

FCC Part 15C Compliance Test Report

Test Report no.:	Cph_FCC_0631_01.doc	Date of Report:	08-08-2006
Number of pages:	112	Customer's Contact person:	Robert Binder
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	Customer:	Nokia Corporation Arco Tower Shimomeguro 1-8-1 Meguro-ku TOKYO 153-0064 JAPAN Tel. +81 3 5759 7001 Fax. +81 3 5740 6858
FCC listing no.:	99059		
IC recognition no.:	4820 and 4820-1		
Tested devices/ accessories:	Phone; RM-156 (hw2401), Headset: HS-23		
FCC ID:	QVVRM-156	IC:	661AE-RM156
Supplement reports:	None		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), IC standards RSS-GEN and RSS-210. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document.		
Date and signature for the contents:			

Jan Engelbrechtsen, Engineer

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	17-07-2006
Testing completed	08-08-2006
The customer's contact person	Robert Binder
Test Plan referred to	T:\Projects\RM-156\TestPlan_RS\RM-156_RS_testplan.xls
Notes	None
Document name	T:\Projects\RM-156\EMC\Results\FCC\Cph_FCC_0631_01.doc

1.1. EUT and Accessory Information

The EUT is a quadri band (GSM900/1800/1900 and WCDMA2100) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-156	004400/84/161817/4	2401	-	02.0.113	29057
Headset	HS-23	386349548301	-	-	-	29063

1.2. Summary of Test Results

Bluetooth:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8.4 (2)	Peak output power	Passed
15.247(c)	A8.5	Band edge compliance of RF emissions	NP
15.247(c)	A8.5	Spurious RF conducted emissions	Passed
15.247(c), 15.209	A8.5	Spurious radiated emissions	NP
15.207	7.2.2	AC power line conducted emissions	NP
15.247(a)(1)	A8.1 (1)	20 dB bandwidth	Passed
15.247(a)(1)	A8.1 (2)	Carrier frequency separation	Passed
15.247(a)(1)(iii)	A8.1 (4)	Number of hopping frequencies	Passed
15.247(a)(1)(iii)	A8.1 (4)	Time of occupancy	Passed

WLAN:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.247(b)(1)	A8.4 (4)	Peak output power	Passed
15.247(c)	A8.5	Band edge compliance of RF emissions	NP
15.247(c)	A8.5	Spurious RF conducted emissions	Passed
15.247(c), 15.209	A8.5	Spurious radiated emissions	NP
15.207	7.2.2	AC power line conducted emissions	NP
15.247(a)(2)	A8.2 (1)	6 dB bandwidth	Passed
15.247(e)	A8.2 (2)	Power spectral density	Passed

PASSED
FAILED
NP

The EUT complies with the essential requirements in the standard.
The EUT does not comply with the essential requirements in the standard.
The test was not performed by the TCC Nokia Copenhagen Laboratory.

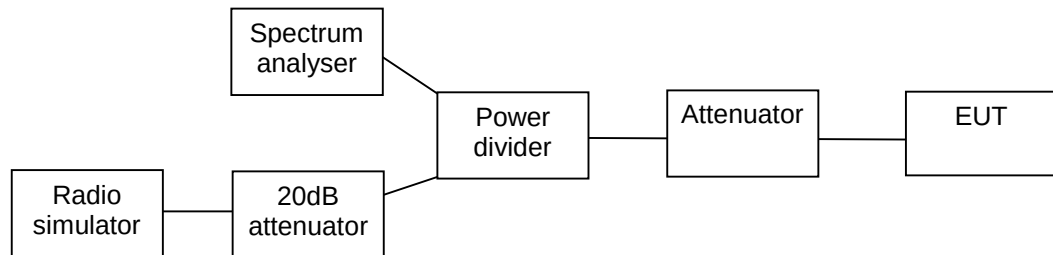
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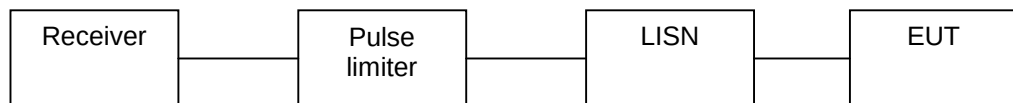
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2. Test setups

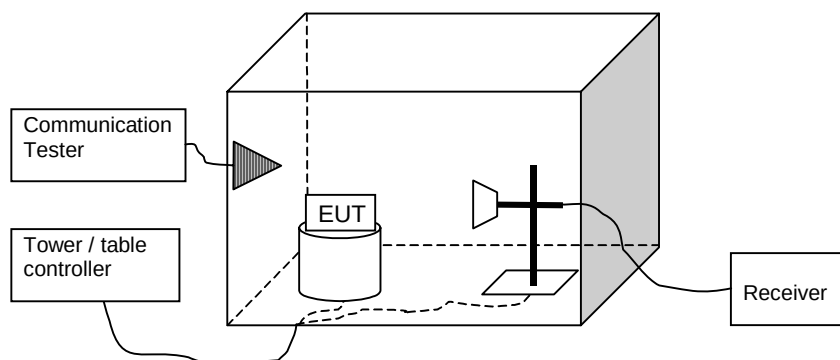
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



3. Peak output power (FCC §15.247(b)(1), RSS-210 A8.4 (2))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3,7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.4 / 45.5 1008.7
Date of measurements	03-08-2006
Measured by	Jan Engelbrechtsen

3.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for peak output power measurements

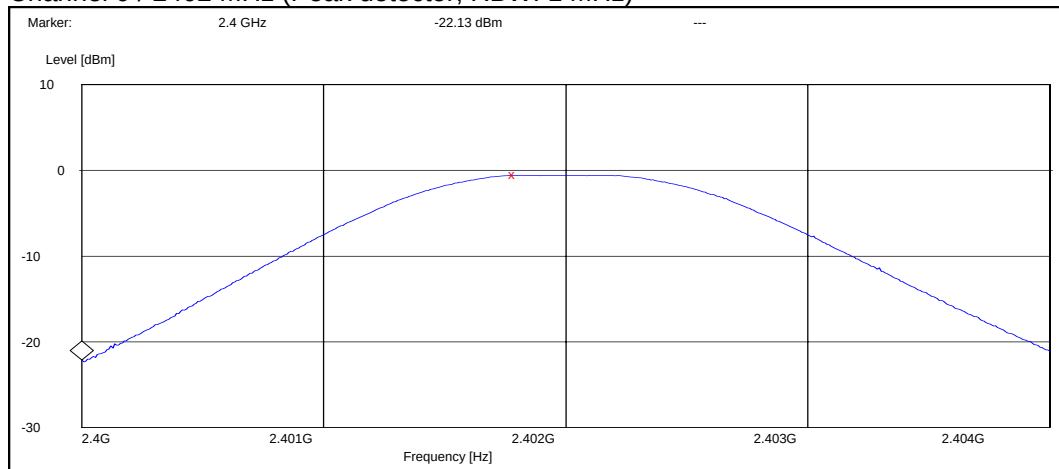
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

3.2. Bluetooth Test results

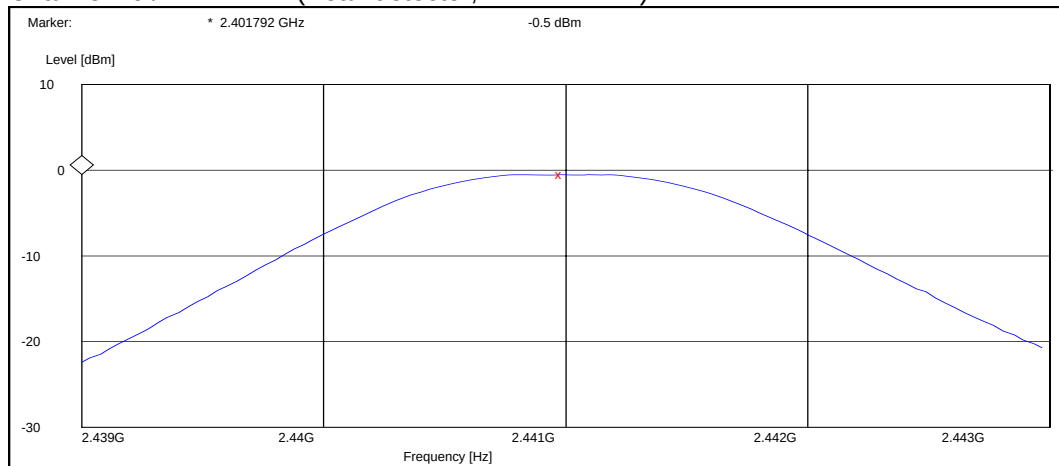
3.2.1 GSKF modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-0.50	0.891	Passed
40 / 2442	-0.50	0.891	Passed
78 / 2480	-0.50	0.891	Passed

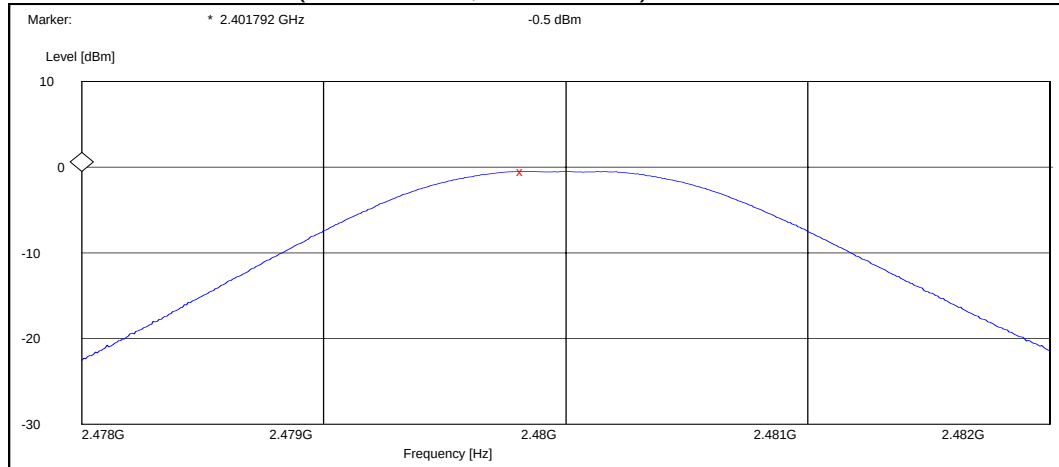
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



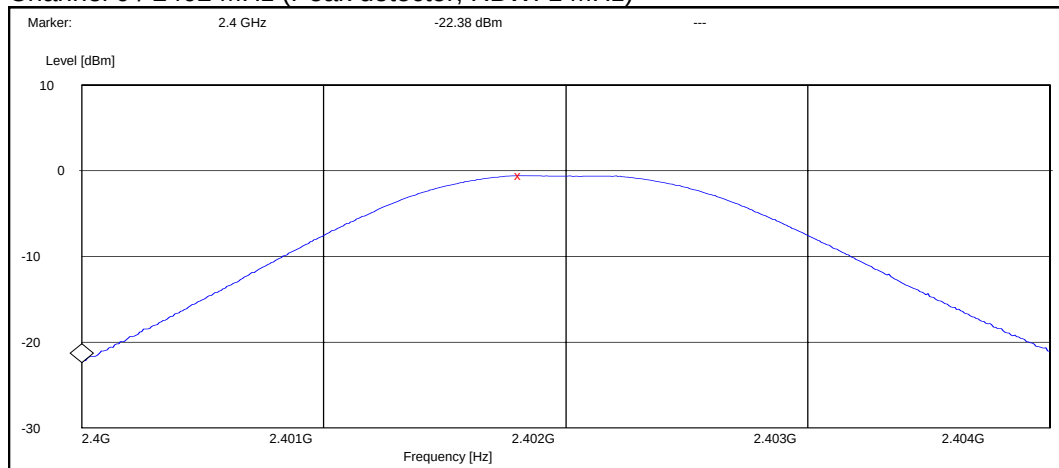
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



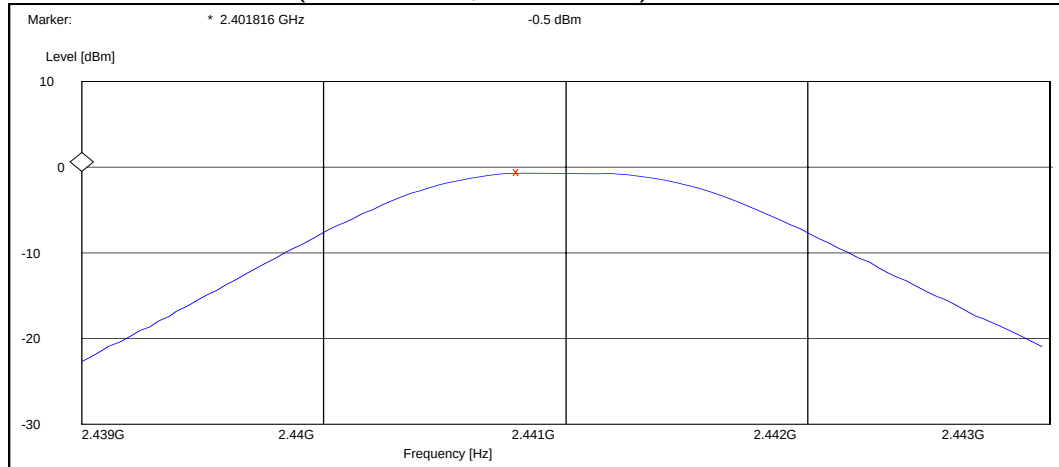
3.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-0.50	0.891	Passed
78 / 2480	-0.50	0.891	Passed

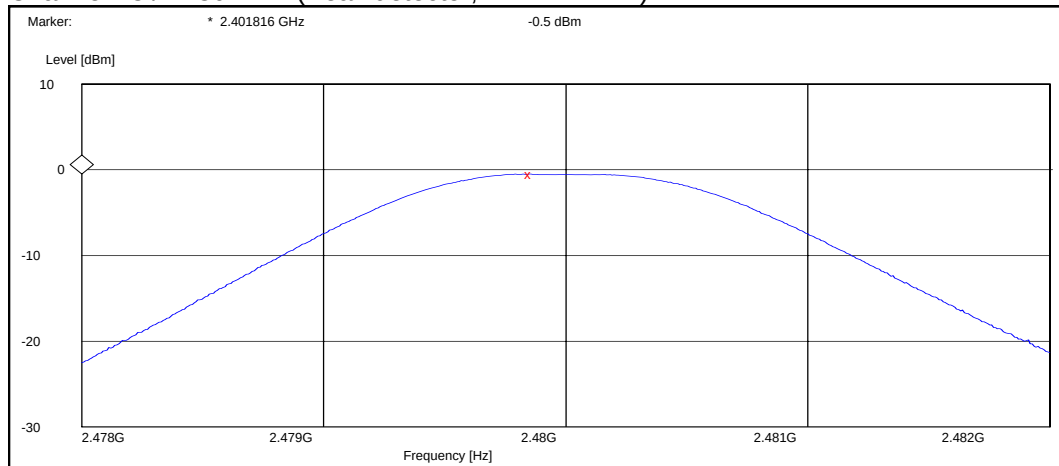
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



4. Spurious RF conducted emissions (FCC §15.247(c), RSS-A8.5)

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3,7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.4 / 45.5 1008.7
Date of measurements	03-08-2006
Measured by	Jan Engelbrechtsen

4.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

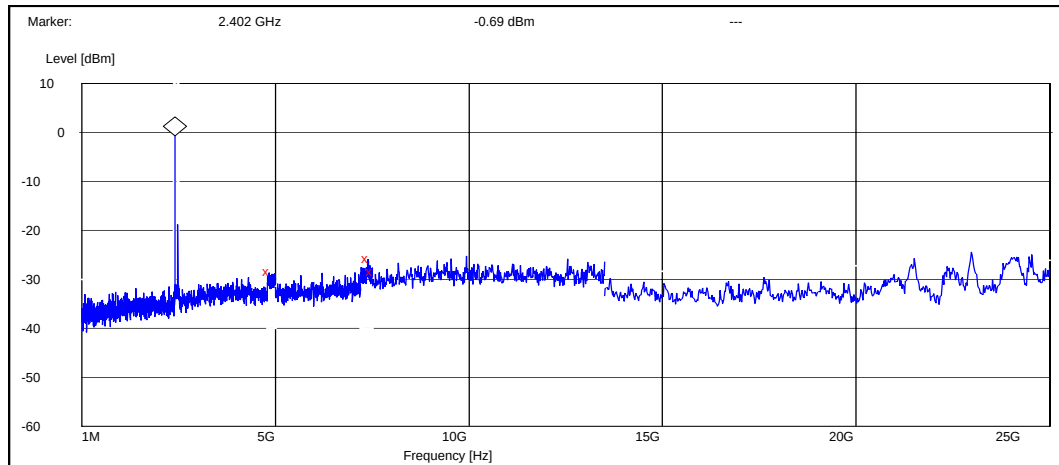
Limits for spurious RF conducted emissions measurements

Frequency range [MHz]	Limit [dBc]
1 – 25000	≤ -20

4.2. Bluetooth Test results

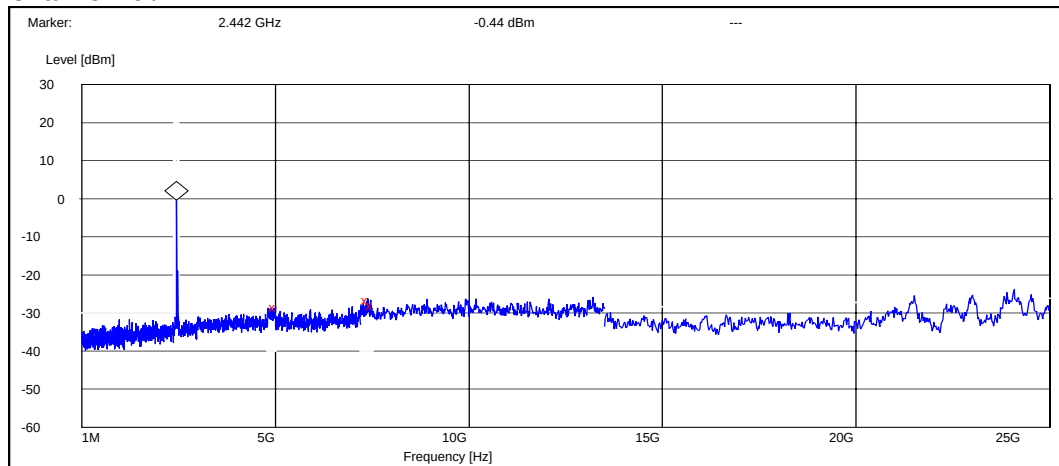
4.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



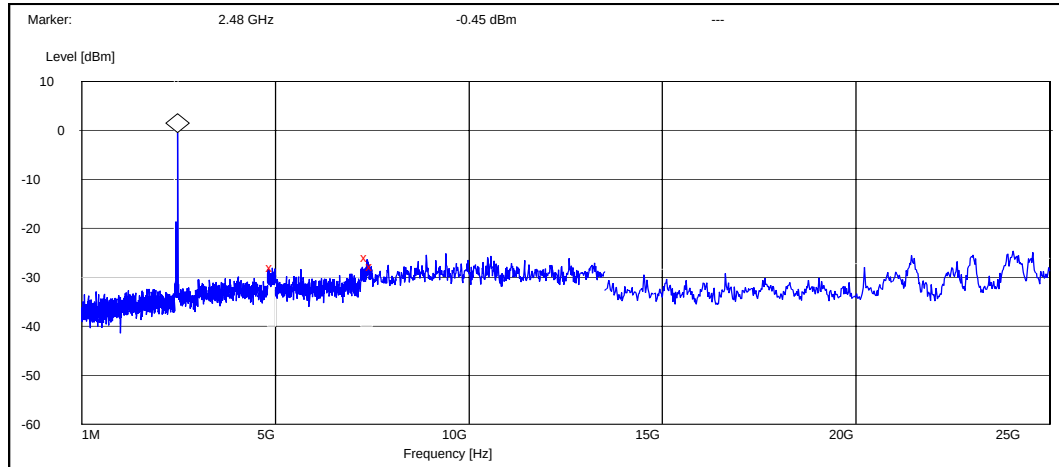
Frequency [MHz]	P [dBc]	Result
4832.800000	-27.614040	Passed
7396.200000	-25.014040	Passed
7500.000000	-27.714040	Passed

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4996.800000	-27.961371	Passed
7380.600000	-26.261371	Passed
7500.000000	-27.561371	Passed

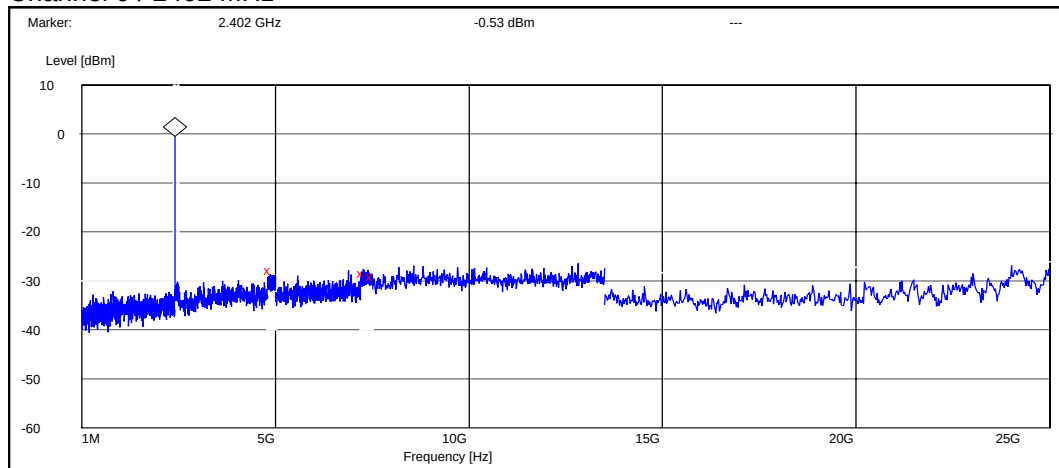
Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4915.200000	-27.546708	Passed
7372.800000	-25.446708	Passed
7500.000000	-27.346708	Passed

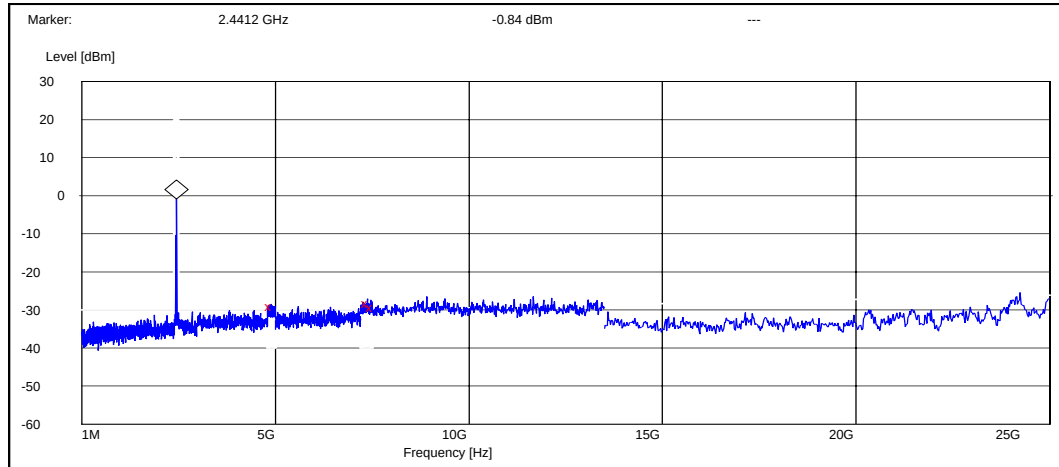
4.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



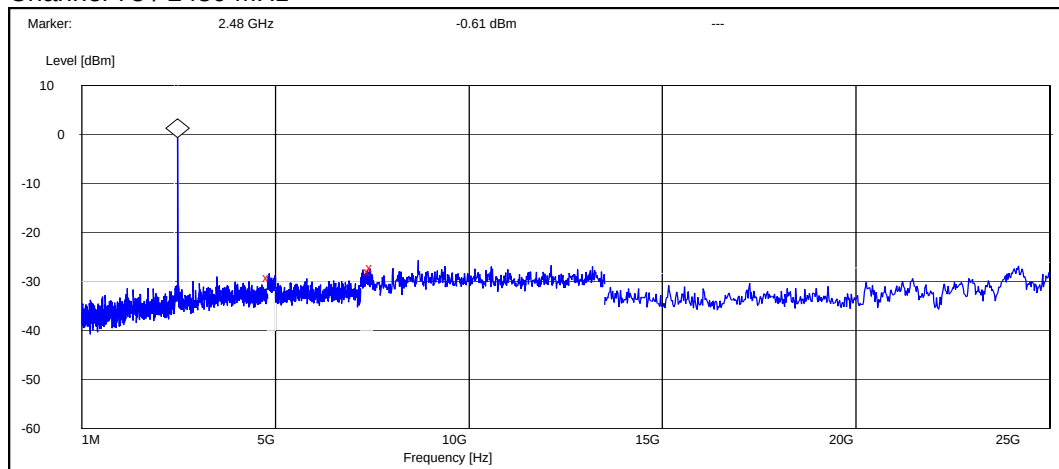
Frequency [MHz]	P [dBc]	Result
4872.000000	-27.274944	Passed
7276.800000	-27.874944	Passed
7500.000000	-28.474944	Passed

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4897.200000	-28.156981	Passed
7379.400000	-27.456981	Passed
7500.000000	-28.356981	Passed

Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4833.200000	-28.592586	Passed
7450.800000	-27.392586	Passed
7500.000000	-26.392586	Passed

5. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.4 / 45.5 1008.7
Date of measurements	03-08-2006
Measured by	Jan Engelbrechtsen

5.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for 20 dB bandwidth measurements

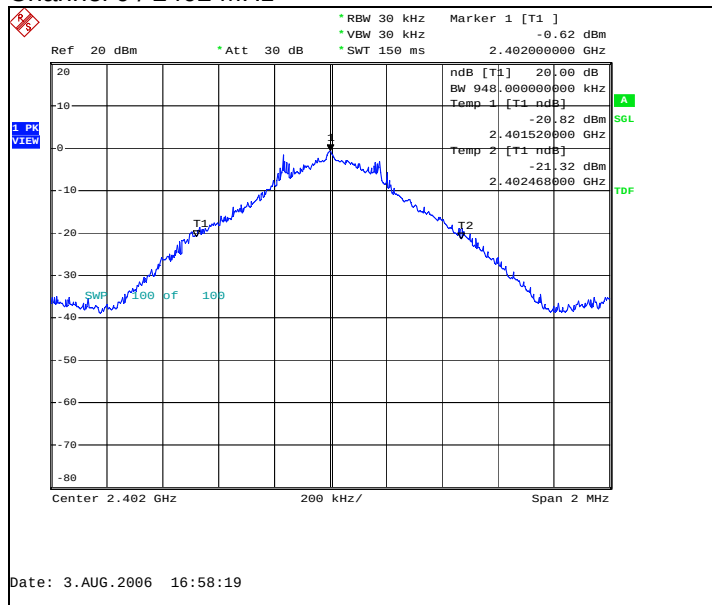
Limit [MHz]
N/A

5.2. Bluetooth Test results

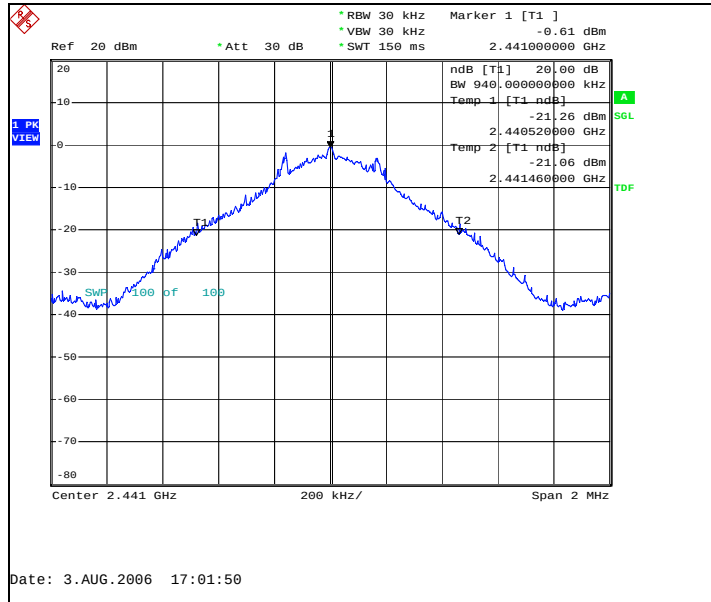
5.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	948.000	Passed
	940.000	Passed
78 / 2480	928.000	Passed

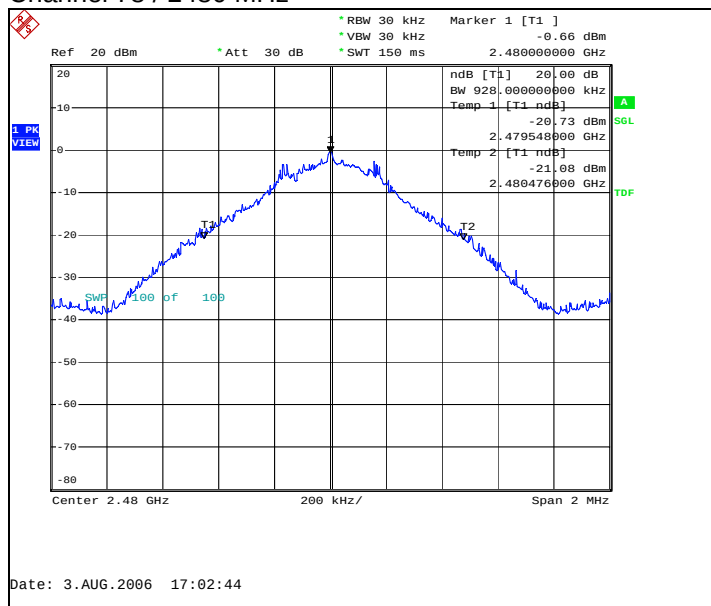
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



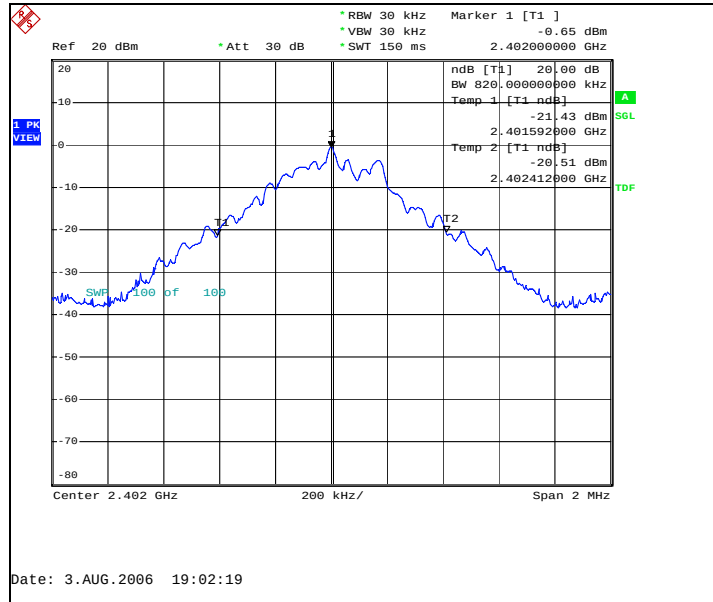
Channel 78 / 2480 MHz



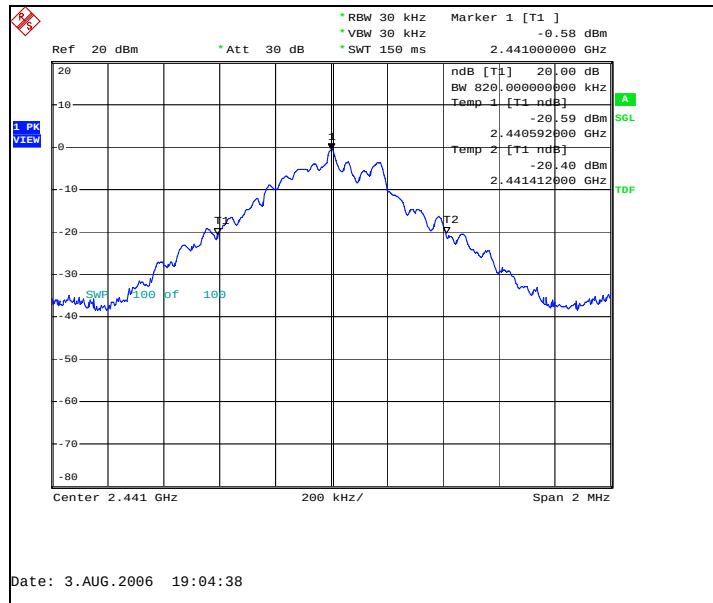
5.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	820.000	Passed
	820.000	Passed
78 / 2480	824.000	Passed

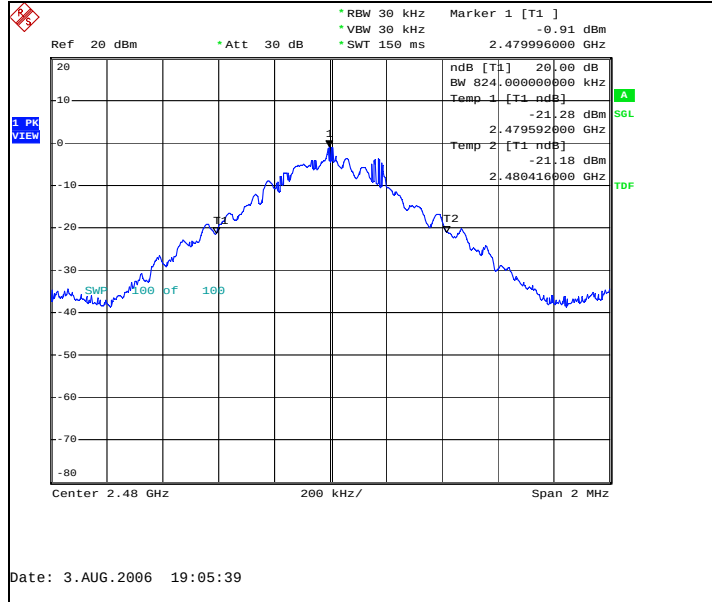
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



6. Carrier frequency separation (FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.4 / 45.5 1008.7
Date of measurements	03-08-2006
Measured by	Jan Engelbrechtsen

6.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for carrier frequency separation measurements

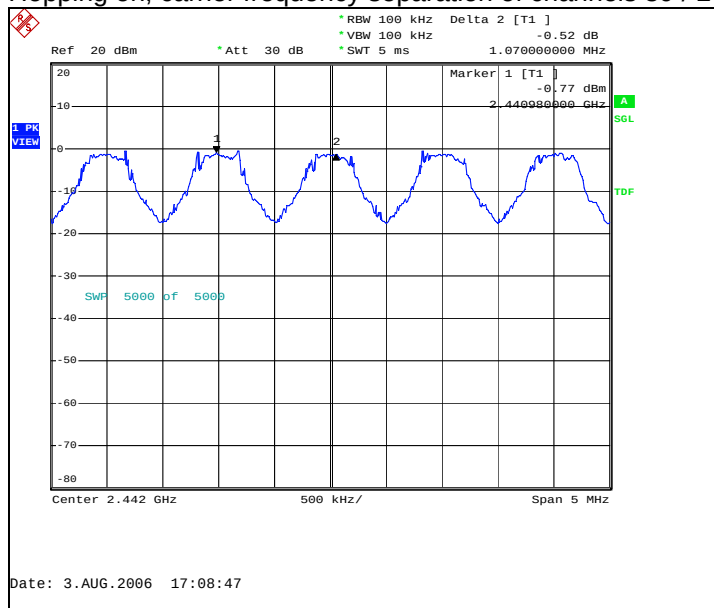
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

6.2. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1070	Passed

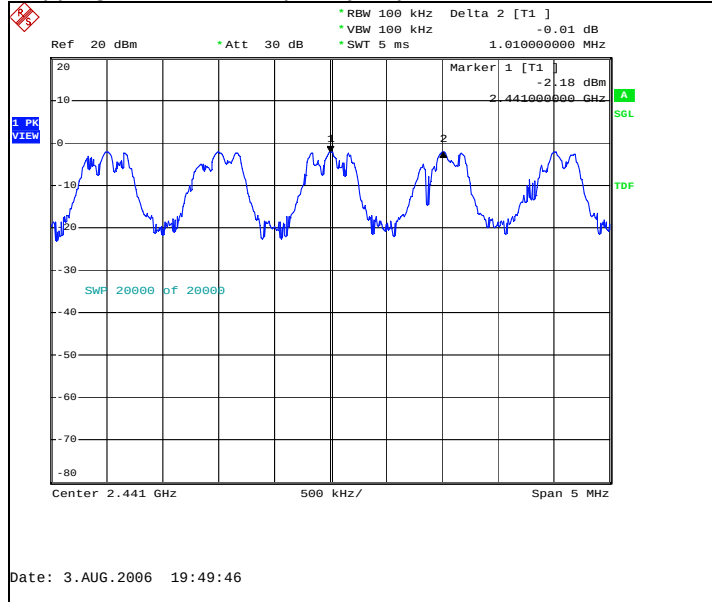
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



6.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1010	Passed

Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



7. Number of hopping frequencies (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.4 / 45.5 1008.7
Date of measurements	03-08-2006
Measured by	Jan Engelbrechtsen

7.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for number of hopping frequencies measurements

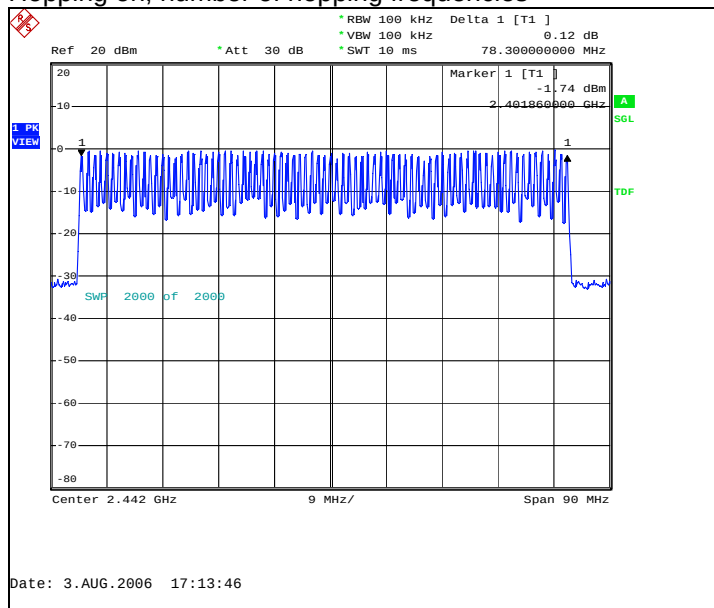
Limit [number]
≥ 15

7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	Passed

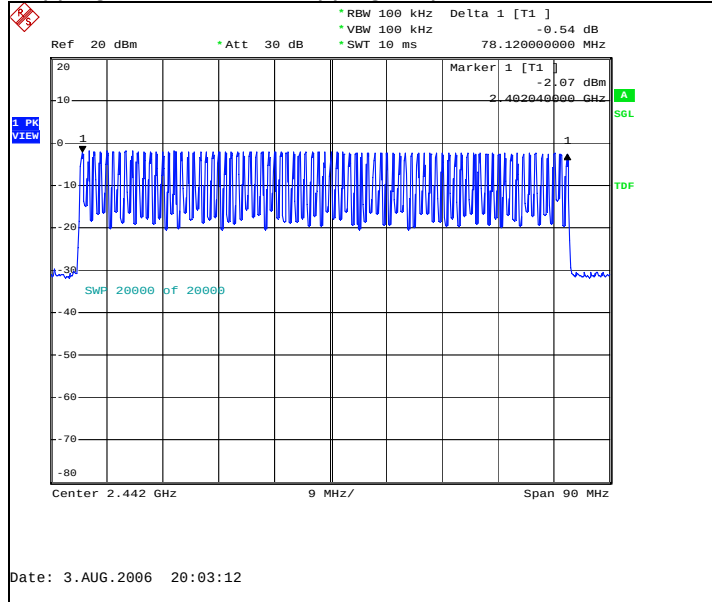
Hopping on, number of hopping frequencies



7.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	Passed

Hopping on, number of hopping frequencies



8. Time of occupancy (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.4 / 45.5 1008.7
Date of measurements	03-08-2006
Measured by	Jan Engelbrechtsen

8.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210 as follows:

The total time of occupancy is get by multiplying the measured number of transmissions occurred during 31.6 second period with the duration of one transmission.

Limits for time of occupancy measurements

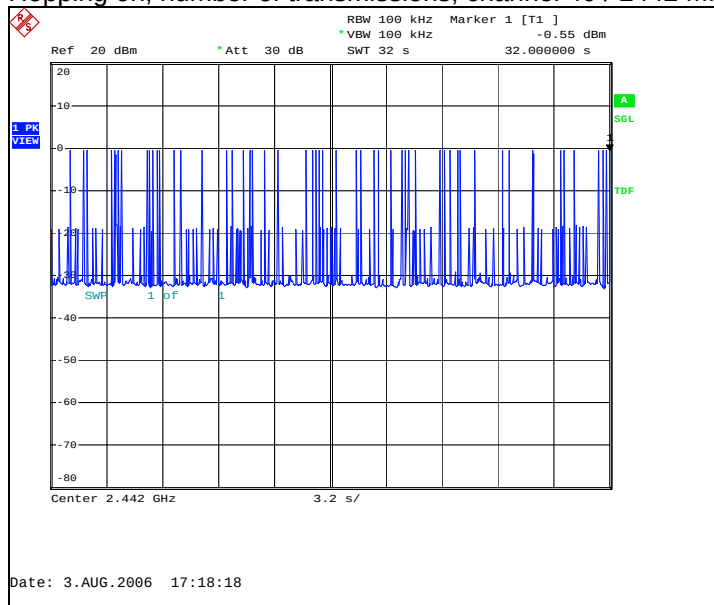
Limit [s]
≤ 0.4

8.2. Bluetooth test results

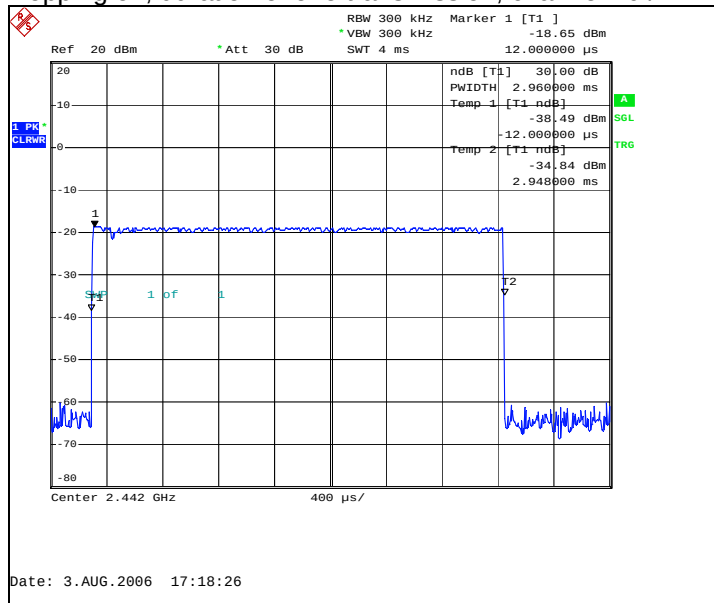
8.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
54	2960.000	0.159840	Passed

Hopping on, number of transmissions, channel 40 / 2442 MHz



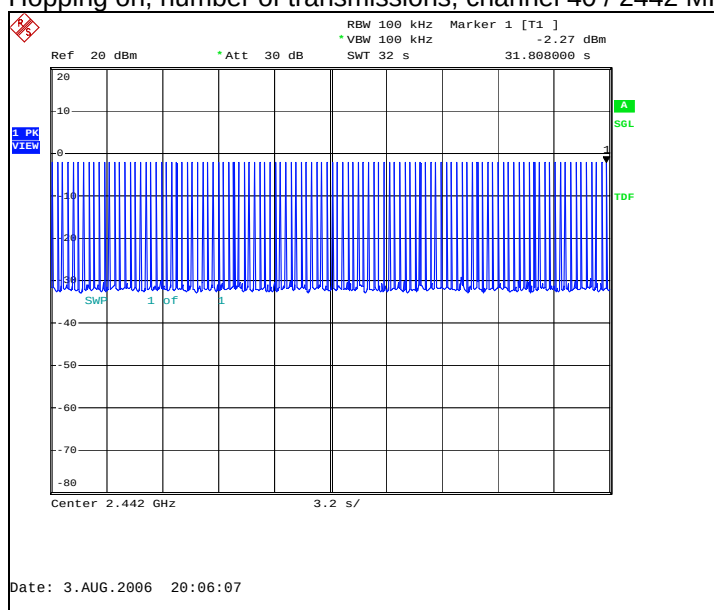
Hopping on, duration of one transmission, channel 40 / 2442 MHz



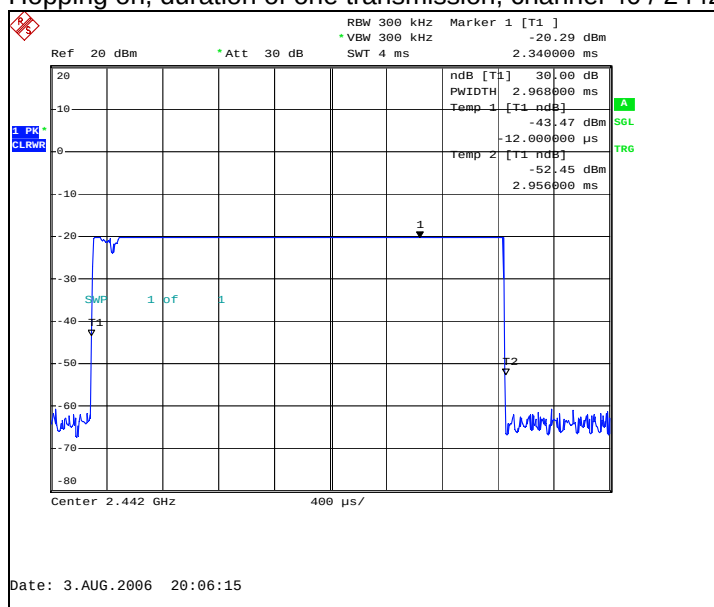
8.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
109	2968.000	0.323512	Passed

Hopping on, number of transmissions, channel 40 / 2442 MHz



Hopping on, duration of one transmission, channel 40 / 2442 MHz



9. Peak output power (FCC §15.247(b) (1), RSS-210 A8.4 (4))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	25.4 / 46.0 1013.4
Date of measurements	01-08-2006
Measured by	Jan Engelbrechtsen

9.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for peak output power measurements

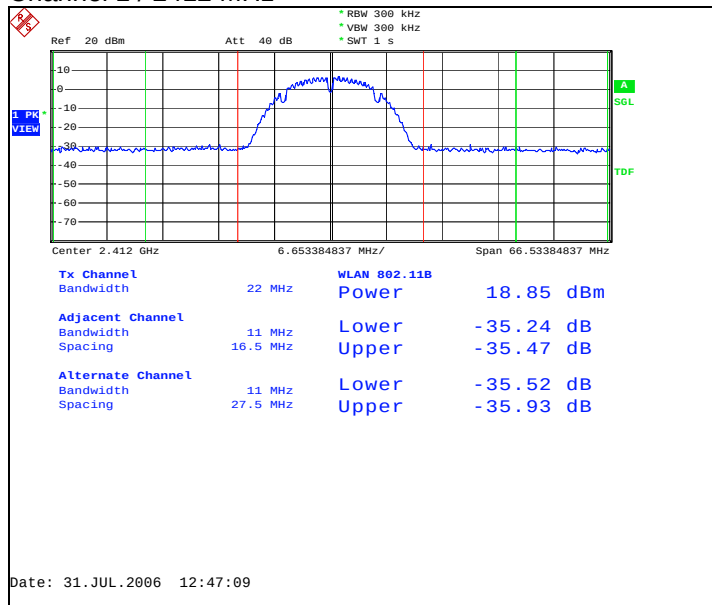
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

9.2. WLAN Test results

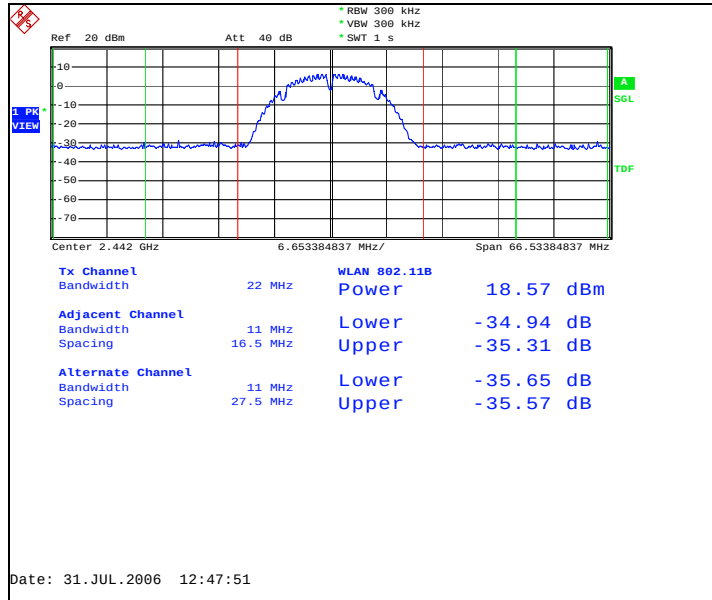
9.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	18.85	0.077	Passed
7 / 2442	18.57	0.072	Passed
11 / 2462	16.51	0.045	Passed

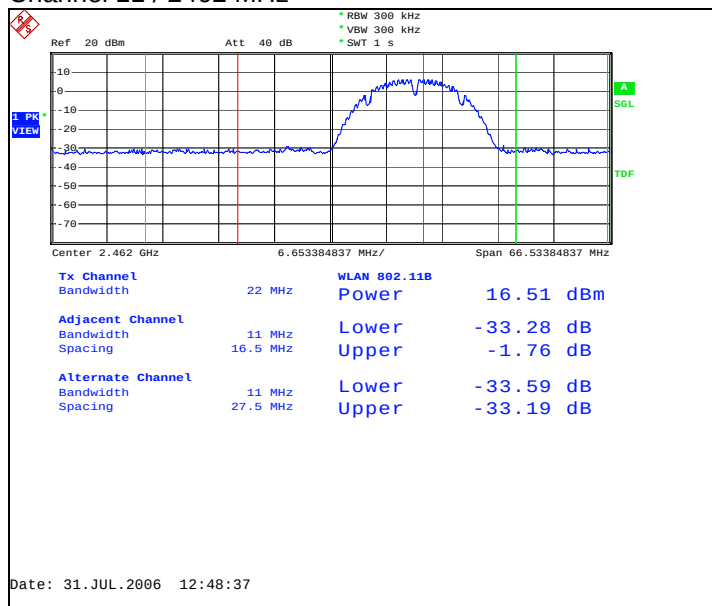
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



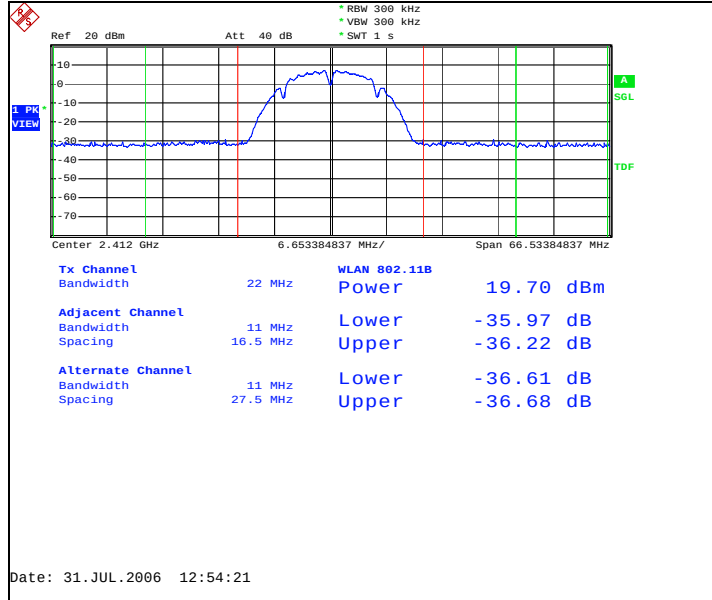
Channel 11 / 2462 MHz



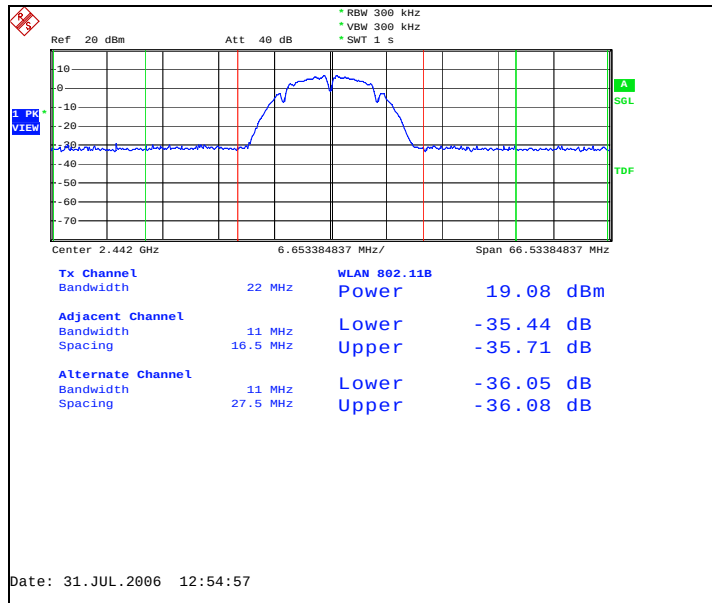
9.2.2 DSSS mode, QPSK modulation, 2 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	19.70	0.093	Passed
7 / 2442	19.08	0.081	Passed
11 / 2462	18.99	0.079	Passed

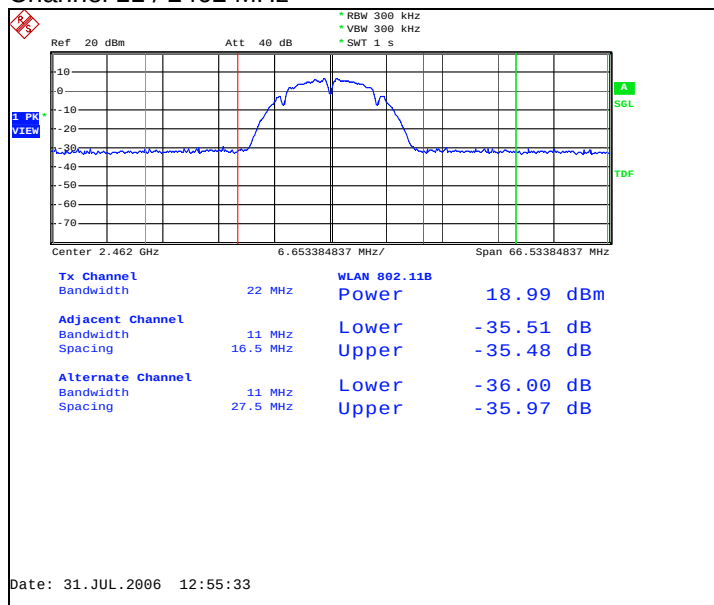
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



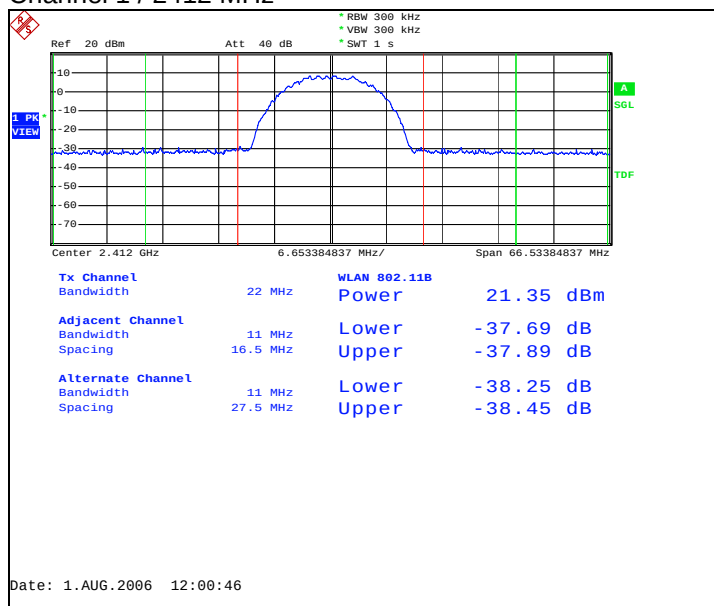
Channel 11 / 2462 MHz



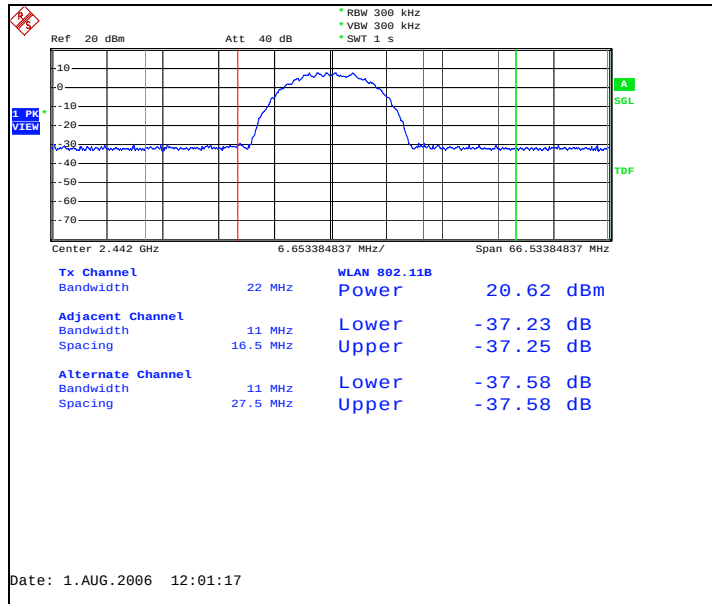
9.2.3 DSSS mode, QPSK modulation, 5.5 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [W]	Result
1 / 2412	21.35	0.136	Passed
7 / 2442	20.62	0.115	Passed
11 / 2462	20.60	0.115	Passed

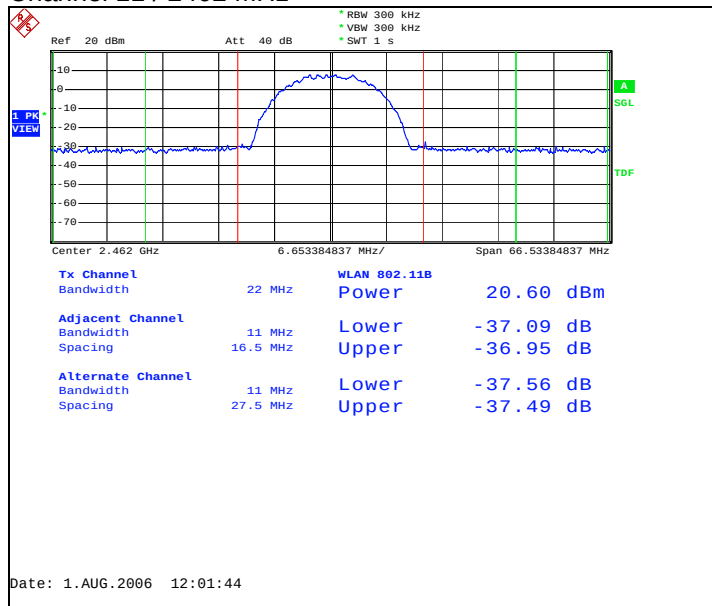
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz

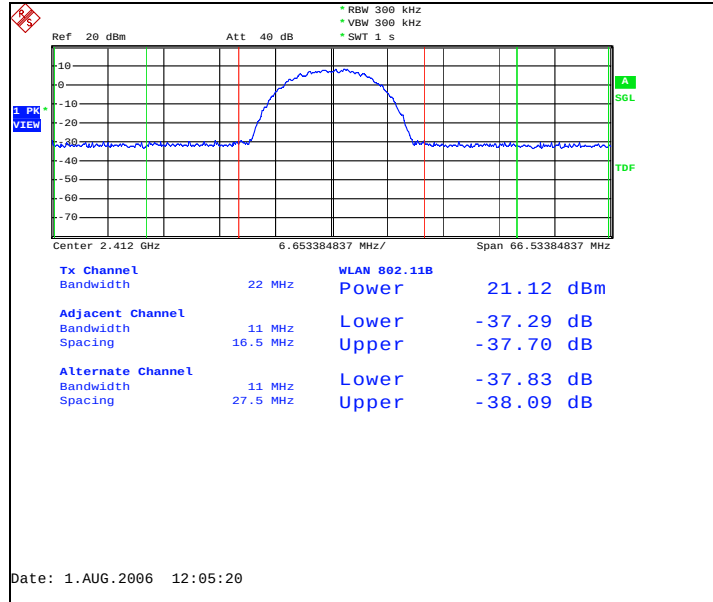


9.2.4 DSSS mode, QPSK modulation, 11 Mbps data rate

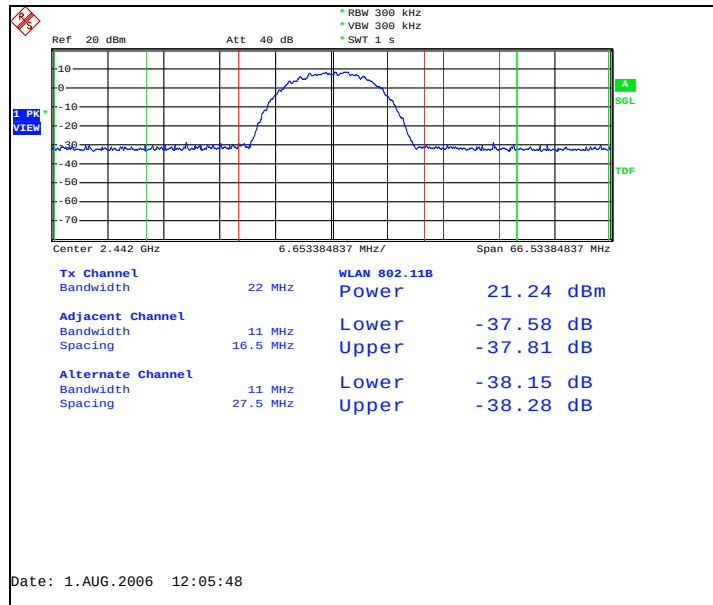
Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	21.12	0.129	Passed

7 / 2442 21.24 0.133 Passed
11 / 2462 21.19 0.132 Passed

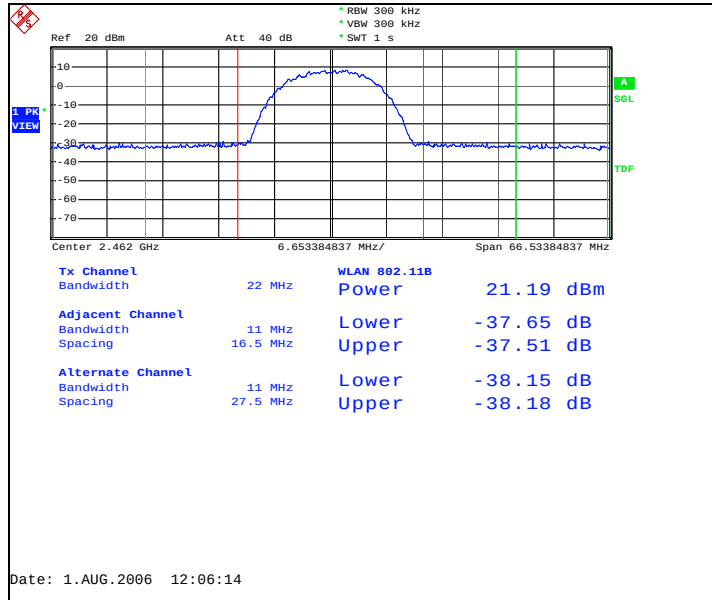
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



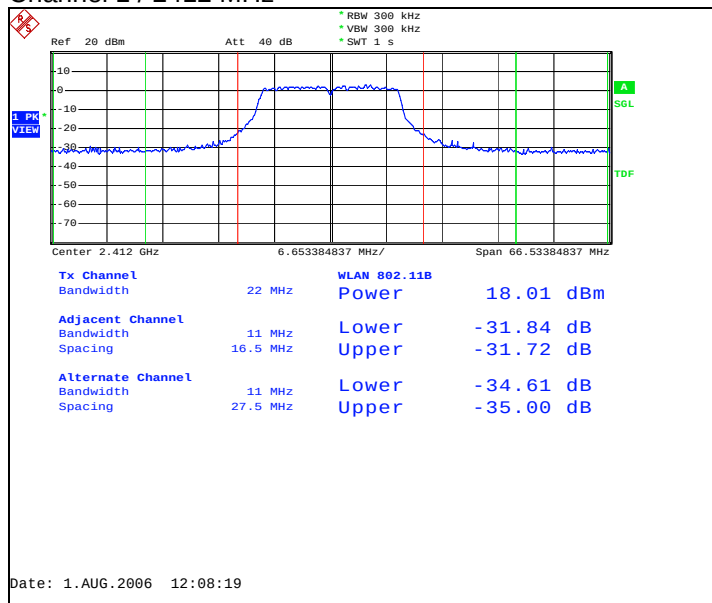
Channel 11 / 2462 MHz



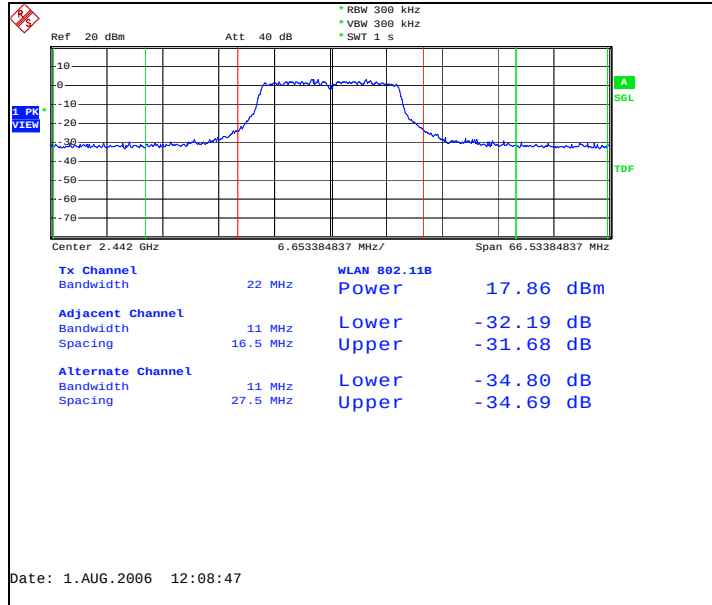
9.2.5 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [W]	Result
1 / 2412	18.01	0.063	Passed
7 / 2442	17.86	0.061	Passed
11 / 2462	17.70	0.059	Passed

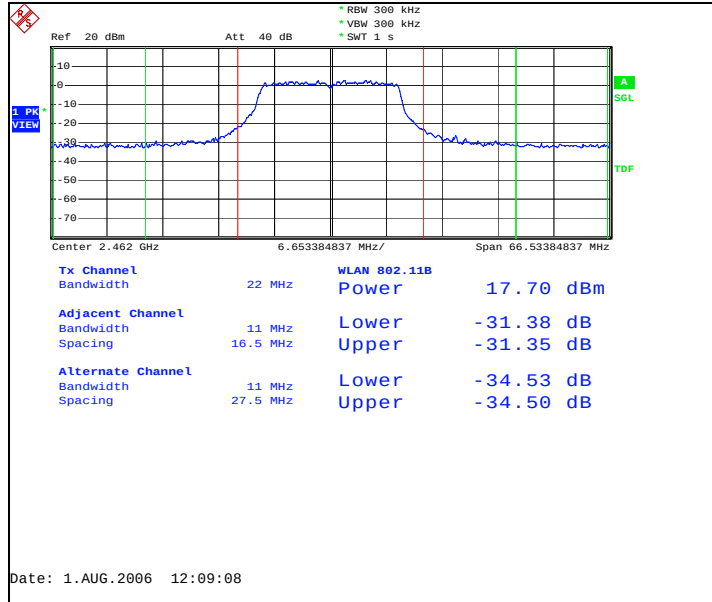
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



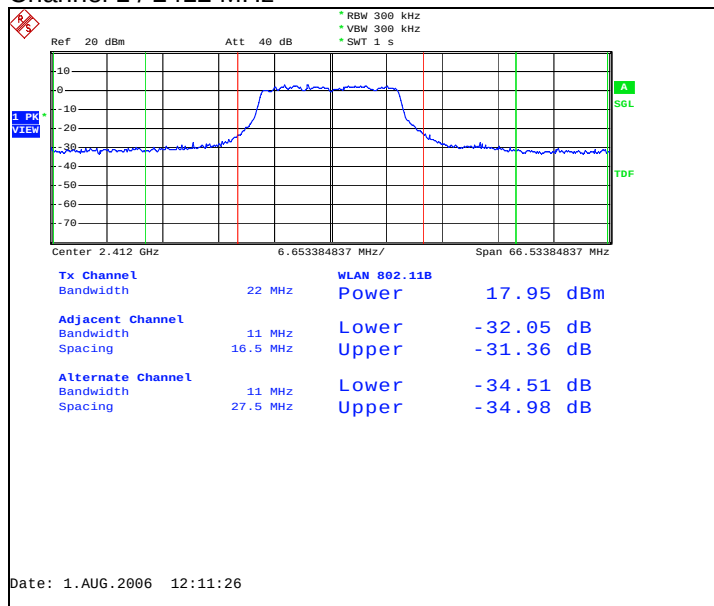
Channel 11 / 2462 MHz



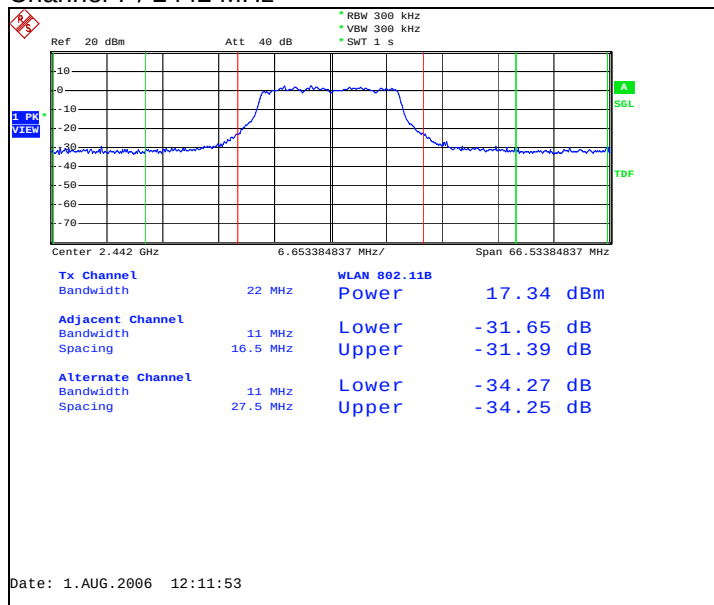
9.2.6 OFDM mode, BPSK modulation, 9 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.95	0.062	Passed
7 / 2442	17.34	0.054	Passed
11 / 2462	17.34	0.054	Passed

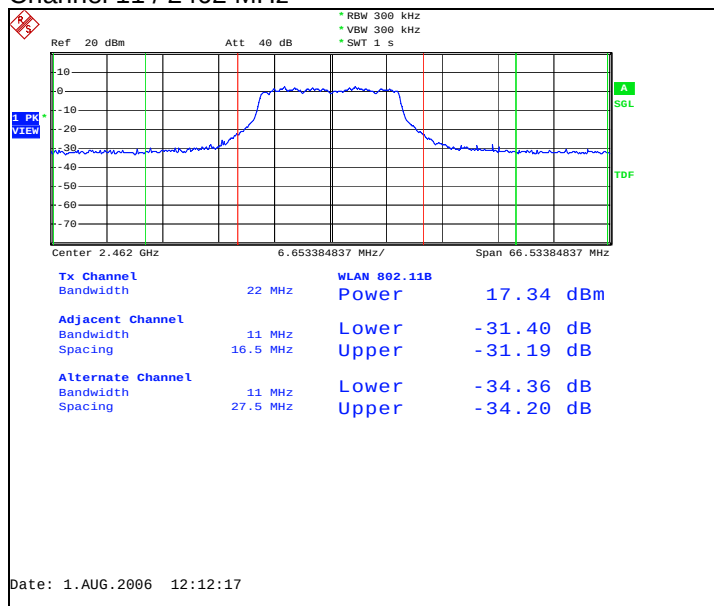
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



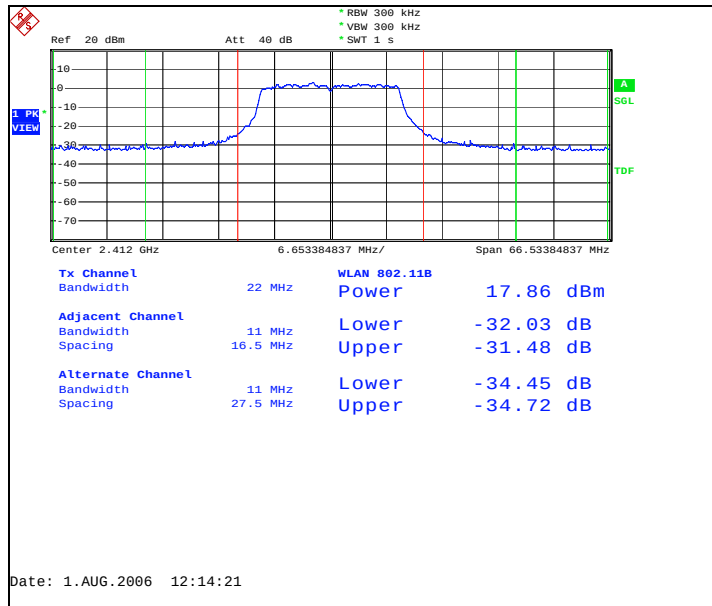
Channel 11 / 2462 MHz



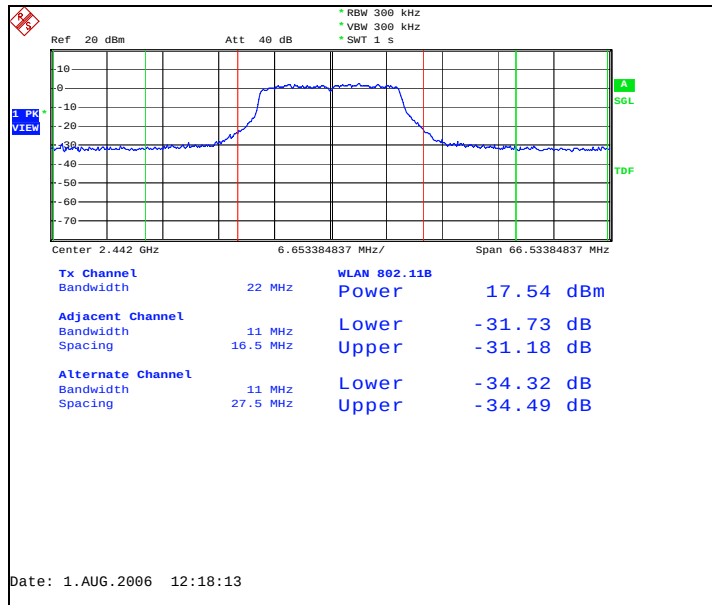
9.2.7 OFDM mode, QPSK modulation, 12 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.86	0.061	Passed
7 / 2442	17.54	0.057	Passed
11 / 2462	17.55	0.057	Passed

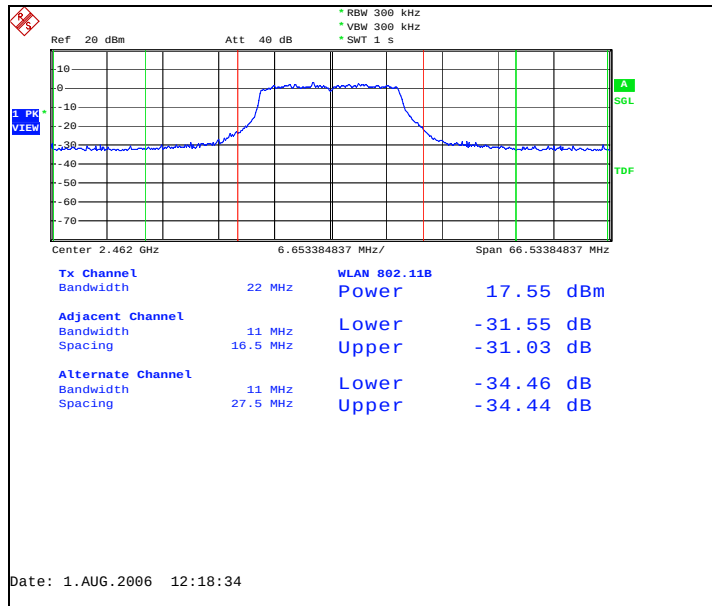
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



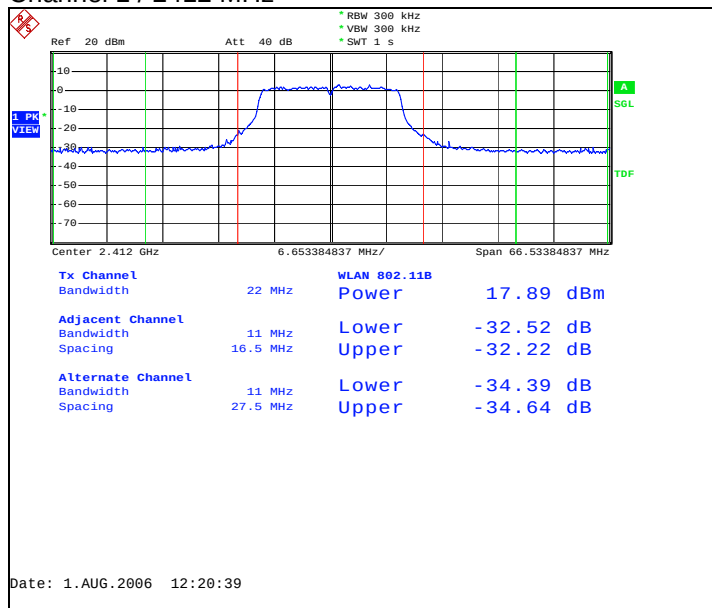
Channel 11 / 2462 MHz



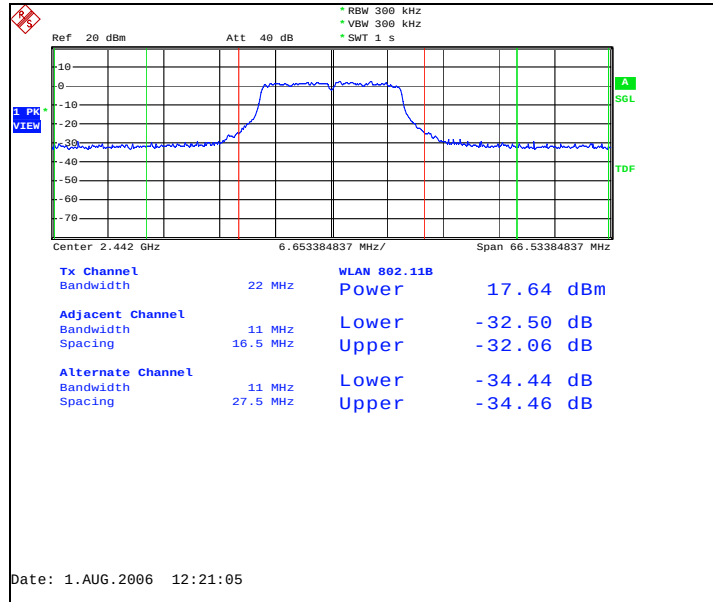
9.2.8 OFDM mode, QPSK modulation, 18 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.89	0.062	Passed
7 / 2442	17.64	0.058	Passed
11 / 2462	17.65	0.058	Passed

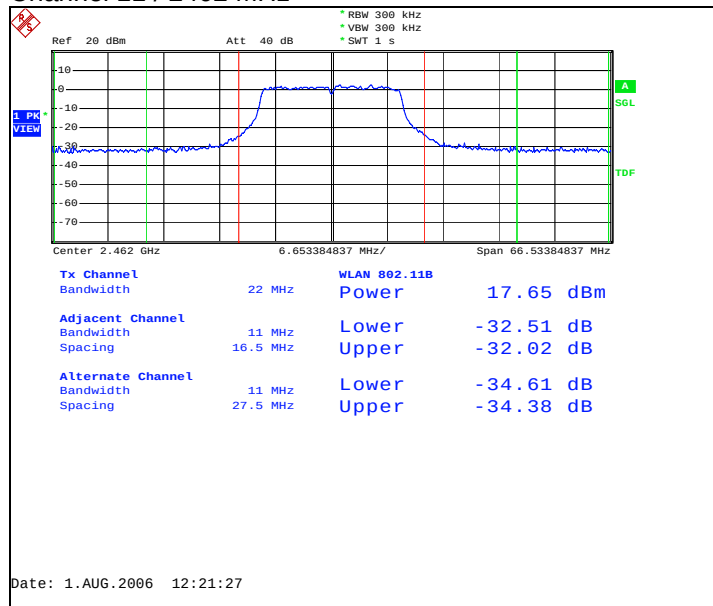
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



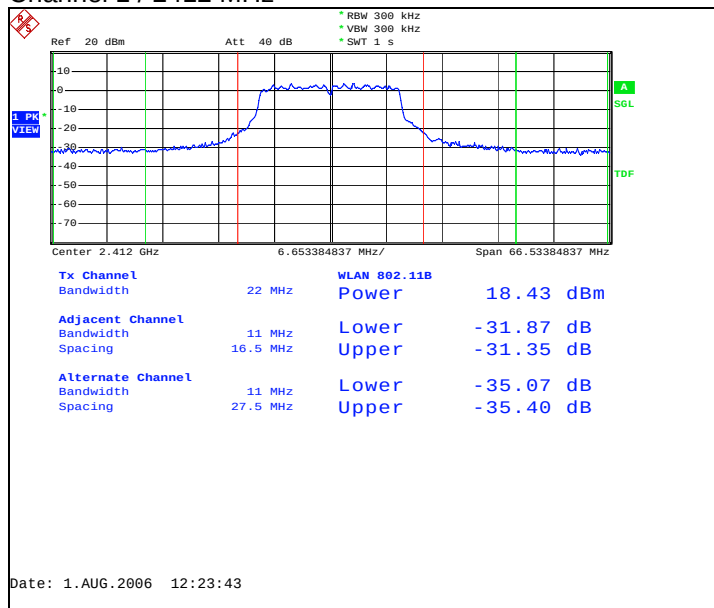
Channel 11 / 2462 MHz



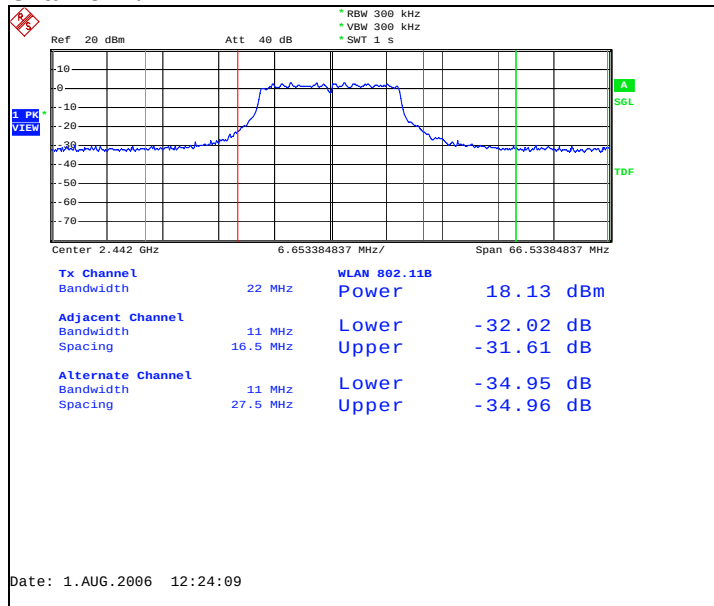
9.2.9 OFDM mode, 16QAM modulation, 24 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	18.43	0.070	Passed
7 / 2442	18.13	0.065	Passed
11 / 2462	18.08	0.064	Passed

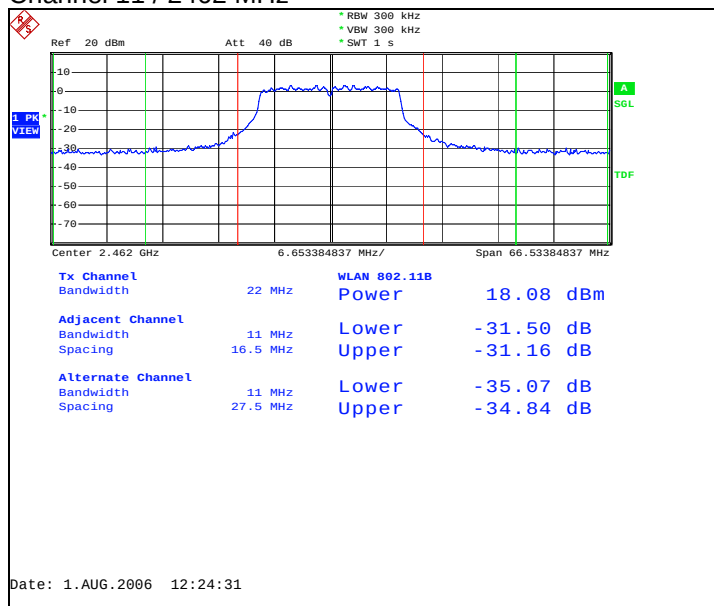
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



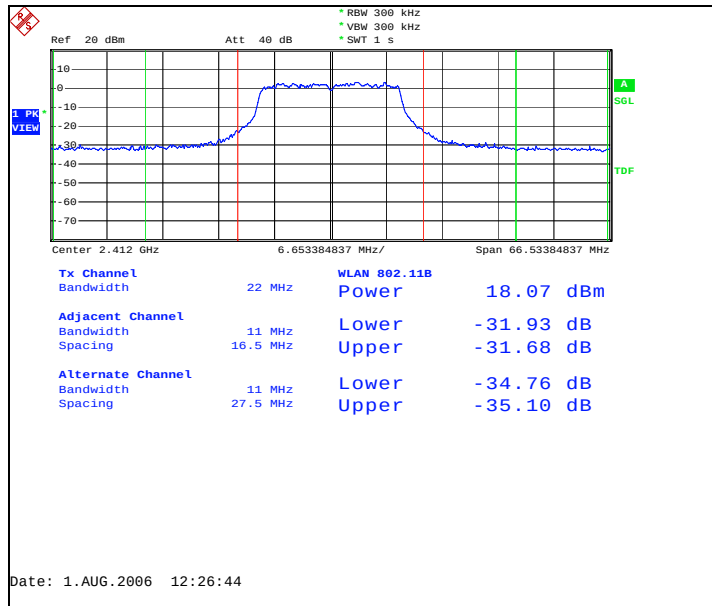
Channel 11 / 2462 MHz



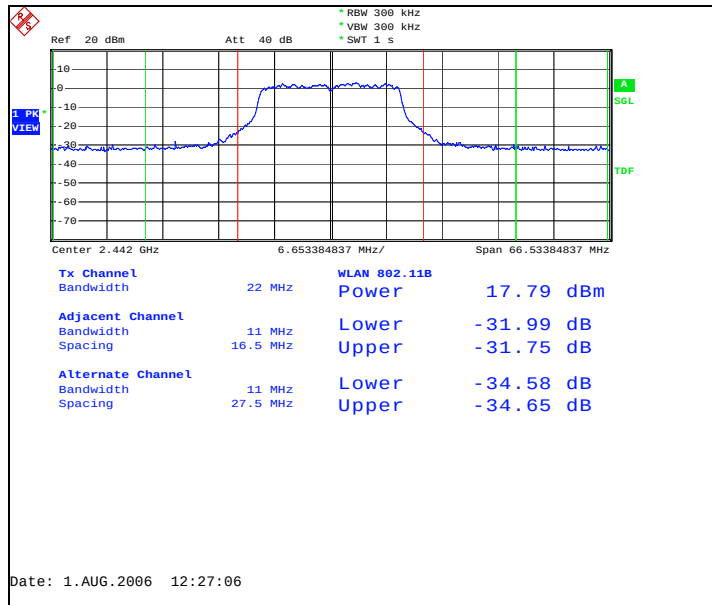
9.2.10 OFDM mode, 16QAM modulation, 36 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	18.07	0.064	Passed
7 / 2442	17.79	0.060	Passed
11 / 2462	17.74	0.059	Passed

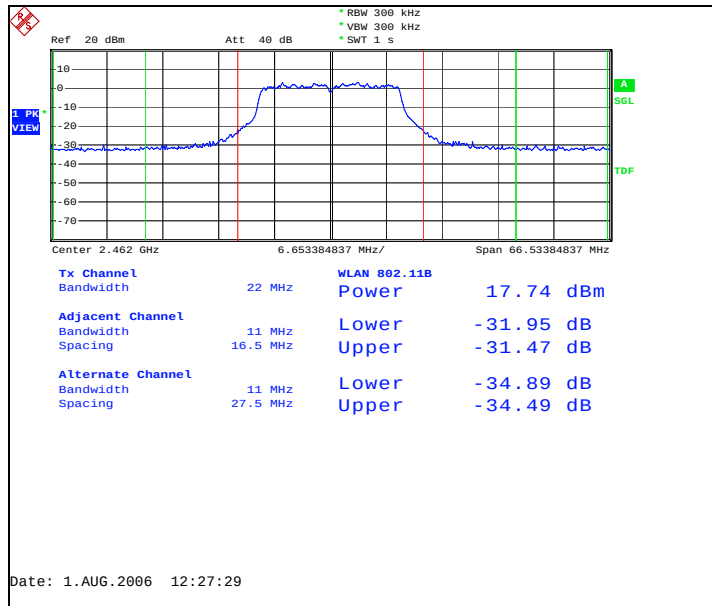
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



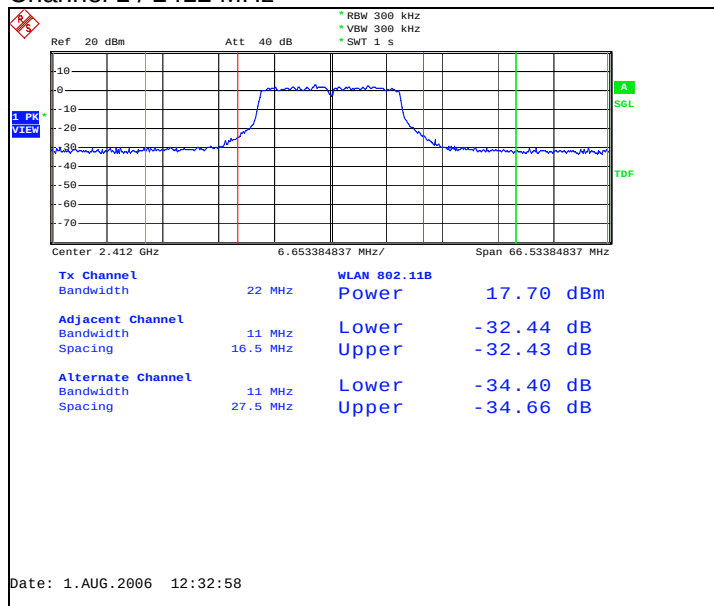
Channel 11 / 2462 MHz



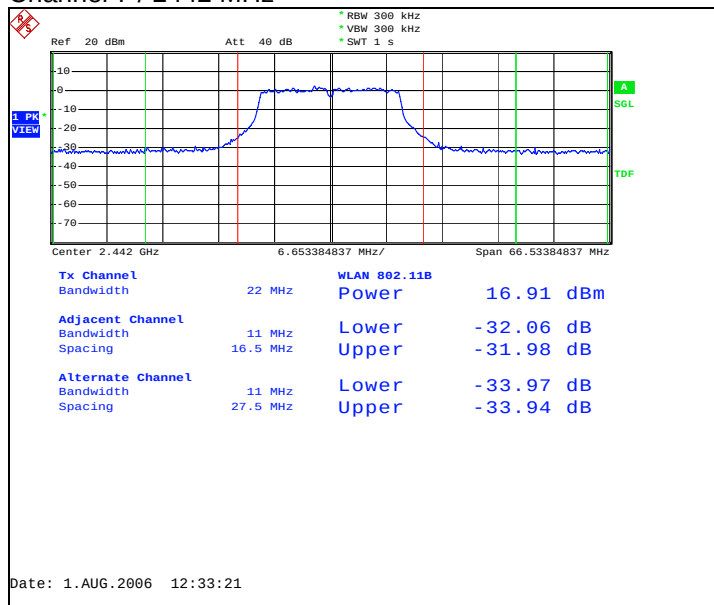
9.2.11 OFDM mode, 64QAM modulation, 48 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.70	0.059	Passed
7 / 2442	16.91	0.049	Passed
11 / 2462	16.43	0.044	Passed

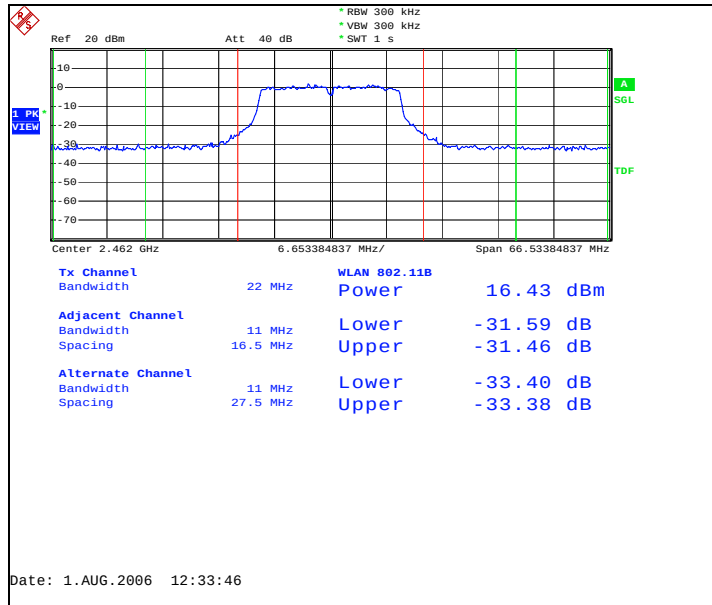
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



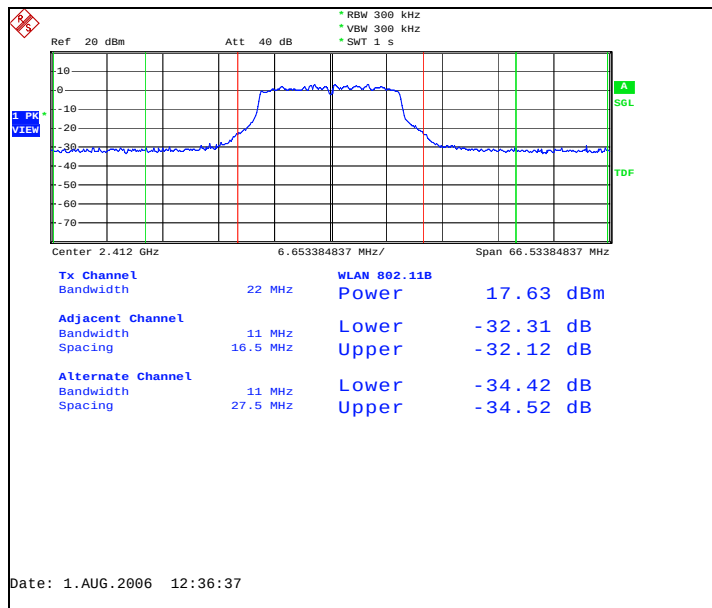
Channel 11 / 2462 MHz



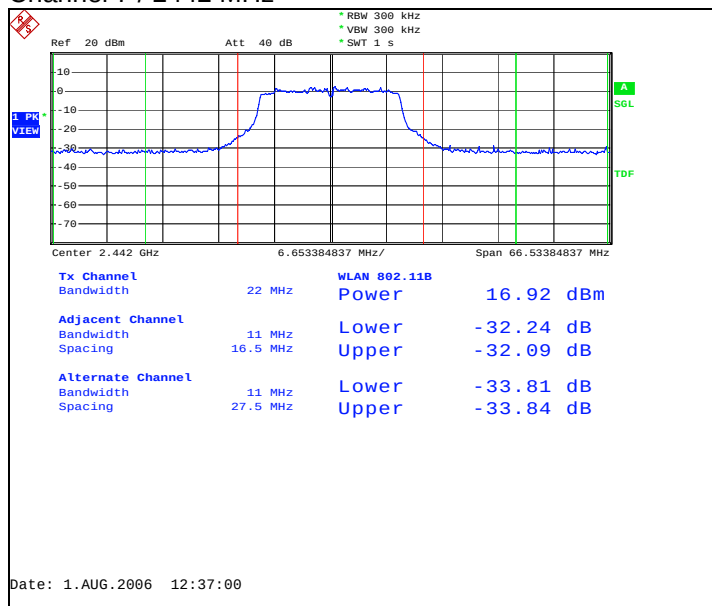
9.2.12 OFDM mode, 64QAM modulation, 54 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.63	0.058	Passed
7 / 2442	16.92	0.049	Passed
11 / 2462	16.79	0.048	Passed

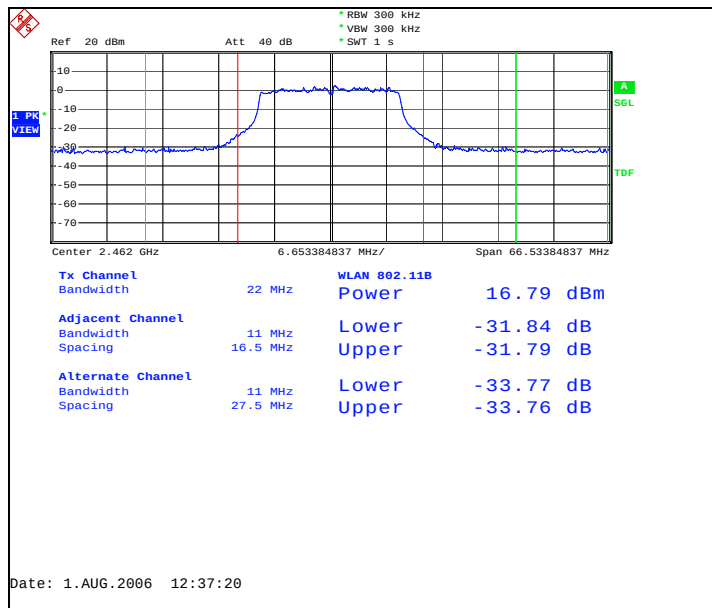
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



10. Spurious RF conducted emissions (FCC §15.247(c), RSS-210 A8.5)

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.7 / 46.5 1004.9
Date of measurements	02-08-2006
Measured by	Jan Engelbrechtsen

10.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

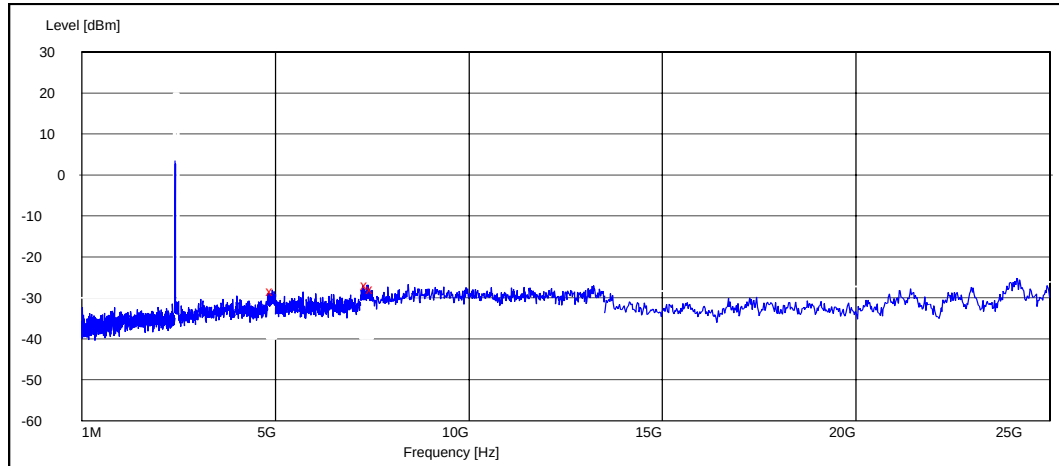
Limits for spurious RF conducted emissions measurements

Frequency range [MHz]	Limit [dBc]
1 – 25000	≤ -20

10.2. WLAN Test results

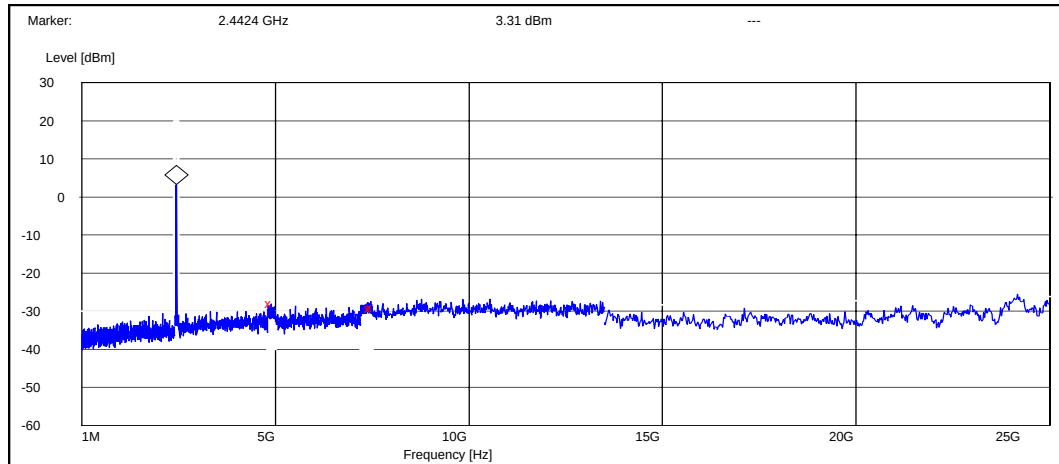
10.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel 1 / 2412 MHz



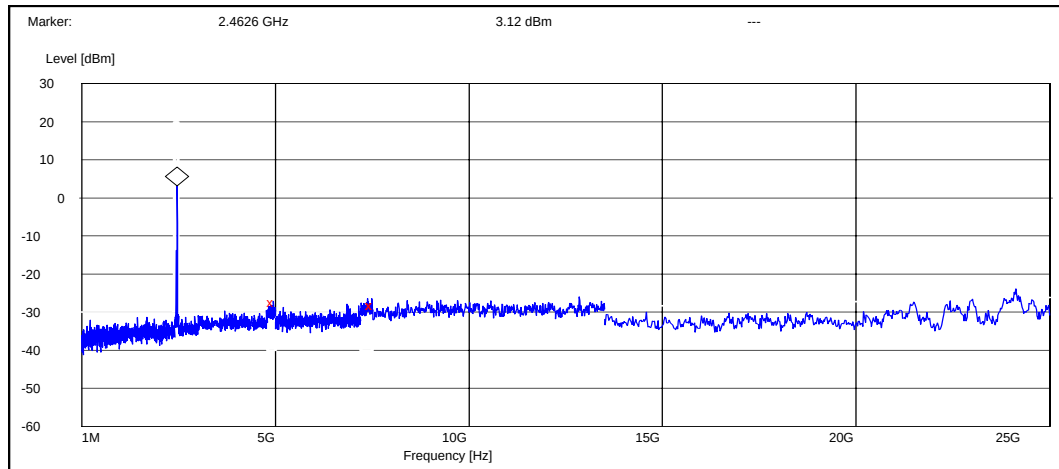
Frequency [MHz]	P [dBc]	Result
4927.200000	-31.760417	Passed
7373.400000	-30.360417	Passed
7500.000000	-31.360417	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4900.800000	-31.208019	Passed
7462.200000	-32.508019	Passed
7500.000000	-32.208019	Passed

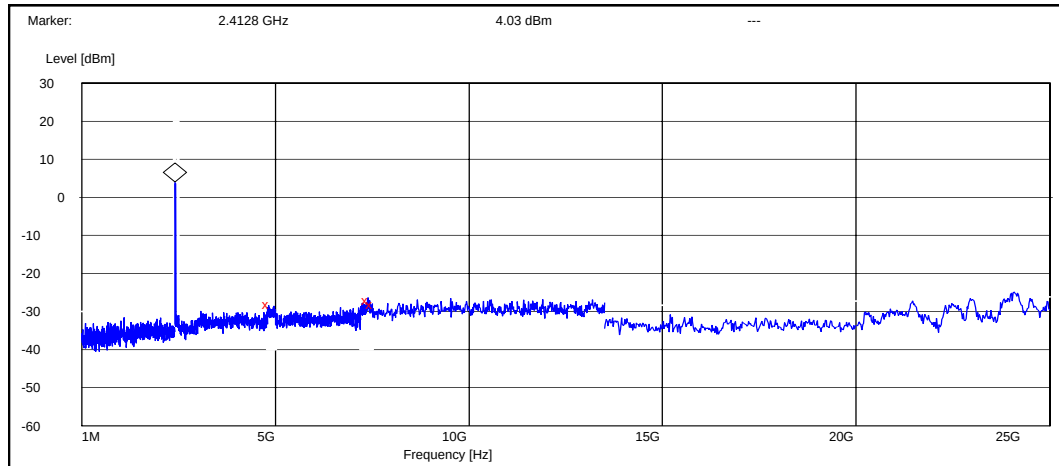
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4944.400000	-30.615837	Passed
7494.600000	-31.415837	Passed
7500.000000	-31.315837	Passed

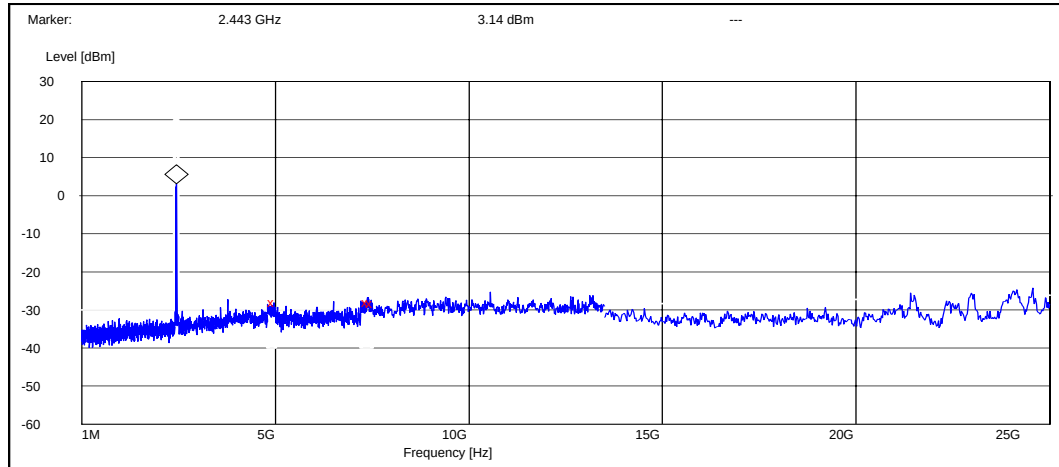
10.2.2 DSSS mode, QPSK modulation, 2 Mbps data rate

Channel 1 / 2412 MHz



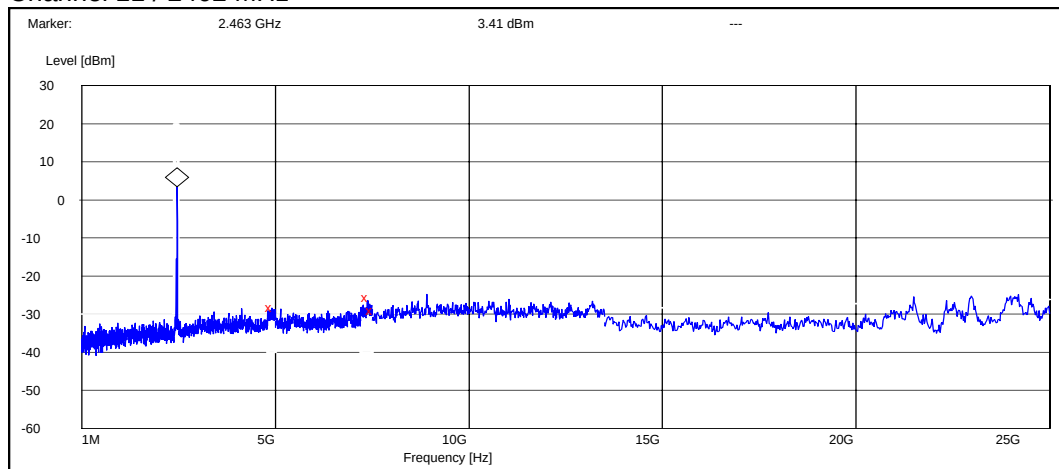
Frequency [MHz]	P [dBc]	Result
4827.600000	-32.234453	Passed
7397.400000	-31.034453	Passed
7500.000000	-32.034453	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4827.600000	-32.234453	Passed
7397.400000	-31.034453	Passed
7500.000000	-32.034453	Passed

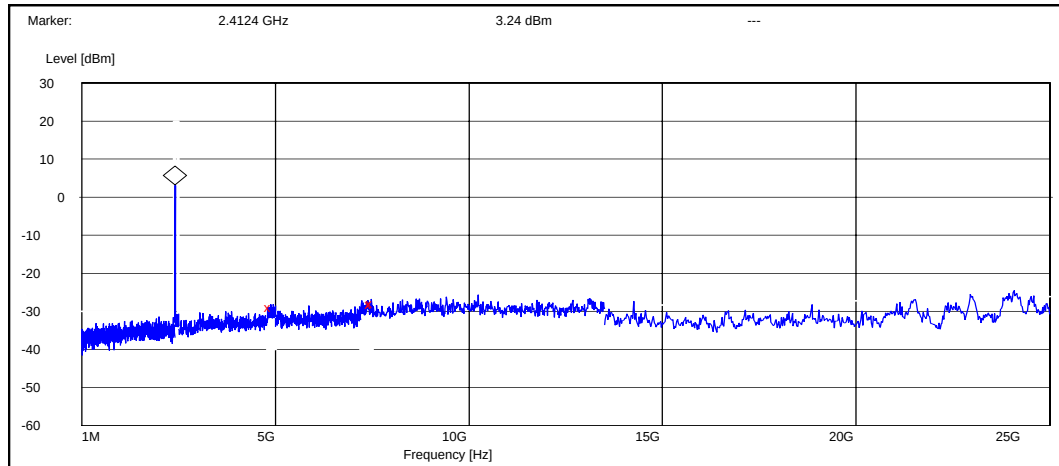
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4905.200000	-31.608668	Passed
7387.200000	-29.008668	Passed
7500.000000	-32.308668	Passed

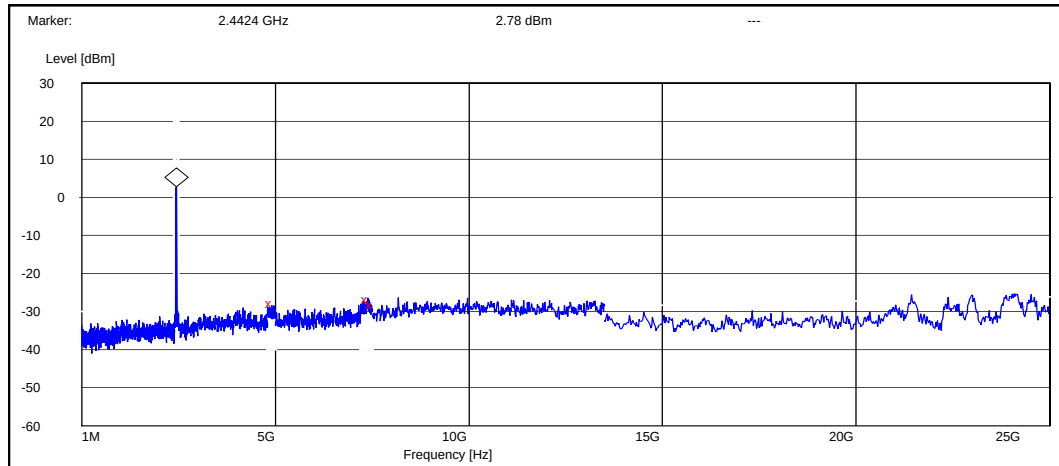
10.2.3 DSSS mode, QPSK modulation, 5.5 Mbps data rate

Channel 1 / 2412 MHz



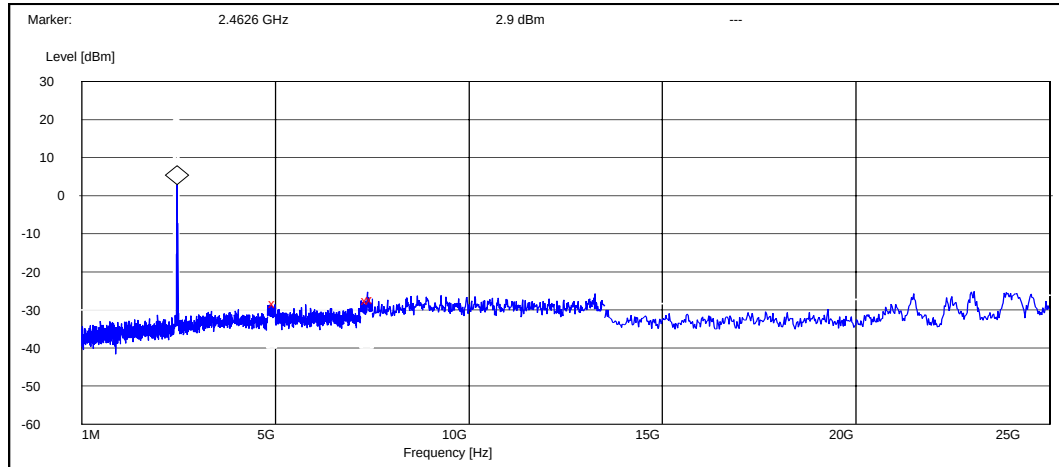
Frequency [MHz]	P [dBc]	Result
4885.600000	-32.135884	Passed
7473.600000	-31.335884	Passed
7500.000000	-31.135884	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4908.000000	-30.676677	Passed
7384.200000	-29.476677	Passed
7500.000000	-30.976677	Passed

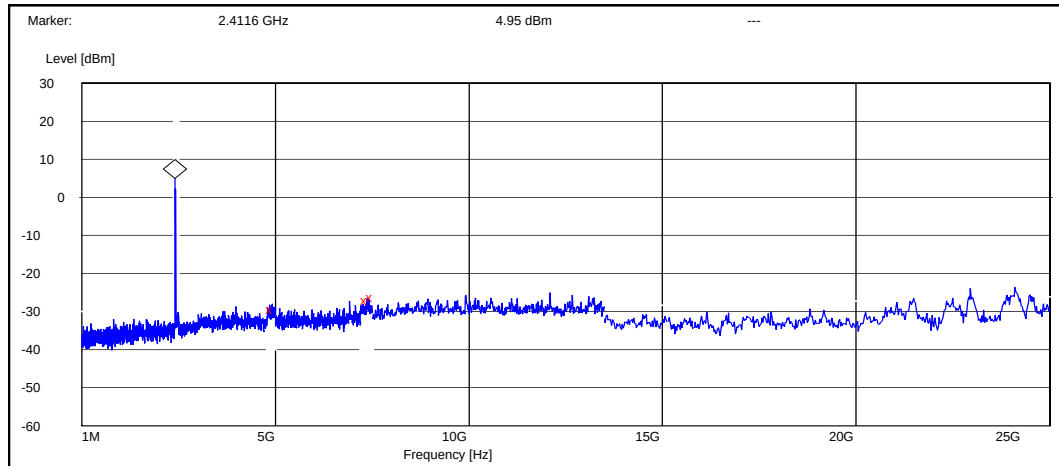
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4989.600000	-31.097468	Passed
7378.200000	-30.397468	Passed
7500.000000	-30.097468	Passed

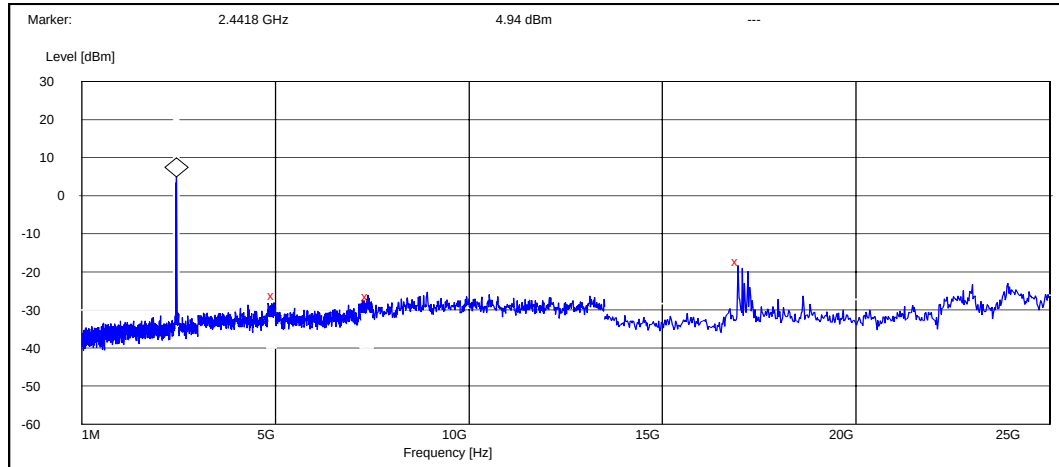
10.2.4 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz



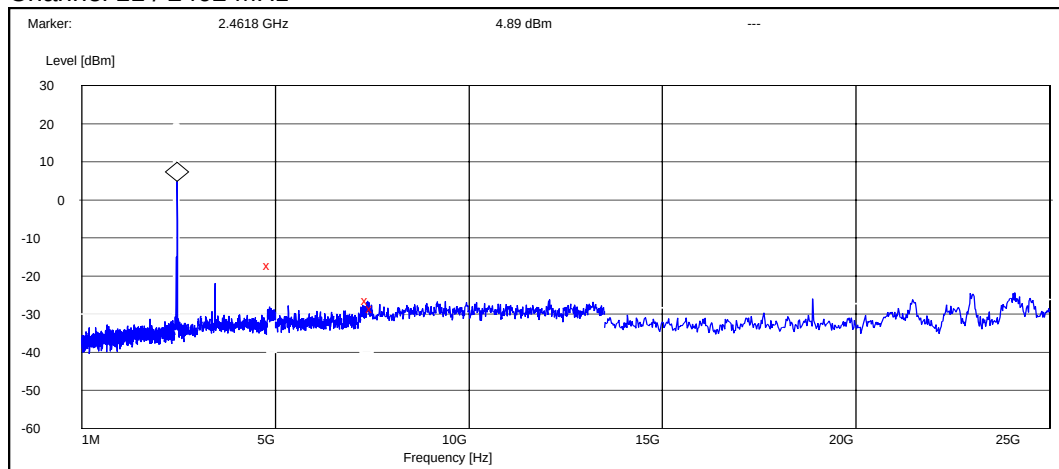
Frequency [MHz]	P [dBc]	Result
4919.200000	-34.252200	Passed
7370.400000	-31.952200	Passed
7500.000000	-31.152200	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4965.600000	-31.139245	Passed
7390.200000	-31.439245	Passed
16950.000000	-22.139245	Passed

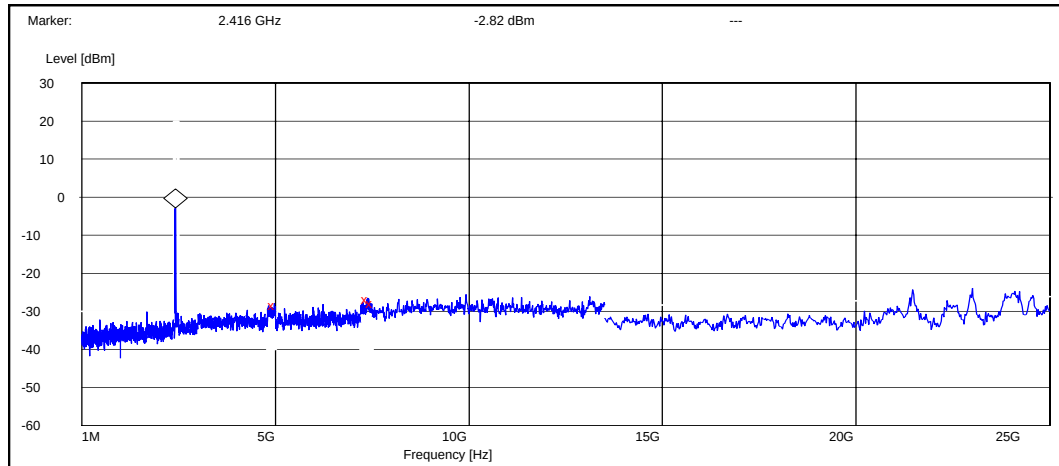
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4848.800000	-22.091471	Passed
7387.200000	-31.291471	Passed
7500.000000	-33.291471	Passed

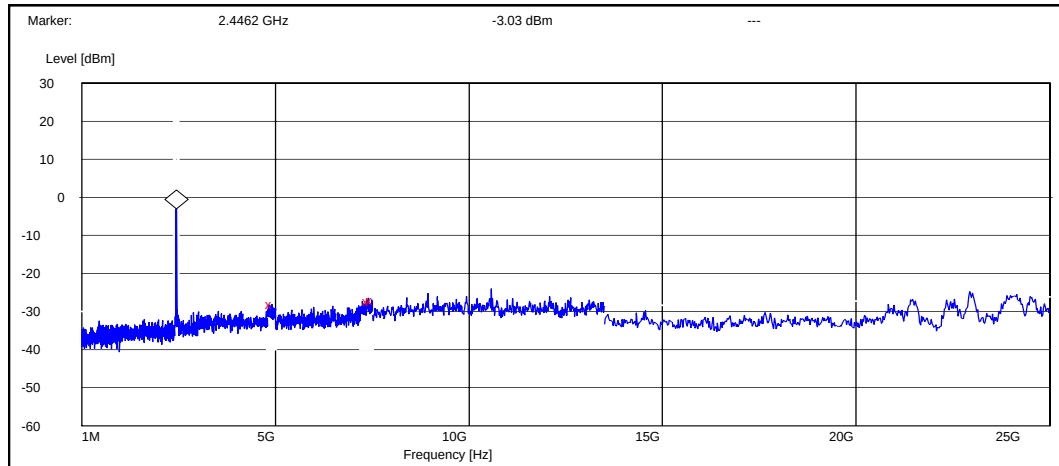
10.2.5 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



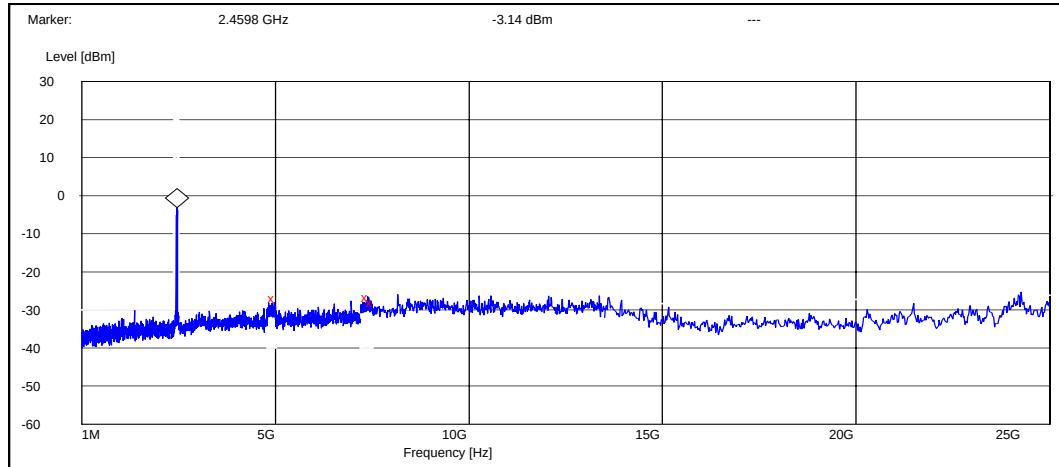
Frequency [MHz]	P [dBc]	Result
4980.000000	-25.578145	Passed
7388.400000	-23.878145	Passed
7500.000000	-25.178145	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4902.800000	-24.968658	Passed
7409.400000	-24.168658	Passed
7500.000000	-23.968658	Passed

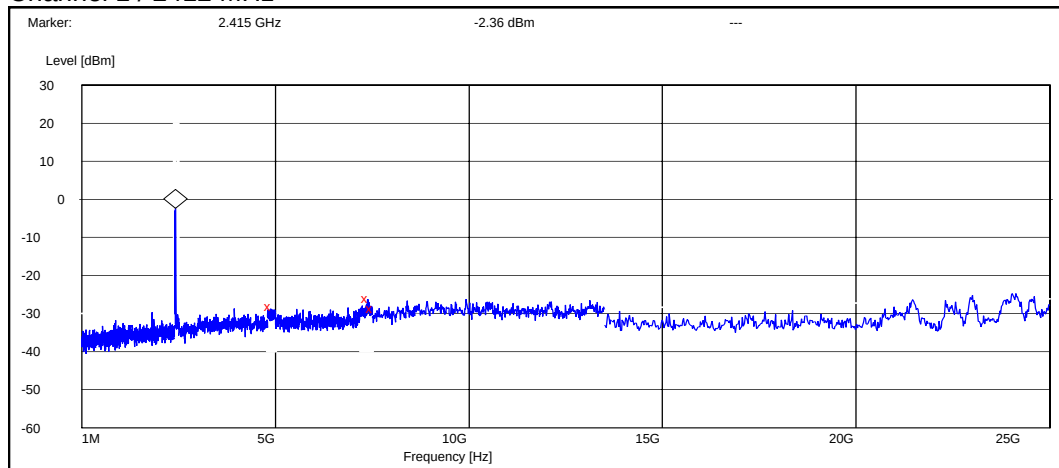
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4976.800000	-23.861652	Passed
7375.800000	-23.661652	Passed
7500.000000	-24.861652	Passed

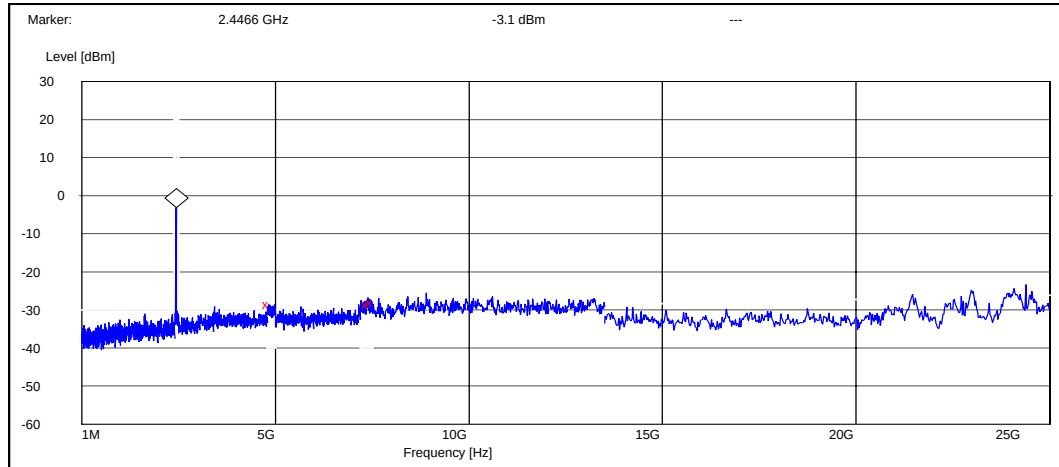
10.2.6 OFDM mode, BPSK modulation, 9 Mbps data rate

Channel 1 / 2412 MHz



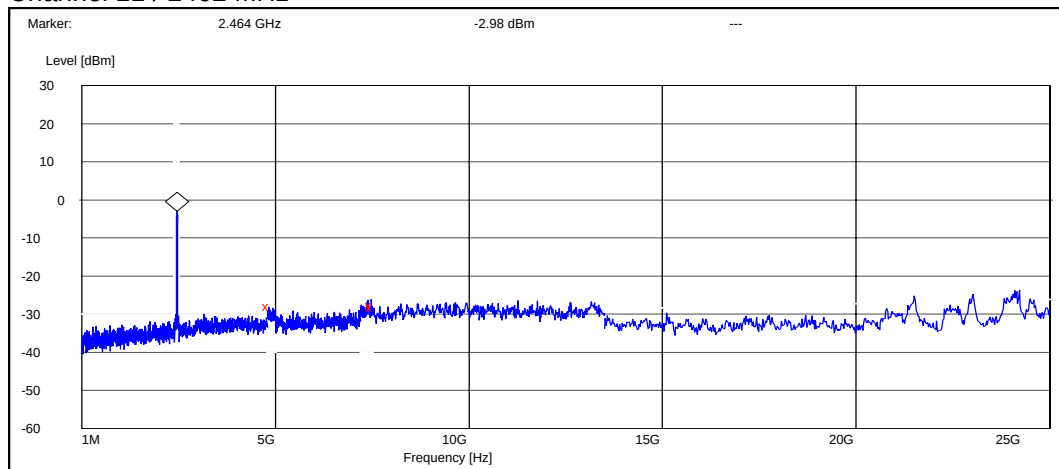
Frequency [MHz]	P [dBc]	Result
4884.800000	-25.644354	Passed
7387.200000	-23.644354	Passed
7500.000000	-26.244354	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4819.600000	-25.496923	Passed
7395.000000	-25.396923	Passed
7500.000000	-24.896923	Passed

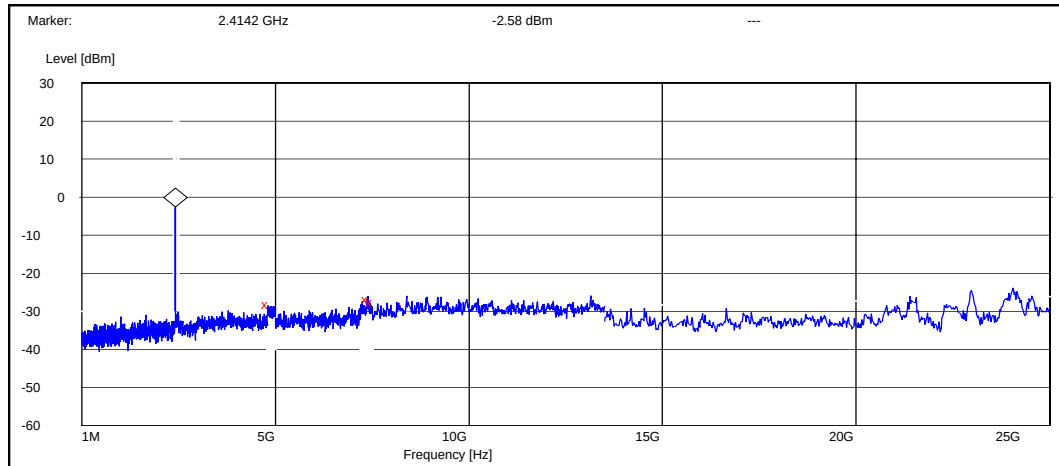
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4824.800000	-25.019272	Passed
7474.200000	-24.619272	Passed
7500.000000	-25.219272	Passed

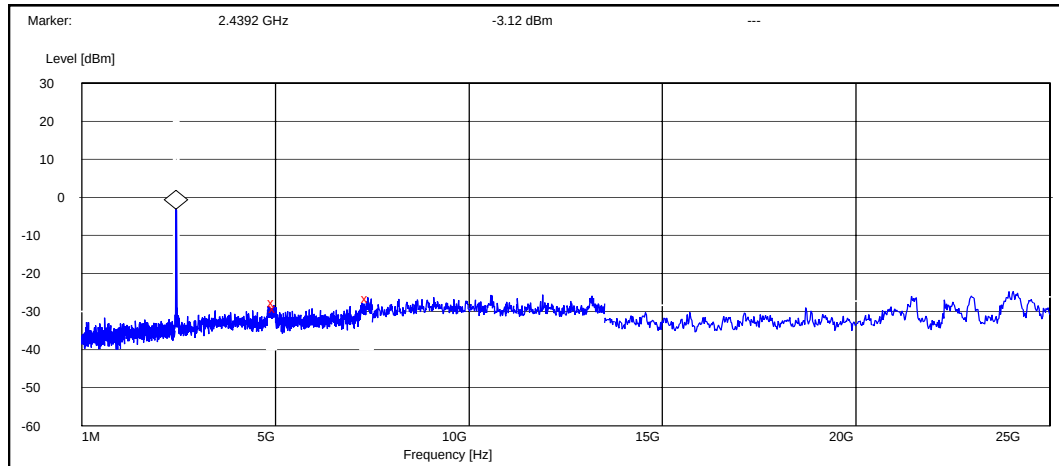
10.2.7 OFDM mode, QPSK modulation, 12 Mbps data rate

Channel 1 / 2412 MHz



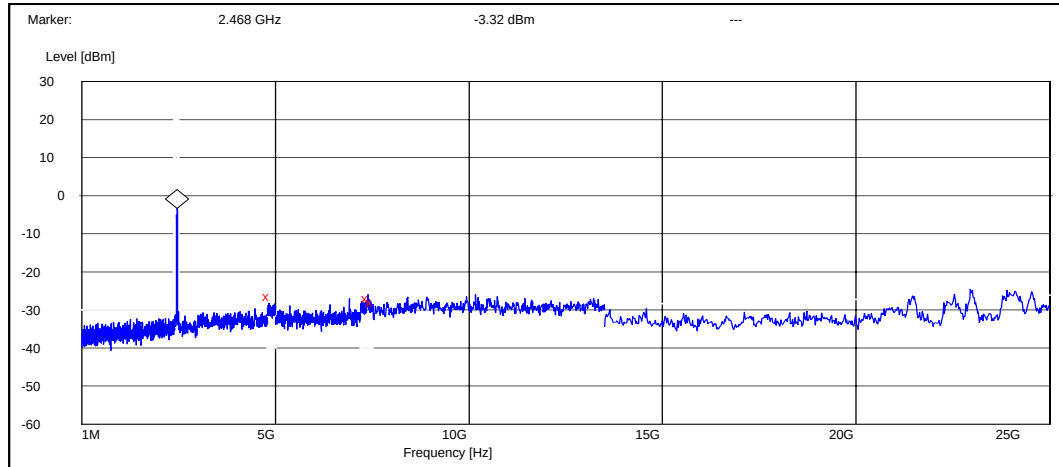
Frequency [MHz]	P [dBc]	Result
4808.000000	-25.621301	Passed
7389.600000	-24.121301	Passed
7500.000000	-25.121301	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4956.400000	-24.580347	Passed
5000.000000	-25.980347	Passed
7381.800000	-23.280347	Passed

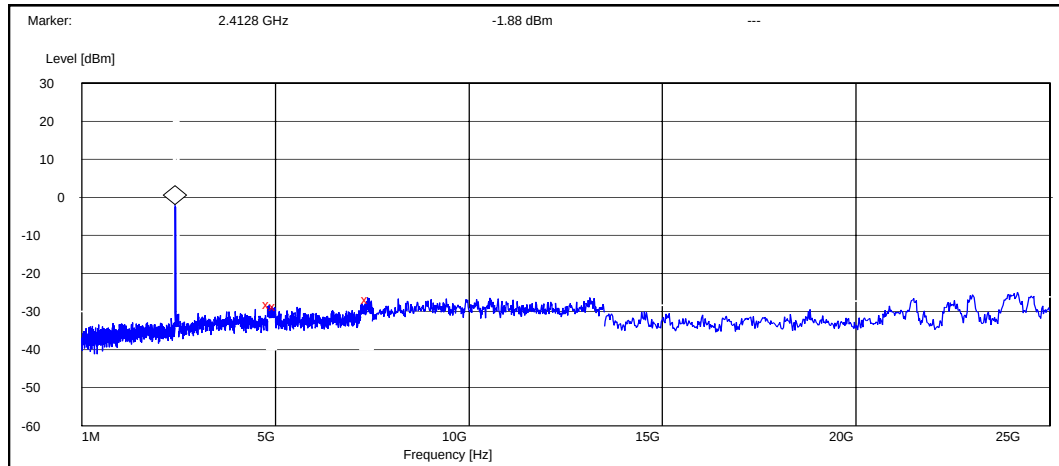
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4836.800000	-23.078972	Passed
7392.600000	-23.578972	Passed
7500.000000	-24.778972	Passed

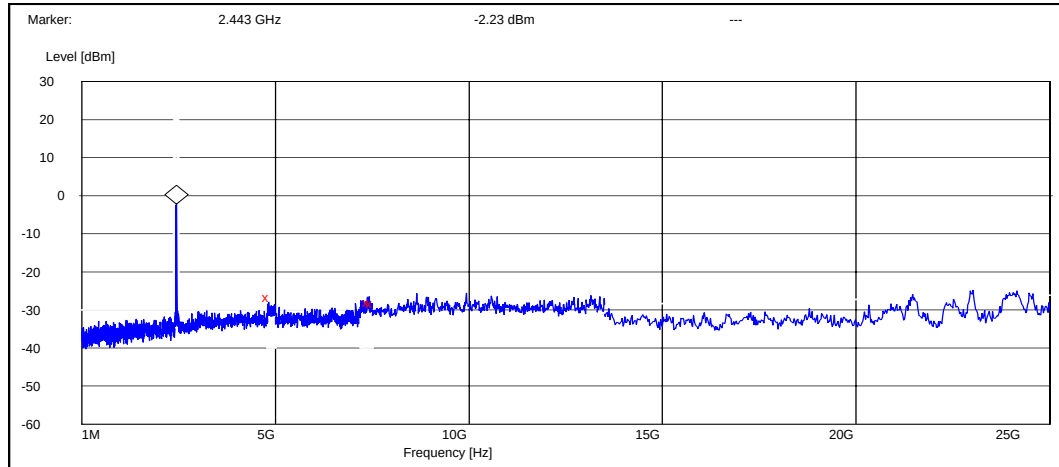
10.2.8 OFDM mode, QPSK modulation, 18 Mbps data rate

Channel 1 / 2412 MHz



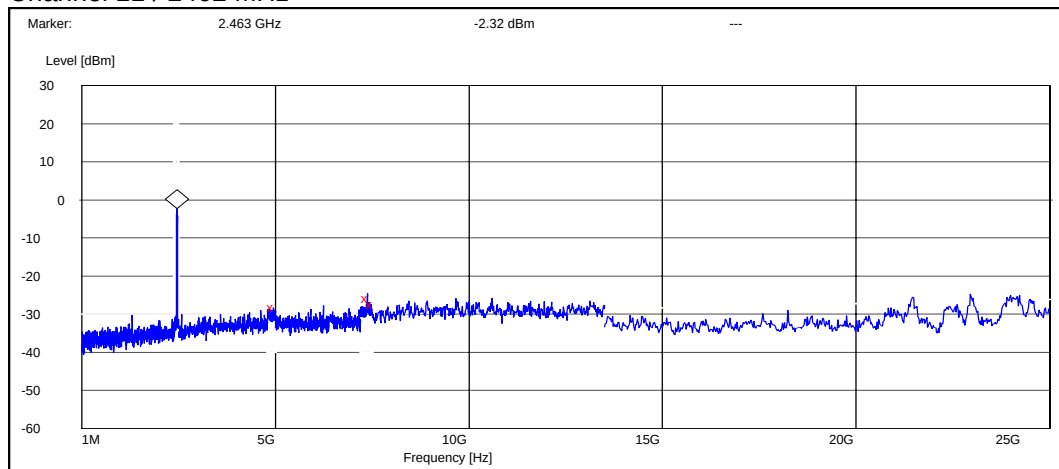
Frequency [MHz]	P [dBc]	Result
4837.200000	-26.218376	Passed
5000.000000	-26.818376	Passed
7385.400000	-24.918376	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4820.000000	-24.569116	Passed
7417.800000	-25.769116	Passed
7500.000000	-26.069116	Passed

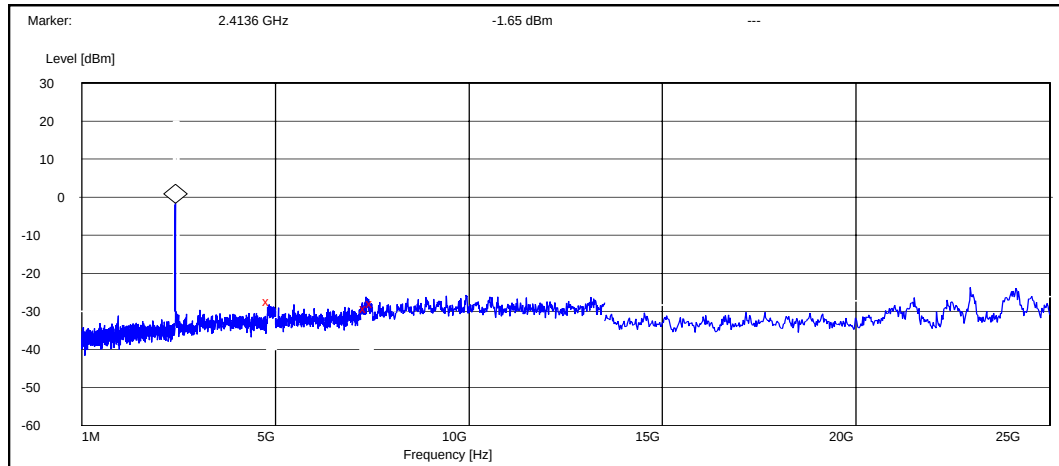
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4951.600000	-25.984608	Passed
7381.200000	-23.684608	Passed
7500.000000	-24.984608	Passed

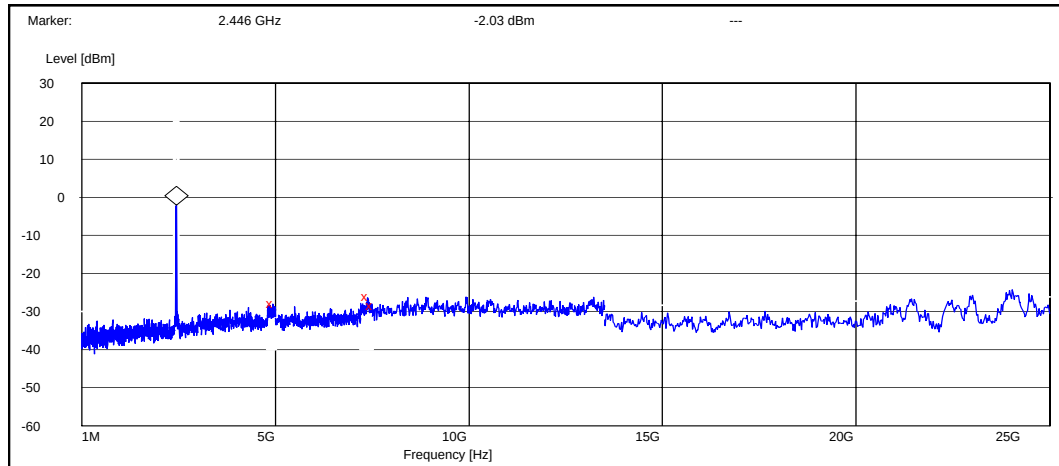
10.2.9 OFDM mode, 16QAM modulation, 24 Mbps data rate

Channel 1 / 2412 MHz



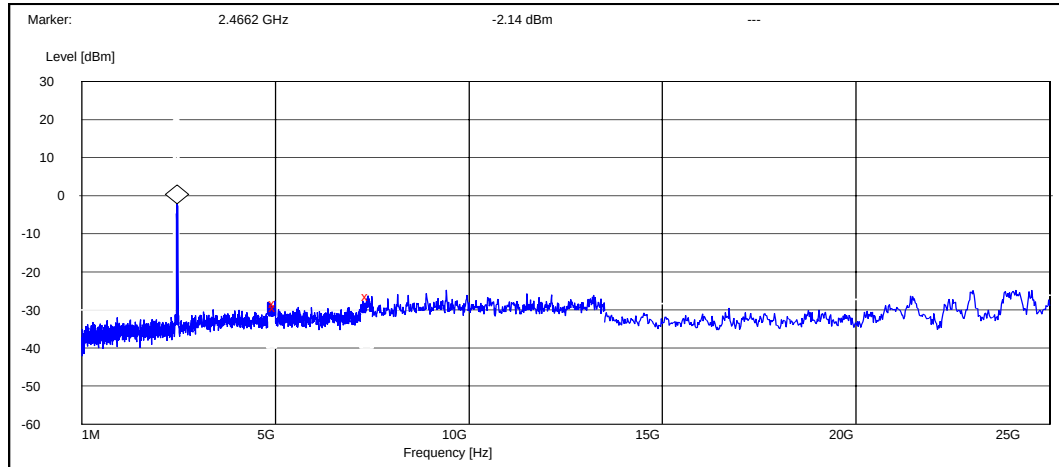
Frequency [MHz]	P [dBc]	Result
4836.400000	-25.653918	Passed
7338.600000	-27.553918	Passed
7500.000000	-26.153918	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4940.000000	-25.770312	Passed
7386.000000	-23.870312	Passed
7500.000000	-26.370312	Passed

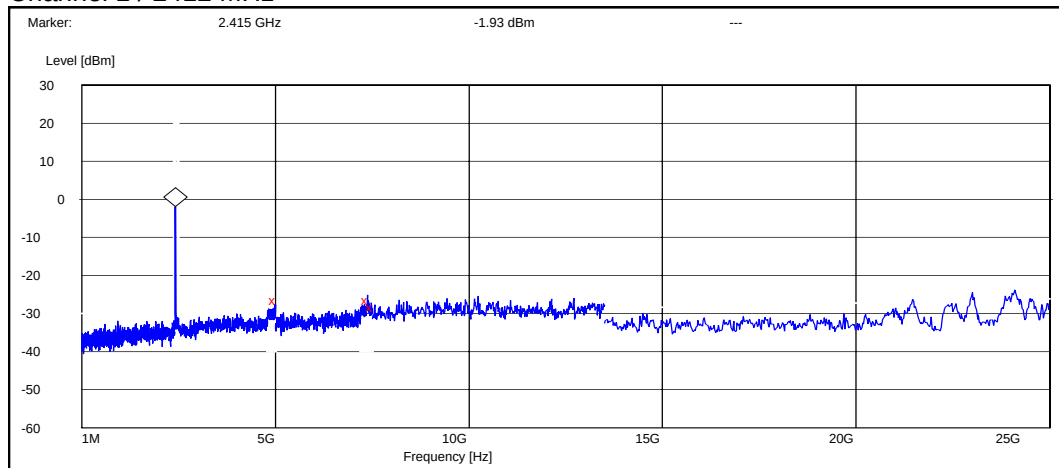
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4984.800000	-26.264233	Passed
5000.000000	-27.264233	Passed
7390.800000	-24.264233	Passed

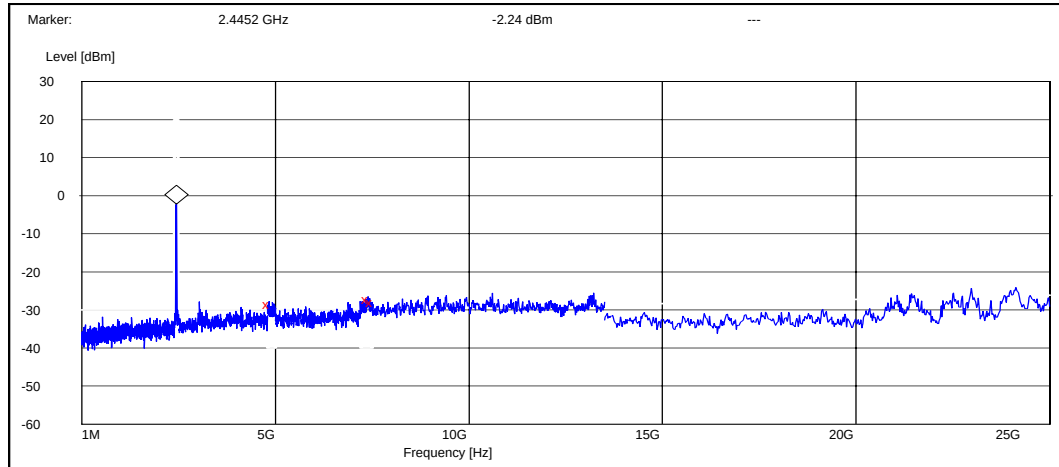
10.2.10 OFDM mode, 16QAM modulation, 36 Mbps data rate

Channel 1 / 2412 MHz



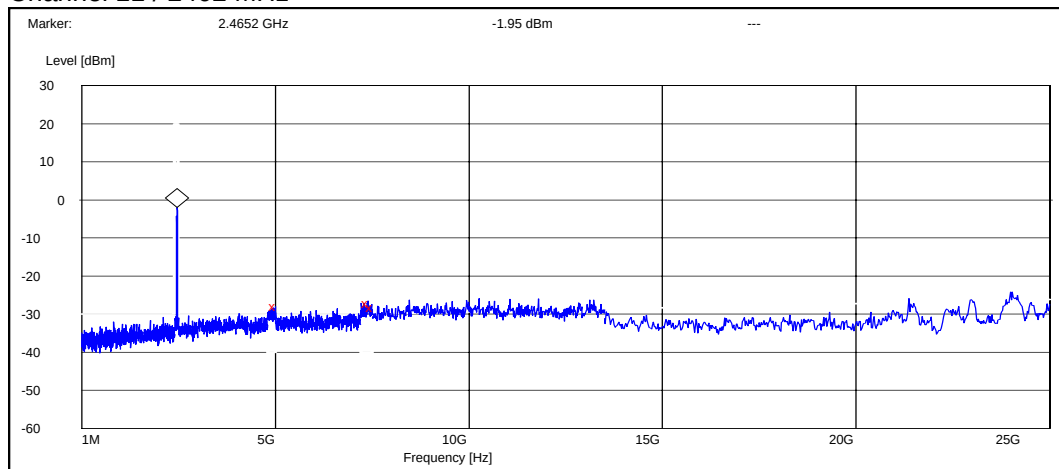
Frequency [MHz]	P [dBc]	Result
4998.400000	-24.473424	Passed
7379.400000	-24.473424	Passed
7500.000000	-26.573424	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4834.800000	-26.264089	Passed
7391.400000	-25.064089	Passed
7500.000000	-25.764089	Passed

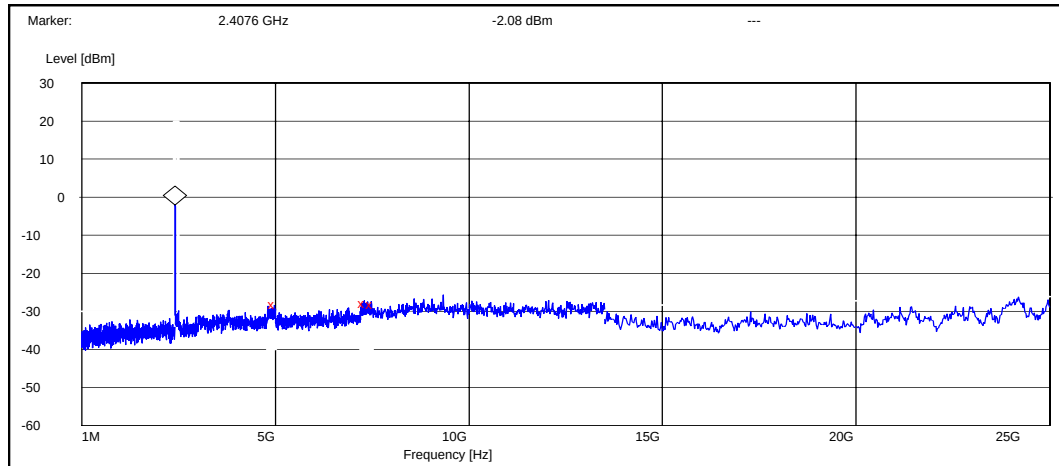
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4999.200000	-26.046111	Passed
7390.200000	-25.146111	Passed
7500.000000	-26.246111	Passed

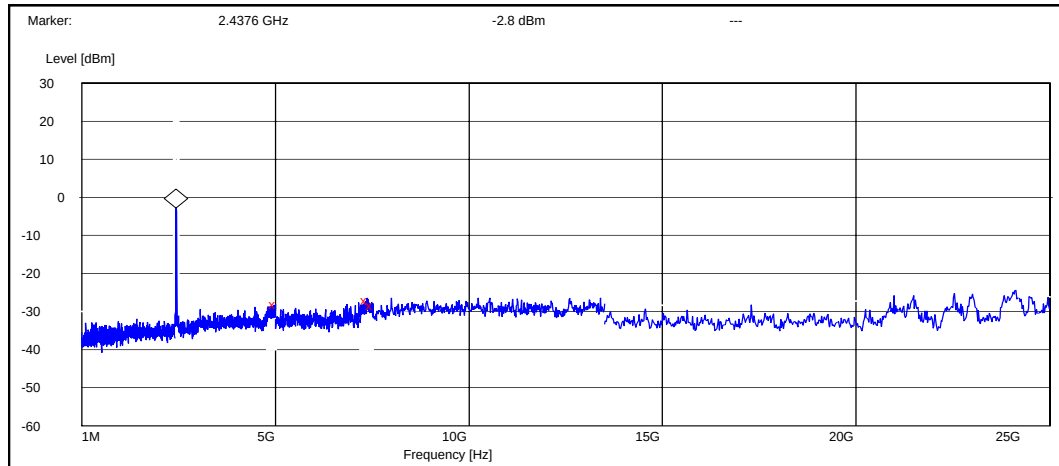
10.2.11 OFDM mode, 64QAM modulation, 48 Mbps data rate

Channel 1 / 2412 MHz



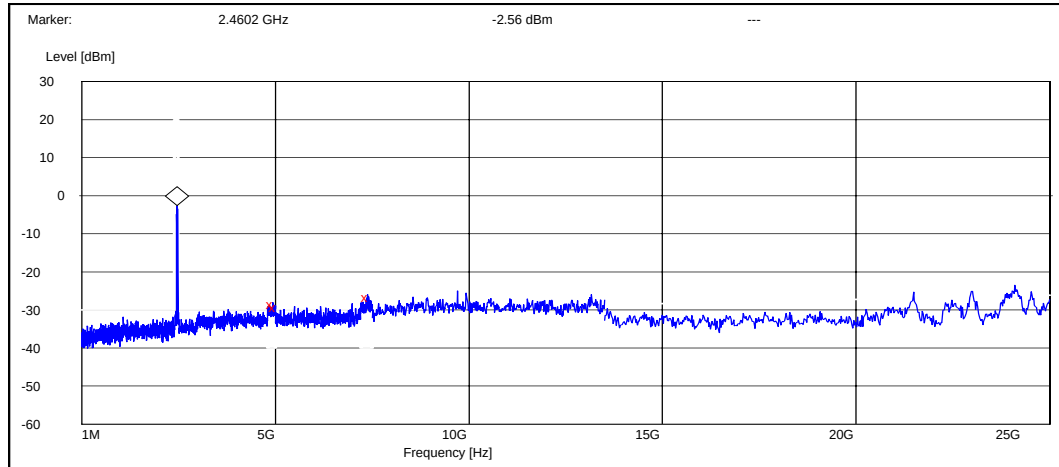
Frequency [MHz]	P [dBc]	Result
4980.400000	-26.119302	Passed
7297.800000	-25.719302	Passed
7500.000000	-26.119302	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4998.800000	-25.402986	Passed
7371.600000	-24.302986	Passed
7500.000000	-25.702986	Passed

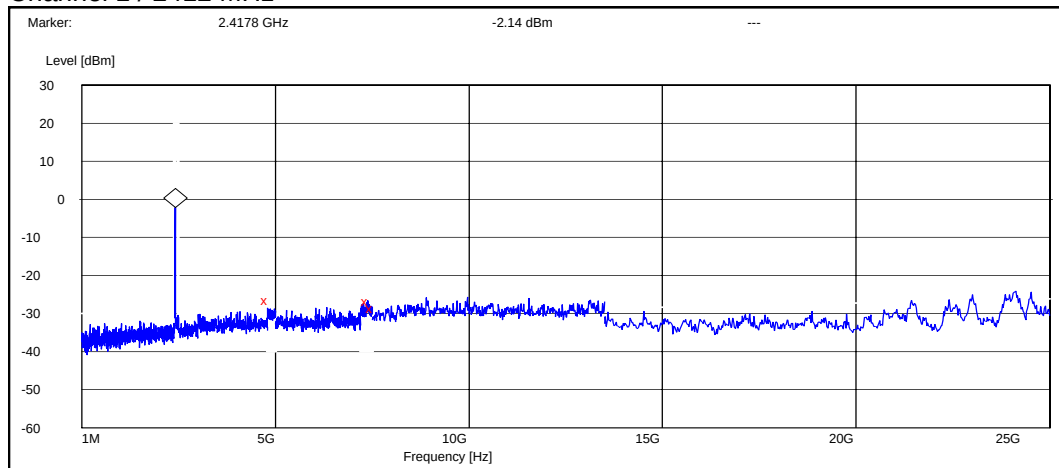
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4942.000000	-25.943951	Passed
5000.000000	-26.643951	Passed
7377.000000	-24.043951	Passed

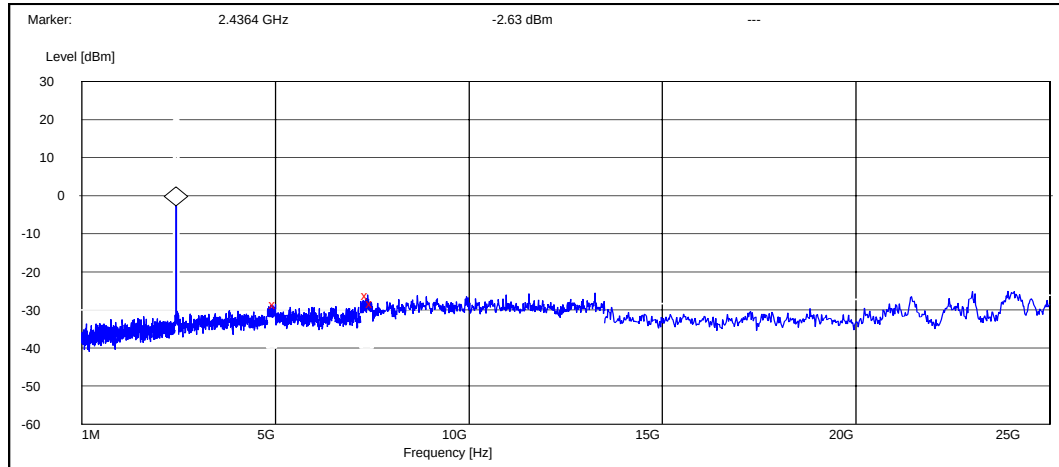
10.2.12 OFDM mode, 64QAM modulation, 54 Mbps data rate

Channel 1 / 2412 MHz



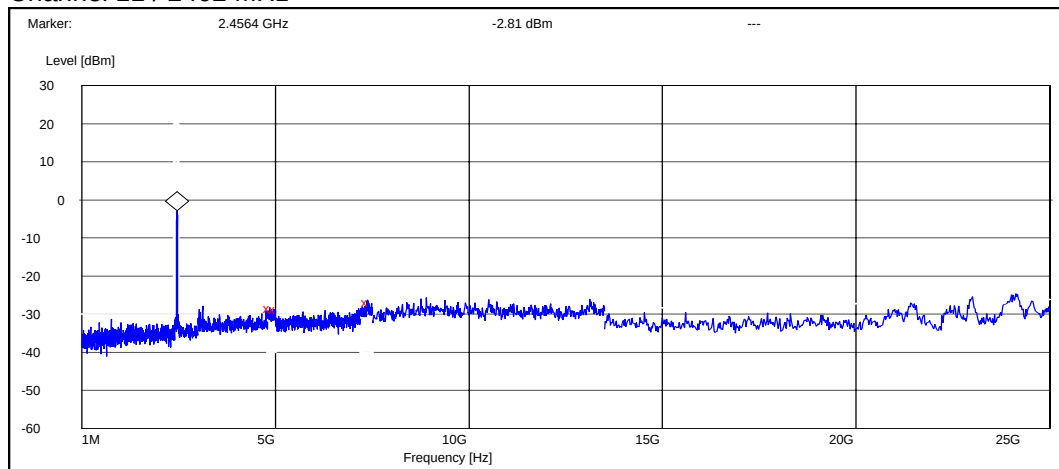
Frequency [MHz]	P [dBc]	Result
4800.800000	-24.462006	Passed
7383.000000	-24.662006	Passed
7500.000000	-26.462006	Passed

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4998.000000	-25.968269	Passed
7378.800000	-23.468269	Passed
7500.000000	-25.768269	Passed

Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4849.200000	-25.592468	Passed
5000.000000	-25.892468	Passed
7383.000000	-23.992468	Passed

11. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	25.8 / 43.0 1012.3
Date of measurements	01-08-2006
Measured by	Jan Engelbrechtsen

11.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for 6 dB bandwidth measurements

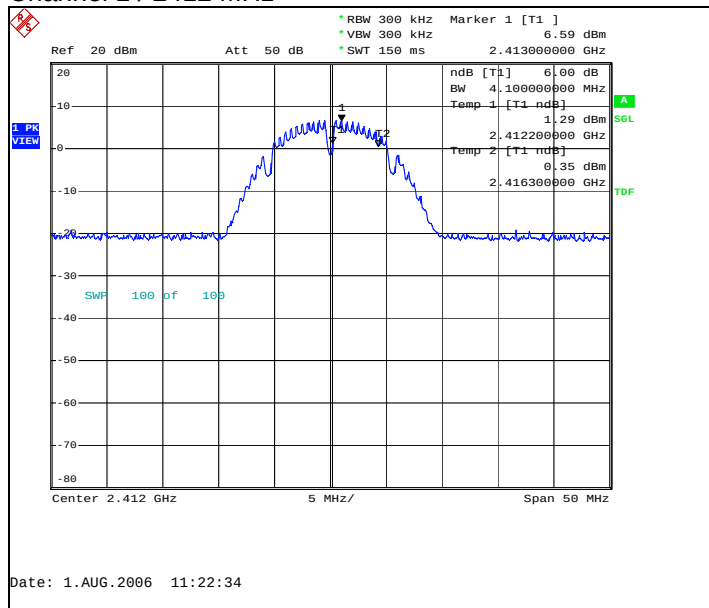
Limit [kHz]
≥ 500

11.2. WLAN test results

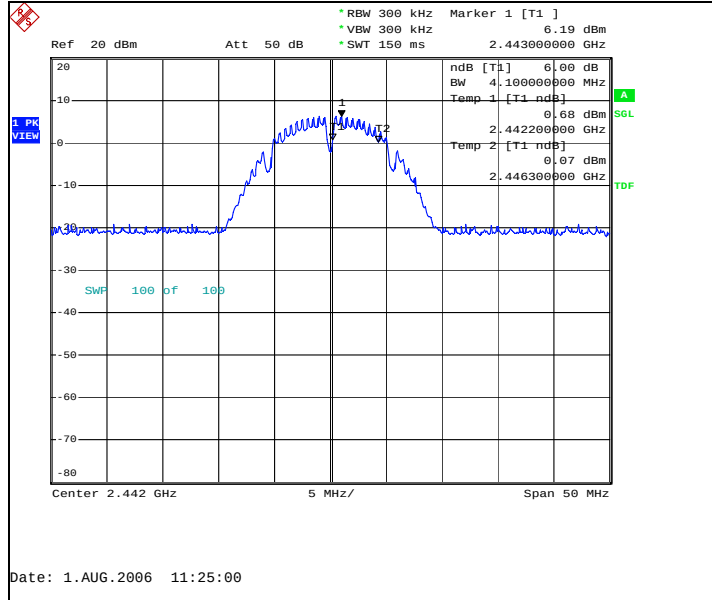
11.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	8200	Passed
7 / 2442	8200	Passed
11 / 2462	8200	Passed

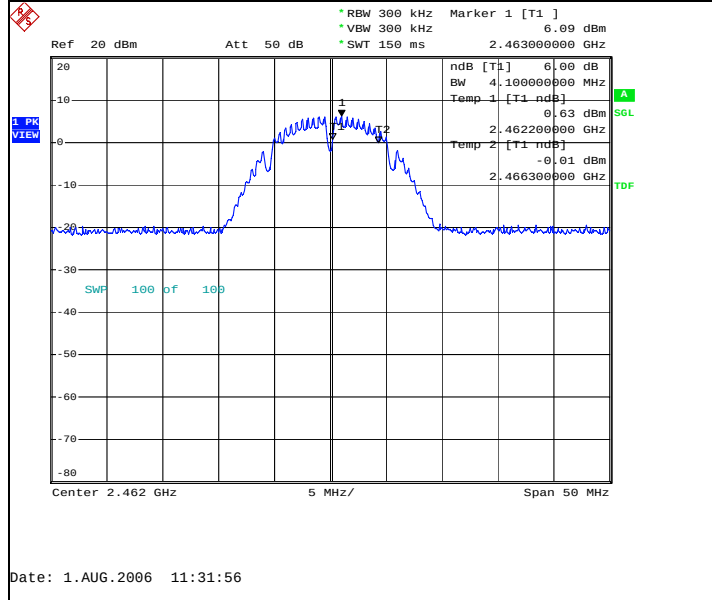
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



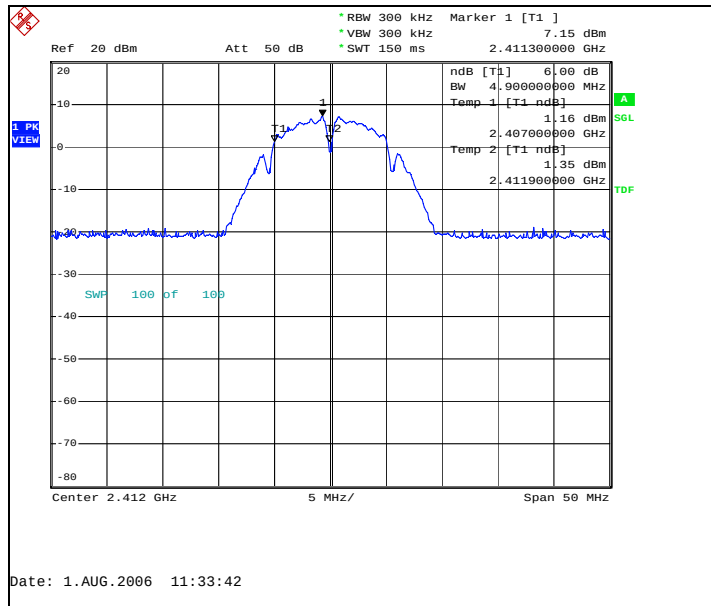
Channel 11 / 2462 MHz



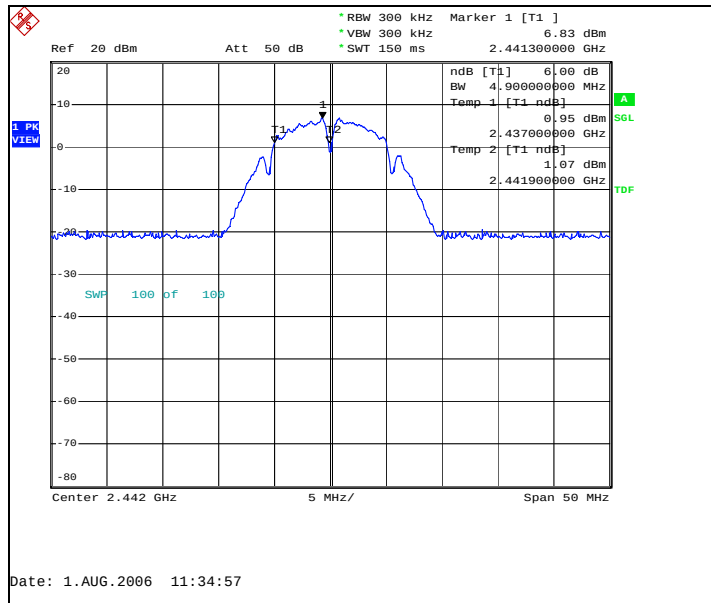
11.2.2 DSSS mode, QPSK modulation, 2 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	9800	Passed
7 / 2442	9800	Passed
11 / 2462	9800	Passed

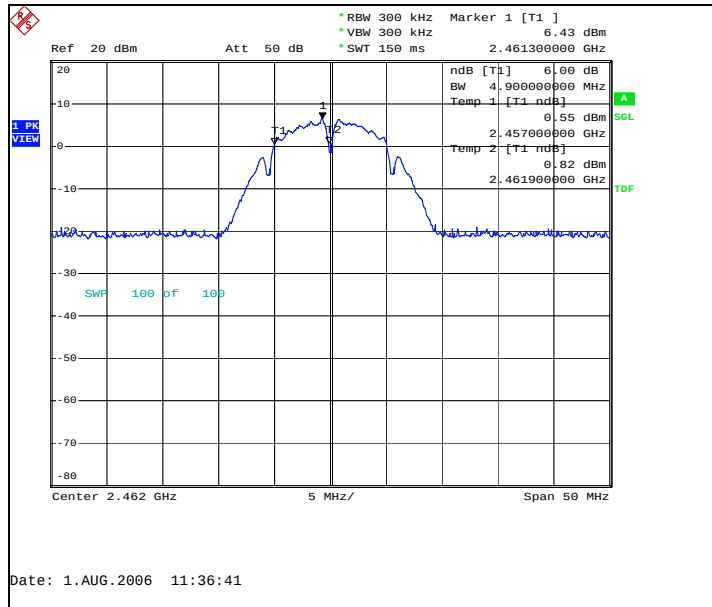
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



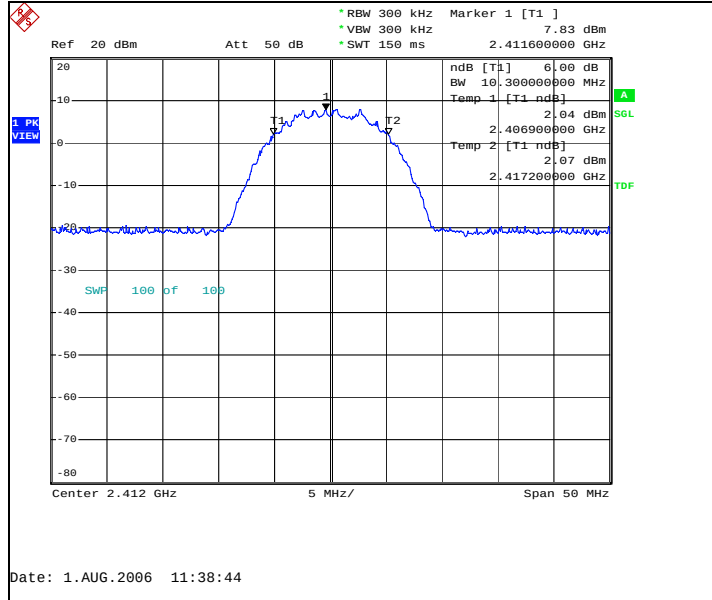
Channel 11 / 2462 MHz



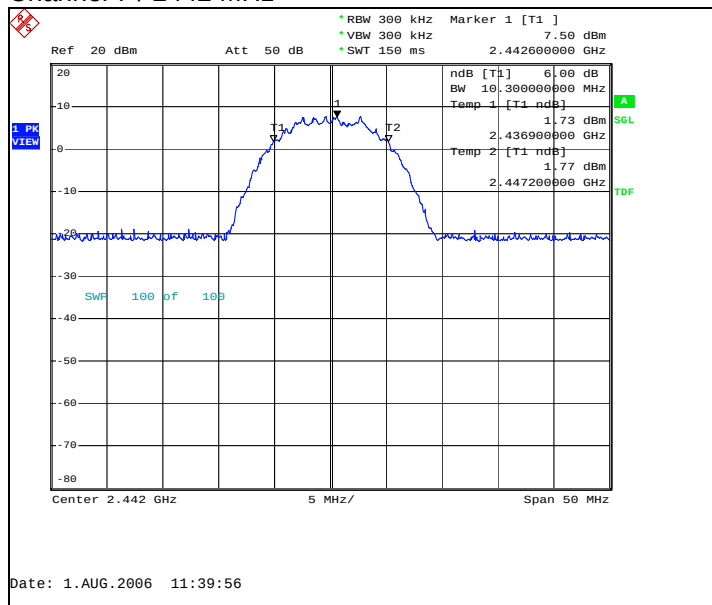
11.2.3 DSSS mode, QPSK modulation, 5.5 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	10300	Passed
7 / 2442	10300	Passed
11 / 2462	10300	Passed

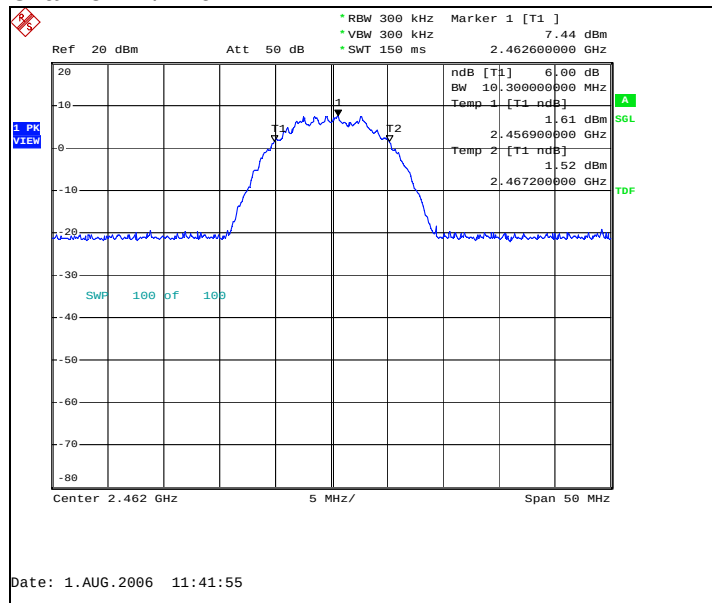
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



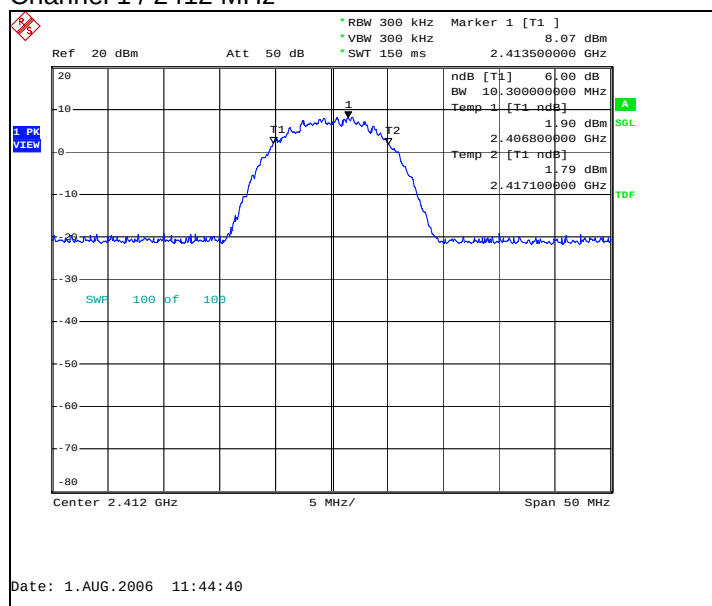
Channel 11 / 2462 MHz



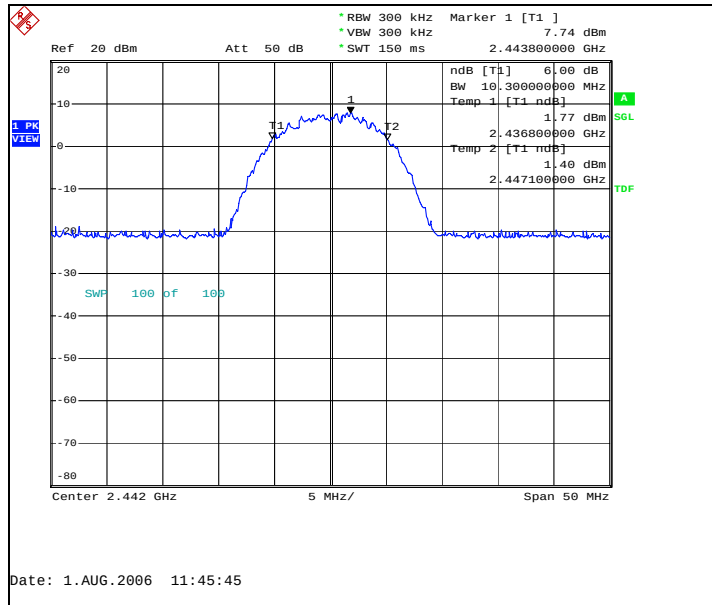
11.2.4 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	10300	Passed
7 / 2442	10300	Passed
11 / 2462	11200	Passed

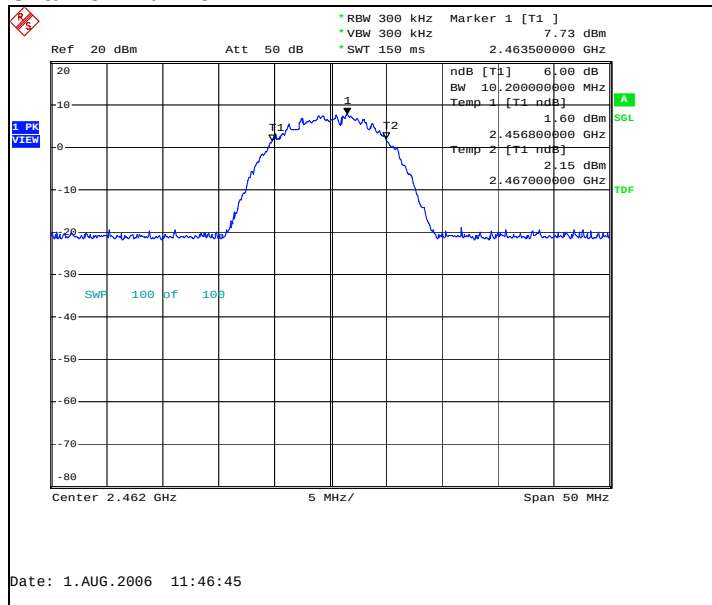
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



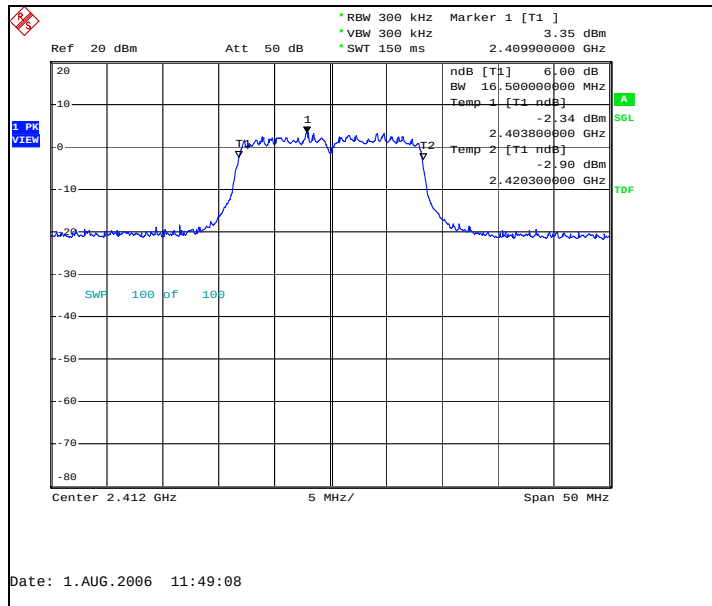
Channel 11 / 2462 MHz



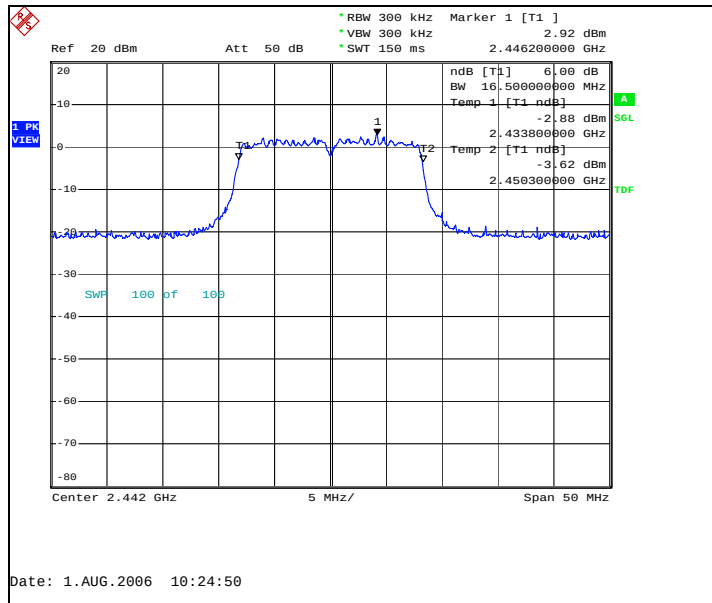
11.2.5 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16500	Passed
7 / 2442	16500	Passed
11 / 2462	16500	Passed

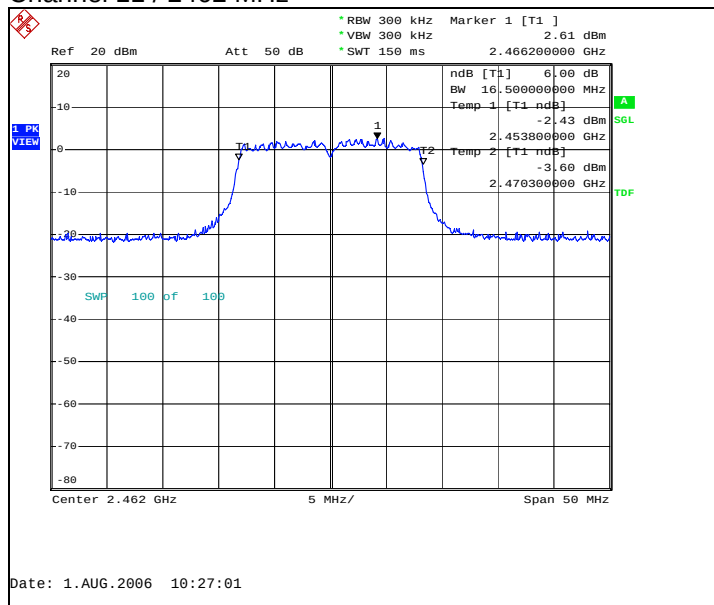
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



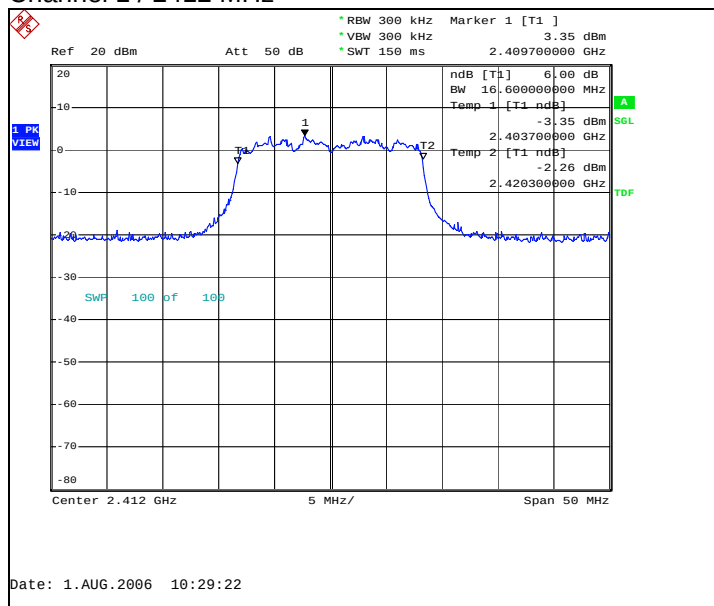
Channel 11 / 2462 MHz



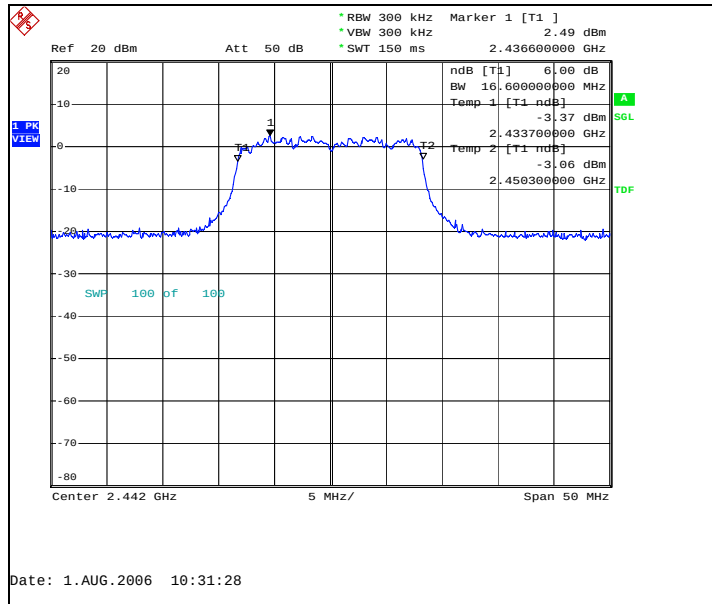
11.2.6 OFDM mode, BPSK modulation, 9 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16600	Passed
7 / 2442	16600	Passed
11 / 2462	16600	Passed

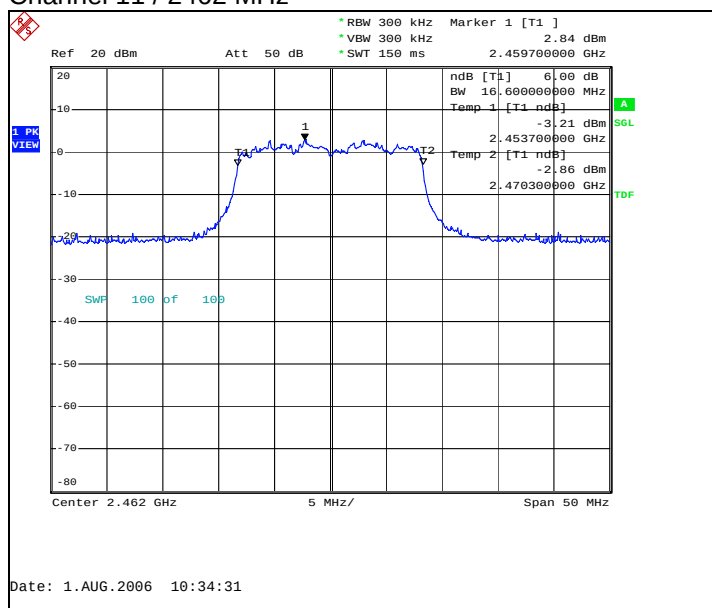
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



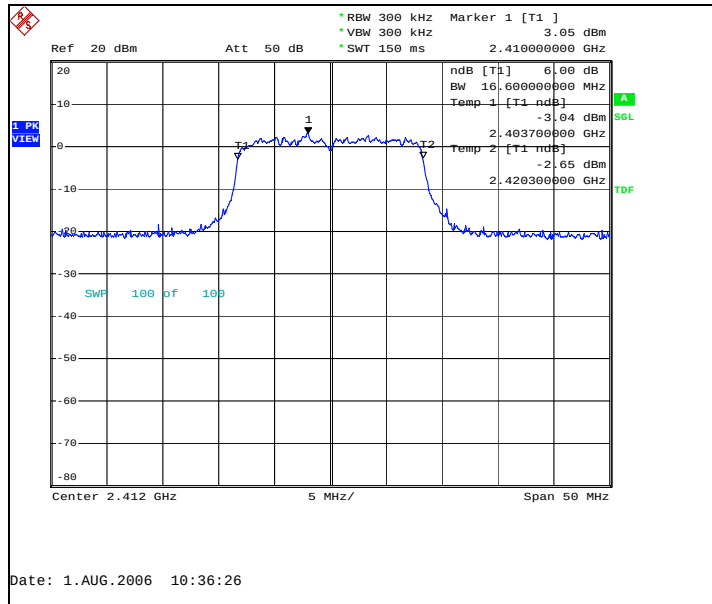
Channel 11 / 2462 MHz



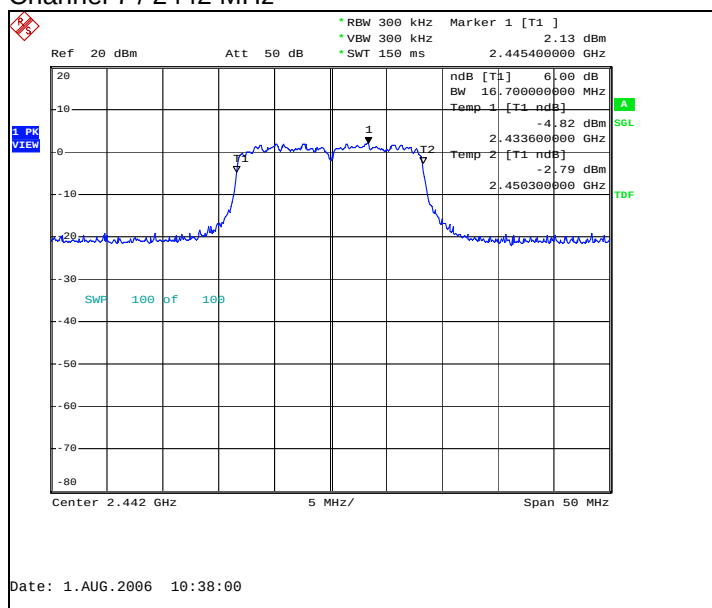
11.2.7 OFDM mode, QPSK modulation, 12 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16600	Passed
7 / 2442	16700	Passed
11 / 2462	16600	Passed

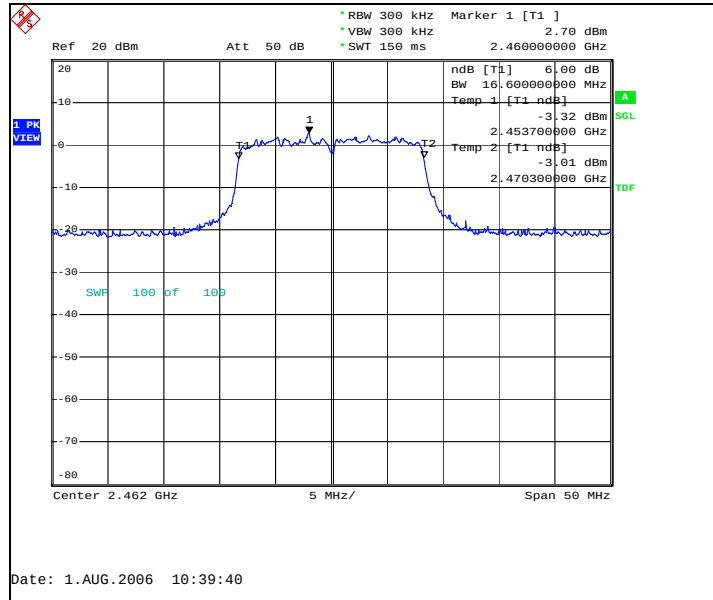
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



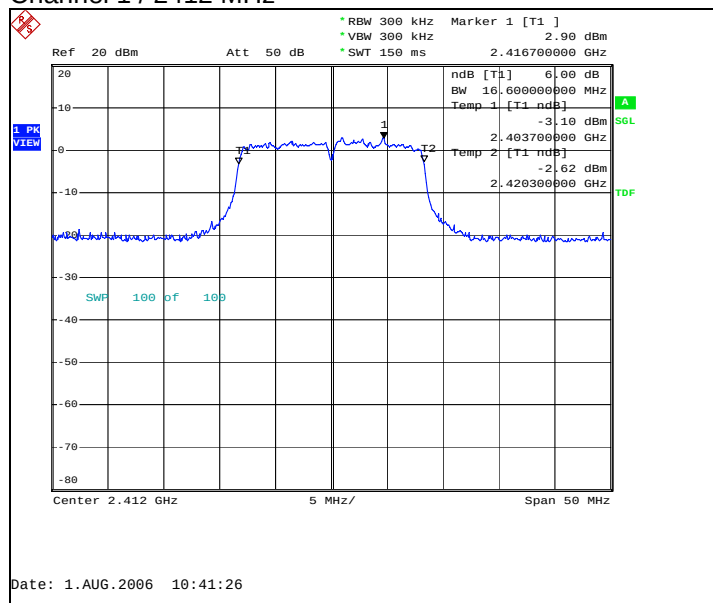
Channel 11 / 2462 MHz



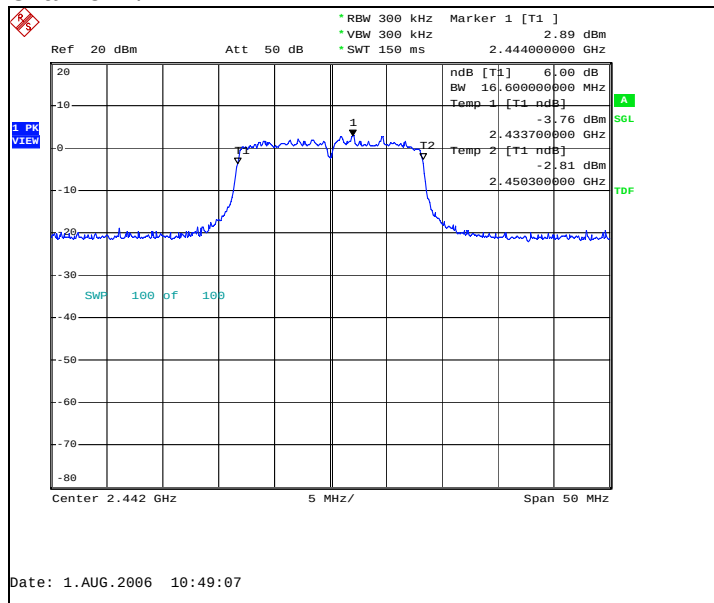
11.2.8 OFDM mode, QPSK modulation, 18 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16600	Passed
7 / 2442	16600	Passed
11 / 2462	16600	Passed

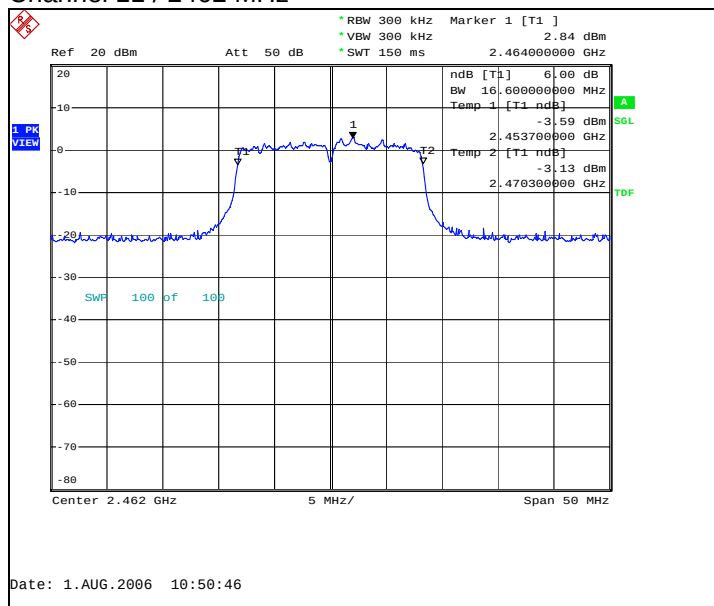
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



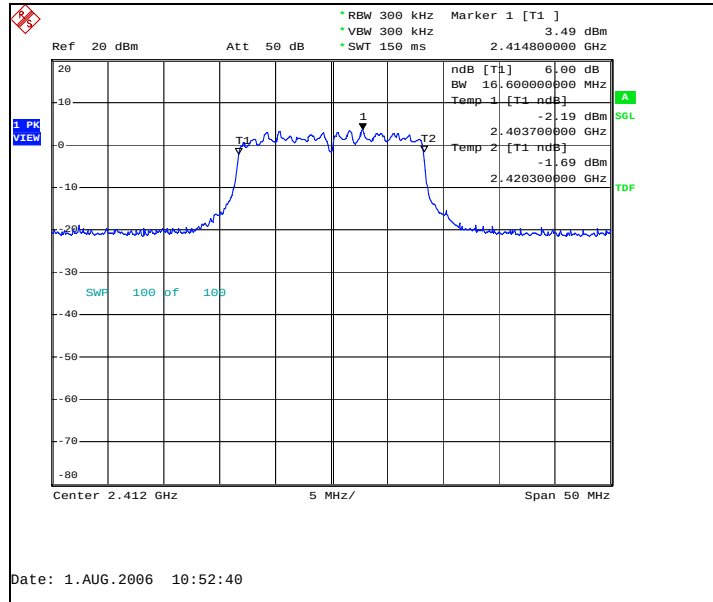
Channel 11 / 2462 MHz



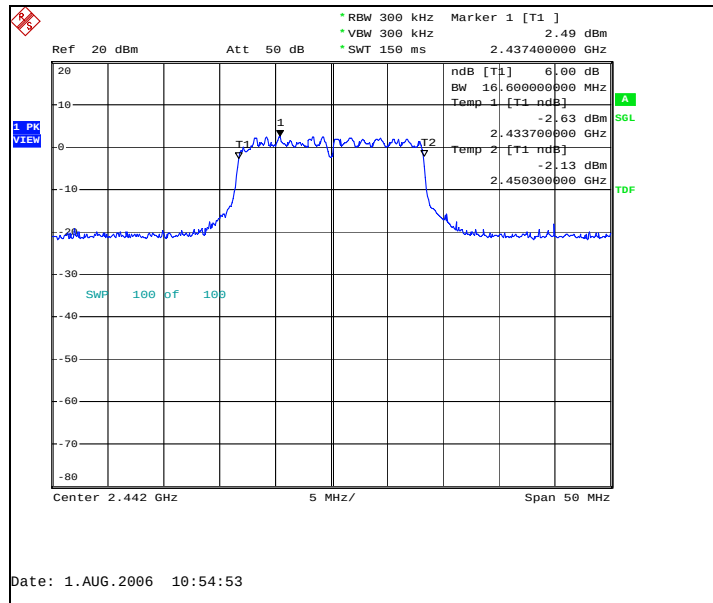
11.2.9 OFDM mode, 16QAM modulation, 24 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16600	Passed
7 / 2442	16600	Passed
11 / 2462	16600	Passed

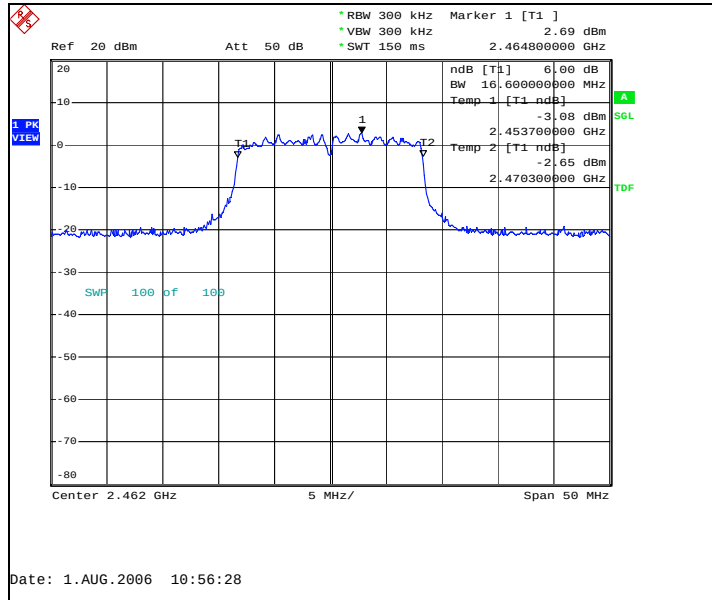
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



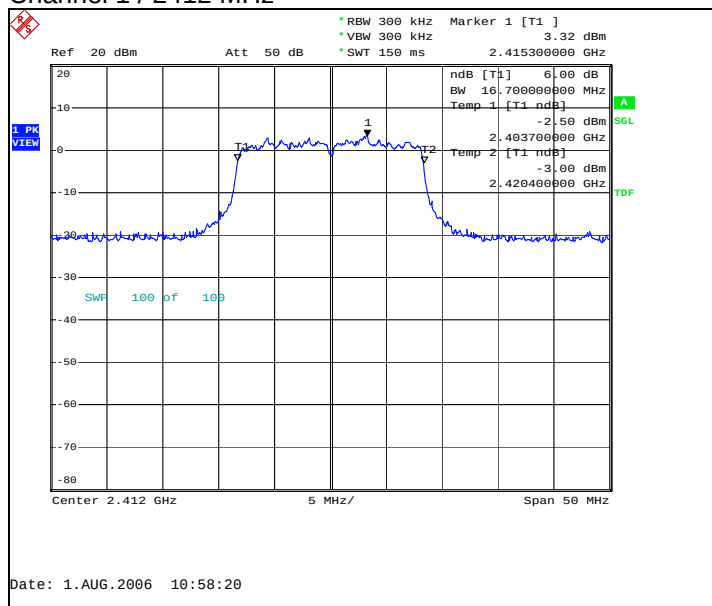
Channel 11 / 2462 MHz



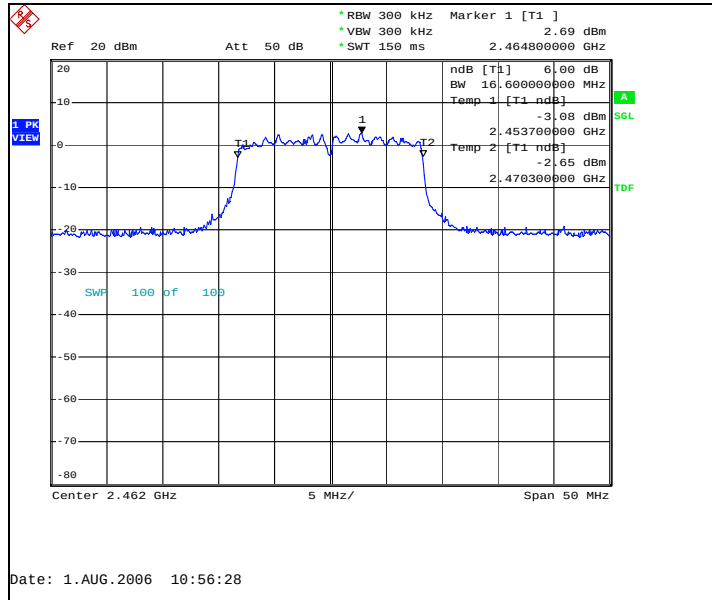
11.2.10 OFDM mode, 16QAM modulation, 36 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16700	Passed
7 / 2442	16700	Passed
11 / 2462	16700	Passed

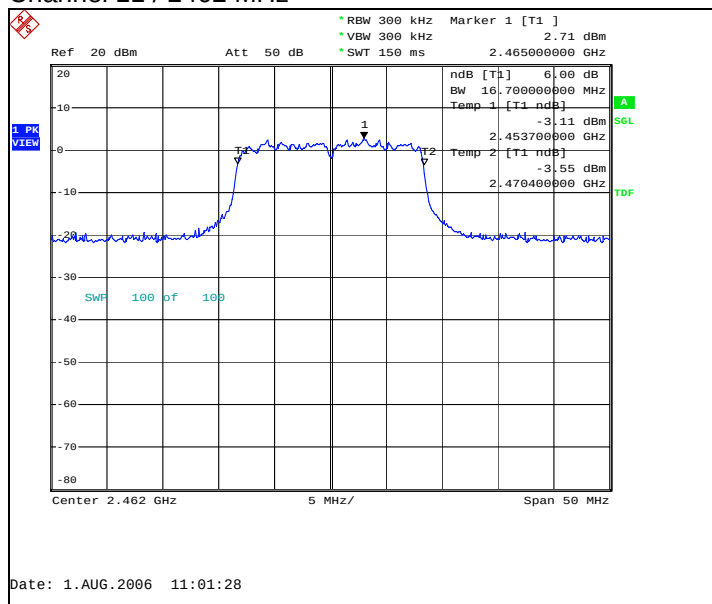
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



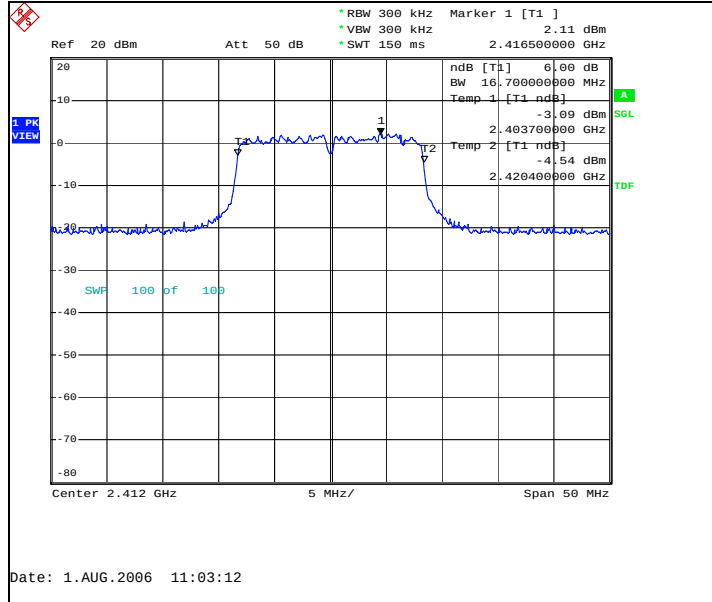
Channel 11 / 2462 MHz



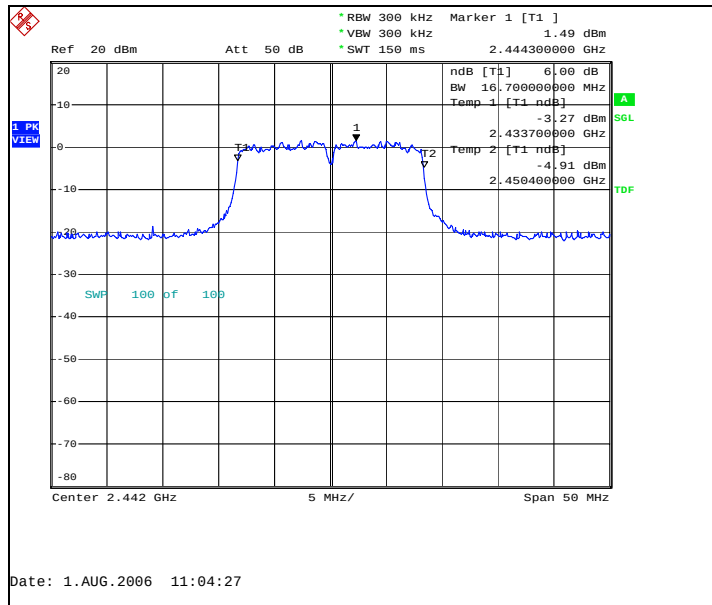
11.2.11 OFDM mode, 64QAM modulation, 48 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16700	Passed
7 / 2442	16700	Passed
11 / 2462	16600	Passed

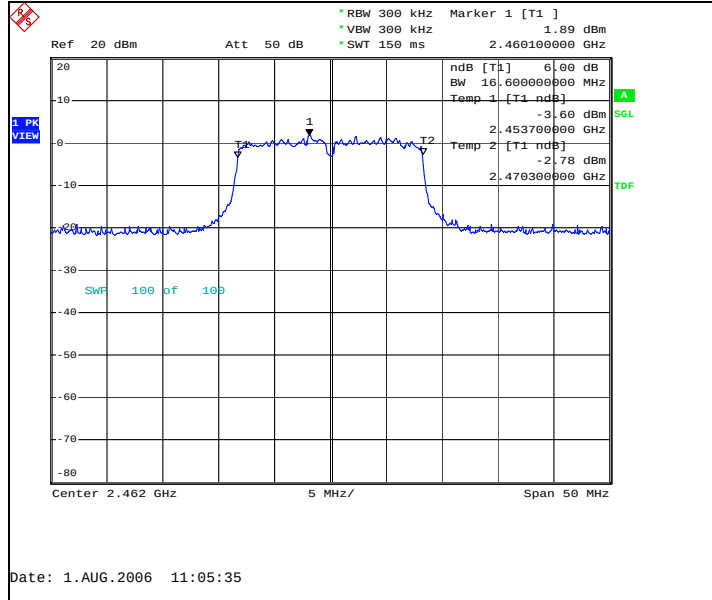
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



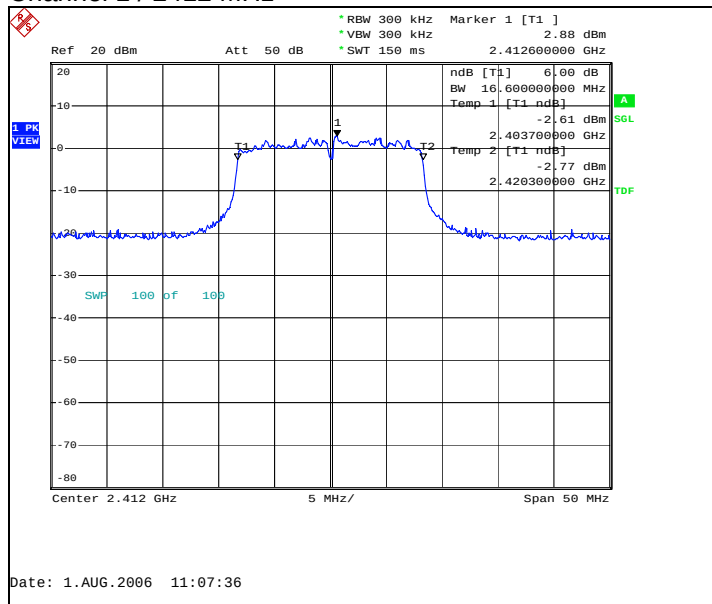
Channel 11 / 2462 MHz



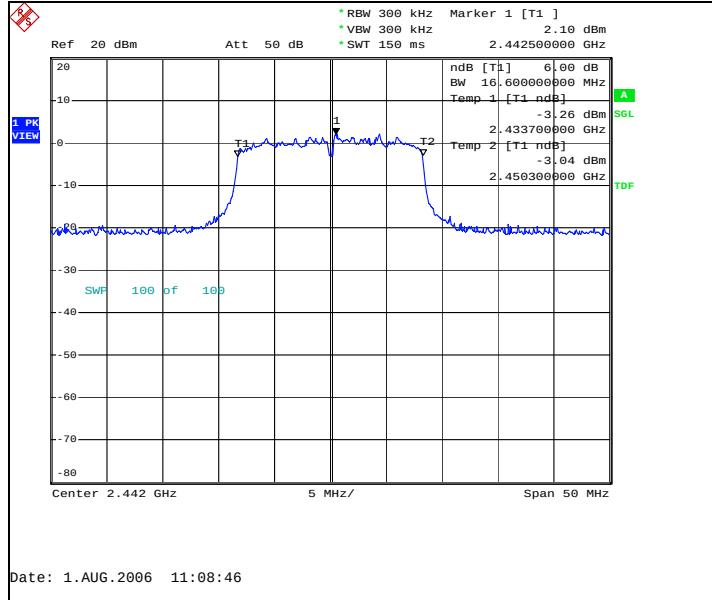
11.2.12 OFDM mode, 64QAM modulation, 54 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16600	Passed
7 / 2442	16600	Passed
11 / 2462	16600	Passed

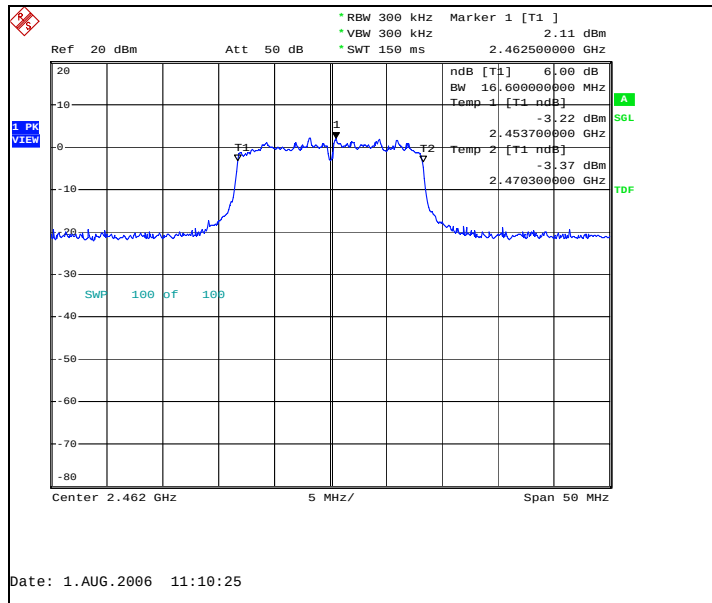
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



12. Power spectral density (FCC §15.247(e), RSS-210 A8.2 (2))

EUT with DUT number	RM-156 dut 29056
Accessories with DUT numbers	HS-23 dut 29063
Operation Voltage [V] / [Hz]	3.7V DC
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	24.7 / 46.5 1004.9
Date of measurements	01-08-2006
Measured by	Jan Engelbrechtsen

12.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for power spectral density measurements

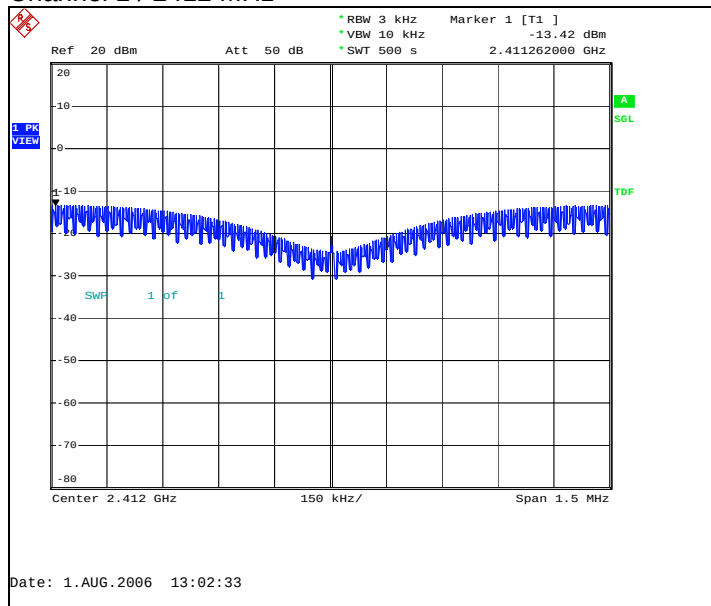
Limit [dBm] @ 3 kHz
≤ 8

12.2. WLAN test results

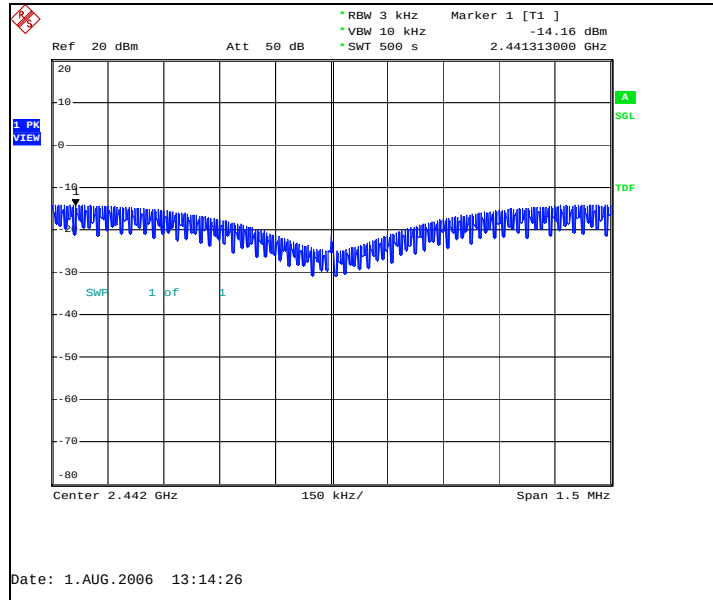
12.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-13.42	Passed
7 / 2442	-14.16	Passed
11 / 2462	-13.96	Passed

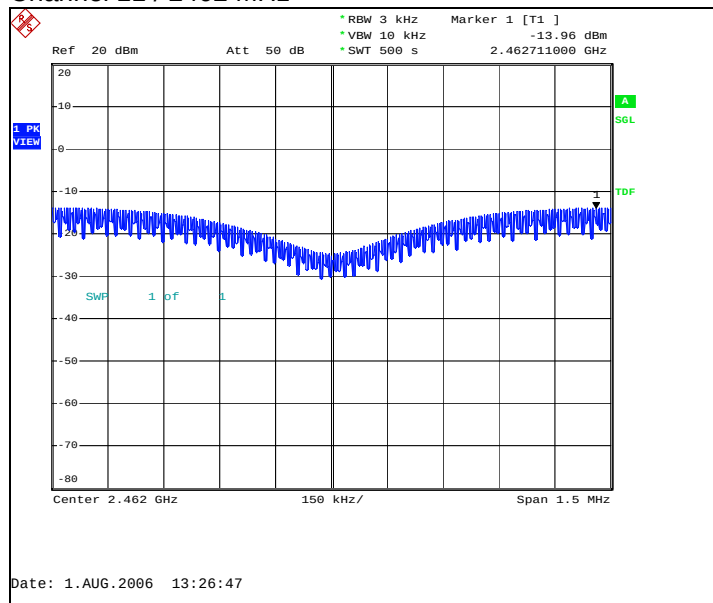
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



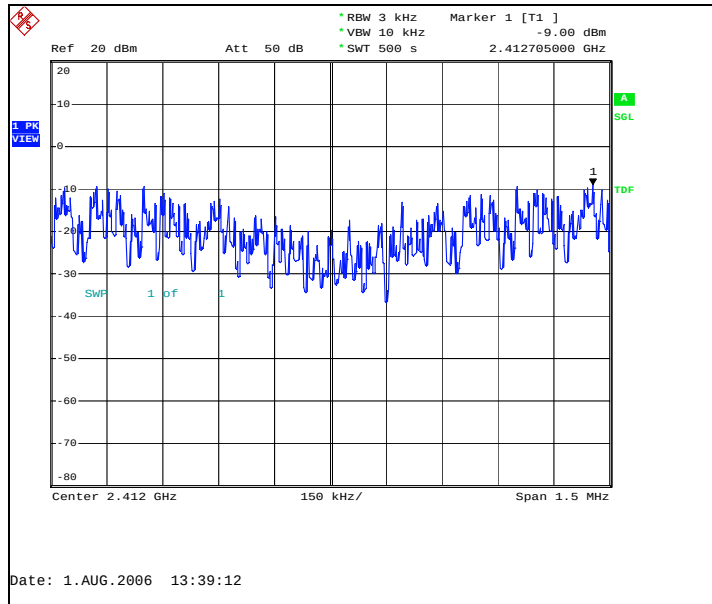
Channel 11 / 2462 MHz



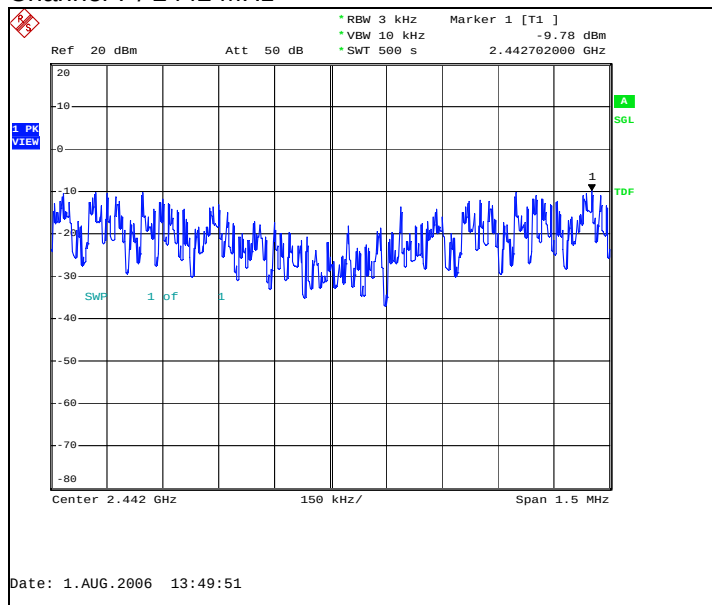
12.2.2 DSSS mode, QPSK modulation, 2 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-9	Passed
7 / 2442	-9.78	Passed
11 / 2462	-9.48	Passed

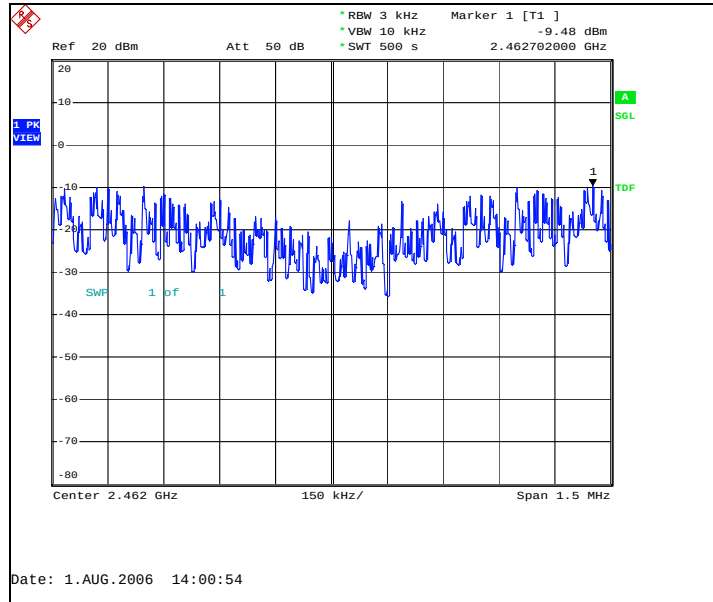
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



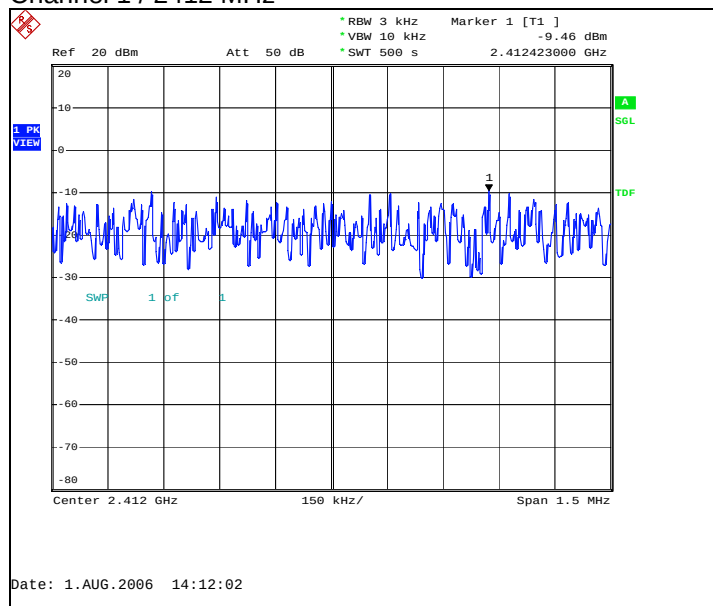
Channel 11 / 2462 MHz



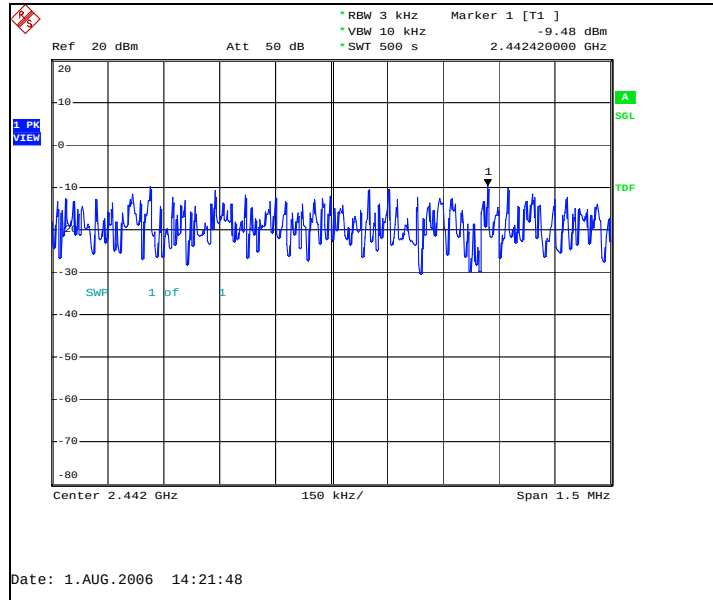
12.2.3 DSSS mode, QPSK modulation, 5.5 Mbps data rate

Channel / f _c [MHz]	P [dBm]	Result
1 / 2412	-9.46	Passed
7 / 2442	-9.48	Passed
11 / 2462	-9.54	Passed

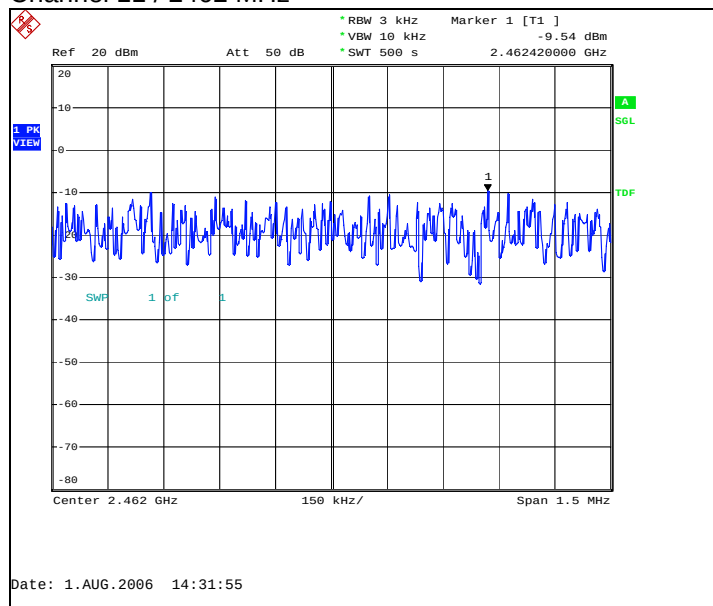
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



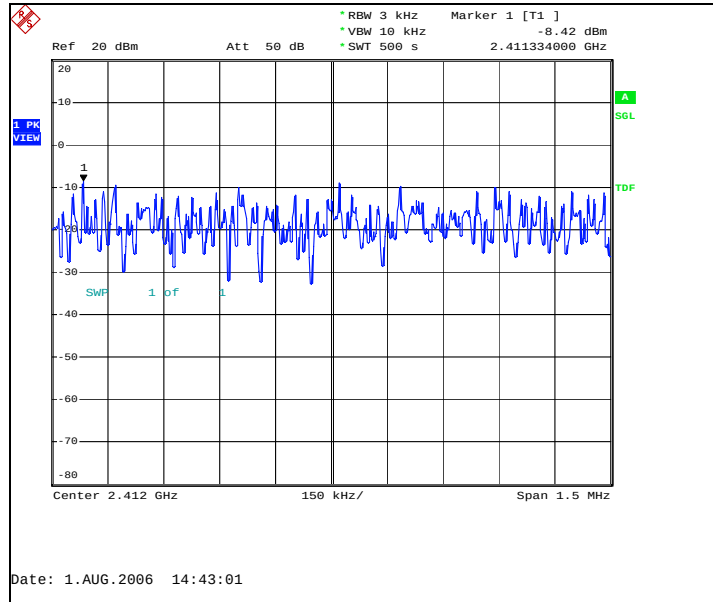
Channel 11 / 2462 MHz



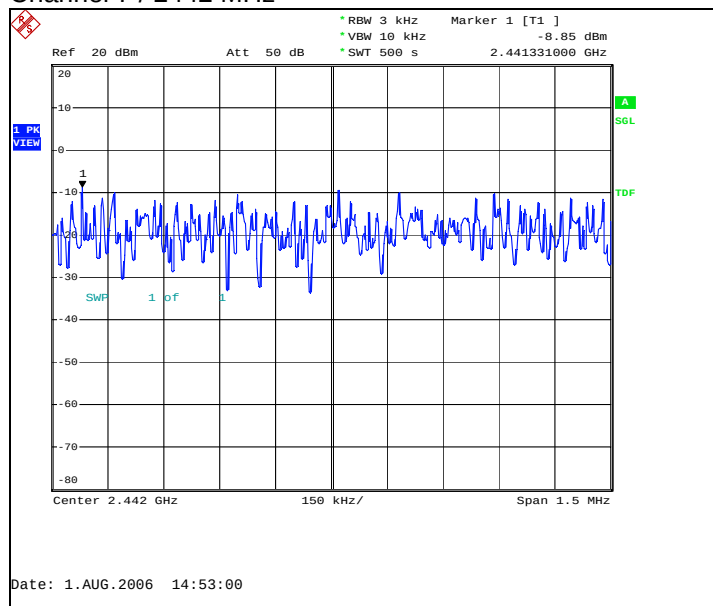
12.2.4 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-8.42	Passed
7 / 2442	-8.85	Passed
11 / 2462	-8.87	Passed

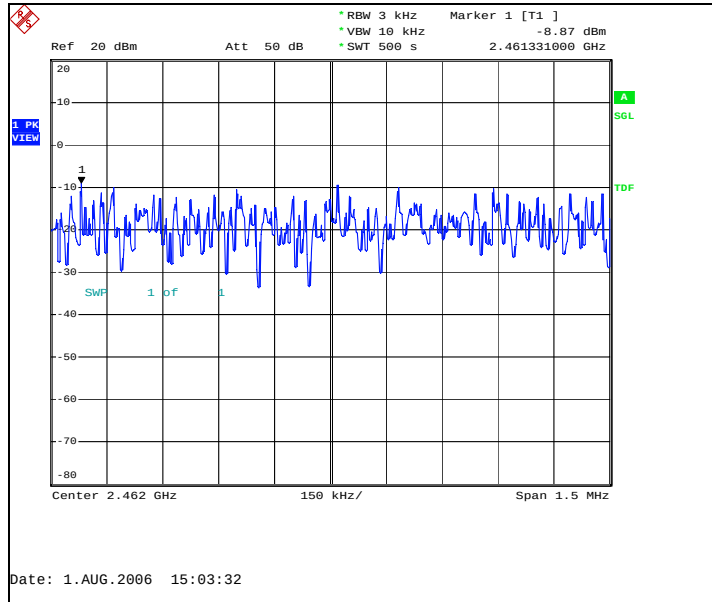
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



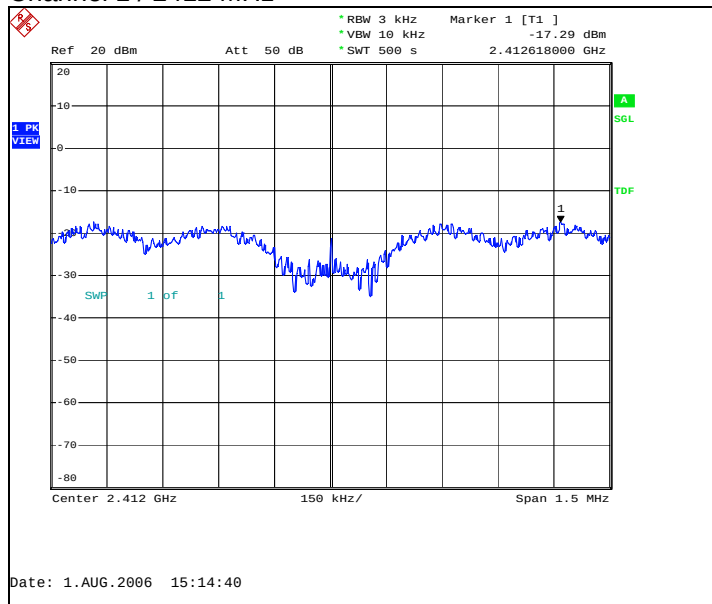
Channel 11 / 2462 MHz



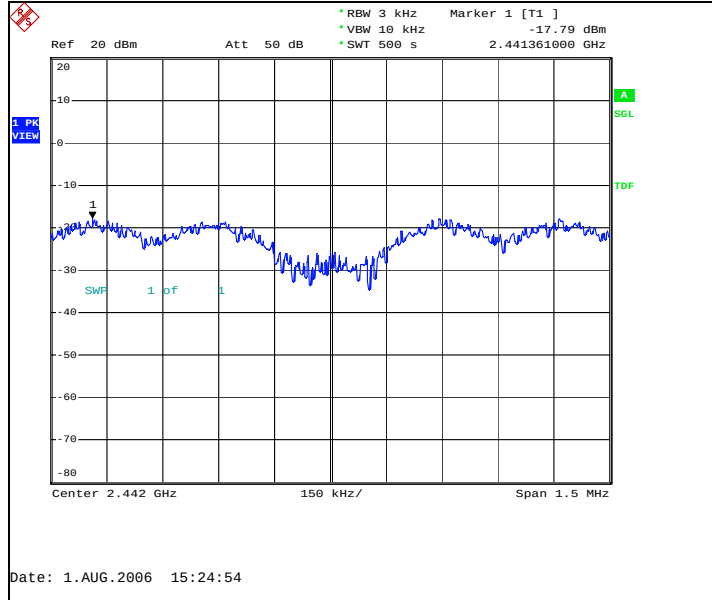
12.2.5 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-17.29	Passed
7 / 2442	-17.79	Passed
11 / 2462	-17.83	Passed

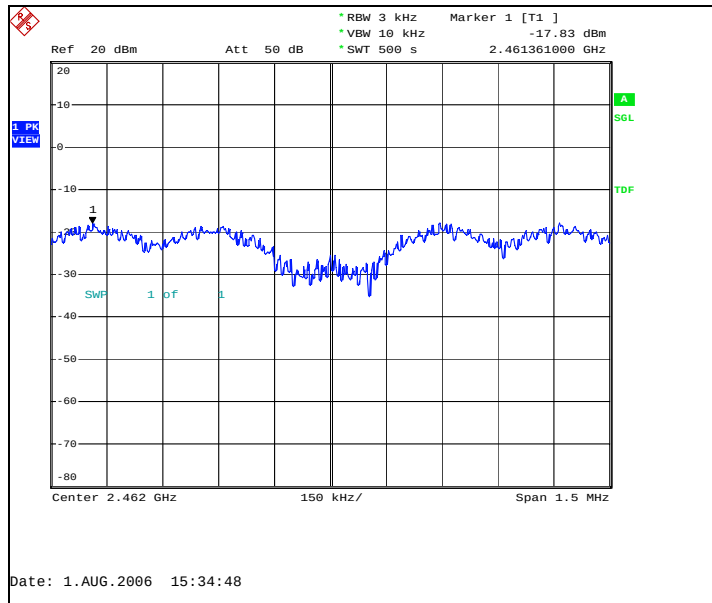
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



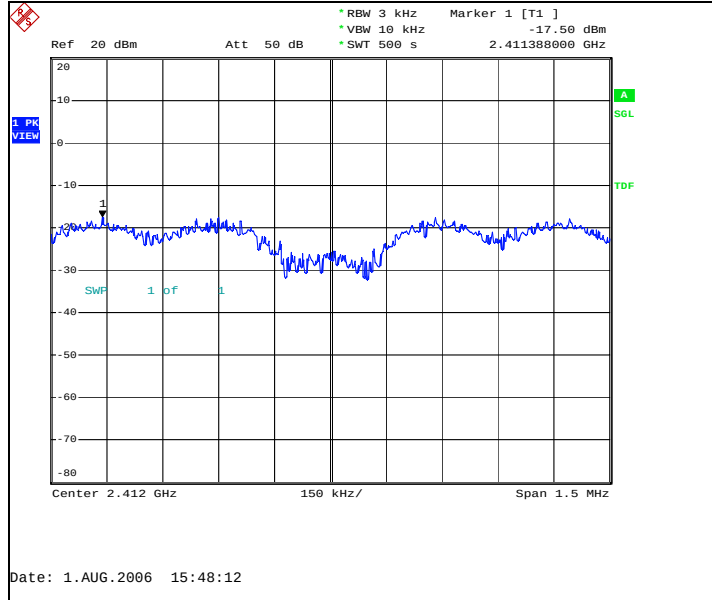
Channel 11 / 2462 MHz



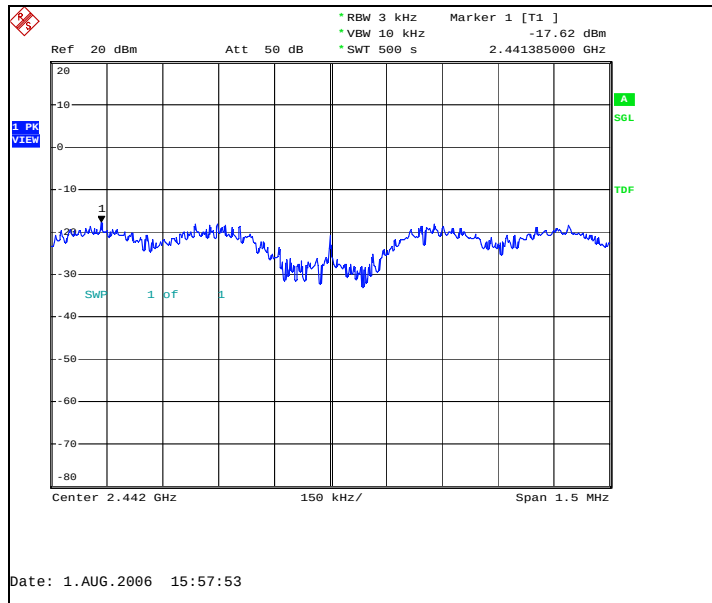
12.2.6 OFDM mode, BPSK modulation, 9 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-17.50	Passed
7 / 2442	-17.62	Passed
11 / 2462	-17.66	Passed

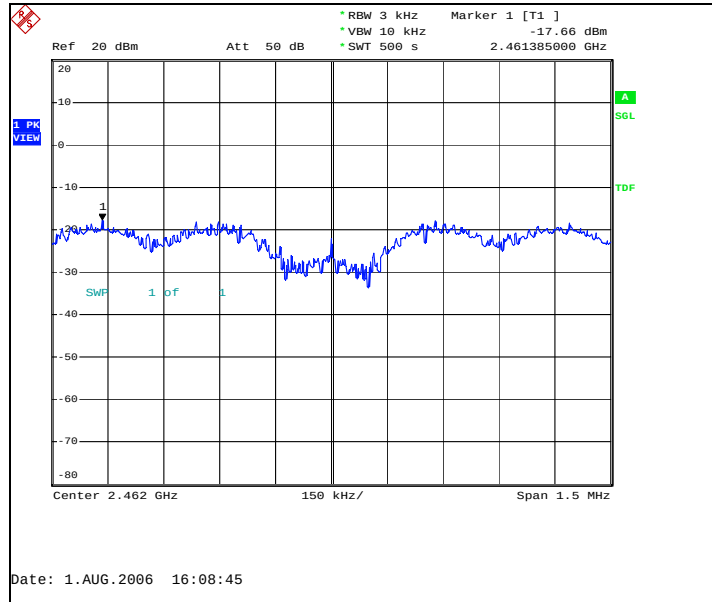
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



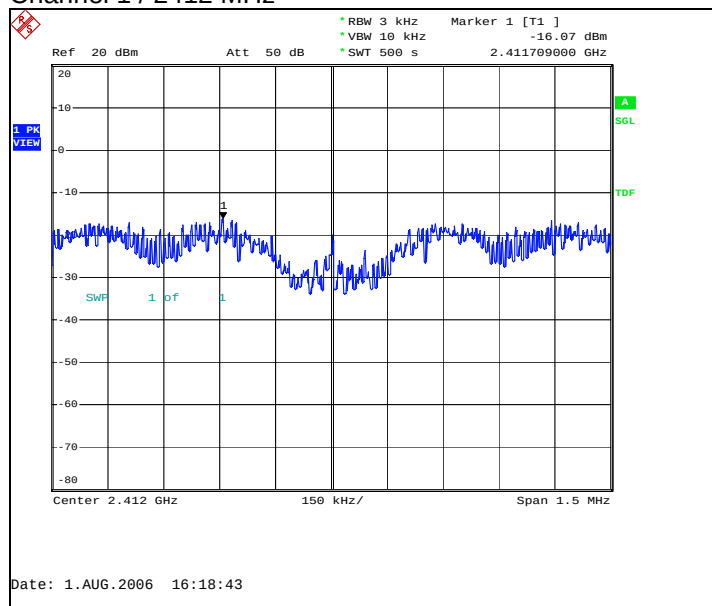
Channel 11 / 2462 MHz



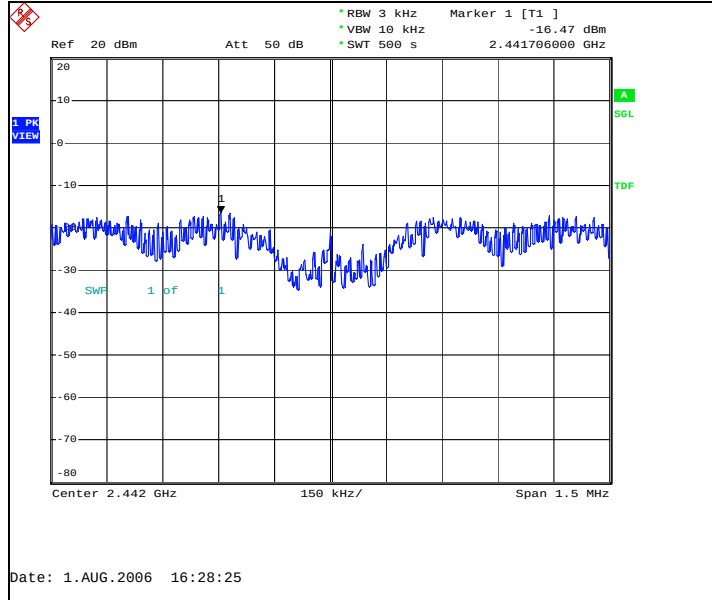
12.2.7 OFDM mode, QPSK modulation, 12 Mbps data rate

Channel / f _c [MHz]	P [dBm]	Result
1 / 2412	-16.07	Passed
7 / 2442	-16.47	Passed
11 / 2462	-16.46	Passed

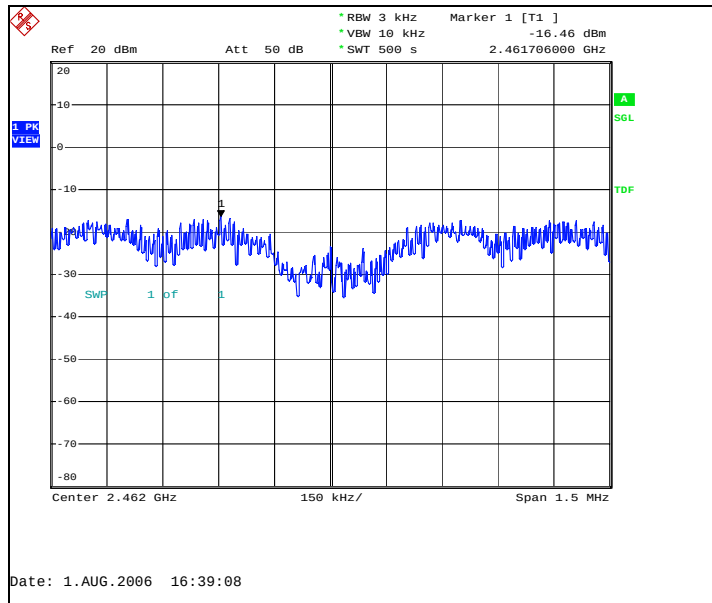
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



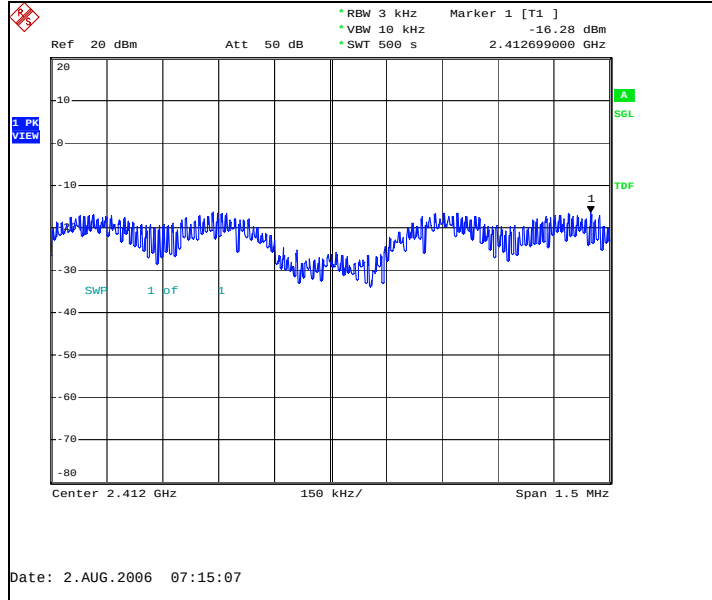
Channel 11 / 2462 MHz



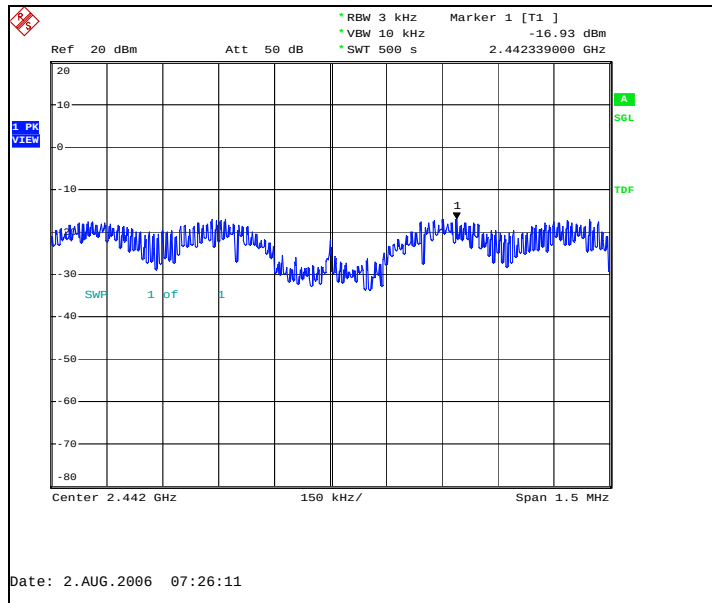
12.2.8 OFDM mode, QPSK modulation, 18 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-16.28	Passed
7 / 2442	-16.93	Passed
11 / 2462	-16.94	Passed

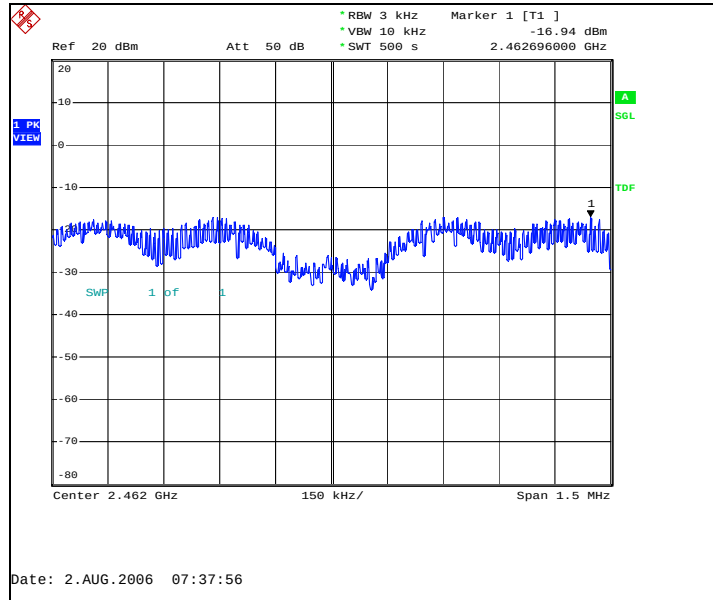
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



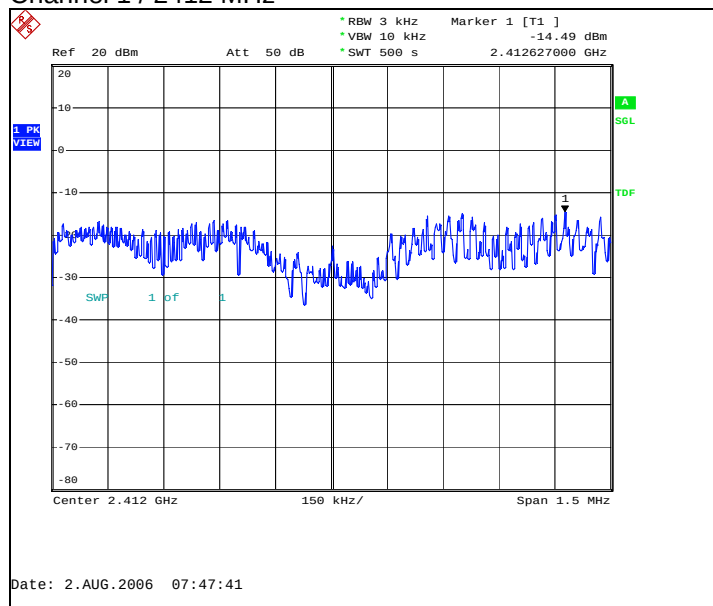
Channel 11 / 2462 MHz



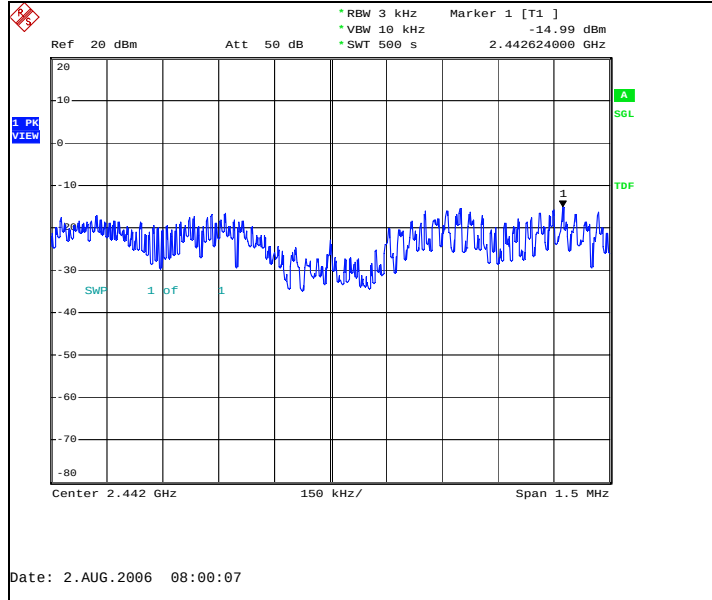
12.2.9 OFDM mode, 16QAM modulation, 24 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-14.49	Passed
7 / 2442	-14.99	Passed
11 / 2462	-14.86	Passed

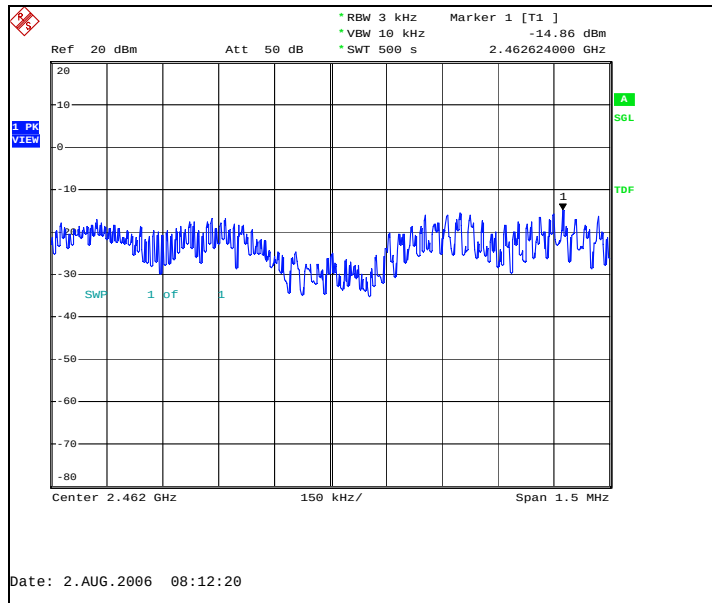
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



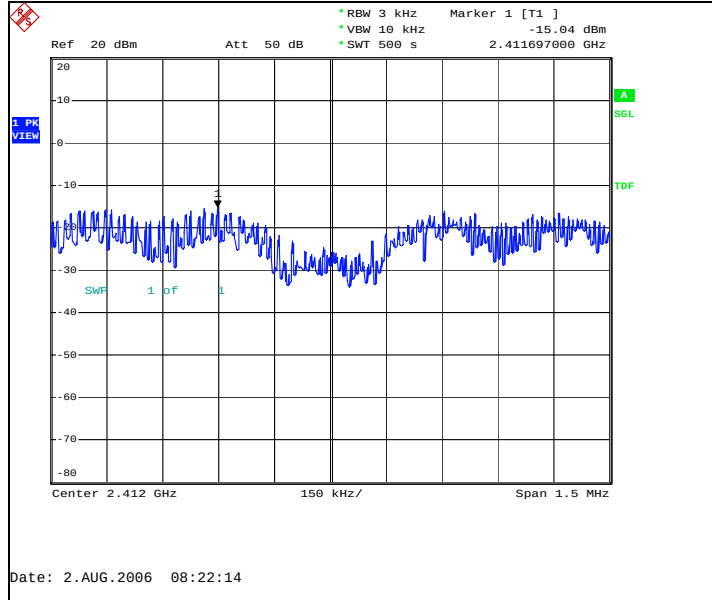
Channel 11 / 2462 MHz



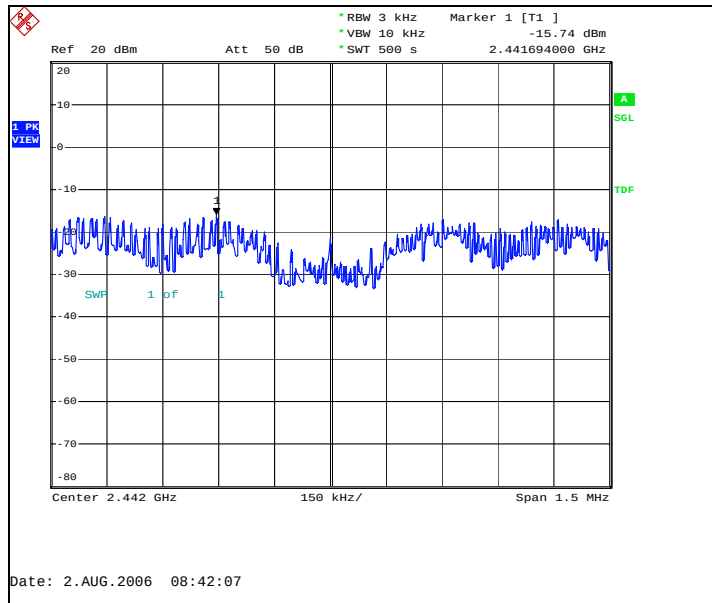
12.2.10 OFDM mode, 16QAM modulation, 36 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-15.04	Passed
7 / 2442	-15.74	Passed
11 / 2462	-15.62	Passed

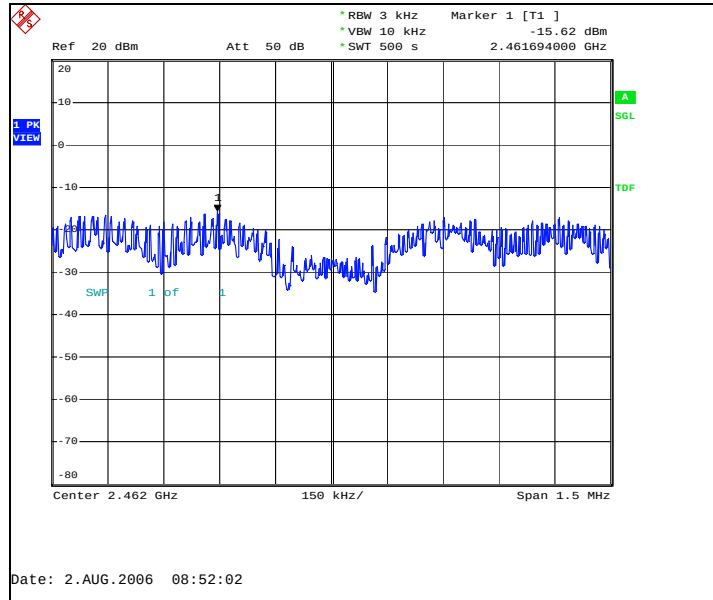
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



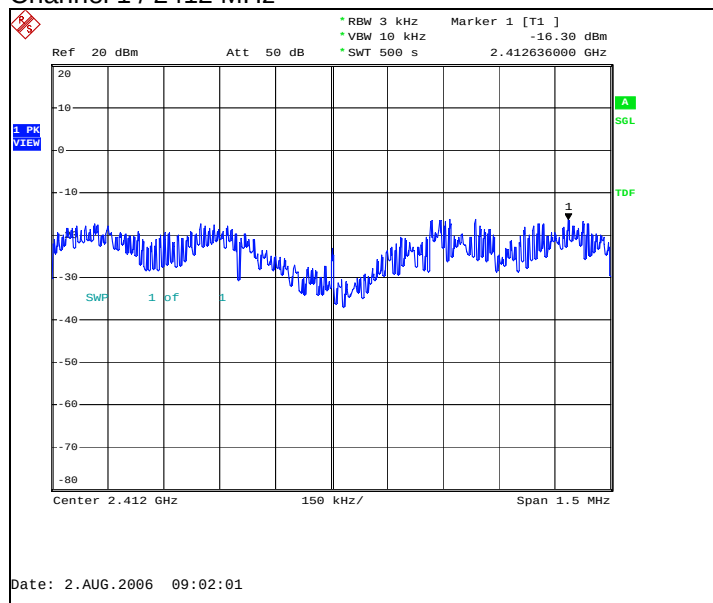
Channel 11 / 2462 MHz



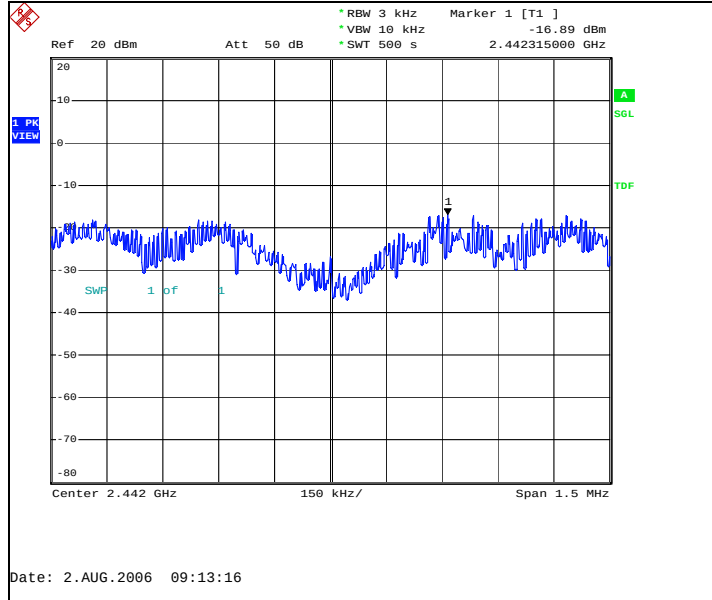
12.2.11 OFDM mode, 64QAM modulation, 48 Mbps data rate

Channel / f _c [MHz]	P [dBm]	Result
1 / 2412	-16.3	Passed
7 / 2442	-16.89	Passed
11 / 2462	-16.85	Passed

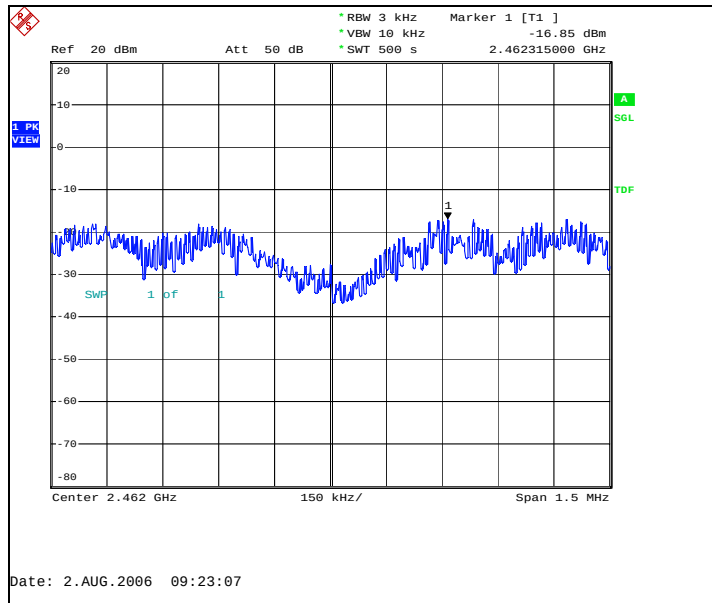
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



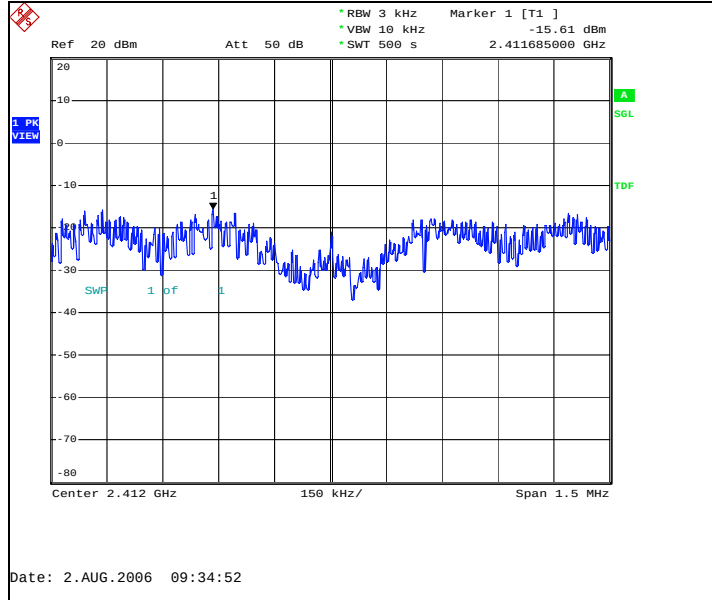
Channel 11 / 2462 MHz



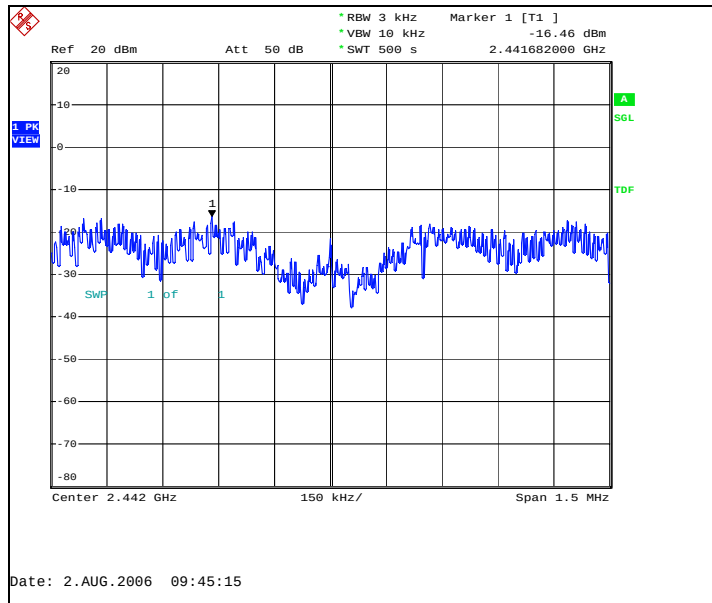
12.2.12 OFDM mode, 64QAM modulation, 54 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-15.61	Passed
7 / 2442	-16.46	Passed
11 / 2462	-16.47	Passed

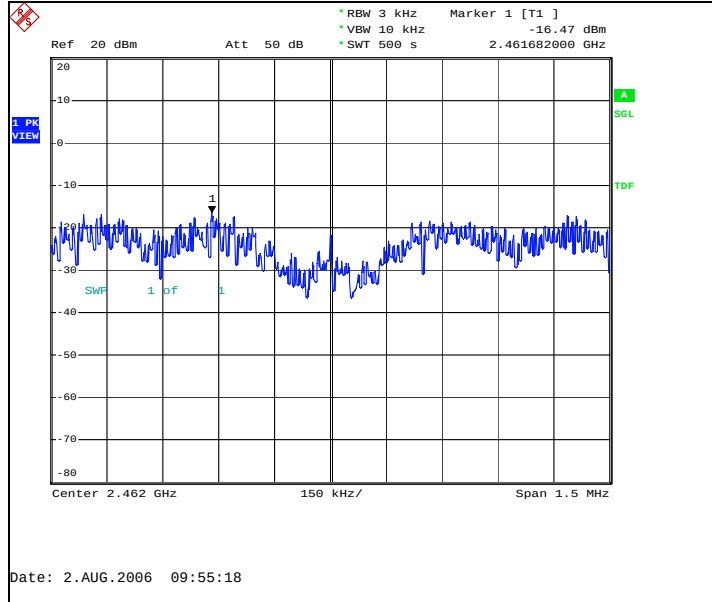
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



13. Test Equipment

13.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15B,15C
13513	Pulse Limiter 9KHz-30MHz	ESH3Z2	Rohde&Schwarz	15B,15C
13666	EMI Test Reciever 9KHz-2,5GHz	ESPC	Rohde&Schwarz	15B,15C
13935	Two Lines Artificial Mains Network	ESH3-Z5	Rohde&Schwarz	15B,15C
16995	Directional Coupler 20dB 0,5-2,0 GHz SMA Conn.	1538RA-20	Weinschel	15B,15C
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15B,15C
19171	Universal Radio Communication Tester	CMU200	Rohde&Schwarz	15B,15C
11386	System DC Power Supply	HP6632A	Hewlett Packard	22.24
11487	Network analyzer 300KHz-3,0GHz	HP8753A	Hewlett Packard	22.24
11584	Spectrum analyzer 50Hz-6,5GHz	HP8561B	Hewlett Packard	22.24
13134	Tracking generator	HP85645A	Hewlett Packard	22.24
13302	Spectrum Analyzer 9KHz-12.8GHz	HP8596E	Hewlett Packard	22.24
13371	Temperature Chamber	S-1,2C	Thermotron	22.24
13524	Digital Radiocomm. Tester	CMD55	Rohde&Schwarz	22.24
14807	S - Parameter Test Set 300KHz-6GHz	HP85047A	Hewlett Packard	22.24
15859	Digital Radio Communication Test Set	4201S	Wavetek	22.24
17277	Multimeter Digital 6 1/2 Digit	AT34401A	Agilent Technologies	22.24
17796	Radio Communication Test Set	4400M	Wavetek	22.24
19374	Resonant Dipole Antenna 850MHz SMA m Conn.	-	NMP Cph	22.24
19375	Resonant Dipole Antenna 1900MHz SMA m Conn.	-	NMP Cph	22.24
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15B,15C

13.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
14020	Programmable Relay Switching System	-	Pickering	15B,15C,22,24
18792	Multi Device Controller	2090	ETS-EMCO	15B,15C,22,24
13829	Turntable Controller	4630-100	Comtest	15B,15C,22,24
14963	RF Preamplifier 100MHz-4GHz (Metal Chassis)	AFS3-00100400	Miteq/NMP Cph	15B,15C,22,24
13668	BiLog Antenna 30-2000MHz	BiLog-CBL6112A	Chase	15B,15C,22,24
18861	EMI Test Receiver 20Hz-26,5GHz	ESI	Rohde&Schwarz	15B,15C,22,24
12679	Dual Log Periodic Antenna 1-18 GHz	HL025	Rohde&Schwarz	15B,15C,22,24
18860	Ultra Broadband Antenna	HL562	Rohde&Schwarz	15B,15C,22,24

Eq. No	Equipment	Type	Manufacturer	Used in
	Ultralog 30-3000MHz			
18773	Shielded Chamber	RFD-100	ETS-Lindgren	15B,15C,22,24
18774	Shielded Chamber	RFSD-F/A-100	ETS-Lindgren	15B,15C,22,24
18324	High Pass Filter 3GHz SMA f Conn	WHJS3000-10SS	Wainwright	15B,15C,22,24
14114	Highpass Filter 1000MHz-4500MHz	WHK1000-12SS	Wainwright	15B,15C,22,24
13918	Highpass Filter 2000-4000MHz 50OHM SMA Conn	WHKS2000-10SS	Wainwright Instruments	15B,15C,22,24
13937	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright Instruments	15B,15C,22,24
13936	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	15B,15C,22,24
13917	Highpass Filter 1000-3000MHz 50OHM SMA Conn	WHKS1000-10SS	Wainwright Instruments	15B,15C,22,24
14188	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright	15B,15C,22,24
14187	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright	15B,15C,22,24
16633	Ultra Stable Notch Filter 1880,0MHz	WRCD1880.0-0.2/40-10SS	Wainwright	15B,15C,22,24
18323	Band reject filter 1947-1953MHz 40dB	WRCG1947/1953-1940/1960-40/6SS	Wainwright	15B,15C,22,24
15190	Infra Red Remote Control Unit	4630	Emco	22,24,15B,15C
14993	EMI Test Receiver 9KHz-2750MHz	ESCS30	Rohde&Schwarz	22,24,15B,15C
15191	Turntable Contoller Unit	G-800SDX	YAESU	22,24,15B,15C
14900	Antenna Controller	HD100	HD GmbH	22,24,15B,15C