MEASUREMENT AND TEST REPORT

VERSION 1.01

Report Prepared for: Rainforest Automation Inc.
34 W 7th Avenue
Vancouver, BC
V5Y 1L6
Canada

Equipment Under Test (EUT): Model RFA-Z105-2, Trade name: EMU-2™

FCC ID: YCXRFA-Z1052
IC Certification number: 8919A-RFAZ1052

FCC Rule Part(s): Part 15B, 15C
Industry Canada Rule Part(s) RSS-210

Tested by: Island Compliance Services Inc.
6454 Fitzgerald Road
Courtenay, BC
V9J 1N7

Prepared By	Authorized By
A. Horel (Technical Writer) 	A. Eadie (Sr. EMC Eng.) 

Note: This test report has been prepared for the Applicant and device described herein. It may not be duplicated or used in part without prior written consent from Island Compliance Services Inc.

FCC OATS registration number: 386117
Industry Canada OATS registration number: 9578B-1

Revision History

Version	Date	Author	Comment
1.0	18/09/2012	A. Horel	Original Release
1.01	26/09/2012	A. Horel	Updated the following: Model Number/Trade Name: Running Header, p.1, p.7 FCC ID: Space Removed p.1 Section 2.2 clarification: p.6 Equipment List: p.29

1.1 CONTENTS

2 SUMMARY OF TEST RESULTS

The equipment under test was found to comply with the test standards and criteria outlined herein.

Test Description	Reference Specification FCC	Reference Specification Industry Canada	Result	Comment
RF Peak Power Output	FCC Subpart C 15.247(b) (3)	RSS 210 Issue 8 A8.4(4)	Complies	
Occupied Bandwidth 6dB Bandwidth	FCC Subpart C 15.247 (a) (2)	RSS 210 Issue 8 A8.2(a)	Complies	
Occupied Bandwidth 20dB Bandwidth	N/A	RSS-Gen Issue 3 4.6.1	Complies	
Power Spectral Density	FCC Subpart C 15.247(e)	RSS 210 Issue 8 A8.2(b)	Complies	
Conducted Spurious Emissions	FCC Subpart C 15.247(d)	RSS 210 Issue 8 A8.5	Complies	
Conducted Spurious Emissions Band Edge	FCC Subpart C 15.247(d)	RSS 210 Issue 8 A8.5	Complies	
Duty Cycle Correction factor	FCC Subpart C 15.35(c)	RSS-Gen Issue 3 4.5	Complies	
Radiated Spurious Emissions Band Edge	FCC Subpart C 15.209(a) 15.205(a)	RSS 210 Issue 8 2.5, A8.5	Complies	
Radiated Spurious Emissions (TX and RX)	FCC Subpart C 15.247, 15.205 FCC Subpart B 15.109	RSS 210 Issue 8 2.5, A8.5 RSS Gen Issue 3 Section 4.10 and section 6 for RX ICES-003 Issue 4	Complies	
Power line Conducted Emission	FCC Subpart C 15.207 (a) FCC Subpart B 15.107	RSS-Gen Issue 3 7.2.4 Ices-003 Issue 4	Complies	

2.1 ENVIRONMENTAL CONDITIONS

Description	Reading
Indoor Temperature	24°C
Indoor Humidity	40-50%
Outdoor Temperature	18-24°C
Outdoor Humidity	980-1005 mBar

2.2 STANDARD TEST CONDITIONS AND ENGINEERING PRACTICES

Except as noted herein, the following conditions and procedures were observed during the testing:

CFR 47, FCC rules Part 15 subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN and RSS0210. ANSI C63.4-2003 or later, was used for all test procedures as required by RSS-Gen I3 2010, Section 4.1. Deviations, modification or clarifications (if any) to above mentioned documents are described herein.

Measurement results, unless otherwise noted, are worst-case measurements.

3 GENERAL EQUIPMENT SPECIFICATIONS

Item	Description
Manufacturer	Rainforest Automation
Model Number	RFA-Z105-2
Trade Name	EMU-2™
Function	Energy Monitoring Unit
Power Supply Input	AC adapter, 2xAAA for backup
Power Output	0.0257W
Antenna Gain/Type	4.5dBi, Integral PCB Trace
Channel Spacing	5MHz
Frequency Range	2405-2480 MHz
Modulation	0-QPSK

3.1 AUXILIARY EQUIPMENT

Equipment	Description
N/A	

3.2 ENGINEERING CHANGES TO PRODUCTION UNIT

N/A

4 RF PEAK POWER OUTPUT

Test Name	Reference Specification	Result	Notes
RF Peak Power Output	15.247(b)(3) A8.4 (4)	Complies	

4.1 TEST METHOD

RSS-Gen Issue 3 4.8 and FCC Publication 558074, Section 15.247(b) – 2. Set the RBW ≥ EBW. Set VBW ≥ 3 x RBW. Set span = zero. Sweep time = auto couple. Detector = peak. Trace mode = max hold. Allow trace to fully stabilize. Use peak marker function to determine the peak amplitude level within the fundamental emission.

4.2 DATA

Channel	Tuned Frequency (GHz)	Peak Power (dBm)	CF (dB)	Corrected (dBm)	Limit (dBm)	Margin (dB)
Low (11)	2.405	-4.9	18	14.1	30	-15.9
Mid (18)	2.440	-6.8	18	11.2	30	-18.8
High (26)	2.480	-8.2	18	9.8	30	-20.2

4.3 PLOT(S)

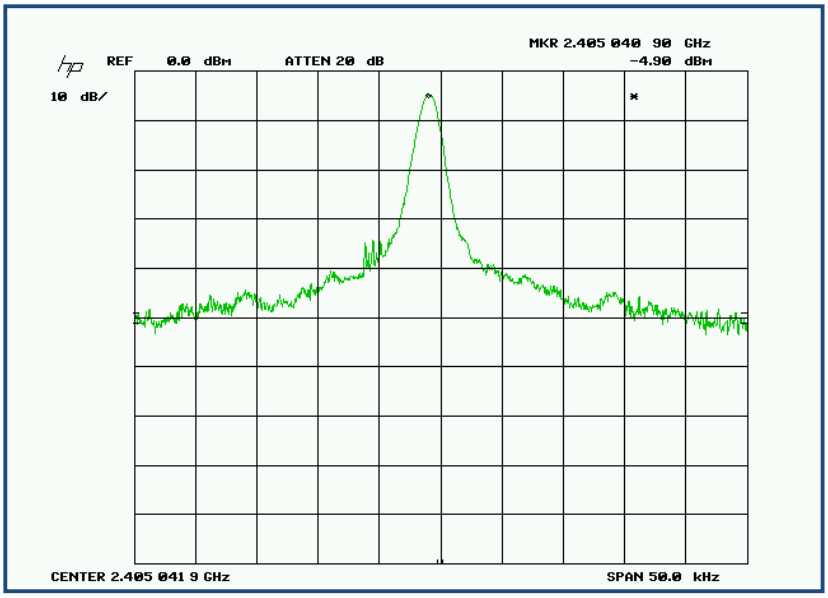


FIGURE 1 - PEAK OUTPUT POWER, LOW CHANNEL

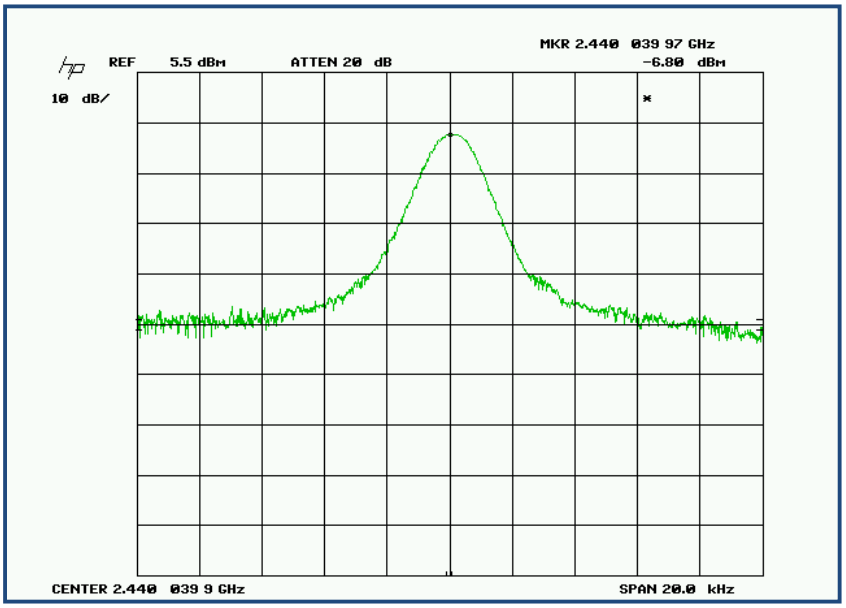


FIGURE 2 - PEAK POWER, MID CHANNEL

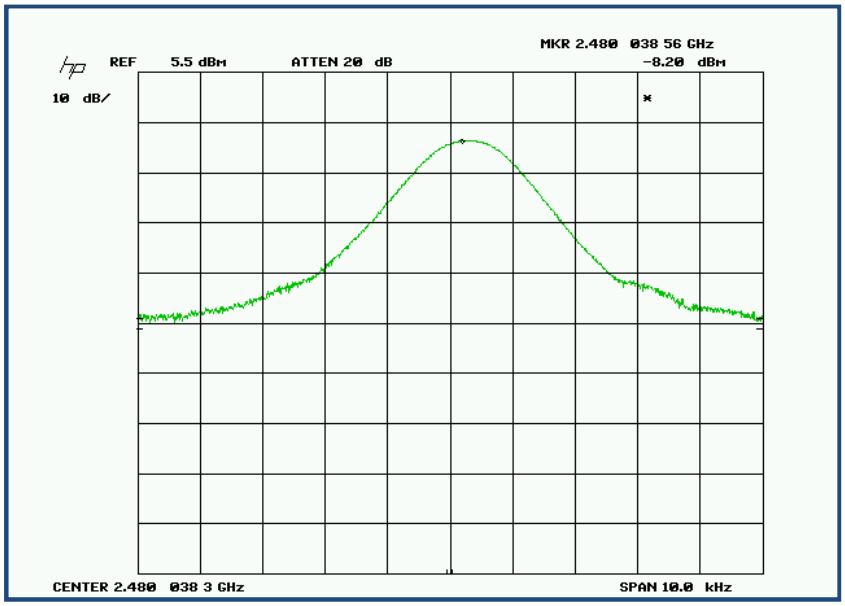


FIGURE 3 - PEAK POWER, HIGH CHANNEL

4.4 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	12/09/2012

5 OCCUPIED BANDWIDTH

Test Description	Reference Specification	Result	Notes
Occupied Bandwidth 6dB and 20dB	15.247(a) A8.2(a) 4.6.1	Complies	

5.1 TEST METHOD

RSS-Gen Issue 4.6.1 and FCC Publication 558074, Section 15.247(a) (2) – Emission Bandwidth (EBW) -
Method: Set RBW=1-5% of the emission bandwidth (EBW), VBW=≥ 3 x RBW, Detector=Peak, Trace mode=max hold, Sweep=auto couple, allow trace to stabilize. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5%.

Test performed with modulation ON and 100% duty cycle

5.2 DATA

Channel	Frequency (GHz)	20dB Bandwidth (MHz)	6dB Bandwidth (MHz)
Low (11)	2.405	2.70	1.66
Mid (18)	2.440	2.82	1.84
High (26)	2.480	2.75	1.84

5.3 PLOTS

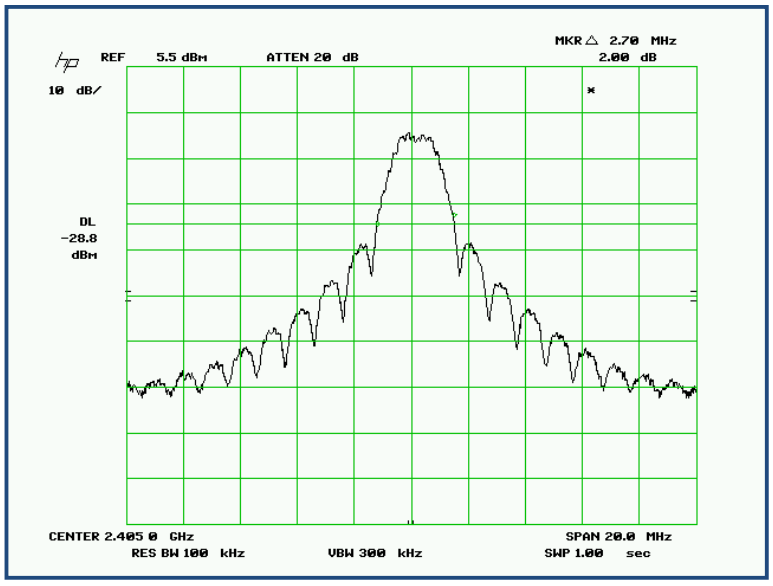


FIGURE 4 - LOW CHANNEL OCCUPIED BANDWIDTH (20DB)

FIGURE 5 – MID CHANNEL OCCUPIED BANDWIDTH (20DB)

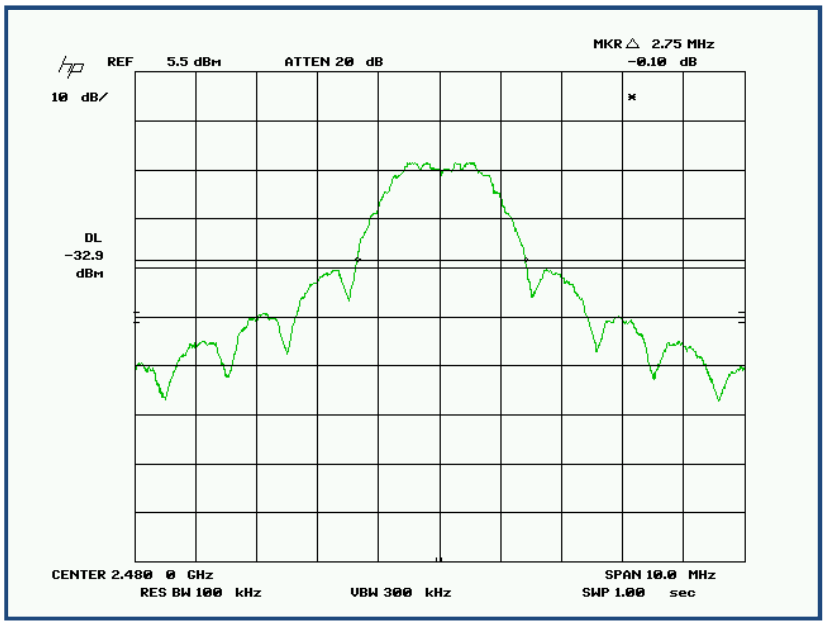


FIGURE 6 - HIGH CHANNEL OCCUPIED BANDWIDTH (20DB)

5.4 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	12/09/2012

6 POWER SPECTRAL DENSITY

Test Description	Reference Specification	Result	Notes
Power Spectral Density	15.247(e) A8.2 (b)	Complies	maximum measured power spectral density:-6.8 dBm

6.1 TEST METHOD

RSS-210 Issue 8 and FCC Publication 558074, Section 15.247(e) - Maximum Power Spectral Density Level in the Fundamental Emission (PSD) – Method: RBW = 100 kHz, VBW ≥ 300 kHz, Span=5-30 % greater than the EBW, Detector= peak, Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize. The peak marker function is used to determine the maximum power level in any 100 kHz band segment within the fundamental EBW. The observed power level is scaled to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100kHz) = -15.2 dB.

6.2 LIMITS

15.247(e) specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

6.3 DATA

Channel	Frequency (GHz)	Pk Power (dBm)	CF (dB)	PSD (dBm)
Low (11)	2.405	-9.6	18	-6.8
Mid (18)	2.440	-10.4	18	-7.6
High (26)	2.480	-12.8	18	-10

Note: All final reported values are corrected values

6.4 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	13/09/2012

7 CONDUCTED SPURIOUS EMISSIONS

Test Description	Reference Specification	Result	Notes
Conducted Spurious Emissions	15.247(c) A8.5	Complies	

7.1 TEST METHOD

RF conducted as per FCC Publication 558074
RSS-210 Issue 8 A8.5

7.2 LIMITS

15.247(c) In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(1) (see 15.205(c)).

7.3 DATA

Channel	Fundamental (dBm)	Harmonic 2 (dBc)	Harmonic 3 (dBc)	Limit (dBc)	Result
Low (11)	10.7	**-30.1**	-42.6	-20	Complies
Mid (18)	9.5	-31.0	-43.0	-20	Complies
High (26)	7.8	-34.4	-56.8	-20	Complies

Note: worst case harmonic: -30.1dBc

7.4 PLOTS

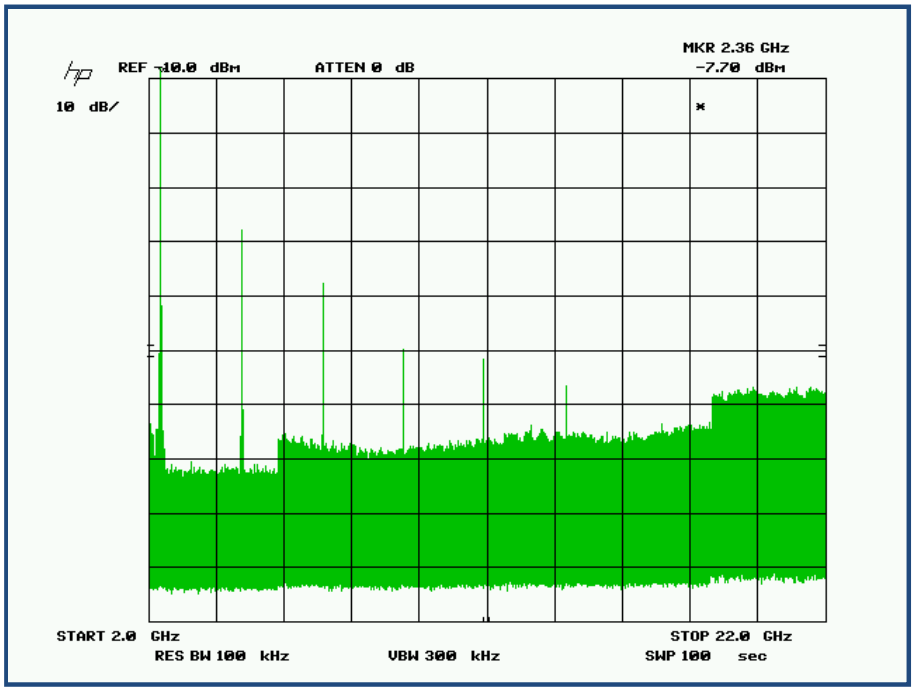


FIGURE 7 - LOW CHANNEL SPURIOUS, 2-22GHZ

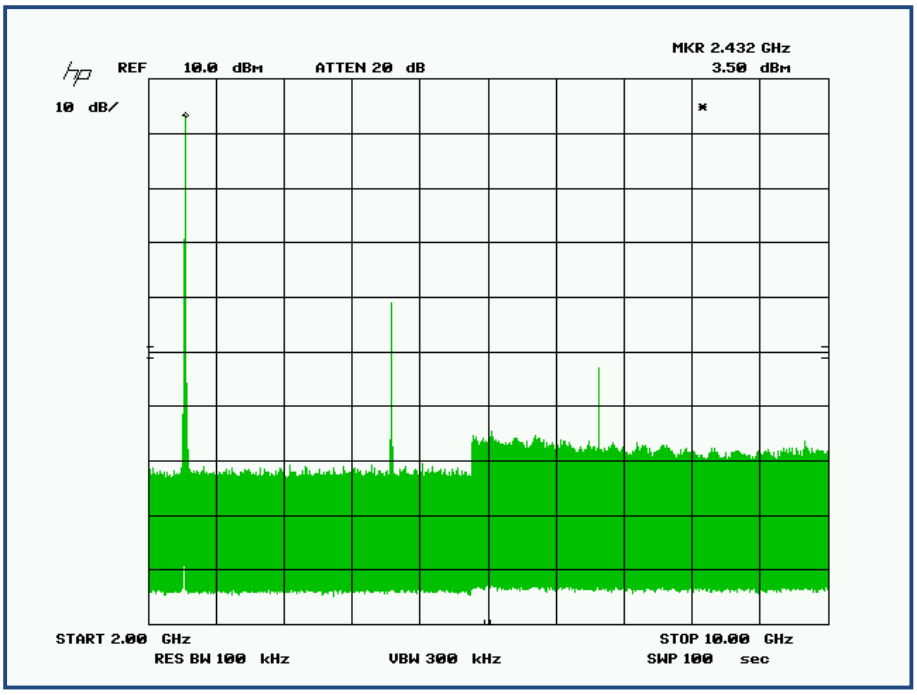


FIGURE 8 – MID CHANNEL SPURIOUS, 2-10GHZ

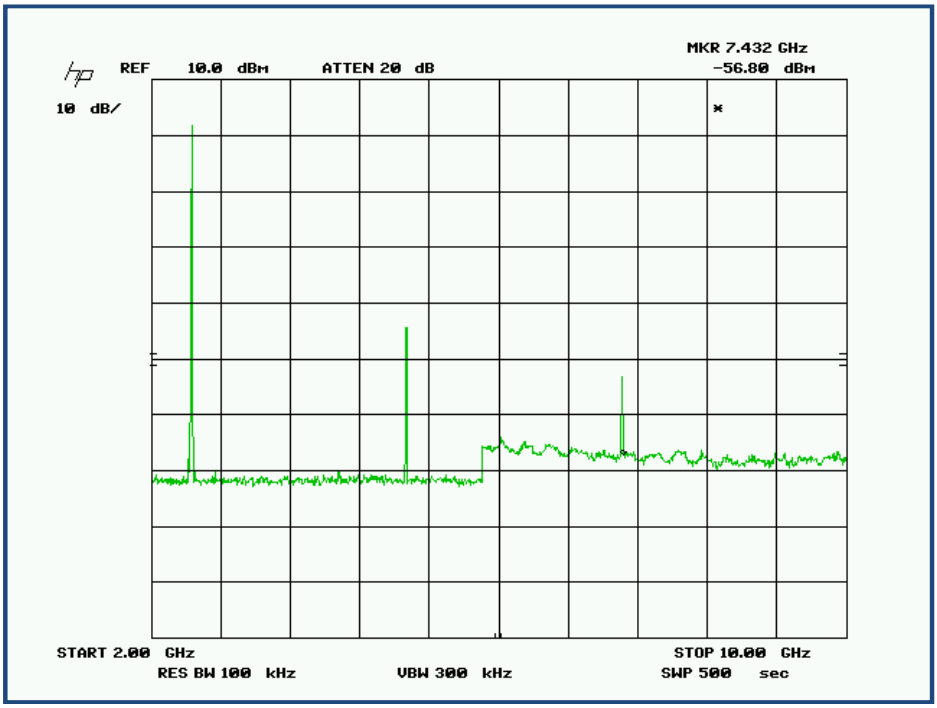


FIGURE 9 – HIGH CHANNEL SPURIOUS, 2-10GHZ

8 CONDUCTED SPURIOUS EMISSIONS BANDEDGE

Test Description	Reference Specification	Limit	Result	Notes
Band Edge Compliance	15.247(d) A8.1	>20dBc, 74dBuV/m pk	Complies	

8.1 TEST METHOD

Using the marker-delta method outlined in DA 00-705 an in-band field strength measurement of the fundamental emission using the RBW and detector function required by C63.4 and FCC Rules for the frequency being measured was undertaken. A spectrum analyzer span was chosen that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. The delta measurement is then subtracted from the field strengths measured. The resultant field strengths (CISPR QP, average, or peak, as appropriate) are then used to determine band-edge compliance as required by Section 15.205.

8.2 LIMITS

15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.3 DATA

An in-band field strength measurement taken at 3m, with RBW = 1MHz, VBW = 1MHz and in peak detection mode resulted in a corrected peak fundamental measurement of **87dBuV**

Using the marker-delta method outlined in DA 00-705, band edge emissions were well below the 74dBuV/m peak limits for restricted bands.

Spurious Emission Frequency (MHz)	Amplitude (dBc)	Pk Fundamental Radiated Ampl. (dBuV)	Spurious Field Strength (delta) (dBuV/m)	Limit	Result
2389	44.9	87	42.1	>20dBc, 74 dBuV/m pk	Complies
2484	36.6	87	50.4	>20dBc, 74 dBuV/m pk	Complies

8.4 PLOTS

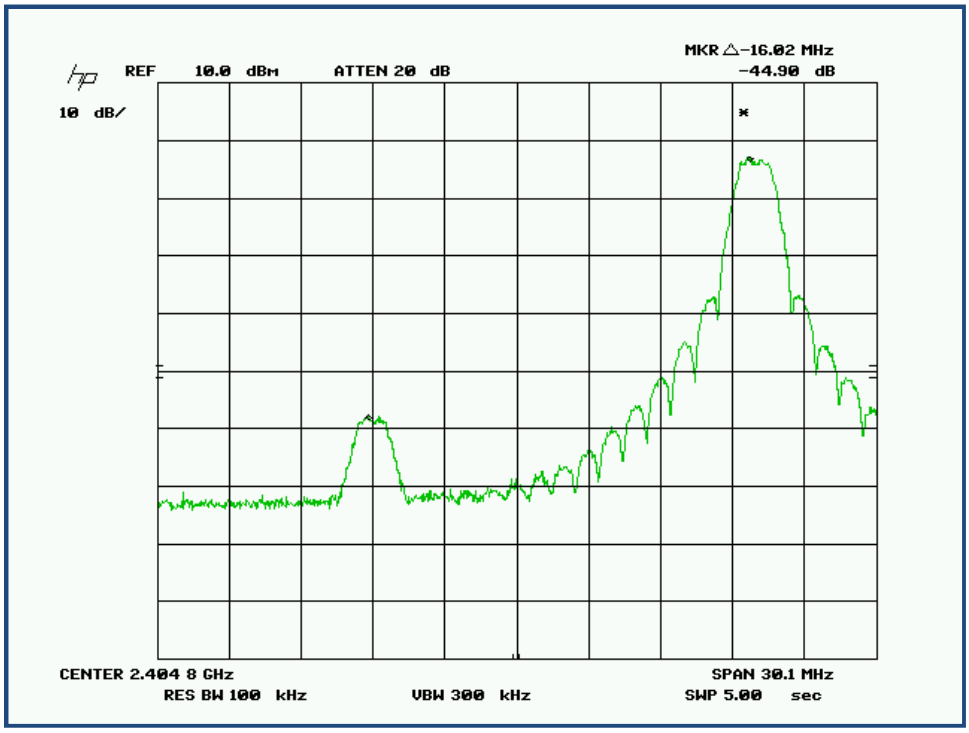


FIGURE 10 – LOWER BANDEDGE (2310-2390MHZ)

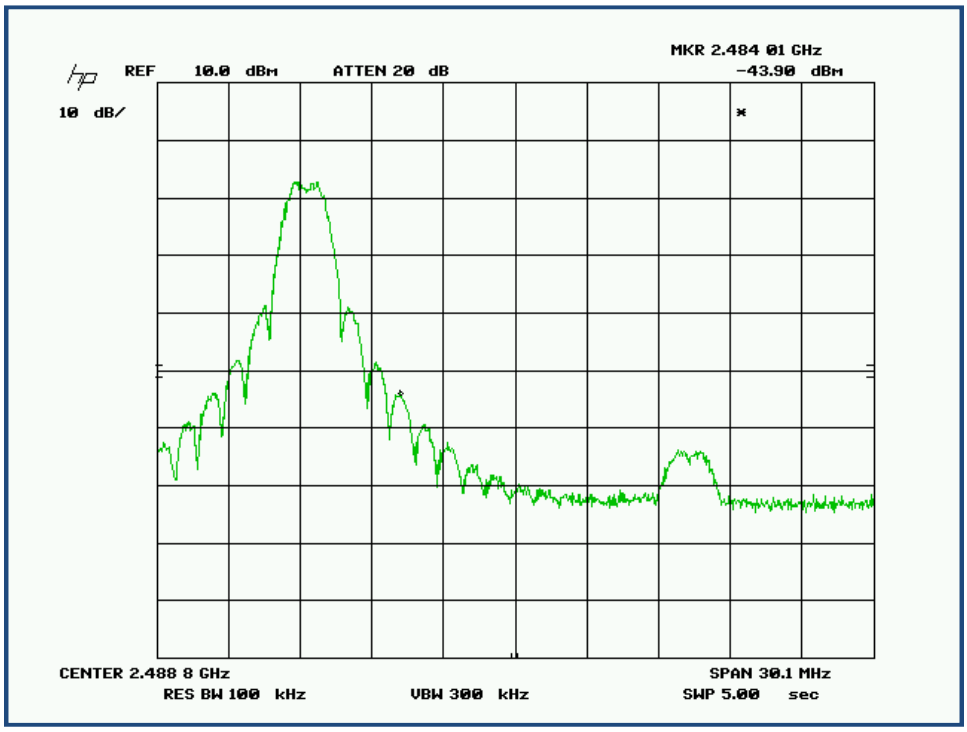


FIGURE 11 – UPPER BANDEDGE (2310-2390MHZ)

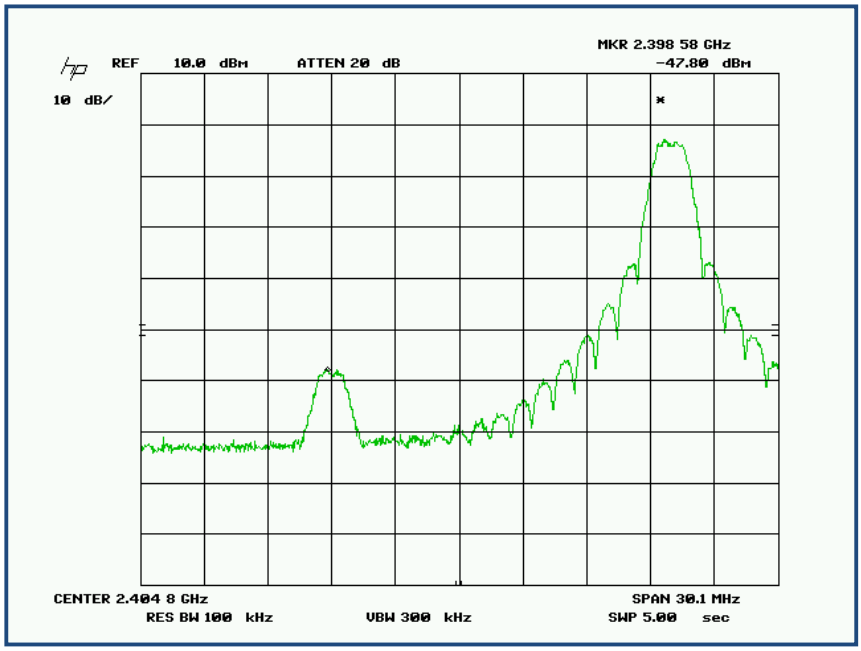


FIGURE 12 – LOWER BANDEDGE (2483.5-2500MHZ)

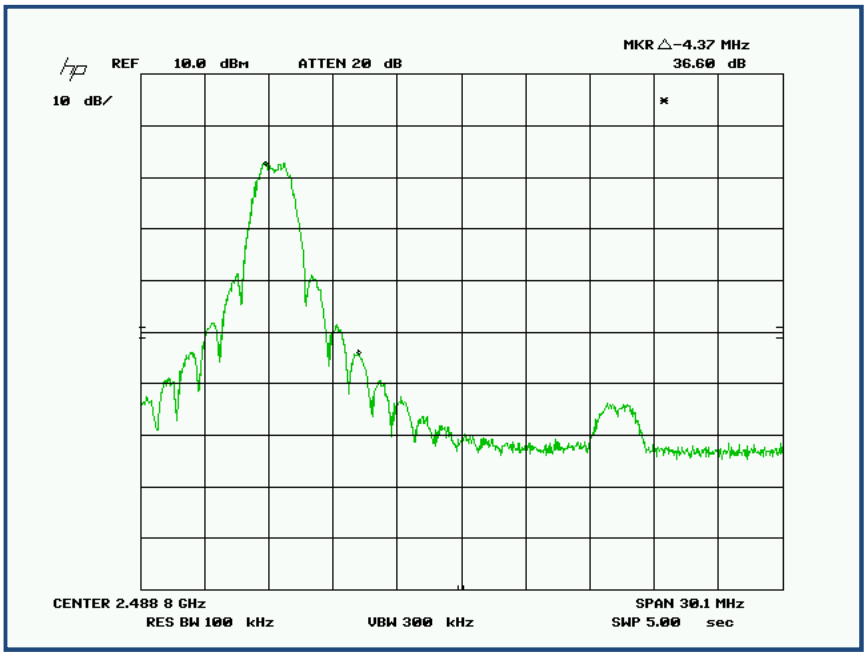


FIGURE 13 – UPPER BANDEDGE (2483.5-2500MHZ)

8.5 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	13/09/2012

9 DUTY CYCLE CORRECTION FACTOR

Test Description	Reference Specification	Result
Duty Cycle Correction Factor	15.35(c) RSS-Gen Issue 3 4.5	Duty cycle correction factor = 20*log(0.822/8.160) = -19.94 dB

9.1 TEST METHOD

As per FCC 15.35 with spectrum analyzer in Zero span mode the EUT was tuned to Low channel (Ch Mid) with 10% duty cycle operating mode as the worst case of EUT normal operation per client.

9.2 TEST LIMITS

15.35 (c) Unless otherwise specified, e.g. §15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

9.3 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	13/09/2012

10 RADIATED SPURIOUS EMISSIONS

10.1 TEST PROCEDURE

The EUT is placed on a non-conducive turntable on the 3m OATS. Exploratory measurements are made using a suitable antenna positioned within 1m of the EUT. Notable emissions are maximized and final measurements are taken if the initial results are within 20 dB of the permissible limit. The EUT is placed at nonconductive plate at the turntable center. For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations. The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

E [µV/m] = URX + ATOT

Where URX is receiver reading and ATOT is total correction factor including cable loss, antenna factor and preamplifier gain (ATOT = LCABLES + AF - GPREAMP).

10.2 DATA

There were no discernible emissions within 20dB of the limit in the 1 GHz – 22GHz range.

10.3 SUMMARY OF TEST RESULTS

Test Description	Reference Specification	Result	Notes
Radiated Spurious Emissions	15.209(a) 15.205(a) A8.5	Complies	

10.3.1 SUMMARY OF 15.205 LIMITS

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1]0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	[2]
13.36–13.41			

FIGURE 14 - RESTRICTED BANDS

10.3.2 SUMMARY OF 15.209 LIMITS

Limits below detailed for 3m measurement distance.

Frequency Range (MHz)	Field Strength (µV/m)	Limit dBuV/m	Detector
30-88	100	40.0	QP
88-216	150	43.5	QP
216-960	200	46.0	QP
960 – 1000	500	54.0	QP
Above 1000	500	54.0	Avg
Above 1000	5000	74.0	Peak

10.4 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	4/09/2012

11 SPURIOUS RADIATED EMISSIONS TX AND RX (BELOW 1GHZ)

11.1 TEST PROCEDURE

Maximizing procedure was performed on the six (6) highest emissions readings between the lowest RF frequency generated on the device (without going below 9 kHz) and the 10th harmonic of the highest fundamental frequency. Where applicable, a hybrid antenna, horn antenna and loop antenna were used to cover the relevant frequency bands.

All data was recorded in the peak detection mode. Quasi-peak readings were performed only when an emission was found to be marginal (within -4 dB of specification limits).

All other measurements were lower than 20dB below the limit.

11.2 CORRECTED AMPLITUDE & MARGIN CALCULATION

The Corrected Amplitude is calculated by adding the Antenna Factor, and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "Margin" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit for Class A. The equation for margin calculation is as follows:

Margin = Corrected Amplitude – Limit

11.3 LIMITS

As per FCC 15.205 Radiated Spurious Emissions Limits noted above

11.4 MEASUREMENT DATA

No.	Freq (MHz)	Rdng (dBuV)	Corrected (dBuV/m)	Spec (dBuV/m)	Margin (dB)	Polarity	Antenna Height
1	47.490M	25.4	32.5	40.0	-7.5	Vert	233
2	86.300M	23.0	34.2	43.5	-9.3	Vert	290
3	73.730M	13.8	22.4	40.0	-17.6	Horiz	265
4	95.307M	12.6	23.4	43.5	-20.1	Horiz	115
5	33.113M	8.8	19.3	40.0	-20.7	Horiz	239
6	02.796M	25.4	36.1	43.5	-7.4	Horiz	295

TABLE 1 - SPURIOUS EMISSIONS MEASUREMENTS

11.5 EMISSIONS PLOT

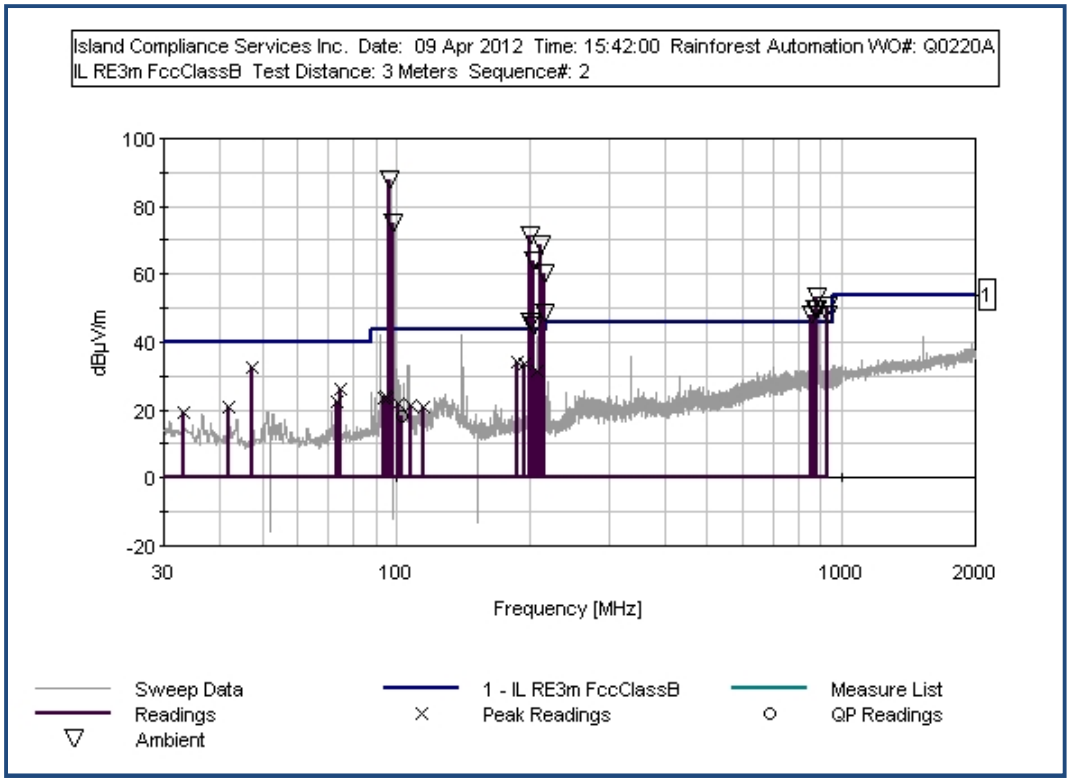


FIGURE 15 - SPURIOUS EMISSIONS PLOT

11.6 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	4/09/2012

12 POWER LINE CONDUCTED EMISSIONS

12.1 TEST METHOD

For the duration of the conducted emissions test, the power cord of the EUT was connected to the main power outlet of the LISN. The LISN in turn is connected to an AC power source. Exploratory tests of the EUT are performed by varying modes and cable positioning. Maximizing procedures are performed on the highest emission readings from the EUT

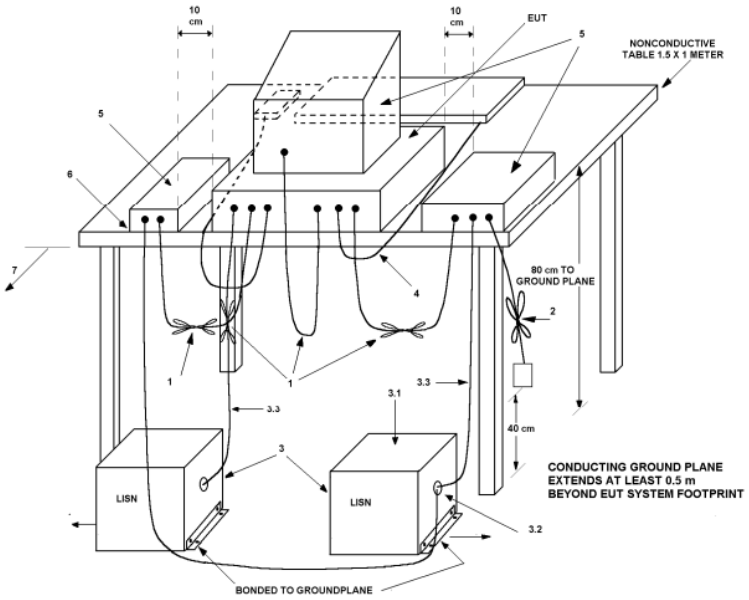


TABLE 2 - TEST ARRANGEMENT FOR CONDUCTED EMISSIONS OF TABLETOP EQUIPMENT

12.2 LIMITS AS PER 15.207

Frequency of emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

TABLE 3 – CONDUCTED EMISSION LIMITS

12.3 LINE RESULTS PLOT

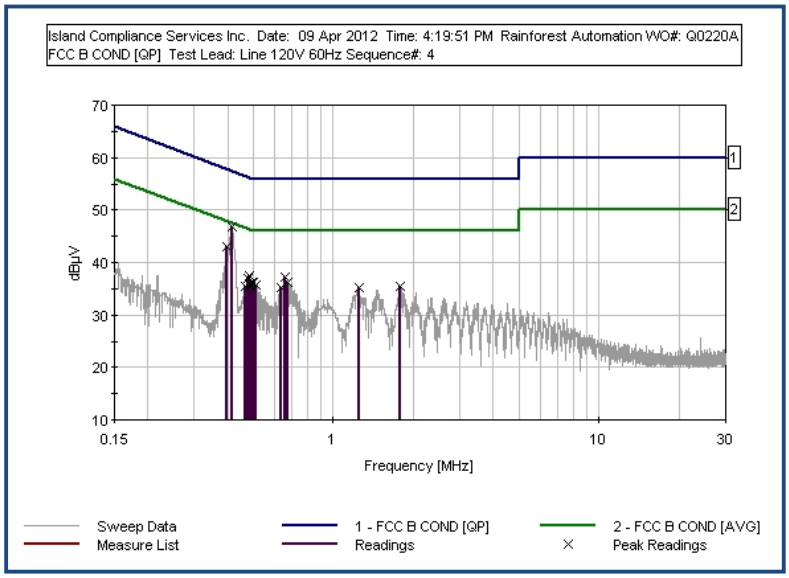


FIGURE 16 - CONDUCTED EMISSIONS PLOT – LINE

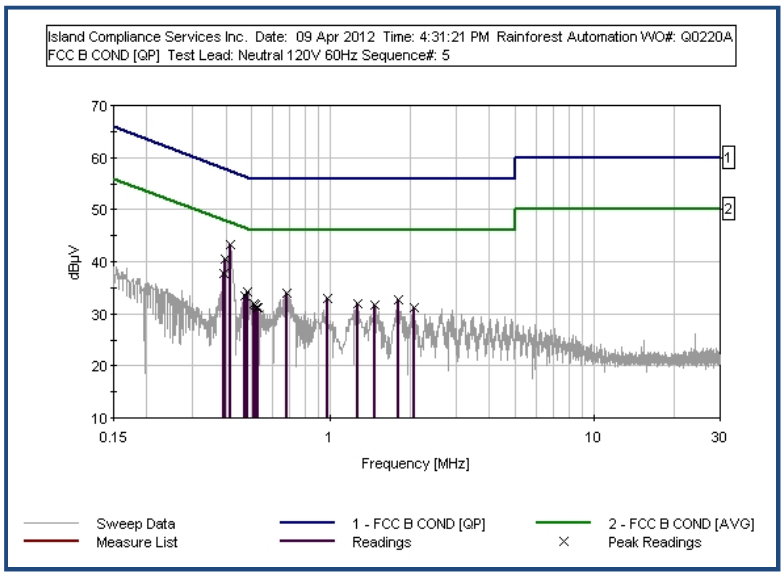


FIGURE 17 - CONDUCTED EMISSIONS PLOT - NEUTRAL

12.4 Measurement Data, Line

No.	Freq (MHz)	Rdng (dBuV)	Corrected (dBuV)	Spec (dBuV)	Margin (dB)	Polarity
1	414.701k	36.8	46.9	57.6	-10.7	Line
2	396.521k	32.8	42.9	57.9	-15.0	Line
3	661.222k	27.1	37.2	56.0	-18.8	Line
4	500.510k	26.0	36.1	56.0	-19.9	Line
5	1.796M	25.3	35.4	56.0	-20.6	Line
6	39.406k	25.2	35.3	56.0	-20.7	Line

12.5 Measurement Data, Neutral

No.	Freq (MHz)	Rdng (dBuV)	Corrected (dBuV)	Spec (dBuV)	Margin (dB)	Polarity
1	415.428k	33.2	43.3	57.5	-14.2	Neutral
2	399.430k	30.4	40.5	57.9	-17.4	Neutral
3	683.038k	23.8	33.9	56.0	-22.1	Neutral
4	1.813M	22.6	32.7	56.0	-23.3	Neutral
5	511.418k	21.9	32.0	56.0	-24.0	Neutral
6	2.068M	21.1	31.2	56.0	-24.8	Neutral

12.6 Additional Information

Description	Comment
Test Engineer	A. Eadie
Test Date	4/09/2012

13 FREQUENCY STABILITY

The following section is provided for information purposes only.

Test Description	Reference Specification	Limit	Result	Notes
Frequency Stability	2.1055	+/-0.005%	Complies	

13.1 LIMITS

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From −30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(2) Beginning at each temperature level specified in paragraph (c)(1) of this section, the frequency shall be measured within one minute after application of primary power to the transmitter and at intervals of no more than one minute thereafter until ten minutes have elapsed or until sufficient measurements are obtained to indicate clearly that the frequency has stabilized within the applicable tolerance, whichever time period is greater. During each test, the ambient temperature shall not be allowed to rise more than 10° centigrade above the respective beginning ambient temperature level.

(3) The elapsed time necessary for the frequency to stabilize within the applicable tolerance from each beginning ambient temperature level as determined from the tests specified in this paragraph shall be specified in the instruction book for the transmitter furnished to the user.

(4) When it is impracticable to subject the complete transmitter to this test because of its physical dimensions or power rating, only its frequency determining and stabilizing portions need be tested.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

13.2 DATA

Temperature (°C)	Lower Channel 6dB Freq	Max Dev (ppm)	Upper Channel 6dB Freq	Max Dev (ppm)
-20	2.4049604	1.66	2.4801148	-0.40
-10	2.4049575	0.46	2.4801158	0.00
0	2.4049604	1.66	2.4801162	0.16
10	2.4049582	0.75	2.4801148	-0.40
20	2.404 9564	0.00	2.480 1158	0.00
30	2.404 9579	0.62	2.480 1128	-1.33
40	2.404 9505	-2.45	2.480 1100	-2.34
55	**2.404 9505**	**-2.45**	**2.480 1100**	**-2.34**

FIGURE 18 - FREQUENCY STABILITY VS TEMPERATURE

Voltage (V)	Lower Channel 6dB Freq	Max Dev (ppm)	Upper Channel 6dB Freq	Max Dev (ppm)
2.7	**2.404 9604**	**1.66**	2.480 1148	-0.40
3.0	2.404 9564	0.00	2.480 1158	0.00
3.3	2.404 9579	0.62	**2.480 1148**	**-0.40**

FIGURE 19 - FREQUENCY STABILITY VS VOLTAGE @ 20°C

13.3 ADDITIONAL INFORMATION

Description	Comment
Test Engineer	A. Eadie
Test Date	17/09/2012

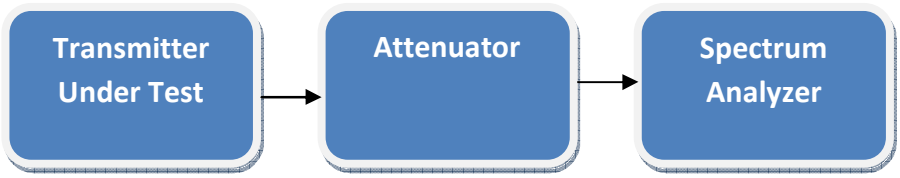
14 TEST EQUIPMENT

All applicable test equipment will be calibrated in accordance with ANSI Standard NCSL Z540-1 or other NIST traceable calibration standard. Equipment is calibrated on a 2 year cycle or according to the manufacturer's recommendations.

Manufacturer	Description	Model	Serial Number	Cal/Char Due Date D/M/Y
HP	Spectrum Analyzer	8566B	1327A00106/ 2648A14332	7/12/2012
Electro Metrics	Line Impedance Stabilization Network	EM-7823	115037	18/10/2012
HP	Pre-selector	85685A	2648A00463	7/12/2012
HP	Quasi Peak Detector	85650A	2521A00704	14/10/2012
Electro Metrics	Hybrid Antenna	EM-3141	9902-1141	18/11/2012
AH Systems	Horn Antenna	SAS-571	1242	18/11/2012
HP	Signal Generator	8657A	2521A00704	15/11/2012
HP	Signal Generator	8673E	2704A00420	7/2/2013
Rohde & Schwarz	Power analyzer	NVRS	844352/043	15/5/2013
Rohde & Schwarz	Power probe	NRV-Z5	8429721029	15/5/2013

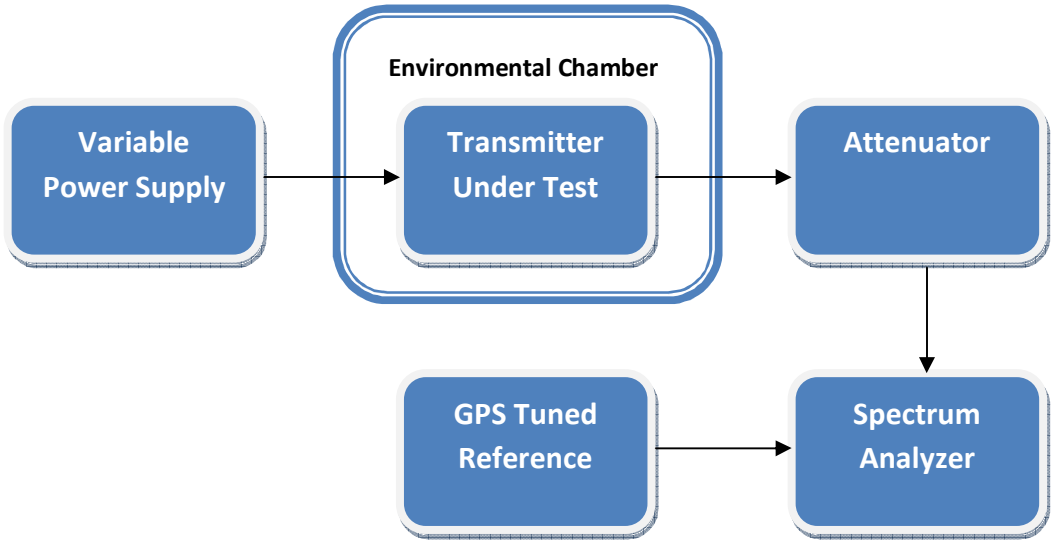
15 TEST DIAGRAMS

15.1 CONDUCTED RF TEST SETUP



15.2 POWER LINE CONDUCTED EMISSIONS TEST SETUP

15.3 FREQUENCY STABILITY



15.4 RADIATED EMISSIONS TEST SETUP