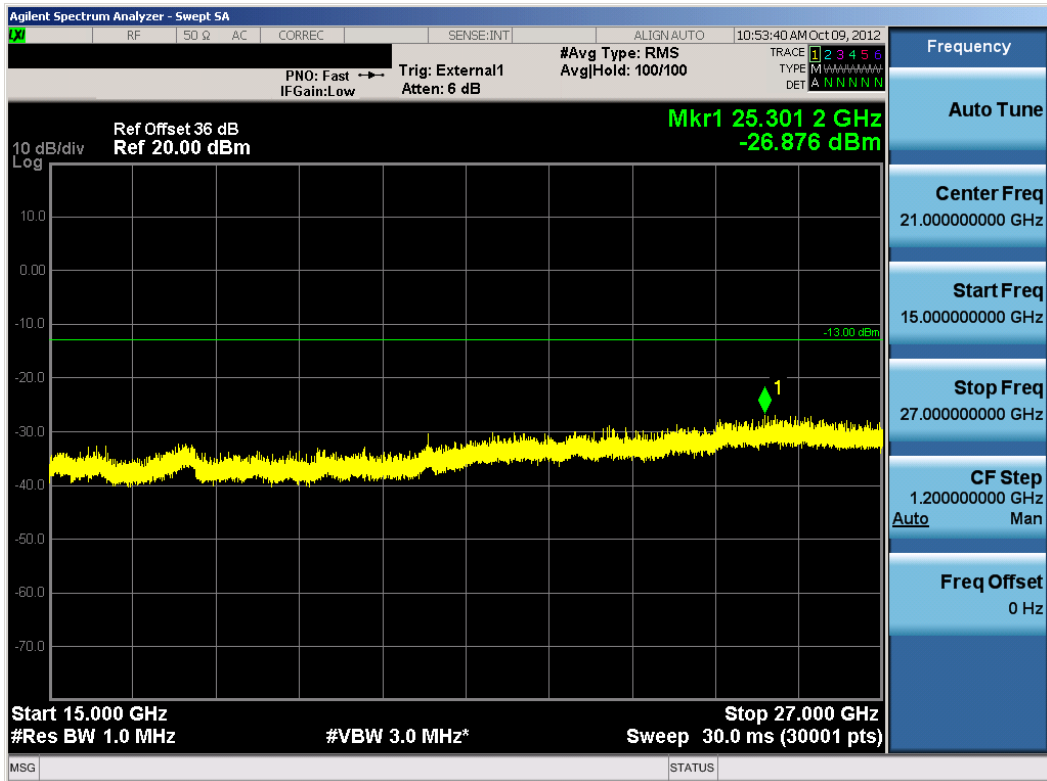


Plot 7-13. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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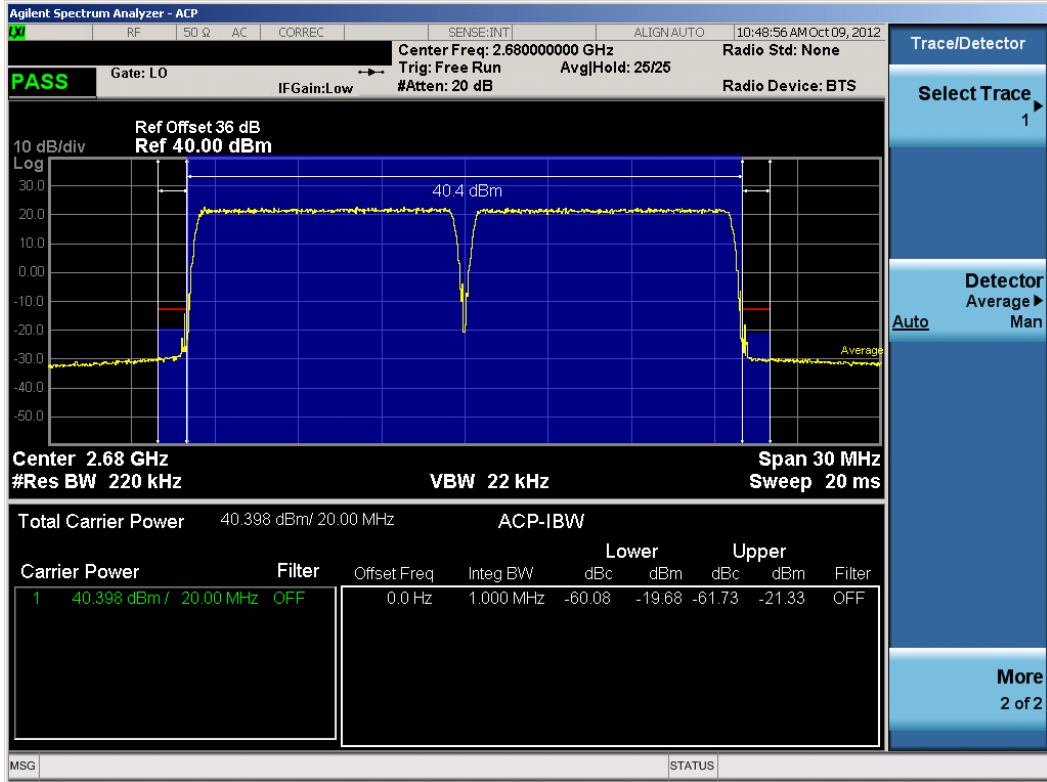


Plot 7-14. Conducted Spurious Plot (WiMAX Mode – High Channel)

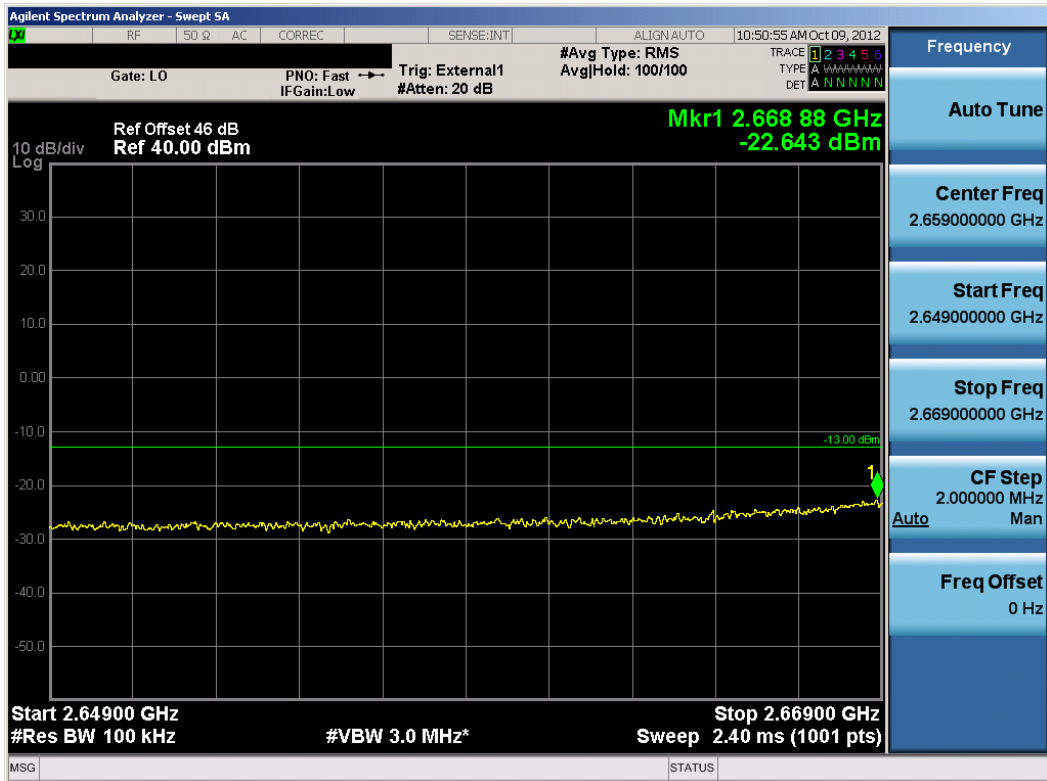


Plot 7-15. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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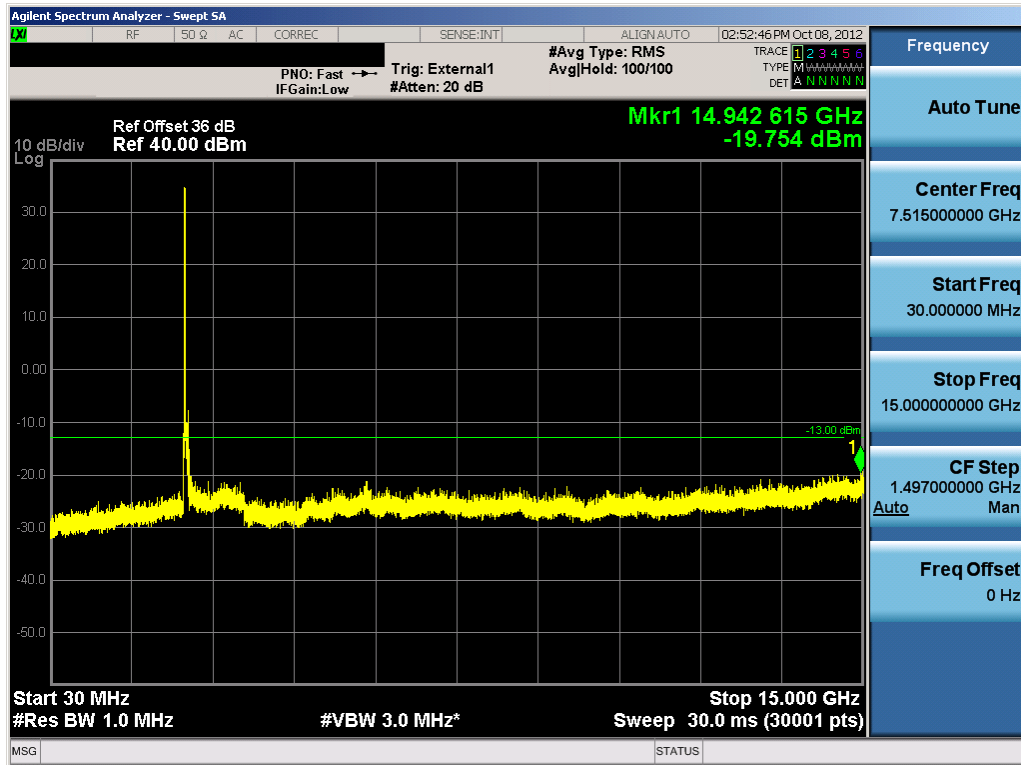
Plot 7-16. Channel Edge Plot (WiMAX Mode – High Channel)



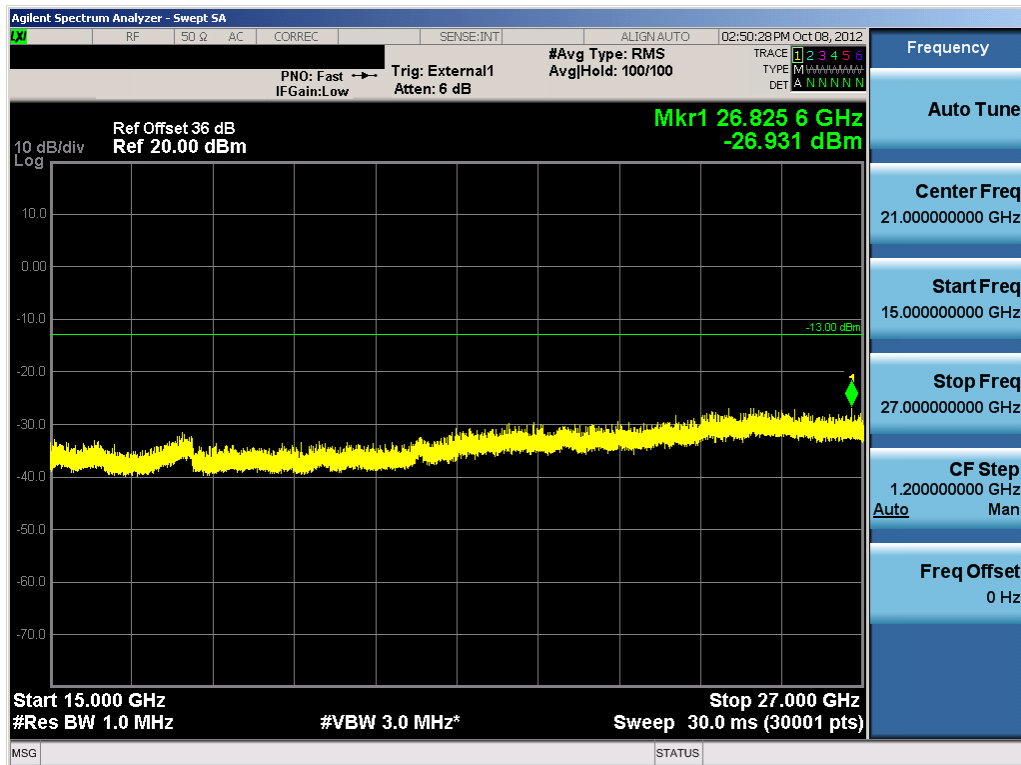
Plot 7-17. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 43 of 247

16-QAM Modulation

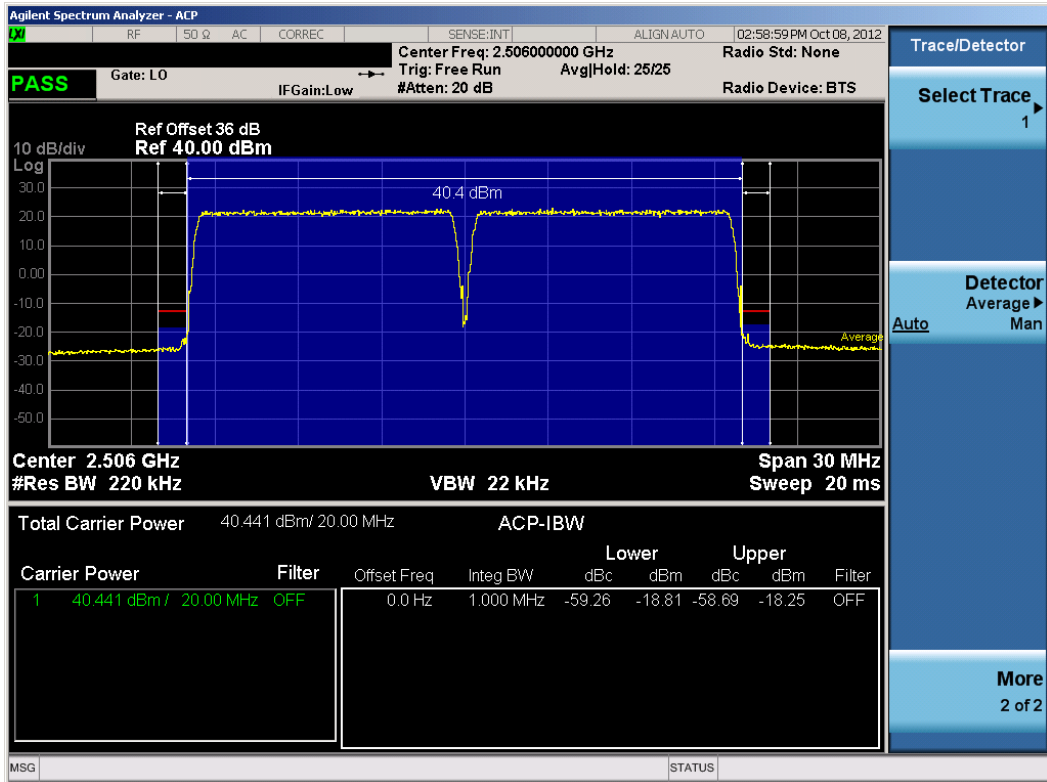


Plot 7-19. Conducted Spurious Plot (WiMAX Mode – Low Channel)

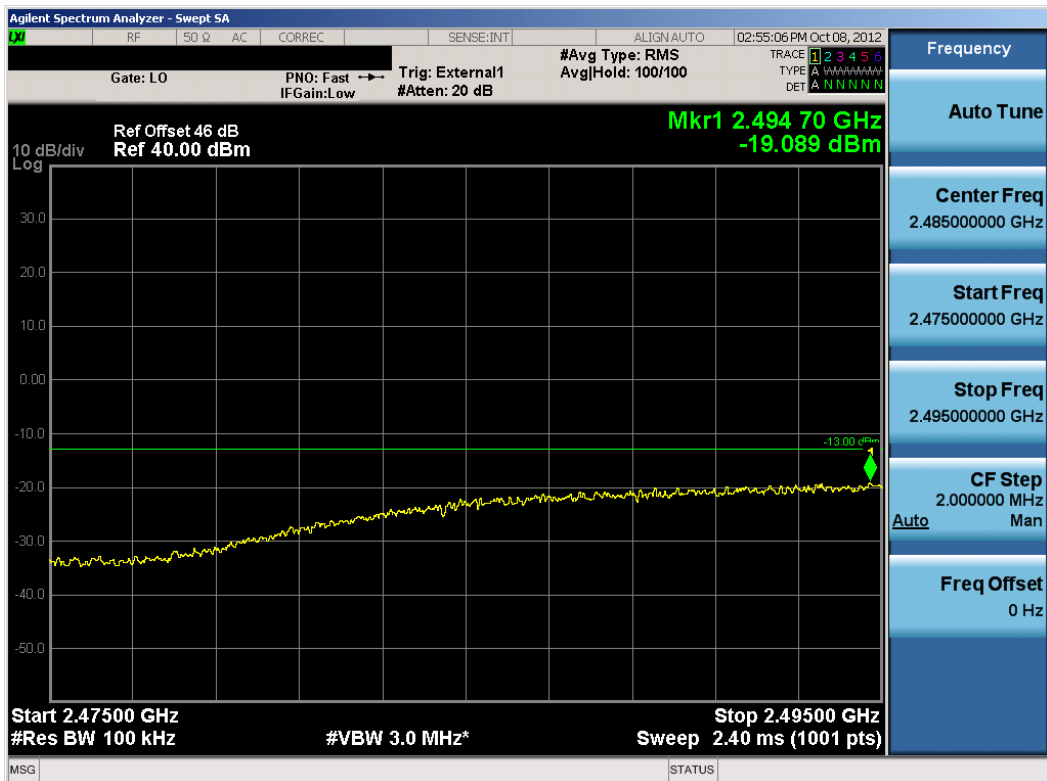


Plot 7-20. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 45 of 247

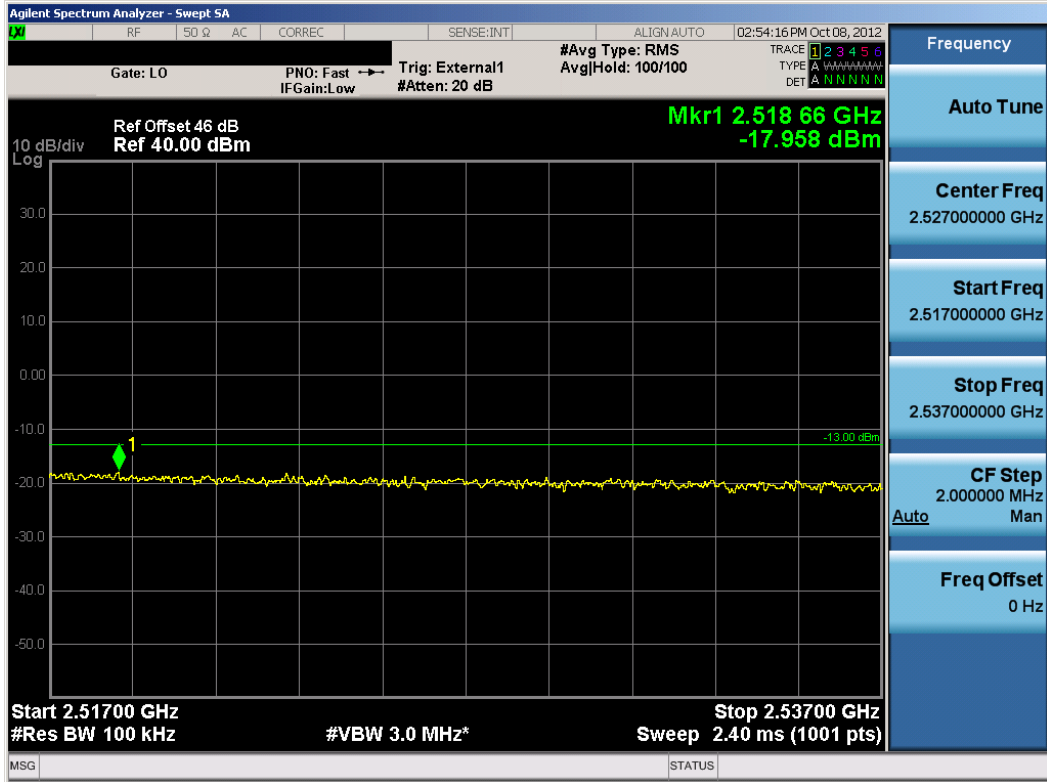


Plot 7-21. Channel Edge Plot (WiMAX Mode – Low Channel)

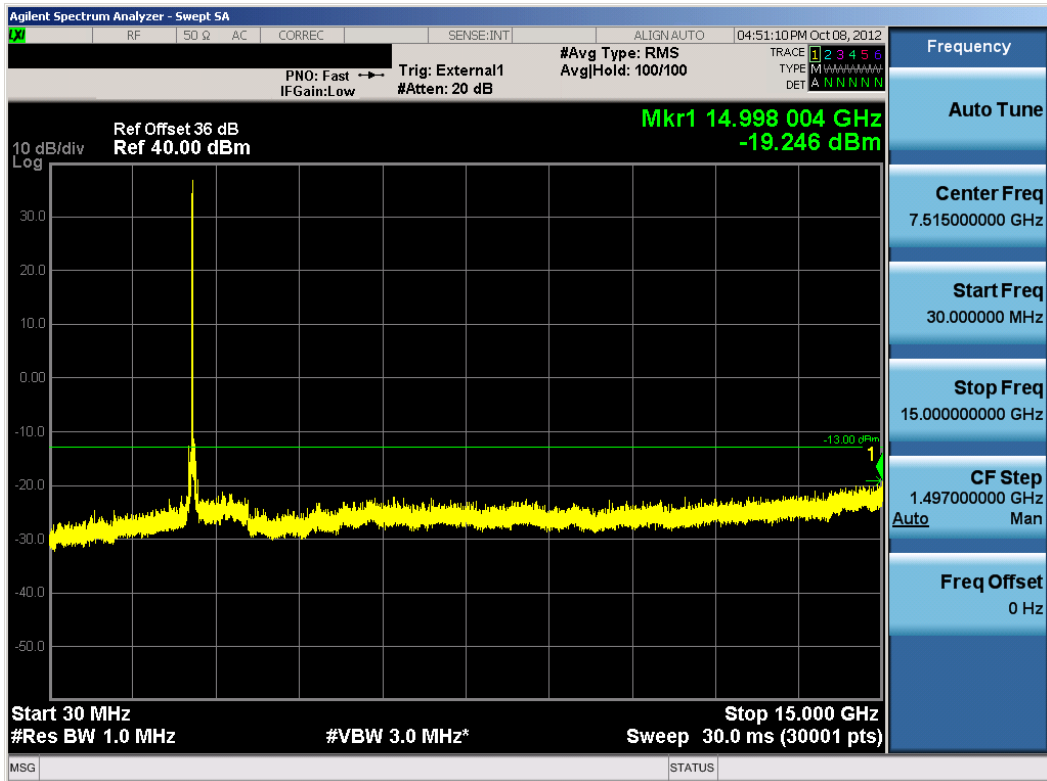


Plot 7-22. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 46 of 247

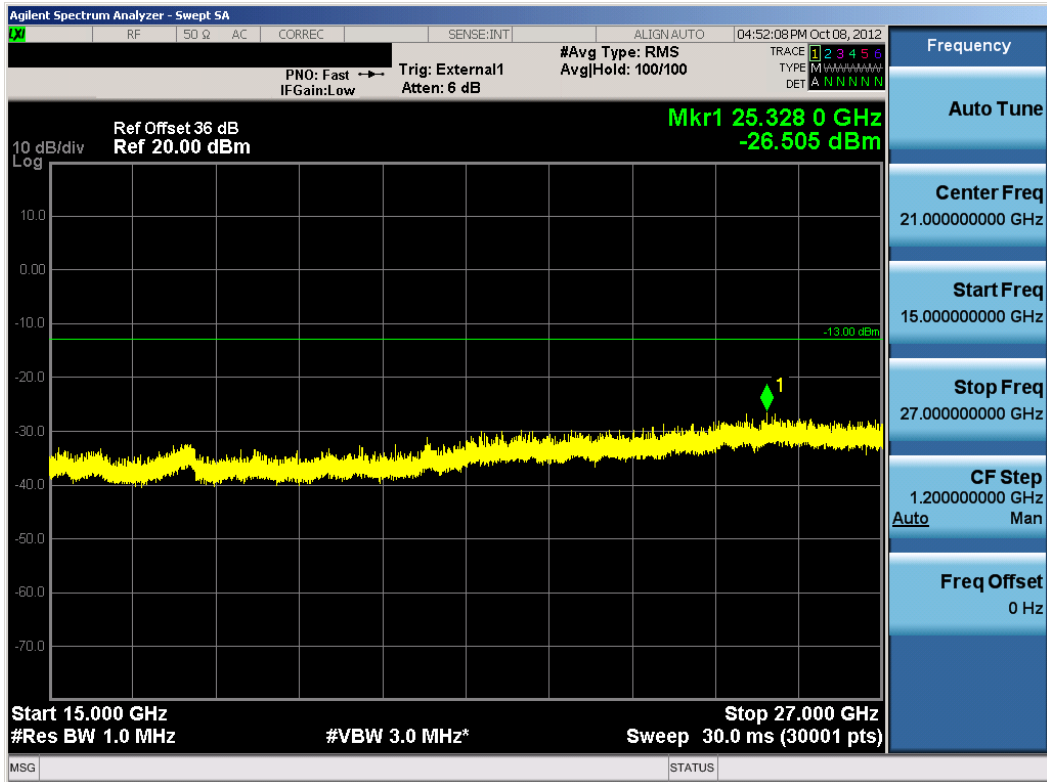


Plot 7-23. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

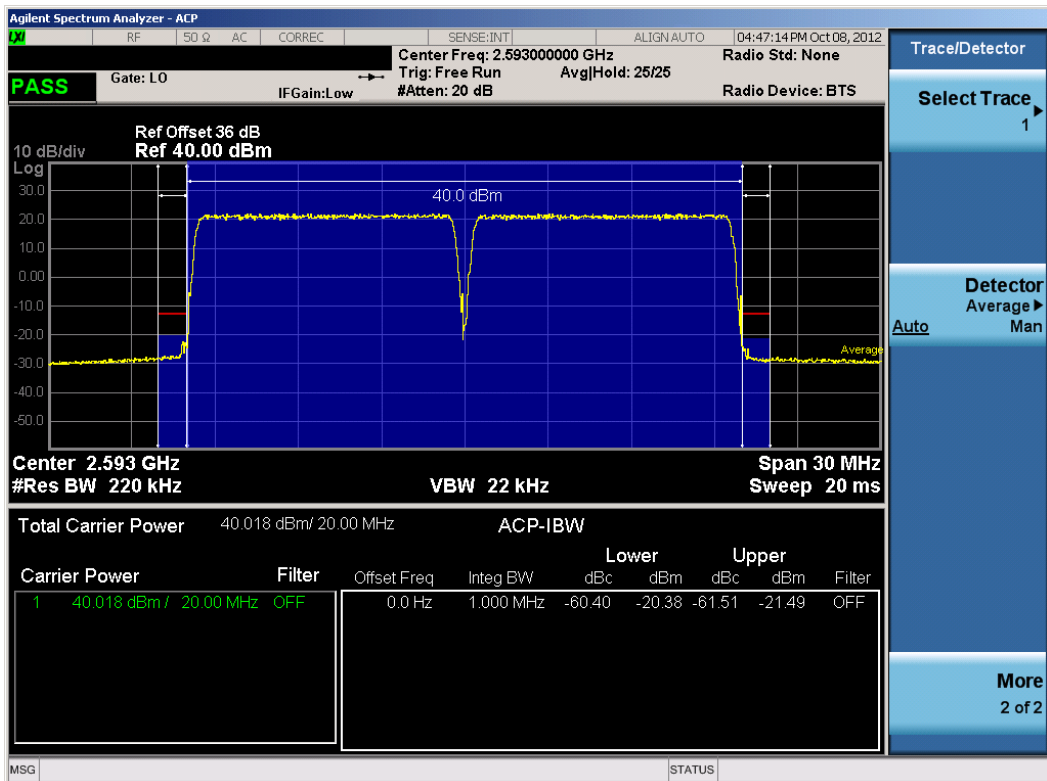


Plot 7-24. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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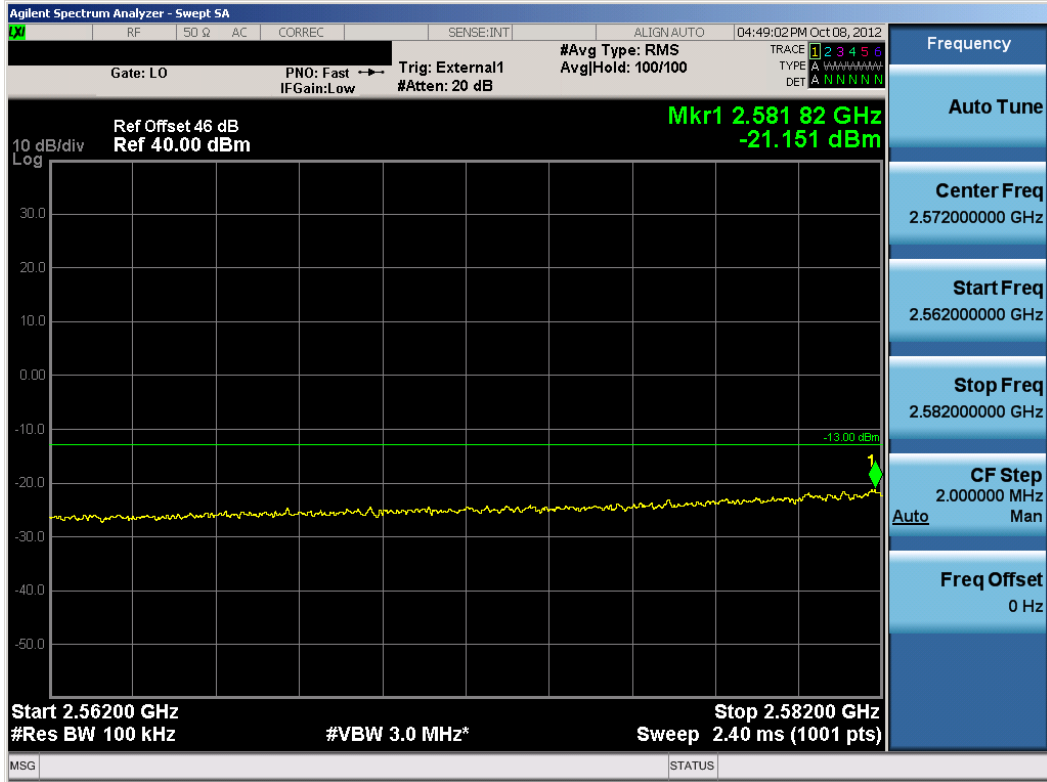


Plot 7-25. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

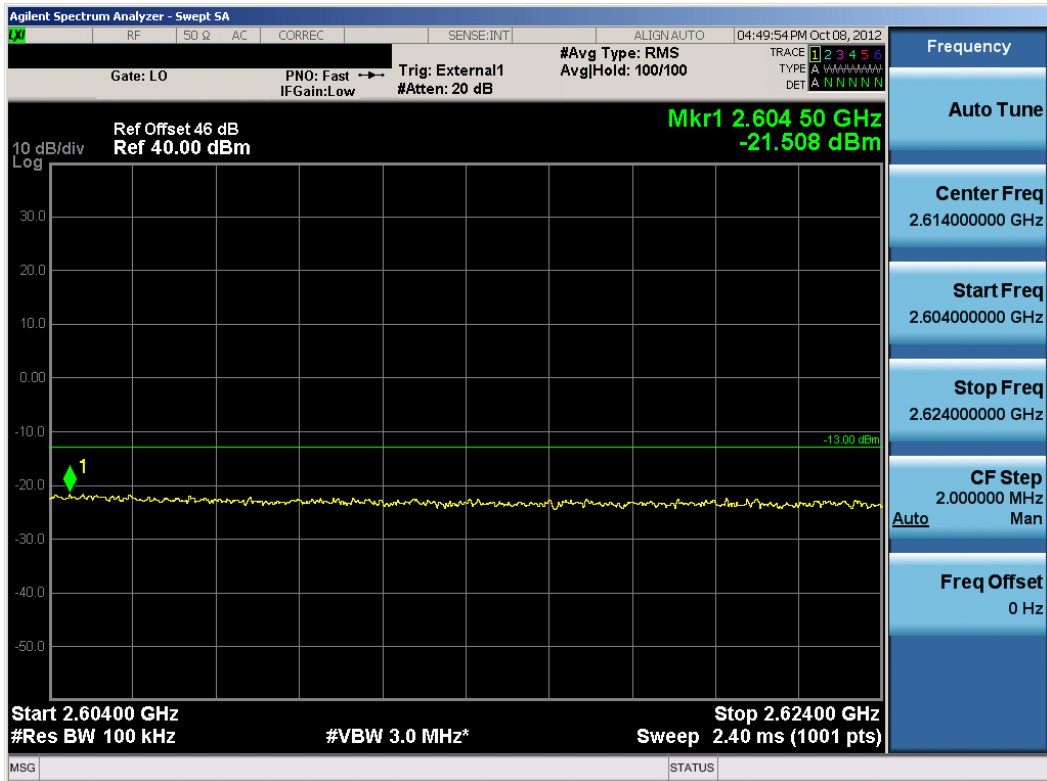


Plot 7-26. Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 48 of 247

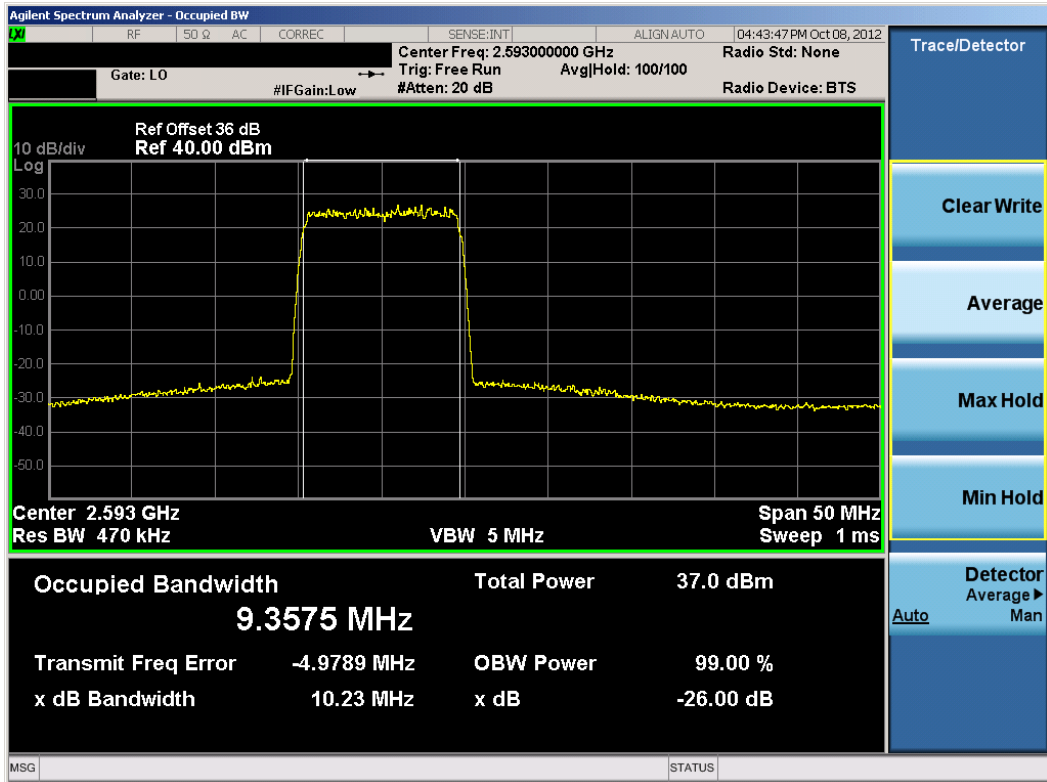


Plot 7-27. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

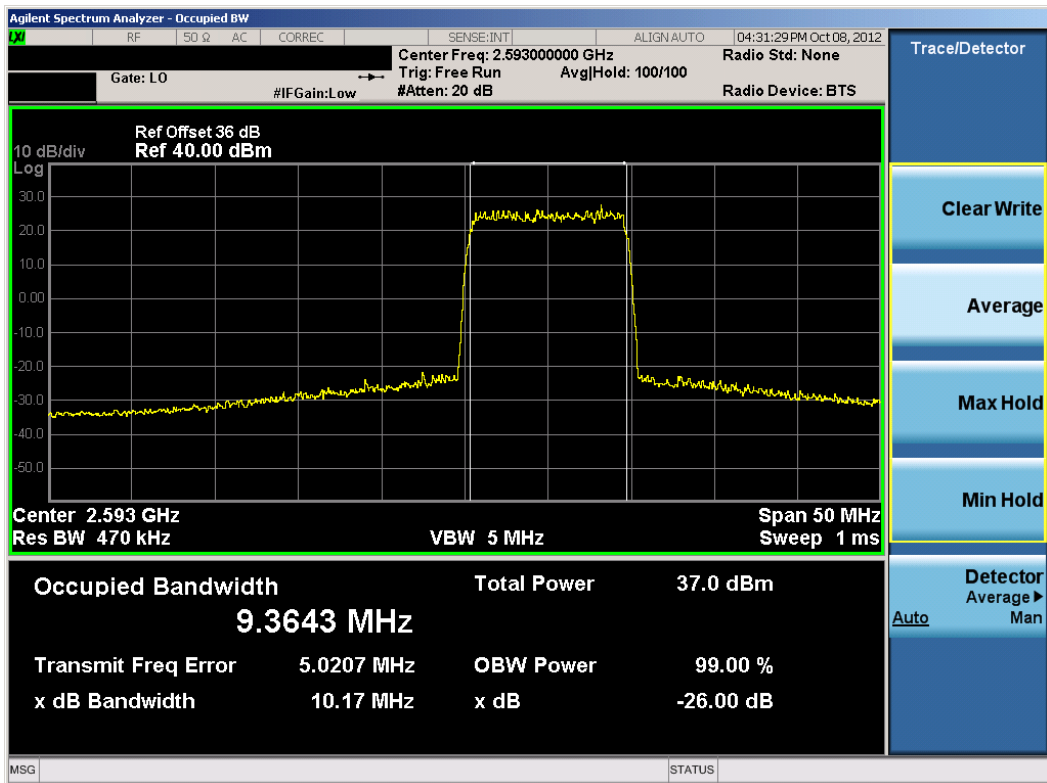


Plot 7-28. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 49 of 247

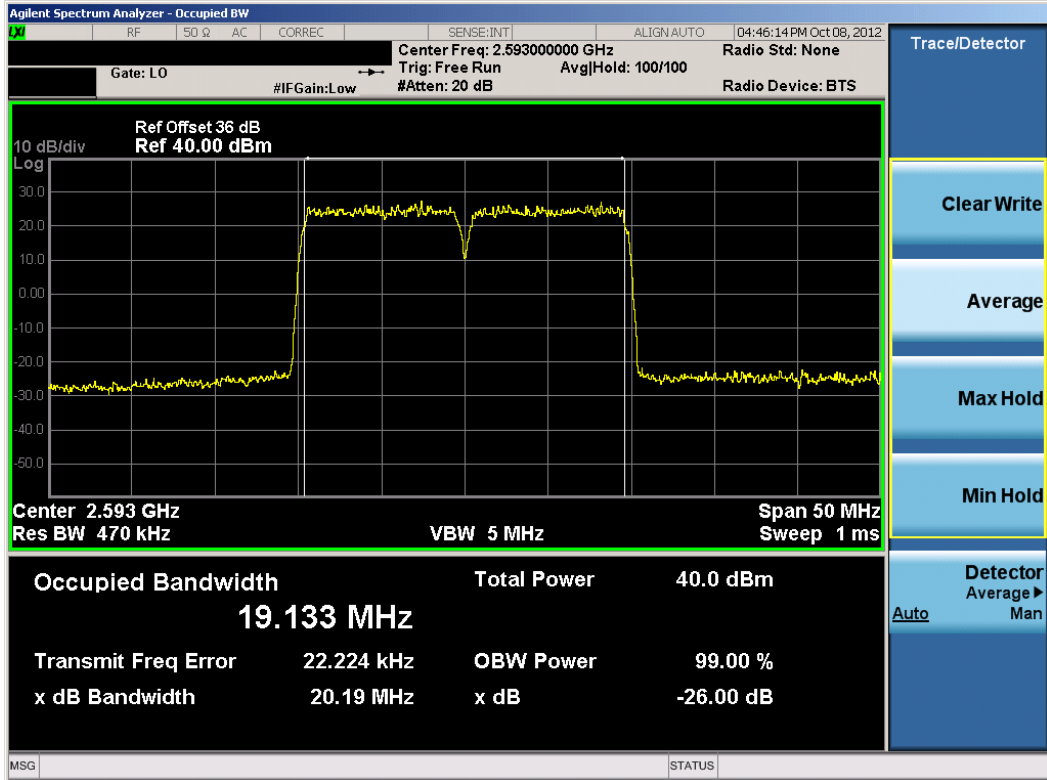


Plot 7-29. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

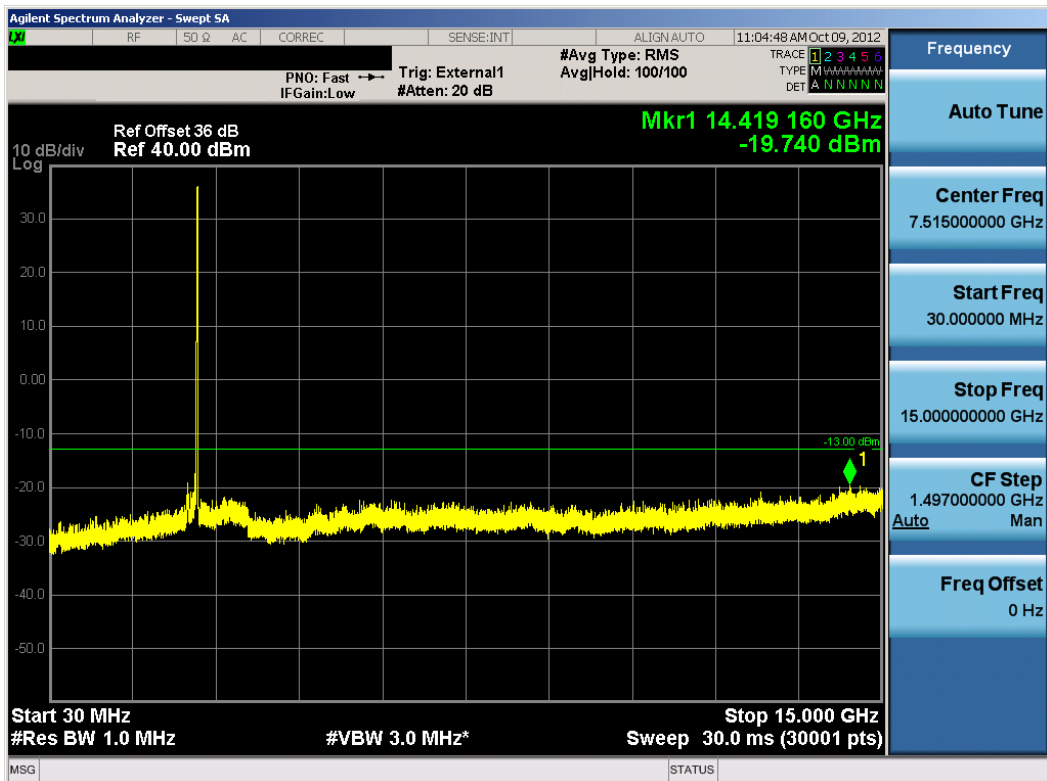


Plot 7-30. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 50 of 247

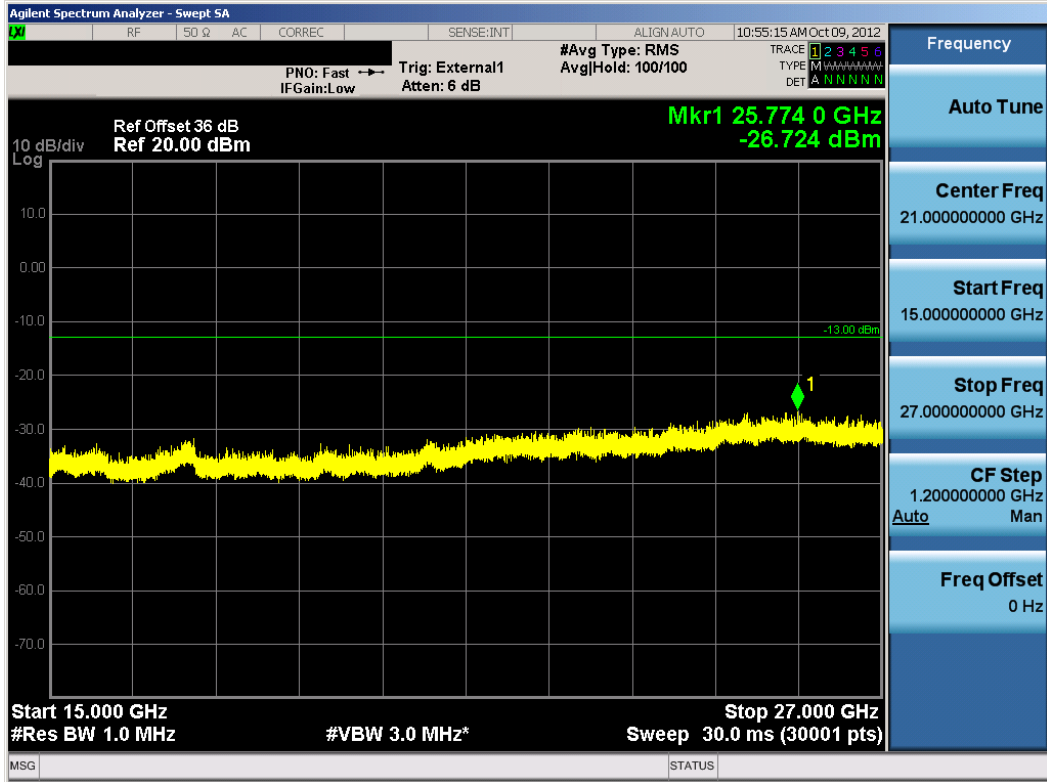


Plot 7-31. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

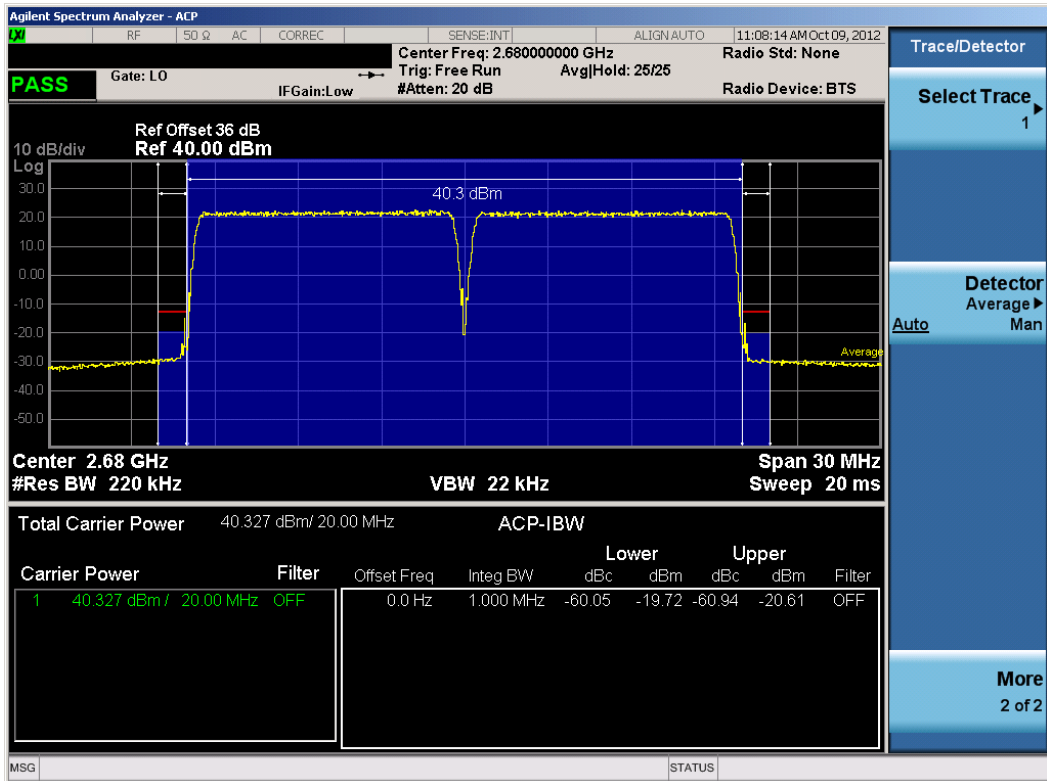


Plot 7-32. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 51 of 247

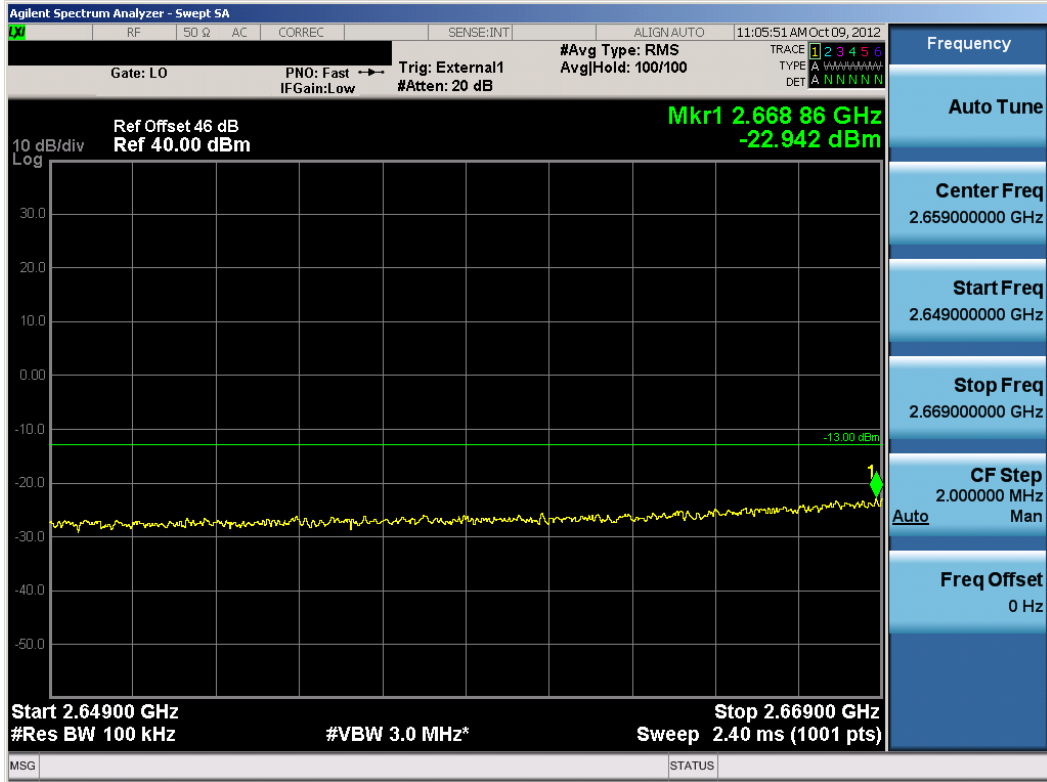


Plot 7-33. Conducted Spurious Plot (WiMAX Mode – High Channel)



Plot 7-34. Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 52 of 247



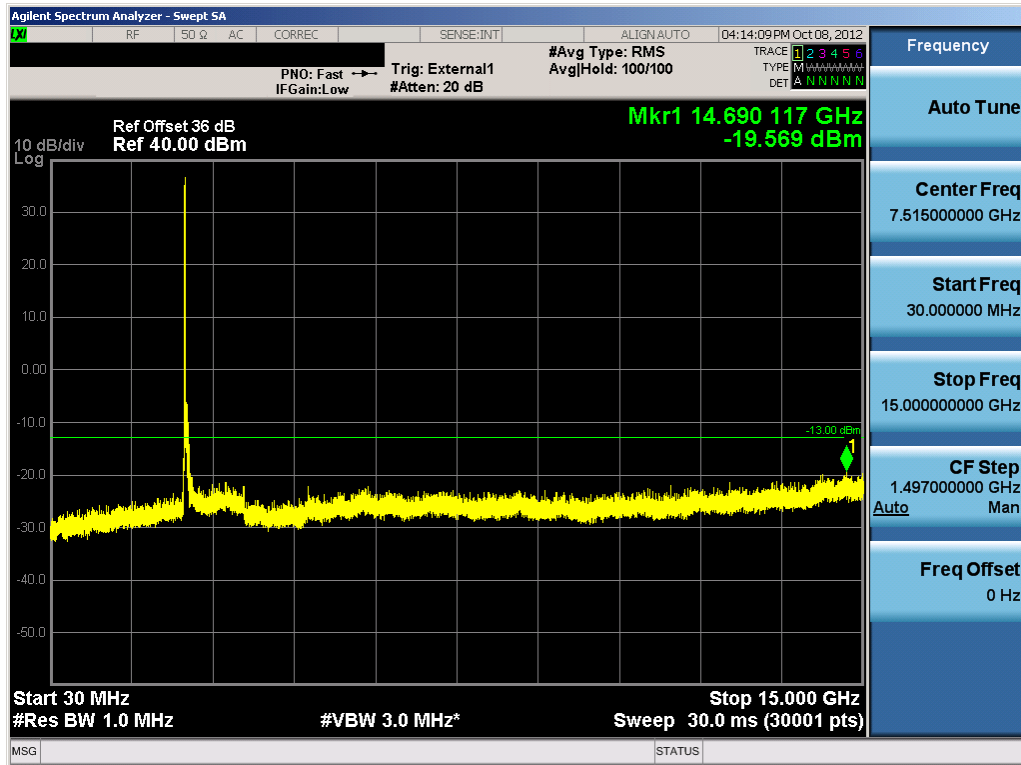
Plot 7-35. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)



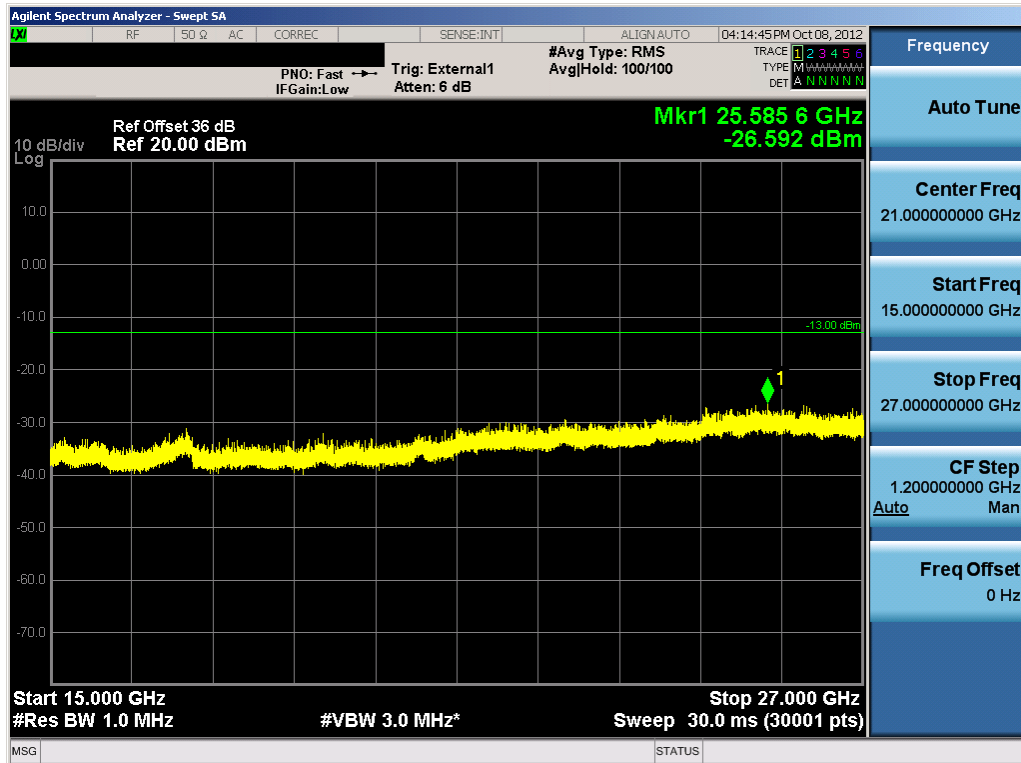
Plot 7-36. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 53 of 247

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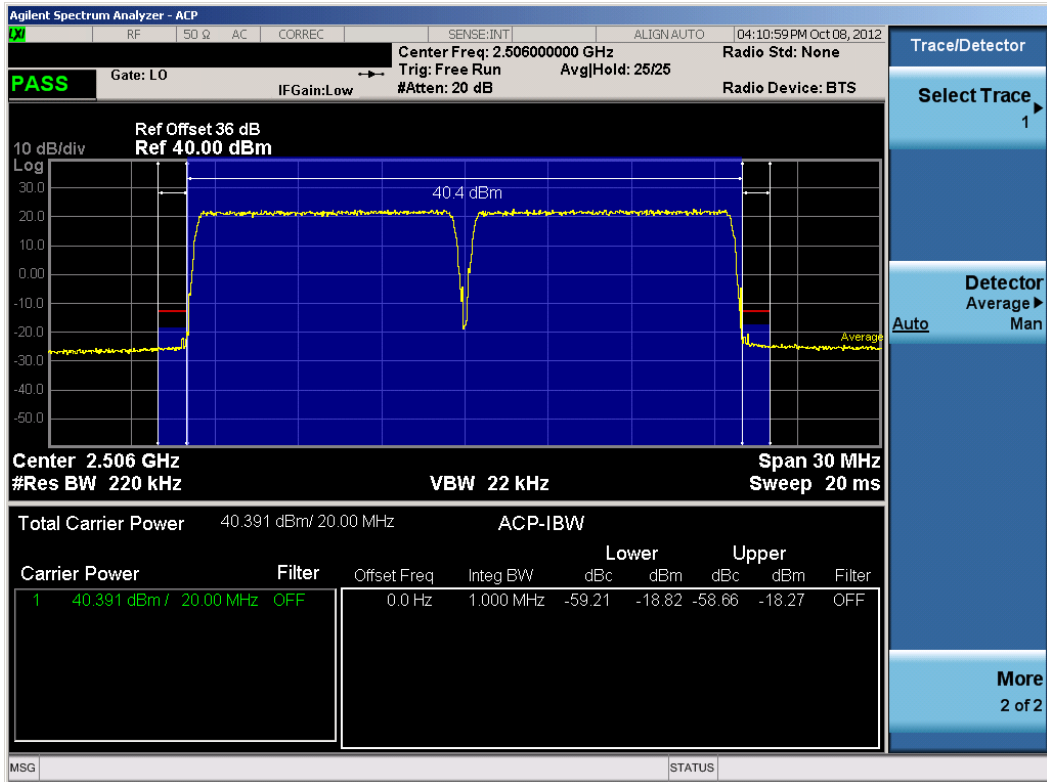


Plot 7-37. Conducted Spurious Plot (WiMAX Mode – Low Channel)

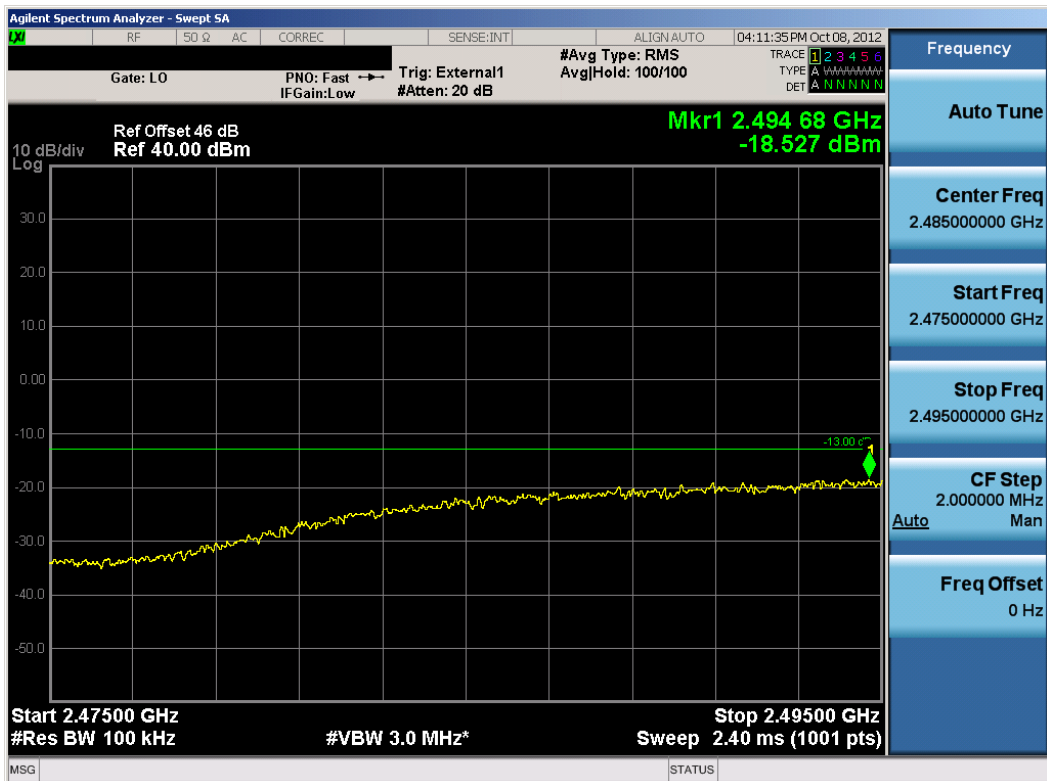


Plot 7-38. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 54 of 247

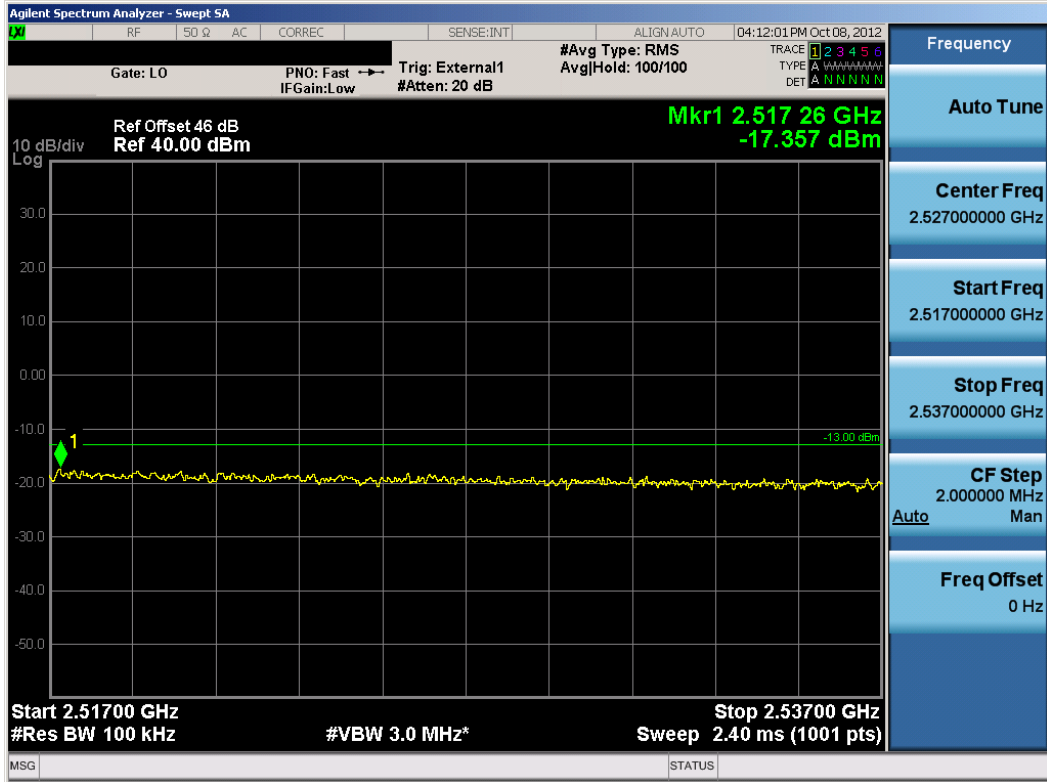


Plot 7-39. Channel Edge Plot (WiMAX Mode – Low Channel)

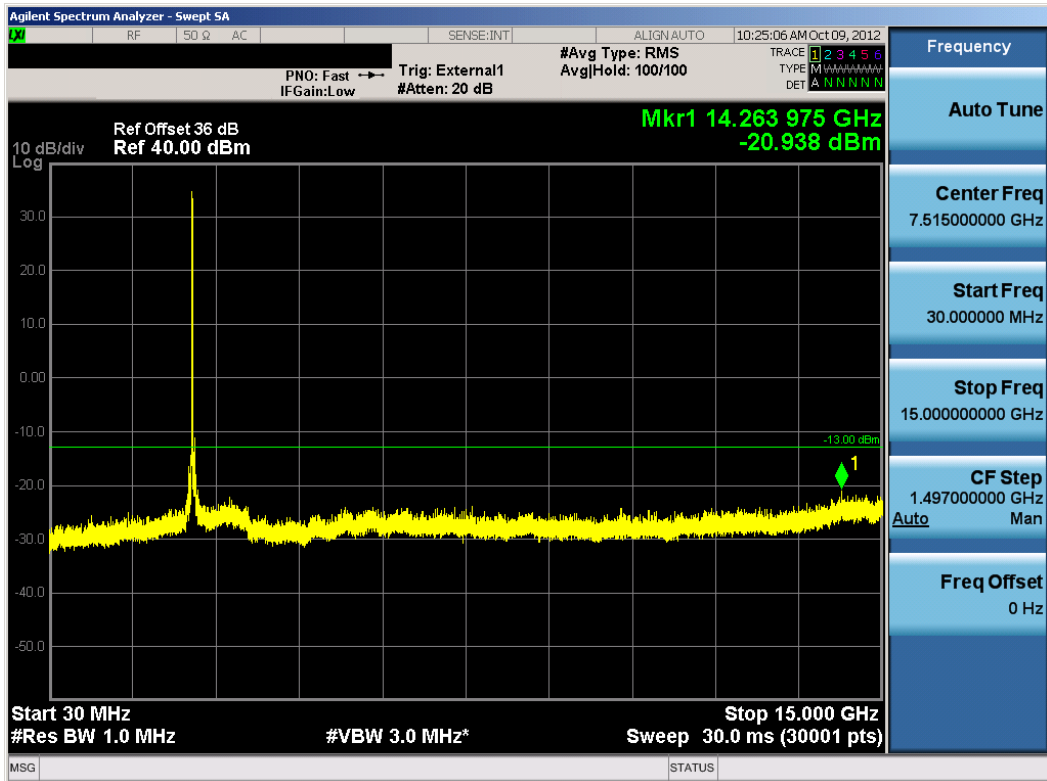


Plot 7-40. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 55 of 247

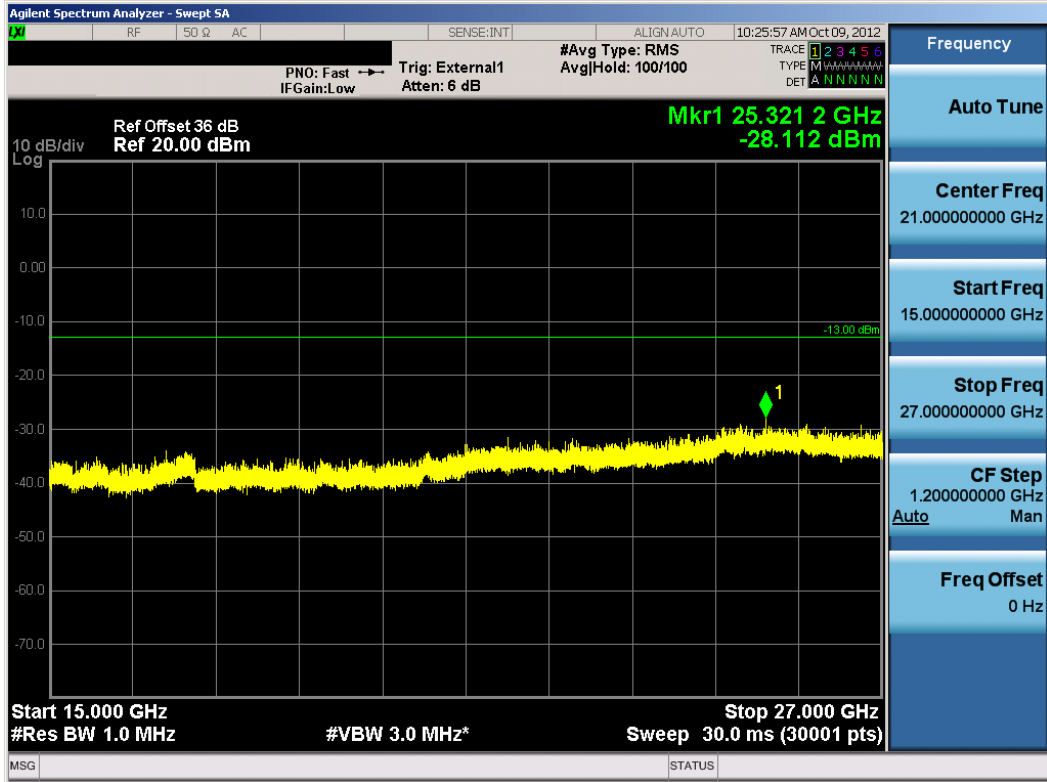


Plot 7-41. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

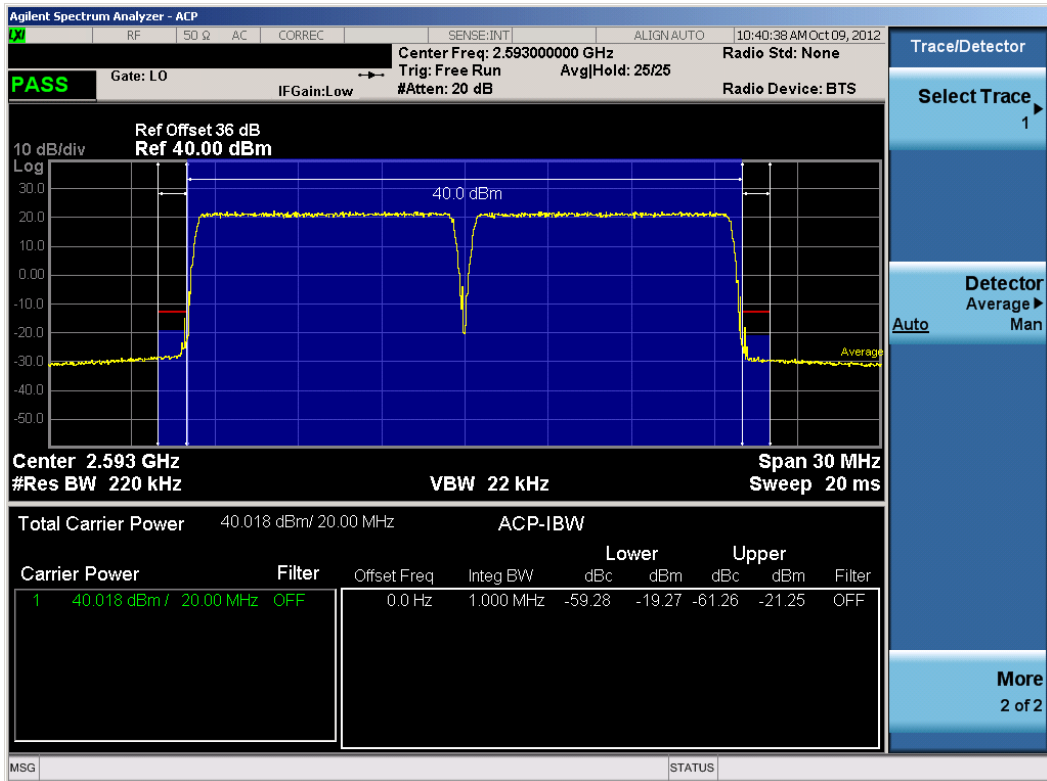


Plot 7-42. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 56 of 247

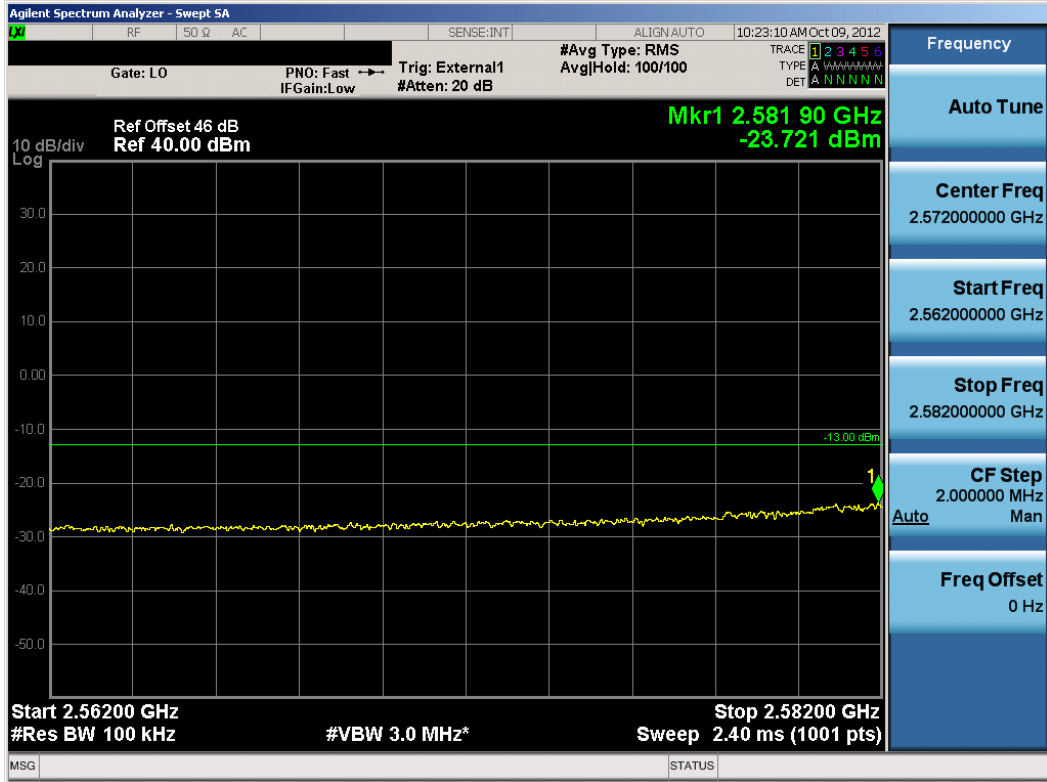


Plot 7-43. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

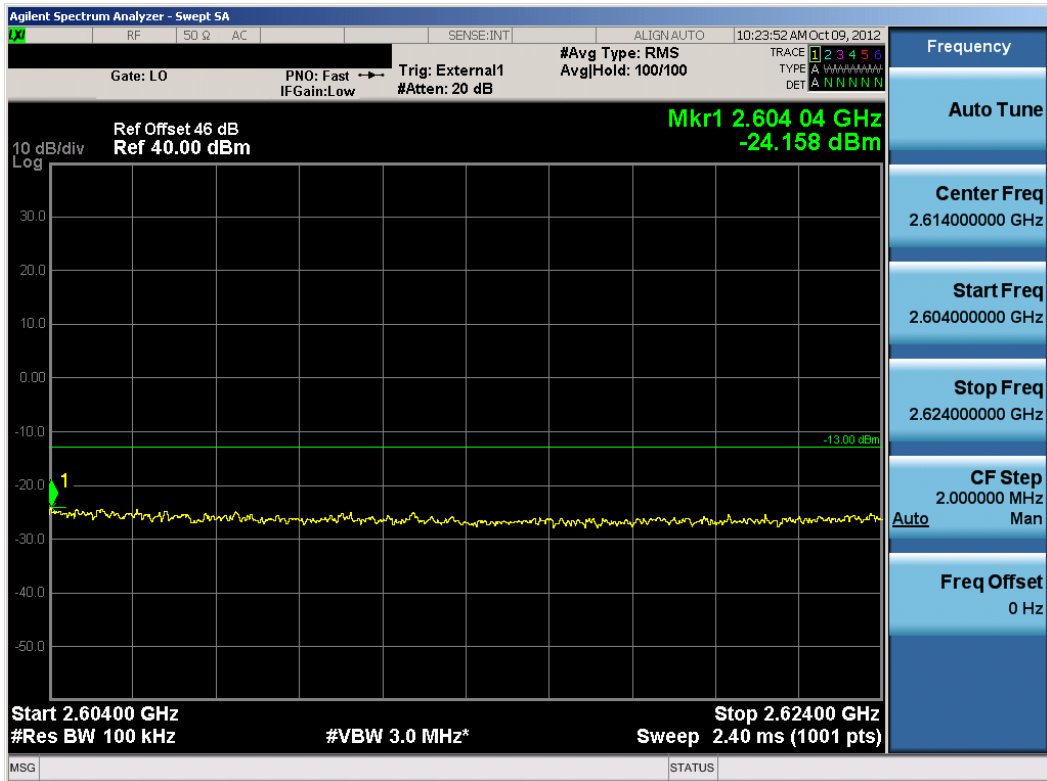


Plot 7-44. Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 57 of 247

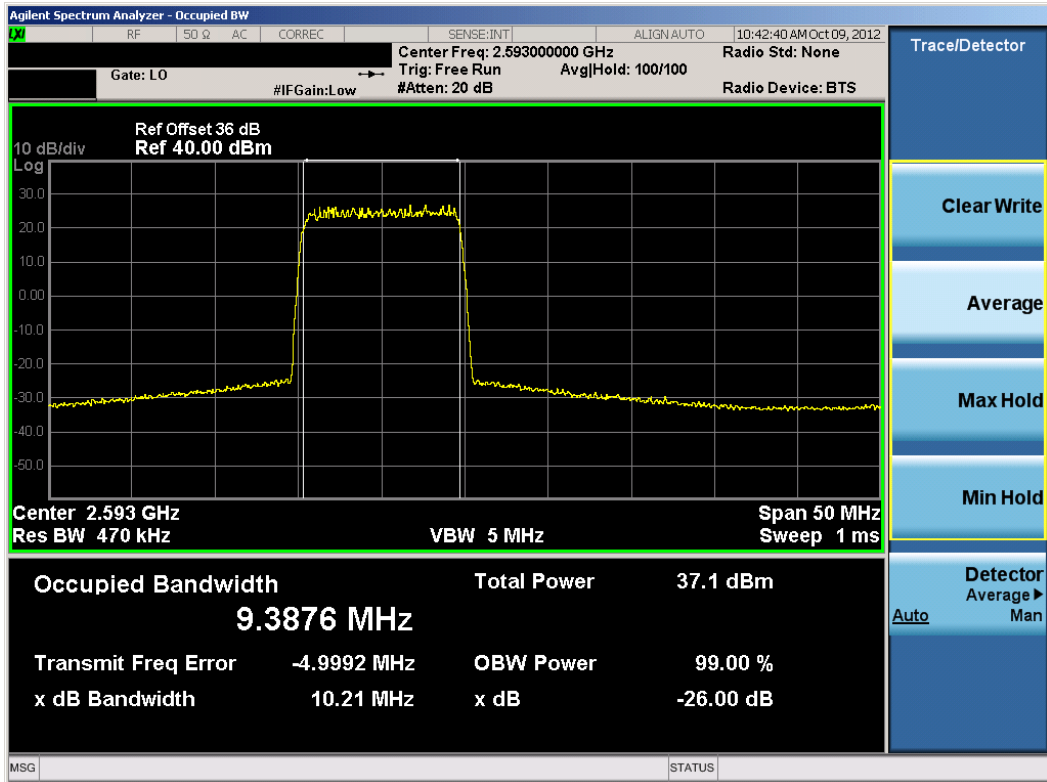


Plot 7-45. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

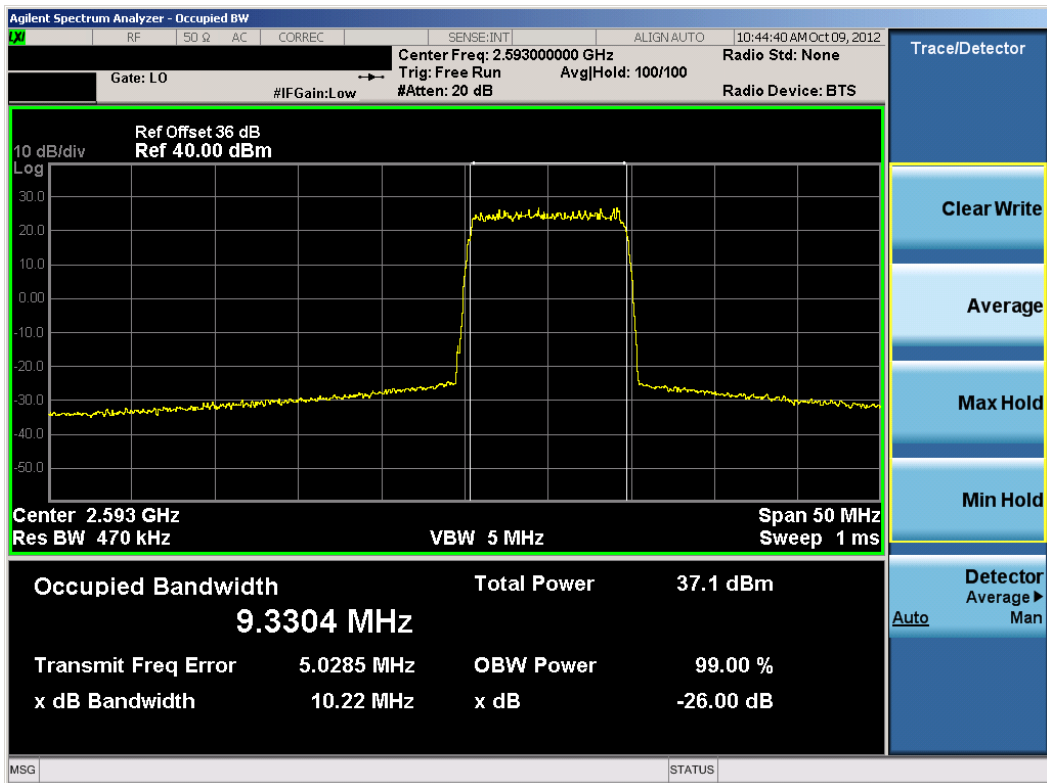


Plot 7-46. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 58 of 247

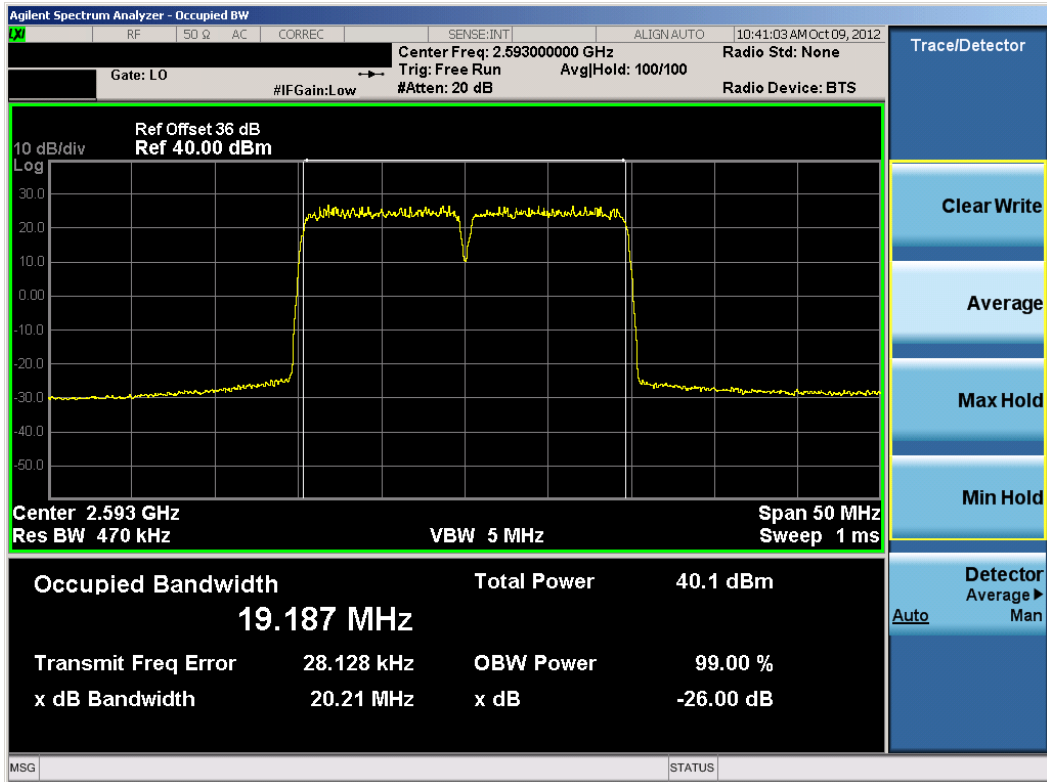


Plot 7-47. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

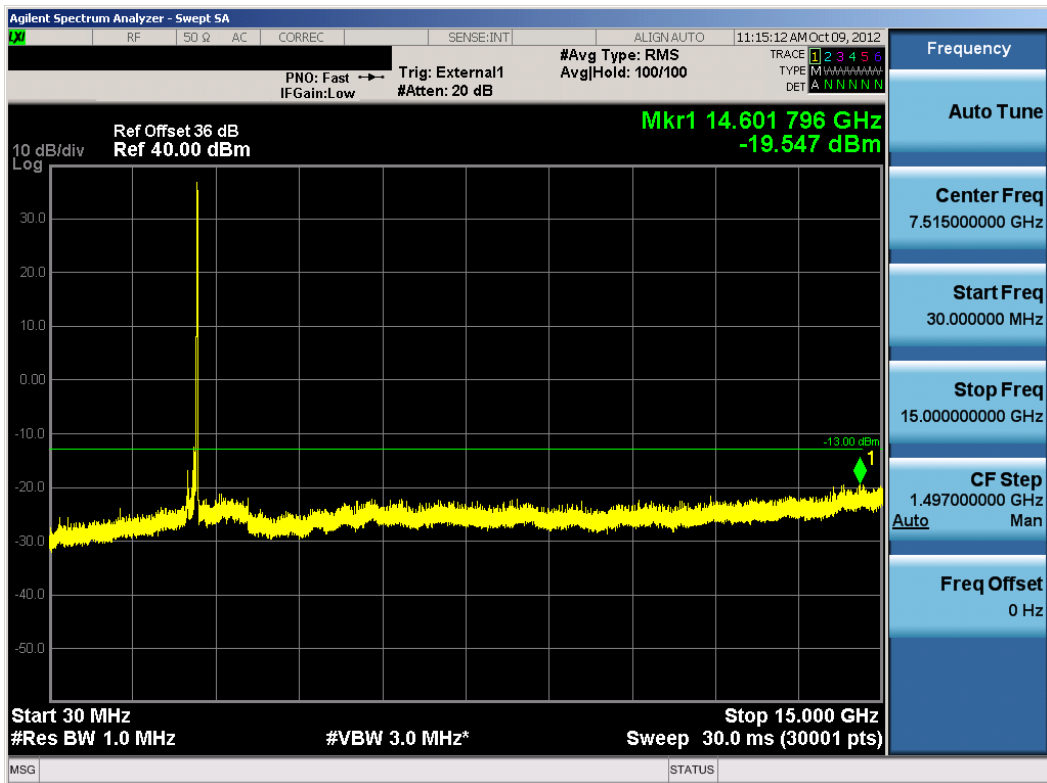


Plot 7-48. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 59 of 247

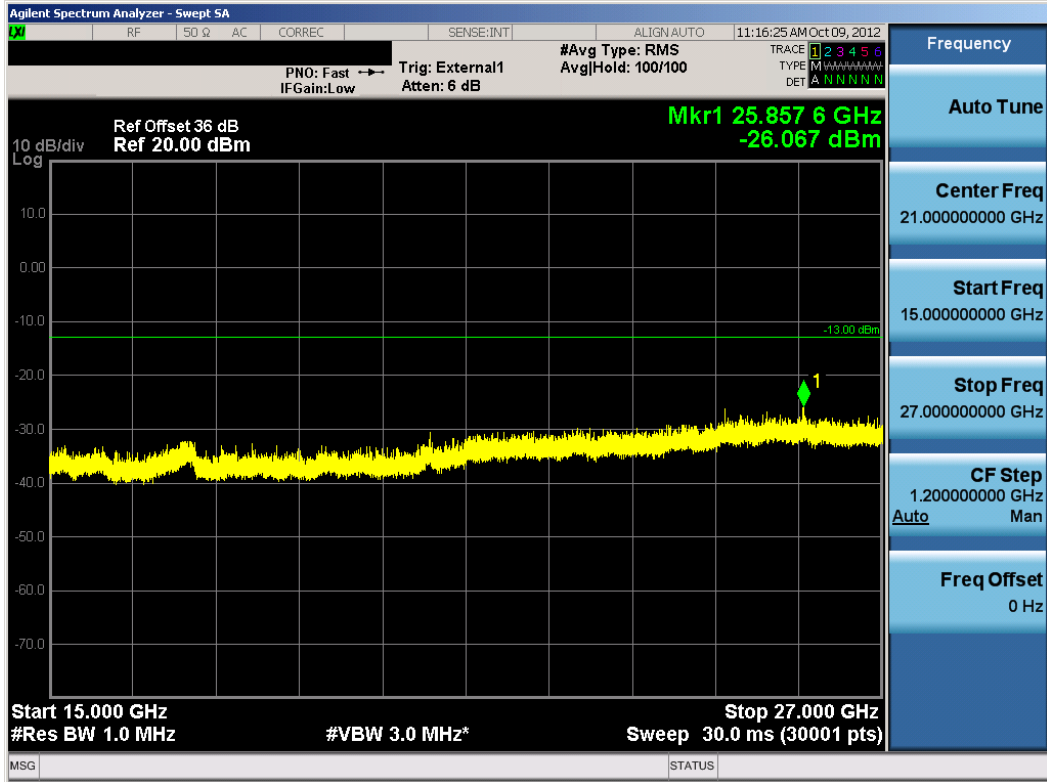


Plot 7-49. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

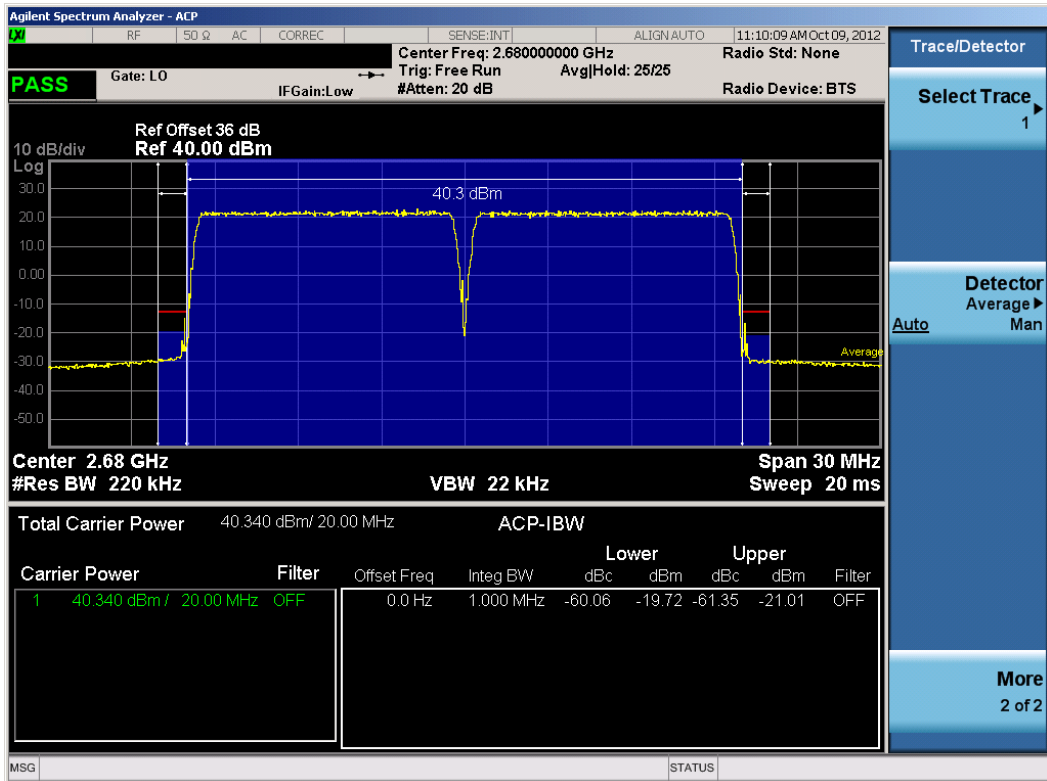


Plot 7-50. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 60 of 247

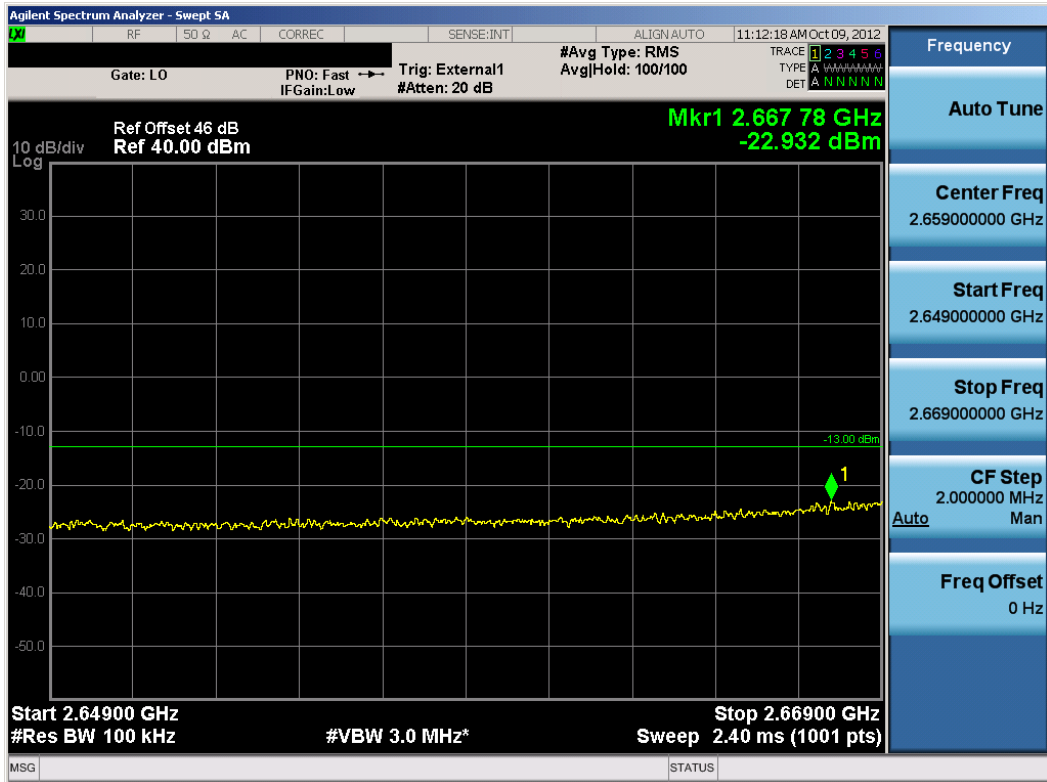


Plot 7-51. Conducted Spurious Plot (WiMAX Mode – High Channel)



Plot 7-52. Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 61 of 247



Plot 7-53. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

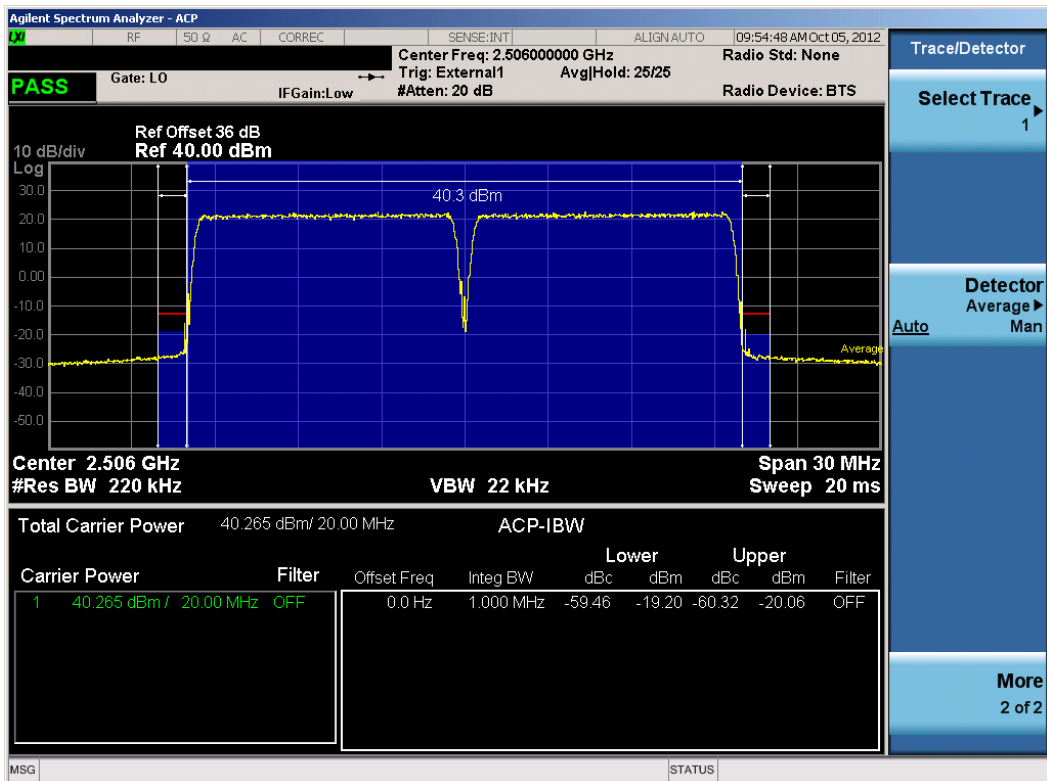


Plot 7-54. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 62 of 247



Plot 7-56. Conducted Spurious Plot (WiMAX Mode – Low Channel)

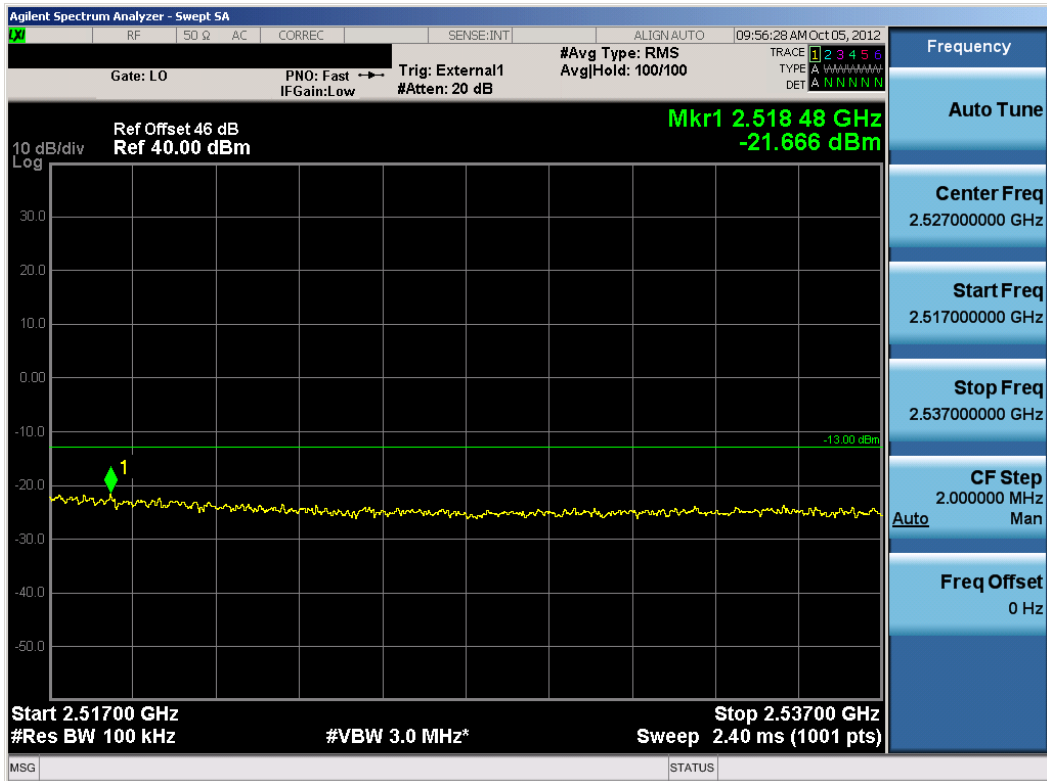


Plot 7-57. Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 64 of 247

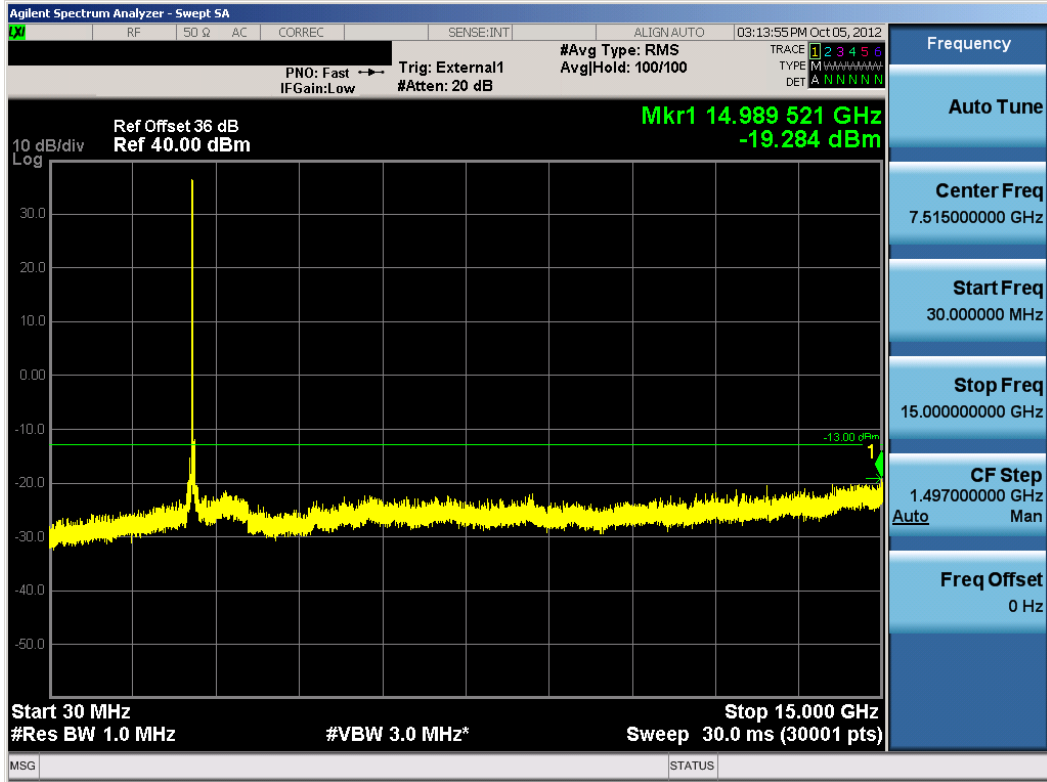


Plot 7-58. Lower Extended Channel Edge Plot (WiMAX Mode - Low Channel)

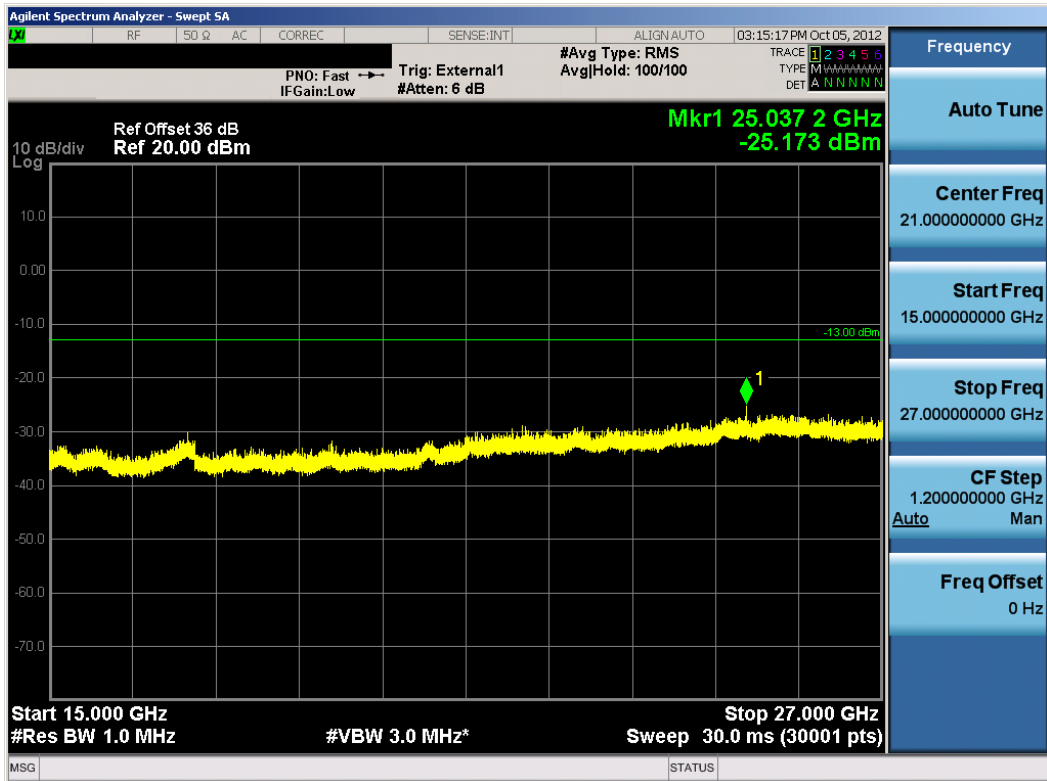


Plot 7-59. Upper Extended Channel Edge Plot (WiMAX Mode - Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 65 of 247

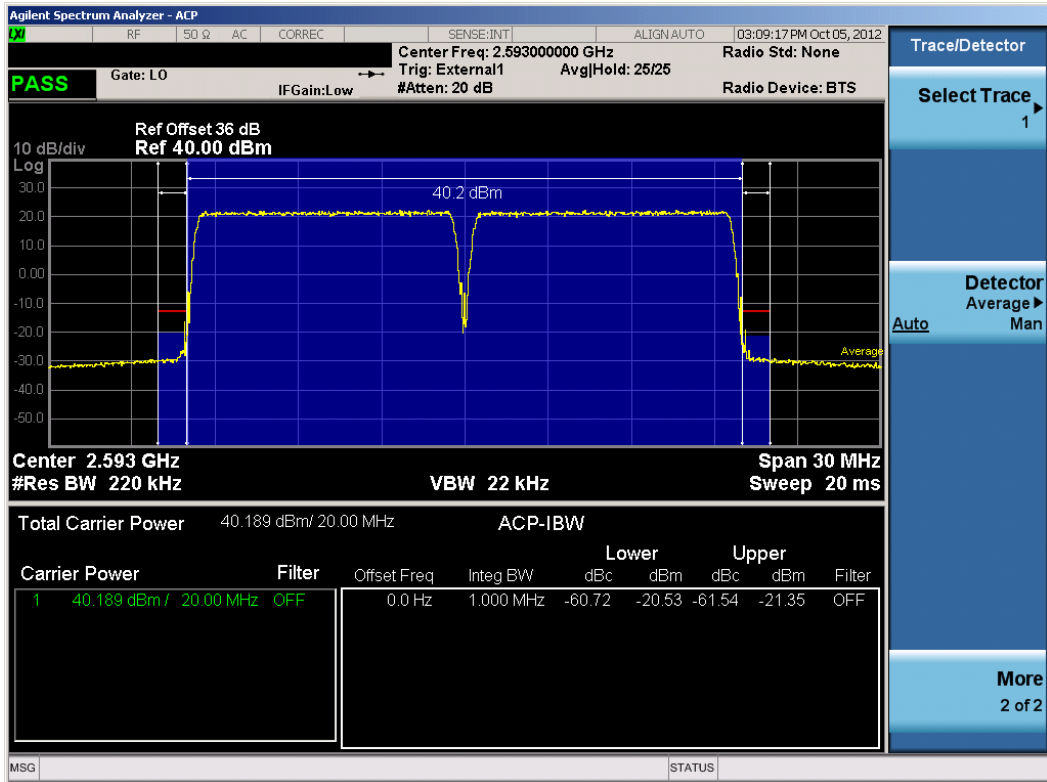


Plot 7-60. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

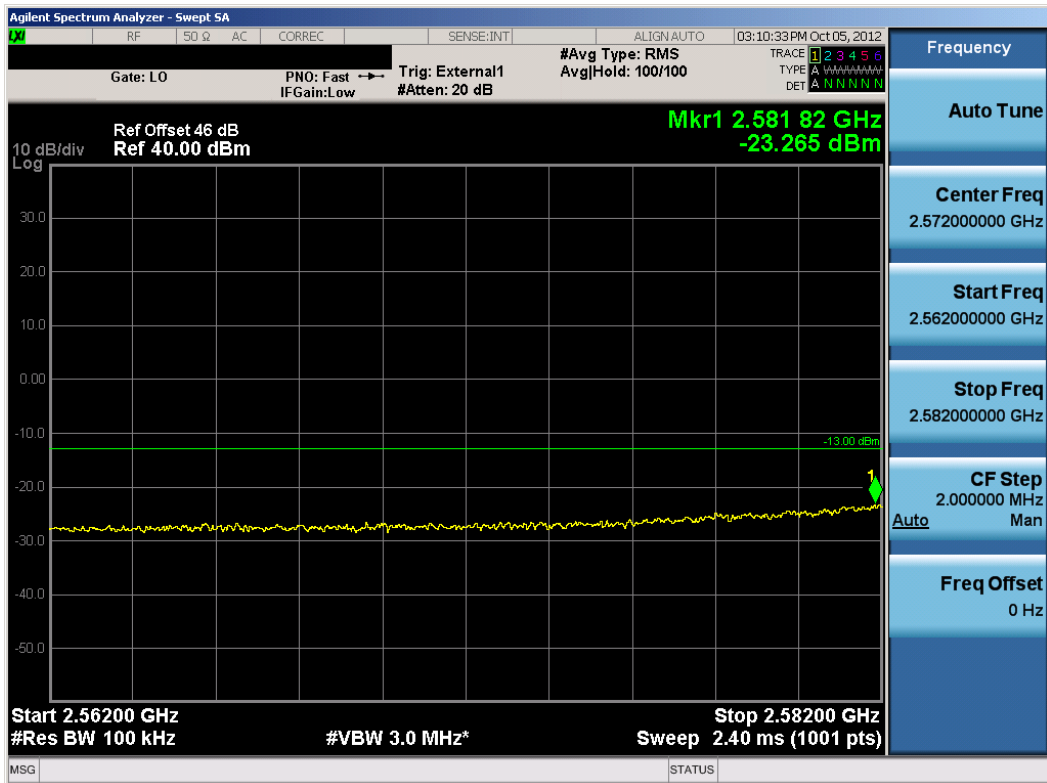


Plot 7-61. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 66 of 247

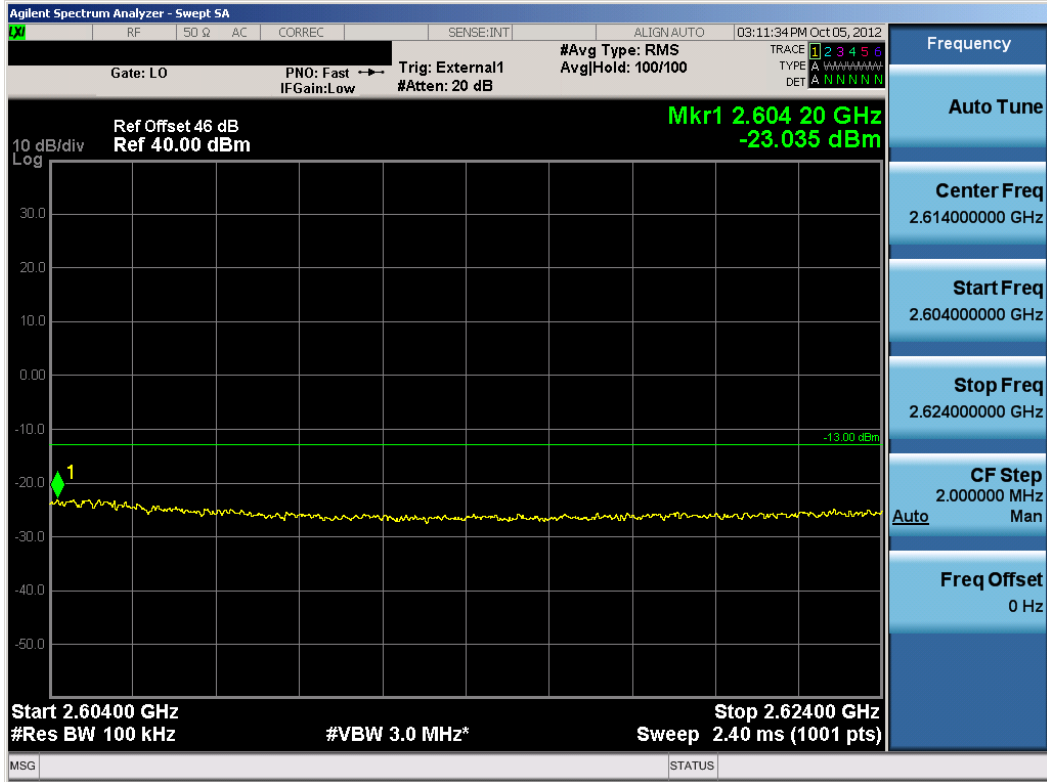


Plot 7-62. Channel Edge Plot (WiMAX Mode – Mid Channel)

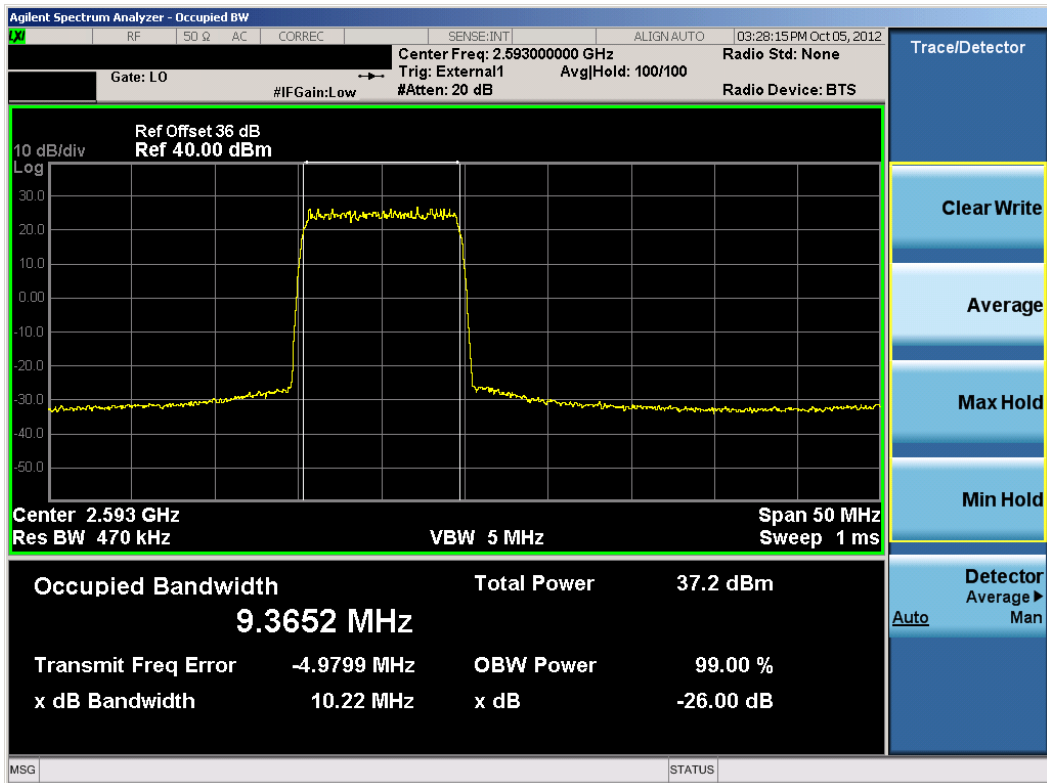


Plot 7-63. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 67 of 247

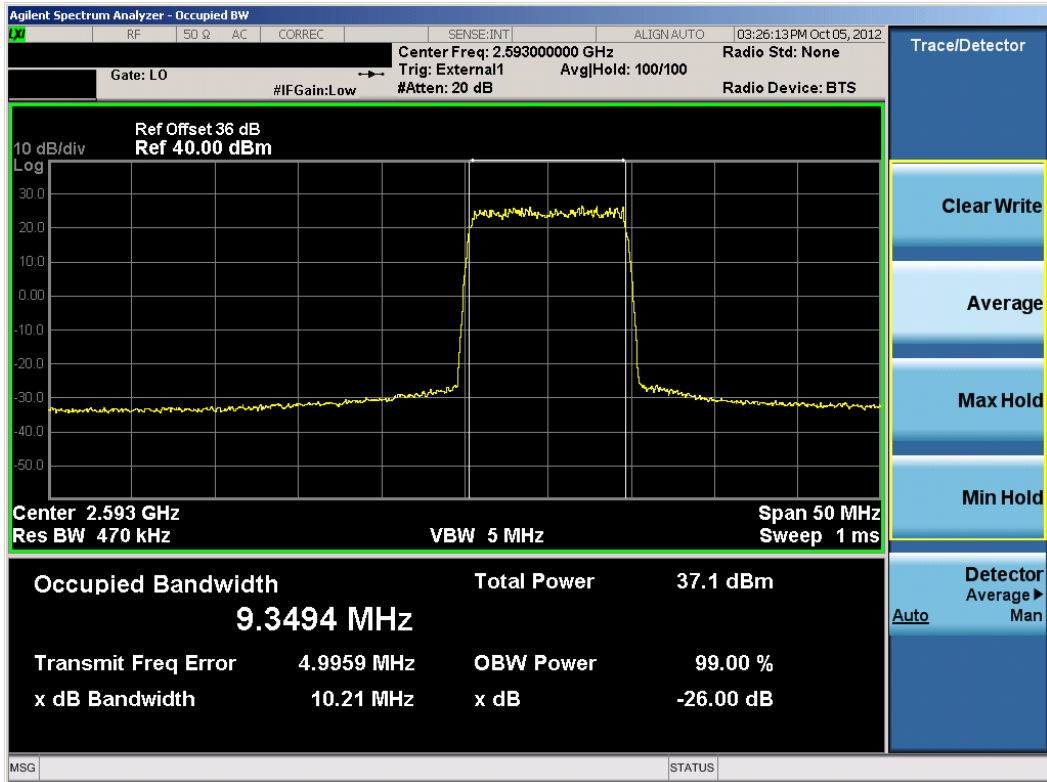


Plot 7-64. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

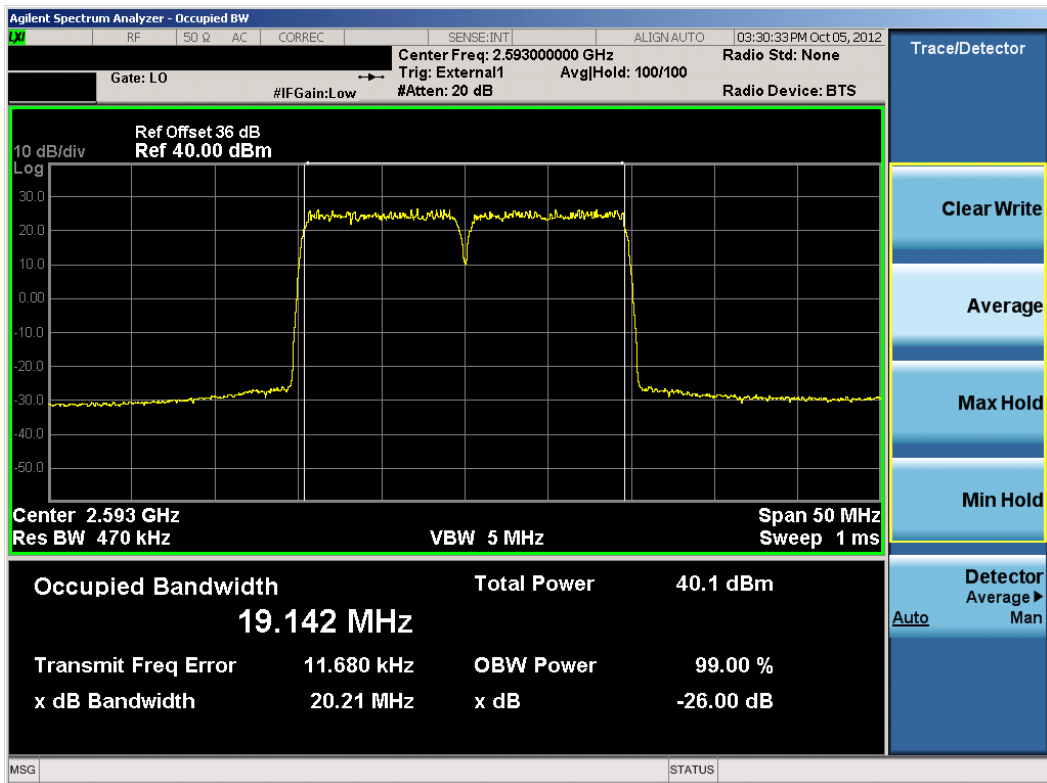


Plot 7-65. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 68 of 247

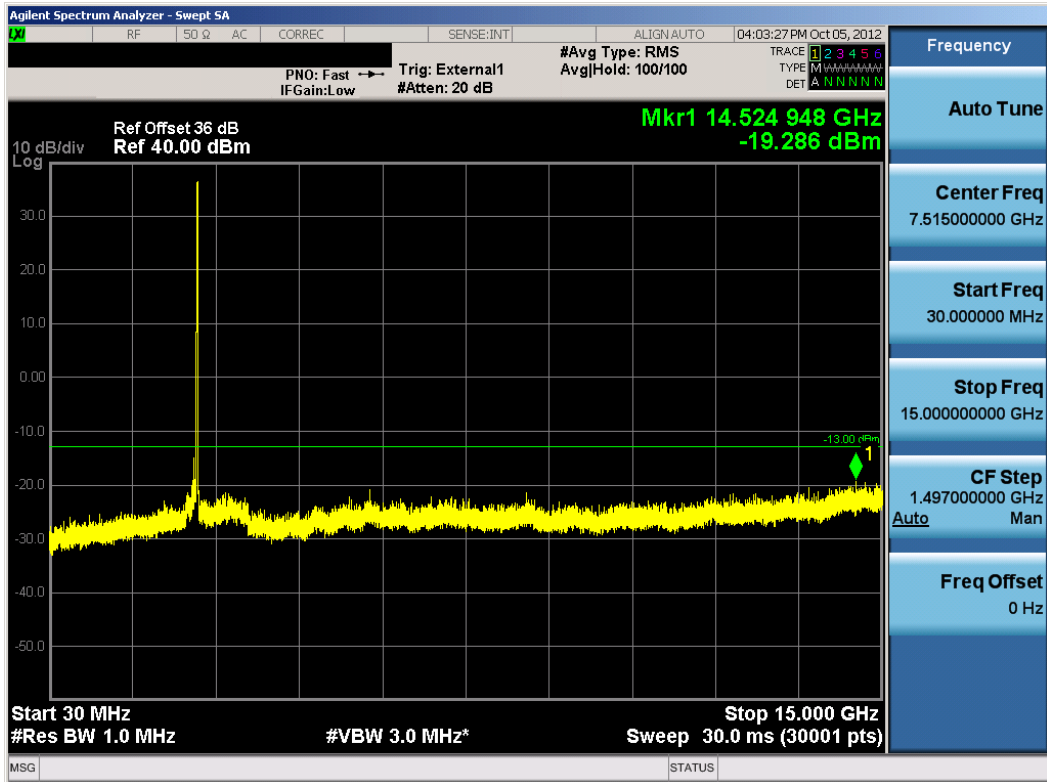


Plot 7-66. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

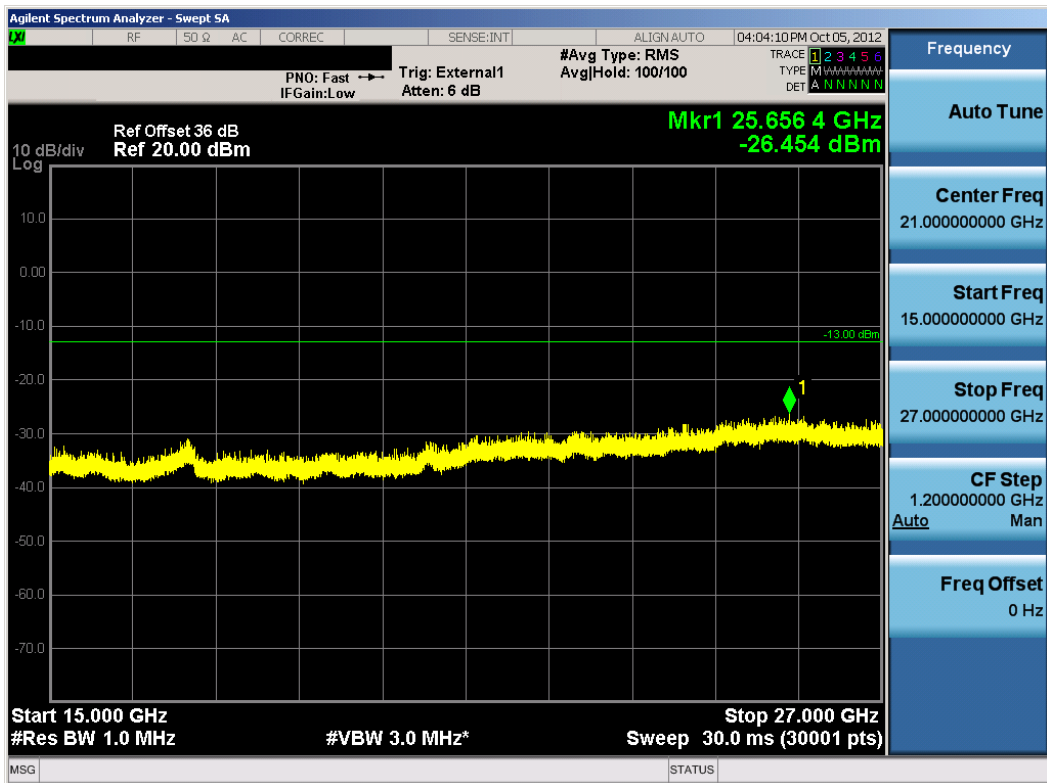


Plot 7-67. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 69 of 247

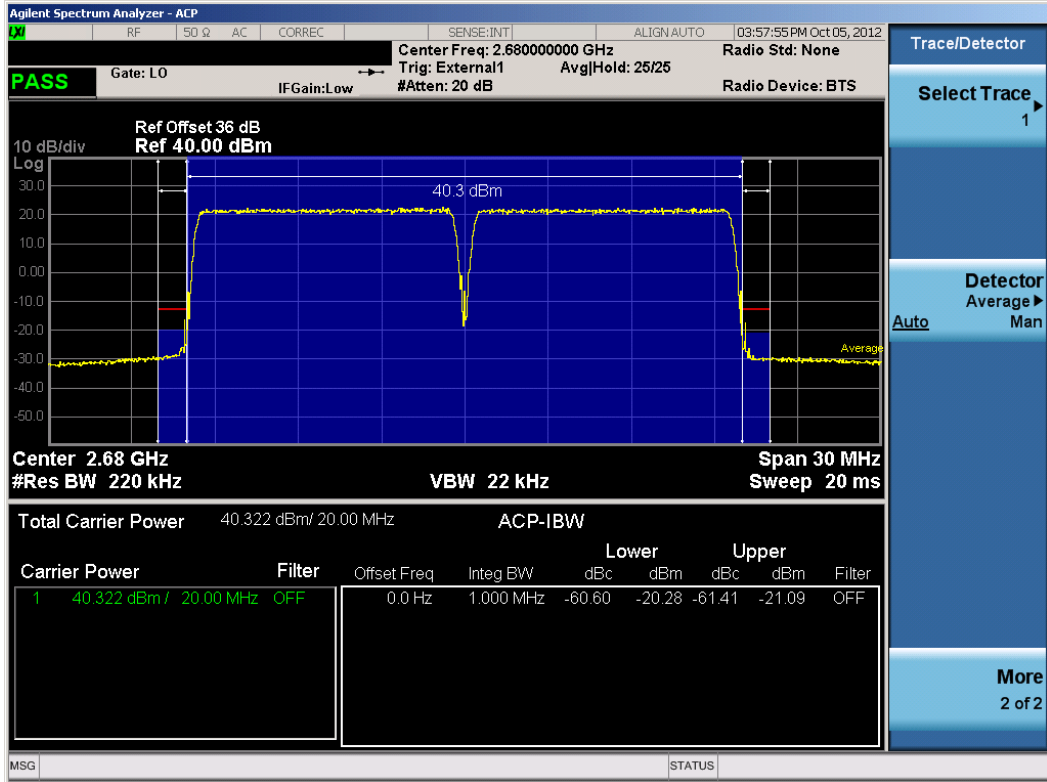


Plot 7-68. Conducted Spurious Plot (WiMAX Mode – High Channel)

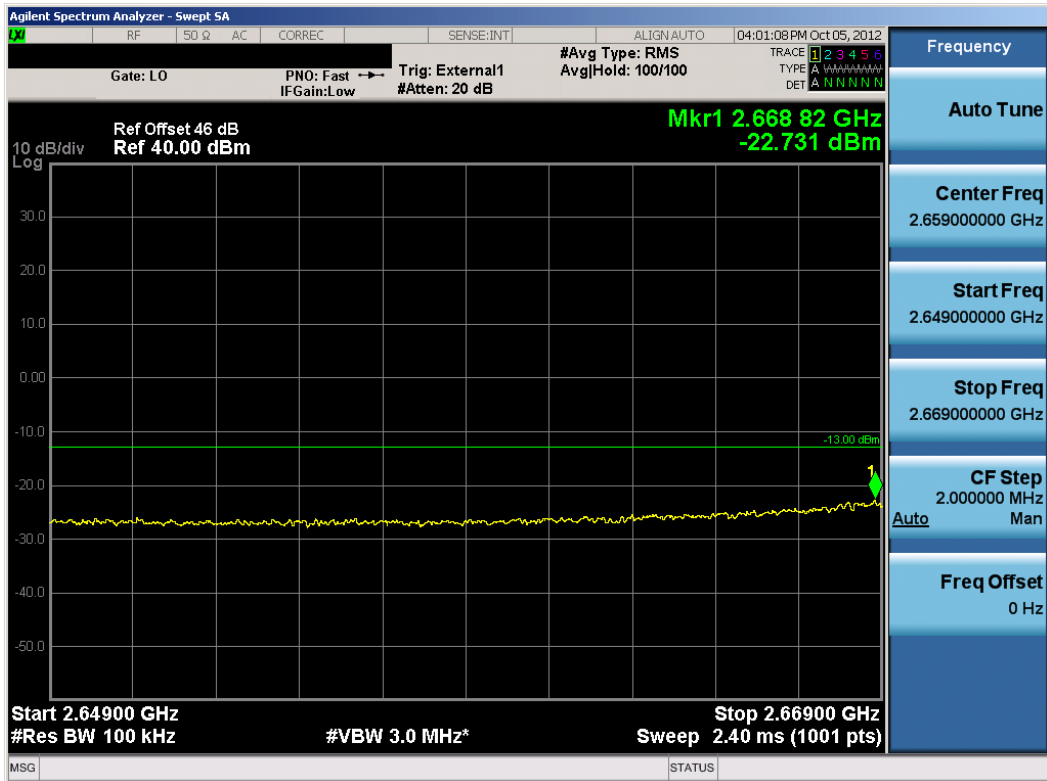


Plot 7-69. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 70 of 247



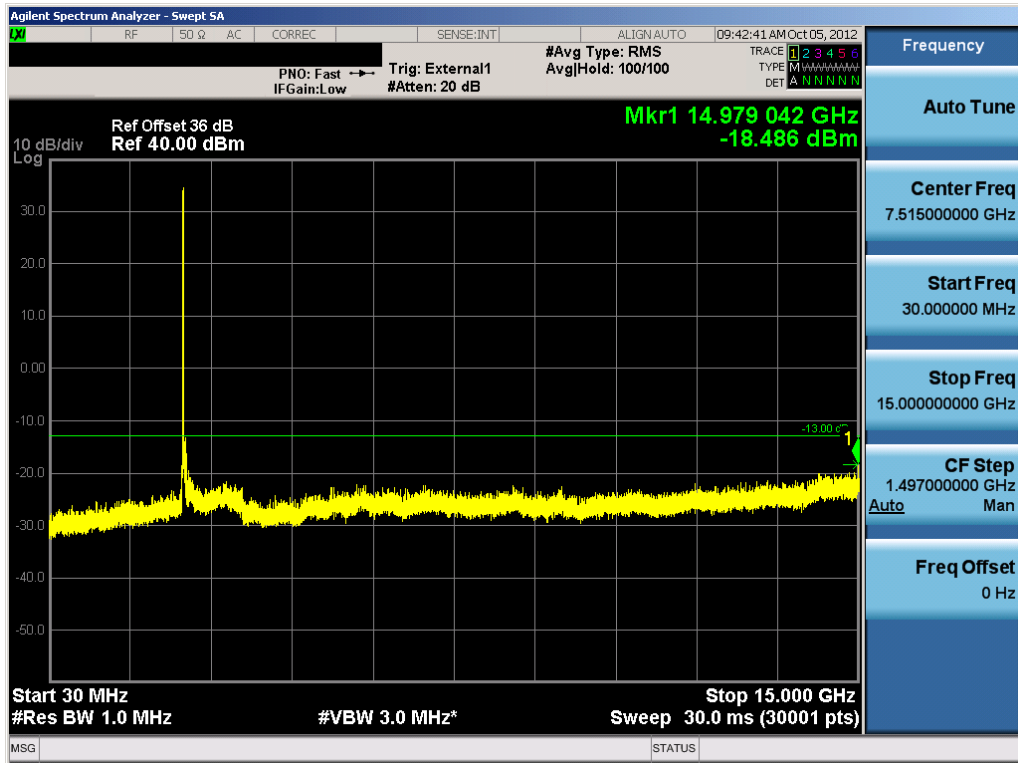
Plot 7-70. Channel Edge Plot (WiMAX Mode – High Channel)



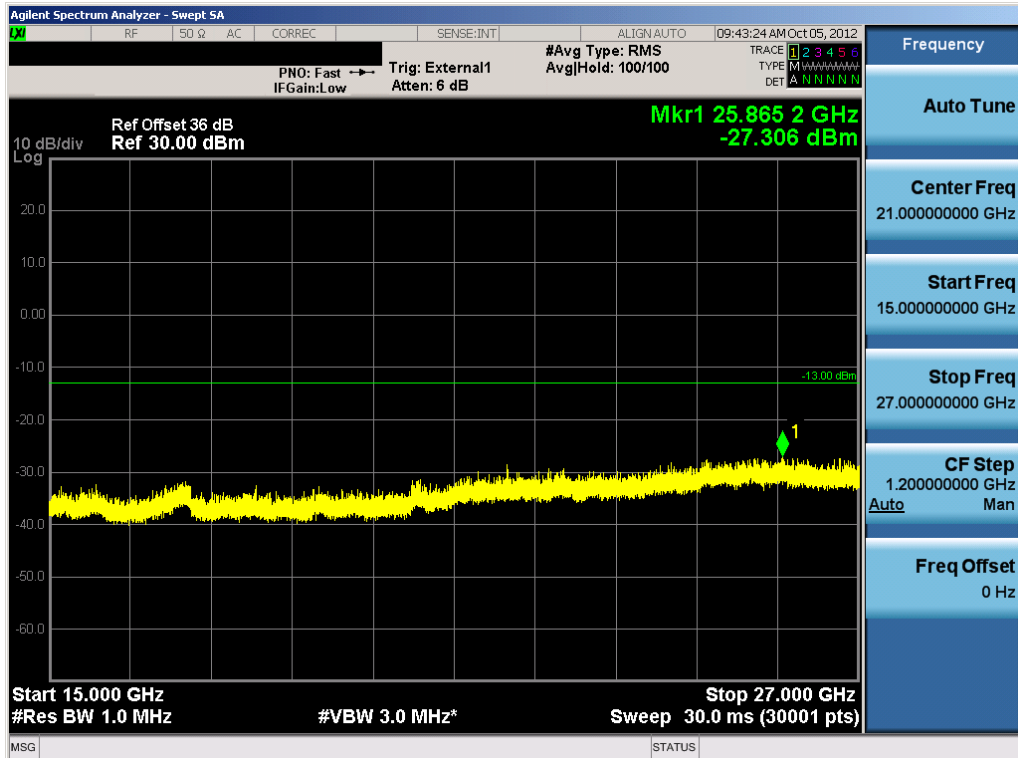
Plot 7-71. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 71 of 247

16-QAM Modulation

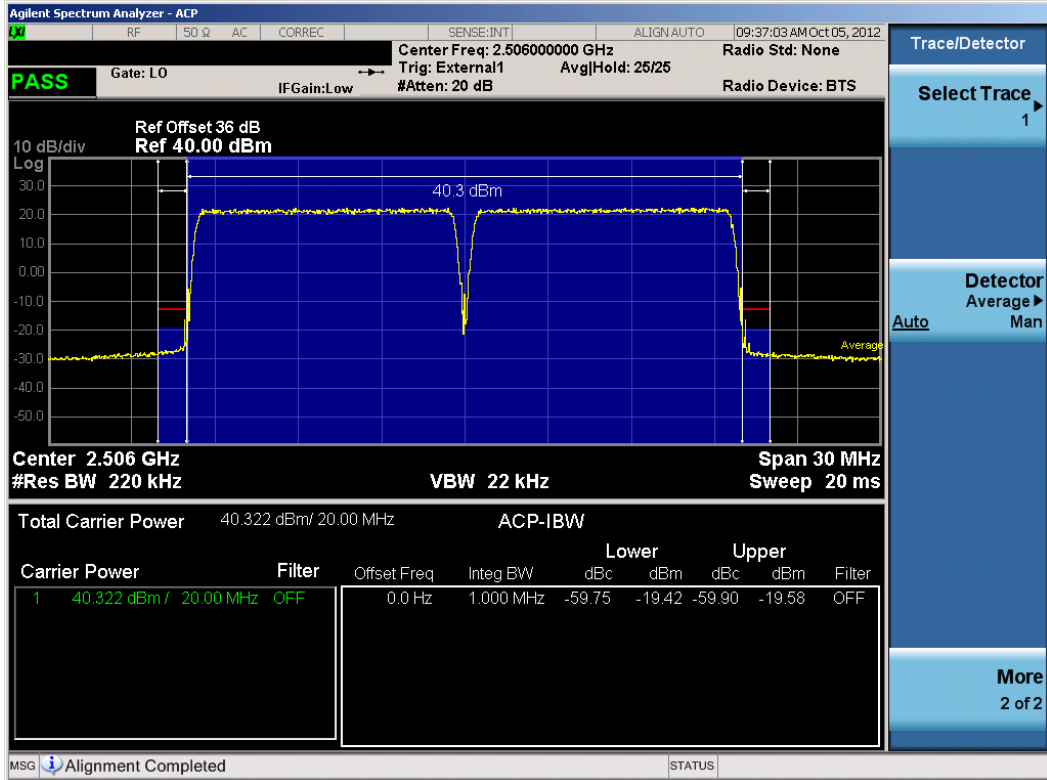


Plot 7-73. Conducted Spurious Plot (WiMAX Mode – Low Channel)

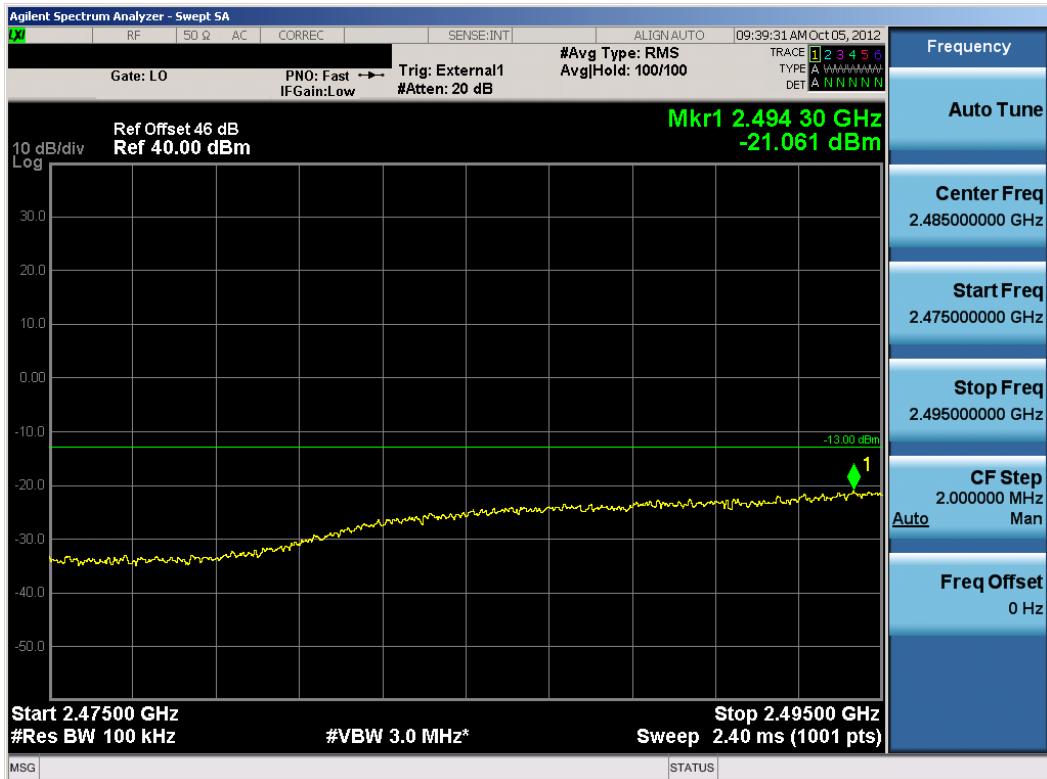


Plot 7-74. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 73 of 247

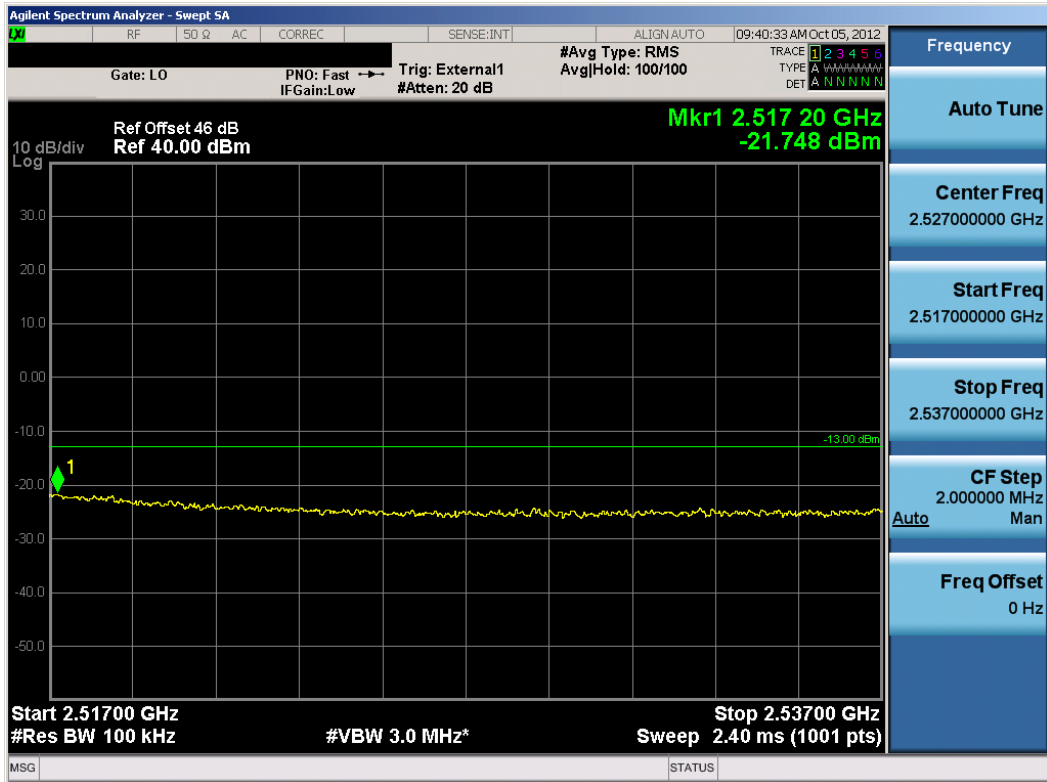


Plot 7-75. Channel Edge Plot (WiMAX Mode – Low Channel)

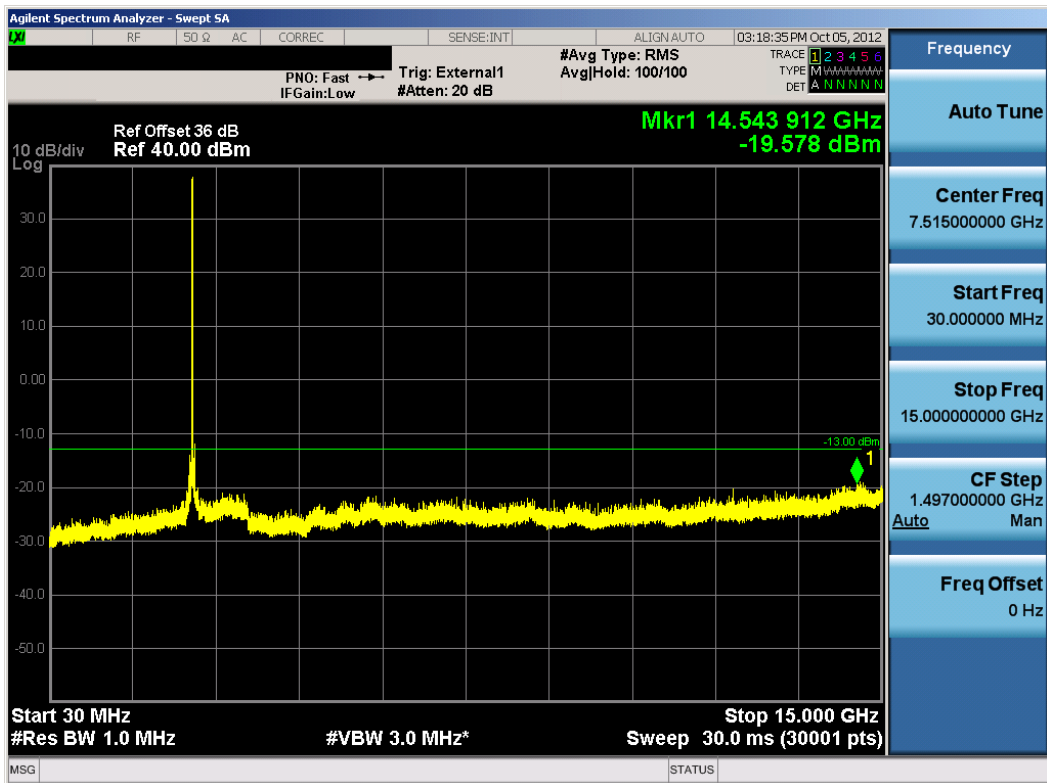


Plot 7-76. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)



FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 74 of 247



Plot 7-77. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

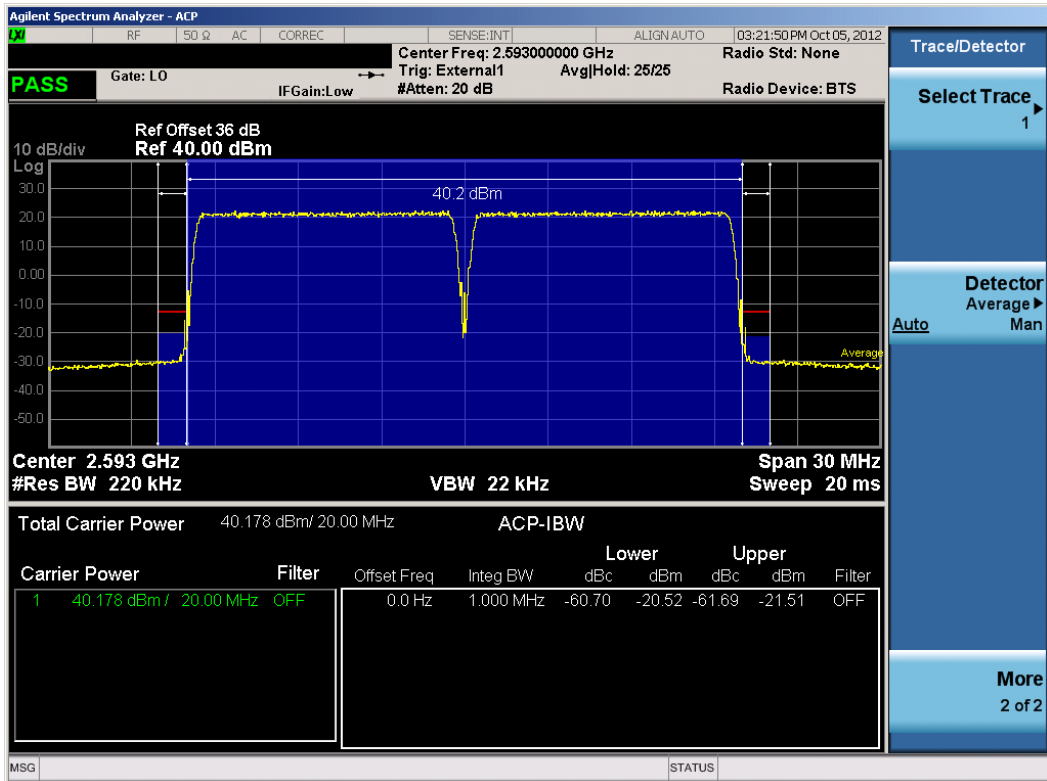


Plot 7-78. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 75 of 247

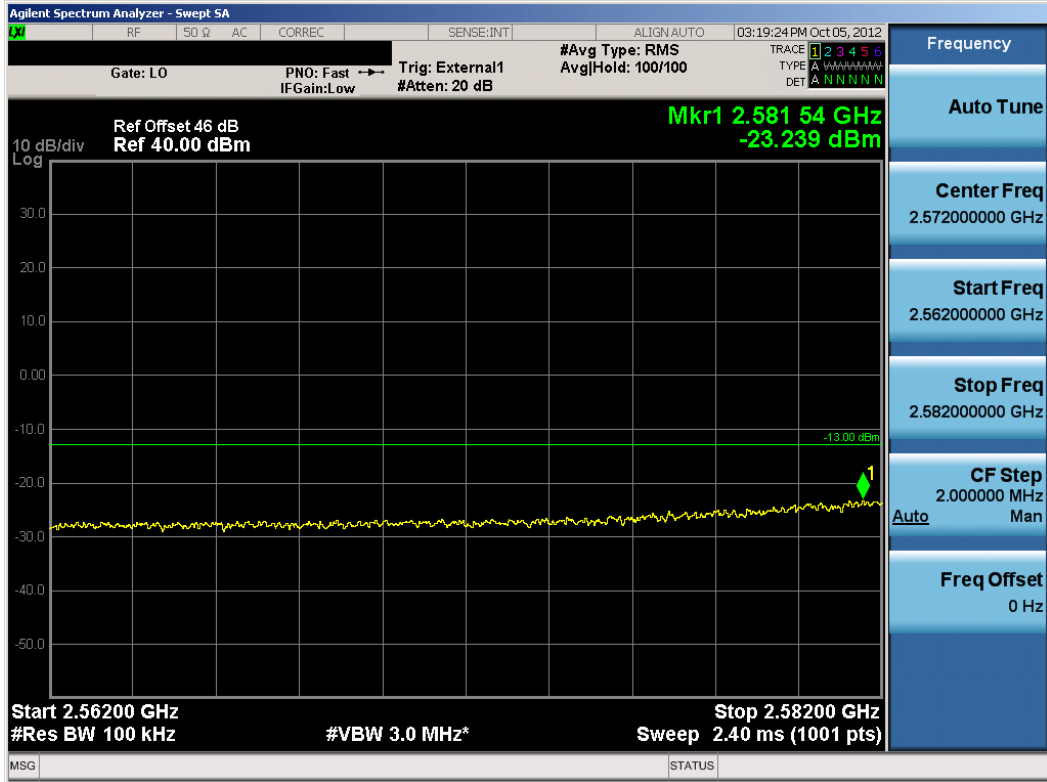


Plot 7-79. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

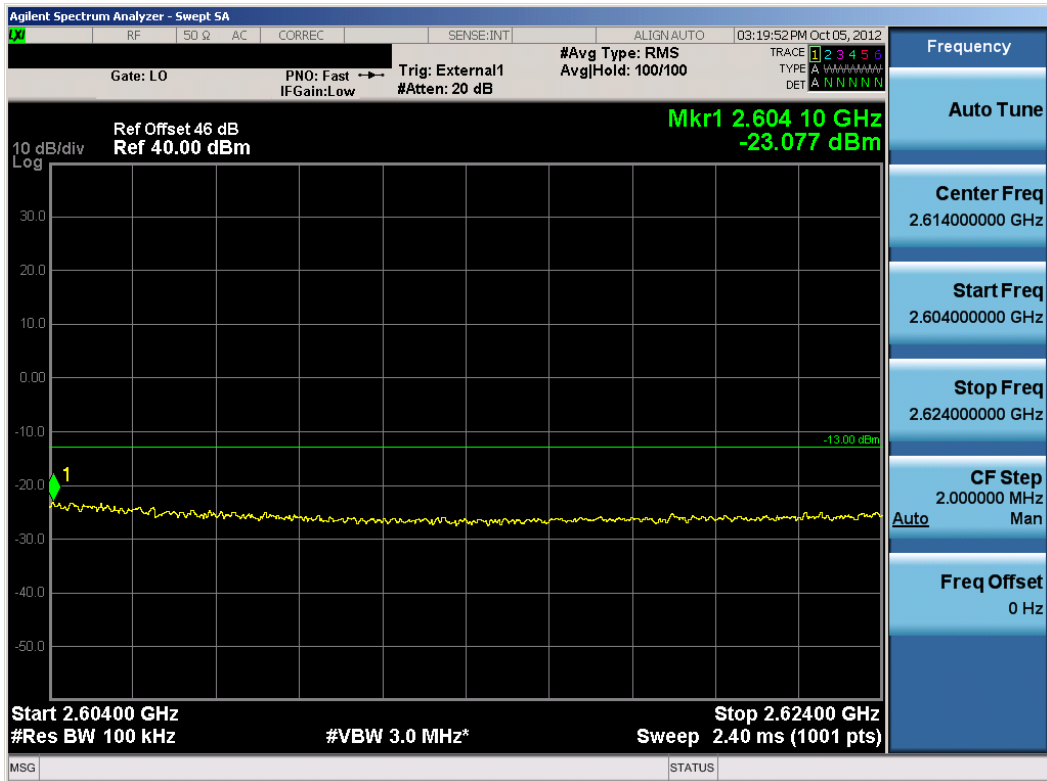


Plot 7-80. Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 76 of 247

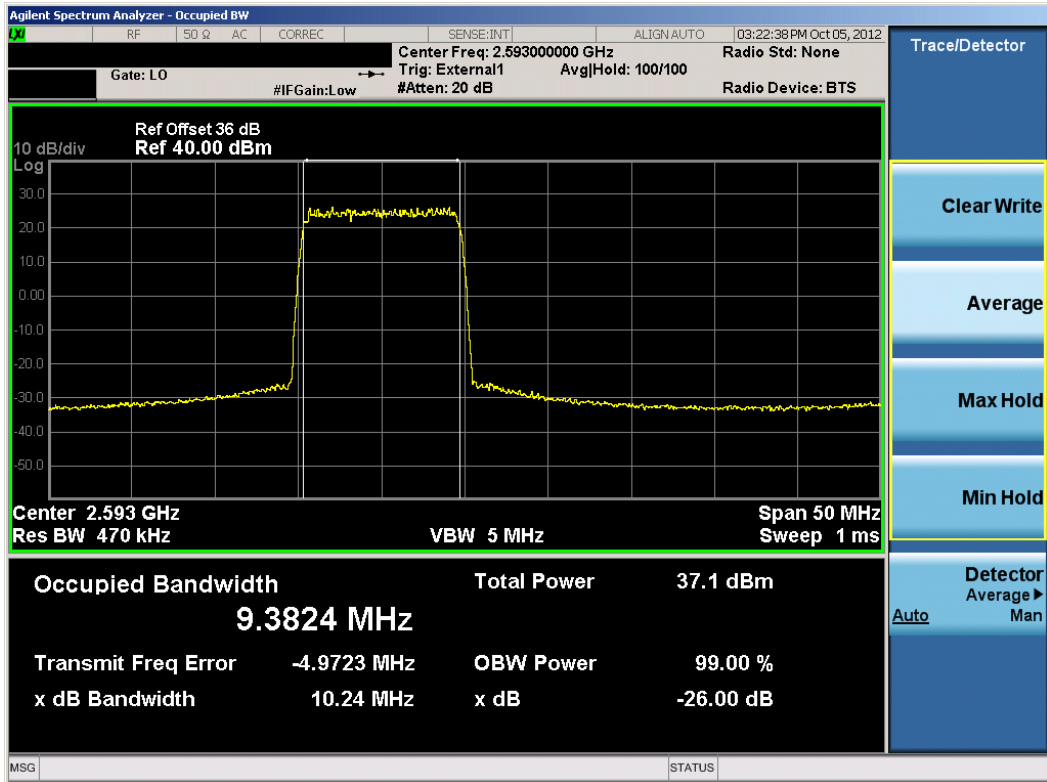


Plot 7-81. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

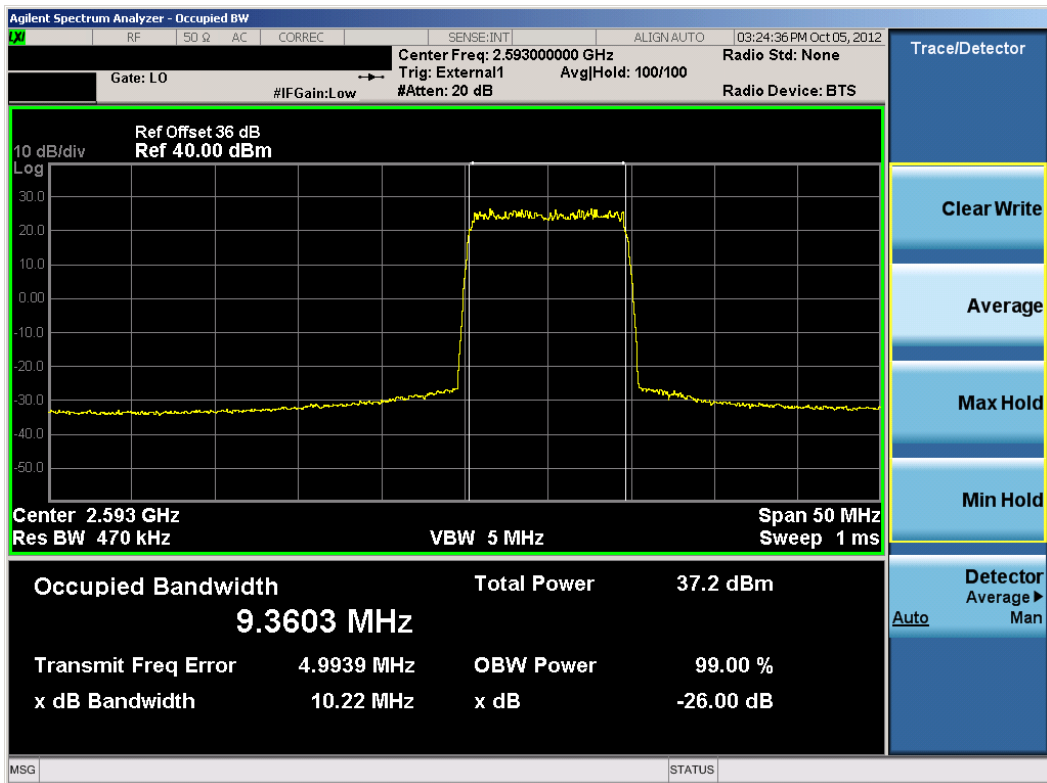


Plot 7-82. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 77 of 247

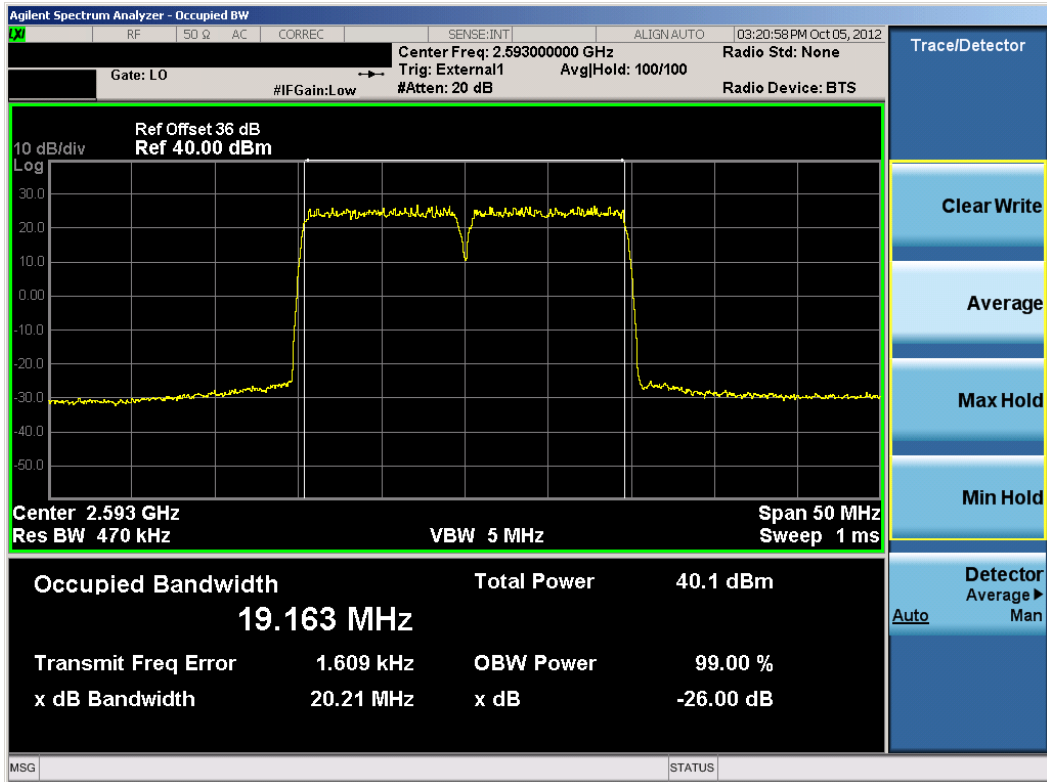


Plot 7-83. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

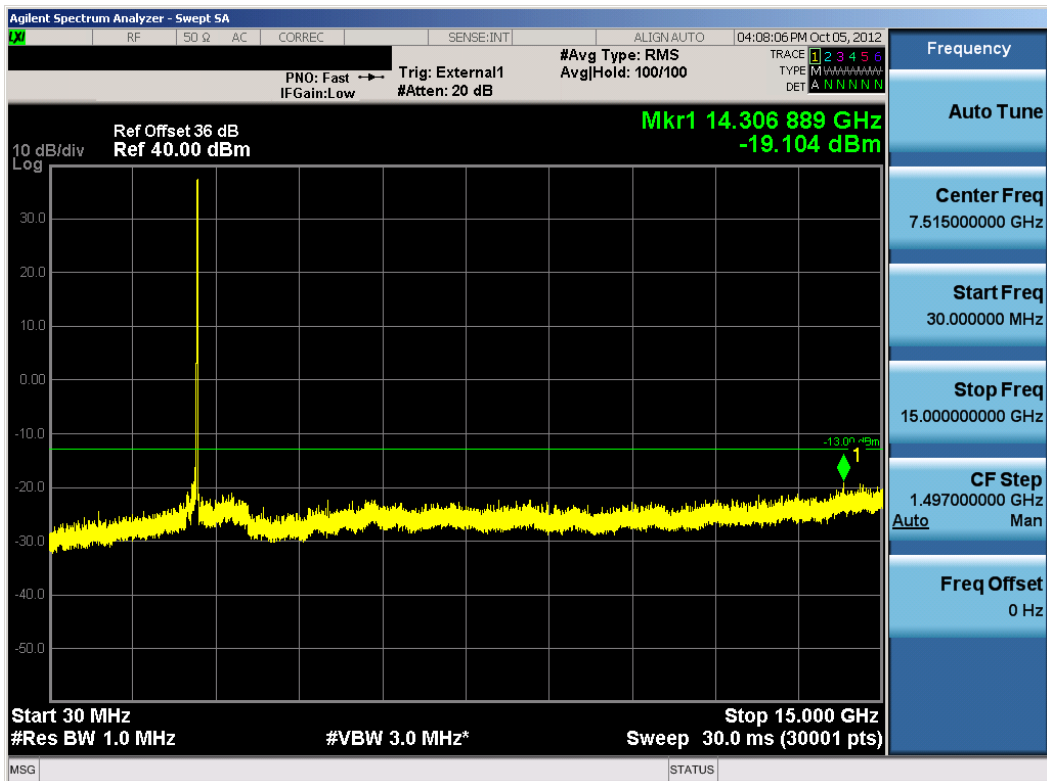


Plot 7-84. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 78 of 247

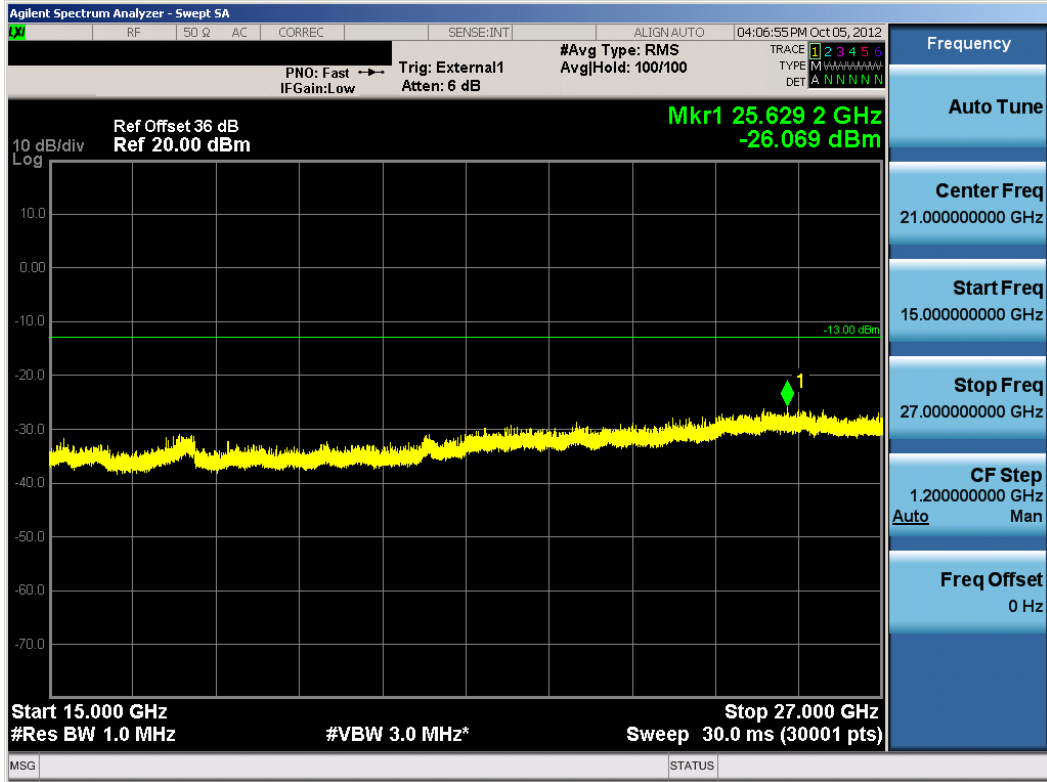


Plot 7-85. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

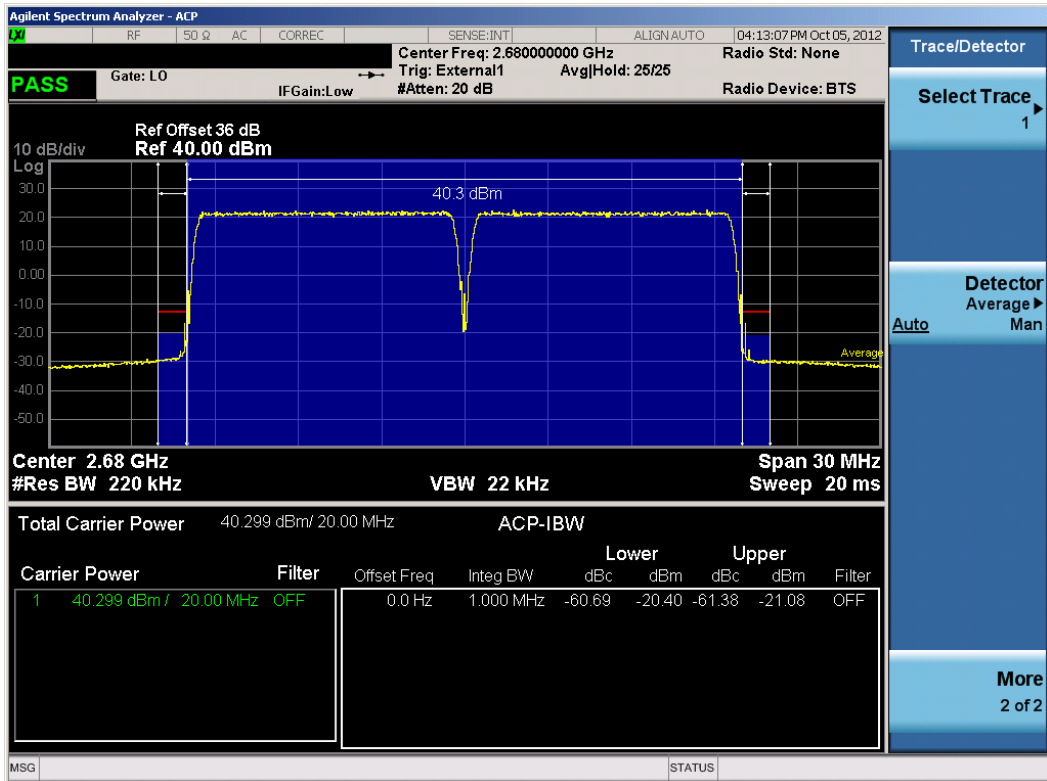


Plot 7-86. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 79 of 247

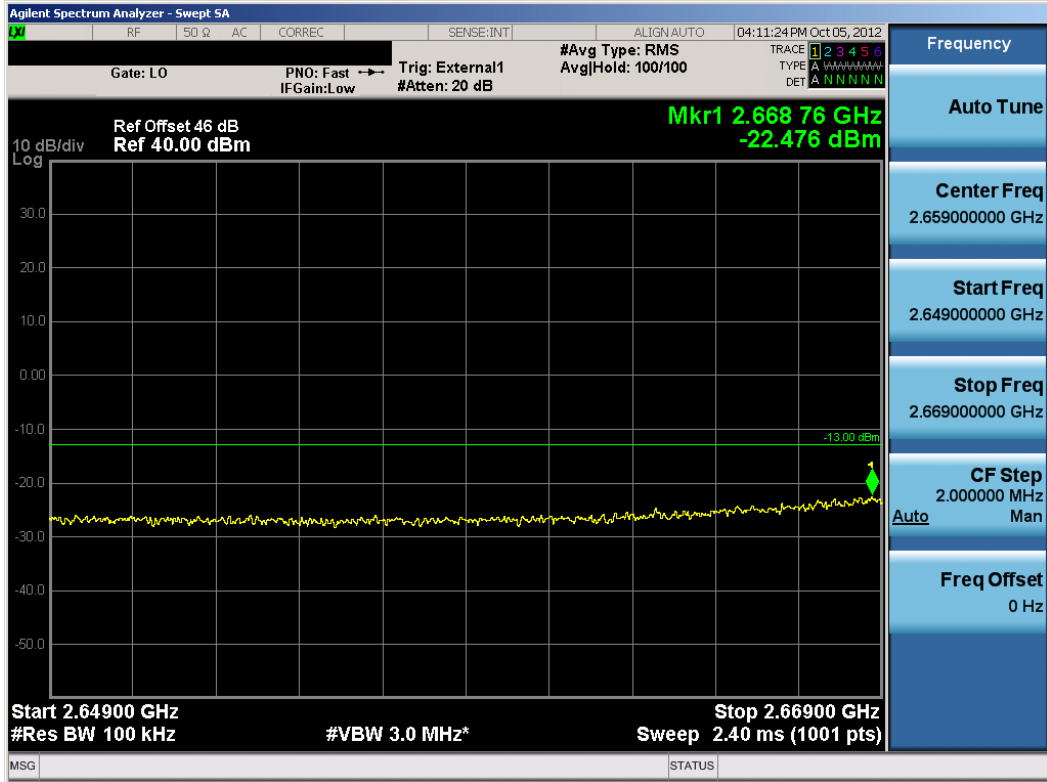


Plot 7-87. Conducted Spurious Plot (WiMAX Mode – High Channel)

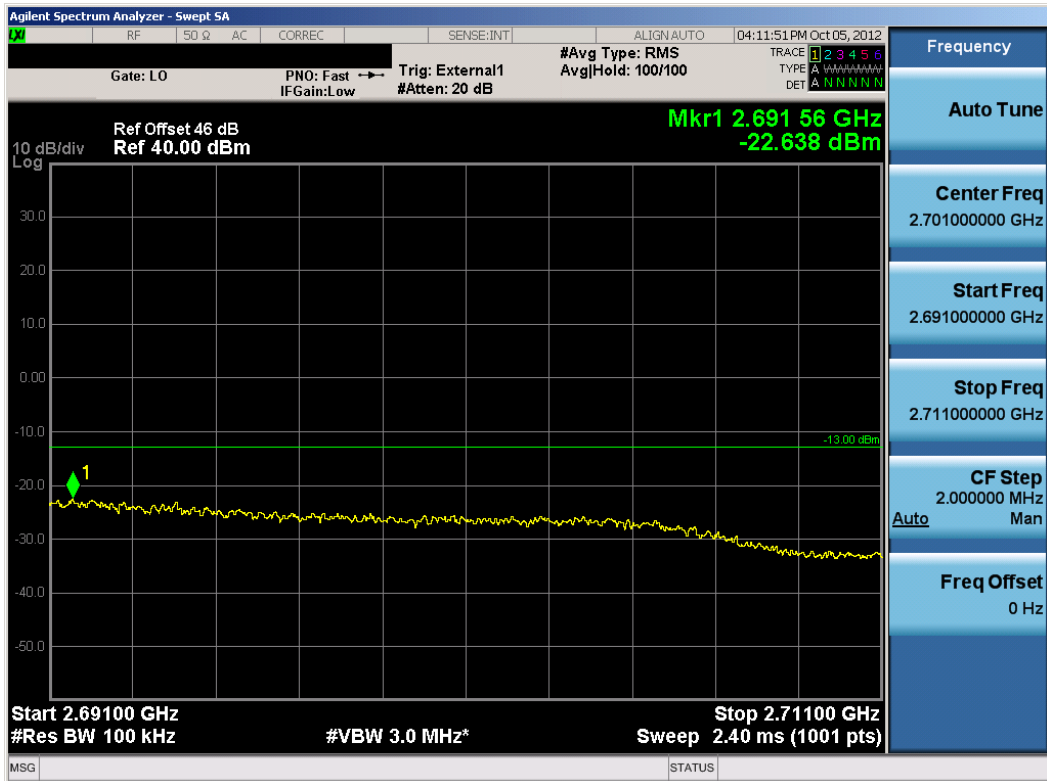


Plot 7-88. Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 80 of 247



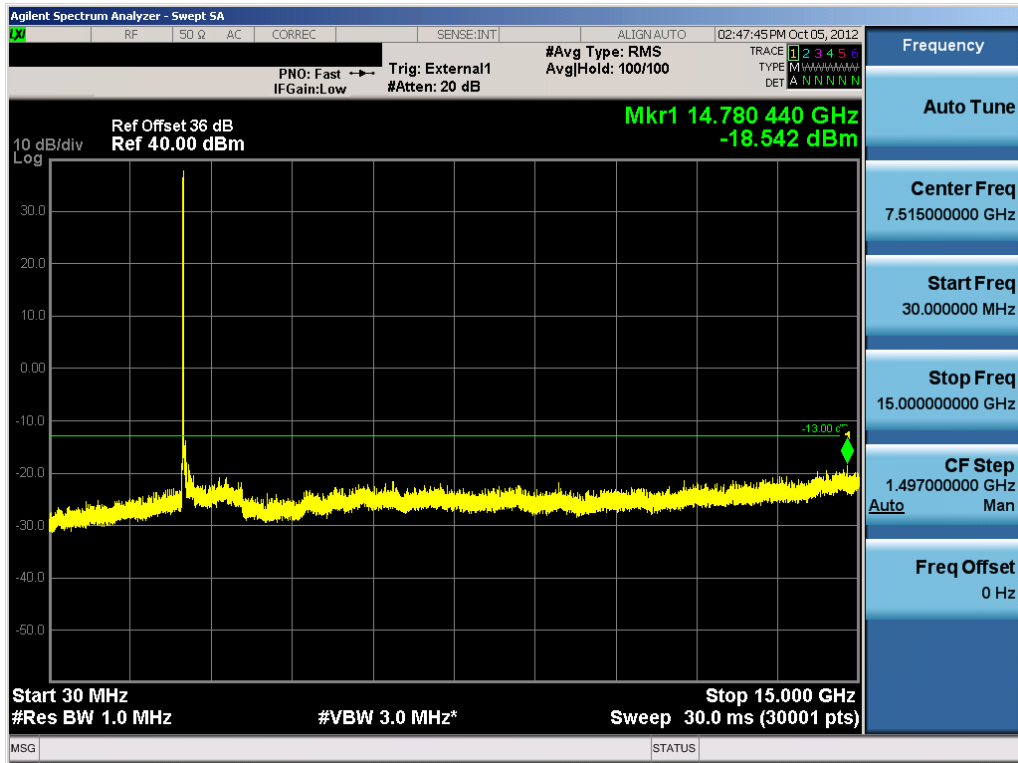
Plot 7-89. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)



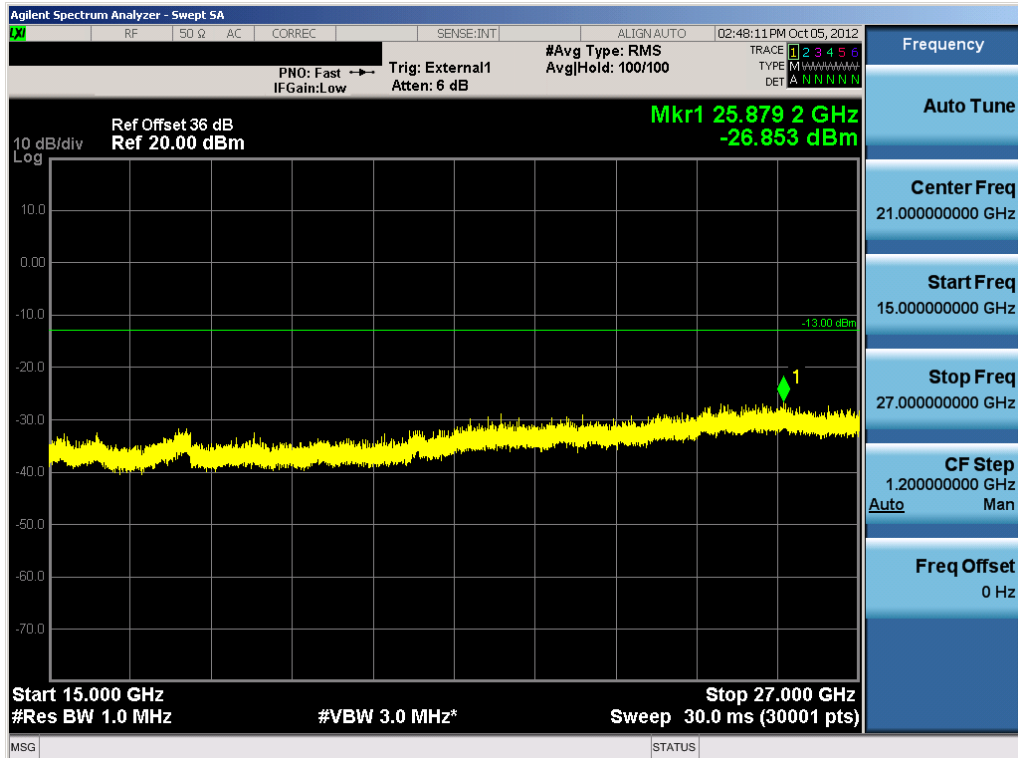
Plot 7-90. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 81 of 247

64-QAM Modulation

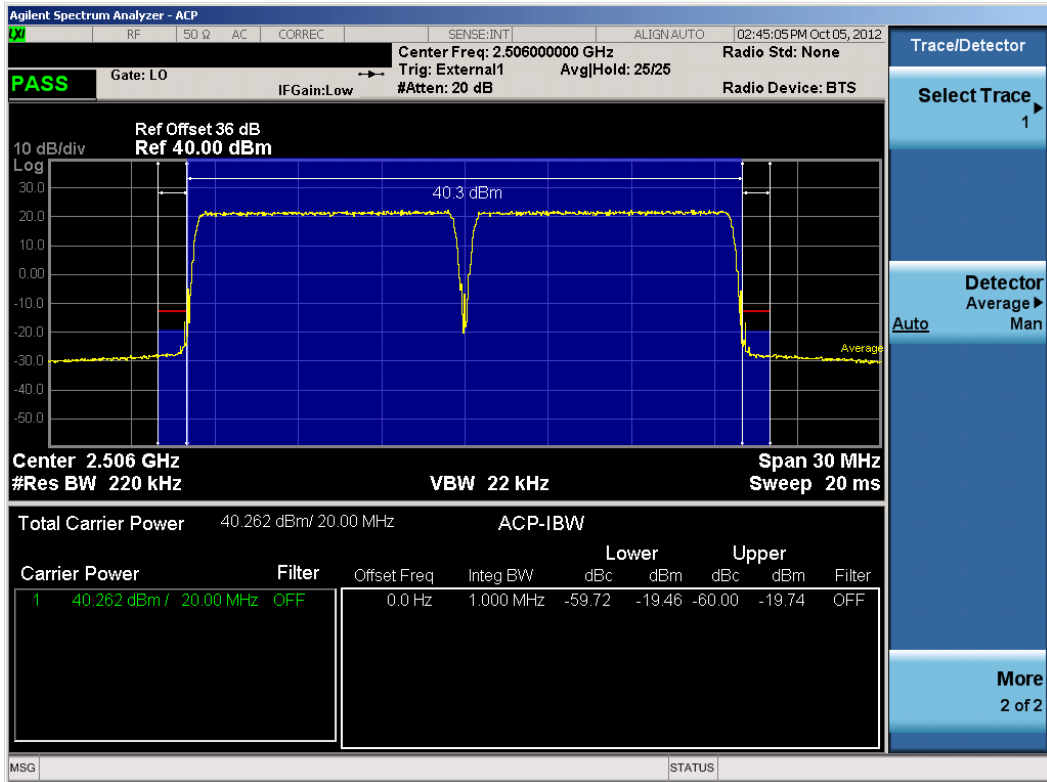


Plot 7-91. Conducted Spurious Plot (WiMAX Mode – Low Channel)

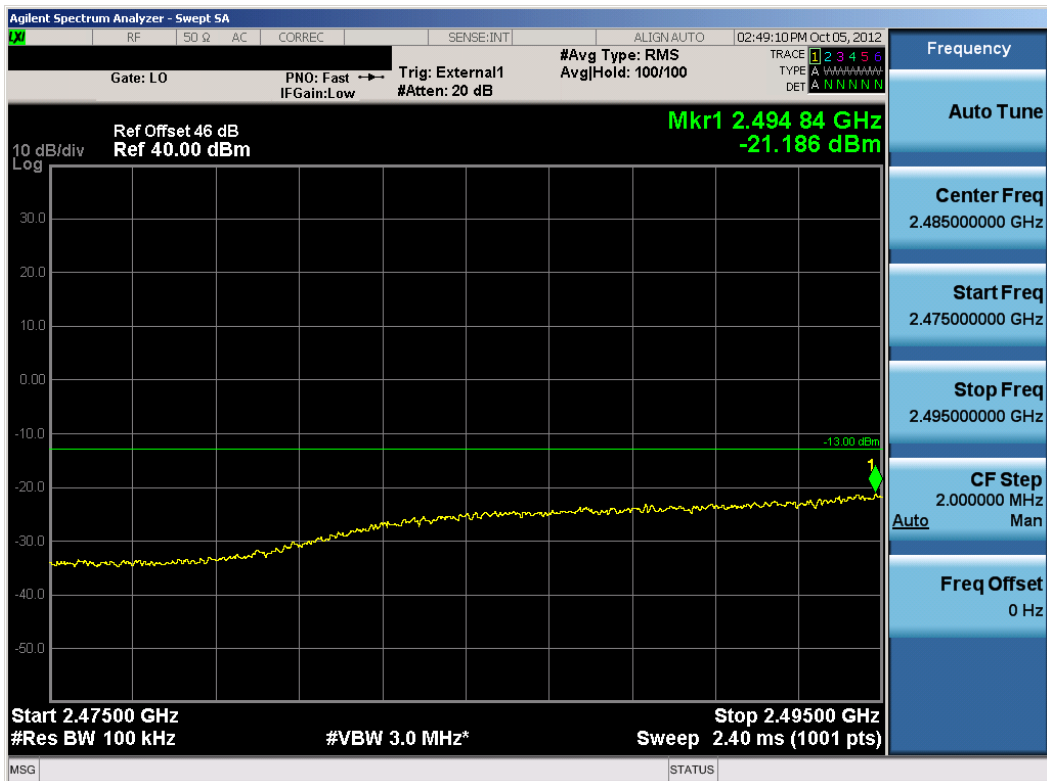


Plot 7-92. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 82 of 247

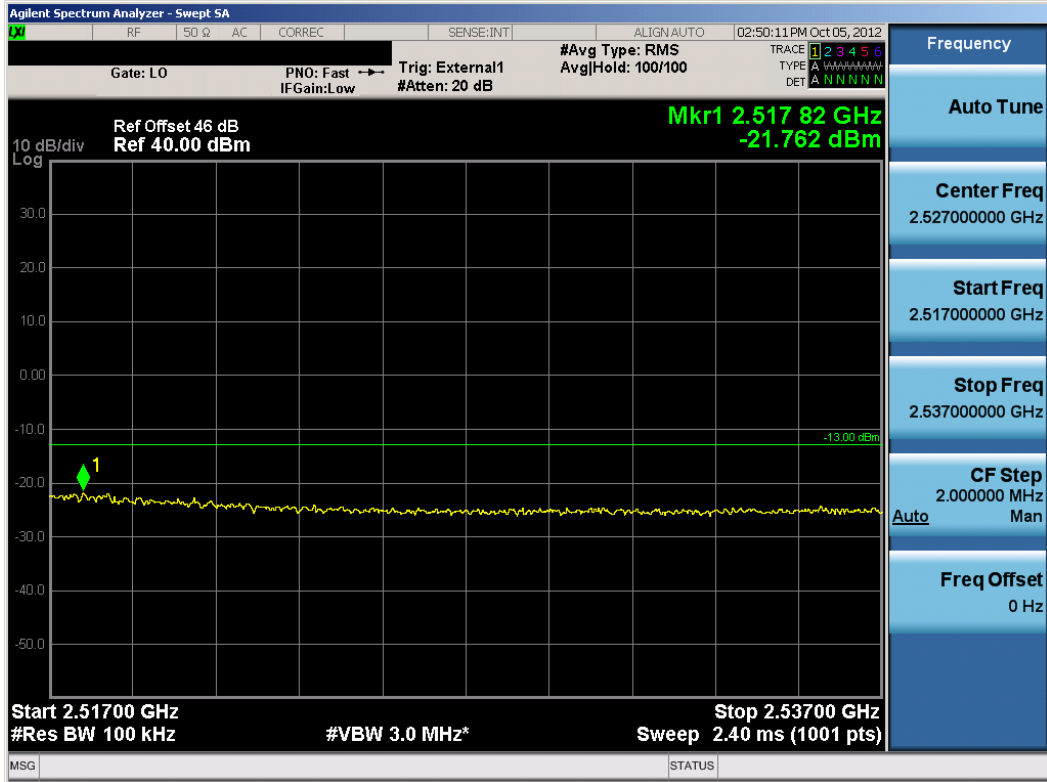


Plot 7-93. Channel Edge Plot (WiMAX Mode – Low Channel)

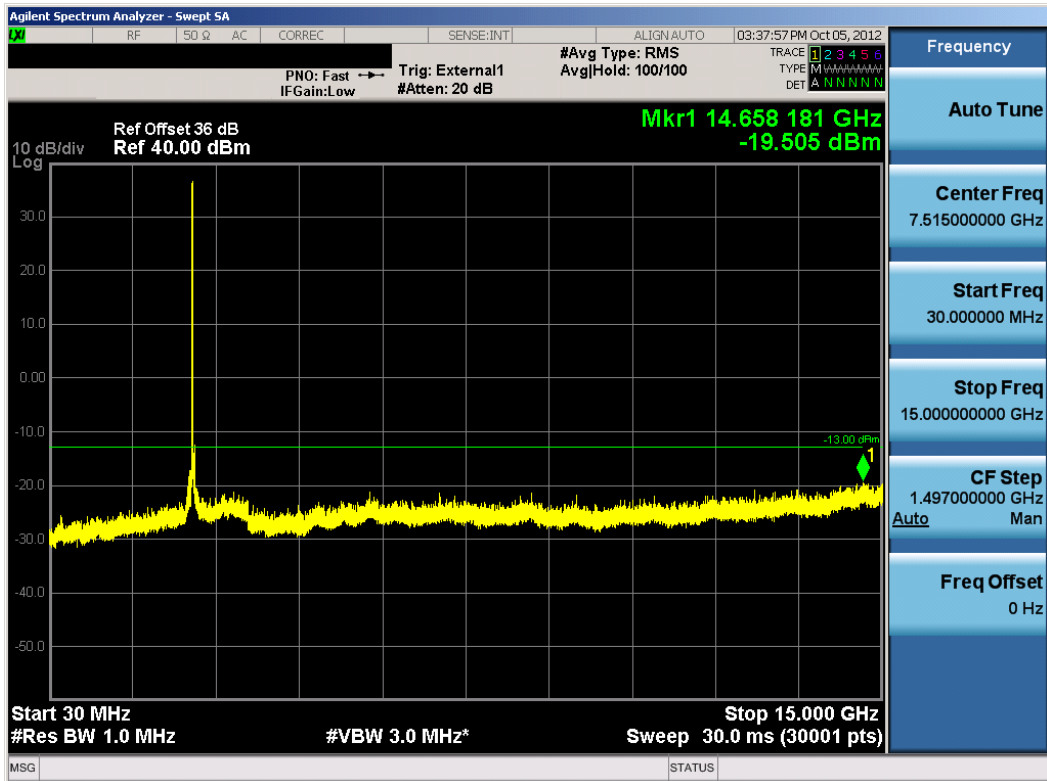


Plot 7-94. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 83 of 247

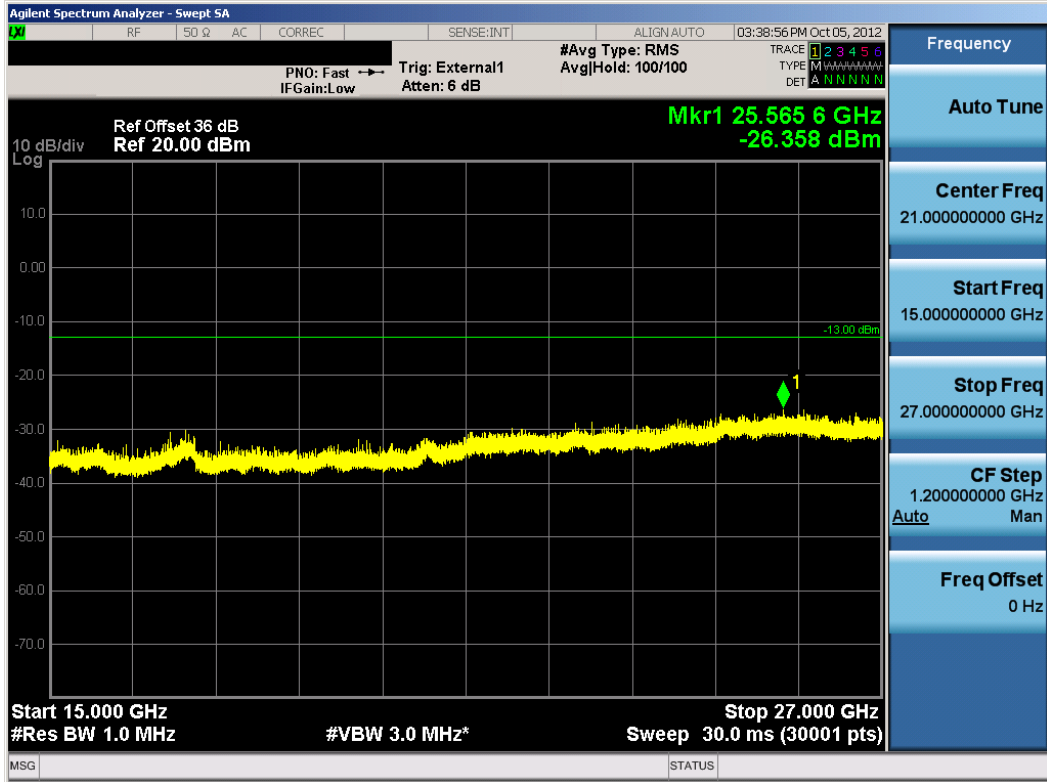


Plot 7-95. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

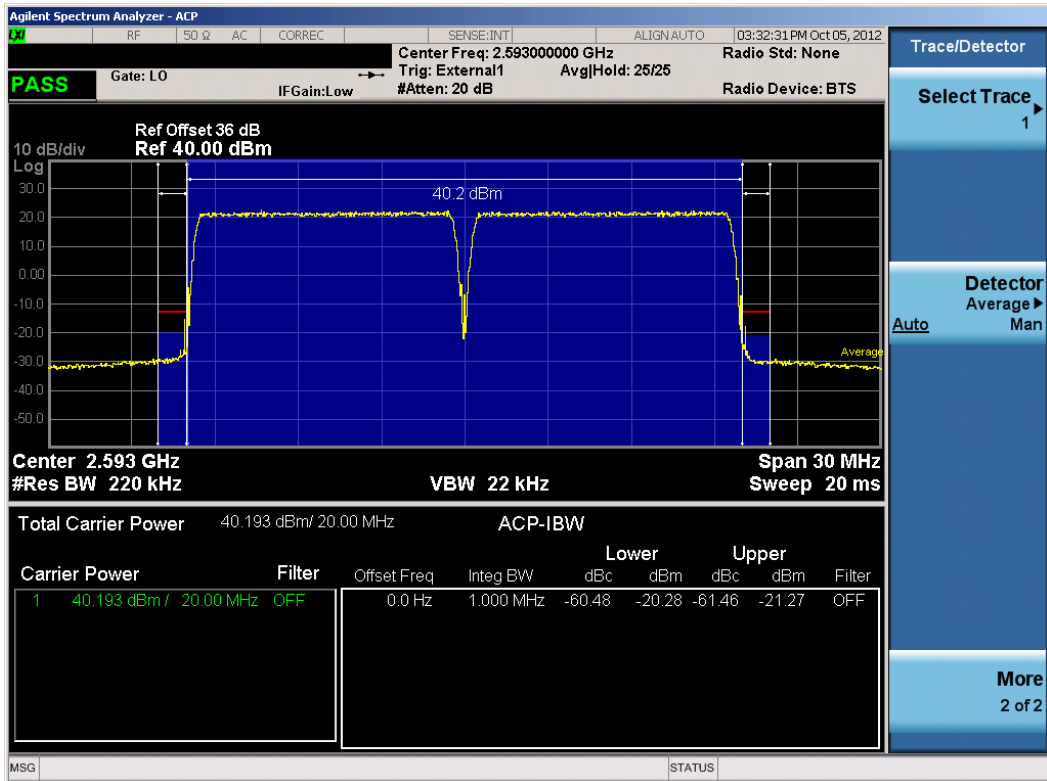


Plot 7-96. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 84 of 247

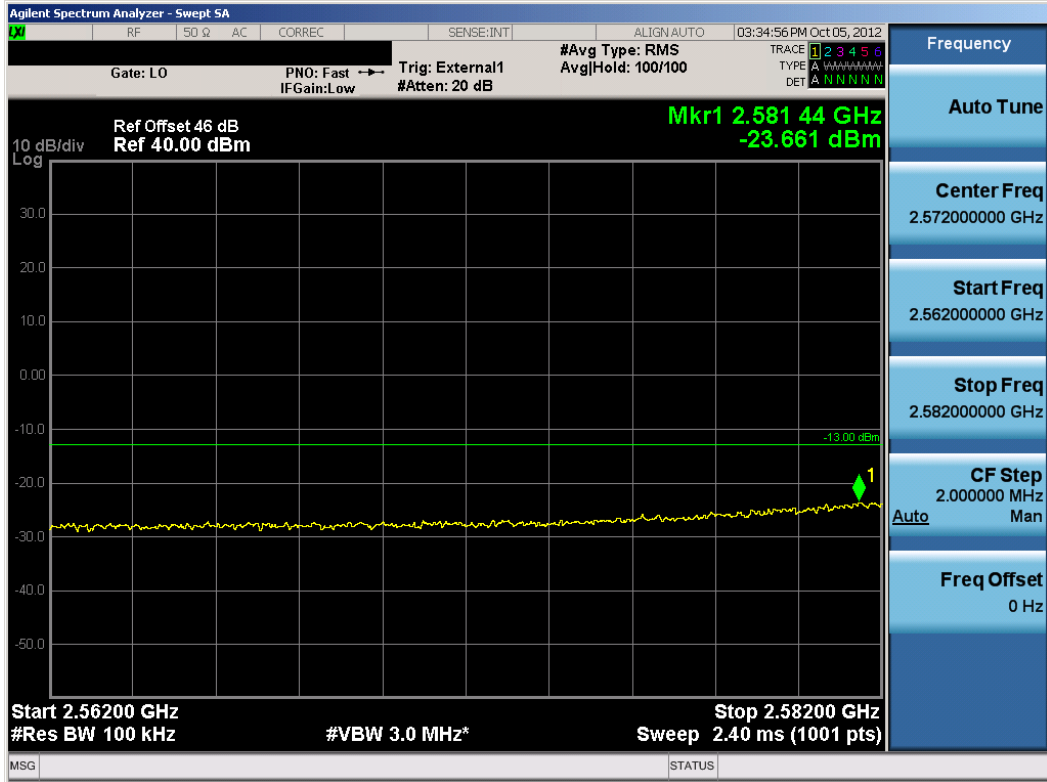


Plot 7-97. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

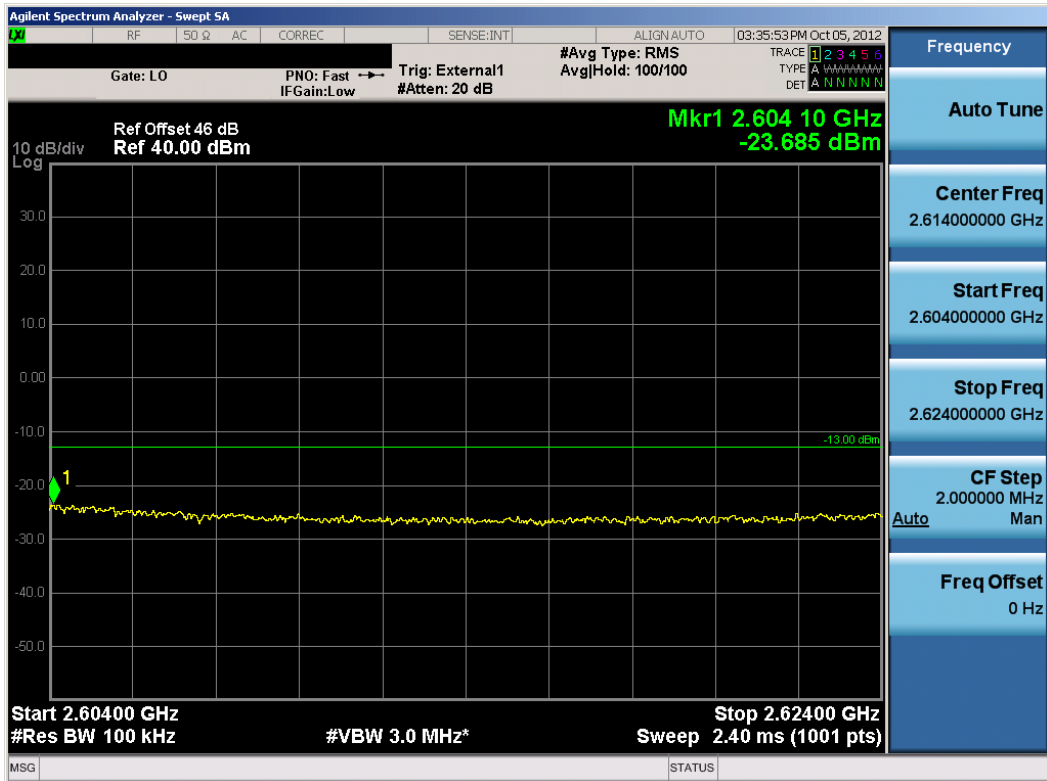


Plot 7-98. Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 85 of 247

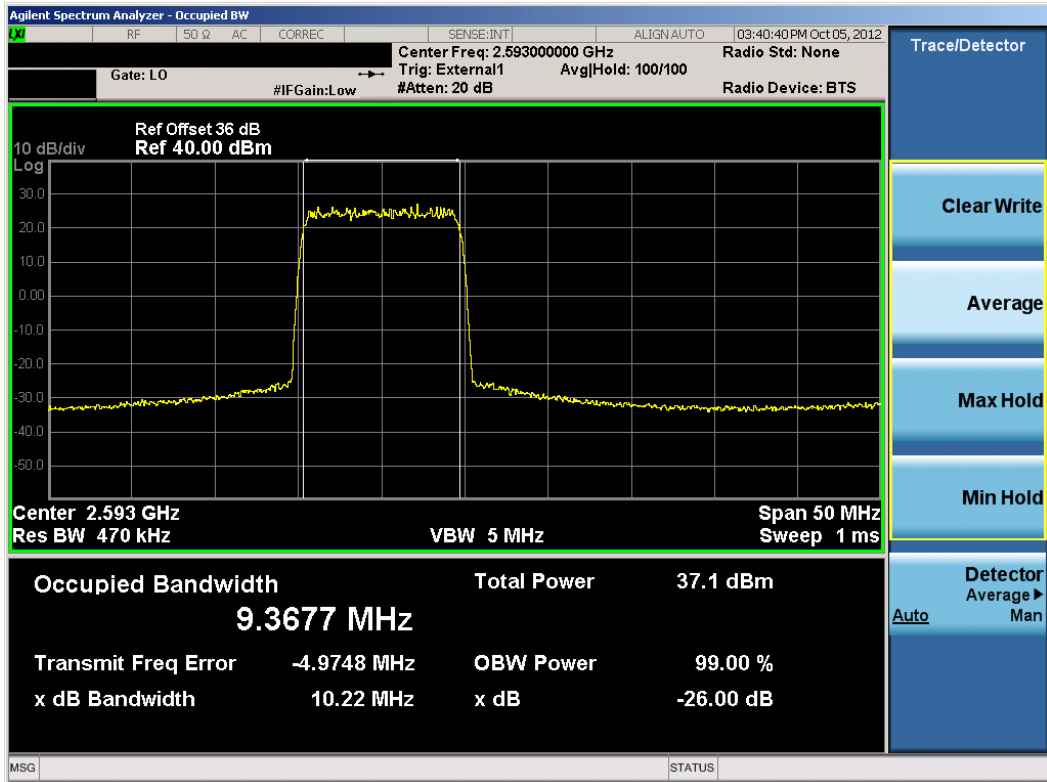


Plot 7-99. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

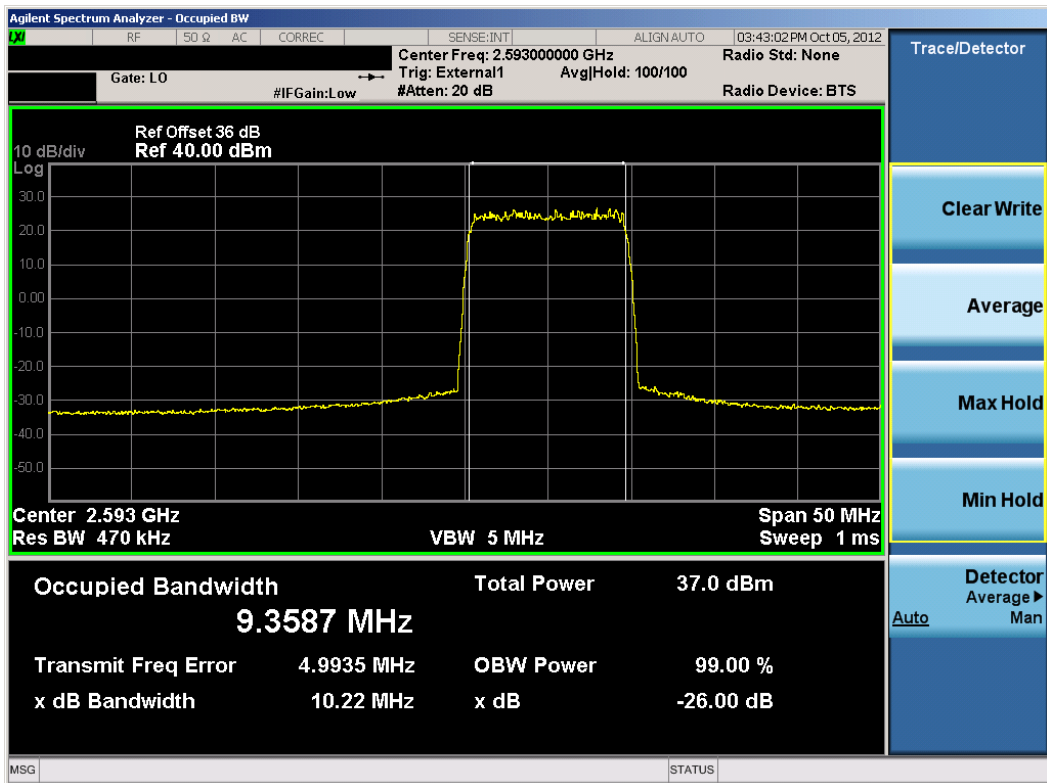


Plot 7-100. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 86 of 247

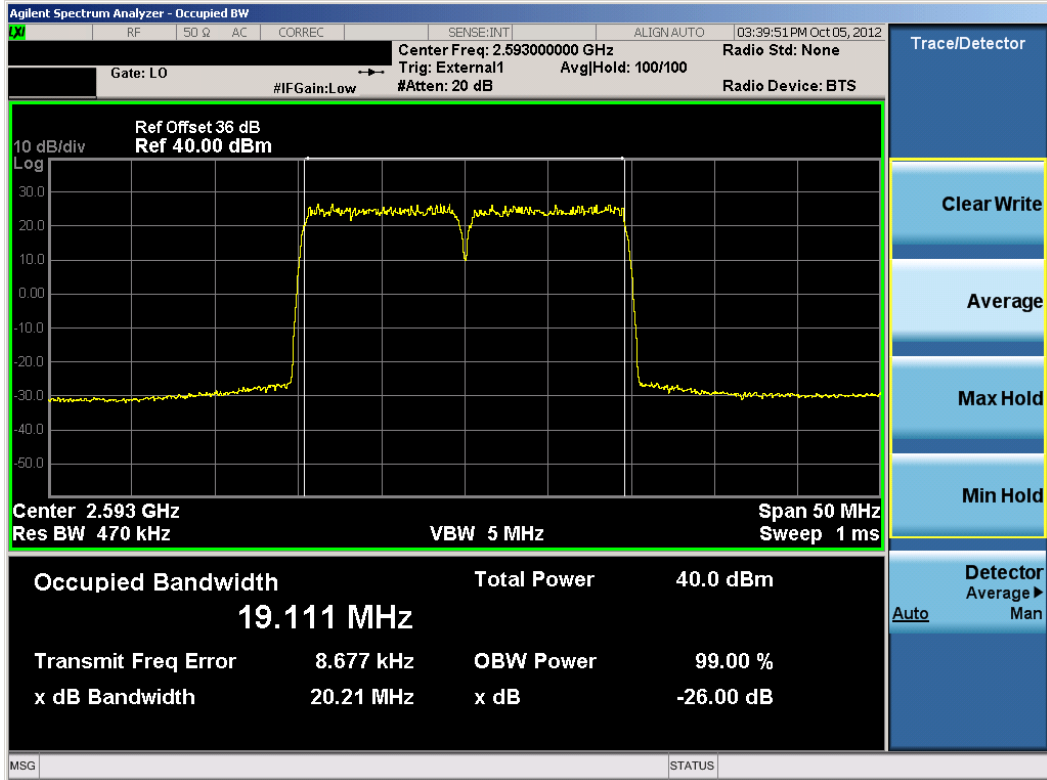


Plot 7-101. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

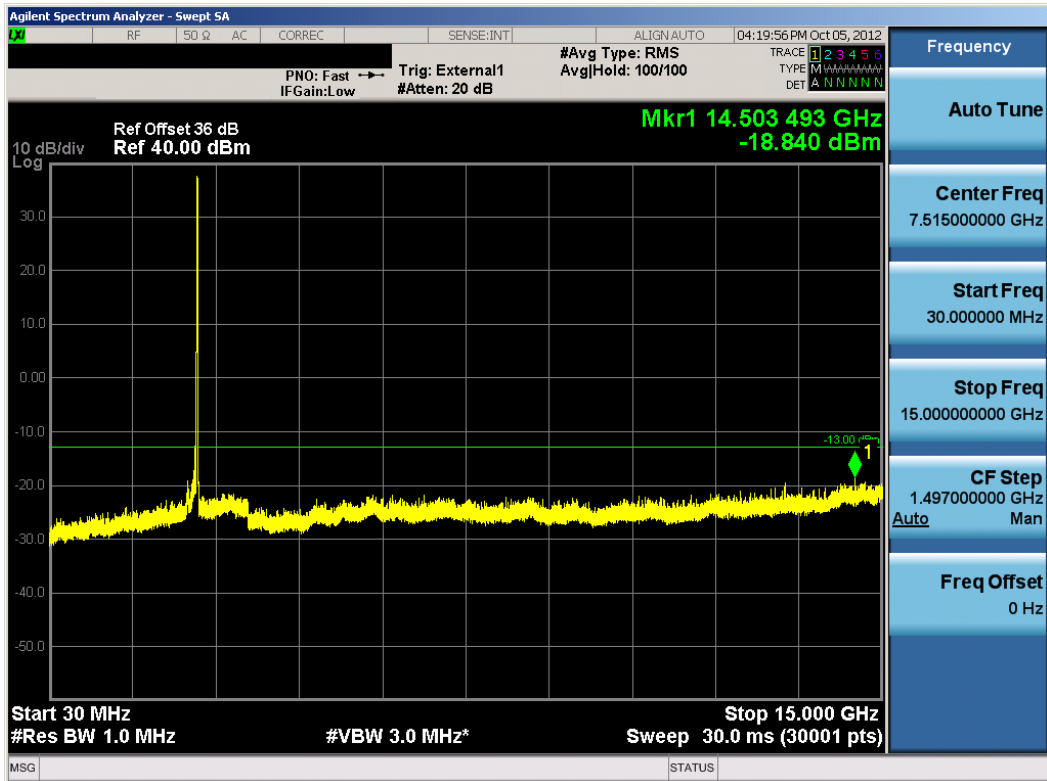


Plot 7-102. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 87 of 247



Plot 7-103. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

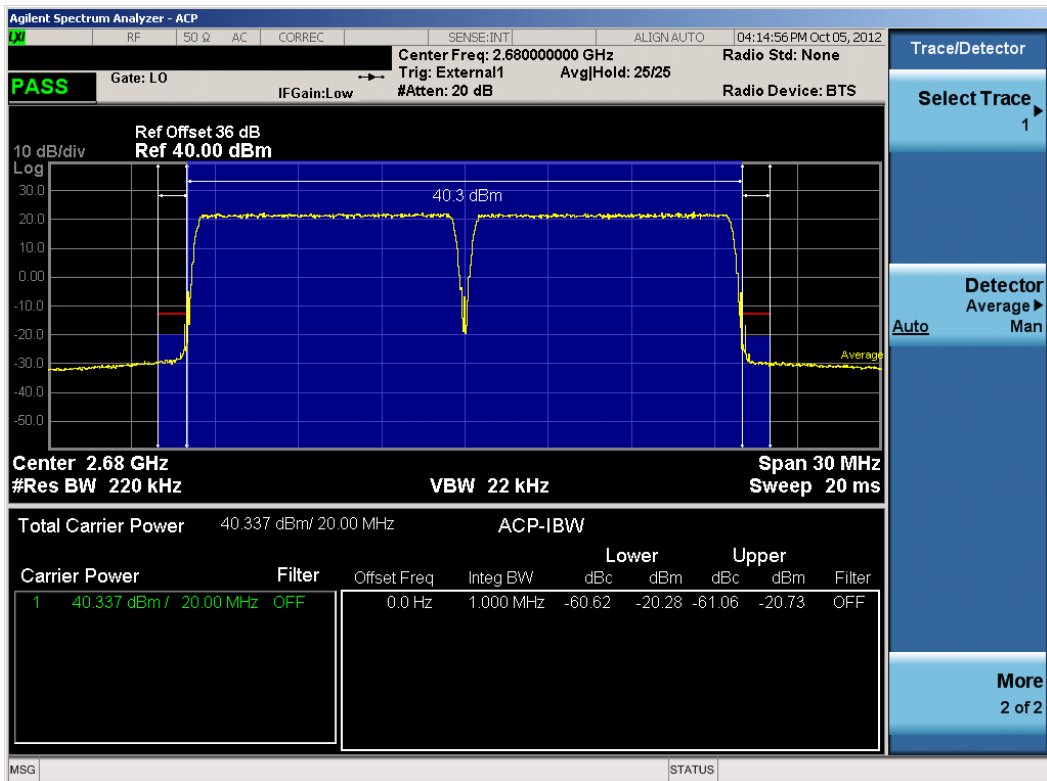


Plot 7-104. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 88 of 247

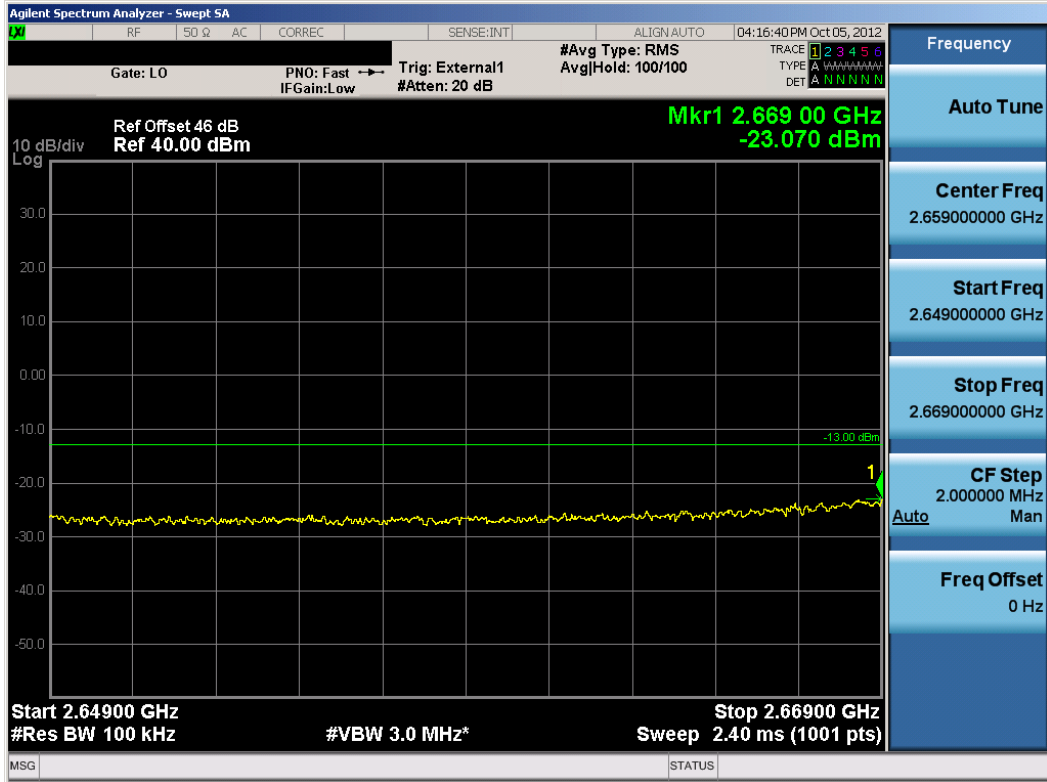


Plot 7-105. Conducted Spurious Plot (WiMAX Mode – High Channel)



Plot 7-106. Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 89 of 247



Plot 7-107. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

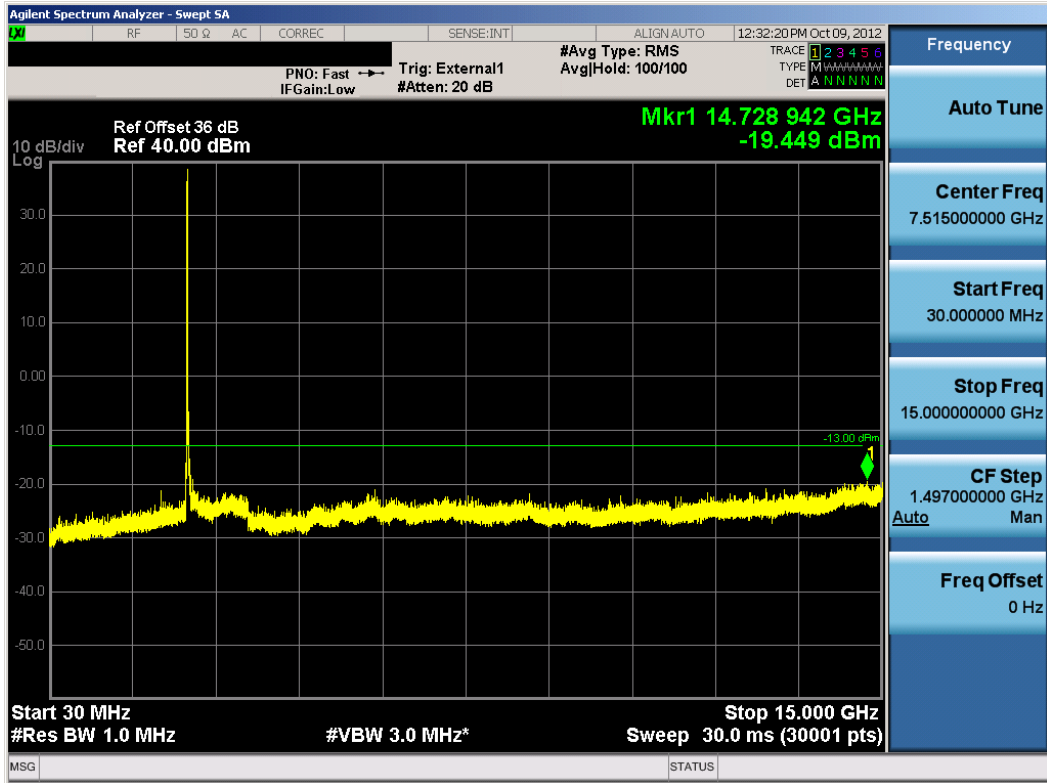


Plot 7-108. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 90 of 247

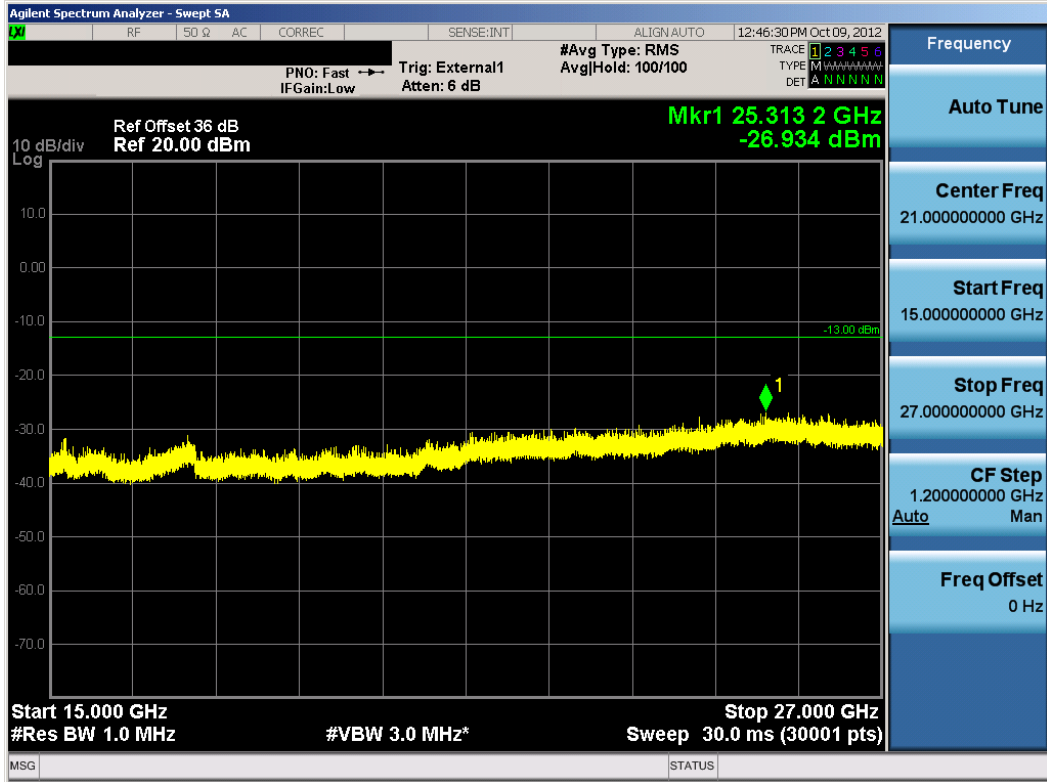
7.3 RF Port 2 (WiMAX)

QPSK Modulation

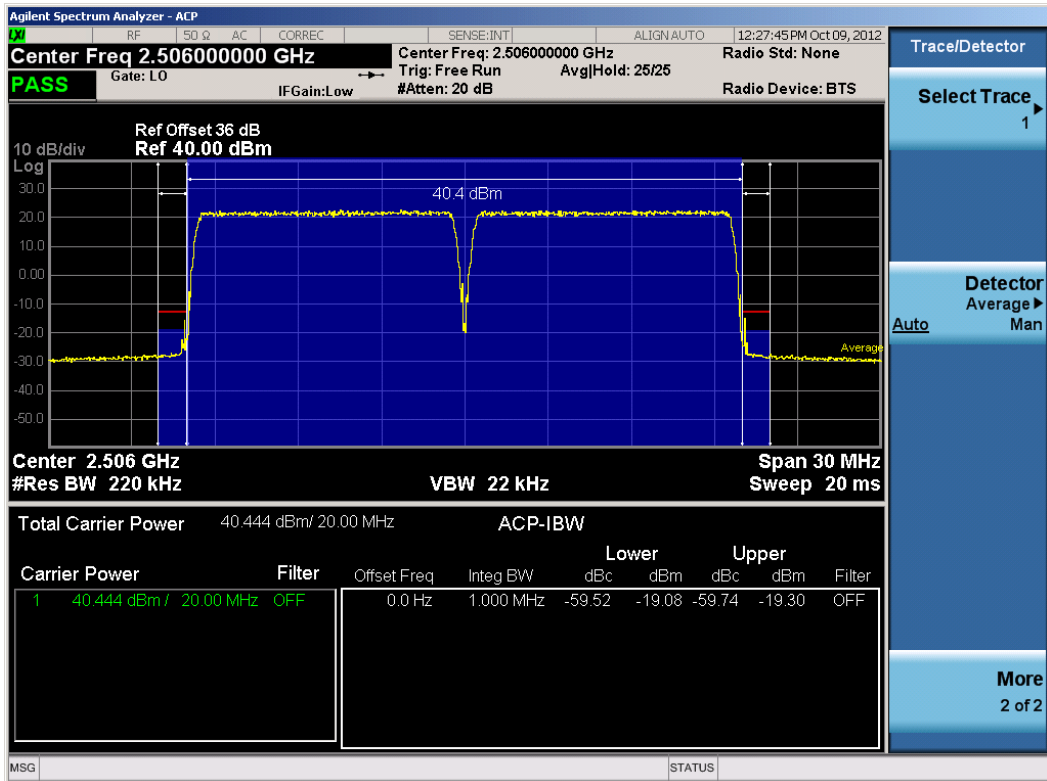


Plot 7-109. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 91 of 247



Plot 7-110. Conducted Spurious Plot (WiMAX Mode – Low Channel)

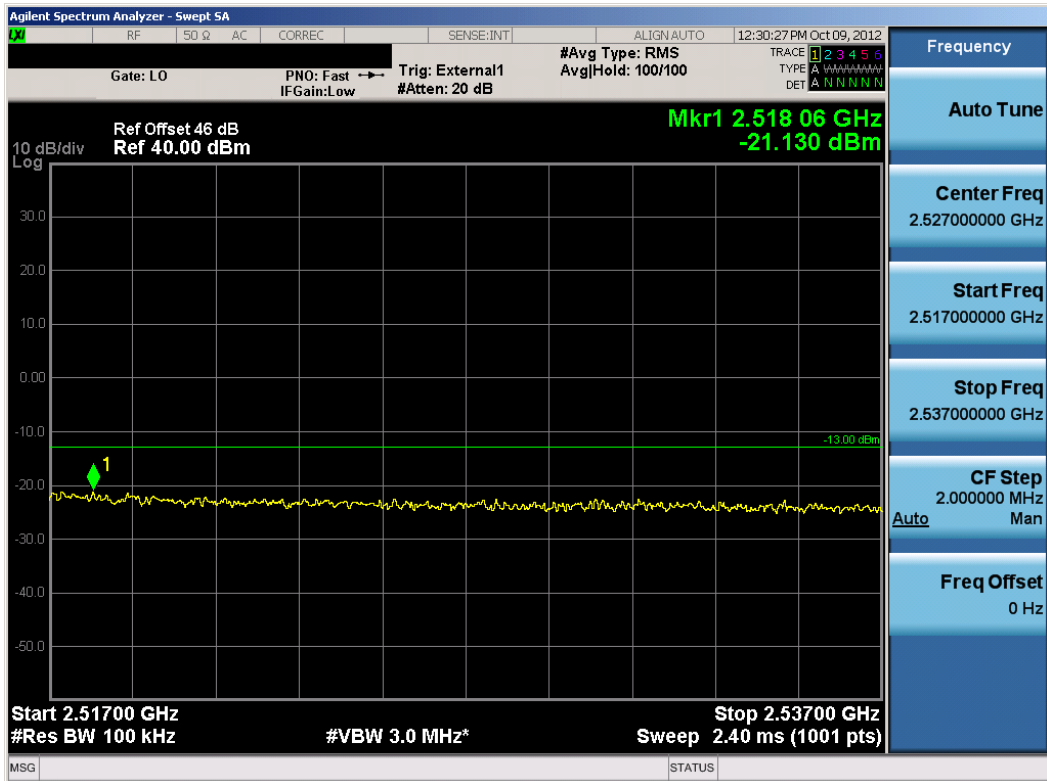


Plot 7-111. Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 92 of 247

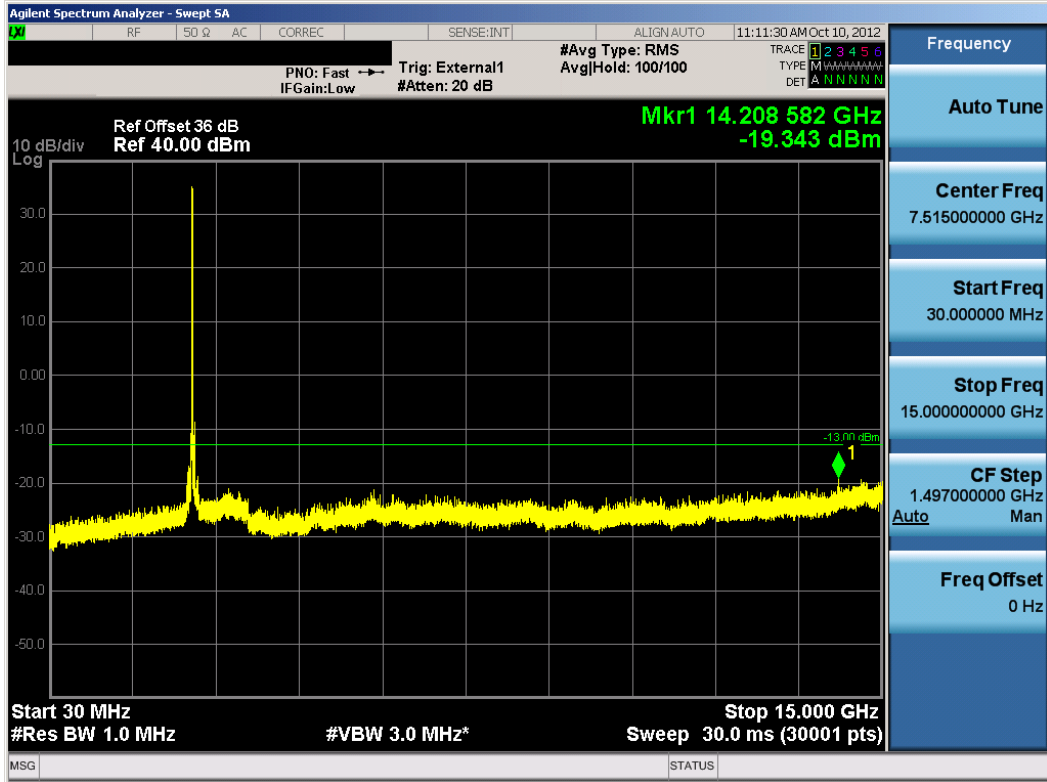


Plot 7-112. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

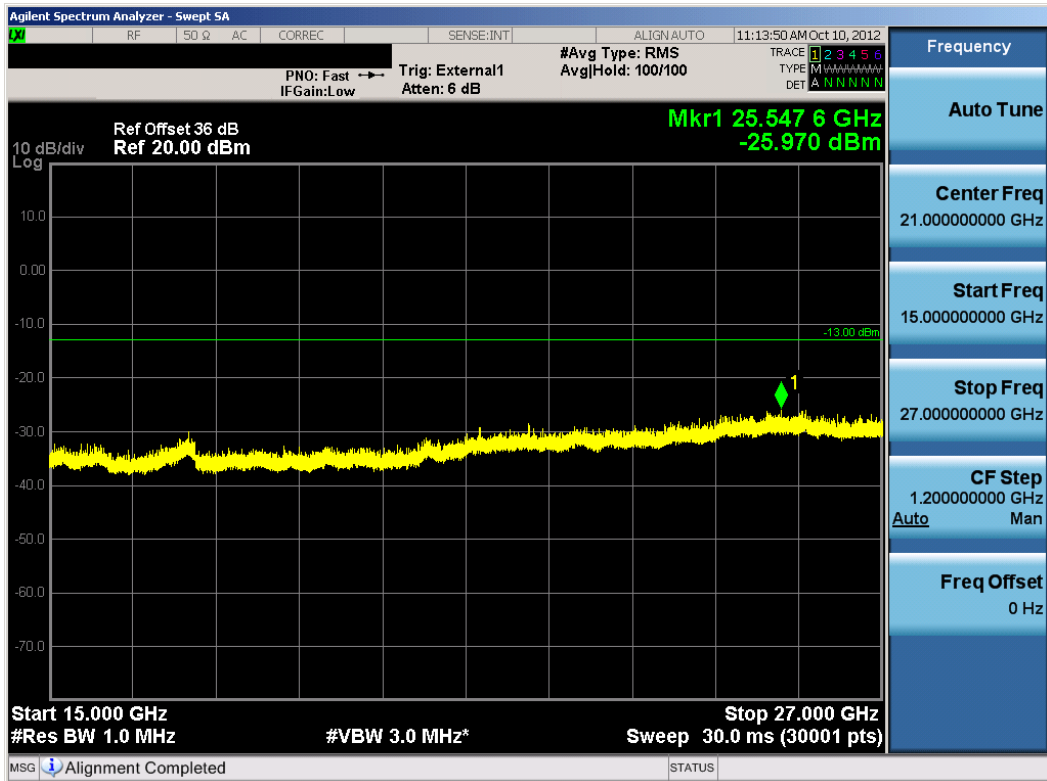


Plot 7-113. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 93 of 247

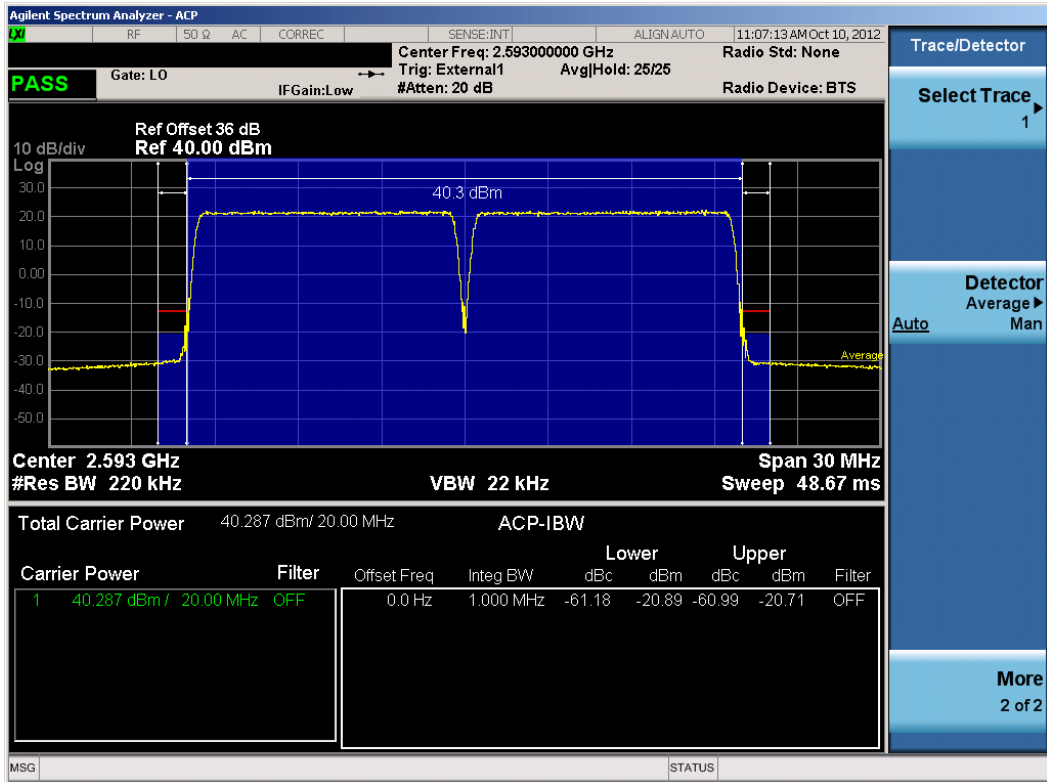


Plot 7-114. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

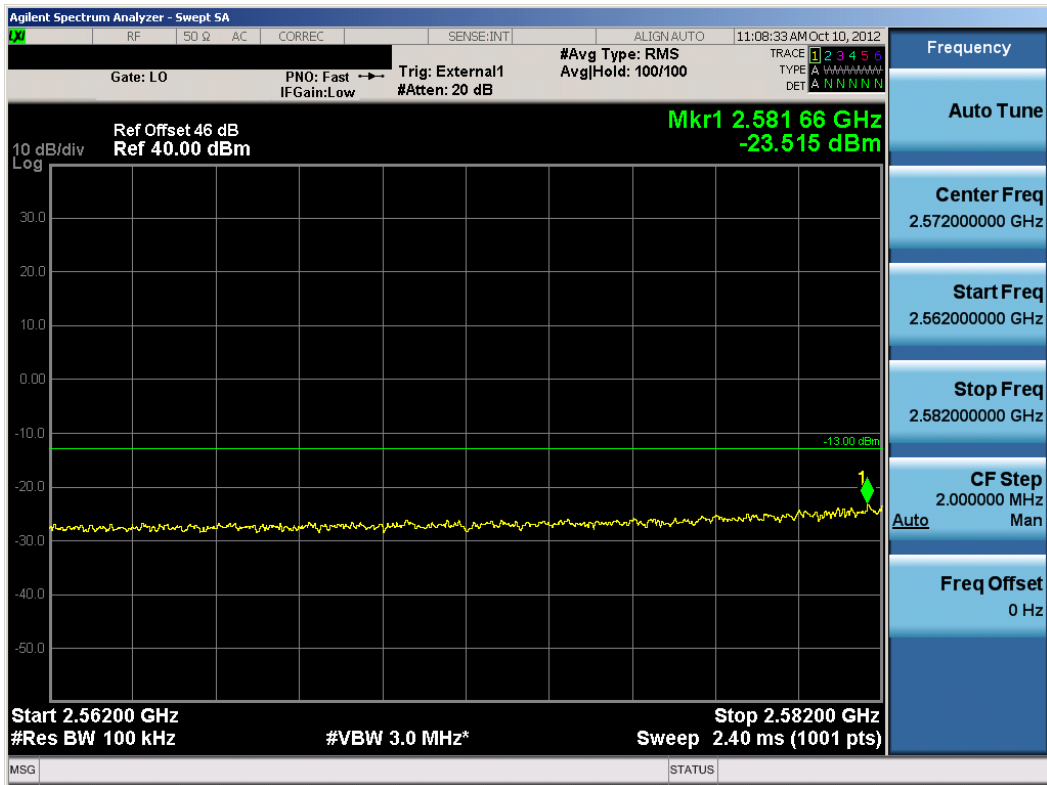


Plot 7-115. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 94 of 247

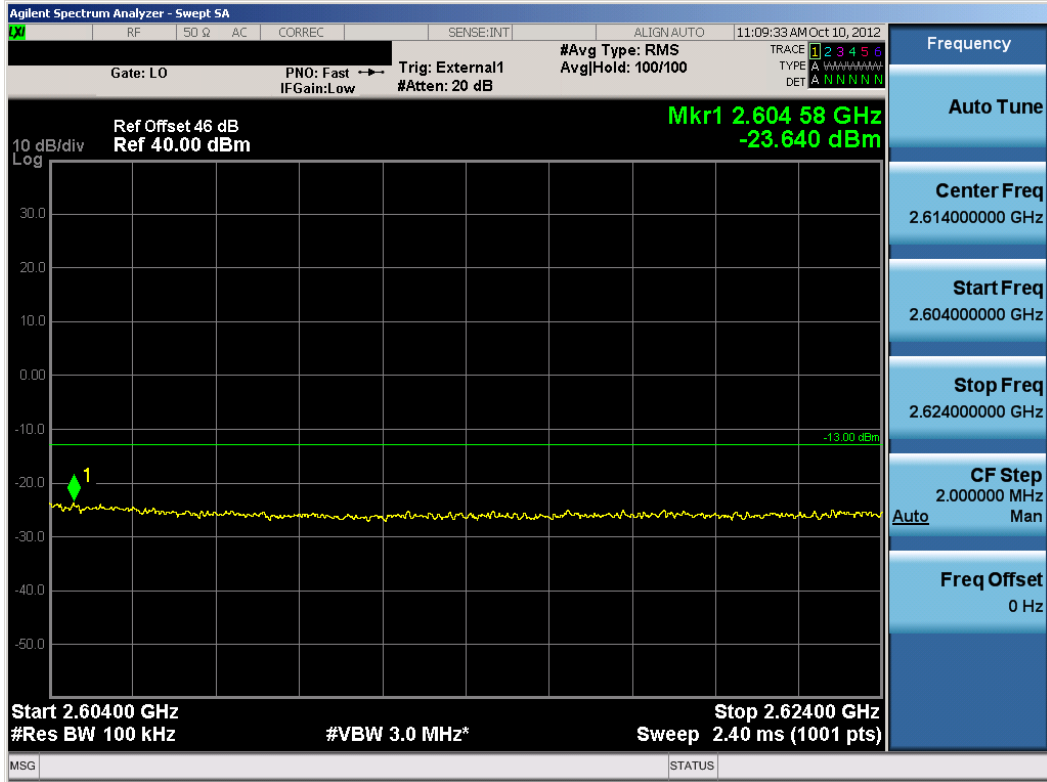


Plot 7-116. Channel Edge Plot (WiMAX Mode – Mid Channel)

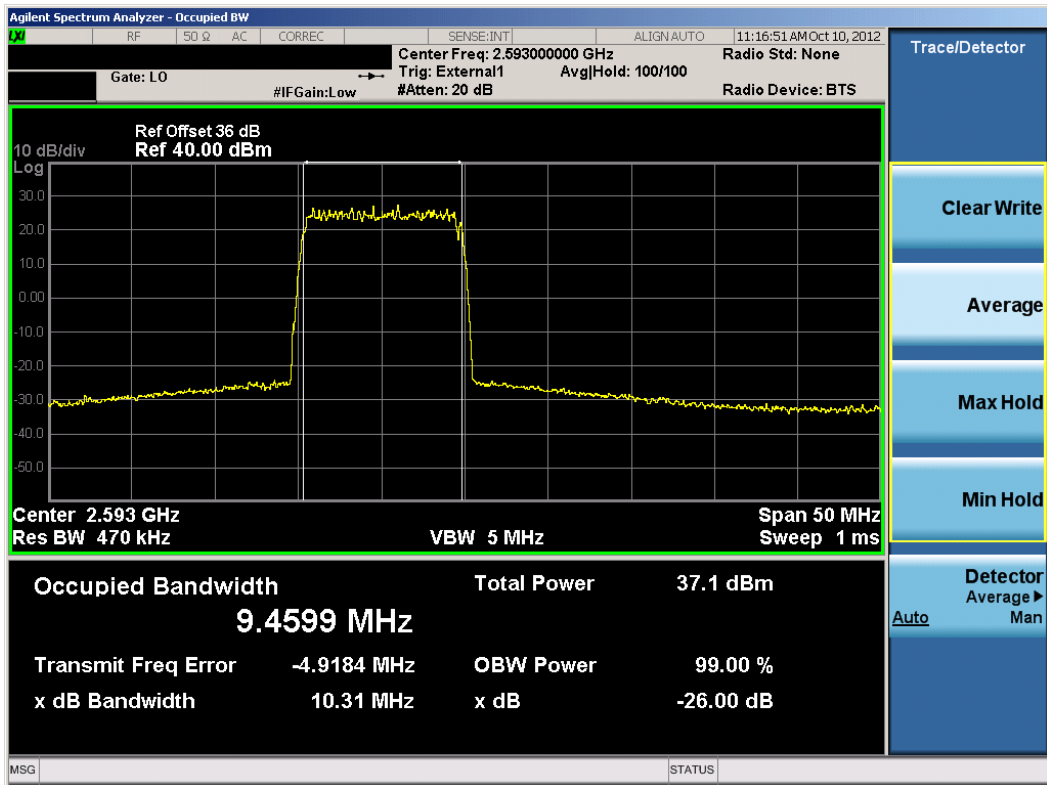


Plot 7-117. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 95 of 247

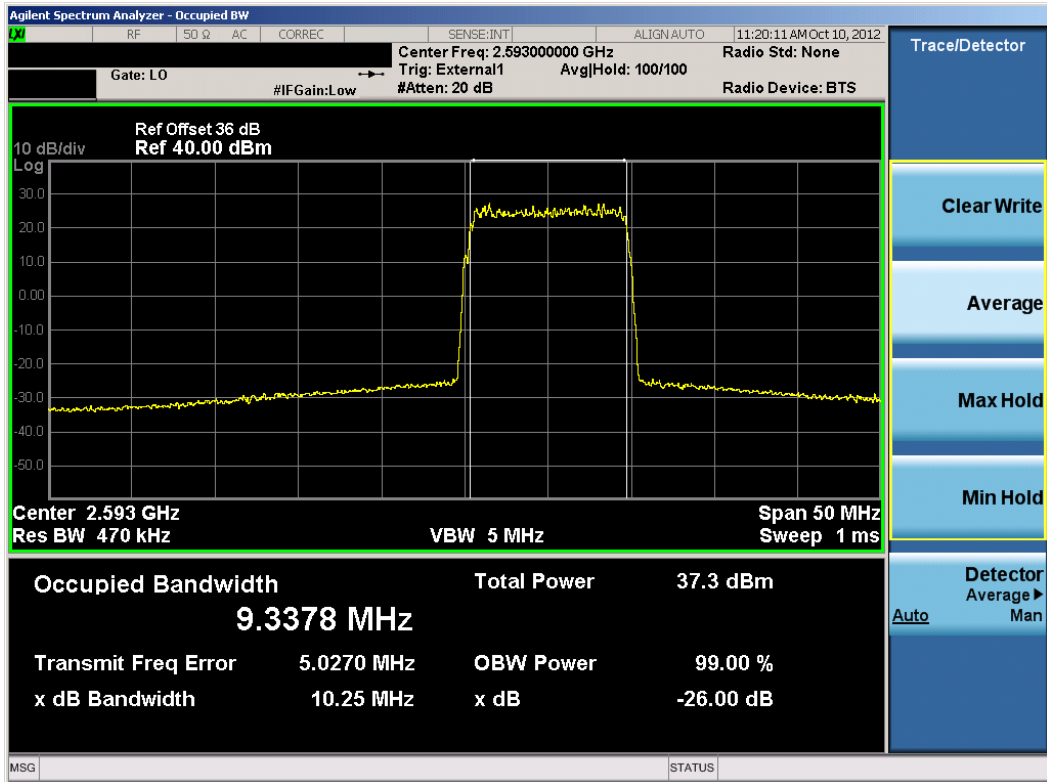


Plot 7-118. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

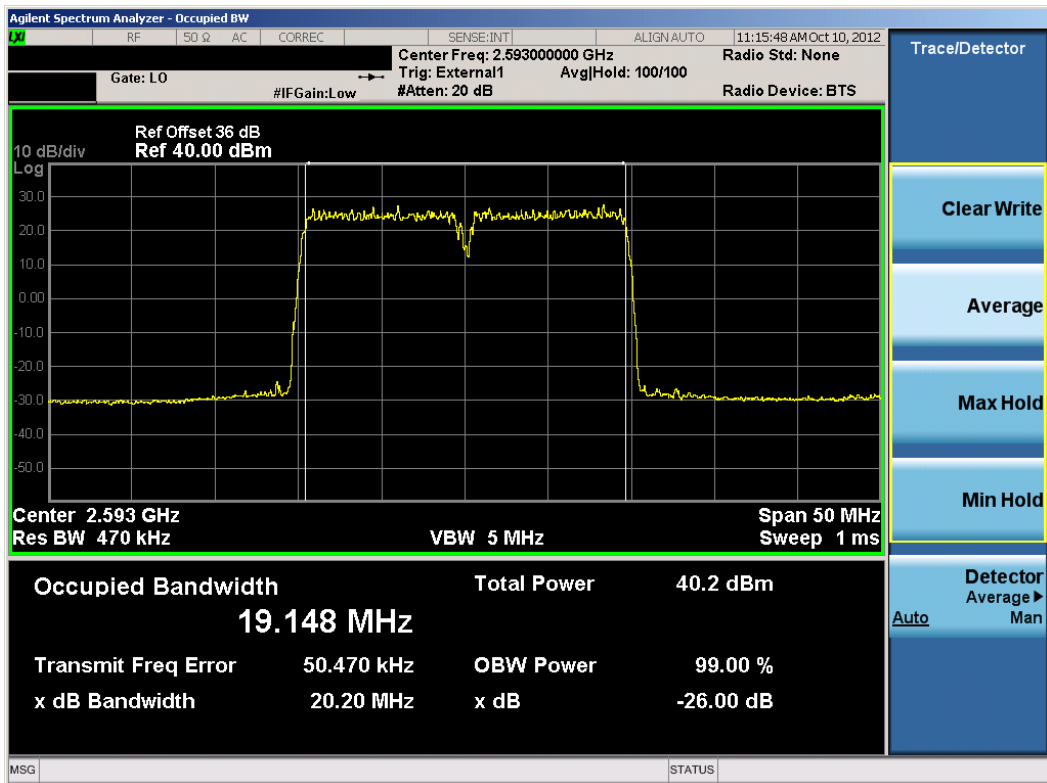


Plot 7-119. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 96 of 247

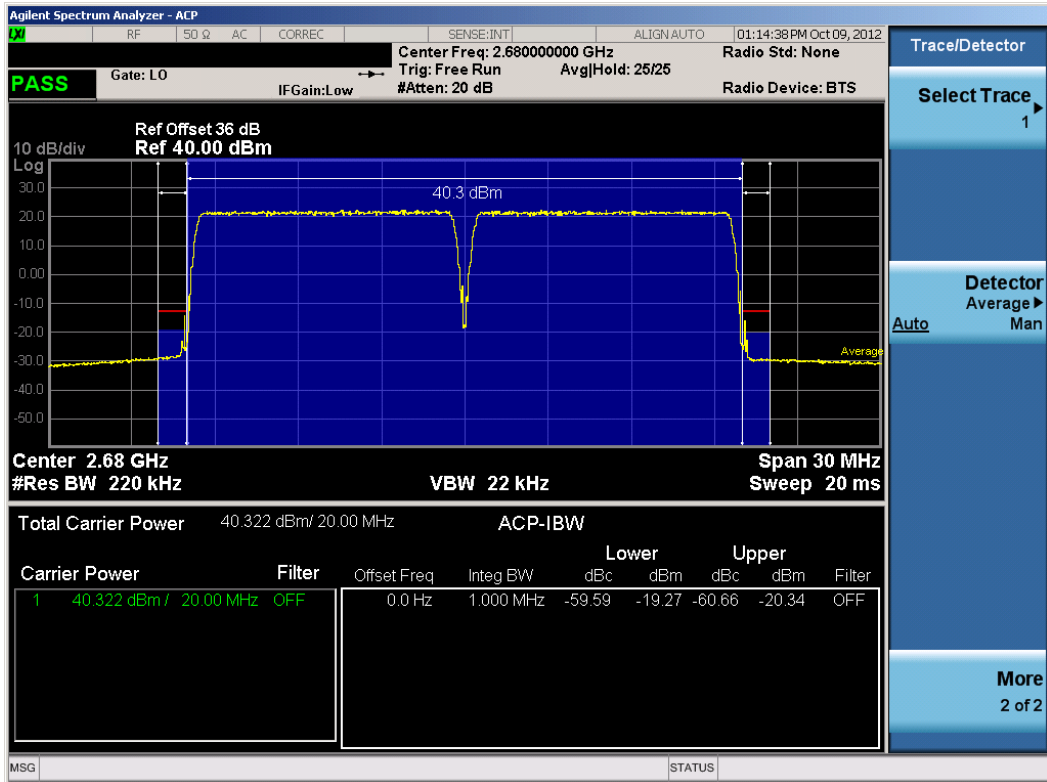


Plot 7-120. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

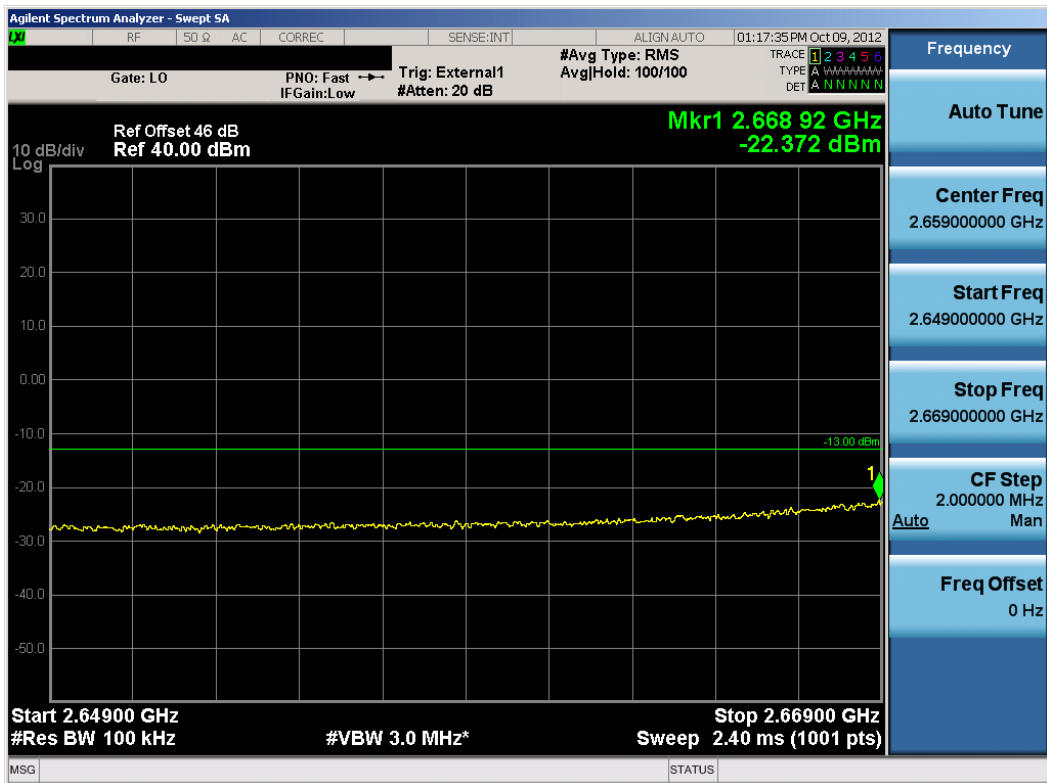


Plot 7-121. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 97 of 247



Plot 7-124. Channel Edge Plot (WiMAX Mode – High Channel)



Plot 7-125. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

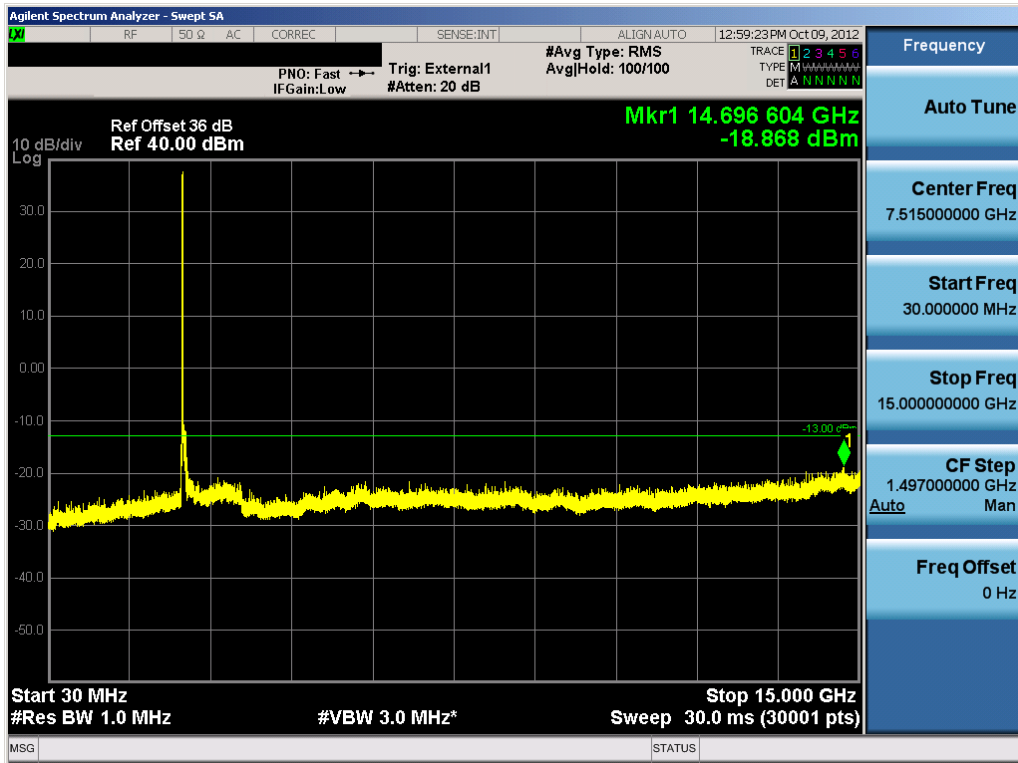
FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 99 of 247



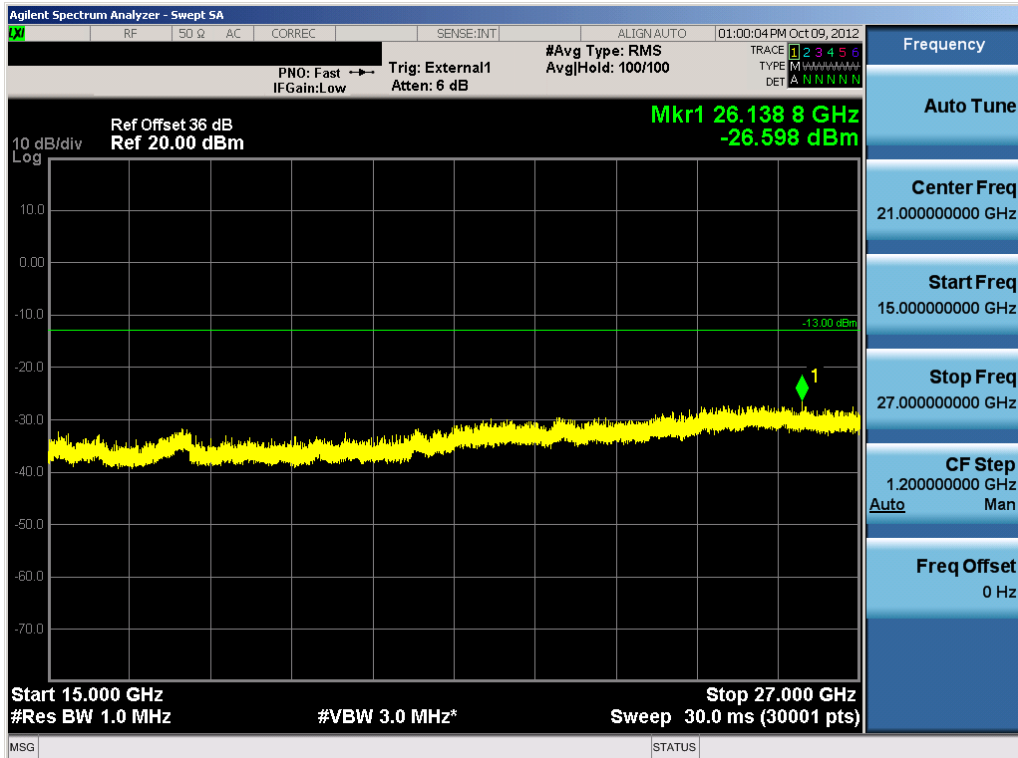
Plot 7-126. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 100 of 247

16-QAM Modulation

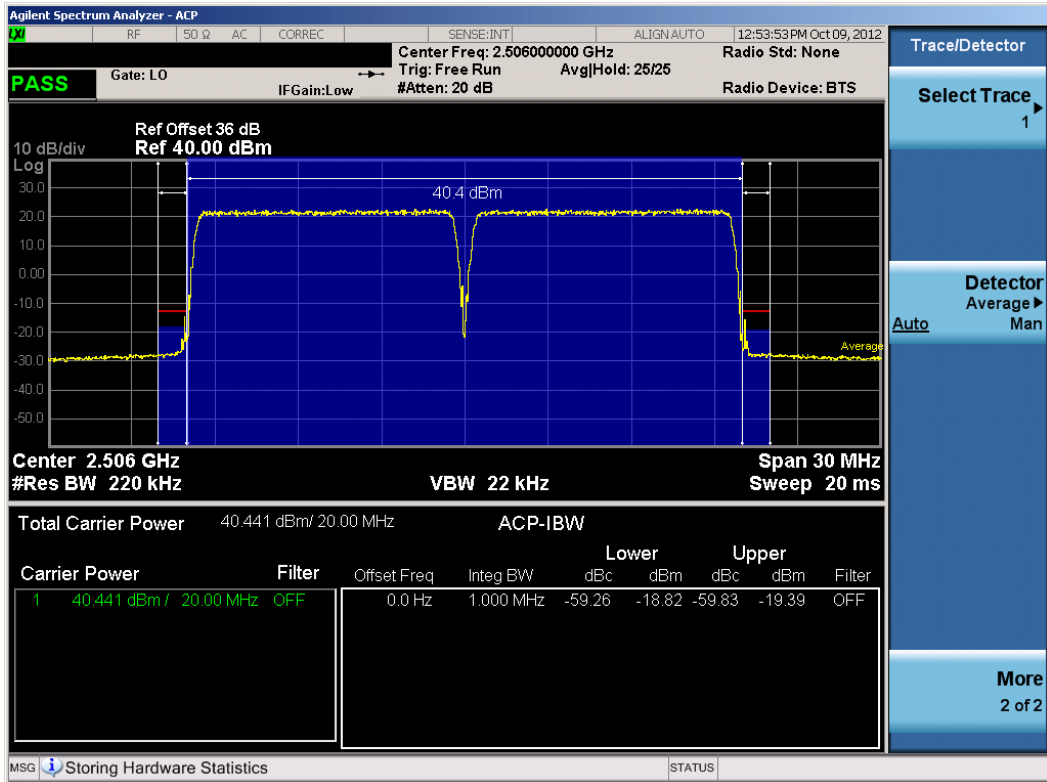


Plot 7-127. Conducted Spurious Plot (WiMAX Mode – Low Channel)



Plot 7-128. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 101 of 247

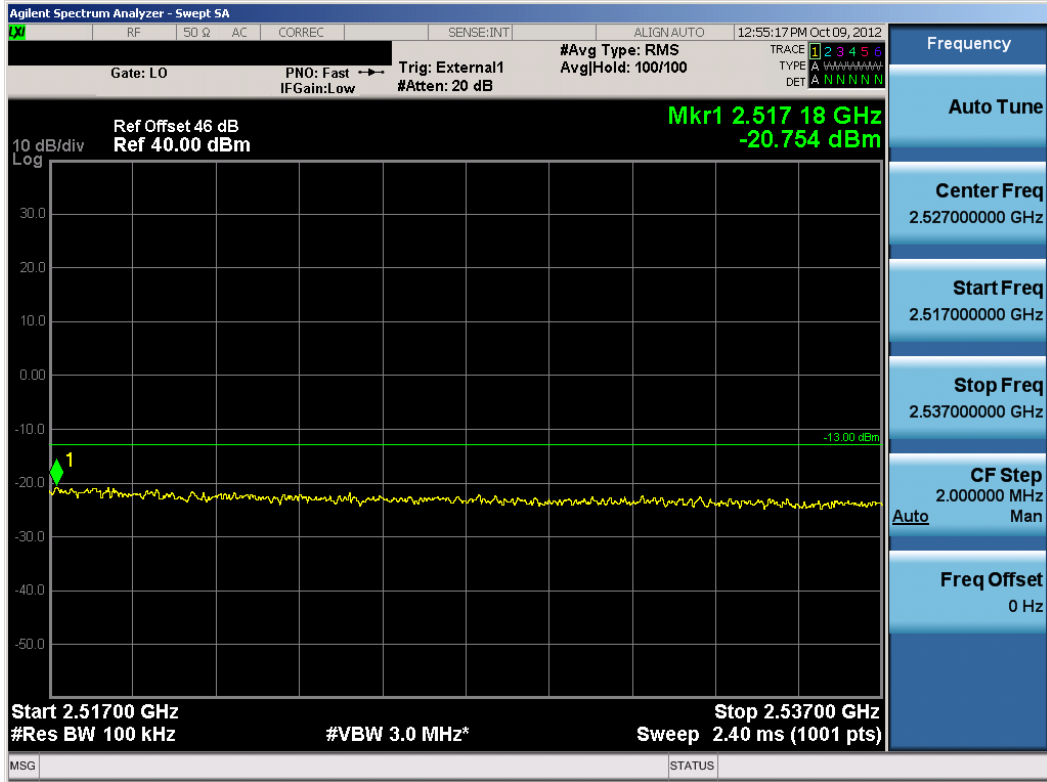


Plot 7-129. Channel Edge Plot (WiMAX Mode – Low Channel)

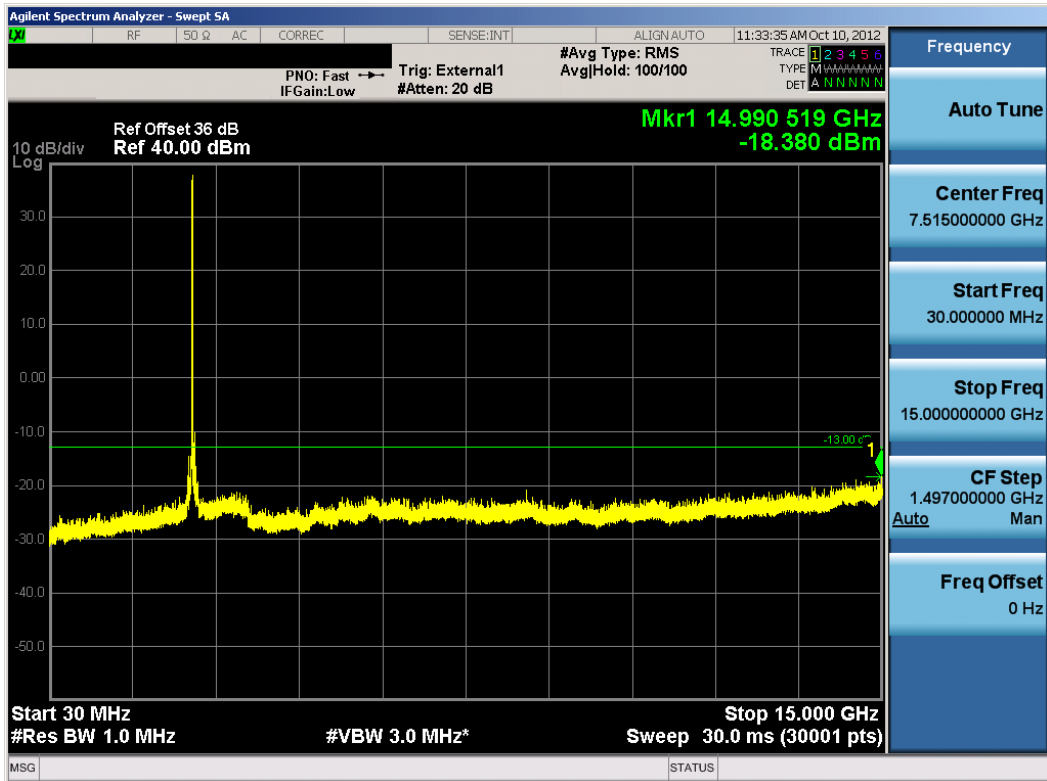


Plot 7-130. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 102 of 247

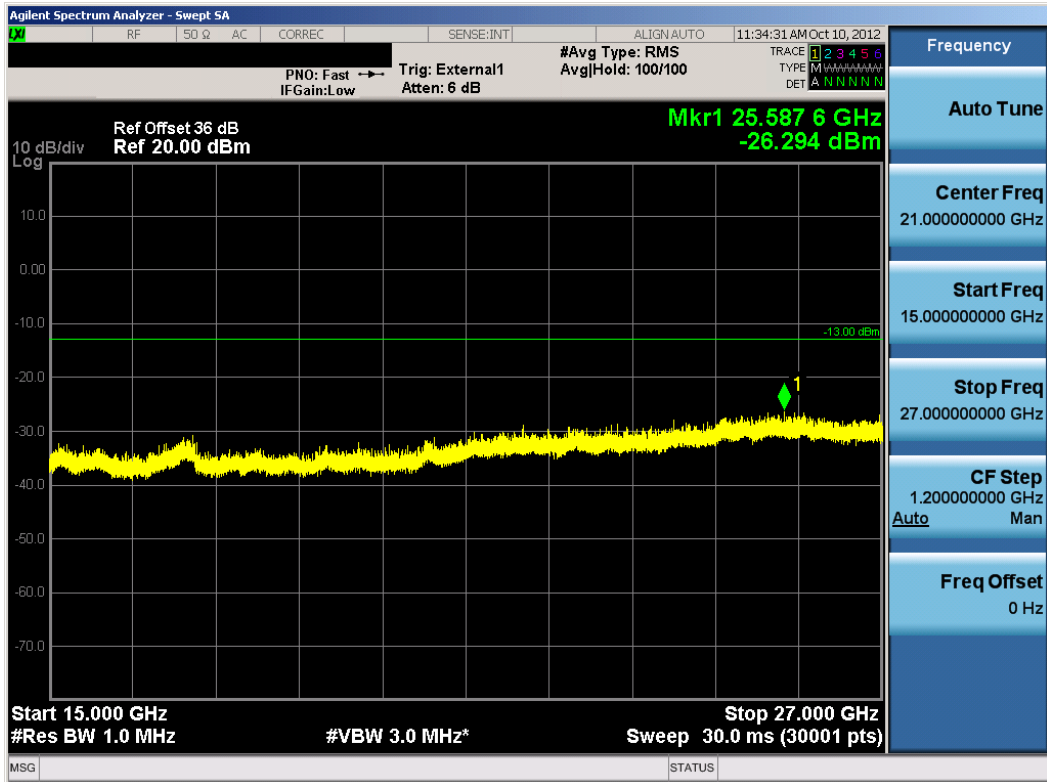


Plot 7-131. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

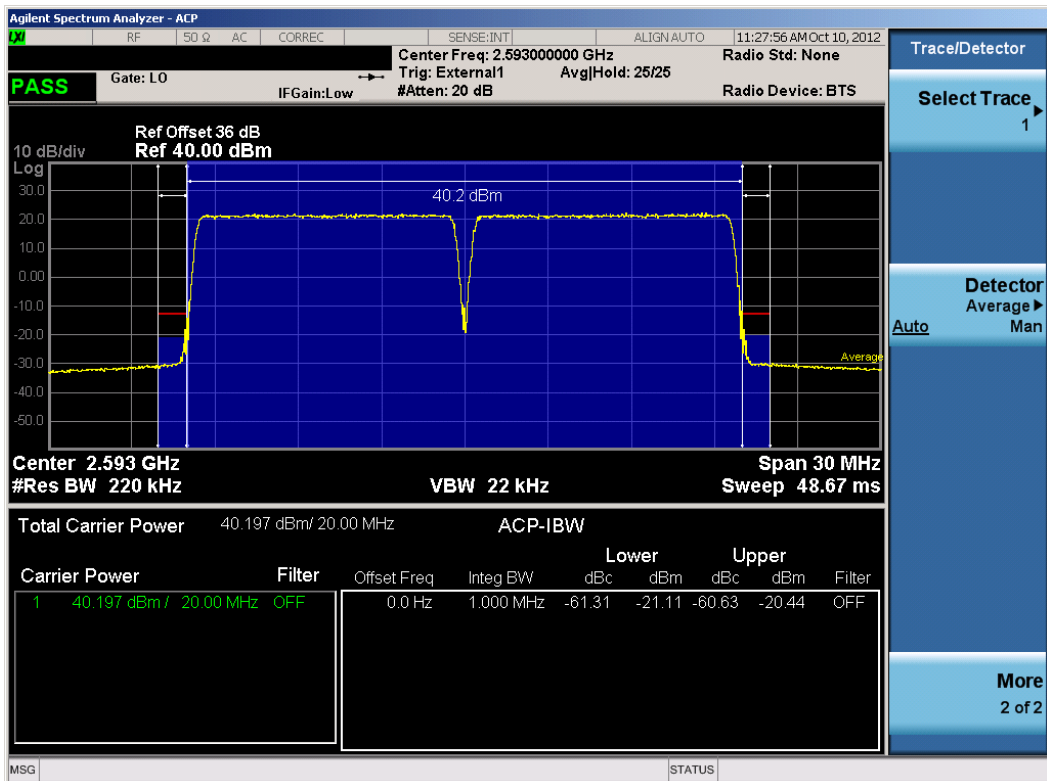


Plot 7-132. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-133. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

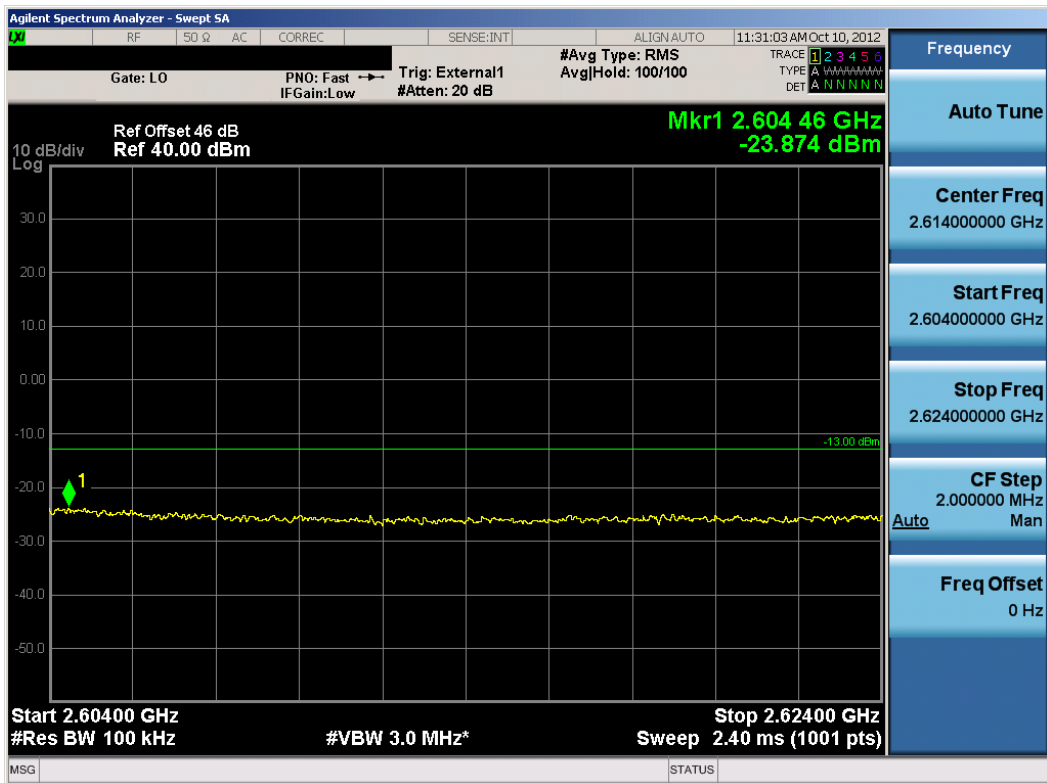


Plot 7-134. Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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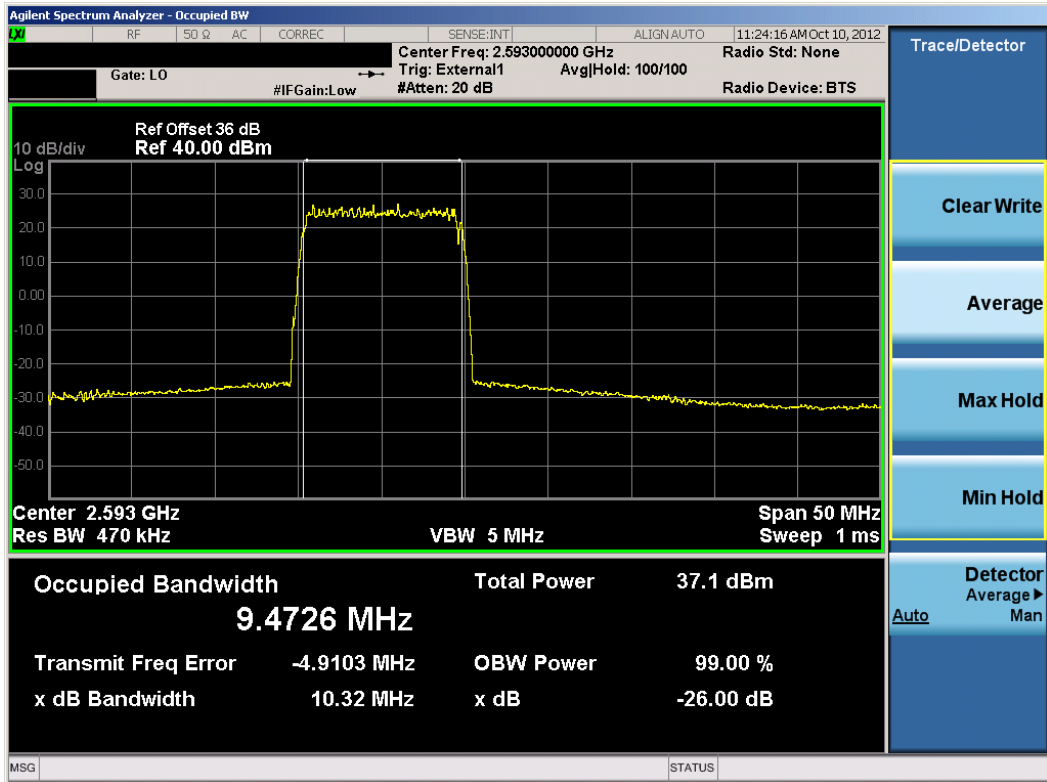


Plot 7-135. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

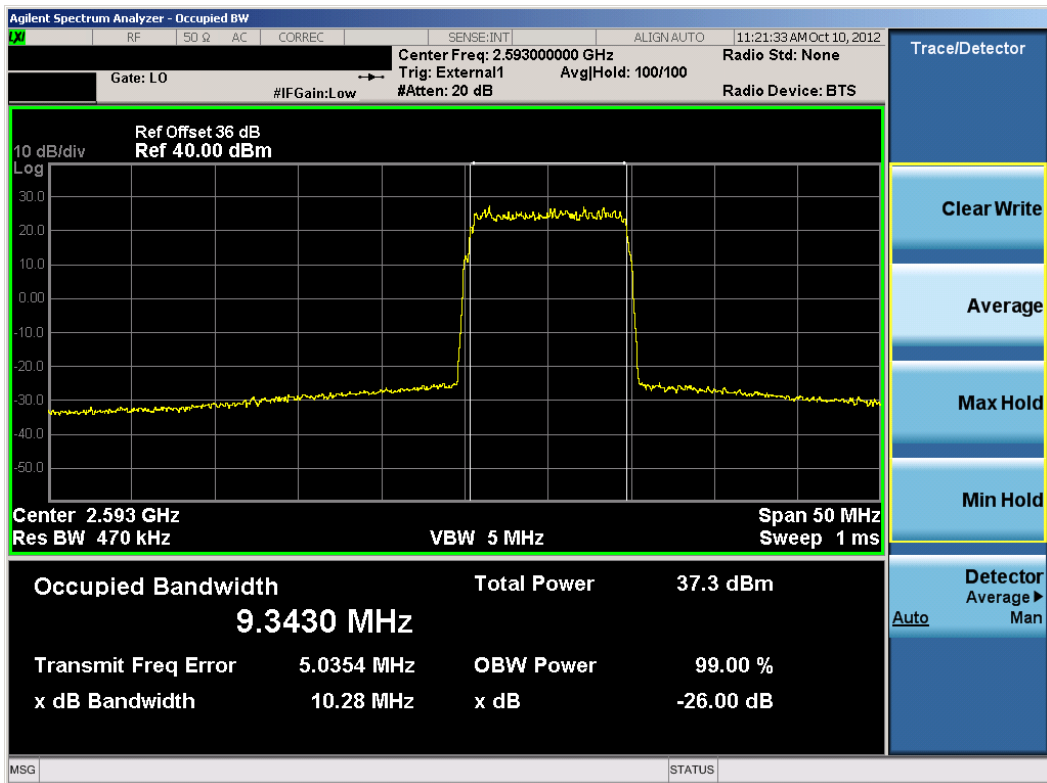


Plot 7-136. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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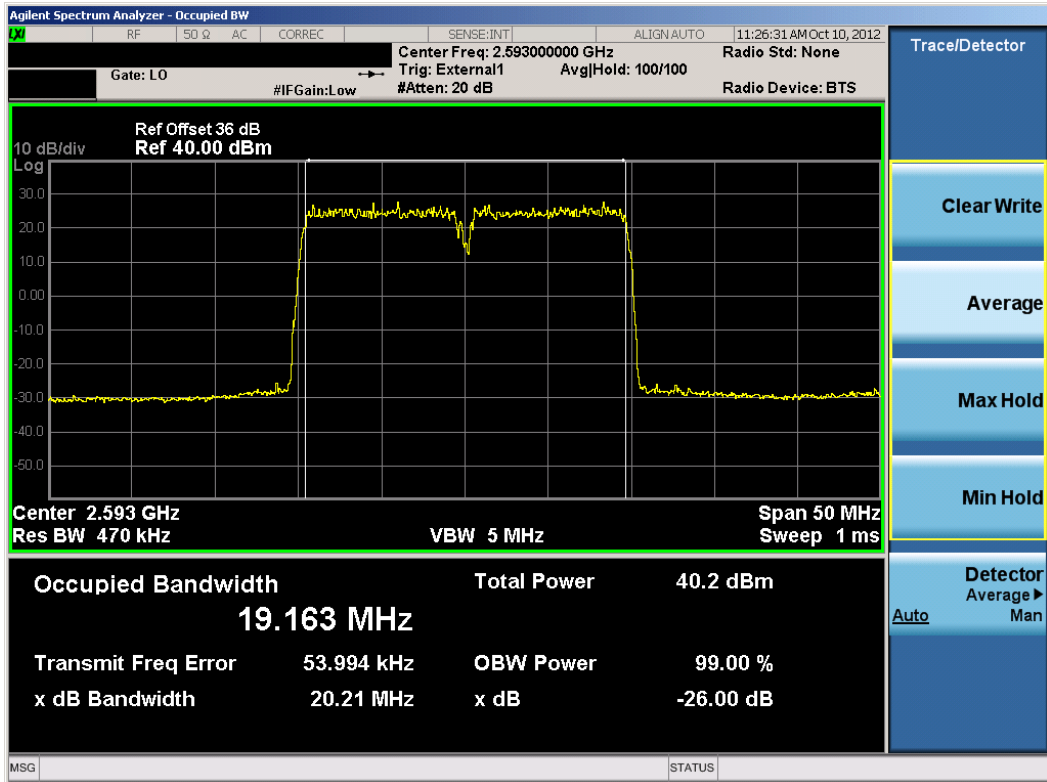


Plot 7-137. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

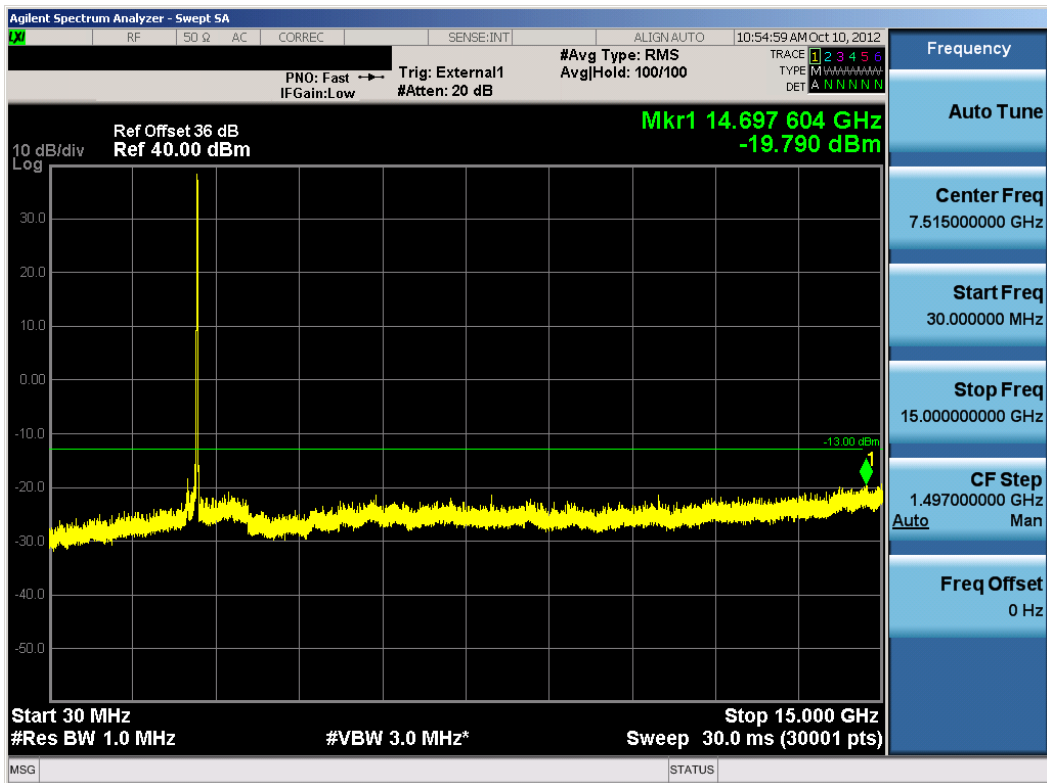


Plot 7-138. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-139. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

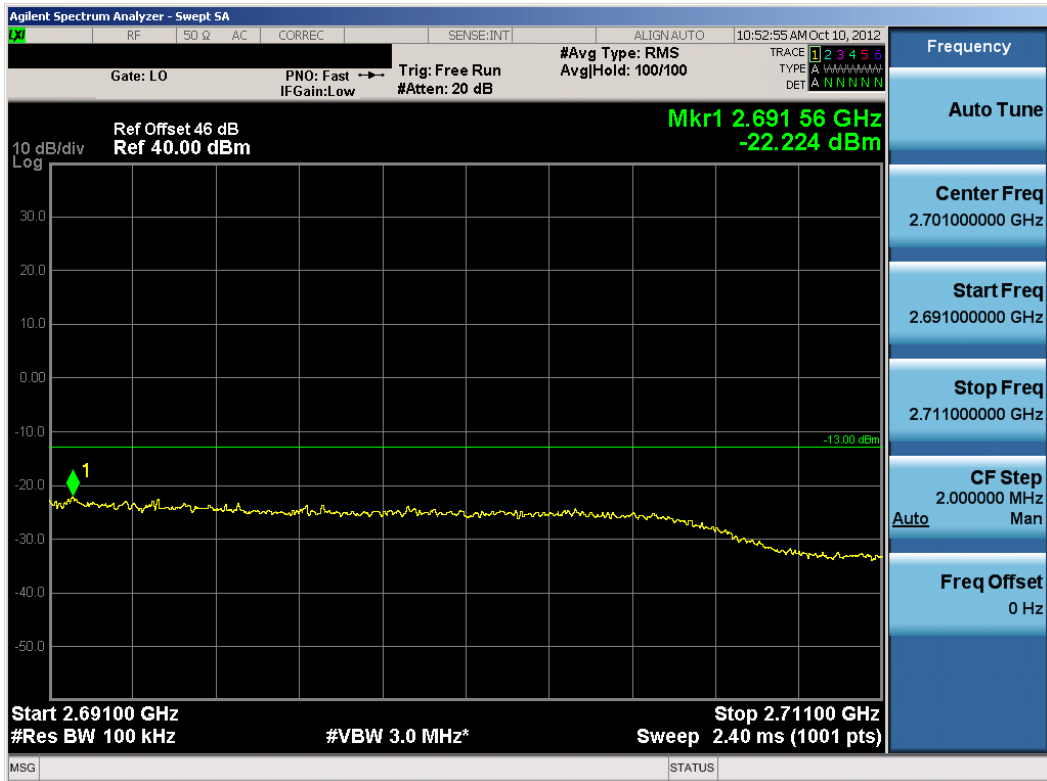


Plot 7-140. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 107 of 247

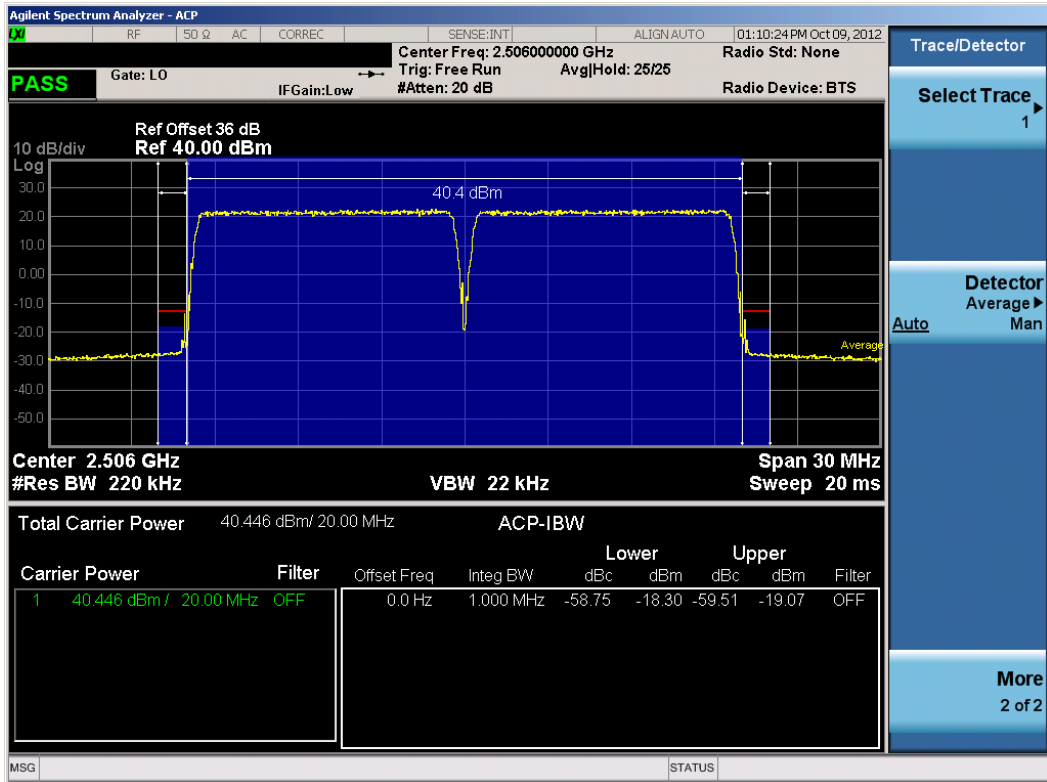


Plot 7-143. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

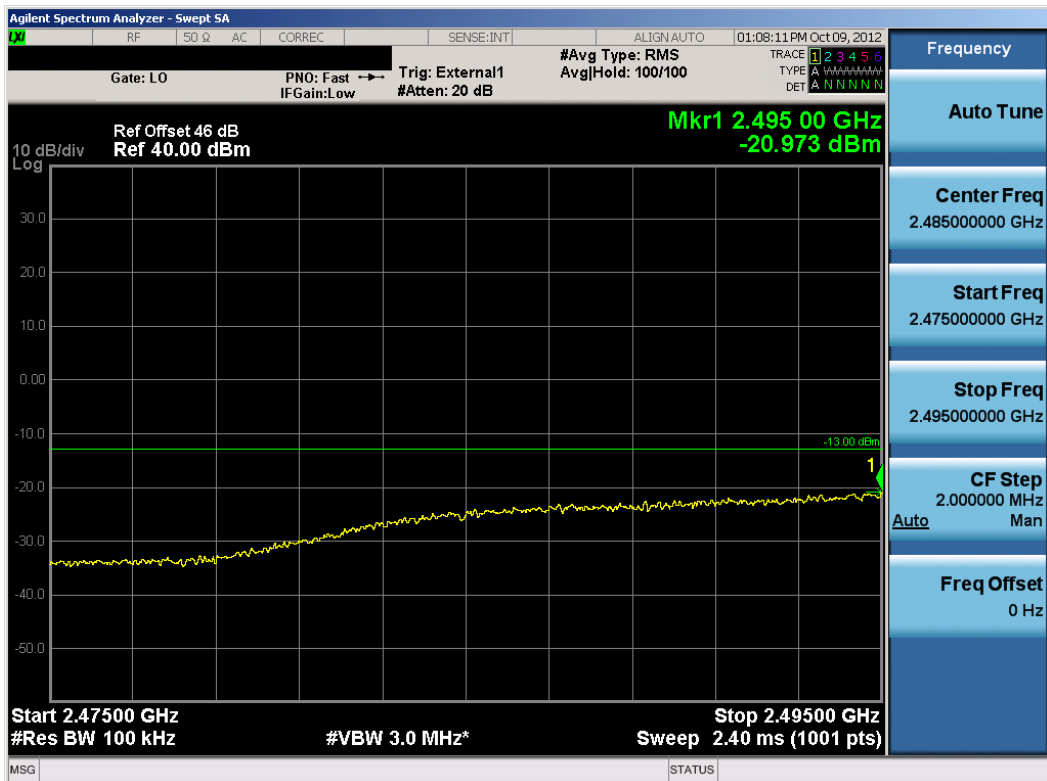


Plot 7-144. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 109 of 247

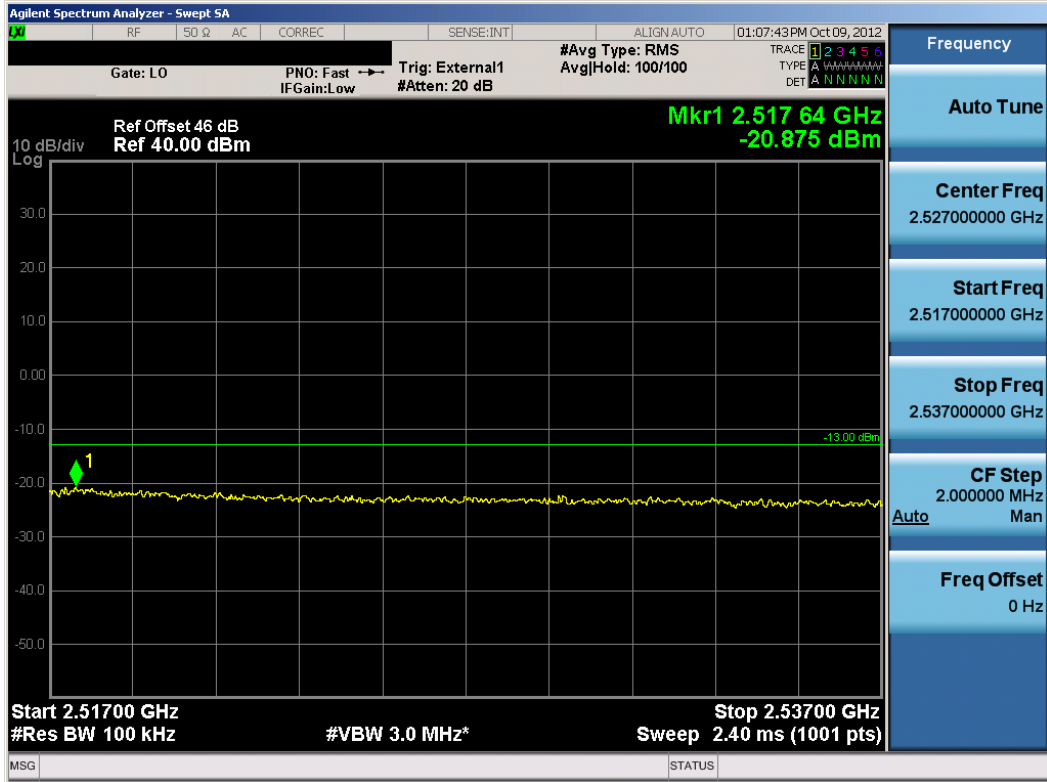


Plot 7-147. Channel Edge Plot (WiMAX Mode – Low Channel)

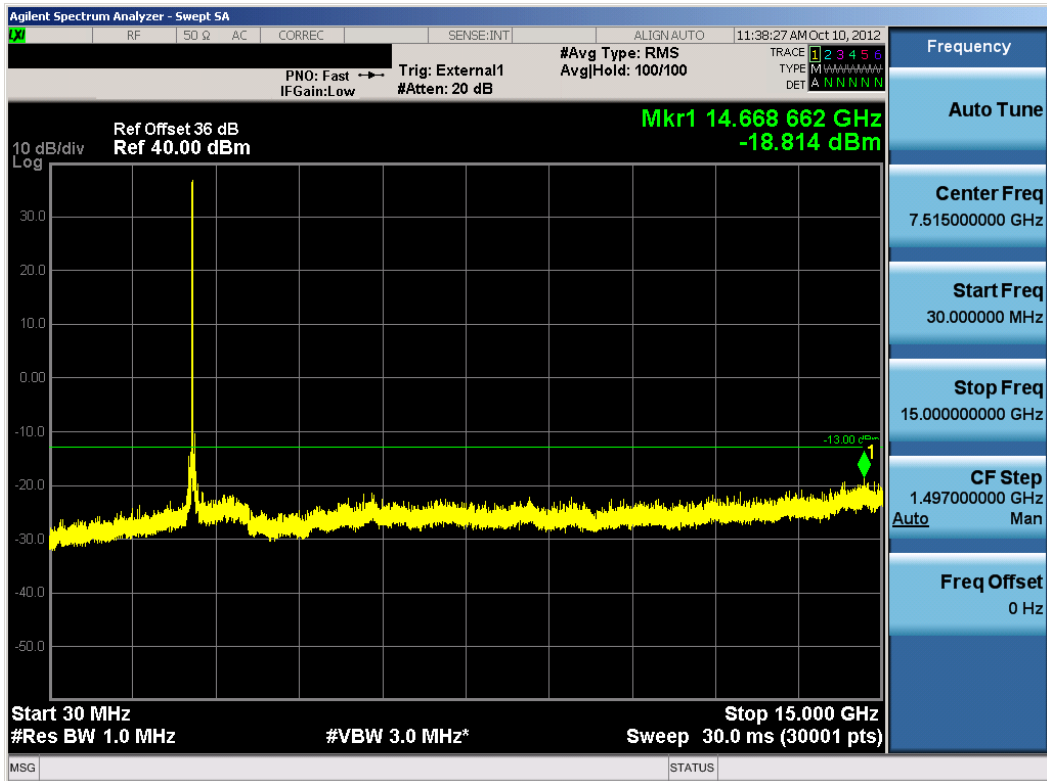


Plot 7-148. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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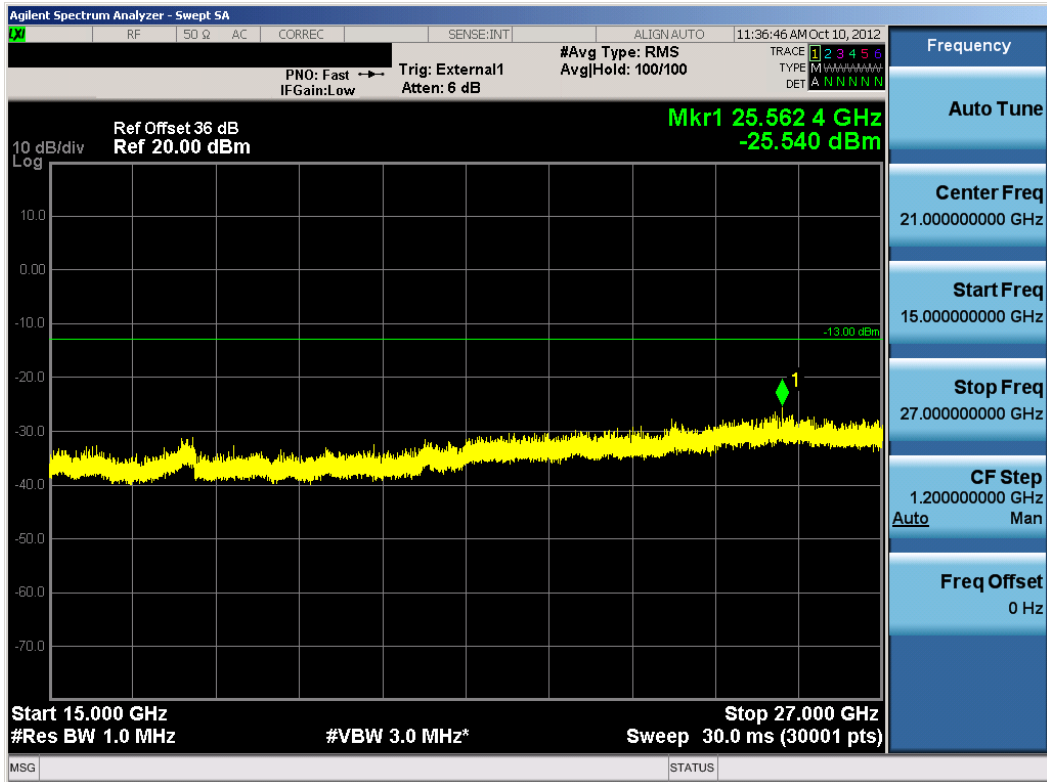


Plot 7-149. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

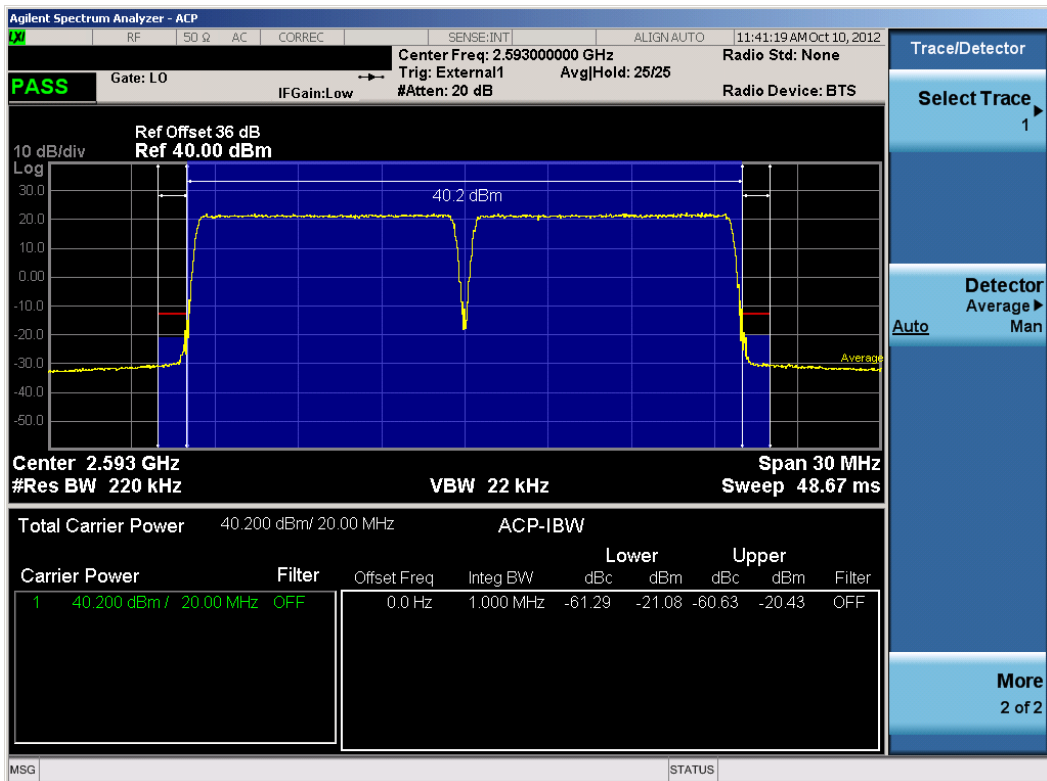


Plot 7-150. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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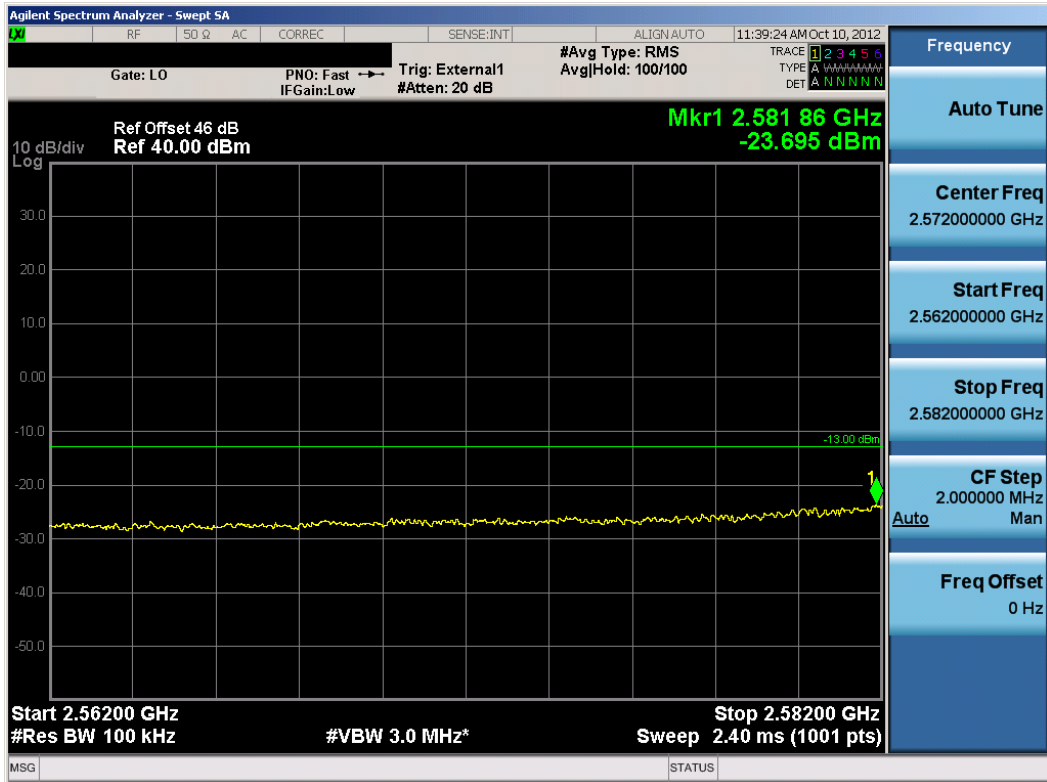


Plot 7-151. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

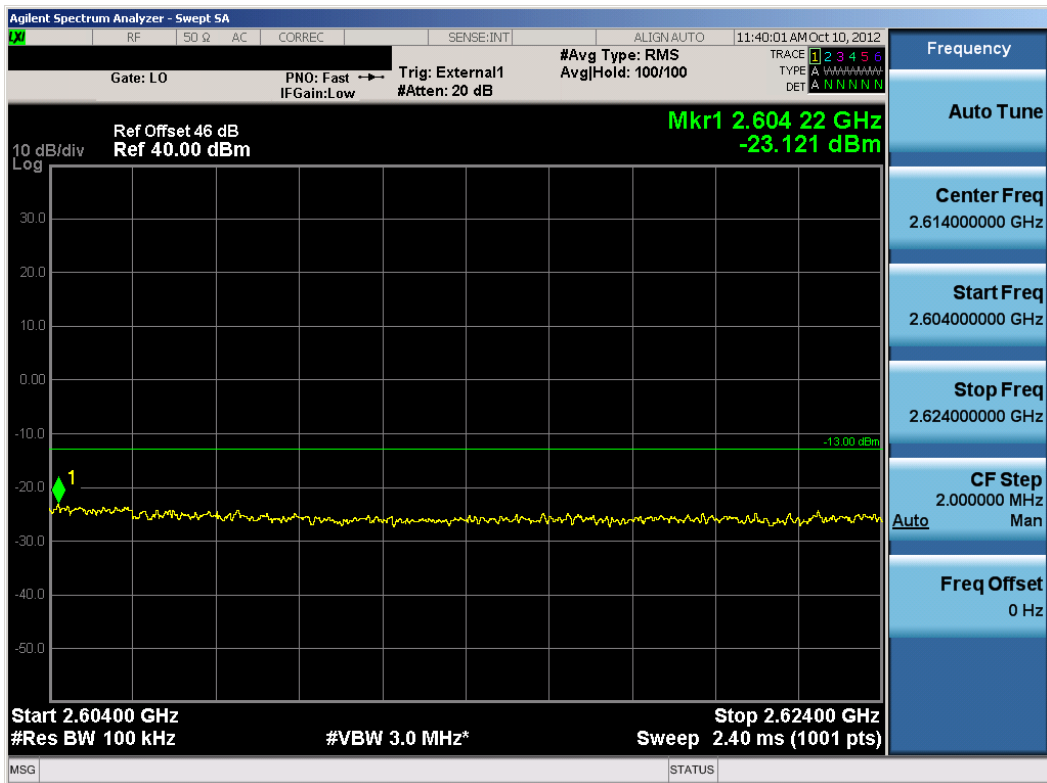


Plot 7-152. Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 113 of 247

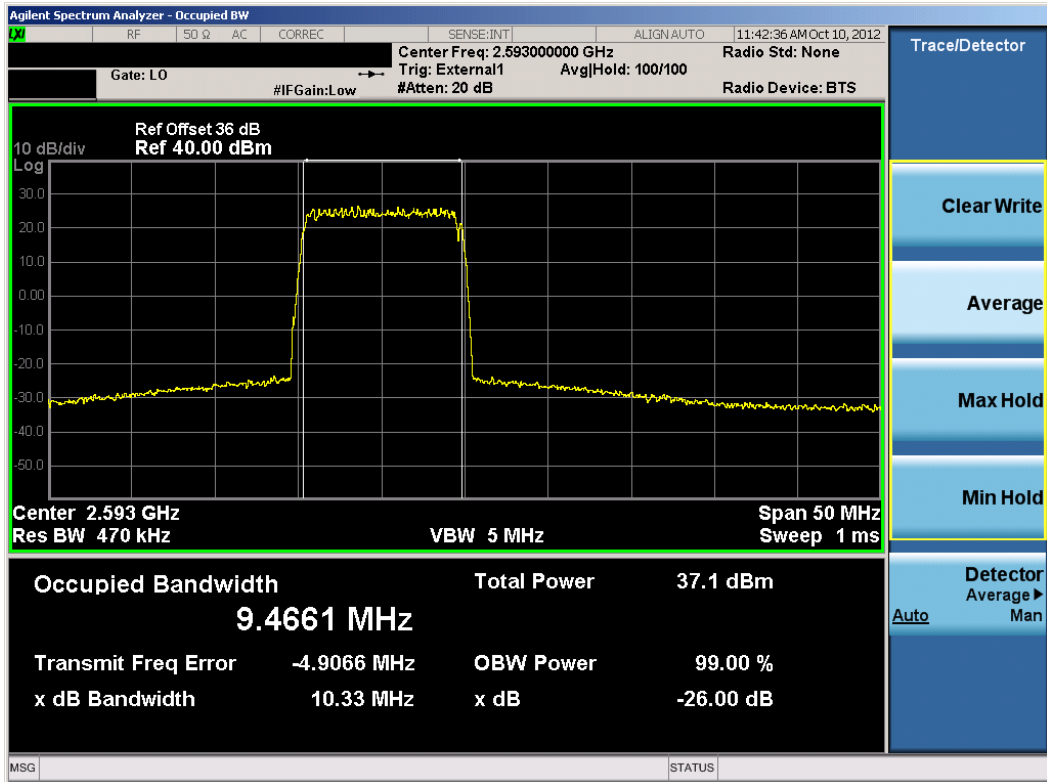


Plot 7-153. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

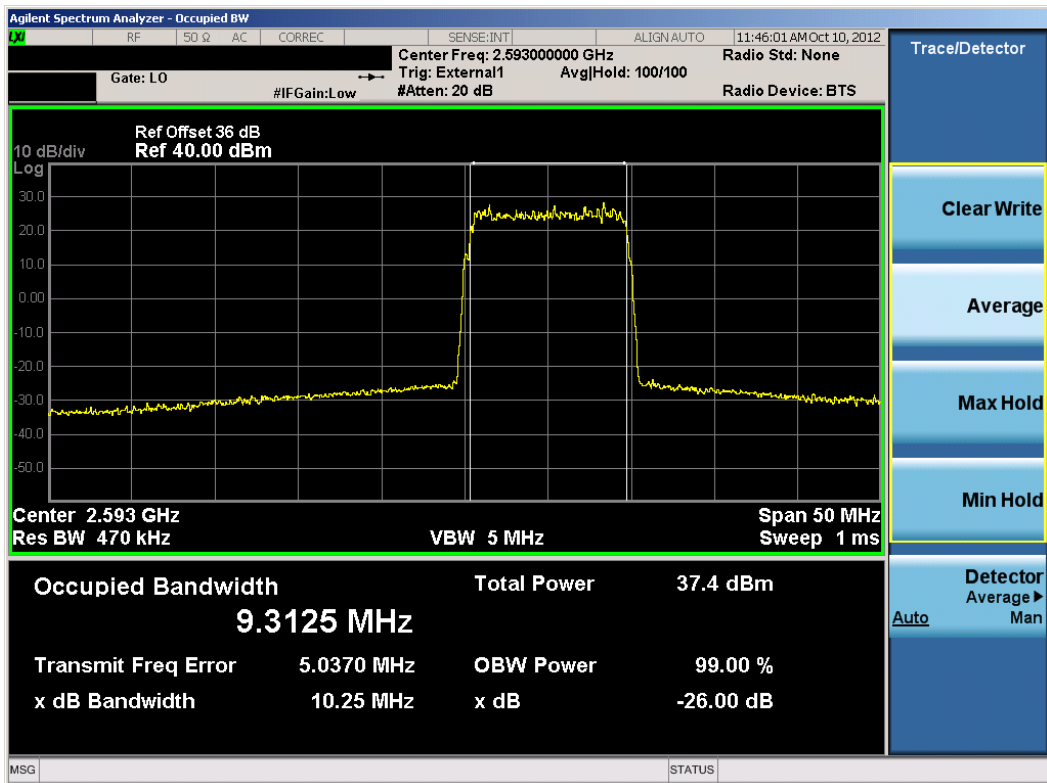


Plot 7-154. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 114 of 247

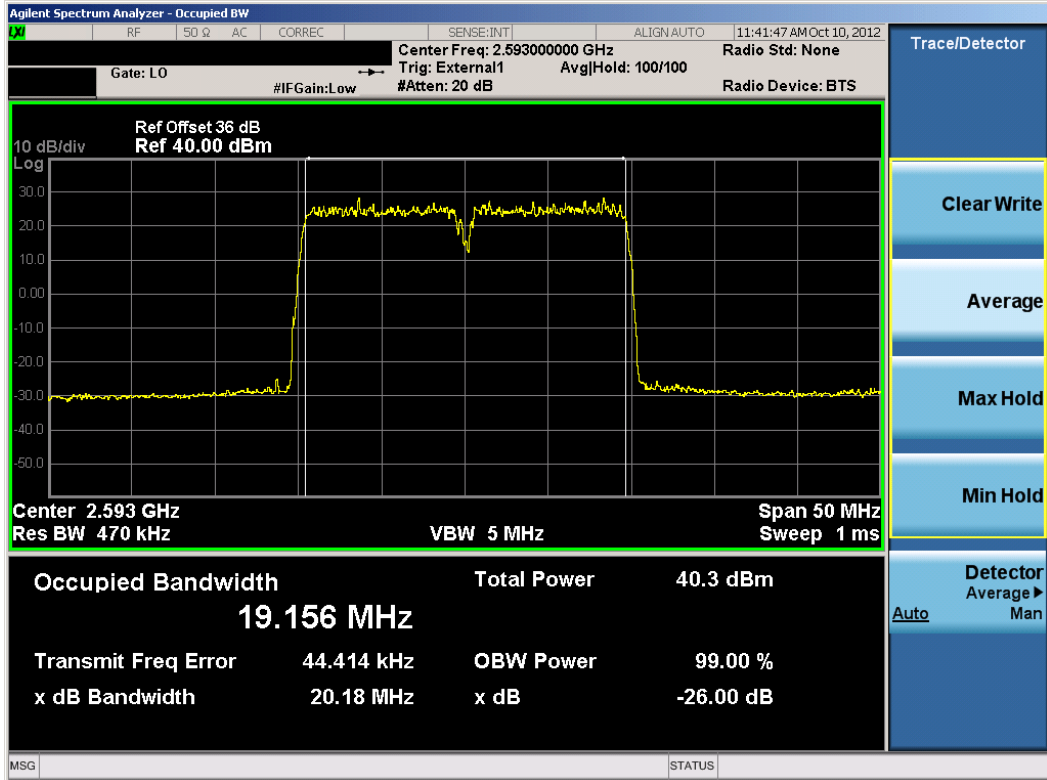


Plot 7-155. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

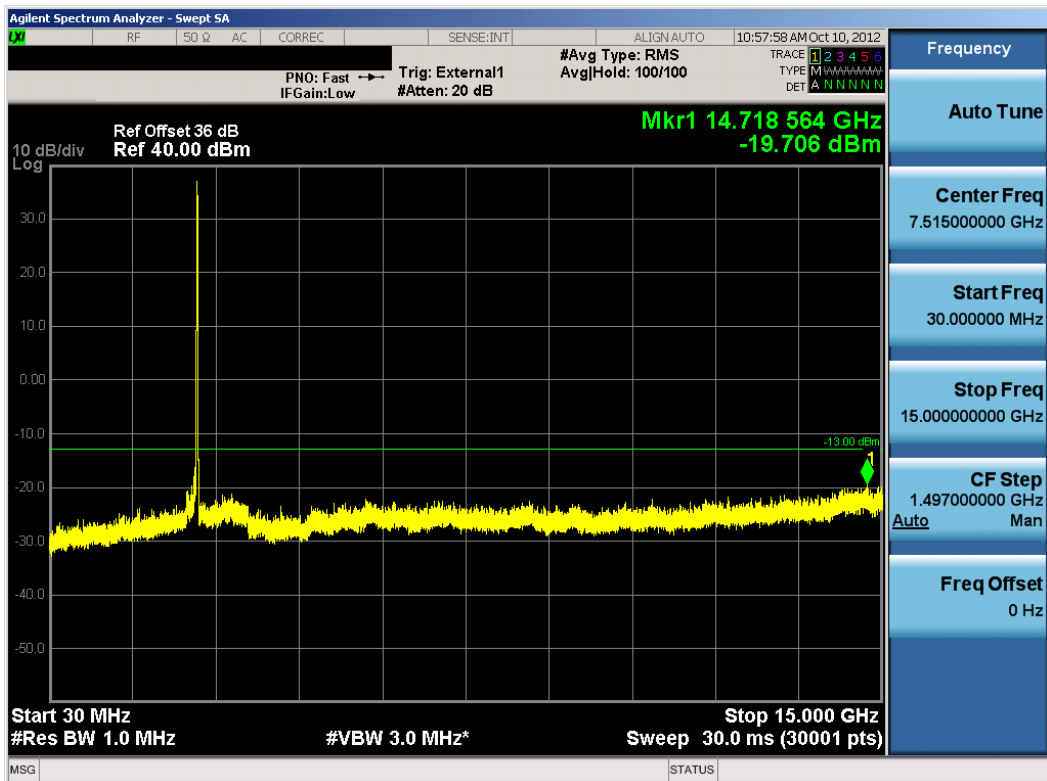


Plot 7-156. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 115 of 247

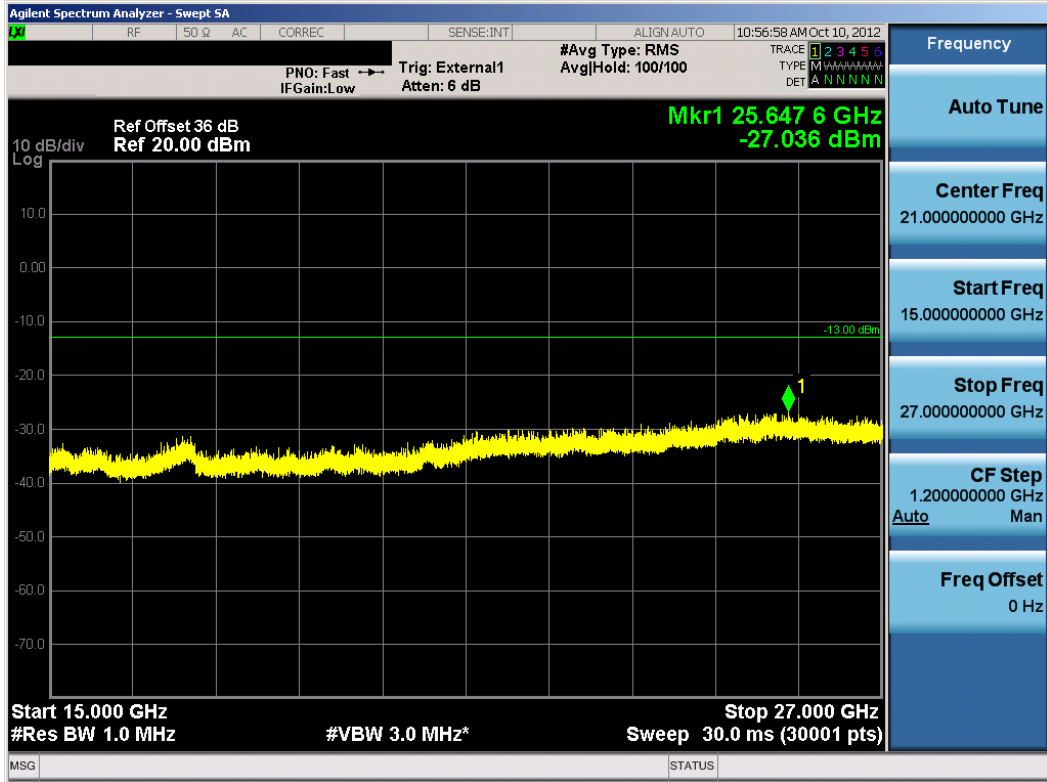


Plot 7-157. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

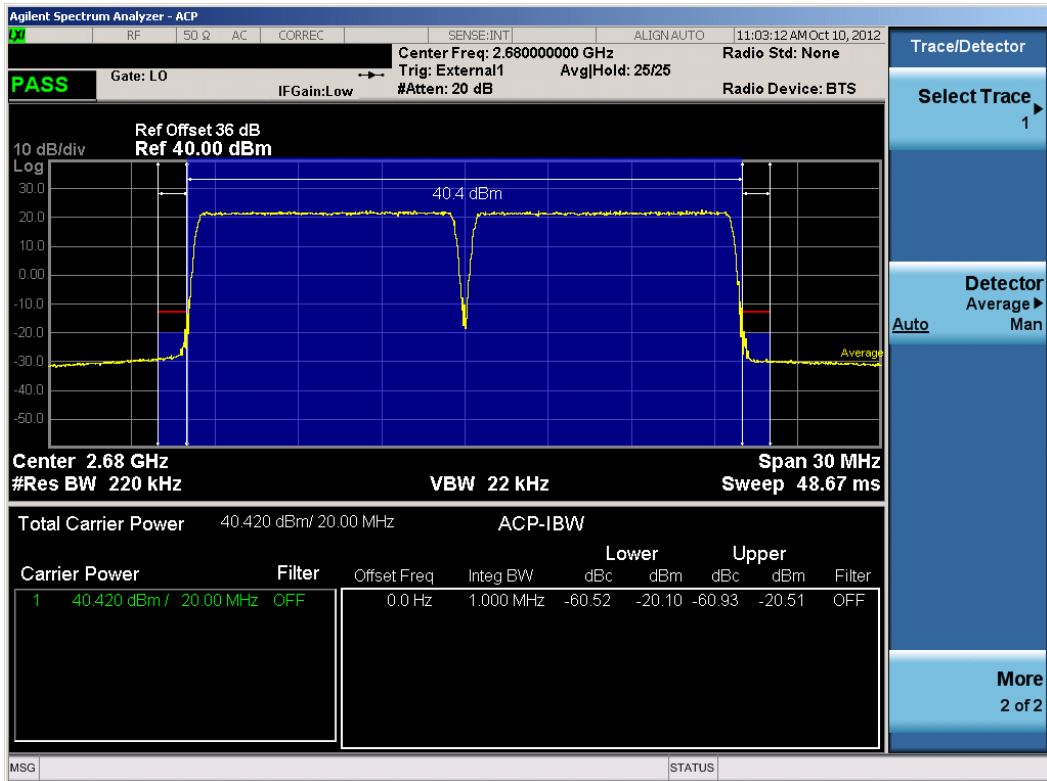


Plot 7-158. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-159. Conducted Spurious Plot (WiMAX Mode – High Channel)

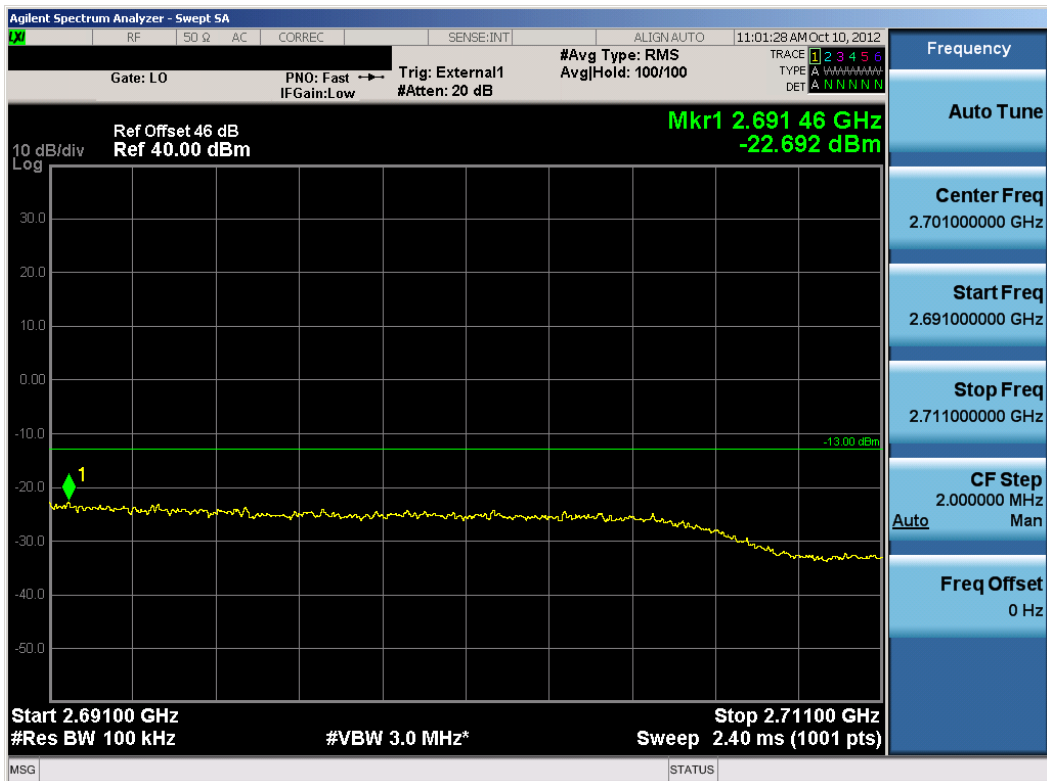


Plot 7-160. Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 117 of 247

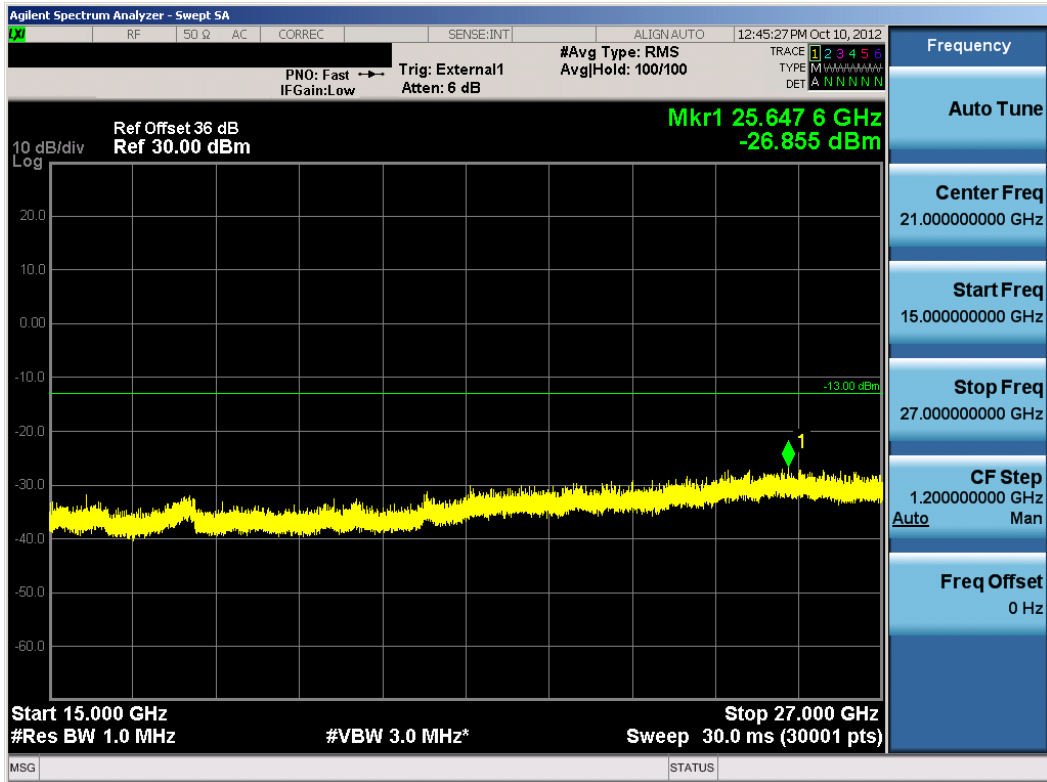


Plot 7-161. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

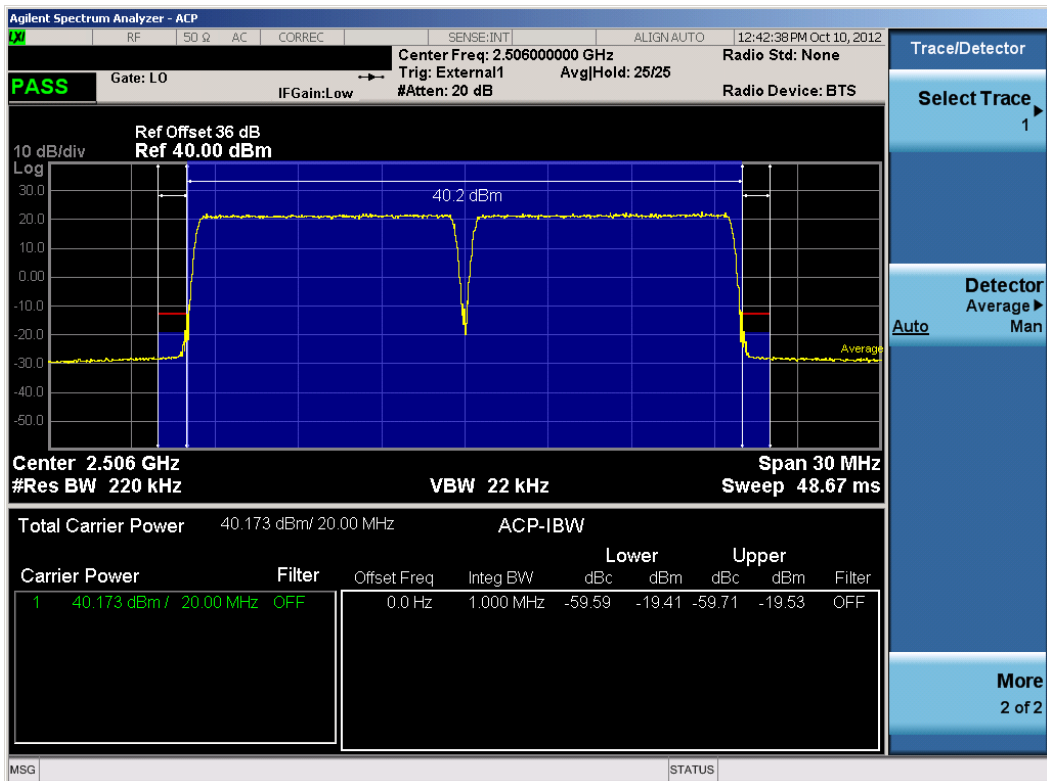


Plot 7-162. Upper Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-164. Conducted Spurious Plot (WiMAX Mode – Low Channel)

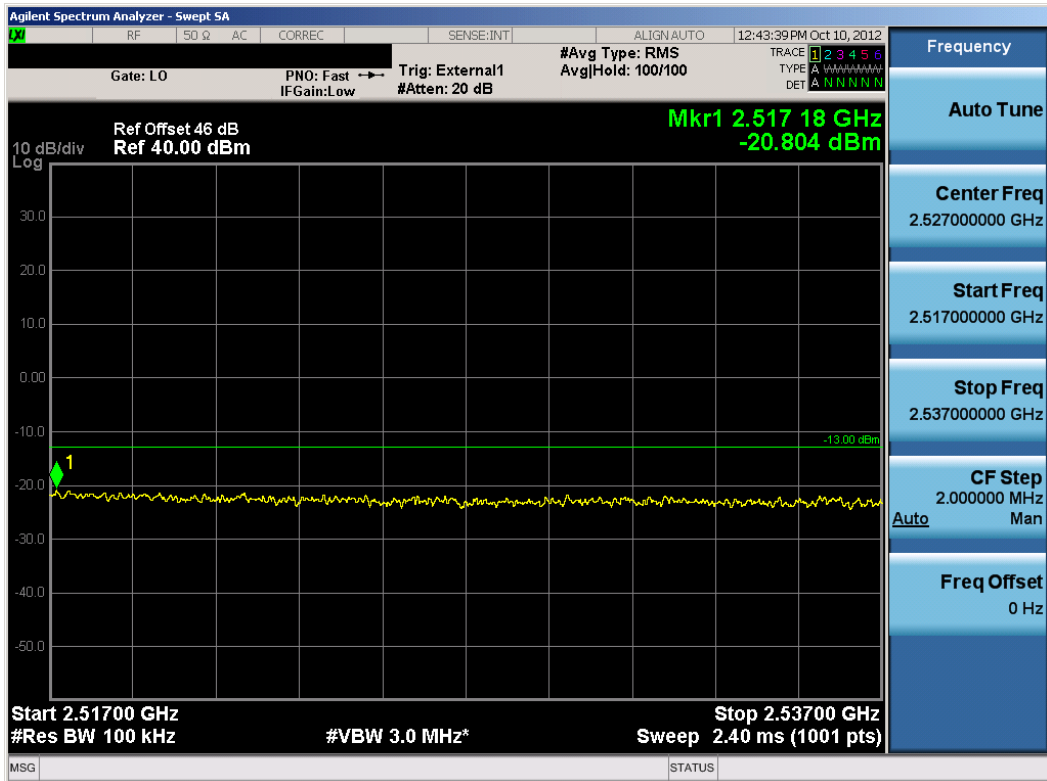


Plot 7-165. Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1210191526.A3L	Test Dates: 09/28 - 11/06/2012	EUT Type: Base Station		Page 120 of 247

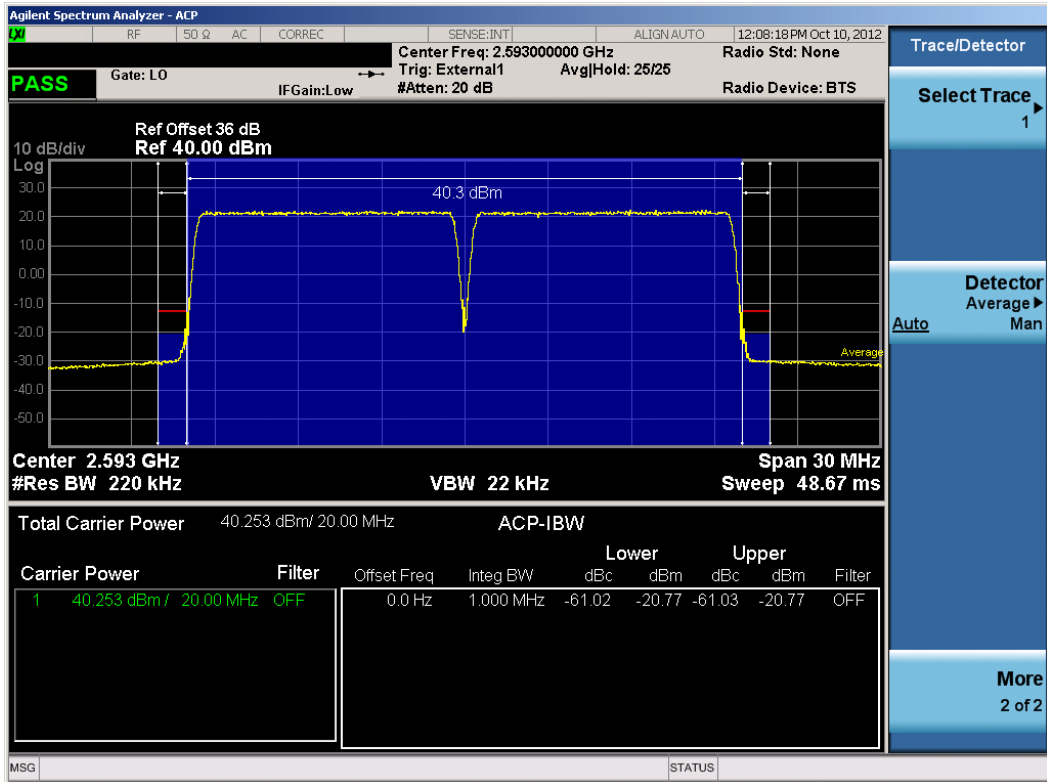


Plot 7-166. Lower Extended Channel Edge Plot (WiMAX Mode – Low Channel)

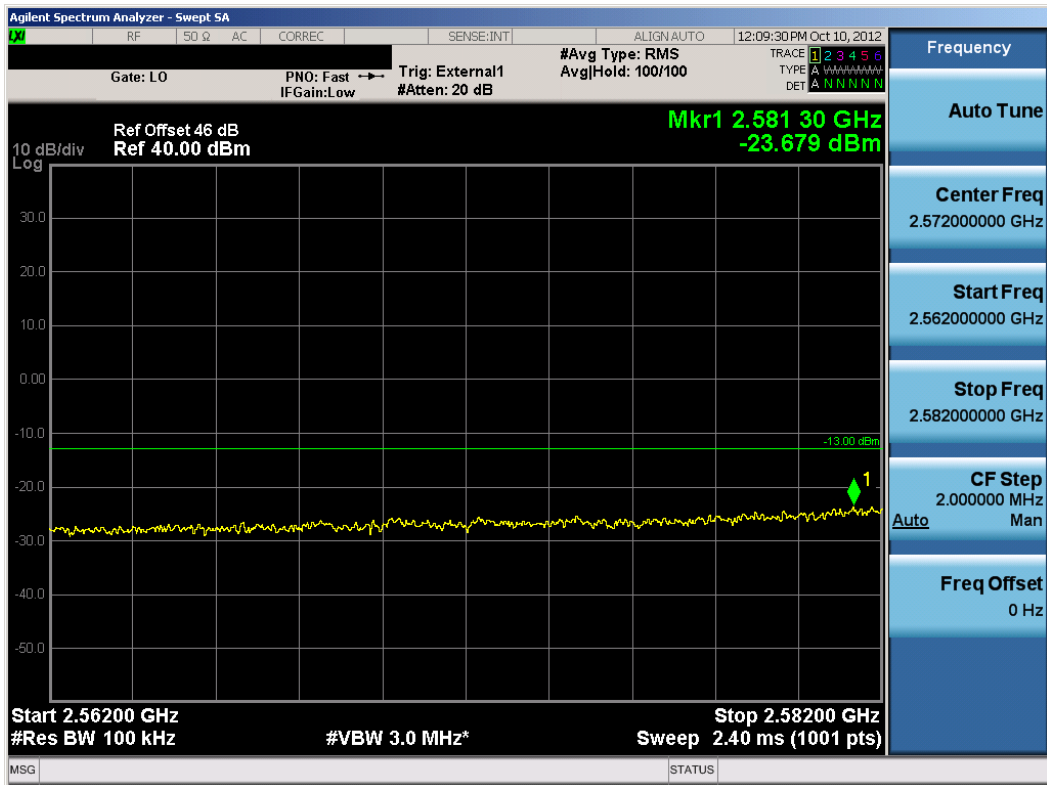


Plot 7-167. Upper Extended Channel Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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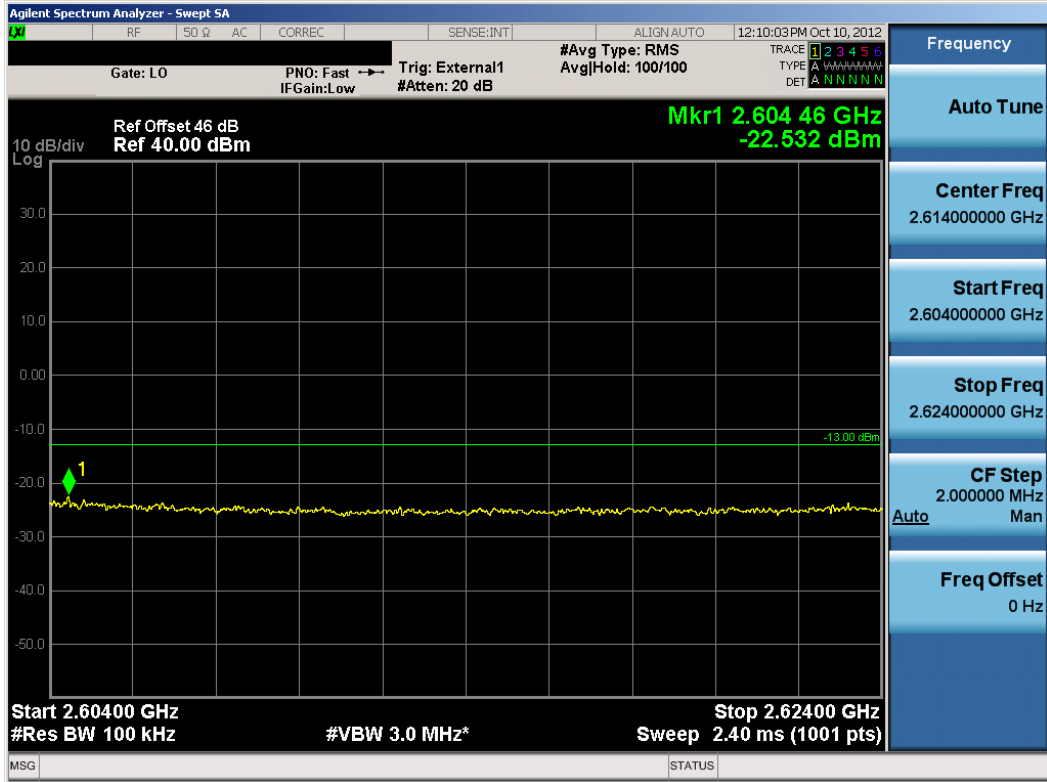


Plot 7-170. Channel Edge Plot (WiMAX Mode – Mid Channel)

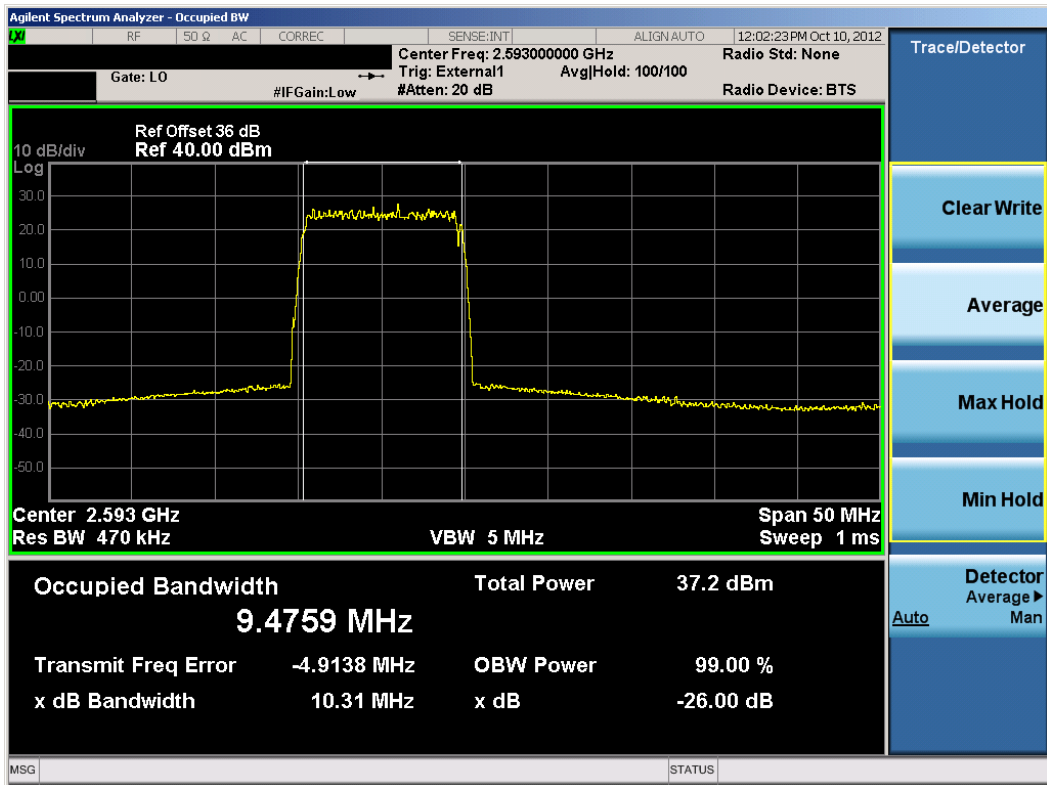


Plot 7-171. Lower Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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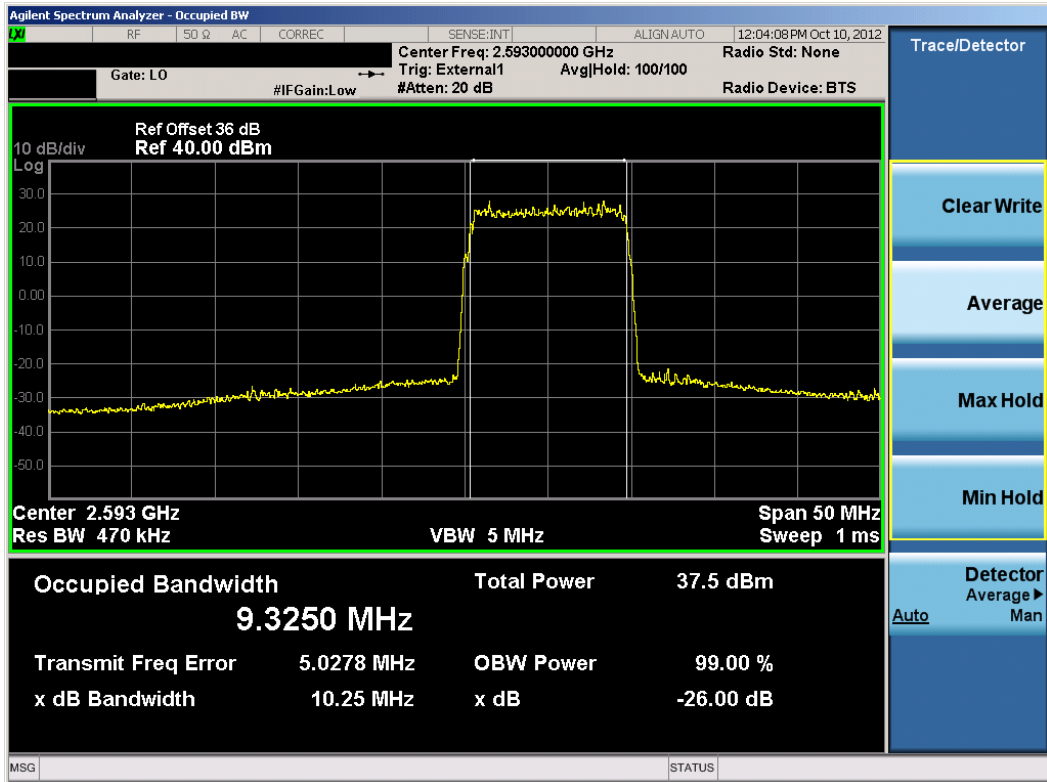


Plot 7-172. Upper Extended Channel Edge Plot (WiMAX Mode – Mid Channel)

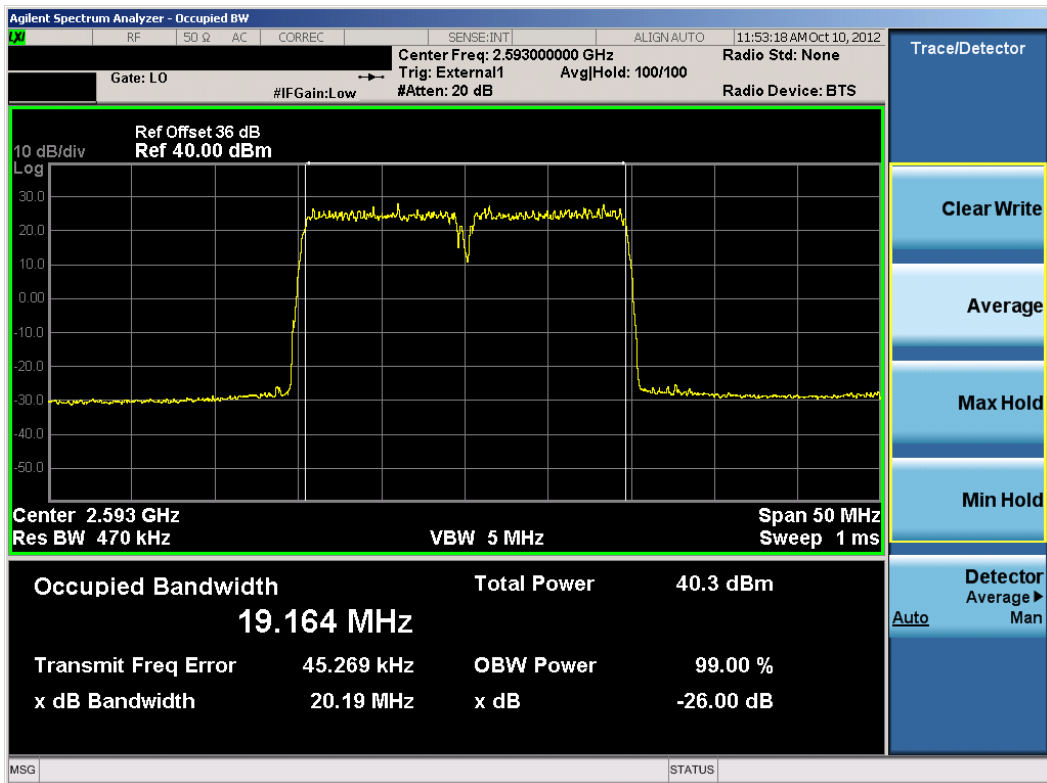


Plot 7-173. Lower Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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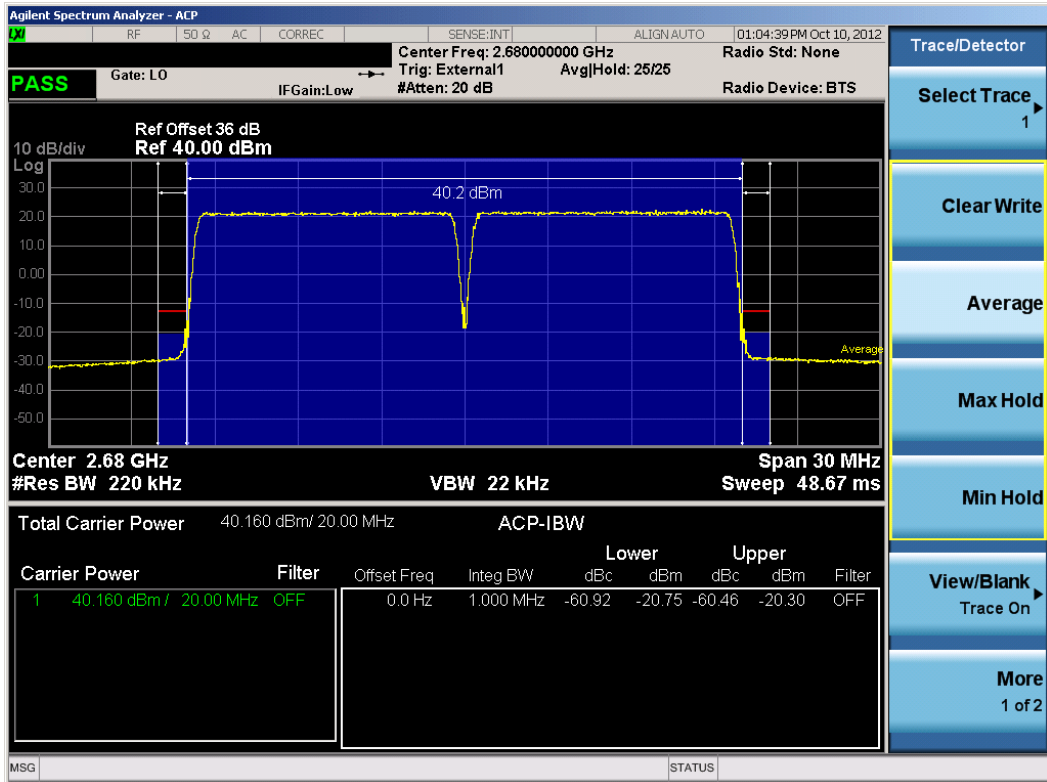


Plot 7-174. Upper Single Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

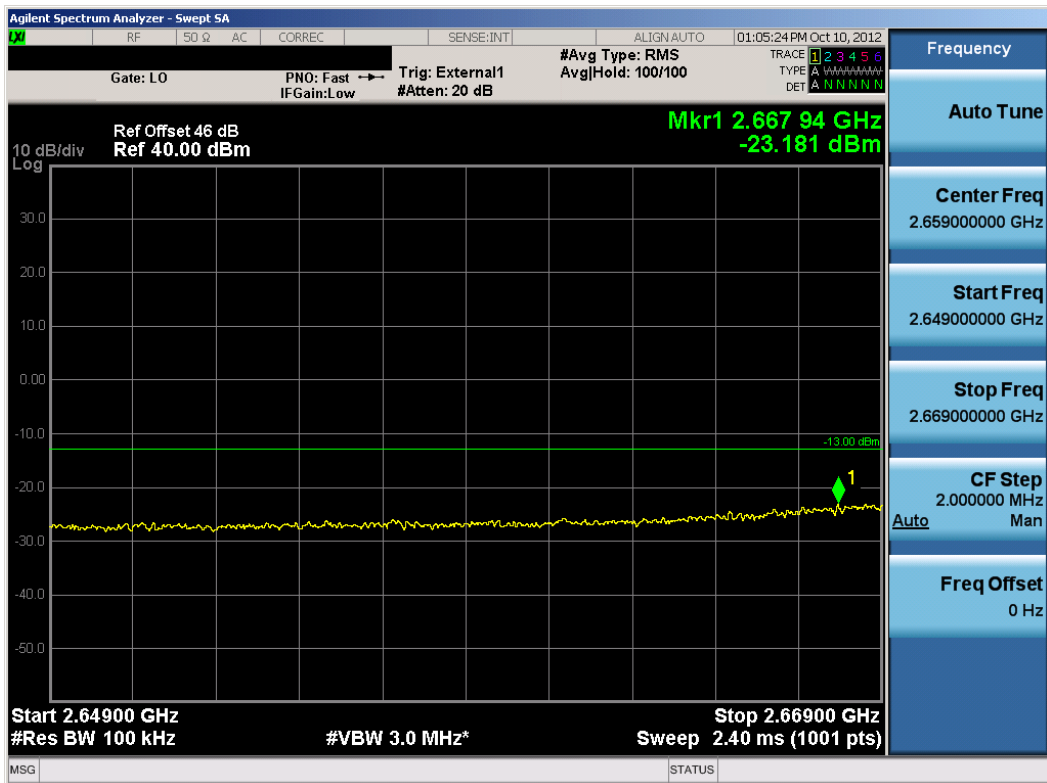


Plot 7-175. Dual Carrier Occupied Bandwidth Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-178. Channel Edge Plot (WiMAX Mode – High Channel)



Plot 7-179. Lower Extended Channel Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSLS-BD104Q1		FCC Pt. 27 WiMAX / TD-LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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