SGS-CSTC Standards Technical Services
Co., Ltd. GuangZhou Branch Testing Center

CNAS TESTING
CNAS L0167

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TEST REPORT

Application No. :	GLEMO081203744RF
Applicant:	Philips Consumer Lifestyle
Manufacture:	Philips Consumer Lifestyle
Factory:	Arts Electronics Co., Ltd.
FCC ID:	BOU-DC350V37
Fundamental Carrier Frequency :	2.402GHz to 2.480GHz

Equipment Under Test (EUT):

Name:	Docking Entertainment System
Model:	DC350/37
Serial No.:	Not supplied by client
Trade Mark:	PHILIPS
Standards:	FCC PART 15 Subpart C: 2008
Date of Receipt:	17 December, 2008
Date of Test:	18 December to 24 December, 2008
Date of Issue:	30 December, 2008

Test Result :	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further detail.

Authorized Signature:

Stephen Guo
Manager

2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Antenna Requirement	FCC PART 15 :2008	Section 15.247 (c)	PASS
Occupied Bandwidth	FCC PART 15 :2008	Section 15.247 (a1)	PASS
Carrier Frequencies Separated	FCC PART 15 :2008	Section 15.247(a)(1)	PASS
Hopping Channel Number	FCC PART 15 :2008	Section 15.247(a)(1)(iii)	PASS
Dwell Time	FCC PART 15 :2008	Section 15.247(a)(1)(iii)	PASS
Pseudorandom Frequency Hopping Sequence	FCC PART 15 :2008	Section 15.247(a)(1)	PASS
Maximum Peak Output Power	FCC PART 15 :2008	Section 15.247(b)(1)	PASS
RF Exposure Compliance Requirement	FCC PART 15 :2008	15.247(b)(4)& TCB Exclusion List (7 July 2002)	PASS
Conducted Emission	FCC PART 15 :2008	Section 15.207	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2008	Section 15.209 &15.247(d)	PASS
Radiated Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2008	Section 15.209 &15.247(d)	PASS
Band Edges Measurement	FCC PART 15 :2008	Section 15.247 (d) &15.205	PASS

Contents

3 General Information

3.1 Client Information

Applicant:	Philips Consumer Lifestyle
Address of Applicant:	3029 E. Governor John Sevier Hwy. Knoxville, TN 37914
Manufacture:	Philips Consumer Lifestyle
Address of Manufacture:	3029 E. Governor John Sevier Hwy. Knoxville, TN 37914
Factory:	Arts Electronics Co., Ltd.
Address of Factory:	NO. 1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, CHINA

3.2 General Description of E.U.T.

Name:	Docking Entertainment System
Model No.:	DC350/37
Trade Mark:	PHILIPS
Operating Frequency	2402MHz to 2480MHz
Channels:	79 Channels with 1MHz step
Type of Modulation	FHSS (Frequency Hopping Spread Spectrum);
Function:	Bluetooth
Bluetooth Chipset:	CSR BC03
Antenna Type:	integral
Antenna Gain:	Max 3dBi from 2400MHz to 2483.5MHz
EUT Power Supply:	Product power supply: AC 100-240V / DC 12V 2A DC 3V (1 x 3V “CR2025” Size button cell) for remote controller Bluetooth chipset power supply: DC 3.3V
Adapter Details:	Model:GFP241DA-1220-1 Input: AC100-240V~ 50-60Hz 0.55A Output: DC 12V, 2A Model:OH-1028A1202000U Input: AC100-240V~ 50/60Hz 0.8A MAX Output: DC 12V, 2A
Power Cord:	1.8m x 2 wires unscreened AC Mains cable 1.8m x 2 wires unscreened DC cable

3.3 Description of Support Units

The EUT has been tested with PC for fixed frequency by testing lab.

3.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15 Subpart C: 2008. ANSI C63.4:2003. DA 00-705.

3.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory. 198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, Guangdong, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

3.6 Other Information Requested by the Customer

None.

3.7 Test Facility

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

- **NVLAP – Lab Code: 200611-0**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399. May 31. 2002. With the above and NVLAP's accreditation. SGS-CSTC is an authorized test laboratory for the DoC process.

4 Equipments Used during Test

	RE in Chamber					
No:	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	28-01-2008	28-01-2009
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2008	04-12-2009
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2008	12-08-2009
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2008	12-08-2009
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2008	12-08-2009
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2008	05-12-2009
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	11-03-2008	11-03-2009
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	11-03-2008	11-03-2009
EMC0075	310N Amplifier	Sonama	310N	272683	10-09-2008	10-09-2009
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2008	09-08-2010
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	10-08-2008	10-08-2009

	Conducted Emission					
No:	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m^3	N/A	N/A	N/A
EMC0102	LISN	Schaffner Chase	MNZ050D/1	1421	14-12-2008	14-12-2009
EMC0118	Two-line v-netwok	Rohde & Schwarz	ENV216	3560.6550.02	28-07-2008	28-07-2009
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	14-12-2008	14-12-2009
EMC0107	Coaxial Cable	SGS	2m	N/A	24-11-2008	26-11-2009
EMC0106	Voltage Probe	SGS	N/A	N/A	N/A	N/A
EMC0120	8 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	20550	21-02-2008	21-02-2009
EMC0121	4 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	20549	21-02-2008	21-02-2009
EMC0122	2 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	20548	21-02-2008	21-02-2009

	Reference Equipment				
No:	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**
No. 1	Notebook	IBM	T40	99-FBAF9 03/09	N/A
No. 2	Philips Bluetooth	Philips	N/A	N/A	N/A

5 Test Results

5.1 E.U.T. test conditions

Power supply:	Product power supply: AC 100-240V / DC 12V 2A DC 3V (1 x 3V "CR2025" Size button cell) for remote controller Bluetooth chipset power supply: DC 3.3V
Type of antenna:	Printed layout
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	38-52 % RH
Atmospheric Pressure:	992 -1010 mbar
Test frequencies:	According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	14	2416	28	2430
1	2403	15	2417	29	2431
2	2404	16	2418	30	2432
3	2405	17	2419	31	2433
4	2406	18	2420	32	2434
5	2407	19	2421	33	2435
6	2408	20	2422	34	2436
7	2409	21	2423	35	2437
8	2410	22	2424	36	2438
9	2411	23	2425	37	2439
10	2412	24	2426	38	2440
11	2413	25	2427	39	2441
12	2414	26	2428	40	2442
13	2415	27	2429	41	2443

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	2444	55	2457	68	2470
43	2445	56	2458	69	2471
44	2446	57	2459	70	2472
45	2447	58	2460	71	2473
46	2448	59	2461	72	2474
47	2449	60	2462	73	2475
48	2450	61	2463	74	2476
49	2451	62	2464	75	2477
50	2452	63	2465	76	2478
51	2453	64	2466	77	2479
52	2454	65	2467	78	2480
53	2455	66	2468		
54	2456	67	2469		

Test frequency is the lowest channel: 0 channel(2402MHz), middle channel: 39 channel(2441MHz) and highest channel: 78 channel(2480MHz)

5.2 Antenna Requirement

5.2.1 Standard requirement

15.203 requirement:
For intentional device. According to 15.203. an intentional radiator shall be designed to Ensure that no antenna other than that furnished by the responsible party shall be used with the device.
15.247(c) (1)(i) requirement:
(i) Systems operating in the 2400-2483.5 MHz bands that are used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.2.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.0dBi.

Test result: The unit does meet the FCC requirements.

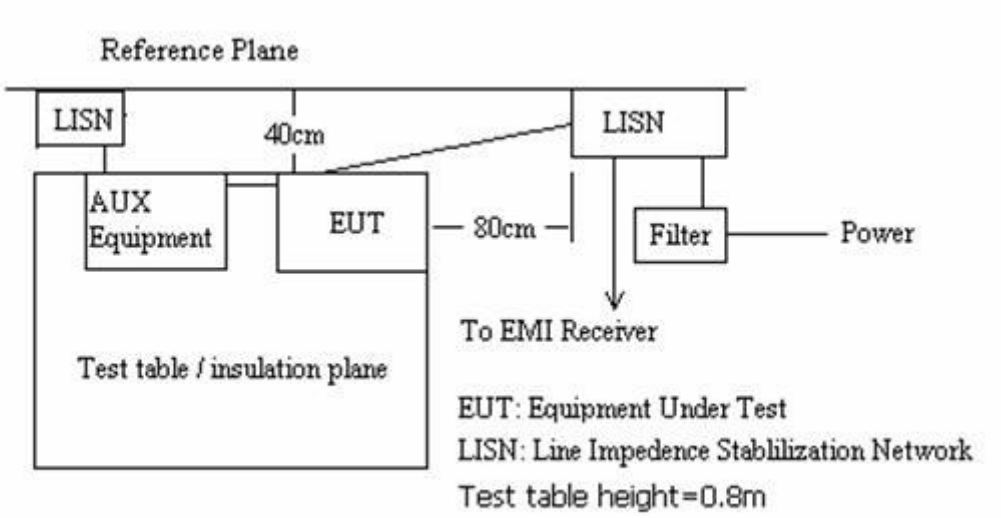
5.3 Conducted Emissions at Mains Terminals 150 kHz to 30MHz

Test Requirement:	FCC Part 15.207
Test Method:	ANSI C63.4
Test Date:	18 December, 2008
Frequency Range:	150KHz to 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)
	Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit
EUT Operation:	Test the EUT in Bluetooth function on mode.

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Plan View of Test Setup

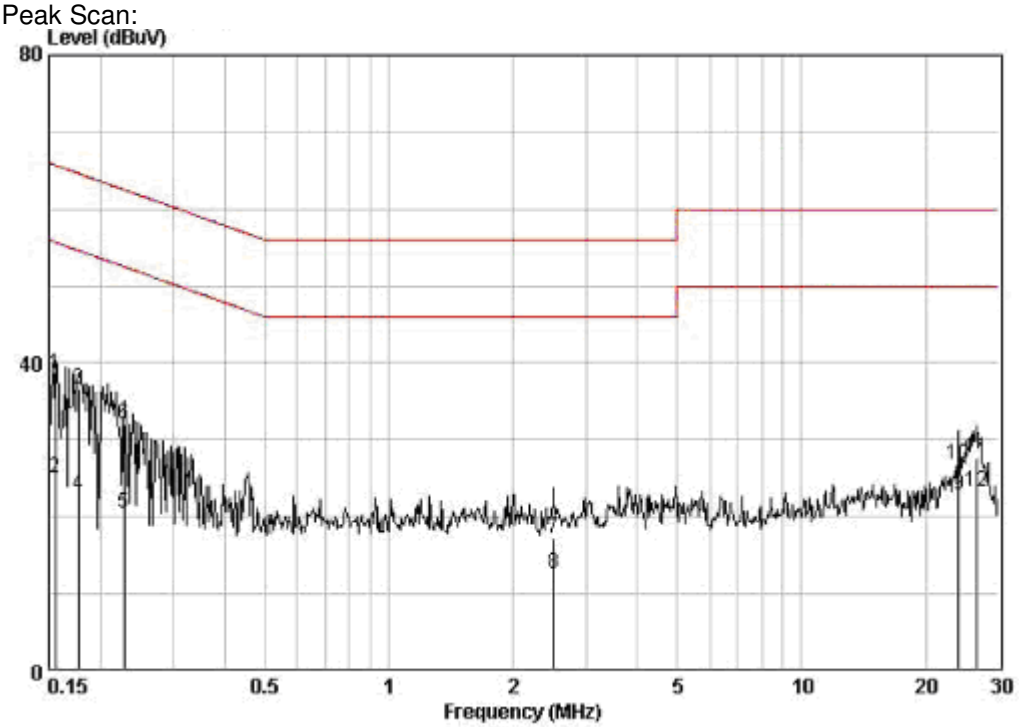


Adapter model:OH-1028A1202000U

Measurement Data **Uncertainty: ± 3dB**

Neutral Line:

Peak Scan:



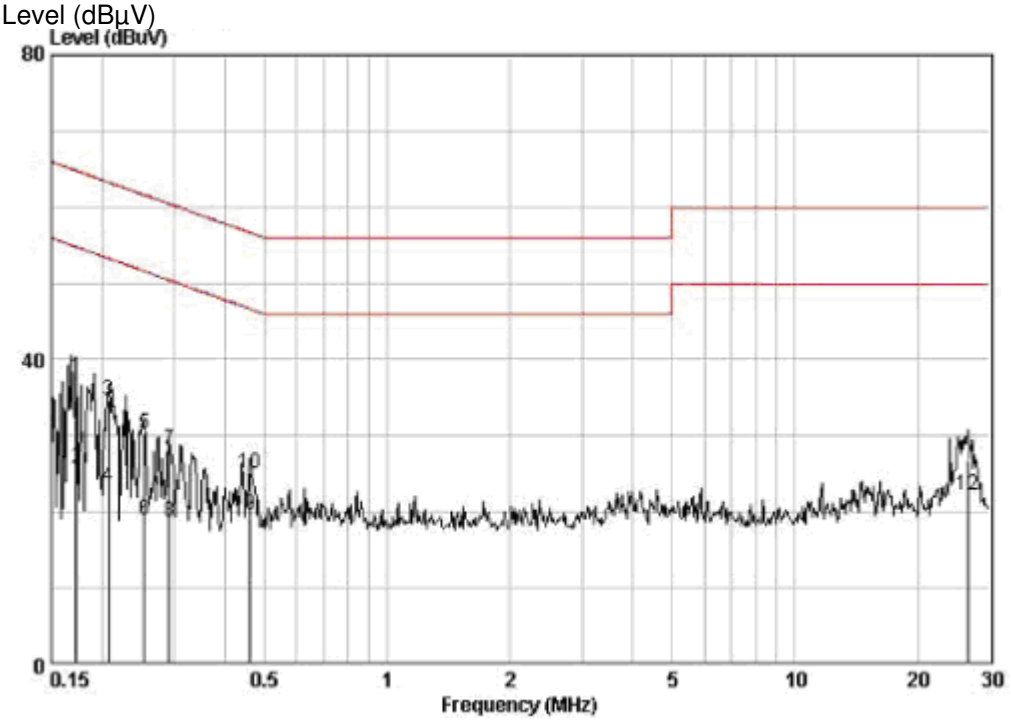
Quasi-peak and Average measurement:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.156	28.90	0.10	9.58	38.59	65.69	-27.11	QP
0.156	15.31	0.10	9.58	25.00	55.69	-30.70	AVERAGE
0.177	26.98	0.12	9.59	36.68	64.64	-27.95	QP
0.177	13.25	0.12	9.59	22.95	54.64	-31.68	AVERAGE
0.228	10.79	0.14	9.59	20.52	52.52	-32.00	AVERAGE
0.228	22.36	0.14	9.59	32.09	62.52	-30.43	QP
2.500	7.36	0.18	9.61	17.15	56.00	-38.85	QP
2.500	2.77	0.18	9.61	12.56	46.00	-33.44	AVERAGE
24.015	12.21	0.51	10.10	22.82	50.00	-27.18	AVERAGE
24.015	16.14	0.51	10.10	26.75	60.00	-33.25	QP
26.558	17.12	0.46	10.10	27.68	60.00	-32.32	QP
26.558	12.74	0.46	10.10	23.30	50.00	-26.70	AVERAGE

Live Line:

Peak Scan:

Level (dBµV)



Quasi-peak and Average measurement:

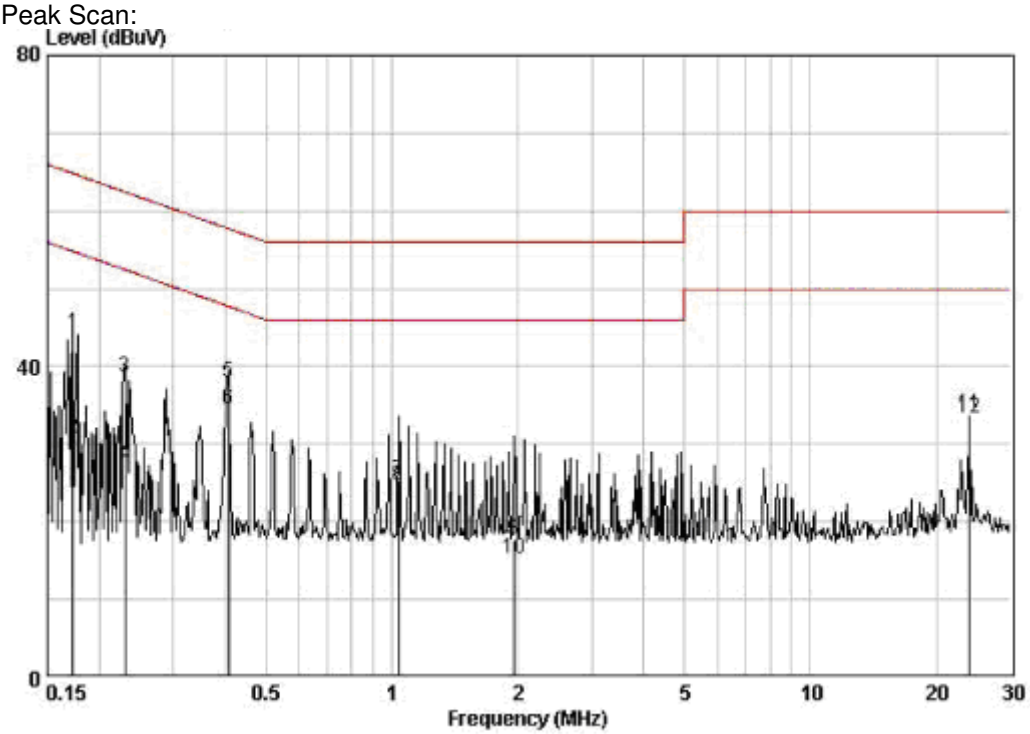
Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.173	28.06	0.12	9.57	37.75	64.81	-27.07	QP
0.173	15.96	0.12	9.57	25.65	54.81	-29.17	AVERAGE
0.207	24.98	0.13	9.58	34.69	63.32	-28.62	QP
0.207	13.66	0.13	9.58	23.37	53.32	-29.94	AVERAGE
0.253	20.48	0.16	9.58	30.22	61.64	-31.43	QP
0.253	9.29	0.16	9.58	19.03	51.64	-32.62	AVERAGE
0.292	18.26	0.17	9.58	28.01	60.46	-32.44	QP
0.292	9.09	0.17	9.58	18.84	50.46	-31.61	AVERAGE
0.461	9.71	0.22	9.59	19.52	46.67	-27.15	AVERAGE
0.461	15.32	0.22	9.59	25.13	56.67	-31.54	QP
26.558	16.44	0.46	9.96	26.86	60.00	-33.14	QP
26.558	11.86	0.46	9.96	22.28	50.00	-27.72	AVERAGE

Adapter model:GFP241DA-1220-1

Measurement Data **Uncertainty: ± 3dB**

Neutral Line:

Peak Scan:



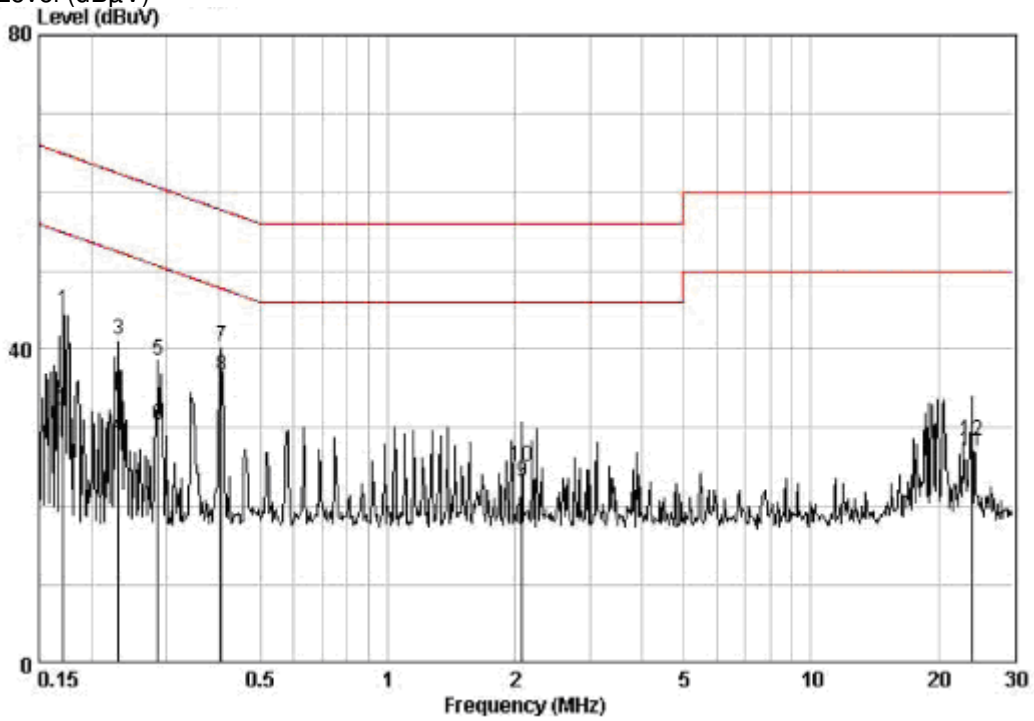
Quasi-peak and Average measurement:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.173	34.56	0.12	9.59	44.26	64.81	-20.55	QP
0.173	21.03	0.12	9.59	30.73	54.81	-24.08	AVERAGE
0.230	28.90	0.15	9.59	38.64	62.44	-23.80	QP
0.230	17.51	0.15	9.59	27.25	52.44	-25.19	AVERAGE
0.406	28.18	0.21	9.59	37.98	57.73	-19.75	QP
0.406	24.59	0.21	9.59	34.39	47.73	-13.34	AVERAGE
1.037	15.44	0.30	9.58	25.32	56.00	-30.68	QP
1.037	14.65	0.30	9.58	24.53	46.00	-21.47	AVERAGE
1.959	7.82	0.21	9.60	17.63	56.00	-38.37	QP
1.959	5.39	0.21	9.60	15.20	46.00	-30.80	AVERAGE
24.005	23.28	0.51	10.10	33.89	60.00	-26.11	QP
24.005	22.66	0.51	10.10	33.27	50.00	-16.73	AVERAGE

Live Line:

Peak Scan:

Level (dBµV)



Quasi-peak and Average measurement:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.171	35.30	0.11	9.57	44.98	64.90	-19.92	QP
0.171	22.50	0.11	9.57	32.18	54.90	-22.72	AVERAGE
0.232	31.54	0.15	9.58	41.27	62.39	-21.12	QP
0.232	19.33	0.15	9.58	29.06	52.39	-23.33	AVERAGE
0.286	28.74	0.17	9.58	38.49	60.63	-22.14	QP
0.286	20.46	0.17	9.58	30.21	50.63	-20.42	AVERAGE
0.404	30.46	0.20	9.59	40.25	57.77	-17.52	QP
0.404	26.90	0.20	9.59	36.69	47.77	-11.08	AVERAGE
2.077	13.31	0.20	9.61	23.13	46.00	-22.87	AVERAGE
2.077	15.26	0.20	9.61	25.08	56.00	-30.92	QP
24.015	16.48	0.51	9.96	26.95	50.00	-23.05	AVERAGE
24.015	17.78	0.51	9.96	28.25	60.00	-31.75	QP

Remark: Level = Real Level + Cable loss + LISN factor

TEST RESULTS: The unit does meet the FCC requirements.

5.4 Occupied Bandwidth

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247 & DA 00-705

Test Date: 19 December , 2008

Test Status: Test the EUT in transmitting mode at lowest, Middle and highest channel.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel;
3. Set the spectrum analyzer: RBW >= 1% of the 20dB bandwidth (set 100kHz). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points or 99% bandwidth.

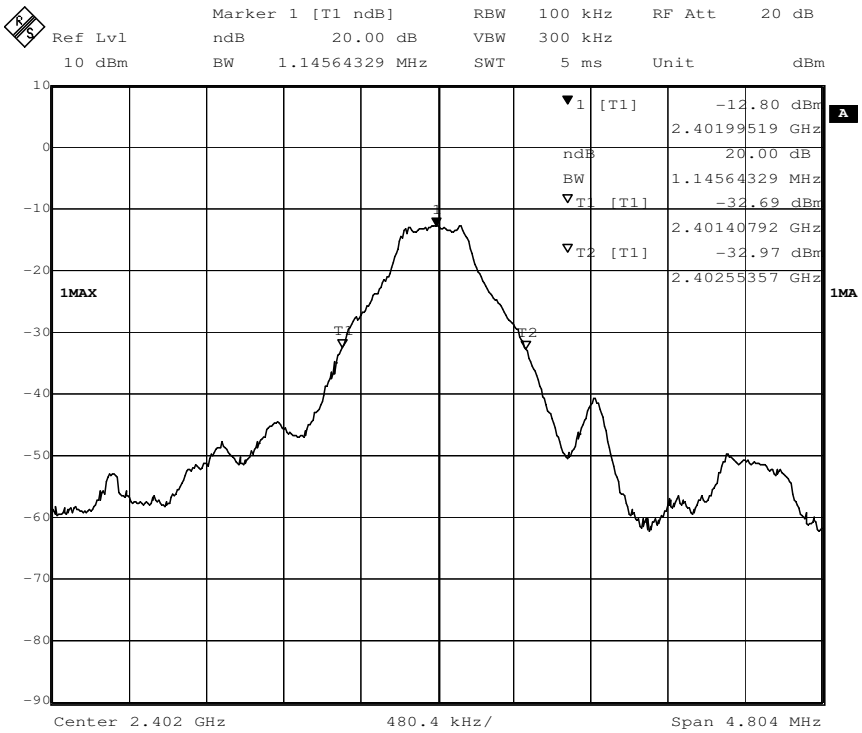
Test result:

GFSK mode:

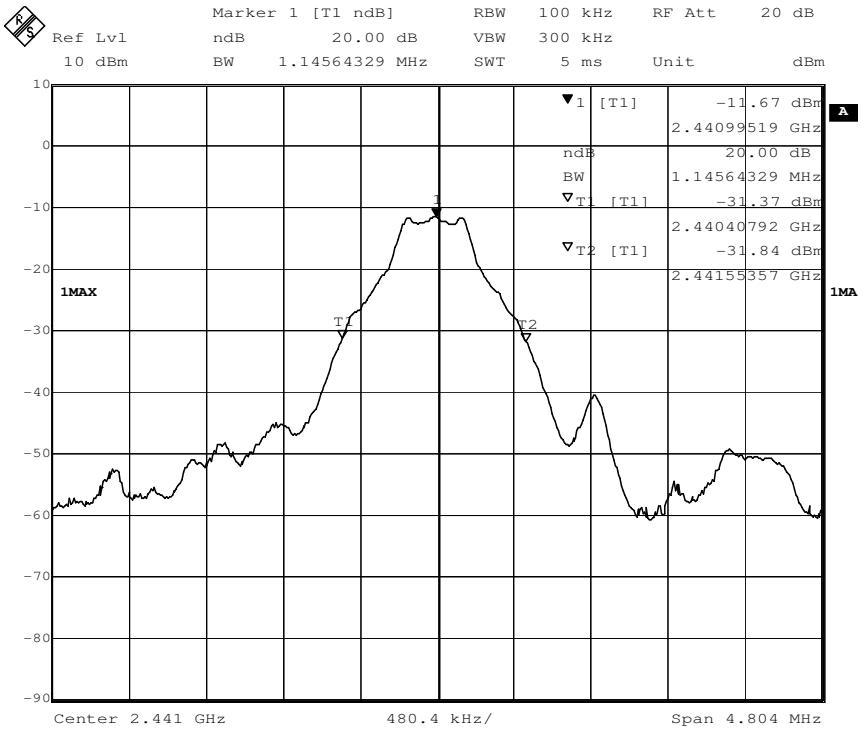
Test Channel	bandwidth
Low	1.1456MHz
Middle	1.1456MHz
High	1.1423MHz

Result plot as follows:

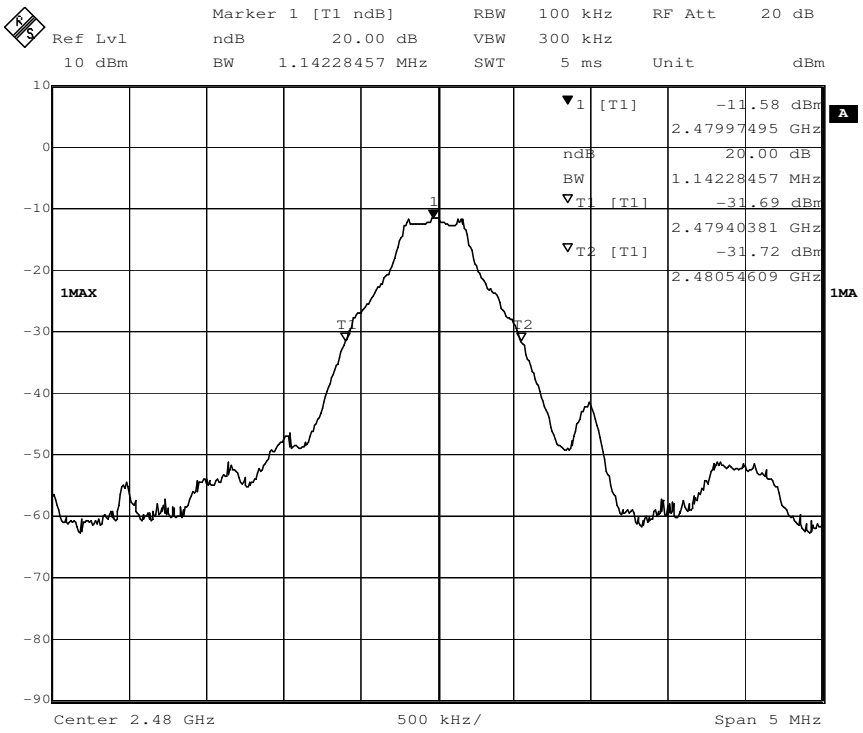
Lowest Channel:



Middle Channel:



Highest Channel:



5.5 Carrier Frequencies Separated

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247 & DA 00-705

Test Date: 19 December, 2008

Test requirements: Regulation 15.247(a),(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier 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.

Test Status: Test in hopping transmitting operating mode.

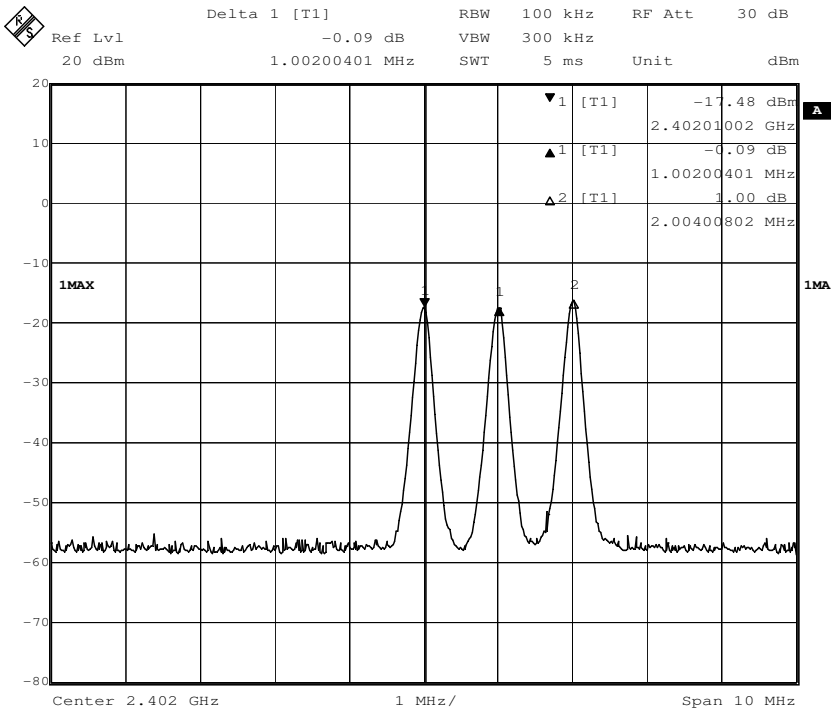
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW >= 1% of the span (set 100 kHz). VBW >= RBW , Span = 6MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

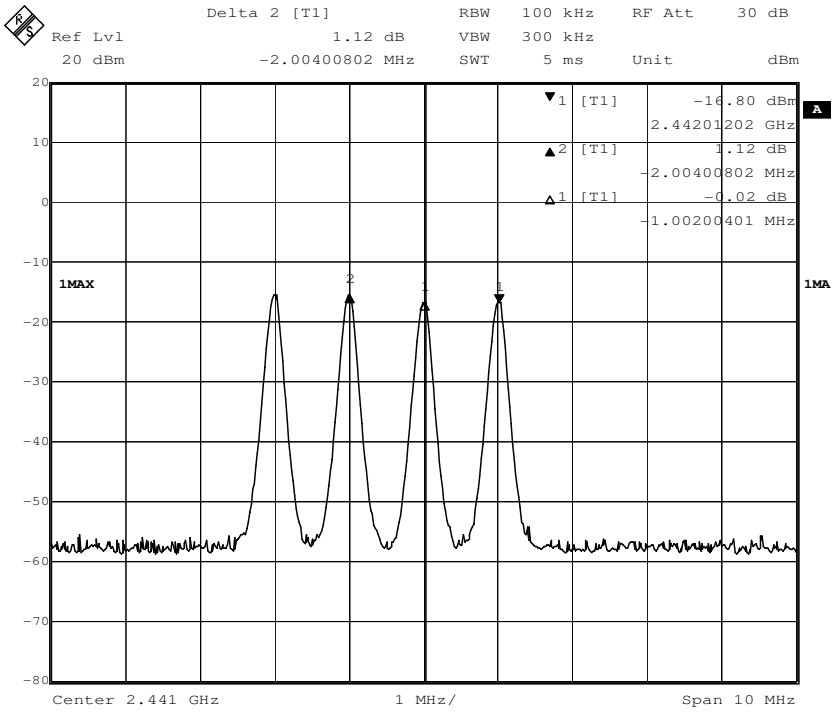
Test result:

Test Channel	Carrier Frequencies Separated	PASS/FAIL
Lower Channels (channel 0 and channel 1)	1.002MHz	Pass
Middle Channels (channel 39 and channel 40)	1.002MHz	Pass
Upper Channels (channel 77 and channel 78)	1.002MHz	Pass
Remark: Test the EUT in Bluetooth function on mode and the limit in is 763.7KHz which is two-thirds of the 20 dB bandwidth of the hopping channel.		

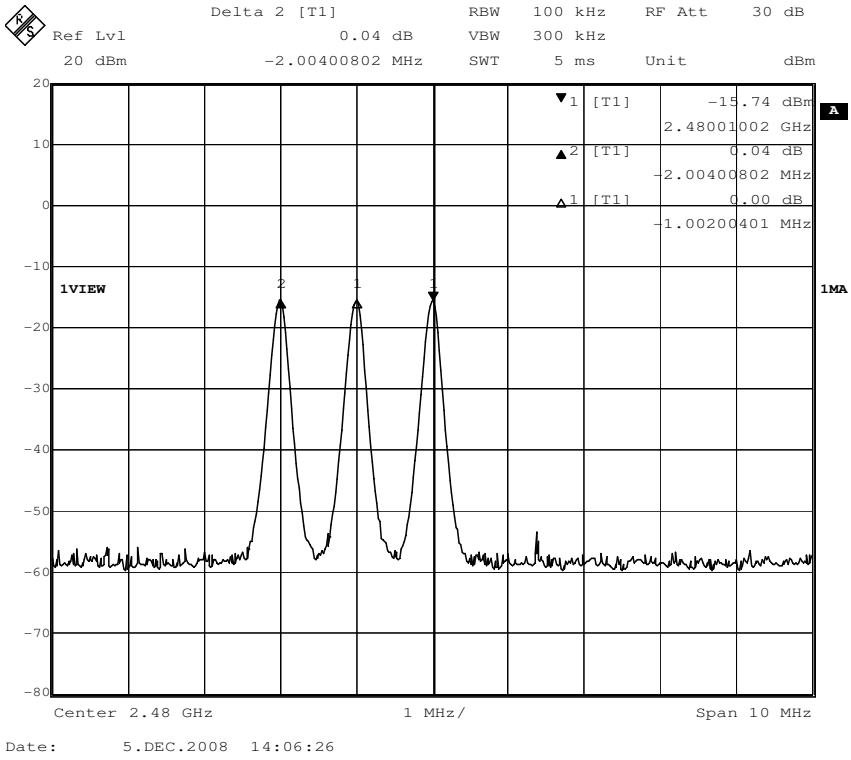
1. Lowest Channels: **Carrier Frequencies Separated**



2. Middle Channels: Carrier Frequencies Separated



3. Highest Channels: **Carrier Frequencies Separated**



Test result: The unit does meet the FCC requirements.

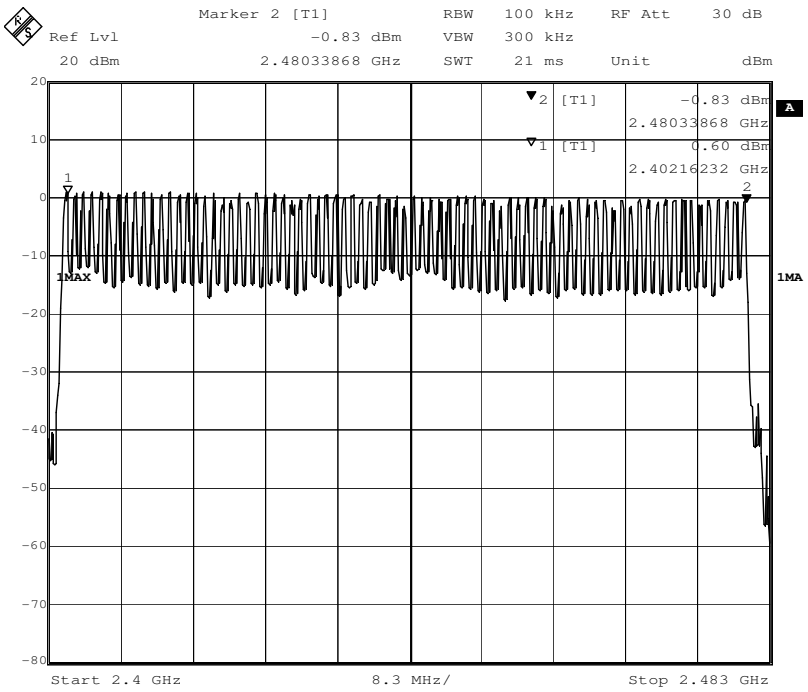
5.6 Hopping Channel Number

Test Requirement:	FCC Part15 C
Test Method:	Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date:	22 December, 2008
Requirements:	Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Status:	Test in hopping transmitting operating mode.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

Test result: Total channels are 79 channels.



Test result: The unit does meet the FCC requirements.

5.7 Dwell Time

Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date:	22 December, 2008
Test requirements:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Status:	Test in hopping transmitting operating mode.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

Test the EUT in Bluetooth function on mode.

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

1. **Channel 0:** 2.402GHz

DH1 time slot = 0.431(ms) * (1600/(2*79)) * 31.6 = 137.920 ms

DH3 time slot = 1.683 (ms) * (1600/(4*79)) * 31.6 = 269.280 ms

DH5 time slot = 2.946(ms) * (1600/(6*79)) * 31.6 = 314.240 ms

2. **Channel 39:** 2.441GHz

DH1 time slot = 0.431 (ms) * (1600/(2*79)) * 31.6 = 137.920 ms

DH3 time slot = 1.683(ms) * (1600/(4*79)) * 31.6 = 269.280 ms

DH5 time slot = 2.946 (ms) * (1600/(6*79)) * 31.6 = 314.240 ms

3. **Channel 78:** 2.480GHz

DH1 time slot = 0.431 (ms) * (1600/(2*79)) * 31.6 = 137.920 ms

DH3 time slot = 1.683 (ms) * (1600/(4*79)) * 31.6 = 269.280 ms

DH5 time slot = 2.946 (ms) * (1600/(6*79)) * 31.6 = 314.240 ms

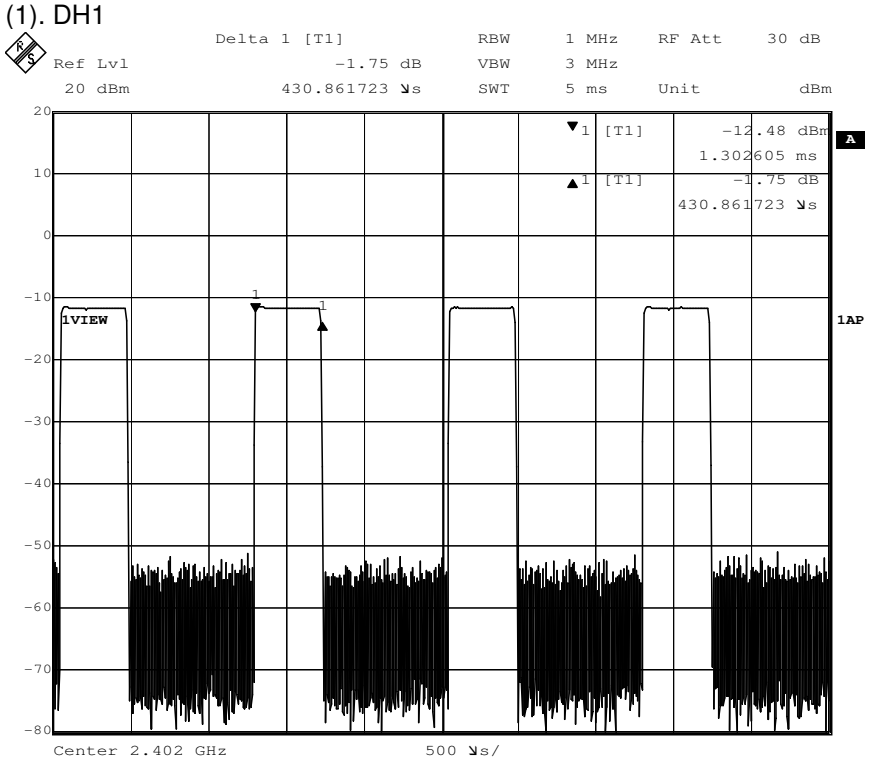
The results are not greater than 0.4 seconds.

The unit does meet the FCC requirements.

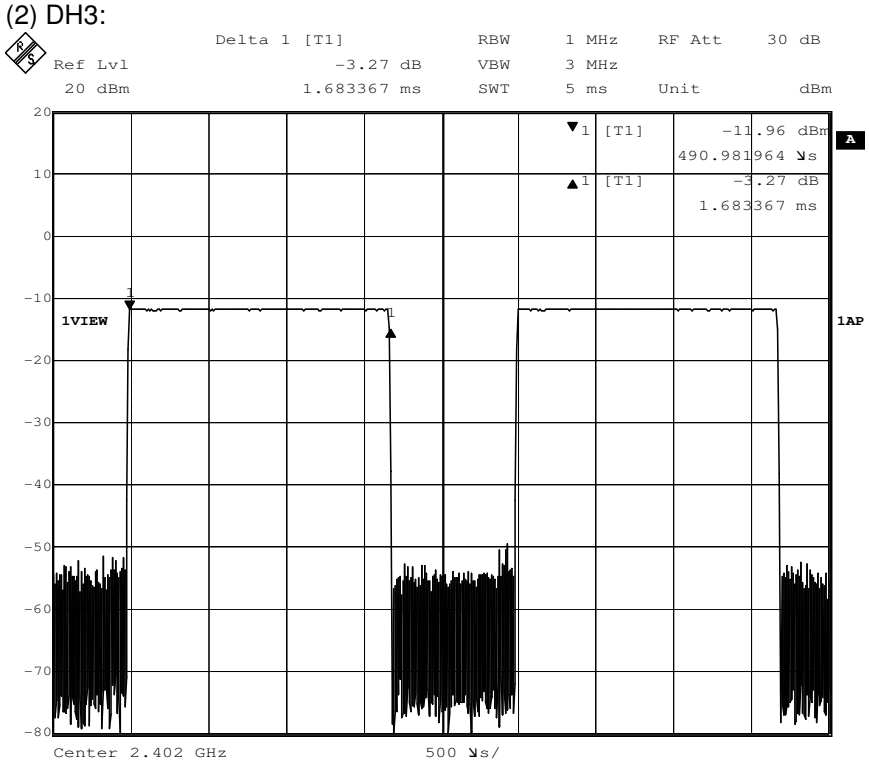
Please refer the graph as below:

1. Lowest channel (2.402 GHz):

(1). DH1

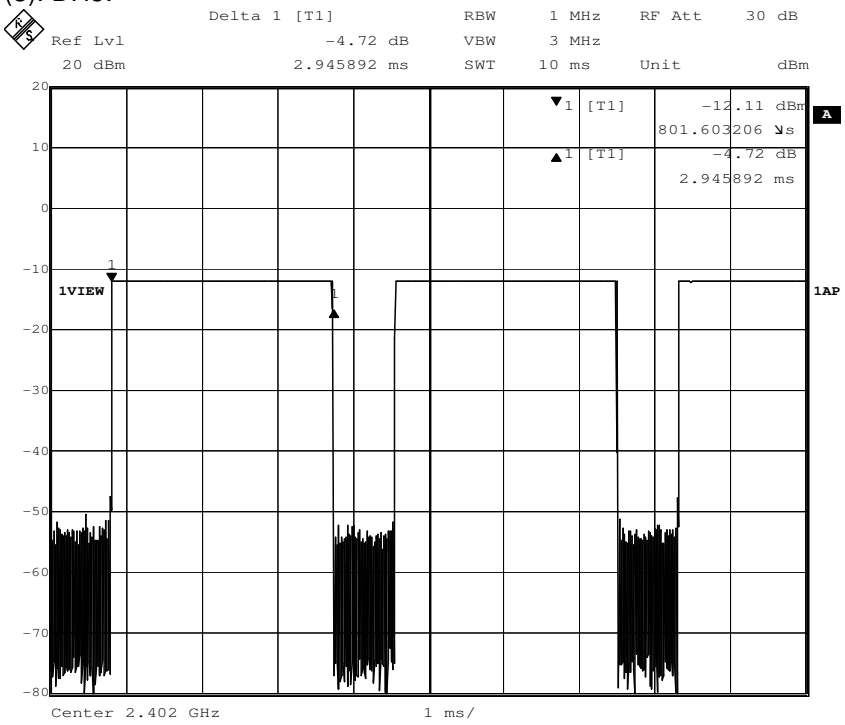


(2) DH3:



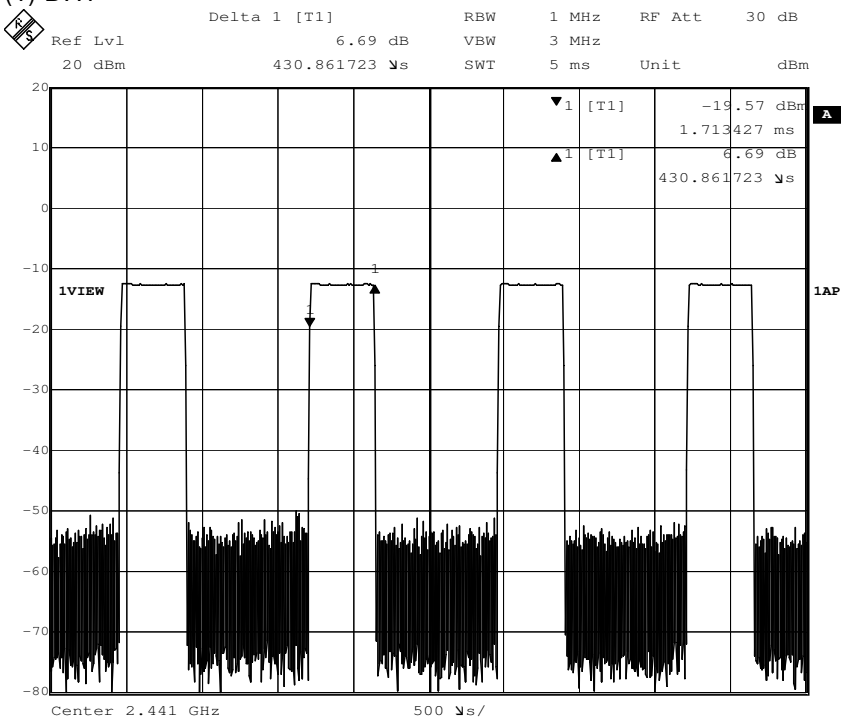
1. Lowest channel (2.402 GHz):

(3). DH5:



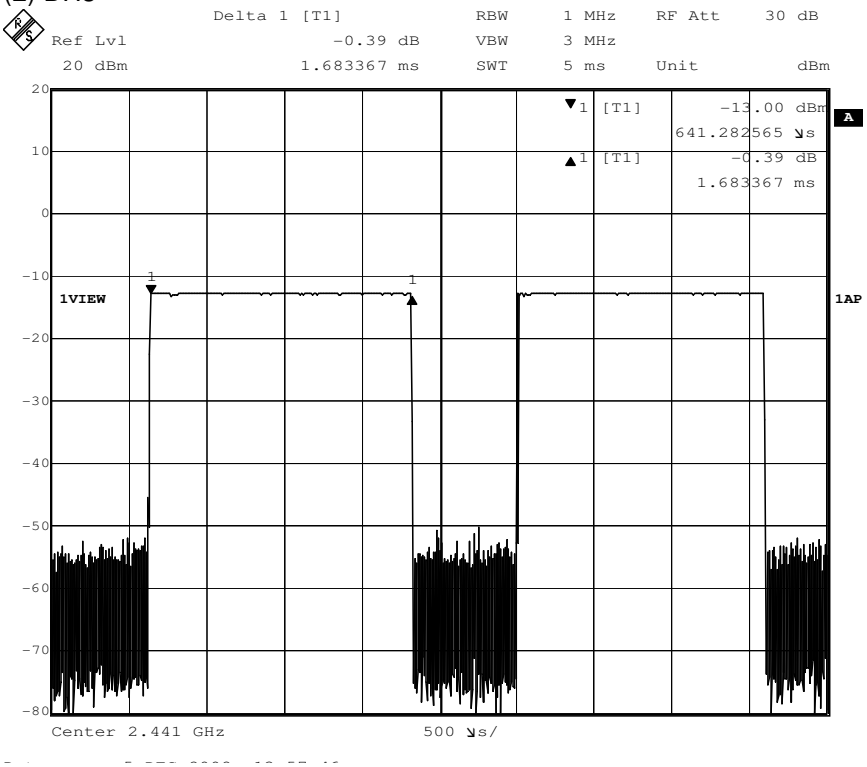
2. Middle Channel (2.441GHz)

(1) DH1

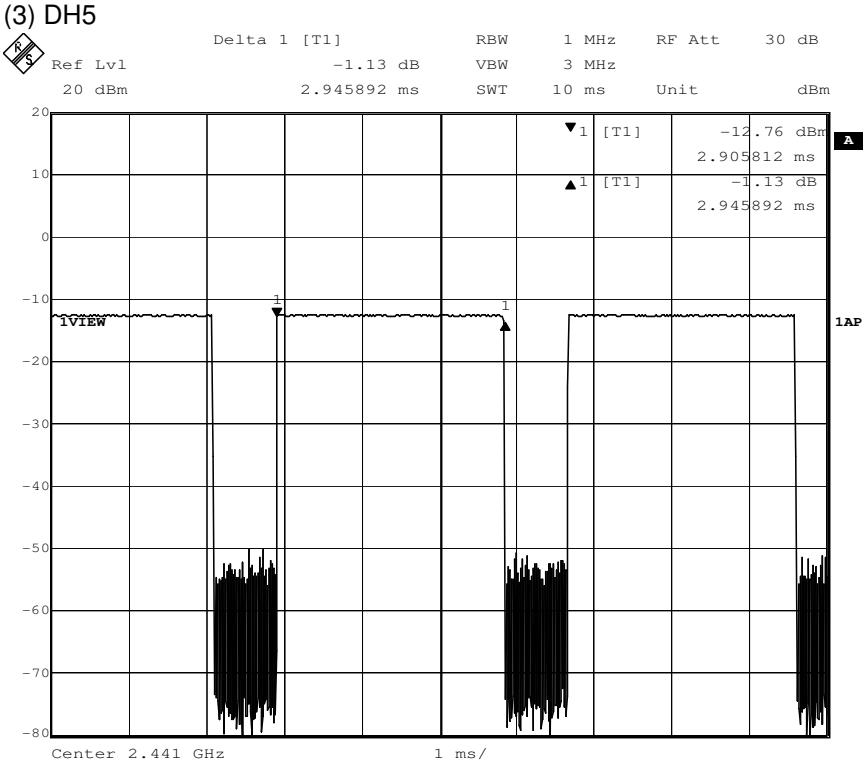


2. Middle Channel (2.441GHz)

(2) DH3

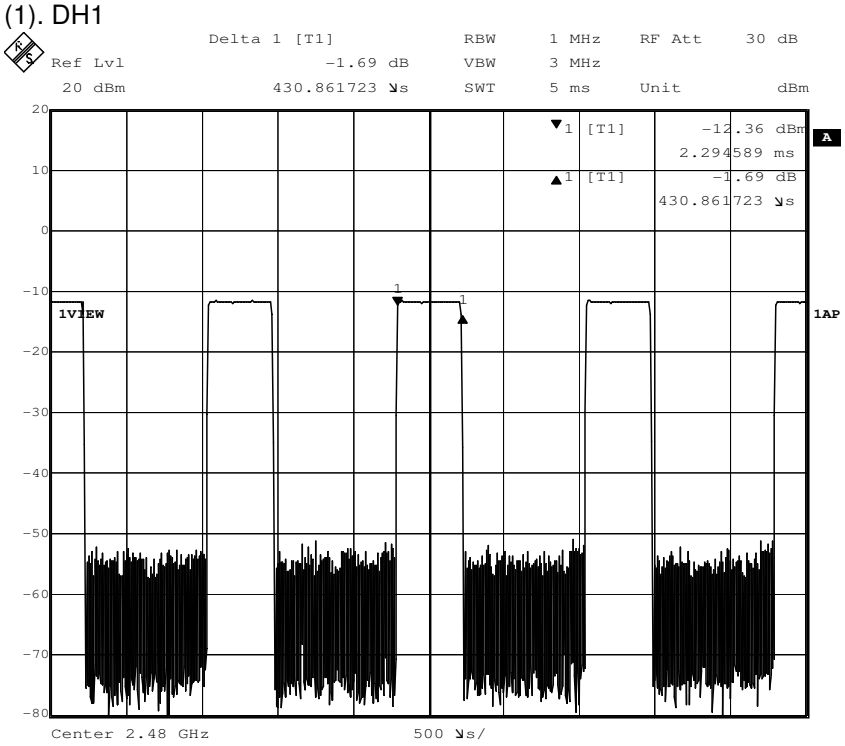


(3) DH5

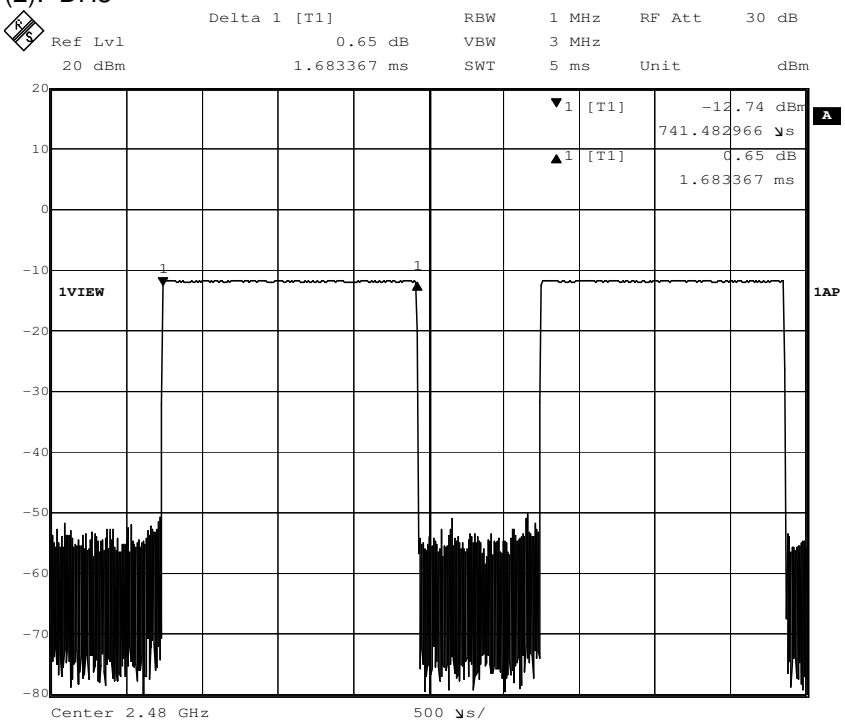


3. Highest channel (2.480GHz)

(1). DH1

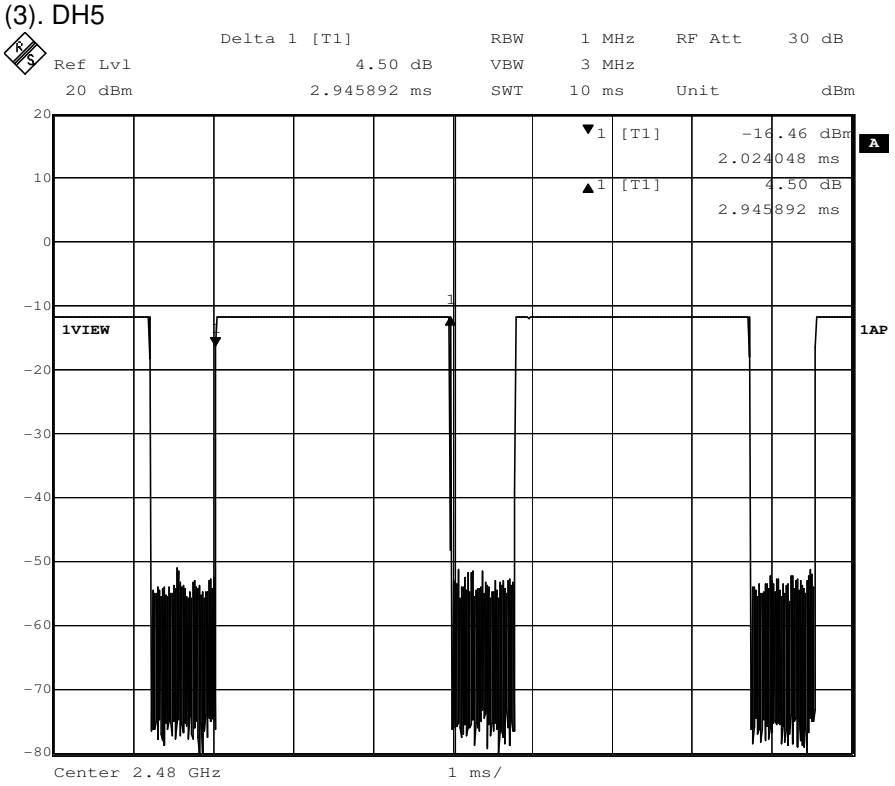


(2). DH3



3. Highest channel (2.480GHz)

(3). DH5



Remark:

In communication data link mode (expect inquiry or page mode) the hopping rate is 1600 per second, the 79 channels will be randomly selected for RF channel, and each channel have equal probability to be selected. The hop selection scheme is defined in Clause 2.6 of Part B of Volume 2 of core specification of Bluetooth.

The Dwell time must be calculated via following formula:

Dwell time = Pulse wide x (Hopping rate / Number of channels) x Period

Period = 0.4 (seconds/ channel) x 79 (channel) = 31.6 seconds

So

Dwell time DH1= slot time * (1600/2/79) * 31.6

Dwell time DH3= slot time * (1600/4/79) * 31.6

Dwell time DH5= slot time * (1600/6/79) * 31.6

The **RF channel will remain fixed for duration of a packet**, that means for DH3 packet the RF frequency will remain unchanged during 3 slots (1slot=1/1600=625us), and for DH5 packet the RF frequency will remain unchanged during 5 slots, illustrated the principle as below:

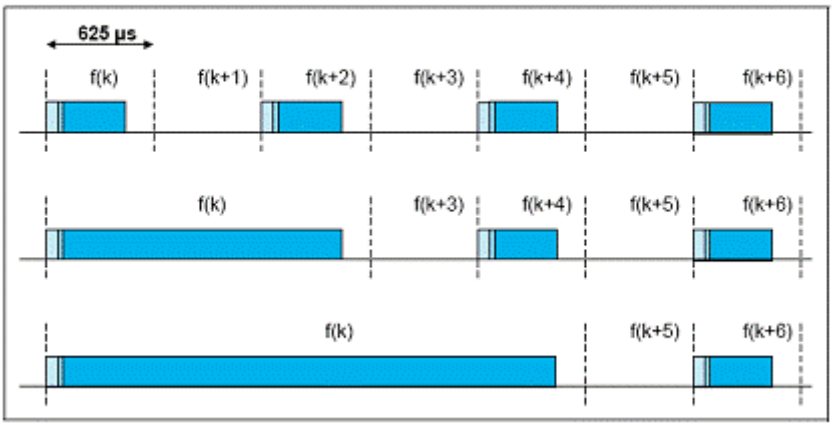


Figure 2.14: Single- and multi-slot packets.

Therefore, in a certain period for different packet types, the quantities of hops (**not hopping rate 1600**) are different, accurately, the quantity of hops for DH1 is double of DH3's and triple of DH5's. "for DH1 packet, 1 hop in 1 slot; for DH3 packet, ½ hop in 1 slot; for DH5 packet, 1/3 hop in 1 slot.", explained as below:

From the illustrated hopping scheme:

For DH1, in two slots, there are two hops, i.e. f(k) in Slot(k), f(k+1) in Slot(k+1), means DH1 1 hop in 1 slot;

For DH3, in four slots, there are two hops, i.e. f(k) in Slot(k) & Slot(k+1) & Slot(k+2), f(k+3) in Slot(k+3), means DH3 2 hops in four slots -> ½ hop in 1 slot;

For DH5, in six slots, there are two hops, i.e. f(k) in Slot(k) & Slot(k+1) & Slot(k+2) & Slot(k+3) & Slot(k+4), f(k+5) in Slot(k+5), means DH3 2 hops in six slots -> 1/3 hop in 1 slot.

The **Hopping rate** in the formula should **not** be fixed value, for DH1, it is 1600/2; for DH3, it is 1600/4; for DH5, it is 1600/6.

To calculate Dwell time of data transmission of Bluetooth system, the worst case is for Bluetooth PICONET that contains two devices only (although Bluetooth PICONET can support up to eight devices), and for Bluetooth data transmission, after device A sending a packet to device B, device A must get response packet from device B to continue data transmission;

For DH1 packet: assume device A is EUT, the worst case is after device A sending a DH1 packet to device B, device A gets a DH1 response packet from device B, that means device A needs 1 time slot for transmitting and 1 time slot for receiving, therefore, the actual hopping rate of device A is half of 1600, i.e. 800 hops per second for EUT;

For DH3 packet: assume device A is EUT, the worst case is after device A sending a DH3 packet to device B, device A gets a DH1 response packet from device B, that means device A needs 3 time slots for transmitting and 1 time slot for receiving, therefore, the actual hopping rate of device A is quarter of 1600, i.e. 400 hops per second for EUT;

For DH5 packet: assume device A is EUT, the worst case is after device A sending a DH5 packet to device B, device A gets a DH1 response packet from device B, that means device A needs 5 time slots for transmitting and 1 time slot for receiving, therefore, the actual hopping rate of device A is sixth of 1600, i.e. 1600/6=266.7 hops per second for EUT;

5.8 Pseudorandom Frequency Hopping Sequence

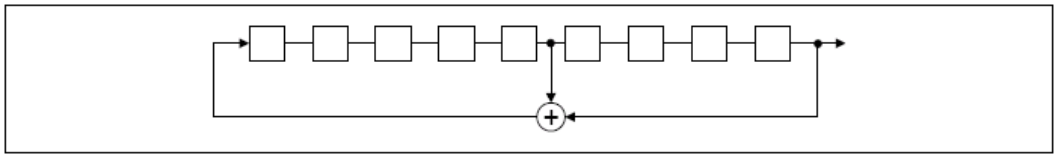
5.8.1 Standard requirement

15.247(a)(1) requirement:
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively. frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

5.8.2 EUT Pseudorandom Frequency Hopping Sequence

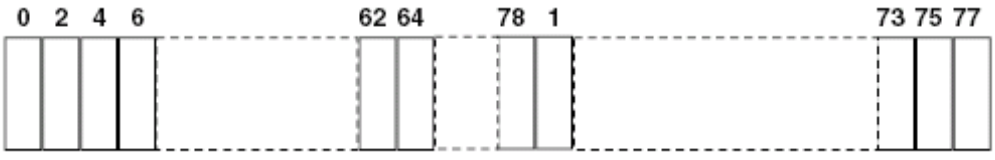
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: 2^9 -1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



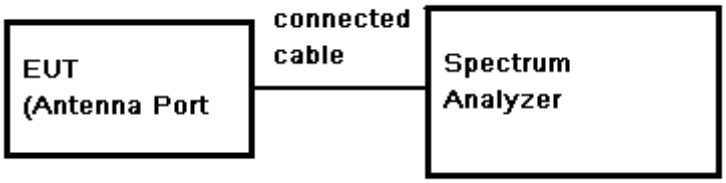
Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

5.9 Maximum Peak Output Power

Test Requirement:	FCC Part 15.247 & DA 00-705
Test Method:	Base on ANSI 63.4.
Test Date:	23 December, 2008
Test Limit:	Regulation 15.247 (b)(1)For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result “Hopping channel number” of this document. The 1 watt (30.0dBm) limit applies.
Test mode:	Test in fixing frequency transmitting mode.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 2 MHz. VBW = 2MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting mode at lowest, middle and highest channel individually. Record the max value.

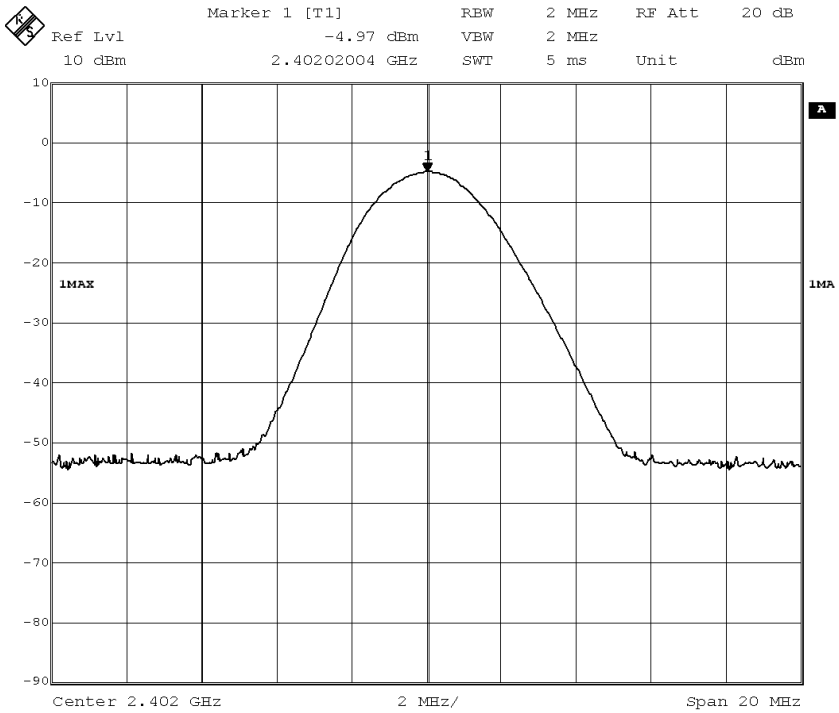
Test Result:

Test Channel	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Lowest	2.402	-4.97	0.20	-4.77	30.0	34.77
Middle	2.441	-4.89	0.20	-4.79	30.0	34.79
Highest	2.480	-4.27	0.20	-4.07	30.0	34.07

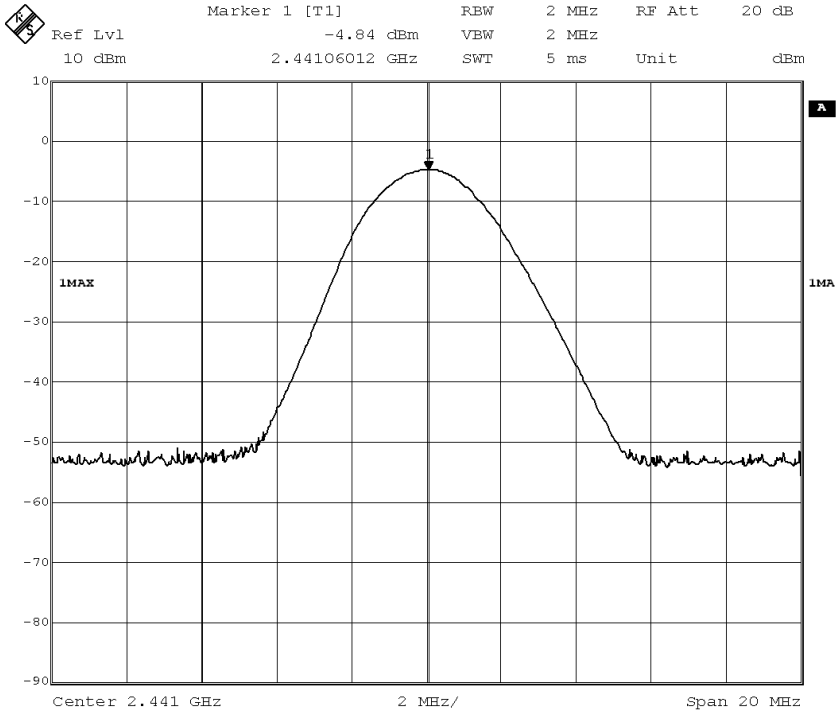
Test result: The unit does meet the FCC requirements.

Test result plot as follows:

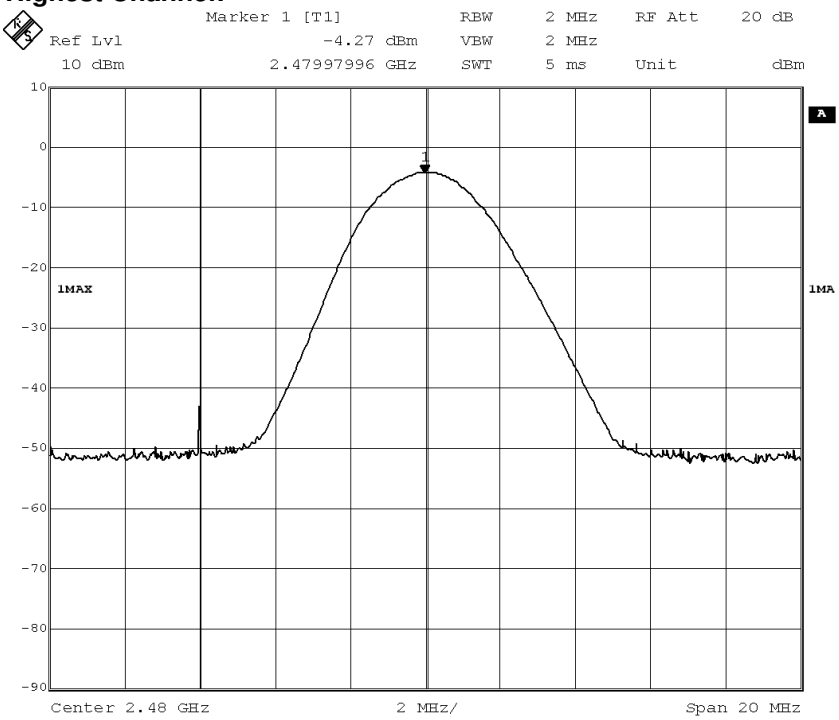
Lowest Channel:



Middle Channel:



Highest Channel:



5.10 RF Exposure Compliance Requirement

5.10.1 Standard requirement

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radia frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

(a) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm^2)	Averaging Times $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm^2)	Averaging Times $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/500	30
1500-100000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

5.10.2 MPE Calculation Method

E (V/m)=(30*P*G)$^{0.5}$/d Power Density: Pd(W/m^2)=E^2/377

E=Electric Field (V/m)

P=Peak RF output Power (W)

G=EUT Antenna numeric gain (numeric)

d= Separation distance between radiator and human body (m)

The formula can be changed to

Pd= (30*P*G)/(377*d^2)

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

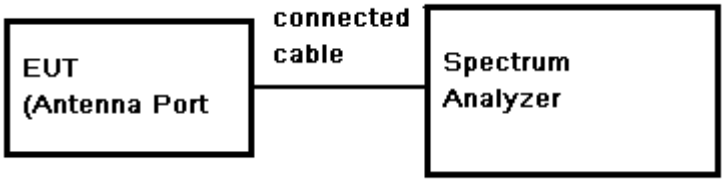
5.10.3 3 Calculated Result and Limit

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
2402	3.0	-11.98	0.063	3.76 x 10^{-5}	1	Complies
2441	3.0	-11.49	0.071	4.24 x 10^{-5}	1	Complies
2480	3.0	-11.53	0.070	4.18 x 10^{-5}	1	Complies

5.11 Conducted Spurious Emissions

Test Requirement:	FCC Part 15.247 & DA 00-705
Test Method:	Based on FCC Part15 C Section 15.247&15.209:
Test Date:	23 December, 2008
Test requirements:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. based on either an RF conducted or a radiated measurement. provided the transmitter demonstrates compliance with the peak conducted power limits.
Test Status:	Test the EUT in transmitting mode at lowest. Middle and highest channel.

Test Configuration:



Test Procedure:

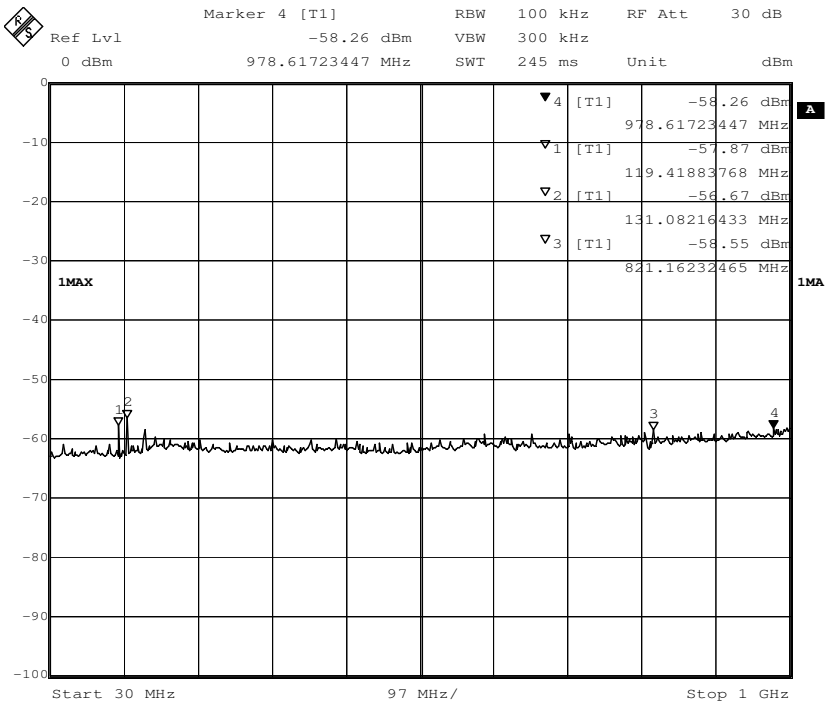
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).

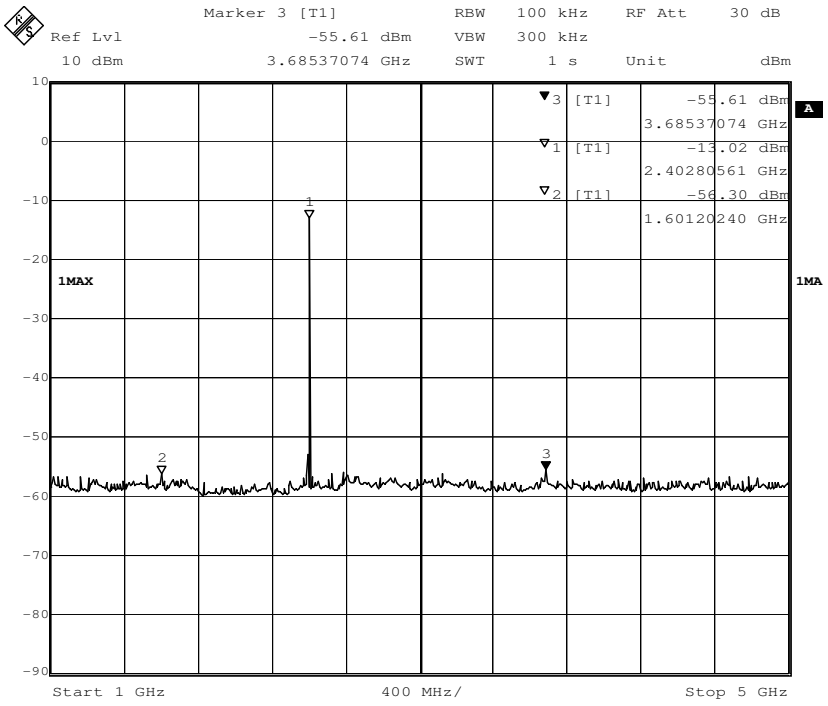
Test result plot as follows:

Lowest Channel:

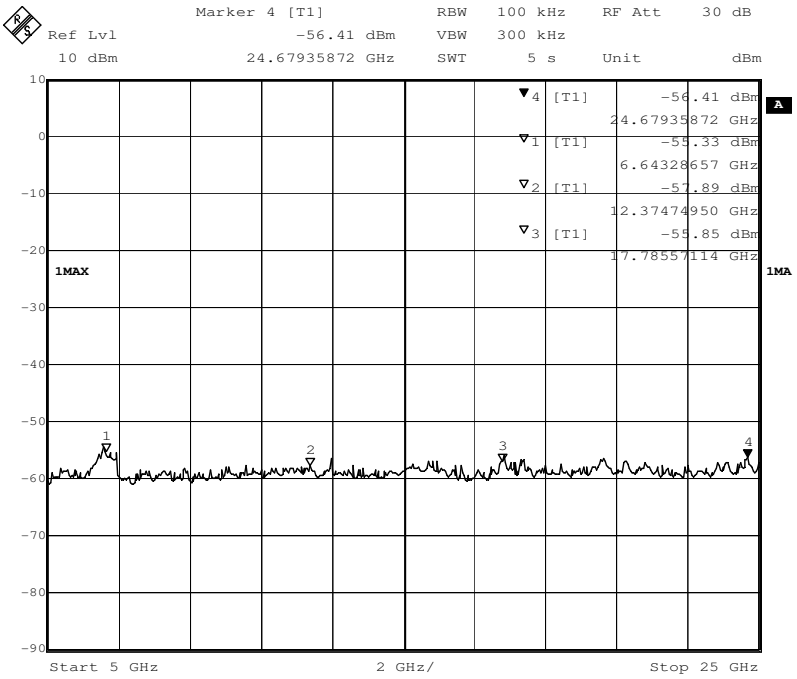
30M to 1GHz



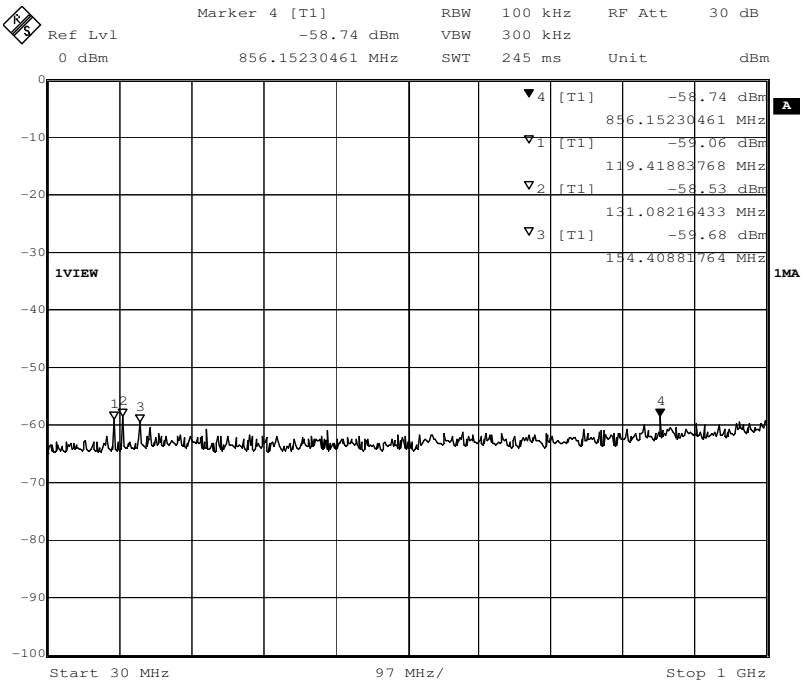
1G to 5GHz



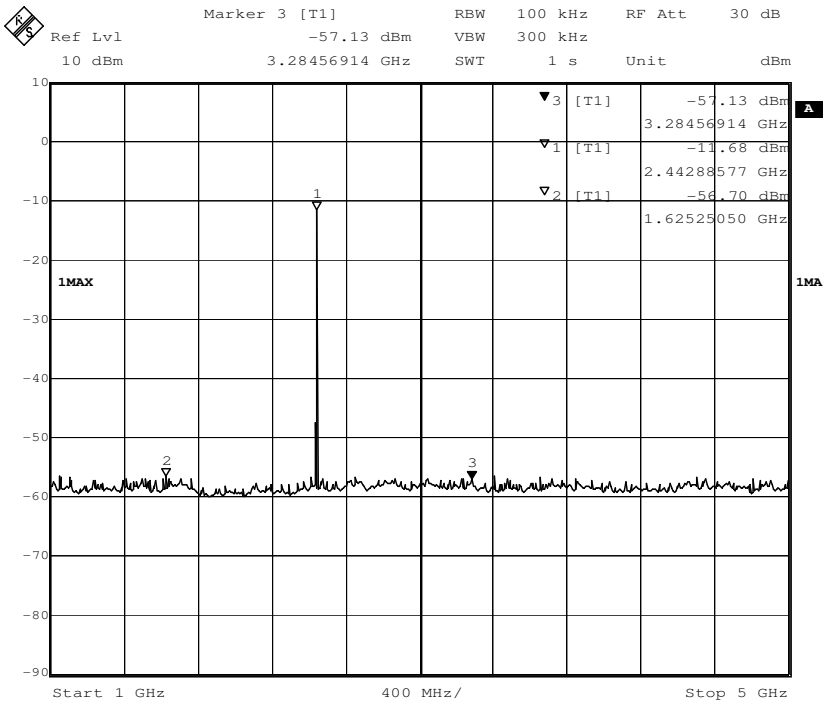
5G to 25GHz



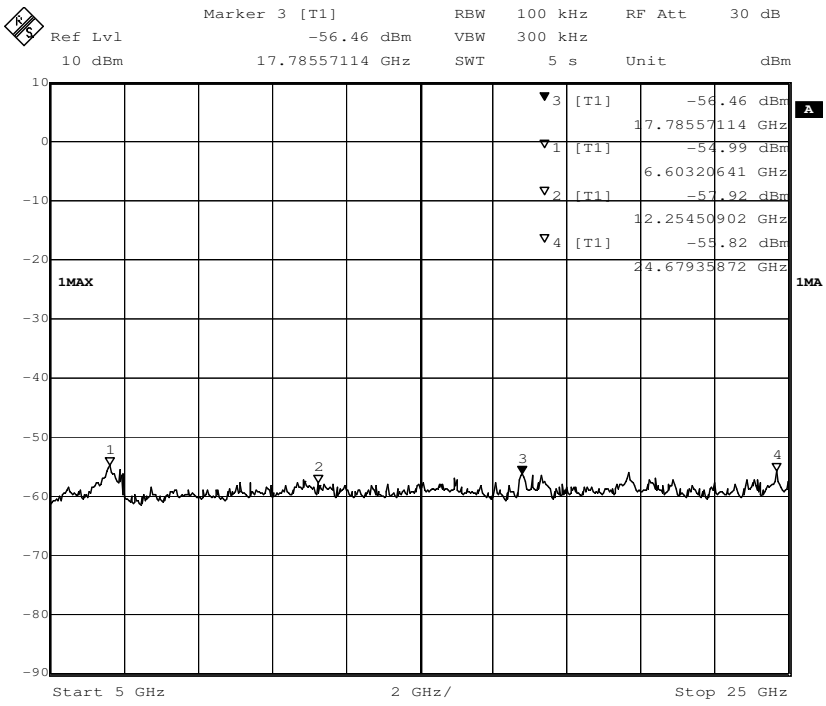
Middle Channel: 30M to 1GHz



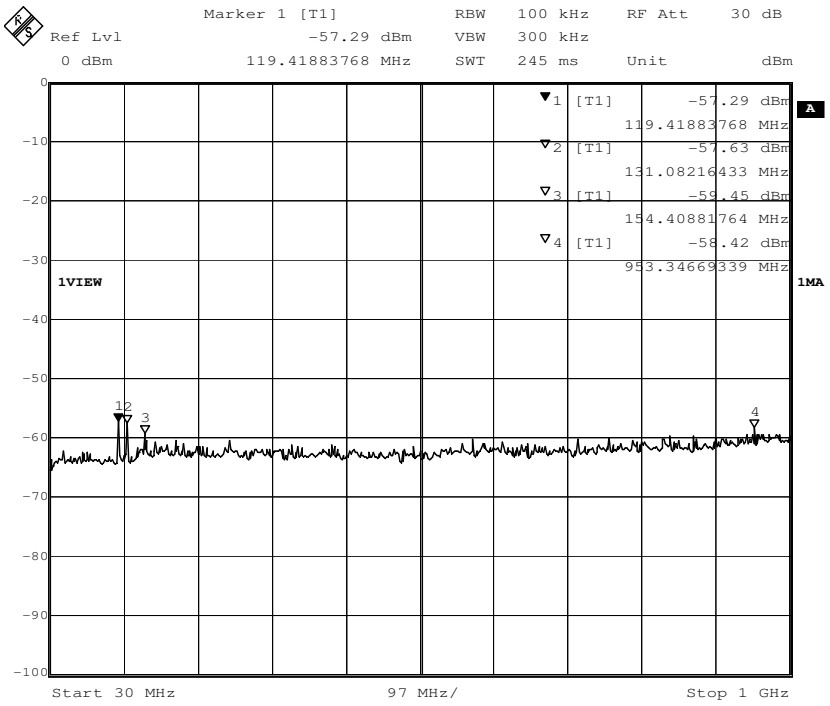
1G to 5GHz



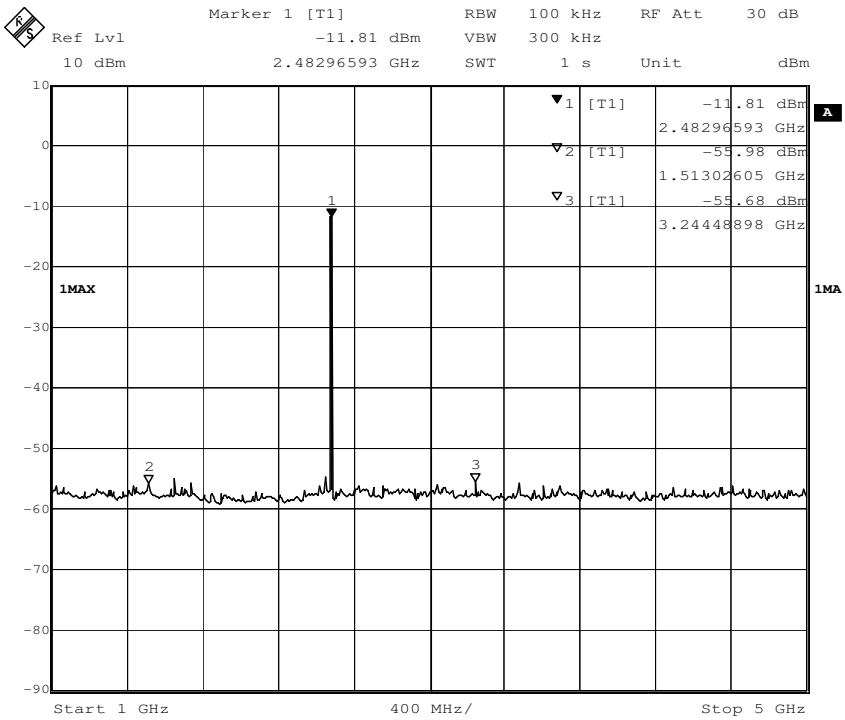
5G to 25GHz



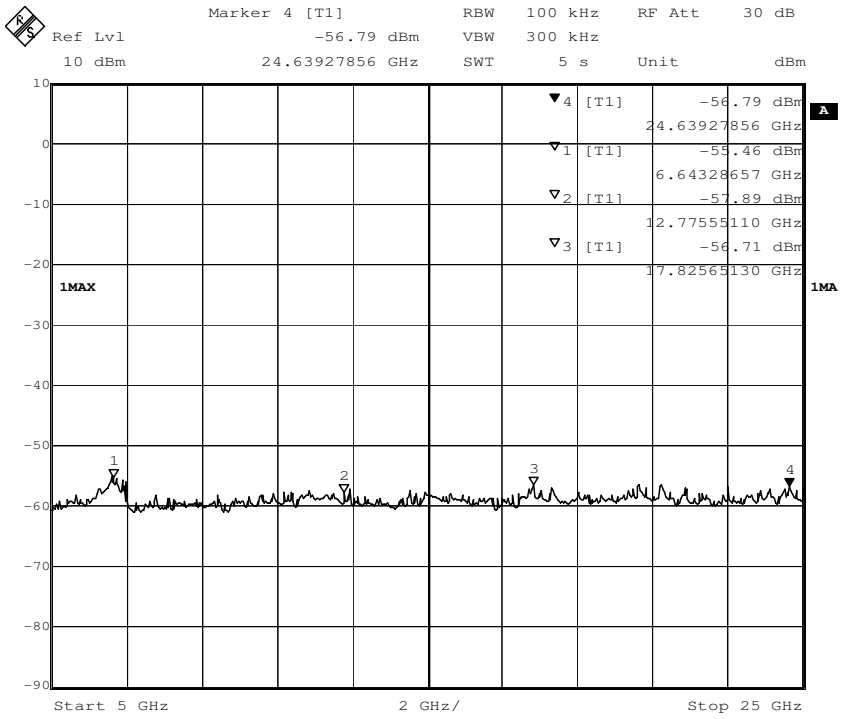
Highest Channel: 30M to 1GHz



1G to 5GHz



5G to 25GHz



5.12 Radiated Spurious Emissions

Test Requirement:	FCC 15.247(d) & 15.209
Test Method:	ANSI C63.4 section 8 & 13
Test Date:	24 December, 2008
Test Status:	Test the EUT in transmitting mode at lowest channel, Middle and highest channel.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
	Test instrumentation resolution bandwidth 120 kHz, VBW 300kHz and Quasi-Peak detector applies (30 MHz – 1000 MHz). 1MHz resolution bandwidth, VBW 3MHz and Peak and Average-Peak detector apply (1000 MHz – 25GHz).
	Receive antenna scan height 1 m – 4 m. polarization Vertical / Horizontal
15.209 Limit:	40.0 dBµV/m between 30MHz & 88MHz
	43.5 dBµV/m between 88MHz & 216MHz
	46.0 dBµV/m between 216MHz & 960MHz
	54.0 dBµV/m above 960MHz
15.247(d) limit:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that
	Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, and provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration:

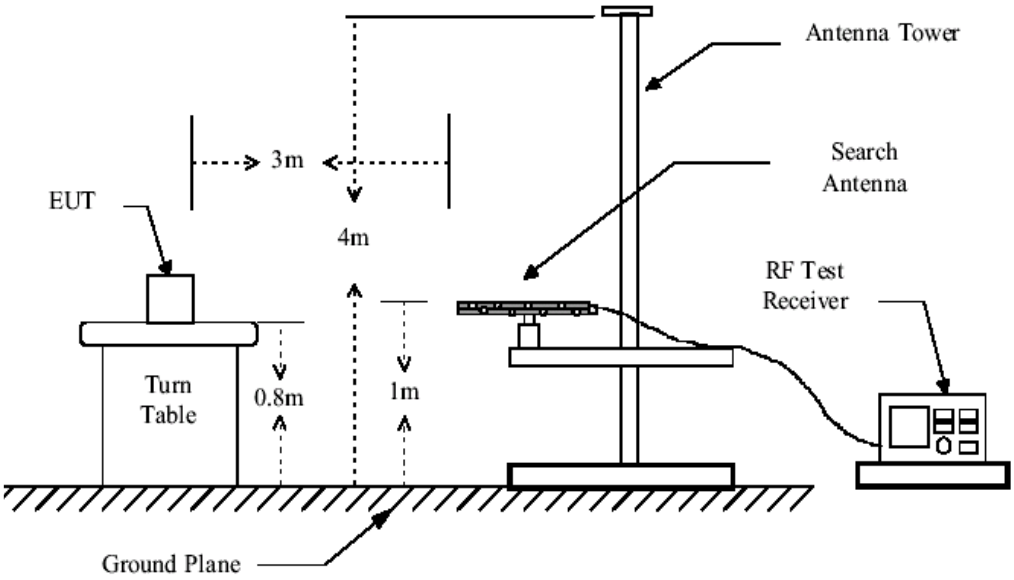


Figure 1. 30MHz to 1GHz radiated emissions test configuration

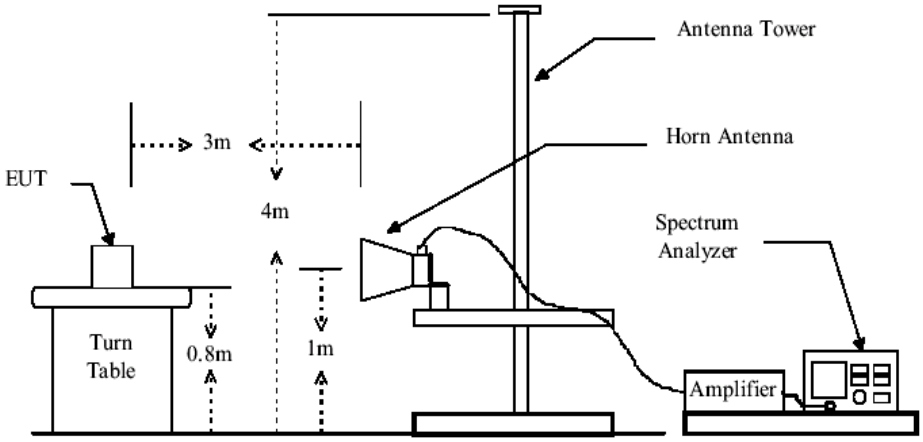


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 25GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit.

Submit this data.

5.12.1 Harmonic and other spurious emissions

5.12.1.1 Test in low Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
317.120	14.03	2.17	24.51	39.54	31.23	46.00	Vertical
167.740	10.00	1.40	24.85	50.98	37.53	43.50	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4804.000	33.19	6.90	33.01	51.42	58.50	74.00	Vertical
7206.000	36.00	8.36	32.20	40.51	49.42	74.00	V
9608.000	36.42	8.80	32.50	41.03	53.22	74.00	V
4804.000	33.19	6.90	33.01	44.01	51.09	74.00	Horizontal
7206.000	36.08	8.36	32.20	40.74	49.20	74.00	H
9608.000	36.40	8.80	32.50	35.77	48.50	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4804.000	33.19	6.90	33.01	36.38	43.46	54.00	Vertical
7206.000	36.05	8.36	32.20	23.73	35.94	54.00	V
9608.000	36.40	8.80	32.50	21.97	34.67	54.00	V
4804.000	33.19	6.90	33.01	37.08	44.16	54.00	Horizontal
7206.000	36.11	8.36	32.20	23.27	35.54	54.00	H
9608.000	36.42	8.80	32.50	23.31	36.03	54.00	H

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

5.12.1.2 Test in middle Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
408.300	16.45	2.50	25.09	42.03	35.89	46.00	Vertical
191.020	10.10	1.60	24.69	51.01	38.03	43.50	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4882.000	33.27	7.20	32.97	51.05	58.54	74.00	Vertical
7323.000	36.16	6.95	32.29	37.18	48.00	74.00	V
9764.000	36.40	7.20	32.44	38.94	50.10	74.00	V
4882.000	33.27	7.20	32.97	50.81	58.31	74.00	Horizontal
7323.000	36.16	6.95	32.29	37.45	48.27	74.00	H
9764.000	36.40	7.20	32.44	38.69	49.85	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4882.000	33.27	7.20	32.97	43.15	50.64	54.00	Vertical
7323.000	36.16	6.95	32.29	22.49	33.31	54.00	V
9764.000	36.40	7.20	32.44	23.96	35.12	54.00	V
4882.000	33.27	7.20	32.97	45.78	53.28	54.00	Horizontal
7323.000	36.16	6.95	32.29	22.95	33.77	54.00	H
9764.000	36.40	7.20	32.44	22.32	33.48	54.00	H

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

5.12.1.3 Test in high Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
157.070	10.44	1.34	24.90	46.86	33.74	46.00	Vertical
325.850	14.00	2.20	24.57	49.70	41.33	46.00	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4960.000	33.36	7.33	32.92	50.62	58.40	74.00	Vertical
7440.000	36.23	6.05	32.37	39.99	49.90	74.00	V
9920.000	36.50	7.04	32.50	40.66	51.70	74.00	V
4960.000	33.36	7.33	32.92	50.93	58.70	74.00	Horizontal
7440.000	36.23	6.05	32.37	40.32	50.23	74.00	H
9920.000	36.50	7.04	32.50	42.03	53.07	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4960.000	33.36	7.33	32.92	43.06	50.84	54.00	Vertical
7440.000	36.23	6.05	32.37	24.69	34.60	54.00	V
9920.000	36.50	7.04	32.50	24.02	35.06	54.00	V
4960.000	33.36	7.33	32.92	43.07	50.84	54.00	Horizontal
7440.000	36.23	6.05	32.37	34.85	44.76	54.00	H
9920.000	36.50	7.04	32.50	32.34	43.38	54.00	H

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Remark:

1). N/A: For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 3rd harmonic.

2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test result: The unit does meet the FCC requirements.

5.12.2 Radiated Emissions which fall in the restricted bands

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	Base on ANSI 63.4
Test Date:	24 December, 2008
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; 54.0 dBμV/m above 960MHz.
Detector:	Peak for pre-scan: 100kHz resolution bandwidth and 100kHz video bandwidth within 1GHz. 1MHz resolution bandwidth and 1MHz video bandwidth above 1GHz

Test Result:
Test the EUT in transmitting mode at the Lowest, middle and the Highest channel.

1. Low Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2390.000	27.88	4.65	34.30	50.7	31.4	48.9	29.6
2483.500	28.74	4.80	34.73	52.8	34.5	51.6	33.3

2. Middle Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2390.000	27.88	4.65	34.30	50.6	32.2	48.8	30.5
2483.500	28.74	4.80	34.73	53.1	31.7	51.4	30.0

3. High Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2390.000	27.88	4.65	34.30	51.6	33.1	49.8	31.4
2483.500	28.74	4.80	34.73	53.5	32.6	51.7	30.8

Remark: No any other emission which falls in restricted bands can be detected and be reported.

The unit does meet the FCC requirements.

Section 15.205 Restricted bands of operation.

(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	GHz
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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

5.13 Band Edges Requirement

Test Requirement:	FCC Part 15 C
Test Method:	Based on ANSI 63.4
	Operation within the band 2400 – 2483.5 MHz
Test Date:	24 December, 2008
Requirements:	Section 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Method of Measurement:	Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. Pretest the EUT in hopping on and hopping off, found the worse case was the hoping off, The band edges was measured and recorded the worse case.

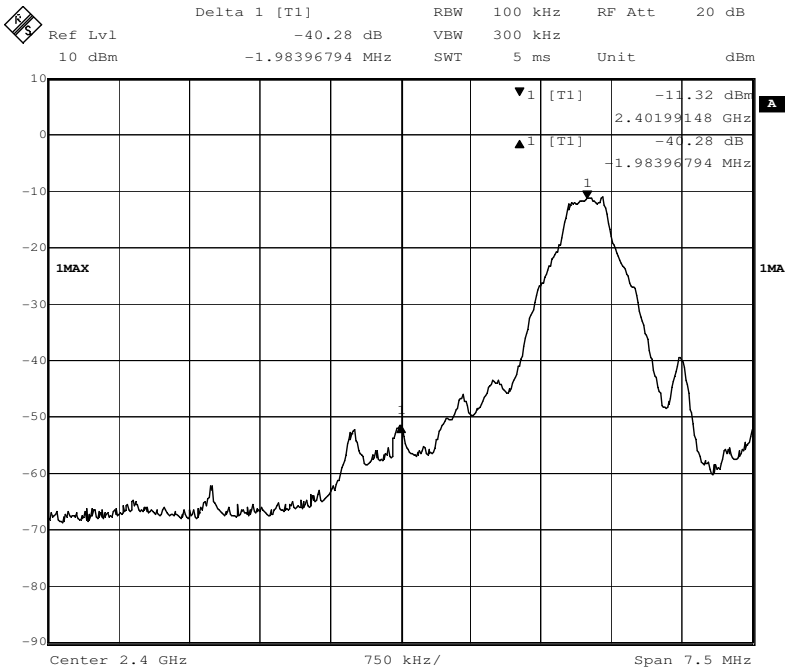
The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB.

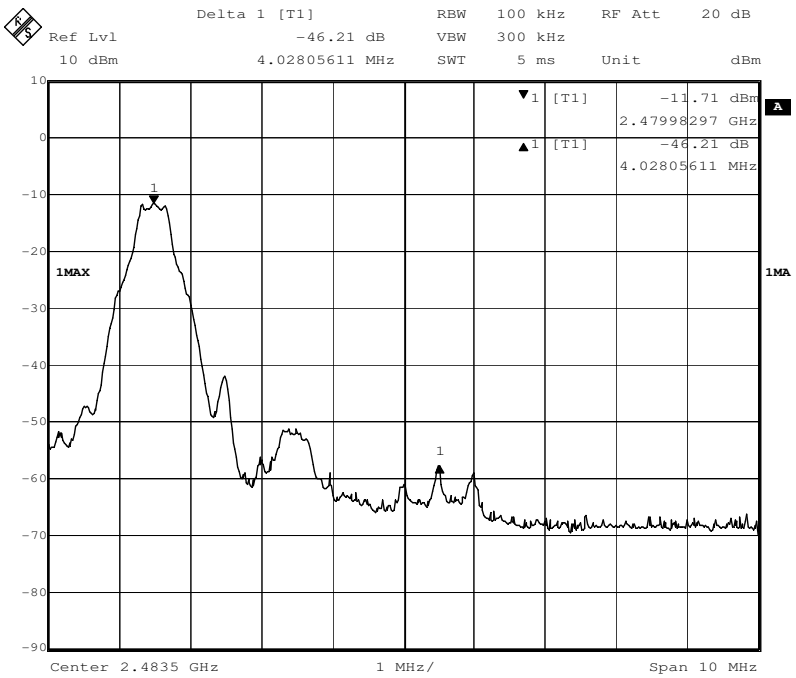
The Upper Edges attenuated more than 20dB.

The graph as below. represents the emissions take for this device.

Lowest Channel:



Highest Channel:



--- End of the Report---