MEASUREMENT REPORT

(FCC : Part 15 Subpart C (15.247) / ANSI C63.4-2003)

Testing Laboratory
1288

Product	:	SilverCare Health Care System
Trade Name	:	SilverCare
Model No.	:	HC1XXYY(X=0~9 ; Y=0~9,A~Z)
Applicant	:	SilverPlus, Inc.
Applicant Address	:	2F.-4, No.15, Ln. 360, Sec. 1, Neihu Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Report Number	MLT0910P15001-1
Applicant	SilverPlus, Inc.
Product	SilverCare Health Care System
Sample Received Date	2009/10/16

Report Prepared By	Jesse Tien
Signature	
Date Prepared	2009/10/19 ~ 2010/04/20

Report Authorized By	Roger Chen
Signature	
Date Authorized	2010/04/20

Test By

Max Light Technology Co., Ltd.
Room 5, 8F, No.125, Section 3 Roosevelt Road,
Taipei, Taiwan., R.O.C.
Office : Tel: 886-2-2363-2447 Fax: 886-2-2363-2597
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CERTIFICATION

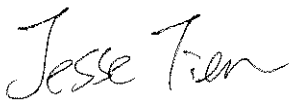
We here by verify that :

The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4-2003. All test were conducted by
MLT(Max Light Technology Co.,Ltd) Room 5, 8F, No.125, Section 3 Roosevelt Road, Taipei, Taiwan, R.O.C Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is in compliance with Class B radiated and conducted emission limit of FCC Rules Part 15 Subpart C (15.247).

Applicant Name	SilverPlus, Inc.
Applicant Address	2F.-4, No.15, Ln. 360, Sec. 1, Neihu Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)
Manufacturer Name	Solidyear Co., Ltd.
Manufacturer Address	2F.-1, No.94, Baozhong Rd., Xindian City, Taipei County 231, Taiwan (R.O.C.)

Equipment	SilverCare Health Care System
Model No	HC1XXYY(X=0~9 ; Y=0~9,A~Z)
FCC ID	X4LHC100BB

Report Prepared By	Jesse Tien
Signature	

Report Authorized By	Roger Chen
Signature	

1. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of SilverPlus, Inc. In support of a Class B Digital Device certification in accordance with Part2 Subpart J and Part 15 Subpart C of the Commission's and Regulations.

1.2 Customer Details

Applicant Name	SilverPlus, Inc.
Applicant Address	2F.-4, No.15, Ln. 360, Sec. 1, Neihu Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)
Manufacturer Name	Solidyear Co., Ltd.
Manufacturer Address	2F.-1, No.94, Baozhong Rd., Xindian City, Taipei County 231, Taiwan (R.O.C.)

1.3 Technical data of EUT

Equipment	SilverCare Health Care System
Model No	HC1XXYY(X=0~9 ; Y=0~9,A~Z)
FCC ID	X4LHC100BB
Power Type	Powered by AC adaptor. Model No.: KSAS0100900100HU Input : AC100~240V , 50/60Hz , 0.4A Output : DC9V , 1A
Type of Modulation	FSK
Type of Antenna	Base : 1/4λ Dipole Sleeve
Frequency of Channel	See Next page

During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to ensure that maximum emission levels were attained.

Frequency of Each Channel (Working Frequency)

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2404	26	2430	52	2456
1	2405	27	2431	53	2457
2	2406	28	2432	54	2458
3	2407	29	2433	55	2459
4	2408	30	2434	56	2460
5	2409	31	2435	57	2461
6	2410	32	2436	58	2462
7	2411	33	2437	59	2463
8	2412	34	2438	60	2464
9	2413	35	2439	61	2465
10	2414	36	2440	62	2466
11	2415	37	2441	63	2467
12	2416	38	2442	64	2468
13	2417	39	2443	65	2469
14	2418	40	2444	66	2470
15	2419	41	2445	67	2471
16	2420	42	2446	68	2472
17	2421	43	2447	69	2473
18	2422	44	2448	70	2474
19	2423	45	2449	71	2475
20	2424	46	2450	72	2476
21	2425	47	2451	73	2477
22	2426	48	2452	74	2478
23	2427	49	2453	75	2479
24	2428	50	2454		
25	2429	51	2455		

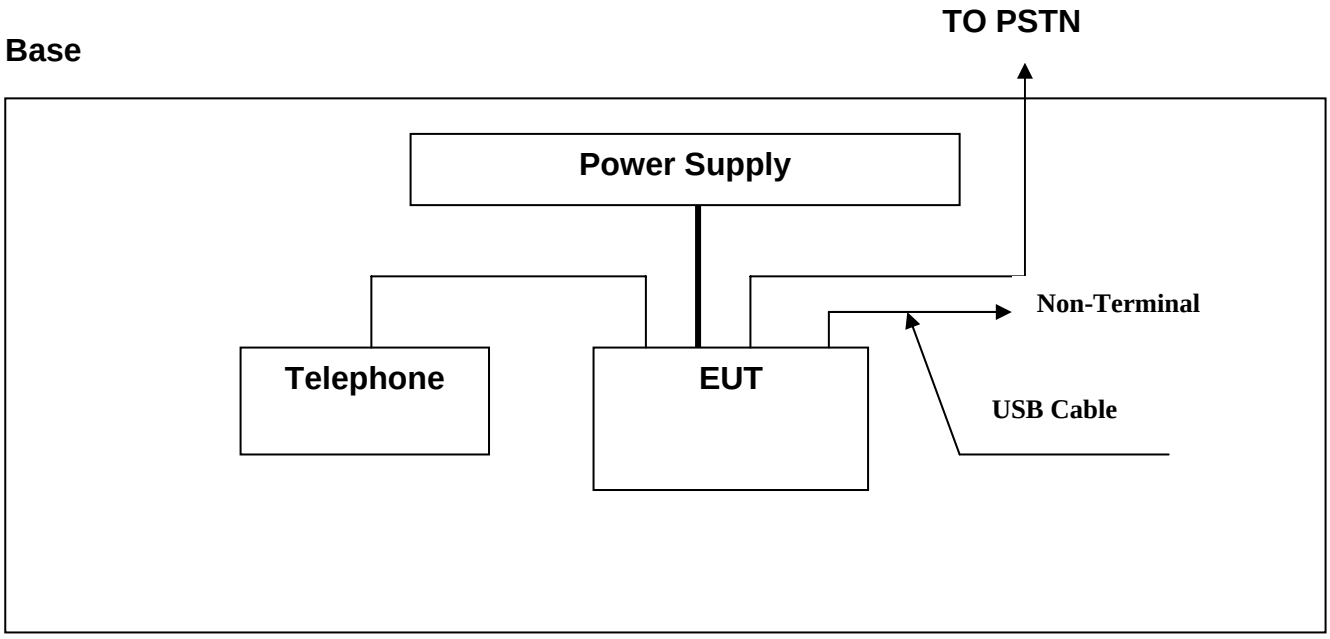
1.4 Summary Of Tests

47 CFR Part 15 Subpart C			
Reference	**Test**	**Results**	**Note**
15.207	AC Power Conducted Emission	PASS	
15.209	Radiated Emissions	PASS	
15.247(a)(1) (i)-(ii)	20dB Bandwidth	PASS	
15.247(a)(1)	Hopping Frequency Separation	PASS	
15.247(a)(1)(iii)	Number of Hopping Channels	PASS	
15.247(a)(1)(iii)	Average Time of Occupancy	PASS	
15.247(b)	Max. Peak Power	PASS	
15.247(d)	Band Edge and Conducted Spurious Emission	PASS	
15.247(c)	Out of Band Spurious Emission	PASS	
15.203	Antenna Requirement	PASS	

1.5 Description of Support Equipment

In order to construct the minimum system which required by the ANSI C63.4-2003, following equipments were used as the support units.

1.6 Configuration of System Under Test



1.7 Test Procedure

All measurements contained in this report were performed according to the techniques described in Measurement procedure ANSI C63.4-2003 followed DA 00 705 for this testing. "Measurement of un-Intentional Radiators."

1.8 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions which the EUT was considered likely to encounter in normal use were investigated. The system's radiated and conducted emissions were investigated while the computer alternately transferred data to the EUT as well as to the monitor and printer. Using a test program which sent a continuous data and transferred data to and from the EUT was proven to worst case emissions. The system's physical layout and cabling was randomly arranged to ensure that maximum emission levels were attained.

The radiated of emission under 1GHz, we measure the lowest, middle and highest channel and the test record on this report is the worst case of all measurement.

2. AC Power Conducted Emissions Requirements

2.1 General & Setup :

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3825/2 Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPER quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.5.

2.2 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US40240137	E7403A	2010/02/12	2011/02/12
2.	EMCO	LISN	2658	3825/2	2010/03/19	2011/03/19
3.	TESEQ	ISN	24810	ISN T8	2010/03/04	2011/03/04

2.3 Test condition:

EUT tested in accordance with the specifications given by the manufacturer, and exercised in the most unfavorable manner.

2.4 Conducted Emissions Limits:

FCC Part 15

Frequency range (MHz)	Limits (dBuV)			
	Class A		Class B	
	QP	Avg.	QP	Avg.
0.15 to 0.50	79	66	66 to 56	56 to 46
0.50 to 5.0	73	60	56	46
5.0 to 30	73	60	60	50

2.5 Measurement Data Of Conducted Emissions:

2.5.1 Conducted Emissions

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : CH 0

Conducted Emissions (Class B)					
Conductor	**Frequency (MHz)**	**Quasi-Peak (dBuV)**	**Limits (dBuV)**	**Average (dBuV)**	**Limits (dBuV)**
L1	0.167	53.66	65.12	-	55.12
	0.194	53.09	63.84	31.06	53.84
	0.280	44.16	60.81	-	50.81
	0.499	47.53	56.01	28.11	46.01
	0.529	45.09	56	-	46
	0.848	41.88	56	-	46
	3.310	9.55	56	-	46
L2	0.192	52.49	63.93	-	53.93
	0.285	44.72	60.68	-	50.68
	0.334	42.87	59.35	-	49.35
	0.466	42.33	56.58	-	46.58
	0.518	40.12	56	-	46
	0.751	37.67	56	-	46
	1.296	36.65	56	-	46

Notes : 1.L1: One end & Ground L2: The other end & Ground

2.Height of table on which the EUT was placed : 0.8 m.

3.The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4.The above test results are obtained under the normal condition.

2.5.2 Conducted Emissions

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : CH 37

Conducted Emissions (Class B)					
Conductor	**Frequency (MHz)**	**Quasi-Peak (dBuV)**	**Limits (dBuV)**	**Average (dBuV)**	**Limits (dBuV)**
L1	0.192	53.20	63.93	30.76	53.93
	0.280	45.57	60.81	-	50.81
	0.505	47.07	56	31.20	46
	0.529	46.71	56	31.01	46
	0.589	41.04	56	-	46
	0.938	41.63	56	-	46
	1.396	42.04	56	-	46
L2	0.186	51.93	64.20	-	54.20
	0.280	44.59	60.81	-	50.81
	0.379	39.69	58.30	-	48.30
	0.499	41.73	56.01	-	46.01
	0.558	40.25	56	-	46
	0.779	35.85	56	-	46
	0.848	36.95	56	-	46

Notes : 1.L1: One end & Ground L2: The other end & Ground

2.Height of table on which the EUT was placed : 0.8 m.

3.The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4.The above test results are obtained under the normal condition.

2.5.3 Conducted Emissions

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

Test Mode : CH 75

Conducted Emissions (Class B)					
Conductor	**Frequency (MHz)**	**Quasi-Peak (dBuV)**	**Limits (dBuV)**	**Average (dBuV)**	**Limits (dBuV)**
L1	0.192	52.58	63.93	-	53.93
	0.285	44.76	60.68	-	50.68
	0.499	47.48	56.01	28.98	46.01
	0.535	46.22	56	30.25	46
	0.589	42.55	56	-	46
	0.979	41.69	56	-	46
	1.464	40.40	56	-	46
L2	0.192	52.32	63.93	-	53.93
	0.285	43.63	60.68	-	50.68
	0.334	38.48	59.35	-	49.35
	0.391	39.03	58.03	-	48.03
	0.518	40.79	56	-	46
	0.848	36.62	56	-	46
	1.388	36.53	56	-	46

Notes : 1.L1: One end & Ground L2: The other end & Ground

2.Height of table on which the EUT was placed : 0.8 m.

3.The Quasi-Peak Value have already met the Average Value Limit showed on above limits.

4.The above test results are obtained under the normal condition.

3. Radiated Emissions Requirements (Below 1GHz)

3.1 General & Setup :

Prior to open-field testing, the EUT was placed in a shielded enclosure and scanned at a close distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the open-field tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT. Final radiation measurements were made on a 10-meter, open-field test site. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 30 MHz to 1000 MHz using an Hewlett Packard 8591EM Spectrum Analyzer, EMCO Biconilog Antenna (Model 3142C) for 30-1000MHz. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization. Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post-detector video filters were used in the test. The spectrum analyzer's 6 dB bandwidth was set to 120 KHz, and the analyzer was operated in the quasi-peak detection mode. The highest emission amplitudes relative to the appropriate limit were measured and recorded in paragraph 3.5.

3.2 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	HP	Spectrum Analyzer	73412A00110	8591EM	2010/03/25	2011/03/25
2.	HP	Pre Amplifier	2944A08954	8447D	2010/03/25	2011/03/25
3.	HP	Pre Amplifier	3113A05475	8447F	2010/03/25	2011/03/25
4.	EMCO	Biconilog Antenna	00059739	3142C	2009/08/19	2010/08/19
5.	Agilent	Spectrum Analyzer	US44300422	E4446A	2009/05/25	2010/05/25
6.	HP	Pre Amplifier	2805A03013	8447F	2010/04/10	2011/04/10
7.	EMCO	Biconilog Antenna	00044568	3142C	2009/08/31	2010/08/31

3.3 Test condition:

EUT tested in accordance with the specifications given by the manufacturer , and exercised in the most unfavorable manner.

3.4 Radiated Emissions Limits:

CISPR 22

Frequency range (MHz)	Limits (dBuV)			
	Class A		Class B	
	Distance (Meter)	Limits (dBuV/m)	Distance (Meter)	Limits (dBuV/m)
30 to 230	10	40	10	30
230 to 1000	10	47	10	37

FCC Part 15

Frequency range (MHz)	Limits (dBuV)			
	Class A		Class B	
	Distance (Meter)	Limits (dBuV/m)	Distance (Meter)	Limits (dBuV/m)
30 to 88	10	39	3	40
88 to 216	10	43.5	3	43.5
216 to 960	10	46.5	3	46
960 to 1000	10	49.5	3	54

3.5 Measurement Data Of Radiated Emissions:

3.5.1 Open Field Radiated Emissions

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

Test Mode : CH75

Radiated Emissions(HORIZONTAL) (Class B)							
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Factor (dB)	Limits (dBuV/m)	Margin (dB)
151.50	63.83	33.80	3.5	120	-30.03	43.5	-9.70
174.72	62.55	33.36	3.1	200	-29.19	43.5	-10.14
641.59	61.32	42.18	2.6	330	-19.14	46	-3.82
713.70	61.78	44.44	1.4	240	-17.34	46	-1.56
727.12	59.60	42.31	1	90	-17.29	46	-3.69
762.70	58.51	41.52	1	170	-16.99	46	-4.48
774.60	58.89	42.10	1.5	220	-16.79	46	-3.90
860.00	56.33	40.58	1	270	-15.75	46	-5.42

Radiated Emissions(VERTICAL) (Class B)							
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Factor (dB)	Limits (dBuV/m)	Margin (dB)
145.07	67.19	35.44	1	320	-31.75	43.5	-8.06
155.55	65.29	34.83	1	40	-30.46	43.5	-8.67
167.69	65.51	35.59	1	160	-29.92	43.5	-7.91
629.70	60.75	40.54	1.9	250	-20.21	46	-5.46
641.60	61.76	41.56	1	180	-20.20	46	-4.44
762.70	60.23	42.45	2.6	270	-17.78	46	-3.55
774.60	59.59	42.30	1.2	240	-17.29	46	-3.70
799.06	59.40	43.15	1	300	-16.25	46	-2.85

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 3 Meter

3.Height of table for EUT placed: 0.8 Meter.

4.Amplitude= Reading Amplitude –Amplifier gain+ Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)

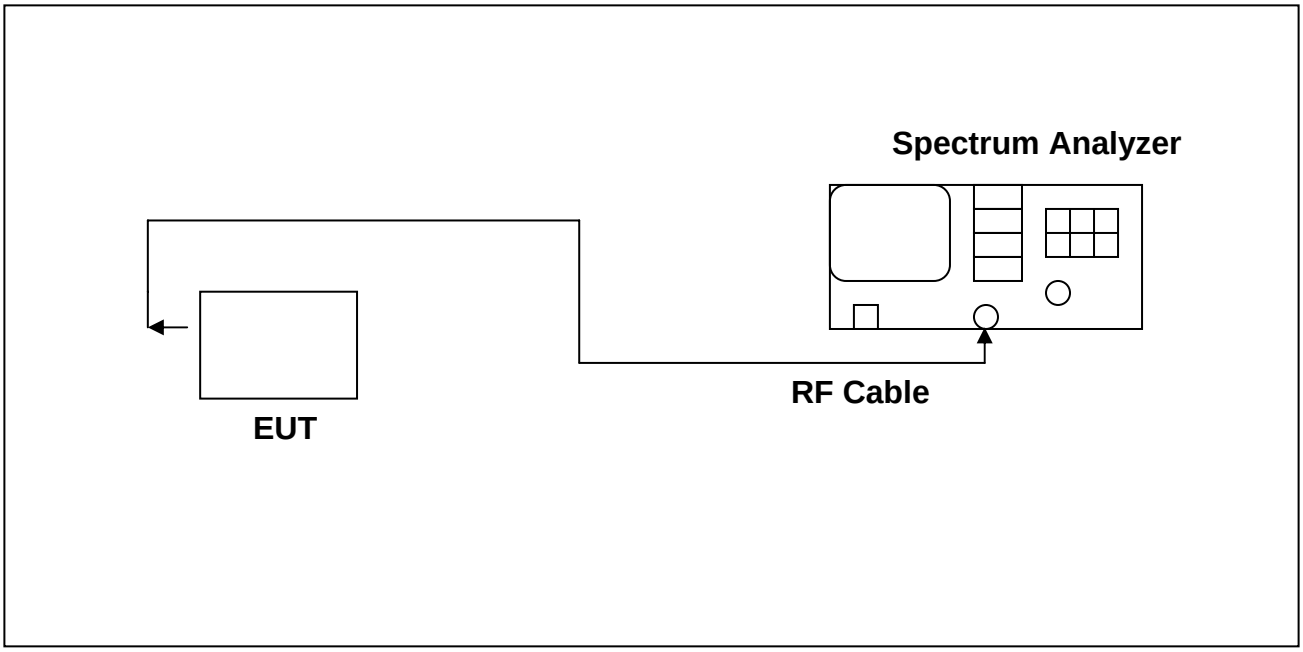
5.Pre amplifier Gain :38dB to 42dB

4. Minimum 20dB RF Bandwidth Requirements

4.1 Test Condition & Setup :

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW and VBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel or the maximum 20 dB bandwidth of the hopping channel is 1 MHz. A peak output reading was taken, a display line was drawn 20 dB lower than peak level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.
The test was performed at 3 channels (Channel 0, 37,75)

4.2 Test Instruments Configuration:



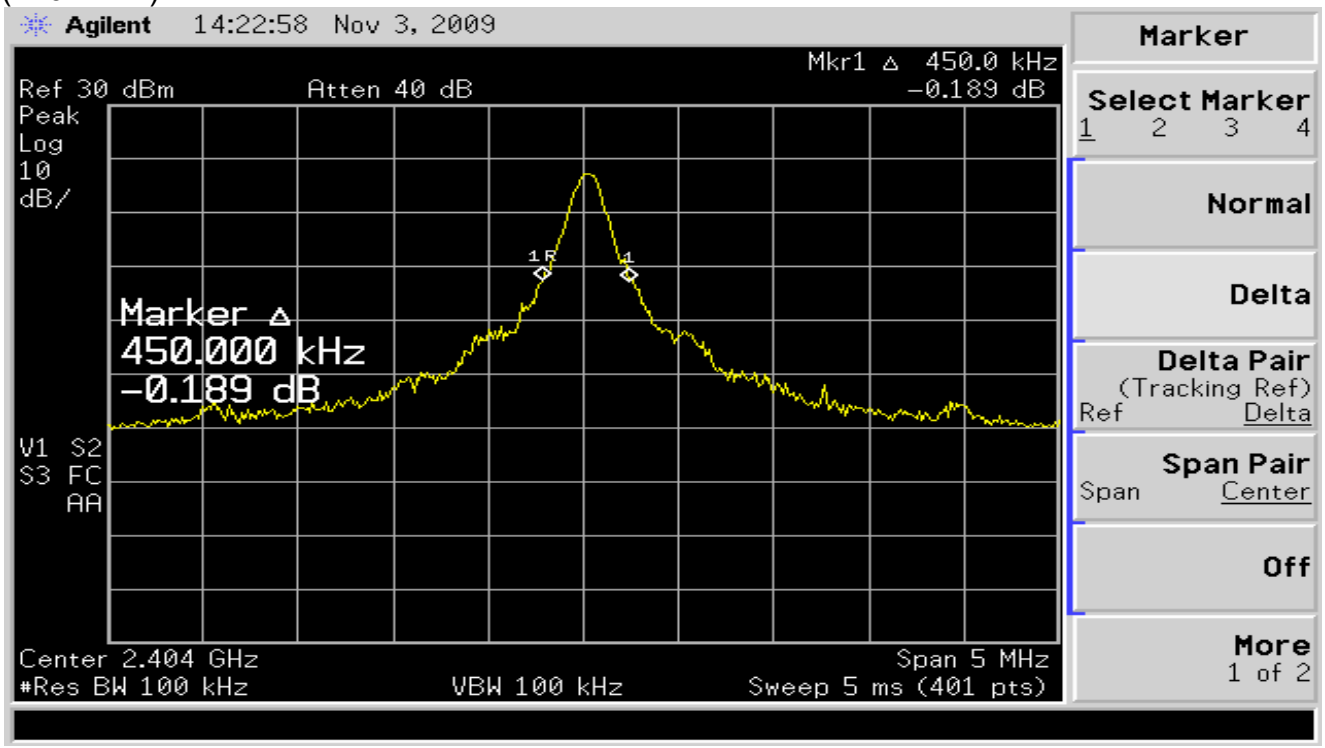
4.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2010/02/02	2011/02/02

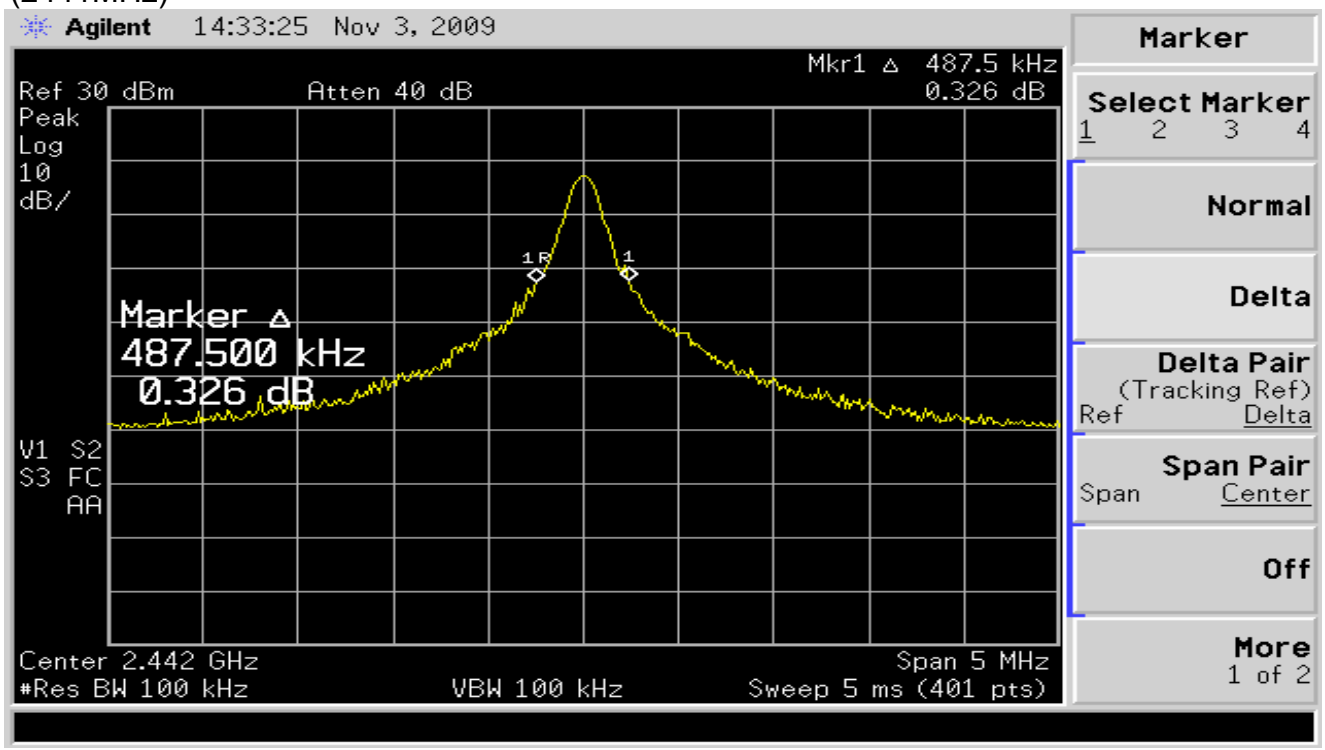
4.4 Test Result:

Frequency (MHz)	Min. 20dB Bandwidth (kHz)	Limit	Pass / Fail
2404	450.00	<1000kHz	Pass
2441	487.50	<1000kHz	Pass
2479	487.50	<1000kHz	Pass

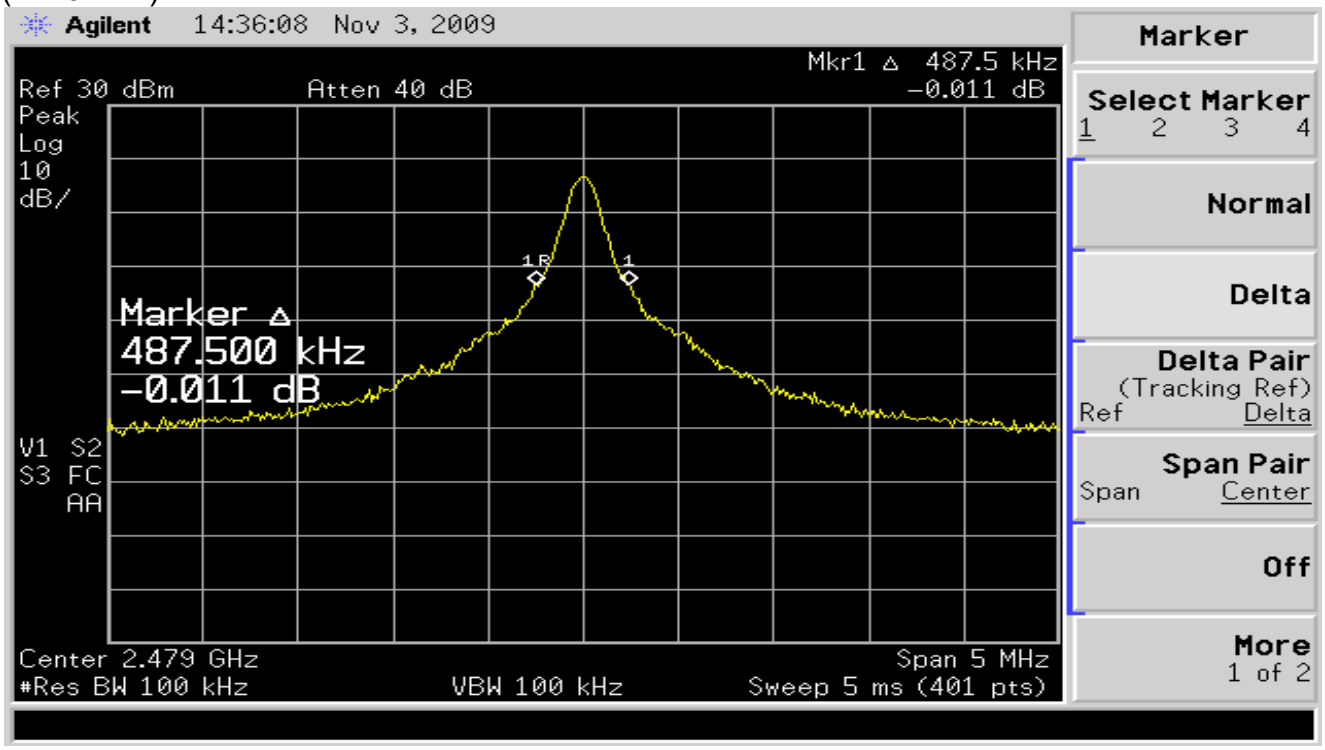
(2404MHz)



(2441MHz)



(2479MHz)

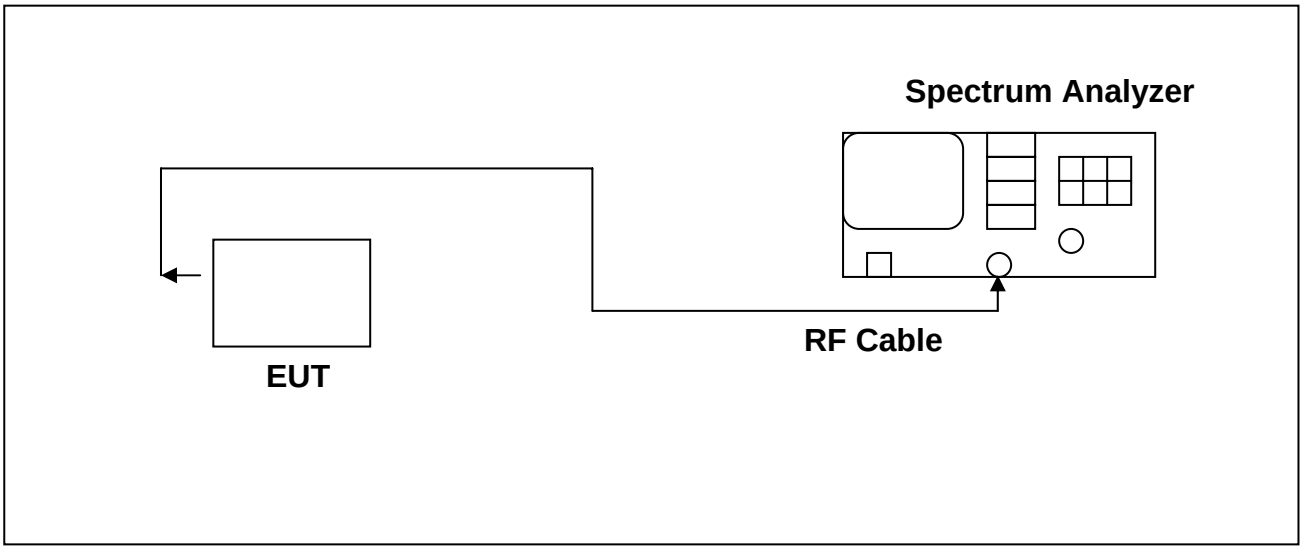


5. Hopping Frequency Separation Requirements

5.1 Test Condition & Setup :

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW and VBW was set to 100 kHz. The Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel,

5.2 Test Instruments Configuration:



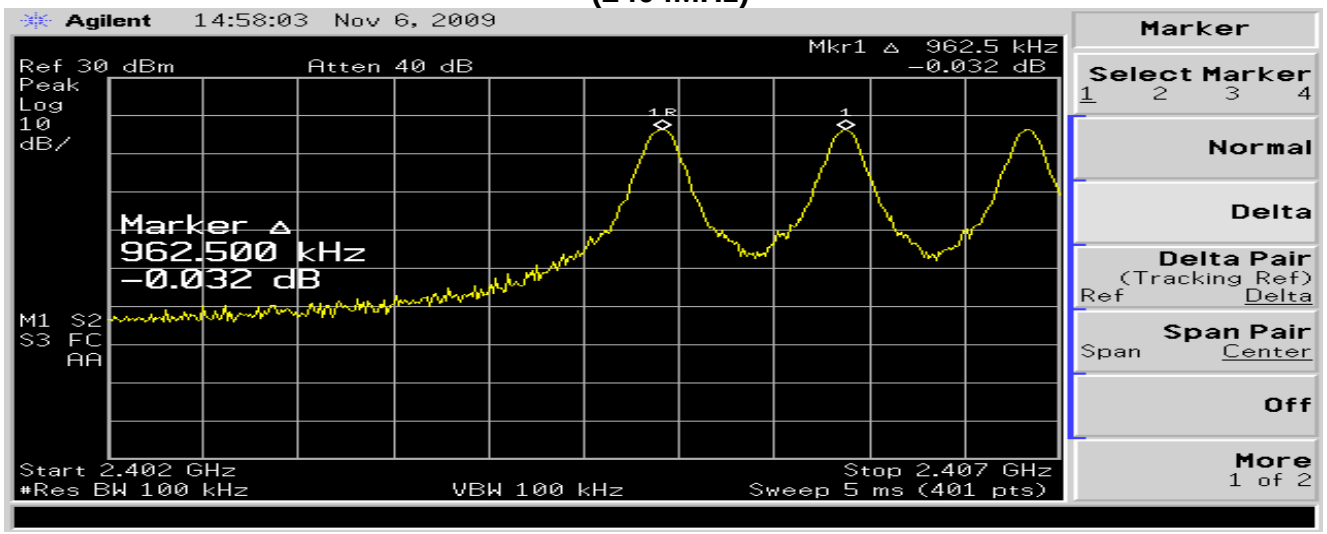
5.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2010/02/02	2011/02/02

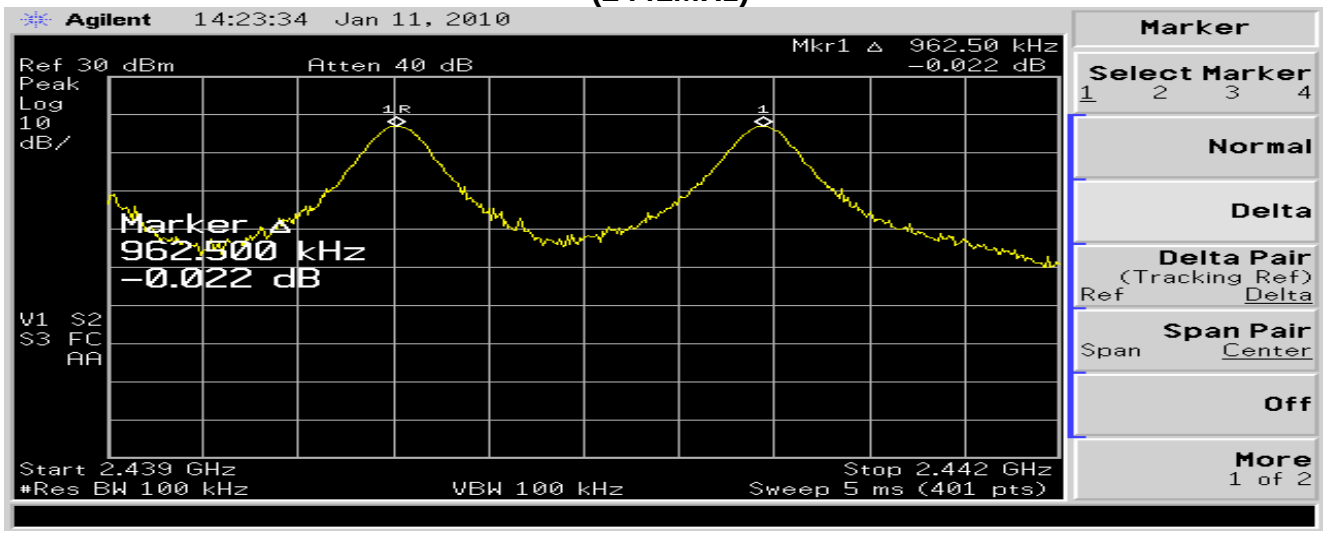
5.4 Test Result:

Frequency (MHz)	Adjacent Channel Separation (kHz)	Minimum Limit (kHz)	Pass / Fail
2404	962.50	641.7	Pass
2441	962.50	641.7	Pass
2479	955.00	636.7	Pass

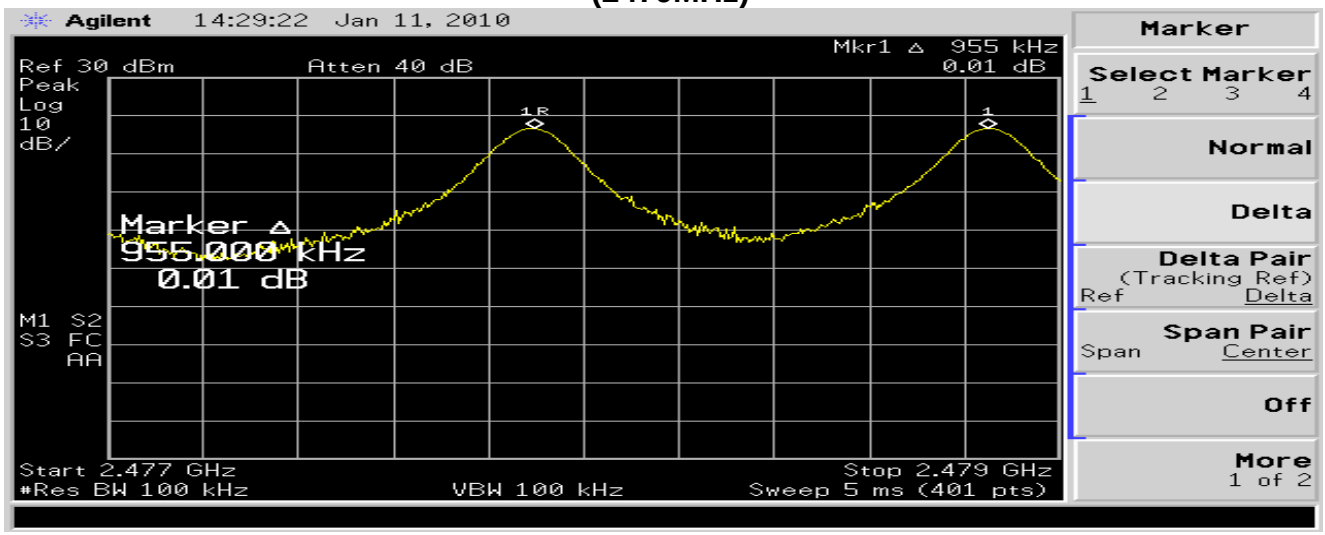
(2404MHz)



(2441MHz)



(2479MHz)

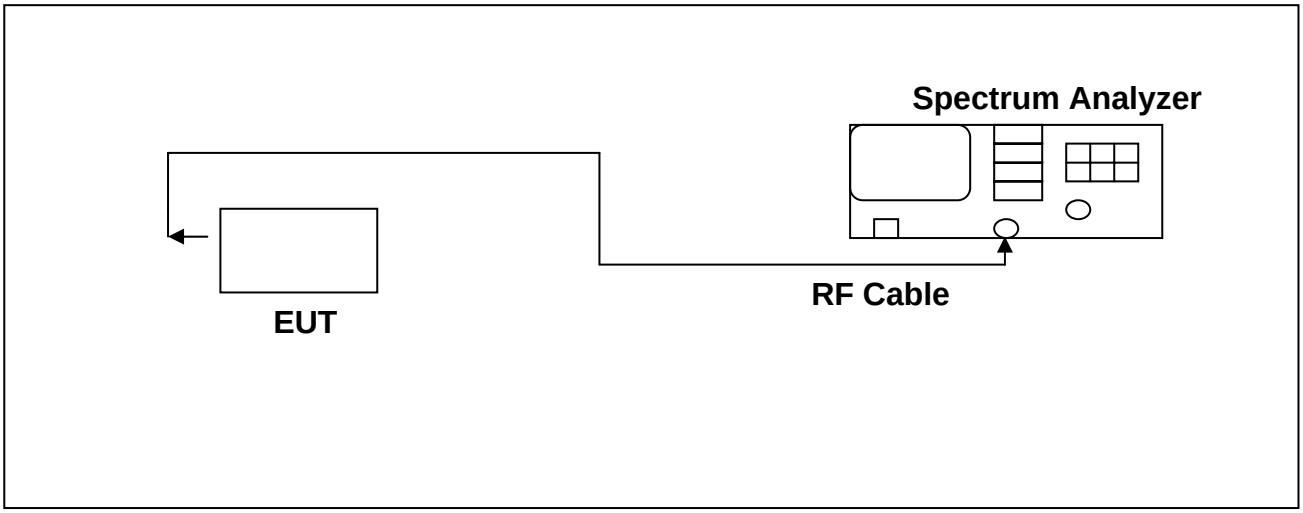

Agilent 14:29:22 Jan 11, 2010
Ref 30 dBm
Atten 40 dB
Mkr1 Δ 955 kHz
0.01 dB
Peak
Log
10
dB/
Marker Δ
955.000 kHz
0.01 dB
M1 S2
S3 FC
AA
Start 2.477 GHz
#Res BW 100 kHz
VBW 100 kHz
Stop 2.479 GHz
Sweep 5 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

6. Number of Hopping Channels Requirements

6.1 Test Condition & Setup :

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW and VBW was set to 100 kHz. The hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

6.2 Test Instruments Configuration:

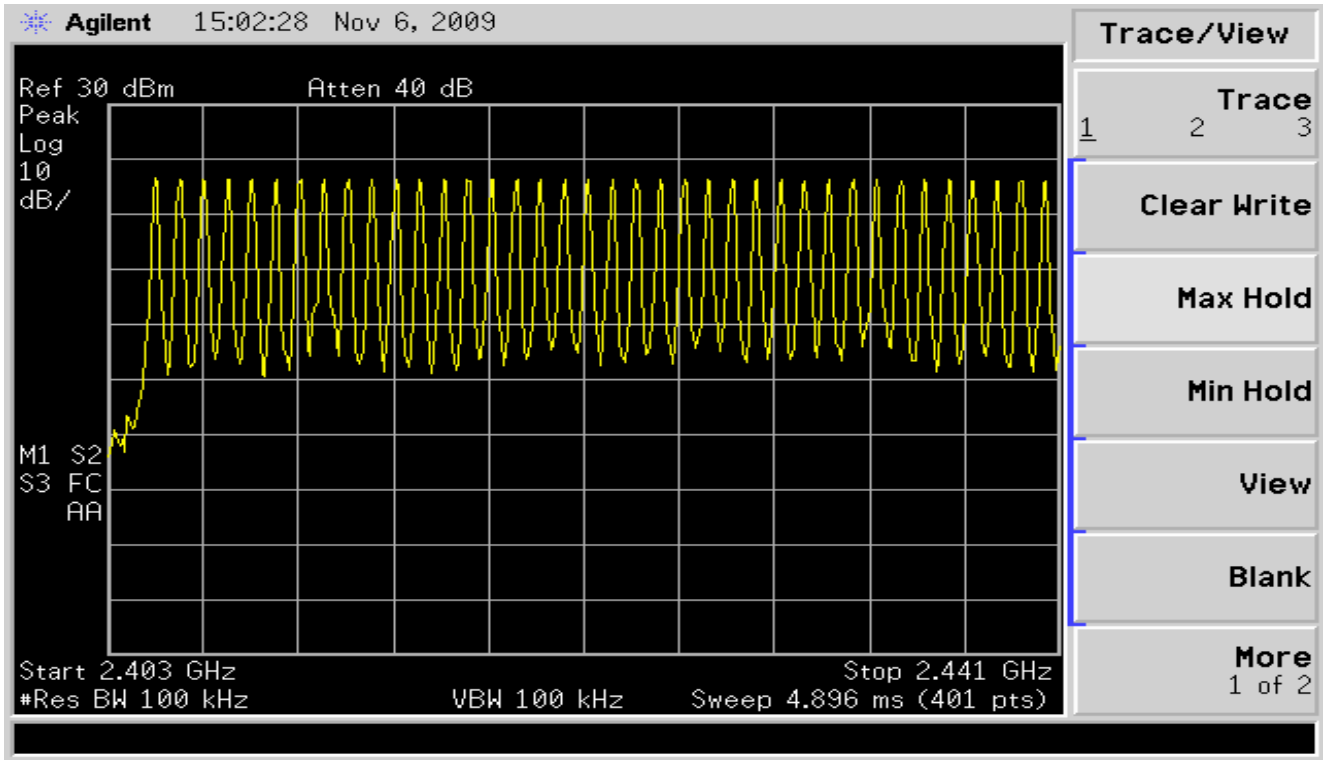


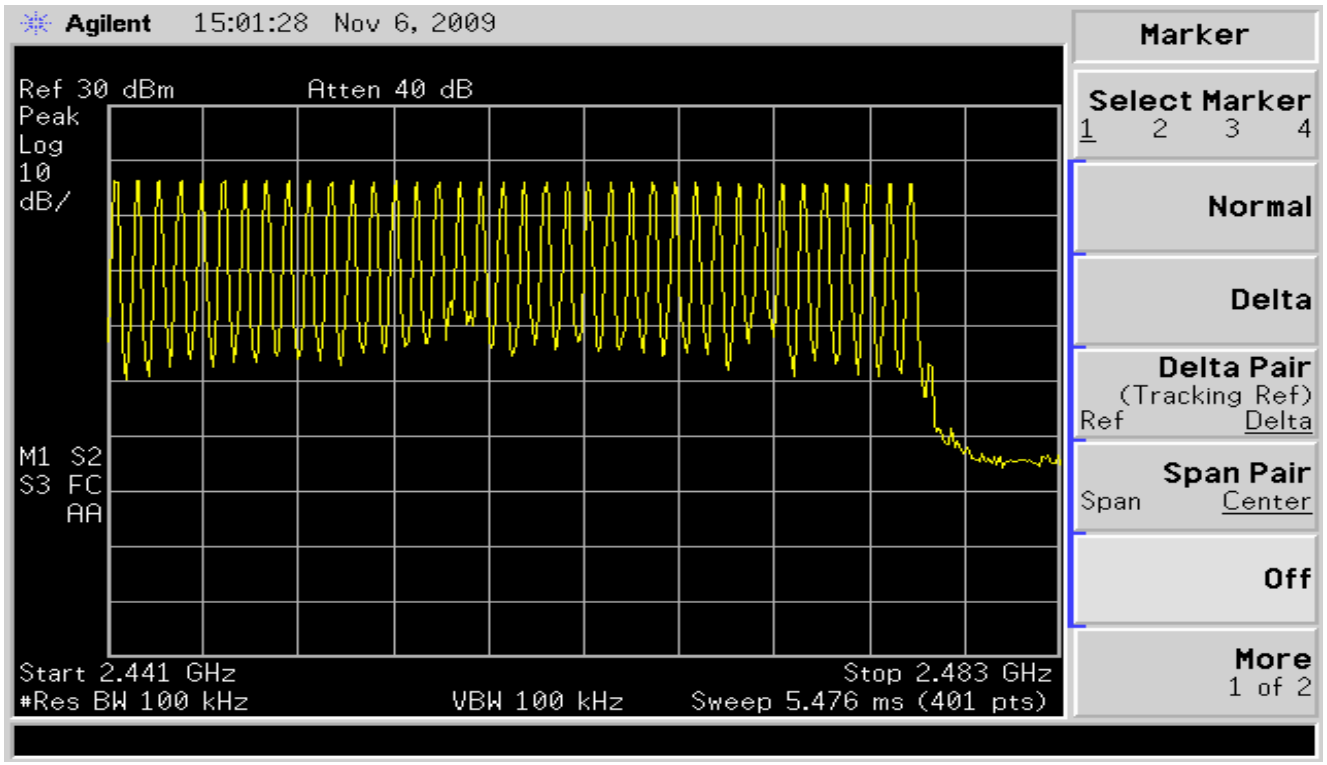
6.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2010/02/02	2011/02/02

6.4 Test Result:

Result (Channel)	Limit (Channel)	Pass / Fail
76	≧15	Pass


Agilent 15:02:28 Nov 6, 2009
Ref 30 dBm
Atten 40 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Start 2.403 GHz
#Res BW 100 kHz
VBW 100 kHz
Stop 2.441 GHz
Sweep 4.896 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

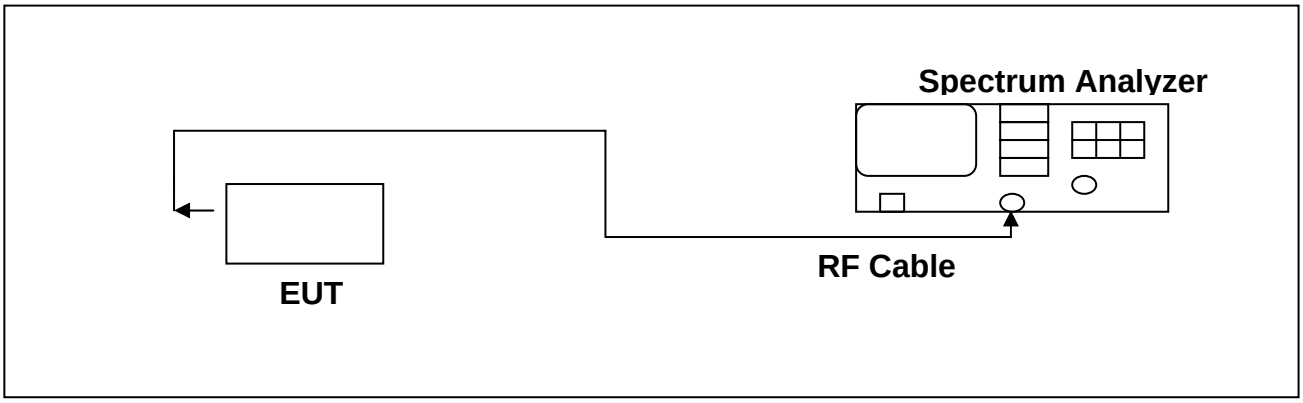

Agilent 15:01:28 Nov 6, 2009
Ref 30 dBm
Atten 40 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Start 2.441 GHz
#Res BW 100 kHz
VBW 100 kHz
Stop 2.483 GHz
Sweep 5.476 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

7. Average Time of Occupancy Requirements

7.1 Test Condition & Setup :

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW and VBW was set to 100 kHz. The hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

7.2 Test Instruments Configuration:

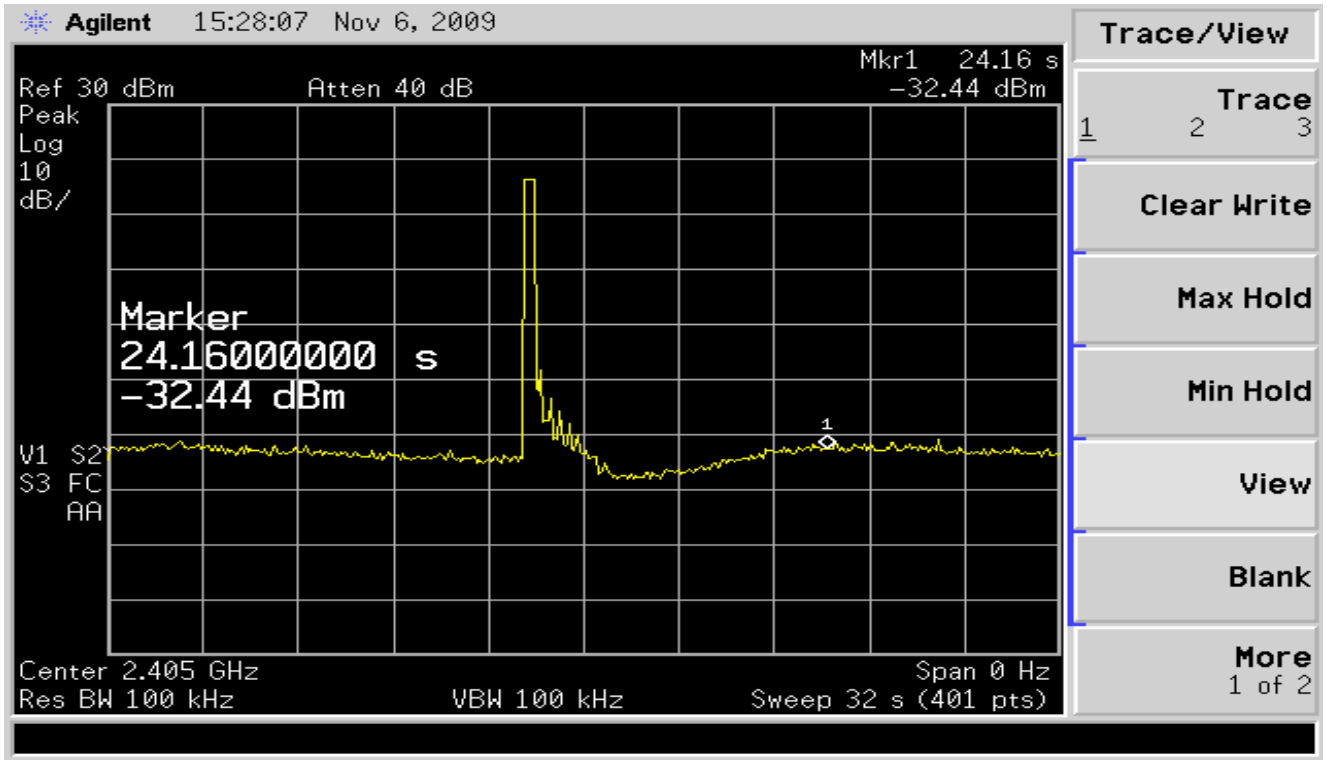


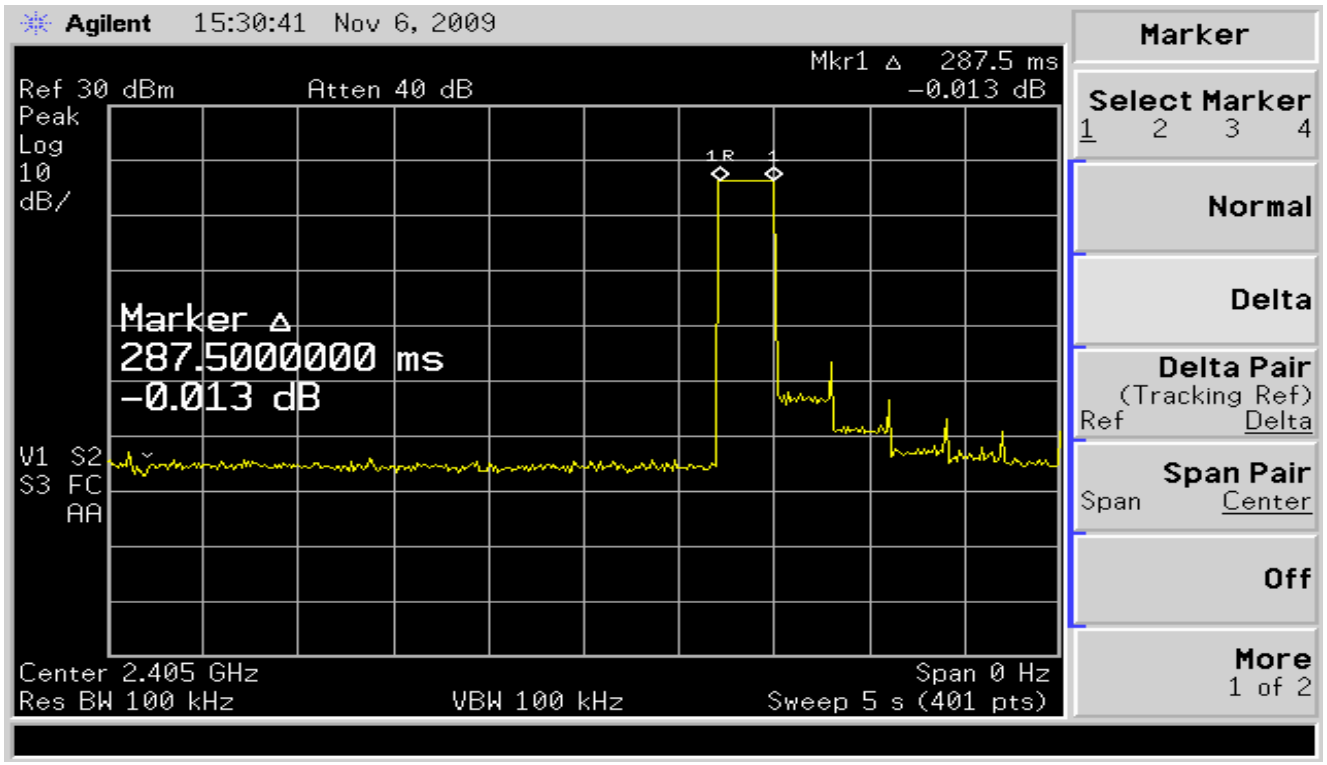
7.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2010/02/02	2011/02/02

7.4 Test Result:

Number of transmission in a 30.4 (76Hopping * 0.4) times	Length of transmission time (m sec)	Result (m sec)	Limit (m sec)	Pass / Fail
1 time	287.5	287.5	400	Pass


Agilent 15:28:07 Nov 6, 2009
Ref 30 dBm
Atten 40 dB
Mkr1 24.16 s
-32.44 dBm
Peak
Log
10
dB/
Marker
24.16000000 s
-32.44 dBm
V1 S2
S3 FC
AA
Center 2.405 GHz
Res BW 100 kHz
VBW 100 kHz
Span 0 Hz
Sweep 32 s (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2


Agilent 15:30:41 Nov 6, 2009
Ref 30 dBm
Atten 40 dB
Mkr1 Δ 287.5 ms
-0.013 dB
Peak
Log
10
dB/
Marker Δ
287.5000000 ms
-0.013 dB
V1 S2
S3 FC
AA
Center 2.405 GHz
Res BW 100 kHz
VBW 100 kHz
Span 0 Hz
Sweep 5 s (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

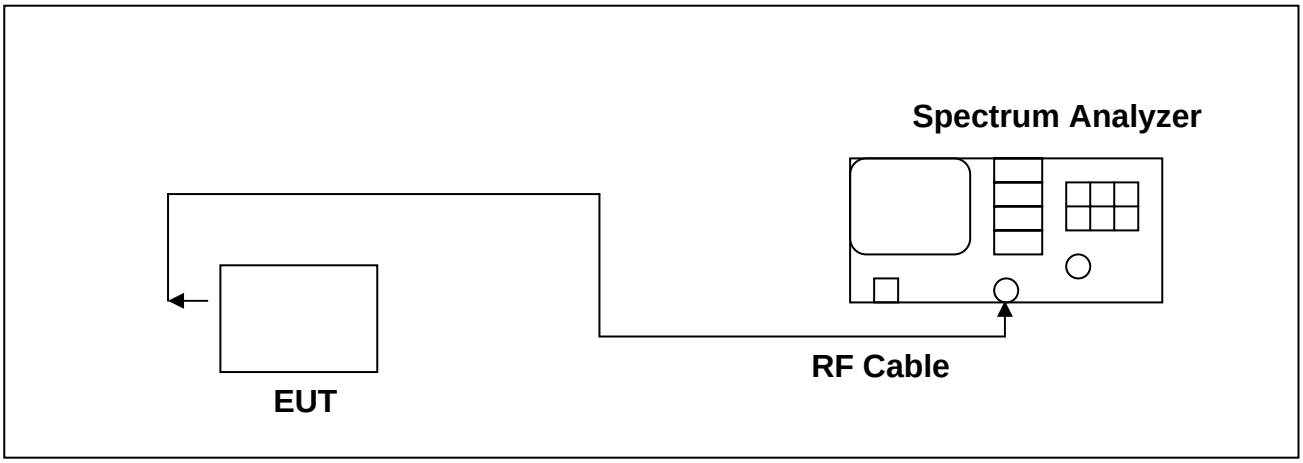
8. Out of Band Conducted Emissions Requirements

8.1 Test Condition & Setup :

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 37,75)

8.2 Test Instruments Configuration:



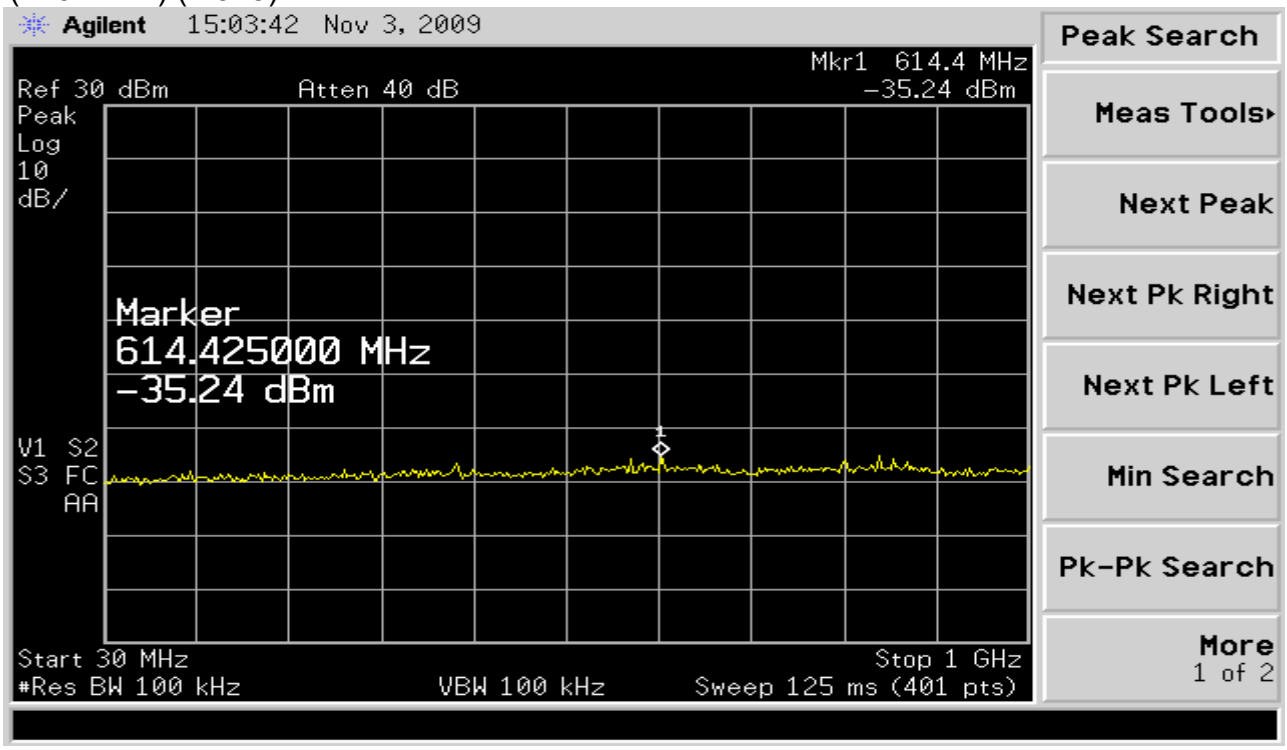
8.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2010/02/02	2011/02/02

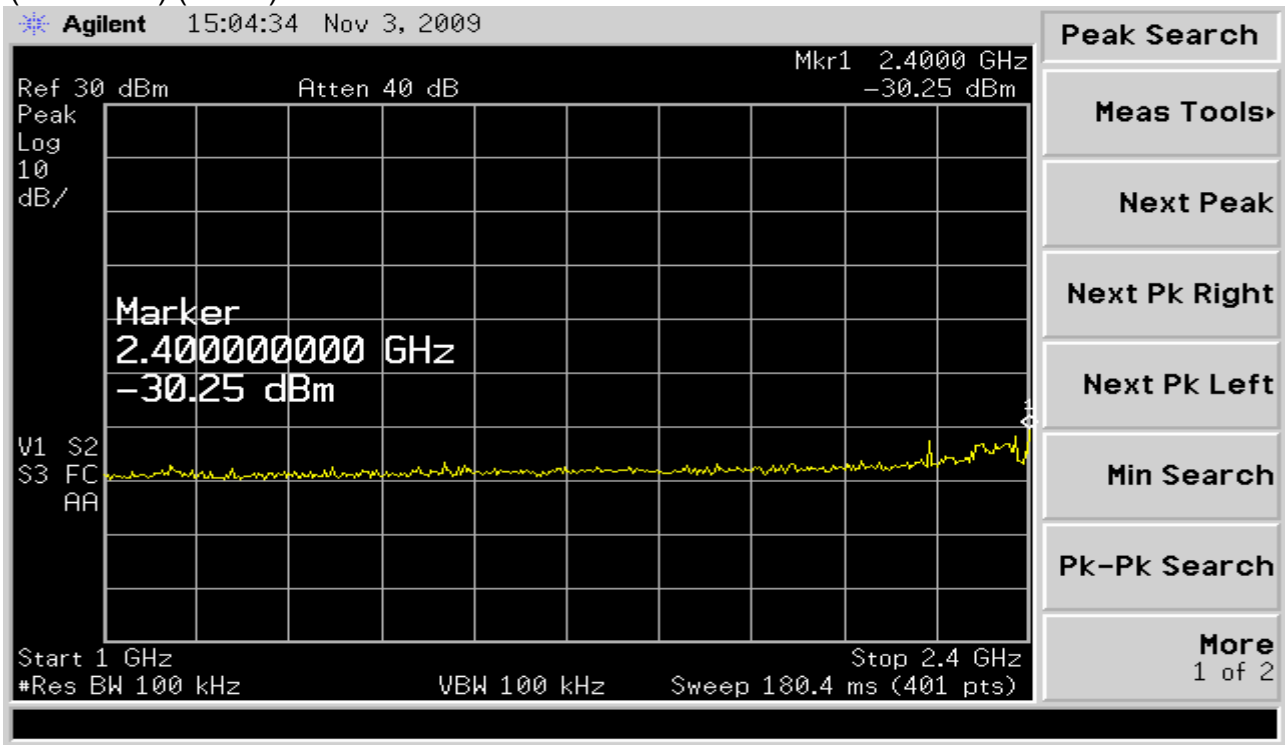
8.4 Test Result:

Refer to attached data sheets. Data shows out of band emissions are suppressed well below the -20 dB minimum required by the Rules.

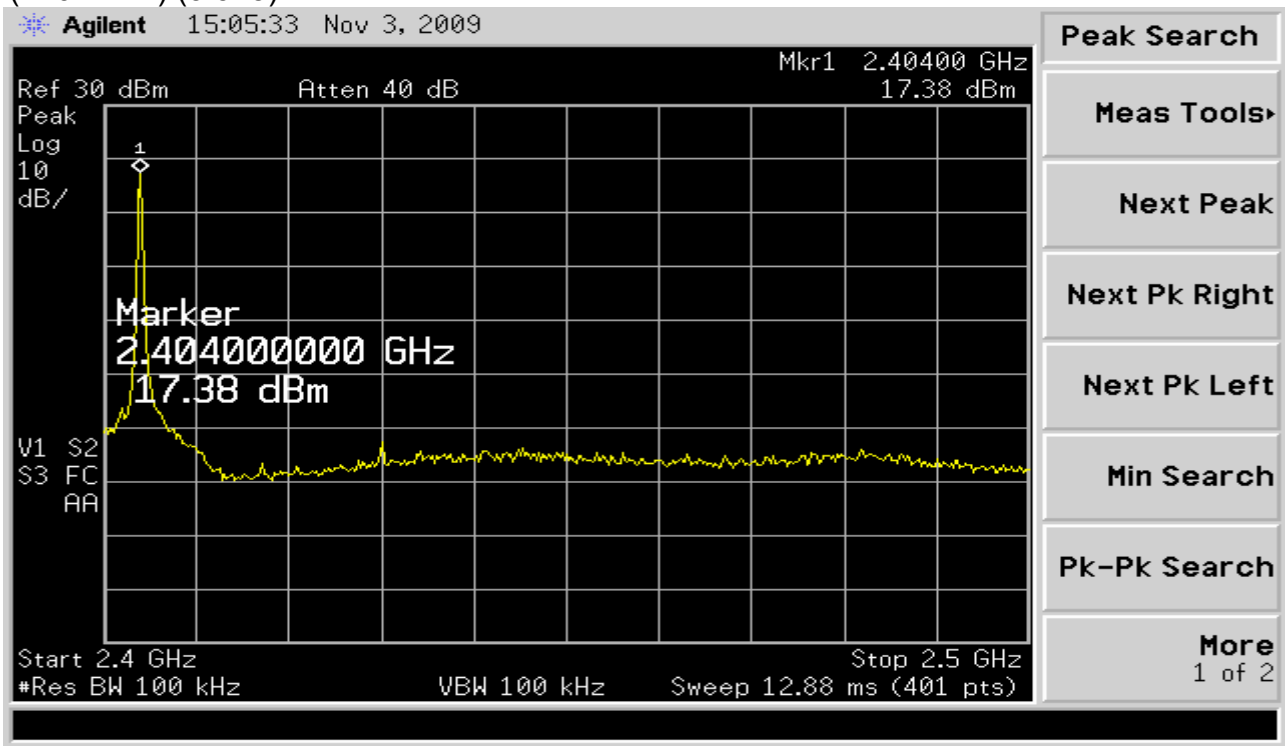
(2404MHz) (1 of 5)



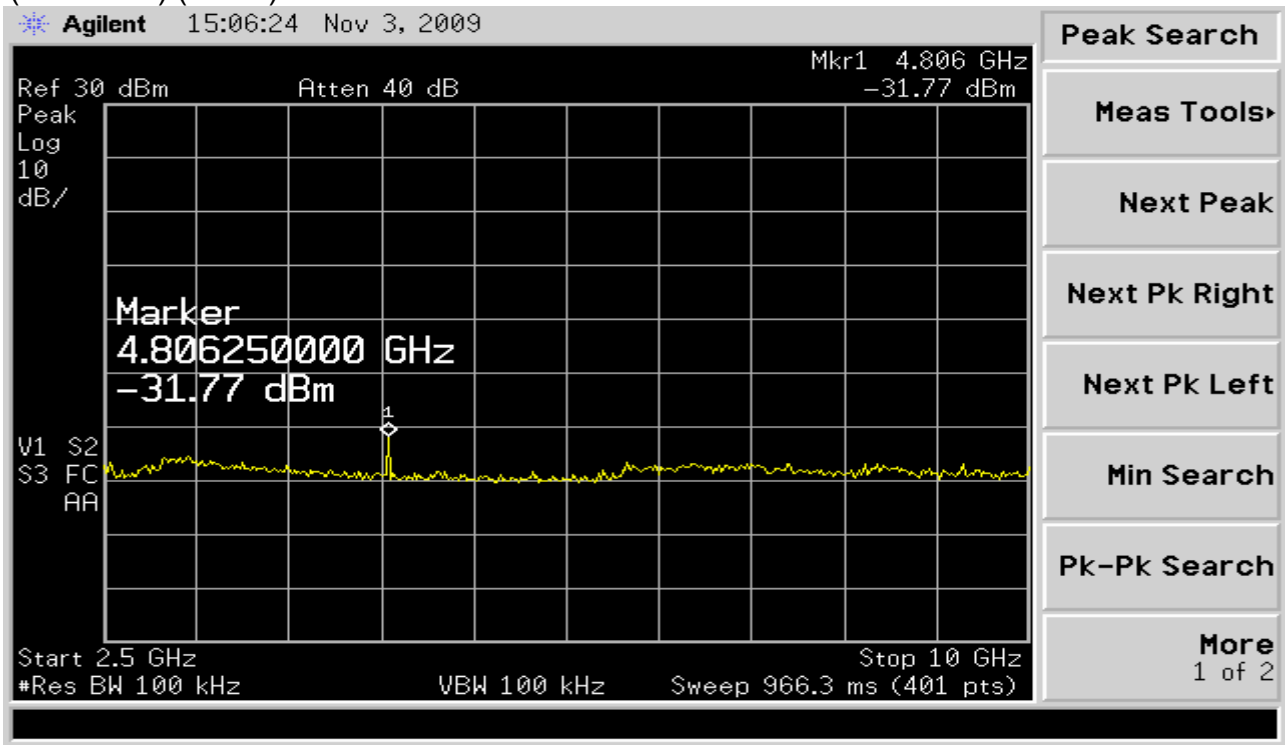
(2404MHz) (2 of 5)



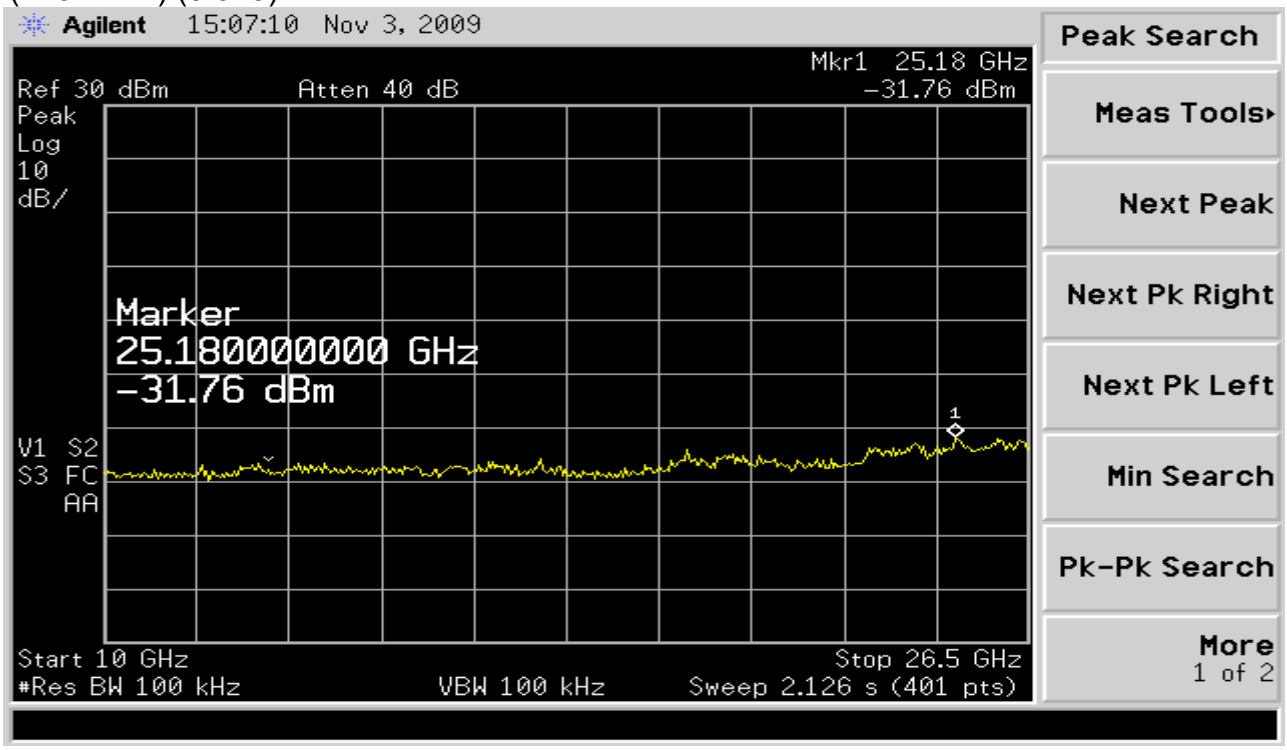
(2404MHz) (3 of 5)



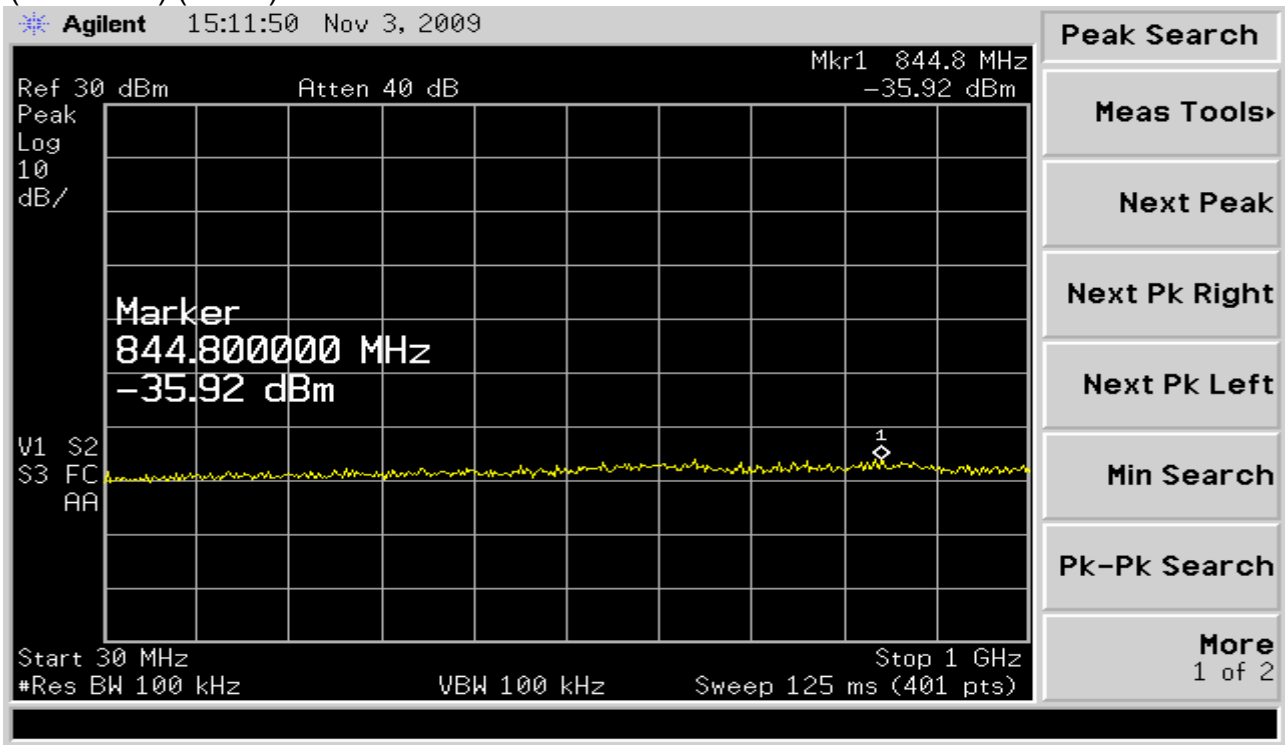
(2404MHz) (4 of 5)



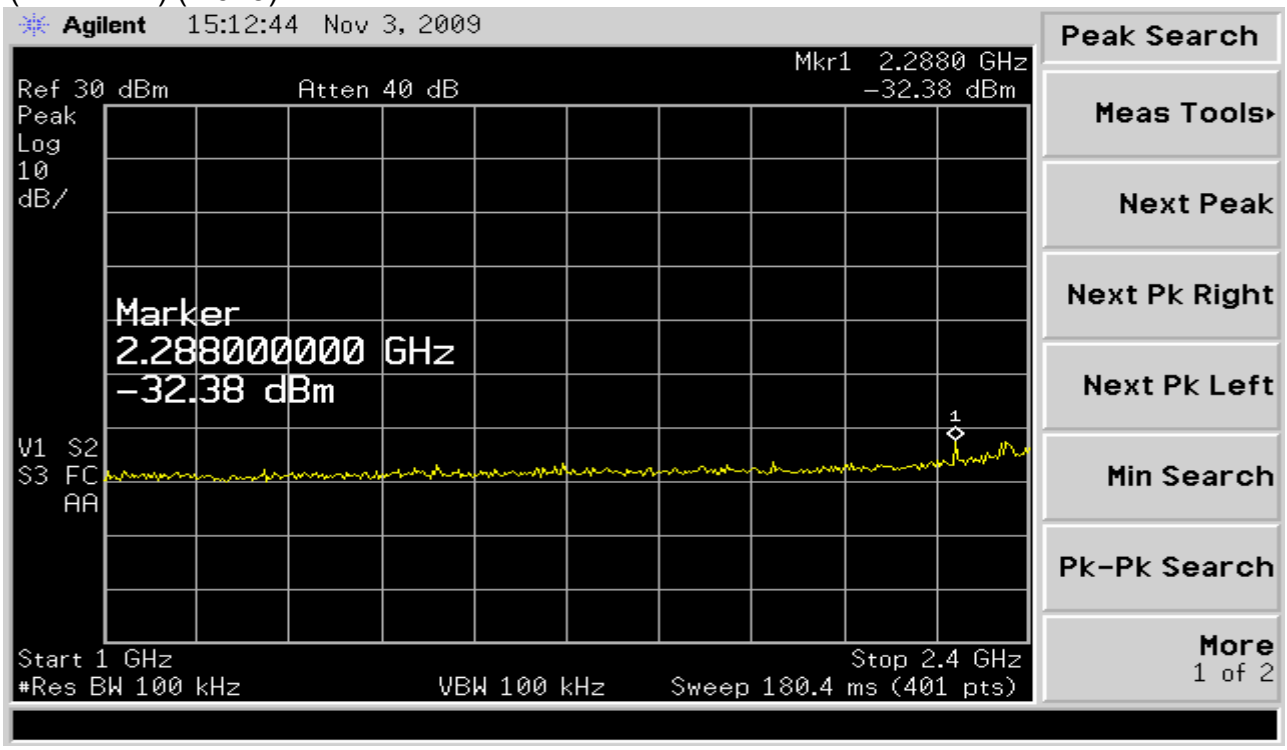
(2404MHz) (5 of 5)



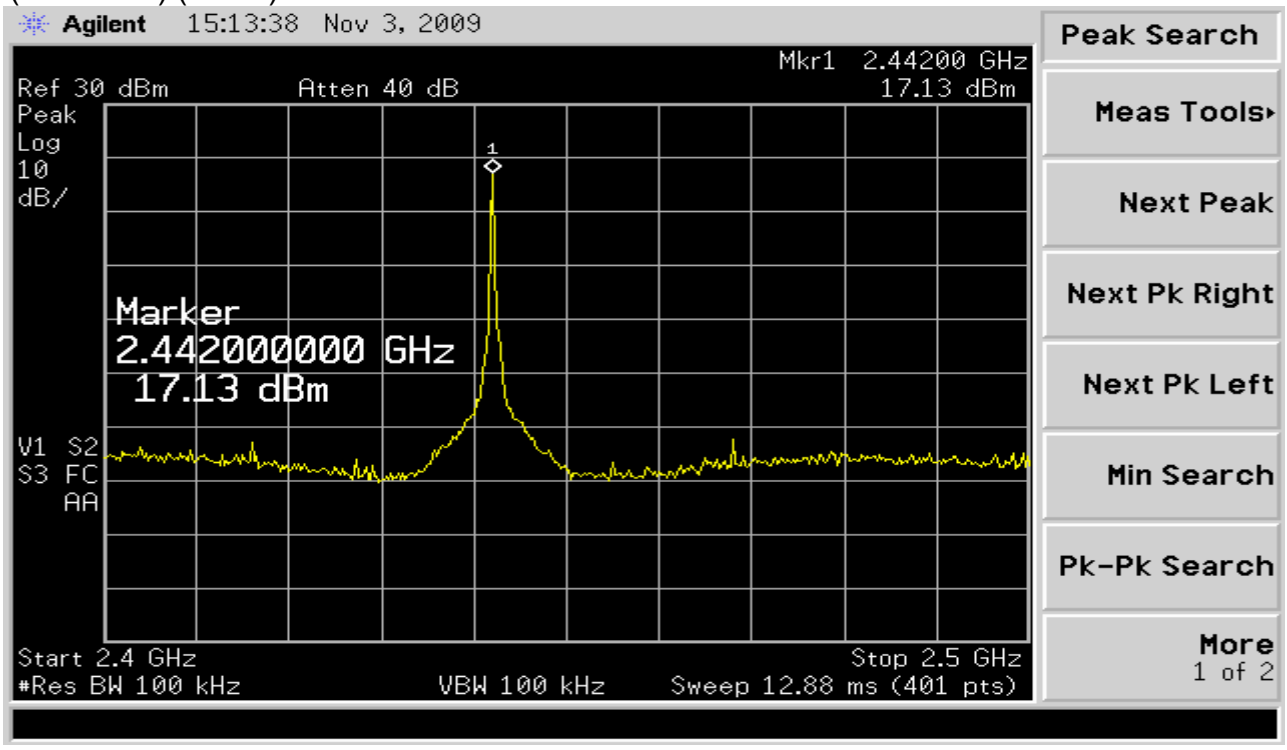
(2441MHz) (1 of 5)



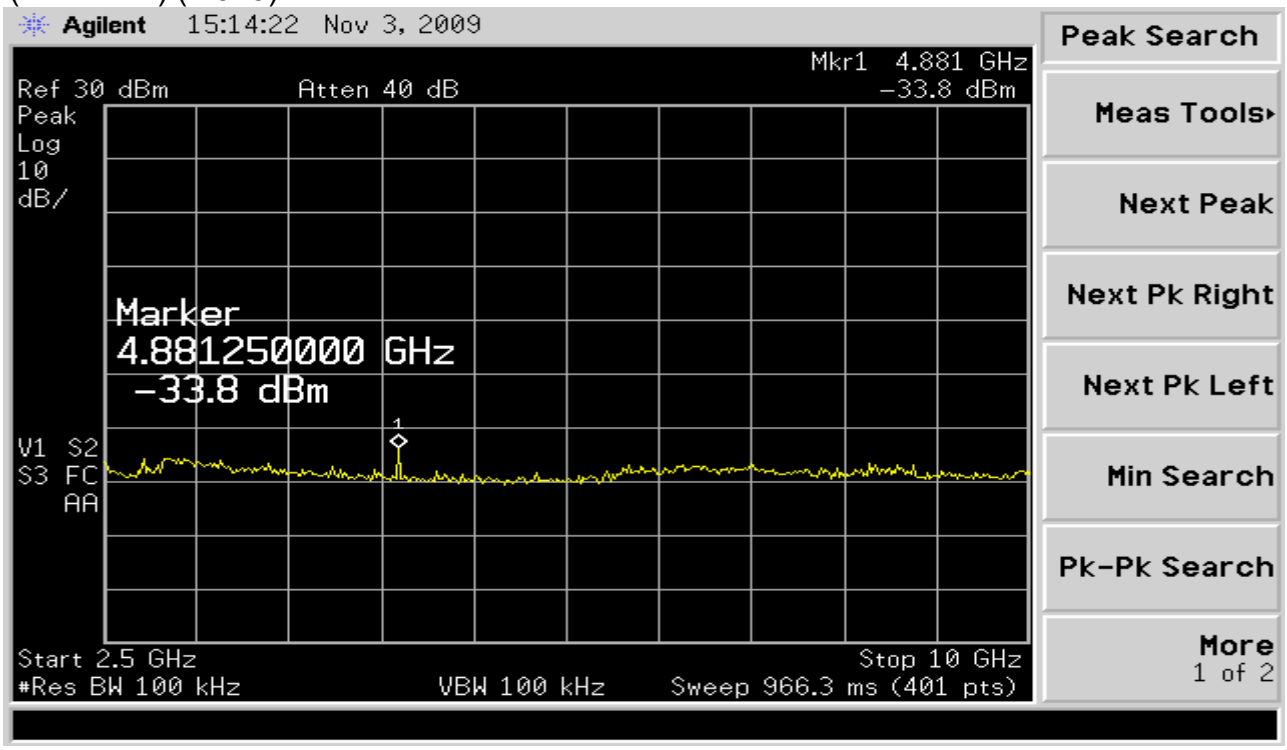
(2441MHz) (2 of 5)



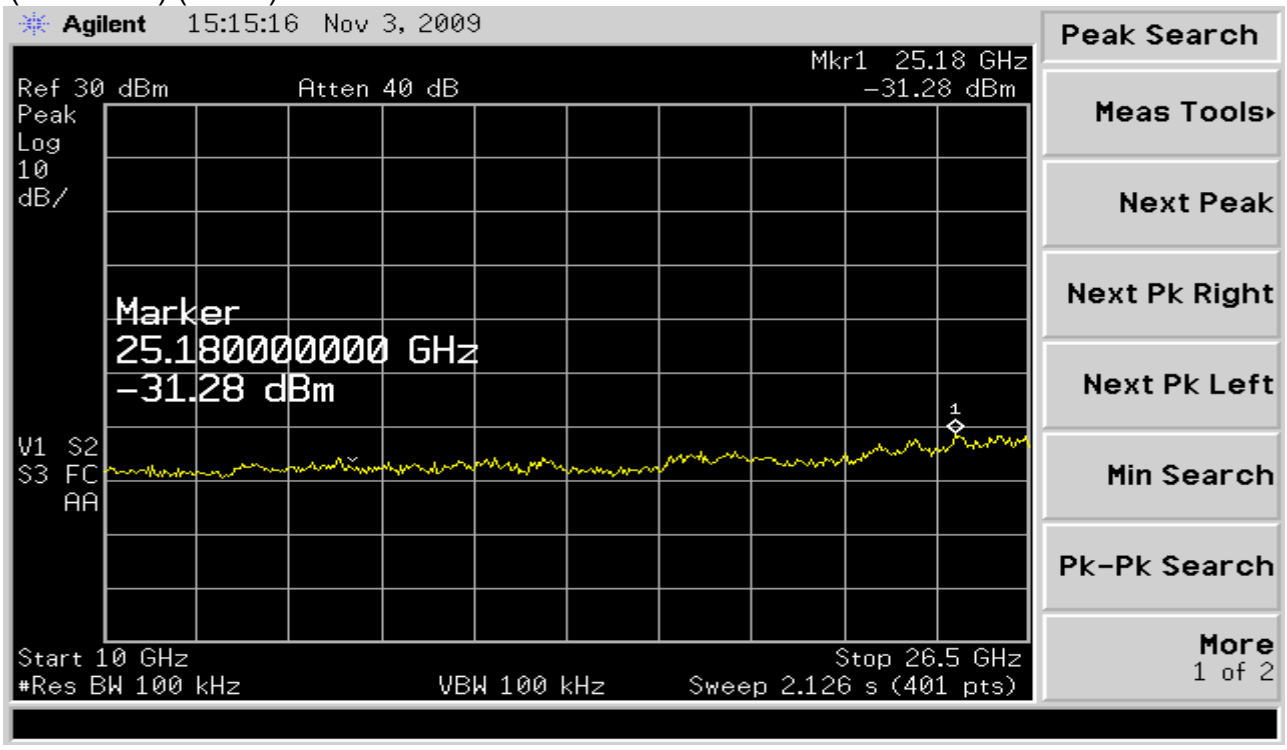
(2441MHz) (3 of 5)



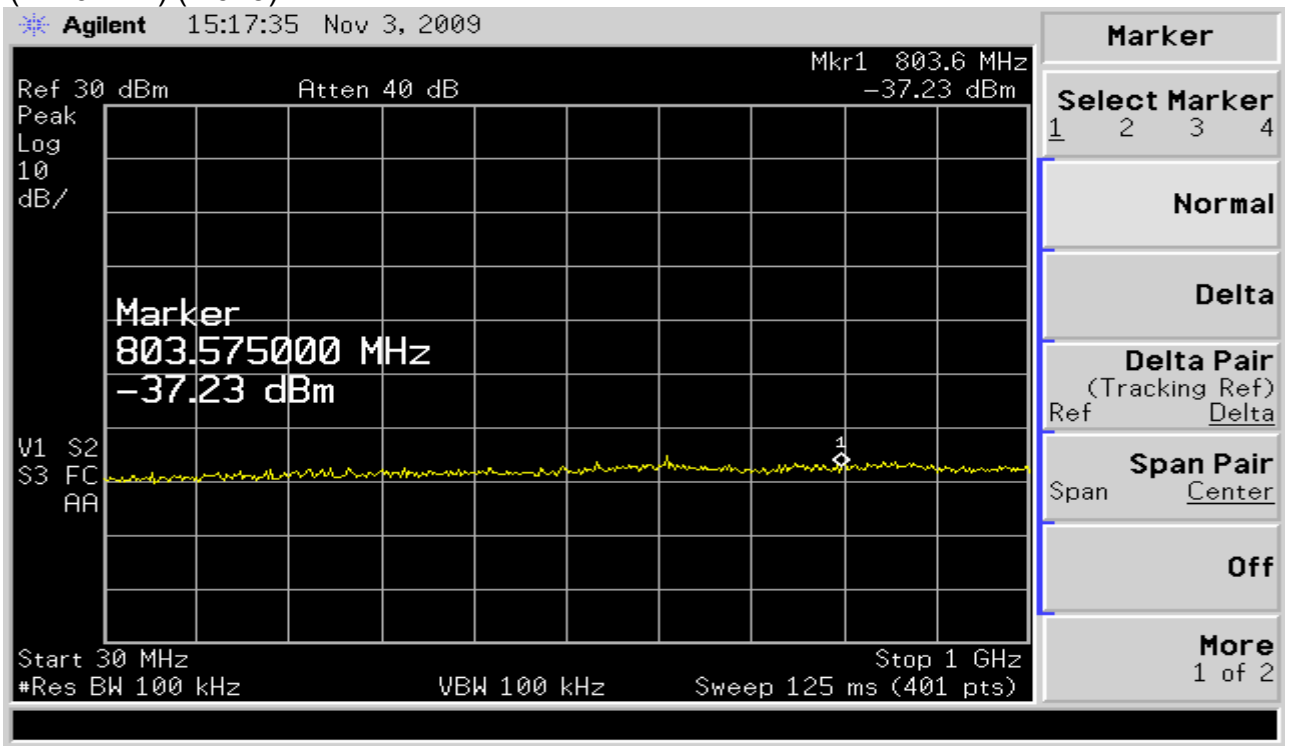
(2441MHz) (4 of 5)



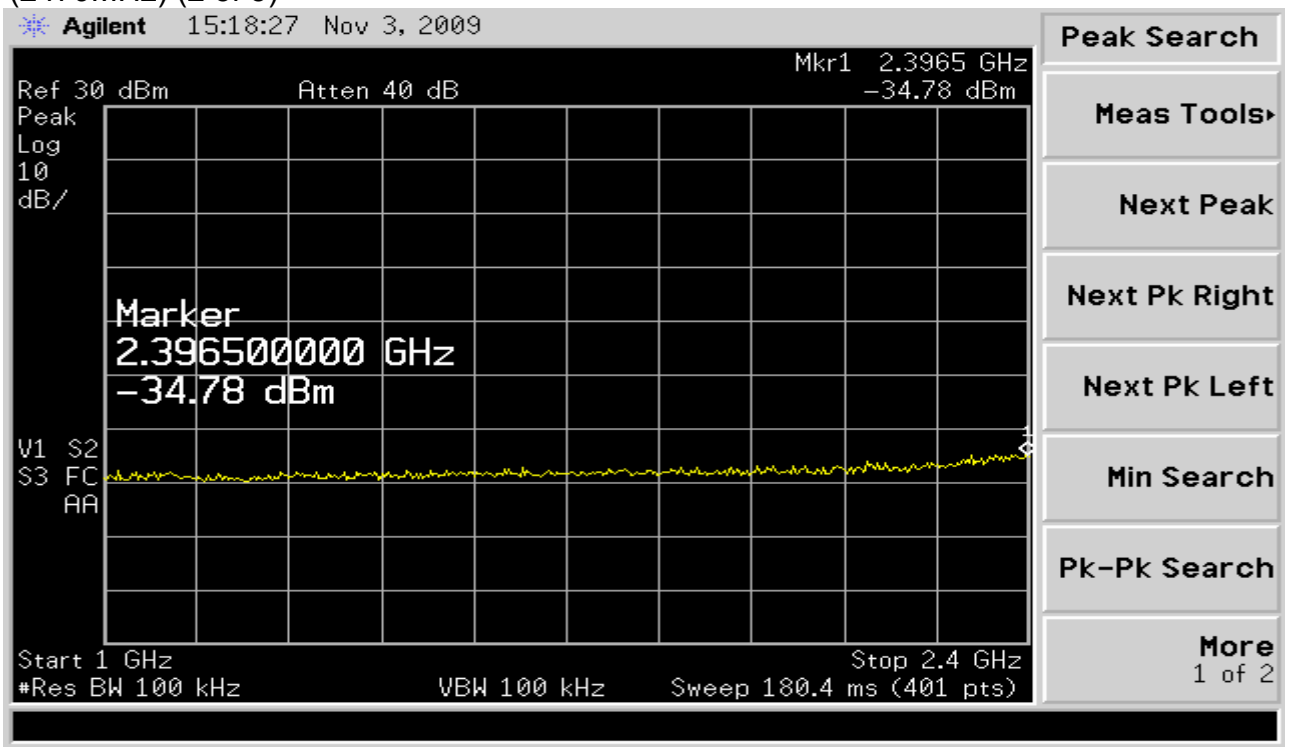
(2441MHz) (5 of 5)



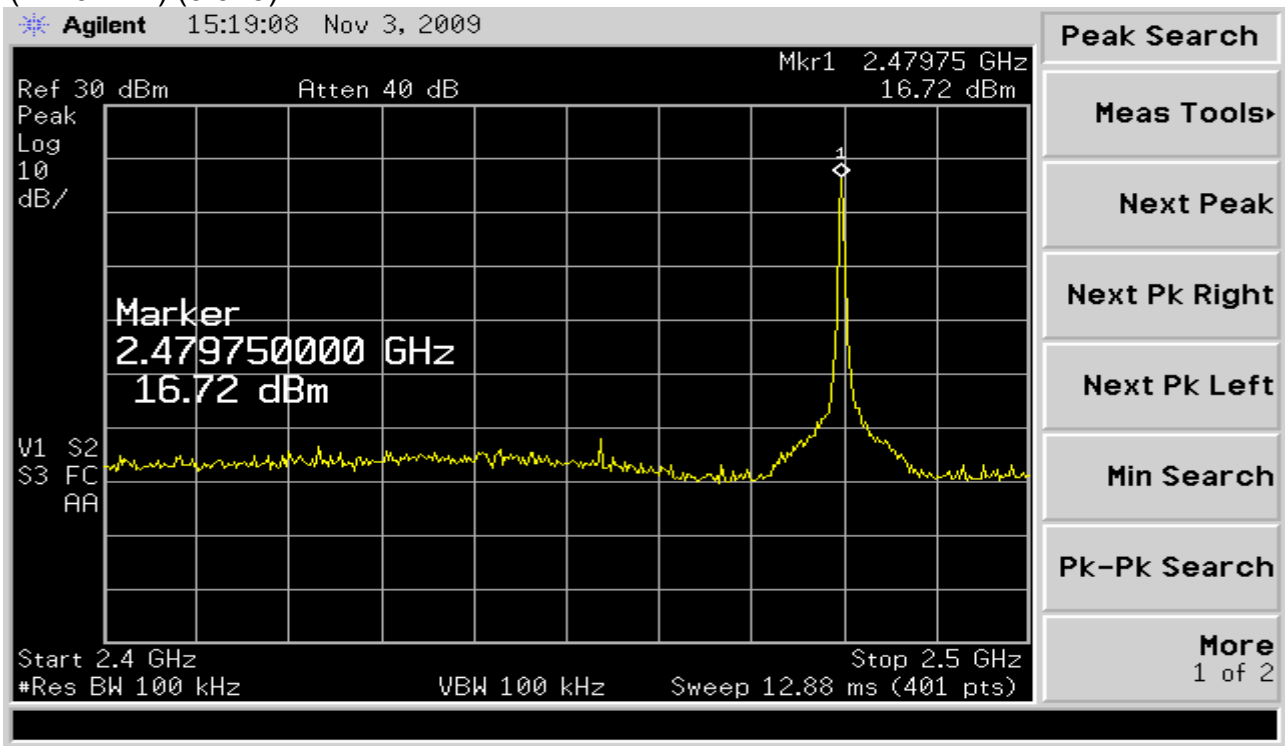
(2479MHz) (1 of 5)



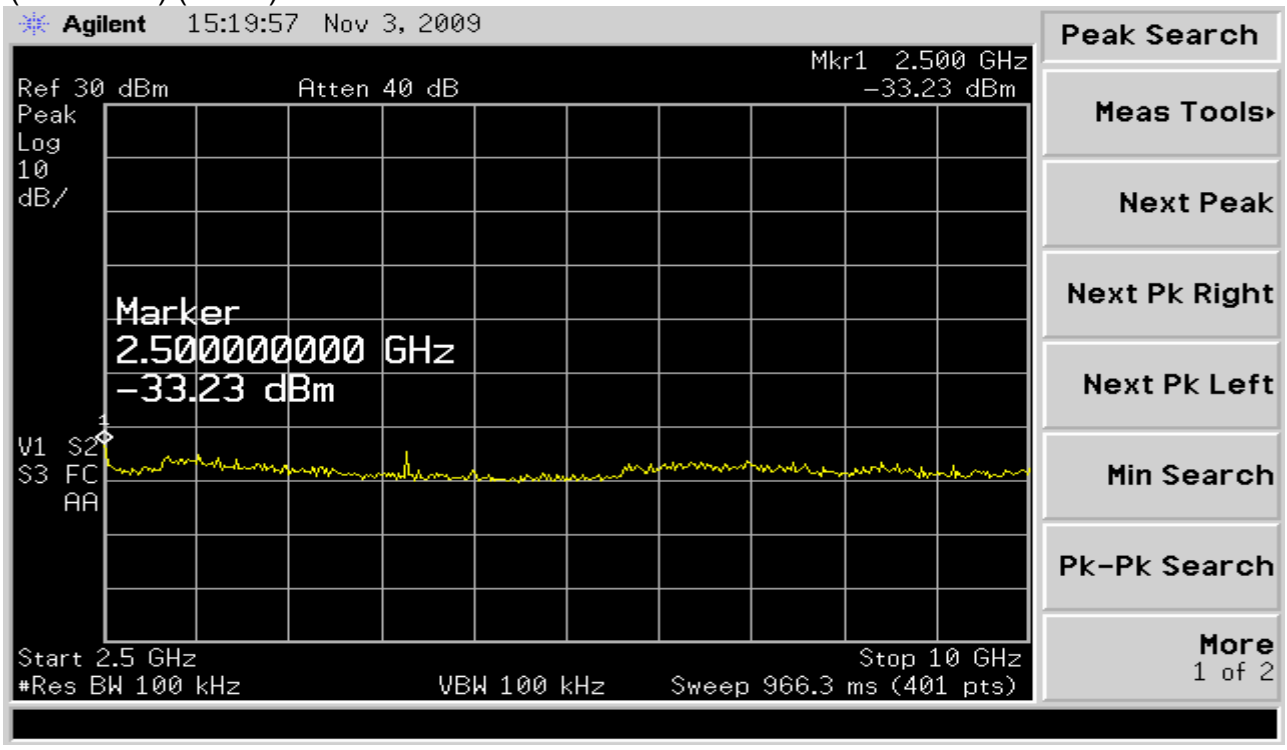
(2479MHz) (2 of 5)



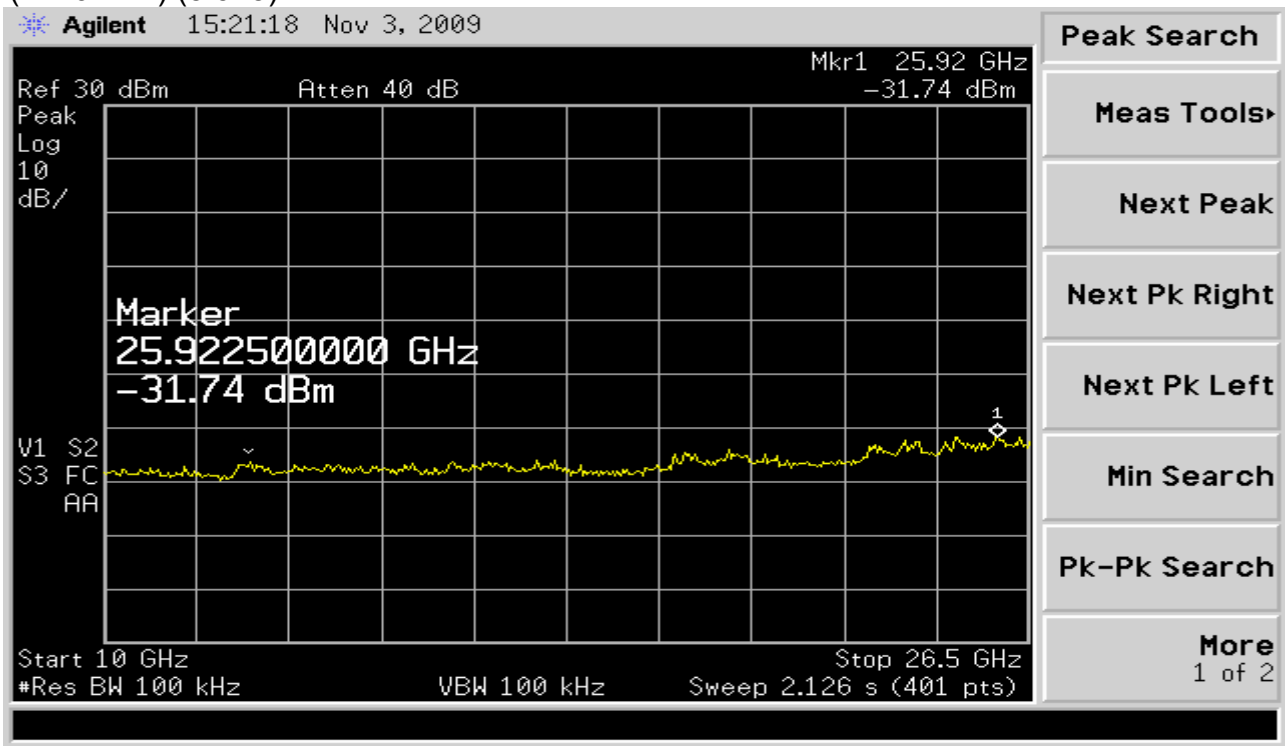
(2479MHz) (3 of 5)



(2479MHz) (4 of 5)



(2479MHz) (5 of 5)



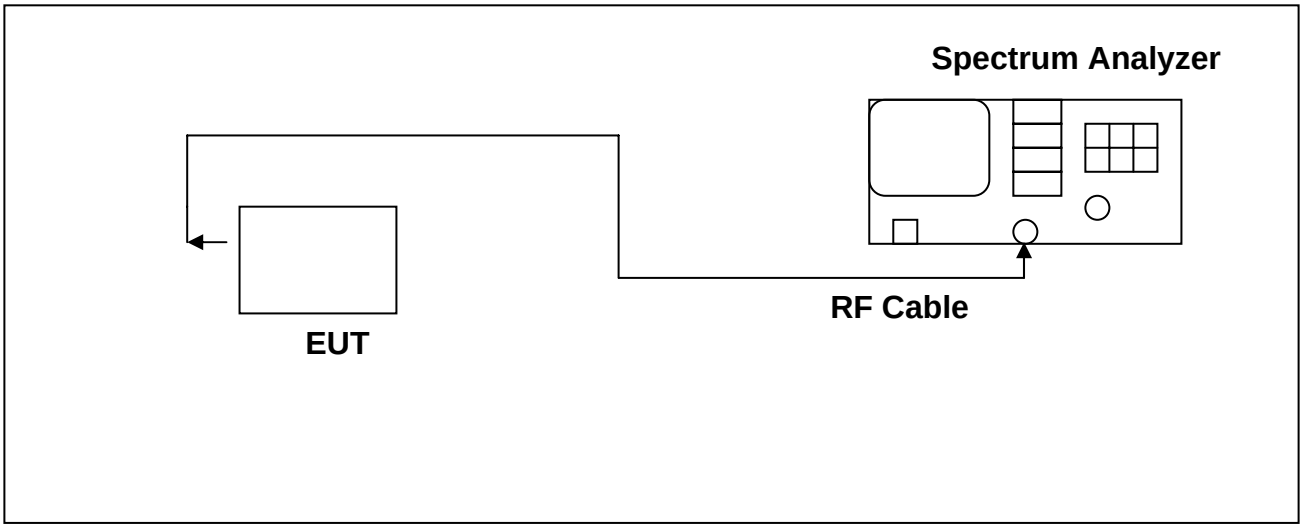
9. Maximum Conducted Output Power Requirements

9.1 Test Condition & Setup :

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW and VBW was set to 3MHz. The channel can be set using the keypad on the EUT. The maximum peak output power shall not exceed 1 watt(30dBm).

The antenna port of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

9.2 Test Instruments Configuration:



9.3 Test Equipment List:

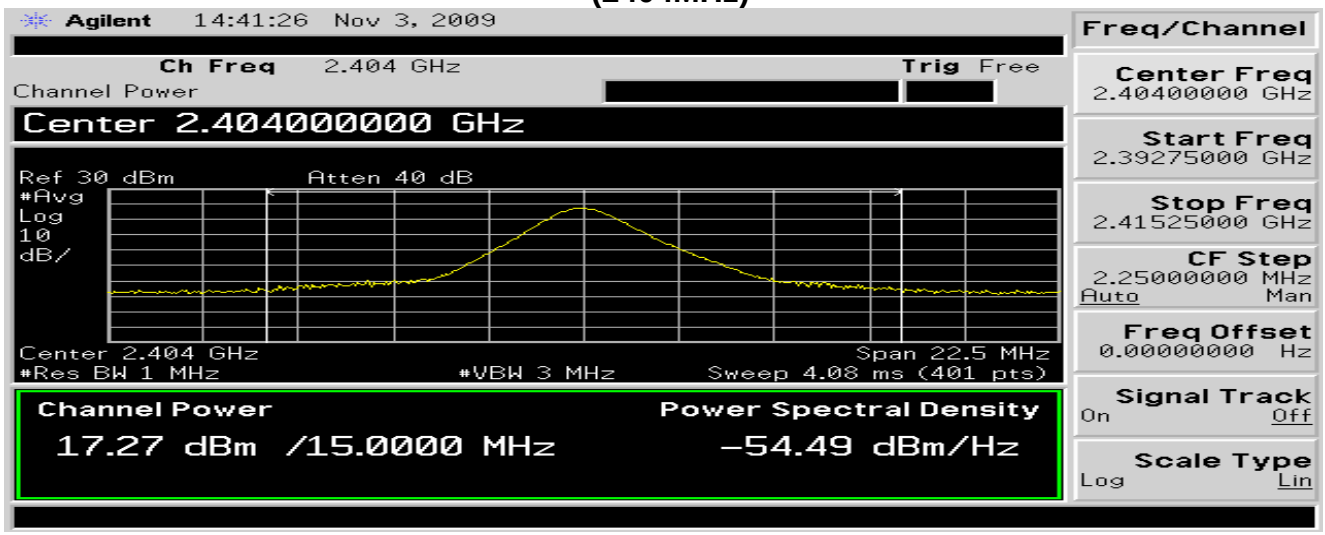
Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US39240419	E4407B	2010/02/02	2011/02/02

9.4 Test Result:

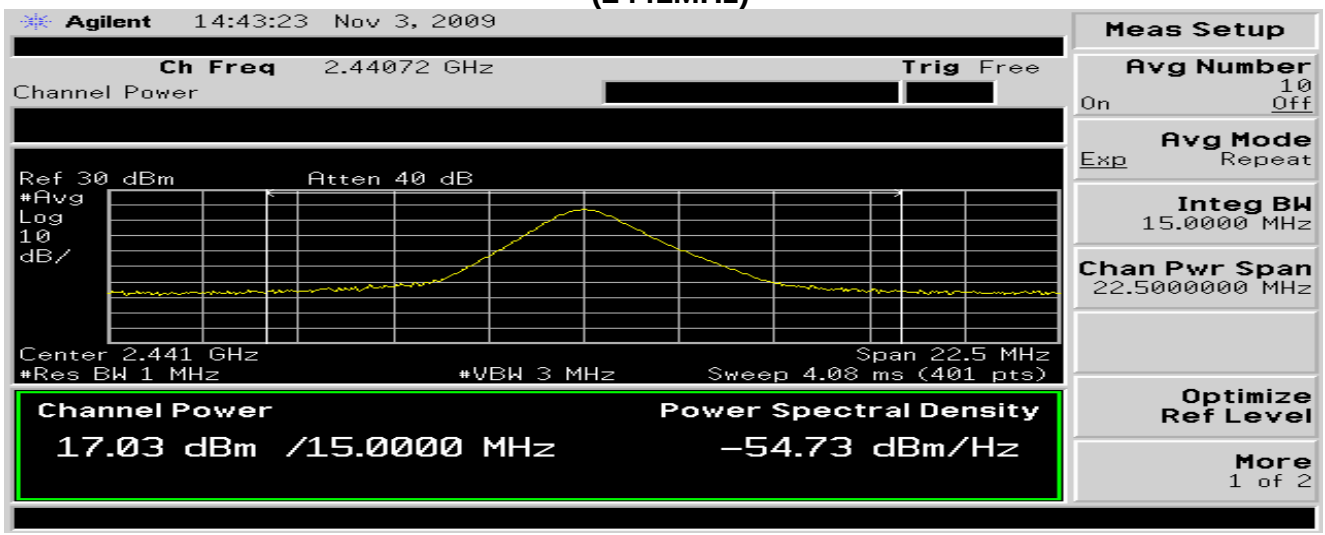
Frequency (MHz)	Result (dBm)	Limit	Pass / Fail
2404	19.32	<30dBm	Pass
2441	19.08	<30dBm	Pass
2479	18.72	<30dBm	Pass

Note : 1. Cable Loss = 2.05dB.
2. Result= Instrument reading value + Cable Loss.

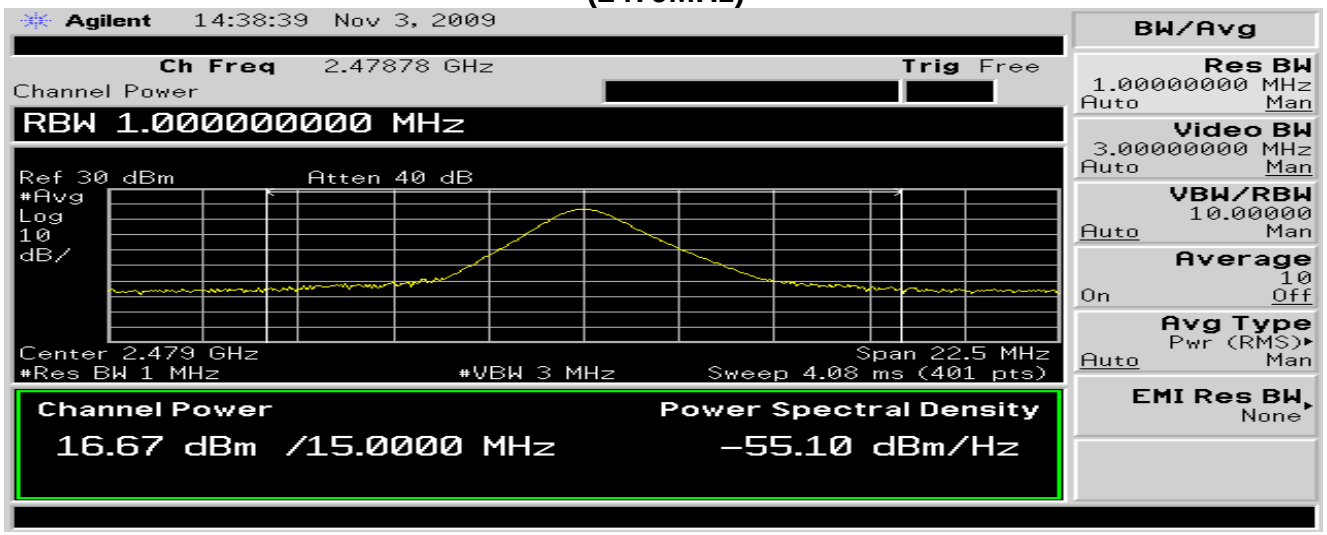
(2404MHz)



(2441MHz)



(2479MHz)


Agilent 14:38:39 Nov 3, 2009
Ch Freq 2.47878 GHz
Trig Free
Channel Power
RBW 1.000000000 MHz
Ref 30 dBm
Atten 40 dB
#Avg
Log
10
dB/
Center 2.479 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 22.5 MHz
Sweep 4.08 ms (401 pts)
Channel Power
16.67 dBm /15.0000 MHz
Power Spectral Density
-55.10 dBm/Hz
BW/Avg
Res BW
1.00000000 MHz
Auto Man
Video BW
3.00000000 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg Type
Pwr (RMS)
Auto Man
EMI Res BW
None

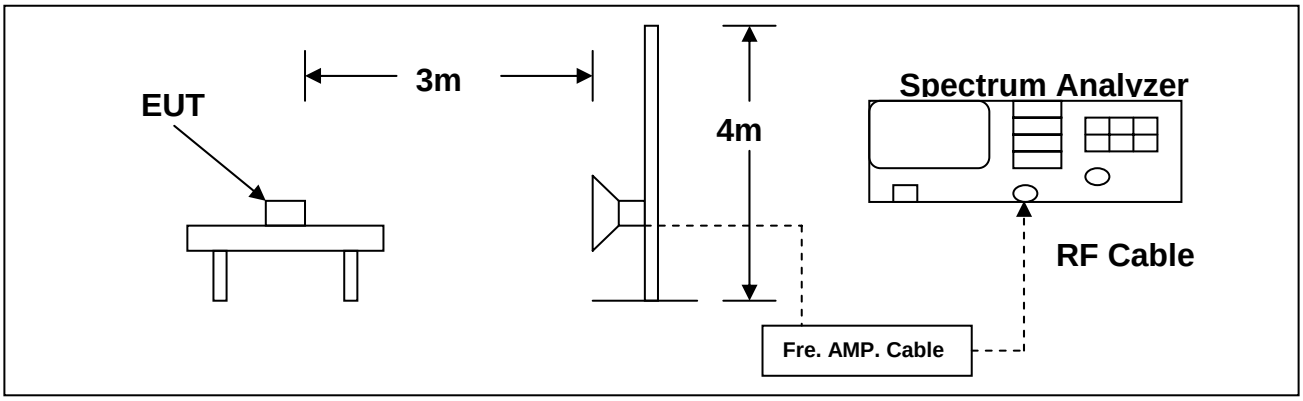
10. Band Edge and Conducted Spurious Emission

10.1 Test Condition & Setup :

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band edge frequency 2400 MHz and up to 2483.5 MHz.

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

10.2 Test Instruments Configuration:



10.3 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US44300422	E4446A	2009/05/25	2010/05/25
2.	TA	Pre Amplifier	RF01	0.10~19.1GHz 60dBm	2009/08/27	2010/08/27
3.	SCHWARZBECK	Horn Antenna	304	BBHA 9120 D	2009/09/15	2010/09/15

10.4 Test Result :

Radiated Emissions (HORIZONTAL) CH00						
Frequency (MHz)	**Amplitude (dBuV/m)**	**Ant. (m)**	**Table (Degree)**	**Duty (dB)**	**Limit (dBuV/m)**	**Margin (dB)**
2325.73	50.88 (PK)	1	350	0	74.00	-3.12
Radiated Emissions (VERTICAL) CH00						
Frequency (MHz)	**Amplitude (dBuV/m)**	**Ant. (m)**	**Table (Degree)**	**Duty (dB)**	**Limit (dBuV/m)**	**Margin (dB)**
2325.95	51.82 (PK)	1	100	0	74.00	-2.18

Radiated Emissions (HORIZONTAL) CH75						
Frequency (MHz)	**Amplitude (dBuV/m)**	**Ant. (m)**	**Table (Degree)**	**Duty (dB)**	**Limit (dBuV/m)**	**Margin (dB)**
2483.56	48.08 (PK)	1	260	0	74.00	-5.92
Radiated Emissions (VERTICAL) CH75						
Frequency (MHz)	**Amplitude (dBuV/m)**	**Ant. (m)**	**Table (Degree)**	**Duty (dB)**	**Limit (dBuV/m)**	**Margin (dB)**
2483.80	53.53 (PK)	1	330	0	74.00	-0.47

Notes : 1.Margin= Amplitude - Limits

2.Height of table for EUT placed: 0.8 Meter.

3.ANT= Antenna height.

4.Duty= Duty cycle correction factor.

5. Amplitude= Reading Amplitude – Amplifier gain+ Cable loss+ Antenna factor (Auto calculate in spectrum analyzer)

11. Radiated Emissions Requirements (Above 1GHz)

11.1 General Configuration:

Prior to open-field testing, the EUT was placed in a shielded enclosure and scanned at a close distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the open field tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, open-field test site. The EUT system was placed on a nonconductive turntable which was 0.8 meters height, top surface 1.0 x 1.5 meter. During the test, EUT was set to transmit continuously & measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting
the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvlt (dBuV) into field intensity in microvolts pre meter(uV/m).
The actual field intensity in decibels referenced to 1 microvolt in to field intensity in microcolts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

Amplitude (dBuV/m)= FI(dBuV)+AF(dBuV)+CL(dBuV)-Gain(dB)

FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(1) For fundamental frequency : Transmitter Output < +30dBm

(2) For spurious frequency : Spurious emission limits = fundamental emission limit /10

11.2 Test Equipment List:

Item	Mfr/Brand	Instruments	Serial No.	Model/Type No.	Calibrated Date	Next Cali. Date
1.	Agilent	Spectrum Analyzer	US44300422	E4446A	2009/05/25	2010/05/25
2.	TA	Pre Amplifier	RF01	0.10~19.1GHz 60dBm	2009/08/27	2010/08/27
3.	Herotek	Pre Amplifier	30690	A402-417	2009/09/11	2010/09/11
4.	SCHWARZBECK	Horn Antenna	181	BBHA 9170	2009/09/14	2010/09/14
5.	SCHWARZBECK	Horn Antenna	304	BBHA 9120 D	2009/09/15	2010/09/15

11.3 Test condition:

EUT tested in accordance with the specifications given by the manufacturer , and exercised in the most unfavorable manner.

Peak Measurement RBW set to 1MHz , VBW set to 1MHz

Average Measurement RBW set to 1MHz , VBW set to 10Hz

11.4 Radiated Emissions Limits:

Frequency range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

11.5 Measurement Data Of Radiated Emissions:

11.5.1 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

Test Mode : (2404MHz)

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)		Ant. (m)	Table (Deg.)	Duty (dB)	Factor (dB)	Limit (dBuV/m)	Margin (dB)
4810.0	89.47	53.02	PK	1	210	0	-36.45	74.00	-20.98
7210.0	80.72	48.98	PK	1	80	0	-31.74	74.00	-25.02
9616.0	61.54	34.41	PK	1	160	0	-27.13	74.00	-39.59
12024.0	68.66	39.02	PK	1	300	0	-29.64	74.00	-34.98
14424.0	62.87	36.87	PK	1	250	0	-26.00	74.00	-37.13
16824.0	54.40	33.67	PK	1	170	0	-20.73	74.00	-40.33

Radiated Emissions(VERTICAL)									
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)		Ant. (m)	Table (Deg.)	Duty (dB)	Factor (dB)	Limit (dBuV/m)	Margin (dB)
4810.0	89.65	53.20	PK	1	150	0	-36.45	74.00	-20.80
7210.0	79.20	47.46	PK	1	110	0	-31.74	74.00	-26.54
9616.0	63.52	36.39	PK	1	320	0	-27.13	74.00	-37.61
12024.0	72.58	42.94	PK	1	350	0	-29.64	74.00	-31.06
14424.0	59.80	33.80	PK	1	260	0	-26.00	74.00	-40.20
16824.0	53.61	32.88	PK	1	190	0	-20.73	74.00	-41.12

Notes : 1.Margin= Amplitude - Limits
2.Distance of Measurement : 3 Meter
3.Height of table for EUT placed: 0.8 Meter.
4.ANT= Antenna height.
5.Duty= Duty cycle correction factor.
6.Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
(Auto calculate in spectrum analyzer)
7.The other emission levels were very low against the limit.
8. Pre Amplifier (RF01) Gain :63dB to 69dB
9. Pre Amplifier (30690) Gain :38dB to 50dB

11.5.2 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

Test Mode : (2441MHz)

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)		Ant. (m)	Table (Deg.)	Duty (dB)	Factor (dB)	Limit (dBuV/m)	Margin (dB)
4876.0	87.36	50.87	PK	1	300	0	-36.49	74.00	-23.13
7318.0	75.37	43.39	PK	1	110	0	-31.98	74.00	-30.61
9766.0	59.71	32.72	PK	1	240	0	-26.99	74.00	-41.28
12200.0	63.68	33.76	PK	1	260	0	-29.92	74.00	-40.24
14648.0	62.64	35.88	PK	1	270	0	-26.76	74.00	-38.12
17088.0	54.31	34.07	PK	1	80	0	-20.24	74.00	-39.93

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)		Ant. (m)	Table (Deg.)	Duty (dB)	Factor (dB)	Limit (dBuV/m)	Margin (dB)
4876.0	89.54	53.05	PK	1	50	0	-36.49	74.00	-20.95
7318.0	76.34	44.36	PK	1	100	0	-31.98	74.00	-29.64
9766.0	60.94	33.95	PK	1	210	0	-26.99	74.00	-40.05
12200.0	68.87	38.95	PK	1	290	0	-29.92	74.00	-35.05
14648.0	61.27	34.51	PK	1	330	0	-26.76	74.00	-39.49

Notes : 1.Margin= Amplitude - Limits
2.Distance of Measurement : 3 Meter
3.Height of table for EUT placed: 0.8 Meter.
4.ANT= Antenna height.
5.Duty= Duty cycle correction factor.
6.Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor (Auto calculate in spectrum analyzer)
7.The other emission levels were very low against the limit.
8. Pre Amplifier (RF01) Gain :63dB to 69dB
9. Pre Amplifier (30690) Gain :38dB to 50dB

11.5.3 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

Test Mode : (2479MHz)

Radiated Emissions (HORIZONTAL)									
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)		Ant. (m)	Table (Deg.)	Duty (dB)	Factor (dB)	Limit (dBuV/m)	Margin (dB)
4960.0	87.91	51.42	PK	1	150	0	-36.49	74.00	-22.58
7438.0	71.27	39.85	PK	1	120	0	-31.42	74.00	-34.15
9910.0	57.66	31.73	PK	1	190	0	-25.93	74.00	-42.27
12400.0	58.68	28.60	PK	1	70	0	-30.08	74.00	-45.40
14864.0	59.97	33.29	PK	1	220	0	-26.68	74.00	-40.71
17344.0	51.04	31.19	PK	1	260	0	-19.85	74.00	-42.81

Radiated Emissions (VERTICAL)									
Frequency (MHz)	Read (dBuV/m)	Amplitude (dBuV/m)		Ant. (m)	Table (Deg.)	Duty (dB)	Factor (dB)	Limit (dBuV/m)	Margin (dB)
4960.0	89.76	53.27	PK	1	210	0	-36.49	74.00	-20.73
7438.0	72.04	40.62	PK	1	160	0	-31.42	74.00	-33.38
9910.0	57.25	31.32	PK	1	90	0	-25.93	74.00	-42.68
12400.0	63.53	33.45	PK	1	330	0	-30.08	74.00	-40.55
14864.0	59.63	32.95	PK	1	290	0	-26.68	74.00	-41.05

Notes : 1.Margin= Amplitude - Limits
2.Distance of Measurement : 3 Meter
3.Height of table for EUT placed: 0.8 Meter.
4.ANT= Antenna height.
5.Duty= Duty cycle correction factor.
6.Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor (Auto calculate in spectrum analyzer)
7.The other emission levels were very low against the limit.
8. Pre Amplifier (RF01) Gain :63dB to 69dB
9. Pre Amplifier (30690) Gain :38dB to 50dB

12. Antenna Requirements

12.1 Standard Applicable :

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

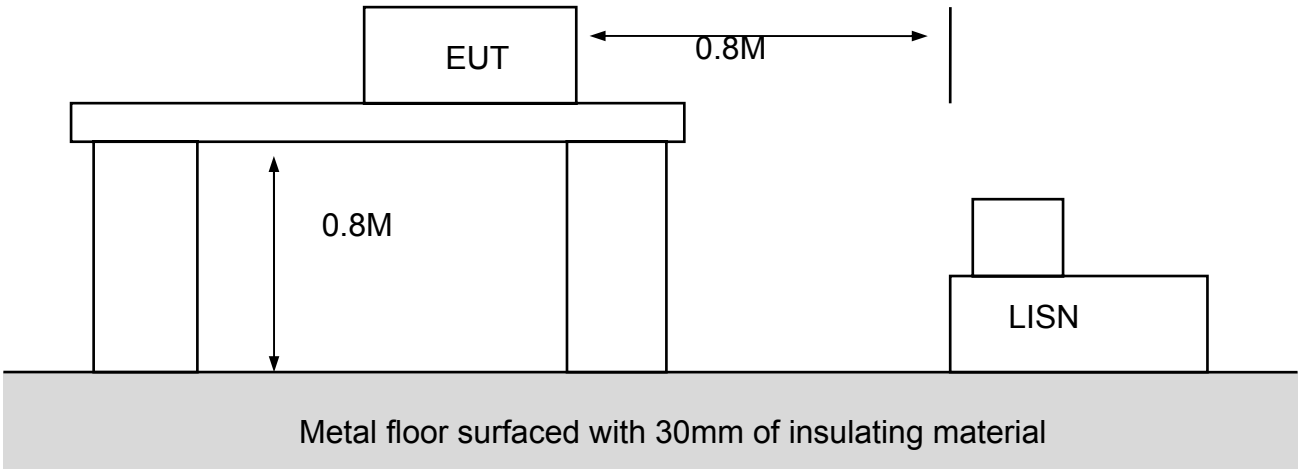
And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

12.2 Antenna Construction

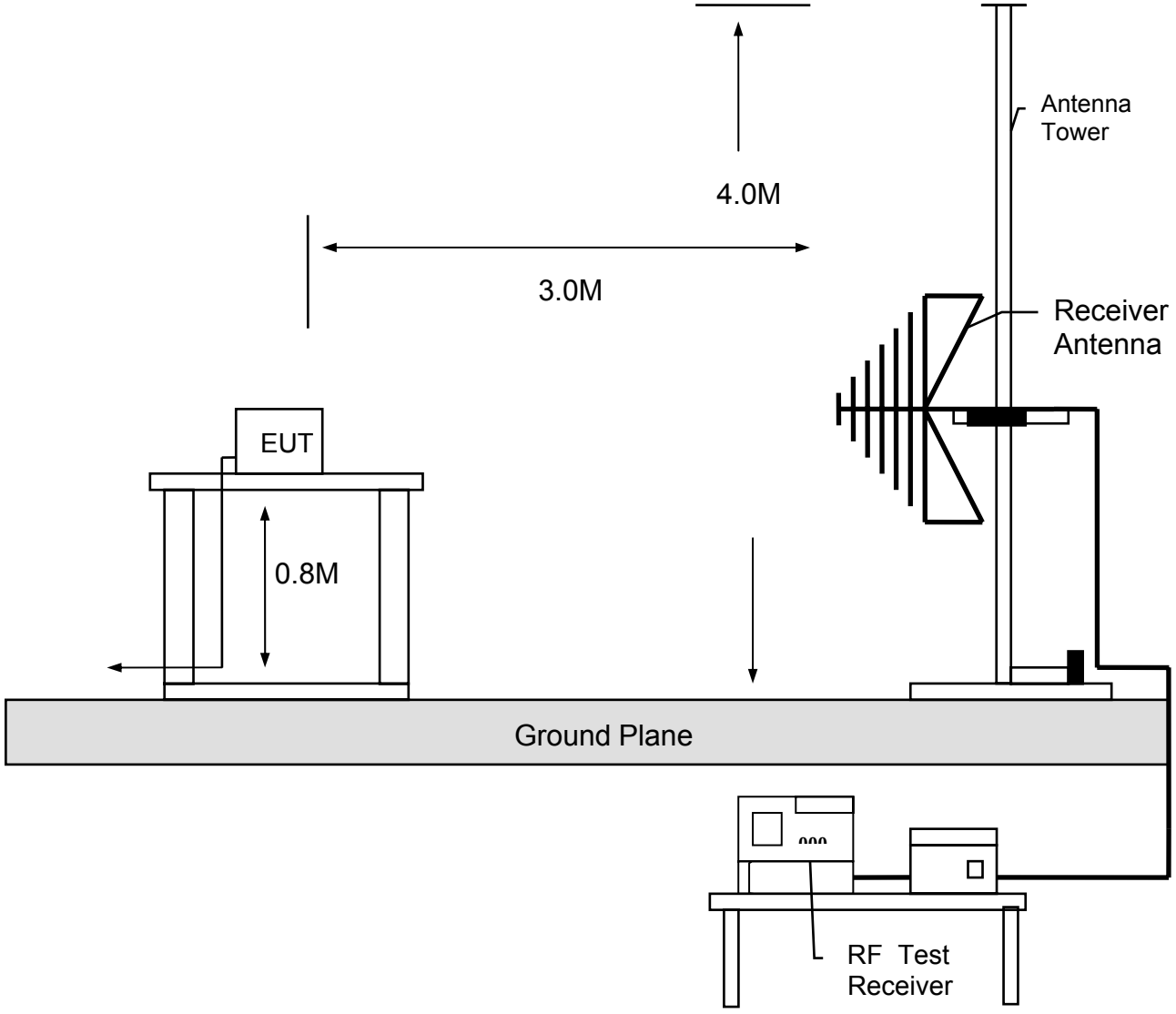
ANT TYPE	GAIN	type of connector
1/4 λ DIPOLE antenna	2.0 dBi	Reverse SMA

Appendix I- EUT Test SETUP

MEASUREMENT OF POWER LINE CONDUCTED RFI VOLTAGE



MEASUREMENT OF RADIATED EMISSION



Appendix II - (Brand / Trade Name & Model No. Multiple Listee)

Model No.	Trade Name
N/A	N/A