47 CFR PART 15B, 15C

TEST REPORT

of

GSM Mobile Phone Watch

Model Name: M500

Brand Name: WATCHFONE

Report No.: SZ07030048E02

FCC ID: U8RM500

prepared for

SMS Technology Australia PTY Ltd.

Suite 8 Harbour Point, Marina Shopping Village Santa Barbara Road,

Hope Island Queensland 4212, Australia

prepared by

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TABLE OF CONTENTS

1. TEST CERTIFICATION

Equipment under Test:	GSM Mobile Phone Watch
Application Type:	Certification
FCC ID:	U8RM500
Model Name:	M500
Brand Name:	WATCHFONE
Applicant Information:	SMS Technology Australia PTY Ltd.
Address:	Suite 8 Harbour Point, Marina Shopping Village Santa Barbara Road, Hope Island Queensland 4212, Australia
Contact:	Gavin Hutcheson
Tel.:	+61755 109 111
Fax:	+61755 109 211
E-mail:	ghutcheson@smstech.com.au
Rated Power:	<= 4dBm
Test Standards:	47 CFR Part 15B, 15C
Test Date(s):	April 20, 2007 - April 22, 2007
Test Result:	PASS

*** We Hereby Certify That:**

The equipment was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test results of this report only apply for the sample equipment identified above. The test data, data evaluation, test procedures and equipment configurations shown in this report were made according to the requirements of related FCC rules. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Ni Yong Dated: 2007.4.23
Ni Yong

Reviewed by: Zhang Weimin Dated: 2007.4.23

Approved by: Shu Luan Dated: 2007.4.23
Shu Luan

2. GENERAL INFORMATION

2.1 Test Sample Information

For the test sample received from/supplied by the applicant, we summarized as below:

1. Equipment under Test (EUT)

EUT Description	:	GSM Mobile Phone Watch
Model Name	:	M500
Manufacturer	:	ELECA (HK) LTD 59th Floor, Diwang Commercial Centr 5002 ShenNan Road, Shenzhen, P. R. China
Serial No.	:	(n.a., marked #1 by test site)
OUI.	:	00025BAC879F
Hardware Version	:	V1.0
Software Version	:	V0.0.1
Modulation(s)	:	Frequency Hopping Spread Spectrum (FHSS)
Frequency Range	:	The frequency range used is from 2402MHz to 2480MHz (79 channels, at intervals of 1MHz); The frequency block is 2400MHz to 2483.5MHz.
Antenna	:	Permanent attached, Gain=2dBi
Power Supply	:	Battery

Model Name:	M500	
Brand Name:	ELECA	
Manufacturer:	ELECA POWER TECH. LTD.	
Serial No.:	(n.a., marked #1 by test site)	
Capacitance:	400mAh	
Voltage:	Rated Normal Voltage:	3.7VDC
	Lowest Extreme Voltage:	3.5VDC
	Highest Extreme Voltage:	4.2VDC

2. Ancillary Equipments (AE)

AE-1	:	AC Adapter (Charger for Battery)
Model Name:	(n.a.)	
Brand Name:	ELECA	
Manufacturer:	HUAYE NEW LTD.	
Serial No.:	(n.a. marked #1 by test site)	
Rated Input:	~ 110-240V, 50-60Hz	
Rated Output:	⎓ 5.5V, 400mA	

	Wire Length:	150cm
AE-2 .....:	Bluetooth Earphone	
	Model Name:	(n.a.)
	Brand Name:	(n.a.)
	Manufacturer:	(n.a.)
	Serial No.:	(n.a., marked #1 by test site)

3. Additional Information

(a) The Test Sample (EUT), containing the GSM Module (EUT_GSMmodule) and the Bluetooth Module (EUT_BTmodule), is classified as a "Class B digital device". The EUT_BTmodule is mainly considered and tested in this test report.

(b) The frequencies allocated for the EUT_BTmodule can be represented with the formula F_{BT}(MHz)=2402+N, N∈[0, 78]; the lowest, middle, highest channel numbers used and tested in this report are separately 0 (2402MHz), 39 (2441MHz) and 78 (2480MHz).

(c) For more detailed description about the Test Sample (EUT), please refer to specification or user's manual supplied by the applicant and/or manufacturer.

2.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15B and Part 15C for the FCC ID Certification:

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

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result	Date of Test
FCC Part 15B Requirement				
1	15.107	Conducted Emissions	PASS	2007-4-22
2	15.109	Radiated Emissions	PASS	2007-4-22
FCC Part 15C Requirement				
1	15.247(a)	Number of Hopping Frequency	PASS	2007-4-21
2	15.247(b)	Peak Output Power	PASS	2007-4-21
3	15.247(a)	20dB Bandwidth	(n.a.)	2007-4-21
4	15.247(a)	Carrier Frequency Separation	PASS	2007-4-21
5	15.247(a)	Time of Occupancy (Dwell time)	PASS	2007-4-21
6	15.247(c)	Conducted Spurious Emission	PASS	2007-4-21
7	15.247(c)	Band Edge	PASS	2007-4-21
8	15.207	Conducted Emission	PASS	2007-4-22
9	15.209 15.247(c)	Radiated Emission	PASS	2007-4-22

2.3 Facilities and Accreditations

2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Board for Laboratories (CNAL) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

2.3.2 Test Environment Conditions

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

Temperature (°C):	20 - 25
Relative Humidity (%):	40 - 60
Atmospheric Pressure (kPa):	960

3. 47 CFR PART 15B REQUIREMENT

3.1 Test Mode(s)

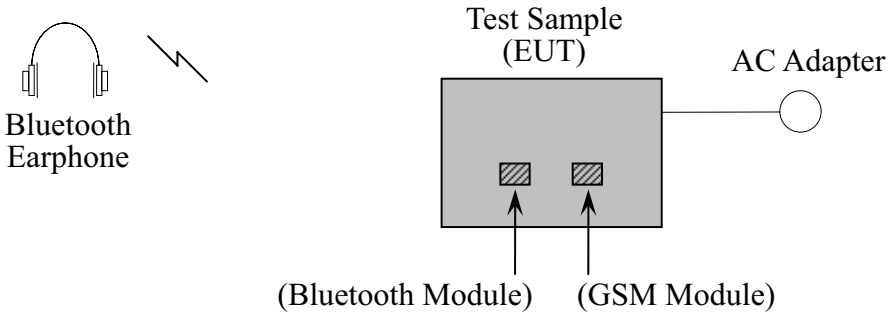
According to the description of Test Sample Configuration in section 2.1 of this test report, several test mode(s) are employed to perform tests as below for the actual application:

1. Call Test Mode

The EUT_GSMmodule of the Test Sample (EUT), allocated a traffic channel, operates on the middle channel of the PCS 1900MHz band under the condition of its maximum output power. The EUT_BTmodule is activated and the audio link of the EUT_GSMmodule is routed to the Bluetooth Earphone (AE-2) via the EUT_BTmodule.

The Test Sample (EUT) is powered by the Battery, which is charged with the AC Adapter (AE-1) powered by 120V 60Hz AC mains supply.

The figure below is the test configuration for the Test Sample (EUT) employed in this test report under this test mode:



3.2 Conducted Emissions

3.2.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ohm line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-Peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

NOTE:

a) The limit subjects to the Class B digital device.
b) The lower limit shall apply at the band edges.
c) The limit decreases linearly with the logarithm of the frequency in the range from 0.15MHz to 0.50MHz.

3.2.2 Test Procedure

(a) The test frequency range is from 150kHz to 30MHz.

(b) The Peak (PK) detector is employed to sweep the conducted interference over the test frequency range.

(c) For the swept signals that are more than or have narrow negative margins beyond the Average (AV) and Quasi-peak (QP) limit lines, the AV and QP detectors are employed to measure these suspect signals to find their maximum QP and AV readings.

(d) Both L Phase and N Phase lines of the power mains connected to the Test Sample (EUT) are employed to perform this test.

(e) All Test Modes for the Test Sample (EUT) listed in section 3.1 are employed to perform this test.

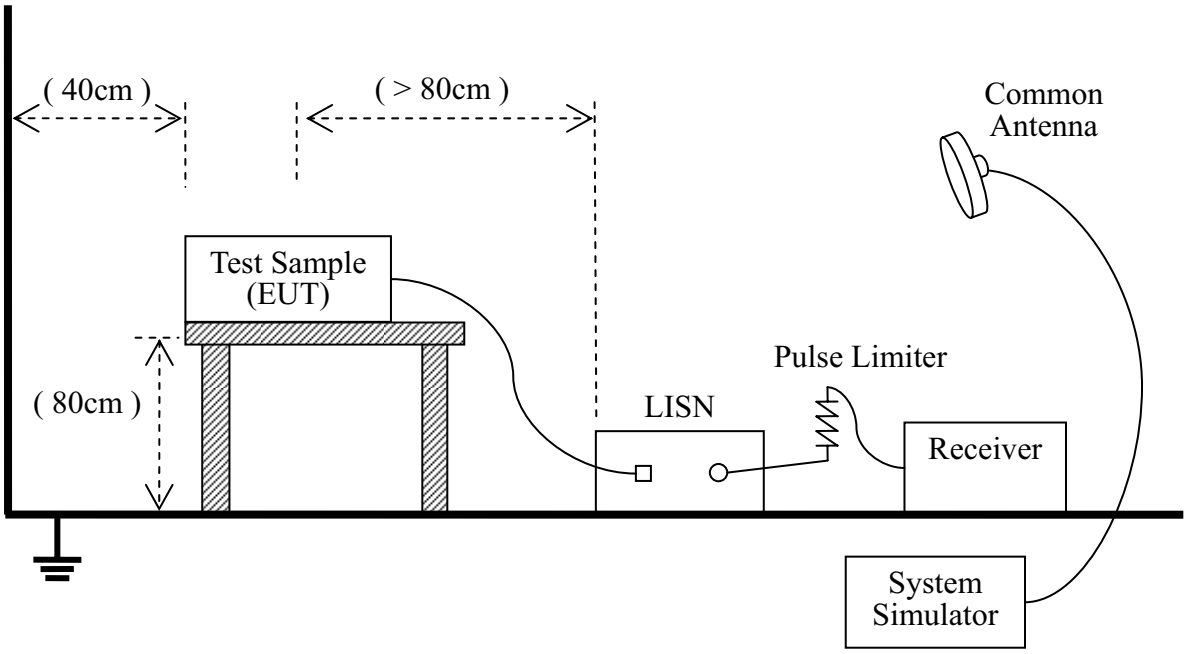
3.2.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The Test Sample (EUT) is connected to the power mains through a LISN which provides 50μH/50Ohm of coupling

impedance for the measuring instrument of a Receiver. A Pulse Limiter is employed to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

The Test Sample (EUT) works together with a System Simulator via a Common Antenna.



2. Equipments List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Agilent	E7405A	US44210471	2006.07	1year
LISN	Schwarzbeck	NSLK 8127	812744	2006.08	1year
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)	(n.a.)
System Simulator	Agilent	E5515C	GB43130131	2006.06	1year
Common Antenna	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)

3.2.4 Test Result

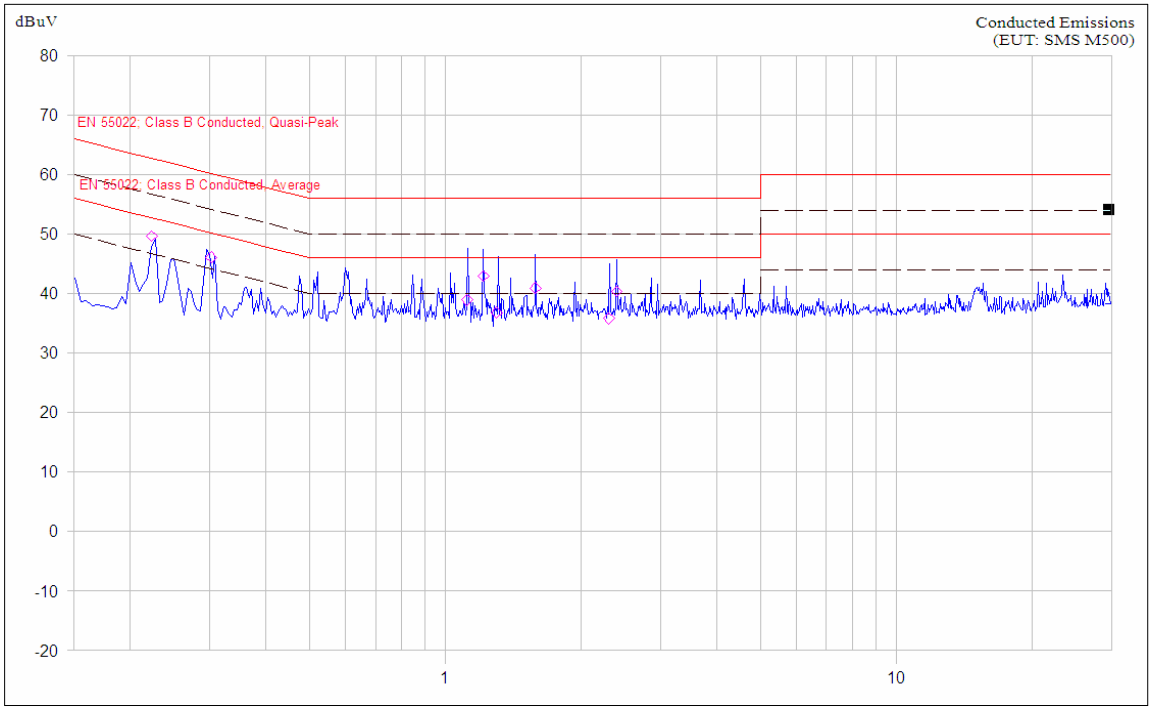
1. Call Test Mode

a) Test Verdict Recorded for Suspect Points

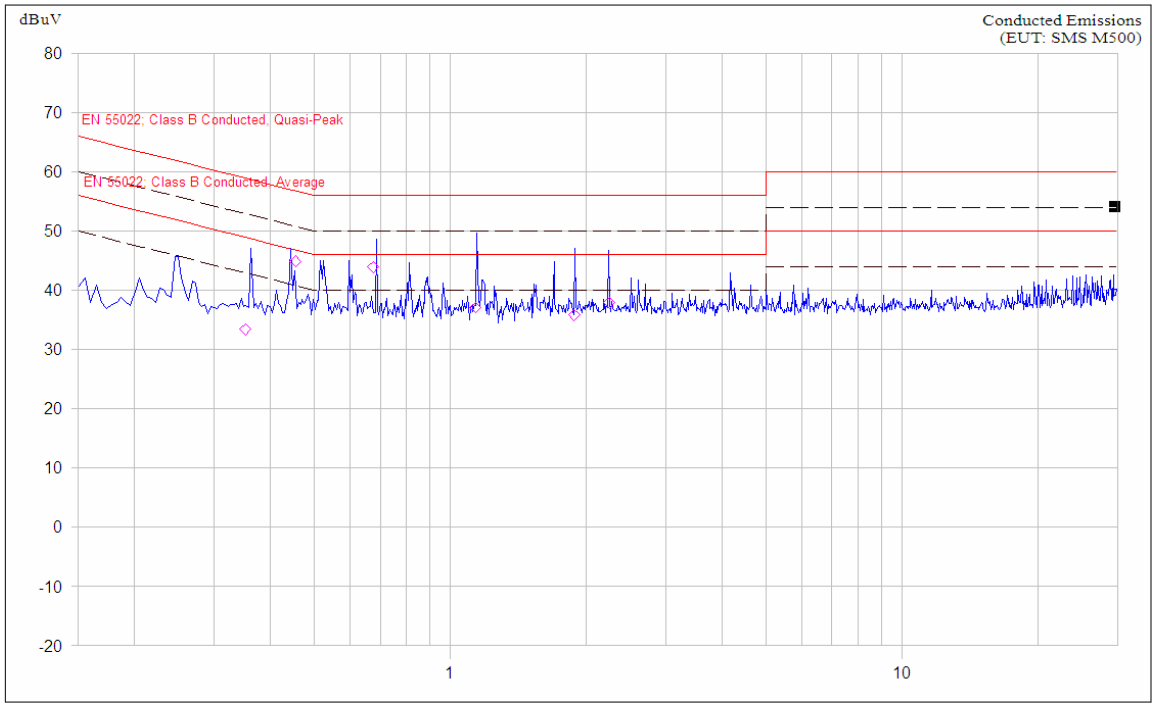
No.	@Frequency (MHz)	Suspect Emission Levels (dBµV)				Limit (dBµV)		Verdict
		PK	QP	AV	Phase	QP	AV	
1	0.352	33.4	29.0	22.4	N	58.9	48.9	PASS
2	0.454	44.9	41.2	26.0	N	56.8	46.8	PASS
3	0.675	43.9	37.3	23.6	N	56.0	46.0	PASS

No.	@Frequency (MHz)	Suspect Emission Levels (dBµV)				Limit (dBµV)		Verdict
		PK	QP	AV	Phase	QP	AV	
4	1.137	37.0	32.3	22.5	N	56.0	46.0	PASS
5	1.879	35.8	30.5	21.7	N	56.0	46.0	PASS
6	2.251	37.9	28.8	21.4	N	56.0	46.0	PASS
7	0.223	49.6	46.3	31.5	L	62.7	52.7	PASS
8	0.302	46.1	42.5	27.1	L	60.2	50.2	PASS
9	1.116	38.9	33.5	23.4	L	56.0	46.0	PASS
10	1.214	42.9	34.1	23.0	L	56.0	46.0	PASS
11	1.584	40.9	32.4	22.8	L	56.0	46.0	PASS
12	2.399	40.3	29.7	21.7	L	56.0	46.0	PASS

b) Test Plots



(Plot A: L Phase)



(Plot B: N Phase)

3.3 Radiated Emissions

3.3.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength	
	μV/m	dBμV/m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE:

a) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
b) In the emission tables above, the tighter limit applies at the band edges.

3.3.2 Test Procedure

(a) The test frequency range is from 30MHz to 1GHz.

(b) The Test Antenna is located at 1m height. The Peak (PK) detector is employed to sweep the radiated interference over the test frequency range while the Turn Table is located separately at the degree of $DEG_{TT}(N)=N*45$, $N \in [0, 8]$.

(c) For each swept signal that is more than or have narrow negative margins beyond the Quasi-peak (QP) limit line, rotate the Turn Table and vary the Test Antenna height until the emission is at its highest amplitude; then tuned the Receiver and use the QP detector to measure this suspect signal to find its maximum QP reading.

(d) Both the Vertical (V) and the Horizontal (H) polarizations of the Test Antenna are employed to perform this test.

(e) All Test Modes for the Test Sample (EUT) listed in section 3.1 are employed to perform this test.

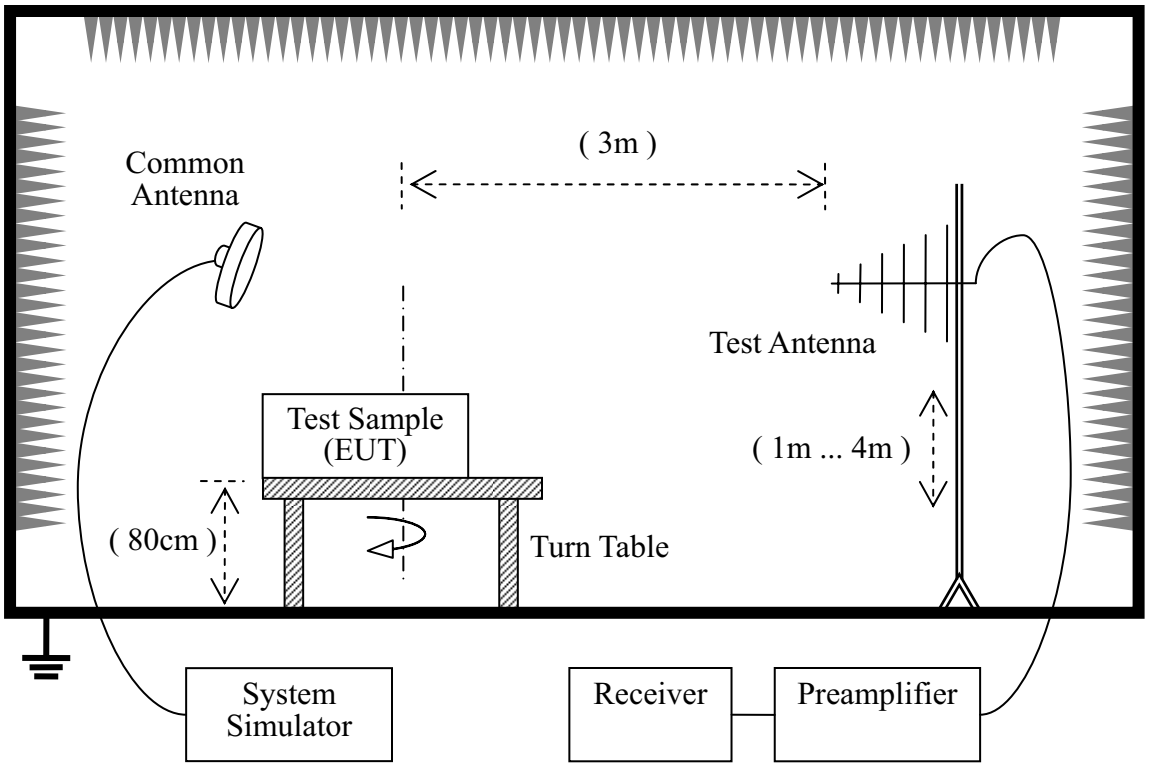
3.3.3 Test Setup

1. Test Setup Sketch

The test is performed in a 3m Semi-Anechoic Chamber. The Test Sample (EUT) is placed on a 0.8m high insulating Turn Table and keeps 3m away from the Test Antenna which is a Bi-Log one with working frequency range from 30MHz to 3GHz and is mounted on a variable-height antenna master

tower. If applicable, a Preamplifier is employed for the measuring instrument of a Receiver. The factors of the whole test system are calibrated to correct the reading.

The Test Sample (EUT) works together with a System Simulator (SS) via a Common Antenna.



2. Equipments List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Agilent	E7405A	US44210471	2006.07	1year
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2006.08	2year
Test Antenna (Bi-Log)	Schwarzbeck	VULB 9163	9163-274	2006.07	1year
System Simulator	Agilent	E5515C	GB43130131	2006.06	1year
Preamplifier	(n.a.)	20dB	(n.a.)	(n.a.)	(n.a.)
Common Antenna	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)

3.3.4 Test Result

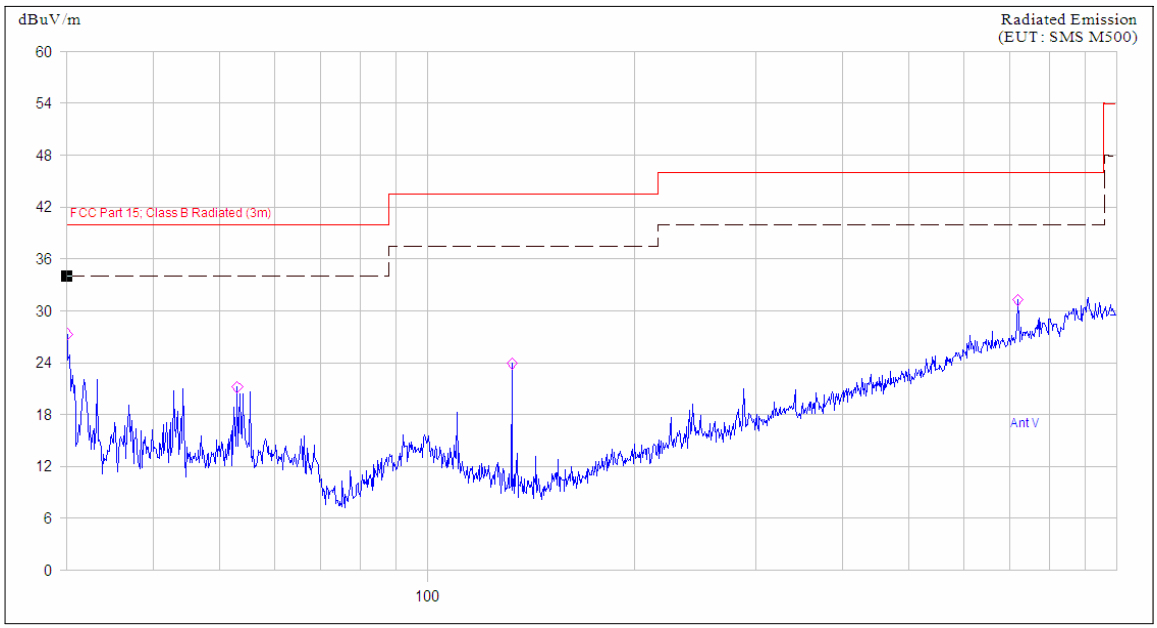
NOTE: the emissions of Test Sample (EUT) and SS carrier frequencies should be ignored.

1. Call Test Mode

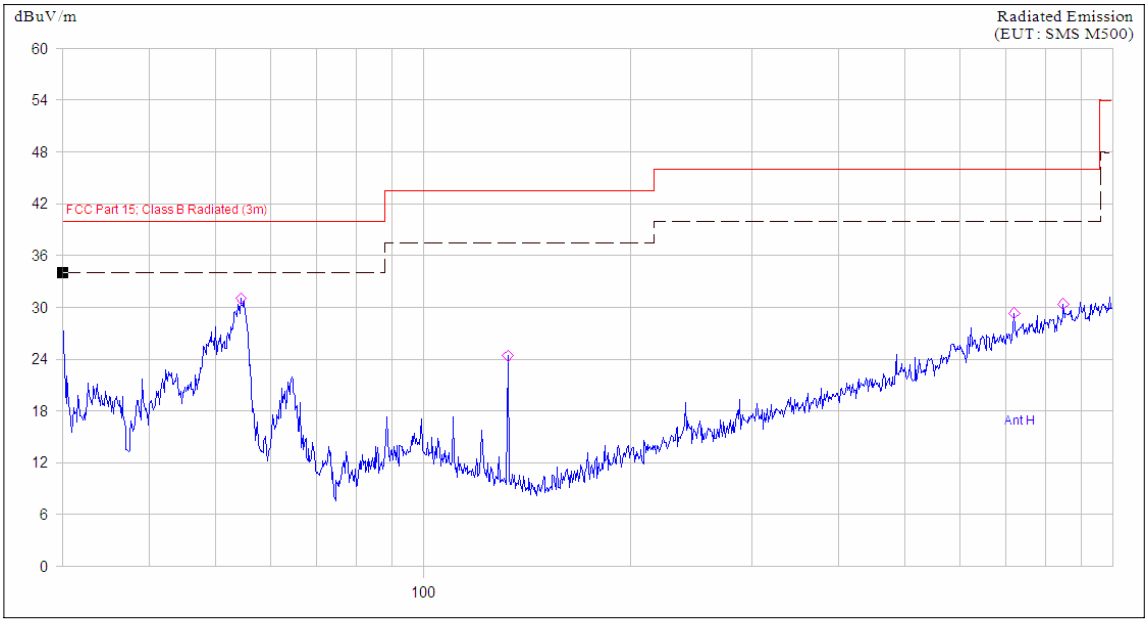
a) Test Verdict Recorded for Suspect Points

No.	@Frequency (MHz)	Suspect Emission Levels (dBμV/m)					QP Limit (dBμV/m)	Result
		PK	QK	Turn Table (degree)	Test Antenna			
					Height (cm)	Polar.		
1	30.072	27.3	---	180	100	V	40.0	PASS
2	52.992	21.2	---	180	100	V	40.0	PASS
3	132.780	23.9	---	180	100	V	43.5	PASS
4	720.108	31.2	---	180	100	V	46.0	PASS
5	54.444	31.0	---	180	100	H	40.0	PASS
6	132.720	24.4	---	180	100	H	43.5	PASS
7	720.168	29.3	---	180	100	H	46.0	PASS
8	848.940	30.4	---	180	100	H	46.0	PASS

b) Test Plots



(Plot A: Test Antenna Vertical)



(Plot B: Test Antenna Horizontal)

4. 47 CFR PART 15C REQUIREMENT

4.1 Number of Hopping Frequency

4.1.1 Requirement

According to FCC section 15.247(a)(1)(ii), frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 75 hopping frequencies.

4.1.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping on test mode, and the middle channel of the EUT_BTmodule is selected to perform this test.

(b) The Spectrum Analyzer is set as below:

- Frequency Range: Wide enough to cover the range from 2400MHz to 2483.5MHz
- Resolution BW: 300kHz
- Video BW: Auto
- Sweep Time: Suitable to capture one transmission burst
- Detector Mode: Peak
- Trace Mode: Max Hold

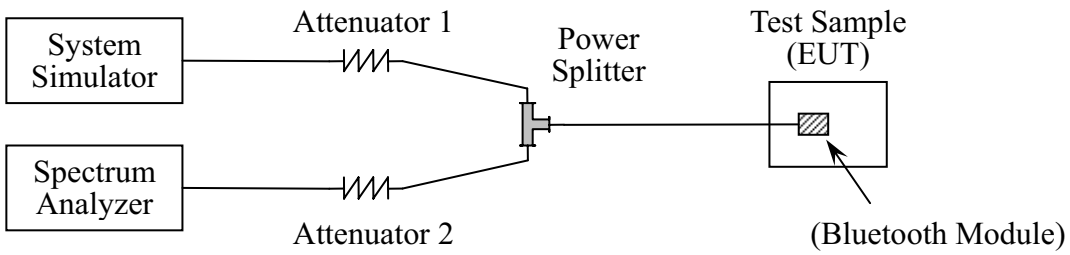
(c) Count the number of the peak envelope of the trace from the Spectrum Analyzer and record it as the number of hopping frequency.

4.1.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

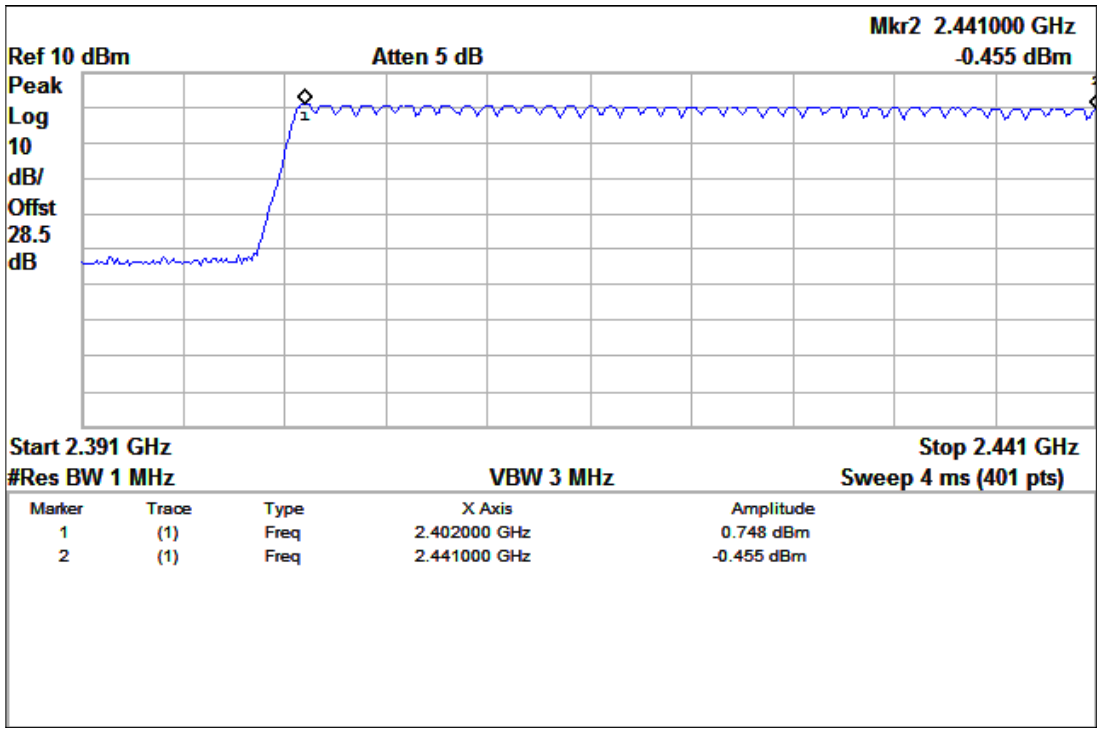
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

4.1.4 Test Result

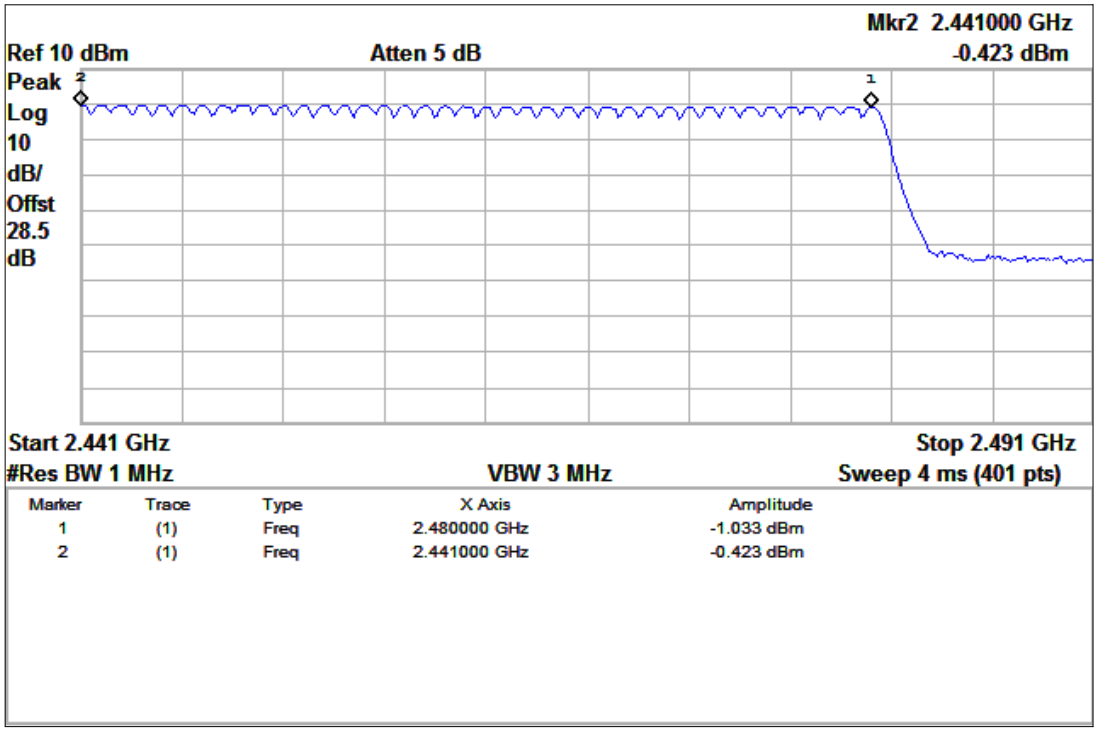
a) Test Verdict

Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Refer to Plot	Verdict
2400 - 2483.5	79	75	Plot A.1/A.2	PASS

b) Test Plots



(Plot A.1: 2402MHz to 2441MHz)



(Plot A.2: 2441MHz to 2480MHz)

4.2 Maximum Peak Output Power

4.2.1 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.

4.2.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping off test mode.

(b) The lowest, middle and highest channels of the EUT_BTmodule are employed to perform this test.

(c) The Spectrum Analyzer is set as below:

- Center Frequency: The frequency of the channel under test
- Resolution BW: 1MHz
- Video BW: Auto
- Frequency Span: Wide enough to cover the complete power envelope of the signal
- Sweep Time: Suitable to capture one transmission burst
- Detector Mode: Peak
- Trace Mode: Max Hold

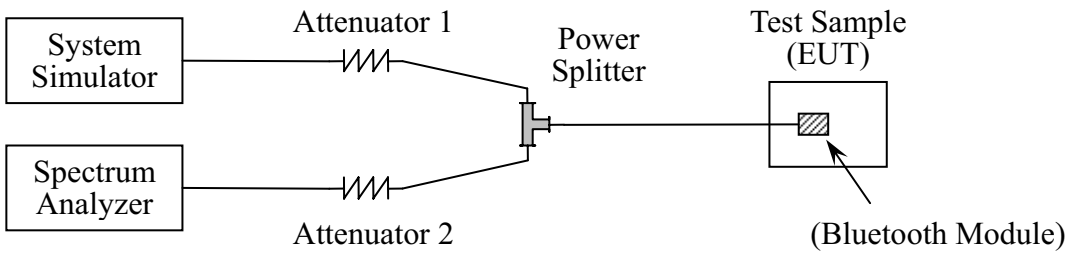
(d) Find the peak value of the trace from the Spectrum Analyzer and record its power.

4.2.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

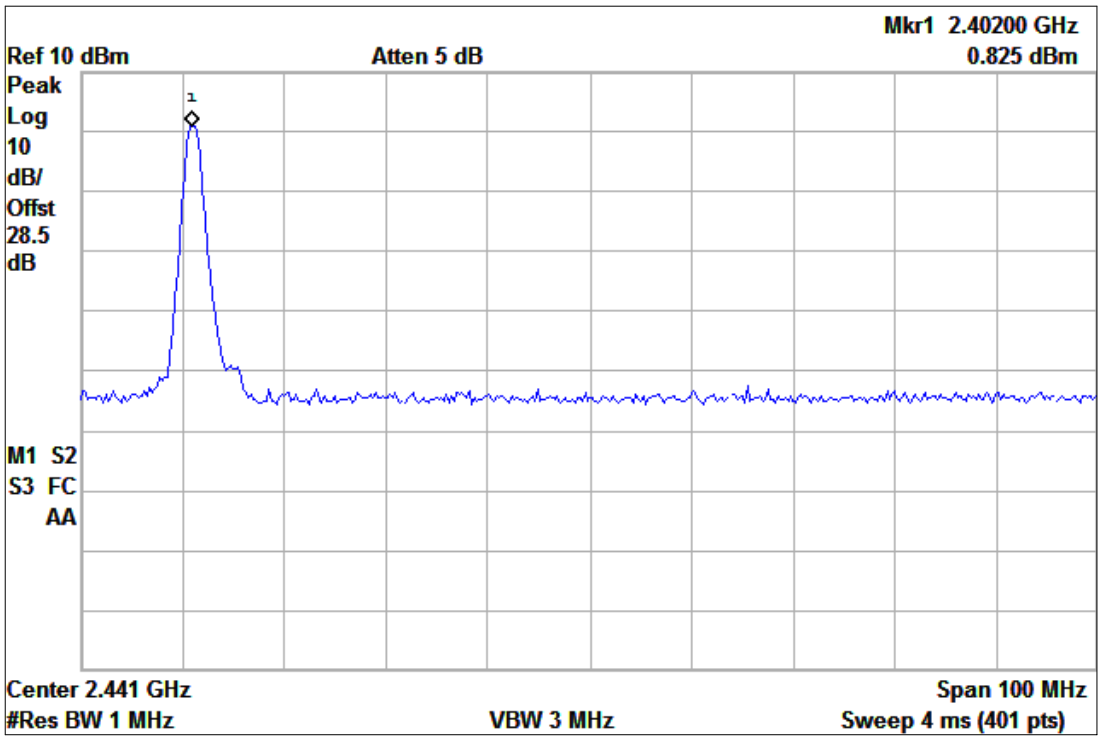
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

4.2.4 Test Result

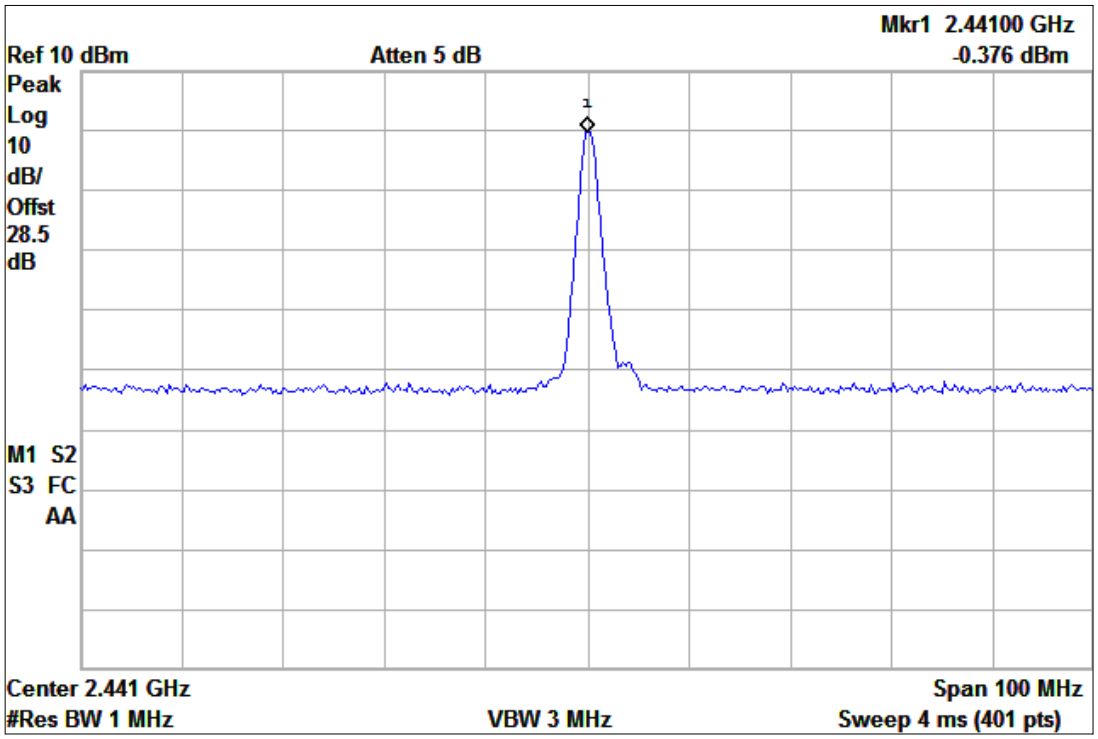
a) Test Verdict

CH	Freq. (MHz)	Measured Max. Peak Output Power			Limit		Verdict
		dBm	W	Refer to Plot	dBm	W	
0	2402	0.825	1.21E-3	Plot A	30	1	PASS
39	2441	-0.376	0.92E-3	Plot B			PASS
78	2480	-1.029	0.79E-3	Plot C			PASS

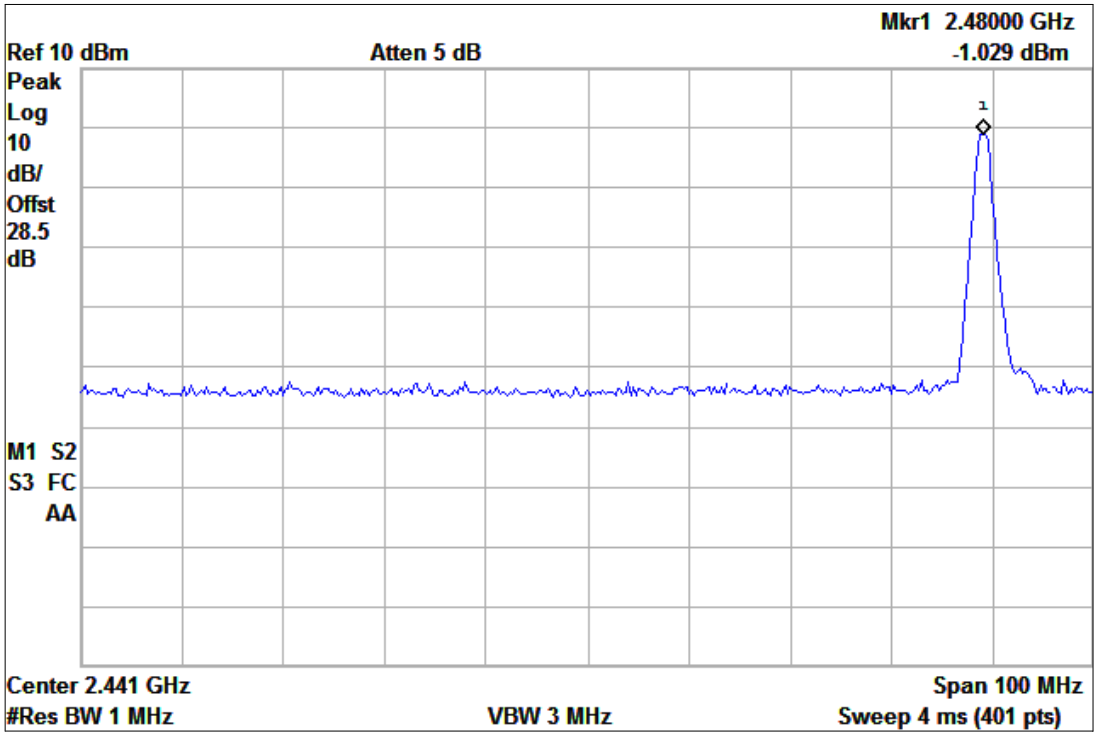
b) Test Plots



(Plot A: Channel = 2402)



(Plot B: Channel = 2441)



(Plot C: Channel = 2480)

4.3 20dB Occupied Bandwidth

4.3.1 Definition

The 20dB bandwidth is known as the 99% emission bandwidth, or 20dB bandwidth (10*log1% = 20dB) taking the total RF output power.

4.3.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping off test mode.

(b) The lowest, middle and highest channels of the EUT_BTmodule are employed to perform this test.

(c) The Spectrum Analyzer is set as below:

- Center Frequency: The frequency of the channel under test
- Resolution BW: 10kHz
- Video BW: Auto
- Frequency Span: Wide enough to cover the complete power envelope of the signal
- Sweep Time: Suitable to capture one transmission burst
- Detector Mode: Peak
- Trace Mode: Max Hold

(d) Find the peak value of the trace and place the Spectrum Analyzer marker on this peak as marker#1.

(e) Use a second marker of the Spectrum Analyzer and find the frequency below the operating frequency at which the level is 20dB below the power of the marker#1. This frequency is recorded as f_L.

(f) Use a third marker (or the delta marker of the second marker) of the Spectrum Analyzer and find the frequency above the operating frequency at which the level is 20dB below the power of the marker#1. This frequency is recorded as f_H.

(g) The difference between the frequencies measured (f_H-f_L) is the 20dB Occupied Bandwidth.

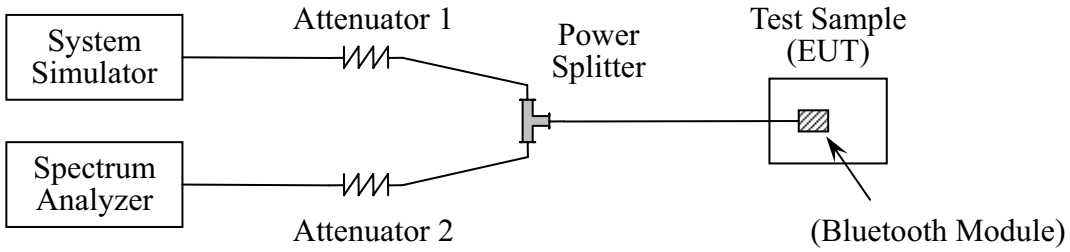
4.3.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the

factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

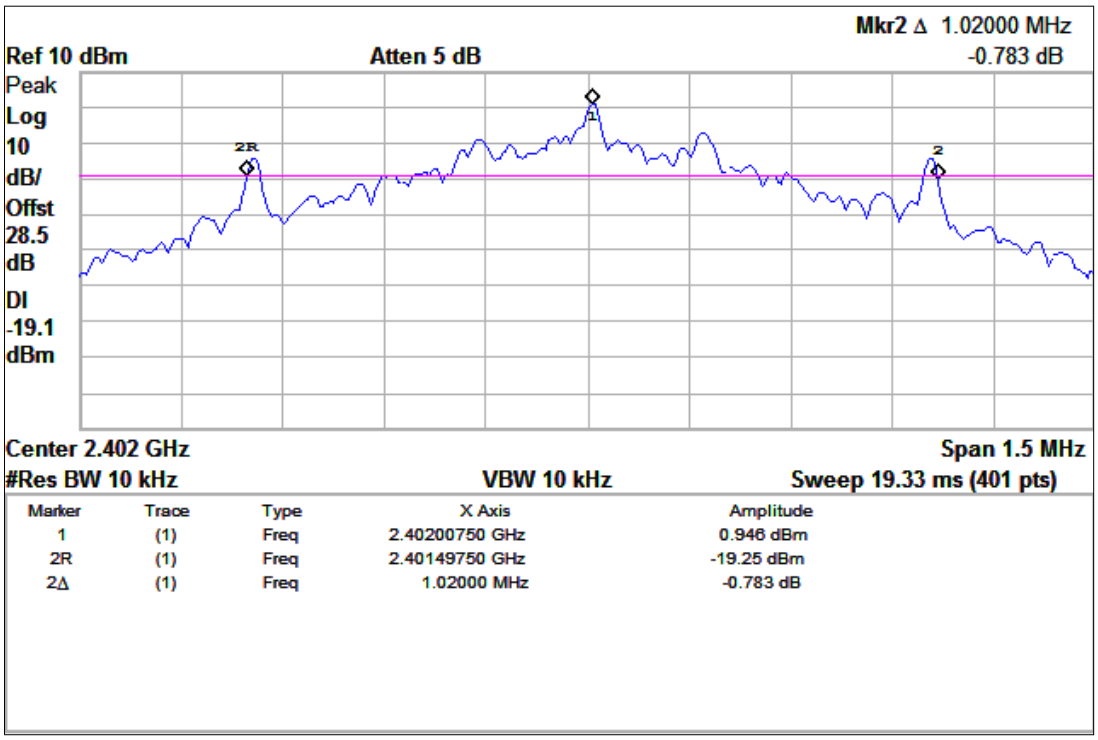
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

4.3.4 Test Result

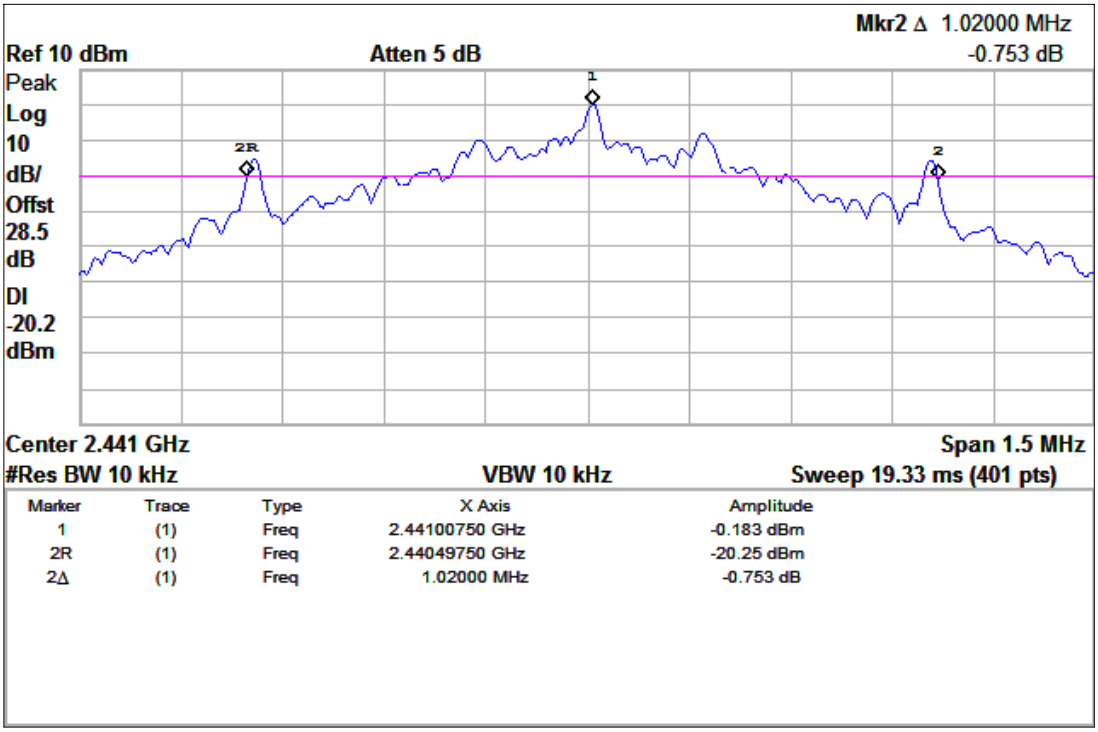
a) Test Verdict

CH	Freq. (MHz)	20dB Bandwidth (MHz)	Refer to Plot
0	2402	1.02	Plot A
39	2441	1.02	Plot B
78	2480	1.02	Plot C

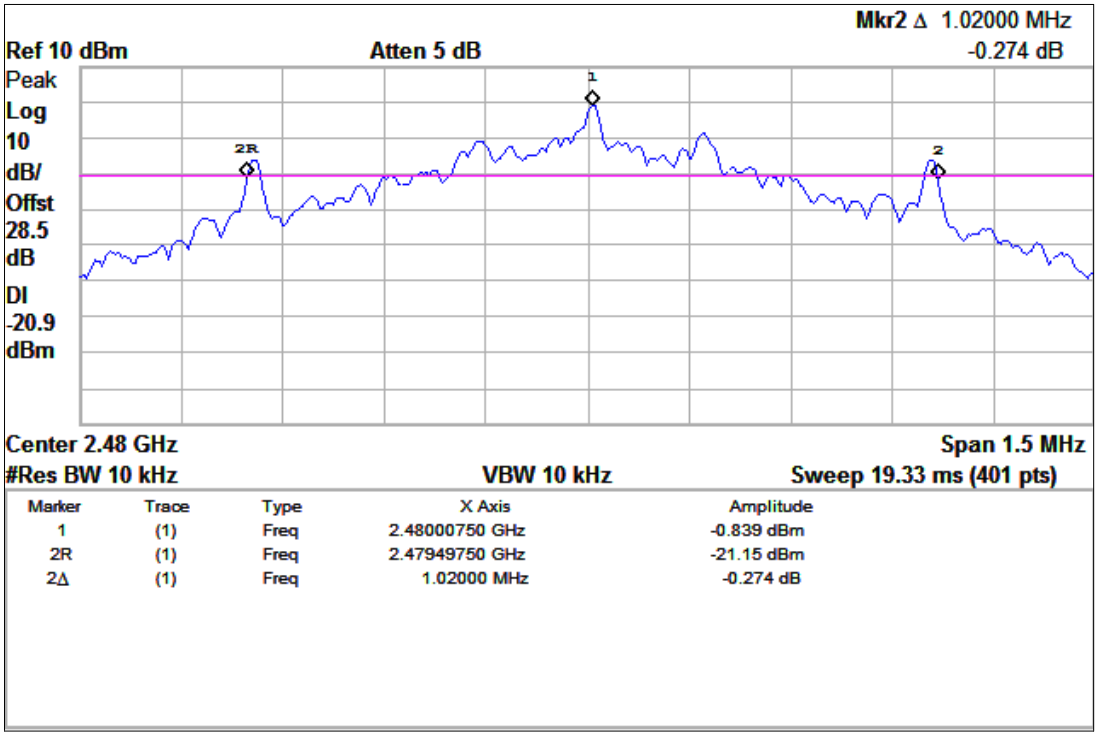
b) Test Plots



(Plot A: Channel = 2402)



(Plot B: Channel = 2441)



(Plot C: Channel = 2480)

4.4 Carried Frequency Separation

4.4.1 Requirement

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.

4.4.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping on test mode, and the middle channel of the EUT_BTmodule is selected to perform this test.

(b) The Spectrum Analyzer is set as below:

- Center Frequency: The frequency of the channel under test
- Resolution BW: 10kHz or 300kHz
- Video BW: Auto
- Sweep Time: Suitable to capture one transmission burst
- Frequency Span: No less than 3MHz
- Detector Mode: Peak
- Trace Mode: Max Hold

(c) Find the peak value of the trace over 1MHz bands of the center frequency from the Spectrum Analyzer and place the Spectrum Analyzer marker on this peak as marker#1. This frequency is recorded as f.

(d) Use a second marker of the Spectrum Analyzer and find the left and/or right peak value of the trace. This frequency is recorded as f'.

(e) The difference between the frequencies measured |f-f'| is the Carried Frequency Separation. The value is recorded and compared with the limit value from the greater one listed as below:

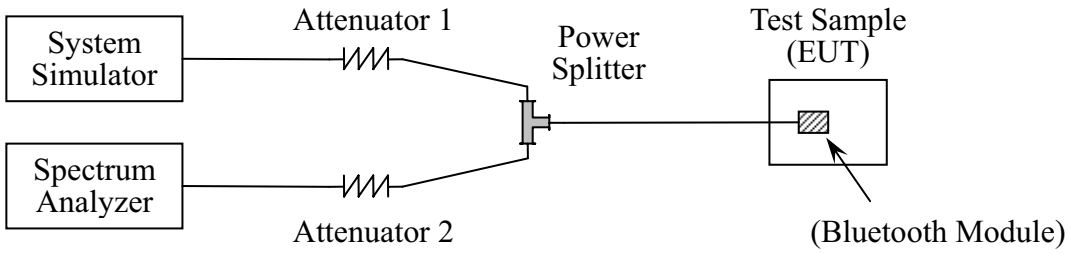
- 25kHz
- the 20dB bandwidth of the hopping channel

4.4.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode transmitting 339 bytes DH5 packages at maximum power condition.

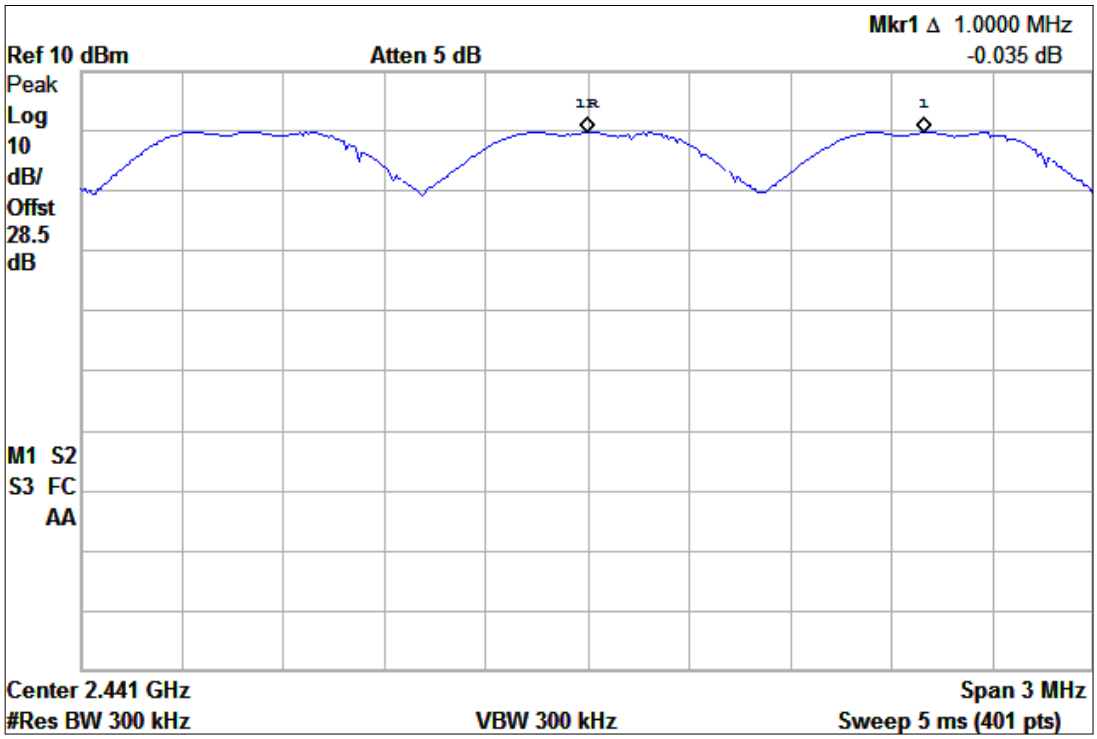


2. Equipments List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

4.4.4 Test Result

For any adjacent channels (e.g. the channel 39 and 40 as showed in the Plot A), the EUT_BTmodule does have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. So, the verdict is PASS.



(Plot A: Carried Frequency Separation)

4.5 Time of Occupancy (Dwell time)

4.5.1 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.

4.5.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping on test mode.

(b) The lowest, middle and highest channels of the EUT_BTmodule are employed to perform this test.

(c) The Spectrum Analyzer is set as below:

- Center Frequency: The frequency of the channel under test
- Resolution BW: 100kHz
- Video BW: Auto
- Frequency Span: 0
- Sweep Time: 10ms
- Sweep Method: Single sweep and cover at least one complete pulse
- Detector Mode: Peak
- Trace Mode: Max Hold

(d) Find the location of the rising edge of a Pulse from the trace of the Spectrum Analyzer and place the marker of the Spectrum Analyzer on this position as marker#1. This time-point is recorded as TP_{Up}.

(e) Use a second marker (or the delta marker of the first marker) and find the location of the falling edge of that Pulse. This time-point is recorded TP_{Down}.

(f) The difference between the time-points measured (TP_{Down}-TP_{Up}) is the Pulse Time, it's recorded as T_{Pulse_Time}.

(g) The Dwell Time recorded as T_{Dwell_Time} can be calculated with the following formulas (for DH5 package type of the EUT_BTmodule):

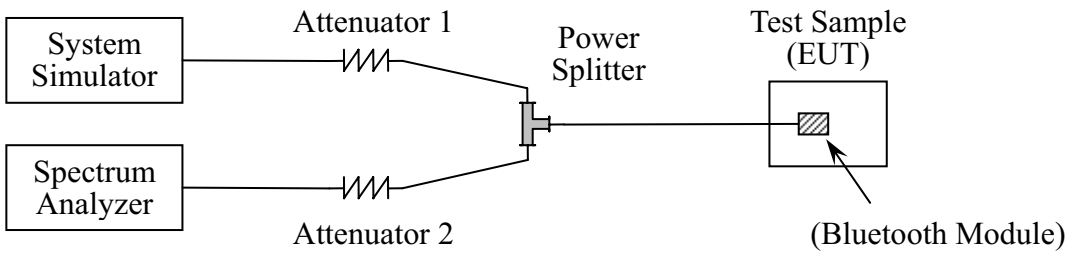
- $T_{Dwell\_Time} = T_{Pulse\_Time} * (1600 / 6) / N_{Number\_of\_Hopping\_Frequency} * T_{Period}$
- $T_{Period} = 0.4s * N_{Number\_of\_Hopping\_Frequency}$

4.5.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

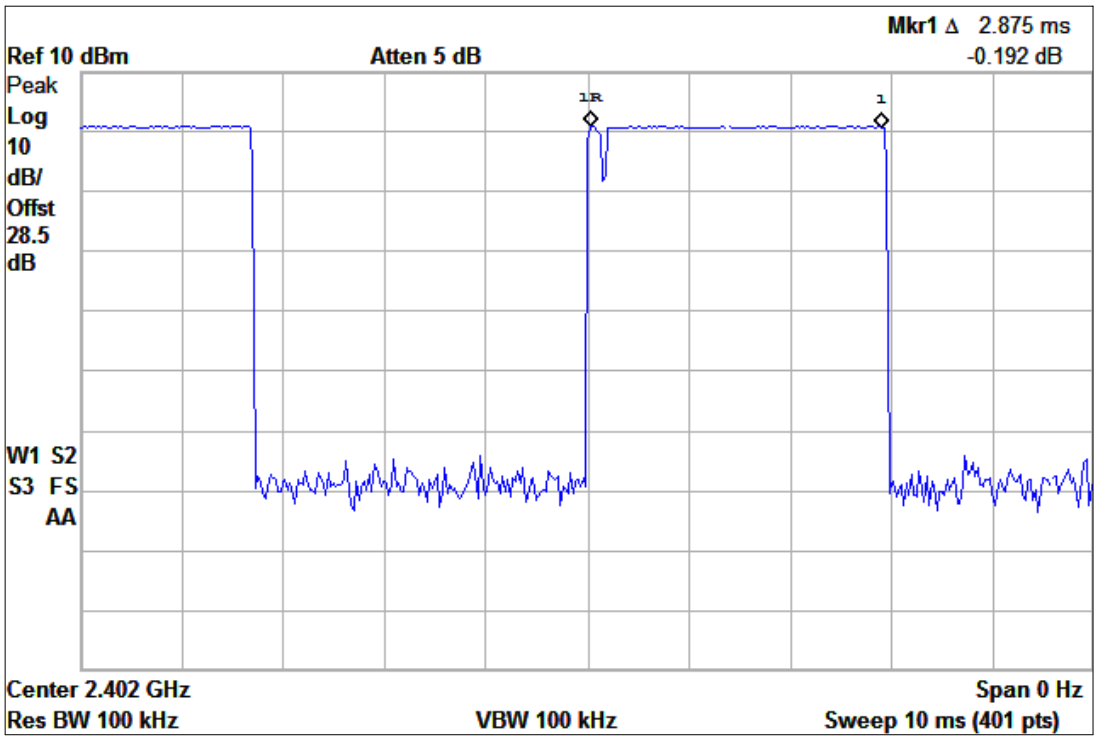
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

4.5.4 Test Result

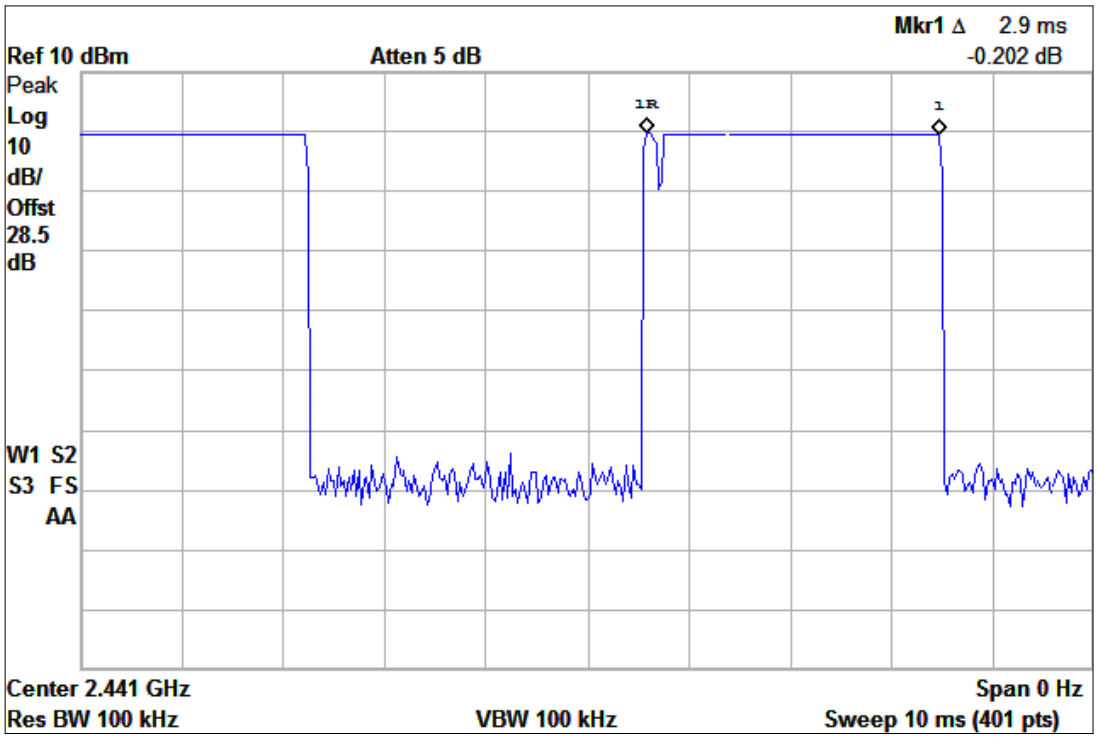
a) Test Verdict

CH	Freq. (MHz)	Pulse Time		Calculated Dwell Time (ms)	Limit (ms)	Verdict
		ms	Refer to Plot			
0	2402	2.875	Plot A	306.7	400	PASS
39	2441	2.900	Plot B	309.3		PASS
78	2480	2.900	Plot C	309.3		PASS

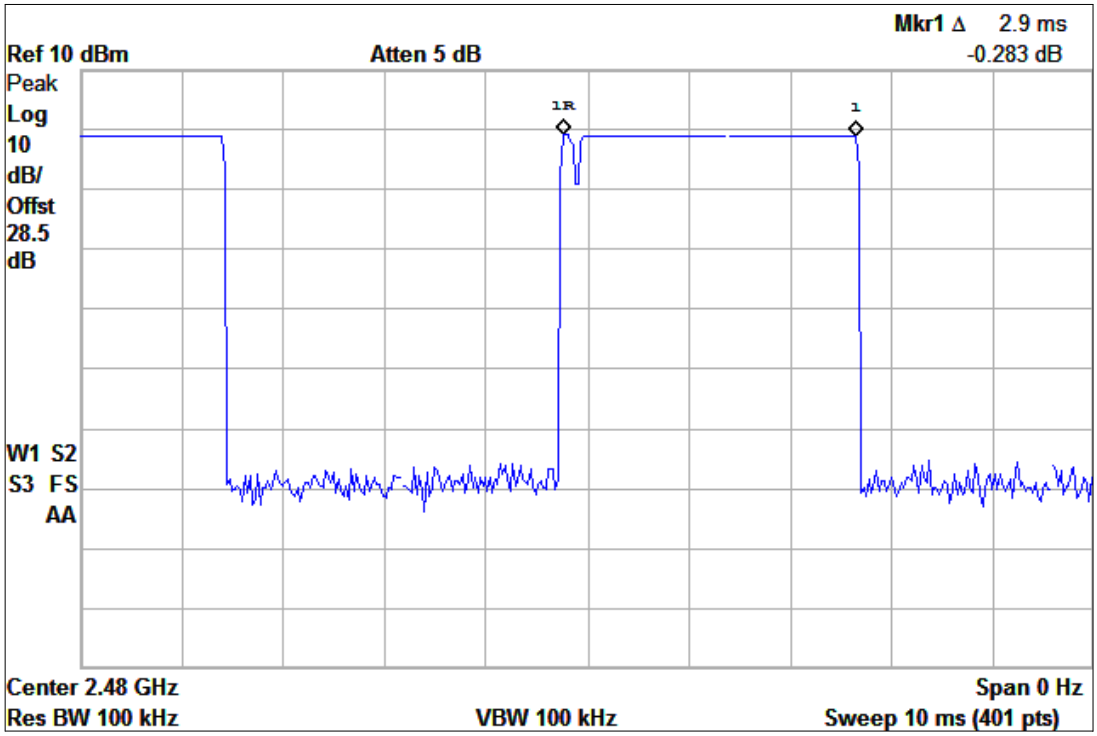
b) Test Plots for the Pulse Time



(Plot A: Channel = 2402)



(Plot B: Channel = 2441)



(Plot C: Channel = 2480)

4.6 Conducted Out of Band Emissions

4.6.1 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.

4.6.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping off test mode.

(b) The lowest, middle and highest channels of the EUT_BTmodule are employed to perform this test.

(c) The test frequency range is from 9kHz to the 10th harmonic of the fundamental frequency.

(d) The Spectrum Analyzer is set as below:

- Resolution BW: 100kHz
- Video BW: Auto
- Sweep Time: Suitable to capture one transmission burst
- Detector Mode: Peak
- Trace Mode: Max Hold

(e) Find the peak value of the operating carrier from the trace of the Spectrum Analyzer, and the power of the peak is recorded as P_c. The limit line for the Out of Band Emissions is (P_c-20dB) recorded as P_{-20dBc}.

(f) Adjust the frequency range to capture the highest level of the out of band emissions. The value is recorded and compared with the limit line f_{-20dBc}.

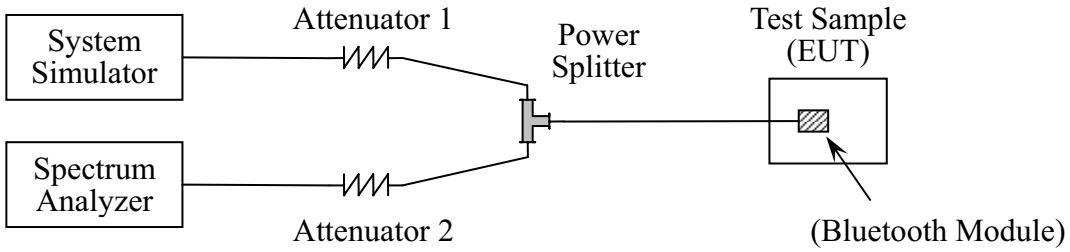
4.6.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode

transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

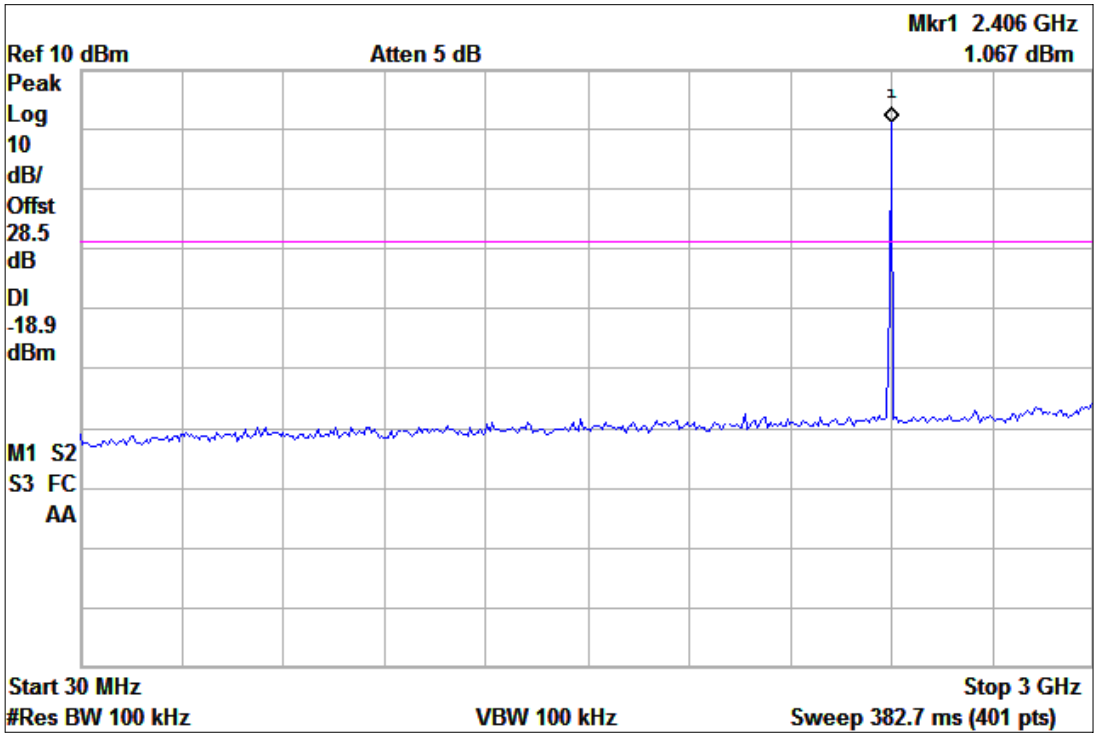
4.6.4 Test Result

NOTE: the power of the EUT_BTmodule transmitting frequency should be ignored.

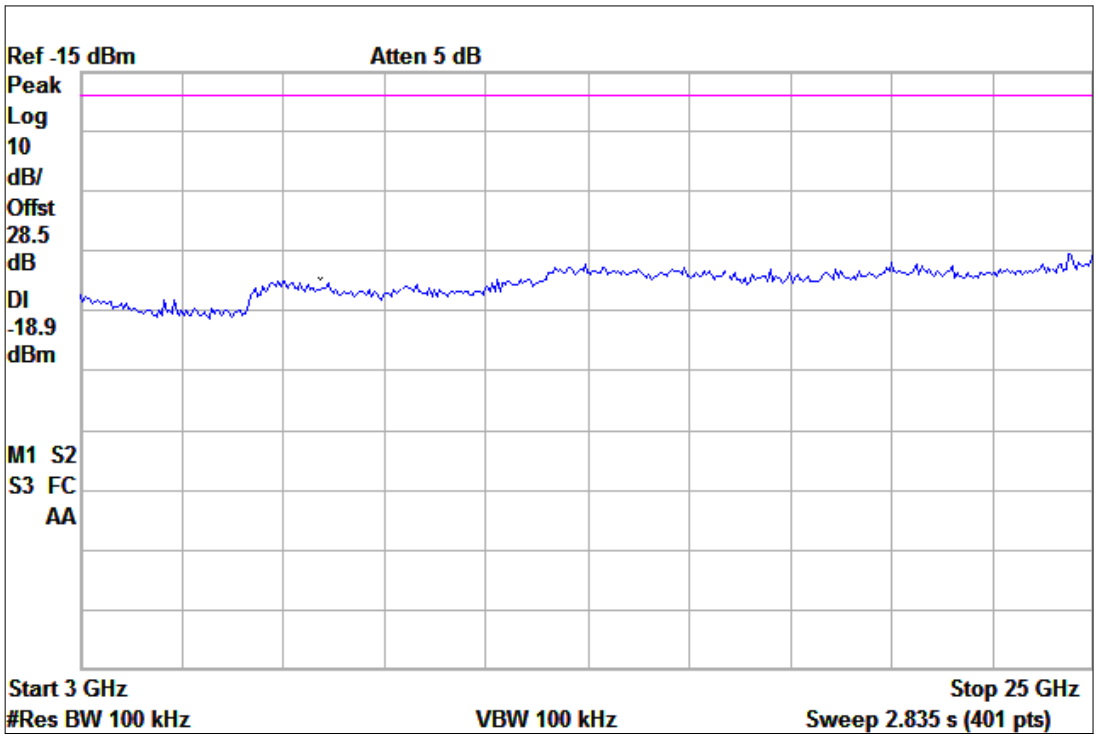
a) Test Verdict

CH	Freq. (MHz)	Measured Max. Out of Band Emissions (dBm)	Refer to Plot	Limit (dBm)		Verdict
				P_c	P_{-20dBc}	
0	2402	-44.96	Plot A.1/A.2	2.710	-17.3	PASS
39	2441	-43.98	Plot B.1/B.2	2.677	-17.3	PASS
78	2480	-43.07	Plot C.1/C.2	1.974	-18.2	PASS

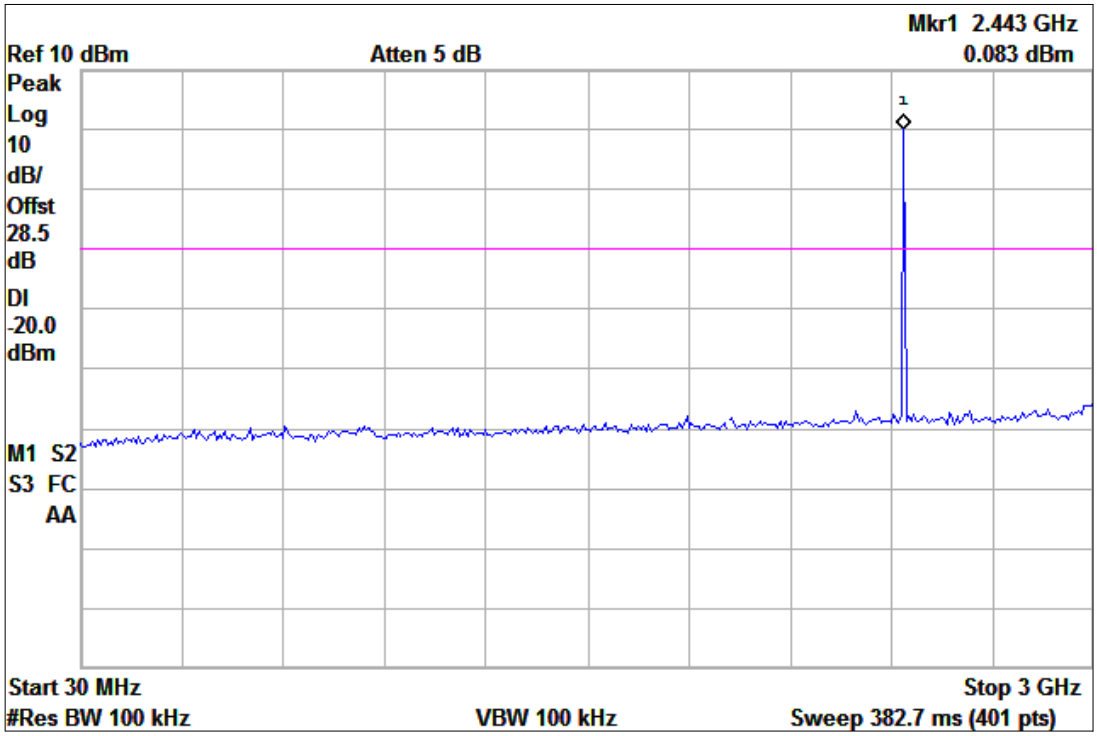
b) Test Plots for the Whole Measurement Frequency Range



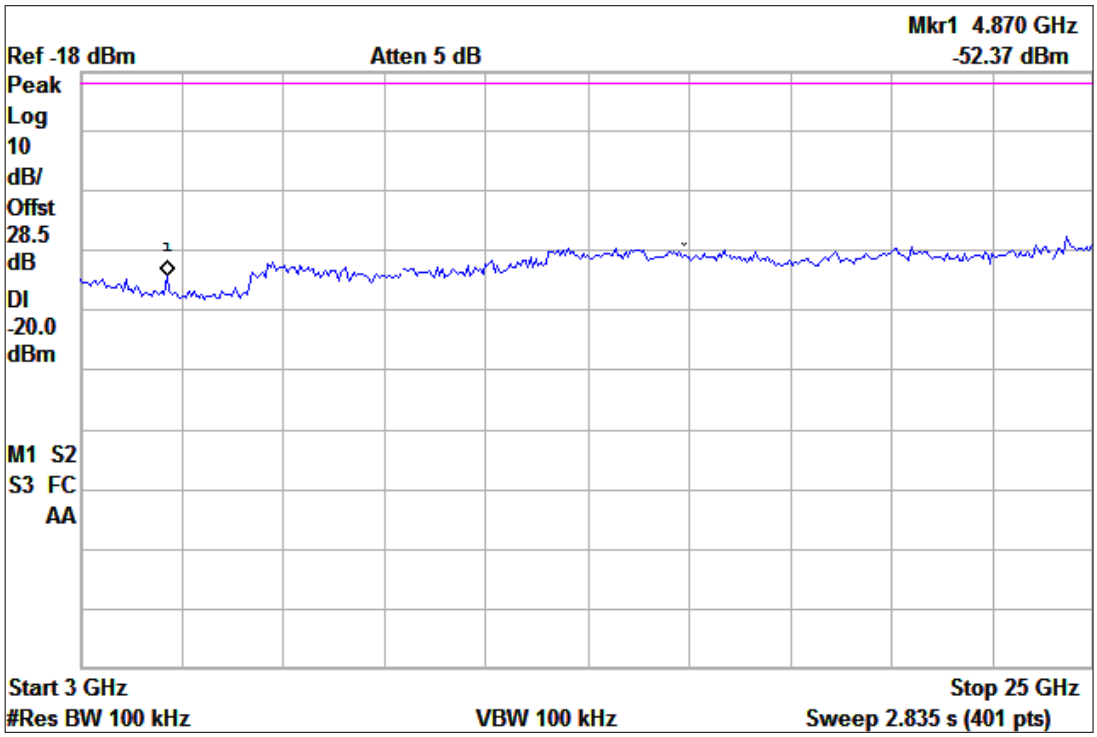
(Plot A.1: Channel = 0, 30MHz to 3GHz)



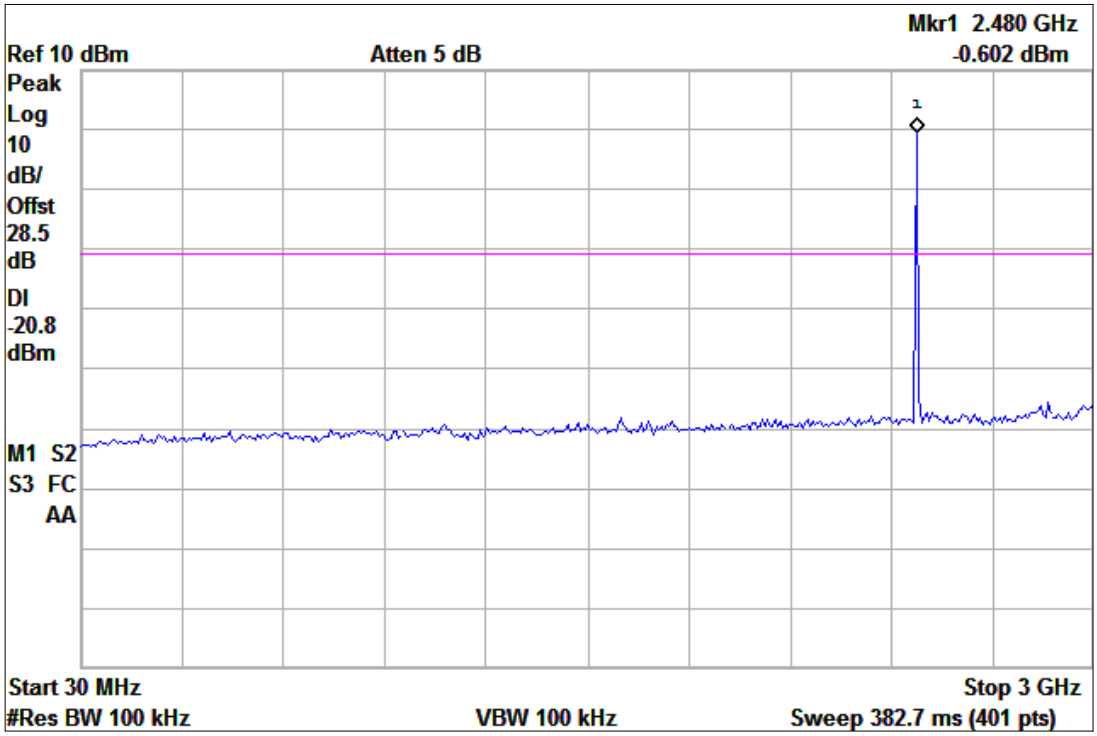
(Plot A.2: Channel = 0, 3GHz to 25GHz)



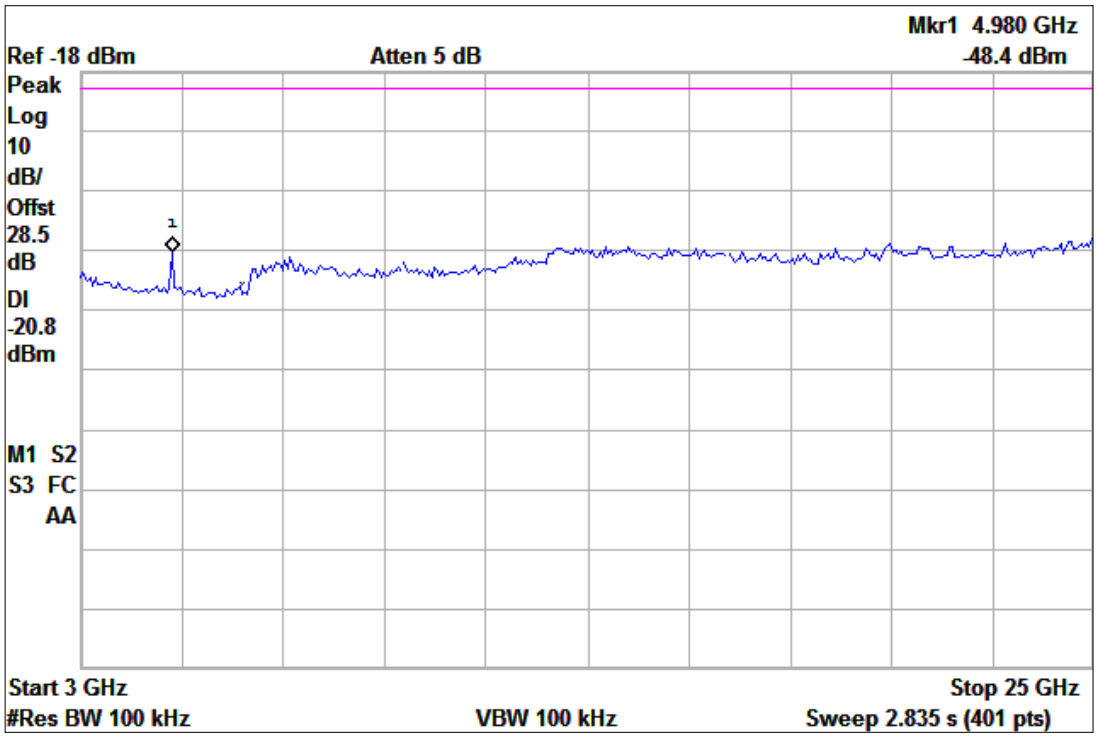
(Plot B.1: Channel = 39, 30MHz to 3GHz)



(Plot B.2: Channel = 39, 3GHz to 25GHz)



(Plot C.1: Channel = 78, 30MHz to 3GHz)



(Plot C.2: Channel = 78, 3GHz to 25GHz)

4.7 Band Edge

4.7.1 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.

4.7.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping off test mode.

(b) The lowest and highest channels of the EUT_BTmodule are employed to perform this test.

(c) The Spectrum Analyzer is set as below:

- Center Frequency: The frequency block vs. the channel under test
- Resolution BW: 100kHz
- Video BW: Auto
- Frequency Span: Wide enough to cover the complete power envelope of the signal
- Sweep Time: Suitable to capture one transmission burst
- Detector Mode: Peak
- Trace Mode: Max Hold

(d) Find the peak value of the operating carrier from the trace of the Spectrum Analyzer and place the Spectrum Analyzer marker on this carrier as marker#1. The power of this peak is recorded as P_c. The limit line for the Out of Band Emissions is (P_c-20dB) recorded as P_{-20dBc}.

(e) Use a second marker of the Spectrum Analyzer and find the peak value within the frequency range up to the center frequency of the Spectrum Analyzer. The power and the frequency of this peak is the measured maximum band edge emission recorded respectively as $P_{Max\_Band\_Edge\_Emission}$ and $f_{Max\_Band\_Edge\_Emission}$, and is compared with the limit line P_{-20dBc}.

(f) Calculate and record the $_{Marker\_Delta}(@f_{Max\_Band\_Edge\_Emission})$ as below:

- $\Delta_{Marker\_Delta}(@f_{Max\_Band\_Edge\_Emission}) = P_c - P_{Max\_Band\_Edge\_Emission}$

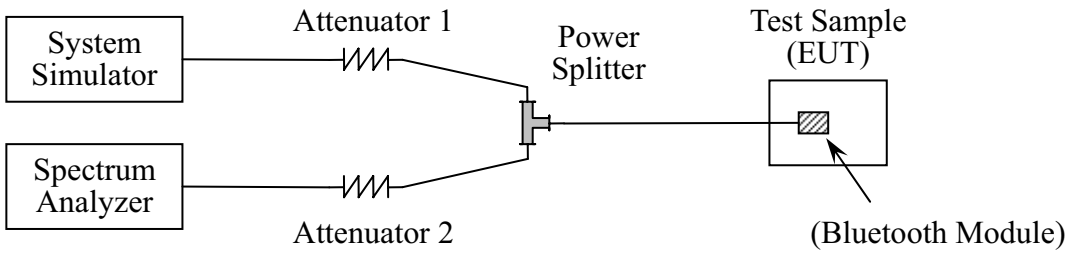
4.7.3 Test Setup

1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded, powered by the Battery, is coupled to a

Spectrum Analyzer and a System Simulator (SS) with appropriate Attenuators via a Power Splitter; the RF load attached to the antenna terminal of the EUT_BTmodule is 50Ohm. The path loss as the factor is calibrated to correct the reading.

The EUT_BTmodule is activated and controlled by the SS, and is set to operate under its test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

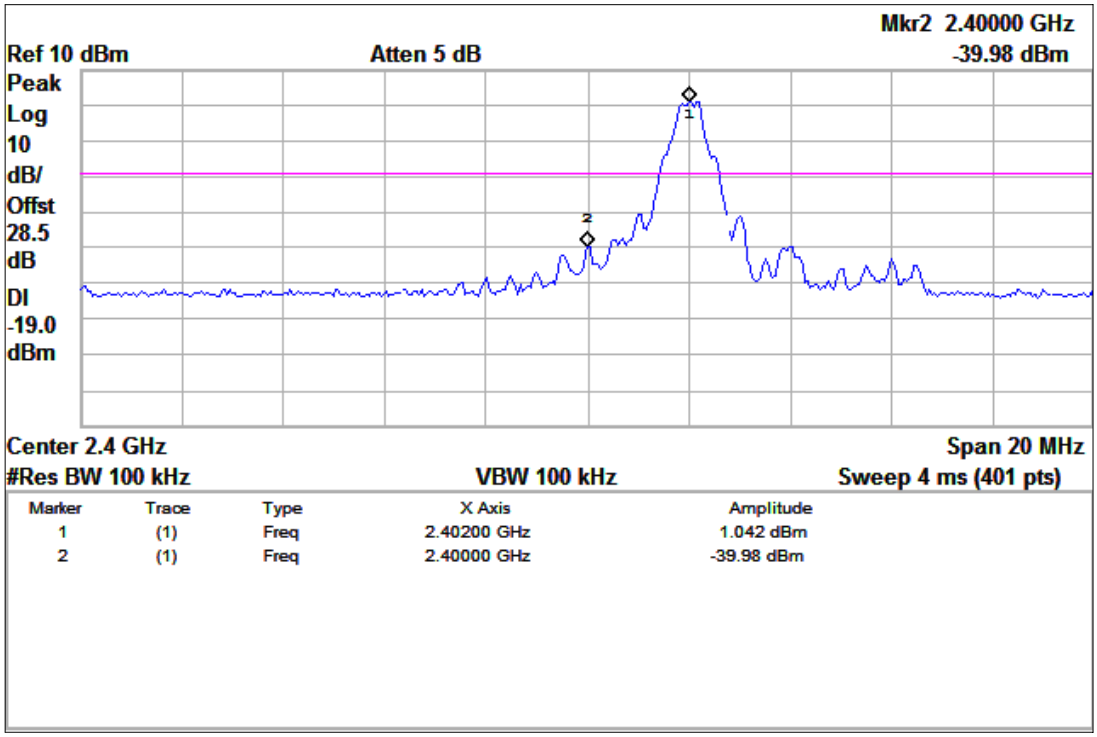
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	R&S	CMU200	100448	2006.10	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2006.07	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

4.7.4 Test Result

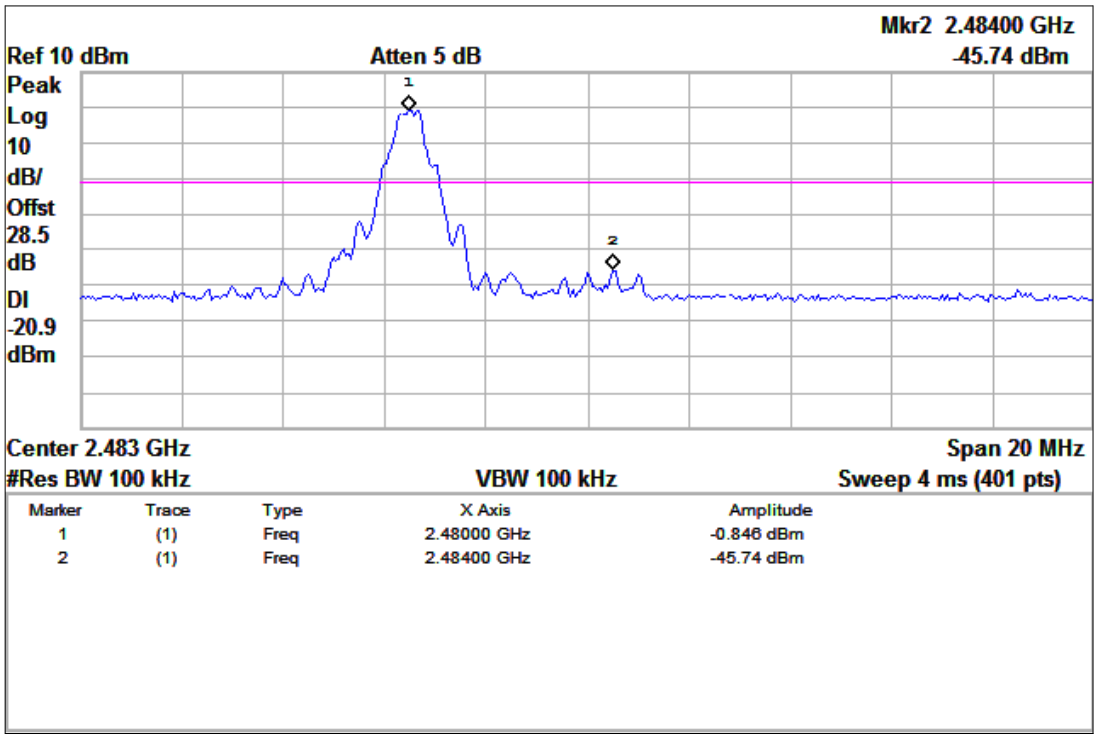
a) Test Verdict

CH	Freq. (MHz)	Measured Max. Band Edge Emission		Limit (dBm)		Δ_{Marker_Delta} (dB)	Refer to Plot	Verdict
		$P_{Max\_Band\_Edge\_Emission}$ (dBm)	@$f_{Max\_Band\_Edge\_Emission}$ (MHz)	P_c	P_{-20dBc}			
0	2402	-37.38	2400.00	2.694	-17.6	40.07	Plot A	PASS
78	2480	-45.75	2484.00	1.991	-18	47.74	Plot B	PASS

b) Test Plots



(Plot A: Channel = 0)



(Plot B: Channel = 78)

4.8 Conducted Emissions

4.8.1 Requirement

According to FCC section 15.207, 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 within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ohm line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-Peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

NOTE:

a) The lower limit shall apply at the band edges.
b) The limit decreases linearly with the logarithm of the frequency in the range from 0.15MHz to 0.50MHz.

4.8.2 Test Procedure

(a) The test frequency range is from 150kHz to 30MHz.

(b) The Peak (PK) detector is employed to sweep the conducted interference over the test frequency range.

(c) For the swept signals that are more than or have narrow negative margins beyond the Average (AV) and Quasi-peak (QP) limit lines, the AV and QP detectors are employed to measure these suspect signals to find their maximum QP and AV readings.

(d) Both L Phase and N Phase lines of the power mains connected to the EUT are employed to perform this test.

4.8.3 Test Setup

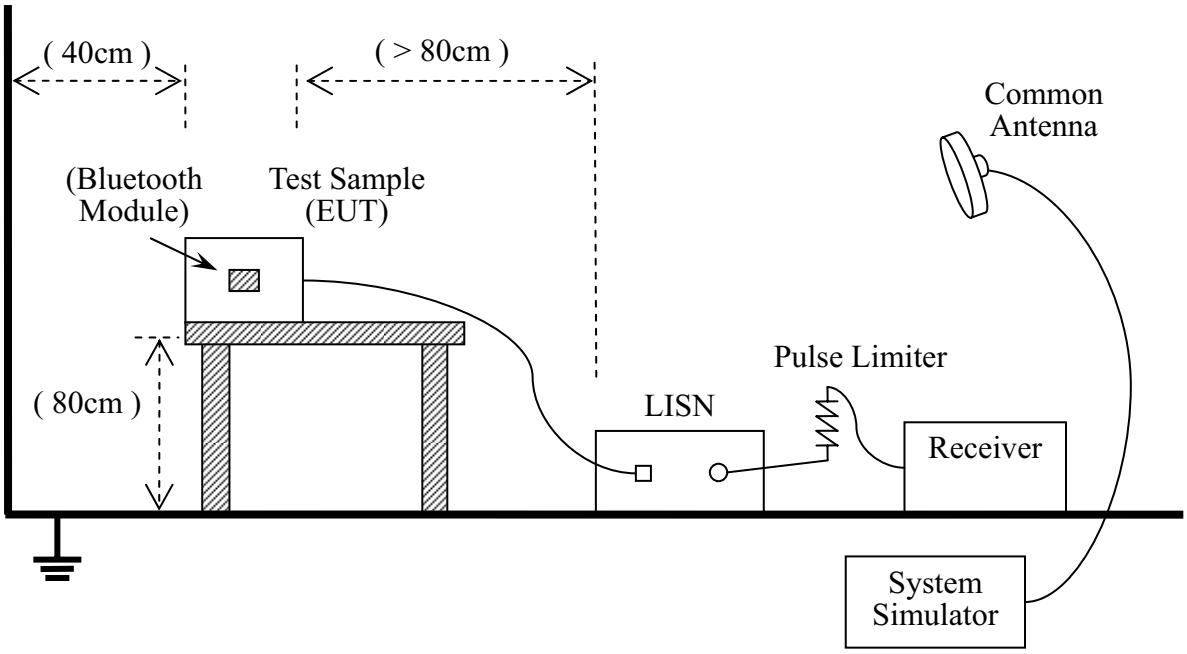
1. Test Setup Sketch

The Test Sample (EUT) with the EUT_BTmodule embedded is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The Test Sample (EUT) is connected to the power mains through a LISN which provides 50μH/50Ohm of coupling impedance for the measuring instrument of a Receiver. A Pulse Limiter is

employed to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

The Test Sample (EUT) with the EUT_BTmodule embedded is powered by the Battery, which is charged with the AC Adapter (AE-1) powered by 120V 60Hz AC mains supply.

The EUT_BTmodule is activated and controlled by the System Simulator via a Common Antenna, and is set to operate under hopping on test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Agilent	E7405A	US44210471	2006.07	1year
LISN	Schwarzbeck	NSLK 8127	812744	2006.08	1year
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)	(n.a.)
System Simulator	R&S	CMU200	100448	2006.10	1year
Common Antenna	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)

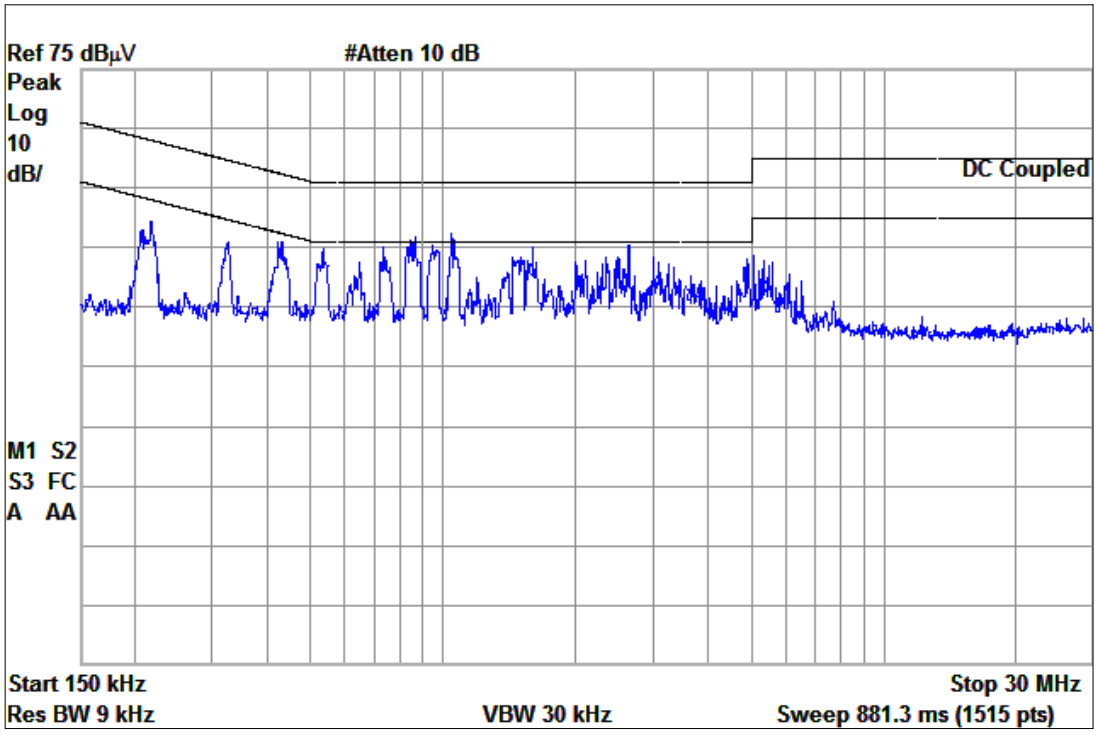
4.8.4 Test Result

a) Test Verdict Recorded for Suspect Points

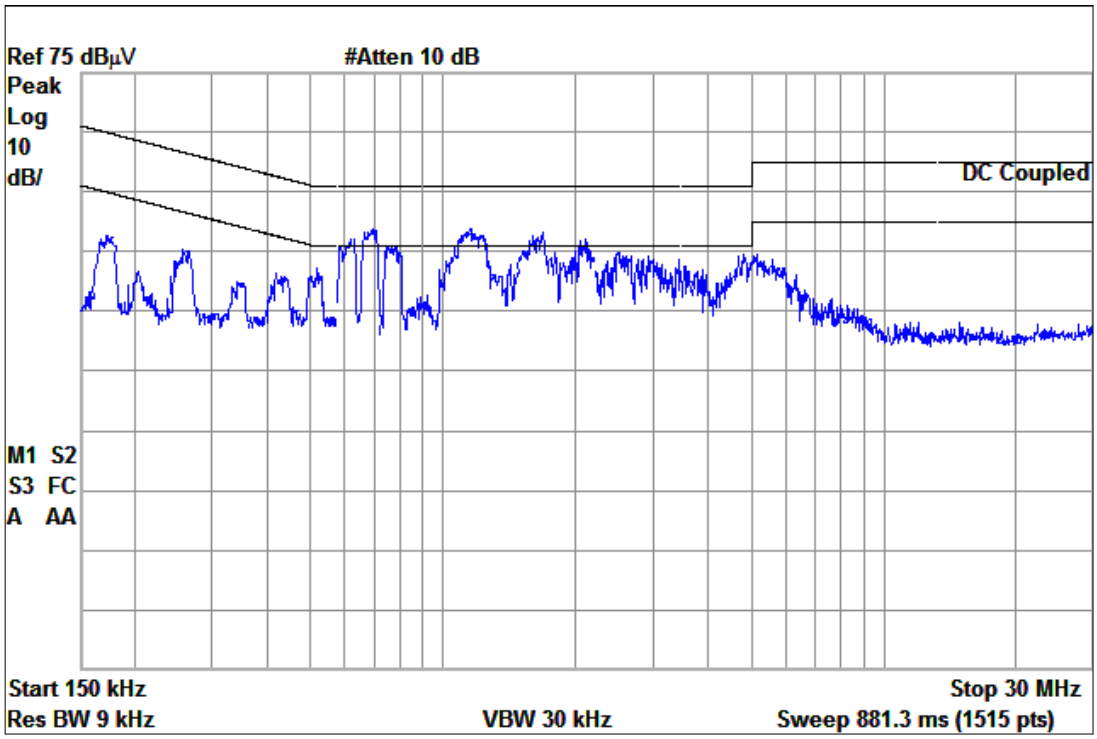
No.	@Frequency (MHz)	Suspect Emission Levels (dBµV)				Limit (dBµV)		Verdict
		PK	QP	AV	Phase	QP	AV	
1	0.6421	47.80	45.76	38.79	N	56.00	46.00	PASS

No.	@Frequency (MHz)	Suspect Emission Levels (dBµV)				Limit (dBµV)		Verdict
		PK	QP	AV	Phase	QP	AV	
2	0.6640	47.89	45.72	37.20	N	56.00	46.00	PASS
3	1.2740	47.05	44.63	35.34	N	56.00	46.00	PASS
4	1.4930	47.16	43.52	32.74	N	56.00	46.00	PASS
5	2.0130	46.71	42.84	30.37	N	56.00	46.00	PASS
6	5.6510	42.82	37.73	24.90	N	60.00	50.00	PASS
7	0.2258	48.42	42.96	35.66	L	62.60	52.60	PASS
8	0.4522	47.60	43.27	35.81	L	56.83	46.83	PASS
9	0.8023	42.26	37.50	29.82	L	56.00	46.00	PASS
10	1.0490	46.69	42.88	33.04	L	56.00	46.00	PASS
11	1.7580	39.24	35.15	26.78	L	56.00	46.00	PASS
12	2.1090	39.51	35.21	26.07	L	56.00	46.00	PASS

b) Test Plots



(Plot A: L Phase)



(Plot B: N Phase)

4.9 Radiated Emissions

4.9.1 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 (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(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.

4.9.2 Test Procedure

(a) The EUT_BTmodule of the EUT is set to operate at hopping off test mode.

(b) The lowest, middle and highest channels of the EUT_BTmodule are employed to perform this test.

(c) The test frequency range is from 9kHz to 30MHz, and from 30MHz to the 10th harmonic of the fundamental frequency.

(d) The corresponding Test Antenna is located at 1m height. The Peak (PK) detector is employed to sweep the radiated field strength over the test frequency range while the Turn Table is located separately at the degree of $STEP_{TT}$(degree)=N*45, N∈[0, 8].

(e) For each fundamental frequency signal, rotate the Turn Table and vary the Test Antenna height until the emission is at its highest amplitude; then tuned the Receiver and use the PK and Average

(AV) detectors to measure and record these maximum readings as $P_{Fundamental\_FieldStrength}$.

(f) Calculate the field strength of band edge emission falling in adjacent restricted bands (from 2310MHz to 2390MHz and from 2483.5MHz to 2500MHz) recorded as $P_{Max\_Band\_Edge\_Field\_Strength}$ that is mentioned in FCC section 15.205(a) via the method of "Marker Delta" described by the formula: $P_{Max\_Band\_Edge\_Field\_Strength} = P_{Fundamental\_FieldStrength} - \Delta_{Marker\_Delta}(@f_{Max\_Band\_Edge\_Emission})$, where the $\Delta_{Marker\_Delta}(@f_{Max\_Band\_Edge\_Emission})$ is the measured maximum band edge emission Δ_{Marker_Delta} virus the frequency $f_{Max\_Band\_Edge\_Emission}$ which are mentioned in the section 4.7. The $P_{Max\_Band\_Edge\_Field\_Strength}$ is compared with the PK and AV limit lines.

(g) Observe the restricted bands mentioned in FCC section 15.205(a), and for each swept signal that is more than or have narrow negative margins beyond the AV limit line, rotate the Turn Table and vary the Test Antenna height until the emission is at its highest amplitude; then tuned the Receiver and use the PK and AV detectors to measure this suspect signal to find its maximum readings and compare with the PK and AV limit lines.

(h) Both the Vertical (V) and the Horizontal (H) polarizations of the Test Antenna are employed to perform this test.

4.9.3 Test Setup

1. Test Setup Sketch

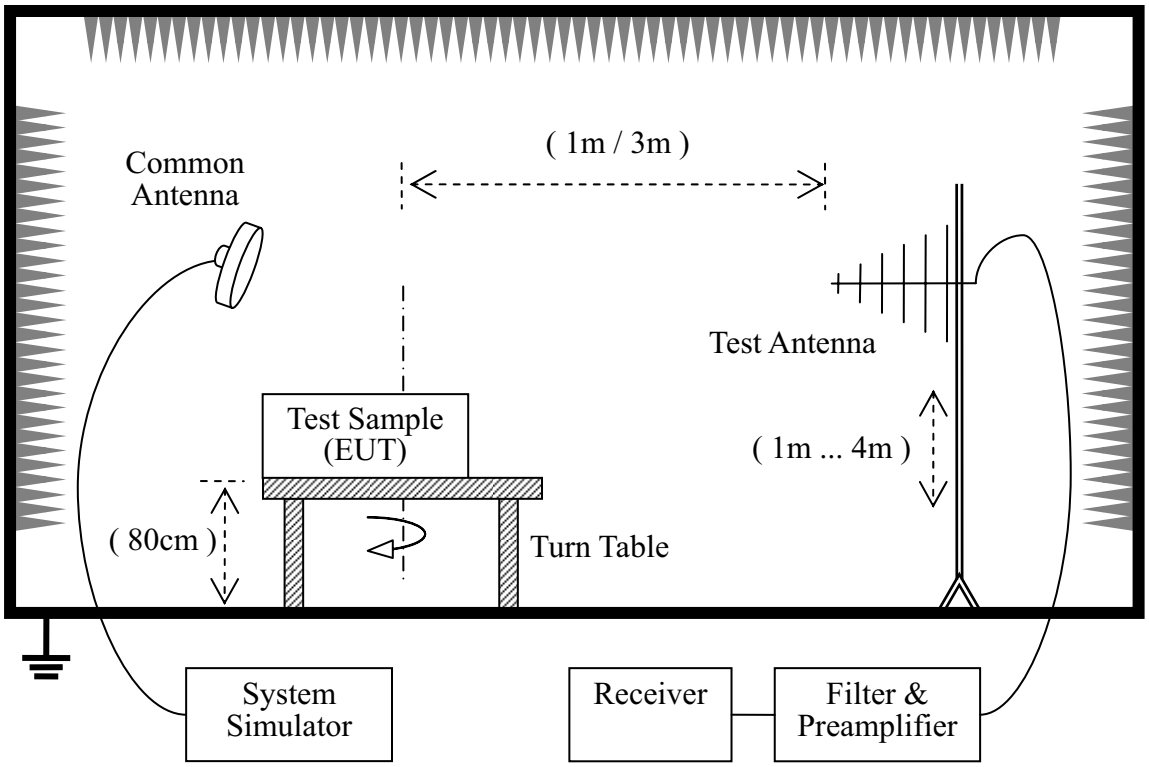
The test is performed in a 3m Semi-Anechoic Chamber. The Test Sample (EUT) with the EUT_BTmodule embedded is placed on a 0.8m high insulating Turn Table and keeps

a) 3m away from the Test Antenna which is a Bi-Log one with working frequency range from 30MHz to 3GHz while a Horn one with working frequency range above 3GHz, and is mounted on a variable-height antenna master tower.
b) 1m away from the Test Antenna which is a Loop one with working frequency range from 9kHz to 30MHz, and the center of which is positioned at 1m above the ground.

If applicable, a Filter (Notch and/or High-Pass) and a Preamplifier are employed for the measuring instrument of a Receiver. The factors of the whole test system are calibrated to correct the reading.

The Test Sample (EUT) with the EUT_BTmodule embedded is powered by the Battery, which is charged with the AC Adapter (AE-1) powered by 120V 60Hz AC mains supply.

The EUT_BTmodule is activated and controlled by the System Simulator via a Common Antenna, and is set to operate under hopping on test mode transmitting 339 bytes DH5 packages at maximum power condition.



2. Equipments List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Agilent	E7405A	US44210471	2006.07	1year
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2006.08	2year
Test Antenna (Bi-Log)	Schwarzbeck	VULB 9163	9163-274	2006.07	1year
Test Antenna (Horn)	Schwarzbeck	BBHA 9120C	9120C-384	2006.07	1year
System Simulator	R&S	CMU200	100448	2006.10	1year
Preamplifier	(n.a.)	20dB	(n.a.)	(n.a.)	(n.a.)
Filter (Notch)	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)
Filter (High-Pass)	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)
Common Antenna	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)

4.9.4 Test Result

1. Test Verdict

a) The Field Strength of Fundamental Emissions

CH	Freq. (MHz)	$P_{Fundamental\_FieldStrength}$ (dBμV/m)		Antenna Polarization	Refer to Plot
		PK	AV		
0	2402	84.03	68.87	H	Plot A.3
		87.97	72.41	V	Plot A.7
39	2441	83.49	67.60	H	Plot B.3
		88.11	72.86	V	Plot B.7
78	2480	83.69	67.67	H	Plot C.3
		88.52	72.32	V	Plot C.7

b) The Calculated Field Strength of Band Edge Emissions Fall in the Restricted Bands

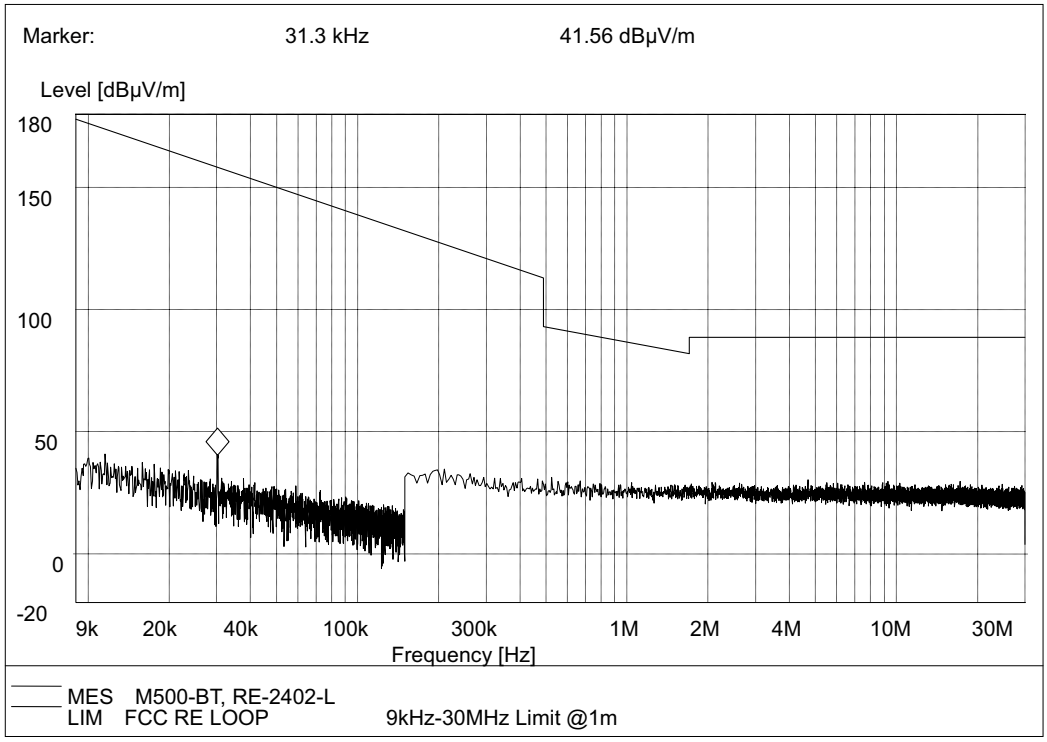
CH	Freq. (MHz)	$P_{Fundamental\_FieldStrength}$		Measured Max. Band Edge Emissions			Limit (dBμV/m)	Verdict
		Detector	dBμV/m	$@f_{Max\_Band\_Edge\_Emission}$ (MHz)	Δ_{Marker_Delta} (dB)	$P_{Max\_Band\_Edge\_Field\_Strength}$ (dBμV/m)		
0	2402	PK	87.97	2400.00	40.07	47.90	74	PASS
		AV	72.41			32.34	54	PASS
78	2480	PK	88.52	2484.00	47.74	40.78	74	PASS
		AV	72.32			24.58	54	PASS

c) The Field Strength of Radiated Emissions Fall in the Restricted Bands

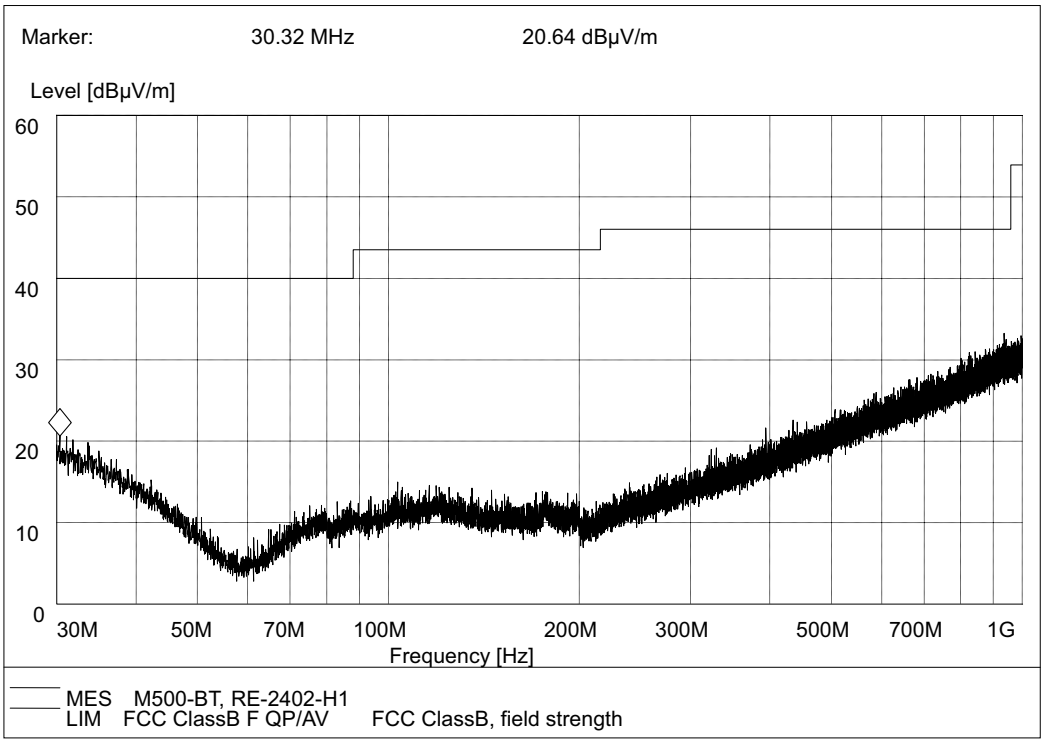
NOTE: also refer to Plot A.1 to Plot A.9, Plot B.1 to Plot B.9 and Plot C.1 to Plot C.9 for the emissions falling in the restricted bands.

CH	Freq. (MHz)	Antenna Polarization	Measured Max. Radiated Emissions in the Restricted Bands (dBμV/m)		Limit (dBμV/m)		Verdict
			PK	AV	PK	AV	
0	2402	V	---	---	74	54	PASS
		H	---	---	74	54	PASS
39	2441	V	---	---	74	54	PASS
		H	---	---	74	54	PASS
78	2480	V	---	---	74	54	PASS
		H	---	---	74	54	PASS

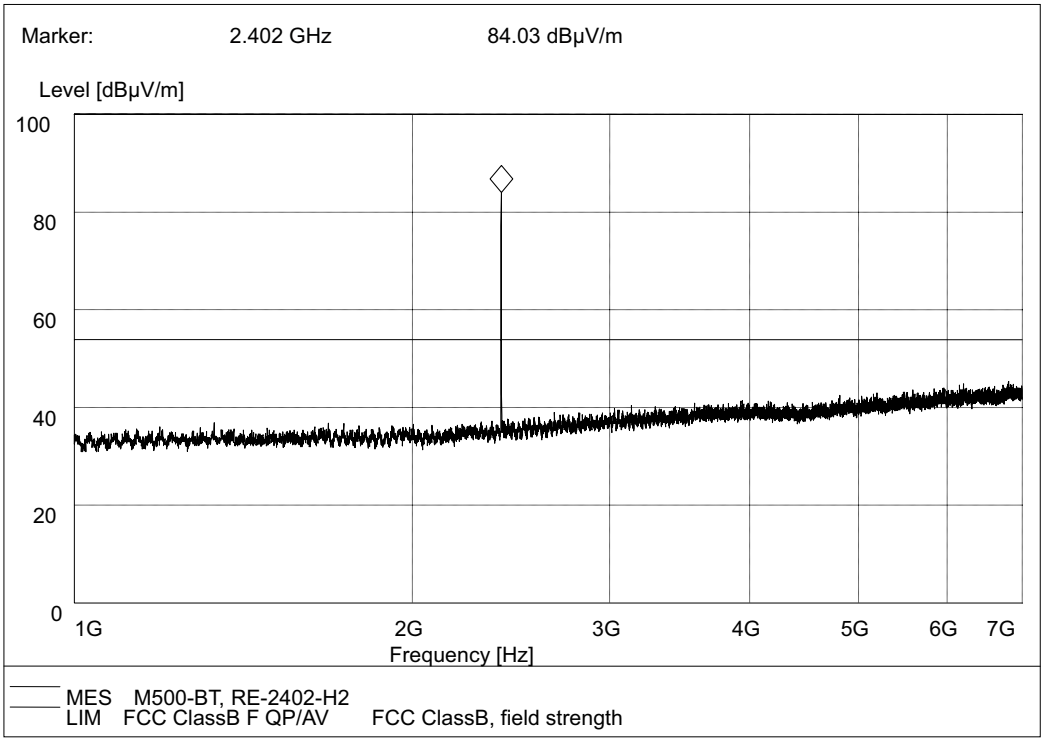
2. Test Plots for the Whole Measurement Frequency Range



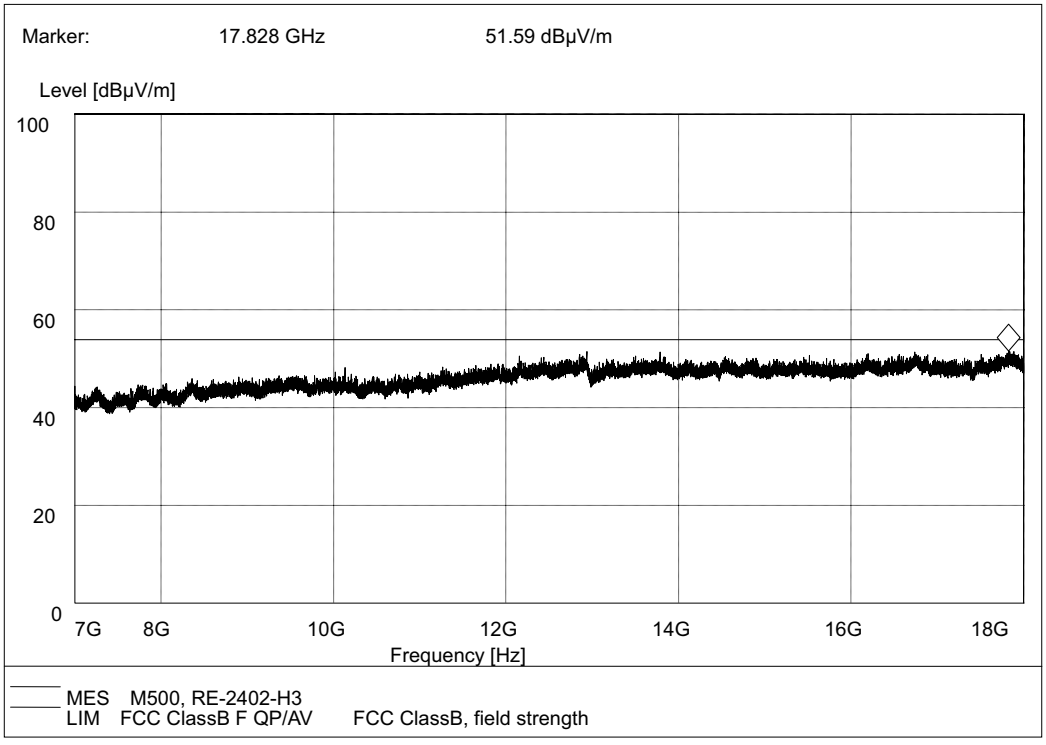
(Plot A.1: 9kHz to 30MHz)



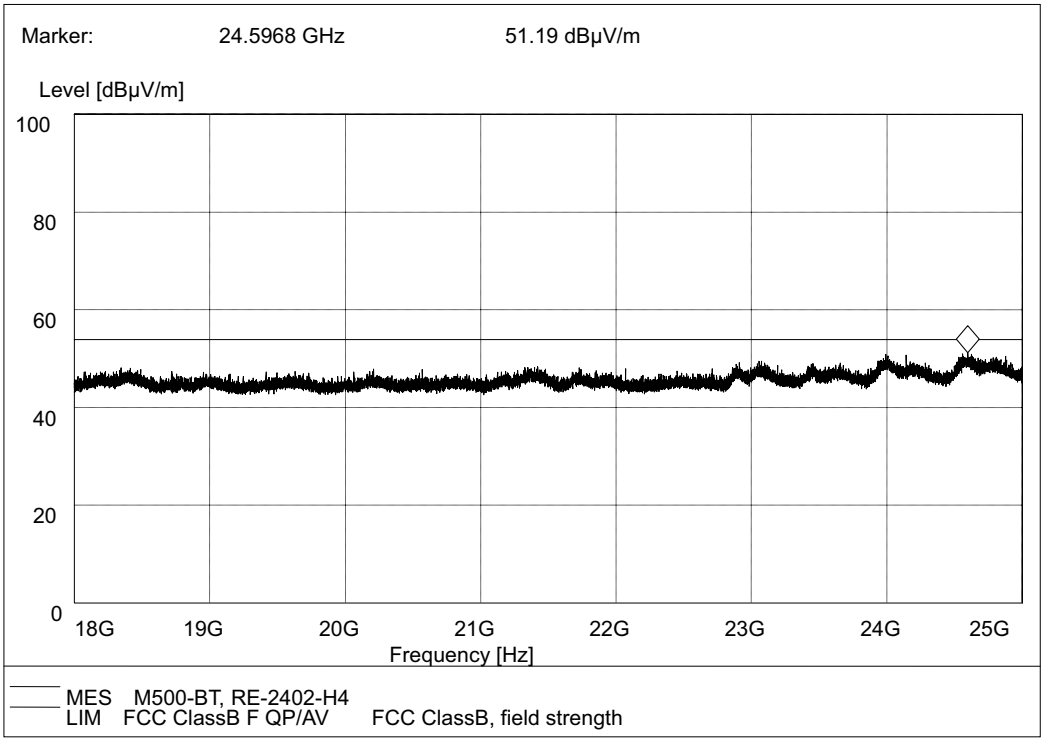
(Plot A.2: Antenna Horizontal, 30MHz to 1GHz)



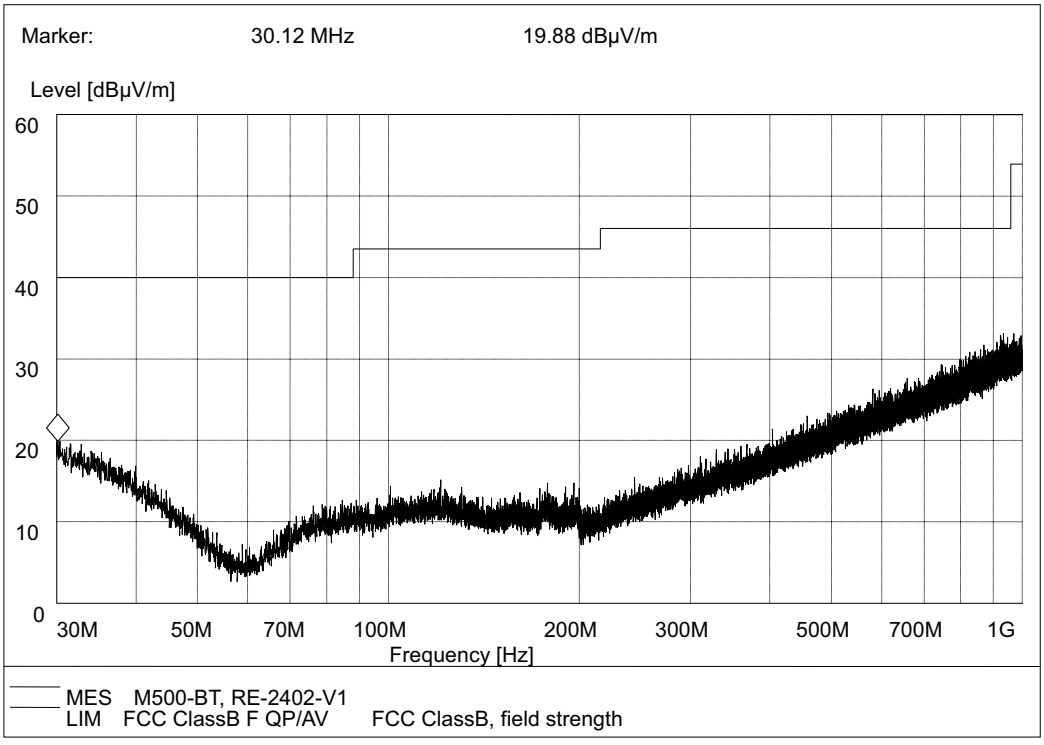
(Plot A.3: Antenna Horizontal, 1GHz to 7GHz)



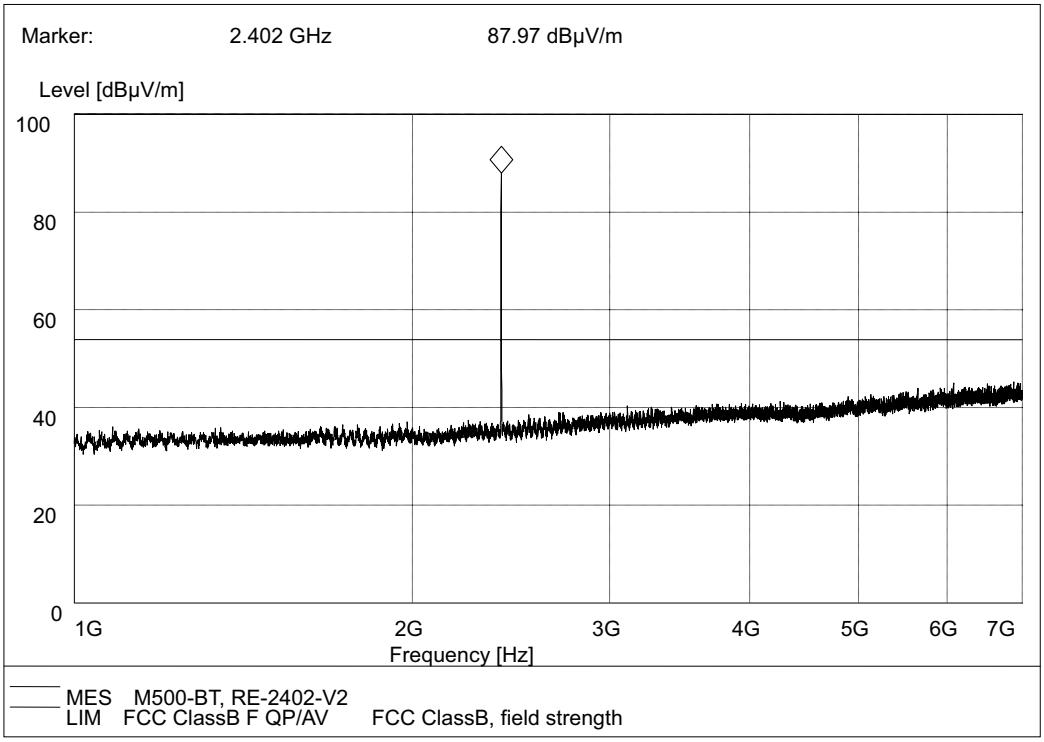
(Plot A.4: Antenna Horizontal, 7GHz to 18GHz)



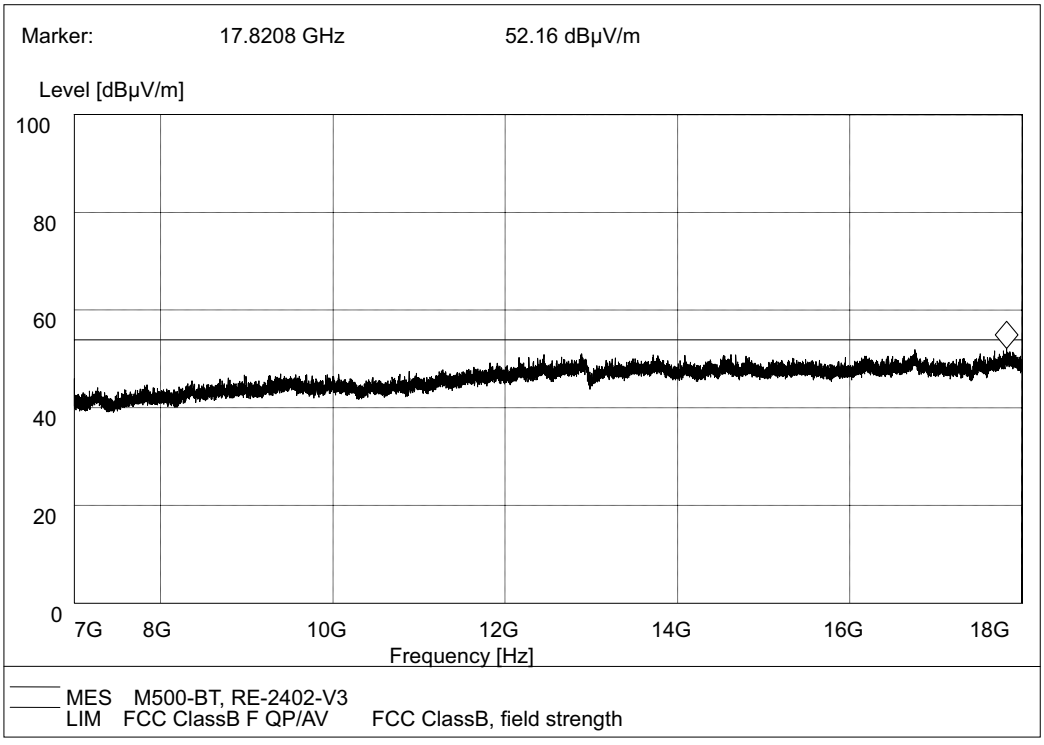
(Plot A.5: Antenna Horizontal, 18GHz to 25GHz)



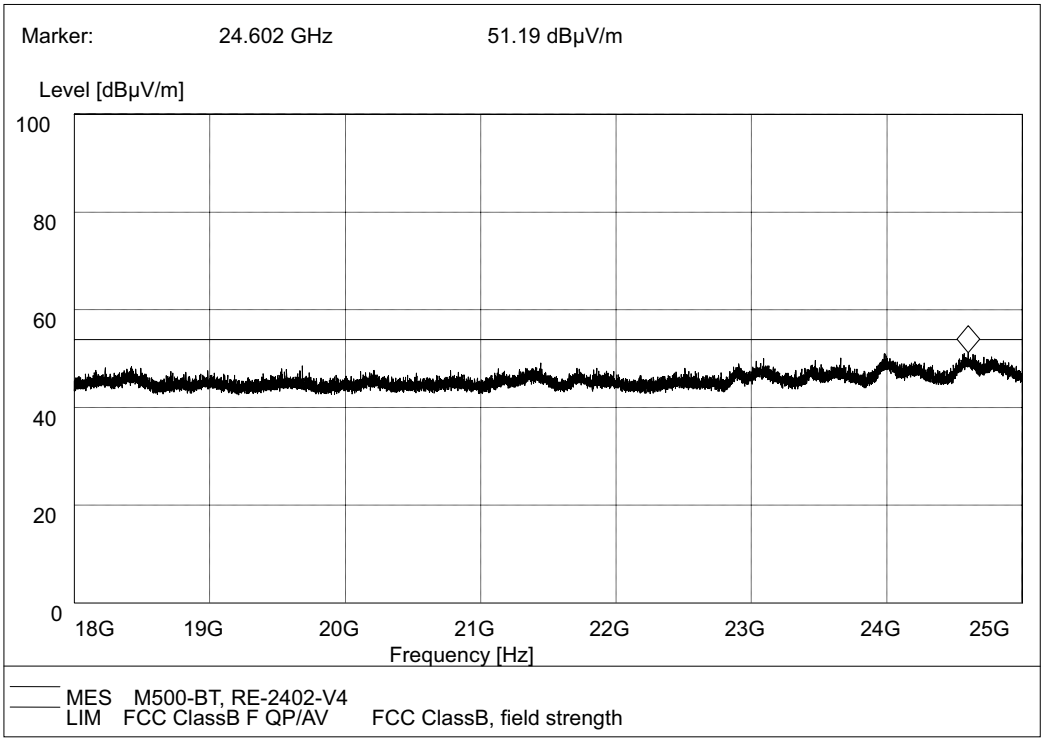
(Plot A.6: Antenna Vertical, 30MHz to 1GHz)



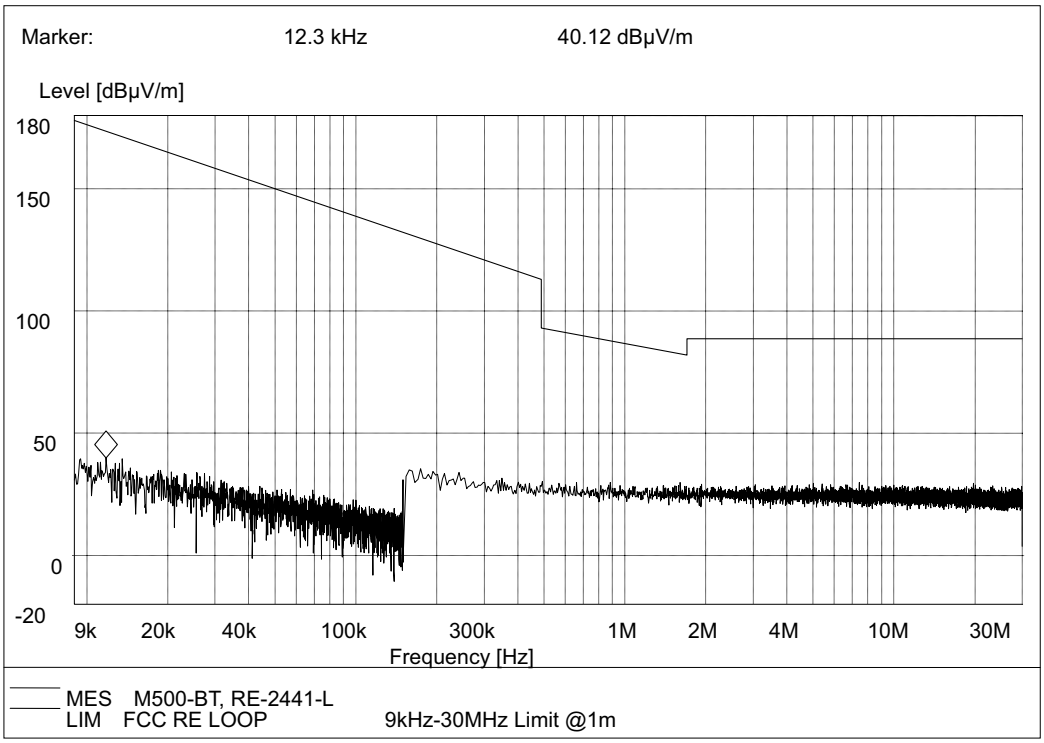
(Plot A.7: Antenna Vertical, 1GHz to 7GHz)



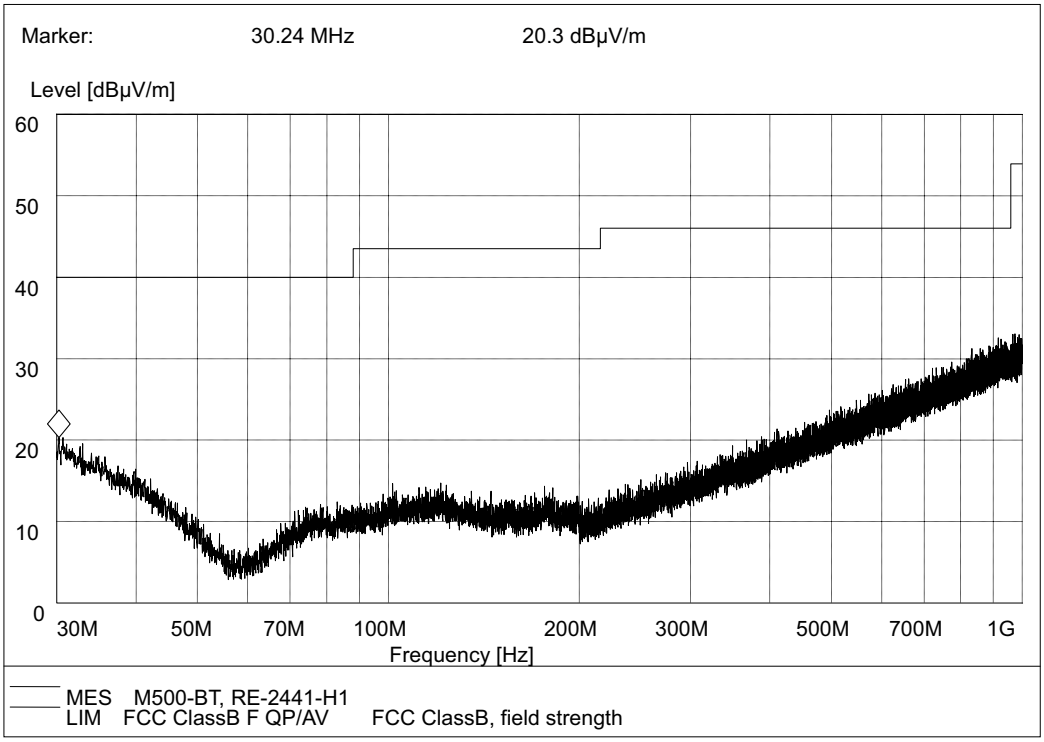
(Plot A.8: Antenna Vertical, 7GHz to 18GHz)



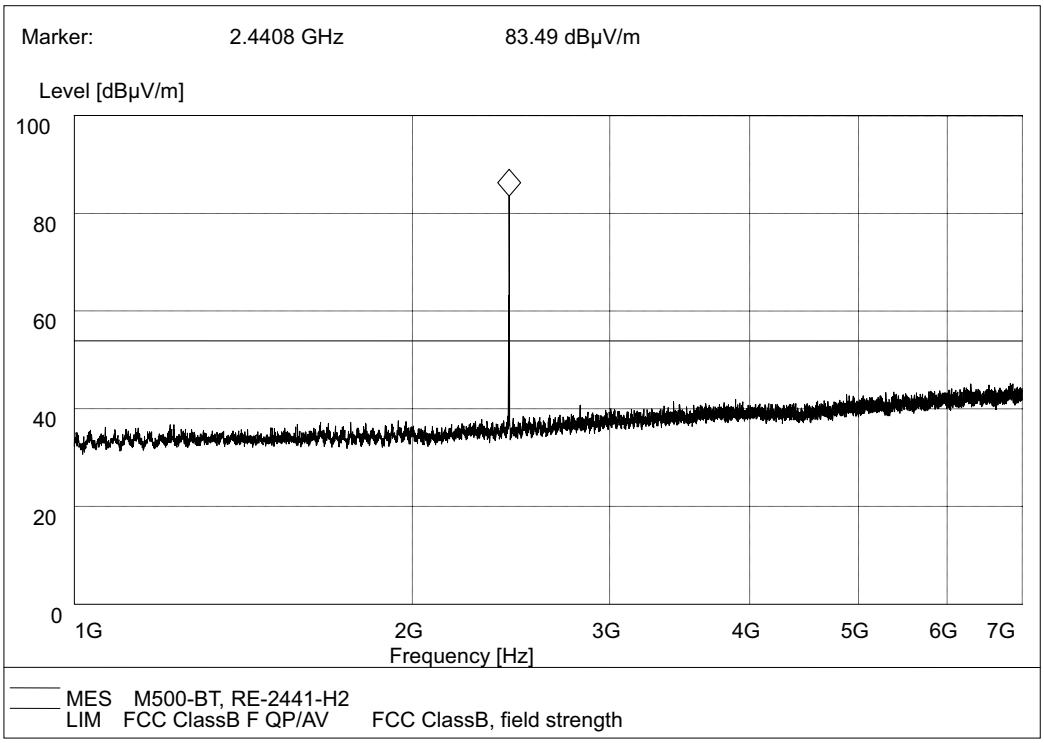
(Plot A.9: Antenna Vertical, 18GHz to 25GHz)



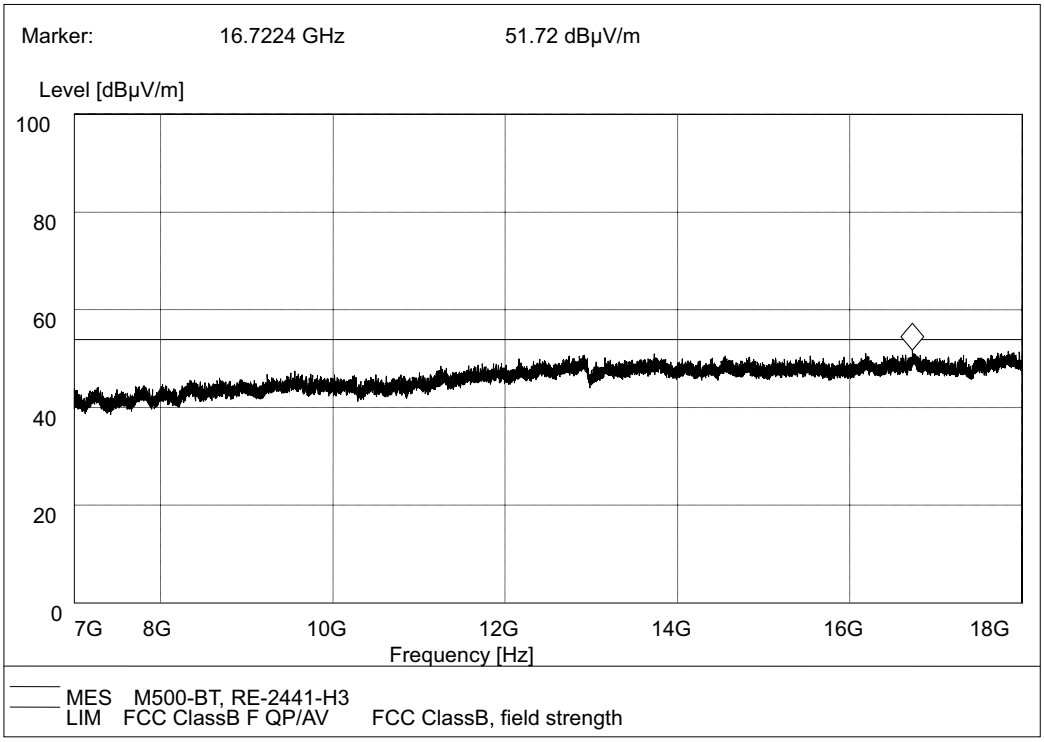
(Plot B.1: 9kHz to 30MHz)



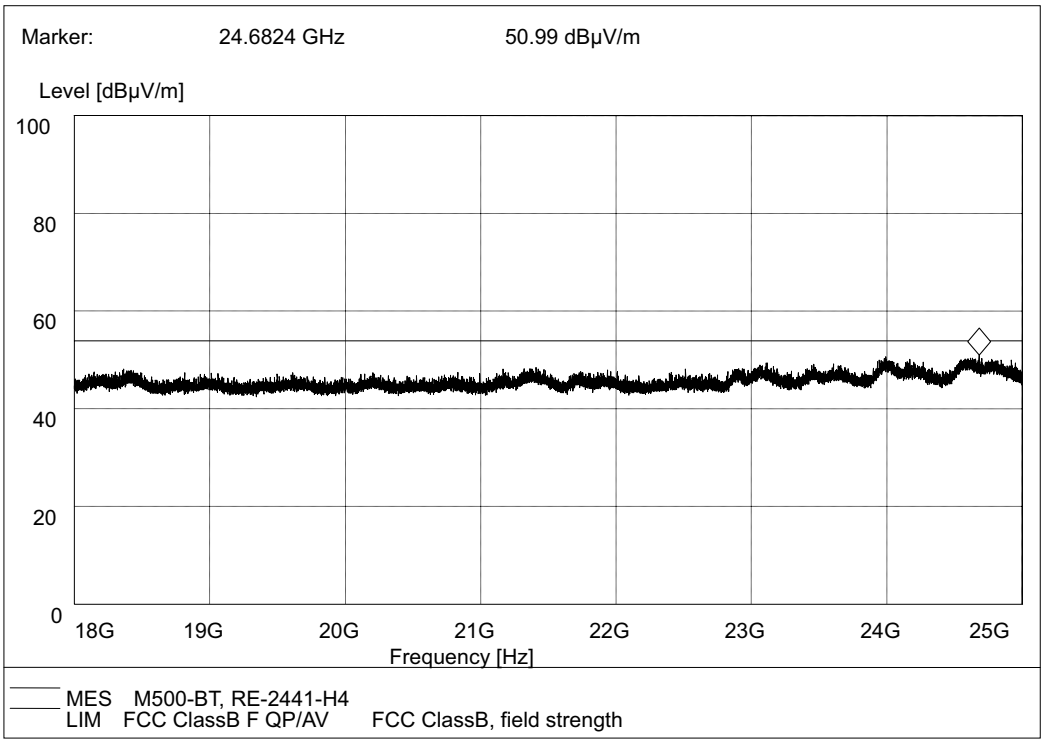
(Plot B.2: Antenna Horizontal, 30MHz to 1GHz)



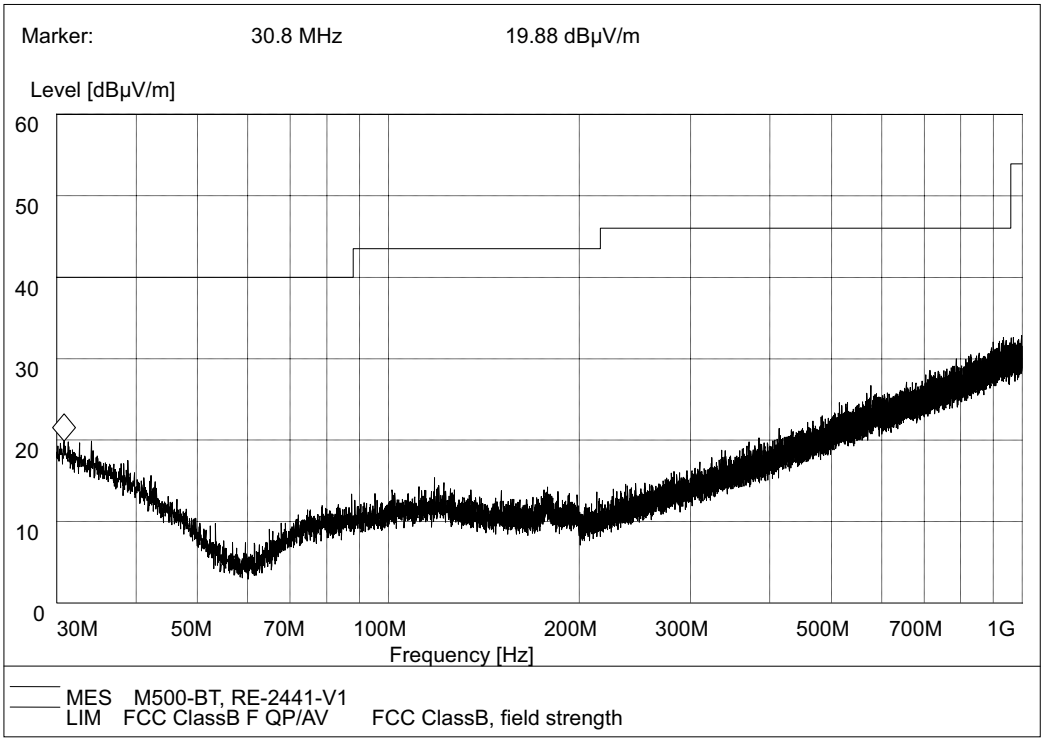
(Plot B.3: Antenna Horizontal, 1GHz to 7GHz)



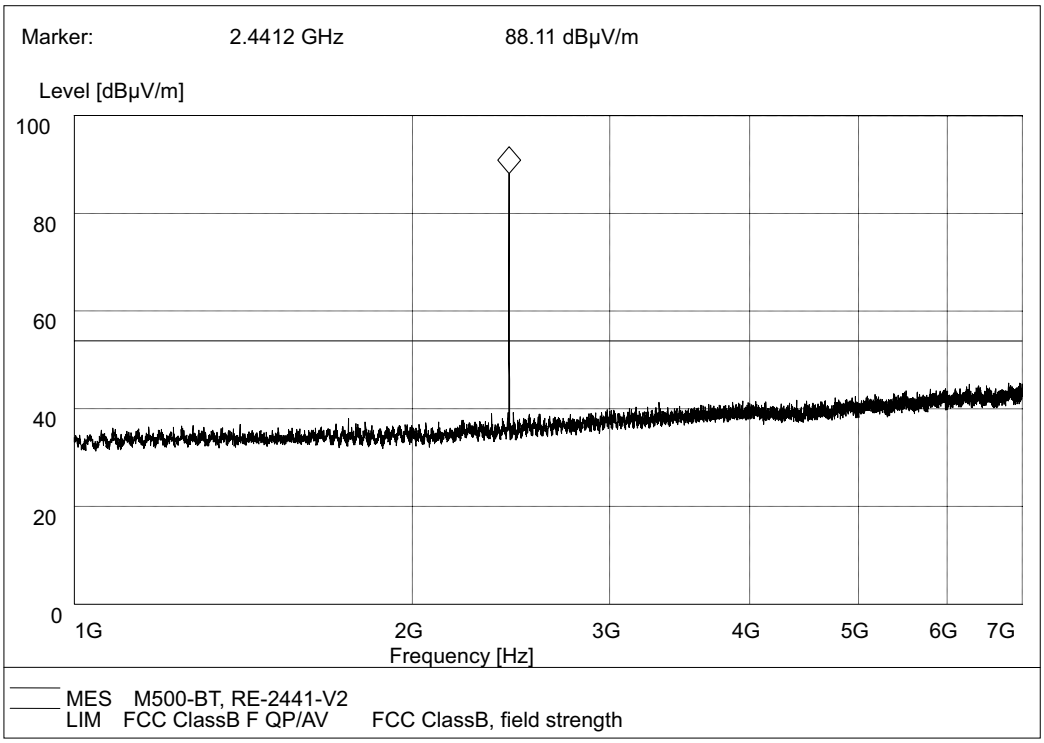
(Plot B.4: Antenna Horizontal, 7GHz to 18GHz)



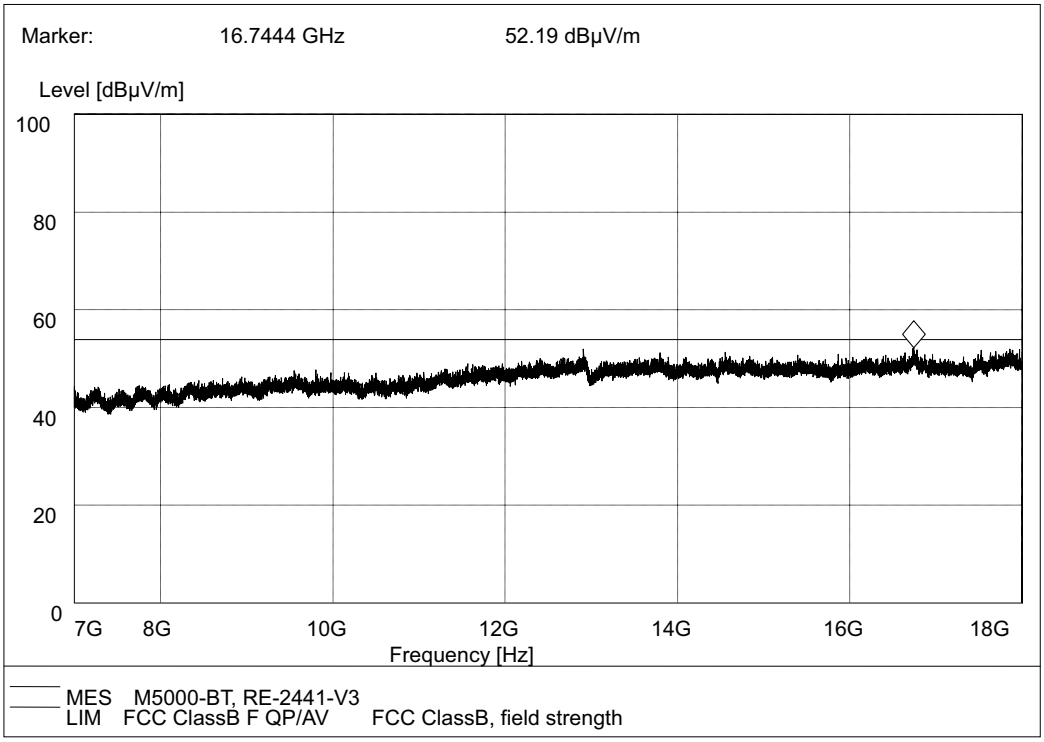
(Plot B.5: Antenna Horizontal, 18GHz to 25GHz)



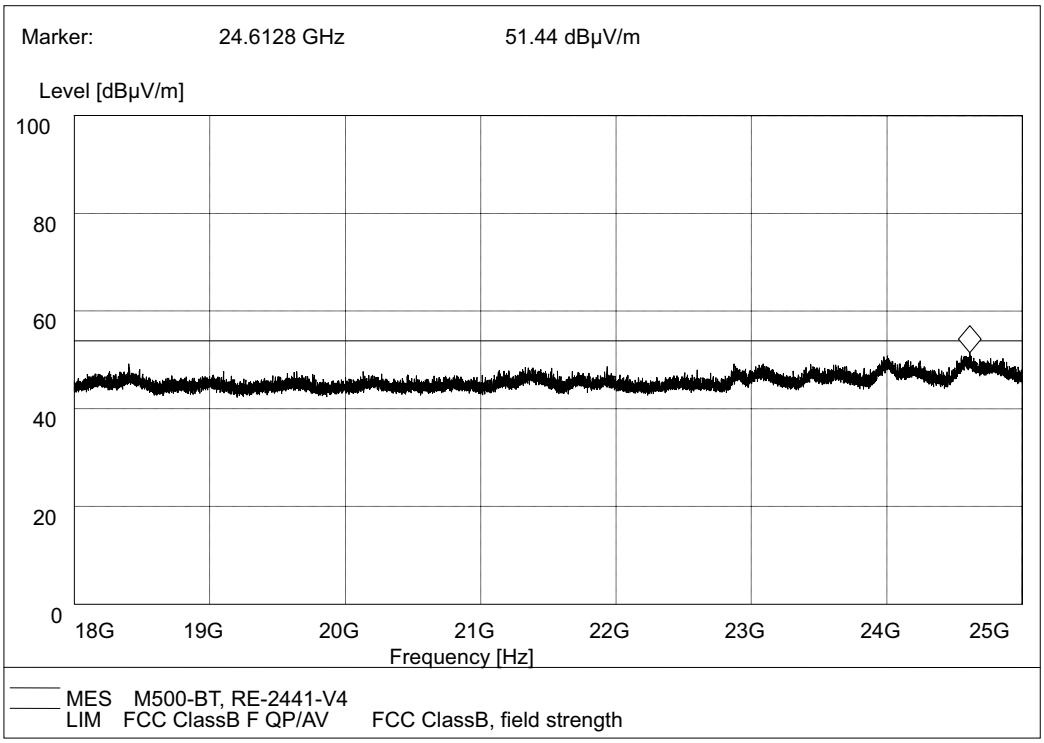
(Plot B.6: Antenna Vertical, 30MHz to 1GHz)



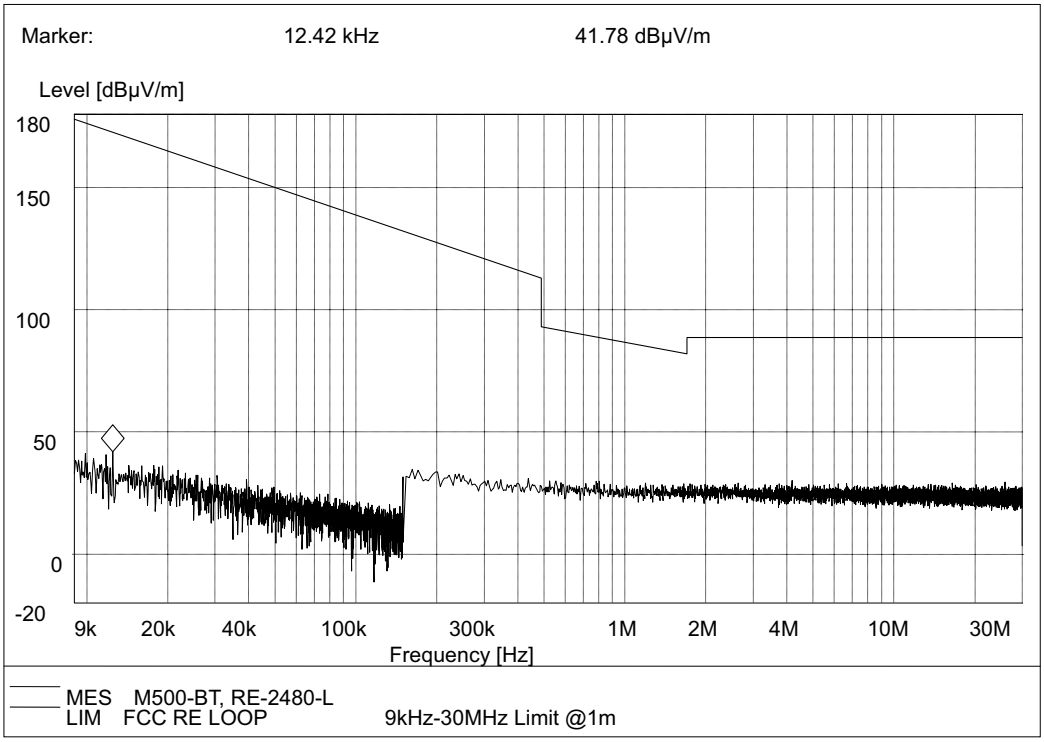
(Plot B.7: Antenna Vertical, 1GHz to 7GHz)



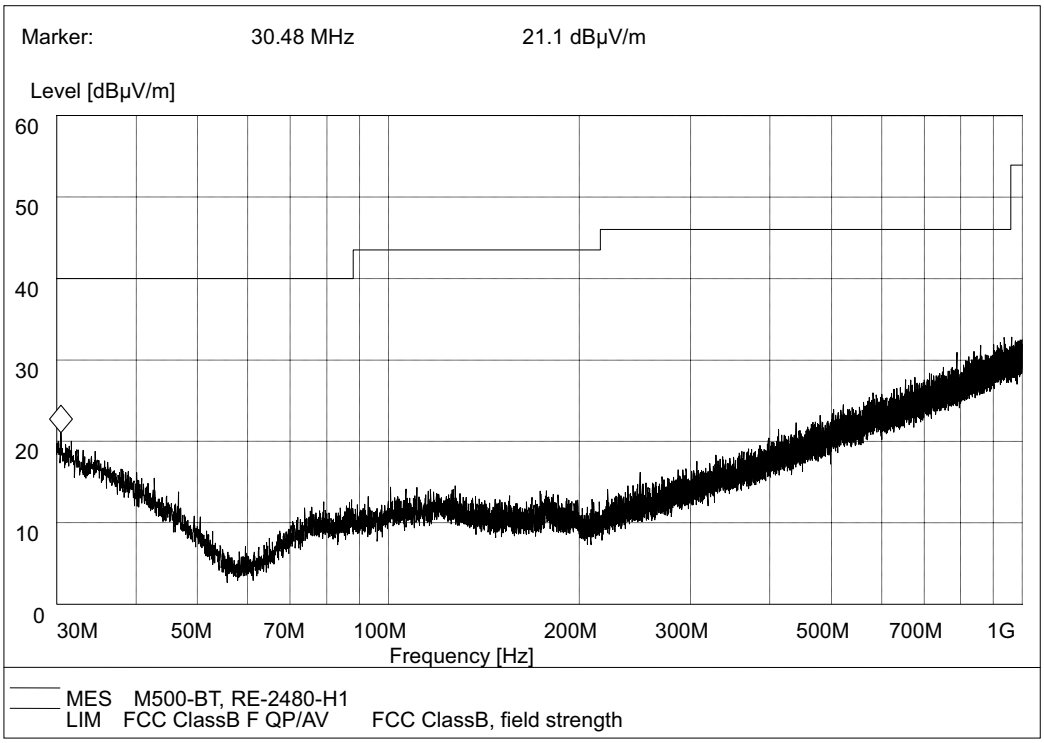
(Plot B.8: Antenna Vertical, 7GHz to 18GHz)



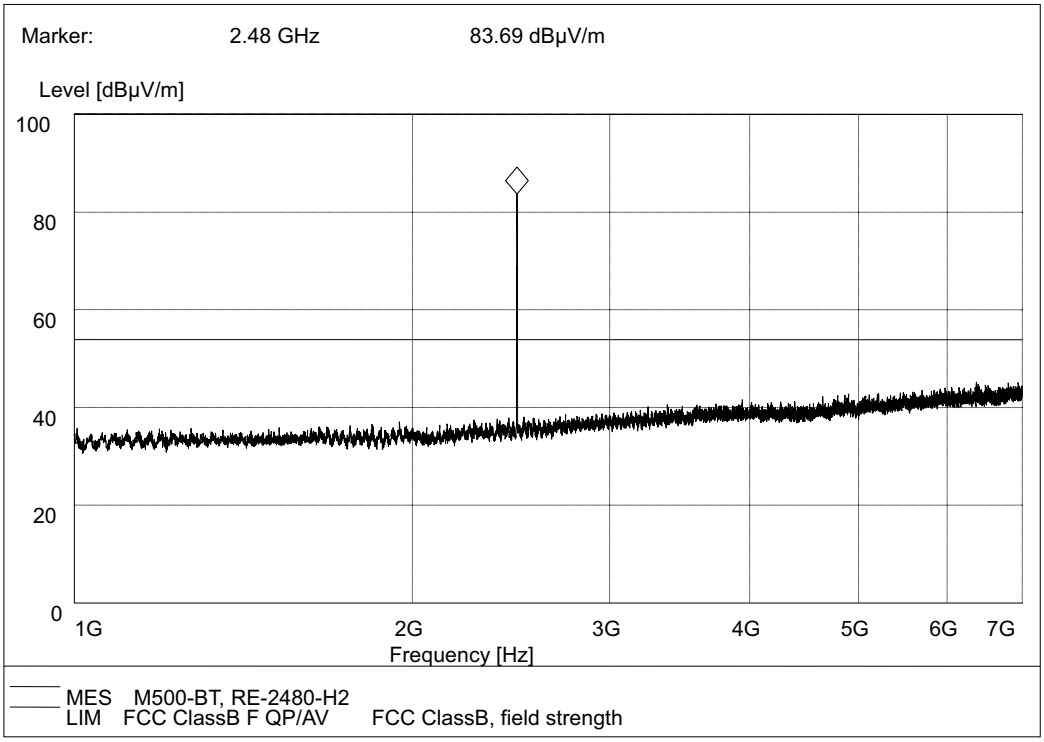
(Plot B.9: Antenna Vertical, 18GHz to 25GHz)



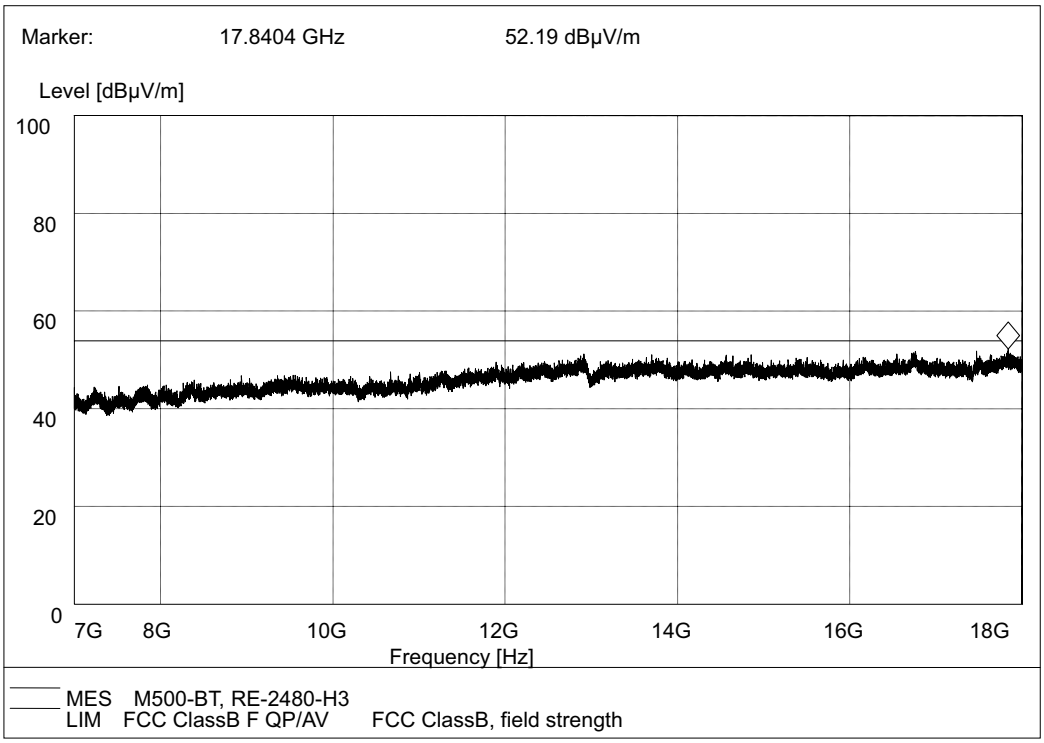
(Plot C.1: 9kHz to 30MHz)



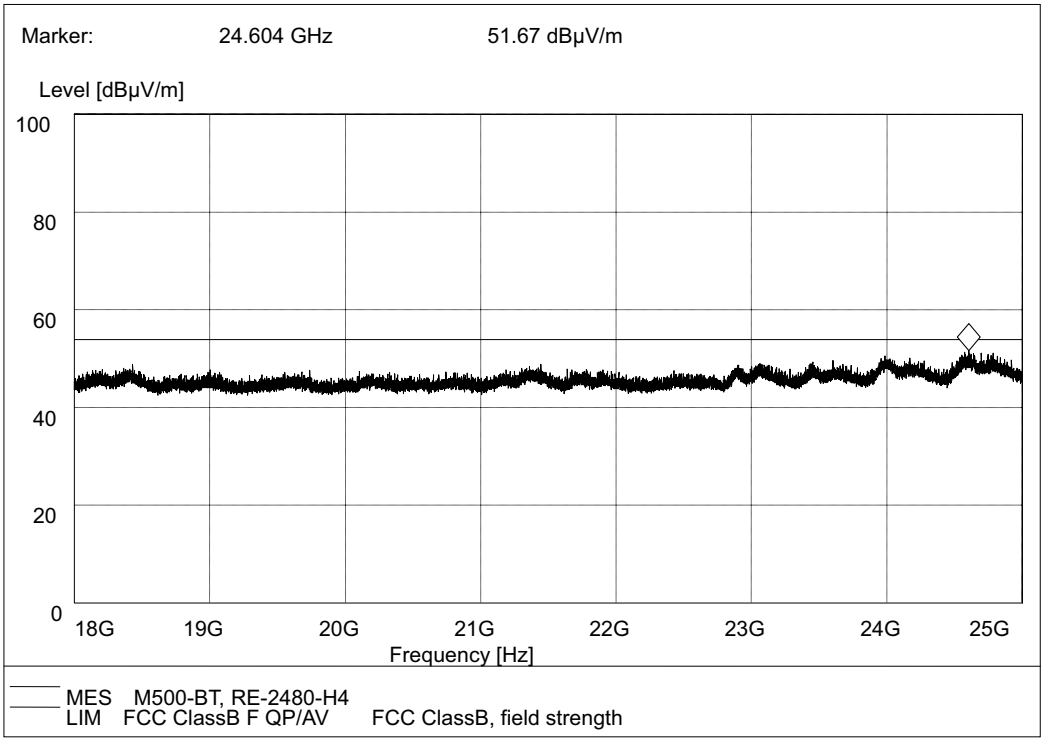
(Plot C.2: Antenna Horizontal, 30MHz to 1GHz)



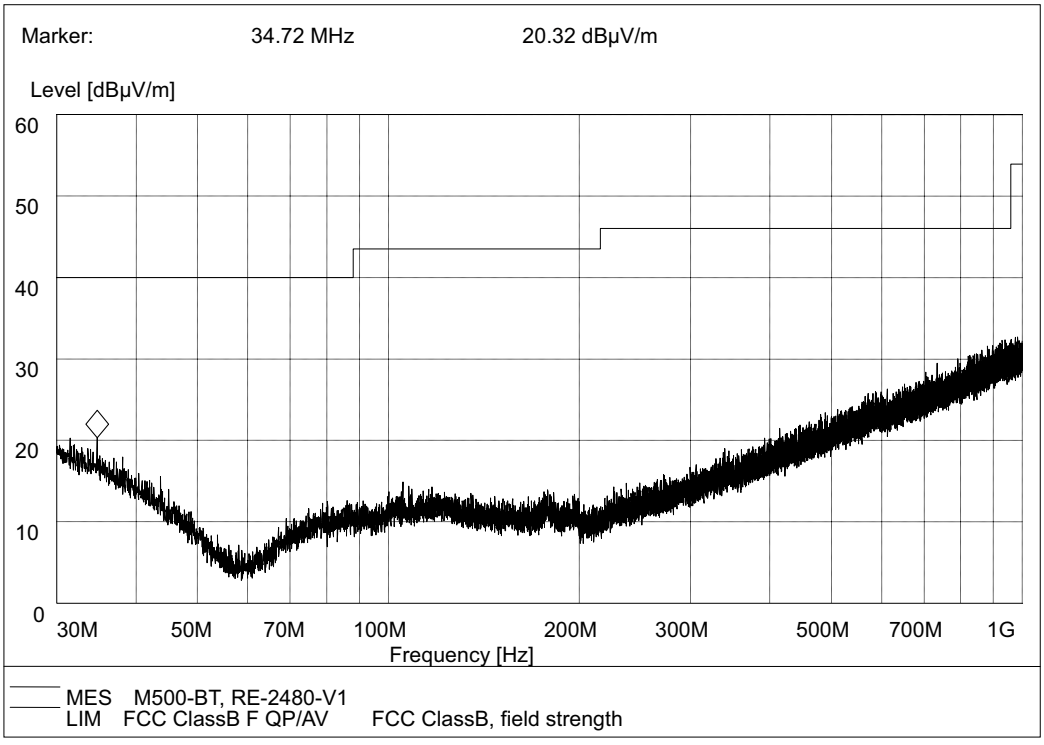
(Plot C.3: Antenna Horizontal, 1GHz to 7GHz)



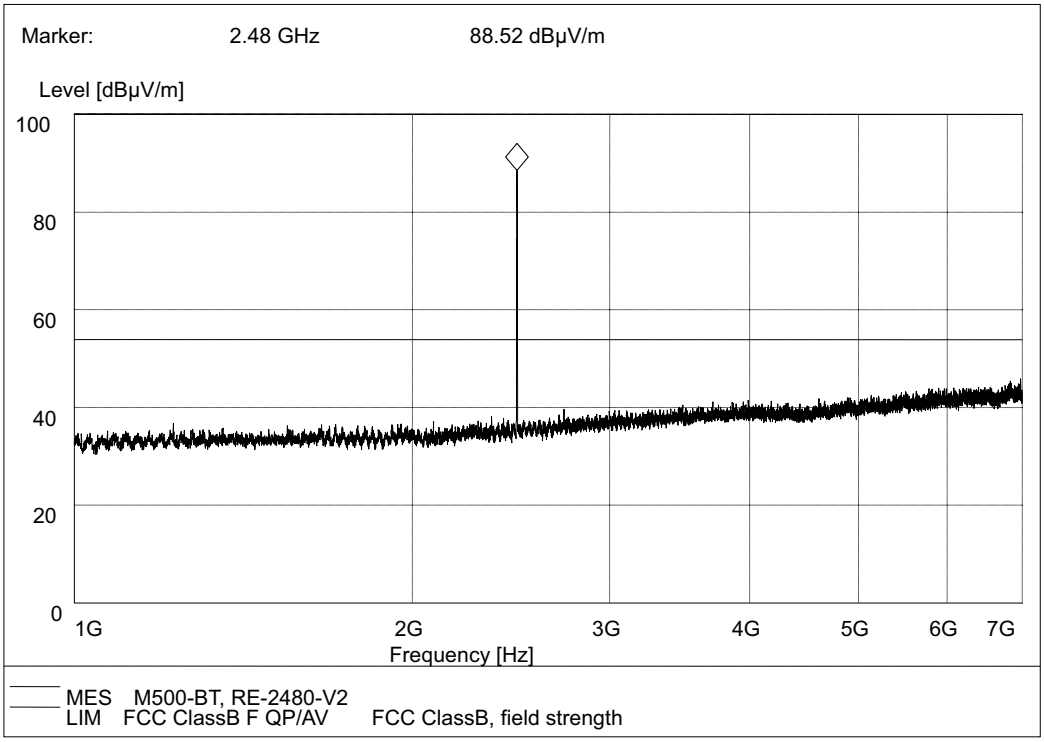
(Plot C.4: Antenna Horizontal, 7GHz to 18GHz)



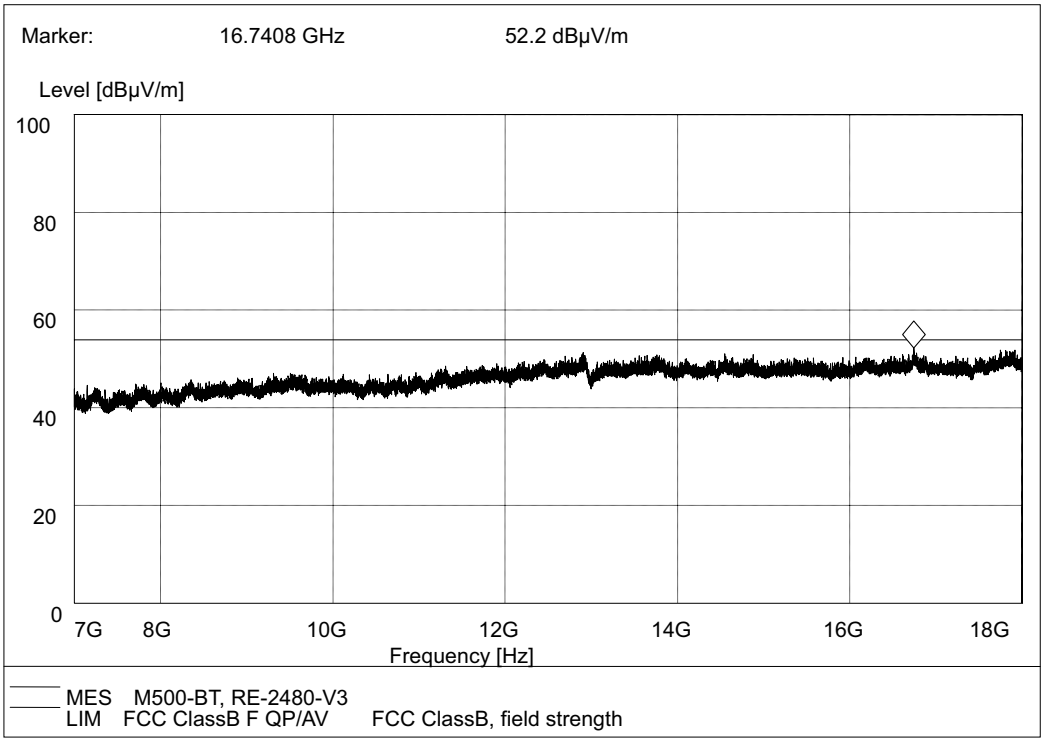
(Plot C.5: Antenna Horizontal, 18GHz to 25GHz)



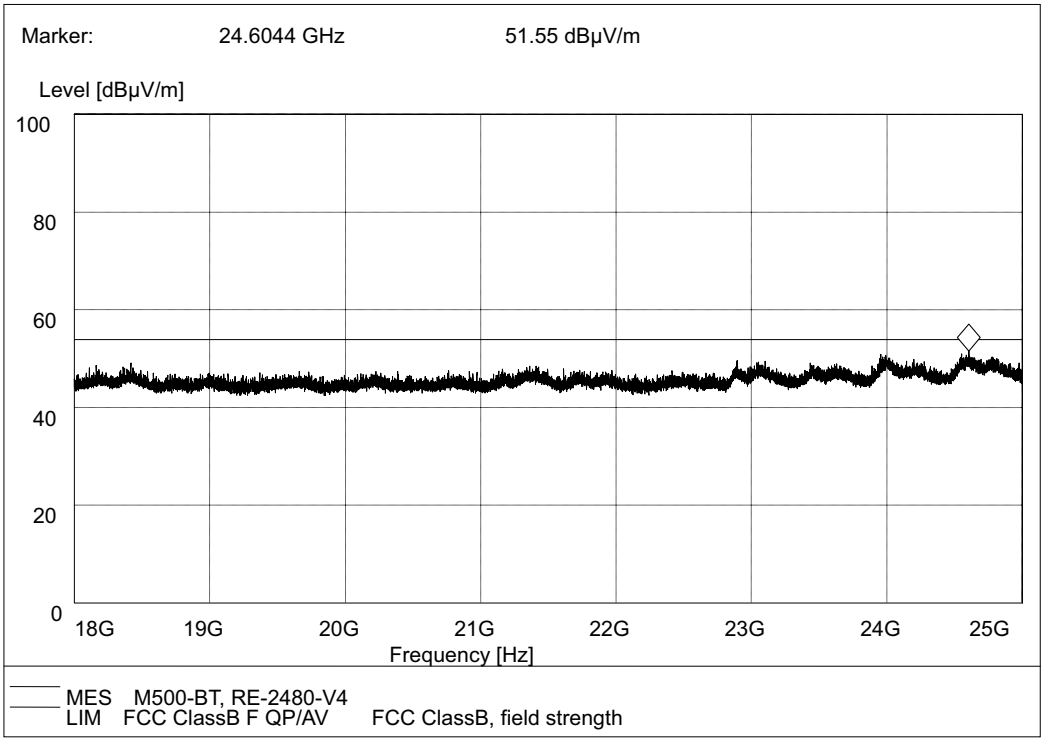
(Plot C.6: Antenna Vertical, 30MHz to 1GHz)



(Plot C.7: Antenna Vertical, 1GHz to 7GHz)



(Plot C.8: Antenna Vertical, 7GHz to 18GHz)



(Plot C.9: Antenna Vertical, 18GHz to 25GHz)

** END OF REPORT **