Nemko Test Report:	115647-1TRFWL
Applicant:	Research in Motion 295 Phillip Street Waterloo, ON N2L 3W8
Apparatus:	BlackBerry® Wireless Handheld M/N: RCD21IN
FCC ID:	L6ARCD20IN
In Accordance With:	FCC Part 15 Subpart C, 15.247 FHSS System and Digitally Modulated Radiators 902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz
Authorized By:	 Andrey Adelberg, EMC/Wireless Specialist
Date:	November 6, 2008
Total Number of Pages:	47

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Section 1 : Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003.

The assessment summary is as follows:

Apparatus Assessed:	BlackBerry® Wireless Handheld M/N: RCD21IN
Specification:	FCC Part 15 Subpart C, 15.247, July 10, 2008 Measurement of Digital Transmission Systems Operating under Section 15.247, March 23, 2005
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Location:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Registration Number:	176392 (3m Semi-Anechoic Chamber)
Tests Performed By:	Jason Nixon, Wireless/Telecom Specialist
Test Dates:	October 21 to 24, 2008

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Smart Phone with Bluetooth and WiFi
Brand Name:	BlackBerry®
Model Name or Number:	RCD21IN
Nemko Sample Number 1:	POP-12901-005, CPR 5571, PIN 40245B23
Nemko Sample Number 2:	POP-12901-005, CPR 5571, PIN 40245AF2
Nemko Sample Number 3:	POP-12901-005, CPR 5697, PIN 4024862B
Nemko Sample Number 4:	POP-12901-005, CPR 5431, PIN 402414AF
Nemko Sample Number 5:	POP-12901-005, CPR 5571, PIN 40245AF2
FCC ID:	L6ARCD20IN
Date of Receipt:	October 21, 2008

Sample Use

Sample	WiFi Conducted	WiFi Radiated	BT Conducted	BT Radiated	Mixed mode
1	X	X			
2				X	
3			X		
4					X
5	X (average power)				

2.2 Accessories

A set of earphones provided with the EUT were used during this assessment.

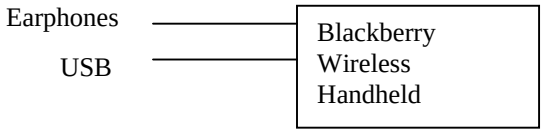
2.3 EUT Description

The EUT is a smart phone using iDEN SMR 800 and 900 bands which also has Bluetooth and WiFi interfaces.

2.4 Technical Specifications of the EUT

Operating Band:	2400-2483.5MHz
Operating Frequency:	Bluetooth : 2402-2480MHz WiFi : 2412-2462MHz
Modulation:	Bluetooth : GFSK, 8PSK WiFi : CCK, OFDM
Antenna Data:	Bluetooth : 0.8dBi PIFA, Integral Antenna WiFi : 2.3dBi Monopole, Integral Antenna
Power Supply Requirements:	3.7VDC Lithium Ion battery

2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

The customer supplied test modes for radiated emissions and conducted measurements. The Bluetooth hopping measurements were performed while synchronized with an R&S CBT tester.

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.247
FHSS System and Digitally Modulated Radiators
902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 ^{o}C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95% and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
Signal Generator	Rohde & Schwarz	SMR40	FA001879	Aug 13/08	Aug 13/09
Spectrum Analyzer	Rohde & Schwarz	FSU46	FA001877	Aug 28/08	Aug 28/09
High Pass Filter	K&L	3.9GHz	FA001340	COU	COU
Tunable notch filter	K&L	3TNF-500/1000-N/N	FA001330	COU	COU
3m EMI Test Chamber	TDK	SAC-3	FA002047	May 06/08	May 06/09
Bilog	Sunol	JB3	FA002108	Jan. 21/08	Jan. 21/09
Biconical	Sunol	BC2	FA002078	July 30/08	July 30/09
Log Periodic Antenna	Sunol	LP5	FA002077	July 23/08	July 23/09
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Mast	Sunol	TLT2	FA002061	NCR	NCR
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 07/07	Dec. 07/08
50 Coax cable	HUBER + SUHNER	None	FA002022	July 07/08	July 07/09
50 Coax cable	HUBER + SUHNER	None	FA002074	July 07/08	July 07/09
Horn Antenna #2	EMCO	3115	FA000825	Jan. 15/08	Jan. 15/09
1 – 18 GHz Amplifier	JCA	JCA118-503	FA002091	Oct 2/08	Oct 2/09
18.0 – 26.0 GHz Amplifier	NARDA	BBS-1826N612	FA001550	COU	COU
26 – 40.0 GHz Amplifier	NARDA	DBL-2640N610	FA001556	COU	COU
18 – 40GHz Horn Antenna	EMCO	3116	FA001847	May 12/08	May 12/09
Bluetooth Tester	Rohde & Schwarz	CBT	RIM000869	14/04/08	14/04/09
Power Meter	HP	E4418B	FA001413	Jun 05/08	Jun 05/09
Power Sensor	HP	8487A	FA001908	Jun 05/08	Jun 05/09

COU – Calibrate on Use
NCR – No Calibration Required

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No : not applicable / not relevant.

Y Yes : Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See Report Summary)

4.1 Bluetooth : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of power supply	N	
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.247(a)(1)	Frequency hopping systems	Y	PASS
15.247(a)(1)(i)	Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725-5850 MHz band	N	
15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400-2483.5 MHz band	Y	PASS
15.247(a)(2)	Systems using digital modulation techniques	N	
15.247(b)(1)	Maximum peak output power of Frequency hopping systems operating in the 2400-2483.5 MHz band and 5725-5850 MHz band	Y	PASS
15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands	N	
15.247(b)(4)	Maximum peak output power	Y	PASS
15.247(c)(1)	Fixed point-to-point Operation with directional antenna gains greater than 6 dBi	N	
15.247(c)(2)	Transmitters operating in the 2400-2483.5 MHz band that emit multiple directional beams	N	
15.247(d)	Radiated Emissions Not in Restricted Bands	Y	PASS
15.247(e)	Power Spectral Density for Digitally Modulated Devices	N	
15.247(f)	Time of Occupancy for Hybrid Systems	N	

4.2 WiFi : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of power supply	N	
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.247(a)(1)	Frequency hopping systems	N	
15.247(a)(1)(i)	Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725-5850 MHz band	N	
15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400-2483.5 MHz band	N	
15.247(a)(2)	Systems using digital modulation techniques	Y	PASS
15.247(b)(1)	Maximum peak output power of Frequency hopping systems operating in the 2400-2483.5 MHz band and 5725-5850 MHz band	N	
15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902-928 MHz band	N	
15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands	Y	PASS
15.247(b)(4)	Maximum peak output power	Y	PASS
15.247(c)(1)	Fixed point-to-point Operation with directional antenna gains greater than 6 dBi	N	
15.247(c)(2)	Transmitters operating in the 2400-2483.5 MHz band that emit multiple directional beams	N	
15.247(d)	Radiated Emissions Not in Restricted Bands	Y	PASS
15.247(e)	Power Spectral Density for Digitally Modulated Devices	N	
15.247(f)	Time of Occupancy for Hybrid Systems	N	

Notes:

Appendix A : Bluetooth Test Results

Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvoltsmeter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Results: Pass

Additional Observations:

The Spectrum was searched from 30MHz to 25GHz.

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

The EUT was measured on three orthogonal axis with a fully charged battery

Peak Detector

	Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Corr. Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	7206	Horn2	V	52.84	1.2	54.04	74	19.96
2	7206	Horn2	H	53.63	1.3	54.93	74	19.07

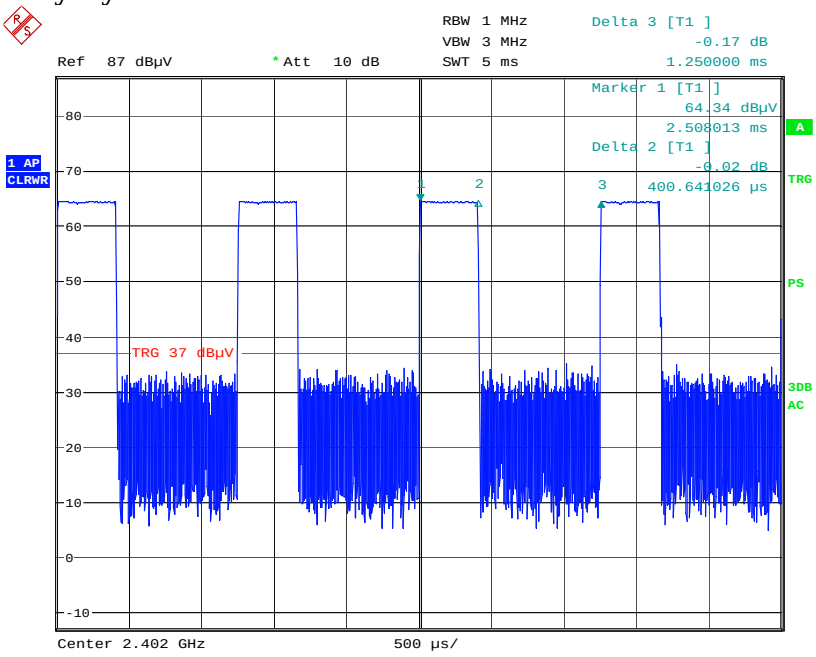
Corr Factor = Cable loss + Antenna Factor – Amp. Gain

Average

	Frequency (MHz)	Antenna	Polarity	RCVD Signal (dBuV)	Corr. Factor (dB)	Duty Cycle Corr. (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	7206	Horn2	V	52.84	1.2	-9.88	44.16	54	9.84
2	7206	Horn2	H	53.63	1.3	-9.88	45.05	54	8.95

Corr Factor = Cable loss + Antenna Factor – Amp. Gain

Duty Cycle:



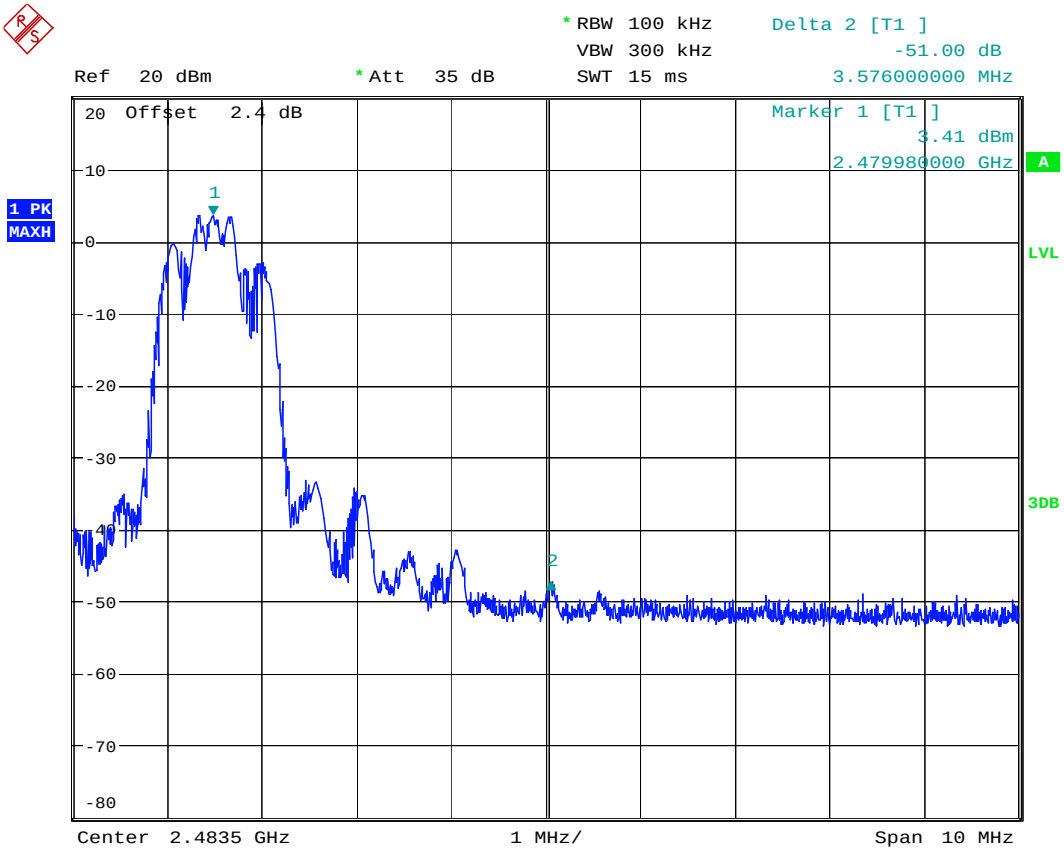
Duty cycle correction = 20log((400.6usec x (100/1.25)/100msec) = -9.88dB

Delta Marker Measurement for 2.4835MHz Band Edge

Measured Field Strength for High Channel in 1MHz RBW = 99.47dBuV/m

Delta Marker = -51dB

Therefore, Peak Field Strength = 99.47dBuV/m - 51dB = 48.47dBuV/m
Limit = 74dBuV/m
Average Field Strength = 48.47dBuV/mdBuV/m – 9.88dB(Duty Cycle) = 38.59dBuV/m
Limit = 54dBuV/m



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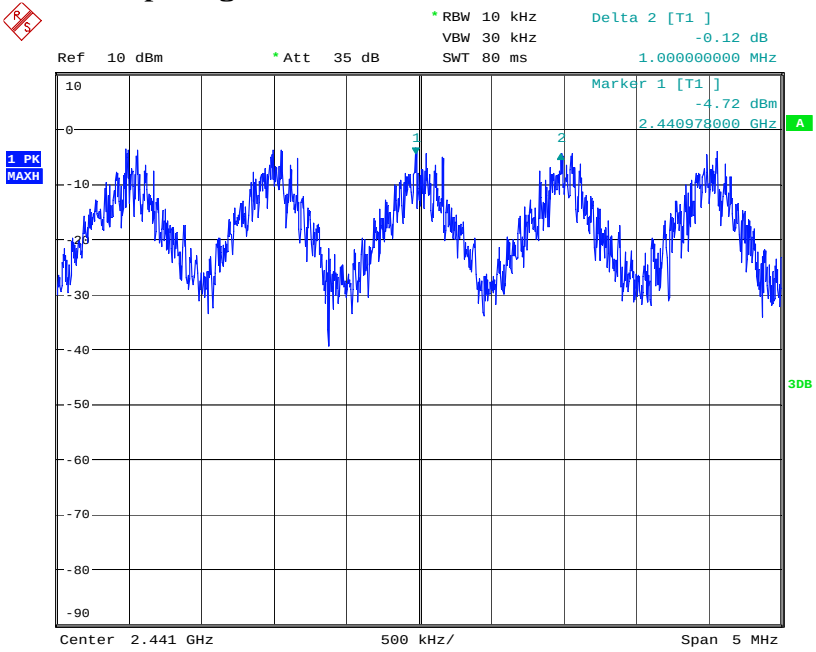
Measurements for Delta marker were performed on DH5, 2-DH5 and 3-DH5 frames. Worst-case (lowest delta value) was found to be 3-DH5 frames and is included above.

Clause 15.247(a)(1) Frequency hopping systems

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 pseudo randomly 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.

Test Results: Pass

Channel Spacing: 1MHz



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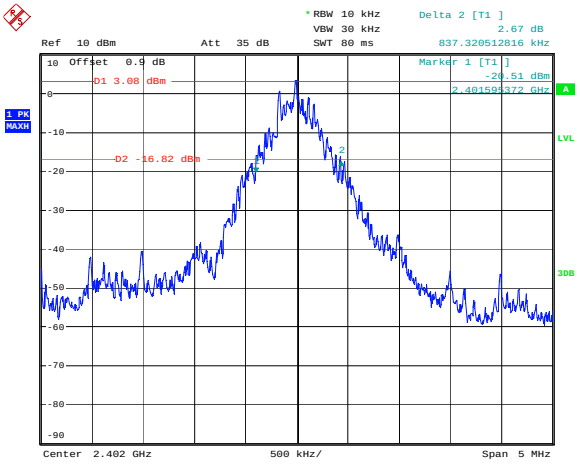
20dB Bandwidth:

Channel (MHz)	DH5	2-DH5	3-DH5
2402	837.32kHz	1.102MHz	1.164MHz
2441	841.35kHz	1.106MHz	1.171MHz
2480	921.47kHz	1.090MHz	1.162MHz

DH5 Frames



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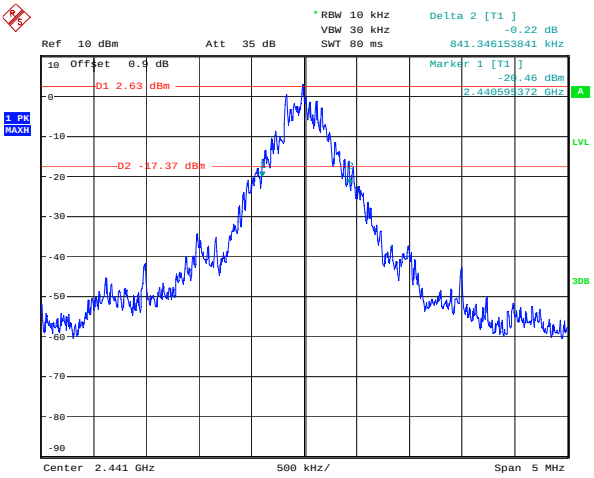

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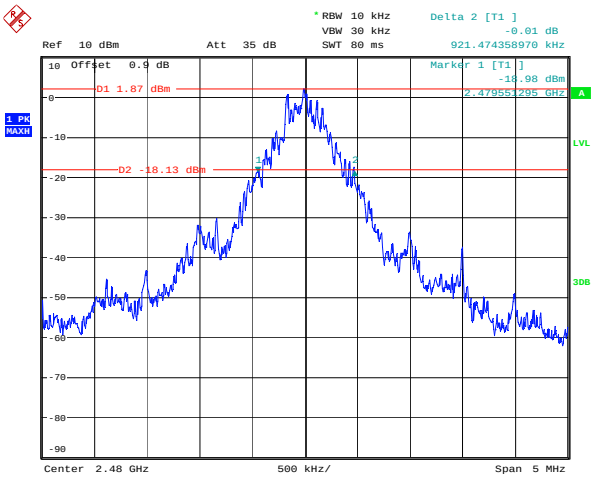

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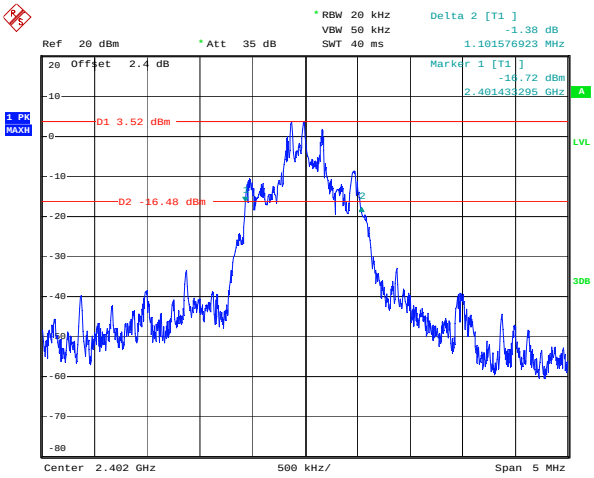
2-DH5 Frames



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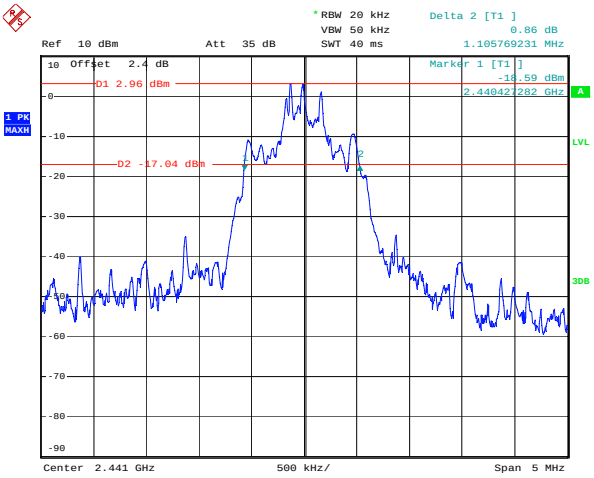

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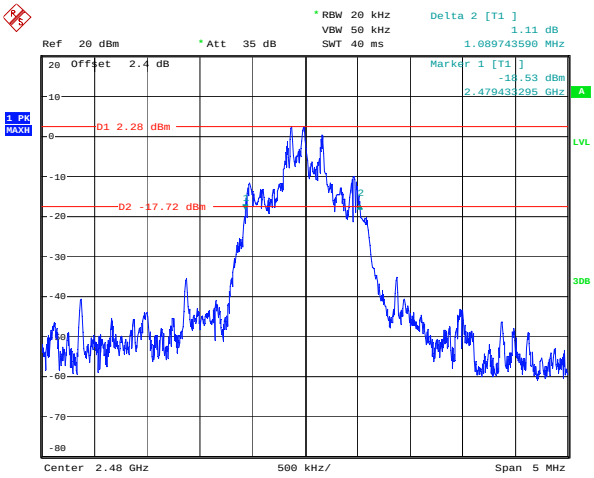

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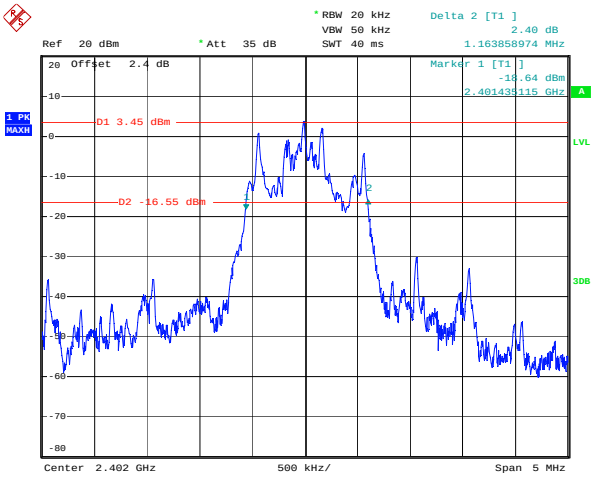
3-DH5 Frames



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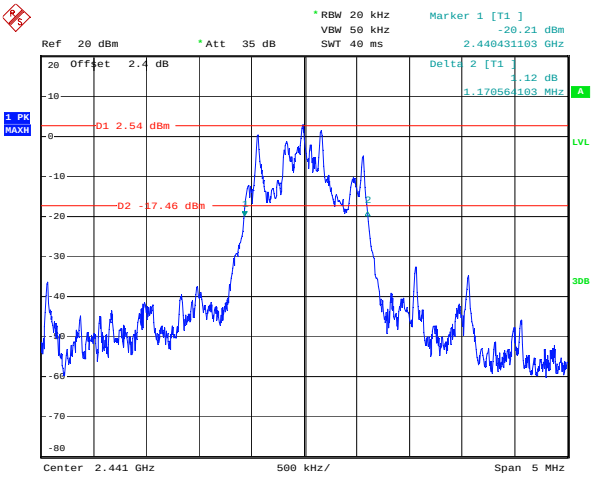

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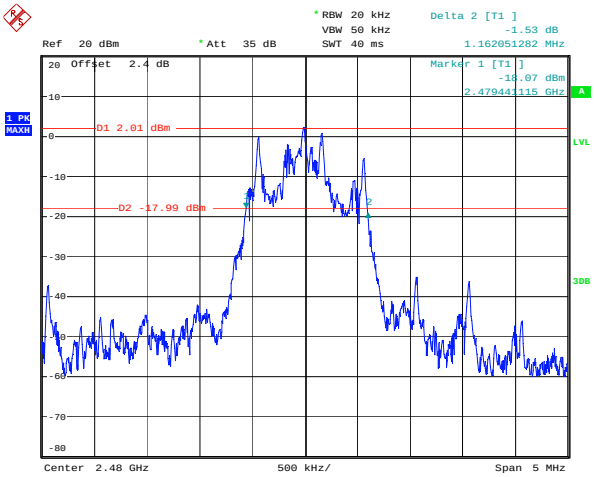

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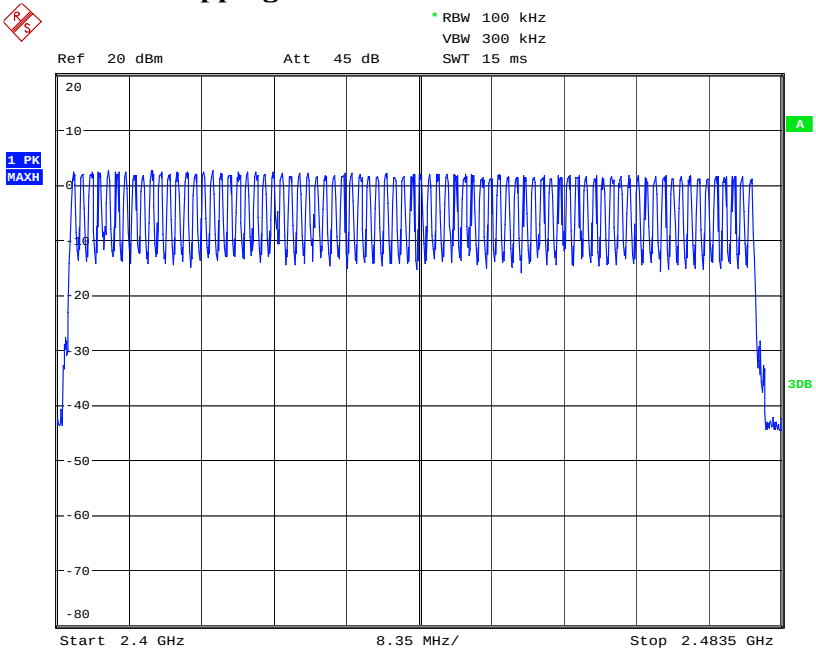
Clause 15.247(a)(1)(iii) Frequency hopping systems operating in the 2400-2483.5 MHz band

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 Results: Pass

Number of Hopping Channels: 79



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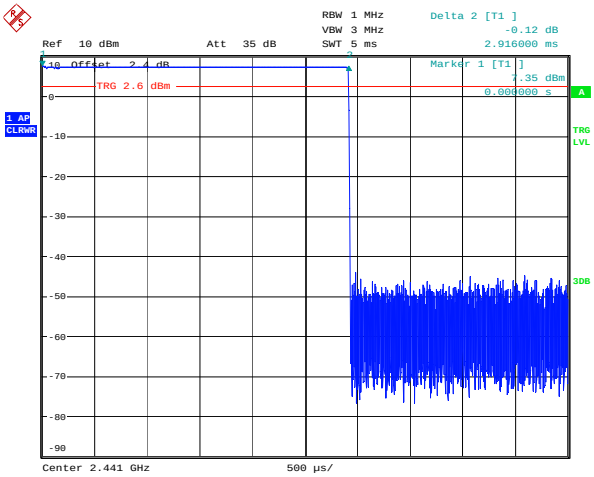
Time of Occupancy:

Frame Type	Hop Dwell time	Hits in 31.6sec	Dwell time in 31.6sec	Limit
DH5	2.916msec	57	166.212msec	≤400msec
2-DH5	2.919msec	66	192.654msec	≤400msec
3-DH5	2.919msec	71	207.249msec	≤400msec

DH5

Dwell Time



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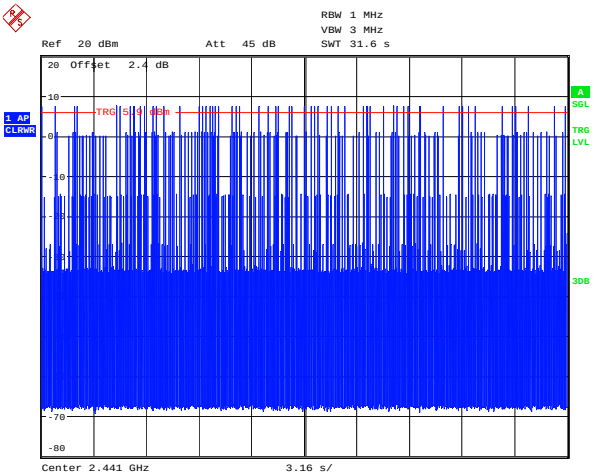
Hits



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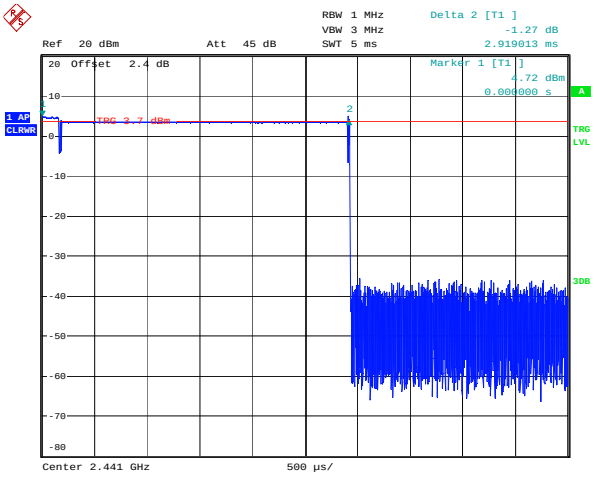
2-DH5

Dwell Time



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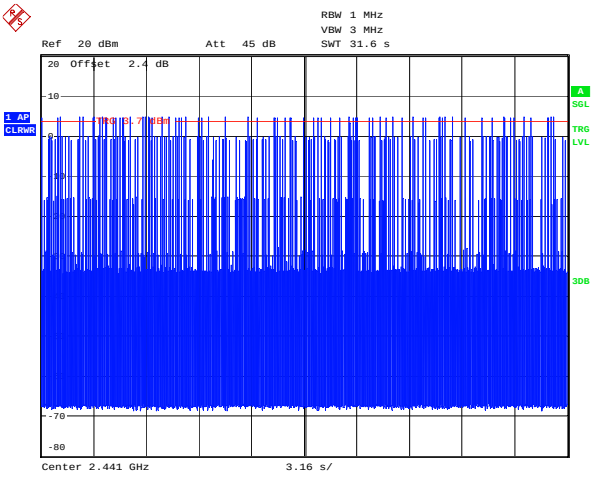

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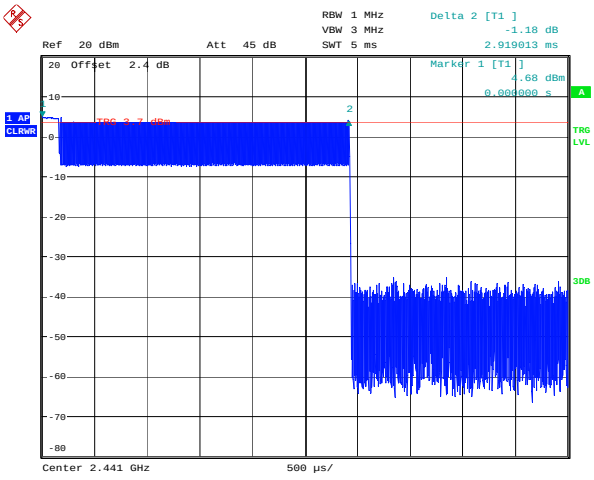
3-DH5

Dwell Time



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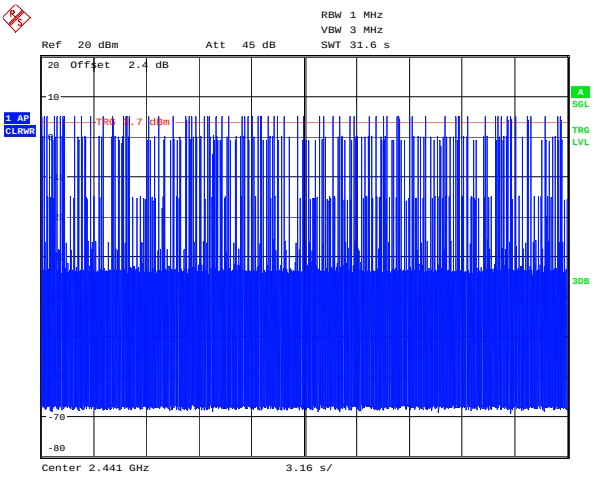

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Clause 15.247(b)(1) Maximum peak output power of Frequency hopping systems operating in the 2400-2483.5 MHz band and 5725-5850 MHz band

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.

Test Results: Pass

Conducted Output Power:

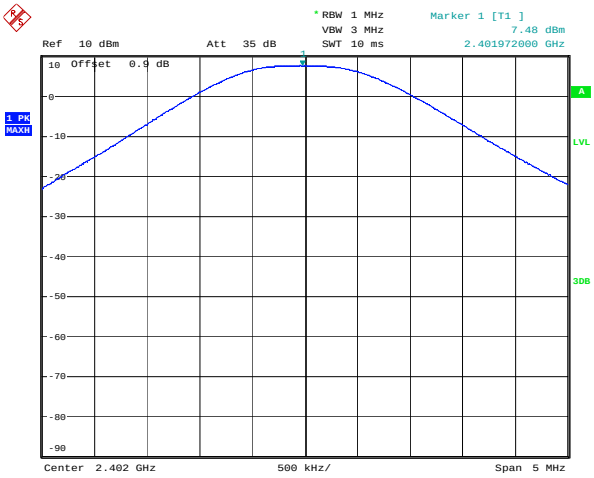
Measured output power = 7.64dBm
Maximum output power = 7.64dBm + 0.8dBi = 8.44dBm EIRP
Limit = 36dBm EIRP

Measurements were performed using fully charged batteries.

Note: The EUT was modified by the manufacturer to perform conducted measurements.

Channel Range	DH5 Frames Measured Power (W)	2-DH5 Frames Measured Power (W)	3-DH5 Frames Measured Power (W)
Low	0.0056	0.0034	0.0035
Mid	0.0054	0.0031	0.0031
High	0.0058	0.0027	0.0027

DH5 Frames



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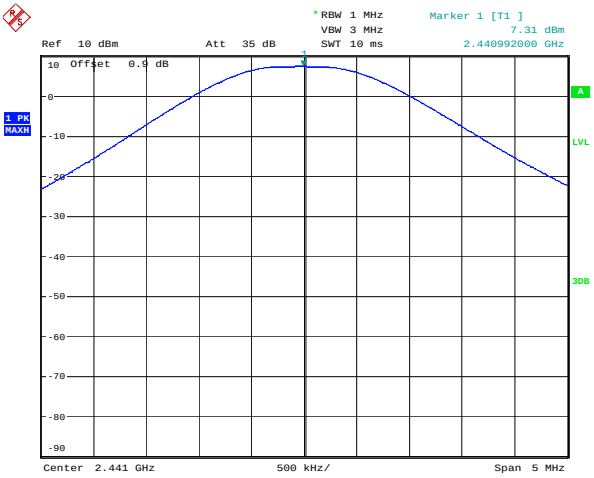

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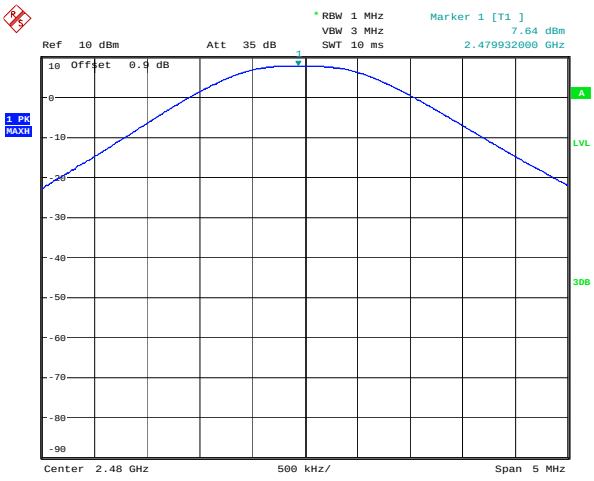

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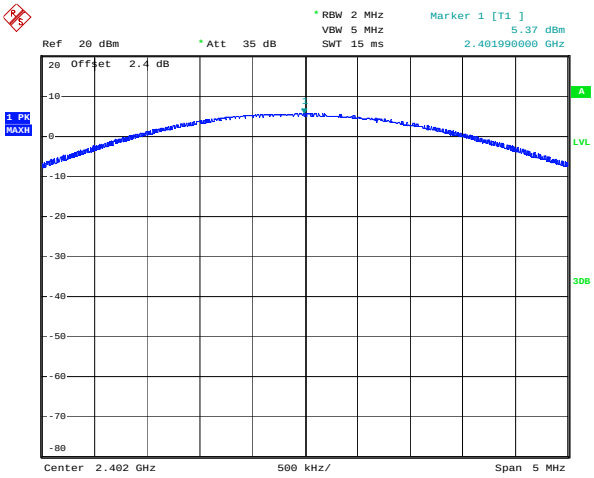
2-DH5 Frames



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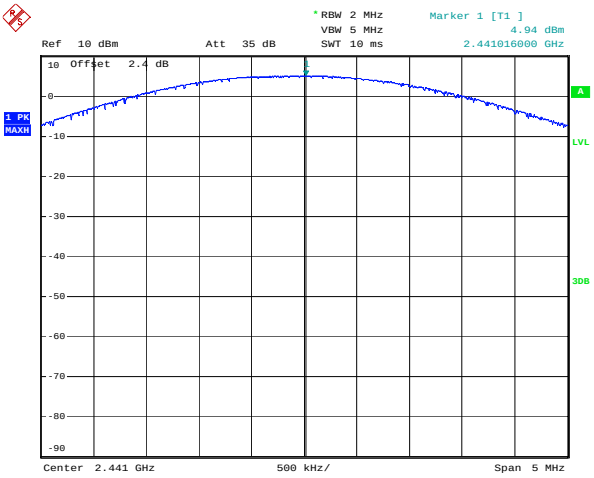

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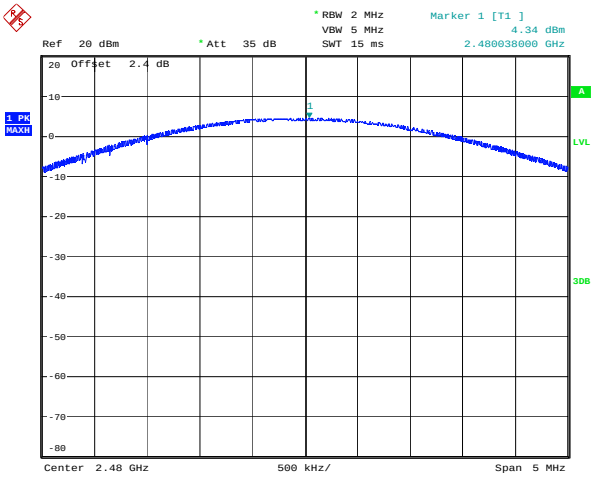

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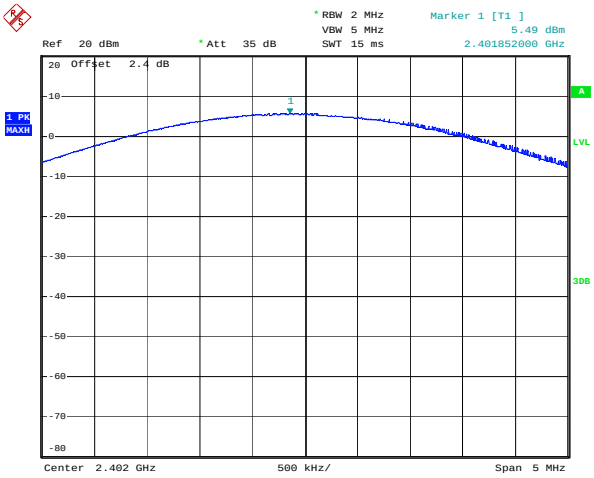
3-DH5 Frames



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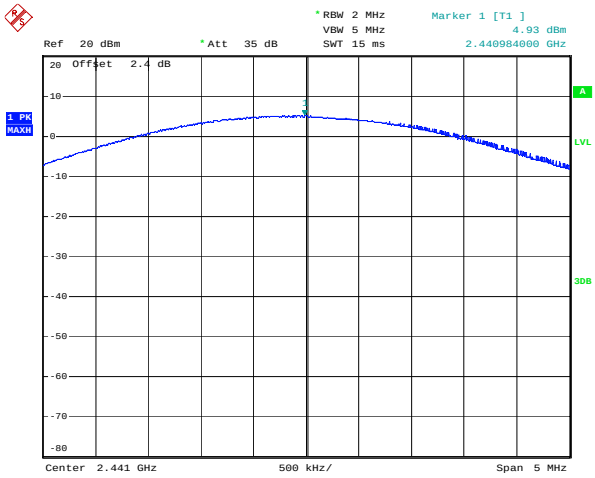

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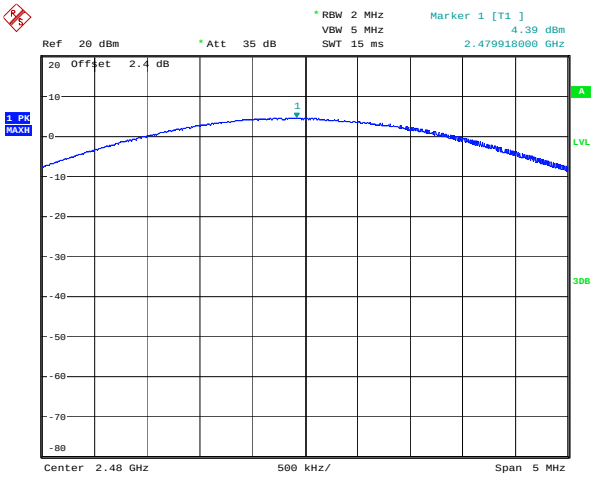

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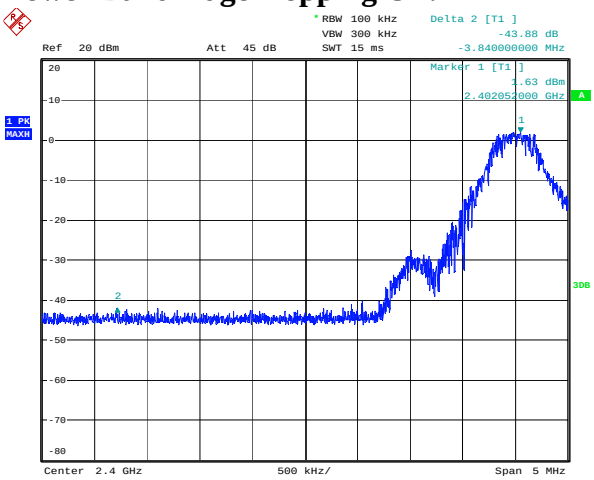
Clause 15.247(d) Radiated Emissions Not in Restricted Bands

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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Results: Pass

The spectrum was searched from 30MHz to 25GHz and no emissions within 20dB below the limit were detected. The EUT was measured on three orthogonal axis with a fully charged battery

Lower Band Edge Hopping On:



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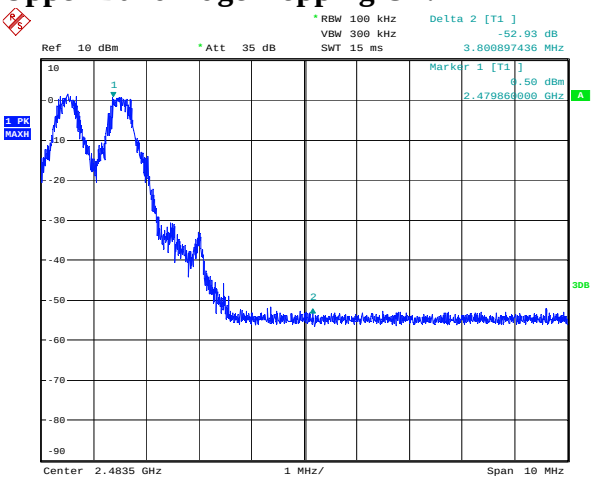

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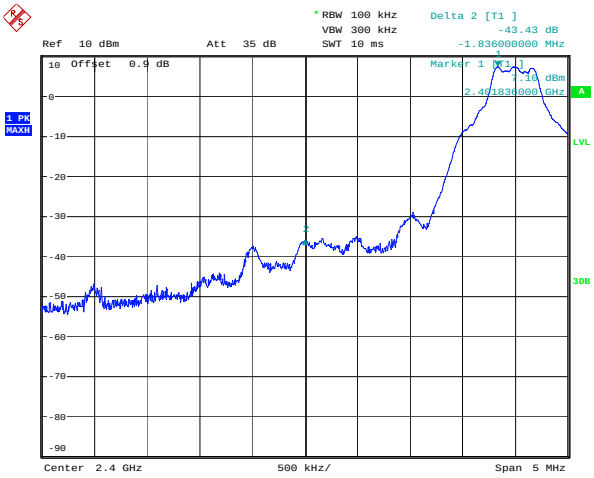
Lower Band Edge Hopping Off:

DH5 Frames



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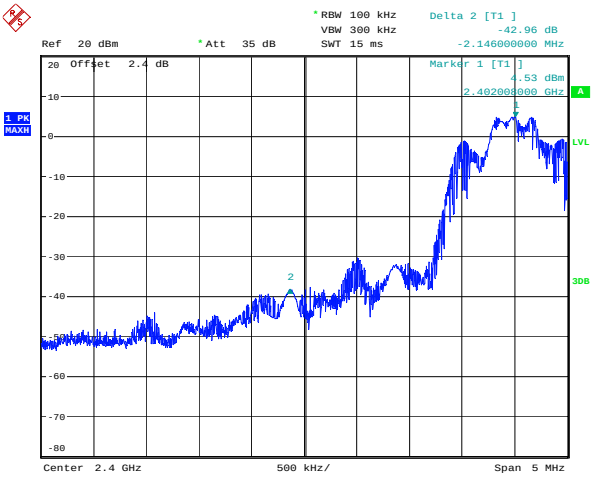
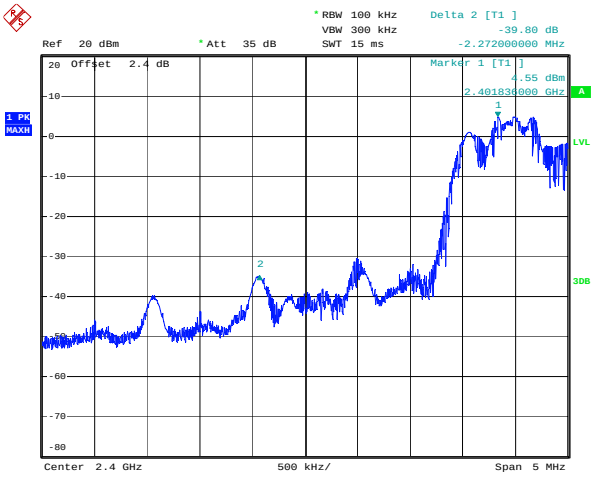
2-DH5 Frames



Date: 22.OCT.2008 22:04:43

3-DH5 Frames



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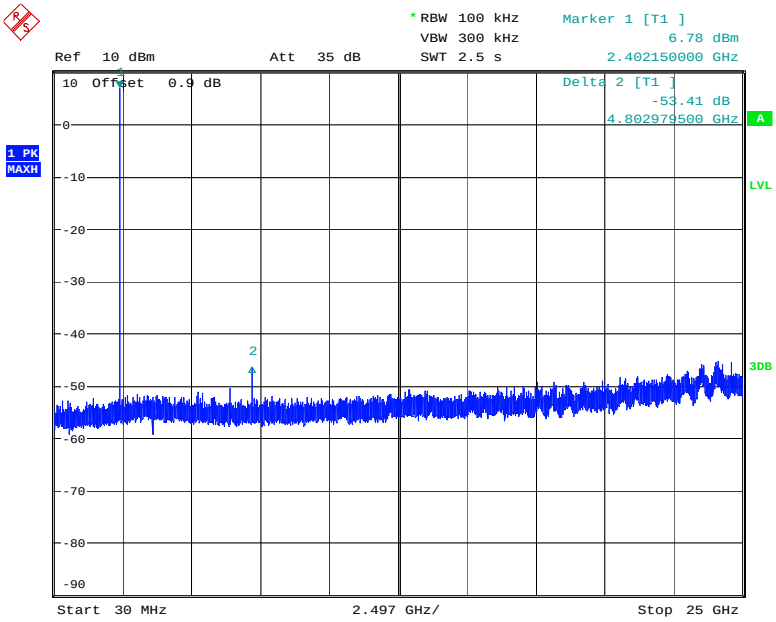
Conducted Emissions:
Low channel



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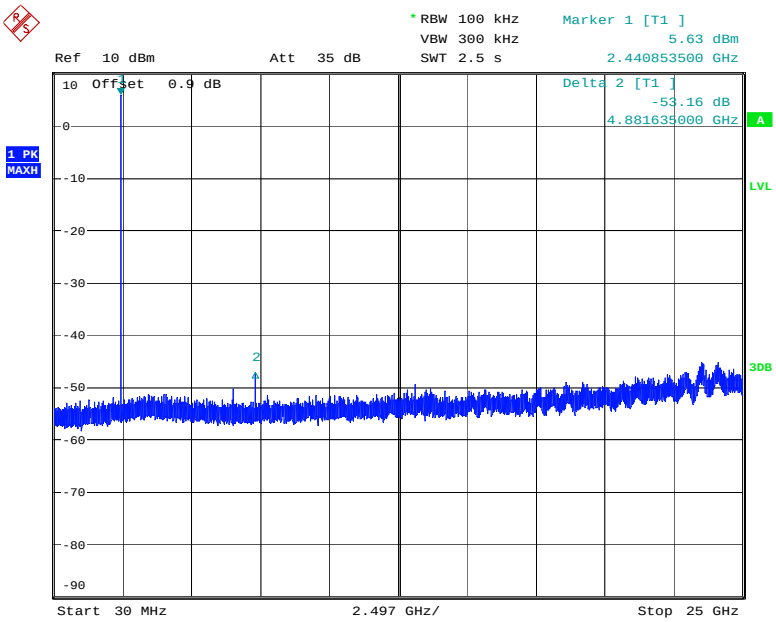
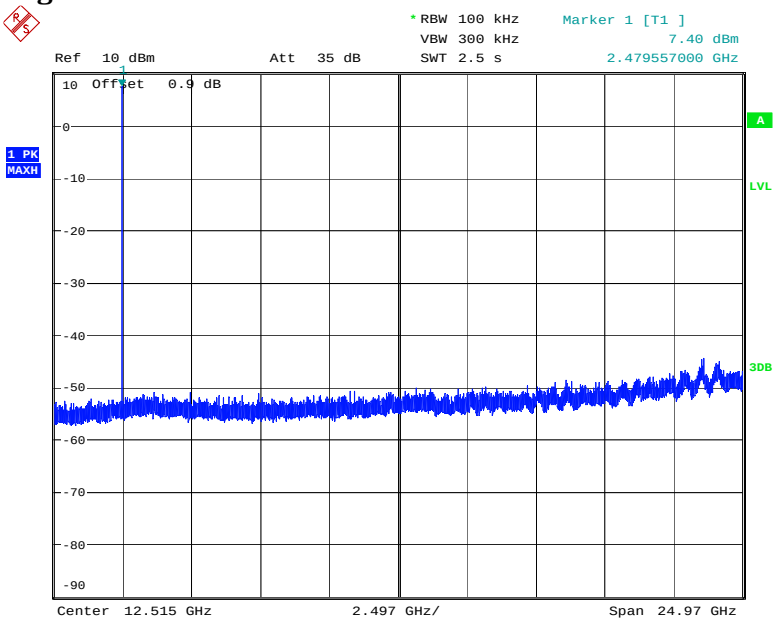
Mid Channel



Date: 21.OCT.2008 15:45:15

High Channel



Date: 21.OCT.2008 15:51:47

Appendix B : WiFi Test Results

Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvoltsmeter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Results: Pass

Additional Observations:

The Spectrum was searched from 30MHz to 25GHz.

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

The EUT was measured on three orthogonal axis with a fully charged battery.

Frequency (MHz)	Pol (V/H)	Rcvd Level (dBuV/m)	Corr. (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4824	V	62.97	-5.9	57.07	74	16.93	Peak
4824	H	62.33	-5.9	56.43	74	17.57	Peak
4824	V	59.02	-5.9	53.12	54	0.88	Average
4824	H	58.55	-5.9	52.65	54	1.35	Average
4874	V	62.35	-5.7	56.65	74	17.35	Peak
4874	H	62.33	-5.7	56.63	74	17.37	Peak
4874	V	58.78	-5.7	53.08	54	0.92	Average
4874	H	58.75	-5.7	53.05	54	0.95	Average
4924	V	60.3	-5.5	54.8	74	19.20	Peak
4924	H	60.93	-5.5	55.43	74	18.57	Peak
4924	V	56.9	-5.5	51.4	54	2.60	Average
4924	H	56.5	-5.5	51	54	3.00	Average

Corr. = cable loss + antenna factor

Peak detector = Peak detector 1MHz RBW/3MHz VBW
Average detector = Peak detector 1MHz RBW/10Hz VBW

2.4835MHz Band Edge

802.11b

Frequency (MHz)	Pol (V/H)	Rcvd Level (dBuV/m)	Corr. (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2483.5	V	34.57	33	67.57	74	6.43	Peak
2483.5	H	33.64	32.8	66.44	74	7.56	Peak
2483.5	V	19.45	33	52.45	54	1.55	Average
2483.5	H	20.04	32.8	52.84	54	1.16	Average

Corr. = cable loss + antenna factor

Peak detector = Peak detector 1MHz RBW/3MHz VBW
Average detector = Peak detector 1MHz RBW/10Hz VBW

802.11g

Frequency (MHz)	Pol (V/H)	Rcvd Level (dBuV/m)	Corr. (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2483.5	V	40.94	33	73.94	74	0.06	Peak
2483.5	H	37.65	32.8	70.45	74	3.55	Peak
2483.5	V	19.44	33	52.44	54	1.56	Average
2483.5	H	18.47	32.8	51.27	54	2.73	Average

Corr. = cable loss + antenna factor

Peak detector = Peak detector 1MHz RBW/3MHz VBW
Average detector = Peak detector 1MHz RBW/10Hz VBW

Clause 15.247(a)(2) Systems using digital modulation techniques

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

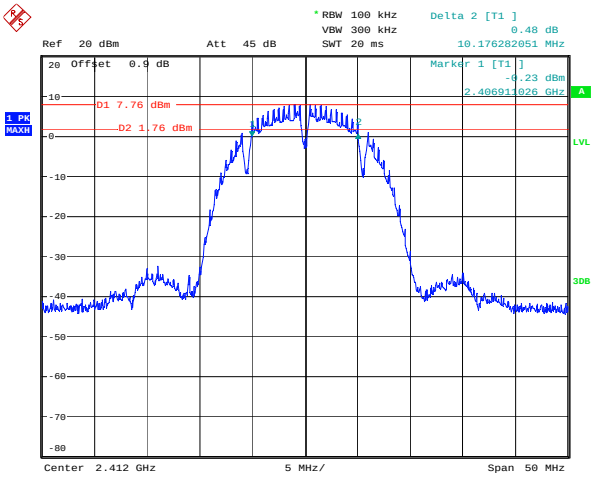
Test Results: Pass

6dB Bandwidth:

Channel (MHz)	802.11b Measured Bandwidth	802.11g Measured Bandwidth	Limit
2412	10.18MHz	16.59MHz	> 500kHz
2437	10.21MHz	16.59MHz	> 500kHz
2462	10.19MHz	16.43MHz	> 500kHz

Note: Measurements were investigated over all modulation rates and only worst-case is included.

802.11b



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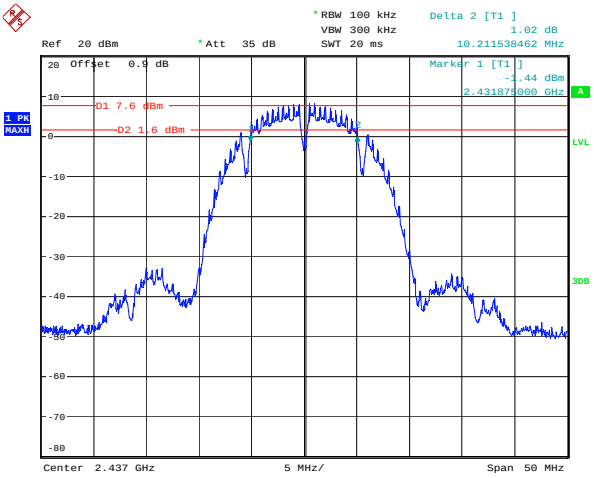

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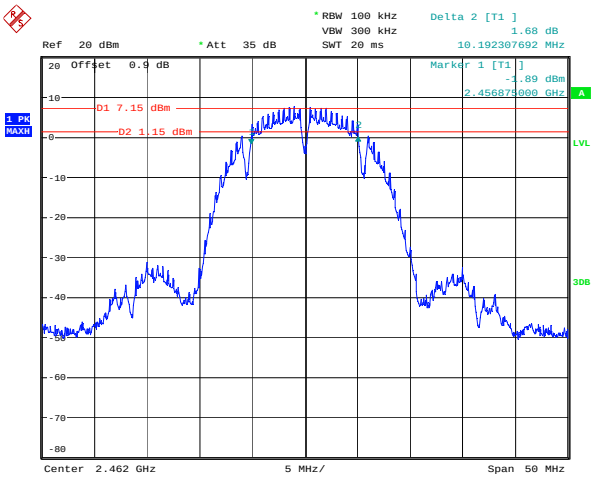

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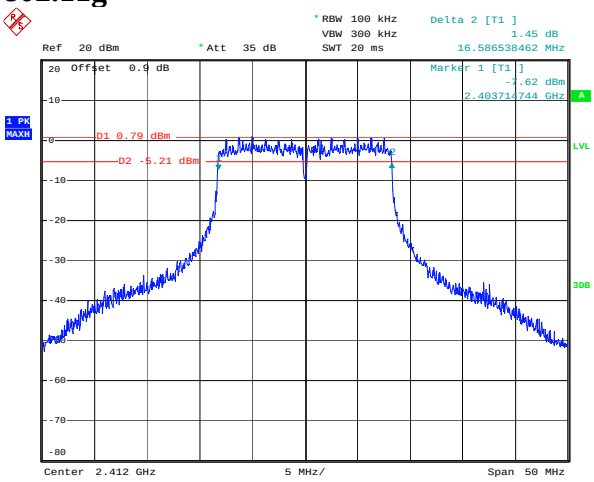
802.11g



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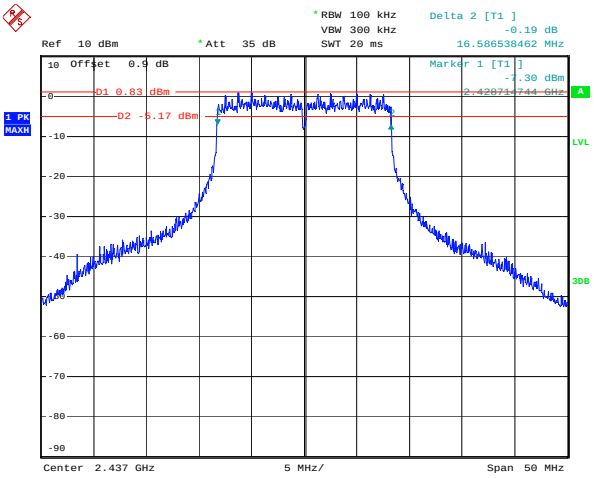

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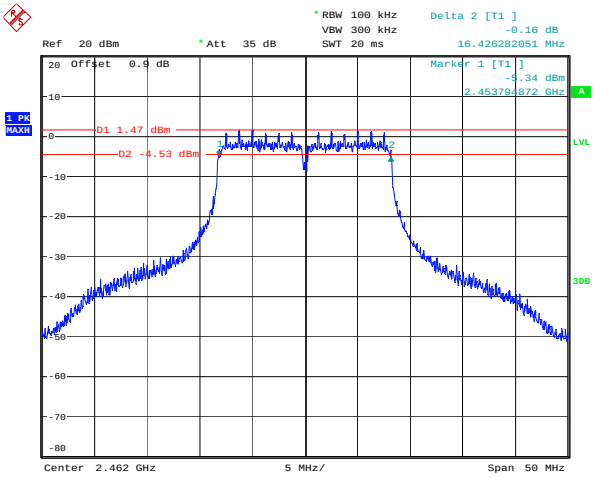


Date: 21.OCT.2008 18:05:07

Clause 15.247(b)(3) Maximum peak output power of systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Results: Pass

Conducted Output Power:

Measured output power = 22.97dBm
Maximum output power = 22.97dBm + 2.3dBi = 25.27dBm EIRP
Limit = 36dBm EIRP

The output power was measured using a fully charged battery.

Note: The EUT was modified by the manufacturer to perform conducted measurements.

Peak Conducted Output power

Channel (MHz)	802.11b Measured Output Power (W)	802.11g Measured Output Power (W)	Limit
2412	0.103	0.153	< 1W
2437	0.099	0.154	< 1W
2462	0.096	0.198	< 1W

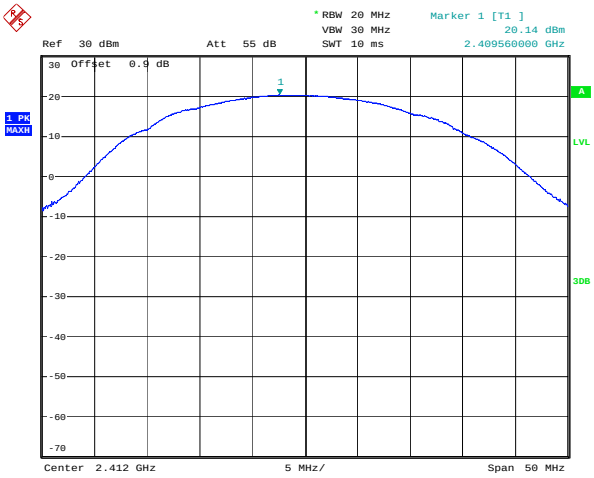
Note: Measurements were investigated over all modulation rates and only worst-case is included.

Average Conducted Power

Channel (MHz)	802.11b Measured Output Power (W)	802.11g Measured Output Power (W)
2412	0.047	0.016
2437	0.046	0.017
2462	0.047	0.017

Note: Average power was performed using a wideband power meter with thermal coupled detector and is for indication only. Measurements were investigated over all modulation rates and only worst-case is included.

802.11b



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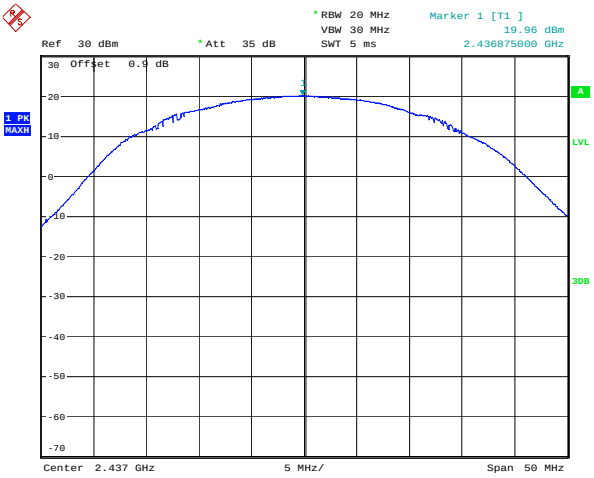

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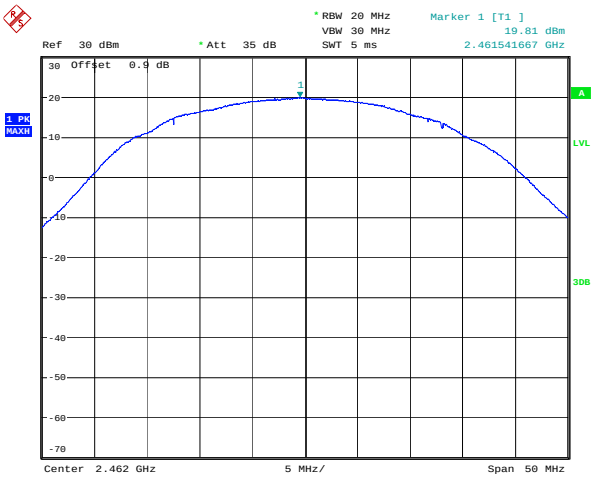

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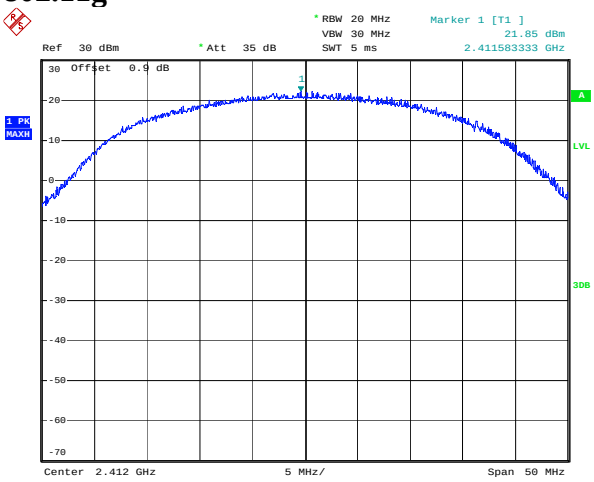
802.11g



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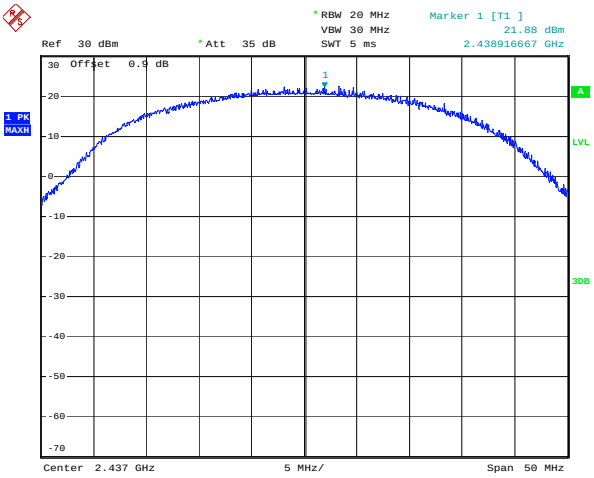

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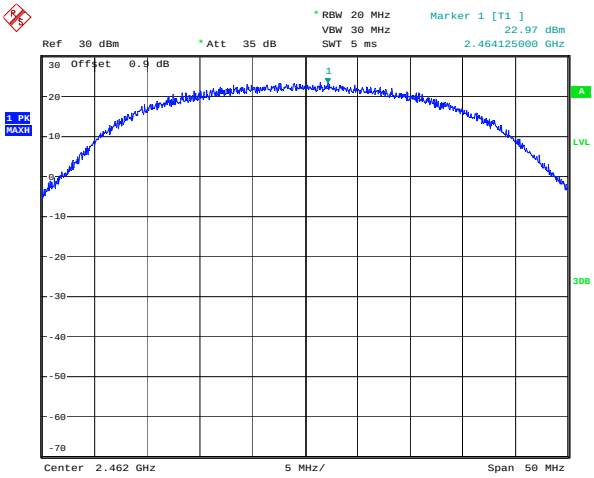


Date: 21.OCT.2008 18:08:07

Clause 15.247(d) Emissions Not in Restricted Bands

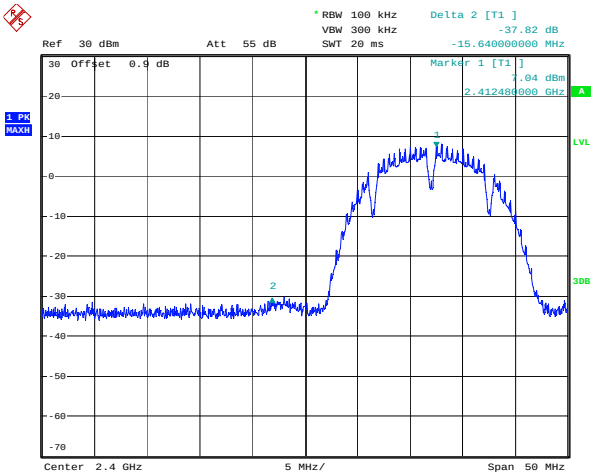
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Results: Pass

The spectrum was searched from 30MHz to 25GHz and no emissions within 20dB below the limit were detected. The EUT was measured with a fully charged battery

Lower Band Edge:

802.11b



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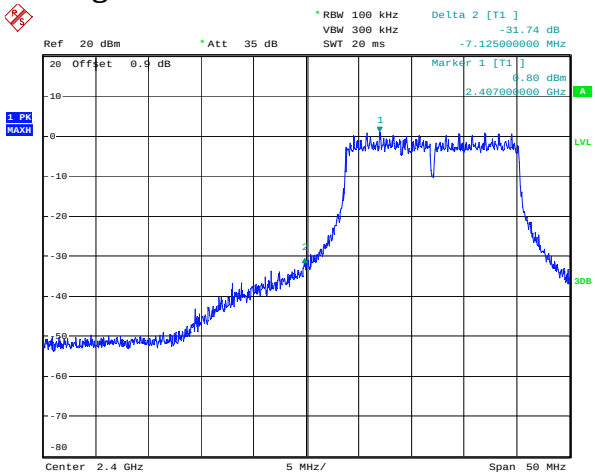
802.11g



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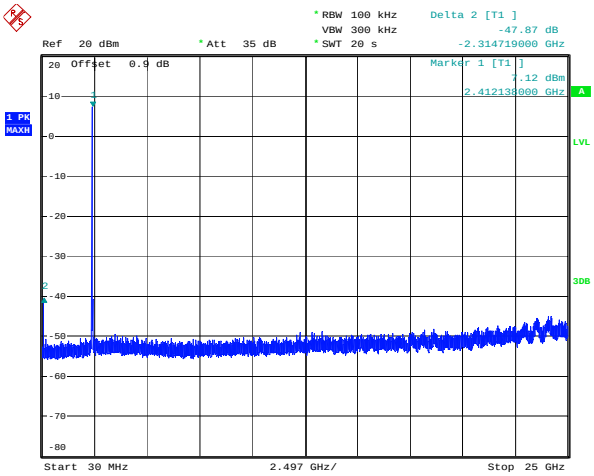
Low Channel

802.11b



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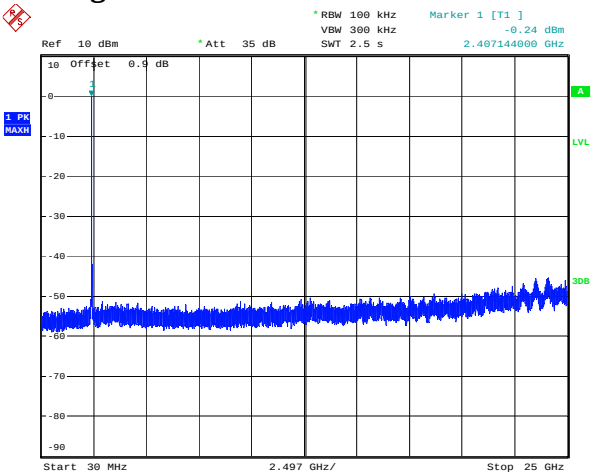
802.11g



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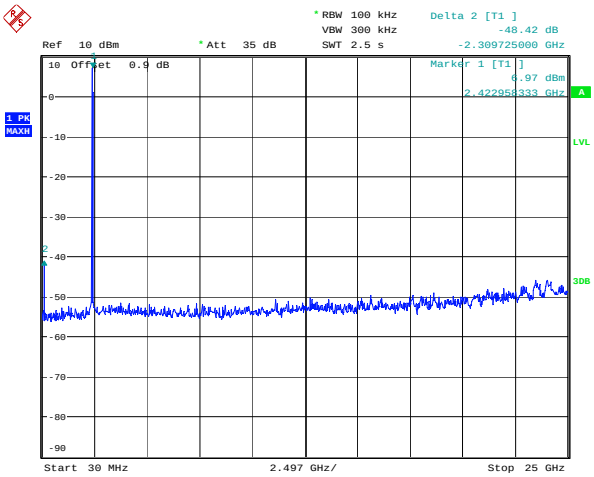
Mid Channel

802.11b



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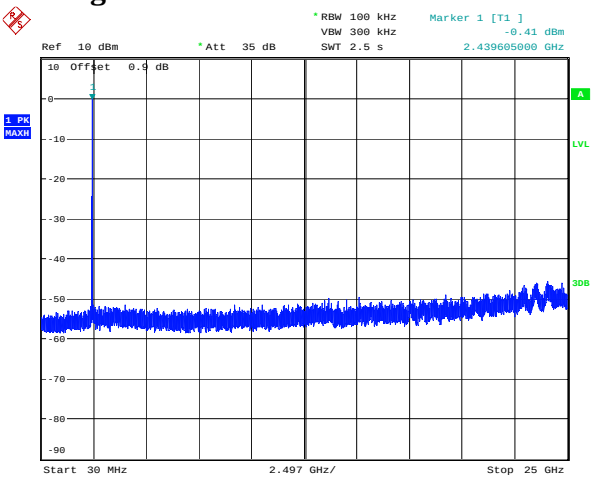
802.11g



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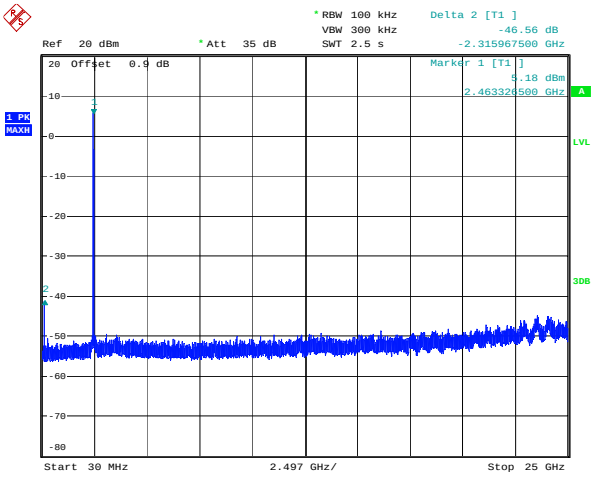
High Channel

802.11b



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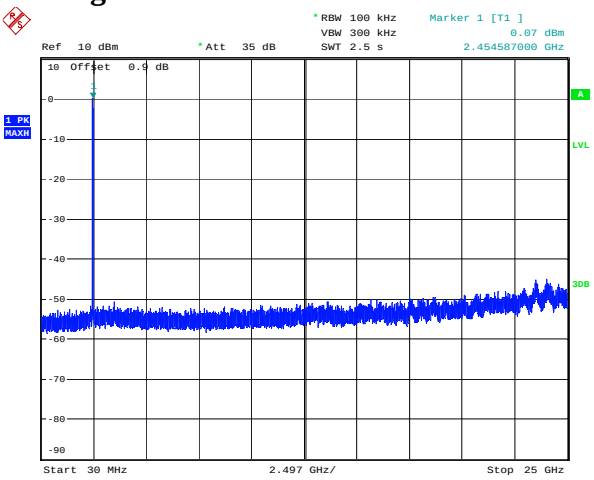
802.11g



Date: 21.OCT.2008 18:10:03

Clause 15.247(e) Power Spectral Density for Digitally Modulated Devices

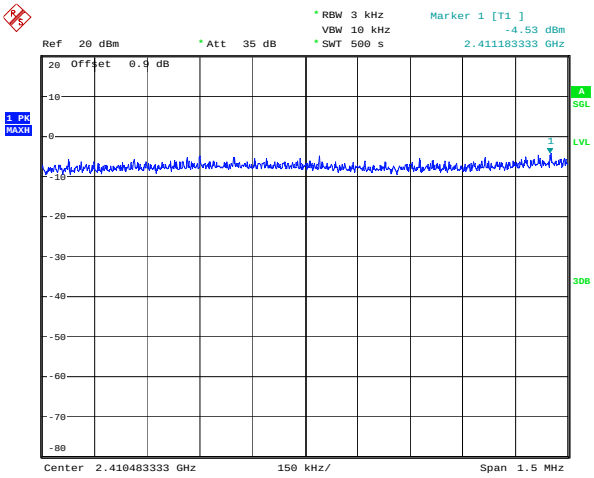
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Results: Pass

Channel (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b		
2412	-4.53	8
2437	-4.57	8
2462	-4.76	8
802.11g		
2412	-11.23	8
2437	-13.03	8
2462	-11.79	8

Note: Measurements were investigated over all modulation rates and only worst-case is included.

802.11b



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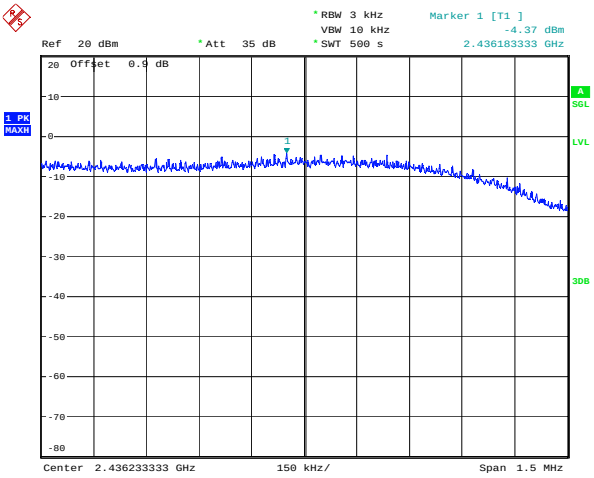

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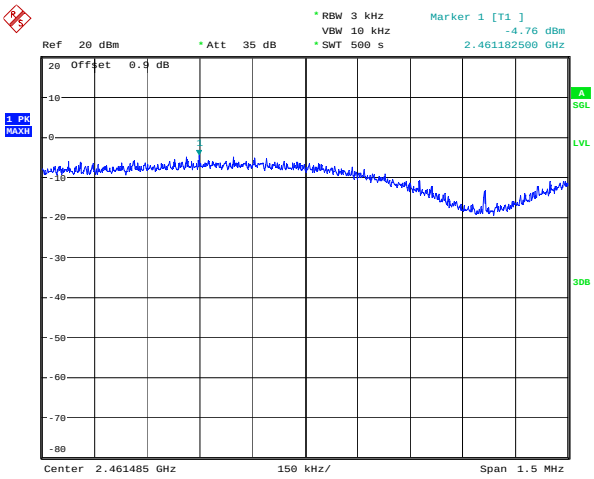
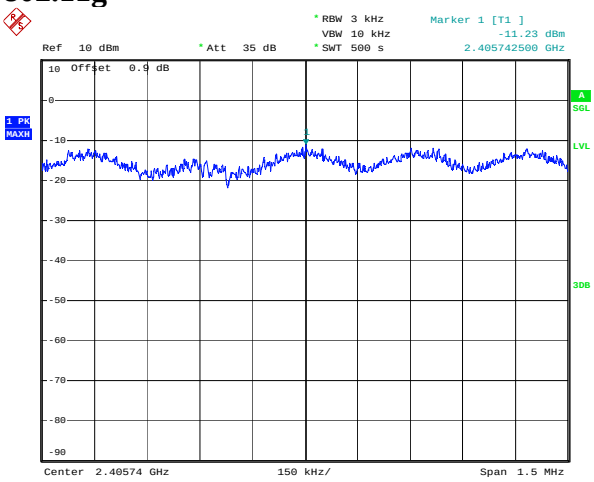
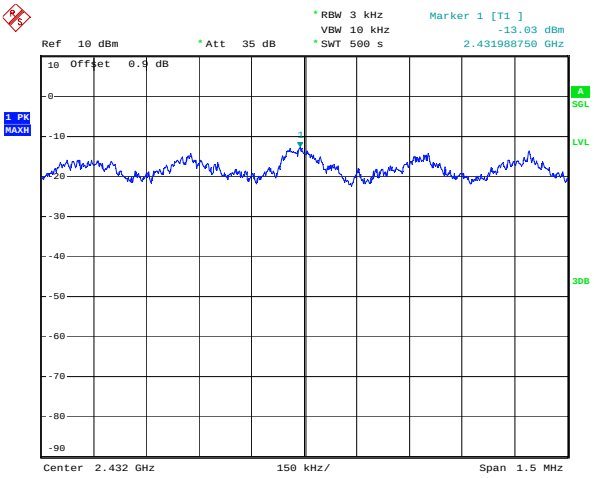


Date: 21.OCT.2008 17:52:34

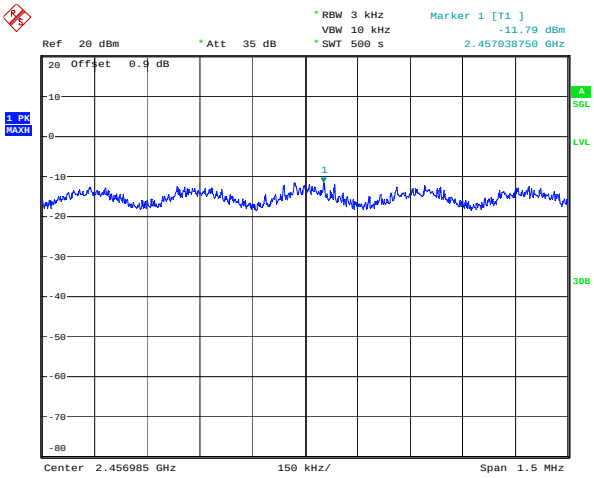
802.11g



Date: 21.OCT.2008 18:20:24



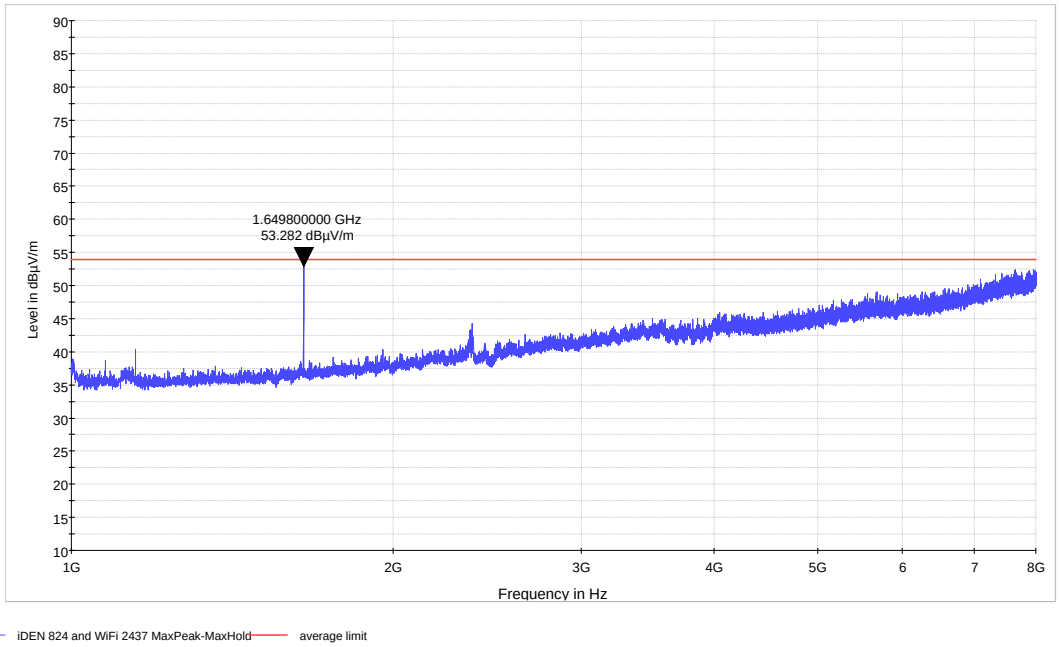
Date: 21.OCT.2008 17:21:20



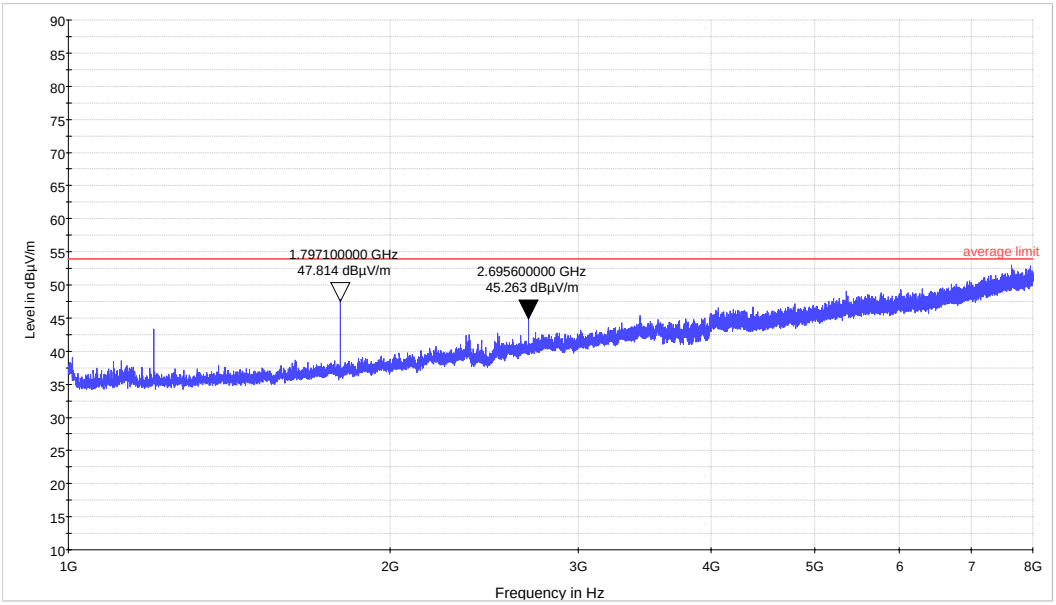
Date: 21.OCT.2008 18:02:35

Appendix C : Mixed Mode Test Results

WiFi and iDEN



Note: Emission at 1.6498GHz is the second harmonic of the iDEN transmitter and does not make part of this assessment.



Note: The emissions at 1.7971GHz and 2.6956GHz are harmonics of the iDEN transmitter and do not form part of this assessment.

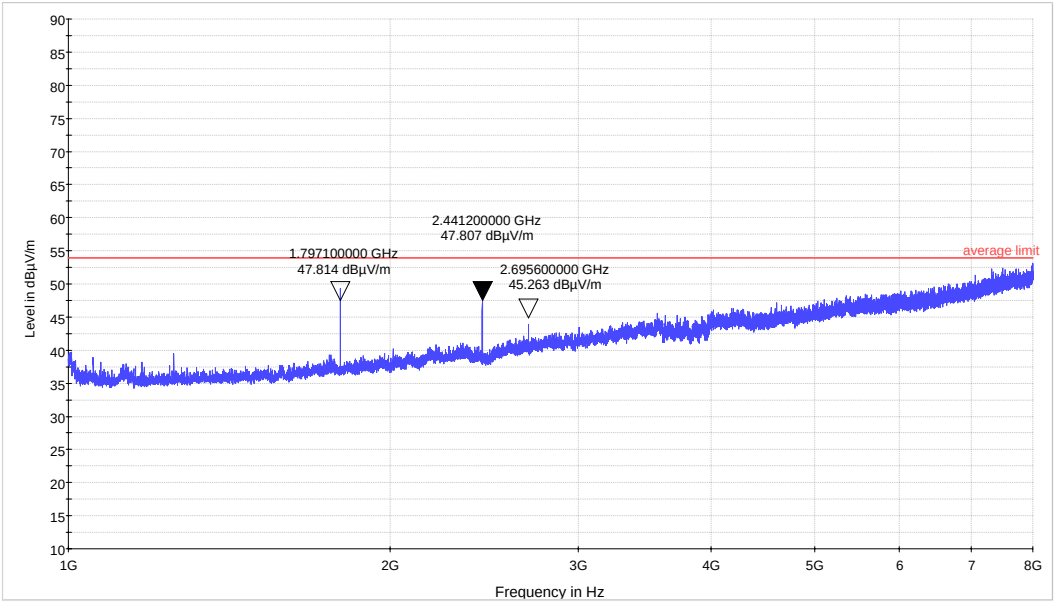
The Spectrum was searched from 1GHz to 25GHz and no emissions that were not related to the individual transmitters were found.

The iDEN transmitter was tuned to a mid channel in the 800 and 900 SMR bands and the WiFi or Bluetooth transmitter was tuned to the mid channel.

The spectral plots were taken using a Peak detector with 1MHz RBW/3MHz VBW. The plots include all cable loss, antenna factor and amplifier gain.

Testing was performed using a tuneable notch filter for the iDEN fundamentals and a 2.4GHz ISM band reject filter for the WiFi or Bluetooth fundamentals.

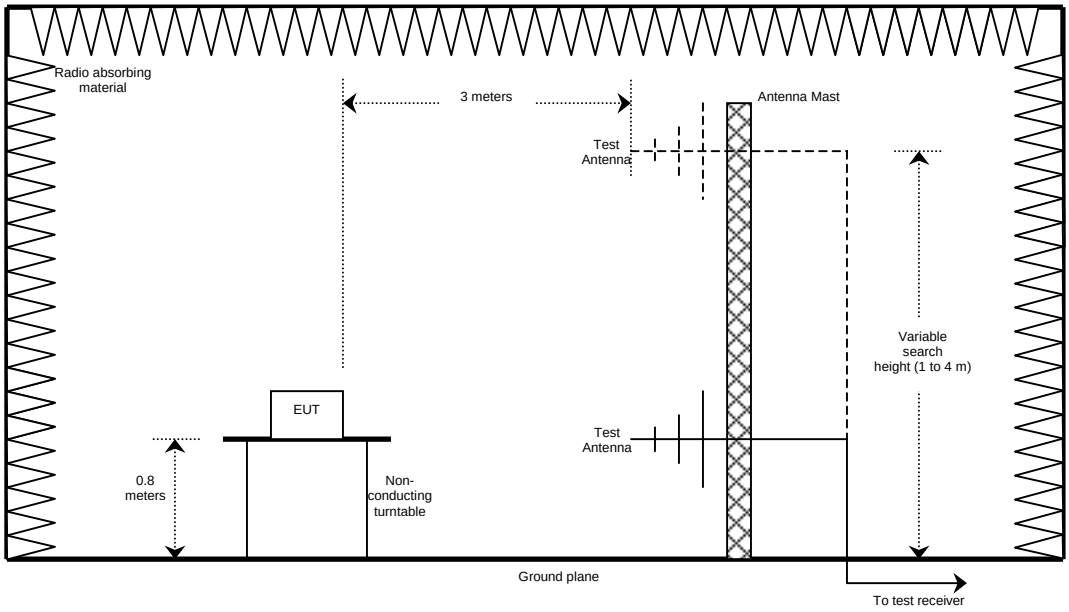
BT and iDEN



Note: The emissions at 1.7971GHz and 2.6956GHz are harmonics of the iDEN transmitter, and the emission at 2.4412GHz is the fundamental of the Bluetooth transmitter, and do not form part of this assessment.

Appendix D : Block Diagram of Test Setups

Radiated Emissions above 30MHz Test Site



Antenna Conducted Measurements