



# **FCC 47 CFR PART 15 SUBPART C**

## **TEST REPORT**

*For*

**Applicant : SHENZHEN KDI COMMUNICATION CO., LTD**

**Address : Stand 7, Shangsha innovation scientific & technology  
Park, Futian district, Shenzhen, China**

**Product Name : Mobile phone**

**Model Name : T818, XT-500**

**Brand Name : Anycool, KDI, KINGBOND, FUJITEL**

**FCC ID : XXE-T818**

**Report No. : MOST091101F4**

**Date of Issue : November. 24, 2009**

**Issued by : Most Technology Service Co.,Ltd**

**Address : No.5, Nangshan 2nd Rd., North Hi-Tech Industrial park ,Nanshan  
Shenzhen Guangdong ,China**

**Tel : 86-755-8617 0306**

**Fax : 86-755-8617 0310**

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## TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY .....	4
2. GENERAL INFORMATION .....	5
2.1 Product Information .....	5
2.2 Objective .....	6
2.3 Test Standards and Results .....	6
2.4 Environmental Conditions .....	6
3. TEST METHODOLOGY .....	7
3.1 TEST FACILITY .....	7
3.2 GENERAL TEST PROCEDURES .....	7
3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS .....	8
4 SETUP OF EQUIPMENT UNDER TEST .....	9
4.1 SETUP CONFIGURATION OF EUT .....	9
4.2 SUPPORT EQUIPMENT .....	9
4.3 TEST EQUIPMENT LIST .....	10
5. 47 CFR Part 15C Requirements .....	11
5.1 Number of Hopping Frequency .....	11
5.1.1 Requirement .....	11
5.1.2 Test Description .....	11
5.1.3 Test Result .....	11
5.2 Peak Output Power .....	13
5.2.1 Requirement .....	13
5.2.2 Test Description .....	13
5.2.3 Test Result .....	13
5.3 20dB Bandwidth .....	14
5.3.1 Definition .....	14
5.3.2 Test Description .....	14
5.3.3 Test Result .....	14
5.4 Peak Power Spectral Density (Not Applicable) .....	15
5.4.1 Definition .....	15
5.4.2 Test Configuration .....	15
5.4.3 Test procedure .....	15
5.4.4 Test results .....	15
5.5 Carried Frequency Separation .....	16
5.5.1 Definition .....	16
5.5.2 Test Description .....	16
5.5.3 Test Result .....	16

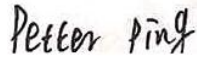
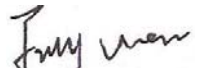
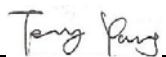
5.6 Time of Occupancy (Dwell time).....	17
5.6.1 Requirement.....	17
5.6.2 Test Description.....	17
5.6.3 Test Result.....	17
5.7 Conducted Spurious Emissions.....	18
5.7.1 Requirement.....	18
5.7.2 Test Description.....	18
5.7.3 Test Result.....	18
5.8 Band Edge .....	22
5.8.1 Requirement.....	22
5.8.2 Test Description.....	22
5.8.3Test Result.....	22
5.9 Radio Frequency Exposure.....	25
5.9.1 Limit.....	25
5.9.2 EUT Specification.....	25
5.9.3 Test Results.....	25
5.9.4 MPE evaluation .....	25
5.10 Radiated Emission Test.....	26
5.10.1 Requirement.....	26
5.10.2 Test Description.....	26
5.10.3 Test Result.....	27

**1. VERIFICATION OF CONFORMITY**

**Equipment Under Test:** MOBILE PHONE  
**Brand Name:** Anycool, KDI, KINGBOND, FUJITEL  
**Model Number:** T818, XT-500  
**FCC ID:** XXE-T818  
**Applicant:** SHENZHEN KDI COMMUNICATION CO., LTD  
Stand 7, Shangsha innovation scientific & technology park, Futian district,  
Shenzhen, China  
**Manufacturer:** SHENZHEN KDI COMMUNICATION CO., LTD  
Stand 7, Shangsha innovation scientific & technology park, Futian district,  
Shenzhen, China  
**Technical Standards:** 47 CFR Part 15 Subpart C  
**File Number:** MOST091101F4  
**Date of test:** November. 17 ~ November. 24, 2009  
**Deviation:** None  
**Condition of Test Sample:** Normal  
**Test Result:** PASS

The above equipment was tested by Most Technology Service Co., Ltd for compliance with the requirements set forth in FCC rules and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by (+ signature):	
	Petter Ping    November. 24, 2009
Review by (+ signature):	
	July Wen    November. 24, 2009
Approved by (+ signature):	
	Terry Yang    November. 24, 2009

## 2. GENERAL INFORMATION

### 2.1 Product Information

<b>EUT1- Mobile Phone</b>	
Description:	MOBILE PHONE
Model Name:	T818
IMEI No.:	352176032745491
Hardware Version:	E880-V7.2
Software Version:	E880_KDI1DOVF3QBUI4T818QBS_EVCOM_MT6225S00.GM_01_0_20091012
Frequency:	Bluetooth: 2402-2480 MHz
<b>Ancillary Equipment – Power Supply</b>	
Description:	AC/DC Adapter
Model Name:	NBT-005C
Brand Name:	N/A
Manufacturer:	ShenZhen nanbang Electronic Co., Ltd.
Rated Input:	AC 100-240V,50/60HZ
Rated Output:	DC 5.0V,500mA
Length DC cable:	100 cm
<b>Ancillary Equipment – Battery</b>	
Description:	Lithium-ion Battery
Model Name:	T818, XT500
Brand Name:	Anycool, FUJITEL
Manufacturer:	SHENZHEN KDI COMMUNICATION CO., LTD
Capacitance:	1250 mAh
Rated Voltage:	3.7V
Charge Limit:	4.2V

**NOTE:**

1. Please refer to Appendix I for the photographs of the EUT. For a more detailed features description about the EUT, please refer to User's Manual.

## 2.2 Objective

The objective of the report is to perform tests according to 47 CFR Part 15 Subpart C (Bluetooth, 2.4GHz ISM band radiators) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-05 Edition)	Radio Frequency Devices

## 2.3 Test Standards and Results

Test items and the results are as bellow:

No.	Section	Description	Result	Date of Test
1	15.247(a)	Number of Hopping Frequency	PASS	2009-11-23
2	15.247(b)	Peak Output Power	PASS	2009-11-23
3	15.247(a)	20dB Bandwidth	PASS	2009-11-23
4	15.247(d)	Peak Power Spectral Density	PASS	2009-11-23
5	15.247(a)	Carrier Frequency Separation	PASS	2009-11-23
6	15.247(a)	Time of Occupancy (Dwell time)	PASS	2009-11-23
7	15.247(c)	Conducted Spurious Emission	PASS	2009-11-23
8	15.247(c)	Band Edge	PASS	2009-11-23
9	15.207	Conducted Emission	PASS	2009-11-23
10	15.209 15.247(c)	Radiated Emission	PASS	2009-11-23

*Note:* 1. The test result judgment is decided by the limit of measurement standard  
2. The information of measurement uncertainty is available upon the customer's request.

## 2.4 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

### 3. TEST METHODOLOGY

#### 3.1 TEST FACILITY

Test Site:	Most Technology Service Co.,ltd
Location:	No.5, Nangshan 2nd Rd., North Hi-Tech Industrial park , Nanshan Shenzhen, Guangdong ,China
Description:	There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2003 and CISPR 16 requirements. The FCC Registration Number is <b>490827</b> .
Site Filing:	The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
Instrument Tolerance:	All measuring equipment is in accord with ANSI C63.4:2003 and CISPR 16 requirements that meet industry regulatory agency and accreditation agency requirement.
Ground Plane:	Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.

#### 3.2 GENERAL TEST PROCEDURES

##### Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4:2003.

**Note: For DSS test reports, the test method is referring to the FCC DSS procedure requirement public notice DA 00-705 document along with ANSI C63.4: 2003.**

### 3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (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
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

## 4 SETUP OF EQUIPMENT UNDER TEST

### 4.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 4.2 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
--						

*Remark:*

*All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

### 4.3 TEST EQUIPMENT LIST

**Instrumentation:** The following list contains equipment used at Most for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

No.	Equipment	Manufacturer	Model No.	S/N	Calibrator due date
1	Test Receiver	Rohde & Schwarz	ESCI	100492	2010/03/14
2	L.I.S.N.	Rohde & Schwarz	ENV216	100093	2010/03/14
3	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2010/03/14
4	Terminator	Hubersuhner	50Ω	No.1	2010/03/14
5	RF Cable	SchwarzBeck	N/A	No.1	2010/03/14
6	Test Receiver	Rohde & Schwarz	ESPI	101202	2010/03/14
7	Bilog Antenna	Sunol	JB3	A121206	2010/03/14
8	Cable	SchwarzBeck	N/A	NO.1	2010/03/14
9	Cable	SchwarzBeck	N/A	NO.2	2010/03/14
10	Cable	SchwarzBeck	N/A	NO.3	2010/03/14
11	DC Power Filter	DuoJi	DL2×30B	N/A	2010/03/14
12	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	2010/03/14
13	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	2010/03/14
14	Test Receiver	Rohde & Schwarz	ESCI	100492	2010/03/14
15	Absorbing Clamp	Luthi	MDS21	3635	2010/03/14
16	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2010/03/14
17	AC Power Source	Kikusui	AC40MA	LM003232	2010/03/14
18	Test Analyzer	Kikusui	KHA1000	LM003720	2010/03/14
19	Line Impedance Network	Kikusui	LIN40MA-PCR-L	LM002352	2010/03/14
20	ESD Tester	Kikusui	KES4021	LM003537	2010/03/14
21	EMC PRO System	EM Test	UCS-500-M4	V0648102026	2010/03/14
22	Signal Generator	IFR	2032	203002/100	2010/03/14
23	Amplifier	A&R	150W1000	301584	2010/03/14
24	CDN	FCC	FCC-801-M2-25	47	2010/03/14
25	CDN	FCC	FCC-801-M3-25	107	2010/03/14
26	EM Injection Clamp	FCC	F-203I-23mm	403	2010/03/14
27	RF Cable	MIYAZAKI	N/A	No.1/No.2	2010/03/14
28	Universal Radio Communication Tester	ROHDE&SCHWARZ	CMU200	0304789	2010/03/14
29	Telecommunication Antenna	European Antennas	PSA 75301R/170	0304213	2010/03/14
30	Spectrum Analyzer	Agilent	E4408	MY41440460	2010/03/14
31	Horn Antenna	SCHWARZBECK	BBHA9120D	D69250	2010/03/14

**NOTE:** Equipments listed above have been calibrated and are in the period of validation.

## 5. 47 CFR Part 15C Requirements

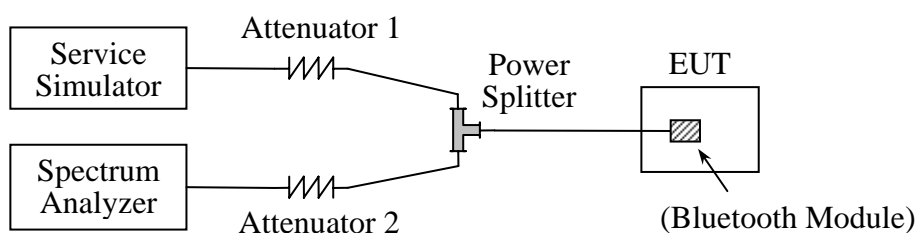
### 5.1 Number of Hopping Frequency

#### 5.1.1 Requirement

According to FCC section 15.247(a) (1) (iii), frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 15 hopping frequencies.

#### 5.1.2 Test Description

##### A. Test Setup:



The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the Bluetooth Service Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the Bluetooth Module of the EUT is activated and controlled by the SS, and is set to operate under test mode transmitting 339 bytes DH5 packages at maximum power.

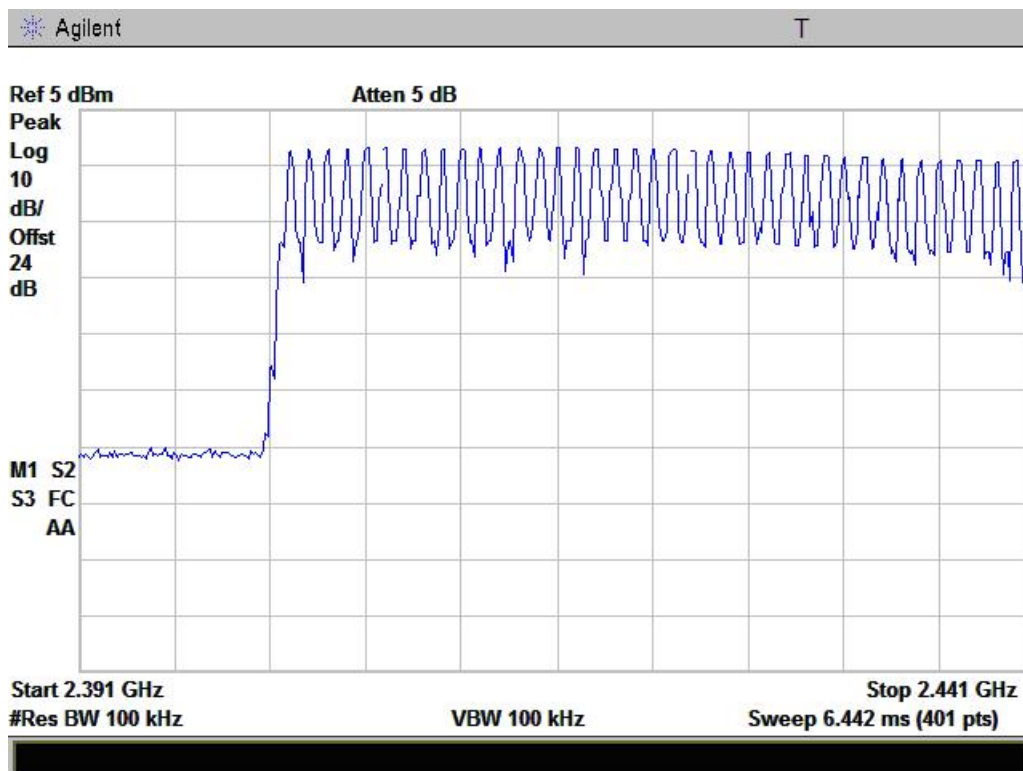
#### 5.1.3 Test Result

The Bluetooth Module operates at hopping-on test mode; the frequencies number employed is counted to verify the Module's using the number of hopping frequency.

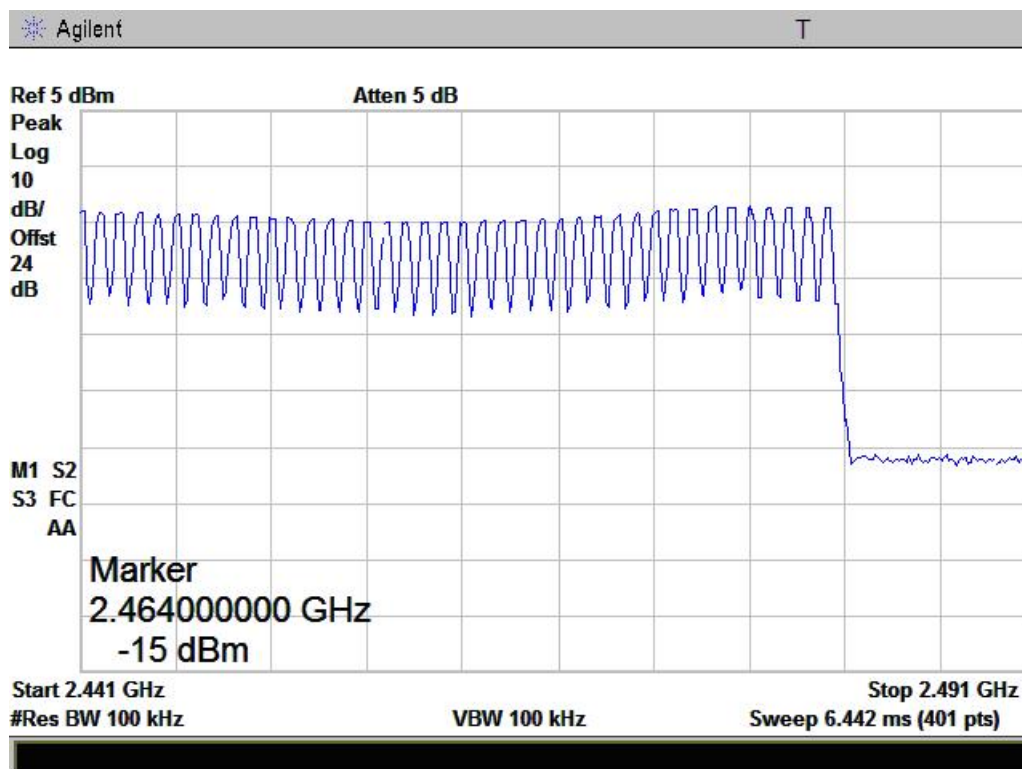
##### B. Test Verdict:

Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Refer to Plot	Verdict
2400 - 2483.5	79	15	Plot 1/ 2	PASS

##### C. Test Plot:



(Plot 1: 2391MHz to 2441MHz)



(Plot 2: 2441MHz to 2491MHz)

## 5.2 Peak Output Power

### 5.2.1 Requirement

According to FCC section 15.247(b)(1), for frequency hopping systems that operates in the 2400MHz to 2483.5MHz band employing at least 75 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt. For all other frequency hopping systems in the 2400MHz to 2483.5MHz band, it is 0.125Watts.

### 5.2.2 Test Description

See section 0 of this report.

### 5.2.3 Test Result

The EUT operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power.

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	mW	dBm	W	
0	2402	-4.69	0.340	30	1	PASS
39	2441	-5.08	0.310			PASS
78	2480	-4.85	0.327			PASS

## 5.3 20dB Bandwidth

### 5.3.1 Definition

The 20dB bandwidth is known as the 99% emission bandwidth, or 20dB bandwidth ( $10 \cdot \log 1\% = 20\text{dB}$ ) taking the total RF output power.

### 5.3.2 Test Description

See section 0 of this report.

### 5.3.3 Test Result

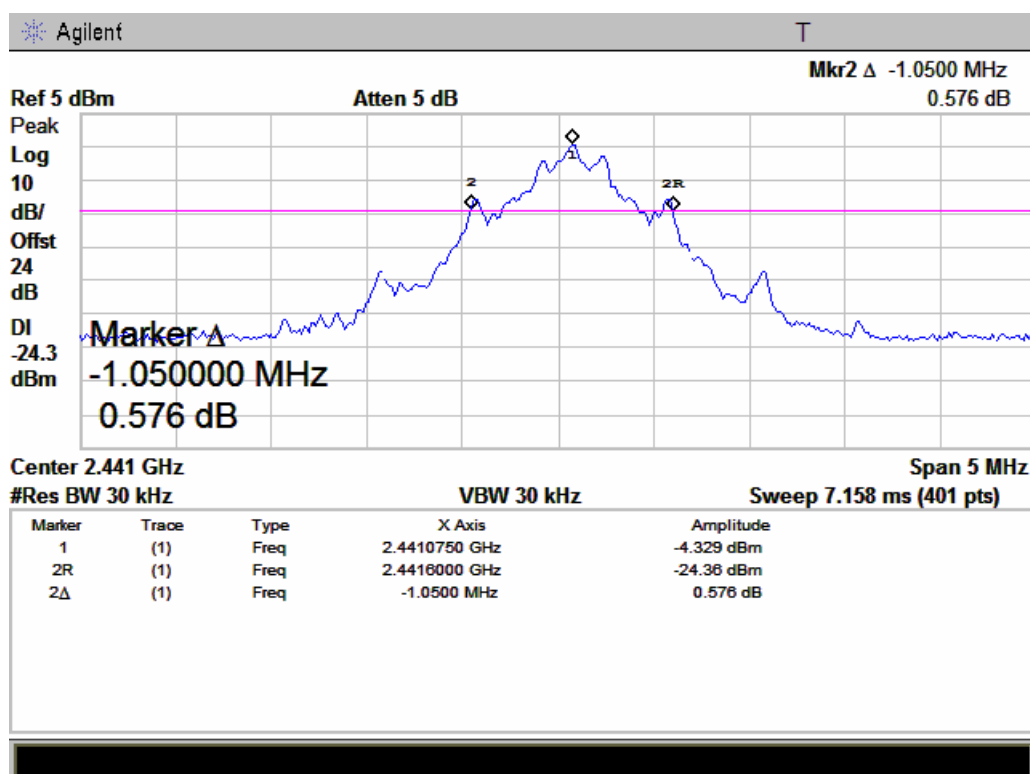
The EUT operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to record the 20dB bandwidth.

#### A. Test Verdict:

The maximum 20dB bandwidth measured is 1.05 MHz according to the table below.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot
39	2441	1.05	Plot 3

#### B. Test Plot:



(Plot 3: Channel = 39)

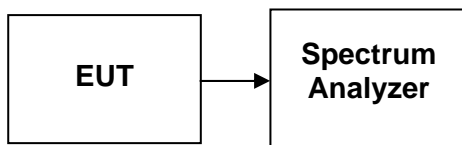
## 5.4 Peak Power Spectral Density (Not Applicable)

### 5.4.1 Definition

1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

### 5.4.2 Test Configuration

### 5.4.3 Test procedure



1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
4. Record the max reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

### 5.4.4 Test results

Not Applicable (The Bluetooth modulation is FHSS).

## 5.5 Carried Frequency Separation

### 5.5.1 Definition

According to FCC section 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

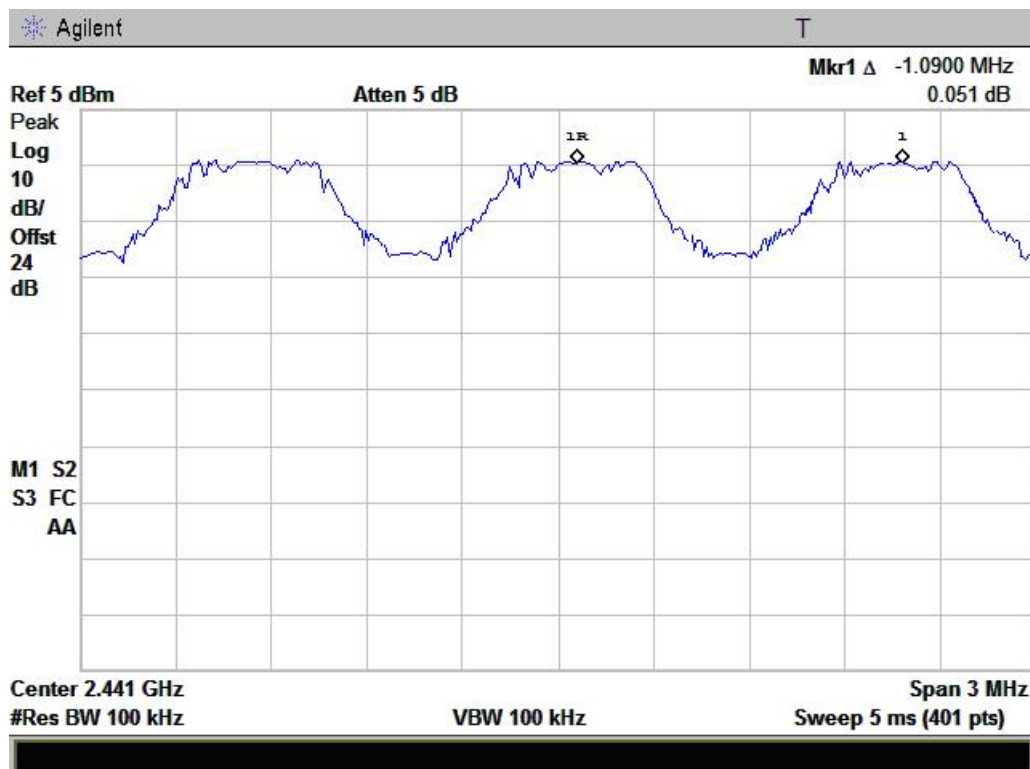
### 5.5.2 Test Description

See section 0 of this report.

### 5.5.3 Test Result

The EUT operates at hopping-on test mode.

For any adjacent channels, the Module does have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. So, the verdict is PASSING.



(Plot 4: Channel = 39)

## 5.6 Time of Occupancy (Dwell time)

### 5.6.1 Requirement

According to FCC section 15.247(a) (1) (iii), frequency hopping systems in the 2400 - 2483.5MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 5.6.2 Test Description

See section 0 of this report.

### 5.6.3 Test Result

#### DH 1

CH Low:  $0.383 * (1600/2)/79 * 31.60 = 122.56$  (ms)

CH Mid:  $0.383 * (1600/2)/79 * 31.60 = 122.56$  (ms)

CH High:  $0.380 * (1600/2)/79 * 31.60 = 121.60$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	0.383	122.56	31.60	400.00	PASS
Mid	0.383	122.56	31.60		PASS
High	0.380	121.60	31.60		PASS

#### DH 3

CH Low:  $1.603 * (1600/4)/79 * 31.60 = 256.48$  (ms)

CH Mid:  $1.600 * (1600/4)/79 * 31.60 = 256.00$  (ms)

CH High:  $1.603 * (1600/4)/79 * 31.60 = 256.48$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	1.603	256.48	31.60	400.00	PASS
Mid	1.600	256.00	31.60		PASS
High	1.603	256.48	31.60		PASS

#### DH 5

CH Low:  $2.905 * (1600/6)/79 * 31.60 = 309.87$  (ms)

CH Mid:  $2.903 * (1600/6)/79 * 31.60 = 309.66$  (ms)

CH High:  $2.900 * (1600/6)/79 * 31.60 = 309.33$  (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	2.905	309.87	31.60	400.00	PASS
Mid	2.903	309.66	31.60		PASS
High	2.900	309.33	31.60		PASS

## 5.7 Conducted Spurious Emissions

### 5.7.1 Requirement

According to FCC section 15.247(c), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### 5.7.2 Test Description

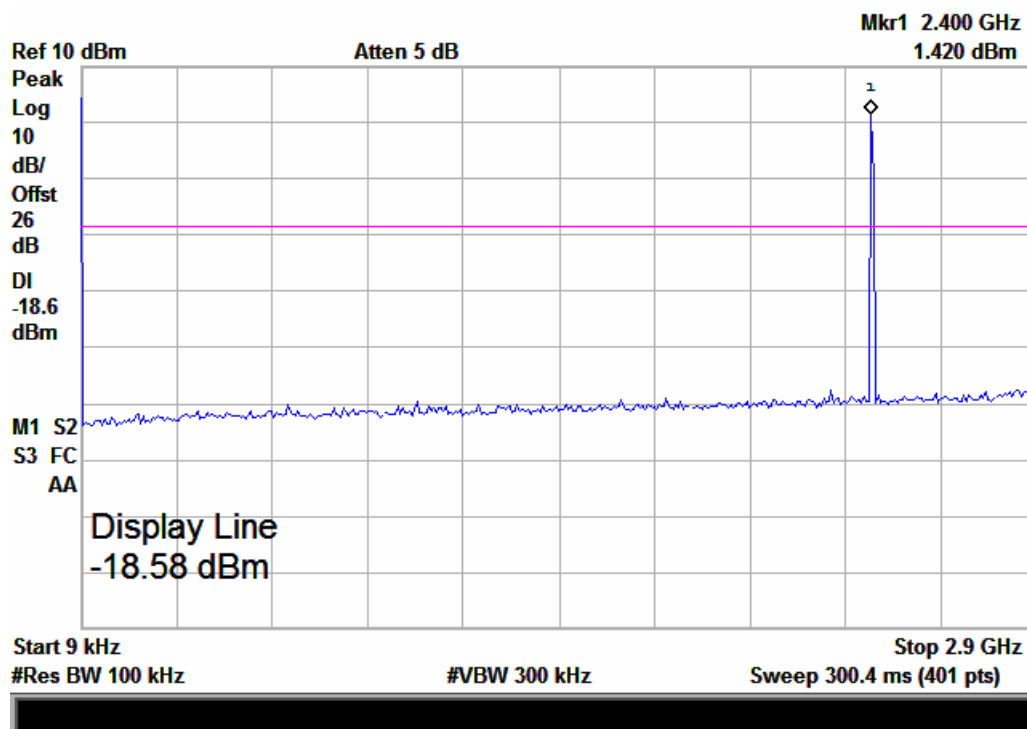
See section 0 of this report.

### 5.7.3 Test Result

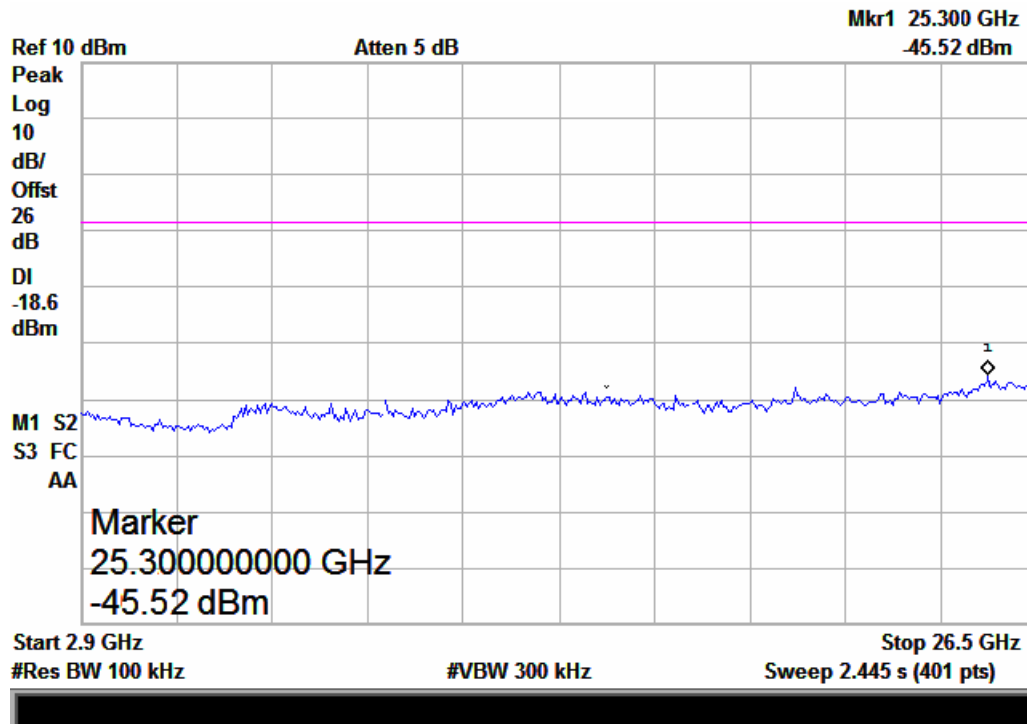
The EUT operates at hopping-off test mode. The measurement frequency range is from 9 KHz to the 10<sup>th</sup> harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

#### Test Plot:

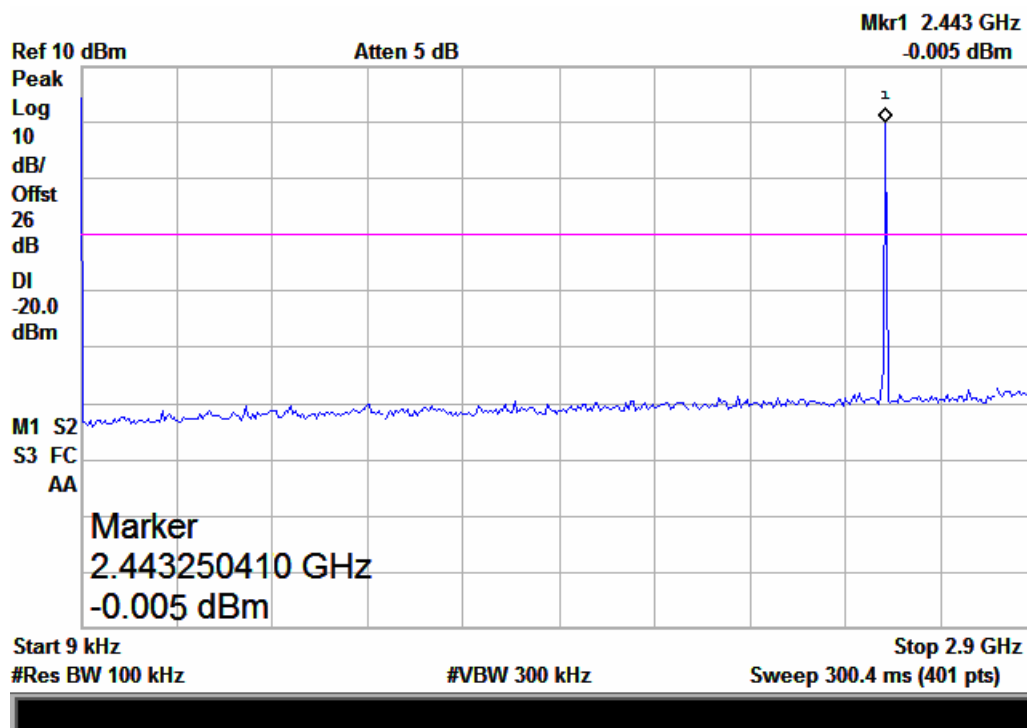
Note: the power of the Module transmitting frequency should be ignored.



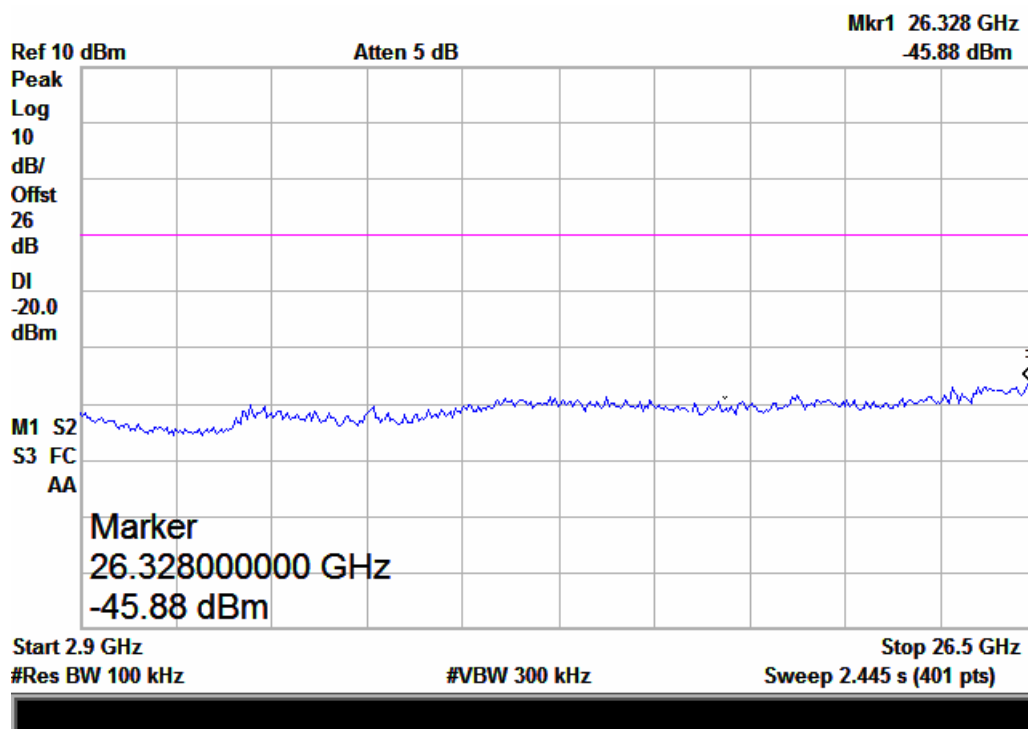
(Plot 5: Channel = 0, 9 KHz to 3GHz)



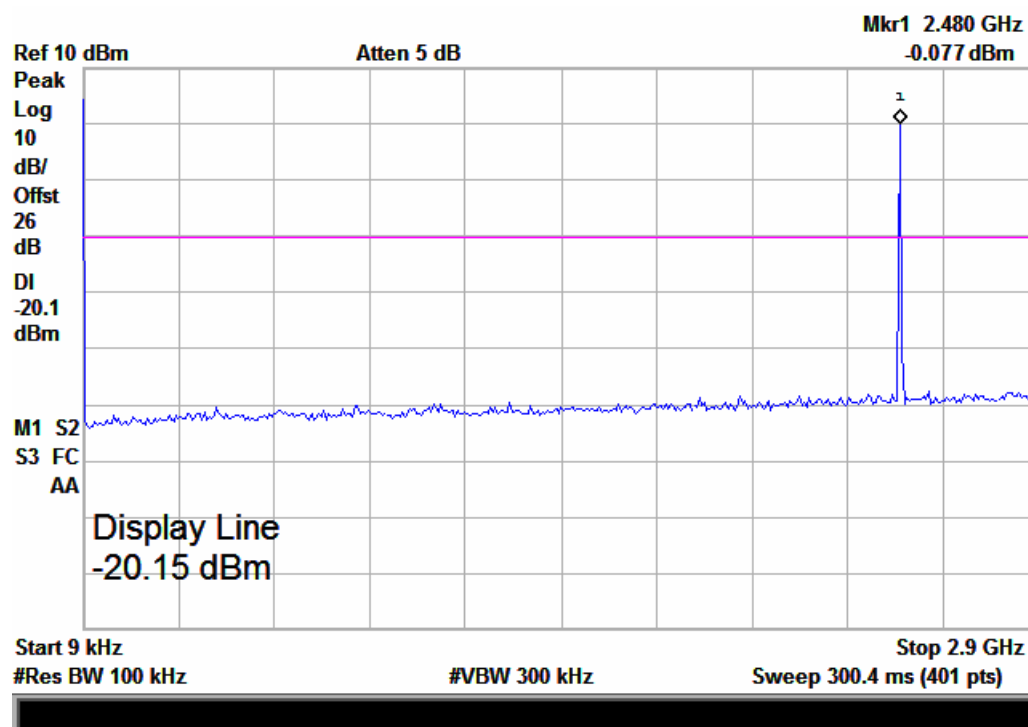
(Plot 6: Channel = 0, 3GHz to 26.5GHz)



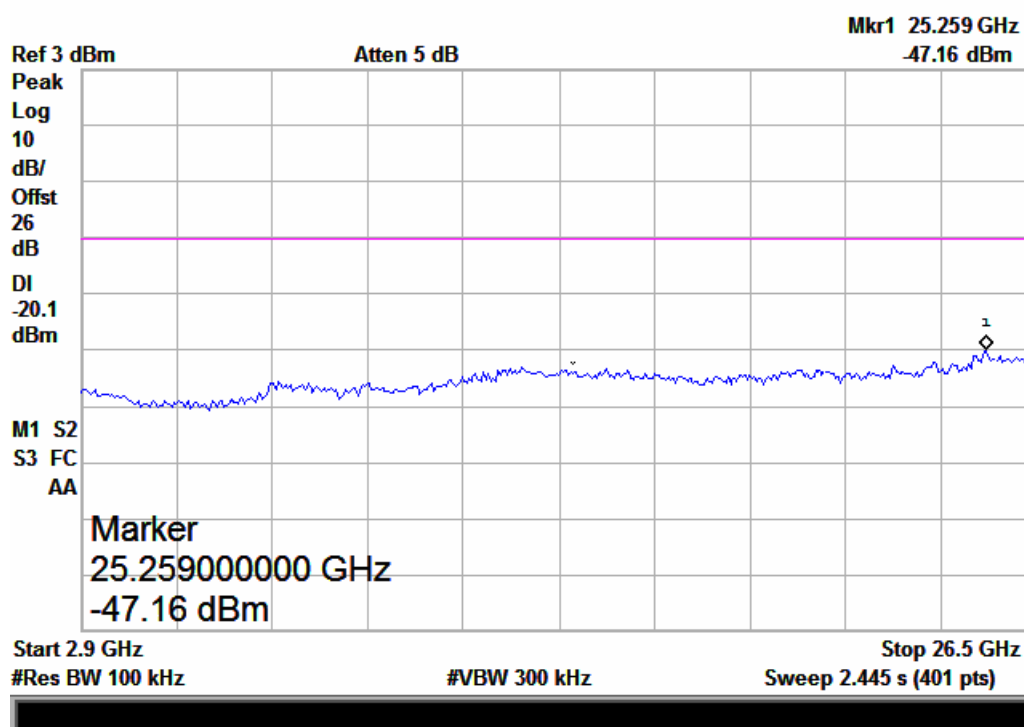
(Plot 7: Channel = 39, 9 KHz to 3GHz)



(Plot 8: Channel = 39, 3GHz to 26.5GHz)



(Plot 9: Channel = 78, 9 KHz to 3GHz)



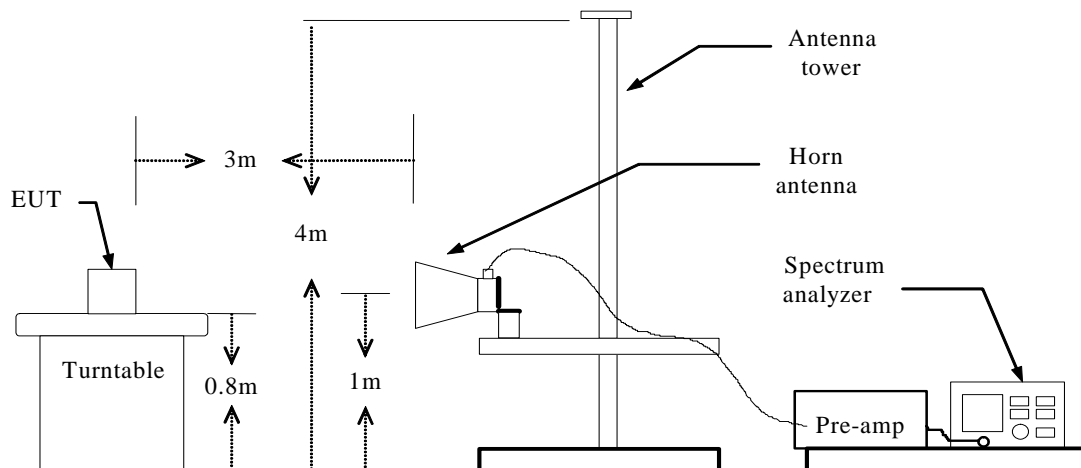
(Plot 10: Channel = 78, 3GHz to 26.5GHz)

## 5.8 Band Edge

### 5.8.1 Requirement

According to FCC section 15.247(c), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

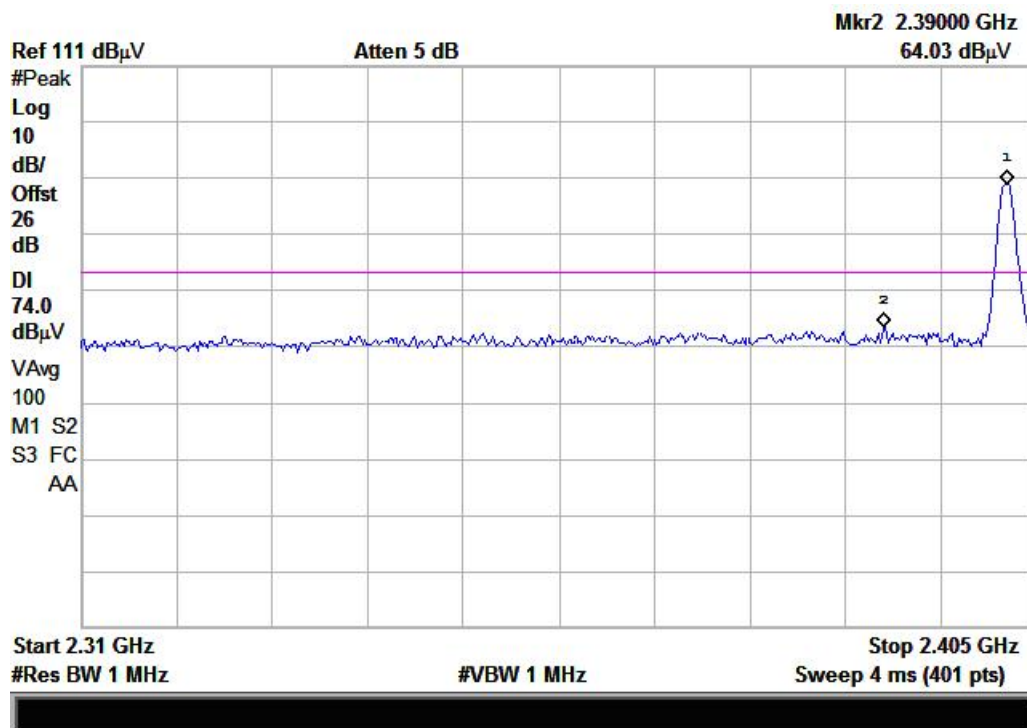
### 5.8.2 Test Description



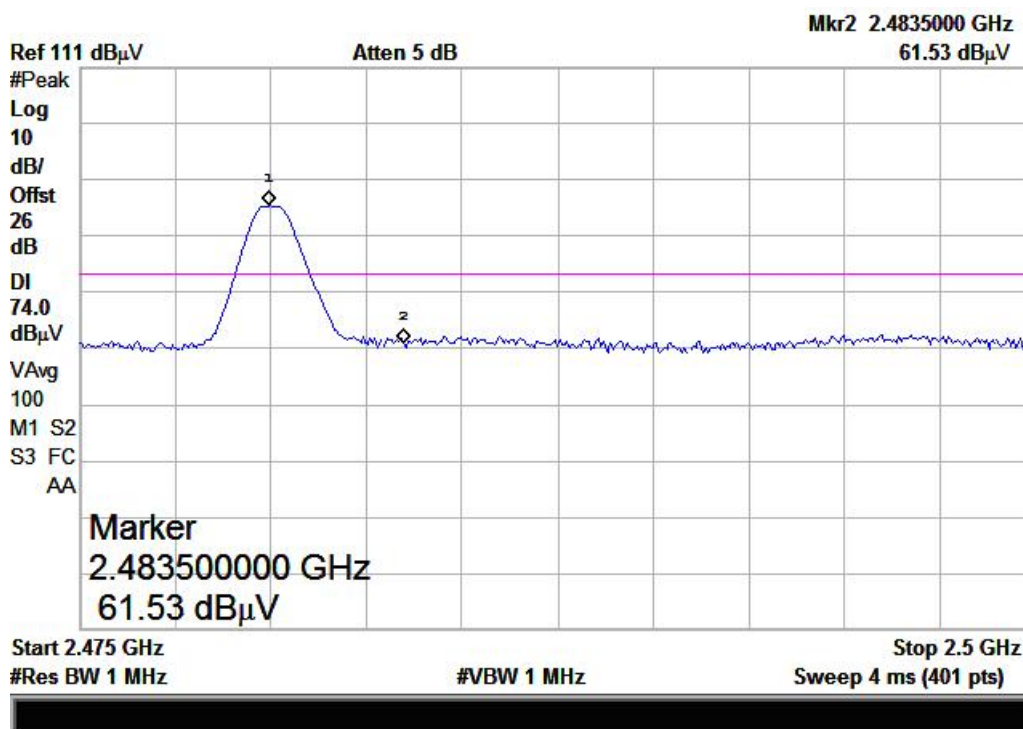
### 5.8.3 Test Result

The EUT operates at hopping-off test mode. The lowest and highest channels are tested to verify the band edge emissions.

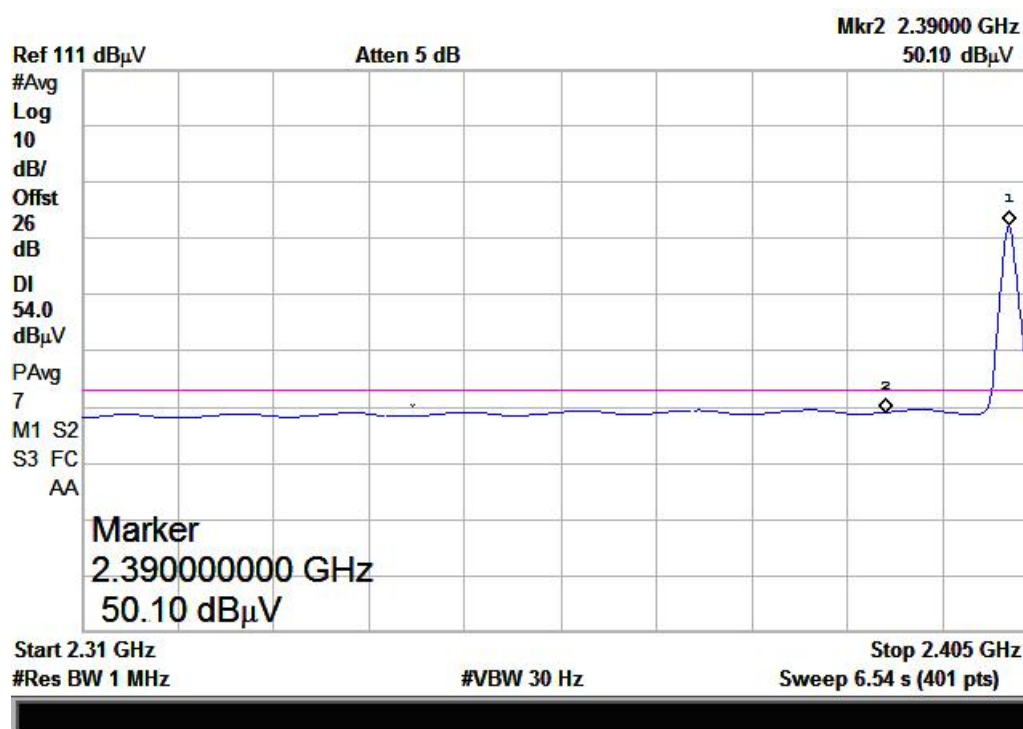
#### Test Plot:



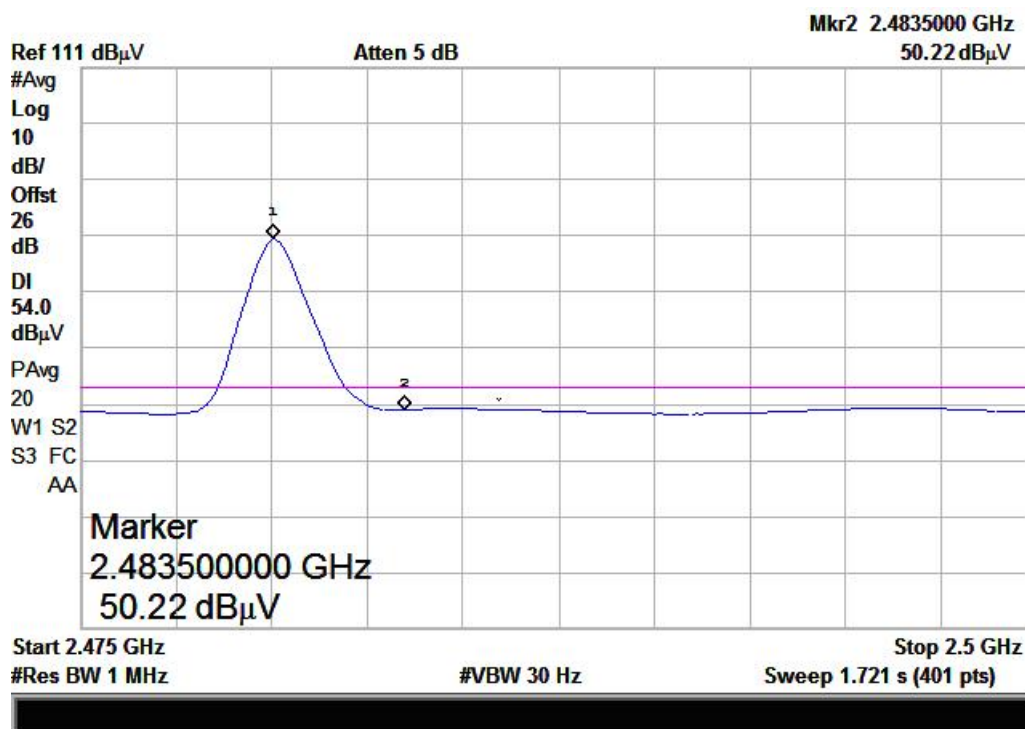
(Plot 11: Channel = 0, Detector Mode: Peak)



(Plot 12: Channel = 78, Detector Mode: Peak)



(Plot 13: Channel = 0, Detector Mode: Average)



(Plot 14: Channel = 78, Detector Mode: Average)

## 5.9 Radio Frequency Exposure

### 5.9.1 Limit

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §15.247(b)(4) and §1.1307(b)(1) of this chapter.

### 5.9.2 EUT Specification

<b>EUT</b>	GSM Mobile Phone
<b>Frequency band (Operating)</b>	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others <u>Bluetooth: 2.402GHz ~ 2.480GHz</u>
<b>Device category</b>	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure ( $S = 5mW/cm^2$ ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ( $S=1mW/cm^2$ )
<b>Antenna diversity</b>	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	-4.69dBm (0.340mW)
<b>Antenna gain (Max)</b>	1.0 dBi
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

**Note:**

1. The maximum output power is -4.69dBm (0.340mW) at 2402MHz.
2. DSS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.

### 5.9.3 Test Results

No non-compliance noted.

(SAR evaluation is not required for the PORTABLE device while its maximum output power is lower than the general population low threshold:  $60/f \text{ (GHz)} = 60/2.441 = 24.58mW$ )

### 5.9.4 MPE evaluation

PASS

## 5.10 Radiated Emission Test

### 5.10.1 Requirement

According to FCC section 15.247(c), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

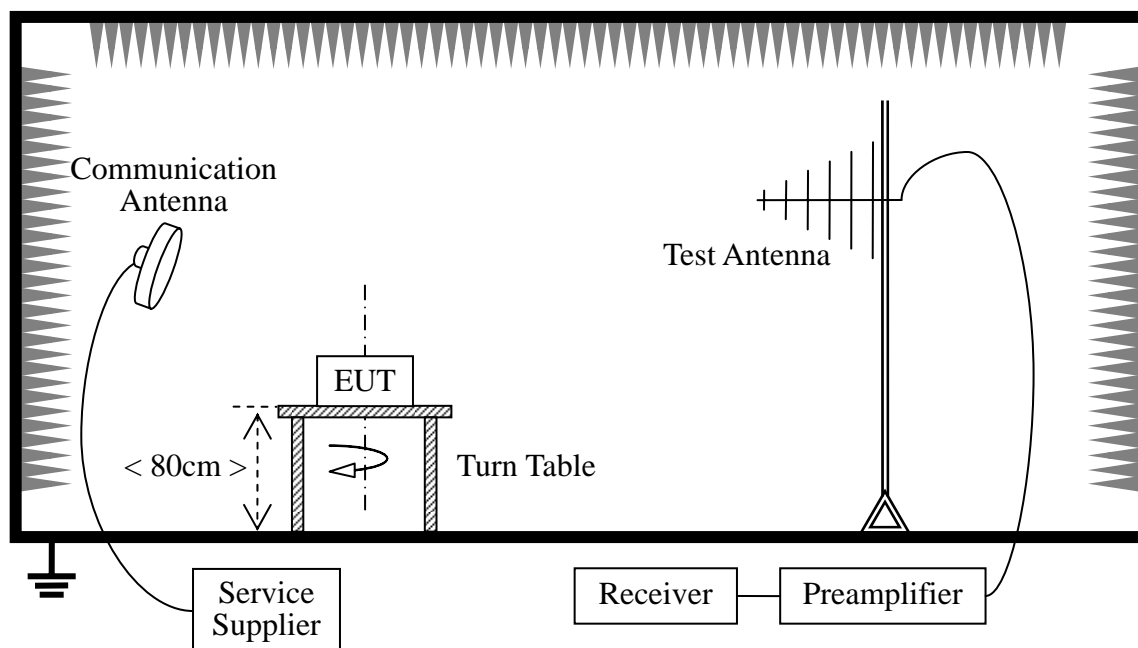
According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ )	Measurement Distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

### 5.10.2 Test Description

#### Test Setup:



The EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz AC mains supply. The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the EUT is activated and transmitting with the other Bluetooth device (Supply by the Applicant) during the test.

For the Test Antenna:

(a) In the frequency range of 9 kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

### 5.10.3 Test Result

#### Below 1 GHz

**Operation Mode:** CH Low

**Test Date:** 2009-11-23

**Temperature:** 20°C

**Tested by:** Petter Ping

**Humidity:** 70 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
--	V	Peak	--	--	--	46.00	> 10
--	V	Peak	--	--	--	46.00	> 10
--	V						> 10
--	H	Peak	--	--	--	46.00	> 10
--	H	Peak	--	--	--	46.00	> 10
--	H	Peak					> 10

#### Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100 kHz.

**Operation Mode:** CH Middle**Test Date:** 2009-11-23**Temperature:** 20°C**Tested by:** Petter Ping**Humidity:** 70 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
--	V	Peak	--	--	--	46.00	> 10
--	V	Peak	--	--	--	46.00	> 10
--	V						> 10
--	H	Peak	--	--	--	46.00	> 10
--	H	Peak	--	--	--	46.00	> 10
--	H	Peak					> 10

**Notes:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100 kHz.

**Operation Mode:** CH High**Test Date:** 2009-11-23**Temperature:** 20°C**Tested by:** Petter Ping**Humidity:** 70 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
--	V	Peak	--	--	--	46.00	> 10
--	V	Peak	--	--	--	46.00	> 10
--	V						> 10
--	H	Peak	--	--	--	46.00	> 10
--	H	Peak	--	--	--	46.00	> 10
--	H	Peak					> 10

**Notes:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100 kHz.

**Above 1 GHz****Operation Mode:** CH Low**Test Date:** 2009-11-23**Temperature:** 20°C**Tested by:** Petter Ping**Humidity:** 70 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4804.46	V	40.11	---	5.95	46.06	---	74.00	54.00	-27.94	Peak
N/A									>10	
N/A										
N/A										
N/A										
4804.46	H	40.56	---	5.95	46.51	---	74.00	54.00	-27.49	Peak
N/A									>10	
N/A										
N/A										
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: CH Mid

Test Date: 2009-11-23

Temperature: 20°C

Tested by: Petter Ping

Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4882.13	V	41.73	---	6.72	48.45	---	74.00	54.00	-25.55	Peak
N/A									>10	
N/A										
N/A										
N/A										
4882.13	H	42.63	---	6.72	49.35	---	74.00	54.00	-24.65	Peak
N/A									>10	
N/A										
N/A										
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

**Operation Mode:** CH High**Test Date:** 2009-11-23**Temperature:** 20°C**Tested by:** Petter Ping**Humidity:** 70 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit dBuV/m	AV Limit dBuV/m	Margin (dB)	Remark
					Peak dBuV/m	AV dBuV/m				
4960.26	V	42.19	---	7.55	49.74	---	74.00	54.00	-24.26	Peak
N/A										
N/A										
N/A										
N/A										
4960.26	H	42.64	---	7.55	50.19	---	74.00	54.00	-23.81	Peak
N/A										
N/A										
N/A										
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

-----END OF REPORT-----