Excellence in Compliance Testing

Certification Test Report

FCC ID: S85-DAS900
IC: 10899A-DAS900

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-210

ACS Report Number: 12-0534.W06.1A

Manufacturer: Channel D Solutions, Inc.
Model: DAS-900

Test Begin Date: January 18, 2013
Test End Date: February 18, 2013

Report Issue Date: February 27, 2013

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612-0

This report is not be used to claim certification, approval, or endorsement by NVLAP, NIST or any government agency.

Reviewed by:
Kirby Munroe
Director, Wireless Certifications
ACS, Inc.

This report contains 23 pages

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specification RSS-210 for Certification.

1.2 Product description

The DAS-900 Antenna Distribution system provides wireless communications through the use of a Frequency-Hopping-Spread-Spectrum RF module and a 900 MHz wireless intercom system which transmits a digitally encoded signal used to expand communications coverage into areas that cannot be covered by a single antenna.

The complete system is designed for and sold only to commercial end-users, and is not available to the general public.

Technical Details:

Frequency Range:	902.57 – 926.65 MHz
Number of Channels:	37
Channel Separation:	669 kHz
Data Rates Supported:	345.6 kbps
Modulation Format:	FSK
Antenna Type / Gain:	TerraWave Model M202020R10007 Dipole / 2 dBi TerraWave Model M3030035O11206 Ceiling Mount Omni / 3.5 dBi
Operating Voltage:	120 VAC
RF Inputs / Outputs:	8

Applicant Information:
Channel D Solutions, Inc.
P.O. Box 1073
Brentwood, TN 37024

Test Sample Serial Numbers: Amplifier S/N: TEST001, Transceiver Module S/N: 001301

Test Sample Condition: The test samples were provided in good working order with no visible defects.

1.3 Test Methodology and Considerations

The EUT consist of a combined FHSS module and external radio frequency power amplifier / 8 port antenna distribution system. All available RF ports were exercised and evaluated where applicable. For radiated emissions, all RF output ports where terminated with minimal length of cable and antennas. Multiple antenna types where evaluated. For RF conducted measurements, each RF port was evaluated independently and the procedures of KDB 662911 D01 Multiple Transmitter Output v01r02 were applied where applicable.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions
5015 B.U. Bowman Drive
Buford, GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by the National Institute of Standards and Technology under their National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 200612-0. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

The Semi-Anechoic Chamber Test Site, Open Area Test Site (OATS) and Conducted Emissions Site have been fully described, submitted to, and accepted by the FCC, Industry Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

FCC Registration Number: 511277
Industry Canada Lab Code: IC 4175A-1
VCCI Member Number: 1831

- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 20' x 30' x 18' shielded enclosure. The chamber is lined with Toyo Ferrite Grid Absorber, model number FFG-1000. The ferrite tile grid is 101 x 101 x 19mm thick and weighs approximately 550 grams. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber.

The turntable is 150cm in diameter and is located 160cm from the back wall of the chamber. The chamber is grounded via 1 – 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Behind the turntable is a 3' x 6' x 4' deep shielded pit used for support equipment if necessary. The pit is equipped with 1 – 4" PVC chases from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:

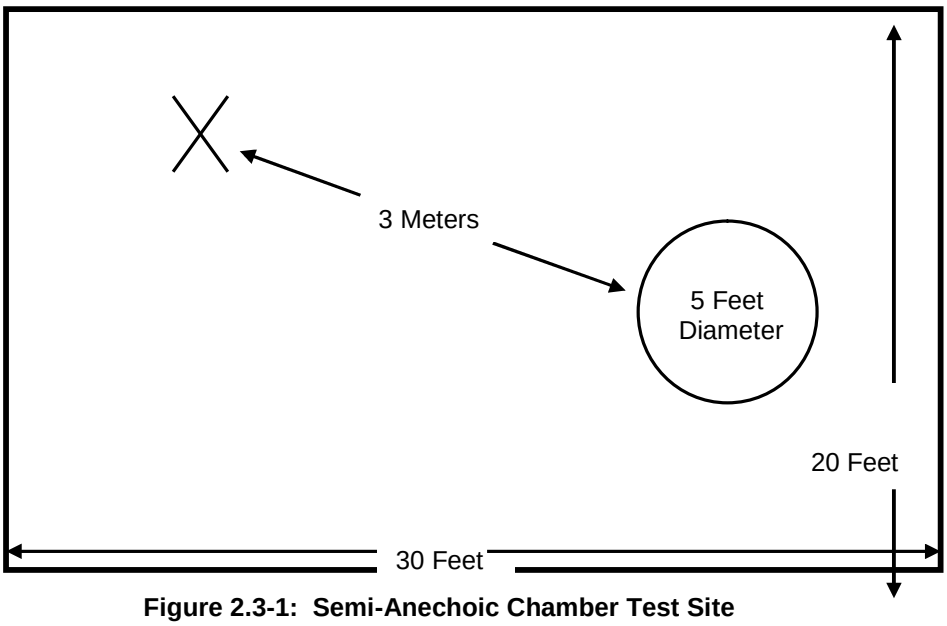


Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.3.2 Open Area Tests Site (OATS)

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 – 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 – 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 2.3-2 below:

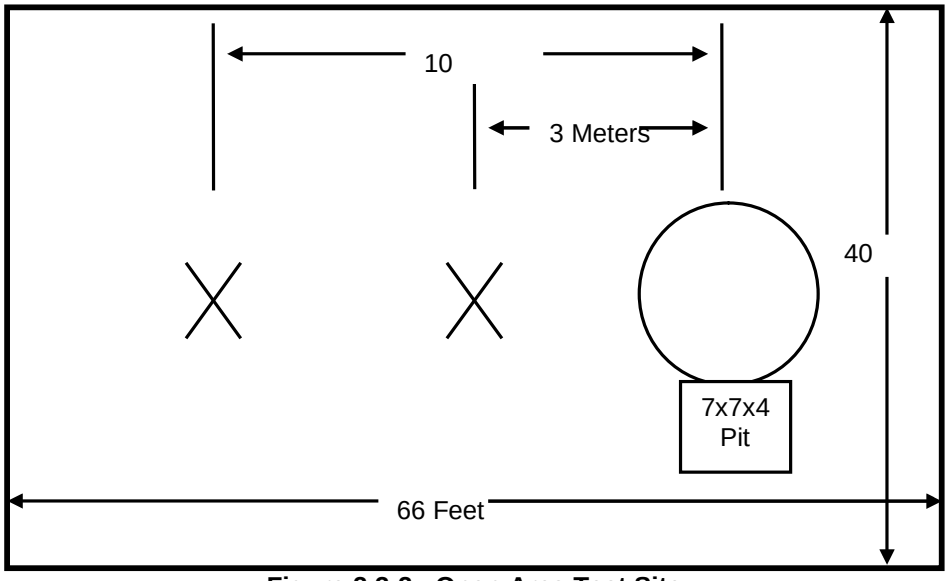


Figure 2.3-2: Open Area Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 8' solid aluminum horizontal ground reference plane (GRP) bonded every 3" to an 8' X 8' vertical ground plane.

The site is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 2.4-1:

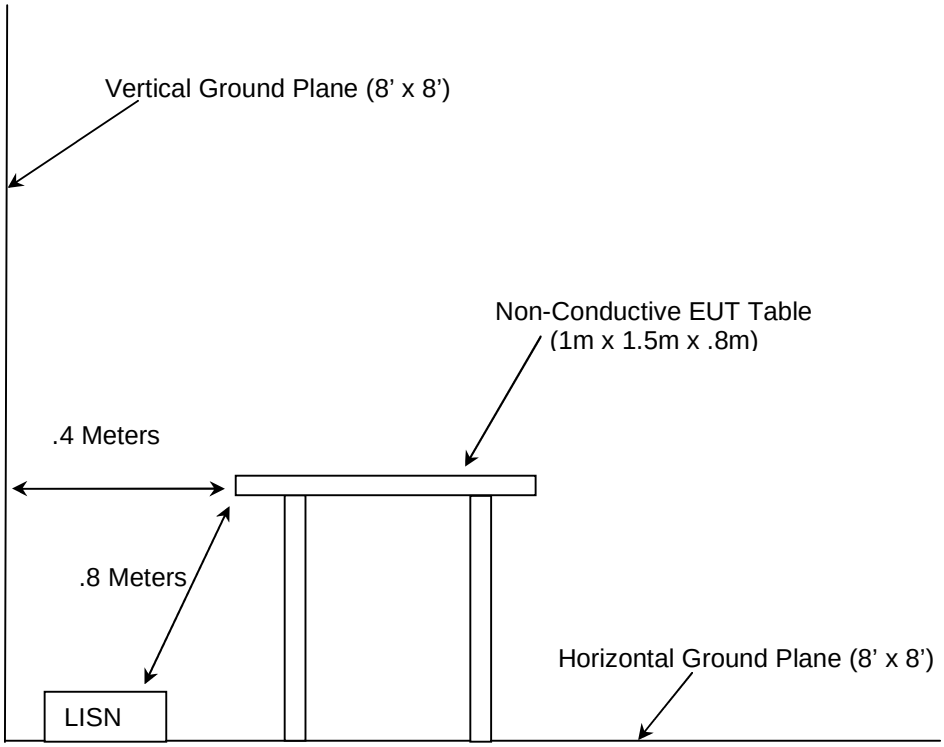


Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2013
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2013
- FCC Public Notice DA 00-705 – Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems, March 30, 2000
- FCC KDB 662911 D01 Multiple Transmitter Output v01r02 - Emissions Testing of Transmitters with Multiple Outputs in the Same Band, September 26, 2012
- Industry Canada Radio Standards Specification: RSS-210 – Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8, December 2010
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 3, December 2010.

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

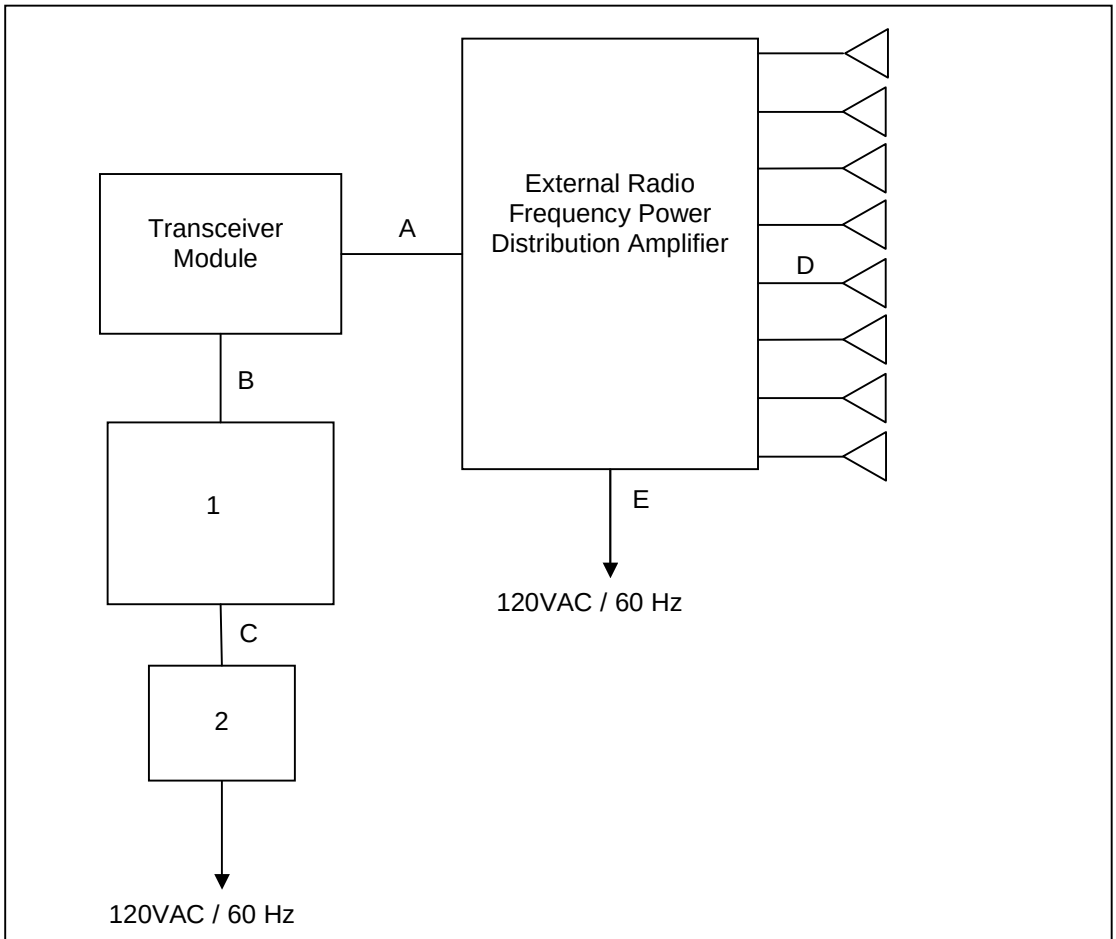
AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
1	Rohde & Schwarz	ESMI - Display	Spectrum Analyzers	833771/007	8/2/2012	8/2/2014
2	Rohde & Schwarz	ESMI-Receiver	Spectrum Analyzers	839587/003	8/2/2012	8/2/2014
30	Spectrum Technologies	DRH-0118	Antennas	970102	4/27/2011	4/27/2013
73	Agilent	8447D	Amplifiers	2727A05624	9/28/2012	9/28/2013
153	EMCO	3825/2	LISN	9411-2268	7/31/2012	7/31/2014
167	ACS	Chamber EMI Cable Set	Cable Set	167	12/17/2012	12/17/2013
168	Hewlett Packard	11947A	Attenuators	44829	2/1/2013	2/1/2014
283	Rohde & Schwarz	FSP40	Spectrum Analyzers	1000033	8/1/2012	8/1/2013
291	Florida RF Cables	SMRE-200W-12.0-SMRE	Cables	None	11/20/2012	11/20/2013
292	Florida RF Cables	SMR-290AW-480.0-SMR	Cables	None	4/2/2012	4/2/2013
324	ACS	Belden	Cables	8214	6/26/2012	6/26/2013
331	Microwave Circuits	H1G513G1	Filters	31417	7/2/2012	7/2/2013
338	Hewlett Packard	8449B	Amplifiers	3008A01111	8/2/2012	8/2/2013
340	Aeroflex/Weinschel	AS-20	Attenuators	7136	8/2/2012	8/2/2013
412	Electro Metrics	LPA-25	Antennas	1241	7/27/2012	7/27/2014
422	Florida RF	SMS-200AW-72.0-SMR	Cables	805	11/20/2012	11/20/2013
544	ETS Lindgren	3110B	Antennas	3361	11/15/2011	11/15/2013
RE90	Agilent	E7404A	Analyzers	US40240143	11/28/2012	11/28/2013

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item	Equipment Type	Manufacturer	Model/Part Number	Serial Number
1	Power / Interface Board	Cirronet / RFM	WIT2410E	ACS 11
2	Power Supply	CUI Inc	EPAS-101W-05	ACS 12

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM



A – RF Cable – Shielded – 130cm
B – Ribbon Cable – Non-shielded – 20cm
C – DC Power Cable – Non-shielded – 190cm
D – RF Cable – Shielded – 915cm
E – AC Power Cable – Non-shielded – 180cm

Figure 6-1: Test Setup Block Diagram

7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement – FCC: Section 15.203

The transceiver module utilizes an MMCX on board connector to the external radio frequency power distribution amplifier. The RF input to the external radio frequency power distribution amplifier utilizes a RP-TNC connector and RF outputs utilize RP-N-Type connectors. All antenna types utilize unique coupling via RP-N-Type connectors.

7.2 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 7.2.4

7.2.1 Measurement Procedure

ANSI C63.4 sections 6 and 7 were the guiding documents for this evaluation. Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Applicable Limit - Corrected Reading

7.2.2 Measurement Results

Results of the test are shown below in and Tables 7.2.2-1 to 7.2.2-4.

Table 7.2.2-1: Conducted EMI Results - Line 1 – Amplifier

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
17.7009	22.83	17.423	10.47	33.3	27.893	60	50	26.7	22.107
17.5238	22.529	17.076	10.47	32.999	27.547	60	50	27.001	22.453
17.0516	21.755	16.364	10.472	32.227	26.836	60	50	27.773	23.164
16.9053	21.83	16.234	10.472	32.302	26.707	60	50	27.698	23.293
16.5927	20.648	15.454	10.473	31.121	25.927	60	50	28.879	24.073
0.191094	30.611	23.618	9.93	40.541	33.548	64.826	54.826	24.285	21.278

Table 7.2.2-2: Conducted EMI Results – Line 2 – Amplifier

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
17.8671	21.795	16.318	10.469	32.264	26.787	60	50	27.736	23.213
17.7704	22.566	16.788	10.47	33.035	27.257	60	50	26.965	22.743
17.2875	21.957	16.702	10.471	32.428	27.174	60	50	27.572	22.826
16.7101	21.356	15.691	10.473	31.829	26.164	60	50	28.171	23.836
7.67577	23.26	15.974	10.111	33.371	26.085	60	50	26.629	23.915
0.187575	33.322	24.839	9.939	43.26	34.778	64.926	54.926	21.666	20.148

Table 7.2.2-3: Conducted EMI Results - Line 1 – Transceiver

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
2.60379	29.869	23.182	10.007	39.876	33.189	56	46	16.124	12.811
2.4233	35.459	28.292	10.004	45.463	38.296	56	46	10.537	7.704
2.09081	29	21.132	10	39	31.132	56	46	17	14.868
1.76811	34.648	27.289	9.996	44.644	37.285	56	46	11.356	8.715
1.61243	32.637	27.204	9.994	42.63	37.198	56	46	13.37	8.802
0.165625	40.029	36.34	9.992	50.021	46.332	65.554	55.554	15.533	9.222

Table 7.2.2-4: Conducted EMI Results – Line 2 – Transceiver

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
2.42366	35.286	27.916	10.004	45.29	37.921	56	46	10.71	8.079
2.26213	36.031	29.096	10.002	46.033	39.098	56	46	9.967	6.902
1.95118	32.173	24.182	9.998	42.171	34.181	56	46	13.829	11.819
1.77535	35.052	29.013	9.996	45.048	39.009	56	46	10.952	6.991
0.322987	38.053	35.729	9.993	48.045	45.721	61.058	51.058	13.012	5.336
0.161	49.03	42.41	10.003	59.033	52.413	65.678	55.678	6.645	3.265

7.3 Peak Output Power - FCC Section 15.247(b)(2) IC: RSS-210 A8.4(1)

7.3.1 Measurement Procedure

Each RF output port of the EUT was directly connected to the input of the power meter. Total power is determine using the measure and sum approach per KDB 662911 D01 Multiple Transmitter Output v01r02.

7.3.2 Measurement Results

Results are shown below in Table 7.3.2-1 below:

Table 7.3.2-1: RF Output Power

Frequency (MHz)	Measured Peak Power (dBm)								Total Peak Power (dBm)	Total Peak Power (mW)
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8		
902.57	11.67	11.70	11.80	11.78	11.77	11.83	11.75	11.71	20.78	119.7
914.61	11.93	11.97	12.10	12.05	12.02	12.11	12.02	11.97	21.05	127.4
926.65	11.88	11.93	12.01	12.03	11.97	12.04	11.97	11.92	21.00	125.9

7.4 Channel Usage Requirements

7.4.1 Carrier Frequency Separation – FCC: Section 15.247(a)(1) IC: RSS-210 A8.1(b)

7.4.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set wide enough to capture two adjacent peaks and the RBW and VBW were set to ≥ 1% of the span.

Carrier frequency separation was measured for all modes of operation and data presented in section 7.4.1.2 below.

7.4.1.2 Measurement Results

Results are shown below in Figure 7.4.1.2-1.

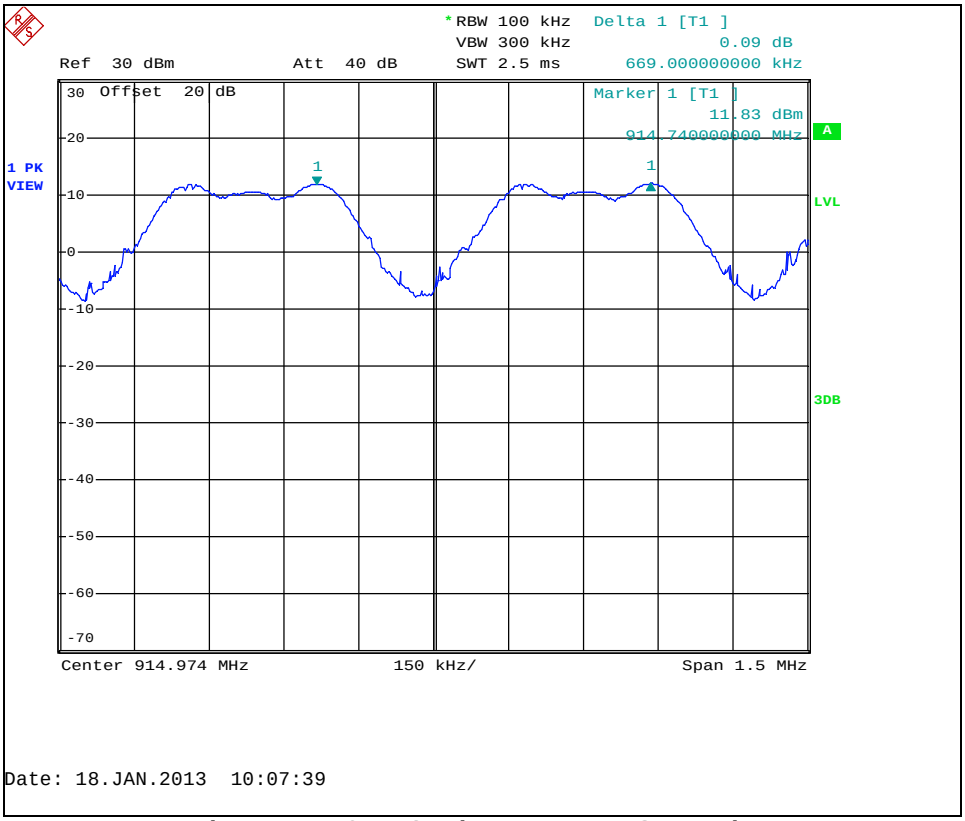


Figure 7.4.1.2-1: Carrier Frequency Separation

7.4.2 Number of Hopping Channels – FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set to encompass the entire frequency band of operation. The spectrum analyzer's RBW was set to ≥ 1% of the span, and the VBW was set to > RBW. The trace was set to max hold with a peak detector active.

7.4.2.2 Measurement Results

Results are shown below in Figure 7.4.2.2-1.

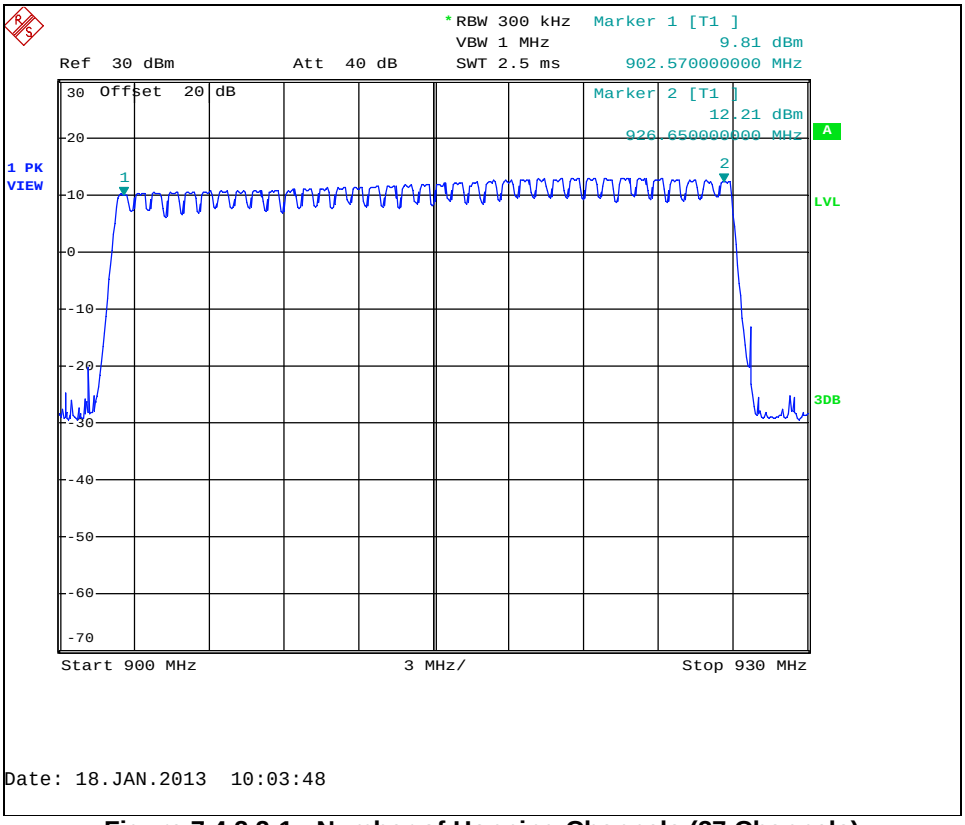


Figure 7.4.2.2-1: Number of Hopping Channels (37 Channels)

7.4.3 Channel Dwell Time – FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.3.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set 0 Hz centered on a hopping channel. The RBW of the spectrum analyzer was set to approximately 1 MHz and VBW set to ≥ RBW. The Marker Delta function of the analyzer was utilized to determine the dwell time.

7.4.3.2 Measurement Results

Results are shown below in Table 7.4.3.2-1 Figures 7.4.3.2-1 through 7.4.3.2-2.

Table 7.4.3.2-1: Channel Dwell Time

Single Occupancy (Dwell Time) (ms)	Number of Occupations / 10s	Total Dwell Time / 10s (ms)
0.772	28	21.62

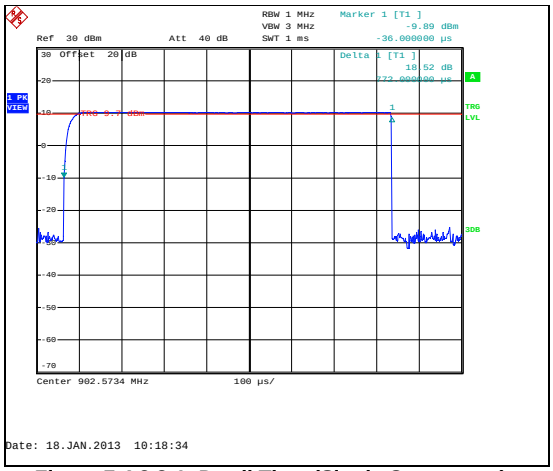


Figure 7.4.3.2-1: Dwell Time (Single Occupancy)

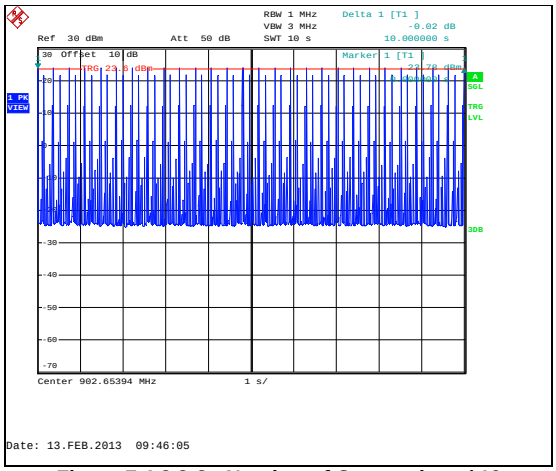


Figure 7.4.3.2-2: Number of Occupations / 10s

7.4.4 20dB / 99% Bandwidth - FCC: Section 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.4.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set between two times and five times the occupied bandwidth (OBW) of the emission. The RBW of the spectrum analyzer was set to approximately 1 % to 5 % of the OBW. The trace was set to max hold with a peak detector active. The Delta function of the analyzer was utilized to determine the 20 dB bandwidth of the emission.

The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission and side bands. The RBW was to ~ 1% of the span. The trace was set to max hold with a sample detector. The occupied bandwidth measurement function of the analyzer was used for the 99% bandwidth.

7.4.4.2 Measurement Results

Results are shown below in Table 7.4.4.2-1 and Figures 7.4.4.2-1 through 7.4.4.2-6.

Table 7.4.4.2-1: 20dB / 99% Bandwidth

Frequency [MHz]	20dB Bandwidth [kHz]	99% Bandwidth [kHz]
902.57	404.0	402.0
914.61	404.0	402.0
926.65	404.0	402.0

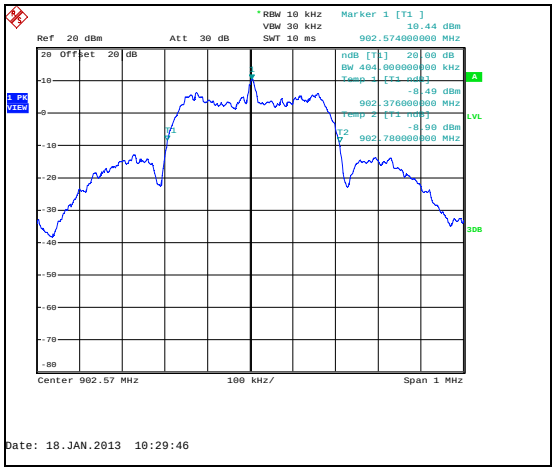


Figure 7.4.4.2-1: 20dB BW - 902.57 MHz

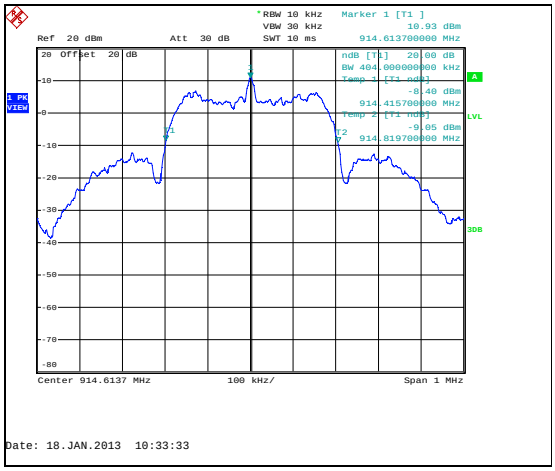


Figure 7.4.4.2-2: 20dB BW – 914.61 MHz

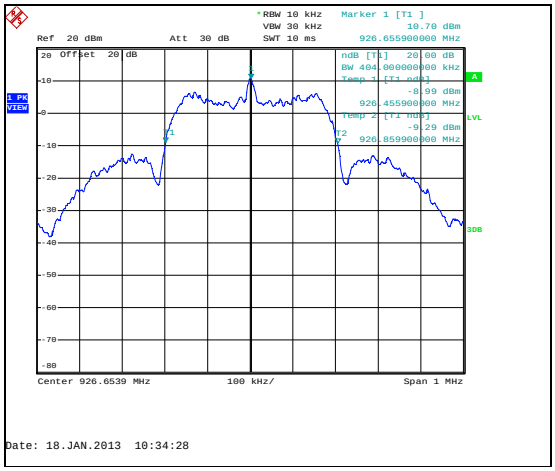


Figure 7.4.4.2-3: 20dB BW – 926.65 MHz

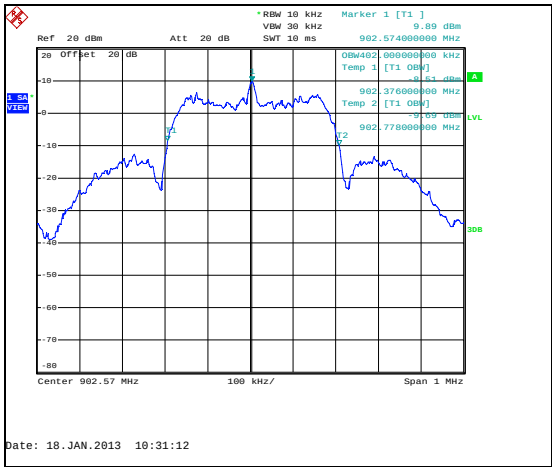


Figure 7.4.4.2-4: 99% BW - 902.57 MHz

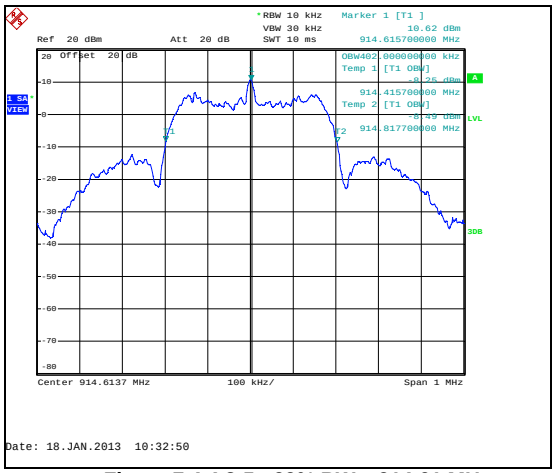


Figure 7.4.4.2-5: 99% BW – 914.61 MHz

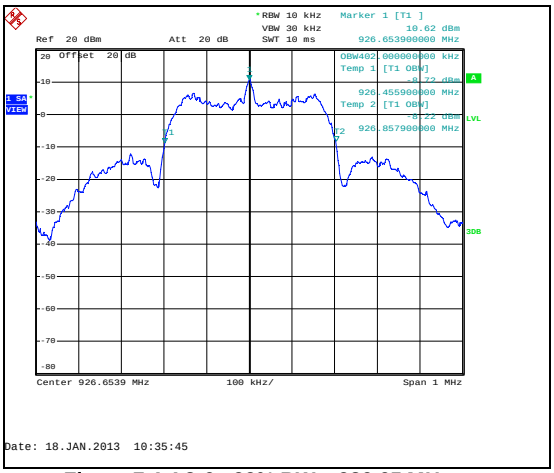


Figure 7.4.4.2-6: 99% BW – 926.65 MHz

7.5 Band-Edge Compliance and Spurious Emissions-FCC 15.247(d) IC: RSS-210 A8.5

7.5.1 Band-Edge Compliance of RF Conducted Emissions

7.5.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement the spectrum analyzer's RBW was set to ≥ 1% of the span, and the VBW was set to >> RBW.

7.5.1.2 Measurement Results

Results are shown in the figures 7.5.1.2-1 to 7.5.1.2-4 below.

NON-HOPPING MODE:

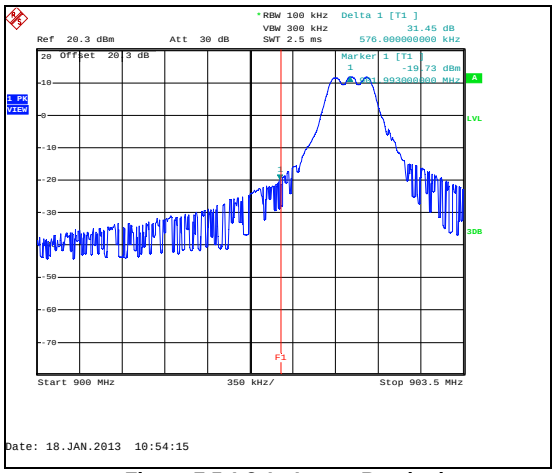


Figure 7.5.1.2-1: Lower Band-edge

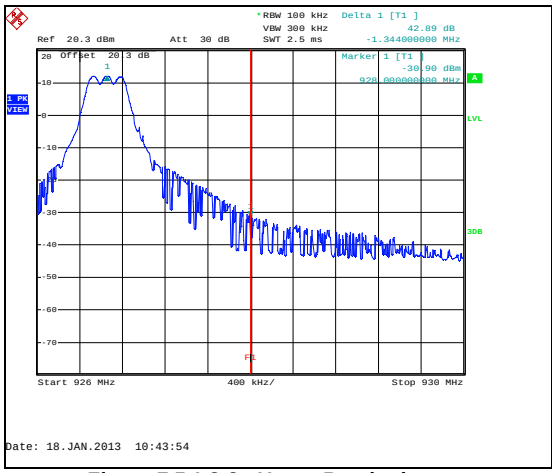


Figure 7.5.1.2-2: Upper Band-edge

HOPPING MODE:

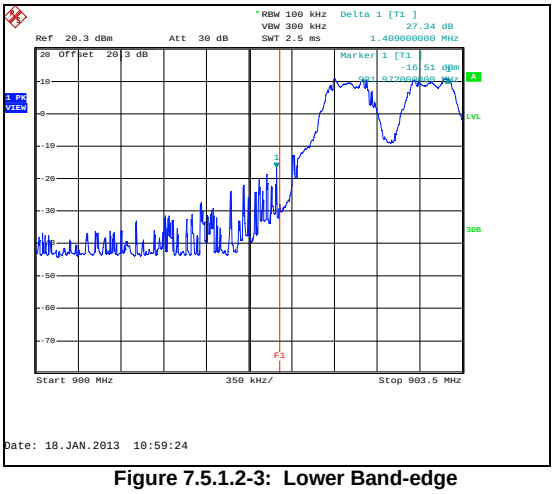


Figure 7.5.1.2-3: Lower Band-edge

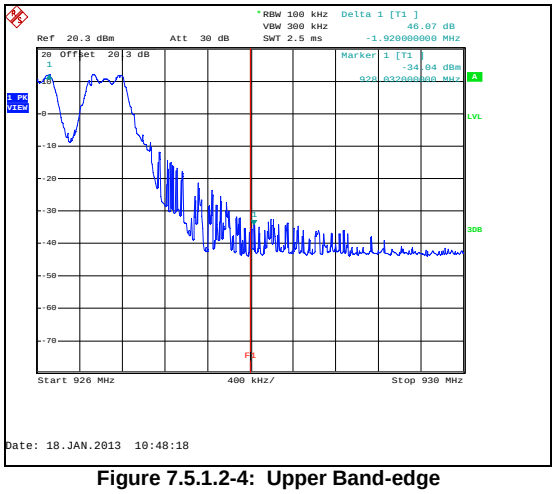


Figure 7.5.1.2-4: Upper Band-edge

7.5.2 RF Conducted Spurious Emissions

7.5.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 10GHz, 10 times the highest fundamental frequency. Measurements were made at the low, center and high channels of the EUT. For each measurement, the spectrum analyzer's RBW was set to 100kHz. A peak detector function was used with the trace set to max hold.

7.5.2.2 Measurement Results

Results are shown below in Figures 7.5.2.2-1 to 7.5.2.2-6:

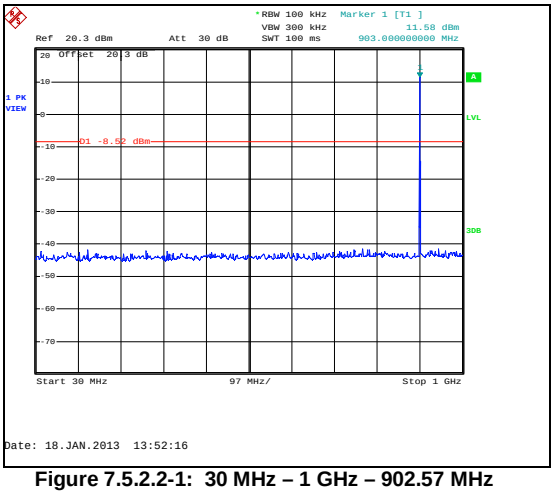


Figure 7.5.2.2-1: 30 MHz – 1 GHz – 902.57 MHz

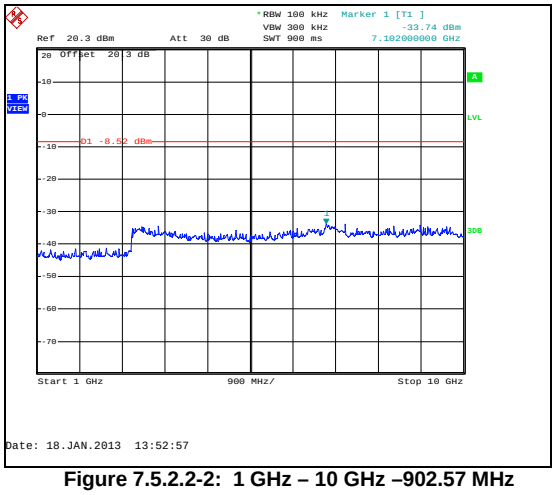


Figure 7.5.2.2-2: 1 GHz – 10 GHz –902.57 MHz

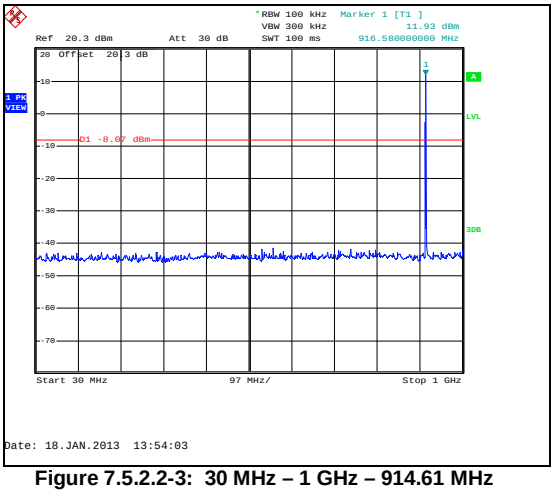


Figure 7.5.2.2-3: 30 MHz – 1 GHz – 914.61 MHz

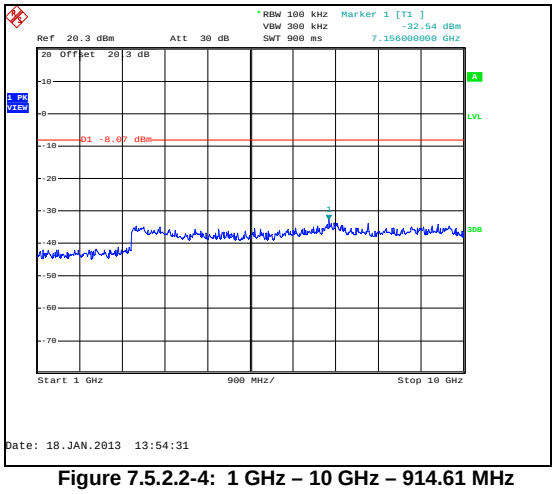


Figure 7.5.2.2-4: 1 GHz – 10 GHz – 914.61 MHz

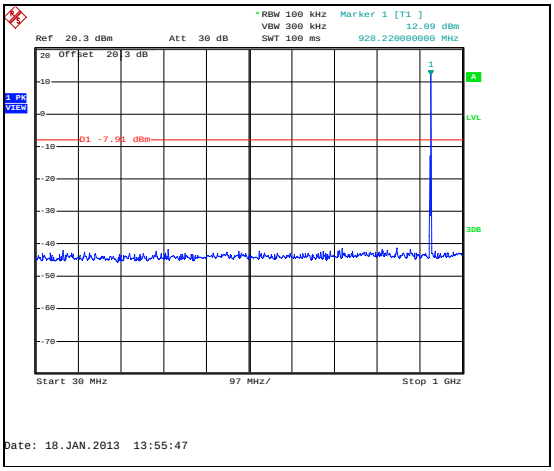


Figure 7.5.2.2-5: 30 MHz – 1 GHz – 926.65 MHz

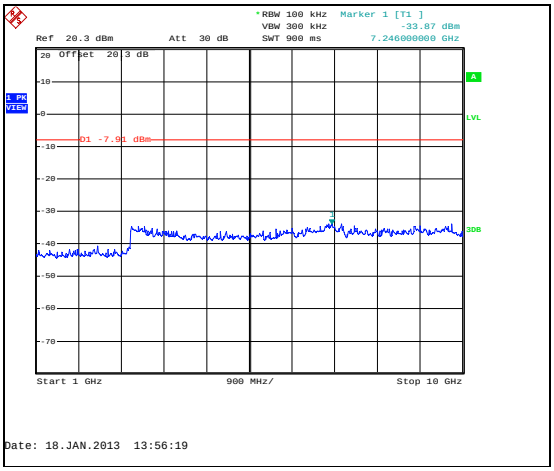


Figure 7.5.2.2-6: 1 GHz – 10 GHz – 926.65 MHz

7.5.3 Radiated Spurious Emissions - FCC Section 15.205 IC: RSS-210 2.6

7.5.3.1 Measurement Procedure

Radiated emissions tests were made over the frequency range of 30MHz to 10GHz, 10 times the highest fundamental frequency.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000MHz, peak and average measurements were made with RBW and VBW of 1 MHz and 3MHz respectively.

The EUT was caused to generate a continuous modulated carrier on the hopping channel.

The transceiver module was evaluated in multiple orientation and worst case provided. Worst case orientation was determined to be Z position.

7.5.3.2 Duty Cycle Correction

For average radiated measurements, using a 0.772% duty cycle, the measured level was reduced by a factor 42.25dB. The duty cycle correction factor is determined using the formula: 20log (Dwell Time/100) = -42.25dB.

7.5.3.3 Measurement Results

Radiated spurious emissions found in the band of 30MHz to 10GHz are reported in the Tables 7.5.3.3-1 and 7.5.3.3-2 below.

Table 7.5.3.3-1: Radiated Spurious Emissions Tabulated Data – Ceiling Mount Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.72026	52.63	47.17	H	-3.85	48.78	1.08	74.0	54.0	25.2	52.9
2707.72026	53.09	47.63	V	-3.85	49.24	1.54	74.0	54.0	24.8	52.5
3610.29368	50.14	41.13	H	-0.64	49.50	-1.76	74.0	54.0	24.5	55.8
3610.29368	53.61	47.12	V	-0.64	52.97	4.23	74.0	54.0	21.0	49.8
4512.8671	59.36	53.14	H	1.24	60.60	12.13	74.0	54.0	13.4	41.9
4512.8671	56.74	50.14	V	1.24	57.98	9.13	74.0	54.0	16.0	44.9
5415.44052	51.26	42.63	H	3.88	55.14	4.26	74.0	54.0	18.9	49.7
5415.44052	52.07	43.39	V	3.88	55.95	5.02	74.0	54.0	18.1	49.0
3939.7	51.12	45.34	H	0.75	51.87	3.84	74.0	54.0	22.1	50.2
3939.7	52.76	48.57	V	0.75	53.51	7.07	74.0	54.0	20.5	46.9
Middle Channel										
2745.84774	52.40	46.71	H	-3.71	48.69	0.75	74.0	54.0	25.3	53.2
2745.84774	53.65	48.44	V	-3.71	49.94	2.48	74.0	54.0	24.1	51.5
3661.13032	53.47	47.12	H	-0.43	53.04	4.45	74.0	54.0	21.0	49.6
3661.13032	56.52	51.31	V	-0.43	56.09	8.64	74.0	54.0	17.9	45.4
4576.4129	54.15	47.25	H	1.40	55.55	6.40	74.0	54.0	18.5	47.6
4576.4129	56.72	50.22	V	1.40	58.12	9.37	74.0	54.0	15.9	44.6
3977.8	52.12	48.29	H	0.91	53.03	6.95	74.0	54.0	21.0	47.1
3977.8	54.20	50.09	V	0.91	55.11	8.75	74.0	54.0	18.9	45.3
High Channel										
2779.96182	56.64	52.63	H	-3.59	53.05	6.79	74.0	54.0	20.9	47.2
2779.96182	55.40	50.73	V	-3.59	51.81	4.89	74.0	54.0	22.2	49.1
3706.61576	54.38	48.34	H	-0.23	54.15	5.86	74.0	54.0	19.9	48.1
3706.61576	57.02	51.69	V	-0.23	56.79	9.21	74.0	54.0	17.2	44.8
4633.2697	49.53	39.33	H	1.54	51.07	-1.38	74.0	54.0	22.9	55.4
4633.2697	49.83	40.52	V	1.54	51.37	-0.19	74.0	54.0	22.6	54.2
4011.9	52.43	48.19	H	1.00	53.43	6.95	74.0	54.0	20.6	47.1
4011.9	54.48	51.31	V	1.00	55.48	10.07	74.0	54.0	18.5	43.9

Table 7.5.3.3-2: Radiated Spurious Emissions Tabulated Data – Whip Antenna

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
2707.72026	54.12	46.76	H	-3.85	50.27	0.67	74.0	54.0	23.7	53.3
2707.72026	57.07	51.56	V	-3.85	53.22	5.47	74.0	54.0	20.8	48.5
3610.29368	53.06	44.22	H	-0.64	52.42	1.33	74.0	54.0	21.6	52.7
3610.29368	56.23	47.68	V	-0.64	55.59	4.79	74.0	54.0	18.4	49.2
4512.8671	61.62	53.75	H	1.24	62.86	12.74	74.0	54.0	11.1	41.3
4512.8671	60.07	52.02	V	1.24	61.31	11.01	74.0	54.0	12.7	43.0
5415.44052	50.41	40.78	H	3.88	54.29	2.41	74.0	54.0	19.7	51.6
5415.44052	51.84	42.47	V	3.88	55.72	4.10	74.0	54.0	18.3	49.9
3940	54.46	51.03	H	0.75	55.21	9.53	74.0	54.0	18.8	44.5
3940	56.16	53.21	V	0.75	56.91	11.71	74.0	54.0	17.1	42.3
Middle Channel										
2745.84774	53.34	45.57	H	-3.71	49.63	-0.39	74.0	54.0	24.4	54.4
2745.84774	54.48	47.77	V	-3.71	50.77	1.81	74.0	54.0	23.2	52.2
3661.13032	55.26	47.10	H	-0.43	54.83	4.43	74.0	54.0	19.2	49.6
3661.13032	59.33	51.92	V	-0.43	58.90	9.25	74.0	54.0	15.1	44.8
4576.4129	62.31	55.37	H	1.40	63.71	14.52	74.0	54.0	10.3	39.5
4576.4129	60.17	52.81	V	1.40	61.57	11.96	74.0	54.0	12.4	42.0
8237.54322	48.12	37.06	V	8.48	56.60	3.29	74.0	54.0	17.4	50.7
3977.86	54.46	50.71	H	0.91	55.37	9.37	74.0	54.0	18.6	44.6
3977.86	56.93	54.05	V	0.91	57.84	12.71	74.0	54.0	16.2	41.3
High Channel										
2779.96182	59.91	54.38	H	-3.59	56.32	8.54	74.0	54.0	17.7	45.5
2779.96182	58.27	52.68	V	-3.59	54.68	6.84	74.0	54.0	19.3	47.2
3706.61576	54.16	45.77	H	-0.23	53.93	3.29	74.0	54.0	20.1	50.7
3706.61576	58.64	51.18	V	-0.23	58.41	8.70	74.0	54.0	15.6	45.3
4633.2697	53.27	44.25	H	1.54	54.81	3.54	74.0	54.0	19.2	50.5
4633.2697	53.86	45.06	V	1.54	55.40	4.35	74.0	54.0	18.6	49.7
4011.9	56.31	53.67	H	1.00	57.31	12.43	74.0	54.0	16.7	41.6
4011.9	58.04	55.78	V	1.00	59.04	14.54	74.0	54.0	15.0	39.5

7.5.3.4 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T = Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
R_U = Uncorrected Reading
R_C = Corrected Level
AF = Antenna Factor
CA = Cable Attenuation
AG = Amplifier Gain
DC = Duty Cycle Correction Factor

Example Calculation: Peak

Corrected Level: 54.12 - 3.85 = 50.27dBuV/m
Margin: 74dBuV/m – 50.27dBuV/m = 23.7dB

Example Calculation: Average

Corrected Level: 46.76 - 3.85 - 42.25 = 0.67dBuV
Margin: 54dBuV – 20.31dBuV = 33.7dB

8 CONCLUSION

In the opinion of ACS, Inc. DAS-900, manufactured by Channel D Solutions, Inc. meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT