TEST REPORT

Report Number: 100457282DEN-001
Project Number: G100457282

Report Issue Date: 7/31/2011

Product Designation: **Model DE50**

Standards: FCC 47 CFR Part 15.247
IC RSS 210: Issue 8:2010
IC RSS-GEN Issue 3:2010

Tested by:
Intertek Testing Services NA, Inc.
1795 Dogwood St. Suite 200
Louisville, CO 80027

Client:
Echostar Corporation dba
EchoStar Technologies LLC
90 Inverness Circle East
Englewood, CO 80112

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TABLE OF CONTENTS

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded **the product tested complies with the requirements of the standard(s) indicated**. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

Section	Test full name	Test date	Result
5	Radiated Emissions – Field Strength of the Fundamental & Harmonics of the Fundamental – FCC 247(b)(3)(d)/15.205/209 (Covers RSS-210 A8.4(4) & A8.5)	07/20/2011 07/26/2011 08/04/2011	Pass
6	Radiated Emissions – Unintentional and Spurious of the Transmitter - FCC 15.209/15.247(d)/15.205 (Covers RSS-210 A8.5, & RSS-GEN 7.2.2)	07/27/2011	Pass
7	Radiated Emissions – Unintentional and Spurious – Band Edge FCC 15.209/15.247(d)/15.205 (Covers RSS-210 A8.5, & RSS-GEN 7.2.2)	07/27/2011	Pass
8	Radiated Emissions – Unintentional – Receiver FCC 5.209/15.247(d)/15.205 (Covers RSS-GEN Section 6)	07/25/2011 07/26/2011	Pass
9	6dB Bandwidth – FCC 15.247(a)(2) (Covers RSS-210 A8.2(a))	07/20/2011	Pass
10	Power Spectral Density (PSD) – FCC 15.247(e) (Covers RSS-210 A8.2(b))	07/20/2011	Pass
11	Occupied Bandwidth – RSS-GEN, Section 4.6.1	07/20/2011	Pass
12	AC Conducted Emissions – FCC 15.207 (Covers RSS-GEN Section 7.2.4)	07/27/2011	Pass

Notes:

1) Product FCC Model DE50 is also marketed as XiP813

2.1 Test Facility

Intertek Denver's testing facilities are located at 1795 Dogwood St. Suite 200 Louisville, CO 80027. The testing facility is ISO17025:2005 accredited by A2LA, our lab code is 2506.02, our VCCI registration numbers are. R-1643, C-1752 and T-1558, our FCC designation no. US1121 and our IC lab no. 2042N.

Testing contained in this test report may not be covered under the laboratories scope of accreditation. A note will be placed in the specific test section for testing not coved under the laboratories scope.

General Radio Remarks:

FCC CFR Part 15.31(e): For a product with an ac voltage supply, the ac voltage was varied between 85% and 115% of the nominal rated supply voltage to determine worst-case fundamental frequency level.

FCC CFR Part 15.35: Measurement Detector Functions and Bandwidths: FCC Part 15.35 was utilized when performing measurements within this report.

Whenever possible the approved test procedures specified in ANSI C63.10 – 2009 for DTS devices were used for testing.

When the field strength (or envelope power) is not constant or when it pulses, and an average detector/limit is specified to be used, a duty cycle correction factor may be utilized to determine the pulsed "average" of the field strength or power.

For remote control operations the set top box is equipped with a rear panel 2.4GHz RF4CE radio. The RF4CE radio has an external antenna port. For optional peripheral device operation the set top box also has a front panel mounted Bluetooth 2.4GHz radio. The Bluetooth radio does not have an external antenna port. For testing purposes a SMA connector will be fitted to bypass the antenna.

RF4CE antenna will be positioned in the worst case orientation during testing. The worst case orientation has been determined as VERTICAL by ETC.

Product-Specific Radio Remarks:

- Product:
  1. Lowest Frequency used: 60kHz
  2. Highest Frequency used : 3GHz

- Detachable RF4CE antenna (rear)
  1. Antenna gain – 2.15 dbi
  2. Modulation details: The onboard solution contains an RF transceiver which is an 802.15.4 Standard compliant radio that operates in one of three channels (15, 20, 25) in the 2.4 GHz ISM frequency band. These three channels are at 2425, 2450, and 2475MHz. The transceiver supports 250 kbps O-QPSK data in 3.0 MHz channels and full direct sequence spread-spectrum encode and decode.

- Onboard Bluetooth antenna (front panel)
  1. Antenna gain – 0dbi
  2. Modulation details: The solution contains an RF transceiver designed to operate in a Bluetooth wireless system in the 2.4 GHz ISM band in 79 channels that are 1 MHz wide. These channels are centered from 2402 MHz to 2480 MHz spaced at 1 MHz. The transceiver supports data modulation and demodulation of GFSK, 8PSK and QPSK signals for data rates up to 1Mbps, 2 Mbps, and 3 Mbps, respectively. The solution is configured to operate as a Class 2 Bluetooth radio with a maximum transmit power of +4 dBm.

Duty Cycle Correction Factors <u>were not</u> utilized in this testing and report per client request.

3 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Advanced satellite receiver set top box	EchoStar Technologies	DE50	EMC1

Receive Date:	07/20/2011
Received Condition:	Good
Type:	Production Sample

Description of Equipment Under Test (provided by client)
The XiP813 is an advanced satellite receiver set top box. The set top box provides various A/V outputs along with ethernet, USB, and eSATA. The set top box is equipped with an internal hard drive for DVR functionality. The set top box is designed for the US market using 120V/60Hz. For remote control operations the set top box is equipped with a rear panel 2.4GHz RF4CE radio. The RF4CE radio has an external antenna port. For optional peripheral device operation the set top box also has a front panel mounted Bluetooth 2.4GHz radio. Product to be marketed and sold in the USA and Canada.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
Input: 100-120 VAC	0.5 A	60Hz	1

Operating modes of the EUT: Intentional Tx Testing

No.	Descriptions of EUT Exercising
1	Tx – Product set up in transmit mode at full power, CW mode
2	Tx – Product configured in continuous transmission with modulation/data transfer enabled.
3	Ethernet data transfer, USB, and eSATA data transfer and video output to all A/V connections

Operating modes of the EUT: Unintentional Rx Testing

No.	Descriptions of EUT Exercising
1	2.4GHz RF4CE and Bluetooth Radio transmit function disabled.
2	Product configured in receive/standby mode for unintentional testing.
3	Product configured in receive/standby mode of operation - Ethernet data transfer, USB data transfer, Video output to all A/V ports/cables.

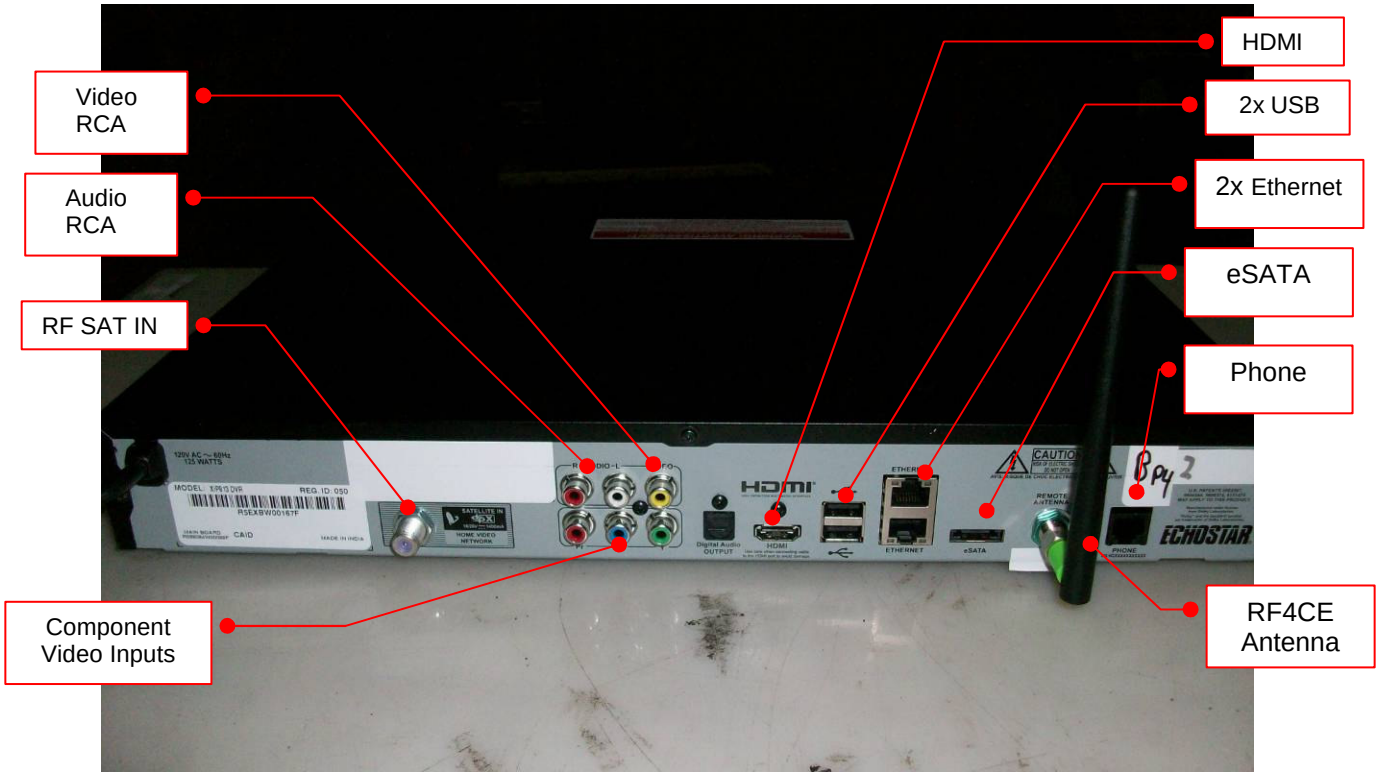
Clock Frequencies of the EUT:

No.	Descriptions of EUT Exercising
1	Lowest frequency used or generated in the product: 65kHz
2	Highest frequency used or generated in the product: 3 GHz

3.1 Product Photos:

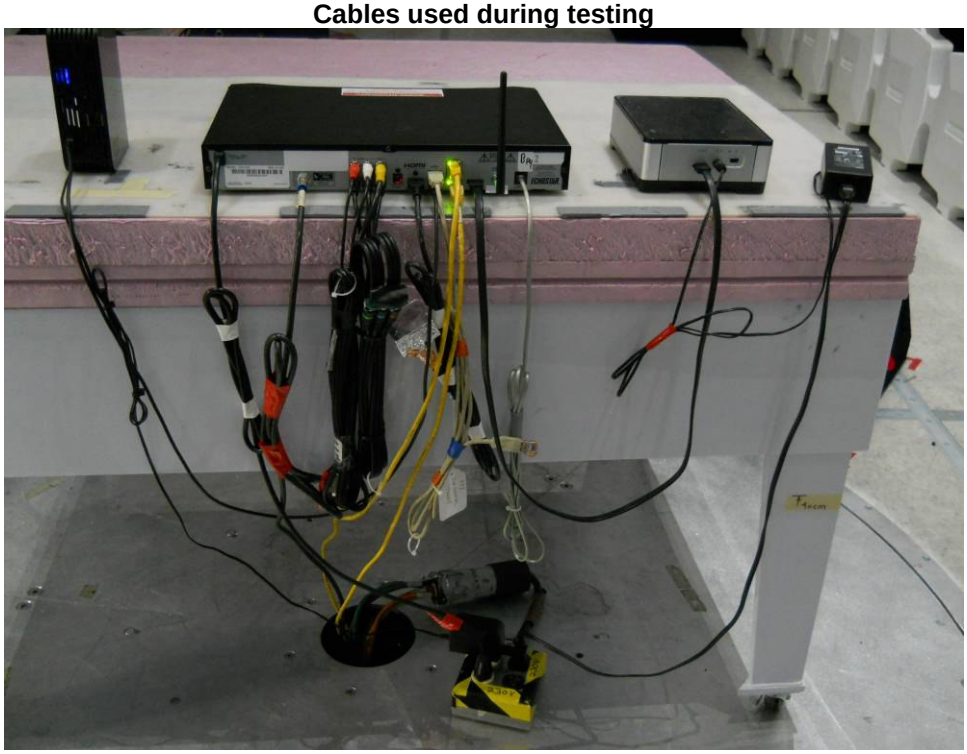
Product Tested Front – Model: DE50

Product Back Panel Ports/Connectors



Complete System

Cables used during testing



Product Photo:

Support Accessories

eSATA Hard Drive

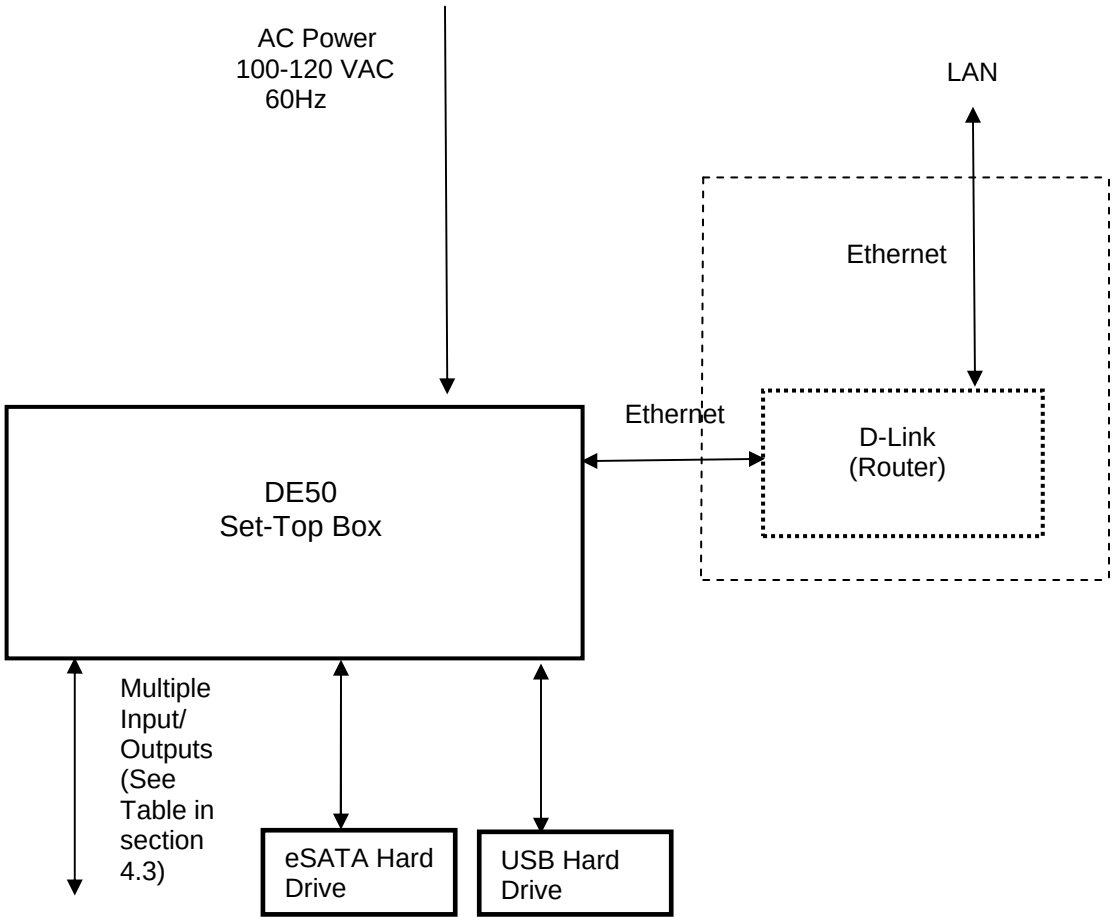
USB Hard Drive

4 System setup including cable interconnection details, support equipment and simplified block diagram

4.1 Method:

Record the details of EUT cabling, document the support equipment, and show the interconnections in a block diagram.

4.2 EUT Block Diagram:



Note: Dashed lines indicate auxiliary/support equipment outside the test area

4.3 Support Data:

ID	Description/ Function	Shield Type	Length	Connector	Connection	Ferrites
1	AC Power	None	1 meter	AC	DE51 Power In	No
2	2x Ethernet	None	> 3 meter	RJ-45	Router/Switch	No
3	USB	Foil	< 1 meter	USB	USB Drive	No
4	Front Panel USB	Foil	< 1 meter	USB	Terminator	No
5	USB	Foil	< 1 meter	USB	Terminator	No
6	RCA A/V Outputs	Braid	1 meter	RCA	Matched Impedance Loads	No
7	HDMI Digital Video Out	Foil	1 meter	HDMI	EDIDI Simulation Box	No
8	RF Coax Cable	Braid	> 3 meter	Type F	Terminator	No
9	eSATA Cable	Braid	< 1 meter		eSATA Drive	No
10	Composite Video Out	Braid	< 1 meter	RCA	Terminator	No
11	Phone Cable	None	< 1 meter	RJ-11	Unterminated	No

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Router/Switch	D-Link	EBR-2310	-----

Notes:

1) All product ports populated with appropriate cables. All cables terminated with an active load or typical device/peripheral.

5 Radiated Emissions – Fundamental Power & Harmonics of the Fundamental

5.1 Method

The test methods used comply with ANSI C63.10 . Unless otherwise stated no deviations were made from **FCC CFR47 15.247 & IC RSS-210**.

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

5.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18882	Spectrum Analyzer (dc-22 GHz)	Hewlett-Packard	8566B	2410A00154	12/06/2010	12/06/2011
18660	Spectrum Analyzer Display Section (set 1)	Hewlett-Packard	85662A	2318A04983	12/10/2010	12/10/2011
18880	Q.P Adapter	Hewlett-Packard	85650A	2811A01300	12/06/2010	12/06/2011
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/03/2011	06/03/2012
18906	Pre-Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/03/2011	06/03/2012
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/03/2011	06/03/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	12/09/2010	12/09/2011
18805	HF Antenna/Harmonic Mixer 18 GHz to 26.5 GHz	Hewlett-Packard	11970K	2332A01280	10/04/2010	10/04/2011
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_CVI	V.1.0	01/01/2011	01/01/2012

5.3 Results:

The sample tested was found to comply with the requirements of:

- FCC 247(b)(3) (d)/15.205/15.209
- RSS-210 A8.4(4) & A8.5

5.4 Setup Photographs:

Test setup – Field Strength Measurements (Front View)

Test setup – Field Strength Measurements (Rear View)

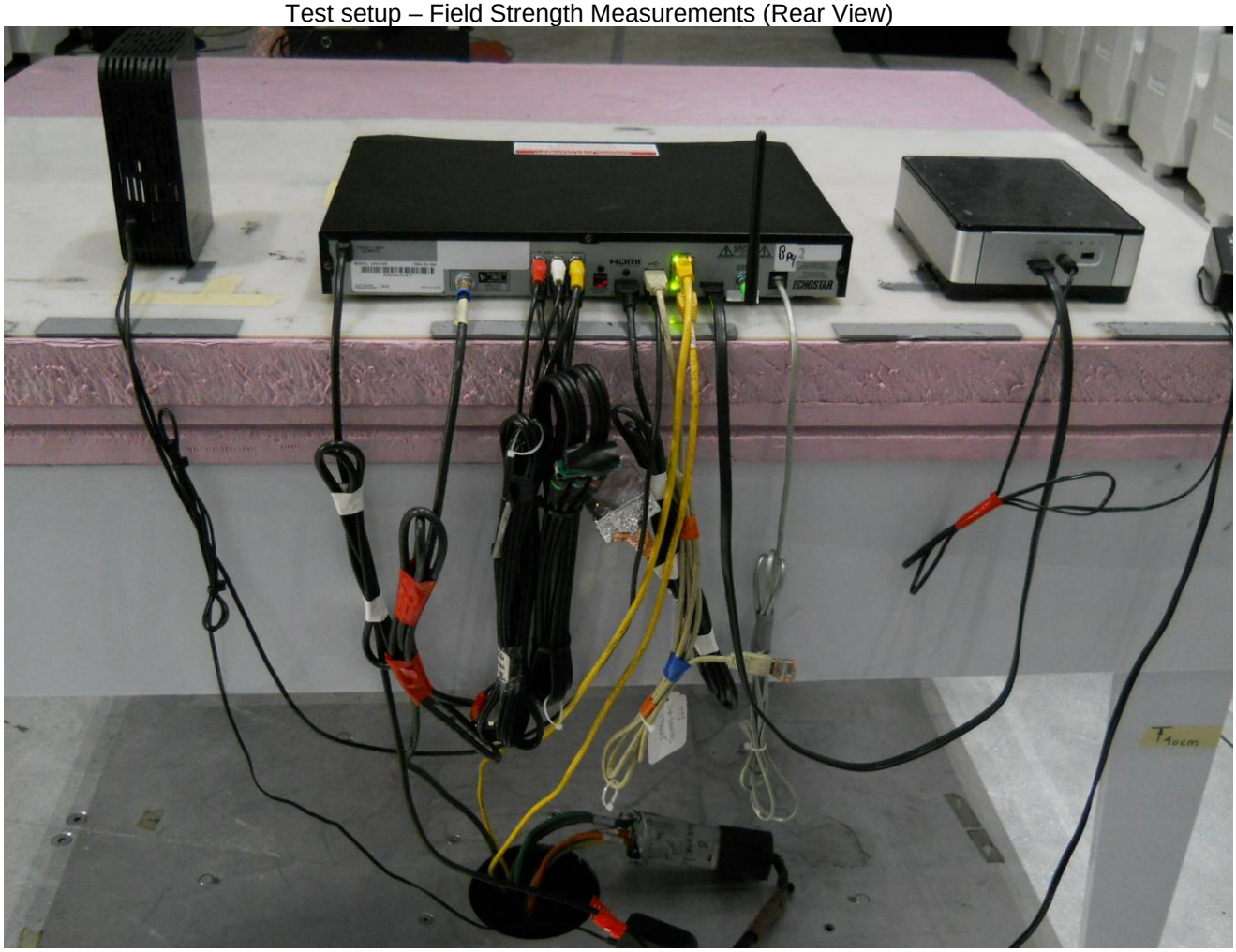
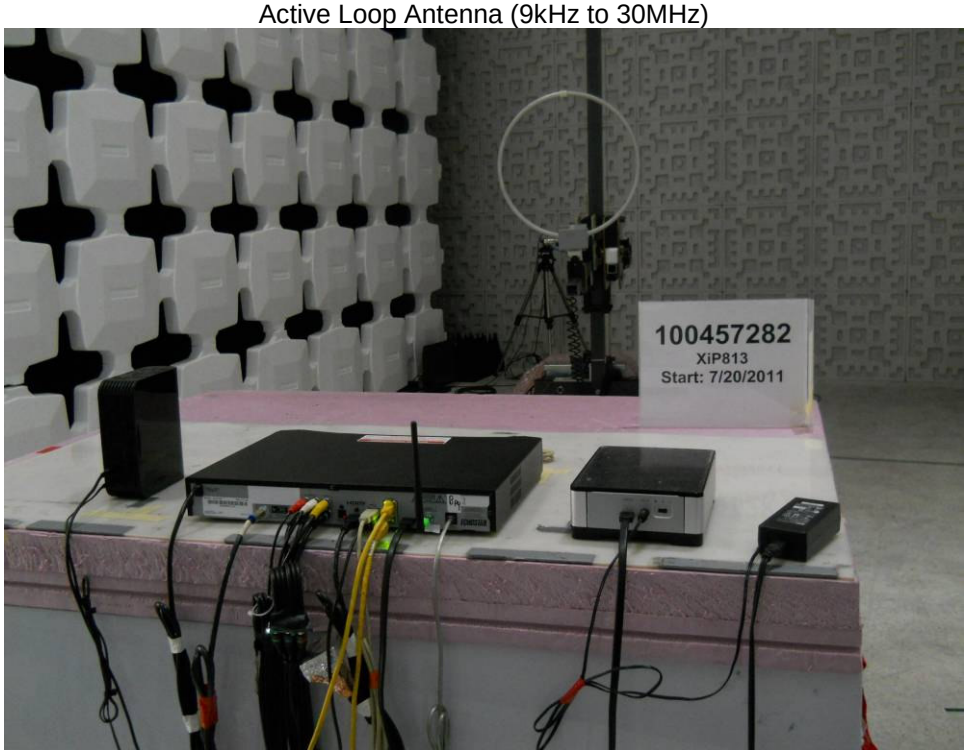


Photo: Antenna Setups

Active Loop Antenna (9kHz to 30MHz)



BiLog Antenna (30MHz to 1000MHz)

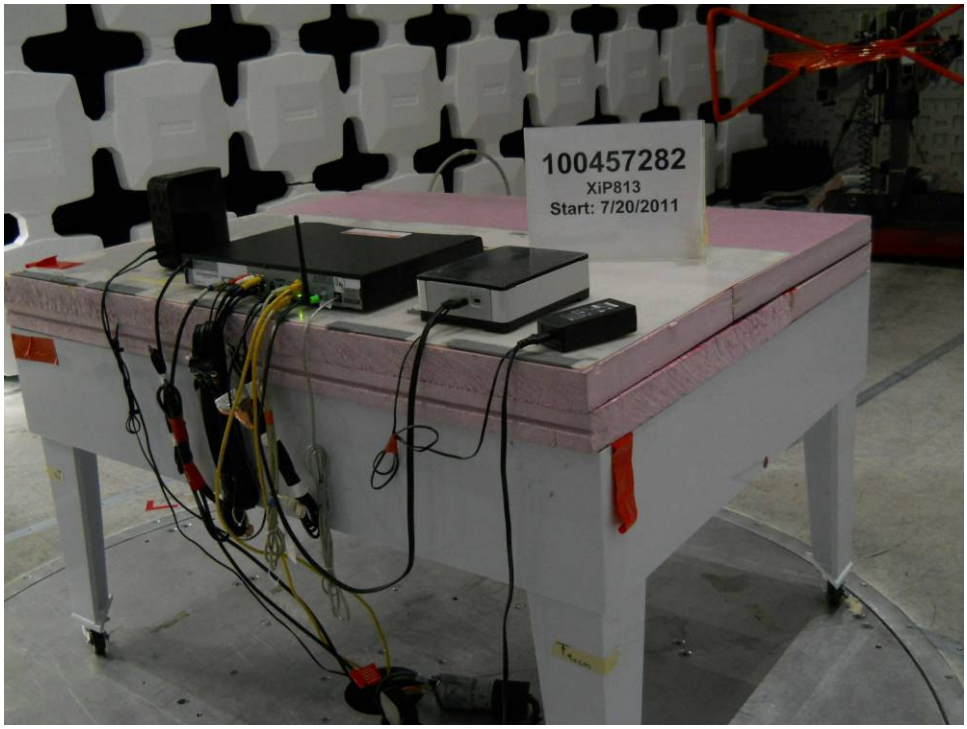


Photo: Antenna Setups

Horn (1GHz – 18GHz)

HF Active Antenna/Harmonic Mixer (18GHz – 26.5GHz)

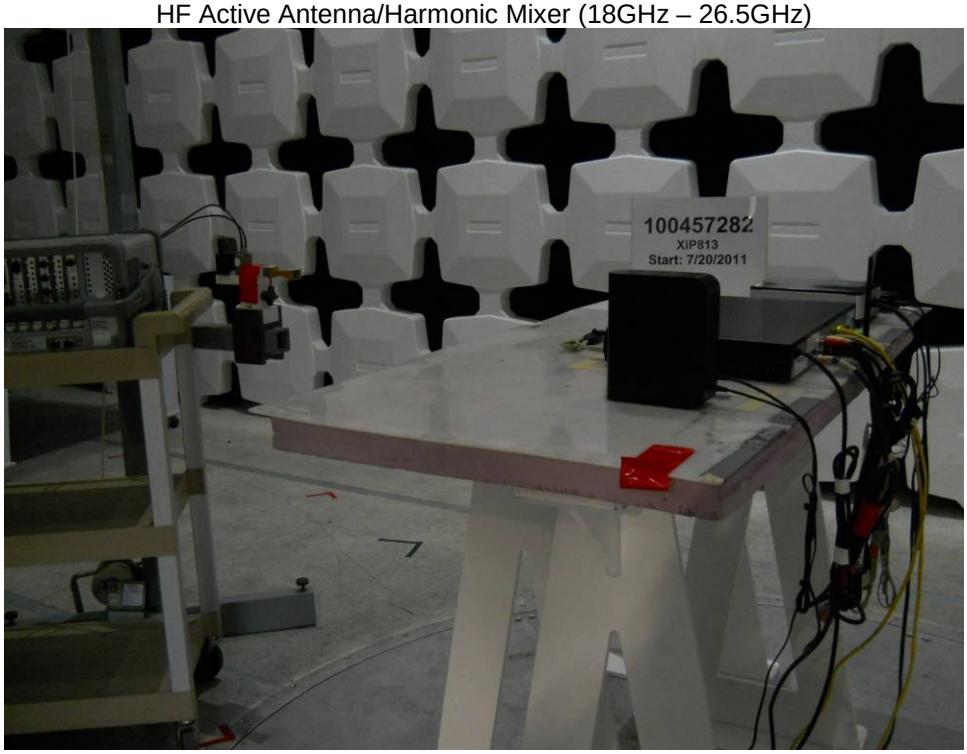
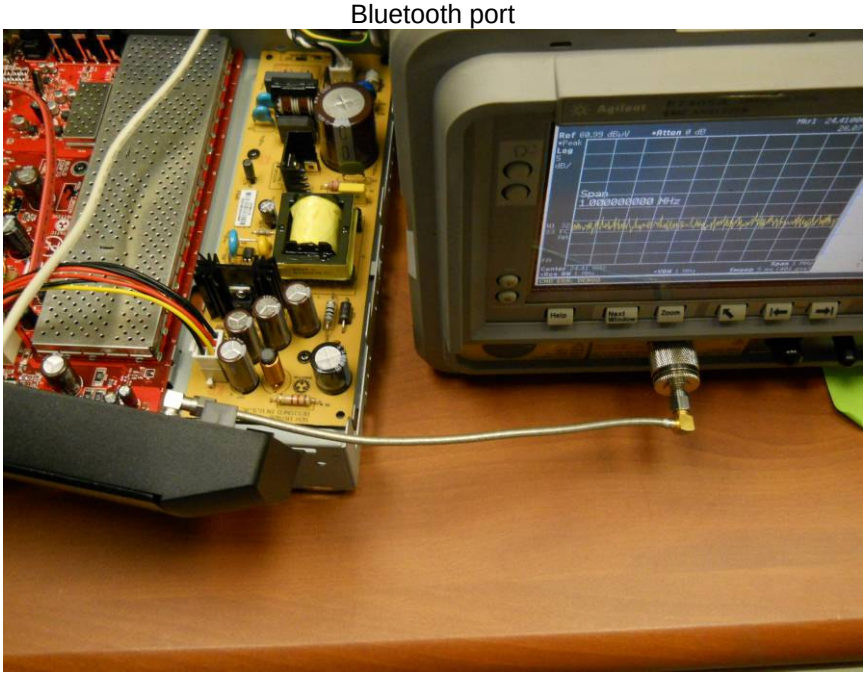


Photo: Conducted Port

RF4CE port

Bluetooth port



5.5 Test Data: AC Variation – Fundamental Frequency

AC Variance – Fundamental Frequency

Test Report #:	**100457282**	Test Area:	CC1 Radiated	Temperature:	24.1	°C
Test Method:	FCC Part 15.31(e)	Test Date:	26-Jul-2011	Relative Humidity:	35.9	%
EUT Model #:	DE50 (XiP813)	EUT Power:	See Below	Air Pressure:	83.1	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver					
Notes:						

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	N/A	N/A
AC Voltage Variation - Fundamental						
RF4CE Fundamental						
AC @ Nominal Voltage: 120VAC/60Hz						
2475.00	60.1 Pk	3.6 / 29.7 / 0.0	93.4	V / 1.8 / 64.0	N/A	N/A
AC @ 115% Nominal Voltage: 138VAC/60Hz						
2475.00	60.2 Pk	3.6 / 29.7 / 0.0	93.5	V / 1.8 / 64.0	N/A	N/A
AC @ 85% Nominal Voltage: 102VAC/60Hz						
2475.00	60.0 Pk	3.6 / 29.7 / 0.0	93.3	V / 1.8 / 64.0	N/A	N/A
Blue Tooth Fundamental						
AC @ Nominal Voltage: 120VAC/60Hz						
2480.00	66.3 Pk	3.6 / 29.8 / 0.0	99.6	V / 1.3 / 3.0	N/A	N/A
AC @ 115% Nominal Voltage: 138VAC/60Hz						
2480.00	66.2 Pk	3.6 / 29.8 / 0.0	99.5	V / 1.3 / 3.0	N/A	N/A
AC @ 85% Nominal Voltage: 102VAC/60Hz						
2480.00	66.0 Pk	3.6 / 29.8 / 0.0	99.3	V / 1.3 / 3.0	N/A	N/A

Conclusion:

There is no significant difference in the radiated field strength of the fundamental frequency with respect to varying the ac voltage. Therefore, all measurements will be taken using the nominal rated voltage of the product.

5.6 Test Data: Fundamental Power & Harmonics of the Fundamental

5.6.1 RF4CE Transmitter

Peak Conducted Output Power of the Fundamental
& Harmonics of the Fundamental
(Spurious of the Transmitter)

Test Report #:	**10045728**	Test Area:	RF Conducted Port Cable	Temperature:	23.2	°C
Test Method:	FCC 15.247(b)(3) FCC 15.247(d)	Test Date:	04-Aug-2011	Relative Humidity:	32.9	%
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	83.2	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver Set-Top Box					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

Notes: **This data sheet assumes no duty cycle correction**

Fundamental Measurements: RBW = 3MHz
Harmonics of the Fundamental Measurements: RBW = 100kHz

Peak Measurements of the RF4CE Radio

FREQ	LEVEL	CABLE LOSS	FINAL	Measurement Method	Duty Cycle Correction	Final Corrected	Limit FCC 15.247(b)(3)	DELTA
(MHz)	(dBuV)	(dB)	(dBuV)		(dB)	(dBuV)	1 W (137 dBuV)	(dB)
The following Duty Cycle was utilized in this test data sheet:								
100.0%								
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate emissions. The testing performed in accordance to 15.247(b)(3) and 15.247(d) emissions and delta limits were calculated as follows: Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.247 and the emission/limit delta was calculated. the DTCF is calculated as follows $20*\log_{10}$(duty cycle in 100mS).								
Part 15.247(b) and 15.247(d) Respectively								
Fundamental Measurements								
Fundamental - Low Channel								
2425	104.1 Pk	0.3 / 0.0 / 0.0	104.4	RF Cond Port	0.0	104.4	137.0	-32.6
Fundamental - Mid Channel								
2450	104.6 Pk	0.3 / 0.0 / 0.0	104.9	RF Cond Port	0.0	104.9	137.0	-32.1
Fundamental - High Channel								
2475	**105.1 Pk**	**0.3 / 0.0 / 0.0**	**105.4**	**RF Cond Port**	**0.0**	**105.4**	**137.0**	**-31.6**

Limit: Output Power of the Fundamental: 137 dBuV

Worst-Case Fundamental – Mid Channel @ 2450 MHz: 31.6 dBuV below the limit

Results: Pass

The following calculations convert the measured signal in dBuV to power in Watts for comparison to the limit:

For a 50 ohm measurement system: 1 dBuV = -106 dBm

1 dBm = .0012589 W

Worst-case Fundamental (High-Channel):

105.4 dBuV = -1.60 dBm

-1.60 dBm = 0.00069 W

Limit per FCC 15.247(b)(3): 1W

Therefore, Delta from Limit: 1 W - 0.00069 W = **0.99931 W (below the limit)**

RF4CE – Harmonics of the Fundamental

FREQ	LEVEL	CABLE LOSS	FINAL	Measurement Method	Duty Cycle Correction	Final Corrected	Limit FCC 15.247(d)	DELTA
(MHz)	(dBuV)	(dB)	(dBuV)		(dB)	(dBuV)	(dBuV/m)	(dB)
Harmonics of the Fundamental – Low Channel								
4850	38.2 Pk	0.5 / 0.0 / 0.0	38.7	RF Cond Port	0.0	38.7	84.0	-45.3
7270	**39.1 Pk**	**0.6 / 0.0 / 0.0**	**39.7**	**RF Cond Port**	**0.0**	**39.7**	**84.0**	**-44.3**
9700	37.9 Pk	0.9 / 0.0 / 0.0	38.8	RF Cond Port	0.0	38.8	84.0	-45.2
12120	37.3 Pk	1.4 / 0.0 / 0.0	38.7	RF Cond Port	0.0	38.7	84.0	-45.3
14550	29.2 Pk	2.2 / 0.0 / 0.0	31.3	RF Cond Port	0.0	31.3	84.0	-52.7
16970	28.3 Pk	3.4 / 0.0 / 0.0	31.7	RF Cond Port	0.0	31.7	84.0	-52.3
19400	29.8 Pk	4.3 / 0.0 / 0.0	34.1	RF Cond Port	0.0	34.1	84.0	-49.9
21820	29.9 Pk	5.1 / 0.0 / 0.0	35.1	RF Cond Port	0.0	35.1	84.0	-48.9
24250	28.1 Pk	6.1 / 0.0 / 0.0	34.2	RF Cond Port	0.0	34.2	84.0	-49.8
Harmonics of the Fundamental – Mid Channel								
4900	28.9 Pk	0.5 / 0.0 / 0.0	29.4	RF Cond Port	0.0	29.4	84.6	-55.2
7350	32.8 Pk	0.6 / 0.0 / 0.0	33.4	RF Cond Port	0.0	33.4	84.6	-51.2
9790	28.8 Pk	0.9 / 0.0 / 0.0	29.6	RF Cond Port	0.0	29.6	84.6	-55.0
12250	26.7 Pk	1.5 / 0.0 / 0.0	28.2	RF Cond Port	0.0	28.2	84.6	-56.4
14700	27.4 Pk	2.2 / 0.0 / 0.0	29.6	RF Cond Port	0.0	29.6	84.6	-55.0
17150	26.9 Pk	3.4 / 0.0 / 0.0	30.3	RF Cond Port	0.0	30.3	84.6	-54.3
19.6	26.6 Pk	0.0 / 0.0 / 0.0	26.6	RF Cond Port	0.0	26.6	84.6	-58.0
22050	28.9 Pk	5.2 / 0.0 / 0.0	34.1	RF Cond Port	0.0	34.1	84.6	-50.5
24500	26.2 Pk	6.2 / 0.0 / 0.0	32.4	RF Cond Port	0.0	32.4	84.6	-52.2
Harmonics of the Fundamental – High Channel								
4950	35.3 Pk	0.5 / 0.0 / 0.0	35.8	RF Cond Port	0.0	35.8	85.1	-49.3
7420	29.4 Pk	0.6 / 0.0 / 0.0	30.1	RF Cond Port	0.0	30.1	85.1	-49.3
9890	27.8 Pk	0.9 / 0.0 / 0.0	28.7	RF Cond Port	0.0	28.7	85.1	-55.0
12370	27.0 Pk	1.5 / 0.0 / 0.0	28.6	RF Cond Port	0.0	28.6	85.1	-56.4
14850	27.1 Pk	2.3 / 0.0 / 0.0	29.3	RF Cond Port	0.0	29.3	85.1	-56.5
17320	28.2 Pk	3.5 / 0.0 / 0.0	31.7	RF Cond Port	0.0	31.7	85.1	-55.8
19800	27.4 Pk	4.4 / 0.0 / 0.0	31.8	RF Cond Port	0.0	31.8	85.1	-53.4
22270	26.8 Pk	5.3 / 0.0 / 0.0	32.1	RF Cond Port	0.0	32.1	85.1	-53.3
24750	26.9 Pk	6.3 / 0.0 / 0.0	33.2	RF Cond Port	0.0	33.2	85.1	-53.0

Limit: Harmonics of the Fundamental: maximum -20 dBc

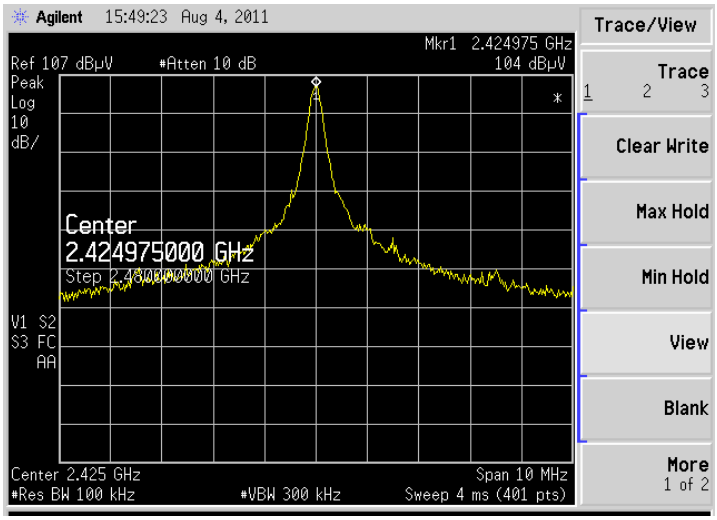
Worst-Case Harmonic: Low-Channel @ 7270 MHz: -44.4 dBc

Results: Pass

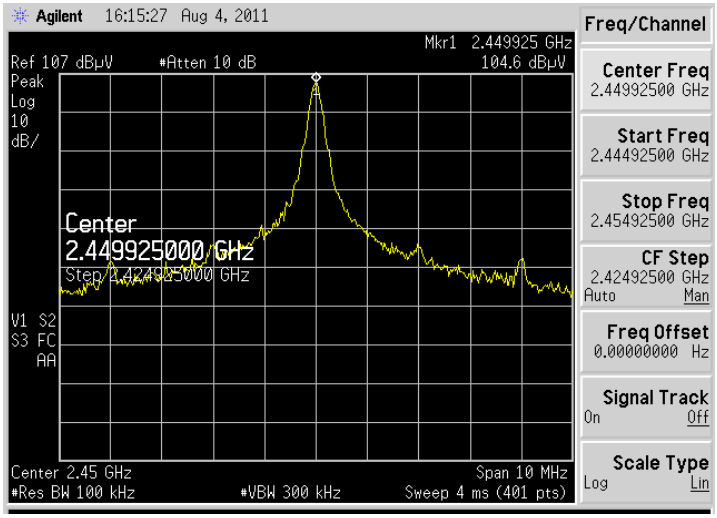
Note: To determine the Limit of Harmonics, fundamental measurements were taken with a 100kHz RBW:

- Low Channel: 104.0 dBuV
- Mid Channel: 104.6 dBuV
- High Channel: 105.1 dBuV

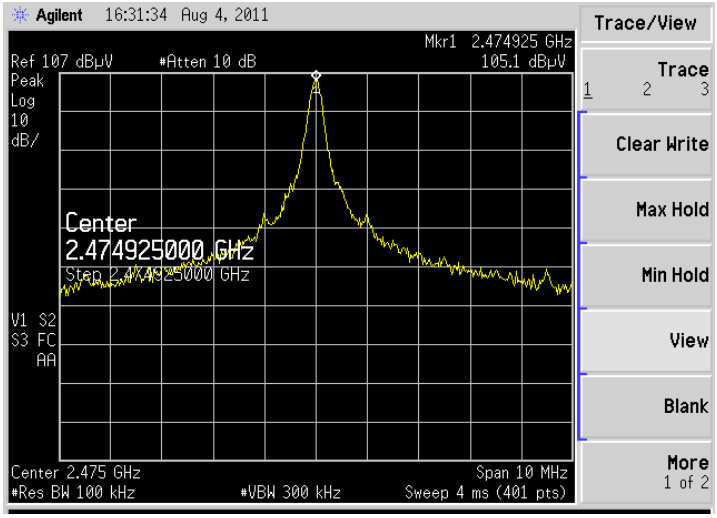
Fundamental Measurements at 100kHz RBW – Low Channel



Mid Channel



High Channel



Example calculation for Intentional Radiated Emissions:

Measured Level	+	Transducer, Cable Loss Pre-Amplifier	=	Corrected Reading	-	Duty Cycle Correction	=	FINAL Measurement	-	Specification Limit	=	Delta from Specification Limit
(dBµV)		(dB)		(dBµV/m)		(dBµV/m)		(dBµV/m)		(dBµV/m)		
24.0		**14.9**		**38.9**		**10.0**		**28.9**		**40.0**		**-11.1**

Notes:

1) All measurements taken using a peak detector – no duty cycle correction is applicable to this product.

Deviations, Additions, or Exclusions: None

RF4CE – Restricted Band Harmonics of the Fundamental (Spurious of the Transmitter – Radiated Average Measurements)

Test Report #:	**100457282**	Test Area:	CC1 Radiated	Temperature:	23.1 °C
Test Method:	FCC 15.247(d) 15.205/ 15.209	Test Date:	27-July-2011	Relative Humidity:	39.4 %
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	83.3 kPa
EUT Serial #:	EMC1				
Manufacturer:	Echostar				
EUT Description:	Advanced Satellite Receiver				
Notes:					
	RF4CE Radio Measurements				

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
The following Duty Cycle was utilized in this testing:								
100.0%								
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and FCC 15.247(d) were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20*\log_{10}$(duty cycle in 100mS).								
Part 15.205/ 15.209								
Harmonics of the Fundamental – FCC Restricted Bands								
Harmonics - Low Channel								
4849.80	30.2 Av	5.2 / 35.0 / 38.9	31.4	H / 1.0 / 243.3	0	31.4	54	-22.6
4848.87	39.6 Av	5.2 / 35.0 / 38.9	40.9	V / 1.6 / 188.8	0	40.9	54	-13.1
7274.70	26.1 Av	6.4 / 38.7 / 39.3	31.8	H / 1.0 / 0.0	0	31.8	54	-22.2
7274.70	26.1 Av	6.4 / 38.7 / 39.3	31.8	V / 1.0 / 0.0	0	31.8	54	-22.2
12124.9	23.2 Av	8.8 / 40.8 / 45.6	27.2	H / 1.0 / 0.0	0	27.2	54	-26.8
12124.9	23.1 Av	8.8 / 40.8 / 45.6	27.1	V / 1.0 / 0.0	0	27.1	54	-26.9
19399.2	11.0 Pk	0.0 / 22.2 / 0.0	23.7	V / 1.0 / 0.0	0	23.7	54	-30.3
19399.2	11.0 Pk	0.0 / 22.2 / 0.0	23.6	H / 1.0 / 0.0	0	23.6	54	-30.4
Harmonics - Mid Channel								
4898.89	39.4 Av	5.2 / 35.1 / 38.8	40.9	V / 1.3 / 188.1	0	40.9	54	-13.1
4898.89	31.4 Av	5.2 / 35.1 / 38.8	33.0	H / 1.0 / 302.9	0	33.0	54	-21.0
7350.00	25.2 Av	6.5 / 38.7 / 39.2	31.3	V / 1.2 / 323.9	0	31.3	54	-22.7
7350.00	25.2 Av	6.5 / 38.7 / 39.2	31.2	H / 1.2 / 323.9	0	31.2	54	-22.8
12250.0	22.5 Av	8.8 / 41.0 / 45.6	26.7	V / 1.2 / 323.9	0	26.7	54	-27.3
12250.0	22.5 Av	8.8 / 41.0 / 45.6	26.7	H / 1.2 / 323.9	0	26.7	54	-27.3
19600.0	8.4 Pk	0.0 / 22.0 / 0.0	20.9	V / 1.0 / 0.0	0	20.9	54	-33.1

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
19600.0	11.0 Pk	0.0 / 22.0 / 0.0	23.5	H / 1.0 / 0.0	0	23.5	54	-30.5
22050.0	15.3 Pk	0.0 / 21.3 / 0.0	27.2	V / 1.0 / 0.0	0	27.2	54	-26.8
22050.0	10.9 Pk	0.0 / 21.3 / 0.0	22.8	H / 1.0 / 0.0	0	22.8	54	-31.2
Harmonics - High Channel								
4948.83	**42.5 Av**	**5.2 / 35.2 / 38.7**	**44.3**	**V / 1.9 / 193.9**	**0**	**44.3**	**54**	**-9.7**
4948.83	30.4 Av	5.2 / 35.2 / 38.7	32.1	H / 1.0 / 319.7	0	32.1	54	-21.9
7424.40	28.2 Av	6.5 / 38.8 / 39.2	34.2	V / 1.0 / 0.0	0	34.2	54	-19.8
7424.40	28.1 Av	6.5 / 38.8 / 39.2	34.2	H / 1.0 / 0.0	0	34.2	54	-19.8
12374.0	22.6 Av	8.9 / 41.1 / 45.7	27.0	V / 1.0 / 0.0	0	27.0	54	-27.0
12374.0	22.7 Av	8.9 / 41.1 / 45.7	27.0	H / 1.0 / 0.0	0	27.0	54	-27.0
19798.4	10.9 Pk	0.0 / 21.8 / 0.0	23.2	V / 1.0 / 0.0	0	23.2	54	-30.8
19798.4	6.7 Pk	0.0 / 21.8 / 0.0	19.0	H / 1.0 / 0.0	0	19.0	54	-35.0
22273.2	4.7 Pk	0.0 / 21.1 / 0.0	16.4	V / 1.0 / 0.0	0	16.4	54	-37.6
22273.2	6.6 Pk	0.0 / 21.1 / 0.0	18.3	H / 1.0 / 0.0	0	18.3	54	-35.7

Average Limit FCC Restricted Bands per 15.209: 54 dBuV/m at 3-meter test distance

Worst-Case Harmonic - High-Channel: 4948.83 MHz, 44.3 dBuV/m (9.7 dB below limit)

Result: Pass

RF4CE – Restricted Band Harmonics of the Fundamental (Spurious of the Transmitter – Radiated Peak Measurements)

Test Report #:	**100457282**	Test Area:	CC1 Radiated	Temperature:	23.1 °C
Test Method:	FCC 15.247(d) 15.205/ 15.209	Test Date:	27-July-2011	Relative Humidity:	39.4 %
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	83.3 kPa
EUT Serial #:	EMC1				
Manufacturer:	Echostar				
EUT Description:	Advanced Satellite Receiver				
Notes:					
	RF4CE Radio Measurements				

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
The following Duty Cycle was utilized in this testing:								
100.0%								
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and FCC 15.247(d) were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20*\log_{10}$(duty cycle in 100mS).								
Part 15.205/ 15.209								
Harmonics of the Fundamental – FCC Restricted Bands								
Harmonics - Low Channel								
4849.80	29.9 Pk	5.2 / 35.0 / 38.9	31.1	H / 1.0 / 243.3	0	31.1	74	-42.9
4848.87	**47.4 Pk**	**5.2 / 35.0 / 38.9**	**48.6**	**V / 1.6 / 188.8**	**0**	**48.6**	**74**	**-25.4**
7274.70	27.2 Pk	6.4 / 38.7 / 39.3	32.9	H / 1.0 / 0.0	0	32.9	74	-41.1
7274.70	26.9 Pk	6.4 / 38.7 / 39.3	32.7	V / 1.0 / 0.0	0	32.7	74	-41.3
12124.9	26.1 Pk	8.8 / 40.8 / 45.6	30.1	H / 1.0 / 0.0	0	30.1	74	-43.9
12124.9	24.2 Pk	8.8 / 40.8 / 45.6	28.2	V / 1.0 / 0.0	0	28.2	74	-45.8
19399.2	11.0 Pk	0.0 / 22.2 / 0.0	23.7	V / 1.0 / 0.0	0	23.7	74	-50.3
19399.2	11.0 Pk	0.0 / 22.2 / 0.0	23.6	H / 1.0 / 0.0	0	23.6	74	-50.4
Harmonics - Mid Channel								
4898.89	45.4 Pk	5.2 / 35.1 / 38.8	46.9	V / 1.3 / 188.1	0	46.9	74	-27.1
4898.89	33.5 Pk	5.2 / 35.1 / 38.8	35.1	H / 1.0 / 302.9	0	35.1	74	-38.9
7350.00	25.9 Pk	6.5 / 38.7 / 39.2	32.0	V / 1.2 / 323.9	0	32.0	74	-42.0
7350.00	26.4 Pk	6.5 / 38.7 / 39.2	32.5	H / 1.2 / 323.9	0	32.5	74	-41.5
12250.0	24.7 Pk	8.8 / 41.0 / 45.6	28.9	V / 1.2 / 323.9	0	28.9	74	-45.1
12250.0	24.9 Pk	8.8 / 41.0 / 45.6	29.2	H / 1.2 / 323.9	0	29.2	74	-44.8
19600.0	8.4 Pk	0.0 / 22.0 / 0.0	20.9	V / 1.0 / 0.0	0	20.9	74	-53.1

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
19600.0	11.0 Pk	0.0 / 22.0 / 0.0	23.5	H / 1.0 / 0.0	0	23.5	74	-50.5
22050.0	10.9 Pk	0.0 / 21.3 / 0.0	22.8	H / 1.0 / 0.0	0	22.8	74	-51.2
22050.0	15.3 Pk	0.0 / 21.3 / 0.0	27.2	V / 1.0 / 0.0	0	27.2	74	-46.8
Harmonics - High Channel								
4948.83	43.4 Pk	5.2 / 35.2 / 38.7	45.2	V / 1.9 / 193.9	0	45.2	74	-28.8
4948.83	30.8 Pk	5.2 / 35.2 / 38.7	32.6	H / 1.0 / 319.7	0	32.6	74	-41.4
7424.40	29.3 Pk	6.5 / 38.8 / 39.2	35.4	V / 1.0 / 0.0	0	35.4	74	-38.6
7424.40	29.1 Pk	6.5 / 38.8 / 39.2	35.1	H / 1.0 / 0.0	0	35.1	74	-38.9
12374.0	25.6 Pk	8.9 / 41.1 / 45.7	30.0	V / 1.0 / 0.0	0	30.0	74	-44.0
12374.0	22.4 Pk	8.9 / 41.1 / 45.7	26.7	H / 1.0 / 0.0	0	26.7	74	-47.3
19798.4	10.9 Pk	0.0 / 21.8 / 0.0	23.2	V / 1.0 / 0.0	0	23.2	74	-50.8
19798.4	6.7 Pk	0.0 / 21.8 / 0.0	19.0	H / 1.0 / 0.0	0	19.0	74	-55.0
22273.2	4.7 Pk	0.0 / 21.1 / 0.0	16.4	V / 1.0 / 0.0	0	16.4	74	-57.6
22273.2	6.6 Pk	0.0 / 21.1 / 0.0	18.3	H / 1.0 / 0.0	0	18.3	74	-55.7

Peak Limit FCC Restricted Bands per 15.209/ 15.35(b): 74 dBuV/m at 3-meter test distance

Worst-Case Harmonic - Mid-Channel: 4898.89 MHz, 46.9 dBuV/m (27.1 dB below limit)

Result: Pass

5.6.2 Bluetooth Transmitter

Peak Conducted Output Power of the Fundamental & Harmonics of the Fundamental (Spurious of the Transmitter)

Test Report #:	**10045728**	Test Area:	RF Conducted Port Cable	Temperature:	23.2	°C
Test Method:	FCC 15.247(b)(3) FCC 15.247(d)	Test Date:	04-Aug-2011	Relative Humidity:	32.9	%
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	83.2	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver Set-Top Box					

Notes: **This data sheet assumes no duty cycle correction**

Fundamental Measurements: RBW = 3MHz
Harmonics of the Fundamental Measurements: RBW = 100kHz

Bluetooth Radio – All measurements peak detector

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE LOSS	FINAL	Measurement Method	Duty Cycle Correction	Final Corrected	Limit FCC 15.247(b)(3)	DELTA
(MHz)	(dBuV)	(dB)	(dBuV)		(dB)	(dBuV)	1 W (137 dBuV)	(dB)
The following Duty Cycle was utilized in this test data sheet:								
100.0%								
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate emissions. The testing performed in accordance to 15.247(b)(3) and 15.247(d) emissions and delta limits were calculated as follows: Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.247 and the emission/limit delta was calculated. the DTCF is calculated as follows $20*\log_{10}$(duty cycle in 100mS).								
Part 15.247(b) and 15.247(d) Respectively								
Fundamental Measurements								
Fundamental - Low Channel								
2402	109.3 Pk	0.3 / 0.0 / 0.0	109.6	RF Cond Port	0.0	109.6	137.0	-27.4
Fundamental - Mid Channel								
2441	110.0 Pk	0.3 / 0.0 / 0.0	110.3	RF Cond Port	0.0	110.3	137.0	-26.7
Fundamental - High Channel								
2480	110.4 Pk	0.3 / 0.0 / 0.0	110.7	RF Cond Port	0.0	110.7	137.0	**-26.3**

Limit: Output Power of the Fundamental: 137 dBuV

Worst-Case Fundamental – High Channel @ 2480.0 MHz: 26.3 dBuV below the limit

Results: Pass

The following calculations convert the measured signal in dBuV to power in Watts for comparison to the limit:

For a 50 ohm measurement system: 1 dBuV = -106 dBm

1 dBm = .0012589 W

Worst-case Fundamental (High-Channel):

110.7 dBuV = 3.70 dBm

3.70 dBm = 0.002344 W

Limit per FCC 15.247(b)(3): 1W

Therefore, Delta from Limit : 1 W - 0.002344 W = **0.99766 W (below limit)**

Bluetooth – Harmonics of the Fundamental

FREQ	LEVEL	CABLE LOSS	FINAL	Measurement Method	Duty Cycle Correction	Final Corrected	Limit FCC 15.247(d)	DELTA
(MHz)	(dBuV)	(dB)	(dBuV)		(dB)	(dBuV)	(dBuV/m)	(dB)
Harmonics of the Fundamental – Low Channel								
4804	46.2 Pk	0.5 / 0.0 / 0.0	46.7	RF Cond Port	0.0	46.7	88.6	-41.9
7206	38.6 Pk	0.6 / 0.0 / 0.0	39.2	RF Cond Port	0.0	39.2	88.6	-49.4
9608	28.9 Pk	0.9 / 0.0 / 0.0	29.8	RF Cond Port	0.0	29.8	88.6	-58.8
1201	28.2 Pk	0.2 / 0.0 / 0.0	28.4	RF Cond Port	0.0	28.4	88.6	-60.2
1442	29.9 Pk	0.2 / 0.0 / 0.0	30.2	RF Cond Port	0.0	30.2	88.6	-58.4
16814	28.6 Pk	3.3 / 0.0 / 0.0	31.9	RF Cond Port	0.0	31.9	88.6	-56.7
19216	28.0 Pk	4.3 / 0.0 / 0.0	32.2	RF Cond Port	0.0	32.2	88.6	-56.4
21621	27.8 Pk	5.1 / 0.0 / 0.0	32.9	RF Cond Port	0.0	32.9	88.6	-55.7
24021	28.1 Pk	6.0 / 0.0 / 0.0	34.1	RF Cond Port	0.0	34.1	88.6	-54.5
Harmonics of the Fundamental – Mid Channel								
4882	53.6 Pk	0.5 / 0.0 / 0.0	54.1	RF Cond Port	0.0	54.1	89.3	**-35.2**
7323	30.6 Pk	0.6 / 0.0 / 0.0	31.3	RF Cond Port	0.0	31.3	89.3	-58.0
9764	29.0 Pk	0.9 / 0.0 / 0.0	29.9	RF Cond Port	0.0	29.9	89.3	-59.4
12205	27.9 Pk	1.5 / 0.0 / 0.0	29.3	RF Cond Port	0.0	29.3	89.3	-60.0
14646	28.4 Pk	2.2 / 0.0 / 0.0	30.6	RF Cond Port	0.0	30.6	89.3	-58.7
17087	28.7 Pk	3.4 / 0.0 / 0.0	32.1	RF Cond Port	0.0	32.1	89.3	-57.2
19528	28.7 Pk	4.4 / 0.0 / 0.0	33	RF Cond Port	0.0	33.0	89.3	-56.3
21969	27.7 Pk	5.2 / 0.0 / 0.0	32.9	RF Cond Port	0.0	32.9	89.3	-56.4
24410	29.0 Pk	6.2 / 0.0 / 0.0	35.2	RF Cond Port	0.0	35.2	89.3	-54.1
Harmonics of the Fundamental – High Channel								
4960	45.1 Pk	0.5 / 0.0 / 0.0	45.6	RF Cond Port	0.0	45.6	89.7	-44.1
7440	33.2 Pk	0.6 / 0.0 / 0.0	33.9	RF Cond Port	0.0	33.9	89.7	-44.1
9920	27.6 Pk	0.9 / 0.0 / 0.0	28.5	RF Cond Port	0.0	28.5	89.7	-55.8
12402	29.4 Pk	1.6 / 0.0 / 0.0	30.9	RF Cond Port	0.0	30.9	89.7	-61.2
1488	28.6 Pk	0.2 / 0.0 / 0.0	28.9	RF Cond Port	0.0	28.9	89.7	-58.8
1736	28.7 Pk	0.3 / 0.0 / 0.0	29	RF Cond Port	0.0	29.0	89.7	-60.8
1984	29.7 Pk	0.3 / 0.0 / 0.0	30	RF Cond Port	0.0	30.0	89.7	-60.7
2232	28.3 Pk	0.3 / 0.0 / 0.0	28.6	RF Cond Port	0.0	28.6	89.7	-59.7
2480	27.7 Pk	0.3 / 0.0 / 0.0	28.1	RF Cond Port	0.0	28.1	89.7	-61.1

Limit: Harmonics of the Fundamental: maximum -20 dBc

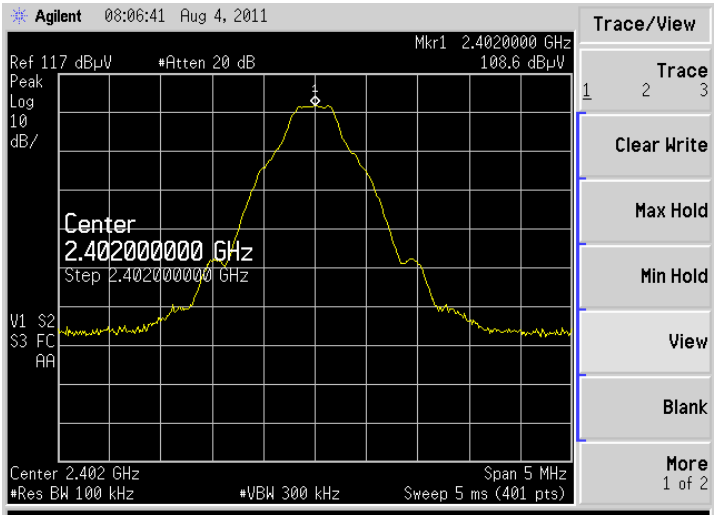
Worst-Case Harmonic: Mid-Channel @ 4882.0 MHz: -35.4 dBc

Results: Pass

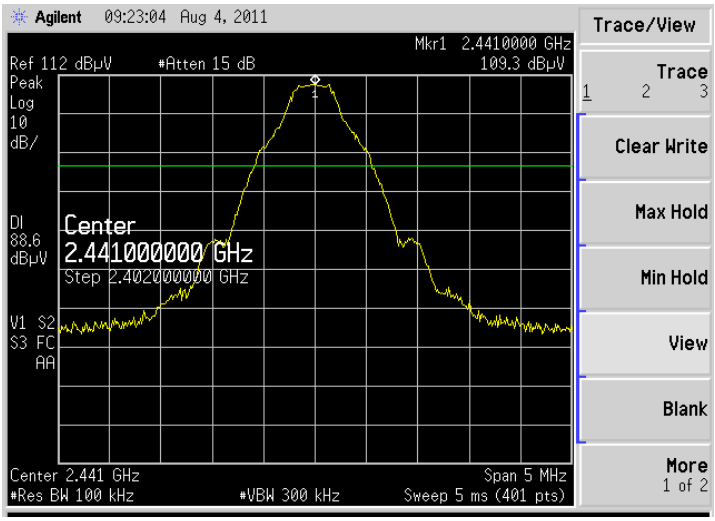
Note: To determine the Limit of Harmonics, fundamental measurements were taken with a 100kHz RBW:

- Low Channel: 108.6 dBuV
- Mid Channel: 109.3 dBuV
- High Channel: 109.7 dBuV

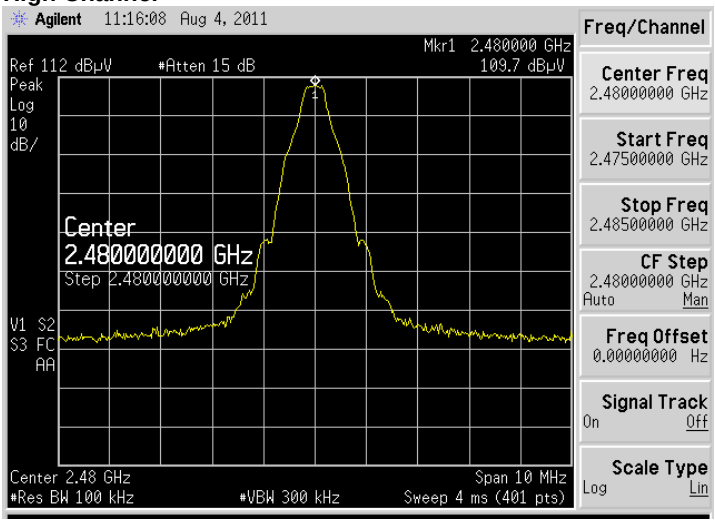
Fundamental Measurements at 100 kHz RBW - Low Channel



Mid Channel



High Channel



Example calculation for Intentional Radiated Emissions:

Measured Level	+	Transducer, Cable Loss Pre-Amplifier	=	Corrected Reading	-	Duty Cycle Correction	=	FINAL Measurement	-	Specification Limit	=	Delta from Specification Limit
(dBµV)		(dB)		(dBµV/m)		(dBµV/m)		(dBµV/m)		(dBµV/m)		
24.0		**14.9**		**38.9**		**10.0**		**28.9**		**40.0**		**-11.1**

Notes:

1) All measurements taken using a peak detector – no duty cycle correction is applicable to this product.

Deviations, Additions, or Exclusions: None

Bluetooth Restricted Band Harmonics of the Fundamental (Spurious of the Transmitter – Radiated Average Measurements)

Test Report #:	**100457282**	Test Area:	CC1 Radiated	Temperature:	23.1 °C
Test Method:	FCC 15.247(d) 15.205/ 15.209	Test Date:	27-July-2011	Relative Humidity:	39.4 %
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	83.3 kPa
EUT Serial #:	EMC1				
Manufacturer:	Echostar				
EUT Description:	Advanced Satellite Receiver				
Notes:					
	Bluetooth Radio Measurements				

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
The following Duty Cycle was utilized in this testing:								
100.0%								
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and FCC 15.247(d) were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20*\log_{10}$(duty cycle in 100mS).								
Part 15.205/ 15.209								
Harmonics of the Fundamental – FCC Restricted Bands								
Harmonics - Low Channel								
4803.98	44.6 Av	5.2 / 34.9 / 39.0	45.7	H / 1.6 / 188.8	0	45.7	54	-8.3
4803.98	41.4 Av	5.2 / 34.9 / 39.0	42.4	V / 1.2 / 323.9	0	42.4	54	-11.6
12010.0	24.6 Av	8.7 / 40.7 / 45.6	28.3	H / 1.0 / 0.0	0	28.3	54	-25.7
12010.0	24.6 Av	8.7 / 40.7 / 45.6	28.4	V / 1.0 / 0.0	0	28.4	54	-25.6
19216.0	11.6 Pk	0.0 / 22.3 / 0.0	24.4	V / 1.0 / 0.0	0	24.4	54	-29.6
19216.0	11.9 Pk	0.0 / 22.3 / 0.0	24.7	H / 1.0 / 0.0	0	24.7	54	-29.3
Harmonics - Mid Channel								
4881.96	51.0 Av	5.2 / 35.1 / 38.8	52.4	H / 1.1 / 357.4	0	52.4	54	-1.6
4881.96	49.0 Av	5.2 / 35.1 / 38.8	50.4	V / 1.2 / 323.9	0	50.4	54	-3.6
7323.00	26.9 Av	6.5 / 38.7 / 39.2	32.9	H / 1.2 / 323.9	0	32.9	54	-21.1
7323.00	26.9 Av	6.5 / 38.7 / 39.2	32.9	V / 1.2 / 323.9	0	32.9	54	-21.1
12205.0	24.7 Av	8.8 / 40.9 / 45.6	28.8	H / 1.2 / 323.9	0	28.8	54	-25.2
12205.0	24.7 Av	8.8 / 40.9 / 45.6	28.8	V / 1.2 / 323.9	0	28.8	54	-25.2
19528.0	14.2 Pk	0.0 / 22.1 / 0.0	26.8	V / 1.0 / 0.0	0	26.8	54	-27.2
19528.0	12.2 Pk	0.0 / 22.1 / 0.0	24.7	H / 1.0 / 0.0	0	24.7	54	-29.3

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Harmonics - High Channel								
4959.97	**47.4 Av**	**5.2 / 35.3 / 38.7**	**49.2**	**H / 1.0 / 0.0**	**0**	**49.2**	**54**	**-4.8**
4959.97	46.5 Av	5.2 / 35.3 / 38.7	48.3	V / 1.0 / 0.0	0	48.3	54	-5.7
7440.00	29.4 Av	6.5 / 38.8 / 39.2	35.5	H / 1.0 / 0.0	0	35.5	54	-18.5
7440.00	29.4 Av	6.5 / 38.8 / 39.2	35.5	V / 1.0 / 0.0	0	35.5	54	-18.5
12400.0	22.6 Av	8.9 / 41.2 / 45.7	27.0	H / 1.0 / 0.0	0	27.0	54	-27.0
12400.0	22.7 Av	8.9 / 41.2 / 45.7	27.0	V / 1.0 / 0.0	0	27.0	54	-27.0
19840.0	3.9 Pk	0.0 / 21.8 / 0.0	16.2	V / 1.0 / 0.0	0	16.2	54	-37.8
19840.0	5.4 Pk	0.0 / 21.8 / 0.0	17.6	H / 1.0 / 0.0	0	17.6	54	-36.4
22320.0	6.6 Pk	0.0 / 21.1 / 0.0	18.2	V / 1.0 / 0.0	0	18.2	54	-35.8
22320.0	4.4 Pk	0.0 / 21.1 / 0.0	16.0	H / 1.0 / 0.0	0	16.0	54	-38.0

Average Limit FCC Restricted Bands per 15.209: 54 dBuV/m at 3-meter test distance

Worst-Case Harmonic - High-Channel: 4959.97 MHz, 49.2 dBuV/m (4.8 dB below limit)

Result: Pass

Bluetooth Restricted Band Harmonics of the Fundamental (Spurious of the Transmitter – Radiated Peak Measurements)

Test Report #:	**100457282**	Test Area:	CC1 Radiated	Temperature:	23.1	°C
Test Method:	FCC 15.247(d) 15.205/ 15.209	Test Date:	27-July-2011	Relative Humidity:	39.4	%
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	83.3	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver					
Notes:	.					
	Bluetooth Radio Measurements					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
The following Duty Cycle was utilized in this testing:								
100.0%								
Averaging method for pulsed signals and calculation in accordance to FCC CFR47 Part 15.35 utilized to calculate field strength emissions.								
The testing performed in accordance to FCC CFR47 Part 15.205 (restricted bands of operation) and FCC 15.247(d) were calculated as follows:								
Final Corrected Peak Measurement – Duty Cycle Correction Factor* = Final Calculated Emission								
The Final Calculated Emission was then compared to the Limits in CFR47 Part 15.209 and the emission/limit delta was calculated.								
the DTCF is calculated as follows $20*\log_{10}$(duty cycle in 100mS).								
Part 15.205/ 15.209								
Harmonics of the Fundamental – FCC Restricted Bands								
Harmonics - Low Channel								
4803.9	45.8 Pk	5.2 / 34.9 / 39.0	46.8	H / 1.6 / 188.8	0	46.8	74	-27.2
4803.9	41.4 Pk	5.2 / 34.9 / 39.0	42.5	V / 1.2 / 323.9	0	42.5	74	-31.5
12010.	26.5 Pk	8.7 / 40.7 / 45.6	30.3	H / 1.0 / 0.0	0	30.3	74	-43.7
12010.	26.0 Pk	8.7 / 40.7 / 45.6	29.8	V / 1.0 / 0.0	0	29.8	74	-44.2
19216.	11.6 Pk	0.0 / 22.3 / 0.0	24.4	V / 1.0 / 0.0	0	24.4	74	-49.6
19216.	11.9 Pk	0.0 / 22.3 / 0.0	24.7	H / 1.0 / 0.0	0	24.7	74	-49.3
Harmonics - Mid Channel								
4881.9	**52.5 Pk**	**5.2 / 35.1 / 38.8**	**53.9**	**H / 1.1 / 357.4**	**0**	**53.9**	**74**	**-20.1**
4881.9	49.4 Pk	5.2 / 35.1 / 38.8	50.8	V / 1.2 / 323.9	0	50.8	74	-23.2
7323.0	27.4 Pk	6.5 / 38.7 / 39.2	33.4	H / 1.2 / 323.9	0	33.4	74	-40.6
7323.0	27.6 Pk	6.5 / 38.7 / 39.2	33.6	V / 1.2 / 323.9	0	33.6	74	-40.4
12205.	26.3 Pk	8.8 / 40.9 / 45.6	30.4	H / 1.2 / 323.9	0	30.4	74	-43.6
12205.	25.8 Pk	8.8 / 40.9 / 45.6	29.9	V / 1.2 / 323.9	0	29.9	74	-44.1
19528.	14.2 Pk	0.0 / 22.1 / 0.0	26.8	V / 1.0 / 0.0	0	26.8	74	-47.2
19528.	12.2 Pk	0.0 / 22.1 / 0.0	24.7	H / 1.0 / 0.0	0	24.7	74	-49.3

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	PEAK Limit FCC 15.35(b)	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Harmonics - High Channel								
4959.9	48.4 Pk	5.2 / 35.3 / 38.7	50.2	H / 1.0 / 0.0	0	50.2	74	-23.8
4959.9	46.4 Pk	5.2 / 35.3 / 38.7	48.2	V / 1.0 / 0.0	0	48.2	74	-25.8
7440.0	30.5 Pk	6.5 / 38.8 / 39.2	36.6	H / 1.0 / 0.0	0	36.6	74	-37.4
7440.0	31.4 Pk	6.5 / 38.8 / 39.2	37.5	V / 1.0 / 0.0	0	37.5	74	-36.5
12400.	25.2 Pk	8.9 / 41.2 / 45.7	29.6	H / 1.0 / 0.0	0	29.6	74	-44.4
12400.	24.2 Pk	8.9 / 41.2 / 45.7	28.6	V / 1.0 / 0.0	0	28.6	74	-45.4
19840.	3.9 Pk	0.0 / 21.8 / 0.0	16.2	V / 1.0 / 0.0	0	16.2	74	-57.8
19840.	5.4 Pk	0.0 / 21.8 / 0.0	17.6	H / 1.0 / 0.0	0	17.6	74	-56.4
22320.	6.6 Pk	0.0 / 21.1 / 0.0	18.2	V / 1.0 / 0.0	0	18.2	74	-55.8
22320.	4.4 Pk	0.0 / 21.1 / 0.0	16.0	H / 1.0 / 0.0	0	16.0	74	-58

Peak Limit FCC Restricted Bands per 15.209/ 15.35(b): 74 dBuV/m at 3-meter test distance

Worst-Case Harmonic - Mid-Channel: 4881.96 MHz, 53.9 dBuV/m (20.1 dB below limit)

Result: Pass

6 Radiated Emissions – Spurious of the Transmitter

6.1 Method

The test methods used comply with ANSI C63.10. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

6.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18882	Spectrum Analyzer (dc-22 GHz)	Hewlett-Packard	8566B	2410A00154	12/06/2010	12/06/2011
18660	Spectrum Analyzer Display Section (set 1)	Hewlett-Packard	85662A	2318A04983	12/10/2010	12/10/2011
18880	Q.P Adapter	Hewlett-Packard	85650A	2811A01300	12/06/2010	12/06/2011
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/03/2011	06/03/2012
18906	Pre-Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/03/2011	06/03/2012
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/03/2011	06/03/2012
18897	Magnetic loop antenna 10kHz-30MHz	EMCO	6502	9205-2738	11/18/2010	11/18/2011
19936	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-1	10/11/2010	10/11/2011
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	12/09/2010	12/09/2011
18805	HF Active Antenna/Harmonic Mixer 18 GHz to 26.5 GHz	Hewlett-Packard	11970K	2332A01280	10/04/2010	10/04/2011
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_CVI	V.1.0	01/01/2011	01/01/2012

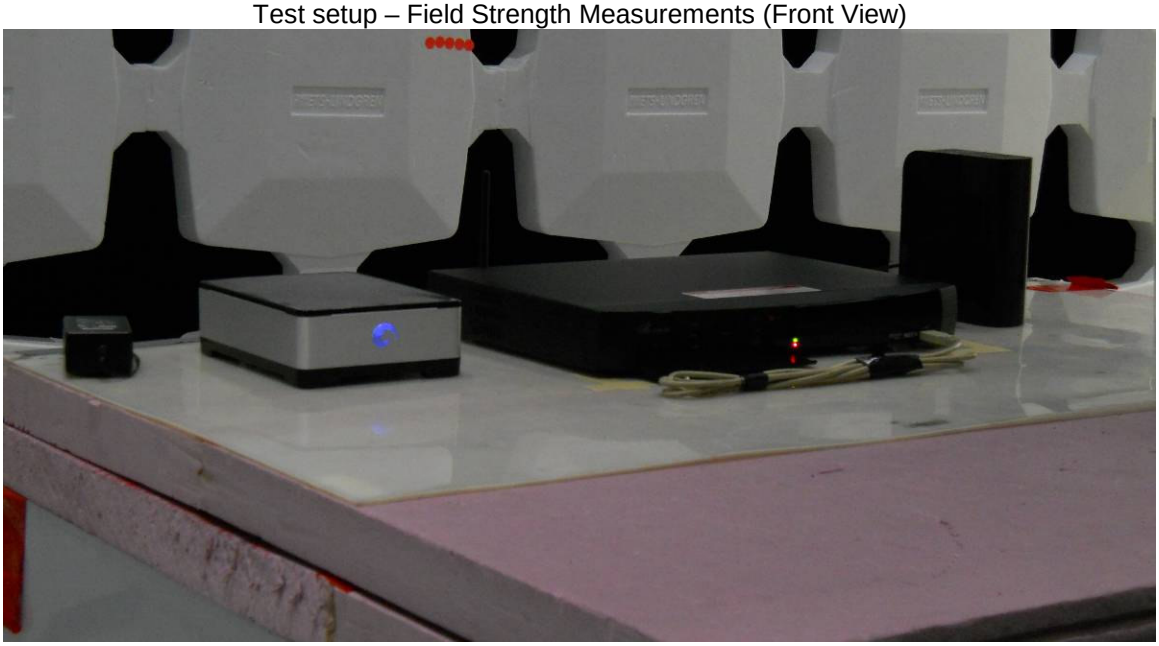
6.3 Results:

The sample tested was found to comply with the requirements of:

- FCC 15.209/ 15.247(d)
- Covers RSS-210 A8.5, & RSS-GEN 7.2.2

6.4 Setup Photographs:

Test setup – Field Strength Measurements (Front View)



Test setup – Field Strength Measurements (Rear View)

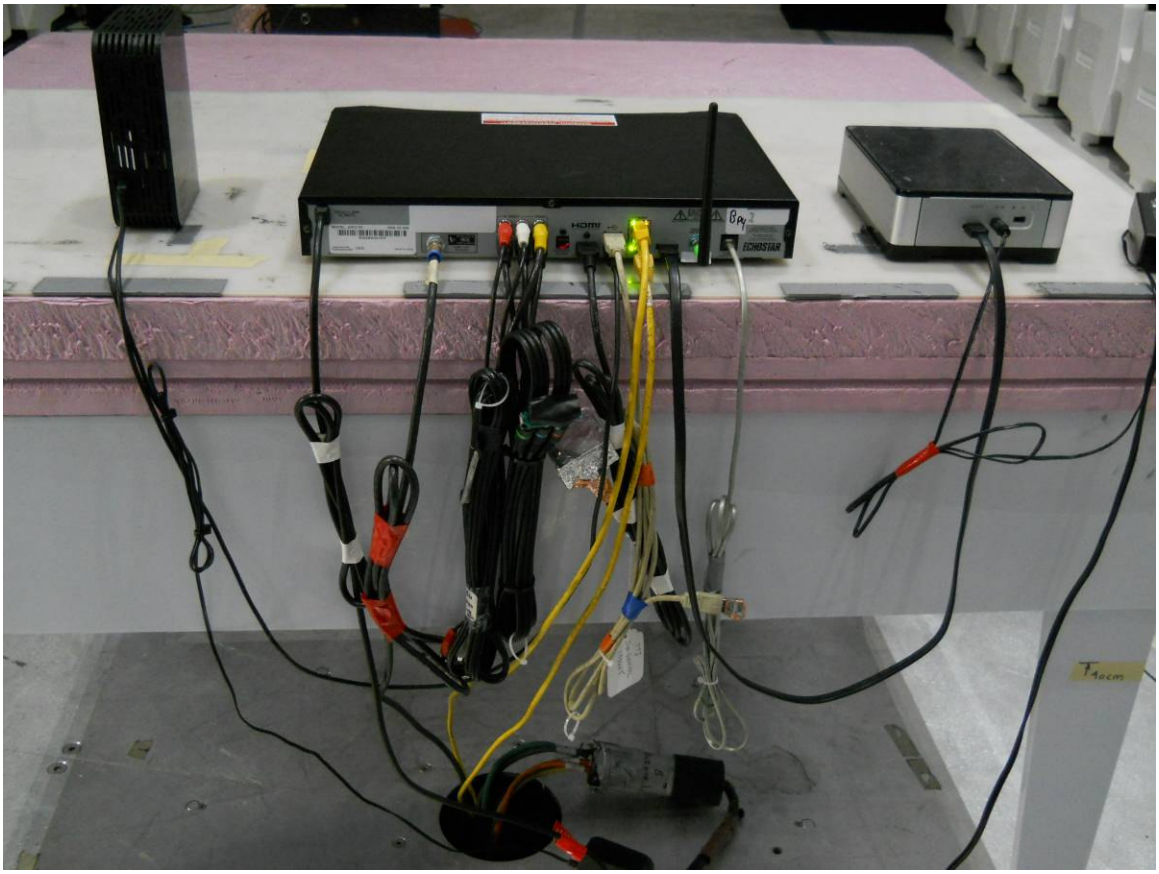
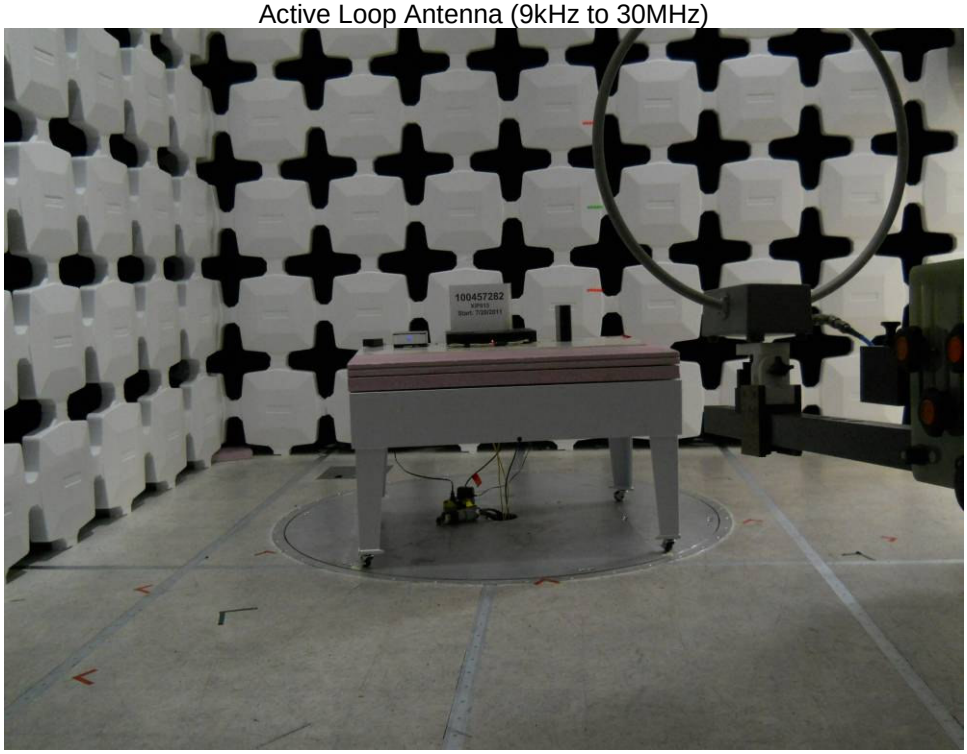


Photo: Antenna Setups

Active Loop Antenna (9kHz to 30MHz)



BiLog Antenna (30MHz to 1000MHz)

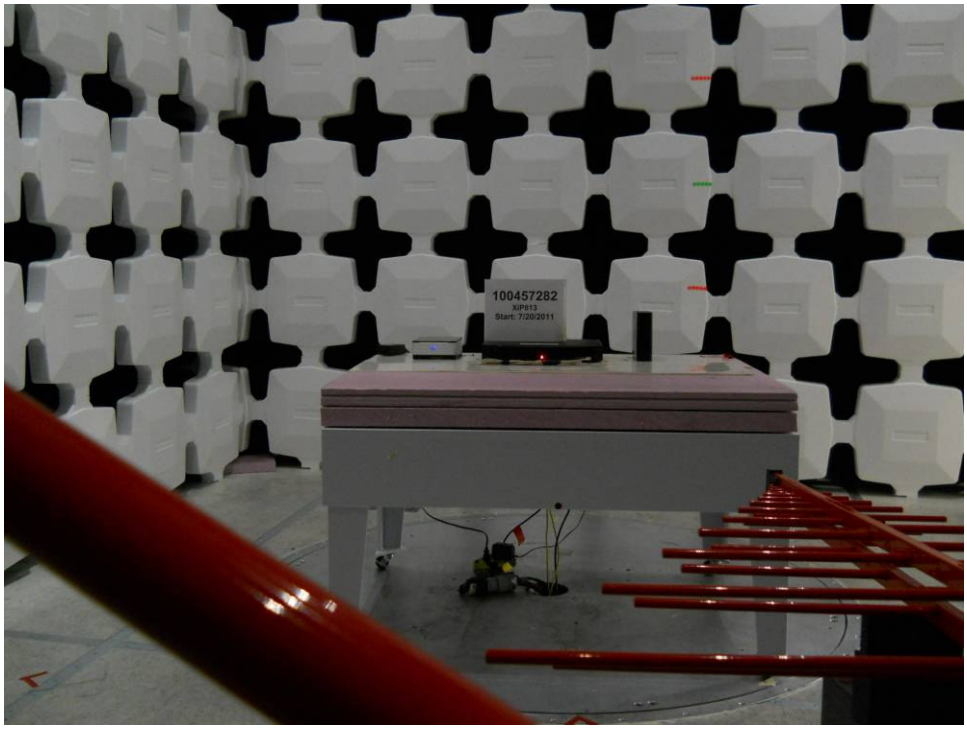
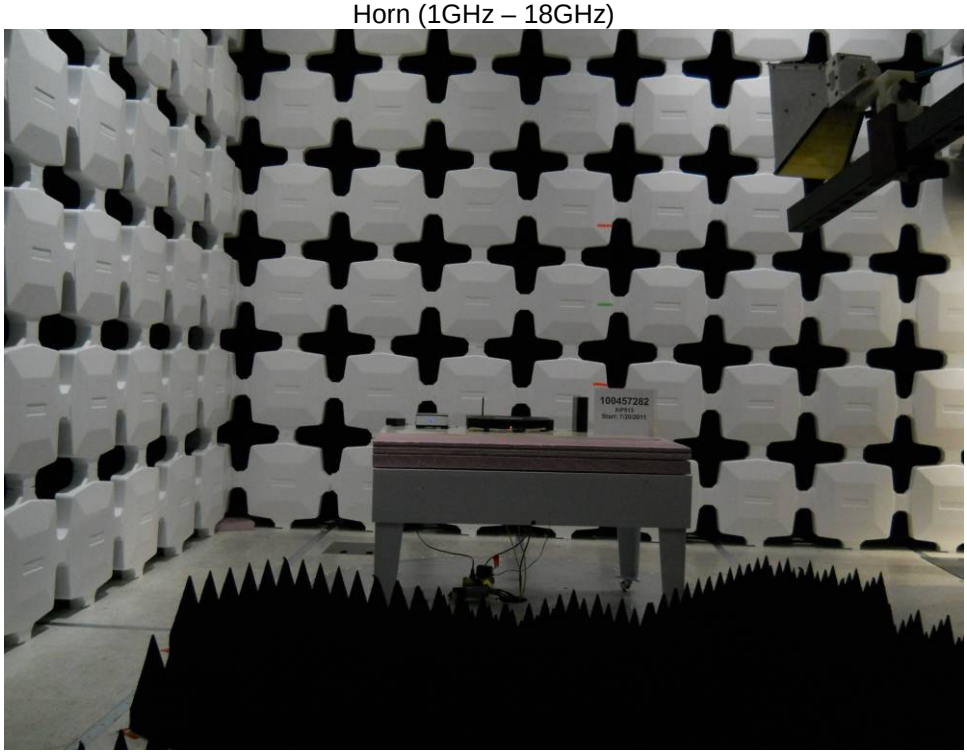
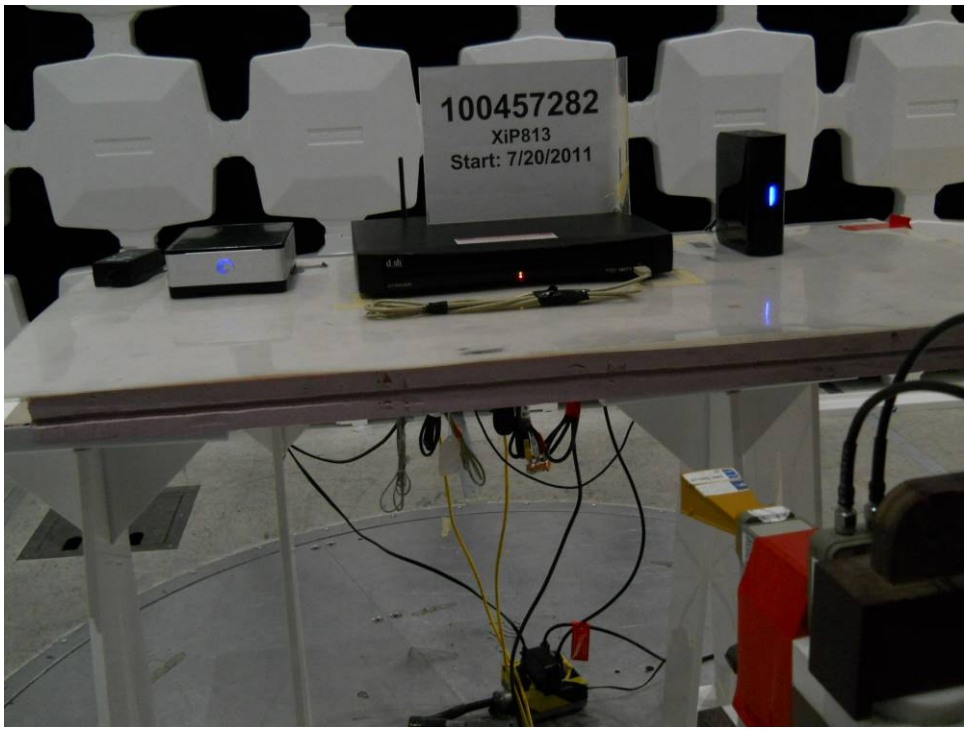


Photo: Antenna Setups

Horn (1GHz – 18GHz)

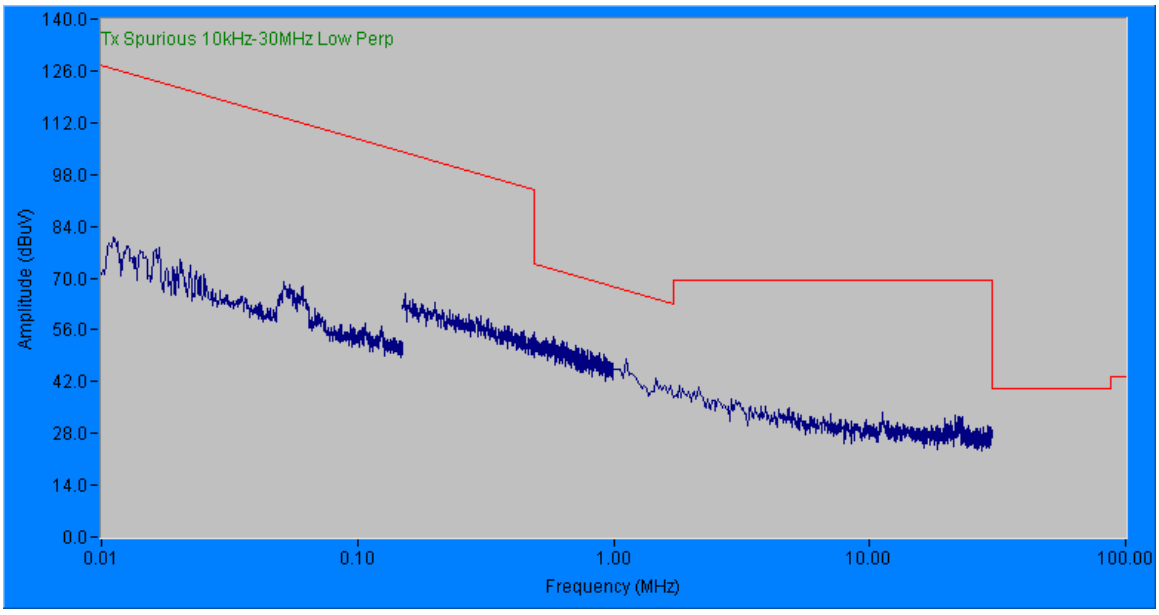


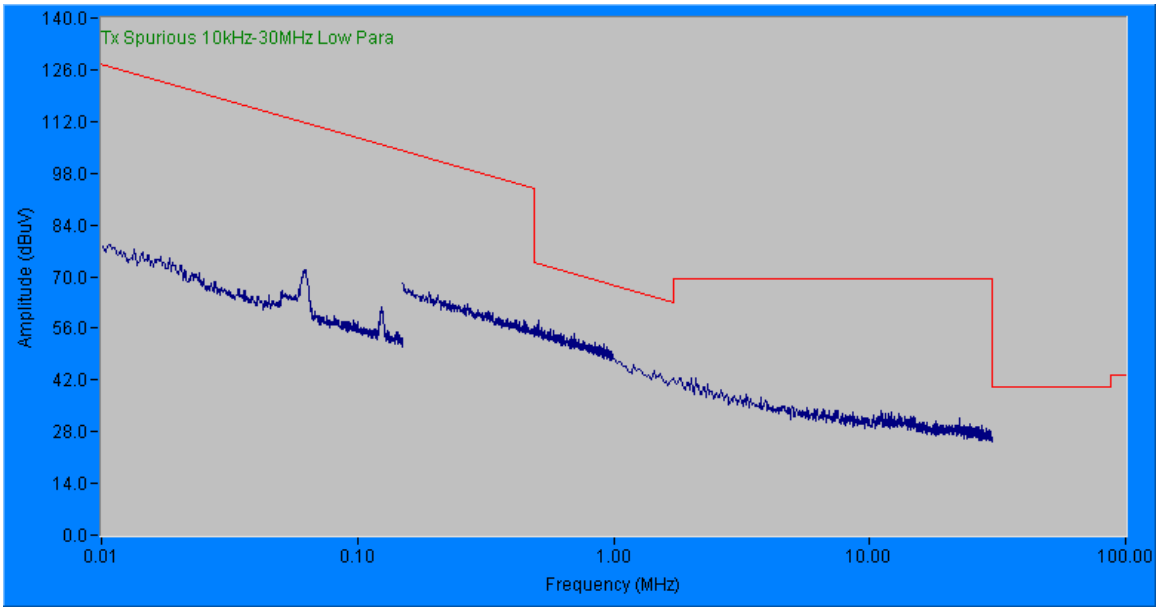
HF Active Antenna/Harmonic Mixer (18GHz – 26.5GHz)



6.5 Plots: Pre-Scan Peak Measurements – Not Final Data – Tx Low Channel

Radiated Emissions – FCC 15.209 (10kHz to 30MHz)

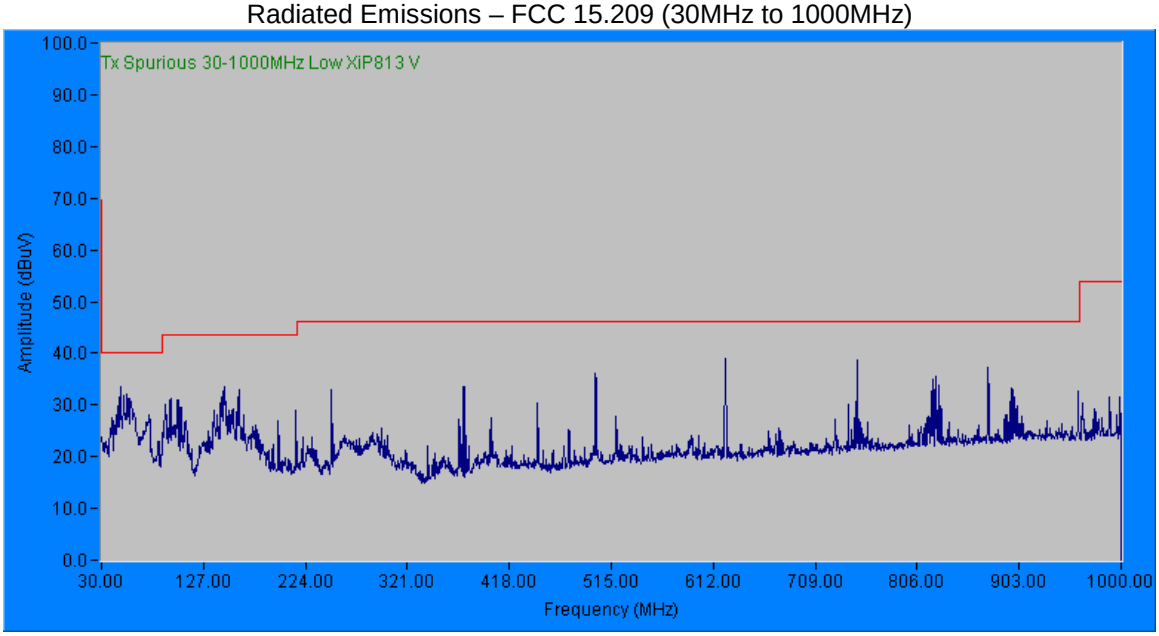


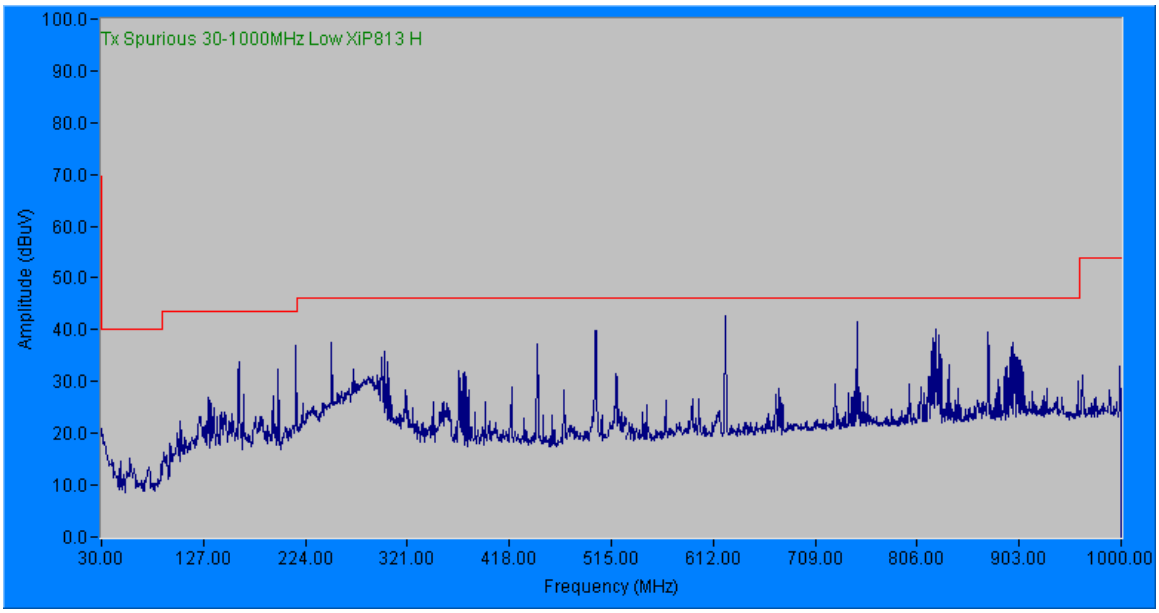


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Tx Low Channel

Radiated Emissions – FCC 15.209 (30MHz to 1000MHz)

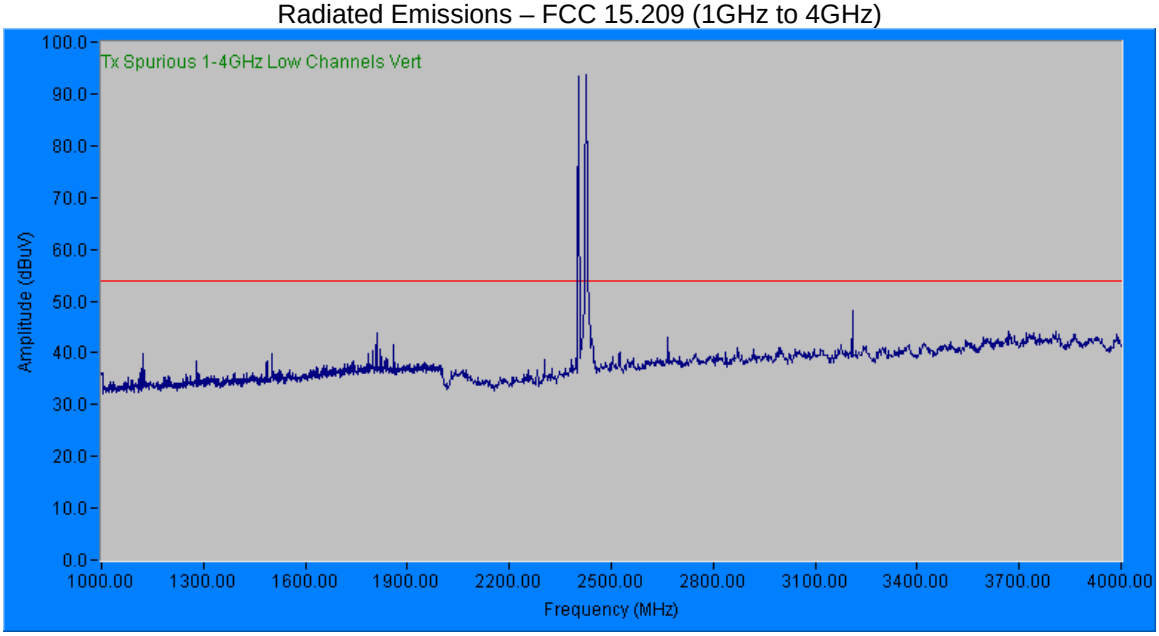


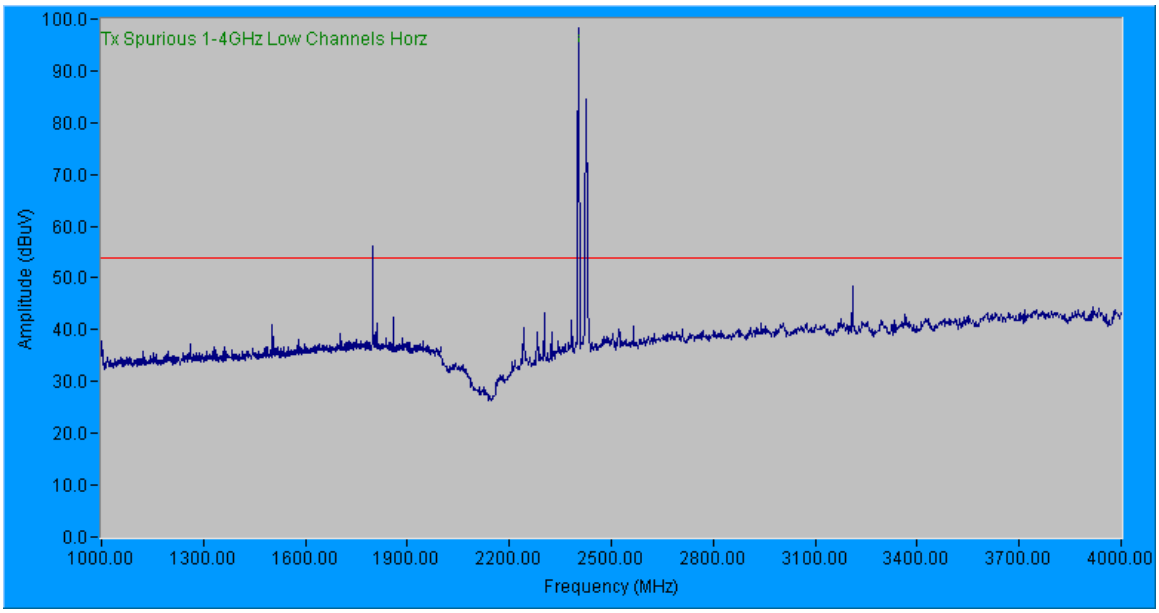


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Low Channel

Radiated Emissions – FCC 15.209 (1GHz to 4GHz)

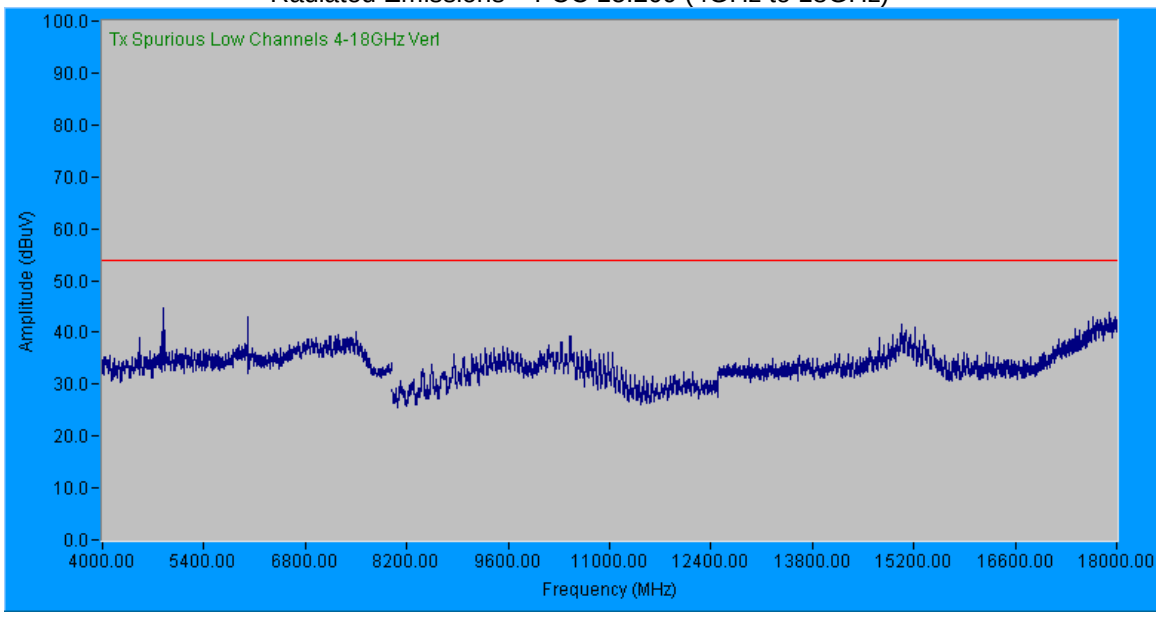


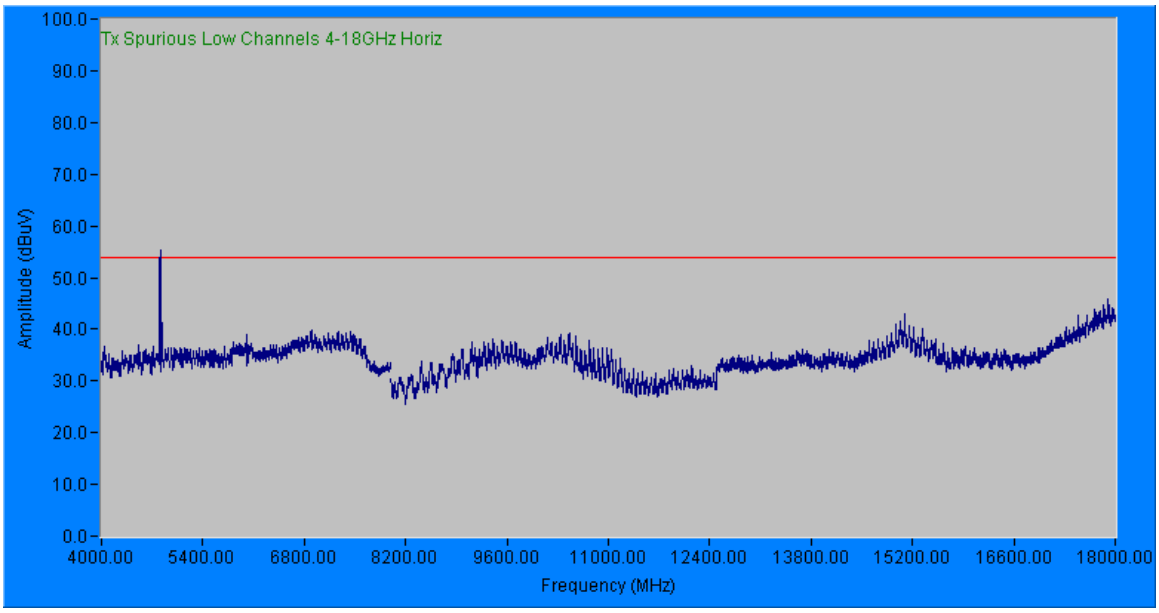


Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Low Channel

Radiated Emissions – FCC 15.209 (4GHz to 18GHz)

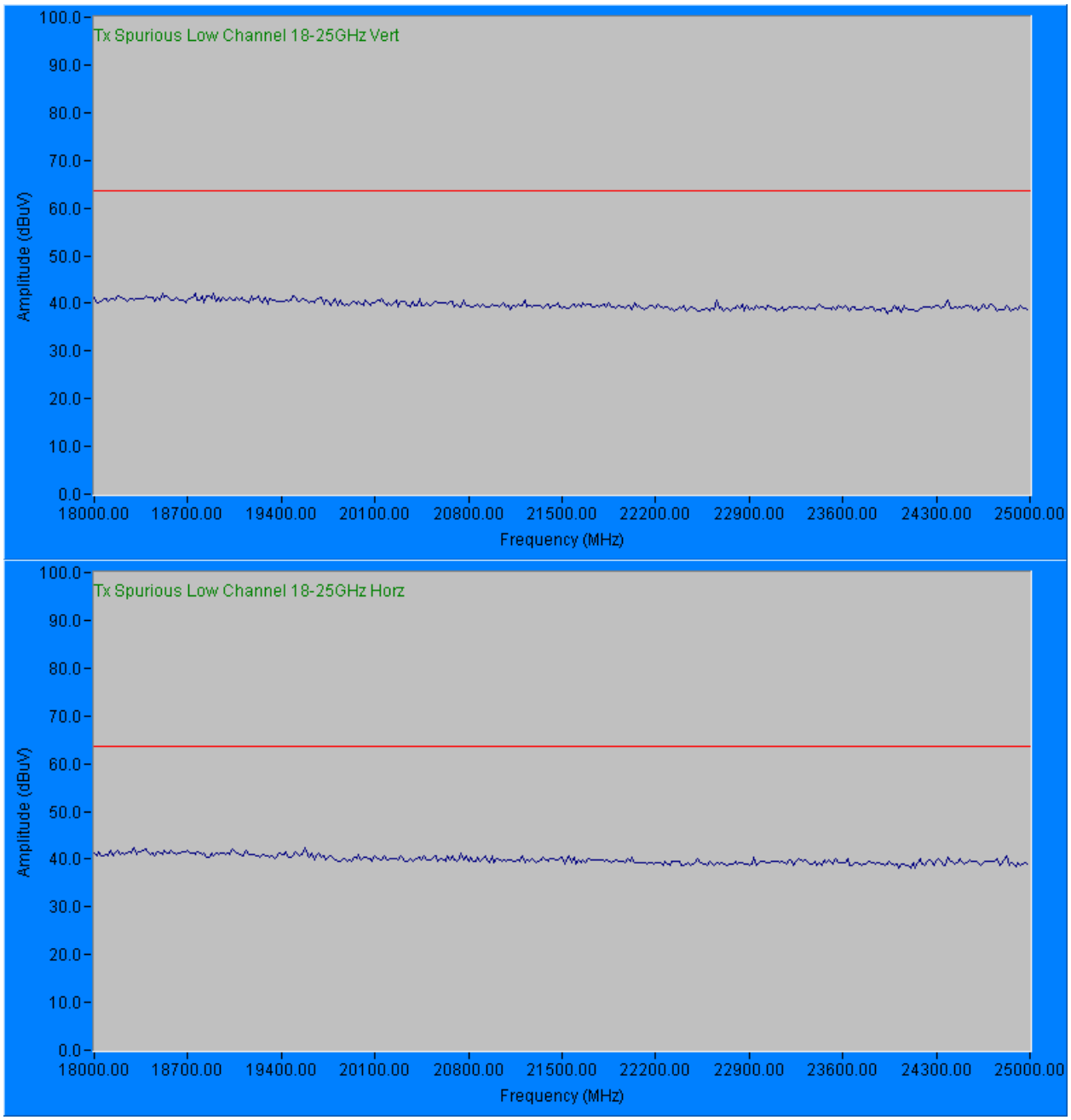




Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Low Channel

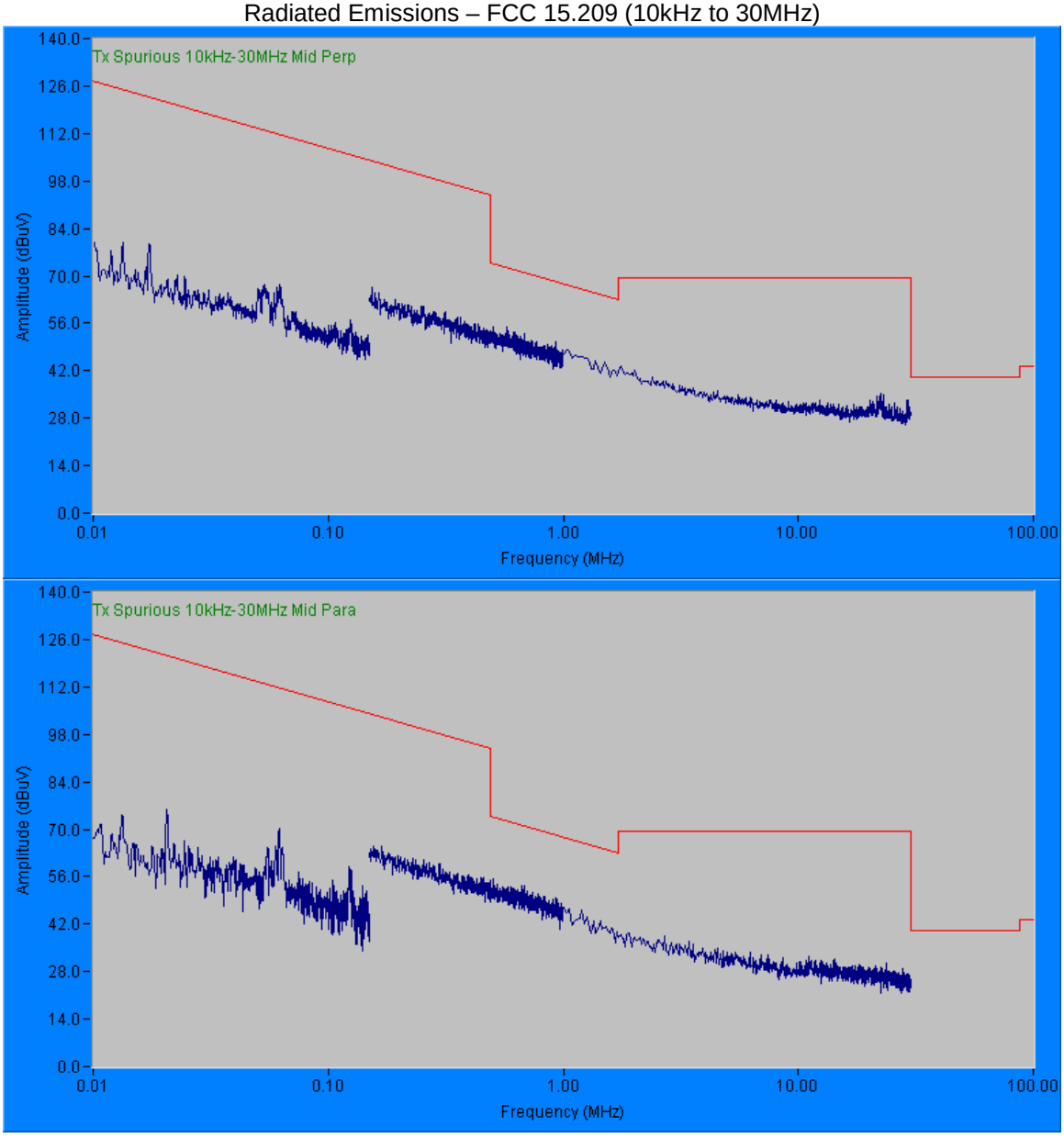
Radiated Emissions – FCC 15.209 (18GHz to 25GHz)



Note: Peak measurements plotted against FCC 15.209 Average Limit
(extrapolated from 3-meter to 1-meter test distance)

6.6 Plots: Pre-Scan Peak Measurements – Not Final Data – Tx Mid Channel

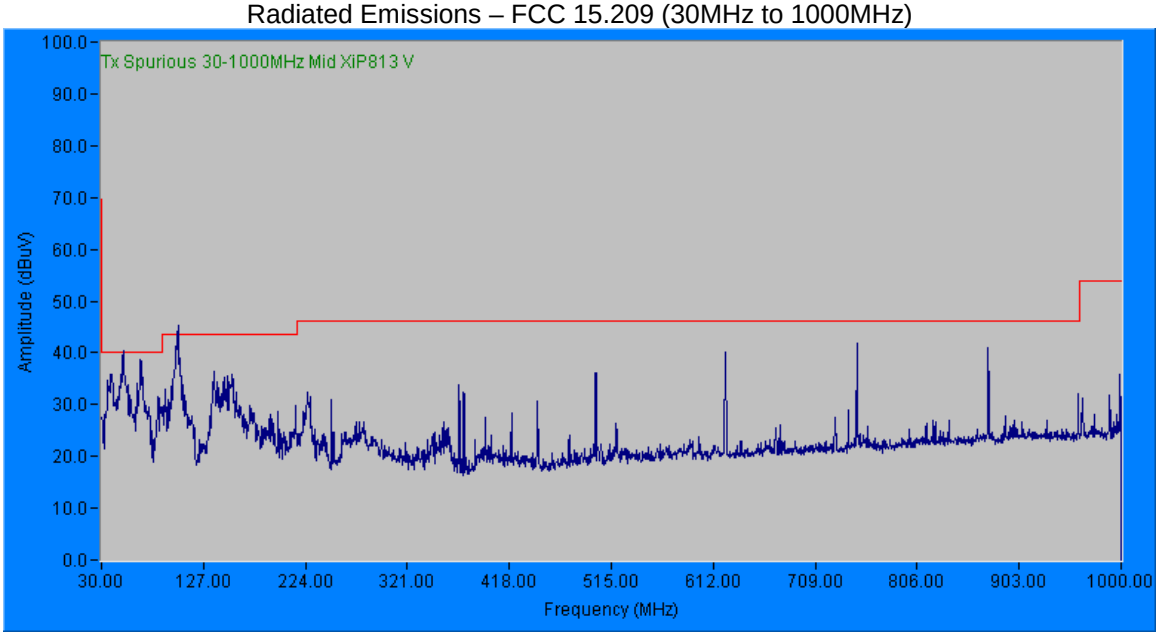
Radiated Emissions – FCC 15.209 (10kHz to 30MHz)

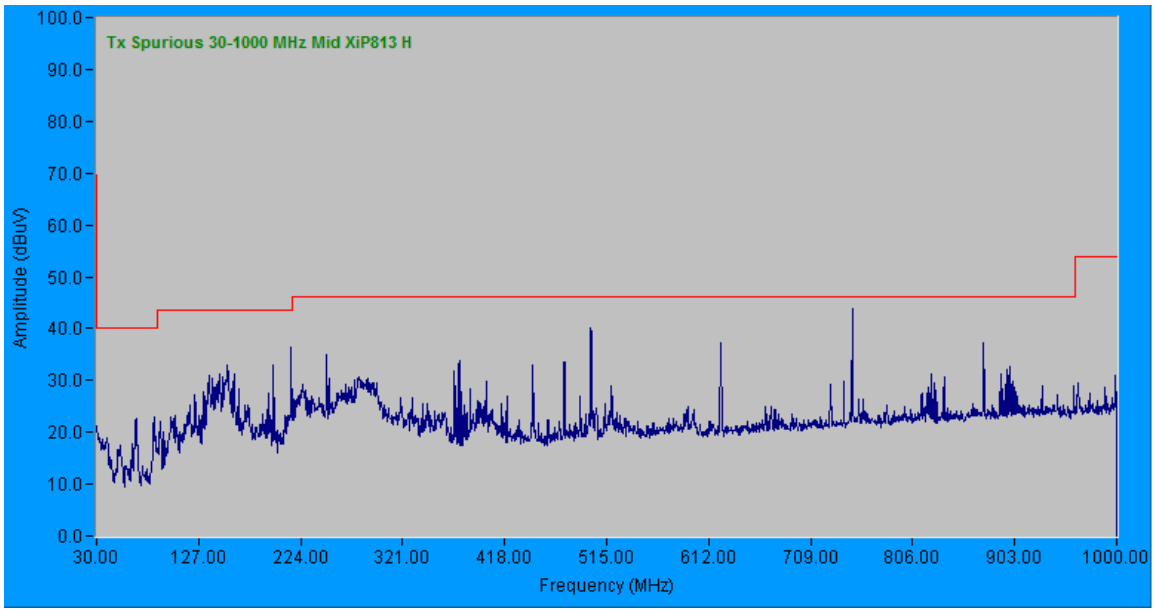


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Tx Mid Channel

Radiated Emissions – FCC 15.209 (30MHz to 1000MHz)

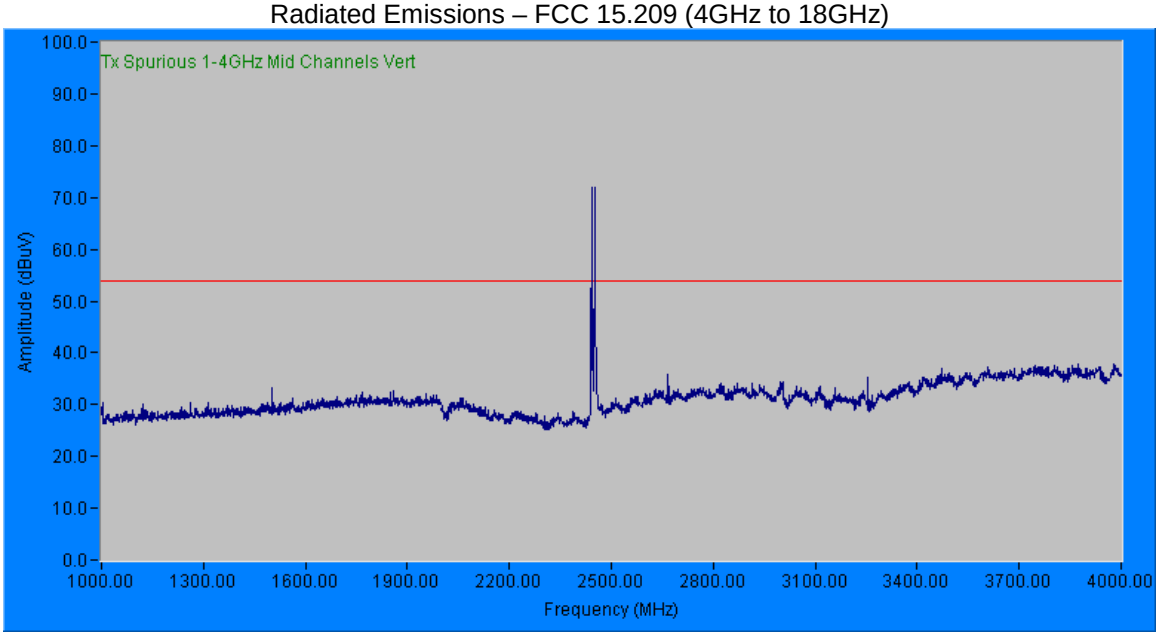


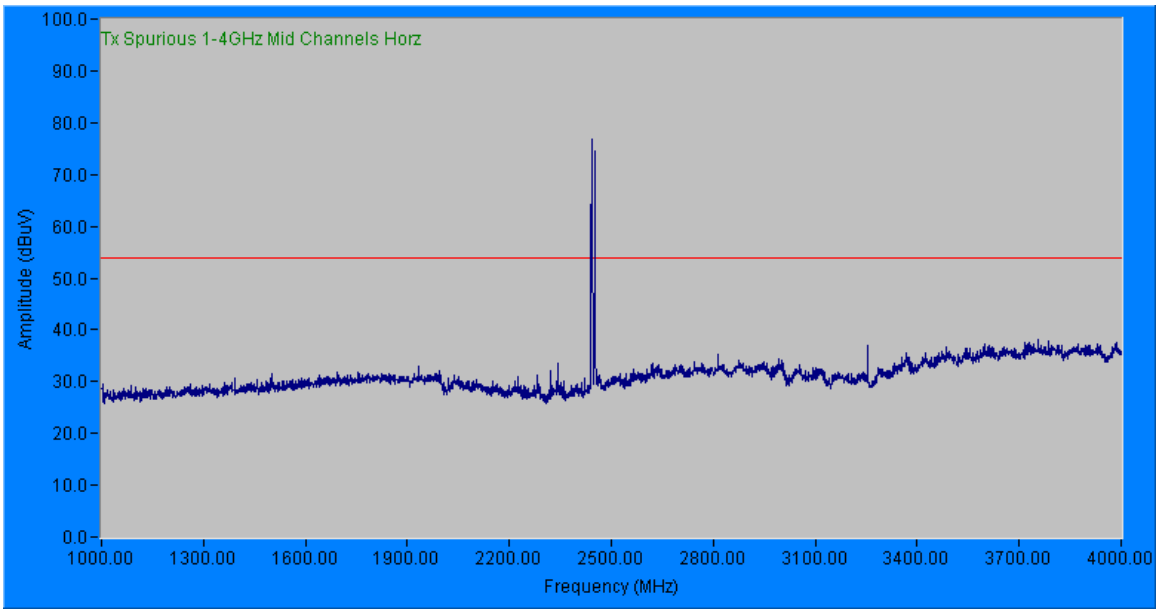


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Mid Channel

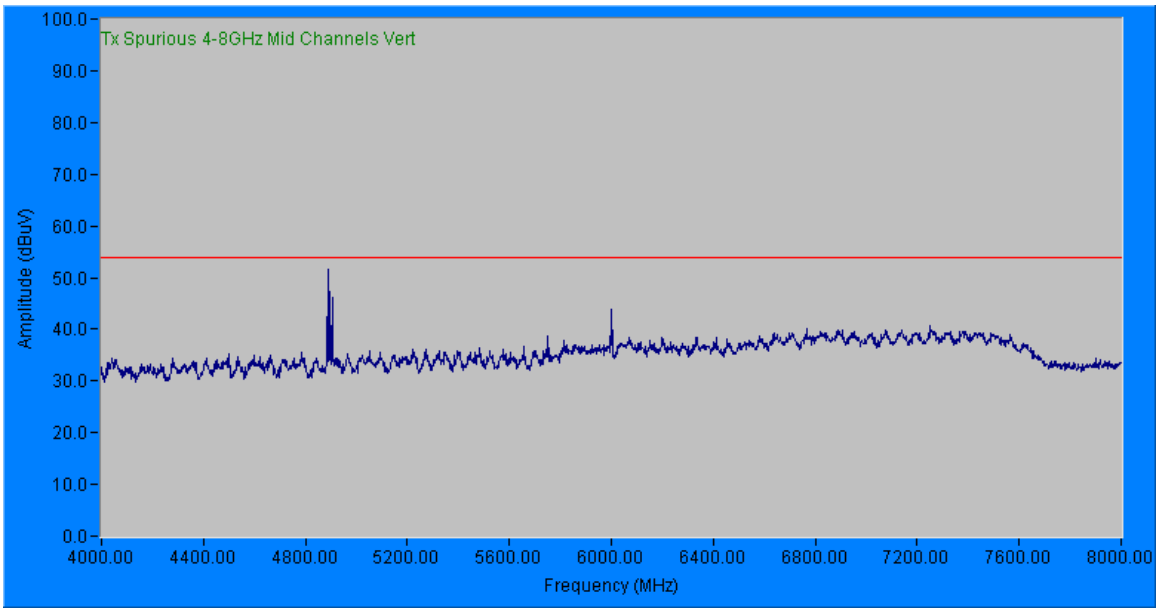
Radiated Emissions – FCC 15.209 (4GHz to 18GHz)

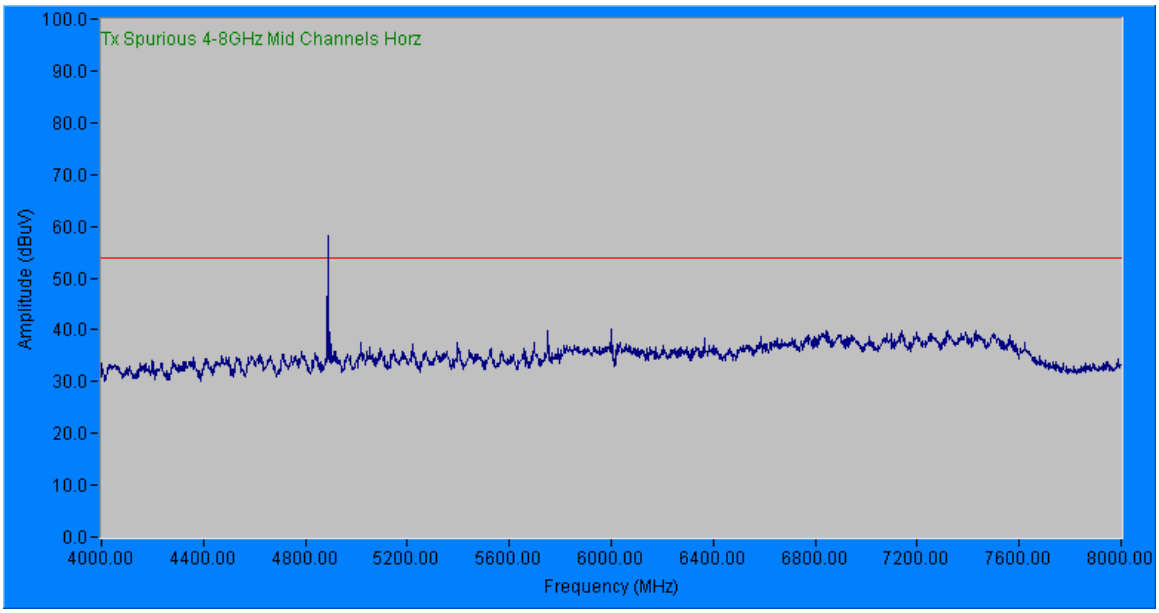




Note: Peak measurements plotted against FCC 15.209 Average Limit

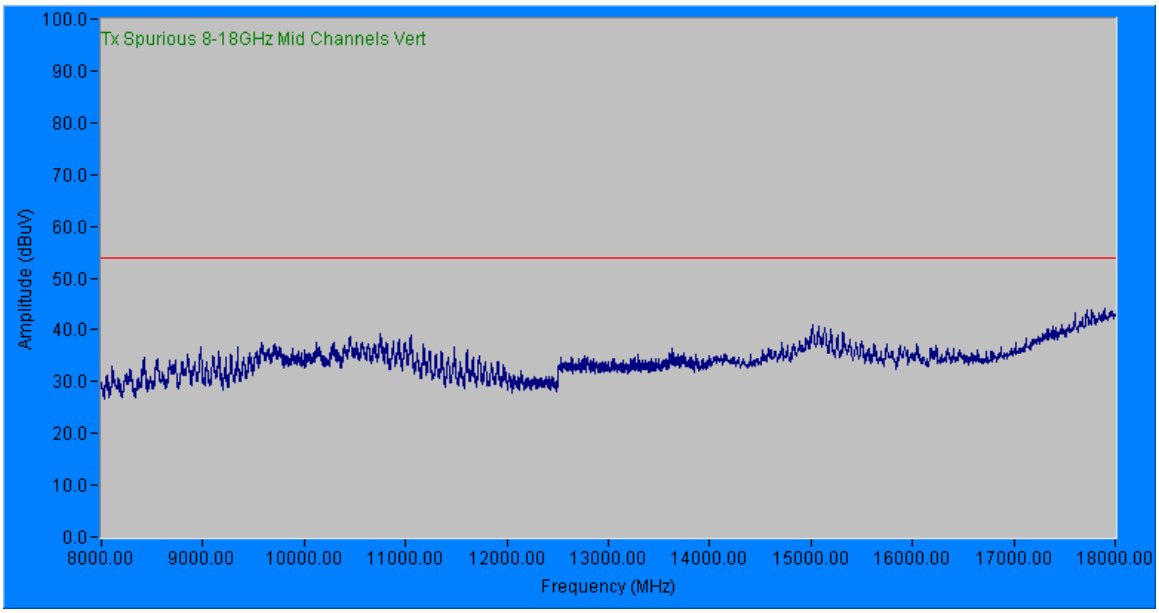
Radiated Emissions – FCC 15.209 (4GHz to 8GHz)

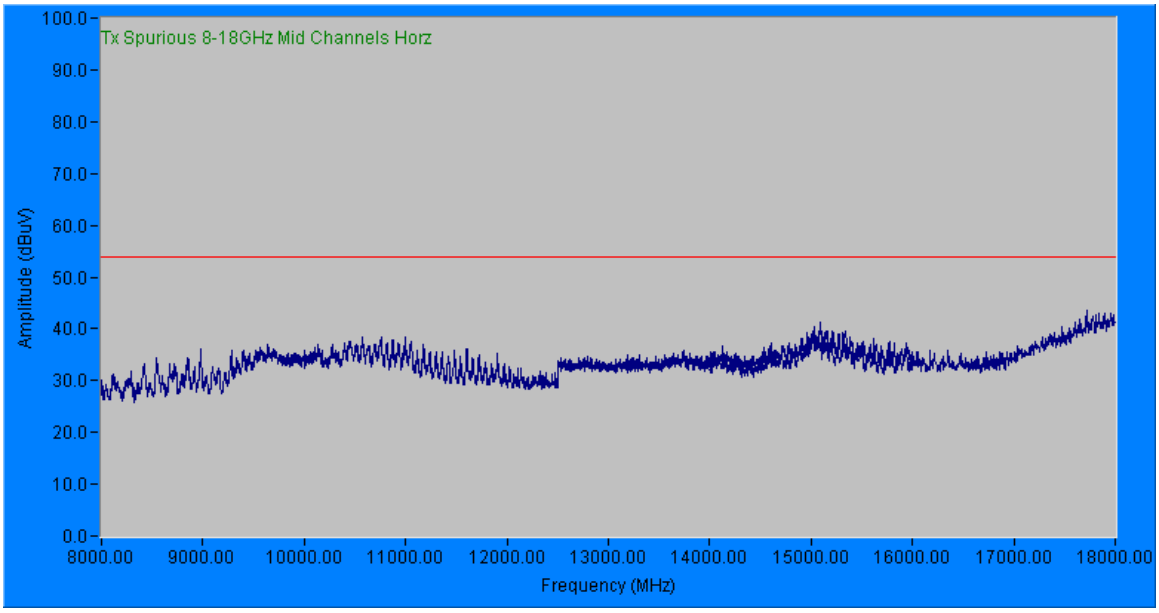




Note: Peak measurements plotted against FCC 15.209 Average Limit

Radiated Emissions – FCC 15.209 (8GHz to 18GHz)

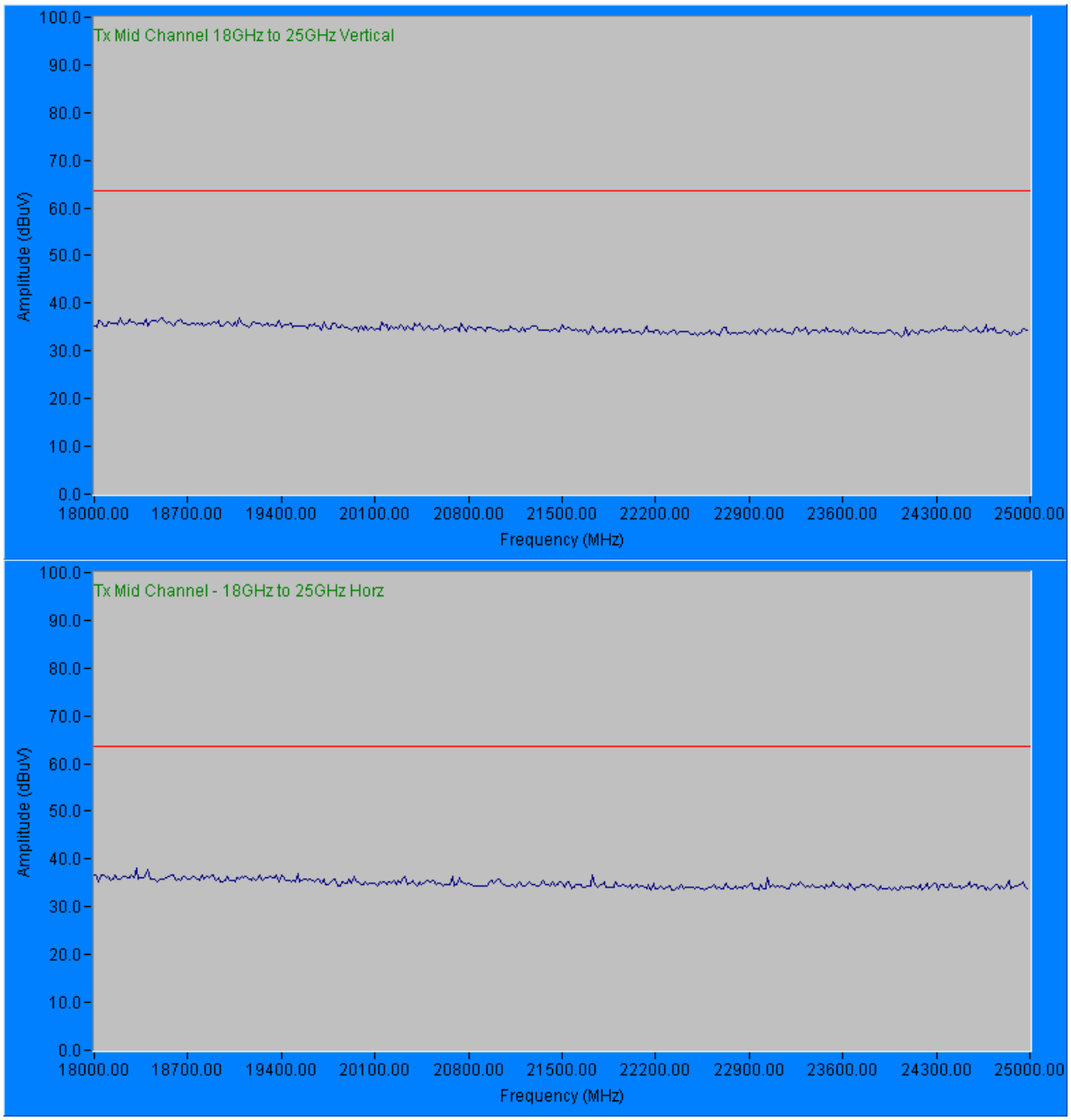




Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Mid Channel

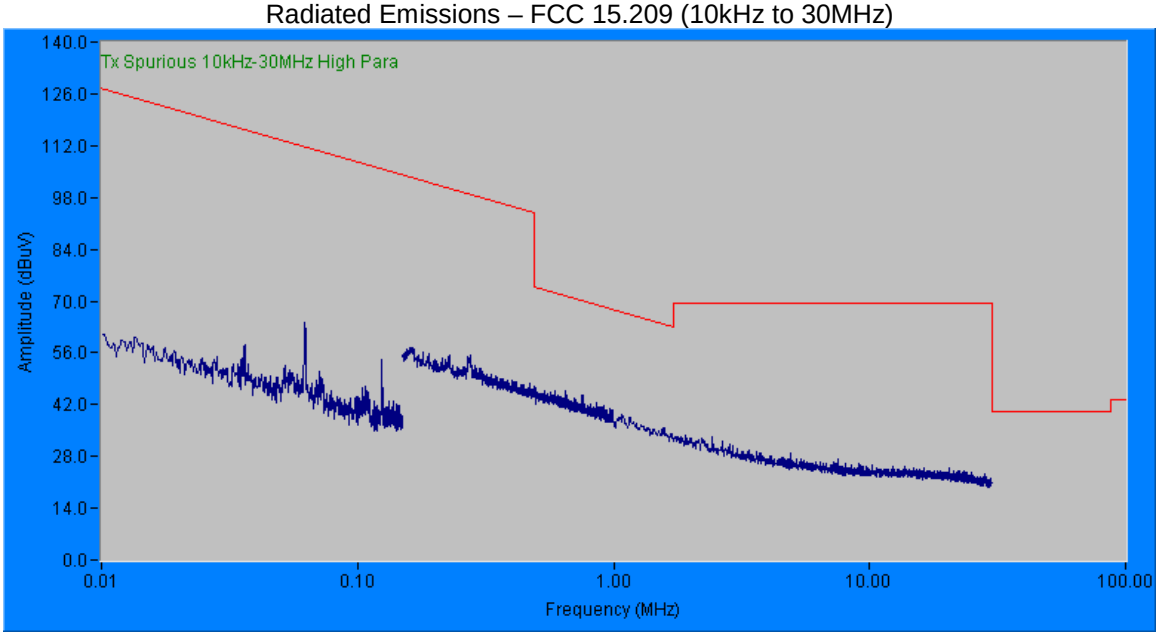
Radiated Emissions – FCC 15.209 (18GHz to 25GHz)

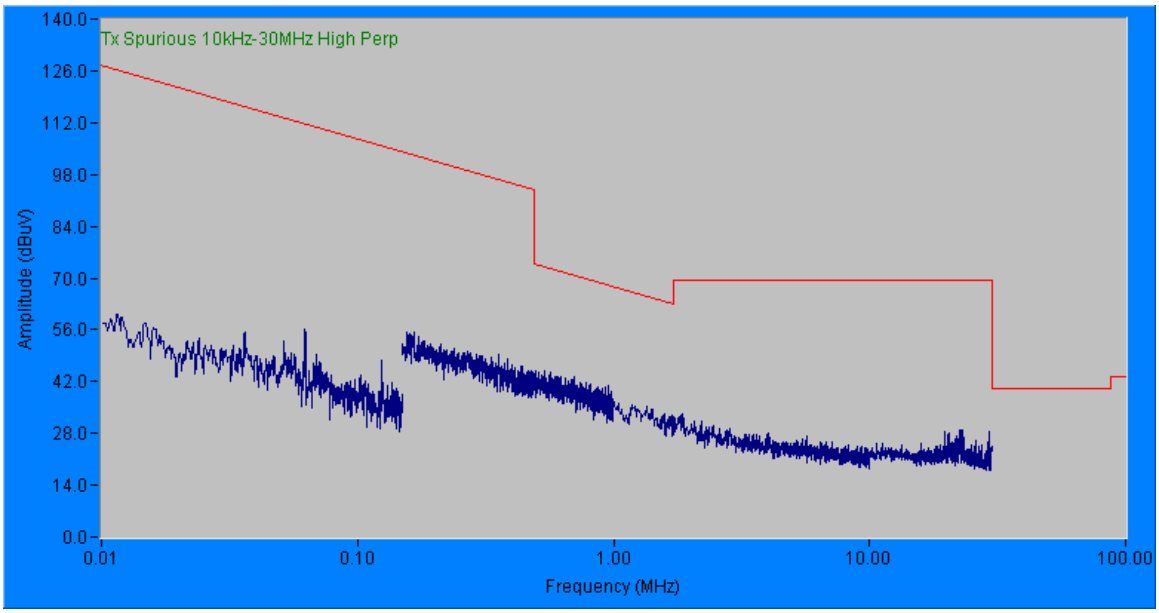


Note: Peak measurements plotted against FCC 15.209 Average Limit
(extrapolated from 3-meter to 1-meter test distance)

Plots: Pre-Scan Peak Measurements – Not Final Data – Tx High Channel

Radiated Emissions – FCC 15.209 (10kHz to 30MHz)

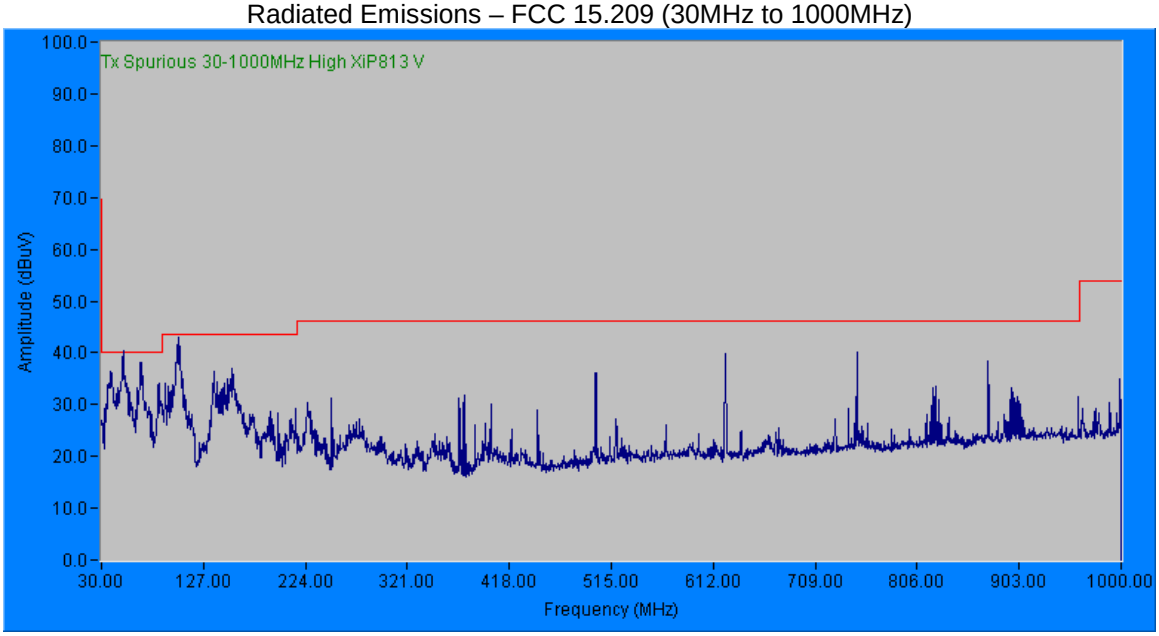


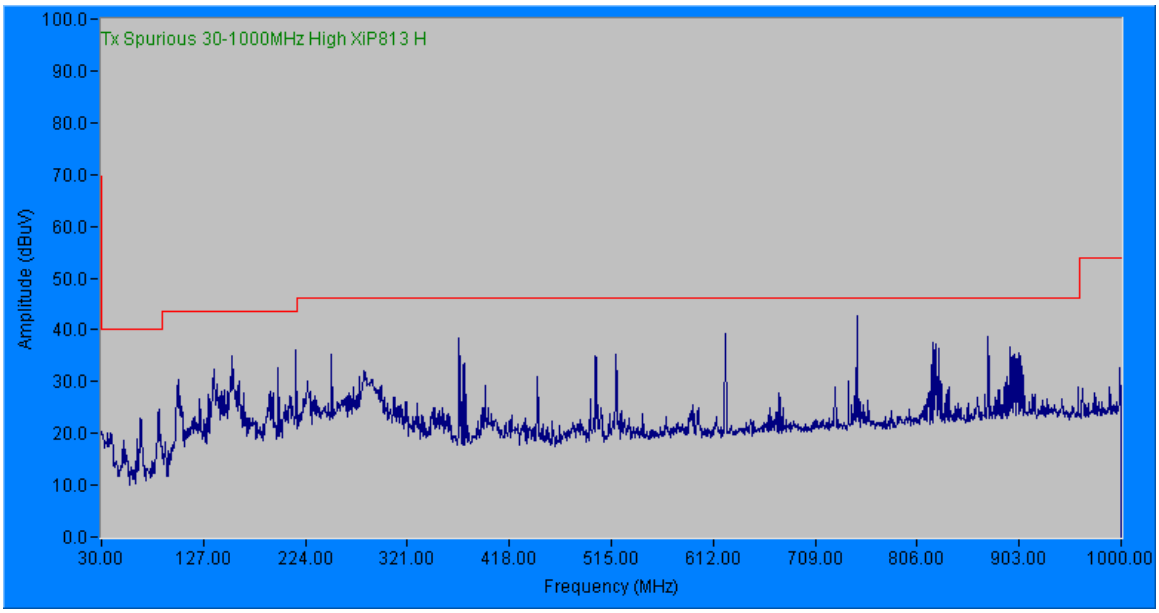


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – Tx High Channel

Radiated Emissions – FCC 15.209 (30MHz to 1000MHz)

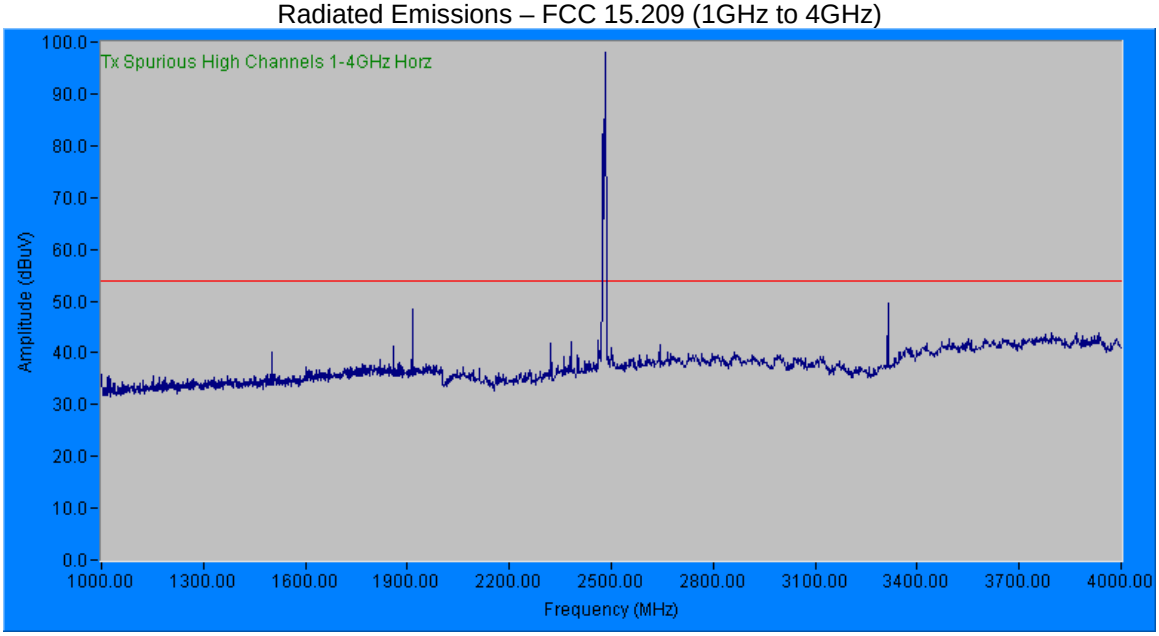


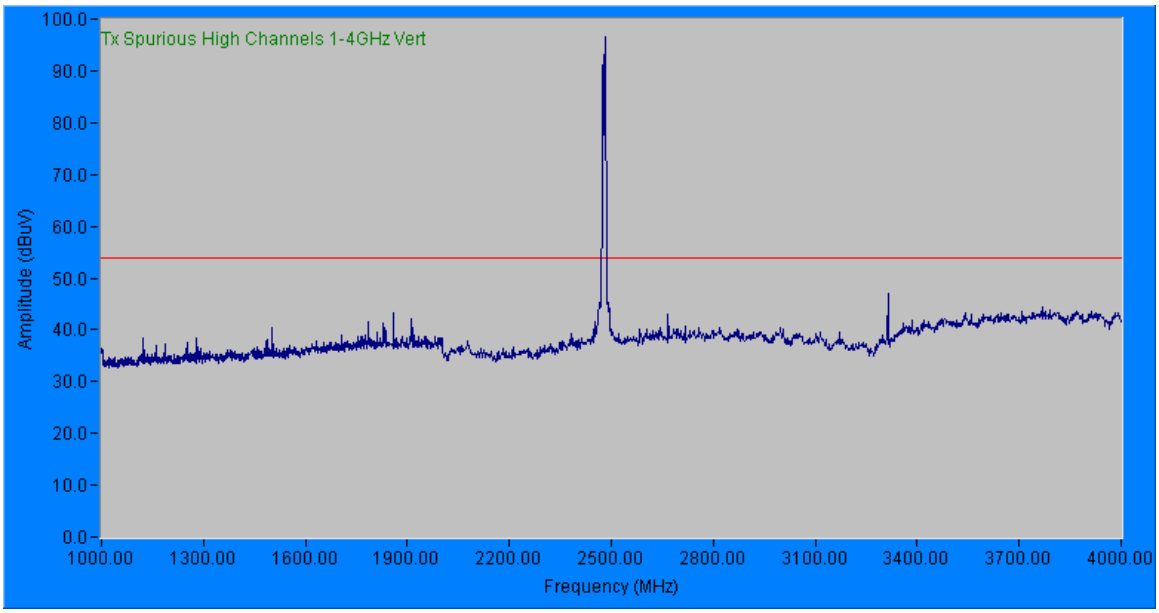


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – High Channel

Radiated Emissions – FCC 15.209 (1GHz to 4GHz)

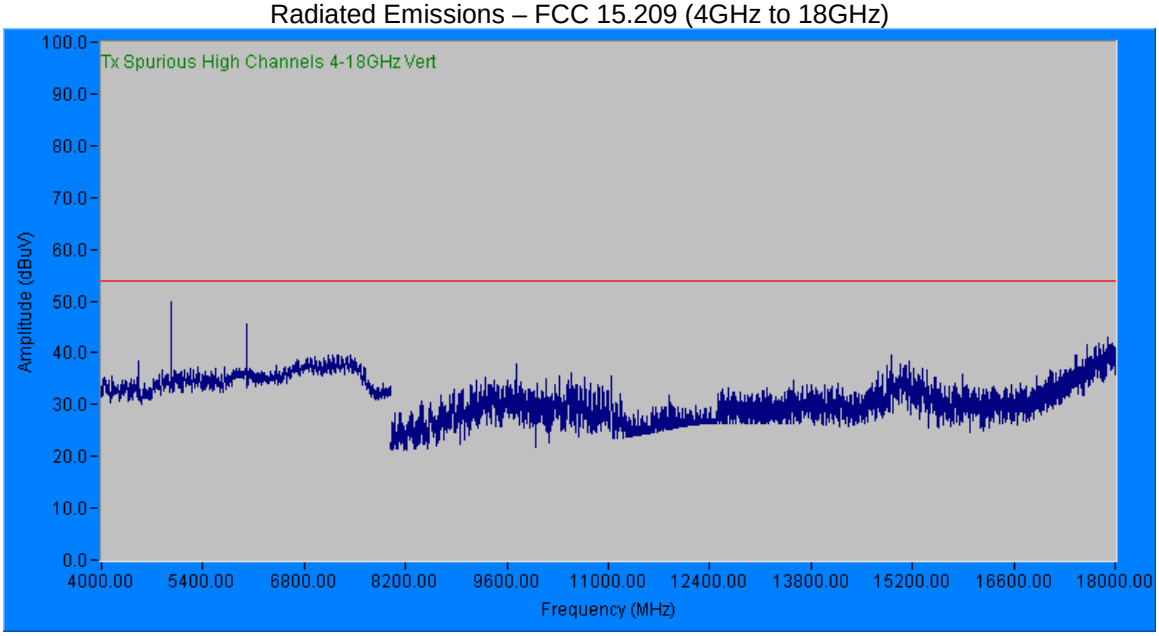


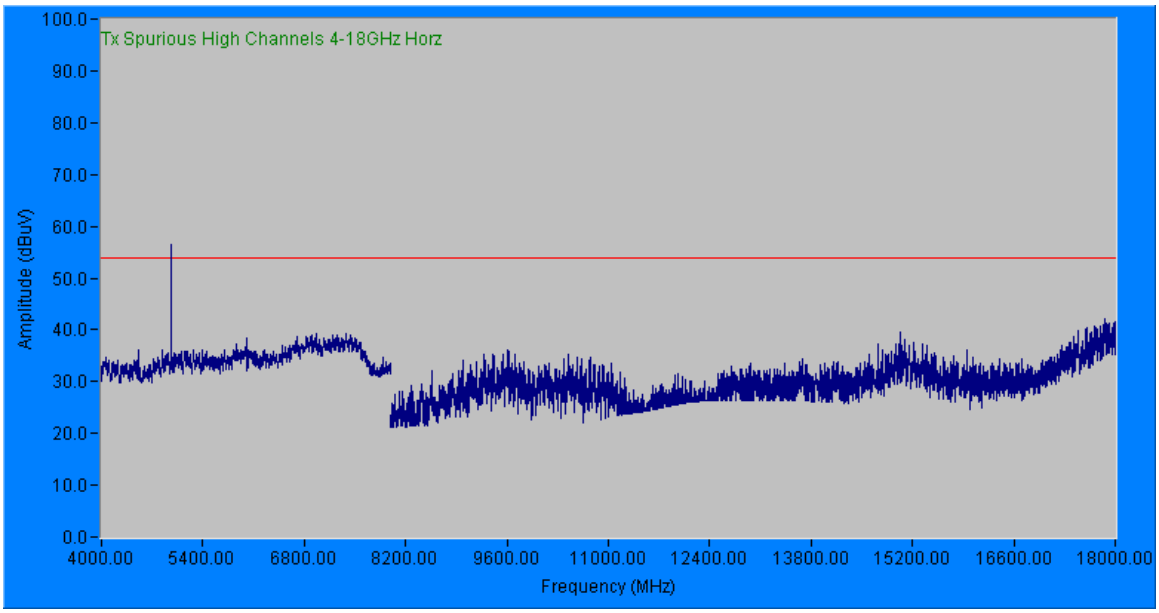


Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – High Channel

Radiated Emissions – FCC 15.209 (4GHz to 18GHz)

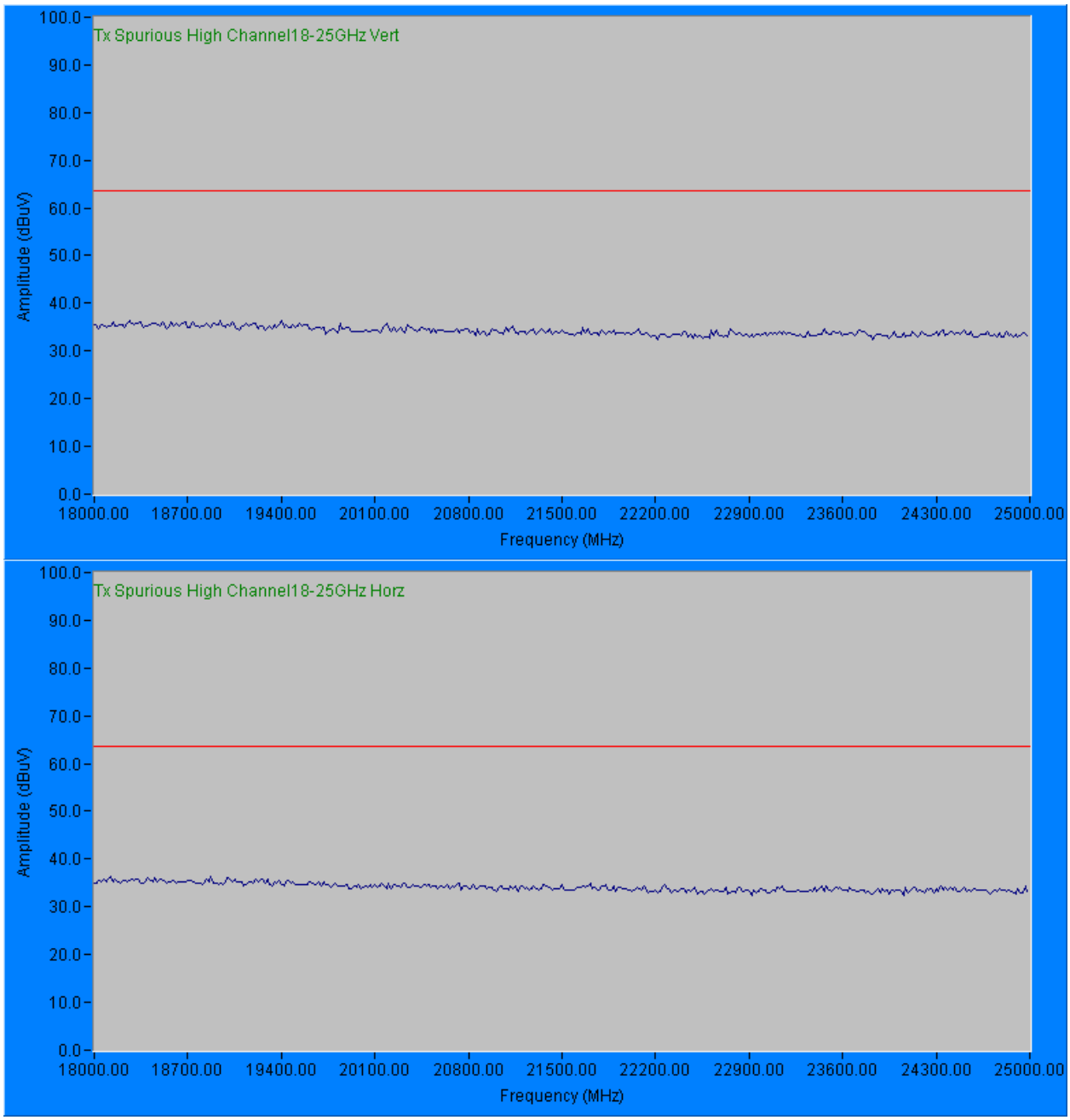




Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Pre-Scan Peak Measurements - Not Final Data – High Channel

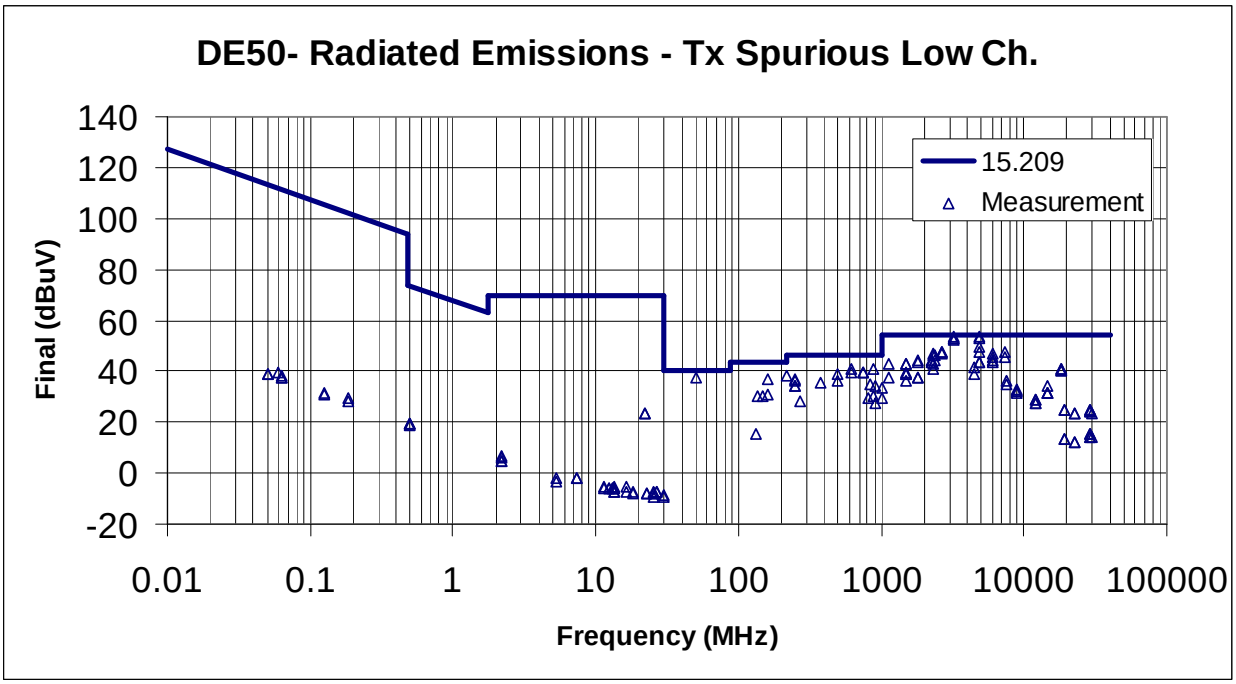
Radiated Emissions – FCC 15.209 (18GHz to 25GHz)



Note: Peak measurements plotted against FCC 15.209 Average Limit
(extrapolated from 3-meter to 1-meter test distance)

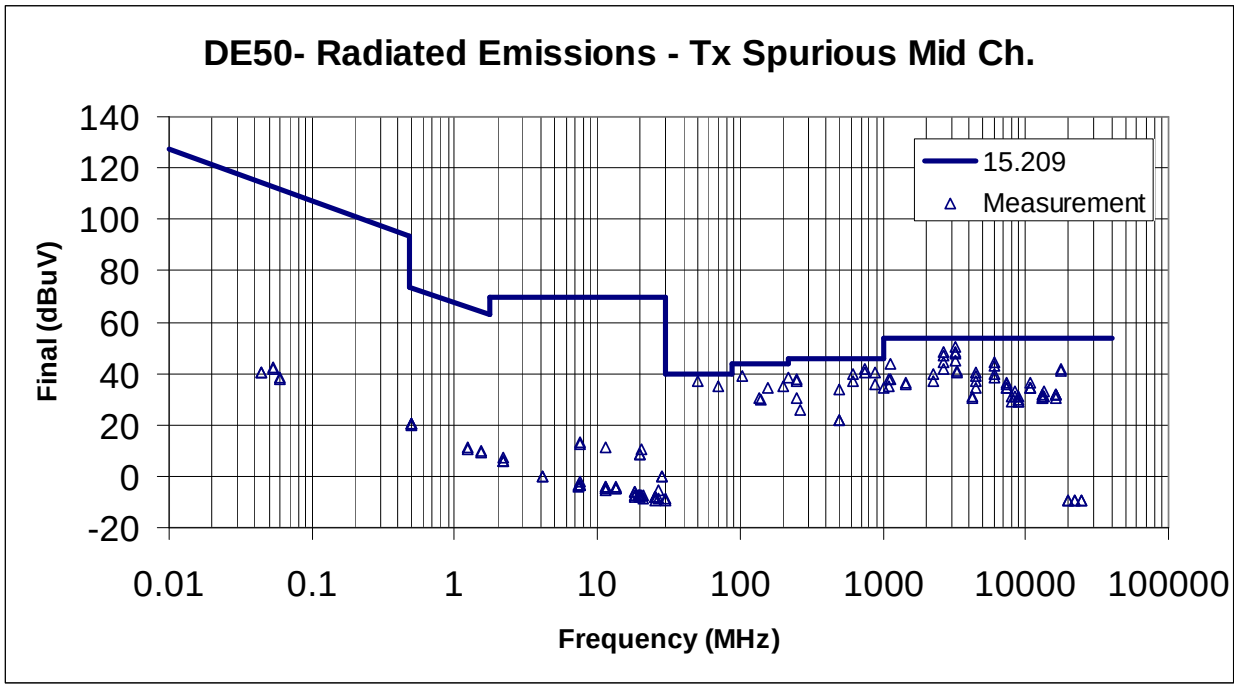
6.7 Plots: Final Peak Measurements – Tx Low Channel

Radiated Emissions – FCC 15.209 (10kHz to 25GHz)



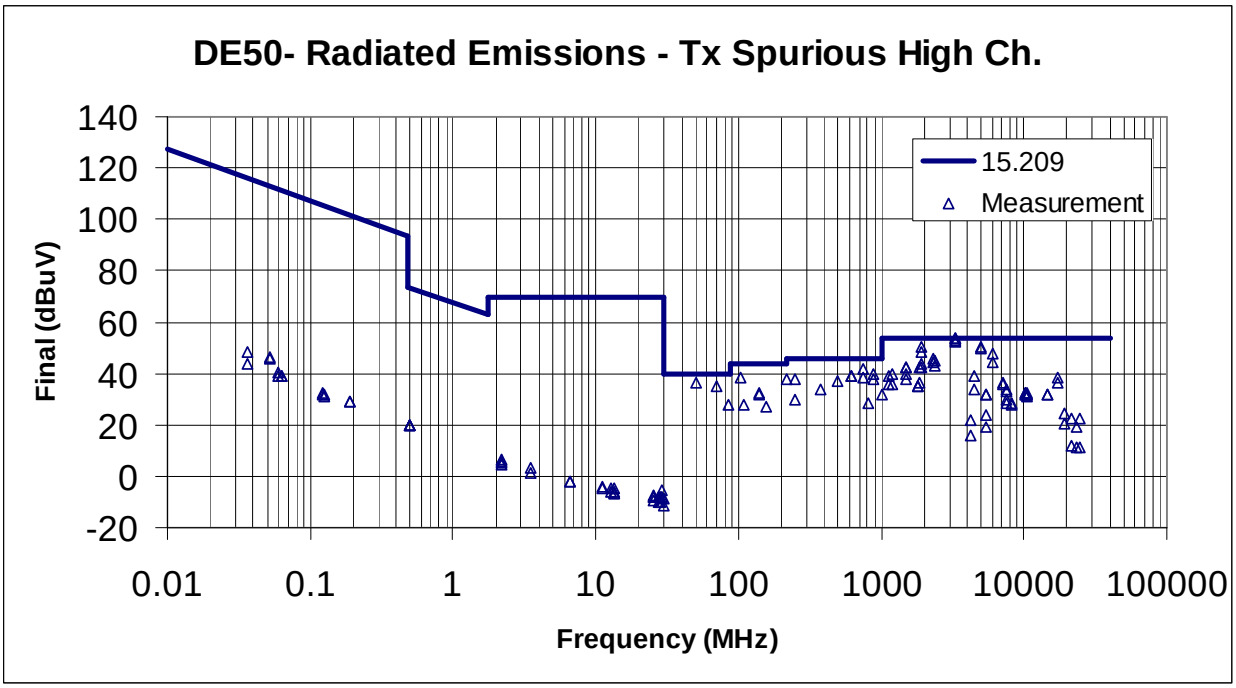
6.8 Plots: Final Peak Measurements – Tx Mid Channel

Radiated Emissions – FCC 15.209 (10kHz to 25GHz)



6.9 Plots: Final Peak Measurements – Tx High Channel

Radiated Emissions – FCC 15.209 (10kHz to 25GHz)



6.10 Test Data: Tx Low Channel

Radiated Electromagnetic Emissions

Test Report #:	**Tx Spurious 10kHz – 30GHz Low Chanel BT and RF4CE**	Test Area:	CC1 Radiated	Temperature:	23.4	°C
Test Method:	FCC Part 15.209	Test Date:	27-Jul-2011	Relative Humidity:	34.8	%
EUT Model #:	DE50 (XiP813)	EUT Power:		Air Pressure:	82.9	kPa
EUT Serial #:				Page:	58 of 132	
Manufacturer:	Echostar					
EUT Description:						
Notes:						

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
Tx Low - Low Channel BT and RF					
0.0503	28.0 Pk	0.0 / 10.8 / 0.0	38.8	Perp / 1.0 / 0.0	-74.8
0.06	28.7 Pk	0.0 / 10.8 / 0.0	39.5	Para / 1.0 / 0.0	-72.5
0.0632	26.8 Pk	0.0 / 10.8 / 0.0	37.6	Perp / 1.0 / 0.0	-74
0.126	21.1 Pk	0.0 / 10.5 / 0.0	31.6	Para / 1.0 / 0.0	-74
0.186	18.0 Pk	0.0 / 10.4 / 0.0	28.4	Para / 1.0 / 0.0	-73.8
0.5	9.2 Pk	0.1 / 10.3 / 0.0	19.6	Perp / 1.0 / 0.0	-54
0.5	8.7 Pk	0.1 / 10.3 / 0.0	19.1	Para / 1.0 / 0.0	-54.5
2.18	-5.9 Pk	0.1 / 10.5 / 0.0	4.7	Perp / 1.0 / 0.0	-64.8
2.18	-5.8 Pk	0.1 / 10.5 / 0.0	4.8	Para / 1.0 / 0.0	-64.7
5.35	-13.0 Pk	0.2 / 10.6 / 0.0	-2.2	Perp / 1.0 / 0.0	-71.7
7.45	-13.0 Pk	0.2 / 10.7 / 0.0	-2.1	Para / 1.0 / 0.0	-71.6
11.29	-16.0 Pk	0.2 / 10.7 / 0.0	-5.1	Para / 1.0 / 0.0	-74.6
12.3	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Para / 1.0 / 0.0	-75.5
12.99	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Para / 1.0 / 0.0	-75.5
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Perp / 1.0 / 0.0	-75.5
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Para / 1.0 / 0.0	-75.5
13.37	-18.0 Pk	0.3 / 10.7 / 0.0	-7	Para / 1.0 / 0.0	-76.5
16.17	-18.0 Pk	0.3 / 10.6 / 0.0	-7.1	Perp / 1.0 / 0.0	-76.6
18.31	-18.0 Pk	0.3 / 10.5 / 0.0	-7.2	Perp / 1.0 / 0.0	-76.7
22.22	12.9 Pk	0.3 / 10.0 / 0.0	23.2	Perp / 1.0 / 0.0	-46.3
22.46	-18.0 Pk	0.3 / 10.0 / 0.0	-7.7	Perp / 1.0 / 0.0	-77.2

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
25.57	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.6	-19.0 Pk	0.4 / 9.4 / 0.0	-9.2	Para / 1.0 / 0.0	-78.7
26.61	-17.0 Pk	0.4 / 9.1 / 0.0	-7.5	Perp / 1.0 / 0.0	-77
29.99	-18.0 Pk	0.4 / 8.1 / 0.0	-9.5	Para / 1.0 / 0.0	-79
50.43	57.1 Qp	0.8 / 7.9 / 28.2	37.6	V / 1.2 / 61.7	-2.4
131.51	28.9 Qp	0.8 / 13.6 / 27.8	15.5	H / 2.1 / 245.4	-28
137.18	44.8 Qp	0.8 / 12.7 / 27.8	30.5	V / 1.0 / 249.1	-13
146.68	44.8 Qp	0.8 / 12.5 / 27.7	30.3	V / 1.0 / 243.8	-13.2
161.13	45.4 Qp	0.9 / 12.6 / 27.7	31.2	V / 1.2 / 201.9	-12.3
162	51.3 Qp	0.9 / 12.6 / 27.7	37.1	H / 2.1 / 245.5	-6.4
216.01	54.2 Qp	1.0 / 10.5 / 27.4	38.3	H / 1.4 / 235.0	-7.7
250	48.5 Qp	1.1 / 11.7 / 27.2	34	V / 1.0 / 289.1	-12
250.01	51.0 Qp	1.1 / 11.7 / 27.2	36.6	H / 1.5 / 148.1	-9.4
250.01	48.4 Qp	1.1 / 11.7 / 27.2	33.9	V / 1.0 / 151.4	-12.1
250.03	50.5 Qp	1.1 / 11.7 / 27.2	36.1	H / 1.0 / 278.8	-9.9
270.01	41.4 Qp	1.1 / 13.2 / 27.1	28.5	H / 1.0 / 79.2	-17.5
375.01	46.9 Qp	1.3 / 15.1 / 27.6	35.7	V / 1.0 / 0.0	-10.3
500.02	47.7 Qp	1.5 / 17.8 / 28.3	38.7	H / 1.0 / 191.8	-7.3
500.02	45.4 Qp	1.5 / 17.8 / 28.3	36.4	V / 1.0 / 197.7	-9.6
625.04	46.8 Qp	1.7 / 19.1 / 28.3	39.3	V / 1.0 / 1.0	-6.7
625.05	48.4 Qp	1.7 / 19.1 / 28.3	40.9	H / 1.0 / 314.8	-5.1
750.01	45.1 Qp	1.9 / 20.6 / 28.1	39.4	V / 1.0 / 102.3	-6.6
750.04	45.1 Qp	1.9 / 20.6 / 28.1	39.5	H / 1.0 / 0.0	-6.5
822.68	33.9 Qp	2.0 / 21.4 / 27.9	29.4	V / 1.0 / 0.0	-16.6
825	39.2 Qp	2.0 / 21.4 / 27.9	34.8	H / 1.0 / 308.9	-11.2
875.01	44.9 Qp	2.1 / 21.8 / 27.7	41	V / 1.0 / 136.5	-5
875.02	34.4 Qp	2.1 / 21.8 / 27.7	30.5	H / 1.0 / 304.3	-15.5
895.34	30.8 Qp	2.1 / 22.2 / 27.7	27.4	V / 1.1 / 203.6	-18.6
900.01	37.2 Qp	2.1 / 22.4 / 27.6	34.1	H / 1.0 / 115.0	-11.9
999.99	36.1 Qp	2.2 / 22.8 / 27.3	33.8	H / 1.3 / 142.7	-20.2
999.99	32.1 Qp	2.2 / 22.8 / 27.3	29.8	V / 1.0 / 283.5	-24.2
1125.03	46.9 Av	2.4 / 25.6 / 37.2	37.7	V / 1.3 / 1.3	-16.3
1125.03	51.8 Pk	2.4 / 25.6 / 37.2	42.6	V / 1.3 / 1.3	-11.4
1483.49	43.8 Av	2.7 / 26.6 / 36.6	36.5	V / 1.5 / 0.0	-17.5
1483.49	46.4 Pk	2.7 / 26.6 / 36.6	39.1	V / 1.5 / 0.0	-14.9
1500.04	46.1 Av	2.7 / 26.7 / 36.6	38.8	H / 1.8 / 293.2	-15.2
1500.04	50.2 Pk	2.7 / 26.7 / 36.6	42.9	H / 1.8 / 293.2	-11.1
1500.07	47.2 Av	2.7 / 26.7 / 36.6	39.9	V / 1.3 / 100.4	-14.1
1500.07	50.4 Pk	2.7 / 26.7 / 36.6	43.1	V / 1.3 / 100.4	-10.9
1803.67	49.7 Av	3.0 / 28.1 / 36.9	44	H / 1.1 / 0.0	-10
1803.67	49.6 Pk	3.0 / 28.1 / 36.9	43.9	H / 1.1 / 0.0	-10.1
1803.75	43.0 Av	3.0 / 28.1 / 36.9	37.3	V / 1.4 / 170.9	-16.7

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
1803.75	43.4 Pk	3.0 / 28.1 / 36.9	37.7	V / 1.4 / 170.9	-16.3
2241.83	49.4 Av	3.4 / 28.8 / 37.2	44.4	H / 1.2 / 5.6	-9.6
2241.83	48.5 Pk	3.4 / 28.8 / 37.2	43.5	H / 1.2 / 5.6	-10.5
2302.28	51.5 Av	3.4 / 29.0 / 37.3	46.7	H / 1.2 / 5.6	-7.3
2302.28	51.2 Pk	3.4 / 29.0 / 37.3	46.4	H / 1.2 / 5.6	-7.6
2321.98	47.3 Av	3.4 / 29.1 / 37.3	42.6	H / 1.2 / 0.0	-11.4
2321.98	45.3 Pk	3.4 / 29.1 / 37.3	40.6	H / 1.2 / 0.0	-13.4
2378.89	48.9 Av	3.5 / 29.3 / 37.4	44.4	H / 1.1 / 20.5	-9.6
2378.89	50.5 Pk	3.5 / 29.3 / 37.4	46	H / 1.1 / 20.5	-8
2664.05	50.6 Av	3.7 / 30.1 / 37.4	47.1	V / 1.3 / 329.4	-6.9
2664.1	50.8 Av	3.7 / 30.1 / 37.4	47.3	V / 1.3 / 329.4	-6.7
2664.1	51.1 Pk	3.7 / 30.1 / 37.4	47.6	V / 1.3 / 329.4	-6.4
3202.64	53.6 Av	4.2 / 32.0 / 37.1	52.7	H / 1.8 / 22.0	-1.3
3202.64	53.4 Pk	4.2 / 32.0 / 37.1	52.5	H / 1.8 / 22.0	-1.5
3202.66	53.6 Av	4.2 / 32.0 / 37.1	52.7	V / 1.1 / 312.8	-1.3
3202.66	54.5 Pk	4.2 / 32.0 / 37.1	53.6	V / 1.1 / 312.8	-0.4
4500.13	39.6 Av	5.0 / 34.3 / 39.8	39	V / 1.3 / 318.4	-15
4500.13	42.0 Pk	5.0 / 34.3 / 39.8	41.5	V / 1.3 / 318.4	-12.5
4803.94	52.1 Av	5.2 / 34.9 / 39.0	53.2	H / 1.1 / 0.0	-0.8
4803.94	52.8 Pk	5.2 / 34.9 / 39.0	53.8	H / 1.1 / 0.0	-0.2
4826.9	46.6 Av	5.2 / 34.9 / 38.9	47.8	V / 1.3 / 309.7	-6.2
4826.9	48.5 Pk	5.2 / 34.9 / 38.9	49.7	V / 1.3 / 309.7	-4.3
4831.4	42.6 Av	5.2 / 34.9 / 38.9	43.8	H / 1.0 / 159.1	-10.2
4831.4	42.4 Pk	5.2 / 34.9 / 38.9	43.6	H / 1.0 / 159.1	-10.4
5993.45	40.1 Av	5.8 / 36.7 / 39.1	43.4	H / 1.1 / 189.2	-10.6
5993.45	40.8 Pk	5.8 / 36.7 / 39.1	44.2	H / 1.1 / 189.2	-9.8
6000.15	42.0 Av	5.8 / 36.7 / 39.1	45.4	V / 1.0 / 78.1	-8.6
6000.15	43.3 Pk	5.8 / 36.7 / 39.1	46.7	V / 1.0 / 78.1	-7.3
7377.91	39.8 Av	6.5 / 38.8 / 39.2	45.9	H / 1.0 / 159.1	-8.1
7377.91	41.4 Pk	6.5 / 38.8 / 39.2	47.4	H / 1.0 / 159.1	-6.6
7505.81	28.9 Av	6.6 / 38.9 / 39.4	34.9	V / 1.0 / 0.0	-19.1
7505.81	30.3 Pk	6.6 / 38.9 / 39.4	36.3	V / 1.0 / 0.0	-17.7
9000	32.3 Av	7.3 / 40.6 / 47.9	32.3	H / 1.0 / 0.0	-21.7
9000	32.8 Pk	7.3 / 40.6 / 47.9	32.8	H / 1.0 / 0.0	-21.2
9000	31.2 Av	7.3 / 40.6 / 47.9	31.3	V / 1.0 / 0.0	-22.7
9000	32.0 Pk	7.3 / 40.6 / 47.9	32.1	V / 1.0 / 0.0	-21.9
12000	23.5 Av	8.7 / 40.7 / 45.6	27.3	H / 1.0 / 0.0	-26.7
12000	25.0 Pk	8.7 / 40.7 / 45.6	28.8	H / 1.0 / 0.0	-25.2
12000	23.5 Av	8.7 / 40.7 / 45.6	27.3	V / 1.0 / 0.0	-26.7
12000	25.2 Pk	8.7 / 40.7 / 45.6	28.9	V / 1.0 / 0.0	-25.1
14500	27.5 Av	9.4 / 42.8 / 48.0	31.8	H / 1.0 / 0.0	-22.2
14500	27.4 Pk	9.4 / 42.8 / 48.0	31.7	H / 1.0 / 0.0	-22.3
14500	27.4 Av	9.4 / 42.8 / 48.0	31.8	V / 1.0 / 0.0	-22.2
14500	29.6 Pk	9.4 / 42.8 / 48.0	33.9	V / 1.0 / 0.0	-20.1

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
18000	28.3 Av	10.9 / 46.9 / 45.1	41	H / 1.0 / 0.0	-13
18000	27.8 Pk	10.9 / 46.9 / 45.1	40.5	H / 1.0 / 0.0	-13.5
18000	28.4 Av	10.9 / 46.9 / 45.1	41.1	V / 1.0 / 0.0	-12.9
18000	27.8 Pk	10.9 / 46.9 / 45.1	40.5	V / 1.0 / 0.0	-13.5
18961	12.1 Pk	0.0 / 22.4 / 0.0	25	H / 1.0 / 0.0	-29
18961	0.4 Av	0.0 / 22.4 / 0.0	13.3	H / 1.0 / 0.0	-40.7
18961	12.1 Pk	0.0 / 22.4 / 0.0	25	V / 1.0 / 0.0	-29
18961	0.4 Av	0.0 / 22.4 / 0.0	13.3	V / 1.0 / 0.0	-40.7
22436	11.9 Pk	0.0 / 21.0 / 0.0	23.4	H / 1.0 / 0.0	-30.6
22436	0.9 Av	0.0 / 21.0 / 0.0	12.4	H / 1.0 / 0.0	-41.6
22436	11.9 Pk	0.0 / 21.0 / 0.0	23.4	V / 1.0 / 0.0	-30.6
22436	0.9 Av	0.0 / 21.0 / 0.0	12.4	V / 1.0 / 0.0	-41.6
28641	11.8 Pk	0.0 / 22.8 / 0.0	25.1	H / 1.0 / 0.0	-28.9
28641	1.1 Av	0.0 / 22.8 / 0.0	14.4	H / 1.0 / 0.0	-39.6
28641	11.8 Pk	0.0 / 22.8 / 0.0	25.1	V / 1.0 / 0.0	-28.9
28641	1.1 Av	0.0 / 22.8 / 0.0	14.4	V / 1.0 / 0.0	-39.6
29100.7	10.8 Pk	0.0 / 22.6 / 0.0	23.9	H / 1.0 / 0.0	-30.1
29100.7	2.1 Av	0.0 / 22.6 / 0.0	15.2	H / 1.0 / 0.0	-38.8
29100.7	10.8 Pk	0.0 / 22.6 / 0.0	23.9	V / 1.0 / 0.0	-30.1
29100.7	2.1 Av	0.0 / 22.6 / 0.0	15.2	V / 1.0 / 0.0	-38.8
29514	10.9 Pk	0.0 / 22.1 / 0.0	23.5	H / 1.0 / 0.0	-30.5
29514	1.3 Av	0.0 / 22.1 / 0.0	13.9	H / 1.0 / 0.0	-40.1
29514	10.9 Pk	0.0 / 22.1 / 0.0	23.5	V / 1.0 / 0.0	-30.5
29514	1.3 Av	0.0 / 22.1 / 0.0	13.9	V / 1.0 / 0.0	-40.1

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
********** Measurement Summary **********					
3202.66	54.5 Pk	4.2 / 32.0 / 37.1	53.6	V / 1.1 / 312.8	-0.4
50.43	57.1 Qp	0.8 / 7.9 / 28.2	37.6	V / 1.2 / 61.7	-2.4
4826.9	48.5 Pk	5.2 / 34.9 / 38.9	49.7	V / 1.3 / 309.7	-4.3
875.01	44.9 Qp	2.1 / 21.8 / 27.7	41	V / 1.0 / 136.5	-5
625.05	48.4 Qp	1.7 / 19.1 / 28.3	40.9	H / 1.0 / 314.8	-5.1
162	51.3 Qp	0.9 / 12.6 / 27.7	37.1	H / 2.1 / 245.5	-6.4
2664.1	51.1 Pk	3.7 / 30.1 / 37.4	47.6	V / 1.3 / 329.4	-6.4
750.04	45.1 Qp	1.9 / 20.6 / 28.1	39.5	H / 1.0 / 0.0	-6.5
7377.91	41.4 Pk	6.5 / 38.8 / 39.2	47.4	H / 1.0 / 159.1	-6.6
500.02	47.7 Qp	1.5 / 17.8 / 28.3	38.7	H / 1.0 / 191.8	-7.3
2302.28	51.5 Av	3.4 / 29.0 / 37.3	46.7	H / 1.2 / 5.6	-7.3
6000.15	43.3 Pk	5.8 / 36.7 / 39.1	46.7	V / 1.0 / 78.1	-7.3
216.01	54.2 Qp	1.0 / 10.5 / 27.4	38.3	H / 1.4 / 235.0	-7.7
2378.89	50.5 Pk	3.5 / 29.3 / 37.4	46	H / 1.1 / 20.5	-8
375.03	48.9 Pk	1.3 / 15.1 / 27.6	37.7	V / 1.0 / 15.2	-8.3

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
250.01	51.0 Qp	1.1 / 11.7 / 27.2	36.6	H / 1.5 / 148.1	-9.4
2241.83	49.4 Av	3.4 / 28.8 / 37.2	44.4	H / 1.2 / 5.6	-9.6
5993.45	40.8 Pk	5.8 / 36.7 / 39.1	44.2	H / 1.1 / 189.2	-9.8
1803.67	49.7 Av	3.0 / 28.1 / 36.9	44	H / 1.1 / 0.0	-10
4831.4	42.6 Av	5.2 / 34.9 / 38.9	43.8	H / 1.0 / 159.1	-10.2
1500.07	50.4 Pk	2.7 / 26.7 / 36.6	43.1	V / 1.3 / 100.4	-10.9
825	39.2 Qp	2.0 / 21.4 / 27.9	34.8	H / 1.0 / 308.9	-11.2
1125.03	51.8 Pk	2.4 / 25.6 / 37.2	42.6	V / 1.3 / 1.3	-11.4
2321.98	47.3 Av	3.4 / 29.1 / 37.3	42.6	H / 1.2 / 0.0	-11.4
900.01	37.2 Qp	2.1 / 22.4 / 27.6	34.1	H / 1.0 / 115.0	-11.9
161.13	45.4 Qp	0.9 / 12.6 / 27.7	31.2	V / 1.2 / 201.9	-12.3
4500.13	42.0 Pk	5.0 / 34.3 / 39.8	41.5	V / 1.3 / 318.4	-12.5
18000	28.4 Av	10.9 / 46.9 / 45.1	41.1	V / 1.0 / 0.0	-12.9
137.18	44.8 Qp	0.8 / 12.7 / 27.8	30.5	V / 1.0 / 249.1	-13
146.68	44.8 Qp	0.8 / 12.5 / 27.7	30.3	V / 1.0 / 243.8	-13.2
1483.49	46.4 Pk	2.7 / 26.6 / 36.6	39.1	V / 1.5 / 0.0	-14.9
822.68	33.9 Qp	2.0 / 21.4 / 27.9	29.4	V / 1.0 / 0.0	-16.6
270.01	41.4 Qp	1.1 / 13.2 / 27.1	28.5	H / 1.0 / 79.2	-17.5
7505.81	30.3 Pk	6.6 / 38.9 / 39.4	36.3	V / 1.0 / 0.0	-17.7
895.34	30.8 Qp	2.1 / 22.2 / 27.7	27.4	V / 1.1 / 203.6	-18.6
14500	29.6 Pk	9.4 / 42.8 / 48.0	33.9	V / 1.0 / 0.0	-20.1
999.99	36.1 Qp	2.2 / 22.8 / 27.3	33.8	H / 1.3 / 142.7	-20.2
9000	32.8 Pk	7.3 / 40.6 / 47.9	32.8	H / 1.0 / 0.0	-21.2
12000	25.2 Pk	8.7 / 40.7 / 45.6	28.9	V / 1.0 / 0.0	-25.1
131.51	28.9 Qp	0.8 / 13.6 / 27.8	15.5	H / 2.1 / 245.4	-28
28641	11.8 Pk	0.0 / 22.8 / 0.0	25.1	V / 1.0 / 0.0	-28.9
18961	12.1 Pk	0.0 / 22.4 / 0.0	25	V / 1.0 / 0.0	-29
29100.7	10.8 Pk	0.0 / 22.6 / 0.0	23.9	V / 1.0 / 0.0	-30.1
29514	10.9 Pk	0.0 / 22.1 / 0.0	23.5	V / 1.0 / 0.0	-30.5
22436	11.9 Pk	0.0 / 21.0 / 0.0	23.4	V / 1.0 / 0.0	-30.6
29100.7	2.1 Av	0.0 / 22.6 / 0.0	15.2	V / 1.0 / 0.0	-38.8
28641	1.1 Av	0.0 / 22.8 / 0.0	14.4	V / 1.0 / 0.0	-39.6
29514	1.3 Av	0.0 / 22.1 / 0.0	13.9	V / 1.0 / 0.0	-40.1
18961	0.4 Av	0.0 / 22.4 / 0.0	13.3	V / 1.0 / 0.0	-40.7
22436	0.9 Av	0.0 / 21.0 / 0.0	12.4	V / 1.0 / 0.0	-41.6
22.22	12.9 Pk	0.3 / 10.0 / 0.0	23.2	Perp / 1.0 / 0.0	-46.3
0.5	8.7 Pk	0.1 / 10.3 / 0.0	19.1	Par / 1.0 / 0.0	-54.5
2.18	-5.9 Pk	0.1 / 10.5 / 0.0	4.7	Perp / 1.0 / 0.0	-64.8
7.45	-13.0 Pk	0.2 / 10.7 / 0.0	-2.1	Par / 1.0 / 0.0	-71.6
5.35	-13.0 Pk	0.2 / 10.6 / 0.0	-2.2	Perp / 1.0 / 0.0	-71.7
0.06	28.7 Pk	0.0 / 10.8 / 0.0	39.5	Par / 1.0 / 0.0	-72.5
0.186	18.0 Pk	0.0 / 10.4 / 0.0	28.4	Par / 1.0 / 0.0	-73.8

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
0.0632	26.8 Pk	0.0 / 10.8 / 0.0	37.6	Perp / 1.0 / 0.0	-74
0.126	21.1 Pk	0.0 / 10.5 / 0.0	31.6	Par / 1.0 / 0.0	-74
11.29	-16.0 Pk	0.2 / 10.7 / 0.0	-5.1	Par / 1.0 / 0.0	-74.6
0.0503	28.0 Pk	0.0 / 10.8 / 0.0	38.8	Perp / 1.0 / 0.0	-74.8
12.3	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Par / 1.0 / 0.0	-75.5
12.99	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Par / 1.0 / 0.0	-75.5
13.37	-18.0 Pk	0.3 / 10.7 / 0.0	-7	Par / 1.0 / 0.0	-76.5
16.17	-18.0 Pk	0.3 / 10.6 / 0.0	-7.1	Perp / 1.0 / 0.0	-76.6
18.31	-18.0 Pk	0.3 / 10.5 / 0.0	-7.2	Perp / 1.0 / 0.0	-76.7
26.61	-17.0 Pk	0.4 / 9.1 / 0.0	-7.5	Perp / 1.0 / 0.0	-77
22.46	-18.0 Pk	0.3 / 10.0 / 0.0	-7.7	Perp / 1.0 / 0.0	-77.2
25.57	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.6	-19.0 Pk	0.4 / 9.4 / 0.0	-9.2	Par / 1.0 / 0.0	-78.7
29.99	-18.0 Pk	0.4 / 8.1 / 0.0	-9.5	Par / 1.0 / 0.0	-79

6.11 Test Data: Tx Mid Channel

Radiated Electromagnetic Emissions

Test Report #:	**Tx Spurious 10kHz – 30GHz Mid Chanel BT and RF4CE**	Test Area:	CC1 Radiated	Temperature:	23.4	°C
Test Method:	FCC Part 15.209	Test Date:	27-Jul-2011	Relative Humidity:	34.8	%
EUT Model #:	DE50 (XiP813)	EUT Power:		Air Pressure:	82.9	kPa
EUT Serial #:						
Manufacturer:	Echostar					
EUT Description:						
Notes:						

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
Mid Channel BT and RF					
0.0444	28.9 Pk	0.0 / 11.3 / 0.0	40.2	Para / 1.0 / 0.0	-74.4
0.0535	30.8 Pk	0.0 / 10.8 / 0.0	41.6	Perp / 1.0 / 0.0	-71.4
0.06	27.7 Pk	0.0 / 10.8 / 0.0	38.5	Para / 1.0 / 0.0	-73.5
0.5	10.1 Pk	0.1 / 10.3 / 0.0	20.5	Para / 1.0 / 0.0	-53.1
0.5	10.0 Pk	0.1 / 10.3 / 0.0	20.4	Perp / 1.0 / 0.0	-53.2
1.24	1.0 Pk	0.1 / 10.4 / 0.0	11.5	Perp / 1.0 / 0.0	-54.2
1.54	-1.3 Pk	0.1 / 10.5 / 0.0	9.3	Para / 1.0 / 0.0	-54.5
2.18	-3.2 Pk	0.1 / 10.5 / 0.0	7.4	Para / 1.0 / 0.0	-62.1
2.18	-4.5 Pk	0.1 / 10.5 / 0.0	6.1	Perp / 1.0 / 0.0	-63.4
4.11	-11.0 Pk	0.1 / 10.6 / 0.0	-0.3	Para / 1.0 / 0.0	-69.8
7.37	-15.0 Pk	0.2 / 10.7 / 0.0	-4.1	Perp / 1.0 / 0.0	-73.6
7.52	-14.0 Pk	0.2 / 10.7 / 0.0	-3.1	Para / 1.0 / 0.0	-72.6
7.53	1.8 Pk	0.2 / 10.7 / 0.0	12.7	Perp / 1.0 / 0.0	-56.8
7.61	-13.0 Pk	0.2 / 10.7 / 0.0	-2.1	Perp / 1.0 / 0.0	-71.6
11.28	-15.0 Pk	0.2 / 10.7 / 0.0	-4.1	Perp / 1.0 / 0.0	-73.6
11.41	-16.0 Pk	0.2 / 10.7 / 0.0	-5	Para / 1.0 / 0.0	-74.5
11.47	-15.0 Pk	0.3 / 10.7 / 0.0	-4	Perp / 1.0 / 0.0	-73.5
13.36	-16.0 Pk	0.3 / 10.7 / 0.0	-5	Para / 1.0 / 0.0	-74.5
13.38	-16.0 Pk	0.3 / 10.7 / 0.0	-5	Perp / 1.0 / 0.0	-74.5
18.36	-17.0 Pk	0.3 / 10.5 / 0.0	-6.2	Perp / 1.0 / 0.0	-75.7
18.43	-19.0 Pk	0.3 / 10.5 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
19.52	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Perp / 1.0 / 0.0	-76.8
19.59	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Perp / 1.0 / 0.0	-76.8
19.77	-2.3 Pk	0.3 / 10.4 / 0.0	8.4	Perp / 1.0 / 0.0	-61.1
19.89	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Perp / 1.0 / 0.0	-76.8
20.11	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Para / 1.0 / 0.0	-76.8

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
20.81	-18.0 Pk	0.3 / 10.3 / 0.0	-7.4	Perp / 1.0 / 0.0	-76.9
25.57	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.6	-19.0 Pk	0.4 / 9.4 / 0.0	-9.2	Para / 1.0 / 0.0	-78.7
25.69	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
26.49	-18.0 Pk	0.4 / 9.2 / 0.0	-8.4	Perp / 1.0 / 0.0	-77.9
28.56	-8.7 Pk	0.4 / 8.5 / 0.0	0.2	Perp / 1.0 / 0.0	-69.3
29.99	-17.0 Pk	0.4 / 8.1 / 0.0	-8.5	Para / 1.0 / 0.0	-78.0
50.45	56.9 Qp	0.8 / 7.9 / 28.2	37.4	V / 1.5 / 156.8	-2.6
69.72	54.8 Qp	0.8 / 8.0 / 28.1	35.4	V / 1.7 / 266.5	-4.6
103.31	55.1 Qp	0.8 / 11.4 / 27.9	39.3	V / 1.0 / 86.2	-4.2
137.17	44.9 Qp	0.8 / 12.7 / 27.8	30.6	V / 1.0 / 129.7	-12.9
137.78	44.5 Qp	0.8 / 12.7 / 27.8	30.1	H / 1.5 / 244.9	-13.4
155.6	48.7 Qp	0.8 / 12.6 / 27.7	34.5	H / 2.2 / 104.9	-9
199.4	49.2 Qp	0.9 / 12.1 / 27.5	34.8	H / 1.7 / 268.2	-8.7
216	54.0 Qp	1.0 / 10.5 / 27.4	38.1	H / 1.4 / 244.3	-5.4
250.01	44.7 Qp	1.1 / 11.7 / 27.2	30.2	V / 1.0 / 133.8	-15.8
250.03	52.0 Qp	1.1 / 11.7 / 27.2	37.5	H / 1.0 / 269.7	-8.5
250.03	51.9 Qp	1.1 / 11.7 / 27.2	37.4	H / 1.5 / 174.4	-8.6
265.86	39.0 Qp	1.1 / 13.0 / 27.2	25.9	H / 1.0 / 244.4	-20.1
500.01	42.6 Qp	1.5 / 17.8 / 28.3	33.7	H / 1.0 / 162.1	-12.3
501.42	30.8 Qp	1.5 / 17.9 / 28.3	21.9	V / 1.0 / 172.1	-24.1
501.42	30.8 Qp	1.5 / 17.9 / 28.3	21.8	V / 1.0 / 172.1	-24.2
625.03	44.9 Qp	1.7 / 19.1 / 28.3	37.4	H / 1.0 / 192.2	-8.6
625.04	47.1 Qp	1.7 / 19.1 / 28.3	39.7	V / 1.0 / 0.0	-6.3
750.02	46.1 Qp	1.9 / 20.6 / 28.1	40.5	V / 1.0 / 194.7	-5.5
750.04	47.5 Qp	1.9 / 20.6 / 28.1	41.8	H / 1.0 / 301.5	-4.2
875.02	39.6 Qp	2.1 / 21.8 / 27.7	35.8	H / 1.0 / 26.4	-10.2
875.02	44.0 Qp	2.1 / 21.8 / 27.7	40.1	V / 1.0 / 156.1	-5.9
999.99	37.0 Qp	2.2 / 22.8 / 27.3	34.6	V / 1.1 / 0.0	-19.4
1100	46.8 Pk	2.3 / 25.6 / 37.2	37.5	H / 1.3 / 33.0	-16.5
1100	44.4 Av	2.3 / 25.6 / 37.2	35.1	H / 1.3 / 33.0	-18.9
1125.06	52.9 Pk	2.4 / 25.6 / 37.2	43.7	V / 1.4 / 42.0	-10.3
1125.06	47.1 Av	2.4 / 25.6 / 37.2	37.9	V / 1.4 / 42.0	-16.1
1450	43.4 Pk	2.7 / 26.5 / 36.6	35.9	H / 1.3 / 33.0	-18.1
1450	43.8 Av	2.7 / 26.5 / 36.6	36.3	H / 1.3 / 33.0	-17.7
2249.16	44.5 Pk	3.4 / 28.8 / 37.2	39.5	H / 1.7 / 12.0	-14.5
2249.16	42.3 Av	3.4 / 28.8 / 37.2	37.3	H / 1.7 / 12.0	-16.7
2664.05	52.0 Pk	3.7 / 30.1 / 37.4	48.5	V / 2.2 / 36.0	-5.5
2664.05	47.7 Av	3.7 / 30.1 / 37.4	44.2	V / 2.2 / 36.0	-9.8
2664.06	50.8 Pk	3.7 / 30.1 / 37.4	47.2	H / 1.4 / 314.0	-6.8
2664.06	45.0 Av	3.7 / 30.1 / 37.4	41.5	H / 1.4 / 314.0	-12.5
3254.64	49.1 Pk	4.2 / 32.2 / 37.0	48.5	V / 1.9 / 48.0	-5.5

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
3254.64	46.0 Av	4.2 / 32.2 / 37.0	45.3	V / 1.9 / 48.0	-8.7
3254.64	50.8 Pk	4.2 / 32.2 / 37.0	50.1	H / 1.7 / 320.0	-3.9
3254.64	48.6 Av	4.2 / 32.2 / 37.0	47.9	H / 1.7 / 320.0	-6.1
3335.22	41.7 Pk	4.2 / 32.4 / 36.9	41.4	H / 1.8 / 178.0	-12.6
3335.22	40.7 Av	4.2 / 32.4 / 36.9	40.4	H / 1.8 / 178.0	-13.6
4228.46	31.5 Pk	4.8 / 33.8 / 39.6	30.5	H / 1.3 / 33.0	-23.5
4228.46	31.8 Av	4.8 / 33.8 / 39.6	30.8	H / 1.3 / 33.0	-23.2
4500.13	39.9 Pk	5.0 / 34.3 / 39.8	39.3	H / 1.5 / 238.0	-14.7
4500.13	35.0 Av	5.0 / 34.3 / 39.8	34.4	H / 1.5 / 238.0	-19.6
4500.14	41.2 Pk	5.0 / 34.3 / 39.8	40.7	V / 1.9 / 314.0	-13.3
4500.14	37.5 Av	5.0 / 34.3 / 39.8	37	V / 1.9 / 314.0	-17
6000.14	39.7 Pk	5.8 / 36.7 / 39.1	43.1	H / 1.7 / 319.0	-10.9
6000.14	34.9 Av	5.8 / 36.7 / 39.1	38.3	H / 1.7 / 319.0	-15.7
6000.14	40.8 Pk	5.8 / 36.7 / 39.1	44.2	V / 1.3 / 76.0	-9.8
6000.14	36.6 Av	5.8 / 36.7 / 39.1	40	V / 1.3 / 76.0	-14
7250.24	28.9 Pk	6.4 / 38.6 / 39.4	34.6	V / 1.3 / 33.0	-19.4
7250.24	30.2 Av	6.4 / 38.6 / 39.4	35.8	V / 1.3 / 33.0	-18.2
7250.24	30.7 Pk	6.4 / 38.6 / 39.4	36.3	V / 1.3 / 33.0	-17.7
7250.24	28.9 Av	6.4 / 38.6 / 39.4	34.6	V / 1.3 / 33.0	-19.4
7900.12	25.0 Pk	6.8 / 39.0 / 39.8	31	H / 1.3 / 33.0	-23
7900.12	23.0 Av	6.8 / 39.0 / 39.8	29	H / 1.3 / 33.0	-25
8420.24	31.9 Pk	7.0 / 39.5 / 47.2	31.2	V / 1.3 / 33.0	-22.8
8420.24	33.5 Av	7.0 / 39.5 / 47.2	32.8	V / 1.3 / 33.0	-21.2
8788.31	31.0 Pk	7.2 / 40.2 / 47.6	30.8	H / 1.4 / 64.0	-23.2
8788.31	30.1 Av	7.2 / 40.2 / 47.6	29.9	H / 1.4 / 64.0	-24.1
8788.31	29.3 Pk	7.2 / 40.2 / 47.6	29.1	V / 1.3 / 116.0	-24.9
8788.31	29.4 Av	7.2 / 40.2 / 47.6	29.2	V / 1.3 / 116.0	-24.8
10800.8	35.9 Pk	8.1 / 40.8 / 48.6	36.2	V / 1.3 / 33.0	-17.8
10800.8	34.2 Av	8.1 / 40.8 / 48.6	34.6	V / 1.3 / 33.0	-19.4
10800.8	34.2 Pk	8.1 / 40.8 / 48.6	34.6	H / 1.3 / 33.0	-19.4
10800.8	34.0 Av	8.1 / 40.8 / 48.6	34.4	H / 1.3 / 33.0	-19.6
13029.7	26.7 Pk	8.9 / 41.8 / 46.4	31	H / 1.4 / 88.0	-23
13029.7	26.4 Av	8.9 / 41.8 / 46.4	30.7	H / 1.4 / 88.0	-23.3
13029.7	27.4 Pk	8.9 / 41.8 / 46.4	31.8	V / 1.3 / 110.0	-22.2
13029.7	26.3 Av	8.9 / 41.8 / 46.4	30.6	V / 1.3 / 110.0	-23.4
13300	28.7 Pk	9.0 / 42.2 / 46.8	33	V / 1.3 / 33.0	-21
13300	26.7 Av	9.0 / 42.2 / 46.8	31.1	V / 1.3 / 33.0	-22.9
16100.1	29.3 Pk	10.2 / 40.8 / 48.2	32.1	V / 1.3 / 33.0	-21.9
16100.1	29.2 Av	10.2 / 40.8 / 48.2	31.9	V / 1.3 / 33.0	-22.1
16100.1	27.7 Pk	10.2 / 40.8 / 48.2	30.5	H / 1.3 / 33.0	-23.5
16100.1	29.1 Av	10.2 / 40.8 / 48.2	31.8	H / 1.3 / 33.0	-22.2
17900	29.8 Pk	10.9 / 46.6 / 45.3	42	V / 1.3 / 33.0	-12

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
17900	28.7 Av	10.9 / 46.6 / 45.3	40.9	V / 1.3 / 33.0	-13.1
19688	10.7 Pk	0.0 / 21.9 / 0.0	-9.5	H / 1.0 / 0.0	-30.9
19688	0.2 Pk	0.0 / 21.9 / 0.0	-9.5	H / 1.0 / 0.0	-41.8
22226	10.9 Pk	0.0 / 21.2 / 0.0	-9.5	H / 1.0 / 0.0	-31.4
22226	0.5 Av	0.0 / 21.2 / 0.0	-9.5	H / 1.0 / 0.0	-42.8
24601.8	9.7 Pk	0.0 / 21.7 / 0.0	-9.5	V / 1.0 / 0.0	-32.1
24601.8	0.8 Av	0.0 / 21.7 / 0.0	-9.5	V / 1.0 / 0.0	-42.6

********** Measurement Summary **********

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
50.45	56.9 Qp	0.8 / 7.9 / 28.2	37.4	V / 1.5 / 156.8	-2.6
3254.64	50.8 Pk	4.2 / 32.2 / 37.0	50.1	H / 1.7 / 320.0	-3.9
103.31	55.1 Qp	0.8 / 11.4 / 27.9	39.3	V / 1.0 / 86.2	-4.2
750.04	47.5 Qp	1.9 / 20.6 / 28.1	41.8	H / 1.0 / 301.5	-4.2
69.72	54.8 Qp	0.8 / 8.0 / 28.1	35.4	V / 1.7 / 266.5	-4.6
216	54.0 Qp	1.0 / 10.5 / 27.4	38.1	H / 1.4 / 244.3	-5.4
2664.05	52.0 Pk	3.7 / 30.1 / 37.4	48.5	V / 2.2 / 36.0	-5.5
875.02	44.0 Qp	2.1 / 21.8 / 27.7	40.1	V / 1.0 / 156.1	-5.9
625.04	47.1 Qp	1.7 / 19.1 / 28.3	39.7	V / 1.0 / 0.0	-6.3
250.03	52.0 Qp	1.1 / 11.7 / 27.2	37.5	H / 1.0 / 269.7	-8.5
199.4	49.2 Qp	0.9 / 12.1 / 27.5	34.8	H / 1.7 / 268.2	-8.7
155.6	48.7 Qp	0.8 / 12.6 / 27.7	34.5	H / 2.2 / 104.9	-9
6000.14	40.8 Pk	5.8 / 36.7 / 39.1	44.2	V / 1.3 / 76.0	-9.8
17900	29.8 Pk	10.9 / 46.6 / 45.3	42	V / 1.3 / 33.0	-12
500.01	42.6 Qp	1.5 / 17.8 / 28.3	33.7	H / 1.0 / 162.1	-12.3
3335.22	41.7 Pk	4.2 / 32.4 / 36.9	41.4	H / 1.8 / 178.0	-12.6
137.17	44.9 Qp	0.8 / 12.7 / 27.8	30.6	V / 1.0 / 129.7	-12.9
4500.14	41.2 Pk	5.0 / 34.3 / 39.8	40.7	V / 1.9 / 314.0	-13.3
137.78	44.5 Qp	0.8 / 12.7 / 27.8	30.1	H / 1.5 / 244.9	-13.4
2249.16	44.5 Pk	3.4 / 28.8 / 37.2	39.5	H / 1.7 / 12.0	-14.5
1100	46.8 Pk	2.3 / 25.6 / 37.2	37.5	H / 1.3 / 33.0	-16.5
7250.24	30.7 Pk	6.4 / 38.6 / 39.4	36.3	V / 1.3 / 33.0	-17.7
1450	43.8 Av	2.7 / 26.5 / 36.6	36.3	H / 1.3 / 33.0	-17.7
10800.8	35.9 Pk	8.1 / 40.8 / 48.6	36.2	V / 1.3 / 33.0	-17.8
999.99	37.0 Qp	2.2 / 22.8 / 27.3	34.6	V / 1.1 / 0.0	-19.4
265.86	39.0 Qp	1.1 / 13.0 / 27.2	25.9	H / 1.0 / 244.4	-20.1
1125.06	42.9 Pk	2.4 / 25.6 / 37.2	33.7	V / 1.4 / 42.0	-20.3
13300	28.7 Pk	9.0 / 42.2 / 46.8	33	V / 1.3 / 33.0	-21
8420.24	33.5 Av	7.0 / 39.5 / 47.2	32.8	V / 1.3 / 33.0	-21.2
16100.1	29.3 Pk	10.2 / 40.8 / 48.2	32.1	V / 1.3 / 33.0	-21.9
13029.7	27.4 Pk	8.9 / 41.8 / 46.4	31.8	V / 1.3 / 110.0	-22.2

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
7900.12	25.0 Pk	6.8 / 39.0 / 39.8	31	H / 1.3 / 33.0	-23
4228.46	31.8 Av	4.8 / 33.8 / 39.6	30.8	H / 1.3 / 33.0	-23.2
8788.31	31.0 Pk	7.2 / 40.2 / 47.6	30.8	H / 1.4 / 64.0	-23.2
501.42	30.8 Qp	1.5 / 17.9 / 28.3	21.9	V / 1.0 / 172.1	-24.1
19688	10.7 Pk	0.0 / 21.9 / 0.0	-9.5	H / 1.0 / 0.0	-30.9
22226	10.9 Pk	0.0 / 21.2 / 0.0	-9.5	H / 1.0 / 0.0	-31.4
24601.8	9.7 Pk	0.0 / 21.7 / 0.0	-9.5	V / 1.0 / 0.0	-32.1
19688	0.2 Pk	0.0 / 21.9 / 0.0	-9.5	H / 1.0 / 0.0	-41.8
24601.8	0.8 Av	0.0 / 21.7 / 0.0	-9.5	V / 1.0 / 0.0	-42.6
22226	0.5 Av	0.0 / 21.2 / 0.0	-9.5	H / 1.0 / 0.0	-42.8
0.5	10.1 Pk	0.1 / 10.3 / 0.0	20.5	Para / 1.0 / 0.0	-53.1
1.24	1.0 Pk	0.1 / 10.4 / 0.0	11.5	Perp / 1.0 / 0.0	-54.2
1.54	-1.3 Pk	0.1 / 10.5 / 0.0	9.3	Para / 1.0 / 0.0	-54.5
7.53	1.8 Pk	0.2 / 10.7 / 0.0	12.7	Perp / 1.0 / 0.0	-56.8
19.77	-2.3 Pk	0.3 / 10.4 / 0.0	8.4	Perp / 1.0 / 0.0	-61.1
2.18	-3.2 Pk	0.1 / 10.5 / 0.0	7.4	Para / 1.0 / 0.0	-62.1
28.56	-8.7 Pk	0.4 / 8.5 / 0.0	0.2	Perp / 1.0 / 0.0	-69.3
4.11	-11.0 Pk	0.1 / 10.6 / 0.0	-0.3	Para / 1.0 / 0.0	-69.8
0.0535	30.8 Pk	0.0 / 10.8 / 0.0	41.6	Perp / 1.0 / 0.0	-71.4
7.61	-13.0 Pk	0.2 / 10.7 / 0.0	-2.1	Perp / 1.0 / 0.0	-71.6
7.52	-14.0 Pk	0.2 / 10.7 / 0.0	-3.1	Para / 1.0 / 0.0	-72.6
0.06	27.7 Pk	0.0 / 10.8 / 0.0	38.5	Para / 1.0 / 0.0	-73.5
11.47	-15.0 Pk	0.3 / 10.7 / 0.0	-4	Perp / 1.0 / 0.0	-73.5
7.37	-15.0 Pk	0.2 / 10.7 / 0.0	-4.1	Perp / 1.0 / 0.0	-73.6
11.28	-15.0 Pk	0.2 / 10.7 / 0.0	-4.1	Perp / 1.0 / 0.0	-73.6
0.0444	28.9 Pk	0.0 / 11.3 / 0.0	40.2	Para / 1.0 / 0.0	-74.4
11.41	-16.0 Pk	0.2 / 10.7 / 0.0	-5	Para / 1.0 / 0.0	-74.5
13.36	-16.0 Pk	0.3 / 10.7 / 0.0	-5	Para / 1.0 / 0.0	-74.5
13.38	-16.0 Pk	0.3 / 10.7 / 0.0	-5	Perp / 1.0 / 0.0	-74.5
18.36	-17.0 Pk	0.3 / 10.5 / 0.0	-6.2	Perp / 1.0 / 0.0	-75.7
19.52	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Perp / 1.0 / 0.0	-76.8
19.59	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Perp / 1.0 / 0.0	-76.8
19.89	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Perp / 1.0 / 0.0	-76.8
20.11	-18.0 Pk	0.3 / 10.4 / 0.0	-7.3	Para / 1.0 / 0.0	-76.8
20.81	-18.0 Pk	0.3 / 10.3 / 0.0	-7.4	Perp / 1.0 / 0.0	-76.9
18.43	-19.0 Pk	0.3 / 10.5 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.57	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.69	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
26.49	-18.0 Pk	0.4 / 9.2 / 0.0	-8.4	Perp / 1.0 / 0.0	-77.9
29.99	-17.0 Pk	0.4 / 8.1 / 0.0	-8.5	Para / 1.0 / 0.0	-78
25.6	-19.0 Pk	0.4 / 9.4 / 0.0	-9.2	Para / 1.0 / 0.0	-78.7

6.12 Test Data: Tx High Channel

Radiated Electromagnetic Emissions

Test Report #:	**Tx Spurious 10kHz – 30GHz Mid Chanel BT and RF4CE**	Test Area:	CC1 Radiated	Temperature:	23.4	°C
Test Method:	FCC Part 15.209	Test Date:	27-Jul-2011	Relative Humidity:	34.8	%
EUT Model #:	DE50 (XiP813)	EUT Power:		Air Pressure:	82.9	kPa
EUT Serial #:						
Manufacturer:	Echostar					
EUT Description:						
Notes:						

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB\m) (dB)	FINAL (dBuV)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) 15.209
High Channel RF & BT					
0.036	36.5 Pk	0.0 / 12.1 / 0.0	48.7	Perp / 1.0 / 0.0	-67.8
0.052	34.9 Pk	0.0 / 10.8 / 0.0	45.7	Perp / 1.0 / 0.0	-67.6
0.06	29.6 Pk	0.0 / 10.8 / 0.0	40.4	Para/ 1.0 / 0.0	-71.6
0.063	28.4 Pk	0.0 / 10.8 / 0.0	39.2	Perp / 1.0 / 0.0	-72.4
0.123	21.5 Pk	0.0 / 10.5 / 0.0	32	Perp / 1.0 / 0.0	-73.8
0.125	21.1 Pk	0.0 / 10.5 / 0.0	31.6	Para/ 1.0 / 0.0	-74
0.19	18.7 Pk	0.0 / 10.4 / 0.0	29.1	Para/ 1.0 / 0.0	-72.9
0.5	9.2 Pk	0.1 / 10.3 / 0.0	19.6	Perp / 1.0 / 0.0	-54
0.5	9.5 Pk	0.1 / 10.3 / 0.0	19.9	Para / 1.0 / 0.0	-53.7
2.18	-5.4 Pk	0.1 / 10.5 / 0.0	5.2	Para / 1.0 / 0.0	-64.3
2.18	-4.0 Pk	0.1 / 10.5 / 0.0	6.6	Perp / 1.0 / 0.0	-62.9
3.48	-9.6 Pk	0.1 / 10.6 / 0.0	1.1	Para/ 1.0 / 0.0	-68.4
6.63	-13.0 Pk	0.2 / 10.7 / 0.0	-2.1	Para/ 1.0 / 0.0	-71.6
11.17	-15.0 Pk	0.2 / 10.8 / 0.0	-4	Para/ 1.0 / 0.0	-73.5
12.7	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Para/ 1.0 / 0.0	-75.5
13.37	-18.0 Pk	0.3 / 10.7 / 0.0	-7	Para / 1.0 / 0.0	-76.5
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Perp / 1.0 / 0.0	-75.5
25.6	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.6	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Para / 1.0 / 0.0	-77.7
27.82	-19.0 Pk	0.4 / 8.8 / 0.0	-9.8	Para/ 1.0 / 0.0	-79.3
28.5	-19.0 Pk	0.4 / 8.6 / 0.0	-10	Perp / 1.0 / 0.0	-79.5
29.36	-14.0 Pk	0.4 / 8.3 / 0.0	-5.3	Perp / 1.0 / 0.0	-74.8
29.91	-20.0 Pk	0.4 / 8.1 / 0.0	-11.5	Para/ 1.0 / 0.0	-81
51.09	55.7 Qp	0.8 / 7.8 / 28.2	36.1	V / 1.0 / 220.8	-3.9
69.69	54.4 Qp	0.8 / 8.0 / 28.1	35	V / 1.0 / 89.5	-5
86.03	47.1 Qp	0.8 / 7.6 / 28.0	27.5	H / 2.2 / 113.0	-12.5
103.31	54.6 Qp	0.8 / 11.4 / 27.9	38.7	V / 1.0 / 112.6	-4.8
109.07	42.3 Qp	0.8 / 12.6 / 27.9	27.8	V / 1.0 / 97.6	-15.7
137.77	46.4 Qp	0.8 / 12.7 / 27.8	32.1	H / 2.1 / 0.0	-11.4

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
137.78	46.5 Qp	0.8 / 12.7 / 27.8	32.2	V / 1.0 / 127.5	-11.3
154.2	41.6 Qp	0.8 / 12.6 / 27.7	27.3	H / 2.1 / 89.1	-16.2
216.01	53.6 Qp	1.0 / 10.5 / 27.4	37.7	H / 1.5 / 248.5	-8.3
250.03	52.1 Qp	1.1 / 11.7 / 27.2	37.6	H / 1.5 / 181.3	-8.4
250.03	44.4 Qp	1.1 / 11.7 / 27.2	29.9	V / 1.0 / 226.2	-16.1
375.01	44.9 Qp	1.3 / 15.1 / 27.6	33.7	H / 1.0 / 66.8	-12.3
500.04	46.1 Qp	1.5 / 17.8 / 28.3	37.1	V / 1.0 / 194.0	-8.9
625.04	46.8 Qp	1.7 / 19.1 / 28.3	39.3	V / 1.0 / 0.0	-6.7
625.05	46.3 Qp	1.7 / 19.1 / 28.3	38.8	H / 1.2 / 319.5	-7.2
750.01	47.6 Qp	1.9 / 20.6 / 28.1	42	H / 2.0 / 300.5	-4
750.04	43.7 Qp	1.9 / 20.6 / 28.1	38.1	V / 1.0 / 193.0	-7.9
820.36	32.8 Qp	2.0 / 21.5 / 27.9	28.3	H / 1.0 / 299.4	-17.7
875.01	41.5 Qp	2.1 / 21.8 / 27.7	37.6	H / 1.1 / 37.9	-8.4
875.04	43.5 Qp	2.1 / 21.8 / 27.7	39.6	V / 1.0 / 155.6	-6.4
999.99	34.2 Qp	2.2 / 22.8 / 27.3	31.9	H / 1.0 / 0.0	-22.1
1125	44.9 Av	2.4 / 25.6 / 37.2	35.7	V / 1.3 / 10.3	-18.3
1125	48.2 Pk	2.4 / 25.6 / 37.2	39	V / 1.3 / 10.3	-15
1186.77	44.5 Av	2.4 / 25.8 / 37.2	35.6	V / 1.3 / 0.0	-18.4
1186.77	48.9 Pk	2.4 / 25.8 / 37.2	40	V / 1.3 / 0.0	-14
1500.03	45.3 Av	2.7 / 26.7 / 36.6	38	H / 1.6 / 168.2	-16
1500.03	49.9 Pk	2.7 / 26.7 / 36.6	42.6	H / 1.6 / 168.2	-11.4
1500.04	47.0 Av	2.7 / 26.7 / 36.6	39.7	V / 1.3 / 225.7	-14.3
1500.04	49.8 Pk	2.7 / 26.7 / 36.6	42.5	V / 1.3 / 225.7	-11.5
1805.23	40.9 Av	3.0 / 28.1 / 36.9	35.2	V / 1.0 / 51.0	-18.8
1805.23	40.7 Pk	3.0 / 28.1 / 36.9	35	V / 1.0 / 51.0	-19
1854.36	42.0 Av	3.1 / 28.2 / 37.0	36.3	V / 1.4 / 301.3	-17.7
1854.36	48.3 Pk	3.1 / 28.2 / 37.0	42.6	V / 1.4 / 301.3	-11.4
1906.79	48.1 Av	3.1 / 28.3 / 37.0	42.5	V / 2.0 / 259.3	-11.5
1906.79	49.1 Pk	3.1 / 28.3 / 37.0	43.5	V / 2.0 / 259.3	-10.5
1909.4	55.7 Av	3.1 / 28.3 / 37.0	50.1	H / 1.1 / 355.1	-3.9
1909.4	54.0 Pk	3.1 / 28.3 / 37.0	48.4	H / 1.1 / 355.1	-5.6
2320.02	50.5 Av	3.4 / 29.1 / 37.3	45.8	H / 1.2 / 0.0	-8.2
2320.02	48.8 Pk	3.4 / 29.1 / 37.3	44.1	H / 1.2 / 0.0	-9.9
2379.87	49.3 Av	3.5 / 29.3 / 37.4	44.8	H / 1.1 / 0.0	-9.2
2379.87	47.9 Pk	3.5 / 29.3 / 37.4	43.4	H / 1.1 / 0.0	-10.6
3306.62	53.2 Av	4.2 / 32.3 / 36.9	52.8	H / 1.0 / 16.8	-1.2
3306.62	53.8 Pk	4.2 / 32.3 / 36.9	53.4	H / 1.0 / 16.8	-0.6
3306.64	54.0 Av	4.2 / 32.3 / 36.9	53.6	V / 1.2 / 304.8	-0.4
3306.64	52.9 Pk	4.2 / 32.3 / 36.9	52.5	V / 1.2 / 304.8	-1.5
4200	22.6 Pk	4.8 / 33.8 / 39.5	21.7	H / 1.3 / 33.0	-32.3
4200	16.5 Av	4.8 / 33.8 / 39.5	15.6	H / 1.3 / 33.0	-38.4
4500.1	39.4 Pk	5.0 / 34.3 / 39.8	38.8	V / 1.8 / 184.0	-15.2
4500.1	34.5 Av	5.0 / 34.3 / 39.8	33.9	V / 1.8 / 184.0	-20.1
4959.97	48.9 Av	5.2 / 35.3 / 38.7	50.7	H / 1.0 / 16.8	-3.3

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
4959.97	48.1 Pk	5.2 / 35.3 / 38.7	49.9	H / 1.0 / 16.8	-4.1
5400.08	20.8 Pk	5.5 / 36.1 / 38.5	23.9	H / 1.3 / 33.0	-30.1
5400.08	16.3 Av	5.5 / 36.1 / 38.5	19.5	H / 1.3 / 33.0	-34.5
5400.08	28.9 Av	5.5 / 36.1 / 38.5	32.1	V / 1.3 / 33.0	-21.9
5400.08	28.9 Pk	5.5 / 36.1 / 38.5	32.1	V / 1.3 / 33.0	-21.9
6000.16	44.1 Pk	5.8 / 36.7 / 39.1	47.4	V / 1.7 / 182.0	-6.6
6000.16	41.4 Av	5.8 / 36.7 / 39.1	44.7	V / 1.7 / 182.0	-9.3
7200.04	30.7 Pk	6.4 / 38.5 / 39.5	36.1	V / 1.3 / 33.0	-17.9
7200.04	30.6 Av	6.4 / 38.5 / 39.5	36	V / 1.3 / 33.0	-18
7500	23.7 Pk	6.6 / 38.9 / 39.4	29.7	H / 1.3 / 33.0	-24.3
7500	22.3 Av	6.6 / 38.9 / 39.4	28.3	H / 1.3 / 33.0	-25.7
7500	27.9 Pk	6.6 / 38.9 / 39.4	34	V / 1.3 / 33.0	-20
7500	26.8 Av	6.6 / 38.9 / 39.4	32.8	V / 1.3 / 33.0	-21.2
8200	28.9 Pk	6.9 / 39.3 / 46.9	28.2	V / 1.3 / 33.0	-25.8
8200	28.7 Av	6.9 / 39.3 / 46.9	28	V / 1.3 / 33.0	-26
10100	32.8 Pk	7.8 / 40.7 / 48.8	32.5	H / 1.6 / 68.0	-21.5
10100	32.4 Av	7.8 / 40.7 / 48.8	32.1	H / 1.6 / 68.0	-21.9
10100	31.9 Pk	7.8 / 40.7 / 48.8	31.7	V / 1.7 / 176.0	-22.3
10100	32.5 Av	7.8 / 40.7 / 48.8	32.2	V / 1.7 / 176.0	-21.8
10400	31.1 Pk	8.0 / 40.8 / 48.9	30.9	V / 1.3 / 33.0	-23.1
10400	32.2 Av	8.0 / 40.8 / 48.9	32.1	V / 1.3 / 33.0	-21.9
10600	32.0 Pk	8.0 / 40.8 / 48.8	32.1	H / 1.3 / 33.0	-21.9
10600	32.5 Av	8.0 / 40.8 / 48.8	32.5	H / 1.3 / 33.0	-21.5
14500	27.6 Pk	9.4 / 42.8 / 48.0	31.9	V / 1.3 / 33.0	-22.1
14500	27.4 Av	9.4 / 42.8 / 48.0	31.7	V / 1.3 / 33.0	-22.3
17400	29.6 Pk	10.7 / 44.4 / 46.1	38.6	H / 1.6 / 68.0	-15.4
17400	27.6 Av	10.7 / 44.4 / 46.1	36.6	H / 1.6 / 68.0	-17.4
19208.5	7.8 Pk	0.0 / 22.3 / 0.0	20.6	H / 1.0 / 0.0	-33.4
19208.5	12.0 Av	0.0 / 22.3 / 0.0	24.8	H / 1.0 / 0.0	-29.2
21272.5	10.5 Pk	0.0 / 21.5 / 0.0	22.5	H / 1.0 / 0.0	-31.5
21272.5	0.3 Av	0.0 / 21.5 / 0.0	11.6	H / 1.0 / 0.0	-42.4
23437.5	7.4 Pk	0.0 / 21.4 / 0.0	19.3	H / 1.0 / 0.0	-34.7
23437.5	0.9 Av	0.0 / 21.4 / 0.0	11	H / 1.0 / 0.0	-43
24772.8	10.0 Pk	0.0 / 21.6 / 0.0	22.2	V / 1.0 / 0.0	-31.8
24772.8	1.0 Av	0.0 / 21.6 / 0.0	11.1	V / 1.0 / 0.0	-42.9

********** Measurement Summary **********

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
3306.64	54.0 Av	4.2 / 32.3 / 36.9	53.6	V / 1.2 / 304.8	-0.4
4959.97	48.9 Av	5.2 / 35.3 / 38.7	50.7	H / 1.0 / 16.8	-3.3
51.09	55.7 Qp	0.8 / 7.8 / 28.2	36.1	V / 1.0 / 220.8	-3.9
1909.4	55.7 Av	3.1 / 28.3 / 37.0	50.1	H / 1.1 / 355.1	-3.9
750.01	47.6 Qp	1.9 / 20.6 / 28.1	42	H / 2.0 / 300.5	-4

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
103.31	54.6 Qp	0.8 / 11.4 / 27.9	38.7	V / 1.0 / 112.6	-4.8
69.69	54.4 Qp	0.8 / 8.0 / 28.1	35	V / 1.0 / 89.5	-5
875.04	43.5 Qp	2.1 / 21.8 / 27.7	39.6	V / 1.0 / 155.6	-6.4
6000.16	44.1 Pk	5.8 / 36.7 / 39.1	47.4	V / 1.7 / 182.0	-6.6
625.04	46.8 Qp	1.7 / 19.1 / 28.3	39.3	V / 1.0 / 0.0	-6.7
2320.02	50.5 Av	3.4 / 29.1 / 37.3	45.8	H / 1.2 / 0.0	-8.2
216.01	53.6 Qp	1.0 / 10.5 / 27.4	37.7	H / 1.5 / 248.5	-8.3
250.03	52.1 Qp	1.1 / 11.7 / 27.2	37.6	H / 1.5 / 181.3	-8.4
500.04	46.1 Qp	1.5 / 17.8 / 28.3	37.1	V / 1.0 / 194.0	-8.9
2379.87	49.3 Av	3.5 / 29.3 / 37.4	44.8	H / 1.1 / 0.0	-9.2
1906.79	49.1 Pk	3.1 / 28.3 / 37.0	43.5	V / 2.0 / 259.3	-10.5
137.78	46.5 Qp	0.8 / 12.7 / 27.8	32.2	V / 1.0 / 127.5	-11.3
1500.03	49.9 Pk	2.7 / 26.7 / 36.6	42.6	H / 1.6 / 168.2	-11.4
1854.36	48.3 Pk	3.1 / 28.2 / 37.0	42.6	V / 1.4 / 301.3	-11.4
375.01	44.9 Qp	1.3 / 15.1 / 27.6	33.7	H / 1.0 / 66.8	-12.3
86.03	47.1 Qp	0.8 / 7.6 / 28.0	27.5	H / 2.2 / 113.0	-12.5
1186.77	48.9 Pk	2.4 / 25.8 / 37.2	40	V / 1.3 / 0.0	-14
1125	48.2 Pk	2.4 / 25.6 / 37.2	39	V / 1.3 / 10.3	-15
4500.1	39.4 Pk	5.0 / 34.3 / 39.8	38.8	V / 1.8 / 184.0	-15.2
17400	29.6 Pk	10.7 / 44.4 / 46.1	38.6	H / 1.6 / 68.0	-15.4
109.07	42.3 Qp	0.8 / 12.6 / 27.9	27.8	V / 1.0 / 97.6	-15.7
154.2	41.6 Qp	0.8 / 12.6 / 27.7	27.3	H / 2.1 / 89.1	-16.2
820.36	32.8 Qp	2.0 / 21.5 / 27.9	28.3	H / 1.0 / 299.4	-17.7
7200.04	30.7 Pk	6.4 / 38.5 / 39.5	36.1	V / 1.3 / 33.0	-17.9
1805.23	40.9 Av	3.0 / 28.1 / 36.9	35.2	V / 1.0 / 51.0	-18.8
7500	27.9 Pk	6.6 / 38.9 / 39.4	34	V / 1.3 / 33.0	-20
10100	32.8 Pk	7.8 / 40.7 / 48.8	32.5	H / 1.6 / 68.0	-21.5
10600	32.5 Av	8.0 / 40.8 / 48.8	32.5	H / 1.3 / 33.0	-21.5
5400.08	28.9 Pk	5.5 / 36.1 / 38.5	32.1	V / 1.3 / 33.0	-21.9
10400	32.2 Av	8.0 / 40.8 / 48.9	32.1	V / 1.3 / 33.0	-21.9
999.99	34.2 Qp	2.2 / 22.8 / 27.3	31.9	H / 1.0 / 0.0	-22.1
14500	27.6 Pk	9.4 / 42.8 / 48.0	31.9	V / 1.3 / 33.0	-22.1
8200	28.9 Pk	6.9 / 39.3 / 46.9	28.2	V / 1.3 / 33.0	-25.8
19208.5	12.0 Av	0.0 / 22.3 / 0.0	24.8	H / 1.0 / 0.0	-29.2
21272.5	10.5 Pk	0.0 / 21.5 / 0.0	22.5	H / 1.0 / 0.0	-31.5
24772.8	10.0 Pk	0.0 / 21.6 / 0.0	22.2	V / 1.0 / 0.0	-31.8
4200	22.6 Pk	4.8 / 33.8 / 39.5	21.7	H / 1.3 / 33.0	-32.3
19208.5	7.8 Pk	0.0 / 22.3 / 0.0	20.6	H / 1.0 / 0.0	-33.4
23437.5	7.4 Pk	0.0 / 21.4 / 0.0	19.3	H / 1.0 / 0.0	-34.7
21272.5	0.3 Av	0.0 / 21.5 / 0.0	11.6	H / 1.0 / 0.0	-42.4
24772.8	1.0 Av	0.0 / 21.6 / 0.0	11.1	V / 1.0 / 0.0	-42.9
23437.5	0.9 Av	0.0 / 21.4 / 0.0	11	H / 1.0 / 0.0	-43
0.5	9.5 Pk	0.1 / 10.3 / 0.0	19.9	Para / 1.0 / 0.0	-53.7
0.5	9.2 Pk	0.1 / 10.3 / 0.0	19.6	Perp / 1.0 / 0.0	-54

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
2.18	-4.0 Pk	0.1 / 10.5 / 0.0	6.6	Perp / 1.0 / 0.0	-62.9
2.18	-5.4 Pk	0.1 / 10.5 / 0.0	5.2	Para / 1.0 / 0.0	-64.3
0.052	34.9 Pk	0.0 / 10.8 / 0.0	45.7	Perp / 1.0 / 0.0	-67.6
0.036	36.5 Pk	0.0 / 12.1 / 0.0	48.7	Perp / 1.0 / 0.0	-67.8
3.48	-9.6 Pk	0.1 / 10.6 / 0.0	1.1	Para/ 1.0 / 0.0	-68.4
0.06	29.6 Pk	0.0 / 10.8 / 0.0	40.4	Para/ 1.0 / 0.0	-71.6
6.63	-13.0 Pk	0.2 / 10.7 / 0.0	-2.1	Para/ 1.0 / 0.0	-71.6
0.063	28.4 Pk	0.0 / 10.8 / 0.0	39.2	Perp / 1.0 / 0.0	-72.4
0.19	18.7 Pk	0.0 / 10.4 / 0.0	29.1	Para/ 1.0 / 0.0	-72.9
11.17	-15.0 Pk	0.2 / 10.8 / 0.0	-4	Para/ 1.0 / 0.0	-73.5
0.123	21.5 Pk	0.0 / 10.5 / 0.0	32	Perp / 1.0 / 0.0	-73.8
0.125	21.1 Pk	0.0 / 10.5 / 0.0	31.6	Para/ 1.0 / 0.0	-74
29.36	-14.0 Pk	0.4 / 8.3 / 0.0	-5.3	Perp / 1.0 / 0.0	-74.8
12.7	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Para/ 1.0 / 0.0	-75.5
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Perp / 1.0 / 0.0	-75.5
13.37	-18.0 Pk	0.3 / 10.7 / 0.0	-7	Para / 1.0 / 0.0	-76.5
25.6	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.6	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Para / 1.0 / 0.0	-77.7
27.82	-19.0 Pk	0.4 / 8.8 / 0.0	-9.8	Para/ 1.0 / 0.0	-79.3
28.5	-19.0 Pk	0.4 / 8.6 / 0.0	-10	Perp / 1.0 / 0.0	-79.5
29.91	-20.0 Pk	0.4 / 8.1 / 0.0	-11.5	Para/ 1.0 / 0.0	-81

Example Unintentional Radiated Emissions Calculation:

Measured Level	+	**Transducer, Cable Loss & Amplifier corrections**	=	**Corrected Reading**	**Specification Limit**	-	**Corrected Reading**	=	**Delta Specification**
(dBµV)		(dB)		(dBµV/m)	(dBµV/m)		(dBµV/m)		
14.0		**14.9**		**28.9**	**40.0**		**28.9**		**-11.1**

Notes: Measurements made >18GHz were made at a test distance of 1m and the measurement data was extrapolated to 3m. The FCC limits were not changed.

Deviations, Additions, or Exclusions: None

7 Band Edge Measurements – Unintentional and Spurious of the Transmitter

7.1 Method

The test methods used comply with ANSI C63.10. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

7.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18882	Spectrum Analyzer (dc-22 GHz)	Hewlett-Packard	8566B	2410A00154	12/06/2010	12/06/2011
18660	Spectrum Analyzer Display Section (set 1)	Hewlett-Packard	85662A	2318A04983	12/10/2010	12/10/2011
18880	Q.P Adapter	Hewlett-Packard	85650A	2811A01300	12/06/2010	12/06/2011
18906	Pre-Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_CVI	V.1.0	01/01/2011	01/01/2012

7.3 Results:

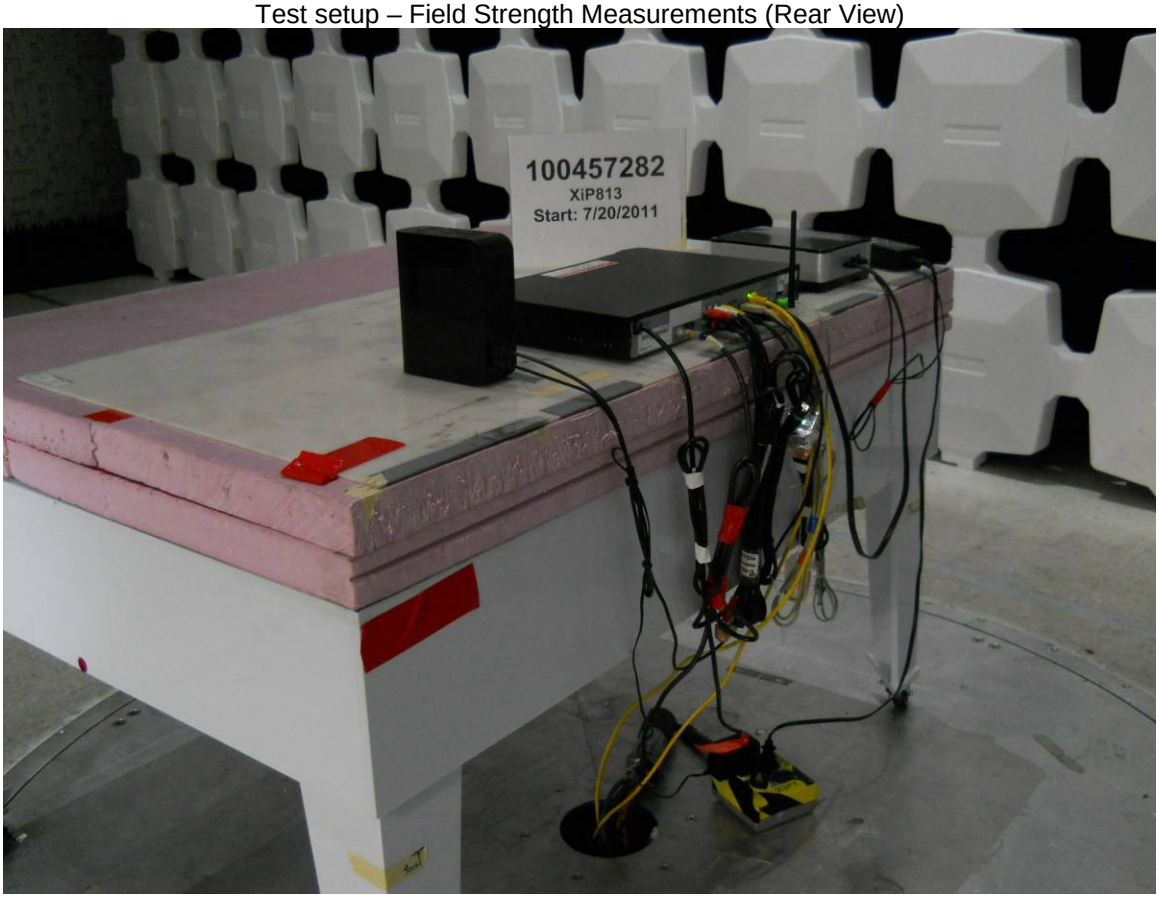
The sample tested was found to comply with the requirements of:

- FCC 15.209/ 15.247(d)
- Covers RSS-210 A8.5, & RSS-GEN 7.2.2

7.4 Setup Photographs:

Test setup – Field Strength Measurements (Front View)

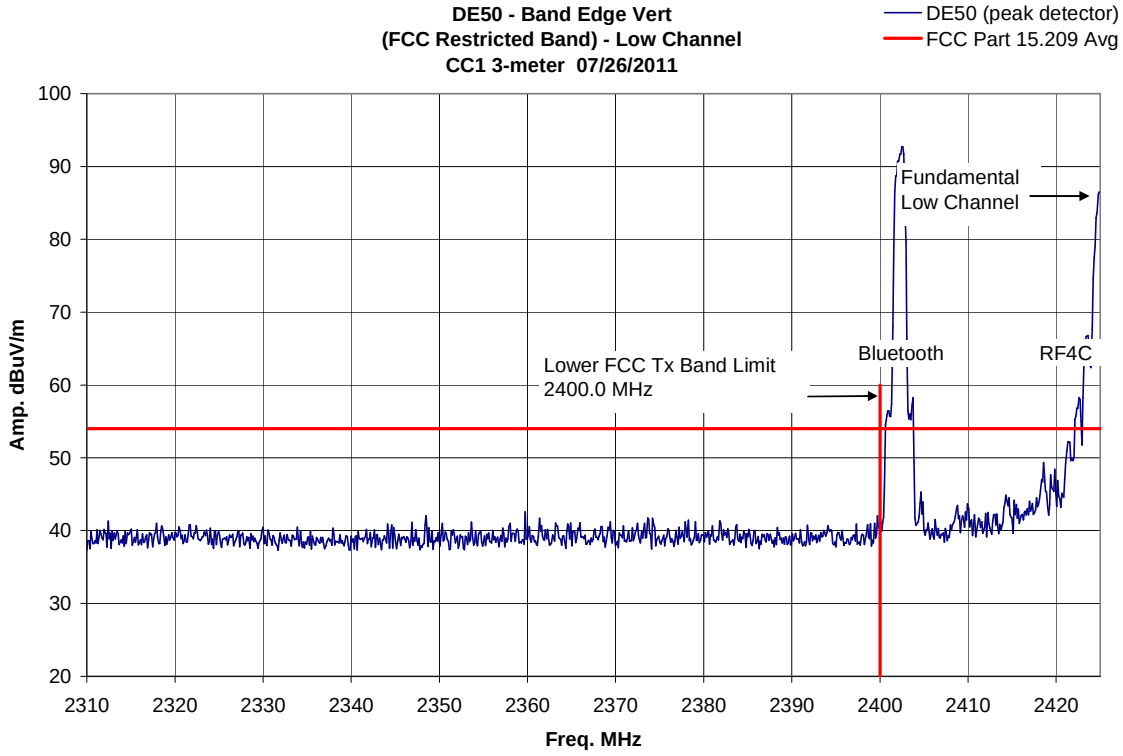
Test setup – Field Strength Measurements (Rear View)



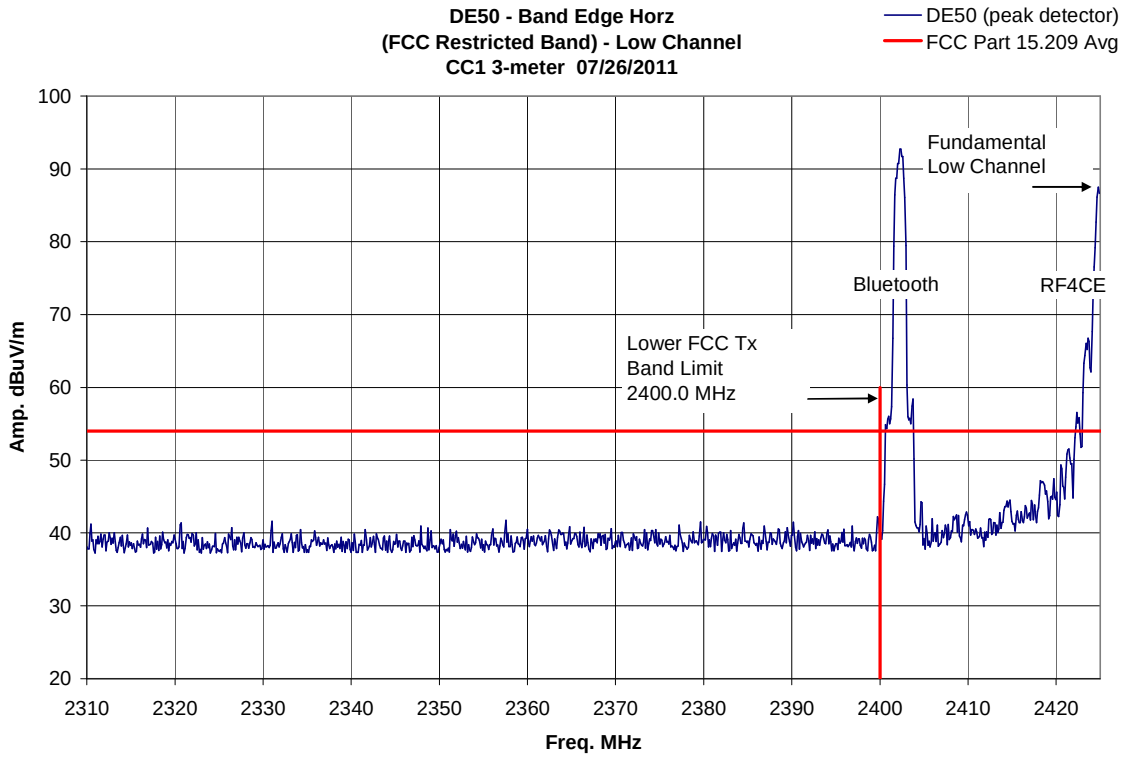
7.5 Band Edge Plot – Low Channel

FCC 15.247(d) / 15.205/209/ RSS-210 A8.5

Vertical Polarization



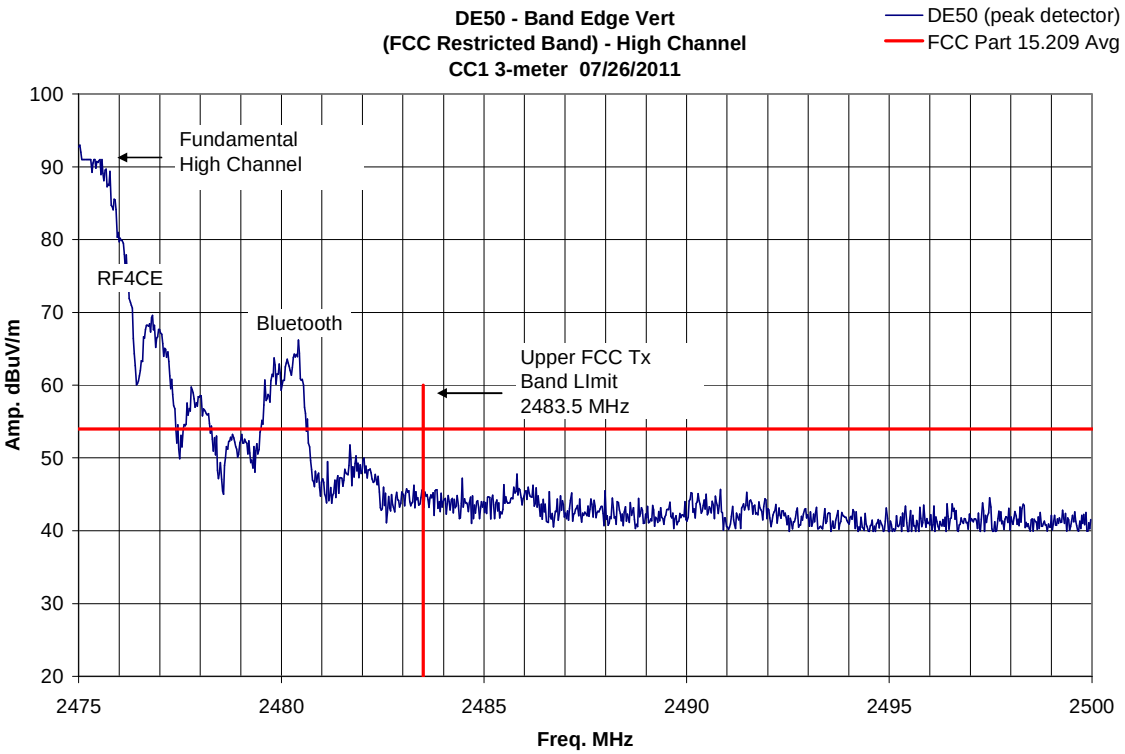
Horizontal Polarization



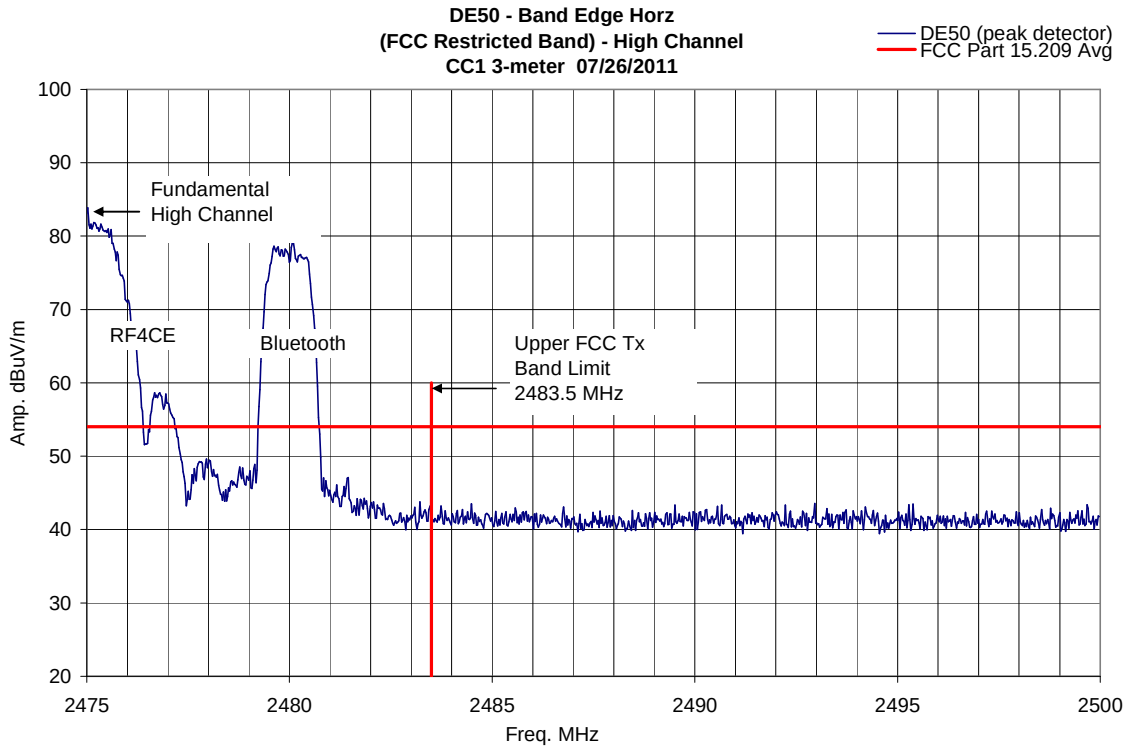
7.6 Band Edge Plot – High Channel

FCC 15.247(d) / 15.205/15.209/ RSS-210 A8.5

Vertical Polarization

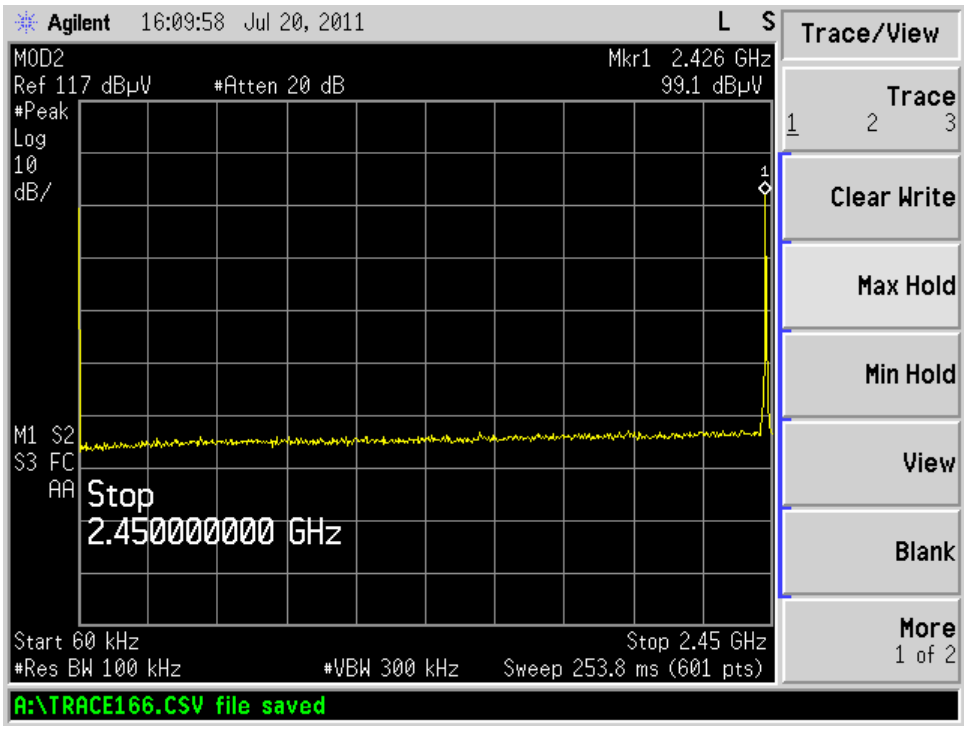


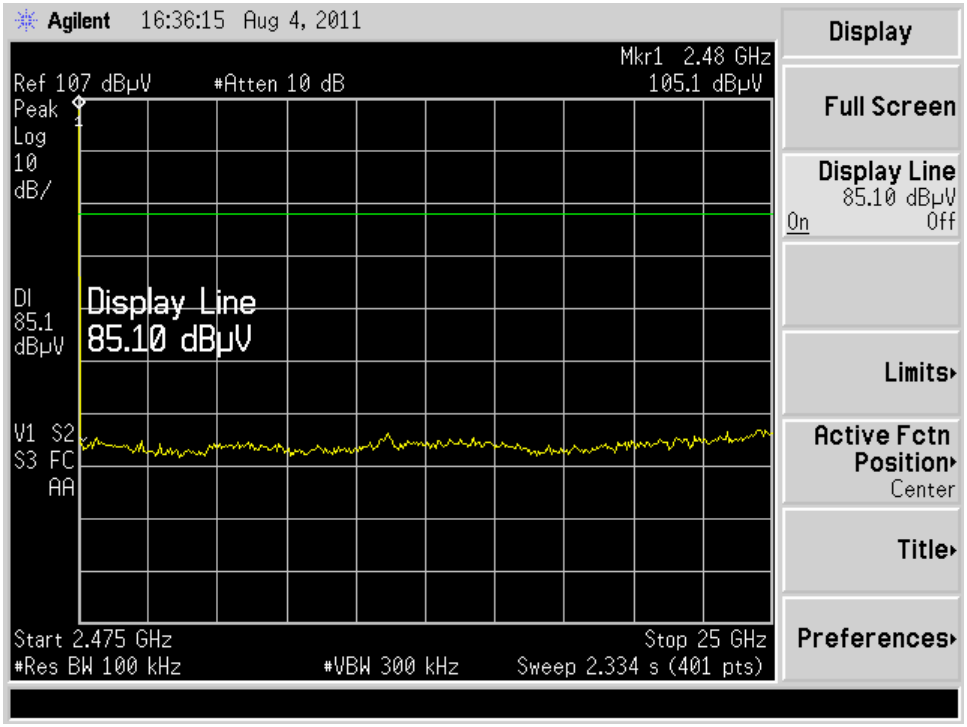
Horizontal Polarization



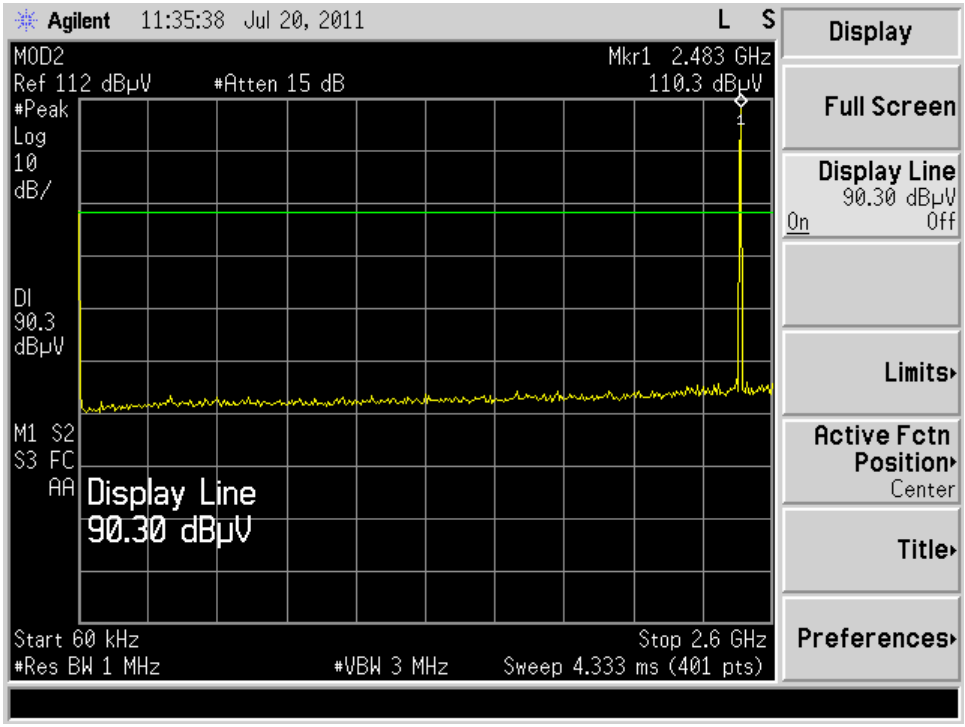
7.7 Expanded Band Edge Conducted Port Measurements

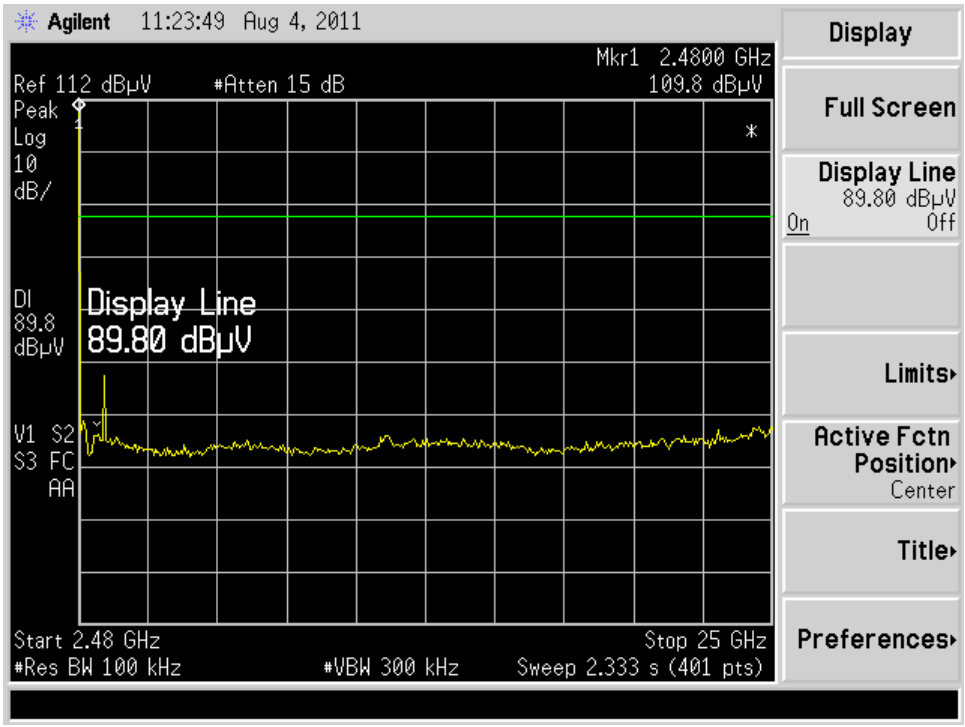
7.7.1 RF4CE





7.7.2 Bluetooth





7.8 Test Data: Band Edge

Radiated Band Edge Emissions

Test Report #:	**100457282**	Test Area:	CC1 Radiated	Temperature:	24.2	°C
Test Method:	FCC Part 15.209	Test Date:	26-Jul-2011	Relative Humidity:	31.7	%
EUT Model #:	DE50 (XiP813)	EUT Power:	120VAC/60Hz	Air Pressure:	82.9	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver					
Notes:	**Tx Spurious with worst-case modulation and data**					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 >1GHz	N/A
Lower Band Edge Measurements						
FCC 15.205 Restricted Band						
2398.00	45.5 Pk	3.5 / 29.4 / 37.4	41.0	V / 1.7 / 320.0	-13.0	N/A
2398.00	53.2 Av	3.5 / 29.4 / 37.4	48.8	V / 1.7 / 320.0	-5.2	N/A
2398.00	53.2 Av	3.5 / 29.4 / 37.4	48.8	V / 1.7 / 320.0	-5.2	N/A
2381.99	48.5 Pk	3.5 / 29.4 / 37.4	44.0	V / 1.6 / 248.0	-10.0	N/A
2381.99	45.6 Av	3.5 / 29.4 / 37.4	41.1	V / 1.6 / 248.0	-12.9	N/A
2378.99	47.2 Pk	3.5 / 29.3 / 37.4	42.7	V / 1.6 / 248.0	-11.3	N/A
2378.99	45.0 Av	3.5 / 29.3 / 37.4	40.4	V / 1.6 / 248.0	-13.6	N/A
2310.05	46.0 Pk	3.4 / 29.1 / 37.3	41.3	V / 1.6 / 288.0	-12.7	N/A
2310.05	44.4 Av	3.4 / 29.1 / 37.3	39.6	V / 1.6 / 288.0	-14.4	N/A
Upper Band Edge Measurements						
FCC 15.205 Restricted Band						
2483.50	51.9 Pk	3.6 / 29.8 / 37.5	47.7	V / 1.6 / 16.0	-6.3	N/A
2483.50	44.6 Av	3.6 / 29.8 / 37.5	40.5	V / 1.6 / 16.0	-13.5	N/A
2485.83	53.4 Pk	3.6 / 29.8 / 37.5	49.2	V / 1.7 / 248.0	-4.8	N/A
2485.83	48.5 Av	3.6 / 29.8 / 37.5	44.4	V / 1.7 / 248.0	-9.6	N/A
2490.45	49.5 Pk	3.6 / 29.8 / 37.5	45.5	V / 1.5 / 314.0	-8.5	N/A
2490.45	47.4 Av	3.6 / 29.8 / 37.5	43.3	V / 1.5 / 314.0	-10.7	N/A
2491.65	48.9 Pk	3.6 / 29.8 / 37.5	44.8	V / 1.5 / 314.0	-9.2	N/A
2491.65	47.2 Av	3.6 / 29.8 / 37.5	43.2	V / 1.5 / 314.0	-10.8	N/A
2483.50	46.5 Pk	3.6 / 29.8 / 37.5	42.4	H / 1.8 / 218.0	-11.6	N/A
2483.50	39.2 Av	3.6 / 29.8 / 37.5	35.1	H / 1.8 / 218.0	-18.9	N/A
2485.83	45.4 Pk	3.6 / 29.8 / 37.5	41.3	H / 1.8 / 32.0	-12.7	N/A
2485.83	44.0 Av	3.6 / 29.8 / 37.5	39.9	H / 1.8 / 32.0	-14.1	N/A
2490.45	44.6 Pk	3.6 / 29.8 / 37.5	40.6	H / 1.8 / 64.0	-13.4	N/A
2490.45	44.3 Av	3.6 / 29.8 / 37.5	40.2	H / 1.8 / 64.0	-13.8	N/A

Note: Both peak and average measurements were below the FCC 15.209/205 Restricted Band Limits

8 Unintentional Radiated Emissions - Receiver

8.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC CFR47 15.247(d)15.209/15.109/RSS-GEN Section 6.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

8.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18882	Spectrum Analyzer (dc-22 GHz)	Hewlett-Packard	8566B	2410A00154	12/06/2010	12/06/2011
18660	Spectrum Analyzer Display Section (set 1)	Hewlett-Packard	85662A	2318A04983	12/10/2010	12/10/2011
18880	Q.P Adapter	Hewlett-Packard	85650A	2811A01300	12/06/2010	12/06/2011
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/03/2011	06/03/2012
18906	RF Pre-Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/03/2011	06/03/2012
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/03/2011	06/03/2012
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/03/2011	06/03/2012
19936	Bilog Antenna 30MHz - 6GHz	Sunol Sciences	JB6	A050707-1	10/11/2010	10/11/2011
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	12/09/2010	12/09/2011
18805	HF Active Antenna/Harmonic Mixer 18 GHz to 26.5 GHz	Hewlett-Packard	11970K	2332A01280	10/04/2010	10/04/2011
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_CVI	V.1.0	01/01/2011	01/01/2012

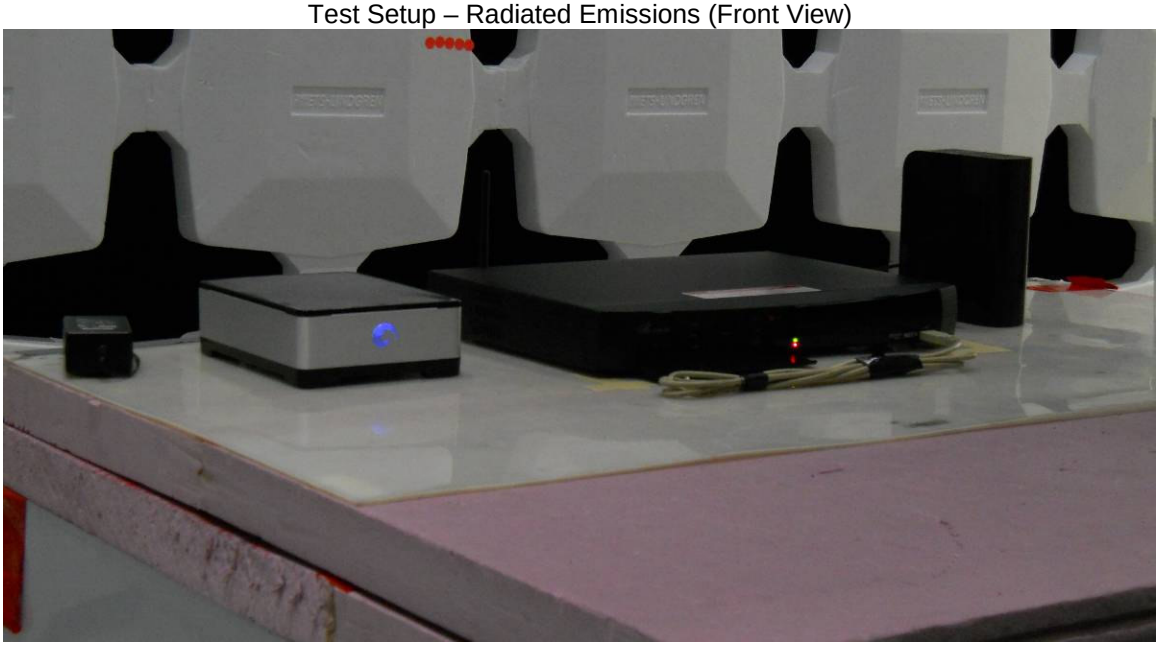
8.3 Results:

The sample tested was found to comply with the requirements of:

- **FCC 15.209/15.109**
- **RSS-GEN Section 6**

8.4 Setup Photographs:

Test Setup – Radiated Emissions (Front View)



Test Setup – Radiated Emissions (Rear View)

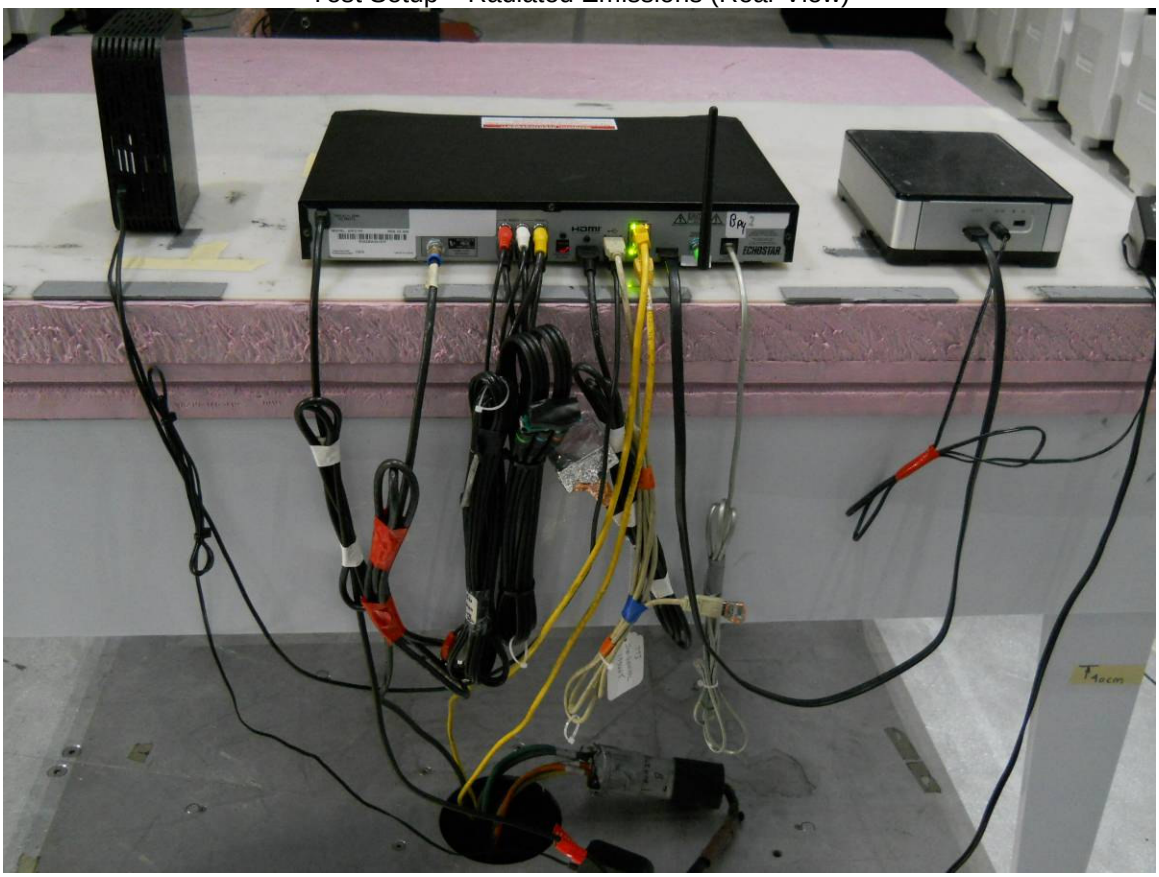
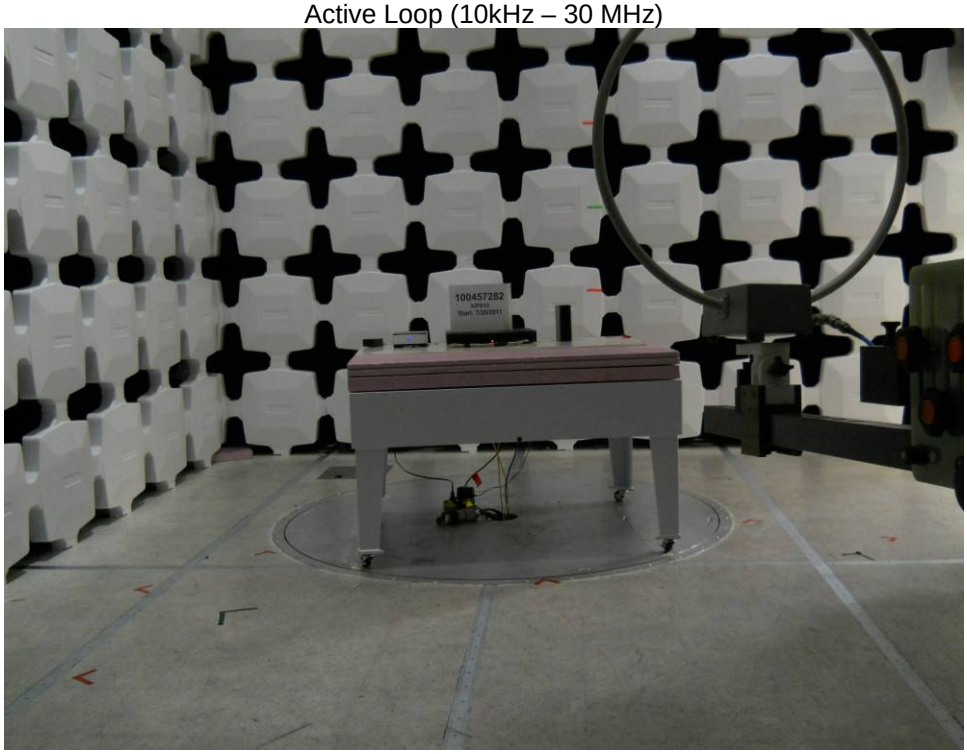
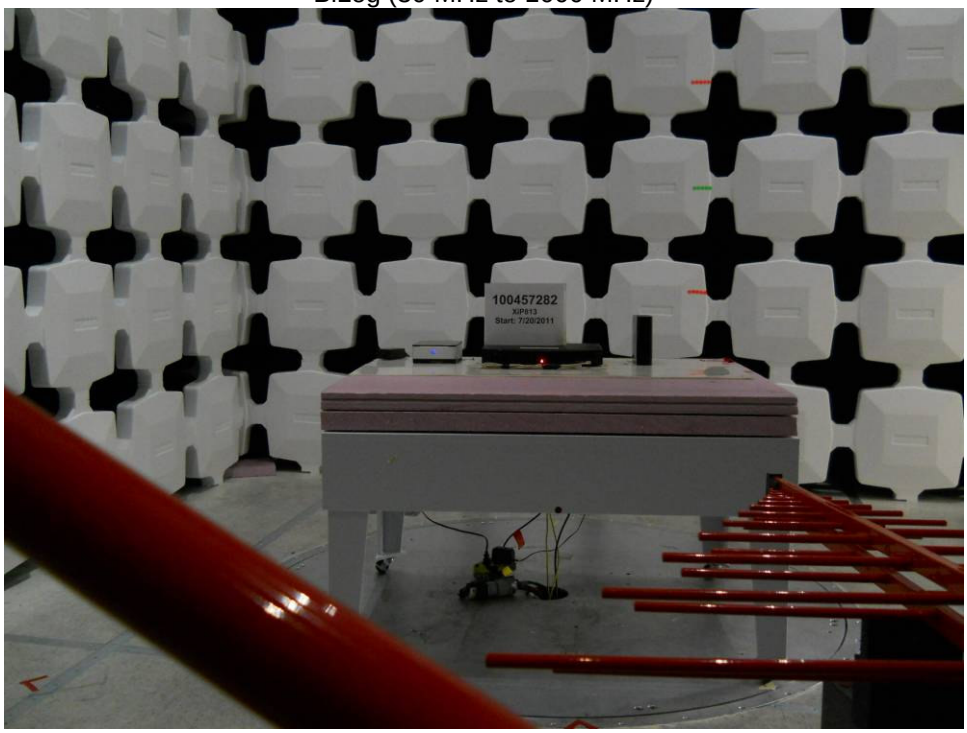


Photo: Test Antennas

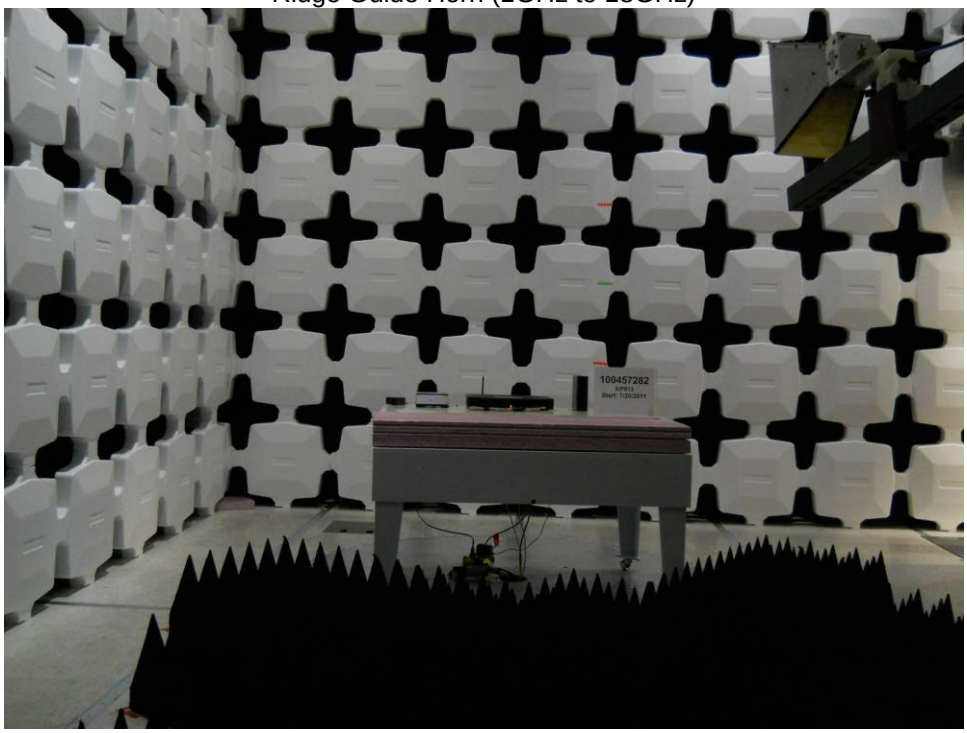
Active Loop (10kHz – 30 MHz)



BiLog (30 MHz to 1000 MHz)



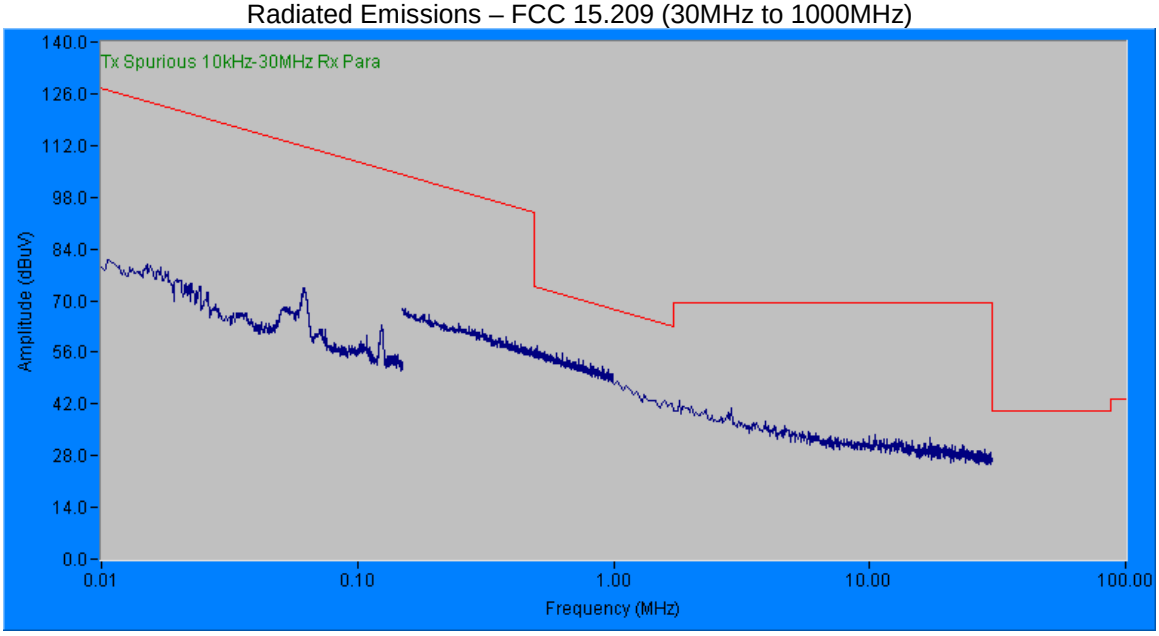
Ridge Guide Horn (1GHz to 18GHz)

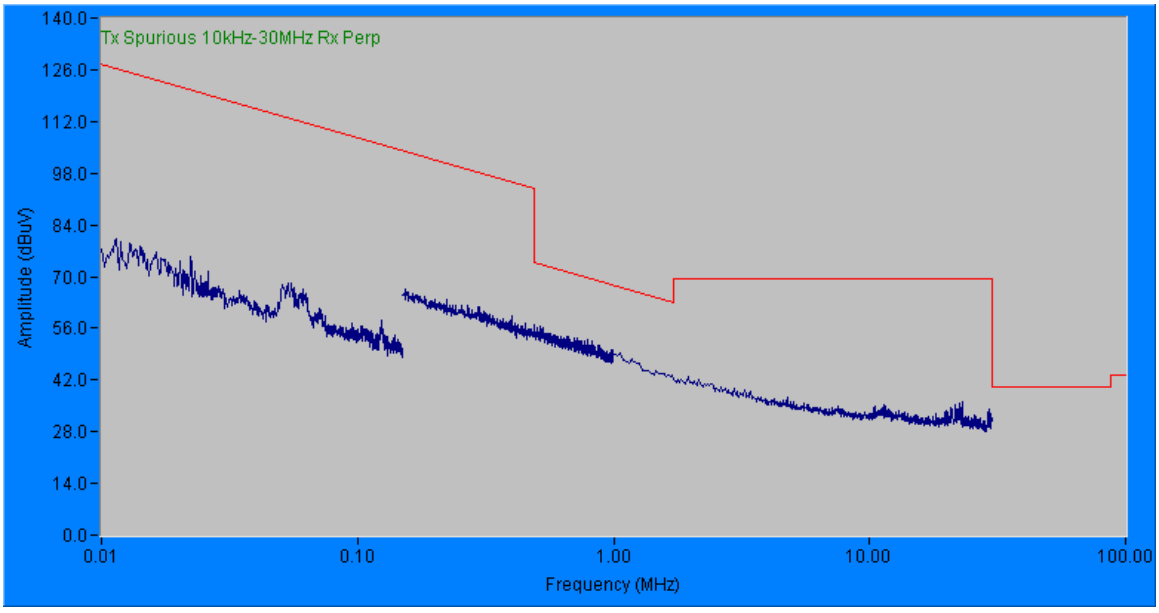


Note: Testing above 1GHz utilizes a boar site antenna mast

8.5 Plots: Pre-Scan Peak Measurements - Not Final Data

Radiated Emissions – FCC 15.209 (30MHz to 1000MHz)

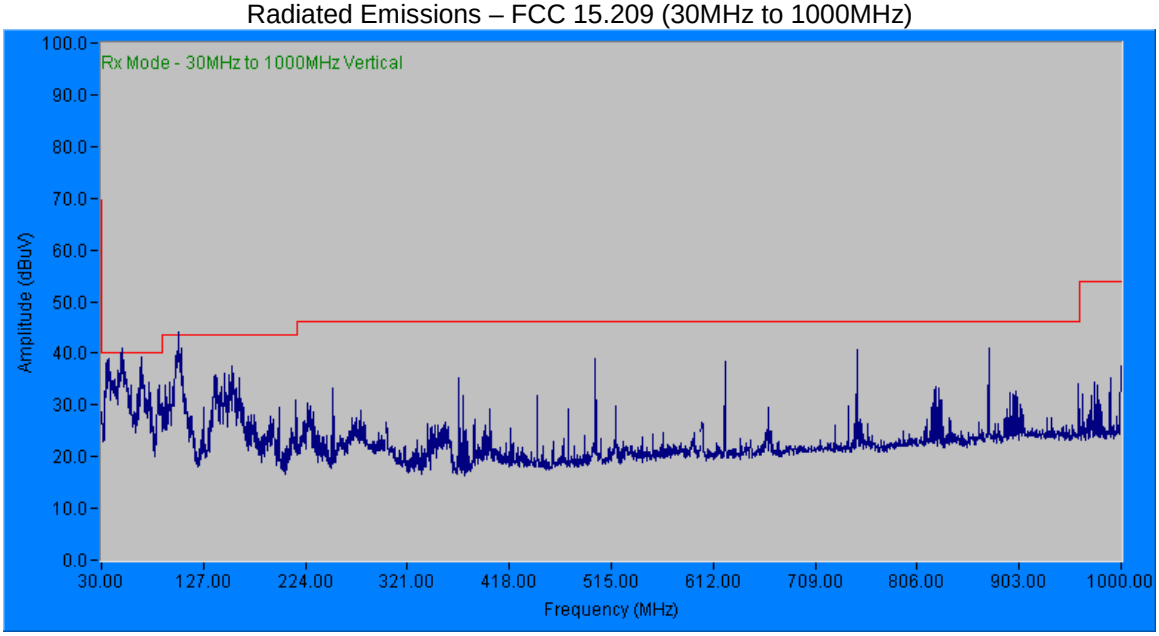


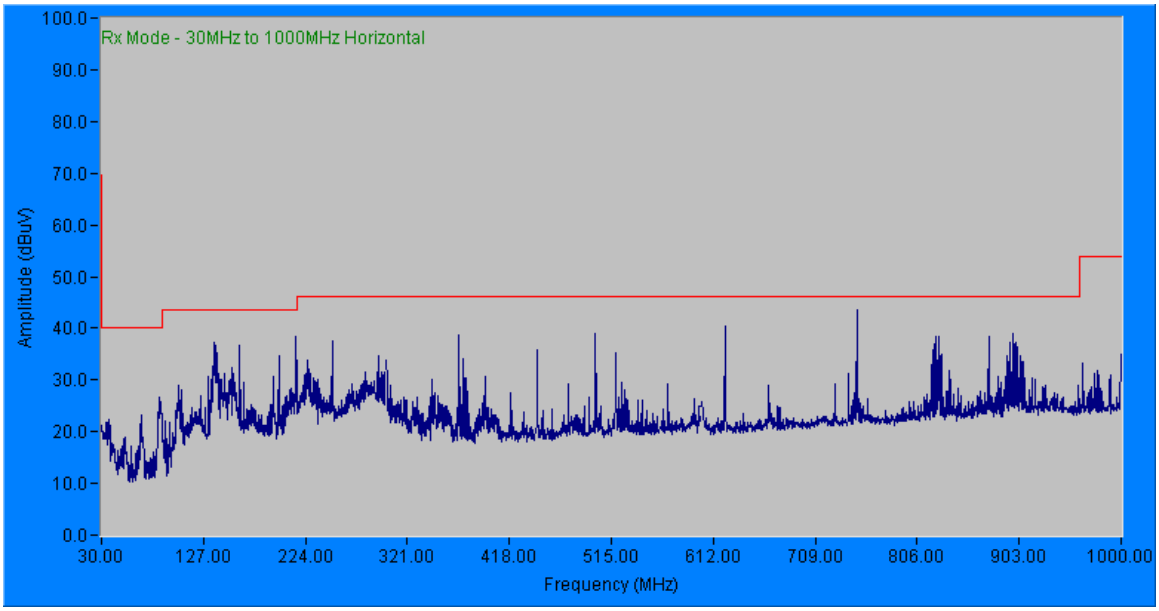


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data

Radiated Emissions – FCC 15.209 (30MHz to 1000MHz)

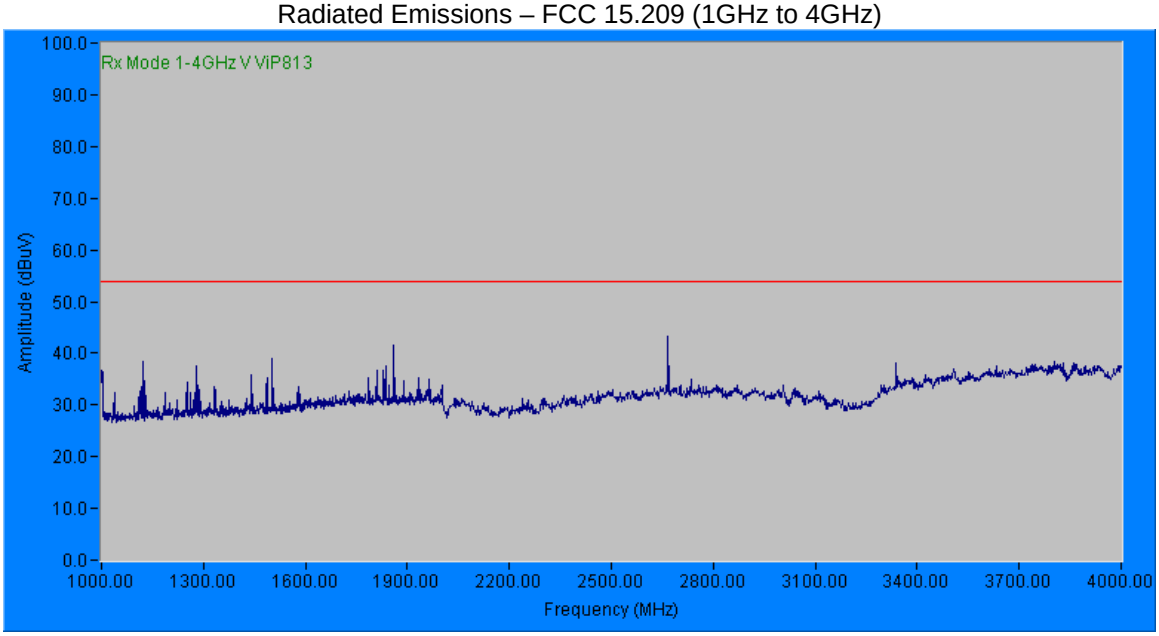


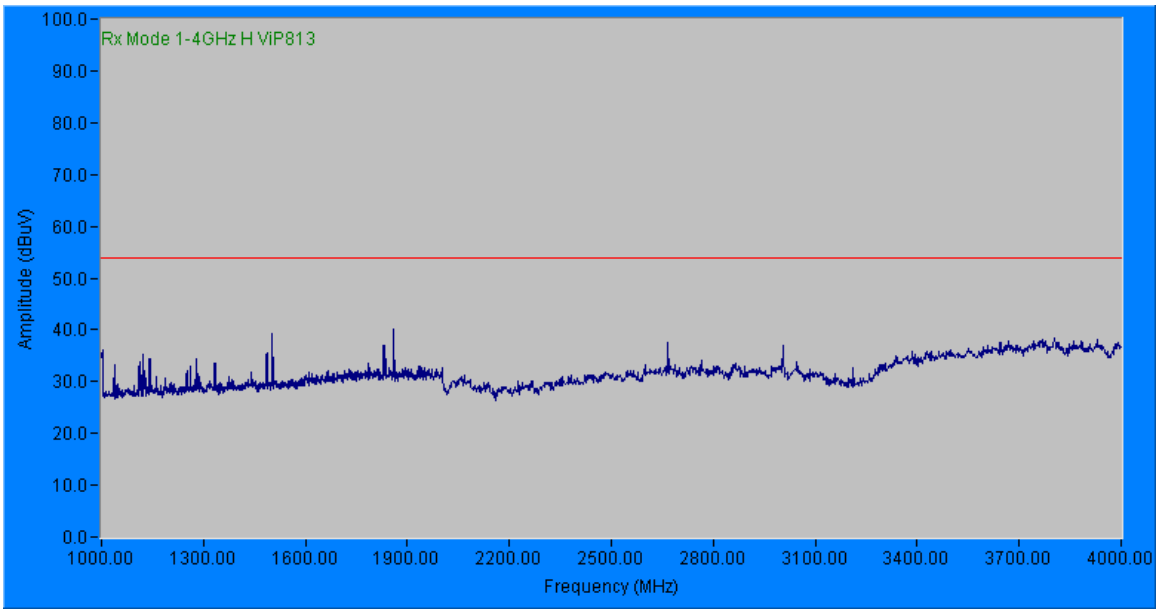


Note: Peak measurements plotted against FCC 15.209 Quasi-Peak Limit

Plots: Pre-Scan Peak Measurements - Not Final Data

Radiated Emissions – FCC 15.209 (1GHz to 4GHz)

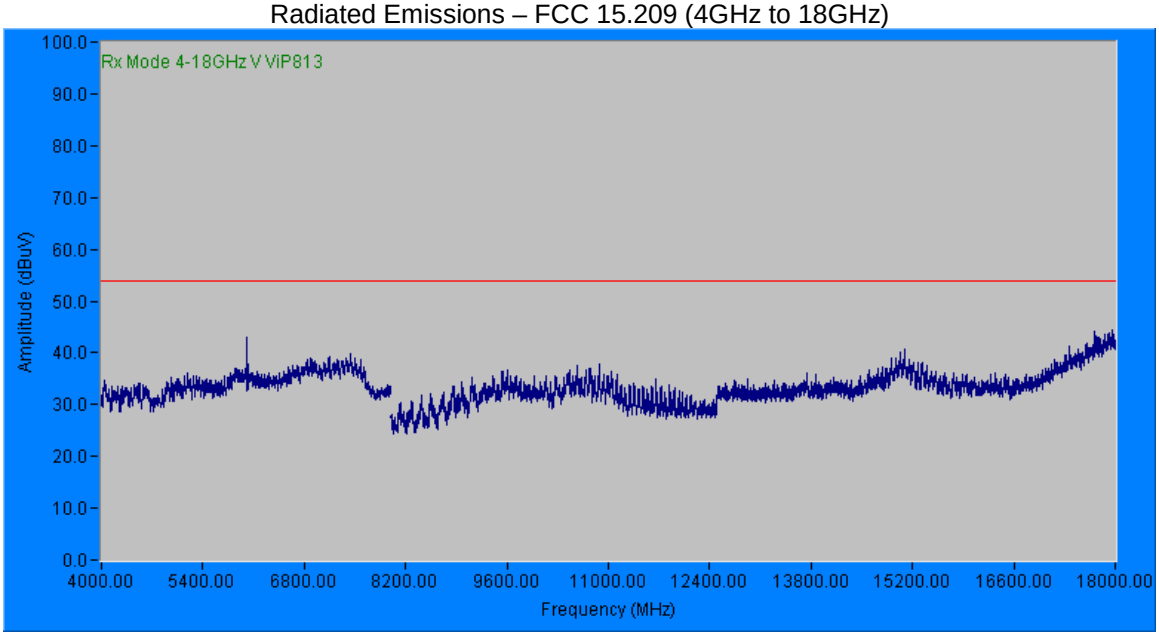


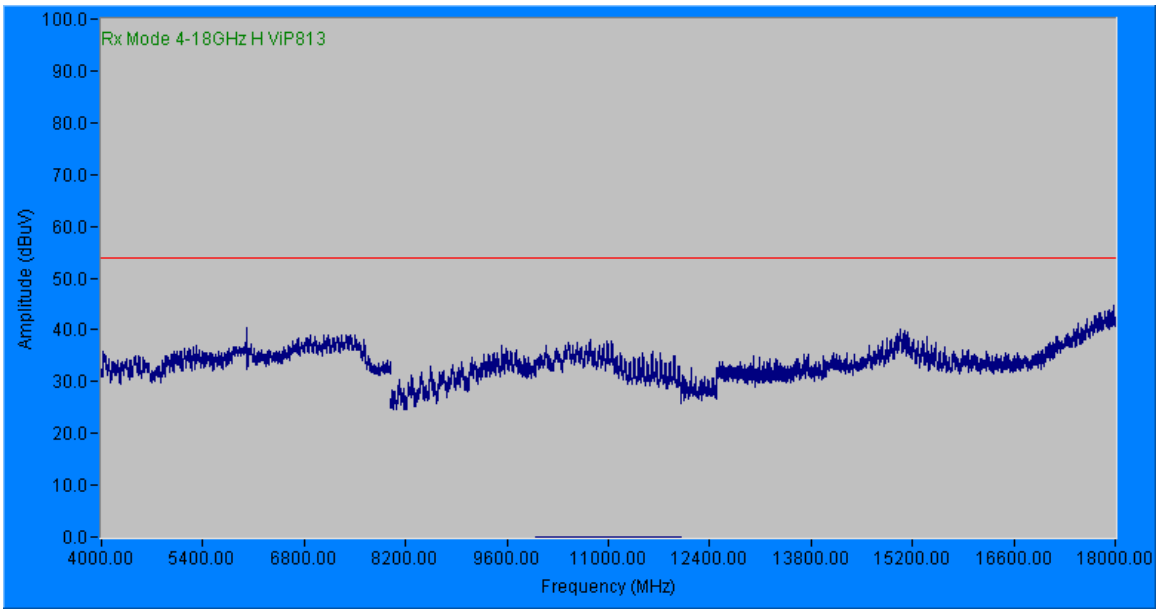


Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Pre-Scan Peak Measurements - Not Final Data

Radiated Emissions – FCC 15.209 (4GHz to 18GHz)

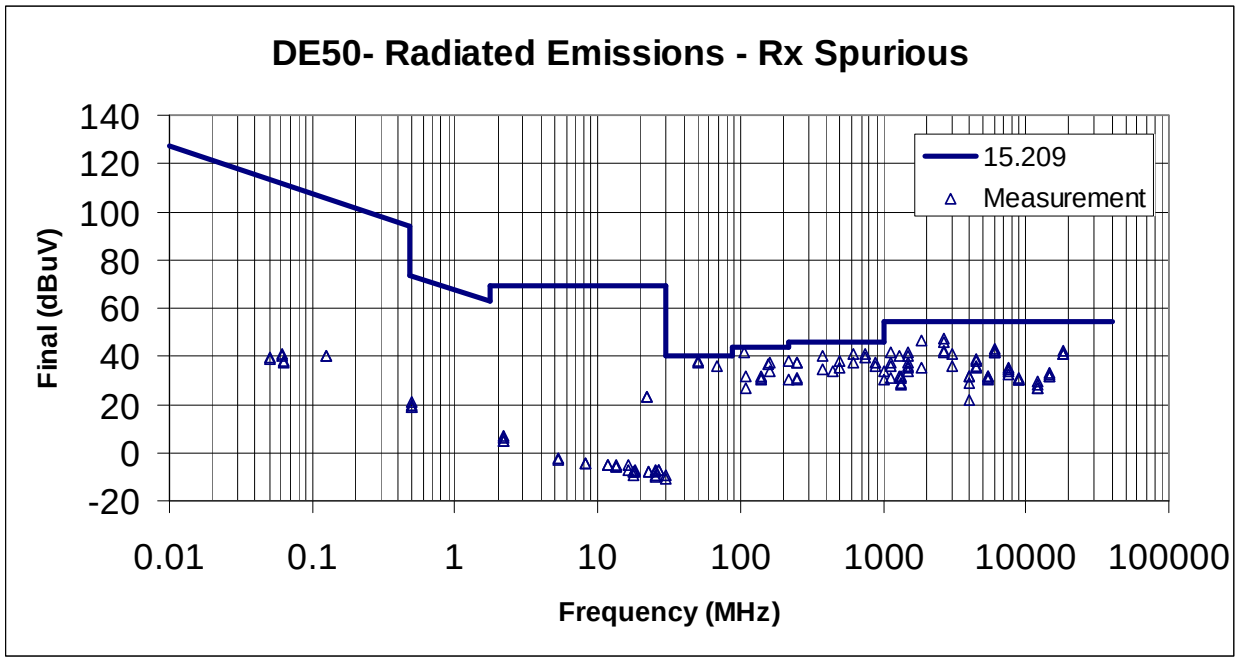




Note: Peak measurements plotted against FCC 15.209 Average Limit

Plots: Final Quasi-Peak & Average Measurements

Radiated Emissions – FCC 15.209 (9kHz to 13GHz)



8.6 Test Data: 10kHz to 30 GHz

Radiated Electromagnetic Emissions

Test Report #:	**Tx Spurious 10kHz – 30GHz Low Chanel BT and RF4CE**	Test Area:	CC1 Radiated	Temperature:	23.4	°C
Test Method:	FCC Part 15.209	Test Date:	27-Jul-2011	Relative Humidity:	34.8	%
EUT Model #:	DE50 (XiP813)	EUT Power:		Air Pressure:	82.9	kPa
EUT Serial #:						
Manufacturer:	Echostar					
EUT Description:						
Notes:						

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209

Rx Spurious - Receive Mode BT and RF

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB\m) (dB)	FINAL (dBuV)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) 15.209
0.0503	28.0 Pk	0.0 / 10.8 / 0.0	38.8	Perp / 1.0 / 0.0	-74.8
0.0503	28.4 Av	0.0 / 10.8 / 0.0	39.2	Perp / 1.0 / 0.0	N/A
0.0607	30.0 Av	0.0 / 10.8 / 0.0	40.8	Para / 1.0 / 0.0	N/A
0.0607	29.5 Pk	0.0 / 10.8 / 0.0	40.3	Para / 1.0 / 0.0	-71.6
0.0632	27.5 Av	0.0 / 10.8 / 0.0	38.3	Perp / 1.0 / 0.0	N/A
0.0632	26.8 Pk	0.0 / 10.8 / 0.0	37.6	Perp / 1.0 / 0.0	-74.0
0.124	30.0 Av	0.0 / 10.5 / 0.0	40.5	Para / 1.0 / 0.0	N/A
0.124	29.8 Pk	0.0 / 10.5 / 0.0	40.3	Para / 1.0 / 0.0	-65.4
0.5	8.3 Av	0.1 / 10.3 / 0.0	18.7	Para / 1.0 / 0.0	N/A
0.5	10.4 Pk	0.1 / 10.3 / 0.0	20.8	Para / 1.0 / 0.0	-52.8
0.5	8.8 Av	0.1 / 10.3 / 0.0	19.2	Perp / 1.0 / 0.0	N/A
0.5	9.2 Pk	0.1 / 10.3 / 0.0	19.6	Perp / 1.0 / 0.0	-54.0
2.18	-4.3 Av	0.1 / 10.5 / 0.0	6.3	Para / 1.0 / 0.0	N/A
2.18	-5.5 Pk	0.1 / 10.5 / 0.0	5.1	Para / 1.0 / 0.0	-64.4
2.18	-3.9 Av	0.1 / 10.5 / 0.0	6.7	Perp / 1.0 / 0.0	N/A
2.18	-5.9 Pk	0.1 / 10.5 / 0.0	4.7	Perp / 1.0 / 0.0	-64.8
5.35	-14.0 Av	0.2 / 10.6 / 0.0	-3.2	Perp / 1.0 / 0.0	N/A
5.35	-13.0 Pk	0.2 / 10.6 / 0.0	-2.2	Perp / 1.0 / 0.0	-71.7
8.12	-15.0 Av	0.2 / 10.7 / 0.0	-4.1	Para / 1.0 / 0.0	N/A
8.12	-15.0 Pk	0.2 / 10.7 / 0.0	-4.1	Para / 1.0 / 0.0	-73.6
11.66	-16.0 Av	0.3 / 10.7 / 0.0	-5	Para / 1.0 / 0.0	N/A
11.66	-16.0 Pk	0.3 / 10.7 / 0.0	-5	Para / 1.0 / 0.0	-74.5
13.37	-17.0 Av	0.3 / 10.7 / 0.0	-6	Para / 1.0 / 0.0	N/A
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Para / 1.0 / 0.0	-75.5
13.37	-16.0 Av	0.3 / 10.7 / 0.0	-5	Perp / 1.0 / 0.0	N/A
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	Perp / 1.0 / 0.0	-75.5
16.17	-16.0 Av	0.3 / 10.6 / 0.0	-5.1	Perp / 1.0 / 0.0	N/A
16.17	-18.0 Pk	0.3 / 10.6 / 0.0	-7.1	Perp / 1.0 / 0.0	-76.6

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
17.82	-19.0 Av	0.3 / 10.5 / 0.0	-8.2	Para / 1.0 / 0.0	N/A
17.82	-20.0 Pk	0.3 / 10.5 / 0.0	-9.2	Para / 1.0 / 0.0	-78.7
17.82	-19.0 Pk	0.3 / 10.5 / 0.0	-8.2	Para / 1.0 / 0.0	-77.7
18.31	-19.0 Av	0.3 / 10.5 / 0.0	-8.2	Perp / 1.0 / 0.0	N/A
18.31	-18.0 Pk	0.3 / 10.5 / 0.0	-7.2	Perp / 1.0 / 0.0	-76.7
22.22	12.9 Av	0.3 / 10.0 / 0.0	23.2	Perp / 1.0 / 0.0	N/A
22.22	12.9 Pk	0.3 / 10.0 / 0.0	23.2	Perp / 1.0 / 0.0	-46.3
22.46	-18.0 Av	0.3 / 10.0 / 0.0	-7.7	Perp / 1.0 / 0.0	N/A
22.46	-18.0 Pk	0.3 / 10.0 / 0.0	-7.7	Perp / 1.0 / 0.0	-77.2
25.57	-17.0 Av	0.4 / 9.4 / 0.0	-7.2	Perp / 1.0 / 0.0	N/A
25.57	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	Perp / 1.0 / 0.0	-77.7
25.6	-19.0 Av	0.4 / 9.4 / 0.0	-9.2	Para / 1.0 / 0.0	N/A
25.6	-20.0 Pk	0.4 / 9.4 / 0.0	-10.2	Para / 1.0 / 0.0	-79.7
26.61	-17.0 Av	0.4 / 9.1 / 0.0	-7.5	Perp / 1.0 / 0.0	N/A
26.61	-17.0 Pk	0.4 / 9.1 / 0.0	-7.5	Perp / 1.0 / 0.0	-77.0
30	-19.0 Av	0.4 / 8.1 / 0.0	-10.5	Para / 1.0 / 0.0	N/A
30	-18.0 Pk	0.4 / 8.1 / 0.0	-9.5	Para / 1.0 / 0.0	-49.5
50.44	57.2 Qp	0.8 / 7.9 / 28.2	37.8	V / 1.0 / 118.0	-2.2
51.05	57.1 Qp	0.8 / 7.8 / 28.2	37.5	V / 1.0 / 188.0	-2.5
68.99	55.5 Qp	0.8 / 8.0 / 28.1	36.1	V / 1.0 / 316.0	-3.9
104.71	57.0 Qp	0.8 / 11.7 / 27.9	41.6	V / 1.0 / 42.0	-1.9
108.14	46.5 Qp	0.8 / 12.4 / 27.9	31.8	V / 1.0 / 105.9	-11.7
108.8	41.2 Qp	0.8 / 12.6 / 27.9	26.7	H / 1.6 / 111.1	-16.8
137.76	45.9 Qp	0.8 / 12.7 / 27.8	31.5	V / 1.0 / 124.3	-12
137.76	44.8 Qp	0.8 / 12.7 / 27.8	30.4	H / 2.2 / 163.3	-13.1
137.77	45.1 Qp	0.8 / 12.7 / 27.8	30.7	H / 1.7 / 238.6	-12.8
155.61	50.9 Qp	0.8 / 12.6 / 27.7	36.6	V / 1.1 / 242.0	-6.9
162.01	48.3 Qp	0.9 / 12.6 / 27.7	34.1	V / 1.1 / 280.0	-9.4
162.01	51.9 Qp	0.9 / 12.6 / 27.7	37.6	H / 2.2 / 242.0	-5.9
216.01	46.5 Qp	1.0 / 10.5 / 27.4	30.6	V / 1.2 / 62.0	-15.4
216.02	53.7 Qp	1.0 / 10.5 / 27.4	37.8	H / 1.4 / 237.7	-8.2
250.01	45.0 Qp	1.1 / 11.7 / 27.2	30.5	V / 1.3 / 135.0	-15.5
250.01	51.5 Qp	1.1 / 11.7 / 27.2	37	H / 1.6 / 182.1	-9
250.01	51.8 Qp	1.1 / 11.7 / 27.2	37.3	H / 1.6 / 193.4	-8.7
250.03	45.6 Qp	1.1 / 11.7 / 27.2	31.2	V / 1.0 / 268.7	-14.8
370.87	45.6 Qp	1.3 / 15.1 / 27.6	34.4	V / 2.2 / 268.0	-11.6
370.92	51.5 Qp	1.3 / 15.1 / 27.6	40.3	H / 1.0 / 307.8	-5.7
445.06	43.2 Qp	1.4 / 17.0 / 28.1	33.6	H / 1.0 / 333.2	-12.4
500.04	47.4 Qp	1.5 / 17.8 / 28.3	38.4	V / 1.3 / 184.0	-7.6
500.04	43.9 Qp	1.5 / 17.8 / 28.3	34.9	H / 1.0 / 183.9	-11.1
625.03	45.0 Qp	1.7 / 19.1 / 28.3	37.5	V / 1.9 / 186.0	-8.5
625.06	48.2 Qp	1.7 / 19.1 / 28.3	40.7	H / 1.2 / 308.2	-5.3
750.03	44.8 Qp	1.9 / 20.6 / 28.1	39.2	H / 1.4 / 165.1	-6.8
750.04	46.8 Qp	1.9 / 20.6 / 28.1	41.2	V / 1.3 / 42.0	-4.8
875.02	41.1 Qp	2.1 / 21.8 / 27.7	37.2	V / 1.8 / 18.0	-8.8
875.07	39.5 Qp	2.1 / 21.8 / 27.7	35.6	H / 1.0 / 58.9	-10.4
999.99	35.8 Qp	2.2 / 22.8 / 27.3	33.5	V / 1.0 / 0.0	-20.5
999.99	32.5 Qp	2.2 / 22.8 / 27.3	30.2	H / 1.0 / 0.0	-23.8
1125.04	46.4 Av	2.4 / 25.6 / 37.2	37.2	V / 1.2 / 0.0	-16.8

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB\m) (dB)	FINAL (dBuV)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) 15.209
1125.04	50.8 Pk	2.4 / 25.6 / 37.2	41.6	V / 1.2 / 0.0	-12.4
1125.07	40.4 Av	2.4 / 25.6 / 37.2	31.2	H / 1.0 / 131.1	-22.8
1125.07	45.2 Pk	2.4 / 25.6 / 37.2	36	H / 1.0 / 131.1	-18
1280.05	40.1 Av	2.5 / 26.1 / 37.0	31.7	V / 1.0 / 317.5	-22.3
1280.05	48.5 Pk	2.5 / 26.1 / 37.0	40.1	V / 1.0 / 317.5	-13.9
1332.03	39.8 Pk	2.6 / 26.2 / 36.9	31.7	H / 1.0 / 216.7	-22.3
1332.03	38.8 Av	2.6 / 26.2 / 36.9	30.7	H / 1.0 / 216.7	-23.3
1335.18	36.5 Av	2.6 / 26.2 / 36.9	28.4	V / 1.7 / 279.6	-25.6
1335.18	37.3 Pk	2.6 / 26.2 / 36.9	29.2	V / 1.7 / 279.6	-24.8
1483.52	41.0 Av	2.7 / 26.6 / 36.6	33.6	H / 1.0 / 194.9	-20.4
1483.52	44.6 Pk	2.7 / 26.6 / 36.6	37.3	H / 1.0 / 194.9	-16.7
1500.05	47.3 Av	2.7 / 26.7 / 36.6	40	V / 1.4 / 104.1	-14
1500.05	48.8 Pk	2.7 / 26.7 / 36.6	41.5	V / 1.4 / 104.1	-12.5
1500.05	42.7 Av	2.7 / 26.7 / 36.6	35.4	H / 2.2 / 143.8	-18.6
1500.05	43.2 Pk	2.7 / 26.7 / 36.6	36	H / 2.2 / 143.8	-18
1854.42	40.6 Av	3.1 / 28.2 / 37.0	34.9	H / 1.2 / 131.1	-19.1
1854.42	52.1 Pk	3.1 / 28.2 / 37.0	46.4	H / 1.2 / 131.1	-7.6
2664.07	49.6 Av	3.7 / 30.1 / 37.4	46	V / 1.6 / 334.4	-8
2664.07	50.6 Pk	3.7 / 30.1 / 37.4	47.1	V / 1.6 / 334.4	-6.9
2664.07	45.0 Av	3.7 / 30.1 / 37.4	41.5	H / 1.2 / 28.6	-12.5
2664.07	45.6 Pk	3.7 / 30.1 / 37.4	42	H / 1.2 / 28.6	-12
3000.1	37.9 Av	4.0 / 31.6 / 37.3	36.2	H / 1.1 / 212.8	-17.8
3000.1	42.4 Pk	4.0 / 31.6 / 37.3	40.7	H / 1.1 / 212.8	-13.3
4023.26	21.4 Av	4.7 / 33.9 / 38.3	21.7	V / 1.0 / 0.0	-32.3
4023.26	28.6 Pk	4.7 / 33.9 / 38.3	28.9	V / 1.0 / 0.0	-25.1
4023.26	31.5 Av	4.7 / 33.9 / 38.3	31.8	H / 1.0 / 0.0	-22.2
4023.26	31.1 Pk	4.7 / 33.9 / 38.3	31.4	H / 1.0 / 0.0	-22.6
4500.11	36.5 Av	5.0 / 34.3 / 39.8	36	V / 1.9 / 181.1	-18
4500.11	39.4 Pk	5.0 / 34.3 / 39.8	38.8	V / 1.9 / 181.1	-15.2
4500.12	35.4 Av	5.0 / 34.3 / 39.8	34.9	H / 1.8 / 122.9	-19.1
4500.12	38.2 Pk	5.0 / 34.3 / 39.8	37.7	H / 1.8 / 122.9	-16.3
5400	28.5 Av	5.5 / 36.1 / 38.5	31.7	V / 1.0 / 0.0	-22.3
5400	27.9 Pk	5.5 / 36.1 / 38.5	31	V / 1.0 / 0.0	-23
5400	28.2 Av	5.5 / 36.1 / 38.5	31.4	H / 1.0 / 0.0	-22.6
5400	27.0 Pk	5.5 / 36.1 / 38.5	30.2	H / 1.0 / 0.0	-23.8
6000.14	38.6 Av	5.8 / 36.7 / 39.1	41.9	V / 1.6 / 132.7	-12.1
6000.14	39.1 Pk	5.8 / 36.7 / 39.1	42.5	V / 1.6 / 132.7	-11.5
6000.16	38.0 Av	5.8 / 36.7 / 39.1	41.3	H / 1.8 / 22.7	-12.7
6000.16	39.6 Pk	5.8 / 36.7 / 39.1	43	H / 1.8 / 22.7	-11
7500	26.3 Pk	6.6 / 38.9 / 39.4	32.3	V / 1.0 / 0.0	-21.7
7500	29.2 Av	6.6 / 38.9 / 39.4	35.3	V / 1.0 / 0.0	-18.7
7500	27.9 Av	6.6 / 38.9 / 39.4	34	H / 1.0 / 0.0	-20
7500	28.2 Pk	6.6 / 38.9 / 39.4	34.3	H / 1.0 / 0.0	-19.7
9000	30.2 Av	7.3 / 40.6 / 47.9	30.3	V / 1.0 / 0.0	-23.7
9000	30.2 Pk	7.3 / 40.6 / 47.9	30.3	V / 1.0 / 0.0	-23.7
9000	30.9 Av	7.3 / 40.6 / 47.9	31	H / 1.0 / 0.0	-23
9000	30.1 Pk	7.3 / 40.6 / 47.9	30.1	H / 1.0 / 0.0	-23.9
12000	23.2 Av	8.7 / 40.7 / 45.6	26.9	V / 1.0 / 0.0	-27.1

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
12000	24.2 Pk	8.7 / 40.7 / 45.6	27.9	V / 1.0 / 0.0	-26.1
12000	23.2 Av	8.7 / 40.7 / 45.6	27	H / 1.0 / 0.0	-27
12000	26.0 Pk	8.7 / 40.7 / 45.6	29.8	H / 1.0 / 0.0	-24.2
14500	27.4 Av	9.4 / 42.8 / 48.0	31.8	V / 1.0 / 0.0	-22.2
14500	28.2 Pk	9.4 / 42.8 / 48.0	32.5	V / 1.0 / 0.0	-21.5
14500	27.4 Av	9.4 / 42.8 / 48.0	31.8	H / 1.0 / 0.0	-22.2
14500	28.6 Pk	9.4 / 42.8 / 48.0	32.9	H / 1.0 / 0.0	-21.1
18000	28.2 Av	10.9 / 46.9 / 45.1	40.9	V / 1.0 / 0.0	-13.1
18000	28.2 Pk	10.9 / 46.9 / 45.1	41	V / 1.0 / 0.0	-13
18000	28.2 Av	10.9 / 46.9 / 45.1	40.9	H / 1.0 / 0.0	-13.1
18000	29.8 Pk	10.9 / 46.9 / 45.1	42.5	H / 1.0 / 0.0	-11.5

********** Measurement Summary **********					
FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz
104.71	57.0 Qp	0.8 / 11.7 / 27.9	41.6	V / 1.0 / 42.0	-1.9
50.44	57.2 Qp	0.8 / 7.9 / 28.2	37.8	V / 1.0 / 118.0	-2.2
51.05	57.1 Qp	0.8 / 7.8 / 28.2	37.5	V / 1.0 / 188.0	-2.5
68.99	55.5 Qp	0.8 / 8.0 / 28.1	36.1	V / 1.0 / 316.0	-3.9
750.04	46.8 Qp	1.9 / 20.6 / 28.1	41.2	V / 1.3 / 42.0	-4.8
625.06	48.2 Qp	1.7 / 19.1 / 28.3	40.7	H / 1.2 / 308.2	-5.3
370.92	51.5 Qp	1.3 / 15.1 / 27.6	40.3	H / 1.0 / 307.8	-5.7
162.01	51.9 Qp	0.9 / 12.6 / 27.7	37.6	H / 2.2 / 242.0	-5.9
155.61	50.9 Qp	0.8 / 12.6 / 27.7	36.6	V / 1.1 / 242.0	-6.9
2664.07	50.6 Pk	3.7 / 30.1 / 37.4	47.1	V / 1.6 / 334.4	-6.9
500.04	47.4 Qp	1.5 / 17.8 / 28.3	38.4	V / 1.3 / 184.0	-7.6
1854.42	52.1 Pk	3.1 / 28.2 / 37.0	46.4	H / 1.2 / 131.1	-7.6
216.02	53.7 Qp	1.0 / 10.5 / 27.4	37.8	H / 1.4 / 237.7	-8.2
250.01	51.8 Qp	1.1 / 11.7 / 27.2	37.3	H / 1.6 / 193.4	-8.7
875.02	41.1 Qp	2.1 / 21.8 / 27.7	37.2	V / 1.8 / 18.0	-8.8
6000.16	39.6 Pk	5.8 / 36.7 / 39.1	43	H / 1.8 / 22.7	-11
18000	29.8 Pk	10.9 / 46.9 / 45.1	42.5	H / 1.0 / 0.0	-11.5
108.14	46.5 Qp	0.8 / 12.4 / 27.9	31.8	V / 1.0 / 105.9	-11.7
137.76	45.9 Qp	0.8 / 12.7 / 27.8	31.5	V / 1.0 / 124.3	-12
445.06	43.2 Qp	1.4 / 17.0 / 28.1	33.6	H / 1.0 / 333.2	-12.4
1125.04	50.8 Pk	2.4 / 25.6 / 37.2	41.6	V / 1.2 / 0.0	-12.4
1500.05	48.8 Pk	2.7 / 26.7 / 36.6	41.5	V / 1.4 / 104.1	-12.5
3000.1	42.4 Pk	4.0 / 31.6 / 37.3	40.7	H / 1.1 / 212.8	-13.3
1280.05	48.5 Pk	2.5 / 26.1 / 37.0	40.1	V / 1.0 / 317.5	-13.9
4500.11	39.4 Pk	5.0 / 34.3 / 39.8	38.8	V / 1.9 / 181.1	-15.2
1483.52	44.6 Pk	2.7 / 26.6 / 36.6	37.3	H / 1.0 / 194.9	-16.7
108.8	41.2 Qp	0.8 / 12.6 / 27.9	26.7	H / 1.6 / 111.1	-16.8
7500	29.2 Av	6.6 / 38.9 / 39.4	35.3	V / 1.0 / 0.0	-18.7
999.99	35.8 Qp	2.2 / 22.8 / 27.3	33.5	V / 1.0 / 0.0	-20.5

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209
14500	28.6 Pk	9.4 / 42.8 / 48.0	32.9	H / 1.0 / 0.0	-21.1
4023.26	31.5 Av	4.7 / 33.9 / 38.3	31.8	H / 1.0 / 0.0	-22.2
1332.03	39.8 Pk	2.6 / 26.2 / 36.9	31.7	H / 1.0 / 216.7	-22.3
5400	28.5 Av	5.5 / 36.1 / 38.5	31.7	V / 1.0 / 0.0	-22.3
9000	30.9 Av	7.3 / 40.6 / 47.9	31	H / 1.0 / 0.0	-23
12000	26.0 Pk	8.7 / 40.7 / 45.6	29.8	H / 1.0 / 0.0	-24.2
1335.18	37.3 Pk	2.6 / 26.2 / 36.9	29.2	V / 1.7 / 279.6	-24.8
22.22	12.9 Pk	0.3 / 10.0 / 0.0	23.2	V / 1.0 / 0.0	-46.3
30	-18.0 Pk	0.4 / 8.1 / 0.0	-9.5	V / 1.0 / 0.0	-49.5
0.5	9.2 Pk	0.1 / 10.3 / 0.0	19.6	V / 1.0 / 0.0	-54
2.18	-5.9 Pk	0.1 / 10.5 / 0.0	4.7	V / 1.0 / 0.0	-64.8
0.124	29.8 Pk	0.0 / 10.5 / 0.0	40.3	V / 1.0 / 0.0	-65.4
0.0607	29.5 Pk	0.0 / 10.8 / 0.0	40.3	V / 1.0 / 0.0	-71.6
5.35	-13.0 Pk	0.2 / 10.6 / 0.0	-2.2	V / 1.0 / 0.0	-71.7
8.12	-15.0 Pk	0.2 / 10.7 / 0.0	-4.1	V / 1.0 / 0.0	-73.6
0.0632	26.8 Pk	0.0 / 10.8 / 0.0	37.6	V / 1.0 / 0.0	-74
11.66	-16.0 Pk	0.3 / 10.7 / 0.0	-5	V / 1.0 / 0.0	-74.5
0.0503	28.0 Pk	0.0 / 10.8 / 0.0	38.8	V / 1.0 / 0.0	-74.8
13.37	-17.0 Pk	0.3 / 10.7 / 0.0	-6	V / 1.0 / 0.0	-75.5
16.17	-18.0 Pk	0.3 / 10.6 / 0.0	-7.1	V / 1.0 / 0.0	-76.6
18.31	-18.0 Pk	0.3 / 10.5 / 0.0	-7.2	V / 1.0 / 0.0	-76.7
26.61	-17.0 Pk	0.4 / 9.1 / 0.0	-7.5	V / 1.0 / 0.0	-77
22.46	-18.0 Pk	0.3 / 10.0 / 0.0	-7.7	V / 1.0 / 0.0	-77.2
25.57	-18.0 Pk	0.4 / 9.4 / 0.0	-8.2	V / 1.0 / 0.0	-77.7
17.82	-20.0 Pk	0.3 / 10.5 / 0.0	-9.2	V / 1.0 / 0.0	-78.7
25.6	-20.0 Pk	0.4 / 9.4 / 0.0	-10.2	V / 1.0 / 0.0	-79.7

Example Unintentional Radiated Emissions Calculation:

Measured Level	+	**Transducer, Cable Loss & Amplifier corrections**	=	**Corrected Reading**	**Specification Limit**	-	**Corrected Reading**	=	**Delta Specification**
(dBµV)		(dB)		(dBµV/m)	(dBµV/m)		(dBµV/m)		
14.0		**14.9**		**28.9**	**40.0**		**28.9**		**-11.1**

Notes:

(1) All measurements taken a 3-meter test distance.

(2) Measurements 30MHz to 1000MHz are quasi-peak detector

(3) Measurements above 1GHz are average detector

Deviations, Additions, or Exclusions: None

9 6dB Bandwidth

9.1 Method

The test methods used comply with ANSI C63.0. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

9.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18913	Spectrum Analyzer with Pre-Amp	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	12/09/2010	12/09/2011

9.3 Results:

The sample tested was found to comply with the requirements of:

- FCC 15.247 (a)(2)
- IC RSS-210 A8.2(a)

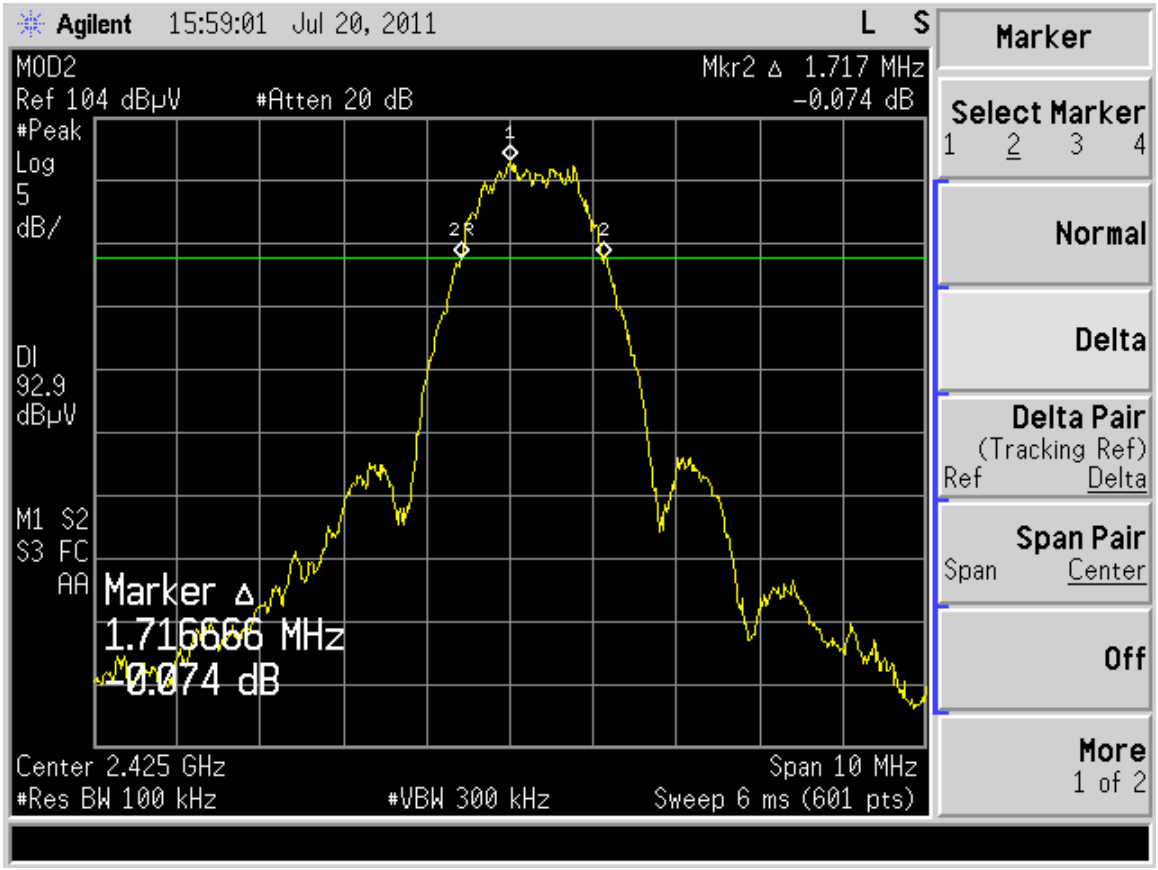
9.4 Test Data:

9.4.1 RF4CE Transmitter

6 dB Bandwidth – DE50 Product – RF4CE Radio

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Channel 1 – 2.425 GHz

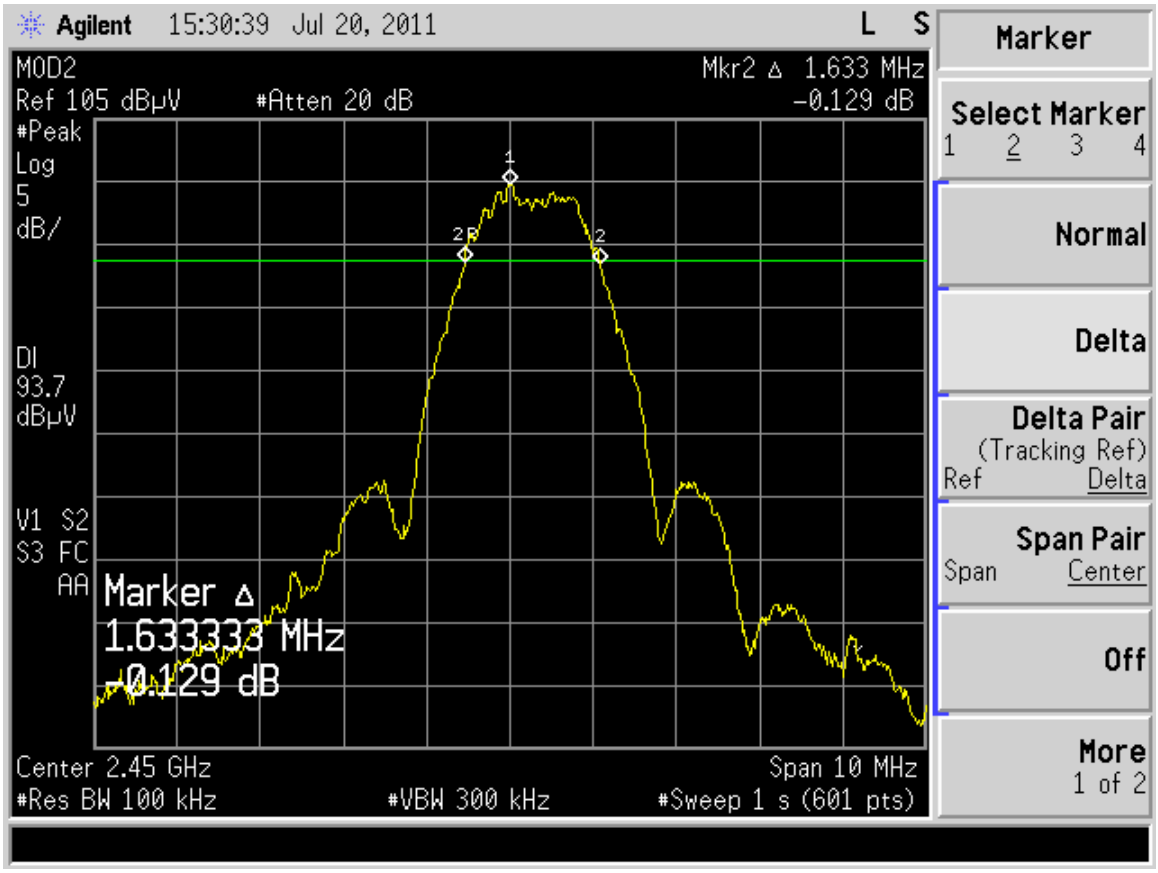


Specification: 6dB Bandwidth > 500 kHz

6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Channel 2 – 2.450 GHz

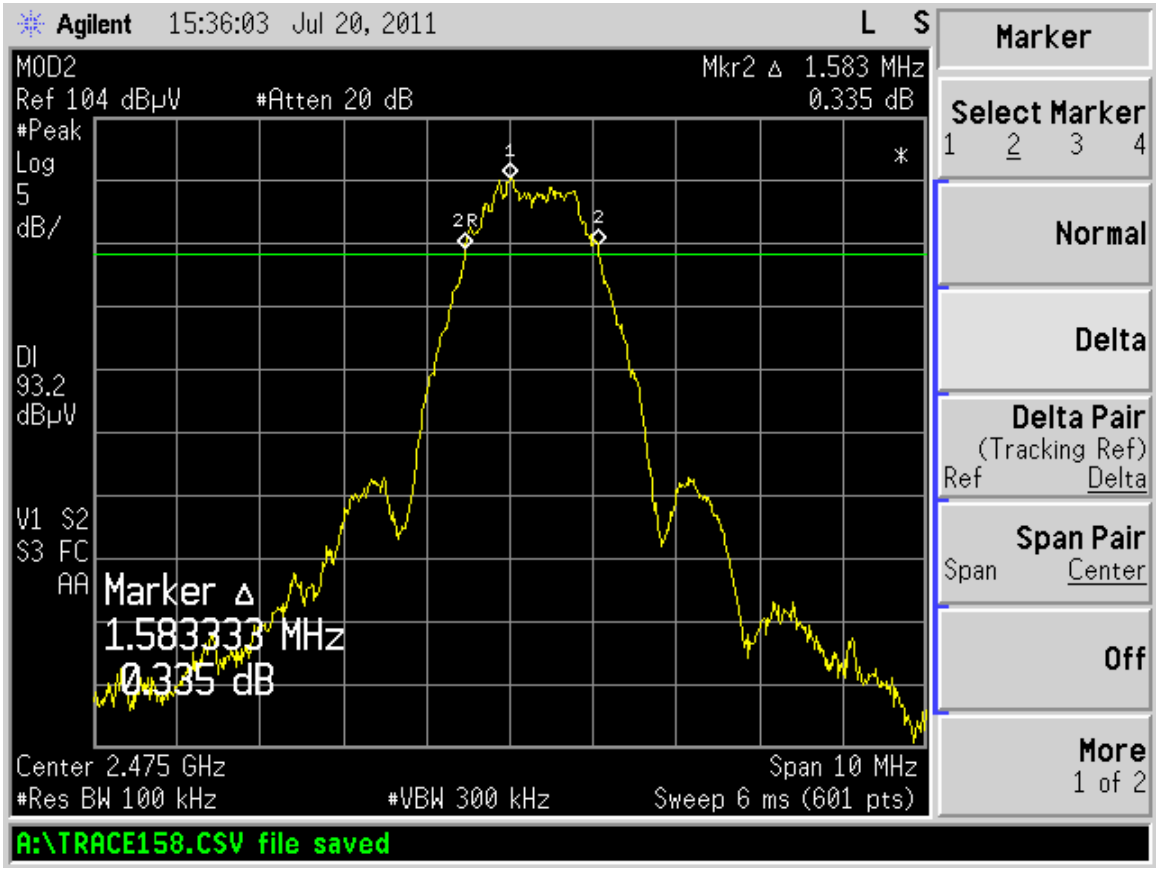


Specification: 6dB Bandwidth > 500 kHz

6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Channel 3 – 2.475 GHz



Specification: 6dB Bandwidth > 500 kHz

Notes:

(1) All measurements are RF Conducted Port.

(2) Worst-case Channel 3 – (6dB Bandwidth 1.58 MHz)

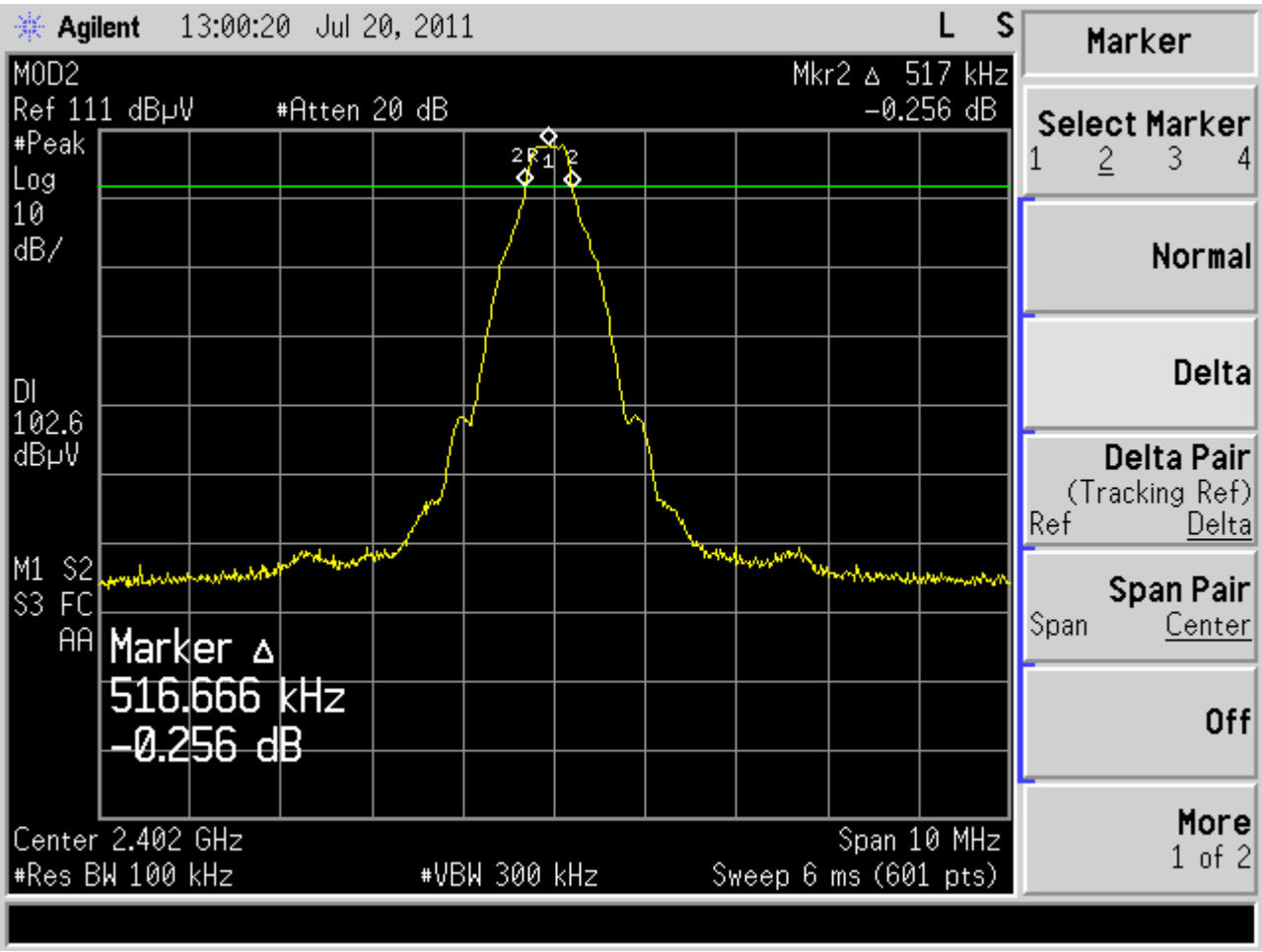
Deviations, Additions, or Exclusions: None

9.4.2 Bluetooth Transmitter

6 dB Bandwidth – DE50 Product – Bluetooth Radio

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Channel 1 – 2.425 GHz

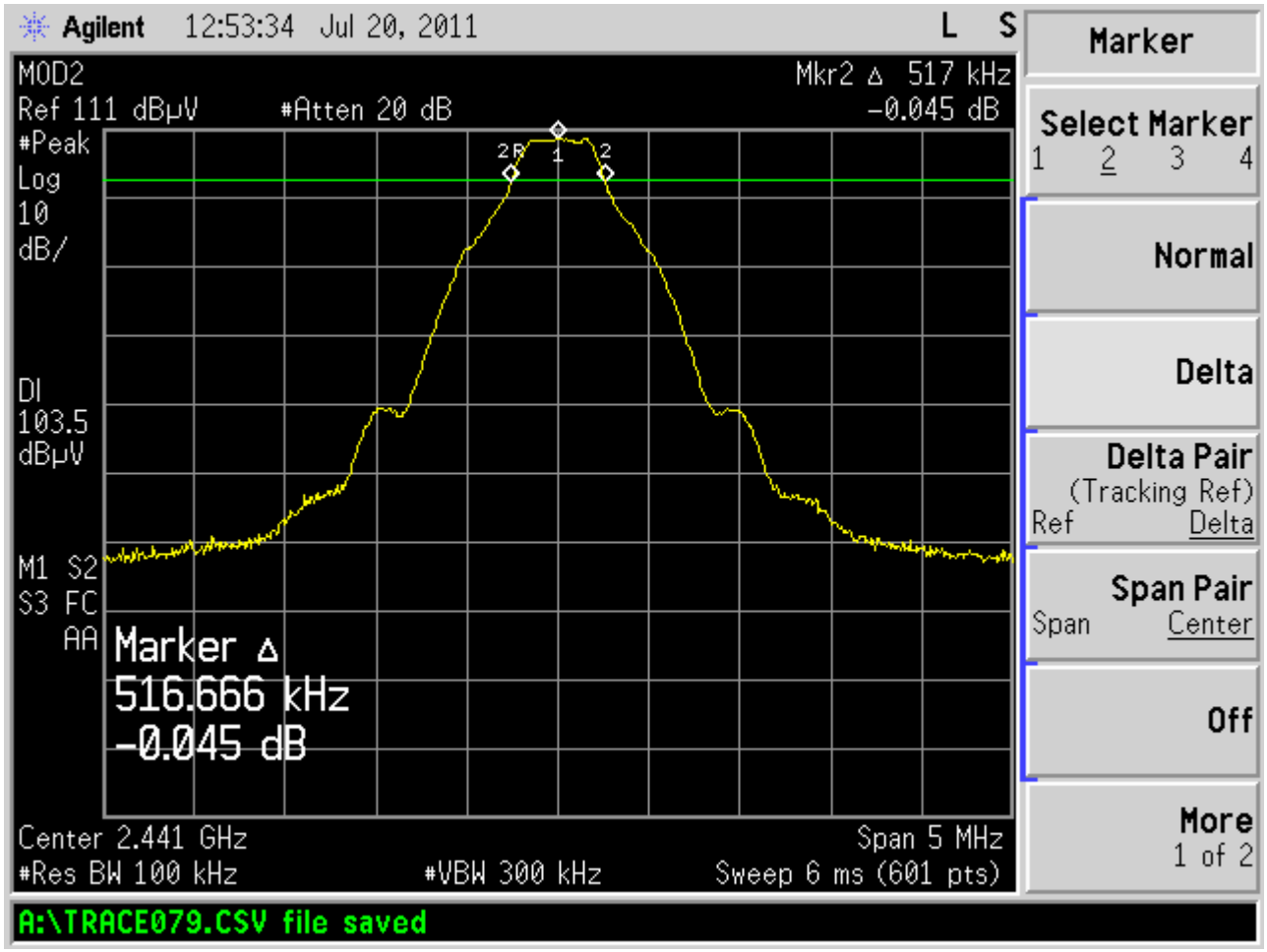


Specification: 6dB Bandwidth > 500 kHz

6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Channel 2 – 2.450 GHz

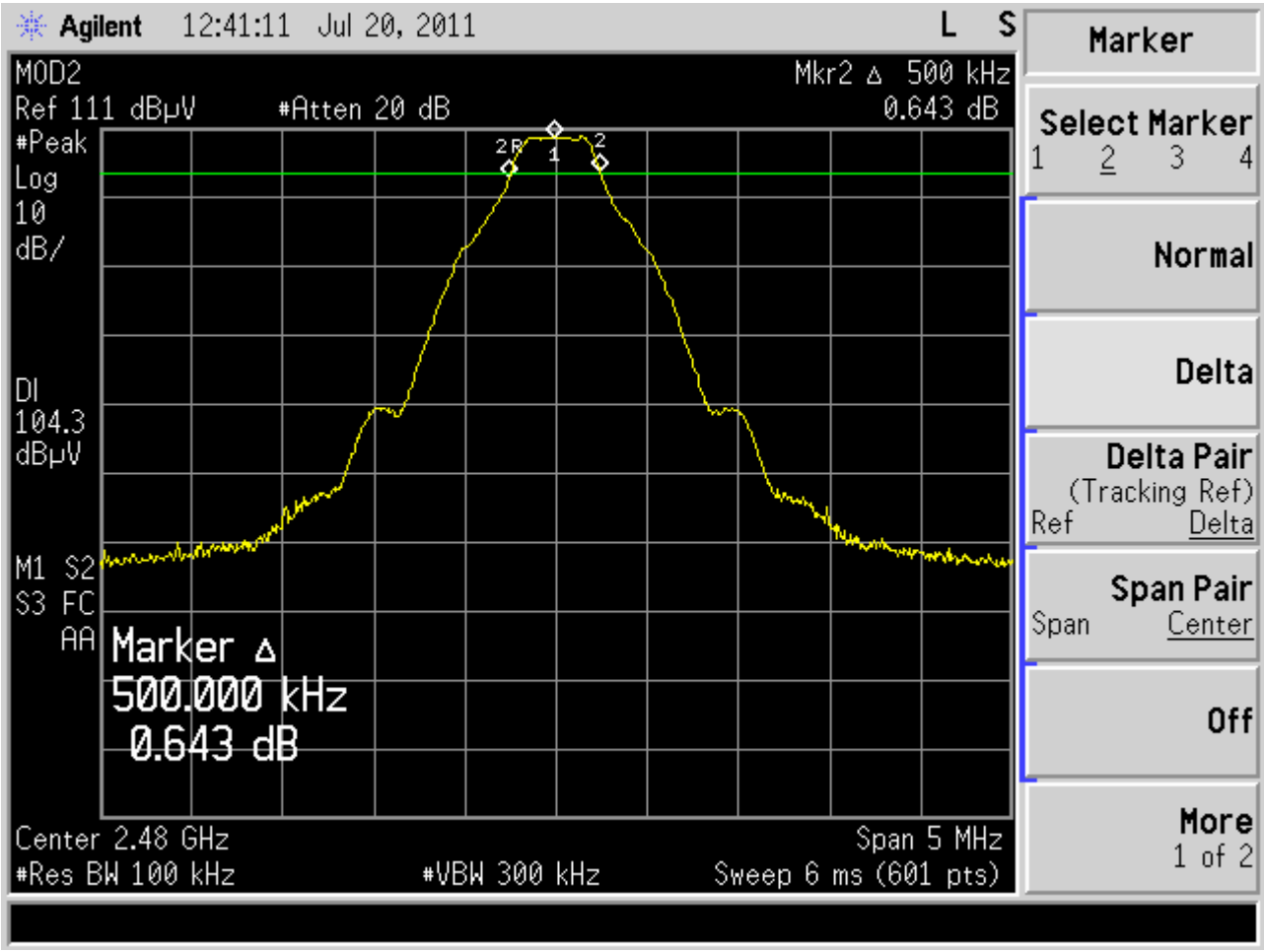


Specification: 6dB Bandwidth > 500 kHz

6 dB Bandwidth

FCC 15.247(a)(2) / RSS-210 A8.2(a)

Channel 3 – 2.475 GHz



Specification: 6dB Bandwidth > 500 kHz

Notes:

(1) All measurements are RF Conducted Port.

(2) Worst-case Channel 3 – (6dB Bandwidth 508.3kHz – when evaluating at the actual data)

Deviations, Additions, or Exclusions: None

10 Power Spectral Density (PSD)

10.1 Method

The test methods used comply with ANSI C63.10. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

10.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18913	Spectrum Analyzer with Pre-Amp	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	12/09/2010	12/09/2011

10.3 Results:

The sample tested was found to comply with the requirements of:

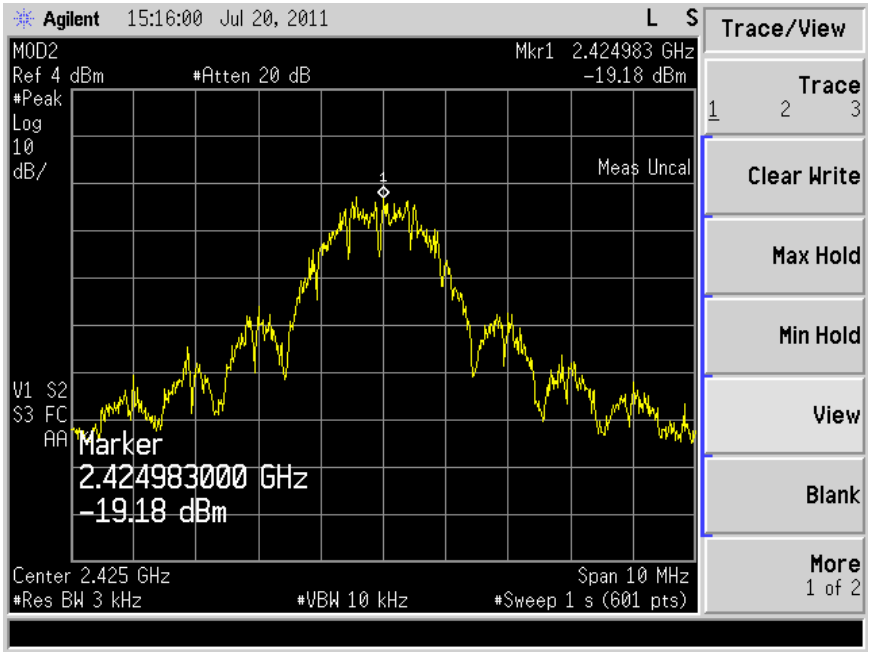
- FCC 15.247(e)
- IC RSS-210 A8.2(b)

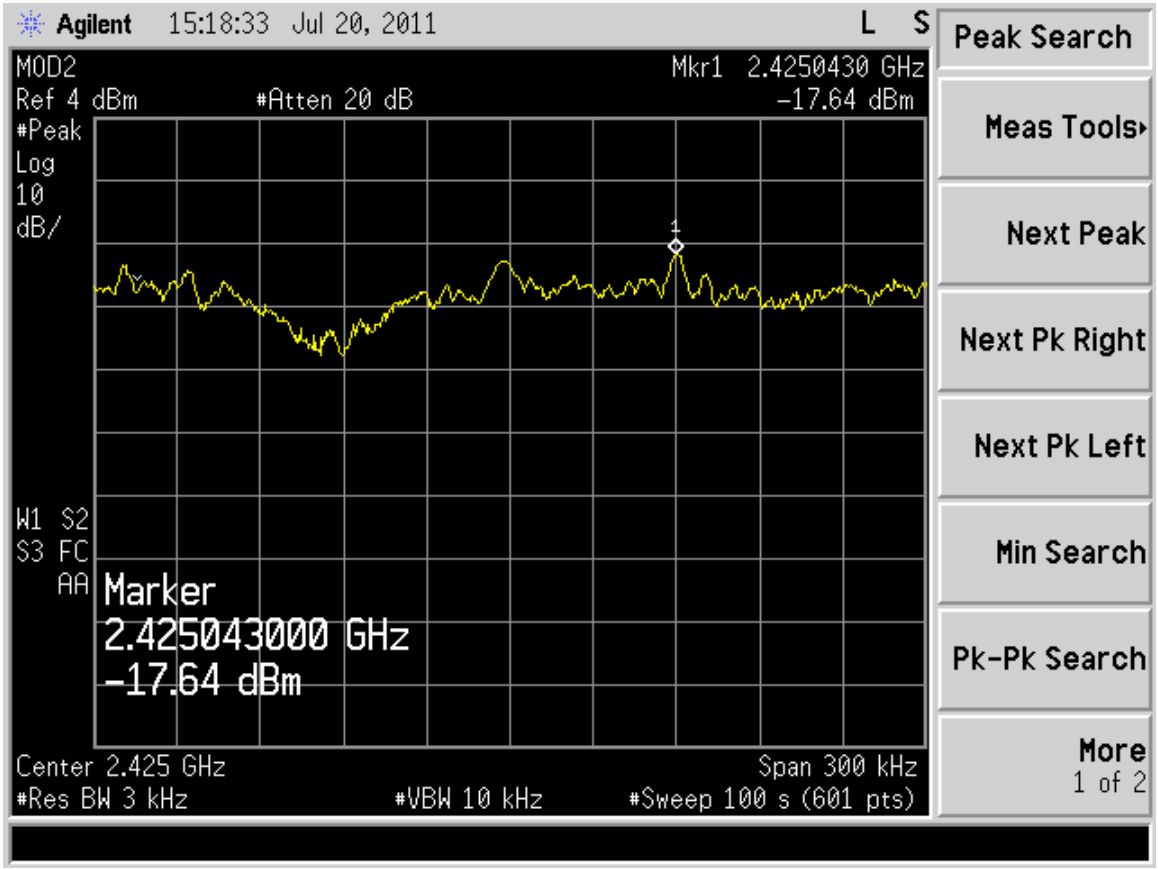
10.4 Test Data:

10.4.1 PDS – RF4CE Transmitter

Power Spectral Density (PSD) – DE50 Product – RF4CE Radio
FCC 15.247(e) / RSS-210 A8.2(b)

Channel 1 – 2.425 GHz

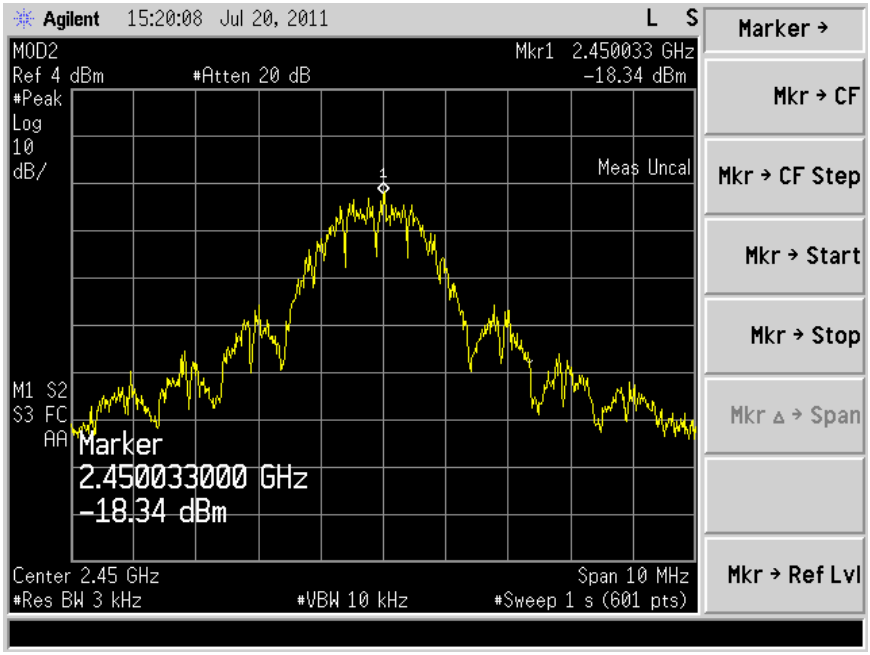


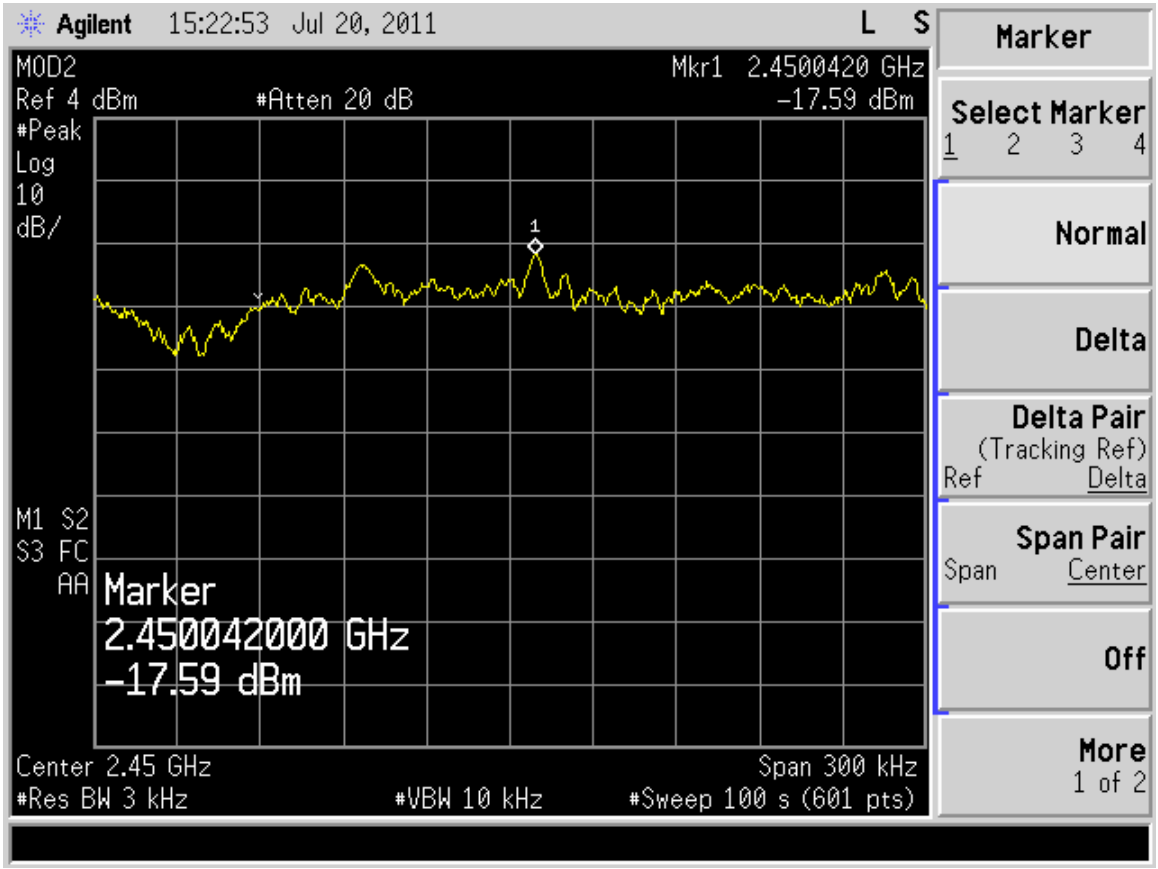


Specification: PSD < +8 dBm

Power Spectral Density (PSD)
FCC 15.247(e) / RSS-210 A8.2(b)

Channel 2 – 2.450 GHz



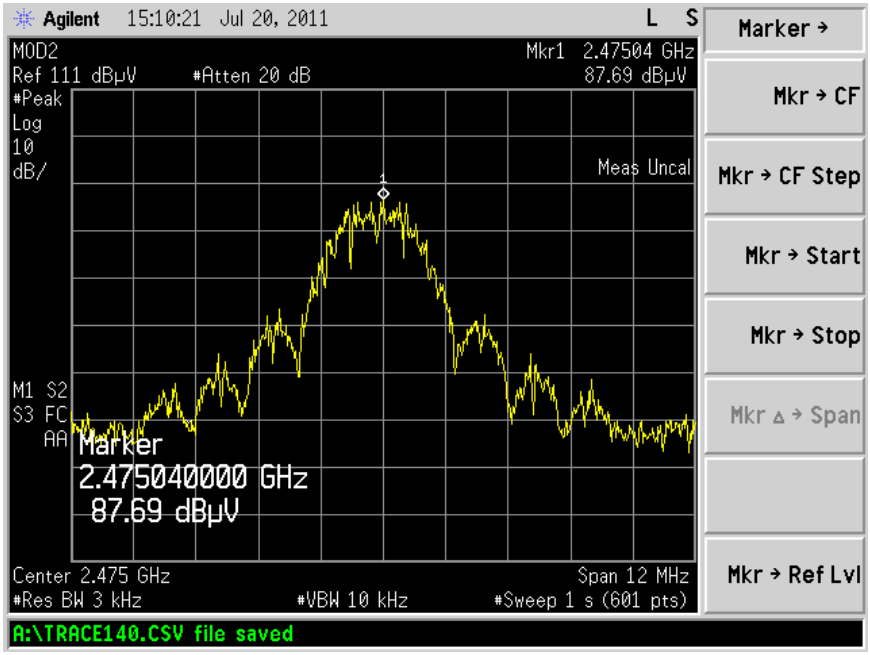


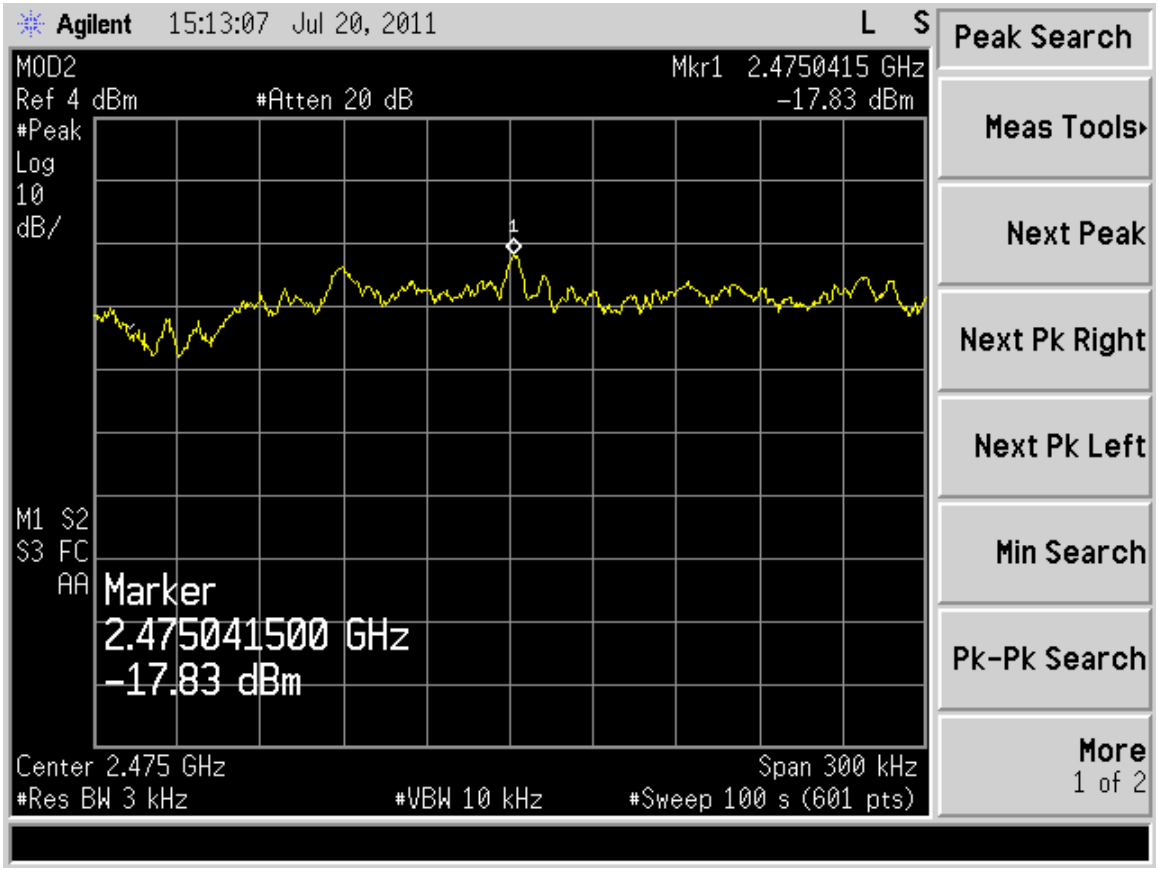
Specification: PSD < +8 dBm

Power Spectral Density (PSD)

FCC 15.247(e / RSS-210 A8.2(b)

Channel 3 – 2.475 GHz



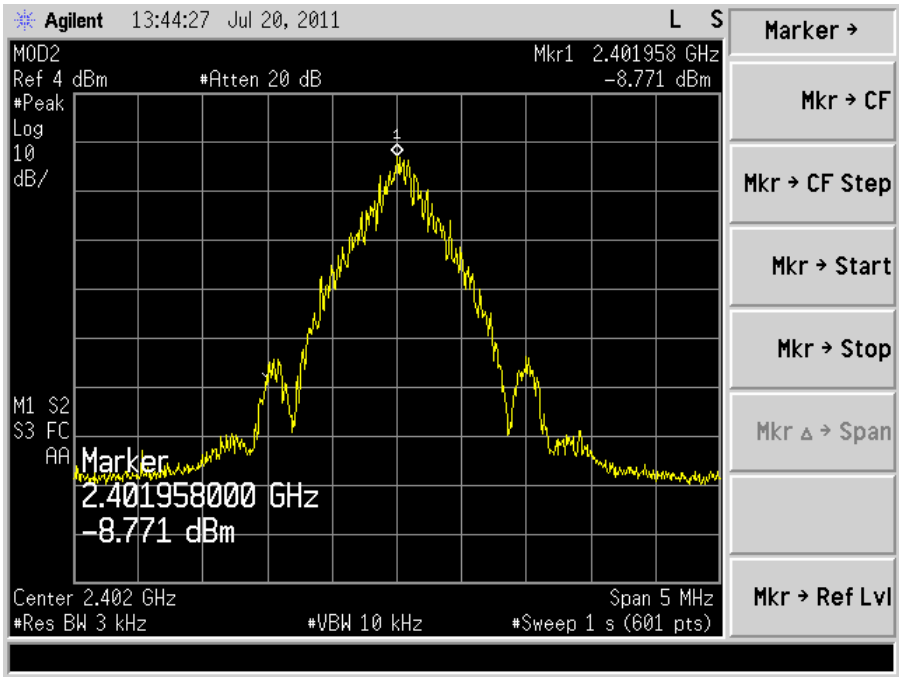


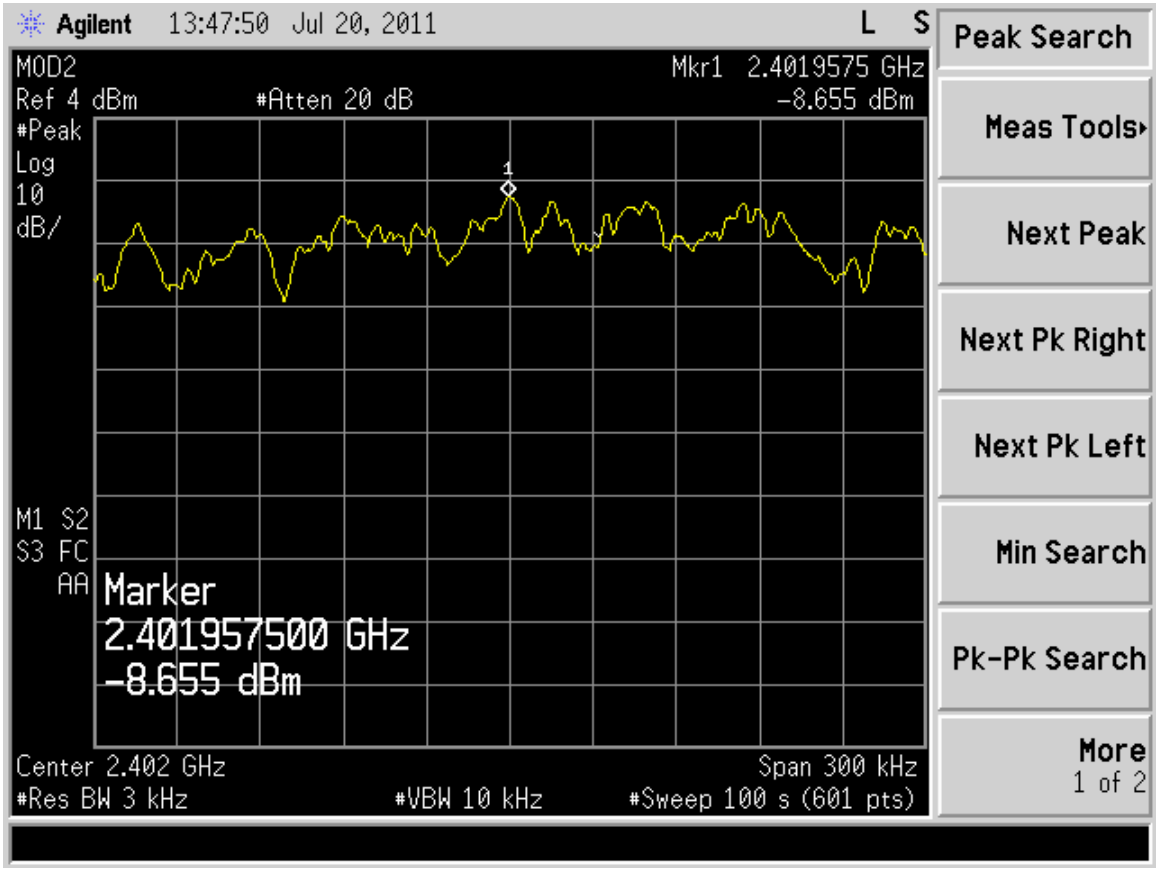
Specification: PSD < +8 dBm

10.4.2 PSD – Bluetooth Transmitter

Power Spectral Density (PSD) – DE50 Product – Bluetooth Radio
FCC 15.247(e) / RSS-210 A8.2(b)

Channel 1 – 2.402 GHz

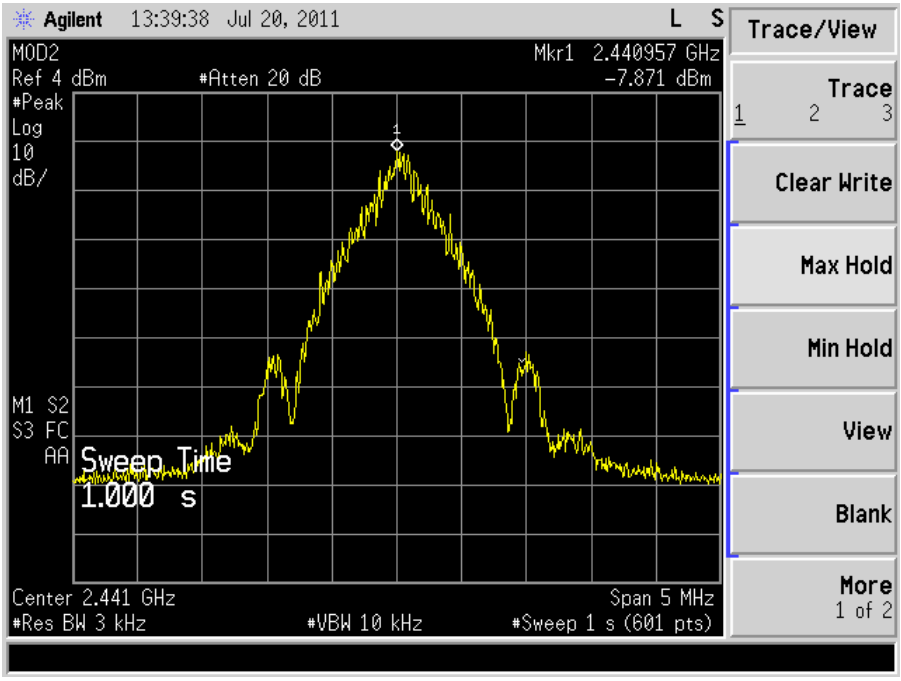


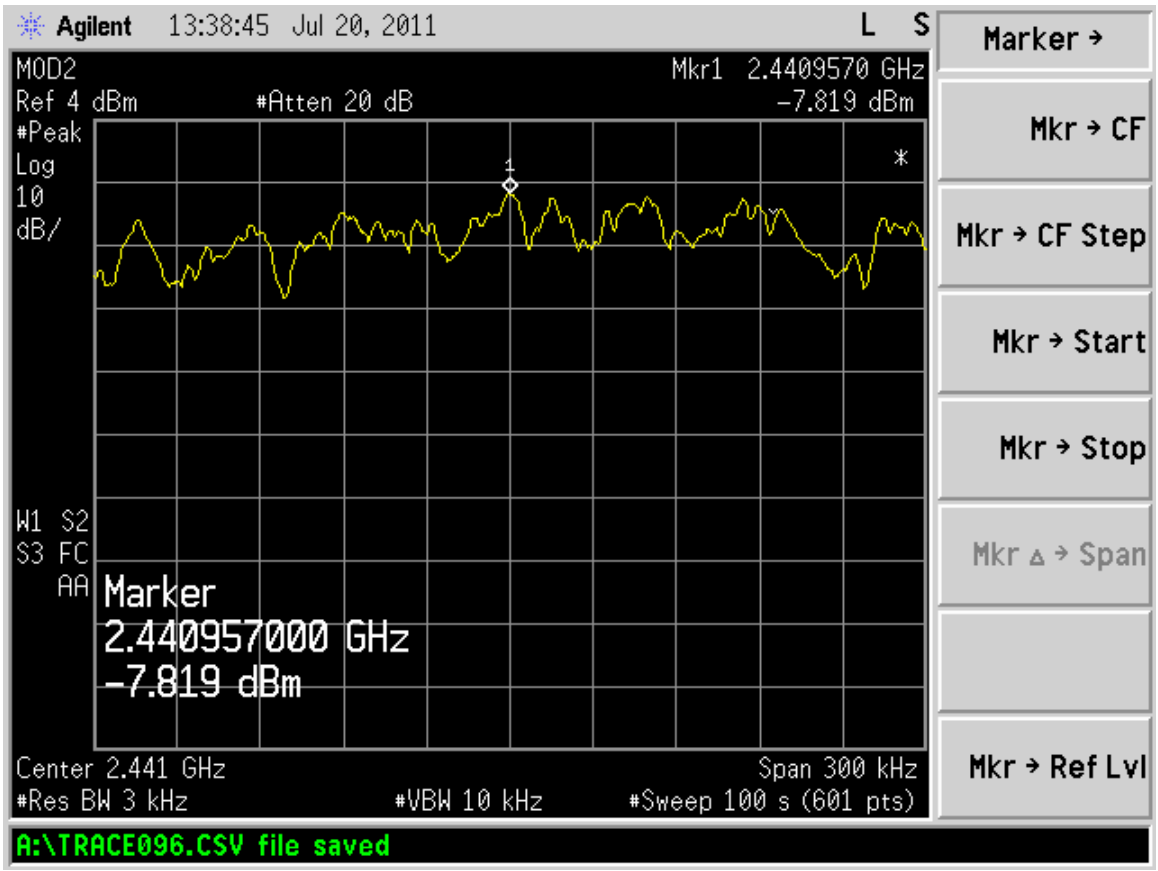


Specification: PSD < +8 dBm

Power Spectral Density (PSD)
FCC 15.247(e) / RSS-210 A8.2(b)

Channel 2 – 2.441 GHz

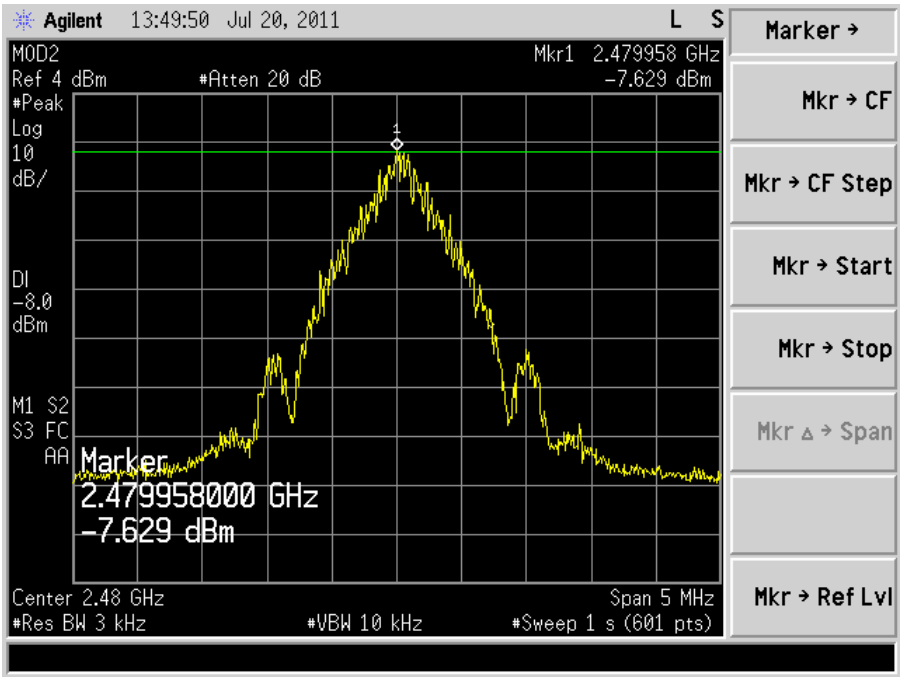


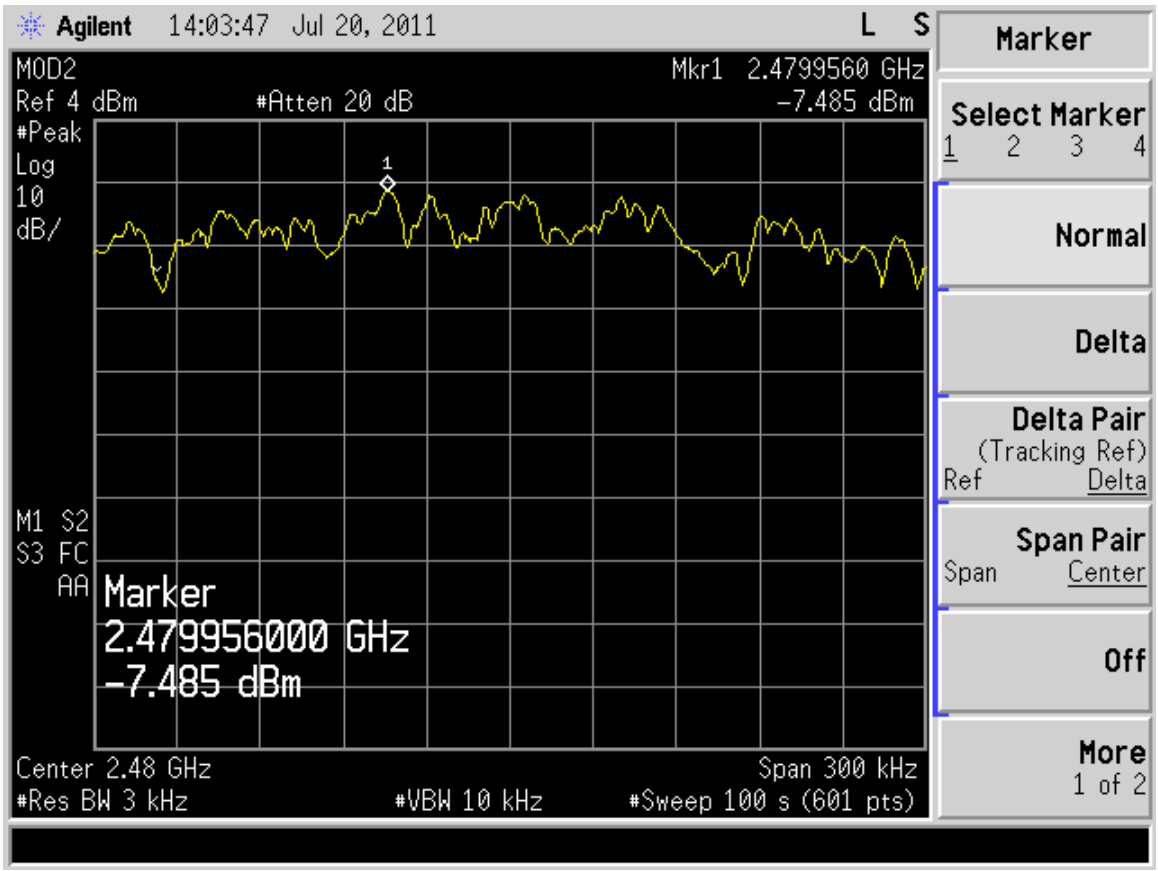


Specification: PSD < +8 dBm

Power Spectral Density (PSD)
FCC 15.247(e / RSS-210 A8.2(b)

Channel 3 – 2.480 GHz





Specification: PSD < +8 dBm

PSD Notes:

(1) All measurements are RF Conducted Port.

(2) **Worst-case High Channel PSD: -7.49 dBm**

Deviations, Additions, or Exclusions: None

11 Occupied Bandwidth (OBW)

11.1 Method

The test methods used comply with ANSI C63.10. Unless otherwise stated no deviations were made from **IC RSS-GEN.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.
.

11.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18913	Spectrum Analyzer with Pre-Amp	Hewlett-Packard	E7405A	My44211889	06/28/2011	06/28/2012
18887	Horn Antenna 1-18GHz	EMCO	3115	9205-3886	12/09/2010	12/09/2011

11.3 Results:

The sample tested was found to comply with the requirements of:

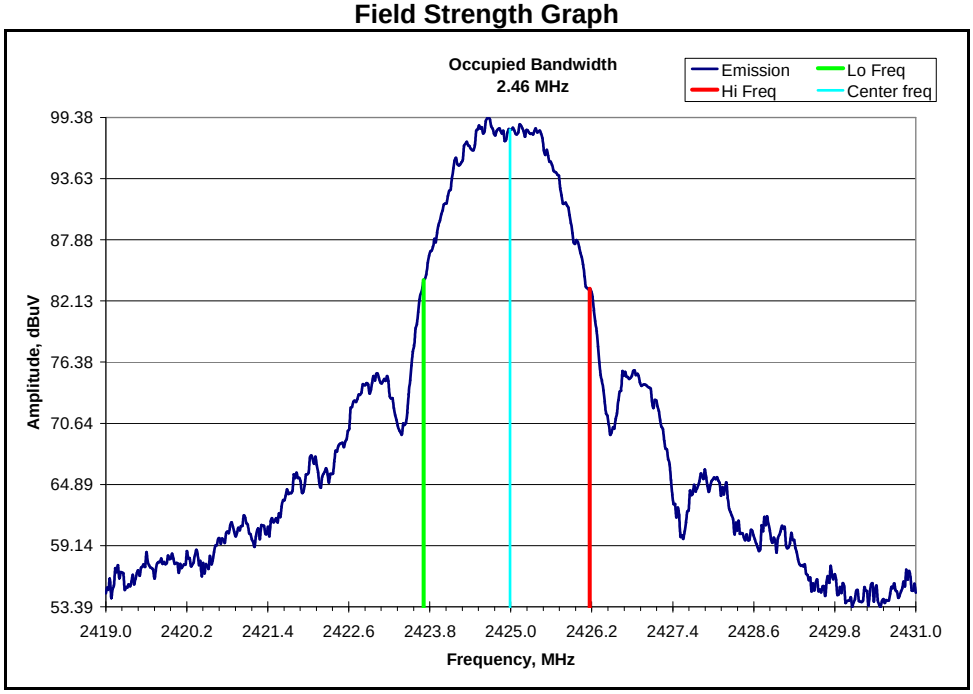
- RSS-GEN, Section 4.6.1

11.4 Test Data:

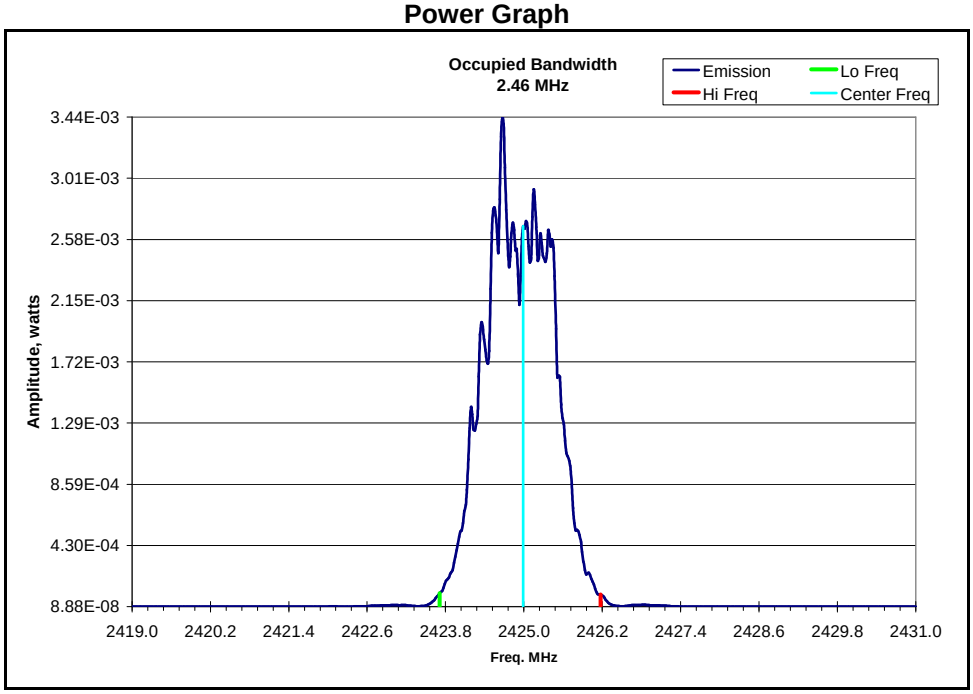
11.4.1 OBW – RF4CE Transmitter

Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Low Channel – 2.425 GHz
Field Strength Graph



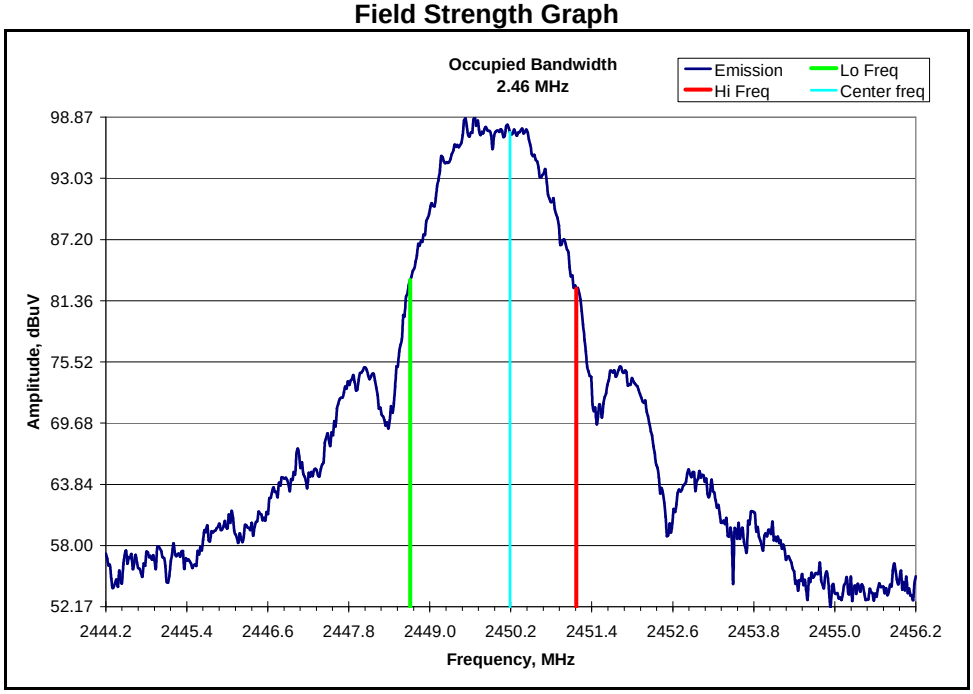
Power Graph



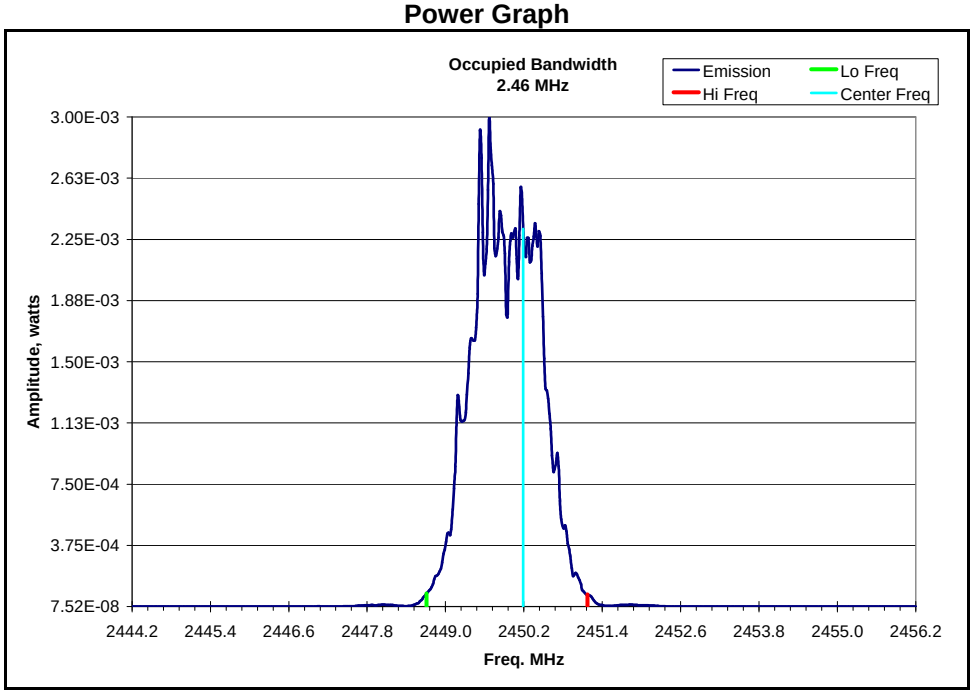
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Mid Channel – 2.450 GHz

Field Strength Graph



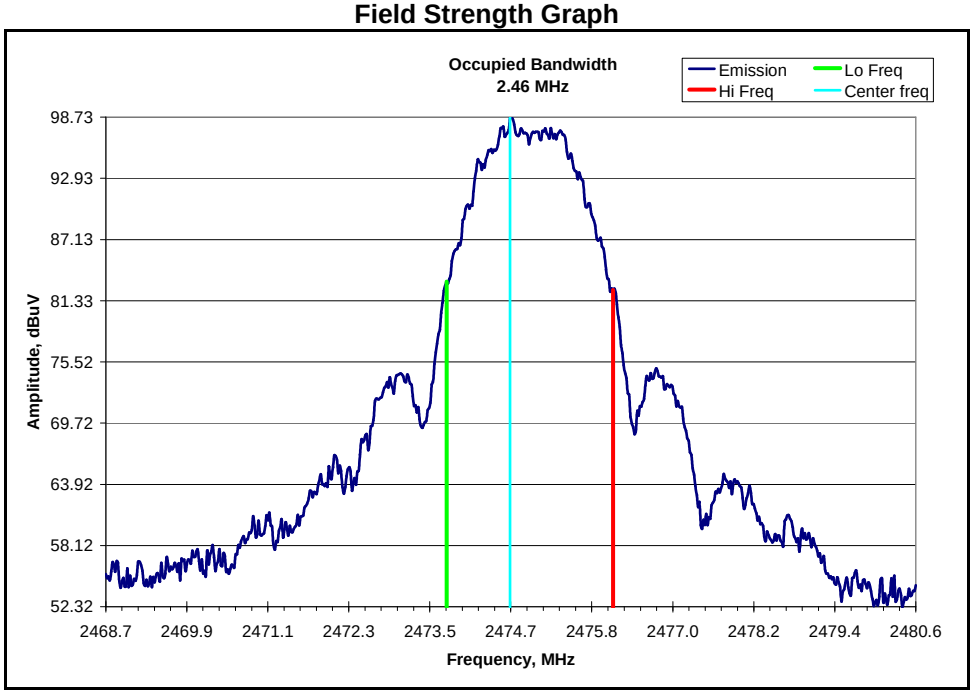
Power Graph



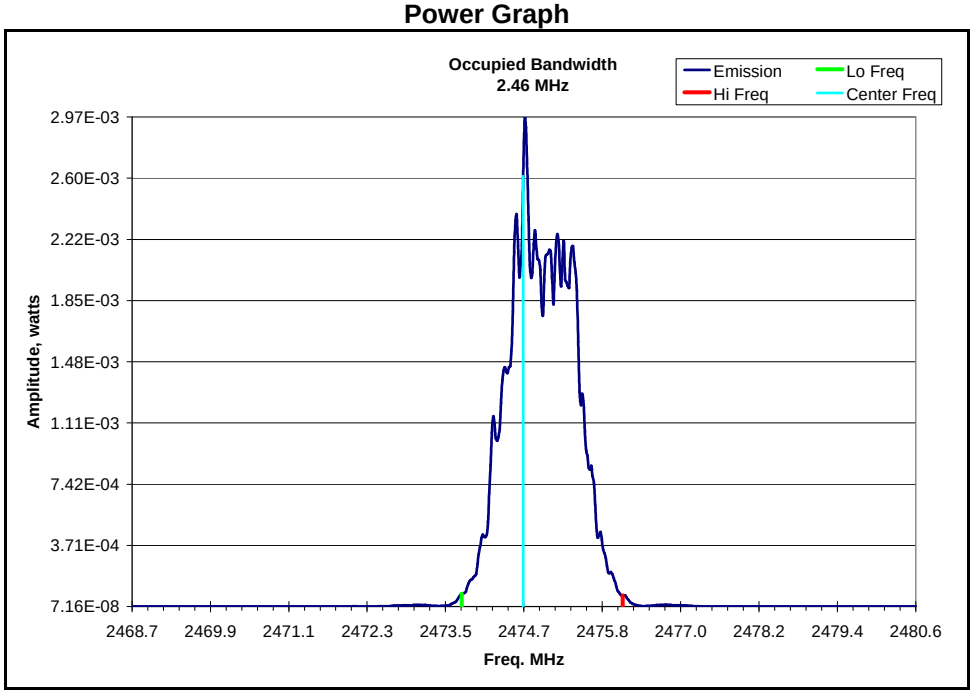
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

High Channel – 2.475 GHz

Field Strength Graph



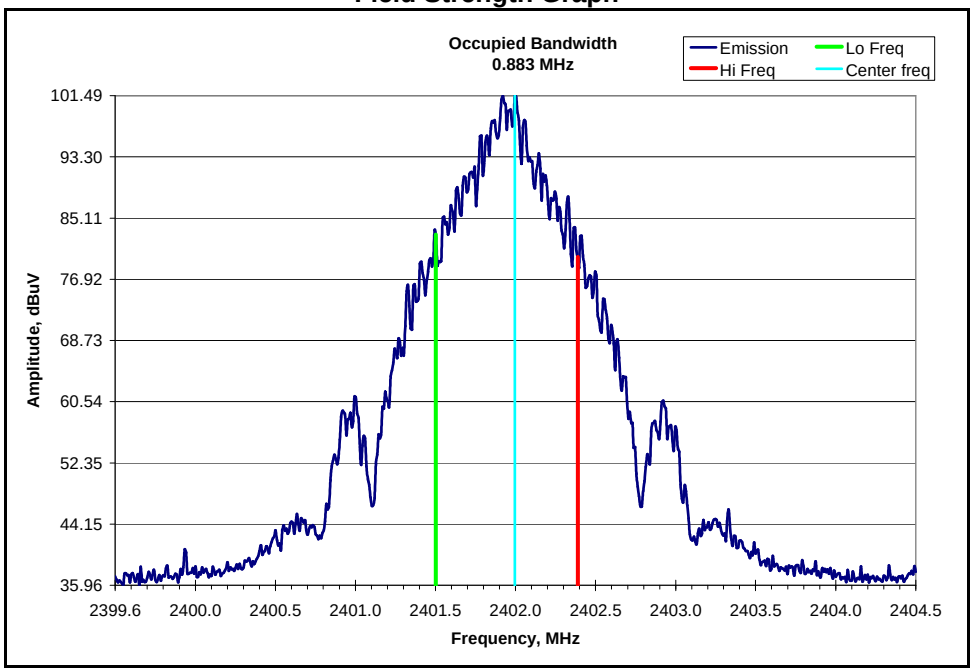
Power Graph



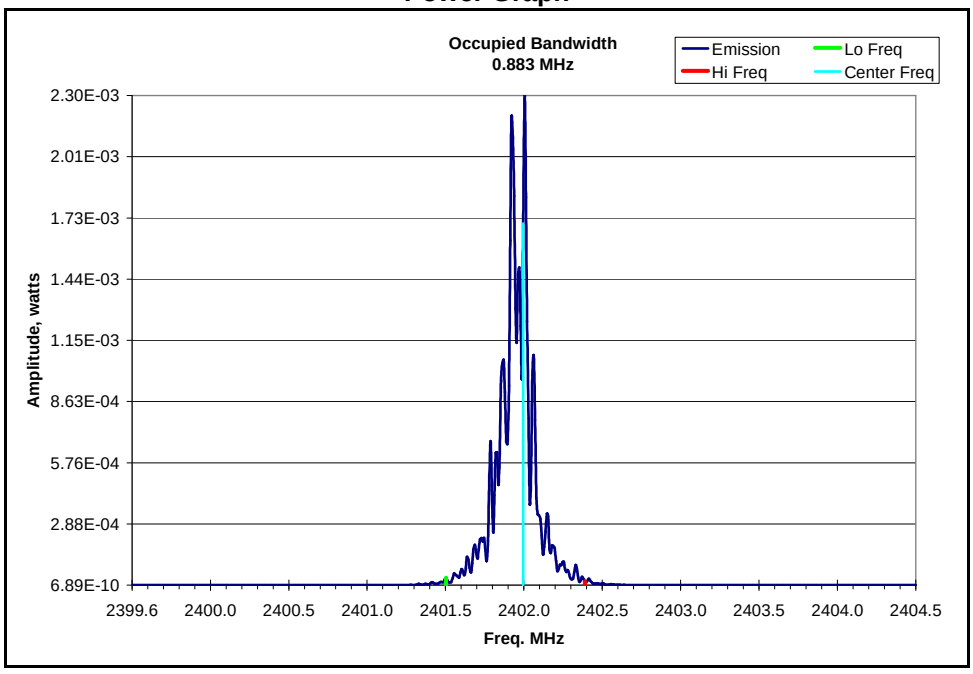
11.4.2 OBW – Bluetooth Transmitter

Occupied Bandwidth - (RSS-GEN, Section 4.6.1)
Low Channel – 2.425 GHz

Field Strength Graph



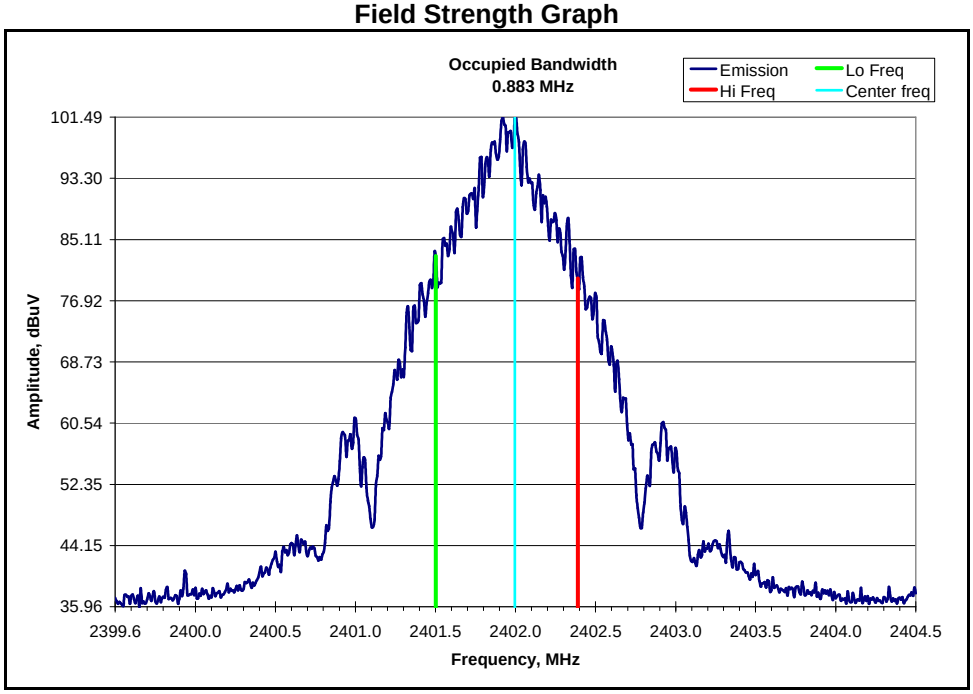
Power Graph



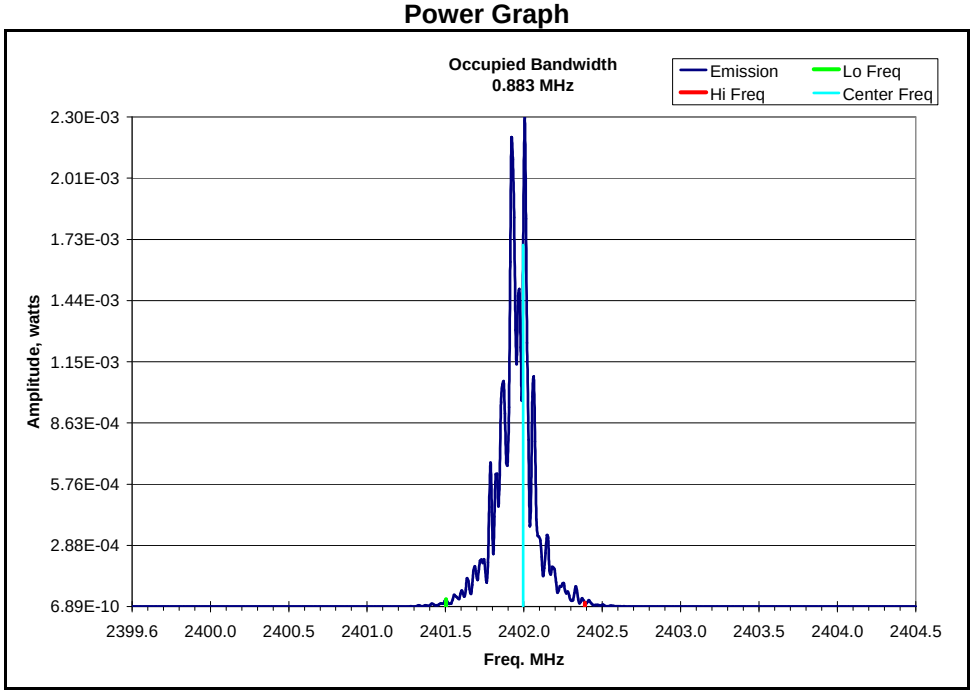
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Mid Channel – 2.450 GHz

Field Strength Graph



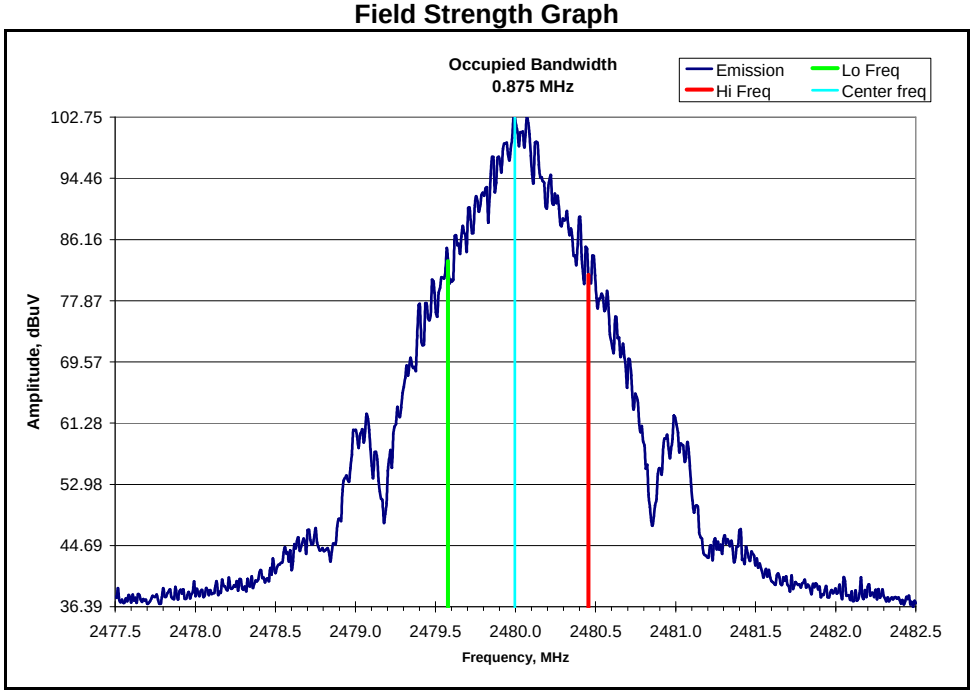
Power Graph



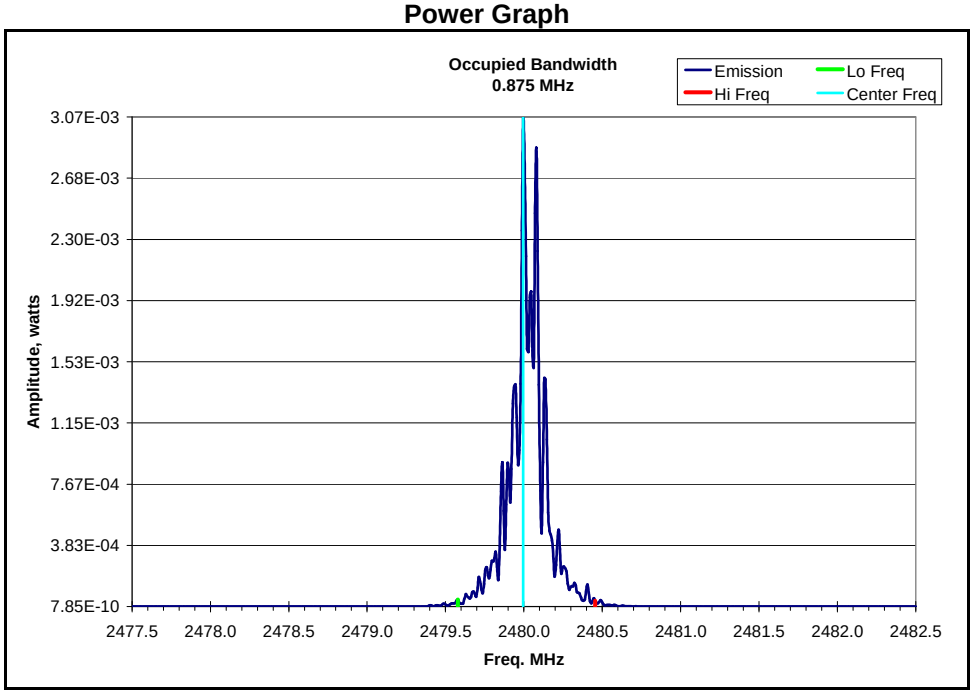
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

High Channel – 2.475 GHz

Field Strength Graph



Power Graph



Notes:

(1) Worst-case Occupied Bandwidth (OBW): High Channel – 2.5125 MHz

Deviations, Additions, or Exclusions: None

12 AC Mains Conducted Emissions

12.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.207/RSS-GEN.**

This testing was performed at Intertek Denver, located at 1795 Dogwood St. Suite 200, Louisville, CO 80027.

12.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18909	EMI Test Receiver	RHODE & SCHWARZ	ESHS 30	842806/001	06/29/2011	06/29/2012
18765	LISN	EMCO	3825/2	9202-1945	01/31/2011	01/31/2012
18885	Transient Limiter	Hewlett-Packard	11947A	3107A00700	04/28/2011	04/28/2012
SW-6	Software application for Radiated and Conducted Emissions	Intertek	OATS_CVI	V.1.0	01/01/2011	01/01/2012

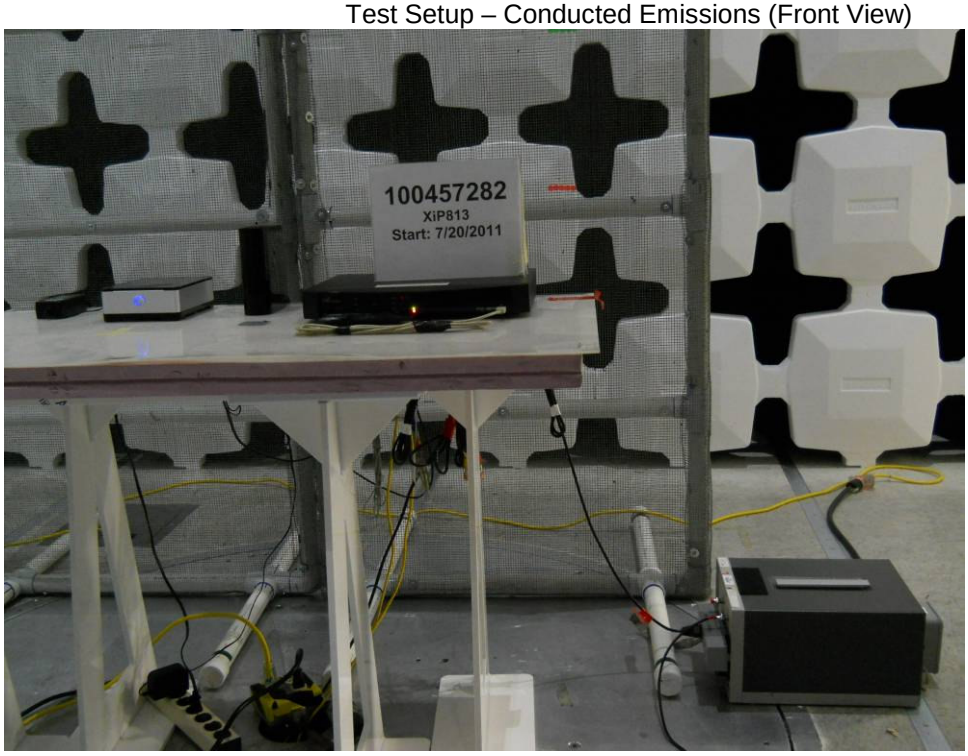
12.3 Results:

The sample tested was found to comply with the requirements of:

- **FCC 15.207/15.107 Class B**
- **RSS-GEN Section 7.2.4**

12.4 Setup Photographs:

Test Setup – Conducted Emissions (Front View)



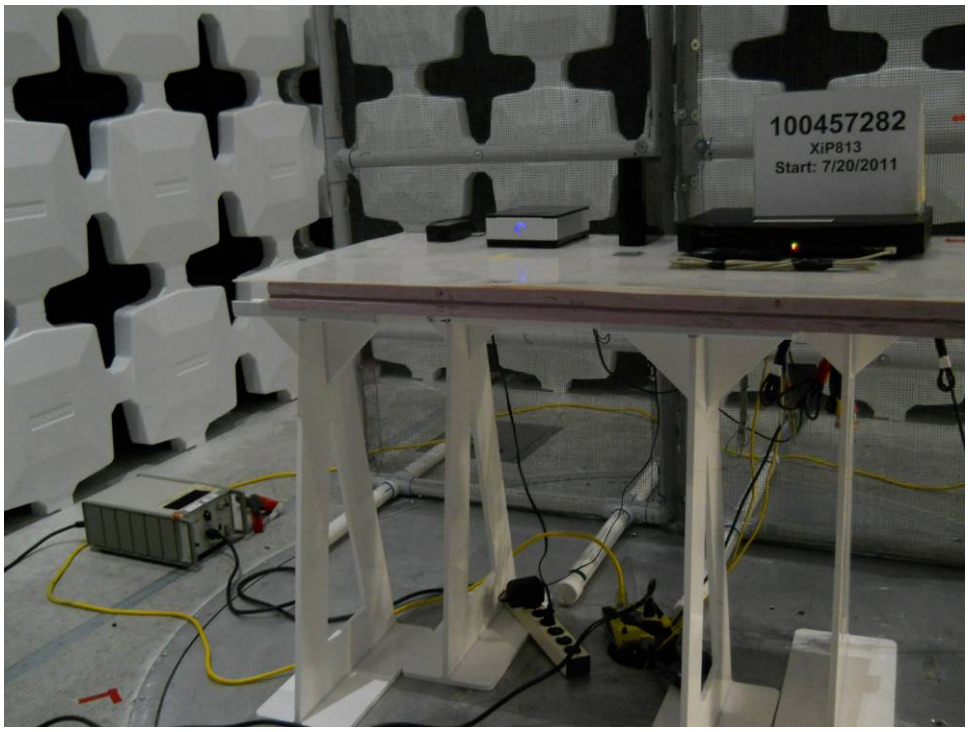
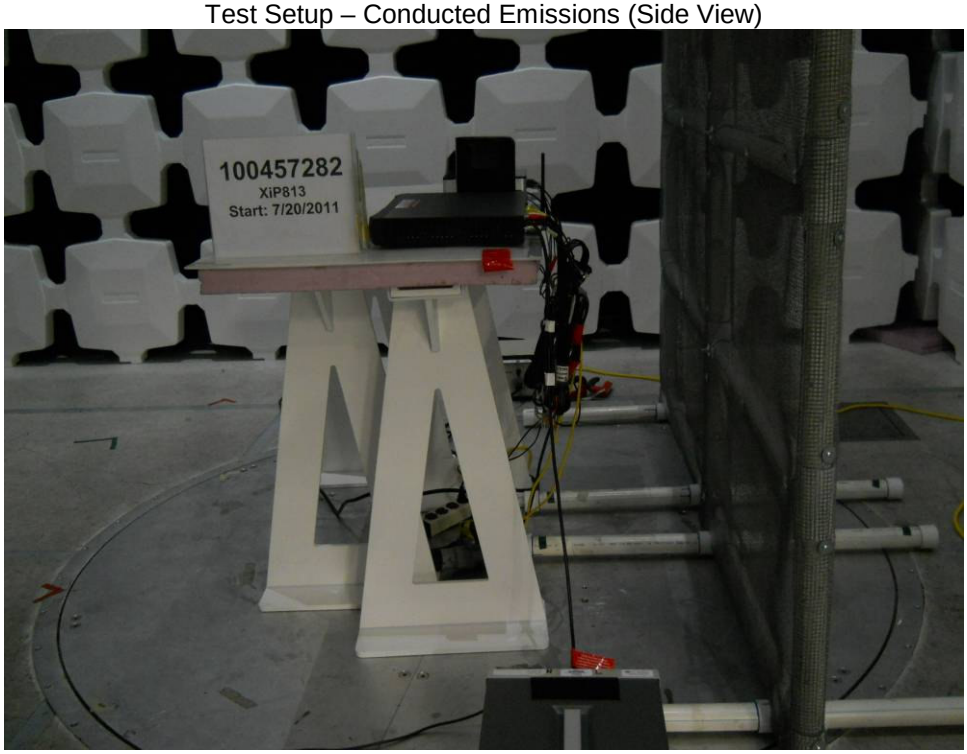


Photo:

Test Setup – Conducted Emissions (Side View)

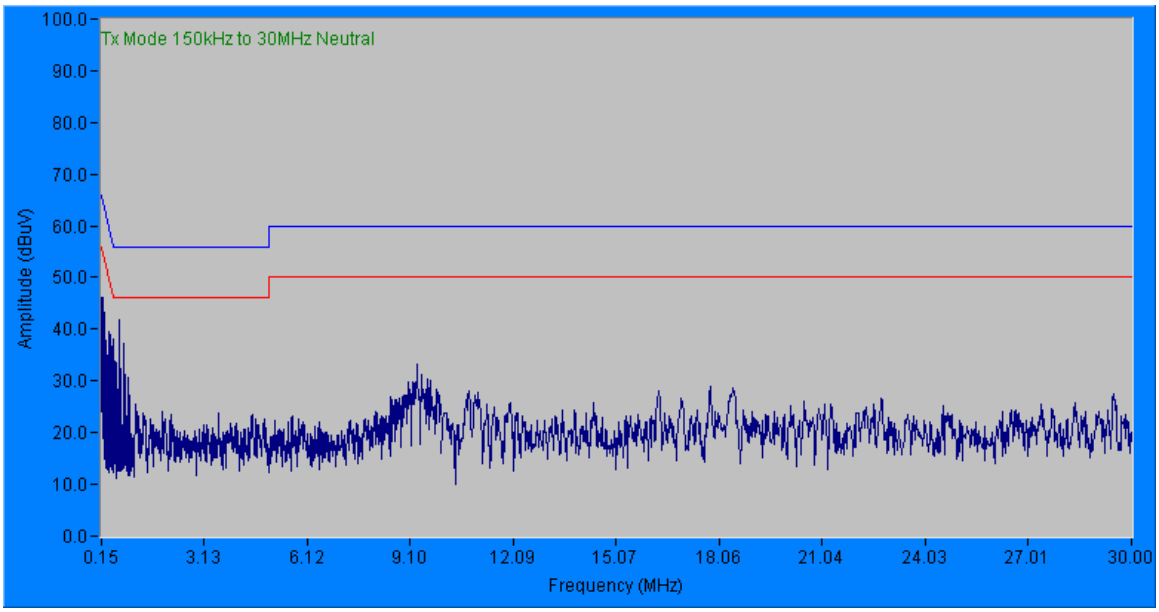


12.5 Plots: Pre-Scan Peak Measurements - Not Final Data

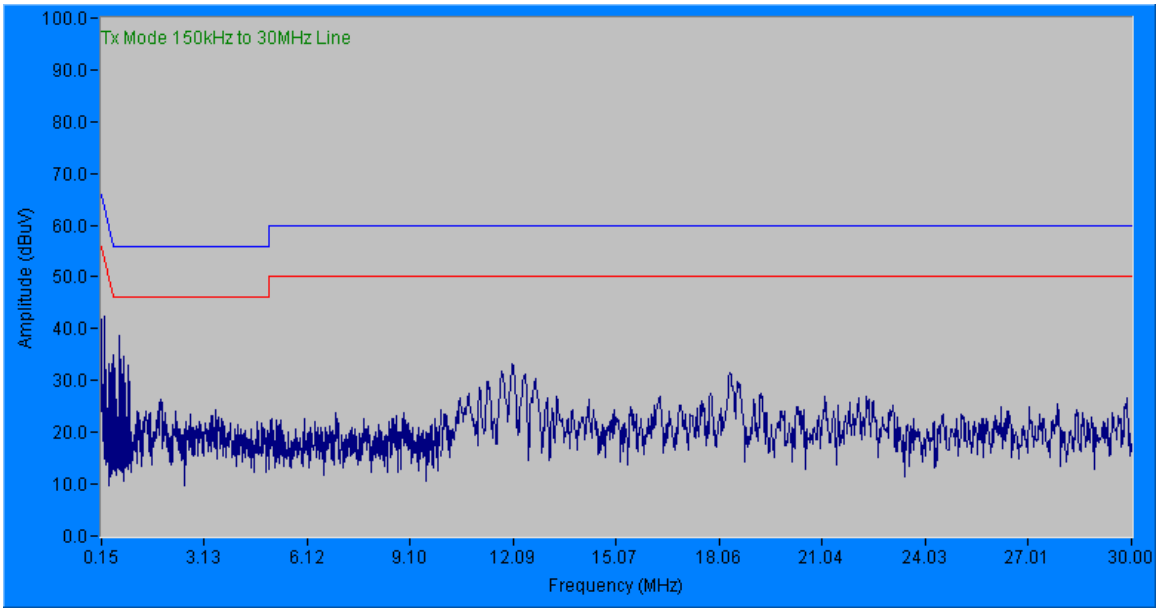
12.5.1 Tx Enabled Conducted Emissions

Conducted Emissions – FCC 15.107, Class B (150 kHz to 30 MHz)

Neutral Line



Live Line

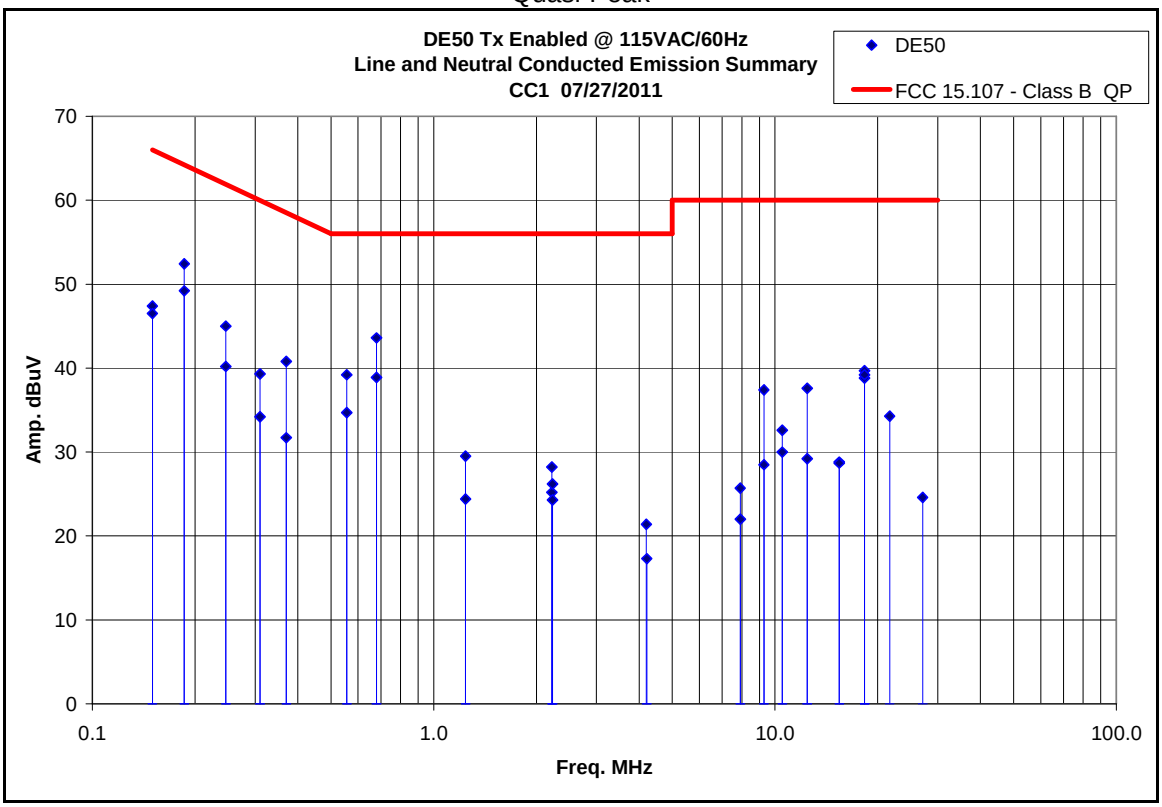


Note: Peak measurements plotted against FCC 15.107 Average & Quasi-Peak Limit

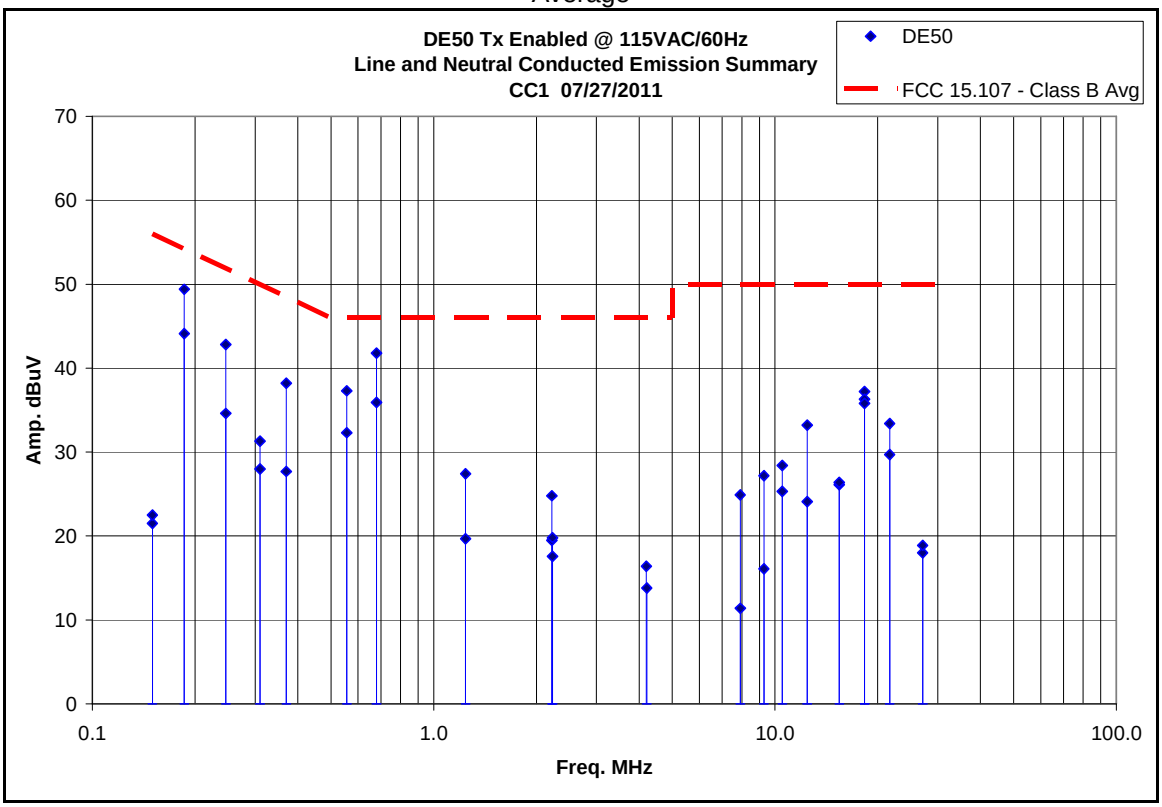
Plots: Final Quasi-Peak and Average Measurements

Conducted Emissions – FCC 15.107, Class B (150 kHz to 30 MHz)

Quasi-Peak



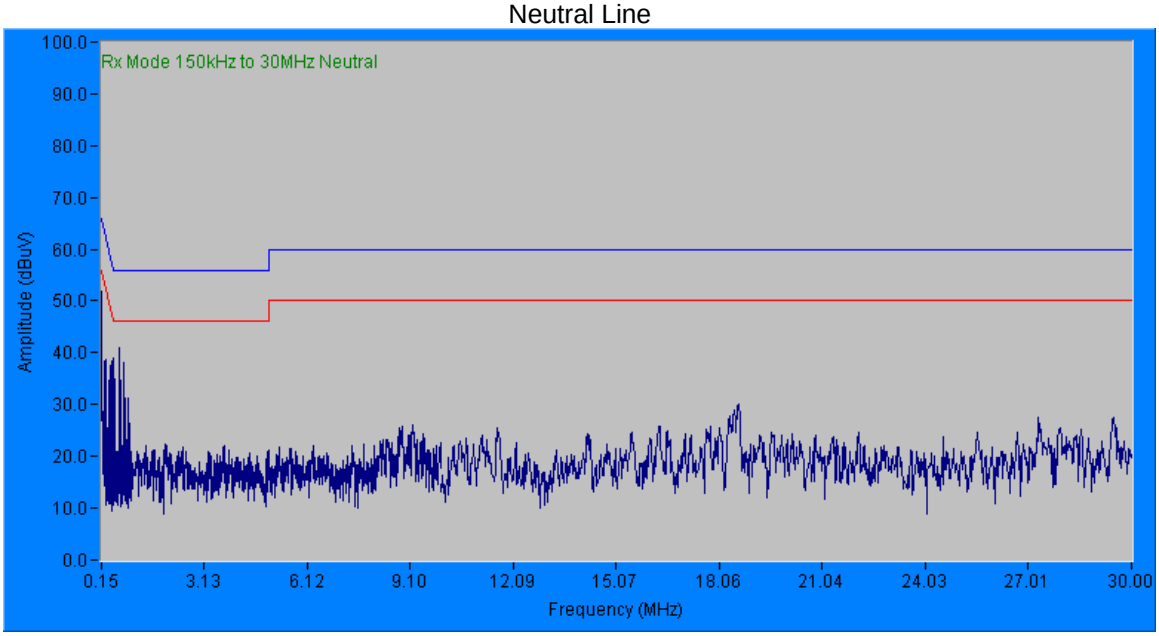
Average



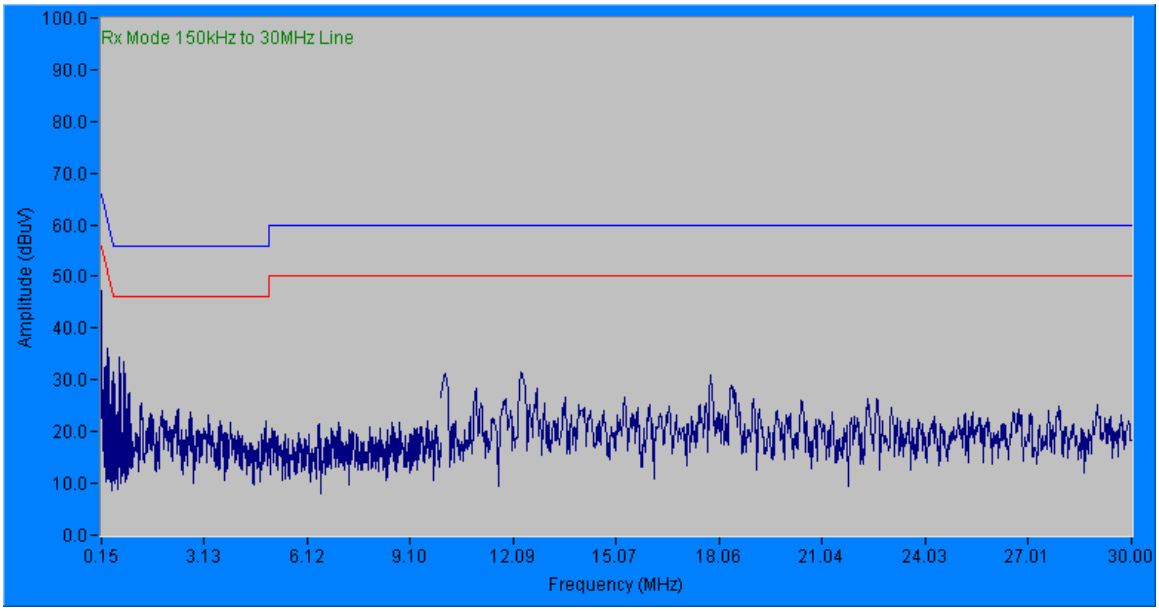
12.5.2 Rx Only Conducted Emissions

Conducted Emissions – FCC 15.107, Class B (150 kHz to 30 MHz)

Neutral Line



Live Line

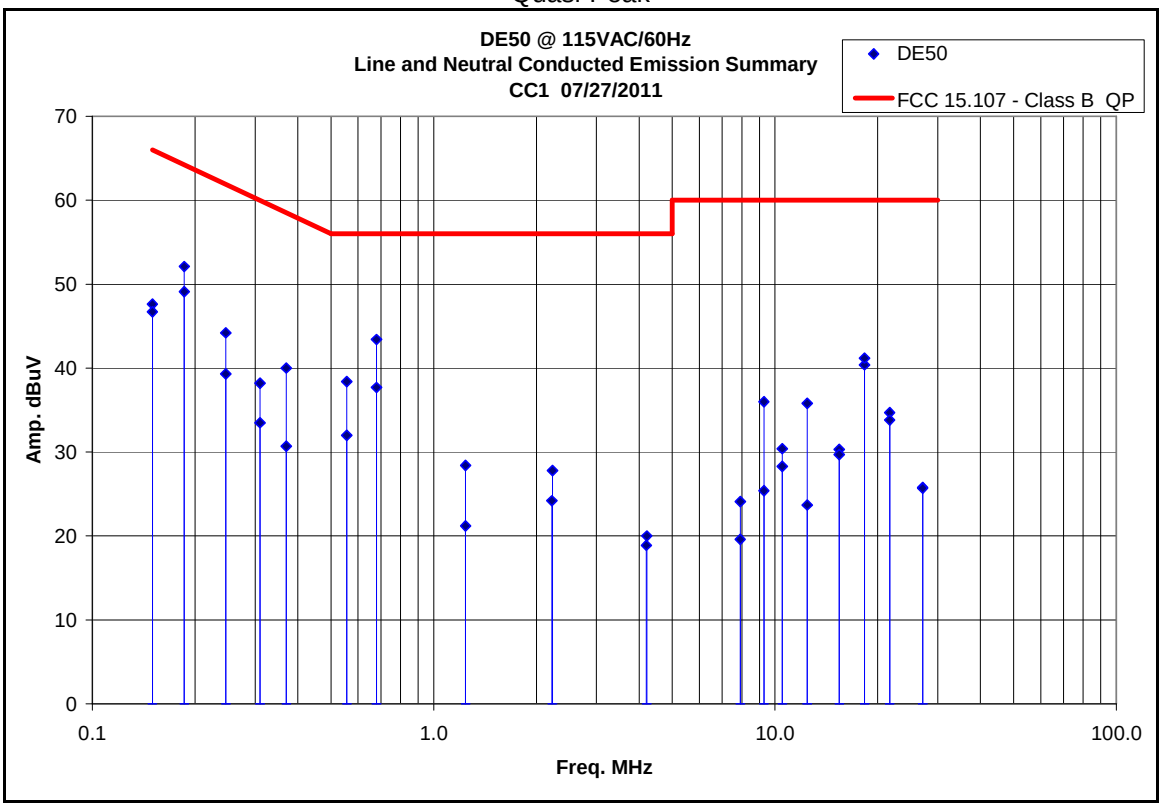


Note: Peak measurements plotted against FCC 15.107 Average & Quasi-Peak Limit

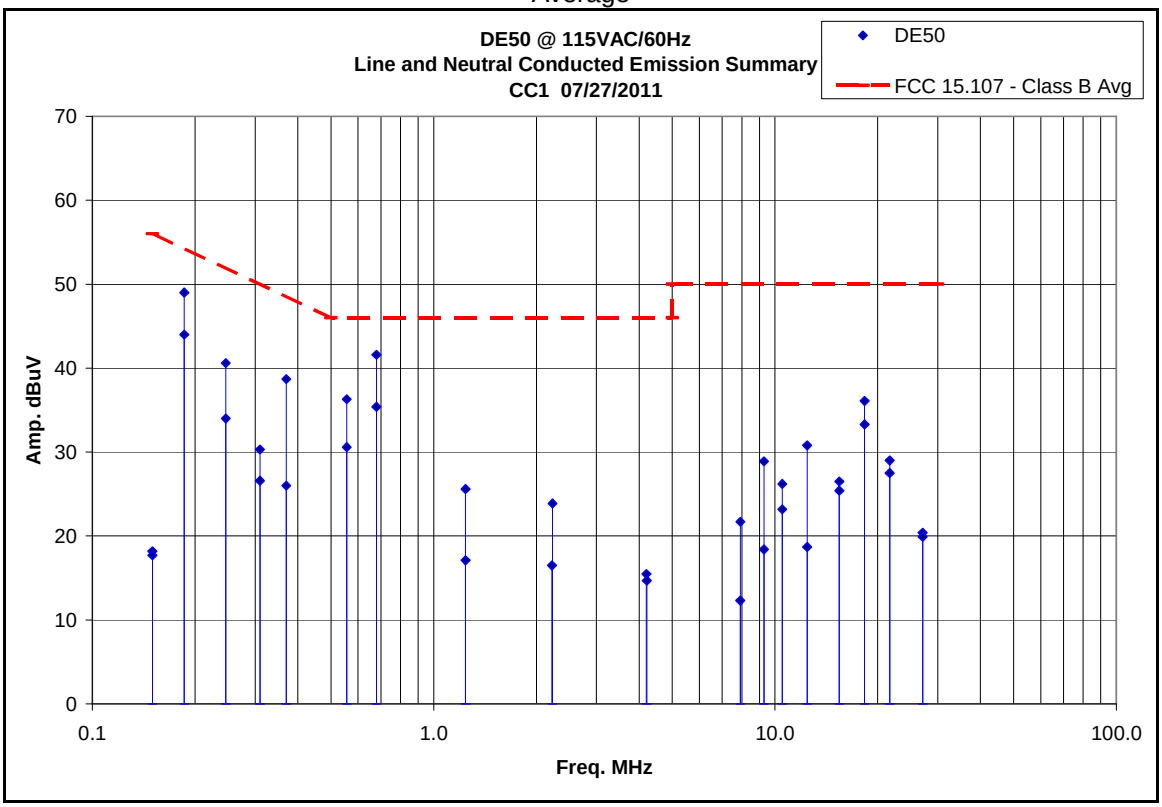
Plots: Final Quasi-Peak and Average Measurements

Conducted Emissions – FCC 15.107, Class B (150 kHz to 30 MHz)

Quasi-Peak



Average



12.6 Test Data: 150kHz to 30MHz

12.6.1 Tx Enabled Conducted Emissions

Conducted Electromagnetic Emissions

Test Report #:	**AC Conducted Run 01**	Test Area:	CC1 Conducted	Temperature:	23.4	°C
Test Method:	FCC Part 15.107 Class B	Test Date:	27-Jul-2011	Relative Humidity:	36.8	%
EUT Model #:	DE50 (XiP813)	EUT Power:	115VAC/60Hz	Air Pressure:	82.9	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver					
Notes:	**Product configured for Tx mode - modulated - worst-case data**					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
Line Measurements						
0.150	11.3 Av	0.1 / 0.2 / -9.9	21.5	Line 1	-34.5	N/A
0.150	37.2 Qp	0.1 / 0.2 / -9.9	47.4	Line 1	N/A	-18.6
0.186	33.9 Av	0.1 / 0.2 / -9.9	44.1	Line 1	-10.1	N/A
0.186	39.0 Qp	0.1 / 0.2 / -9.9	49.2	Line 1	N/A	-15.0
0.246	24.5 Av	0.1 / 0.1 / -9.9	34.6	Line 1	-17.3	N/A
0.246	30.1 Qp	0.1 / 0.1 / -9.9	40.2	Line 1	N/A	-21.7
0.310	17.8 Av	0.1 / 0.1 / -10.0	28.0	Line 1	-22.0	N/A
0.310	24.0 Qp	0.1 / 0.1 / -10.0	34.2	Line 1	N/A	-25.8
0.370	17.5 Av	0.1 / 0.1 / -10.0	27.7	Line 1	-20.8	N/A
0.370	21.5 Qp	0.1 / 0.1 / -10.0	31.7	Line 1	N/A	-26.8
0.556	22.1 Av	0.1 / 0.1 / -10.0	32.3	Line 1	-13.7	N/A
0.556	24.5 Qp	0.1 / 0.1 / -10.0	34.7	Line 1	N/A	-21.3
0.680	25.7 Av	0.1 / 0.1 / -10.0	35.9	Line 1	-10.1	N/A
0.680	28.7 Qp	0.1 / 0.1 / -10.0	38.9	Line 1	N/A	-17.1
1.24	17.1 Av	0.2 / 0.1 / -10.0	27.4	Line 1	-18.6	N/A
1.24	19.2 Qp	0.2 / 0.1 / -10.0	29.5	Line 1	N/A	-26.5
2.22	14.5 Av	0.2 / 0.1 / -10.0	24.8	Line 1	-21.2	N/A
2.22	17.9 Qp	0.2 / 0.1 / -10.0	28.2	Line 1	N/A	-27.8
4.21	3.4 Av	0.3 / 0.1 / -10.0	13.8	Line 1	-32.2	N/A
4.21	6.9 Qp	0.3 / 0.1 / -10.0	17.3	Line 1	N/A	-38.7
7.92	0.8 Av	0.5 / 0.1 / -10.0	11.4	Line 1	-38.6	N/A
7.92	11.4 Qp	0.5 / 0.1 / -10.0	22.0	Line 1	N/A	-38.0
9.28	5.4 Av	0.6 / 0.1 / -10.0	16.1	Line 1	-33.9	N/A
9.28	17.8 Qp	0.6 / 0.1 / -10.0	28.5	Line 1	N/A	-31.5
10.51	17.7 Av	0.6 / 0.1 / -10.0	28.4	Line 1	-21.6	N/A
10.51	21.9 Qp	0.6 / 0.1 / -10.0	32.6	Line 1	N/A	-27.4
12.43	22.2 Av	0.8 / 0.2 / -10.0	33.2	Line 1	-16.8	N/A

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
12.43	26.6 Qp	0.8 / 0.2 / -10.0	37.6	Line 1	N/A	-22.4
15.44	14.9 Av	1.0 / 0.2 / -10.0	26.1	Line 1	-23.9	N/A
15.44	17.6 Qp	1.0 / 0.2 / -10.0	28.8	Line 1	N/A	-31.2
18.30	25.9 Av	1.1 / 0.2 / -10.0	37.2	Line 1	-12.8	N/A
18.30	28.4 Qp	1.1 / 0.2 / -10.0	39.7	Line 1	N/A	-20.3
21.66	21.7 Av	1.1 / 0.6 / -10.0	33.4	Line 1	-16.6	N/A
21.66	22.6 Qp	1.1 / 0.6 / -10.0	34.3	Line 1	N/A	-25.7
27.08	6.0 Av	1.3 / 0.7 / -10.0	18.0	Line 1	-32.0	N/A
27.08	12.6 Qp	1.3 / 0.7 / -10.0	24.6	Line 1	N/A	-35.4
0.150	12.3 Av	0.1 / 0.2 / -9.9	22.5	Neutral	-33.5	N/A
0.150	36.3 Qp	0.1 / 0.2 / -9.9	46.5	Neutral	N/A	-19.5
0.186	39.2 Av	0.1 / 0.2 / -9.9	49.4	Neutral	-4.8	N/A
0.186	42.2 Qp	0.1 / 0.2 / -9.9	52.4	Neutral	N/A	-11.8
0.246	32.7 Av	0.1 / 0.1 / -9.9	42.8	Neutral	-9.1	N/A
0.246	34.9 Qp	0.1 / 0.1 / -9.9	45.0	Neutral	N/A	-16.9
0.310	21.1 Av	0.1 / 0.1 / -10.0	31.3	Neutral	-18.7	N/A
0.310	29.1 Qp	0.1 / 0.1 / -10.0	39.3	Neutral	N/A	-20.7
0.370	28.0 Av	0.1 / 0.1 / -10.0	38.2	Neutral	-10.3	N/A
0.370	30.6 Qp	0.1 / 0.1 / -10.0	40.8	Neutral	N/A	-17.7
0.556	27.1 Av	0.1 / 0.1 / -10.0	37.3	Neutral	-8.7	N/A
0.556	29.0 Qp	0.1 / 0.1 / -10.0	39.2	Neutral	N/A	-16.8
0.680	31.6 Av	0.1 / 0.1 / -10.0	41.8	Neutral	-4.2	N/A
0.680	33.4 Qp	0.1 / 0.1 / -10.0	43.6	Neutral	N/A	-12.4
1.24	9.4 Av	0.2 / 0.1 / -10.0	19.7	Neutral	-26.3	N/A
1.24	14.1 Qp	0.2 / 0.1 / -10.0	24.4	Neutral	N/A	-31.6
2.22	9.2 Av	0.2 / 0.1 / -10.0	19.5	Neutral	-26.5	N/A
2.22	14.9 Qp	0.2 / 0.1 / -10.0	25.2	Neutral	N/A	-30.8
2.23	7.3 Av	0.2 / 0.1 / -10.0	17.6	Neutral	-28.4	N/A
2.23	14.0 Qp	0.2 / 0.1 / -10.0	24.3	Neutral	N/A	-31.7
2.23	9.5 Av	0.2 / 0.1 / -10.0	19.8	Neutral	-26.2	N/A
2.23	15.9 Qp	0.2 / 0.1 / -10.0	26.2	Neutral	N/A	-29.8
4.20	6.0 Av	0.3 / 0.1 / -10.0	16.4	Neutral	-29.6	N/A
4.20	11.0 Qp	0.3 / 0.1 / -10.0	21.4	Neutral	N/A	-34.6
7.91	14.3 Av	0.5 / 0.1 / -10.0	24.9	Neutral	-25.1	N/A
7.91	15.1 Qp	0.5 / 0.1 / -10.0	25.7	Neutral	N/A	-34.3
9.28	16.5 Av	0.6 / 0.1 / -10.0	27.2	Neutral	-22.8	N/A
9.28	26.7 Qp	0.6 / 0.1 / -10.0	37.4	Neutral	N/A	-22.6
10.51	14.6 Av	0.6 / 0.1 / -10.0	25.3	Neutral	-24.7	N/A
10.51	19.3 Qp	0.6 / 0.1 / -10.0	30.0	Neutral	N/A	-30.0
12.43	13.1 Av	0.8 / 0.2 / -10.0	24.1	Neutral	-25.9	N/A
12.43	18.2 Qp	0.8 / 0.2 / -10.0	29.2	Neutral	N/A	-30.8
15.43	15.2 Av	1.0 / 0.2 / -10.0	26.4	Neutral	-23.6	N/A
15.43	17.5 Qp	1.0 / 0.2 / -10.0	28.7	Neutral	N/A	-31.3
18.30	25.0 Av	1.1 / 0.2 / -10.0	36.3	Neutral	-13.7	N/A
18.30	27.5 Qp	1.1 / 0.2 / -10.0	38.8	Neutral	N/A	-21.2

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
18.30	24.5 Av	1.1 / 0.2 / -10.0	35.8	Neutral	-14.2	N/A
18.30	27.9 Qp	1.1 / 0.2 / -10.0	39.2	Neutral	N/A	-20.8
21.66	18.0 Av	1.1 / 0.6 / -10.0	29.7	Neutral	-20.3	N/A
21.66	25.1 Qp	1.1 / 0.6 / -10.0	36.8	Neutral	N/A	-23.2
27.08	6.8 Av	1.3 / 0.7 / -10.0	18.9	Neutral	-31.1	N/A
27.08	12.9 Qp	1.3 / 0.7 / -10.0	24.9	Neutral	N/A	-35.1

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
********** Measurement Summary **********						
0.680	31.6 Av	0.1 / 0.1 / -10.0	41.8	Neutral	-4.2	N/A
0.186	39.2 Av	0.1 / 0.2 / -9.9	49.4	Neutral	-4.8	N/A
0.556	27.1 Av	0.1 / 0.1 / -10.0	37.3	Neutral	-8.7	N/A
0.246	32.7 Av	0.1 / 0.1 / -9.9	42.8	Neutral	-9.1	N/A
0.370	28.0 Av	0.1 / 0.1 / -10.0	38.2	Neutral	-10.3	N/A
18.30	25.9 Av	1.1 / 0.2 / -10.0	37.2	Line 1	-12.8	N/A
18.30	25.0 Av	1.1 / 0.2 / -10.0	36.3	Neutral	-13.7	N/A
21.66	21.7 Av	1.1 / 0.6 / -10.0	33.4	Line 1	-16.6	N/A
12.43	22.2 Av	0.8 / 0.2 / -10.0	33.2	Line 1	-16.8	N/A
0.150	37.2 Qp	0.1 / 0.2 / -9.9	47.4	Line 1	N/A	-18.6
1.24	17.1 Av	0.2 / 0.1 / -10.0	27.4	Line 1	-18.6	N/A
0.310	21.1 Av	0.1 / 0.1 / -10.0	31.3	Neutral	-18.7	N/A
2.22	14.5 Av	0.2 / 0.1 / -10.0	24.8	Line 1	-21.2	N/A
18.30	27.5 Qp	1.1 / 0.2 / -10.0	38.8	Neutral	N/A	-21.2
10.51	17.7 Av	0.6 / 0.1 / -10.0	28.4	Line 1	-21.6	N/A
9.28	26.7 Qp	0.6 / 0.1 / -10.0	37.4	Neutral	N/A	-22.6
15.43	15.2 Av	1.0 / 0.2 / -10.0	26.4	Neutral	-23.6	N/A
15.44	14.9 Av	1.0 / 0.2 / -10.0	26.1	Line 1	-23.9	N/A
7.91	14.3 Av	0.5 / 0.1 / -10.0	24.9	Neutral	-25.1	N/A
2.23	9.5 Av	0.2 / 0.1 / -10.0	19.8	Neutral	-26.2	N/A
2.22	17.9 Qp	0.2 / 0.1 / -10.0	28.2	Line 1	N/A	-27.8
4.20	6.0 Av	0.3 / 0.1 / -10.0	16.4	Neutral	-29.6	N/A
27.08	6.8 Av	1.3 / 0.7 / -10.0	18.9	Neutral	-31.1	N/A
4.21	3.4 Av	0.3 / 0.1 / -10.0	13.8	Line 1	-32.2	N/A
4.20	11.0 Qp	0.3 / 0.1 / -10.0	21.4	Neutral	N/A	-34.6
7.92	11.4 Qp	0.5 / 0.1 / -10.0	22.0	Line 1	N/A	-38.0

12.6.2 Rx Only Conducted Emissions

Conducted Electromagnetic Emissions

Test Report #:	**100457282**	Test Area:	CC1 Conducted	Temperature:	23.4	°C
Test Method:	FCC Part 15.107 Class B	Test Date:	27-Jul-2011	Relative Humidity:	37.1	%
EUT Model #:	DE50 (XiP813)	EUT Power:	115VAC/60Hz	Air Pressure:	82.9	kPa
EUT Serial #:	EMC1					
Manufacturer:	Echostar					
EUT Description:	Advanced Satellite Receiver					
Notes:	**Product configured for Rx mode - Idle**					

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
Line Measurements						
0.150	8.0 Av	0.1 / 0.2 / -9.9	18.2	Line 1	-37.8	N/A
0.150	37.4 Qp	0.1 / 0.2 / -9.9	47.6	Line 1	N/A	-18.4
0.186	33.8 Av	0.1 / 0.2 / -9.9	44.0	Line 1	-10.2	N/A
0.186	38.9 Qp	0.1 / 0.2 / -9.9	49.1	Line 1	N/A	-15.1
0.246	23.9 Av	0.1 / 0.1 / -9.9	34.0	Line 1	-17.9	N/A
0.246	29.2 Qp	0.1 / 0.1 / -9.9	39.3	Line 1	N/A	-22.6
0.310	16.4 Av	0.1 / 0.1 / -10.0	26.6	Line 1	-23.4	N/A
0.310	23.3 Qp	0.1 / 0.1 / -10.0	33.5	Line 1	N/A	-26.5
0.370	15.8 Av	0.1 / 0.1 / -10.0	26.0	Line 1	-22.5	N/A
0.370	20.5 Qp	0.1 / 0.1 / -10.0	30.7	Line 1	N/A	-27.8
0.556	20.4 Av	0.1 / 0.1 / -10.0	30.6	Line 1	-15.4	N/A
0.556	21.8 Qp	0.1 / 0.1 / -10.0	32.0	Line 1	N/A	-24.0
0.680	25.2 Av	0.1 / 0.1 / -10.0	35.4	Line 1	-10.6	N/A
0.680	27.5 Qp	0.1 / 0.1 / -10.0	37.7	Line 1	N/A	-18.3
1.24	15.3 Av	0.2 / 0.1 / -10.0	25.6	Line 1	-20.4	N/A
1.24	18.1 Qp	0.2 / 0.1 / -10.0	28.4	Line 1	N/A	-27.6
2.23	13.6 Av	0.2 / 0.1 / -10.0	23.9	Line 1	-22.1	N/A
2.23	17.5 Qp	0.2 / 0.1 / -10.0	27.8	Line 1	N/A	-28.2
4.20	5.1 Av	0.3 / 0.1 / -10.0	15.5	Line 1	-30.5	N/A
4.20	8.5 Qp	0.3 / 0.1 / -10.0	18.9	Line 1	N/A	-37.1
7.91	1.8 Av	0.5 / 0.1 / -10.0	12.3	Line 1	-37.7	N/A
7.91	9.0 Qp	0.5 / 0.1 / -10.0	19.6	Line 1	N/A	-40.4
9.28	7.7 Av	0.6 / 0.1 / -10.0	18.4	Line 1	-31.6	N/A
9.28	14.7 Qp	0.6 / 0.1 / -10.0	25.4	Line 1	N/A	-34.6
10.51	15.5 Av	0.6 / 0.1 / -10.0	26.2	Line 1	-23.8	N/A
10.51	19.7 Qp	0.6 / 0.1 / -10.0	30.4	Line 1	N/A	-29.6
12.43	19.8 Av	0.8 / 0.2 / -10.0	30.8	Line 1	-19.2	N/A
12.43	24.8 Qp	0.8 / 0.2 / -10.0	35.8	Line 1	N/A	-24.2
15.43	15.3 Av	1.0 / 0.2 / -10.0	26.5	Line 1	-23.5	N/A

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
15.43	19.1 Qp	1.0 / 0.2 / -10.0	30.3	Line 1	N/A	-29.7
18.31	22.0 Av	1.1 / 0.2 / -10.0	33.3	Line 1	-16.7	N/A
18.31	29.1 Qp	1.1 / 0.2 / -10.0	40.4	Line 1	N/A	-19.6
21.66	17.3 Av	1.1 / 0.6 / -10.0	29.0	Line 1	-21.0	N/A
21.66	23.0 Qp	1.1 / 0.6 / -10.0	34.7	Line 1	N/A	-25.3
27.08	8.4 Av	1.3 / 0.7 / -10.0	20.4	Line 1	-29.6	N/A
27.08	13.8 Qp	1.3 / 0.7 / -10.0	25.8	Line 1	N/A	-34.2
Neutral Measurements						
0.150	7.5 Av	0.1 / 0.2 / -9.9	17.7	Neutral	-38.3	N/A
0.150	36.5 Qp	0.1 / 0.2 / -9.9	46.7	Neutral	N/A	-19.3
0.186	38.8 Av	0.1 / 0.2 / -9.9	49.0	Neutral	-5.2	N/A
0.186	41.9 Qp	0.1 / 0.2 / -9.9	52.1	Neutral	N/A	-12.1
0.246	30.5 Av	0.1 / 0.1 / -9.9	40.6	Neutral	-11.3	N/A
0.246	34.1 Qp	0.1 / 0.1 / -9.9	44.2	Neutral	N/A	-17.7
0.310	20.1 Av	0.1 / 0.1 / -10.0	30.3	Neutral	-19.7	N/A
0.310	28.0 Qp	0.1 / 0.1 / -10.0	38.2	Neutral	N/A	-21.8
0.370	28.5 Av	0.1 / 0.1 / -10.0	38.7	Neutral	-9.8	N/A
0.370	29.8 Qp	0.1 / 0.1 / -10.0	40.0	Neutral	N/A	-18.5
0.556	26.1 Av	0.1 / 0.1 / -10.0	36.3	Neutral	-9.7	N/A
0.556	28.2 Qp	0.1 / 0.1 / -10.0	38.4	Neutral	N/A	-17.6
0.680	31.4 Av	0.1 / 0.1 / -10.0	41.6	Neutral	-4.4	N/A
0.680	33.2 Qp	0.1 / 0.1 / -10.0	43.4	Neutral	N/A	-12.6
1.24	6.8 Av	0.2 / 0.1 / -10.0	17.1	Neutral	-28.9	N/A
1.24	10.9 Qp	0.2 / 0.1 / -10.0	21.2	Neutral	N/A	-34.8
2.22	6.2 Av	0.2 / 0.1 / -10.0	16.5	Neutral	-29.5	N/A
2.22	13.9 Qp	0.2 / 0.1 / -10.0	24.2	Neutral	N/A	-31.8
4.21	4.3 Av	0.3 / 0.1 / -10.0	14.7	Neutral	-31.3	N/A
4.21	9.6 Qp	0.3 / 0.1 / -10.0	20.0	Neutral	N/A	-36.0
7.92	11.1 Av	0.5 / 0.1 / -10.0	21.7	Neutral	-28.3	N/A
7.92	13.5 Qp	0.5 / 0.1 / -10.0	24.1	Neutral	N/A	-35.9
9.28	18.2 Av	0.6 / 0.1 / -10.0	28.9	Neutral	-21.1	N/A
9.28	25.3 Qp	0.6 / 0.1 / -10.0	36.0	Neutral	N/A	-24.0
10.51	12.5 Av	0.6 / 0.1 / -10.0	23.2	Neutral	-26.8	N/A
10.51	17.6 Qp	0.6 / 0.1 / -10.0	28.3	Neutral	N/A	-31.7
12.43	7.7 Av	0.8 / 0.2 / -10.0	18.7	Neutral	-31.3	N/A
12.43	12.7 Qp	0.8 / 0.2 / -10.0	23.7	Neutral	N/A	-36.3
15.43	14.2 Av	1.0 / 0.2 / -10.0	25.4	Neutral	-24.6	N/A
15.43	18.5 Qp	1.0 / 0.2 / -10.0	29.7	Neutral	N/A	-30.3
18.30	24.8 Av	1.1 / 0.2 / -10.0	36.1	Neutral	-13.9	N/A
18.30	29.9 Qp	1.1 / 0.2 / -10.0	41.2	Neutral	N/A	-18.8
21.66	15.8 Av	1.1 / 0.6 / -10.0	27.5	Neutral	-22.5	N/A
21.66	22.1 Qp	1.1 / 0.6 / -10.0	33.8	Neutral	N/A	-26.2
27.08	7.9 Av	1.3 / 0.7 / -10.0	19.9	Neutral	-30.1	N/A
27.08	13.7 Qp	1.3 / 0.7 / -10.0	25.7	Neutral	N/A	-34.3

FREQ	LEVEL	CABLE / LISN / ATTEN	FINAL	TEST POINT	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB)	(dBuV)		AV15.107B	QP15.107B
********** Measurement Summary **********						
0.680	31.4 Av	0.1 / 0.1 / -10.0	41.6	Neutral	-4.4	N/A
0.186	38.8 Av	0.1 / 0.2 / -9.9	49.0	Neutral	-5.2	N/A
0.556	26.1 Av	0.1 / 0.1 / -10.0	36.3	Neutral	-9.7	N/A
0.370	28.5 Av	0.1 / 0.1 / -10.0	38.7	Neutral	-9.8	N/A
0.246	30.5 Av	0.1 / 0.1 / -9.9	40.6	Neutral	-11.3	N/A
18.30	24.8 Av	1.1 / 0.2 / -10.0	36.1	Neutral	-13.9	N/A
18.31	22.0 Av	1.1 / 0.2 / -10.0	33.3	Line 1	-16.7	N/A
0.150	37.4 Qp	0.1 / 0.2 / -9.9	47.6	Line 1	N/A	-18.4
12.43	19.8 Av	0.8 / 0.2 / -10.0	30.8	Line 1	-19.2	N/A
18.31	29.1 Qp	1.1 / 0.2 / -10.0	40.4	Line 1	N/A	-19.6
0.310	20.1 Av	0.1 / 0.1 / -10.0	30.3	Neutral	-19.7	N/A
1.24	15.3 Av	0.2 / 0.1 / -10.0	25.6	Line 1	-20.4	N/A
21.66	17.3 Av	1.1 / 0.6 / -10.0	29.0	Line 1	-21.0	N/A
9.28	18.2 Av	0.6 / 0.1 / -10.0	28.9	Neutral	-21.1	N/A
2.23	13.6 Av	0.2 / 0.1 / -10.0	23.9	Line 1	-22.1	N/A
15.43	15.3 Av	1.0 / 0.2 / -10.0	26.5	Line 1	-23.5	N/A
10.51	15.5 Av	0.6 / 0.1 / -10.0	26.2	Line 1	-23.8	N/A
7.92	11.1 Av	0.5 / 0.1 / -10.0	21.7	Neutral	-28.3	N/A
2.22	6.2 Av	0.2 / 0.1 / -10.0	16.5	Neutral	-29.5	N/A
27.08	8.4 Av	1.3 / 0.7 / -10.0	20.4	Line 1	-29.6	N/A
4.20	5.1 Av	0.3 / 0.1 / -10.0	15.5	Line 1	-30.5	N/A
4.21	4.3 Av	0.3 / 0.1 / -10.0	14.7	Neutral	-31.3	N/A
9.28	7.7 Av	0.6 / 0.1 / -10.0	18.4	Line 1	-31.6	N/A
7.92	13.5 Qp	0.5 / 0.1 / -10.0	24.1	Neutral	N/A	-35.9
4.21	9.6 Qp	0.3 / 0.1 / -10.0	20.0	Neutral	N/A	-36.0
7.91	1.8 Av	0.5 / 0.1 / -10.0	12.3	Line 1	-37.7	N/A

Example calculation:

Measured Level	+	**Transducer, Cable Loss & Amplifier corrections**	=	**Corrected Reading**	**Specification Limit**	-	**Corrected Reading**	=	**Delta Specification**
(dBµV)		(dB)		(dBµV/m)	(dBµV/m)		(dBµV/m)		
14.0		**14.9**		**28.9**	**40.0**		**28.9**		**-11.1**

Notes:
(1) All measurements taken with both Quasi-Peak and Average detectors.

Deviations, Additions, or Exclusions: None

13 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment

meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of k = 2, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

Parameter	Uncertainty ±	Notes
Radiated emissions, 10kHz to 1000 MHz	4.4 dB	
Radiated emissions, 1 to 18 GHz	4.7 dB	
AC mains Conducted emissions, 9kHz to 30 MHz	3.14 dB	

14 Duty Cycle Correction Factor

No duty cycle correction factor was applied during this testing – therefore, no product Duty Cycle verification was applicable.

15 Revision History

Revision Level	Date	Report Number	Notes
0	07/31/2011	100457282DEN-001	Original Issue
1	08/08/2011	100457282DEN-001	Revised report per TCB reviewer request: • Added fundamental signal measurements with a RBW of 100 kHz for use as the reference to determine the -20 dBc limit for harmonics. Author: Michael Kanda  Reviewer: Mike Spataro 
2	8/9/2011	100457282DEN-001	Revised report – added 6dB bandwidth plots for RF4CE radio. Author: Michael Kanda  Reviewer: Mike Spataro