TEST REPORT

1. Applicant

Name	:	Cordrix Co.,Ltd.
Address	:	#207, Business Incubator, HUFS, 89 Wangsan-ri, Mohyeon-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-791, Korea

2. Products

Type of Product	:	Bluetooth Stereo Headset
Model/Type	:	CBSH100
Manufacturer	:	Cordrix Co.,Ltd.

3. Test Standard	:	FCC CFR 47 Part 15, Subpart C section 15.247
4. Test Method	:	ANSI C63.4-2003
5. Test Result	:	Positive
6. Date of Application	:	April 10th, 2011
7. Date of Issue	:	May 19th, 2011

Tested by

Jong-gon Ban
Telecommunication Center
Senior Engineer

Approved by

Jeong-min Kim
Telecommunication Center
Manager

Korea Testing Laboratory

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1. GENERAL INFORMATIONS

1.1. Applicant (Client)

Name	Cordrix Co.,Ltd.
Address	#207, Business Incubator, HUFS, 89 Wangsan-ri, Mohyeon-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
Contact Person	Kyu-don Lee
Telephone No.	+82-31-323-2582
Facsimile No.	+82-31-323-4582
E-mail address	kdlee@cordrix.co.kr
Manufacturer Name	Cordrix Co.,Ltd.
Manufacturer Address	#207, Business Incubator, HUFS, 89 Wangsan-ri, Mohyeon-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

1.2. Equipment (EUT)

Type of Product	Bluetooth Stereo Headset
Model Name	CBSH100
FCC ID	VYI-CBSH100
Frequency Range	2,402 ~ 2,480 MHz
Max RF Output Power	3.31dBm
Modulation Technique	Frequency Hopping Spread Spectrum
Type of Modulation	GFSK
Number of Channels	79
Antenna Type	Chip Antenna
Antenna Gain	0.57 dBi
FCC Classification	FCC Part 15 Spread Spectrum Transmitter (DSS)
Power Supply	DC 3.7V (Battery)
Hardware Version	REV 1.1
Software Version	REV 1.0
Bluetooth Core spec	v2.1

1.3. Testing Laboratory

Testing Place	Korea Testing Laboratory (KTL) 1271-12, Sa-Dong Sangnok-Gu, Ansan-si, Gyunggi-Do , Korea
FCC registration number	408324
Industry Canada filing number	6298
Test Engineer	Jong-gon Ban
Telephone number	+82 31 5000 133
Facsimile number	+82 31 5000 149
E-mail address	banjg@ktl.re.kr
Other Comments	-

1.4. Channel numbers and Frequencies

Channel	FREQ(MHz)	Channel	FREQ(MHz)	Channel	FREQ(MHz)	Channel	FREQ(MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	-	-

2. SUMMARY OF TEST RESULTS

Testing performed for : Cordrix Co.,Ltd.

Equipment Under Test : CBSH100

Receipt of Test Sample : April 14th, 2011

Test Start Date : April 14th, 2011

Test End Date : May 16th, 2011

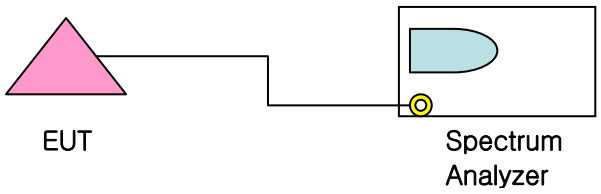
The following table represents the list of measurements required under the FCC CFR47 Part 15.207, 15.247, and 15.209

FCC Rules	Test Requirements	Results	Comments
15.247(a)(1)	20dB Bandwidth	Pass	See Data sheets
15.247(b)(1)	Maximum Peak Power	Pass	See Data sheets
15.247(d)	100 KHz Bandwidth of Frequency Band Edges	Pass	See Data sheets
15.247(a)(1)	Hopping channel separation	Pass	See Data sheets
15.247(b)(iii)	Number of hopping channels	Pass	See Data sheets
15.247(a)(1)(iii)	Dwell time	Pass	See Data sheets
15.247(d)	Conducted Spurious Emission	Pass	See Data sheets
15.209	Radiated Spurious Emissions	Pass	See Data sheets
15.207	AC line Conducted Emissions	Pass	See Data sheets

3. Measurement & Results

3.1. 20 dB Bandwidth

3.1.1. Test Setup Layout



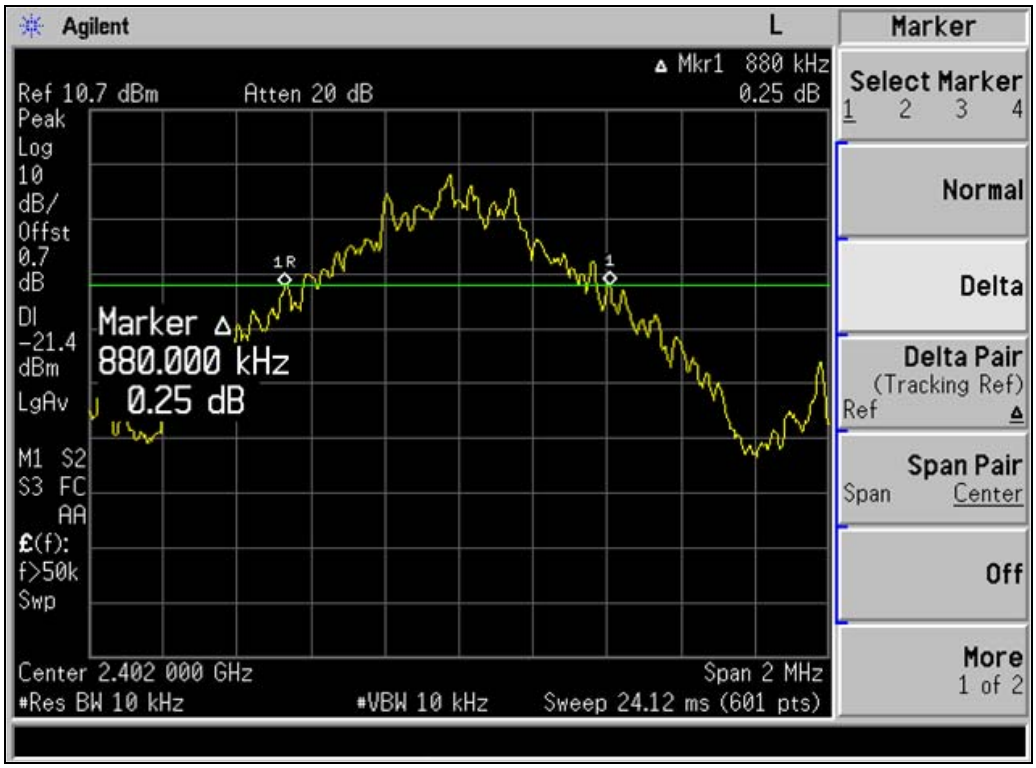
3.1.2. Test Condition & Limit

- Set RBW & VBW of Spectrum analyzer to 10 kHz
- The 20dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 20dB . Frequencies that are separated by 25 kHz or two-thirds of the 20 dB Bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

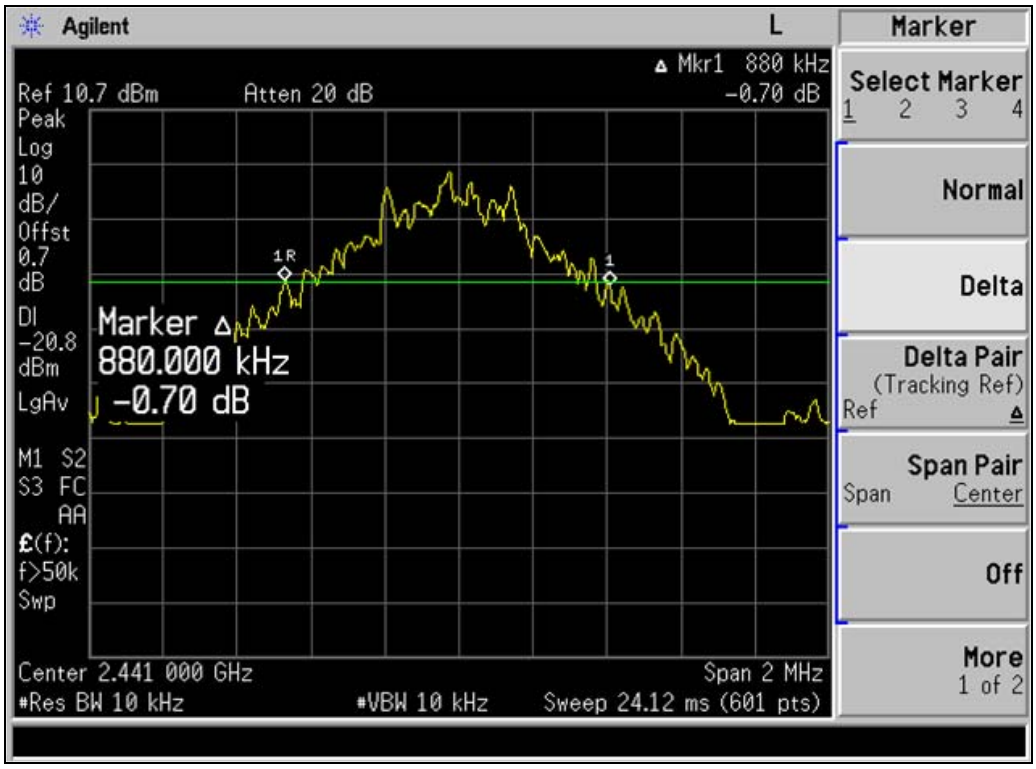
3.1.3. Test result

* Operation Mode : GFSK

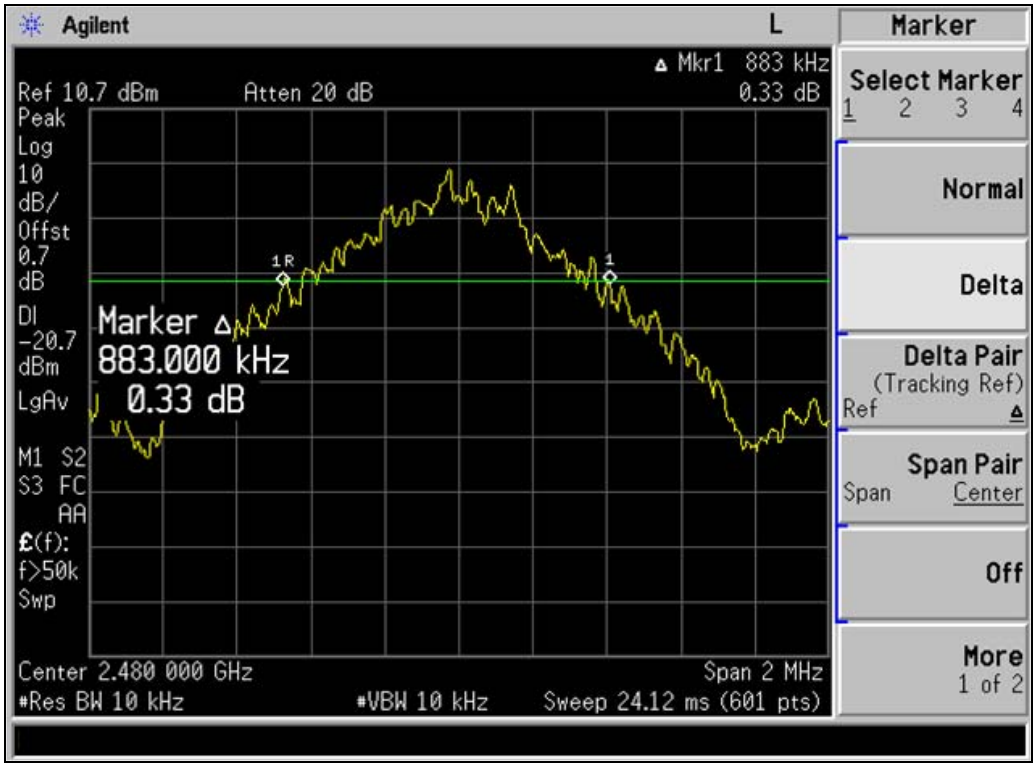
Channels	Frequency (MHz)	Result (MHz)	Verdict
Low	2402	0.880	Pass
Middle	2441	0.880	Pass
High	2480	0.883	Pass



– Low Channel (GFSK) –



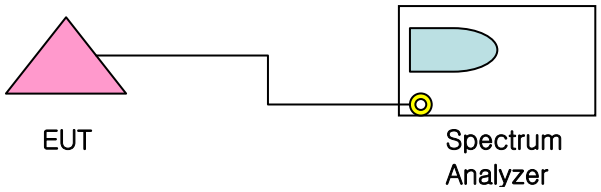
– Mid Channel (GFSK) –



– High Channel (GFSK) –

3.2. Maximum Peak Power

3.2.1. Test Setup Layout



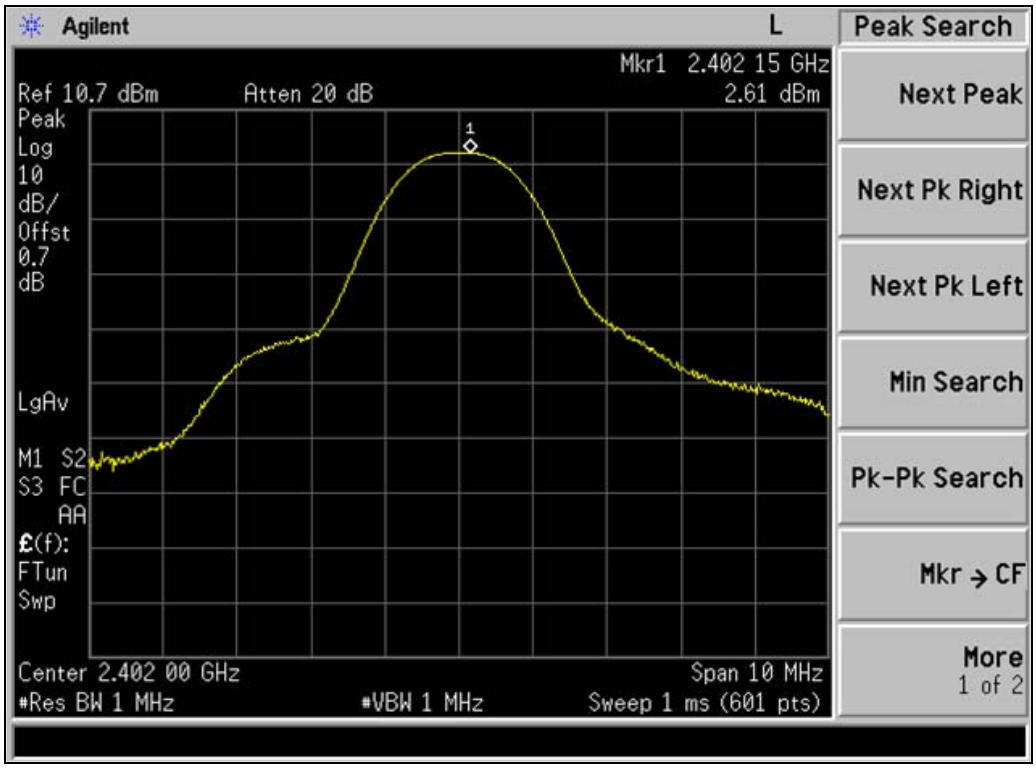
3.2.2. Test Condition & Limit

- Set RBW & VBW of Spectrum analyzer to 1 MHz
- The Maximum Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt.

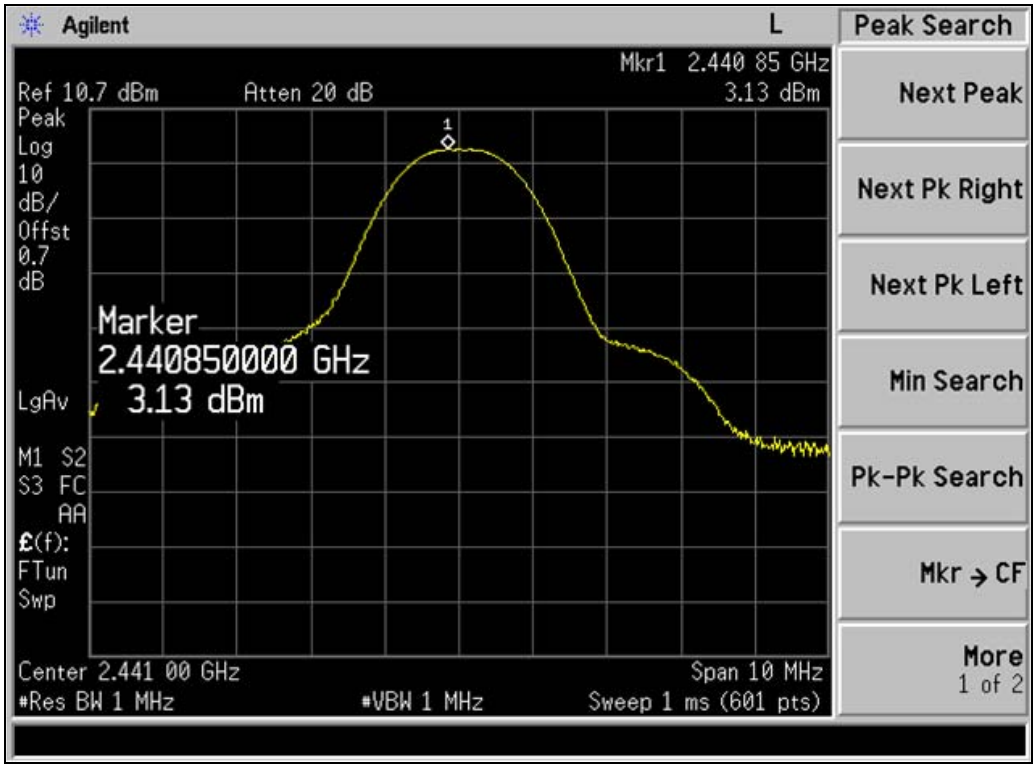
3.2.3. Test result

* Operation Mode : GFSK

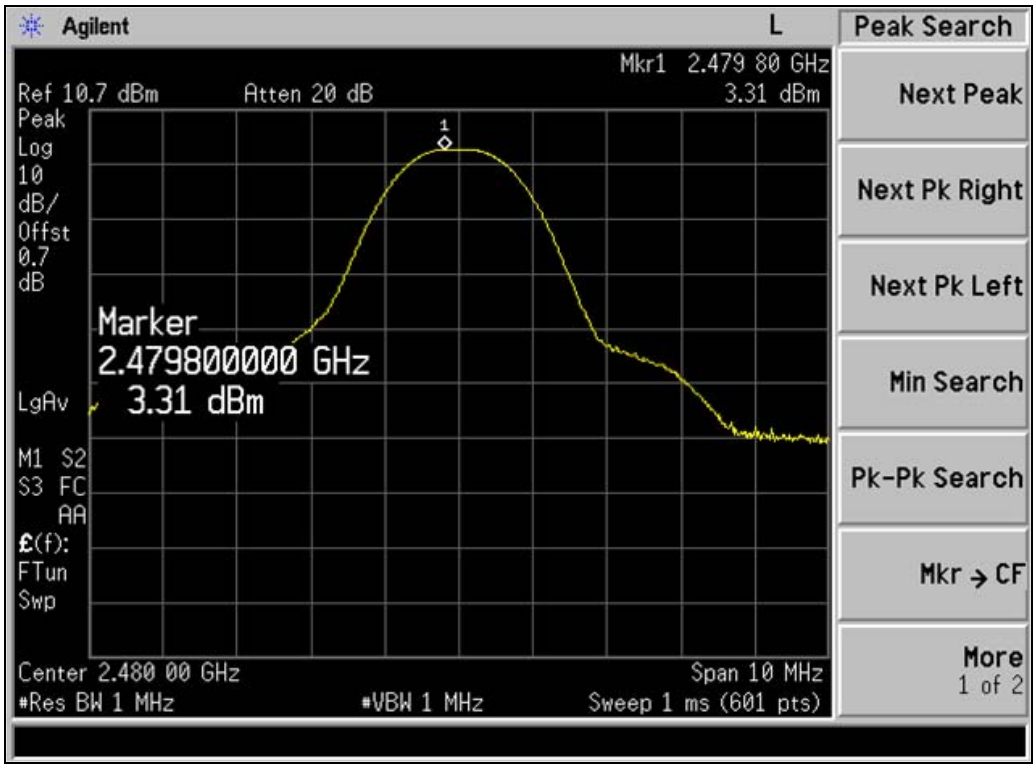
Channels	Frequency (MHz)	Result (dBm)	Limit (dBm)	Verdict
0	2402	2.61	30	Pass
39	2441	3.13	30	Pass
78	2480	3.31	30	Pass



– Low Channel (GFSK) –



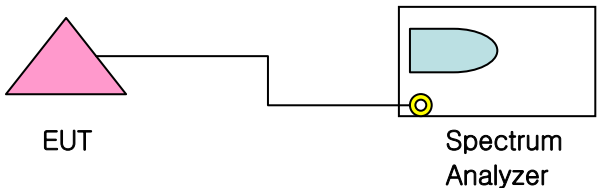
– Mid Channel (GFSK) –



– High Channel (GFSK) –

3.3. 100 KHz Bandwidth of Frequency Band Edges

3.3.1. Test Setup Layout



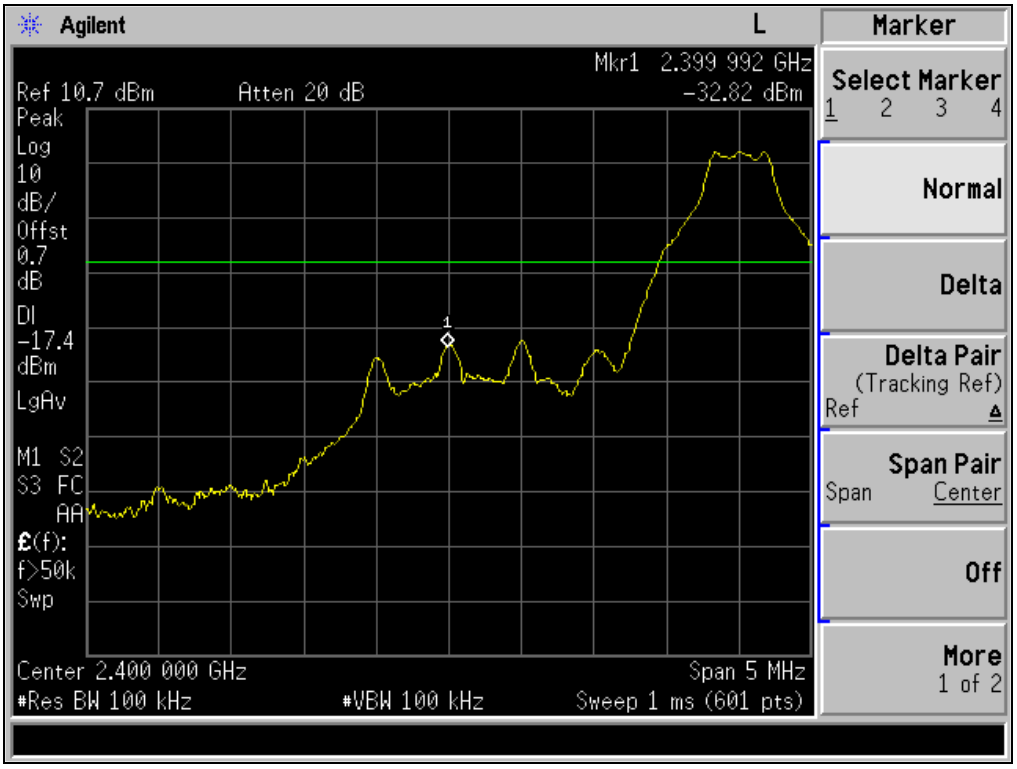
3.3.2. Test Condition & Limit

- Set RBW & VBW of Spectrum analyzer to 100 kHz
- 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.
- The maximum frequency range measuring with the spectrum from 30 MHz to 25 GHz is investigated with the transmitter

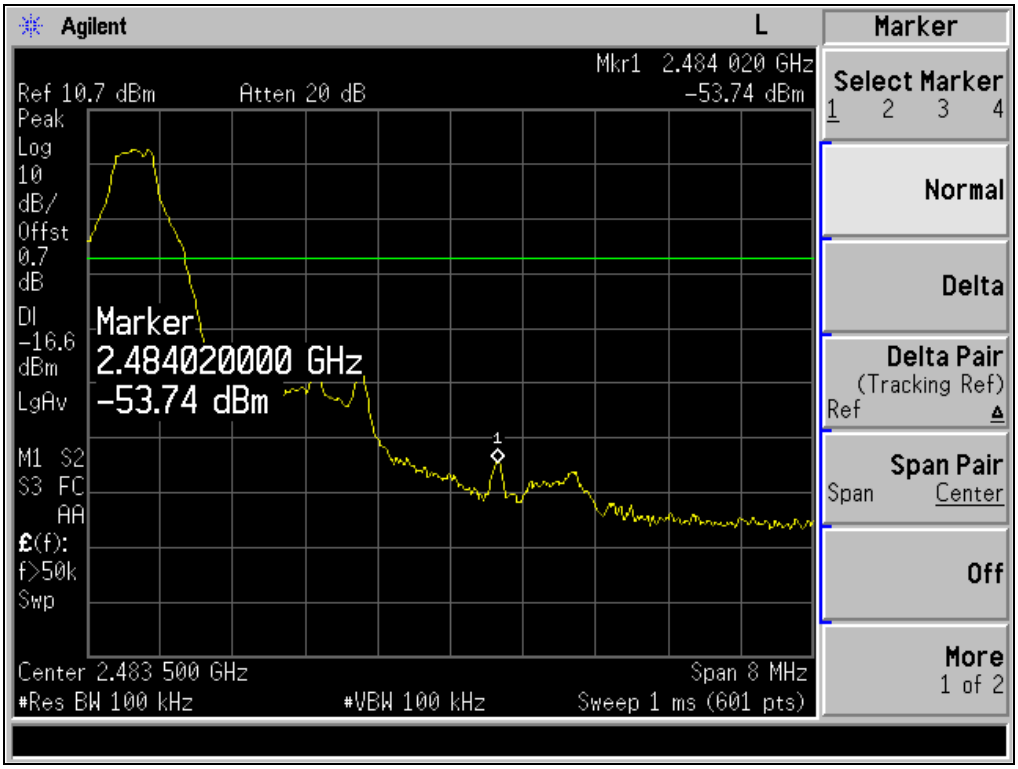
3.3.3. Test result

* Operation Mode : GFSK

Channels	Frequency (MHz)	Result (dBc)	Limit (dBc)	Verdict
Low	2402	30 >	20	Pass
High	2480	50 >	20	Pass



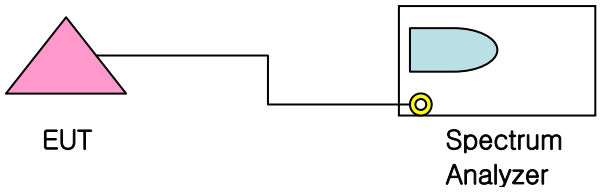
– Band edge lower side (GFSK) –



– Band edge higher side (GFSK) –

3.4. Hopping Channel Separation

3.4.1. Test Setup Layout



3.4.2. Test Condition & Limit

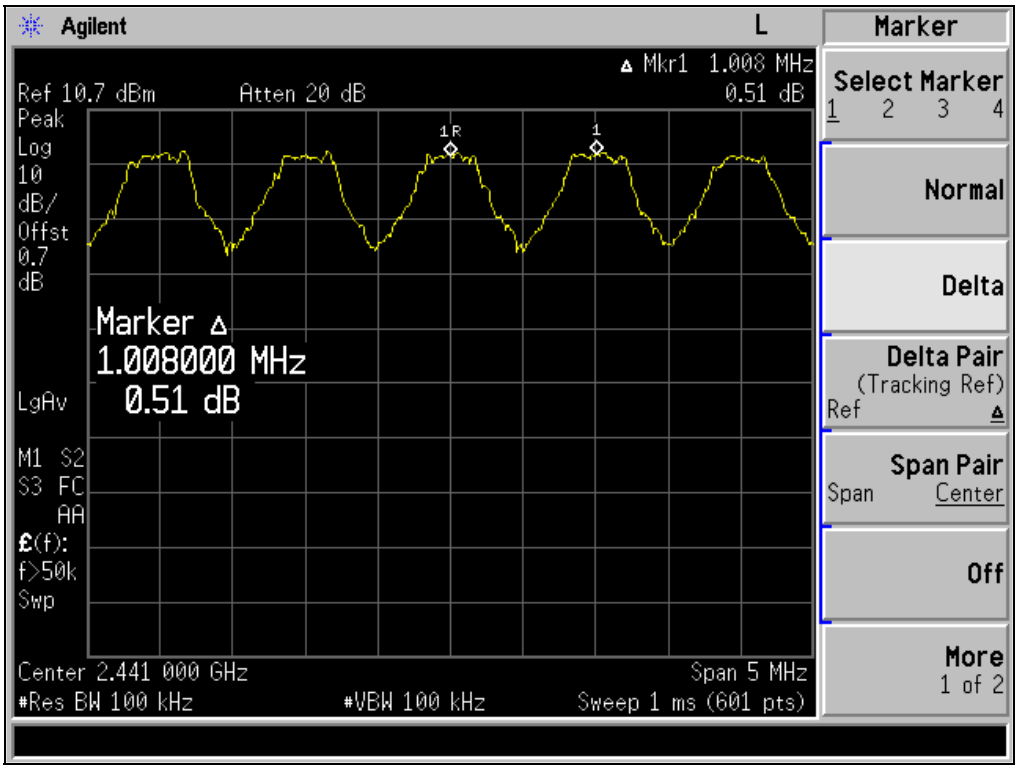
- Set the center frequency of spectrum analyzer = middle of hopping frequency
- Set the spectrum analyzer as RBW, VBW = 100 kHz, Span = 5 MHz
- Frequency hopping system shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the two-third of 20dB bandwidth of the hopping channel, whichever is greater.

3.4.3. Test result

* Operation Mode : GFSK

Channels	Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
Hopping	2441	1.008	0.587	Pass

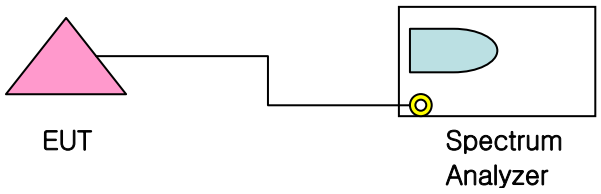
※Remark : 20dB bandwidth is 0.880 MHz



– Channel separation (GFSK) –

3.5. Number of Hopping Channels

3.5.1. Test Setup Layout



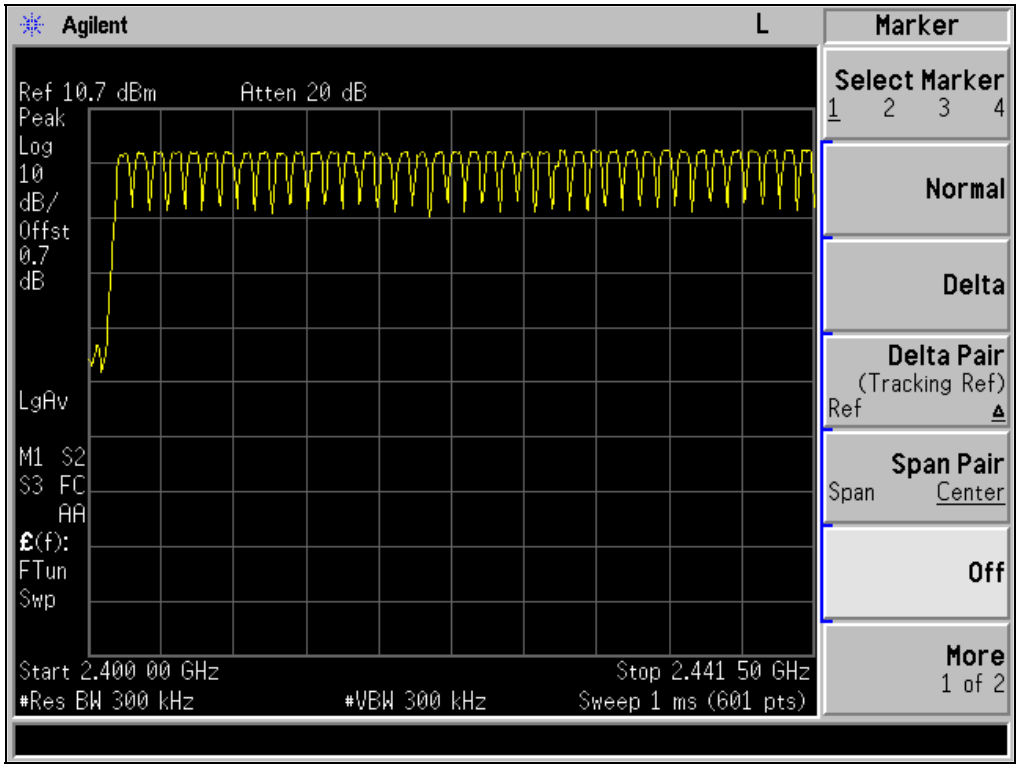
3.5.2. Test Condition & Limit

- Set the spectrum analyzer as start frequency = 2,400 MHz, stop frequency = 2,441.5 MHz and start frequency = 2,441.5 MHz, stop frequency = 2,483.5 MHz
- Set the spectrum analyzer as RBW, VBW = 300 kHz
- Frequency hopping system operating in the 2,400 ~ 2,483.5 MHz bands shall use at least 15 hopping frequencies.

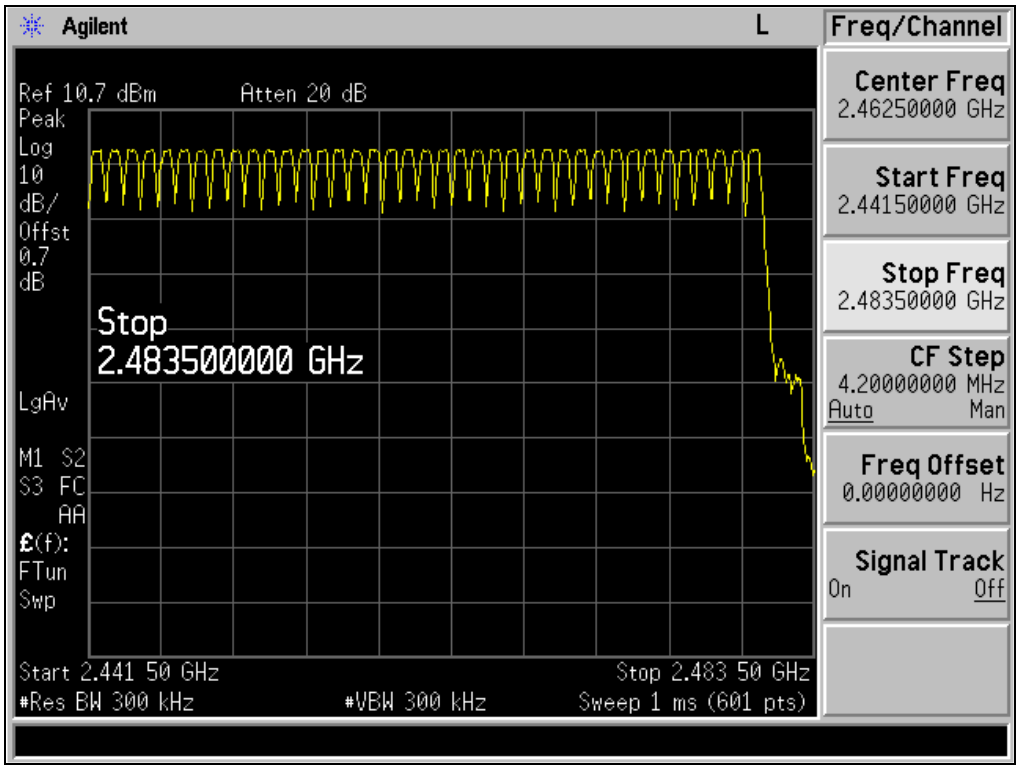
3.5.3. Test result

* Operation Mode : GFSK

Channels	Result (Number of Hopping channels)	Limit (channel)	Verdict
Hopping	79	>=15	Pass



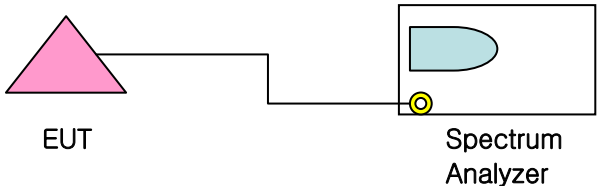
– Number of hopping channel (GFSK) –



– Number of hopping channel (GFSK) –

3.6. Dwell Time

3.6.1. Test Setup Layout



3.6.2. Test Condition & Limit

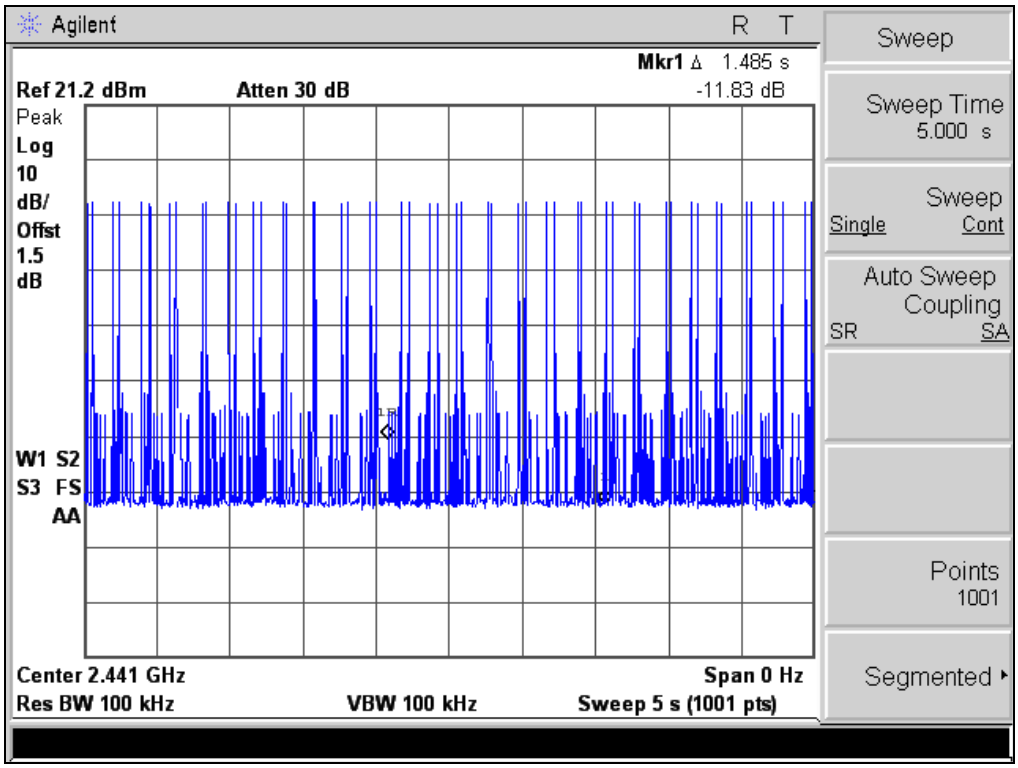
- Set the spectrum analyzer to zero span mode and RBW, VBW = 3 MHz.
- Frequency hopping systems in the 2,400-2,483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Since the Bluetooth technology uses 79 channels this period is calculated to be 31.6 seconds.

The dwell time is calculated by:
Dwell time = time domain slot length x (hop rate / number of hopping per channel) x 31.6 with:

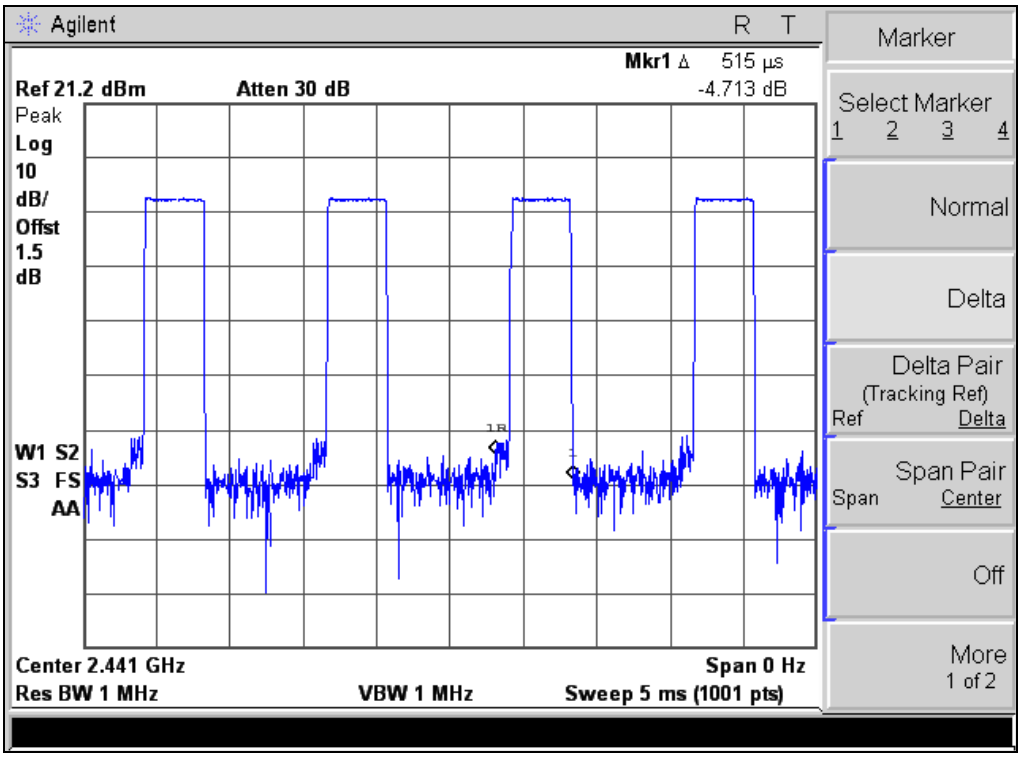
3.6.3. Test result

* Operation Mode : GFSK

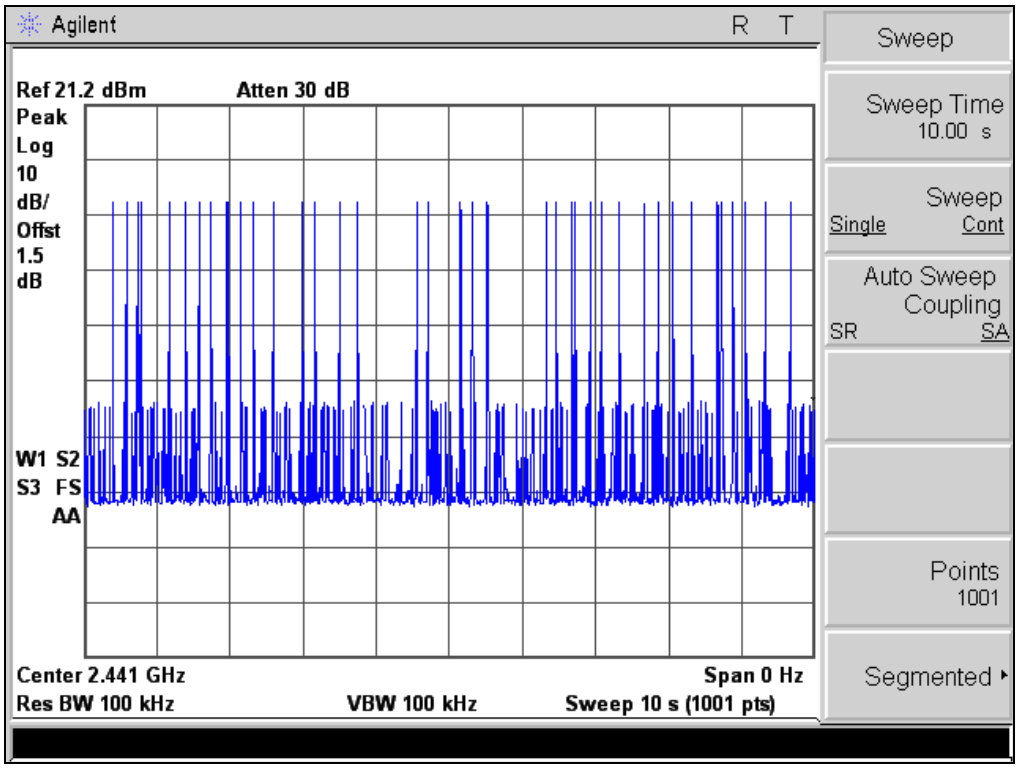
Channels	Type slot length(ms)	Dwell time (ms)	Limits (msec)	Packet type	Verdict
Mid	0.515	162.7	≤ 400	DH1	Pass
Mid	1.77	212.5	≤ 400	DH3	Pass
Mid	3.02	200.4	≤ 400	DH5	Pass



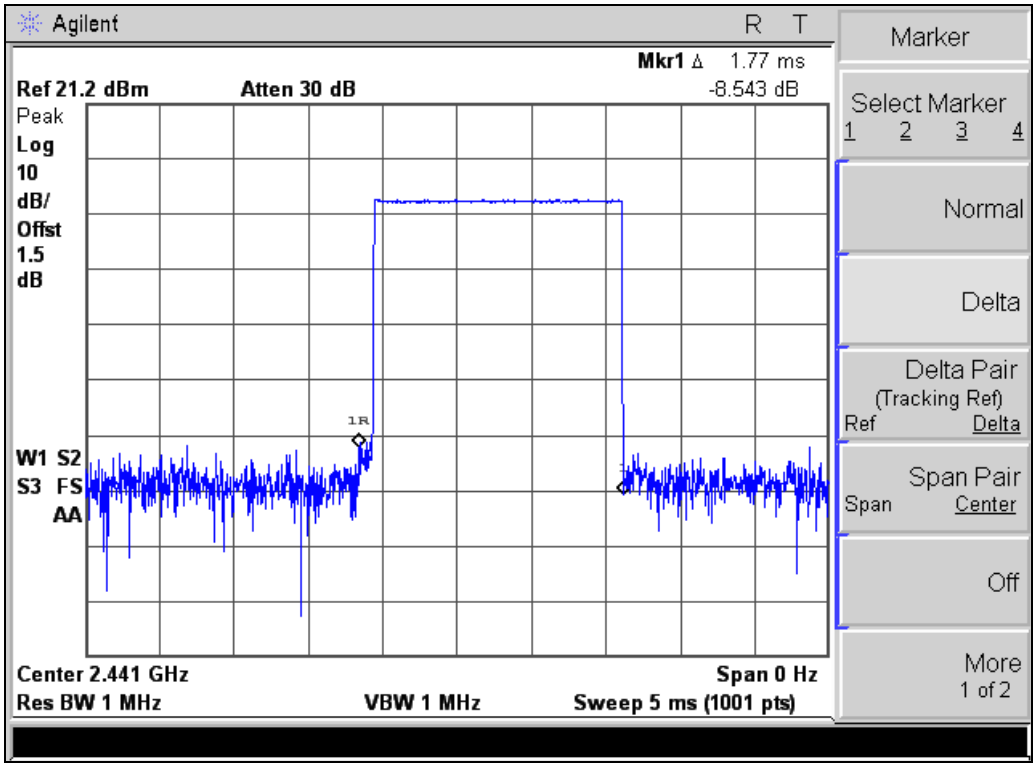
– DH1 packet type (GFSK) –



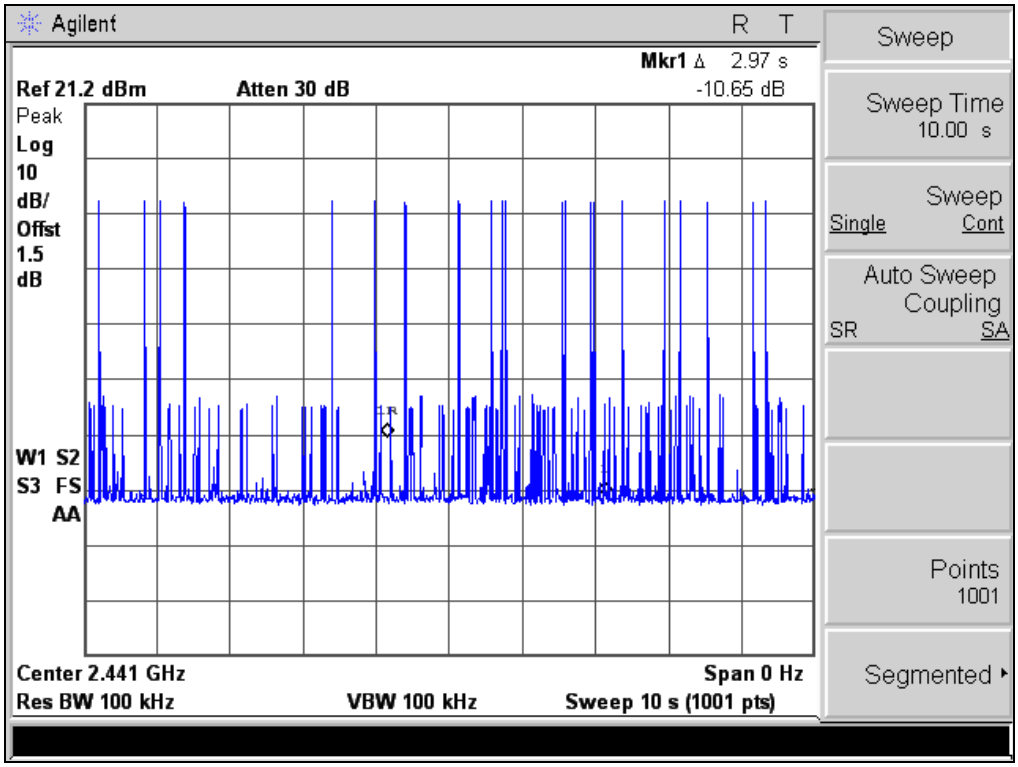
– DH1 packet type (GFSK) –



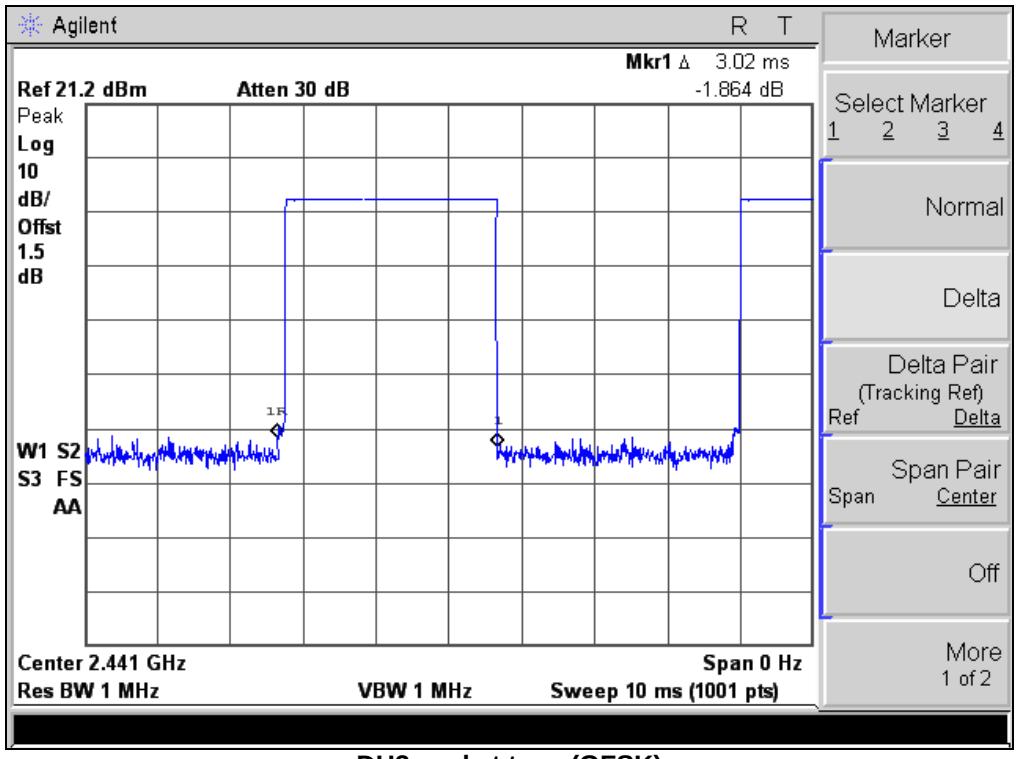
– DH2 packet type (GFSK) –



– DH2 packet type (GFSK) –



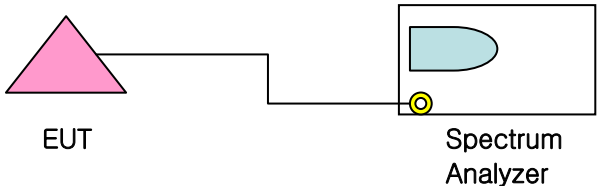
– DH3 packet type (GFSK) –



– DH3 packet type (GFSK) –

3.7. Conducted Spurious Emission

3.7.1. Test Setup Layout



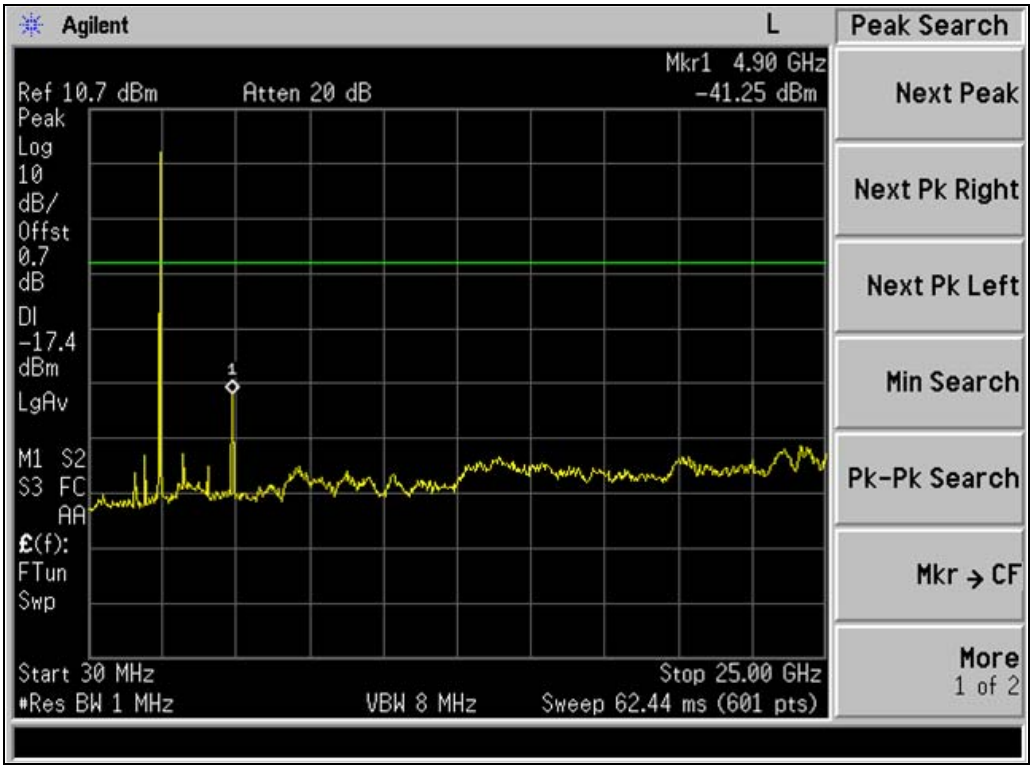
3.7.2. Test Condition & Limit

- Set the spectrum analyzer as RBW, VBW = 1 MHz
- The reference value for the measurement of the spurious RF conducted emissions is determined during the test “band edge compliance” (cf. chapter 4.5). This value is used to calculate the 20 dBc limit.
- 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.

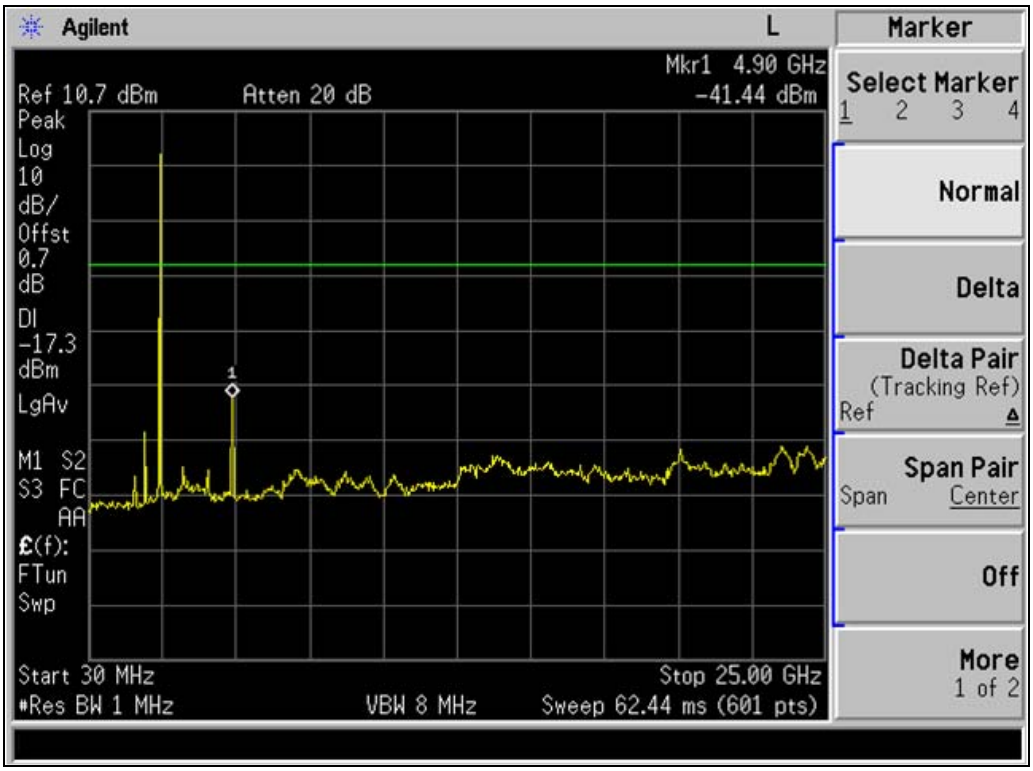
3.7.3. Test result

* Operation Mode : GFSK

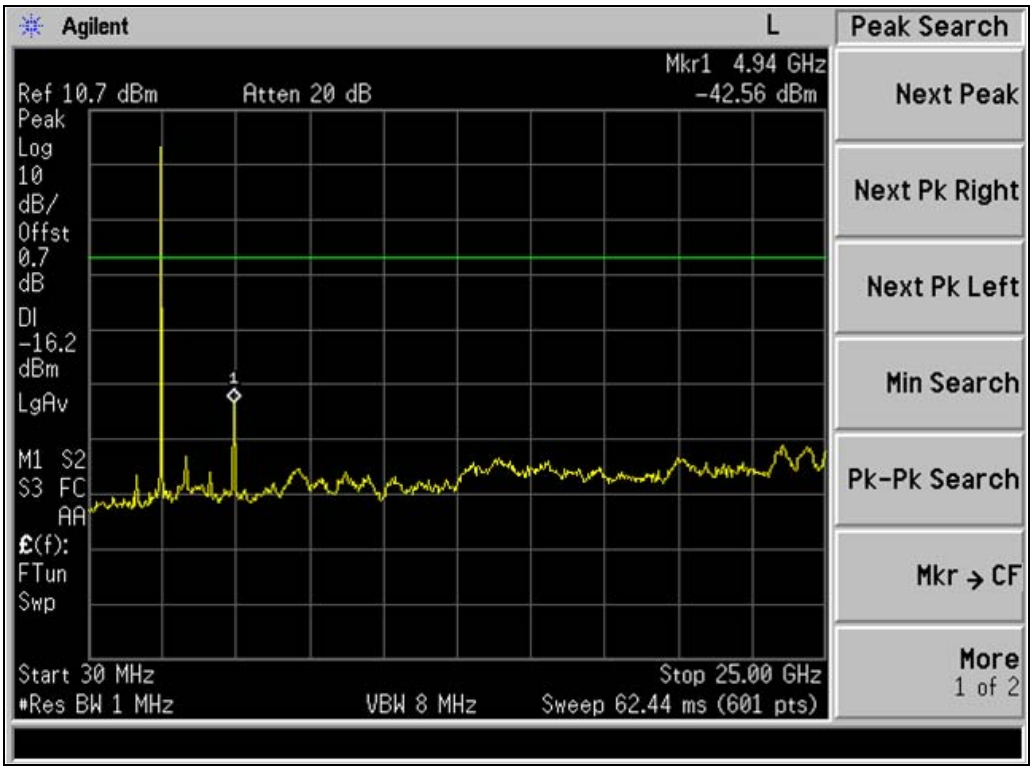
Channels	Frequency (MHz)	Result (dBc)	Limit (dBc)	Verdict
Low	2,402	40 >	20	Pass
Mid	2,441	40 >	20	Pass
High	2,480	40 >	20	Pass



– Low channel (GFSK) –



– Mid channel (GFSK) –



– High channel (GFSK) –

3.8. Radiated Spurious Emissions

3.8.1. Test Procedure

3.8.1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Biconi-Log antenna : 30 to 1000 MHz or Horn Antenna : 1 to 40 GHz) was placed at the distance of 3 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT. Emission levels from the EUT with various configurations were examined on a spectrum analyzer connected with a RF amplifier and graphed.
The emission was within the illumination area of the 3 dB beam width of the antenna so that the maximum emission from the EUT is measured.

3.8.1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level. Receiving antenna polarization was changed vertical and horizontal. The worst value was recorded.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

Tested in x, y, z axis and worst case results are reported

The maximum frequency range measuring with the spectrum from 30 MHz to 40 GHz is investigated with the transmitter

3.8.2. Limits

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

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

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 Field Strength Measurement Distance (MHz) (microvolts/meter) (meters)

Frequency (MHz)	Field Strength (microvolts/meter)	Distance (Meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200**	3
above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

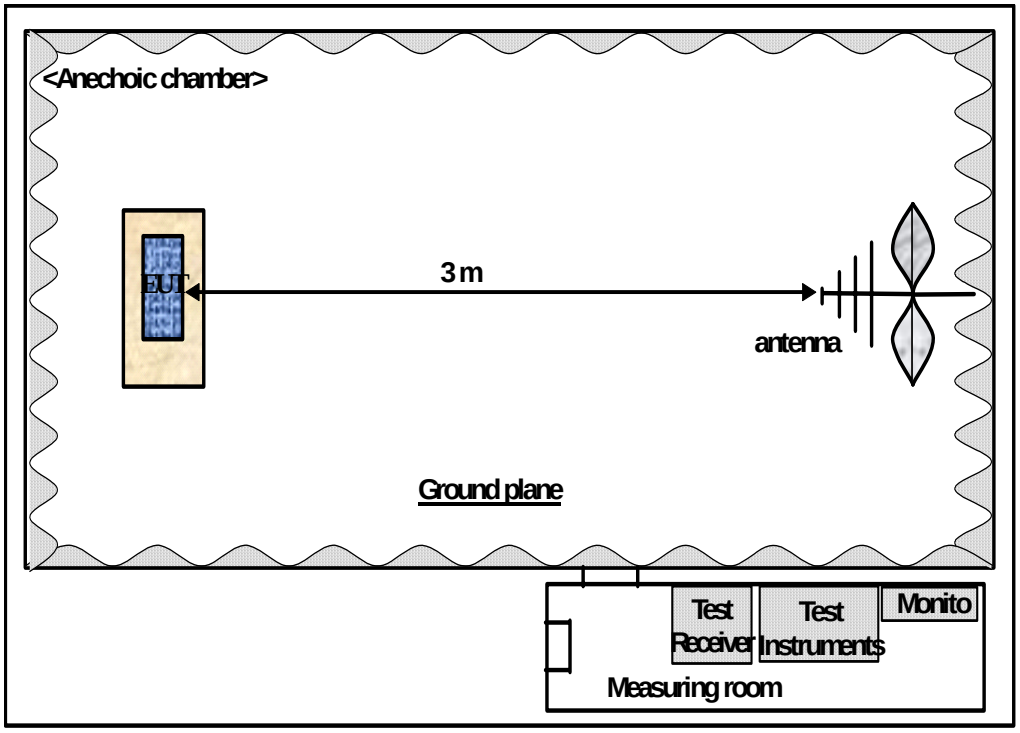
3.8.3. Sample Calculation

The emission level measured in decibels above one microvolt (dBμV) was following sample calculation.

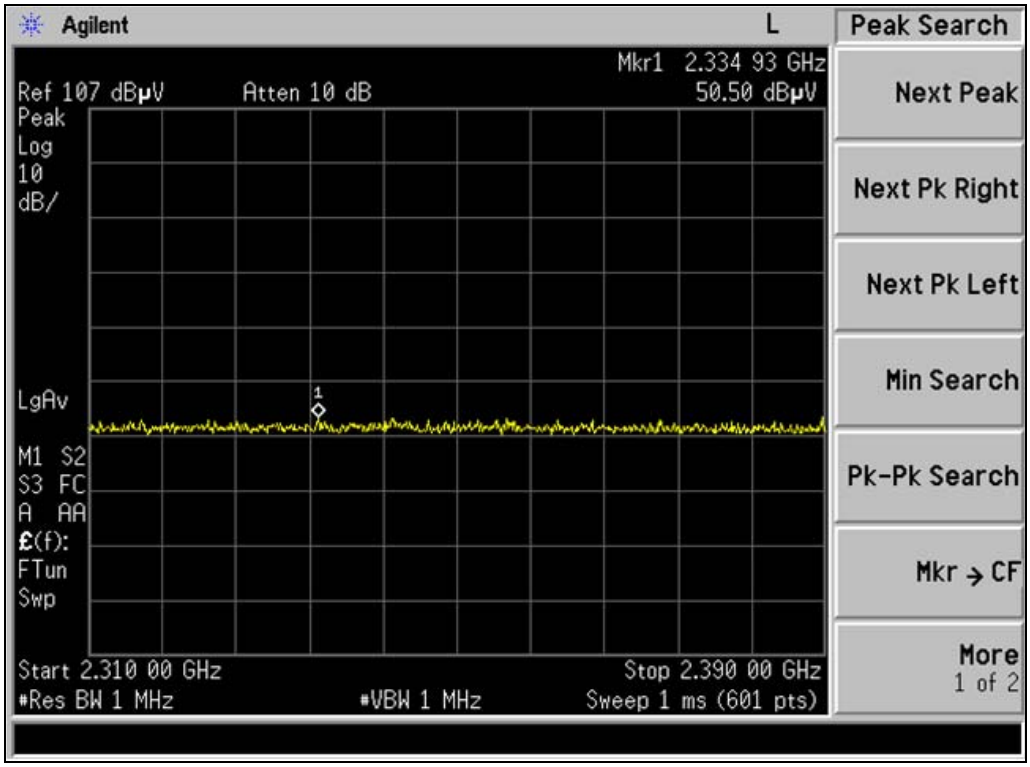
For example ;

Measured Value at	4804 MHz	45.79 dBμV
Antenna Factor & Cable loss		28.20 dB
− Preamplifier		-25.00 dB
= Radiated Emission		48.99 dBμV/m

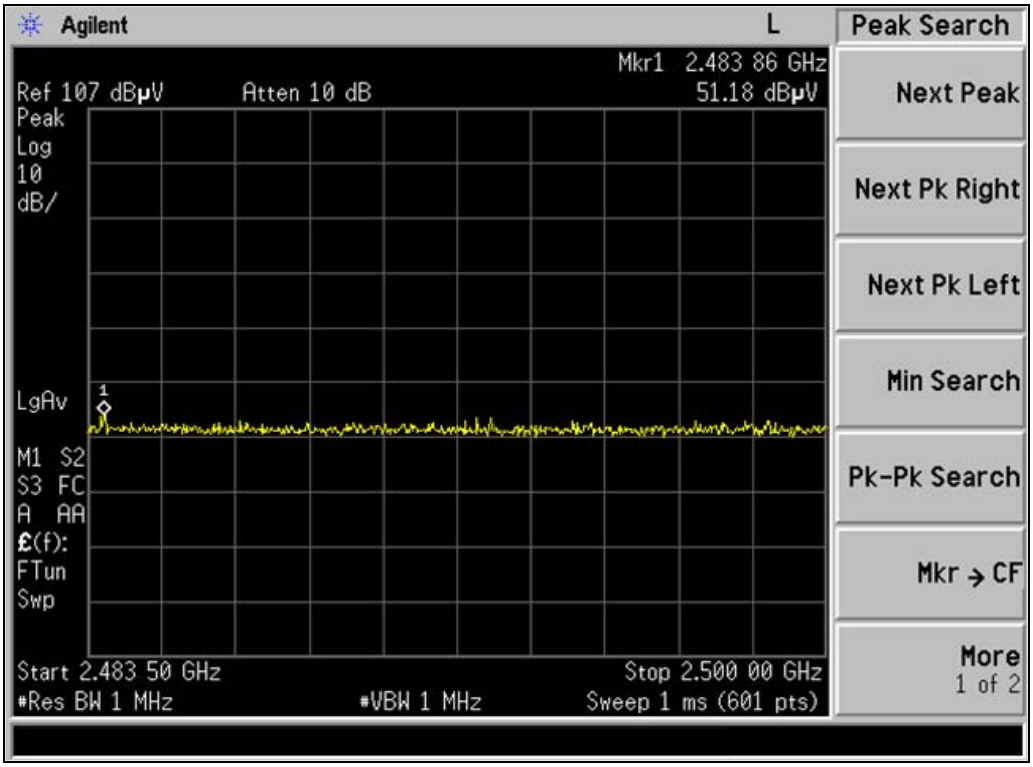
3.8.4. Measurement Configuration



3.8.5. Restricted Bandedge Graph



– Lower side bandedge –



– Upper side bandedge –

3.8.6. Restricted Bandedge Test Results

FCC ID : VYI-CBSH100
Test distance : 3m
Date : April 12th, 2011

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
2334.93	H	1000, Peak	53.40	-2.9	50.50	74.0	23.50	Peak	X
2483.86	V	1000, Peak	54.28	-3.1	51.18	74.0	22.82	Peak	X

Level Corrected = Reading level + Correction factor (dB/m)
Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

Note
1. Measurement was done over the Restricted Bands. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. Pre-amplifier was used.
3. Test results include the rotation of the EUT through three orthogonal axes to determine the maximum emission.
4. If the peak measured values are lower than average limits, average measurements are not performed.

Remark
1. Noise floor of 30 ~ 1000 MHz : <20 dBuV at 3m distance
2. Noise floor of 1000 ~ 5000 MHz : <40 dBuV at 3m distance
3. Noise floor of 5000 ~ 25000 MHz : <50 dBuV at 3m distance

3.8.7. Spurious Emission Test Results

3.8.7.1 Spurious Radiated Emission (Worst case configuration, 30 MHz ~ 1 GHz)

FCC ID : VYI-CBSH100
Test distance : 3m
Date : April 12th, 2011

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/Z
32.68	V	120 kHz	31.40	19.04	12.36	40.0	27.64	X
547.08	V	120 kHz	24.17	8.55	15.62	46.0	30.38	X
721.76	V	120 kHz	24.61	4.90	19.71	46.0	26.29	Z

Level Corrected = Reading level + Correction factor (dB/m)
Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

Note 1. Measurement was done over the frequency range from 30 MHz to 1 GHz. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. Testing is include the rotation of the EUT through three orthogonal axes to determine the maximum emission.

Remark 1. Noise floor of 30 ~ 1000 MHz : <20 dBuV at 3m distance
2. Noise floor of 1000 ~ 5000 MHz : <40 dBuV at 3m distance
3. Noise floor of 5000 ~ 25000 MHz : <45 dBuV at 3m distance

3.8.7.2 Spurious Radiated Emission (1 GHz ~ 25 GHz)

FCC ID : VYI-CBSH100
Test distance : 3m
Date : April 12th , 2011

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 0									
4804	H	1000, Peak	45.79	3.2	48.99	74.0	25.01	Peak	X
7206	V	1000, Peak	51.17	7.1	58.27	74.0	15.73	Peak	X
7206	V	1000, Peak	40.91	7.1	48.01	54.0	5.99	Average	Y

Level Corrected = Reading level + Correction factor (dB/m)
Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

Note
1. Measurement was done over the frequency range from 1GHz to 10th harmonic. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. Pre-amplifier was used in the range between 1 ~ 25 GHz.
3. Test results include the rotation of the EUT through three orthogonal axes to determine the maximum emission.
4. If the peak measured values are lower than average limits, average measurements are not performed.

Remark
1. Noise floor of 30 ~ 1000 MHz : <20 dBuV at 3m distance
2. Noise floor of 1000 ~ 5000 MHz : <40 dBuV at 3m distance
3. Noise floor of 5000 ~ 25000 MHz : <50 dBuV at 3m distance

FCC ID : VYI-CBSH100
Test distance : 3m
Date : April 12th , 2011

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 39									
4882	H	1000, Peak	45.07	3.3	48.37	74.0	25.63	Peak	X
7323	V	1000, Peak	52.05	7.3	59.35	74.0	14.65	Peak	X
7323	V	1000, Peak	40.91	7.3	48.21	54.0	5.79	Average	Y

Level Corrected = Reading level + Correction factor (dB/m)
Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

Note
1. Measurement was done over the frequency range from 1GHz to 10th harmonic. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. Pre-amplifier was used in the range between 1 ~ 25 GHz.
3. Test results include the rotation of the EUT through three orthogonal axes to determine the maximum emission.
4. If the peak measured values are lower than average limits, average measurements are not performed.

Remark
1. Noise floor of 30 ~ 1000 MHz : <20 dBuV at 3m distance
2. Noise floor of 1000 ~ 5000 MHz : <40 dBuV at 3m distance
3. Noise floor of 5000 ~ 25000 MHz : <50 dBuV at 3m distance

FCC ID : VYI-CBSH100
Test distance : 3m
Date : April 12th , 2011

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 78									
4960	H	1000, Peak	44.46	3.4	47.86	74.0	26.14	Peak	X
7440	H	1000, Peak	51.31	7.6	58.91	74.0	15.09	Peak	X
7440	V	1000, Peak	41.02	7.6	48.62	54.0	5.38	Average	Y

Level Corrected = Reading level + Correction factor (dB/m)
Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

Note
1. Measurement was done over the frequency range from 1GHz to 10th harmonic. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. Pre-amplifier was used in the range between 1 ~ 25 GHz.
3. Test results include the rotation of the EUT through three orthogonal axes to determine the maximum emission.
4. If the peak measured values are lower than average limits, average measurements are not performed.

Remark
1. Noise floor of 30 ~ 1000 MHz : <20 dBuV at 3m distance
2. Noise floor of 1000 ~ 5000 MHz : <40 dBuV at 3m distance
3. Noise floor of 5000 ~ 25000 MHz : <50 dBuV at 3m distance

3.9. AC Conducted Emissions

3.9.1. Test Procedure

Conducted emission measurements on the EUT were performed by "AC Power Line Conducted Emissions Testing" procedure as per ANSI C63.4. The EUT was set up on a wooden table 0.8 meters height, 1.0 by 1.5 meters in size, placed in the shielded enclosed with a side of wall of which constituted a vertical conducting surface of 2.2 m x 3.1 m in size to maintain 40 cm from the rear of EUT

LISN(Line Impedance Stabilization Network, ROHDE & SCHWARZ, ESH3-Z5, 50 ohm / 50 μH) was installed and electrically boned to the conducting ground plane. The EUT was connected to the LISN using a typical power adapter.
One of two 50 ohm output terminals of the LISN was connected to the EMI Receiver (ROHDE & SCHWARZ, ESCI, 9 kHz to 3 GHz) and the other was terminated in 50 ohms. Measurements were again performed after interchanging such a connection oppositely.
The frequency range from 150 kHz to 30 MHz was examined and the remarkable frequencies were measured with Quasi-peak and Average values using the EMI receiver instrument (ROHDE & SCHWARZ, ESI, 9 kHz to 3 GHz ; Detector Function ; CISPR Quasi-Peak & Average). The 6 dB bandwidth of the Receiver was set to 9 kHz

The position of connecting cables of the EUT was changed to find the worst case configuration during measurements. The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

3.9.2. Limits

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

Frequency (MHz)	Conducted Limits (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

- Decreases with the logarithm of the frequency.

3.9.3. Sample calculation

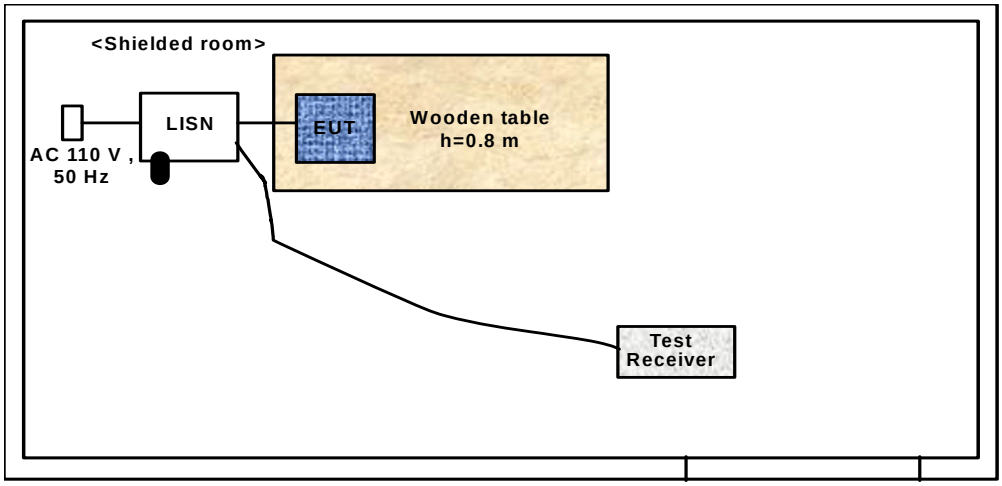
The emission level measured in decibels above one microvolt (dBμV) was converted into microvolt (μV) as shown in following sample calculation.

For example :

Measured Value at		0.4245 MHz	25.5 dBμV @ Q-Peak mode
+	Correct factor *		9.9 dB
=	Conducted Emission		35.4 dBμV

* Correct factor is adding RF cable loss and Attenuation

3.9.4. Photograph for the test configuration



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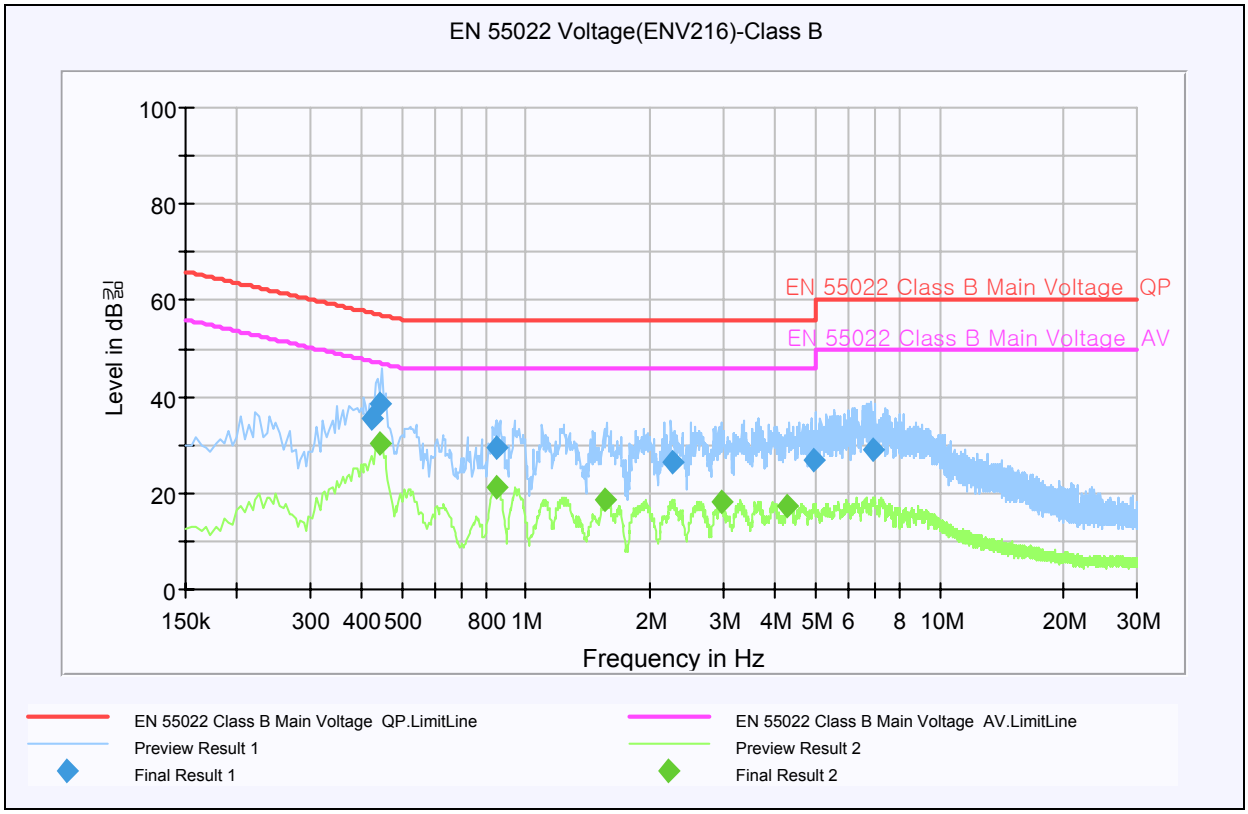
3.9.5. Test Results



Final Measurement – QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.424500	35.4	9.9	22.0	57.4
0.442500	38.4	9.9	18.6	57.0
0.847500	29.3	10.0	26.7	56.0
2.260500	26.5	9.8	29.5	56.0
4.974000	27.0	9.8	29.0	56.0
6.900000	29.2	9.9	30.8	60.0

Final Measurement – Average

Frequency (MHz)	Average (dBµV)	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.442500	30.5	9.9	16.5	47.0
0.843000	21.3	10.0	24.7	46.0
1.549500	18.7	9.9	27.3	46.0
2.971500	18.1	9.9	27.9	46.0
4.263000	17.1	9.9	28.9	46.0

4. TEST EQUIPMENTS

No.	Equipment	Manufacturer	Model	S/N	Effective Cal.Duration
1	EMI Receiver (20 Hz ~ 26.5 GHz)	R&S	ESIB	100280	08/17/2010 ~ 08/17/2011
2	Spectrum Analyzer (100 Hz ~ 26.5 GHz)	Agilent	E4407B	US41443316	12/01/2010 ~ 12/01/2011
3	Spectrum Analyzer (3 Hz ~ 50 GHz)	Agilent	E4448A	MY43360322	08/30/2010 ~ 08/30/2011
4	Pre-Amplifier (100 kHz ~ 1 GHz)	SONOMA.	310N	186270	08/25/2010 ~ 08/25/2011
5	Pre-Amplifier (0.5 GHz ~ 26.5 GHz)	Agilent	83017A	MY39500982	04/02/2011 ~ 04/02/2012
6	LISN(50 Ω , 50 μH) (10 kHz ~ 100 MHz)	R&S	ESH3-Z5	826789009	07/05/2010 ~ 07/05/2011
7	Biconi-Log Ant. (30 MHz ~ 1000 MHz)	Schwarzbeck	VULB9168	9168-180	08/24/2010 ~ 08/24/2012
8	Horn Ant. (1 GHz ~ 18 GHz)	EMCO	3115	9012-3595	03/26/2010 ~ 03/26/2012
9	Horn Ant. (18 GHz ~ 40 GHz)	EMCO	3116	2664	03/26/2010 ~ 03/26/2012
10	Active Loop Ant. (9 kHz ~ 30 MHz)	EMCO	6502	2532	06/08/2010 ~ 06/08/2012
11	DC Power Supply	Agilent	E4356A	MY41000296	10/01/2010 ~ 10/01/2011
12	Power Meter	Agilent	E4417A	GB4129075	09/17/2010 ~ 09/17/2011
13	Bluetooth tester	Anritsu	MT8852B	6K00006994	01/28/2011 ~ 01/28/2012