

TEST REPORT

1. Applicant

Name : Datalogic ADC s.r.l
Address : Via S. Vitalino, 13 - Calderara di Reno - 40012 (Bologna) - ITALY

2. Products

Name : Mobile Computer
Model : LYNX
Manufacturer : POINT MOBILE CO.,LTD

3. Test Standard : FCC CFR 47 Part 15C, section 15.247 / IC RSS-210 Annex 8

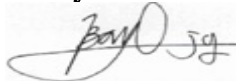
4. Test Method : ANSI C63.4-2009

5. Test Results : Positive

6. Date of Application : June 29, 2012

7. Date of Issue : July 20, 2012

Tested by



Jong-gon Ban

Telecommunication Center
Senior Engineer

Approved by



Jeong-min Kim

Telecommunication Center
Manager

The test results contained apply only to the test sample(s) supplied by the applicant, and this test report shall not be reproduced in full or in part without approval of the KTL in advance.

Korea Testing Laboratory

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1. GENERAL INFORMATION

1.1. Applicant (Client)

Name	Datalogic ADC s.r.l.
Address	Via S. Vitalino, 13 – Calderara di Reno – 40012 (Bologna) - ITALY
Contact Person	Ruggero Cacioppo
Telephone No.	+39 051 314 73 93
E-mail address	Ruggero.cacioppo@datalogic.com
Manufacturer	POINT MOBILE CO.,LTD
Manufacturer Address	B-9F, Kabul great valley, 60-5, Gasan-dong, Geumcheon-gu, Seoul, Korea

1.2. Feature of Equipment(EUT)

FCC ID & Model Number	FCC ID : U4G0070, Model Name : LYNX	
IC Number & Model Number	IC Number : 3862E-0070, Model Number : LYNX H2N0WI-1Q1-MEN0	
Series Model Description	LYNX H2N0LD-1N1-MEN0	Bluetooth, WiFi, Reader 1D, Numeric, Camera, GSM, UMTS, GPS
	LYNX H2N0WI-1N1-MEN0	Bluetooth, WiFi, Reader 2D, Numeric, Camera, GSM, UMTS, GPS
	LYNX H2N0LD-1Q1-MEN0	Bluetooth, WiFi, Reader 1D, QWERTY, Camera, GSM, UMTS, GPS
	LYNX H2N0WI-1Q1-MEN0	Bluetooth, WiFi, Reader 2D, QWERTY, Camera, GSM, UMTS, GPS
<u>Test Sample</u>	<u>Bluetooth, WiFi, Reader 2D, QWERTY, Camera, GSM, UMTS, GPS</u>	
RF Features	Bluetooth: BR(GFSK), EDR(π /4DQPSK, 8DPSK)	
	WLAN : 802.11b/b/n (BPSK/QPSK/CCK/16-QAM/64-QAM)	
	GSM: GSM/GPRS/EDGE850,1900	
	UMTS: WCDMA/HSPA850,1900	
Antenna Type	Internal Antenna	
Scan engine	1D laser / 2D imager	
Keypad and buttons	Numeric (32 keys) / Qwerty (51 keys)	
AC/DC Adapter	Input : 100 -240 V 50/60 Hz 0.4 A, Output : DC 5.0 V, 1800 mA,	
Battery	Li-ion, 3.7 V, 1800 mAh (3600mAh optional)	
H/W & S/W version	H/W Ver. : 8 S/W Ver. : 50.00.53 B5	
<u>RF Module certificate</u> <u>802.11 b/g/n</u>	FCC ID: TWG-SDC SSD40L, IC No. : 6616A-SDC SSD40L Name of Grantee: Summit Data Communications, Inc.	
<u>RF Module certificate</u> <u>GSM/UMTS</u>	FCC ID: QIPPH8-P, IC No. : 7830A-PH8P Name of Grantee: Cinterion Wireless Modules GmbH	

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	-

2. SUMMARY OF TEST RESULTS

Testing performed for : Datalogic ADC s.r.l.

Equipment Under Test : LYNX

Receipt of Test Sample : June 29, 2012

Test Start Date : June 30, 2012

Test End Date : July 16, 2012

The following table represents the list of measurements required under the FCC CFR47 Part 15.247 & IC RSS-210 Annex 8.

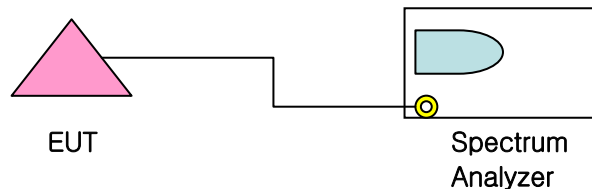
FCC Rules	IC Rules	Test Items	Results	Remarks
15.247(a)(1)	RSS-210 : A8.1.a	20dB Bandwidth	Pass	-
-	Gen 4.4.1	99% Bandwidth	Pass	-
15.247(b)(1)	RSS-210 : A8.4	Maximum Peak Power	Pass	-
15.247(d)	RSS-210 : A8.5	100 KHz Bandwidth of Frequency Band Edges	Pass	-
15.247(a)(1)	RSS-210 : A8.1.b	Hopping channel separation	Pass	-
15.247(b)(iii)	RSS-210 : A8.1.d	Number of hopping channels	Pass	-
15.247(a)(1)(iii)	RSS-210 : A8.1.d	Dwell time	Pass	-
15.247(d)	RSS-210 : A8.5	Radiated Spurious Emissions	Pass	*WLAN test results are added.
22.913(a), 24.232(c)	RSS-132 : 4.4 RSS-133 : 6.4	ERP & EIRP	Pass	*GSM/WCDMA test results are added
22.917, 24.238	RSS-132 : 4.5.1 RSS-133 : 6.5.1	Radiated Spurious Emissions	Pass	
-	Gen 4.10	Receiver Spurious Emissions	Pass	-

*WLAN & GSM/WCDMA RF modules have FCC/IC certificates already.
So only the radiated emission tests are performed.

3. Measurement & Results

3.1. 20 dB Bandwidth & 99% 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.

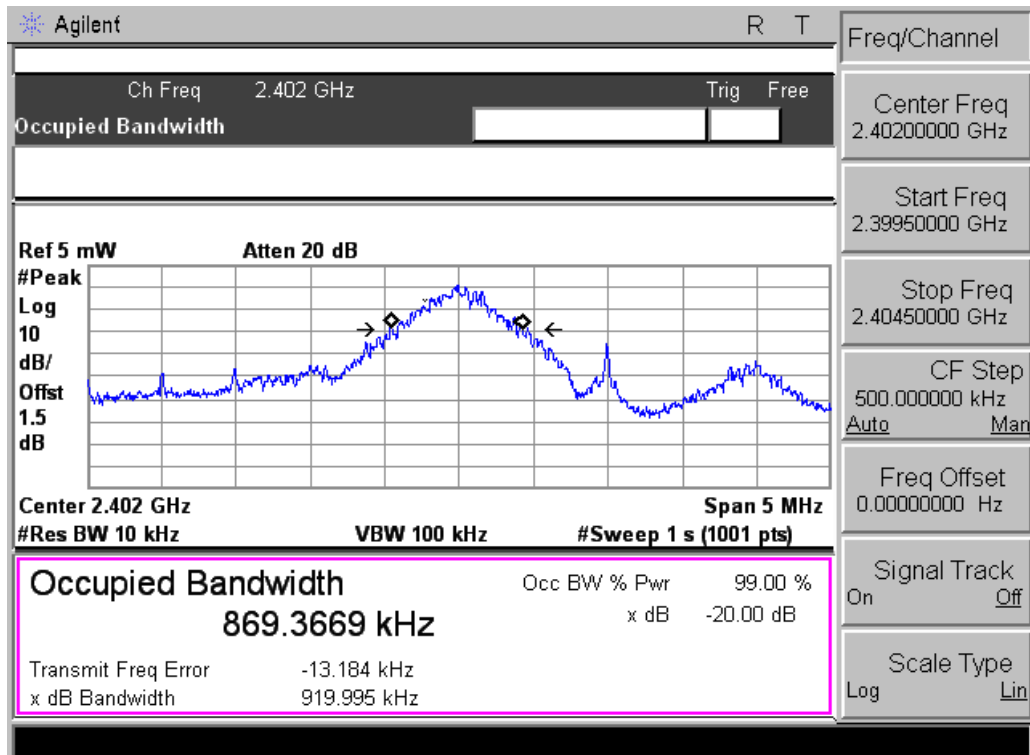
3.1.3. Test result

* Operation Mode : GFSK

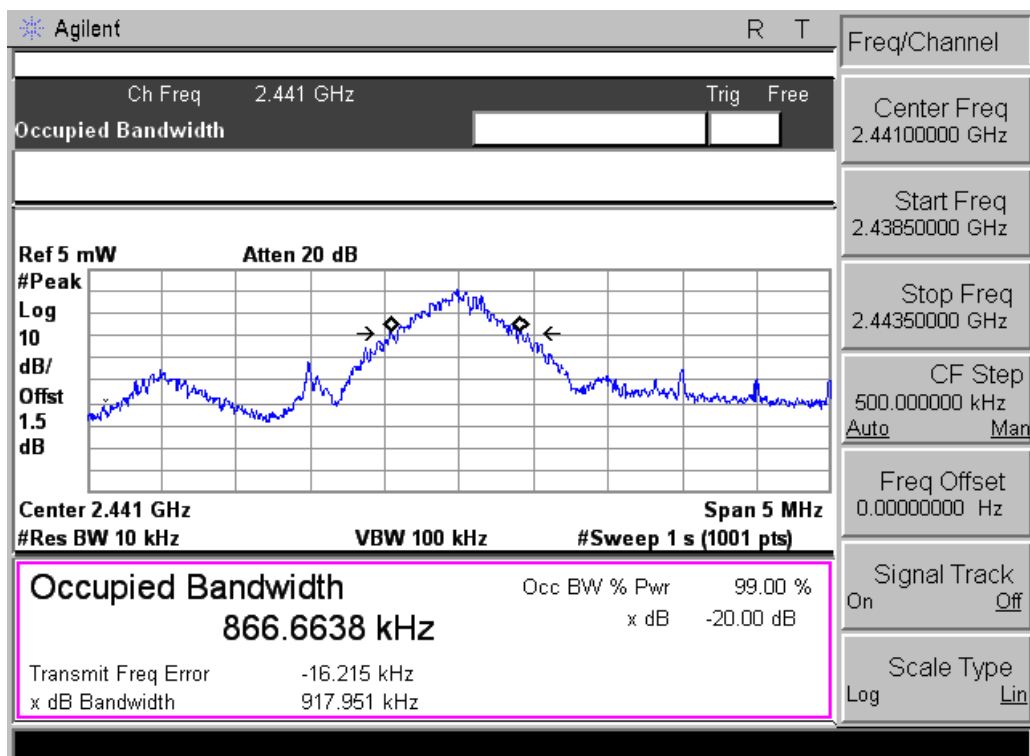
Channels	Frequency (MHz)	20dB Bandwidth Result (MHz)	99% Bandwidth Result (MHz)	Verdict
Low	2402	0.920	0.869	Pass
Middle	2441	0.918	0.867	Pass
High	2480	0.921	0.872	Pass

* Operation Mode : 8DPSK

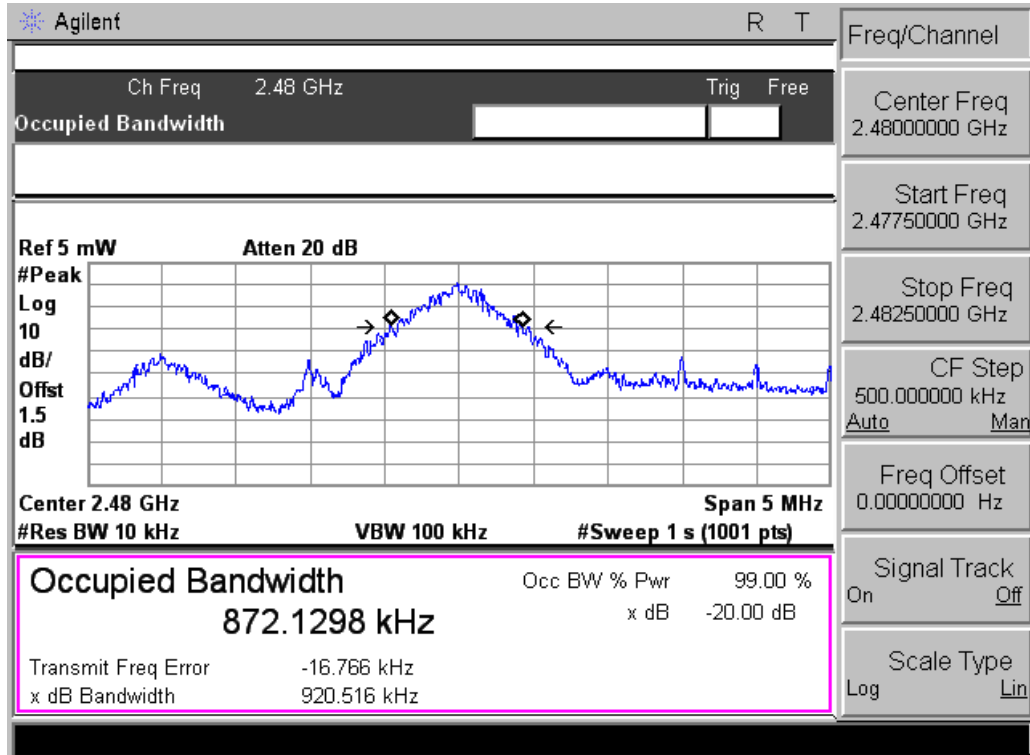
Channels	Frequency (MHz)	20dB Bandwidth Result (MHz)	99% Bandwidth Result (MHz)	Verdict
Low	2402	1.254	1.184	Pass
Middle	2441	1.260	1.192	Pass
High	2480	1.262	1.191	Pass



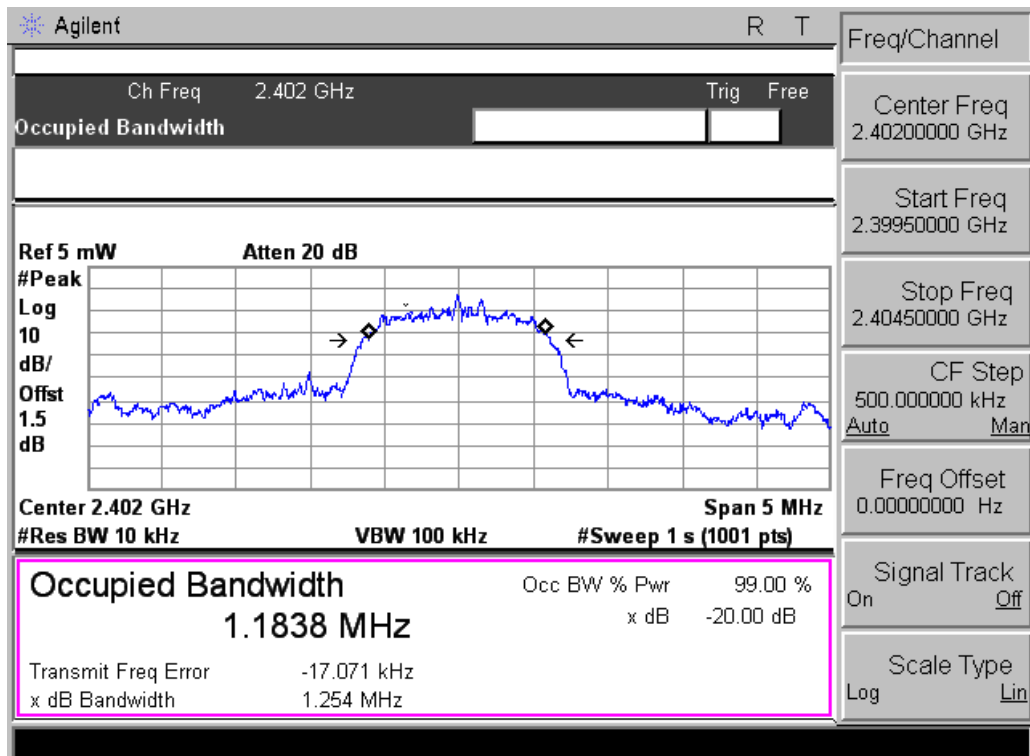
– Low Channel (GFSK) –



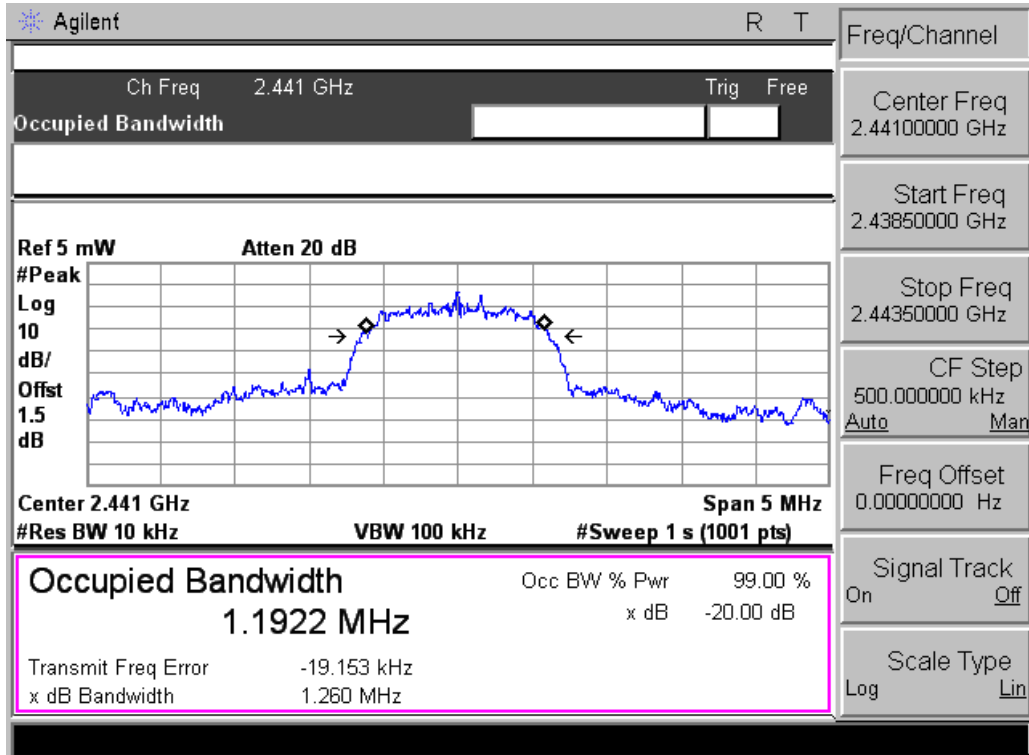
– Mid Channel (GFSK) –



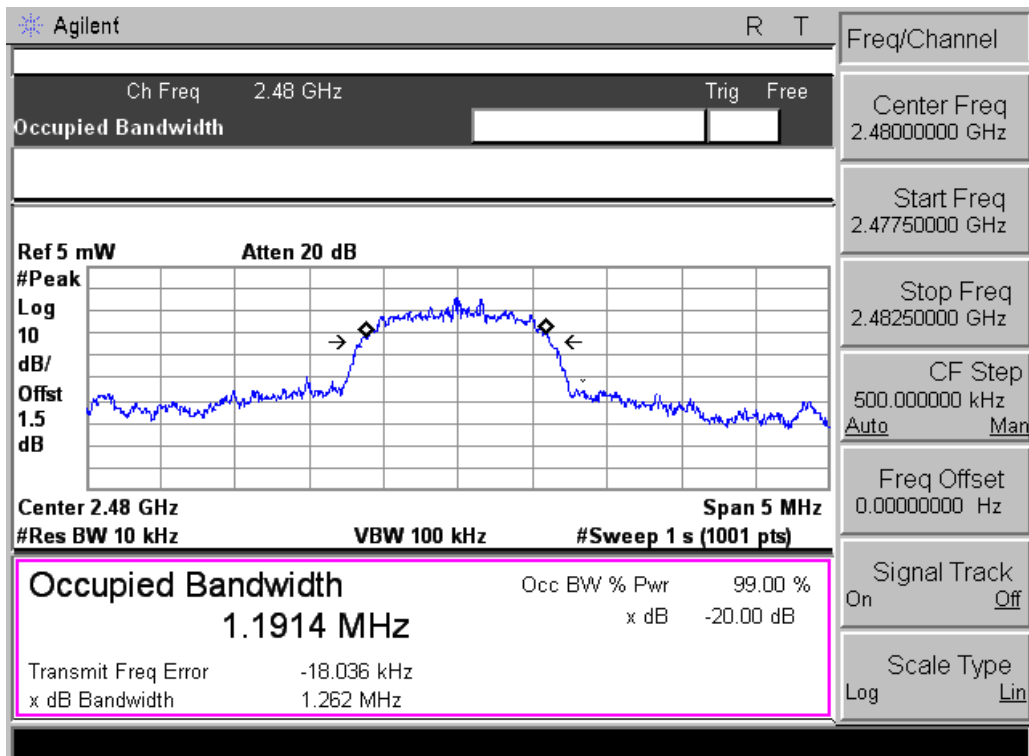
– High Channel (GFSK) –



– Low Channel (8DPSK) –



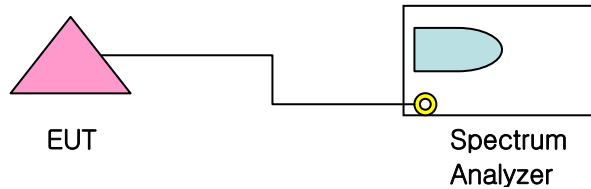
– Mid Channel (8DPSK) –



– High Channel (8DPSK) –

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.

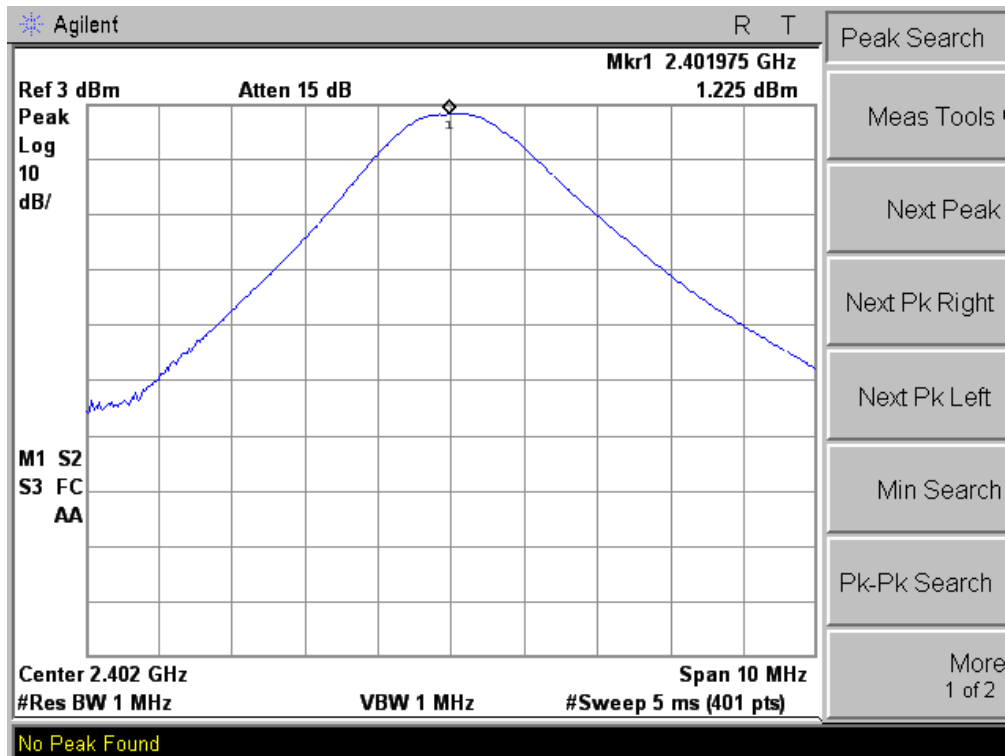
3.2.3. Test result

* Operation Mode : GFSK

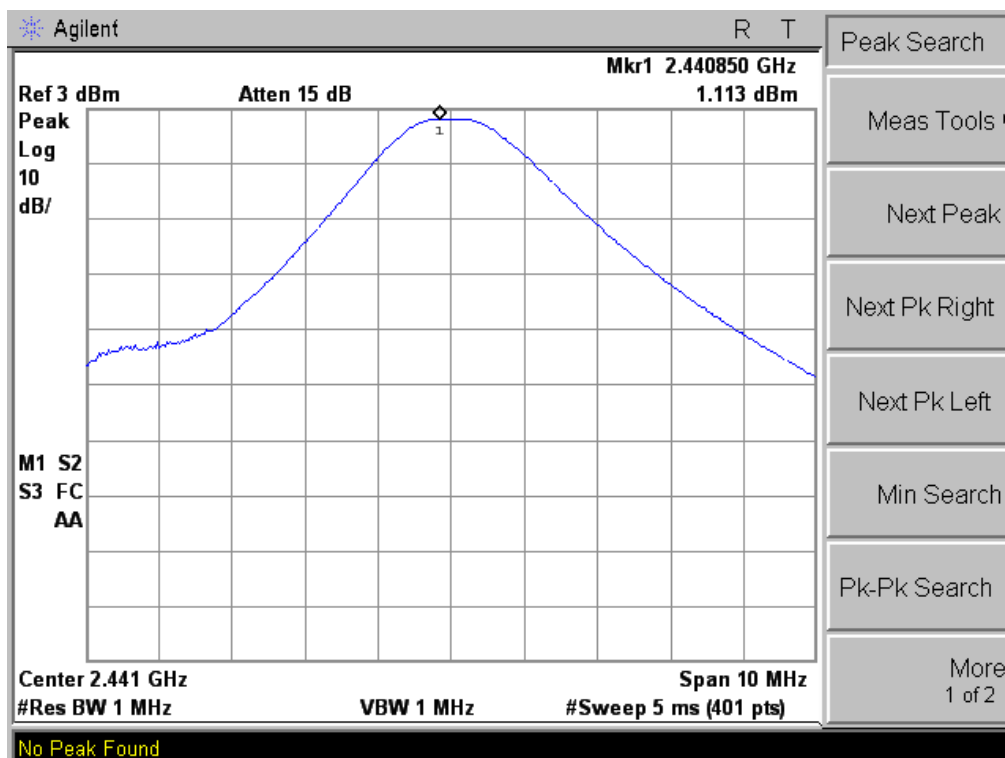
Channels	Frequency (MHz)	Result (dBm)	Limit (dBm)	Verdict
0	2402	1.23	30	Pass
39	2441	1.11	30	Pass
78	2480	0.93	30	Pass

* Operation Mode : 8DPSK

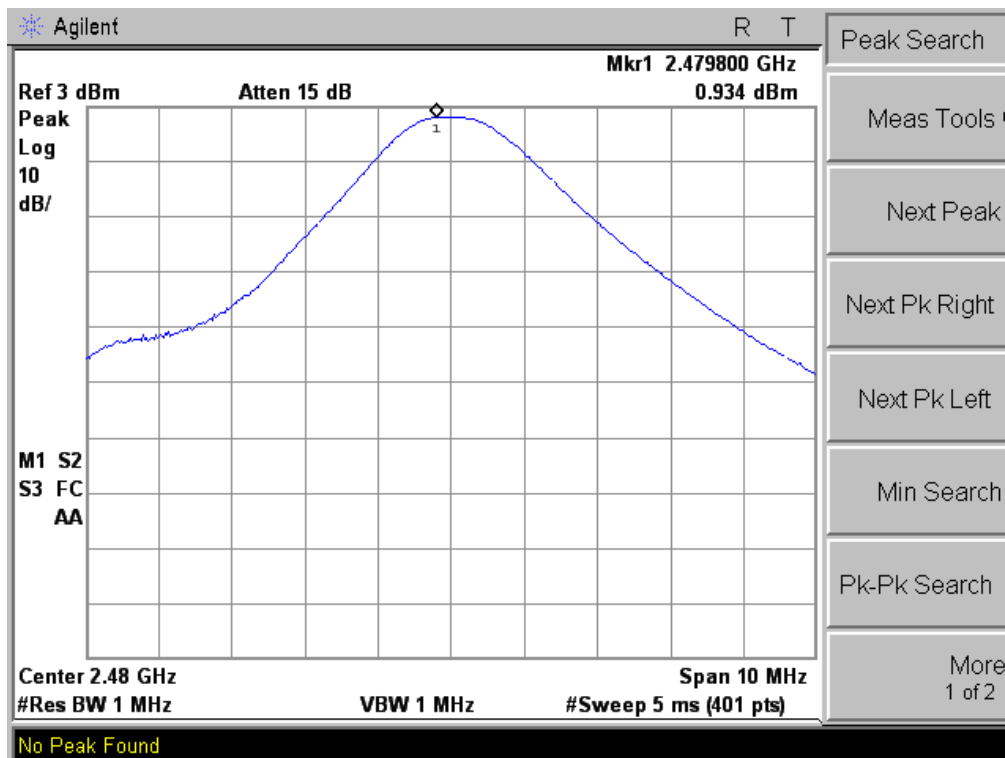
Channels	Frequency (MHz)	Result (dBm)	Limit (dBm)	Verdict
0	2402	-1.58	30	Pass
39	2441	-1.41	30	Pass
78	2480	-1.20	30	Pass



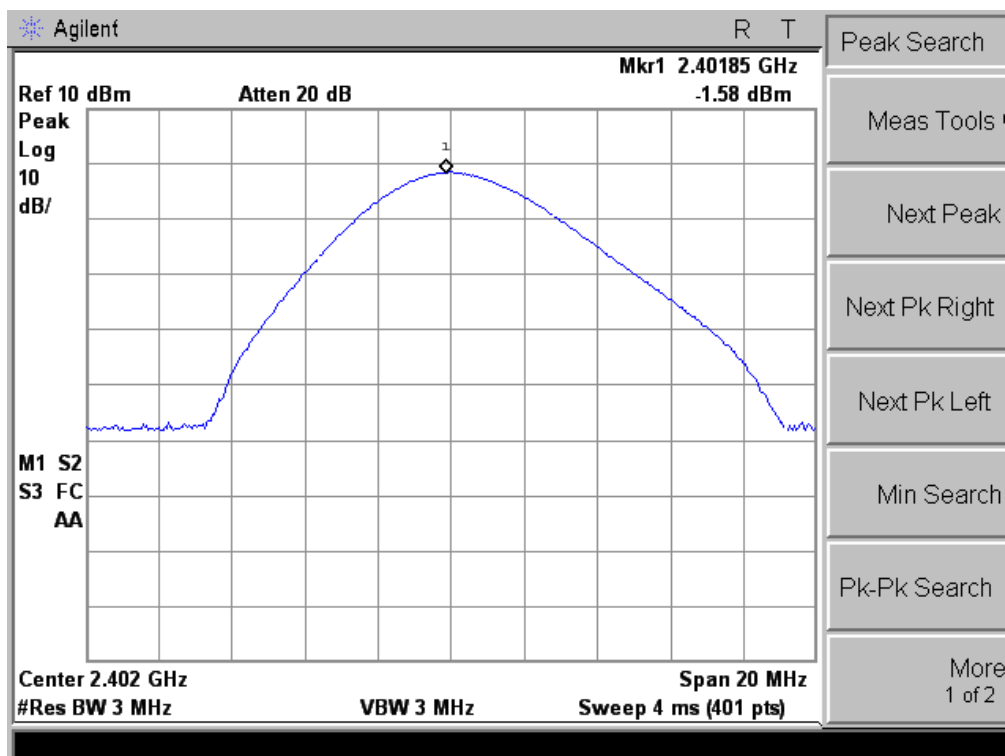
– Low Channel (GFSK) –



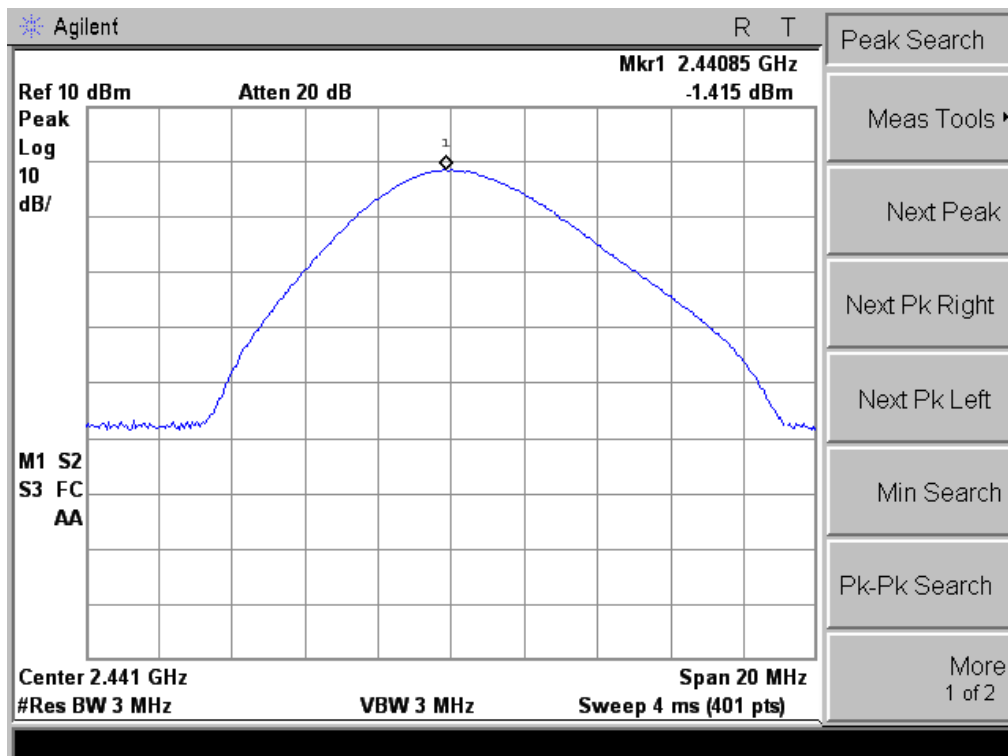
– Mid Channel (GFSK) –



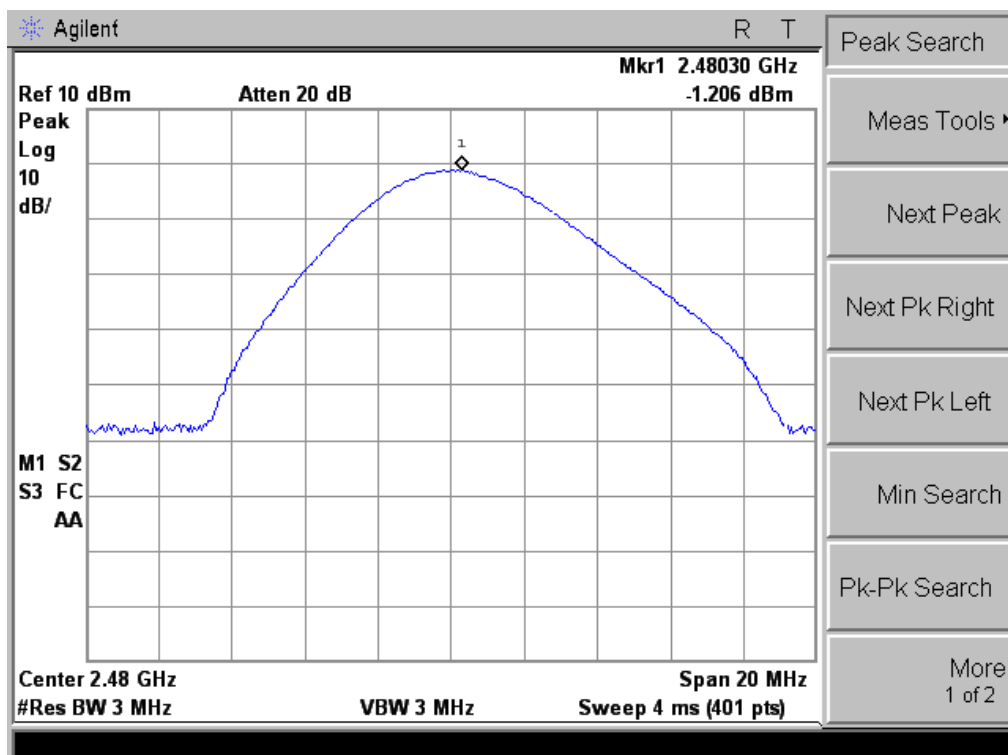
– High Channel (GFSK) –



– Low Channel (8DPSK) –



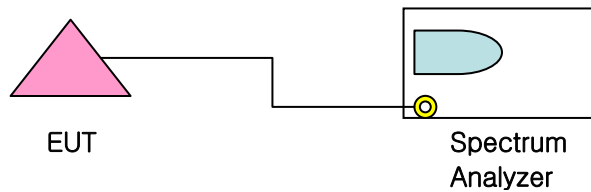
– Mid Channel (8DPSK) –



– High Channel (8DPSK) –

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

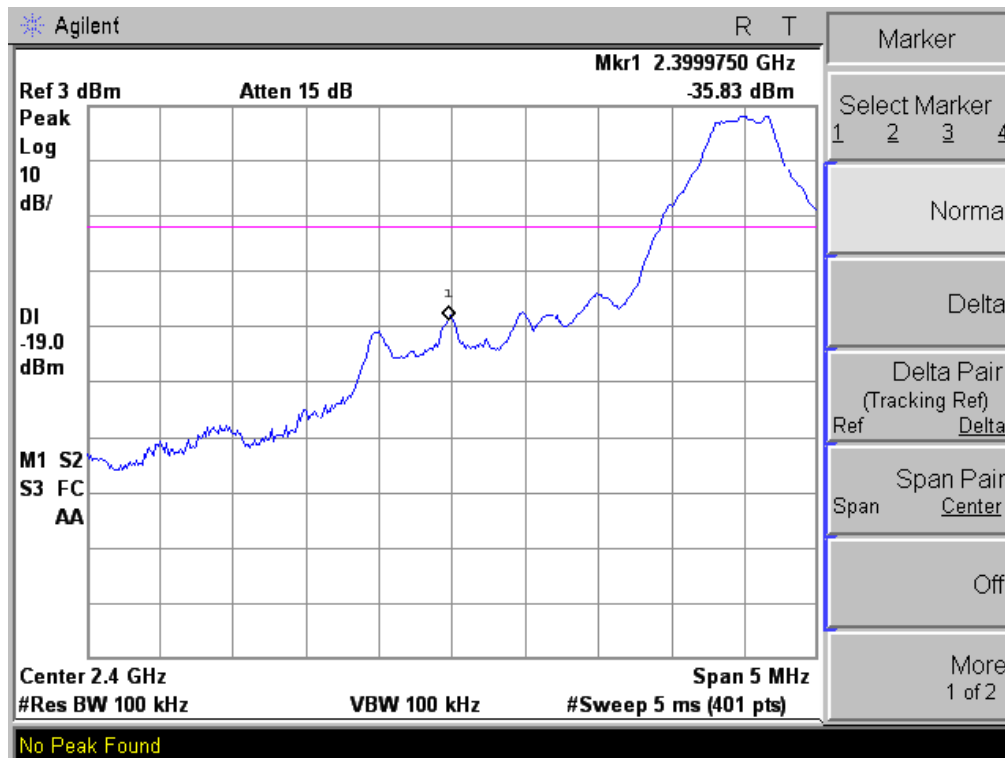
3.3.3. Test result

Operation Mode : GFSK

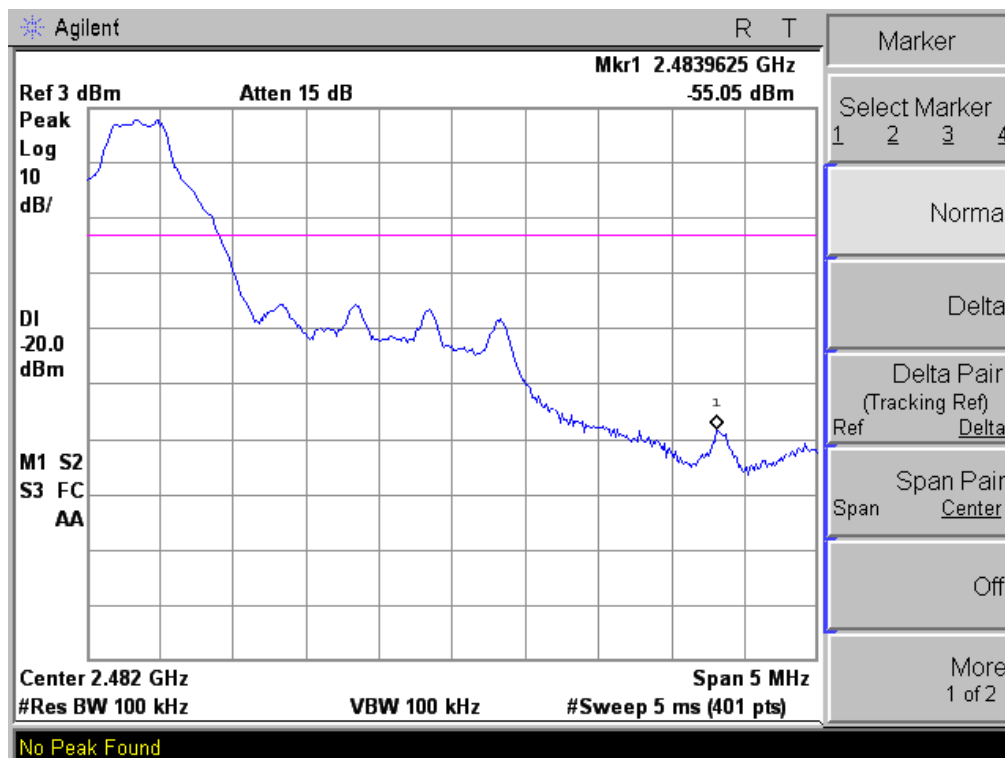
Channels	Frequency (MHz)	Result (dBc)	Limit (dBc)	Verdict
Low	2402	35 >	20	Pass
High	2480	35 >	20	Pass

* Operation Mode : 8DPSK

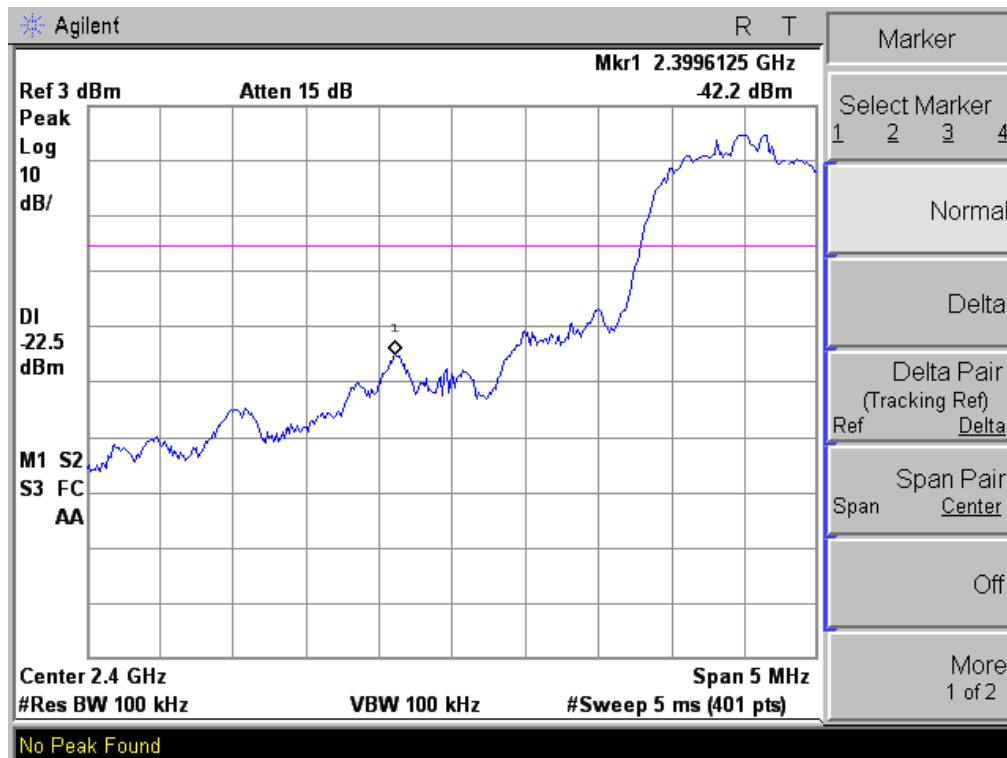
Channels	Frequency (MHz)	Result (dBc)	Limit (dBc)	Verdict
Low	2402	35 >	20	Pass
High	2480	35 >	20	Pass



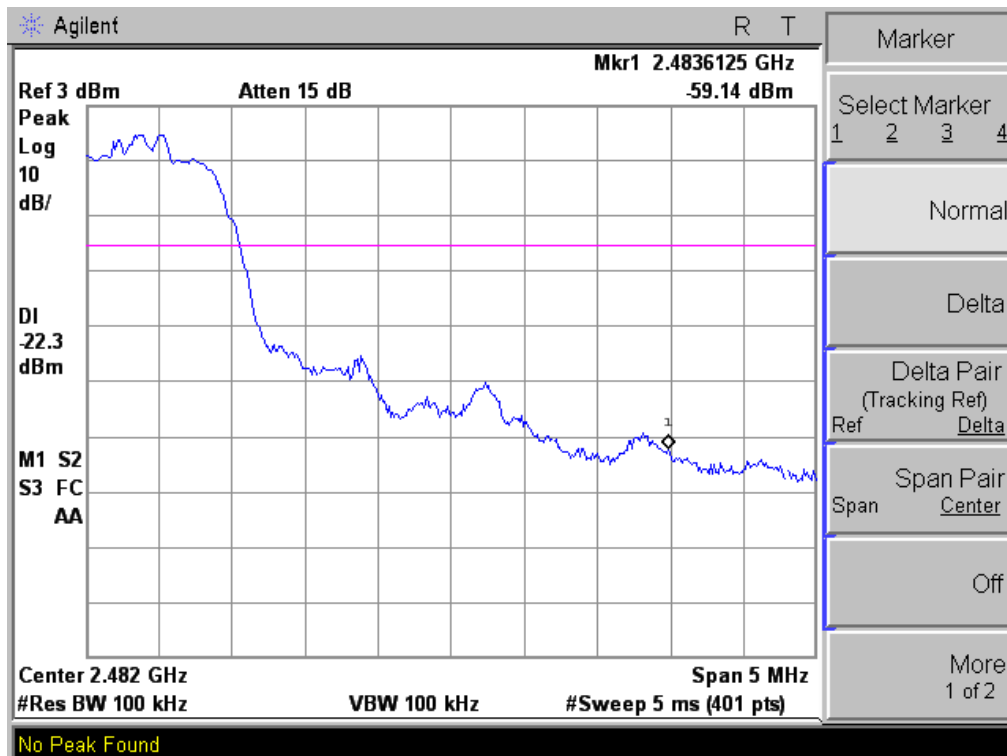
– Band edge lower side (GFSK) –



– Band edge higher side (GFSK) –



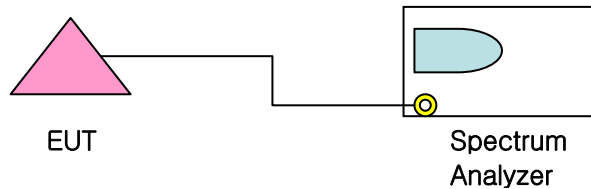
– Band edge lower side (8DPSK) –



– Band edge higher side (8DPSK) –

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

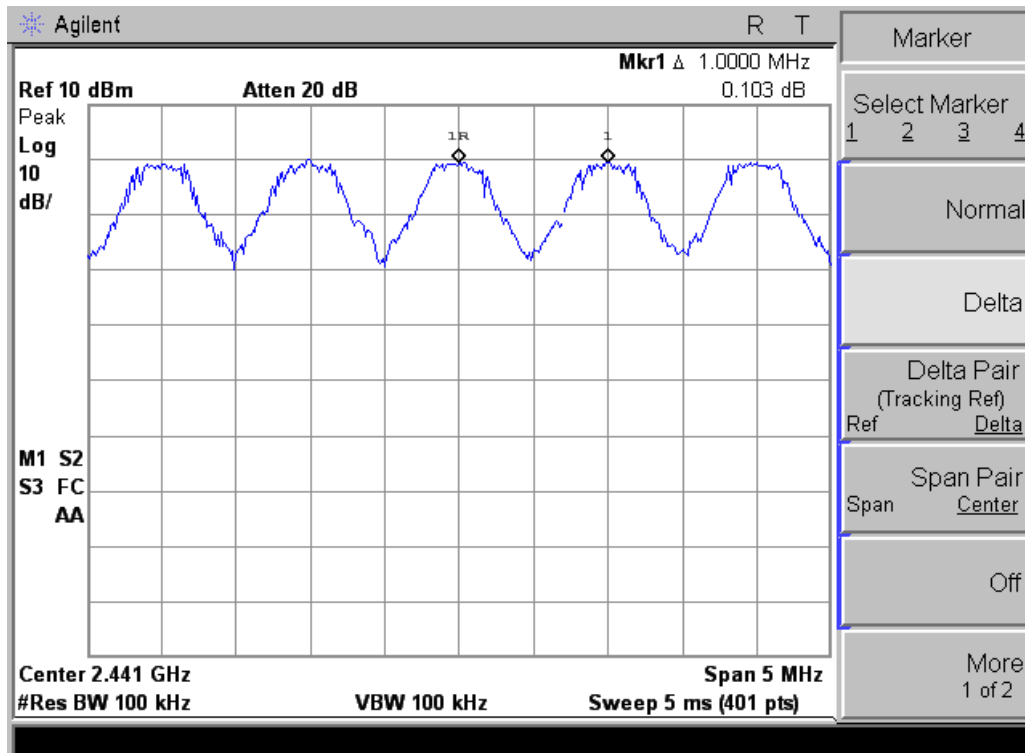
Channels	Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
Hopping	2441	1.012	0.617	Pass

※ Remark : 20dB bandwidth is 0.921 MHz

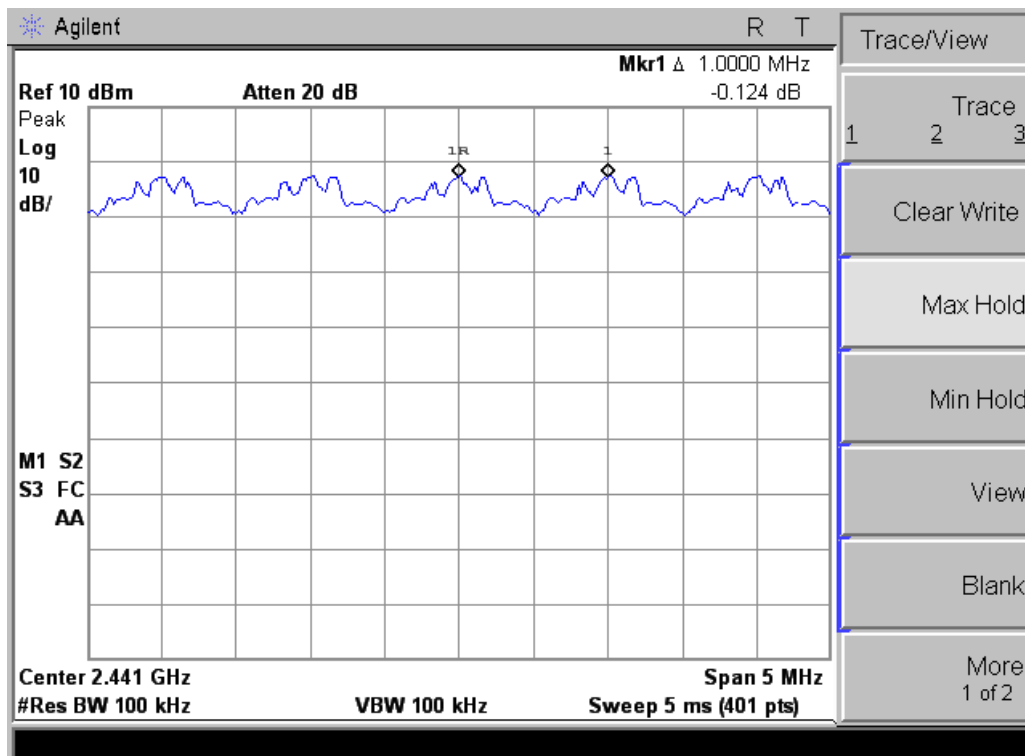
* Operation Mode : 8DPSK

Channels	Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
Hopping	2441	1.012	0.863	Pass

※ Remark : 20dB bandwidth is 1.295 MHz



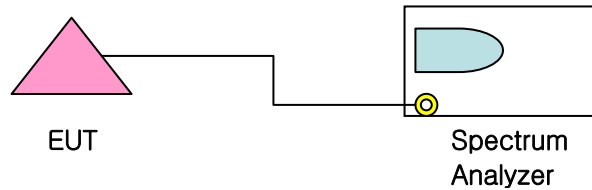
– Channel Separation (GFSK) –



–Channel Separation (8DPSK)

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.

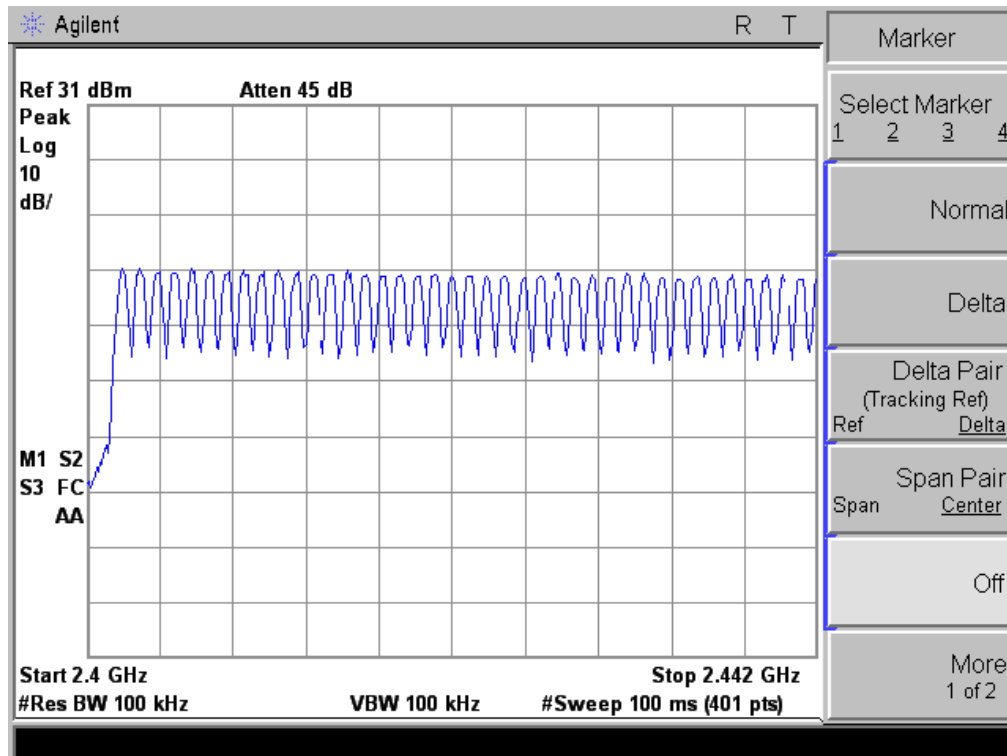
3.5.3. Test result

* Operation Mode : GFSK

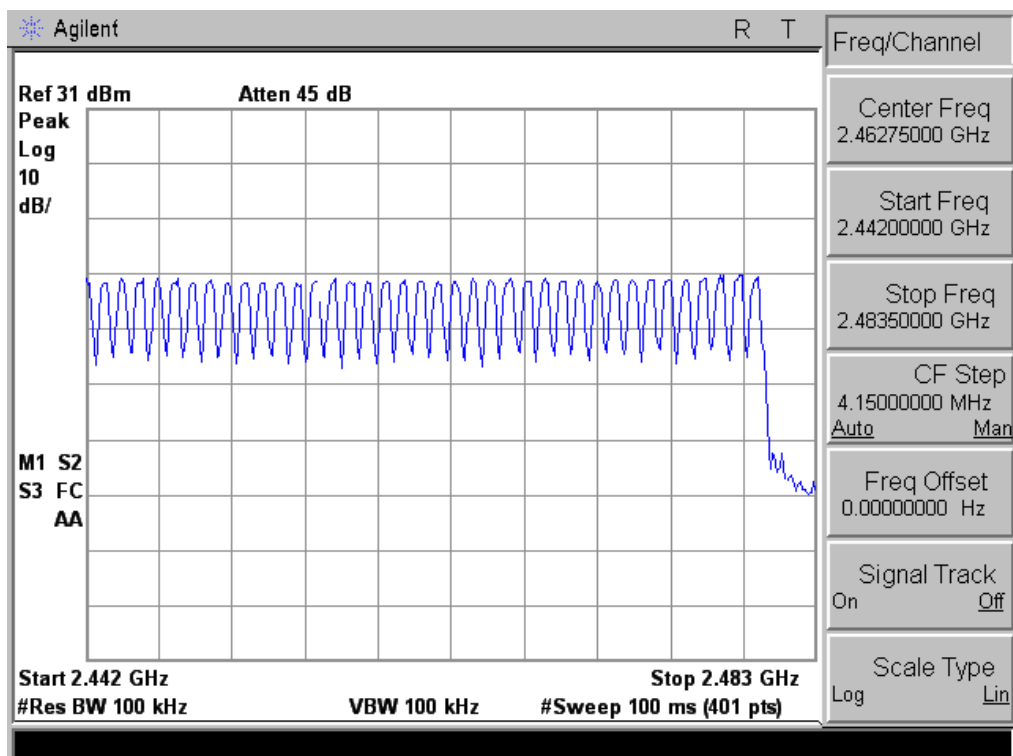
Channels	Result (Number fo Hopping channels)	Limit (channel)	Verdict
Hopping	79	≥ 15	Pass

* Operation Mode : 8DPSK

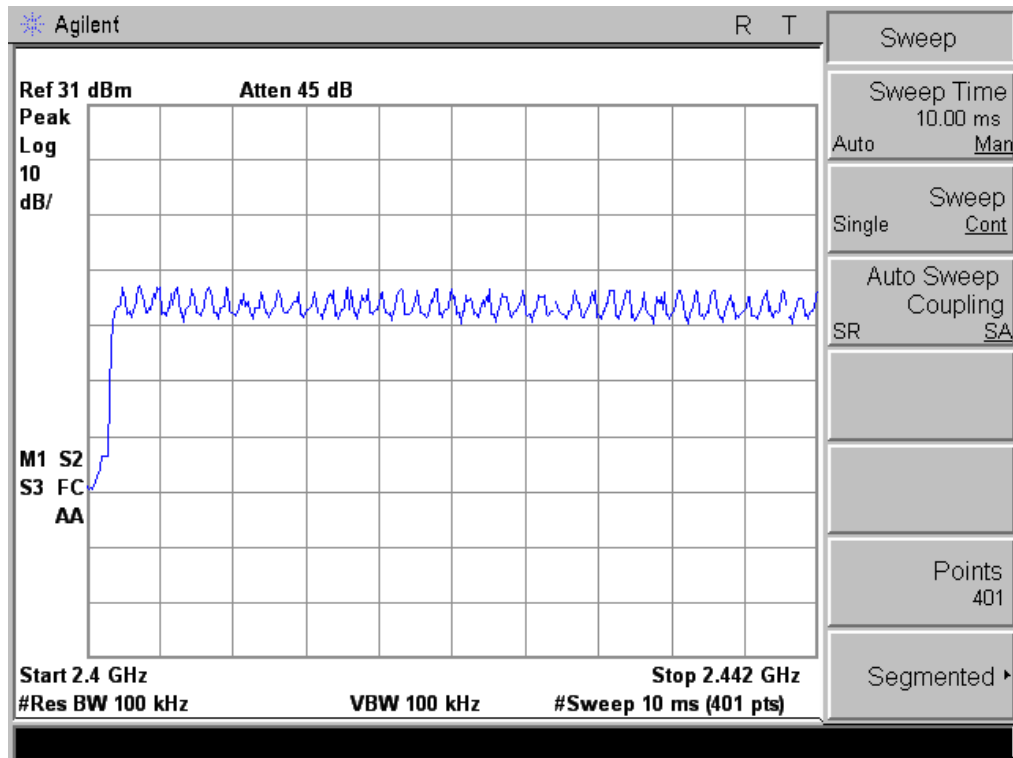
Channels	Result (Number fo Hopping channels)	Limit (channel)	Verdict
Hopping	79	≥ 15	Pass



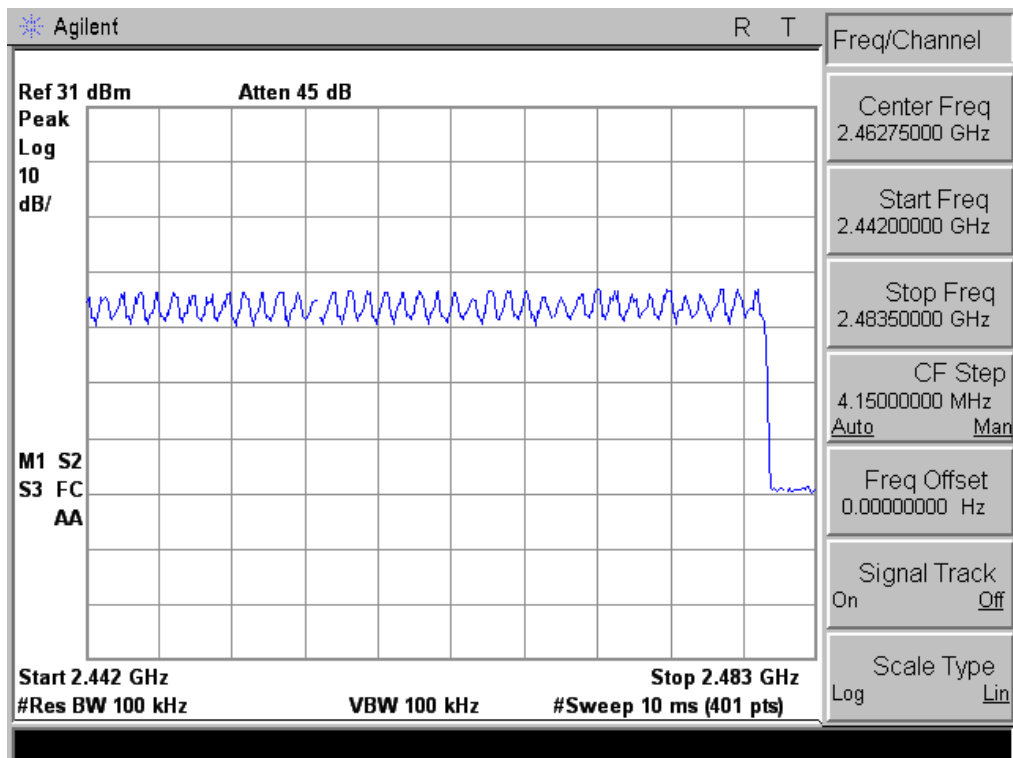
– Number of hopping channel (GFSK) –



– Number of hopping channel (GFSK) –



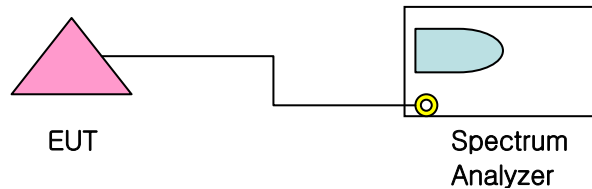
- - Number of hopping channel (8DPSK) -



- - Number of hopping channel (8DPSK) -

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

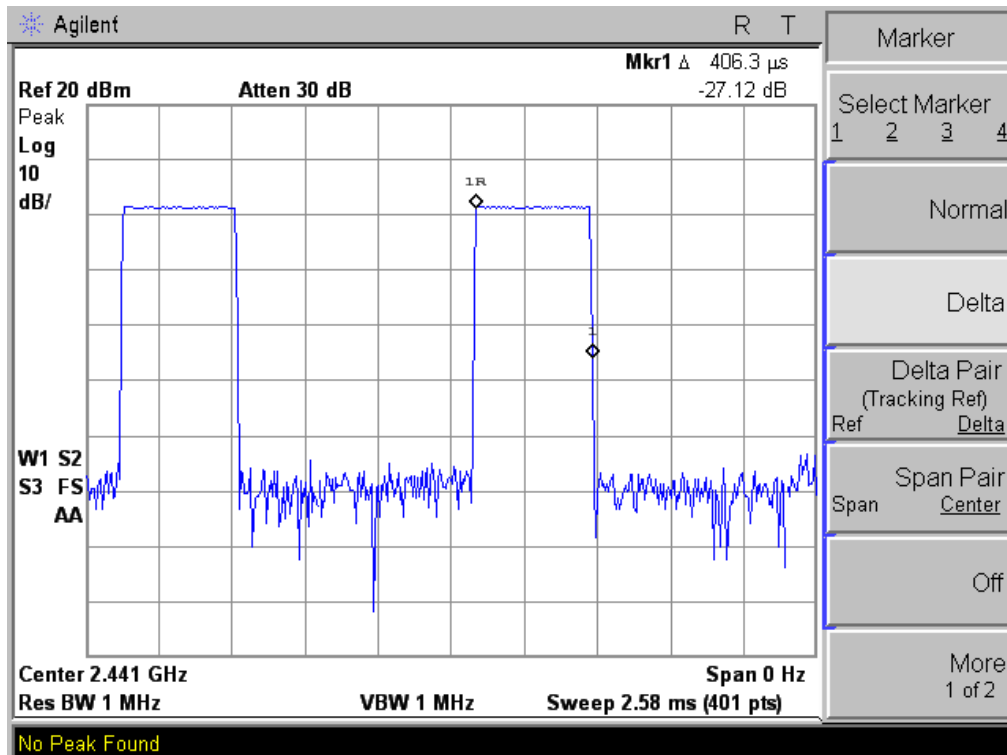
DH1 : $0.406 * (1600/2)/79 * 31.6 = 129.9$ (ms) DH3 : $1.601 * (1600/4)/79 * 31.6 = 256.1$ (ms)
DH5 : $2.829 * (1600/6)/79 * 31.6 = 301.7$ (ms)

Channels	Type slot length(ms)	Dwell time (ms)	Limits (msec)	Packet type	Verdict
Mid	0.406	129.9	≤ 400	DH1	Pass
Mid	1.601	256.1	≤ 400	DH3	Pass
Mid	2.829	301.7	≤ 400	DH5	Pass

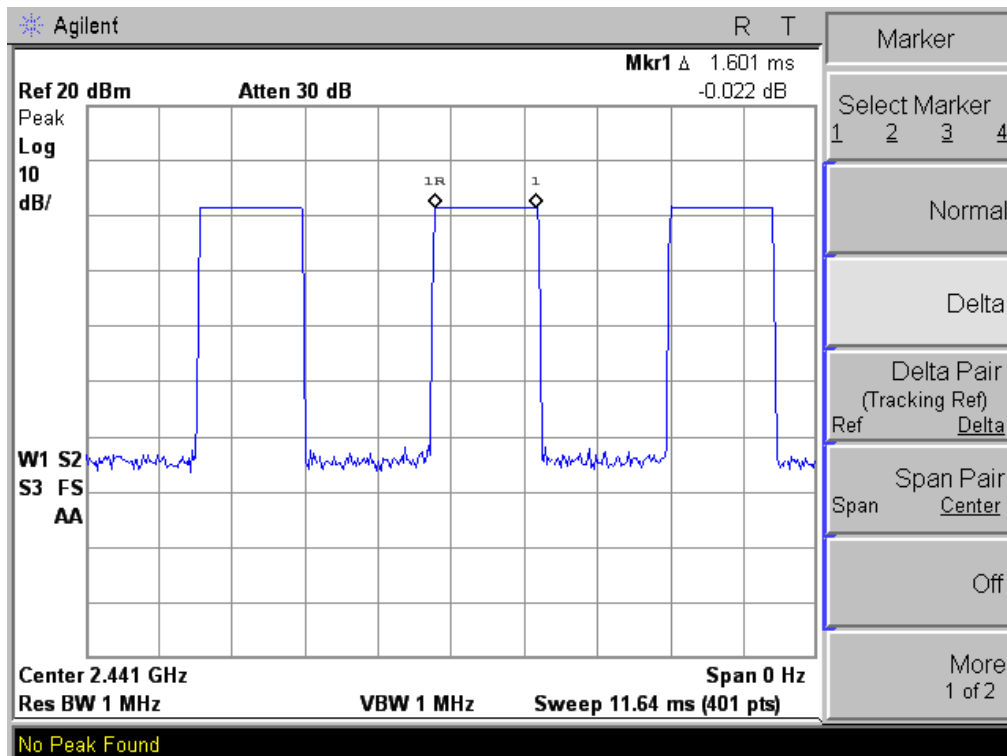
* Operation Mode : 8DPSK

3-DH1 : $0.439 * (1600/2)/79 * 31.6 = 140.5$ (ms) 3-DH3 : $1.467 * (1600/4)/79 * 31.6 = 234.7$ (ms)
3-DH5 : $2.927 * (1600/6)/79 * 31.6 = 312.2$ (ms)

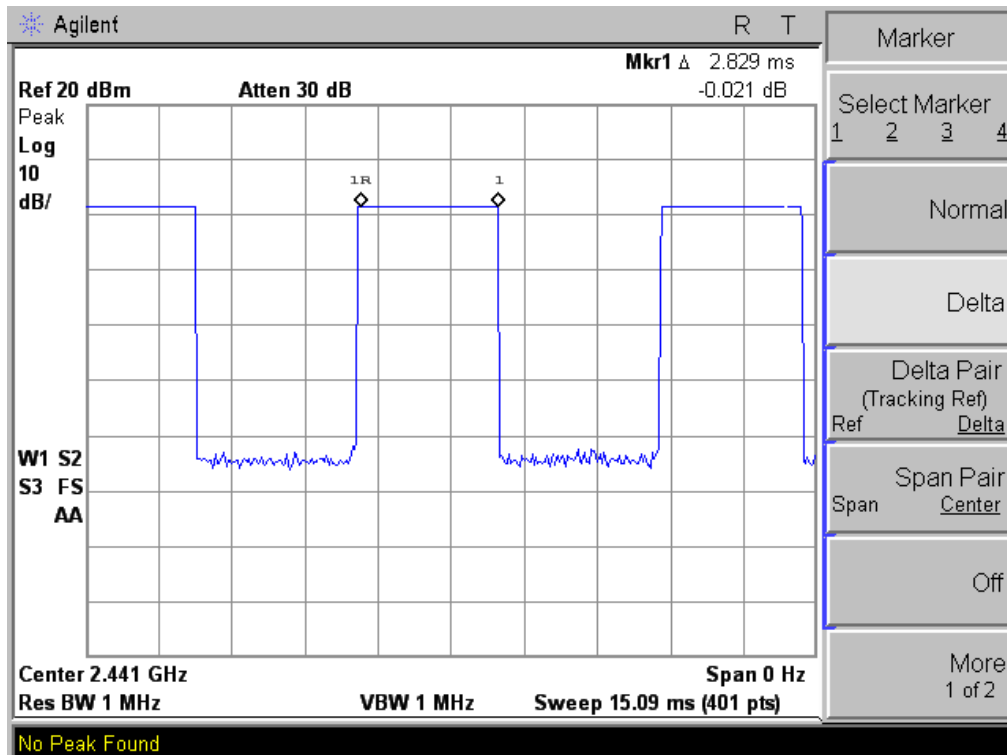
Channels	Type slot length(ms)	Dwell time (ms)	Limits (msec)	Packet type	Verdict
Mid	0.439	140.5	≤ 400	3-DH1	Pass
Mid	1.467	234.7	≤ 400	3-DH3	Pass
Mid	2.927	312.2	≤ 400	3-DH5	Pass



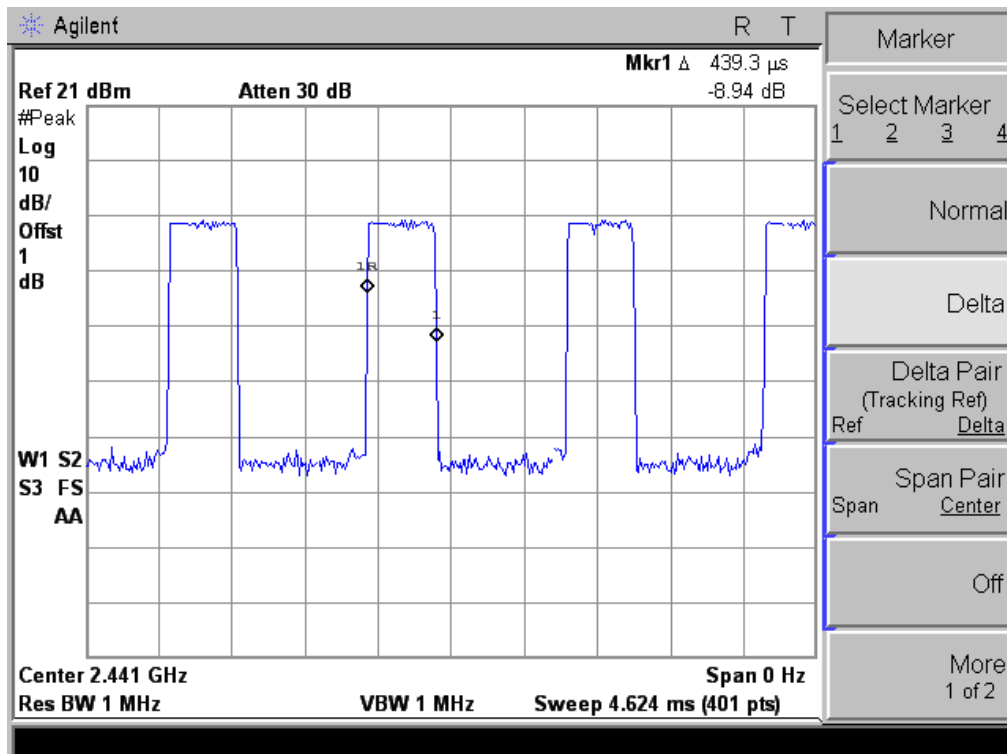
– DH1 packet type (GFSK) –



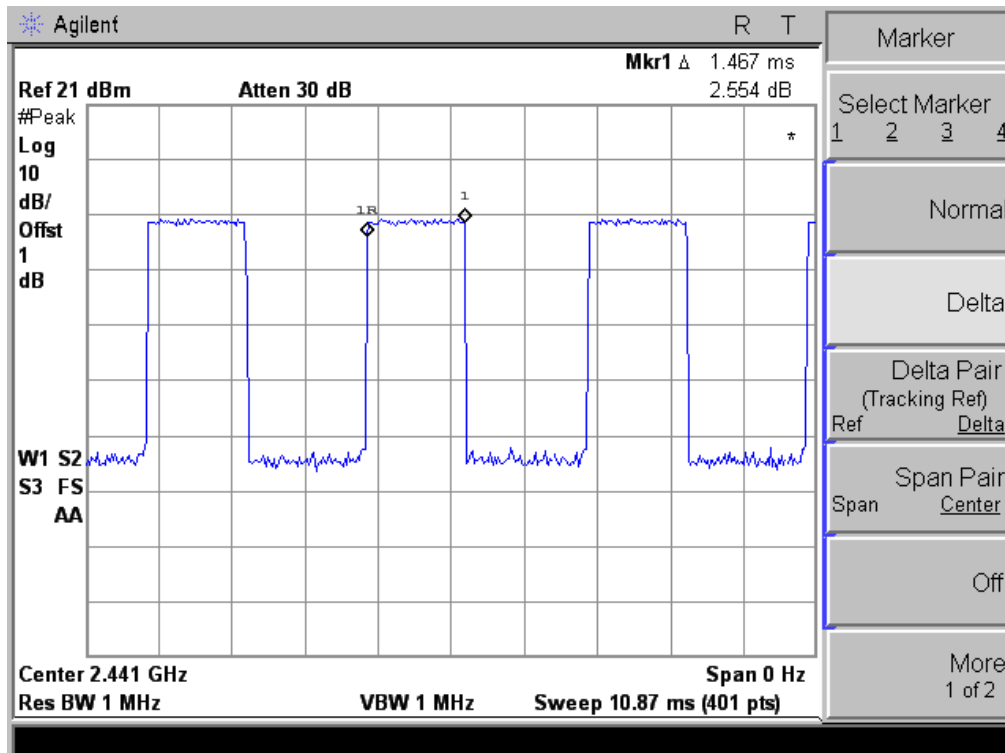
– DH3 packet type (GFSK) –



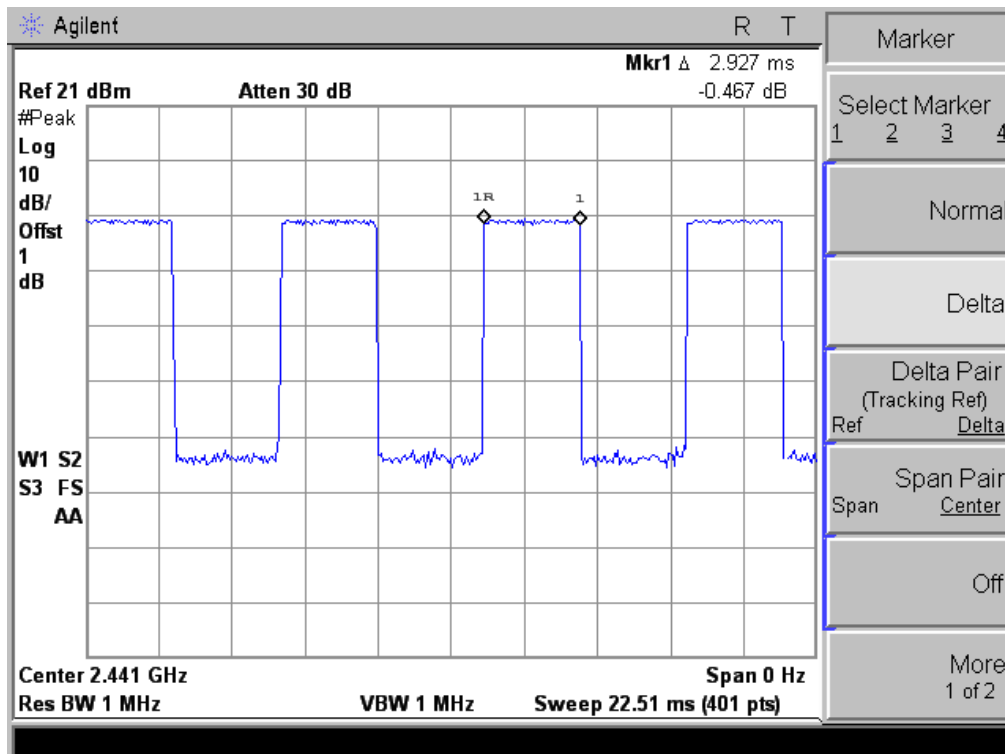
– DH5 packet type (GFSK) –



– 3-DH1 packet type (8DPSK) –



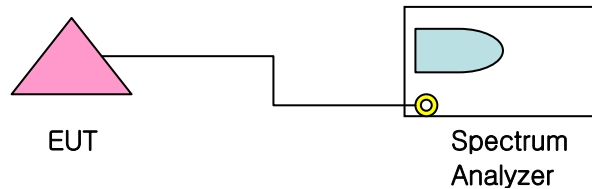
– 3-DH3 packet type (8DPSK) –



– 3-DH5 packet type (8DPSK) –

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.

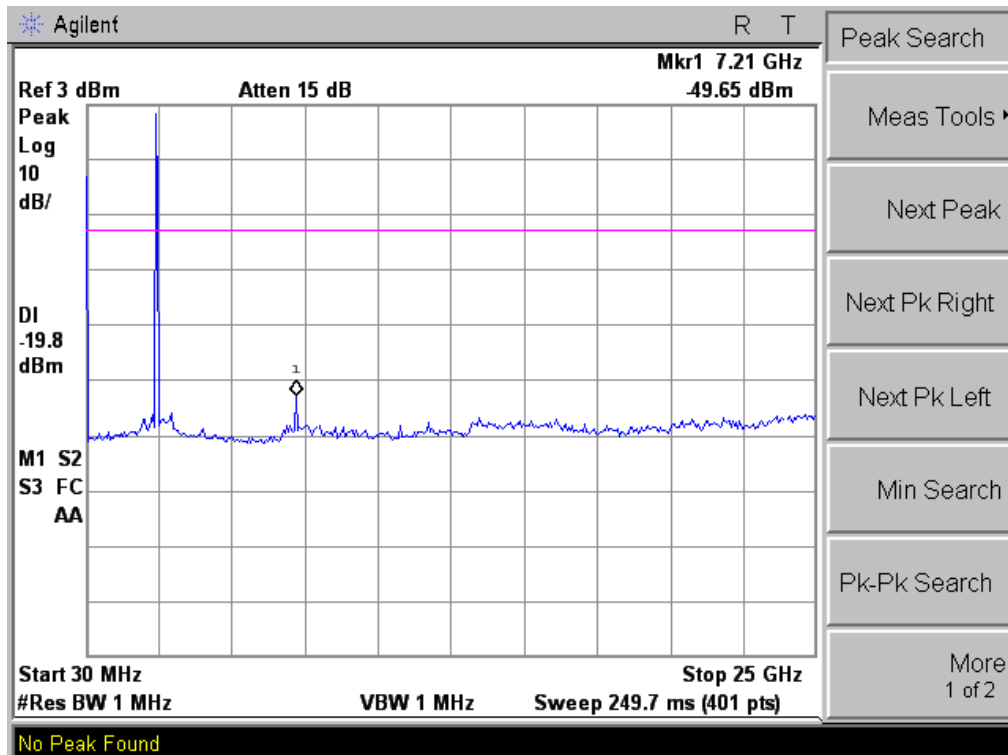
3.7.3. Test result

* Operation Mode : GFSK

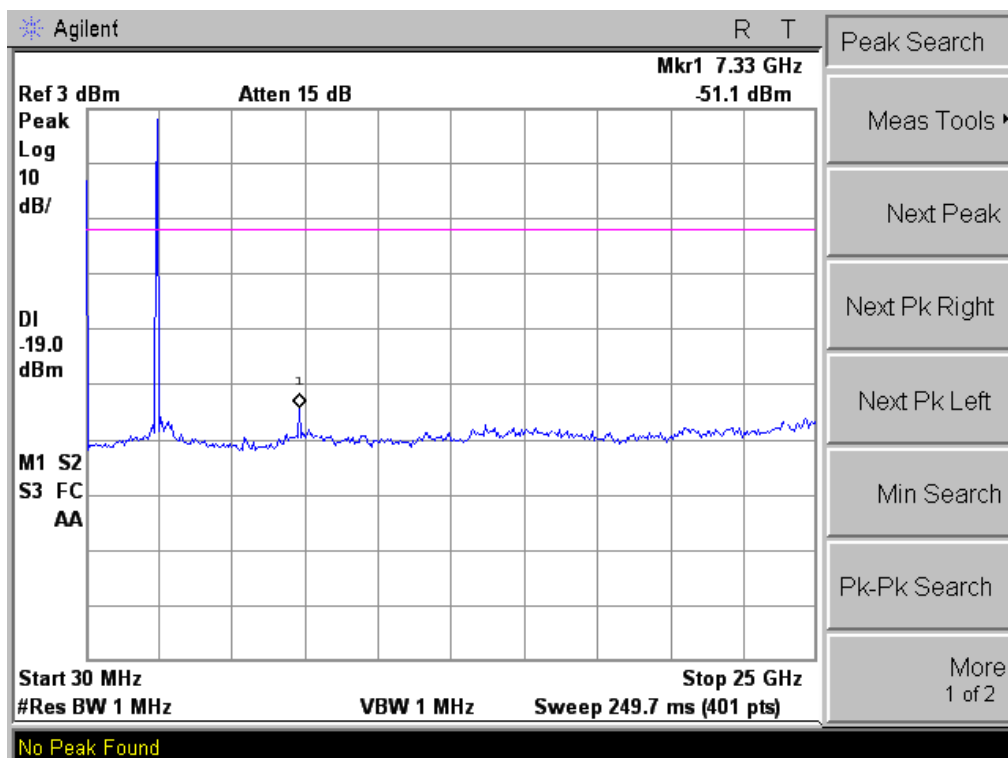
Channels	Frequency (MHz)	Result (dBc)	Limit (dBc)	Verdict
Low	2,402	40 >	20	Pass
Mid	2,441	40 >	20	Pass
High	2,480	40 >	20	Pass

* Operation Mode : 8DPSK

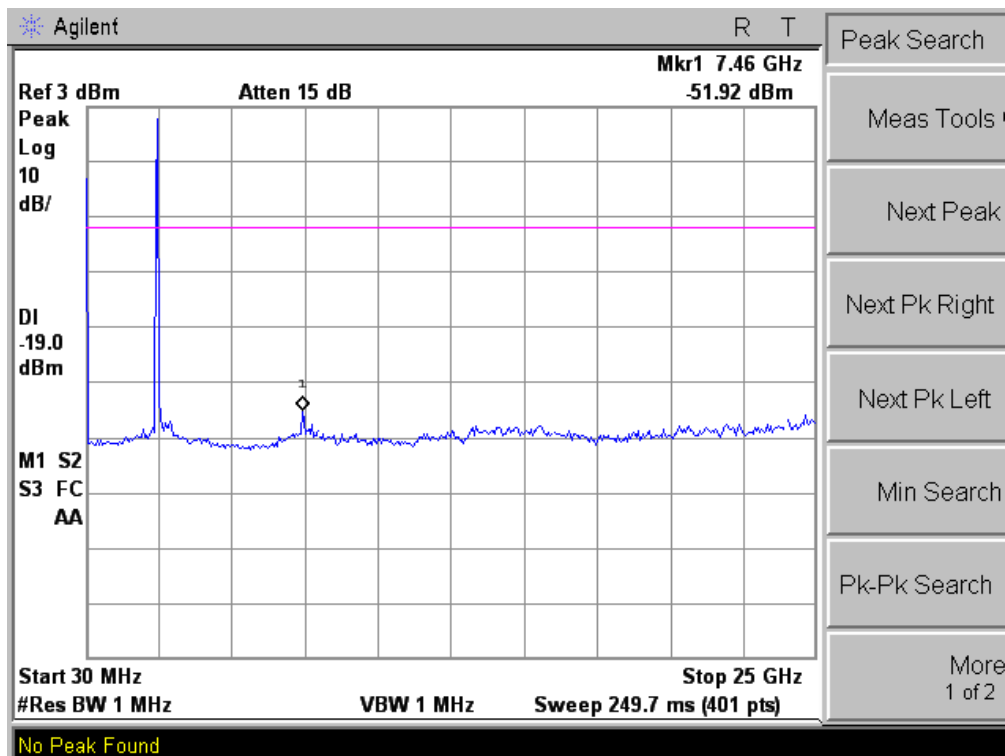
Channels	Frequency (MHz)	Result (dBc)	Limit (dBc)	Verdict
Low	2,402	40 >	20	Pass
Mid	2,441	40 >	20	Pass
High	2,480	40 >	20	Pass



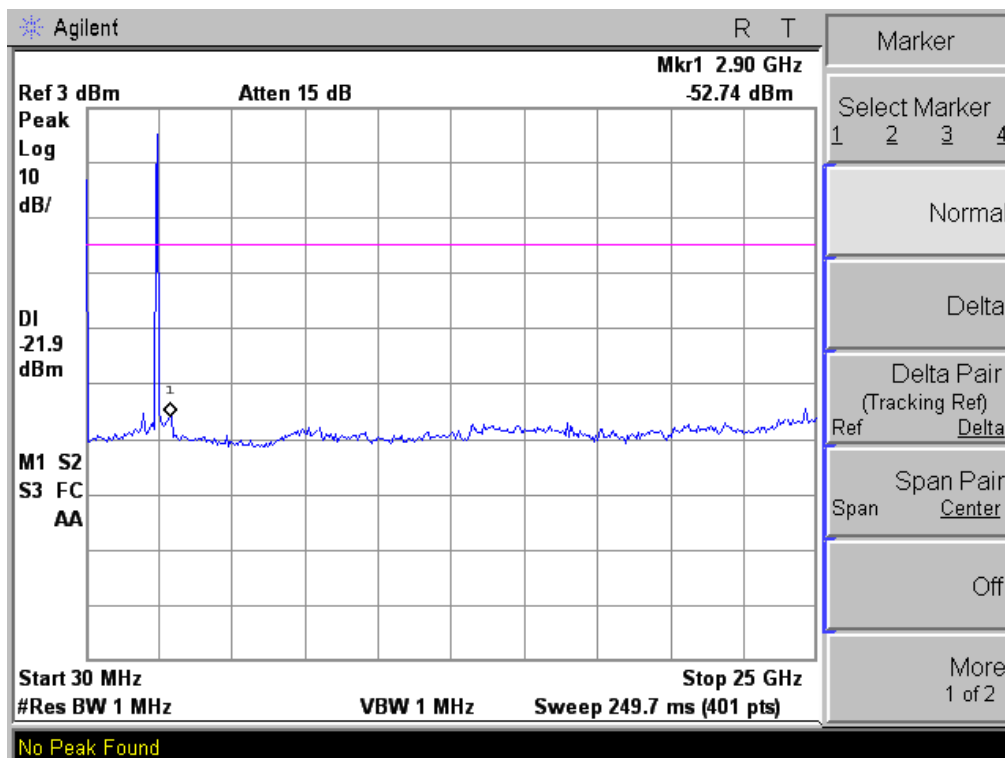
– Low channel (GFSK) –



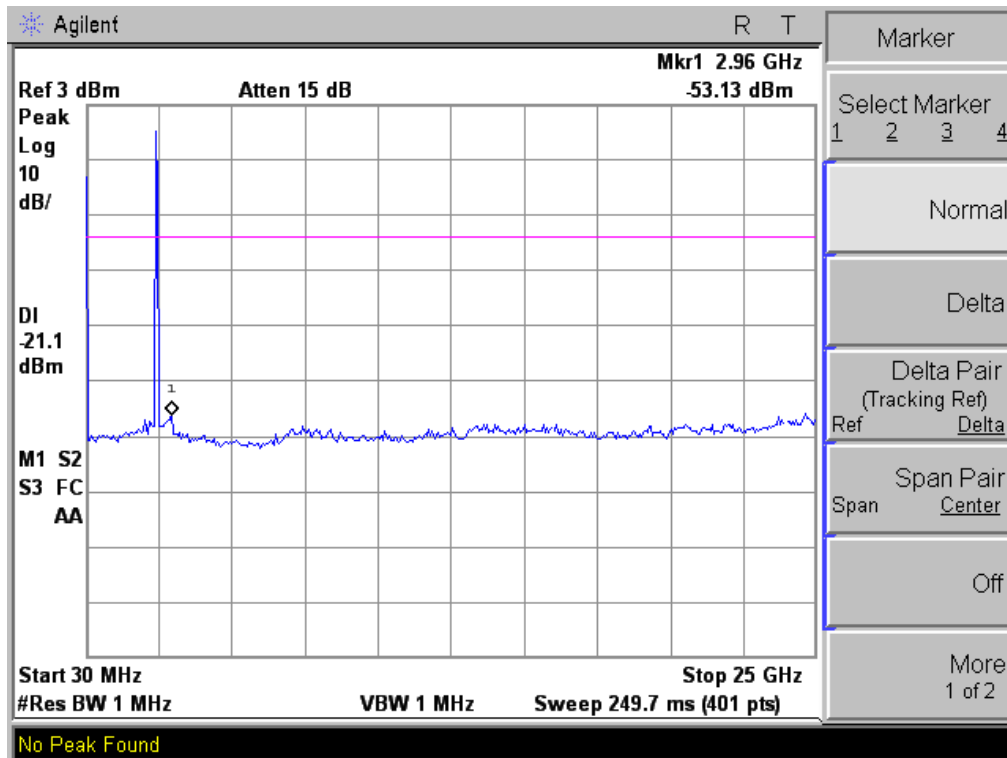
– Mid channel (GFSK) –



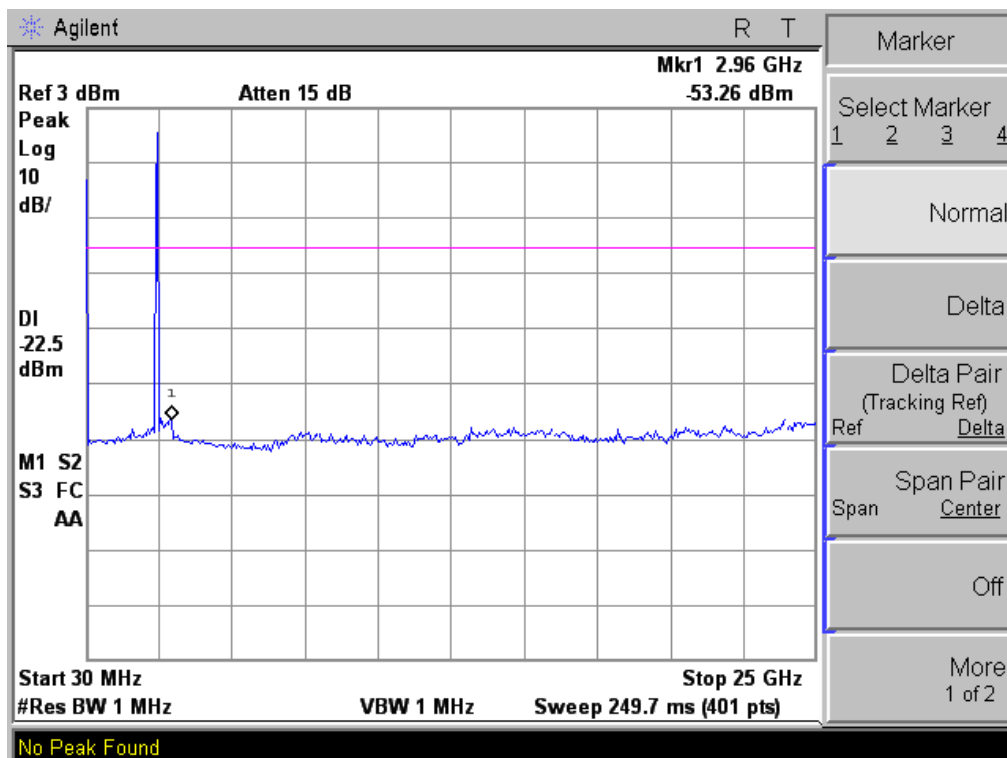
– High channel (GFSK) –



– Low channel (8DPQSK) –



– Mid channel (8DPQSK) –



– High channel (8DPQSK) –

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.

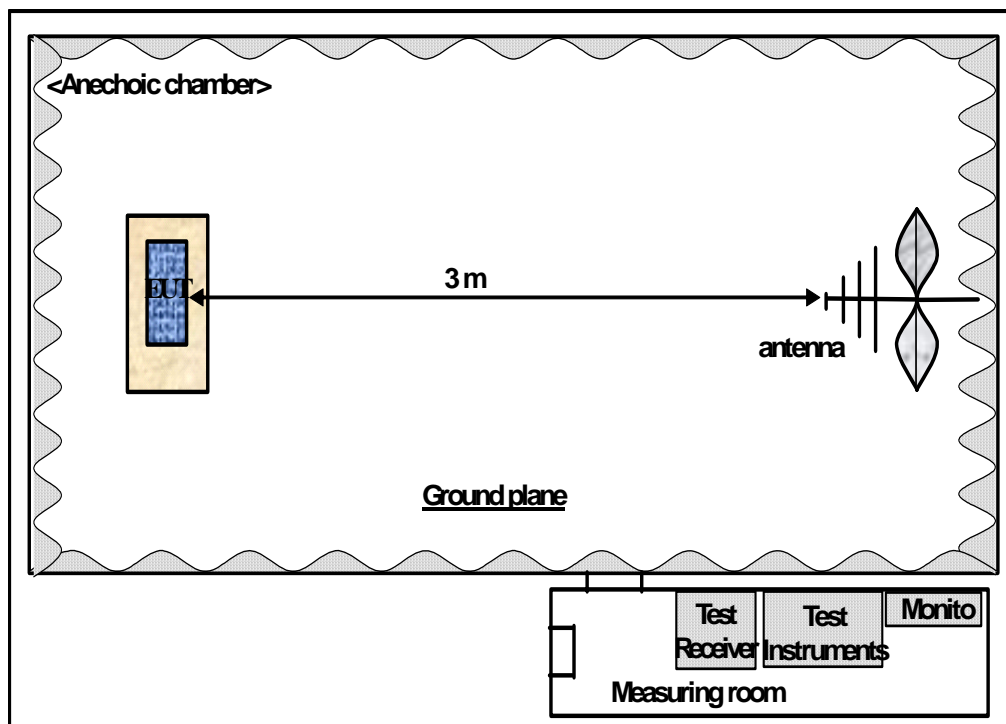
3.8.3. Sample Calculation

The emission level measured in decibels above one microvolt ($\text{dB}_{\mu\text{V}}$) was following sample calculation.

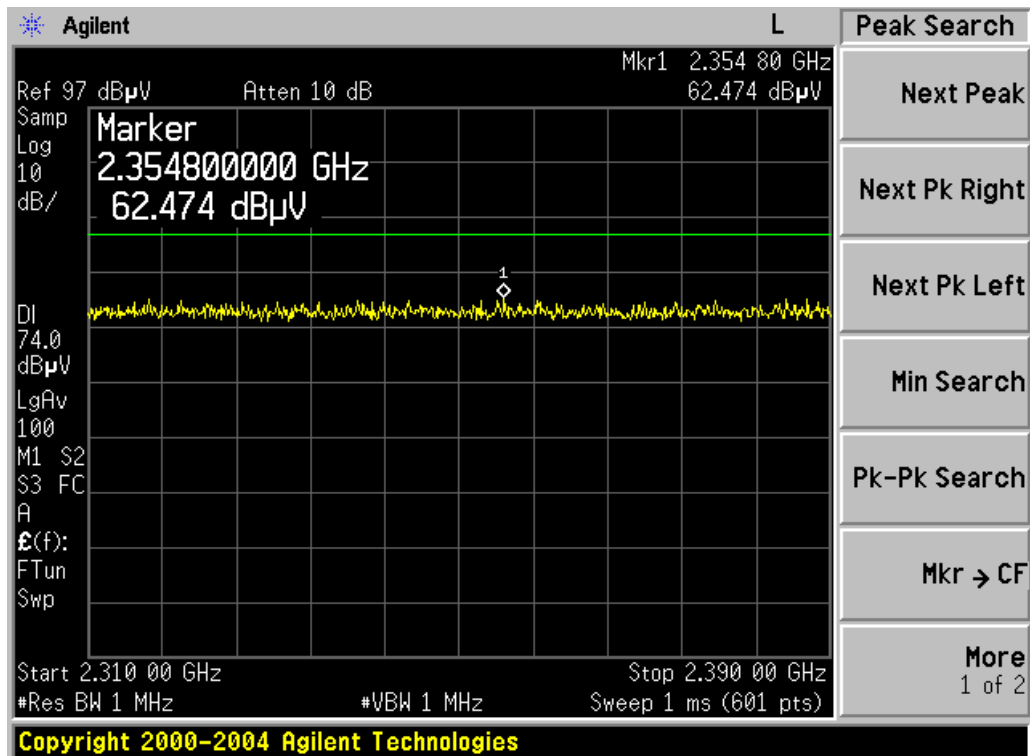
For example ;

Measured Value at <u>2354.8 MHz</u>	36.10 $\text{dB}_{\mu\text{V}}$
Antenna Factor, Cable loss & Preamplifier	26.37 dB
<hr/>	
= Radiated Emission	62.47 $\text{dB}_{\mu\text{V}}/\text{m}$

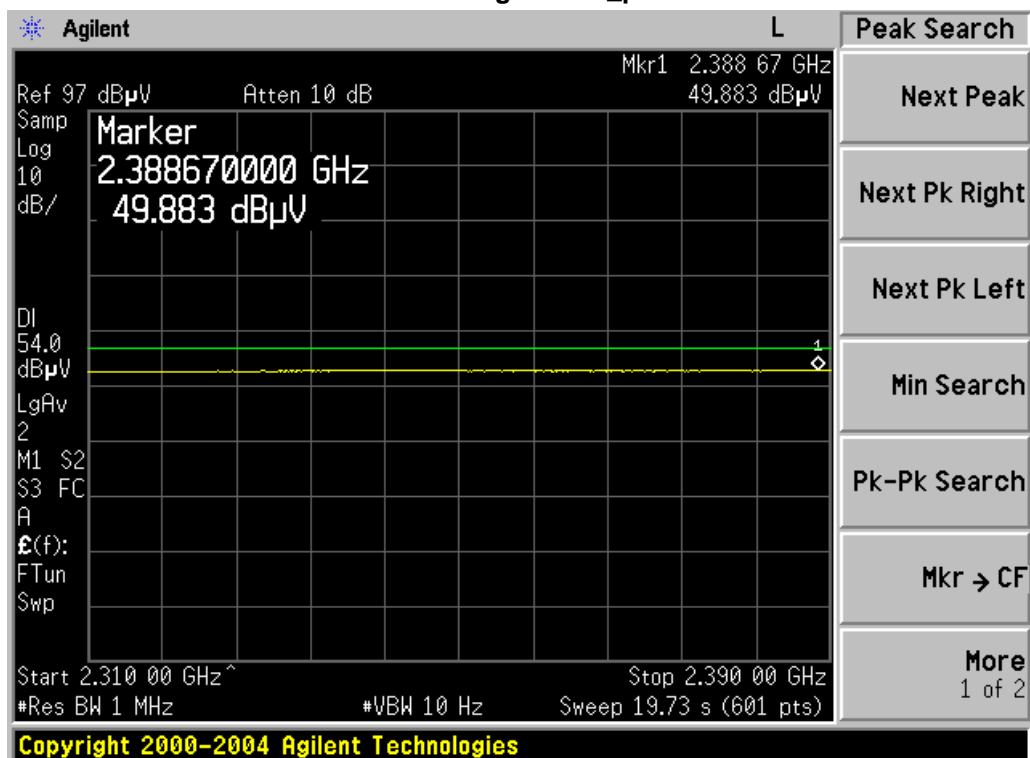
3.8.4. Measurement Configuration



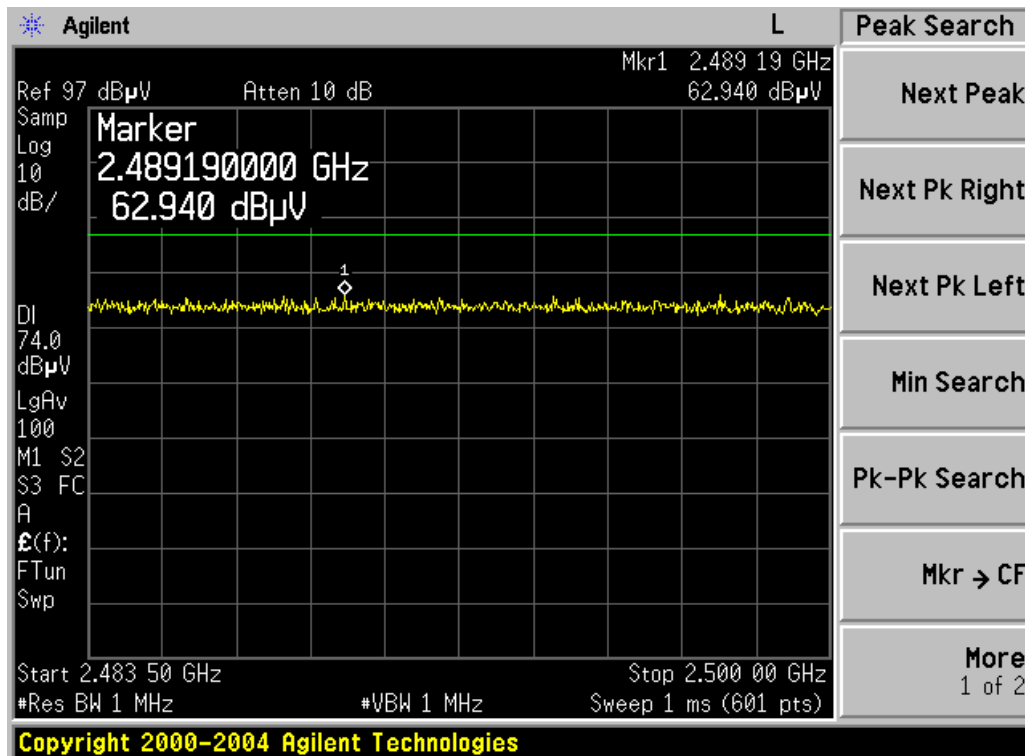
3.8.5. Restricted Bandedge Graph (Bluetooth)



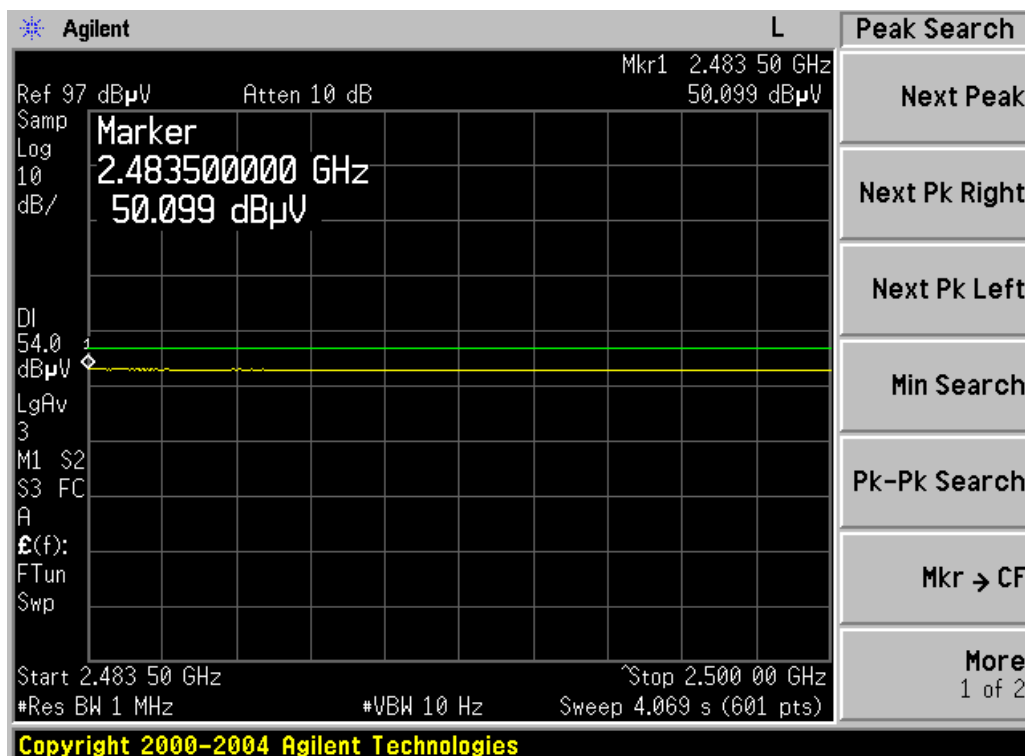
< Lower side bandedge GFSK_peak detector >



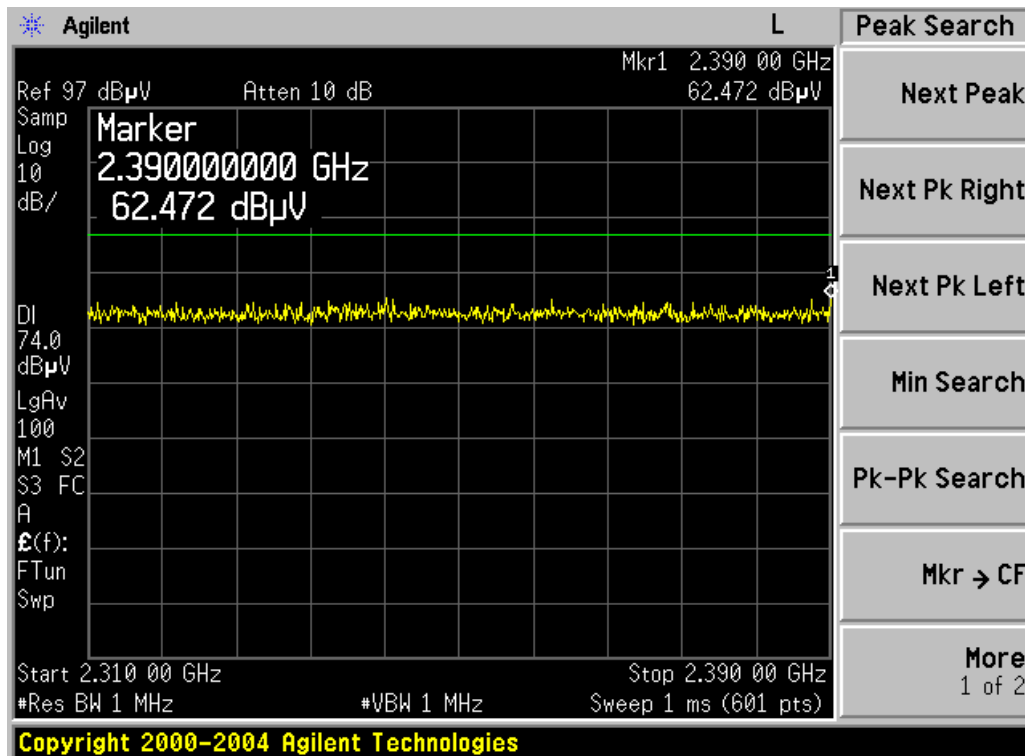
<Lower side bandedge GFSK_average detector>



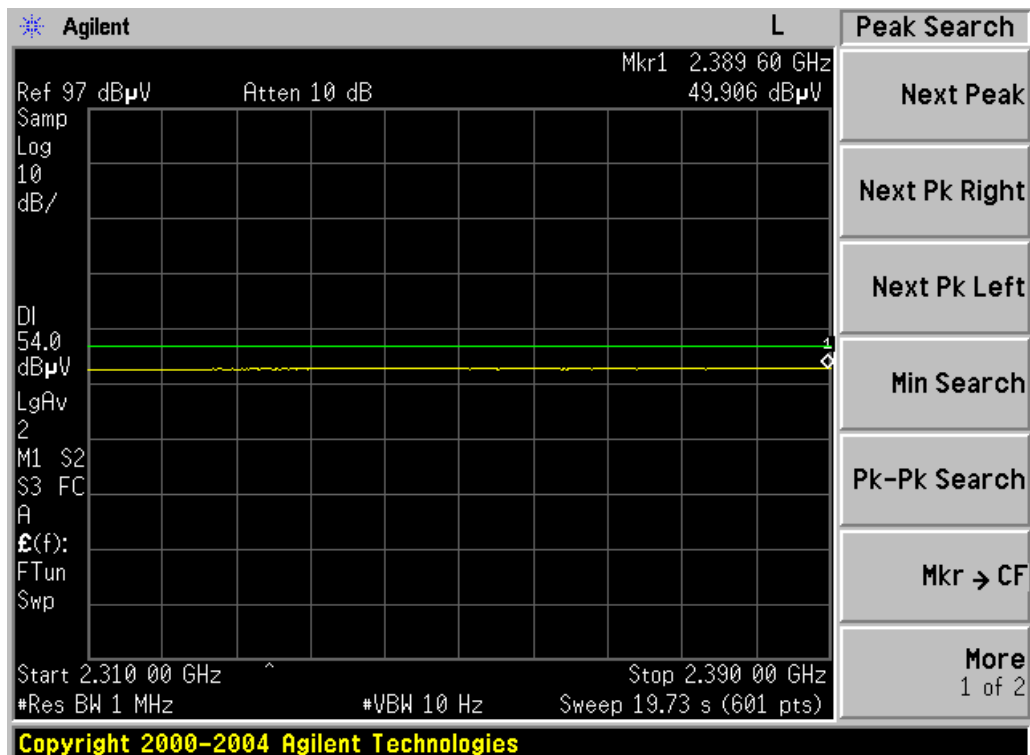
< Higher side bandedge GFSK_peak detector>



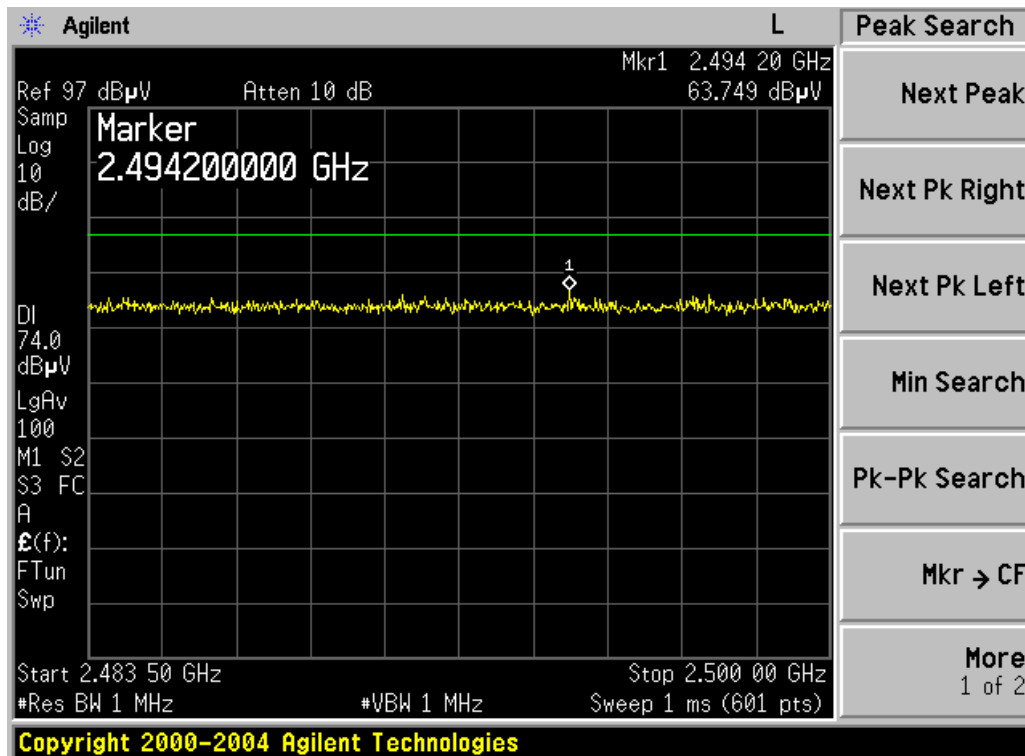
< Higher side bandedge GFSK_average detector>



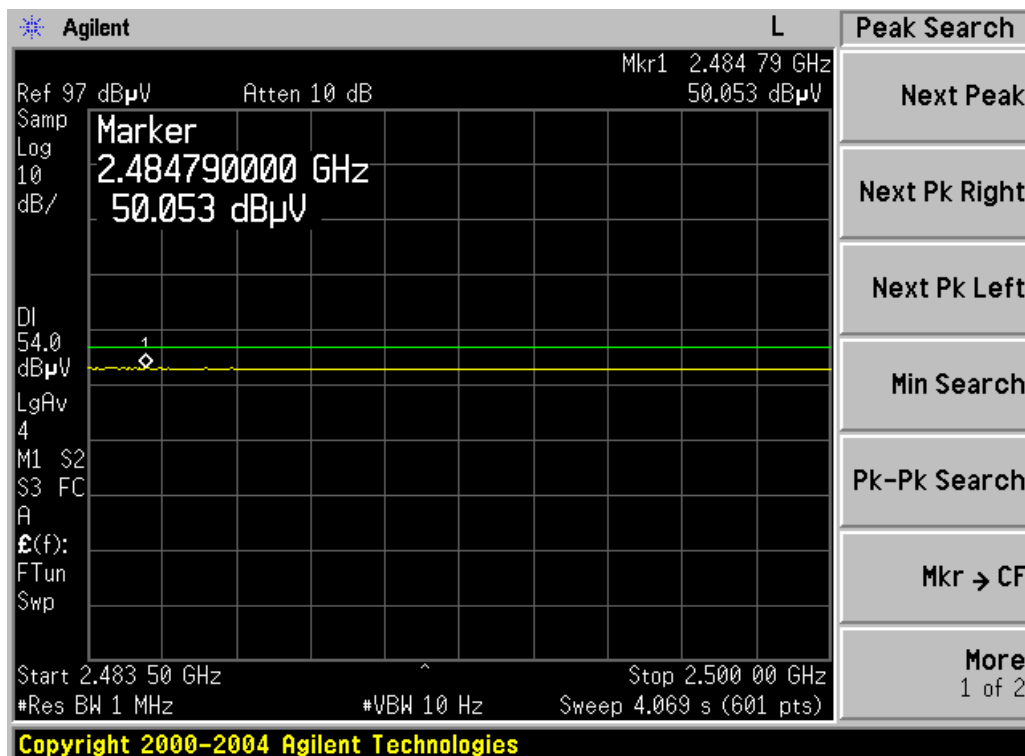
<Lower side bandedge 8DPSK_peak detector>



< Lower side bandedge 8DPSK_average detector>



< Higher side bandedge 8DPSK_peak detector>



< Higher side bandedge 8DPSK_average detector>

3.8.6. Restricted Bandedge Test Results (Bluetooth)

FCC ID : U4G0070
Test distance : 3m
Date : July 9th, 2012

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
GFSK - Lower side bandedge – 2402 MHz									
2,354.80	H	1000, Peak	36.10	26.37	62.47	74.0	11.53	Peak	X
2,388.67	H	1000, Peak	23.26	26.62	49.88	54.0	4.12	Average	X
GFSK - Higher side bandedge – 2480 MHz									
2,489.19	H	1000, Peak	36.23	26.71	62.94	74.0	11.06	Peak	X
2,483.50	H	1000, Peak	23.39	26.71	50.10	54.0	3.90	Average	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

FCC ID : U4G0070
Test distance : 3m
Date : July 9th, 2012

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
8DPSK - Lower side bandedge – 2402 MHz									
2,390.00	H	1000, Peak	35.85	26.62	62.47	74.0	11.53	Peak	X
2389.60	H	1000, Peak	23.29	26.62	49.91	54.0	4.09	Average	X
8DPSK - Higher side bandedge – 2480 MHz									
2,494.20	H	1000, Peak	37.04	26.71	63.75	74.0	10.25	Peak	X
2,484.79	H	1000, Peak	23.34	26.71	50.05	54.0	3.95	Average	X

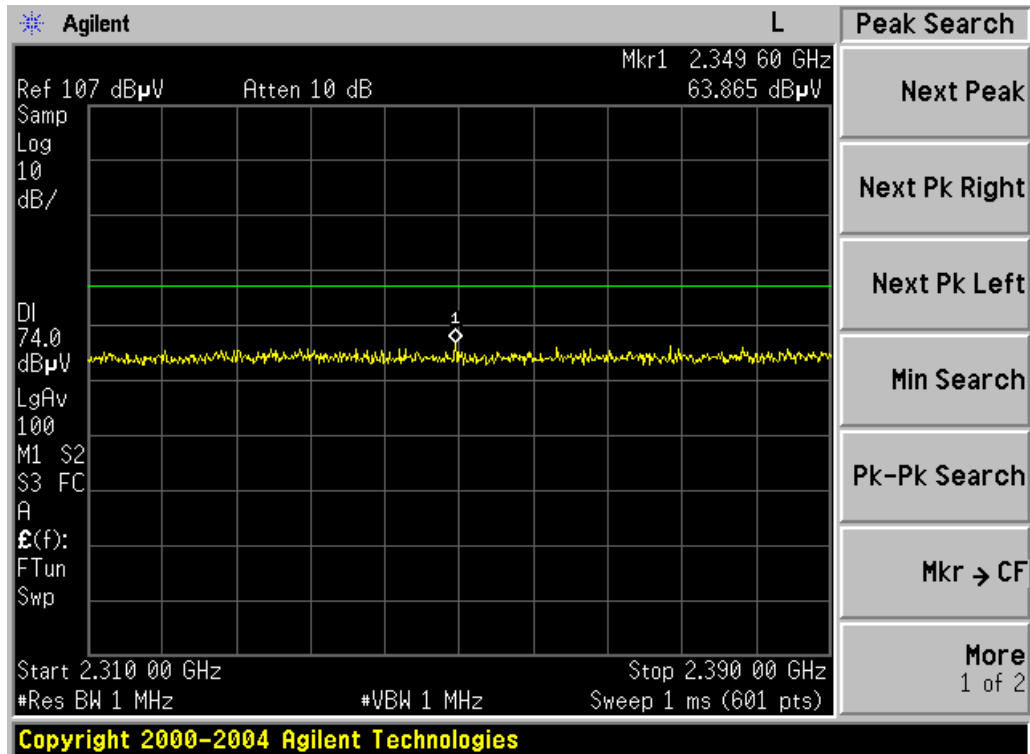
Level Corrected = Reading level + Correction factor (dB/m)

Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

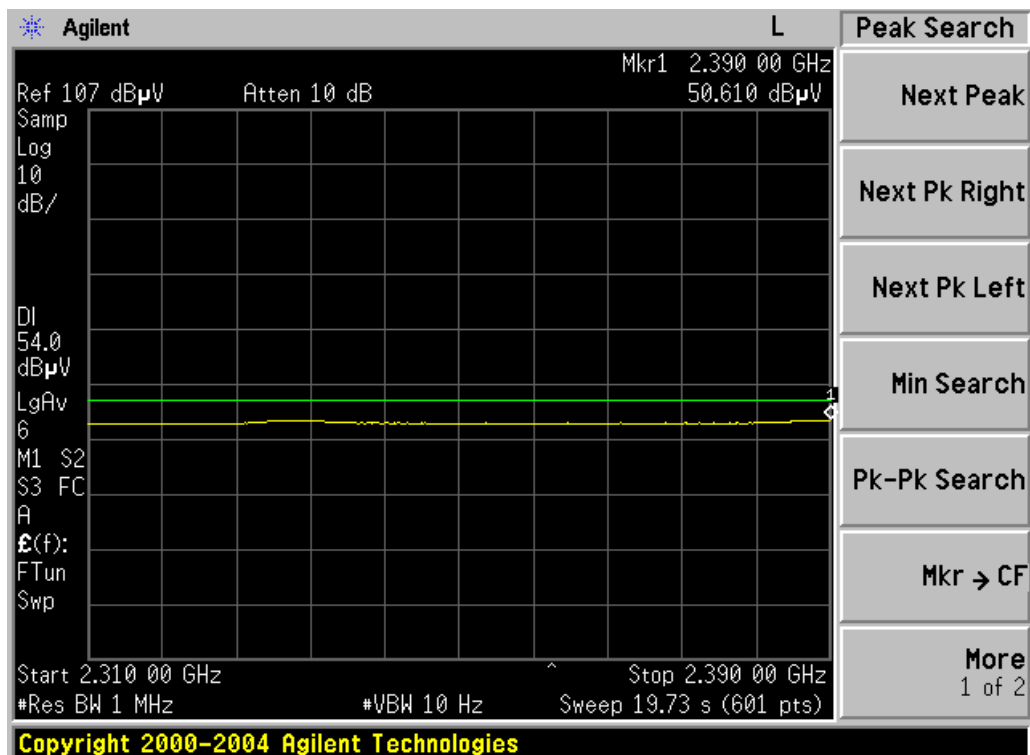
- Note**
1. Measurement was done over the Restricted Bands. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
 2. Pre-amplifier was used.
 3. Test results include the rotation of the EUT through three orthogonal axes to 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

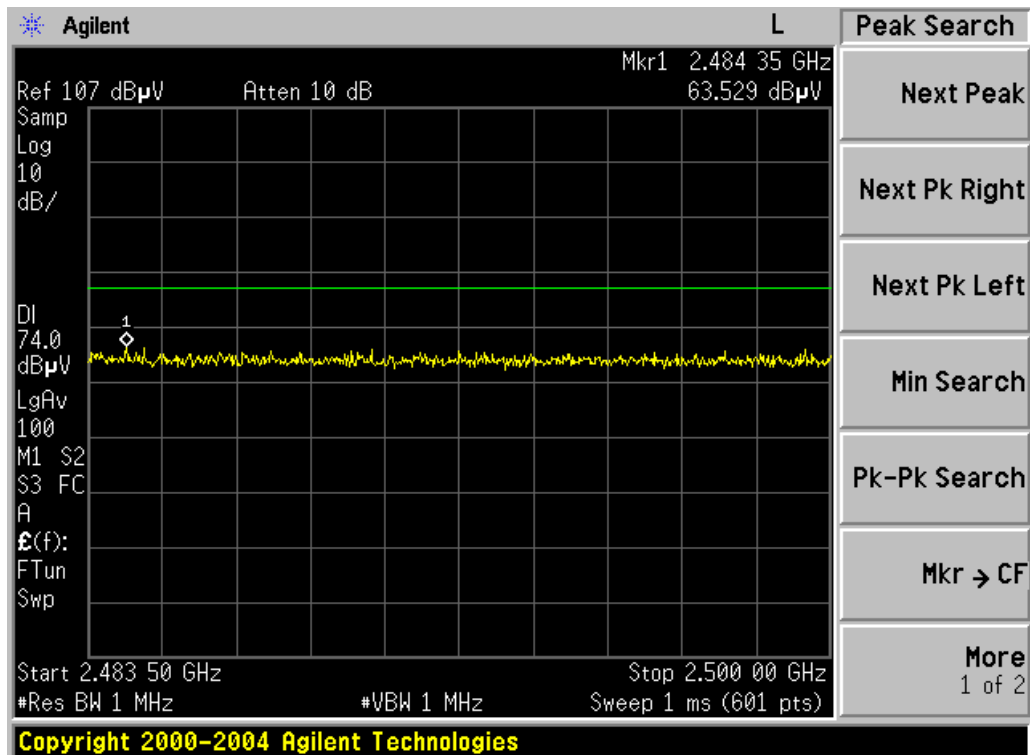
3.8.7. Restricted Bandedge Graph (WLAN)



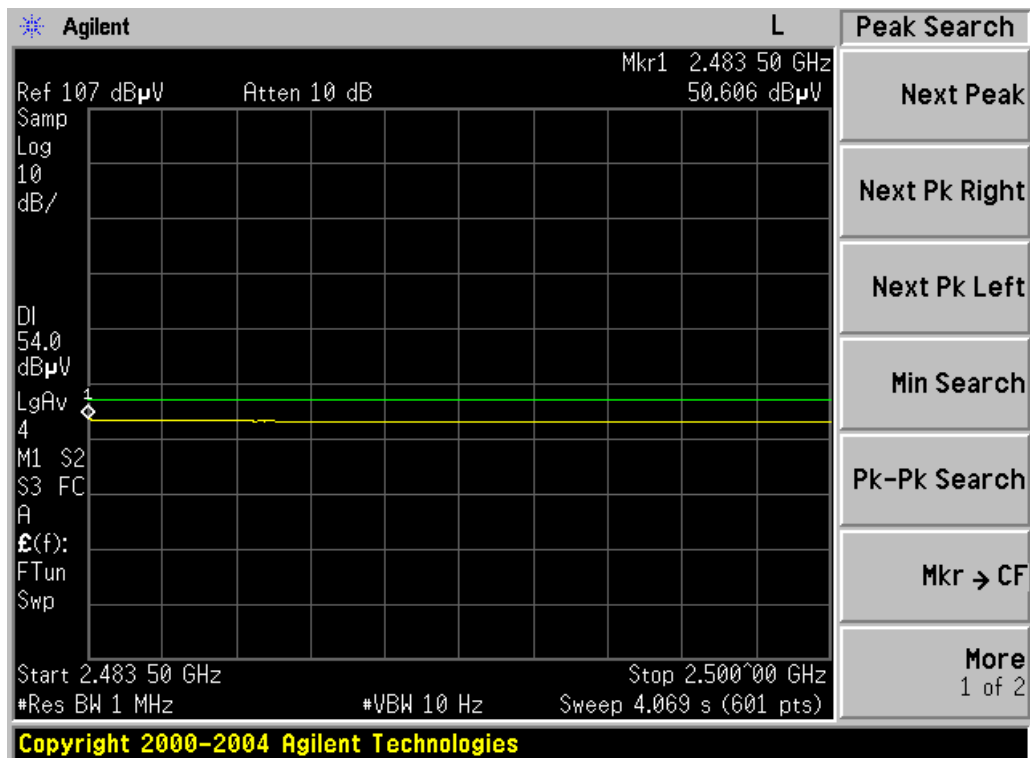
<Lower side bandedge 802.11b_peak detector>



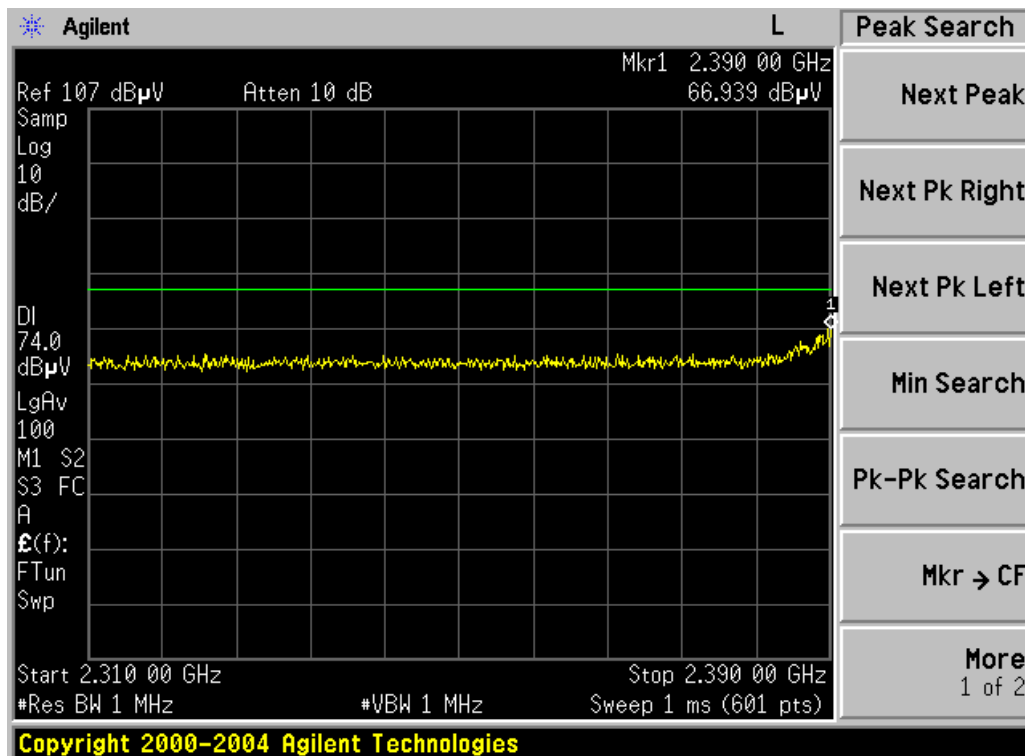
<Lower side bandedge 802.11b_average detector>



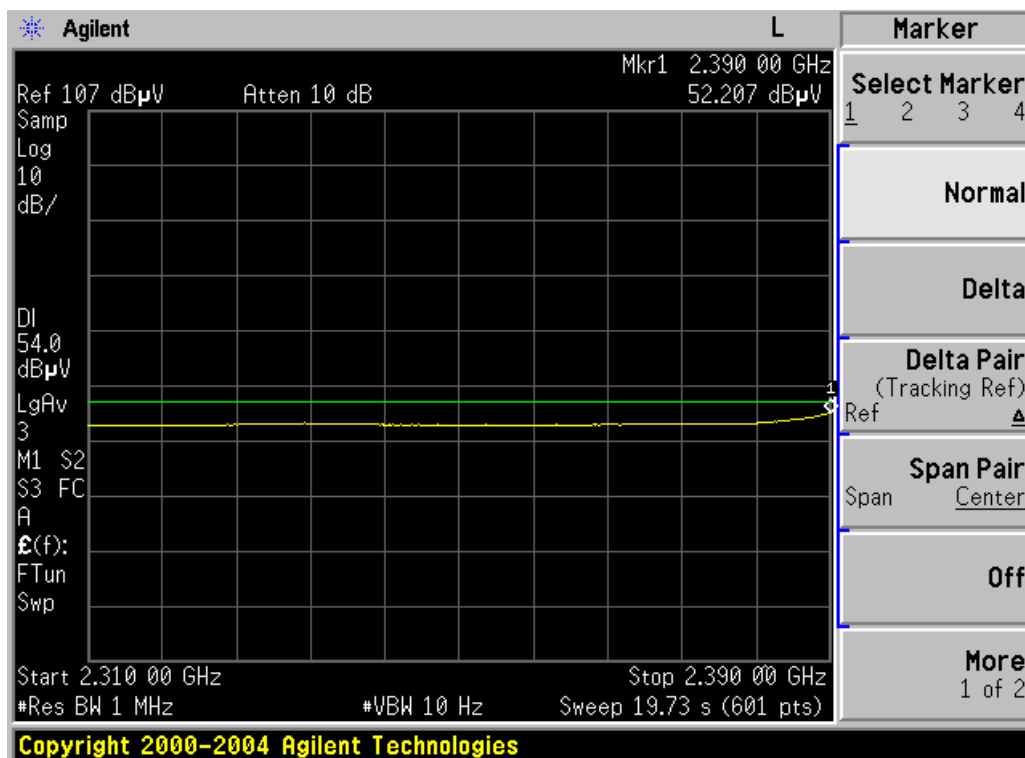
<Higher side bandedge 802.11b_peak detector>



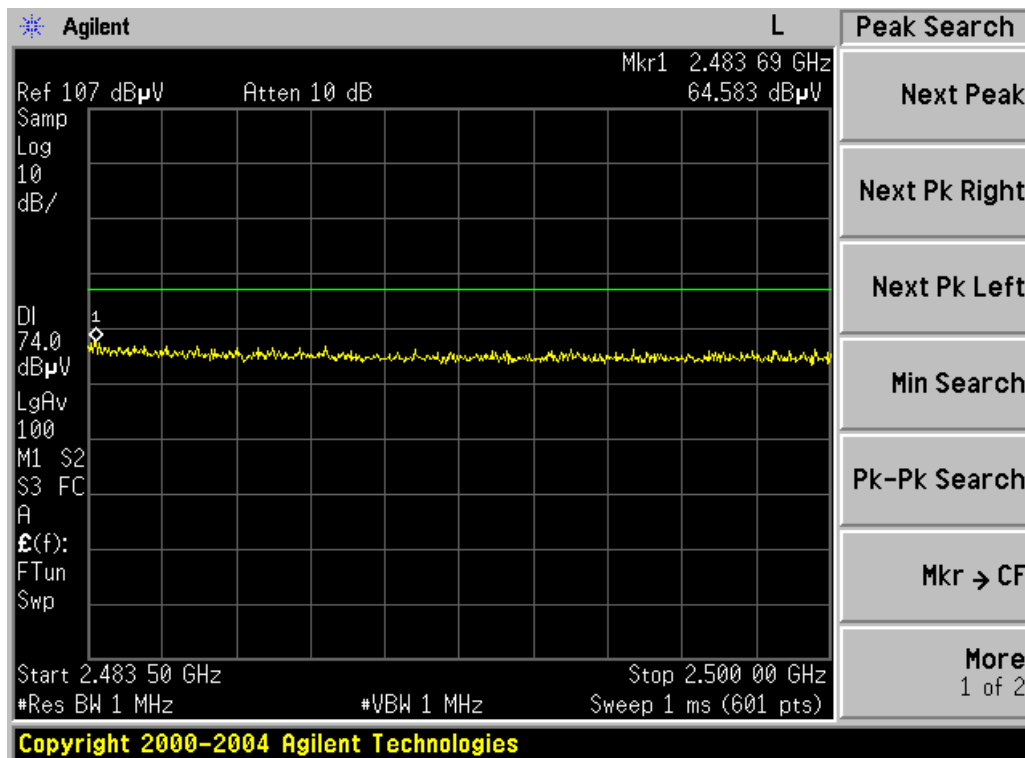
<Higher side bandedge 802.11b_average detector>



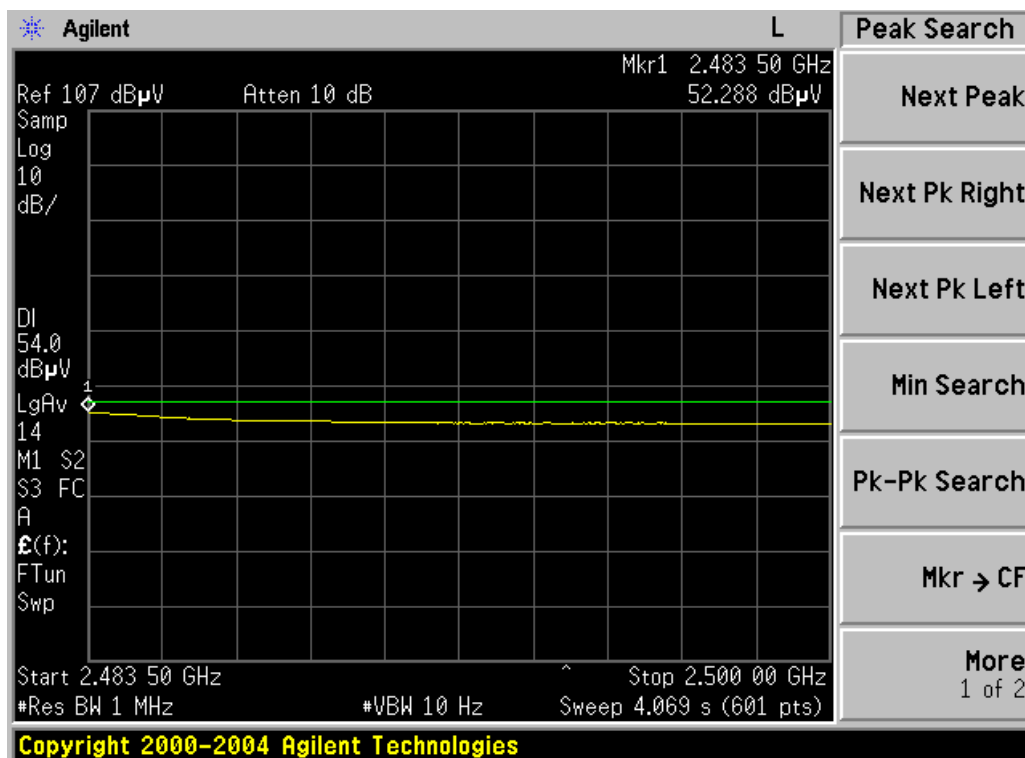
<Lower side bandedge 802.11g_peak detector>



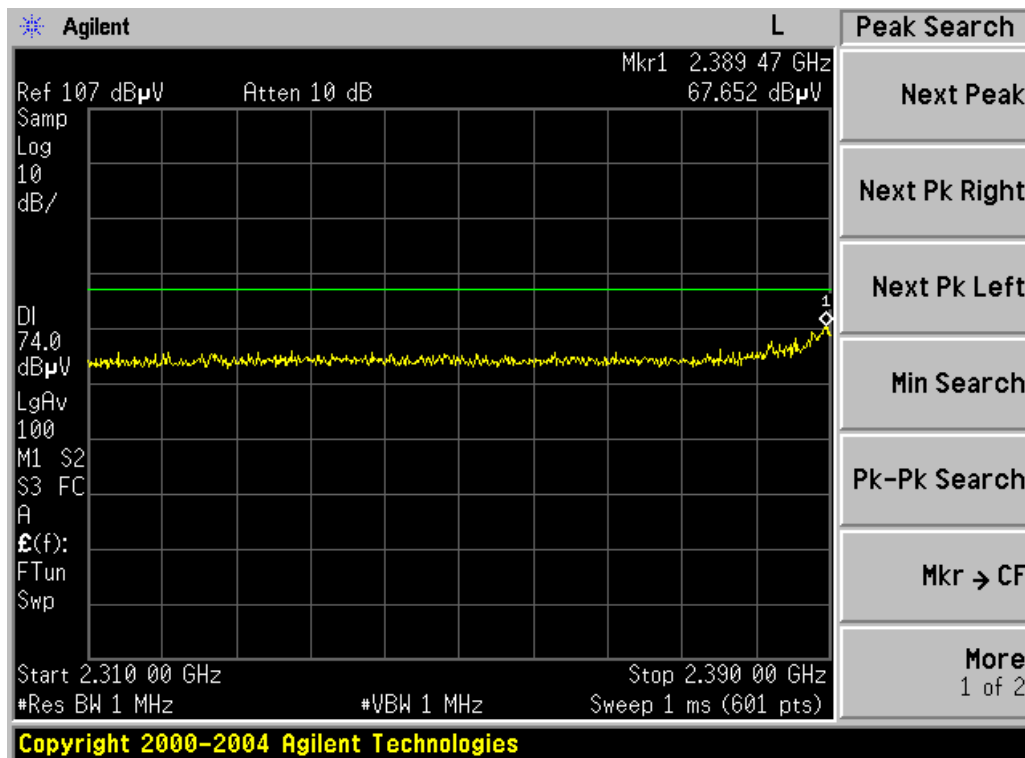
<Lower side bandedge 802.11g_average detector>



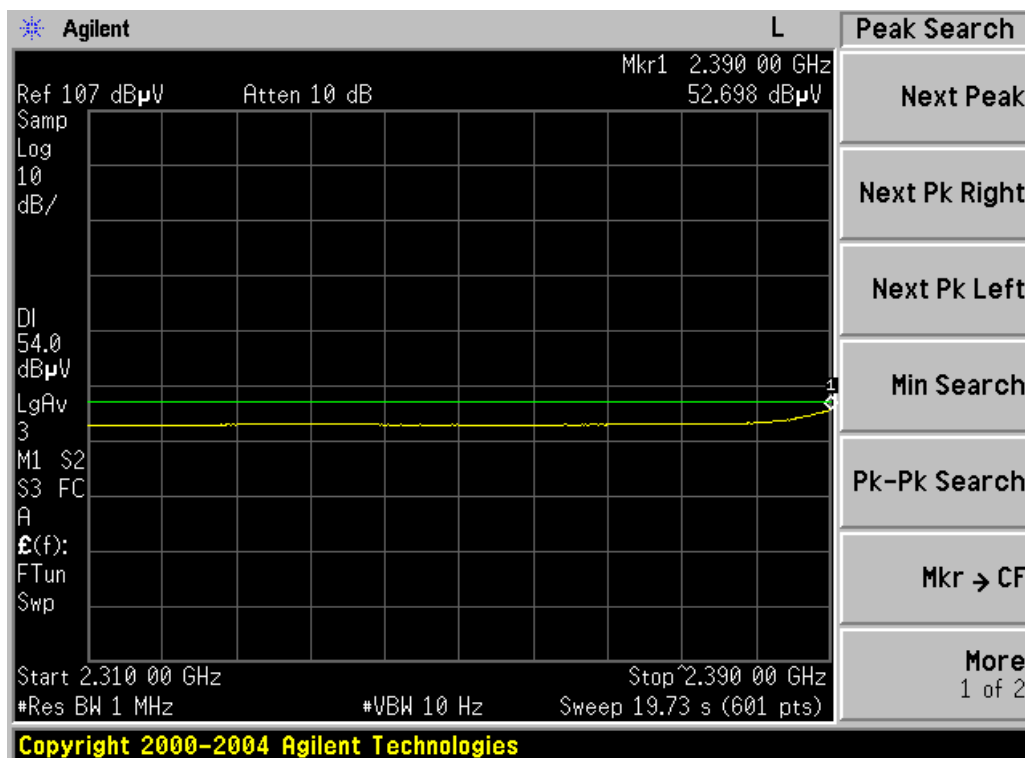
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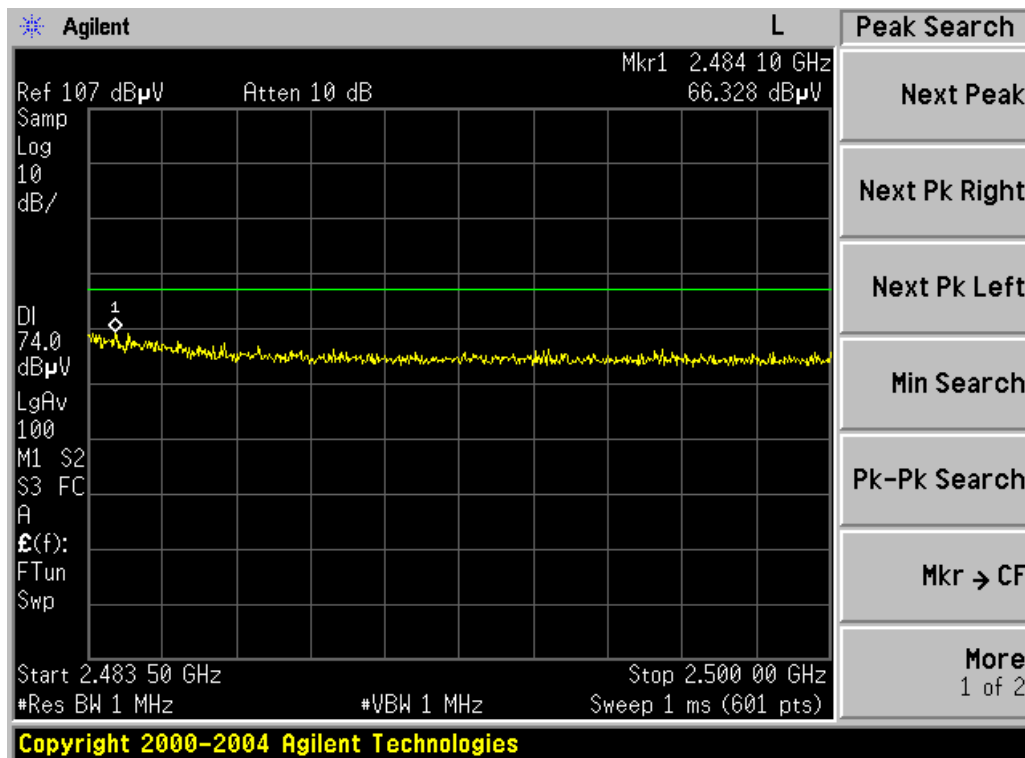
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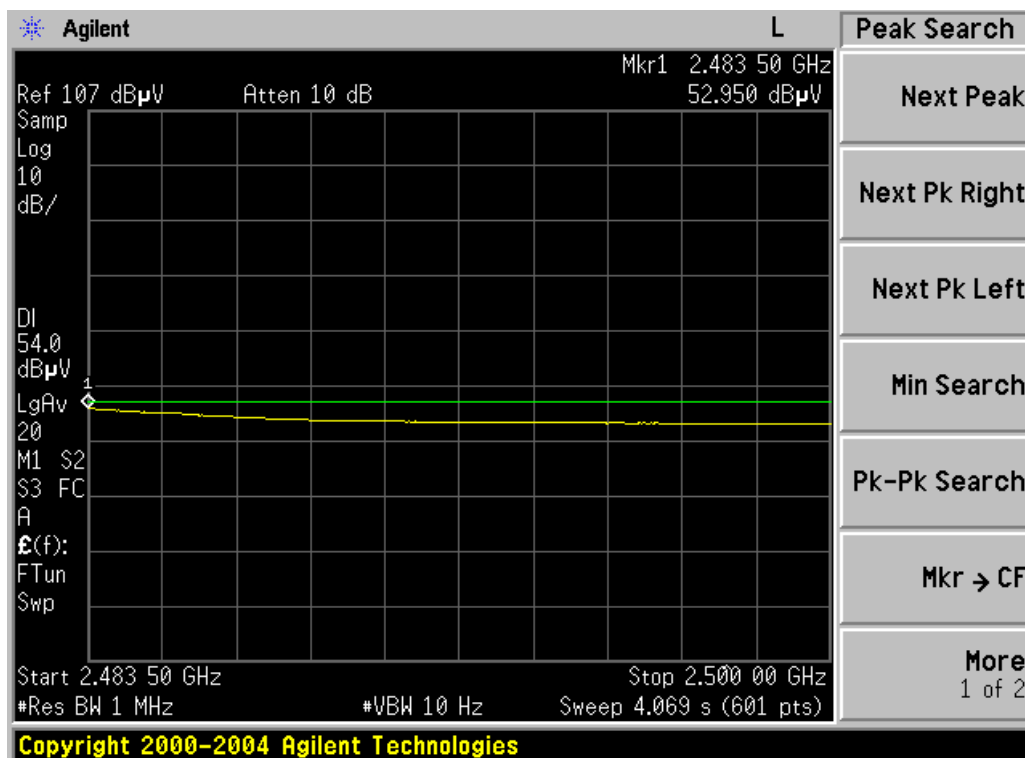
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<Lower side bandedge 802.11n_average detector>



<Higher side bandedge 802.11n_peak detector>



<Higher side bandedge 802.11n_average detector>

3.8.8. Restricted Bandedge Test Results (WLAN)

FCC ID : U4G0070
Test distance : 3m
Date : July 9th, 2012

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
802.11b mode - Lower side bandedge – 2412 MHz									
2,349.60	H	1000, Peak	37.25	26.62	63.87	74.0	10.13	Peak	X
2,390.00	H	1000, Peak	24.24	26.37	50.61	54.0	3.39	Average	X
802.11b mode - Higher side bandedge – 2462 MHz									
2,484.35	H	1000, Peak	36.82	26.71	63.53	74.0	10.47	Peak	X
2,483.50	H	1000, Peak	23.90	26.71	50.61	54.0	3.39	Average	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

FCC ID : U4G0070
Test distance : 3m
Date : July 9th, 2012

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
802.11g mode - Lower side bandedge – 2412 MHz									
2,390.00	H	1000, Peak	40.32	26.62	66.94	74.0	7.06	Peak	X
2,390.00	H	1000, Peak	25.84	26.37	52.21	54.0	1.79	Average	X
802.11g mode - Higher side bandedge – 2462 MHz									
2,483.69	H	1000, Peak	37.87	26.71	64.58	74.0	9.42	Peak	X
2,483.50	H	1000, Peak	25.58	26.71	52.29	54.0	1.71	Average	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

FCC ID : U4G0070
Test distance : 3m
Date : July 9th, 2012

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
802.11n mode - Lower side bandedge – 2412 MHz									
2,389.47	H	1000, Peak	41.03	26.62	67.65	74.0	6.35	Peak	X
2,390.00	H	1000, Peak	26.33	26.37	52.70	54.0	1.30	Average	X
802.11n mode - Higher side bandedge – 2462 MHz									
2,484.10	H	1000, Peak	39.62	26.71	66.33	74.0	7.67	Peak	X
2,483.50	H	1000, Peak	26.24	26.71	52.95	54.0	1.05	Average	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

3.8.9. Spurious Emission Test Results (Bluetooth)

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

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 BT mode : GFSK, 8DPSK

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/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.
3. Any emission values below more than 20dB are not recorded.

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

3.8.9.2 Radiated Spurious Emission (1 GHz ~ 25 GHz)

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 BT mode : GFSK

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	38.83	17.02	55.85	74.0	18.15	Peak	X
4804	H	1000, Peak	30.05	17.02	47.07	54.0	6.93	Average	X
Middle channel Ch. 39									
4882	H	1000, Peak	39.73	15.74	55.47	74.0	18.53	Peak	X
4882	H	1000, Peak	30.84	15.74	46.54	54.0	7.46	Average	X
Highest channel Ch. 79									
4960	H	1000, Peak	39.21	16.54	55.75	74.0	18.25	Peak	X
4960	H	1000, Peak	30.15	16.54	46.69	54.0	7.31	Average	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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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 : U4G0070
Test distance : 3m
Date : July 10th, 2012
BT mode : 8DPSK

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 0									
-	-	-	-	-	-	-	-	-	-
Lowest channel Ch. 39									
-	-	-	-	-	-	-	-	-	-
Lowest channel Ch. 79									
-	-	-	-	-	-	-	-	-	-

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.
 5. Any emission values below more than 20 dB are not recorded.

- 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

3.8.10. Spurious Emission Test Results (WLAN)

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

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WLAN mode : 802.11b/g/n

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/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.
3. Any emission values below more than 20dB are not recorded.

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

3.8.10.2 Radiated Spurious Emission (1 GHz ~ 25 GHz)

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WLAN mode : 802.11b

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 1									
4824	H	1000, Peak	42.10	17.02	59.12	74.0	14.88	Peak	X
4824	V	1000, Peak	30.30	17.02	47.32	54.0	6.68	Average	X
7236	H	1000, Peak	45.07	21.58	66.65	74.0	7.35	Peak	X
7236	H	1000, Peak	31.31	21.58	52.89	54.0	1.11	Average	X
Middle channel Ch. 6									
4874	H	1000, Peak	39.83	15.74	56.85	74.0	17.15	Peak	X
4874	H	1000, Peak	28.75	15.74	45.77	54.0	8.23	Average	X
7311	V	1000, Peak	42.55	20.62	64.13	74.0	9.87	Peak	Y
7311	H	1000, Peak	30.10	20.62	51.68	54.0	2.32	Average	X
Highest channel Ch. 11									
4924	H	1000, Peak	41.98	16.54	58.52	74.0	15.48	Peak	X
4924	V	1000, Peak	28.48	16.54	45.02	54.0	8.98	Average	X
7386	V	1000, Peak	43.26	20.62	63.88	74.0	10.12	Peak	Y
7386	H	1000, Peak	30.53	20.62	51.15	54.0	2.85	Average	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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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 : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WLAN mode : 802.11g

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 1									
4824	H	1000, Peak	42.66	17.02	59.68	74.0	14.32	Peak	X
4824	V	1000, Peak	30.14	17.02	47.16	54.0	6.84	Average	X
7236	H	1000, Peak	41.57	21.58	63.15	74.0	10.85	Peak	Y
7236	H	1000, Peak	30.01	21.58	51.59	54.0	2.41	Average	X
Middle channel Ch. 6									
4874	H	1000, Peak	43.47	15.74	59.21	74.0	14.79	Peak	X
4874	V	1000, Peak	30.75	15.74	46.49	54.0	7.51	Average	X
7311	V	1000, Peak	42.19	20.62	62.81	74.0	11.19	Peak	X
7311	H	1000, Peak	30.71	20.62	51.33	54.0	2.67	Average	X
Highest channel Ch. 11									
4924	H	1000, Peak	42.79	16.54	59.33	74.0	14.67	Peak	X
4924	V	1000, Peak	29.92	16.54	46.46	54.0	7.54	Average	X
7386	V	1000, Peak	42.05	20.62	62.67	74.0	11.33	Peak	Y
7386	H	1000, Peak	31.22	20.62	51.84	54.0	2.16	Average	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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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 : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WLAN mode : 802.11n

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/Z
Lowest channel Ch. 1									
4824	H	1000, Peak	42.29	17.02	59.31	74.0	14.69	Peak	X
4824	V	1000, Peak	28.09	17.02	45.11	54.0	8.89	Average	X
7236	H	1000, Peak	42.38	21.58	63.96	74.0	10.04	Peak	Y
7236	H	1000, Peak	30.21	21.58	51.79	54.0	2.21	Average	X
Middle channel Ch. 6									
4874	H	1000, Peak	43.25	15.74	58.99	74.0	15.01	Peak	X
4874	V	1000, Peak	29.42	15.74	45.16	54.0	8.84	Average	X
7311	V	1000, Peak	43.67	20.62	64.29	74.0	9.71	Peak	Y
7311	H	1000, Peak	31.39	20.62	52.01	54.0	1.99	Average	X
Highest channel Ch. 11									
4924	H	1000, Peak	42.33	16.54	58.87	74.0	15.13	Peak	X
4924	V	1000, Peak	28.62	16.54	45.16	54.0	8.84	Average	X
7386	V	1000, Peak	43.49	20.62	64.11	74.0	9.89	Peak	Y
7386	H	1000, Peak	30.92	20.62	51.54	54.0	2.46	Average	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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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. Receiver Radiated Spurious Emissions

3.9.1. Test Procedure

Same with the 3.8.1 Test procedure

3.9.2. Limits

Same with the 3.8.2 Limits

3.9.3. Receiver Spurious Emission Test Results (Bluetooth)

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

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 BT mode : GFSK, 8DPSK

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/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.
3. Any emission values below more than 20dB are not recorded.

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

3.9.3.2 Receiver Radiated Spurious Emission (1 GHz ~ 25 GHz)

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 BT mode : GFSK, 8DPSK

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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

3.9.4. Receiver Spurious Emission Test Results (WLAN)

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

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WLAN mode : 802.11b/g/n

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/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.
3. Any emission values below more than 20dB are not recorded.

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

3.9.4.2 Receiver Radiated Spurious Emission (1 GHz ~ 25 GHz)

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WLAN mode : 802.11b/g/n

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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

3.9.5. Receiver Spurious Emission Test Results (GSM/WCDMA)

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

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 GSM mode : GSM850/1900

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/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.
3. Any emission values below more than 20dB are not recorded.

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

3.9.5.2 Receiver Radiated Spurious Emission (1 GHz ~ 25 GHz)

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 GSM mode : GSM850/1900

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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

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

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WCDMA mode : WCDMA850/1900

Frequency (MHz)	Antenna Pol.	Bandwidth	Reading level [Quasi-Peak]	Correction factor	Level Corrected	Limit	Margin	Plane X/Y/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.
3. Any emission values below more than 20dB are not recorded.

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

3.9.5.4 Receiver Radiated Spurious Emission (1 GHz ~ 25 GHz)

FCC ID : U4G0070
 Test distance : 3m
 Date : July 10th, 2012
 WCDMA mode : WCDMA850/1900

Frequency (MHz)	Antenna Pol.	Bandwidth Detector	Reading level	Correction factor	Level Corrected	Limit	Margin	Remark	Plane X/Y/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 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.
 5. Any emission values below more than 20 dB are not recorded.

- 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

3.10. Effective Radiated Power

3.10.1. Test Procedure

The radiated and spurious measurements were made Fully-anechoic chamber at a 3-meter test range. The EUT was placed on the rotating device at 1.5m and at a distance of 3-meters from the receive antenna. The rotating device which can rotate horizontal axis was mounted on the turn unit to facilitate rotation around a vertical axis. The measurement was made for each horizontal/vertical position combination with receive antenna horizontally polarized. This measurement was repeated with receive antenna vertically polarized. The substitution antenna will replace the EUT antenna it the same position and in vertical polarization. The frequency of the signal generator shall be set to the frequencies that were measured on the EUT. The signal generator, output level, shall be adjusted until an equal or a known related level to what was measured from the EUT is obtained in the spectrum analyzer. This level was recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

All modes of operation were investigated, and the worst-case results are reported.

3.10.2. Limit

FCC 22.913(b) : The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

FCC 24.232(b) : The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

3.10.3. Test Results

• GSM 850 Test Data

Frequency(MHz)	Measured Level [dBm]	Correction Factor [dB]	Polarization [H/V]	ERP [dBm]
824.2	-22.59	54.71	H	32.12
836.6	-21.75	53.52	H	31.80
848.8	-21.45	53.57	H	31.92

• GSM 1900 Test Data

Frequency(MHz)	Measured Level [dBm]	Correction Factor [dB]	Polarization [H/V]	EIRP [dBm]
1850.2	-31.16	61.52	H	30.36
1880.0	-29.93	61.75	H	31.82
1909.8	-30.05	61.94	H	31.89

• WCDMA 850 Test Data

Frequency(MHz)	Measured Level [dBm]	Correction Factor [dB]	Polarization [H/V]	ERP [dBm]
824.2	-31.99	54.49	H	22.50
836.6	-31.05	53.52	H	22.47
848.8	-32.33	53.19	H	20.86

• WCDMA1900 Test Data

Frequency(MHz)	Measured Level [dBm]	Correction Factor [dB]	Polarization [H/V]	EIRP [dBm]
1850.2	-37.59	61.79	H	24.20
1880.0	-36.95	61.75	H	24.80
1909.8	-36.69	62.15	H	25.46

3.11. Field Strength of Spurious Radiation

3.11.1. Limit

FCC 22.917(a) & 24.238(a) : The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

- Limit : -13 dBm

3.11.2. Test Results (GSM850)

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 824.2 MHz					
1648.4	-62.96	7.66	-55.30	H	-13
2472.6	-57.08	10.78	-46.30	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 836.6 MHz					
1673.2	-45.93	7.70	-38.23	H	-13
2509.8	-54.40	10.81	-43.59	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 848.8 MHz					
1697.6	-45.54	8.02	-37.54	H	-13
2546.4	-57.47	10.82	-46.65	V	-13

3.11.3. Test Results (GSM1900)

Frequency (MHz)	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 1850.2 MHz					
3700.4	-59.70	12.02	-47.68	V	-13
5550.6	-59.92	12.58	-47.34	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1880.0 MHz					
3760.0	-60.87	12.23	-48.64	V	-13
5640.0	-59.84	12.59	-47.25	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1909.8 MHz					
3819.6	-60.51	12.29	-48.22	V	-13
5729.4	-60.21	12.60	-47.61-	V	-13

3.11.4.Results (WCDMA850)

Frequency (MHz)	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 826.4 MHz					
1648.4	-63.66	7.76	-55.90	H	-13
4132.0			-61.75		-13
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 836.6 MHz					
1673.2	-64.55	7.70	-56.85	H	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 846.6 MHz					
1693.2	-57.35	8.12	-49.23	H	-13
-	-	-	-	-	-

3.11.5. Test Results (WCDMA1900)

Frequency (MHz)	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 1852.4 MHz					
3704.8	-64.02	12.09	-51.93	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1880.0 MHz					
3760.0	-66.94	12.23	-54.71	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1907.6 MHz					
3815.2	-49.18	12.35	-46.83	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

4. TEST EQUIPMENTS

No.	Equipment	Manufacturer	Model	S/N	Calibration Due date
1	Spectrum Analyzer	Agilent	E4407B	US41443316	02-01-2013
2	Synthesized Sweeper	HP	83620A	3250A01653	02-14-2013
3	Digital RF Signal Generator	Agilent	E4438C	US41460859	02-01-2013
4	Signal Generator	R&S	SMIQ O3	DE22348	02-15-2013
5	PSA Series Spectrum Analyzer	Agilent	E4448A	US44300484	02-06-2013
6	DC Power Supply	Agilent	E4356A	MY41000296	02-05-2013
7	DC Power Supply	Agilent	E3645A	MY40000851	01-29-2013
8	AC Power Supply	Agilent	6811B	MY41000446	02-06-2013
9	Oscilloscope	Agilent	DSO6054A	MY44001104	02-08-2013
10	Directional Coupler	Agilent	87300C	MY44300126	02-13-2013
11	Directional Coupler	Agilent	773D	MY28390213	02-13-2013
12	VHF Attenuator	HP	355D	2522A45959	02-16-2013
13	Coaxial Attenuator	Weinschel	56-20	N8527	02-13-2013
14	Coaxial Attenuator	Agilent	8491B	50109	02-10-2013
15	Power Divider	HP	11636A	09084	02-13-2013
16	Power Splitter	HP	11667A	21063	02-13-2013
17	Frequency Counter	Anritsu	MF2412B	6200303497	01-31-2013
18	Synthesized Sweeper	HP	83620A	3250A01053	02-15-2013
19	Temp/Humidity Chamber	ESPEC	SH-641	92007482	02-07-2013
20	Function/Arbitrary Waveform Generator	Agilent	33220A	MY44029652	01-20-2013
21	EMI Receiver	R&S	ESIB26	100280	03-20-2013
22	Pre-Amplifier	HP	83017A	MY39500982	02-16-2013
23	Pre-Amplifier	SONA INSTRUMENT	310	284609	02-06-2013
24	Tuned Dipole Antenna	Schwarzbeck	UHA 9103	--	09-09-2012
25	Biconi-Log Antenna	ETS-Lindgren	UBAA9114	9114-201	04-05-2013
26	Double Ridge Wave Guide	ETS-Lindgren	3115	00125694	06-20-2013