EMISSIONS TEST REPORT

Report Number: 3192580BOX-001
Project Number: 3192580

Testing performed on the

topSPEECH-Lydia-PDA

Model: VOXter 1006 Series WL-BT

To
CFR47 "Telecommunications"
FCC Part 15 Subpart C "Intentional Radiators" 15.247
IC RSS-210 "Low Power License Exempt Radiocommunications Devices"
Issue 7 June 2007 Annex 8 "Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz"

For

topsystem Systemhaus GmbH

Test Performed by:	Test Authorized by:
Intertek – ETL SEMKO	topsystem Systemhaus GmbH
70 Codman Hill Road	Adenauerstr. 20
Boxborough, MA 01719	Europark A2
	DE-52146 Würselen

Prepared by: _____ Date: November 13, 2009
Nicholas Abbondante

Reviewed by: _____ Date: 11/16/09
Jeff Goulet

1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company:	topsystem Systemhaus GmbH Adenauerstr. 20 Europark A2 DE-52146 Würselen
Contact:	Herr Jäker
Telephone:	+49 (2405) 4670 - 0
Fax:	+49 (2405) 4670 - 10
Email:	m.jaeker@topsystems.de

1.2 Equipment Under Test

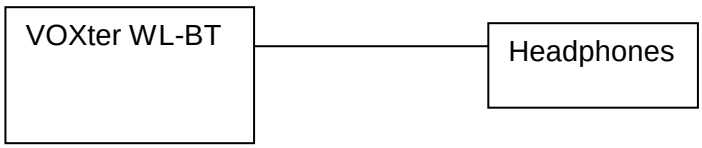
Equipment Type:	topSPEECH-Lydia-PDA
Model Number(s):	VOXter 1006 Series WL-BT
Serial number(s):	08241172 (Germany), 09240287 (USA)
Manufacturer:	topsystem Systemhaus GmbH
EUT receive date:	10/24/2008(Germany); 09/09/2009(USA)
EUT received condition:	Prototype in Good Condition
Test start date:	12/18/2008(Germany); 10/13/2009(USA)
Test end date:	12/18/2008(Germany); 11/09/2009 (USA)

1.3 Test Plan Reference: Tested according to the standards listed, and using the guidance of ANSI C63.4:2003, IC RSS-Gen Issue 2 June 2007, and FCC KDB 558074.

1.4 Test Configuration

Fresh 3.7V Battery

1.4.1 Block Diagram



1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
Headphone Cable	Braid	Metal/360	0.8 (coiled)	1

1.4.3. Support Equipment:

Name: Headphones
Model No.: topSPEECH BSVOX9
Serial No.: 0809144

1.5 Mode(s) of Operation:

During transmitter testing, the EUT was configured to transmit continuously at 80% of maximum power on specific channels low, mid and high channels in WLAN mode.

1.6 Floor Standing Equipment: Applicable:____ Not Applicable: X

2.0 Test Summary

TEST STANDARD	RESULTS	
FCC Part 15 Subpart C 15.247 IC RSS-210 Issue 7 June 2007 Annex 8		
SUB-TEST	**TEST PARAMETER**	**COMMENT**
RF Output Power and Human RF Exposure FCC 15.247(b)(3-5) RSS-210 A8.4, RSS-102 4.3	The RF output power must not exceed 36 dBm EIRP. The human RF Exposure limit is 1 mW/cm^2.	Pass
6 dB Bandwidth FCC 15.247(a)(2), RSS-210 A8.2	The 6dB bandwidth must exceed 500 kHz.	Pass
Peak Power Spectral Density FCC 15.247(e), RSS-210 A8.2	The peak power spectral density must not exceed 8 dBm in any 3 kHz bandwidth.	Pass
Band Edge Compliance FCC 15.215, 15.247(d) RSS-210 2.1, A8.5	Spurious emissions at the band edges must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions at the upper band edge which fall into the restricted band from 2483.5 – 2500 MHz must meet the general requirements of 15.209 and RSS-210 2.7 Tables 2 and 3 using a 1 MHz bandwidth.	Pass
Radiated Emissions FCC 15.205, 15.209, 15.247(d) RSS-210 2.2, 2.7, A8.5 RSS-Gen 4.10, 6.0	Spurious emissions must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions which fall in the restricted bands of 15.205 must meet the general limits of 15.209. Emissions which fall in the restricted bands of RSS-210 2.2 Table 1 must meet the general limits of RSS-210 2.7 Tables 2 and 3. Receiver spurious emissions must meet the limits of RSS-Gen Table 1.	Pass

Notes: AC line-conducted emissions testing was not performed as the EUT is battery powered and does not operate while charging.

REVISION SUMMARY – The following changes have been made to this Report:

Date	Project No.	Project Handler	Page(s)	Item	Description of Change
11/10/09	3192580	Nick Abbondante	2, 4, 7-8, 49-80	Receiver data	Added Receive mode data to report

3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBµV/m

Level in µV/m = [10(32 dBµV/m)/20] = 39.8 µV/m

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBµV
RF = Reading from receiver in dBµV
LF = LISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBµV to µV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in µV
NF = Net Reading in dBµV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBµV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 µV/m

3.1 Measurement Uncertainty

For radiated emissions, U_{lab} (4.9 dB at 3m and 4.2 dB at 10m) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

For conducted emissions, U_{lab} (3.2 dB in worst case) < U_{CISPR} (3.6 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

3.2 Site Description

Test Site(s): Boxborough USA OATS Site 2 & 10m ALSE Chamber; Kaufbeuren Germany Chamber 1

Kaufbeuren, Germany:
The test site was the semi-anechoic chamber Intertek Germany (PM KF 1150). The measurement distance EUT – Antenna was d = 3 m below 1 GHz, 3.75 m from 1-18 GHz.

Boxborough, USA:
Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a Quonset Hut, with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal ground-plane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the ground-plane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed. However, the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical ground-plane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical ground-plane is electrically connected to the reference ground-plane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

The AMAP Building and Lab includes general lab space that can be used for testing where a shielded/enclosed environment is not required.

Our 10m ALSE chamber is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.247, Industry Canada RSS-210 Annex 8

Test: RF Output Power and Human RF Exposure

Performance Criterion: The RF output power must not exceed 36 dBm EIRP. The human RF Exposure limit is 1 mW/cm^2.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	20	Humidity (%):	46	Pressure (hPa):	1007
Pretest Verification Performed		Yes		Equipment under Test:		VOXter 1006 Series WL-BT	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		09240287	
Engineer's Initials:	NNA	Date Test Performed:	10/13-15/2009	Reviewer's Initials:	JG	Date Reviewed:	11/16/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Weather Station	Davis Instruments	7400	PE80519A93	06/10/2010
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	HORN ANTENNA	EMCO	3115	9610-4980	02/25/2010
4	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	12/10/2009

Software Utilized:

Name	Manufacturer	Version
Excel 2003	Microsoft	(11.5612.5606) SP3

Test Details:

Notes: The EUT was measured in a radiated fashion. The RF output power was measured via integration using a 50 MHz span with a sample detector for non-overlapping integration, a 100 kHz resolution bandwidth and 500 points of resolution. The data obtained was adjusted for equipment losses and converted from a field strength reading to a power reading using the provisions of KDB 558074 and RSS-Gen 4.6. The general human RF exposure limit is 1 mW/cm^2. The power density S generated by some value of EIRP at a given distance d is related by the equation:

$$S=EIRP / (4\pi d^2)$$

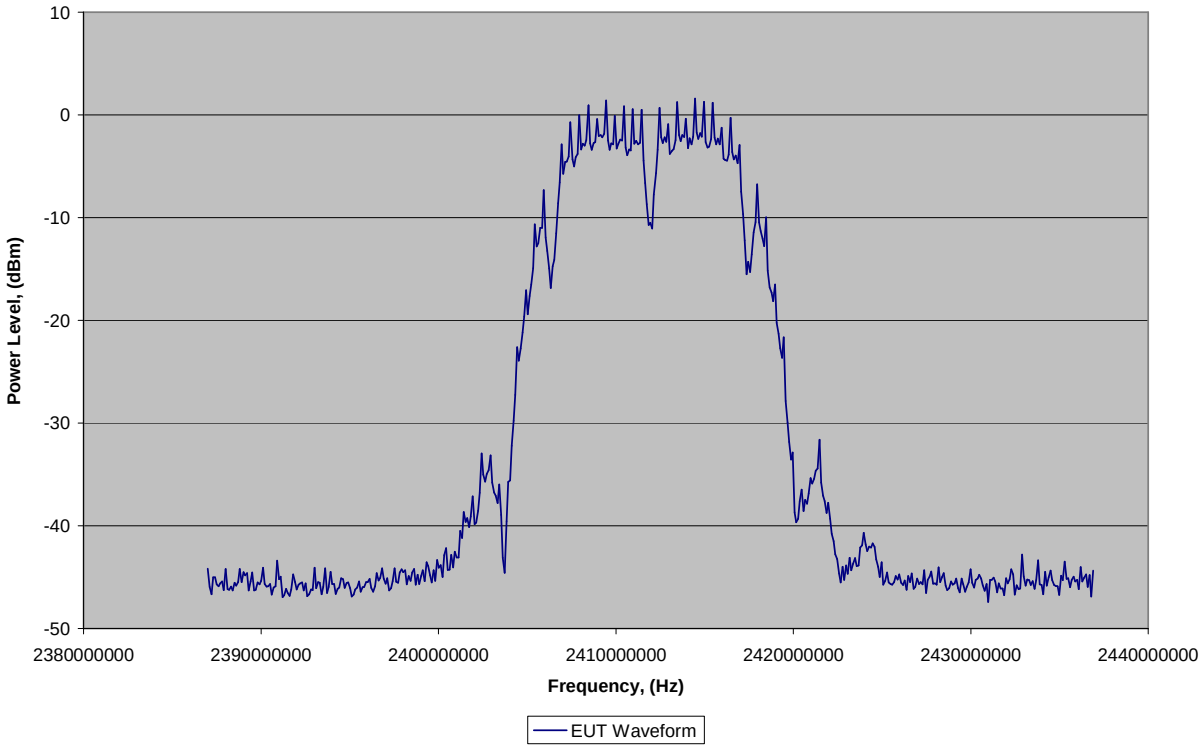
The distance, given a maximum EIRP of 19.115 dBm (81.56 mW), at which the radiated power density of the EUT is equal to the human RF exposure limit is 2.55 cm from the antenna.

The EUT requires a SAR RF exposure evaluation as the output power is 81.56 mW and the device is used within 20 cm of the body, which is above the exemption threshold for both FCC and Industry Canada (25 mW and 20 mW respectively).

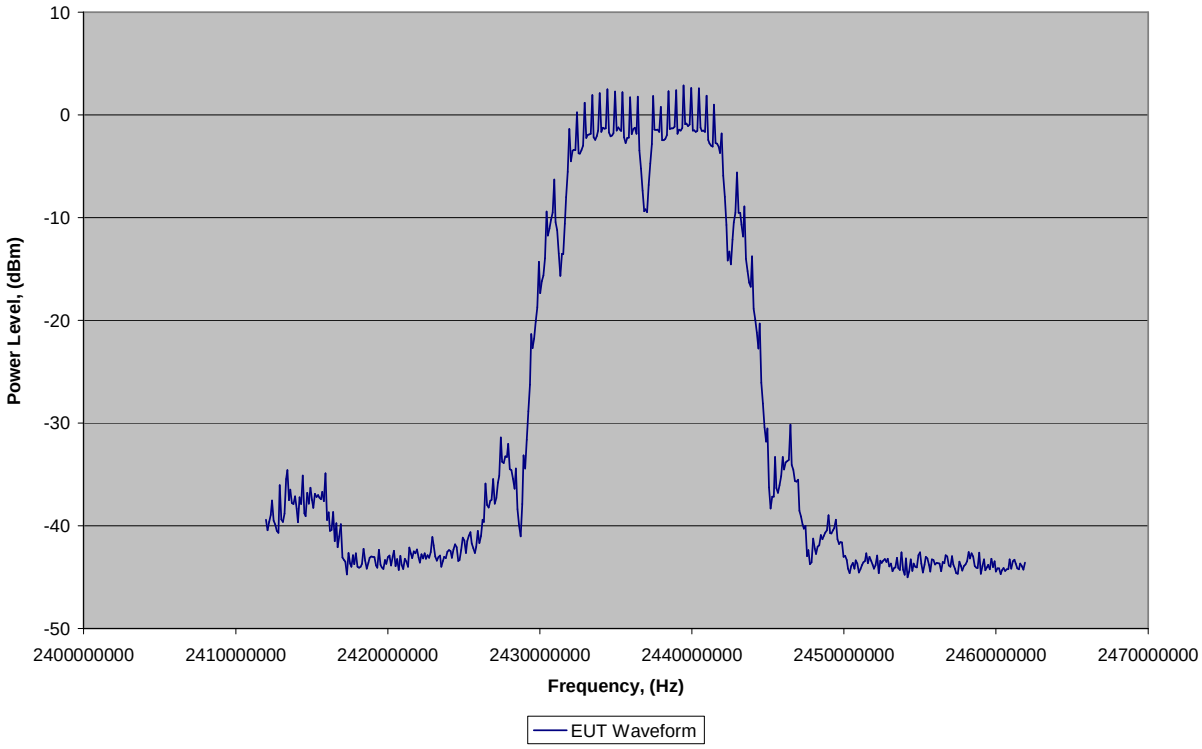
The maximum RF output power for each datarate is as follows:
802.11b 1 MB/s: 19.115 dBm (81.56 mW)
802.11g 6 MB/s: 18.059 dBm (63.96 mW)
802.11b 11 MB/s: 19.050 dBm (80.35 mW)
802.11g 54 MB/s: 18.106 dBm (64.65 mW)

Given the results for output power, the 802.11b 1 MB/s and the 802.11g 54 MB/s data rates were selected for testing for spurious emissions.

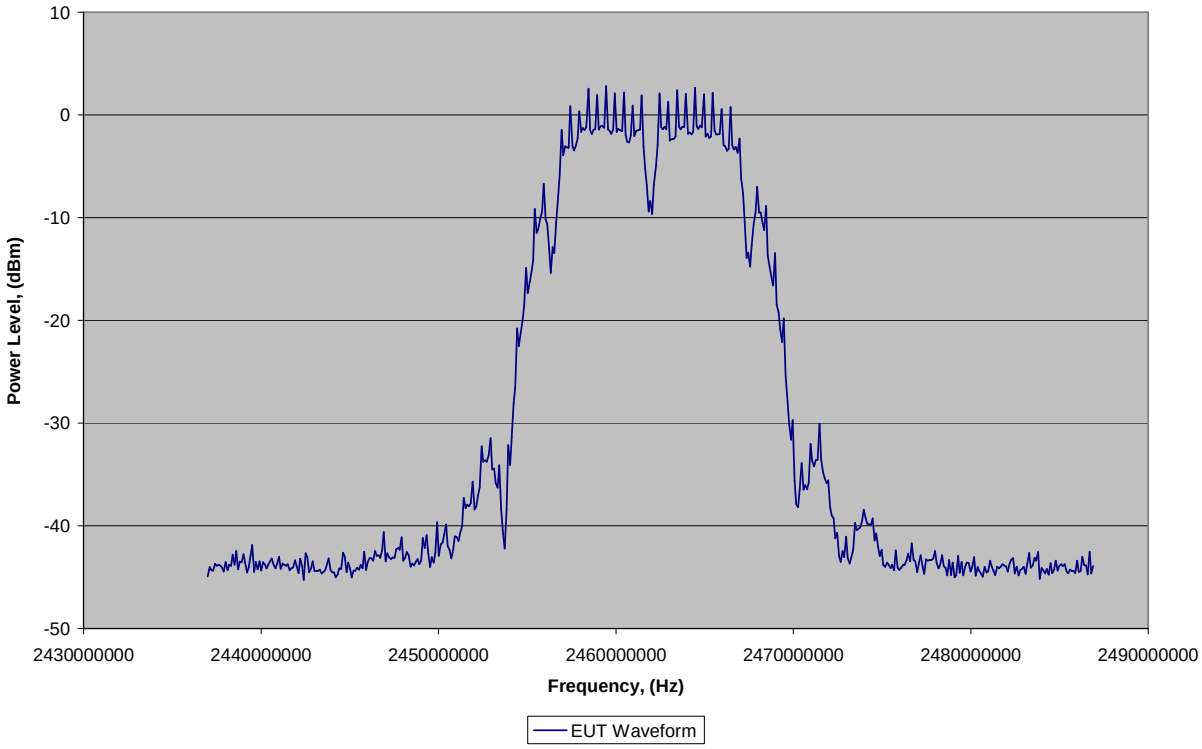
RF Power Trace, Channel 1, 1MB/s, 61.884mW, 17.916dBm



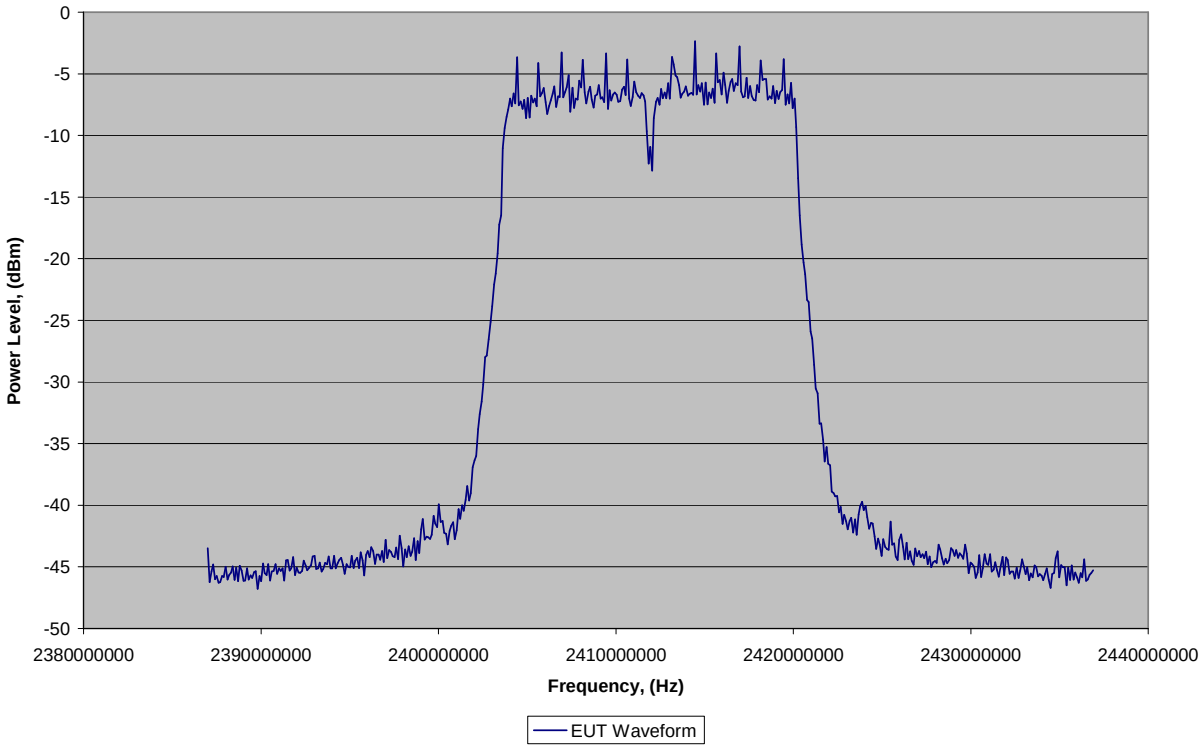
RF Power Trace, Channel 6, 1MB/s, 81.573mW, 19.115dBm



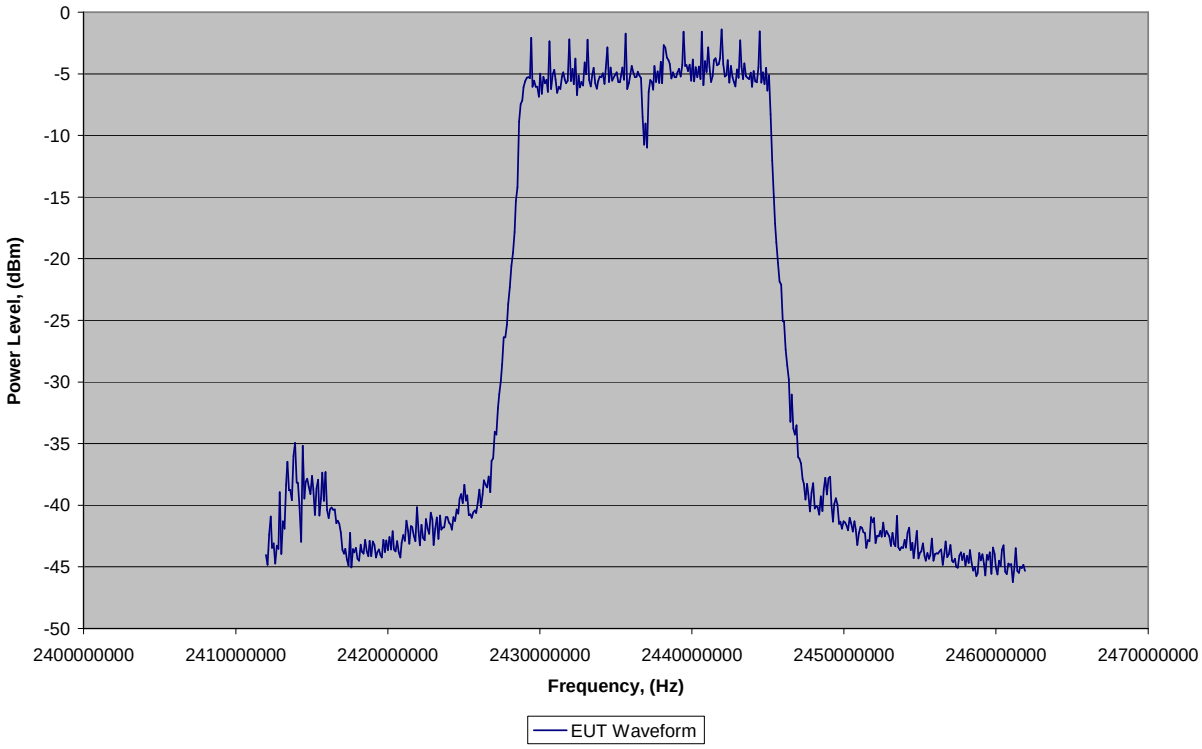
RF Power Trace, Channel 11, 1MB/s, 81.021mW, 19.086dBm



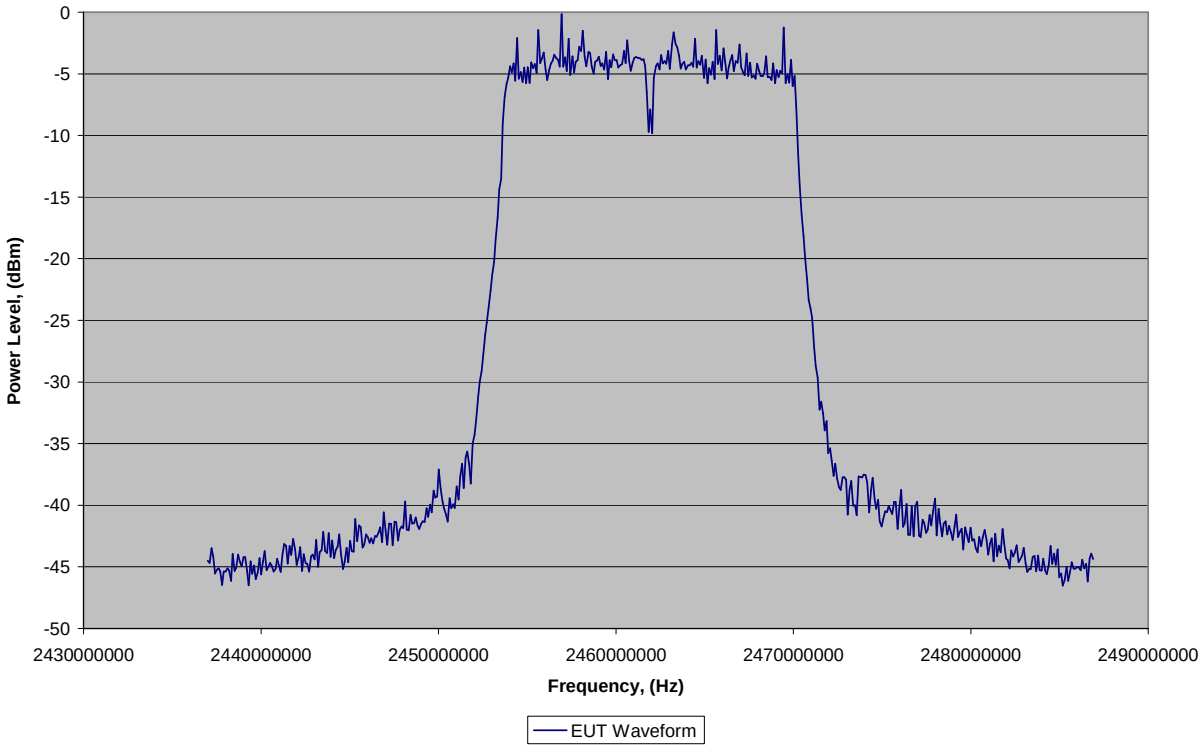
RF Power Trace, Channel 1, 6MB/s, 38.122mW, 15.812dBm



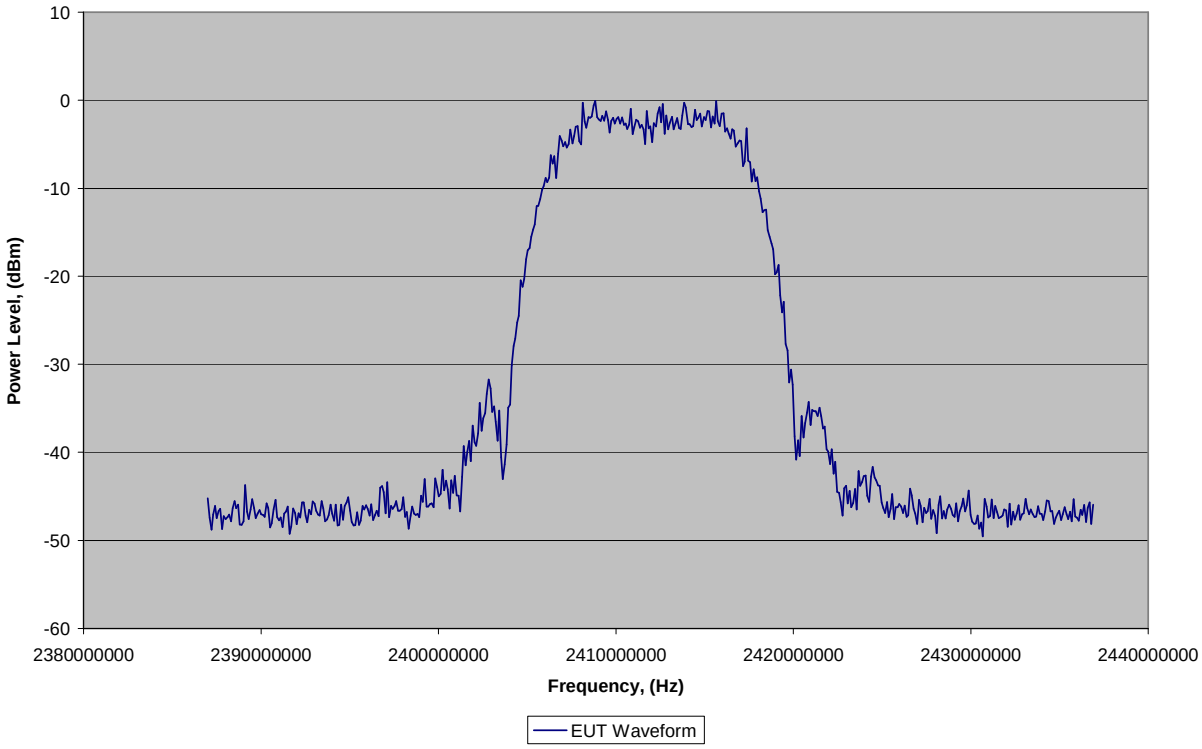
RF Power Trace, Channel 6, 6MB/s, 54.022mW, 17.326dBm



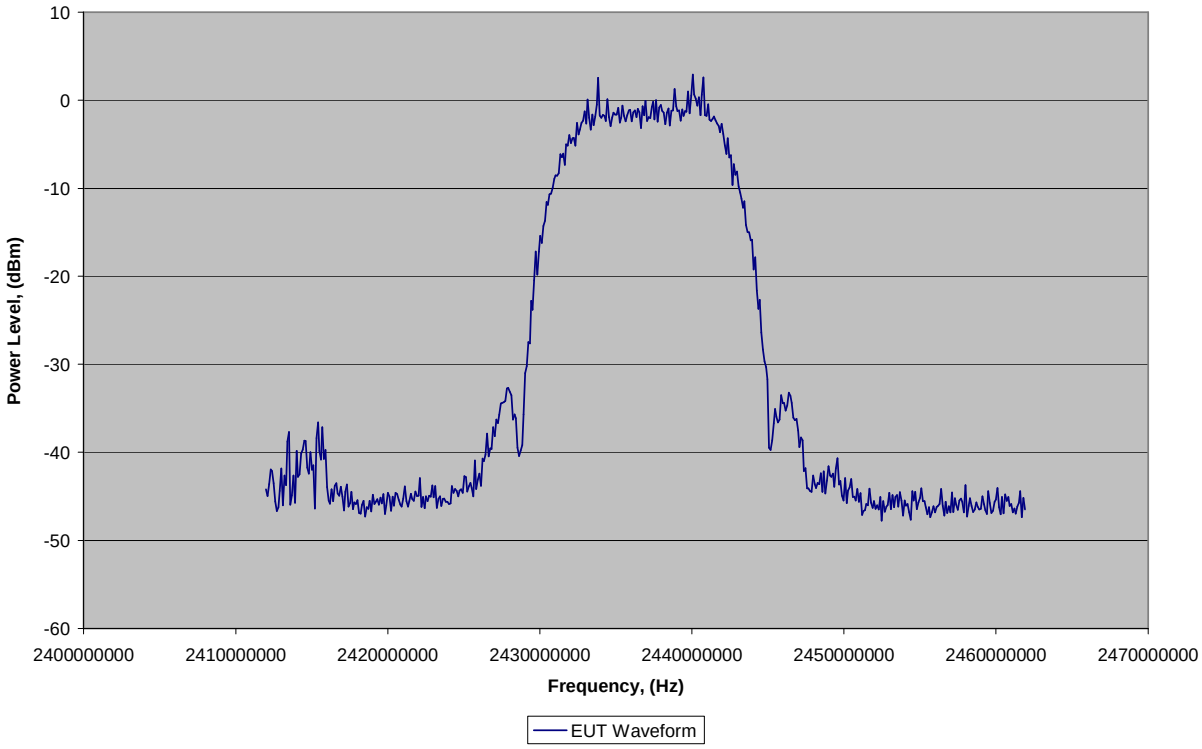
RF Power Trace, Channel 11, 6MB/s, 63.955mW, 18.059dBm



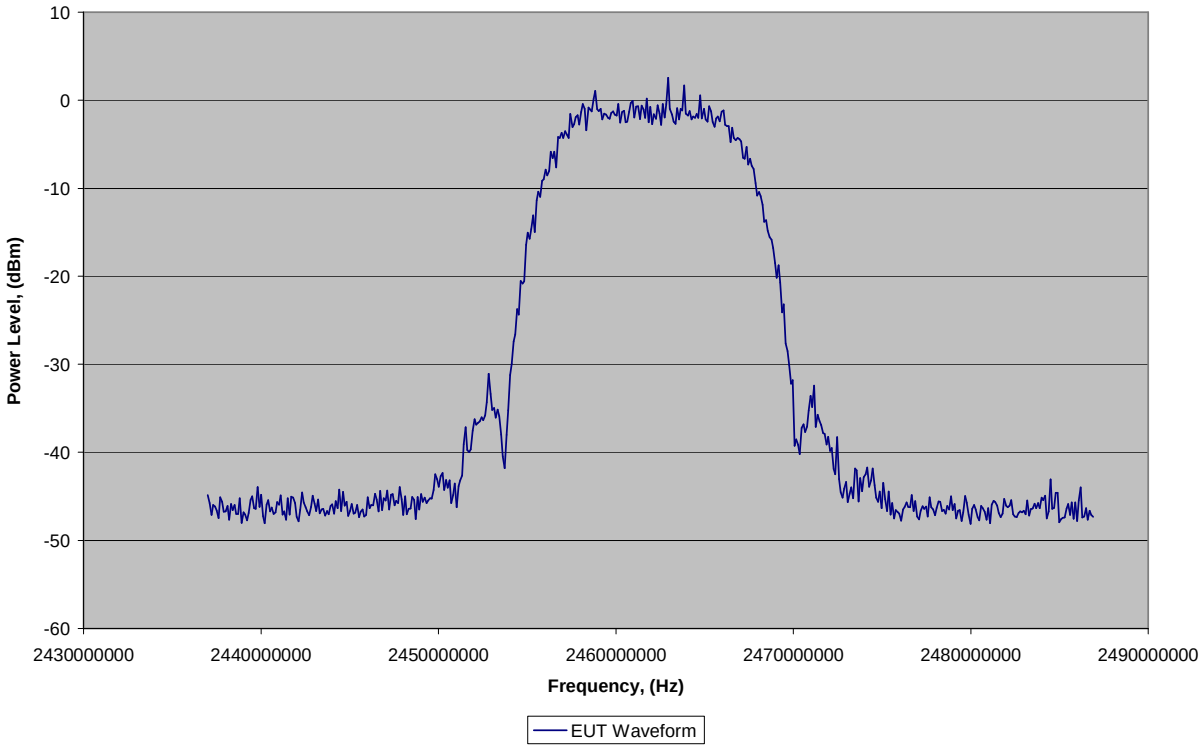
RF Power Trace, Channel 1, 11MB/s, 61.836mW, 17.912dBm



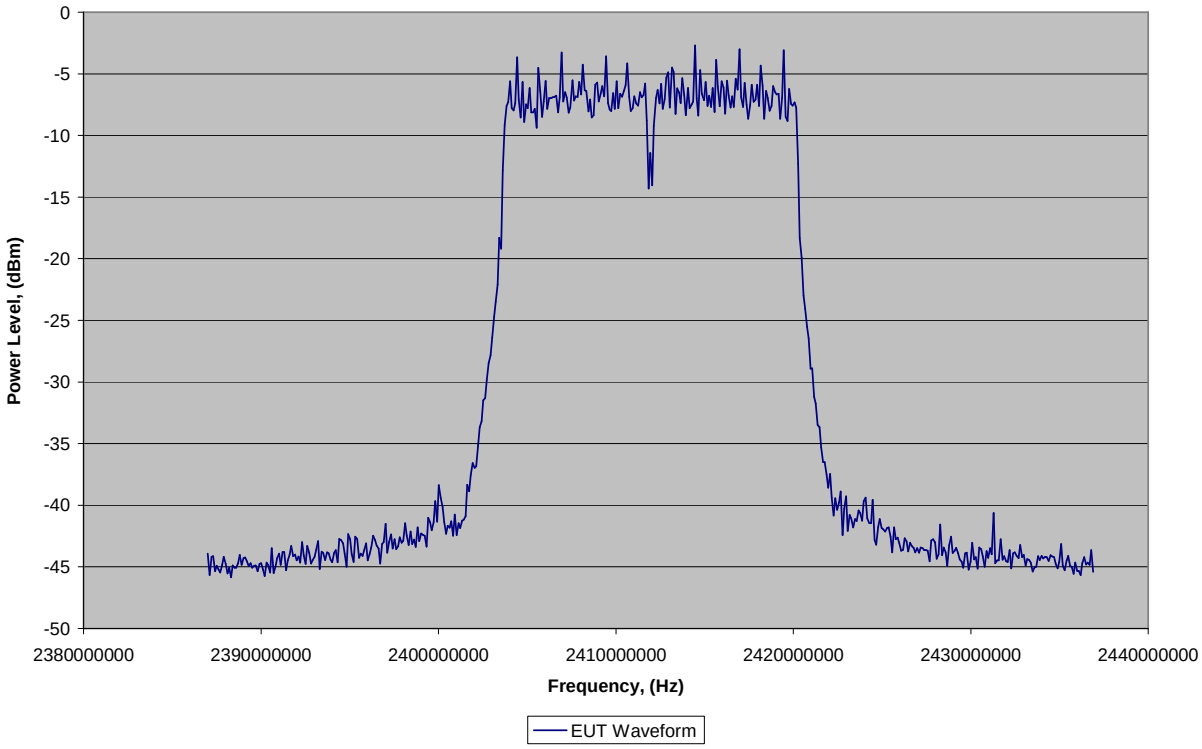
RF Power Trace, Channel 6, 11MB/s, 80.344mW, 19.05dBm



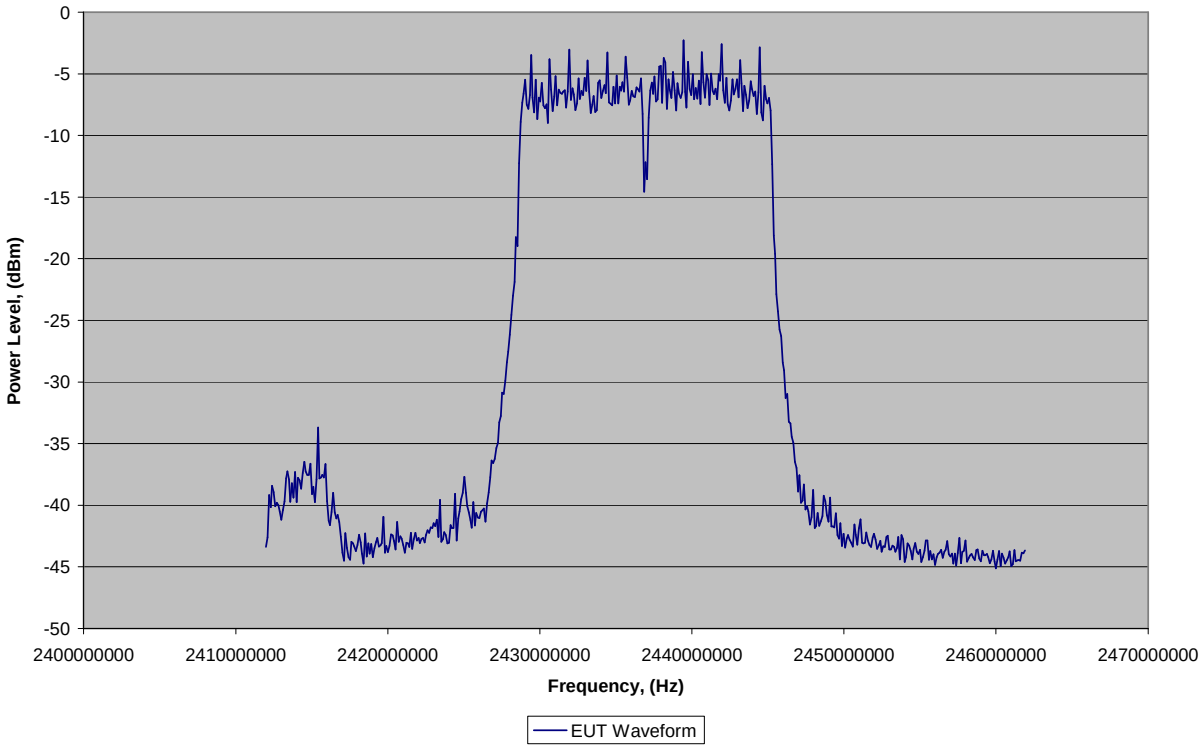
RF Power Trace, Channel 11, 11MB/s, 75.645mW, 18.788dBm



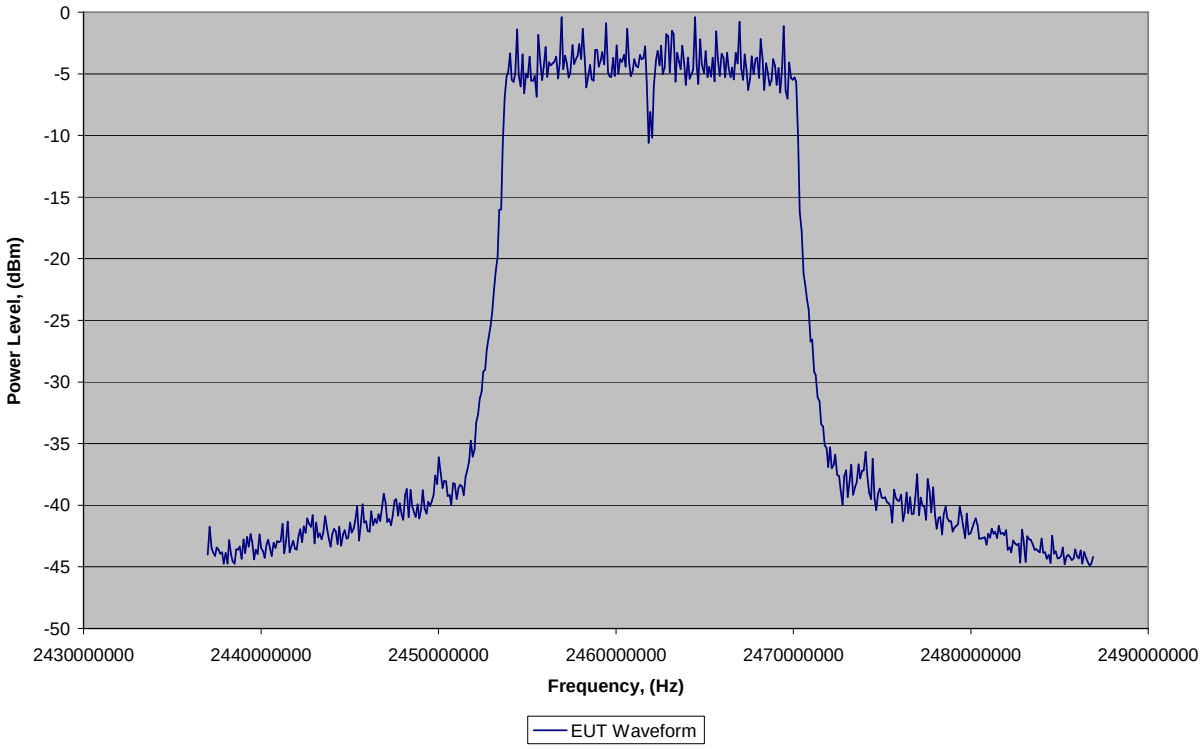
RF Power Trace, Channel 1, 54MB/s, 35.733mW, 15.531dBm



RF Power Trace, Channel 6, 54MB/s, 39.357mW, 15.95dBm



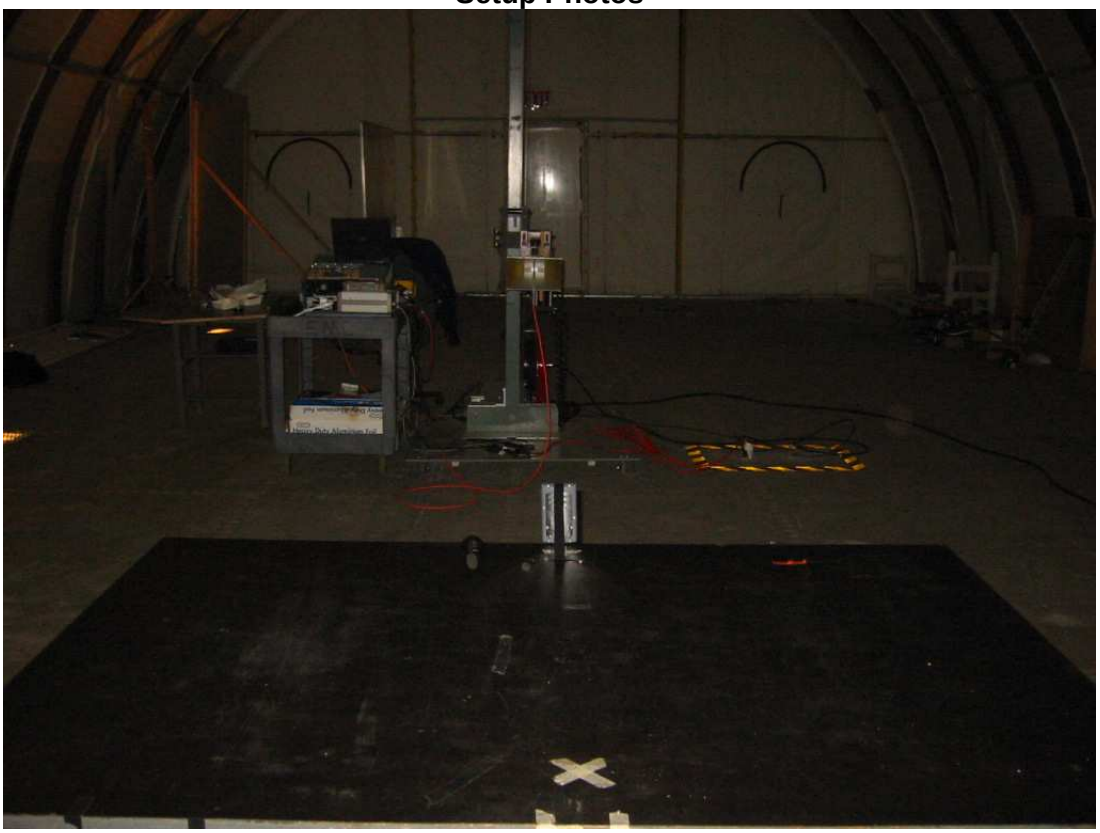
RF Power Trace, Channel 11, 54MB/s, 64.656mW, 18.106dBm



Setup Photos

RF Output Power

Setup Photos



RF Output Power

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.247, Industry Canada RSS-210 Annex 8

Test: 6 dB Bandwidth

Performance Criterion: The 6dB bandwidth must exceed 500 kHz.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	20	Humidity (%):	46	Pressure (hPa):	1007
Pretest Verification Performed		Yes		Equipment under Test:		VOXter 1006 Series WL-BT	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		09240287	
Engineer's Initials:	NA	Date Test Performed:	10/13-15/2009	Reviewer's Initials:		Date Reviewed:	11/16/09

Test Equipment Used:

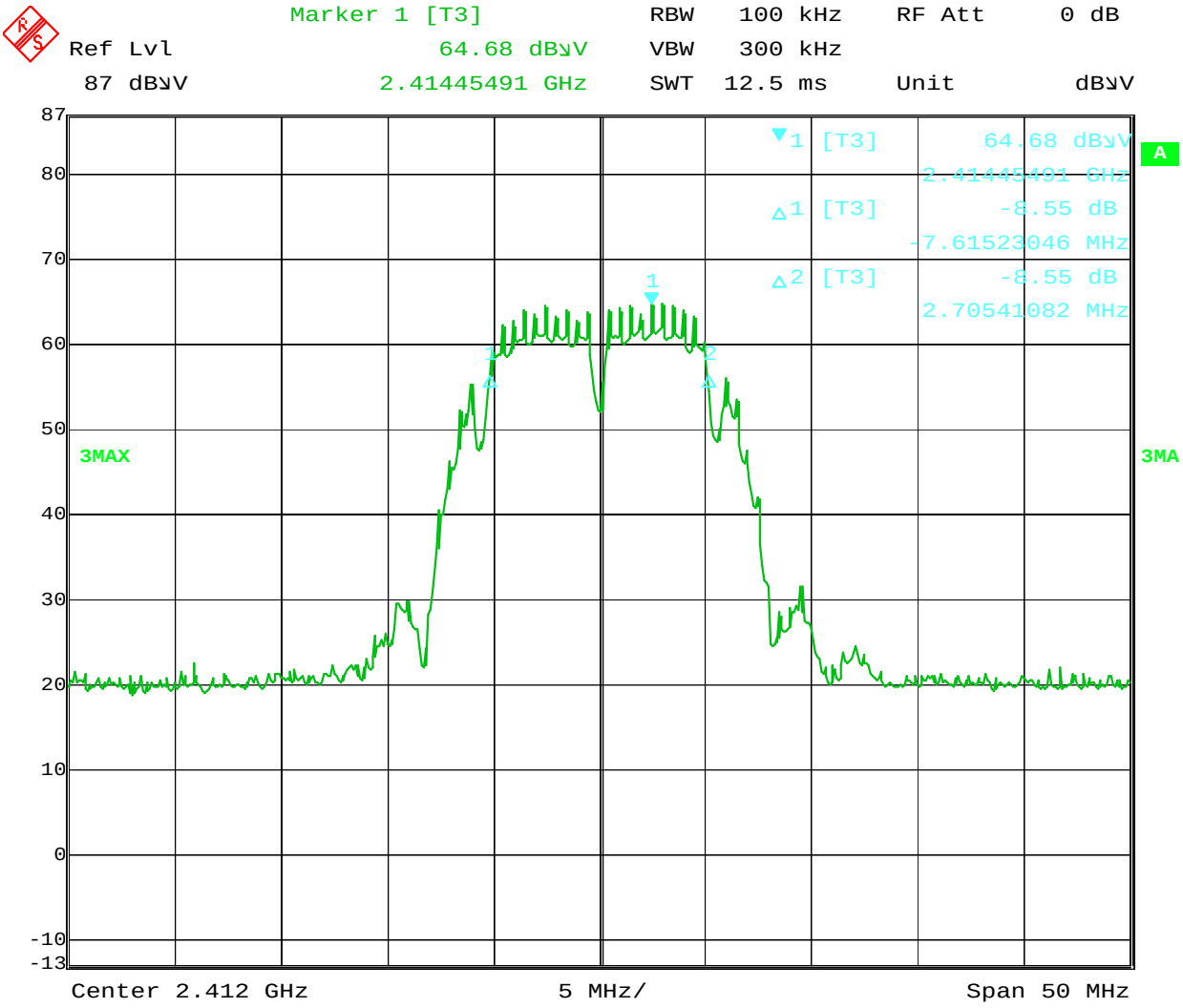
TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Weather Station	Davis Instruments	7400	PE80519A93	06/10/2010
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	HORN ANTENNA	EMCO	3115	9610-4980	02/25/2010
4	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	12/10/2009

Software Utilized:

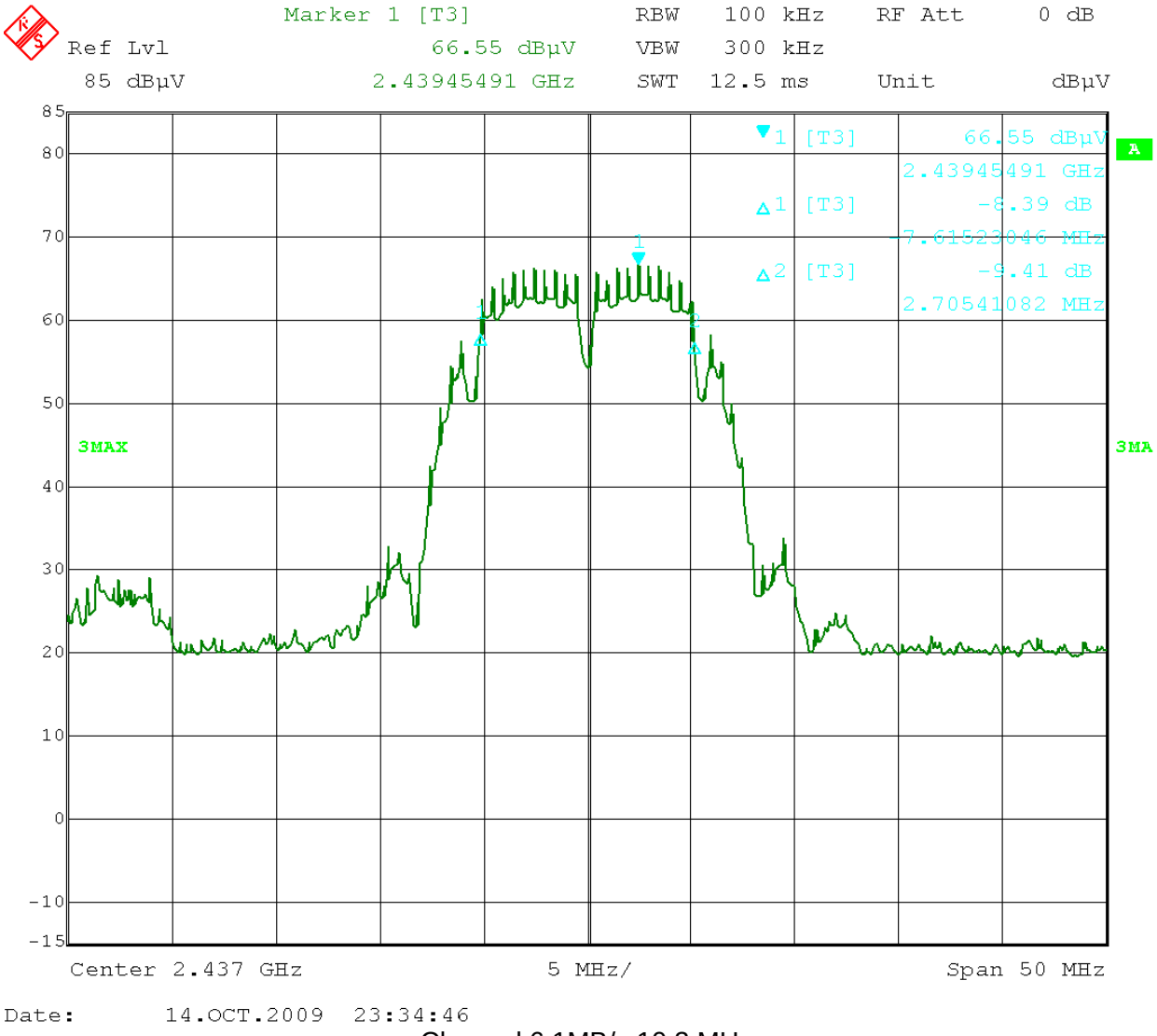
Name	Manufacturer	Version
None		

Test Details:

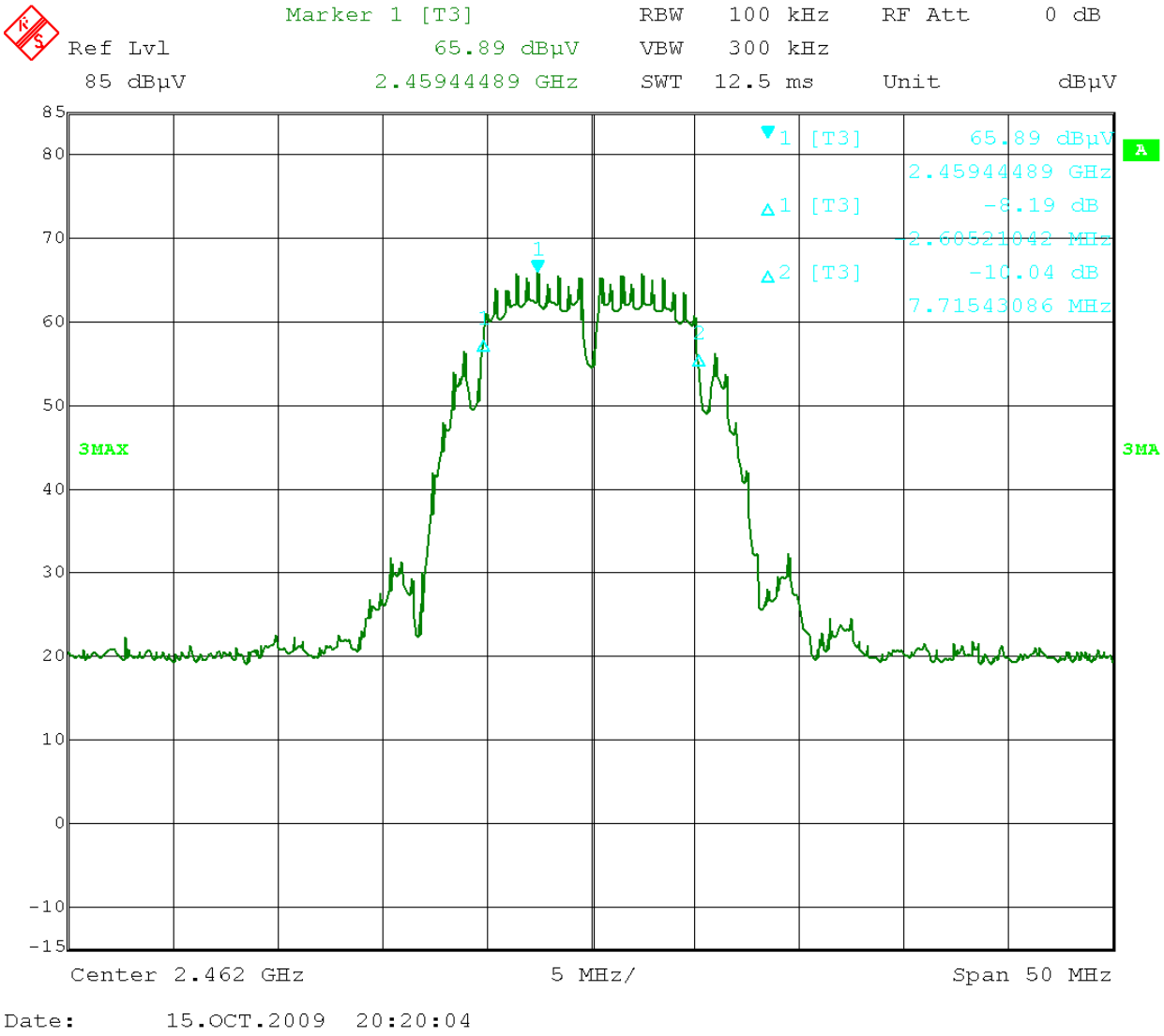
Notes: This is a relative measurement and the plots do not represent the actual EUT output power. The 6 dB bandwidth for each data rate is as follows:
802.11b 1 MB/s: 10.32 MHz
802.11g 54 MB/s: 16.63 MHz



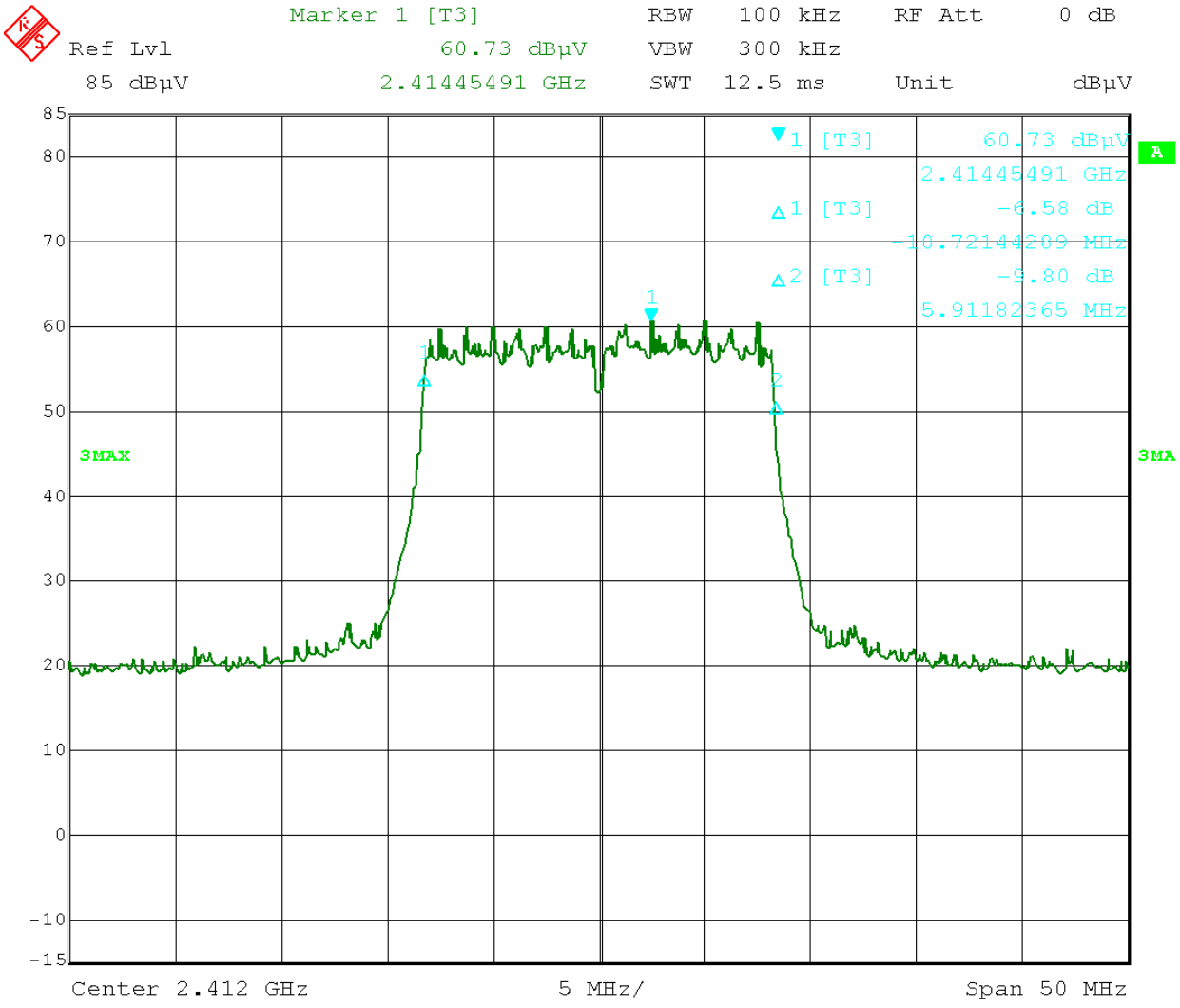
Channel 1 1MB/s 10.32 MHz



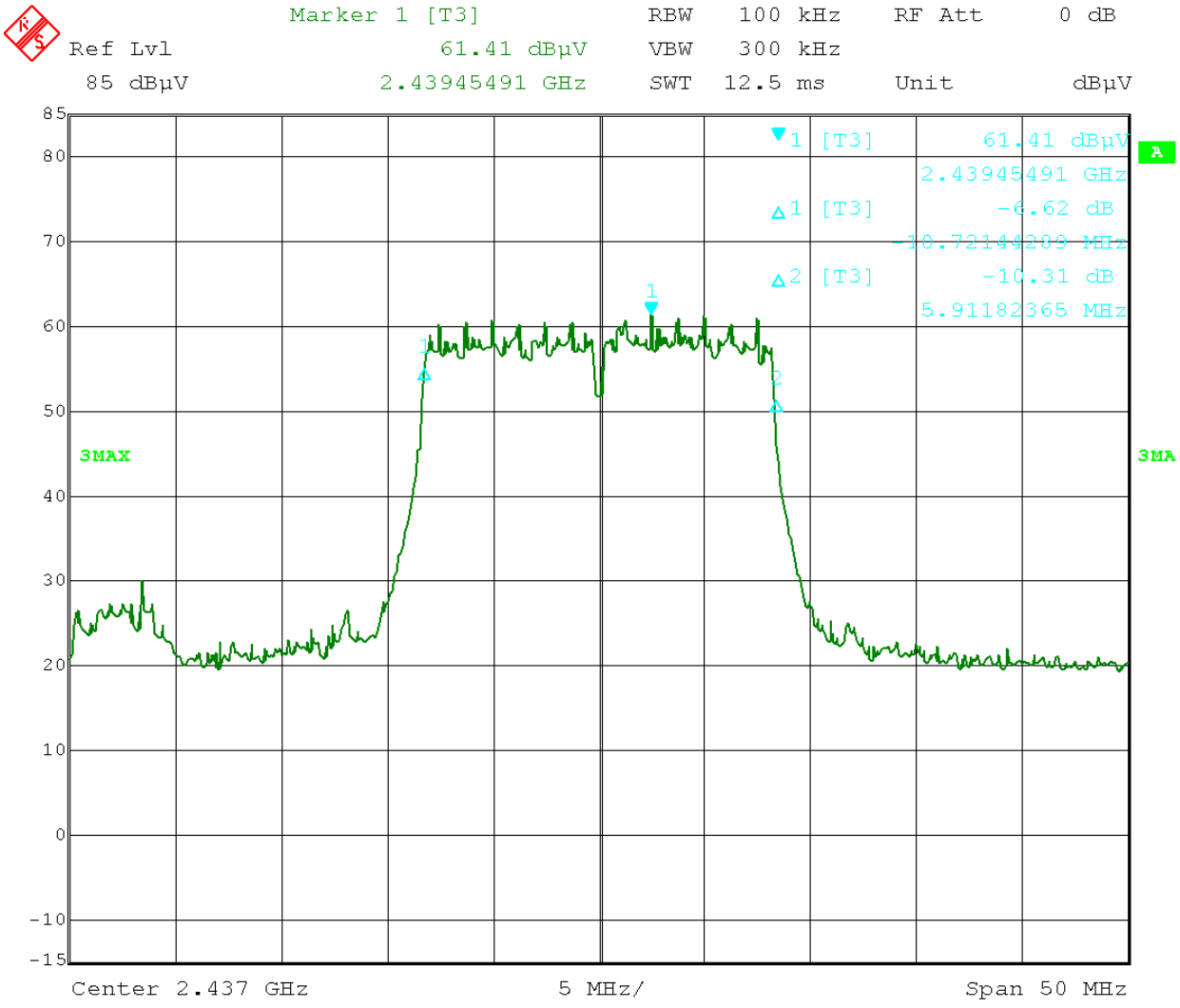
Channel 6 1MB/s 10.3 MHz



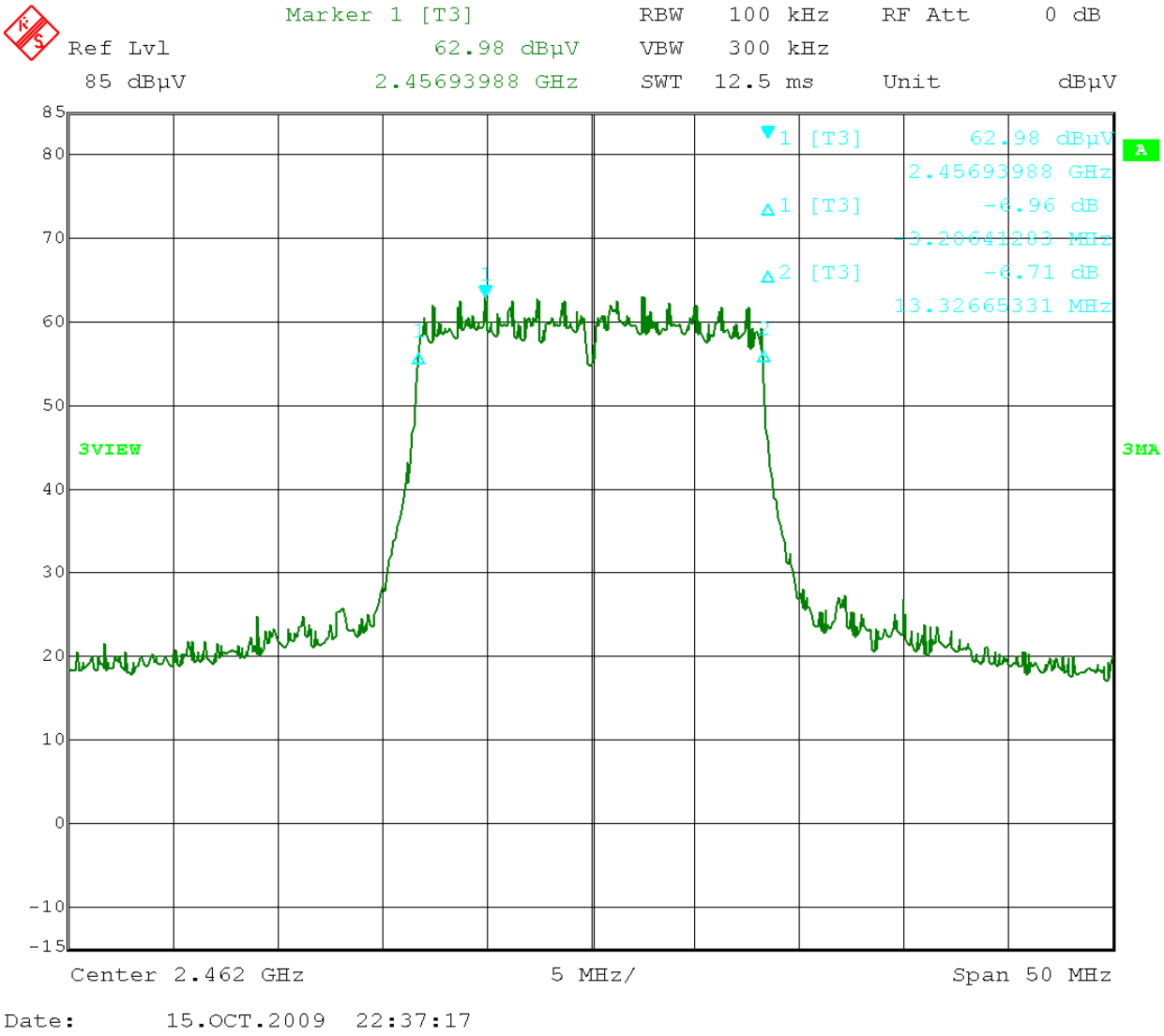
Channel 11 1MB/s 10.3 MHz



Channel 1 54MB/s 16.63 MHz



Channel 6 54MB/s 16.63 MHz



Channel 11 54MB/s 16.53 MHz

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.247, Industry Canada RSS-210 Annex 8

Test: Peak Power Spectral Density

Performance Criterion: The peak power spectral density must not exceed 8 dBm in any 3 kHz bandwidth.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	20	Humidity (%):	46	Pressure (hPa):	1007
Pretest Verification Performed		Yes		Equipment under Test:		VOXter 1006 Series WL-BT	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		09240287	
Engineer's Initials:	NNA	Date Test Performed:	10/13-15/2009	Reviewer's Initials:	JG	Date Reviewed:	11/16/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Weather Station	Davis Instruments	7400	PE80519A93	06/10/2010
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	HORN ANTENNA	EMCO	3115	9610-4980	02/25/2010
4	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	12/10/2009

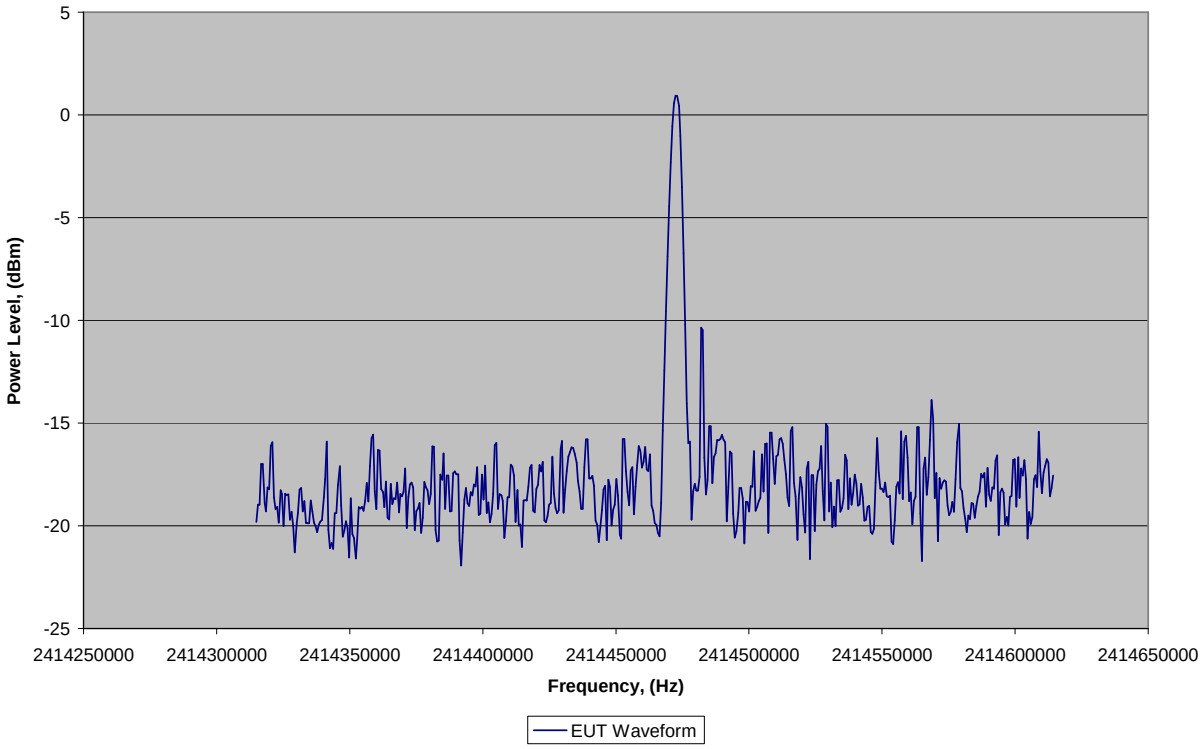
Software Utilized:

Name	Manufacturer	Version
Excel 2003	Microsoft	(11.5612.5606) SP3

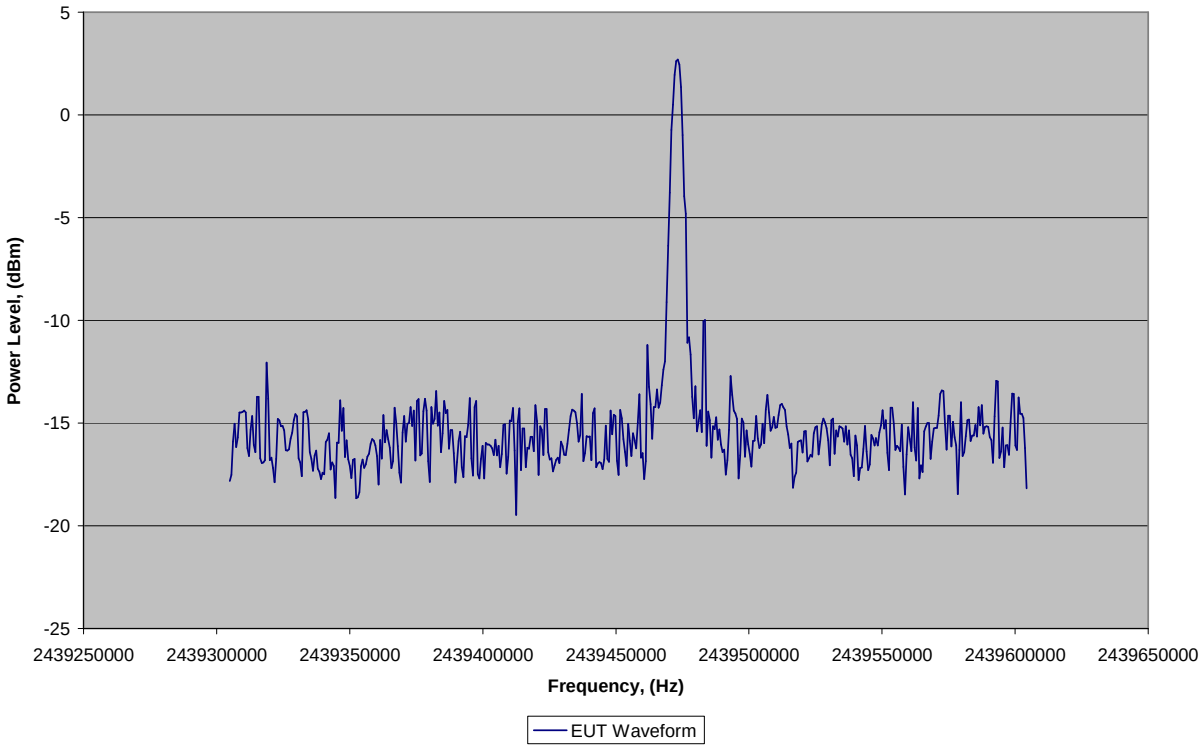
Test Details:

Notes: The 300 kHz span centered around the highest amplitude section of the waveform envelope was tested, per KDB 558074. The EUT was measured in a radiated fashion. The peak power spectral density was measured via integration using a 300 kHz span with a peak detector, a 3 kHz resolution bandwidth and 500 points of resolution (except for two measurements which used a 3 kHz RBW, 500 points of resolution and a 50 MHz span). The data obtained was adjusted for equipment losses and converted from a field strength reading to a power reading using the provisions of KDB 558074 and RSS-Gen 4.6.

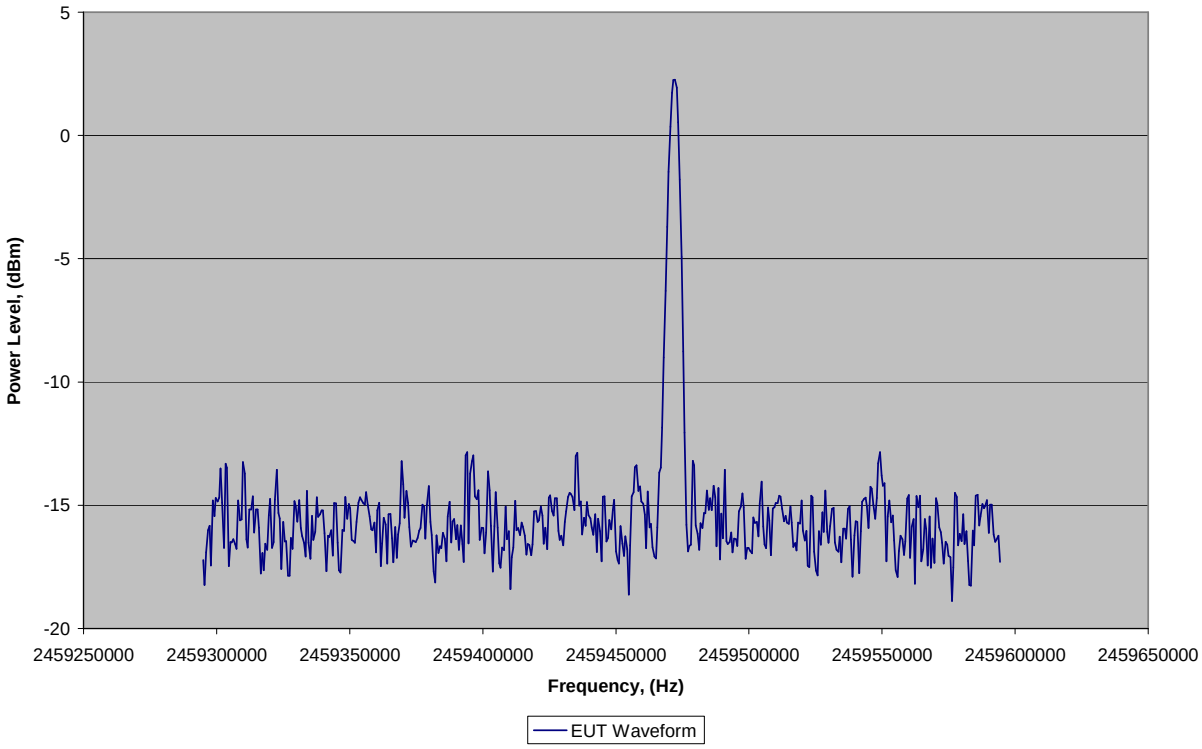
Peak Power Spectral Density, Channel 1, 1MB/s, 0.93 dBm



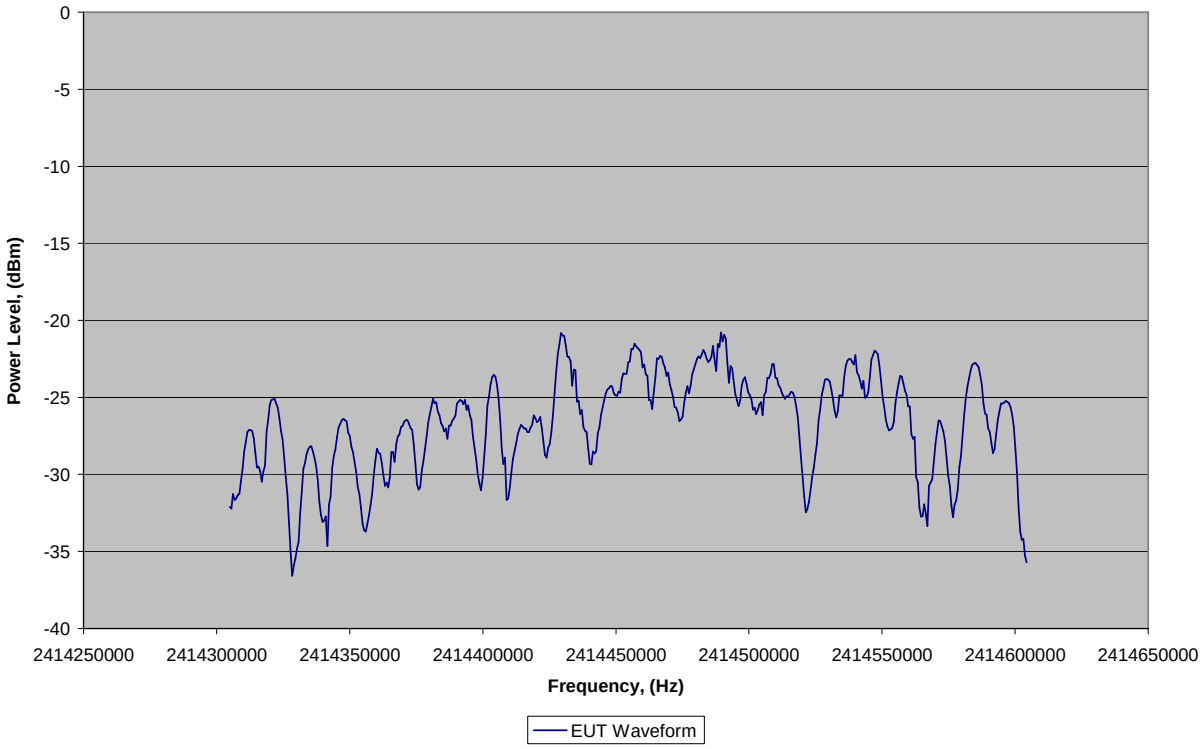
Peak Power Spectral Density, Channel 6, 1MB/s, 2.69 dBm



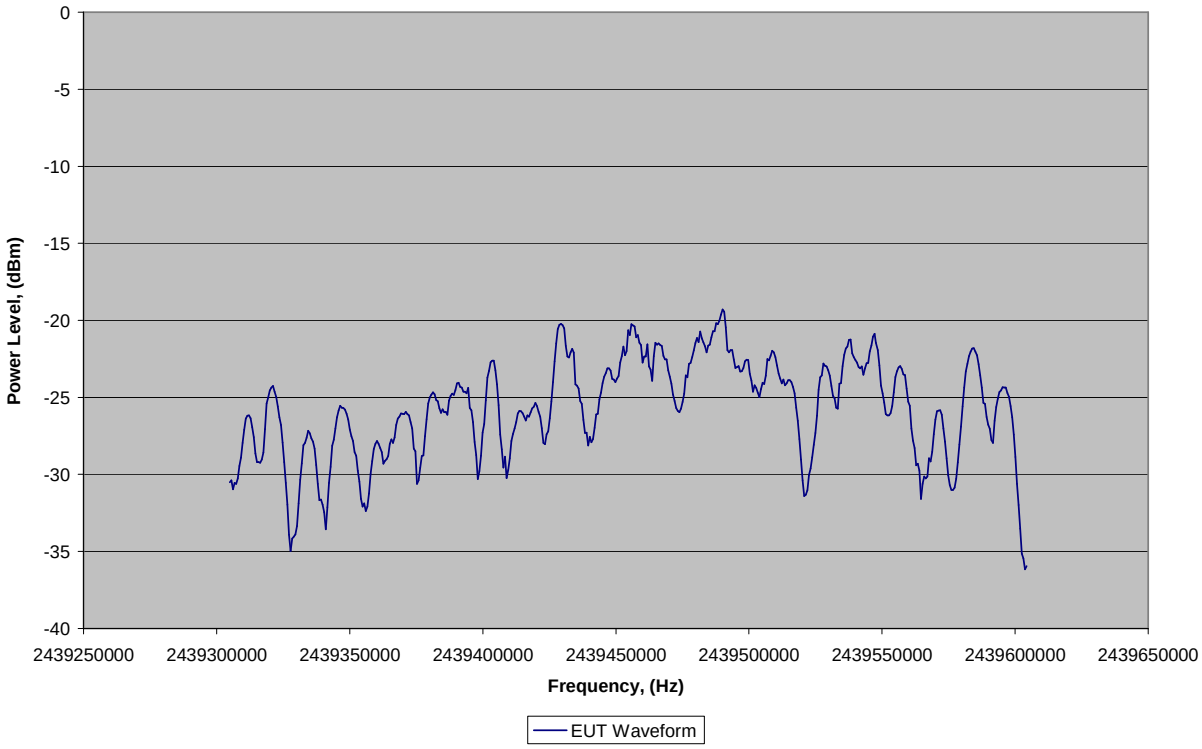
Peak Power Spectral Density, Channel 11, 1MB/s, 2.26 dBm



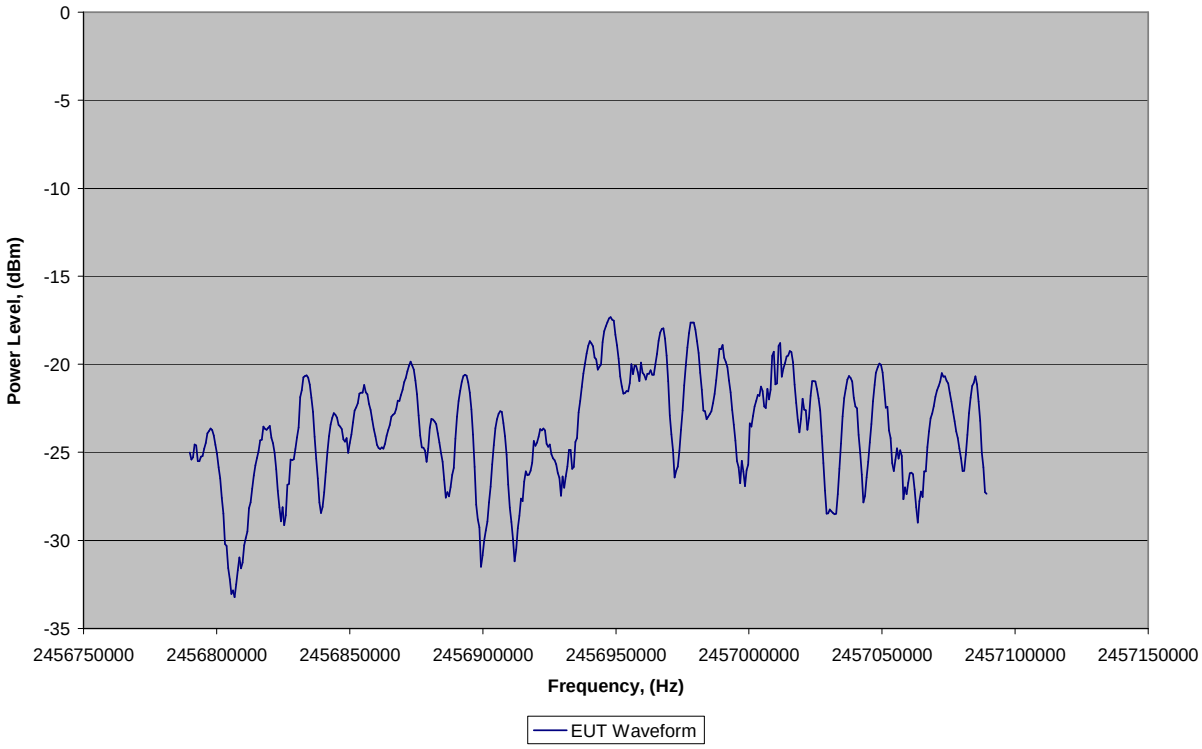
Peak Power Spectral Density, Channel 1, 54MB/s, -20.79 dBm



Peak Power Spectral Density, Channel 6, 54MB/s, -19.31 dBm



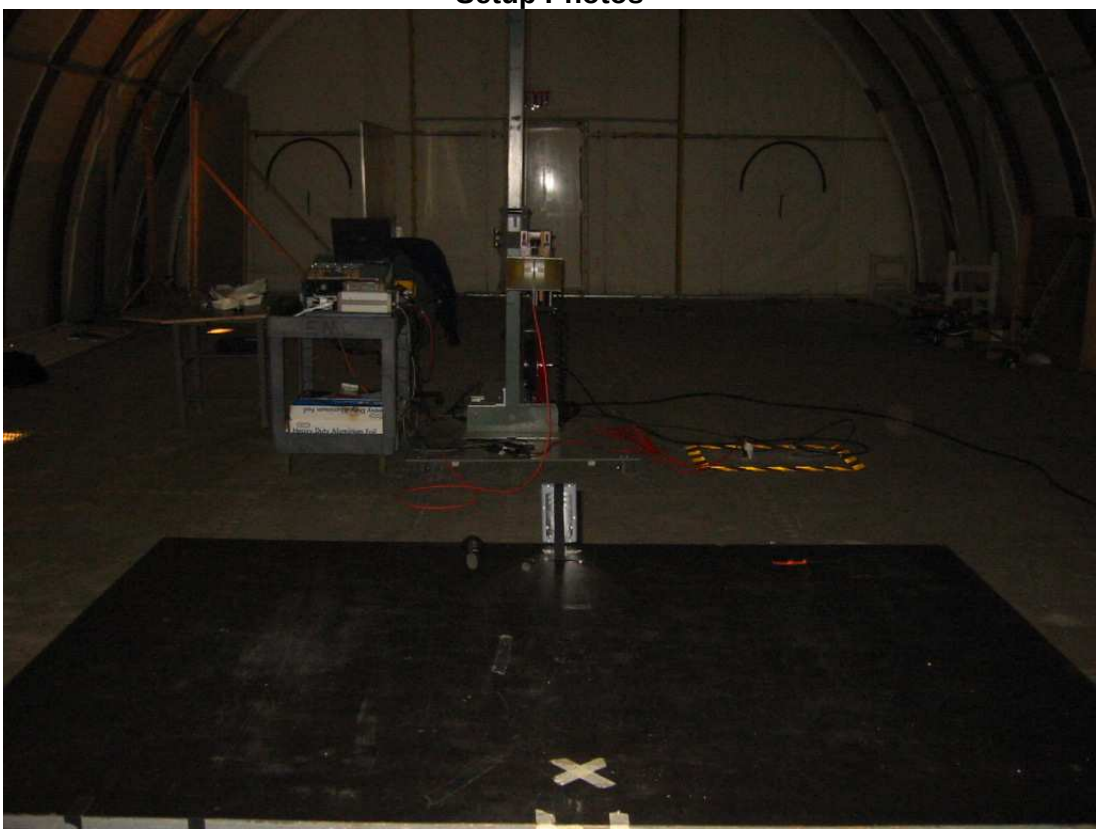
Peak Power Spectral Density, Channel 11, 54MB/s, -17.33 dBm



Setup Photos

Peak Power Spectral Density

Setup Photos



Peak Power Spectral Density

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.247, Industry Canada RSS-210 Annex 8

Test: Band Edge Compliance

Performance Criterion: Spurious emissions at the band edges must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions at the upper band edge which fall into the restricted band from 2483.5 – 2500 MHz must meet the general requirements of 15.209 and RSS-210 2.7 Tables 2 and 3 using a 1 MHz bandwidth.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	20	Humidity (%):	46	Pressure (hPa):	1007
Pretest Verification Performed		Yes		Equipment under Test:		VOXter 1006 Series WL-BT	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		09240287	
Engineer's Initials:	NNA	Date Test Performed:	10/13-15/2009	Reviewer's Initials:		Date Reviewed:	11/16/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Weather Station	Davis Instruments	7400	PE80519A93	06/10/2010
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	HORN ANTENNA	EMCO	3115	9610-4980	02/25/2010
4	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	12/10/2009

Software Utilized:

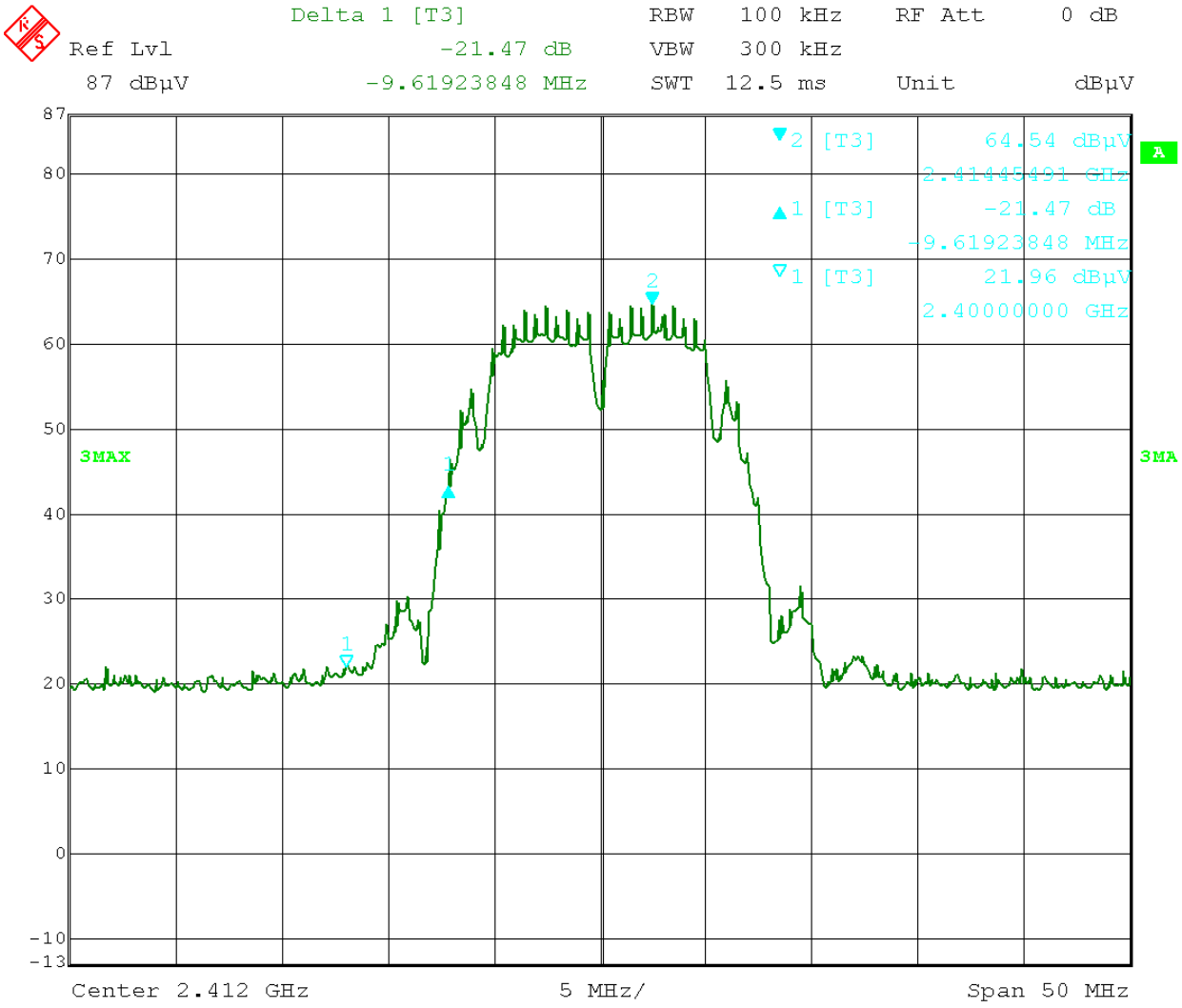
Name	Manufacturer	Version
Excel 2003	Microsoft	(11.5612.5606) SP3
EMI Boxborough.xls	Intertek	4/17/09

Test Details:

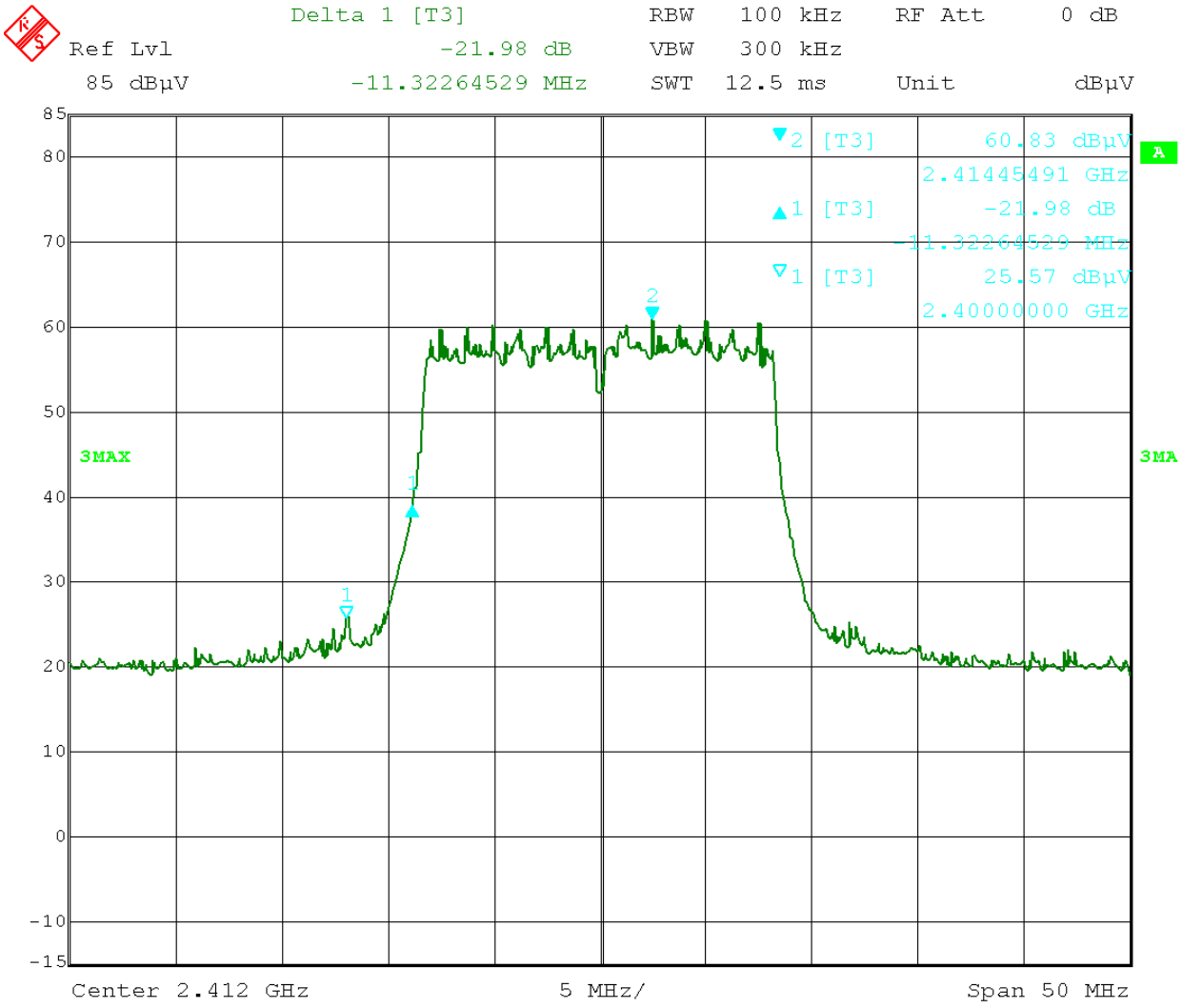
Radiated Emissions

Company: topsystem Systemhaus GmbH | Antenna & Cables: HF | Bands: N, LF, HF, SHF
Model #: VOXter 1006 Series WL-BT | Antenna: HORN3 V3m 3-03-09.txt | HORN3 H3m 3-03-09.txt
Serial #: 09240287 | Cable(s): MEG005 12-10-2009.txt | NONE.
Engineers: Nicholas Abbondante | Location: Site 2 | Barometer: DAV002 | Filter: NONE
Project #: 3192580 | Date(s): 10/13-15/2009
Standard: FCC Part 15 Subpart C 15.247/IC RSS-210 Annex 8 | Temp/Humidity/Pressure: 20c | 46% | 1007mB
Receiver: R&S FSEK-30 (ROS001) | Limit Distance (m): 3
PreAmp: PRE9 04-03-10.txt | Test Distance (m): 3
PreAmp Used? (Y or N): N | Voltage/Frequency: Fresh 3.7V Battery | Frequency Range: 1-4 GHz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

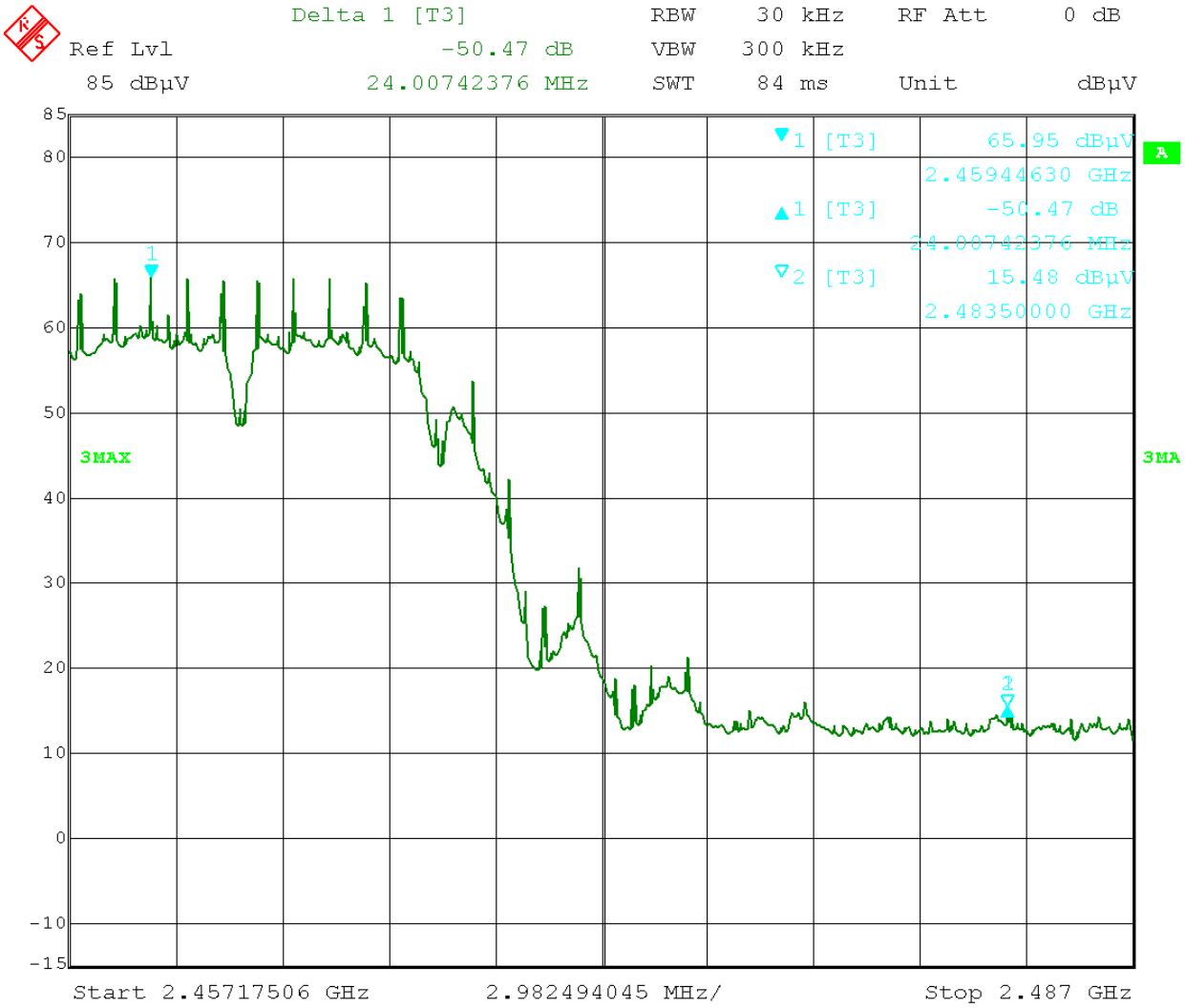
Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 802.11b (1MB/s) SMU 80%													
Note: Marker-Delta 50.47 dB													
PK	V	2462.000	69.80	28.52	3.09	0.00	0.00	101.42	-	-	1/3 MHz		
AVG	V	2462.000	66.81	28.52	3.09	0.00	0.00	98.43	-	-	1/3 MHz		
PK	V	2483.500	19.33	28.57	3.11	0.00	0.00	51.01	74.00	-22.99	1/3 MHz	RB	
AVG	V	2483.500	16.34	28.57	3.11	0.00	0.00	48.02	54.00	-5.98	1/3 MHz	RB	
Note: 802.11g (54MB/s) SMU 80%													
Note: Marker-Delta 43.88 dB													
PK	V	2462.000	73.33	28.52	3.09	0.00	0.00	104.95	-	-	1/3 MHz		
AVG	V	2462.000	65.10	28.52	3.09	0.00	0.00	96.72	-	-	1/3 MHz		
PK	V	2483.500	29.45	28.57	3.11	0.00	0.00	61.13	74.00	-12.87	1/3 MHz	RB	
AVG	V	2483.500	21.22	28.57	3.11	0.00	0.00	52.90	54.00	-1.10	1/3 MHz	RB	



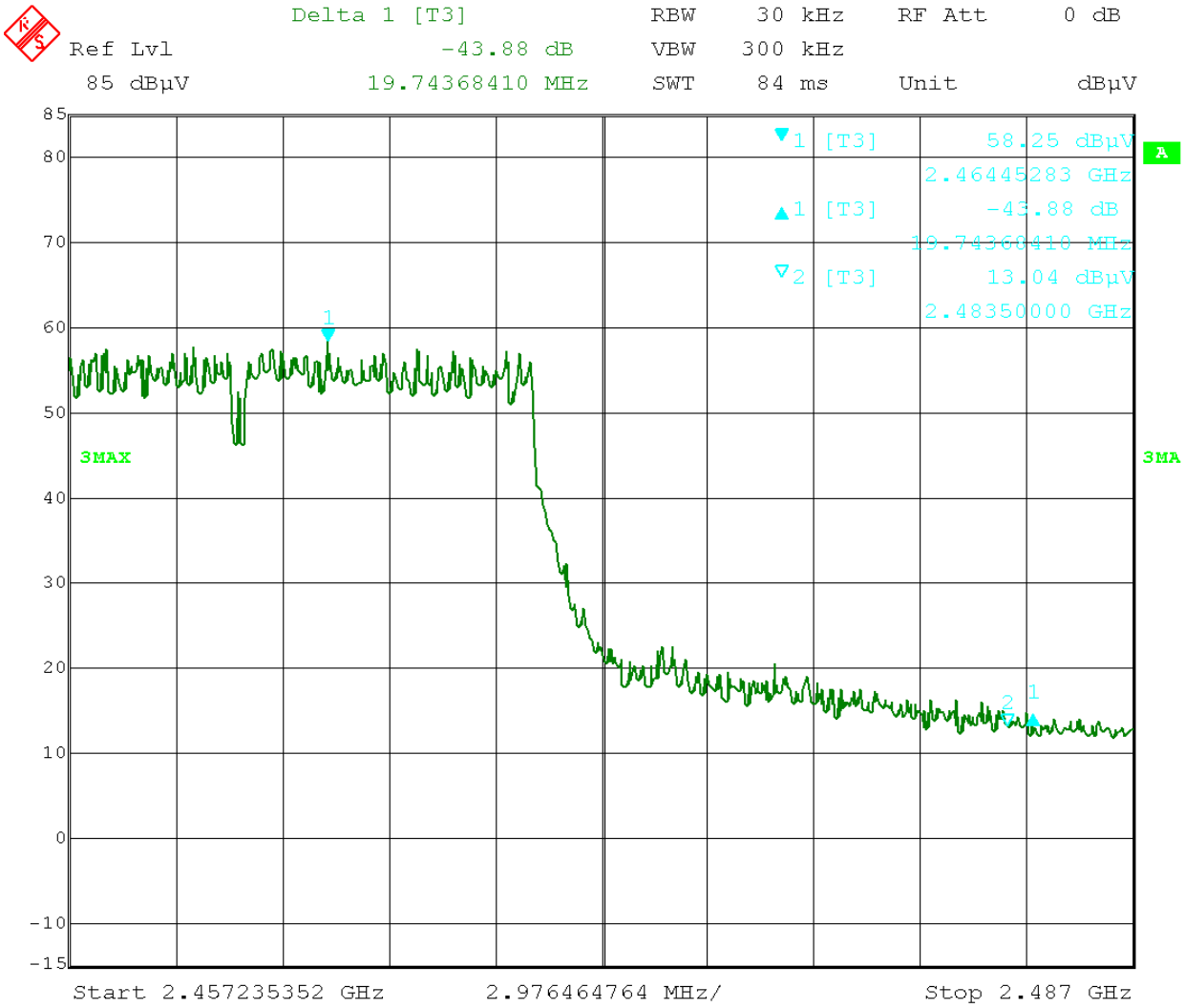
Channel 1 (2412 MHz) 802.11b 1 MB/s Lower Band Edge Compliance



Channel 1 (2412 MHz) 802.11g 54 MB/s Lower Band Edge Compliance



Channel 11 (2462 MHz) 802.11b 1 MB/s Upper Band Edge Compliance Marker Delta 50.47 dB

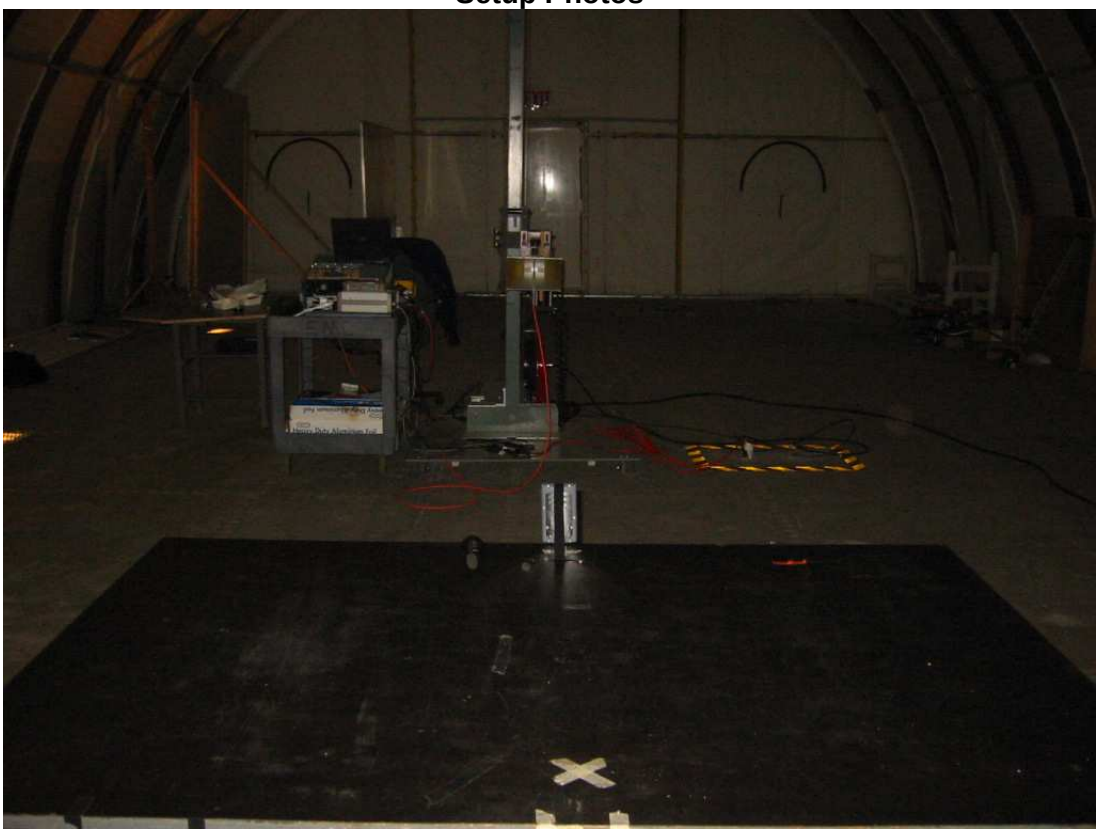


Channel 11 (2462 MHz) 802.11g 54 MB/s Upper Band Edge Compliance Marker Delta 43.88dB

Setup Photos

Band Edge Compliance

Setup Photos



Band Edge Compliance

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.247, Industry Canada RSS-210 Annex 8, Industry Canada RSS-Gen

Test: Radiated Spurious Emissions

Performance Criterion: Spurious emissions must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions which fall in the restricted bands of 15.205 must meet the general limits of 15.209. Emissions which fall in the restricted bands of RSS-210 2.2 Table 1 must meet the general limits of RSS-210 2.7 Tables 2 and 3. If the emissions meet the general limits of 15.209 outside of the restricted bands, it is not necessary to demonstrate compliance to the 20 dBc limit in a 100 kHz bandwidth. Receiver spurious emissions must meet the limits of RSS-Gen Table 1.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	20/21/21/20/22	Humidity (%):	46/58/47/42/41	Pressure (hPa):	1007/1007/1007/1016/1013
Pretest Verification Performed		Yes		Equipment under Test:		VOXter 1006 Series WL-BT	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		09240287, 08241172	
Engineer's Initials:	NA	Date Test Performed:	12/18/2008 10/13-15/2009 10/27-30/2009 11/09/2009	Reviewer's Initials:	JG	Date Reviewed:	11/16/09

Test Equipment Used:
10m Chamber

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Bilog antenna	Chase	CBL6141A	4195	6-12-10
2	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2443A04077	01/05/2010
3	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	01/30/2010
4	Cable	Huber and Suhner	Sucoflex 106	233089 004	5/01/10
5	Cable	Huber and Suhner	Sucoflex 106	233096 002	5/01/10
6	Cable	Huber and Suhner	Sucoflex 106	233089 001	5/01/10
7	Cable	Huber and Suhner	Sucoflex 106	233089 002	5/01/10
8	Cable	Huber and Suhner	Sucoflex 106	145409	04/10/2010
9	Weather Station	Davis Instruments	7400	PE80529A39A	06/10/2010

OATS 2

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Weather Station	Davis Instruments	7400	PE80519A93	06/10/2010
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	04/03/2010
4	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	12/10/2009
5	HORN ANTENNA	EMCO	3115	9610-4980	02/25/2010
6	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/10/2009
7	3GHz High Pass Filter	Reactel, Inc	7HSX-3G/18G-S11	06-1	10/26/2010
8	18GHz High Pass Filter	Reactel, Inc	7HS-18G/40G K11	(06)1	04/21/2010
9	40 GHz Cable	Megaphase	TM40-K1K1-80	58013901001	05/26/2010
10	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	01/27/2010

Kaufbeuren Chamber 1

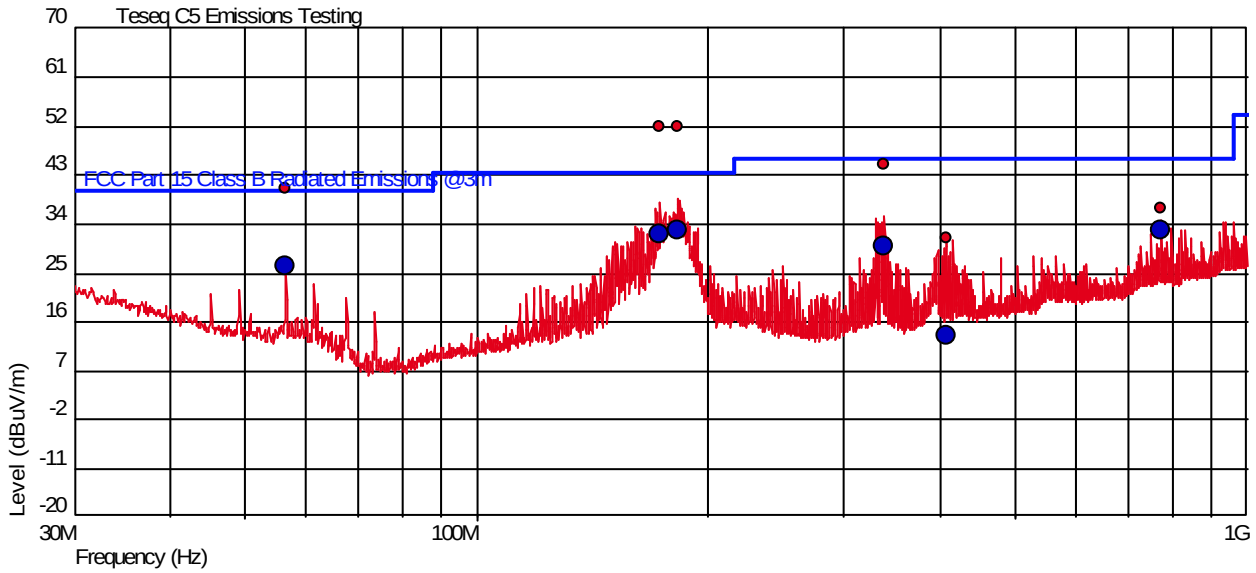
TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Temperature/Humidity Sensor	AHLBORN	ALMEMO 2590	H07070120	01/01/2009
2	Cable	Rohde & Schwarz	SMR20	FP1/X5	Verified
3	BILOG Antenna	Rohde & Schwarz	HL 562	100354	07/27/2011
4	EMI Receiver, 20 Hz – 26.5 GHz	Rohde & Schwarz	ESIB 26	100150	04/01/2009
5	Cable	Rohde & Schwarz	N/L	ESIB26 to AP1/X1	05/09/2009
6	Cable	Rohde & Schwarz	N/L	HF906 Blau	02/05/2010

Software Utilized:

Name	Manufacturer	Version
Excel 2003	Microsoft	(11.5612.5606) SP3
EMI Boxborough.xls	Intertek	4/17/09
C5	Teseq	Rev 1.0

Test Details:

Vertical Ch1 1MB/s



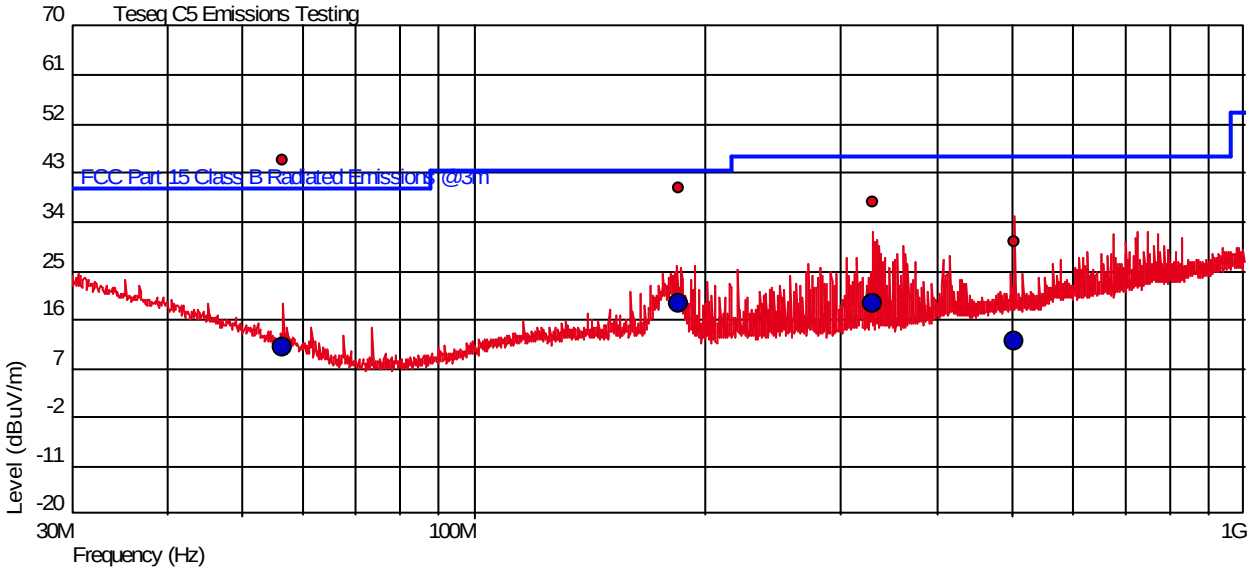
Vertical Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.44 M	26.88	12.736	-26.349	1.08	270.00	78.10	-51.22	100.0 k
172.86 M	37.85	11.128	-25.228	1.19	110.00	78.10	-40.25	100.0 k
182.14 M	37.26	10.557	-25.146	1.18	54.00	78.10	-40.84	100.0 k
338.5 M	33.67	14.510	-25.684	1.77	90.00	78.10	-44.43	100.0 k
406.82 M	21.99	16.373	-25.897	1.43	157.00	78.10	-56.11	100.0 k
774.08 M	34.29	22.482	-25.120	1.63	342.00	78.10	-43.81	100.0 k

Vertical Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.44 M	26.32	12.736	-26.349	40.00	-13.68	270	1.08	100 k
172.86 M	32.28	11.128	-25.228	43.50	-11.22	110	1.19	100 k
182.14 M	32.73	10.557	-25.146	43.50	-10.77	54	1.18	100 k
338.5 M	29.94	14.510	-25.684	46.00	-16.06	90	1.77	100 k
406.82 M	13.30	16.373	-25.897	46.00	-32.70	157	1.43	100 k
774.08 M	32.75	22.482	-25.120	46.00	-13.25	342	1.63	100 k

Horizontal Ch1 1MB/s



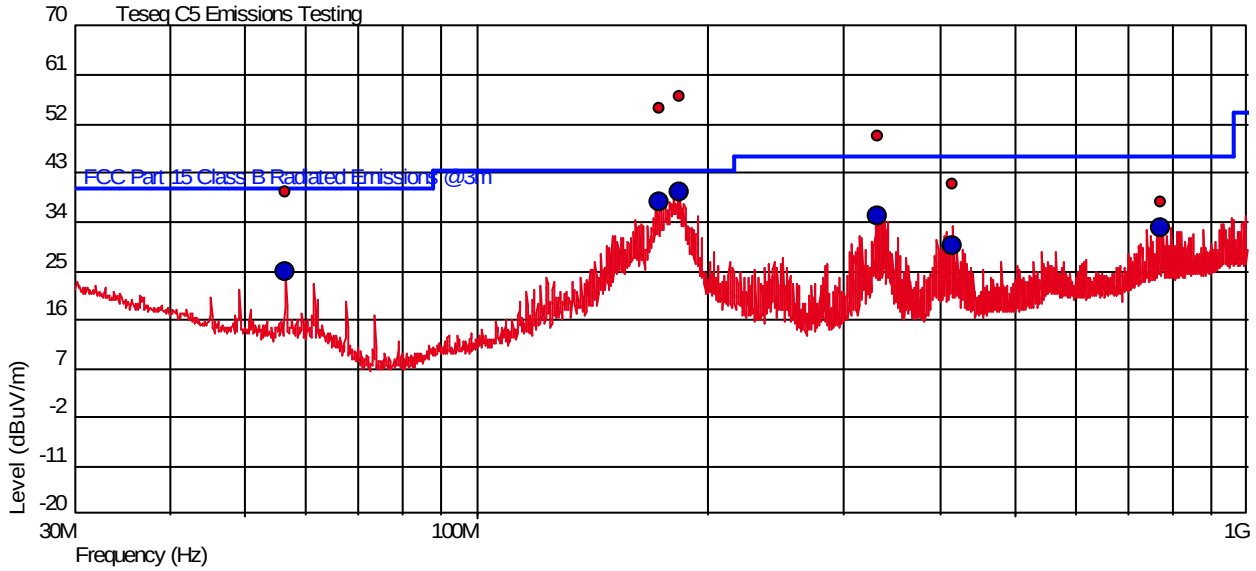
Horizontal Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.44 M	30.82	12.012	-26.349	1.47	45.00	78.10	-47.27	100.0 k
184.26 M	25.70	10.685	-25.128	1.68	36.00	78.10	-52.40	100.0 k
329.14 M	26.64	14.600	-25.646	1.15	132.00	78.10	-51.46	100.0 k
504.36 M	22.59	18.226	-26.025	3.96	107.00	78.10	-55.51	100.0 k

Horizontal Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.44 M	10.90	12.012	-26.349	40.00	-29.10	45	1.47	100 k
184.26 M	18.80	10.685	-25.128	43.50	-24.70	36	1.68	100 k
329.14 M	19.00	14.600	-25.646	46.00	-27.00	132	1.15	100 k
504.36 M	11.89	18.226	-26.025	46.00	-34.11	107	3.96	100 k

Vertical Ch1 54MB/s



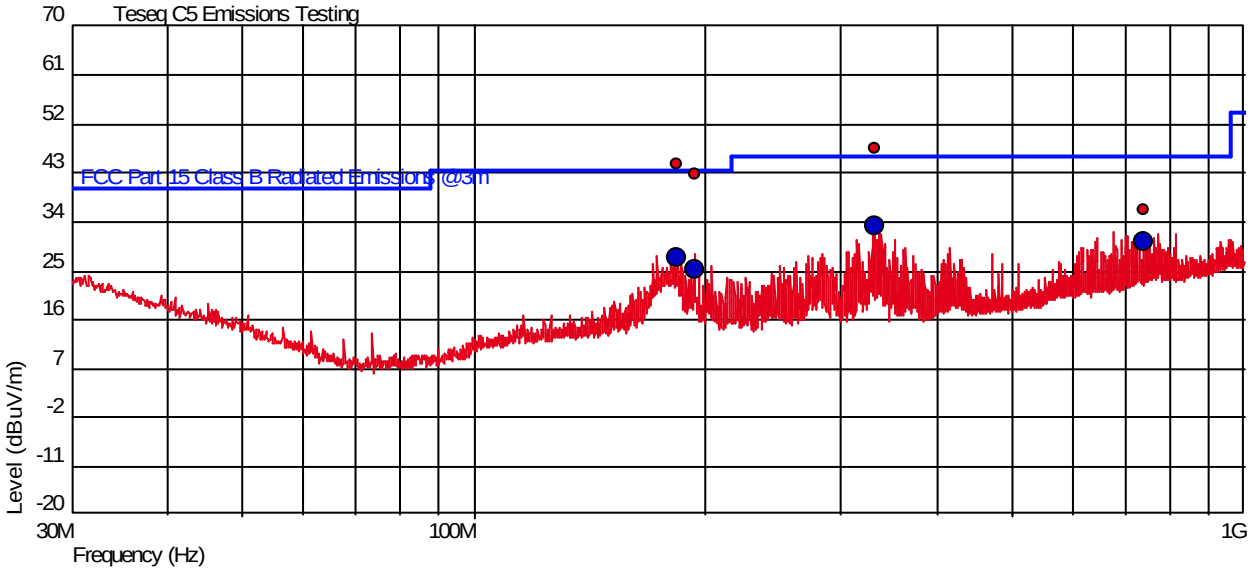
Vertical Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.424794 M	25.89	12.745	-26.349	1.12	265.00	72.21	-46.32	100.0 k
172.98 M	40.86	11.121	-25.227	1.16	61.00	72.21	-31.35	100.0 k
183.76 M	42.44	10.525	-25.132	1.10	109.00	72.21	-29.77	100.0 k
331.34 M	38.11	14.080	-25.655	1.74	83.00	72.21	-34.11	100.0 k
416.02 M	31.28	16.259	-25.893	1.45	114.00	72.21	-40.93	100.0 k
774.04 M	34.95	22.481	-25.120	1.56	337.00	72.21	-37.26	100.0 k

Vertical Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.424794 M	24.70	12.745	-26.349	40.00	-15.30	265	1.12	100 k
172.98 M	37.77	11.121	-25.227	43.50	-5.73	61	1.16	100 k
183.76 M	39.32	10.525	-25.132	43.50	-4.18	109	1.10	100 k
331.34 M	35.22	14.080	-25.655	46.00	-10.78	83	1.74	100 k
416.02 M	29.69	16.259	-25.893	46.00	-16.31	114	1.45	100 k
774.04 M	33.05	22.481	-25.120	46.00	-12.95	337	1.56	100 k

Horizontal Ch1 54MB/s



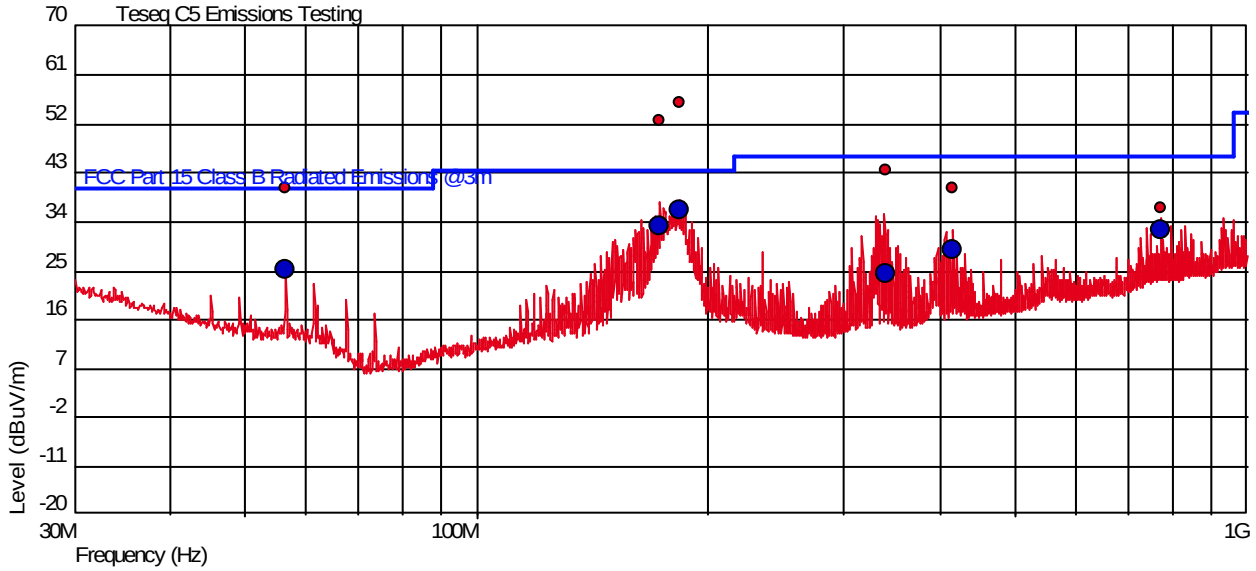
Horizontal Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
183.8 M	29.94	10.676	-25.132	2.06	50.00	72.21	-42.27	100.0 k
193.48 M	29.08	11.448	-25.052	1.89	56.00	72.21	-43.13	100.0 k
331.36 M	36.59	14.627	-25.655	1.07	147.00	72.21	-35.62	100.0 k
742.52 M	32.63	21.750	-25.285	1.29	224.00	72.21	-39.59	100.0 k

Horizontal Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
183.8 M	27.20	10.676	-25.132	43.50	-16.30	50	2.06	100 k
193.48 M	25.31	11.448	-25.052	43.50	-18.19	56	1.89	100 k
331.36 M	33.05	14.627	-25.655	46.00	-12.95	147	1.07	100 k
742.52 M	30.28	21.750	-25.285	46.00	-15.72	224	1.29	100 k

Vertical Ch6 1MB/s



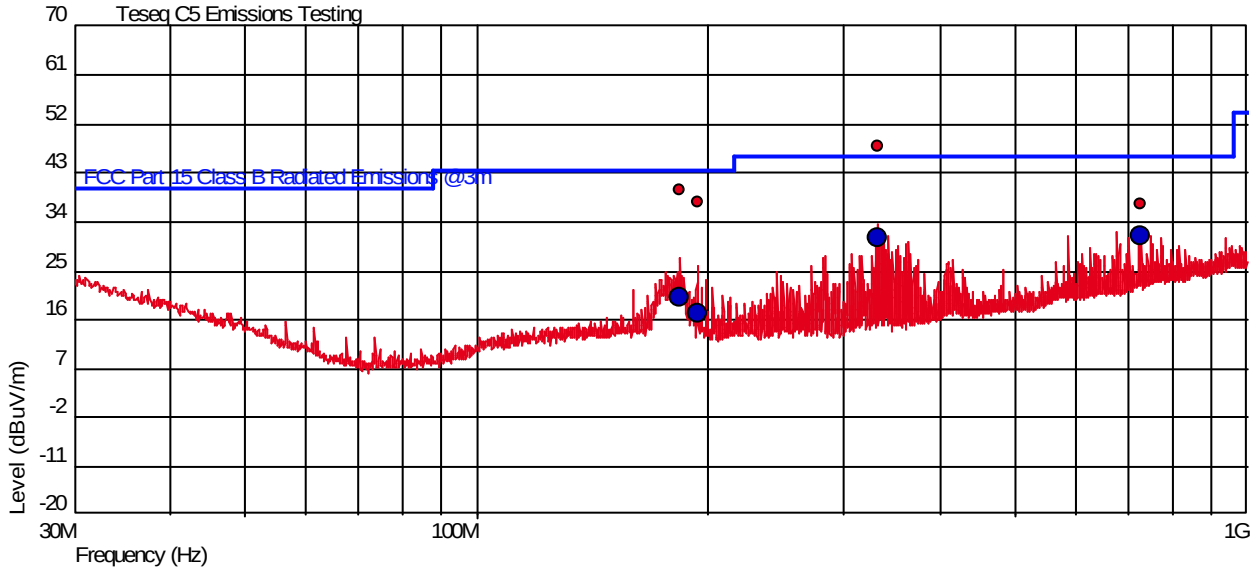
Vertical Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.44 M	26.50	12.736	-26.349	1.07	250.00	78.10	-51.60	100.0 k
172.88 M	38.36	11.127	-25.227	1.14	90.00	78.10	-39.74	100.0 k
183.82 M	41.44	10.524	-25.132	1.08	68.00	78.10	-36.66	100.0 k
338.94 M	32.15	14.536	-25.686	1.70	80.00	78.10	-45.95	100.0 k
416.04 M	30.51	16.258	-25.893	1.66	70.00	78.10	-47.60	100.0 k
774.08 M	34.05	22.482	-25.120	1.57	349.00	78.10	-44.05	100.0 k

Vertical Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.44 M	25.24	12.736	-26.349	40.00	-14.76	250	1.07	100 k
172.88 M	33.29	11.127	-25.227	43.50	-10.21	90	1.14	100 k
183.82 M	36.30	10.524	-25.132	43.50	-7.20	68	1.08	100 k
338.94 M	24.55	14.536	-25.686	46.00	-21.45	80	1.70	100 k
416.04 M	28.71	16.258	-25.893	46.00	-17.29	70	1.66	100 k
774.08 M	32.39	22.482	-25.120	46.00	-13.61	349	1.57	100 k

Horizontal Ch6 1MB/s



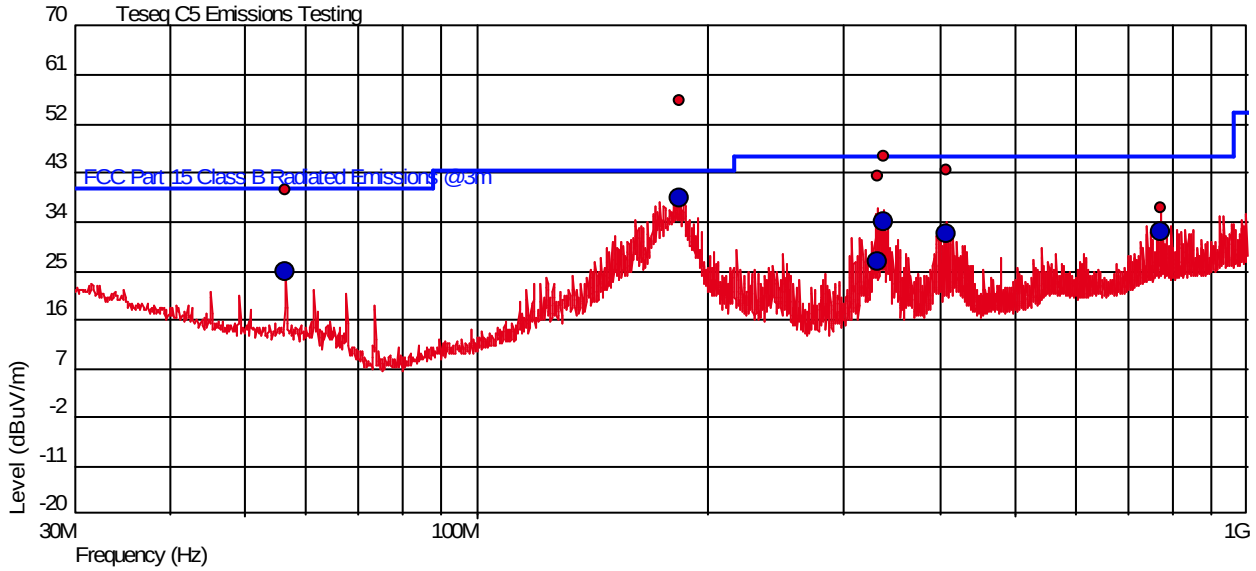
Horizontal Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
183.9 M	25.27	10.678	-25.131	1.87	92.00	78.10	-52.83	100.0 k
193.36 M	23.83	11.436	-25.053	1.07	232.00	78.10	-54.27	100.0 k
331.32 M	36.99	14.626	-25.655	1.11	138.00	78.10	-41.11	100.0 k
728.04 M	33.57	21.839	-25.384	1.35	243.00	78.10	-44.54	100.0 k

Horizontal Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
183.9 M	20.12	10.678	-25.131	43.50	-23.38	92	1.87	100 k
193.36 M	17.26	11.436	-25.053	43.50	-26.24	232	1.07	100 k
331.32 M	30.88	14.626	-25.655	46.00	-15.12	138	1.11	100 k
728.04 M	31.56	21.839	-25.384	46.00	-14.44	243	1.35	100 k

Vertical Ch6 54MB/s



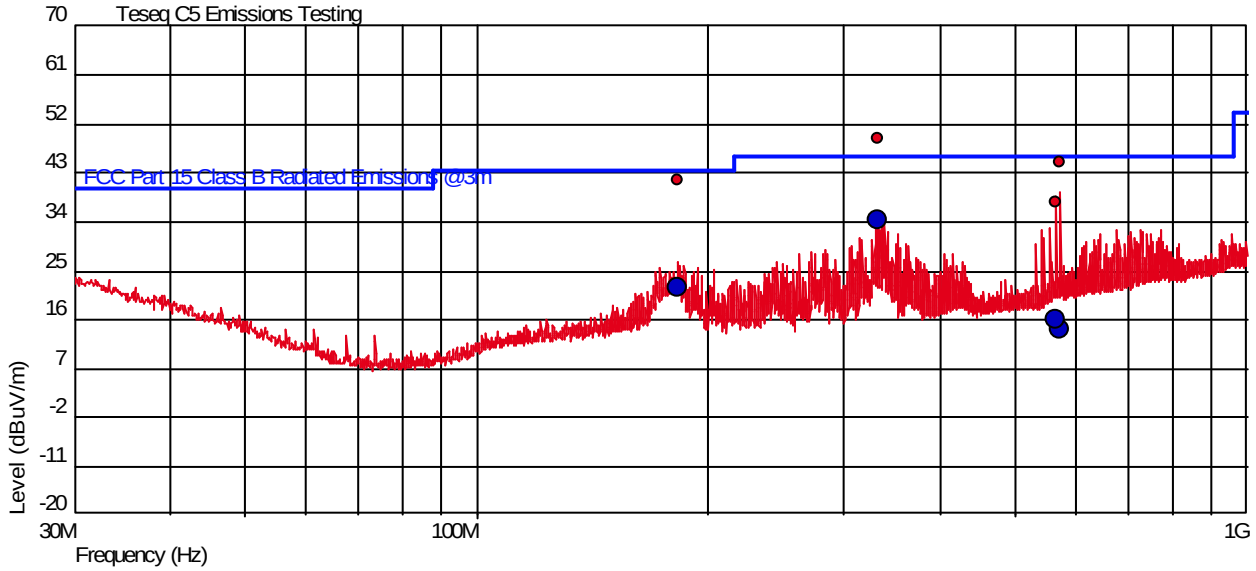
Vertical Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.44 M	26.09	12.736	-26.349	1.16	274.00	72.21	-46.12	100.0 k
183.72 M	41.84	10.526	-25.133	1.07	127.00	72.21	-30.37	100.0 k
331.04 M	30.74	14.062	-25.654	1.81	75.00	72.21	-41.47	100.0 k
338.58 M	35.03	14.515	-25.685	1.64	79.00	72.21	-37.18	100.0 k
406.3 M	33.79	16.352	-25.897	1.18	110.00	72.21	-38.43	100.0 k
774.08 M	33.88	22.482	-25.120	1.65	344.00	72.21	-38.33	100.0 k

Vertical Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.44 M	24.91	12.736	-26.349	40.00	-15.09	274	1.16	100 k
183.72 M	38.49	10.526	-25.133	43.50	-5.01	127	1.07	100 k
331.04 M	26.58	14.062	-25.654	46.00	-19.42	75	1.81	100 k
338.58 M	33.81	14.515	-25.685	46.00	-12.19	79	1.64	100 k
406.3 M	31.93	16.352	-25.897	46.00	-14.07	110	1.18	100 k
774.08 M	32.29	22.482	-25.120	46.00	-13.71	344	1.65	100 k

Horizontal Ch6 54MB/s



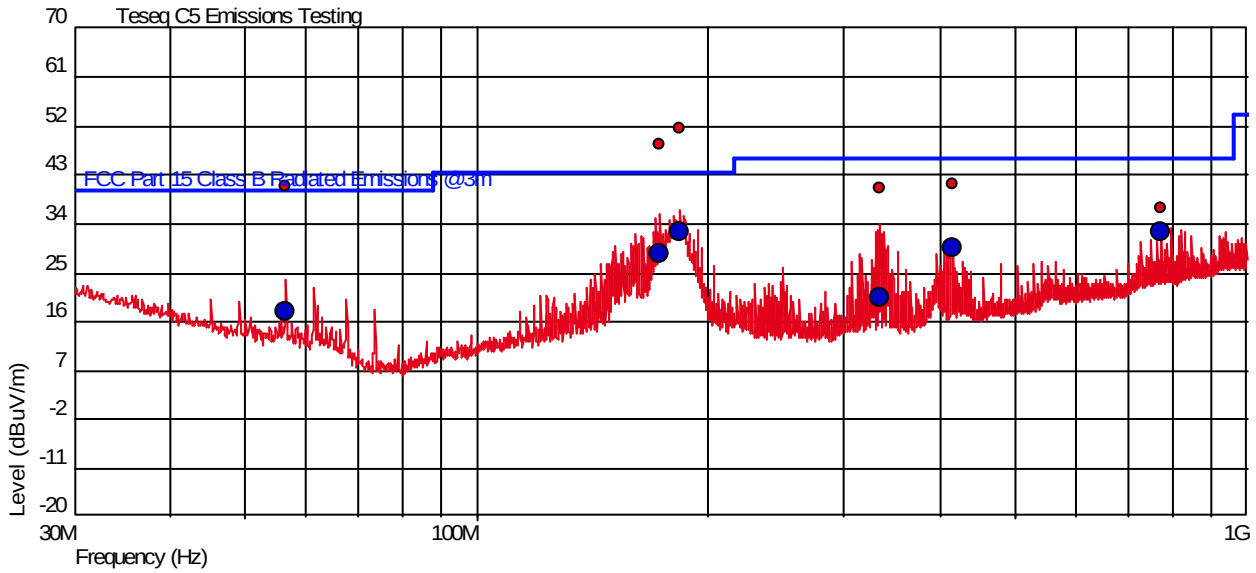
Horizontal Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
182.58 M	27.04	10.652	-25.142	1.89	231.00	72.21	-45.17	100.0 k
331.36 M	38.47	14.627	-25.655	1.11	131.00	72.21	-33.74	100.0 k
565.177853 M	31.49	19.704	-25.980	1.25	303.00	72.21	-40.72	100.0 k
572.225844 M	38.70	19.889	-25.984	3.27	142.00	72.21	-33.52	100.0 k

Horizontal Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
182.58 M	21.92	10.652	-25.142	43.50	-21.58	231	1.89	100 k
331.36 M	34.28	14.627	-25.655	46.00	-11.72	131	1.11	100 k
565.177853 M	15.99	19.704	-25.980	46.00	-30.01	303	1.25	100 k
572.225844 M	14.15	19.889	-25.984	46.00	-31.85	142	3.27	100 k

Vertical Ch11 1MB/s



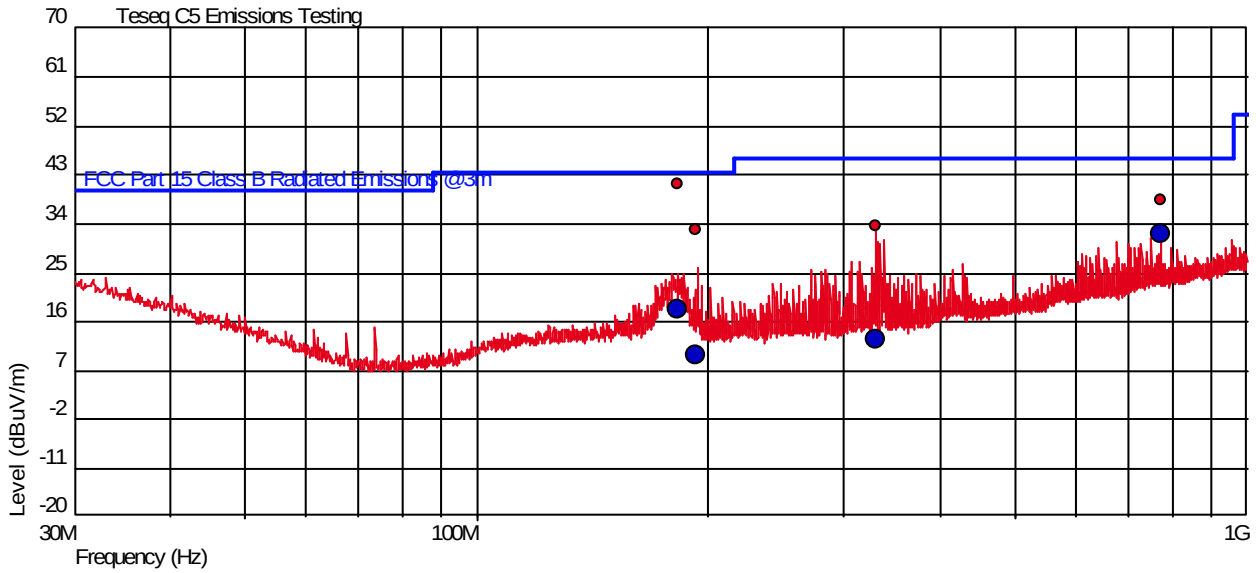
Vertical Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.44 M	27.32	12.736	-26.349	2.80	263.00	78.10	-50.78	100.0 k
172.78 M	34.52	11.133	-25.228	1.08	96.00	78.10	-43.59	100.0 k
183.3 M	36.94	10.534	-25.136	1.08	8.00	78.10	-41.16	100.0 k
333.56 M	29.11	14.214	-25.664	1.66	47.00	78.10	-48.99	100.0 k
416.02 M	31.49	16.259	-25.893	1.37	108.00	78.10	-46.61	100.0 k
774.08 M	34.35	22.482	-25.120	1.56	345.00	78.10	-43.75	100.0 k

Vertical Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.44 M	18.05	12.736	-26.349	40.00	-21.95	263	2.80	100 k
172.78 M	28.57	11.133	-25.228	43.50	-14.93	96	1.08	100 k
183.3 M	32.37	10.534	-25.136	43.50	-11.13	8	1.08	100 k
333.56 M	20.49	14.214	-25.664	46.00	-25.51	47	1.66	100 k
416.02 M	29.44	16.259	-25.893	46.00	-16.56	108	1.37	100 k
774.08 M	32.34	22.482	-25.120	46.00	-13.66	345	1.56	100 k

Horizontal Ch11 1MB/s



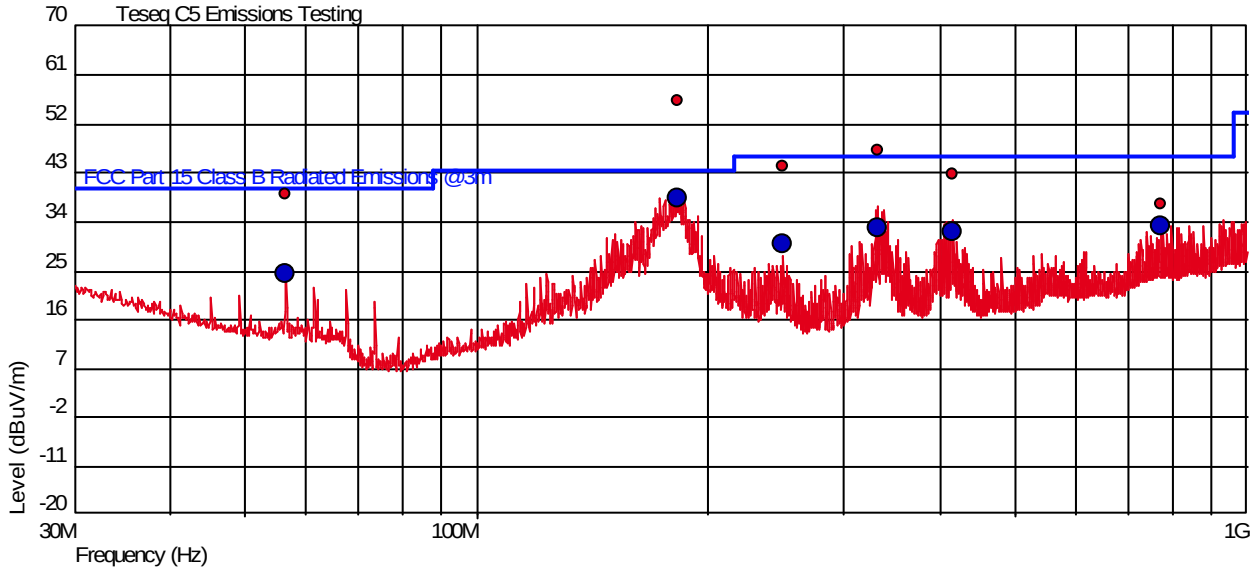
Horizontal Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
182.62 M	26.74	10.652	-25.142	2.14	244.00	78.10	-51.36	100.0 k
193.08 M	19.23	11.408	-25.055	1.73	223.00	78.10	-58.87	100.0 k
329.38 M	22.43	14.600	-25.647	1.19	114.00	78.10	-55.67	100.0 k
774.04 M	35.56	22.300	-25.120	1.26	254.00	78.10	-42.54	100.0 k

Horizontal Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
182.62 M	18.18	10.652	-25.142	43.50	-25.32	244	2.14	100 k
193.08 M	9.66	11.408	-25.055	43.50	-33.84	223	1.73	100 k
329.38 M	12.92	14.600	-25.647	46.00	-33.08	114	1.19	100 k
774.04 M	32.01	22.300	-25.120	46.00	-13.99	254	1.26	100 k

Vertical Ch11 54MB/s



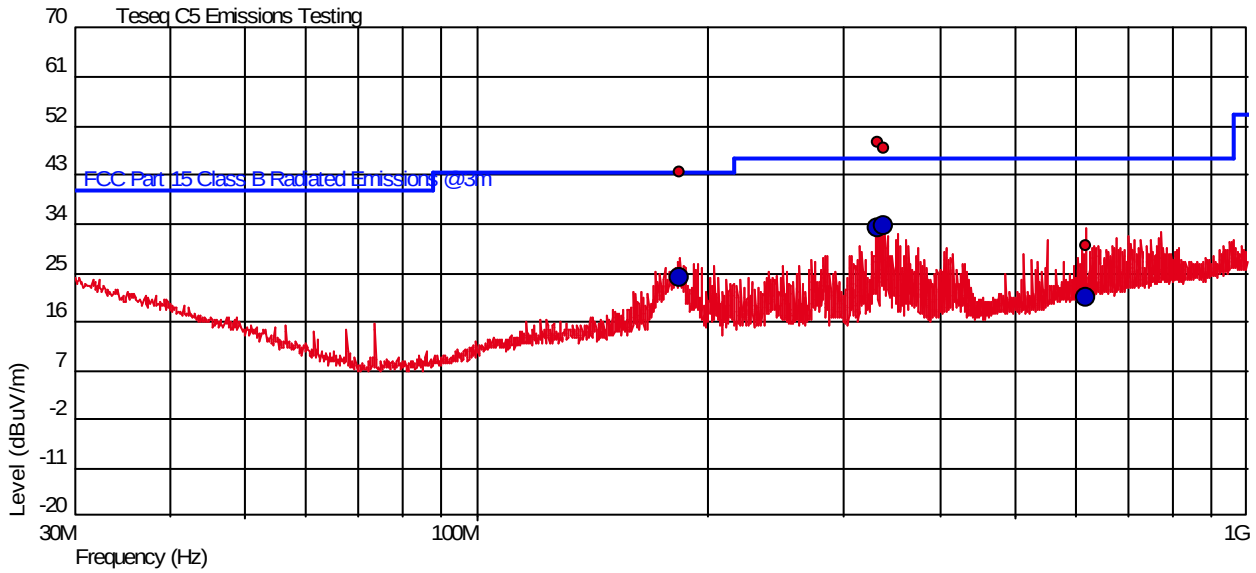
Vertical Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
56.44 M	25.65	12.736	-26.349	1.09	261.00	72.21	-46.56	100.0 k
182.62 M	41.77	10.548	-25.142	1.07	25.00	72.21	-30.44	100.0 k
250.28 M	31.80	12.922	-25.352	1.07	45.00	72.21	-40.41	100.0 k
331.48 M	35.39	14.089	-25.656	1.86	76.00	72.21	-36.82	100.0 k
416.02 M	33.28	16.259	-25.893	1.44	110.00	72.21	-38.93	100.0 k
774.04 M	34.79	22.481	-25.120	1.62	348.00	72.21	-37.42	100.0 k

Vertical Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
56.44 M	24.50	12.736	-26.349	40.00	-15.50	261	1.09	100 k
182.62 M	38.23	10.548	-25.142	43.50	-5.27	25	1.07	100 k
250.28 M	29.82	12.922	-25.352	46.00	-16.18	45	1.07	100 k
331.48 M	33.04	14.089	-25.656	46.00	-12.96	76	1.86	100 k
416.02 M	32.10	16.259	-25.893	46.00	-13.90	110	1.44	100 k
774.04 M	33.12	22.481	-25.120	46.00	-12.88	348	1.62	100 k

Horizontal Ch11 54MB/s



Horizontal Peak Measured

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Height(m)	Angle(Deg)	Limit(dBuV/m)	Margin(dBuV/m)	RBW(Hz)
183.74 M	29.00	10.675	-25.132	2.18	56.00	72.21	-43.21	100.0 k
331.36 M	37.75	14.627	-25.655	1.08	140.00	72.21	-34.46	100.0 k
338.62 M	36.95	14.772	-25.685	1.10	127.00	72.21	-35.26	100.0 k
616.735468 M	24.07	20.000	-25.943	1.53	200.00	72.21	-48.14	100.0 k

Horizontal Measured: QP

Frequency(Hz)	Level(dBuV/m)	Ant. Fact.	Other Fact.	Limit(dBuV/m)	Margin(dBuV/m)	Angle(Deg)	Mast Height(m)	RBW(Hz)
183.74 M	24.06	10.675	-25.132	43.50	-19.44	56	2.18	100 k
331.36 M	33.22	14.627	-25.655	46.00	-12.78	140	1.08	100 k
338.62 M	33.76	14.772	-25.685	46.00	-12.24	127	1.10	100 k
616.735468 M	20.35	20.000	-25.943	46.00	-25.65	200	1.53	100 k

Radiated Emissions

Company:	topsystem Systemhaus GmbH			Antenna & Cables:	HF	Bands: N, LF, HF, SHF	
Model #:	VOXter 1006 Series WL-BT			Antenna:	HORN3 V3m 3-03-09.txt	HORN3 H3m 3-03-09.txt	
Serial #:	09240287			Cable(s):	MEG005 12-10-2009.txt	NONE.	
Engineers:	Nicholas Abbondante	Location:	Site 2	Barometer:	DAV002	Filter:	NONE
Project #:	3192580	Date(s):	10/13-15/2009				
Standard:	FCC Part 15 Subpart C 15.247/IC RSS-210 Annex 8			Temp/Humidity/Pressure:	20c	46%	1007mB
Receiver:	R&S FSEK-30 (ROS001)	Limit Distance (m):	3				
PreAmp:	PRE9 04-03-10.txt	Test Distance (m):	3				

PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 3.7V Battery Frequency Range: 1-4 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 802.11b (1MB/s) SMU 80%													
PK	V	2412.000	65.64	28.42	3.06	0.00	0.00	97.12	-	-	100/300 kHz		
PK	V	2437.000	66.55	28.47	3.07	0.00	0.00	98.10	-	-	100/300 kHz		
PK	V	2462.000	65.89	28.52	3.09	0.00	0.00	97.51	-	-	100/300 kHz		
Note: 802.11g (54MB/s) SMU 80%													
PK	V	2412.000	60.73	28.42	3.06	0.00	0.00	92.21	-	-	100/300 kHz		
PK	V	2437.000	61.41	28.47	3.07	0.00	0.00	92.96	-	-	100/300 kHz		
PK	V	2462.000	62.98	28.52	3.09	0.00	0.00	94.60	-	-	100/300 kHz		

Notes: No emissions above the instrumentation noise floor other than the fundamental were observed in the range from 1-4 GHz.

Radiated Emissions

Company: topsystem Systemhaus GmbH
Model #: VOXter 1006 Series WL-BT
Serial #: 09240287
Engineers: Nicholas Abbondante
Project #: 3192580
Standard: FCC Part 15 Subpart C 15.247/IC RSS-210 Annex 8
Receiver: R&S FSEK-30 (ROS001)
PreAmp: PRE9 04-03-10.txt

Date(s): 10/13/09 10/28/09 10/29/09
Location: Site 2
Limit Distance (m): 3
Test Distance (m): 3

Antenna & Cables: LF Bands: N, LF, HF, SHF
Antenna: HORN3 V3m 3-03-09.txt HORN3 H3m 3-03-09.txt
Cable(s): MEG005 12-10-2009.txt CBL030 12-10-09.txt
Barometer: DAV002 Filter: REA004
Temp/Humidity/Pressure: 21c 58% 1007mB

PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 3.7V Battery Frequency Range: Frequencies Shown

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 802.11b (1MB/s)													
PK	V	4824.000	44.94	33.54	6.32	28.09	0.00	56.71	74.00	-17.29	1/3 MHz	RB	RB
AVG	V	4824.000	41.48	33.54	6.32	28.09	0.00	53.25	54.00	-0.75	1/3 MHz	RB	RB
PK	H	4824.000	44.22	33.44	6.32	28.09	0.00	55.90	74.00	-18.10	1/3 MHz	RB	RB
AVG	H	4824.000	38.44	33.44	6.32	28.09	0.00	50.12	54.00	-3.88	1/3 MHz	RB	RB
PK	V	7236.000	27.80	36.07	8.04	27.30	0.00	44.61	78.10	-33.49	100/300 kHz		
PK	V	9648.000	29.82	39.46	9.47	26.43	0.00	52.32	78.10	-25.78	100/300 kHz		
PK	V	12060.000	35.88	39.14	10.78	26.34	0.00	59.46	74.00	-14.54	1/3 MHz	RB	RB
AVG	V	12060.000	24.28	39.14	10.78	26.34	0.00	47.86	54.00	-6.14	1/3 MHz	RB	RB
PK	V	14472.000	36.73	43.12	12.26	26.39	0.00	65.72	74.00	-8.28	1/3 MHz	RB	RB
AVG	V	14472.000	23.85	43.12	12.26	26.39	0.00	52.84	54.00	-1.16	1/3 MHz	RB	RB
PK	V	16884.000	26.09	40.54	13.65	27.27	0.00	53.01	78.10	-25.09	100/300 kHz		
PK	V	4874.000	42.88	33.70	6.36	28.09	0.00	54.84	74.00	-19.16	1/3 MHz	RB	RB
AVG	V	4874.000	38.54	33.70	6.36	28.09	0.00	50.50	54.00	-3.50	1/3 MHz	RB	RB
PK	V	7311.000	37.50	36.25	8.10	27.27	0.00	54.57	74.00	-19.43	1/3 MHz	RB	RB
AVG	V	7311.000	25.34	36.25	8.10	27.27	0.00	42.41	54.00	-11.59	1/3 MHz	RB	RB
PK	V	9748.000	29.93	39.70	9.53	26.39	0.00	52.77	78.10	-25.33	100/300 kHz		
PK	V	12185.000	36.20	39.02	10.84	26.34	0.00	59.71	74.00	-14.29	1/3 MHz	RB	RB
AVG	V	12185.000	26.71	39.02	10.84	26.34	0.00	50.22	54.00	-3.78	1/3 MHz	RB	RB
PK	V	14622.000	26.27	43.13	12.35	26.39	0.00	55.36	78.10	-22.74	100/300 kHz		
PK	V	17059.000	26.72	41.57	13.74	27.35	0.00	54.69	78.10	-23.41	100/300 kHz		
PK	H	4924.000	40.71	33.70	6.39	28.09	0.00	52.71	74.00	-21.29	1/3 MHz	RB	RB
AVG	H	4924.000	37.09	33.70	6.39	28.09	0.00	49.09	54.00	-4.91	1/3 MHz	RB	RB
PK	V	7386.000	37.88	36.43	8.15	27.24	0.00	55.22	74.00	-18.78	1/3 MHz	RB	RB
AVG	V	7386.000	26.39	36.43	8.15	27.24	0.00	43.73	54.00	-10.27	1/3 MHz	RB	RB
PK	V	9848.000	29.60	39.94	9.60	26.35	0.00	52.78	78.10	-25.32	100/300 kHz		
PK	V	12310.000	36.10	38.89	10.89	26.35	0.00	59.54	74.00	-14.46	1/3 MHz	RB	RB
AVG	V	12310.000	23.70	38.89	10.89	26.35	0.00	47.14	54.00	-6.86	1/3 MHz	RB	RB
PK	V	14772.000	26.25	43.04	12.44	26.40	0.00	55.33	78.10	-22.77	100/300 kHz		
PK	V	17234.000	26.46	42.97	13.85	27.43	0.00	55.85	78.10	-22.25	100/300 kHz		
Note: 802.11g (54MB/s)													
PK	V	4824.000	42.47	33.54	6.32	28.09	0.00	54.24	74.00	-19.76	1/3 MHz	RB	RB
AVG	V	4824.000	33.68	33.54	6.32	28.09	0.00	45.45	54.00	-8.55	1/3 MHz	RB	RB
PK	V	7236.000	27.85	36.07	8.04	27.30	0.00	44.66	72.21	-27.55	100/300 kHz		
PK	V	9648.000	25.76	39.46	9.47	26.43	0.00	48.26	72.21	-23.95	100/300 kHz		
PK	V	12060.000	36.63	39.14	10.78	26.34	0.00	60.21	74.00	-13.79	1/3 MHz	RB	RB
AVG	V	12060.000	24.69	39.14	10.78	26.34	0.00	48.27	54.00	-5.73	1/3 MHz	RB	RB
PK	V	14472.000	36.10	43.12	12.26	26.39	0.00	65.09	74.00	-8.91	1/3 MHz	RB	RB
AVG	V	14472.000	24.56	43.12	12.26	26.39	0.00	53.55	54.00	-0.45	1/3 MHz	RB	RB
PK	V	16884.000	26.93	40.54	13.65	27.27	0.00	53.85	72.21	-18.36	100/300 kHz		
PK	V	4874.000	40.82	33.70	6.36	28.09	0.00	52.78	74.00	-21.22	1/3 MHz	RB	RB
AVG	V	4874.000	32.68	33.70	6.36	28.09	0.00	44.64	54.00	-9.36	1/3 MHz	RB	RB
PK	V	7311.000	37.99	36.25	8.10	27.27	0.00	55.06	74.00	-18.94	1/3 MHz	RB	RB
AVG	V	7311.000	26.71	36.25	8.10	27.27	0.00	43.78	54.00	-10.22	1/3 MHz	RB	RB
PK	V	9748.000	26.64	39.70	9.53	26.39	0.00	49.48	72.21	-22.73	100/300 kHz		
PK	V	12185.000	36.00	39.02	10.84	26.34	0.00	59.51	74.00	-14.49	1/3 MHz	RB	RB
AVG	V	12185.000	24.28	39.02	10.84	26.34	0.00	47.79	54.00	-6.21	1/3 MHz	RB	RB
PK	V	14622.000	26.74	43.13	12.35	26.39	0.00	55.83	72.21	-16.38	100/300 kHz		
PK	V	17059.000	26.72	41.57	13.74	27.35	0.00	54.69	72.21	-17.52	100/300 kHz		
PK	H	4924.000	39.74	33.70	6.39	28.09	0.00	51.74	74.00	-22.26	1/3 MHz	RB	RB
AVG	H	4924.000	30.51	33.70	6.39	28.09	0.00	42.51	54.00	-11.49	1/3 MHz	RB	RB
PK	V	7386.000	38.07	36.43	8.15	27.24	0.00	55.41	74.00	-18.59	1/3 MHz	RB	RB
AVG	V	7386.000	26.60	36.43	8.15	27.24	0.00	43.94	54.00	-10.06	1/3 MHz	RB	RB
PK	V	9848.000	26.64	39.94	9.60	26.35	0.00	49.82	72.21	-22.39	100/300 kHz		
PK	V	12310.000	36.61	38.89	10.89	26.35	0.00	60.05	74.00	-13.95	1/3 MHz	RB	RB
AVG	V	12310.000	24.83	38.89	10.89	26.35	0.00	48.27	54.00	-5.73	1/3 MHz	RB	RB
PK	V	14772.000	26.28	43.04	12.44	26.40	0.00	55.36	72.21	-16.85	100/300 kHz		
PK	V	17234.000	26.60	42.97	13.85	27.43	0.00	55.99	72.21	-16.22	100/300 kHz		

Special Radiated Emissions

Company: topsystem Systemhaus GmbH
Model #: VOXter 1006 Series WL-BT
Serial #: 09240287
Engineers: Nicholas Abbondante Location: Site 2
Project #: 3192580 Date(s): 10/28/09
Standard: FCC Part 15 Subpart C 15.247/IC RSS-210 Annex 8
Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3
PreAmp: PRE9 04-03-10.txt Test Distance (m): 3

Antenna & Cables: SHF Bands: N, LF, HF, SHF
Antenna: EMC04 V1m 01-27-2010.txt EMC04 H1m 01-27-2010.txt
Cable(s): CBL030 12-10-09.txt MEG003 05-26-10.txt
Barometer: DAV002 Filter: REA006
Temp/Humidity/Pressure: 21c 58% 1007mB

PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 3.7V Battery Frequency Range: 18-25 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

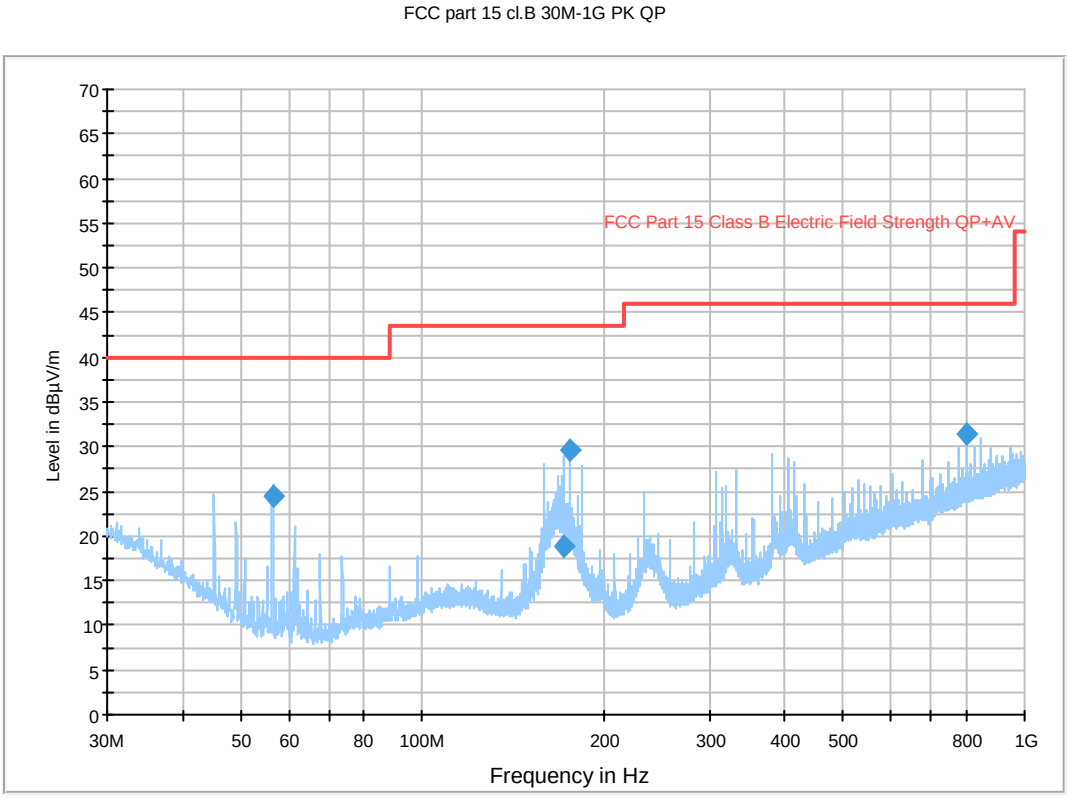
Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: Measurements are of instrumentation noise floor													
Note: 802.11b 1 MB/s													
PK	V	19296.000	33.12	45.55	8.87	28.38	0.00	59.17	74.00	-14.83	1/3 MHz	RB	RB
AVG	V	19296.000	23.54	45.55	8.87	28.38	0.00	49.59	54.00	-4.41	1/3 MHz	RB	RB
PK	V	21708.000	24.96	45.77	9.67	29.07	0.00	51.32	78.10	-26.78	100/300 kHz		
PK	V	24120.000	22.70	45.80	10.40	29.59	0.00	49.30	78.10	-28.80	100/300 kHz		
PK	V	19496.000	34.51	45.68	8.96	28.47	0.00	60.68	74.00	-13.32	1/3 MHz	RB	RB
AVG	V	19496.000	24.83	45.68	8.96	28.47	0.00	51.00	54.00	-3.00	1/3 MHz	RB	RB
PK	V	21933.000	24.04	45.68	9.74	29.12	0.00	50.35	78.10	-27.75	100/300 kHz		
PK	V	24370.000	24.95	46.02	10.49	29.65	0.00	51.81	78.10	-26.29	100/300 kHz		
PK	V	19696.000	33.26	45.67	9.05	28.56	0.00	59.42	74.00	-14.58	1/3 MHz	RB	RB
AVG	V	19696.000	23.40	45.67	9.05	28.56	0.00	49.56	54.00	-4.44	1/3 MHz	RB	RB
PK	V	22158.000	33.25	45.69	9.83	29.17	0.00	59.61	74.00	-14.39	1/3 MHz	RB	RB
AVG	V	22158.000	23.40	45.69	9.83	29.17	0.00	49.76	54.00	-4.24	1/3 MHz	RB	RB
PK	V	24620.000	23.50	46.22	10.57	29.70	0.00	50.59	78.10	-27.51	100/300 kHz		
Note: 802.11g 54 MB/s													
PK	V	19296.000	34.58	45.55	8.87	28.38	0.00	60.63	74.00	-13.37	1/3 MHz	RB	RB
AVG	V	19296.000	24.42	45.55	8.87	28.38	0.00	50.47	54.00	-3.53	1/3 MHz	RB	RB
PK	V	21708.000	23.81	45.77	9.67	29.07	0.00	50.17	72.21	-22.04	100/300 kHz		
PK	V	24120.000	23.31	45.80	10.40	29.59	0.00	49.91	72.21	-22.30	100/300 kHz		
PK	V	19496.000	33.69	45.68	8.96	28.47	0.00	59.86	74.00	-14.14	1/3 MHz	RB	RB
AVG	V	19496.000	24.14	45.68	8.96	28.47	0.00	50.31	54.00	-3.69	1/3 MHz	RB	RB
PK	V	21933.000	23.89	45.68	9.74	29.12	0.00	50.20	72.21	-22.01	100/300 kHz		
PK	V	24370.000	24.36	46.02	10.49	29.65	0.00	51.22	72.21	-20.99	100/300 kHz		
PK	V	19696.000	33.48	45.67	9.05	28.56	0.00	59.64	74.00	-14.36	1/3 MHz	RB	RB
AVG	V	19696.000	24.56	45.67	9.05	28.56	0.00	50.72	54.00	-3.28	1/3 MHz	RB	RB
PK	V	22158.000	32.92	45.69	9.83	29.17	0.00	59.28	74.00	-14.72	1/3 MHz	RB	RB
AVG	V	22158.000	23.85	45.69	9.83	29.17	0.00	50.21	54.00	-3.79	1/3 MHz	RB	RB
PK	V	24620.000	24.47	46.22	10.57	29.70	0.00	51.56	72.21	-20.65	100/300 kHz		

Receiver Radiated Emissions

Hardware Setup: EMI radiated\EMI_HL562_3m - [EMI radiated]

Subrange 1

Frequency Range:	30 MHz - 1 GHz
Receiver:	ESIB 26 [ESIB 26] @ GPIB0 (ADR 23), SN 100150/026, FW 4.33
Signal Path:	ESIB 26-HL562 FW 1.0
Antenna:	HL562 Correction Table (vertical): BiLog HL562 Correction Table (horizontal): BiLog HL562 Correction Table: EMI-W30.08 HL562
Antenna Tower:	Inn-Co Mast [Inn-Co Antenna Tower] @ GPIB0 (ADR 15)
Turntable:	Inn-Co Turntable [Inn-Co Turntable] @ GPIB0 (ADR 15)



The FCC Part 15 Subpart B limits are identical to the RSS-Gen Table 1 limits.

Common Information

Test Description:	Radiated Emissions Receive Mode 30-1000 MHz
Test Site:	Kaufbeuren Kammer 1
Test Standard:	IC RSS-Gen
Operator Name:	Nick Abbondante
Comment:	

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
56.435000	24.5	1000.00	120.000	233.0	V	-6.0	5.9	15.5	40.0
171.440000	18.8	1000.00	120.000	120.0	V	270.0	8.5	24.7	43.5
176.005000	29.7	1000.00	120.000	100.0	V	147.0	8.9	13.8	43.5
798.660000	31.4	1000.00	120.000	135.0	V	184.0	21.6	14.6	46.0

Receiver Radiated Emissions

Company:	topsystem Systemhaus GmbH		Antenna & Cables:	LF	Bands: N, LF, HF, SHF
Model #:	VOXter 1006 Series WL-BT		Antenna:	HORN3 V3m 3-03-09.txt	HORN3 H3m 3-03-09.txt
Serial #:	09240287		Cable(s):	MEG005 12-10-2009.txt	CBL030 12-10-09.txt
Engineers:	Nicholas Abbondante	Location: Site 2	Barometer:	DAV002	Filter: NONE
Project #:	3192580	Date(s): 11/09/09			
Standard:	IC RSS-Gen Table 1		Temp/Humidity/Pressure:	22c	41% 1013mB
Receiver:	R&S FSEK-30 (ROS001)	Limit Distance (m): 3			
PreAmp:	PRE9 04-03-10.txt	Test Distance (m): 3			

PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 3.7V Battery Frequency Range: 1-12.5 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
PK	V	1248.496	40.32	24.85	2.91	27.82	0.00	40.26	74.00	-33.74	1/3 MHz		RB
AVG	V	1248.496	35.73	24.85	2.91	27.82	0.00	35.67	54.00	-18.33	1/3 MHz		RB
PK	V	1609.218	41.18	26.04	3.37	27.85	0.00	42.74	74.00	-31.26	1/3 MHz	RB	RB
AVG	V	1609.218	35.07	26.04	3.37	27.85	0.00	36.63	54.00	-17.37	1/3 MHz	RB	RB
PK	V	3216.433	38.82	30.52	5.13	27.97	0.00	46.50	74.00	-27.50	1/3 MHz		
AVG	V	3216.433	31.61	30.52	5.13	27.97	0.00	39.29	54.00	-14.71	1/3 MHz		
PK	V	12097.695	32.65	39.10	10.79	26.34	0.00	56.21	74.00	-17.79	1/3 MHz	RB	RB
AVG	V	12097.695	23.26	39.10	10.79	26.34	0.00	46.82	54.00	-7.18	1/3 MHz	RB	RB

Radiated Emissions Setup Photos

30-1000 MHz

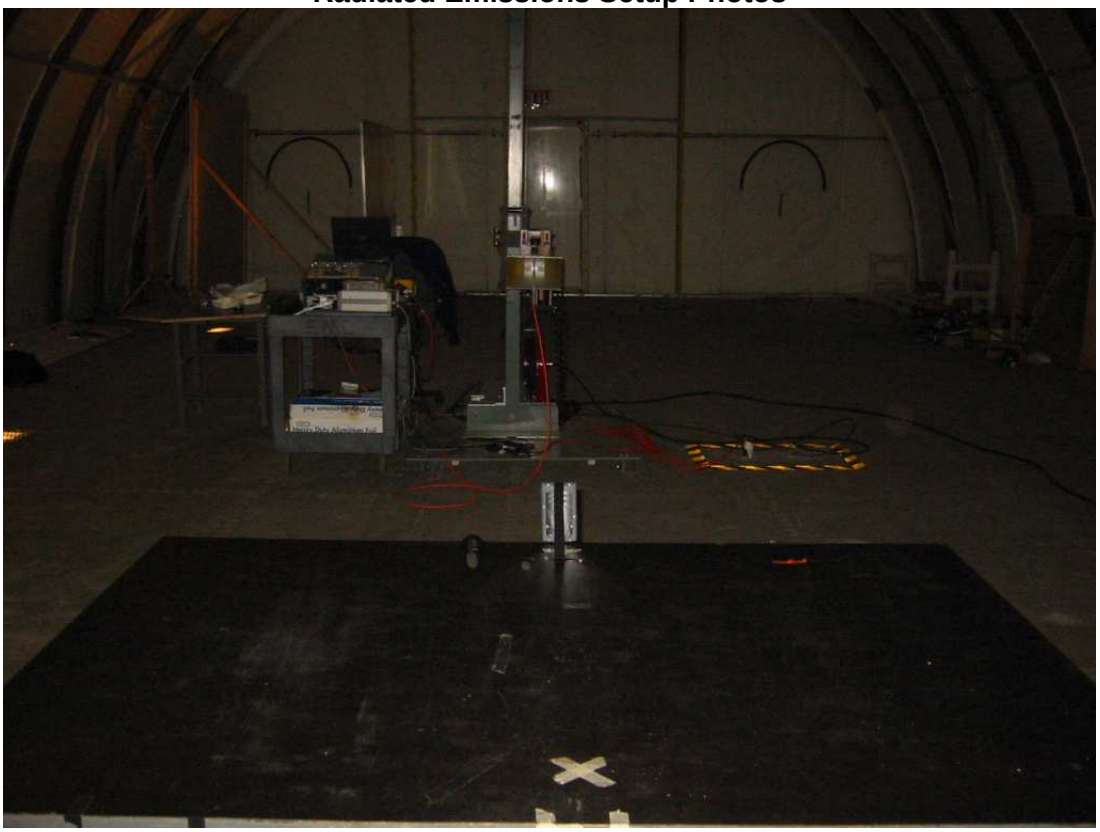
Radiated Emissions Setup Photos

30-1000 MHz

Radiated Emissions Setup Photos

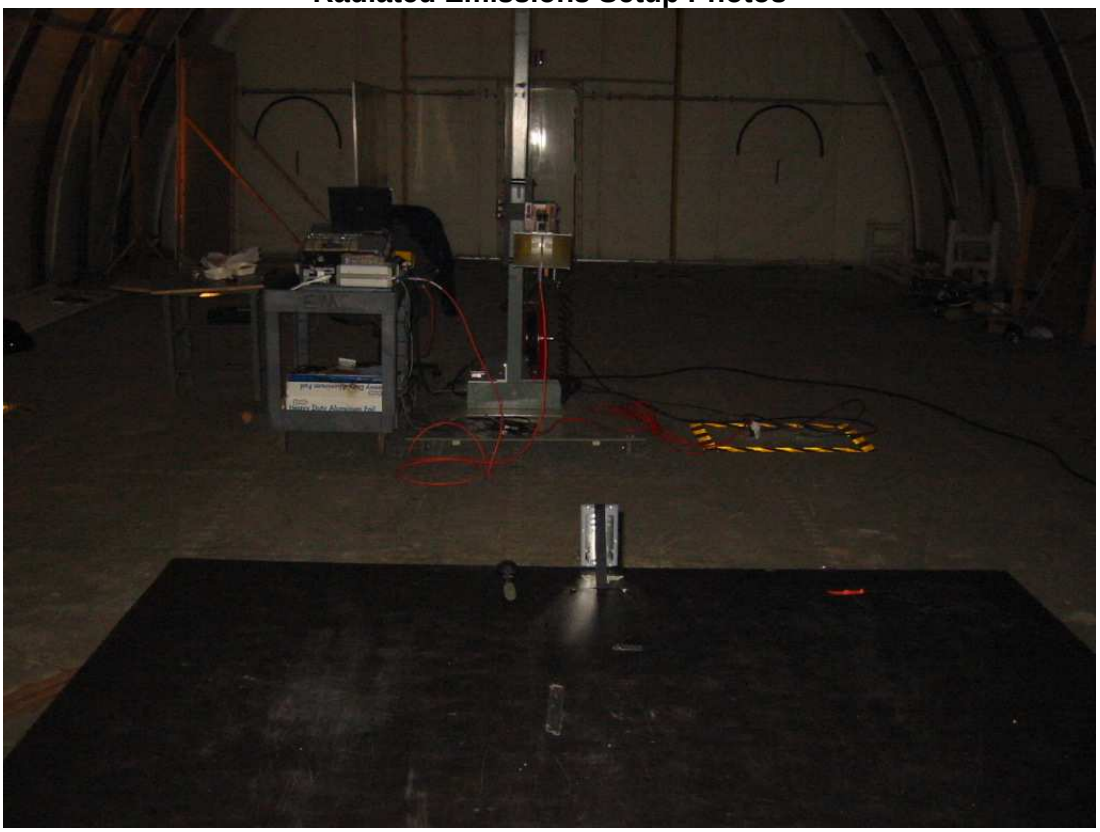
1-4 GHz

Radiated Emissions Setup Photos



1-4 GHz

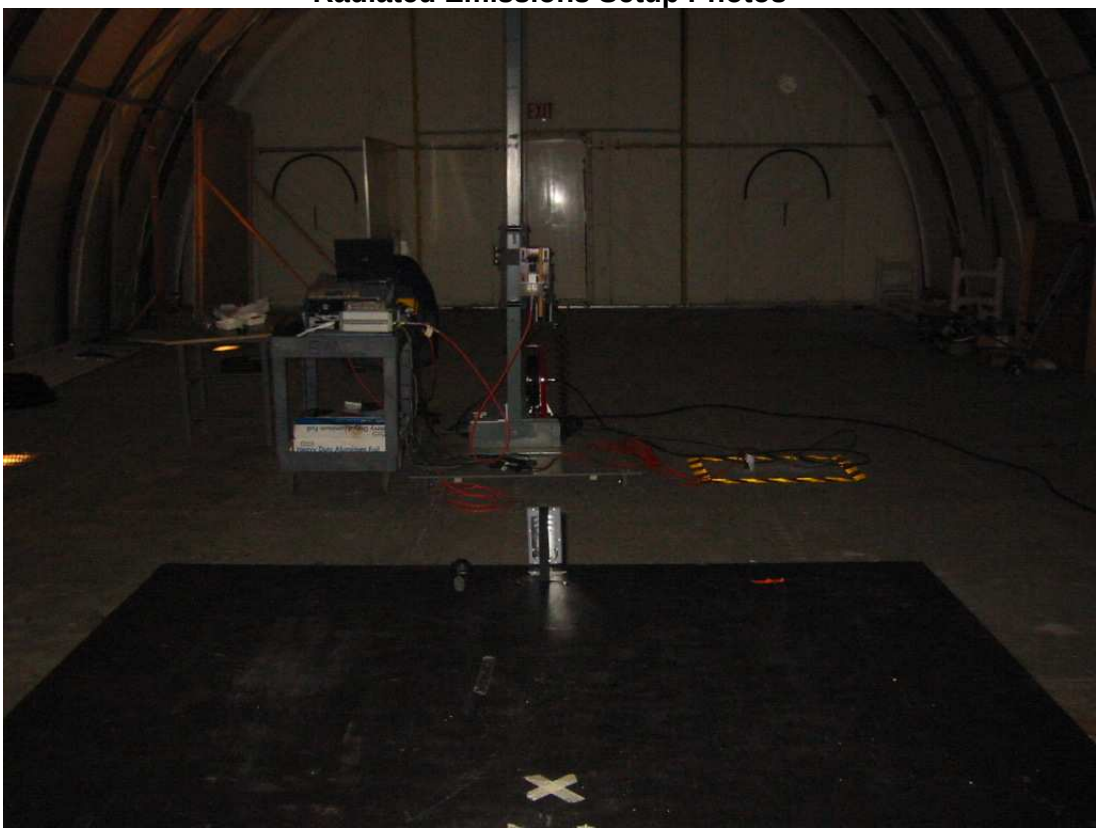
Radiated Emissions Setup Photos



4-18 GHz

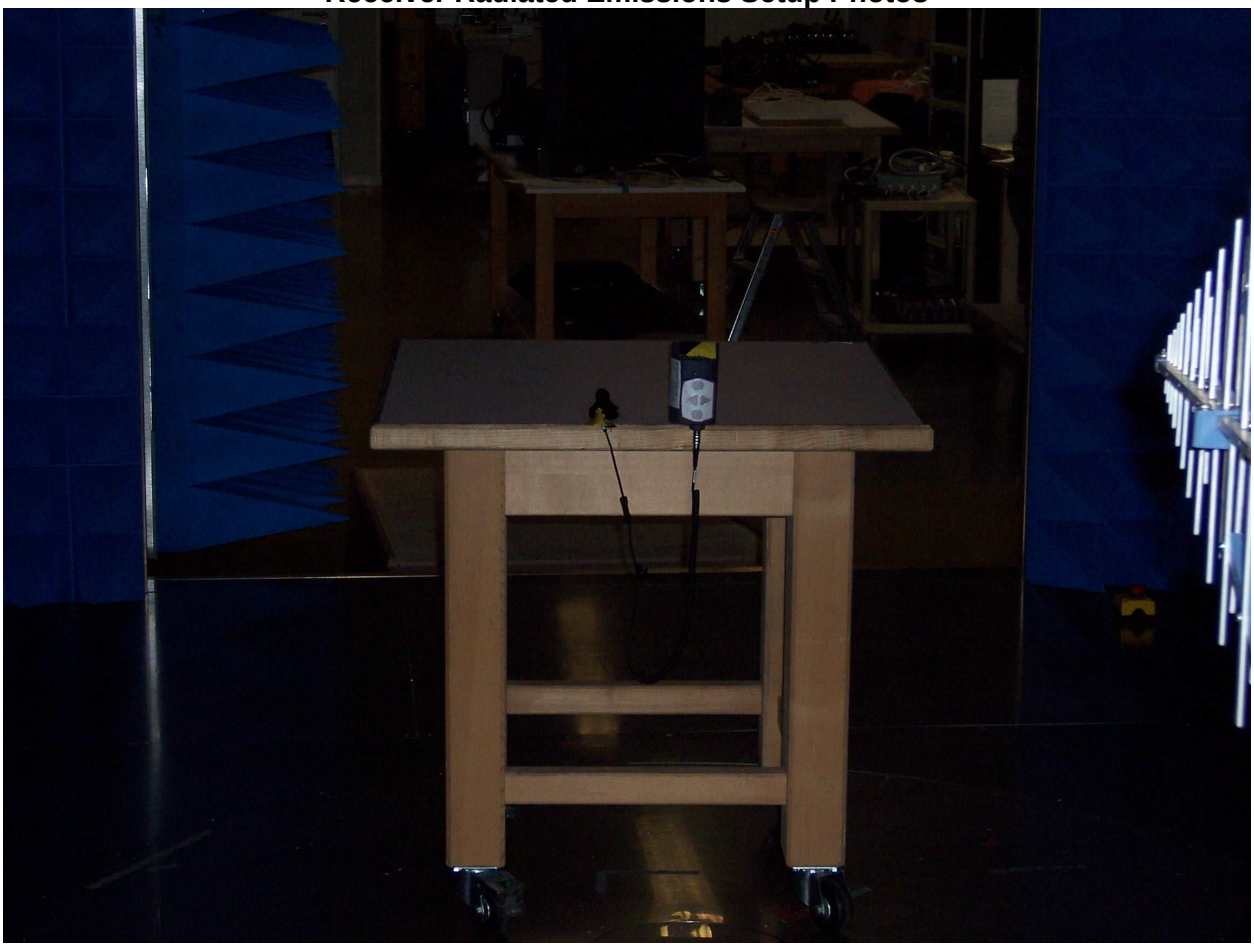
4-18 GHz

18-25 GHz

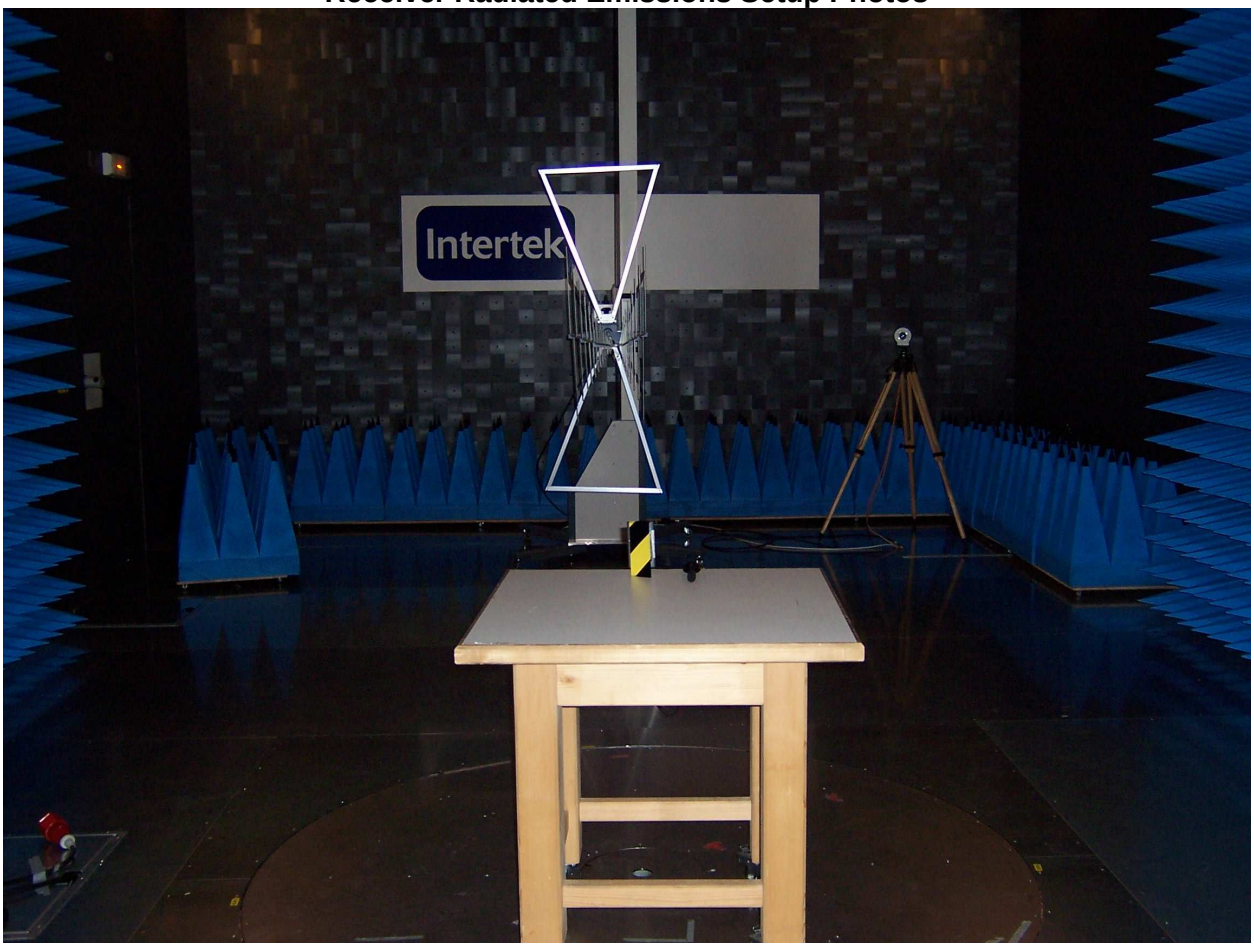


18-25 GHz

Receiver Radiated Emissions Setup Photos



Receiver Radiated Emissions Setup Photos



Receiver Radiated Emissions Setup Photos

Receiver Radiated Emissions Setup Photos