TEST REPORT

of

FCC Part 15 Subpart B & C

Product : **GT Bluetooth Mouse**

Model: **KOV-GTM-B**

Applicant: **KeyOvation LLC**

Address: **1101 Arrow Point Drive Bldg. 4,**
Suite #401 Cedar Park,
Texas, United States78613

Manufacturer: **Datacomp Electronics Co., Ltd.**

Test Performed by:

International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; TAF: 0997; IC: IC4067B-1;
VCCI: R-1435, C-1440, T-1676, G-17, R-2598, C-2845, T-1464, G-16, G-211
NEMKO: ELA 113B
*Address:
No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-10LR036FC**
Issue Date : **10/20/2010**

This report totally contains 91 pages including this cover page and contents page.

Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247)
Test Procedure:	ANSI C63.4:2003
Equipment Tested:	GT Bluetooth Mouse
Model:	KOV-GTM-B
Applicant:	KeyOvation LLC
Manufacturer :	Datacomp Electronics Co., Ltd.
Sample received Date:	10/1/2010
Final test Date:	refer to the date of test data
Test Site:	International Standards Laboratory
Test Distance:	3M
Temperature:	refer to each site test data
Humidity:	refer to each site test data
Input power:	Conduction input power: DC 3 V Radiation input power: DC 3 V
Test Result:	PASS
Report Engineer:	Daphne Liu
Test Engineer:	Scott Chien Scott Chien
Approved By:	Jim Chu / Director

2. Test Results Summary

The Bluetooth functions of EUT has been tested according to **ANSI C63.4, 2003** and FHSS test procedure of FCC Public Notice **DA00-705** for compliance to FCC 47CFR 15.247 requirements which listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207(a)	AC Power Line Emissions	-----	
15.247(b) (1)	Max. Peak Output Power	Pass	
15.209(a)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247(d)	Conducted Emissions 30MHz – 25G Hz	Pass	
15.247 (d)	Band Edge Measurement	Pass	
15.247(a)(1)(iii)	Number of Hopping Frequency Used	Pass	
15.247(a) (1)(ii)	Spectrum Bandwidth Of FHSS device	Pass	
15.247(a)(1)	Hopping Channel Separation	Pass	
15.247(a)(1)(iii)	Dwell Time	Pass	

2.1 Description of EUT

EUT

Description:	GT Bluetooth Mouse
Condition:	Pre-Production
Model:	KOV-GTM-B
FCC ID:	**YVL-KOVGTMBT**
Serial number:	N/A
Battery port:	one
Power:	From DC battery (AAA) 1.5V x2 supply

Frequency Range of Bluetooth:	2400 - 2483.5 MHz
Support channel:	79 Channels
Modulation Skill:	GFSK (1Mbps) DQPSK(2Mbps), 8DPSK(3Mbps)

The channels and the operation frequency of Bluetooth listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	2402	01	2403
02	2404	03	2405
04	2406	05	2407
……			
75	2477	76	2478
77	2479	78	2480

Antennas Type:

Bluetooth:	Printed on PCB
Antenna Connected:	The antenna printed on the PCB of the Bluetooth module .The user is not possible to change the antenna without disassembling the EUT.
Antenna Gain:	0.54 dBi.
Power Type of BT module:	Fixture supply voltage

2.2 Description of Support Equipment

No	Unit	Model / Serial No.	Brand	Power Cord	FCC ID
1	Notebook Personal Computer	Latitude D620 S/N:N/A	DELL	Non-shielded Detachable	FCC DOC

2.3 Software for Controlling Support Unit

During the test, the EUT is connected to a notebook PC which excutes the RF software to make the transmitter continuously send RF signals.

	Filename	Issued Date
Bluetooth	EDR_RF_test_Customer_080812.exe	08/12/2008

2.3.1 I/O Cable Condition of EUT and Support Units

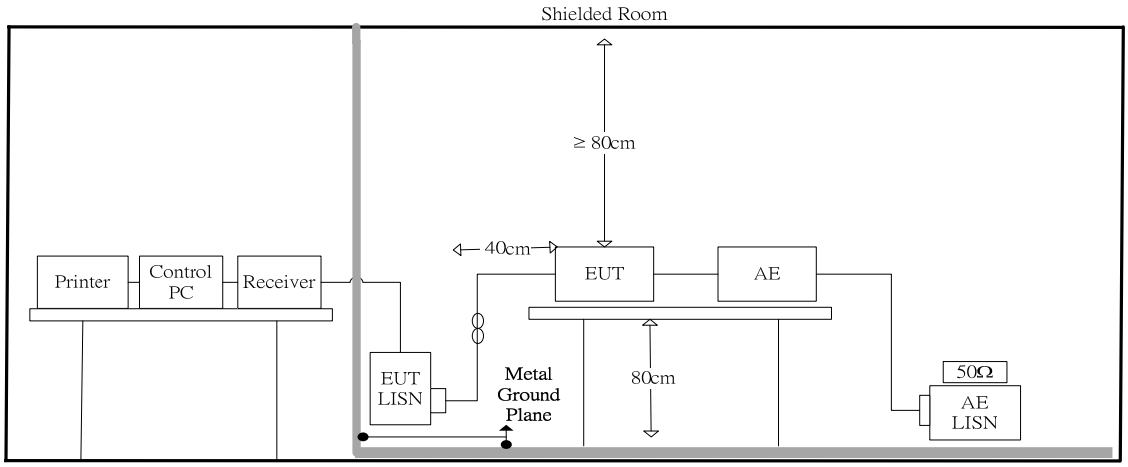
Description	Path	Cable Length	Cable Type	Connector Type
RS232 Cable	NB RS232 port to EUT RS232 connect	0.5M	Non-shielded, Detachable	Plastic Head

3. TEST RESULTS (Bluetooth)

3.1 Powerline Conducted Emissions

3.1.1 Test Setup and Procedure

3.1.2 Test Setup



3.1.3 Test Procedure

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

3.1.4 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz~30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

****Remarks: It is not necessary to be tested in this item.**

3.2 FHSS Maximum Peak Output Power

3.2.1 Test Procedure

The Transmitter output of EUT was connected to the peak power analyzer.

3.2.2 Test Setup

3.2.3 Test Data

Maximum Peak Output Power

1 Mbps Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
00	**2402**	-4.40	1.10	0.47	-3.30	30	Pass
39	**2441**	-3.70	1.10	0.55	-2.60	30	Pass
78	**2480**	-3.31	1.10	0.60	-2.21	30	Pass

2 Mbps Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

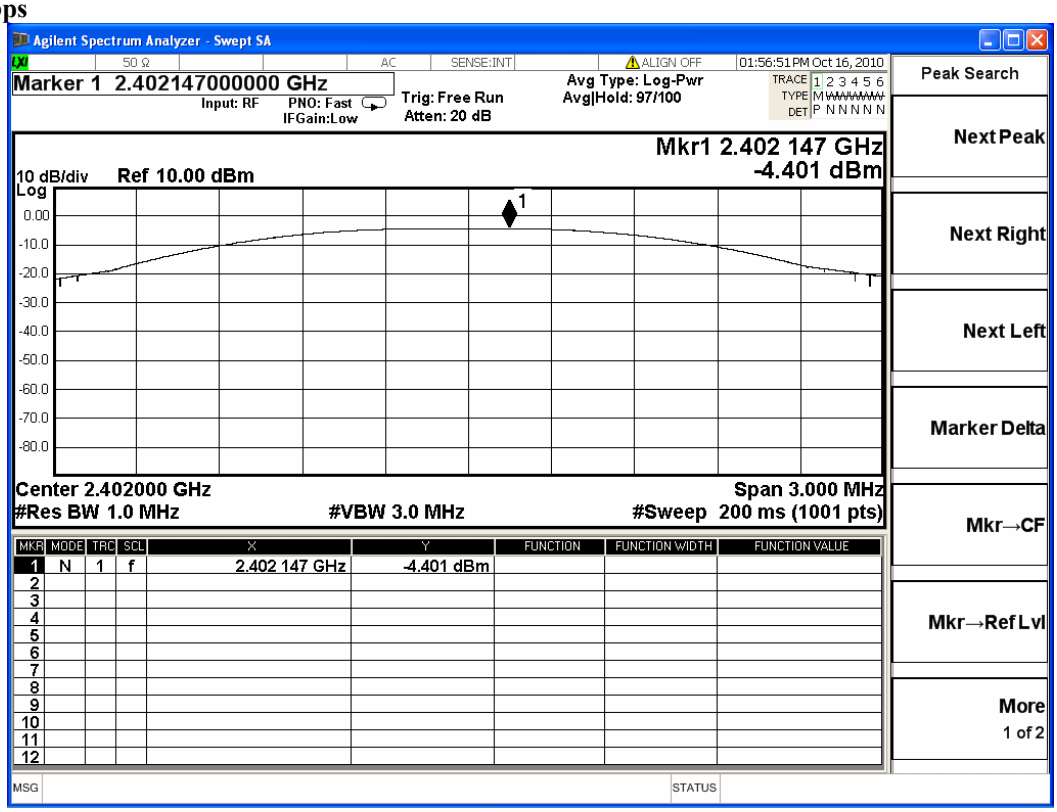
Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
00	**2402**	-4.40	1.10	0.47	-3.30	30	Pass
39	**2441**	-3.74	1.10	0.54	-2.64	30	Pass
78	**2480**	-3.27	1.10	0.61	-2.17	30	Pass

3 Mbps Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
00	**2402**	-4.21	1.10	0.49	-3.11	30	Pass
39	**2441**	-3.62	1.10	0.56	-2.52	30	Pass
78	**2480**	-3.17	1.10	0.62	-2.07	30	Pass

1 Mbps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50 Ω
AC
SENSE:INT
ALIGN OFF
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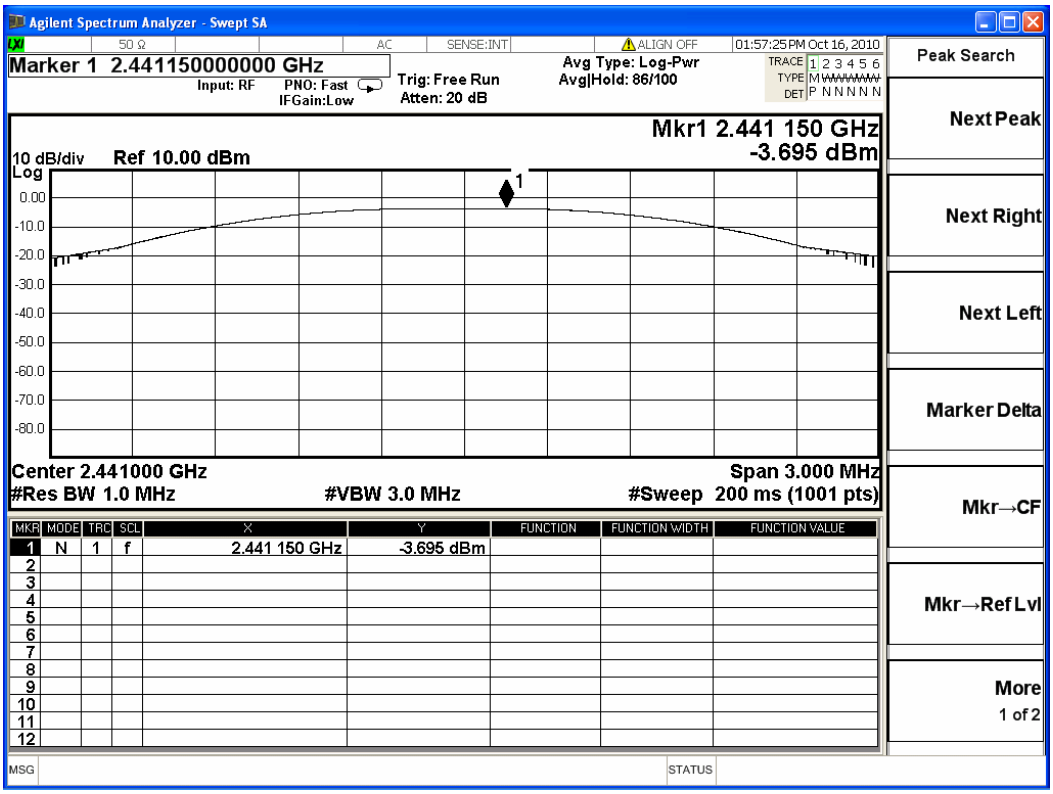
Marker 1 2.402147000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 97/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.402 147 GHz
-4.401 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.402000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.402 147 GHz -4.401 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS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50 Ω
AC
SENSE:INT
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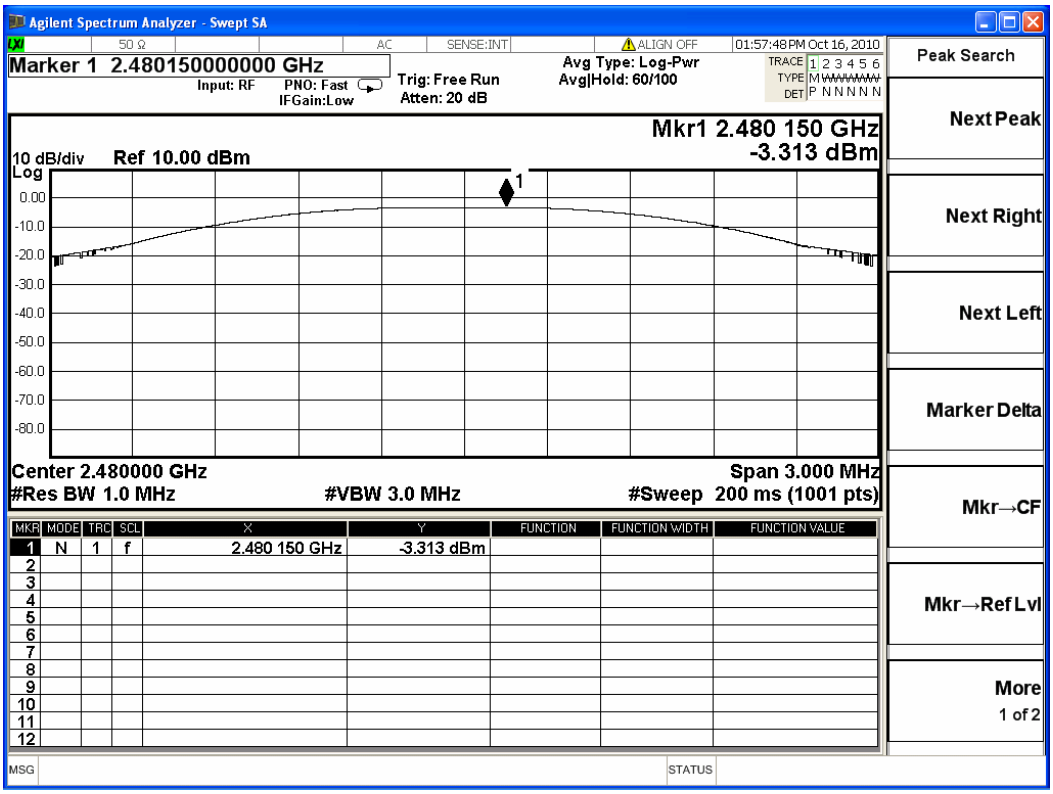
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 86/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.441 150 GHz
-3.695 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.441 150 GHz -3.695 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS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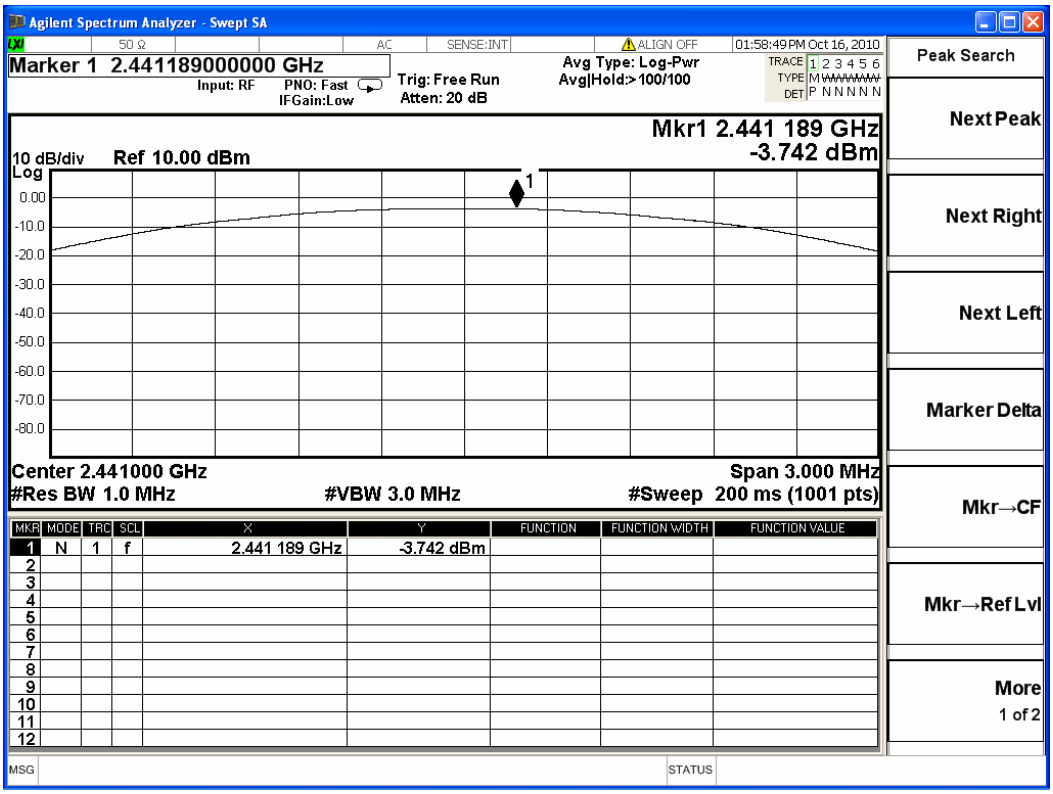
Marker 1 2.480150000000 GHz
Input: RF PNO: Fast IFGain:Low
Trig: Free Run Atten: 20 dB
Avg Type: Log-Pwr Avg|Hold: 60/100
01:57:48 PM Oct 16, 2010
Mkr1 2.480 150 GHz -3.313 dBm
10 dB/div Ref 10.00 dBm
Log
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
1 N 1 f 2.480 150 GHz -3.313 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More 1 of 2

2 Mbps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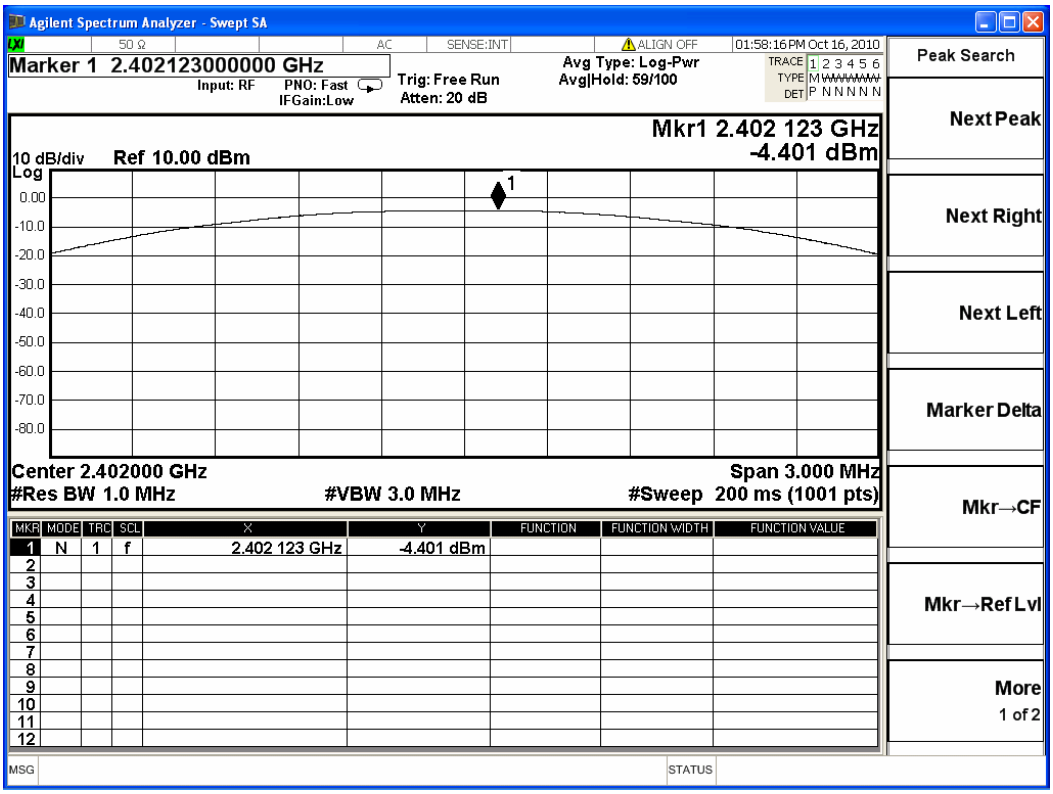
Marker 1 2.441189000000 GHz
Input: RF PNO: Fast IFGain:Low
Trig: Free Run Atten: 20 dB
Avg Type: Log-Pwr Avg|Hold:>100/100
01:58:49 PM Oct 16, 2010
Mkr1 2.441 189 GHz -3.742 dBm
10 dB/div Ref 10.00 dBm
Log
Center 2.441000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
1 N 1 f 2.441 189 GHz -3.742 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More 1 of 2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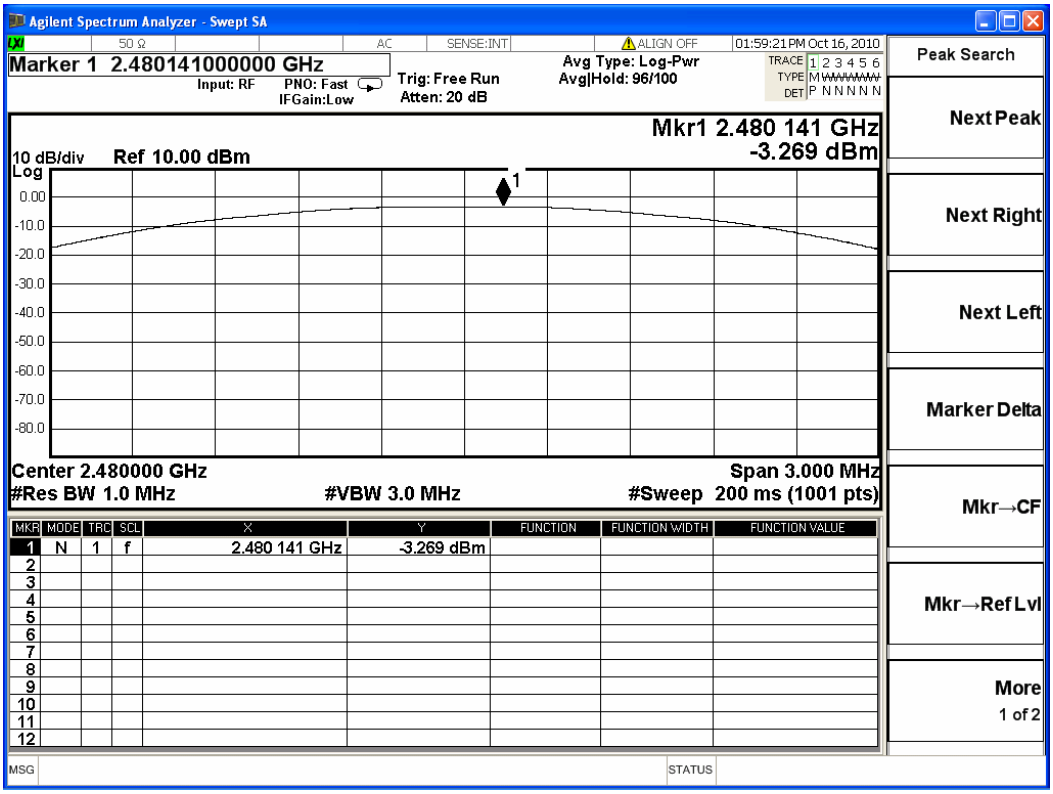
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 2.402 123 GHz
-4.401 dBm
10 dB/div
Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.402000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.402 123 GHz -4.401 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS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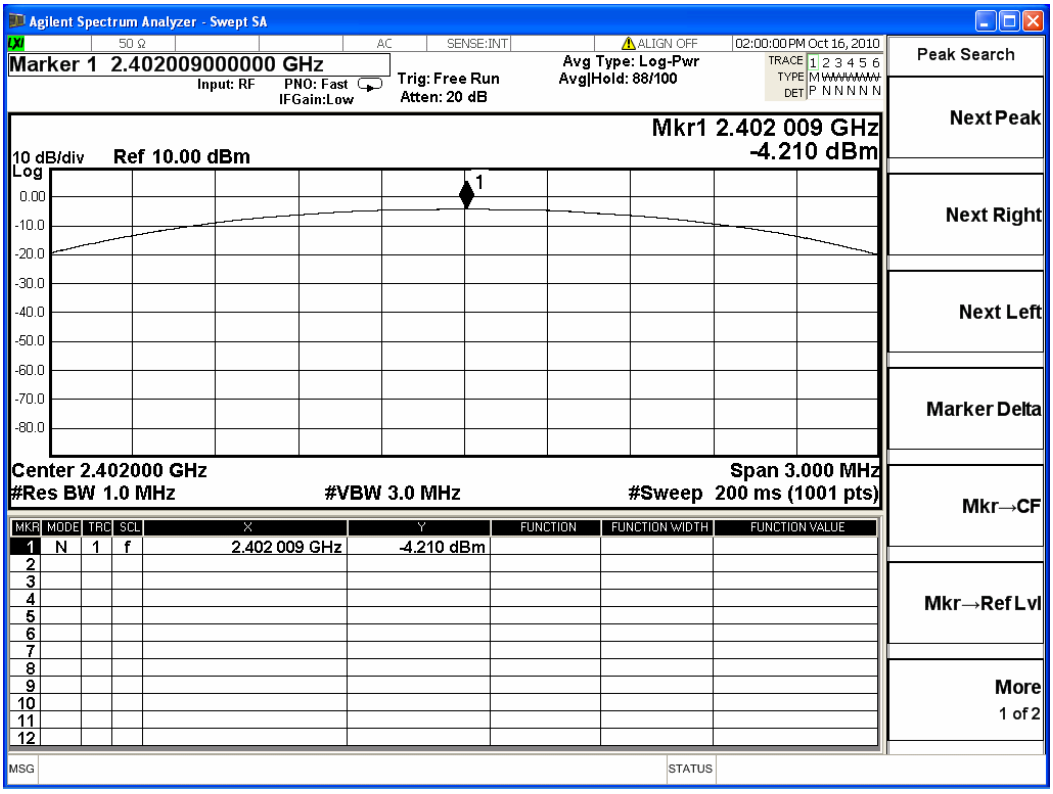
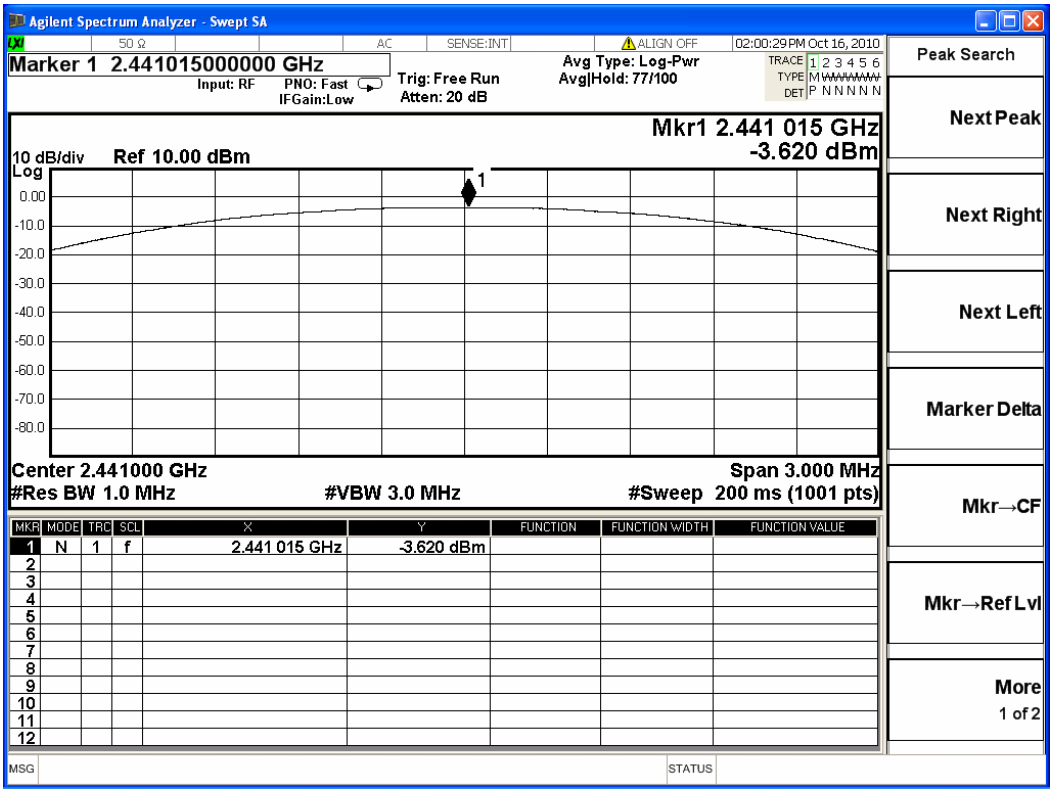
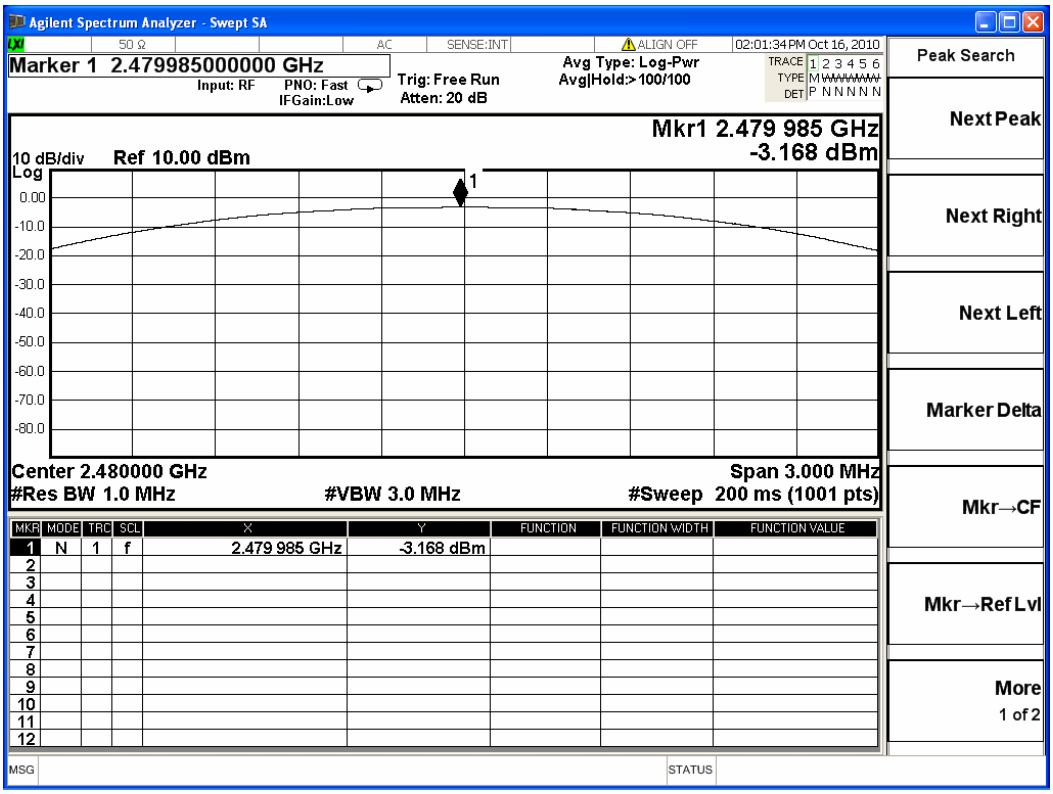
50 Ω
AC
SENSE:INT
ALIGN OFF
01:59:21 PM Oct 16, 2010
Marker 1 2.480141000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 96/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 2.480 141 GHz
-3.269 dBm
10 dB/div
Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.480 141 GHz -3.269 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

3 Mbps


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN OFF
02:00:00 PM Oct 16, 2010
Marker 1 2.402009000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 88/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.402 009 GHz
-4.210 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.402000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.402 009 GHz -4.210 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN OFF
02:00:29 PM Oct 16, 2010
Marker 1 2.441015000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 77/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.441 015 GHz
-3.620 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.441 015 GHz -3.620 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
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ALIGN OFF
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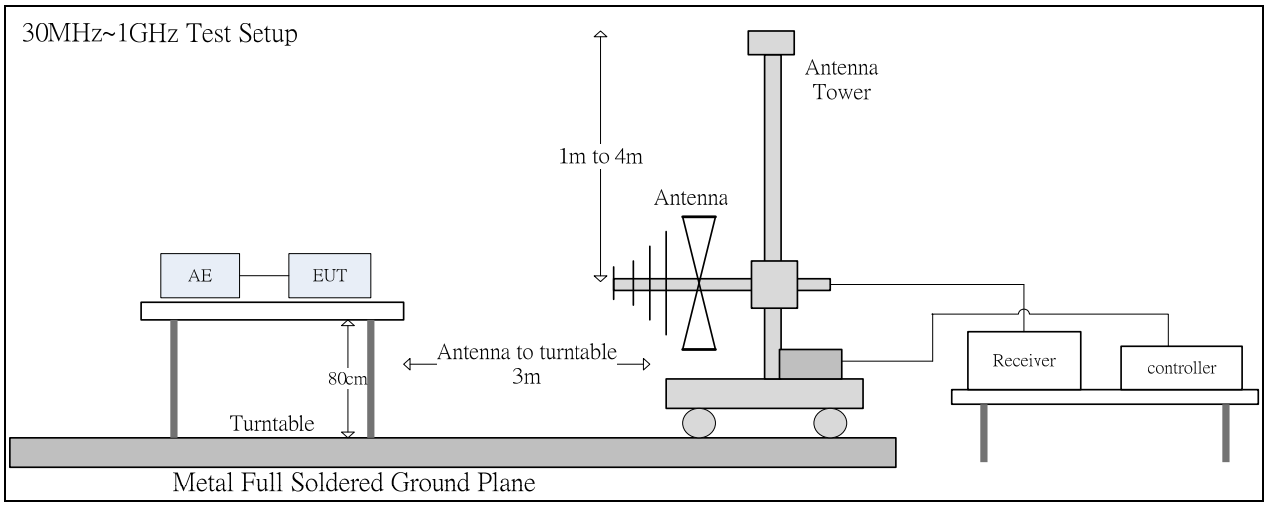
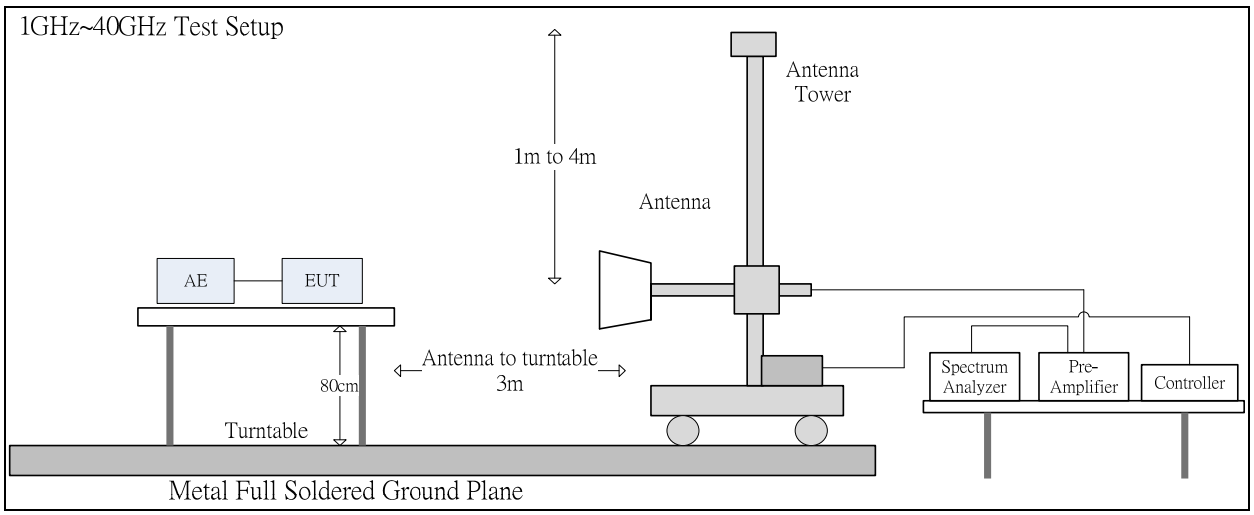
Marker 1 2.479985000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.479 985 GHz
-3.168 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.000 MHz
#Sweep 200 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.479 985 GHz -3.168 dBm
Peak Search
Next Peak
Next Right
Next Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

3.3 Radiated Emission Measurement

3.4 Test Setup and Procedure

3.4.1 Test Setup





3.4.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. We found the maximum readings by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured.

30M to 1GHz: The highest emissions between 30 MHz to 1000 MHz were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

1GHz – 25GHz: The highest emissions were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in peak mode to determine the precise amplitude of the emission. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission. During test the EMI receiver and spectrum was setup according to EMI Receiver/Spectrum Analyzer Configuration.

For the test of 2nd to 10th harmonics frequencies, the equipment setup was also referred to EMI Receiver/Spectrum Analyzer Configuration. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

3.4.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

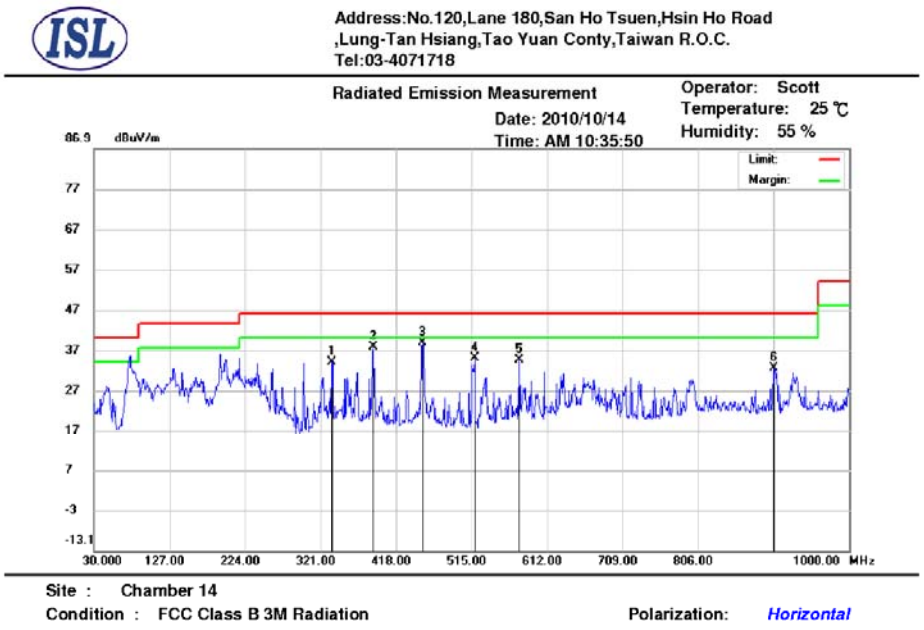
Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	1K Hz

3.4.4 Test Data (30MHz – 1GHz):

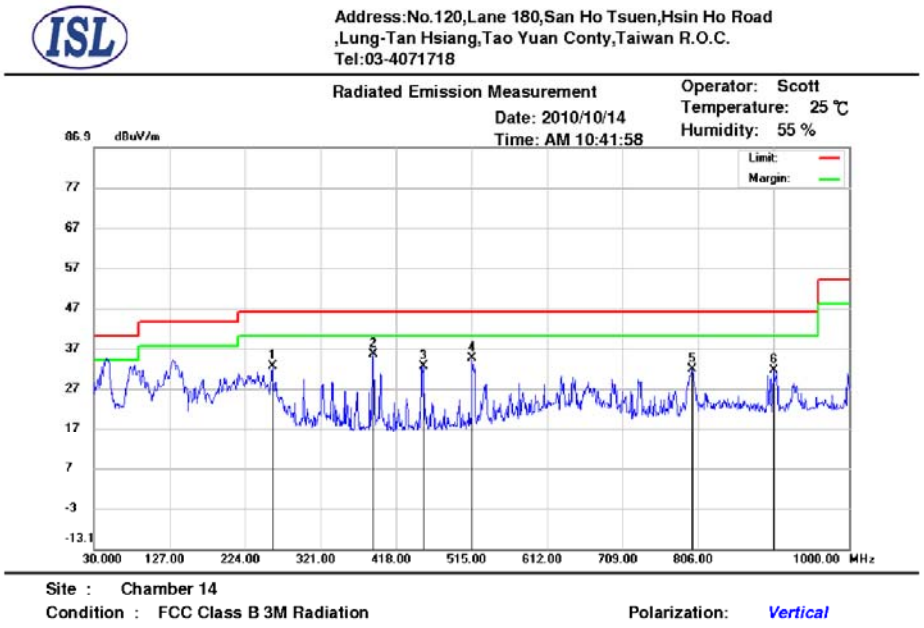
30M – 1GHz Open Field Radiated Emissions (Horizontal) Channel 00, 39, 78



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	335.5500	52.17	14.8	1.07	34.09	33.95	46.00	-12.05	318	81	peak
2	388.9000	54.25	16.21	1.18	33.78	37.86	46.00	-8.14	239	291	peak
3	451.9500	54.05	17.12	1.3	33.73	38.74	46.00	-7.26	320	203	peak
4	518.8800	49.28	18.08	1.34	33.71	34.99	46.00	-11.01	100	47	peak
5	576.1100	47.75	18.86	1.45	33.64	34.42	46.00	-11.58	100	161	peak
6	903.0000	41.98	21.53	1.81	32.86	32.46	46.00	-13.54	272	30	peak

*:Maximum data x:Over limit !:over margin

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 00, 39, 78



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	258.9200	52.44	13.51	1	34.4	32.55	46.00	-13.45	100	25	peak
2	388.9000	51.93	16.21	1.18	33.78	35.54	46.00	-10.46	274	43	peak
3	453.8900	47.87	17.15	1.3	33.73	32.59	46.00	-13.41	389	212	peak
4	515.9700	48.79	18.02	1.33	33.71	34.43	46.00	-11.57	241	352	peak
5	798.2400	42.47	20.58	1.7	32.96	31.79	46.00	-14.21	369	128	peak
6	903.0000	40.98	21.53	1.81	32.86	31.46	46.00	-14.54	273	328	peak

*:Maximum data x:Over limit !:over margin

NOTE:

¬ During the Pre-test, the EUT has been tested for Channel 00, 39, 78 transmit from Main and Aux antenna respectively to get all the critical emission frequencies. In the final test all the critical emission frequencies has been tested and the test data are listed above.

¬ Margin = Corrected Amplitude – Limit

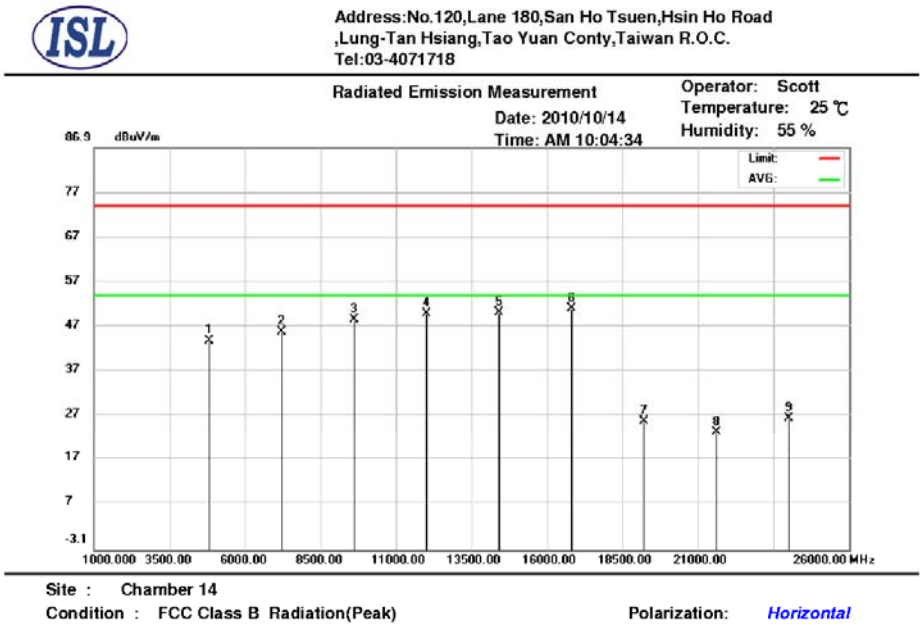
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 30MHz to 1GHz have been tested

3.4.5 Test Data (1GHz – 25 GHz)

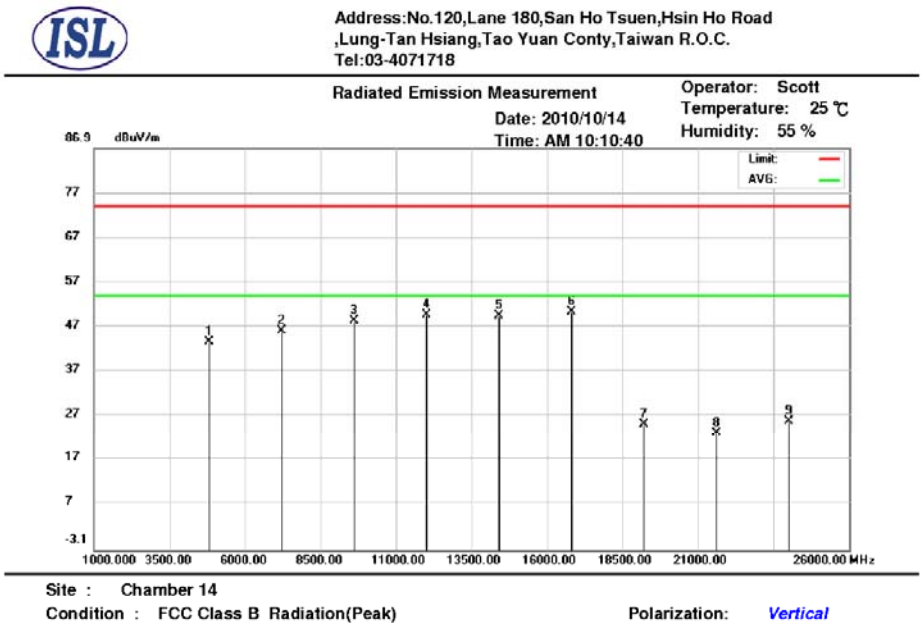
1GHz~ 25 GHz (Horizontal), Channel 00: 2402 MHz



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	4802.000	53.18	34.64	3.42	47.32	43.92	74.00	-30.08	159	104	peak
2	7206.000	51.95	36.08	4.18	46.34	45.87	74.00	-28.13	378	71	peak
3	9608.000	50.00	37.11	4.92	43.56	48.47	74.00	-25.53	100	301	peak
4	12010.000	48.23	39.3	5.6	43.31	49.82	74.00	-24.18	343	90	peak
5	14412.000	51.00	39.76	6	46.56	50.20	74.00	-23.80	100	27	peak
6	16814.000	49.10	42.17	6.66	46.89	51.04	74.00	-22.96	208	135	peak
7	19216.000	44.78	23.84	5.7	48.43	25.89	74.00	-48.11	309	19	peak
8	21618.000	39.01	24.48	6.02	46.26	23.25	74.00	-50.75	100	71	peak
9	24020.000	40.43	24.7	6.4	45.1	26.43	74.00	-47.57	273	324	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Channel 00: 2402 MHz



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	4803.940	52.80	34.64	3.42	47.32	43.54	74.00	-30.46	254	291	peak
2	7206.000	52.13	36.08	4.18	46.34	46.05	74.00	-27.95	385	51	peak
3	9606.000	49.78	37.11	4.92	43.56	48.25	74.00	-25.75	124	240	peak
4	12010.000	47.97	39.3	5.6	43.31	49.56	74.00	-24.44	196	157	peak
5	14412.000	50.24	39.76	6	46.56	49.44	74.00	-24.56	100	321	peak
6	16814.000	48.36	42.17	6.66	46.89	50.30	74.00	-23.70	200	193	peak
7	19216.000	43.96	23.84	5.7	48.43	25.07	74.00	-48.93	323	150	peak
8	21618.000	38.81	24.48	6.02	46.26	23.05	74.00	-50.95	192	130	peak
9	24020.000	39.81	24.7	6.4	45.1	25.81	74.00	-48.19	199	282	peak

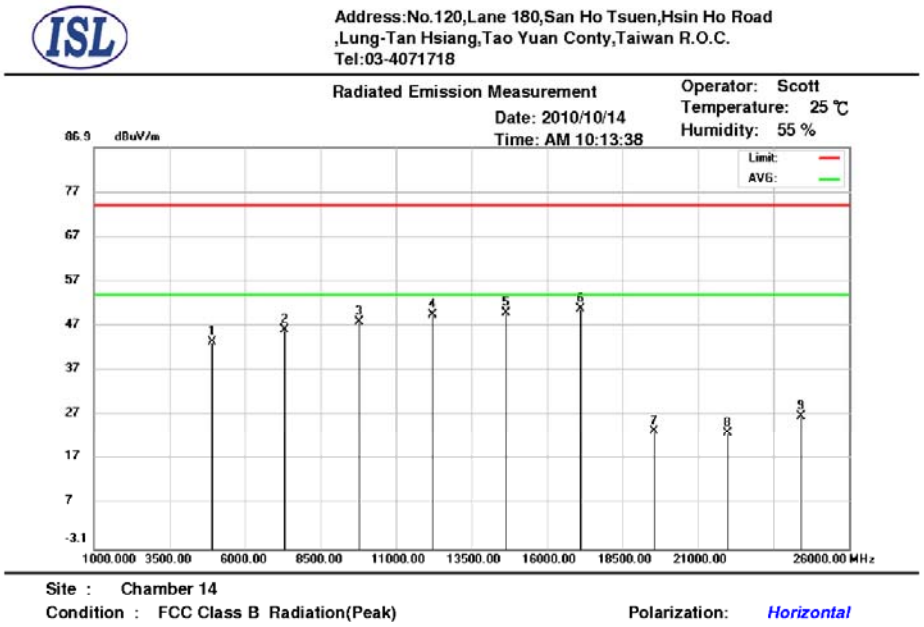
*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, Where limits are specified by agencies for both average and peak (or quasi-peak) detection, if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- " * ": Fundamental Frequency, "**": Not in the restricted band, Limit level=Fundamental Emission-20dB
- " pk": peak mode, "av": average mode
- "---": No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 39: 2441 MHz

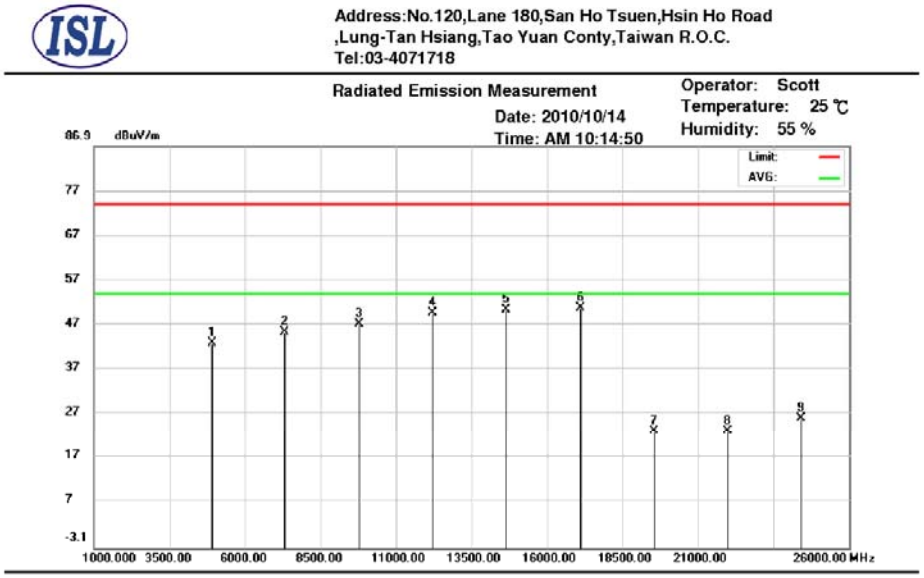


Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	4882.000	52.71	34.62	3.45	47.35	43.43	74.00	-30.57	100	299	peak
2	7323.000	52.06	36.01	4.23	46.24	46.06	74.00	-27.94	300	121	peak
3	9764.000	49.21	37.26	4.95	43.49	47.93	74.00	-26.07	280	138	peak
4	12205.000	47.94	39.34	5.64	43.5	49.42	74.00	-24.58	211	335	peak
5	14646.000	50.66	40.02	6.06	46.79	49.95	74.00	-24.05	108	313	peak
6	17087.000	48.50	41.96	6.73	46.49	50.70	74.00	-23.30	100	21	peak
7	19528.000	41.88	23.91	5.71	48.17	23.33	74.00	-50.67	185	84	peak
8	21969.000	38.18	24.41	6.09	45.84	22.84	74.00	-51.16	341	300	peak
9	24410.000	40.72	24.7	6.48	45.1	26.80	74.00	-47.20	100	102	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical) Channel 39: 2441 MHz

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road
,Lung-Tan Hsiang,Tao Yuan Conty,Taiwan R.O.C.
Tel:03-4071718



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	4881.960	52.16	34.62	3.45	47.35	42.88	74.00	-31.12	191	65	peak
2	7323.000	51.36	36.01	4.23	46.24	45.36	74.00	-28.64	379	341	peak
3	9764.000	48.49	37.26	4.95	43.49	47.21	74.00	-26.79	335	283	peak
4	12205.000	48.24	39.34	5.64	43.5	49.72	74.00	-24.28	100	208	peak
5	14646.000	50.97	40.02	6.06	46.79	50.26	74.00	-23.74	100	343	peak
6	17087.000	48.65	41.96	6.73	46.49	50.85	74.00	-23.15	268	304	peak
7	19528.000	41.77	23.91	5.71	48.17	23.22	74.00	-50.78	100	40	peak
8	21969.000	38.41	24.41	6.09	45.84	23.07	74.00	-50.93	173	68	peak
9	24410.000	40.05	24.7	6.48	45.1	26.13	74.00	-47.87	261	88	peak

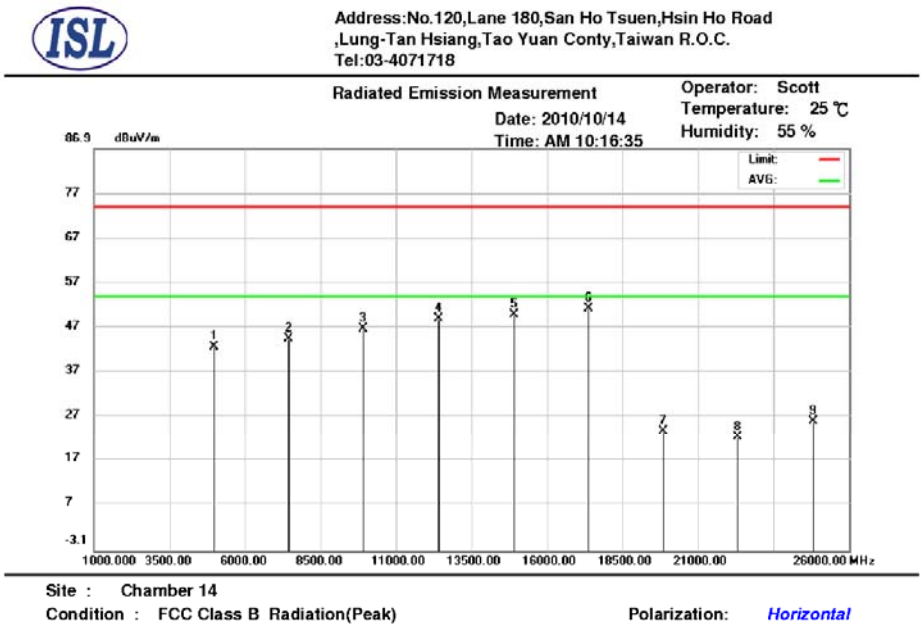
*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used:Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- " * ": Fundamental Frequency, "**": Not in the restricted band, Limit level=Fundamental Emission-20dB
- " pk": peak mode, "av": average mode
- "---": No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 78: 2480 MHz

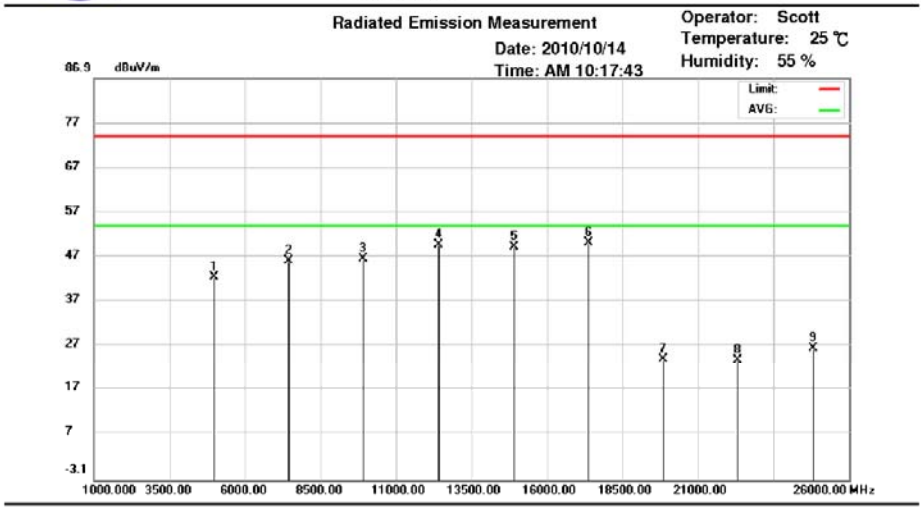


Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	4960.000	52.03	34.61	3.48	47.38	42.74	74.00	-31.26	383	339	peak
2	7440.000	50.41	35.94	4.28	46.15	44.48	74.00	-29.52	367	41	peak
3	9920.000	47.80	37.42	4.98	43.43	46.77	74.00	-27.23	110	64	peak
4	12400.000	47.64	39.38	5.68	43.7	49.00	74.00	-25.00	243	305	peak
5	14880.000	50.54	40.2	6.15	46.93	49.96	74.00	-24.04	109	115	peak
6	17360.000	48.65	41.52	6.84	45.84	51.17	74.00	-22.83	394	256	peak
7	19840.000	41.95	24.04	5.77	47.86	23.90	74.00	-50.10	305	64	peak
8	22320.000	37.67	24.46	6.1	45.74	22.49	74.00	-51.51	124	213	peak
9	24800.000	40.05	24.58	6.56	45.1	26.09	74.00	-47.91	126	138	peak

*:Maximum data x:Over limit !:over margin

1GHz~ 25 GHz (Vertical), Channel 78 : 2480 MHz

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road
,Lung-Tan Hsiang,Tao Yuan Conty,Taiwan R.O.C.
Tel:03-4071718



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	4959.890	51.72	34.61	3.48	47.38	42.43	74.00	-31.57	128	125	peak
2	7440.000	51.96	35.94	4.28	46.15	46.03	74.00	-27.97	355	229	peak
3	9920.000	47.62	37.42	4.98	43.43	46.59	74.00	-27.41	284	77	peak
4	12400.000	48.21	39.38	5.68	43.7	49.57	74.00	-24.43	113	43	peak
5	14880.000	49.89	40.2	6.15	46.93	49.31	74.00	-24.69	136	247	peak
6	17360.000	47.62	41.52	6.84	45.84	50.14	74.00	-23.86	100	79	peak
7	19840.000	42.16	24.04	5.77	47.86	24.11	74.00	-49.89	199	215	peak
8	22320.000	39.05	24.46	6.1	45.74	23.87	74.00	-50.13	100	358	peak
9	24800.000	40.51	24.58	6.56	45.1	26.55	74.00	-47.45	391	60	peak

*:Maximum data x:Over limit !:over margin

Note:

- According to the standards used, Where limits are specified by agencies for both average and peak (or quasi-peak) detection, if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- " * ": Fundamental Frequency, "**": Not in the restricted band, Limit level=Fundamental Emission-20dB
- " pk": peak mode, "av": average mode
- "---": No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

3.5 Conducted Emissions Measurement

3.5.1 Test Procedure

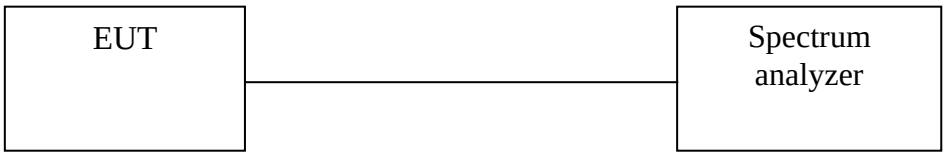
Conducted

1. The transmitter output of EUT was connected to the spectrum analyzer.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   RBW: 100KHz
   VBW: 100KHz
   Frequency: 30MHz ~ 25GHz.
   Sweep time: auto
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed

3.5.2 Test Setup

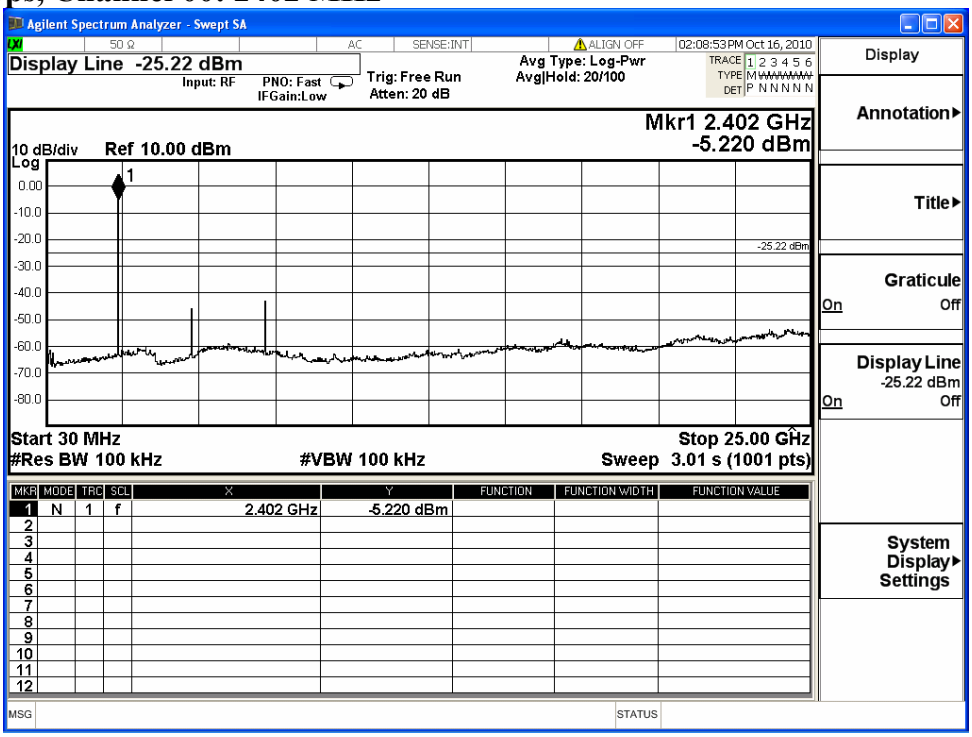
Conducted

Condition 1:

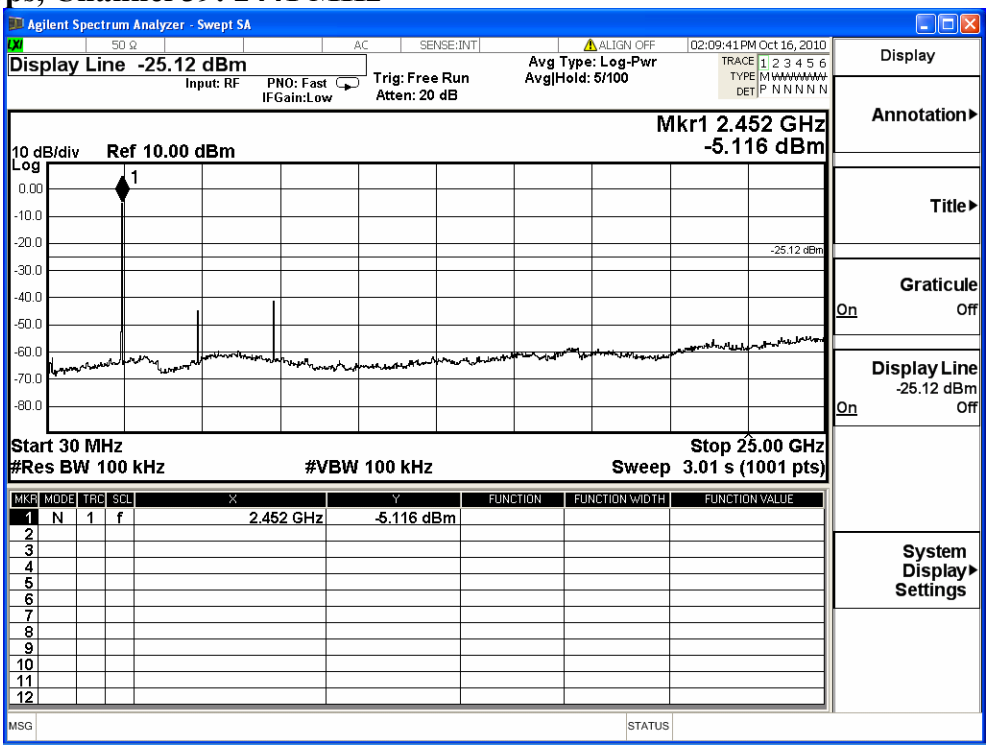


3.5.3 Test Data:

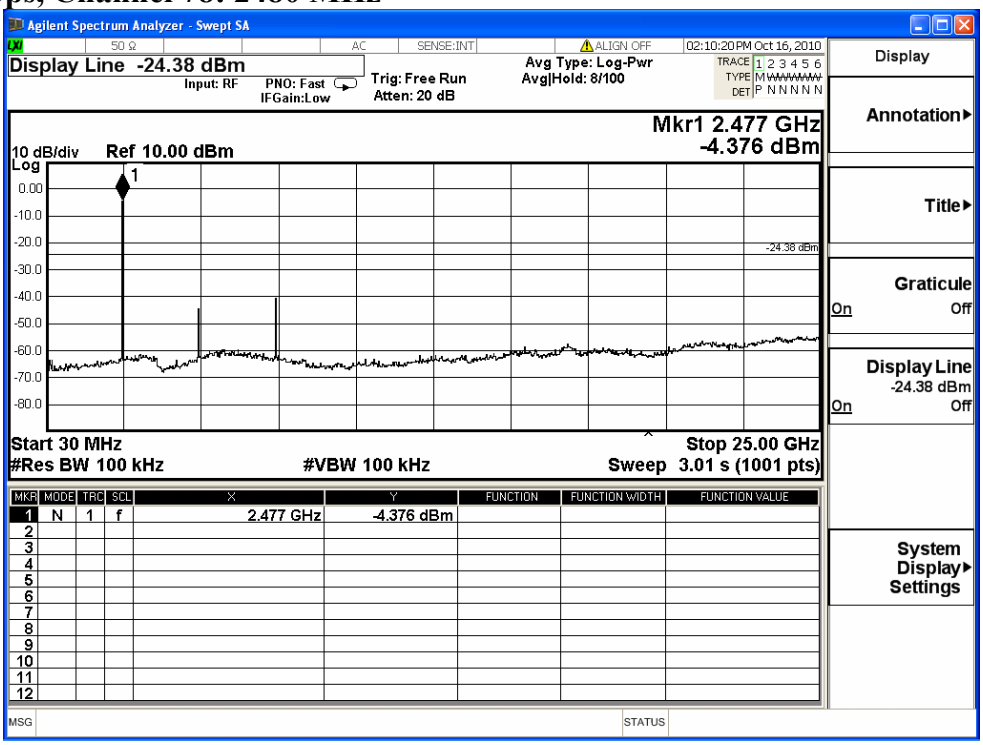
1Mbps, Channel 00: 2402 MHz



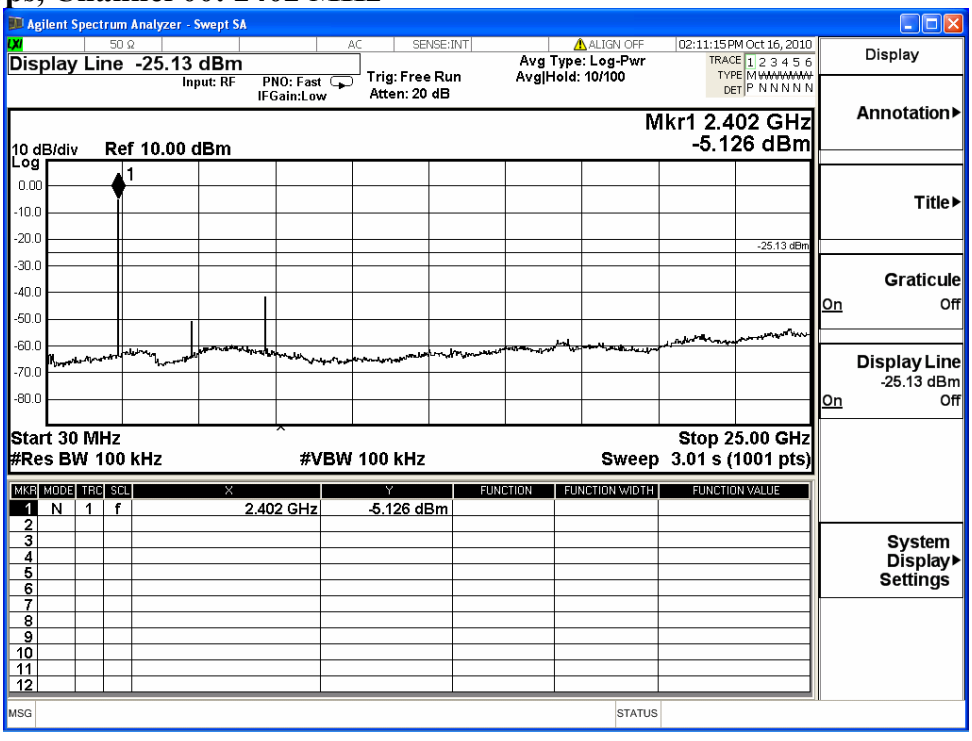
1Mbps, Channel 39: 2441 MHz



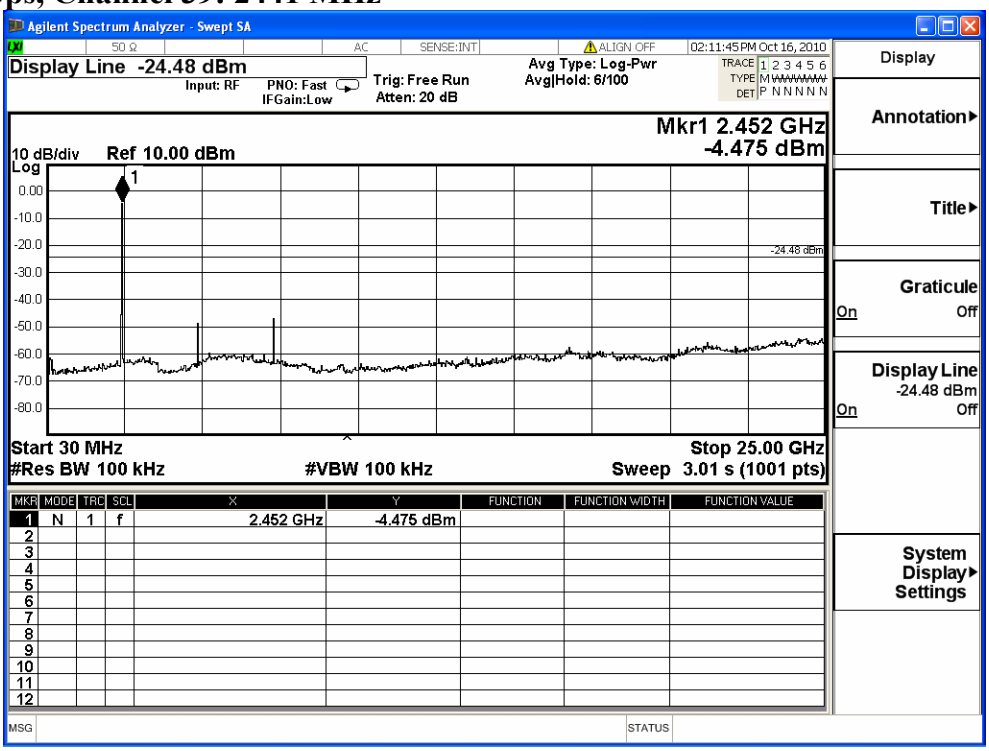
1Mbps, Channel 78: 2480 MHz



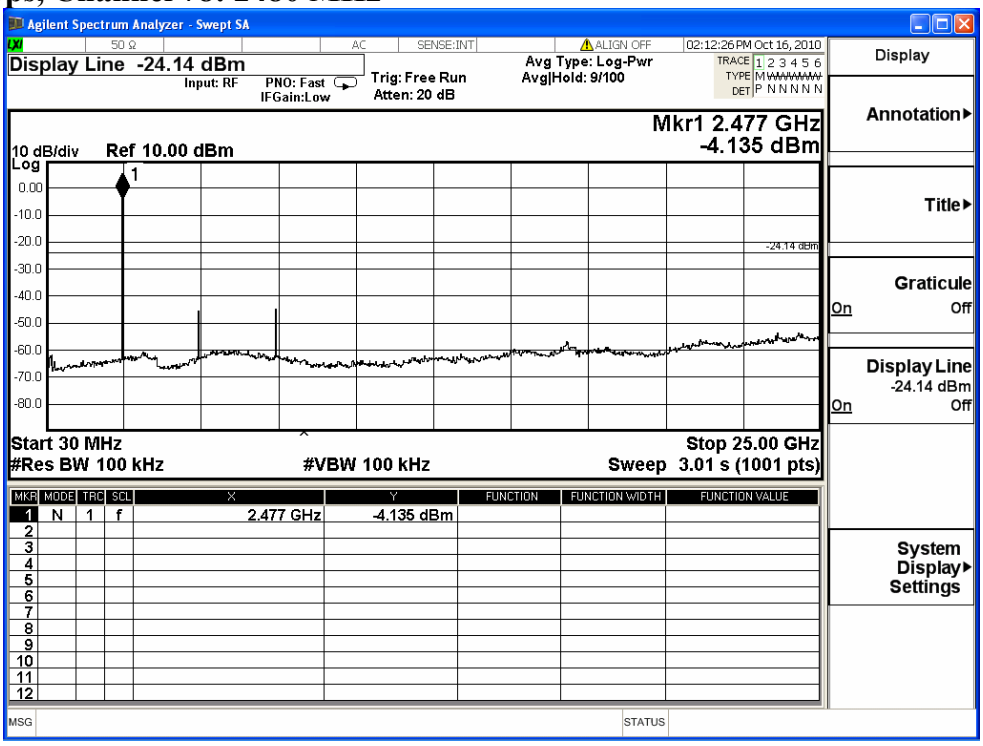
2Mbps, Channel 00: 2402 MHz



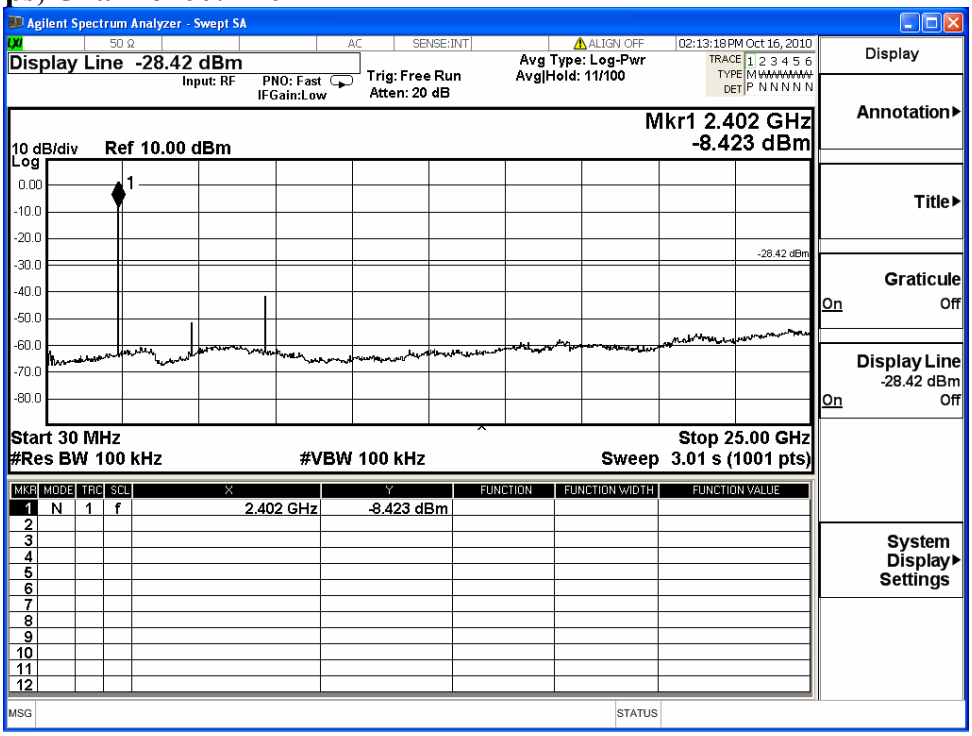
2Mbps, Channel 39: 2441 MHz



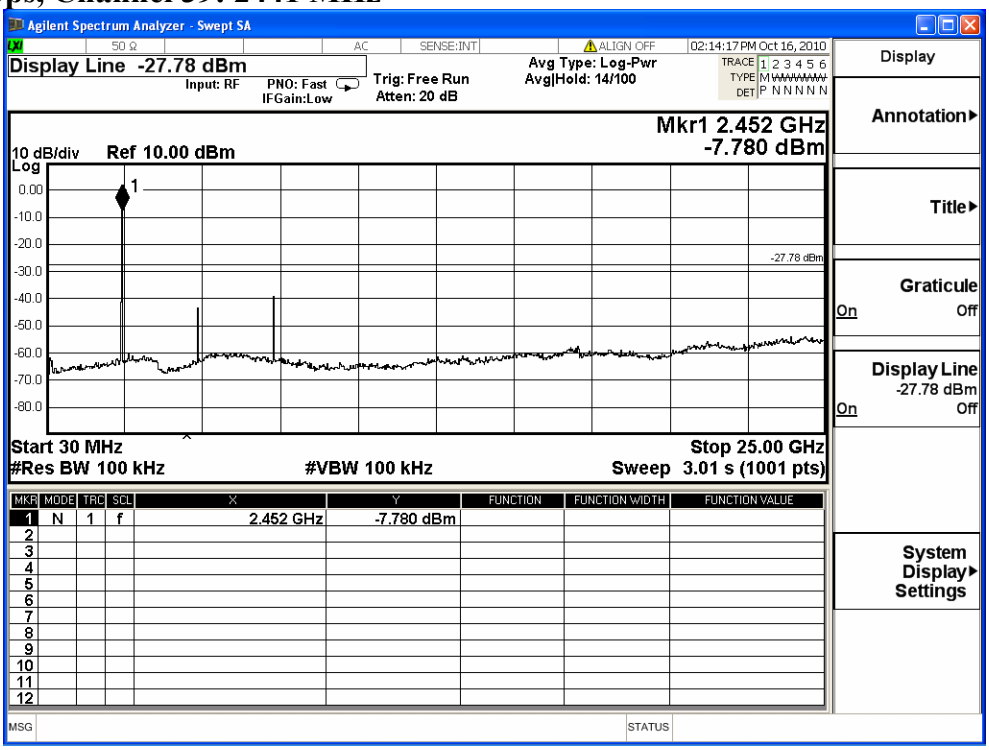
2Mbps, Channel 78: 2480 MHz



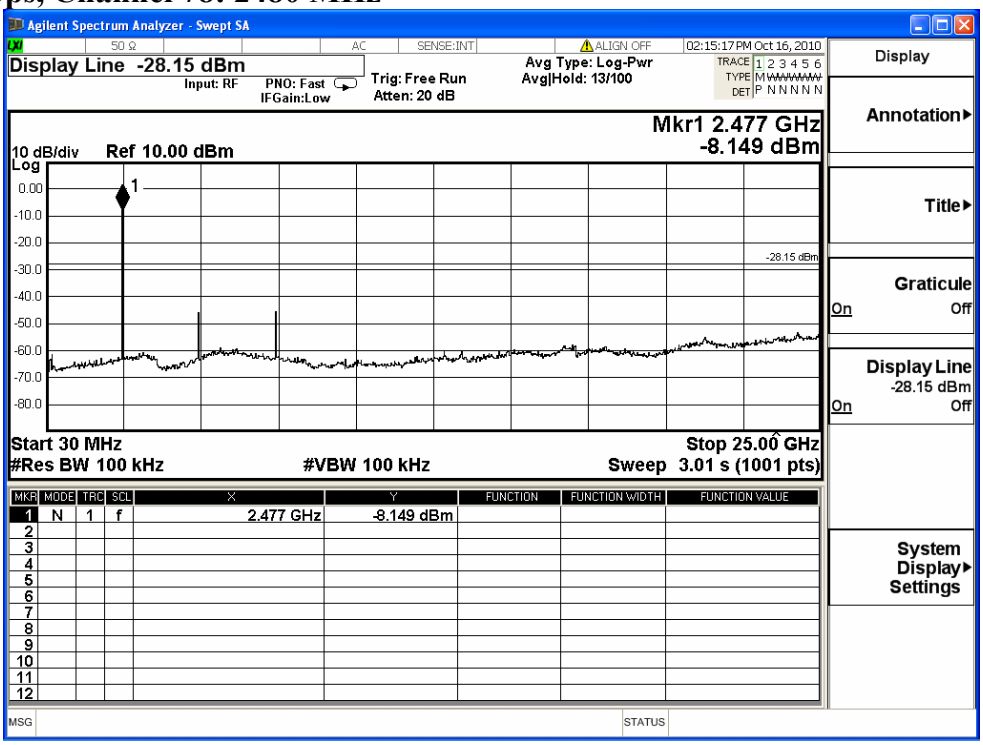
3Mbps, Channel 00: 2402 MHz



3Mbps, Channel 39: 2441 MHz



3Mbps, Channel 78: 2480 MHz



3.6 Band Edge Measurement

3.6.1 Test Procedure

Conducted

1. The transmitter output of EUT was connected to the spectrum analyzer.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN: 100MHz
   RBW: 100KHz
   VBW: 100KHz
   Center frequency: 2.375GHz, 2.5GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed
3. Find the next peak frequency outside the operation frequency band

Radiated

1. Antenna and Turntable test procedure same as Radiated Emission Measurement.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN: 100MHz
   RBW: 100KHz
   VBW: 100KHz
   Center frequency: 2.375GHz, 2.5GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed
3. Find the next peak frequency outside the operation frequency band

3.6.2 Test Setup

Conducted

Radiated

Same as *Radiated Emission Measurement*

3.6.3 Test Data: 1Mbps

Table: Band Edge measurement

Conducted Test

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2401.84	105.132	---	---
Outside band	2400	59.728	45.404	Pass
78	2479.84	105.638	---	---
Outside band	2483.5	43.552	62.086	Pass

Radiated Test

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):60

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2402.06	64.86	---	---
Outside band	2400	23.93	40.93	Pass
78	2479.84	64.49	---	---
Outside band	2483.92	22.13	42.36	Pass

RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement

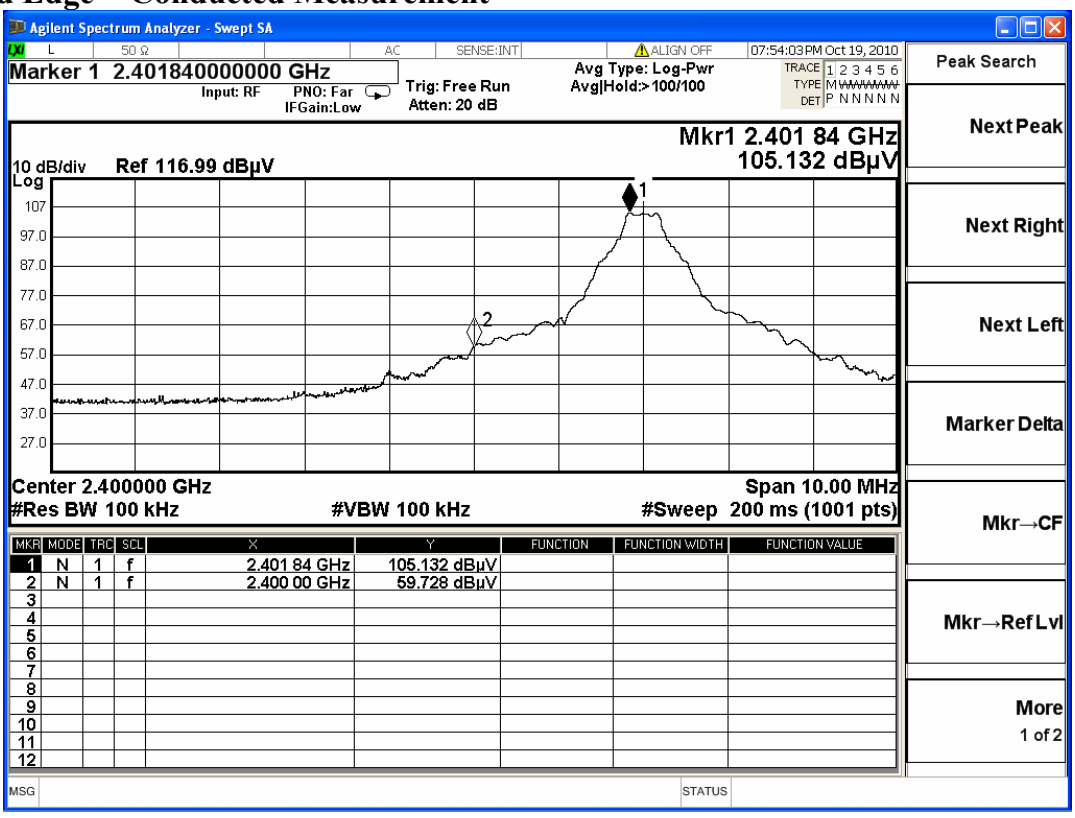
Conducted Test

Temperature (℃):25

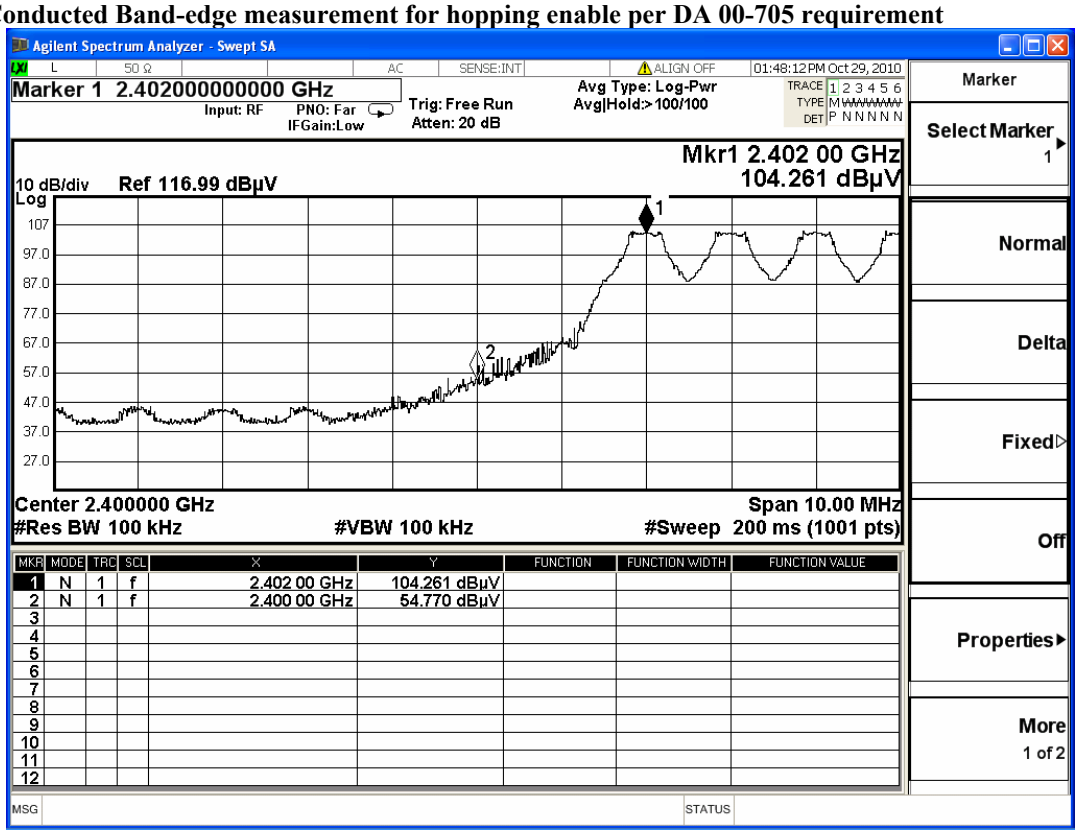
Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2402	104.261	---	---
Outside band	2400	54.77	49.491	Pass
78	2480	104.389	---	---
Outside band	2485.07	44.507	59.882	Pass

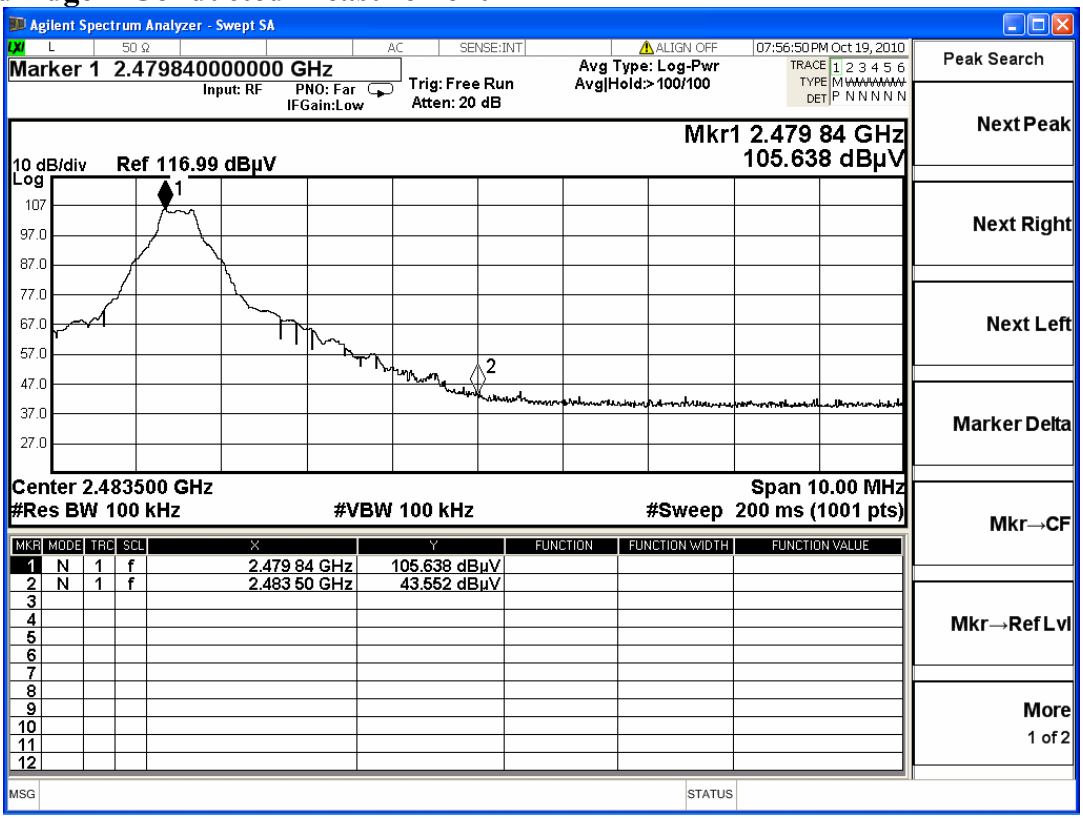
Band Edge Conducted Measurement



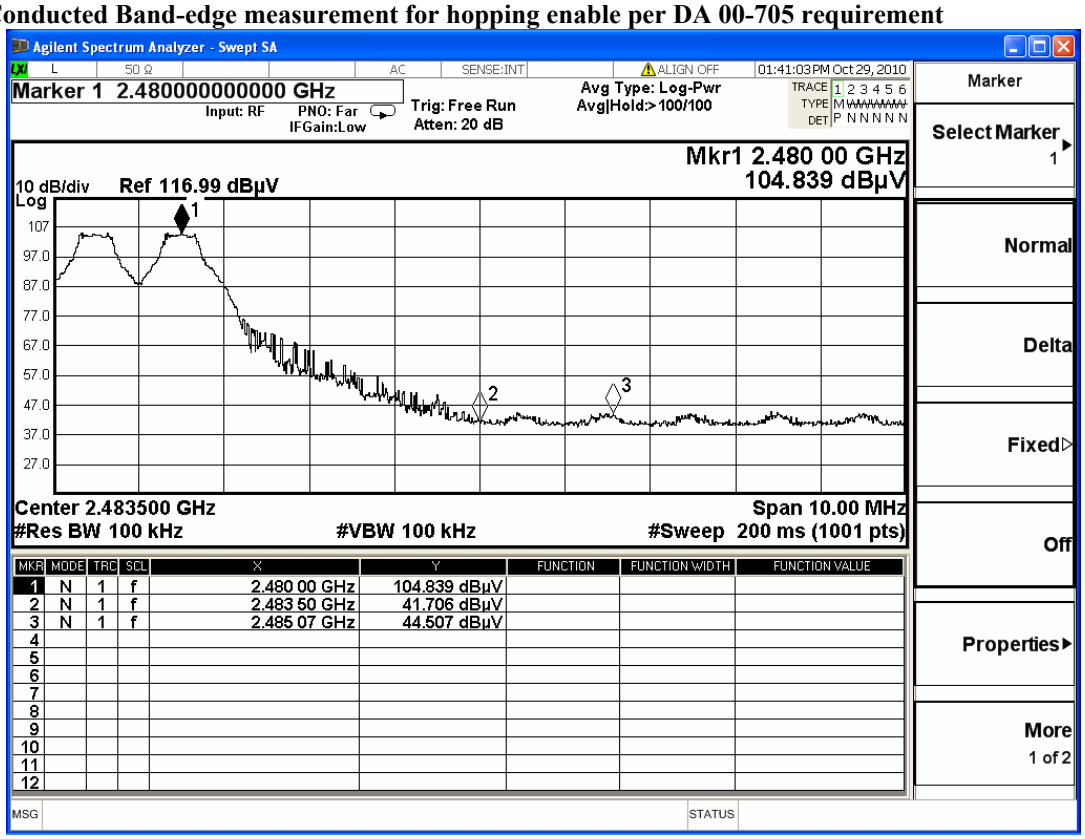
RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement



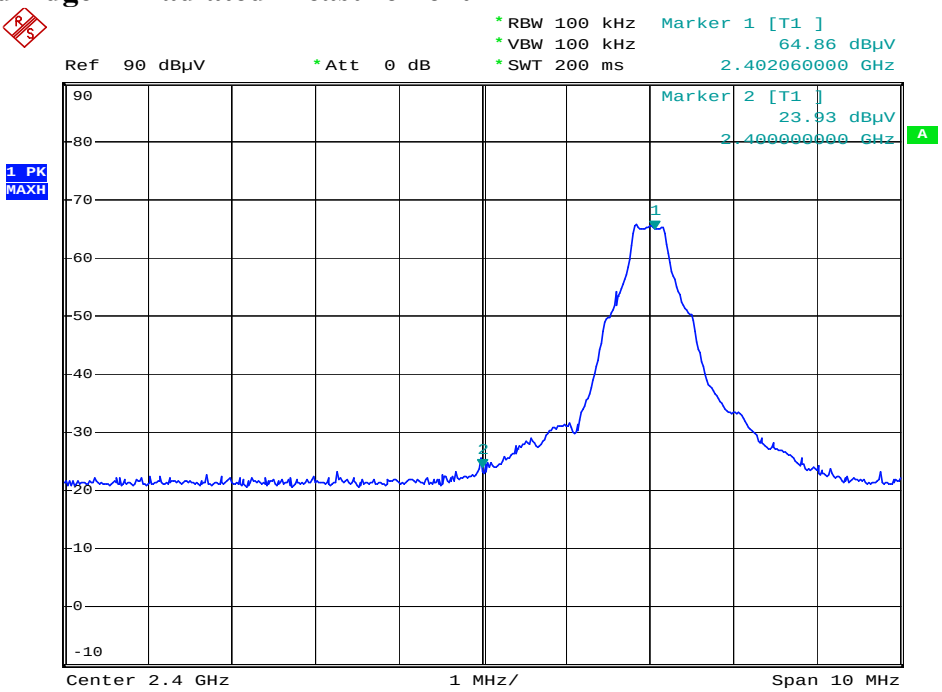
Band Edge Conducted Measurement



RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement

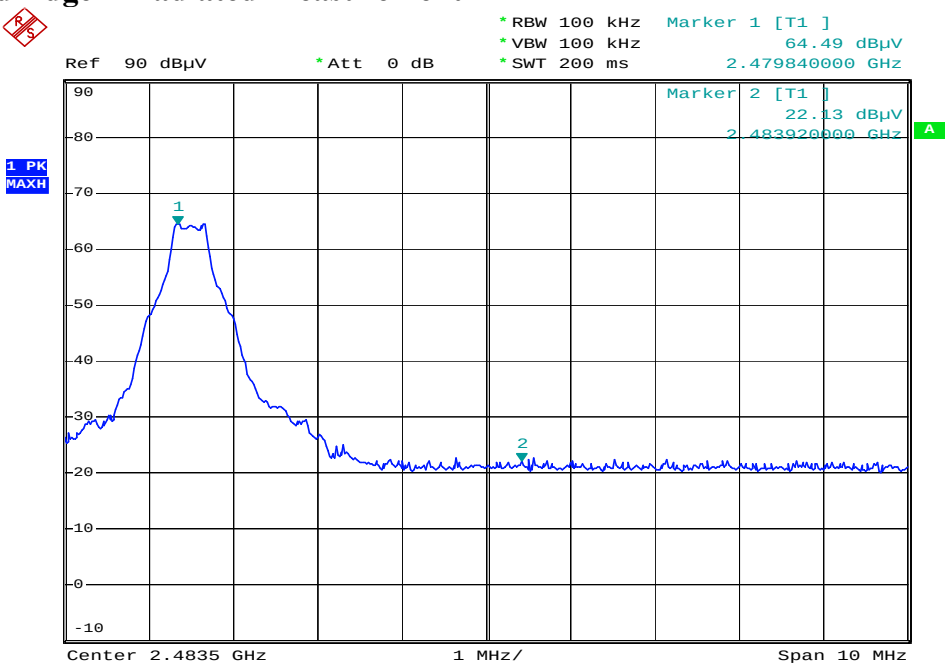


Band Edge Radiated Measurement



Date: 12.OCT.2010 22:11:07

Band Edge Radiated Measurement



Date: 12.OCT.2010 22:20:42

3.6.4 Test Data: 2Mbps

Table: Band Edge measurement

Conducted Test

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2401.84	105.098	---	---
Outside band	2400	54.791	50.307	Pass
78	2479.84	105.633	---	---
Outside band	2483.5	41.128	64.505	Pass

Radiated Test

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):60

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2401.84	61.77	---	---
Outside band	2399.86	21.76	40.01	Pass
78	2479.84	59.12	---	---
Outside band	2485.46	22.35	36.77	Pass

RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement

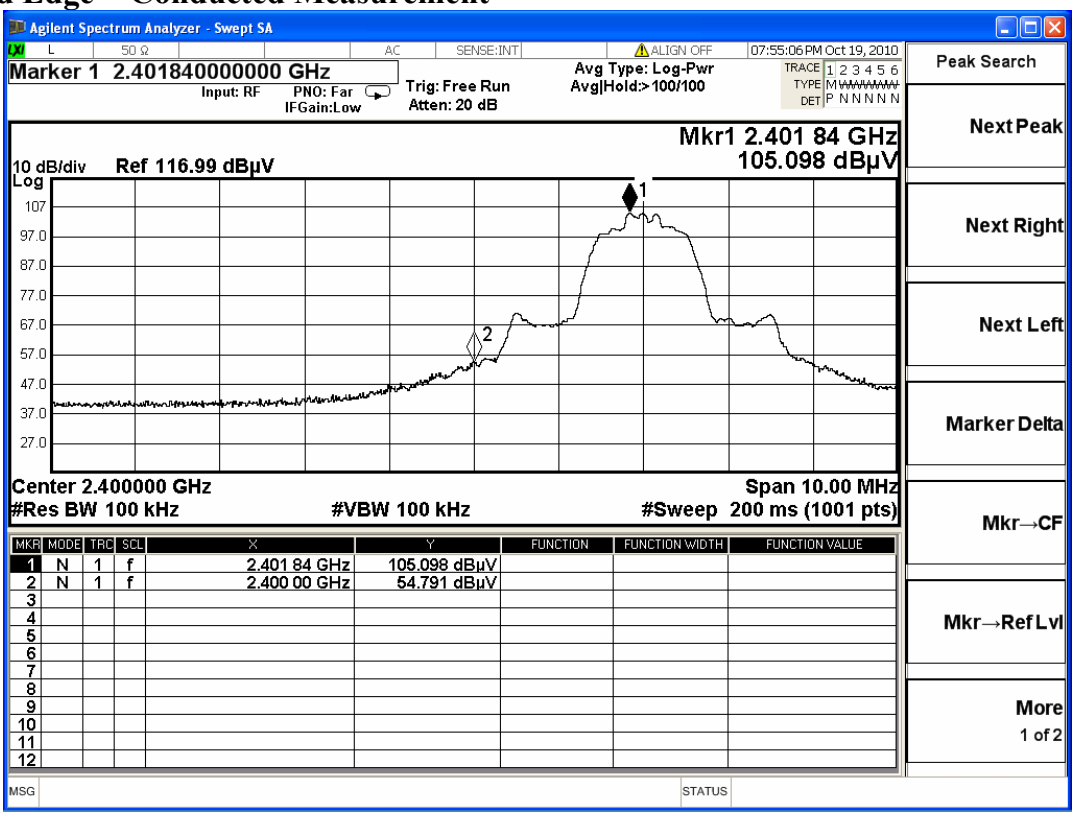
Conducted Test

Temperature (℃):25

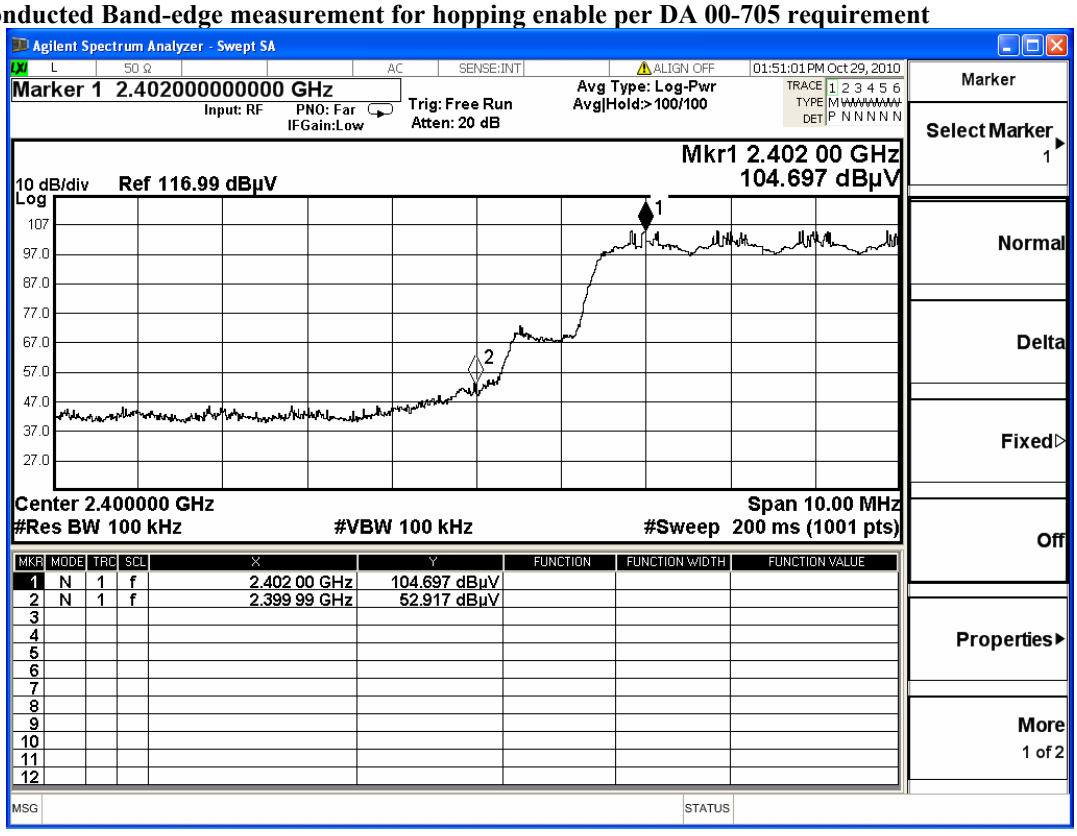
Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2402	104.697	---	---
Outside band	2399.99	52.917	51.78	Pass
78	2480.14	104.537	---	---
Outside band	2485.44	43.637	60.9	Pass

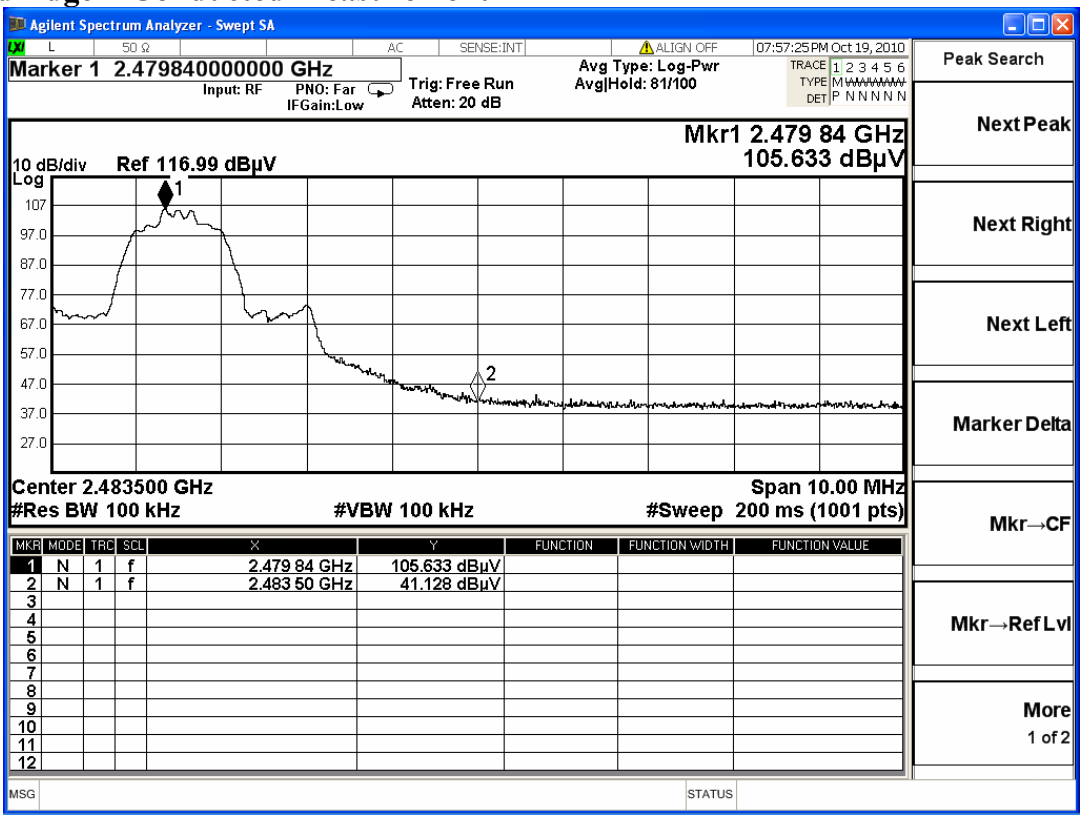
Band Edge Conducted Measurement



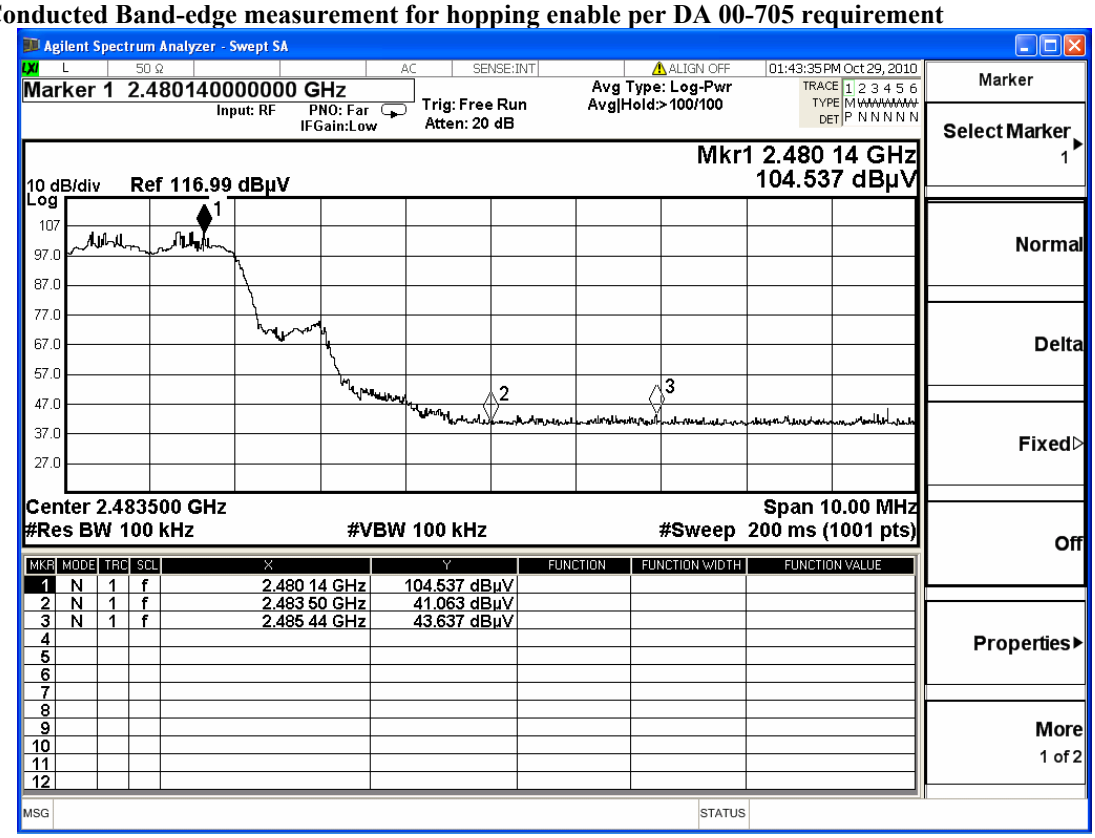
RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement



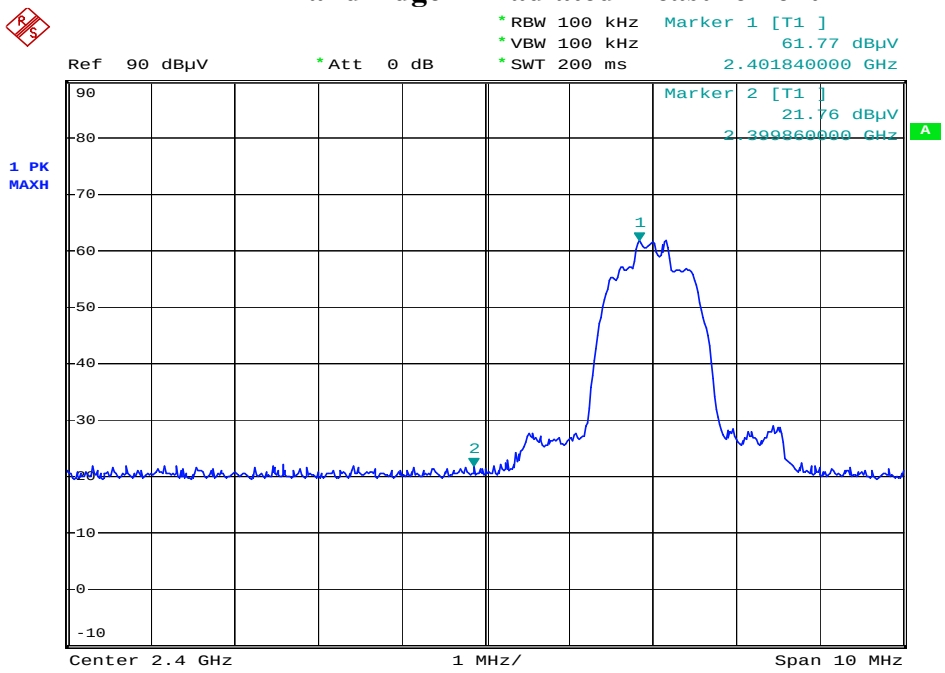
Band Edge Conducted Measurement



RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement

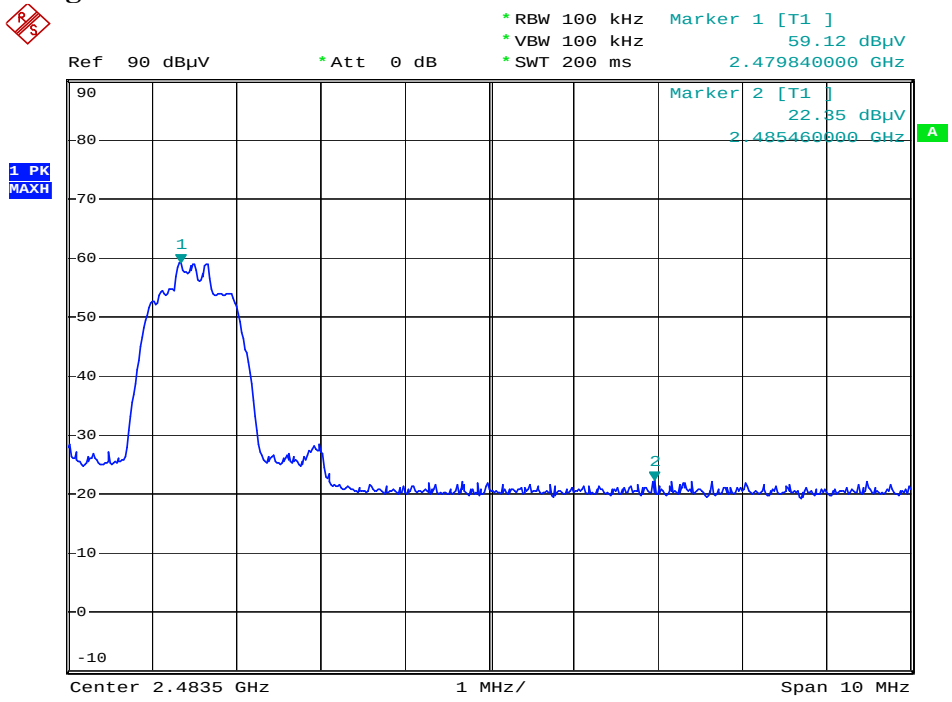


Band Edge Radiated Measurement



Date: 13.OCT.2010 13:01:14

Band Edge Radiated Measurement



Date: 13.OCT.2010 13:09:46

3.6.5 Test Data: 3Mbps

Table: Band Edge measurement (Conducted)

Conducted Test

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2401.84	105.091	---	---
Outside band	2400	54.087	51.004	Pass
78	2479.84	105.623	---	---
Outside band	2483.5	42.659	62.964	Pass

Radiated Test

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):60

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2401.86	65.45	---	---
Outside band	2400.02	22.48	42.97	Pass
78	2479.84	64.45	---	---
Outside band	2483.56	21.75	42.7	Pass

RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement

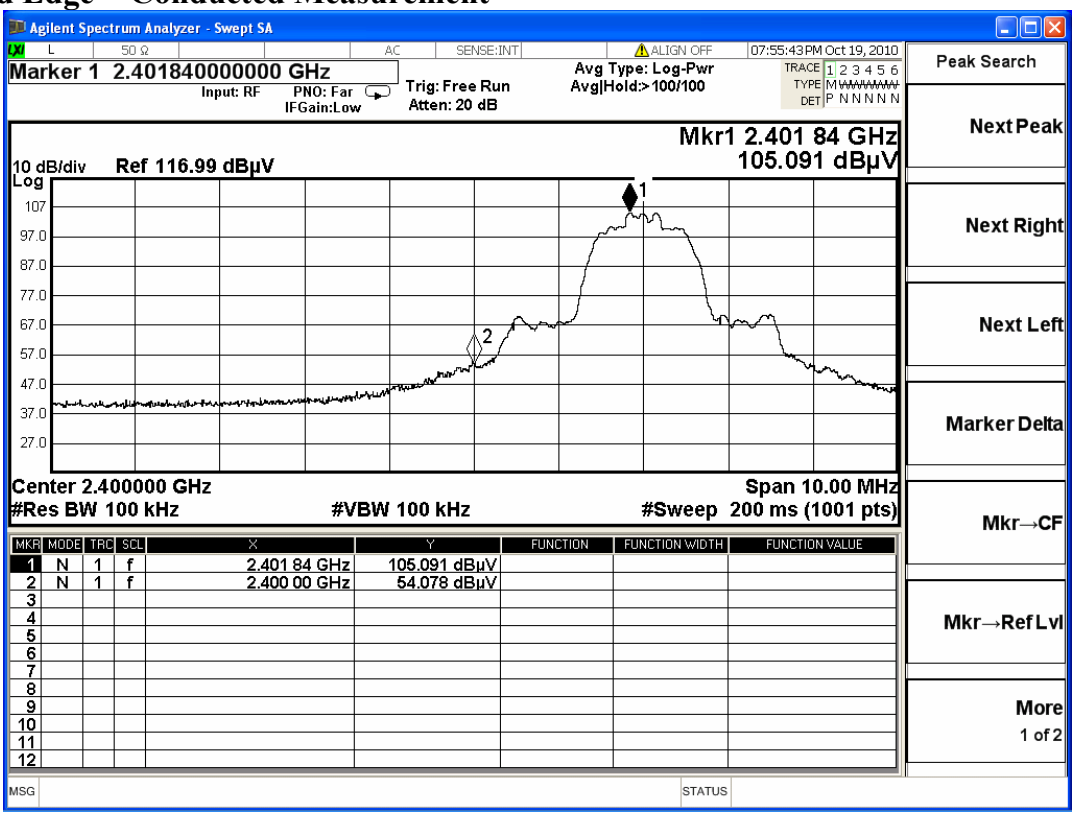
Conducted Test

Temperature (℃):25

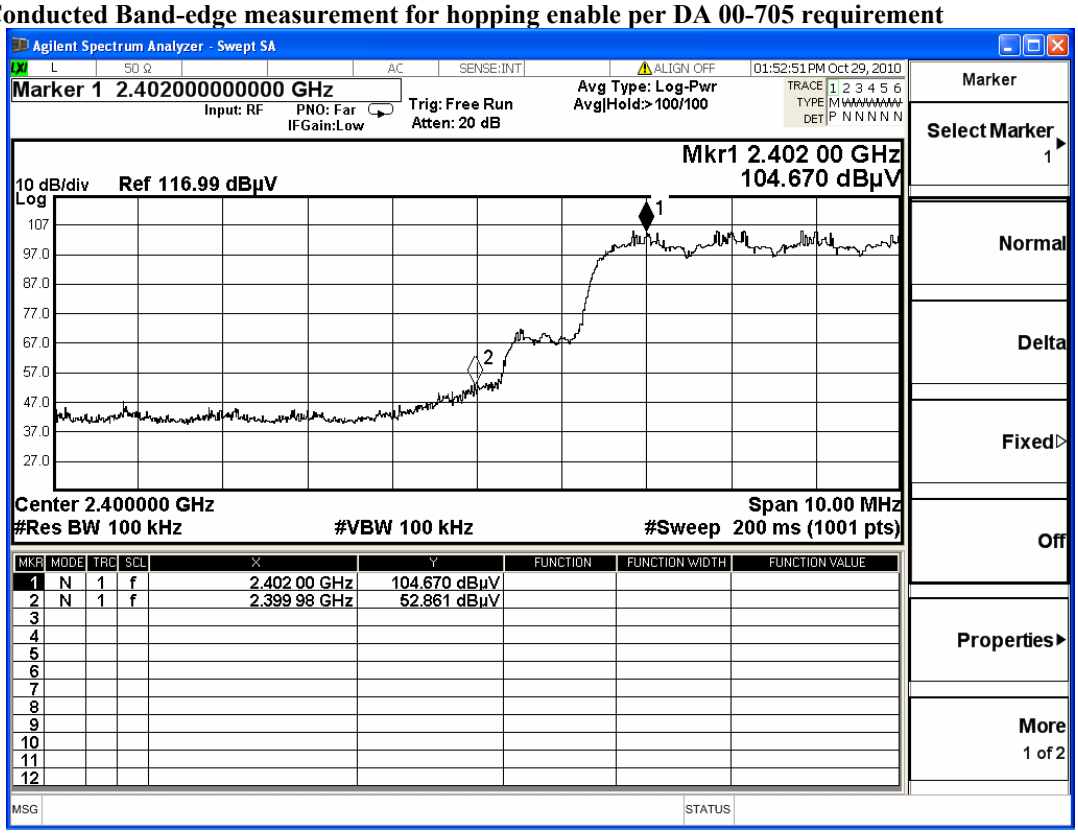
Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
00	2402	104.67	---	---
Outside band	2399.98	52.861	51.809	Pass
78	2480	104.799	---	---
Outside band	2485.03	43.852	60.947	Pass

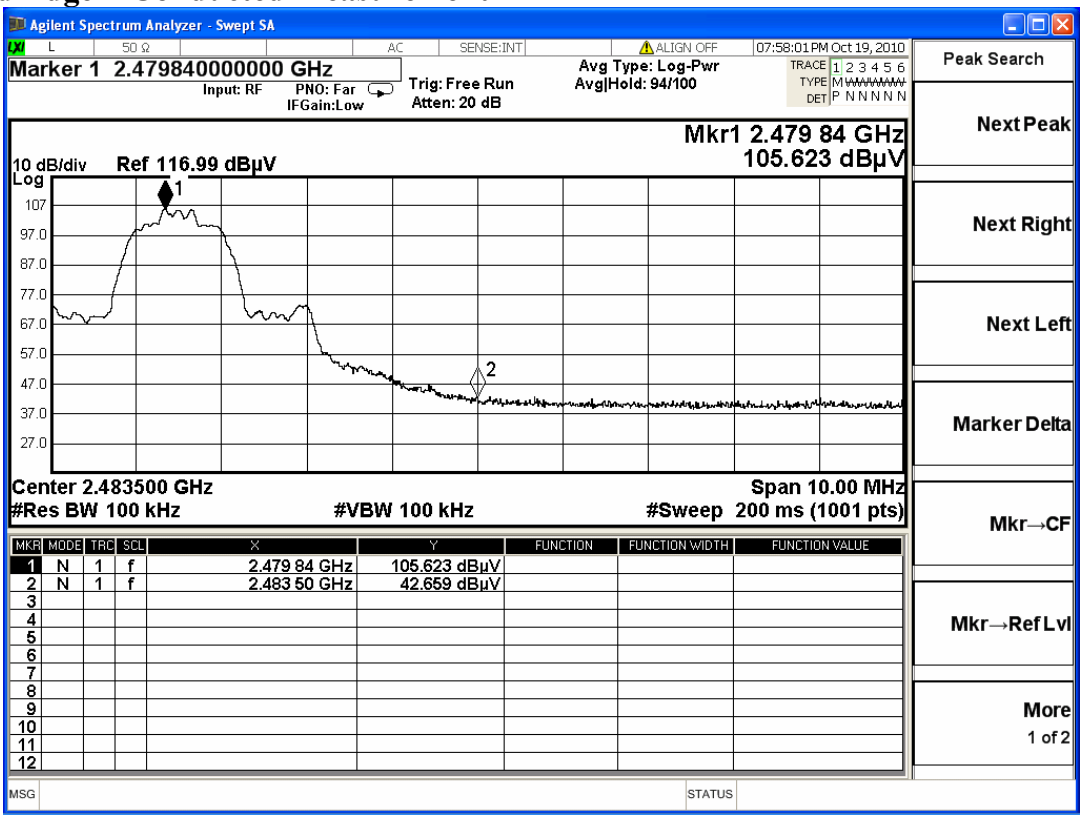
Band Edge Conducted Measurement



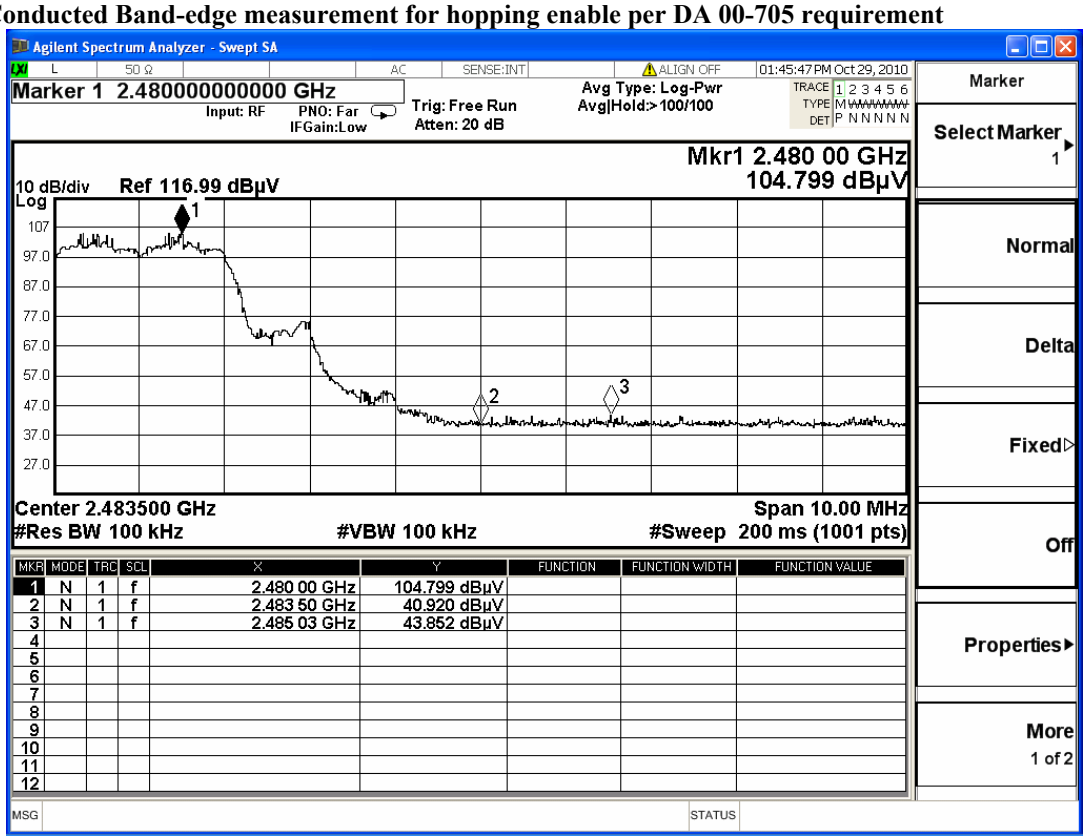
RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement



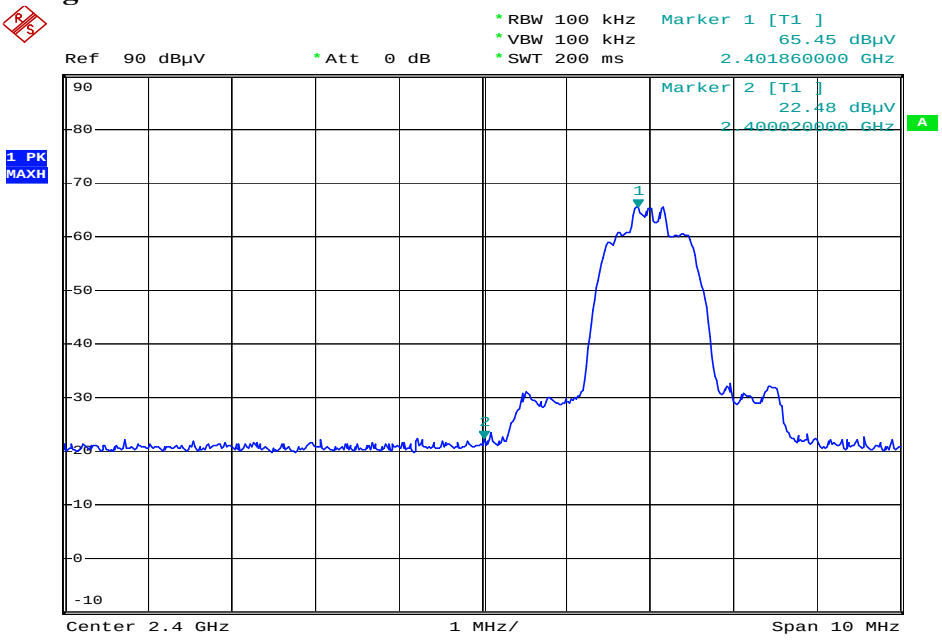
Band Edge Conducted Measurement



RF Conducted Band-edge measurement for hopping enable per DA 00-705 requirement

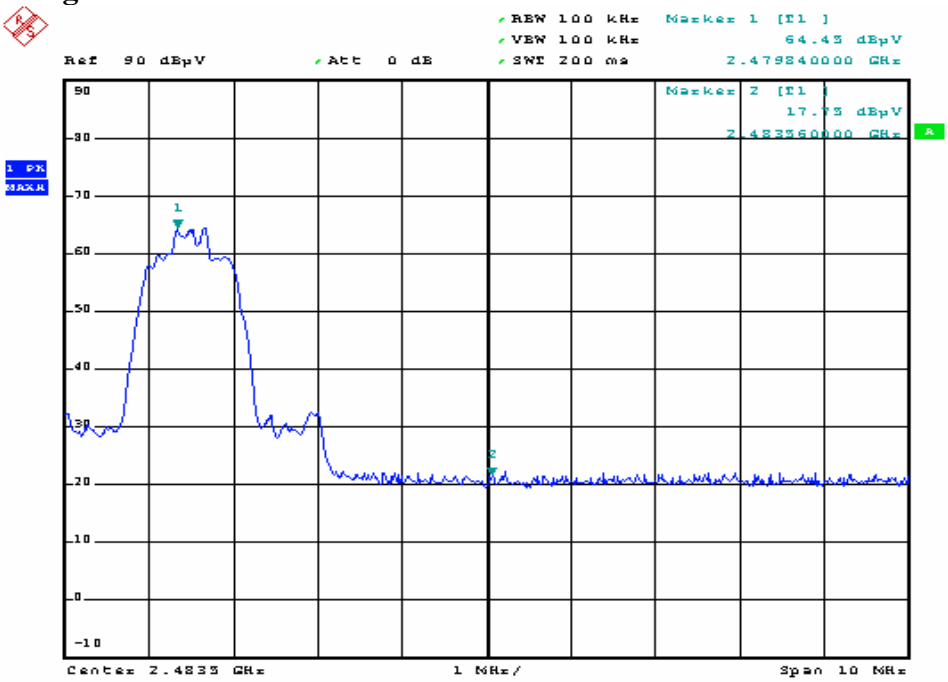


Band Edge Radiated Measurement



Date: 12.OCT.2010 22:12:39

Band Edge Radiated Measurement



Date: 12.OCT.2010 22:22:00

3.7 Restricted Bands Measurement

3.7.1 Test Procedure (Radiated)

1. Antenna and Turntable test procedure same as Radiated Emission Measurement.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN: 100MHz
   RBW: 1MHz
   VBW: 3MHz
   Center frequency: 2.375GHz, 2.5GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band
4. For peak frequency emission level measurement in Restricted Band,
   Change RBW: 1MHz
   VBW: 1KHz
   Span: 100MHz.
5. Get the spectrum reading after Maximum Hold function is completed.

3.7.2 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

3.7.3 Test Data: 1Mbps

Table Band Edge measurement (Radiated)

Temp. (° C): 25

Test Engineer:Scott Chien Humidity (%): 55

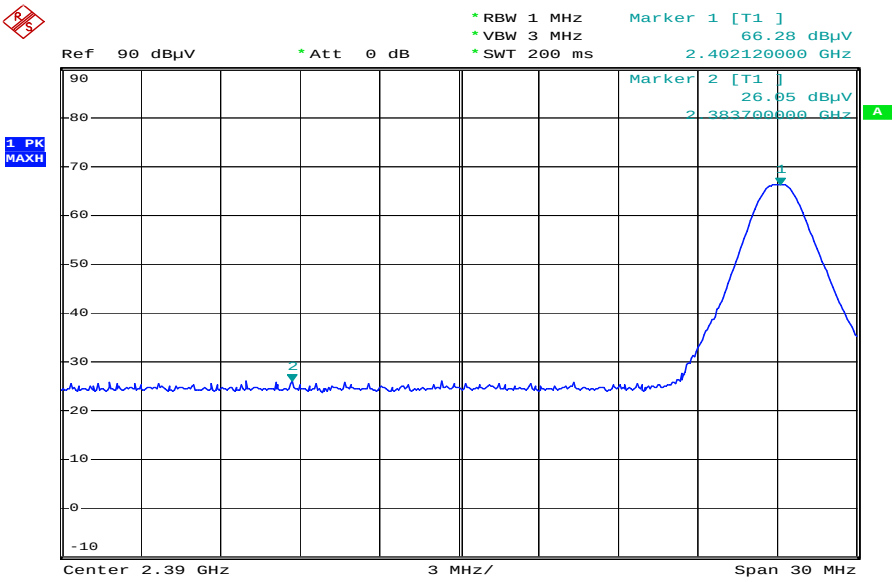
Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_00 (peak mode)	2402.12	66.28	34.68	100.96	---	3MHz	---
Channel_00 (average mode)	2402.6	65.5	34.68	100.18	---	1KHz	---
Channel_78 (peak mode)	2480.16	59.54	34.86	94.4	---	3MHz	---
Channel_78 (average mode)	2480.02	58.82	34.86	93.68	---	1KHz	---
Channel_00 Restricted band (peak mode)	2383.7	26.05	34.65	60.7	74	3MHz	Pass
Restricted band (average mode)	2390	12.28	34.65	46.93	54	1KHz	Pass
Channel_78 Restricted band (peak mode)	2483.5	26.96	34.86	61.82	74	3MHz	Pass
Restricted band (average mode)	2483.5	18.82	34.86	53.68	54	1KHz	Pass

Radiatied Cable Loss	2390	2400	2402	2480	2483.5
Chamber Ant. Factor	32.32	32.34	32.34	32.47	32.47
Chamber Cable Loss	2.33	2.34	2.34	2.39	2.39

Note:

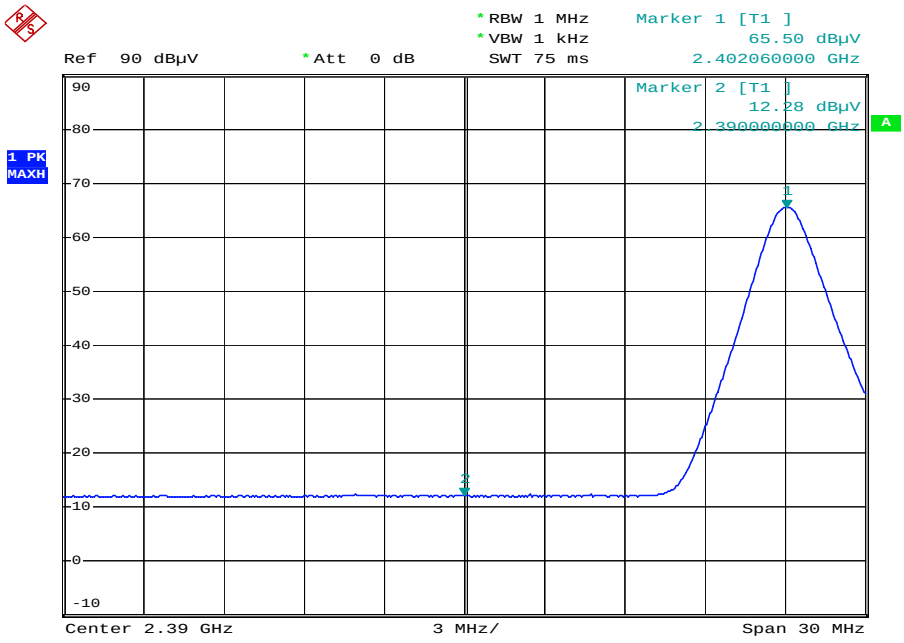
- The Spectrum plot of emission level measurement in Restricted band is attached.
- Emission Level=Spectrum Reading+Correction Factor
- Correction Factor=Antenna Factor+cable loss
- Both Horizontal and Vertical polarizaion have been tested and the worst data is listed above.

Restricted Band (Radiated)-Peak Mode (Channel 00)



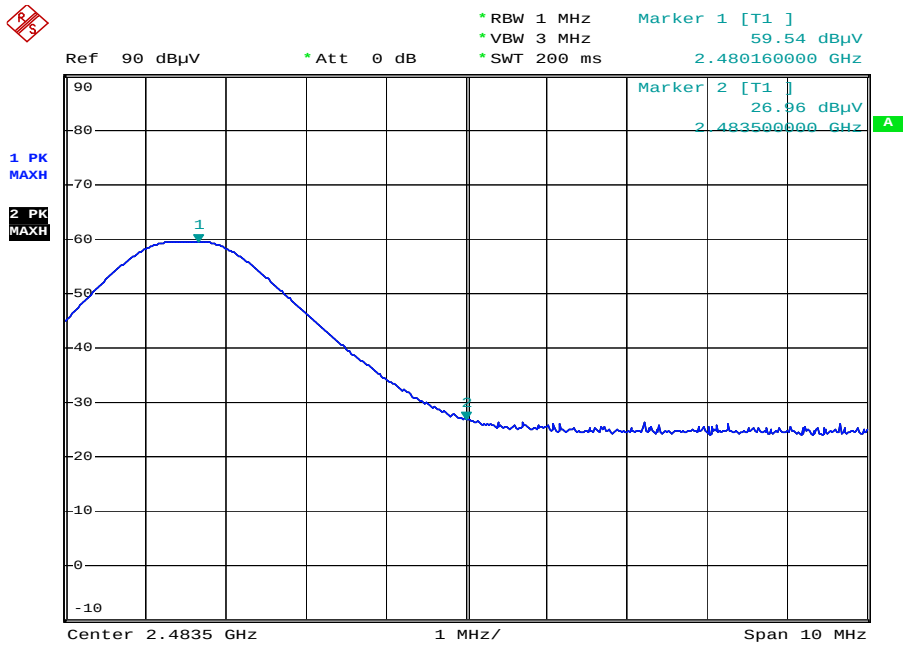
Date: 12.OCT.2010 22:00:14

Restricted Band (Radiated)-Average Mode (Channel 00)



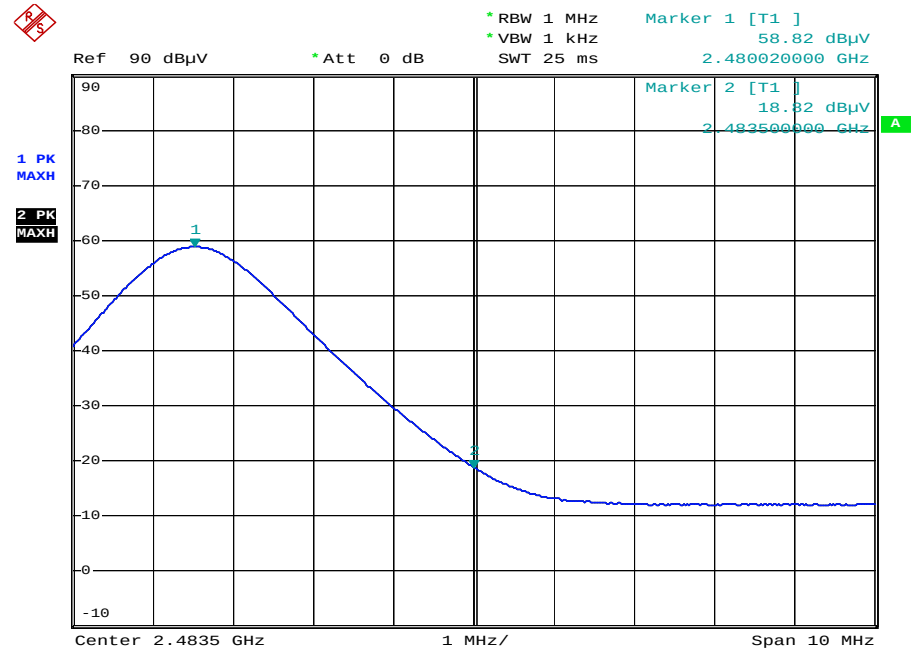
Date: 12.OCT.2010 22:01:52

Restricted Band (Radiated)-Peak Mode (Channel 78)



Date: 13.OCT.2010 13:07:02

Restricted Band (Radiated)-Average Mode (Channel 78)



Date: 13.OCT.2010 13:07:33

3.7.4 Test Data: 2Mbps

Table Band Edge measurement (Radiated)

Temp. (° C): 25

Test Engineer:Scott Chien Humidity (%): 55

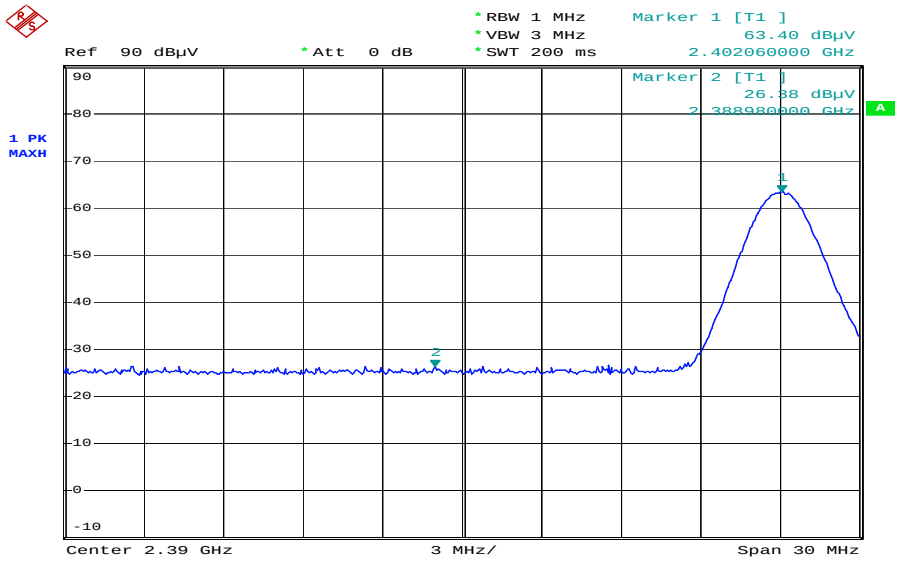
Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_00 (peak mode)	2402.06	63.4	34.68	98.08	---	3MHz	---
Channel_00 (average mode)	2402.06	58.6	34.68	93.28	---	1KHz	---
Channel_78 (peak mode)	2480.02	59.51	34.86	94.37	---	3MHz	---
Channel_78 (average mode)	2480.08	55.85	34.86	90.71	---	1KHz	---
Channel_00 Restricted band (peak mode)	2388.98	26.38	34.65	61.03	74	3MHz	Pass
Restricted band (average mode)	2390	12.07	34.65	46.72	54	1KHz	Pass
Channel_78 Restricted band (peak mode)	2483.54	27.29	34.86	62.15	74	3MHz	Pass
Restricted band (average mode)	2483.5	18.08	34.86	52.94	54	1KHz	Pass

Radiatied Cable Loss	2390	2400	2402	2480	2483.5
Chamber Ant. Factor	32.32	32.34	32.34	32.47	32.47
Chamber Cable Loss	2.33	2.34	2.34	2.39	2.39

Note:

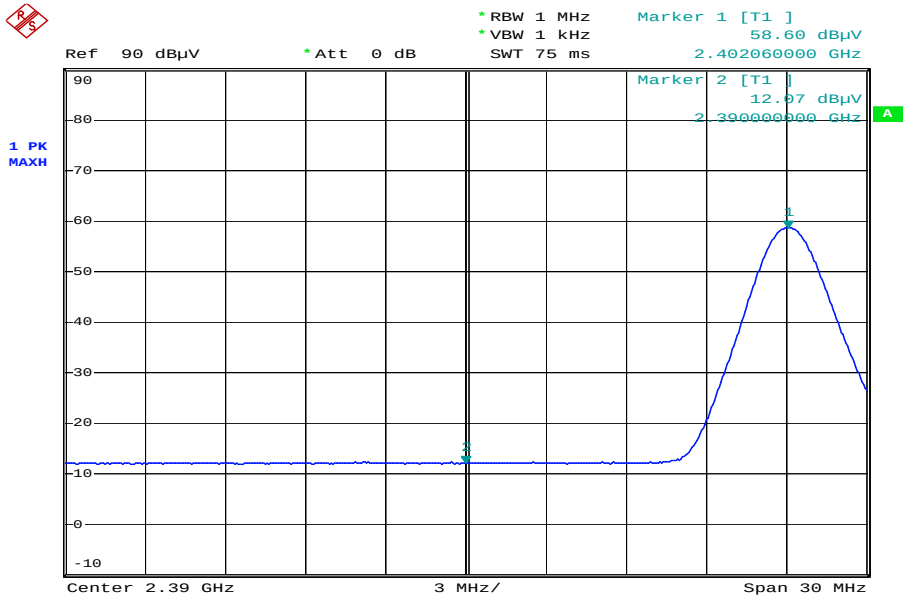
- The Spectrum plot of emission level measurement in Restricted band is attached.
- Emission Level=Spectrum Reading+Correction Factor
- Correction Factor=Antenna Factor+cable loss
- Both Horizontal and Vertical polarizaion have been tested and the worst data is listed above.

Restricted Band (Radiated)-Peak Mode (Channel 00)



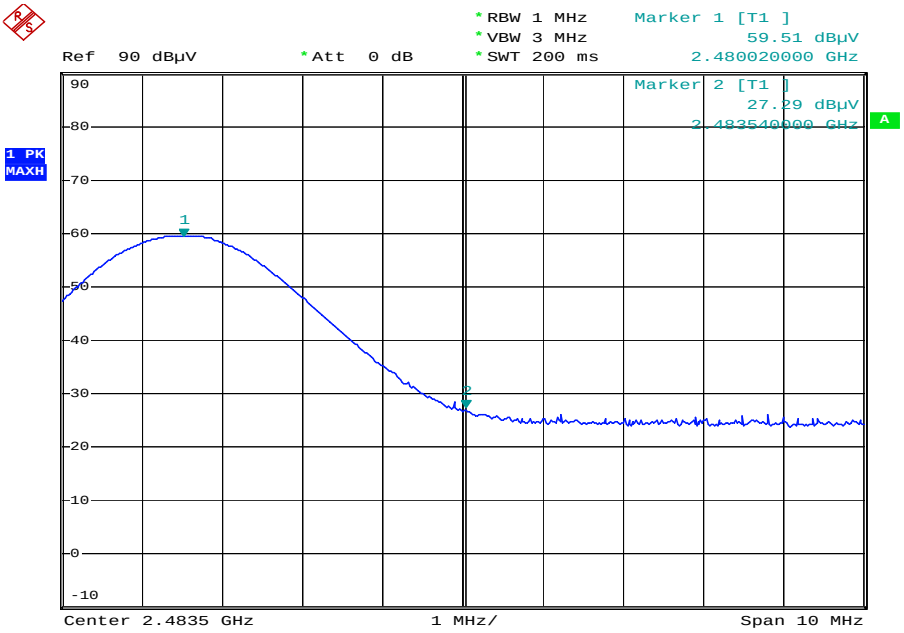
Date: 13.OCT.2010 12:58:03

Restricted Band (Radiated)-Average Mode (Channel 00)



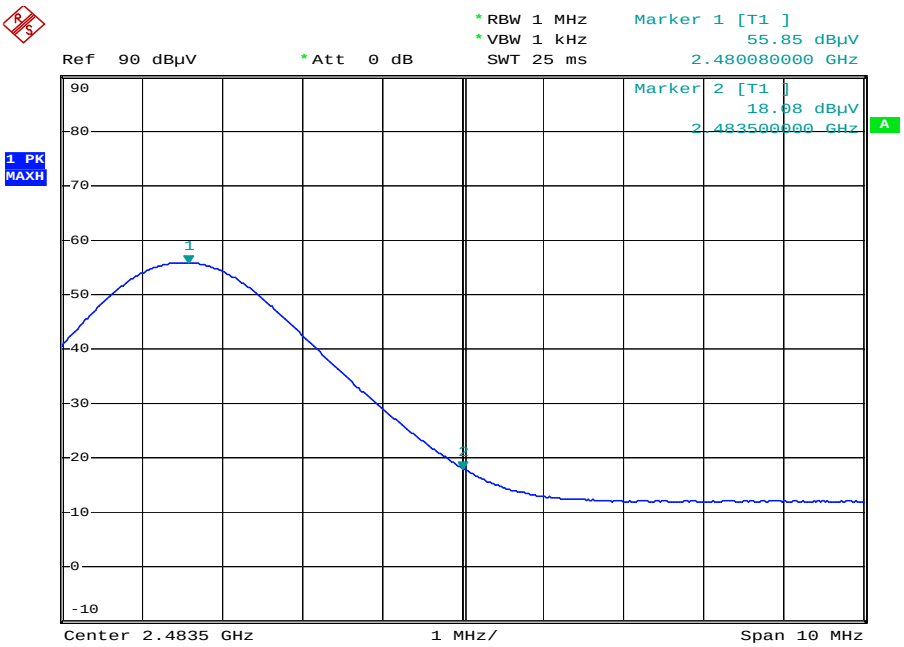
Date: 13.OCT.2010 13:00:26

Restricted Band (Radiated)-Peak Mode (Channel 78)



Date: 13.OCT.2010 13:10:25

Restricted Band (Radiated)-Average Mode (Channel 78)



Date: 13.OCT.2010 13:10:55

3.7.5 Test Data: 3Mbps

Table Band Edge measurement (Radiated)

Temp. (° C): 25

Test Engineer:Scott Chien Humidity (%): 55

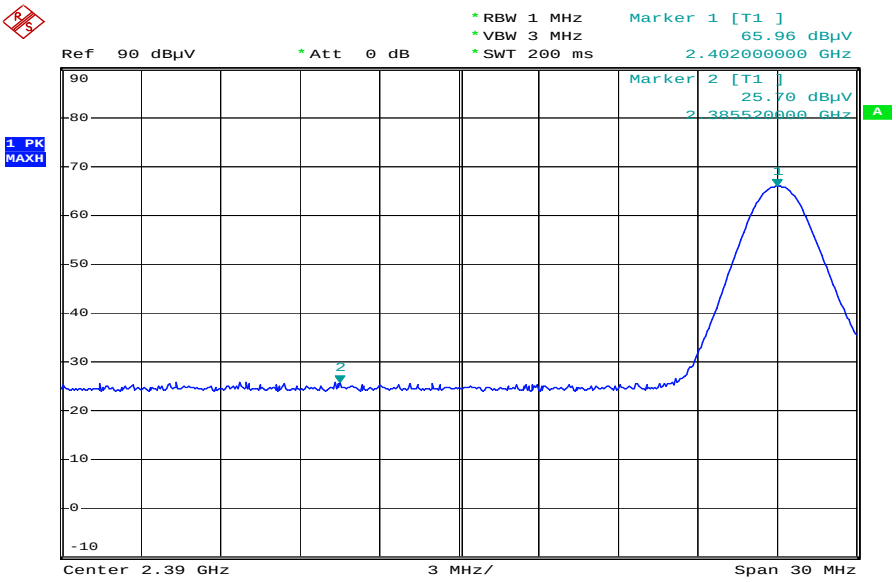
Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_00 (peak mode)	2402	65.96	34.68	100.64	---	3MHz	---
Channel_00 (average mode)	2402.06	62.19	34.68	96.87	---	1KHz	---
Channel_78 (peak mode)	2480.18	64.73	34.86	99.59	---	3MHz	---
Channel_78 (average mode)	2480.02	61.18	34.86	96.04	---	1KHz	---
Channel_00 Restricted band (peak mode)	2385.52	25.7	34.65	60.35	74	3MHz	Pass
Restricted band (average mode)	2390	11.99	34.65	46.64	54	1KHz	Pass
Channel_78 Restricted band (peak mode)	2483.5	28.93	34.86	63.79	74	3MHz	Pass
Restricted band (average mode)	2483.5	17.75	34.86	52.61	54	1KHz	Pass

Radiatied Cable Loss	2390	2400	2402	2480	2483.5
Chamber Ant. Factor	32.32	32.34	32.34	32.47	32.47
Chamber Cable Loss	2.33	2.34	2.34	2.39	2.39

Note:

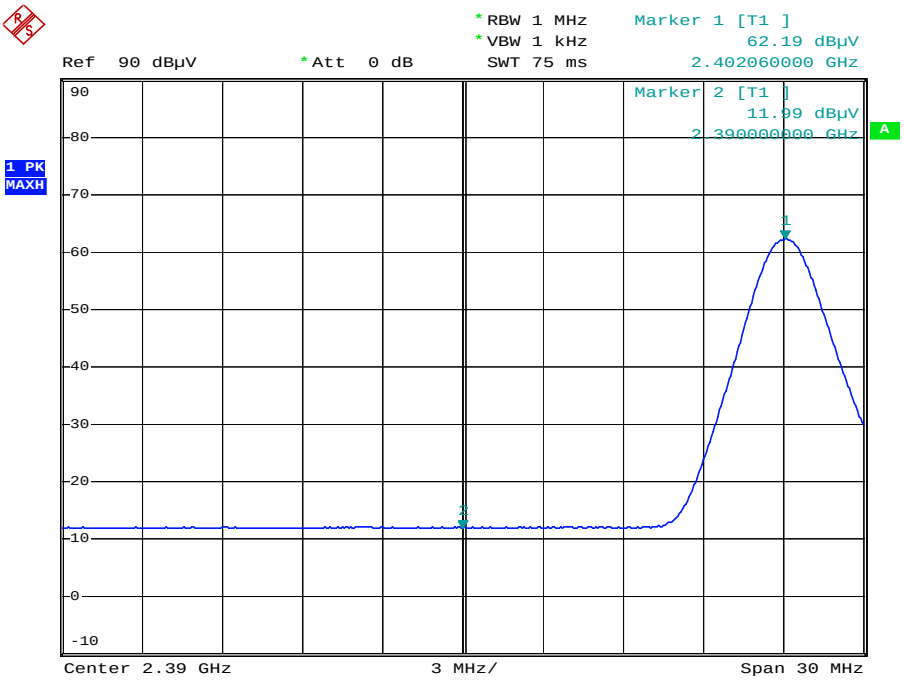
- The Spectrum plot of emission level measurement in Restricted band is attached.
- Emission Level=Spectrum Reading+Correction Factor
- Correction Factor=Antenna Factor+cable loss
- Both Horizontal and Vertical polarizaion have been tested and the worst data is listed above.

Restricted Band (Radiated)-Peak Mode (Channel 00)



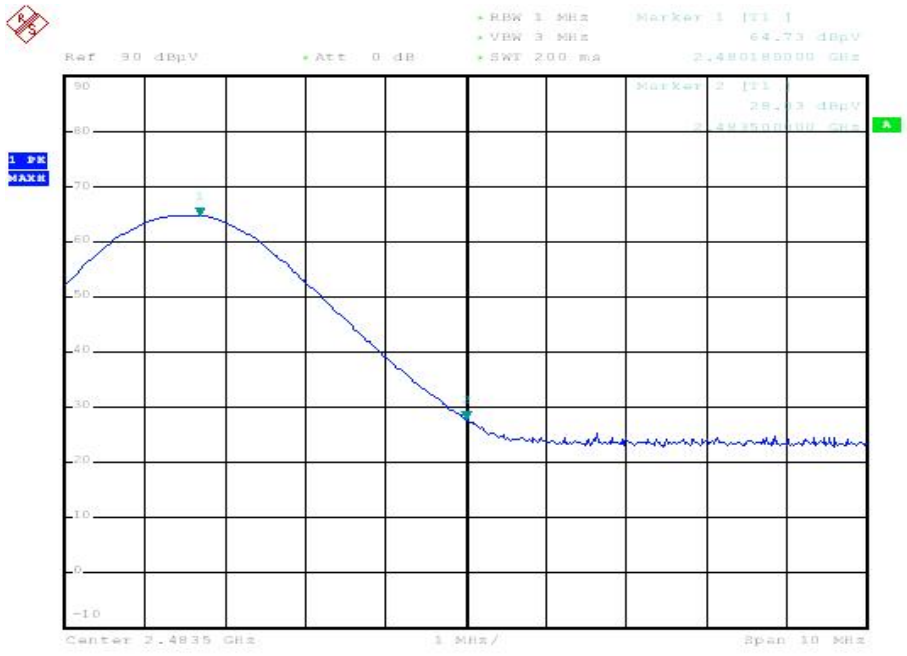
Date: 12.OCT.2010 22:14:38

Restricted Band (Radiated)-Average Mode (Channel 00)



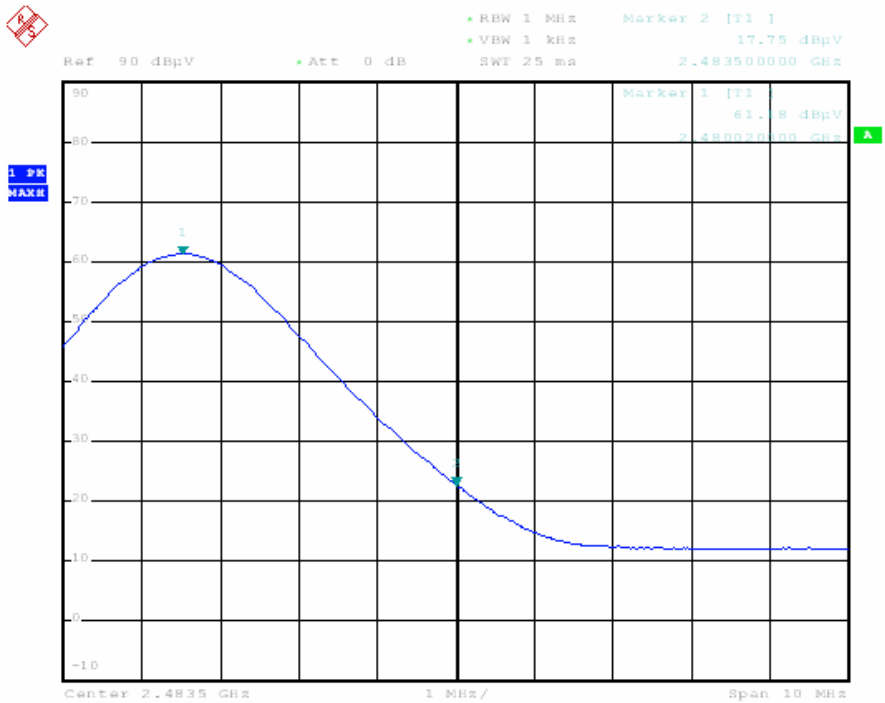
Date: 12.OCT.2010 22:15:34

Restricted Band (Radiated)-Peak Mode (Channel 78)



Date: 12.OCT.2010 22:22:48

Restricted Band (Radiated)-Average Mode (Channel 78)



Date: 12.OCT.2010 22:23:17

3.8 Bandwidth & Hopping Channel Separation

3.8.1 Standard Applicable

According to §15.247(a)(1), frequency hopping system 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies.

3.8.2 Test Procedure

♦ **Bandwidth Test Procedure**

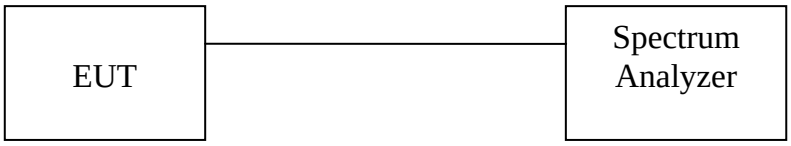
The Transmitter output of EUT was connected to the spectrum analyzer. The 20 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

Equipment mode	Spectrum analyzer
Detector function	Peak mode
RBW	30KHz
VBW	100KHz

♦ **Hopping Channel Separation Test Procedure**

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
   Equipment mode: Spectrum analyzer
   RBW: 100KHz
   VBW: 300KHz
   SPAN:3MHz
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer Marker function.
4. Repeat above procedures until all frequencies measured were complete.

3.8.3 Test Setup



3.8.4 Test Data: 1Mbps

20dB Bandwidth

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	20dB Bandwidth (KHz)
00	**2402**	936
39	**2441**	936
78	**2480**	934

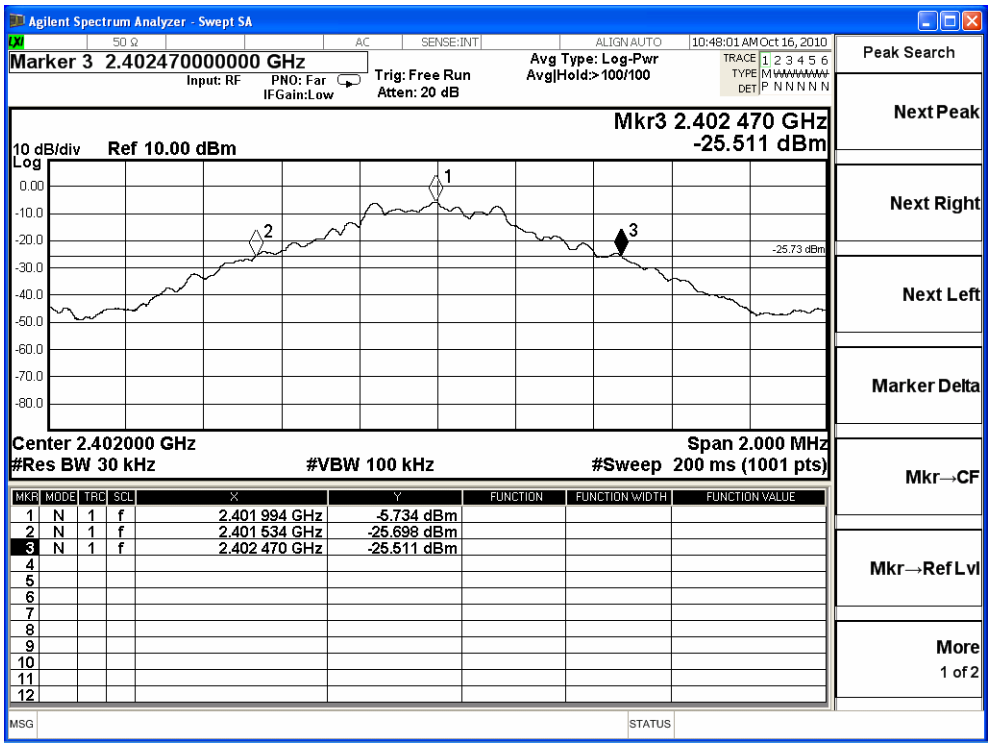
Hopping Channel Separation

Temperature (℃):25

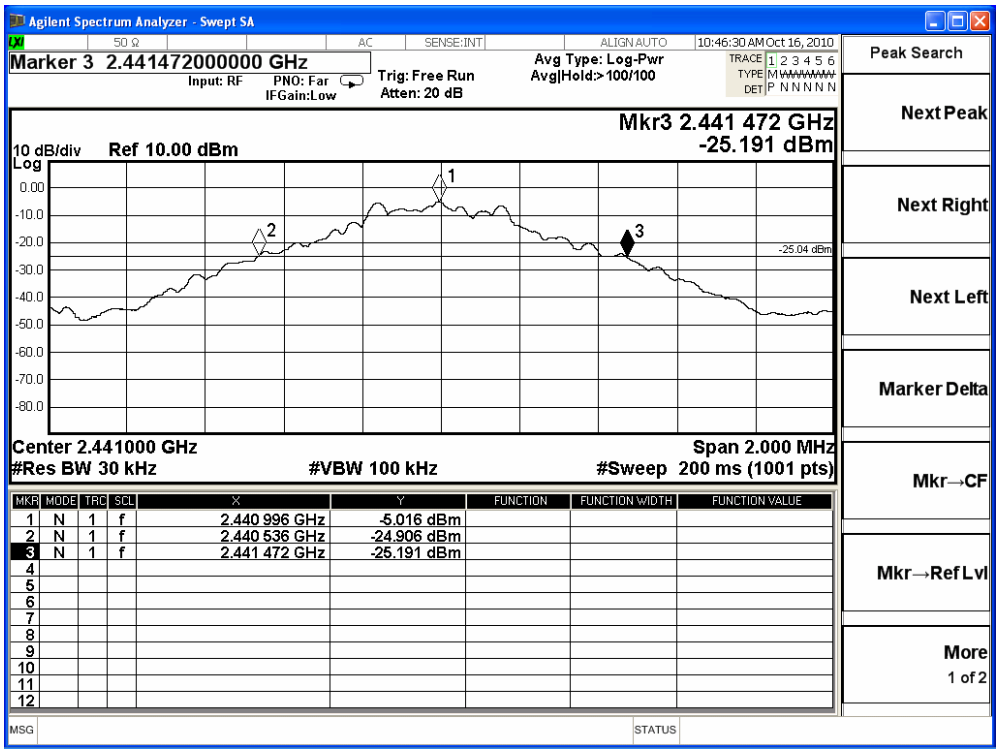
Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Separation (KHz)	Limit (KHz)	Pass/Fail
00	**2402**	1000	≧ 624	Pass
39	**2441**	1000	≧ 624	Pass
78	**2480**	1000	≧ 622.67	Pass

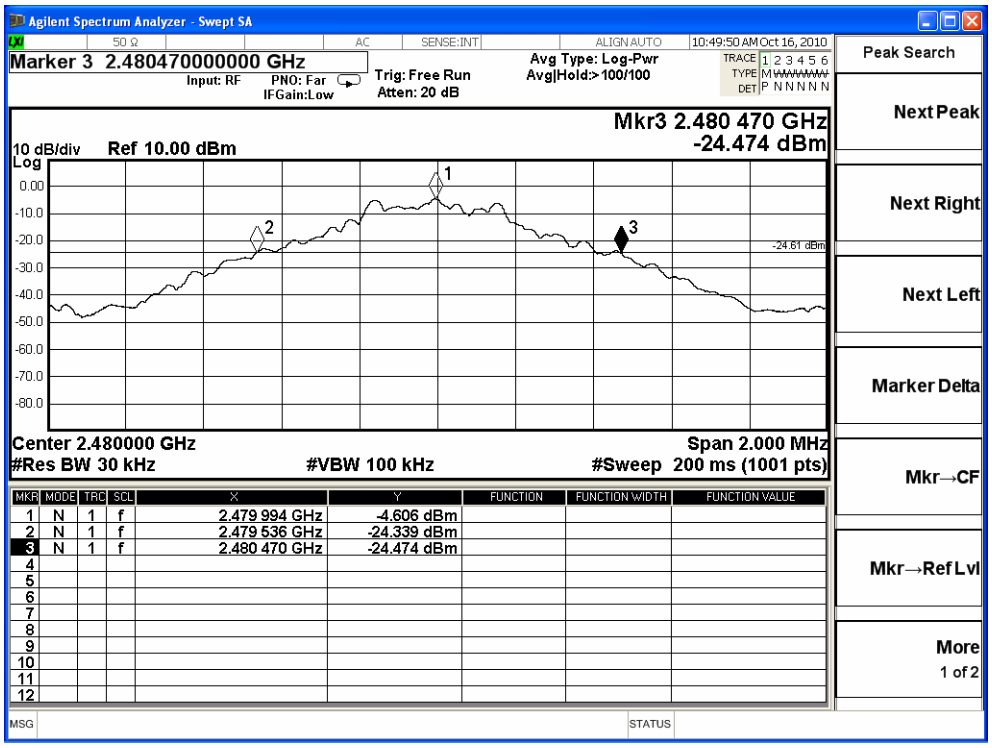
20dB Bandwidth Channel 00:



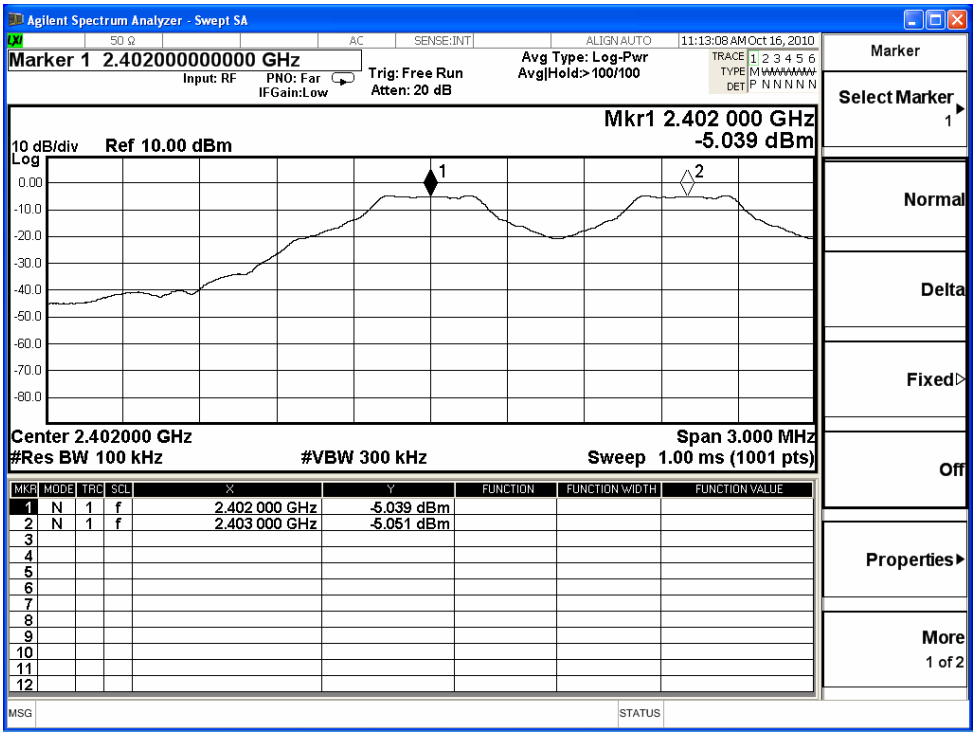
20dB Bandwidth Channel 39:



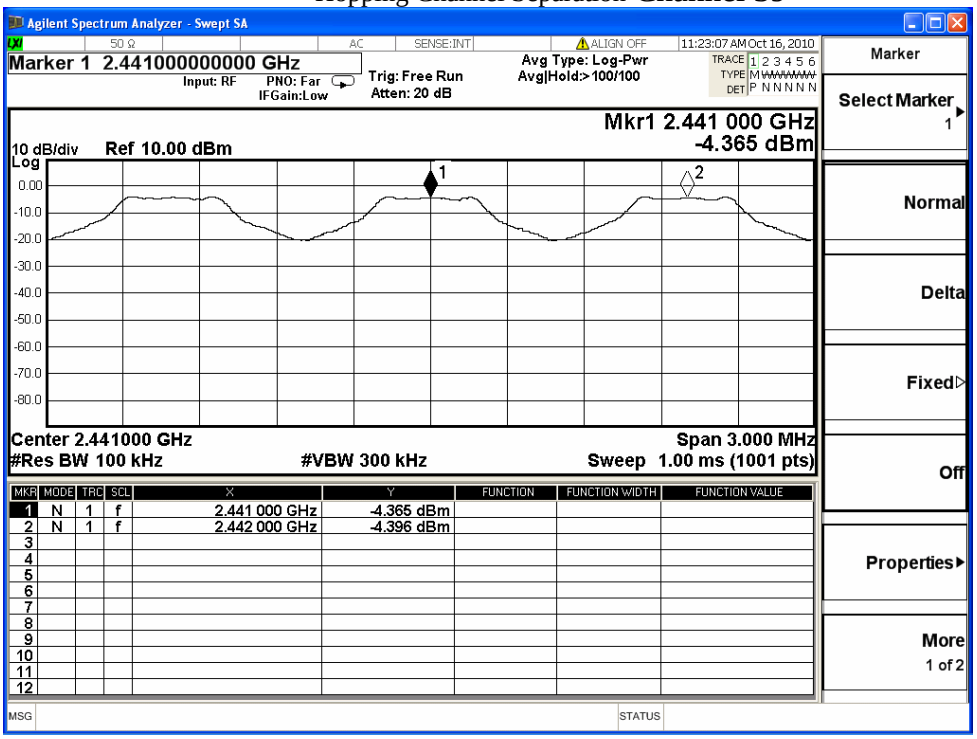
20dB Bandwidth Channel 78:



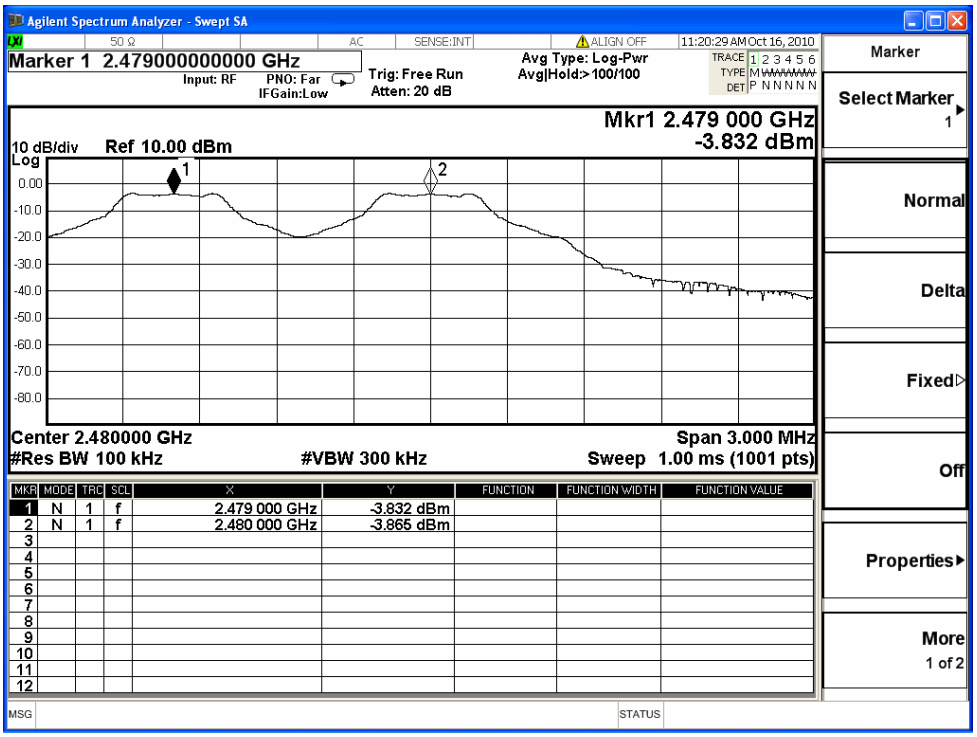
Hopping Channel Separation Channel 00



Hopping Channel Separation Channel 39



Hopping Channel Separation Channel 78



3.8.5 Test Data: 2 Mbps

20dB Bandwidth

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	20dB Bandwidth (KHz)
00	**2402**	1248
39	**2441**	1242
78	**2480**	1238

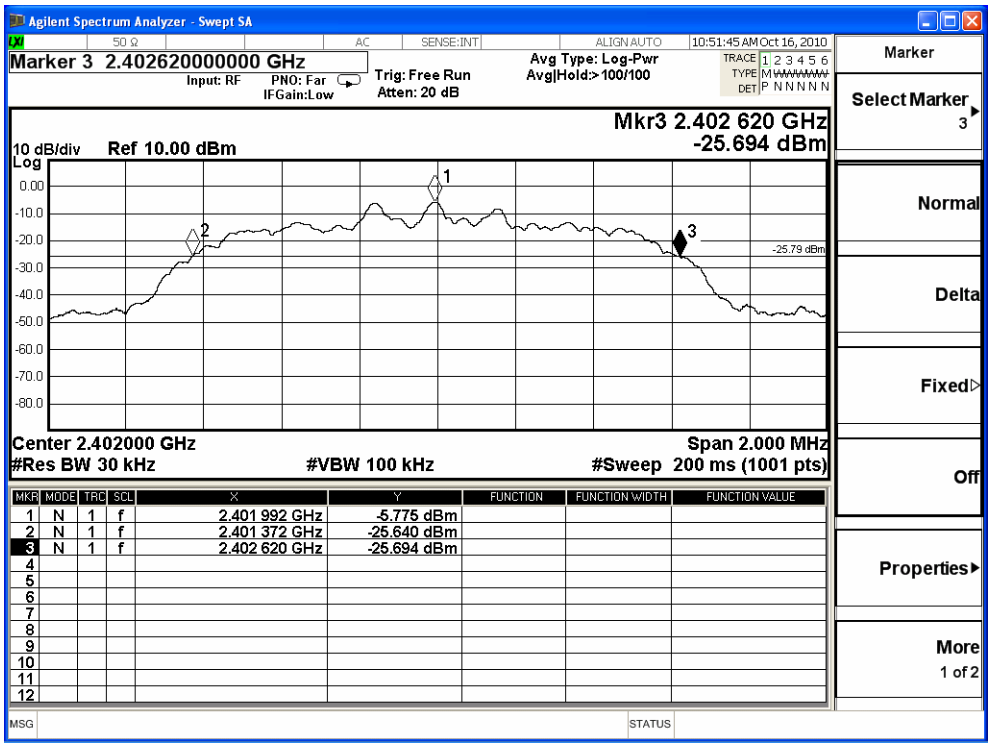
Hopping Channel Separation

Temperature (℃):25

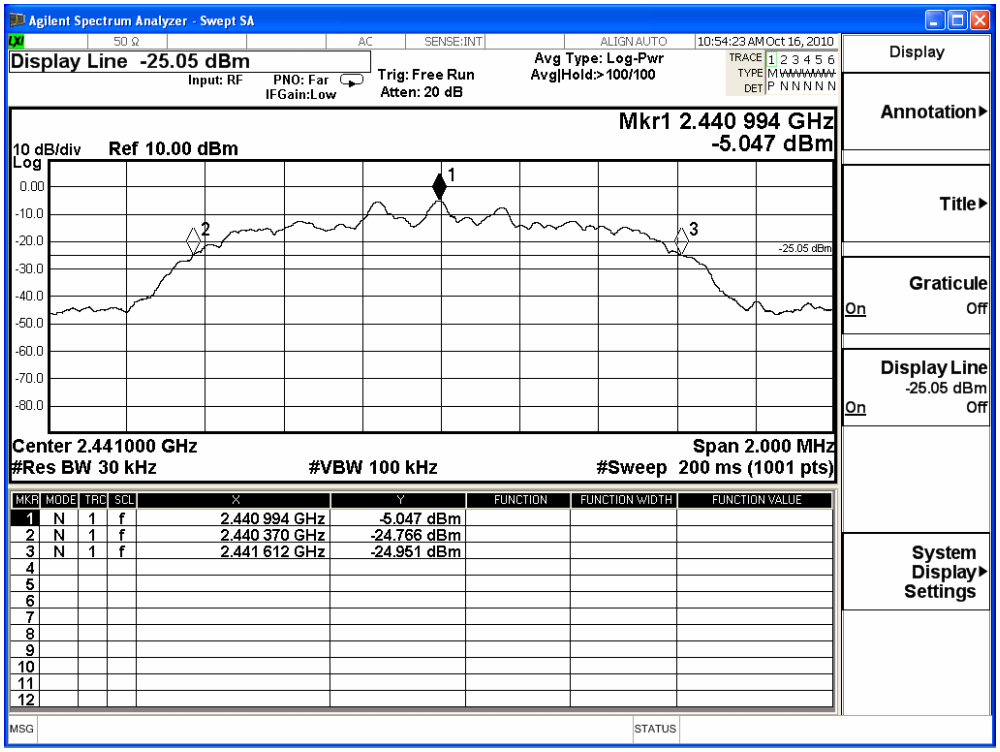
Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Separation (KHz)	Limit (KHz)		Pass/Fail
00	**2402**	1000	≧	832	Pass
39	**2441**	1000	≧	828	Pass
78	**2480**	1000	≧	825.33	Pass

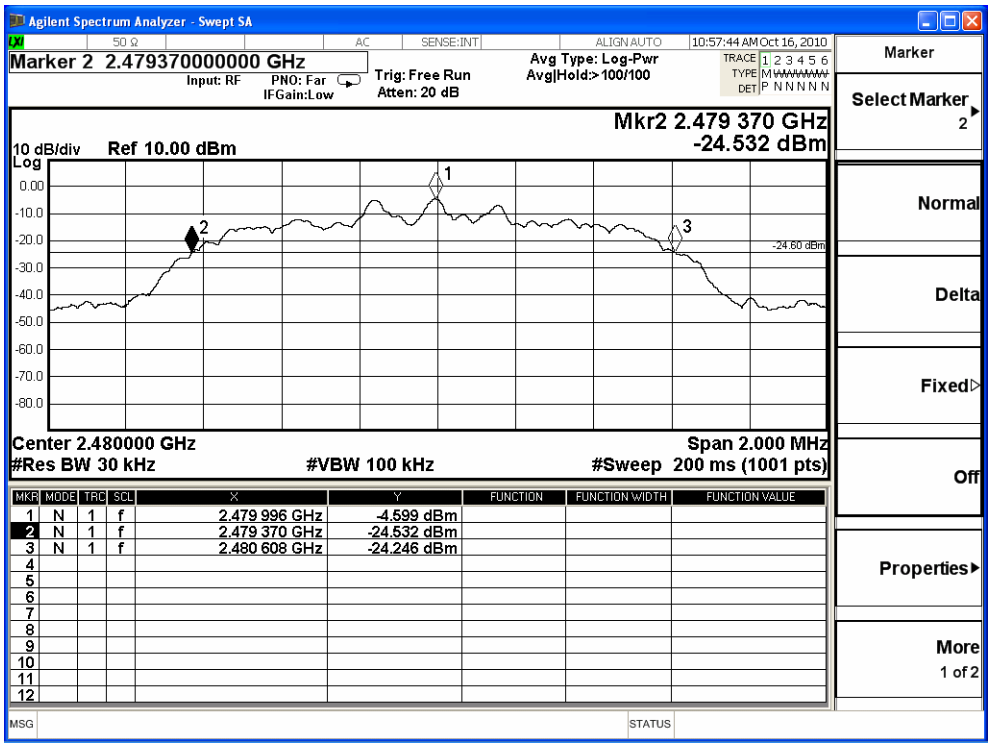
20dB Bandwidth Channel 00:



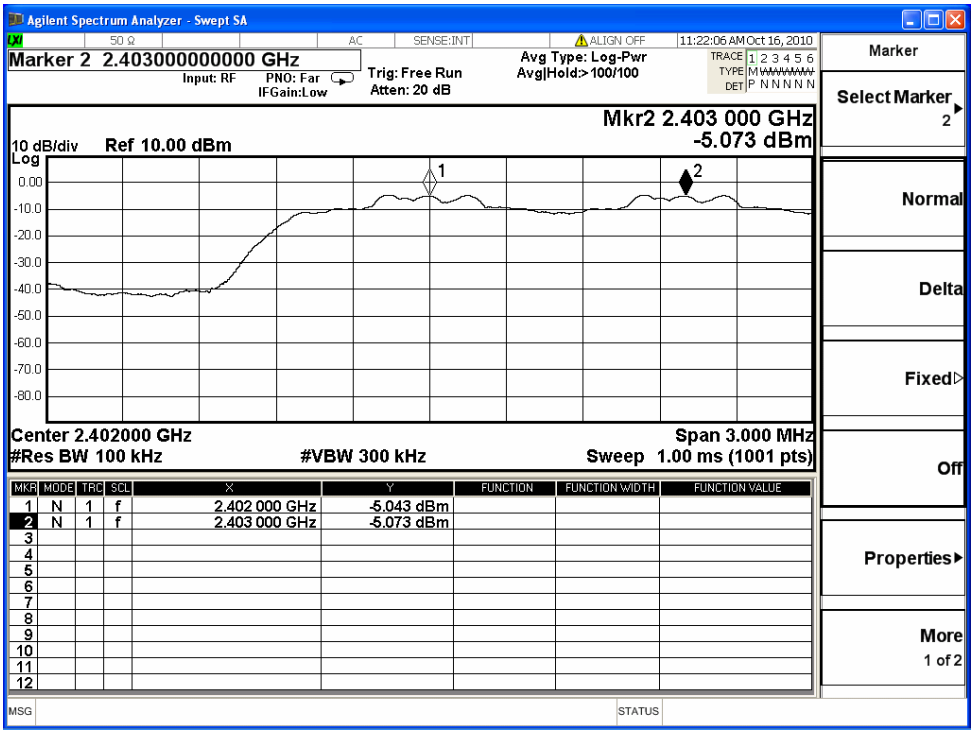
20dB Bandwidth Channel 39:



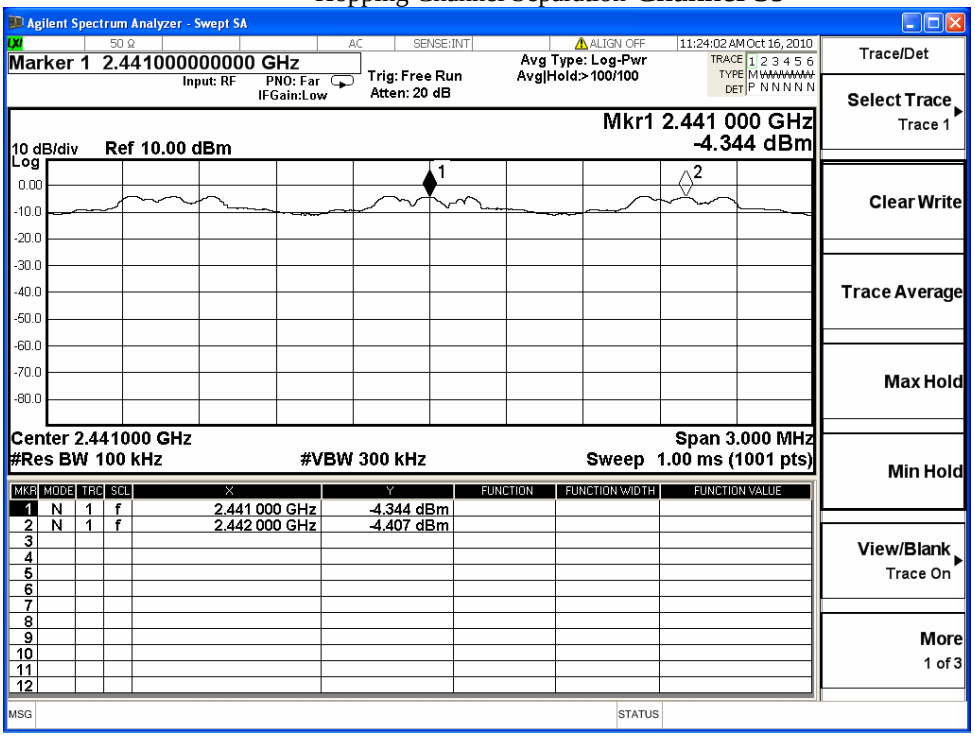
20dB Bandwidth Channel 78:



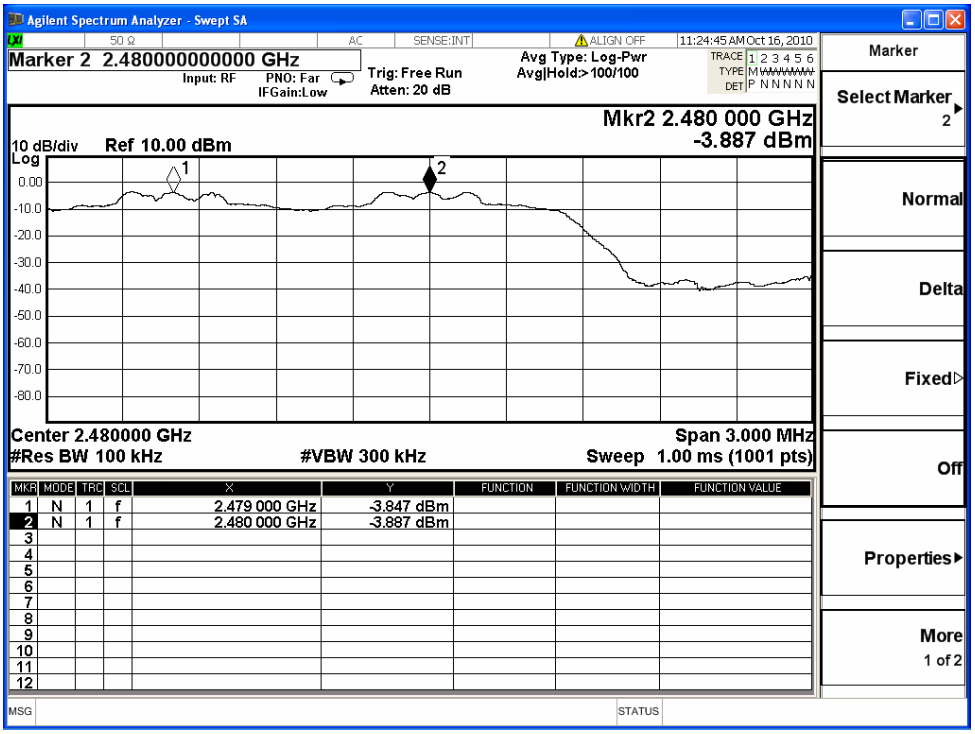
Hopping Channel Separation Channel 00



Hopping Channel Separation Channel 39



Hopping Channel Separation Channel 78



3.8.6 Test Data: 3Mbps

20dB Bandwidth

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	20dB Bandwidth (KHz)
00	**2402**	1254
39	**2441**	1256
78	**2480**	1256

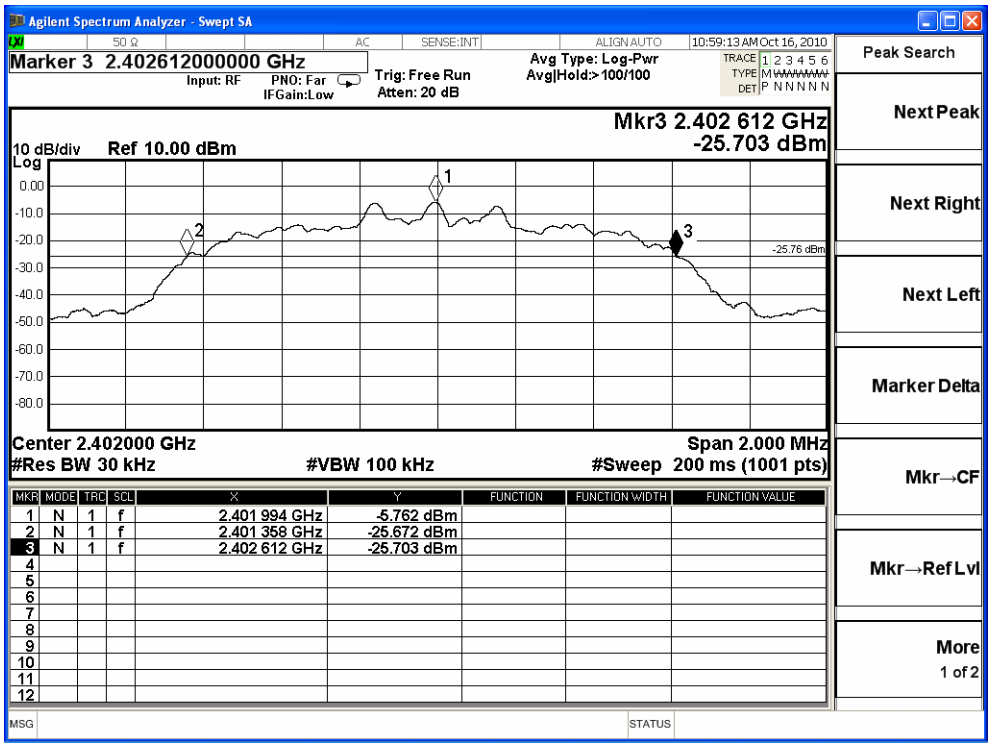
Hopping Channel Separation

Temperature (℃):25

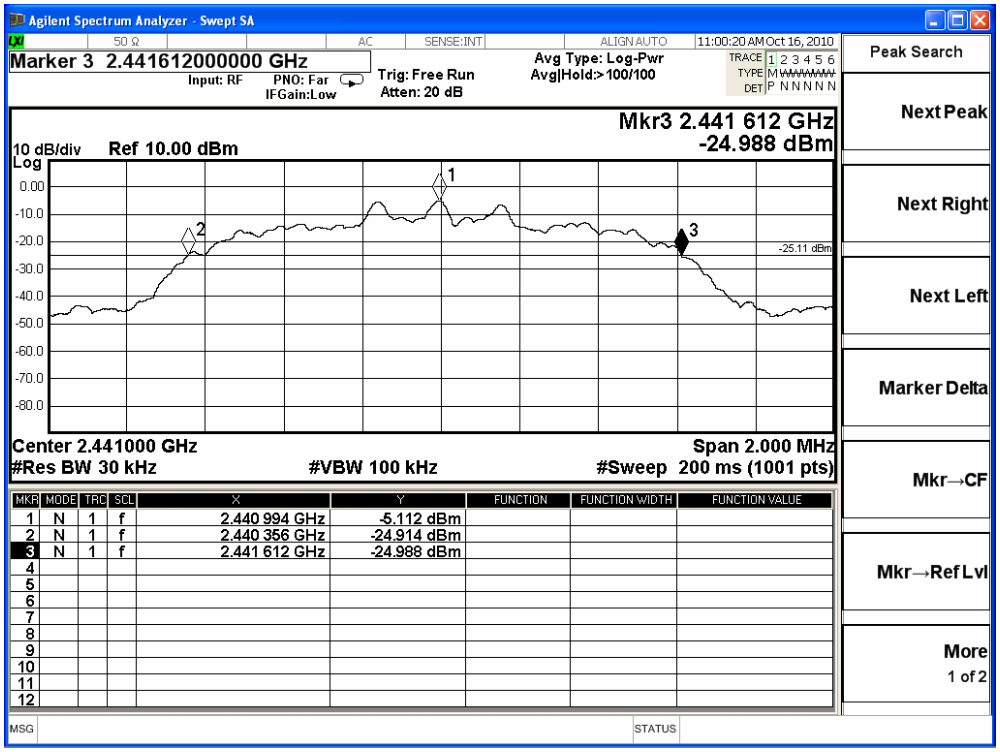
Test Engineer:Scott Chien Humidity (%):55

Channel	Frequency (MHz)	Separation (KHz)	Limit (KHz)	Pass/Fail
00	**2402**	1000	≧ 836	Pass
39	**2441**	1000	≧ 837.33	Pass
78	**2480**	1000	≧ 837.33	Pass

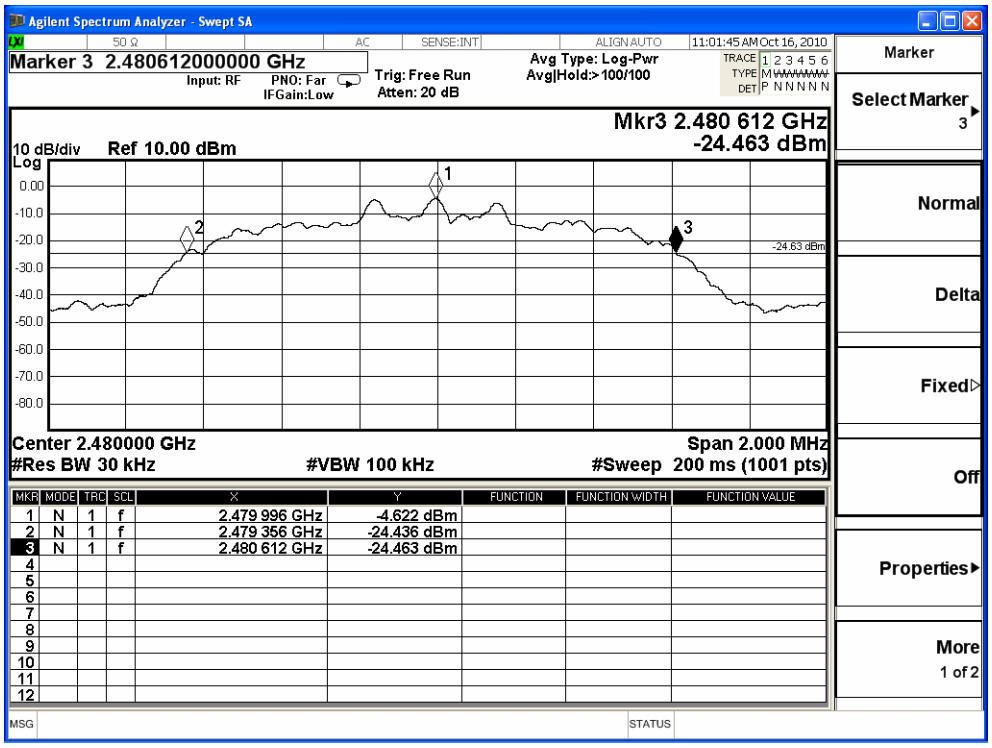
20dB Bandwidth Channel 00:



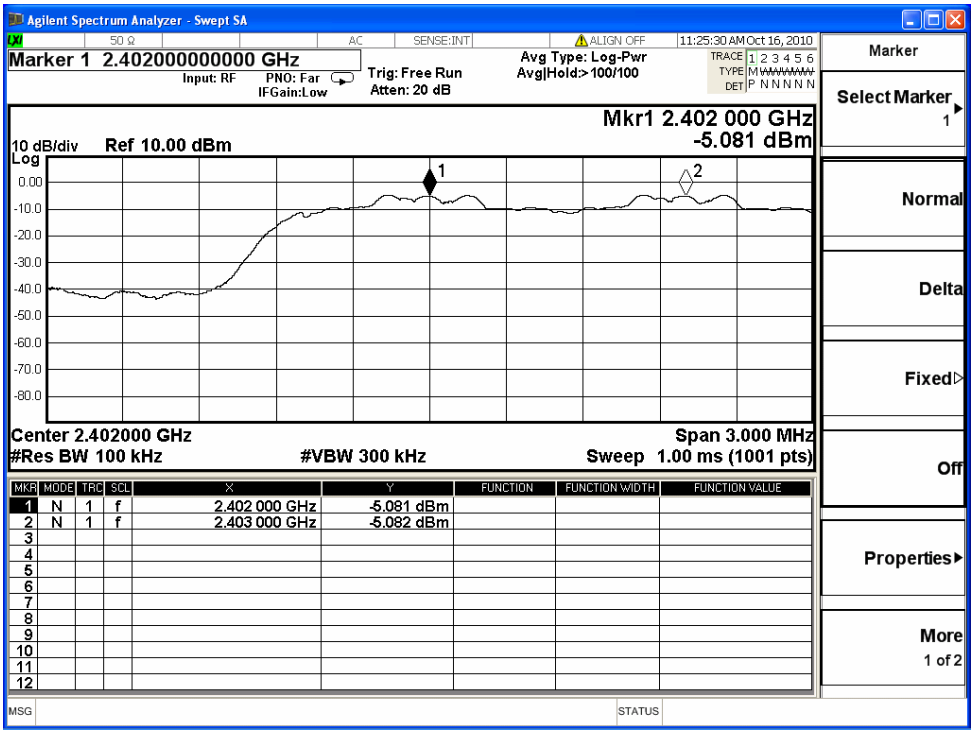
20dB Bandwidth Channel 39:



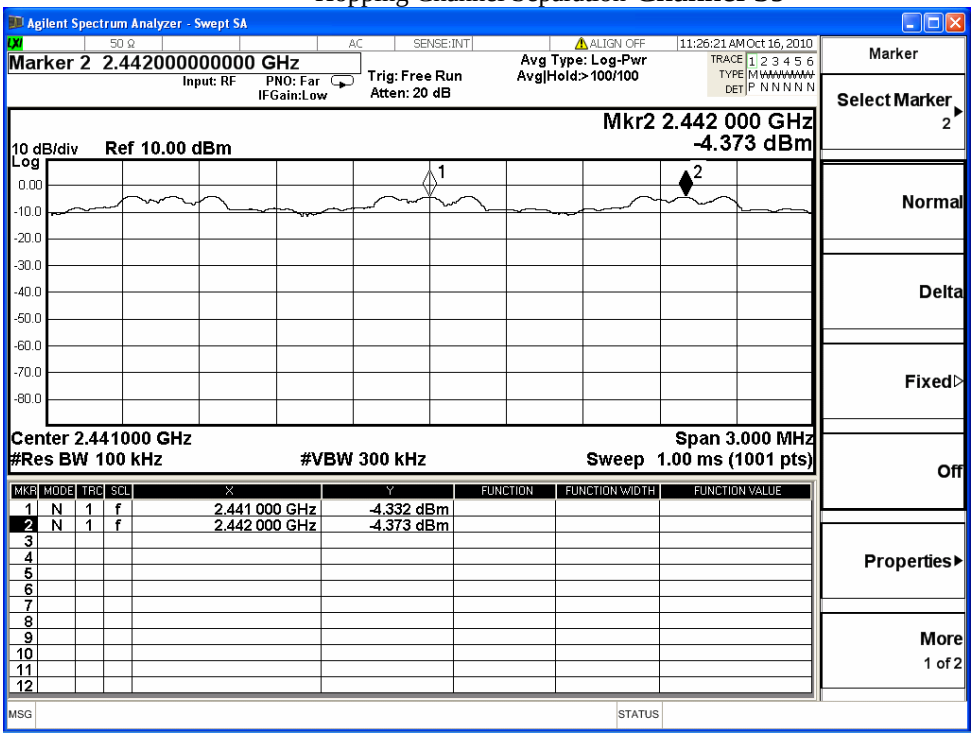
20dB Bandwidth Channel 78:



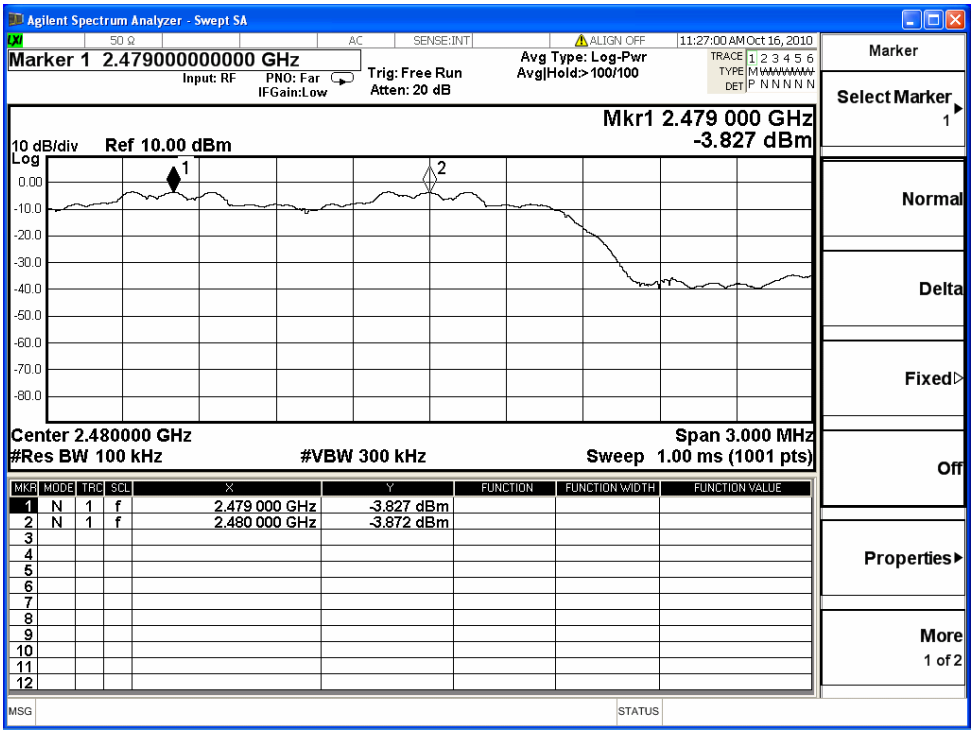
Hopping Channel Separation Channel 00



Hopping Channel Separation Channel 39



Hopping Channel Separation Channel 78

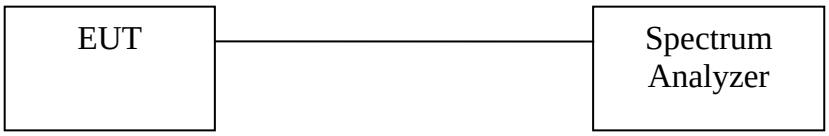


3.9 Number of Hopping Frequency Used

3.9.1 Test Procedure

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
   Equipment mode: Spectrum analyzer
   RBW: 300KHz
   VBW: 1MHz
2. Set the spectrum analyzer on Max-Hold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
3. Repeat above procedures until all frequencies measured were complete.

3.9.2 Test Setup

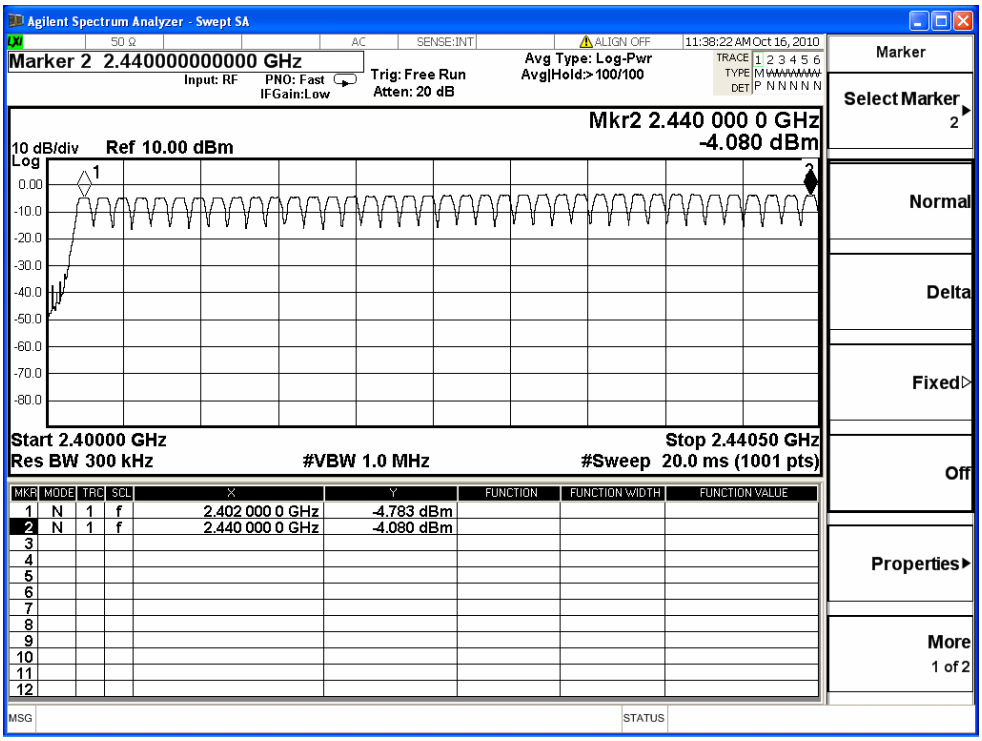


3.9.3 Test Data

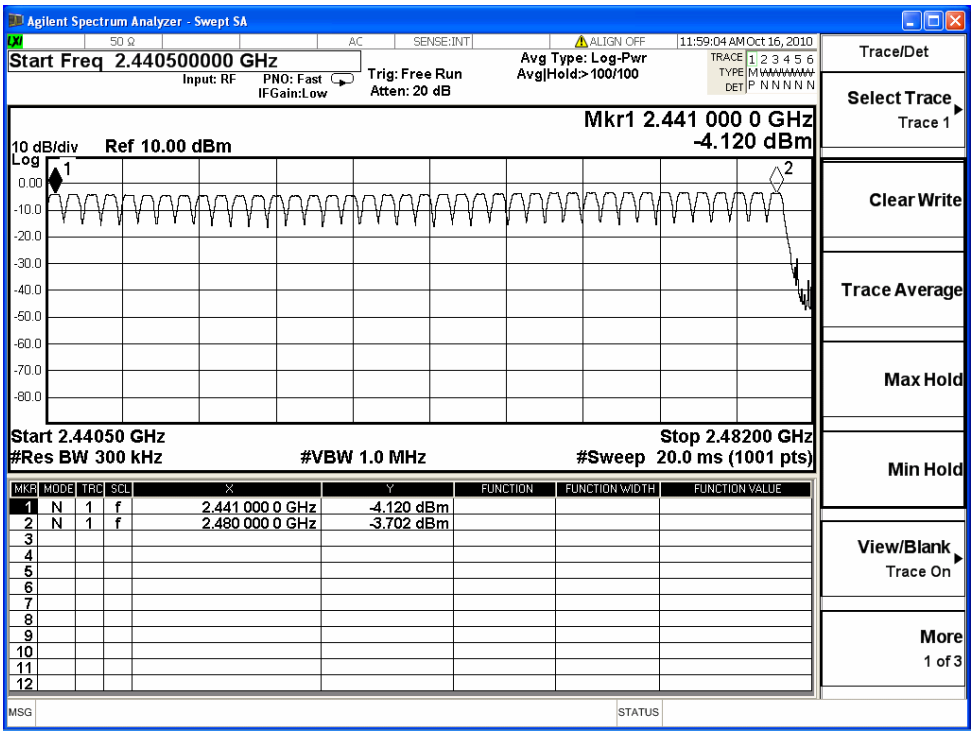
Number of Hopping Frequency Used

Test result	Limit (Channels)	Pass/Fail
79	>75	Pass

2400~2405MHz



2405~2482MHz

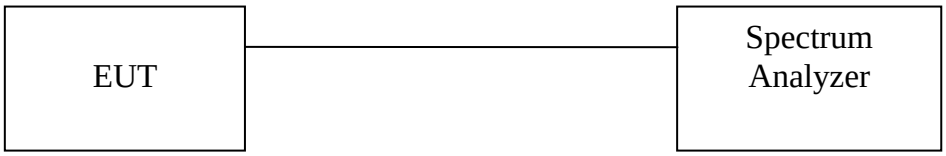


3.10 Dwell Time

3.10.1 Test Procedure

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
   Equipment mode: Spectrum analyzer
   RBW: 1MHz
   VBW: 1MHz
   SPAN: Zero Span
2. Adjust the center frequency of spectrum analyzer on any frequency be measured.
3. Measure the Dwell Time by spectrum analyzer Marker function.
4. Repeat above procedures until all frequencies measured were complete.

3.10.2 Test Setup



3.10.3 Test Data: 1Mbps

Dwell Time

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2402**	397	254.08	< 400	Pass
DH3	**2402**	1650	352.00	< 400	Pass
DH5	**2402**	2900	371.20	< 400	Pass

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2441**	397	254.08	< 400	Pass
DH3	**2441**	1650	352.00	< 400	Pass
DH5	**2441**	2890	369.92	< 400	Pass

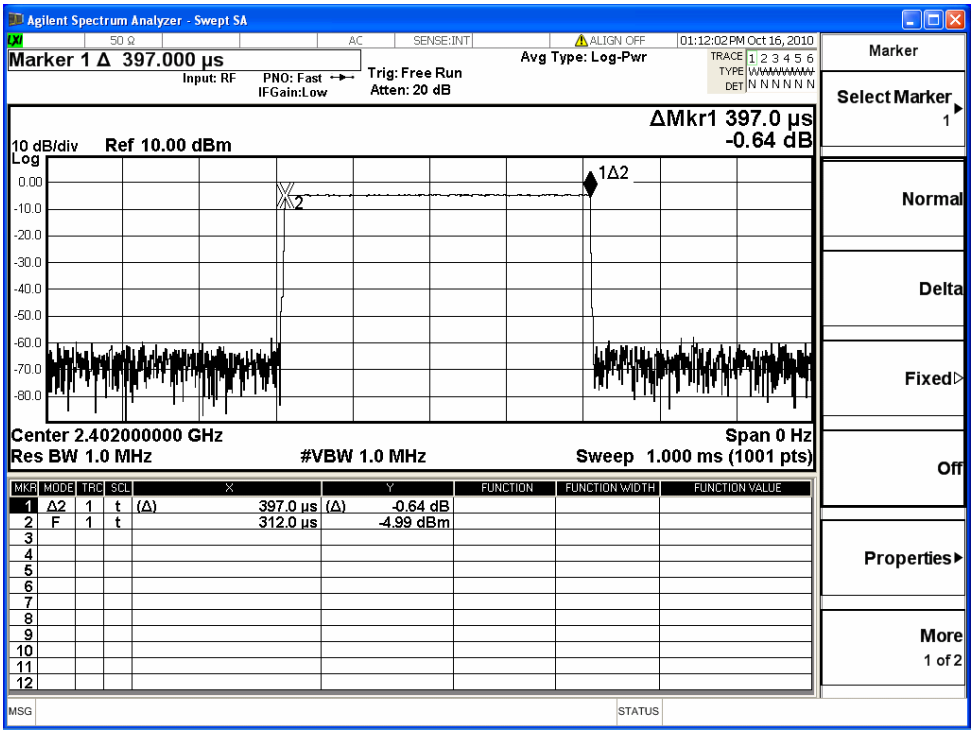
Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2480**	398	254.72	< 400	Pass
DH3	**2480**	1647	351.36	< 400	Pass
DH5	**2480**	2895	370.56	< 400	Pass

Note:

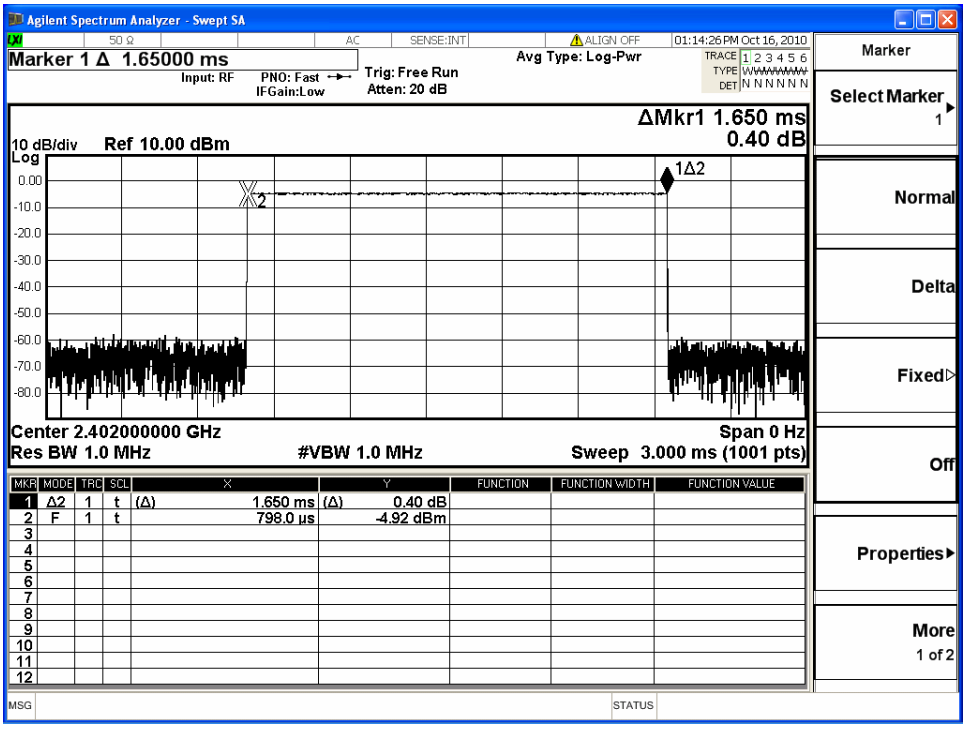
A period time=79x0.4(s)=31.6(s)

CH00	DH1 time slot=	397 (μs)*(1600/(1*79))*31.6=	254.08 (ms)
	DH3 time slot=	1650 (μs)*(1600/(3*79))*31.6=	352.00 (ms)
	DH5 time slot=	2900 (μs)*(1600/(5*79))*31.6=	371.20 (ms)
CH39	DH1 time slot=	397 (μs)*(1600/(1*79))*31.6=	254.08 (ms)
	DH3 time slot=	1650 (μs)*(1600/(3*79))*31.6=	352.00 (ms)
	DH5 time slot=	2890 (μs)*(1600/(5*79))*31.6=	369.92 (ms)
CH78	DH1 time slot=	398 (μs)*(1600/(1*79))*31.6=	254.72 (ms)
	DH3 time slot=	1647 (μs)*(1600/(3*79))*31.6=	351.36 (ms)
	DH5 time slot=	2895 (μs)*(1600/(5*79))*31.6=	370.56 (ms)

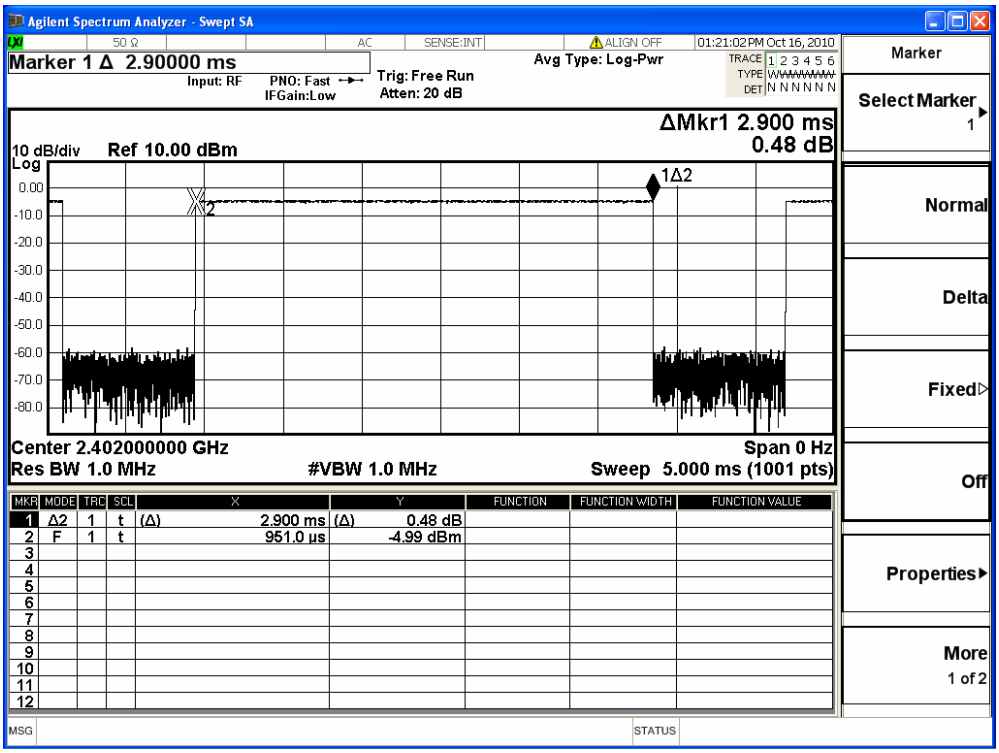
Channel 00 DH1:



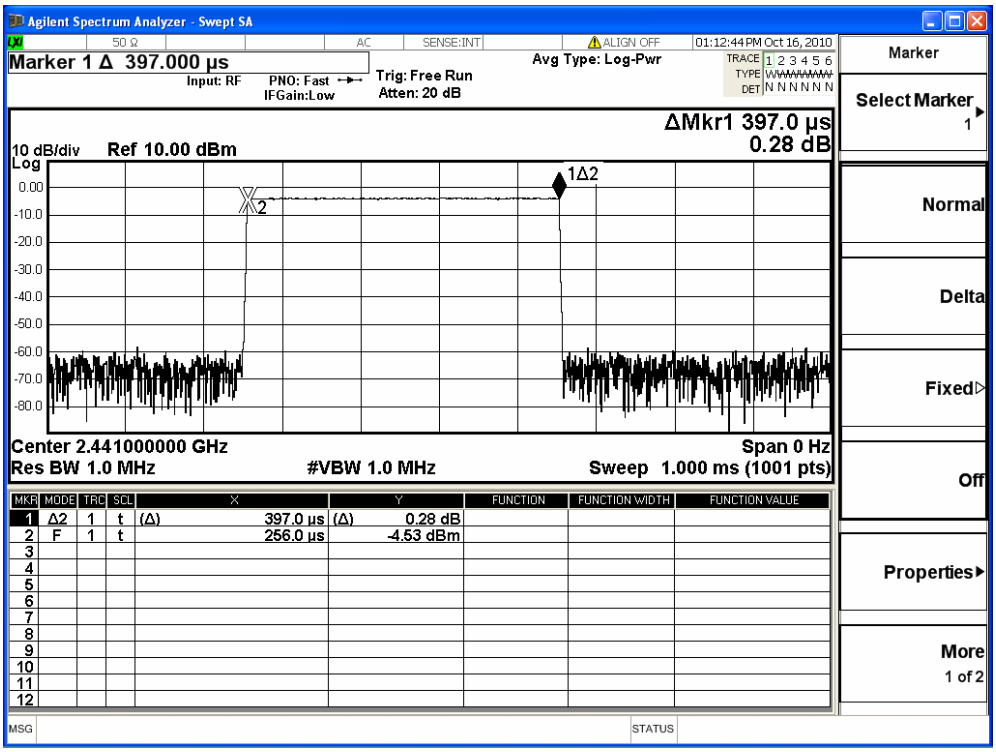
Channel 00 DH3:



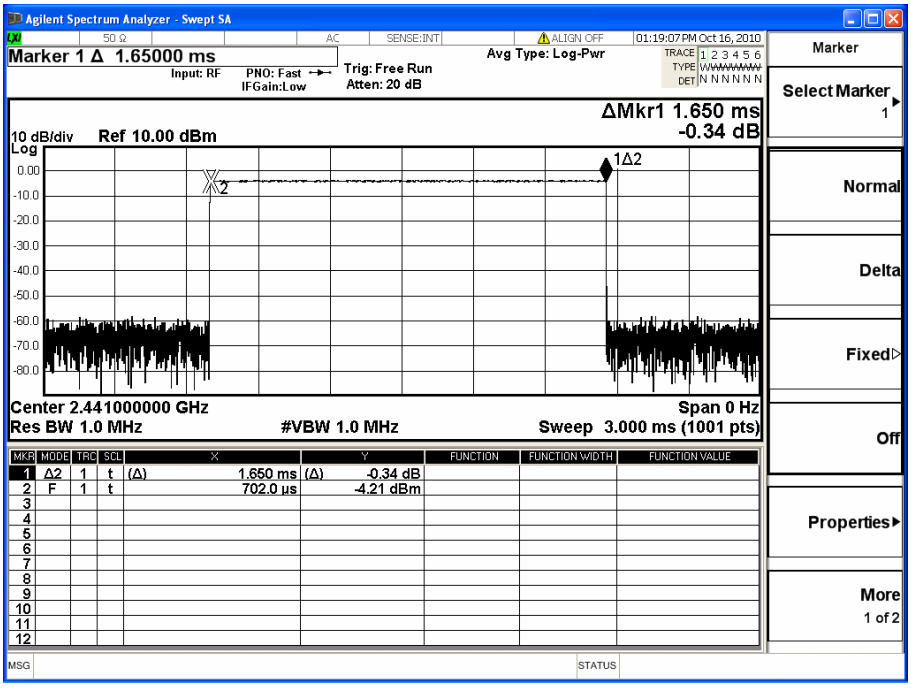
Channel 00 DH5:



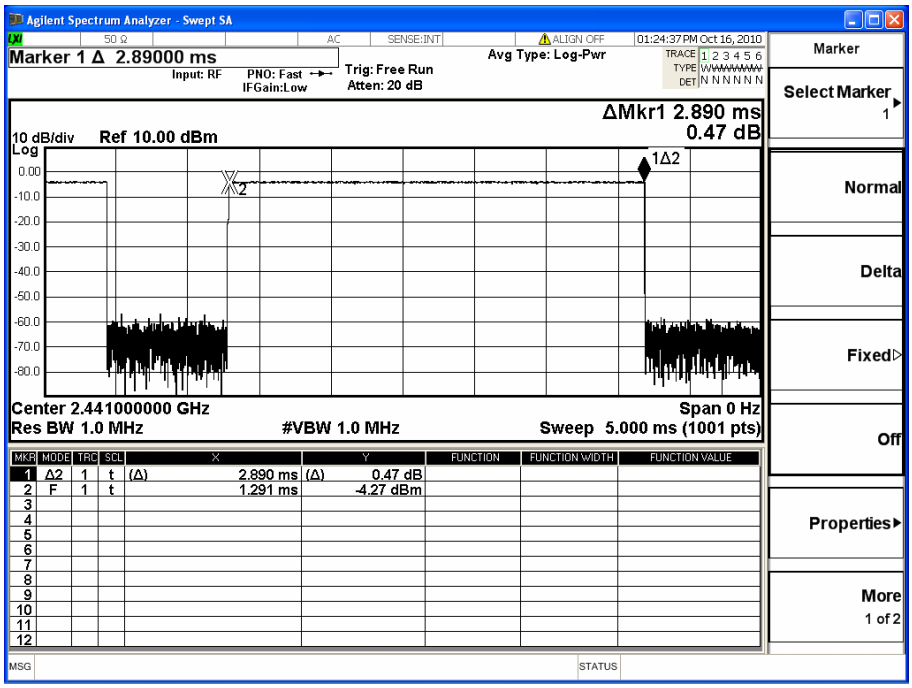
Channel 39 DH1:



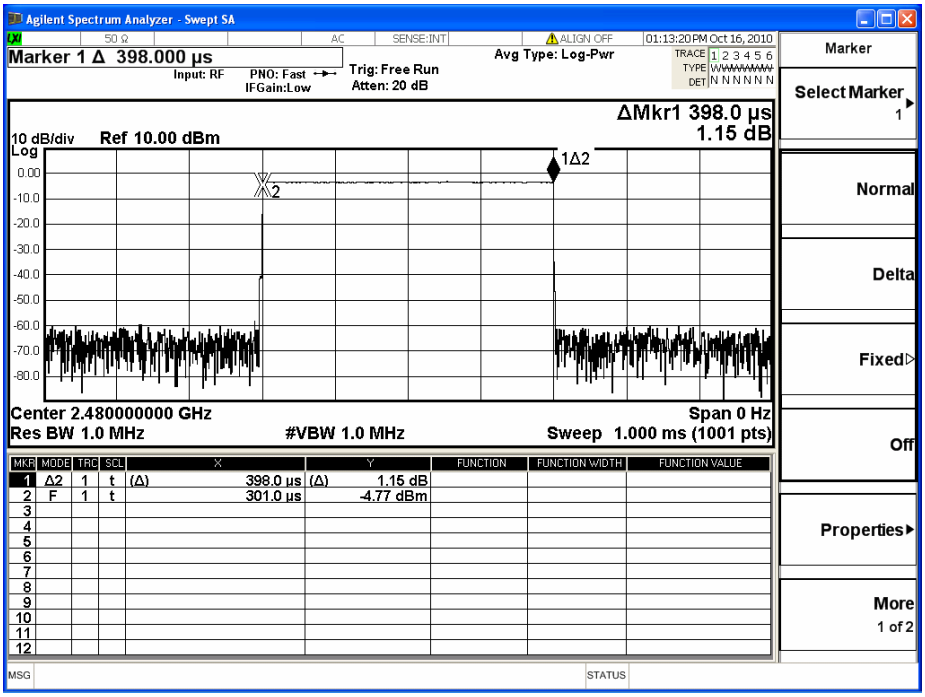
Channel 39 DH3:



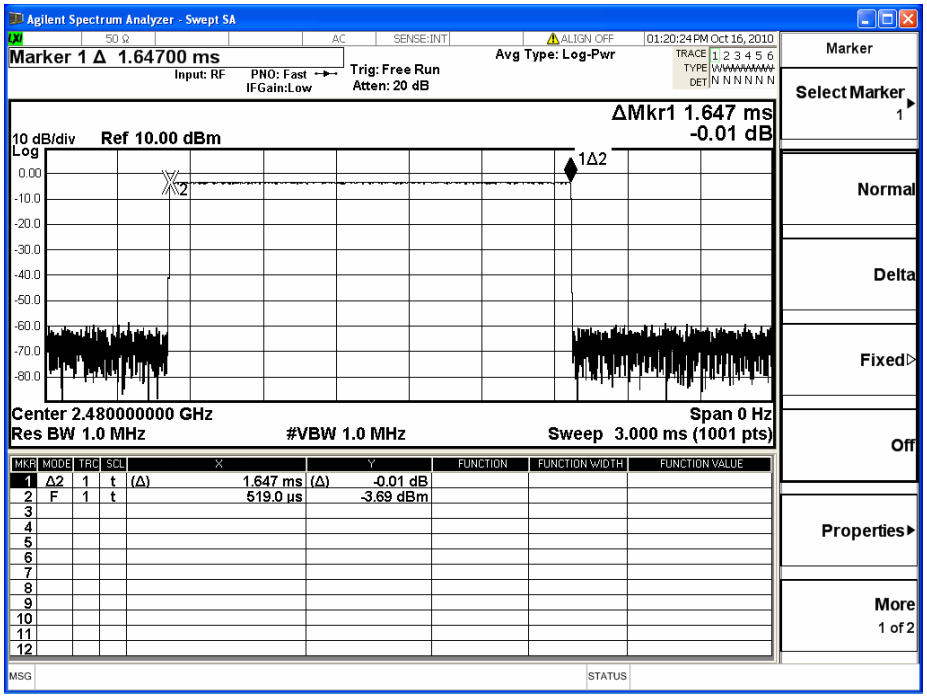
Channel 39 DH5:



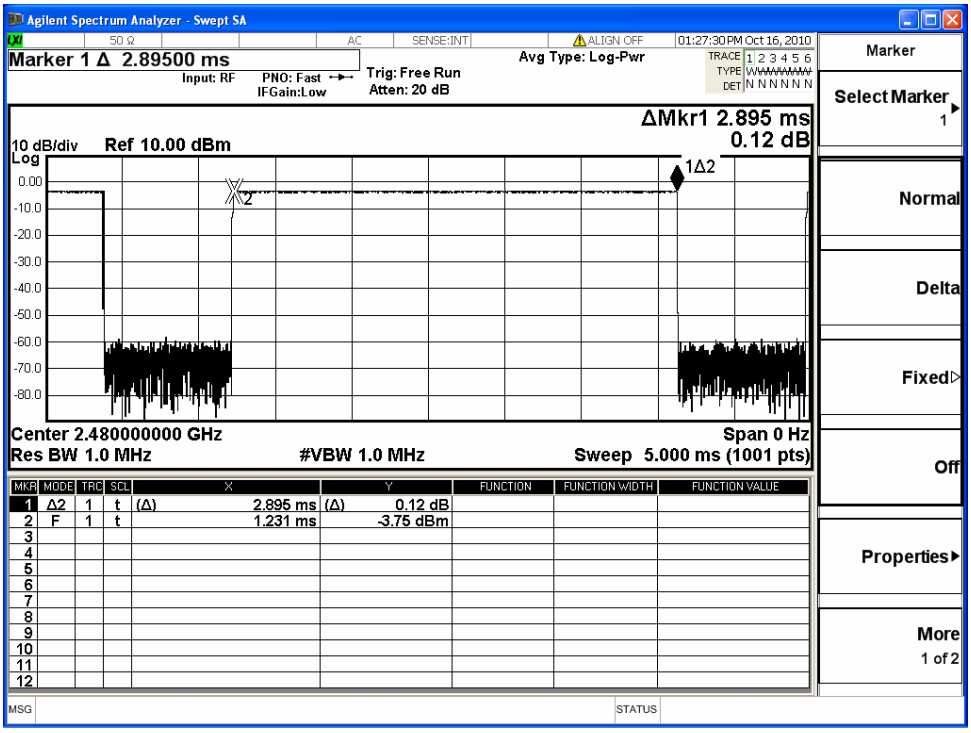
Channel 78 DH1:



Channel 78 DH3:



Channel 78 DH5:



3.10.4 Test Data: 2Mbps

Dwell Time

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2402**	409	261.76	< 400	Pass
DH3	**2402**	1662	354.56	< 400	Pass
DH5	**2402**	2890	369.92	< 400	Pass

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2441**	408	261.12	< 400	Pass
DH3	**2441**	1662	354.56	< 400	Pass
DH5	**2441**	2900	371.20	< 400	Pass

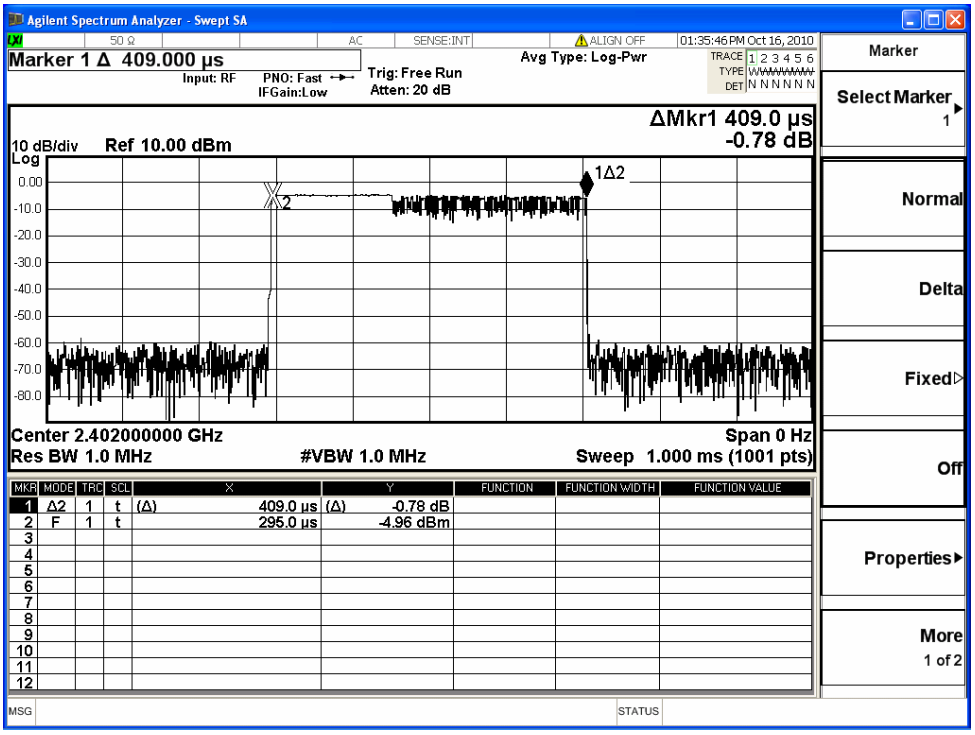
Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2480**	409	261.76	< 400	Pass
DH3	**2480**	1662	354.56	< 400	Pass
DH5	**2480**	2910	372.48	< 400	Pass

Note:

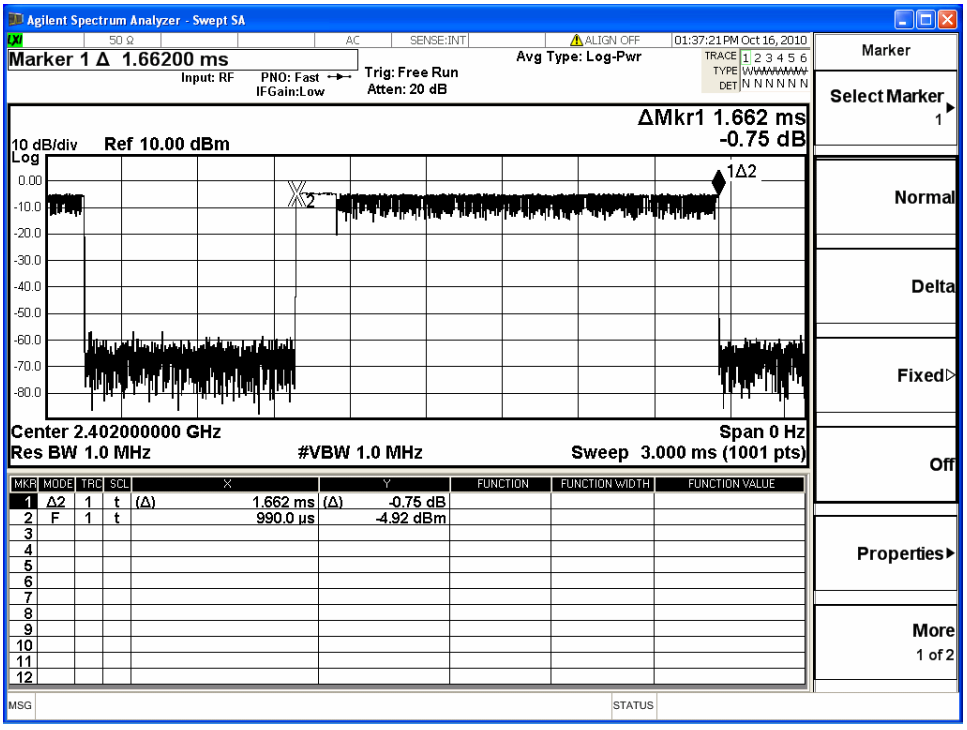
A period time=79x0.4(s)=31.6(s)

CH00	DH1 time slot=	409 (μs)*(1600/(1*79))*31.6=	261.76 (ms)
	DH3 time slot=	1662 (μs)*(1600/(3*79))*31.6=	354.56 (ms)
	DH5 time slot=	2890 (μs)*(1600/(5*79))*31.6=	369.92 (ms)
CH39	DH1 time slot=	408 (μs)*(1600/(1*79))*31.6=	261.12 (ms)
	DH3 time slot=	1662 (μs)*(1600/(3*79))*31.6=	354.56 (ms)
	DH5 time slot=	2900 (μs)*(1600/(5*79))*31.6=	371.20 (ms)
CH78	DH1 time slot=	409 (μs)*(1600/(1*79))*31.6=	261.76 (ms)
	DH3 time slot=	1662 (μs)*(1600/(3*79))*31.6=	354.56 (ms)
	DH5 time slot=	2910 (μs)*(1600/(5*79))*31.6=	372.48 (ms)

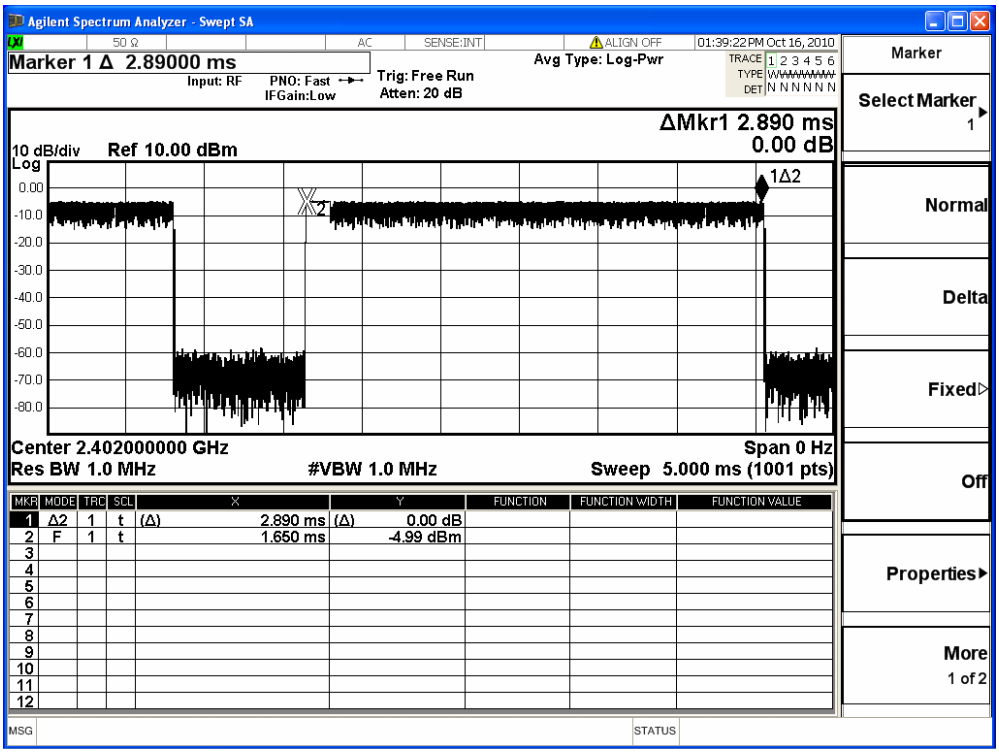
Channel 00 DH1:



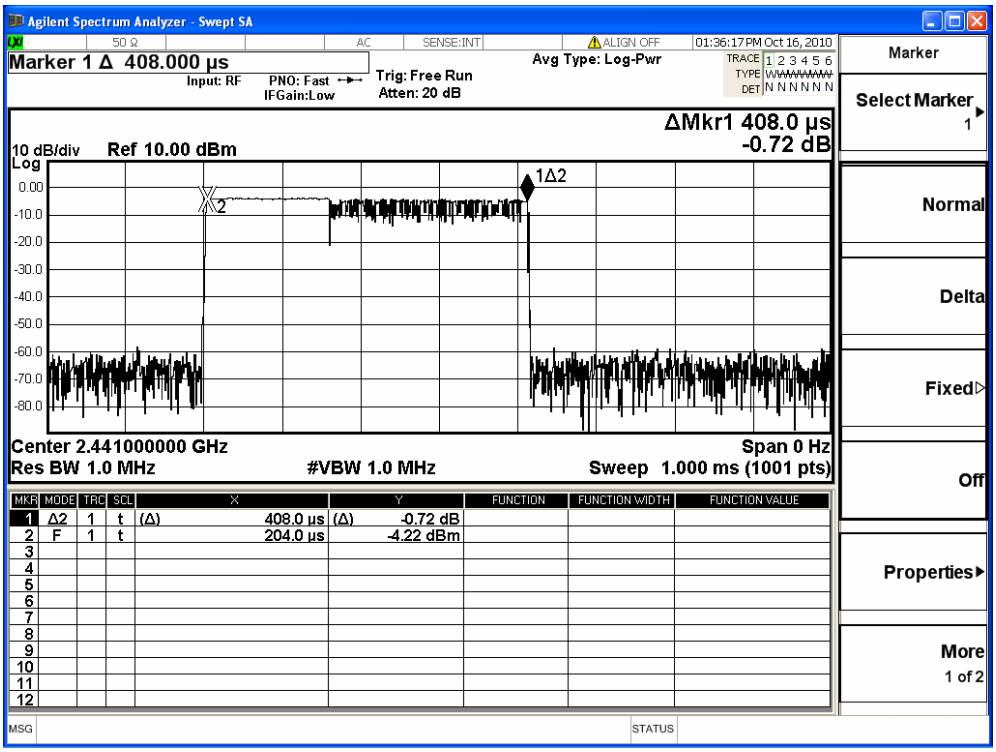
Channel 00 DH3:



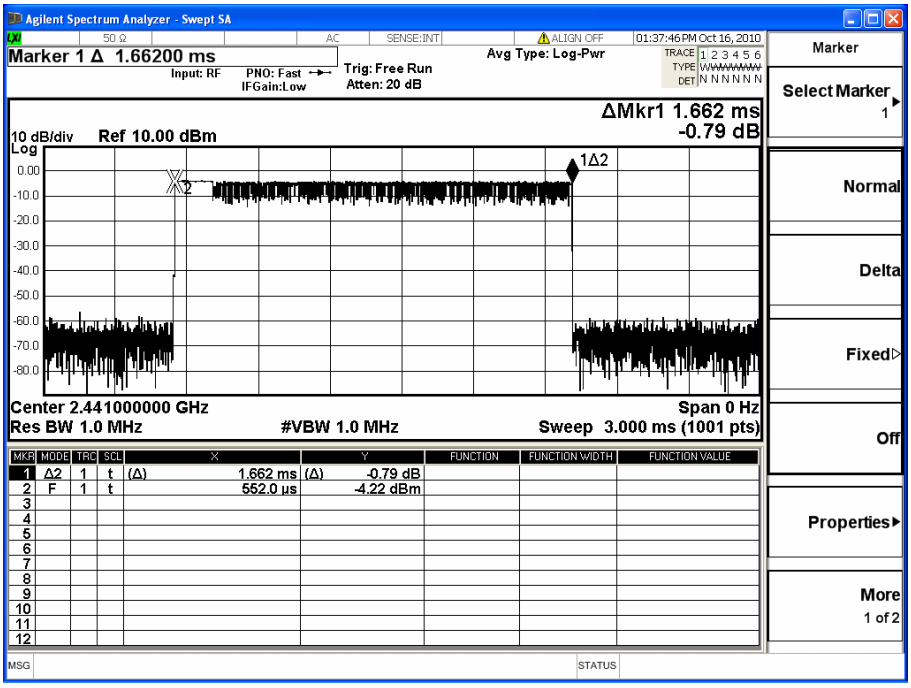
Channel 00 DH5:



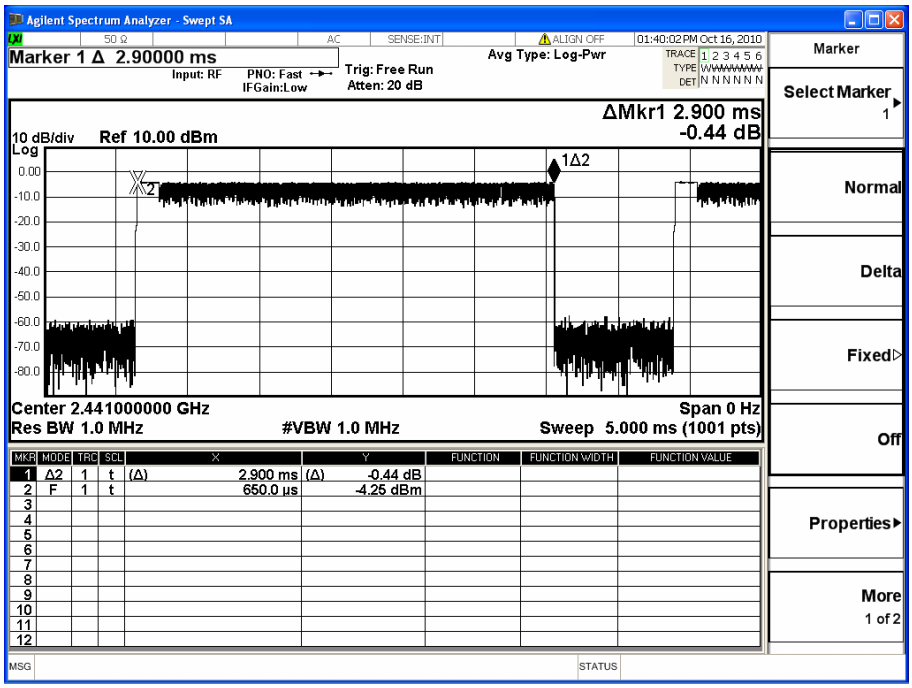
Channel 39 DH1:



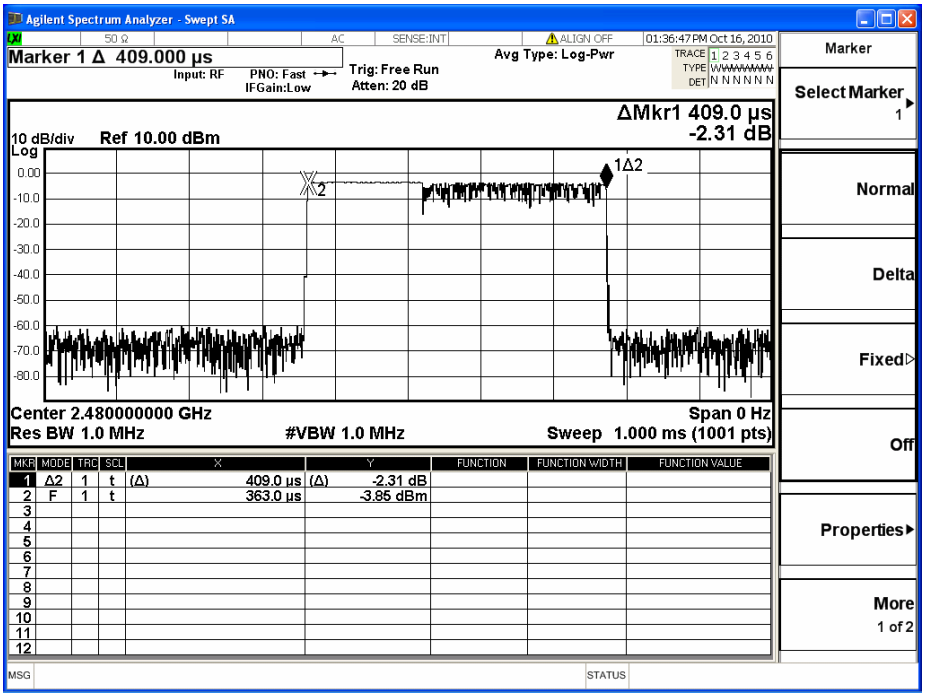
Channel 39 DH3:



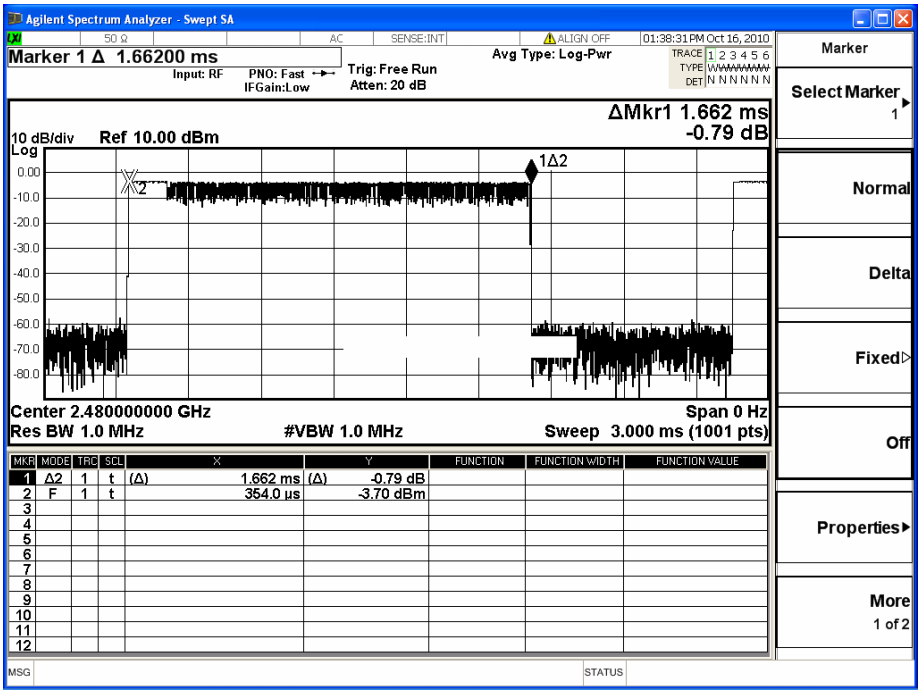
Channel 39 DH5:



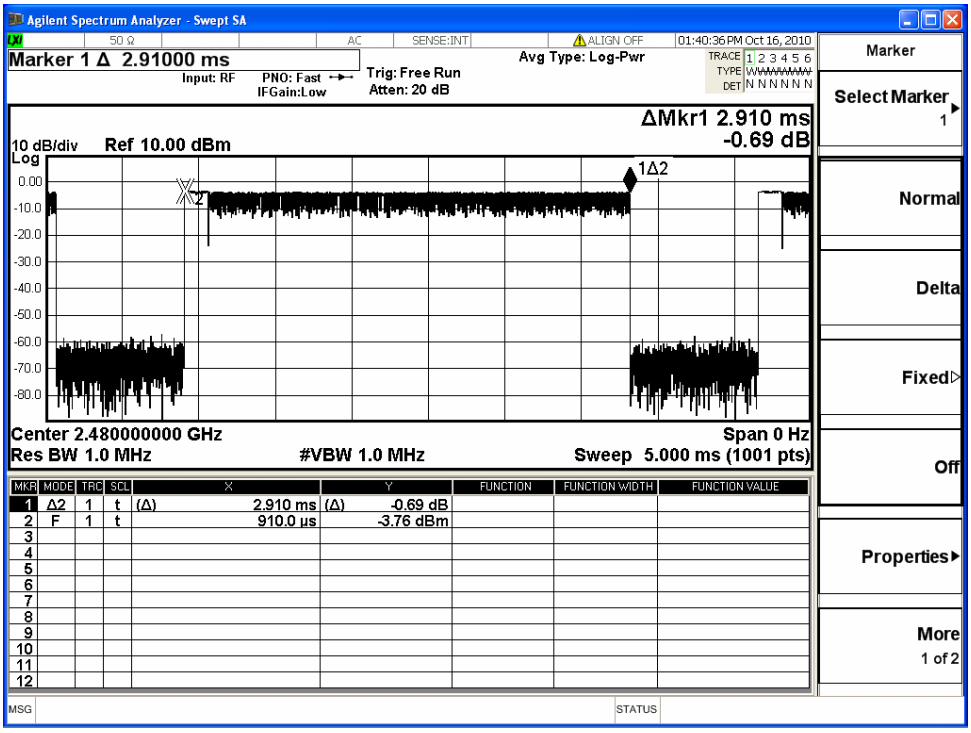
Channel 78 DH1:



Channel 78 DH3:



Channel 78 DH5:



3.10.5 Test Data: 3Mbps

Dwell Time

Temperature (℃):25

Test Engineer:Scott Chien Humidity (%):55

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2402**	408	261.12	< 400	Pass
DH3	**2402**	1662	354.56	< 400	Pass
DH5	**2402**	2910	372.48	< 400	Pass

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2441**	408	261.12	< 400	Pass
DH3	**2441**	1662	354.56	< 400	Pass
DH5	**2441**	2910	372.48	< 400	Pass

Mode	Frequency (MHz)	Spectrum Reading (μs)	Test Result (ms)	Limit (ms)	Pass/Fail
DH1	**2480**	408	261.12	< 400	Pass
DH3	**2480**	1662	354.56	< 400	Pass
DH5	**2480**	2910	372.48	< 400	Pass

Note:

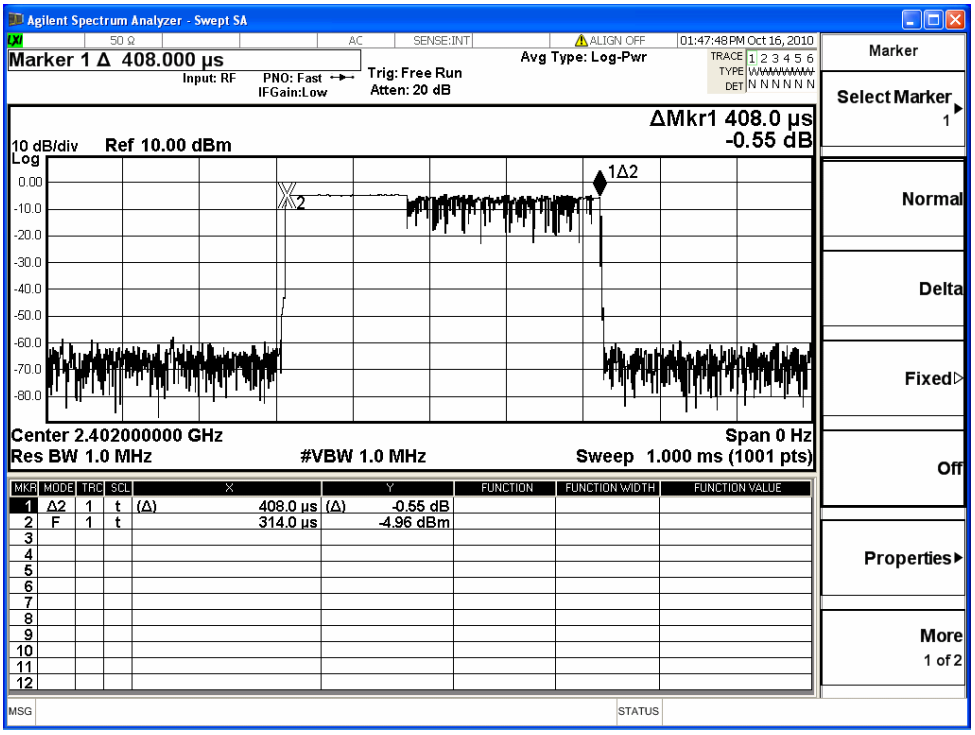
A period time=79x0.4(s)=31.6(s)

CH00 DH1 time slot= 408 (μs)*(1600/(1*79))*31.6= 261.12 (ms)
DH3 time slot= 1662 (μs)*(1600/(3*79))*31.6= 354.56 (ms)
DH5 time slot= 2910 (μs)*(1600/(5*79))*31.6= 372.48 (ms)

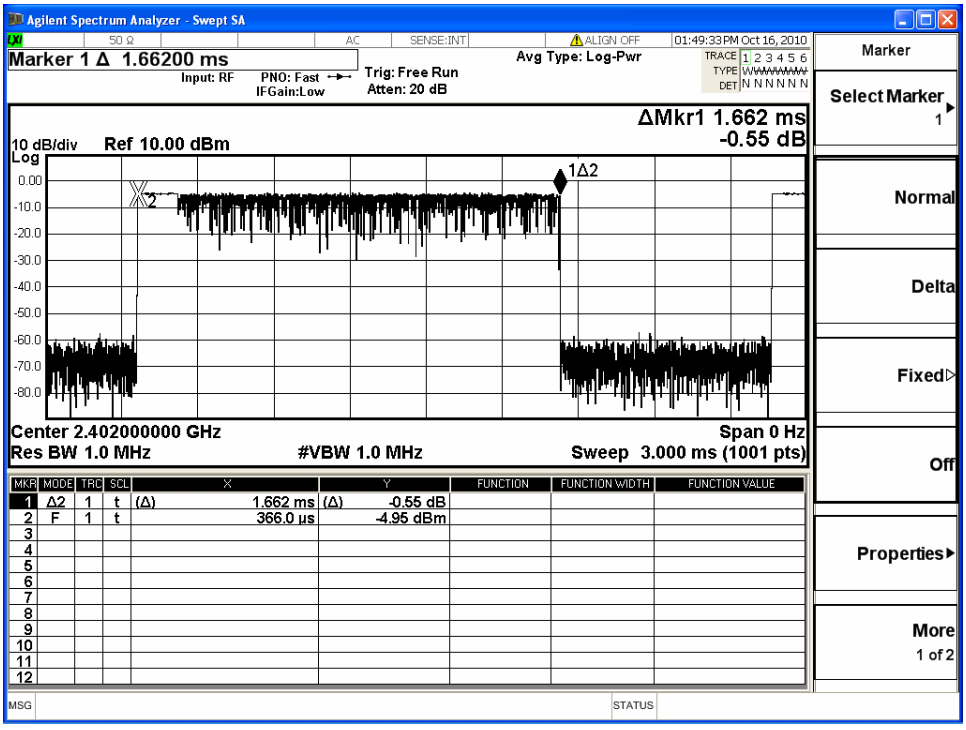
CH39 DH1 time slot= 408 (μs)*(1600/(1*79))*31.6= 261.12 (ms)
DH3 time slot= 1662 (μs)*(1600/(3*79))*31.6= 354.56 (ms)
DH5 time slot= 2910 (μs)*(1600/(5*79))*31.6= 372.48 (ms)

CH78 DH1 time slot= 408 (μs)*(1600/(1*79))*31.6= 261.12 (ms)
DH3 time slot= 1662 (μs)*(1600/(3*79))*31.6= 354.56 (ms)
DH5 time slot= 2910 (μs)*(1600/(5*79))*31.6= 372.48 (ms)

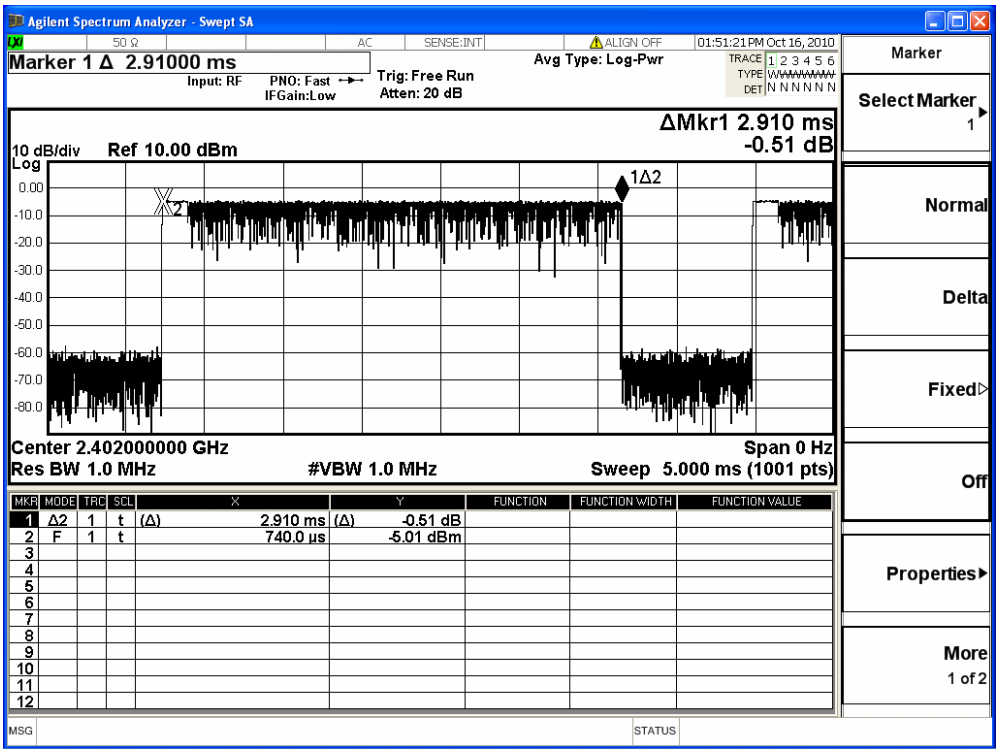
Channel 00 DH1:



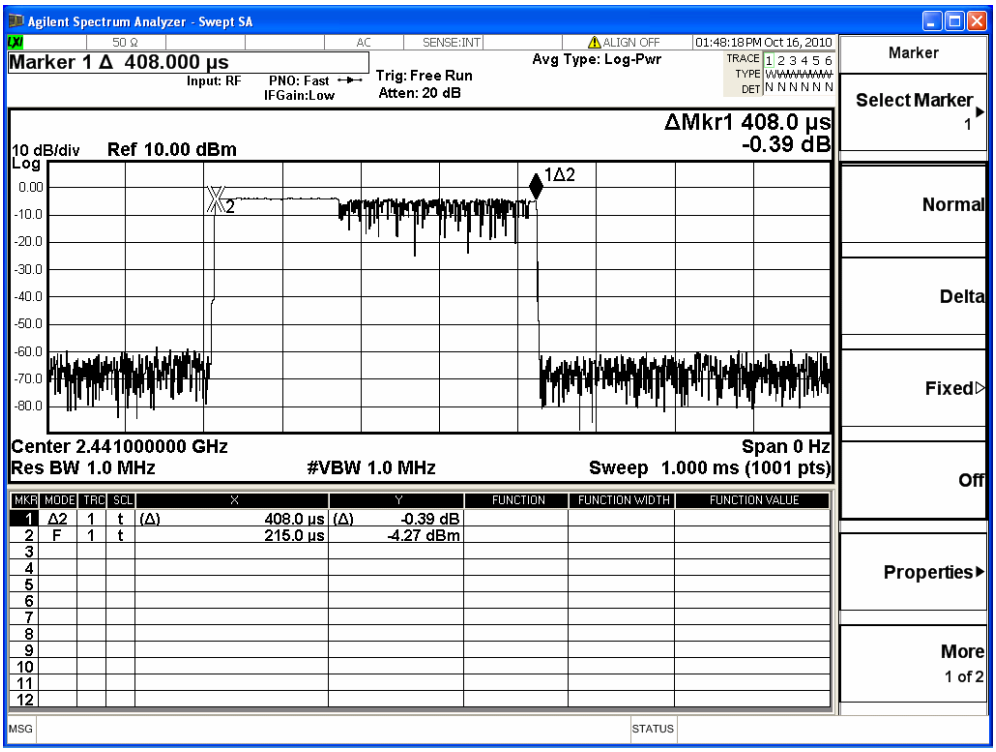
Channel 00 DH3:



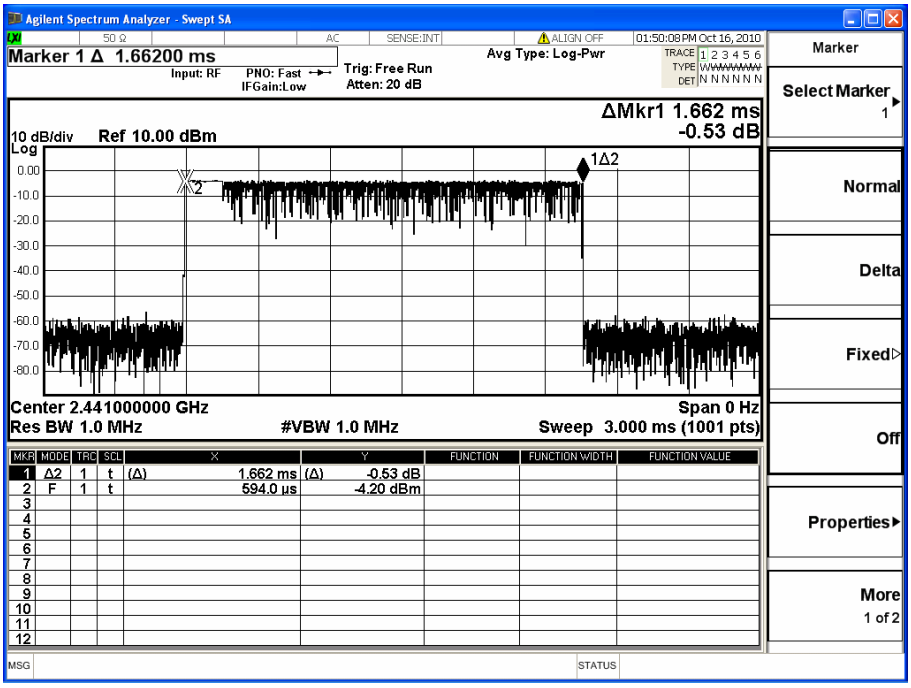
Channel 00 DH5:



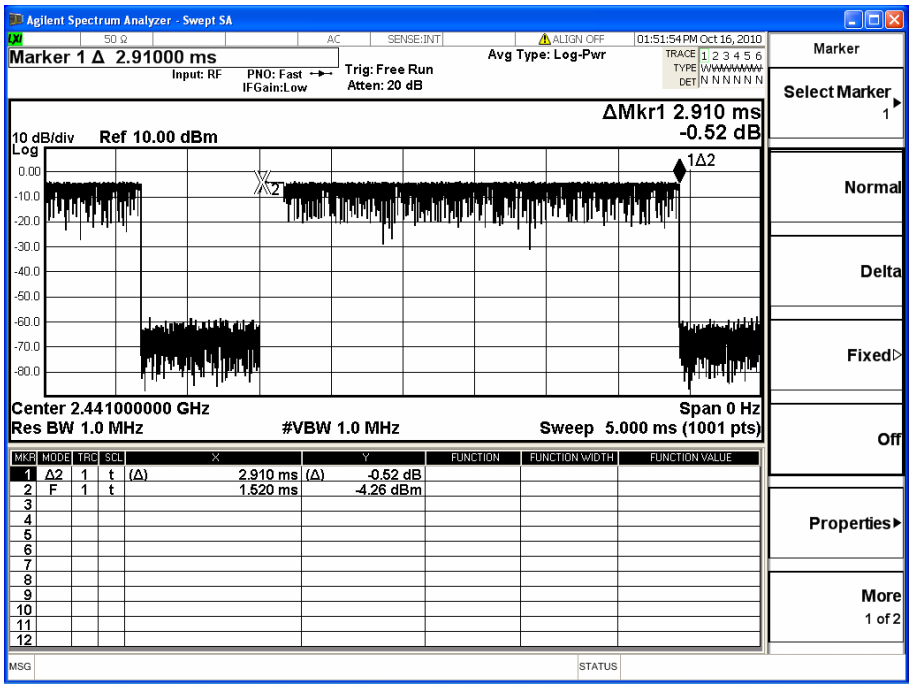
Channel 39 DH1:



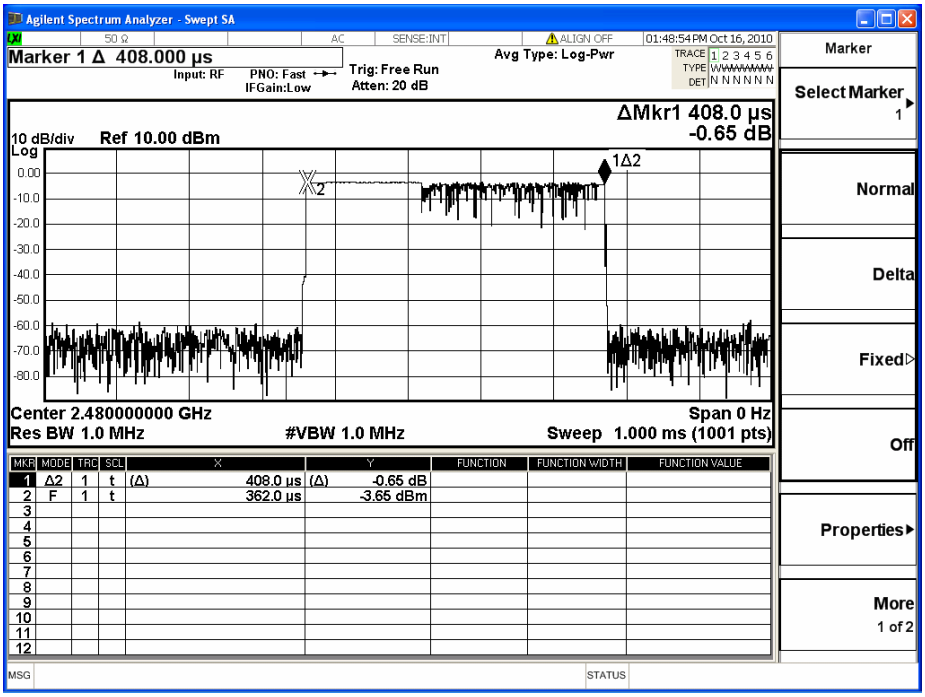
Channel 39 DH3:



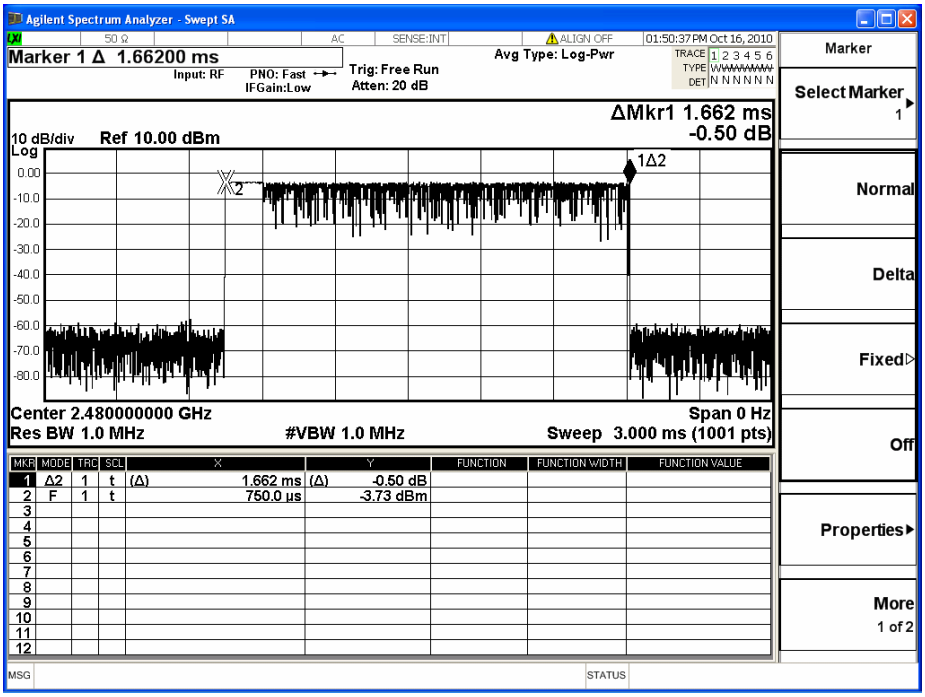
Channel 39 DH5:



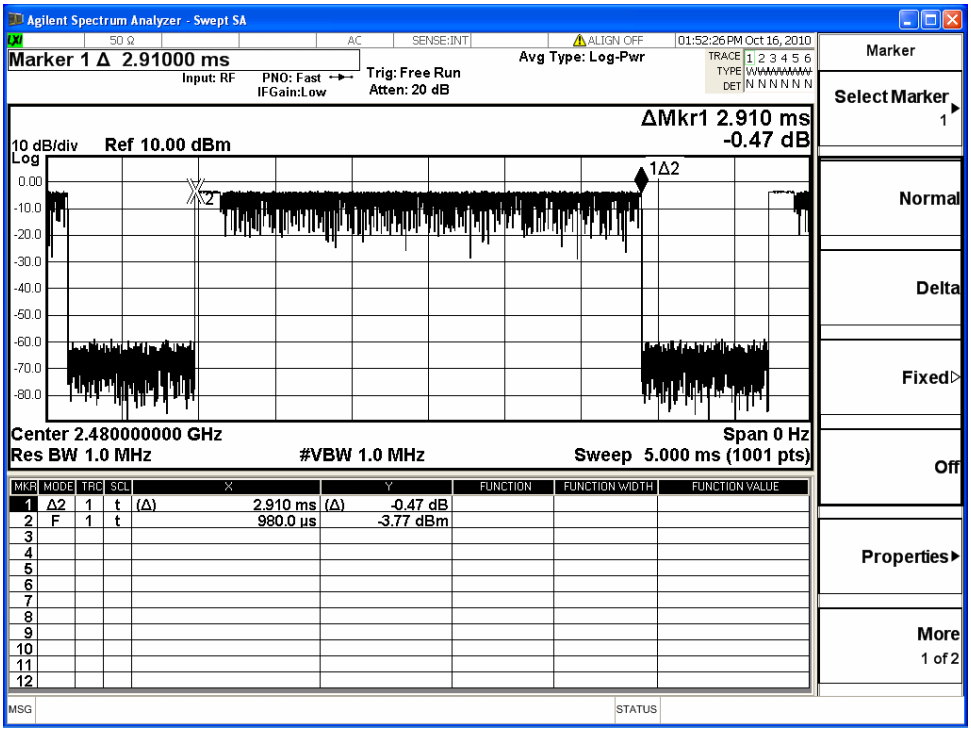
Channel 78 DH1:



Channel 78 DH3:



Channel 78 DH5:



4. Appendix

4.1 Appendix A: Test Equipment

4.1.1 Test Equipment List

Location Chmb14	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber14)	BILOG Antenna 14	Schaffner	CBL6112D	22612	03/19/2010	03/19/2011
Radiation (Chamber14)	Coaxial Cable Chmb 14-3M	NOKIA KABEL	M17/74-RG213	Chmb 14-3M	11/02/2009	11/02/2010
Radiation (Chamber14)	EMI Receiver 06	Schwarzbeck Mess-Elektronik	FCVU 1534	1534-149	07/02/2010	07/02/2011
Radiation (Chamber14)	Spectrum Analyzer 21	Agilent	N9010A	MY49060537	07/13/2010	07/13/2011

Location Chmb14	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber14)	Spectrum Analyzer 21	Agilent	N9010A	MY49060537	07/13/2010	07/13/2011
Rad. Above 1GHz (Chamber14)	Horn Antenna 06	ETS	3117	00066665	08/24/2010	08/24/2011
Rad. Above 1GHz (Chamber14)	Horn Antenna 04	Com-Power	AH-826	081-001	03/09/2009	03/09/2011
Rad. Above 1GHz (Chamber14)	Horn Antenna 05	Com-Power	AH-640	100A	12/24/2008	12/24/2010
Rad. Above 1GHz (Chamber14)	SUCOFLEX 1GHz~26.5GHz cable	HUBER+SUHNER AG.	Sucoflex 104	286305/4	08/21/2010	08/21/2011
Rad. Above 1GHz (Chamber14)	Preamplifier 15	Agilent	8449B	3008A2471	01/06/2010	01/06/2011
Rad. Above 1GHz (Chamber14)	Preamplifier 13	MITEQ	JS44-00101800-25-10P-44	1329256	06/10/2010	06/10/2011
Rad. Above 1GHz (Chamber14)	Preamplifier 09	MITEQ	AFS44-00102650-40-10P-44	858687	03/12/2009	03/12/2011
Rad. Above 1GHz (Chamber14)	Spectrum Analyzer 19	R&S	FSP40	100116	10/18/2010	10/18/2011

Note: Calibration is traceable to NIST or national or international standards.

4.1.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

Radiation/Conduction	Filename	Version	Issued Date
Lung_Tan Conduction	EZ EMC	1.1.4.2	2/10/2007
Lung_Tan Radiation	EZ EMC	1.1.4.2	1/24/2007

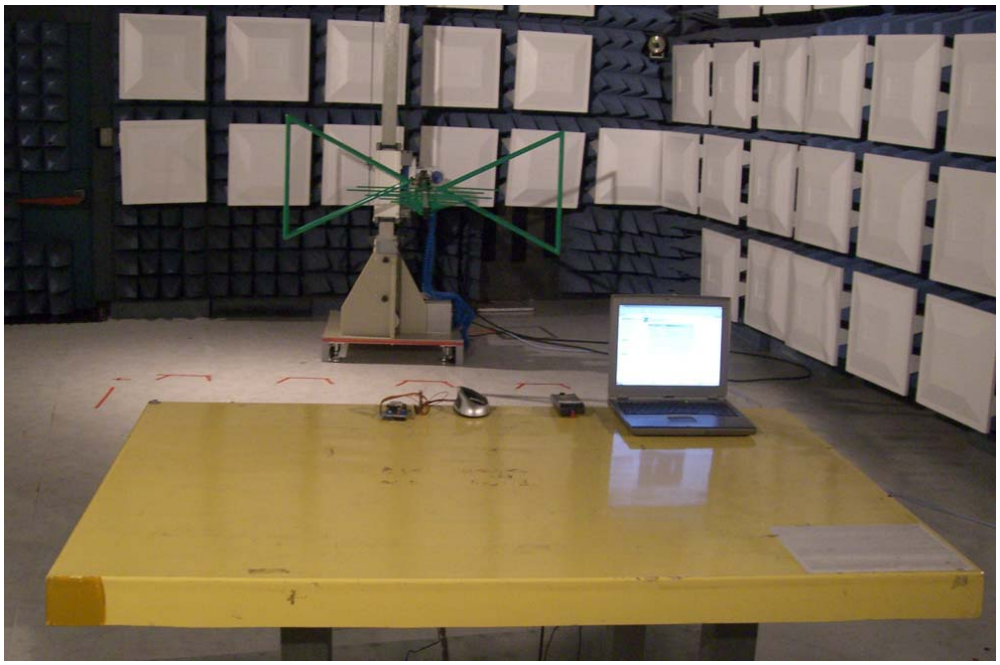
4.2 Appendix B: Accuracy of Measurement

The measurement uncertainty refers to CISPR 16-4-2:2003. The coverage factor k = 2 yields approximately a 95 % level of confidence.

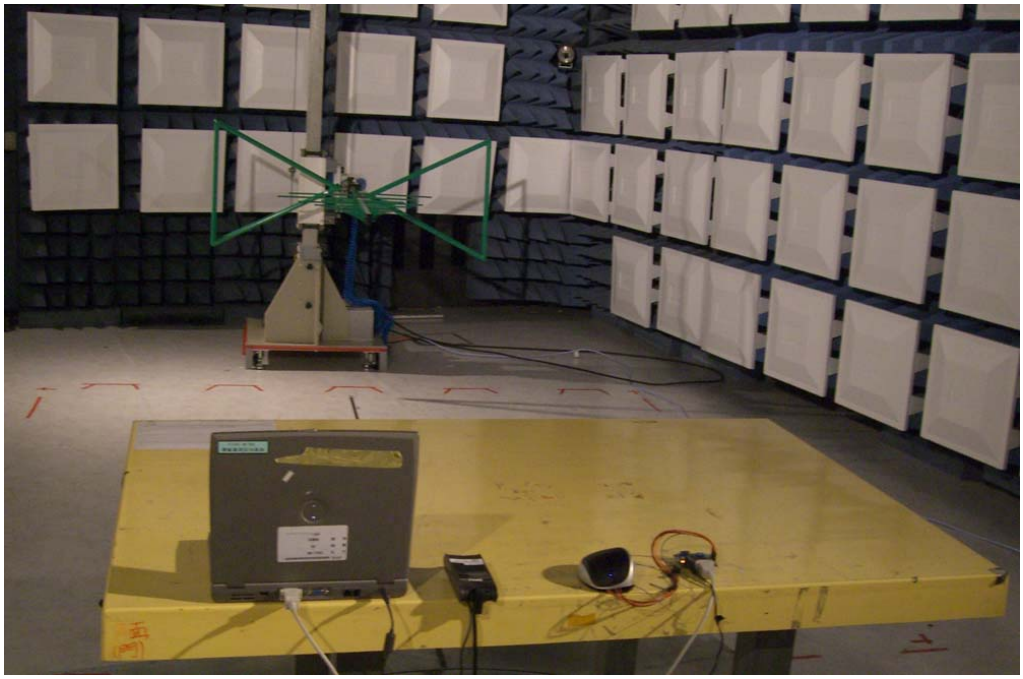
<Chamber 14 (3M)>
1GHz~18GHz ±3.722 dB

4.3 Appendix C: Photographs of EUT Configuration Test Set Up

The Front View of Highest Radiated Set-up For EUT



The Back View of Highest Radiated Set-up For EUT



4.4 Appendix D: Antenna Spec.

Please refer to the attached file.