17 March, 2010

Nokia (China) Investment Co., Ltd
B2, Nokia China Campus.Beijing
Economic and Tech Development Area, No.5. Donghuan Zhonglu.

Dear Yan Wang :

Enclosed you will find your file copy of a Part 15 Certification (FCC ID: QTLBH-108).

For your reference, TCB will normally take another 5 days for reviewing the report. Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

Shawn Xing
Assistant Manager

Enclosure

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com

Nokia (China) Investment Co., Ltd

Application
For
Certification
(FCC ID: QTLBH-108)

Mono Bluetooth Headset

MODEL: BH-108(HW:V3.3, SW:V4.0, MV:V2.0)

2.4GHz Transceiver

SZ10010286-6
Billy Li
17 March, 2010

TRF No.: FCC 15C_TXa
FCC ID: QTLBH-108

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China

Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com

LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Nokia (China) Investment Co., Ltd

MODEL: BH-108(HW:V3.3, SW:V4.0, MV:V2.0)

FCC ID: QTLBH-108

17 March, 2010

This report concerns (check one:) Original Grant ___X___ Class II Change _____

Equipment Type: DSS - Part 15 Spread Spectrum Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No __X__

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No __X__

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-08 Edition] provision.

Report prepared by:

Shawn Xing
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
6F, Block D, Huahan Building, Langshan Road,
Nanshan District, Shenzhen, P. R. China
Phone: (86 755) 8601 6288
Fax: (86 755) 8601 6751

Table of Contents

List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operational Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photos	External Photo	external photos.pdf
Internal Photos	Internal Photo	internal photos.pdf
ID Label/Location Info	Label Artwork and Location	label.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Users Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	letter of agency.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Mono Bluetooth Headset model: BH-108(HW: V3.3, SW: V4.0, MV: V2.0). It is powered by an internal 3.7V rechargeable battery, and also can be charged by an external adapter (Input: 100-240VAC, 50/60Hz, output: DC 5.0V, 350mA).

Antenna Type: metal stip antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is an application for certification of a transceiver.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003) and DA 00-705. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data is **Interterk Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

The EUT was powered fully charged 3.7V internal rechargeable battery and was charged by an external adaptor (Input: 100-240V AC, 50/ 60Hz, output: DC 5.0V, 350mA) in the testing.

All packets DH1, DH3 & DH5 mode in all modulation type GFSK, π/4 –DQPSK and 8-DPSK were tested, and only the worst data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was placed in the center of the turntable when powered by internal rechargeable battery and the rear of unit shall be flushed with the rear of the table when powered by adapter.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level.

2.3 Special Accessories

No special accessories used.

2.4 Equipment Modification

Any modifications installed previous to testing by Nokia (China) Investment Co., Ltd will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

This product was tested in the following configuration:

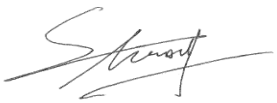
Refer List:

Description	Manufacturer	Model No.
Mobile phone	Nokia	N73
Adapter	Nokia	AC-3U
Bluetooth tester	R&S	CBT

All the items listed under section 2.0 of this report are

Confirmed by:

Shawn Xing
Assistant Manager
Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
Agent for Nokia (China) Investment Co., Ltd



Signature

17 March, 2010 Date

EXHIBIT 3

TEST RESULTS

3.0 **Test Results**

Data is included worst-case configuration (the configuration which resulted in the highest emission levels).

3.1 **Radiated Test Results**

A sample calculation, configuration photographs and data tables of the emissions are included.

3.1.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB

AV = -10 dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBµV/m

Level in µV/m = Common Antilogarithm [(32 dBµV/m)/20] = 39.8 µV/m

3.1.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

3.1.3 Radiated Emissions

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
49.407 MHz

Judgement: Passed by 12.6 dB

TEST PERSONNEL:

Signature

Billy Li, Compliance Engineer
Typed/Printed Name

17 March, 2010
Date

Applicant: Nokia (China) Investment Co., Ltd Date of Test: 17 March, 2010
Model: BH-108(HW:V3.3, SW:V4.0, MV:V2.0)
Sample: 1/2
Worst Case Operating Mode: Link with Mobile Phone (with the adapter)

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Vertical	221.090	35.1	20.0	11.4	26.5	46.0	-19.5
Vertical	275.410	31.8	20.0	12.9	24.7	46.0	-21.3
Horizontal	49.407	38.2	20.0	9.2	27.4	40.0	-12.6
Horizontal	113.420	41.7	20.0	8.6	30.3	43.5	-13.2
Horizontal	167.740	37.9	20.0	9.5	27.4	43.5	-16.1
Horizontal	382.110	33.5	20.0	16.1	29.6	46.0	-16.4

NOTES:
1. Quasi-Peak detector is used except for others stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

Test Engineer: Billy Li

3.1.4 Transmitter Spurious Emissions (Radiated)

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
12010.000 MHz

Judgement: Passed by 17.4 dB

TEST PERSONNEL:

Signature

Billy Li, Compliance Engineer
Typed/Printed Name

17 March, 2010
Date

Applicant: NOKIA (CHINA) INVESTMENT CO., LTD Date of Test: 17 March, 2010
Model: BH-108(HW: V3.3, SW: V4.0, MV: V2.0)
Sample: 2/2
Mode: TX-Channel 0 (2402MHz)

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	**2402.000	108.0	36.7	28.5	99.8	--	--
Horizontal	*4803.720	48.3	36.1	33.1	45.3	74.0	-28.7
Horizontal	*12010.000	52.7	35.6	39.5	56.6	74.0	-17.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	**2402.000	108.0	36.7	28.5	--	99.8	--	--
Horizontal	*12010.000	52.7	35.6	39.5	30.1	26.5	54.0	-27.5

NOTES: 1. Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Billy Li

Applicant: NOKIA (CHINA) INVESTMENT CO., LTD Date of Test: 17 March, 2010
Model: BH-108(HW: V3.3, SW: V4.0, MV: V2.0)
Sample: 2/2
Mode: TX-Channel 39 (2441MHz)

Table 3

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4882.000	49.0	36.1	33.3	46.2	74.0	-27.8
Vertical	*7332.000	49.7	36.2	37.9	51.4	74.0	-22.6
Vertical	*12205.000	52.4	36.3	39.6	55.7	74.0	-18.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*12205.000	52.4	36.3	39.6	30.1	25.6	54.0	-28.4

NOTES: 1. Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Billy Li

Applicant: NOKIA (CHINA) INVESTMENT CO., LTD Date of Test: 17 March, 2010
Model: BH-108(HW: V3.3, SW: V4.0, MV: V2.0)
Sample: 2/2
Mode: TX-Channel 78 (2480MHz)

Table 4

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Vertical	**2480.000	108.1	36.7	28.6	100.0	–	–
Vertical	*4960.000	47.0	36.1	33.4	44.3	74.0	-29.7
Vertical	*7440.000	49.7	36.2	38.2	51.7	74.0	-22.3
Vertical	*12400.000	51.8	36.3	39.6	55.1	74.0	-19.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Vertical	**2480.000	108.1	36.7	28.6	--	100.0	--	--
Vertical	*12400.000	51.8	36.3	39.6	30.1	25.0	54.0	-29.0

NOTES: 1. Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Billy Li

3.1.5 Receiver Spurious Emissions (Radiated)

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
45.400 MHz

Judgement: Passed by 9.3 dB

TEST PERSONNEL:

Signature

Billy Li, Compliance Engineer
Typed/Printed Name

17 March, 2010
Date

Company: NOKIA (CHINA) INVESTMENT CO., LTD Date of Test: 17 March, 2010
Model: BH-108(HW:V3.3, SW:V4.0, MV:V2.0)
Sample:2/2
Worst Case Operating Mode: Receive, adapter charged

Table 5

Radiated Scan
Pursuant to 15.109 Emissions Requirement

Polarization	Frequency (MHz)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	45.400	30.7	40.0	-9.3
Horizontal	125.500	25.3	43.5	-18.2
Horizontal	138.900	26.2	43.5	-17.3
Horizontal	265.800	30.8	46.0	-15.2
Horizontal	758.500	32.5	46.0	-13.5
Horizontal	822.250	31.6	46.0	-14.4
Horizontal	2402.000	21.0	54.0	-33.0
Horizontal	4804.000	21.2	54.0	-32.8

Notes:
1. Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.
2. Negative sign (–) in the margin column signify levels below the limit.
3. Horn antenna is used for the emission over 1000MHz.
4. Uncertainty: ±4.8dB at a level of confidence of 95%.

3.2 **Conducted Emission at Mains Terminal**

3.2.1 Conducted Emissions Configuration Photograph

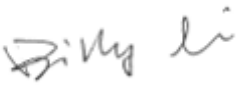
For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

3.2.2 Conducted Emissions

Worst Case Line-Conducted Configuration
at
3.386 MHz and 2.554 MHz

Judgement: Passed by 25.0 dB margin

TEST PERSONNEL:



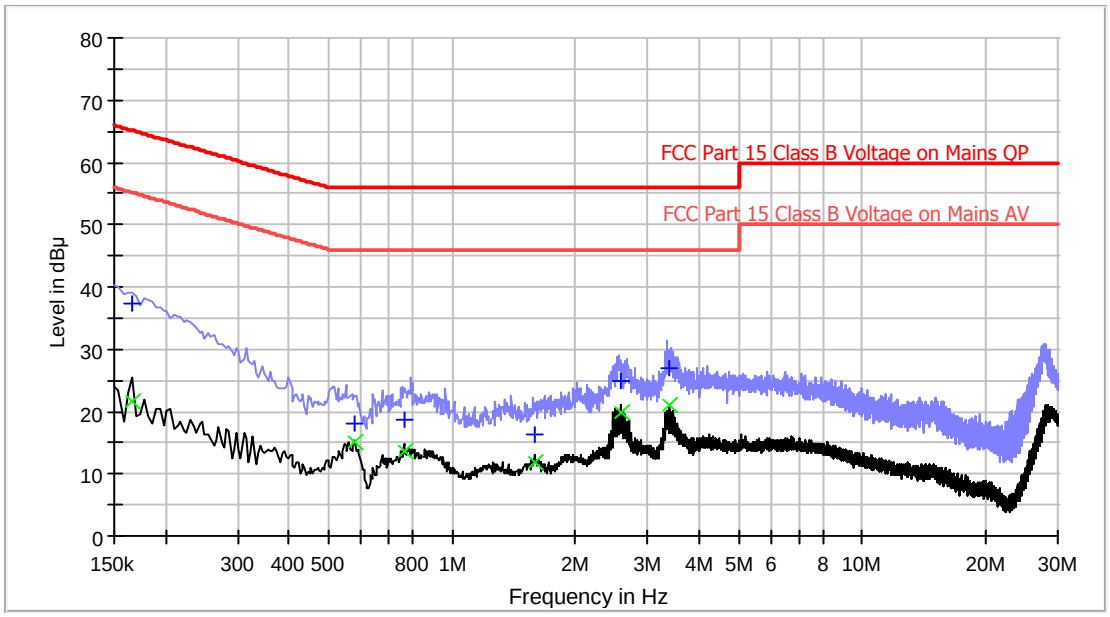
Signature

Billy Li, Compliance Engineer
Typed/Printed Name

17 March, 2010
Date

Company: NOKIA (CHINA) INVESTMENT CO., LTD Date of Test: 17 March, 2010
Model: BH-108(HW:V3.3, SW:V4.0, MV:V2.0)
Sample:1/2
Worst Case Operating Mode: Link with Mobile Phone

Conducted Emission Test - FCC



Result Table-QP

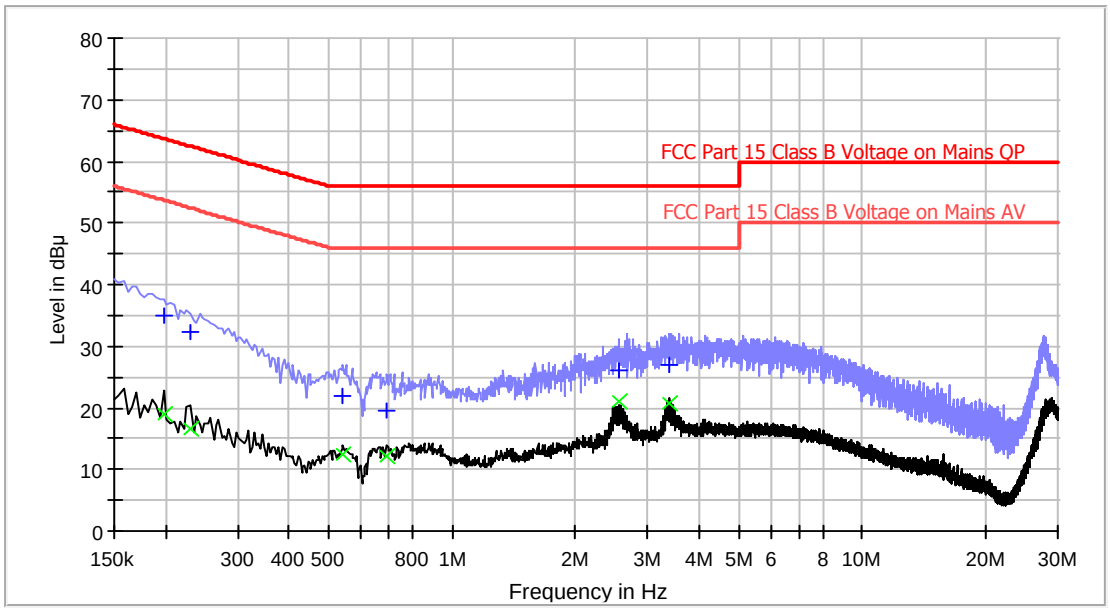
Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.166000	37.4	L1	9.6	27.8	65.2
0.578000	18.1	L1	9.7	37.9	56.0
0.766000	18.7	L1	9.7	37.3	56.0
1.594000	16.2	L1	9.7	39.8	56.0
2.570000	25.0	L1	9.7	31.0	56.0
3.386000	26.9	L1	9.7	29.1	56.0

Result Table-AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.166000	21.7	L1	9.6	33.5	55.2
0.578000	15.2	L1	9.7	30.8	46.0
0.766000	13.7	L1	9.7	32.3	46.0
1.594000	11.8	L1	9.7	34.2	46.0
2.570000	19.7	L1	9.7	26.3	46.0
3.386000	21.0	L1	9.7	25.0	46.0

Company: NOKIA (CHINA) INVESTMENT CO., LTD Date of Test: 17 March, 2010
Model: BH-108(HW:V3.3, SW:V4.0, MV:V2.0)
Sample:1/2
Worst Case Operating Mode: Link with Mobile Phone

Conducted Emission Test - FCC



Result Table-QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.198000	35.0	N	9.6	28.7	63.7
0.230000	32.3	N	9.6	30.1	62.4
0.542000	22.0	N	9.6	34.0	56.0
0.694000	19.5	N	9.6	36.5	56.0
2.554000	26.1	N	9.7	29.9	56.0
3.402000	27.0	N	9.7	29.0	56.0

Result Table-AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.198000	18.9	N	9.6	34.8	53.7
0.230000	16.5	N	9.6	35.9	52.4
0.542000	12.4	N	9.6	33.6	46.0
0.694000	12.2	N	9.6	33.8	46.0
2.554000	21.0	N	9.7	25.0	46.0
3.402000	20.9	N	9.7	25.1	46.0

3.3 Peak Power

Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(1)

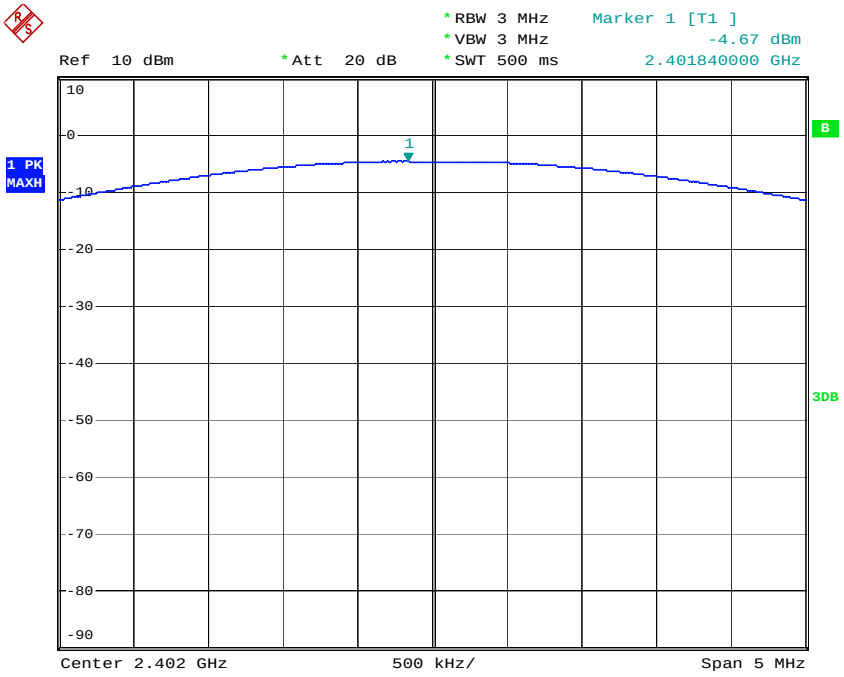
The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW > 20dB bandwidth and power was read directly in dBm. Cable loss was considered during this measurement.

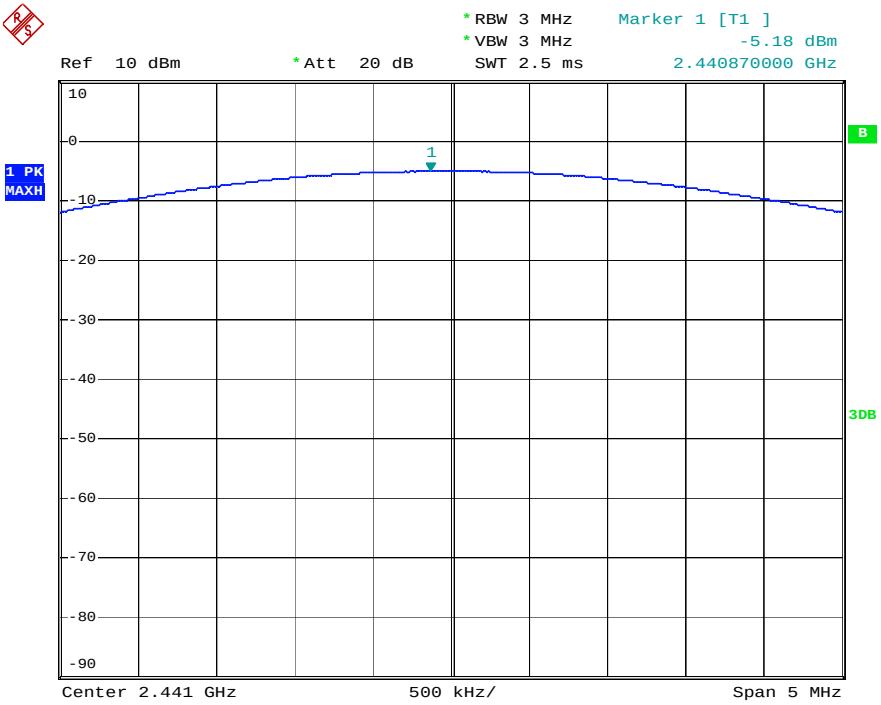
For antenna with gains of 6dBi or less, maximum allowed transmitter output 1 watt (+30dBm)

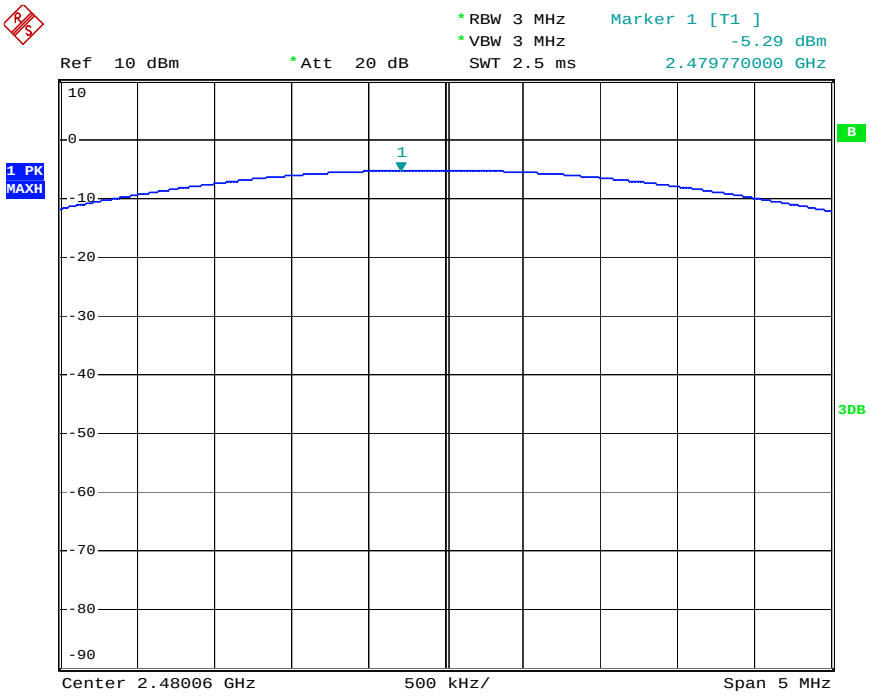
Antenna Gain = 0dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
2402	3.83	2.42
2441	3.32	2.15
2480	3.21	2.09

Cable loss: 1.5dB, Power Splitter attenuation 7dB

Modulation Type: GFSK
Packet: DH1




*RBW 3 MHz
Marker 1 [T1]
*VBW 3 MHz
-5.18 dBm
Ref 10 dBm
*Att 20 dB
SWT 2.5 ms
2.440870000 GHz
1 PK
MAXH
B
3DB
Center 2.441 GHz
500 kHz/
Span 5 MHz


*RBW 3 MHz
Marker 1 [T1]
*VBW 3 MHz
-5.29 dBm
Ref 10 dBm
*Att 20 dB
SWT 2.5 ms
2.479770000 GHz
1 PK
MAXH
B
3DB
Center 2.48006 GHz
500 kHz/
Span 5 MHz

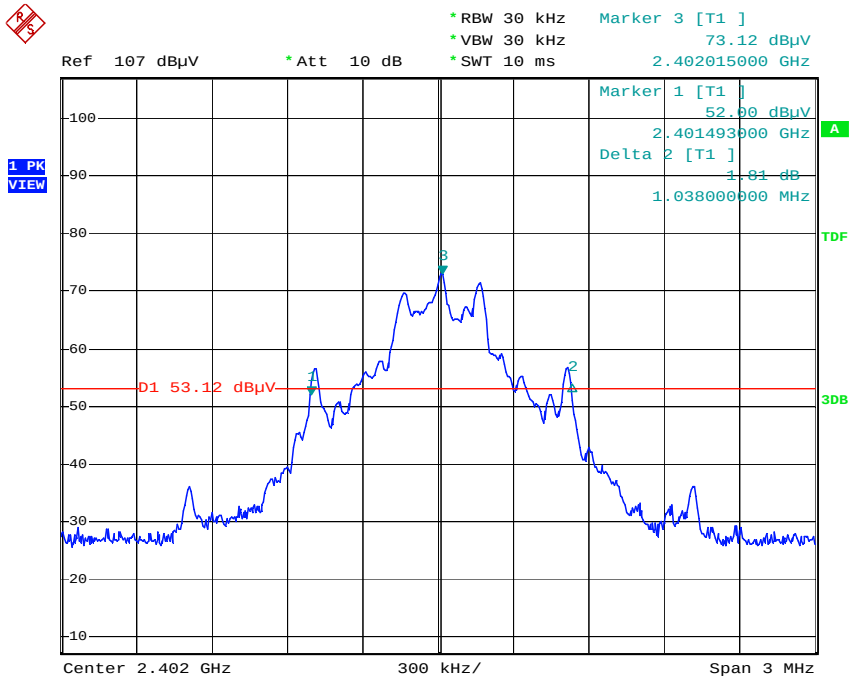
3.4 **20dB Bandwidth**

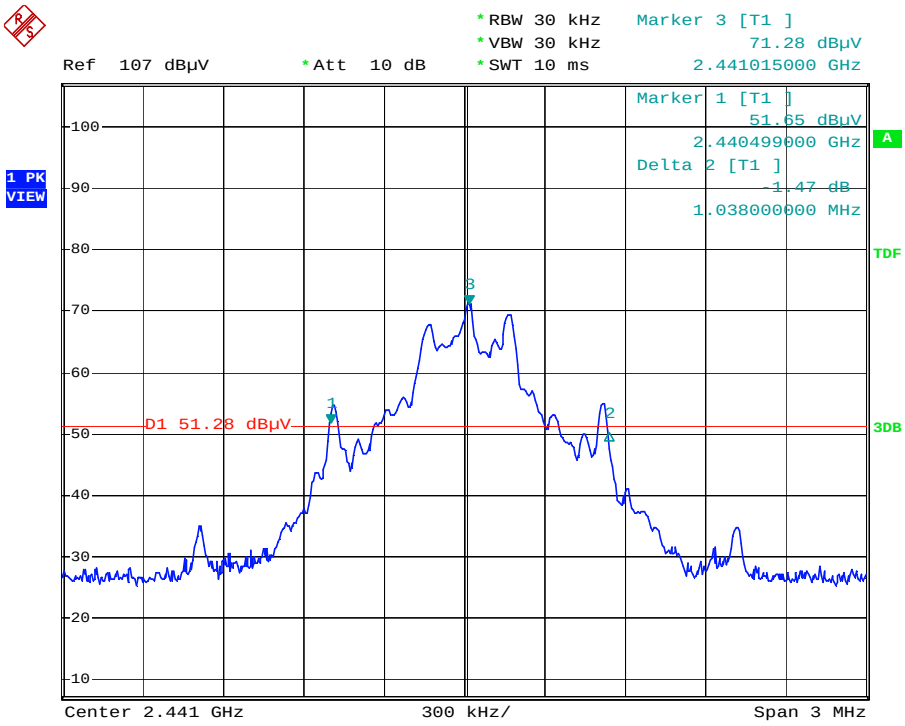
Maximum 20dB RF Bandwidth, FCC Rule 15.247(a) (1):

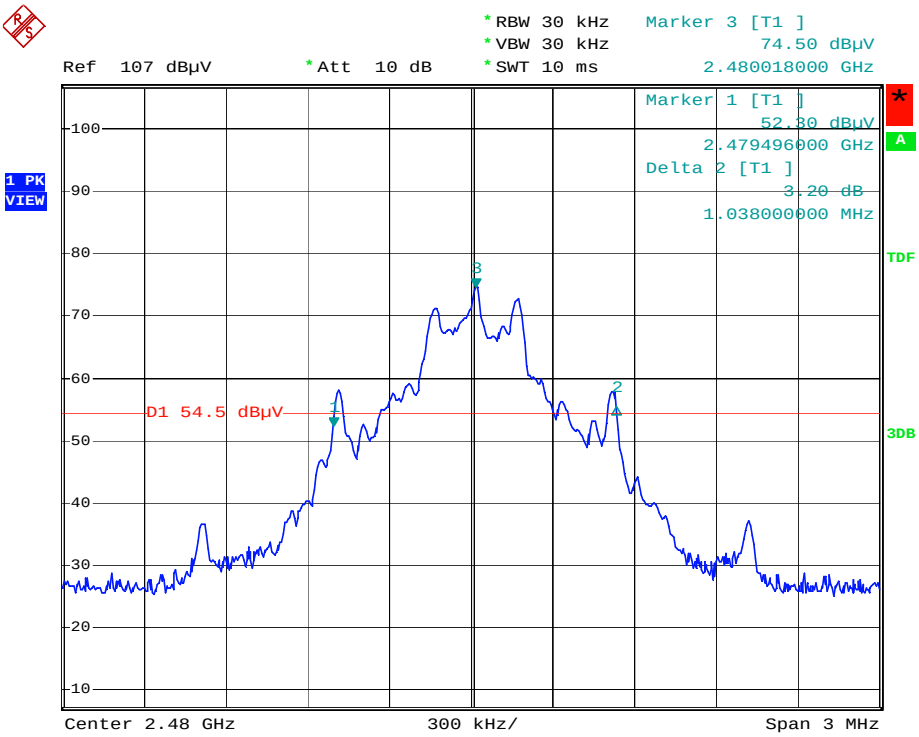
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

Frequency (MHz)	20 dB Bandwidth (MHz)
2402，2441，2480	1.038

Modulation Type: 8 -DPSK
Packet: DH5




*RBW 30 kHz
*VBW 30 kHz
*SWT 10 ms
Marker 3 [T1]
71.28 dBµV
2.441015000 GHz
Ref 107 dBµV
*Att 10 dB
Marker 1 [T1]
51.65 dBµV
2.440499000 GHz
Delta 2 [T1]
-1.47 dB
1.038000000 MHz
1 PK VIEW
A
TDF
3DB
D1 51.28 dBµV
Center 2.441 GHz
300 kHz/
Span 3 MHz


*RBW 30 kHz
*VBW 30 kHz
*SWT 10 ms
Marker 3 [T1]
74.50 dBµV
2.480018000 GHz
Ref 107 dBµV
*Att 10 dB
Marker 1 [T1]
52.30 dBµV
2.479496000 GHz
Delta 2 [T1]
3.20 dB
1.038000000 MHz
1 PK VIEW
A
TDF
3DB
D1 54.5 dBµV
Center 2.48 GHz
300 kHz/
Span 3 MHz

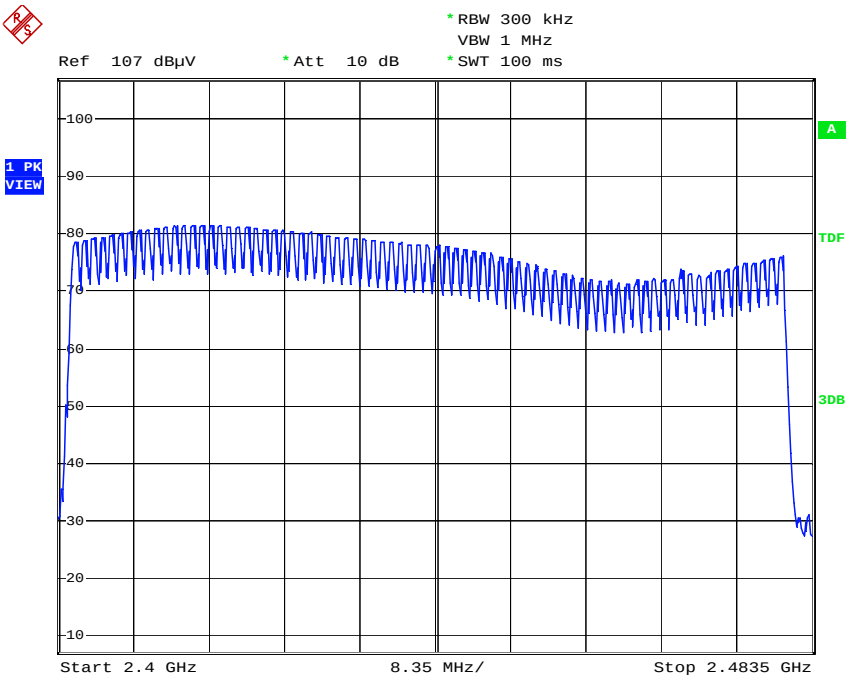
3.5 Channel Number (Number of Hopping Frequencies)

Minimum Number of Hopping Frequencies, FCC Rule 15.247(a) (1) (iii):

The RF passband of the EUT was divided into 5 approximately equal bands. With the analyzer set to MAX HOLD readings were taken for 2-3 minutes. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

Number of hopping channels =	79

Modulation Type: GFSK
Packet: DH1



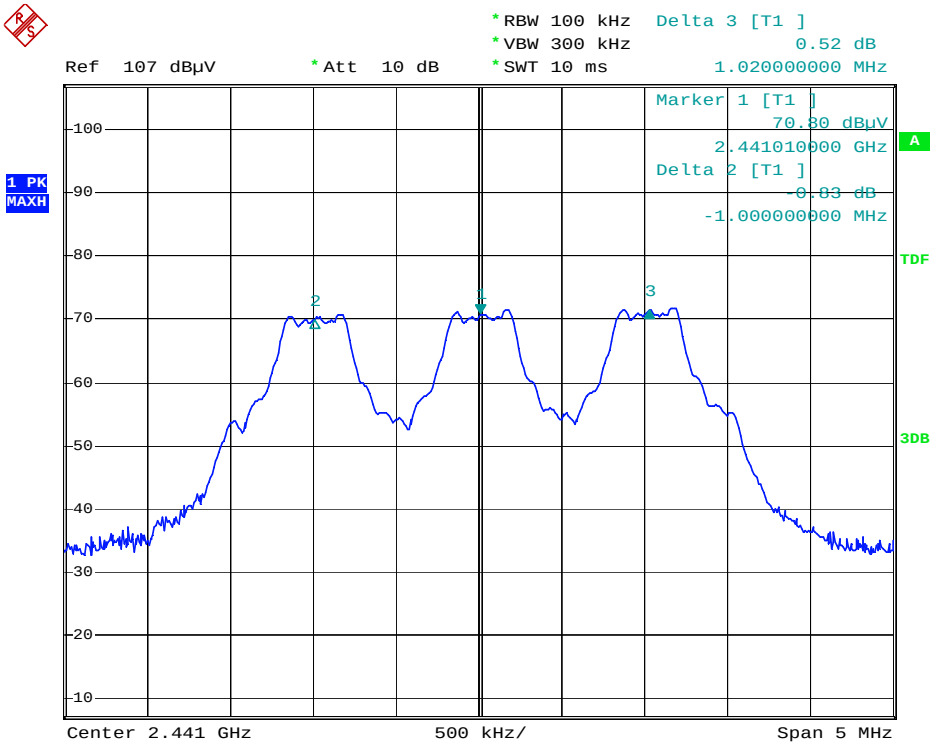
3.6 Channel Separation (Carrier Frequency Separation)

Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1):

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit:

2/3 of 20dB bandwidth of hopping channel: 0.692MHz

Channel Separation	1 MHz



3.7 Dwell Time (Time of Occupancy)

Average Channel Occupancy Time, FCC Ref: 15.247(a)(1)(iii):

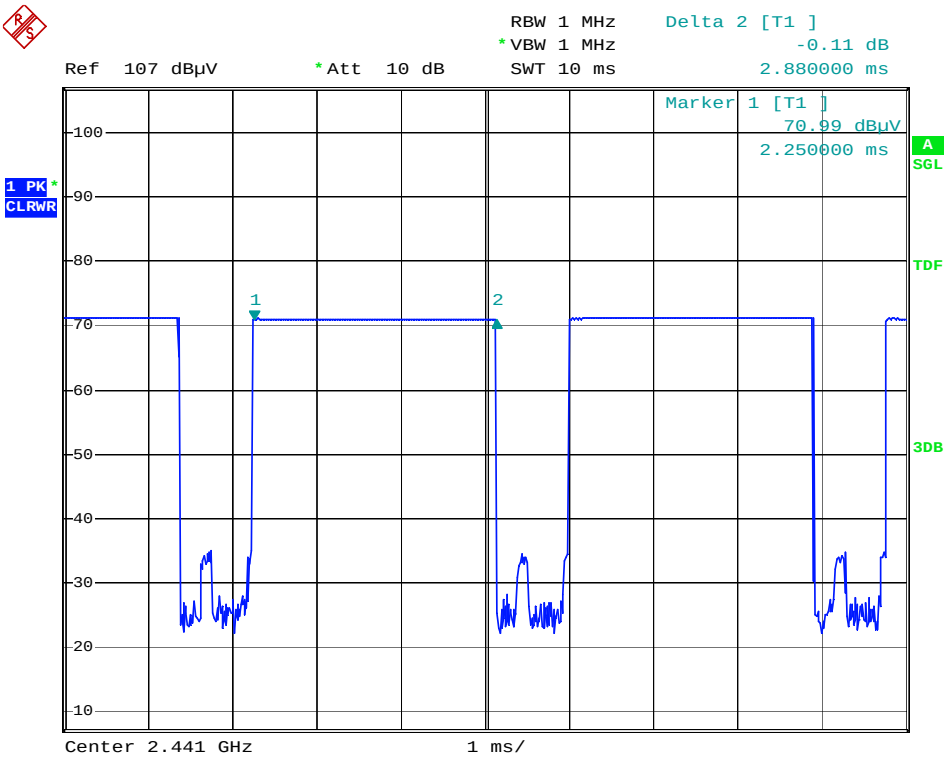
The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 10ms, the SPAN was set to ZERO SPAN, and the TRGGER was set to VIDEO. The time duration of the transmissions so captured was measured with the MARKER DELTA function.

The maximum number of hopping channels in 31.6s
=1600 / 6 / 79 *31.6=106.7

Max Dwell Time = 2.88 ms * 107	= 308.16 ms

< limit 0.4s

Modulation Type: 8 -DPSK
Packet: DH5


RBW 1 MHz
*VBW 1 MHz
SWT 10 ms
Delta 2 [T1]
-0.11 dB
2.880000 ms
Ref 107 dBµV
*Att 10 dB
Marker 1 [T1]
70.99 dBµV
2.250000 ms
1 PK *
CLRWR
A
SGL
TDF
3DB
100
90
80
70
60
50
40
30
20
10
1
2
Center 2.441 GHz
1 ms/

3.8 **Band Edge**

Out of Band Conducted Emissions, FCC Rule 15.247(d):

In any 100 KHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

Furthermore, delta measurement technique for measuring bandage emissions was shown as below:

(i) Lower channel 2402MHz:

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the bandedge plot

= 99.8dBµv/m-40.8dB
= 59.0dBµv/m

Average Resultant field strength = 59.0dBµv/m-30.1dB
= 28.9dBµv/m

(ii) Upper channel 2480MHz:

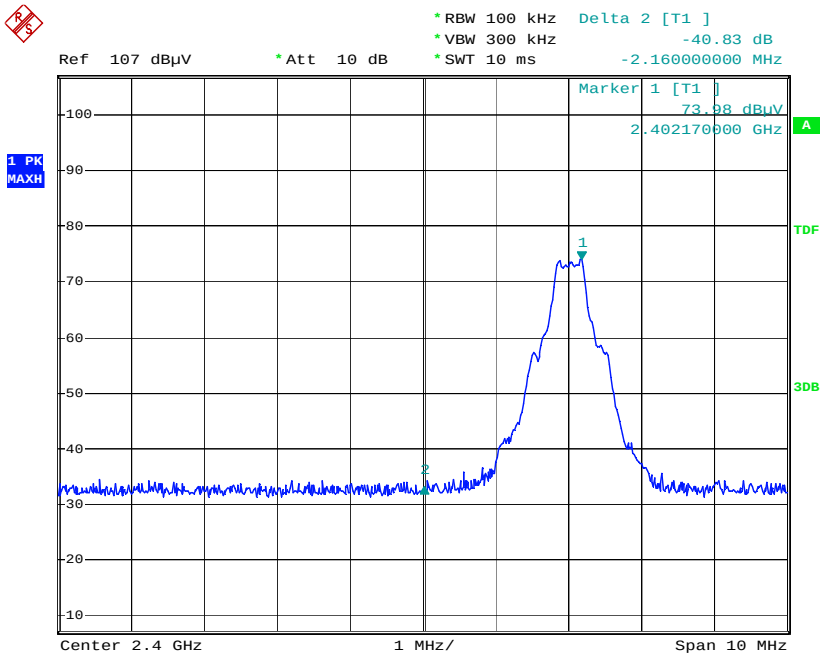
Peak Resultant field strength = Fundamental emissions (peak value) – delta from the bandedge plot

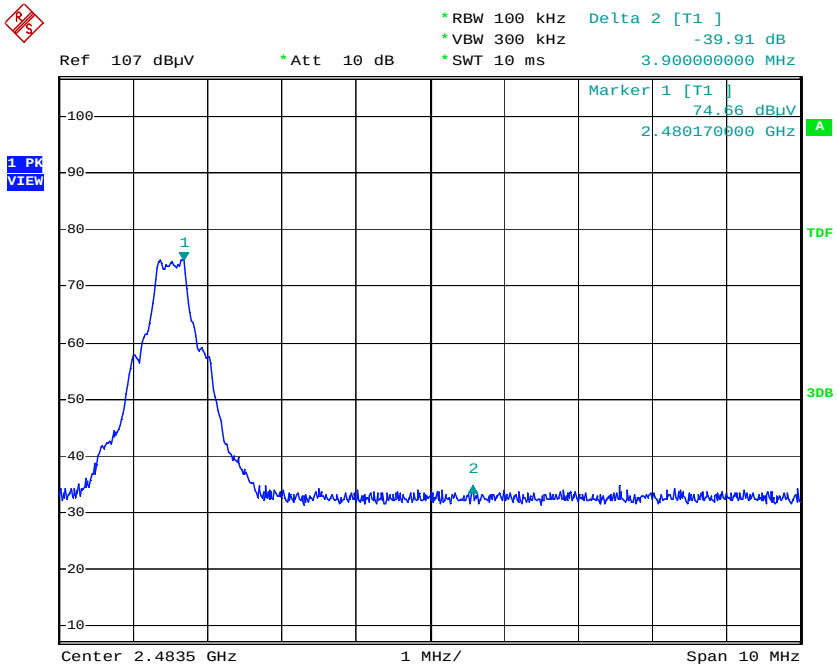
= 100.0dBµv/m-39.9dB
= 60.1dBµv/m

Average Resultant field strength = 60.1dBµv/m-30.1dB
= 30.0dBµv/m

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74 dBµv/m (Peak Limit) and 54dBµv/m (Average Limit).

Modulation Type: GFSK
Packet: DH1





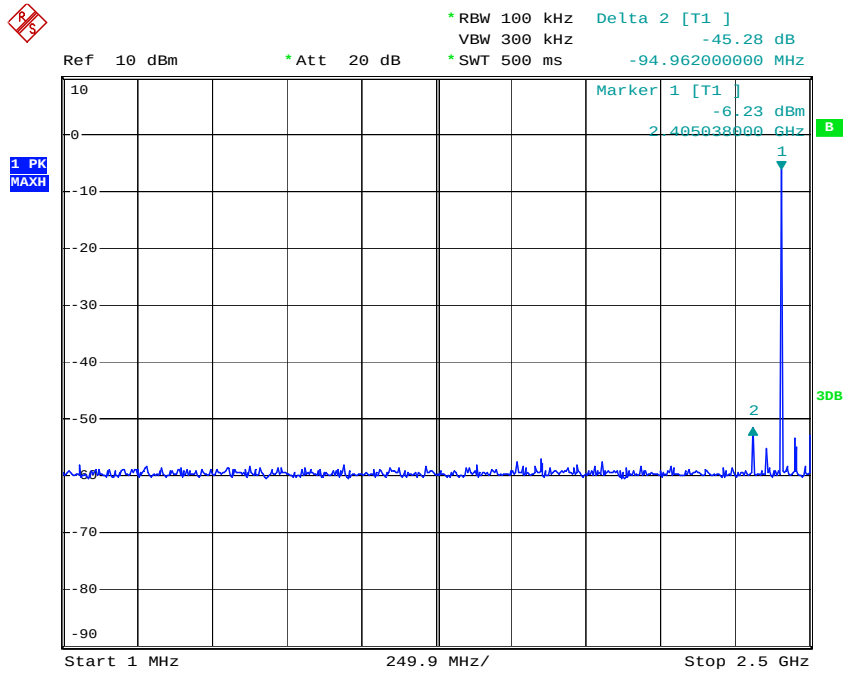
3.9 **Transmitter Spurious Emissions (Conducted)**

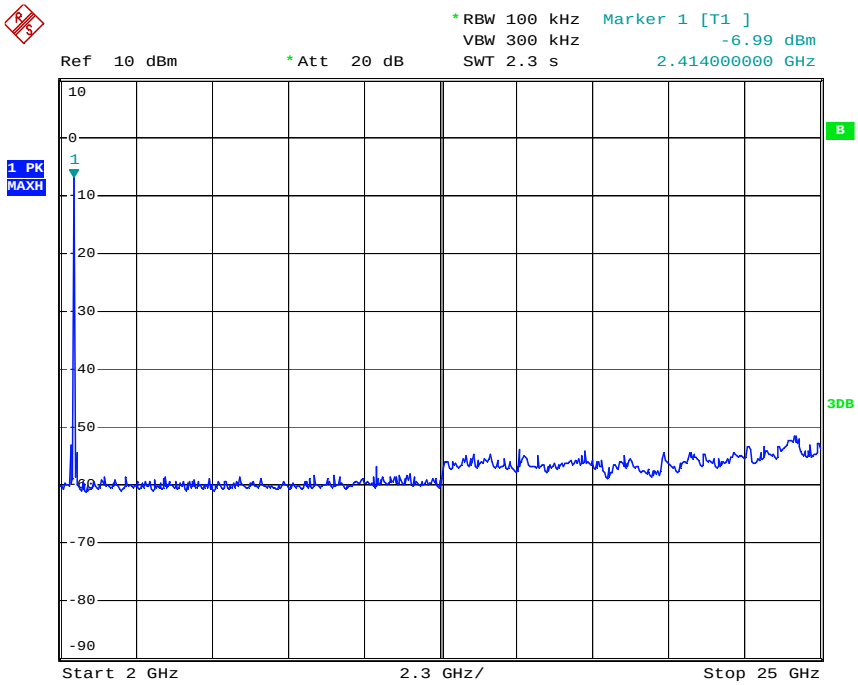
Out of Band Conducted Spurious Emissions, FCC Rule 15.247(d):

All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

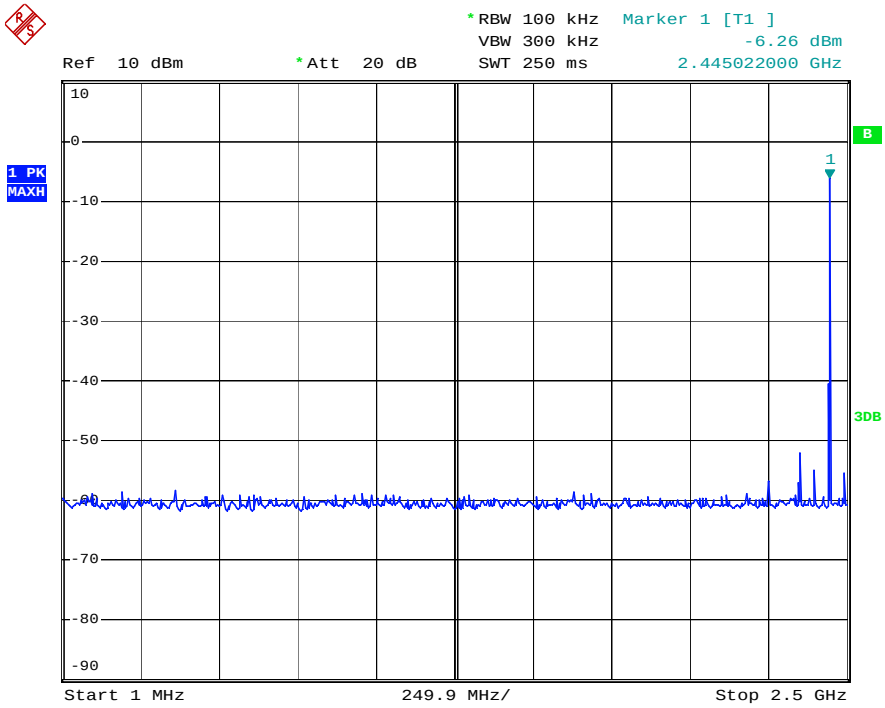
Modulation Type: GFSK
Packet: DH1

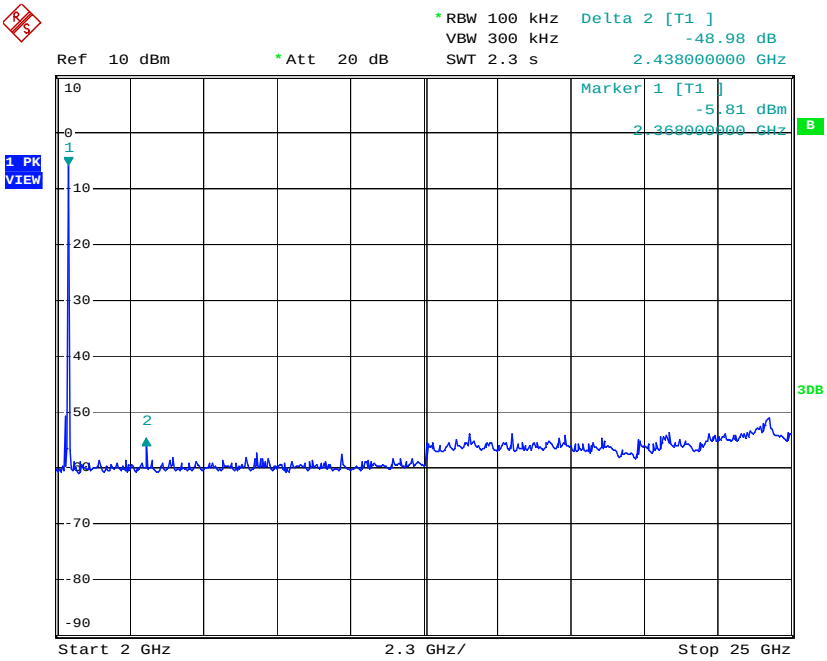
2402MHz:



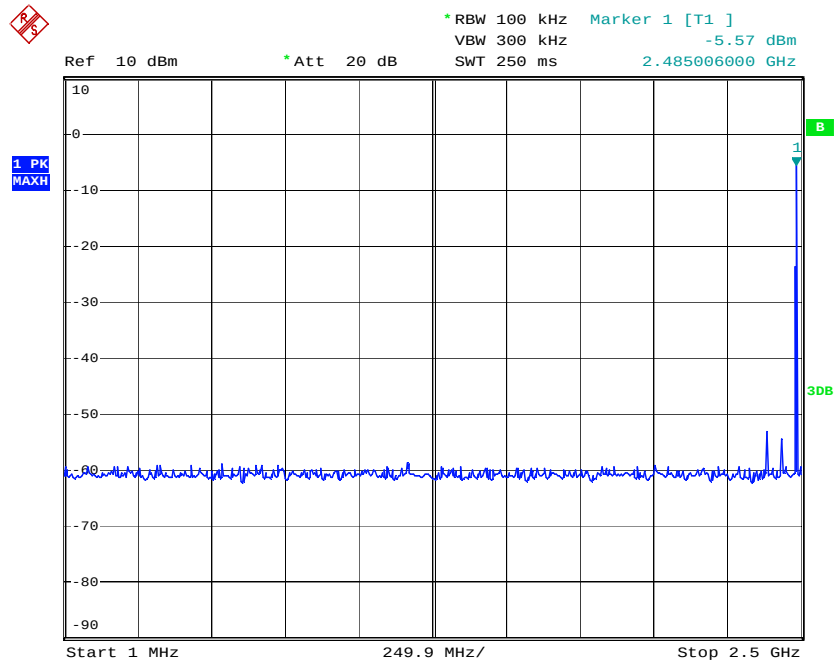


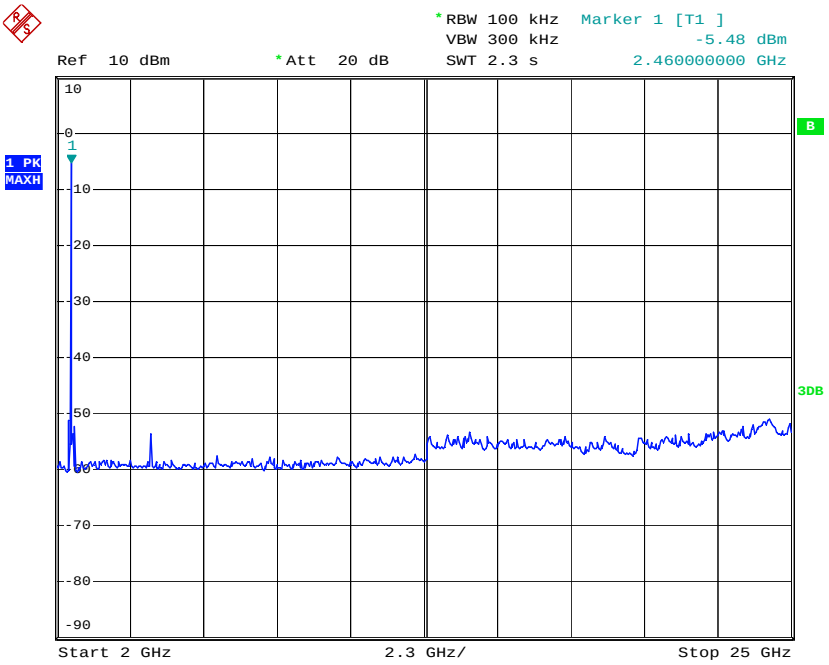
2441MHz:


*RBW 100 kHz
Marker 1 [T1]
VBW 300 kHz
-6.26 dBm
Ref 10 dBm
*Att 20 dB
SWT 250 ms
2.445022000 GHz
1 PK
MAXH
B
3DB
Start 1 MHz
249.9 MHz/
Stop 2.5 GHz


*RBW 100 kHz
Delta 2 [T1]
VBW 300 kHz
-48.98 dB
Ref 10 dBm
*Att 20 dB
SWT 2.3 s
2.438000000 GHz
Marker 1 [T1]
-5.81 dBm
2.368000000 GHz
1 PK
VIEW
B
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

2480MHz:


*RBW 100 kHz
Marker 1 [T1]
VBW 300 kHz
-5.57 dBm
Ref 10 dBm
*Att 20 dB
SWT 250 ms
2.485006000 GHz
1 PK
MAXH
B
3DB
Start 1 MHz
249.9 MHz/
Stop 2.5 GHz


*RBW 100 kHz
Marker 1 [T1]
VBW 300 kHz
-5.48 dBm
Ref 10 dBm
*Att 20 dB
SWT 2.3 s
2.460000000 GHz
1 PK
MAXH
B
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

3.10 Radio Frequency Radiation Exposure, FCC Rule 15.247(i):

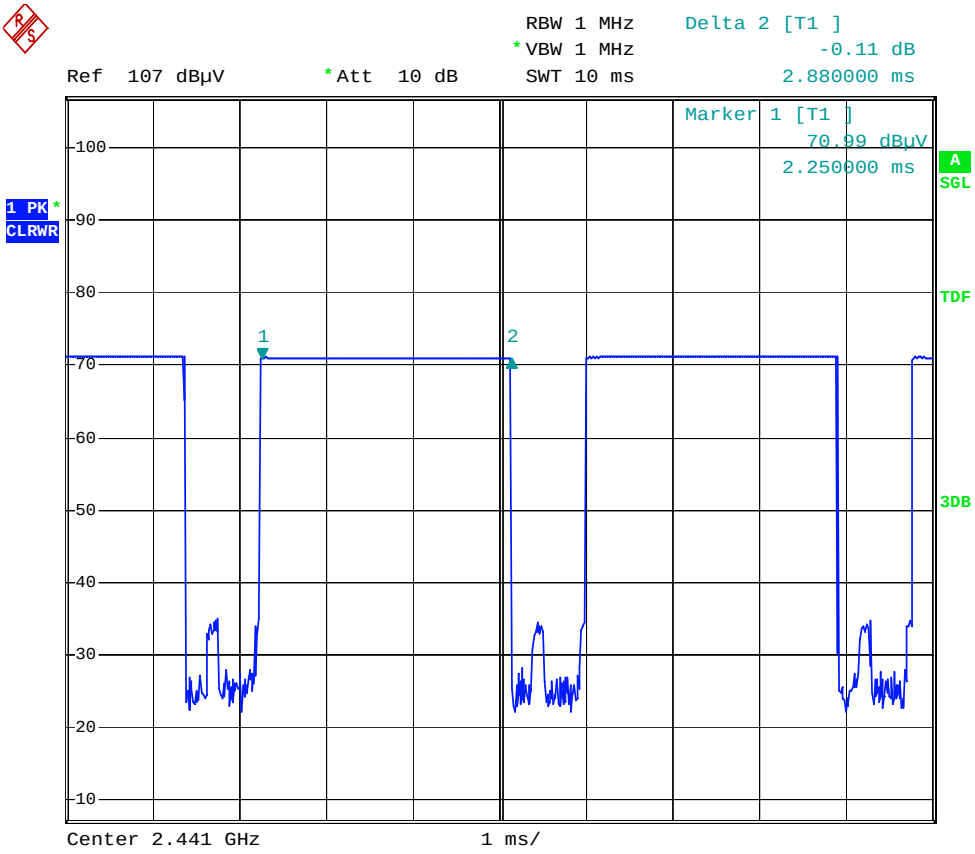
The EUT is a Bluetooth Headset used in portable application, less than 20 cm from any body part of the user or near by persons.

According to the DA 00-705 and KDB 447498,

The power thresholds for source-based time-averaging Conducted output power (in the worst-case duty cycle of DH5 of 8-DPSK modulation type)
= 2.42*(2.88/3.76) mW
= 2.68 dBm

And SAR Low Threshold Level:
60/f (GHz) = 60/2.45
= 24.5 mW
= 13.9 dBm

Since 2.68 dBm is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.


RBW 1 MHz
Delta 2 [T1]
*VBW 1 MHz
-0.11 dB
Ref 107 dBµV
*Att 10 dB
SWT 10 ms
2.880000 ms
Marker 1 [T1]
70.99 dBµV
2.250000 ms
1 PK*
CLRWR
A
SGL
TDF
3DB
100
90
80
70
60
50
40
30
20
10
1
2
Center 2.441 GHz
1 ms/

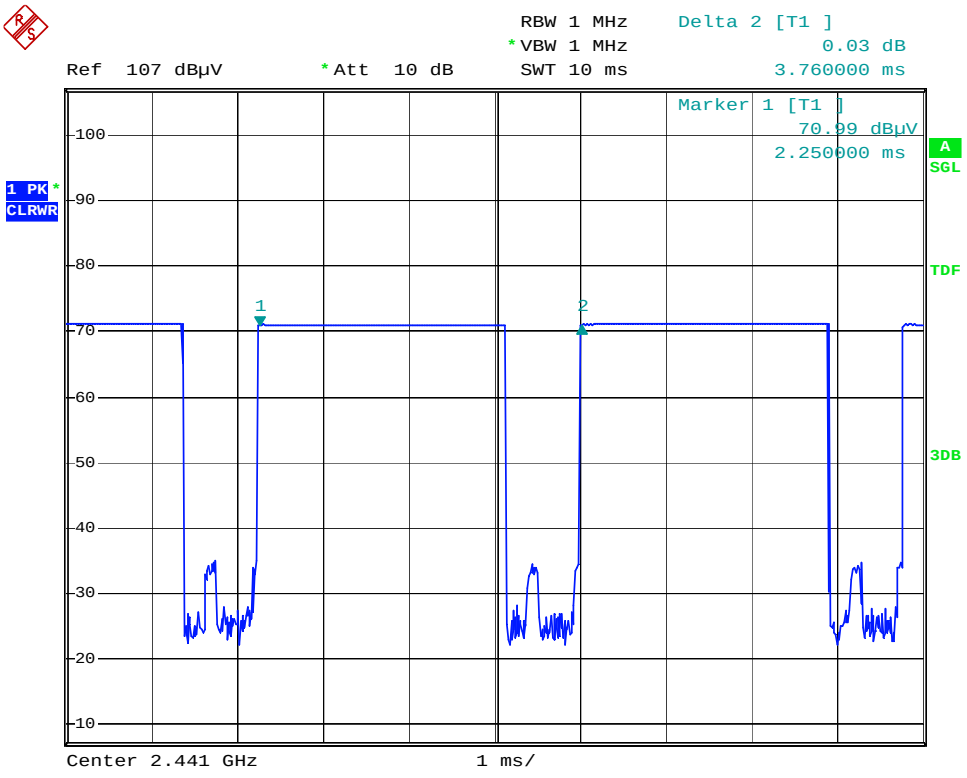

RBW 1 MHz
Delta 2 [T1]
*VBW 1 MHz
0.03 dB
Ref 107 dBµV
*Att 10 dB
SWT 10 ms
3.760000 ms
Marker 1 [T1]
70.99 dBµV
2.250000 ms
1 PK*
CLRWR
A
SGL
TDF
3DB
100
90
80
70
60
50
40
30
20
10
1
2
Center 2.441 GHz
1 ms/

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 **Equipment Photographs**

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 5

PRODUCT LABELLING

5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 7

INSTRUCTION MANUAL

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandedge, the test procedure and calculation of factor such as pulse desensitization.

8.1 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (T_{eff}) is approximately 360µs for Bluetooth. With a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

8.2 Transmitter Duty Cycle Calculation, FCC Rule 15.35(b, c)

Based on the Bluetooth Specification Version 2.1+ EDR, transmitter ON time is independent of packet type (DH1, DH3 and DH5) and packet length (single-slot and multi-slot). The maximum transmitter ON time for the Bluetooth is 625µs.

Each TX and RX time slot is 625µs in length. A TDD scheme is used where master and slave alternately transmit. For one period for a pseudo-random hopping through all 79 RF channels, for DH5:

Time of 1 hopset (5 TX slots + 1 RX slot) = 0.625 ms x 6 = 3.75 ms

Time of 1 cycle =3.75 ms x 79 = 296.25 ms

Average factor = 20 log (3.125 / 100) = -30.1 dB

8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2003.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjust through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

8.3 **Emissions Test Procedures (cont'd)**

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

EXHIBIT 9

TEST EQUIPMENT LIST

9.0 Test Equipment List

.

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	25-Nov-09	25-May-11
SZ185-01	EMI Receiver	R&S	ESCI	100547	18-May-09	18-May-10
SZ061-08	Horn Antenna	ETS	3115	00092346	15-Mar-10	15-Sep-11
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	19-Mar-09	19-Mar-10
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	18-Mar-09	18-Mar-10
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	09-Jan-10	09-Jan-11
SZ062-02	RF Cable	RADIALL	RG 213U	--	26-Oct-09	26-Apr-10
SZ062-06	RF Cable	RADIALL	0.04-26.5GHz	--	17-Aug-09	17-Aug-10
SZ062-01	RF Cable	MIZU	RG58/AU	2M	17-Aug-09	17-Aug-10
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	23-Nov-09	23-Nov-10
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	23-Nov-09	23-Nov-10
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	23-Nov-09	23-Nov-10
SZ188-03	Shielding Room	ETS	RFD-100	4100	15-Sep-07	15-Sep-10
SZ067-03	Power Splitter	R&S	RVZ	100410	08-Mar-10	08-Mar-11

10.0 **Annex**

Document History

Report No.	Issue Date	Change
SZ10010286-6	17 March, 2010	Original