

2.4 GHz HAN Radio Emissions Test Results

TEST RESULTS

Radiated Test Set-up, 30-26 GHz

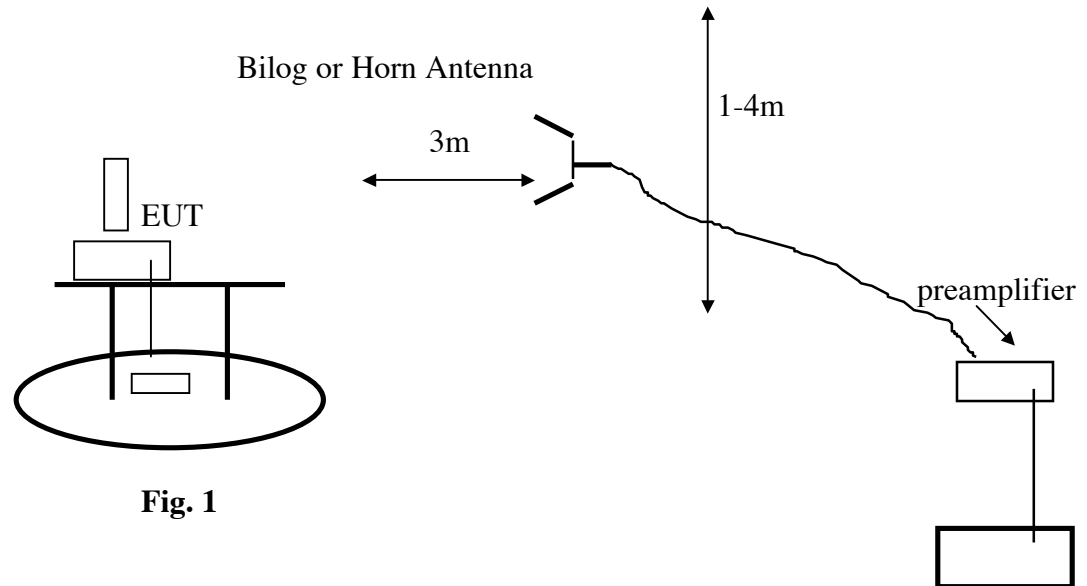


Fig. 1

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 10th harmonic of the fundamental.
5. 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

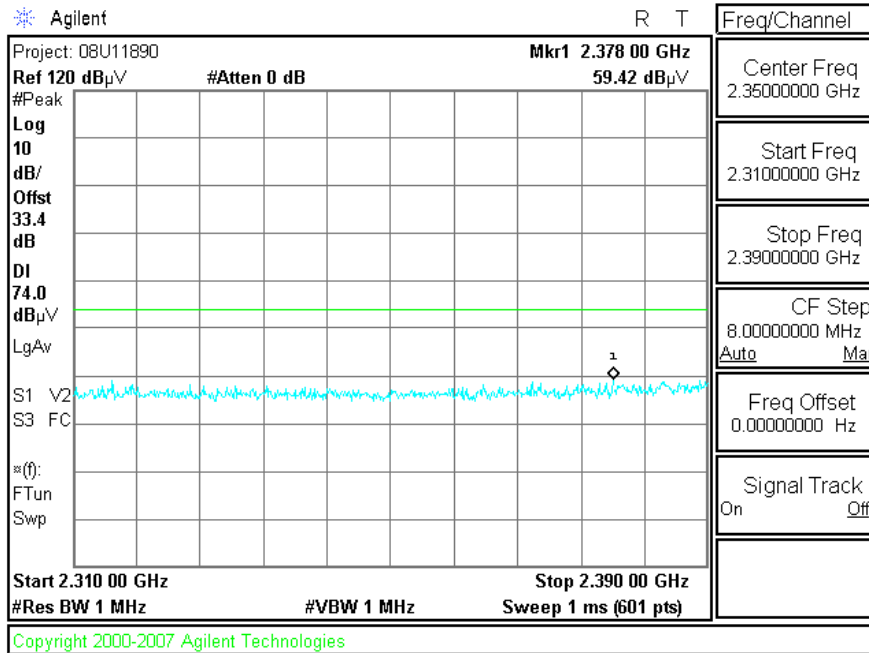
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505 (1)	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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

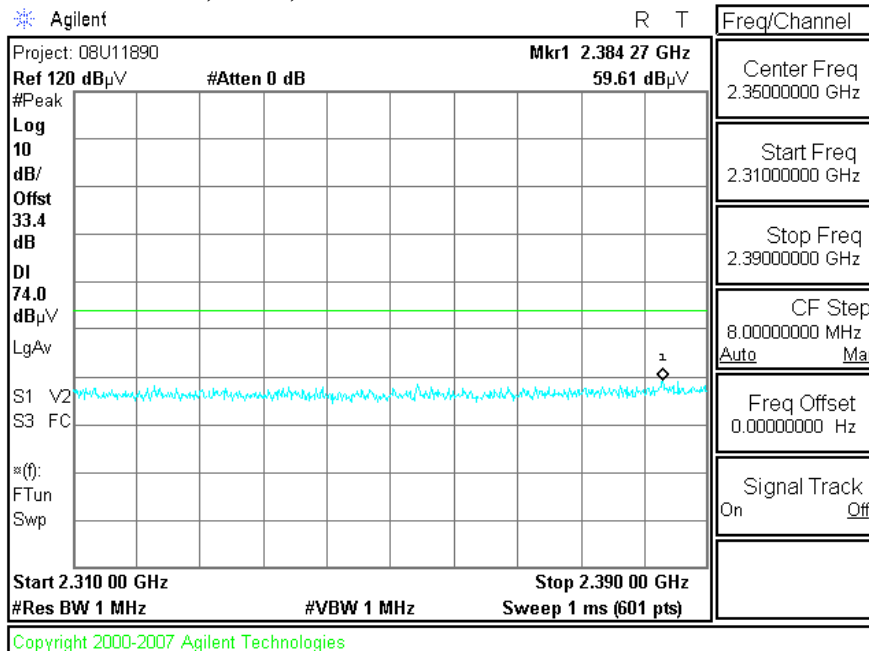
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

2.4 GHz HAN Radio Band Edge Emissions

LOW Channel, Peak, Vertical

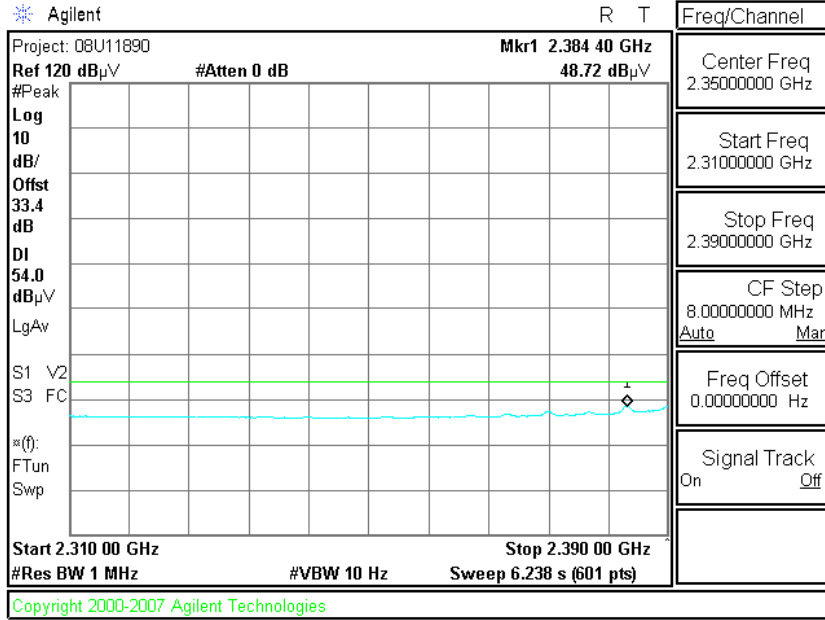


LOW Channel, Peak, Horizontal

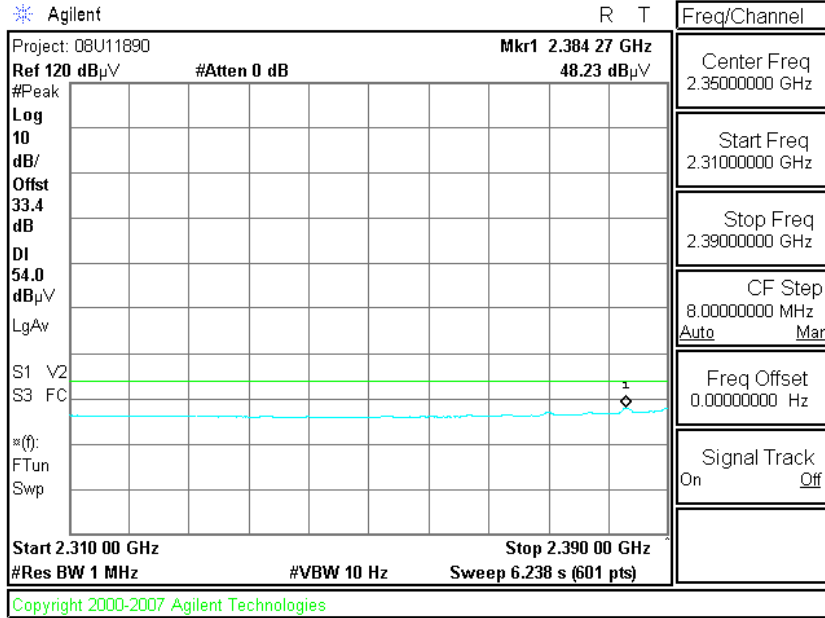


2.4 GHz HAN Radio Band Edge Emissions

LOW Channel, Average, Vertical

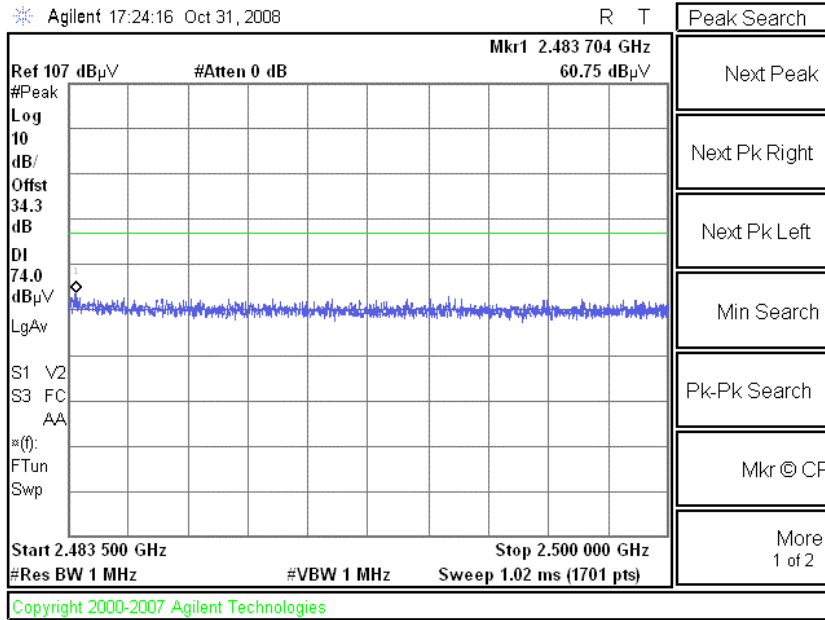


LOW Channel, Average, Horizontal

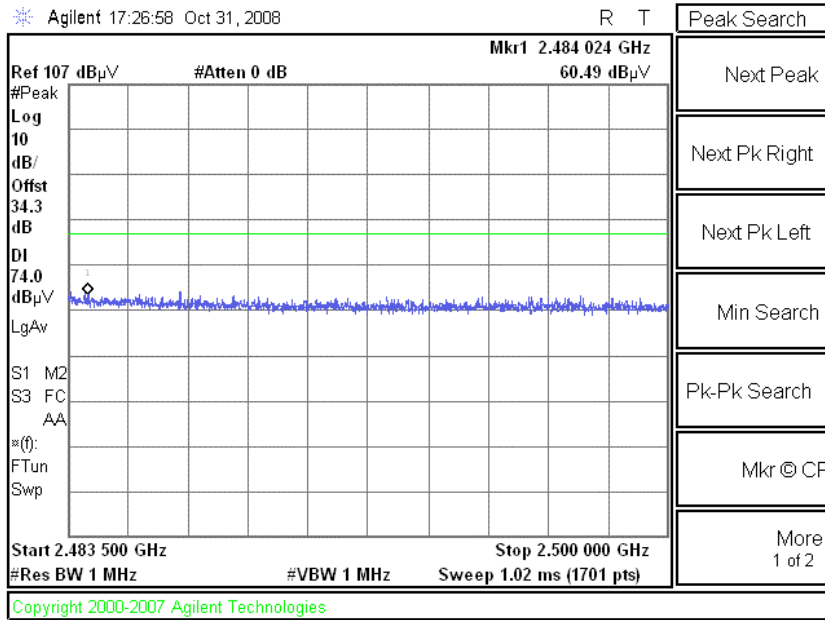


2.4 GHz Band Edge

2475.4 MHz, Peak, Vertical

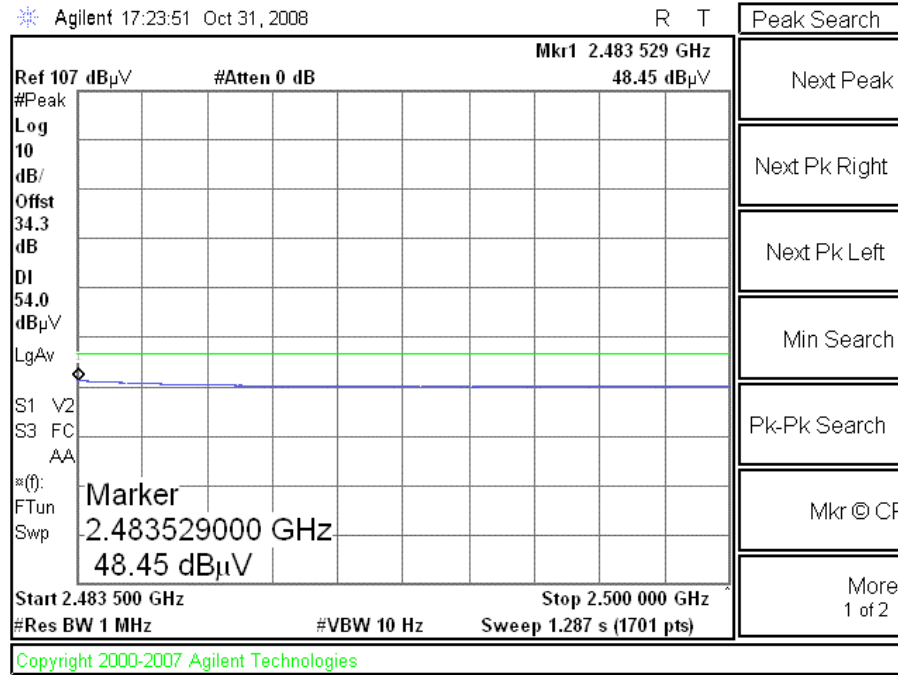


2475.4 MHz, Peak, Horizontal

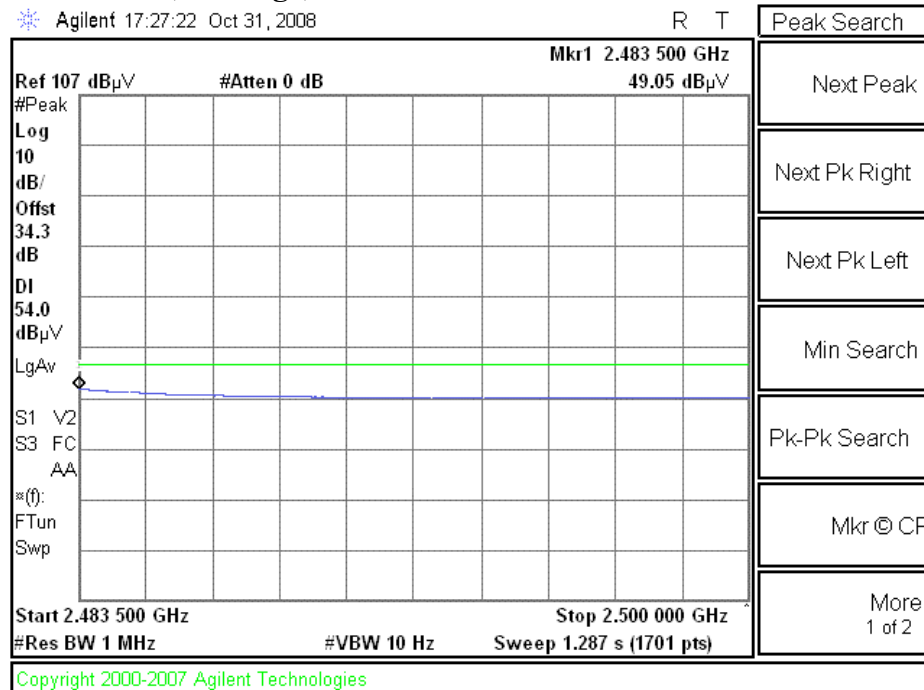


2.4 GHz Band Edge

2475.4 MHz, Average, Vertical

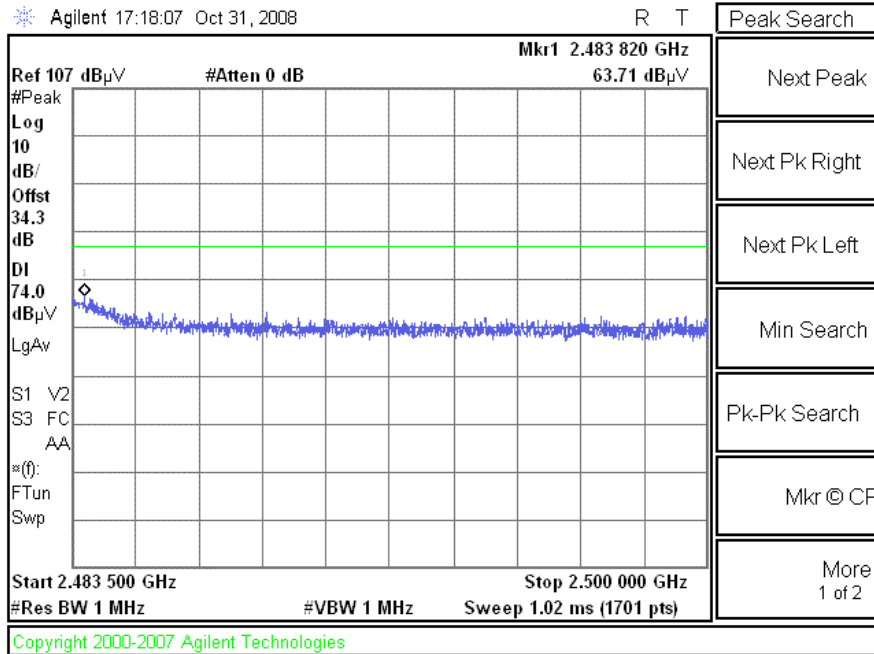


2475.4 MHz, Average, Horizontal



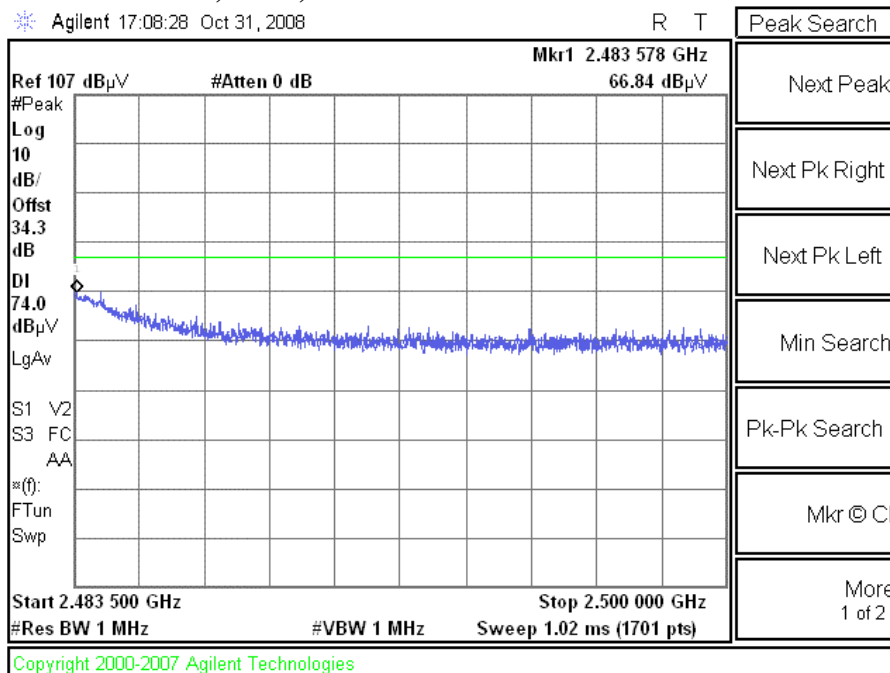
2.4 GHz Band Edge

HIGH Channel, Peak, Vertical



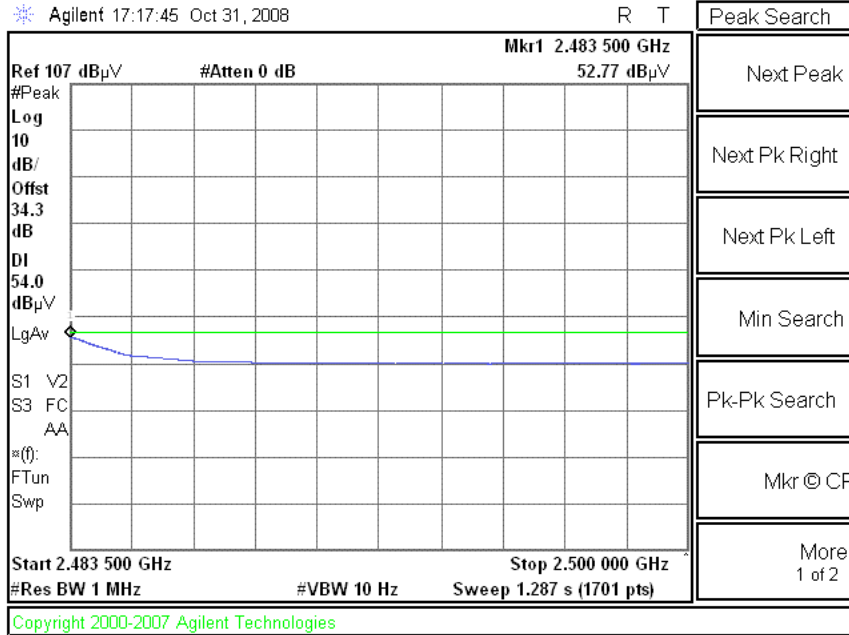
- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- Mkr © CF
- More 1 of 2

HIGH Channel, Peak, Horizontal



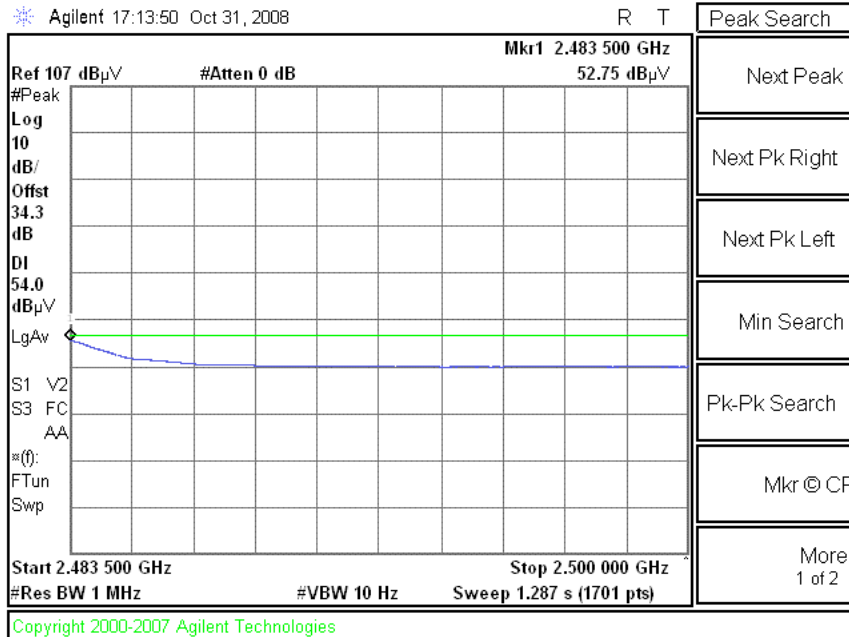
- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- Mkr © CF
- More 1 of 2

High Channel, Vertical, Average



- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- Mkr @ CF
- More 1 of 2

High Channel, Horizontal, Average



- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- Mkr @ CF
- More 1 of 2

2.4 GHz HAN Radiated Spurious, LOW, MID, HIGH Channels

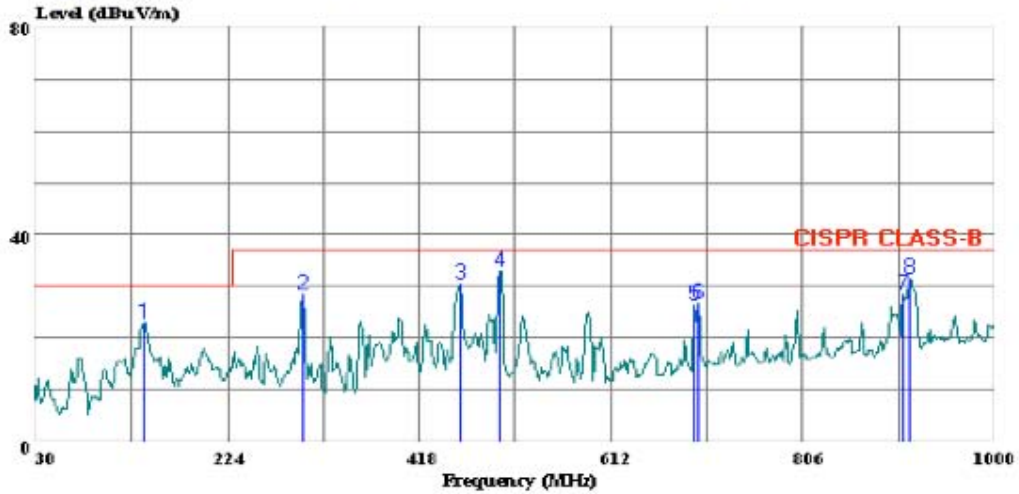
High Frequency Measurement																			
Compliance Certification Services, Morgan Hill Open Field Site																			
Company:		Silver Spring Network																	
Project #:		08U11890																	
Date:		8/15/08																	
Test Engineer:		Thanh Nguyen																	
Configuration:		EUT at Y position																	
Mode:		Transmit 2.4GHz Band																	
Test Equipment:																			
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz							
T60; S/N: 2238 @3m				T144 Miteq 3008A00931															
Hi Frequency Cables																			
2 foot cable				3 foot cable				12 foot cable				HPF				Reject Filter			
Gordon 187207002								Gordon 203134001				HPF_4.0GHz							
Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz; VBW=10Hz																			
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)				
Channel setting ATSI07=11																			
CH 2405.8 MHz			ATSI112 =9																
4.812	3.0	45.55	35.38	33.0	10.9	-36.5	0.0	0.6	53.6	43.4	74	54	-20.4	-10.6	V				
12.026	3.0	42.53	29.04	37.5	16.1	-35.4	0.0	0.9	61.6	48.1	74	54	-12.4	-5.9	V				
4.812	3.0	45.6	35.5	33.0	10.9	-36.5	0.0	0.6	53.7	43.5	74	54	-20.3	-10.5	H				
12.027	3.0	41.9	29.0	37.5	16.1	-35.4	0.0	0.9	61.0	48.1	74	54	-13.0	-5.9	H				
Channel setting ATSI07=18																			
Channel 2440.8MHz			ATSI 112=9																
4.882	3.0	43.35	32.69	33.1	10.9	-36.5	0.0	0.6	51.5	40.8	74	54	-22.5	-13.2	V				
7.322	3.0	42.79	30.99	35.5	12.7	-36.2	0.0	0.6	55.4	43.6	74	54	-18.6	-10.4	V				
12.204	3.0	41.28	28.63	37.4	16.2	-35.4	0.0	0.9	60.4	47.8	74	54	-13.6	-6.2	V				
4.882	3.0	43.26	33.21	33.1	10.9	-36.5	0.0	0.6	51.4	41.4	74	54	-22.6	-12.6	H				
12.204	3.0	41.67	29.67	37.4	16.2	-35.4	0.0	0.9	60.8	48.8	74	54	-13.2	-5.2	H				
Channel Setting ATSI07=26																			
Channel 2480.9MHz			ATSI112=9																
4.962	3.0	45.13	34.13	33.1	11.0	-36.5	0.0	0.6	53.4	42.4	74	54	-20.6	-11.6	V				
7.443	3.0	41.86	30.12	35.6	12.7	-36.2	0.0	0.6	54.6	42.9	74	54	-19.4	-11.1	V				
12.405	3.0	41.85	29.12	37.4	16.3	-35.4	0.0	0.9	61.1	48.3	74	54	-12.9	-5.7	V				
4.962	3.0	45.92	36.38	33.1	11.0	-36.5	0.0	0.6	54.2	44.7	74	54	-19.8	-9.3	H				
7.443	3.0	43.33	32.81	35.6	12.7	-36.2	0.0	0.6	56.1	45.6	74	54	-17.9	-8.4	H				
12.405	3.0	41.85	29.12	37.4	16.3	-35.4	0.0	0.9	61.1	48.3	74	54	-12.9	-5.7	H				
f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss Amp Preamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit																			

Radiated Emissions 30-1000 MHz



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 18 File#: 08U11890.EMI Date: 08-22-2008 Time: 10:39:16



Trace: 17

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration:: EUT with Laptop
 Mode : : Tx, 802.15.4 2.4GHz, Ch. 1 Max Power
 Target: : CISPR Class B

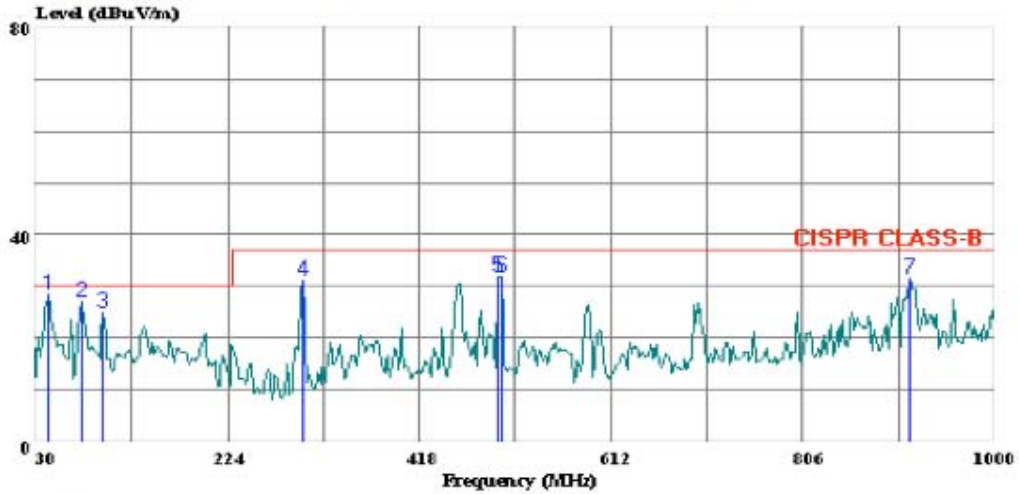
Page: 1

	Read	Limit	Over				
Freq	Level	Factor	Level	Line	Limit	Remark	
MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	138.640	40.80	-17.92	22.88	30.00	-7.12	Peak
2	300.630	43.90	-15.47	28.43	37.00	-8.57	Peak
3	458.740	41.47	-11.00	30.47	37.00	-6.53	Peak
4	499.480	42.80	-9.87	32.93	37.00	-4.07	Peak
5	696.390	32.75	-6.42	26.33	37.00	-10.67	Peak
6	701.240	33.00	-6.29	26.71	37.00	-10.29	Peak
7	906.880	30.55	-2.22	28.33	37.00	-8.67	Peak
8	914.640	33.74	-2.06	31.68	37.00	-5.32	Peak



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 20 File#: 08U11890.EMI Date: 08-22-2008 Time: 10:46:05



Trace: 19

Ref Trace:

Condition: CISPR CLASS-B VERTICAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 802.15.4 2.4GHz, Ch. 1 Max Power
 Target: : CISPR Class B

Page: 1

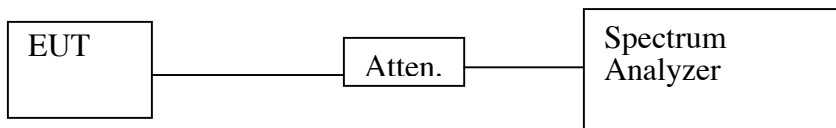
	Read	Read	Limit	Over		
Freq	Level	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	43.580	49.03	-20.69	28.34	30.00	-1.66 Peak
2	75.590	50.64	-23.54	27.10	30.00	-2.90 Peak
3	96.930	46.65	-21.85	24.80	30.00	-5.20 Peak
4	300.630	46.56	-15.47	31.09	37.00	-5.91 Peak
5	497.540	41.95	-9.94	32.01	37.00	-4.99 Peak
6	502.390	41.69	-9.83	31.86	37.00	-5.14 Peak
7	914.640	33.72	-2.06	31.66	37.00	-5.34 Peak

6dB Bandwidth for DTS

Test Requirement: FCC: 15.247 (a)2

IC: RSS-210 Sec. 6.2.2(o)(iv)

Test Set-up



Test Procedures

A modified EUT with a coaxial cable attached to the radio antenna port was configured on a test bench. The cable's SMA connector was connected to the spectrum analyzer. The EUT transmission was continuous at the LOW channel. While the transmitter broadcast a steady stream of digital data, the analyzer OCCUPIED BW function was activated to measure 6 dB BW and 99% BW.

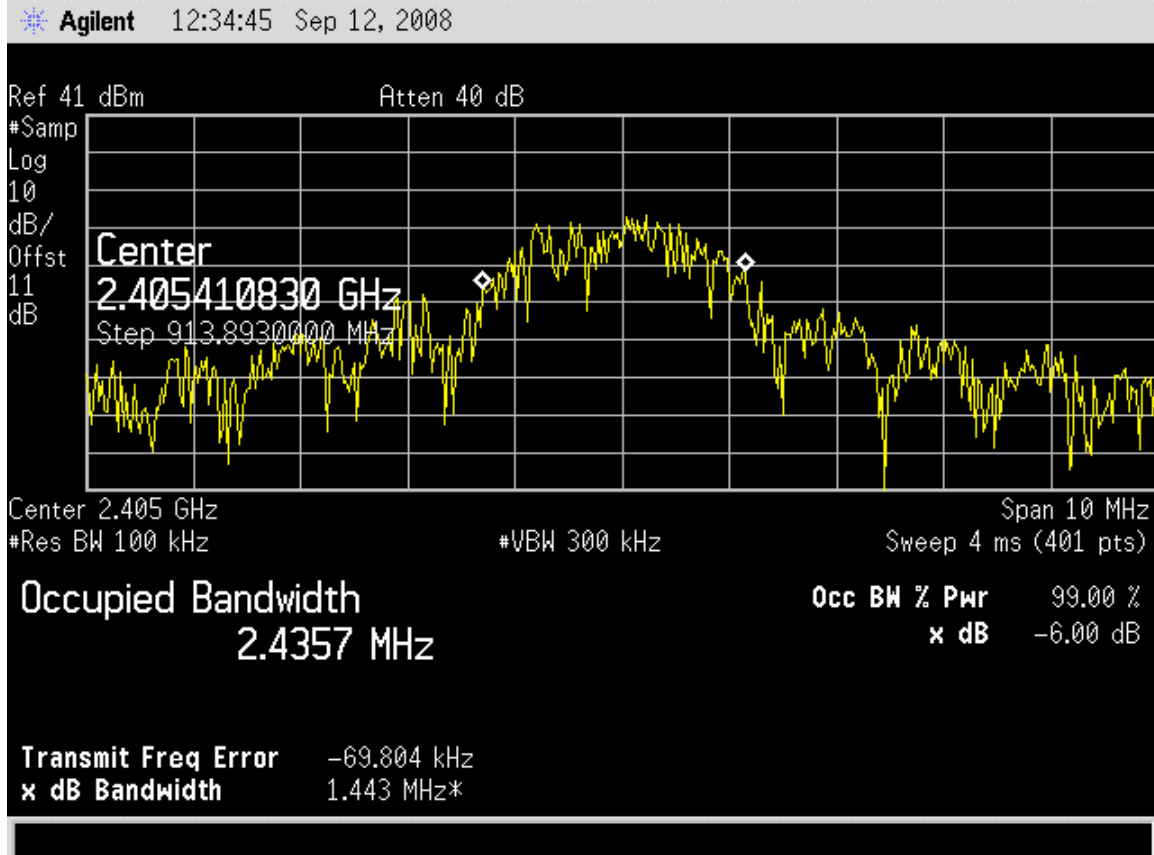
Test was repeated for MID and HIGH channels.

Test Results. No non-compliance noted. Refer to data sheets below.

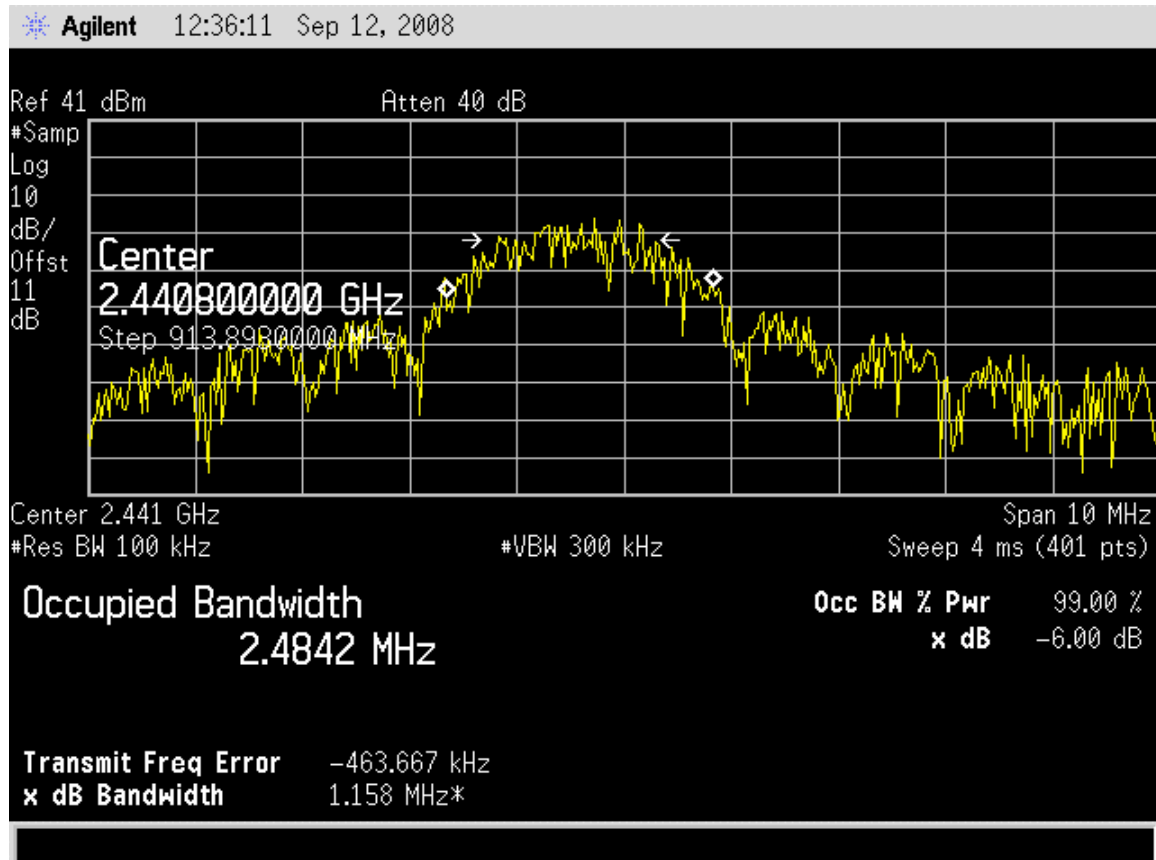
Minimum 6 dB BW: 1.158 MHz

Minimum Required: 500 kHz

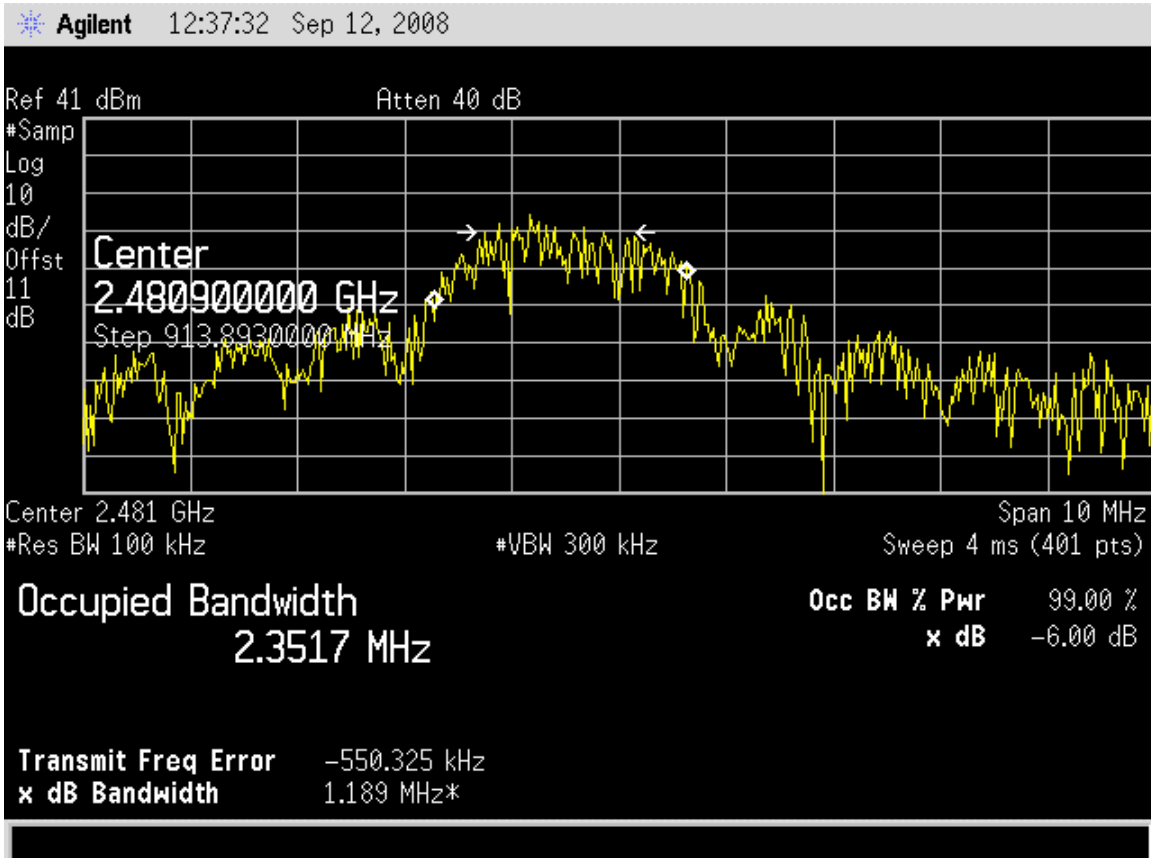
6dB Bandwidth LOW Channel



6 dB BW, MID Channel

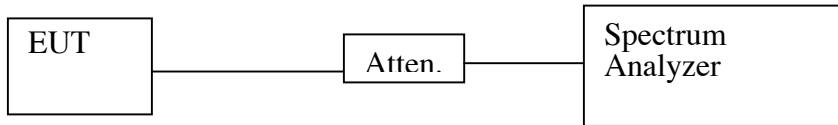


6 dB BW, HIGH Channel



99% Bandwidth

Test Setup



Limit

None: for reporting purposes only.

Test Procedure

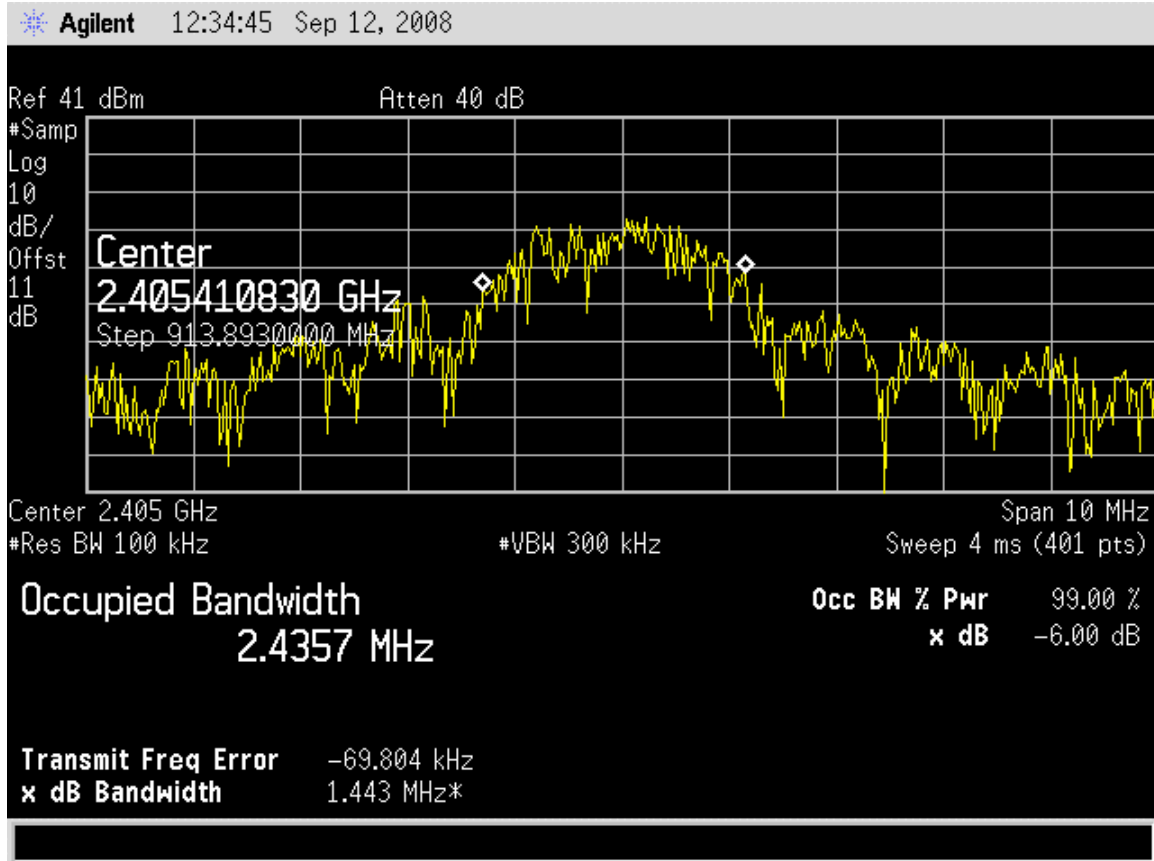
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal OCCUPIED BW function was utilized.

Test Results

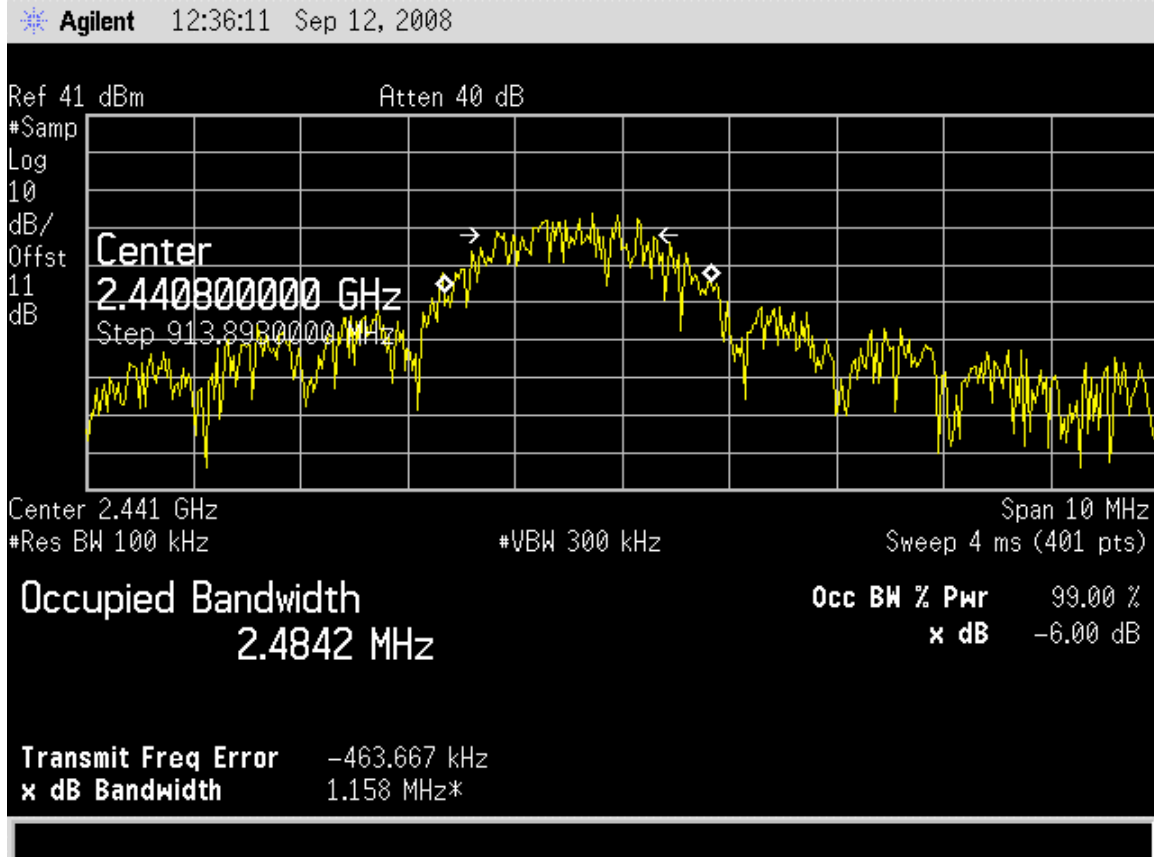
Refer to spectrum analyzer charts below. 99% bandwidth approximately 2.4 MHz.

Emission Designator: 2M40G1D

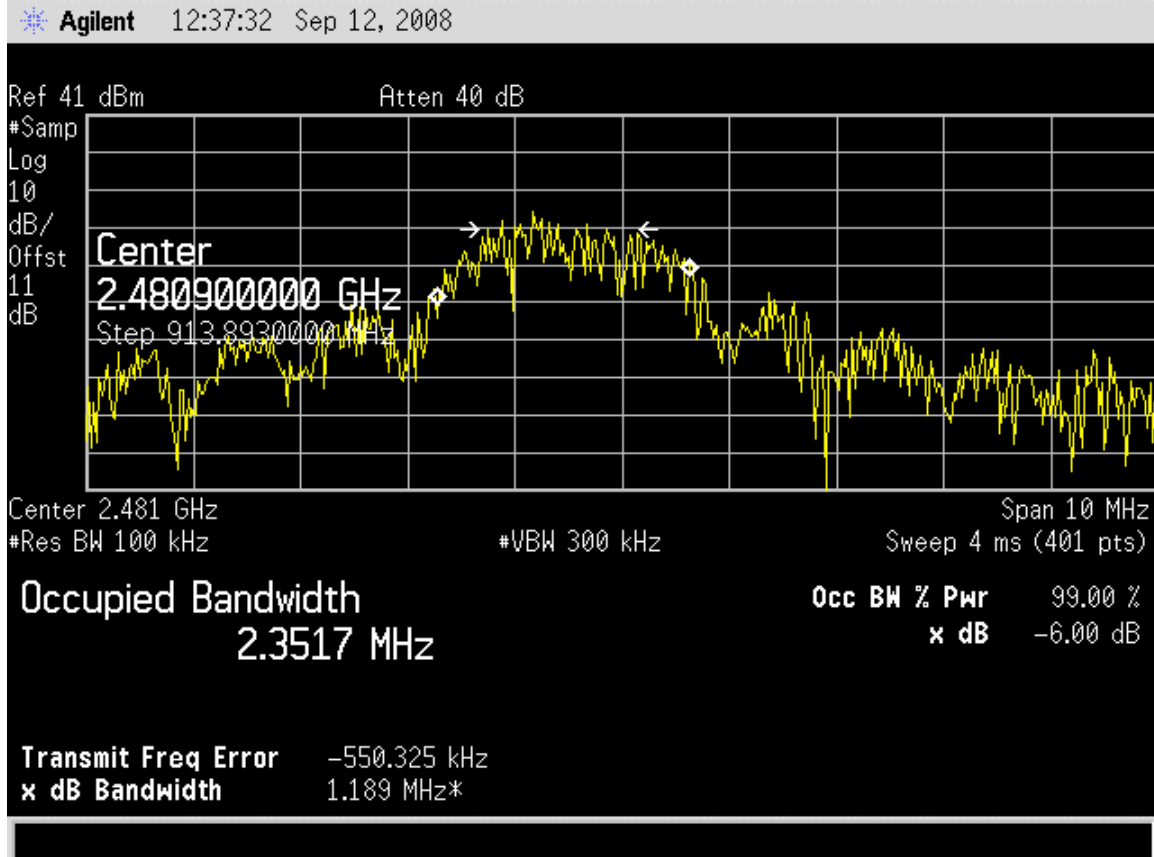
99% Bandwidth LOW Channel



99% Bandwidth MID Channel



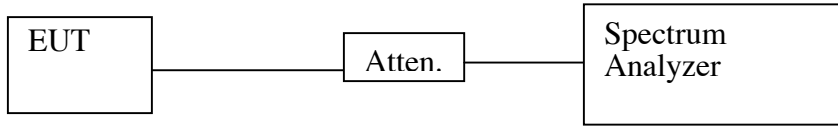
99% Bandwidth HIGH Channel



RF Power Output

Test Requirement: FCC: 15.247(b)
IC: RSS-210 Sec. 6.2.2(o)(iv)

Test Setup



Test Procedures

1. The EUT was configured on a test bench. RBW was set to a value higher than the 2.5 MHz 99% band width: RBW=3 MHz, VBW=8 MHz
2. The spectrum analyzer detector was set to PEAK and the highest value was recorded using the analyzer PEAK SEARCH function.

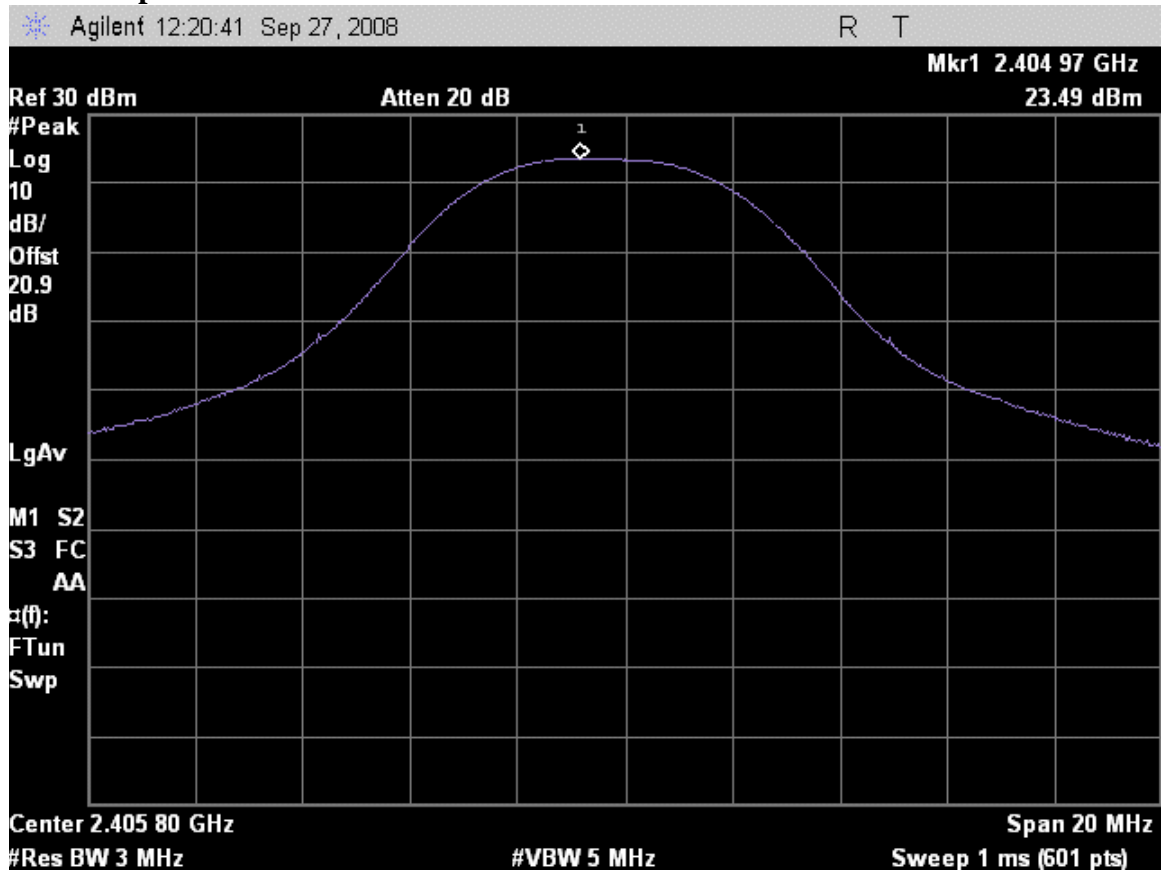
Test Results

Refer to spectrum analyzer graphs. Reference level offset corrects for external attenuation and cable loss.

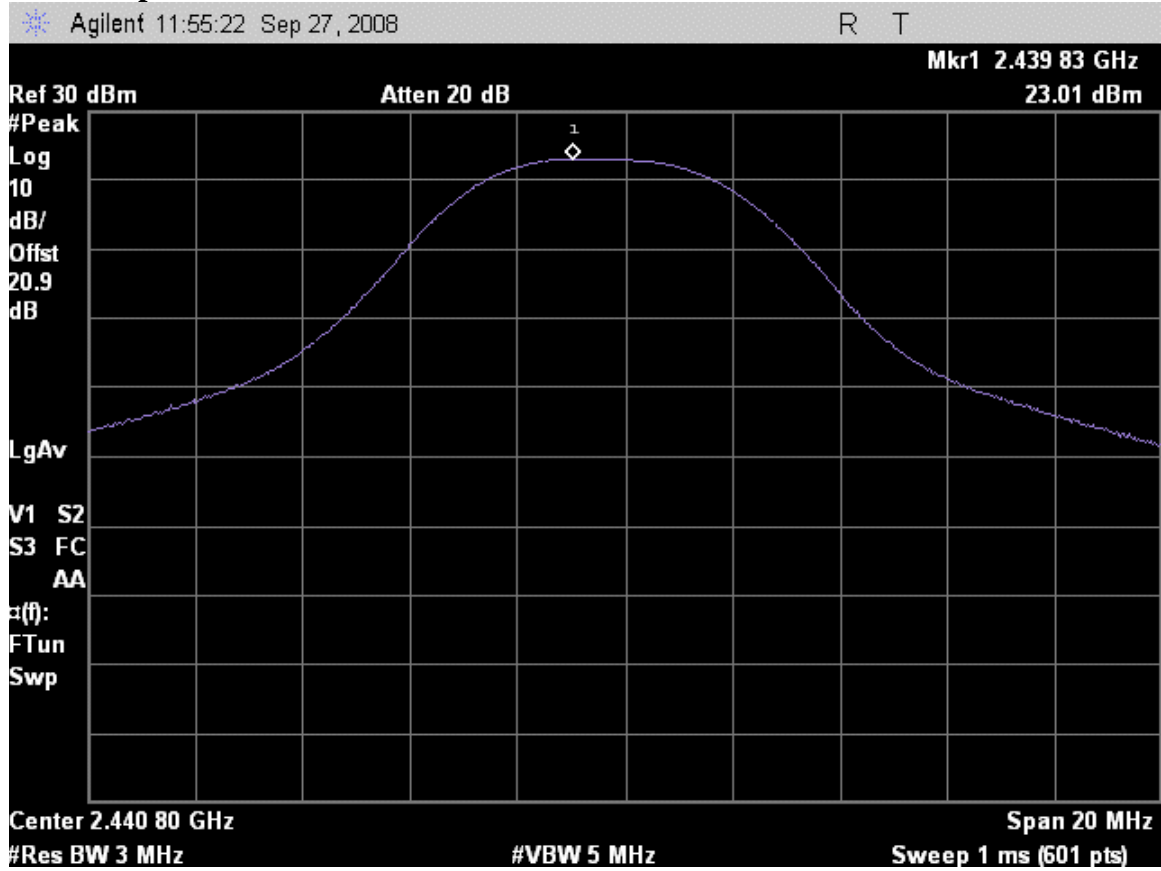
Channel	Frequency, MHz	Output Power, dBm
Low	2405.8	23.49
Mid	2440.8	23.01
High-1	2475.4	22.67
High	2480.9	15.86

Note: Highest channel output power limited by band edge considerations. Output power setting for all other channels is ATS112=9, approximately 23 dBm.

Peak Output Power LOW Channel



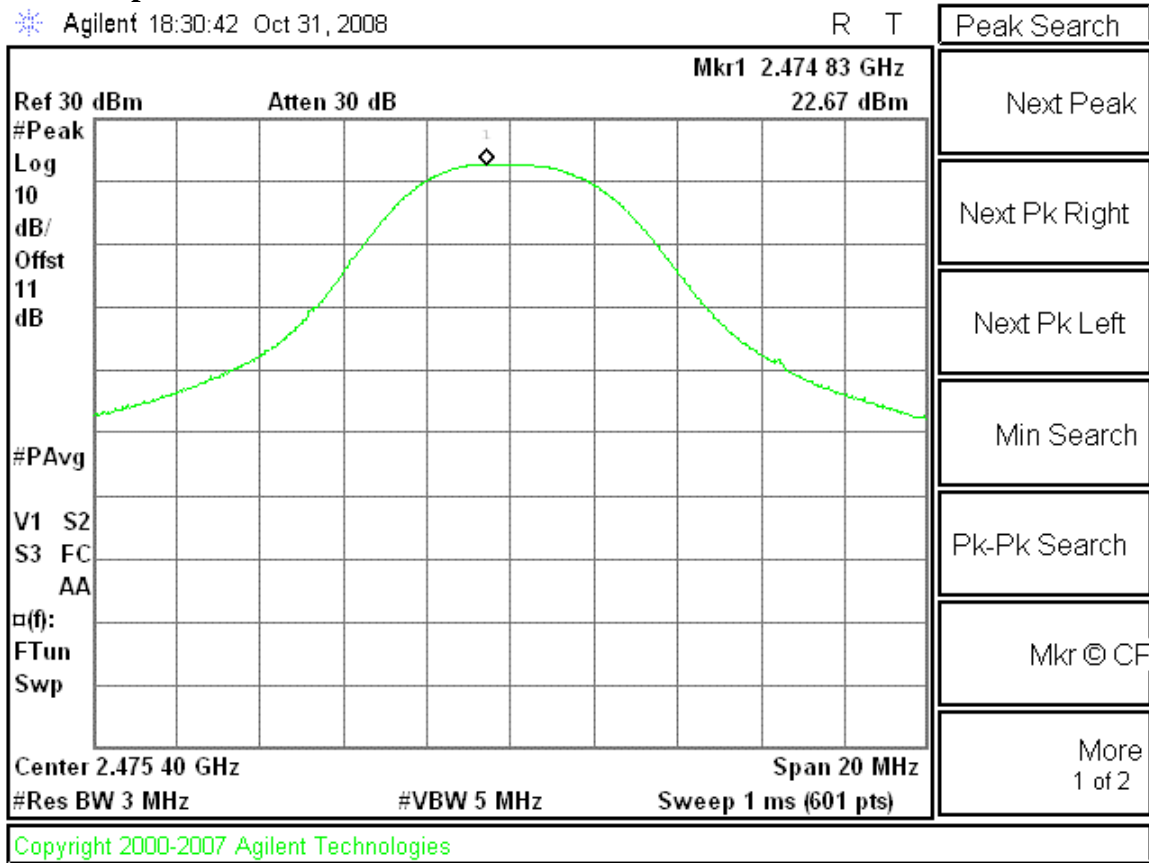
Peak Output Power MID Channel



Peak Output Power 2475.4 MHz

Agilent 18:30:42 Oct 31, 2008

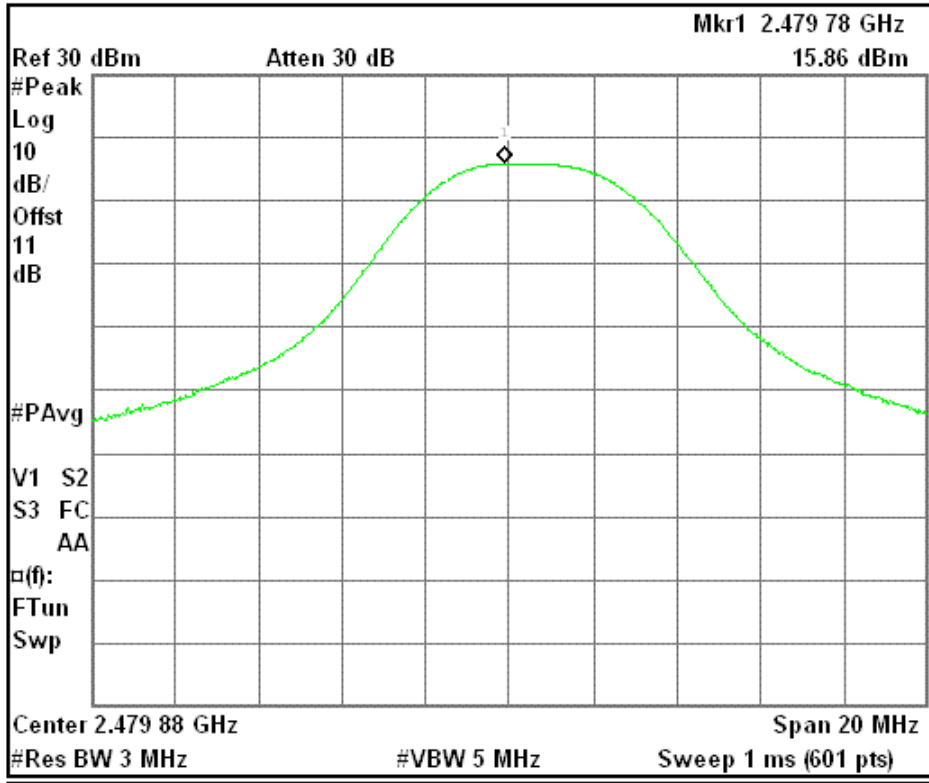
R T



Peak Output Power HIGH Channel

Agilent 18:45:17 Oct 31, 2008

R T



Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr © CF
More 1 of 2

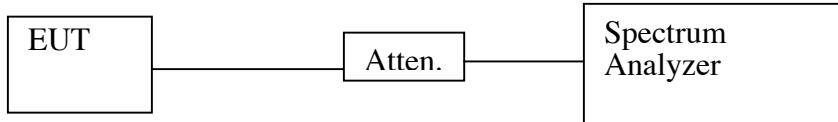
Copyright 2000-2007 Agilent Technologies

Spurious Emissions, Conducted

Test Requirement: FCC: 15.247(d)

IC: RSS-210 Sec. 6.2.2(o)(e1)

Test Setup



Test Procedure

1. The EUT was configured on a test bench. The cable was connected between the EUT antenna port and the spectrum analyzer input port.

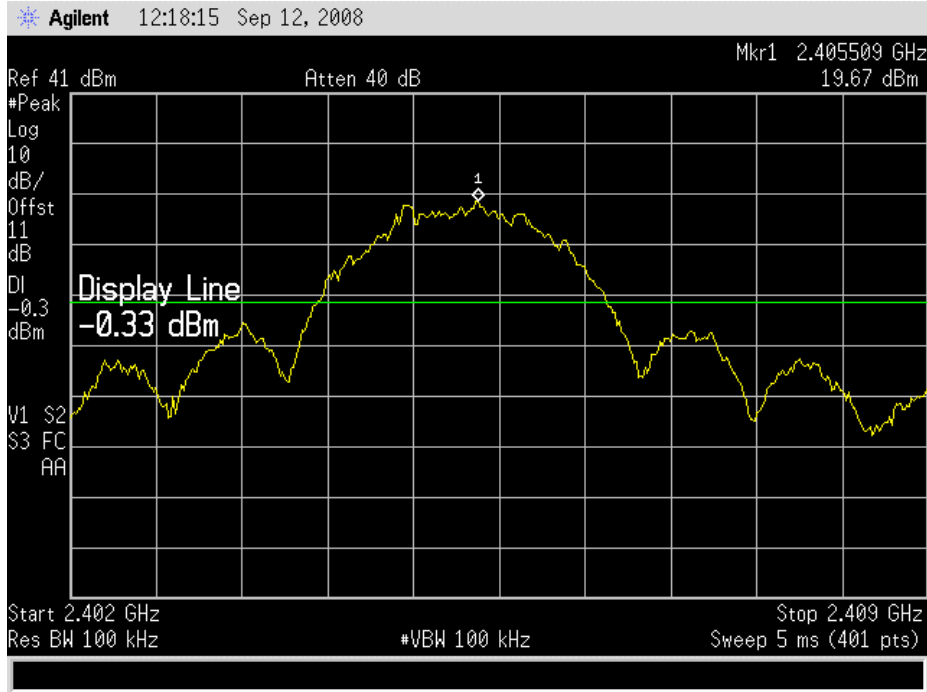
Spectrum analyzer RES BW was set to 100 kHz. While the transmitter broadcast a steady stream of digital data, the analyzer MAX HOLD function was used to capture the envelope of the transmission.

Readings were taken out to 10fo.

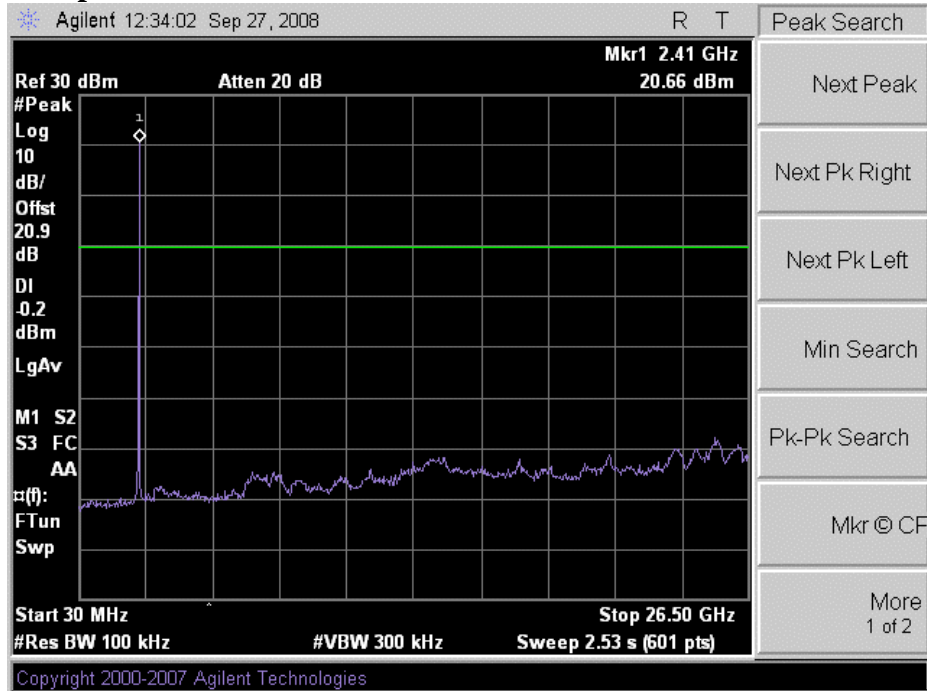
Test Results

Refer to spectrum analyzer plots. Data shows out of band emissions are suppressed well below the -20 dBc minimum required by the Rules.

Lower band edge, -20 dBc, LOW Channel



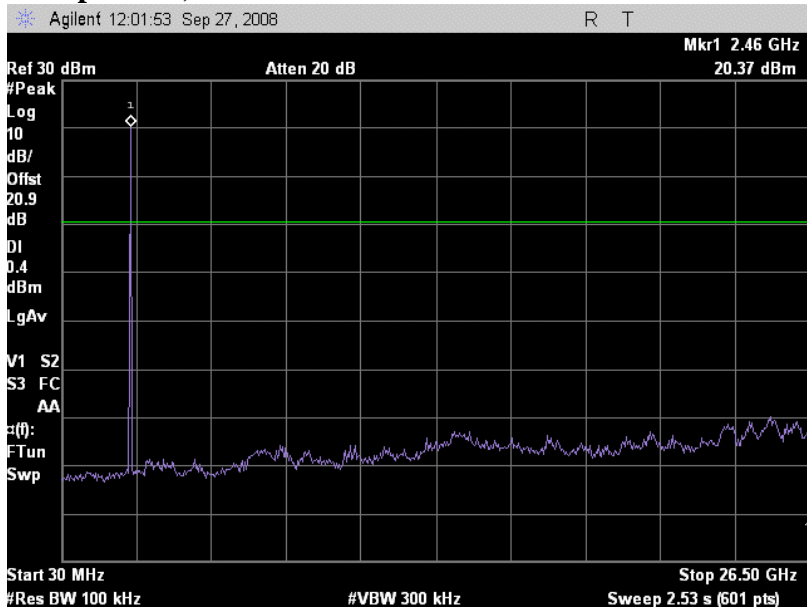
TX Spurious Emissions LOW Channel



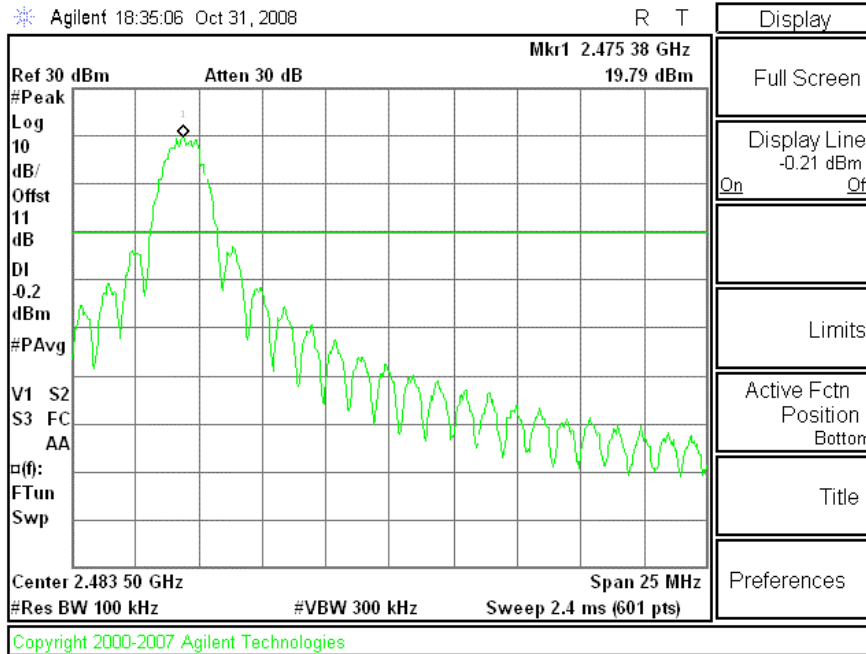
-20 dBc MID Channel Reference



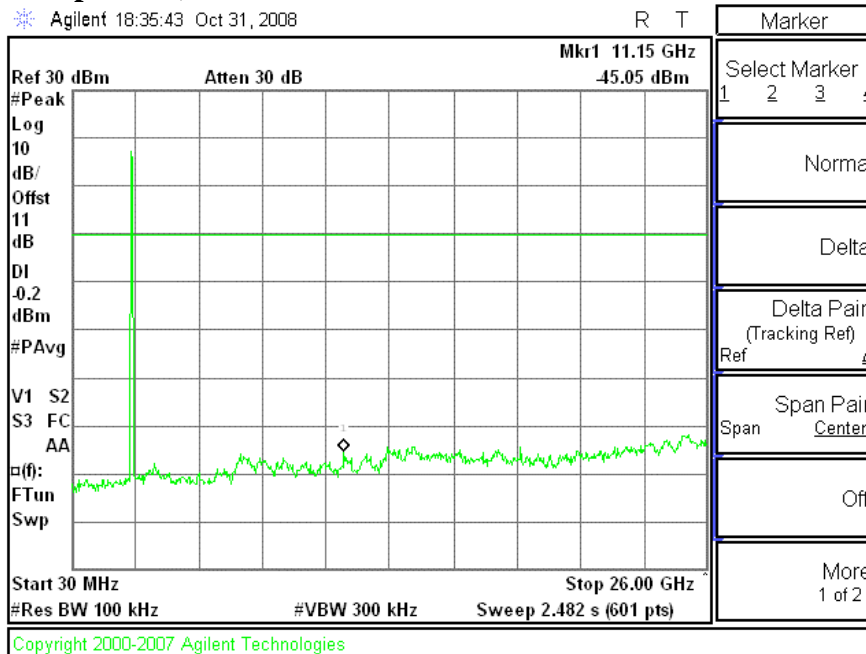
TX Spurious, MID Channel



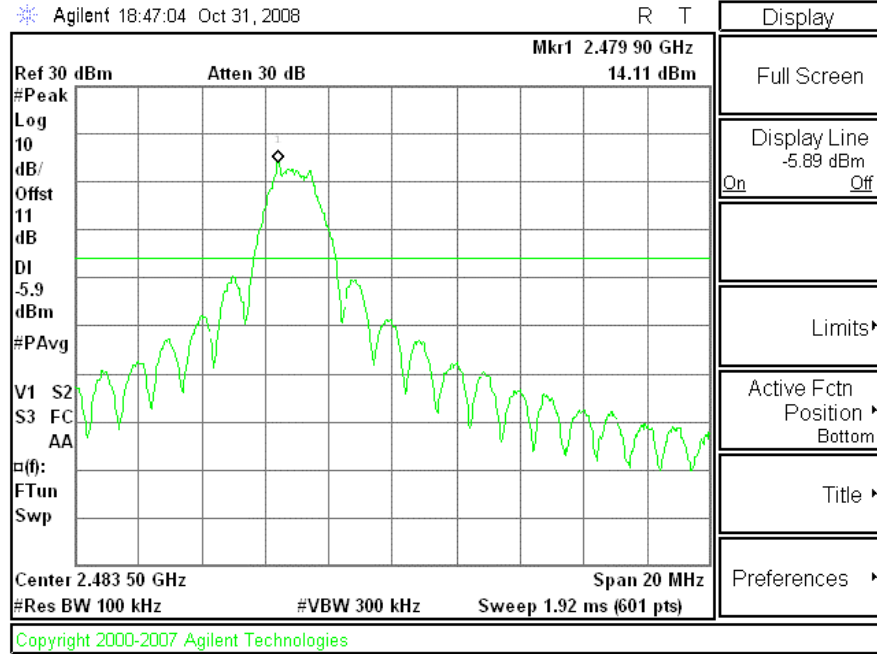
2475.4 MHz -20 dBc



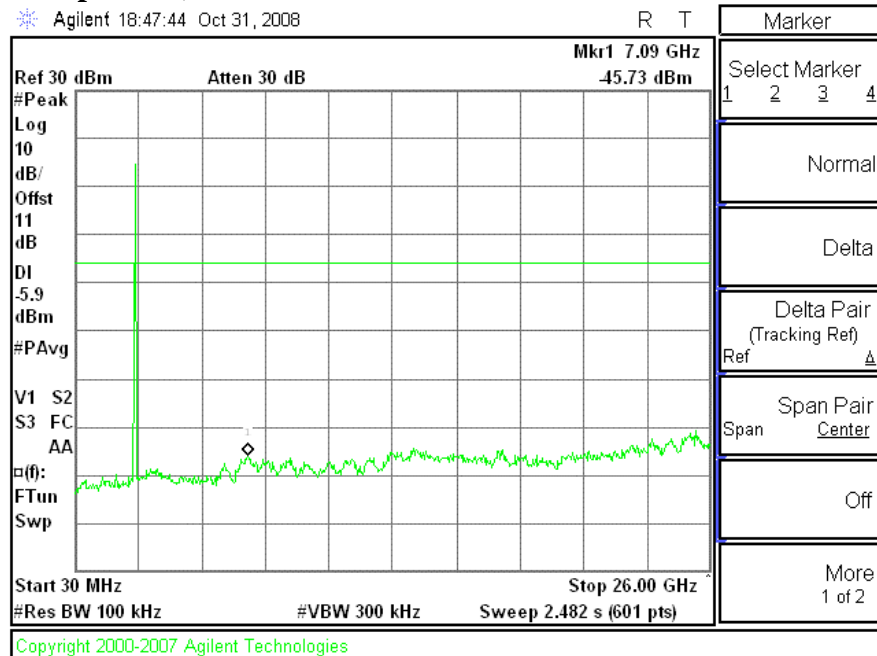
TX Spurious, 2475.4 MHz



Upper band edge, -20 dBc HIGH Channel



TX Spurious, HIGH Channel

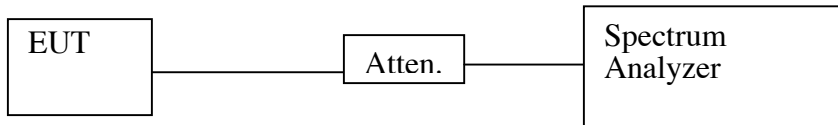


Power Spectral Density

Test Requirement: 15.247(e)

RSS-210 Sec. 6.2.2(o)(iv)

Test Setup



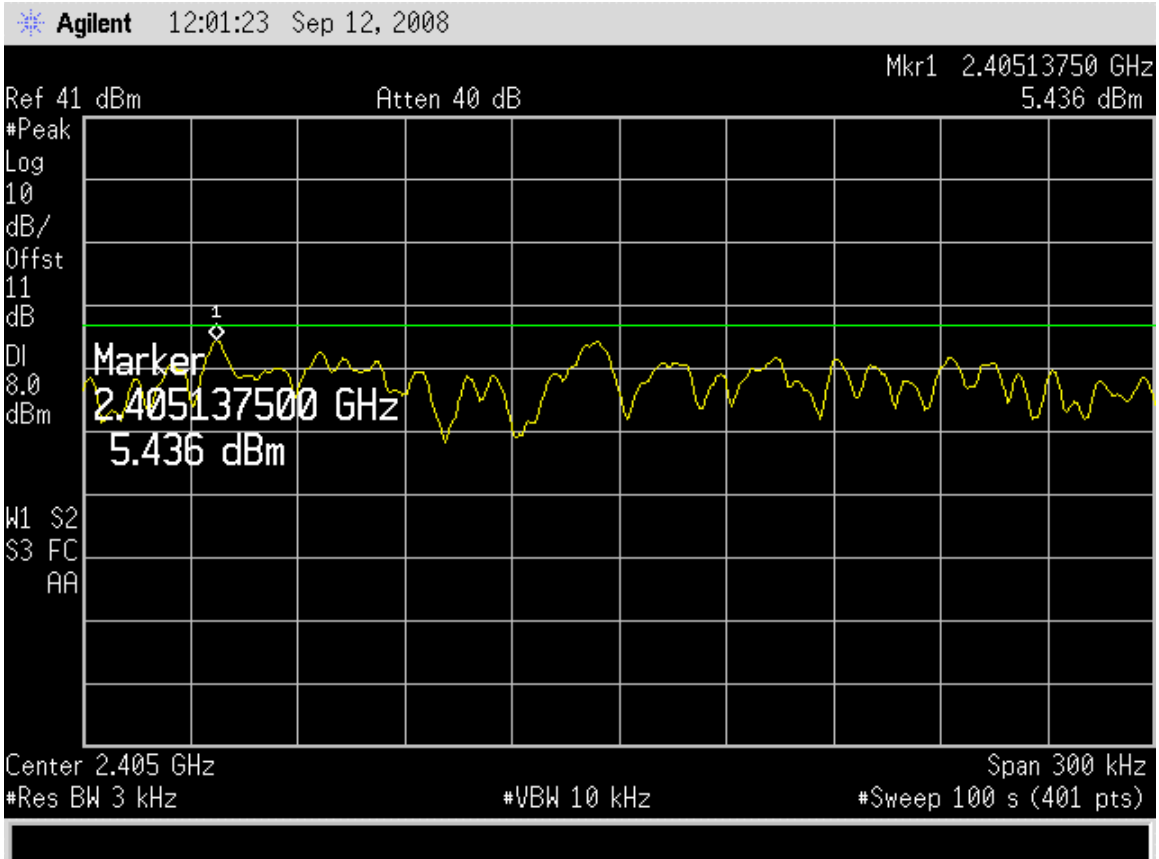
Test Procedure

1. Determine frequency at which maximum emission occurs during pre-scan.
2. Reduce SPAN to 300 kHz, while adjusting tuning frequency so that peak remains at center of screen.
3. Set RES BW = 3 kHz, VID BW = 10 kHz, SWEEP = 100 sec.
4. Record highest reading and compare to 8 dBm limit.

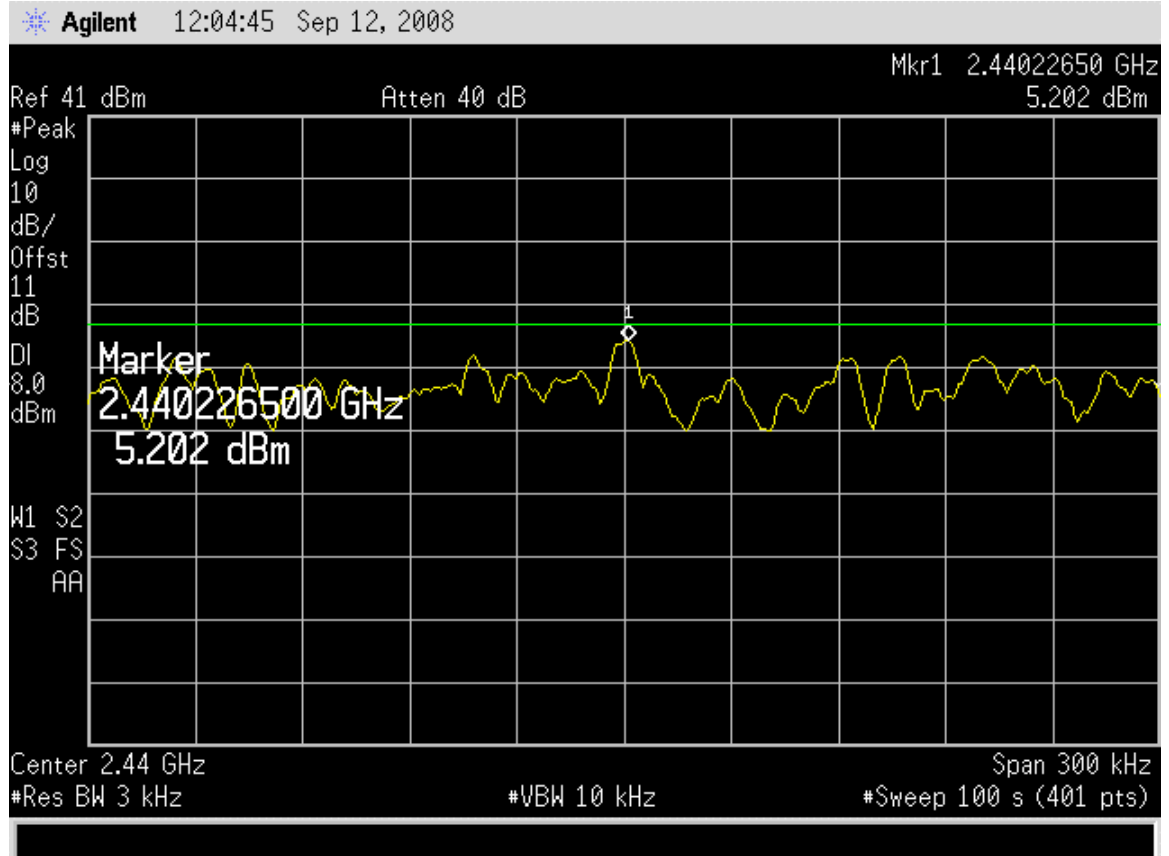
Test Results

Maximum PSD was 5.4 dBm. Refer to attached spectrum analyzer chart.

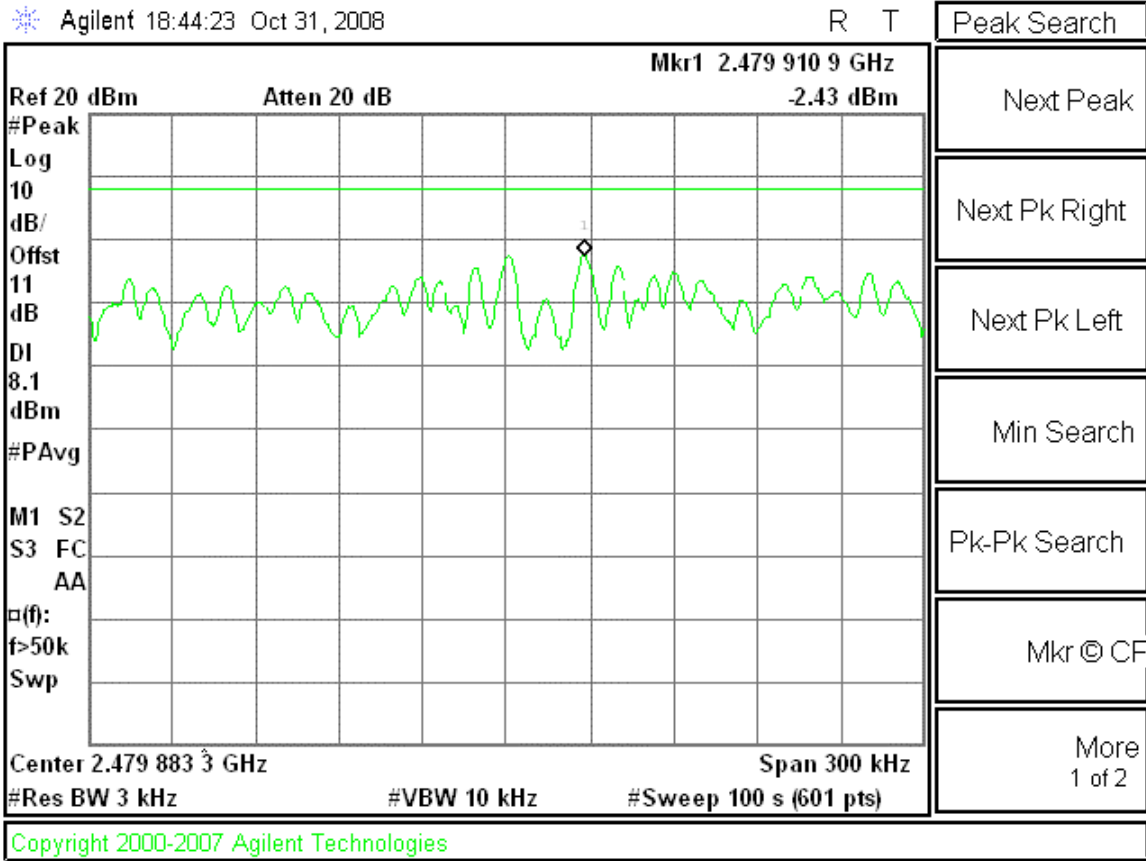
Power Spectral Density LOW Channel



Power Spectral Density MID Channel



Power Spectral Density HIGH Channel



FREQUENCY HOPPING SPREAD SPECTRUM RADIO EMISSIONS

TEST RESULTS

Radiated Test Set-up, 30 MHz-26 GHz

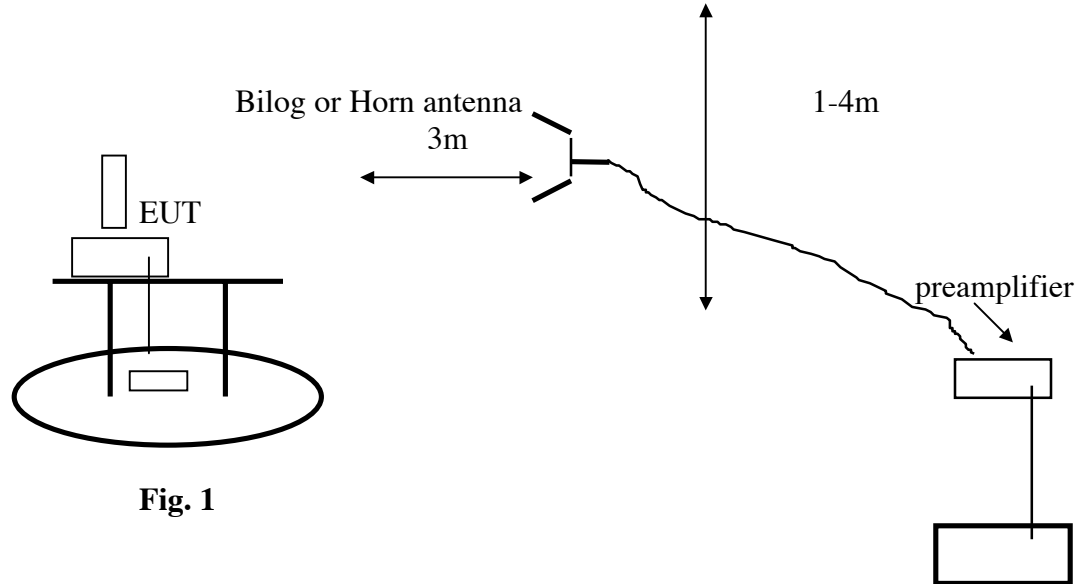


Fig. 1

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 10th harmonic of the fundamental.
6. 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

Radiated Emissions Above 1 GHz, Low Channel

High Frequency Measurement
 Compliance Certification Services, Morgan Hill Open Field Site

Company: Silver Spring Network
 Project #: 08U11890
 Date: 8/15/08
 Test Engineer: Thanh Nguyen
 Configuration: EUT at Y position
 Mode: Transmit

Test Equipment:

Horn 1-18GHz: T73; S/N: 6717 @3m
 Pre-amplifier 1-26GHz: T144 Miteq 3008A00931
 Pre-amplifier 26-40GHz:
 Horn > 18GHz:
 2 foot cable:
 3 foot cable:
 12 foot cable: Gordon 203134001
 HPF: HPP_1.5GHz
 Reject Filter:
 Peak Measurements: RBW=VBW=1MHz
 Average Measurements: RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Setting ATTS112=20															
Low CH 902.325 MHz ATS 107= 0															
2.707	3.0	50.72	46.90	29.2	8.6	-37.4	0.0	0.6	51.6	47.8	74	54	-22.4	-6.2	V
3.609	3.0	42.15	30.69	31.6	9.6	-36.9	0.0	0.6	47.0	35.5	74	54	-27.0	-18.5	V
4.512	3.0	42.28	33.48	33.0	10.6	-36.5	0.0	0.6	50.0	41.2	74	54	-24.0	-12.8	V
5.414	3.0	42.43	33.55	33.8	11.2	-36.3	0.0	0.5	51.6	42.7	74	54	-22.4	-11.3	V
8.121	3.0	40.70	29.31	35.5	13.1	-36.2	0.0	0.7	53.7	42.3	74	54	-20.3	-11.7	V
9.023	3.0	40.31	28.15	36.5	13.5	-36.7	0.0	0.7	54.4	42.2	74	54	-19.6	-11.8	Noise floor
2.707	3.0	53.06	51.24	29.2	8.6	-37.4	0.0	0.6	54.0	52.2	74	54	-20.0	-1.8	H
3.609	3.0	42.18	33.75	31.6	9.6	-36.9	0.0	0.6	47.0	38.6	74	54	-27.0	-15.4	H
4.512	3.0	43.67	36.12	33.0	10.6	-36.5	0.0	0.6	51.3	43.8	74	54	-22.7	-10.2	H
5.414	3.0	43.65	36.85	33.8	11.2	-36.3	0.0	0.5	52.8	46.0	74	54	-21.2	-8.0	H
8.121	3.0	43.89	34.97	35.5	13.1	-36.2	0.0	0.7	56.9	48.0	74	54	-17.1	-6.0	H
9.023	3.0	41.43	28.02	36.5	13.5	-36.7	0.0	0.7	55.5	42.1	74	54	-18.5	-11.9	Noise floor

f Measurement Frequency
 Dist Distance to Antenna
 Read Analyzer Reading
 AF Antenna Factor
 CL Cable Loss
 Amp Preamp Gain
 D Corr Distance Correct to 3 meters
 Avg Average Field Strength @ 3 m
 Peak Calculated Peak Field Strength
 HPF High Pass Filter
 Avg Lim Average Field Strength Limit
 Pk Lim Peak Field Strength Limit
 Avg Mar Margin vs. Average Limit
 Pk Mar Margin vs. Peak Limit

Radiated Emissions Above 1 GHz, Mid Channel

High Frequency Measurement
 Compliance Certification Services, Morgan Hill Open Field Site

Company: Silver Spring Network
 Project #: 08U11890
 Date: 8/15/08
 Test Engineer: Thanh Nguyen
 Configuration: EUT at Y position
 Mode: Transmit MID Channel 914.95MHZ

Test Equipment:

Horn 1-18GHz: T73; S/N: 6717 @3m
 Pre-amplifer 1-26GHz: T144 Miteq 3008A00931
 Pre-amplifer 26-40GHz:
 Horn > 18GHz:
 HI Frequency Cables:
 2 foot cable:
 3 foot cable:
 12 foot cable: Gordon 203134001
 HPF: HPF_1.5GHz
 Reject Filter:
 Peak Measurements: RBW=VBW=1MHz
 Average Measurements: RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Mid CH 914.950MHz															
Power Setting ATSI12=20															
Channel setting ATSI07=42															
2.744	3.0	54.03	52.29	29.3	8.7	-37.4	0.0	0.6	55.1	53.4	74	54	-18.9	-0.6	V
3.660	3.0	48.72	44.62	31.7	9.7	-36.9	0.0	0.6	53.8	49.7	74	54	-20.2	-4.3	V
4.575	3.0	41.50	29.09	33.1	10.7	-36.5	0.0	0.6	49.3	36.9	74	54	-24.7	-17.1	V
7.319	3.0	44.99	37.88	35.0	12.7	-36.2	0.0	0.6	57.1	49.9	74	54	-16.9	-4.1	V
8.234	3.0	40.55	30.32	35.6	13.1	-36.3	0.0	0.7	53.7	43.5	74	54	-20.3	-10.5	V
9.149	3.0	39.90	28.09	36.5	13.6	-36.7	0.0	0.7	54.1	42.3	74	54	-19.9	-11.7	Noise floor
2.744	3.0	47.37	43.10	29.3	8.7	-37.4	0.0	0.6	48.4	44.2	74	54	-25.6	-9.8	H
3.660	3.0	50.90	44.53	31.7	9.7	-36.9	0.0	0.6	56.0	49.6	74	54	-18.0	-4.4	H
4.575	3.0	42.73	33.78	33.1	10.7	-36.5	0.0	0.6	50.5	41.6	74	54	-23.5	-12.4	H
7.319	3.0	47.15	41.87	35.0	12.7	-36.2	0.0	0.6	59.2	53.9	74	54	-14.8	-0.1	H
8.234	3.0	43.94	35.94	35.6	13.1	-36.3	0.0	0.7	57.1	49.1	74	54	-16.9	-4.9	H
9.149	3.0	40.89	28.54	36.5	13.6	-36.7	0.0	0.7	55.1	42.7	74	54	-18.9	-11.3	Noise floor

f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit
 Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit
 Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit
 AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit
 CL Cable Loss HPF High Pass Filter

Radiated Emissions Above 1 GHz, High Channel

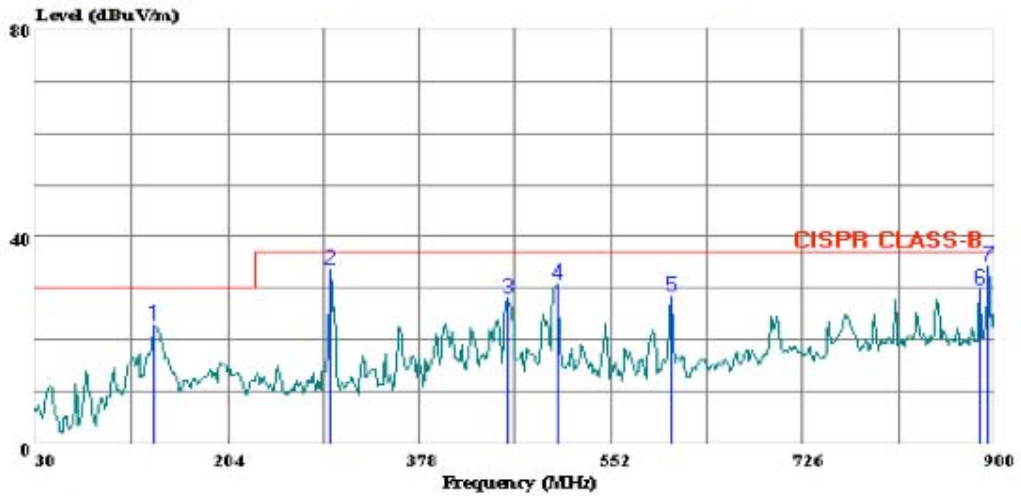
High Frequency Measurement																																														
Compliance Certification Services, Morgan Hill Open Field Site																																														
Company:		Silver Spring Network																																												
Project #:		08U11890																																												
Date:		8/16/08																																												
Test Engineer:		Thanh Nguyen																																												
Configuration:		EUT at XY position																																												
Mode:		Transmit High Channel 926.866MHZ																																												
Test Equipment:																																														
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz																																					
T73; S/N: 6717 @3m			T144 Miteq 3008A00931																																											
Hi Frequency Cables																																														
2 foot cable			3 foot cable			12 foot cable			HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz																																	
						Gordon 203134001			HPF_1.5GHz																																					
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)																															
Power Setting ATSI12=20																																														
Channel setting ATSI07=82																																														
2.781	3.0	47.5	43.7	29.4	8.7	-37.4	0.0	0.6	48.7	44.9	74	54	-25.3	-9.1	V																															
3.707	3.0	42.1	32.1	31.8	9.7	-36.8	0.0	0.6	47.4	37.4	74	54	-26.6	-16.6	V																															
4.634	3.0	43.8	37.3	33.1	10.7	-36.5	0.0	0.6	51.7	45.2	74	54	-22.3	-8.8	V																															
7.415	3.0	42.6	30.7	35.0	12.7	-36.2	0.0	0.6	54.8	42.9	74	54	-19.2	-11.1	V																															
8.342	3.0	41.1	28.7	35.7	13.2	-36.3	0.0	0.7	54.4	42.0	74	54	-19.6	-12.0	V																															
2.781	3.0	51.85	49.04	29.4	8.7	-37.4	0.0	0.6	53.1	50.3	74	54	-20.9	-3.7	H																															
3.707	3.0	46.10	39.90	31.8	9.7	-36.8	0.0	0.6	51.4	45.2	74	54	-22.6	-8.8	H																															
4.634	3.0	47.20	42.86	33.1	10.7	-36.5	0.0	0.6	55.1	50.8	74	54	-18.9	-3.2	H																															
7.415	3.0	42.27	29.33	35.0	12.7	-36.2	0.0	0.6	54.4	41.5	74	54	-19.6	-12.5	H																															
8.342	3.0	40.75	28.92	35.7	13.2	-36.3	0.0	0.7	54.0	42.2	74	54	-20.0	-11.8	H																															
<table style="width:100%; border: none;"> <tr> <td>f</td> <td>Measurement Frequency</td> <td>Amp</td> <td>Preamp Gain</td> <td>Avg Lim</td> <td>Average Field Strength Limit</td> </tr> <tr> <td>Dist</td> <td>Distance to Antenna</td> <td>D Corr</td> <td>Distance Correct to 3 meters</td> <td>Pk Lim</td> <td>Peak Field Strength Limit</td> </tr> <tr> <td>Read</td> <td>Analyzer Reading</td> <td>Avg</td> <td>Average Field Strength @ 3 m</td> <td>Avg Mar</td> <td>Margin vs. Average Limit</td> </tr> <tr> <td>AF</td> <td>Antenna Factor</td> <td>Peak</td> <td>Calculated Peak Field Strength</td> <td>Pk Mar</td> <td>Margin vs. Peak Limit</td> </tr> <tr> <td>CL</td> <td>Cable Loss</td> <td>HPF</td> <td>High Pass Filter</td> <td></td> <td></td> </tr> </table>																	f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit	Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit	Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit	AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit	CL	Cable Loss	HPF	High Pass Filter		
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit																																									
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit																																									
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit																																									
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit																																									
CL	Cable Loss	HPF	High Pass Filter																																											

Radiated Emissions Below 1 GHZ



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 24 File#: 08U11890.emi Date: 08-22-2008 Time: 11:07:00



Trace: 23

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 900MHz, Hopping Max Power
 Target: : CISPR Class B

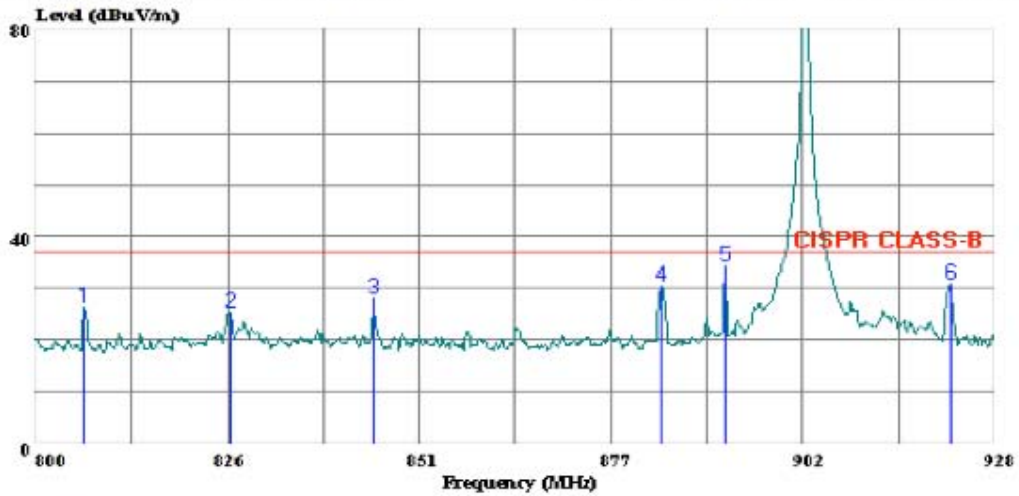
Page: 1

	Read	Read	Limit	Over		
Freq	Level	Factor	Level	Limit	Limit	Remark
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	137.880	40.83	-17.92	22.91	30.00	-7.09 Peak
2	297.090	49.38	-15.65	33.73	37.00	-3.27 Peak
3	458.040	39.10	-11.01	28.09	37.00	-8.91 Peak
4	503.280	40.50	-9.82	30.68	37.00	-6.32 Peak
5	605.940	36.93	-8.39	28.54	37.00	-8.46 Peak
6	886.080	32.61	-2.65	29.96	37.00	-7.04 Peak
7	894.780	36.66	-2.40	34.26	37.00	-2.74 Peak



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 32 File#: 08U11890.emi Date: 08-22-2008 Time: 11:32:22



Trace: 31

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 900MHz, Hopping Max Power
 Target: : CISPR Class B

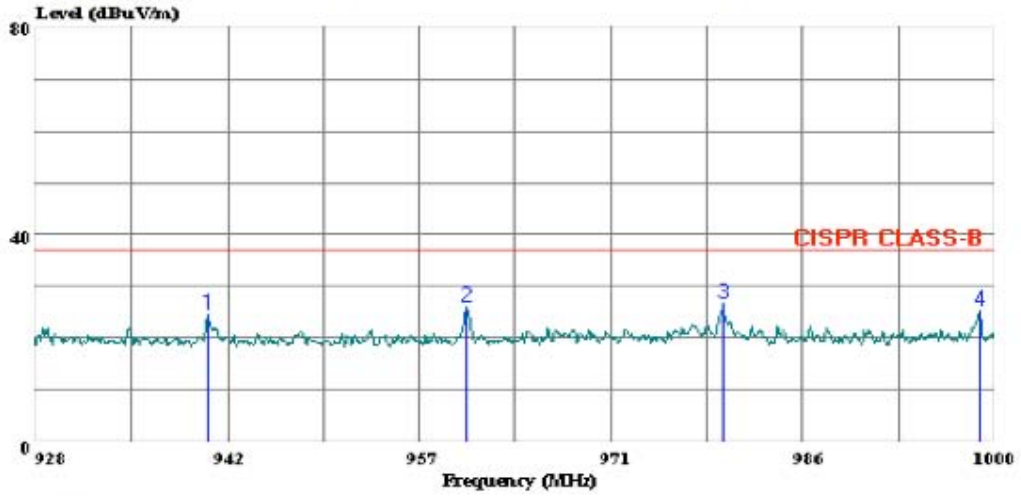
Page: 1

	Read	Read	Limit	Over		
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	806.272	30.81	-4.35	26.46	37.00	-10.54 Peak
2	825.856	29.17	-3.96	25.21	37.00	-11.79 Peak
3	845.056	31.69	-3.59	28.10	37.00	-8.90 Peak
4	883.584	33.13	-2.72	30.40	37.00	-6.60 Peak
5	892.032	36.84	-2.49	34.36	37.00	-2.64 Peak
6	922.112	32.54	-1.83	30.71	37.00	-6.29 Peak



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 26 File#: 08U11890.emi Date: 08-22-2008 Time: 11:13:25



Trace: 25

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 900MHz, Hopping Max Power
 Target: : CISPR Class B

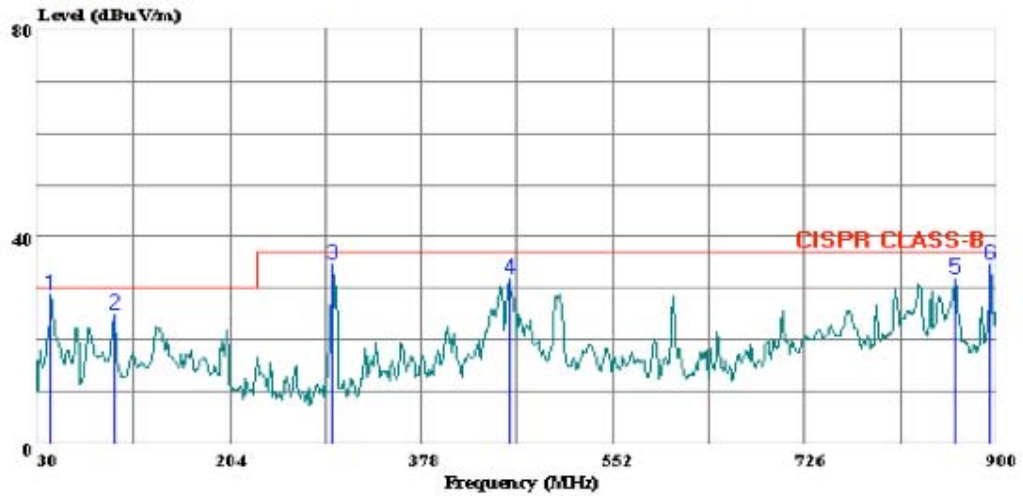
Page: 1

	Read Freq	Read Level	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	940.888	25.96	-1.53	24.43	37.00	-12.57	Peak
2	960.328	27.13	-1.01	26.12	37.00	-10.88	Peak
3	979.624	27.31	-0.70	26.61	37.00	-10.39	Peak
4	998.848	25.71	-0.30	25.41	37.00	-11.59	Peak



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 22 File#: 08U11890.emi Date: 08-22-2008 Time: 11:00:29



Trace: 21

Ref Trace:

Condition: CISPR CLASS-B VERTICAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 900MHz, Hopping Max Power
 Target: : CISPR Class B

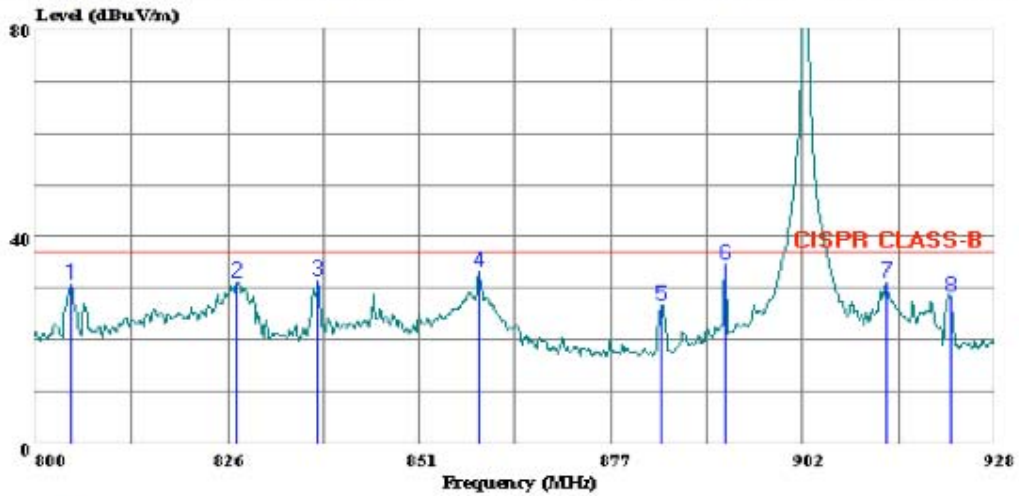
Page: 1

	Read Freq	Read Level	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	42.180	48.70	-19.82	28.89	30.00	-1.11	Peak
2	98.730	46.34	-21.40	24.94	30.00	-5.06	Peak
3	297.090	50.18	-15.65	34.53	37.00	-2.47	Peak
4	458.040	42.79	-11.01	31.78	37.00	-5.22	Peak
5	862.590	34.91	-3.16	31.75	37.00	-5.25	Peak
6	894.780	37.05	-2.40	34.65	37.00	-2.35	Peak



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 30 File#: 08U11890.emi Date: 08-22-2008 Time: 11:26:33



Trace: 29

Ref Trace:

Condition: CISPR CLASS-B VERTICAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 900MHz, Hopping Max Power
 Target: : CISPR Class B

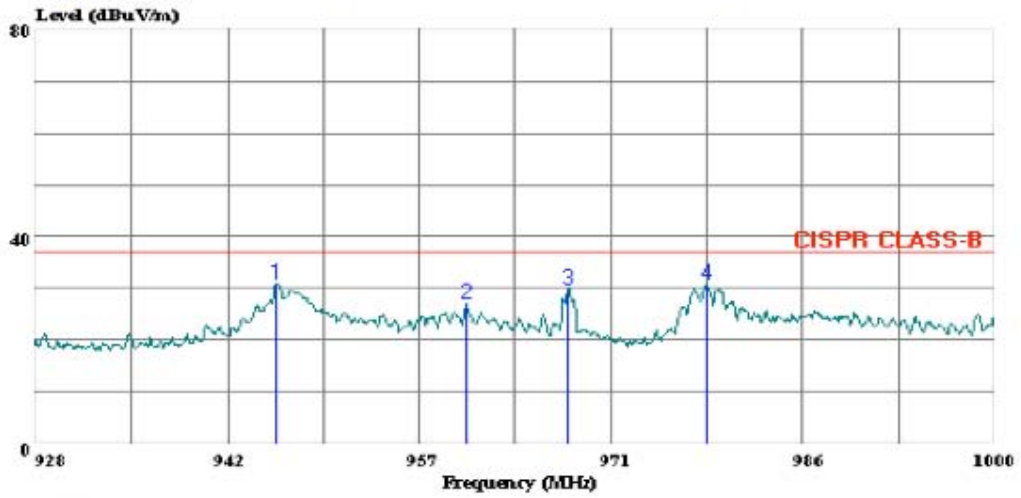
Page: 1

	Read	Read	Limit	Over		
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	804.736	35.12	-4.40	30.72	37.00	-6.28 Peak
2	826.880	35.19	-3.94	31.25	37.00	-5.75 Peak
3	837.632	35.11	-3.73	31.38	37.00	-5.62 Peak
4	859.136	36.57	-3.22	33.35	37.00	-3.65 Peak
5	883.584	29.47	-2.72	26.75	37.00	-10.25 Peak
6	892.032	37.07	-2.49	34.59	37.00	-2.41 Peak
7	913.536	33.20	-2.07	31.13	37.00	-5.87 Peak
8	922.112	30.29	-1.83	28.46	37.00	-8.54 Peak



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 28 File#: 08U11890.emi Date: 08-22-2008 Time: 11:20:03



Trace: 27

Ref Trace:

Condition: CISPR CLASS-B VERTICAL
 Test Operator:: William Zhuang
 Project #: : 08U11890
 Company: : Silver Spring
 Configuration: : EUT with Laptop
 Mode : : Tx, 900MHz, Hopping Max Power
 Target: : CISPR Class B

Page: 1

	Read	Read	Limit	Over		
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	946.072	32.15	-1.41	30.73	37.00	-6.27 Peak
2	960.328	27.90	-1.01	26.89	37.00	-10.11 Peak
3	968.032	30.85	-0.93	29.92	37.00	-7.08 Peak
4	978.328	31.51	-0.75	30.76	37.00	-6.24 Peak

20 dB Bandwidth

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to approximately 5% of the 20 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

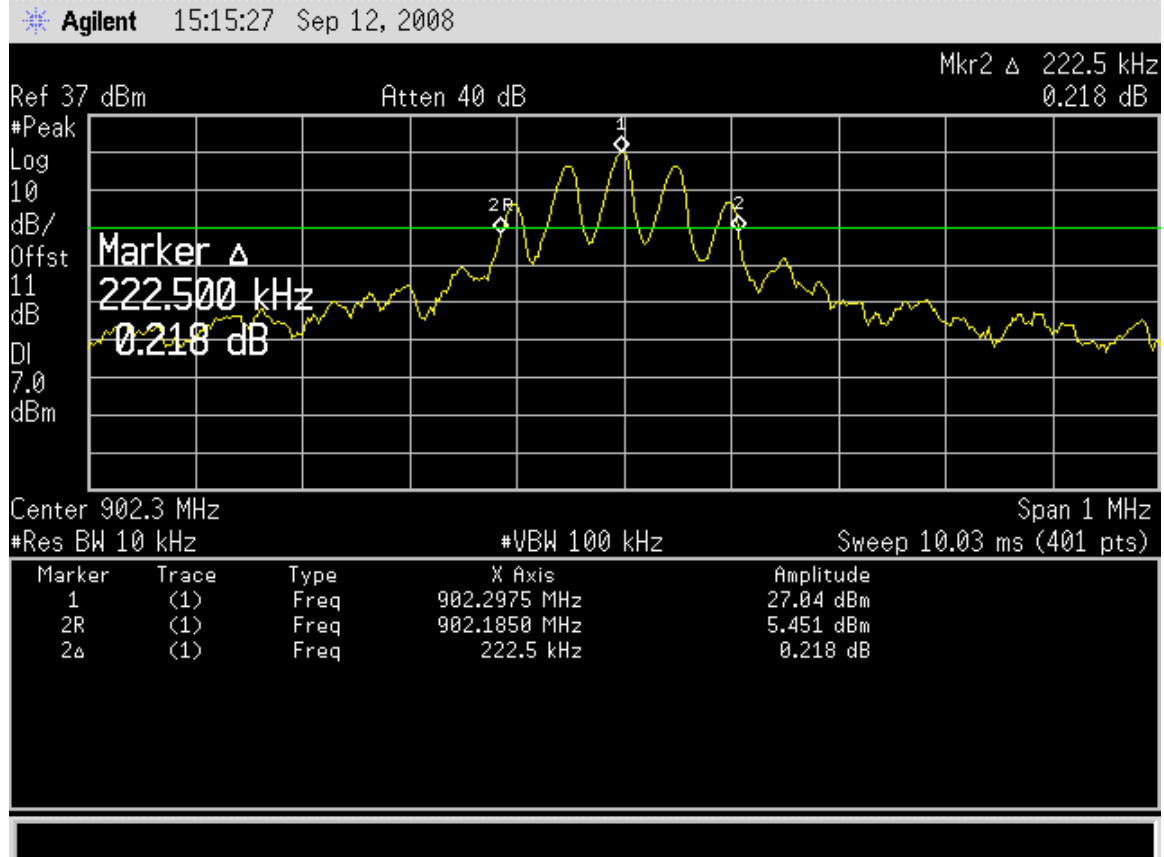
RESULTS

No non-compliance noted:

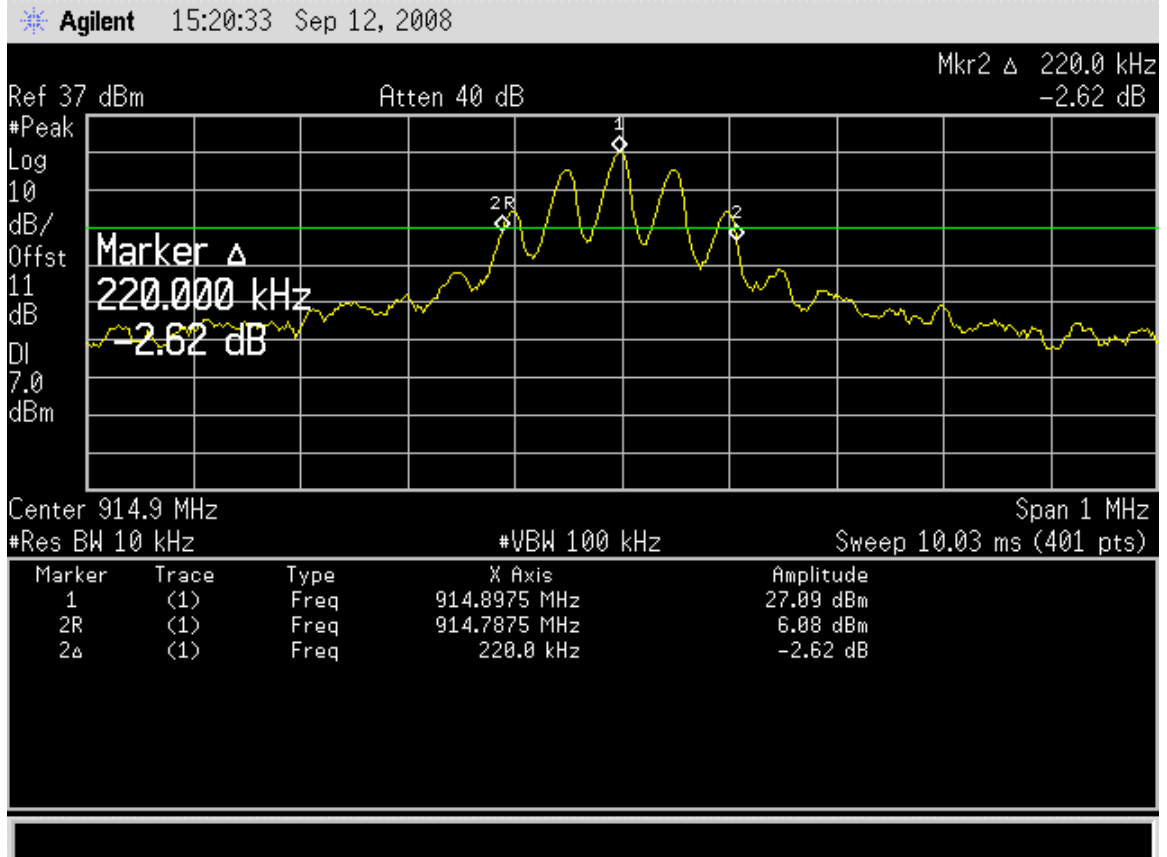
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
Low	902.3	222.5
Middle	914.9	220
High	926.9	215

Emission Designator: 223KF1D

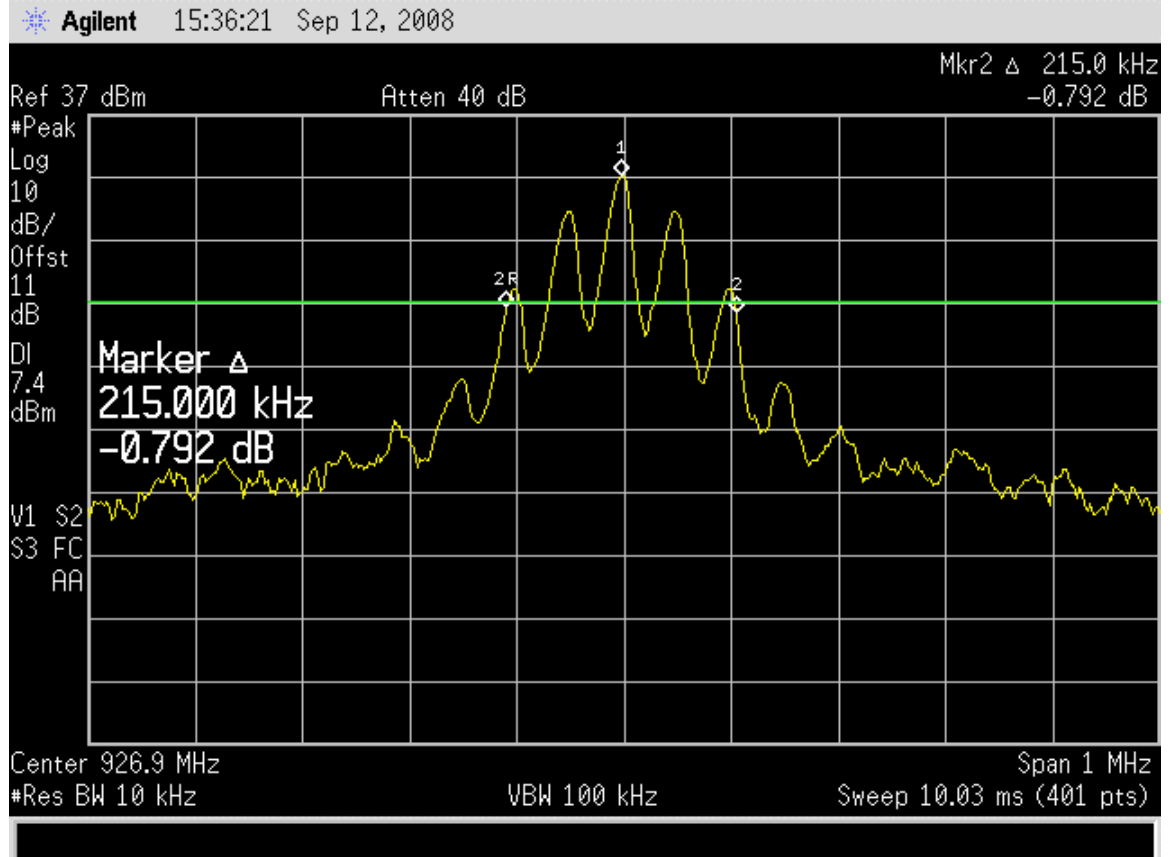
20 dB BANDWIDTH LOW CHANNEL



20 dB BANDWIDTH MID CHANNEL



20 dB BANDWIDTH HIGH CHANNEL



HOPPING FREQUENCY SEPARATION

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 hopping channel, whichever is greater.

TEST PROCEDURE

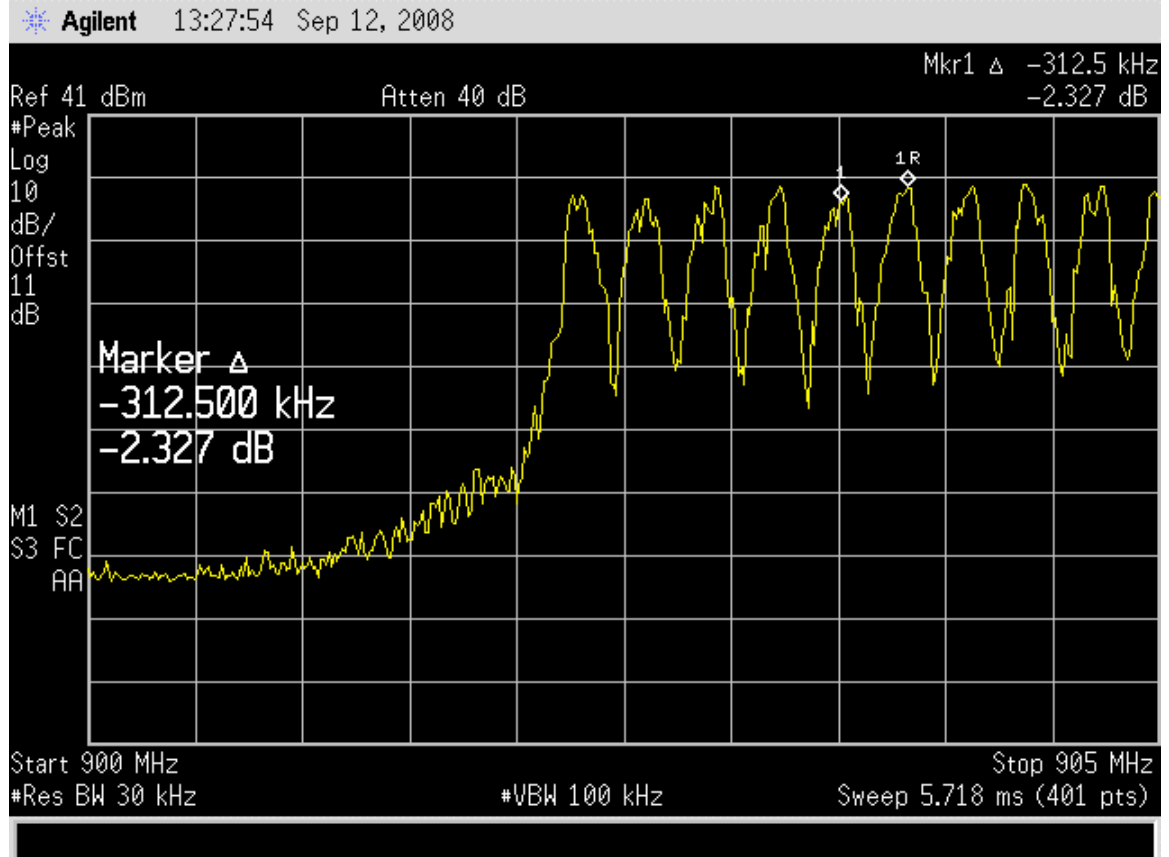
The transmitter output is connected to a spectrum analyzer. The RBW is set to 10 kHz and the VBW is set to 30 kHz. The sweep time is coupled.

RESULTS

No non-compliance noted:

The separation is 312.5KHz.

HOPPING FREQUENCY SEPARATION



NUMBER OF HOPPING CHANNELS

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

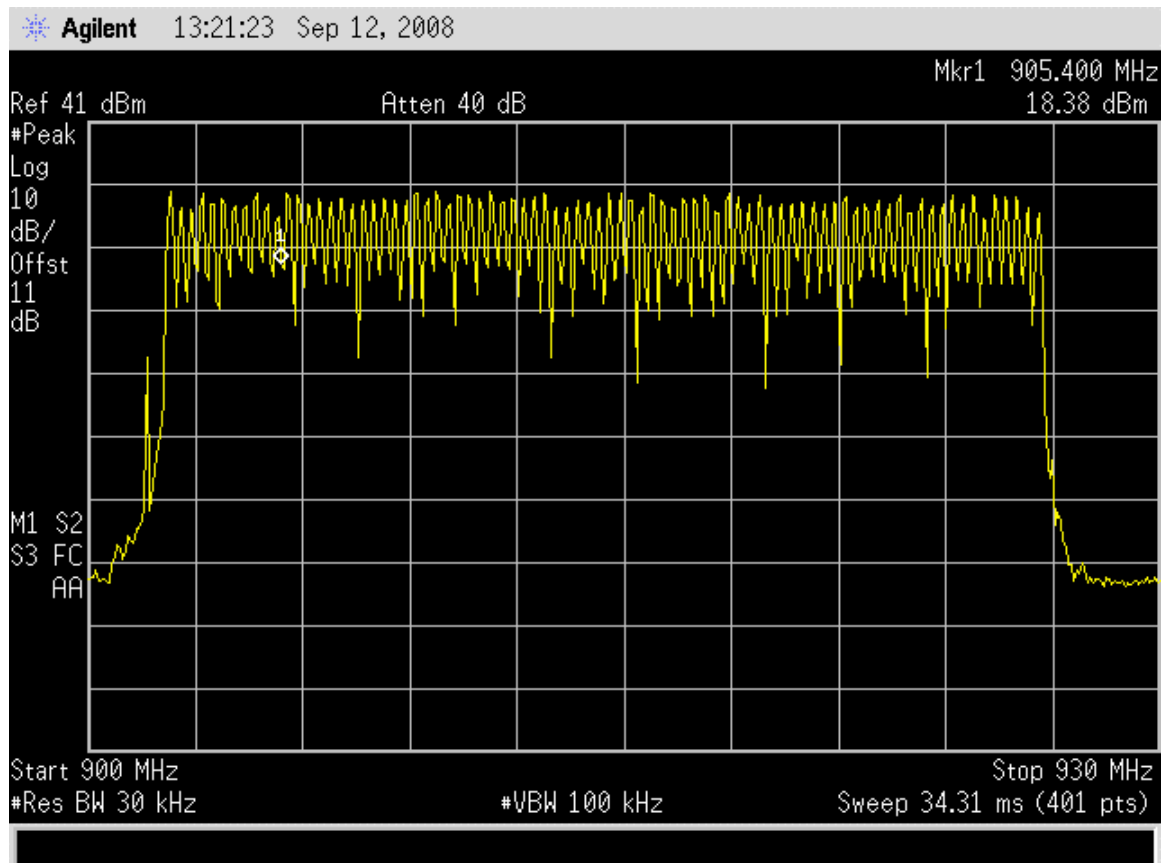
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to 3 % of the span. The analyzer is set to Max Hold.

RESULTS

No non-compliance noted:

83 Channels observed.

NUMBER OF HOPPING CHANNELS



AVERAGE TIME OF OCCUPANCY

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.

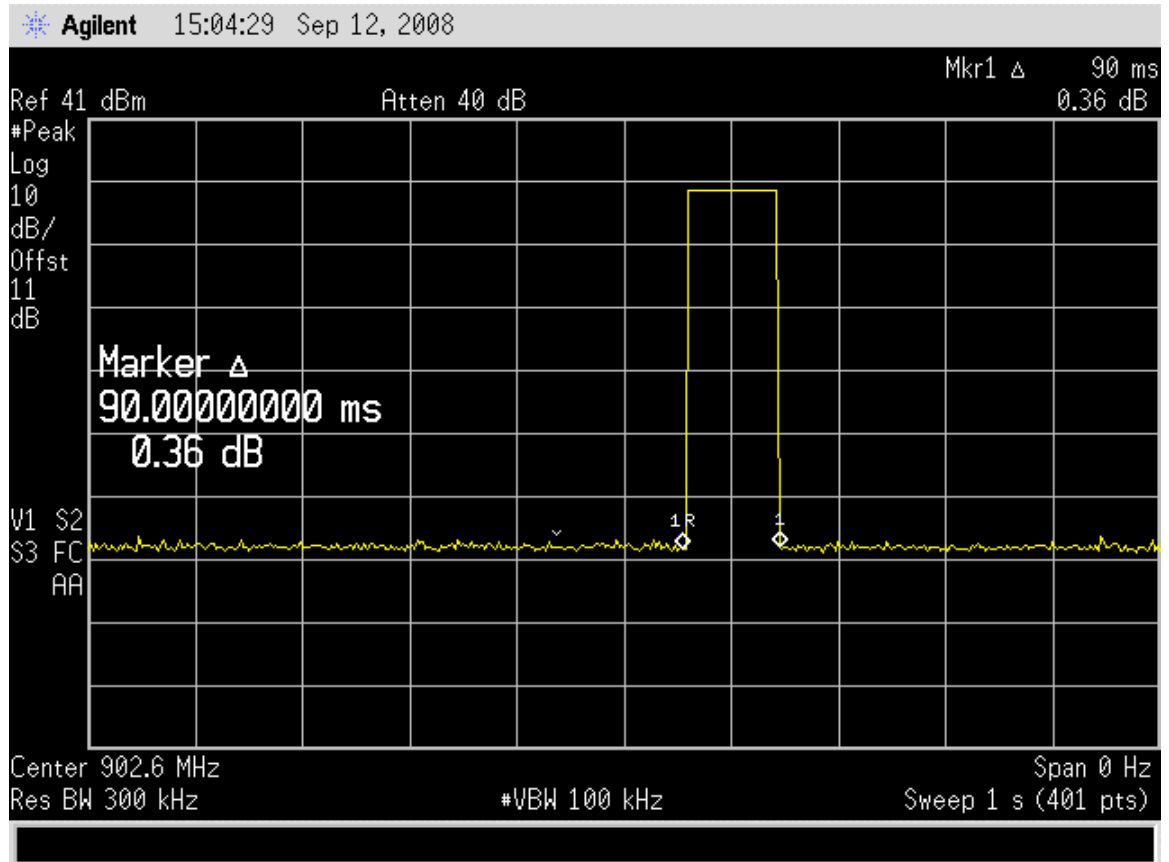
RESULTS

No non-compliance noted:

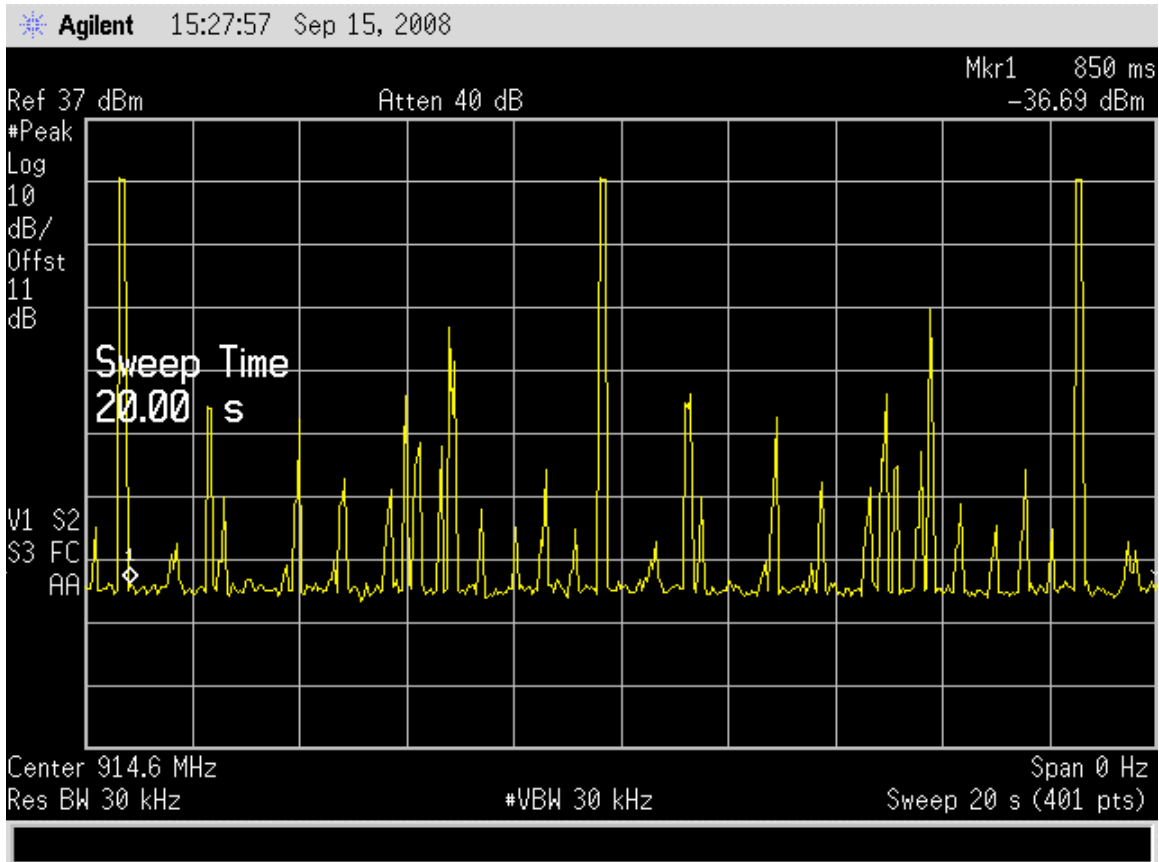
There are 3 pulses within the 20-second period. The on time for each pulse is 90 msec.

Therefore, the average time of occupancy in the specified 20-second period is 270 sec.

PULSE WIDTH



NUMBER OF PULSES IN 20 SECOND OBSERVATION PERIOD



PEAK OUTPUT POWER

PEAK POWER LIMIT

§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.

The maximum antenna gain is 2.4 dBi, therefore the power limit is 30 dBm.

TEST PROCEDURE

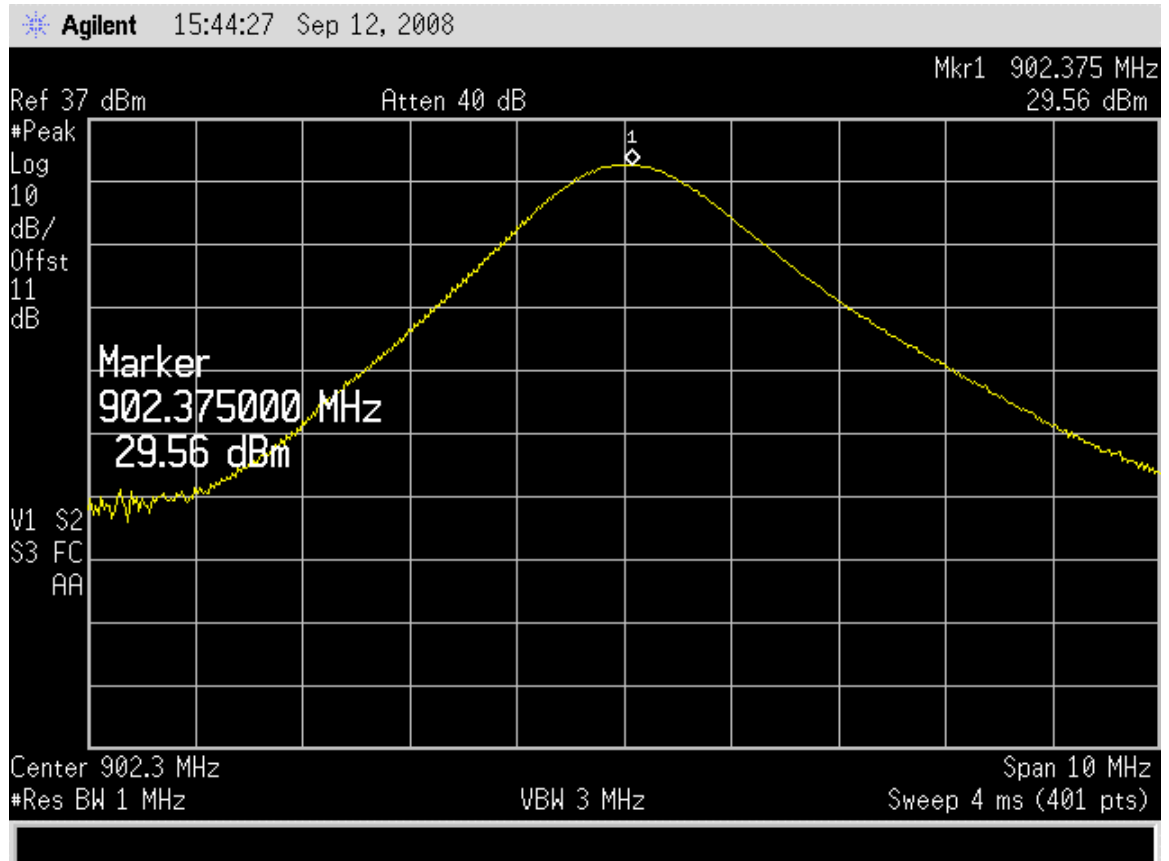
The transmitter output is connected to a spectrum analyzer and the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

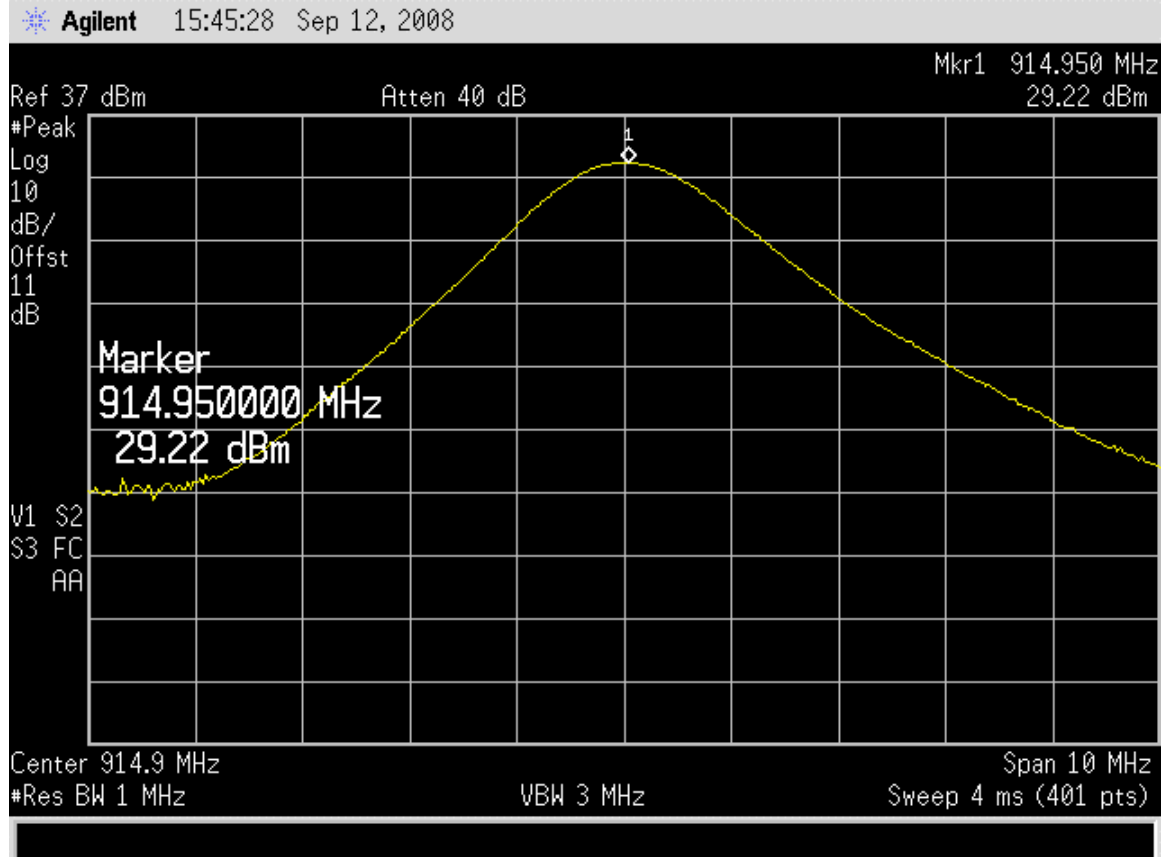
No non-compliance noted:

Channel	Frequency	P out
Low	902.3	29.56
Mid	914.9	29.22
High	926.9	28.84

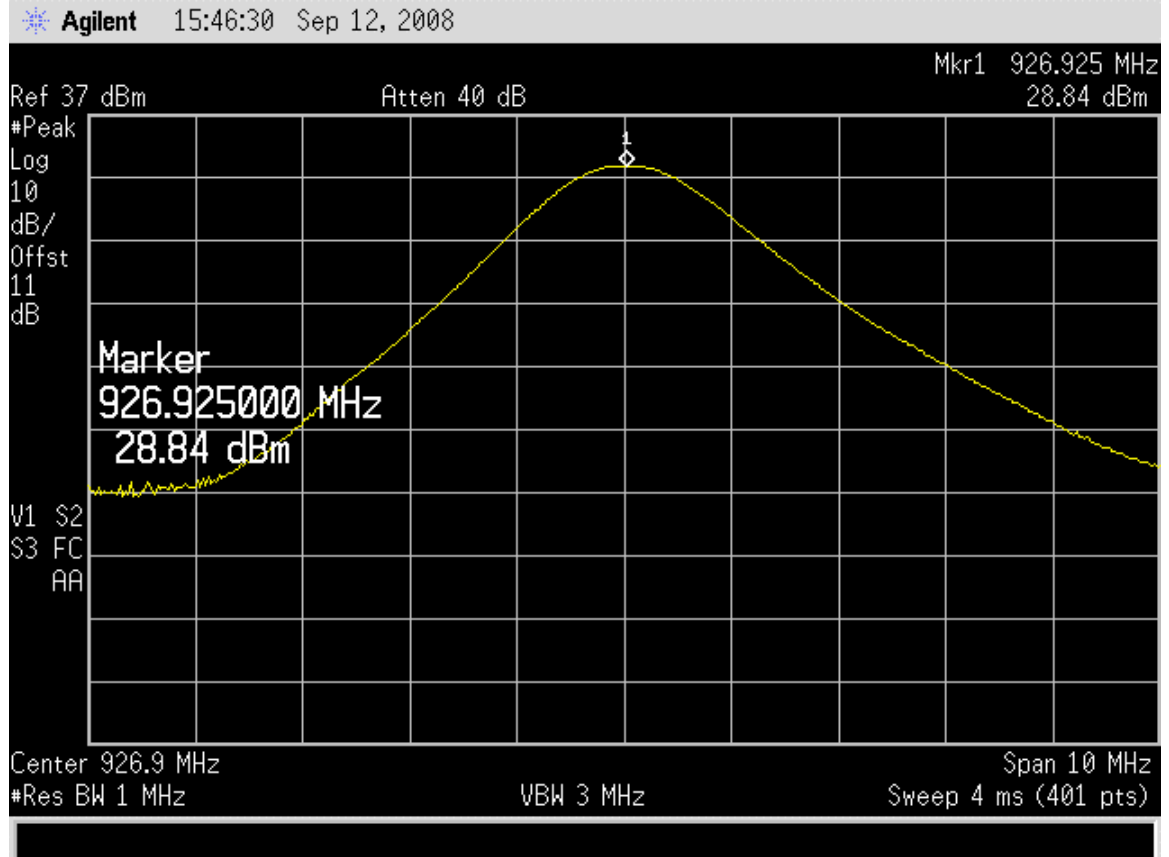
OUTPUT POWER LOW CHANNEL



OUTPUT POWER MID CHANNEL



OUTPUT POWER HIGH CHANNEL



MAXIMUM PERMISSIBLE EXPOSURE

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

$$S = E^2 / 3770$$

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:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

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/cm²

Substituting the logarithmic form of power and gain using:

$$P \text{ (mW)} = 10^{(P \text{ (dBm)} / 10)} \text{ and}$$

$$G \text{ (numeric)} = 10^{(G \text{ (dBi)} / 10)}$$

yields

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

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm²

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

LIMITS

From §1.1310 Table 1 (B), $S = 0.6 \text{ mW/cm}^2$

RESULTS

No non-compliance noted:

Power Density Limit (mW/cm²)	Output Power (dBm)	Antenna Gain (dBi)	S, mW/cm² at 20cm
0.6	29.56	2.40	0.31

MPE Distance: 14.4 cm

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

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

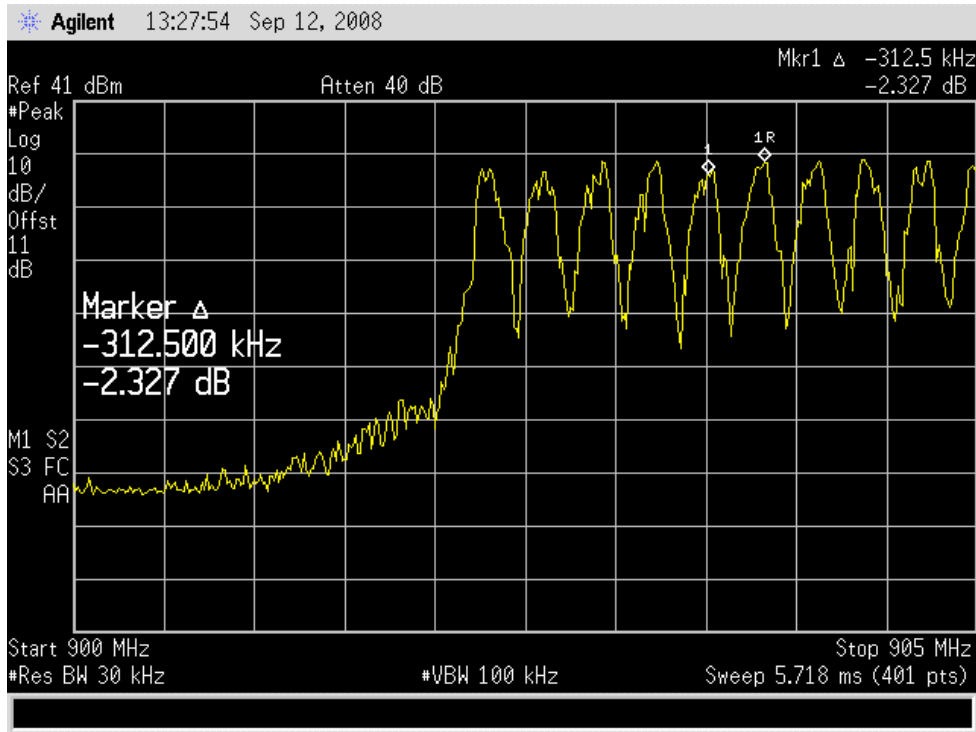
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

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

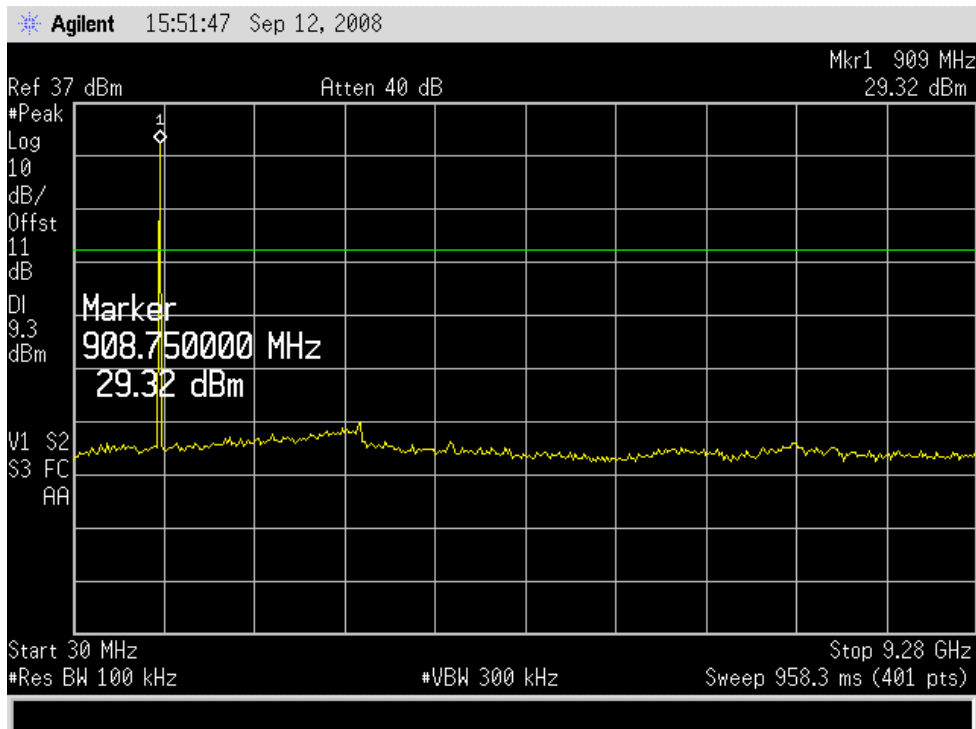
RESULTS

No non-compliance noted:

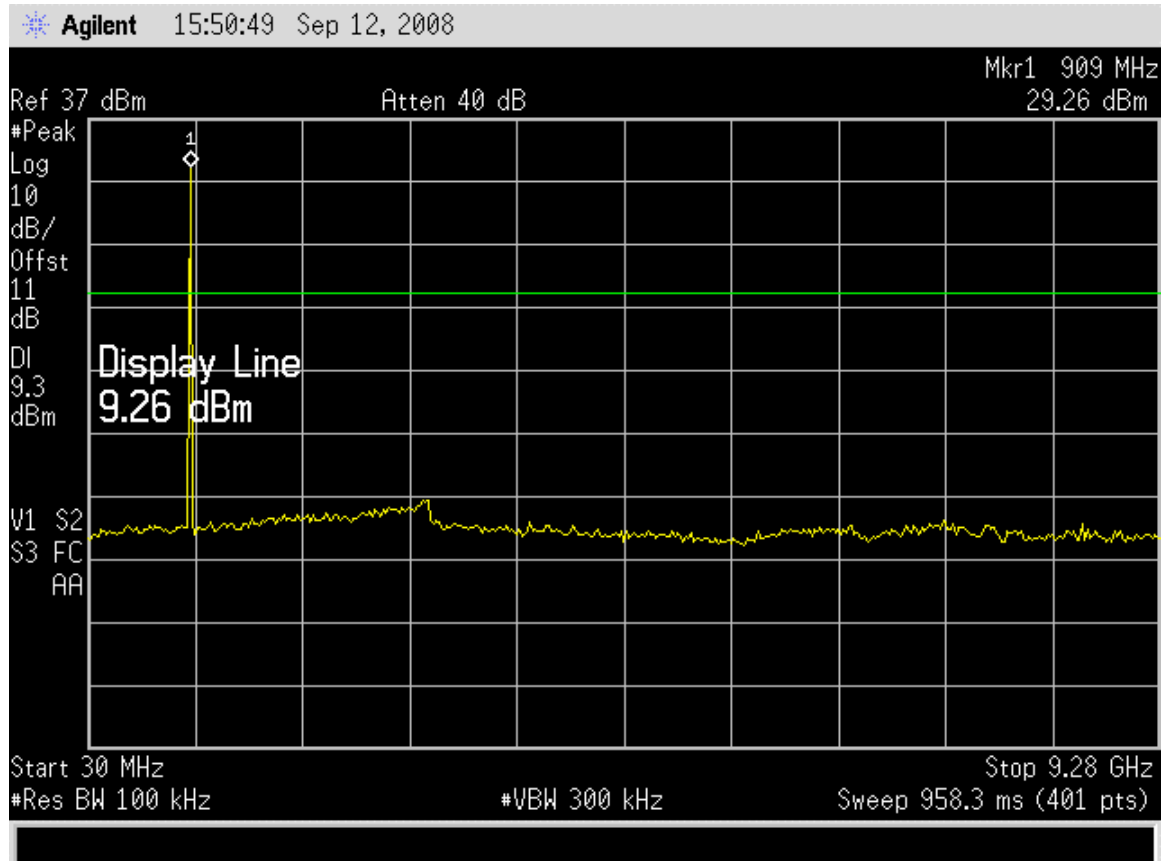
SPURIOUS EMISSIONS, LOW CHANNEL, HOPPING



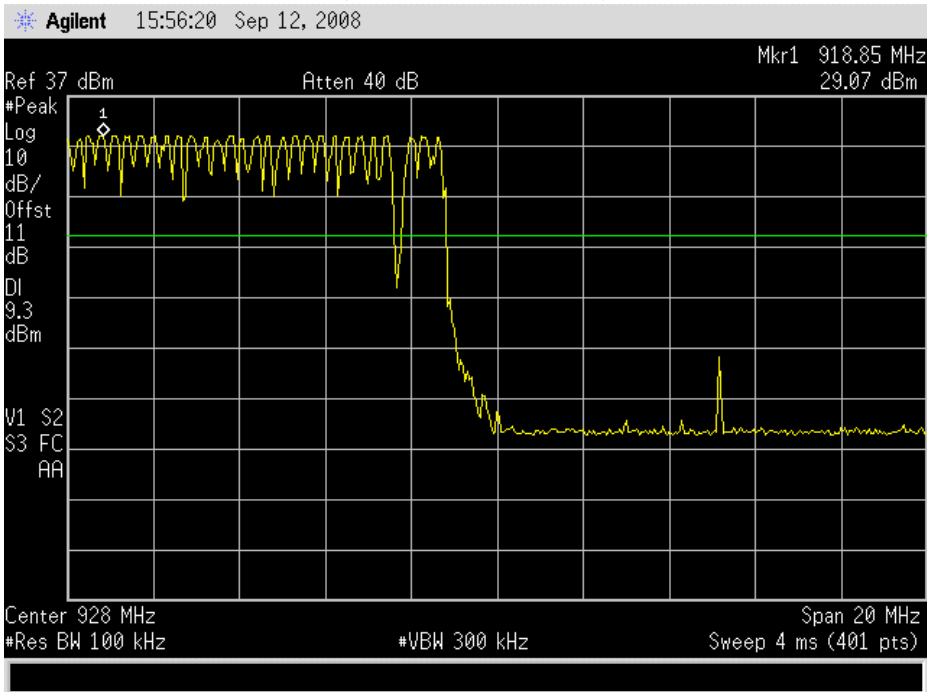
SPURIOUS EMISSIONS, LOW CHANNEL



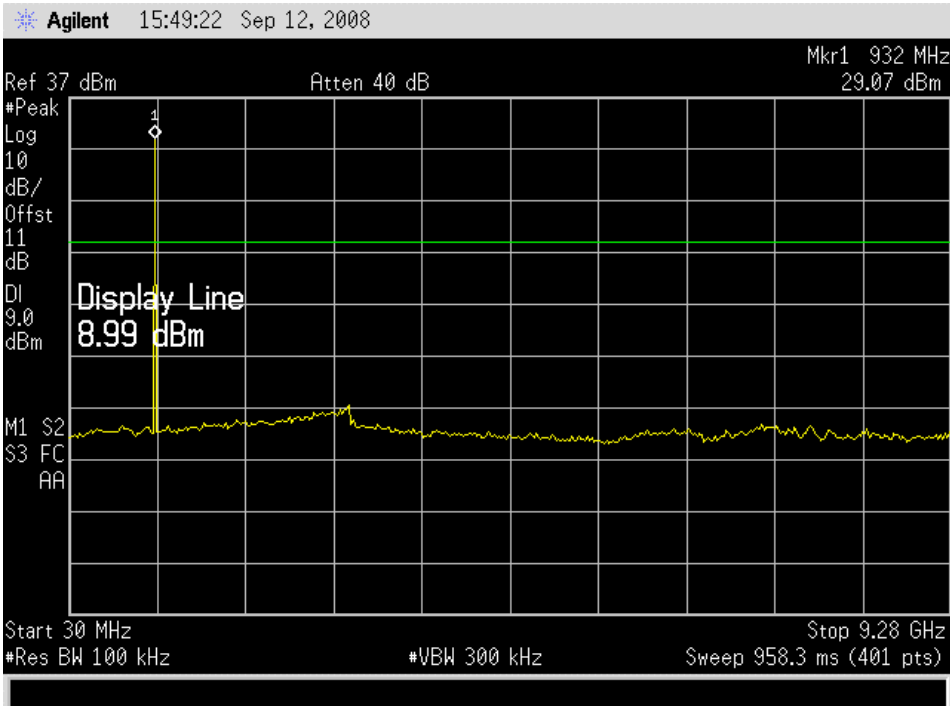
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL, HOPPING



SPURIOUS EMISSIONS, HIGH CHANNEL, HOPPING



4.4 POWERLINE CONDUCTED EMISSIONS

LIMIT

§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 μ H/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.

RESULTS

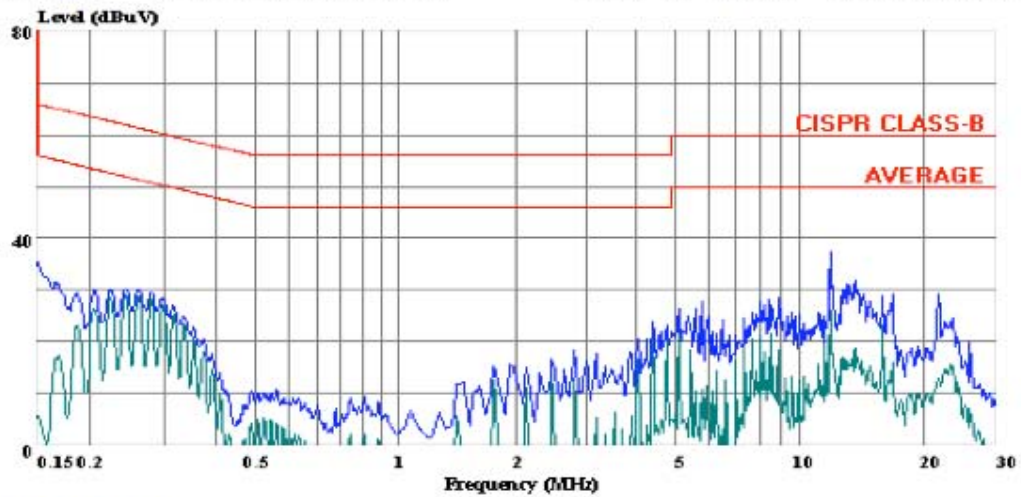
No non-compliance noted:

900 HAN, LINE 1 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 21 File#: 08U11890_LC.EMI Date: 08-22-2008 Time: 14:25:48



(Line Conduction)

Trace: 19

Ref Trace:

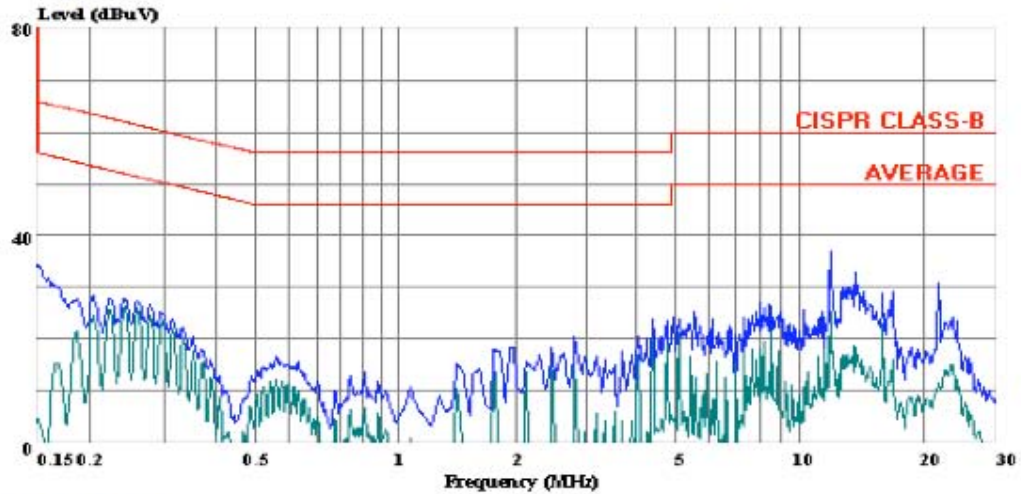
Condition: CISPR CLASS-B
Test Operator:: William Zhuang
Project #: : 08U11890
Company: : Silver Spring Networks
Configuration:: EUT With support equipment
Mode: : Worst case (900MHz, 802.15.4)
Target: : FCC Class B
Voltage: : 115VAC / 60 Hz
: L1: Peak (Blue), Average (Green)

900 HAN, LINE 2 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 28 File#: 08U11890_LC.EMI Date: 08-22-2008 Time: 14:32:59



(Line Conduction)
Trace: 26

Ref Trace:

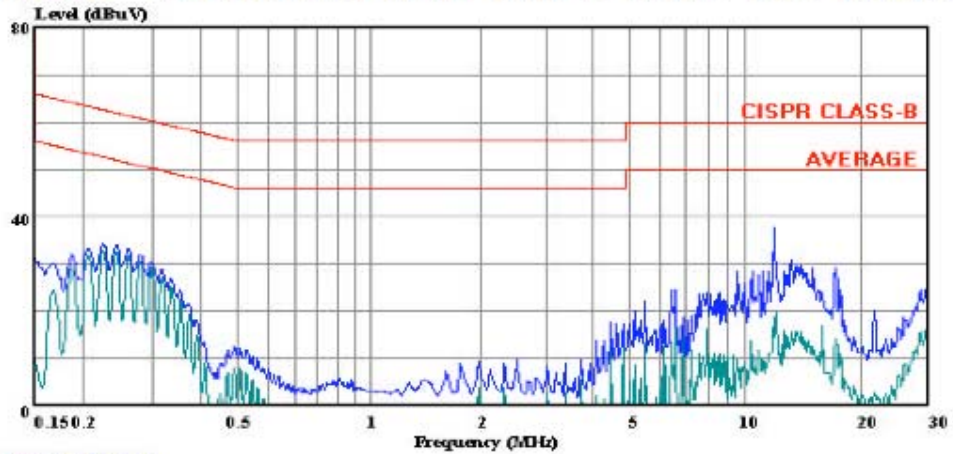
Condition: CISPR CLASS-B
Test Operator:: William Zhuang
Project #: : 08U11890
Company: : Silver Spring Networks
Configuration:: EUT With support equipment
Mode: : Worst case (900MHz, 802.15.4)
Target: : FCC Class B
Voltage: : 115VAC / 60 Hz
: L2: Peak (Blue), Average (Green)

2.4 GHz HAN, LINE 1 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 42 File#: 08U11890 LC.EMI Date: 09-24-2008 Time: 10:59:25



(Line Conduction)
Trace: 40

Ref Trace:

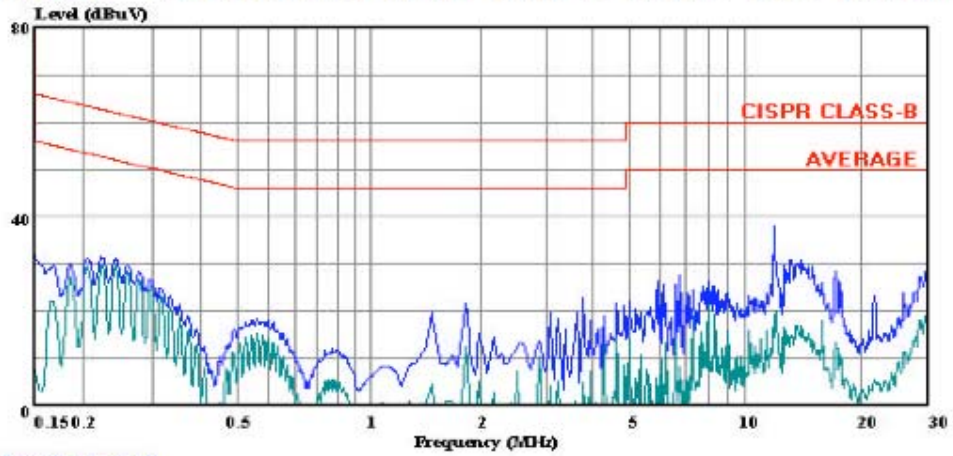
Condition: CISPR CLASS-B
Test Operator:: Thanh Nguyen
Project #: 08U11890
Company: Silver Spring Networks
Configuration:: EUT With support equipment
Mode: Worst case (2400MHz, 802.15.4)
Target: FCC Class B
Voltage: 115VAC / 60 Hz
: L1: Peak (Blue), Average (Green)

2.4 GHz HAN, LINE 2 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 35 File#: 08U11890 LC.EMI Date: 09-24-2008 Time: 10:51:08



(Line Conduction)
Trace: 33

Ref Trace:

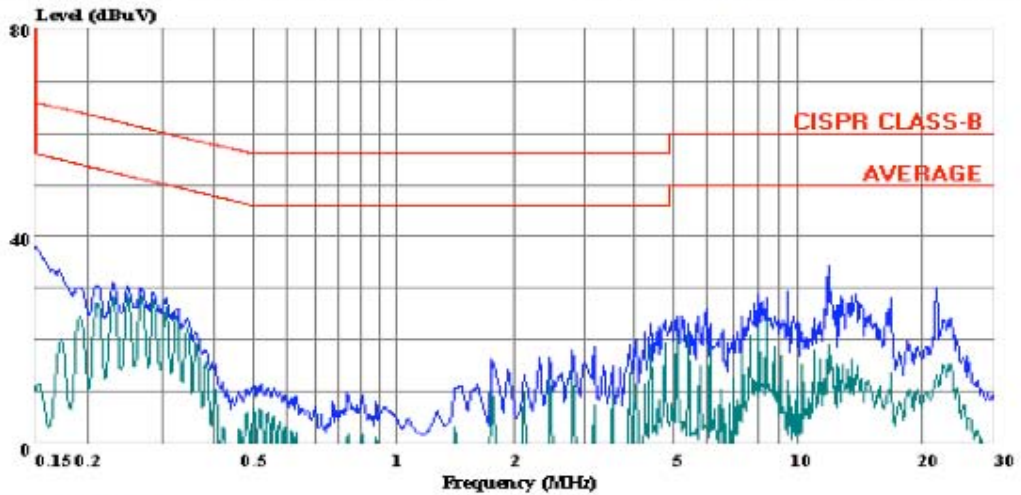
Condition: CISPR CLASS-B
Test Operator:: Thanh Nguyen
Project #: : 08U11890
Company: : Silver Spring Networks
Configuration:: EUT With support equipment
Mode: : Worst case (2400MHz, 802.15.4)
Target: : FCC Class B
Voltage: : 115VAC / 60 Hz
: L2: Peak (Blue), Average (Green)

900 MHz FHSS, LINE 1 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 08U11890_LC.EMI Date: 08-22-2008 Time: 14:05:31



(Line Conduction)

Trace: 5

Ref Trace:

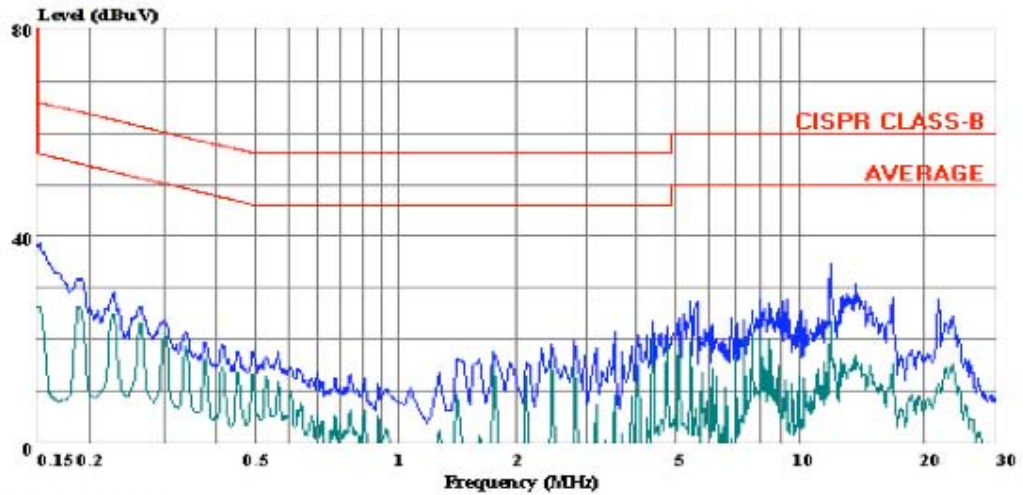
Condition: CISPR CLASS-B
Test Operator:: William Zhuang
Project #: : 08U11890
Company: : Silver Spring Networks
Configuration:: EUT With support equipment
Mode: : Normal (Hopping, Max Power)
Target: : FCC Class B
Voltage: : 115VAC / 60 Hz
: L1: Peak (Blue), Average (Green)

900 MHz FHSS, LINE 2 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 14 File#: 08U11890_LC.EMI Date: 08-22-2008 Time: 14:15:32



(Line Conduction)

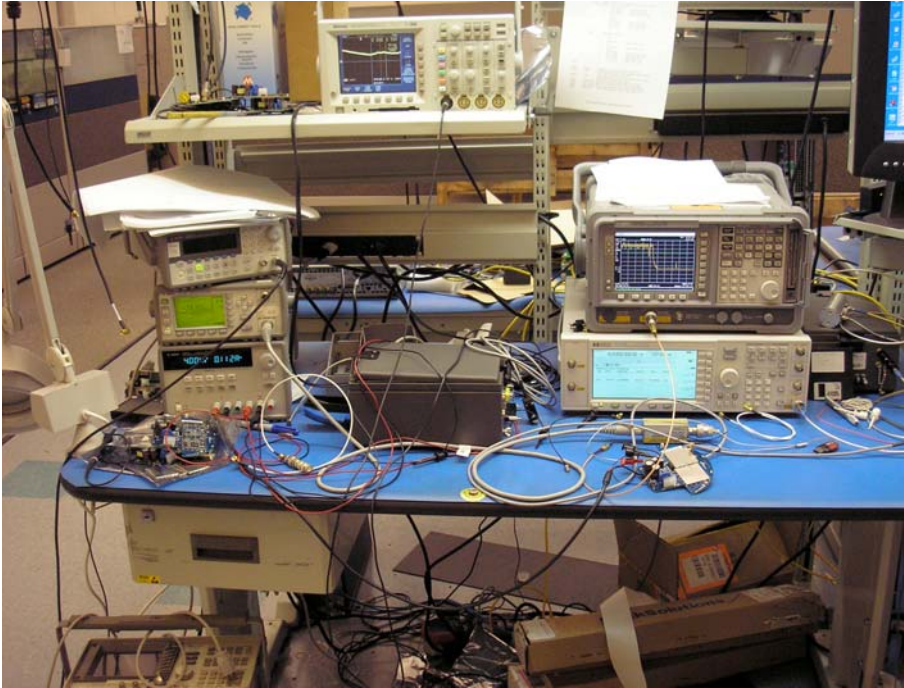
Trace: 12

Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: William Zhuang
Project #: : 08U11890
Company: : Silver Spring Networks
Configuration:: EUT With support equipment
Mode: : Normal (Hopping, Max Power)
Target: : FCC Class B
Voltage: : 115VAC / 60 Hz
: L2: Peak (Blue), Average (Green)

SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP, SILVER SPRING NETWORKS



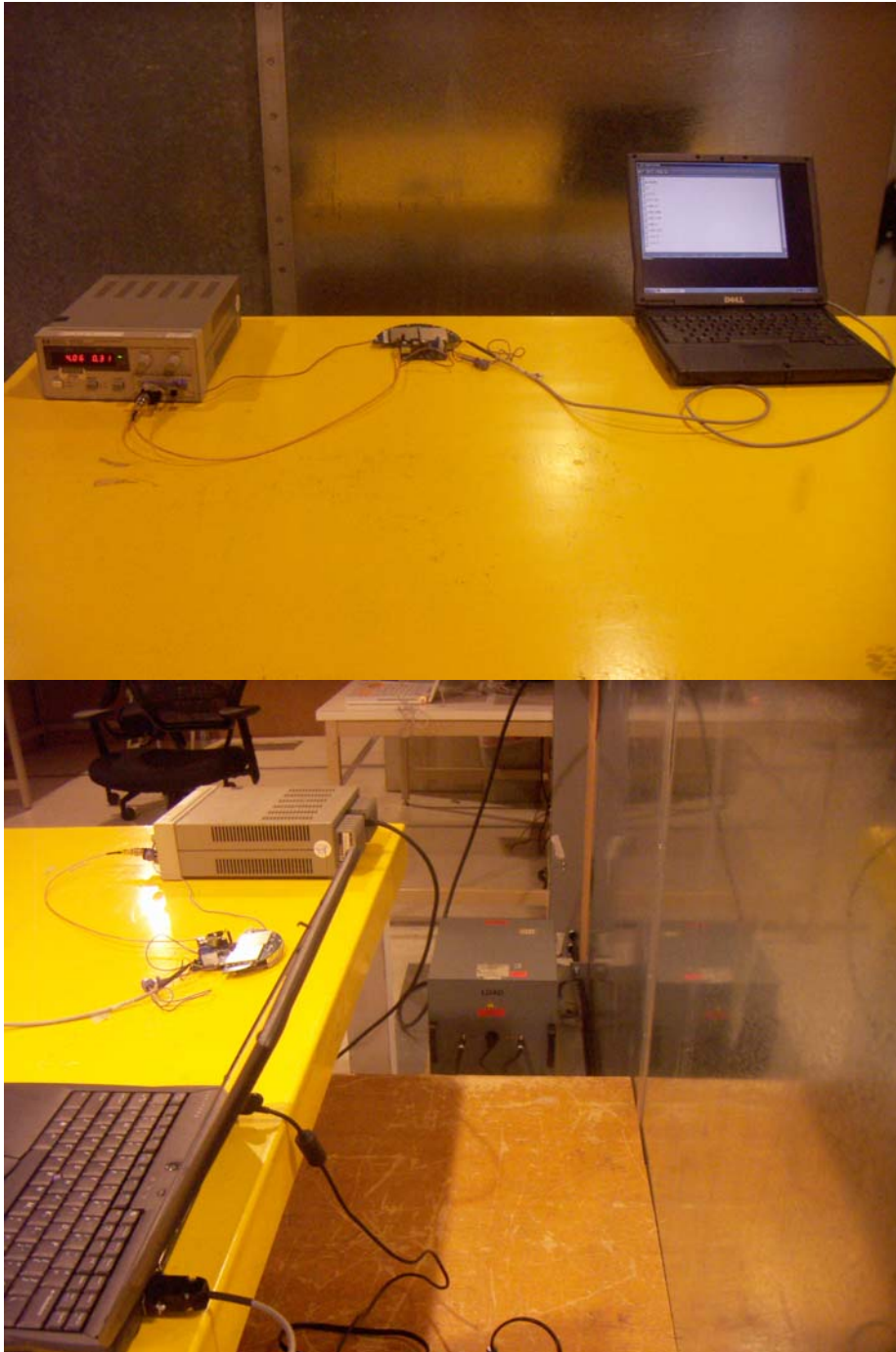
ANTENNA PORT CONDUCTED TESTS, CCS



RADIATED RF MEASUREMENT SETUP



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



END OF REPORT

Report Revision History

Revision No.	Revision Description	Pages Revised	Revised by	Date
-	Original Issue		T. Cokenias	10/12/08
1	Add 2.4 GHz band edge emissions test and high channel conducted data		T. Cokenias	11/20/08