EMISSIONS TEST REPORT FOR A LOW POWER TRANSMITTER

I. GENERAL INFORMATION

Requirement:	FCC
Test Requirements:	FCC Part 15
Applicant:	Intelleflex Corp 2465 Augustine Drive, Suite 102 Santa Clara, CA 95054

FCC ID:	VBLFMR-6000
IC:	7151A-FMR6000
Model No.:	FMR-6000

II. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

The Intelleflex FMR-6000 is a 902-928 MHz FHSS RFID reader. The module supports two standard RFID modulation protocols, C1C2 and C3.

III. TEST DATES AND TEST LOCATION

Testing was performed 19 and 29 November 2010 and 1 December 2010.

All testing was performed at

Bay Area Compliance Laboratory
1490 Anvilwood Road
Sunnyvale, CA 94089

T.N. Cokenias 16 December 2010
EMC Consultant/Agent for Intelleflex Corporation

15.203 Antenna connector requirement

The EUT uses an external antenna with a unique antenna connector.

Antenna description	Mfr.	Model No.	Gain
Panel antenna	MTi	MT-262006/TRH/A/K	9dBic *
Panel antenna	MTi	MT-262013/NRH	6dBiL

' Max gain is 7.86 dBiL

TEST PROCEDURES

All tests were performed in accordance with the applicable procedures called out in the following documents, unless otherwise noted:

FCC 47CFR15

RSS-210 Issue 7: Low power license exempt radio frequency devices (July 2007)
RSS-212: Test Facilities and Test Methods for Radio Equipment

ANSI C63.4 – 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

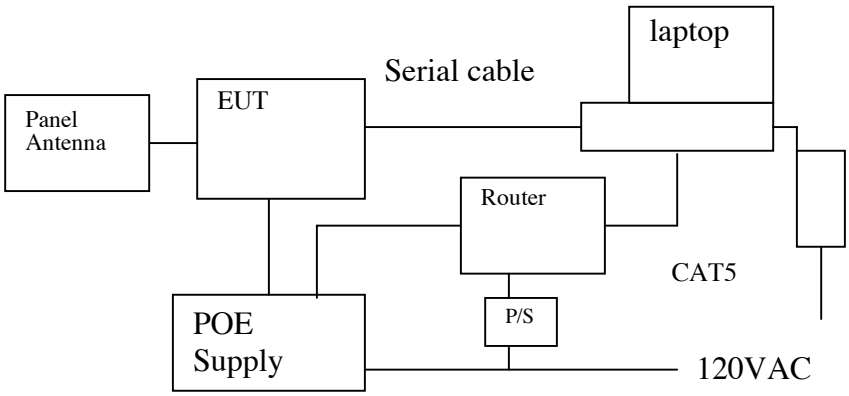
For each modulation type, tests were performed at three frequencies:

Channel 0 (LOW) – 902.75 MHz
Channel 26 (MID) - 915.75 MHz
Channel 49 (HIGH) – 927.25 MHz

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	3/24/10
Agilent	Spectrum Analyzer	E4440A	US45303156	8/9/10
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	6/16/10
Hewlett Packard	Pre amplifier	8447D	2944A06639	6/18/10
A. H. Systems	Horn Antenna	SAS-200/571	261	9/23/10
Mini-Circuits	Pre Amplifier	ZVA-183-S	570400946	2010-05-10
Solar Electronics	LISN	9252-50-R-24-N	511213	6/28/10

Test Set-up Diagram



Support Equipment

Equipment	Mfr	Model	Serial No.
POE adapter (EUT)	SL Power and AULT	PW180KB4800F01 (0.35A and 0.4A)	n/a
Laptop PC	HP	Pavillion	0045-648-759-531
PC AC/DC adapter	HP	DC359A	CT59C70AMFSY592
Router	Motorola	2247-62-10NAFP	142243293120

IV. TEST RESULTS

Radiated Test Set-up, 30 MHz-9.3 GHz

Test requirement: 15.205, 15.207, 15.247

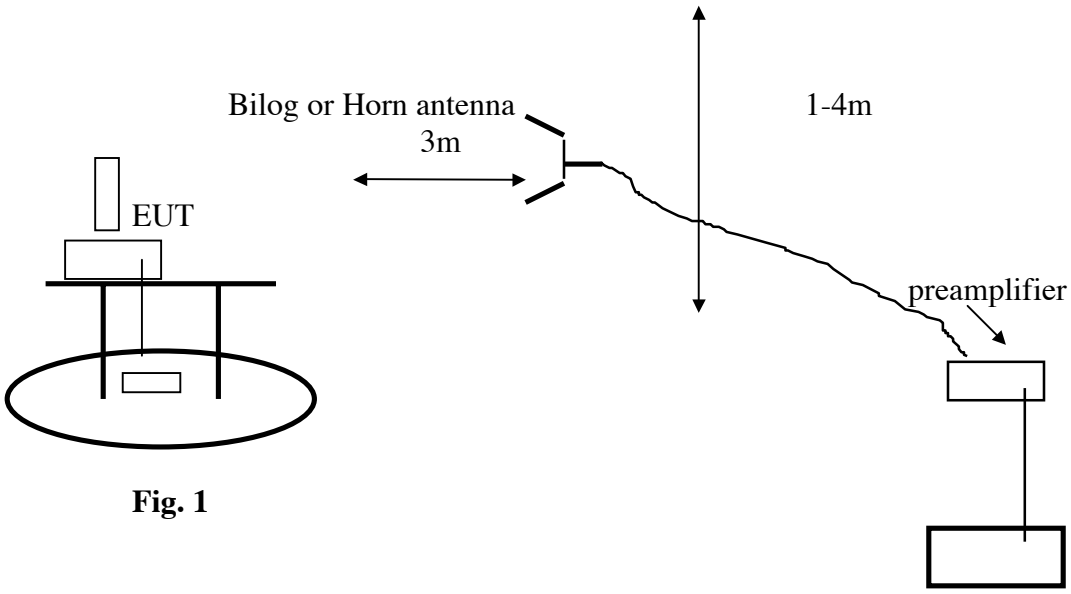


Fig. 1

Test Procedures

Radiated emissions generated by the transmitter portion of the EUT were measured.

1. The EUT was placed on a wooden table resting on a turntable on the test site. The search antenna was placed 3m from the EUT. The EUT antenna was mounted in the with the EUT TX antenna pointed directly to the search antenna.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.

3. Emissions were investigated to the 10^{th} harmonic of the fundamental.

4. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Test Results: Worst-case results are presented. Refer to data sheets below. Restricted band emissions meet 54 dBuV/m. Other undesired emissions from the transmitter meet the -20 dBc requirement in 15.247(d).

15.205 Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505 (1)	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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

15.209 General Field Strength Limits

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Restricted Bands, Industry Canada RSS-210

Table 1: Restricted Frequency Bands (Note)

MHz
0.090-0.110
2.1735-2.1905
3.020-3.026
4.125-4.128
4.17725-4.17775
4.20725-4.20775
5.677-5.683
6.215-6.218
6.26775-6.26825
6.31175-6.31225
8.291-8.294
8.362-8.366
8.37625-8.38675
8.41425-8.41475
12.29-12.293
12.51975-12.52025
12.57675-12.57725
13.36-13.41
16.42-16.423
16.69475-16.69525
16.80425-16.80475
25.5-25.67
37.5-38.25

MHz
73-74.6
74.8-75.2
108-138
156.52475-156.52525
156.7-156.9
240-285
322-335.4
399.9-410
608-614
960-1427
1435-1626.5
1645.5-1646.5
1660-1710
1718.8-1722.2
2200-2300
2310-2390
2655-2900
3260-3267
3332-3339
3345.8-3358
3500-4400
4500-5150
5350-5460

MHz
7250-7750
8025-8500

GHz
9.0-9.2
9.3-9.5
10.6-12.7
13.25-13.4
14.47-14.5
15.35-16.2
17.7-21.4
22.01-23.12
23.6-24.0
31.2-31.8
36.43-36.5
Above 38.6

Note: Certain frequency bands listed in Table 1 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard as well as in RSS-310.

General emissions limits, RSS-210

Table 2: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz (Note)

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: Transmitting devices are not permitted in Table 1 bands or in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz). Prohibition of operation in TV bands does not apply to momentary devices, or to medical telemetry devices in the band 174-216 MHz, and to perimeter protection systems in the bands 54-72 and 76-88 MHz. The perimeter protection devices are to meet Table 3 field strengths limits.

Radiated Emissions Above 1 GHz: C1C2 Operation

Company Name:Inte T1011192
Product Type:
FCC15.247 Radiated Emission Test
(Spurious Emission at Restri
Above 1GHz to 10th
Tester: Jack L
Date: 2010-12-

CiG2 Power setting: 1F

Freq. GHz	Read dBuV	POL	Cable dB	AF 1/dB	Amp dB	Detector	TOTAL dBuV/m	Limit dBuV/m	Margin dB	LOW Ch
2708	46	V	2.82	28.9	27.9	Peak	50.04	74	-23.96	
2708	43	H	2.82	28.9	27.9	Peak	46.34	74	-27.66	
2708	39	V	2.82	28.9	27.9	Ave	42.9	54	-11.1	
2708	36	H	2.82	28.9	27.9	Ave	40.21	54	-13.79	

Freq. GHz	Read dBuV	POL	Cable dB	AF 1/dB	Amp dB	Detector	TOTAL dBuV/m	Limit dBuV/m	Margin dB	MID Ch
2746	44	V	2.82	28.9	27.9	Peak	47.6	74	-26.4	
2746	43	H	2.82	28.9	27.9	Peak	46.79	74	-27.21	
2746	38	V	2.82	28.9	27.9	Ave	42.28	54	-11.72	
2746	37	H	2.82	28.9	27.9	Ave	40.45	54	-13.55	

Freq. GHz	Read dBuV	POL	Cable dB	AF 1/dB	Amp dB	Detector	TOTAL dBuV/m	Limit dBuV/m	Margin dB	HIGH Ch
2781	41	V	2.82	28.9	27.9	Peak	44.8	74	-29.2	
2781	41	H	2.82	28.9	27.9	Peak	44.94	74	-29.06	
2781	33	V	2.82	28.9	27.9	Ave	36.73	54	-17.27	
2781	32	H	2.82	28.9	27.9	Ave	36.01	54	-17.99	

Radiated Emissions Above 1 GHz: C3 Operation

Company Name:Inte T1011192
Product Type:
FCC15.247 Radiated Emission Testing at Chamber3
(Spurious Emission at Restricted bands)
Above 1GHz to 10th harmonic
Tester: Jack Liu
Date: 2010-12-01

C3 Power setting: 1F

Freq. GHz	Read dBuV	POL	Cable dB	AF 1/dB	Amp dB	Detector	TOTAL dBuV/m	Limit dBuV/m	Margin dB	LOW Ch
2708	46.7	V	2.82	28.9	27.9	Peak	50.56	74	-23.44	
2708	44.4	H	2.82	28.9	27.9	Peak	48.24	74	-25.76	
2708	41.9	V	2.82	28.9	27.9	Ave	45.77	54	-8.23	
2708	39.5	H	2.82	28.9	27.9	Ave	43.35	54	-10.65	

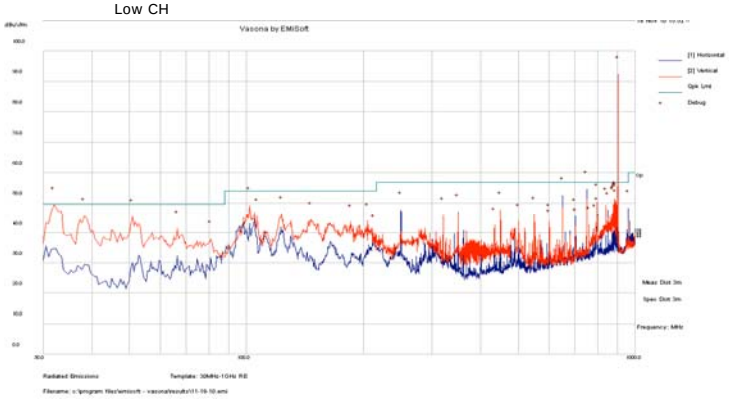
Freq. GHz	Read dBuV	POL	Cable dB	AF 1/dB	Amp dB	Detector	TOTAL dBuV/m	Limit dBuV/m	Margin dB	MID Ch
2746	43.7	V	2.82	28.9	27.9	Peak	47.56	74	-26.44	
2746	44.4	H	2.82	28.9	27.9	Peak	48.23	74	-25.77	
2746	38.1	V	2.82	28.9	27.9	Ave	41.9	54	-12.1	
2746	39.2	H	2.82	28.9	27.9	Ave	43	54	-11	

Freq. GHz	Read dBuV	POL	Cable dB	AF 1/dB	Amp dB	Detector	TOTAL dBuV/m	Limit dBuV/m	Margin dB	HIGH Ch
2781	41.3	V	2.82	28.9	27.9	Peak	45.18	74	-28.82	
2781	40.5	H	2.82	28.9	27.9	Peak	44.29	74	-29.71	
2781	33.3	V	2.82	28.9	27.9	Ave	37.1	54	-16.9	
2781	31	H	2.82	28.9	27.9	Ave	34.79	54	-19.21	

Radiated Emissions Below 1 GHZ: C3 Protocol

Company Name:Intelleflex **T1011192**
Product Type:
FCC15B ClassA Radiated Emission Testing at Chamber3
(Spurious Emission)
30MHz to 1GHz
Tester: Jack Liu
Date: 2010-11-19

Notes: C3 modulation
Low CH



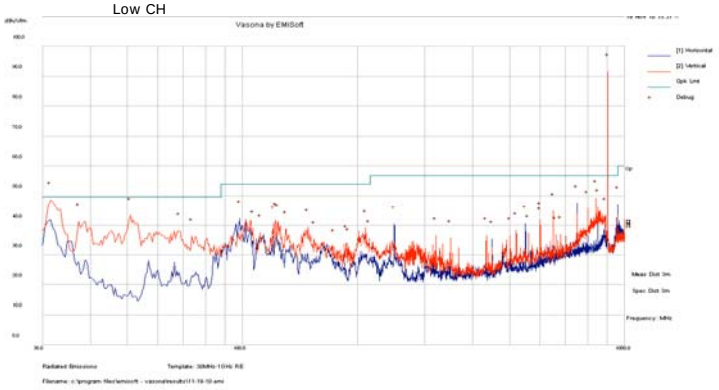
Peak Scan

No	Frequency MH	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1	903	75.53	13.93	2.75	92.21	Peak [Scan]	H	200	0	56.9	35.31	fundamental
2	31.94	39.09	10.42	-0.19	49.33	Peak [Scan]	V	100	0	49.54	-0.21	Pass
3	750.225	40.54	13.4	0.62	54.56	Peak [Scan]	H	100	0	56.9	-2.34	Pass
4	38.245	40.18	10.48	-5.09	45.57	Peak [Scan]	V	100	0	49.54	-3.97	Pass
5	50.855	46.84	10.61	-12.21	45.24	Peak [Scan]	V	100	0	49.54	-4.3	Pass
6	650.315	40.38	13	-0.95	52.44	Peak [Scan]	H	100	0	56.9	-4.46	Pass
7	101.78	47.95	10.9	-9.63	49.23	Peak [Scan]	V	100	0	53.98	-4.75	Pass
8	886.025	34.95	13.7	2.58	51.23	Peak [Scan]	V	100	0	56.9	-5.67	Pass
9	889.905	34.5	13.7	2.66	50.86	Peak [Scan]	V	100	0	56.9	-6.04	Pass
10	884.57	34.27	13.7	2.57	50.53	Peak [Scan]	V	100	0	56.9	-6.37	Pass
11	797.27	35.52	13.47	1.39	50.39	Peak [Scan]	V	100	0	56.9	-6.51	Pass
12	891.36	33.87	13.73	2.69	50.29	Peak [Scan]	V	100	0	56.9	-6.61	Pass
13	880.205	33.45	13.7	2.57	49.72	Peak [Scan]	V	100	0	56.9	-7.18	Pass
14	877.295	33.03	13.7	2.57	49.3	Peak [Scan]	V	100	0	56.9	-7.6	Pass
15	123.12	41.59	11.03	-6.42	46.2	Peak [Scan]	V	100	0	53.98	-7.78	Pass
16	840.435	33.2	13.6	2.3	49.1	Peak [Scan]	V	100	0	56.9	-7.8	Pass
17	66.375	42.96	10.7	-12.35	41.31	Peak [Scan]	V	100	0	49.54	-8.23	Pass
18	888.45	32.23	13.7	2.63	48.56	Peak [Scan]	V	100	0	56.9	-8.34	Pass
19	106.63	42.91	10.9	-8.36	45.45	Peak [Scan]	V	100	0	53.98	-8.53	Pass
20	450.01	39.82	12.4	-4.53	47.69	Peak [Scan]	V	100	0	56.9	-9.21	Pass
21	249.705	44.64	11.8	-8.83	47.61	Peak [Scan]	H	100	0	56.9	-9.29	Pass
22	850.135	31.66	13.6	2.33	47.59	Peak [Scan]	H	100	0	56.9	-9.31	Pass
23	146.4	40.93	11.16	-7.8	44.3	Peak [Scan]	V	100	0	53.98	-9.68	Pass
24	350.1	40.82	12.1	-6.01	46.91	Peak [Scan]	H	100	0	56.9	-9.99	Pass
25	205.085	41.67	11.5	-9.2	43.97	Peak [Scan]	V	100	0	53.98	-10.01	Pass
26	185.2	41.35	11.35	-9.16	43.54	Peak [Scan]	V	100	0	53.98	-10.44	Pass
27	549.92	36.07	12.7	-2.79	45.98	Peak [Scan]	V	100	0	56.9	-10.92	Pass
28	800.18	30.93	13.5	1.43	45.86	Peak [Scan]	H	100	0	56.9	-11.04	Pass
29	320.515	40.4	12.09	-6.71	45.79	Peak [Scan]	V	100	0	56.9	-11.11	Pass
30	700.27	32.4	13.2	-0.16	45.44	Peak [Scan]	H	100	0	56.9	-11.46	Pass
31	80.925	39.84	10.8	-12.73	37.91	Peak [Scan]	V	100	0	49.54	-11.63	Pass
32	960.23	30.74	13.9	3.56	48.2	Peak [Scan]	H	200	0	60	-11.8	Pass
33	501.42	34.5	12.6	-3.33	43.77	Peak [Scan]	V	100	0	56.9	-13.13	Pass
34	600.36	32.97	12.81	-2.04	43.74	Peak [Scan]	V	100	0	56.9	-13.16	Pass
35	790.48	28.91	13.4	1.14	43.45	Peak [Scan]	V	100	0	56.9	-13.45	Pass
36	212.845	38.14	11.53	-9.72	39.95	Peak [Scan]	V	100	0	53.98	-14.03	Pass
37	760.41	28.57	13.4	0.73	42.7	Peak [Scan]	V	200	0	56.9	-14.2	Pass
38	434.49	34.56	12.35	-4.52	42.39	Peak [Scan]	V	100	0	56.9	-14.51	Pass
39	701.725	29.11	13.22	-0.18	42.14	Peak [Scan]	H	200	0	56.9	-14.76	Pass
40	601.815	30.95	12.84	-2.03	41.75	Peak [Scan]	V	100	0	56.9	-15.15	Pass

Radiated Emissions Below 1 GHZ: C1C2 Protocol

Company Name:Intelleflex **T1011192**
Product Type:
FCC15B ClassA Radiated Emission Testing at Chamber3
(Spurious Emission)
30MHz to 1GHz
Tester: Jack Liu
Date: 2010-11-19

Notes: C1G2 modulation
Low CH



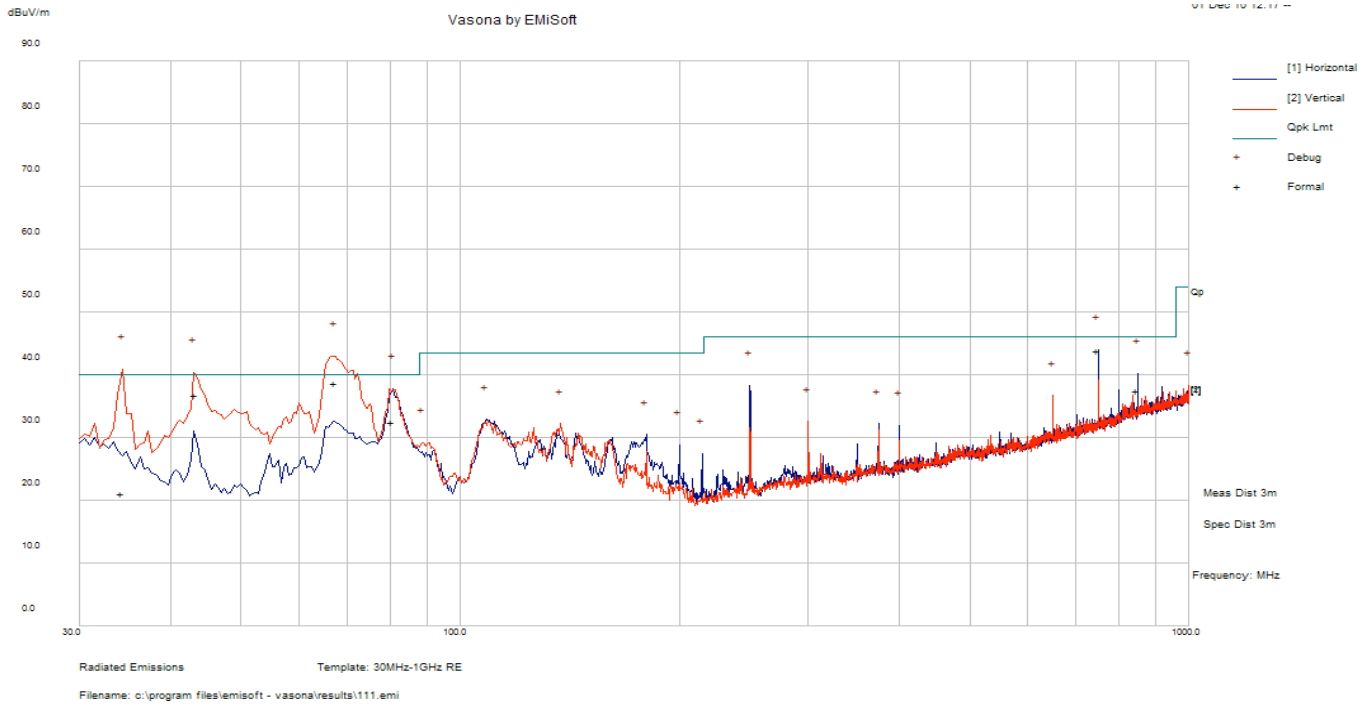
Vasona Data : List of Debug Frequencies

No	Frequency MH	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement	Pol	Limit dBuV/m	Margin dB	Pass /Fail
1	903	74.78	13.93	2.75	91.45	Peak [Scan]	V	56.9	34.55	fundamental
2	31.455	38	10.42	0.21	48.63	Peak [Scan]	V	49.54	-0.91	Pass
3	50.855	44.96	10.61	-12.21	43.37	Peak [Scan]	V	49.54	-6.17	Pass
4	840.435	33.35	13.6	2.3	49.25	Peak [Scan]	V	56.9	-7.65	Pass
5	750.225	33.5	13.4	0.62	47.52	Peak [Scan]	H	56.9	-9.38	Pass
6	37.275	35.28	10.48	-4.36	41.4	Peak [Scan]	V	49.54	-8.14	Pass
7	850.135	30.27	13.6	2.33	46.2	Peak [Scan]	V	56.9	-10.7	Pass
8	800.18	30.73	13.5	1.43	45.66	Peak [Scan]	V	56.9	-11.24	Pass
9	650.315	32.87	13	-0.95	44.92	Peak [Scan]	V	56.9	-11.98	Pass
10	98.385	42.03	10.88	-10.65	42.26	Peak [Scan]	H	53.98	-11.72	Pass
11	122.15	37.11	11.02	-6.46	41.68	Peak [Scan]	V	53.98	-12.3	Pass
12	68.315	39.78	10.7	-12.3	38.17	Peak [Scan]	V	49.54	-11.37	Pass
13	123.605	36.56	11.04	-6.4	41.2	Peak [Scan]	V	53.98	-12.78	Pass
14	890.875	26.95	13.72	2.68	43.35	Peak [Scan]	V	56.9	-13.55	Pass
15	120.695	36.01	11.01	-6.51	40.51	Peak [Scan]	V	53.98	-13.47	Pass
16	73.65	37.79	10.74	-12.26	36.27	Peak [Scan]	V	49.54	-13.27	Pass
17	148.34	36.14	11.18	-7.87	39.45	Peak [Scan]	V	53.98	-14.53	Pass
18	600.36	31.06	12.81	-2.04	41.83	Peak [Scan]	V	56.9	-15.07	Pass
19	209.935	37.45	11.5	-9.81	39.13	Peak [Scan]	V	53.98	-14.85	Pass
20	106.63	36.37	10.9	-8.36	38.9	Peak [Scan]	V	53.98	-15.08	Pass
21	129.91	34.21	11.1	-6.55	38.76	Peak [Scan]	V	53.98	-15.22	Pass
22	549.92	30.65	12.7	-2.79	40.56	Peak [Scan]	H	56.9	-16.34	Pass
23	249.705	37.46	11.8	-8.83	40.43	Peak [Scan]	H	56.9	-16.47	Pass
24	111.48	33.96	10.92	-7.38	37.5	Peak [Scan]	V	53.98	-16.48	Pass
25	601.815	29.17	12.84	-2.03	39.98	Peak [Scan]	V	56.9	-16.92	Pass
26	960.23	29.67	13.9	3.56	47.13	Peak [Scan]	H	60	-12.87	Pass
27	519.85	28.95	12.6	-3.3	38.25	Peak [Scan]	V	56.9	-18.65	Pass
28	214.785	33.77	11.55	-9.66	35.66	Peak [Scan]	V	53.98	-18.32	Pass
29	154.16	32.01	11.2	-7.92	35.29	Peak [Scan]	V	53.98	-18.69	Pass
30	560.105	27.16	12.7	-2.57	37.29	Peak [Scan]	V	56.9	-19.61	Pass
31	680.385	24.11	13.29	-0.51	36.9	Peak [Scan]	V	56.9	-20	Pass
32	660.015	24.57	13.1	-0.79	36.88	Peak [Scan]	V	56.9	-20.02	Pass
33	434.49	28.76	12.35	-4.52	36.59	Peak [Scan]	V	56.9	-20.31	Pass
34	320.515	31.19	12.09	-6.71	36.58	Peak [Scan]	V	56.9	-20.32	Pass
35	500.935	27.27	12.6	-3.32	36.55	Peak [Scan]	V	56.9	-20.35	Pass
36	187.14	31.72	11.37	-9.1	33.99	Peak [Scan]	V	53.98	-19.99	Pass
37	350.1	29.48	12.1	-6.01	35.57	Peak [Scan]	V	56.9	-21.33	Pass
38	189.565	30.51	11.4	-9.02	32.89	Peak [Scan]	V	53.98	-21.09	Pass
39	450.01	27.5	12.4	-4.53	35.37	Peak [Scan]	H	56.9	-21.53	Pass
40	173.56	30.04	11.3	-8.72	32.63	Peak [Scan]	V	53.98	-21.35	Pass

TX Idle Emissions

QP Scan

No	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Limit dBuV/m	Margin dB	Pass /Fail
1	67.217	40.38	10.7	-12.33	38.75	Quasi Max	V	40	-1.25	Pass
2	34.32825	12.79	10.45	-2.06	21.18	Quasi Max	V	40	-18.82	Pass
3	43.33525	34.89	10.54	-8.68	36.75	Quasi Max	V	40	-3.25	Pass
4	749.99725	29.8	13.4	0.61	43.81	Quasi Max	H	46	-2.19	Pass
5	80.69025	34.43	10.8	-12.71	32.52	Quasi Max	H	40	-7.48	Pass
6	849.97175	21.54	13.6	2.33	37.47	Quasi Max	H	46	-8.53	Pass



20 dB Bandwidth

Test Requirement: 15.247(a)1(i)

LIMIT

Maximum allowed 20 dB BW is 500 kHz.

99% Occupied Bandwidth

Test requirement: Industry Canada RSS-Gen Sec. 4.6.1

LIMIT

None, for information purposes only

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The internal OCC BW function was activated to measure and display both 99% and -20 dB BW.

RESULTS

No non-compliance noted:

C1C2 TX mode

Channel	Frequency, MHz	99% Occ BW (kHz)	-20 dB Occ. BW (kHz)
Low	902.75	396.6	419.9
Mid	915.75	394.6	417.8
High	927.25	397.2	420.1

Emission Designator: 420KP1D

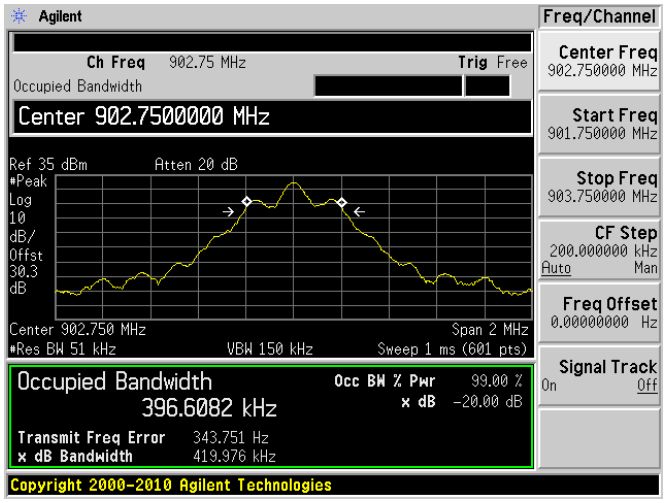
C3 TX mode

Channel	Frequency, MHz	99% Occ BW (kHz)	-20 dB Occ. BW (kHz)
Low	902.75	342.47	366.6
Mid	915.75	344.91	371.6
High	927,25	340.6	367.8

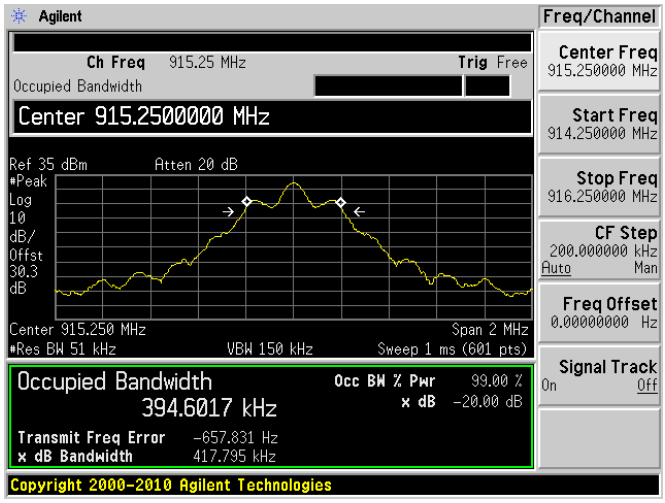
Emission Designator: 372KP1D

Refer to spectrum analyzer plots below.

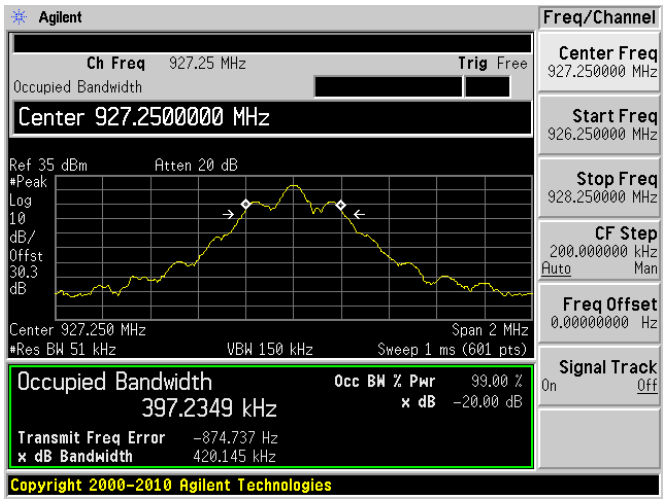
20 dB BANDWIDTH C1C2 LOW CHANNEL



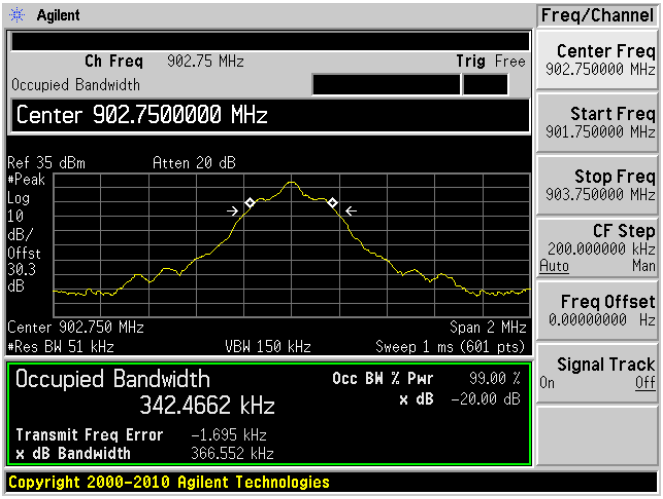
20 dB BANDWIDTH C1C2 MID CHANNEL



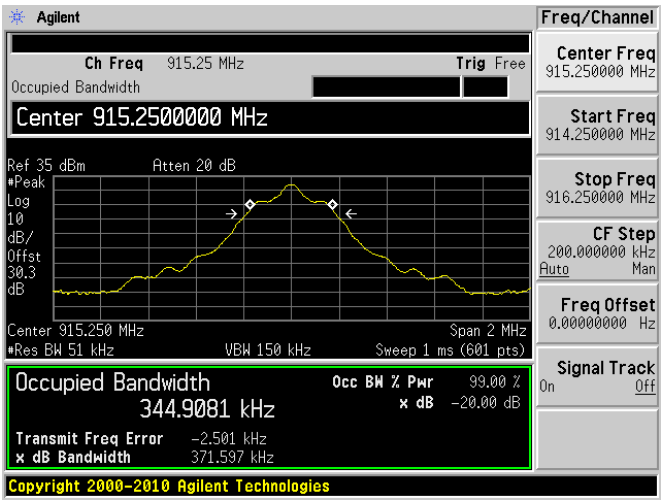
20 dB BANDWIDTH C1C2 HIGH CHANNEL



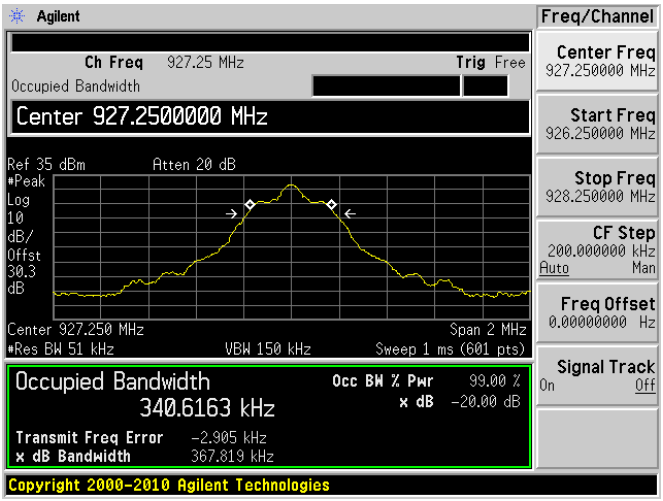
20 dB BANDWIDTH C3 LOW CHANNEL



20 dB BANDWIDTH C3 MID CHANNEL



20 dB BANDWIDTH C3 HIGH CHANNEL



HOPPING FREQUENCY SEPARATION

Test requirement: 15.247(a)1

LIMIT

§15.247 (a) (1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

TEST PROCEDURE

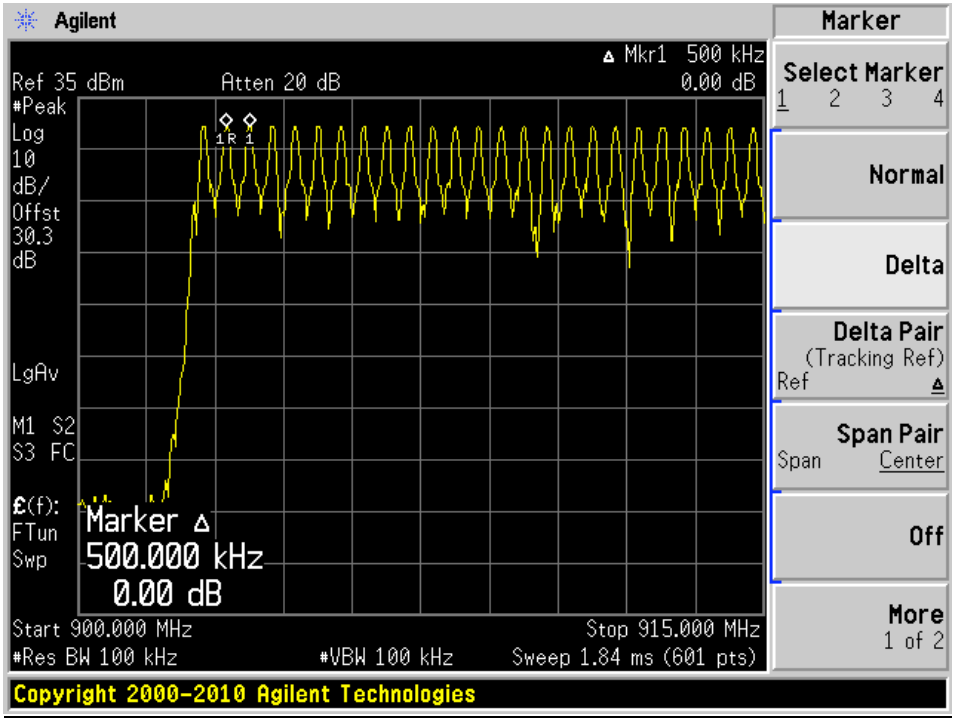
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

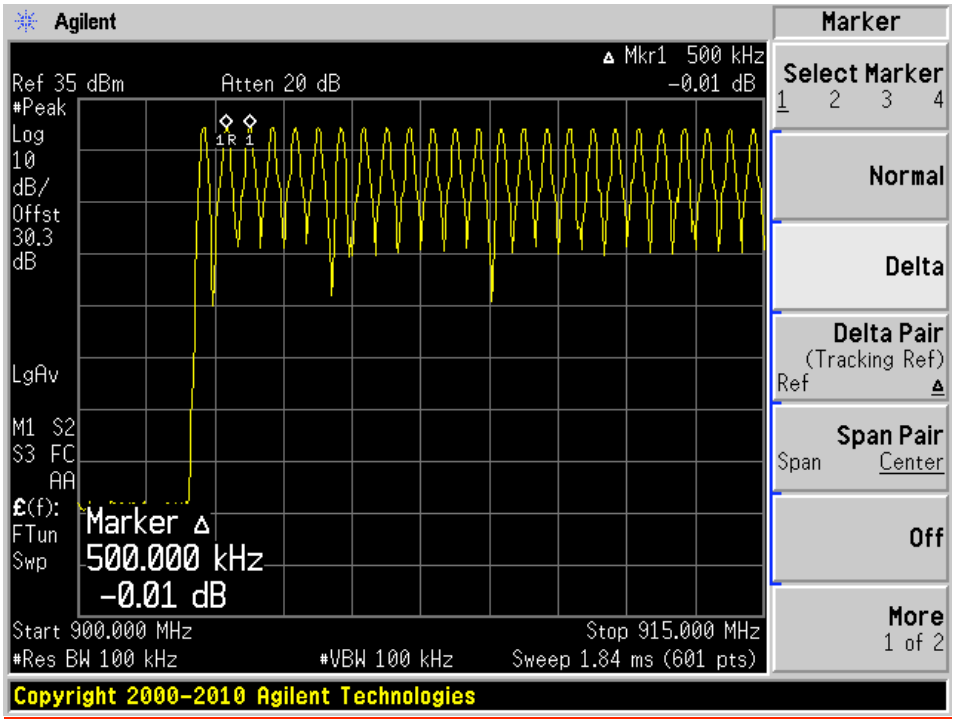
No non-compliance noted:

The separation is 500 KHz, which is larger than the 20 dB hopping channel bandwidth.

HOPPING FREQUENCY SEPARATION C1C2 TX Mode



HOPPING FREQUENCY SEPARATION C3 TX Mode



NUMBER OF HOPPING CHANNELS

Test requirement: 15.247(a)1(i)

LIMIT

§15.247 (a) (1) (i) For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

TEST PROCEDURE

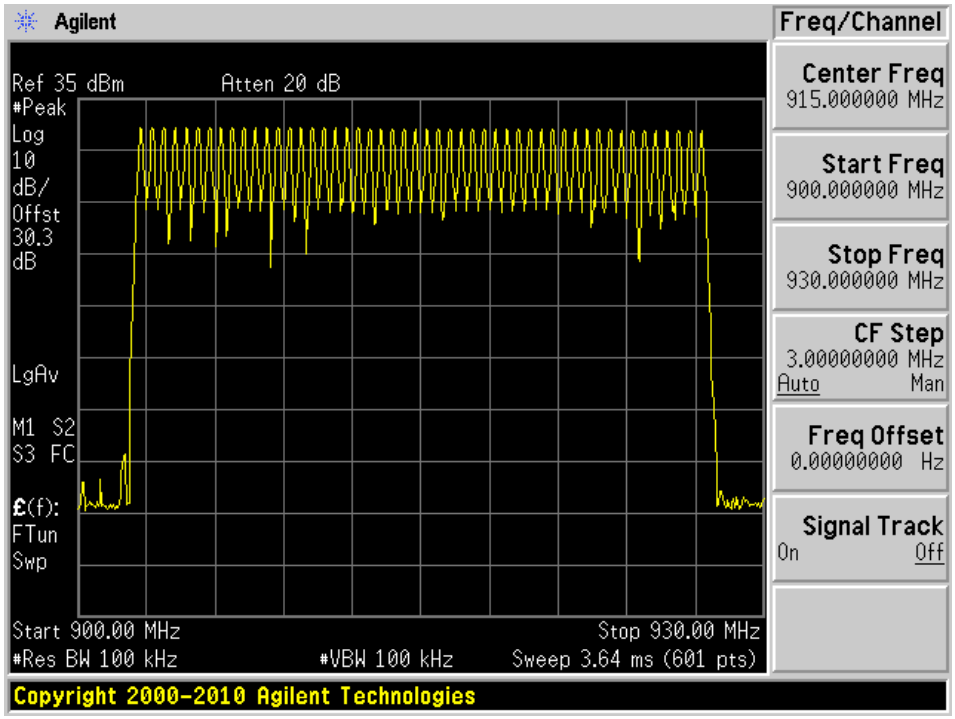
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to 3 % of the span. The analyzer is set to Max Hold.

RESULTS

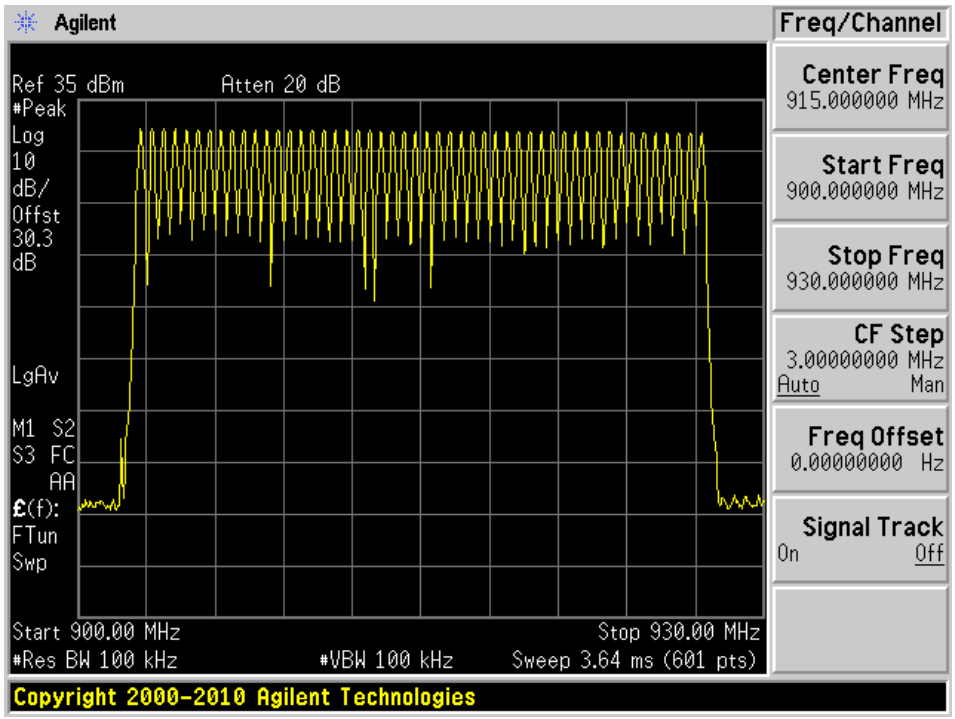
No non-compliance noted:

50 Channels observed, 902.75– 927.25 MHz. Refer to spectrum analyzer plots below.

NUMBER OF HOPPING CHANNELS C1C2 Modulation



NUMBER OF HOPPING CHANNELS C3 Modulation



AVERAGE TIME OF OCCUPANCY

Test requirement: 15.247(a)1(i)

LIMIT

§15.247 (a) (1) (i) For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 20 second scan, to enable resolution of each occurrence.

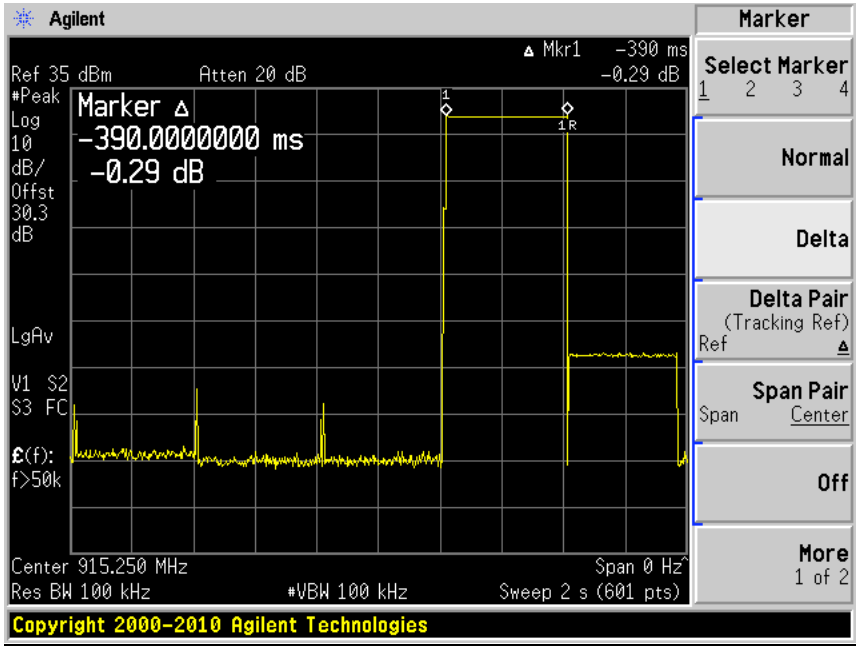
RESULTS

No non-compliance noted:

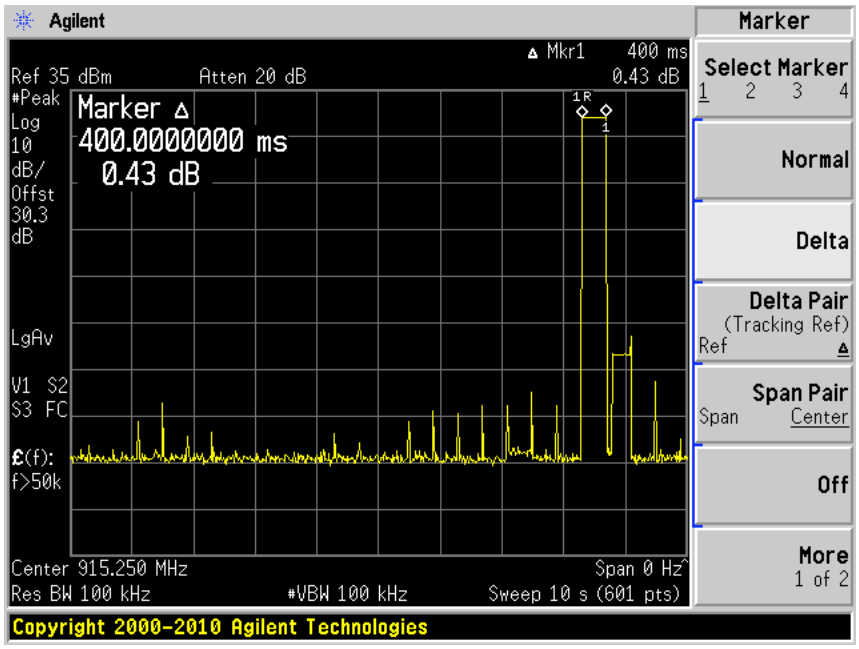
On time in 10 seconds:

390 msec.

PULSE WIDTH C1C2 Modulation: 390 msec

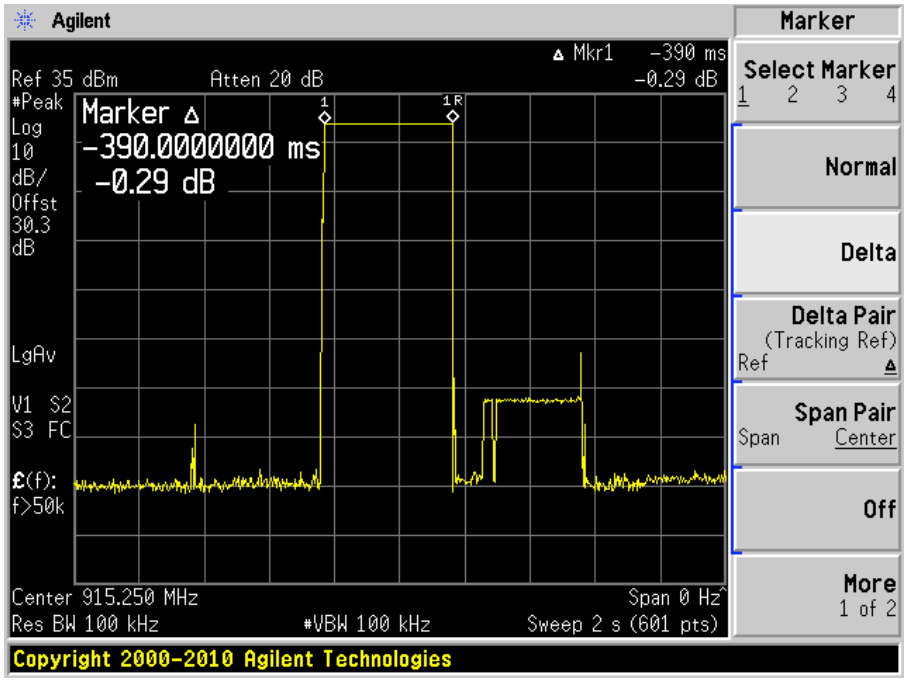


NUMBER OF PULSES IN 10 SECOND OBSERVATION PERIOD C1C2 Modulation

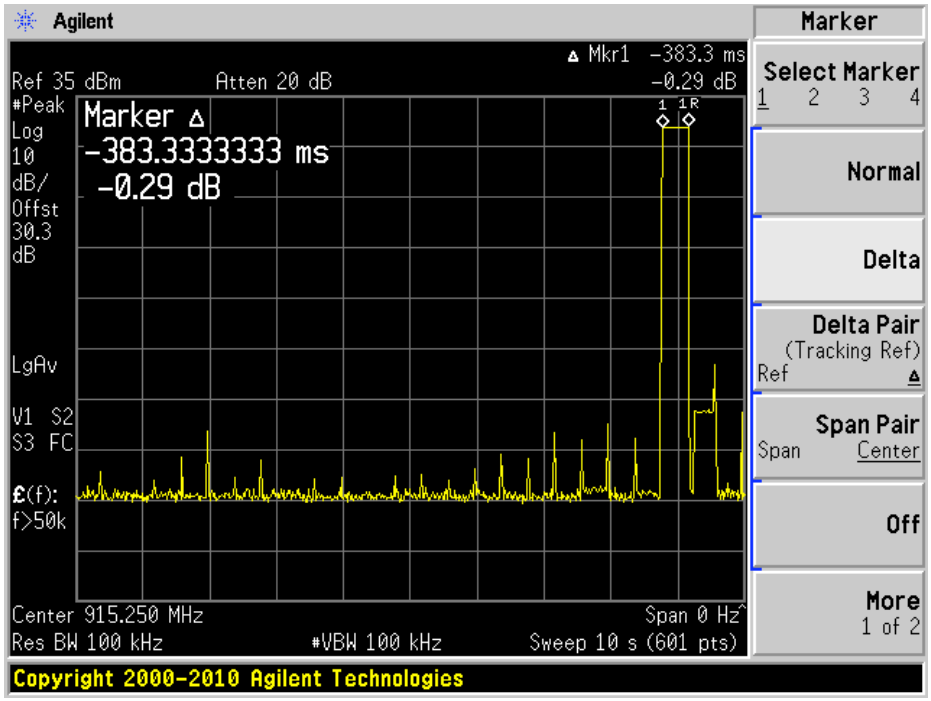


One 390 msec pulse in 10 second period
Meets 0.4 second occupancy/10 seconds limit.

PULSE WIDTH C3 Modulation: 390 msec



NUMBER OF PULSES IN 10 SECOND OBSERVATION PERIOD C3 Modulation



One 390 msec pulse in 10 second period
Meets 0.4 second occupancy/10 seconds limit.

PEAK OUTPUT POWER

Test requirement:

15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:
§15.247 (b) (2) For frequency hopping systems operating in the 902-928 MHz band, employing at least 50 hopping channels: 1 watt; and employing less than 50 hopping channels, but at least 25 hopping channels: 0.25 watt.
§15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with PEAK detector ON and the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

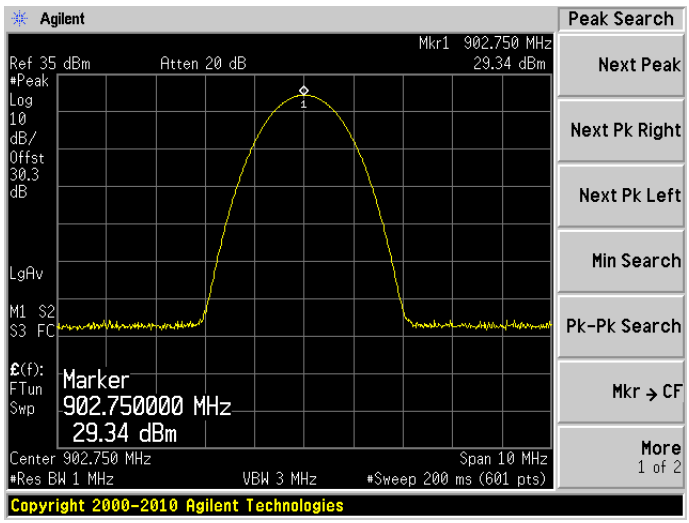
RESULTS

No non-compliance noted:

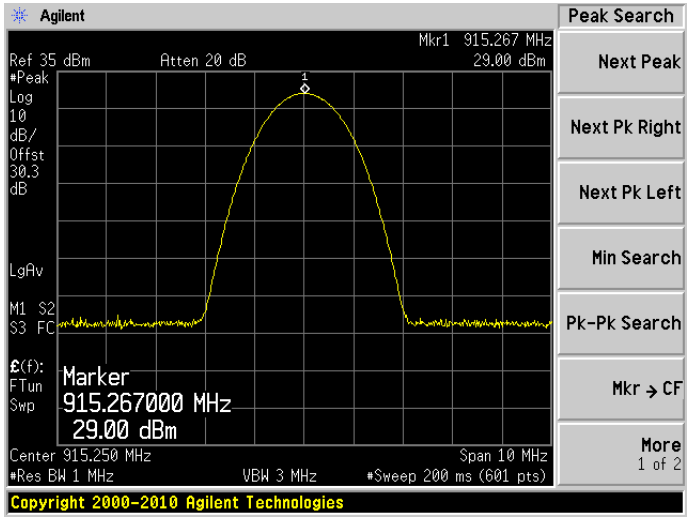
Power Setting: 1F

Channel	Frequency	P out C1C2	Pout C3
Low	902.75	29.34	29.6
Mid	915.75	29	29.2
High	927.25	28.95	28.75

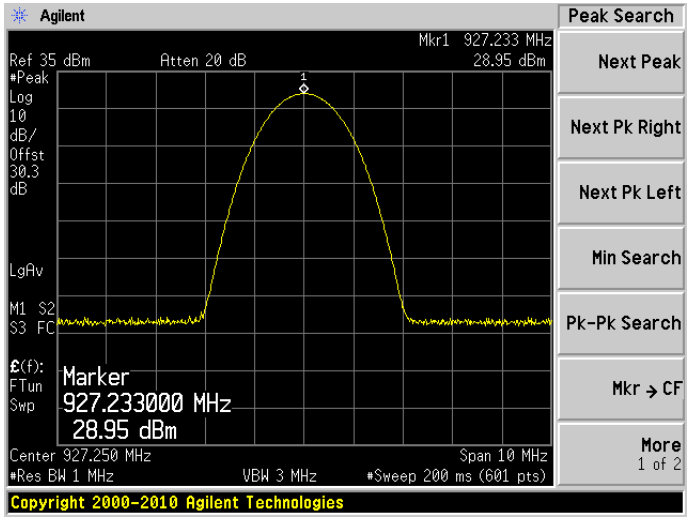
OUTPUT POWER LOW CHANNEL C1C2



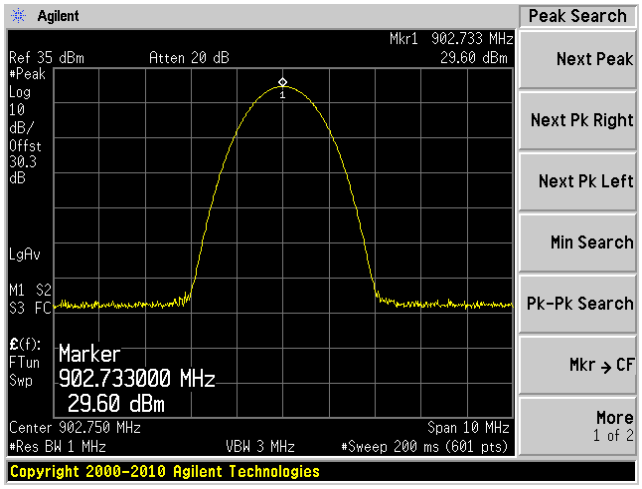
OUTPUT POWER MID CHANNEL C1C2



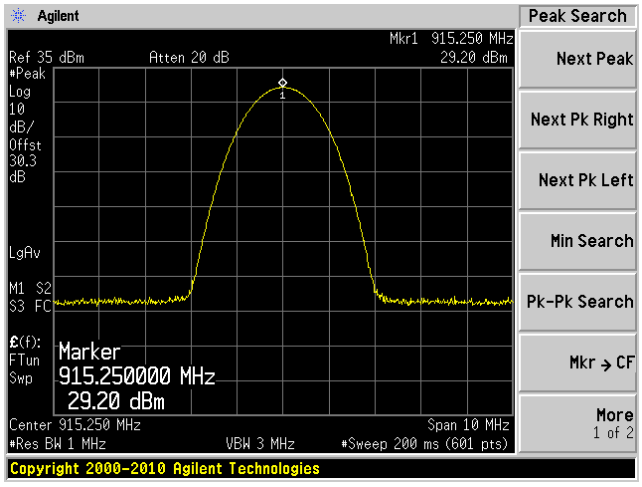
OUTPUT POWER HIGH CHANNEL C1C2



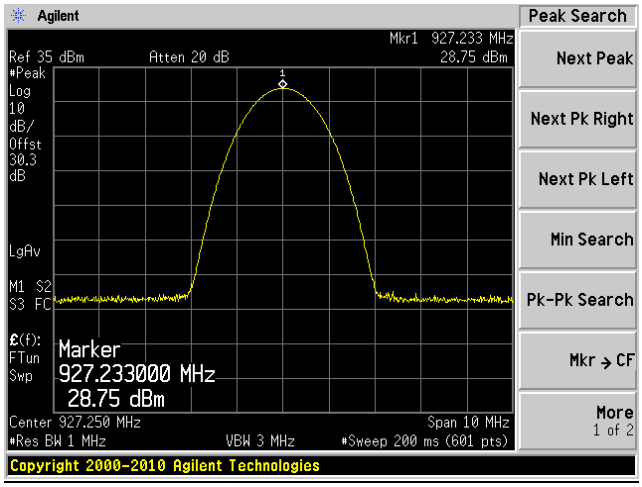
OUTPUT POWER LOW CHANNEL C3



OUTPUT POWER MID CHANNEL C3



OUTPUT POWER HIGH CHANNEL C3



MAXIMUM PERMISSIBLE EXPOSURE

Test requirement: 1.1307

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$E = \sqrt{(30 * P * G) / d}$

and

$S = E \wedge 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10 \wedge ((P + G) / 20) / \sqrt{S}$ Equation (1)

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Equation (1) and the measured peak power is used to calculate the MPE distance.

LIMITS

From §1.1310 Table 1 (B), S = 0.6 mW/cm^2

RESULTS

For worst case output power = 28.14 dBm (C3 Low channel) into an antenna with a maximum gain of 7.86 dBiL to produce the maximum allowed 36 dBi EIRP:

Max RF Power P, dBm	TX Antenna G, dBi	MPE distance cm	S, mW/cm@ at 20 cm
28.14	7.86	23	0.79

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

CONDUCTED SPURIOUS EMISSIONS

Test requirement: 15.247(d)

LIMITS

§15.247 (c) In any 100 kHz 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 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. 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(a) (see §15.205(c)).

TEST PROCEDURE

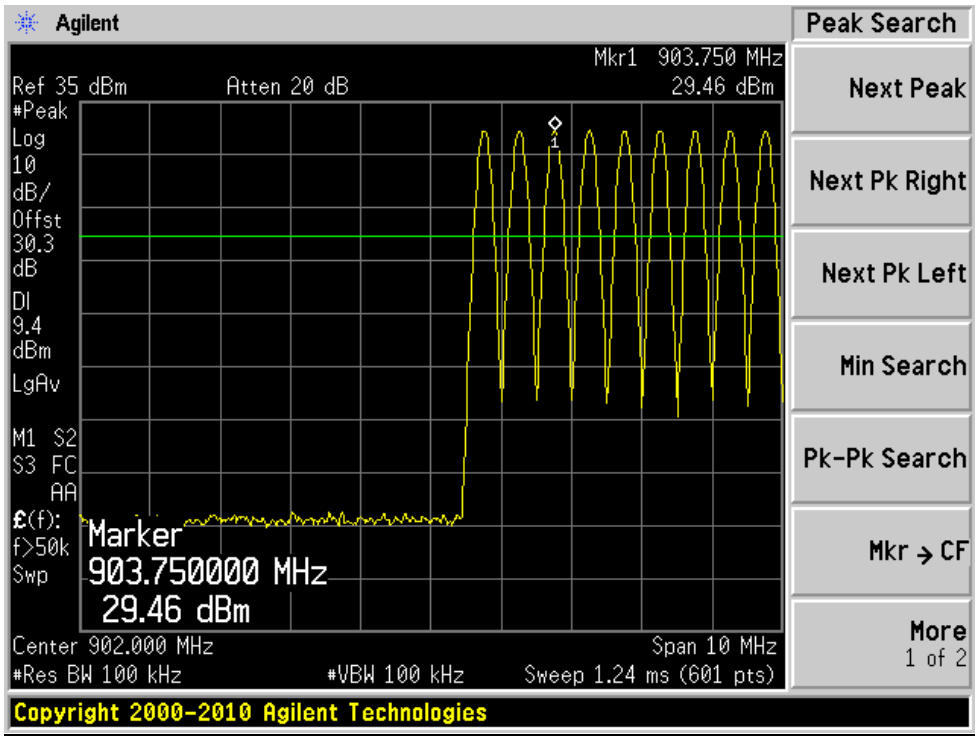
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

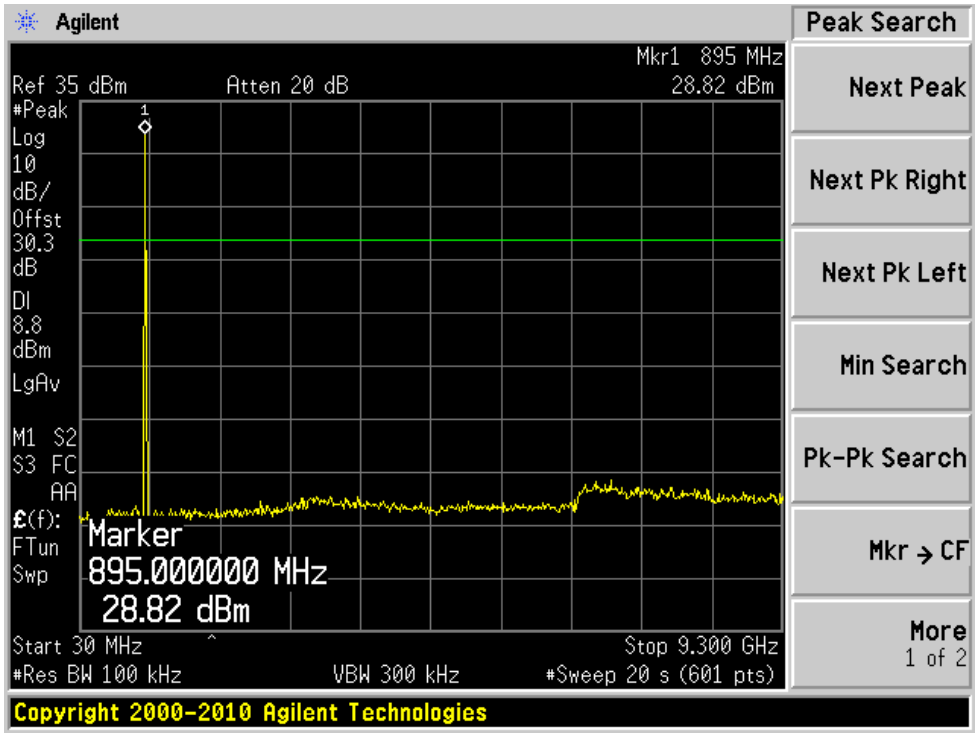
RESULTS

No non-compliance noted:

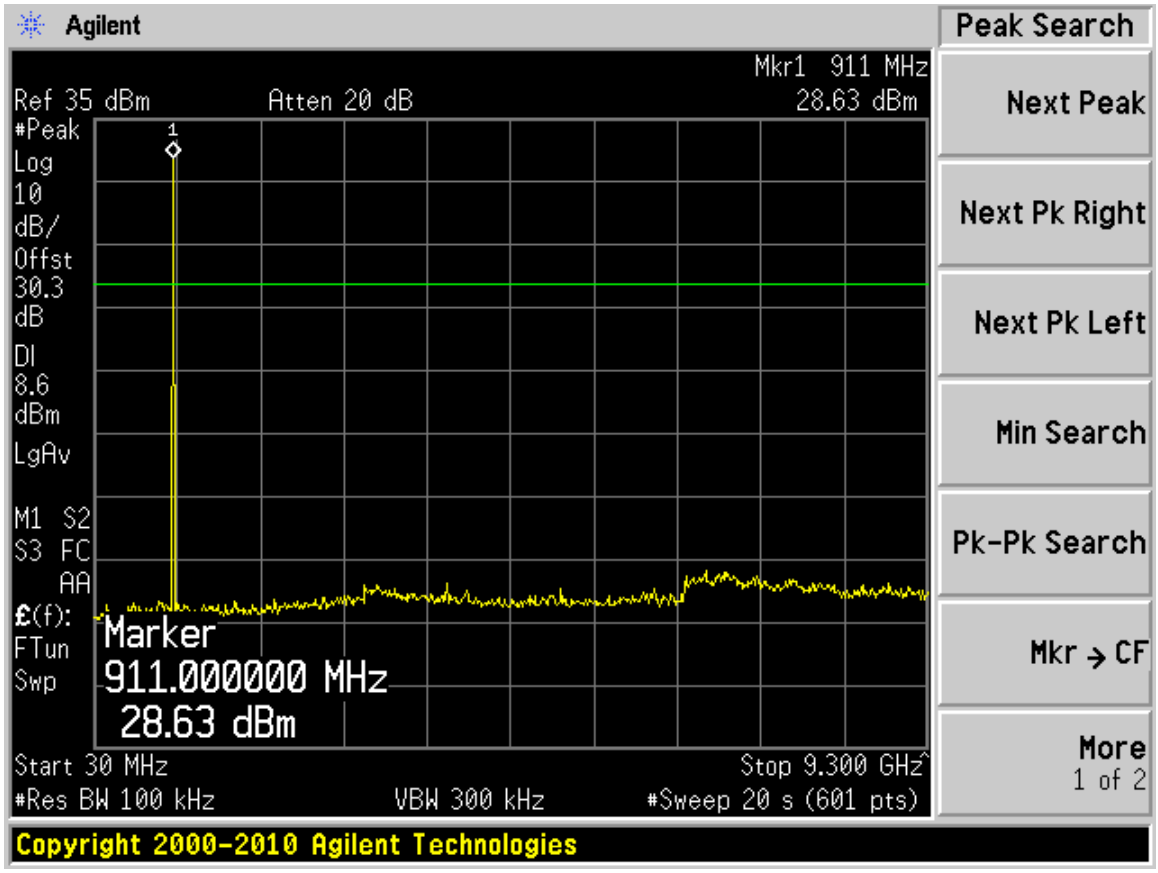
SPURIOUS EMISSIONS, LOW CHANNEL, HOPPING, C1C2



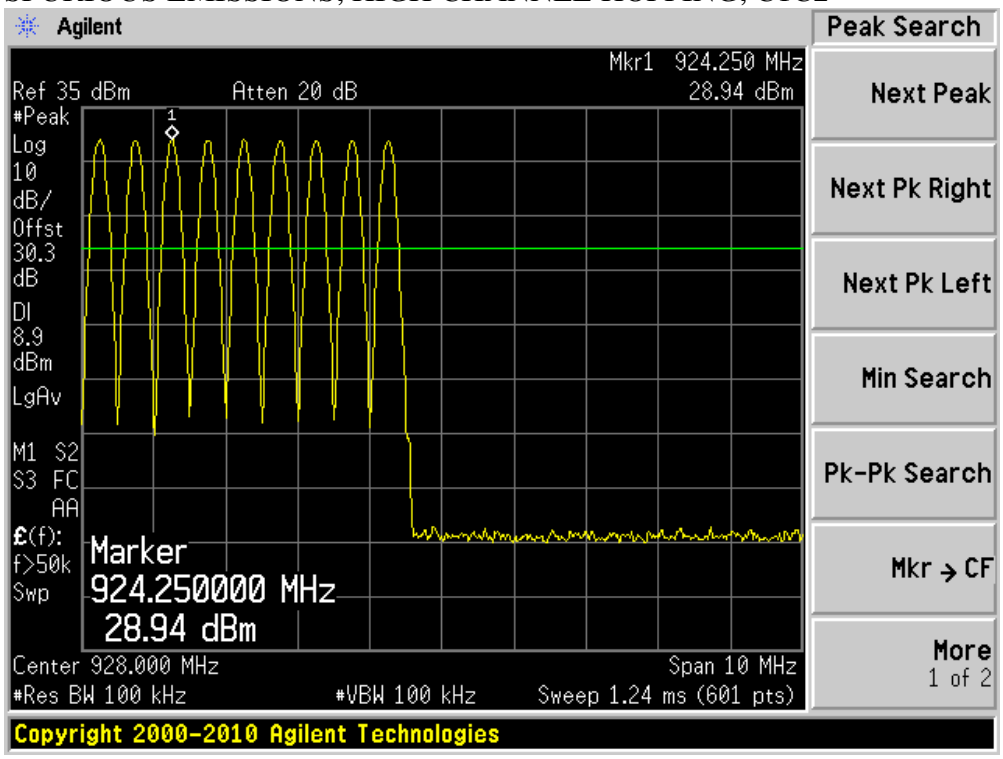
SPURIOUS EMISSIONS, LOW CHANNEL C1C2



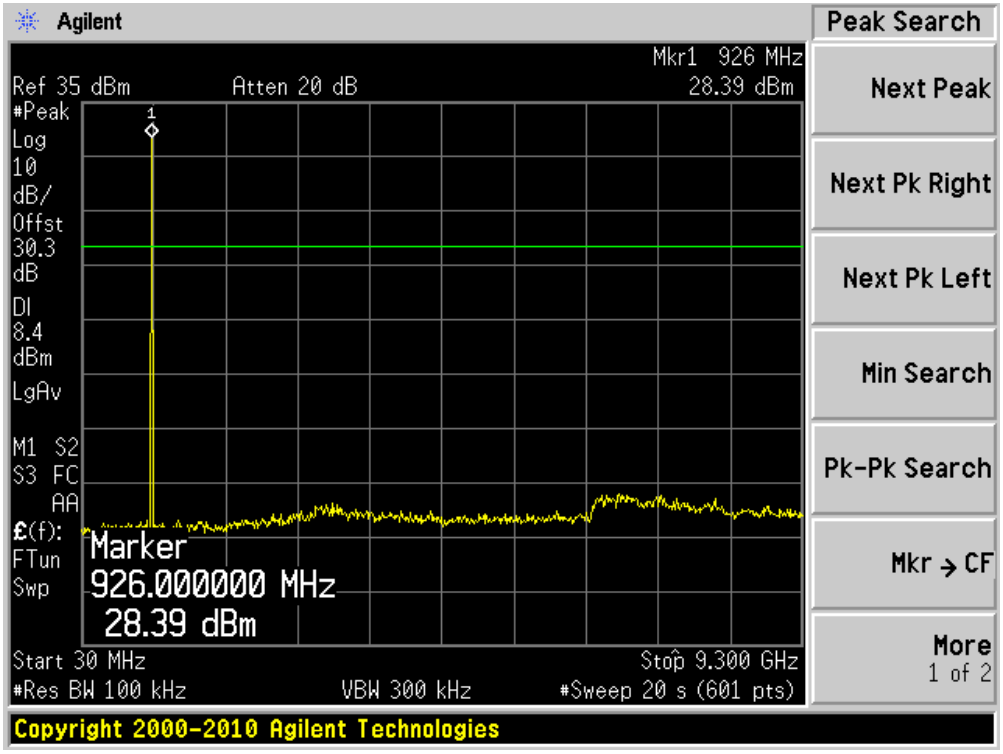
SPURIOUS EMISSIONS, MID CHANNEL C1C2



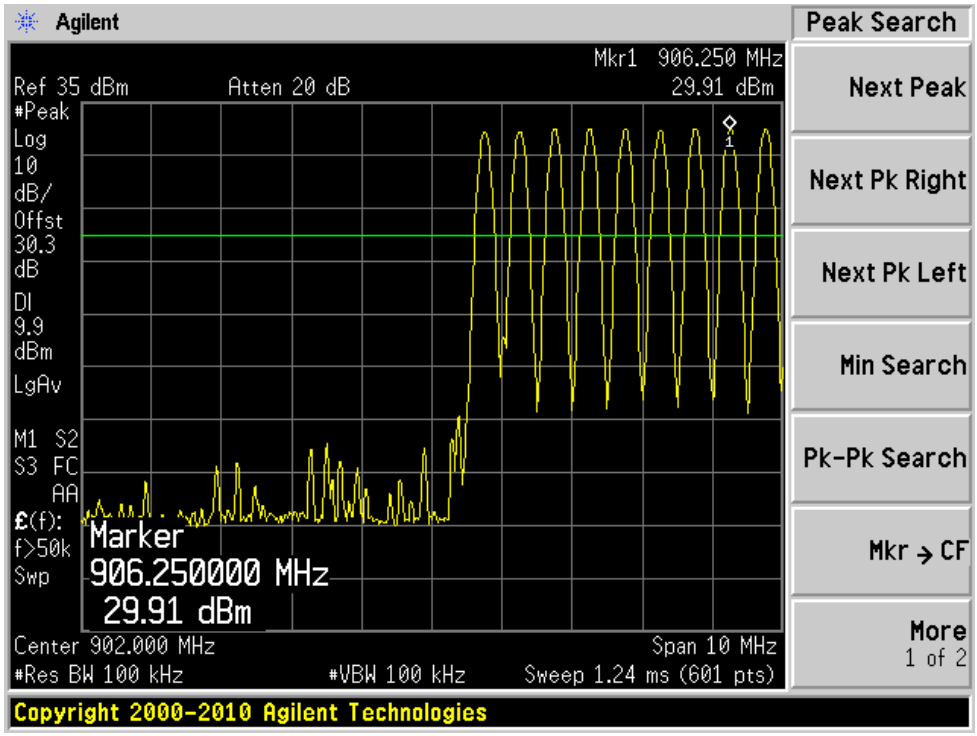
SPURIOUS EMISSIONS, HIGH CHANNEL HOPPING, C1C2



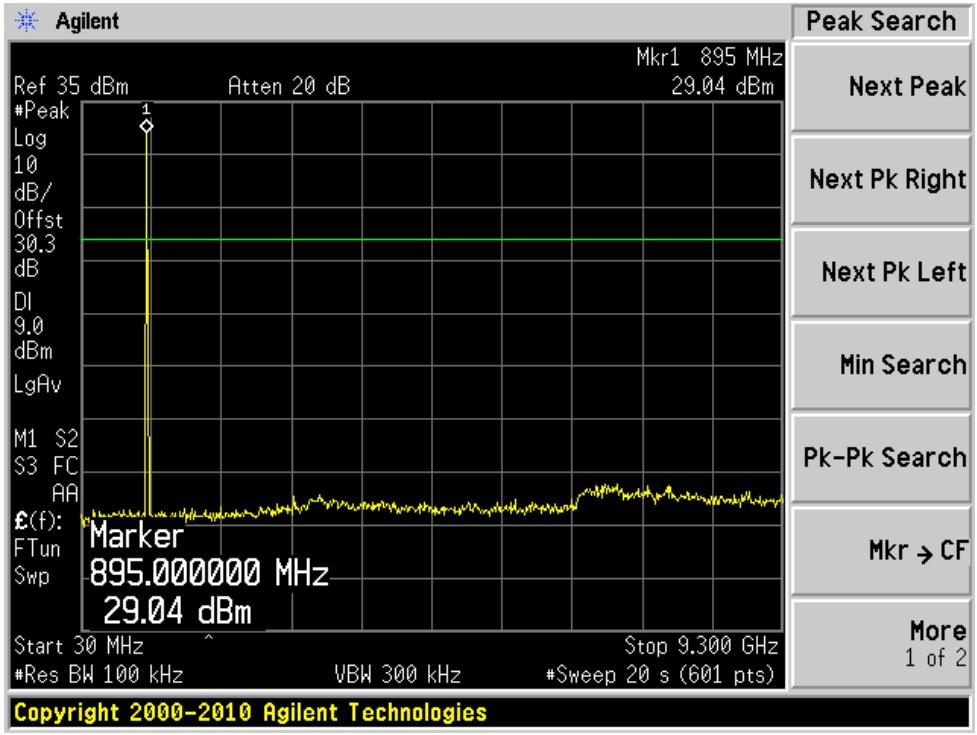
SPURIOUS EMISSIONS, HIGH CHANNEL C1C2



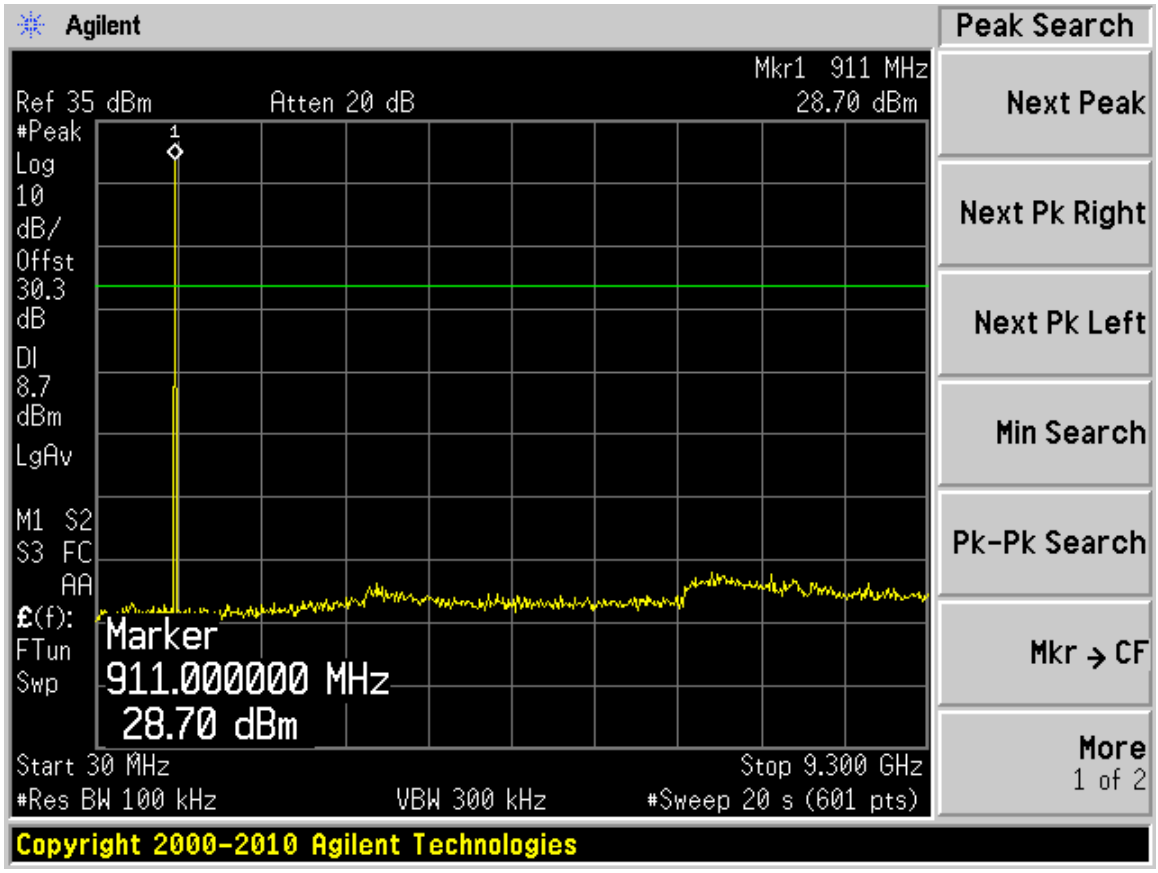
SPURIOUS EMISSIONS, LOW CHANNEL HOPPING C3



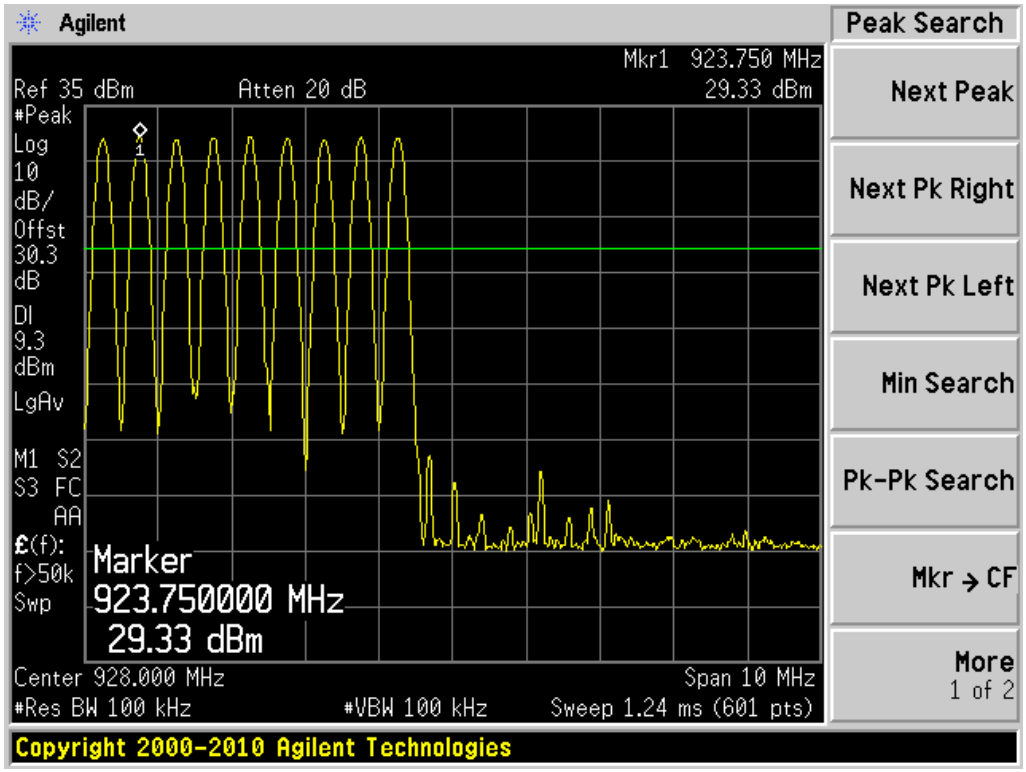
SPURIOUS EMISSIONS, LOW CHANNEL C3



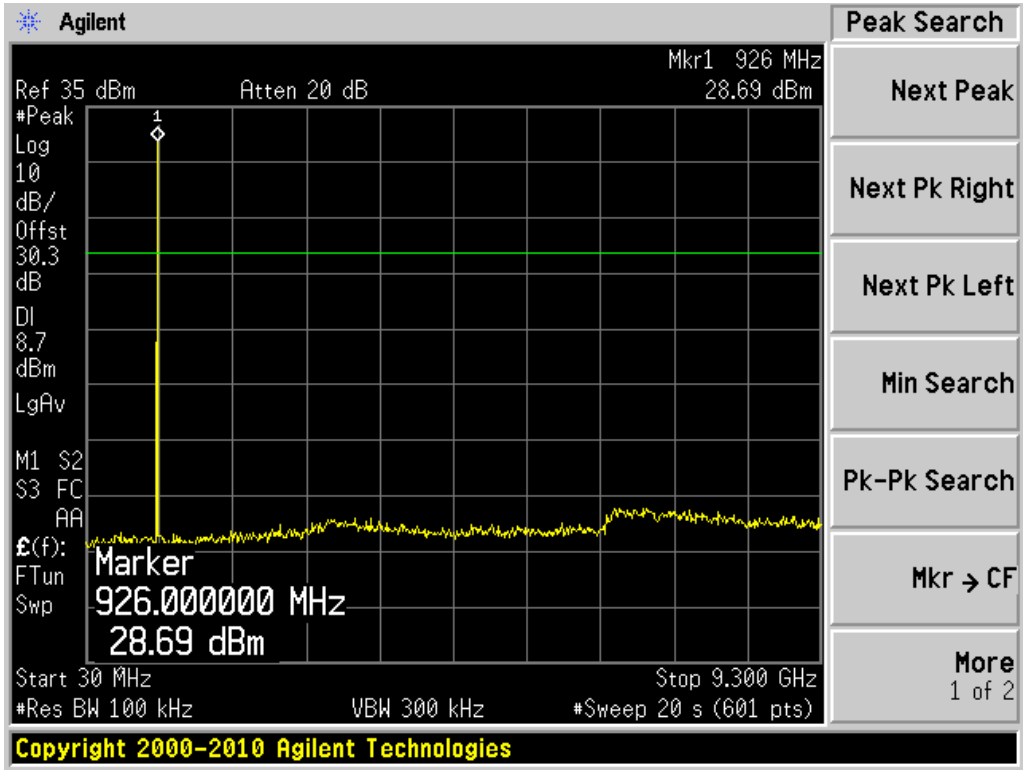
SPURIOUS EMISSIONS, MID CHANNELC3



SPURIOUS EMISSIONS, HIGH CHANNEL, HOPPING C3



SPURIOUS EMISSIONS, HIGH CHANNELC3



POWERLINE CONDUCTED EMISSIONS

Test requirement:

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

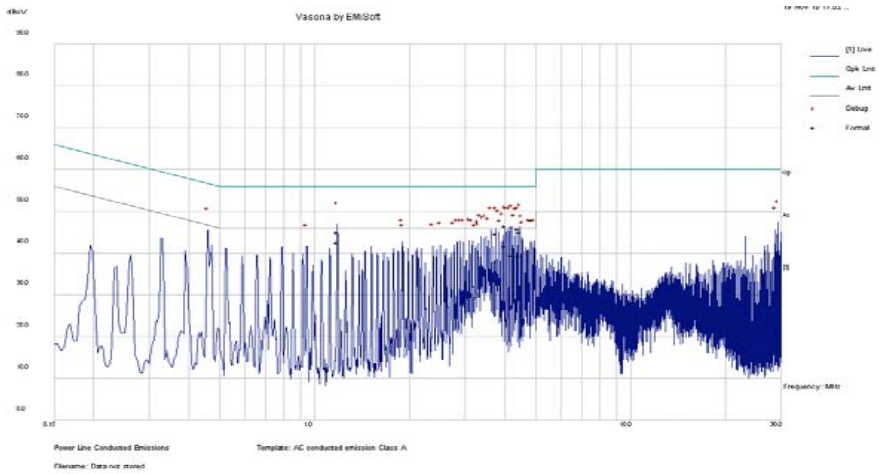
Tests were performed for the two types of POE unit that will be shipped with the EUT, one a 350 mA output, the other with a 400 mA output.

RESULTS

No non-compliance noted:

Company Name:Intelleflex **T1011192**
Product Type:
FCC15.247 Conducted Emission Testing at Chamber3
150kHz to 30MHz
Tester: Jack Liu
Date: 2010-11-19

Notes: C3 modulation
Low CH
ITE POE Model PW180KA4800F01 C1029B
Line

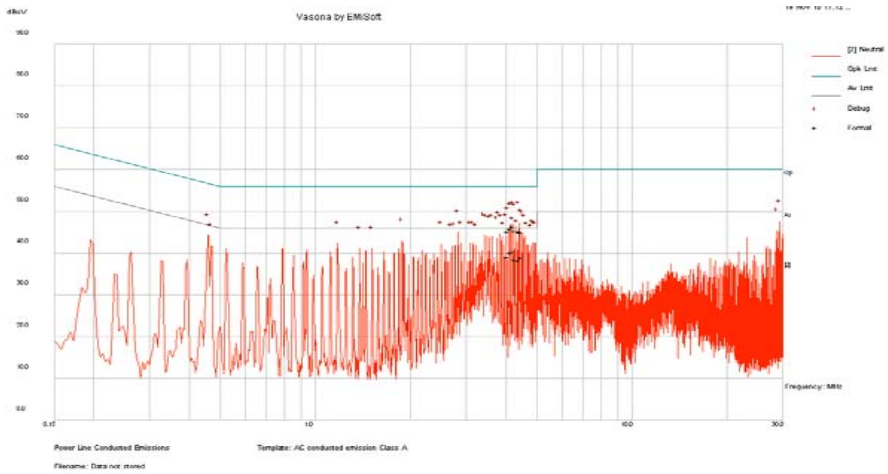


Vasona Data : Formally Assessed Peaks

No	Frequency MH	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement	Line	Limit dBuV	Margin dB	Pass /Fail
1	1.179066	34.75	9.75	0.5	45.01	Quasi Peak	Line	56	-10.99	Pass
2	4.465906	34.54	9.93	0.5	44.98	Quasi Peak	Line	56	-11.02	Pass
3	4.201407	35.75	9.91	0.5	46.17	Quasi Peak	Line	56	-9.83	Pass
4	4.005131	36.22	9.9	0.5	46.62	Quasi Peak	Line	56	-9.38	Pass
5	3.742049	34.3	9.89	0.5	44.7	Quasi Peak	Line	56	-11.3	Pass
6	4.39959	35.42	9.93	0.5	45.85	Quasi Peak	Line	56	-10.15	Pass
7	1.179066	32.32	9.75	0.5	42.58	Average	Line	46	-3.42	Pass
8	4.465906	28.84	9.93	0.5	39.28	Average	Line	46	-6.72	Pass
9	4.201407	29.07	9.91	0.5	39.48	Average	Line	46	-6.52	Pass
10	4.005131	31.32	9.9	0.5	41.72	Average	Line	46	-4.28	Pass
11	3.742049	27.51	9.89	0.5	37.9	Average	Line	46	-8.1	Pass
12	4.39959	28.96	9.93	0.5	39.38	Average	Line	46	-6.62	Pass

Company Name:Intelleflex **T1011192**
Product Type:
FCC15.247 Conducted Emission Testing at Chamber3
150kHz to 30MHz
Tester: Jack Liu
Date: 2010-11-19

Notes: C3 modulation
Low CH
ITE POE Model PW180KA4800F01 C1029B
Neutral



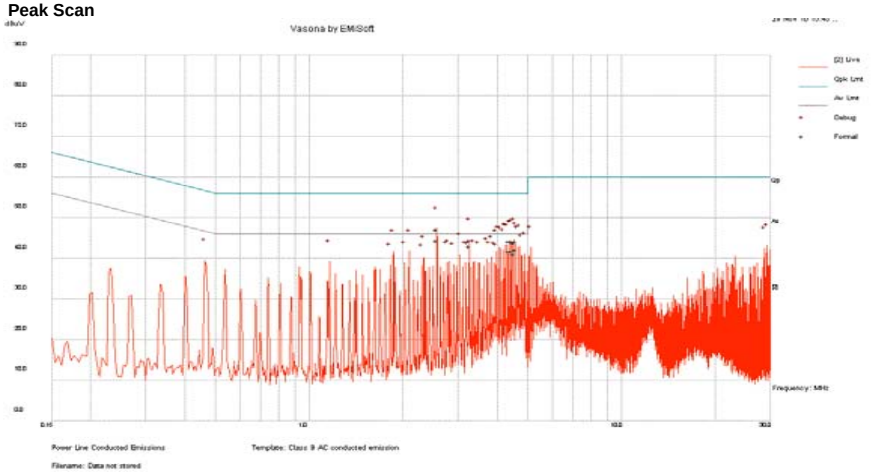
QP Scan

No	Frequency MH	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement	Line	Limit dBuV	Margin dB	Pass /Fail
1	4.399513	34.78	9.93	0.5	45.21	Quasi Peak	Neutral	56	-10.79	Pass
2	4.200195	35.93	9.91	0.5	46.34	Quasi Peak	Neutral	56	-9.66	Pass
3	4.134666	35.41	9.91	0.5	45.82	Quasi Peak	Neutral	56	-10.18	Pass
4	4.265377	34.9	9.92	0.5	45.32	Quasi Peak	Neutral	56	-10.68	Pass
5	4.070007	34.74	9.9	0.5	45.14	Quasi Peak	Neutral	56	-10.86	Pass
6	4.46392	34.54	9.93	0.5	44.97	Quasi Peak	Neutral	56	-11.03	Pass
7	4.399513	27.83	9.93	0.5	38.26	Average	Neutral	46	-7.74	Pass
8	4.200195	29.89	9.91	0.5	40.3	Average	Neutral	46	-5.7	Pass
9	4.134666	29.76	9.91	0.5	40.16	Average	Neutral	46	-5.84	Pass
10	4.265377	28.08	9.92	0.5	38.49	Average	Neutral	46	-7.51	Pass
11	4.070007	28.78	9.9	0.5	39.18	Average	Neutral	46	-6.82	Pass
12	4.46392	28.62	9.93	0.5	39.05	Average	Neutral	46	-6.95	Pass

Company Name:Intelleflex **T1011192**
Product Type:
FCC15.247 Conducted Emission Testing at Chamber2
150kHz to 30MHz
Tester: Jack Liu
Date: 2010-11-29

Notes: C3 modulation
Low CH
ITE POE Model PW180KA4800F01 C1013B 0.4A
Line

Peak Scan

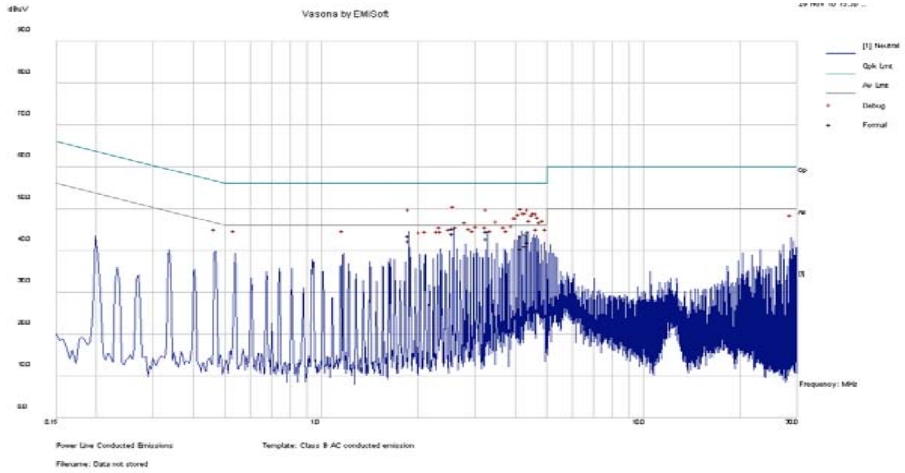


QP Scan

No	Frequency MH	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement	Line	Limit dBuV	Margin dB	Pass /Fail
1	2.559505	36.92	9.72	0.5	47.14	Quasi Peak	Line	56	-8.86	Pass
2	4.515387	33.56	9.76	0.5	43.83	Quasi Peak	Line	56	-12.17	Pass
3	3.256216	34.15	9.72	0.5	44.37	Quasi Peak	Line	56	-11.63	Pass
4	4.446384	34.01	9.76	0.5	44.27	Quasi Peak	Line	56	-11.73	Pass
5	4.378281	33.93	9.76	0.5	44.19	Quasi Peak	Line	56	-11.81	Pass
6	4.579008	34	9.77	0.5	44.27	Quasi Peak	Line	56	-11.73	Pass
7	2.559505	34.16	9.72	0.5	44.37	Average	Line	46	-1.63	Pass
8	4.515387	30.82	9.76	0.5	41.08	Average	Line	46	-4.92	Pass
9	3.256216	32.73	9.72	0.5	42.95	Average	Line	46	-3.05	Pass
10	4.446384	31.55	9.76	0.5	41.81	Average	Line	46	-4.19	Pass
11	4.378281	31.59	9.76	0.5	41.85	Average	Line	46	-4.15	Pass
12	4.579008	31.98	9.77	0.5	42.25	Average	Line	46	-3.75	Pass

Company Name:Intelleflex **T1011192**
Product Type:
FCC15.247 Conducted Emission Testing at Chamber2
150kHz to 30MHz
Tester: Jack Liu
Date: 2010-11-29

Notes: C3 modulation
Low CH
ITE POE Model PW180KA4800F01 C1013B 0.4A
Neutral



QP Scan

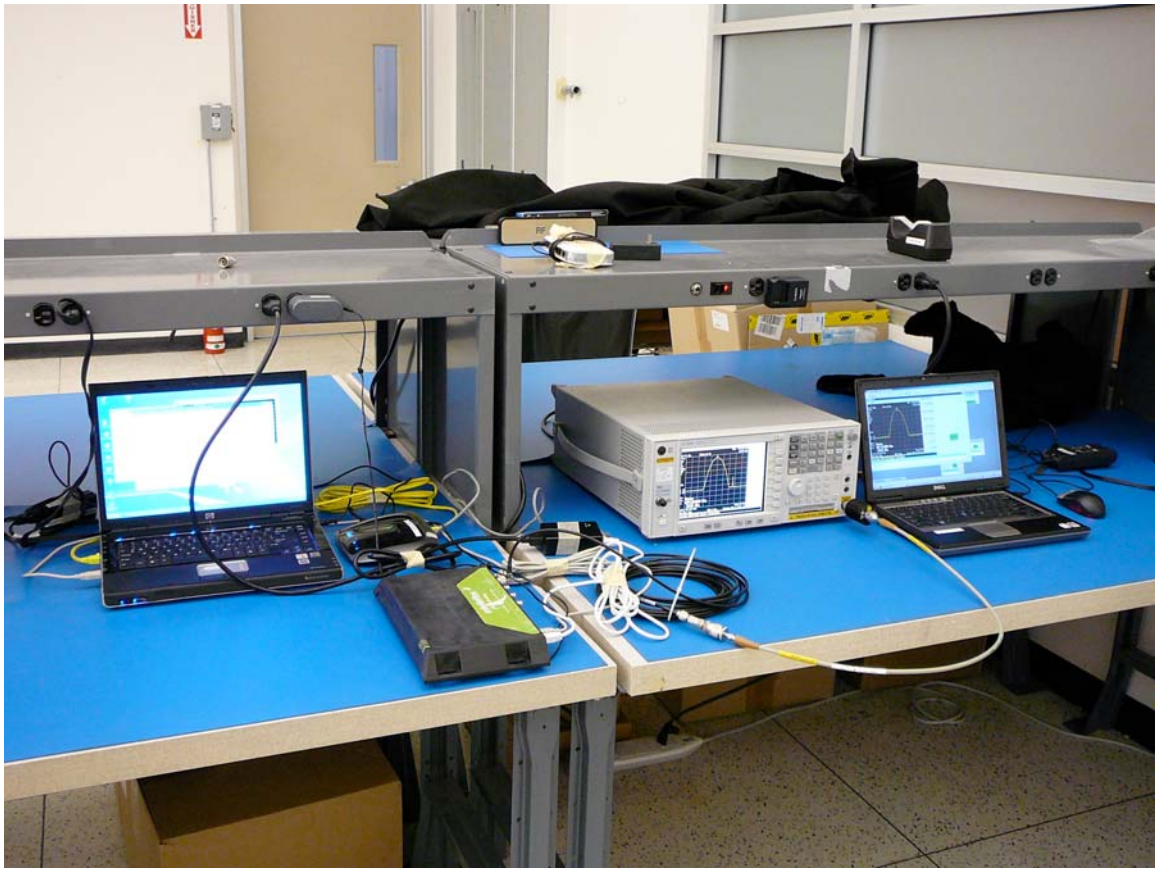
No	Frequency MH	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement	Line	Limit dBuV	Margin dB	Pass /Fail
1	2.567424	35.03	9.72	0.5	45.24	Quasi Peak	Neutral	56	-10.76	Pass
2	4.179954	33.15	9.75	0.5	43.41	Quasi Peak	Neutral	56	-12.59	Pass
3	3.264572	34.31	9.72	0.5	44.53	Quasi Peak	Neutral	56	-11.47	Pass
4	4.381509	34.15	9.76	0.5	44.41	Quasi Peak	Neutral	56	-11.59	Pass
5	1.86421	33.38	9.72	0.5	43.6	Quasi Peak	Neutral	56	-12.4	Pass
6	4.31346	33.59	9.76	0.5	43.85	Quasi Peak	Neutral	56	-12.15	Pass
7	2.567424	33.82	9.72	0.5	44.04	Average	Neutral	46	-1.96	Pass
8	4.179954	30.23	9.75	0.5	40.48	Average	Neutral	46	-5.52	Pass
9	3.264572	32.64	9.72	0.5	42.86	Average	Neutral	46	-3.14	Pass
10	4.381509	31.8	9.76	0.5	42.06	Average	Neutral	46	-3.94	Pass
11	1.86421	32.12	9.72	0.5	42.35	Average	Neutral	46	-3.65	Pass
12	4.31346	30.87	9.76	0.5	41.13	Average	Neutral	46	-4.87	Pass

RECEIVER EMISSIONS

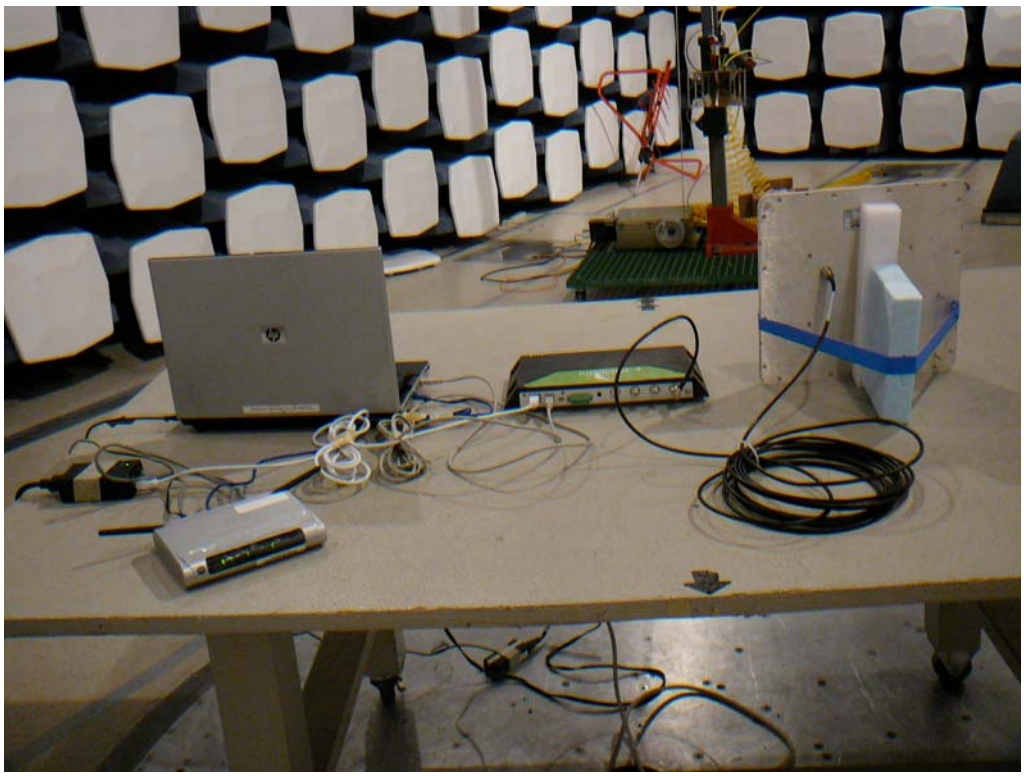
The EUT does not have a receive-only mode. When tags are being read, the transmitter is on constantly to power the tag. The transmitter spurious emissions meet all restricted band emissions limits, as shown above, and therefore the receive mode is also compliant with the limits on restricted bands.

SETUP PHOTOS

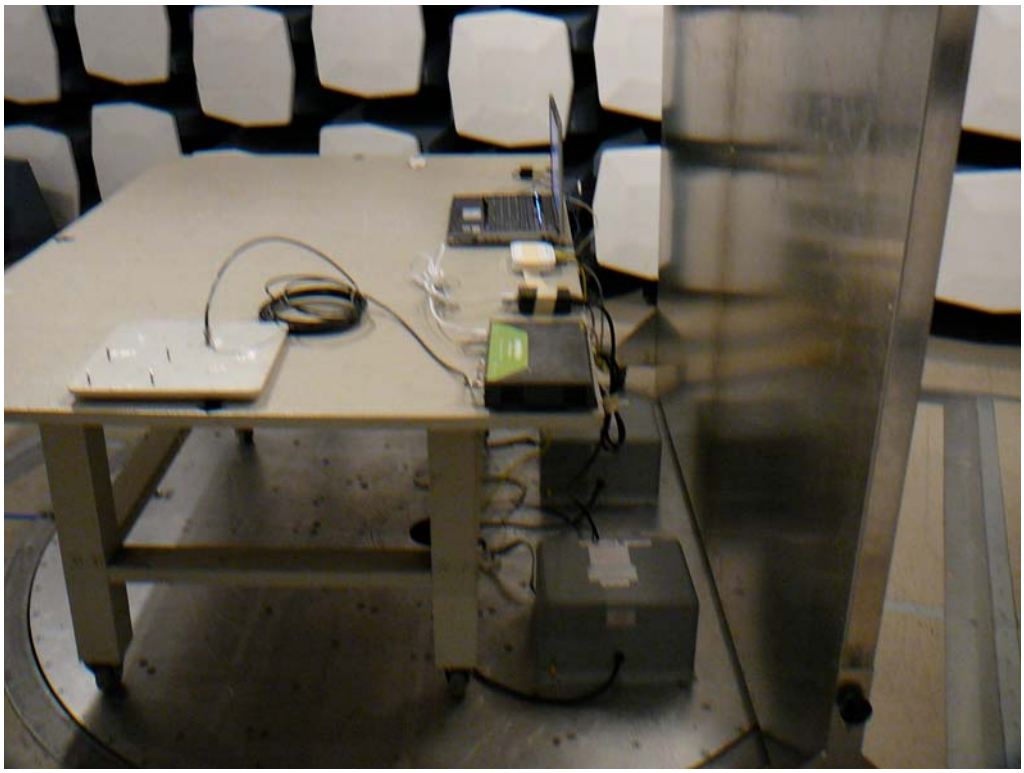
TX ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



TX RADIATED RF MEASUREMENT SETUP



TX POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



END OF REPORT

Report Revision History

Revision No.	Revision Description	Pages Revised	Revised by	Date
-	Original Issue		T. Cokenias	12/06/2010
1	Correct typos pointed out by reviewer	3,13,16,28	T. Cokenias	12/16/2010