

Test Report of FCC Part 15 C for FCC Certificate

On Behalf of

Guangzhou Liwei Electronics Co.,LTD.

Product Description: Bluetooth Headset(Class 2)

Brand Name: CCK

Model No.: 5230

FCC ID: VO8-5230

Prepared for: Guangzhou Liwei Electronics Co., LTD.

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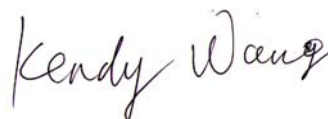
Report No.: BCT08LR-912E

Issue Date: December 20, 2008

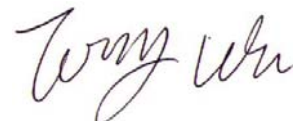
Test Date: December 03~20, 2008

Test by:

Reviewed By:



Kendy Wang



Tony Wu



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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	Guangzhou Liwei Electronics Co., LTD.
Address of applicant:	NO.33 Zhenzhong North Rd., ShenShan Ind. Park, BaiYun District, GuangZhou, GuangDong, China
Manufacturer:	Guangzhou Liwei Electronics Co., LTD.
Address of manufacturer:	NO.33 Zhenzhong North Rd., ShenShan Ind. Park, BaiYun District, GuangZhou, GuangDong, China
Equipment Under Test:	Bluetooth Headset(Class 2)
Brand Name:	CCK
Model No.:	5230
Type of Modulation:	FHSS
Frequency Band:	2402 MHz ~ 2480 MHz
Number of Channels:	79
Channel Bandwidth:	1 MHz
Antenna Type:	Built-in Antenna
Output Power Class:	Class 2
Power Supply:	3.7 V from inner rechargeable battery, AC/DC Adaptor is attached.

Remark: ** The test data gathered are from the production sample provided by the manufacturer.*

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.207, and 15.247 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters. Test method also refer to FCC Measurement Techniques document of Public Notice DA 00-705.

1.4 Test Facility

All measurement required was performed at laboratory of Bontek Compliance Testing Laboratory Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China and SGS-CSTC Standards Technical Services Co., Ltd ShenZhen Branch EMC Lab at No.1 Workshop, M-10, Middle Section, Science&Technology Park, Shenzhen 518057, China

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

FCC – Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

IC Registration No.: 126111

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 126111 on March, 2008.

FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd ShenZhen Branch EMC Lab, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

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

All the test method also refer to FCC Measurement Techniques document of Public Notice DA 00-705.

2.4 List of Measuring Equipments Used

For Radiated Spurious Emission (30~25GHz) test: SGS-CSTC Shenzhen Branch:

Items	Equipment	Manufacturer	Model No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESI 26	2008/6	1 year
2	Horn Antenna	R/S	CH14-H052	2008/6	1 year
3	3m Semi- Anechoic Chamber	ETS	N/A	2008/6	1 year
4	Horn Antenna	R/S	HF906	2008/6	1 year
5	Spectrum Analyzer	HP	8594EM	2008/6	1 year

For other test: Bontek Compliance Testing Laboratory Ltd

Items	Equipment	Manufacturer	Model No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESCI	2008/02/22	1 Year
2	EMI Test Receiver	R&S	ESPI	2008/02/22	1 Year
3	Amplifier	HP	8447D	2008/02/22	1 Year
4	3 phase Artificial Mains (L.I.S.N)	SCHWARZBECK	NSLK 8128	2008/02/22	1 Year
5	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	2008/02/22	1 Year
6	Horn Antenna	SCHWARZBECK	BBHA9120A	2008/02/22	1 Year
7	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	2008/09/04	1 Year
8	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2008/09/04	1 Year
9	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	2008/09/04	1 Year
10	Power Clamp	SCHWARZBECK	MDS-21	2008/02/22	1 Year

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.203/15.247(b)/(c)	Antenna Requirement	Pass
15.207	AC Power Line Conducted Emission	Pass
15.247(a)(1)	Hopping Channel Bandwidth	Pass
15.247(a)(1)	Hopping Channel Separation	Pass
15.247(a)(1)	Number of Hopping Frequency Used	Pass
15.247(a)(1)(iii)	Dwell Time of Each Frequency	Pass
15.247(b)(1)	Maximum Peak Output Power	Pass
15.247(d)	Band Edges Emission	Pass
15.247(d)	Spurious Radiated Emission	Pass
15.247(d)	Peak Power Spectral Density	Pass

4. ANTENNA REQUIREMENT

4.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Section 15.247(b)/(c):

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

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.2 Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement.

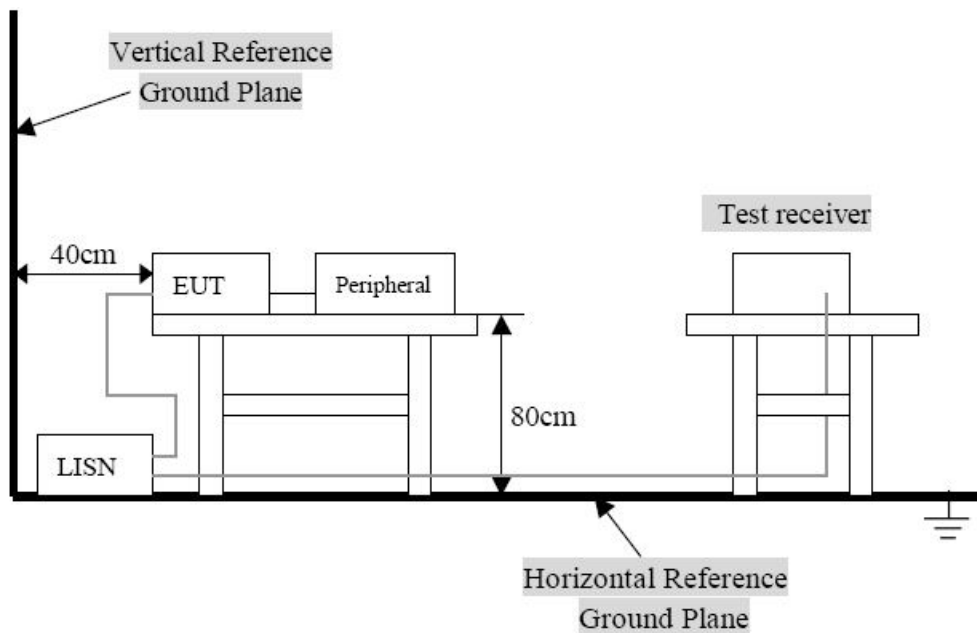
5. TEST OF CONDUCTED EMISSION

5.1 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

5.2 Test Setup Diagram



Remark: 1. The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC 15.207 limits.

2. The EUT was connected to a 120 VAC/ 60Hz power source.

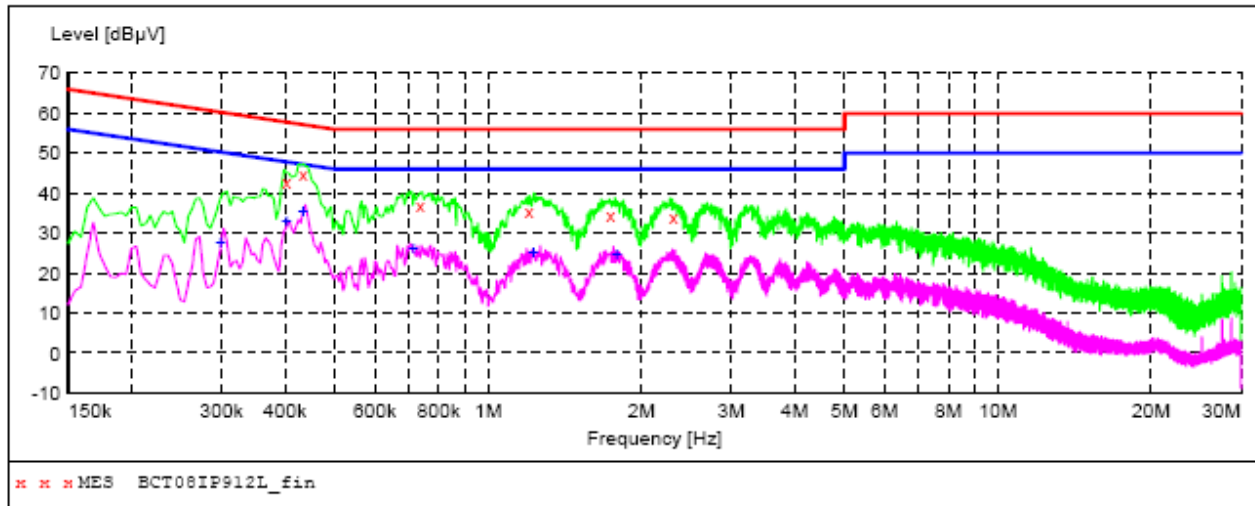
5.3 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Charging Mode

Conducted Emission from AC/DC Adaptor:

EUT: Bluetooth Headset(Class 2)
 Operating Condition: Charging Mode
 Test Site: Shielded Room
 Operator: Jip
 Test Specification: DC 3.7V from AC/DC adapter (AC 120V/60Hz)
 Comment: Live Line

SCAN TABLE: "Voltage (150K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "BCT08IP912L_fin"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.402000	42.90	10.4	58	14.9	QP	L1	GND
0.433500	45.10	10.3	57	12.1	QP	L1	GND
0.735000	37.10	10.2	56	18.9	QP	L1	GND
1.203000	35.60	10.3	56	20.4	QP	L1	GND
1.738500	34.60	10.2	56	21.4	QP	L1	GND
2.310000	34.00	10.2	56	22.0	QP	L1	GND

MEASUREMENT RESULT: "BCT08IP912L_fin2"

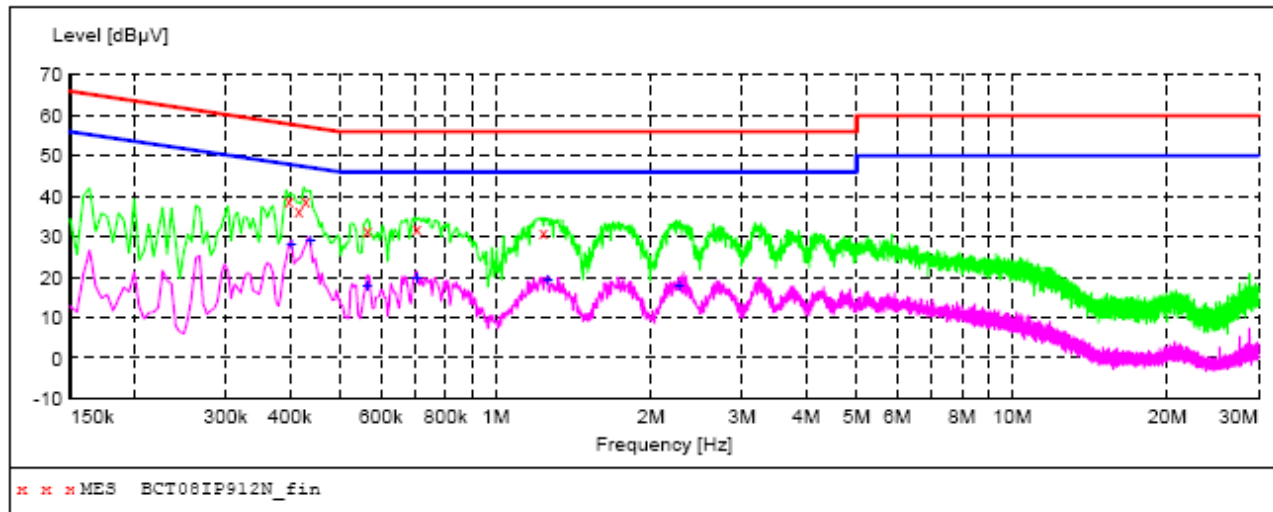
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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.298500	27.90	10.6	50	22.4	AV	L1	GND
0.402000	33.20	10.4	48	14.6	AV	L1	GND
0.433500	35.50	10.3	47	11.7	AV	L1	GND
0.712500	26.40	10.2	46	19.6	AV	L1	GND
1.225500	25.40	10.3	46	20.6	AV	L1	GND
1.788000	24.60	10.2	46	21.4	AV	L1	GND

Conducted Emission from AC/DC Adaptor:

EUT: Bluetooth Headset(Class 2)
 Operating Condition: Charging Mode
 Test Site: Shielded Room
 Operator: Jip
 Test Specification: DC 3.7V from AC/DC adapter (AC 120V/60Hz)
 Comment: Live Line

SCAN TABLE: "Voltage (150K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "BCT08IP912N_fin"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.397500	38.90	10.4	58	19.0	QP	N	GND
0.415500	36.40	10.4	58	21.1	QP	N	GND
0.429000	38.80	10.3	57	18.5	QP	N	GND
0.564000	31.50	10.2	56	24.5	QP	N	GND
0.703500	32.20	10.2	56	23.8	QP	N	GND
1.239000	31.40	10.3	56	24.6	QP	N	GND

MEASUREMENT RESULT: "BCT08IP912N_fin2"

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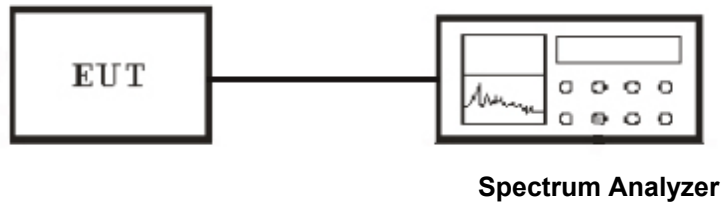
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.402000	28.20	10.4	48	19.6	AV	N	GND
0.438000	29.00	10.3	47	18.1	AV	N	GND
0.564000	18.00	10.2	46	28.0	AV	N	GND
0.703500	20.10	10.2	46	25.9	AV	N	GND
1.261500	19.30	10.3	46	26.7	AV	N	GND
2.269500	18.10	10.2	46	27.9	AV	N	GND

6. Test of Hopping Channel Bandwidth

6.1 Applicable Standard

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.4.

6.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 30KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The spectrum width with level higher than 20dB below the peak level.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

6.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Modulation Type	Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Min. Limit (kHz)
FHSS	Low	2402.00	754	>25
FHSS	Middle	2440.00	858	>25
FHSS	High	2480.00	684	>25

Channel Low :

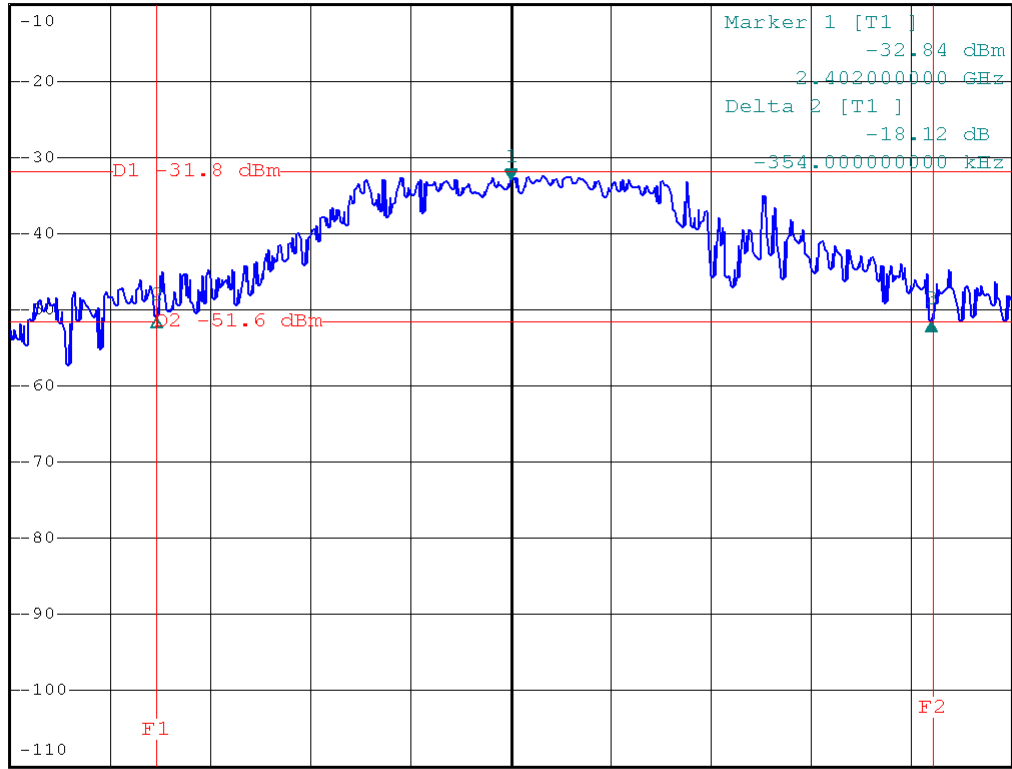


*RBW 100 kHz Delta 3 [T1]
 VBW 300 kHz -18.64 dB
 SWT 2.5 ms 420.000000000 kHz

Ref -10 dBm

*Att 20 dB

1 PK
 VIEW



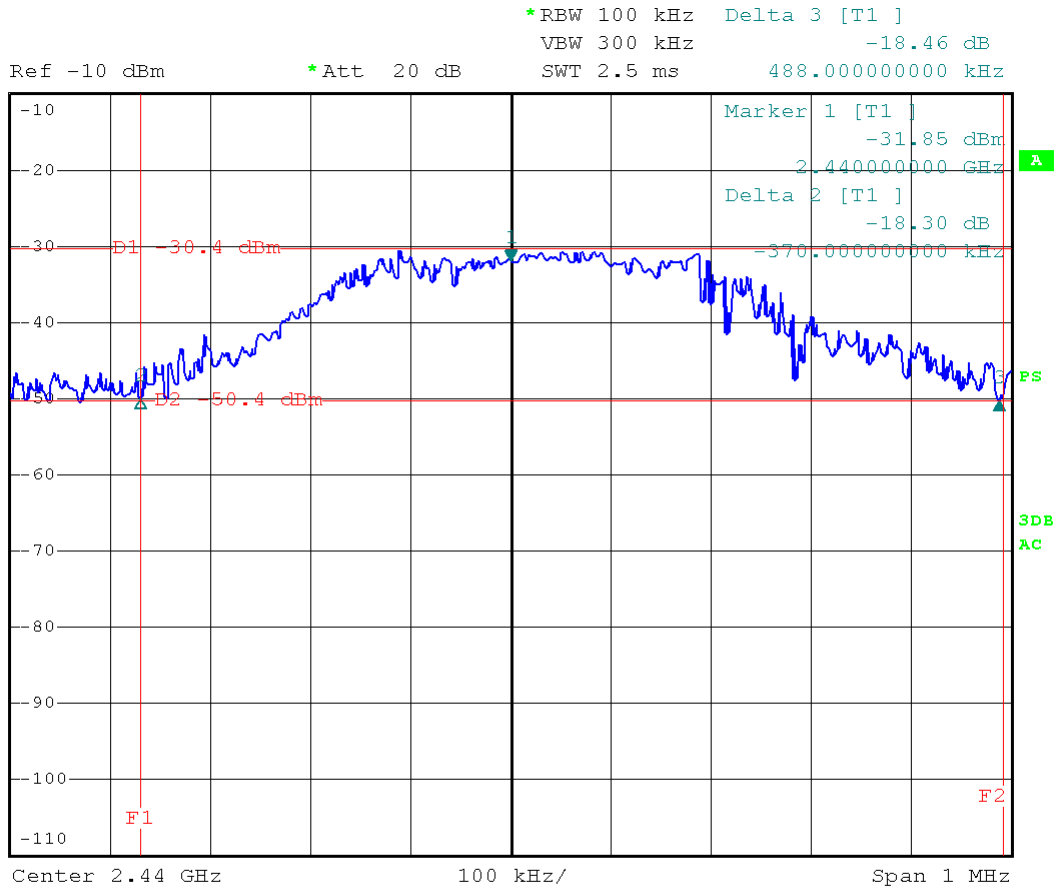
Center 2.402 GHz

100 kHz/

Span 1 MHz

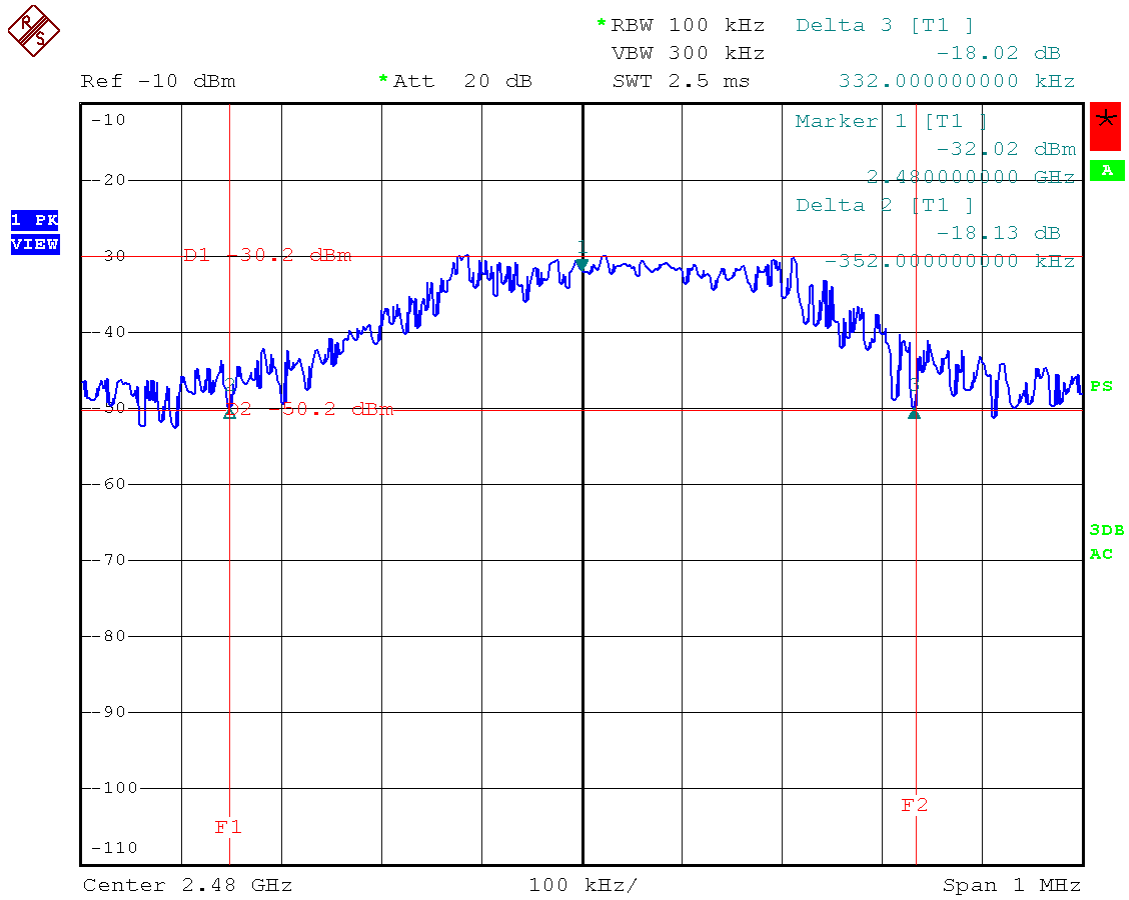
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Channel Middle :



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Channel High :



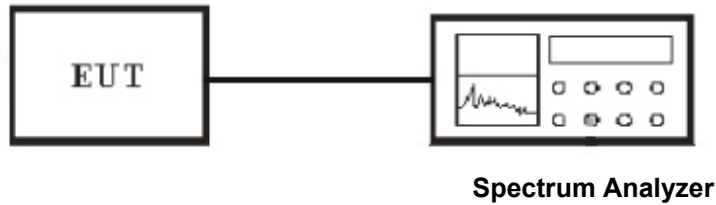
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7. Test of Hopping Channel Separation

7.1 Applicable Standard

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

7.2 EUT Setup



7.3 Test Equipment List and Details

See section 2.4.

7.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The Hopping Channel Separation is defined as the separation between 2 neighboring hopping frequencies.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

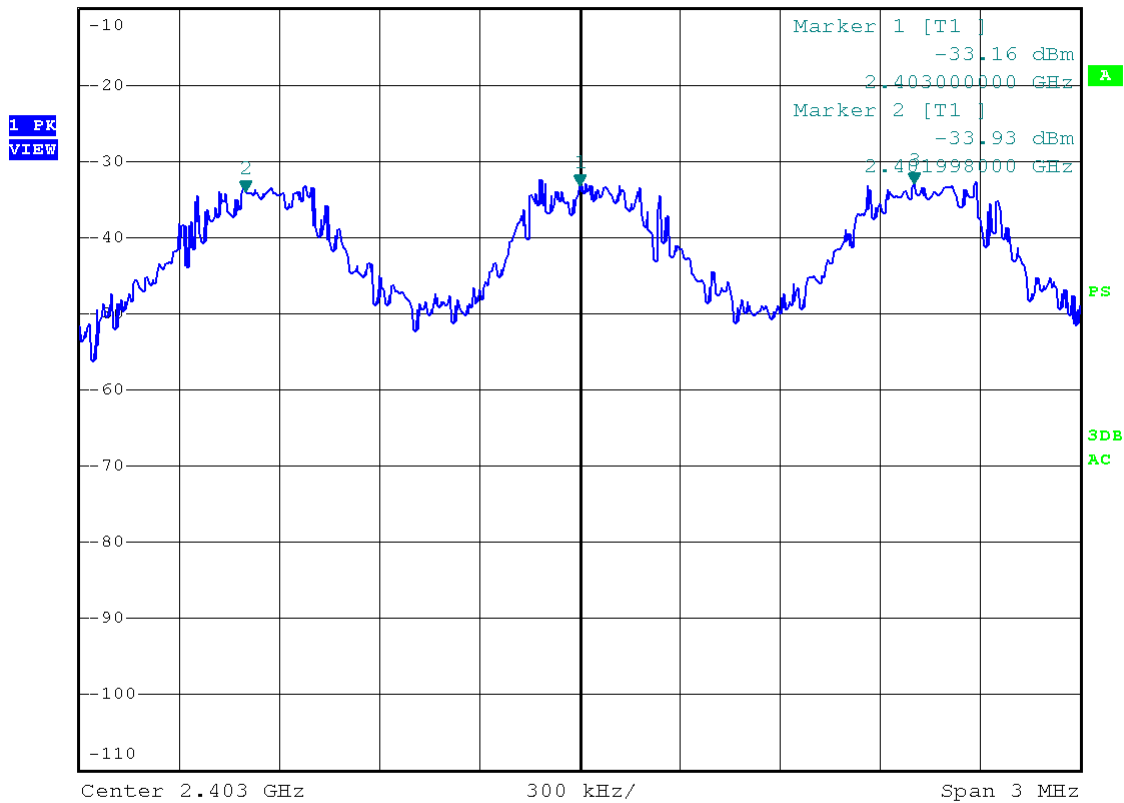
7.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Channel Low :



Ref -10 dBm *Att 20 dB *RBW 100 kHz Marker 3 [T1]
VEW 300 kHz -33.07 dBm
*SWT 2.5 ms 2.404002000 GHz

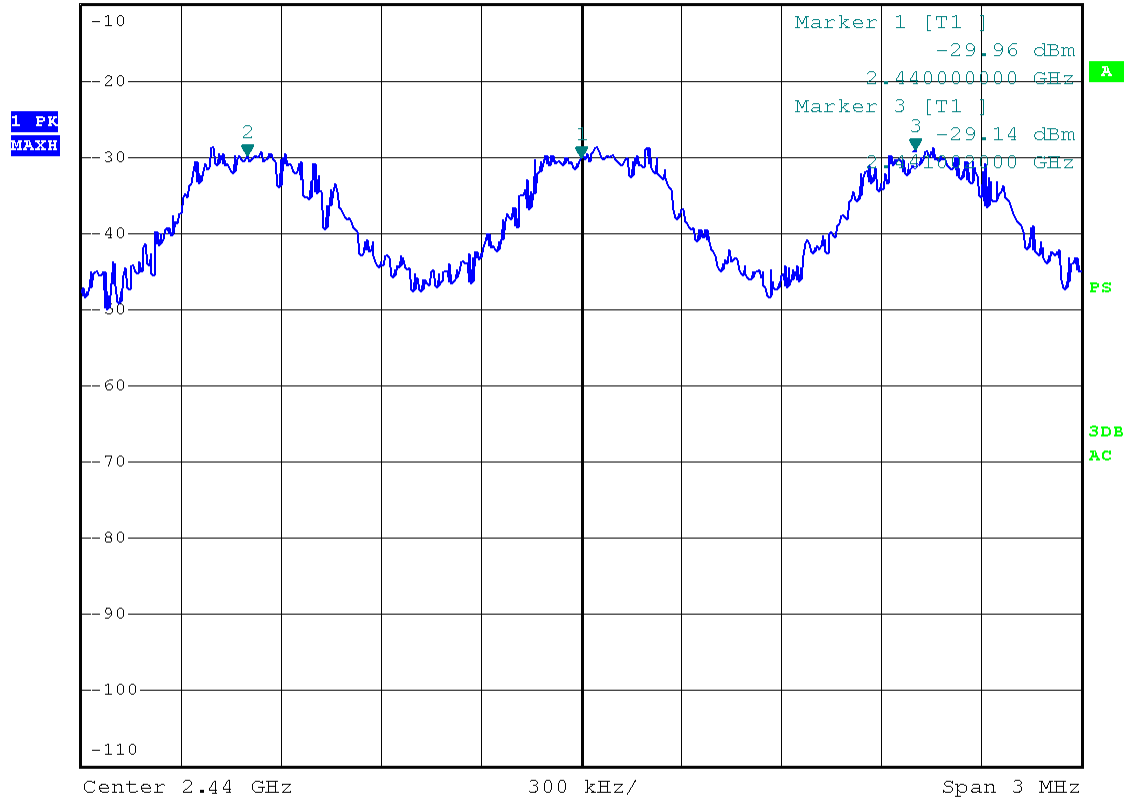


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Channel Middle :



Ref -10 dBm *Att 20 dB *RBW 100 kHz Marker 2 [T1]
 VBW 300 kHz -29.91 dBm
 SWT 2.5 ms 2.438998000 GHz

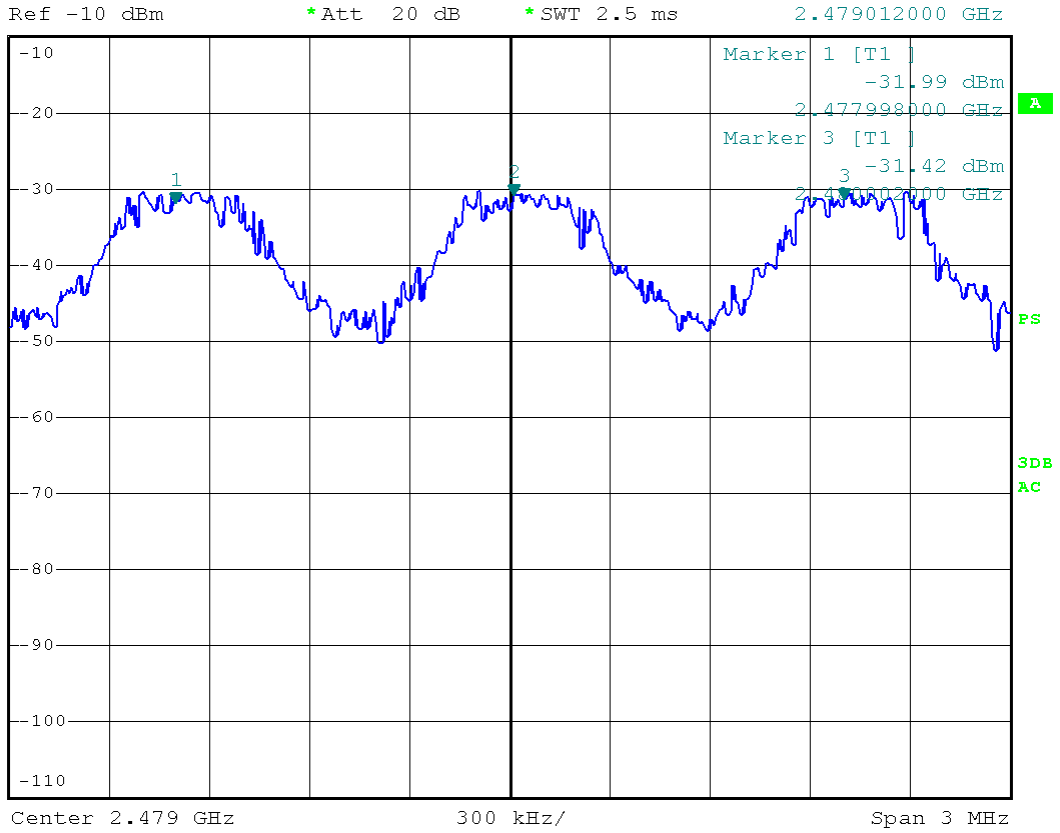


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Channel High :



*RBW 100 kHz Marker 2 [T1]
VBW 300 kHz -30.85 dBm
*SWT 2.5 ms 2.479012000 GHz



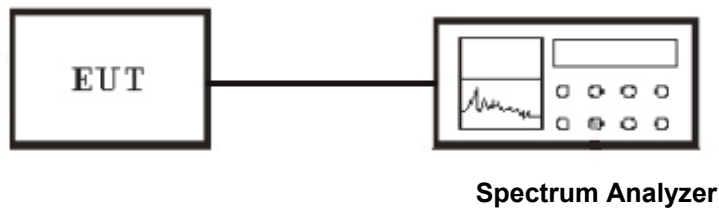
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8. Test of Number of Hopping Frequency

8.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 15 non-overlapping hopping channels. Frequency hopping system which use fewer than 75 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping system may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

8.2 EUT Setup



8.3 Test Equipment List and Details

See section 2.4.

8.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. Observe frequency hopping in 2400MHz~2483.5MHz, there are at least 32 non-overlapping channels.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

8.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Modulation Type	Frequency (MHz)	Number of Hopping Channels	Min. Limit (kHz)
FHSS	2402.0~2480.0	79	>15

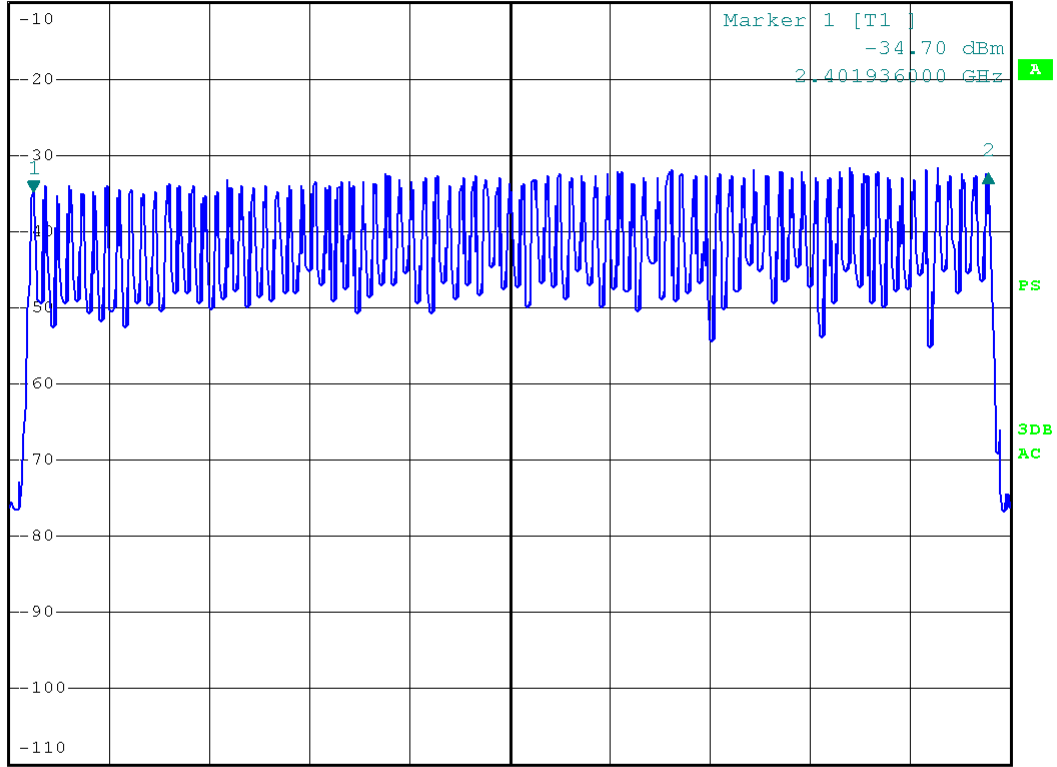


*RBW 100 kHz Delta 2 [T1]
 VBW 300 kHz 2.16 dB
 SWT 10 ms 78.204000000 MHz

Ref -10 dBm

*Att 20 dB

1 PK
VIEW



Center 2.441 GHz 8.2 MHz/ Span 82 MHz

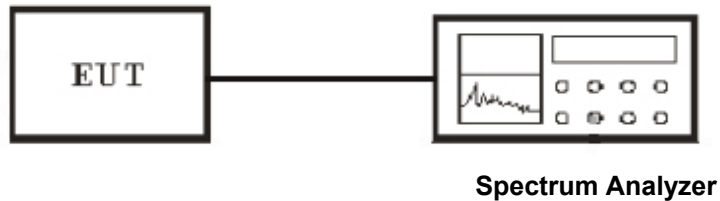
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9. Test of Dwell Time of Each Frequency

9.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4seconds multiplied by the number of hopping channels employed.

9.2 EUT Setup



9.3 Test Equipment List and Details

See section 2.4.

9.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 1000kHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is more than once pulse time.
4. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
5. Measure the maximum time duration of one single pulse.

9.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Modulation Type	Channel No.	Frequency (MHz)	Dwell Time (ms)	Limit (ms)
FHSS	Low	2402.00	115.18	400
FHSS	Middle	2440.00	117.75	400
FHSS	High	2479.00	120.32	400

A period time = 0.4 (ms) * 79 = 31.6 (s)

CH Low:

DH1 time slot = 0.360 (ms) * (1600/(2*79)) * 31.6 = 115.18 (ms)

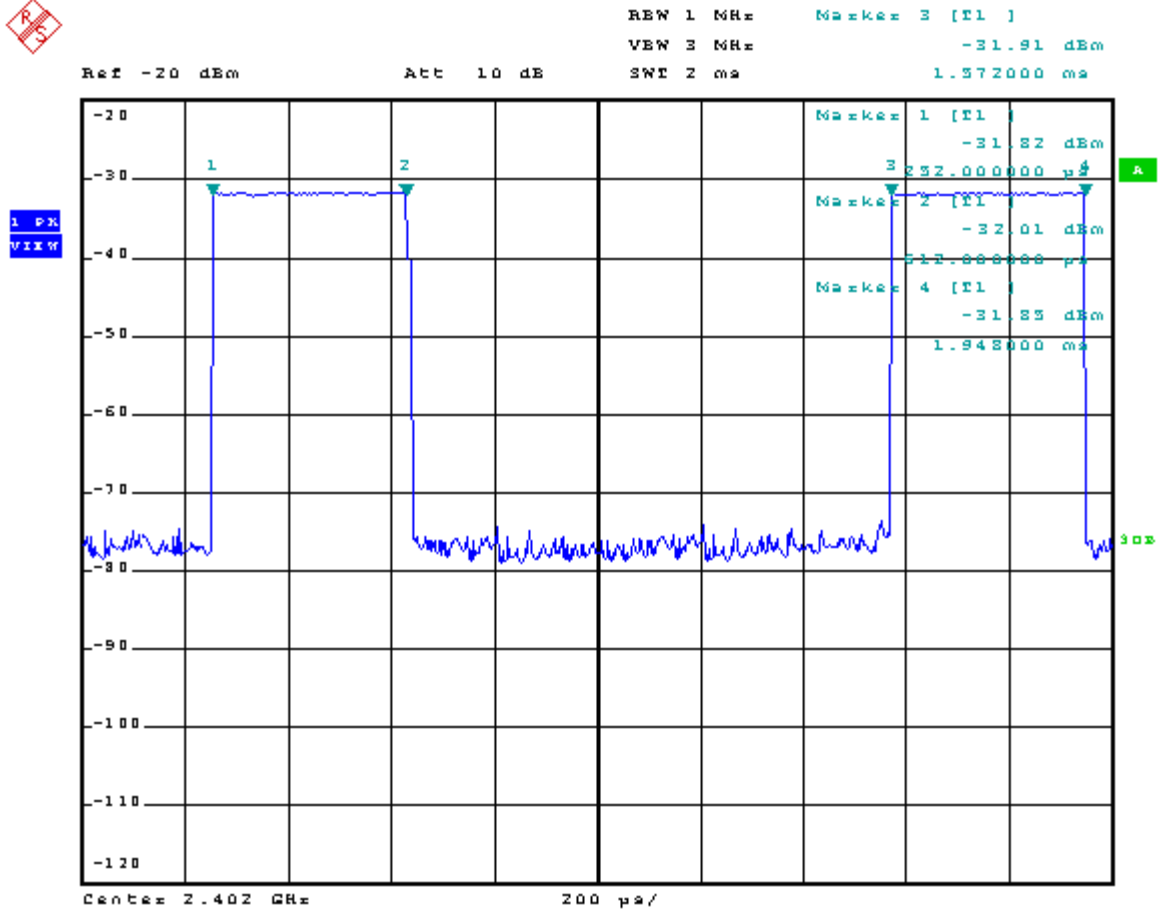
CH Mid:

DH1 time slot = 0.368 (ms) * (1600/(2*79)) * 31.6 = 117.75 (ms)

CH High:

DH1 time slot = 0.376 (ms) * (1600/(2*79)) * 31.6 = 120.32 (ms)

Channel Low :

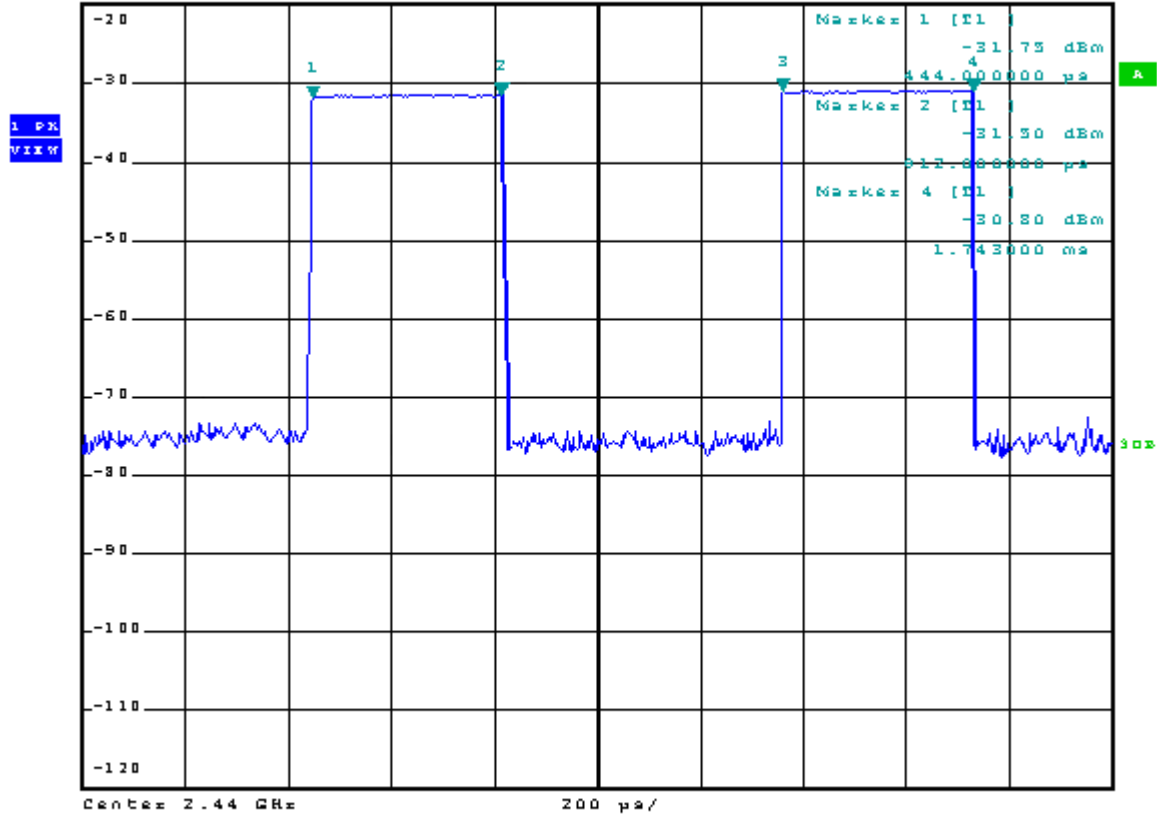


Date: 8. DEC. 2008 10:34:58

Channel Middle :

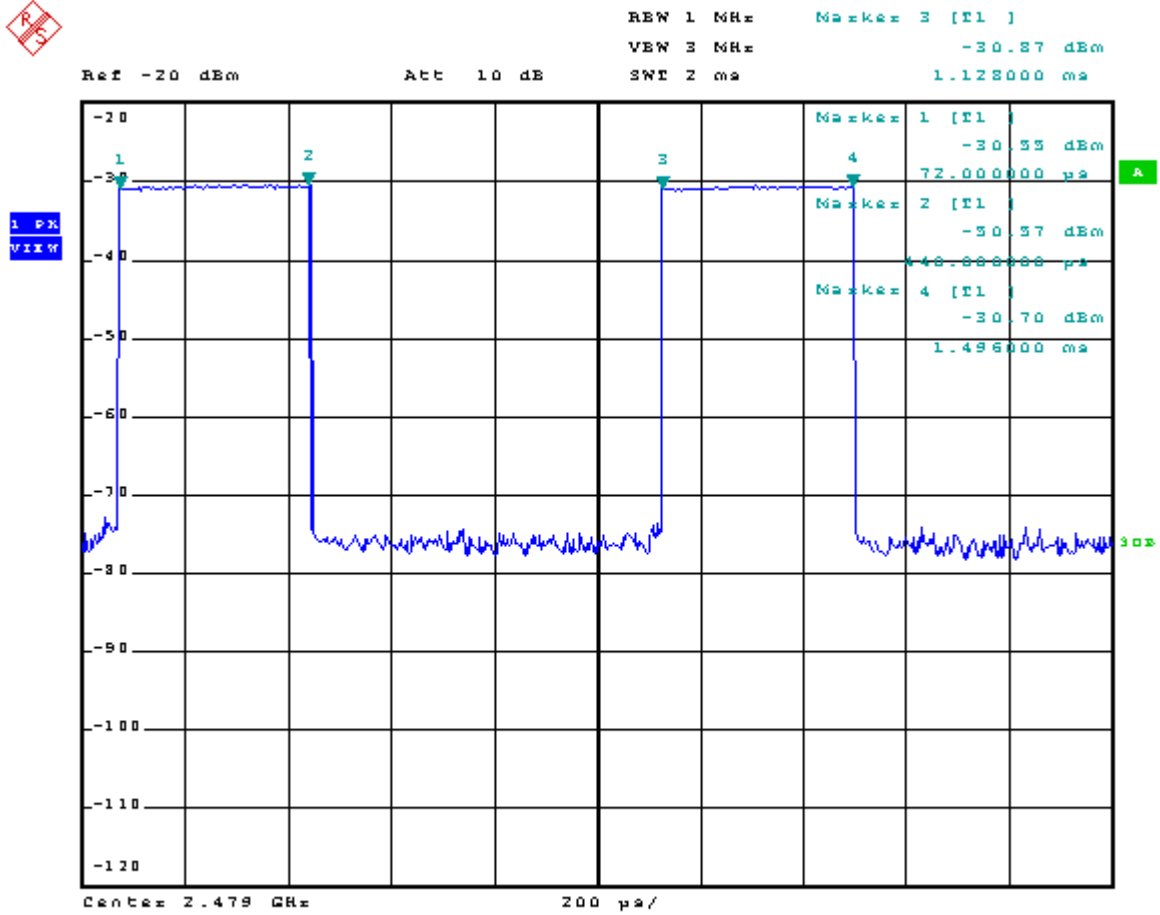


RBW 1 MHz Masker 3 [E1]
 VBW 3 MHz -31.03 dBm
 Ref -20 dBm Att 10 dB SWI 2 ma 1.372000 ma



Date: 8. DEC. 2008 10:30:47

Channel High :



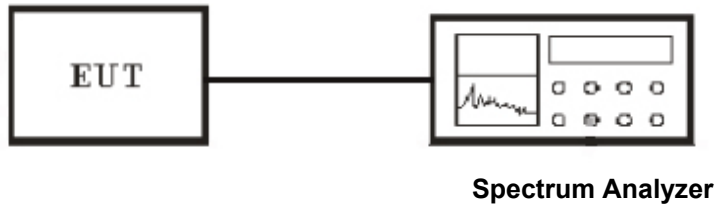
Date: 8 DEC 2008 10:28:07

10. Test of Maximum Peak Output Power

10.1 Applicable Standard

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels and The maximum peak output power shall not exceed 1 watt. For all other frequency hopping systems in this frequency band, The maximum peak output power shall not exceed 0.125 watt.

10.2 EUT Setup



10.3 Test Equipment List and Details

See section 2.4.

10.4 Test Procedure

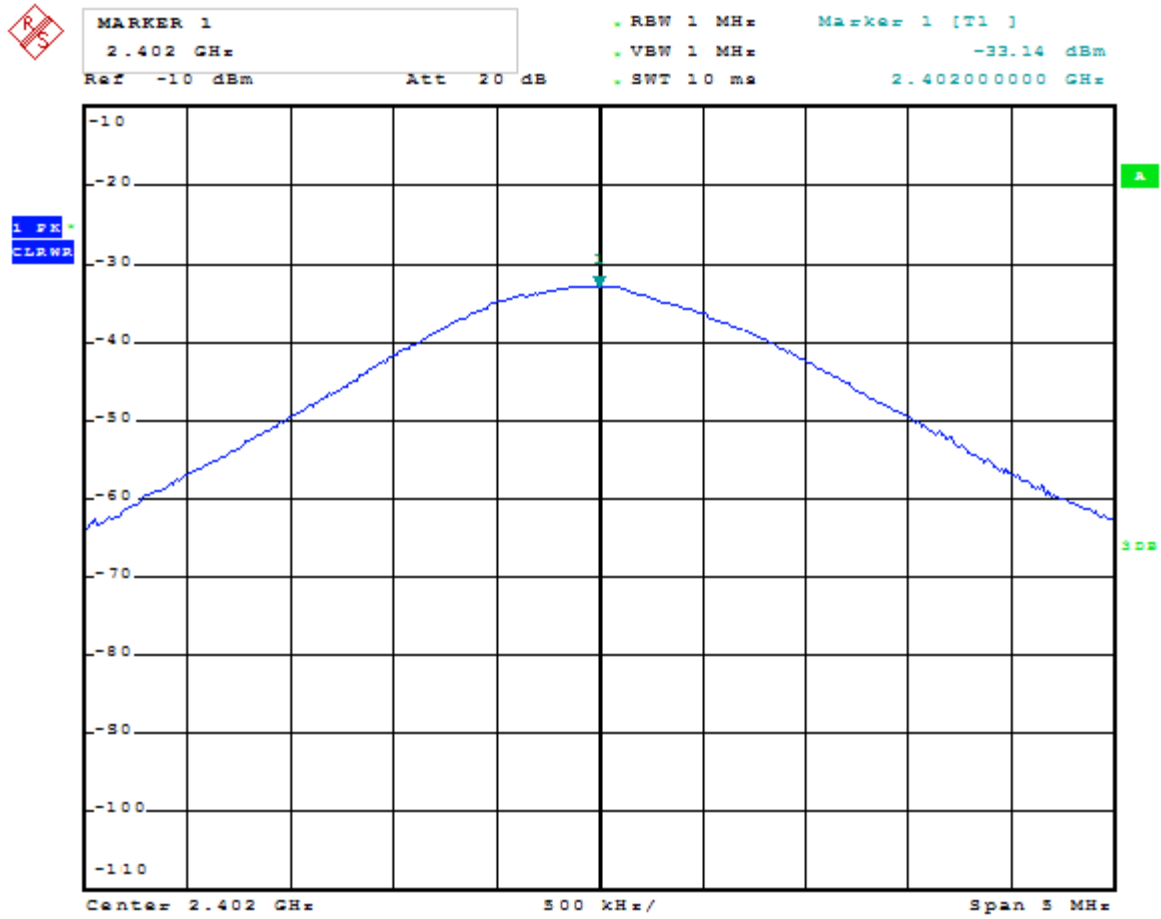
1. The transmitter output was connected to the peak power meter and recorded the peak value.
2. Peak power meter parameter set to auto attenuator and filter is the same as.
3. Repeated the 1 for the middle and highest channel of the EUT.

10.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

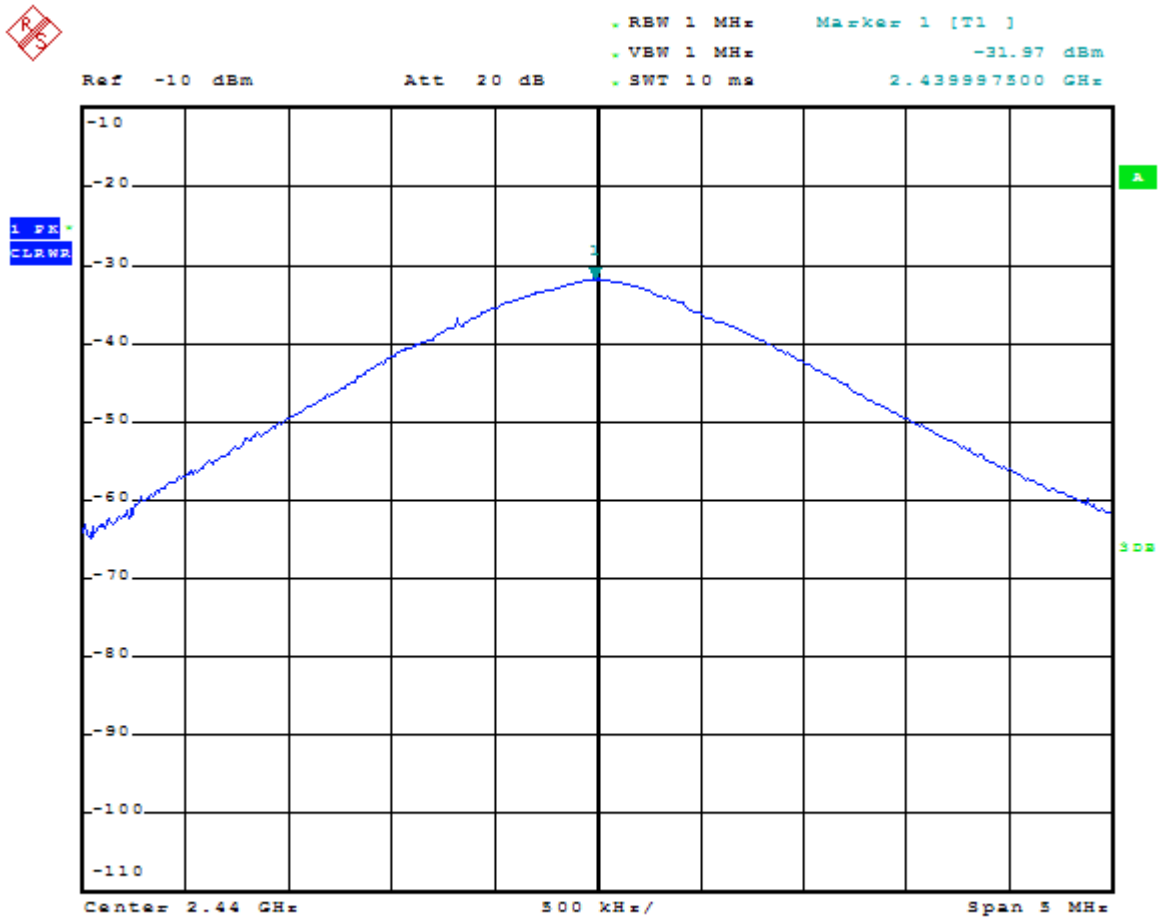
Modulation Type	Channel No.	Frequency (MHz)	Output Power (dBm)	Limits (dBm)	Margin (dB)
FHSS	Low	2402.00	-33.14	20.9	54.04
FHSS	Middle	2440.00	-31.97	20.9	52.87
FHSS	High	2480.00	-32.75	20.9	53.65

Channel Low :



Date: 19.DEC.2008 18:23:16

Channel Middle :



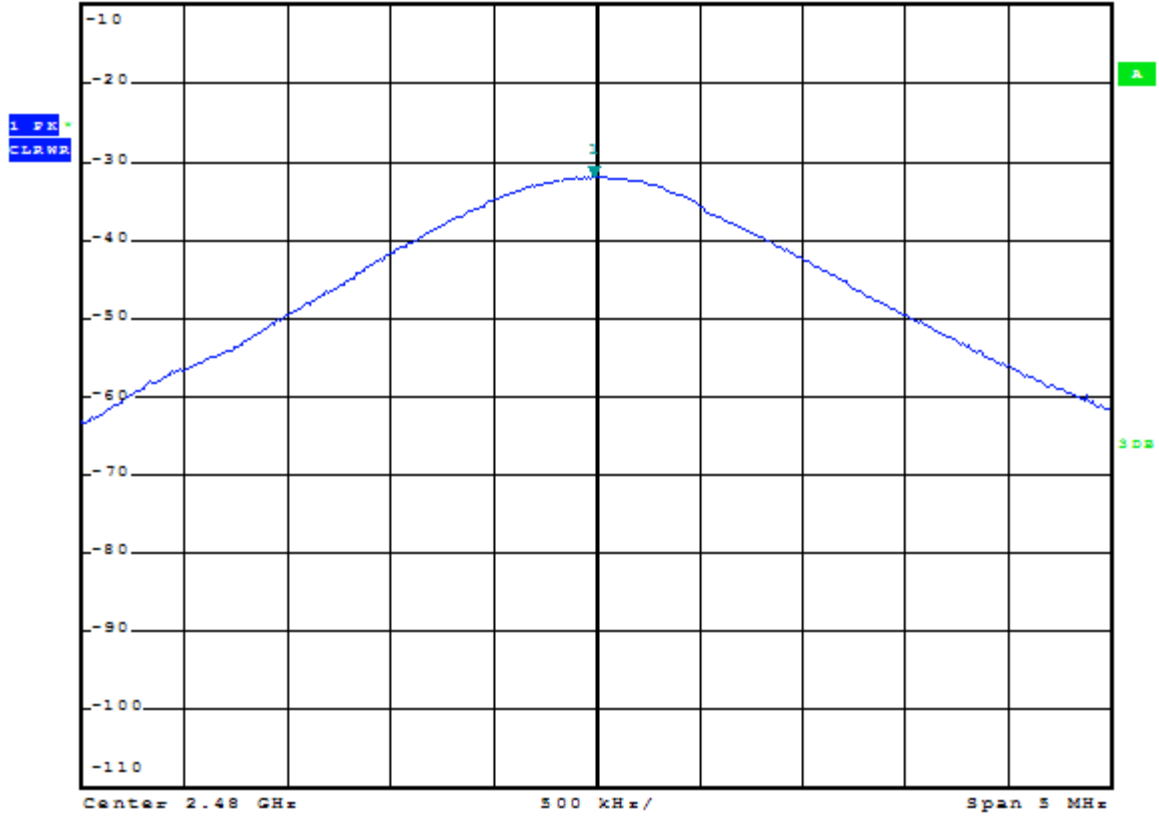
Date: 19.DEC.2008 18:44:45

Channel High :



MARKER 1
2.47999 GHz
Ref -10 dBm Att 20 dB

RBW 1 MHz Marker 1 [T1]
VBW 1 MHz -32.75 dBm
SWT 10 ms 2.479990000 GHz



Date: 19.DEC.2008 18:34:02

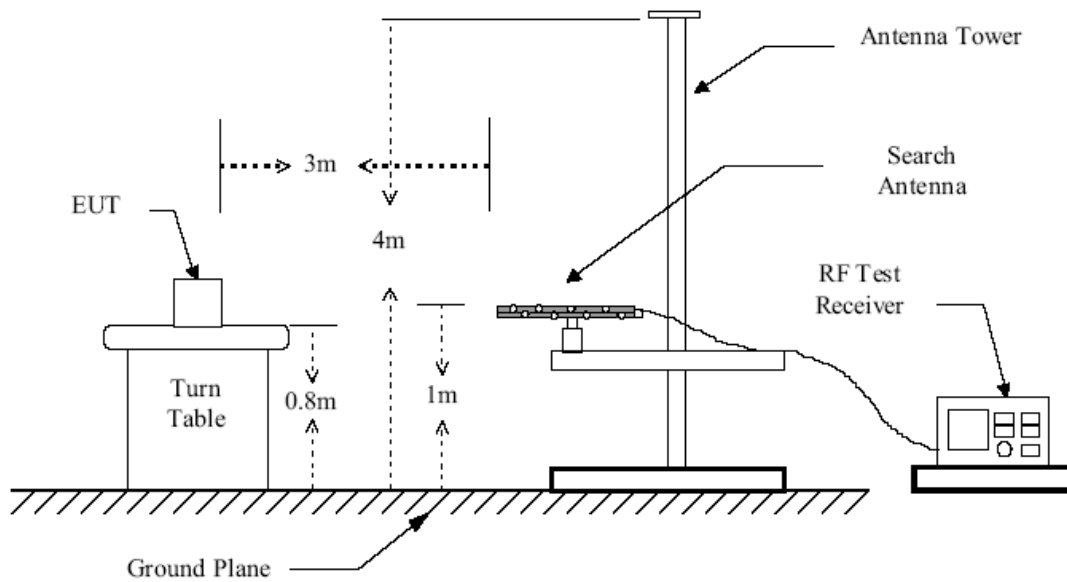
11. Test of Band Edges Emission

11.1 Applicable Standard

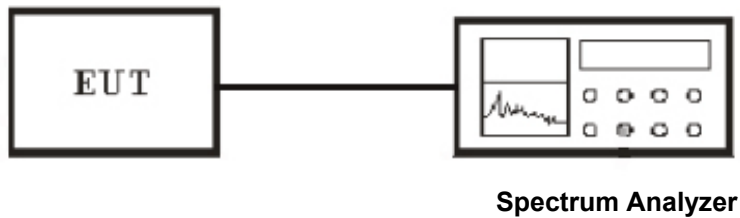
Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

11.2 EUT Setup

Radiated Measurement Setup



Conducted Measurement Setup



11.3 Test Equipment List and Details

See section 2.4.

11.4 Test Procedure

Conducted Measurement

1. The transmitter is set to the lowest channel.
2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
3. Set both RBW and VBW of spectrum analyzer to 100KHz with convenient frequency span including 100MHz bandwidth from lower band edge. Then detector set to peak and max hold this trace.
4. The lowest band edges emission was measured and recorded.
5. The transmitter set to the highest channel and repeated 2~4.

Radiated Measurement

1. Configure the EUT according to ANSI C63.4.
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For band edge emission, use 10Hz VBW and 1MHz RBW for reading under AV and use 1MHz VBW and 1MHz RBW for reading under PK.

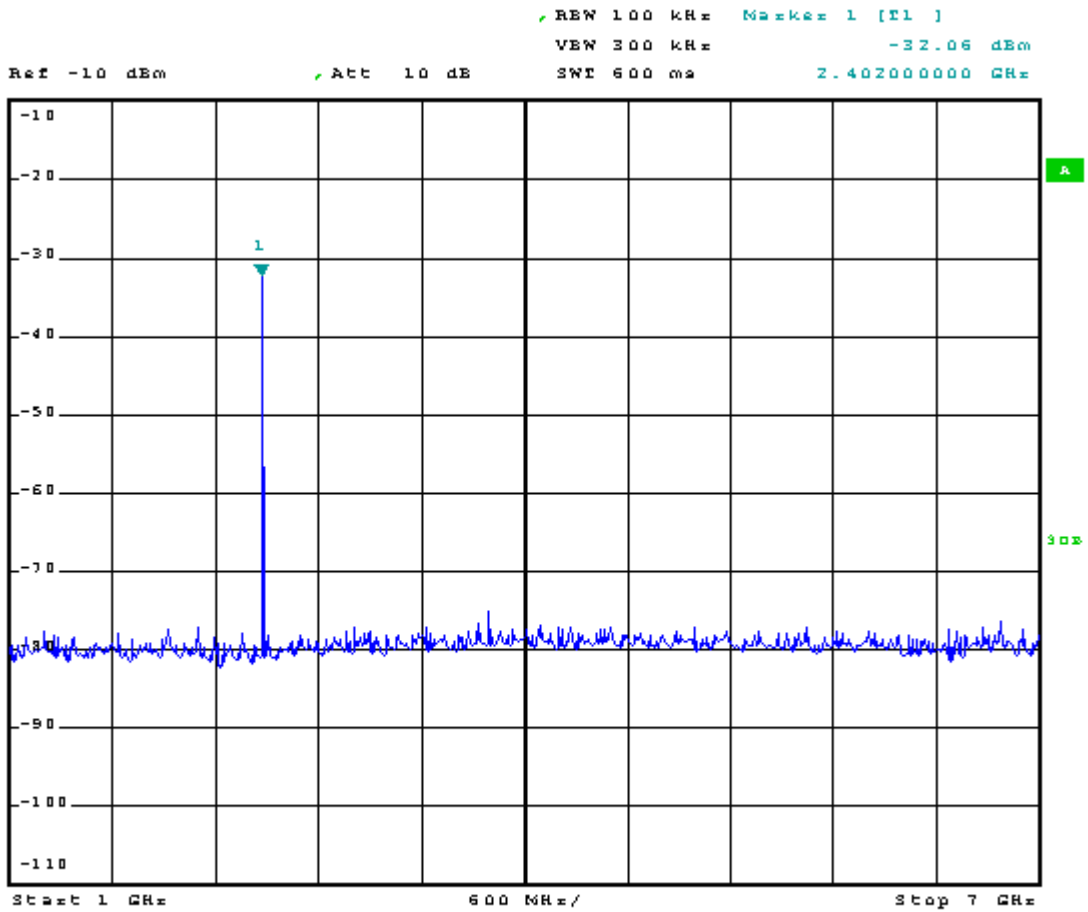
11.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Radiated Test Result

Frequency (MHz)	Antenna Polarization	Emission Read Value (dBμV/m)	Limits (dBμV/m)
<2400	H	39.14	54
>2483.5	H	42.04	54

Conducted Test Result



Date: 4. DEC. 2008 19:10:30

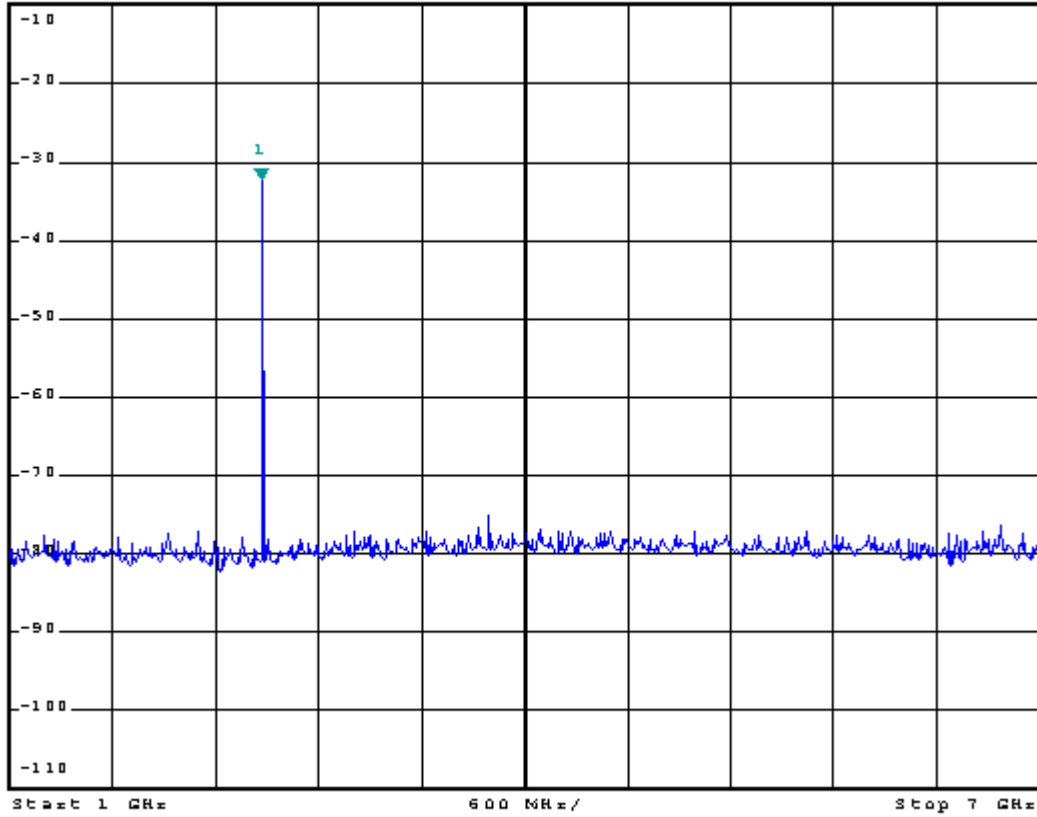


RBW 100 kHz Mask 1 [11]
VBW 300 kHz -32.03 dBm
SWE 600 ms 2.480000000 GHz

Ref -10 dBm

Att 10 dB

1 PN
VIEW



Date: 4 DEC 2008 19:19:30

12. Test of Spurious Radiated Emission

12.1 Applicable Standard

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

12.2 EUT Setup

Radiated Measurement Setup

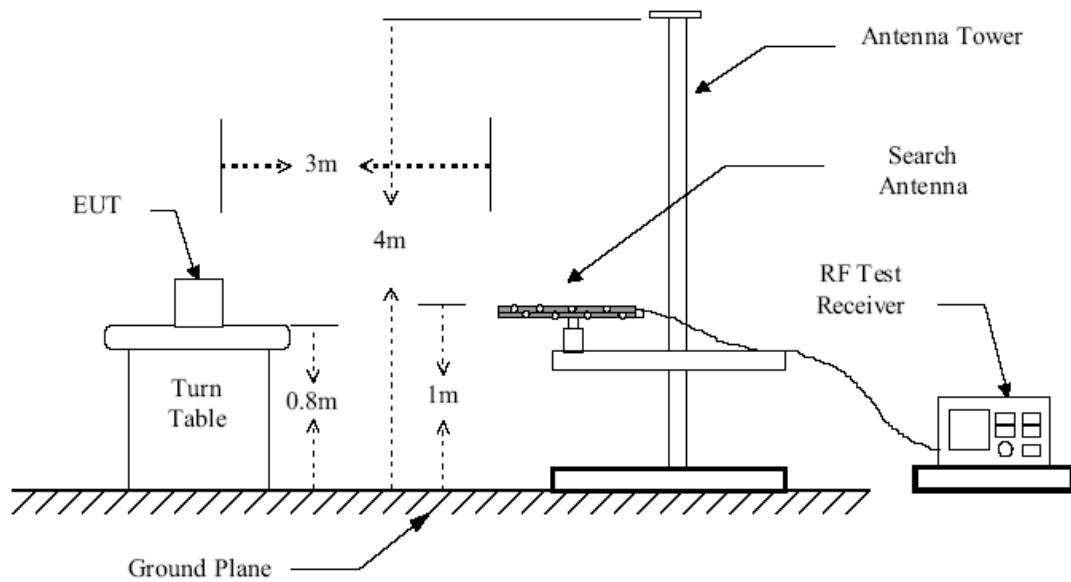


Figure 1 : Frequencies measured below 1 GHz configuration

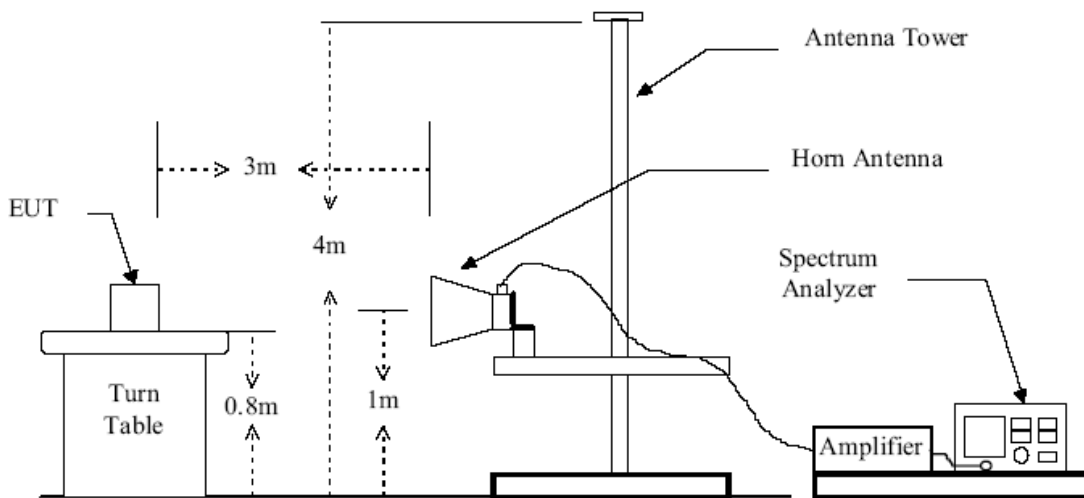
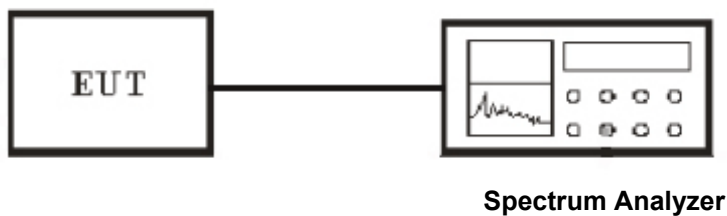


Figure 2 : Frequencies measured above 1 GHz configuration

Conducted Measurement Setup



12.3 Test Equipment List and Details

See section 2.4.

12.4 Test Procedure

Radiated Measurement

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

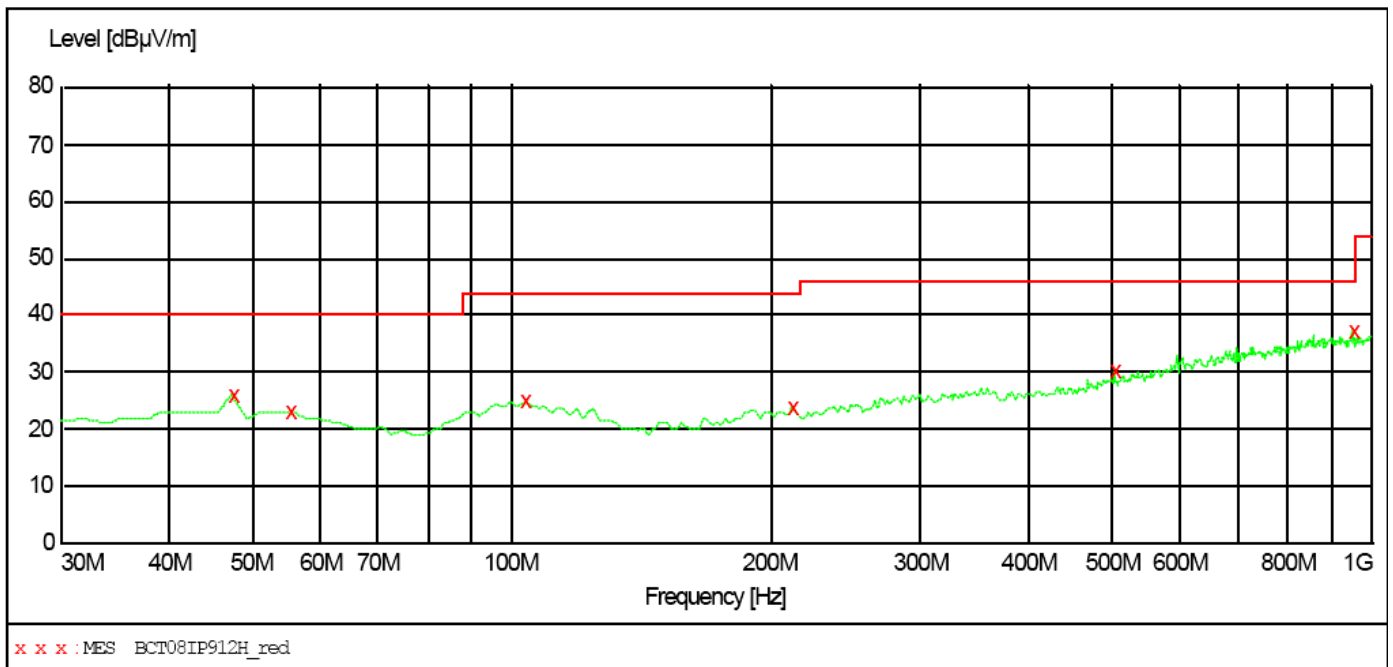
Conducted Measurement

1. For emission above 1GHz,conducted measurement method is used.
2. The transmitter is set to the lowest channel.
3. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
4. Set RBW to 1 MHz and VBW to 3 MHz, Then detector set to peak and max hold this trace.
5. The lowest band edges emission was measured and recorded.
6. The transmitter set to the highest channel and repeated 2~4.

12.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5230
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx & Charging Mode

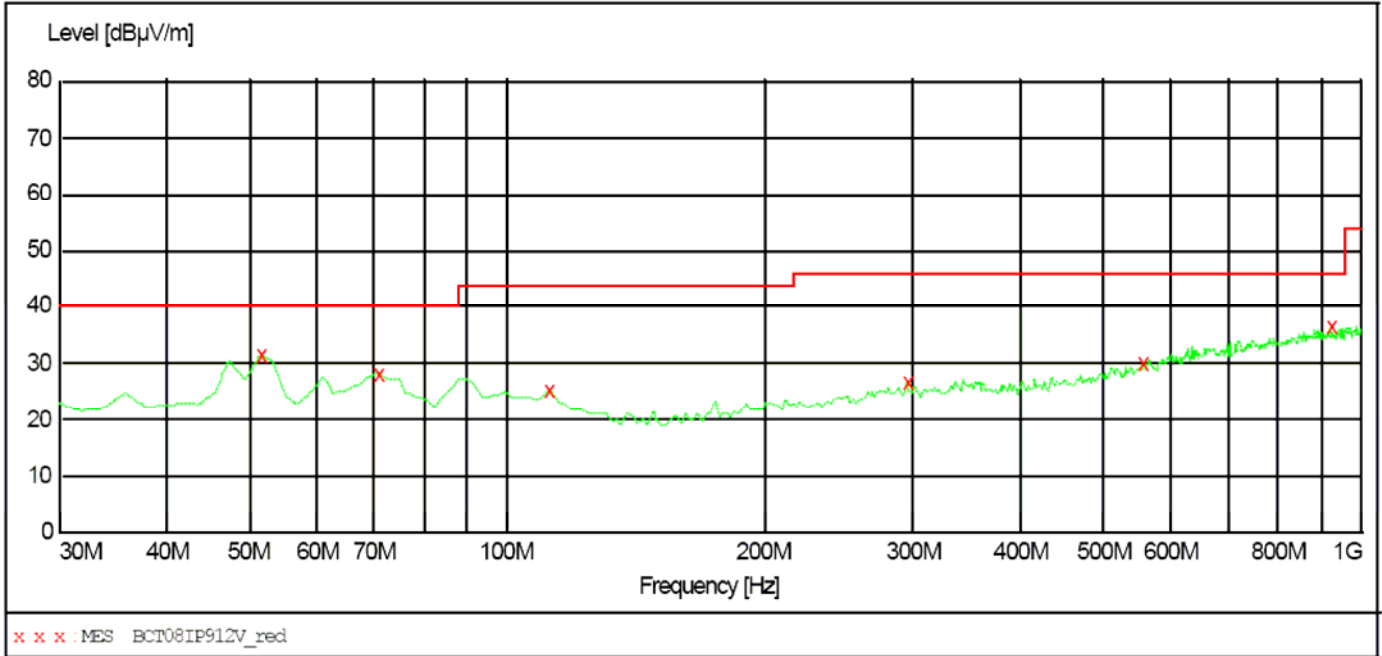
Spurious Emission (30~1000MHz)



MEASUREMENT RESULT: "BCT08IP912H_red"

12/3/2008 15:17

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	25.90	16.7	40.0	14.1	QP	100.0	0.00	HORIZONTAL
55.220000	23.10	16.5	40.0	16.9	QP	100.0	0.00	HORIZONTAL
103.720000	24.80	18.1	43.5	18.7	QP	100.0	0.00	HORIZONTAL
212.360000	24.00	16.9	43.5	19.5	QP	300.0	0.00	HORIZONTAL
503.360000	30.20	22.8	46.0	15.8	QP	100.0	0.00	HORIZONTAL
947.620000	37.30	29.6	46.0	8.7	QP	100.0	0.00	HORIZONTAL



MEASUREMENT RESULT: "BCT08IP912V_red"

12/3/2008 15:13

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
51.340000	31.30	16.6	40.0	8.7	QP	100.0	0.00	VERTICAL
70.740000	28.10	13.3	40.0	11.9	QP	100.0	0.00	VERTICAL
111.480000	25.20	17.3	43.5	18.3	QP	100.0	0.00	VERTICAL
293.840000	26.90	20.0	46.0	19.1	QP	100.0	0.00	VERTICAL
553.800000	29.80	24.1	46.0	16.2	QP	100.0	0.00	VERTICAL
918.520000	36.50	29.4	46.0	9.5	QP	100.0	0.00	VERTICAL

Harmonics

Channel Low								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
4804.0	H	1.00	24.5	24.2	48.7	74.0	25.3	P
			19.3	24.2	43.5	54.0	10.5	A
4804.0	V	1.00	25.1	24.2	49.3	74.0	24.7	P
			21.5	24.2	45.9	54.0	28.9	A
7206.0	H	1.00	24.7	24.8	49.5	74.0	24.5	P
			20.6	24.8	45.4	54.0	8.6	A
7206.0	V	1.00	27.2	24.8	52.0	74.0	22.0	P
			22.1	24.8	46.9	54.0	7.1	A
9608.0	H	1.00	19.8	25.1	44.9	74.0	29.1	P
			16.3	25.1	41.4	54.0	12.6	A
9608.0	V	1.00	21.1	25.1	46.2	74.0	27.8	P
			18.9	25.1	44.0	54.0	10.0	A
12010.0	---		---	---	---	---	---	
14412.0	---		---	---	---	---	---	
16814.0	---		---	---	---	---	---	
19216.0	---		---	---	---	---	---	
21618.0	---		---	---	---	---	---	
24020.0	---		---	---	---	---	---	
<p>Remark: 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier Margin = Level-Limit Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value 2. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. 3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz. 4. The test limit distance is 3m limit</p>								

Channel Mid								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBµV/m)	Margin (dBµV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBµV	Transd	Result dBµV/m			
4880.00	H	1.00	22.9	24.3	47.2	74.0	26.8	P
			18.6	24.3	42.9	54.0	11.1	A
4880.00	V	1.00	23.8	24.3	48.1	74.0	25.9	P
			20.2	24.3	44.5	54.0	9.5	A
7320.00	H	1.00	22.9	24.8	47.7	74.0	26.3	P
			19.9	24.8	44.7	54.0	9.3	A
7320.00	V	1.00	25.8	24.8	50.6	74.0	23.4	P
			22.4	24.8	47.2	54.0	6.8	A
9760.00	H	1.00	21.3	25.0	46.3	74.0	27.7	P
			18.5	25.0	43.5	54.0	10.5	A
9760.00	V	1.00	23.1	25.0	48.1	74.0	25.9	P
			19.6	25.0	44.6	54.0	9.4	A
12200.00	---		---	---	---	---	---	
14640.00	---		---	---	---	---	---	
17080.00	---		---	---	---	---	---	
19520.00	---		---	---	---	---	---	
21960.00	---		---	---	---	---	---	
244000.00	---		---	---	---	---	---	

**Remark: 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value**

2. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

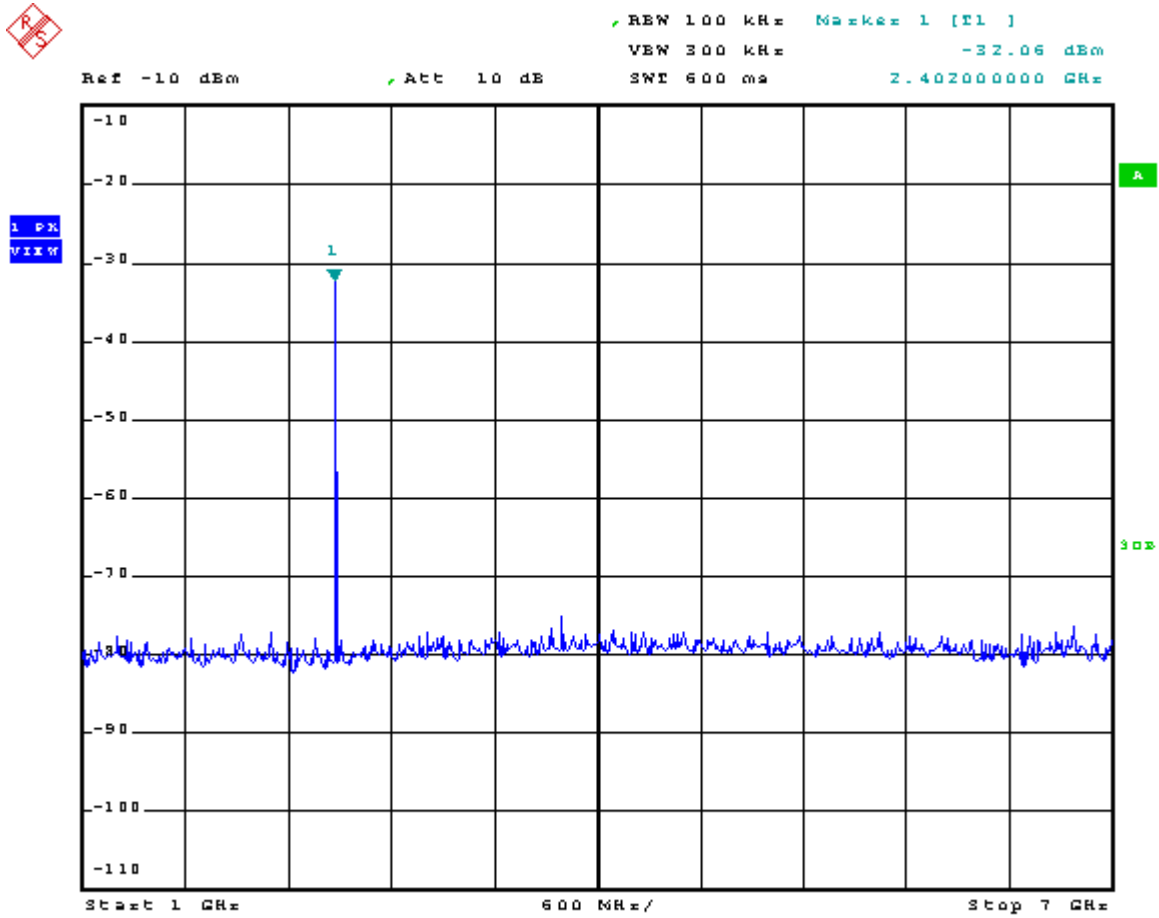
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz.

4. The test limit distance is 3m limit

Channel High								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBµV/m)	Margin (dBµV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBµV	Transd	Result dBµV/m			
4960.02	H	1.00	23.8	24.0	47.8	74.0	26.2	P
			21.3	24.0	45.3	54.0	8.7	A
4960.02	V	1.00	25.1	24.0	49.1	74.0	24.9	P
			22.8	24.0	46.8	54.0	7.2	A
7440.03	H	1.00	20.3	25.2	45.5	74.0	28.5	P
			18.4	25.2	43.6	54.0	10.4	A
7440.03	V	1.00	21.2	25.2	46.4	74.0	27.6	P
			19.2	25.2	44.4	54.0	9.6	A
9920.04	H	1.00	20.2	24.9	45.1	74.0	28.9	P
			16.9	24.9	41.8	54.0	12.2	A
9920.04	V	1.00	25.9	24.9	50.8	74.0	23.2	P
			20.8	24.9	45.7	54.0	8.3	A
12400.05	---		---	---	---	---	---	
14880.06	---		---	---	---	---	---	
17360.07	---		---	---	---	---	---	
19840.08	---		---	---	---	---	---	
22320.09	---		---	---	---	---	---	
24800.10	---		---	---	---	---	---	
<p>Remark: 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier Margin = Level-Limit Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value 2. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. 3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz. 4. The test limit distance is 3m limit</p>								

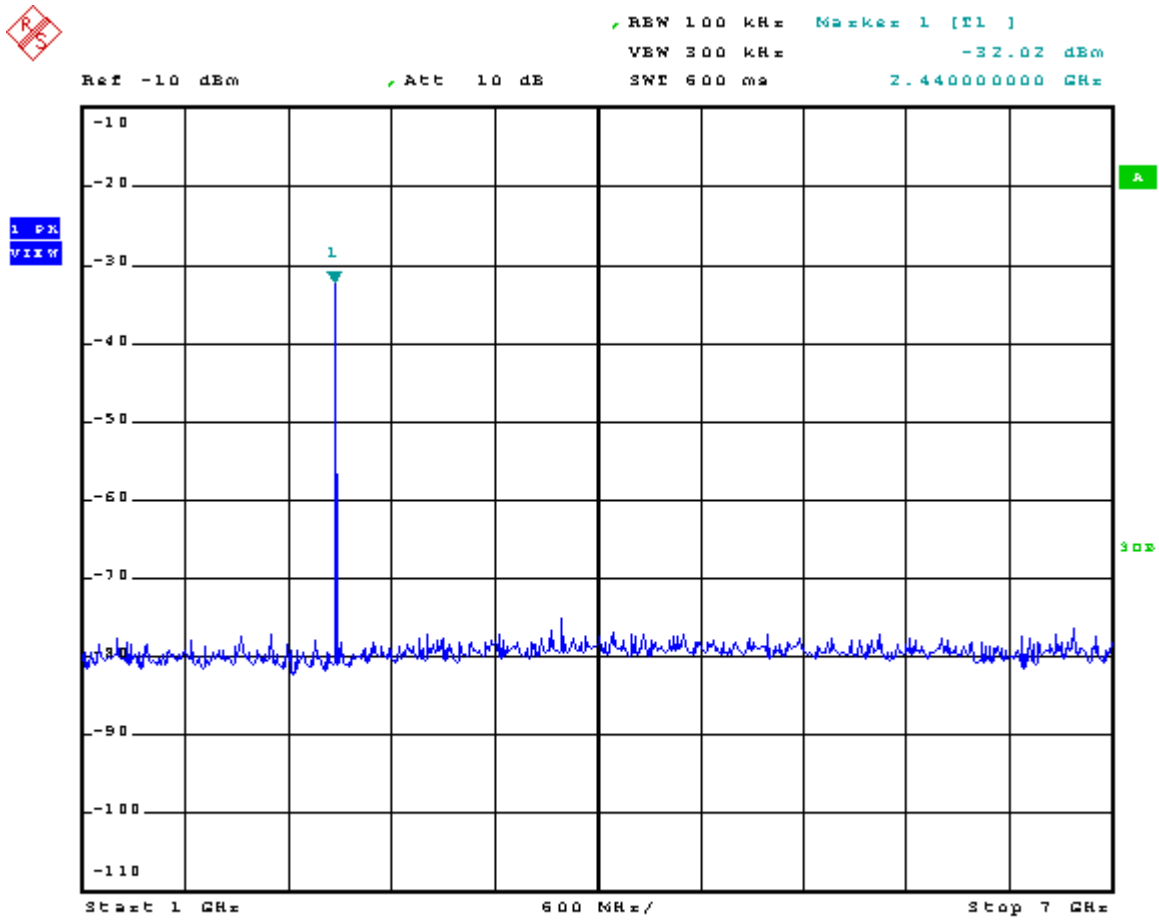
Conducted Test Result (1~7GHz)

Channel Low :



Date: 4. DEC. 2008 19:10:30

Channel Middle :

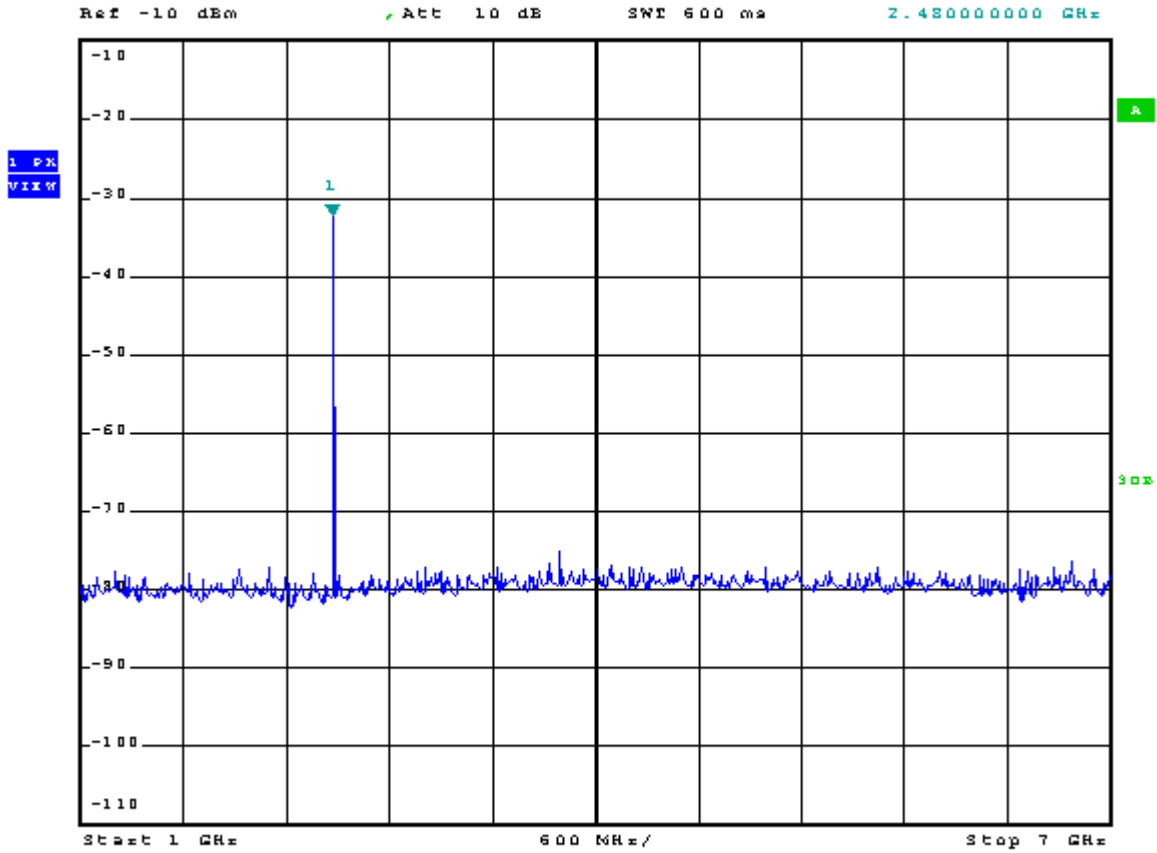


Date: 4. DEC. 2008 19:13:30

Channel High :



REW 100 kHz Marker 1 [F1]
VBW 300 kHz -32.03 dBm
SWT 600 ms 2.480000000 GHz



Date: 4 . DEC . 2008 19 : 19 : 30

Conducted Test Result (7~26GHz)



RES 100 kHz

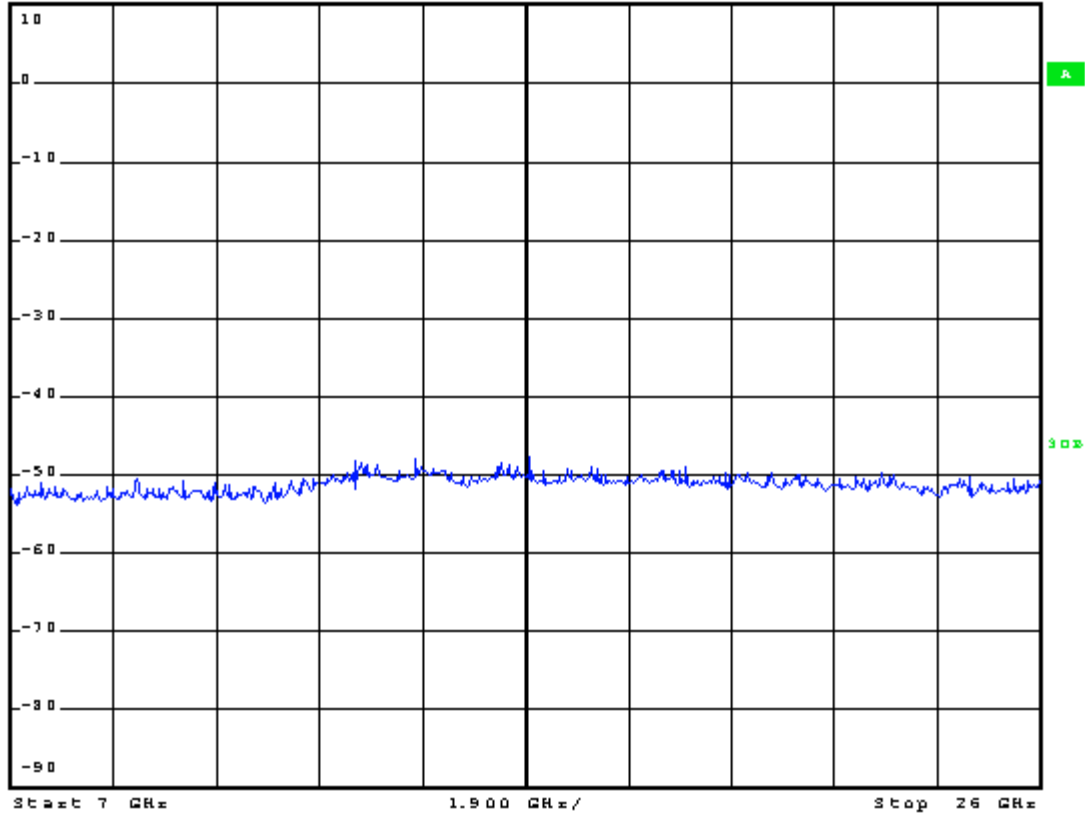
VEN 300 kHz

SWI 600 ms

Ref 10 dBm

Att 40 dB

DPN
VIEW



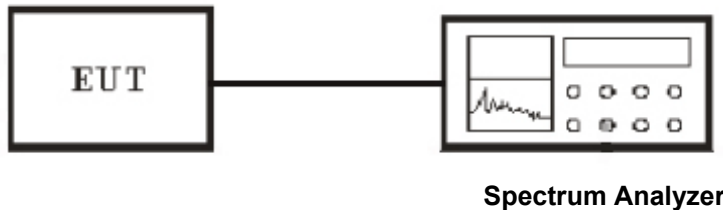
Date: 8. DEC. 2008 10:42:39

13. Test of Peak Power Spectral Density

13.1 Applicable Standard

According to § 15.247(d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3kHz band during any time interval of continuous transmission.

13.2 EUT Setup



13.3 Test Equipment List and Details

See section 2.4.

13.4 Test Procedure

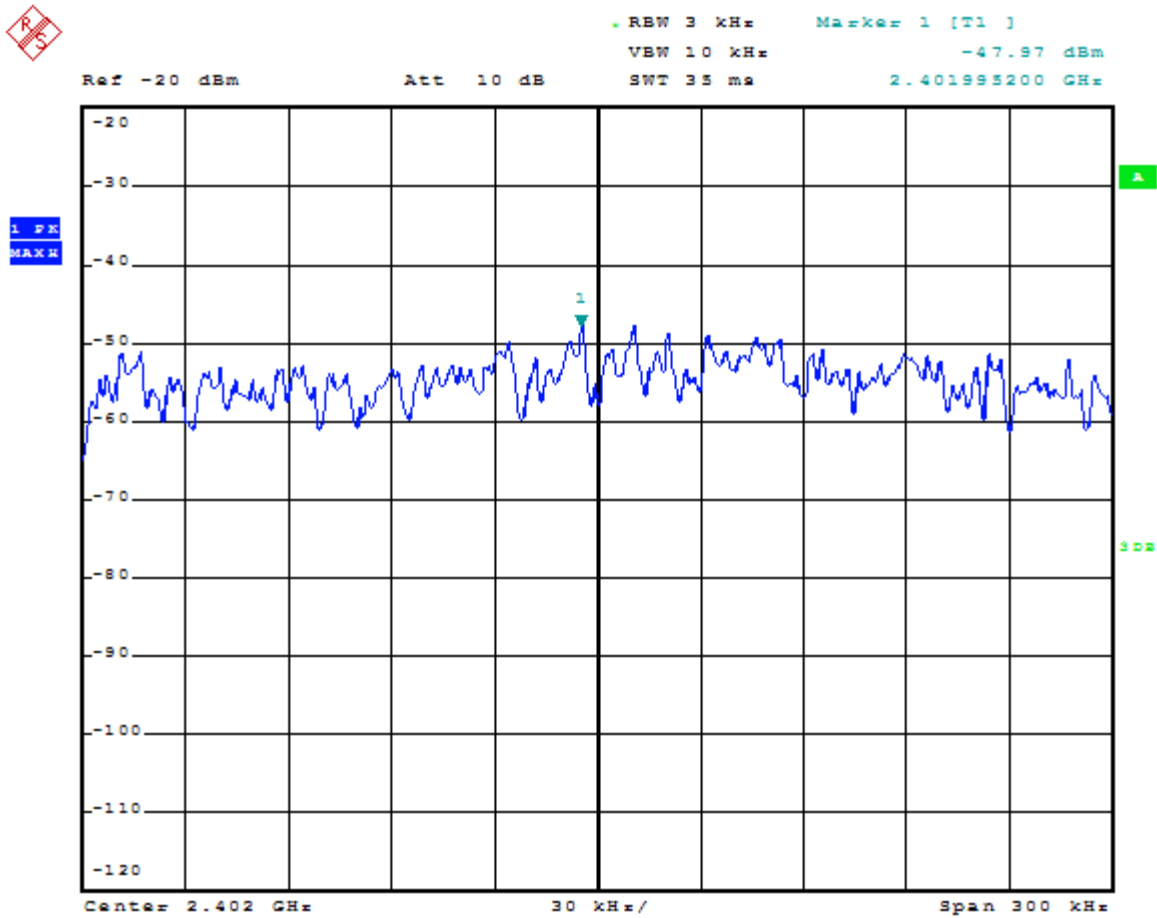
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 300KHz, Sweep=100s
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

13.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset(Class 2)
Humidity (%RH) : 50~54	M/N: 5250
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

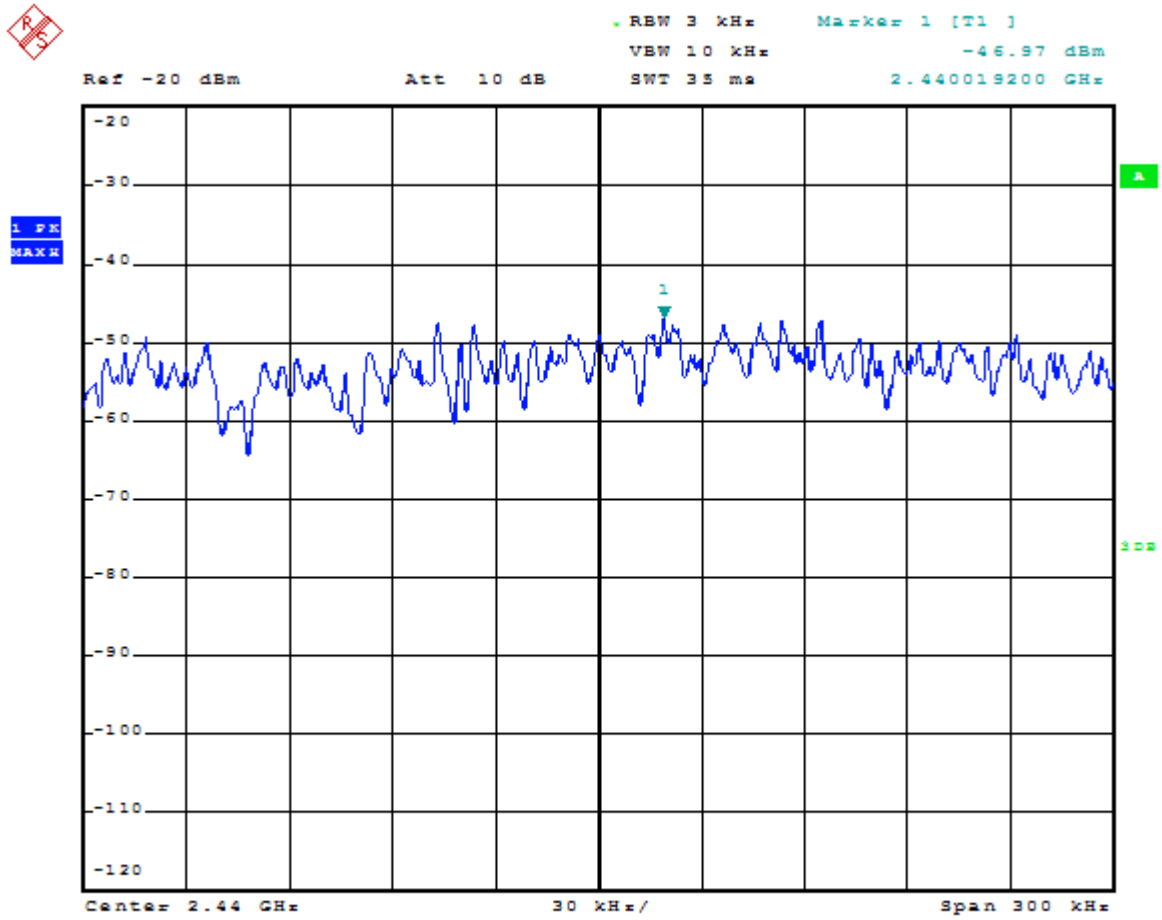
CH	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
Low	-47.97	1.20	-46.77	8
Mid	-46.97	1.20	-45.77	8
High	-46.57	1.20	-45.37	8

Channel Low :



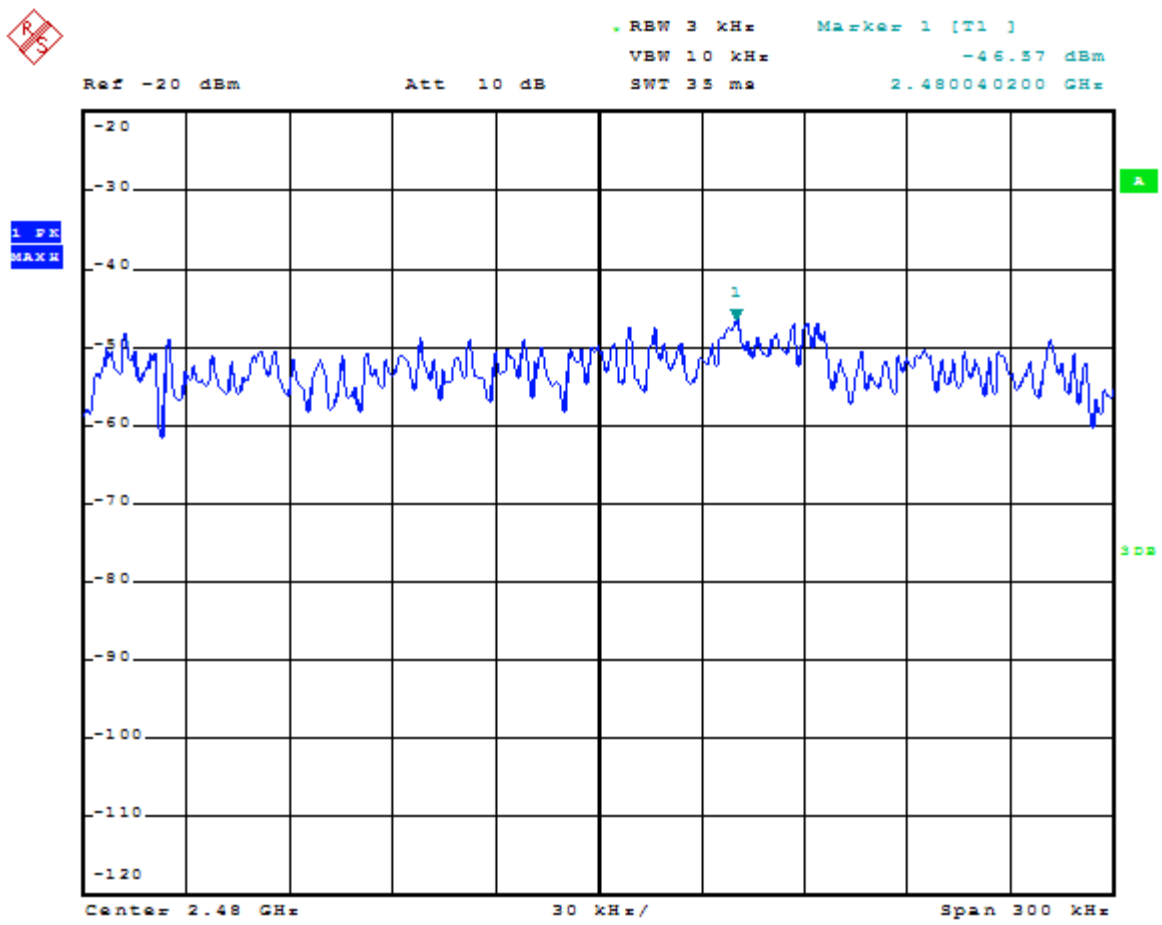
Date: 20.DEC.2008 10:51:49

Channel Mid :



Date: 20.DEC.2008 10:47:42

Channel High :



Date: 20.DEC.2008 10:43:15

14. RF EXPOSURE

14.1 Applicable Standard

According to § 15.247(b)(4) and § 1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

14.2 Test Result

This is a portable device and the Max peak output power is -31.97dBm (0.0006mW) lower than low threshold $60/\text{fGHz mW}$ (24.896mW), $d < 2.5\text{cm}$ in general population category. So the SAR measurement is not necessary.