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FCC TEST REPORT For BT

Application No. :	SHEM1209001334RF
Applicant:	Audio Partnership Plc
FCC ID:	YKBMA200-003
IC ID:	9095A-MA200003
Equipment Under Test (EUT):	
Product Name:	Wireless Music System
Model:	Air 200
Brand Name:	Cambridge Audio
Standards:	FCC PART 15 Subpart C: 2011 RSS-210 Issue 8 (December 2010) RSS-Gen Issue 3 (December 2010)
Date of Receipt:	September 13, 2012
Date of Test:	September 14, 2012 to October 20 , 2012
Date of Issue:	October 25, 2012
Test Result :	**PASS ***

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.

E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.

E&E EMC Engineer
SGS-CSTC(Shanghai) Co., Ltd.

2 Test Summary

Test items	FCC REFERANCE	IC REFERANCE	Result
Antenna Requirement	Section 15.247 (c)	---	PASS
20dB Bandwidth	Section 15.247 (a)(1)	RSS-Gen Issue 3 Clause 4.6.1	PASS
Carrier Frequencies Separated	Section 15.247(a)(1)	RSS-210 Issue 8 Annex 8.1(b)	PASS
Hopping Channel Number	Section 15.247(a)(1)(iii)	RSS-210 Issue 8 Annex 8.1(d)	PASS
Dwell Time	Section 15.247(a)(1)(iii)	RSS-210 Issue 8 Annex 8.1(d)	PASS
Maximum Peak Output Power	Section 15.247(b)(1)	RSS-210 Issue 8 Annex 8.4(2)	PASS
Pseudorandom Frequency Hopping Sequence	Section 15.247(b)(4)&TCB Exclusion List (7 July 2002)	RSS-210 Issue 8 Annex 8.1(b)	PASS
RF Exposure Compliance Requirement	15.247(i)	RSS-Gen Issue 3 Clause 5.6	PASS
Conducted Spurious Emission (30MHz to 25GHz)	&15.247(d)	RSS-210 Issue 8 Annex 8.5	PASS
Radiated Spurious Emission (30MHz to 25GHz)	Section 15.209 &15.247(d)	RSS-210 Issue 8 Annex 8.5	PASS
Band Edges Measurement	Section 15.247 (d) &15.205	RSS-Gen Issue 3 Clause 7.2.2	PASS
Power line conducted emission	Section 15.207	RSS-Gen Issue 8 Clause 7.2.4	PASS
Occupied bandwidth	---	RSS-Gen Issue 3 Clause 4.6.1	Tested

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4 General Information

4.1 Client Information

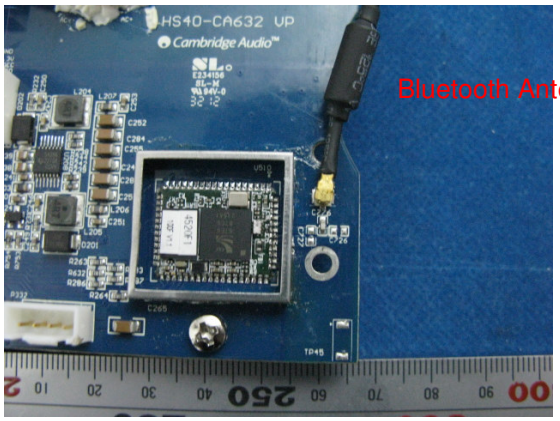
Applicant:	Audio Partnership Plc
Address of Applicant:	Gallery Court, Hankey Place London, SE1 4BB United Kingdom
Manufacturer:	Audio Partnership Plc
Address of Manufacturer:	Gallery Court, Hankey Place London, SE1 4BB United Kingdom
Factory:	Hansong(Nanjing) Technology Ltd.

4.2 General Description of E.U.T.

Product Name:	Wireless Music System
Model No.(EUT):	Air 200
Add Model No.:	N/A
Model Difference:	N/A
Trade Mark:	Cambridge Audio
Supported Frequency Bands:	WiFi (802.11 b/g): 2.412 to 2.462GHz Bluetooth(BT): 2.402GHz to 2.480GHz

4.3 Details of E.U.T.

Technical Specifications:

BT Version:	☐2.0 ☐2.1 ☒3.0 ☐Other:
Modulation Type:	☒GFSK ☒π/4DQPSK ☒8DPSK ☐Other:
Frequency Range / Channel Number:	☒ 2402-2480MHz / 79 Channels
Equipment classification:	☒ equipment for fixed use
Antenna Type:	PIFA antenna (as below figure) 
Antenna Gain:	2.0 dBi

Power Supply:

Rated Input:	100-120V/220-240V AC 50/60Hz Rated Power Consumption: 280W
Power Cable:	2 wires
	1.5m

4.4 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

For Bluetooth

Channel	Frequency
The lowest channel(CH1)	2402MHz
The middle channel(CH40)	2441MHz
The Highest channel(CH79)	2480MHz

4.5 Standards Applicable for Testing

The standard used were FCC PART 15 Subpart C: 2011, ANSI C63.10: 2009. RSS-210 Issue 8, RSS-Gen Issue 3.

4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

4.7 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-03	2013-06-01
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-06-03	2013-06-01
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-06-03	2013-06-01
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-03	2013-06-01
5	Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 373	2012-03-15	2013-03-14
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-09	2013-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY－2009P	--	2012-10-15	2013-10-14
8	CLAMP METER	FLUKE	316	86080010	2012-06-03	2013-06-01
9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-14	2013-10-13
11	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-06-17	2013-06-16
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/ 2000.0-0.2/40-5SSK	11	2012-06-03	2013-06-01
13	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9	2012-06-03	2013-06-01
14	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-06-03	2013-06-01

15	Low nosie amplifier	TESEQ	LNA6900	70133	2012-07-05	2013-07-04
16	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-04	2013-06-03
17	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-06-03	2013-06-01

6 Test Results

6.1 E.U.T. test conditions

Power supply:	120VAC, 60Hz
Requirements:	15.31(e) 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. For battery operated equipment, the equipment tests shall be performed using a new battery.
Type of antenna:	PIFA antenna
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	35-75 % RH
Atmospheric Pressure:	992 -1020 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

Pursuant to Part 15.31(c) For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported.

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

6.2 Antenna Requirement

6.2.1 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 band 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.

6.2.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement. The gain of the antenna is less than 2.0 dBi.

Test result: The EUT does meet the FCC requirements.

6.3 20dB Bandwidth

Test Requirement: FCC Part 15 C Section 15.247 (a)(1)
RSS-Gen Issue 3 Clause 4.6.1

Test Method: ANSI C63.10:2009 Clause 6.9.1

Test Date: September. 20, 2012

Test Status: Test in fixing operating frequency at lowest, Middle, 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 the 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.

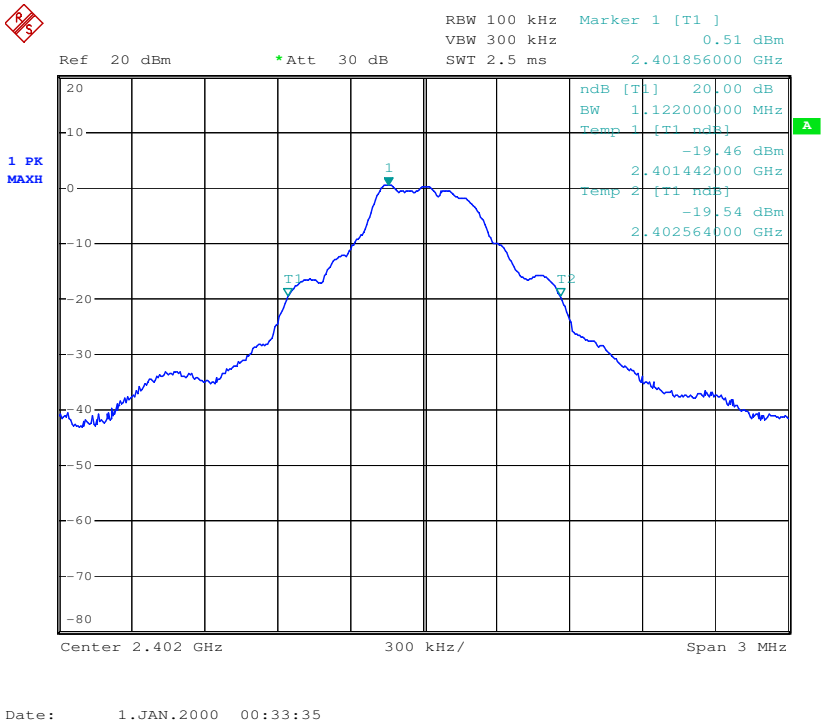
Test result: Pass

Test date

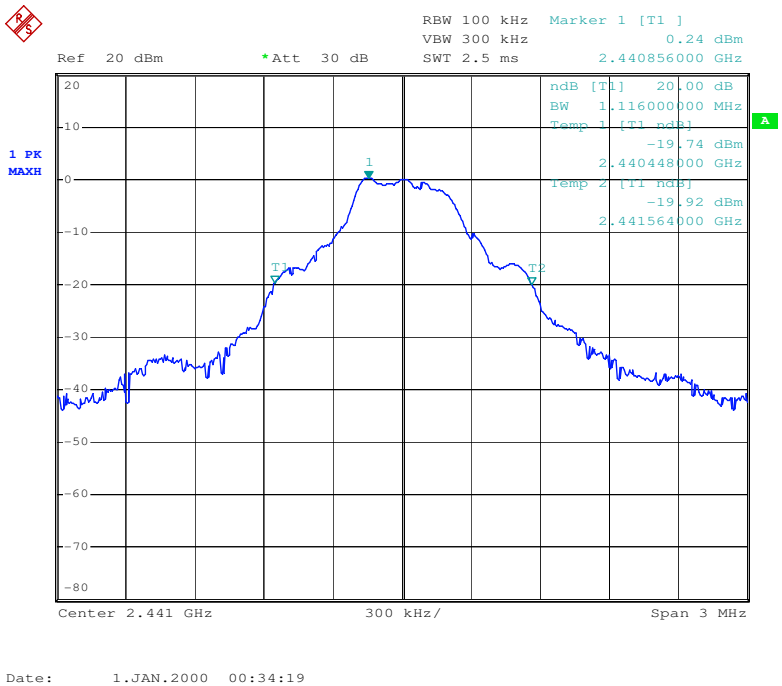
Test Channel	Channel Frequency (MHz)	Modulation	Bandwidth(MHz)
Low	2402	GFSK	1.122
Middle	2441	GFSK	1.116
High	2480	GFSK	1.110
Low	2402	π/4DQPSK	1.344
Middle	2441	π/4DQPSK	1.362
High	2480	π/4DQPSK	1.362
Low	2402	8DPSK	1.350
Middle	2441	8DPSK	1.338
High	2480	8DPSK	1.350

Result plot as follows:

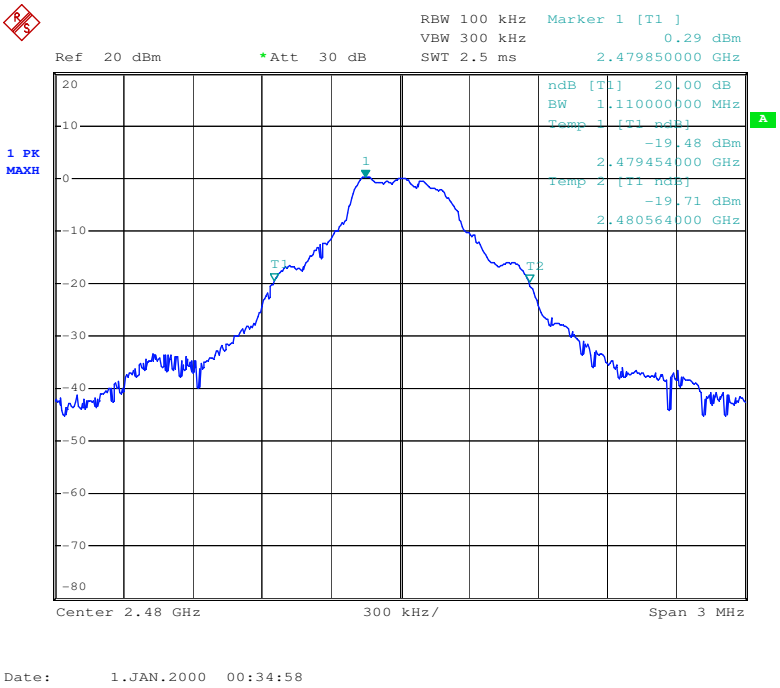
Lowest Channel – GFSK:



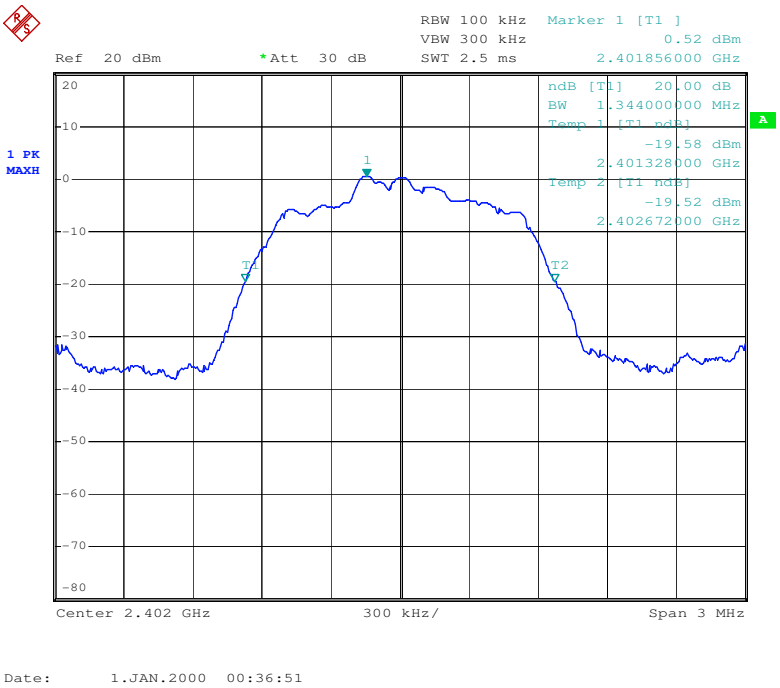
Middle Channel – GFSK:



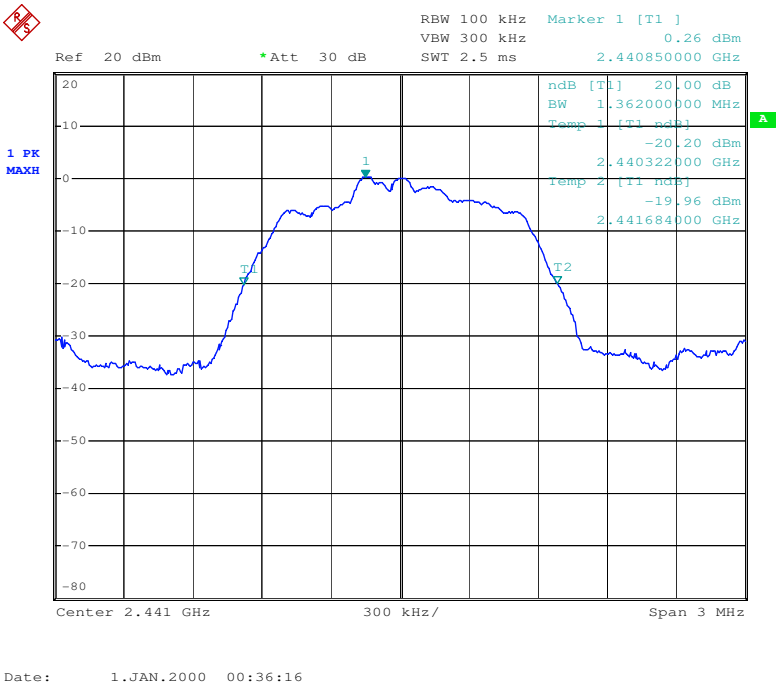
Highest Channel – GFSK:



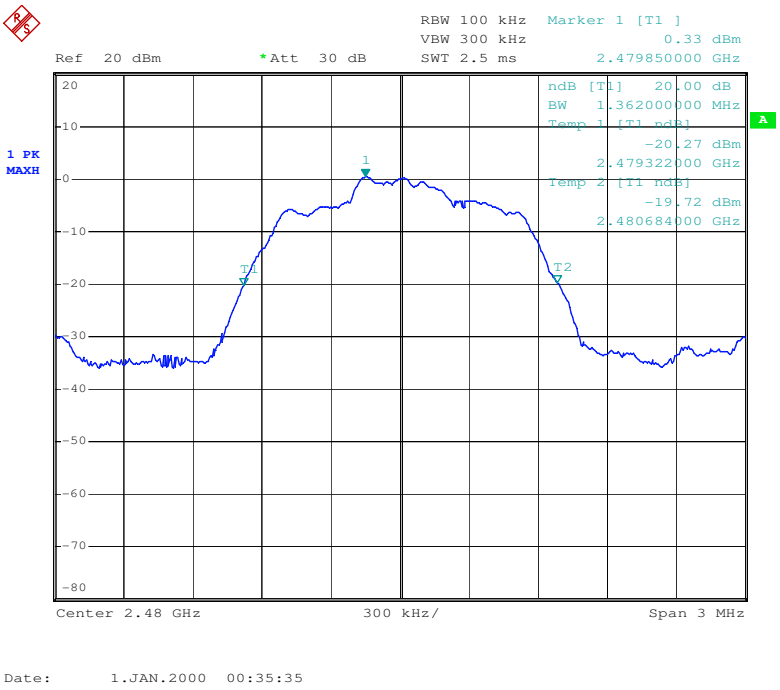
Lowest Channel –π/4DQPSK:



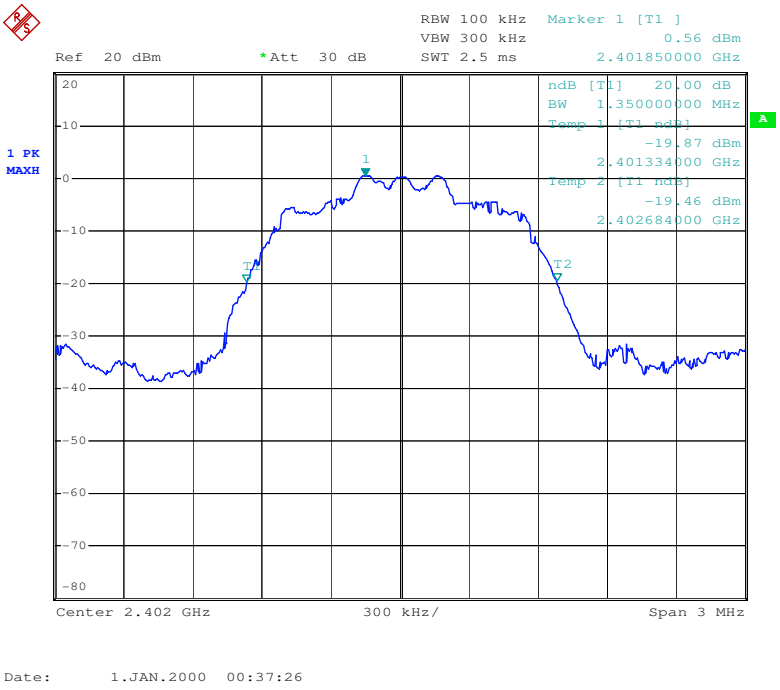
Middle Channel –π/4DQPSK:



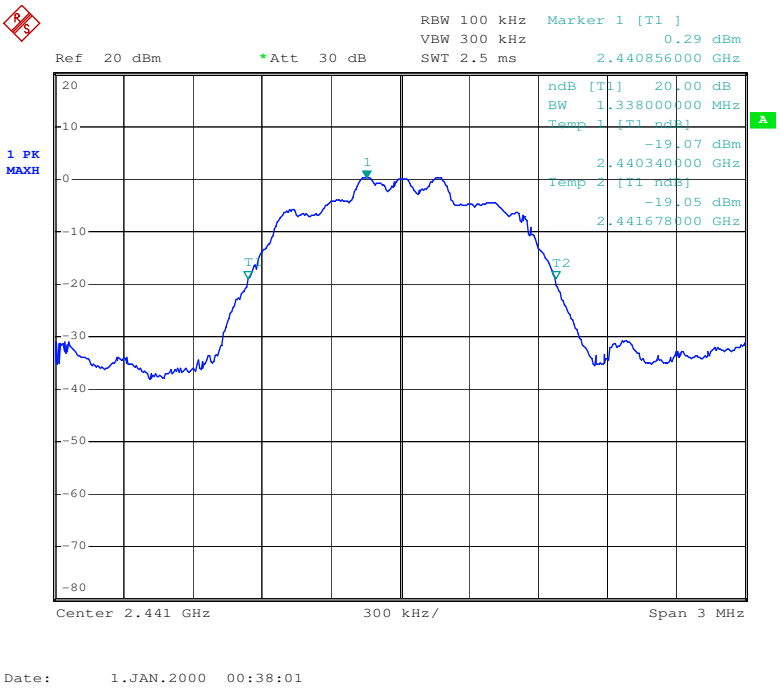
Highest Channel –π/4DQPSK:



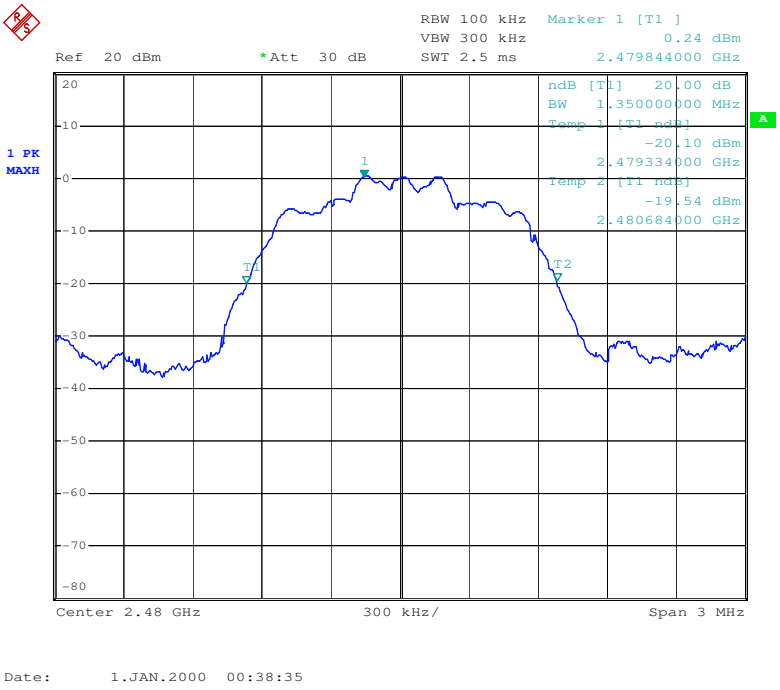
Lowest Channel –8DPSK:



Middle Channel –8DPSK:



Highest Channel –8DPSK:



6.4 Carrier Frequencies Separated

Test Requirement: FCC Part 15 C Section 15.247 (a)(1)
RSS-Gen Issue 3 Clause 8.1(b)

Test Method: ANSI C63.10:2009 Clause 7.7.2

Test Date: September 20, 2012

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:

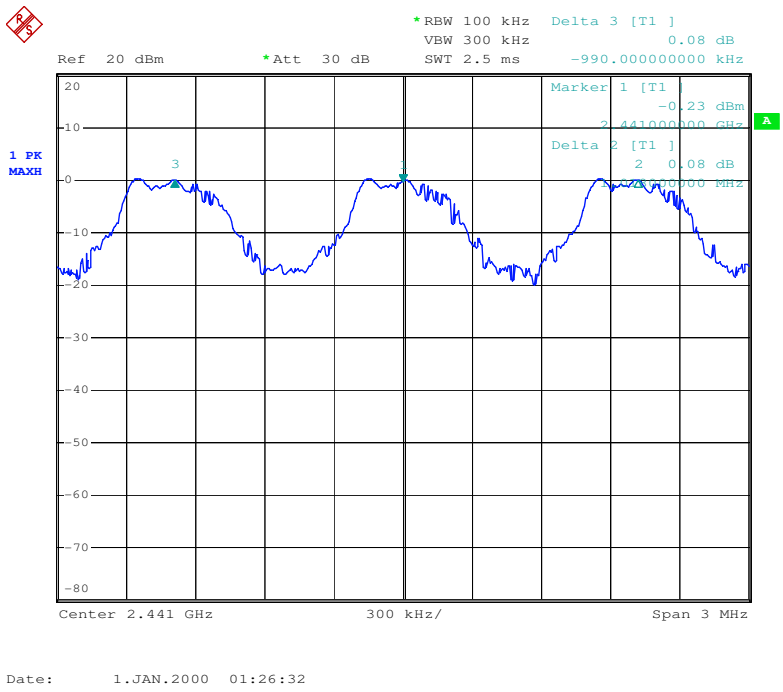
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW >= 1% of the span (set 100 kHz). VBW >= RBW , Span = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. Allow the trace to stabilize. Use the marker-delta 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: Pass

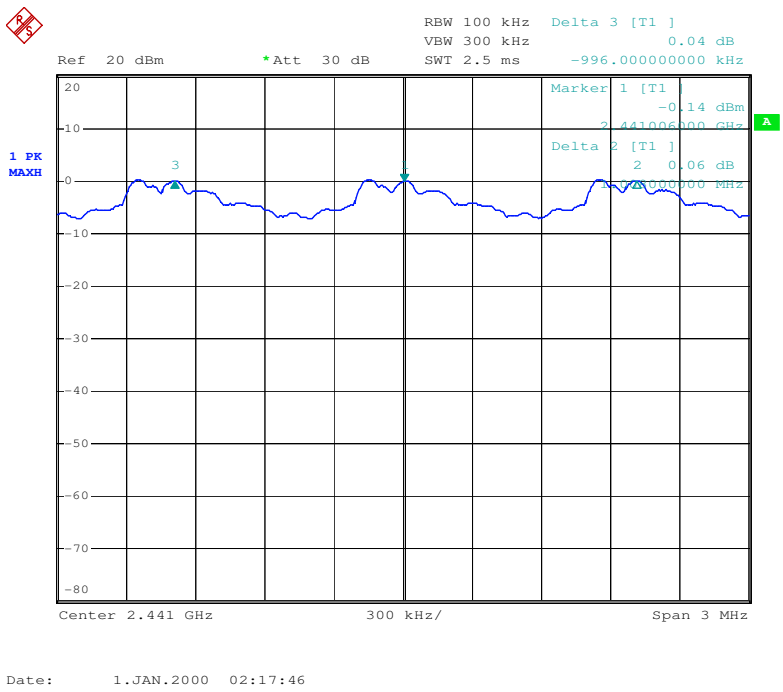
Test Channel	Modulation	Carrier Frequencies Separated	Limit (25kHz or two-thirds of the 20 dB bandwidth)	PASS/FAIL
Middle Channels (channel 39 and channel 40)	GFSK	990kHz	25kHz/748kHz	PASS
Middle Channels (channel 39 and channel 40)	π/4DQPSK	996kHz	25kHz/908kHz	PASS
Middle Channels (channel 39 and channel 40)	8DPSK	996kHz	25kHz/900kHz	PASS

Result plot as follows:

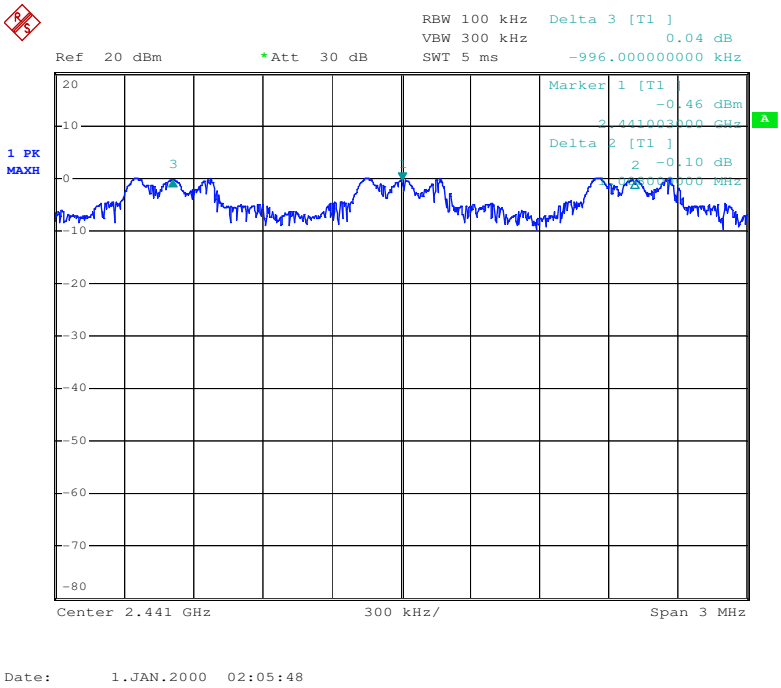
Middle Channels Modulation: GFSK



Middle Channels Modulation: π/4DQPSK



Middle Channels Modulation: 8DPSK



Test result: The EUT does meet the FCC requirements.

6.5 Hopping Channel Number

Test Requirement: FCC Part15 C Section 15.247(a)(1)(iii)
RSS-210 Issue 8 Annex 8.1(d)

Test Method: ANSI C63.10:2009 Clause 7.7.3

Test Date: September 21, 2012

Requirements: Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

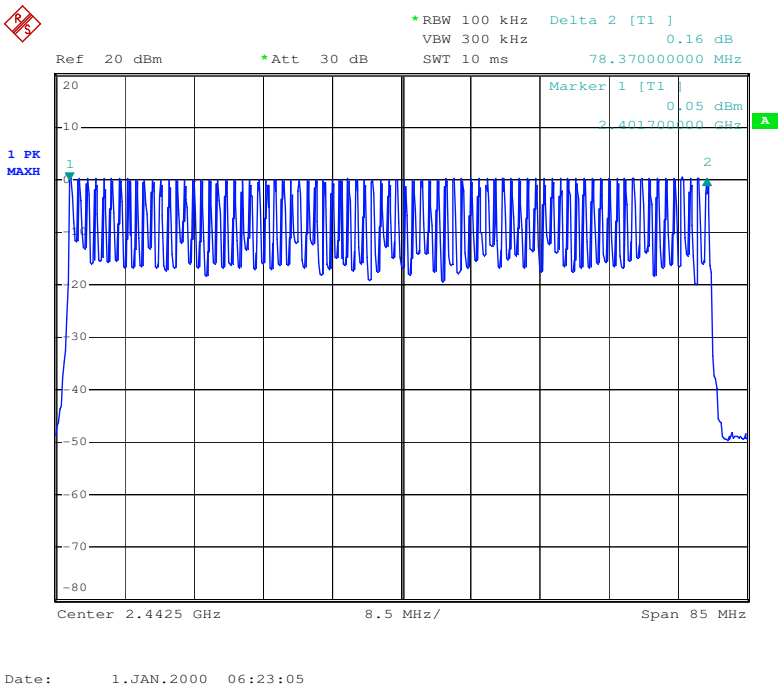
Test Status: Test in hopping transmitting operating mode.

Test Procedure:

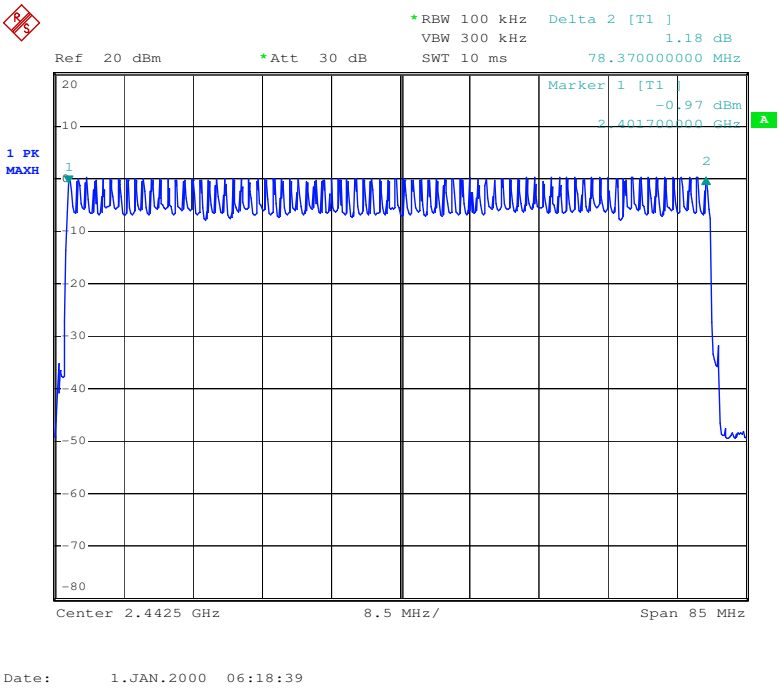
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up 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. The EUT does meet the FCC requirements.

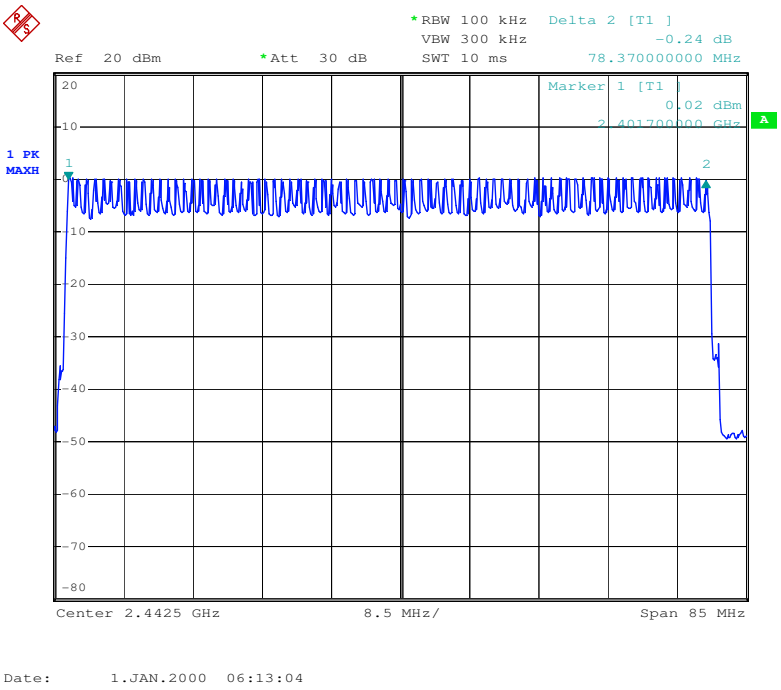
GFSK



π/4DQPSK



8DPSK



6.6 Dwell Time

Test Requirement: FCC Part 15 C Section 15.247(a)(1)(iii)

RSS-210 Issue 8 Annex 8.1(d)

Test Method: ANSI C63.10:2009 Clause 7.7.3

Test Date: September 21, 2012

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: Hopping transmitting with all kind of modulation.

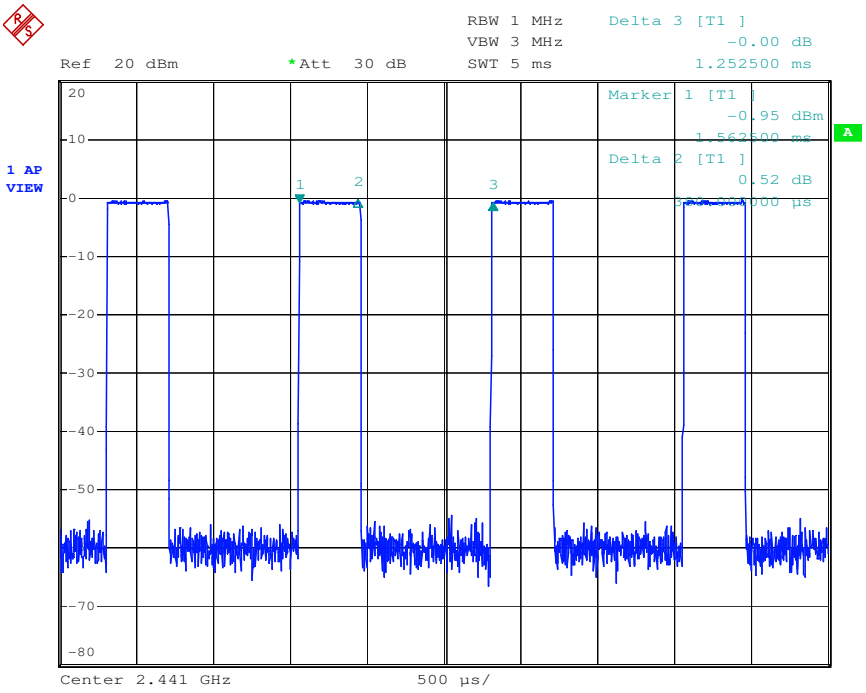
Test Procedure:

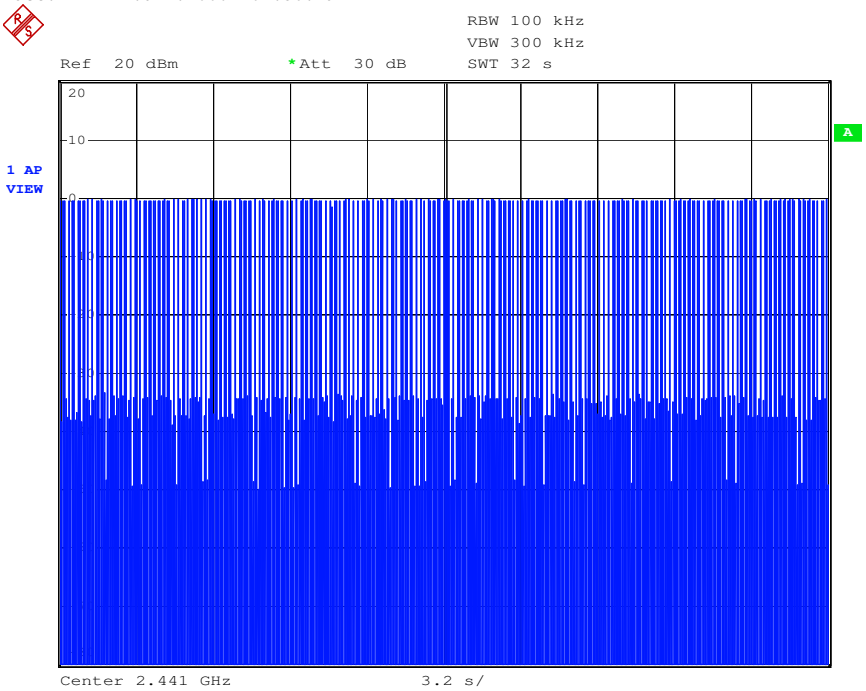
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Use Emission width / No. of Hopping Channels in 31.6s to determine the dwell time.

Frequency (MHz)	Modulation	Packet	Emission Width (ms)	Number of Hopping Channel in 31.6s	Average Time of Occupancy(s)	Limit(s)	Result
2441	GFSK	DH1	0.38	201	0.076	0.4	Pass
		DH3	1.66	125	0.208	0.4	Pass
		DH5	2.92	90	0.263	0.4	Pass
2441	π/4DQPSK	2DH1	0.40	211	0.084	0.4	Pass
		2DH3	1.66	140	0.232	0.4	Pass
		2DH5	2.92	88	0.257	0.4	Pass
2441	8DPSK	3DH1	0.40	164	0.066	0.4	Pass
		3DH3	1.64	123	0.202	0.4	Pass
		3DH5	2.92	102	0.298	0.4	Pass

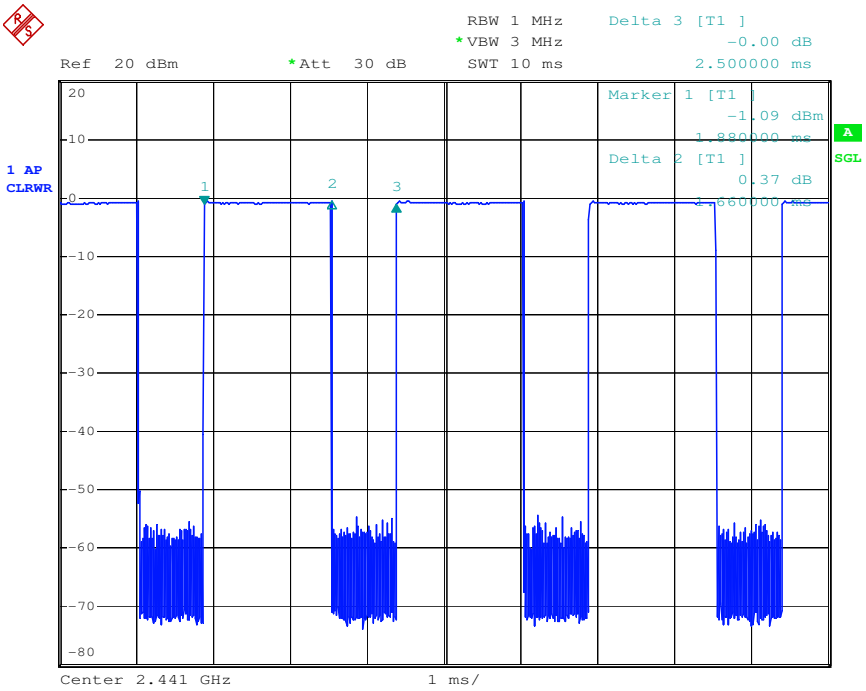
Refer testing graph as below:

Frequency 2441MHz: Modulation: GFSK-DH1

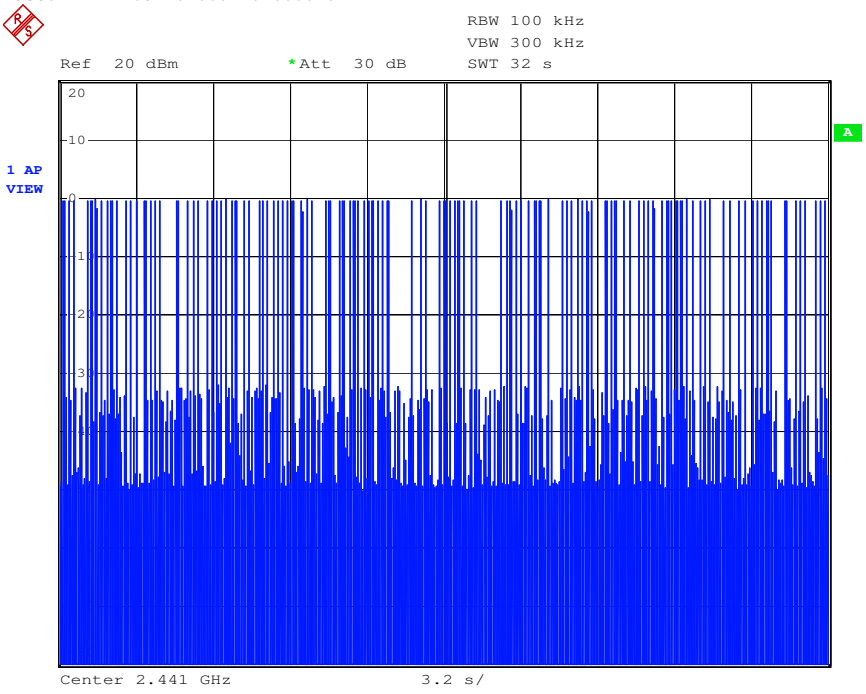




Frequency 2441MHz: Modulation: GFSK- DH3



Date: 1.JAN.2000 04:06:28



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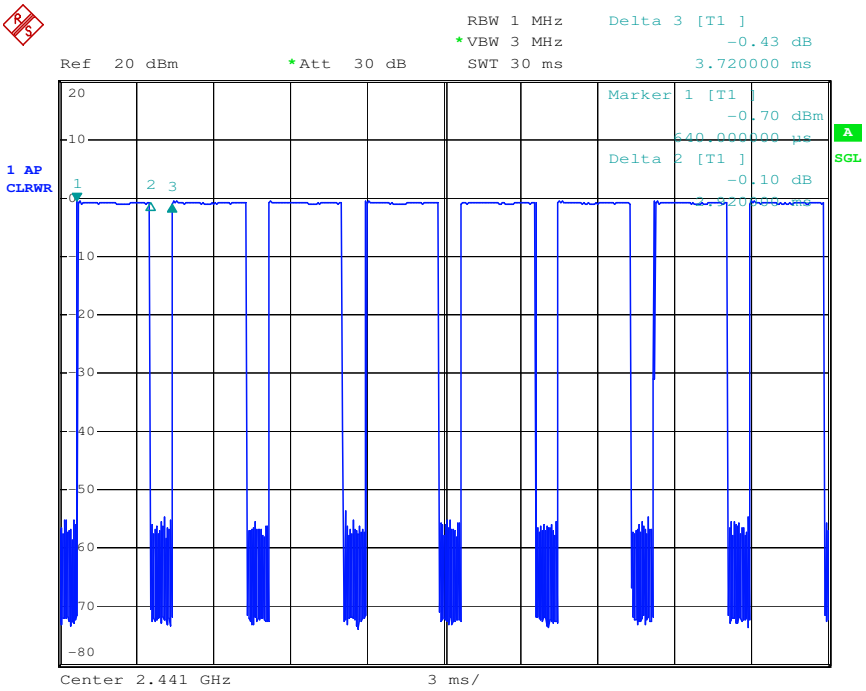
Frequency 2441MHz: Modulation: GFSK- DH5



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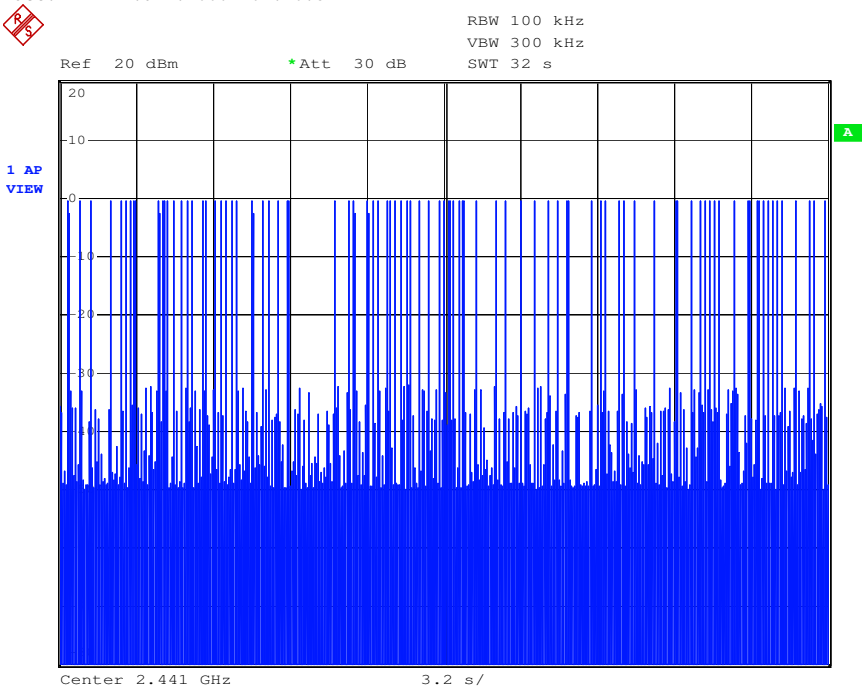
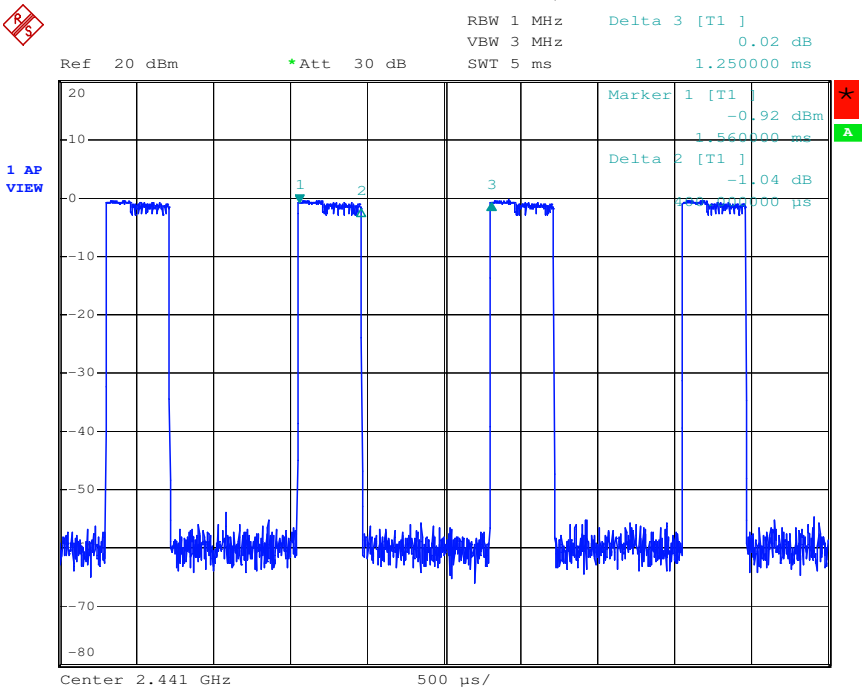
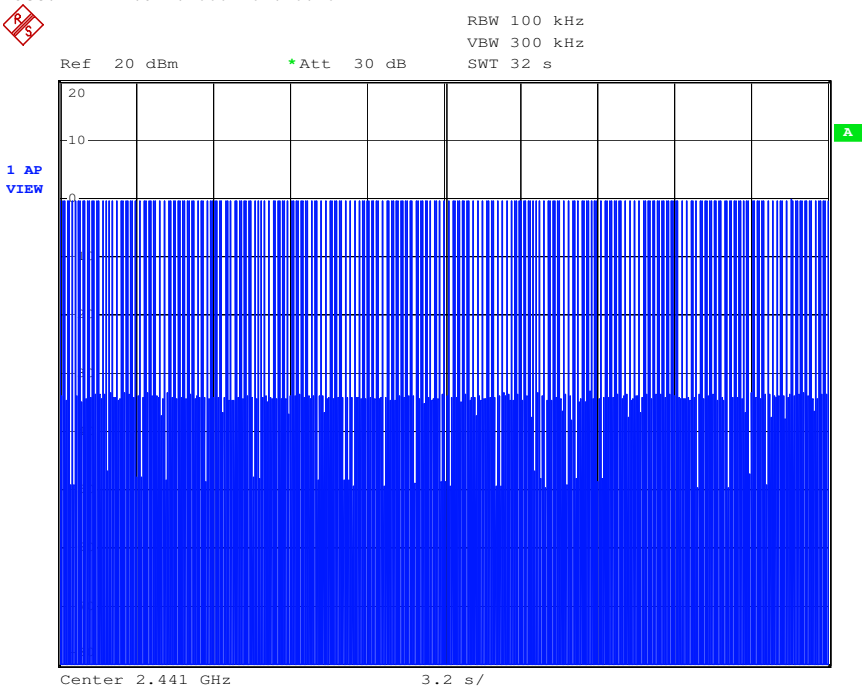


Date: 1.JAN.2000 04:36:48

Frequency 2441MHz: Modulation: π/4DQPSK-2DH1

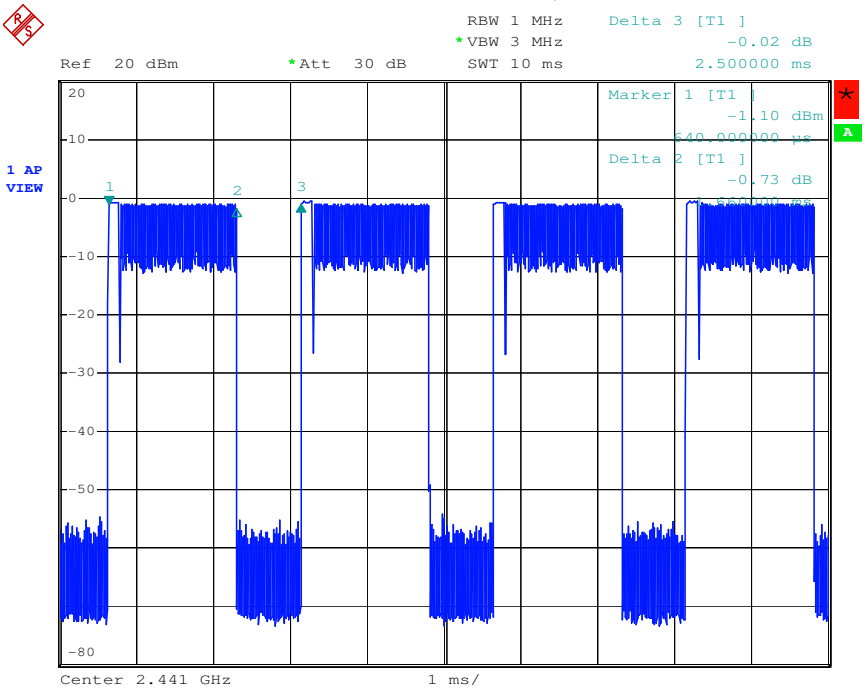


Date: 1.JAN.2000 02:40:40

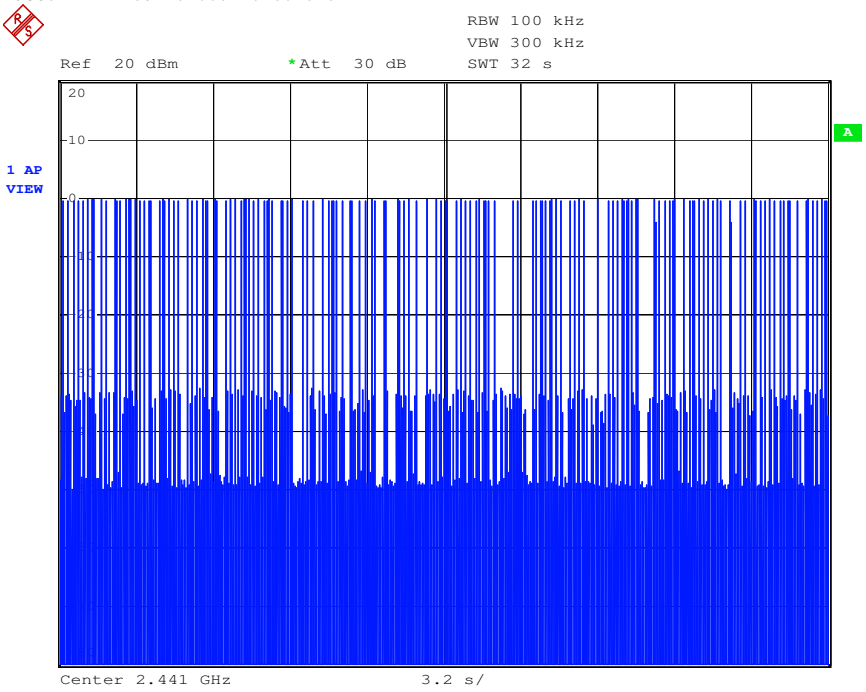


Date: 1.JAN.2000 04:42:31

Frequency 2441MHz: Modulation: π/4DQPSK-2DH3

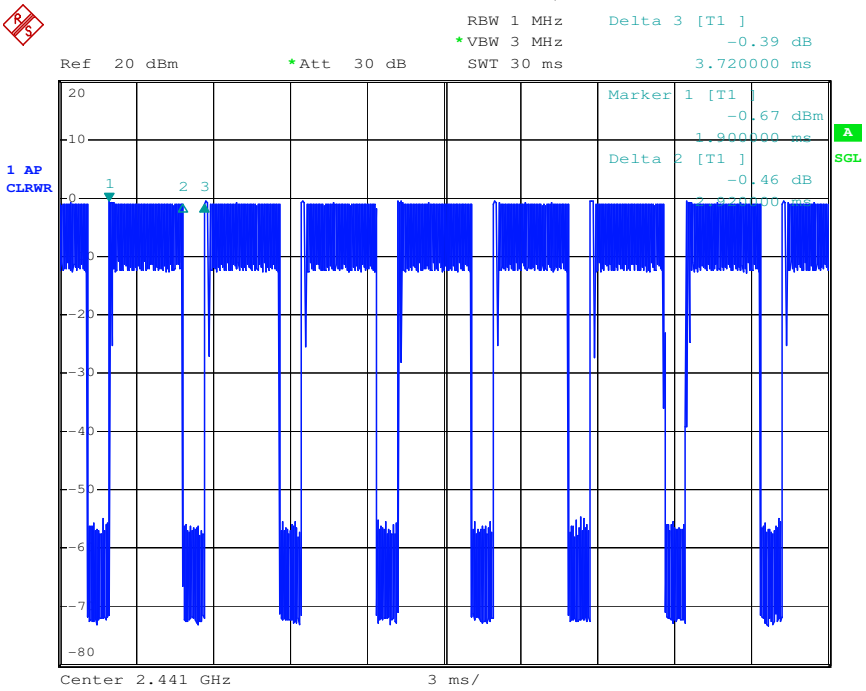


Date: 1.JAN.2000 04:01:46

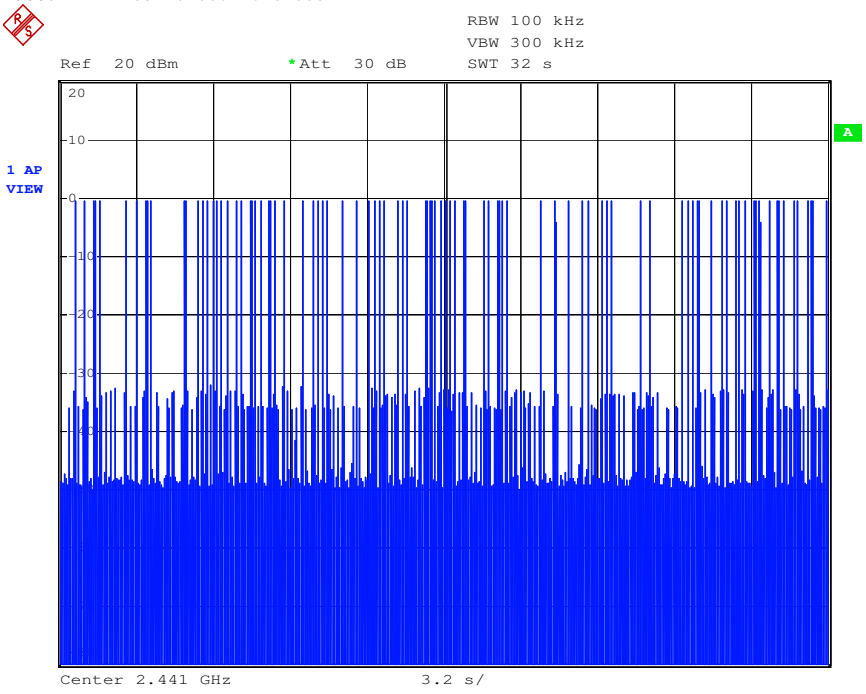


Date: 1.JAN.2000 04:46:42

Frequency 2441MHz: Modulation: π/4DQPSK-2DH5

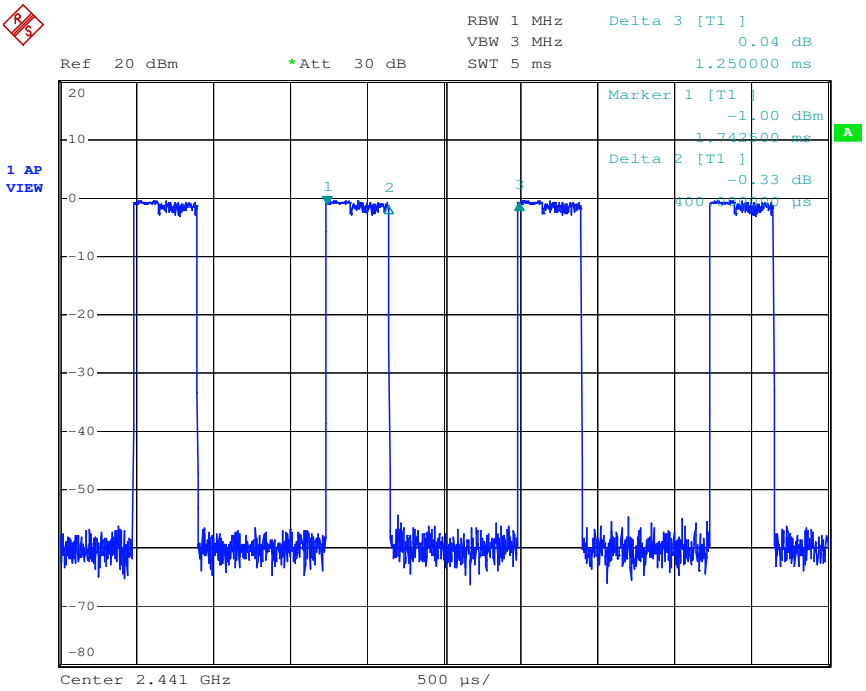


Date: 1.JAN.2000 04:16:52

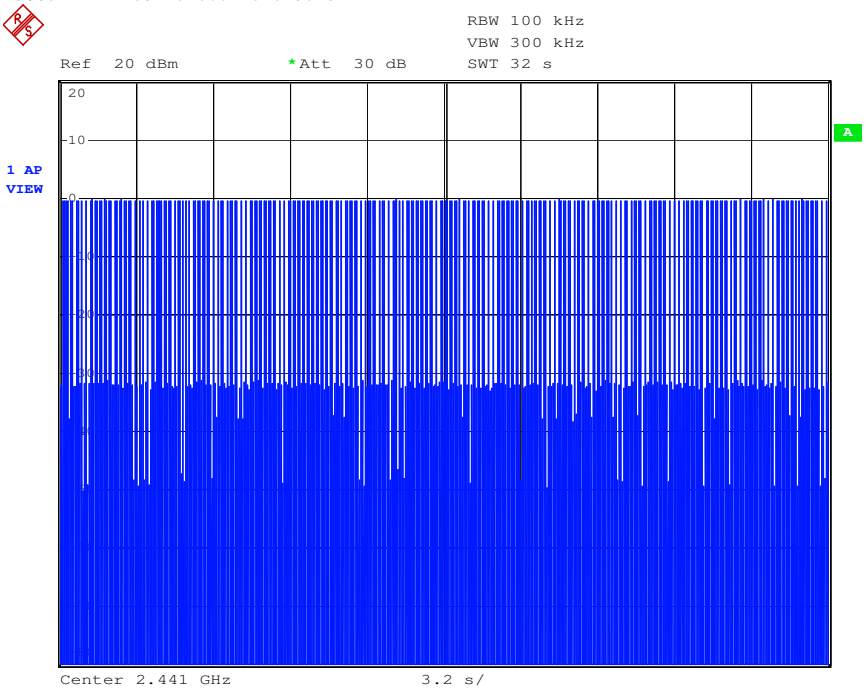


Date: 1.JAN.2000 04:52:02

Frequency 2441MHz: Modulation: 8DPSK-3DH1

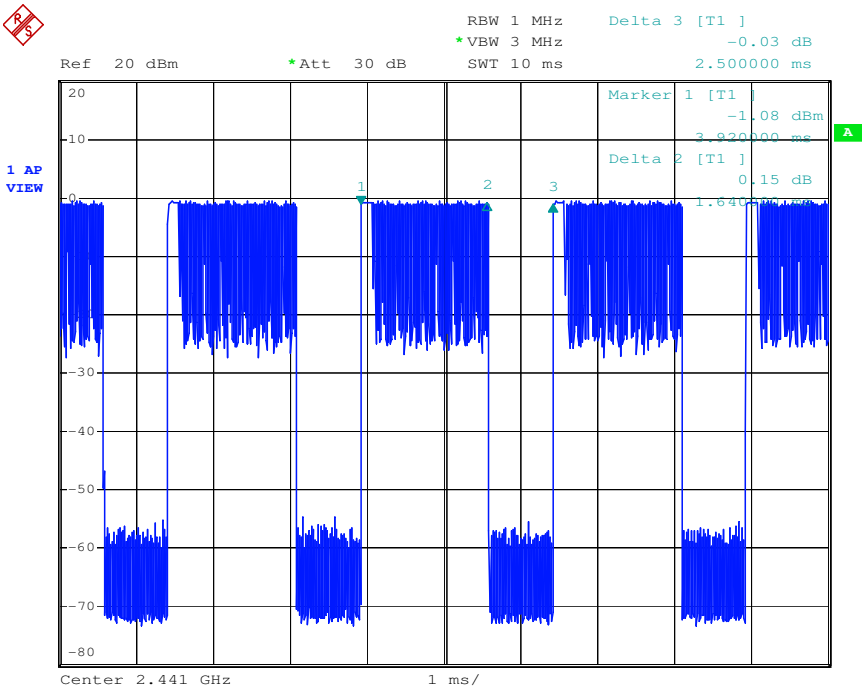


Date: 1.JAN.2000 02:43:45

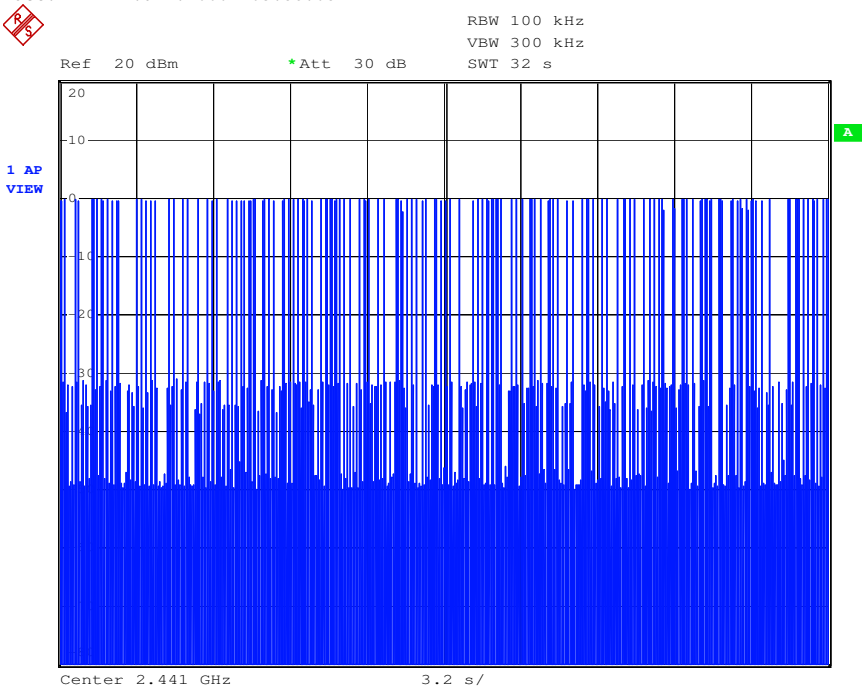


Date: 1.JAN.2000 05:33:30

Frequency 2441MHz: Modulation: 8DPSK-3DH3

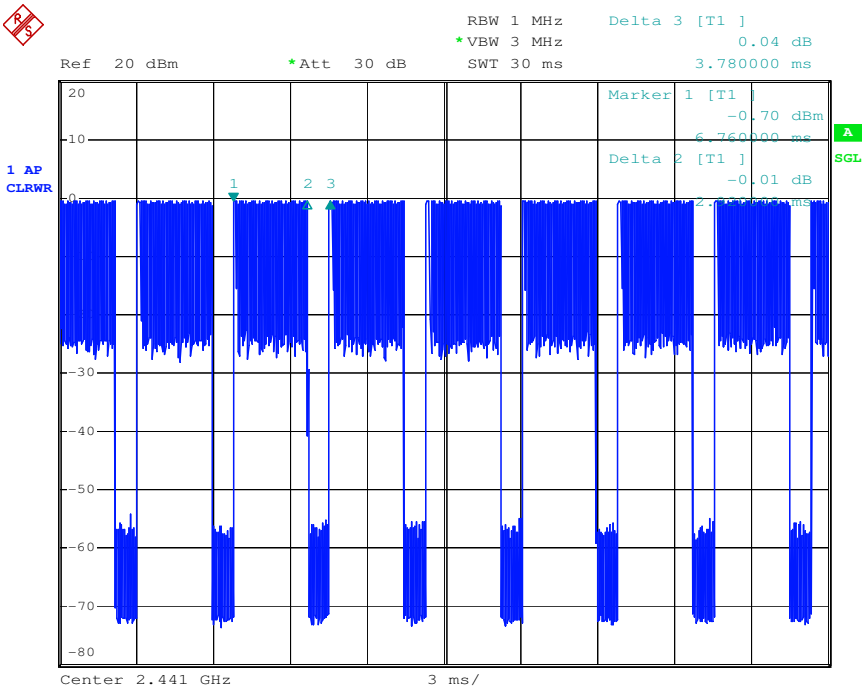


Date: 1.JAN.2000 03:58:05

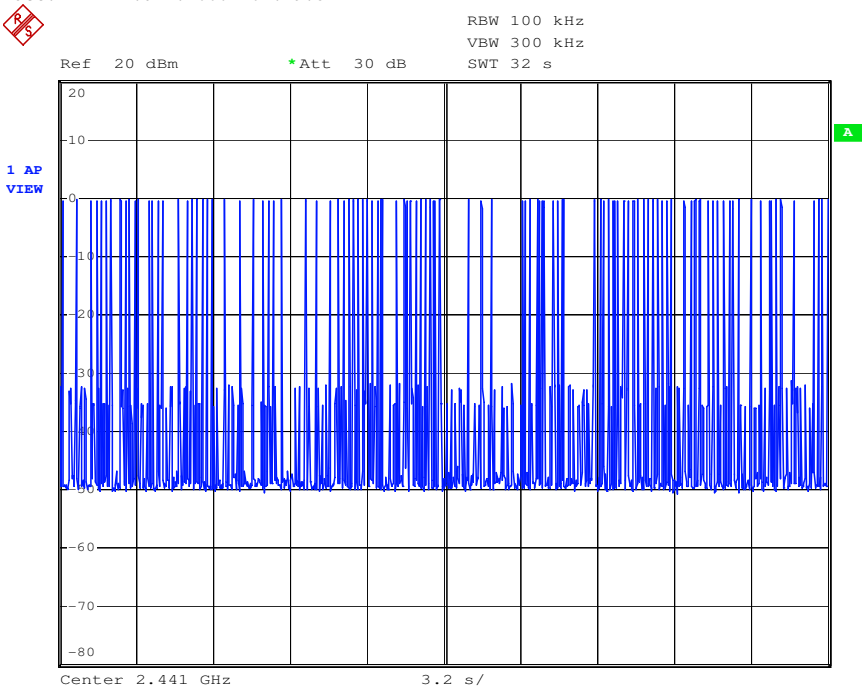


Date: 1.JAN.2000 05:37:01

Frequency 2441MHz: Modulation: 8DPSK-3DH5



Date: 1.JAN.2000 04:19:54



Date: 1.JAN.2000 06:02:02

6.7 Maximum Peak Output Power

Test Requirement: FCC Part 15.247 Section 15.247(b)(1)
RSS-210 Issue 8 Annex 8.4(2)

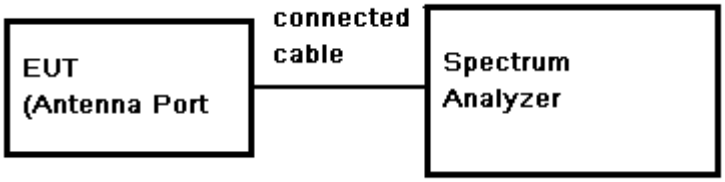
Test Method: ANSI C64.10:2009 Clause 6.10.1

Test Date: September 21, 2012

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 = 3 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

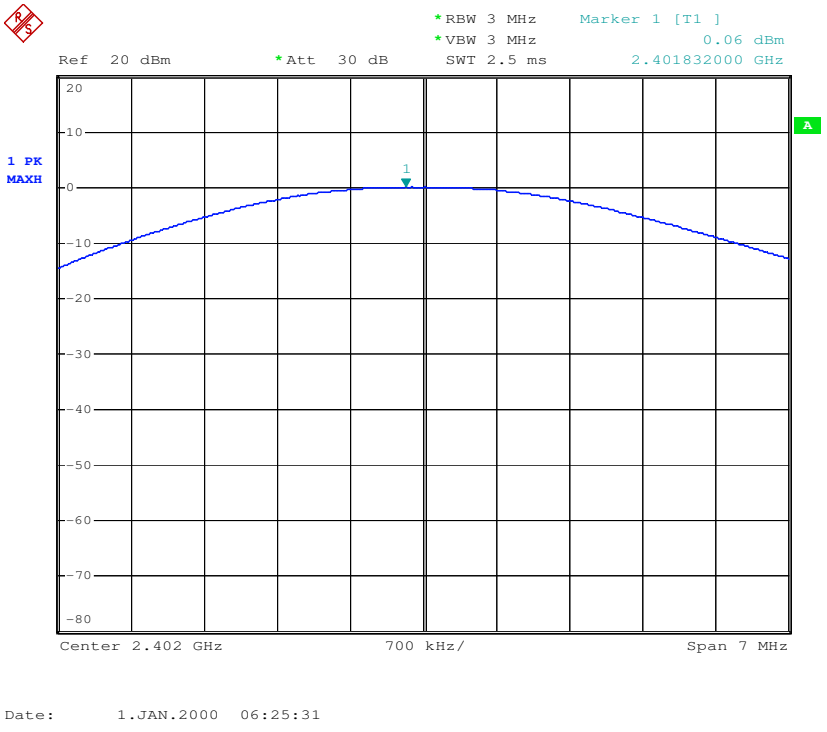
Test Results record:

Test Channel	Modulation	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power		Limit (dBm)	Margin (dB)
					(dBm)	(mW)		
Lowest	GFSK	2402	0.06	0.6	0.66	1.164	30	29.34
Middle	GFSK	2441	-0.24	0.6	0.36	1.086	30	29.64
Highest	GFSK	2480	-0.02	0.6	0.58	1.143	30	29.42
Lowest	π/4DQPSK	2402	-0.03	0.6	0.57	1.140	30	29.43
Middle	π/4DQPSK	2441	-0.26	0.6	0.34	1.081	30	29.66

Highest	π/4DQPSK	2480	-0.01	0.6	0.59	1.146	30	29.41
Lowest	8DPSK	2402	0.35	0.6	0.95	1.245	30	29.05
Middle	8DPSK	2441	0.04	0.6	0.64	1.159	30	29.36
Highest	8DPSK	2480	0.27	0.6	0.87	1.222	30	29.13

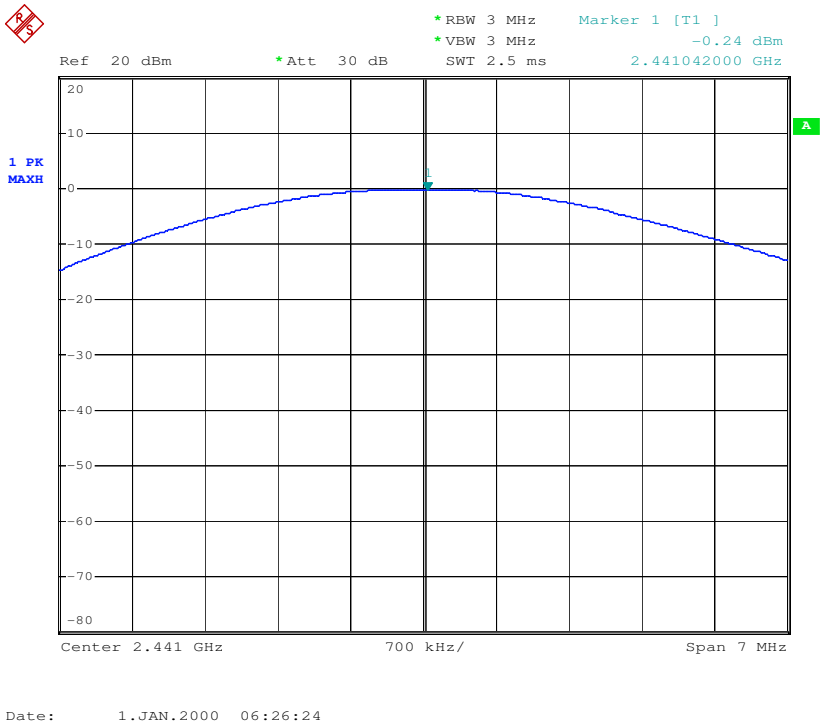
Test result plot as follows:

Low Channel Modulation: GFSK



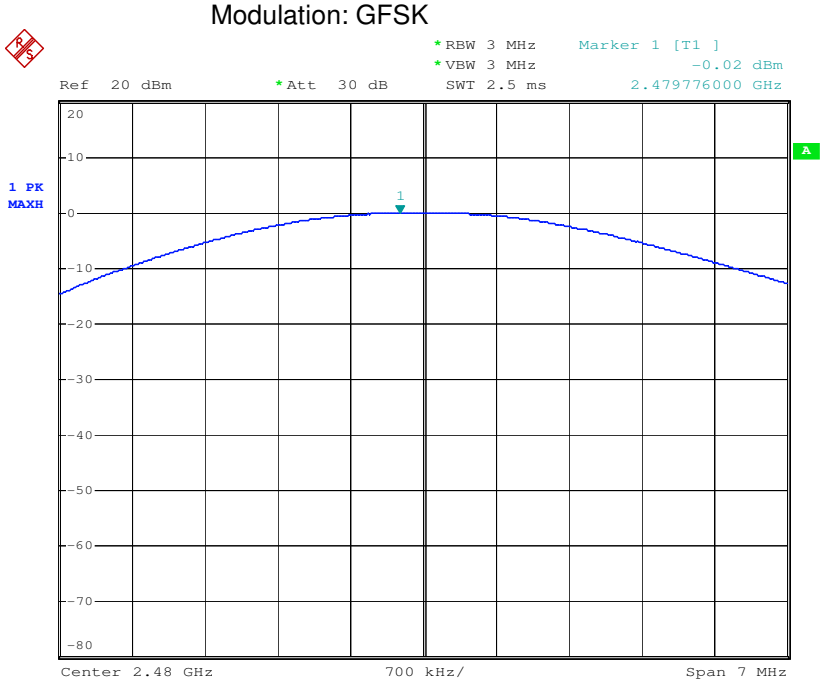
Middle Channel

Modulation: GFSK



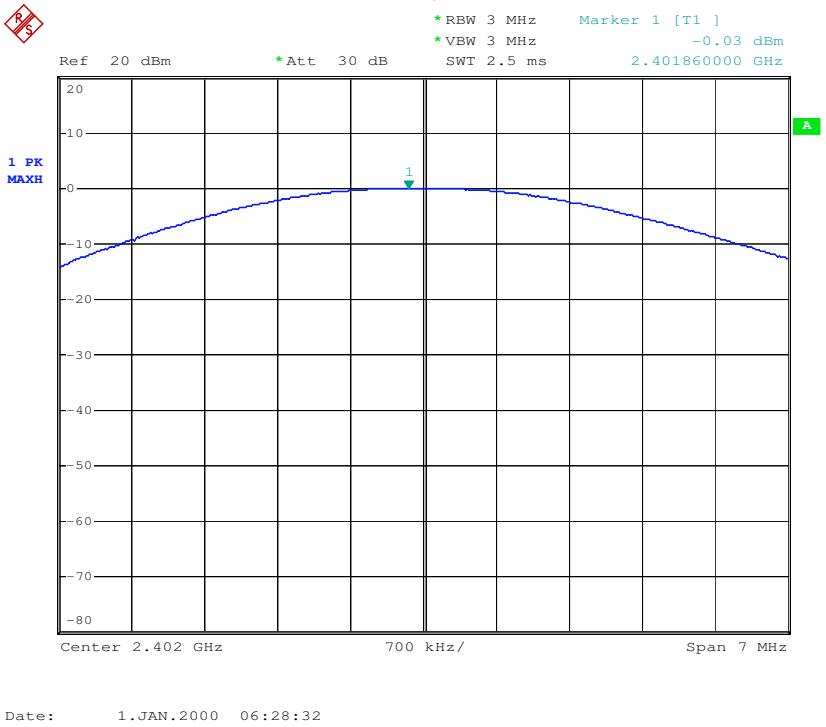
High Channel

Modulation: GFSK



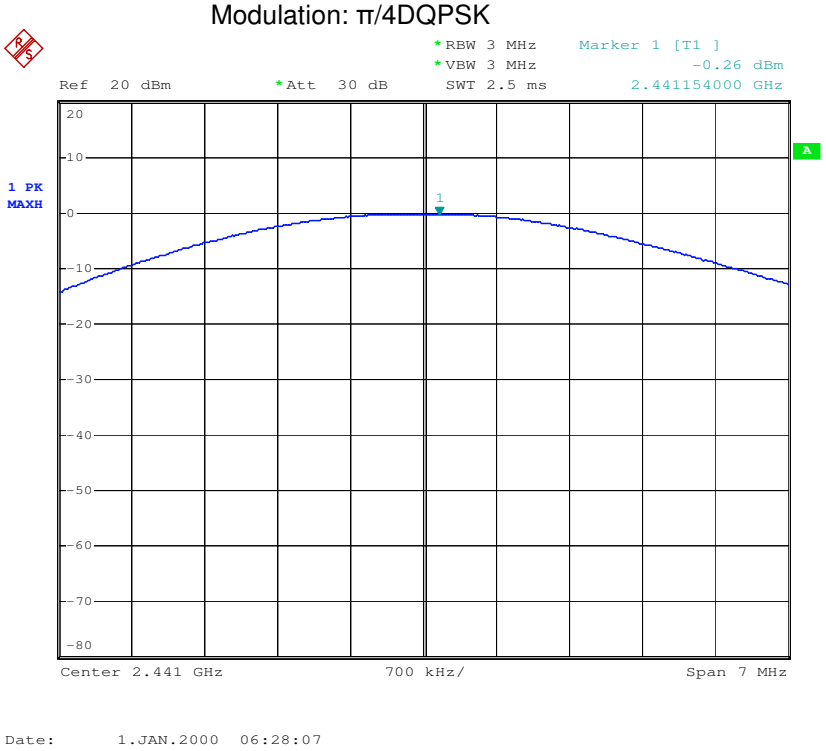
Low Channel

Modulation: π/4DQPSK



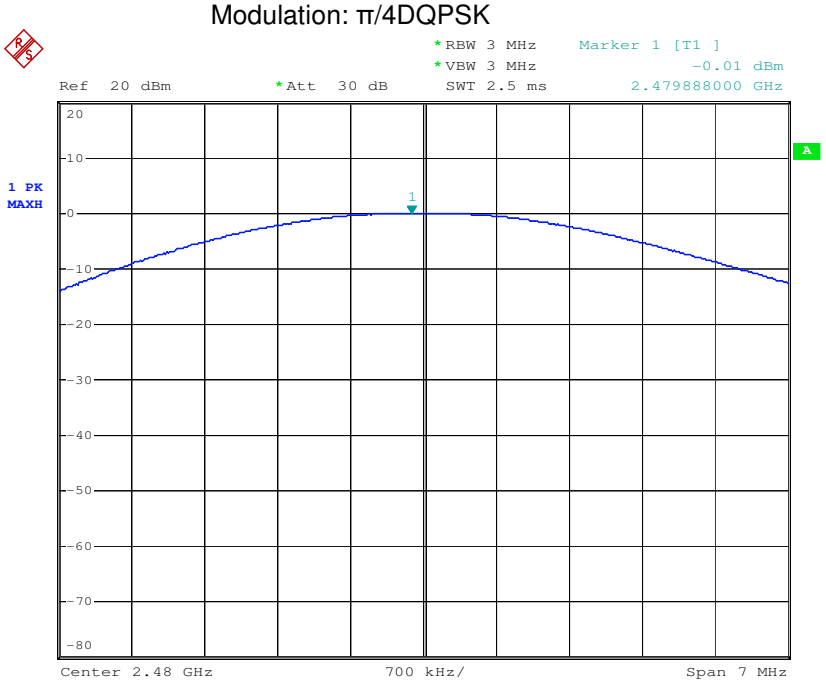
Middle Channel

Modulation: π/4DQPSK



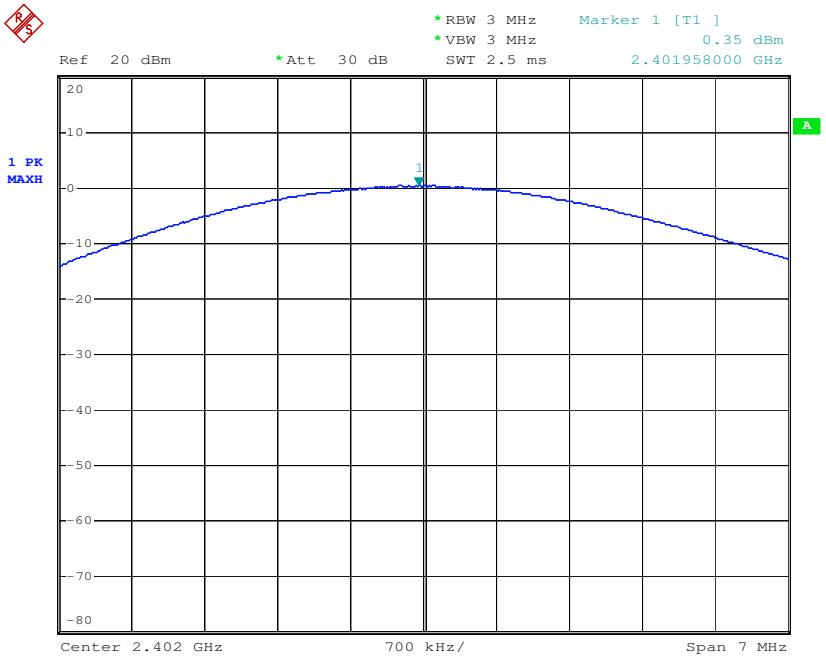
High Channel

Modulation: π/4DQPSK



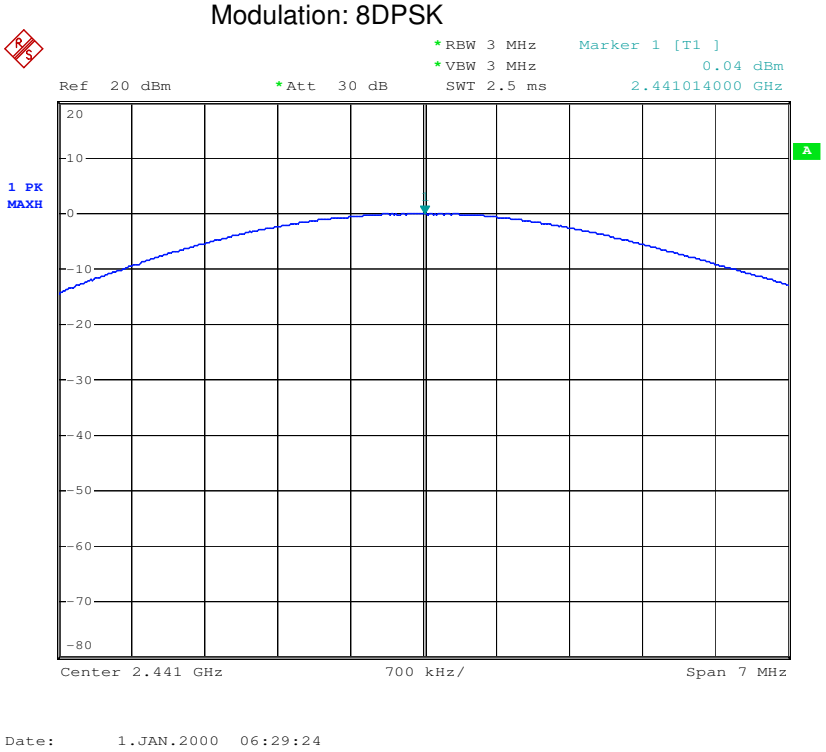
Low Channel

Modulation: 8DPSK



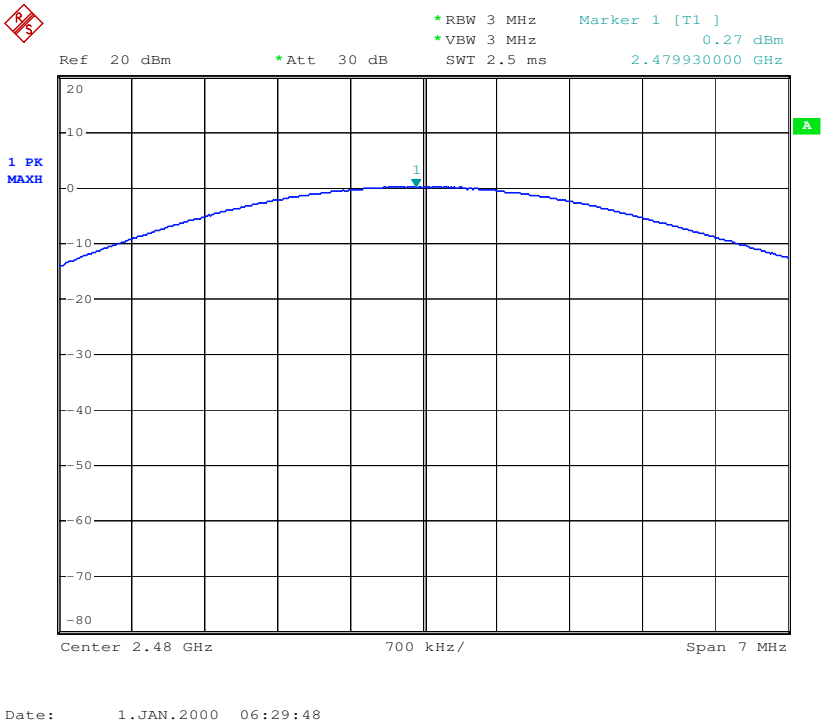
Middle Channel

Modulation: 8DPSK



High Channel

Modulation: 8DPSK



6.8 Pseudorandom Frequency Hopping Sequence

6.8.1 Standard requirement

15.247(i) and RSS210 Issue 8 Annex 8.1 requirement:

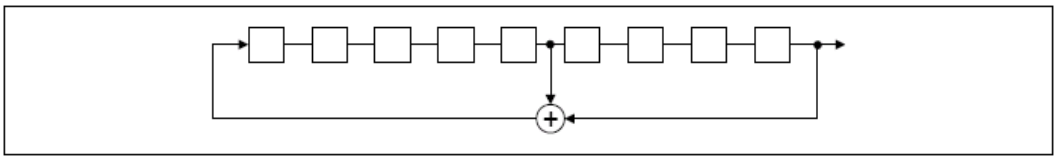
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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.

6.8.2 EUT Pseudorandom Frequency Hopping Sequence:

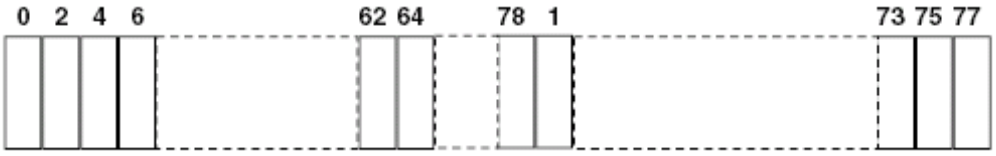
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized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

• Number of shift register stages: 9
• Length of pseudo-random sequence: 29 -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.

6.9 RF Exposure Compliance Requirement

6.9.1 Standard requirement

15.247(i) requirement:
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section. if transmitting antennas of directional gain greater than 6 dBi are used. the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1). (b)(2). and (b)(3) of this section. as appropriate. by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TCB Exclusion List (7 July 2002)

Exposure category	low threshold	high threshold
General population	(60/*f*GHz) mW. $d < 2.5$ cm (120/*f*GHz) mW. $d \geq 2.5$ cm	(900/*f*GHz) mW. $d < 20$ cm
Occupational	(375/*f*GHz) mW. $d < 2.5$ cm (900/*f*GHz) mW. $d \geq 2.5$ cm	(2250/*f*GHz) mW. $d < 20$ cm

6.9.2 Output power Results:

Test Channel	Modulation	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power	
					(dBm)	(mW)
Lowest	GFSK	2402	0.06	0.6	0.66	1.164
Middle	GFSK	2441	-0.24	0.6	0.36	1.086
Highest	GFSK	2480	-0.02	0.6	0.58	1.143
Lowest	π/4DQPSK	2402	-0.03	0.6	0.57	1.140
Middle	π/4DQPSK	2441	-0.26	0.6	0.34	1.081
Highest	π/4DQPSK	2480	-0.01	0.6	0.59	1.146
Lowest	8DPSK	2402	0.35	0.6	0.95	1.245
Middle	8DPSK	2441	0.04	0.6	0.64	1.159
Highest	8DPSK	2480	0.27	0.6	0.87	1.222

Mark: the RF output power is from section 6.7. So the test method please reference the report section 6.7.

6.9.3 EUT RF Exposure

The Max Conducted Peak Output Power is 0.95dBm(1.245mW) at 2402MHz.
And the antenna gain at 2402MHz is 2.0dBi PCB integrated in the actual use logarithmic terms convert to numeric result is nearly 1.585;

According to the formula. calculate the EIRP test result:

EIRP= P x G = 1.245 mW x 1.585 = 1.973 mW ①

SAR requirement:

S= 60 / f(GHz) = 60/2.402 = 24.979 mW ② ;

① < ②.

So the SAR test for Bluetooth is not required.

6.10 Conducted Spurious Emissions

Test Requirement: FCC Part 15 Section 15.207 &15.247(d)

RSS-210 Issue 8 Annex 8.5

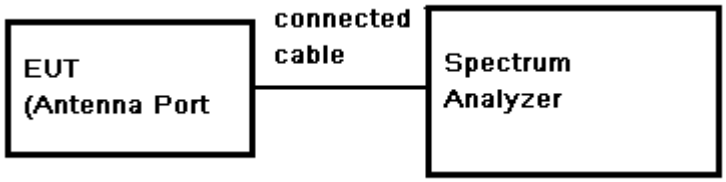
Test Method: ANSI C63.10:2009 Clause 7.7.10

Test Date: September 8, 2012

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 lowest. Middle, highest channel.
Remark: 8DPSK Modulation mode is the worst case (base on the 6.1 section Effective Isotrapically Radiated Power test result in this report, 8DPSK modulation is the worst case).

Test Configuration:

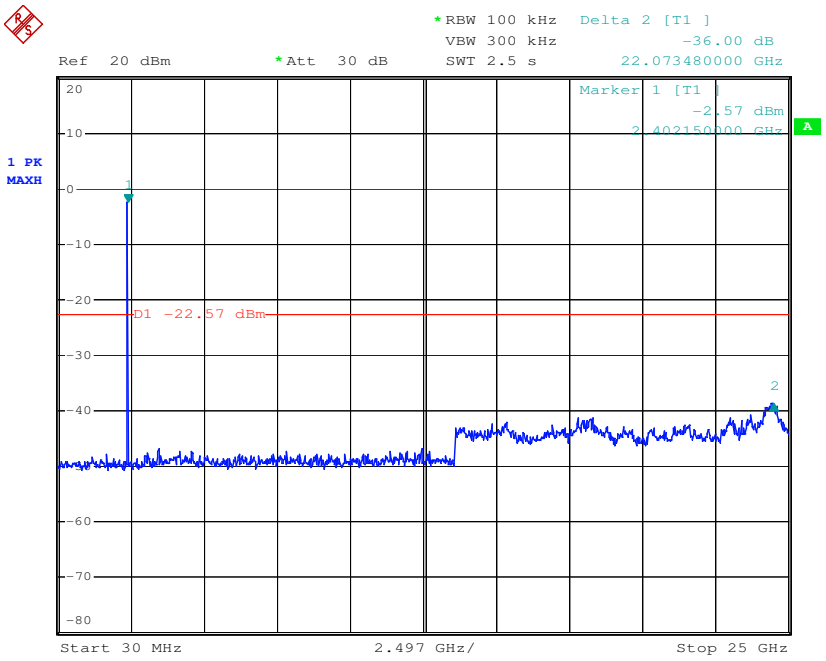


Test Procedure: 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

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

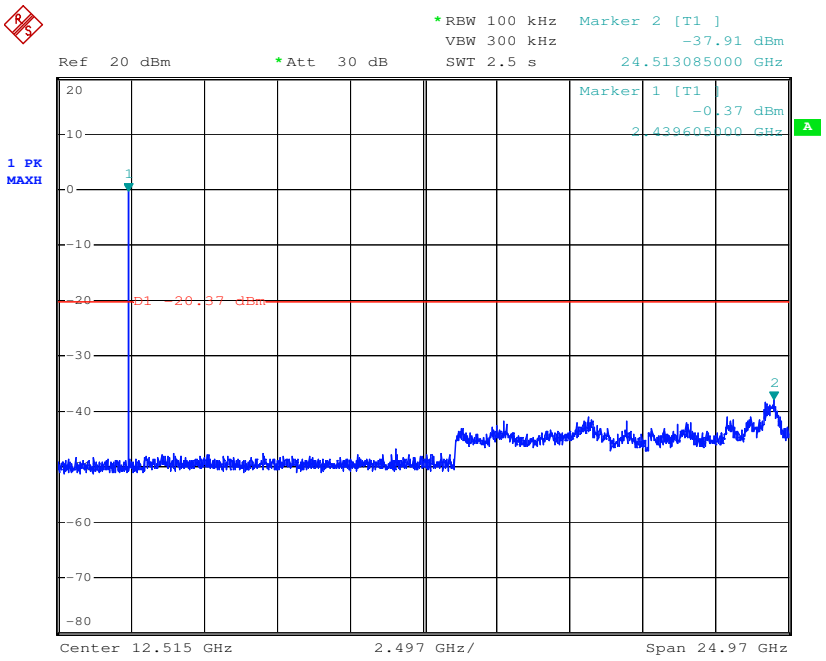
Test result The EUT does meet the FCC requirements.

Low Channel:



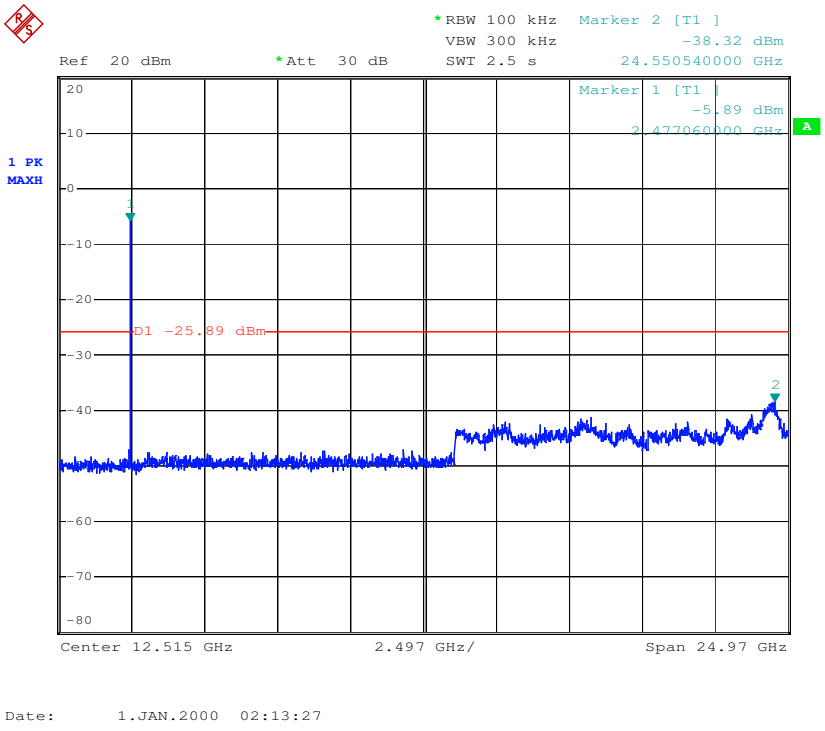
Date: 1.JAN.2000 02:07:53

Middle Channel:



Date: 1.JAN.2000 02:09:36

High Channel:



6.11 Radiated Spurious Emissions

Test Requirement:	FCC Part 15 Section 15.209 &15.247(d) RSS-210 Issue 8 Annex 8.5
Test Method:	ANSI C63.10:2009 Clause 6.12
Test Date:	September 22 ,2012
Test Status:	Test the lowest. Middle, highest channel with charger or only battery. Remark: 8DPSK Modulation mode is the worst case (base on the 6.1 section Effective Isotrapically Radiated Power test result in this report, 8DPSK modulation is the worst case).
Test site/setup:	Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). For PK value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration:

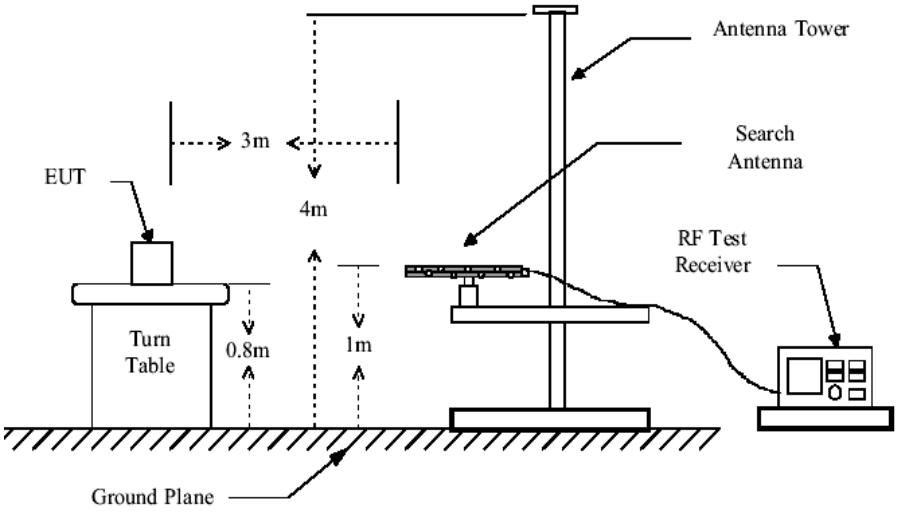


Figure 1. 30MHz to 1GHz radiated emissions test configuration

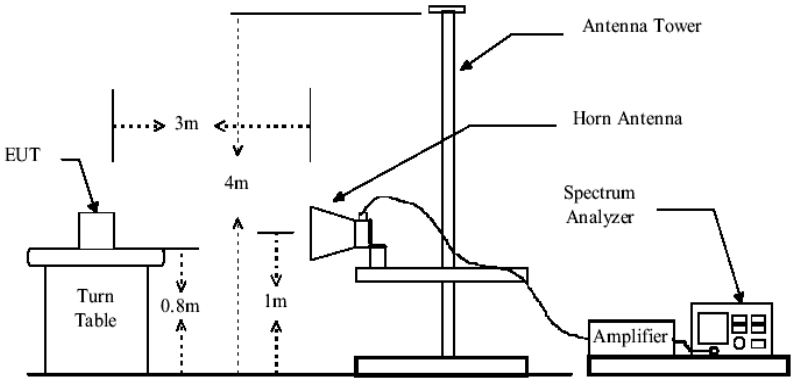


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure:

The procedure used was ANSI Standard C63.10:2009. 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.

Low nosie amplifier was used below 1GHz,High pass Filter was used above 3GHz.

Between 1G and 3GHz, we did not use any amplifier or filter.

Pre-test was performed on GFSK and EDR mode with charging mode and only battery power mode, Compliance test was performed on worse case (8DPSK mode with charging).

1) 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 5rd harmonic.

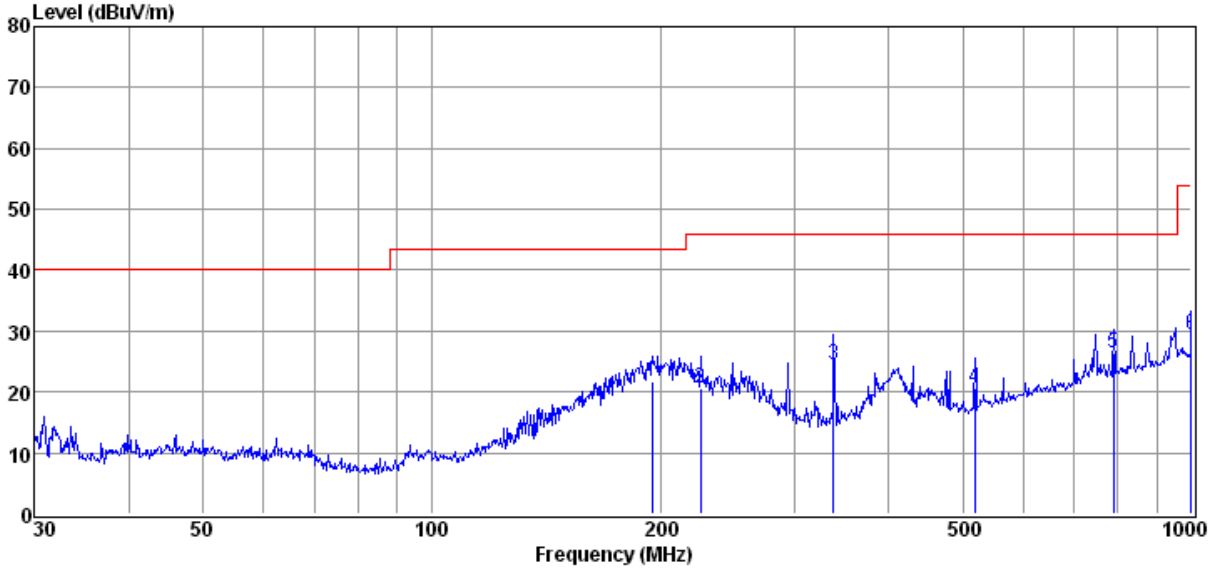
As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

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

Test Results: The EUT does meet the FCC requirements.

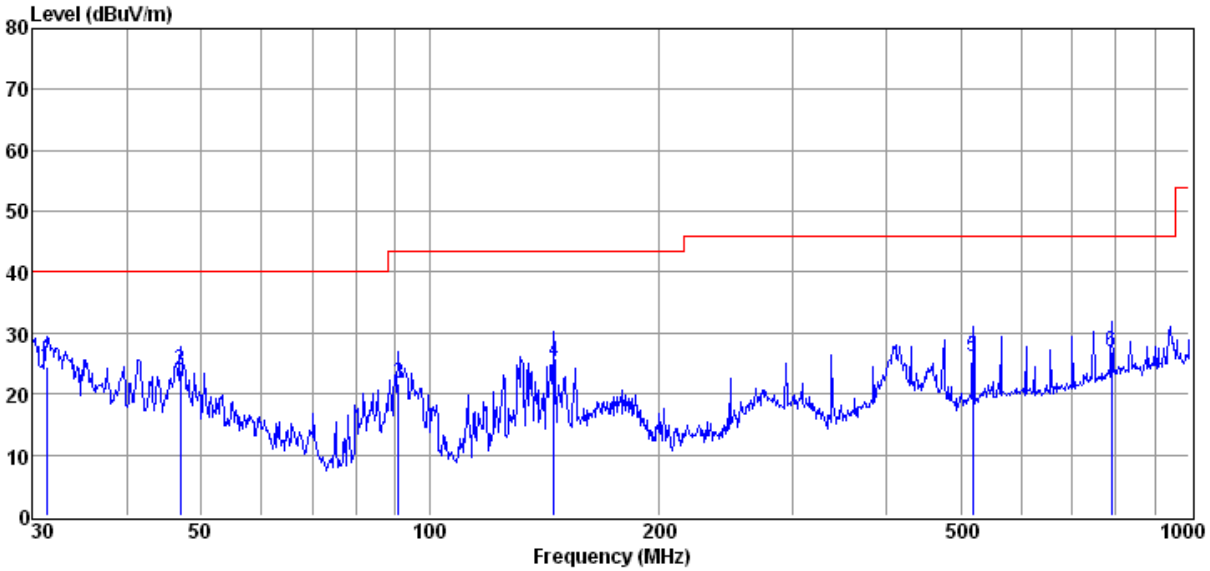
8DPSK with charging mode test data as follows:

30MHz~1GHz Spurious Emission,Quasi-Peak Measurement **Horizontal**



Freq (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
195.14	35.47	9.49	24.60	1.49	21.85	43.50	-21.65	QP	HORIZONTAL
226.10	34.51	9.22	24.60	1.62	20.75	46.00	-25.25	QP	HORIZONTAL
338.40	33.44	13.37	24.50	2.08	24.39	46.00	-21.61	QP	HORIZONTAL
519.07	25.33	16.96	24.30	2.67	20.66	46.00	-25.34	QP	HORIZONTAL
790.62	24.82	22.12	24.00	3.43	26.37	46.00	-19.63	QP	HORIZONTAL
1000.00	24.93	24.30	23.70	3.89	29.42	54.00	-24.58	QP	HORIZONTAL

30MHz~1GHz Spurious Emission,Quasi-Peak Measurement **Vertical**



Freq (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
31.29	36.44	12.18	24.70	0.44	24.36	40.00	-15.64	QP	VERTICAL
47.00	34.97	12.98	24.70	0.62	23.87	40.00	-16.13	QP	VERTICAL
90.86	37.03	8.56	24.70	0.96	21.85	43.50	-21.65	QP	VERTICAL
145.86	36.33	12.45	24.70	1.25	25.33	43.50	-18.17	QP	VERTICAL
519.07	30.67	16.96	24.30	2.67	26.00	46.00	-20.00	QP	VERTICAL
790.62	25.27	22.31	24.00	3.43	27.01	46.00	-18.99	QP	VERTICAL

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

Test in **Channel Low** in transmitting status- **Vertical** polarization

Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4804.15	30.8	1.2	0.5	43.4	58.12	47.22	74.0
7208.20	36.0	1.7	0.8	43.1	59.45	54.85	74.0
9609.87	37.8	2.2	0.9	43.9	55.17	52.17	74.0

Average Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4804.15	30.8	1.2	0.5	43.4	53.46	42.56	54.0
7208.20	36.0	1.7	0.8	43.1	47.16	42.56	54.0
9609.87	37.8	2.2	0.9	43.9	43.82	40.82	54.0

Remark: No other radiation has been found.

Test in **Channel Low** in transmitting status- **Horizontal** polarization

Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4803.86	30.8	1.2	0.5	43.4	58.16	47.26	74.0
7207.92	36.0	1.7	0.8	43.1	57.24	52.64	74.0
9609.85	37.8	2.2	0.9	43.9	55.49	52.49	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4803.86	30.8	1.2	0.5	43.4	49.27	38.37	54.0
7207.92	36.0	1.7	0.8	43.1	46.83	42.23	54.0
9609.85	37.8	2.2	0.9	43.9	44.12	41.12	54.0

Remark: No other radiation has been found.

Test in **Channel Middle** in transmitting status- **Vertical** polarization

Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.10	30.8	1.2	0.5	43.4	58.51	47.61	74.0
7323.82	36.0	1.7	0.8	43.1	55.26	50.66	74.0
9765.96	37.8	2.2	0.9	43.9	51.29	48.29	74.0

Average Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.10	30.8	1.2	0.5	43.4	47.27	36.37	54.0
7323.82	36.0	1.7	0.8	43.1	47.15	42.55	54.0
9765.96	37.8	2.2	0.9	43.9	35.46	32.46	54.0

Remark: No other radiation has been found.

Test in **Channel Middle** in transmitting status- **Horizontal** polarization

Peak Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.27	30.8	1.2	0.5	43.4	65.67	54.77	74.0
7324.18	36.0	1.7	0.8	43.1	63.33	58.73	74.0
9765.79	37.8	2.2	0.9	43.9	55.10	52.10	74.0

Average Measurement

Frequency (MHz)	Antenna factors(dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4882.27	30.8	1.2	0.5	43.4	54.24	43.34	54.0
7324.18	36.0	1.7	0.8	43.1	54.28	49.68	54.0
9765.79	37.8	2.2	0.9	43.9	43.13	40.13	54.0

Remark: No other radiation has been found.

Test in **Channel High** in transmitting status- **Vertical** polarization

Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4957.87	30.8	1.2	0.5	43.4	58.46	47.56	74.0
7440.22	36.0	1.7	0.8	43.1	65.24	60.64	74.0
9918.53	37.8	2.2	0.9	43.9	54.47	51.47	74.0

Average Measurement.

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4957.87	30.8	1.2	0.5	43.4	47.19	36.29	54.0
7440.22	36.0	1.7	0.8	43.1	56.82	52.22	54.0
9918.53	37.8	2.2	0.9	43.9	41.62	38.62	54.0

Remark: No other radiation has been found.

Test in **Channel High** in transmitting status- **Horizontal** polarization

Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4957.20	30.8	1.2	0.5	43.4	62.27	51.37	74.0
7440.82	36.0	1.7	0.8	43.1	64.68	60.08	74.0
9918.15	37.8	2.2	0.9	43.9	54.69	51.69	74.0

Average Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Filter (dB)	Preamp factor(dB)	Emission Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)
4957.20	30.8	1.2	0.5	43.4	51.19	40.29	54.0
7440.82	36.0	1.7	0.8	43.1	57.32	52.72	54.0
9918.15	37.8	2.2	0.9	43.9	41.83	38.83	54.0

Remark: No other radiation has been found.

Test Level =Receiver Reading + Antenna Factor + Cable Factor+ Filter –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.

6.11.1 Radiated Emissions which fall in the restricted bands

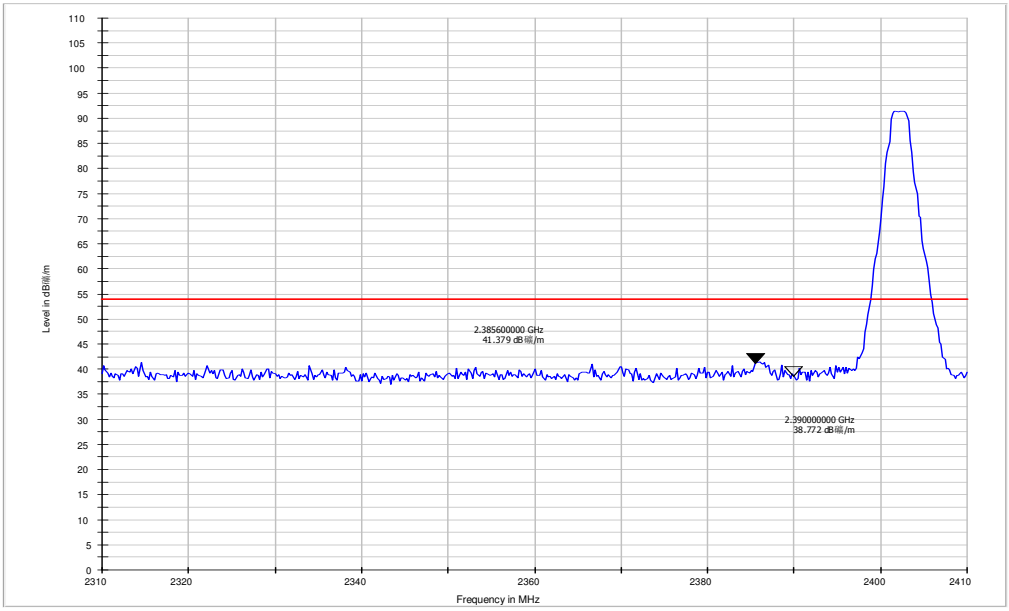
Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI 63.10:2009 Clause 6.12
Test Date:	September 22, 2012
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:	For PK value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold

According to section,15.35(b) 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.

Pre-test were performed for there spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was sumitted.

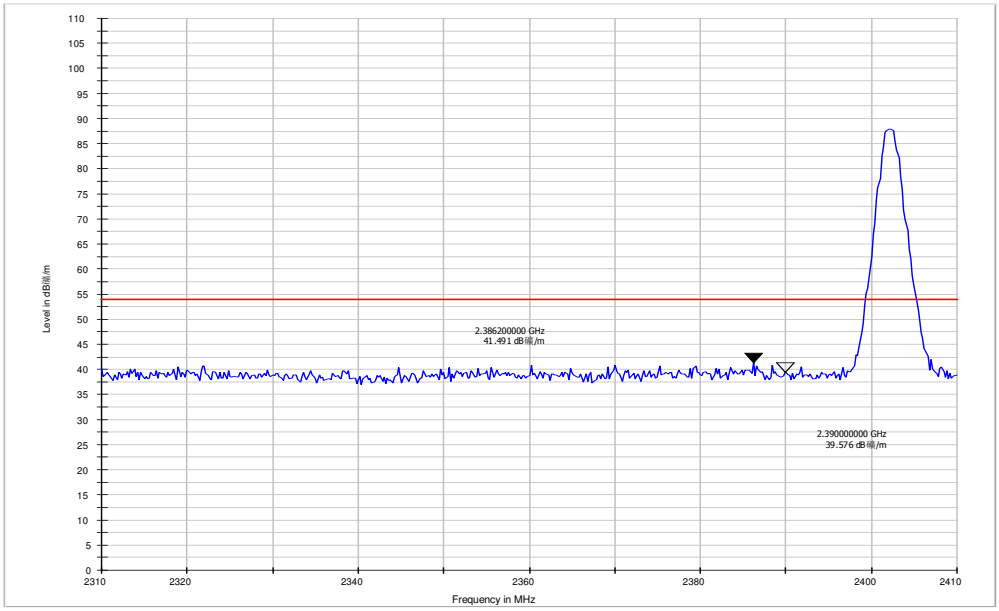
Test Result: The EUT does meet the FCC requirements.

Measurement Result:
CH Low 2412MHz Radiated Bandedge **Modulation: GFSK**
Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2385.60	51.78	27.28	42.50	4.82	41.38	54.00	12.62

Vertical, Peak Detector:

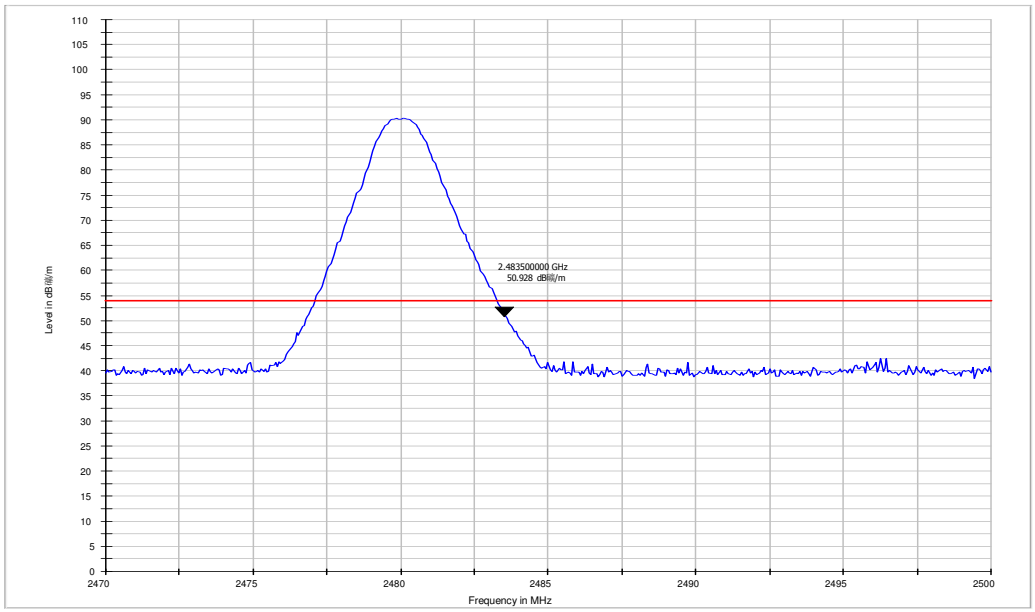


Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2386.2	51.89	27.28	42.5	4.82	41.49	54	12.51

CH Low 2480MHz Radiated Bandedge

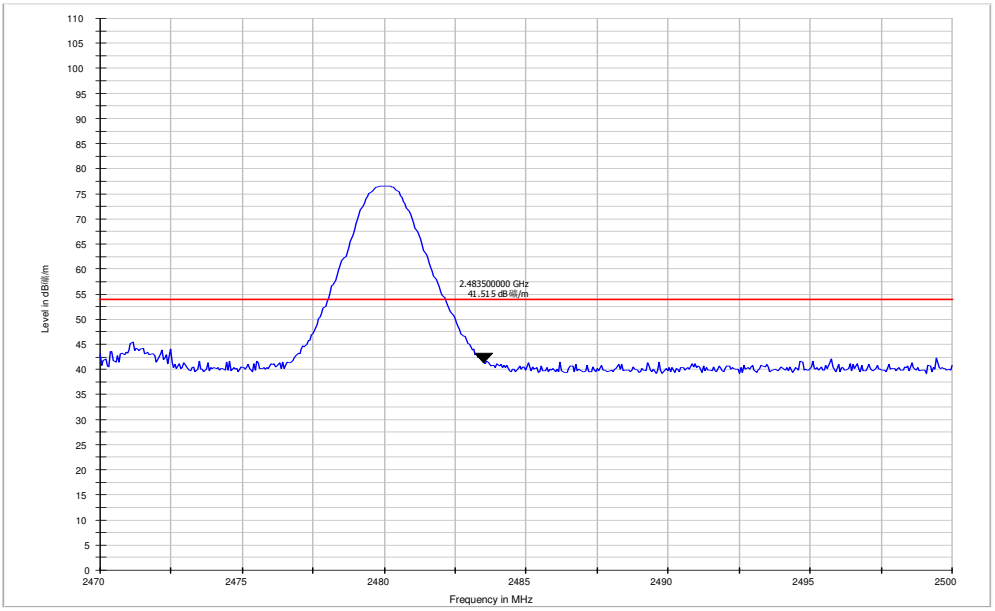
Modulation: GFSK

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	61.17	27.48	42.54	4.82	50.93	54	3.07

Vertical, Peak Detector:

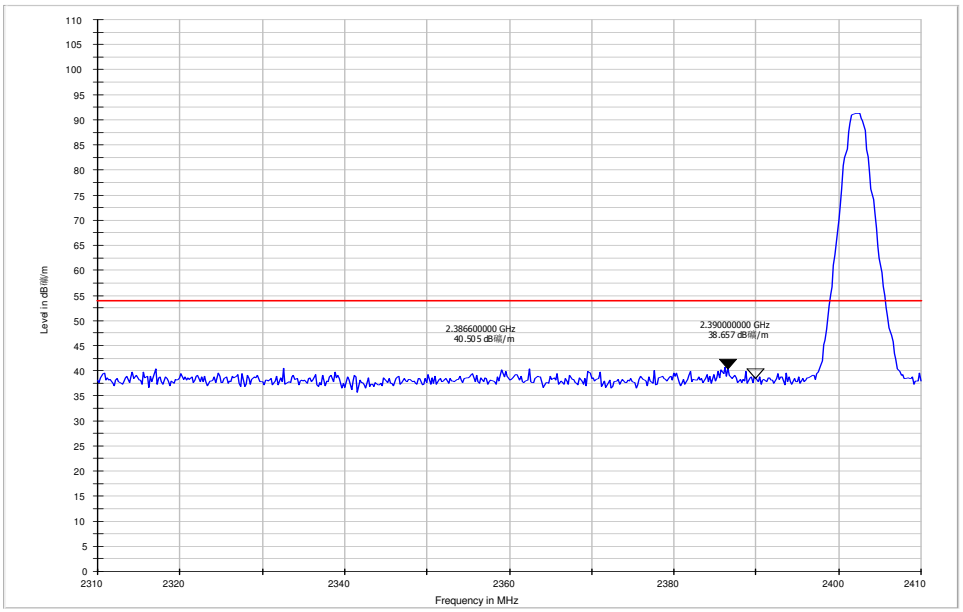


Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	51.76	27.48	42.54	4.82	41.52	54	12.48

CH Low 2412MHz Radiated Bandedge

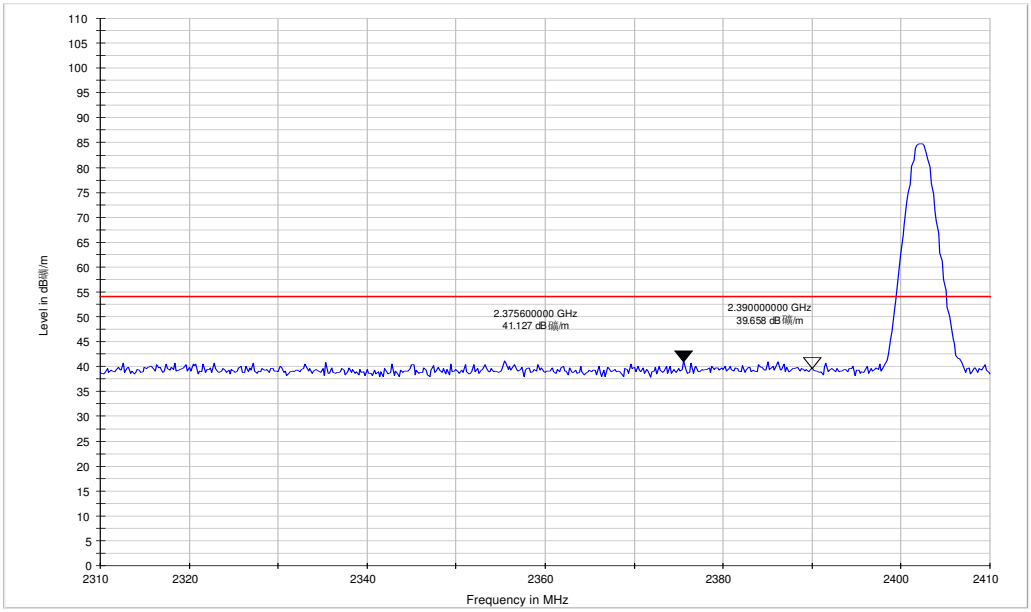
Modulation: π/4DQPSK

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2386.60	50.91	27.28	42.5	4.82	40.51	54	13.49

Vertical, Peak Detector:

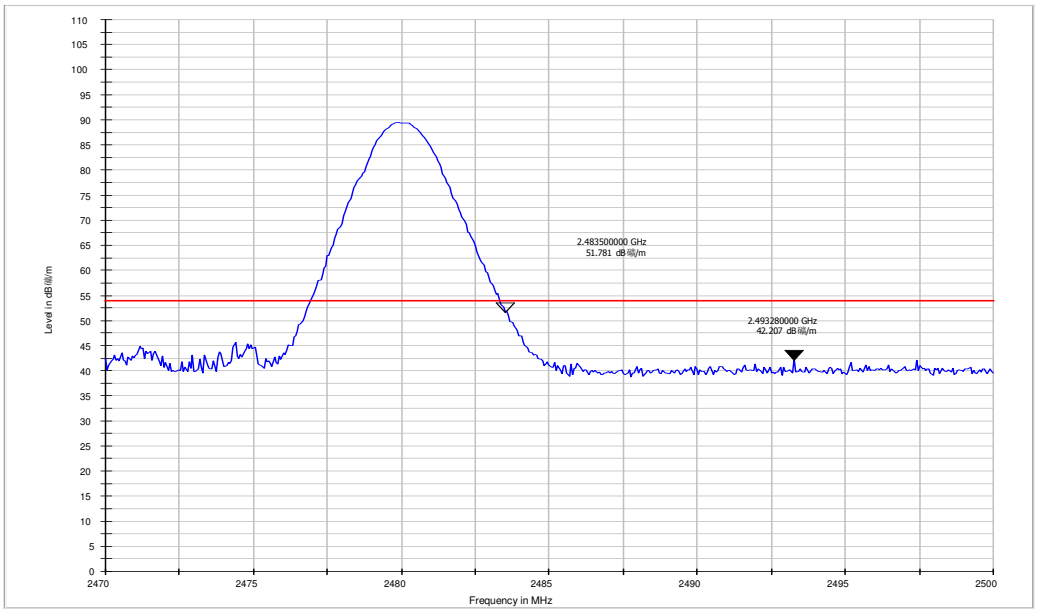


Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.0	51.53	27.28	42.5	4.82	41.13	54	12.87

CH Low 2480MHz Radiated Bandedge

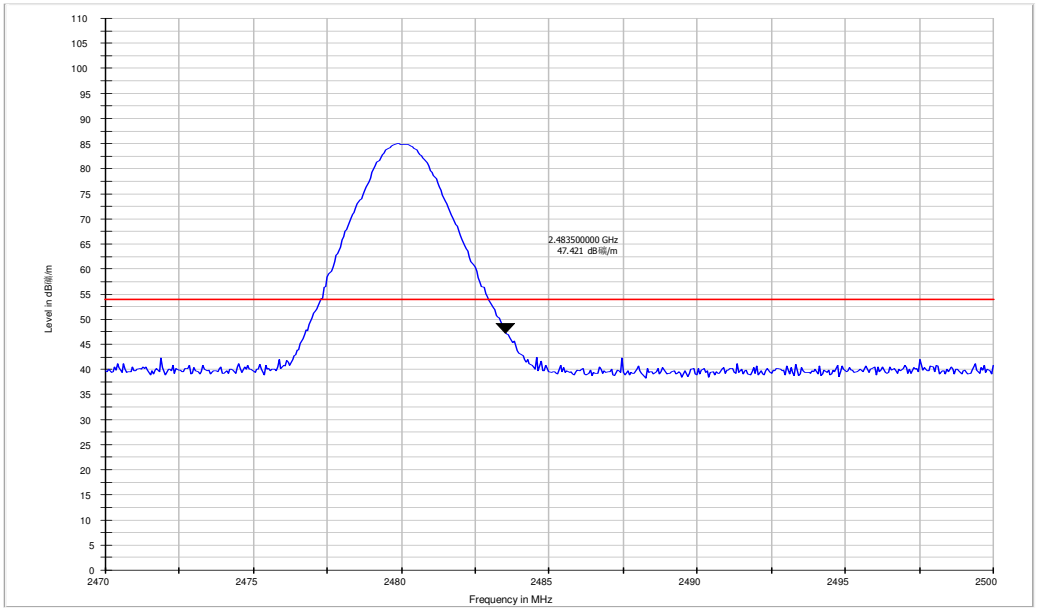
Modulation: π/4DQPSK

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	62.02	27.48	42.54	4.82	51.78	54	2.22

Vertical, Peak Detector:

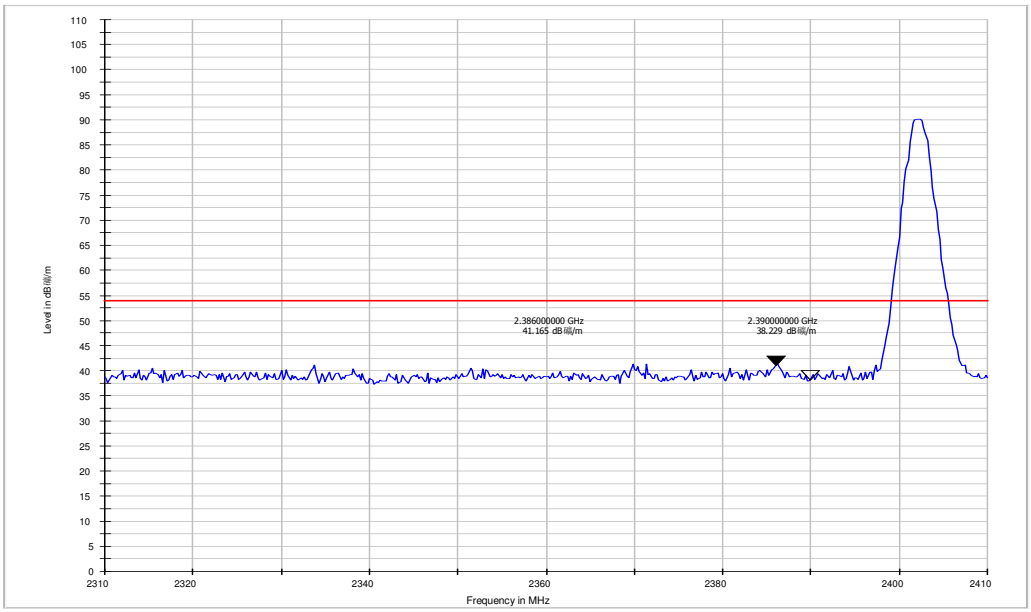


Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	57.66	27.48	42.54	4.82	47.42	54	6.58

CH Low 2412MHz Radiated Bandedge

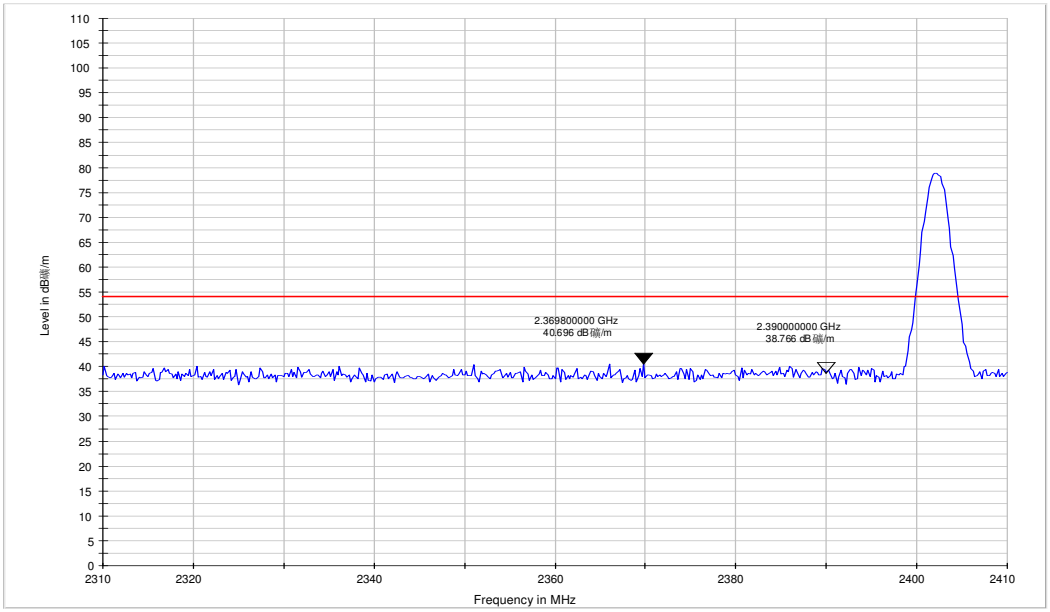
Modulation: 8DPSK

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.0	51.57	27.28	42.5	4.82	41.17	54	12.83

Vertical, Peak Detector:

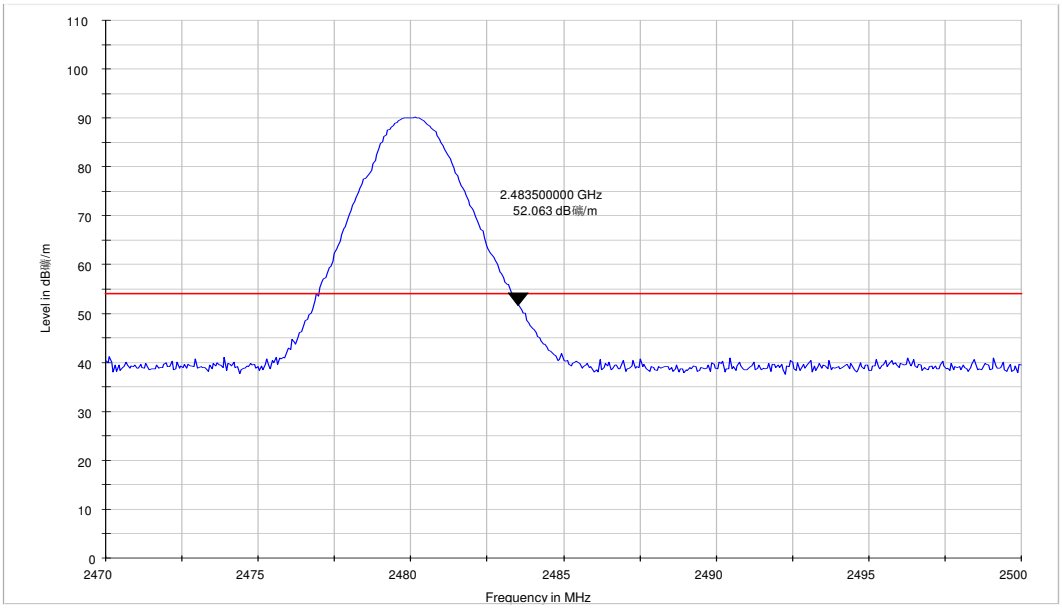


Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390	49.17	27.28	42.5	4.82	38.77	54	15.23

CH Low 2480MHz Radiated Bandedge

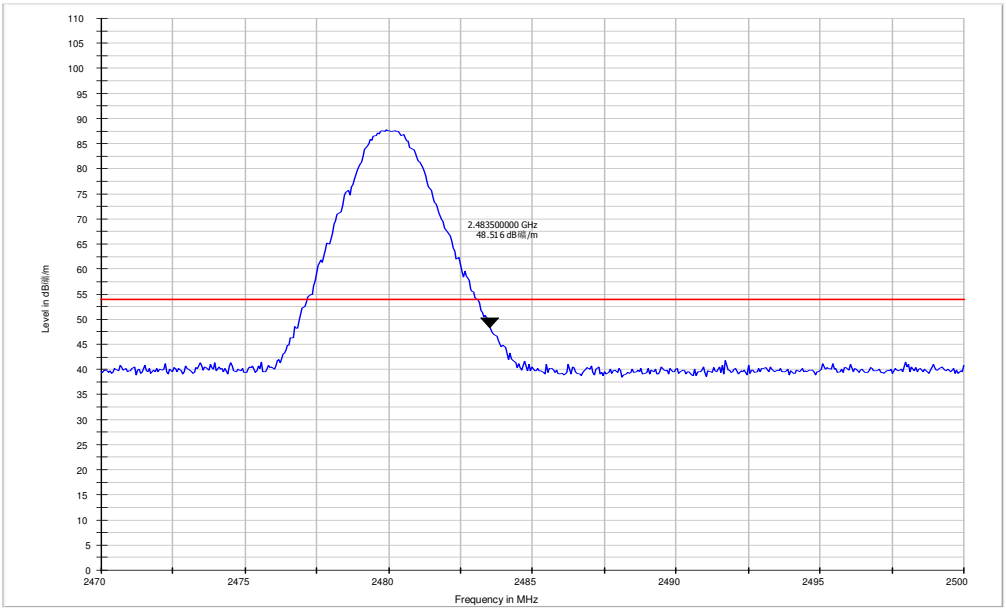
Modulation: 8DPSK

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.5	62.3	27.48	42.54	4.82	52.06	54	1.94

Vertical, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.5	58.76	27.48	42.54	4.82	48.52	54	5.48

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

Test Level = Receiver Reading + Antenna Factor + Cable Factor- Preamplifier Factor

All frequencies within the “Restricted bands” have been evaluated to compliance. Section 15.205 Restricted bands of operation.

Except as shown in paragraph 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		

6.12 Band Edges Requirement

Test Requirement:	FCC Part 15 C Section 15.247 (d) & 15.205 RSS-Gen Issue 3 Clause 7.2.2
Test Method:	Based on ANSI 63.10 Clause 6.9 Operation within the band 2400M – 2483.5 MHz
Test Date:	September 16,2012
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 300 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB.

The Upper Edges attenuated more than 20dB.

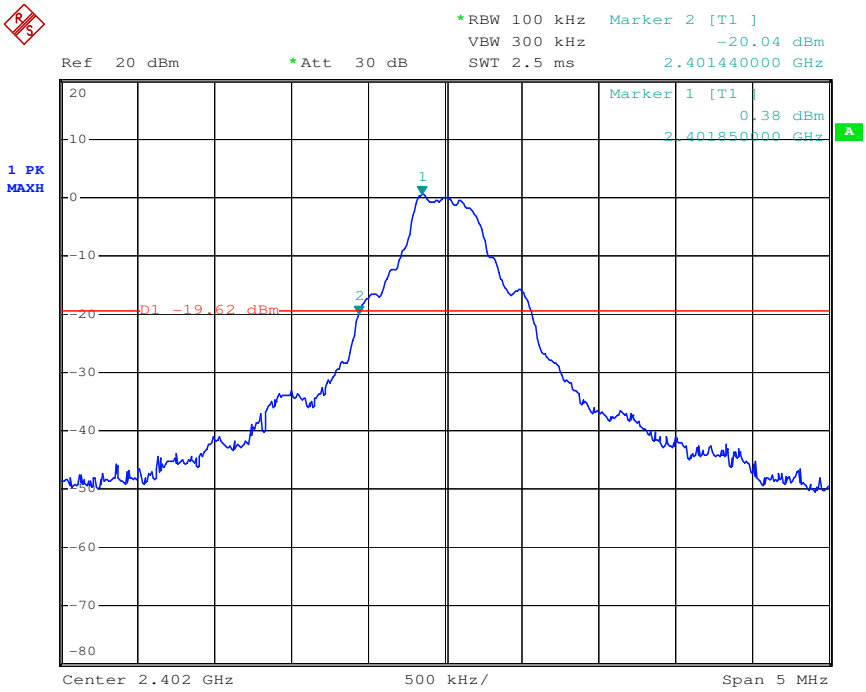
Test Result: The EUT does meet the FCC requirements.

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

Test results: The EUT does meet the FCC requirements.

Low Channel

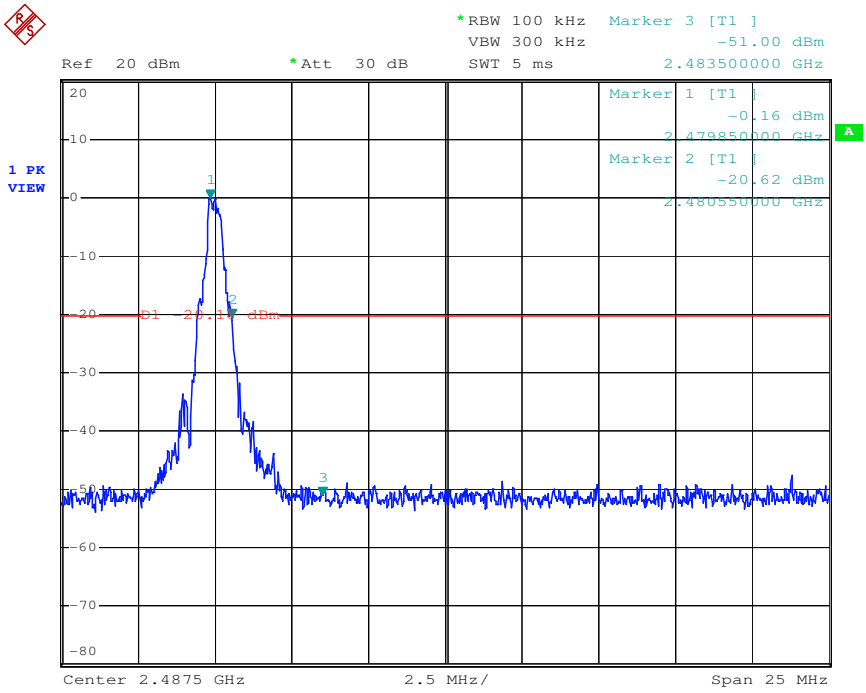
Test Status: GFSK- Static



Date: 1.JAN.2000 01:03:46

High Channel

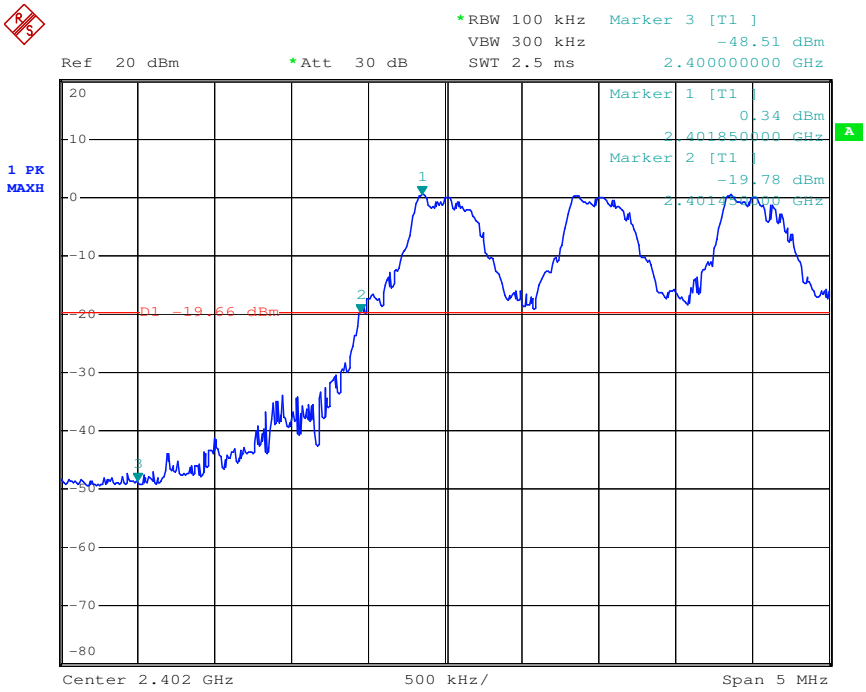
Test Status: GFSK- Static



Date: 1.JAN.2000 05:45:03

Low Channel

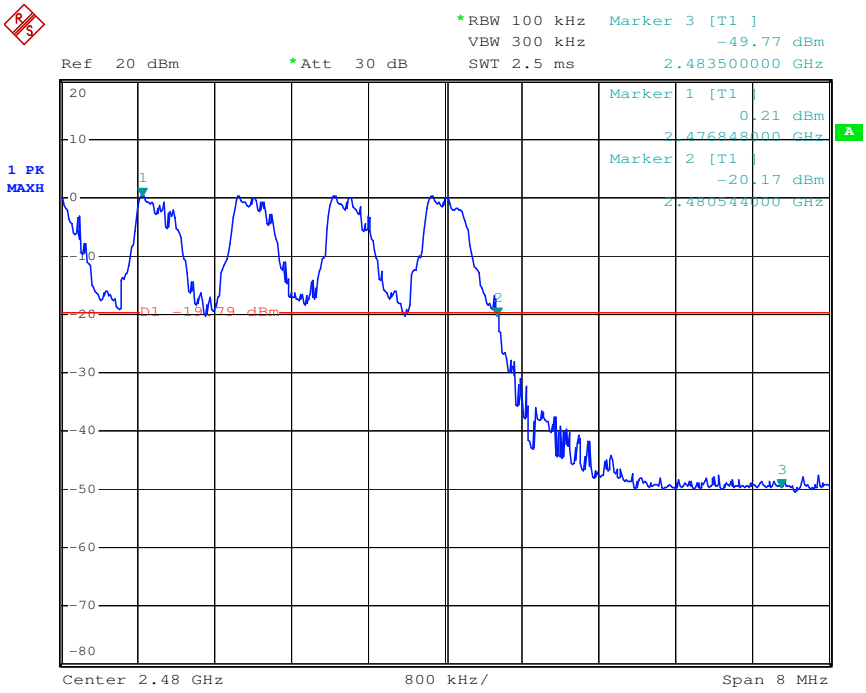
Test Status: GFSK- Hopping



Date: 1.JAN.2000 01:11:20

High Channel

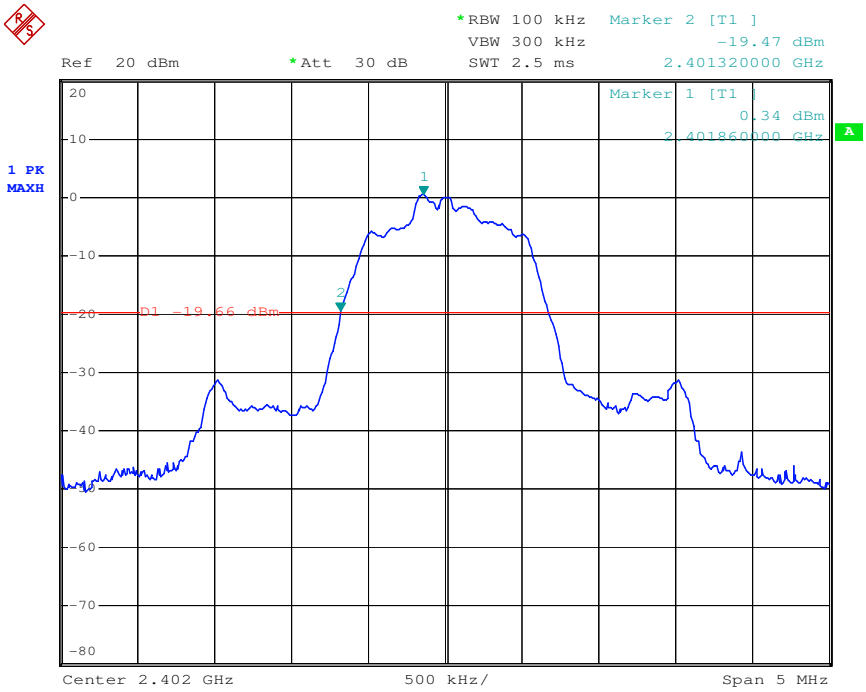
Test Status: GFSK- Hopping



Date: 1.JAN.2000 01:20:04

Low Channel

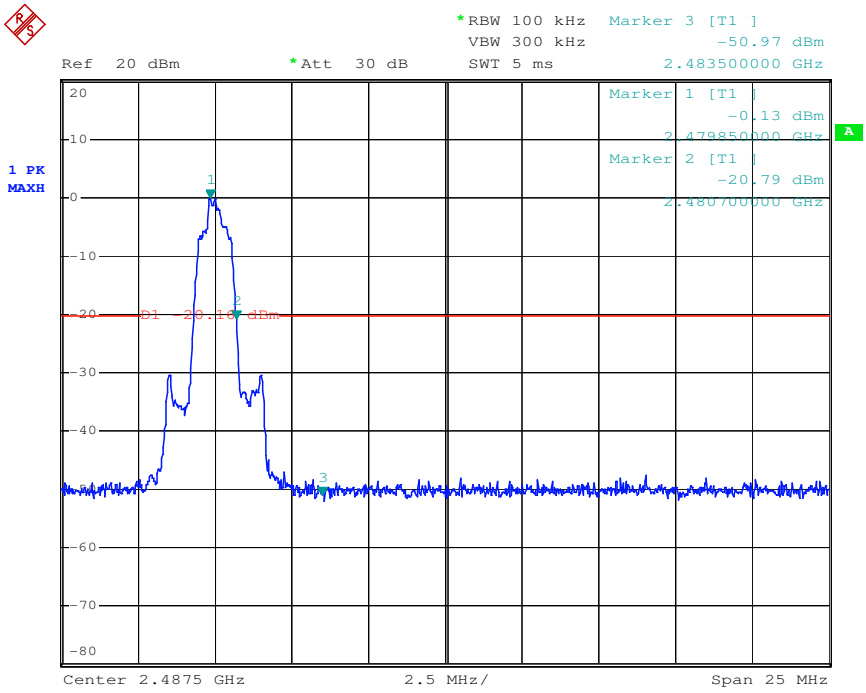
Test Status: π/4DQPSK - Static



Date: 1.JAN.2000 01:00:33

High Channel

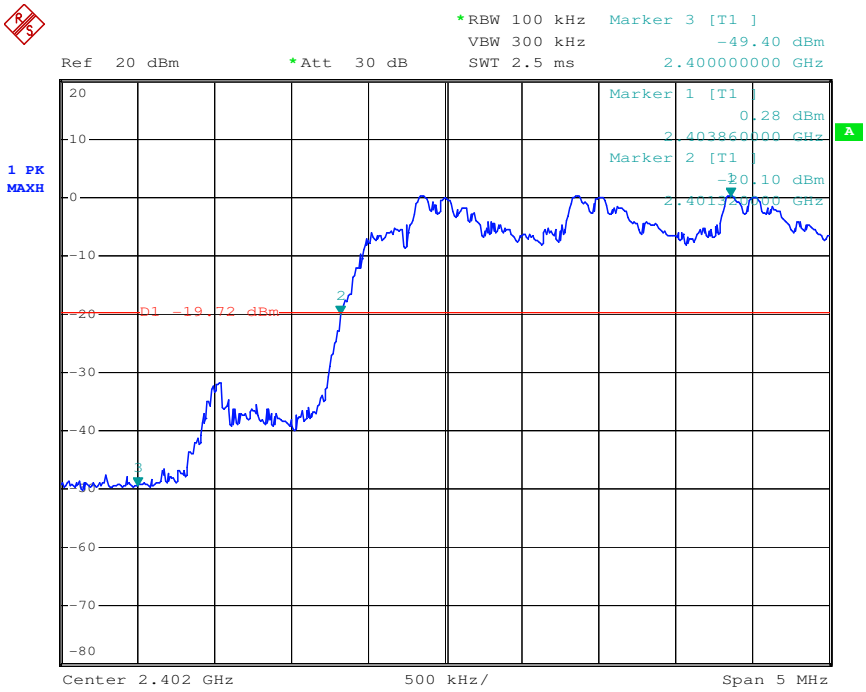
Test Status: π/4DQPSK - Static



Date: 1.JAN.2000 05:44:10

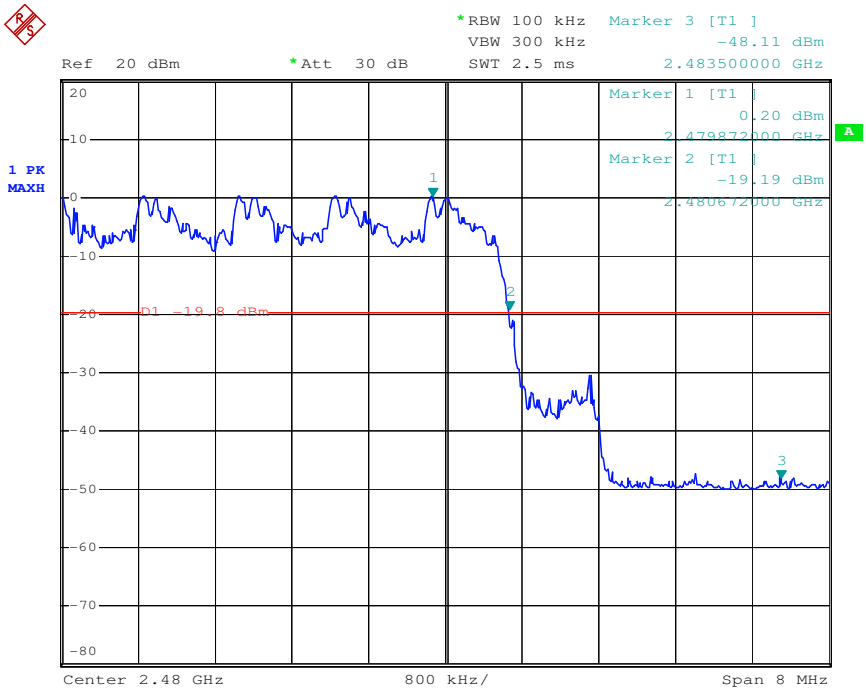
Low Channel

Test Status: π/4DQPSK - Hopping



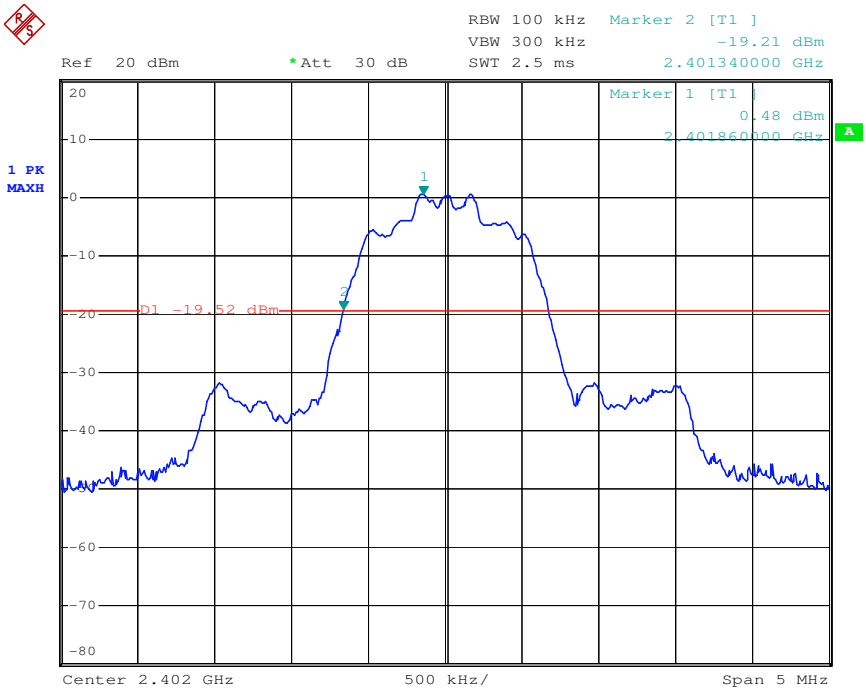
High Channel

Test Status: π/4DQPSK - Hopping



Low Channel

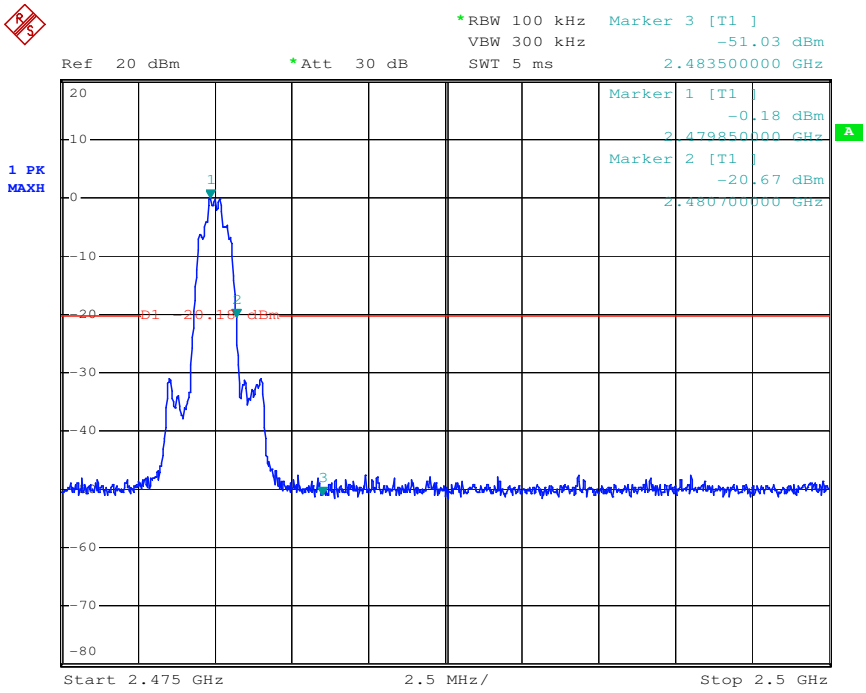
Test Status: 8DPSK - Static



Date: 1.JAN.2000 00:41:29

High Channel

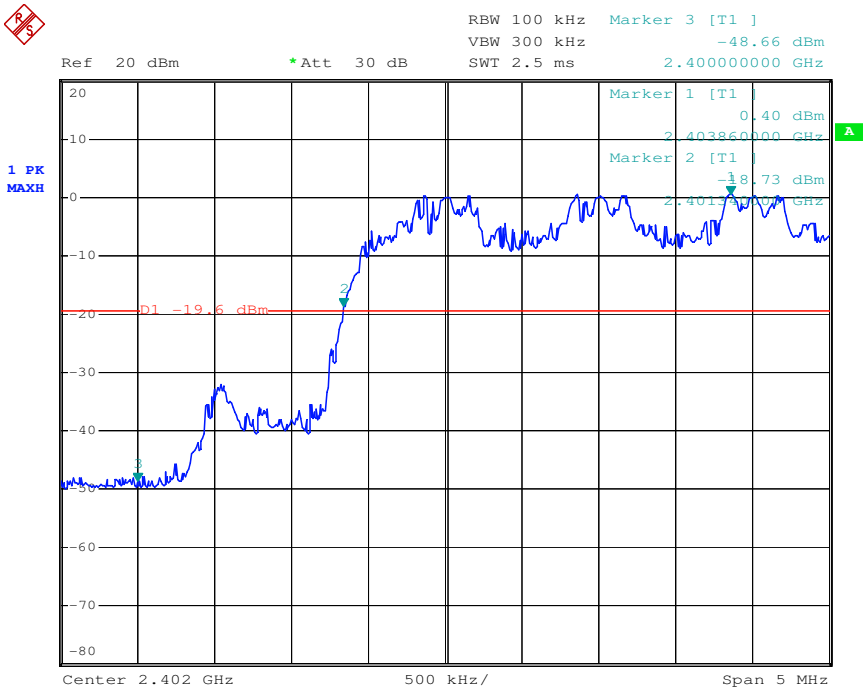
Test Status: 8DPSK - Static



Date: 1.JAN.2000 05:42:53

Low Channel

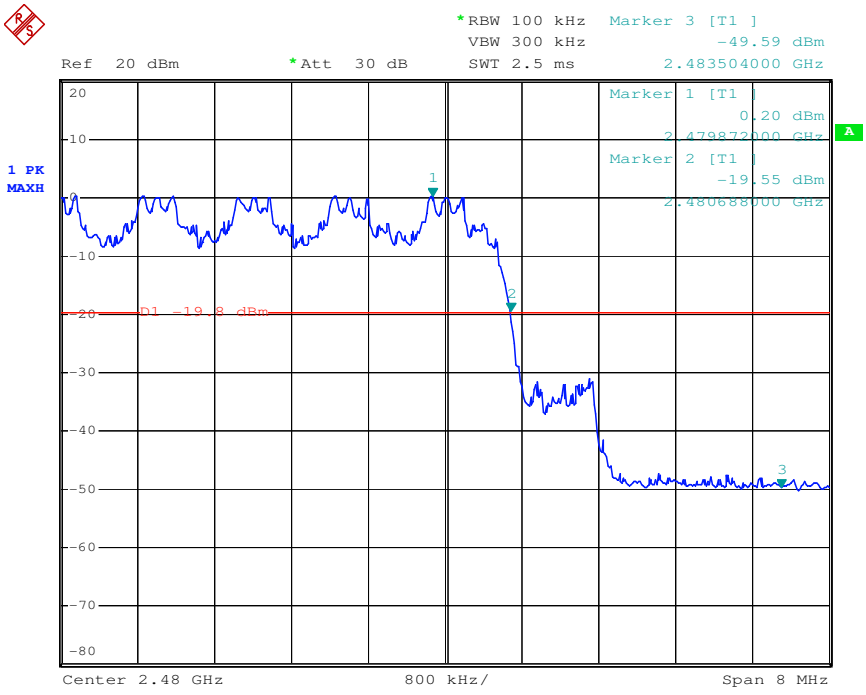
Test Status: 8DPSK - Hopping



Date: 1.JAN.2000 00:46:07

High Channel

Test Status: 8DPSK - Hopping



Date: 1.JAN.2000 00:50:59

6.13 Conducted Emission Test

Test Requirement: FCC Part15 15.207

Test date: October. 10, 2012

Standard Applicable According to section 15.207,frequency 150KHz to 30MHz shall not not exceed the limit table as blew.

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

*

EUT Setup 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.

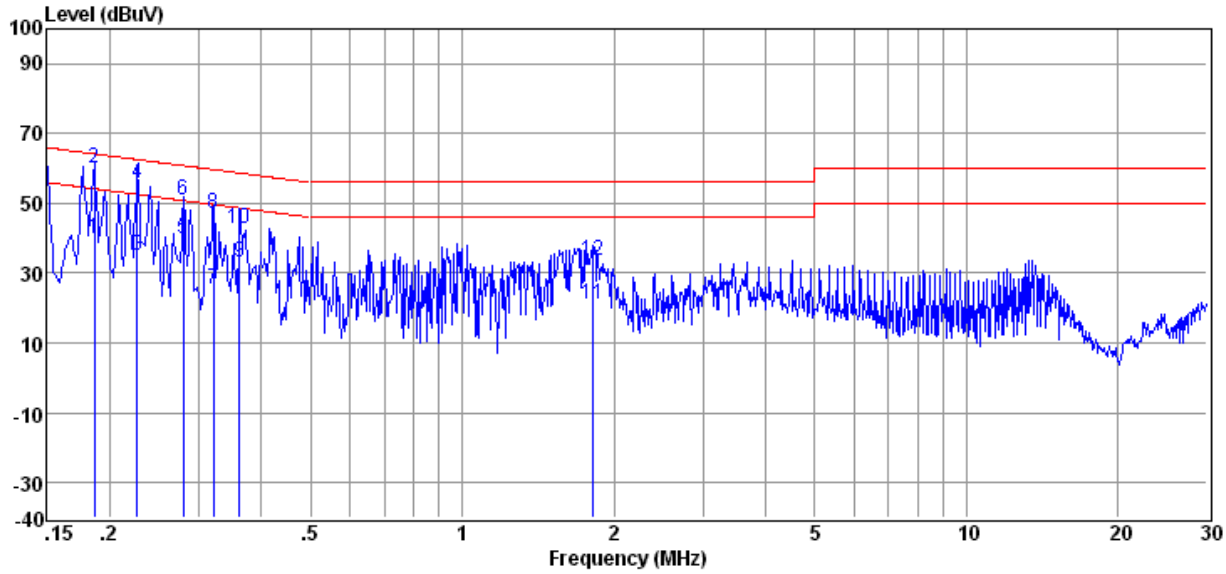
2.EUT is charged with PC.The AC Power adaptor of PC was plug-in LISN.The rear of the EUT and periphearals were placed flushed with the rear of the tabletop.

3.The LISN was connected with 120V AC/60Hz power source.

Measurement Result Operation mode: Transimitter conducted to Receiver by wireless.

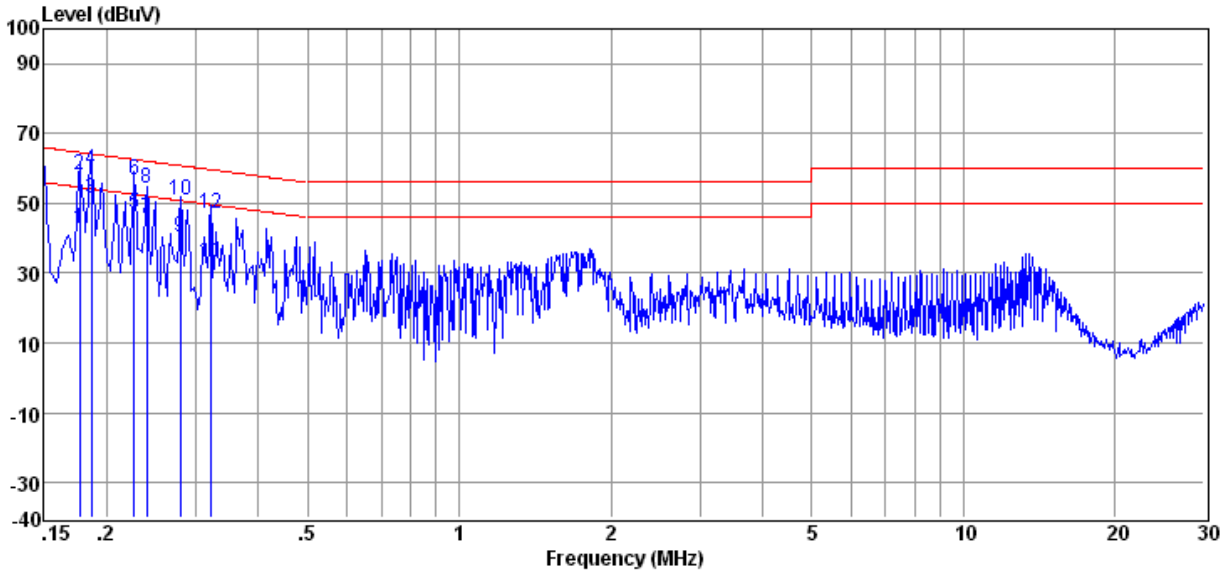
Note:All test modes have been tested, below show the worst plots.

L line:



Item (Mark)	Freq (MHz)	Read Level (dBµV)	LISN Factor (dB)	Cable Loss (dB)	Level (dBµV)	Limit Line (dBµV)	Over Limit (dB)	Detector
1	0.186	39.70	0.13	0.10	39.93	54.20	-14.27	Average
2	0.186	59.82	0.13	0.10	60.05	64.20	-4.15	QP
3	0.227	34.81	0.11	0.10	35.02	52.57	-17.55	Average
4	0.227	55.74	0.11	0.10	55.95	62.57	-6.62	QP
5	0.280	39.43	0.13	0.10	39.66	50.81	-11.15	Average
6	0.280	50.54	0.13	0.10	50.77	60.81	-10.04	QP
7	0.322	25.11	0.14	0.10	25.35	49.66	-24.31	Average
8	0.322	46.82	0.14	0.10	47.06	59.66	-12.60	QP
9	0.361	33.10	0.15	0.10	33.35	48.69	-15.34	Average
10	0.361	42.62	0.15	0.10	42.87	58.69	-15.82	QP
11	1.810	20.65	0.28	0.10	21.03	46.00	-24.97	Average
12	1.810	33.22	0.28	0.10	33.60	56.00	-22.40	QP

N Line:



Item (Mark)	Freq (MHz)	Read Level (dBµV)	LISN Factor (dB)	Cable Loss (dB)	Level (dBµV)	Limit Line (dBµV)	Over Limit (dB)	Detector
1	0.177	42.53	0.15	0.10	42.78	54.64	-11.86	Average
2	0.177	58.12	0.15	0.10	58.37	64.64	-6.27	QP
3	0.186	51.14	0.13	0.10	51.37	54.20	-2.83	Average
4	0.186	59.16	0.13	0.10	59.39	64.20	-4.81	QP
5	0.227	47.03	0.11	0.10	47.24	52.57	-5.33	Average
6	0.227	56.40	0.11	0.10	56.61	62.57	-5.96	QP
7	0.240	45.30	0.11	0.10	45.51	52.08	-6.57	Average
8	0.240	54.22	0.11	0.10	54.43	62.08	-7.65	QP
9	0.280	40.19	0.13	0.10	40.42	50.81	-10.39	Average
10	0.280	50.52	0.13	0.10	50.75	60.81	-10.06	QP
11	0.322	32.72	0.14	0.10	32.96	49.66	-16.70	Average
12	0.322	46.68	0.14	0.10	46.92	59.66	-12.74	QP

6.14 Occupied Bandwidth Test

Test Requirement: RSS-Gen Issue 3 Clause 4.6.1

Test date: September 20, 2012

Standard Applicable According to the section RSS-Gen Issue 3 Clause 4.6.1

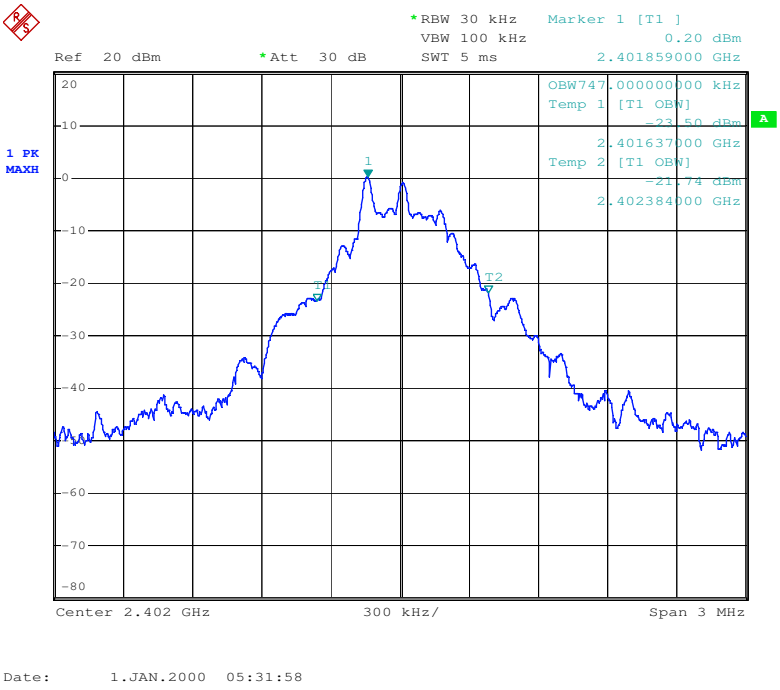
EUT Setup The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz,the video bandwidth set at 300kHz.

Test date

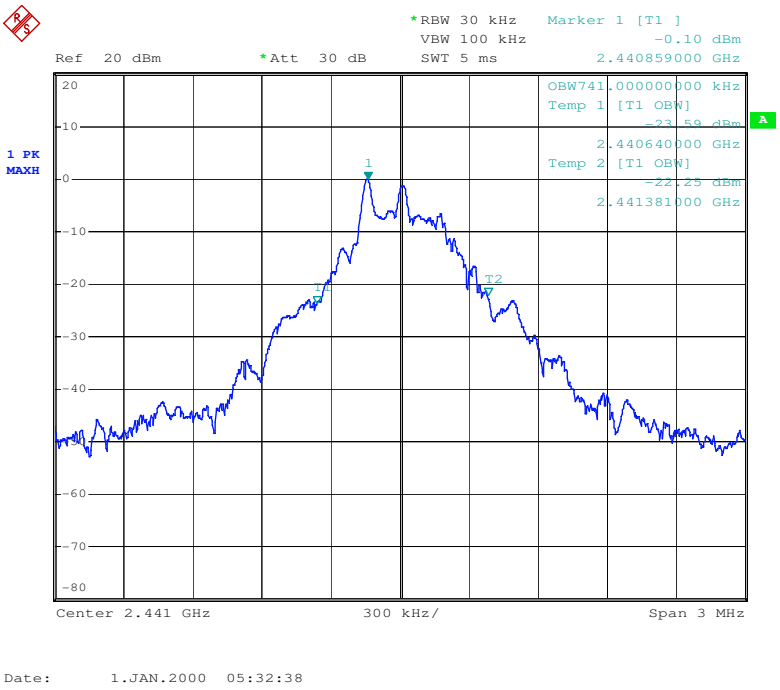
Test Channel	Channel Frequency (MHz)	Modulation	Occupied Bandwidth(MHz)
Low	2402	GFSK	0.747
Middle	2441	GFSK	0.741
High	2480	GFSK	0.735
Low	2402	π/4DQPSK	1.155
Middle	2441	π/4DQPSK	1.158
High	2480	π/4DQPSK	1.152
Low	2402	8DPSK	1.143
Middle	2441	8DPSK	1.143
High	2480	8DPSK	1.146

Result plot as follows:

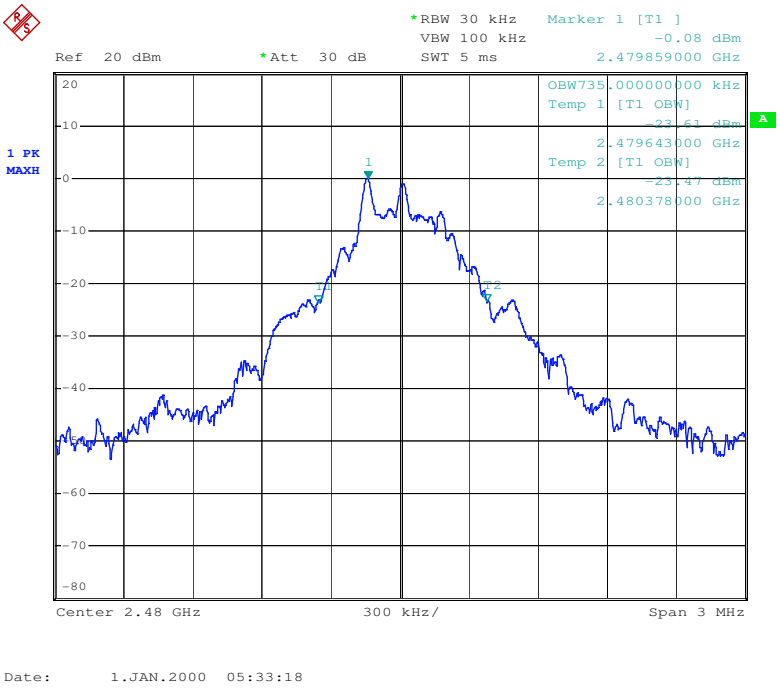
Lowest Channel – GFSK:



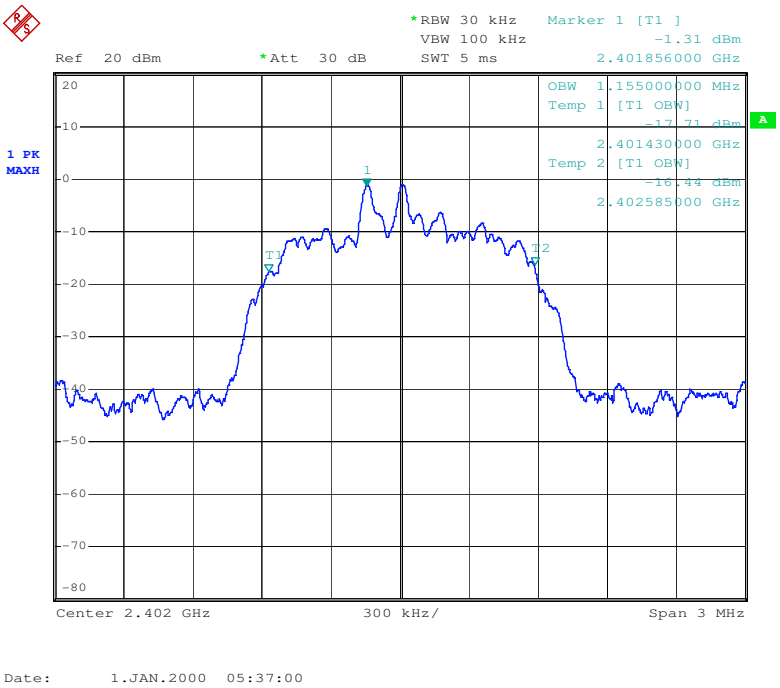
Middle Channel – GFSK:



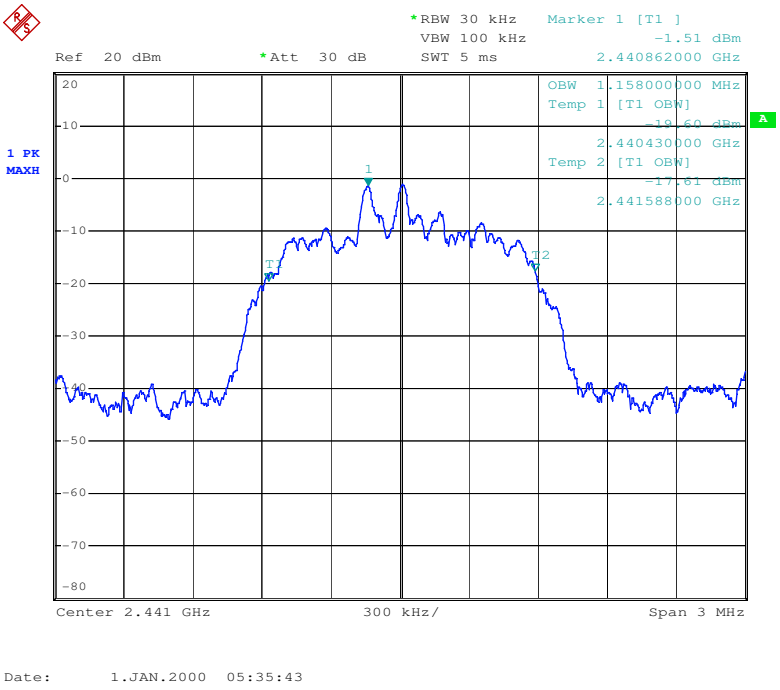
Highest Channel – GFSK:



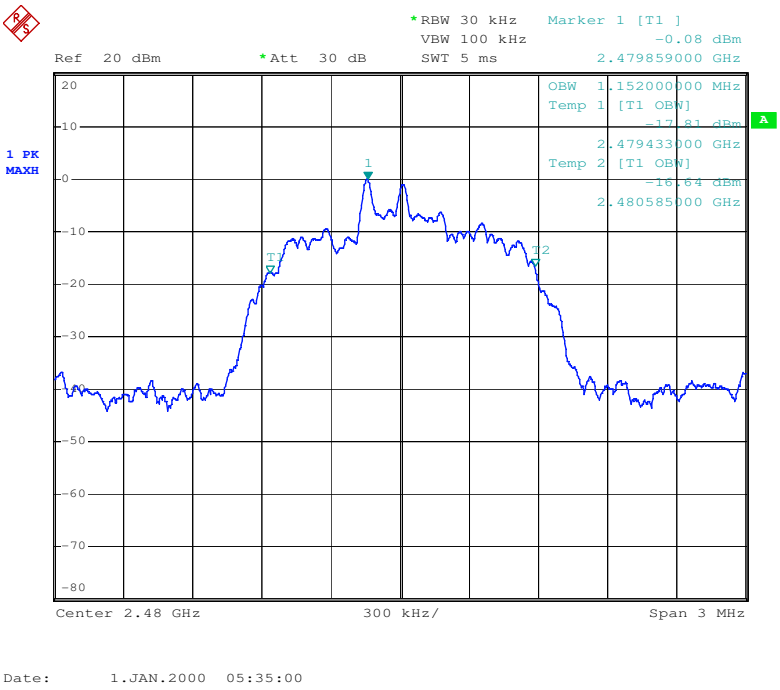
Lowest Channel –π/4DQPSK:



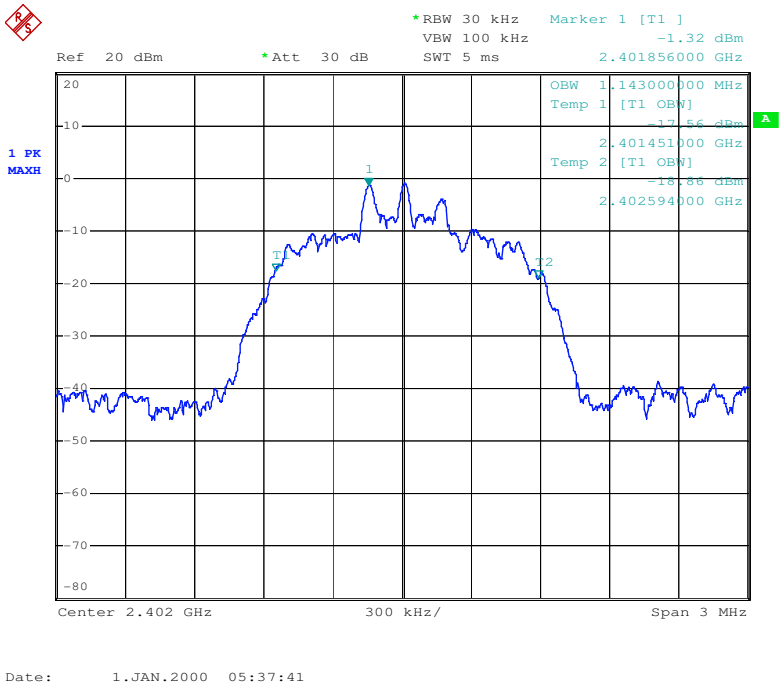
Middle Channel –π/4DQPSK:



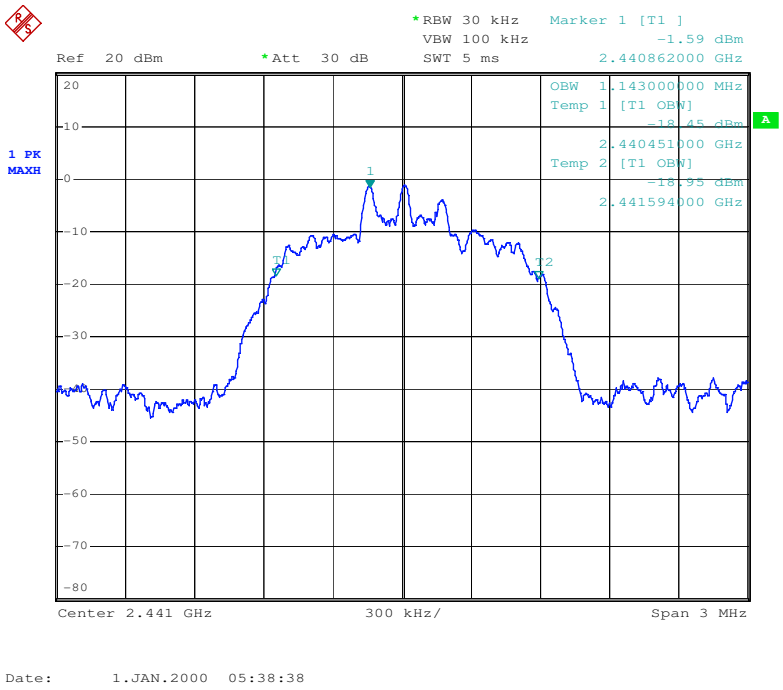
Highest Channel –π/4DQPSK:



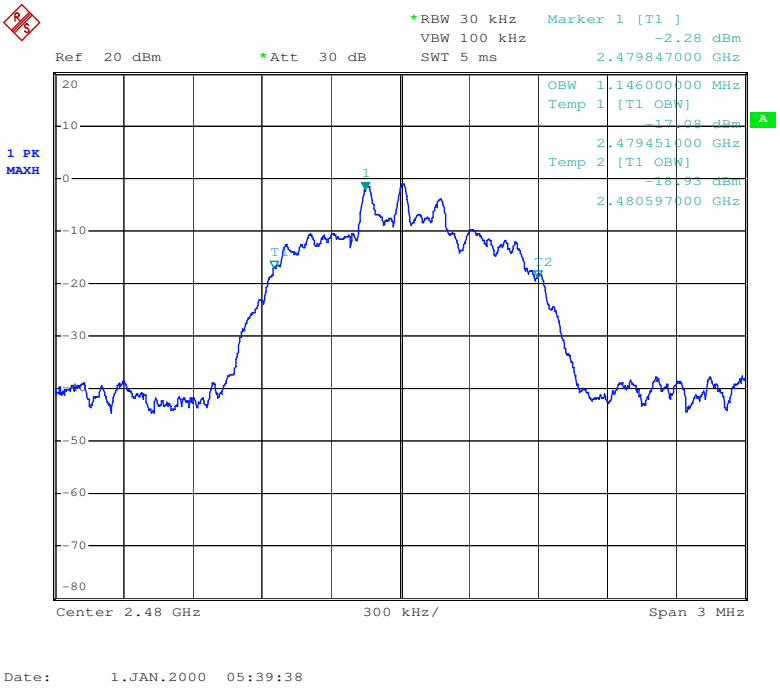
Lowest Channel –8DPSK:



Middle Channel –8DPSK:



Highest Channel –8DPSK:



7 Test Setup Photographs

Refer to the < Appendix C_Test Setup photos>.

8 EUT Constructional Details

Refer to the < Appendix A_External Photos > & < Appendix B_Internal Photos >.

End of Report