FCC Part 15
EMI TEST REPORT
of

E.U.T. ： Bluetooth Module
Model ： BM153-CB1-SJ
FCC ID ： BYG023

for

APPLICANT : SANGEAN ELECTRONICS INC.
ADDRESS : NO.18, LANE 7, LI-DE STREET, CHUNG HO DISTRICT, NEW TAIPEI CITY,23584, TAIWAN, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 34. LIN 5, DINGFU VIL., LINKOU DIST.,
NEW TAIPEI CITY, TAIWAN, 24442, R.O.C.
Tel:(02)26023052 Fax:(02)26010910
http://www.etc.org.tw ; e-mail : emc@etc.org.tw

Report Number : 12-07-RBF-005-02

TEST REPORT CERTIFICATION

Applicant : SANGEAN ELECTRONICS INC.
NO.18, LANE 7, LI-DE STREET, CHUNG HO DISTRICT,
NEW TAIPEI CITY,23584, TAIWAN, R.O.C.

Manufacture : SANGEAN ELECTRONICS INC.
NO.18, LANE 7, LI-DE STREET, CHUNG HO DISTRICT,
NEW TAIPEI CITY,23584, TAIWAN, R.O.C.

Description of Device :

a) Type of EUT : BLUETOOTH MODULE
b) Trade Name : Sunitec
c) Model No. : BM153-CB1-SJ
d) Power Supply : DC 5.0V

Regulation Applied : FCC Rules and Regulations Part 15 Subpart C

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC.

Summary of Tests

Test	Results
Radiated Emission	**Pass**
Conducted Emission	**Pass**
Hopping Channel Separation	**Pass**
Number of Hopping frequencies used	**Pass**
Hopping Channel Bandwidth	**Pass**
Dwell Time of each frequency	**Pass**
Output Power Requirement	**Pass**
100 kHz Bandwidth of Frequency Band Edges Requirement	**Pass**
Out-of-Band Conducted Emission Requirement	**Pass**

Date Test Item Received	:	*Jul. 11, 2012*
Date Test Campaign Completed	:	*Jan. 06, 2013*
Date of Issue	:	*Jan. 06, 2013*

Test Engineer : ______________________

(Jiapeng Chen, Engineer)

Approve & Authorized : ______________________

S. S. Liou, Section Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

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1 GENERAL INFORMATION

1.1 Product Description

a)	Type of EUT	:	BLUETOOTH MODULE
b)	Trade Name	:	Sunitec
c)	Model No.	:	BM153-CB1-SJ
d)	Power Supply	:	DC 5.0V
e)	Limited Modular Approval	:	This EUT is a Bluetooth module and is intended to be installed into the host WR-22, DDR-31BT, DDR-47BT and DDR-38. Host devices are radio receivers with FM / AM / USB and Bluetooth functions.

1.2 Test Methodology

Both conducted and radiated emissions were performed according to the procedures illustrated in ANSI C63.4 (2003). Other required measurements were illustrated in separate sections of this test report for details. FCC DA 00-705 was used as the referencing measurement procedure of RF tests.

There are three types of datarate in the module: 1Mb, 2Mb and 3Mb. Pretests have been performed with these datarates. The 1Mb mode was found the worst case so it was chosen for the final test and the test data was recorded in the test report.

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at NO. 34. LIN 5, DINGFU VIL., LINKOU DIST., NEW TAIPEI CITY, TAIWAN, 24442, R.O.C.
This site has been fully described in a report submitted to your office, and accepted in a letter dated Jan. 11, 2011.

2 PROVISIONS APPLICABLE

2.1 Definition

Unintentional radiator:
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

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

Frequency MHz	Quasi Peak dBμV	Average dBμV
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

* Decreases with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limits is same as above table.

(2) Radiated Emission Requirement

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency MHz	Distance Meters	Radiated dBμV/m	Radiated μV/m
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

(3) Antenna Requirement

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

(4) Hopping Channel Separation

According to 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

(5) Number of Hopping frequencies used

According to 15.247(a)(1)(iii), frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

(6) Hopping Channel Bandwidth

For frequency hopping system operating in the 2400–2483.5 MHz band, there is no requirement for the maximum 20dB bandwidth of the hopping channel. The measurement of the hopping channel bandwidth is for the reference of the hopping channel separation requirement.

(7) Dwell Time of each frequency

According to 15.247(a)(1)(iii), for frequency hopping system operating in the 2400-2483.5 band, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

(8) Output Power Requirement

According to 15.247(b)(1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

(9) 100 kHz Bandwidth of Frequency Band Edges Requirement

According to 15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

(10) Out-of-Band Conducted Emission Requirement

According to 15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

2.3 Restricted Bands of Operation

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
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	3360-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

For both radiated and conducted emissions, the system was configured for testing in a typical fashion as a customer would normally use it. The peripherals other than EUT were connected in normally standing by situation. Three highest emissions were verified with varying placement of the transmitting antenna connected to EUT (if applicable) to maximize the emission from EUT.

For conducted and radiated emissions, whichever RF channel is operated, the digital circuits' function identically. As the reason, measurement of emissions from digital circuits is performed with the highest, middle and the lowest channel by transmitting mode.

3.2 Devices for Tested System

Device	Manufacture	Model / FCC ID.	Description
Bluetooth Module *	SANGEAN ELECTRONICS INC.	BM153-CB1-SJ/ BYG023	1.2m shielded USB Cable
Radio Receiver	SANGEAN ELECTRONICS INC.	WR-22	1.6m Unshielded AC Power Cord
iPod	Apple	A1051	1.0m Unshielded Line
Earphone	KINYO	EM-3000	0.6m Unshielded Cable

Remark "*" means equipment under test.

4 RADIATED EMISSION MEASUREMENT

4.1 Applicable Standard

For unintentional radiator, the radiated emission shall comply with §15.109(a).
For intentional radiators, according to §15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with §15.247 (c)

4.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the placement of cables associated with EUT to obtain the worse case and record the result.

Figure 1 : Frequencies measured below 1 GHz configuration

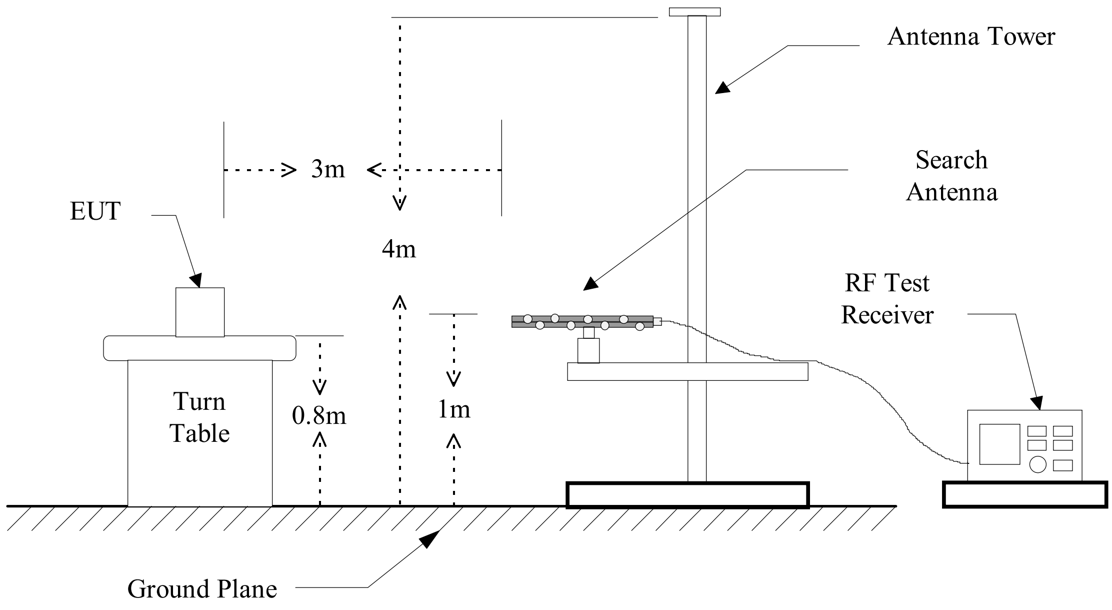
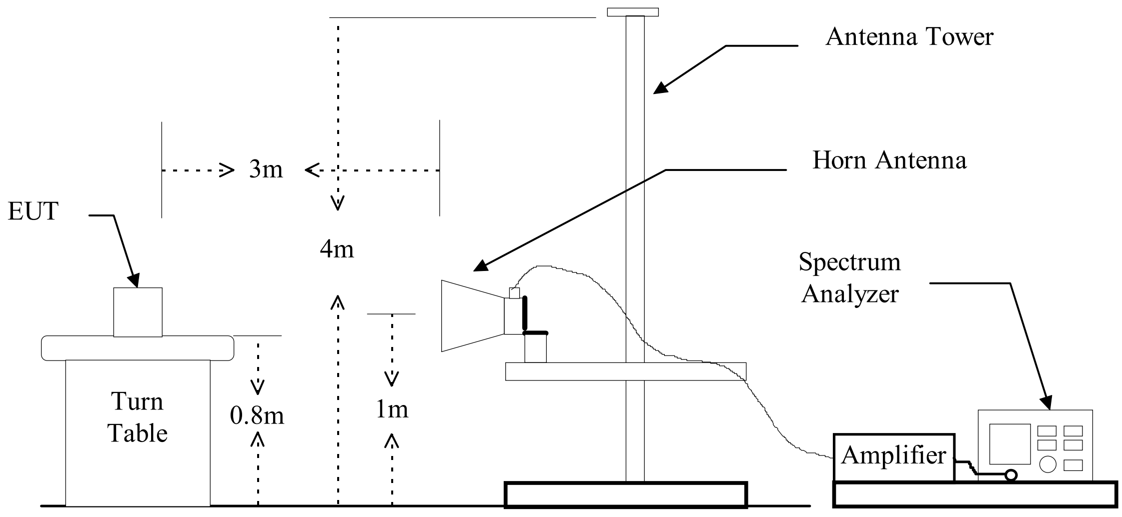


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Measuring Instrument

The following instrument are used for radiated emissions measurement:

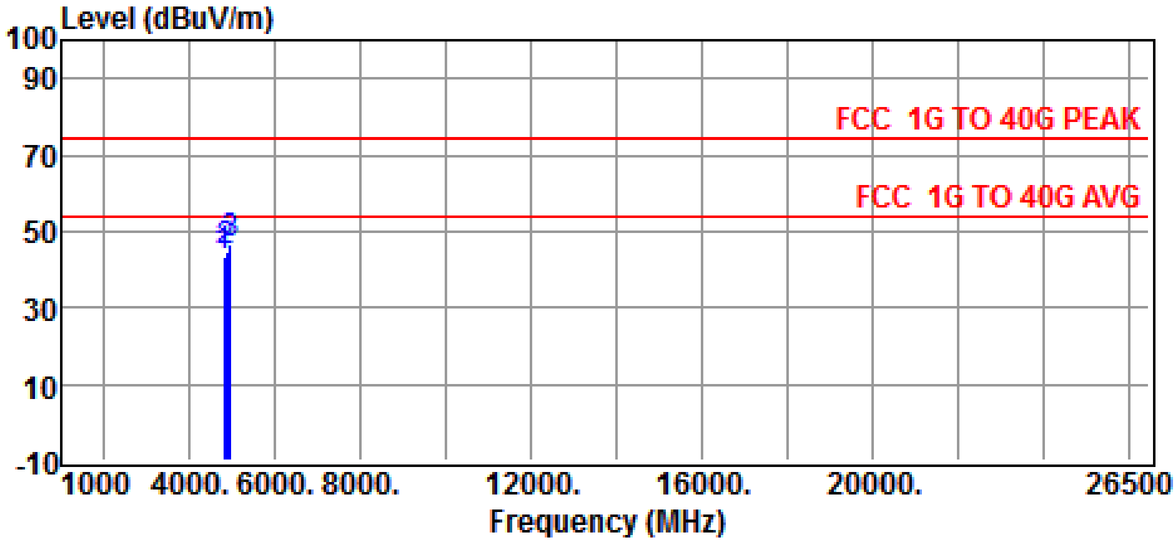
Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Test Receiver	Rohde & Schwarz	ESVS30	2012/05/07	2013/05/07
EMI Test Receiver	Rohde & Schwarz	ESL	2012/07/30	2013/07/30
Bi-Log Antenna	ETC	MCTD 2756	2012/01/10	2013/01/09
Log-periodic Antenna	EMCO	3146	2011/11/04	2012/11/03
Double Ridged Guide Horn Antenna	EMCO	3116	2011/10/24	2012/10/26
Biconical Antenna	EMCO	3110B	2011/11/18	2012/11/17
Double Ridged Antenna	EMCO	3115	2012/05/18	2013/05/18
Amplifier	HP	8449B	2011/12/28	2012/12/27
Amplifier	HP	83051A	2012/05/16	2013/05/16
Amplifier	HP	8447D	2012/05/16	2013/05/16
EMI Test Receiver	Rohde & Schwarz	ESU 40	2012/09/17	2013/09/17

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	10 Hz

4.4 Radiated Emission Data

4.4.1 Tx Portion

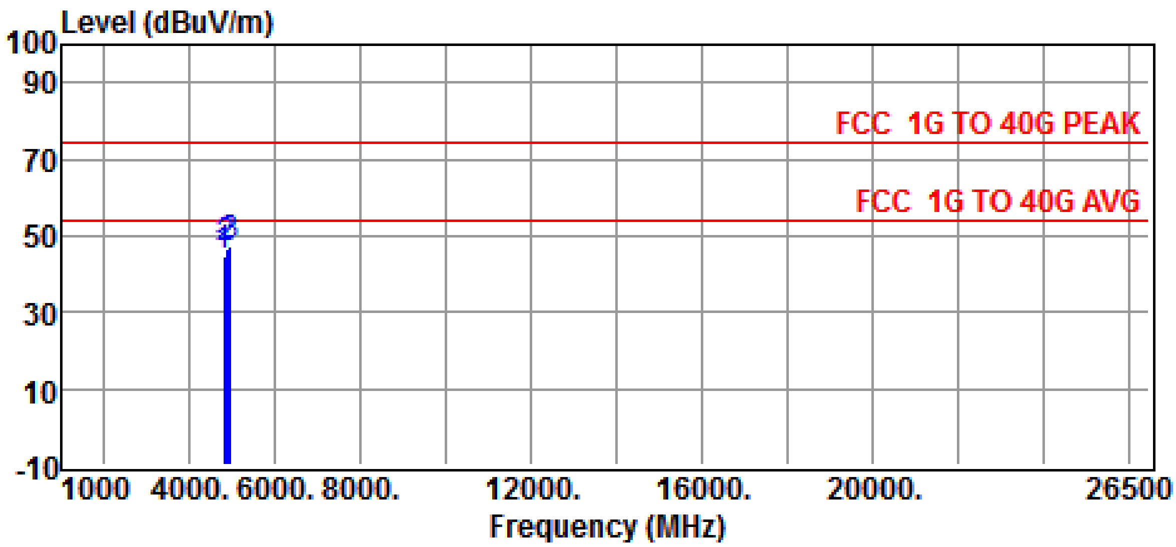


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host WR-22		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	41.9	1.2	43.1	74.0	-30.9	Peak
4882.0000	43.3	1.3	44.6	74.0	-29.4	Peak
4960.0000	45.2	1.6	46.8	74.0	-27.2	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.



Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host WR-22		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	43.7	1.2	44.9	74.0	-29.1	Peak
4882.0000	45.4	1.3	46.7	74.0	-27.3	Peak
4960.0000	45.4	1.6	47.0	74.0	-27.0	Peak

Note :

1. Result = Reading + Corrected Factor
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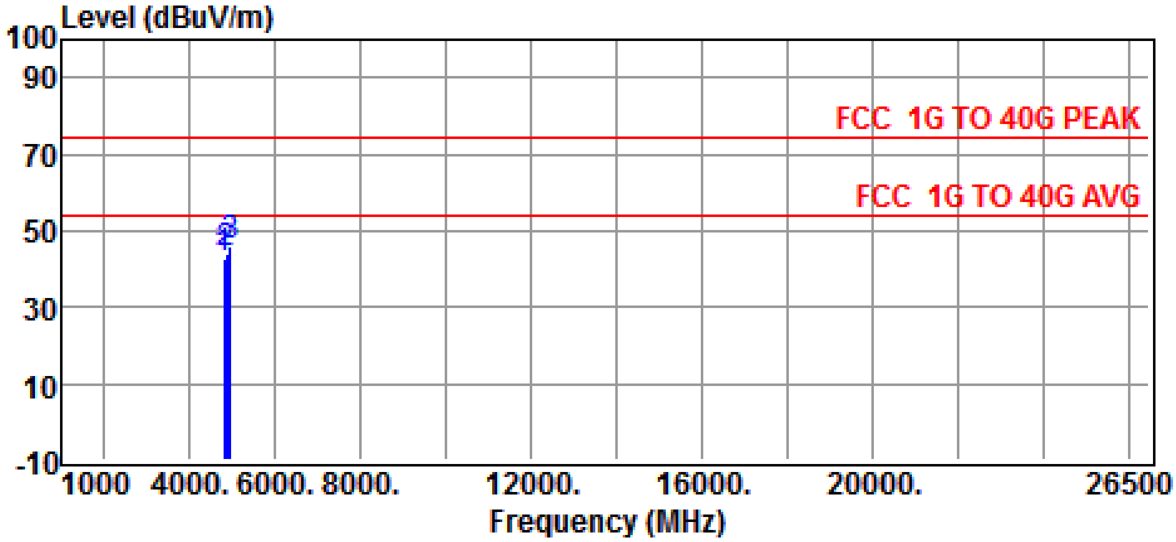
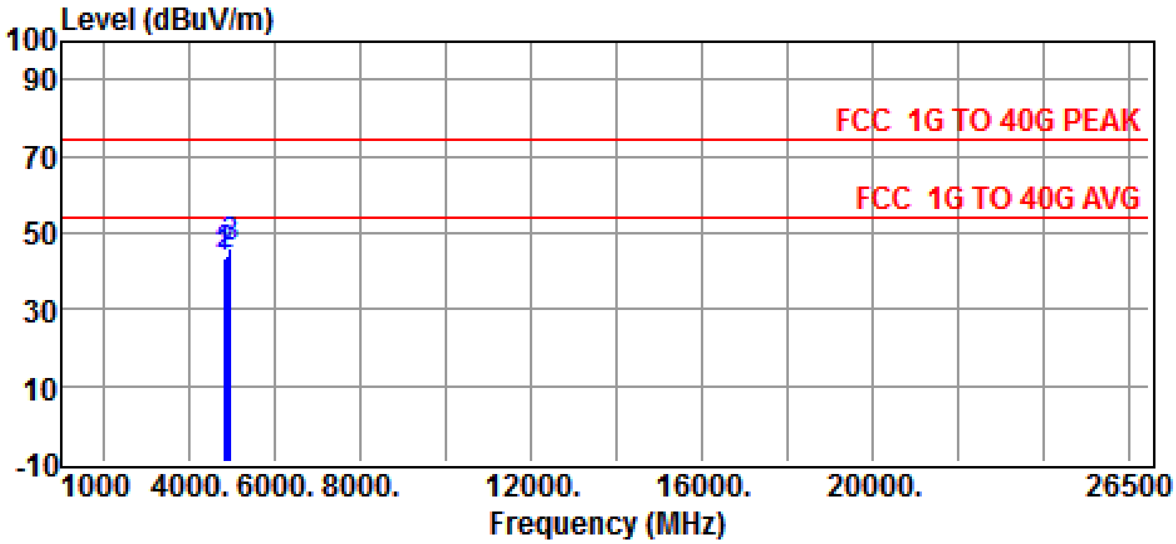


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host DDR-31BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	41.7	1.2	42.9	74.0	-31.1	Peak
4882.0000	42.5	1.3	43.8	74.0	-30.2	Peak
4960.0000	44.1	1.6	45.7	74.0	-28.3	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.



Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host DDR-31BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	42.1	1.2	43.3	74.0	-30.7	Peak
4882.0000	42.9	1.3	44.2	74.0	-29.8	Peak
4960.0000	44.2	1.6	45.8	74.0	-28.2	Peak

Note :

1. Result = Reading + Corrected Factor
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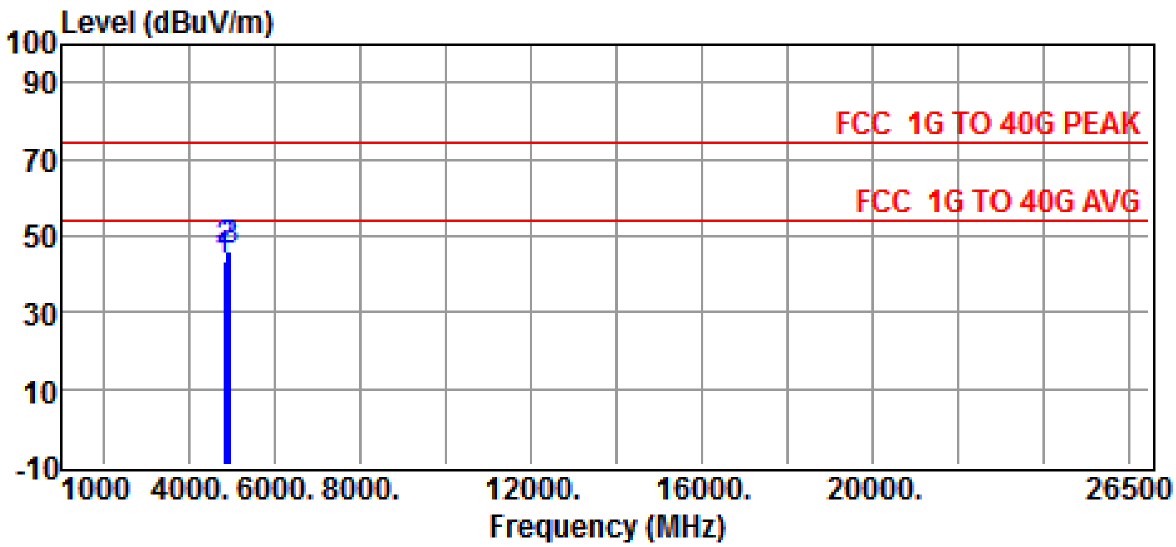
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.



Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host DDR-47BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	41.9	1.2	43.1	74.0	-30.9	Peak
4882.0000	44.4	1.3	45.7	74.0	-28.3	Peak
4960.0000	44.6	1.6	46.2	74.0	-27.8	Peak

Note :

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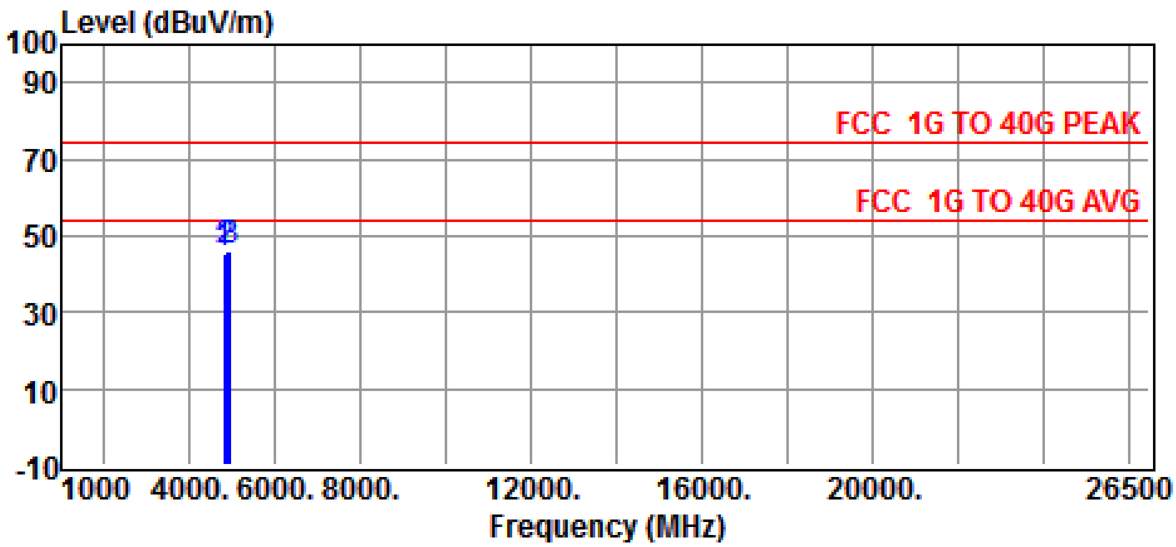
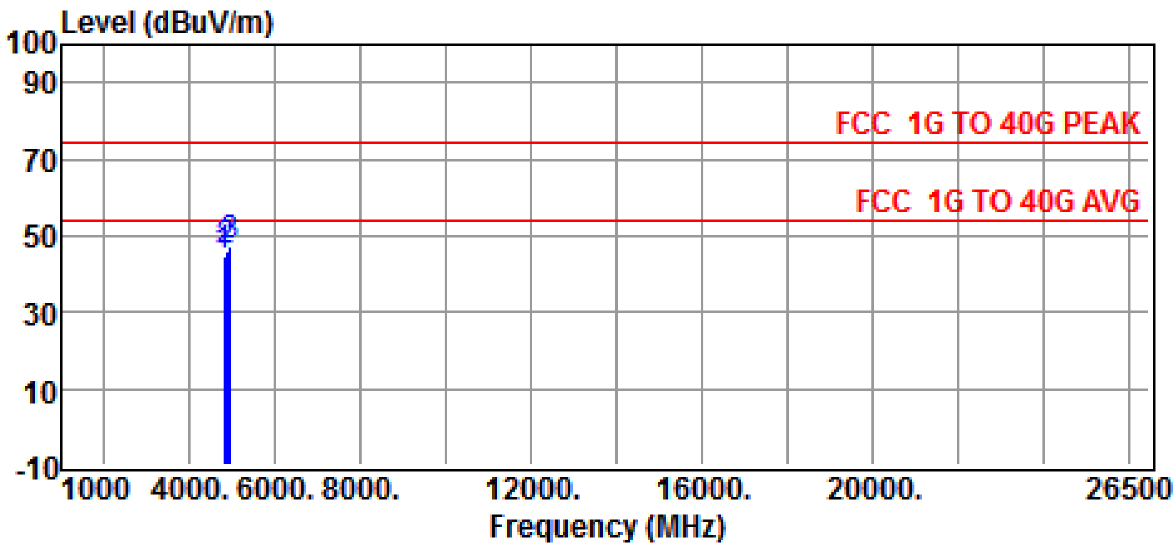


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host DDR-47BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	43.9	1.2	45.1	74.0	-28.9	Peak
4882.0000	44.7	1.3	46.0	74.0	-28.0	Peak
4960.0000	44.5	1.6	46.1	74.0	-27.9	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

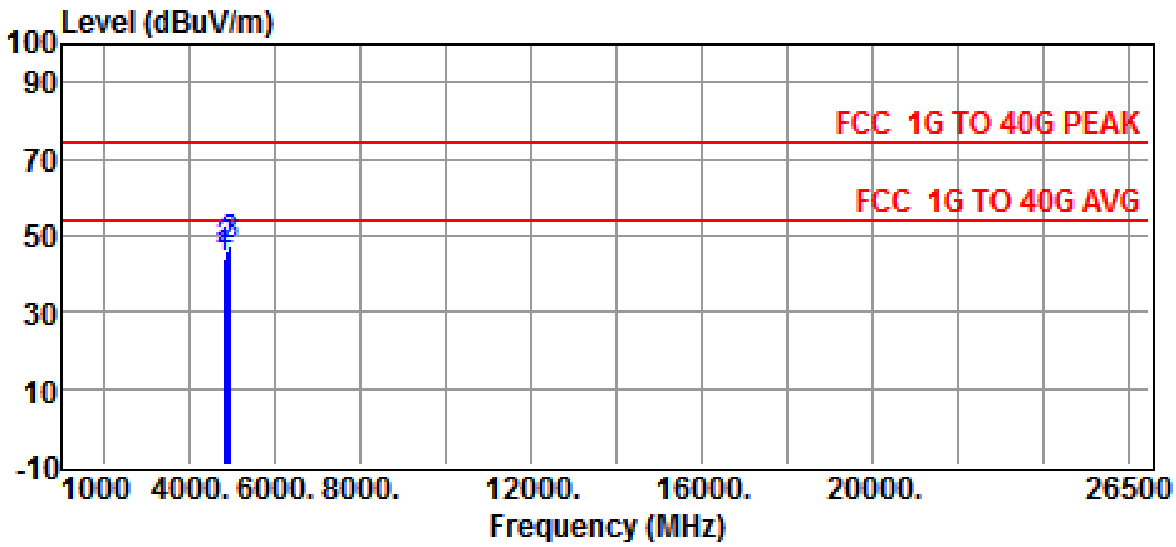


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host DDR-38		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	43.4	1.2	44.6	74.0	-29.4	Peak
4882.0000	44.5	1.3	45.8	74.0	-28.2	Peak
4960.0000	45.7	1.6	47.3	74.0	-26.7	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.



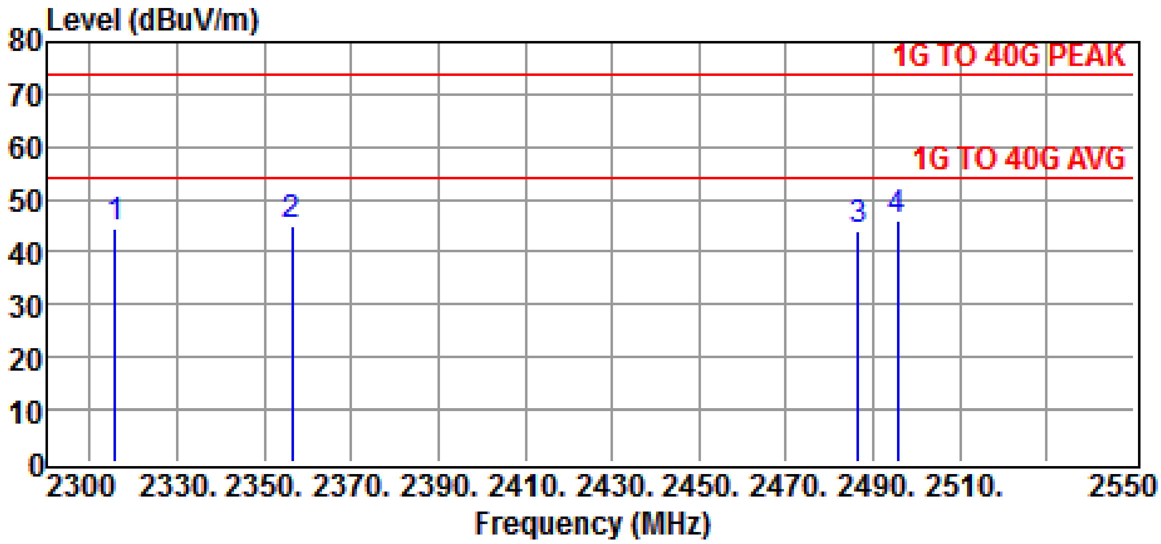
Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:TX-CH Lo 2402MHz-MI 2440MHz-HI 2480MHz		
Memo	:EUT Installed in host DDR-38		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
4804.0000	42.7	1.2	43.9	74.0	-30.1	Peak
4882.0000	44.4	1.3	45.7	74.0	-28.3	Peak
4960.0000	46.0	1.6	47.6	74.0	-26.4	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

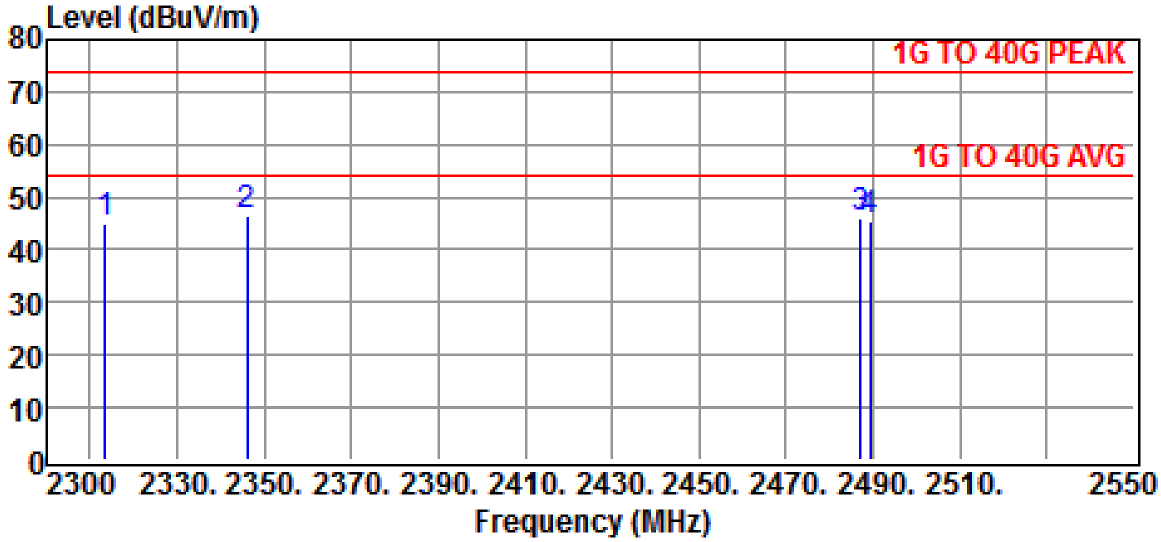
4.4.2 Radiated Emissions in Restricted Bands



Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in WR-22		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2315.6700	50.8	-6.2	44.6	74.0	-29.4	Peak
2356.4800	51.2	-6.0	45.2	74.0	-28.8	Peak
2486.7400	49.6	-5.5	44.1	74.0	-29.9	Peak
2495.6200	51.4	-5.5	45.9	74.0	-28.1	Peak

Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

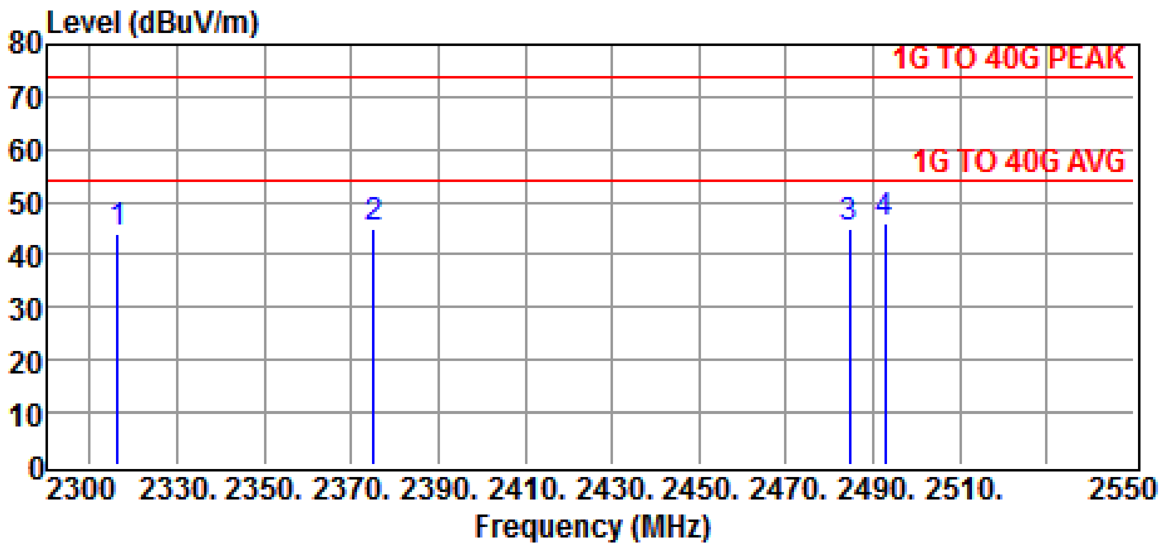


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in WR-22		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2313.4900	51.3	-6.2	45.1	74.0	-28.9	Peak
2345.9800	52.7	-6.0	46.7	74.0	-27.3	Peak
2487.2500	51.4	-5.5	45.9	74.0	-28.1	Peak
2489.2400	51.2	-5.5	45.7	74.0	-28.3	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

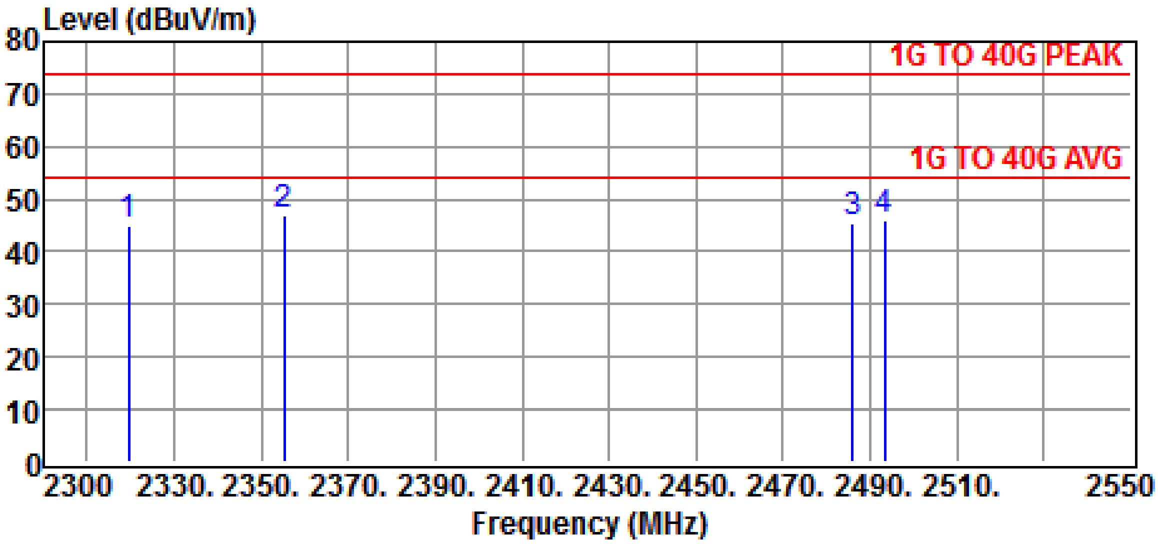


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in DDR-31BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2316.2400	50.1	-6.2	43.9	74.0	-30.1	Peak
2375.2300	50.7	-5.9	44.8	74.0	-29.2	Peak
2484.6800	50.7	-5.5	45.2	74.0	-28.8	Peak
2492.7400	51.7	-5.5	46.2	74.0	-27.8	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

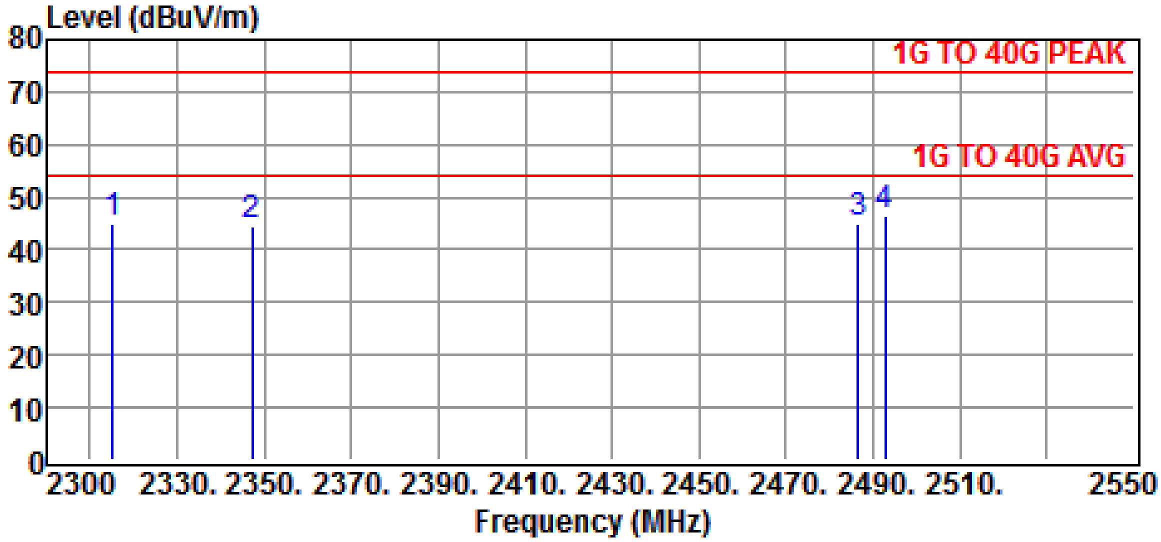


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in DDR-31BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2319.5200	51.2	-6.1	45.1	74.0	-28.9	Peak
2355.2400	52.9	-6.0	46.9	74.0	-27.1	Peak
2485.9500	51.2	-5.5	45.7	74.0	-28.3	Peak
2493.2100	51.7	-5.5	46.2	74.0	-27.8	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

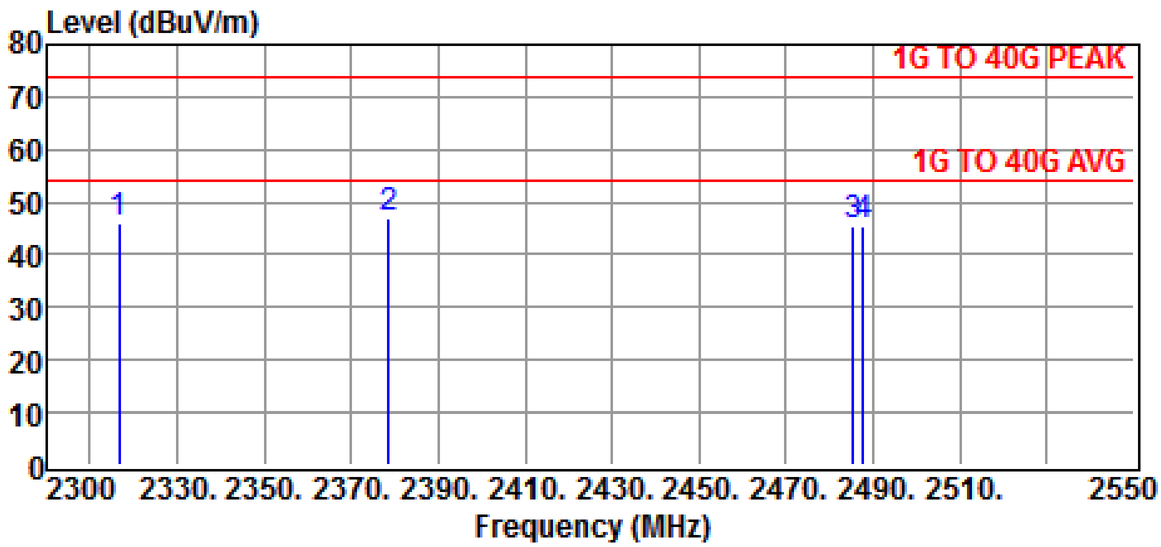


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in DDR-47BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2315.2400	51.3	-6.2	45.1	74.0	-28.9	Peak
2347.2100	50.4	-6.0	44.4	74.0	-29.6	Peak
2486.5700	50.7	-5.5	45.2	74.0	-28.8	Peak
2492.6500	52.1	-5.5	46.6	74.0	-27.4	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

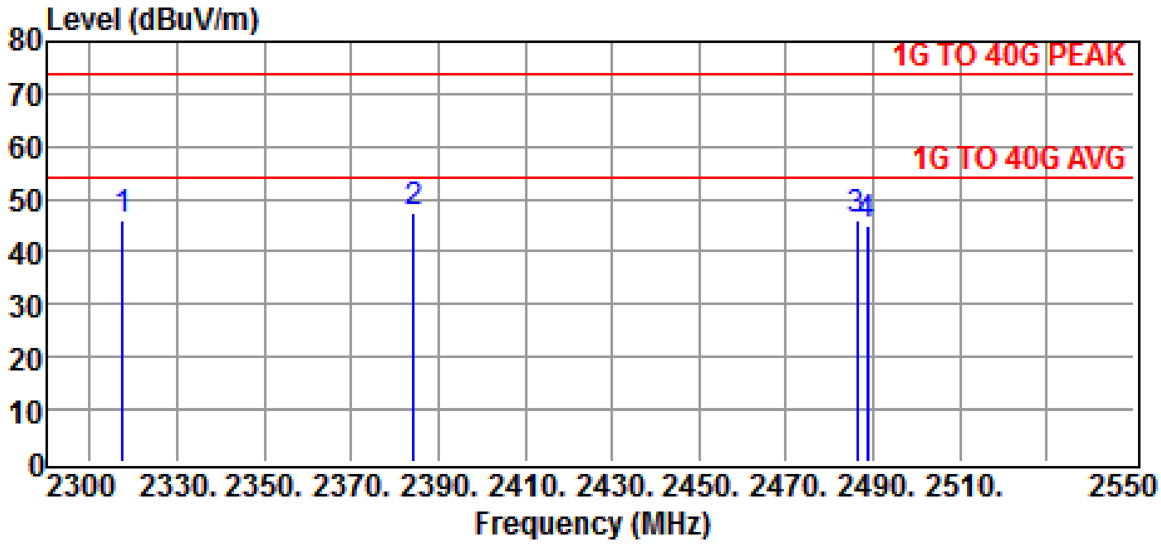


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in DDR-47BT		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2316.5400	52.0	-6.2	45.8	74.0	-28.2	Peak
2378.5400	52.8	-5.9	46.9	74.0	-27.1	Peak
2485.6200	51.2	-5.5	45.7	74.0	-28.3	Peak
2487.6500	51.2	-5.5	45.7	74.0	-28.3	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

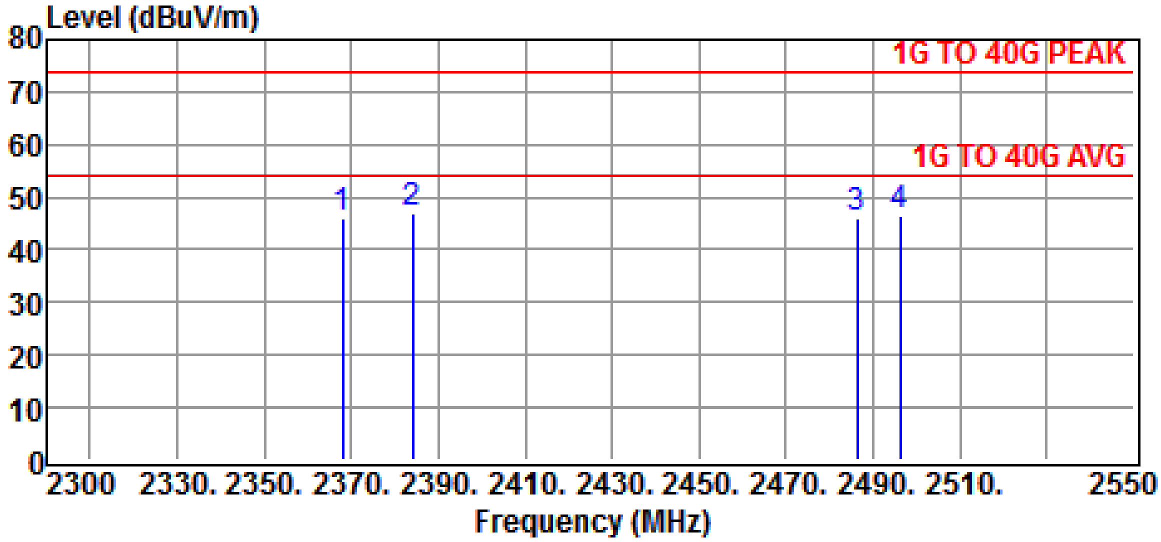


Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in DDR-38		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2317.4500	52.4	-6.2	46.2	74.0	-27.8	Peak
2384.3200	53.1	-5.9	47.2	74.0	-26.8	Peak
2486.2100	51.6	-5.5	46.1	74.0	-27.9	Peak
2488.6200	50.7	-5.5	45.2	74.0	-28.8	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.



Site	:chamber #2	Date	:2013-01-06
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:25°C
Power Rating	:DC 5.0V	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:CH LO & HI - Restricted Bands		
Memo	:EUT installed in DDR-38		

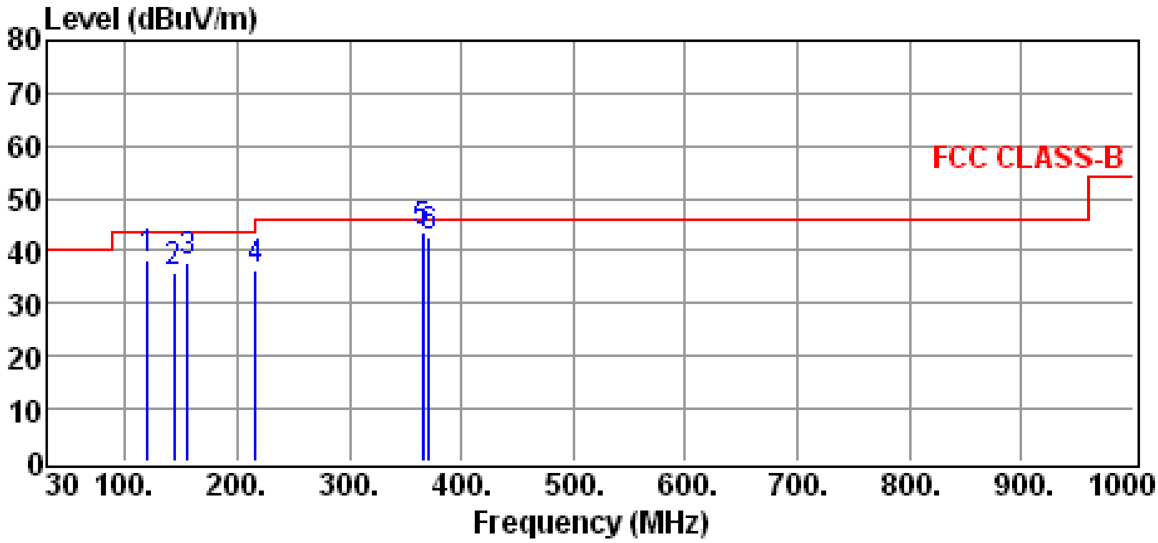
Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
2368.0000	51.8	-6.0	45.8	74.0	-28.2	Peak
2384.2100	52.8	-5.9	46.9	74.0	-27.1	Peak
2486.2100	51.3	-5.5	45.8	74.0	-28.2	Peak
2496.2100	51.8	-5.5	46.3	74.0	-27.7	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

4.4.3 Other Emissions

a) Emission frequencies below 1 GHz

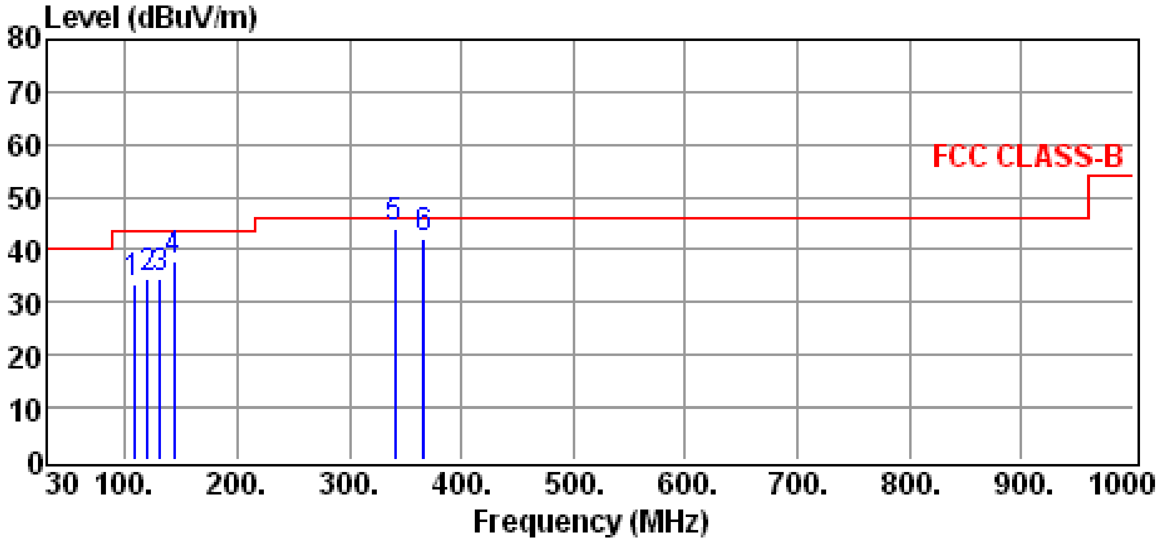


Site	:Open site	Date	:2012-09-28
EUT	:Bluetooth Module	Ant. Pol.	:HORIZONTAL
Model	:BM153-CB1-SJ	Detector	:Q.P.
Power Rating	:120Vac/60Hz	Engineer	:Jiapeng
Limit	:FCC CLASS-B	Temp.	:25 ˚C
Memo	:Installed in host WR-22	Humi.	:63 %

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB
119.7010	26.0	12.4	38.4	43.5	-5.1
143.5490	22.0	13.9	35.9	43.5	-7.6
156.2860	23.9	14.1	38.0	43.5	-5.5
216.1770	22.5	13.9	36.4	46.0	-9.6
365.8000	25.3	18.2	43.5	46.0	-2.5
371.4000	24.5	18.3	42.8	46.0	-3.2

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result

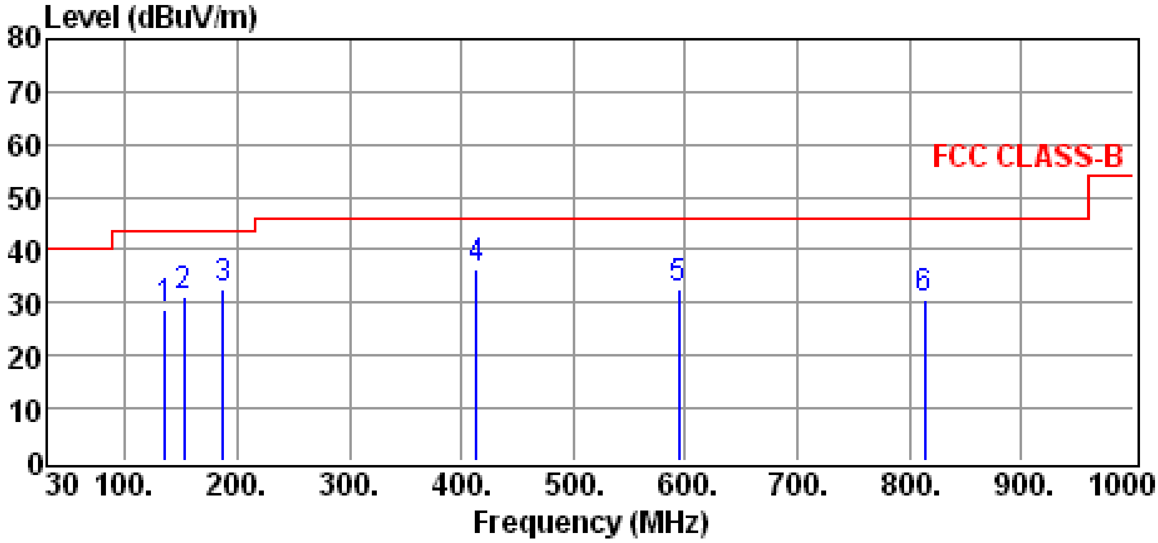


Site	:Open site	Date	:2012-09-28
EUT	:Bluetooth Module	Ant. Pol.	:VERTICAL
Model	:BM153-CB1-SJ	Detector	:Q.P.
Power Rating	:120Vac/60Hz	Engineer	:Jiapeng
Limit	:FCC CLASS-B	Temp.	:25 ˚C
Memo	:Installed in host WR-22	Humi.	:63 %

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB
107.7800	22.0	11.7	33.7	43.5	-9.8
119.7000	22.1	12.4	34.5	43.5	-9.0
131.6250	21.2	13.3	34.5	43.5	-9.0
143.5490	24.1	13.9	38.0	43.5	-5.5
341.3000	26.6	17.7	44.3	46.0	-1.7
366.5000	24.1	18.2	42.3	46.0	-3.7

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result

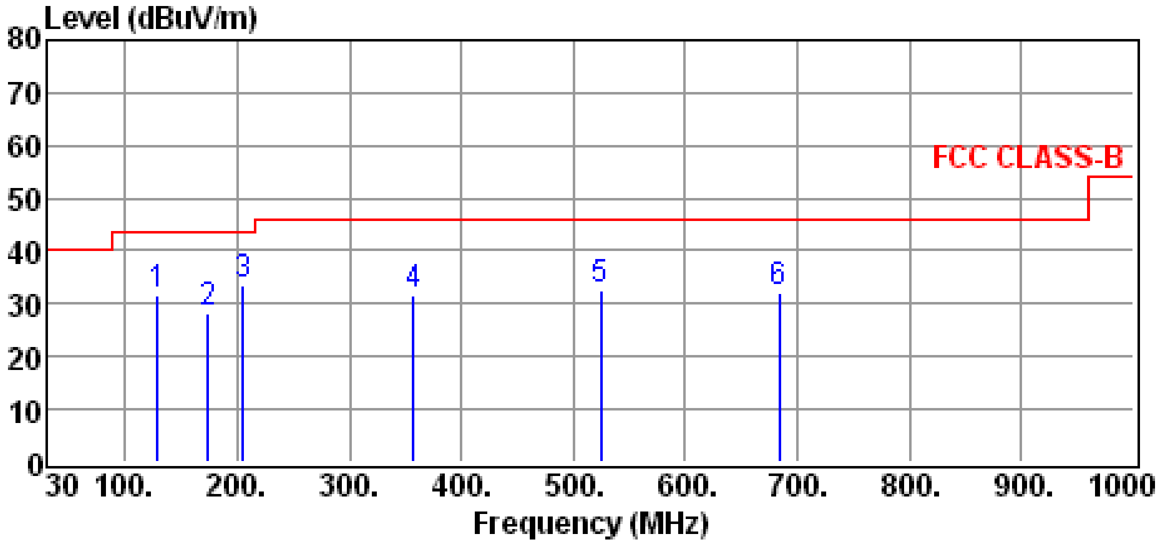


Site	: Chamber	Date	: 2012-11-22
EUT	:Bluetooth Module	Ant. Pol.	: HORIZONTAL
Model	:BM153-CB1-SJ	Detector	:
Power Rating	:120Vac/60Hz	Engineer	:Jiapeng
Limit	: FCC CLASS-B	Temp.	: 24 °C
Memo	:Installed in host DDR-31BT	Humi.	: 58 %

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB
136.2400	14.8	13.8	28.6	43.5	-14.9
152.1700	16.8	14.1	30.9	43.5	-12.6
187.3400	16.8	15.7	32.5	43.5	-11.0
413.5200	17.0	19.5	36.5	46.0	-9.5
594.2800	9.5	23.0	32.5	46.0	-13.5
813.2700	3.8	26.7	30.5	46.0	-15.5

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result

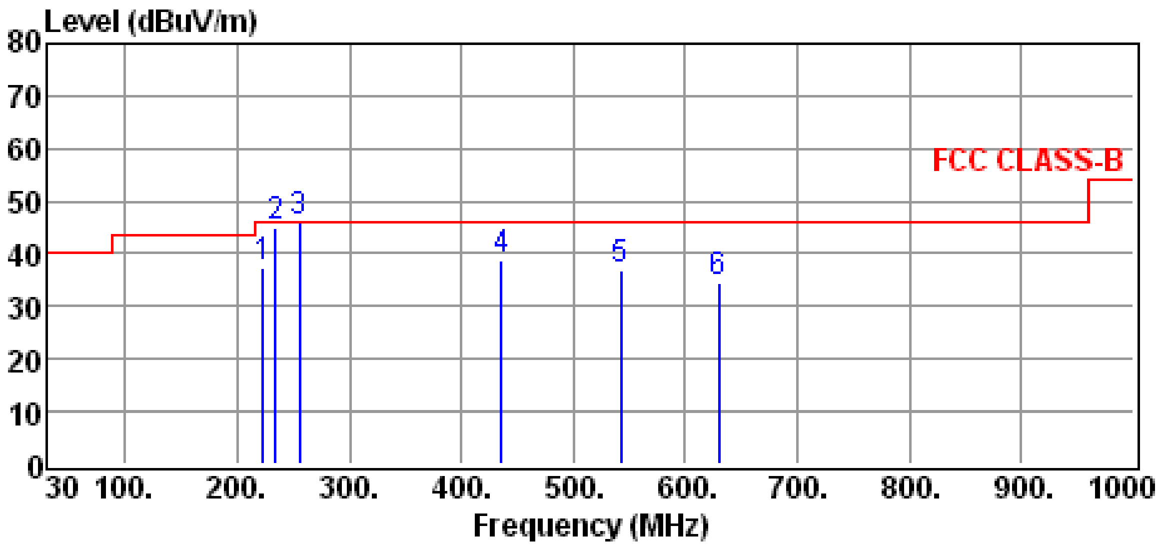


Site	: Chamber	Date	: 2012-11-22
EUT	:Bluetooth Module	Ant. Pol.	: VERTICAL
Model	:BM153-CB1-SJ	Detector	:
Power Rating	:120Vac/60Hz	Engineer	:Jiapeng
Limit	: FCC CLASS-B	Temp.	: 24 ˚C
Memo	:Installed in host DDR-31BT	Humi.	: 58 %

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB
128.6400	18.6	13.2	31.8	43.5	-11.7
174.3300	13.7	14.5	28.2	43.5	-15.3
205.3800	16.0	17.6	33.6	43.5	-9.9
358.1700	13.5	18.0	31.5	46.0	-14.5
524.6200	10.8	22.0	32.8	46.0	-13.2
684.1300	7.0	24.9	31.9	46.0	-14.1

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result

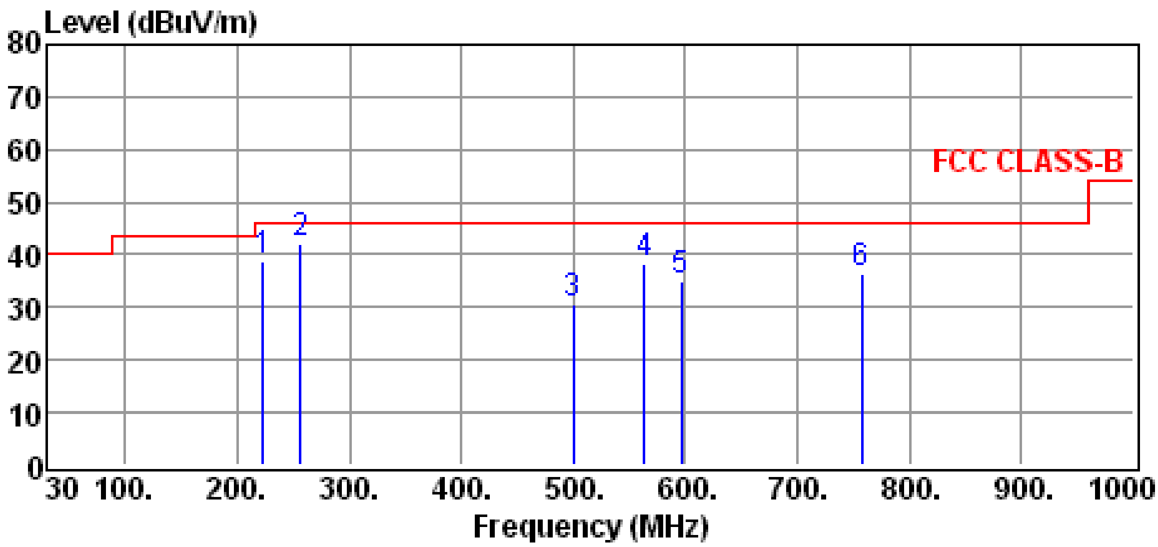


Site	:open site #2	Date	:2012-11-22
EUT	:Bluetooth Module	Ant. Pol.	:HORIZONTAL
Model	:BM153-CB1-SJ	Detector	:
Power Rating	:120Vac/60Hz	Engineer	:Jiapeng
Limit	:FCC CLASS-B	Temp.	:24 ˚C
Memo	:Installed in host DDR-47BT	Humi.	:58 %

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB
223.7700	35.25	2.25	37.50	46.00	-8.50
234.6000	42.79	2.31	45.10	46.00	-0.90
256.2000	43.37	2.43	45.80	46.00	-0.20
436.5000	35.61	3.29	38.90	46.00	-7.10
542.9000	33.07	3.73	36.80	46.00	-9.20
629.7000	30.63	4.07	34.70	46.00	-11.30

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result

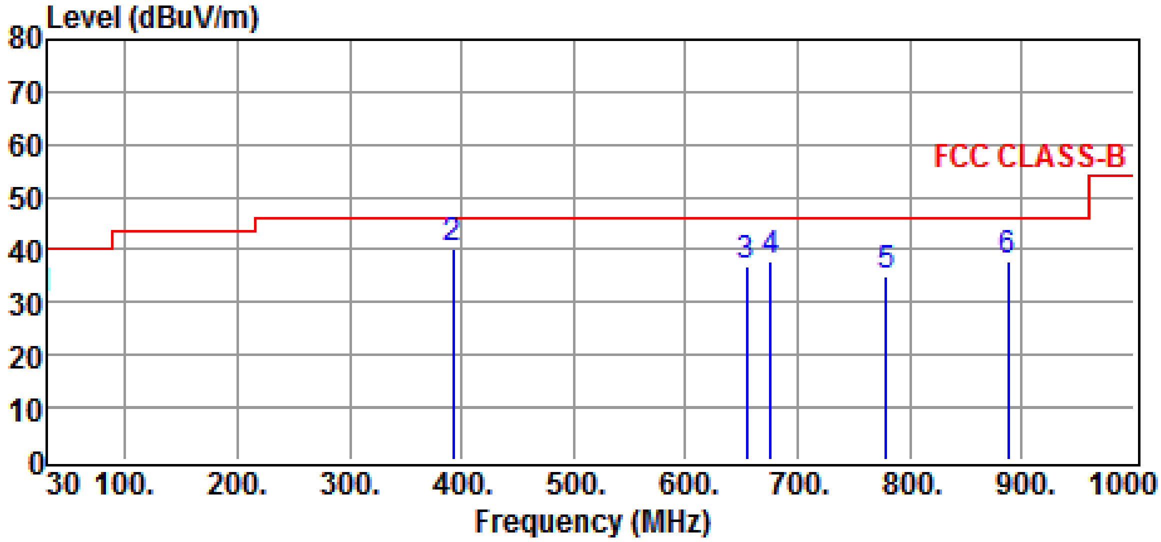


Site	:open site #2	Date	:2012-11-22
EUT	:Bluetooth Module	Ant. Pol.	:VERTICAL
Model	:BM153-CB1-SJ	Detector	:
Power Rating	:120Vac/60Hz	Engineer	:Jiapeng
Limit	:FCC CLASS-B	Temp.	:24 ˚C
Memo	:Installed in host DDR-47BT	Humi.	:58 %

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB
223.7700	36.75	2.25	39.00	46.00	-7.00
256.2900	39.57	2.43	42.00	46.00	-4.00
500.1000	27.05	3.55	30.60	46.00	-15.40
563.3000	34.49	3.81	38.30	46.00	-7.70
596.1000	30.96	3.94	34.90	46.00	-11.10
757.8000	31.64	4.56	36.20	46.00	-9.80

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result

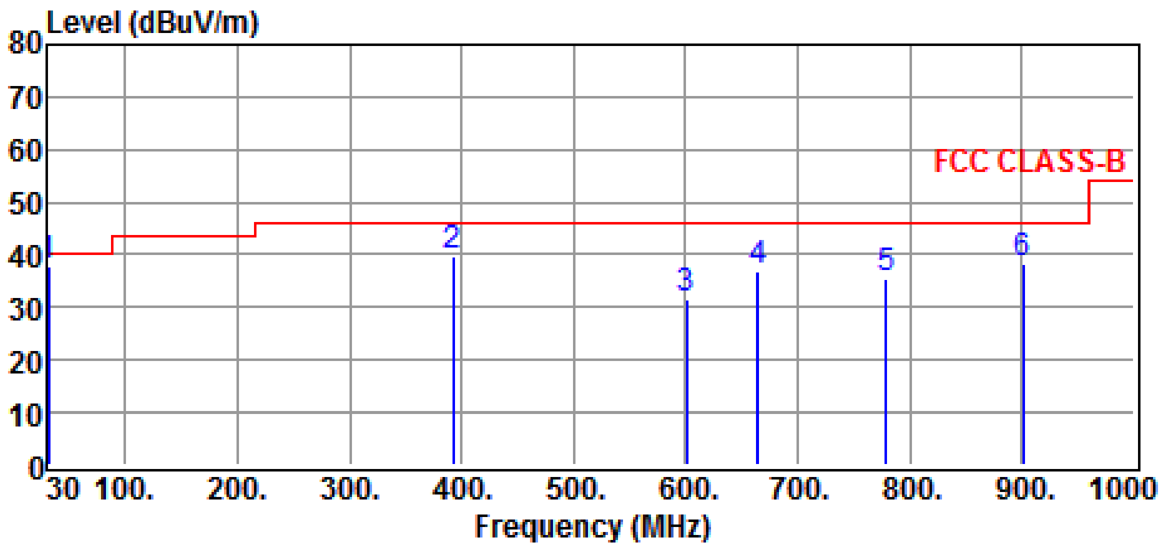


Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC CLASS-B	Ant. Pol.	:HORIZONTAL
EUT	:Bluetooth Module	Temp.	:24 ˚C
Power Rating	:120Vac/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Test Mode	:Bluetooth		
Memo	:Installed in host DDR-38		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
30.0000	14.8	15.7	30.5	40.0	-9.5	QP
392.7800	21.5	18.9	40.4	46.0	-5.6	QP
654.6800	12.4	24.4	36.8	46.0	-9.2	QP
676.0200	12.9	24.8	37.7	46.0	-8.3	QP
778.8400	9.2	26.0	35.2	46.0	-10.8	QP
887.4800	10.1	27.9	38.0	46.0	-8.0	QP

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result



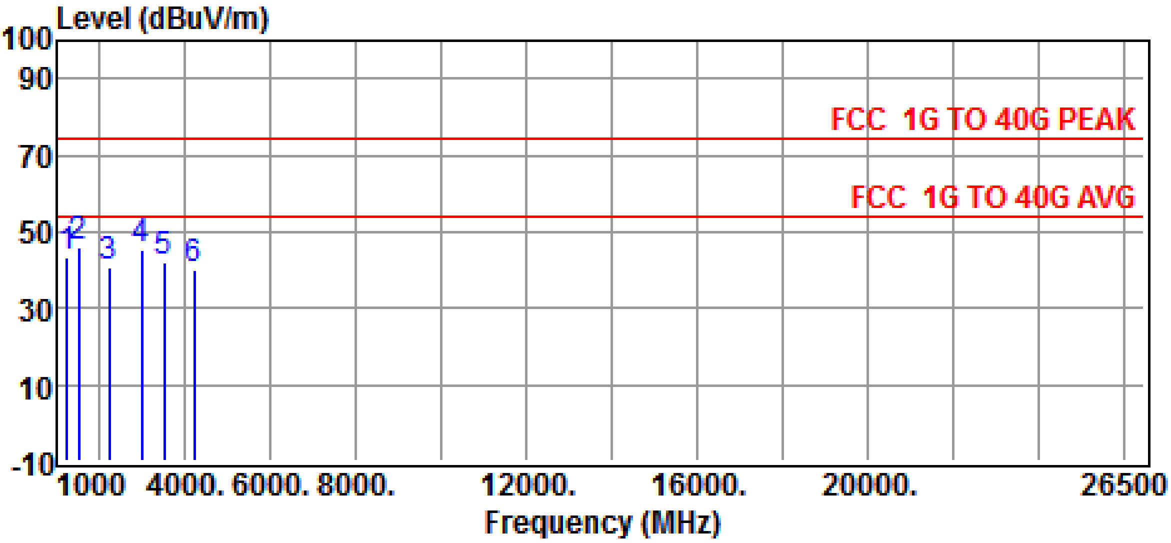
Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC CLASS-B	Ant. Pol.	:VERTICAL
EUT	:Bluetooth Module	Temp.	:24 ˚C
Power Rating	:120Vac/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Test Mode	:Bluetooth		
Memo	:Installed in host DDR-38		

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
31.9400	23.0	15.1	38.1	40.0	-1.9	QP
392.7800	20.7	18.9	39.6	46.0	-6.4	QP
600.3600	8.7	23.1	31.8	46.0	-14.2	QP
664.3800	12.4	24.5	36.9	46.0	-9.1	QP
778.8400	9.3	26.0	35.3	46.0	-10.7	QP
901.0600	10.4	28.1	38.5	46.0	-7.5	QP

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result

b) Emission frequencies above 1 GHz

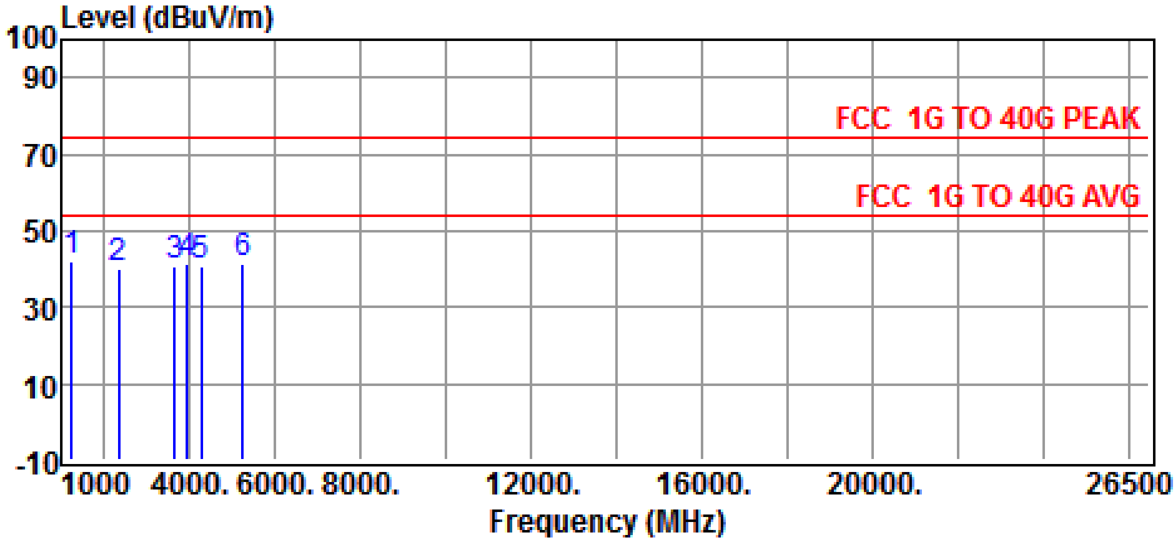


Site	:chamber #2	Date	:2012-09-28
Limit	:1-6GHZ CLASS B PEAK	Ant. Pol.	:HORIZONTAL
EUT	:FM/DAB Radio	Temp.	:25 °C
Power Rating	:120Vac/60Hz	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host WR-22	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1256.4500	54.3	-11.1	43.2	74.0	-30.8	Peak
1520.9800	55.5	-9.8	45.7	74.0	-28.3	Peak
2225.7400	46.9	-6.4	40.5	74.0	-33.5	Peak
2985.2600	49.0	-3.7	45.3	74.0	-28.7	Peak
3524.1600	44.2	-2.1	42.1	74.0	-31.9	Peak
4236.2500	40.2	0.0	40.2	74.0	-33.8	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

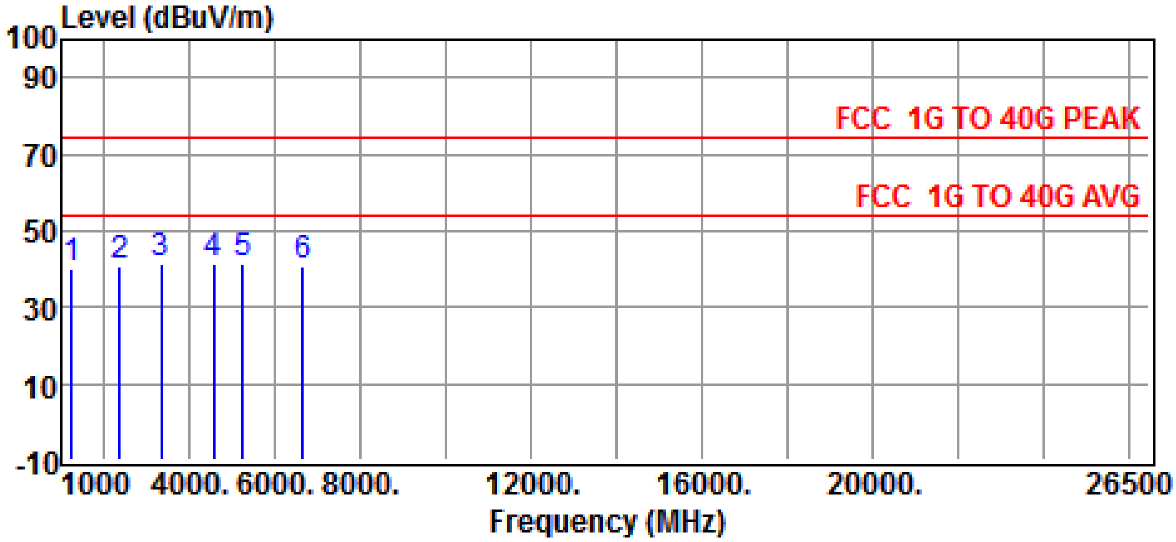


Site	:chamber #2	Date	:2012-09-28
Limit	:1-6GHZ CLASS B PEAK	Ant. Pol.	:VERTICAL
EUT	:FM/DAB Radio	Temp.	:25 ˚C
Power Rating	:120Vac/60Hz	Humi.	:63%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host WR-22	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1259.5400	53.1	-11.1	42.0	74.0	-32.0	Peak
2335.2100	45.8	-6.0	39.8	74.0	-34.2	Peak
3654.2100	42.1	-1.5	40.6	74.0	-33.4	Peak
3954.1500	41.4	-0.3	41.1	74.0	-32.9	Peak
4268.5200	40.6	0.0	40.6	74.0	-33.4	Peak
5265.2400	39.4	2.2	41.6	74.0	-32.4	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

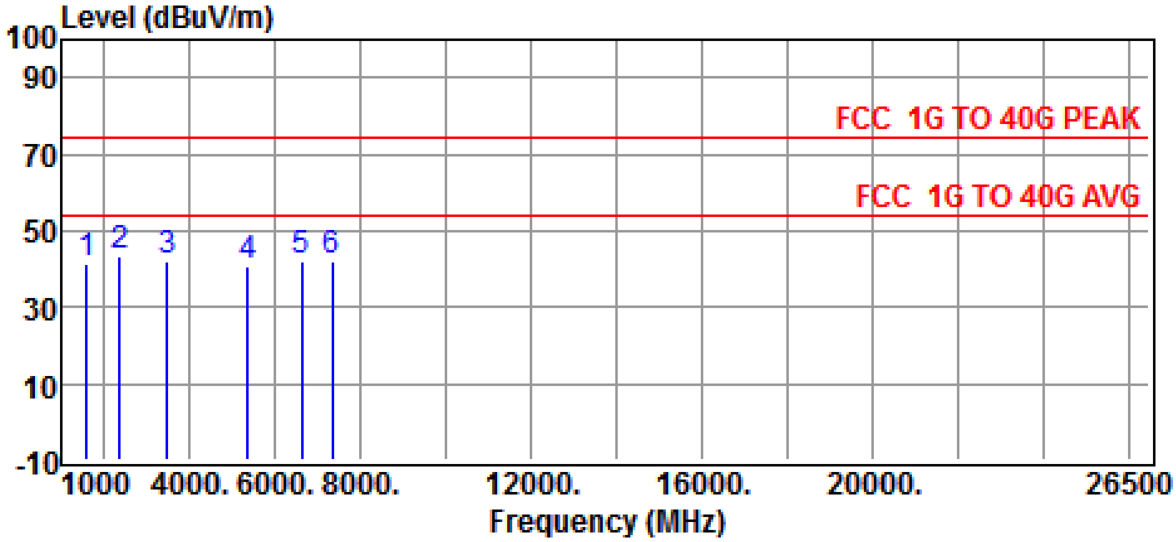


Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC 1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:FM/DAB Radio	Temp.	:24˚C
Power Rating	:120Vac/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host DDR-31BT	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1257.0000	50.9	-11.1	39.8	74.0	-34.2	Peak
2368.0000	46.5	-6.0	40.5	74.0	-33.5	Peak
3354.0000	44.1	-2.6	41.5	74.0	-32.5	Peak
4589.0000	41.2	0.5	41.7	74.0	-32.3	Peak
5268.0000	39.3	2.2	41.5	74.0	-32.5	Peak
6665.0000	36.9	4.0	40.9	74.0	-33.1	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

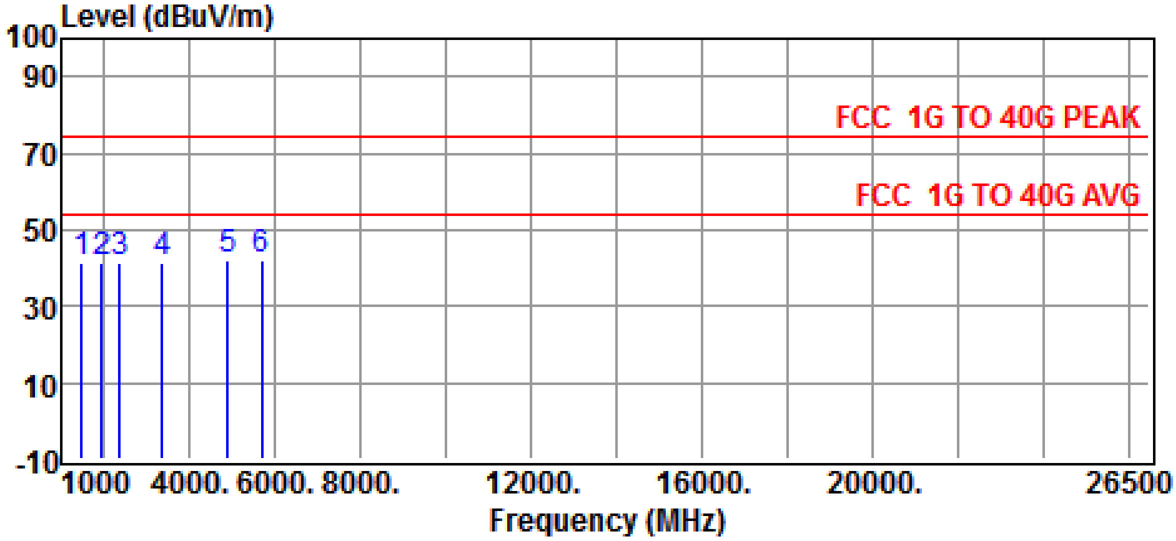


Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC 1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:FM/DAB Radio	Temp.	:24˚C
Power Rating	:120Vac/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host DDR-31BT	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1589.0000	50.6	-9.4	41.2	74.0	-32.8	Peak
2358.0000	49.5	-6.0	43.5	74.0	-30.5	Peak
3489.0000	44.0	-2.1	41.9	74.0	-32.1	Peak
5369.0000	38.3	2.4	40.7	74.0	-33.3	Peak
6627.0000	37.9	3.9	41.8	74.0	-32.2	Peak
7348.0000	36.1	5.9	42.0	74.0	-32.0	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

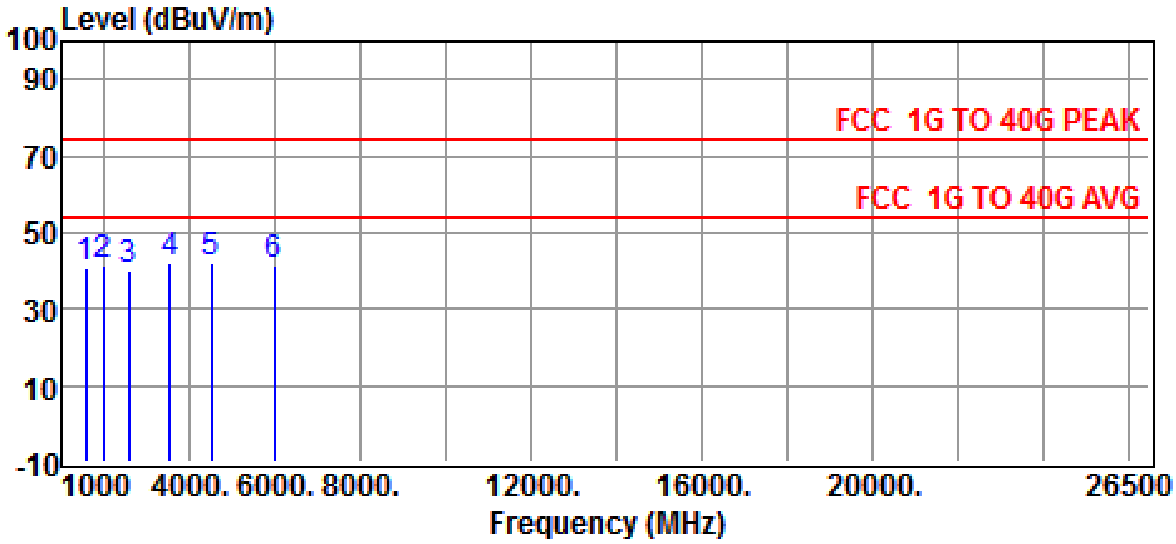


Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC 1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:FM/DAB Radio	Temp.	:24˚C
Power Rating	:120V/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host DDR-47BT	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1487.0000	51.1	-10.0	41.1	74.0	-32.9	Peak
1968.0000	48.9	-7.3	41.6	74.0	-32.4	Peak
2357.0000	47.2	-6.0	41.2	74.0	-32.8	Peak
3357.0000	44.1	-2.5	41.6	74.0	-32.4	Peak
4897.0000	40.8	1.3	42.1	74.0	-31.9	Peak
5698.0000	39.0	3.0	42.0	74.0	-32.0	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit - Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

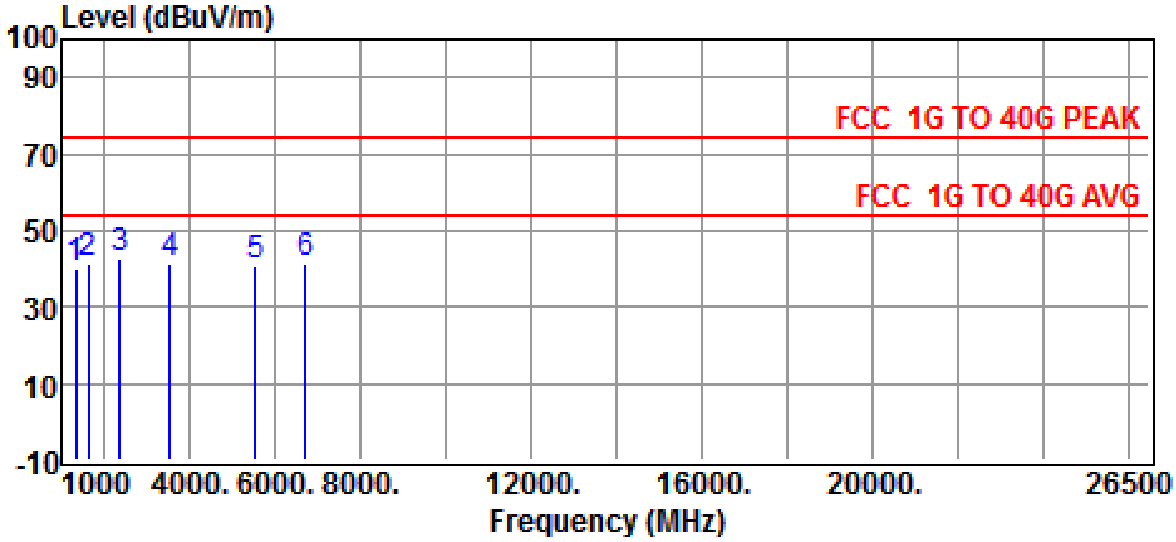


Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC 1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:FM/DAB Radio	Temp.	:24˚C
Power Rating	:120V/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host DDR-47BT	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1587.0000	50.0	-9.4	40.6	74.0	-33.4	Peak
1985.0000	48.9	-7.3	41.6	74.0	-32.4	Peak
2587.0000	45.5	-5.3	40.2	74.0	-33.8	Peak
3548.0000	43.8	-1.9	41.9	74.0	-32.1	Peak
4528.0000	41.7	0.3	42.0	74.0	-32.0	Peak
5987.0000	38.2	3.4	41.6	74.0	-32.4	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

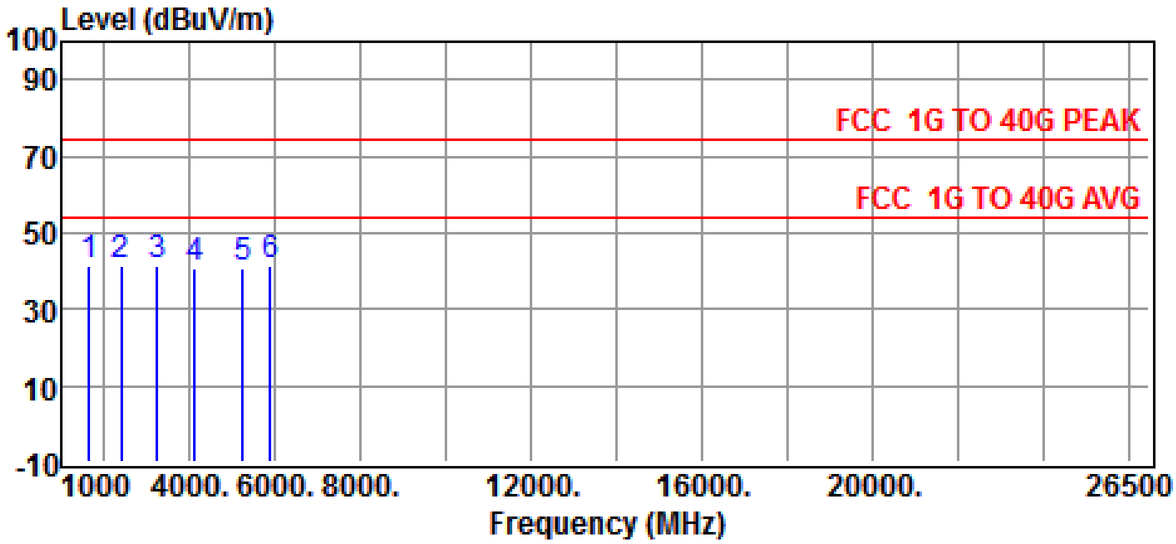


Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC 1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:FM/DAB Radio	Temp.	:24˚C
Power Rating	:120V/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host DDR-38	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1352.0000	51.0	-10.7	40.3	74.0	-33.7	Peak
1628.0000	50.9	-9.2	41.7	74.0	-32.3	Peak
2375.0000	48.4	-5.9	42.5	74.0	-31.5	Peak
3547.0000	43.5	-1.9	41.6	74.0	-32.4	Peak
5550.0000	38.2	2.7	40.9	74.0	-33.1	Peak
6724.0000	37.3	4.2	41.5	74.0	-32.5	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.



Site	:CHAMBER #2	Date	:2012-11-22
Limit	:FCC 1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:FM/DAB Radio	Temp.	:24˚C
Power Rating	:120V/60Hz	Humi.	:58%
Model	:BM153-CB1-SJ	Engineer.	:Jiapeng
Memo	:Installed in host DDR-38	Memo	:

Freq MHz	Reading dBuV	Correction Factor dB	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
1651.0000	50.2	-9.1	41.1	74.0	-32.9	Peak
2387.0000	47.5	-5.9	41.6	74.0	-32.4	Peak
3257.0000	44.3	-2.8	41.5	74.0	-32.5	Peak
4132.0000	40.8	0.0	40.8	74.0	-33.2	Peak
5241.0000	38.7	2.2	40.9	74.0	-33.1	Peak
5895.0000	38.3	3.3	41.6	74.0	-32.4	Peak

Note :

1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
3. The margin value=Limit – Result
4. Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

4.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss (if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

where Corrected Factor

= Antenna FACTOR + Cable Loss + High Pass Filter Loss - Amplifier Gain

4.6 Photos of Radiation Measuring Setup

EUT installed in host WR-22

EUT installed in host DDR-31BT

EUT installed in host DDR-47BT

EUT installed in host DDR-38

5 CONDUCTED EMISSION MEASUREMENT

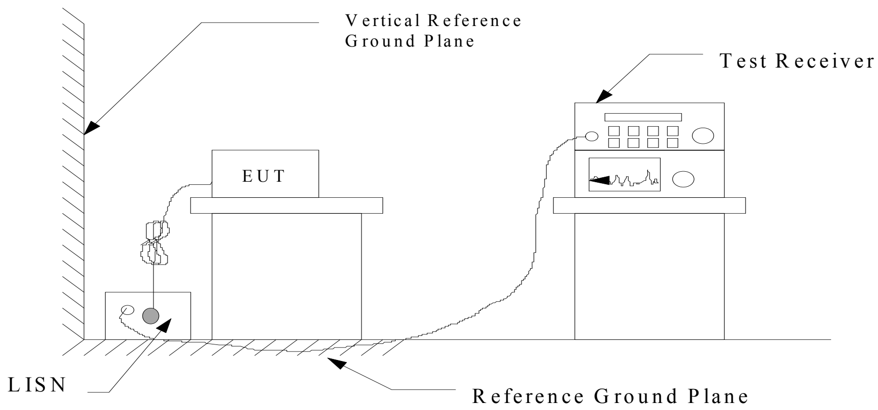
5.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and § 15.207(a) respectively. Both Limits are identical specification.

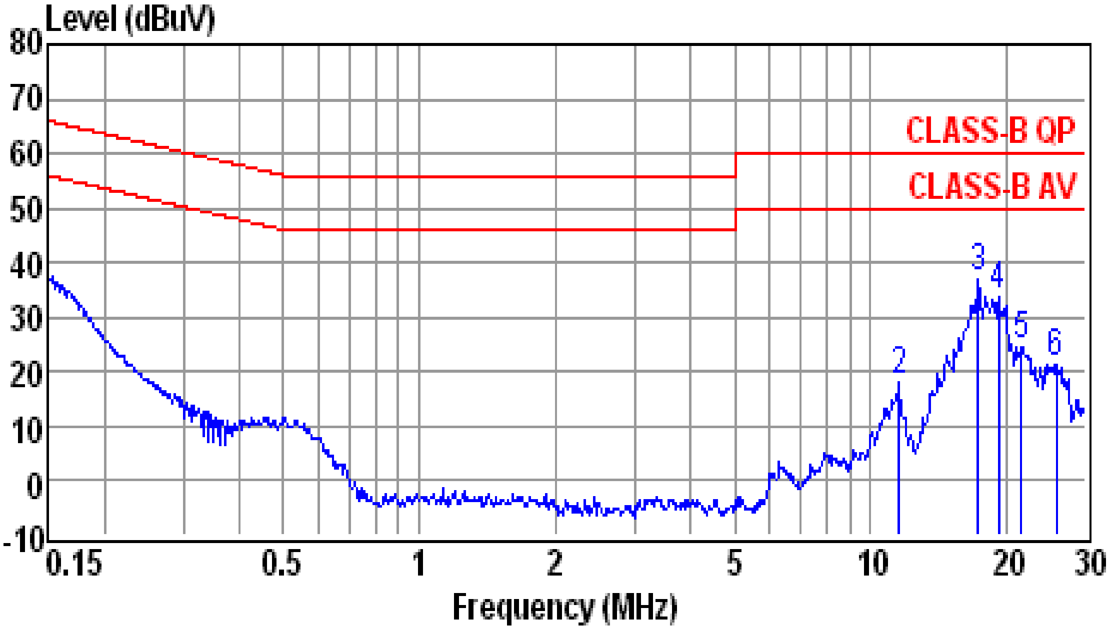
5.2 Measurement Procedure

1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 or 8 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



5.3 Conducted Emission Data

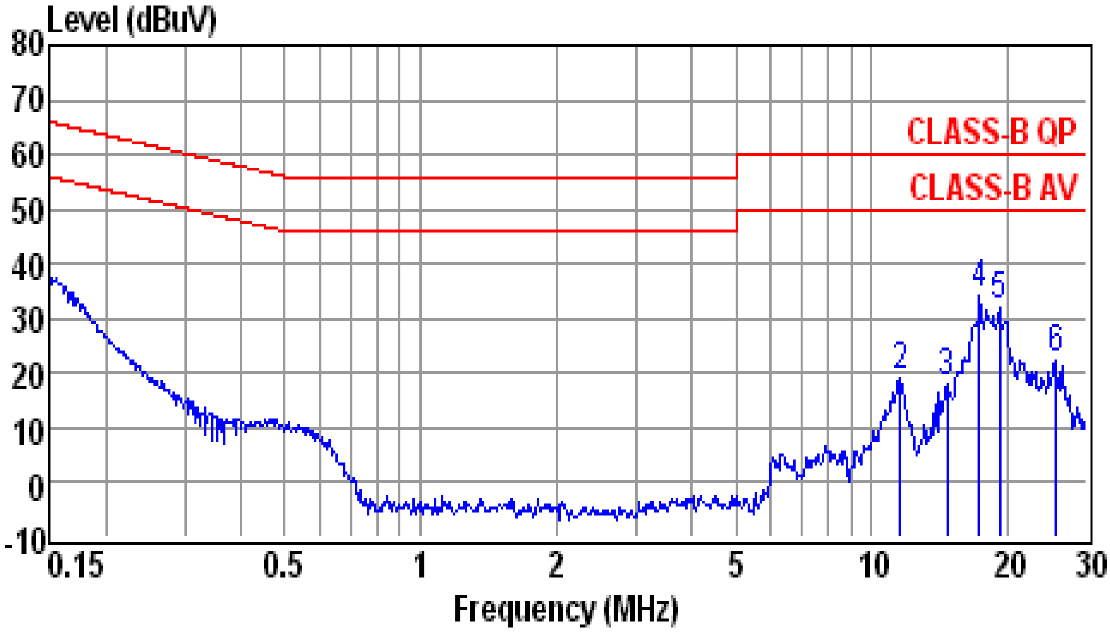


Site	: conducted #1	Date	: 09-28-2012
Condition	: CLASS-B QP	LISN	: NEUTRAL
Tem / Hum	: 25 ℃ / 58%	Test Mode	: Bluetooth
EUT	:BM153-CB1-SJ	Power Rating	: 120V/60Hz
Memo	:Installed in host WR-22	Memo	:

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1500	38.3	0.1	38.4	66.0	-27.6	QP
11.5590	17.3	0.6	17.9	60.0	-42.1	QP
17.3830	36.0	0.7	36.7	60.0	-23.3	QP
19.2240	33.0	0.7	33.7	60.0	-26.3	QP
21.6000	23.9	0.8	24.7	60.0	-35.3	QP
25.8640	20.6	0.8	21.4	60.0	-38.6	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

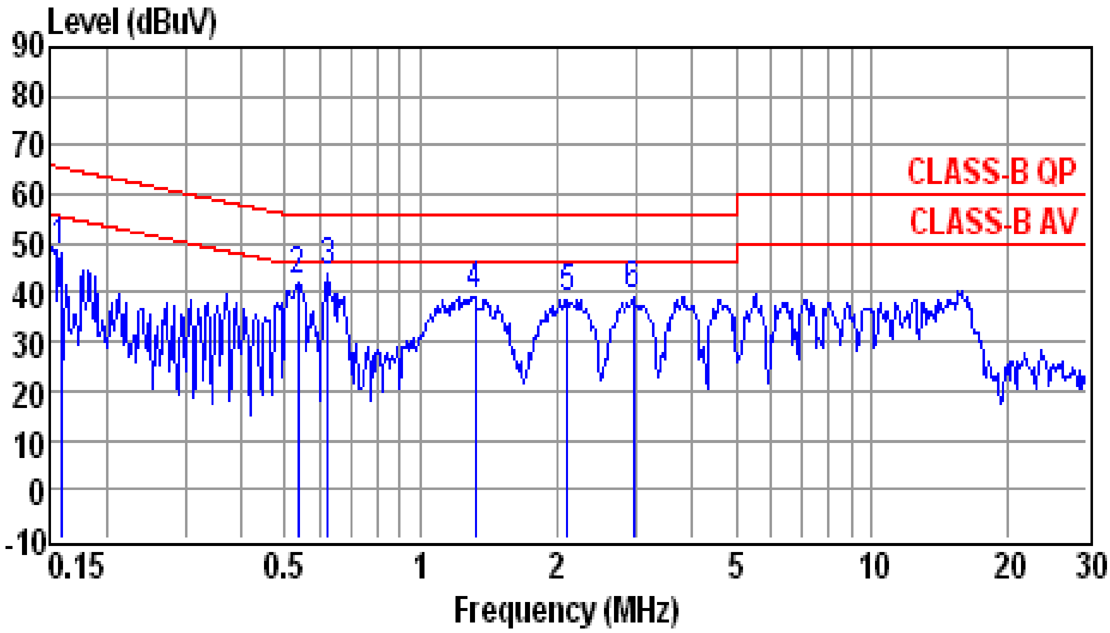


Site	: conducted #1	Date	: 09-28-2012
Condition	: CLASS-B QP	LISN	: LINE
Tem / Hum	: 25 ℃ / 58%	Test Mode	: Bluetooth
EUT	: BM153-CB1-SJ	Power Rating	: 120V/60Hz
Memo	: Installed in host WR-22	Memo	:

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1500	38.6	0.1	38.7	66.0	-27.3	QP
11.5590	18.3	0.6	18.9	60.0	-41.1	QP
14.6720	17.1	0.7	17.8	60.0	-42.2	QP
17.3830	33.6	0.7	34.3	60.0	-25.7	QP
19.2240	31.2	0.7	31.9	60.0	-28.1	QP
25.5910	21.5	0.8	22.3	60.0	-37.7	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

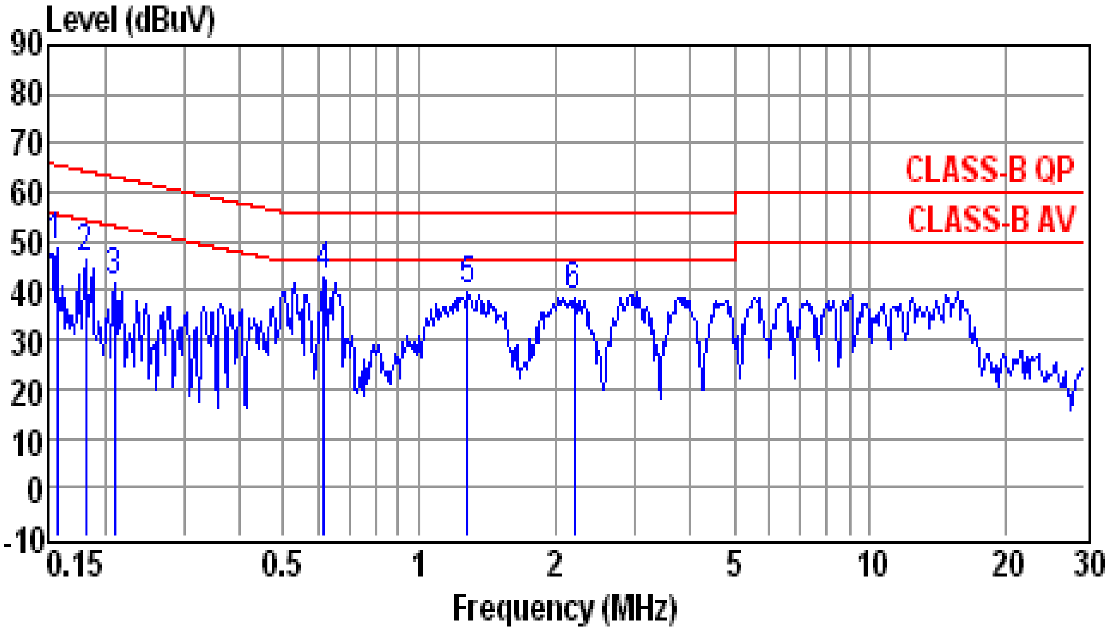


Site	: conducted #1	Date	: 11-22-2012
Condition	: CLASS-B QP	LISN	: NEUTRAL
Tem / Hum	: 24 ℃ / 58%	Test Mode	: Bluetooth
Memo	: Installed in host DDR-31BT	Power Rating	: 120V/60Hz

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1590	47.8	0.2	48.0	65.5	-17.5	QP
0.5350	41.7	0.2	41.9	56.0	-14.1	QP
0.6205	43.5	0.2	43.7	56.0	-12.3	QP
1.3240	38.9	0.4	39.3	56.0	-16.7	QP
2.1100	38.3	0.4	38.7	56.0	-17.3	QP
2.9620	39.0	0.4	39.4	56.0	-16.6	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

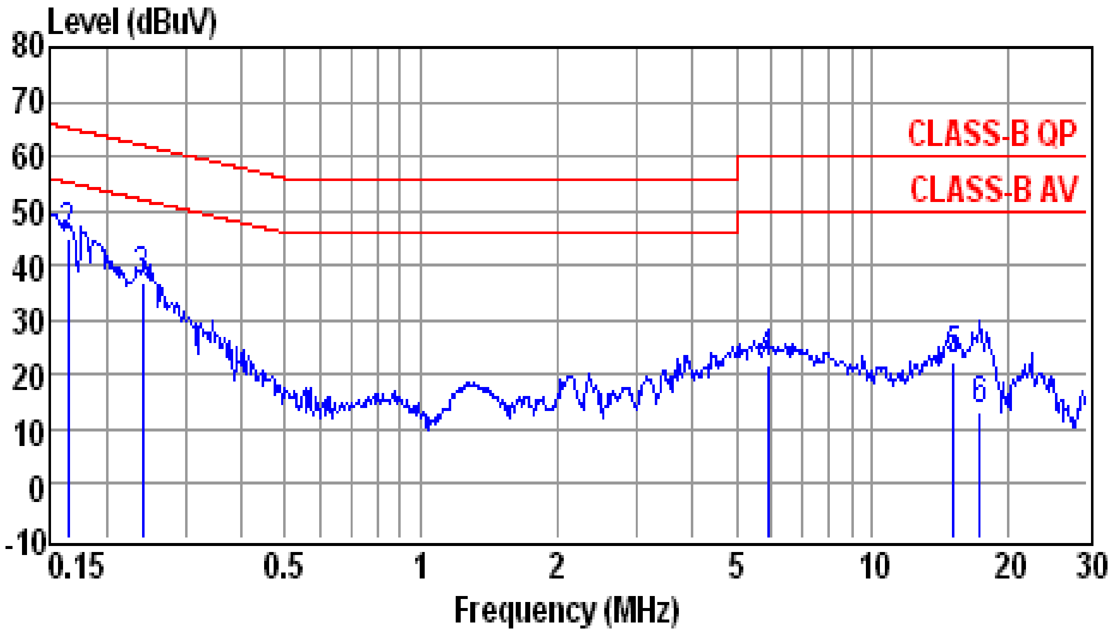


Site	: conducted #1	Date	: 11-22-2012
Condition	: CLASS-B QP	LISN	: LINE
Tem / Hum	: 24 ℃ / 58%	Test Mode	: Bluetooth
Memo	: Installed in host DDR-31BT	Power Rating	: 120V/60Hz

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1573	48.2	0.3	48.5	65.6	-17.1	QP
0.1815	46.2	0.3	46.5	64.4	-17.9	QP
0.2106	41.4	0.3	41.7	63.2	-21.5	QP
0.6140	42.5	0.3	42.8	56.0	-13.2	QP
1.2820	39.0	0.4	39.4	56.0	-16.6	QP
2.2010	38.4	0.4	38.8	56.0	-17.2	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

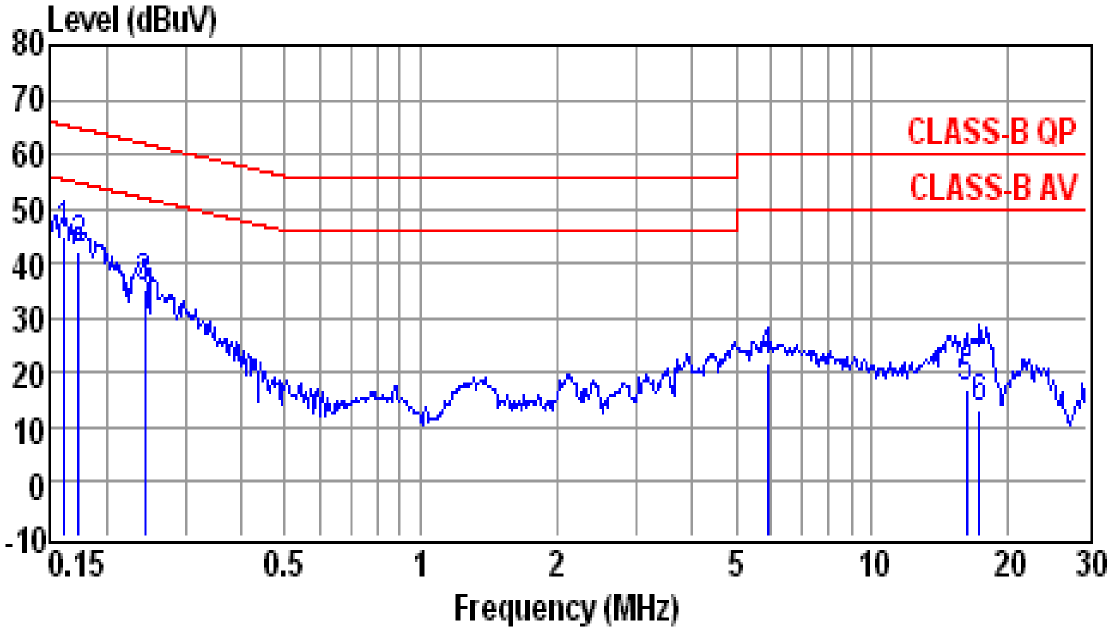


Site	: conducted #1	Date	: 11-22-2012
Condition	: CLASS-B QP	LISN	: NEUTRAL
Tem / Hum	: 24 ℃ / 58%	Test Mode	: Bluetooth
EUT	: BM153-CB1-SJ	Power Rating	: 120V/60Hz
Memo	: Installed in host DDR-47BT	Memo	:

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1500	44.4	0.2	44.6	66.0	-21.4	QP
0.1650	44.7	0.2	44.9	65.2	-20.3	QP
0.2417	36.8	0.2	37.0	62.0	-25.0	QP
5.8670	21.1	0.5	21.6	60.0	-38.4	QP
15.1460	21.9	0.7	22.6	60.0	-37.4	QP
17.3830	12.2	0.9	13.1	60.0	-46.9	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

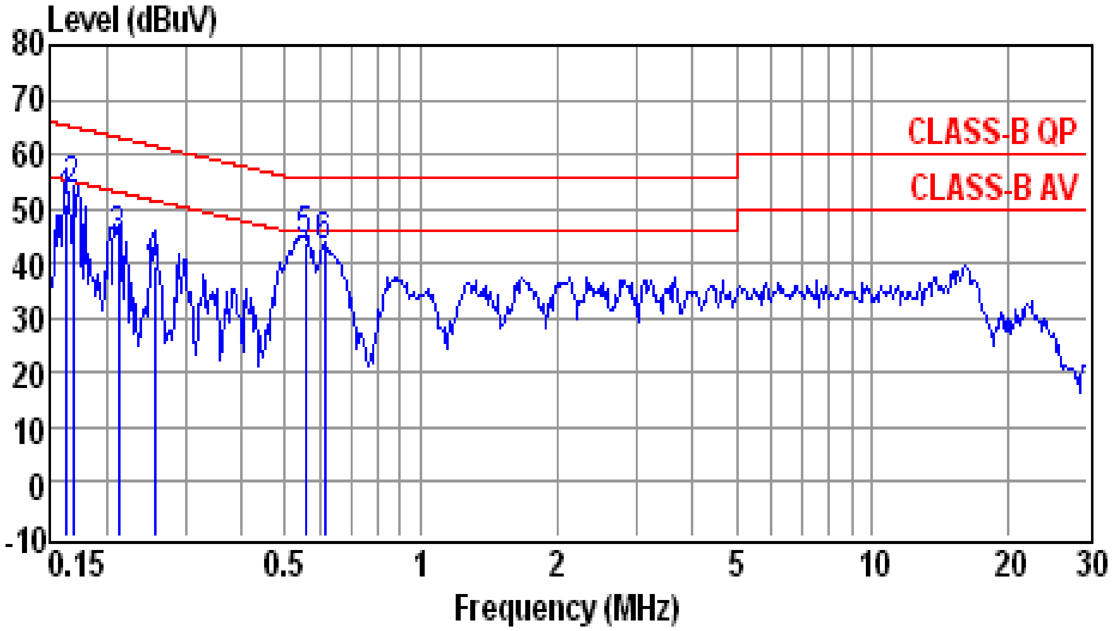


Site	: conducted #1	Date	: 11-22-2012
Condition	: CLASS-B QP	LISN	: LINE
Tem / Hum	: 24 ℃ / 58%	Test Mode	: Bluetooth
EUT	: BM153-CB1-SJ	Power Rating	: 120V/60Hz
Memo	: Installed in host DDR-47BT	Memo	:

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1624	44.6	0.3	44.9	65.3	-20.4	QP
0.1740	42.0	0.3	42.3	64.8	-22.5	QP
0.2442	35.2	0.3	35.5	62.0	-26.5	QP
5.8670	21.3	0.6	21.9	60.0	-38.1	QP
16.2260	16.3	0.9	17.2	60.0	-42.8	QP
17.3830	12.1	1.1	13.2	60.0	-46.8	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

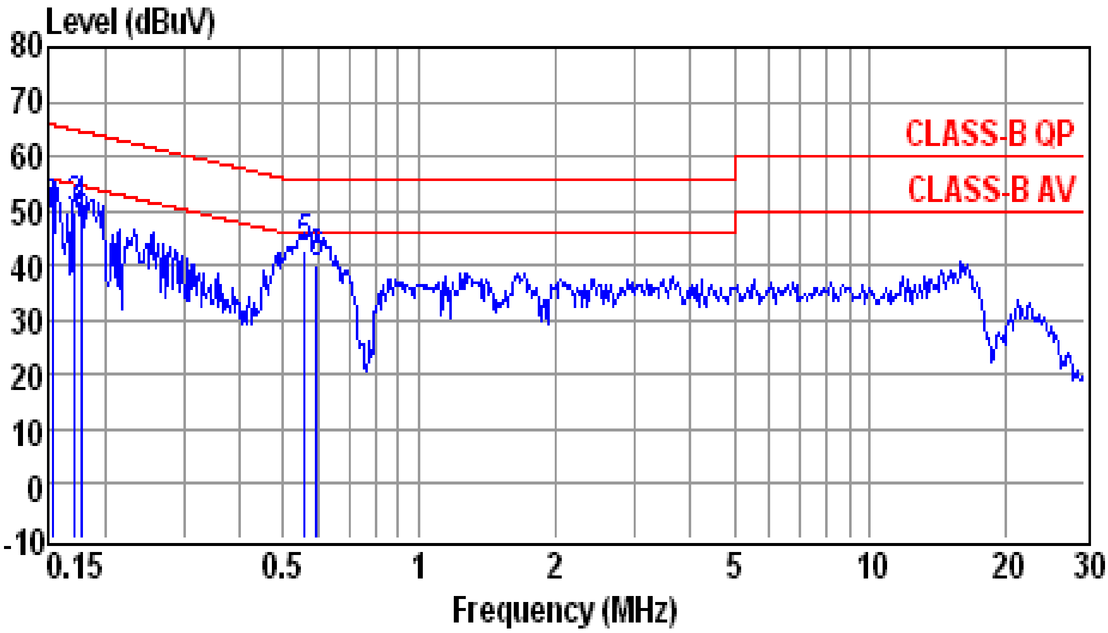


Site	: conducted #1	Date	: 11-22-2012
Condition	: CLASS-B QP	LISN	: NEUTRAL
Tem / Hum	: 24 ℃ / 58%	Test Mode	: Bluetooth
EUT	: BM153-CB1-SJ	Power Rating	: 120V/60Hz
Memo	: Installed in host DDR-38	Memo	:

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1641	50.4	0.2	50.6	65.3	-14.7	QP
0.1694	53.1	0.2	53.3	65.0	-11.7	QP
0.2128	43.4	0.2	43.6	63.1	-19.5	QP
0.2562	39.3	0.2	39.5	61.6	-22.1	QP
0.5523	43.5	0.2	43.7	56.0	-12.3	QP
0.6108	42.4	0.2	42.6	56.0	-13.4	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss



Site	: conducted #1	Date	: 11-22-2012
Condition	: CLASS-B QP	LISN	: LINE
Tem / Hum	: 24 ℃ / 58%	Test Mode	: Bluetooth
EUT	: BM153-CB1-SJ	Power Rating	: 120V/60Hz
Memo	: Installed in host DDR-38	Memo	:

Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
0.1500	55.6	0.3	55.9	66.0	-10.1	QP
0.1532	48.9	0.3	49.2	65.8	-16.6	QP
0.1722	49.3	0.3	49.6	64.9	-15.3	QP
0.1777	49.6	0.3	49.9	64.6	-14.7	QP
0.5581	42.5	0.3	42.8	56.0	-13.2	QP
0.5916	40.1	0.3	40.4	56.0	-15.6	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

5.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR

Assume a receiver reading of 22.5 dBμV is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dBμV.

RESULT = 22.5 + 0.1 = 22.6 dBμV
Level in μV = Common Antilogarithm[(22.6 dBμV)/20]
= 13.48 μV

5.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test .

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESCI	2012/07/16	2013/07/16
LISN	EMCO	3625/2	2012/03/30	2013/04/02
LISN	Rohde & Schwarz	ESH2-Z5	2012/08/23	2013/08/23

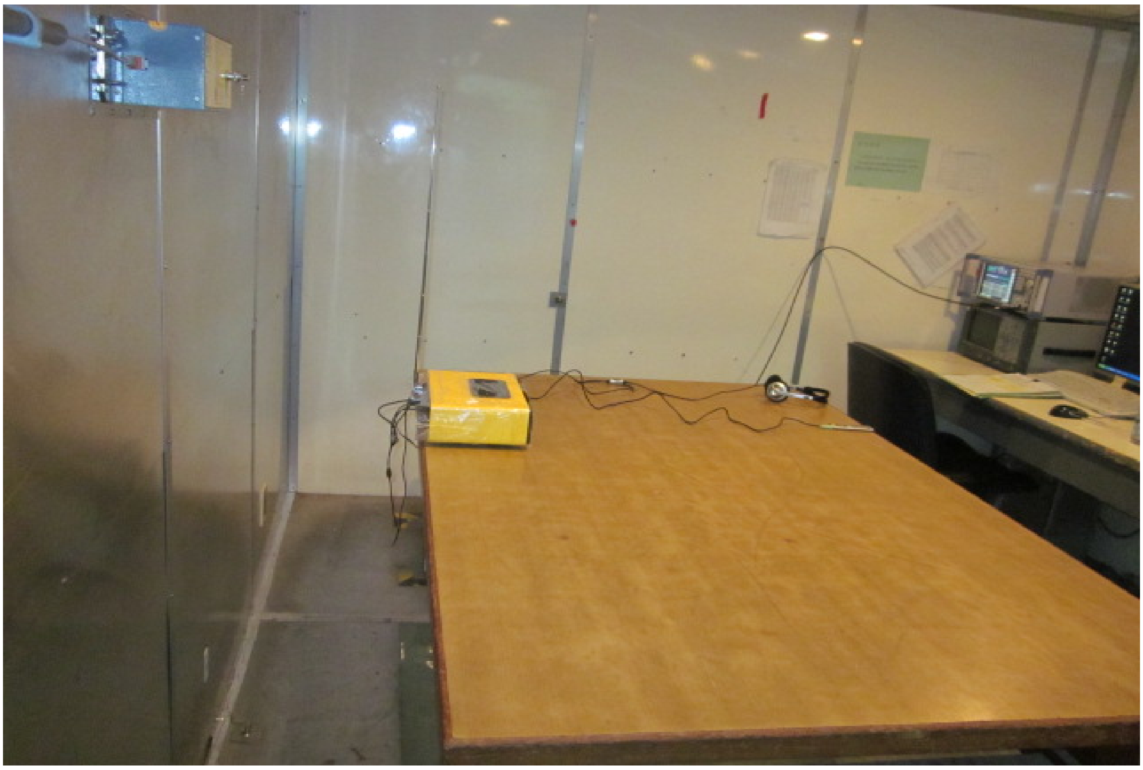
5.6 Photos of Conduction Measuring Setup

EUT installed in host WR-22

EUT installed in host DDR-31BT

EUT installed in host DDR-47BT

EUT installed in host DDR-38



6 ANTENNA REQUIREMENT

6.1 Standard Applicable

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

6.2 Antenna Construction

The antenna is permanently integrated on the PCB, no consideration of replacement.
Please see photos submitted in Exhibit B.

7 HOPPING CHANNEL SEPARATION

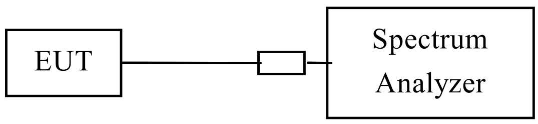
7.1 Standard Applicable

According to 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

7.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. The EUT must have its hopping function enabled. Then set it to any one convenient frequency within its operating range.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels
   Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
   Video (or Average) Bandwidth (VBW) ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
4. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all frequencies measured were complete.

Figure 4 : Measurement configuration.



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

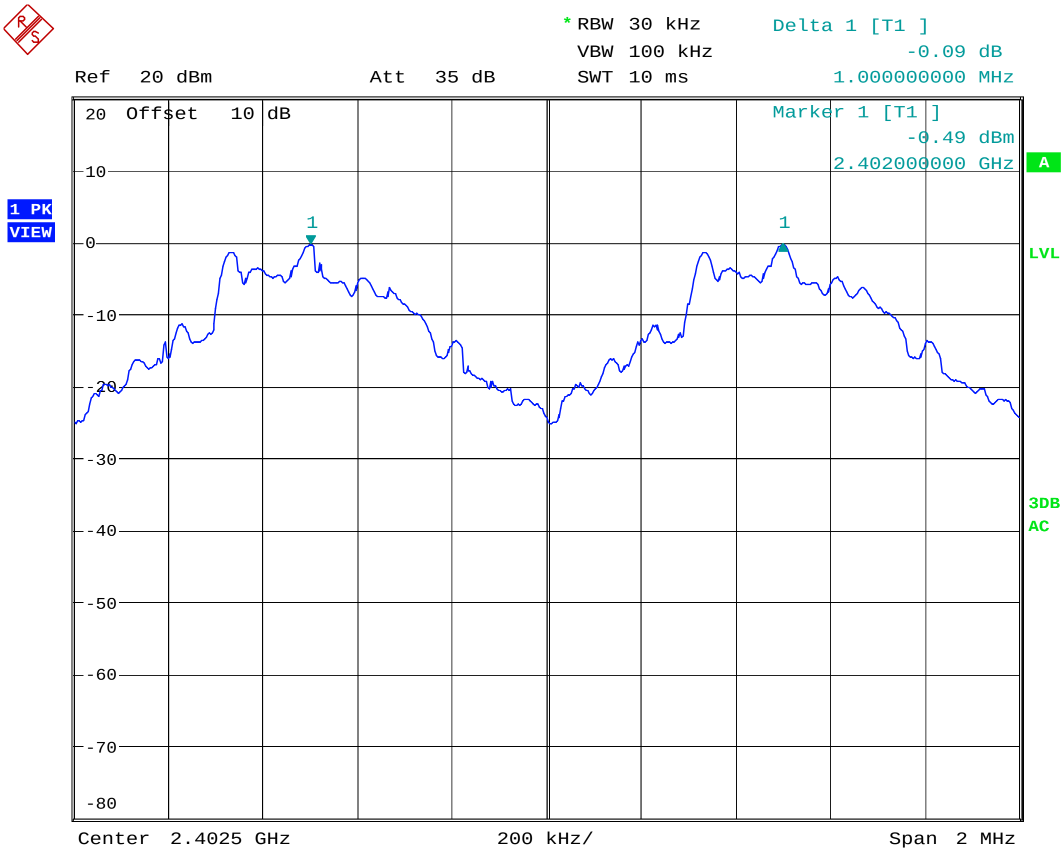
7.4 Measurement Data

Test Date : Jul. 17, 2012 Temperature : 25 °C Humidity : 65 %

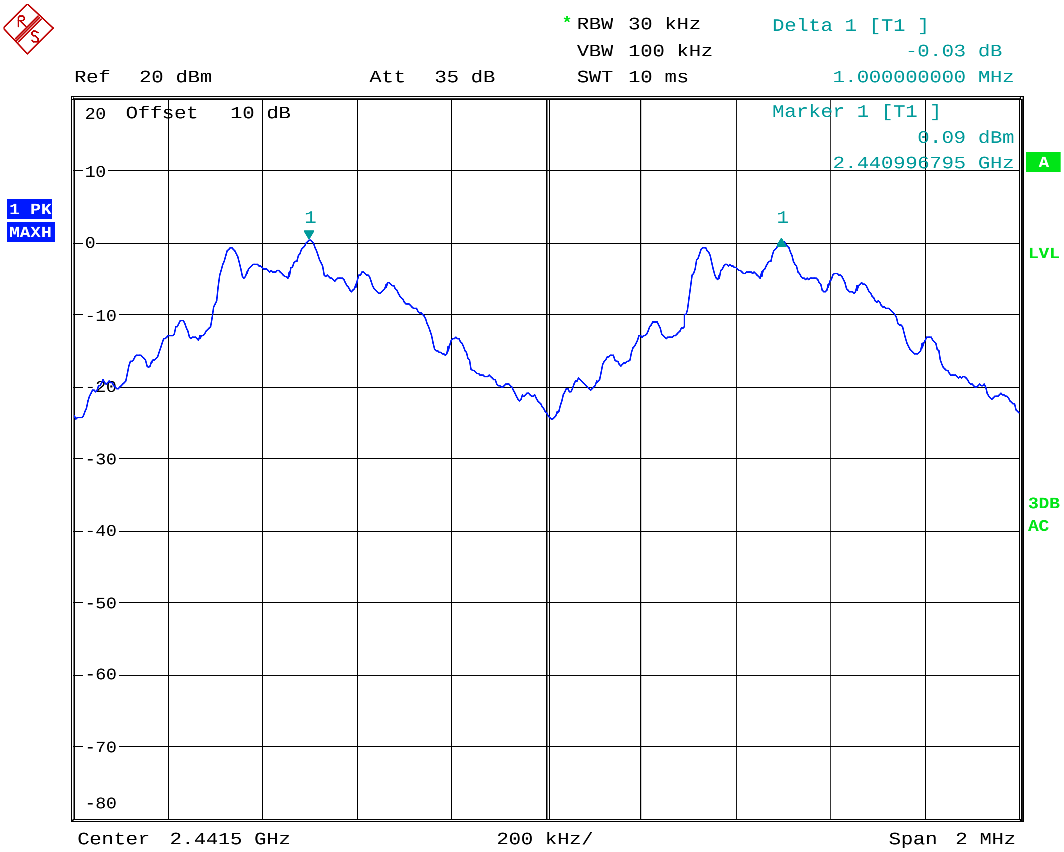
a) Channel Low : Adjacent Hopping Channel Separation is 1000 MHz
b) Channel Middle : Adjacent Hopping Channel Separation is 1000 MHz
c) Channel High : Adjacent Hopping Channel Separation is 1003 MHz

Note : The expanded uncertainty: frequency $\times 1.65\times 10^{-6}$ (1 GHz $< f \leq$ 18 GHz).

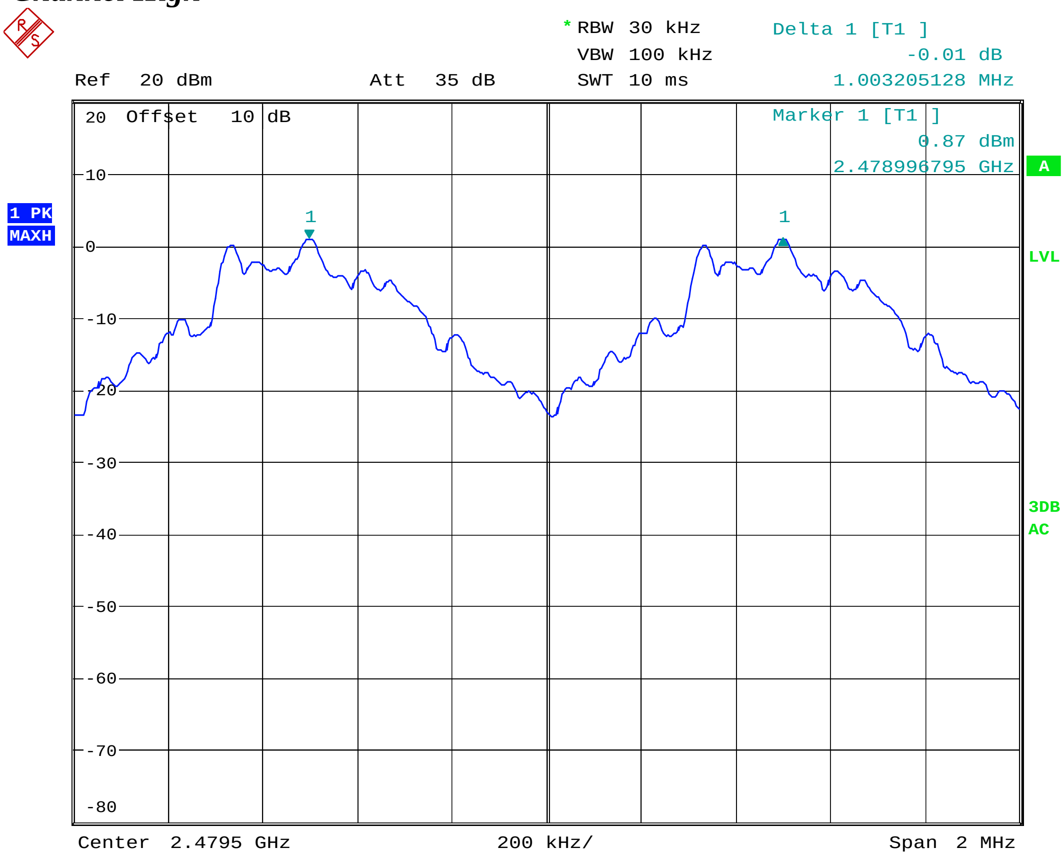
Channel Low


*RBW 30 kHz
VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-0.09 dB
1.000000000 MHz
Ref 20 dBm
Att 35 dB
20 Offset 10 dB
Marker 1 [T1]
-0.49 dBm
2.402000000 GHz
A
1 PK
VIEW
LVL
3DB
AC
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
1
Center 2.4025 GHz
200 kHz/
Span 2 MHz

Channel Middle



Channel High



8 NUMBER OF HOPPING FREQUENCY USED

8.1 Standard Applicable

According to 15.247(a)(1)(iii), frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. The EUT must have its hopping function enabled.
3. Use the following spectrum analyzer settings:
   Span = the frequency band of operation
   RBW ≥ 1% of the span
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
4. Allow the trace to stabilize. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all frequencies measured were complete.

8.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

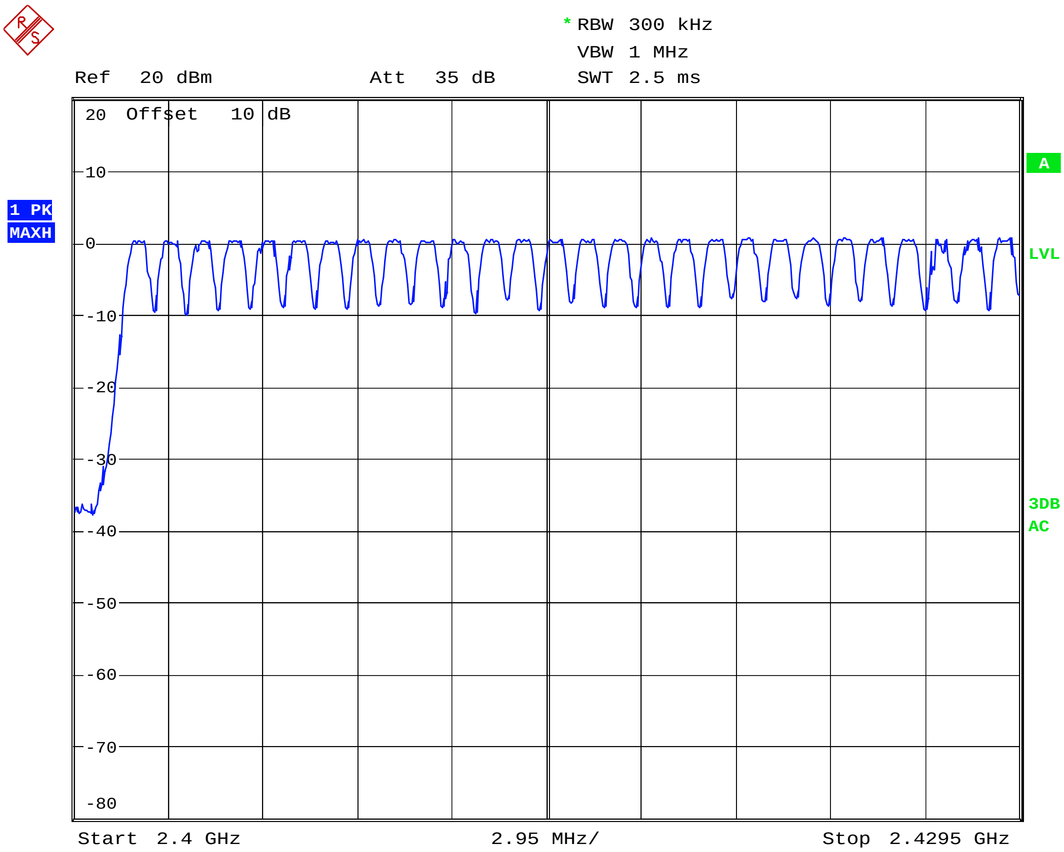
8.4 Measurement Data

Test Date : Sep. 17, 2012 Temperature : 25 °C Humidity : 65 %

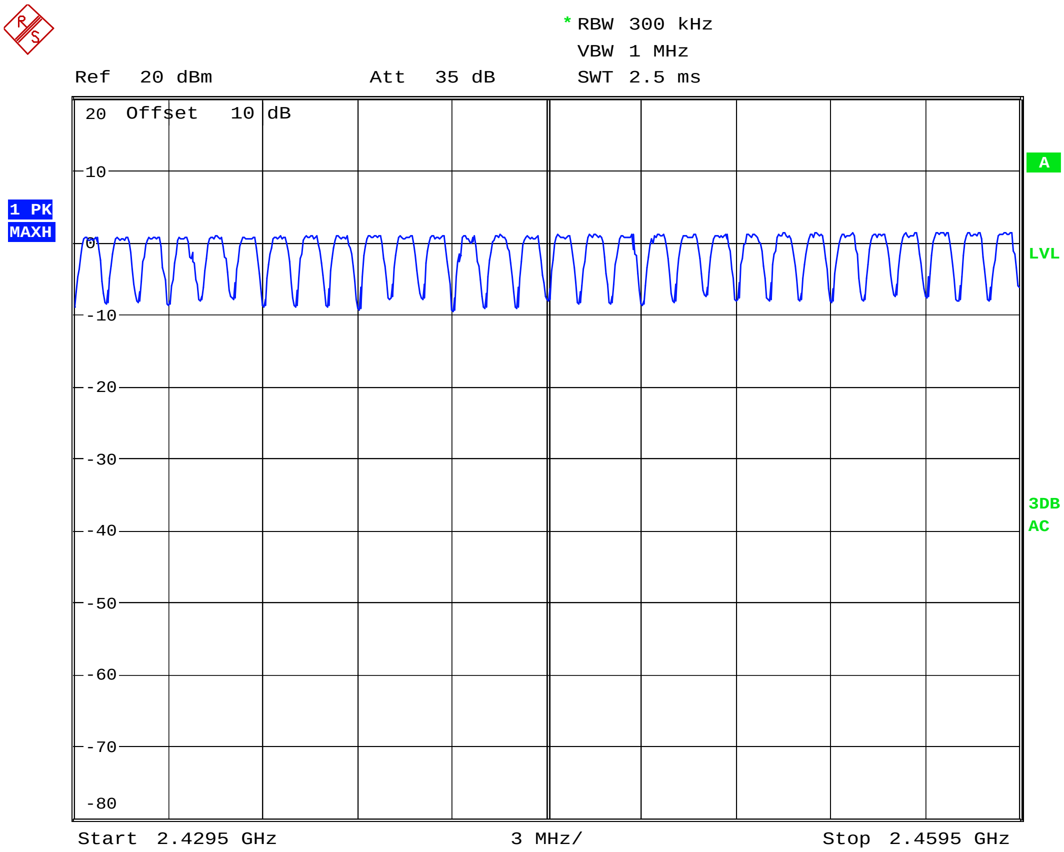
There are 79 hopping frequencies used.

Note : The expanded uncertainty: frequency* $\times 1.65\times 10^{-6}$ *(1 GHz* $< f \leq$ *18 GHz).

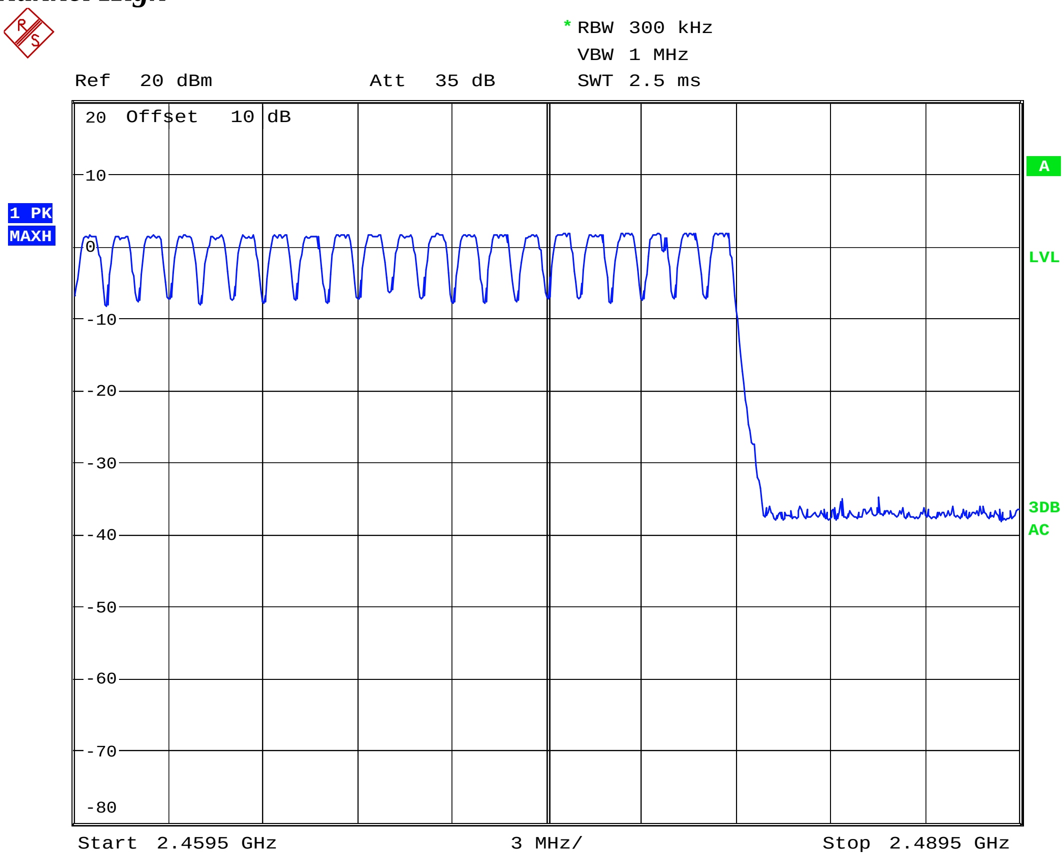
Channel Low


*RBW 300 kHz
VBW 1 MHz
Ref 20 dBm
Att 35 dB
SWT 2.5 ms
20 Offset 10 dB
1 PK
MAXH
A
LVL
3DB
AC
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Start 2.4 GHz
2.95 MHz/
Stop 2.4295 GHz

Channel Middle



Channel High



9 CHANNEL BANDWIDTH

9.1 Standard Applicable

For frequency hopping system operating in the 2400–2483.5 MHz band, there is no requirement for the maximum 20dB bandwidth of the hopping channel. The measurement of the hopping channel bandwidth is for the reference of the hopping channel separation requirement.

9.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
   RBW ≥ 1% of the 20 dB bandwidth
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all frequencies measured were complete.

9.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

9.4 Measurement Data

Test Date : Jul. 17, 2012 Temperature : 25 °C Humidity : 65 %

Mode: 1Mb datarate

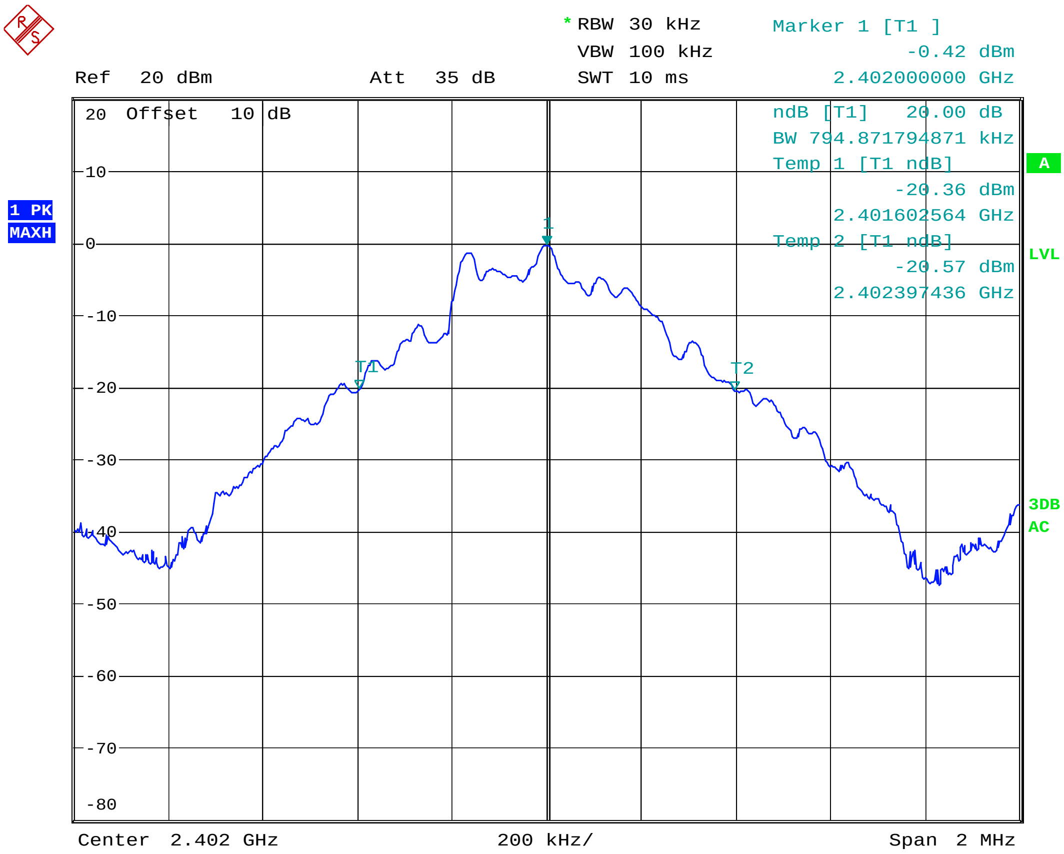
a) Channel Low : Channel Bandwidth is 794 kHz
b) Channel Middle : Channel Bandwidth is 798 kHz
c) Channel High : Channel Bandwidth is 798 kHz

Mode: 3Mb datarate

a) Channel Low : Channel Bandwidth is 1242 kHz
b) Channel Middle : Channel Bandwidth is 1266 kHz
c) Channel High : Channel Bandwidth is 1272 kHz

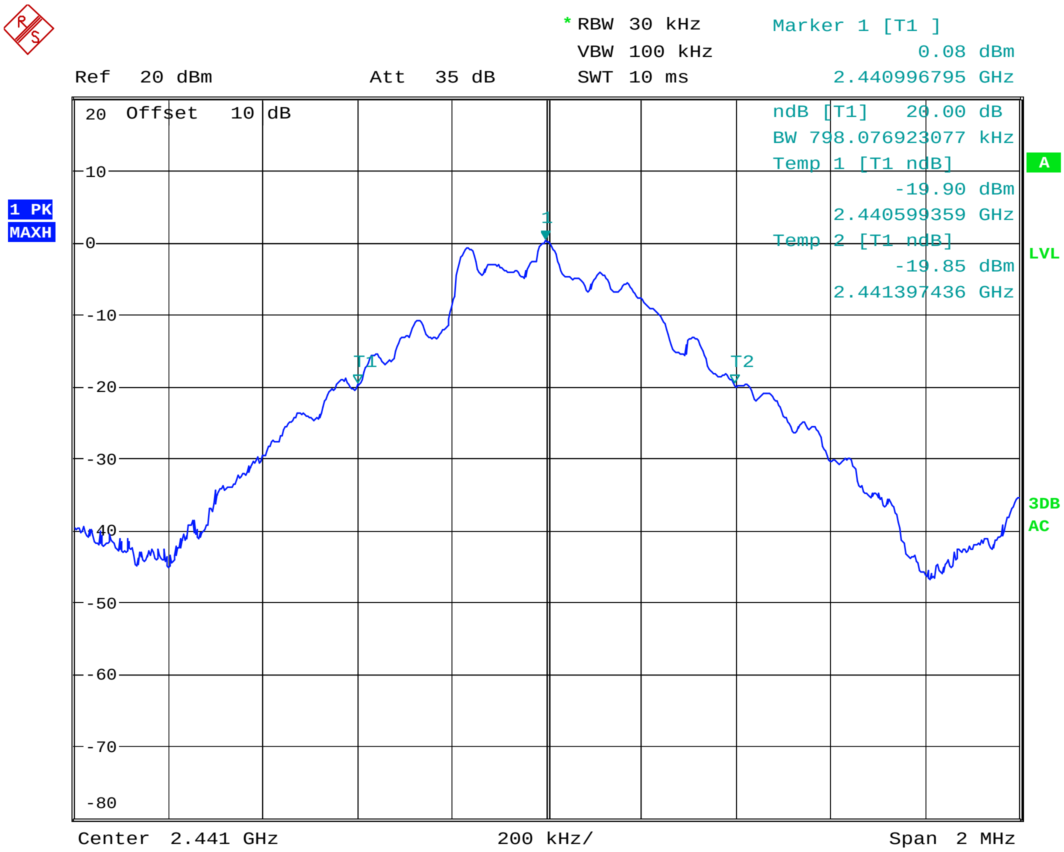
Note : The expanded uncertainty of channel bandwidth tests is 2dB.

Mode: 1Mb daterate
Channel Low



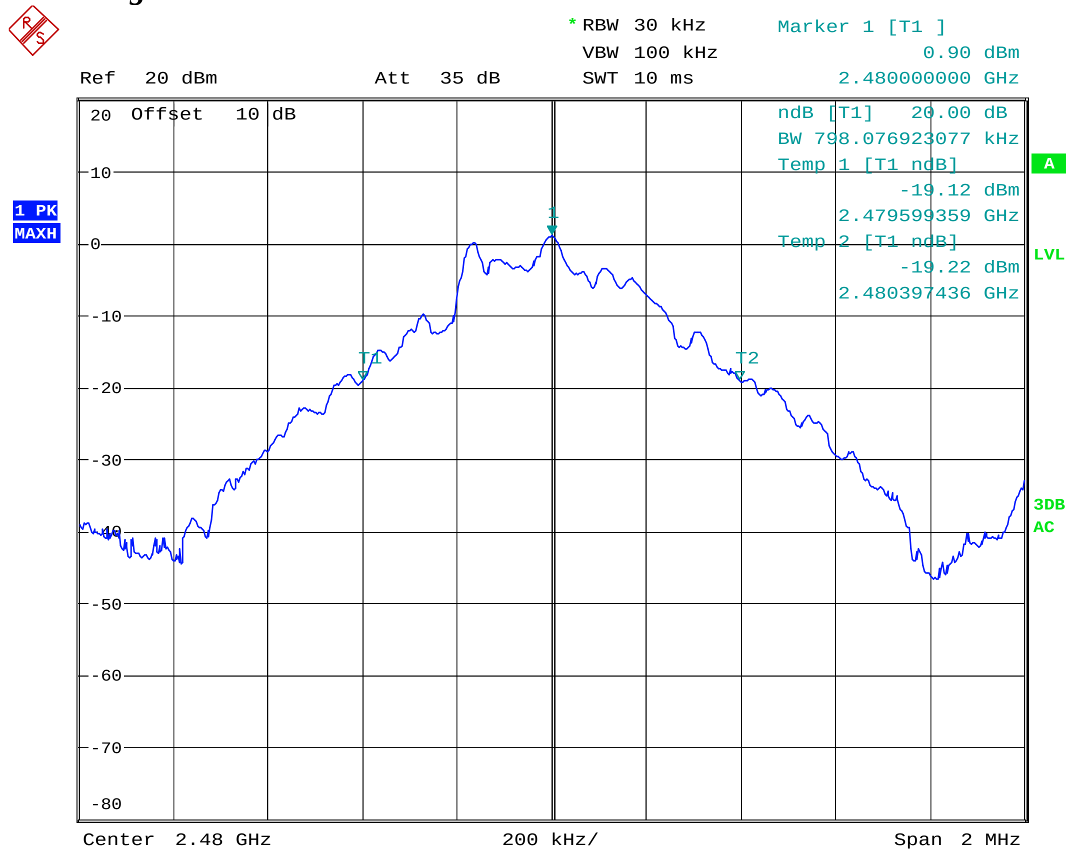
Mode: 1Mb daterate

Channel Middle

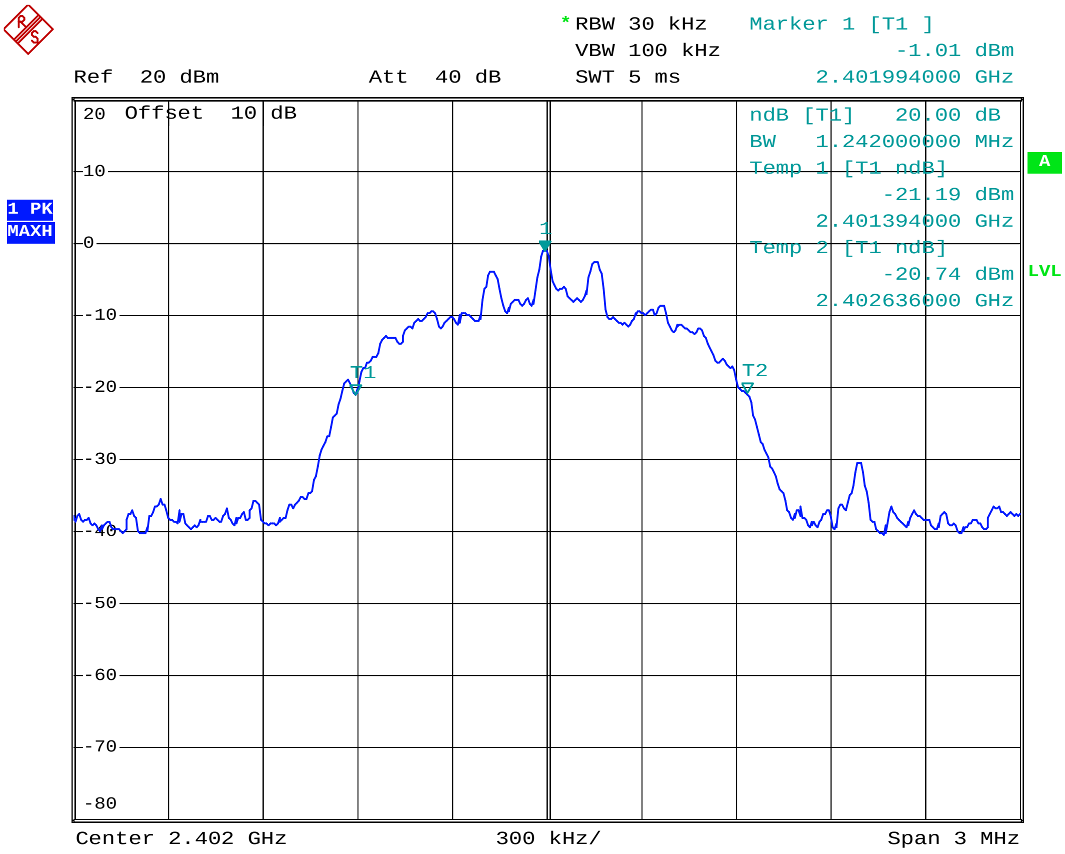


Mode: 1Mb daterate

Channel High

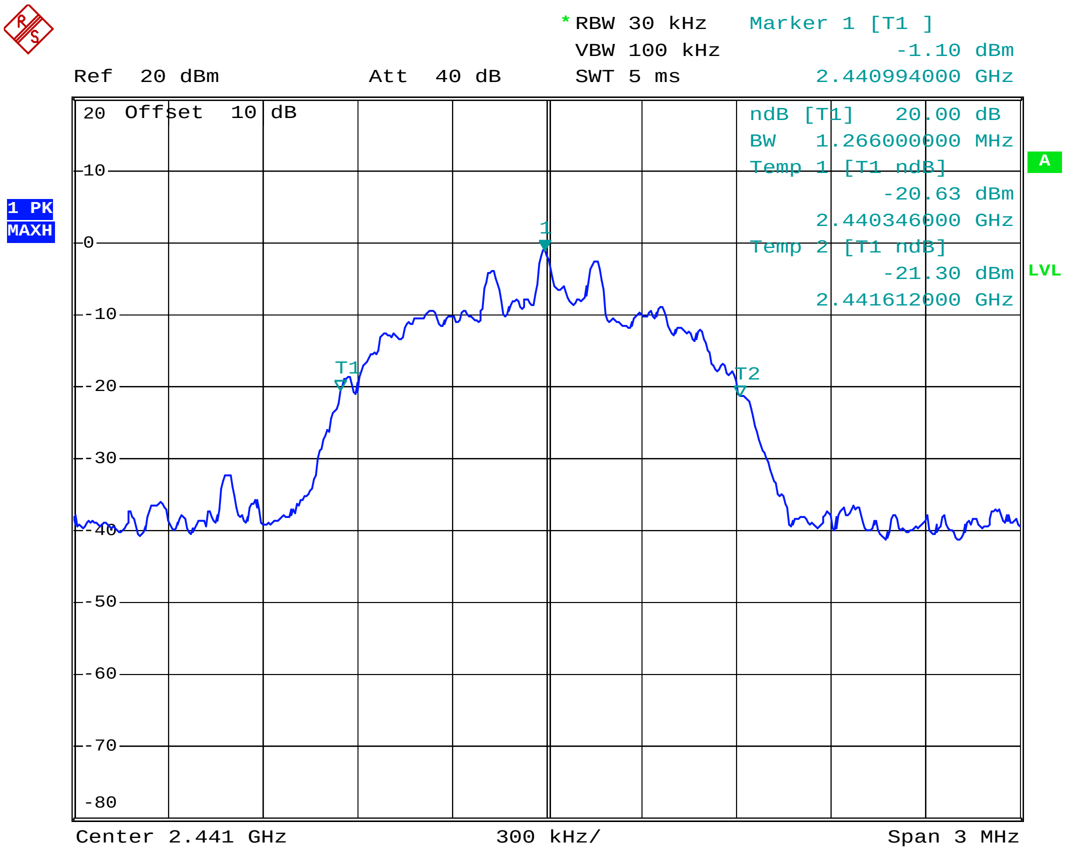


Mode: 3Mb daterate
Channel Low



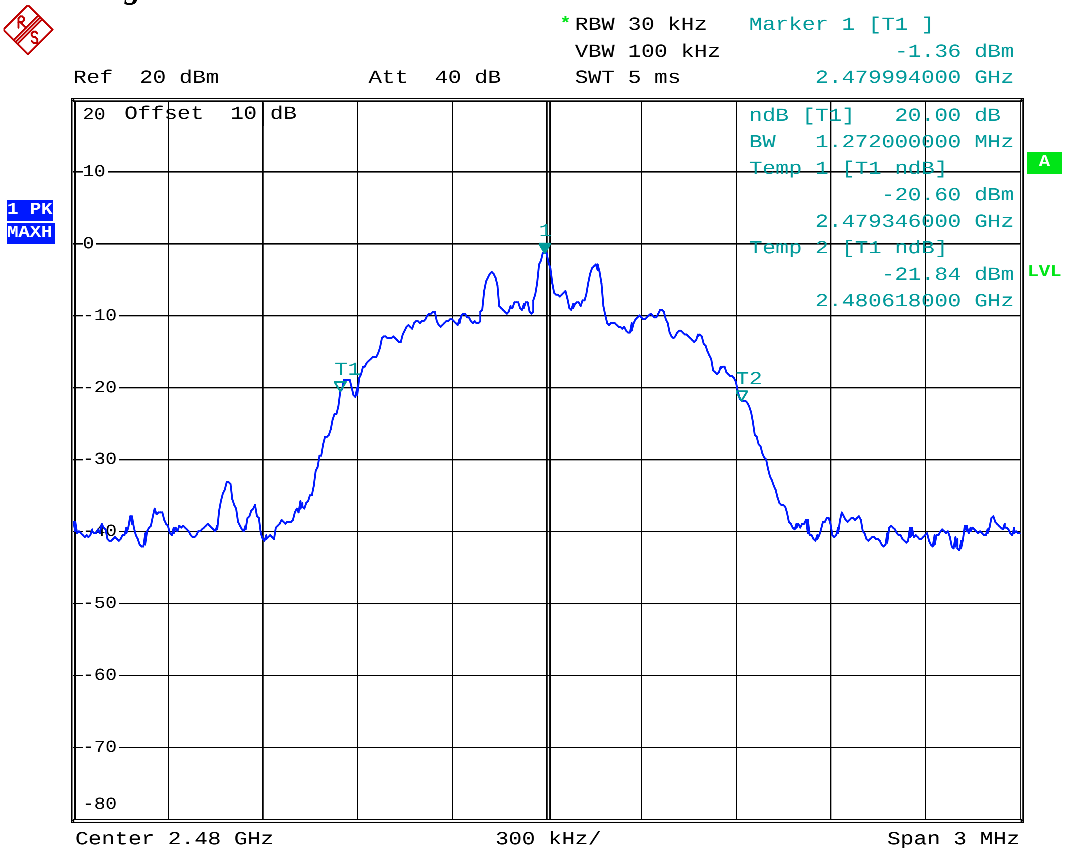
Mode: 3Mb daterate

Channel Middle



Mode: 3Mb daterate

Channel High



10 DWELL TIME ON EACH CHANNEL

10.1 Standard Applicable

According to 15.247(a)(1)(iii), for frequency hopping system operating in the 2400-2483.5 band, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

10.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. The EUT must have its hopping function enabled.
3. Use the following spectrum analyzer settings:
   Span = zero span, centered on a hopping channel
   RBW = 1 MHz
   VBW ≥ RBW
   Sweep = as necessary to capture the entire dwell time per hopping channel
   Detector function = peak
   Trace = max hold
4. Use the marker-delta function to determine the dwell time. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all frequencies measured were complete.

10.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

10.4 Measurement Data

Test Date : Sep. 17, 2012 Temperature : 25 °C Humidity : 65 %

Period = 0.4(seconds) x 79(channels) = 31.6 seconds

A. DH1 Mode

The Bluetooth system hops at a rate of 1600 times per second. This means there are 1600 timeslots in one second. The DH1 data rate operates on a one-slot transmission and one-slot receiving basis. Thus there are 1600/(1+1) = 800 transmissions per second. In one period for each particular channel there are 10.13 x 31.6 = 320.1 times of transmissions.

a) Channel Low : the dwell time is 0.481ms x 320.1 = 153.9 ms
b) Channel Middle : the dwell time is 0.465ms x 320.1 = 148.8 ms
c) Channel Hi : the dwell time is 0.449ms x 320.1 = 143.7 ms

The maximum time of occupancy for a particular channel is 153.9ms in any 31.6 second period, which is less than the 400ms allowed by the rules; therefore, it meets the requirements of this section.

B. DH3 Mode

The Bluetooth system hops at a rate of 1600 times per second. This means there are 1600 timeslots in one second. The DH3 data rate operates on a three-slot transmission and one-slot receiving basis. Thus there are 1600/(3+1) = 400 transmissions per second. In one period for each particular channel there are 5.06 x 31.6 = 159.9 times of transmissions.

a) Channel Low : the dwell time is 1.92ms x 159.9 = 307.0 ms
b) Channel Middle : the dwell time is 1.78ms x 159.9 = 284.6 ms
c) Channel Hi : the dwell time is 1.78ms x 159.9 = 284.6 ms

The maximum time of occupancy for a particular channel is 307.0ms in any 31.6 second period, which is less than the 400 ms allowed by the rules; therefore, it meets the requirements of this section.

C. DH5 Mode

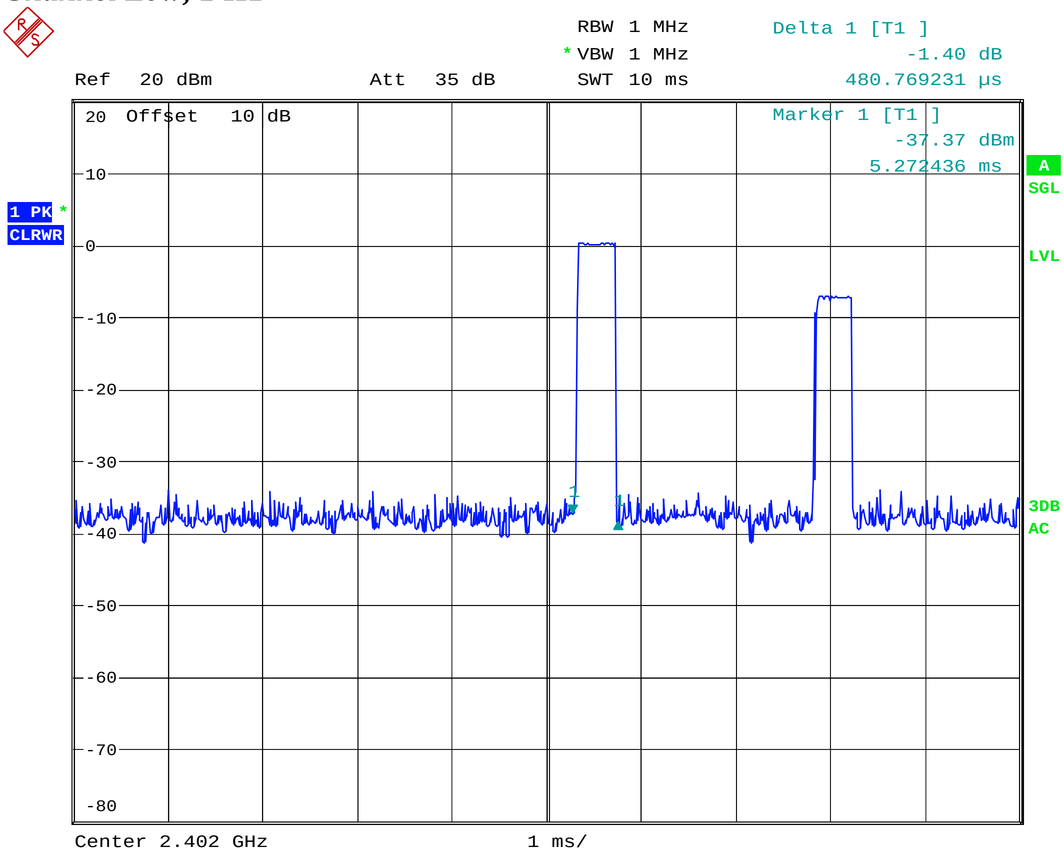
The Bluetooth system hops at a rate of 1600 times per second. This means there are 1600 timeslots in one second. The DH5 data rate operates on a five-slot transmission and one-slot receiving basis. Thus there are 1600/(5+1) = 266.7 transmissions per second. In one period for each particular channel there are 3.38 x 31.6 = 106.81 times of transmissions.

a) Channel Low : the dwell time is 3.13ms x 106.81 = 334.3 ms
b) Channel Middle : the dwell time is 3.13ms x 106.81 = 334.3 ms
c) Channel Hi : the dwell time is 3.21ms x 106.81 = 342.9 ms

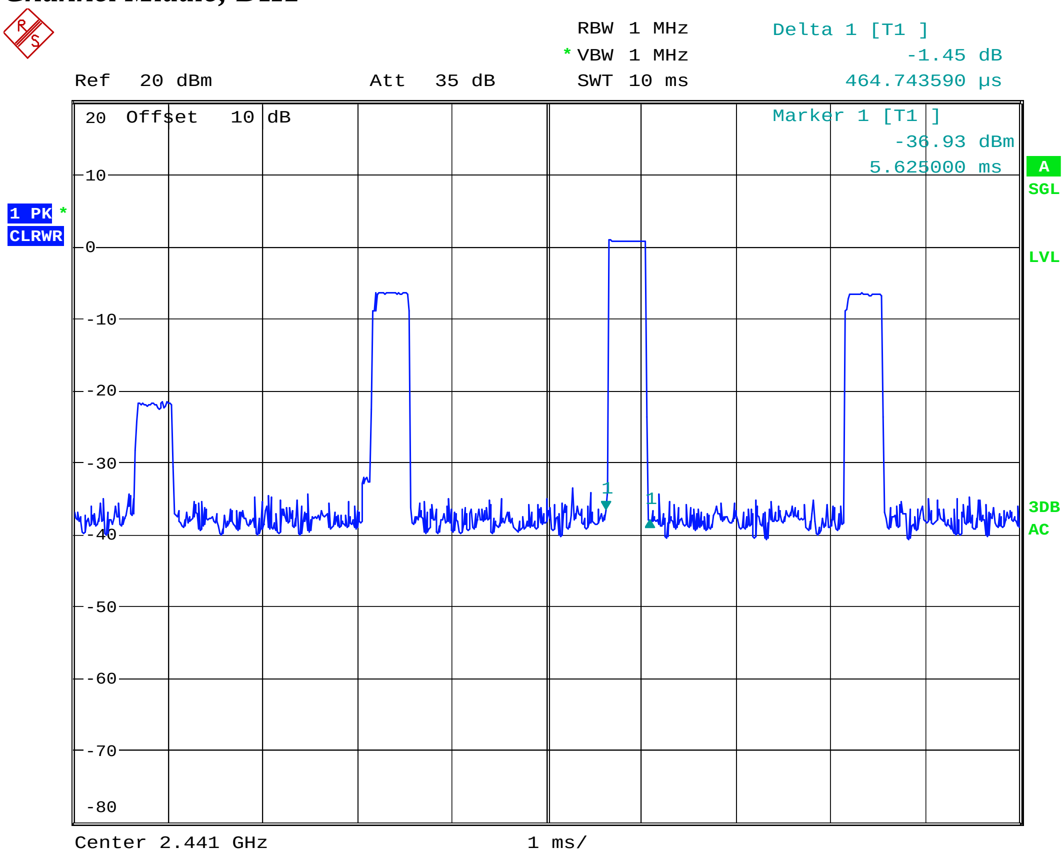
The maximum time of occupancy for a particular channel is 342.9ms in any 31.6 second period, which is less than the 400 ms allowed by the rules; therefore, it meets the requirements of this section.

Note : The expanded uncertainty of dwell time on each channel tests is 2dB.

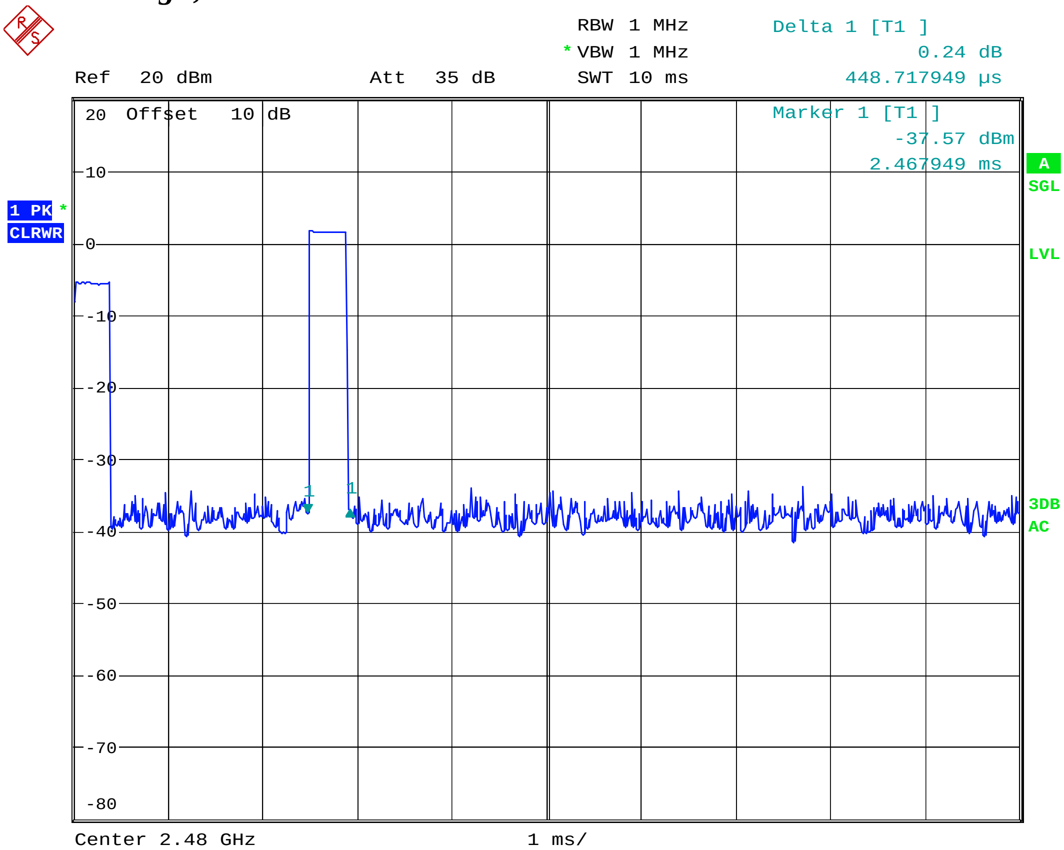
Channel Low; DH1



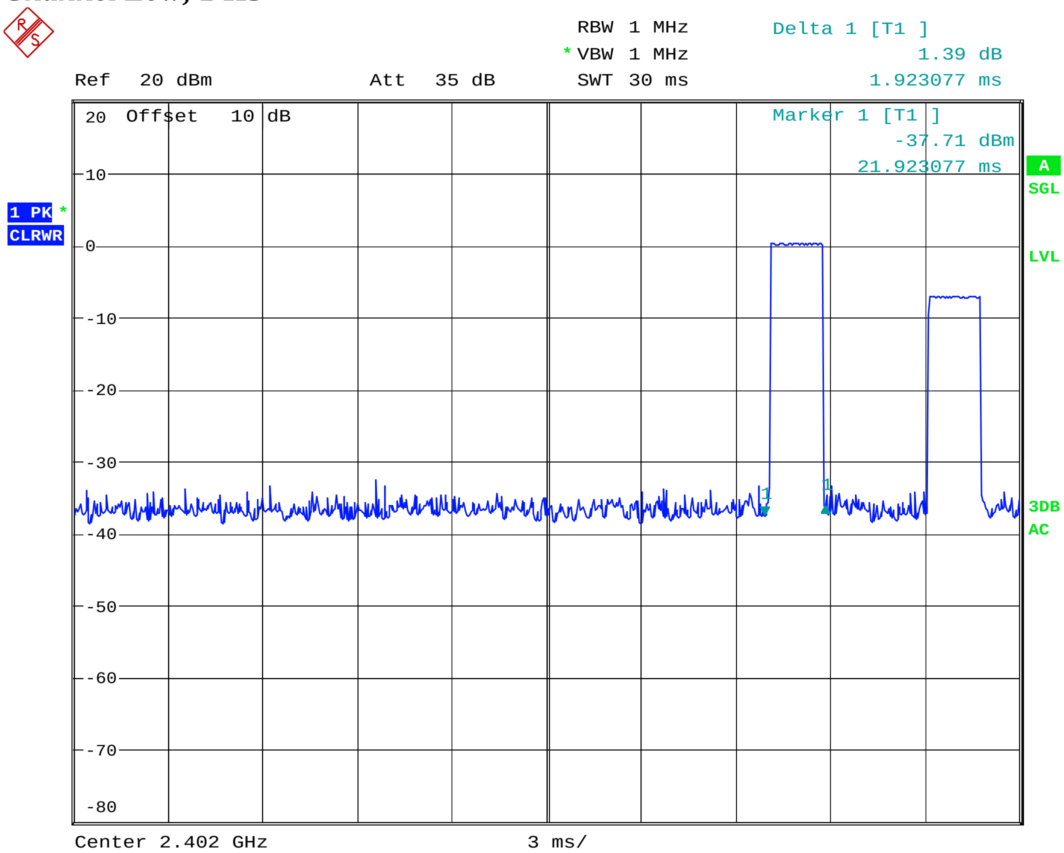
Channel Middle; DH1



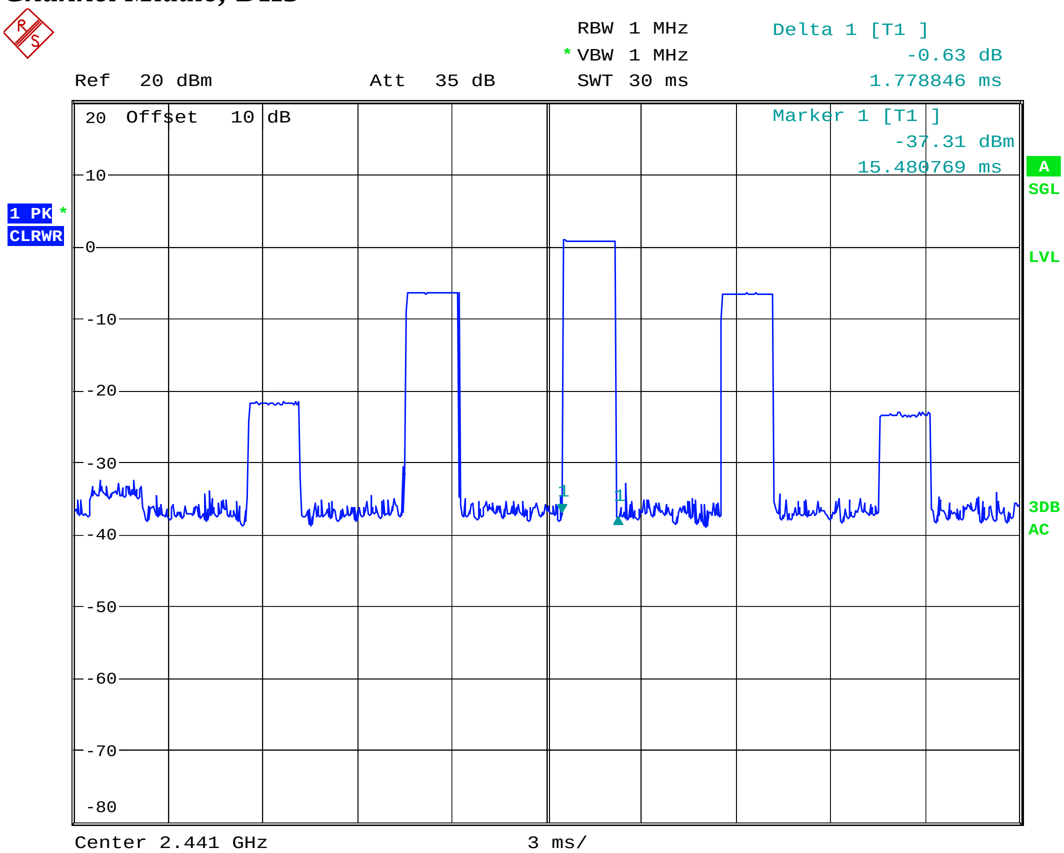
Channel High; DH1



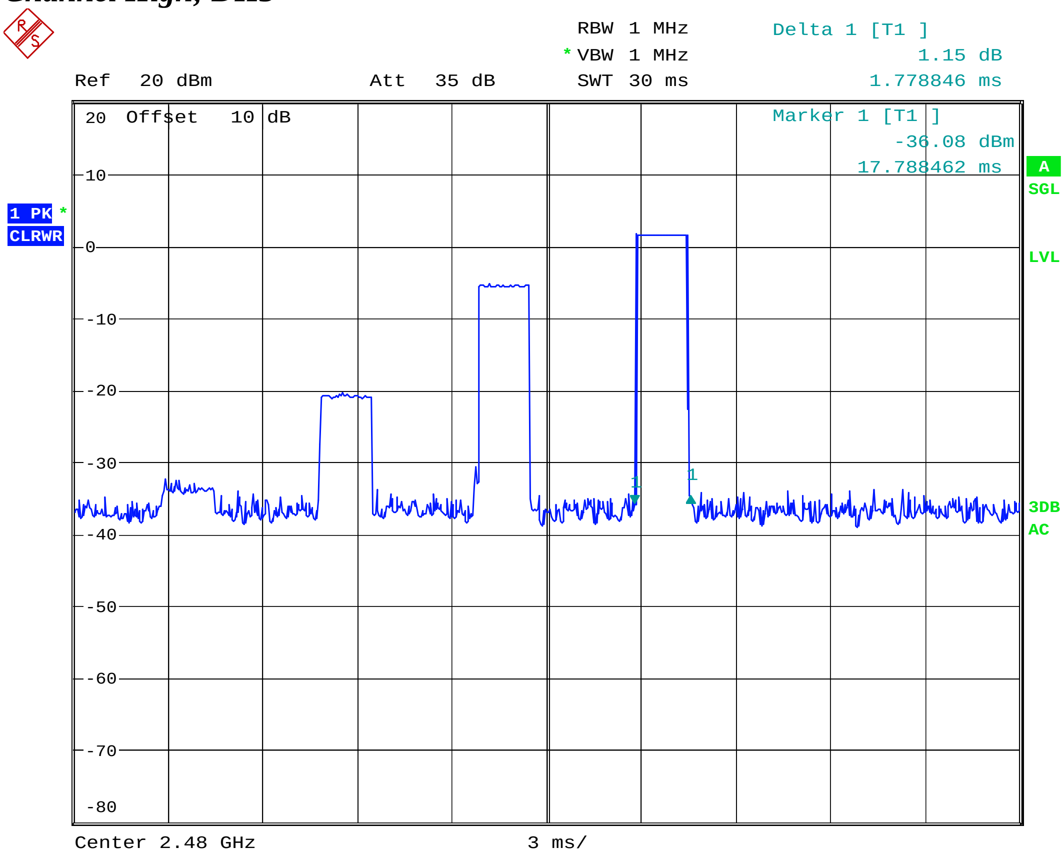
Channel Low; DH3



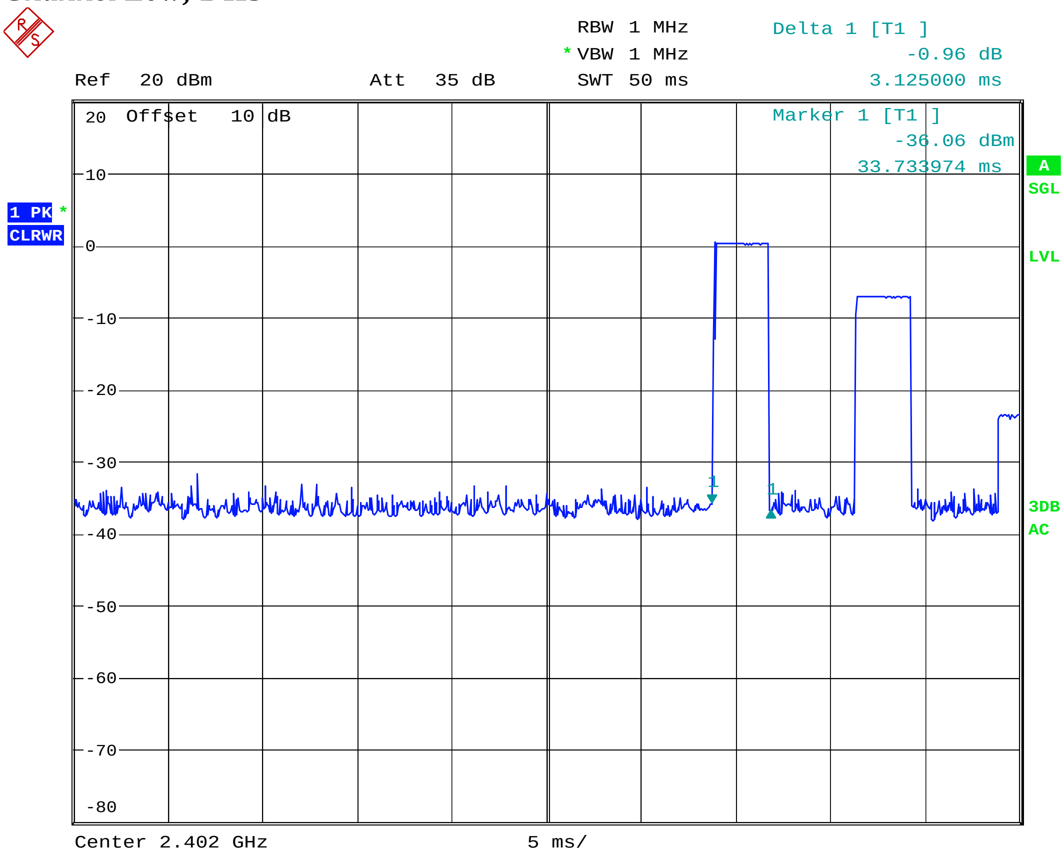
Channel Middle; DH3



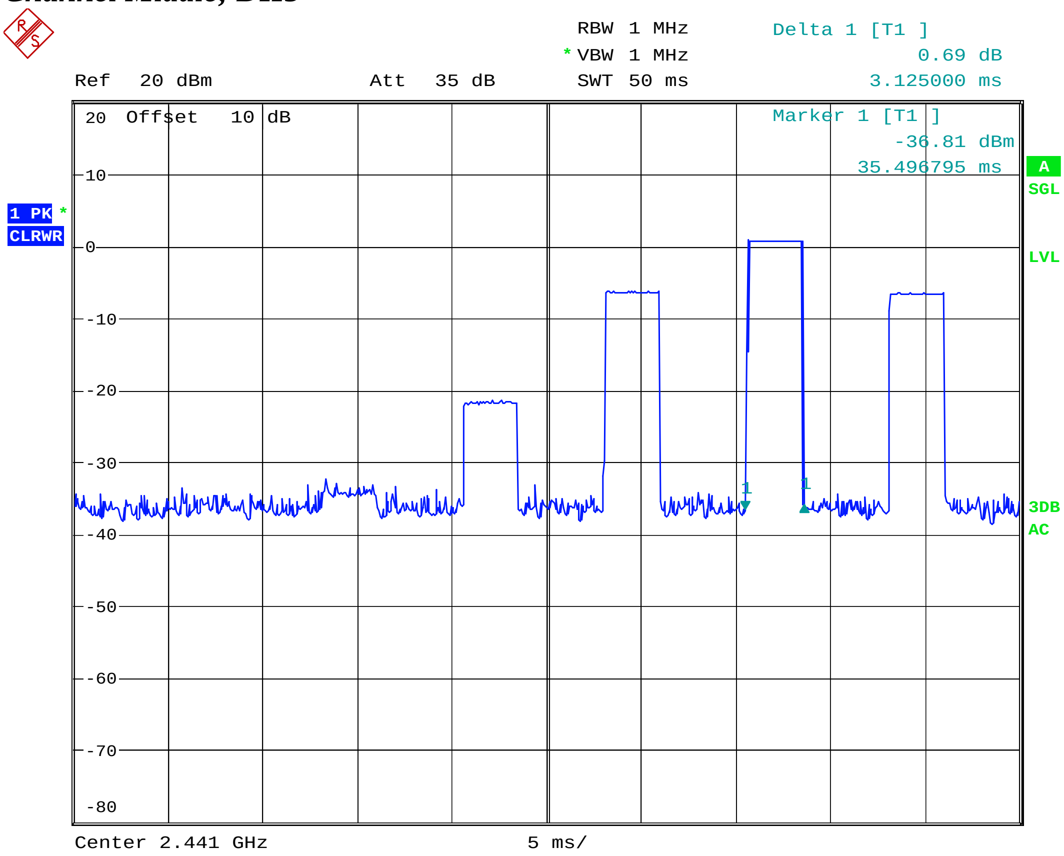
Channel High; DH3



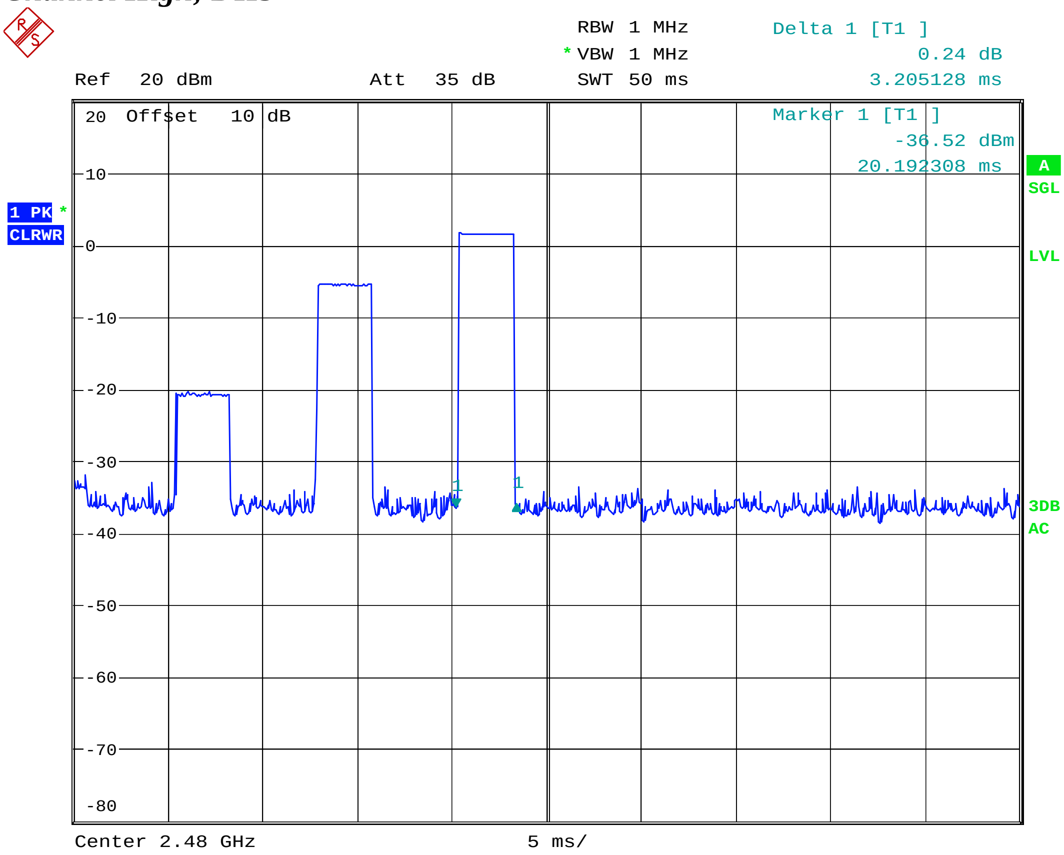
Channel Low; DH5



Channel Middle; DH5



Channel High; DH5



11 OUTPUT POWER MEASUREMENT

11.1 Standard Applicable

According to 15.247(b)(1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Use the following spectrum analyzer settings:
   Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
   RBW > the 20 dB bandwidth of the emission being measured
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all frequencies measured were complete.

11.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

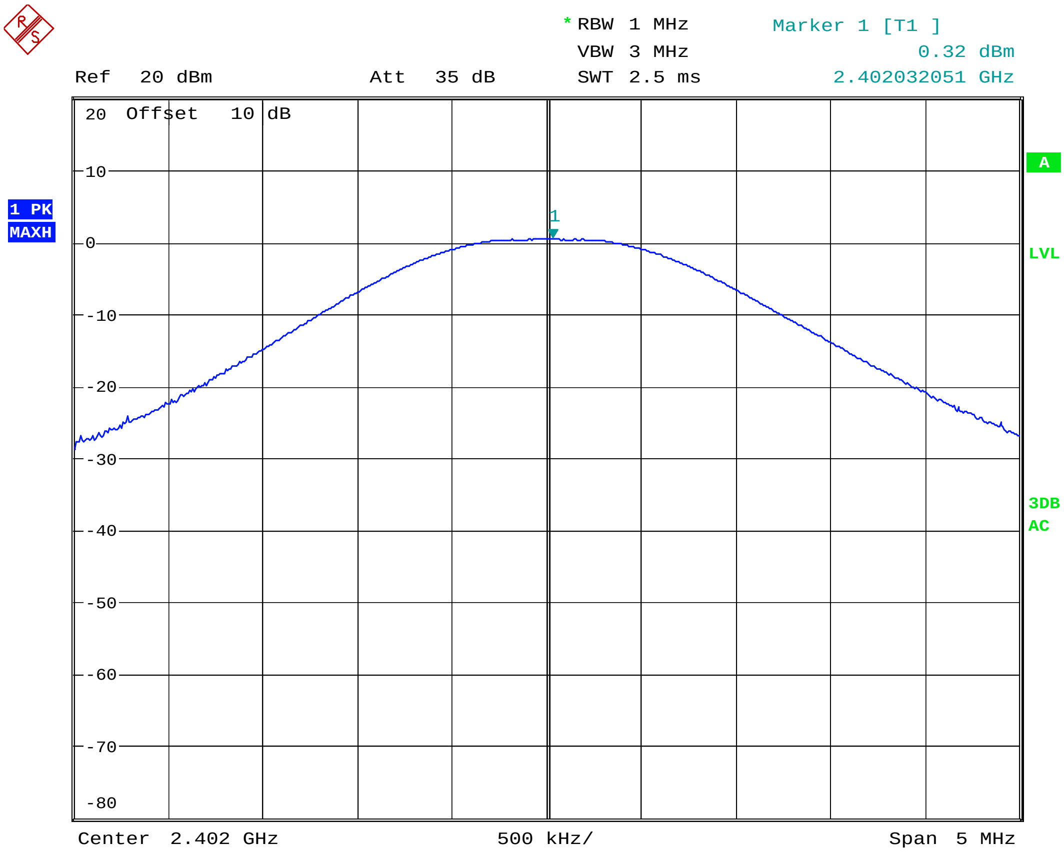
11.4 Measurement Data

Test Date : Jul. 17, 2012   Temperature : 25 °C   Humidity : 65 %

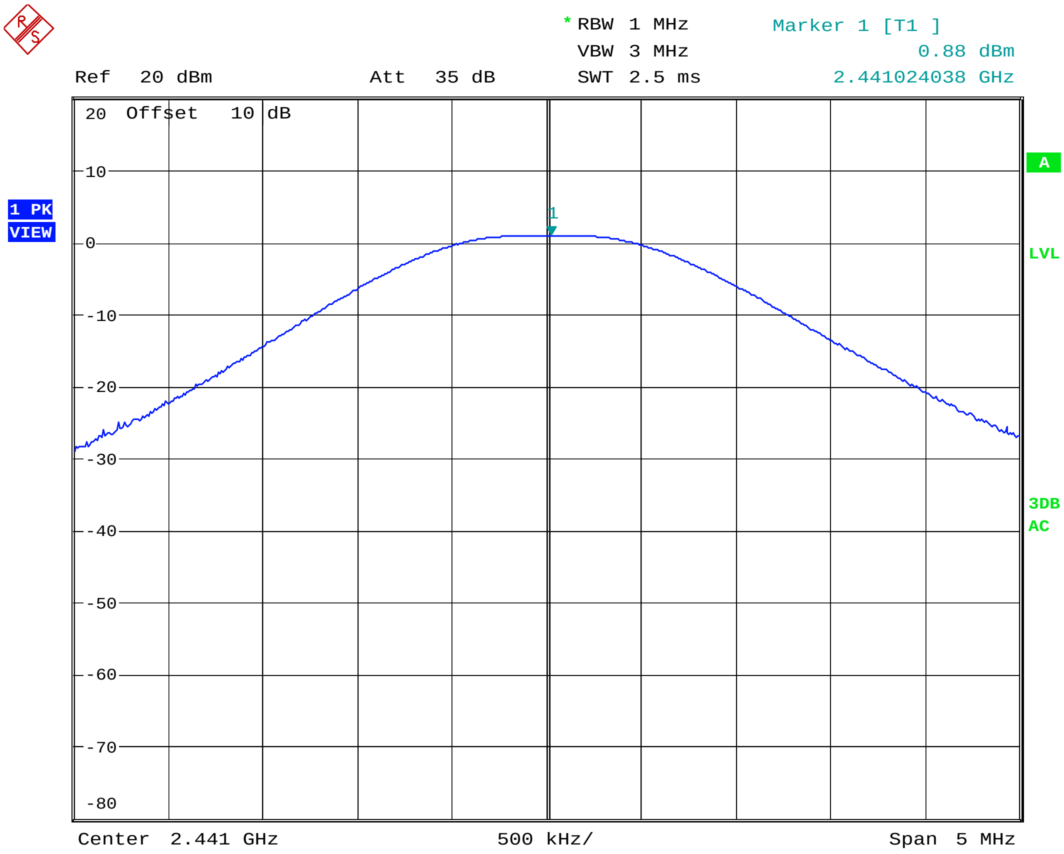
a) Channel Low : Output Peak Power is 0.32 dBm = **1.076** mW
b) Channel Middle : Output Peak Power is 0.88 dBm = **1.225** mW
c) Channel High : Output Peak Power is 1.68 dBm = **1.472** mW

Note : The expanded uncertainty: 2dB.

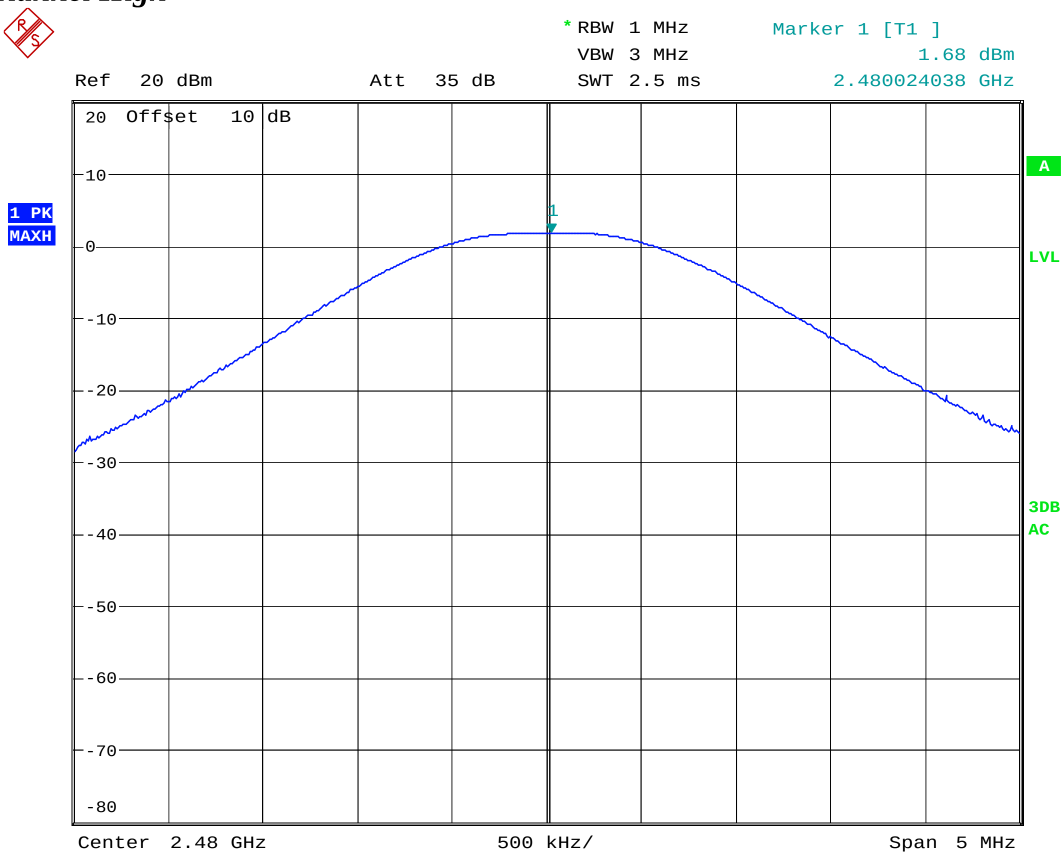
Channel Low


*RBW 1 MHz
VBW 3 MHz
SWT 2.5 ms
Marker 1 [T1]
0.32 dBm
2.402032051 GHz
Ref 20 dBm
Att 35 dB
20 Offset 10 dB
1 PK
MAXH
A
LVL
3DB
AC
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Center 2.402 GHz
500 kHz/
Span 5 MHz

Channel Middle



Channel High



12 100 kHz BANDWIDTH OF BAND EDGES MEASUREMENT

12.1 Standard Applicable

According to 15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

12.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Use the following spectrum analyzer settings:

   Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation

   RBW ≥ 1% of the span

   VBW ≥ RBW

   Sweep = auto

   Detector function = peak

   Trace = max hold
4. Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all measured frequencies were complete.

12.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

12.4 Measurement Data

Test Date : Jul. 17, 2012 Temperature : 25 °C Humidity : 65 %

Mode: 1Mb datarate

a) Lower Band Edge : All emissions in this 100kHz bandwidth are attenuated more than 20dB from the carrier.

b) Upper Band Edge : All emissions in this 100kHz bandwidth are attenuated more than 20dB from the carrier.

Mode: 3Mb datarate

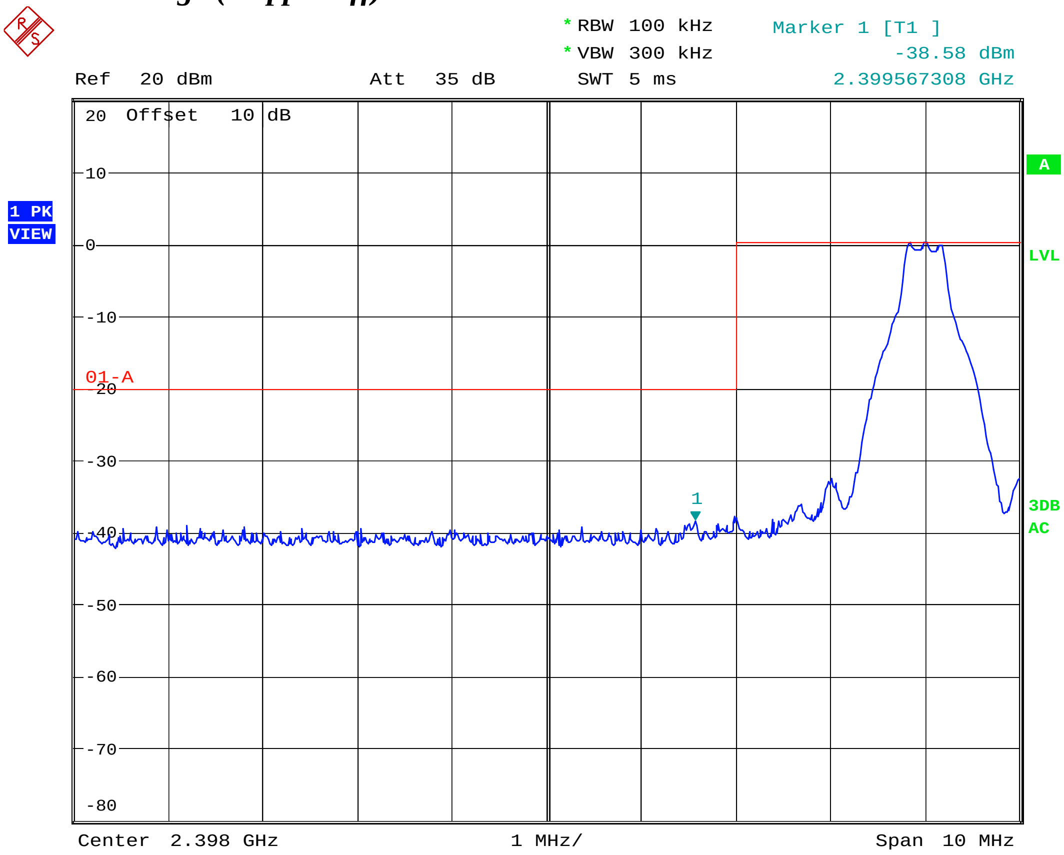
a) Lower Band Edge : All emissions in this 100kHz bandwidth are attenuated more than 20dB from the carrier.

b) Upper Band Edge : All emissions in this 100kHz bandwidth are attenuated more than 20dB from the carrier.

Note : The expanded uncertainty: 2dB.

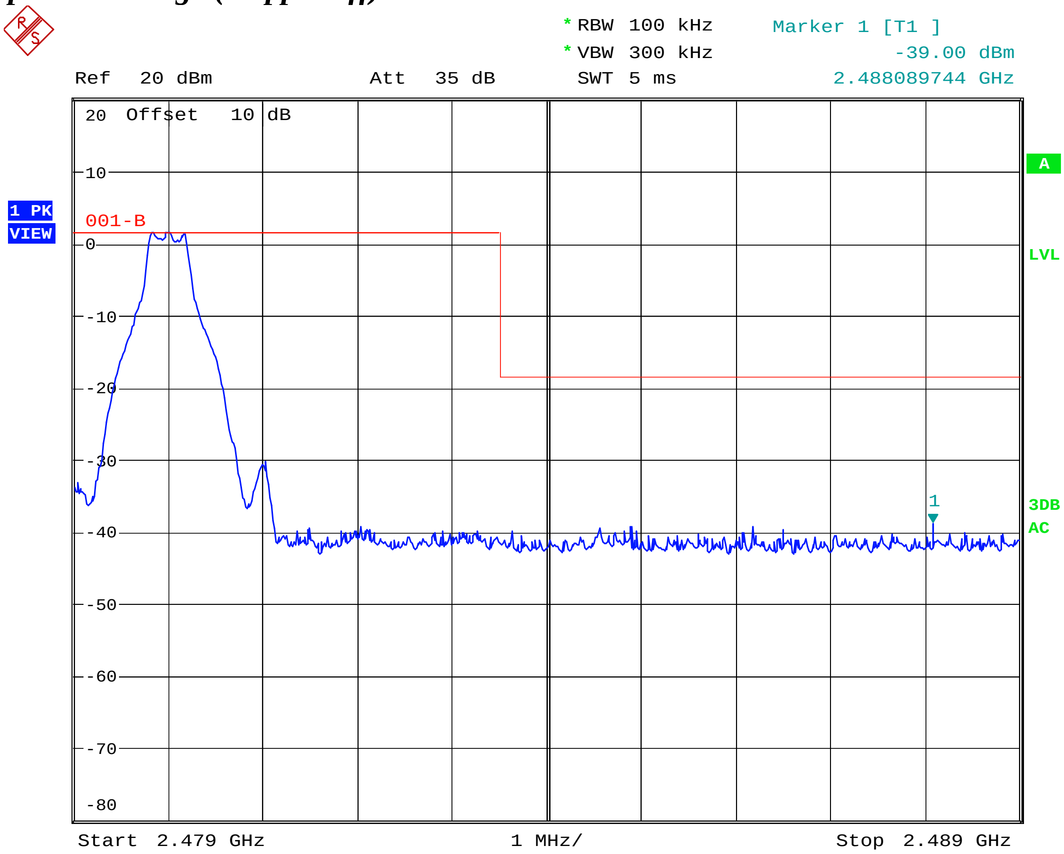
Mode: 1Mb datarate

Lower Band Edge (Hoppin off)



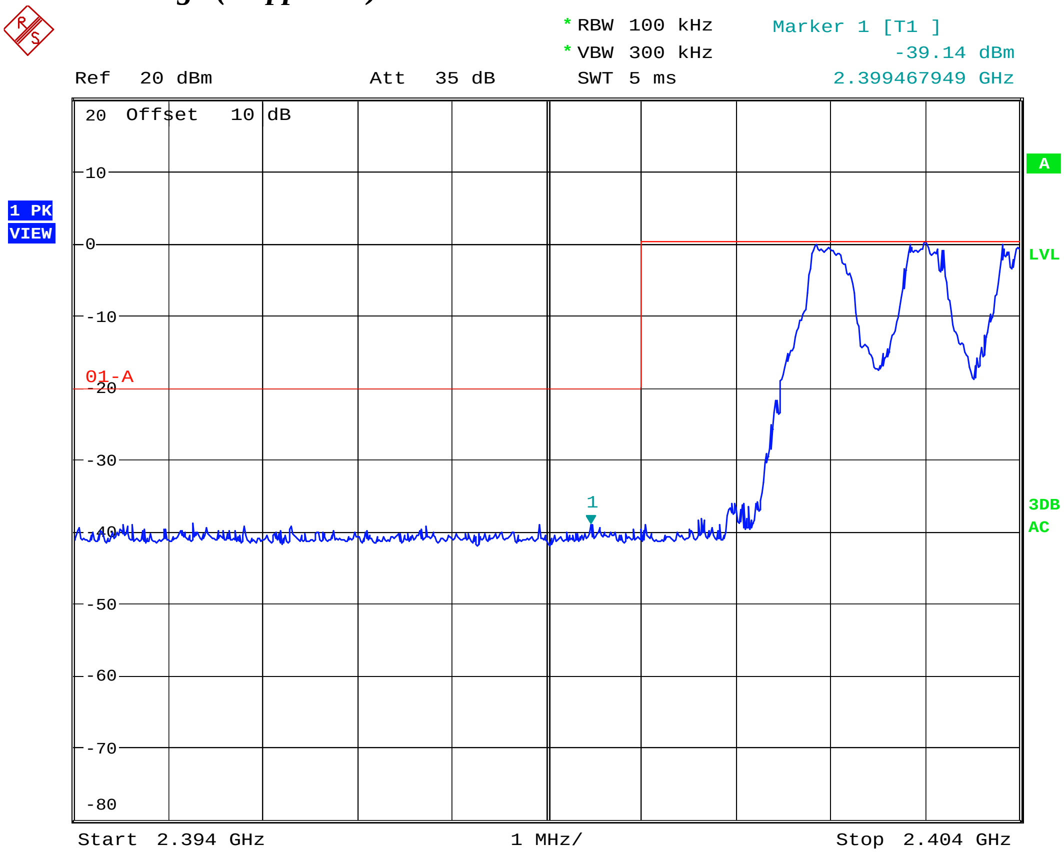
Mode: 1Mb datarate

Upper Band Edge (Hoppin off)



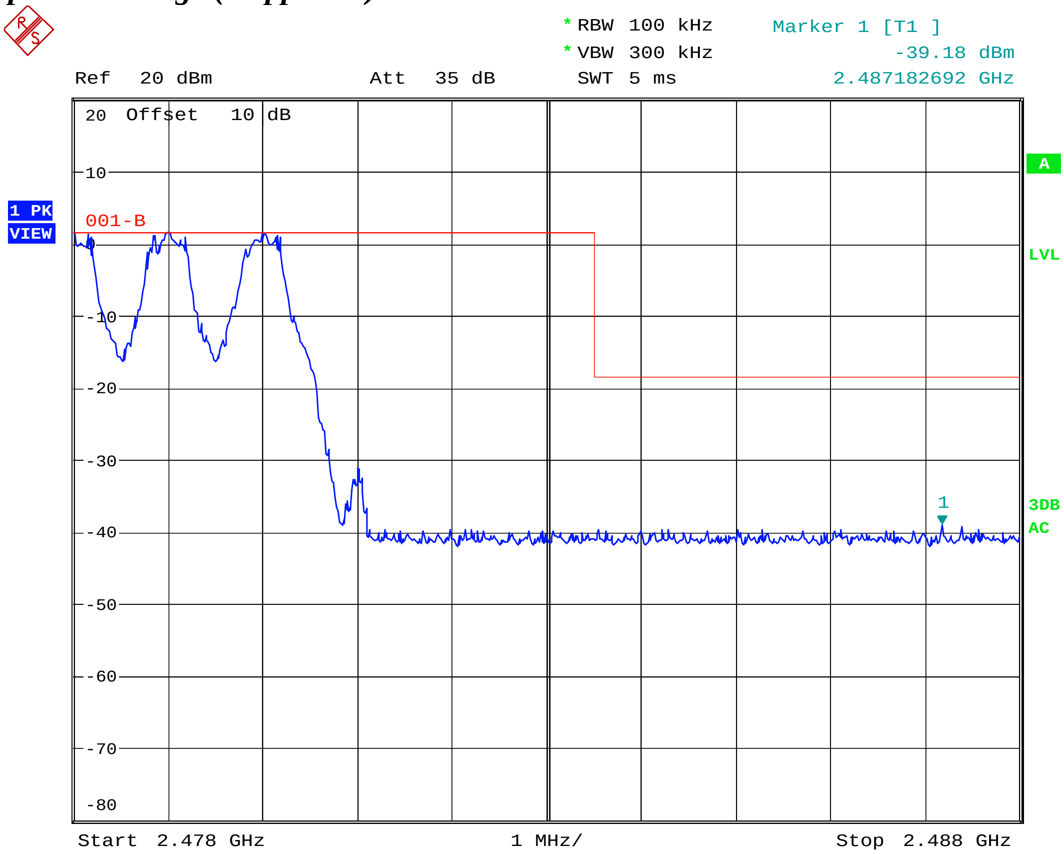
Mode: 1Mb datarate

Lower Band Edge (Hoppin on)



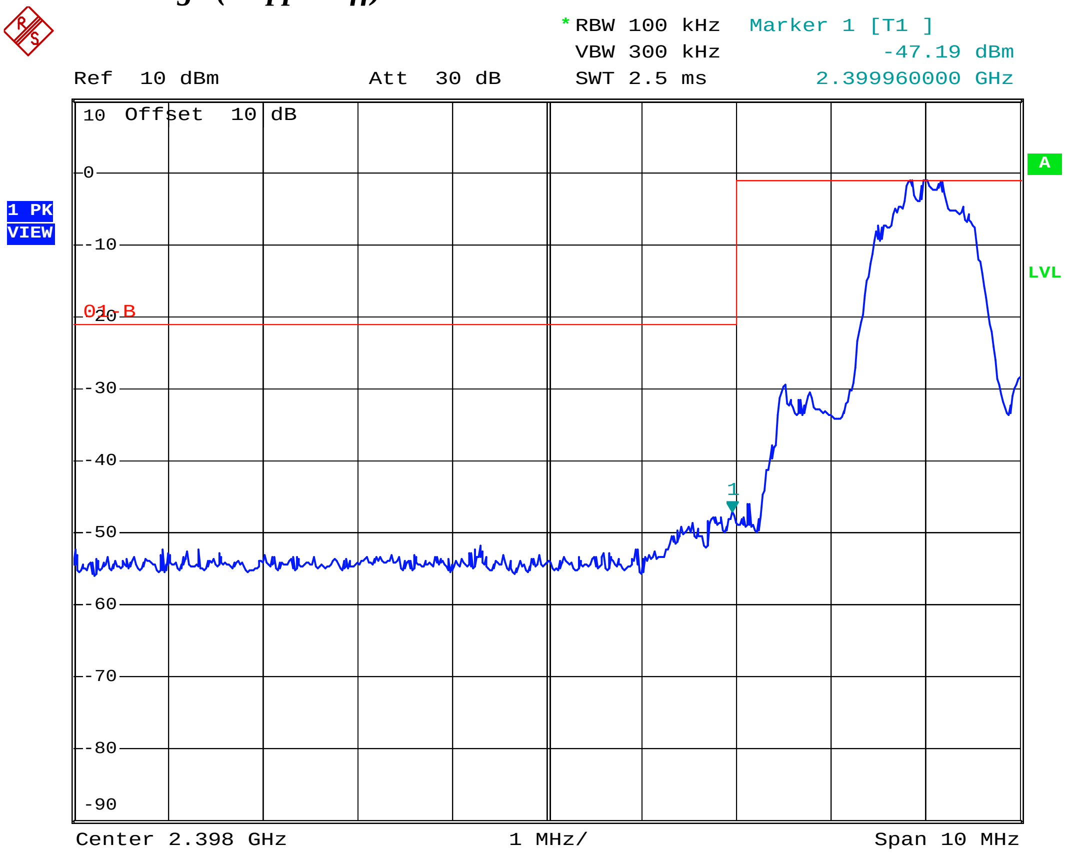
Mode: 1Mb datarate

Upper Band Edge (Hoppin on)



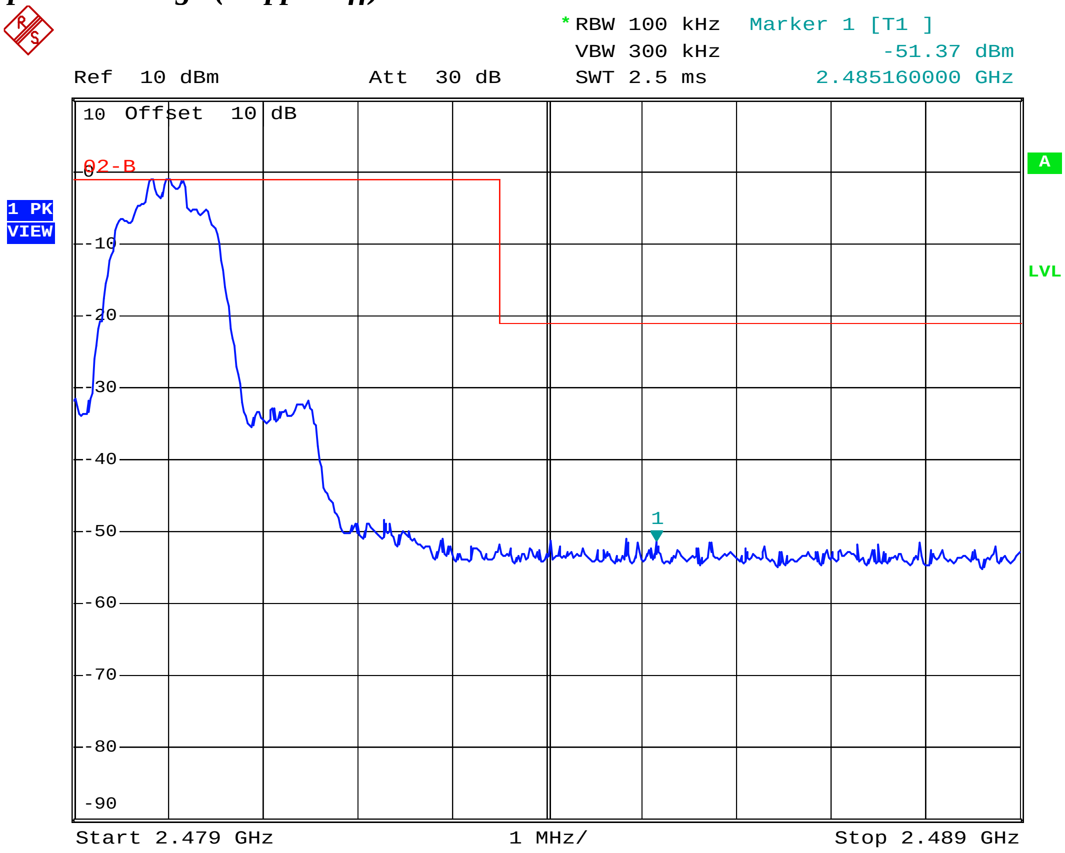
Mode: 3Mb datarate

Lower Band Edge (Hoppin off)



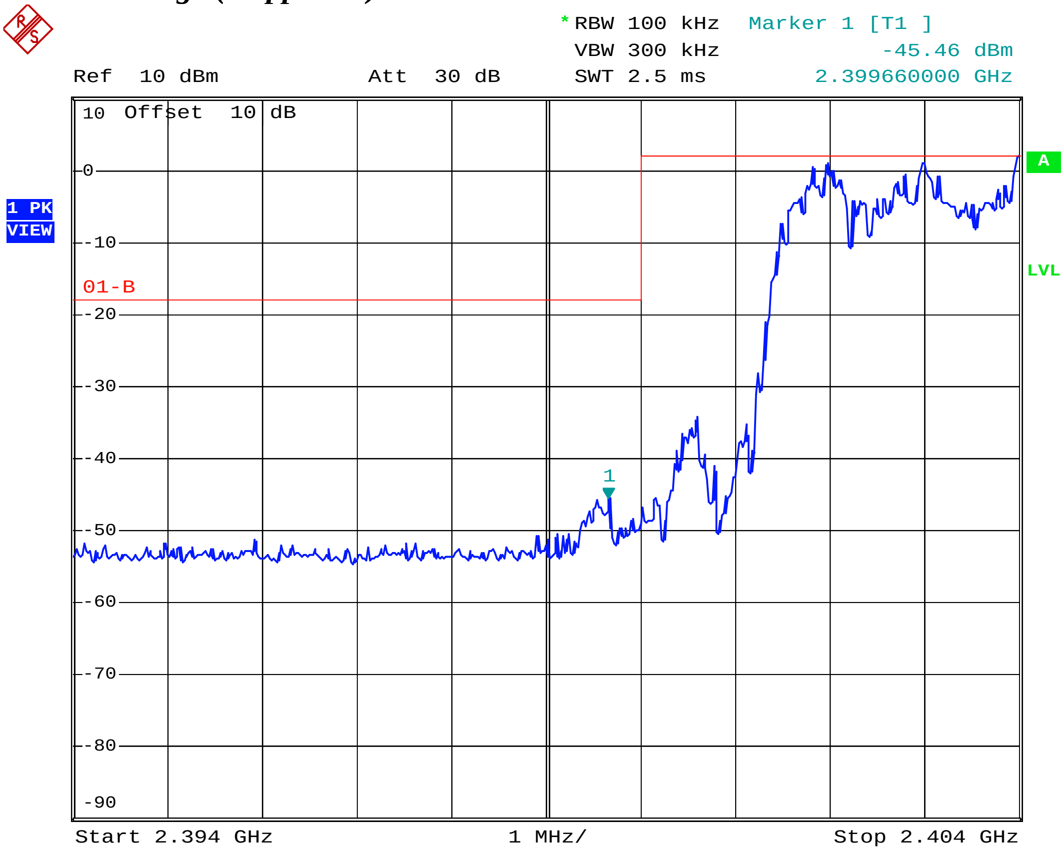
Mode: 3Mb datarate

Upper Band Edge (Hoppin off)



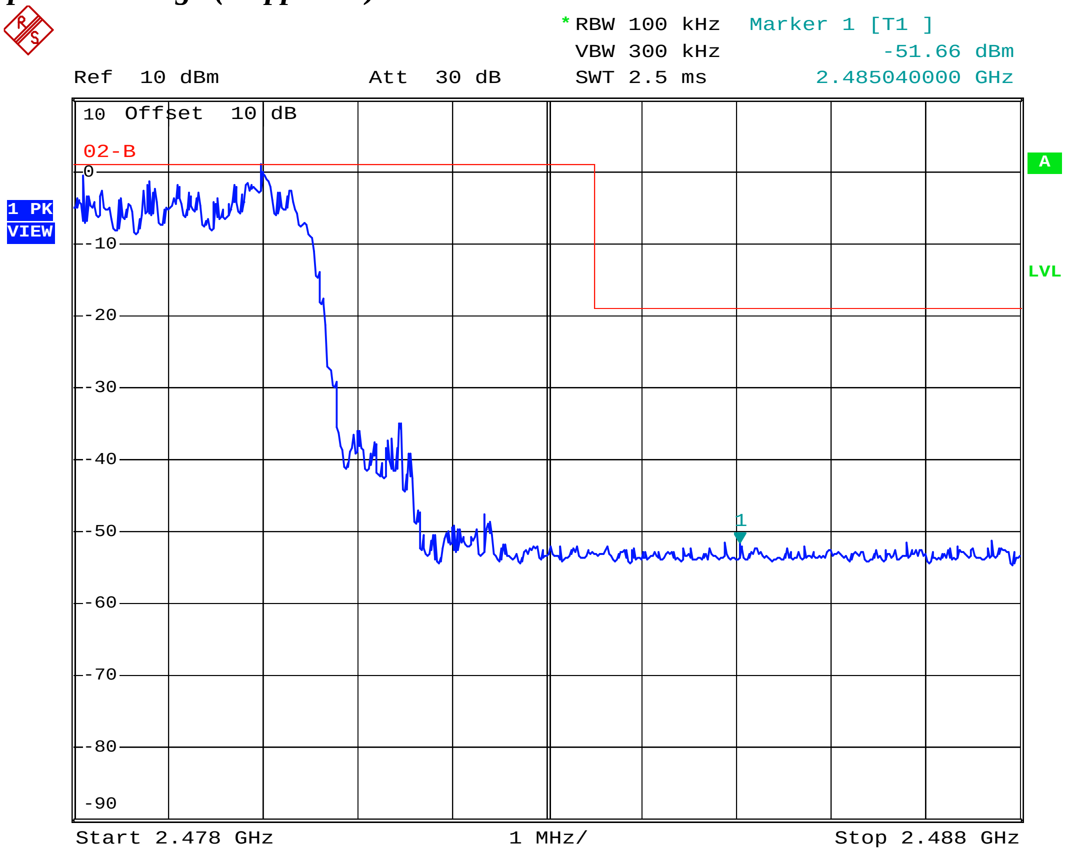
Mode: 3Mb datarate

Lower Band Edge (Hoppin on)



Mode: 3Mb datarate

Upper Band Edge (Hoppin on)



13 CONDUCTED SPURIOUS EMISSION MEASUREMENT

13.1 Standard Applicable

According to 15.247(c), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

13.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Use the following spectrum analyzer settings:

   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

   RBW = 100 kHz

   VBW ≥ RBW

   Sweep = auto

   Detector function = peak

   Trace = max hold.
4. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all measured frequencies were complete.

13.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSP40	2011/09/21	2012/09/20
Attenuator	Weinschel Engineering	1	N/A	N/A

13.4 Measurement Data

Test Date : Jul. 17, 2012 Temperature : 25 °C Humidity : 65 %

Mode : Low Channel

a) 1 GHz to 25 GHz frequency band: All emissions are attenuated more than 20dB from the carrier.

Mode : Middle Channel

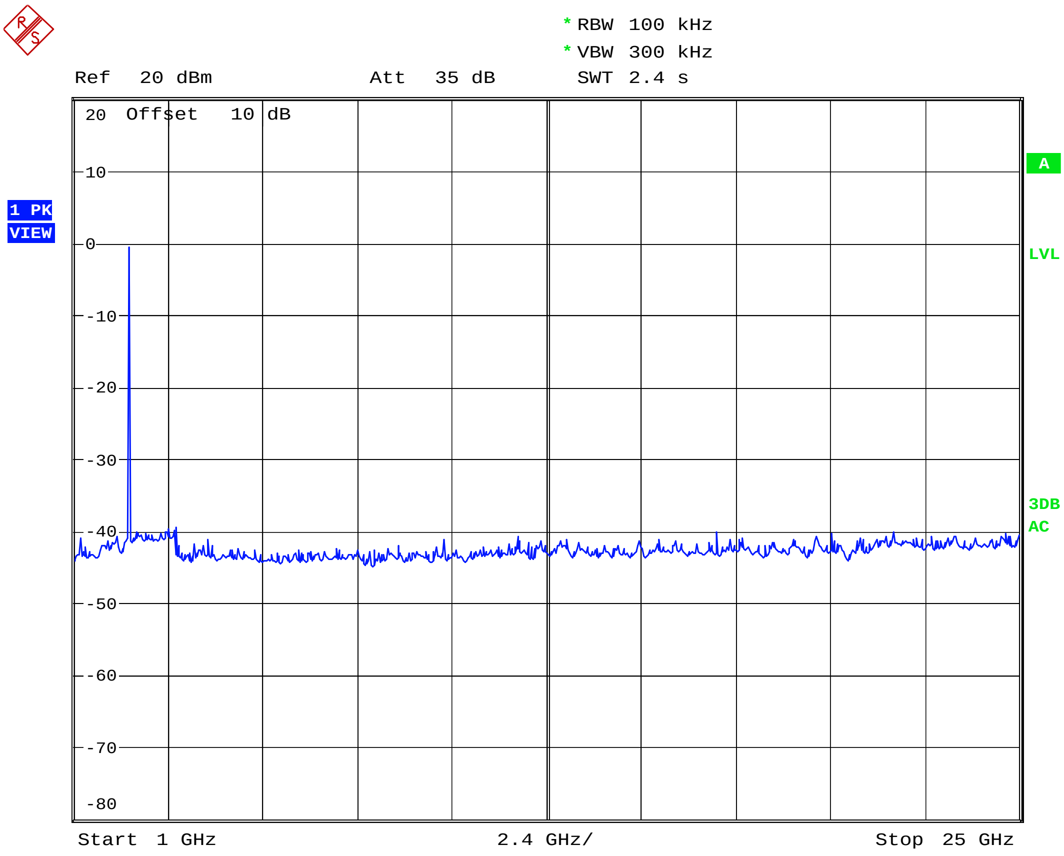
a) 1 GHz to 25 GHz frequency band: All emissions are attenuated more than 20dB from the carrier.

Mode : High Channel

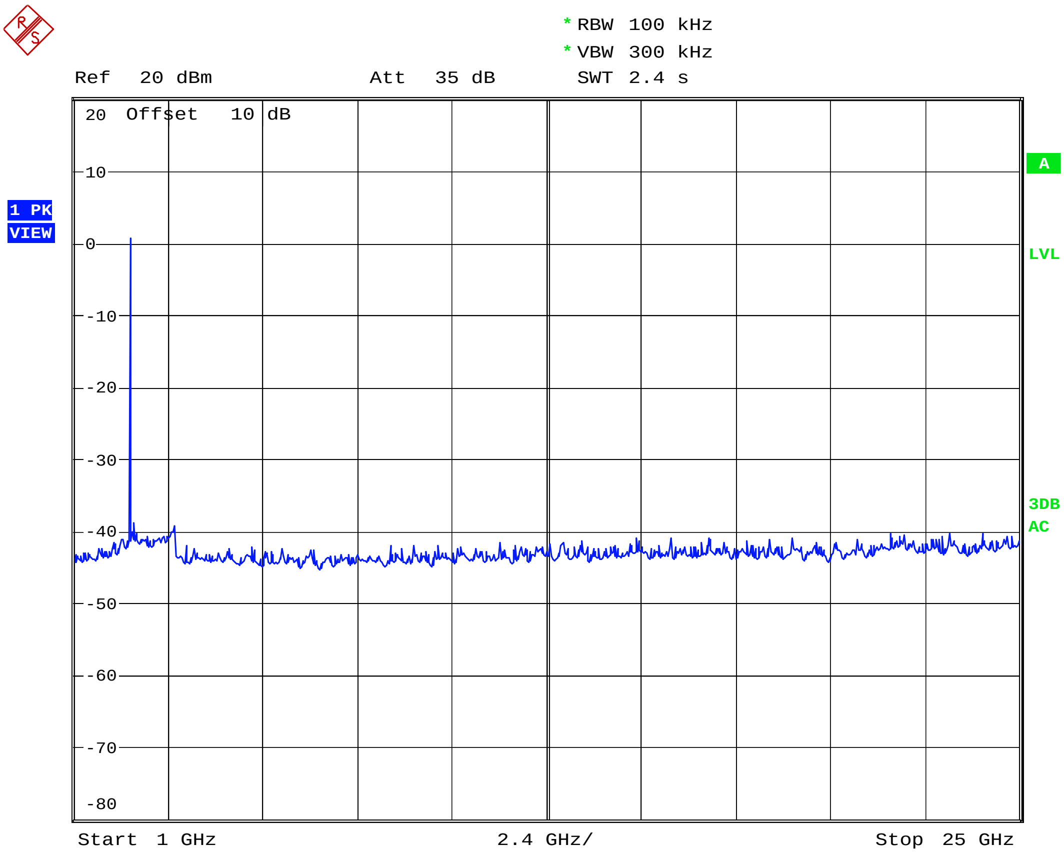
a) 1 GHz to 25 GHz frequency band: All emissions are attenuated more than 20dB from the carrier.

Note : The expanded uncertainty: 2dB.

Channel Low


*RBW 100 kHz
*VBW 300 kHz
Ref 20 dBm
Att 35 dB
SWT 2.4 s
Offset 10 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1 PK
VIEW
A
LVL
3DB
AC
Start 1 GHz
2.4 GHz/
Stop 25 GHz

Channel Middle



Channel High