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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 556682

FCC TEST REPORT

Application No.: SZEMO060400784AV

Applicant: Thomson Industry (Shenzhen) Co., Ltd.

Fundamental Frequency : 2.404GHz to 2.478GHz

FCC ID: G95RS2100

Equipment under Test (EUT):

Name: audio system with 2.4G wireless*

Model: RS2100

* This report is only about the main unit of the audio system with 2.4G wireless.

Standards: FCC PART 15, SUBPART C : 2006

Date of Receipt: 25 April 2006

Date of Test: 26 April to 14 June 2006

Date of Issue: 15 June 2006

Test Result :	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Robinson Lo
Laboratory Manager

2 Test Summary

Test	Test Requirement	Stanadard Paragraph	Result
Conduct Emission	FCC PART 15 2006	Section 15.207	PASS
Number of hopping Frequency	FCC PART 15 2006	Section 15.247	PASS
Occupied Bandwidth	FCC PART 15 2006	Section 15.247 (a2)	PASS
Channnel Separated	FCC PART 15 2006	Section 15.247(a)	PASS
Occupied Time	FCC PART 15 2006	Section 15.247(a1)	PASS
Band edge	FCC PART 15 2006	Section 15.247	PASS
Maximum Peak Output Power	FCC PART 15 :2006	Section 15.247 (b)	PASS
Radiated Emission (30MHz to 25GHz)	FCC PART 15 :2006	Section 15.209	PASS

The test result is only about the main unit of the audio system with 2.4G wireless.

3 Contents

4 General Information

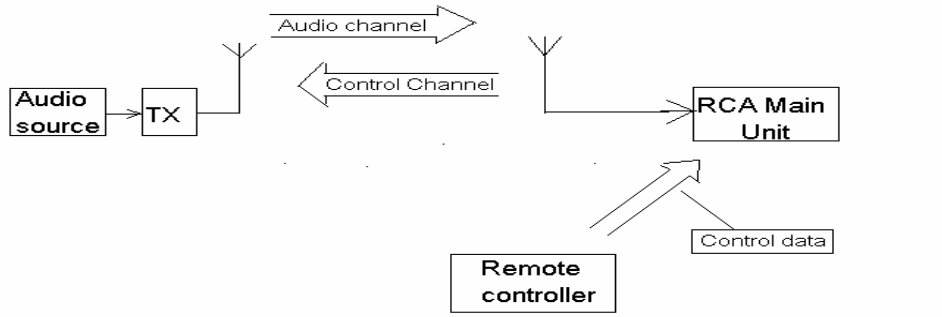
4.1 Client Information

Applicant:	Thomson Industry (shenzhen) Co., Ltd.
Address of Applicant:	2/F, Block B, Shen Fu Bao Science & Technology Industrial Group, 3 Huanghuai Road, Futian Bonded Zone, ShenZhen, PRC

4.2 Details of E.U.T.

Product Name:	audio system with 2.4G wireless
Model:	RS2100
Power Supply:	120 Vac / 60 Hz for AC/DC
Power Cord:	2wire x 1.8m unscreened dc power input cable.

4.3 Description of Support Units



The MAIN UNIT(MU), USB DUNGLE(UD) and REMOTE CONTROLLER(RC) are a complete system. The system is based on wireless digital audio transfer from an audio source to MAIN UNIT, and REMOTE CONTROLLER can control MAIN UNIT by radio. It is noted that the communication between USB DUNGLE and MAIN UNIT are based on half-duplex transmission, MAIN UNIT and REMOTE CONTROLLER are base on simplex transmission.

The jack on the UD unit is connected with an audio source like CD player or MP3 player. The 3.5mm jack on the MU unit is connected with MP3 player. The jack on the MU unit is connected with the headphones.

Note:

1. All frequencies are in 2.404GHz to 2.478GHz for MU/UD, 2.401GHz to 2.470GHz for RC.

2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.

(The locations of these frequencies one near the top, one near the middle and one near the bottom.)

3. So all the items as

followed in testing report are need to test these three frequencies:

Top: Channel – 1; Middle: Channel – 19; Bottom: Channel – 38.

MU: MAIN UNIT
UB: USB DUNGLE
RC: REMOTE CONTROLLER

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 8215 5555 Fax: +86 20 8207 5059

No tests were sub-contracted.

4.5 Other Information Requested by the Customer

None.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**
  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0. Effective through December 31, 2004.
- **ACA**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
  The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.
  Date of Registration: September 29, 2005. Valid until September 28, 2008.
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**
  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 556682**
  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682, Aug. 04, 2005
- **Industry Canada (IC)**
  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6002.

5 Test Results

5.1 Test Instruments

Item	Test Equipment	Manufacturer	Serial No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	SEL0017	28-04-2005	27-04-2007
2	EMI Test Receiver	Rohde & Schwarz	100249	22-09-2005	21-09-2006
3	EMI Test software	AUDIX	E3	N/A	N/A
4	Coaxial cable	SGS	SEL0028	20-05-2006	19-05-2007
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	00042673	03-03-2006	02-03-2007
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	2944A10861	26-08-2005	25-08-2006
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	00035926	30-12-2004	29-12-2006
8	Pre-amplifier (1-18GHz)	Rohde & Schwarz	1091457	29-07-2005	28-07-2007
9	Cable (0-18GHz)	MCE Mobile Communications	249439	20-05-2006	19-05-2007
9	Shielding Room	ZhongYu Electron	SEL0042	N/A	N/A
10	LISN	ETS-LINDGREN	00033512	19-09-2005	18-09-2006
11	EMI Test Receiver	Rohde & Schwarz	100119	03-03-2006	02-03-2007
12	Coaxial Cable	SGS	SEL0024	20-05-2006	19-05-2007

5.2 E.U.T. Operation

Input voltage: 120Vac / 60Hz for AC/DC supplied

Operating Environment:
Temperature: 24.0 °C
Humidity: 52 % RH
Atmospheric Pressure: 1008 mbar

5.3 Test Procedure & Measurement Data

5.3.1 Conducted Emissions

Test Requirement:	FCC Part15 C
Test Method:	ANSI C63.4
Test Date:	06 to 09 June 2006
Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

Test Procedure:

a. The EUT was placed 0.8 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power port of a line impedance stabilization network(LISN)
c. All the support units are connected to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150kHz to 30MHz was searched.
h. Set the test-receiver system to Peak Detect Function and specified bandwidth with maximum Hold Mode

Operating Environment:

Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

EUT Operation: Test the EUT in all normal operation mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate.

5.3.1.1 Measurement Data

(1) Under only main unit operation

An initial pre-scan was performed on the live and neutral lines under FM, CD PLAY, MP3, with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with worst case peak emission were detected under FM.

The following Quasi-Peak and Average measurements were performed on the EUT.:

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.177	-0.06	-0.04	23.63	23.53	64.63	-41.10	QP
0.177	-0.06	-0.04	16.63	16.53	54.63	-38.10	Average
0.266	-0.03	-0.04	23.62	23.55	61.24	-37.69	QP
0.266	-0.03	-0.04	16.63	16.56	51.24	-34.68	Average
0.354	0.00	-0.04	22.32	22.28	58.87	-36.59	QP
0.354	0.00	-0.04	14.52	14.48	48.87	-34.39	Average
0.425	0.00	-0.04	21.25	21.21	57.35	-36.14	QP
0.425	0.00	-0.04	14.62	14.58	47.35	-32.77	Average
0.594	0.00	-0.04	22.16	22.12	56.00	-33.88	QP
0.594	0.00	-0.04	12.36	12.32	46.00	-33.68	Average
0.965	0.09	-0.04	22.25	22.30	56.00	-33.70	QP
0.965	0.09	-0.04	13.25	13.30	46.00	-32.70	Average

TEST RESULTS: The unit does meet the FCC requirements.

(2) Under wireless communication

Quasi-Peak and Average measurement were performed at the frequencies with wire communication.

The following Quasi-Peak and Average measurements were performed on the EUT.

Frequency (MHz)	Cable Loss (dB)	LISN Factor (dB)	Read Level (dBuV)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.321	0.00	-0.04	35.65	35.61	59.68	-24.07	QP
0.321	0.00	-0.04	30.15	30.11	49.68	-19.57	Average
0.684	0.00	-0.04	36.32	36.28	56.00	-19.72	QP
0.684	0.00	-0.04	31.46	31.42	46.00	-14.58	Average
0.895	0.07	-0.04	36.54	36.57	56.00	-19.43	QP
0.895	0.07	-0.04	27.65	27.68	46.00	-18.32	Average
1.265	0.10	-0.05	34.12	34.17	56.00	-21.83	QP
1.265	0.10	-0.05	27.62	27.67	46.00	-18.33	Average
2.645	0.10	-0.07	34.21	34.24	56.00	-21.76	QP
2.645	0.10	-0.07	28.96	28.99	46.00	-17.01	Average
3.145	0.10	-0.08	32.25	32.27	56.00	-23.73	QP
3.145	0.10	-0.08	26.62	26.64	46.00	-19.36	Average

5.3.2 Number of Hopping Frequency

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247:
Test Date: 09 June 2006

Operating Environment:

Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Test Results: PASS

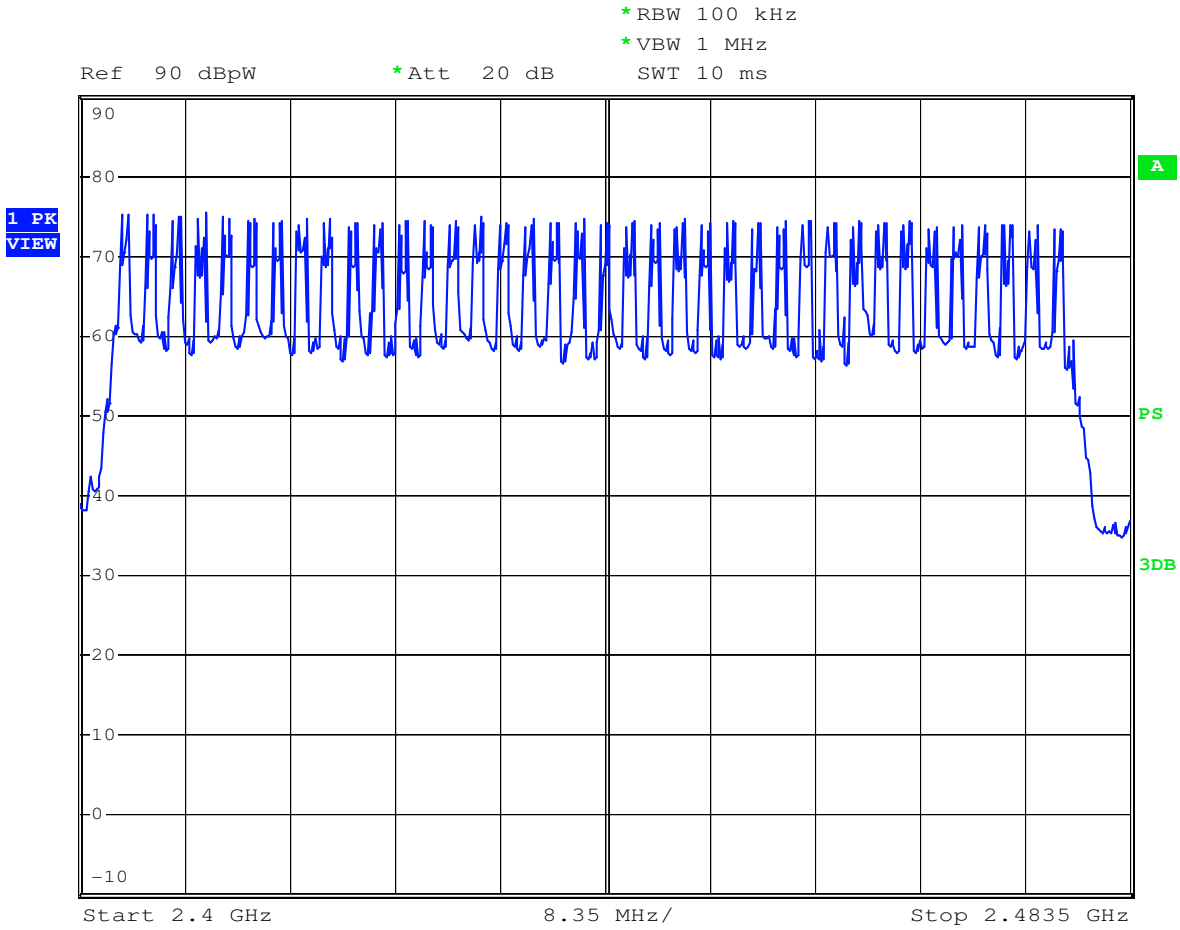
Test Procedure:

1 The transmitter output was connected to the spectrum analyze directly.
2 Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz
3 The number of hopping frequency used is defined as thedevice has the numbers of total channel.

Requirement:

Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channnels.

Number of Hopping Frequency Channel	Limits Channel
38	15



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5.3.3 Pseudorandom Hopping Algorithm

Test Requirement: FCC Part15.247(a)(1)
Test Method: Based on FCC Part15 C Section 15.247:
Test Date: 09 June 2006
Operating Environment:
Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1010 Mbar
Test Results: PASS
Requirements:

The channel frequencies shall be selected from a pseudorandom ordered list of hopping frequencies. Each frequency must be used equally by transmitter.

Pseudo random properties of the embedded FHSS engine

The embedded FHSS engine uses 38 hopping locations, out of which 18 are non-overlapping channels. The hopping sequence is contained in a table with the 38 frequency location entries staggered in a pseudorandom order(See Following Figure). A single data frame is transmitted on each frequency location before skipping to the next hopping frequency in the list, Upon completion of the list, the hopping sequence is repeated on a cyclic basis.

Upon reception of faulty/no data, the frequency(ies)resulting in loss of data is temporarily removed from the hopping list. The hopping sequence sycle is thus correspondingly shortened. The frequency locations resulting in loss of data are added to a list of banned frequencies containing the frequency locations unsuitable for use. This list is limited to a maximum number(NBCH), set to 0×12 in this application.

The duration of the ban is given by the equation(BCHD+1).NBCH.tp

The BCHD parameter is set to 0×0A and tp is 2.91ms for the 44.1KHz sampling setting.

In normal operation, the initial pseudorandom list of frequency hopping locations is volatile in terms of the number of hopping frequencies in use and the sequence of which they occur. These elements combined result in n unpredictable hopping sequence with pseudorandom properties.

Base sequence hopping frequency locations

Hopping Frequency Location	Frequency /UDC* (GHz)	Hopping Frequency Location	Frequency /UDC* (GHz)	Hopping Frequency Location	Frequency /UDC* (GHz)
1	2.404	14	2.430	27	2.456
2	2.406	15	2.432	28	2.458
3	2.408	16	2.434	29	2.460
4	2.410	17	2.436	30	2.462
5	2.412	18	2.438	31	2.464
6	2.414	19	2.440	32	2.466
7	2.416	20	2.442	33	2.468
8	2.418	21	2.444	34	2.470
9	2.420	22	2.446	35	2.472
10	2.422	23	2.448	36	2.474
11	2.424	24	2.45	37	2.476
12	2.426	25	2.452	38	2.478
13	2.428	26	2.454		

*UDC=User Defined Channel centre frequency defined for the Main Unit.

5.3.4 Channel Separation

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247:
Test Date: 09 June 2006

Operating Environment:

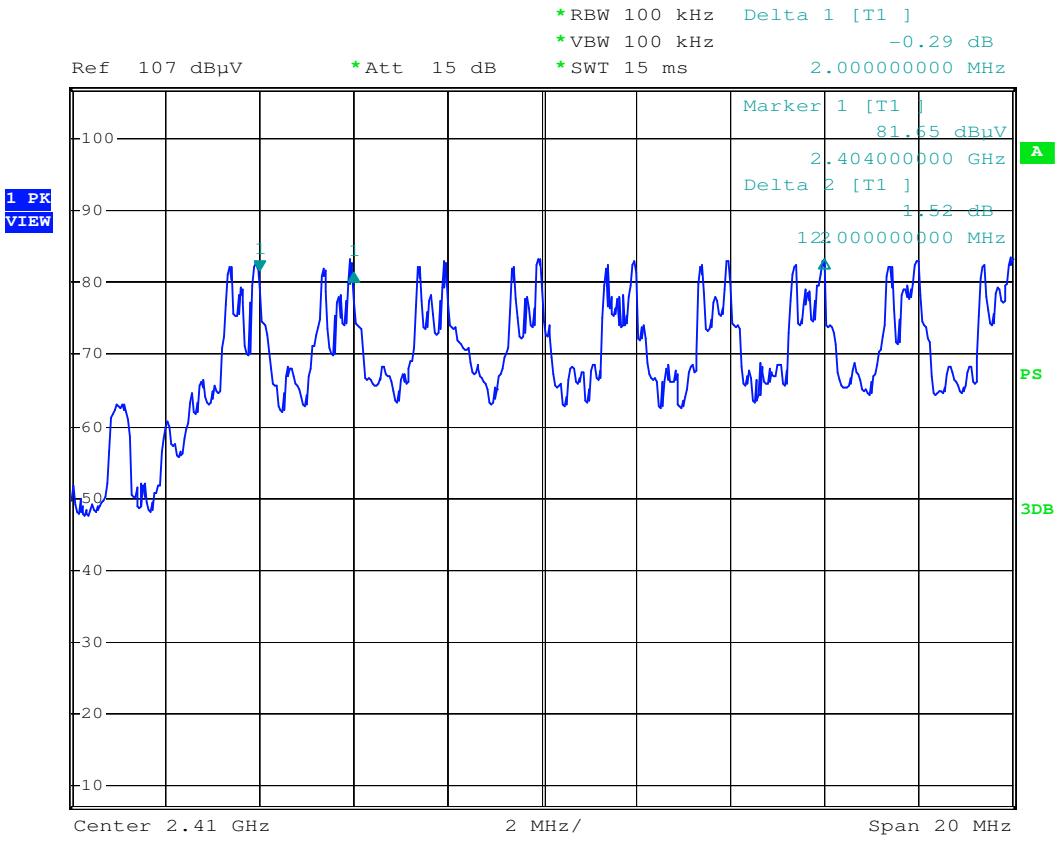
Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Test Results: PASS

Requirements:

15.247 (a1) Frequency hopping systems shall have hopping channel carrier frequencies separated by aminimum of 25 KHz or the hopping channel, whichever is greater.
Or
Frequency hopping systerms shall have hopping channel carrier frquencies channel,whichever is greater, provided the system operates with an output power no greater than 125mW

Measurement Data:
Channel Separation: 2 MHz
. MU/UD Channnel separate



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5.3.5 Occupied Bandwith

Requirement: FCC Part15 C
Test Method: Based on FCC Part15 Section 15.15.247
Test Date: 05 June 2006

Operating Environment:
Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Teat Results: PASS

Test Procedure:

1 The transmitter output was connected to the spectrum analyzer directly.

2 Set RBW of spectrum analyzer to 100K and VBW to 100K.

3 The Hopping Channel bandwidth is defined as the frequency range where the power is higher than peak power minus 20dB.

Requirments:

Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 non-overlapping channels. No requirements for bandwidth for this frequency band.

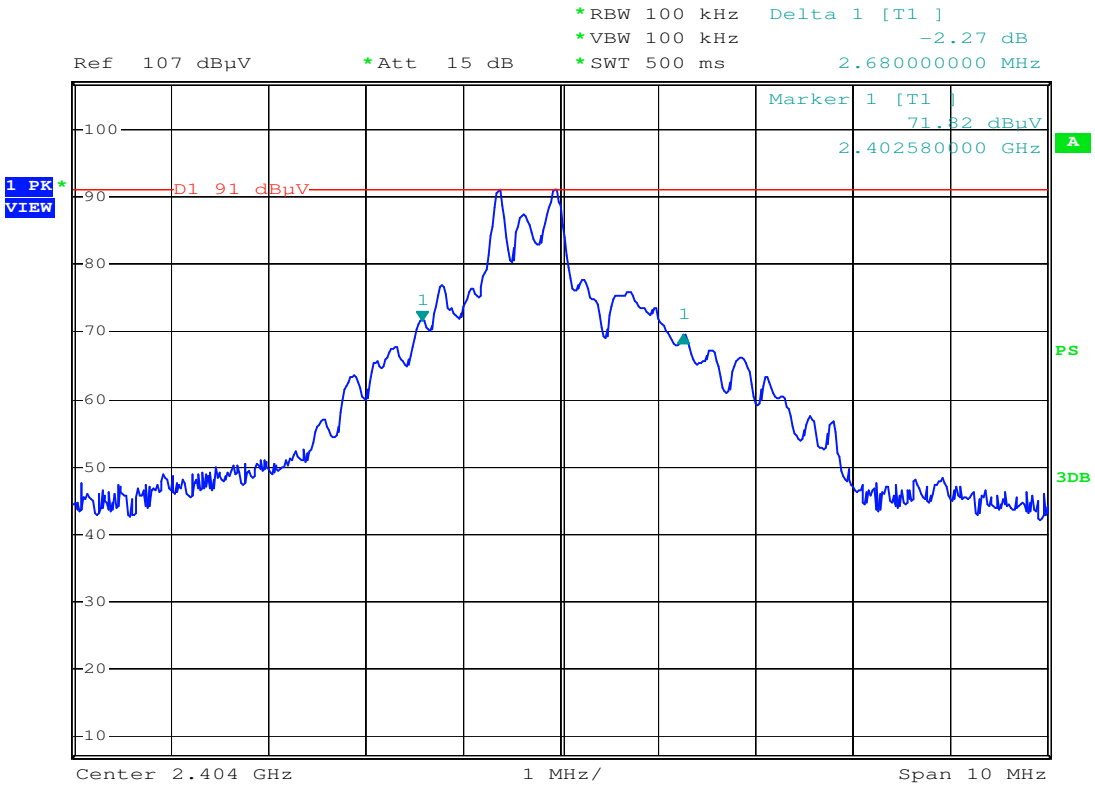
No requirements for Digital Transmitter.

Measurement Data: 38RF channels are in use for MU

The 38 defined channel(UDC) centre frequencies used by the MU is below. The values are in GHz.

MU in Tx-mode:20dB Bandwidth of the hopping channel:2.6-2.8MHz

CH1 20dB bandwidth 2.404GHz



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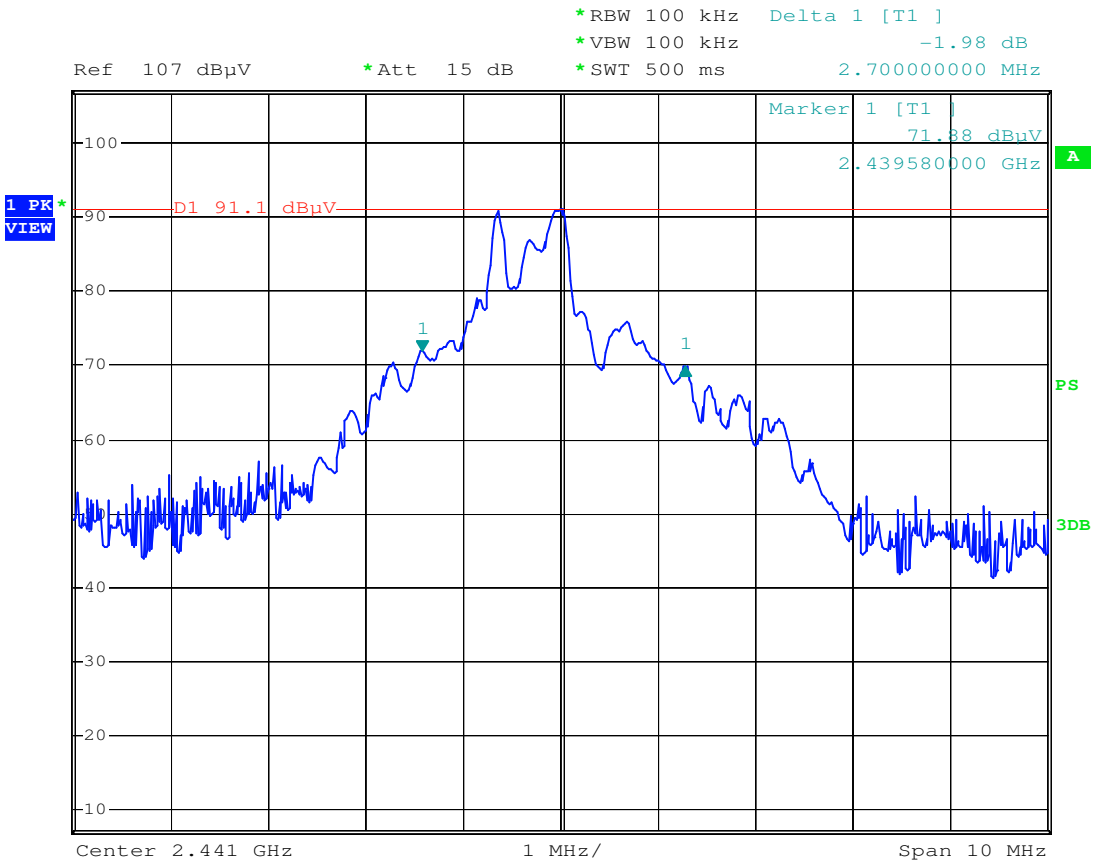
CH19 20dB bandwidth 2.440GHz



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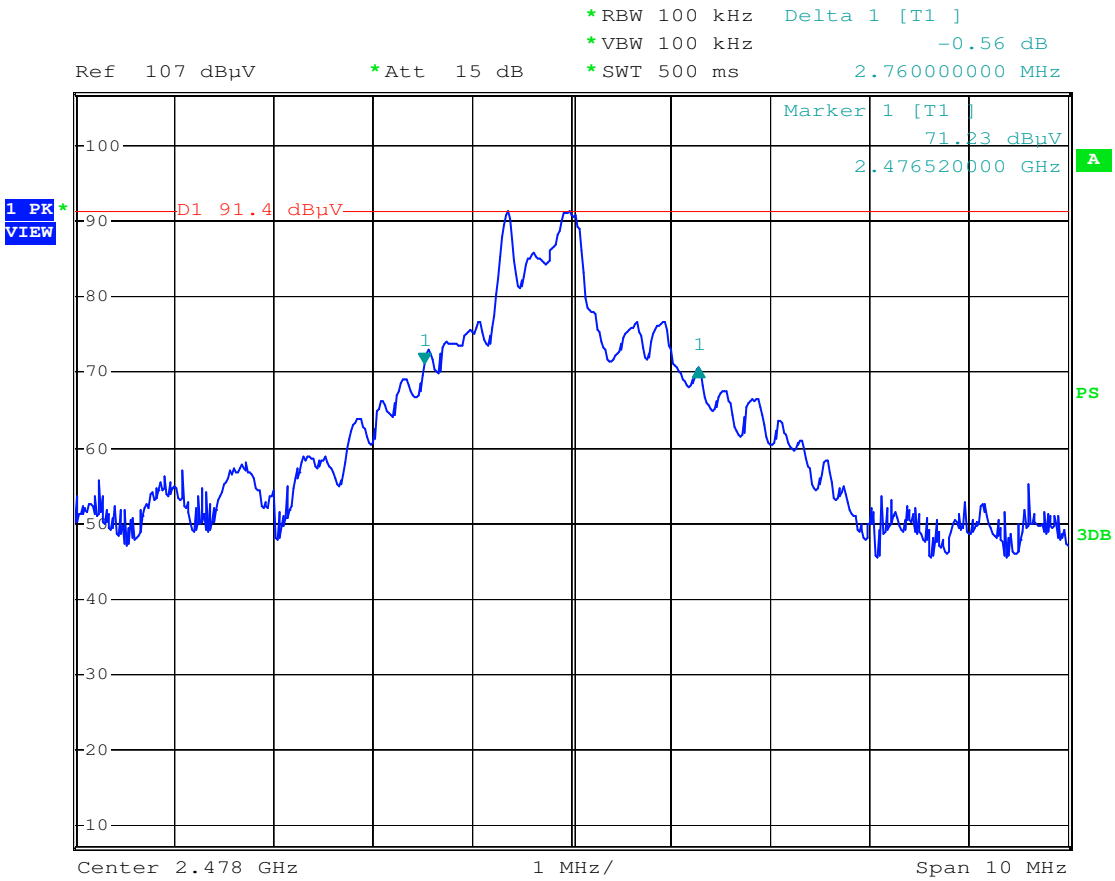
MU 20dB bandwidth 2.478GHz



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5.3.6 Occupancy Time

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 14 June 2006

Operating Environment:

Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Test result PASS

Test Procedure:

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 1 MHz and VBW to 1 MHz
3. Set the center frequency would be measured and set frequency span to zero span.

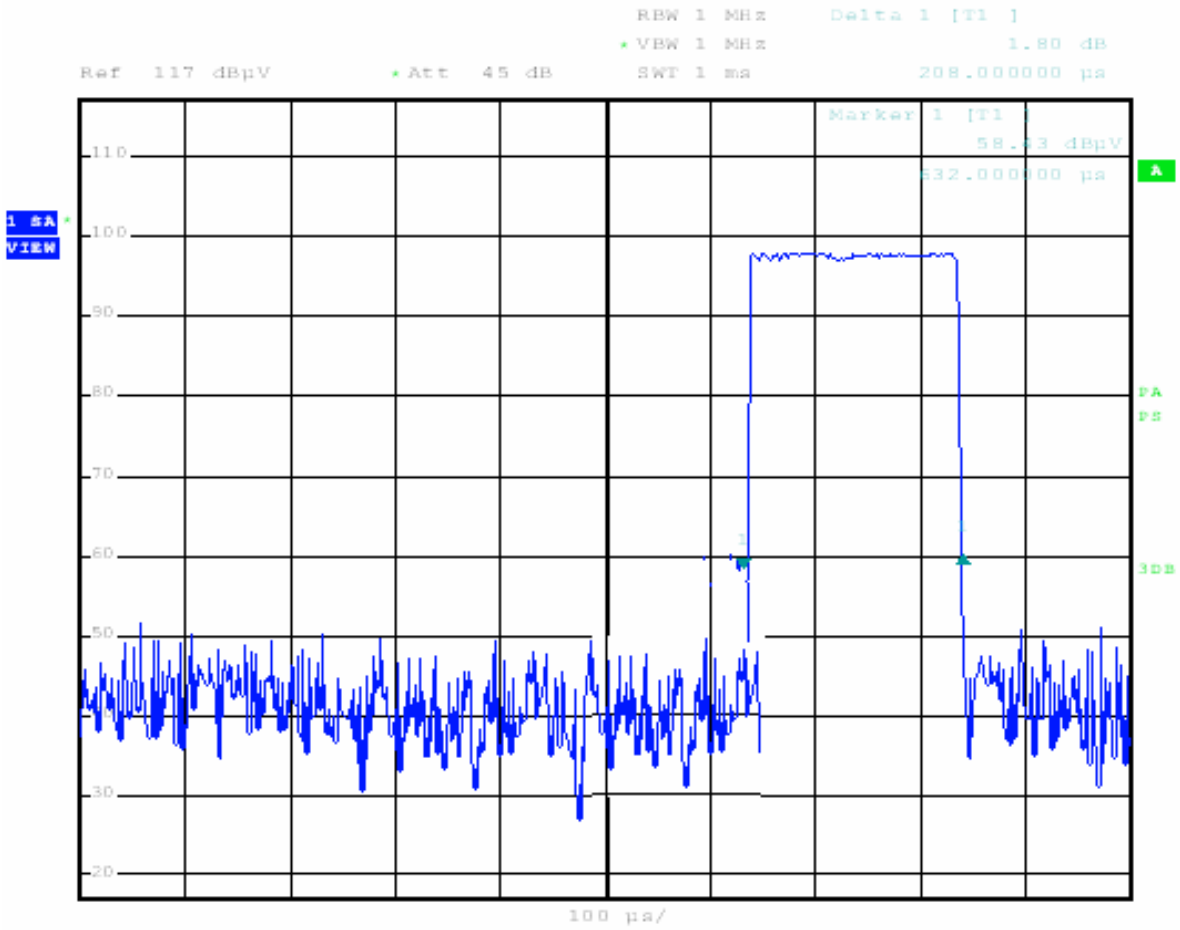
Requirements:

The average time of occupancy on channel shall not be greater than 0.4 seconds within aperiod of 0.4 seconds multiplied by the number of hopping channels employed.

Measurement Data:

MU Dwell time: 0.101S

MU Dwell Time



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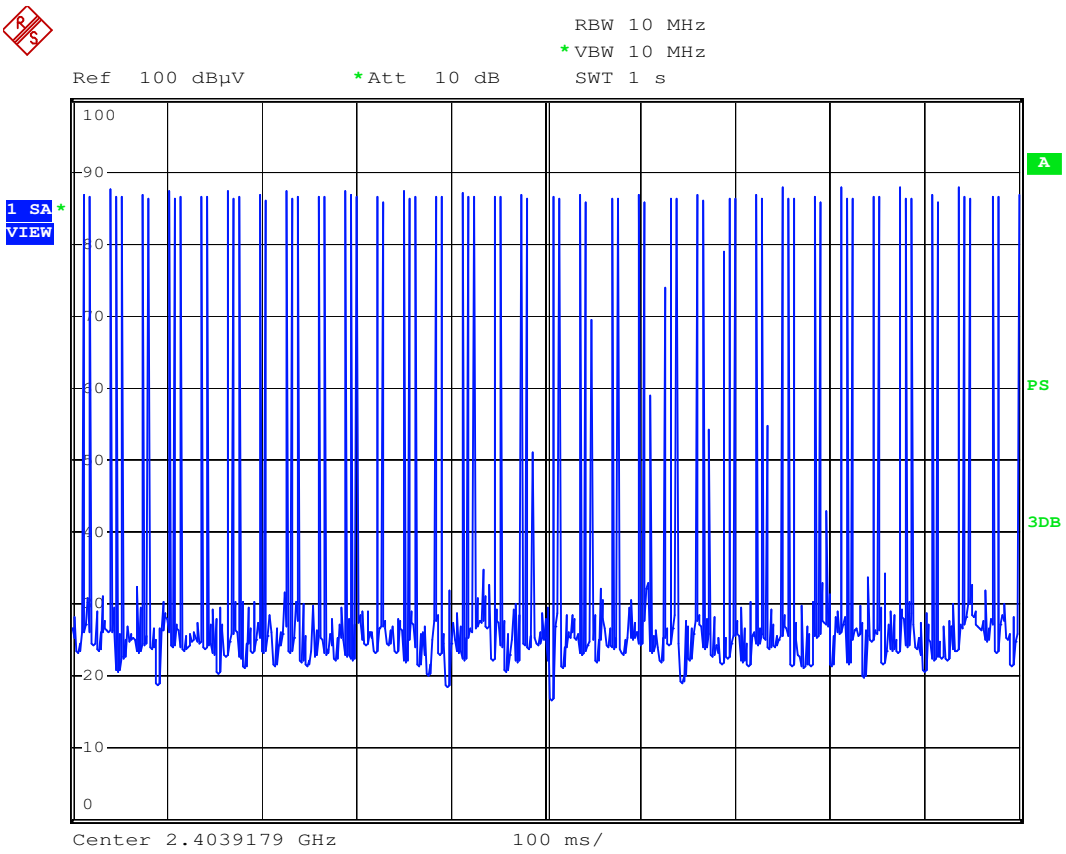

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**Remark:

1. Dwell Time=Channel Number x 0.4(S) x average hopping channel x package transfer time.
2. Average Hopping Channel=hops/sweep time.

5.3.7 Bandwidth of Frequency Band Edges

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 13 June 2006

Operating Environment:

Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Test Procedure:

1. The transmitter output was connected to the spectrum analyzer via a low loss cable.
2. Set both RBW and VBW of spectrum analyzer to 100KHz with suitable frequency span including 100KHz bandwidth from band edge.
3. The band edges was measured and recorded.

Test result: PASS

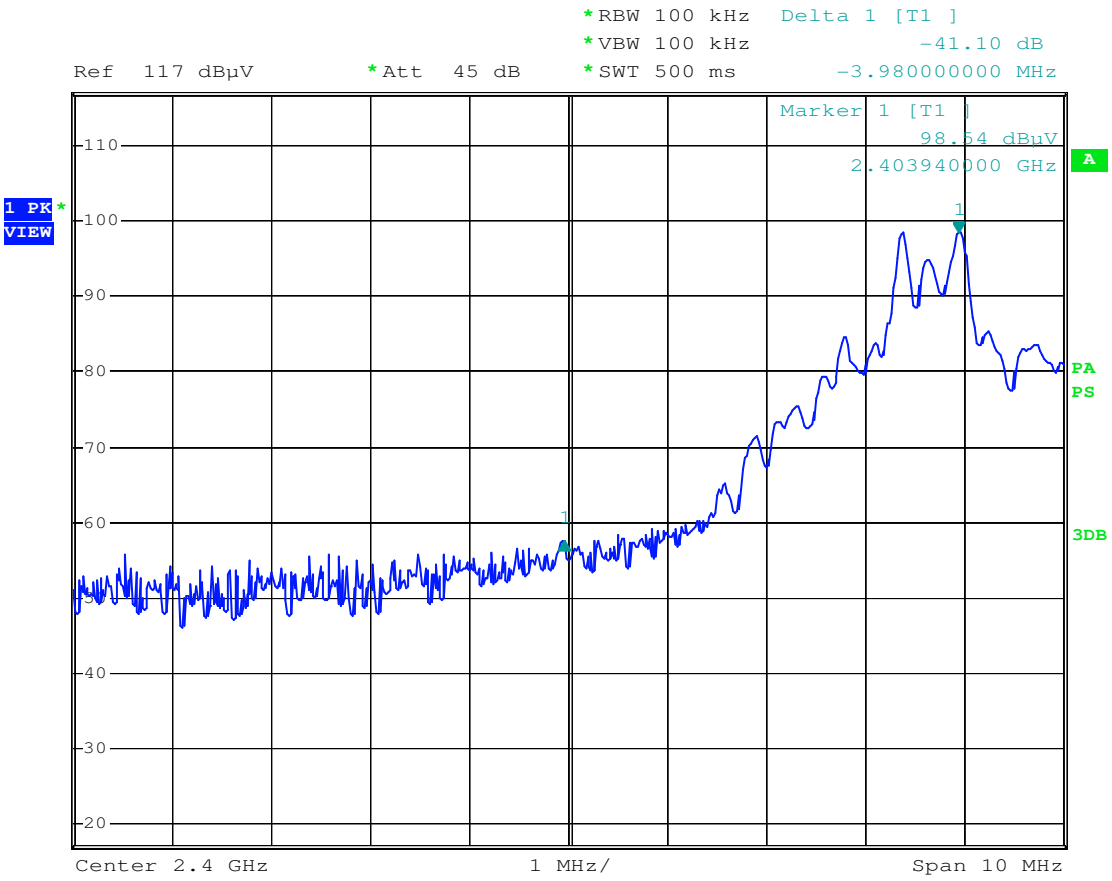
Band-edge conducted power

MU Tx-mode

Frequency GHz	Power below nearest channel, dB RF channel 2404/2478MHz, Frequencyhopping		Limit dB	Margin dB
2.4	Peak	57.44	74	16.56
	Average	37.44	54	16.56
2.4835	Peak	49.66	74	24.34
	Average	29.66	54	24.34

*Remark: Measured: Peak-Average=-23dB But maxium duty cycle according to Para(b):-20dB

MU Band-edge field strength 2.4GHz



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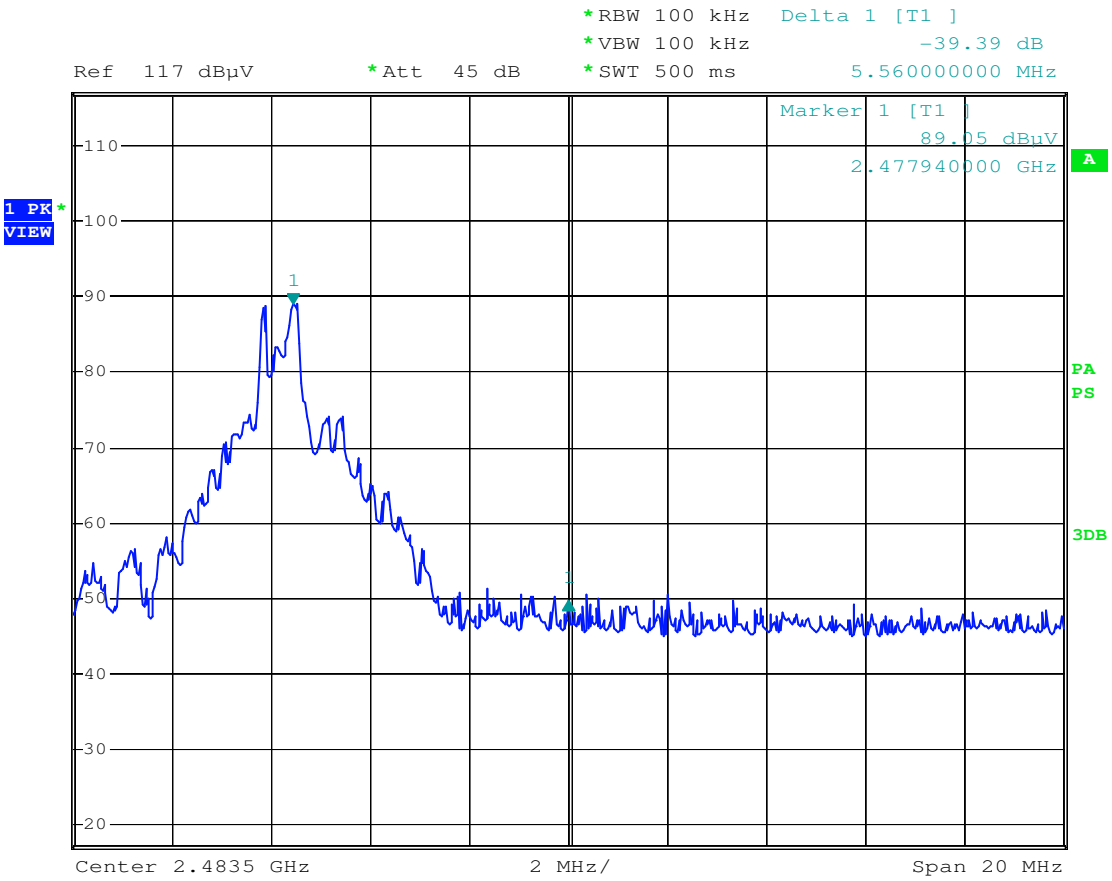
MU Band-edge field strength 2.4835GHz



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5.3.8 Radiated Emissions which fall in the restricted bands

Test Requirement: Section 15.247 (c) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Method: Base on ANSI 63.4.

Test Date: 15 June 2006

Measurement Distance: 3m (Semi-Anechoic Chamber)

Limit: 40.0 dBμV/m between 30MHz & 88MHz

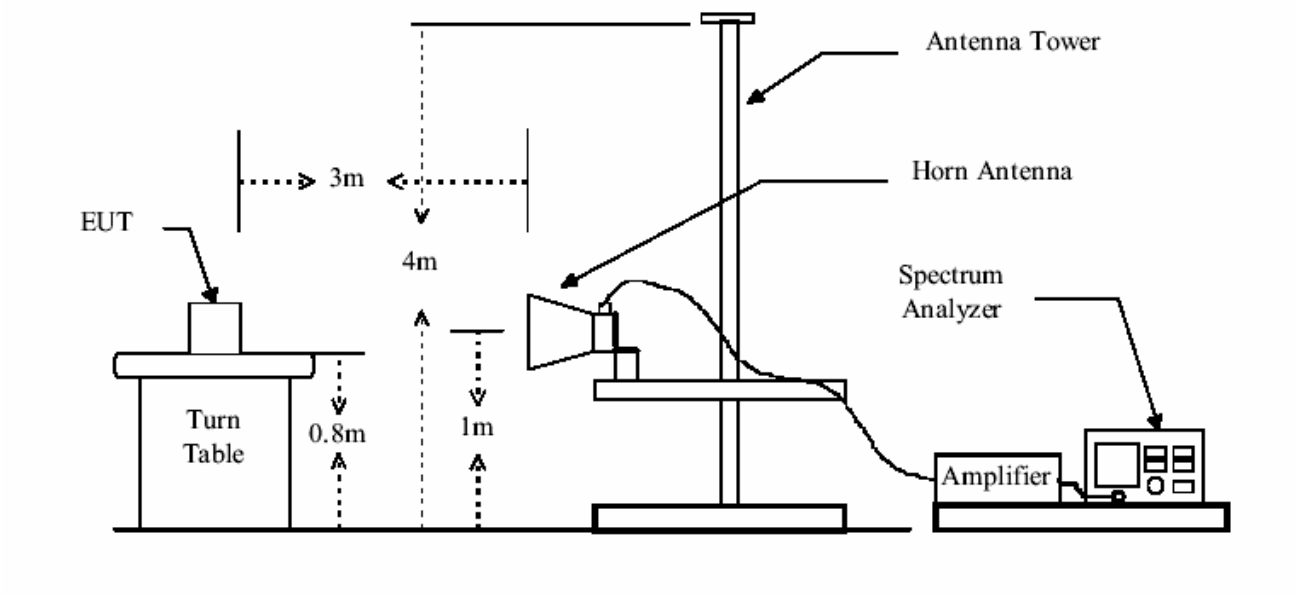
43.5 dBμV/m between 88MHz & 216MHz

46.0 dBμV/m between 216MHz & 960MHz

54.0 dBμV/m above 960MHz

Detector: Peak for pre-scan , 120kHz resolution bandwidth within 1GHz, 1MHz resolution bandwidth above 1GHz

Test Configuration:



Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 25GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

Test Result:

1. Channel 1 (2.404GHz)

Test Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	
					Peak	AV
2390.000	45.4	36.0	74.0	54.0	28.6	18.0
2483.500	46.2	38.0	74.0	54.0	27.8	16.0

2. Channel 19 (2.440GHz)

Test Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	
					Peak	AV
2390.000	44.8	36.0	74.0	54.0	29.2	18.0
2483.500	47.2	38.2	74.0	54.0	26.8	15.8

3. Channel 38 (2.478GHz)

Test Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	
					Peak	AV
2390.000	45.0	35.9	74.0	54.0	29.0	18.1
2483.500	46.8	38.5	74.0	54.0	27.2	15.5

The unit does meet the FCC requirements.

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

5.3.9 Peak power Output

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 13 June 2006

Operating Environment:

Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Test result: PASS

Test Procedure:

1 The transmitter output was connected to the spectrum analyzer directly

2 The center frequency of the spectrum analyzer was set to the fundamental frequency and set RBW 1MHz and VBW to 1MHz.

Requirements:

The maximum peak output power shall not exceed the following limits:

For frequency hopping systems at least 75 hopping channels:1 Watt

For all other frequency hopping systems in the 2400-2483.5MHz band: 0.125 Watts

For Digtial Thansmission Systems in the 2400-2483.5MHz band: 1Watt

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated value above by the amount in dB the directional gain of the antenna exceeds 6dBi.

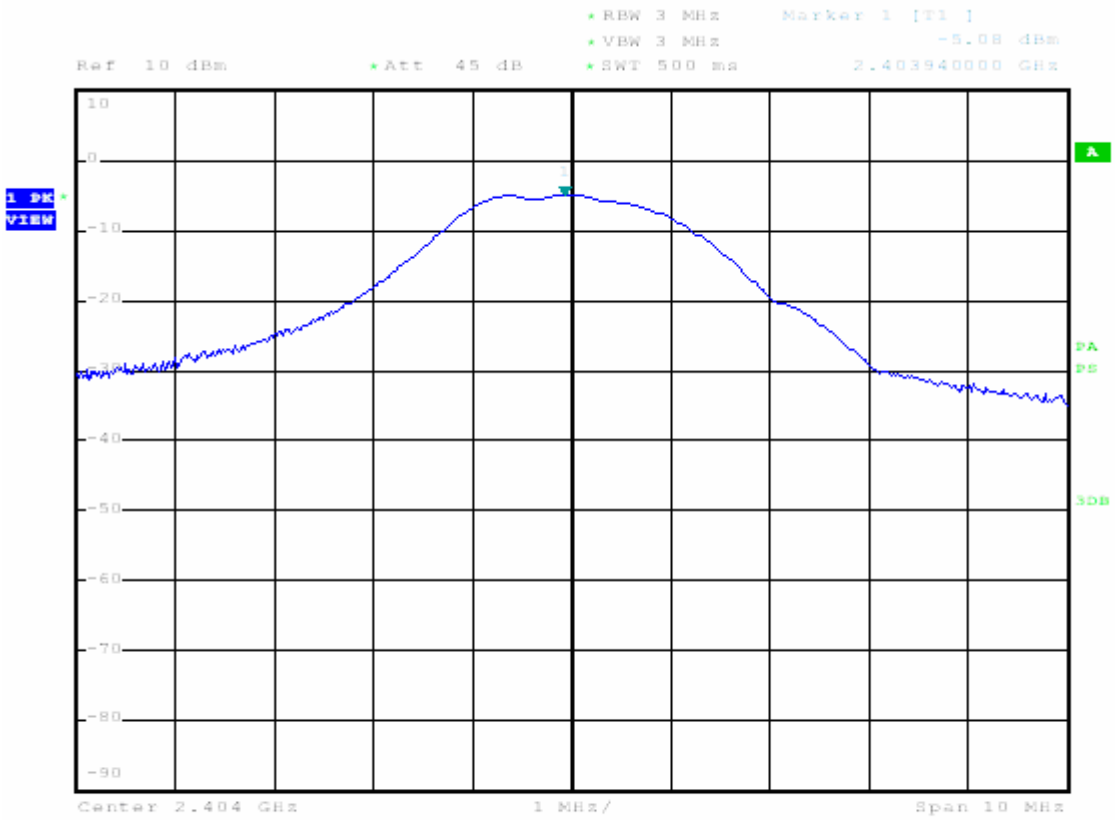
Measurement Data:

Maximum Conducted Peak Power, mWatts

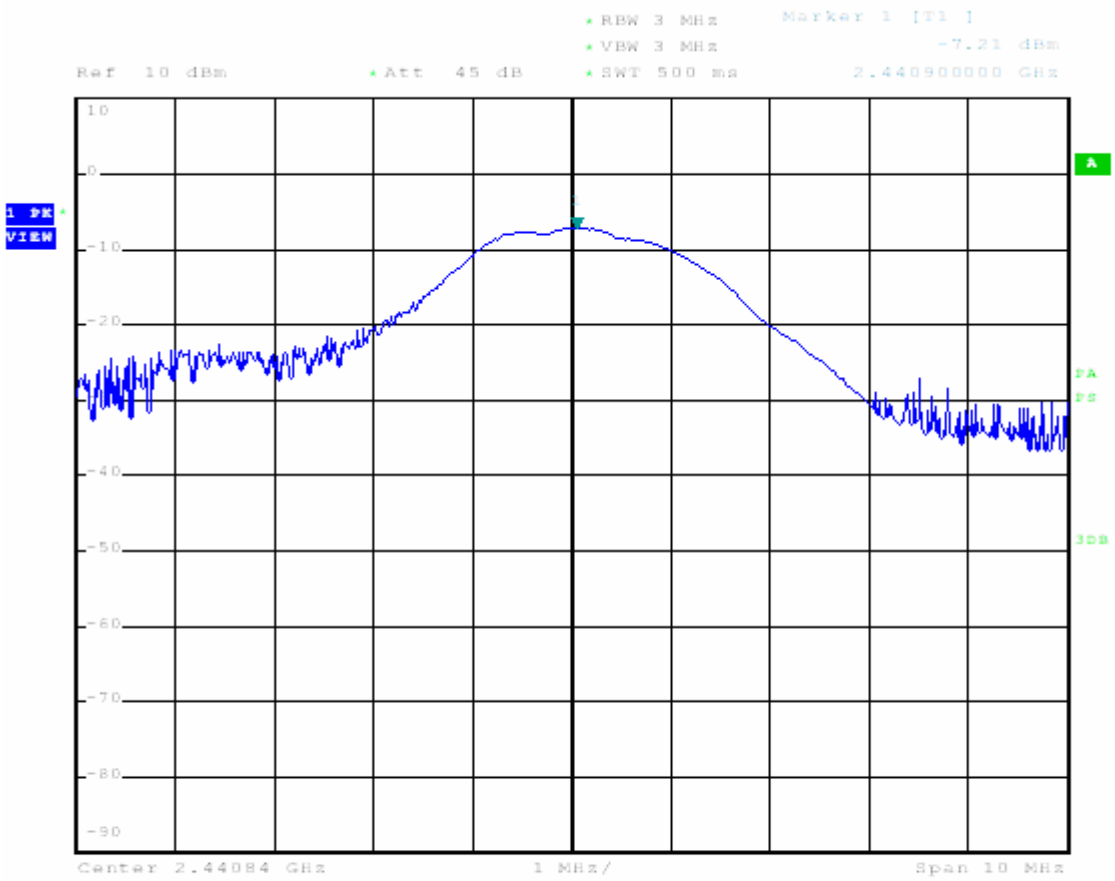
MU in Tx-mode

RF Channel	2404MHz	2440MHz	2478MHz
Measured value(dBm)	-5.08	-7.21	-14.33

MU Conducted peak power at 2404 MHz

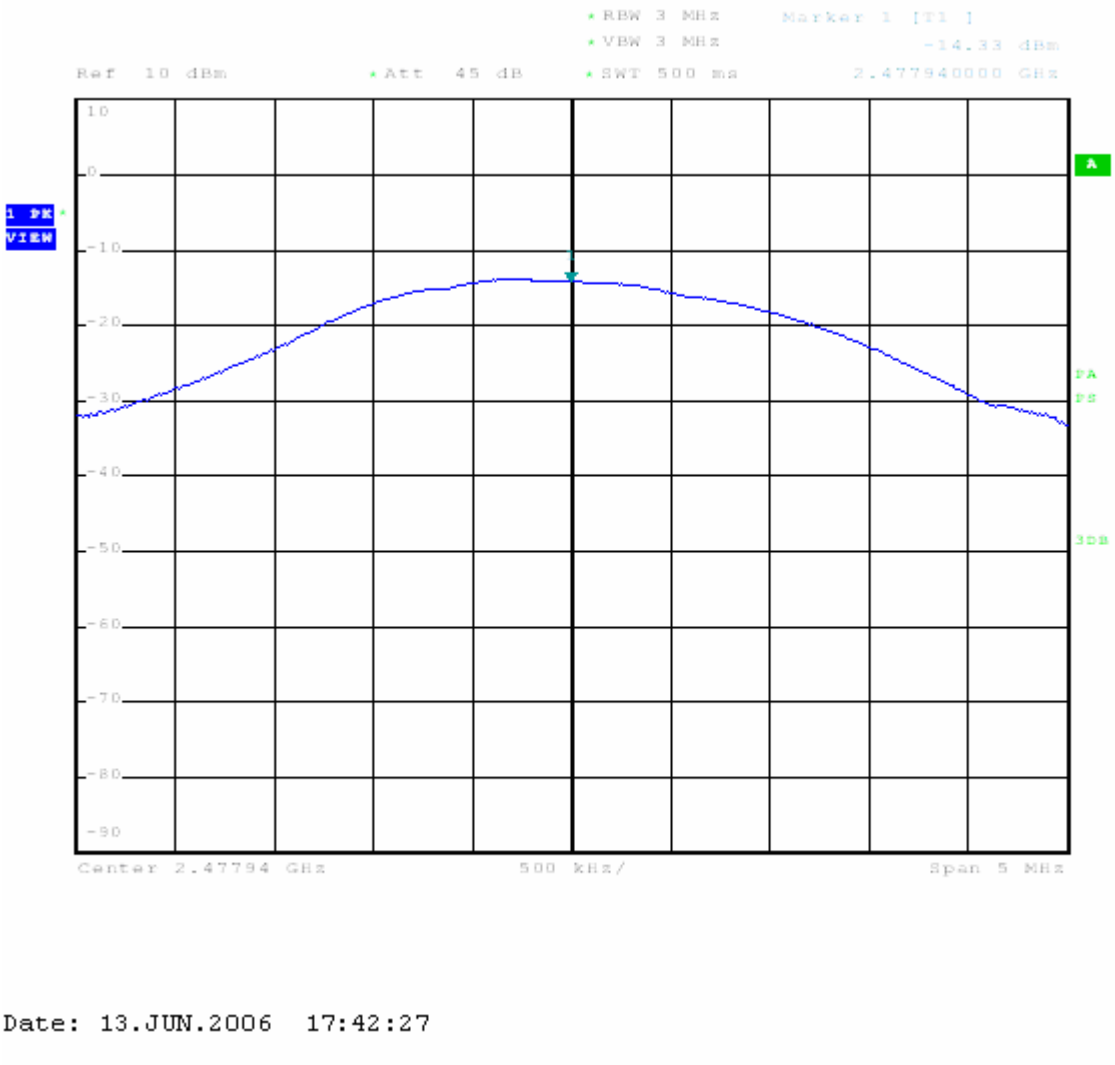


MU Conducted peak power at 2440 MHz



Date: 13.JUN.2006 17:46:37

MU Conducted peak power at 2478 MHz



5.3.10 Spurious Emissions (Radiated)

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 05 June 2006

Operating Environment:
Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1012 Mbar

Requirements:

Regulation 15.247 (C) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Procedures:

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degress to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and Four meters above ground to find the maximum value of the field strength for both horizontalntal horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower(from 1m to 4m) and turntable(from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. For testing below 1 GHz, if the emission level of the EUT in peak mode was 3dB lower than average limit specified, then testing will be stopped and peak values of EUT will be reported , otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
8. 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 average 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.
9. 30 MHz – 10GHz for transmitting mode. Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 M – 25GHz)

Test Result:
Please refer to the measurement graph and data.
Measurement Data:
Band-edge conducted power
MU Tx-mode

Frequency	Power below nearest channel, dB	Limit	Margin
GHz	RF channel 2404/2478MHz, Frequency hopping	dB	dB
2.4	-28.42	-20	8.42
2.4835	-39.67	-20	19.67

Radiated Emission, 30MHz—25GHz
30MHz—18GHz measured at a distance of 3m,18-25GHz measured by conducted.
*Antenna factor, amplifier gain and cable loss are included in spectrum analyzer.

The following test results were performed on the comple system at 30MHz-1000MHz.
(1) Under only main unit operation
Horizonal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
49.400	0.79	8.67	28.11	34.94	16.29	40.00	-23.71
67.830	0.80	6.96	28.01	35.16	14.91	40.00	-25.09
95.960	1.16	8.95	27.91	35.56	17.76	43.50	-25.74
186.170	1.38	10.02	27.23	36.28	20.45	43.50	-23.05
391.810	2.18	16.20	27.35	32.12	23.15	46.00	-22.85
655.650	2.82	20.84	27.42	32.57	28.81	46.00	-17.19

Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
44.500	0.70	9.66	28.10	33.90	16.16	40.00	-23.84
74.725	0.95	7.30	28.00	33.38	13.63	40.00	-26.37
131.275	1.28	7.76	27.59	33.61	15.06	43.50	-28.44
197.575	1.40	10.17	27.17	33.97	18.37	43.50	-25.13
381.850	2.15	16.08	27.30	31.25	22.18	46.00	-23.82
655.825	2.82	20.84	27.42	30.40	26.64	46.00	-19.36

(2) Under wireless communication
Horizonal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
117.300	1.25	8.08	27.71	36.18	17.80	43.50	-25.70
191.020	1.39	10.11	27.20	51.40	35.70	43.50	-7.80
202.660	1.42	10.32	27.14	51.02	35.62	43.50	-7.88
238.550	1.62	11.93	26.96	48.30	34.89	46.00	-11.11
325.850	1.99	14.83	26.92	42.48	32.38	46.00	-13.62
359.800	2.09	15.65	27.16	51.30	41.88	46.00	-4.12

Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
118.270	1.25	8.02	27.70	54.58	36.15	43.50	-7.35
214.300	1.49	10.93	27.08	49.12	34.46	43.50	-9.04
225.940	1.55	11.53	27.02	50.73	36.79	46.00	-9.21
288.020	1.85	13.40	26.76	47.37	35.86	46.00	-10.14
357.860	2.08	15.59	27.14	51.44	41.97	46.00	-4.03
597.450	2.70	19.68	27.62	39.80	34.56	46.00	-11.44

The following test results were performed on the MU at above 1 GHz.
MU on the Lowest Channel (2.404GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
4808.665	2.70	34.04	45.40	65.50	56.84	74.00	-17.16	PK
4808.665	2.70	34.04	45.40	38.50	29.84	54.00	-24.16	AV
9040.000	3.39	36.36	42.73	41.75	38.77	54.00	-15.23	NA
9880.000	3.48	37.19	41.97	40.56	39.26	54.00	-14.74	NA
11780.000	3.78	38.52	43.15	40.61	39.76	54.00	-14.24	NA
14120.000	4.09	39.05	45.76	42.32	39.70	54.00	-14.30	NA

MU on the Middle Channel (2.440GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
4881.080	2.72	34.02	45.42	67.51	58.83	74.00	-15.17	PK
4881.080	2.72	34.02	45.42	38.51	29.83	54.00	-24.17	AV
9320.000	3.42	36.68	42.48	40.02	37.64	54.00	-16.36	NA
11020.000	3.66	38.30	42.60	40.16	39.52	54.00	-14.48	NA
13230.000	3.97	39.06	44.85	45.39	43.57	54.00	-10.43	NA
15140.000	4.20	40.01	45.04	43.51	42.68	54.00	-11.32	NA

MU on the Middle Channel (2.478GHz)

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
4955.110	2.74	34.01	45.44	62.89	54.20	74.00	-19.8	PK
4955.110	2.74	34.01	45.44	35.49	26.80	54.00	-27.20	AV
8920.000	3.37	36.26	42.84	43.12	39.91	54.00	-14.09	NA
10310.000	3.55	37.65	42.09	42.10	41.21	54.00	-12.79	NA
13130.000	3.96	39.11	44.75	44.60	42.92	54.00	-11.08	NA
16350.000	4.34	41.15	43.96	41.50	43.03	54.00	-10.97	NA