TEST REPORT – EMC Emissions

Report Number: 100259922DEN-002
Project Number: 100259922

Report Issue Date: 12/13/2010

Product Designation: **Model SA-0202123001-01 (Sling Extender)**

Standards: FCC 47 CFR Part 15.247
IC RSS 210: Issue 7
IC RSS-GEN Issue 2: 2007

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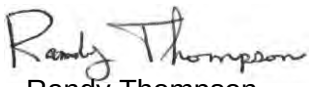
Report prepared by



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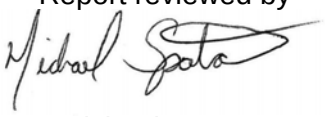

Michael Spataro
Engineering Team Leader

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Section **Page**

Product Under Test

Model SA-0202123001-01
(Sling Extender)

Sling Extender with AC Power Adapter/Ethernet

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)	11/02/2010 11/03/2010 01/10/2011	Pass
6	Radiated Emissions – Unintentional & Spurious – Band Edge FCC 15.209/ 15.247(d) (Covers RSS-210, Section 2.7, Tables 2 & 3)	11/02/2010 11/03/2010 01/10/2011	Pass
7	6dB Bandwidth – FCC 15.247 (a)(2) (Covers RSS-210 A8.2(a))	11/04/2010	Pass
8	Power Spectral Density (PSD) – FCC 15.247(e) (Covers RSS-210 A8.2(b))	11/04/2010	Pass
9	Occupied Bandwidth - RSS-GEN, Section 4.6.1	11/07/2010	Pass
10	AC Conducted Emissions – FCC 15.207 (Covers RSS-210)	11/03/2010	Pass

Notes:

1) Product has a detachable antenna - therefore, all measurements are RF conducted port when applicable.

General Remarks:

The following remarks are to be considered as "where applicable" and are taken into account while completing any FCC/IC/ETSI Radio tests at Intertek-Louisville.

Testing was performed in 3 different orthogonal axes to determine the worst-case emissions from the device. The worst-case axis and emissions are shown in this report.

FCC CFR47 Part 15.31: Measurement Standards: In any case where the device is powered off a battery, a fresh battery was used during testing. In cases where the device is powered of an AC Supply, voltage was varied per Part 15.31 to find worst-case emissions.

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 FCC KDB 558074 for DTS devices was used for testing.

Where RF Conducted Port measurements cannot be performed, Radiated Field Strength measurements may be taken as an alternative test procedure to demonstrate compliance with the various requirements of the standard. This method is utilized when the product is configured with an integral antenna or an external antenna that is not detachable.

3 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Sling Extender Placeshifting Receiver	EchoStar Technologies	SA-0202123001-01	AAKQNV00242J

Receive Date:	11/02/2010
Received Condition:	Good
Type:	Production Sample

Description of Equipment Under Test (provided by client)

Model SA-0202123001-01 Sling Extender – Placeshifting Receiver.

Product operates on (3) discrete Zigbee channels: 2.425 GHz, 2.450 GHz and 2.475 GHz. The product incorporates an external detachable antenna with a manufacturer-declared gain of 2dBi.

There is no programmable software and only a single channel is active at a time.

External AC Power Adapter: Input 120 VAC/ 60Hz, DC Output to Sling Extender.

Product to be sold initially in USA & Canada.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
AC Adapter 120 VAC	---	60Hz	1

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Tx - Product set up in transmit mode at full power, CW mode
2	Rx – Product set up in "standby" receive mode Sling Extender Receiver active with all cables attached in normal mode of operation.

Clock Frequencies of the EUT:

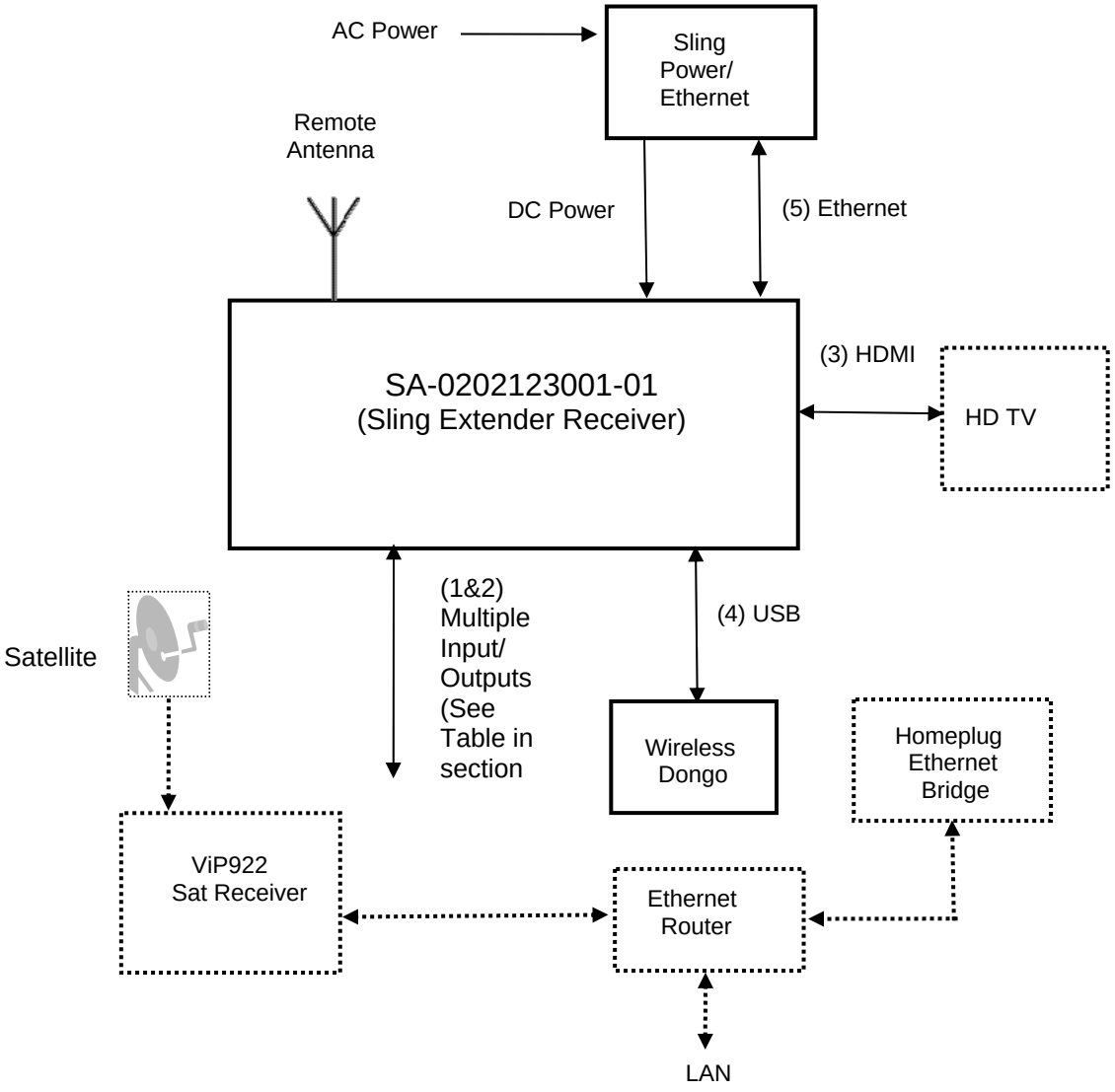
No.	Descriptions of Product Clocks
1	Transmit Frequences: 2.425GHz, 2.450GHz, 2.475GHz – (1) channel at a time
2	Lowest Frequency Utilized: 1 MHz

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: Equipment/cables in dashed-lines were not inside test volume.



4.3 Data:

ID	Description/ Function	Shield Type	Length	Connector	Connection	Ferrites
1	Composite Audio/Video	Foil	1 meter	RCA	Terminator	None
2	Component Video-HD (Y,Pb,Pr)	Braid	1 meter	RCA	Terminator	None
3	HDMI	Foil	1 meter	HDMI	HD TV	None
4	USB	Braid	1 meter	USB	Dongo	None
5	Ethernet	None	3 meters	RJ-45	Router/Switch	None

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Homeplug Ethernet Bridge	Sling Media	SL300-100	S3010700002266
Slingloaded Satellite Receiver	Echostar Technologies, L.L.C.	ViP922 DuoDVR	161750R74652U0004K
15” HD TV	ViewSonic	N1630w	QYE081511366
Ethernet Router	D-Link	EBR-2310	F311393000205

General notes:

5 Radiated Emissions – Field Strength of the Fundamental & Harmonics of the Fundamental

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC CFR47 15.247 & IC RSS-210**.

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US1121 and our IC lab no. 2042N.

5.1 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18882	Spectrum Analyzer (dc-22 GHz)	Hewlett-Packard	8566B	2410A00154	11/12/2009	11/12/2010
18660	Spectrum Analyzer Display Section (set 1)	Hewlett-Packard	85662A	2318A04983	11/12/2009	11/12/2010
18880	Q.P Adapter	Hewlett-Packard	85650A	2811A01300	11/12/2009	11/12/2010
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	05/07/2010	05/07/2011
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/04/2010	06/04/2011
18906	Pre-Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/11/2010	06/11/2011
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/07/2010	06/07/2011
18901	RF Pre-Amplifier (8-18 GHz)	Avantek	AWT-18037	1002	06/07/2010	06/07/2011
18798	Bicon Antenna 30 - 300 MHz	EMCO	3109	9801-3142	02/03/2010	02/03/2011
18808	Log Periodic Antenna	EMCO	3146	9203-3376	12/05/2009	12/05/2010
18886	Ridged Guide Antenna 1-18GHz	TENSOR	4105	2020	10/08/2010	10/08/2011
18805	HF Antenna/Harmonic Mixer 18 GHz to 26.5 GHz	Hewlett-Packard	11970K	2332A01280	10/04/2010	10/04/2011

5.2 Results:

The sample tested was found to Comply.

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

5.3 Setup Photographs:

Test setup – Field Strength Measurements (Front View)

Photo:

Test setup – Field Strength Measurements (Rear View)

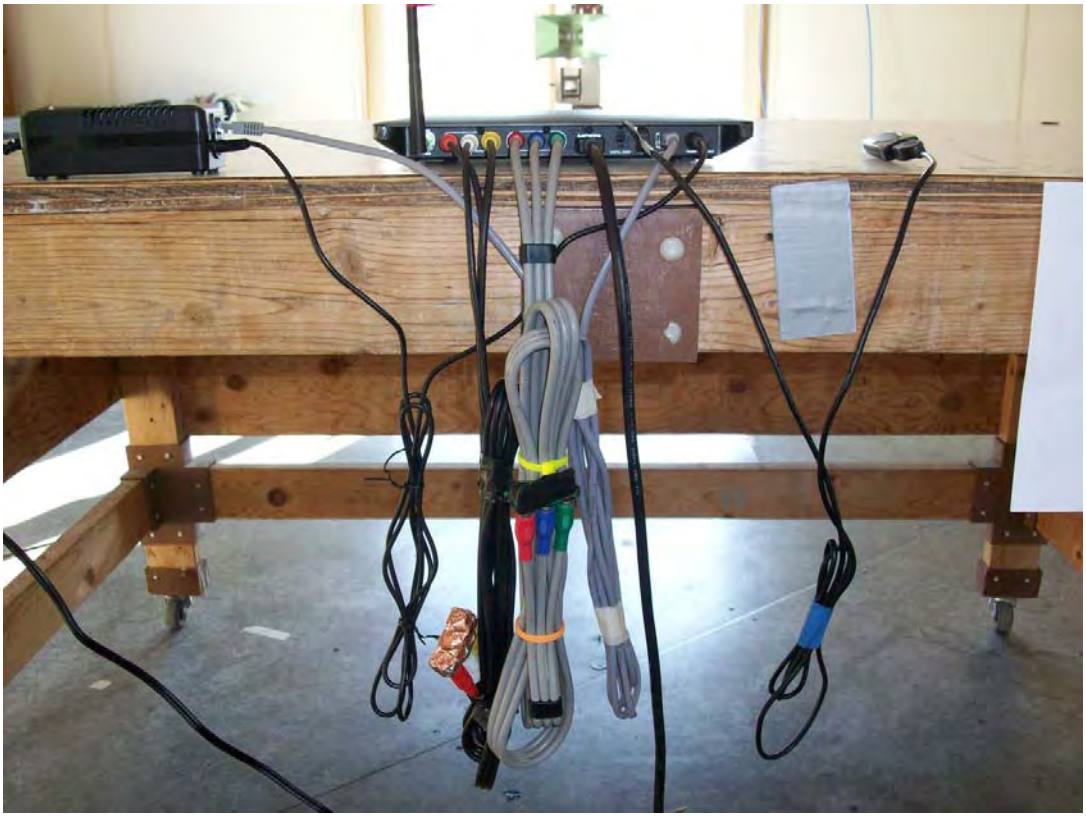


Photo:

Test setup – RF Conducted Port Measurements

5.4 Test Data:

Fundamental and Harmonics of the Fundamental (Spurious of the Transmitter)

Test Report #:	**500267071**	Test Area:	CC1	Temperature:	23.1	°C
Test Method:	FCC 15.247(b)(3) FCC 15.247(d)	Test Date:	10-Jan-2011	Relative Humidity:	28.2	%
EUT Model #:	SA-0202123001-01	EUT Power:	120VAC/60Hz	Air Pressure:	80.2	kPa
EUT Serial #:	AAKQNV00242J					
Manufacturer:	Echostar					
EUT Description:	Sling Extender - Placeshifting Receiver					

Notes: **This data sheet assumes product operates worst-case : 100% duty cycle**

Powered from Homeplug Ethernet Bridge

The product was tested in the normal operating axis – product flat on table per manufacturer's specifications.

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 declared by the manufacturer:								
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) "not to exceed 20dB"								
Part 15.247(b) and 15.247(d) Respectively								
Fundamental Measurements								
Fundamental - Low Channel								
2424.92	**101.8 Pk**	**0.3 / 0.0 / 0.0**	**102.2**	RF Conducted Port	**0.0**	**102.2**	**137.0**	**-34.8**
Fundamental - Mid Channel								
2449.91	101.8 Pk	0.3 / 0.0 / 0.0	102.1	RF Conducted Port	0.0	102.1	137.0	-34.9
Fundamental - High Channel								
2474.91	101.5 Pk	0.3 / 0.0 / 0.0	101.9	RF Conducted Port	0.0	101.9	137.0	-35.1

Field Strength (dBuV/m) to Power (Watts) Conversion - Worst-case Fundamental (Low-Channel):

102.2 dBuV = -4.8 dBm

-4.8 dBm = 0.00033 W

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

Therefore, Delta from Limit : 1 W - 0.00033 W = **0.99967 W (below limit)**

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								
4849.85	29.3 Pk	0.5	29.8	RF Conducted Port	0.0	29.8	82.2	-52.4
7274.77	25.7 Pk	0.6	26.3	RF Conducted Port	0.0	26.3	82.2	-55.9
9699.69	22.6 Pk	0.9	23.4	RF Conducted Port	0.0	23.4	82.2	-58.8
12124.6	22.3 Pk	1.4	23.7	RF Conducted Port	0.0	23.7	82.2	-58.5
14549.5	25.1 Pk	2.2	27.3	RF Conducted Port	0.0	27.3	82.2	-54.9
16974.5	21.6 Pk	3.4	25	RF Conducted Port	0.0	25.0	82.2	-57.2
19399.4	26.4 Pk	4.3	30.7	RF Conducted Port	0.0	30.7	82.2	-51.5
21824.3	26.1 Pk	5.1	31.2	RF Conducted Port	0.0	31.2	82.2	-51.0
24249.2	27.7 Pk	6.1	33.8	RF Conducted Port	0.0	33.8	82.2	-48.4
Harmonics of the Fundamental- Mid Channel								
4899.83	**33.6 Pk**	**0.5**	**34.1**	RF Conducted Port	**0.0**	**34.1**	**82.1**	**-48.0**
7349.74	25.1 Pk	0.6	25.7	RF Conducted Port	0.0	25.7	82.1	-56.4
9799.66	21.4 Pk	0.9	22.3	RF Conducted Port	0.0	22.3	82.1	-59.8
12249.6	23.7 Pk	1.4	25.2	RF Conducted Port	0.0	25.2	82.1	-56.9
14699.5	25.5 Pk	2.2	27.7	RF Conducted Port	0.0	27.7	82.1	-54.4
17149.4	23.4 Pk	3.4	26.8	RF Conducted Port	0.0	26.8	82.1	-55.3
19599.3	25.9 Pk	4.3	30.3	RF Conducted Port	0.0	30.3	82.1	-51.8
22049.2	23.9 Pk	5.1	29.1	RF Conducted Port	0.0	29.1	82.1	-53.0
24499.2	23.3 Pk	6.1	29.5	RF Conducted Port	0.0	29.5	82.1	-52.6
Harmonics of the Fundamental- High Channel								
4949.82	29.4 Pk	0.5	29.9	RF Conducted Port	0.0	29.9	81.9	-52.0
7424.73	30.2 Pk	0.6	30.9	RF Conducted Port	0.0	30.9	81.9	-52.0
9899.64	24.8 Pk	0.9	25.7	RF Conducted Port	0.0	25.7	81.9	-51.0
12374.5	21.7 Pk	1.4	23.2	RF Conducted Port	0.0	23.2	81.9	-56.2
14849.5	25.8 Pk	2.2	28.1	RF Conducted Port	0.0	28.1	81.9	-58.7
17324.4	25.7 Pk	3.4	29.2	RF Conducted Port	0.0	29.2	81.9	-53.8
19799.3	24.2 Pk	4.3	28.6	RF Conducted Port	0.0	28.6	81.9	-52.7
22274.2	26.4 Pk	5.1	31.7	RF Conducted Port	0.0	31.7	81.9	-53.3
24749.1	29.6 Pk	6.1	35.9	RF Conducted Port	0.0	35.9	81.9	-50.2

Limit: Harmonics of the Fundamental: maximum -20 dBc

Worst-Case Harmonic: Mid-Channel @ 4899.83 MHz: -48.0 dBc

Results: Pass

Restricted Band Harmonics of the Fundamental (Spurious of the Transmitter)

Test Report #:	**500267071**	Test Area:	Pinewood Site 1 (3m)	Temperature:	24.3	°C
Test Method:	FCC 15.247(d) 15.205/ 15.209	Test Date:	02-Nov-2010	Relative Humidity:	25.8	%
EUT Model #:	SA-0202123001-01	EUT Power:	120VAC/60Hz	Air Pressure:	79.9	kPa
EUT Serial #:	AAKQNV00242J					
Manufacturer:	Echostar					
EUT Description:	Sling Extender - Placeshifting Receiver					

Notes: **This data sheet assumes product operates worst-case : 100% duty cycle**

Powered from Homeplug Ethernet Bridge

All measurements taken at 3-meter product-to-antenna test distance

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	Limit FCC 15.205/209	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
The following Duty Cycle was declared by the manufacturer:								
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) “not to exceed 20dB”								
Part 15.205/ 15.209								
Harmonics of the Fundamental – FCC Restricted Bands								
Harmonics - Low Channel								
4849.82	48.0 Pk	5.6 / 33.3 / 39.2	47.7	V / 1.6 / 28.0	0.0	47.7	54.0	-6.3
4849.82	37.9 Pk	5.6 / 33.3 / 39.2	37.6	H / 1.4 / 12.0	0.0	37.6	54.0	-16.4
7274.82	36.6 Pk	7.3 / 36.3 / 39.6	40.6	V / 1.6 / 354.0	0.0	40.6	54.0	-13.4
7274.82	35.1 Pk	7.3 / 36.3 / 39.6	39.1	H / 1.4 / 176.0	0.0	39.1	54.0	-14.9
12124.5	41.4 Pk	9.7 / 40.1 / 45.4	45.7	H / 1.3 / 10.0	0.0	45.7	54.0	-8.3
12124.6	42.3 Pk	9.7 / 40.1 / 45.4	46.7	V / 1.3 / 10.0	0.0	46.7	54.0	-7.3
19400.2	11.1 Pk	0.0 / 22.2 / 0.0	33.3	V /1.0 / 0	0.0	33.3	54.0	-20.7
Harmonics - Mid Channel								
4899.81	37.7 Pk	5.6 / 33.4 / 39.2	37.6	H / 1.5 / 134.0	0.0	37.6	54.0	-16.4
4899.82	**49.5 Pk**	**5.6 / 33.4 / 39.2**	**49.3**	**V / 1.5 / 32.0**	**0.0**	**49.3**	**54.0**	**-4.7**
7349.7	35.1 Pk	7.4 / 36.4 / 39.4	39.5	H / 1.5 / 164.0	0.0	39.5	54.0	-14.5
7349.82	36.4 Pk	7.4 / 36.4 / 39.4	40.7	V / 1.3 / 24.0	0.0	40.7	54.0	-13.3
12249.5	41.2 Pk	9.8 / 40.9 / 45.2	46.7	V / 1.3 / 10.0	0.0	46.7	54.0	-7.3
12249.5	41.4 Pk	9.8 / 40.9 / 45.2	46.9	H / 1.3 / 10.0	0.0	46.9	54.0	-7.1
19600.6	10.9 Pk	0.0 / 22.0 / 0.0	32.9	V /1.0 / 0	0.0	32.9	54.0	-21.1
22050.4	11.4 Pk	0.0 / 21.3 / 0.0	32.7	V /1.0 / 0	0.0	32.7	54.0	-21.3

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit FCC 15.205/209	DELTA
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Harmonics - High Channel								
4949.82	44.3 Pk	5.7 / 33.5 / 39.1	44.3	V / 1.9 / 350.0	0.0	44.3	54.0	-9.7
4949.83	36.1 Pk	5.7 / 33.5 / 39.1	36.1	H / 1.4 / 178.0	0.0	36.1	54.0	-17.9
7424.8	35.7 Pk	7.4 / 36.4 / 39.4	40.1	V / 1.4 / 12.0	0.0	40.1	54.0	-13.9
7424.8	36.5 Pk	7.4 / 36.4 / 39.4	40.9	H / 1.4 / 352.0	0.0	40.9	54.0	-13.1
12374.5	39.4 Pk	9.9 / 41.9 / 45.0	46.1	V / 1.3 / 10.0	0.0	46.1	54.0	-7.9
12374.5	38.8 Pk	9.9 / 41.9 / 45.0	45.5	H / 1.3 / 10.0	0.0	45.5	54.0	-8.5
19800.7	11.3 Pk	0.0 / 21.8 / 0.0	33.1	V /1.0 / 0	0.0	33.1	54.0	-20.9
22275.2	11.2 Pk	0.0 / 21.1 / 0.0	32.3	V /1.0 / 0	0.0	32.3	54.0	-21.7

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

Worst-Case Harmonic - Mid-Channel: 899.82 MHz, 49.3 dBuV/m (4.7 dB below limit)

Result: Pass

Example calculation:

Measured Level	+	Transducer, Cable Loss & Amplifier corrections	=	Final Measured Reading	-	Duty Cycle Correction Factor	=	Final Corrected Reading	Specification Limit	-	Final Corrected Reading	=	Delta Specification
(dBμV)		(dB)		(dBμV/m)		(dB)		(dBμV/m)	(dBμV/m)		(dBμV/m)		
14.0		**14.9**		**28.9**		**10**		**18.9**	**40.0**		**18.9**		**-21.1**

Deviations, Additions, or Exclusions: None

Notes:

(1) RF Conducted Port measurements include the fundamental up to the 10th harmonic of the fundamental – low, mid and high channels.

(2) All FCC Restricted Band measurements of the harmonics of the fundamental (spurious) taken at a 3-meter product-to-antenna test distance.

(3) HF antenna/harmonic mixer combination used for frequencies above 18GHz. Cable loss and antenna factors are combined in calibration and thus, correction factors.

(4) All measurements using peak detector – no duty cycle correction is applicable to this product.

6 Radiated Emissions – Unintentional and Spurious

6.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US1121 and our IC lab no. 2042N.

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	11/12/2009	11/12/2010
18660	Spectrum Analyzer Display Section (set 1)	Hewlett-Packard	85662A	2318A04983	11/12/2009	11/12/2010
18880	Q.P Adapter	Hewlett-Packard	85650A	2811A01300	11/12/2009	11/12/2010
18913	Spectrum Analyzer	Hewlett-Packard	E7405A	My44211889	05/07/2010	05/07/2011
18912	9 kHz- 1.3GHz Pre Amp	Hewlett-Packard	8447F	3113A05545	06/04/2010	06/04/2011
18906	Pre-Amplifier (1-4 GHz)	Mini-Circuits Lab	ZHL-42	N052792-2	06/11/2010	06/11/2011
18900	RF Pre-Amplifier (4-8 GHz)	Avantek	AFT97-8434-10F	1007	06/07/2010	06/07/2011
18897	Magnetic loop antenna 10kHz-30MHz	EMCO	6502	9205-2738	11/18/2010	11/18/2011
18798	Bicon Antenna 30 - 300 MHz	EMCO	3109	9801-3142	02/03/2010	02/03/2011
18808	Log Periodic Antenna	EMCO	3146	9203-3376	12/05/2009	12/05/2010
18886	Ridged Guide Antenna 1-18GHz	TENSOR	4105	2020	10/08/2010	10/08/2011
18805	HF Antenna/Harmonic Mixer 18 GHz to 26.5 GHz	Hewlett-Packard	11970K	2332A01280	10/04/2010	10/04/2011

6.3 Results:

The sample tested was found to Comply.

- FCC 15.209/ 15.247(d)
- IC RSS-210, Section 2.7, Tables 2 & 3

6.4 Setup Photographs:

Test setup – Field Strength Measurements (Front View)

Photo:

Test setup – Field Strength Measurements (Rear View)

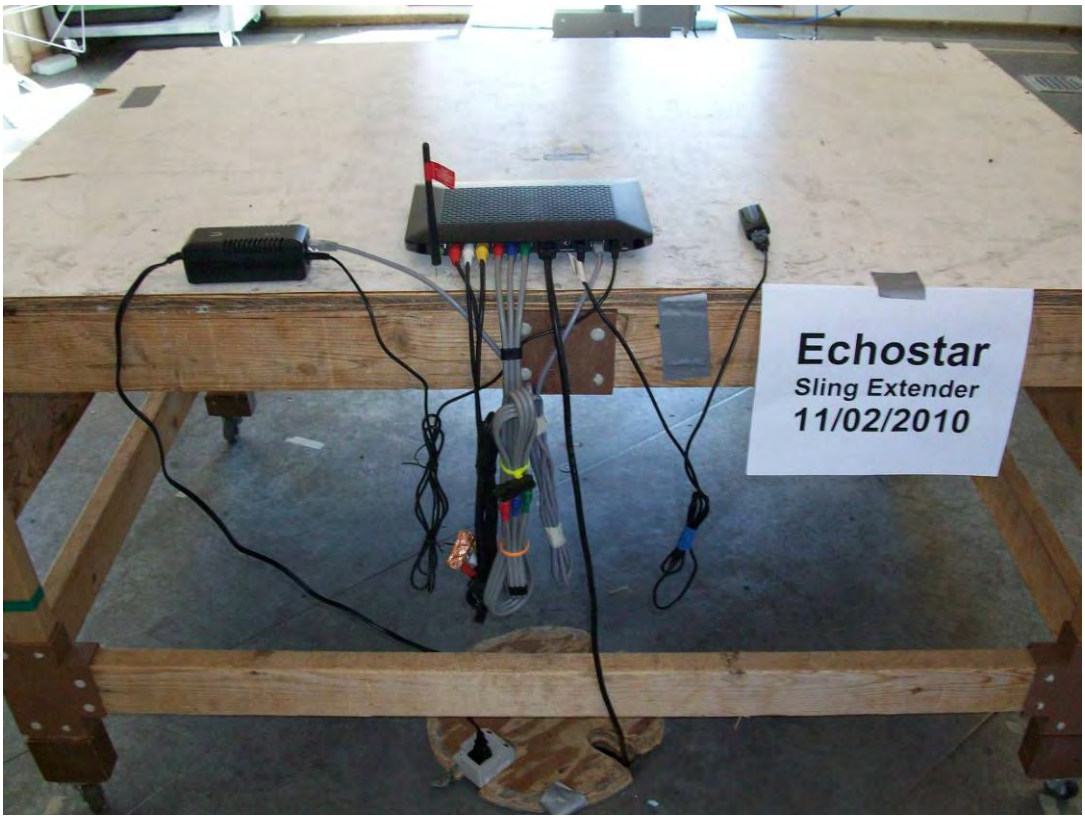
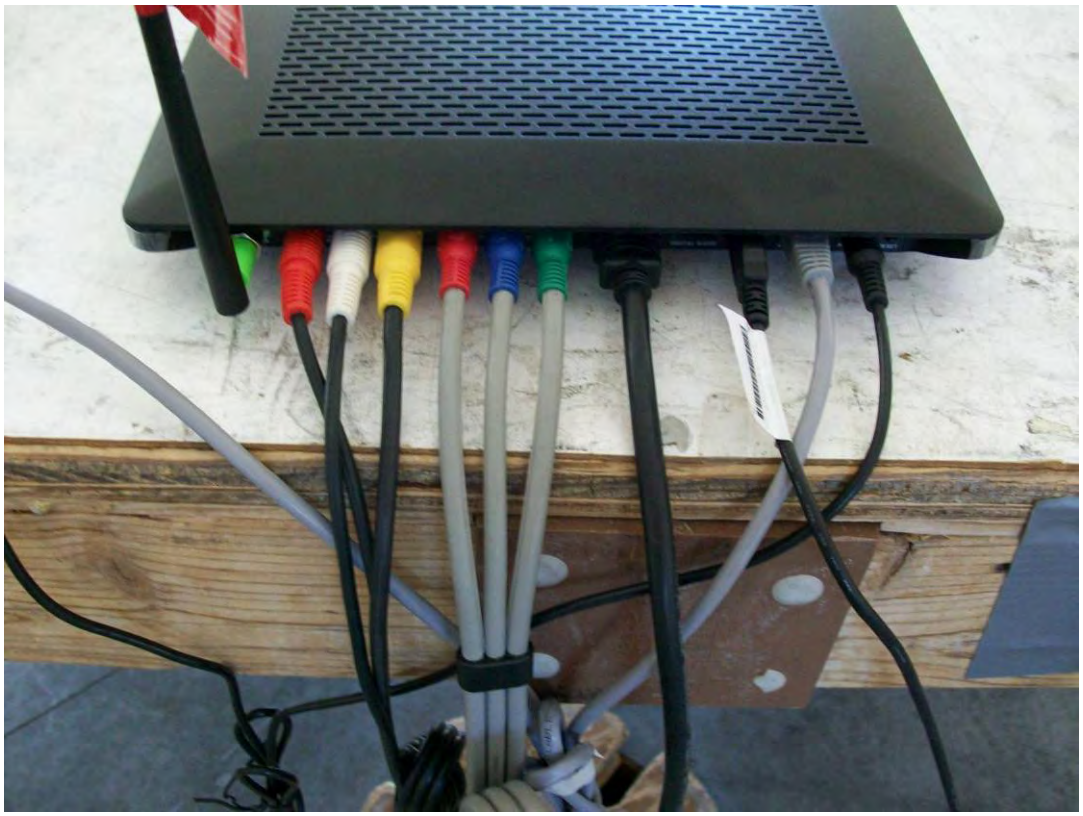
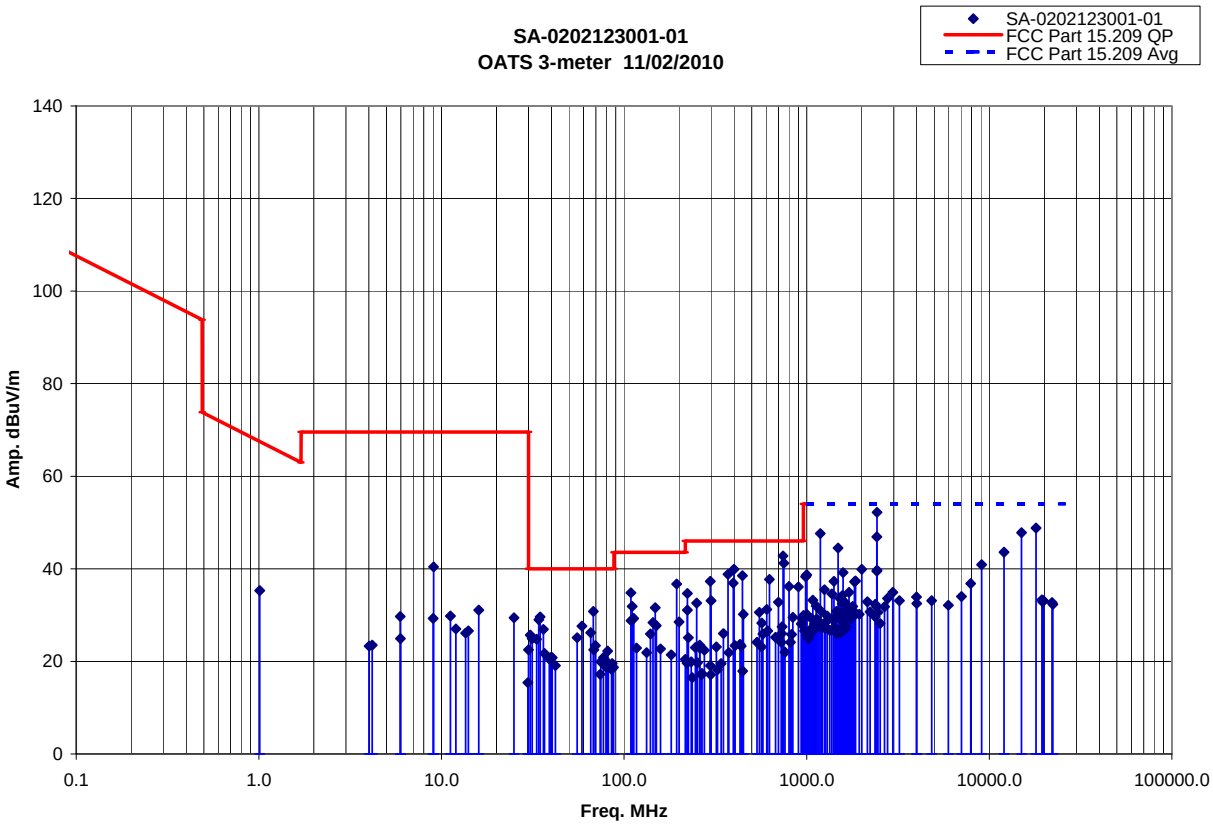


Photo:

Test setup – Field Strength Measurements (Rear View)



6.5 Plot Summary:



6.6 Test Data:

Radiated Electromagnetic Emissions
(Unintentional & Spurious)

Test Report #:	**500267071 Unintentional**	Test Area:	Pinewood Site 1 (3m)	Temperature:	25.8	°C
Test Method:	FCC Part 15.209	Test Date:	02-Nov-2010	Relative Humidity:	23.4	%
EUT Model #:	SA-0202123001-01	EUT Power:	Powered from Homeplug Ethernet Bridge	Air Pressure:	79.9	kPa
EUT Serial #:	AAKQNV00242J					
Manufacturer:	Echostar					
EUT Description:	Sling Extender - Placeshifting Receiver					

Notes: Homeplug Ethernet Bridge Input: 120VAC/60Hz

Lowest clock utilized in product: 1 MHz

Loop Antenna – 10kHz to 30MHz

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)	**FCC 15.209 <1GHz**	N/A
********** **Measurement Summary** **********						
9.06	**29.4 Qp**	**0.2 / 10.8 / 0.0**	**40.4**	**H / 1.0 / 267.0**	**-29.1**	**N/A**
1.01	24.8 Qp	0.1 / 10.4 / 0.0	35.3	V / 1.0 / 0.0	-32.2	N/A
16.01	20.2 Qp	0.3 / 10.6 / 0.0	31.1	H / 1.0 / 212.0	-38.4	N/A
11.21	18.9 Qp	0.2 / 10.8 / 0.0	29.8	V / 1.0 / 0.0	-39.7	N/A
5.94	19.0 Qp	0.1 / 10.6 / 0.0	29.7	H / 1.0 / 164.0	-39.8	N/A
24.98	19.4 Qp	0.5 / 9.6 / 0.0	29.4	H / 1.0 / 212.0	-40.1	N/A
9.01	18.2 Qp	0.2 / 10.8 / 0.0	29.3	H / 1.0 / 264.0	-40.2	N/A
12.00	16.0 Qp	0.3 / 10.7 / 0.0	27.0	H / 1.0 / 204.0	-42.5	N/A
14.06	15.7 Qp	0.3 / 10.6 / 0.0	26.6	V / 1.0 / 0.0	-42.9	N/A
13.55	15.2 Qp	0.3 / 10.7 / 0.0	26.1	V / 1.0 / 0.0	-43.4	N/A
5.97	14.2 Qp	0.1 / 10.6 / 0.0	24.9	V / 1.0 / 112.0	-44.6	N/A
4.17	12.7 Qp	0.2 / 10.6 / 0.0	23.5	V / 1.0 / 0.0	-46.0	N/A
4.02	12.6 Qp	0.2 / 10.6 / 0.0	23.3	H / 1.0 / 0.0	-46.2	N/A
29.70	6.7 Qp	0.5 / 8.2 / 0.0	15.4	V / 1.0 / 0.0	-54.1	N/A

Radiated Electromagnetic Emissions

Test Report #:	**500267071 Unintentional**	Test Area:	Pinewood Site 1 (3m)	Temperature:	25.8	°C
Test Method:	FCC Part 15.209	Test Date:	02-Nov-2010	Relative Humidity:	23.4	%
EUT Model #:	SA-0202123001-01	EUT Power:	Powered from Homeplug Ethernet Bridge	Air Pressure:	79.9	kPa
EUT Serial #:	AAKQNV00242J					
Manufacturer:	Echostar					
EUT Description:	Sling Extender - Placeshifting Receiver					
Notes:	Homeplug Ethernet Bridge Input: 120VAC/60Hz					

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

Biconical Antenna - 30MHz to 200MHz

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	**FCC 15.209 <1GHz**	N/A
********** **Measurement Summary** **********						
194.39	**48.8 Qp**	**1.5 / 13.7 / 27.3**	**36.7**	**H / 1.9 / 244.0**	**-6.8**	**N/A**
108.81	51.0 Qp	1.1 / 10.4 / 27.7	34.8	H / 1.7 / 348.0	-8.7	N/A
67.99	50.1 Qp	0.8 / 7.7 / 27.9	30.8	V / 1.0 / 0.0	-9.2	N/A
34.66	43.9 Qp	0.6 / 13.3 / 28.1	29.6	V / 1.0 / 0.0	-10.4	N/A
34.09	43.2 Qp	0.6 / 13.2 / 28.1	29.0	V / 1.0 / 0.0	-11.0	N/A
110.78	47.8 Qp	1.1 / 10.7 / 27.7	31.9	H / 1.8 / 145.0	-11.6	N/A
148.12	45.4 Qp	1.3 / 12.4 / 27.5	31.6	V / 1.0 / 180.0	-11.9	N/A
58.74	45.6 Qp	0.7 / 9.2 / 28.0	27.6	V / 1.0 / 180.0	-12.4	N/A
36.14	41.8 Qp	0.6 / 12.6 / 28.1	26.9	V / 1.0 / 0.0	-13.1	N/A
65.68	45.5 Qp	0.8 / 7.9 / 27.9	26.2	V / 1.0 / 0.0	-13.8	N/A
113.07	44.9 Qp	1.1 / 11.0 / 27.7	29.3	H / 1.6 / 180.0	-14.2	N/A
30.62	39.6 Qp	0.5 / 13.7 / 28.2	25.7	V / 1.0 / 0.0	-14.3	N/A
109.39	44.9 Qp	1.1 / 10.5 / 27.7	28.8	H / 1.6 / 180.0	-14.7	N/A
55.30	42.5 Qp	0.7 / 9.9 / 28.0	25.1	V / 1.0 / 90.0	-14.9	N/A
31.43	38.6 Qp	0.6 / 13.8 / 28.1	24.9	V / 1.0 / 0.0	-15.1	N/A
144.14	42.2 Qp	1.3 / 12.5 / 27.5	28.4	V / 1.0 / 180.0	-15.1	N/A
33.16	39.3 Qp	0.6 / 13.0 / 28.1	24.8	V / 1.0 / 0.0	-15.2	N/A
149.96	41.5 Qp	1.3 / 12.4 / 27.5	27.7	V / 1.0 / 180.0	-15.8	N/A
69.70	42.9 Qp	0.8 / 7.6 / 27.9	23.4	V / 1.0 / 0.0	-16.6	N/A
30.00	36.4 Qp	0.5 / 13.7 / 28.1	22.5	V / 1.0 / 0.0	-17.5	N/A
68.27	42.0 Qp	0.8 / 7.7 / 27.9	22.5	V / 1.0 / 90.0	-17.5	N/A
139.21	39.6 Qp	1.3 / 12.6 / 27.6	25.9	H / 1.6 / 180.0	-17.6	N/A
81.20	42.1 Qp	0.9 / 7.0 / 27.8	22.2	H / 1.6 / 0.0	-17.8	N/A
36.63	36.5 Qp	0.6 / 12.6 / 28.1	21.7	V / 1.0 / 0.0	-18.3	N/A
39.54	36.0 Qp	0.6 / 12.2 / 28.1	20.8	V / 1.0 / 0.0	-19.2	N/A

40.34	35.9 Qp	0.7 / 12.3 / 28.0	20.8	V / 1.0 / 0.0	-19.2	N/A
77.20	40.1 Qp	0.9 / 7.7 / 27.9	20.8	H / 1.6 / 0.0	-19.2	N/A
38.95	35.8 Qp	0.6 / 12.1 / 28.1	20.5	V / 1.0 / 0.0	-19.5	N/A
79.73	40.0 Qp	0.9 / 7.1 / 27.9	20.1	H / 1.6 / 0.0	-19.9	N/A
74.56	36.7 Qp	0.9 / 10.2 / 27.9	19.9	H / 1.6 / 0.0	-20.1	N/A
86.06	39.1 Qp	0.9 / 7.2 / 27.8	19.5	V / 1.0 / 270.0	-20.5	N/A
117.06	37.8 Qp	1.2 / 11.6 / 27.7	22.9	H / 1.6 / 180.0	-20.6	N/A
158.44	36.5 Qp	1.4 / 12.3 / 27.5	22.7	V / 1.0 / 90.0	-20.8	N/A
42.11	34.8 Qp	0.7 / 11.7 / 28.0	19.1	V / 1.0 / 0.0	-20.9	N/A
82.04	38.9 Qp	0.9 / 7.0 / 27.8	19.0	V / 1.0 / 270.0	-21.0	N/A
79.97	38.6 Qp	0.9 / 7.0 / 27.9	18.7	H / 1.6 / 0.0	-21.3	N/A
87.47	38.2 Qp	1.0 / 7.4 / 27.8	18.7	H / 1.6 / 0.0	-21.3	N/A
132.94	36.0 Qp	1.2 / 12.3 / 27.6	21.9	V / 1.0 / 0.0	-21.6	N/A
85.49	38.0 Qp	0.9 / 7.2 / 27.8	18.3	V / 1.0 / 180.0	-21.7	N/A
180.96	34.6 Qp	1.4 / 12.8 / 27.4	21.4	V / 1.0 / 90.0	-22.1	N/A
73.93	35.2 Qp	0.8 / 9.0 / 27.9	17.2	H / 1.6 / 0.0	-22.8	N/A

Radiated Electromagnetic Emissions

Test Report #:	**500267071 Unintentional**	Test Area:	Pinewood Site 1 (3m)	Temperature:	25.8	°C
Test Method:	FCC Part 15.209	Test Date:	02-Nov-2010	Relative Humidity:	23.4	%
EUT Model #:	SA-0202123001-01	EUT Power:	Powered from Homeplug Ethernet Bridge	Air Pressure:	79.9	kPa
EUT Serial #:	AAKQNV00242J					
Manufacturer:	Echostar					
EUT Description:	Sling Extender - Placeshifting Receiver					

Notes: Homeplug Ethernet Bridge Input: 120VAC/60Hz

Highest clock utilized in product: 24GHz

Log Periodic Antenna, Horn Antenna & Harmonic Mixer - 200MHz to 26.5GHz

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)	**FCC 15.209 <1GHz**	**FCC 15.209 >1GHz**
********** Measurement Summary **********						
2428.39	58.4 Av	3.2 / 28.3 / 37.7	52.2	V / 1.5 / 34.0	N/A	-1.8
741.73	46.6 Qp	3.2 / 20.9 / 28.0	42.8	V / 1.3 / 182.0	-3.2	N/A
749.97	45.0 Qp	3.2 / 20.9 / 28.0	41.2	H / 1.2 / 348.0	-4.8	N/A
17996.3	37.9 Av	12.0 / 44.2 / 45.3	48.8	V / 1.0 / 0.0	N/A	-5.2
399.96	50.0 Qp	2.2 / 15.4 / 27.6	39.9	V / 1.5 / 188.0	-6.1	N/A
15005.9	40.5 Av	11.0 / 43.6 / 47.4	47.8	V / 1.0 / 0.0	N/A	-6.2
1187.97	58.1 Av	2.2 / 24.6 / 37.3	47.6	V / 1.2 / 8.0	N/A	-6.4
2421.40	53.0 Av	3.2 / 28.3 / 37.6	46.9	V / 1.4 / 48.0	N/A	-7.1
370.84	49.4 Qp	2.1 / 14.8 / 27.4	38.8	V / 1.2 / 124.0	-7.2	N/A
445.03	47.5 Qp	2.4 / 16.5 / 27.9	38.5	V / 1.2 / 316.0	-7.5	N/A
624.97	43.7 Qp	3.0 / 19.2 / 28.2	37.7	H / 1.4 / 48.0	-8.3	N/A
296.66	47.2 Qp	1.9 / 15.2 / 27.0	37.3	V / 1.4 / 186.0	-8.7	N/A
395.96	47.0 Qp	2.2 / 15.3 / 27.6	36.9	V / 3.1 / 280.0	-9.1	N/A
1483.48	53.6 Av	2.5 / 25.1 / 36.7	44.5	V / 1.1 / 358.0	N/A	-9.5
799.97	39.5 Qp	3.3 / 21.2 / 27.8	36.2	V / 1.0 / 90.0	-9.8	N/A
899.96	37.5 Qp	3.6 / 22.5 / 27.5	36.1	H / 1.6 / 180.0	-9.9	N/A
12026.5	39.9 Av	9.6 / 39.7 / 45.6	43.6	V / 1.0 / 0.0	N/A	-10.4
222.48	49.4 Qp	1.6 / 10.9 / 27.2	34.7	H / 1.4 / 212.0	-11.3	N/A
299.96	43.5 Qp	1.9 / 14.7 / 27.0	33.1	V / 1.5 / 168.0	-12.9	N/A
9067.69	42.8 Av	8.4 / 37.1 / 47.4	40.9	V / 1.0 / 0.0	N/A	-13.1
699.97	36.6 Qp	3.3 / 20.9 / 28.1	32.8	V / 1.1 / 350.0	-13.2	N/A
249.99	46.0 Qp	1.7 / 11.9 / 27.1	32.6	H / 1.3 / 212.0	-13.4	N/A
2002.72	46.9 Av	3.0 / 27.3 / 37.3	39.9	V / 1.2 / 212.0	N/A	-14.1
2430.39	45.8 Av	3.2 / 28.3 / 37.7	39.7	V / 1.6 / 30.0	N/A	-14.3
2419.40	45.6 Av	3.2 / 28.3 / 37.6	39.5	V / 1.7 / 352.0	N/A	-14.5
604.76	37.6 Qp	2.9 / 18.8 / 28.2	31.2	V / 1.1 / 32.0	-14.8	N/A
1583.96	48.0 Av	2.6 / 25.4 / 36.8	39.2	V / 1.6 / 5.0	N/A	-14.8

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	**FCC 15.209 <1GHz**	**FCC 15.209 >1GHz**
222.54	45.8 Qp	1.6 / 10.9 / 27.2	31.1	H / 1.6 / 0.0	-14.9	N/A
200.00	43.1 Qp	1.5 / 11.2 / 27.3	28.5	V / 1.0 / 124.0	-15.0	N/A
1000.00	48.5 Av	3.7 / 23.7 / 37.3	38.7	H / 1.1 / 48.0	N/A	-15.3
549.97	38.0 Qp	2.6 / 18.1 / 28.2	30.6	V / 1.0 / 0.0	-15.4	N/A
993.57	38.4 Qp	3.7 / 23.6 / 27.1	38.5	V / 1.0 / 0.0	-15.5	N/A
986.37	38.3 Qp	3.7 / 23.5 / 27.2	38.3	V / 1.0 / 0.0	-15.7	N/A
449.97	39.0 Qp	2.4 / 16.6 / 27.9	30.2	V / 1.0 / 90.0	-15.8	N/A
959.97	30.5 Qp	3.7 / 23.0 / 27.3	29.9	V / 1.0 / 270.0	-16.1	N/A
839.96	32.0 Qp	3.4 / 21.8 / 27.6	29.5	V / 1.0 / 180.0	-16.5	N/A
1854.36	44.6 Av	2.9 / 27.0 / 37.1	37.4	V / 1.4 / 20.0	N/A	-16.6
1409.31	46.5 Av	2.4 / 25.2 / 36.8	37.3	V / 1.1 / 12.0	N/A	-16.7
949.96	30.1 Qp	3.7 / 22.8 / 27.4	29.2	V / 1.0 / 0.0	-16.8	N/A
1826.65	44.4 Av	2.8 / 27.0 / 37.1	37.2	V / 1.0 / 180.0	N/A	-16.8
7906.66	32.1 Av	7.6 / 36.6 / 39.5	36.8	V / 1.0 / 0.0	N/A	-17.2
566.97	35.5 Qp	2.7 / 18.3 / 28.2	28.3	V / 1.0 / 270.0	-17.7	N/A
933.30	29.2 Qp	3.7 / 22.7 / 27.4	28.1	V / 1.0 / 0.0	-17.9	N/A
733.29	31.4 Qp	3.2 / 20.9 / 28.0	27.5	H / 1.6 / 0.0	-18.5	N/A
1249.98	45.6 Av	2.2 / 24.8 / 37.2	35.5	V / 1.0 / 90.0	N/A	-18.5
1706.02	42.9 Av	2.7 / 26.2 / 36.9	34.9	V / 1.0 / 0.0	N/A	-19.1
2967.01	38.6 Av	3.7 / 30.0 / 37.5	34.9	V / 1.0 / 0.0	N/A	-19.1
611.98	32.9 Qp	2.9 / 19.0 / 28.2	26.6	V / 1.0 / 0.0	-19.4	N/A
1374.97	44.0 Av	2.4 / 25.1 / 36.9	34.6	V / 1.0 / 90.0	N/A	-19.4
1565.96	43.1 Av	2.6 / 25.3 / 36.8	34.2	V / 1.0 / 180.0	N/A	-19.8
349.97	36.8 Qp	2.1 / 14.5 / 27.3	26.0	V / 1.0 / 90.0	-20.0	N/A
728.97	29.9 Qp	3.2 / 20.9 / 28.0	26.0	V / 1.0 / 0.0	-20.0	N/A
7032.45	31.4 Av	7.1 / 35.6 / 40.1	34.0	V / 1.0 / 0.0	N/A	-20.0
575.97	33.0 Qp	2.8 / 18.4 / 28.2	25.9	H / 1.6 / 90.0	-20.1	N/A
3996.22	33.2 Av	4.7 / 32.7 / 36.9	33.9	V / 1.0 / 0.0	N/A	-20.1
826.16	28.6 Qp	3.3 / 21.5 / 27.7	25.8	V / 1.0 / 0.0	-20.2	N/A
1511.98	42.8 Av	2.5 / 25.2 / 36.7	33.7	V / 1.0 / 180.0	N/A	-20.3
2771.96	38.3 Av	3.5 / 29.2 / 37.5	33.6	V / 1.0 / 270.0	N/A	-20.4
674.97	29.4 Qp	3.1 / 20.9 / 28.1	25.2	V / 1.0 / 0.0	-20.8	N/A
1079.97	44.2 Av	2.1 / 24.2 / 37.3	33.2	V / 1.0 / 0.0	N/A	-20.8
224.97	39.6 Qp	1.6 / 11.0 / 27.2	25.1	H / 1.6 / 0.0	-20.9	N/A
3215.97	35.1 Av	4.0 / 31.3 / 37.4	33.1	V / 1.0 / 0.0	N/A	-20.9
4827.23	33.5 Av	5.6 / 33.2 / 39.2	33.1	V / 1.0 / 0.0	N/A	-20.9
2151.07	39.6 Av	3.1 / 27.6 / 37.4	32.9	V / 1.0 / 0.0	N/A	-21.1
1619.96	41.3 Av	2.6 / 25.5 / 36.8	32.7	V / 1.0 / 180.0	N/A	-21.3
1566.64	41.4 Av	2.6 / 25.3 / 36.8	32.5	V / 1.0 / 180.0	N/A	-21.5
4005.58	33.3 Av	4.8 / 32.7 / 38.2	32.5	V / 1.0 / 0.0	N/A	-21.5
2375.97	38.5 Av	3.2 / 28.3 / 37.6	32.3	V / 1.0 / 0.0	N/A	-21.7
533.29	31.8 Qp	2.6 / 17.9 / 28.2	24.1	V / 1.0 / 0.0	-21.9	N/A
724.97	28.1 Qp	3.2 / 20.9 / 28.0	24.1	V / 1.0 / 0.0	-21.9	N/A
815.92	27.1 Qp	3.3 / 21.4 / 27.7	24.1	V / 1.0 / 0.0	-21.9	N/A
5960.79	30.6 Av	6.2 / 34.4 / 39.1	32.1	V / 1.0 / 0.0	N/A	-21.9
1124.98	42.8 Av	2.1 / 24.4 / 37.3	32.0	V / 1.0 / 0.0	N/A	-22.0

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	**FCC 15.209 <1GHz**	**FCC 15.209 >1GHz**
1785.58	39.1 Av	2.8 / 27.0 / 37.0	31.9	V / 1.0 / 0.0	N/A	-22.1
2411.97	37.9 Av	3.2 / 28.3 / 37.6	31.8	V / 1.0 / 0.0	N/A	-22.2
2670.30	36.8 Av	3.4 / 29.1 / 37.5	31.8	V / 1.0 / 270.0	N/A	-22.2
431.96	33.0 Qp	2.3 / 16.2 / 27.8	23.7	V / 1.0 / 270.0	-22.3	N/A
259.83	36.2 Qp	1.8 / 12.5 / 27.1	23.5	V / 1.0 / 180.0	-22.5	N/A
404.97	33.4 Qp	2.2 / 15.5 / 27.6	23.4	H / 1.6 / 0.0	-22.6	N/A
437.36	32.5 Qp	2.4 / 16.3 / 27.9	23.3	V / 1.0 / 90.0	-22.7	N/A
1699.97	39.2 Av	2.7 / 26.1 / 36.9	31.2	V / 1.0 / 0.0	N/A	-22.8
319.95	33.4 Qp	2.0 / 14.9 / 27.1	23.1	H / 1.6 / 180.0	-22.9	N/A
566.63	30.4 Qp	2.7 / 18.3 / 28.2	23.1	V / 1.0 / 0.0	-22.9	N/A
245.30	36.7 Qp	1.7 / 11.6 / 27.1	23.0	H / 1.6 / 180.0	-23.0	N/A
215.96	35.0 Qp	1.6 / 11.0 / 27.2	20.4	V / 1.0 / 0.0	-23.1	N/A
260.21	35.6 Qp	1.8 / 12.6 / 27.1	22.9	V / 1.0 / 180.0	-23.1	N/A
1780.19	38.1 Av	2.8 / 27.0 / 37.0	30.9	V / 1.0 / 0.0	N/A	-23.1
1799.97	38.1 Av	2.8 / 27.1 / 37.0	30.9	V / 1.0 / 90.0	N/A	-23.1
1199.97	41.2 Av	2.2 / 24.7 / 37.3	30.8	V / 1.0 / 0.0	N/A	-23.2
1457.97	40.0 Av	2.5 / 25.1 / 36.7	30.8	V / 1.0 / 180.0	N/A	-23.2
1778.36	38.0 Av	2.8 / 27.0 / 37.0	30.8	V / 1.0 / 0.0	N/A	-23.2
1557.66	39.6 Av	2.6 / 25.3 / 36.8	30.7	V / 1.0 / 180.0	N/A	-23.3
2225.25	37.2 Av	3.1 / 27.8 / 37.5	30.7	V / 1.0 / 270.0	N/A	-23.3
1633.31	39.1 Av	2.6 / 25.6 / 36.8	30.6	V / 1.0 / 0.0	N/A	-23.4
2455.68	36.8 Av	3.2 / 28.3 / 37.7	30.6	V / 1.0 / 180.0	N/A	-23.4
274.97	34.1 Qp	1.8 / 13.5 / 27.0	22.4	H / 1.6 / 0.0	-23.6	N/A
1000.76	41.8 Av	2.0 / 23.7 / 37.3	30.2	V / 1.0 / 180.0	N/A	-23.8
1943.97	36.8 Av	2.9 / 27.6 / 37.2	30.2	V / 1.0 / 180.0	N/A	-23.8
761.36	25.8 Qp	3.2 / 21.0 / 27.9	22.0	V / 1.0 / 90.0	-24.0	N/A
1499.97	39.0 Av	2.5 / 25.2 / 36.7	30.0	V / 1.0 / 0.0	N/A	-24.0
1538.96	39.0 Av	2.5 / 25.2 / 36.8	30.0	V / 1.0 / 180.0	N/A	-24.0
374.96	32.4 Qp	2.1 / 14.8 / 27.5	21.9	H / 1.6 / 0.0	-24.1	N/A
1624.98	38.5 Av	2.6 / 25.6 / 36.8	29.9	V / 1.0 / 180.0	N/A	-24.1
1295.97	39.6 Av	2.3 / 25.0 / 37.1	29.8	V / 1.0 / 90.0	N/A	-24.2
1439.96	38.9 Av	2.4 / 25.1 / 36.8	29.7	V / 1.0 / 180.0	N/A	-24.3
979.17	29.9 Qp	3.7 / 23.2 / 27.2	29.6	V / 1.0 / 0.0	-24.4	N/A
1673.96	37.9 Av	2.7 / 25.9 / 36.8	29.6	V / 1.0 / 180.0	N/A	-24.4
2374.97	35.7 Av	3.2 / 28.3 / 37.6	29.6	V / 1.0 / 0.0	N/A	-24.4
1599.97	38.1 Av	2.6 / 25.4 / 36.8	29.4	V / 1.0 / 0.0	N/A	-24.6
1766.65	36.7 Av	2.8 / 26.9 / 37.0	29.4	V / 1.0 / 0.0	N/A	-24.6
1727.97	36.9 Av	2.7 / 26.5 / 36.9	29.3	V / 1.0 / 0.0	N/A	-24.7
1066.63	40.3 Av	2.1 / 24.1 / 37.3	29.2	V / 1.0 / 270.0	N/A	-24.8
1133.29	39.9 Av	2.1 / 24.4 / 37.3	29.1	V / 1.0 / 0.0	N/A	-24.9
1133.98	39.8 Av	2.1 / 24.4 / 37.3	29.1	V / 1.0 / 0.0	N/A	-24.9
1150.16	39.4 Av	2.2 / 24.5 / 37.3	28.8	V / 1.0 / 0.0	N/A	-25.2
1403.98	38.1 Av	2.4 / 25.2 / 36.8	28.8	V / 1.0 / 270.0	N/A	-25.2
1166.38	39.1 Av	2.2 / 24.6 / 37.3	28.5	V / 1.0 / 0.0	N/A	-25.5

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	**FCC 15.209 <1GHz**	**FCC 15.209 >1GHz**
1592.96	37.2 Av	2.6 / 25.4 / 36.8	28.5	V / 1.0 / 180.0	N/A	-25.5
1260.96	38.5 Av	2.3 / 24.9 / 37.2	28.4	V / 1.0 / 0.0	N/A	-25.6
2521.95	34.1 Av	3.3 / 28.6 / 37.7	28.2	V / 1.0 / 0.0	N/A	-25.8
1101.56	39.0 Av	2.1 / 24.2 / 37.3	28.1	V / 1.0 / 0.0	N/A	-25.9
1117.77	38.9 Av	2.1 / 24.3 / 37.3	28.0	V / 1.0 / 0.0	N/A	-26.0
233.30	34.1 Qp	1.6 / 11.3 / 27.2	19.9	V / 1.0 / 270.0	-26.1	N/A
1160.97	38.5 Av	2.2 / 24.5 / 37.3	27.9	V / 1.0 / 0.0	N/A	-26.1
252.12	33.0 Qp	1.7 / 12.1 / 27.1	19.7	V / 1.0 / 0.0	-26.3	N/A
221.28	34.3 Qp	1.6 / 11.0 / 27.2	19.6	H / 1.6 / 0.0	-26.4	N/A
340.17	30.4 Qp	2.0 / 14.4 / 27.2	19.5	V / 1.0 / 0.0	-26.5	N/A
1253.53	37.6 Av	2.3 / 24.8 / 37.2	27.5	V / 1.0 / 0.0	N/A	-26.5
1266.63	37.5 Av	2.3 / 24.9 / 37.1	27.4	V / 1.0 / 270.0	N/A	-26.6
1646.98	35.8 Av	2.6 / 25.7 / 36.8	27.4	V / 1.0 / 0.0	N/A	-26.6
1112.60	38.1 Av	2.1 / 24.3 / 37.3	27.3	V / 1.0 / 0.0	N/A	-26.7
1214.98	37.6 Av	2.2 / 24.7 / 37.3	27.3	V / 1.0 / 0.0	N/A	-26.7
1433.31	36.4 Av	2.4 / 25.1 / 36.8	27.2	V / 1.0 / 180.0	N/A	-26.8
296.05	28.9 Qp	1.9 / 15.3 / 26.9	19.1	V / 1.0 / 0.0	-26.9	N/A
1263.55	37.1 Av	2.3 / 24.9 / 37.2	27.1	V / 1.0 / 0.0	N/A	-26.9
1631.83	35.6 Av	2.6 / 25.6 / 36.8	27.1	V / 1.0 / 0.0	N/A	-26.9
1049.97	38.0 Av	2.0 / 24.1 / 37.3	26.9	V / 1.0 / 90.0	N/A	-27.1
1106.97	37.9 Av	2.1 / 24.3 / 37.3	26.9	V / 1.0 / 0.0	N/A	-27.1
1085.37	37.9 Av	2.1 / 24.2 / 37.3	26.8	V / 1.0 / 0.0	N/A	-27.2
1533.30	35.9 Av	2.5 / 25.2 / 36.8	26.8	V / 1.0 / 0.0	N/A	-27.2
1335.14	36.4 Av	2.3 / 25.0 / 37.0	26.7	V / 1.0 / 0.0	N/A	-27.3
971.96	27.0 Qp	3.7 / 23.1 / 27.2	26.6	V / 1.0 / 180.0	-27.4	N/A
1053.00	37.4 Av	2.1 / 24.1 / 37.3	26.3	V / 1.0 / 90.0	N/A	-27.7
1549.97	35.3 Av	2.5 / 25.2 / 36.8	26.3	V / 1.0 / 0.0	N/A	-27.7
324.95	28.7 Qp	2.0 / 14.6 / 27.1	18.2	V / 1.0 / 0.0	-27.8	N/A
1036.77	37.4 Av	2.0 / 24.0 / 37.3	26.2	V / 1.0 / 0.0	N/A	-27.8
446.39	26.9 Qp	2.4 / 16.5 / 27.9	17.9	V / 1.0 / 0.0	-28.1	N/A
998.97	25.8 Qp	3.7 / 23.6 / 27.1	25.9	H / 1.6 / 0.0	-28.1	N/A
1466.64	35.0 Av	2.5 / 25.1 / 36.7	25.9	V / 1.0 / 0.0	N/A	-28.1
1025.96	37.1 Av	2.0 / 23.9 / 37.3	25.8	H / 1.0 / 0.0	N/A	-28.2
266.69	29.6 Qp	1.8 / 13.0 / 27.0	17.4	V / 1.0 / 0.0	-28.6	N/A
1007.98	36.6 Av	2.0 / 23.8 / 37.3	25.2	V / 1.0 / 0.0	N/A	-28.8
265.21	29.4 Qp	1.8 / 12.9 / 27.0	17.1	V / 1.0 / 0.0	-28.9	N/A
297.60	27.1 Qp	1.9 / 15.1 / 27.0	17.1	V / 1.0 / 0.0	-28.9	N/A
1020.57	36.3 Av	2.0 / 23.9 / 37.3	24.9	V / 1.0 / 0.0	N/A	-29.1
235.99	30.8 Qp	1.7 / 11.3 / 27.1	16.5	V / 1.0 / 0.0	N/A	-29.5
Harmonic Mixer Data 18GHz to 26.5GHz – No signals found: Noise Floor						
19400.2	11.1 Pk	0.0 / 22.2 / 0.0	33.3	V / 1.0 / 0.0	N/A	-20.7
19800.7	11.3 Pk	0.0 / 21.8 / 0.0	33.1	V / 1.0 / 0.0	N/A	-20.9
19600.6	10.9 Pk	0.0 / 22.0 / 0.0	32.9	V / 1.0 / 0.0	N/A	-21.1
22050.4	11.4 Pk	0.0 / 21.3 / 0.0	32.7	V / 1.0 / 0.0	N/A	-21.3
22275.2	11.2 Pk	0.0 / 21.1 / 0.0	32.3	V / 1.0 / 0.0	N/A	-21.7

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 are Field Strength measurements taken at 3-meter product-to-antenna.

(2) Quasi-peak detector measurements up to 1GHz – Average detector measurements above 1 GHz.

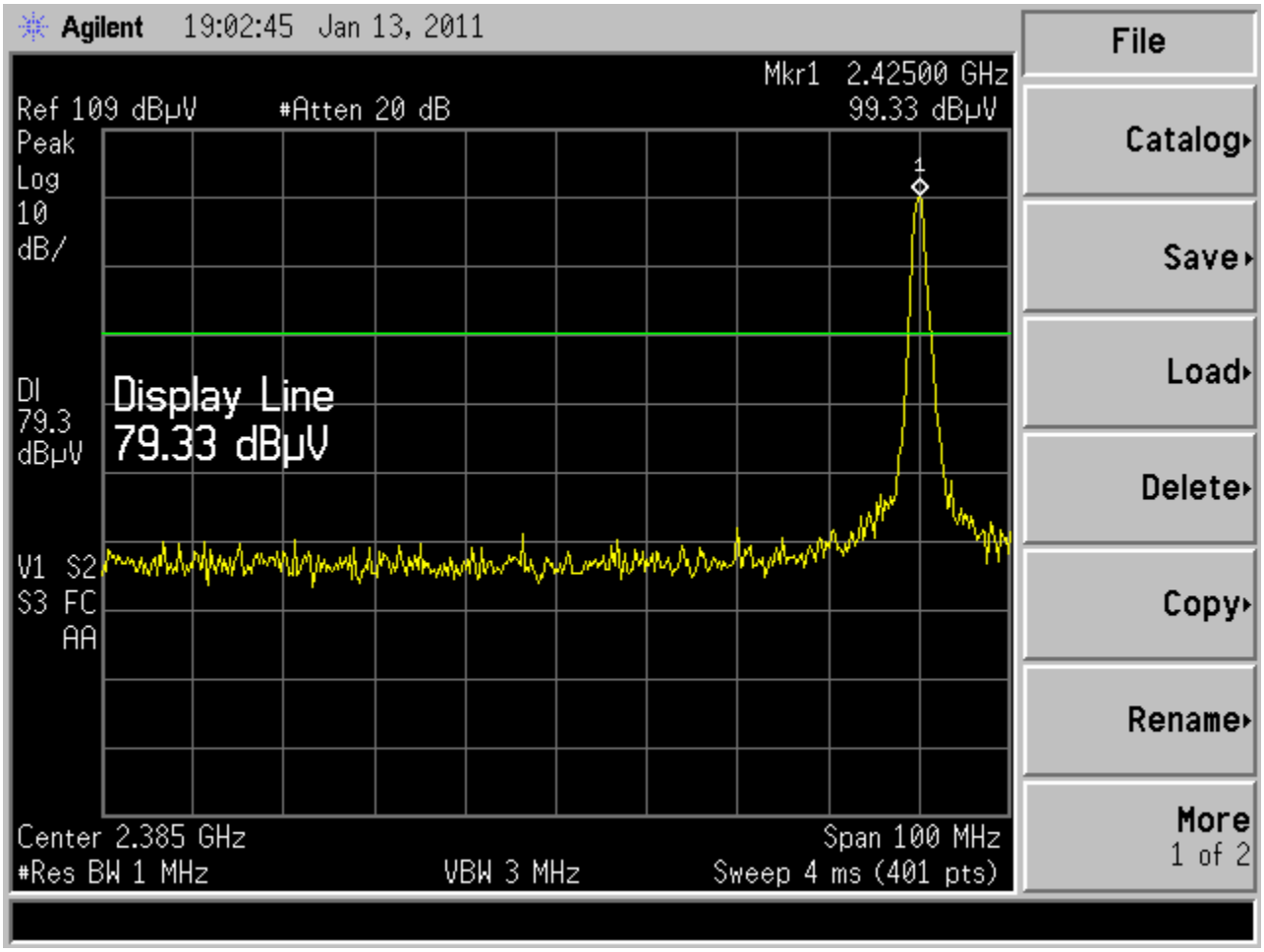
(3) Worst-case Band Edge Radiated Field Strength measurement: Low Channel

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	FCC 15.209 <1GHz	FCC 15.209 >1GHz
2421.40	53.0 Av	3.2 / 28.3 / 37.6	46.9	V / 1.4 / 48.0	N/A	-7.1

Deviations, Additions, or Exclusions: None

Band Edge – Low Channel

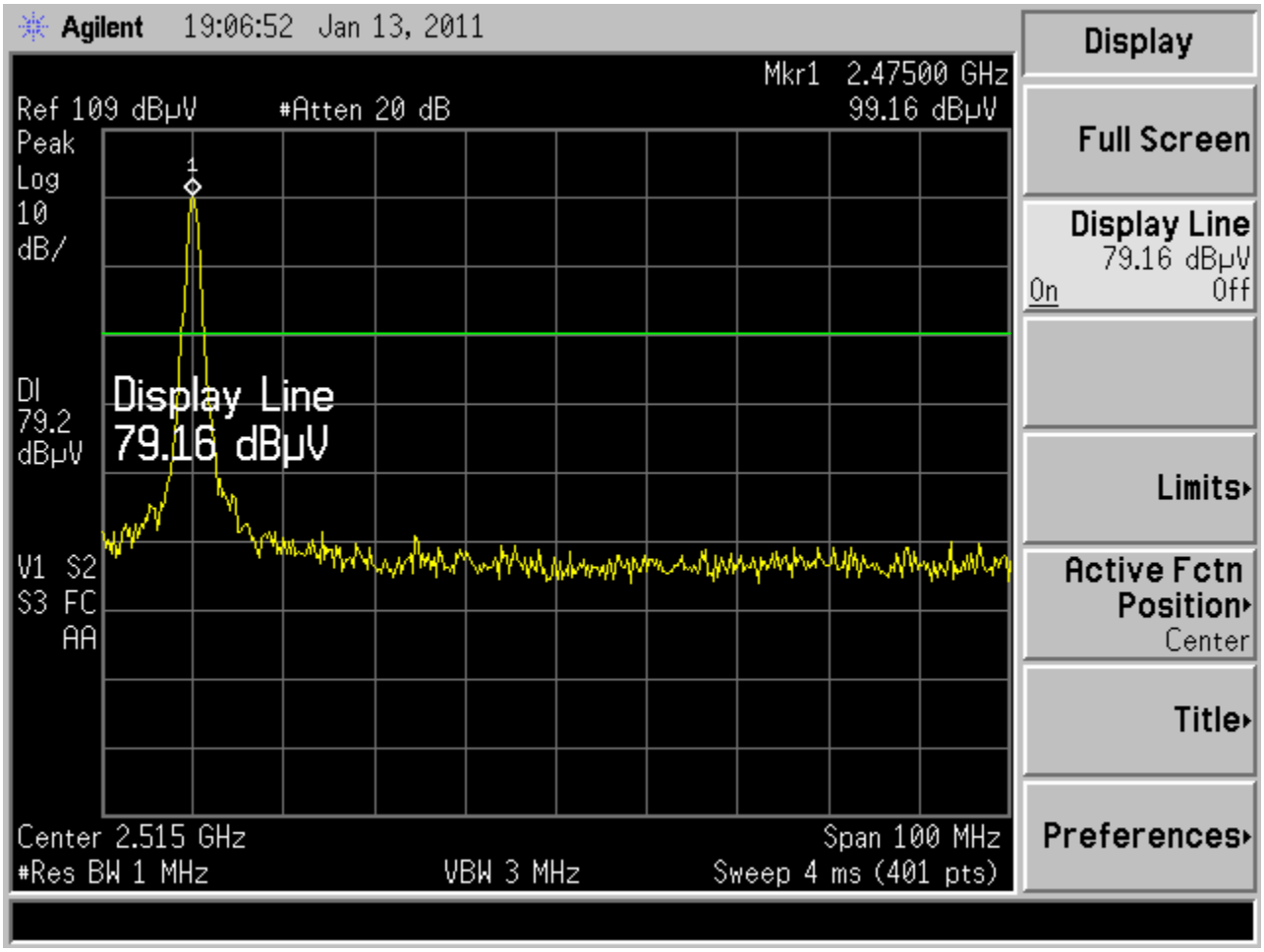
FCC 15.247(d) / RSS-210 A8.5



Specification: Spurious Emissions -20 dBc

Band Edge – High Channel

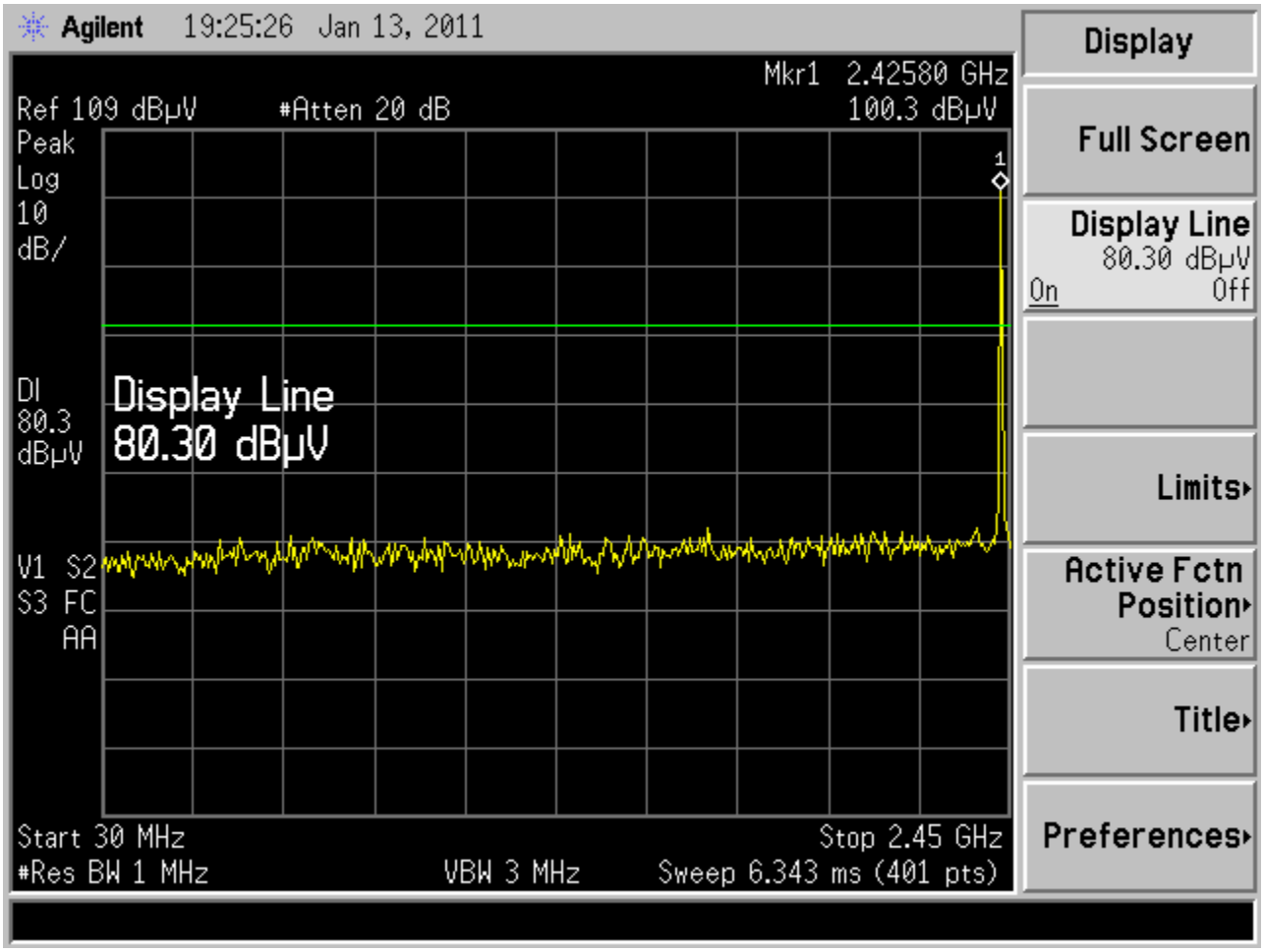
FCC 15.247(d) / RSS-210 A8.5



Specification: Spurious Emissions -20 dBc

Spurious Emissions – 30MHz to 2.4 GHz

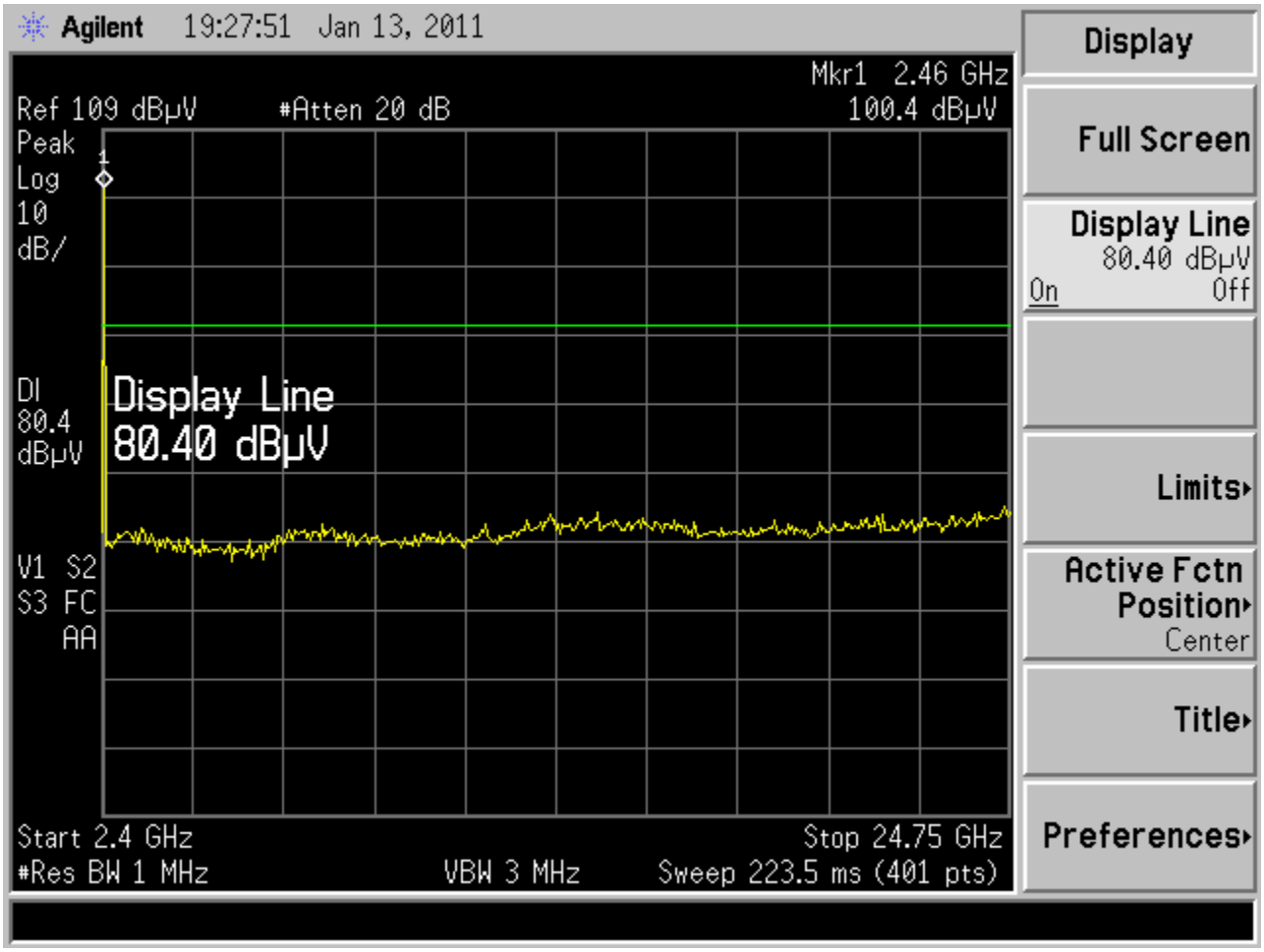
FCC 15.247(d) / RSS-210 A8.5



Specification: Spurious Emissions -20 dBc

Spurious Emissions – 2.4 GHz to 24.475 GHz

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



Specification: Spurious Emissions -20 dBc

7 6dB Bandwidth

7.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US1121 and our IC lab no. 2042N.

7.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18913	Spectrum Analyzer with Pre-Amp	Hewlett-Packard	E7405A	My44211889	05/11/2010	05/11/2011

7.3 Results:

The sample tested was found to Comply.

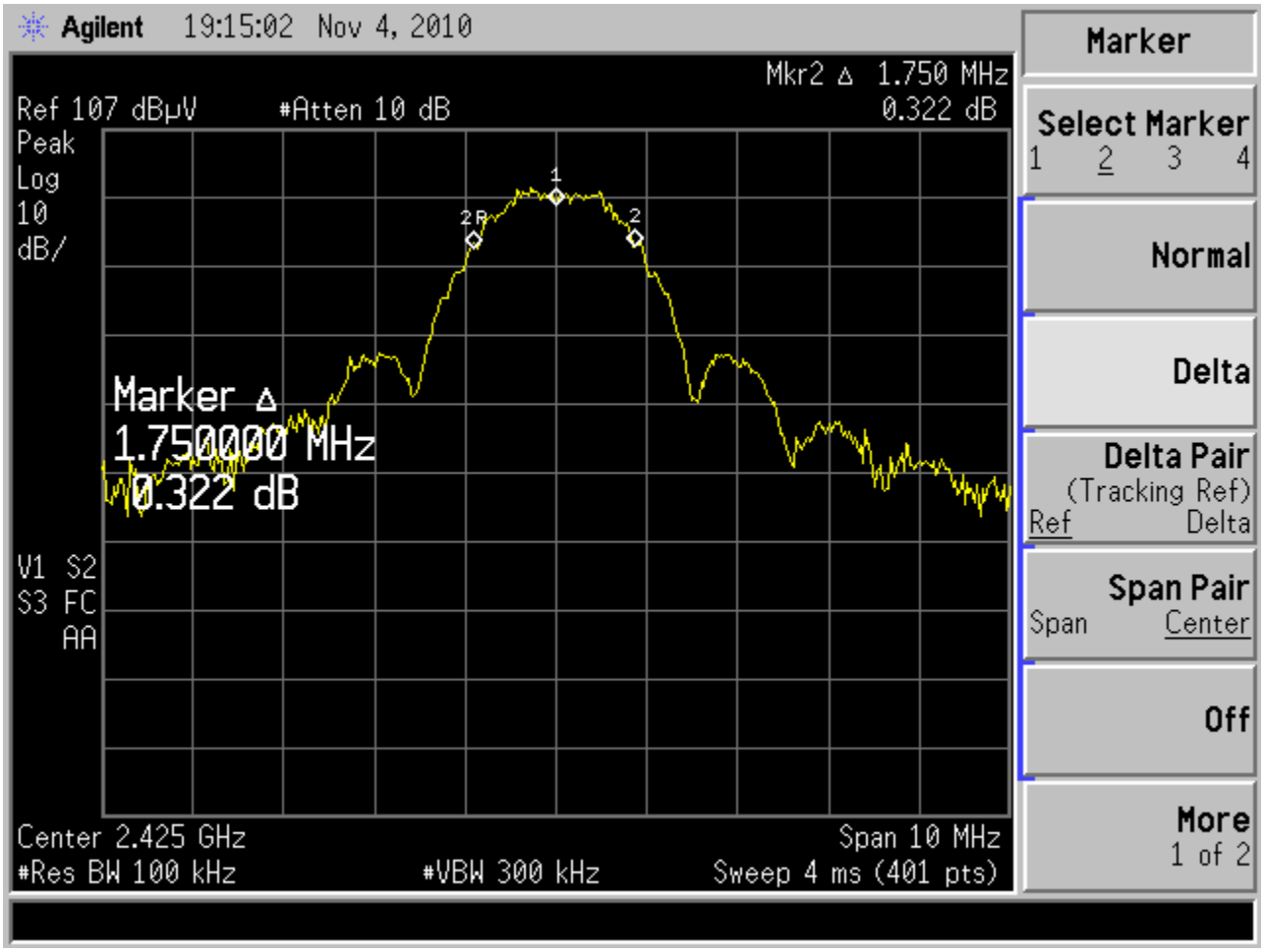
- FCC 15.247 (a)(2)
- IC RSS-210 A8.2(a)

7.4 Test Data:

6 dB Bandwidth

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

Channel 1 – 2.425 GHz

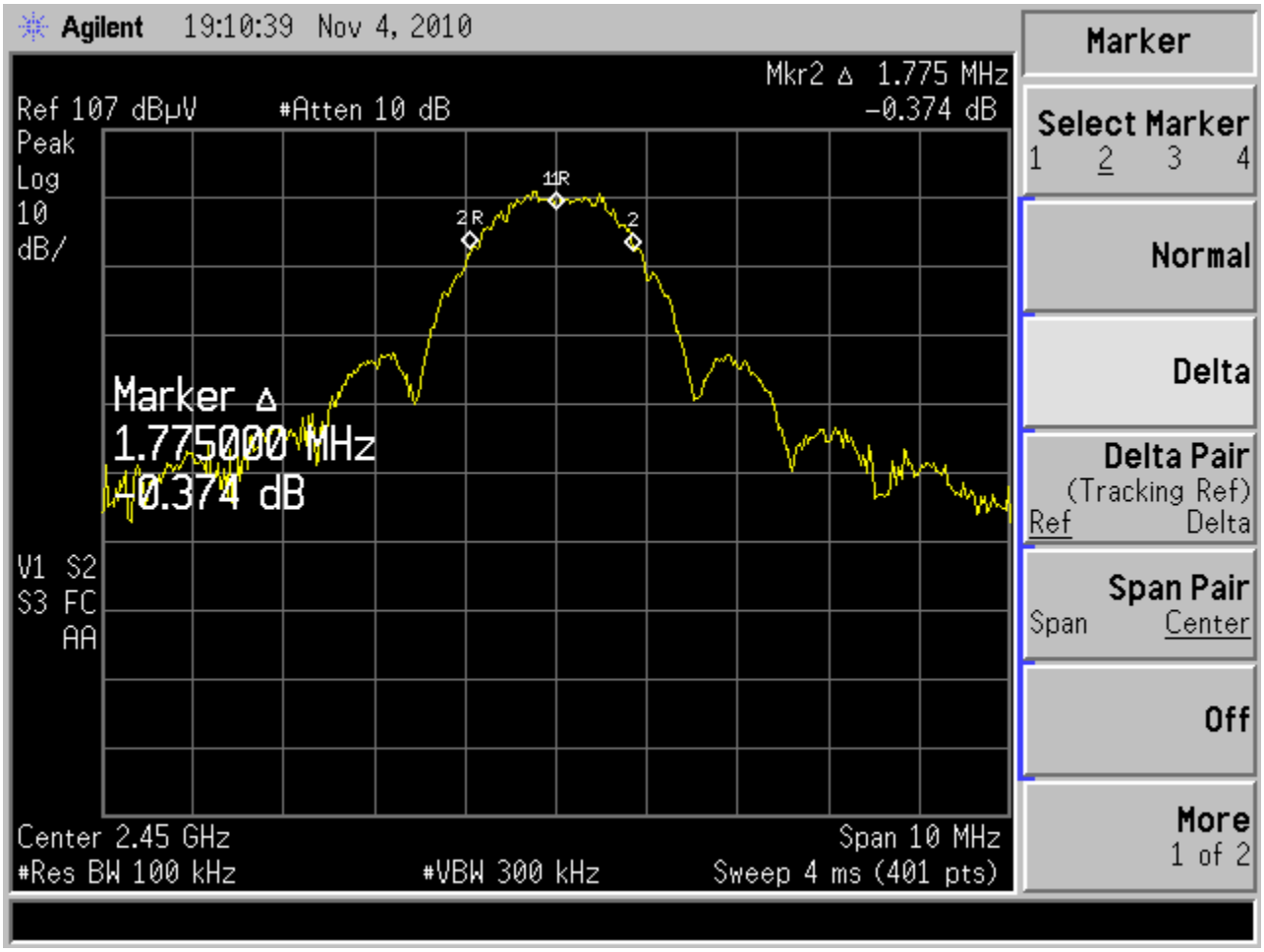


Specification: 6dB Bandwidth > 500 kHz

6 dB Bandwidth

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

Channel 2 – 2.450 GHz

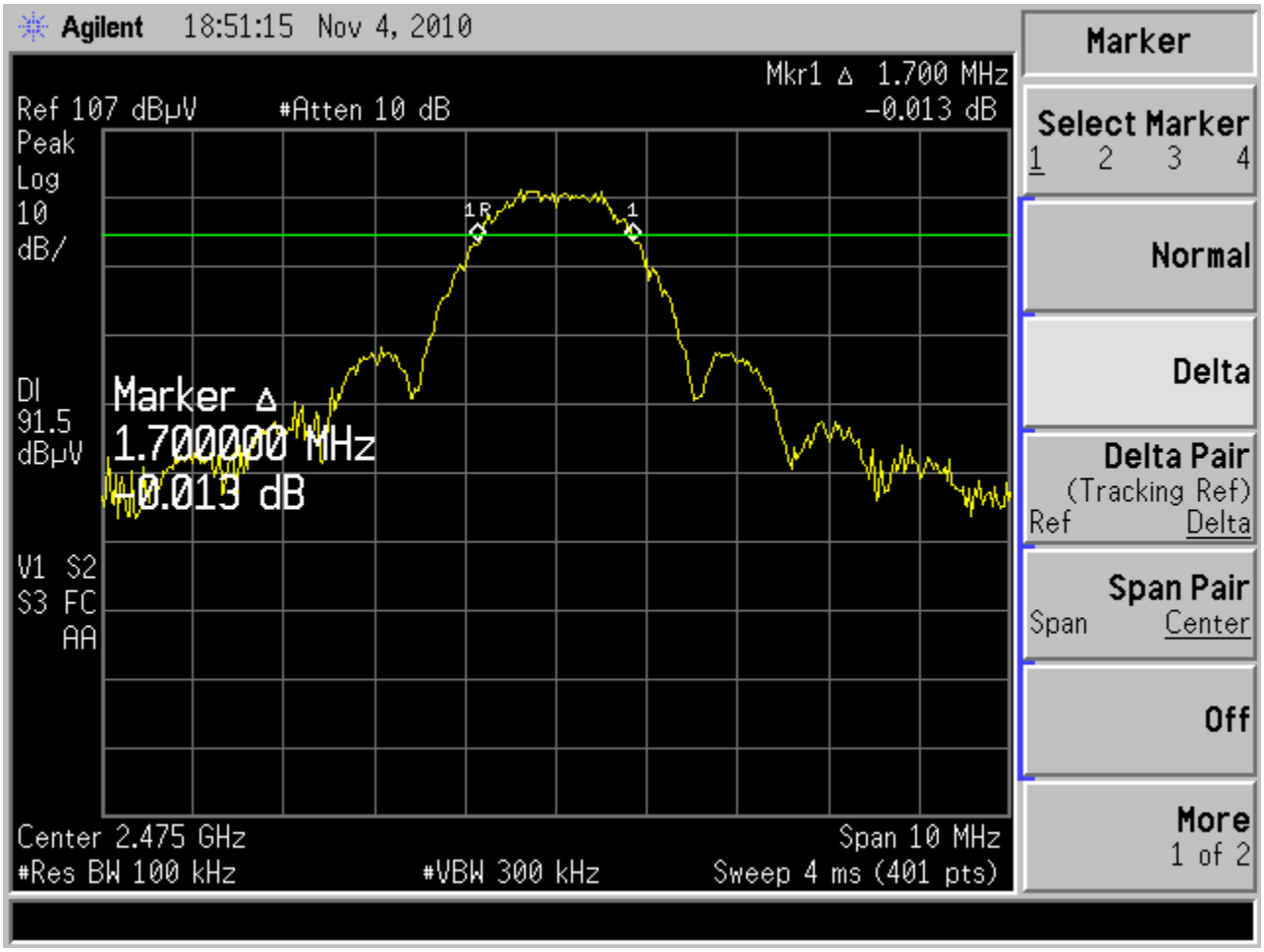


Specification: 6dB Bandwidth > 500 kHz

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 – 2.475 GHz (6dB Bandwidth 1.700 MHz)

Deviations, Additions, or Exclusions: None

8 Power Spectral Density (PSD)

8.1 Method

The test methods used comply with ANSI C63.4 and CISPR 16. Unless otherwise stated no deviations were made from **FCC 15.247 & IC RSS-210.**

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US1121 and our IC lab no. 2042N.

8.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18913	Spectrum Analyzer with Pre-Amp	Hewlett-Packard	E7405A	My44211889	05/11/2010	05/11/2011

8.3 Results:

The sample tested was found to Comply.

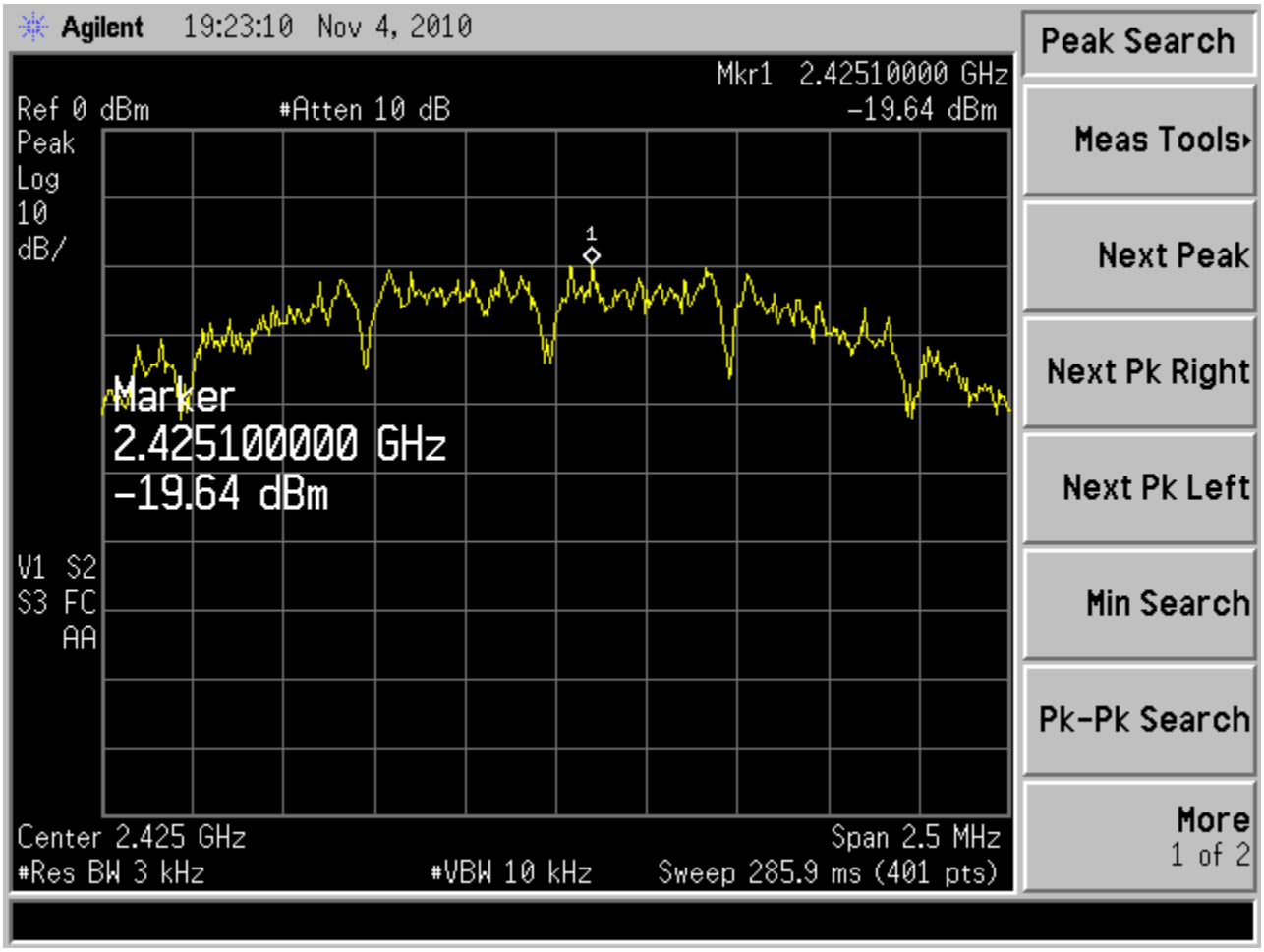
- FCC 15.247(e)
- IC RSS-210 A8.2(b)

8.4 Test Data:

Power Spectral Density (PSD)

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

Channel 1 – 2.425 GHz

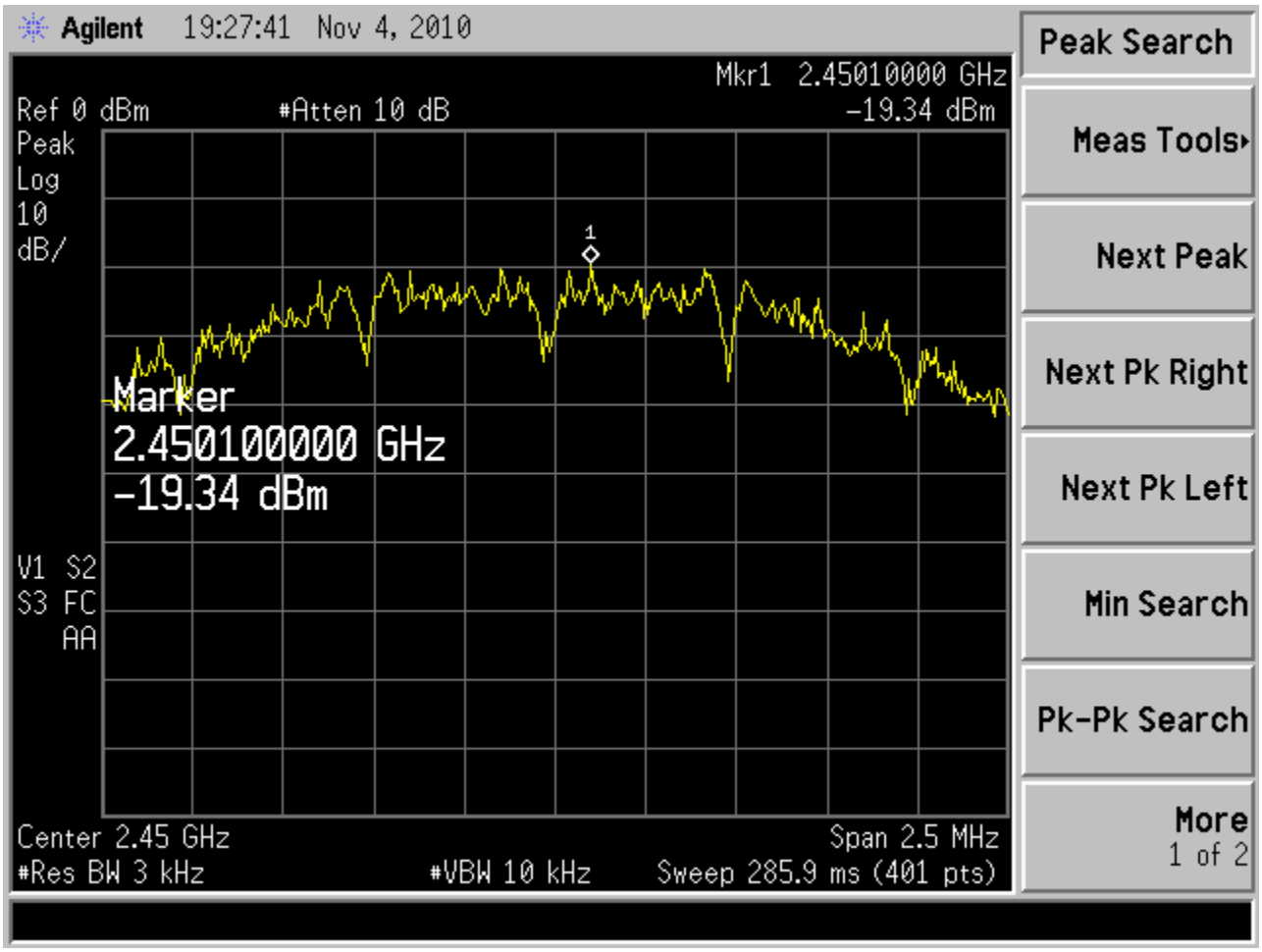


Specification: PSD < 8 dBm

Power Spectral Density (PSD)

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

Channel 2 – 2.450 GHz

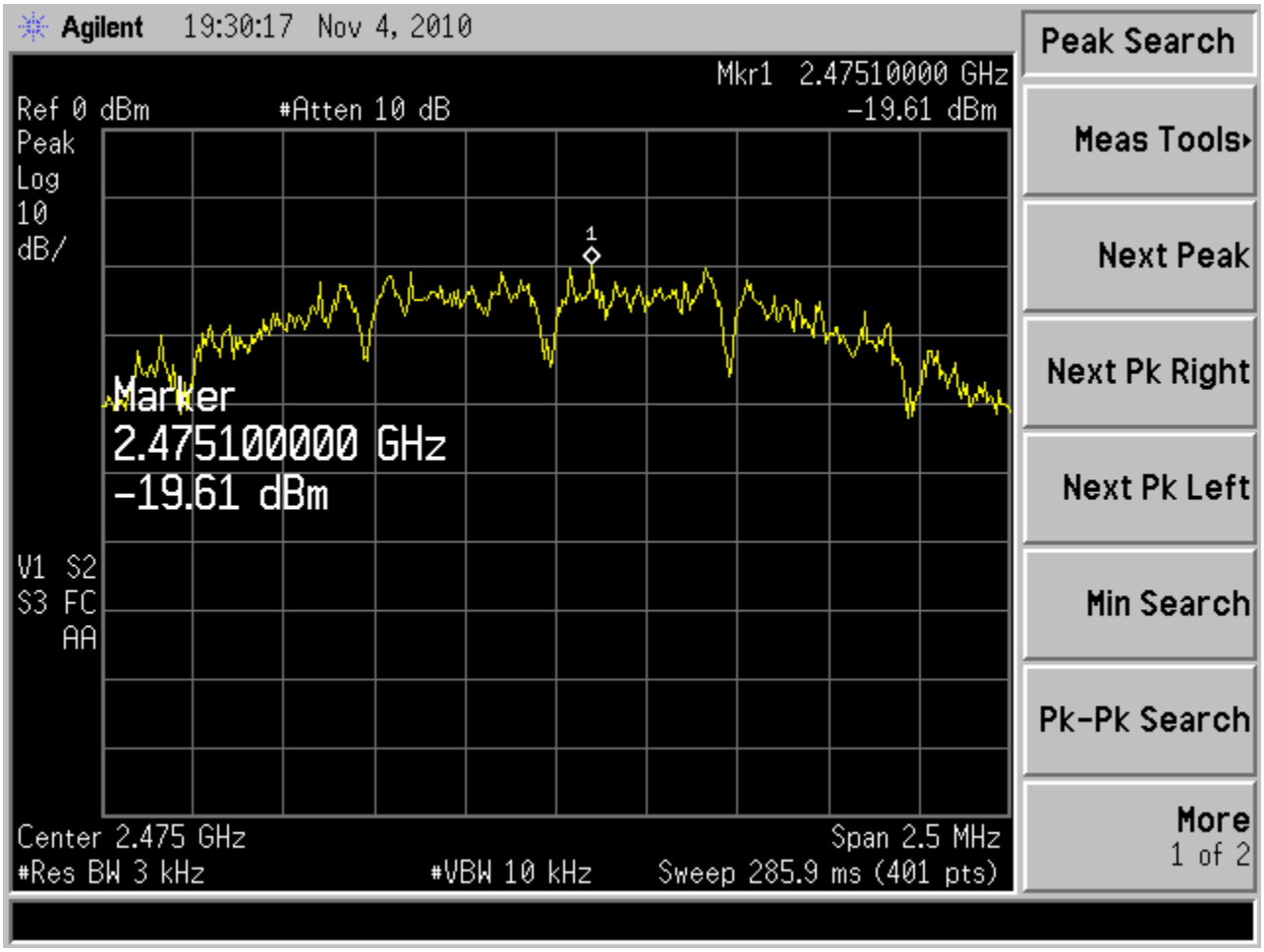


Specification: PSD < 8 dBm

Power Spectral Density (PSD)

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

Channel 3 – 2.475 GHz



Specification: PSD < 8 dBm

Notes:

(1) All measurements are RF Conducted Port.

(2) Worst-case PSD Channel 2 – 2.450 GHz (27.34 dBm below limit)

Deviations, Additions, or Exclusions: None

9 Occupied Bandwidth (OBW)

9.1 Method

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

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US1121 and our IC lab no. 2042N.

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	05/11/2010	05/11/2011

9.3 Results:

The sample tested was found to Comply.

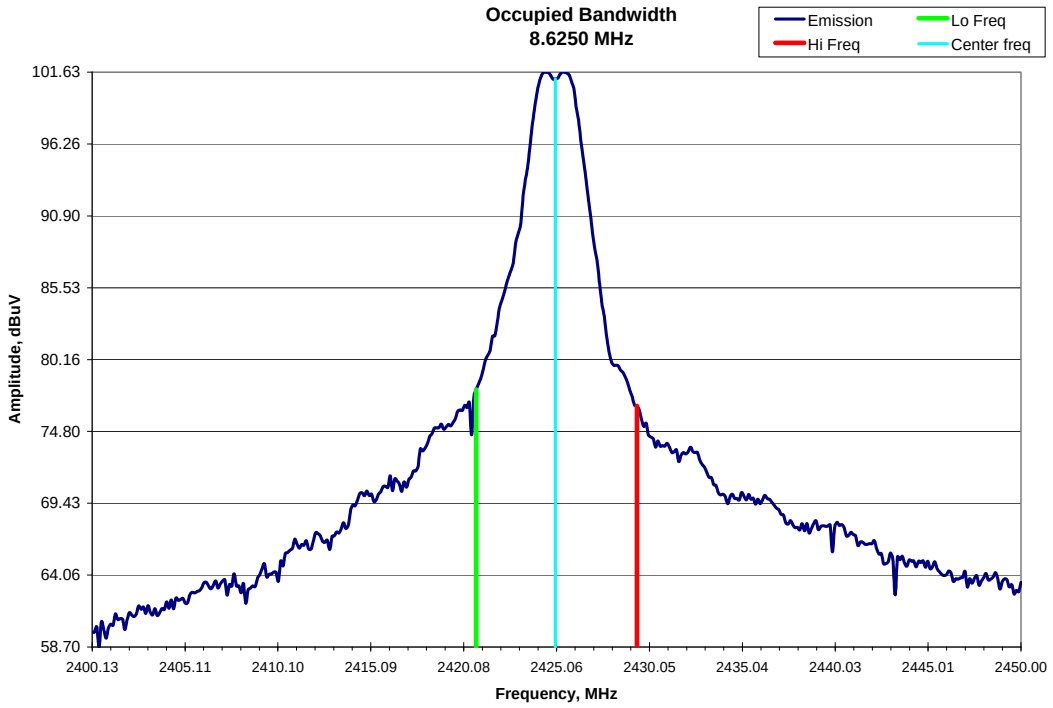
- RSS-GEN, Section 4.6.1

9.4 Test Data:

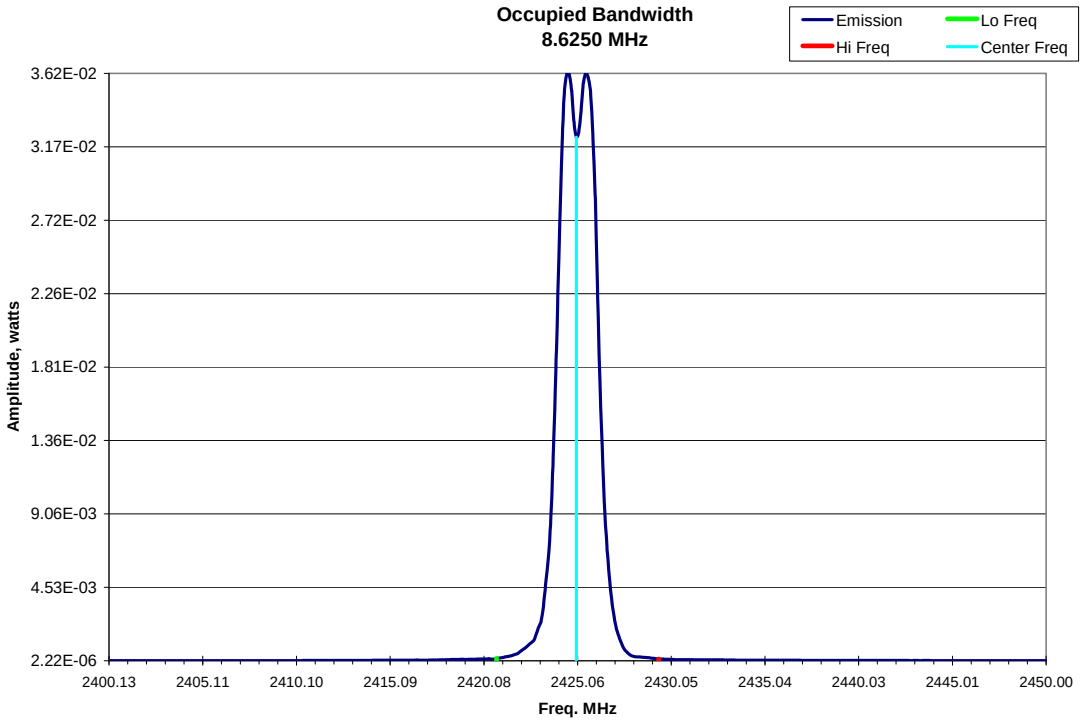
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Channel 1 – 2.425 GHz

Field Strength Graph



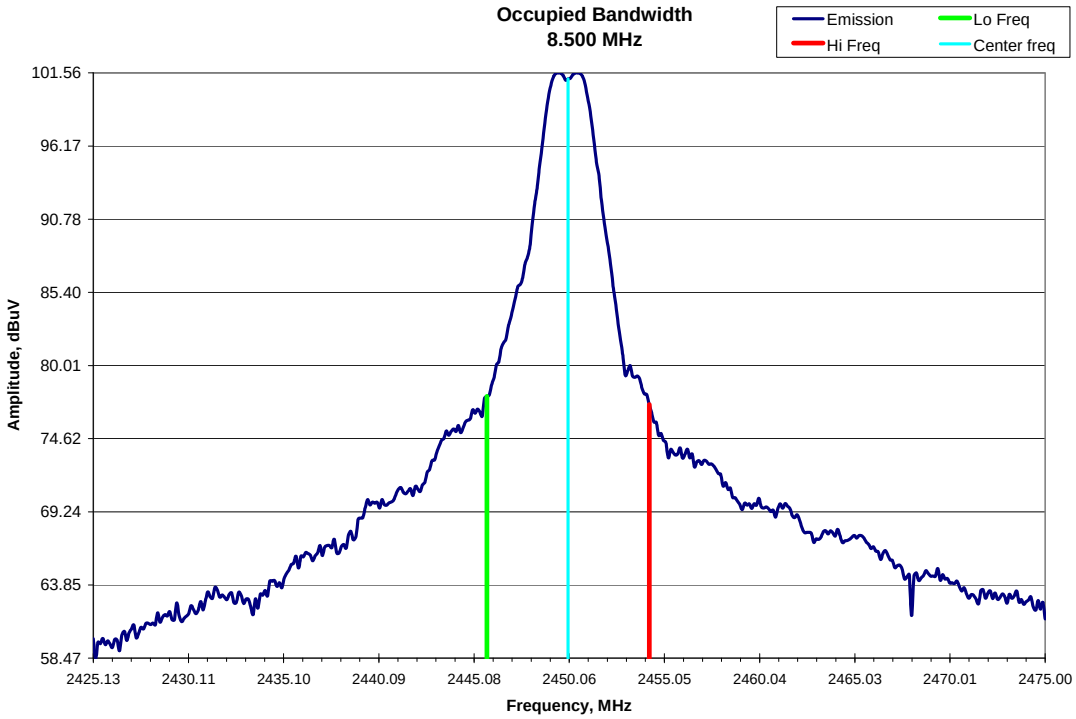
Power Graph



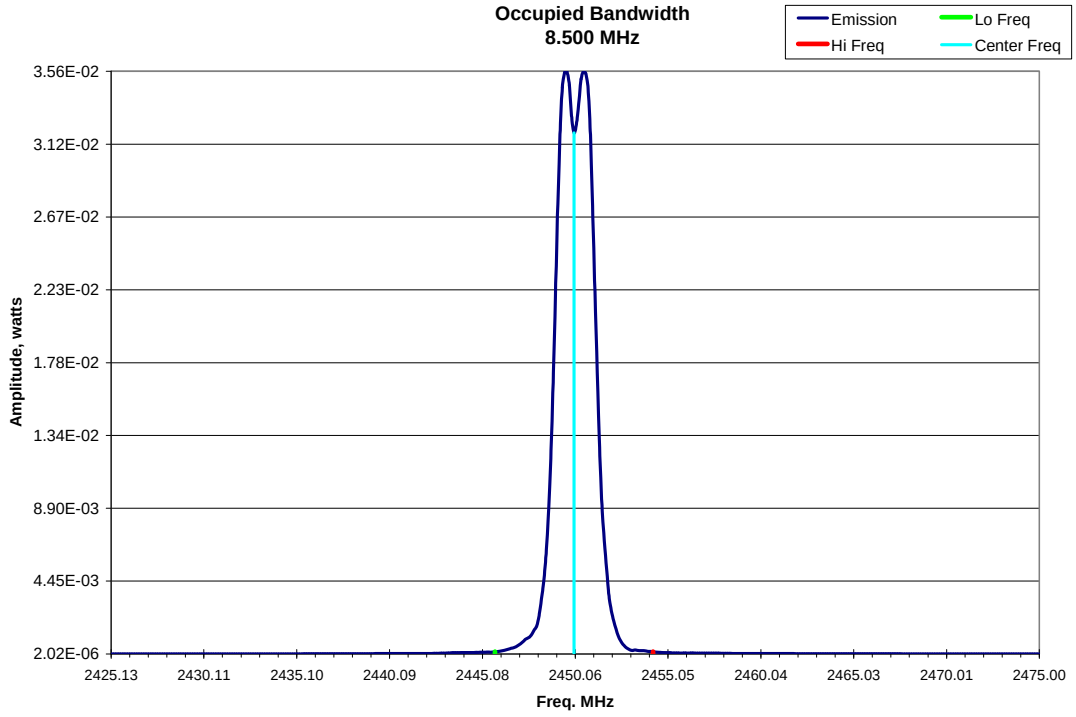
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Channel 2 – 2.450 GHz

Field Strength Graph



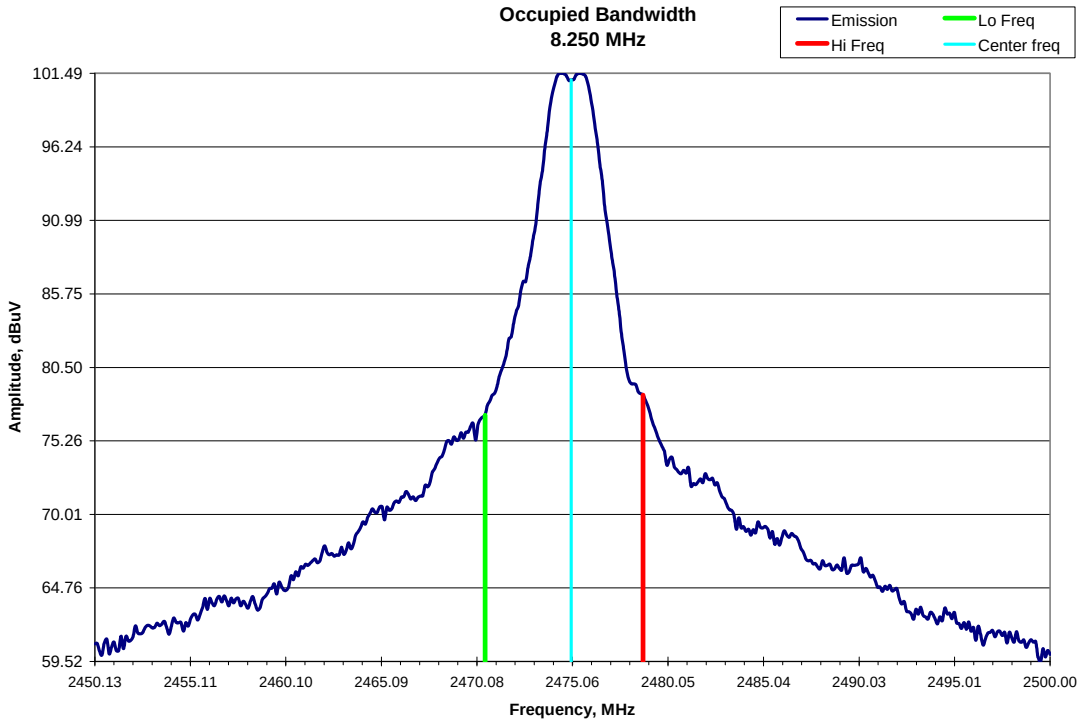
Power Graph



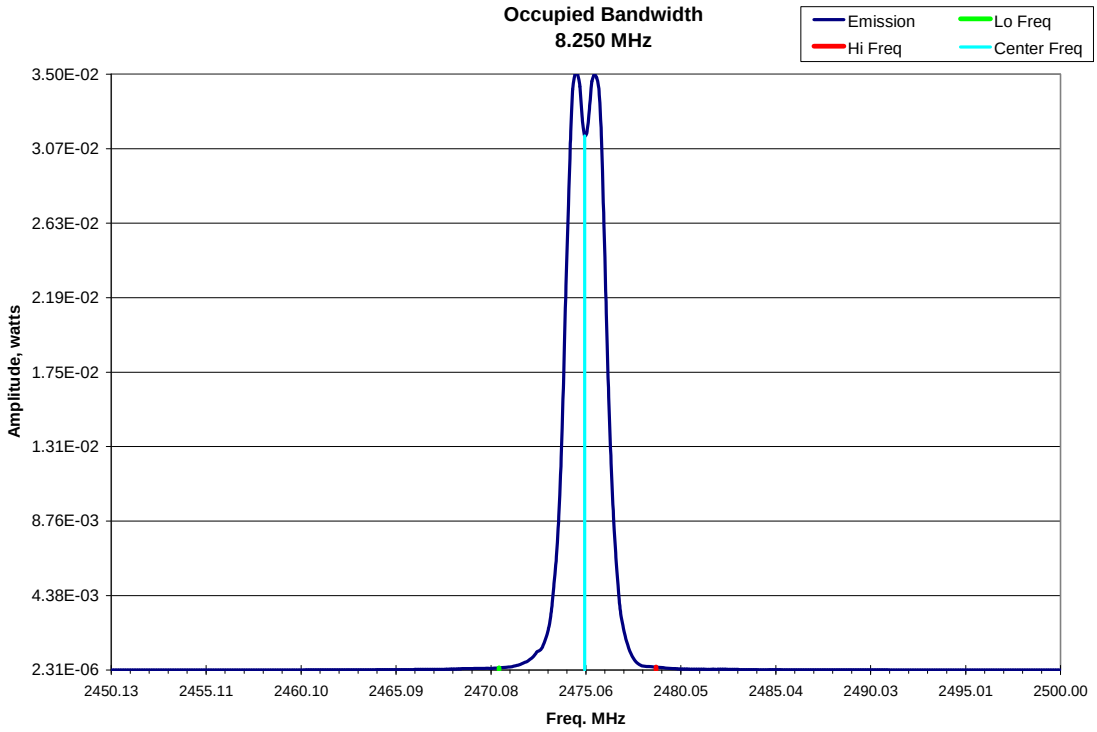
Occupied Bandwidth - (RSS-GEN, Section 4.6.1)

Channel 3 – 2.475 GHz

Field Strength Graph



Power Graph



Notes:

(1) All measurements are RF Conducted Port.

Deviations, Additions, or Exclusions: None

10 AC Conducted Emissions

10.1 Method

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

Intertek Louisville's emissions testing facility is located at 40 Meadow Rd. in Pinewood Springs CO 80540. The emissions testing facility is ISO17025:2005 accredited by NVLAP, our lab code is 200624-0, BSMI lab number is SL2-IN-E-029R, our VCCI registration no. R-1643, our FCC designation no. US1121 and our IC lab no. 2042N.

10.2 Test Equipment Used:

Asset ID:	Description:	Manufacturer:	Model:	Serial:	Cal Date	Cal Due
18909	EMI Test Receiver	RHODE & SCHWARZ	ESHS 30	842806/001	06/15/2010	06/15/2011
18890	LISN 50 ohm/50uH 3 line (1kHz - 30 MHz)	RHODE & SCHWARZ	ESH2-Z5	830364/002	05/21/2010	05/21/2011
18885	Transient Limiter	Hewlett-Packard	11947A	3107A00700	04/27/2010	04/27/2011

10.3 Results:

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

- **FCC Part 15.107**
- **IC RSS-210**

10.4 Setup Photographs:

Test Setup – Conducted Emissions (Front View)

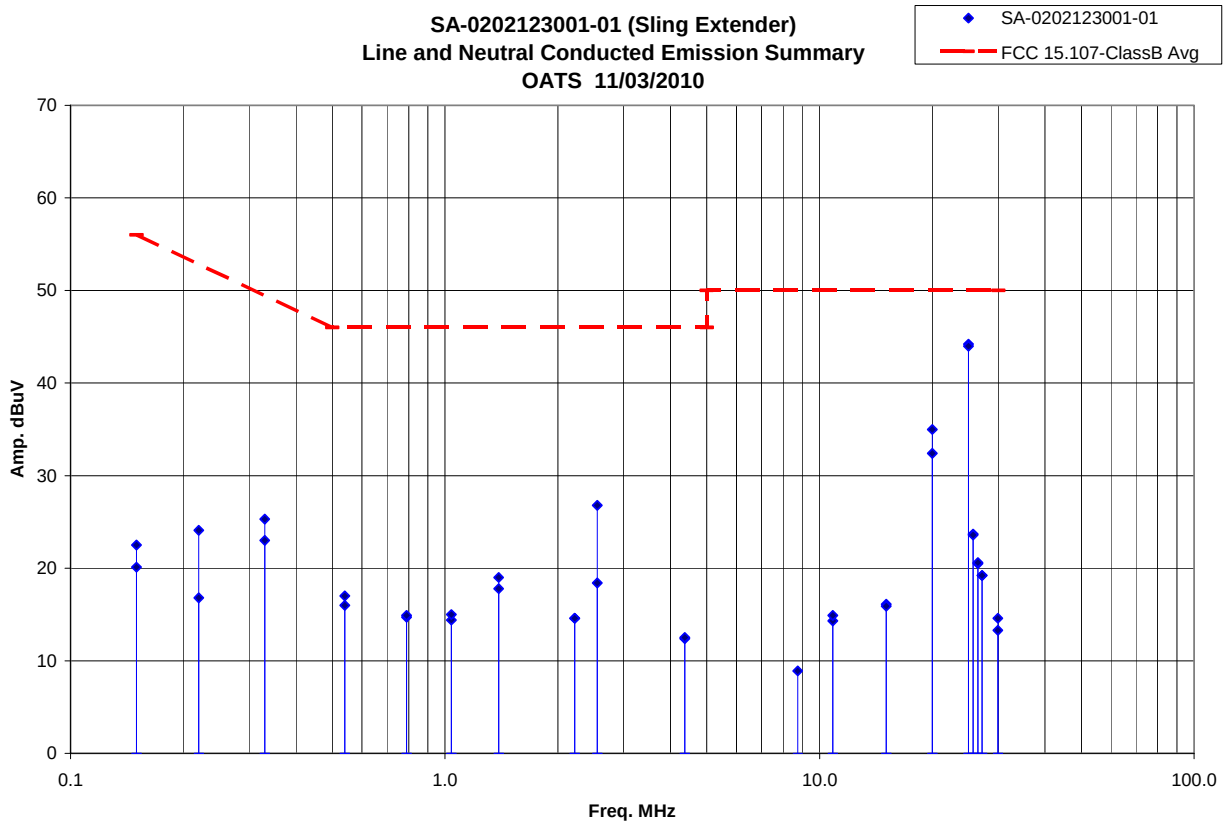
Photo:

Test Setup – Conducted Emissions (Side View)

10.5 Plots: Summary Data:

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

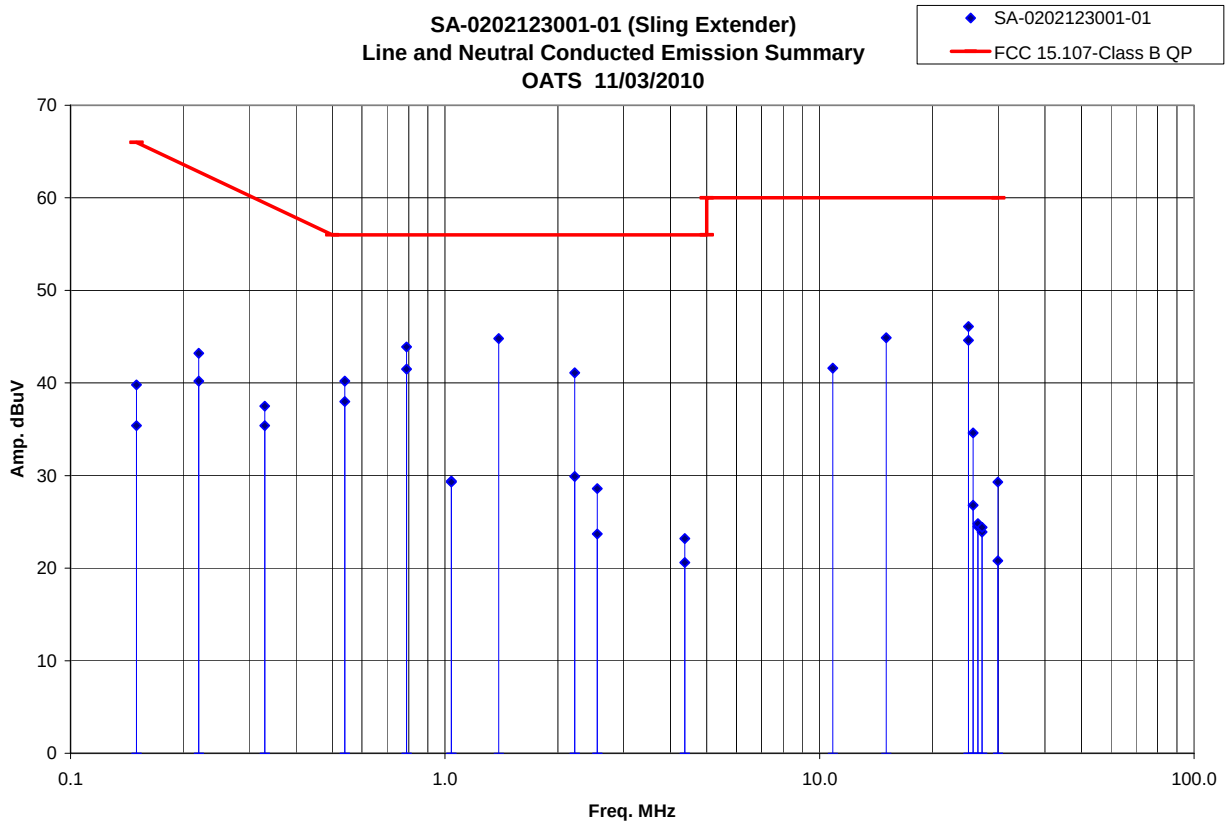
(Average Measurements)



Plots:

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

(Quasi-Peak Measurements)



10.6 Test Data:

Conducted Electromagnetic Emissions

Test Report #:	**100259922 11-3-10 Run 01**	Test Area:	Pinewood Site 1 Cond	Temperature:	23.6	°C
Test Method:	FCC Part 15.107 Class B	Test Date:	03-Nov-2010	Relative Humidity:	25.1	%
EUT Model #:	SA-0202123001-01	EUT Power:	115VAC/60Hz	Air Pressure:	80.1	kPa
EUT Serial #:	AAKQNV00242J					

Manufacturer: Echostar

EUT Description: Sling Extender - Placeshifting Receiver

Notes: Sling Powered from Sling AC Adapter Input Power of 115VAC/60Hz

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)		**FCC 15.107 Class B Avg**	**FCC 15.107 Class B QP**
********** Measurement Summary **********						
25.00	**31.9 Av**	**1.1 / 1.3 / -10.0**	**44.2**	**Neutral**	**-5.8**	**N/A**
1.39	34.4 Qp	0.2 / 0.2 / -10.0	44.8	Line 1	N/A	-11.2
0.790	33.6 Qp	0.2 / 0.1 / -10.0	43.9	Line 1	N/A	-12.1
2.22	30.6 Qp	0.3 / 0.2 / -10.0	41.1	Neutral	N/A	-14.9
20.01	23.2 Pk	1.0 / 0.8 / -10.0	35.0	Neutral	-15.0	-25.0
15.08	33.8 Qp	0.8 / 0.3 / -10.0	44.9	Neutral	N/A	-15.1
0.540	30.0 Qp	0.1 / 0.1 / -10.0	40.2	Neutral	N/A	-15.8
10.85	30.7 Qp	0.7 / 0.2 / -10.0	41.6	Line 1	N/A	-18.4
2.55	16.3 Av	0.3 / 0.2 / -10.0	26.8	Neutral	-19.2	N/A
0.220	33.0 Qp	0.1 / 0.1 / -10.0	43.2	Neutral	N/A	-19.6
0.330	27.3 Qp	0.1 / 0.1 / -10.0	37.5	Neutral	N/A	-22.0
25.69	22.2 Qp	1.1 / 1.3 / -10.0	34.6	Line 1	N/A	-25.4
0.150	29.7 Qp	0.1 / 0.1 / -9.9	39.8	Neutral	N/A	-26.2
1.04	19.0 Qp	0.2 / 0.2 / -10.0	29.4	Neutral	N/A	-26.6
26.49	8.1 Av	1.1 / 1.4 / -10.0	20.6	Line 1	-29.4	N/A
29.91	16.3 Qp	1.2 / 1.8 / -10.0	29.3	Line 1	N/A	-30.7
27.16	6.5 Av	1.2 / 1.5 / -10.0	19.2	Line 1	-30.8	N/A
8.74	-1.9 Av	0.6 / 0.2 / -10.0	8.9	Neutral	-41.1	N/A
4.37	0.0 Qp	0.3 / 0.2 / -10.0	10.5	Line 1	N/A	-45.5

11 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	4.8 dB	
Radiated emissions, 1 to 18 GHz	4.9 dB	
AC mains Conducted emissions, 150kHz to 30 MHz	3.14 dB	

12 Duty Cycle

The following Tx Duty Cycle is declared by the manufacturer: 100 ms

Therefore, no Duty Cycle verification/correction was applicable.

13 Revision History

Revision Level	Date	Report Number	Notes	Revised By	Reviewed By
0	12/13/2010	100259922DEN-002	Original Issue		
1	01/24/2011	100259922DEN-002	Report Revisions per TCB Review 1. added antenna gain per client, page 6 2. removed power dBm to field strength dBuV/m equation, page 5 3. modified harmonic mixer verbiage to include attached antenna, page 9, 18 4. corrected setup photos and added new/modified RF port and radiated restricted band test data, page 6,7, 10-16 5. added notes, page 17 6. added notes, page 30 7. added band edge and spurious RF port plots, page 32-34 8. Changed FCC lab designation # in the header for sections 5-10.	R.T.	MAS