

FCC Part 15C Compliance Test Report

Test Report no.:	Tre_FCC_0814_05.doc	Date of Report:	09-Oct-2008
Number of pages:	47	Customer's Contact person:	Sonja Länkinen
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FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	Phone RM-356 / AC-Charger AC-8E / Battery BL-5J / Audio adapter AD-54 / Headset HS-45		
FCC ID:	LJPRM-356	IC:	661E-RM356
Supplement reports:			
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). 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:			

Jari Jantunen, Test System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	04-Apr-2008
Testing completed	25-Apr-2008
The customer's contact person	Sonja Länkinen
Test Plan referred to	T:\Projects\RM-356\TestPlan_RS\RS_Testplan_RM-356.xls
Notes	-
Document name	T:\Projects\RM-356\EMC\Results\FCC\Tre_FCC_0814_05.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band I/VIII) 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-356	004401100484472	0502	-	V01.10.1	41450
Phone	RM-356	004401100484449	0502	-	V01.10.1	41449
Battery	BL-5J	-	-	-	-	41454
Battery	BL-5J	-	-	-	-	41453
AC-Charger	AC-8E	-	-	-	-	41458
AC-Charger	AC-8E	-	-	-	-	41451
Audio adapter	AD-54	46	0.5	1.5	0.1	41045
Headset	HS-45	-	-	-	-	41046

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)	Conducted peak output power	NP
15.247(d)	A8.5	Band edge compliance of RF emissions	NP
15.247(d)	A8.5	Spurious RF conducted emissions	NP
15.247(d), 15.209	A8.5	Spurious radiated emissions	NP
15.207	7.2.2	AC powerline conducted emissions	PASSED
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 <i>RSS-GEN</i> or <i>RSS-210</i>	Name of the test	Result
15.247(b)(1)	A8.4 (4)	Conducted peak output power	PASSED
15.247(d)	A8.5	Band edge compliance of RF emissions	NP
15.247(d)	A8.5	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	PASSED
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 Tampere Laboratory.

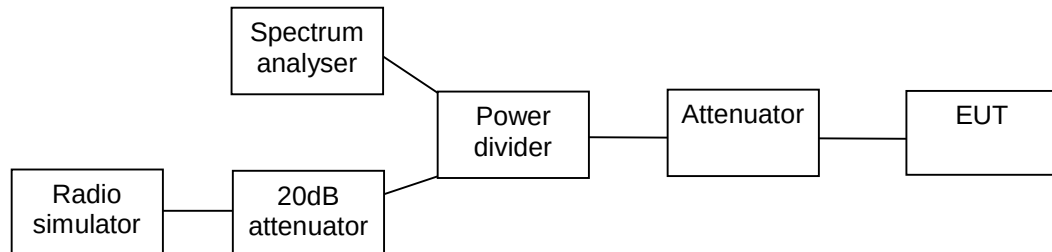
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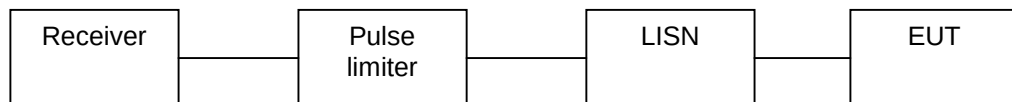
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2. Test setups

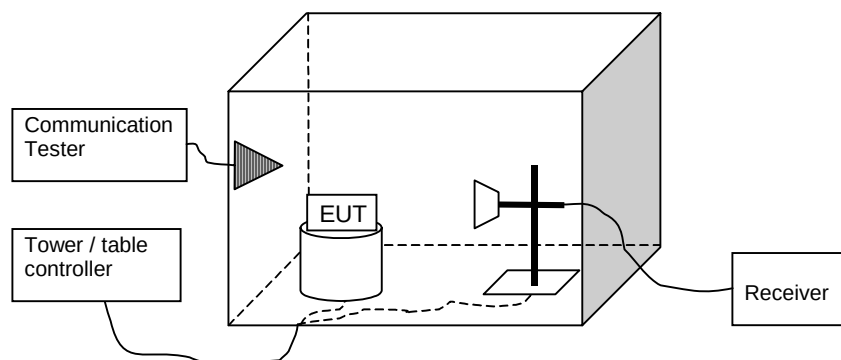
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



3. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-356 DUT 41449
Accessories with DUT numbers	BL-5J DUT 41453, AC-8E DUT 41451, AD-54 DUT 41045, HS-45 DUT 41046
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 41 / 102.3
Date of measurements	22-Apr-2008
Measured by	Jari Jantunen

3.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-GEN as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

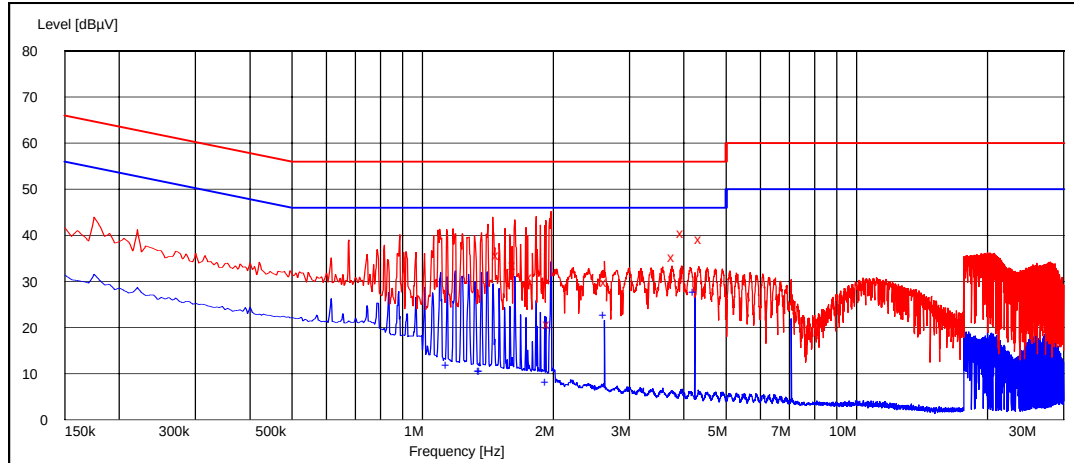
CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

3.2. Bluetooth Test results

3.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

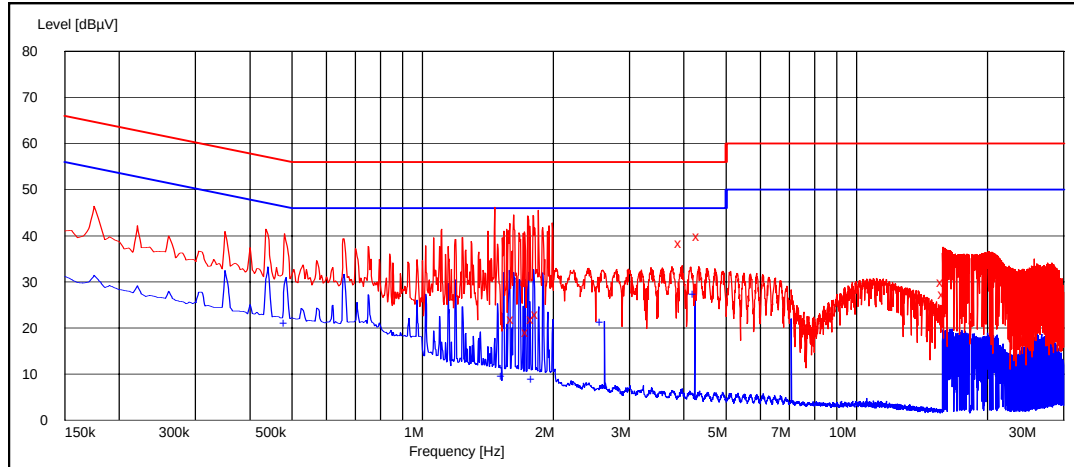
Frequency [MHz]	U [dBμV]	Line	Result
1.495000	35.80	L1	PASSED
1.635000	33.60	L1	PASSED
1.785000	31.00	L1	PASSED
1.960000	20.80	L1	PASSED
2.655000	30.00	L1	PASSED
3.800000	35.20	L1	PASSED
3.985000	40.60	L1	PASSED
4.380000	39.10	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.145000	11.90	L1	PASSED
1.360000	10.50	L1	PASSED
1.365000	10.50	L1	PASSED
1.940000	8.20	L1	PASSED
2.640000	22.70	L1	PASSED
4.240000	27.70	N	PASSED

3.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.620000	21.90	L1	PASSED
1.750000	19.10	L1	PASSED
1.800000	22.00	L1	PASSED
1.840000	23.10	L1	PASSED
3.935000	38.50	L1	PASSED
4.335000	40.00	L1	PASSED
15.805000	29.90	L1	PASSED
15.960000	27.30	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.485000	21.00	L1	PASSED
1.535000	9.60	L1	PASSED
1.800000	8.90	L1	PASSED
2.595000	21.30	N	PASSED
4.240000	27.40	N	PASSED

4. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 98.9
Date of measurements	09-Apr-2008
Measured by	Petteri Suni

4.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for 20 dB bandwidth measurements

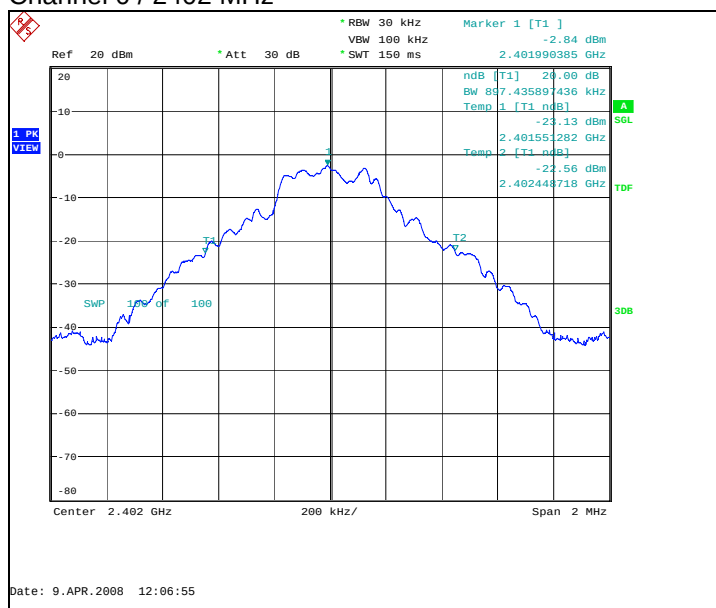
Limit [MHz]
N/A

4.2. Bluetooth Test results

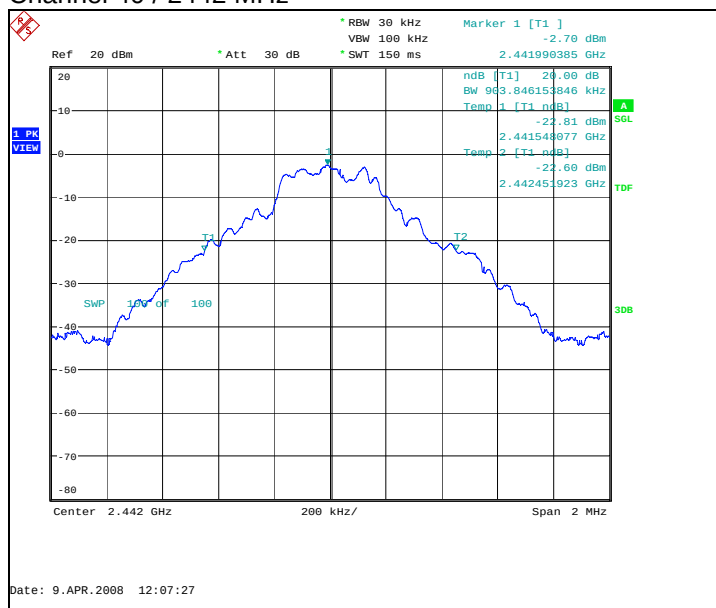
4.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	897.436	PASSED
40 / 2442	903.846	PASSED
78 / 2480	907.051	PASSED

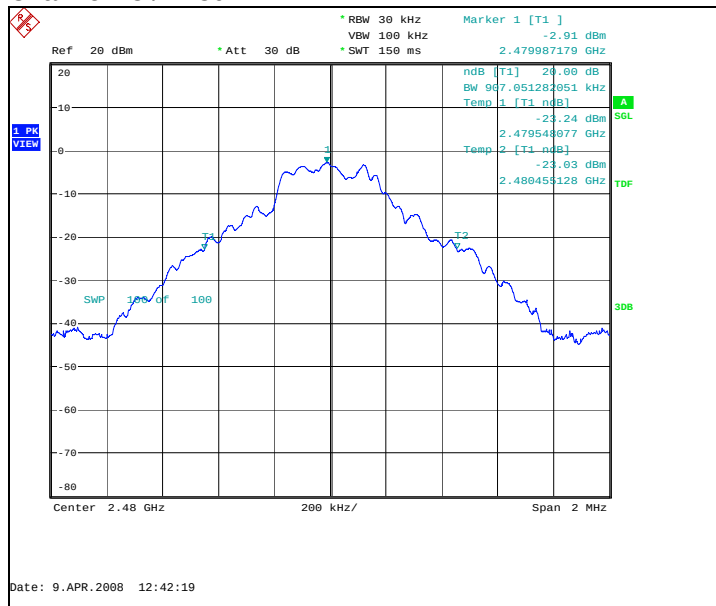
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



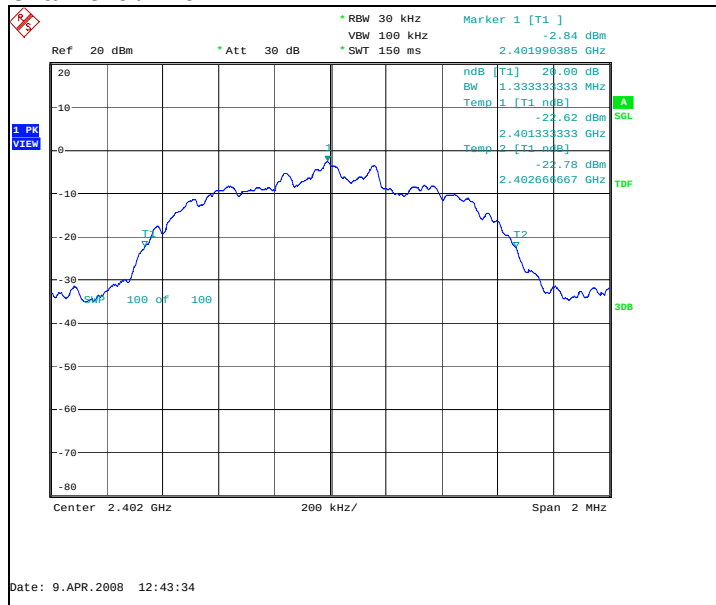
Channel 78 / 2480 MHz



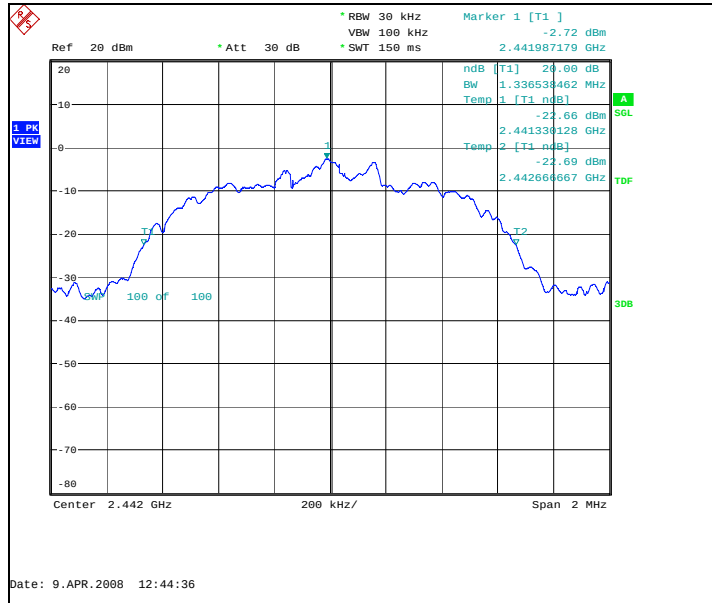
4.2.2 8DPSK modulation, PRBS packet type

Channel / f _c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1333.333	PASSED
40 / 2442	1336.538	PASSED
78 / 2480	1336.538	PASSED

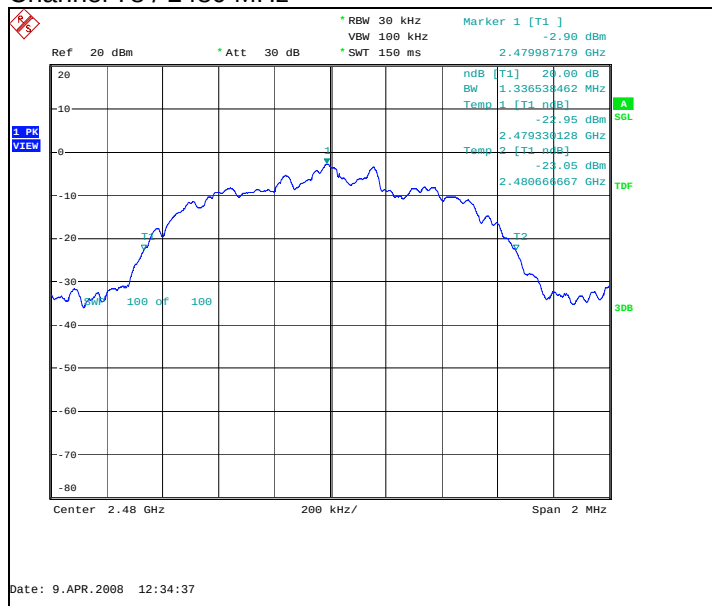
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



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

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 98.9
Date of measurements	09-Apr-2008
Measured by	Petteri Suni

5.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for carrier frequency separation measurements

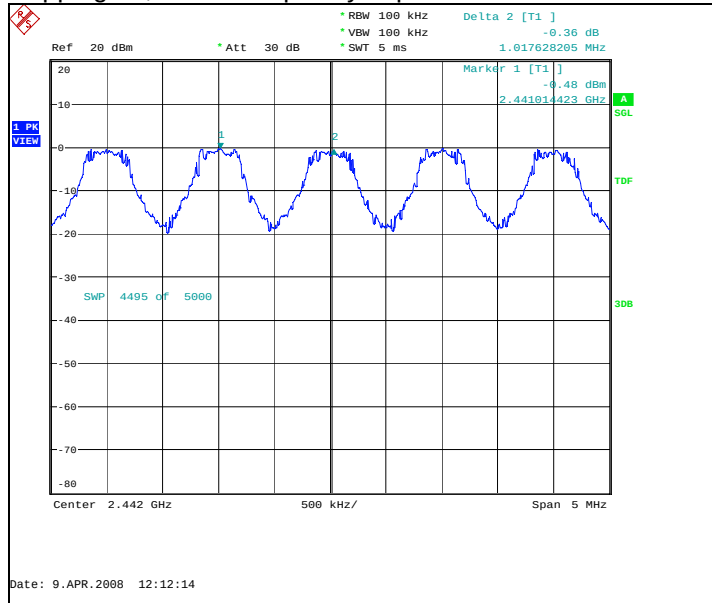
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

5.2. Bluetooth Test results

5.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1017.628	PASSED

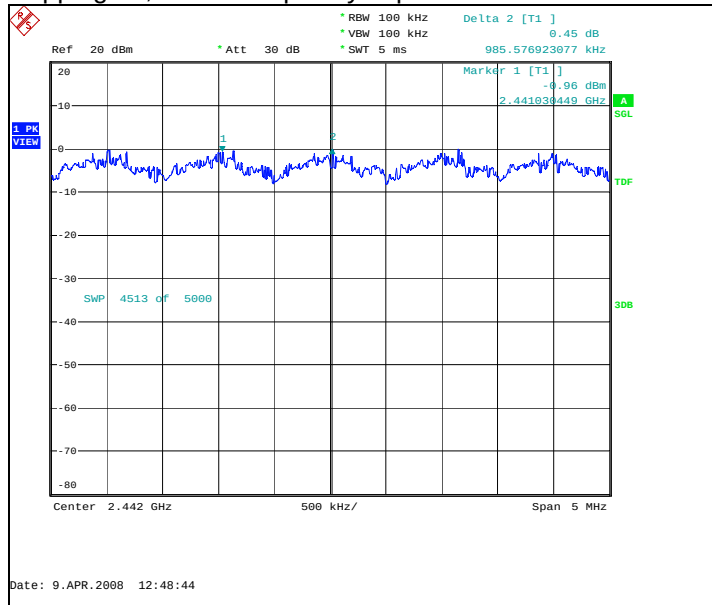
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



5.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
985.577	PASSED

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



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

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 98.9
Date of measurements	09-Apr-2008
Measured by	Petteri Suni

6.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for number of hopping frequencies measurements

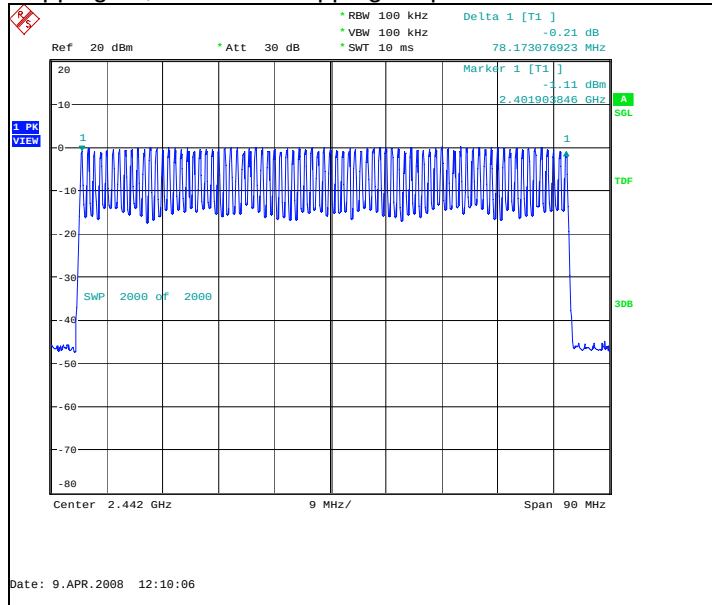
Limit [number]
≥ 15

6.2. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

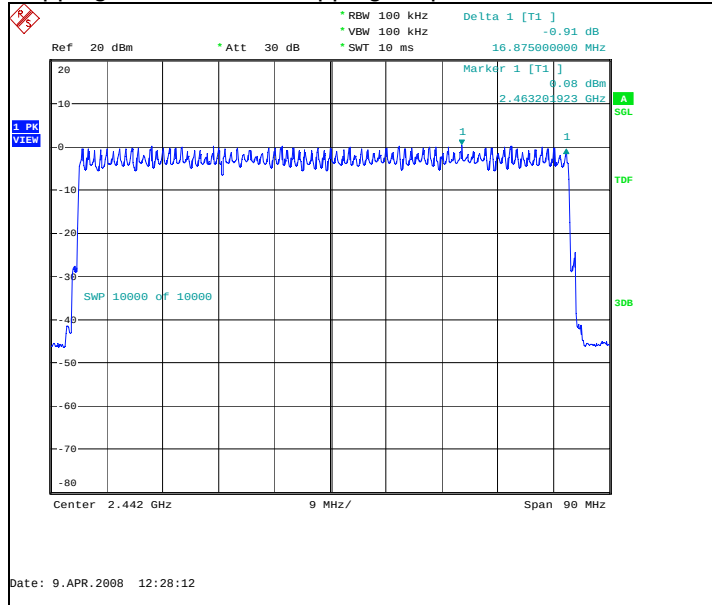
Hopping on, number of hopping frequencies



6.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

Hopping on, number of hopping frequencies



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

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 98.9
Date of measurements	09-Apr-2008
Measured by	Petteri Suni

7.1. Test method and limit

The measurement is made according to Public notice DA 00-705 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

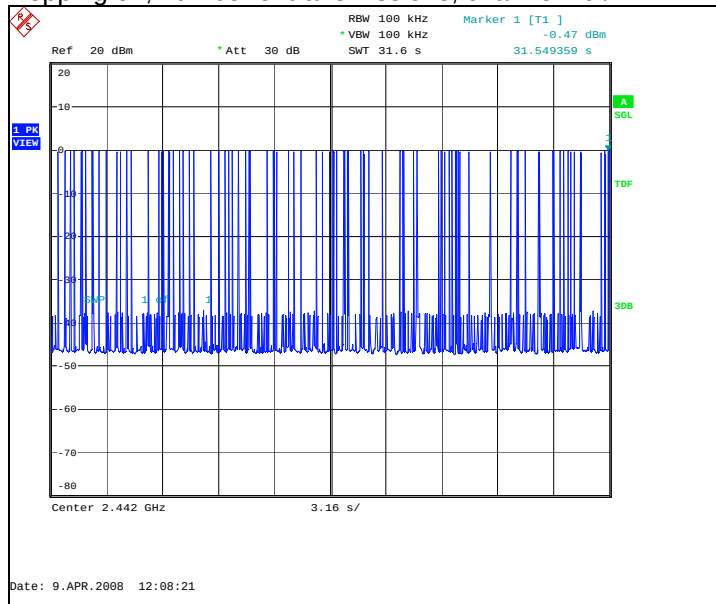
Limit [s]
≤ 0.4

7.2. Bluetooth test results

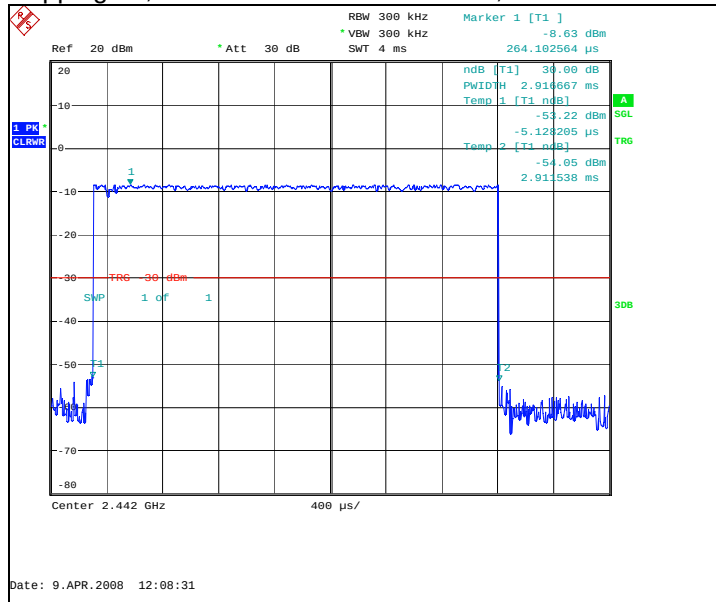
7.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μs]	Time of occupancy [s]	Result
77	2,917	0.224583	PASSED

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



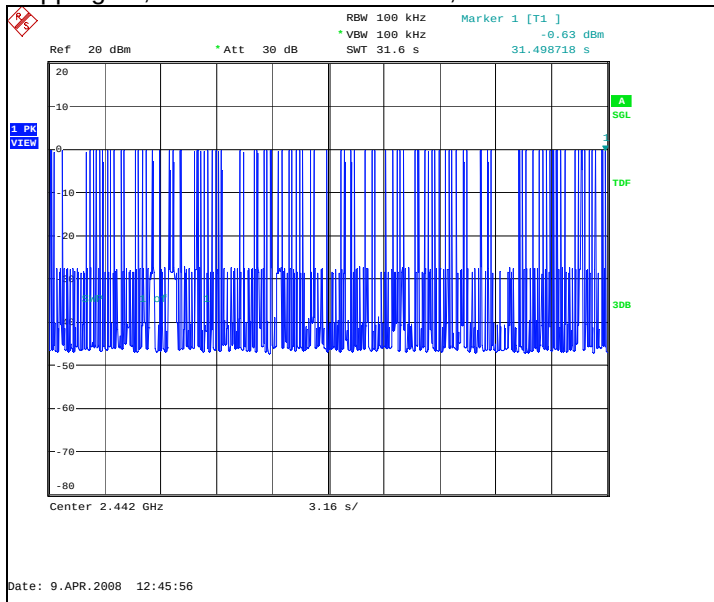
Hopping on, duration of one transmission, channel 40 / 2442 MHz



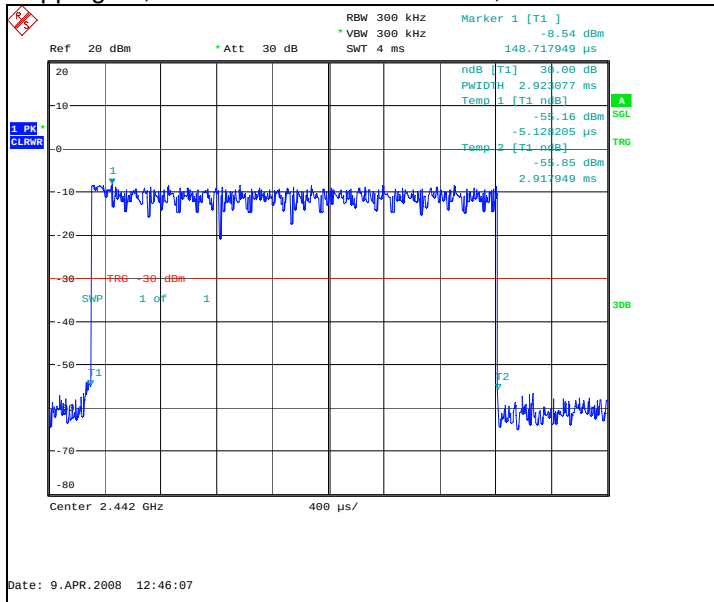
7.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
99	2,923	0.289385	PASSED

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



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



8. Conducted peak output power (FCC §15.247(b)(1), RSS-210 A8.4 (4))

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 100.1
Date of measurements	10-Apr-2008
Measured by	Petteri Suni

8.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for conducted peak output power measurements

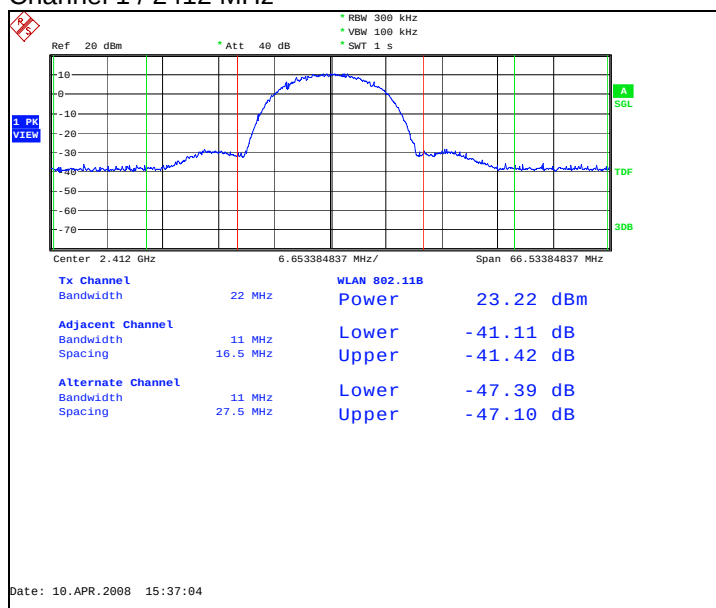
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

8.2. WLAN Test results

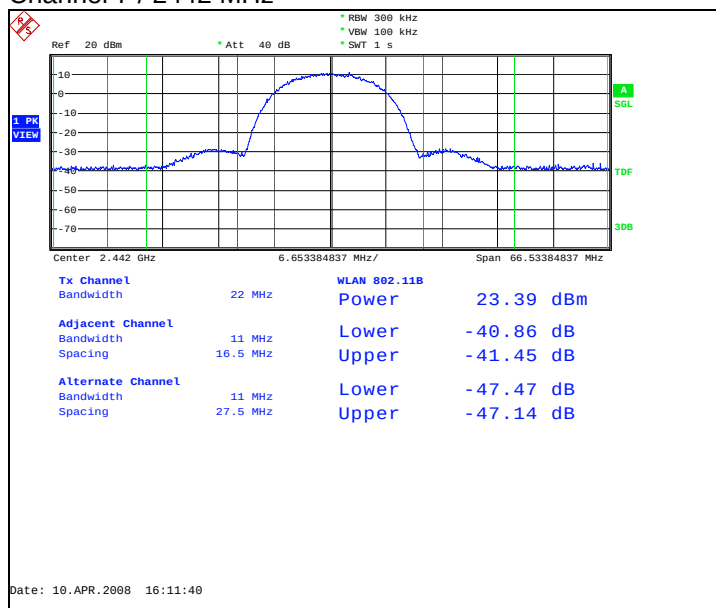
8.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	23.22	0.210	PASSED
7 / 2442	23.39	0.218	PASSED
11 / 2462	0.00	0.001	PASSED

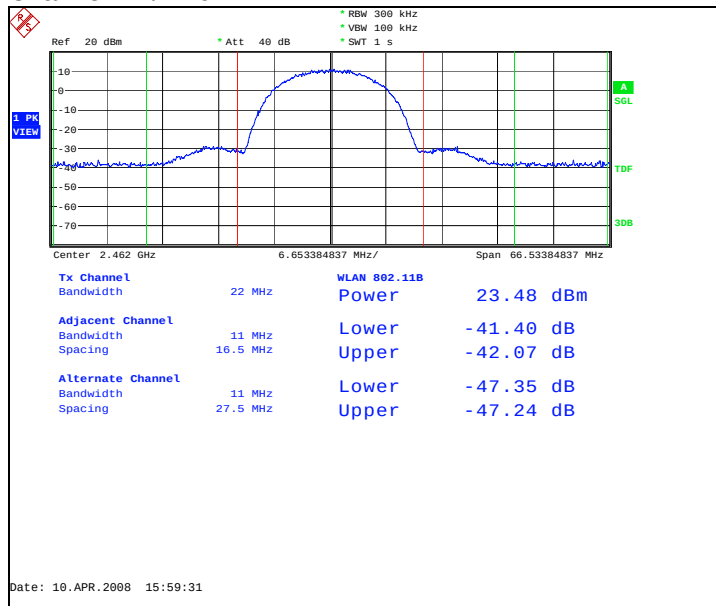
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



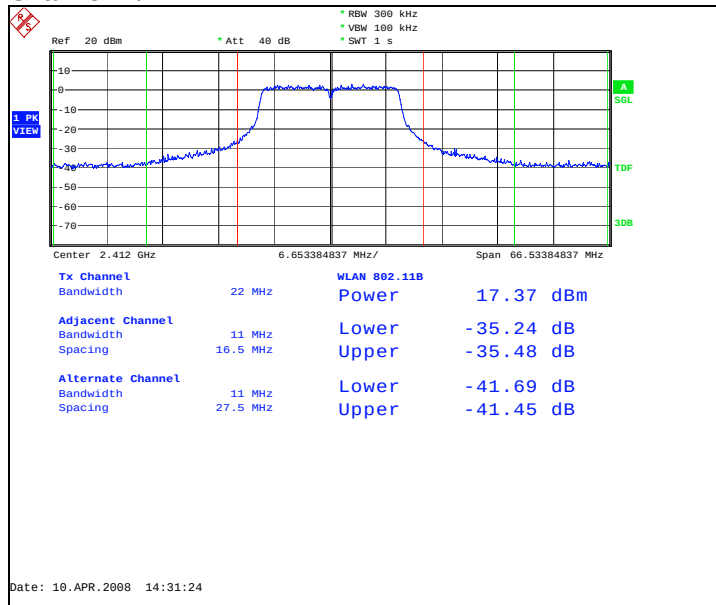
Channel 11 / 2462 MHz



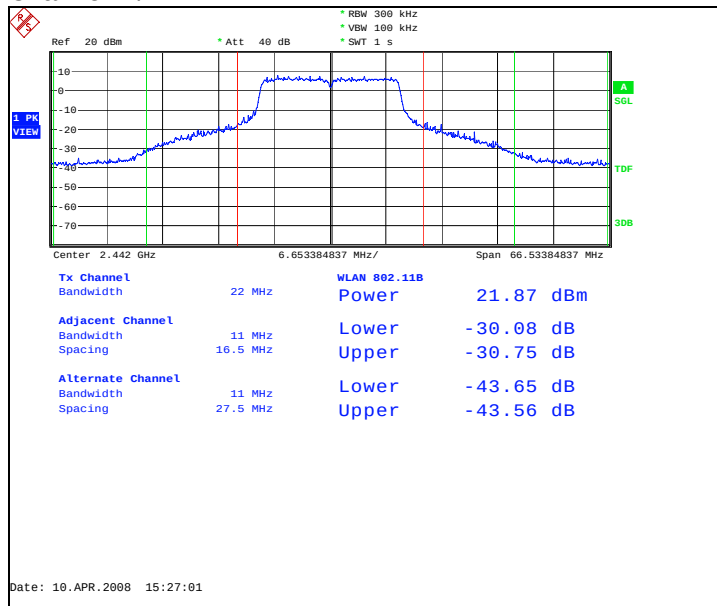
8.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.37	0.055	PASSED
7 / 2442	21.87	0.154	PASSED
11 / 2462	17.81	0.060	PASSED

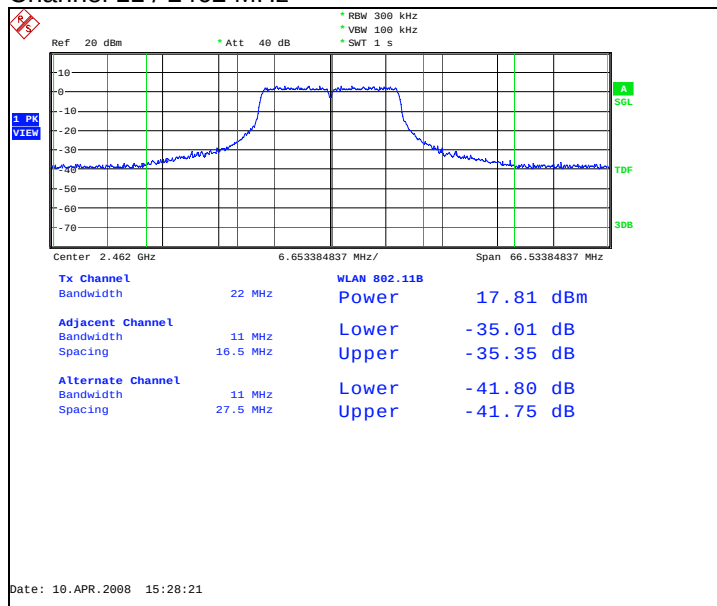
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 100.1
Date of measurements	10-Apr-2008
Measured by	Petteri Suni

9.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

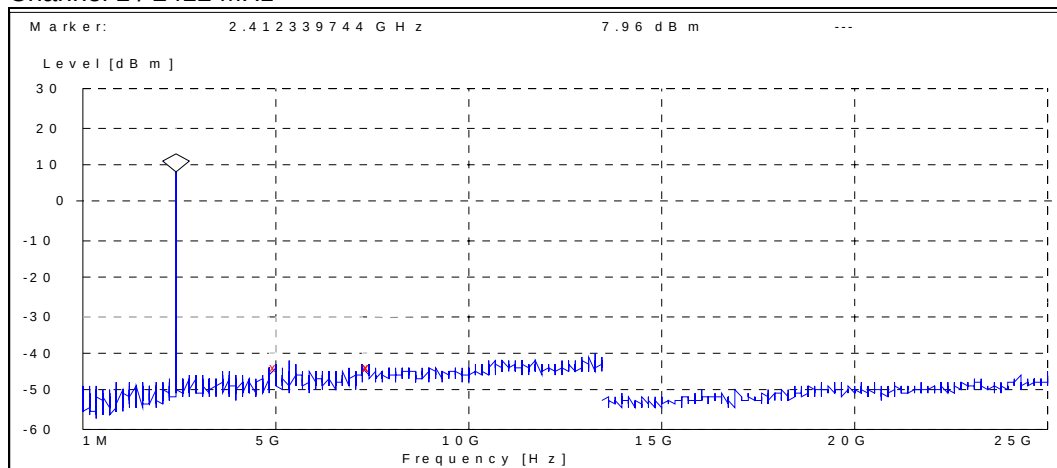
Limits for spurious RF conducted emissions measurements

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

9.2. WLAN Test results

9.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

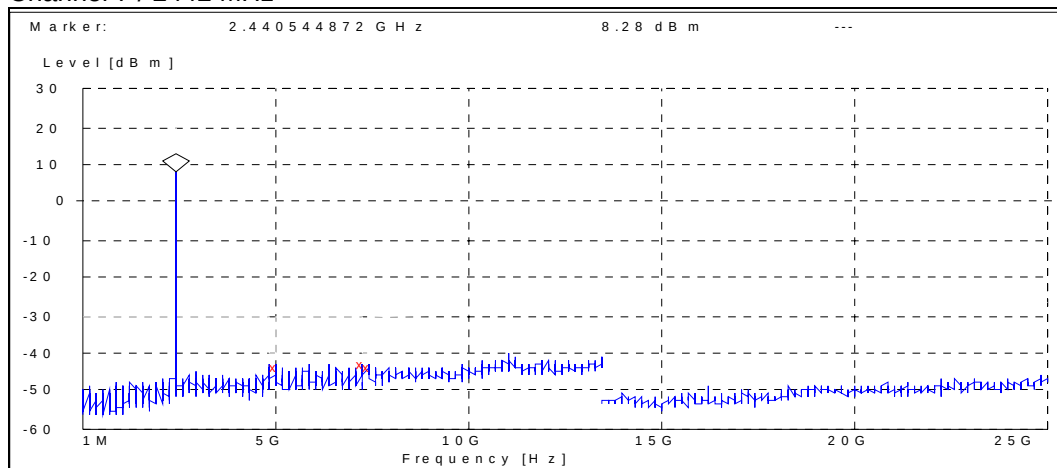
Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4944.871795	-51.360088	PASSED
7458.173077	-51.460088	PASSED
7500.000000	-51.960088	PASSED

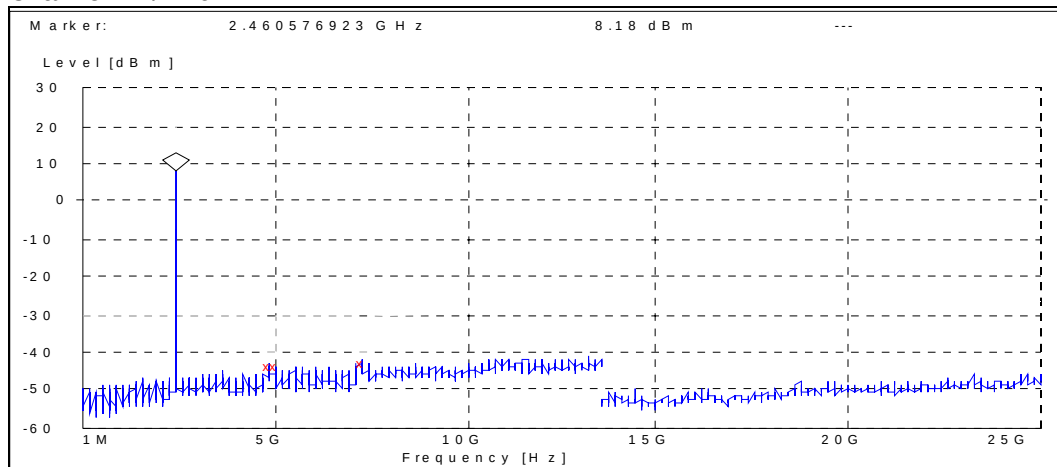
Channel 7 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4991.666667	-51.884999	PASSED
7307.211538	-50.884999	PASSED
7500.000000	-51.884999	PASSED

Channel 11 / 2462 MHz

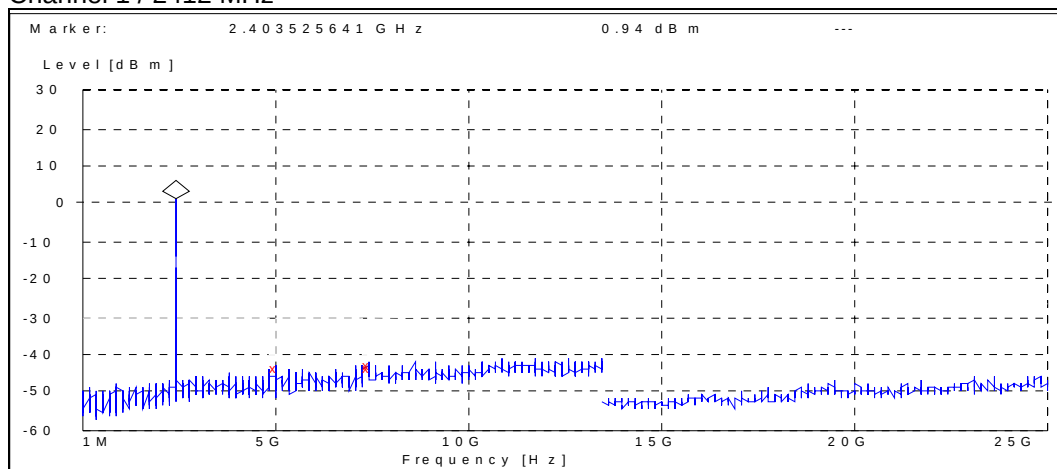


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4951.602564	-51.976698	PASSED
5000.000000	-51.476698	PASSED
7345.673077	-50.876698	PASSED

9.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

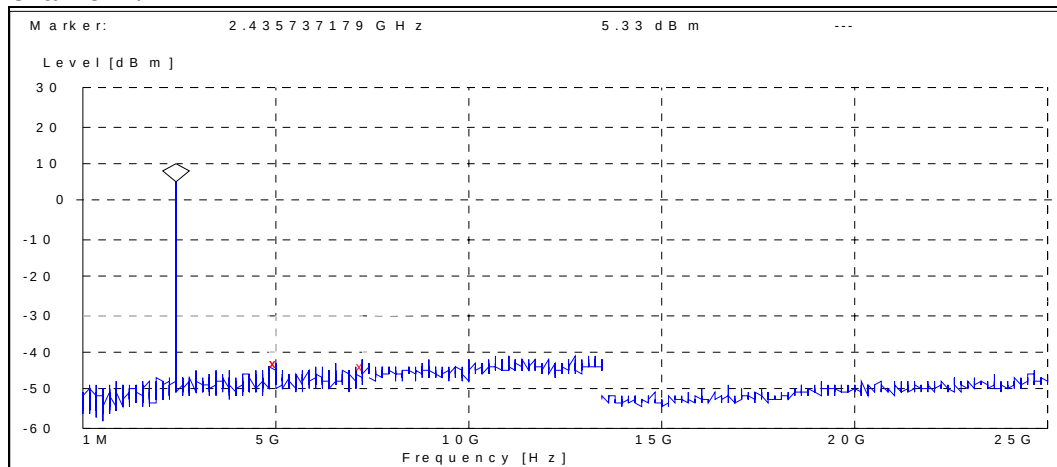
Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4950.000000	-44.735974	PASSED
7411.057692	-44.535974	PASSED
7500.000000	-43.935974	PASSED

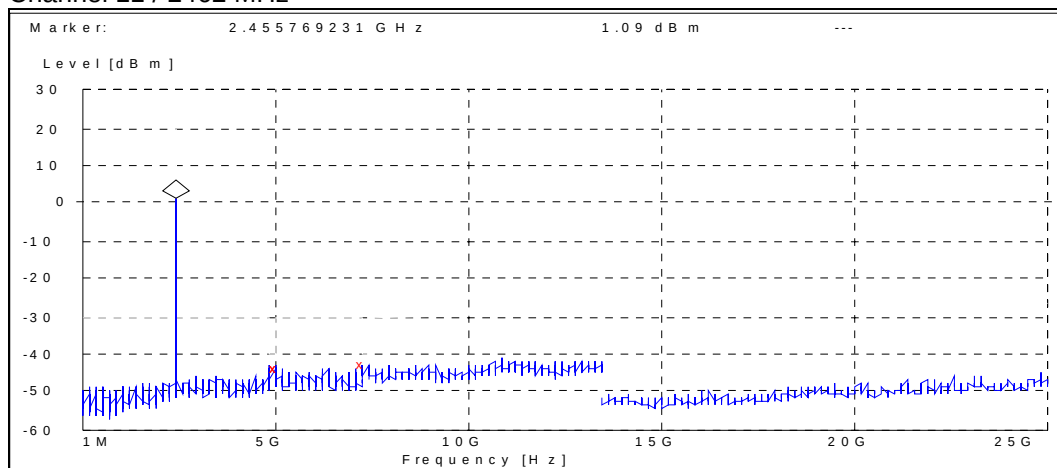
Channel 7 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4989.743590	-48.528824	PASSED
5000.000000	-48.228824	PASSED
7256.730769	-48.928824	PASSED

Channel 11 / 2462 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4942.307692	-44.586188	PASSED
5000.000000	-44.786188	PASSED
7283.653846	-44.086188	PASSED

10. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-356 DUT 41449
Accessories with DUT numbers	BL-5J DUT 41453 / AC-8E DUT 41451 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 46 / 102.1
Date of measurements	23-Apr-2008
Measured by	Jari Jantunen

10.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [\mu\text{V/m}] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Detector
30 – 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
Above 1000	500	54	Average
Above 1000	5000	74	Peak

10.2. WLAN Test results

10.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	49.20	288.40	50.90	-1.7	HORIZONTAL	PASSED
7236.000000	62.90	1 396.37	60.30	2.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	35.90	62.37	37.60	-1.7	HORIZONTAL	PASSED
7236.000000	51.20	363.08	48.60	2.6	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
38.176353	26.40	20.89	41.40	-15.0	VERTICAL	PASSED
73.408016	21.90	12.45	47.50	-25.6	HORIZONTAL	PASSED
74.569940	19.30	9.23	44.70	-25.4	HORIZONTAL	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4884.267535	48.60	269.15	50.40	-1.8	HORIZONTAL	PASSED
7325.651303	57.50	749.89	54.50	3.0	VERTICAL	PASSED
7325.655311	57.20	724.44	54.20	3.0	VERTICAL	PASSED
17898.297595	53.60	478.63	33.90	19.7	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4884.267535	36.50	66.83	38.30	-1.8	HORIZONTAL	PASSED
7325.651303	46.00	199.53	43.00	3.0	VERTICAL	PASSED
7325.655311	46.10	201.84	43.10	3.0	VERTICAL	PASSED
17902.297595	40.60	107.15	20.90	19.7	HORIZONTAL	PASSED

Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	50.20	323.59	52.00	-1.8	HORIZONTAL	PASSED
7386.000000	58.50	841.40	55.00	3.5	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	37.50	74.99	39.30	-1.8	HORIZONTAL	PASSED
7386.000000	46.40	208.93	42.90	3.5	HORIZONTAL	PASSED

10.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	41.60	120.23	43.30	-1.7	HORIZONTAL	PASSED
7236.000000	57.70	767.36	55.10	2.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	29.60	30.20	31.30	-1.7	HORIZONTAL	PASSED
7236.000000	40.90	110.92	38.30	2.6	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
38.176353	26.10	20.18	41.10	-15.0	VERTICAL	PASSED
73.548497	21.90	12.45	47.40	-25.5	HORIZONTAL	PASSED
74.269940	22.10	12.74	47.60	-25.5	HORIZONTAL	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4884.761523	49.20	288.40	51.00	-1.8	HORIZONTAL	PASSED
4885.767535	49.50	298.54	51.30	-1.8	HORIZONTAL	PASSED
7324.149299	61.50	1 188.50	58.50	3.0	VERTICAL	PASSED
7328.153307	60.60	1 071.52	57.60	3.0	VERTICAL	PASSED
7345.197395	56.00	630.96	52.80	3.2	VERTICAL	PASSED
17900.293587	53.10	451.86	33.40	19.7	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4881.261523	34.00	50.12	35.80	-1.8	HORIZONTAL	PASSED
4883.767535	35.10	56.89	36.90	-1.8	HORIZONTAL	PASSED
7324.149299	45.70	192.75	42.70	3.0	VERTICAL	PASSED
7324.153307	46.20	204.17	43.20	3.0	VERTICAL	PASSED
7344.697395	37.10	71.61	33.90	3.2	VERTICAL	PASSED
17897.293587	40.50	105.93	20.90	19.6	HORIZONTAL	PASSED

Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	43.60	151.36	45.40	-1.8	HORIZONTAL	PASSED
7386.000000	51.00	354.81	47.50	3.5	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	30.30	32.73	32.10	-1.8	HORIZONTAL	PASSED
7386.000000	37.10	71.61	33.60	3.5	HORIZONTAL	PASSED

11. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-356 DUT 41449
Accessories with DUT numbers	BL-5J DUT 41453, AC-8E DUT 41451, AD-54 DUT 41045, HS-45 DUT 41046
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 41 / 102.3
Date of measurements	22-Apr-2008
Measured by	Jari Jantunen

11.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-GEN as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

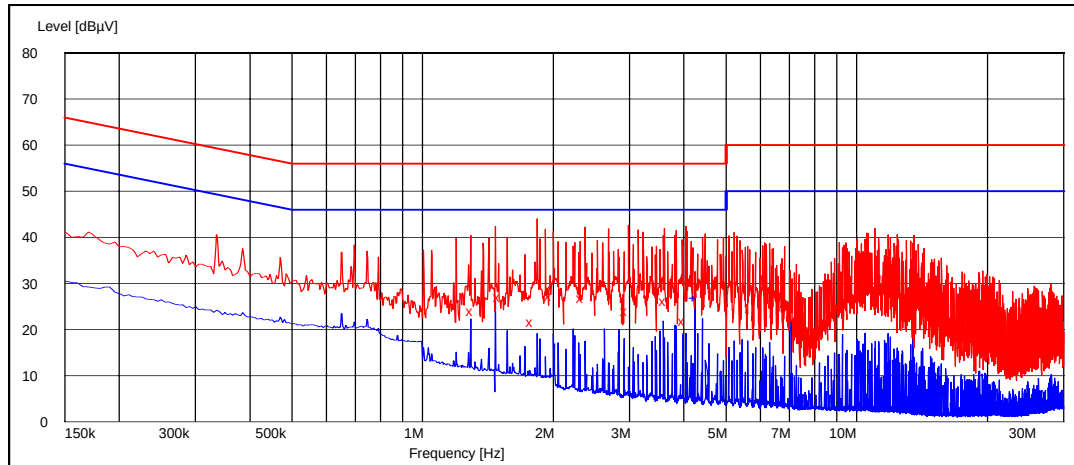
CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

11.2. WLAN Test results

11.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

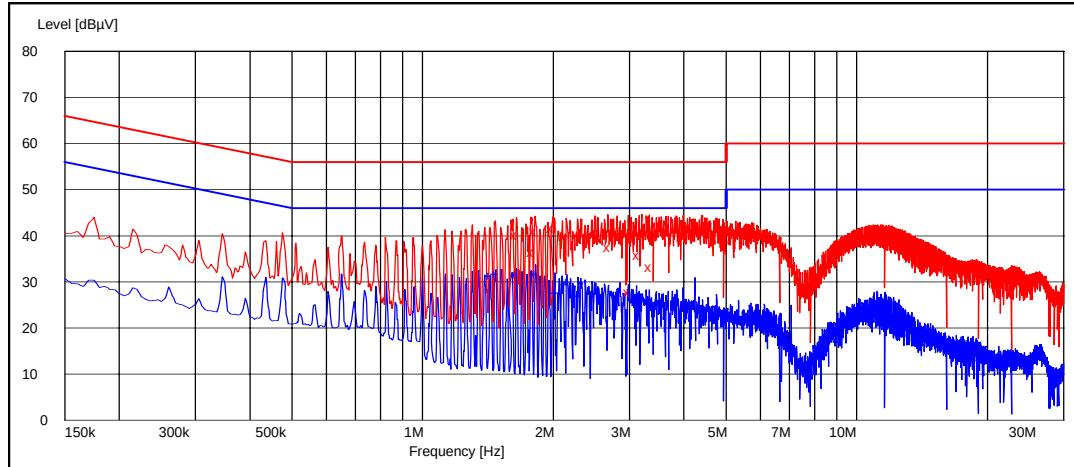
Frequency [MHz]	U [dBμV]	Line	Result
1.300000	24.10	L1	PASSED
1.505000	27.10	L1	PASSED
1.790000	21.70	L1	PASSED
1.970000	27.20	L1	PASSED
2.340000	26.80	L1	PASSED
2.955000	24.00	L1	PASSED
3.625000	26.20	L1	PASSED
4.010000	21.80	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
4.240000	26.80	L1	PASSED

11.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.645000	40.10	L1	PASSED
1.795000	36.40	L1	PASSED
1.820000	40.90	L1	PASSED
1.995000	41.70	L1	PASSED
2.695000	37.60	L1	PASSED
3.000000	27.80	N	PASSED
3.160000	35.80	L1	PASSED
3.355000	33.20	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.435000	31.30	L1	PASSED
1.480000	31.80	L1	PASSED
1.650000	31.50	L1	PASSED
1.825000	31.70	L1	PASSED
2.035000	27.60	L1	PASSED
2.135000	29.50	N	PASSED
2.170000	29.90	L1	PASSED
2.300000	26.90	L1	PASSED

12. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 100.1
Date of measurements	10-Apr-2008
Measured by	Petteri Suni

12.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for 6 dB bandwidth measurements

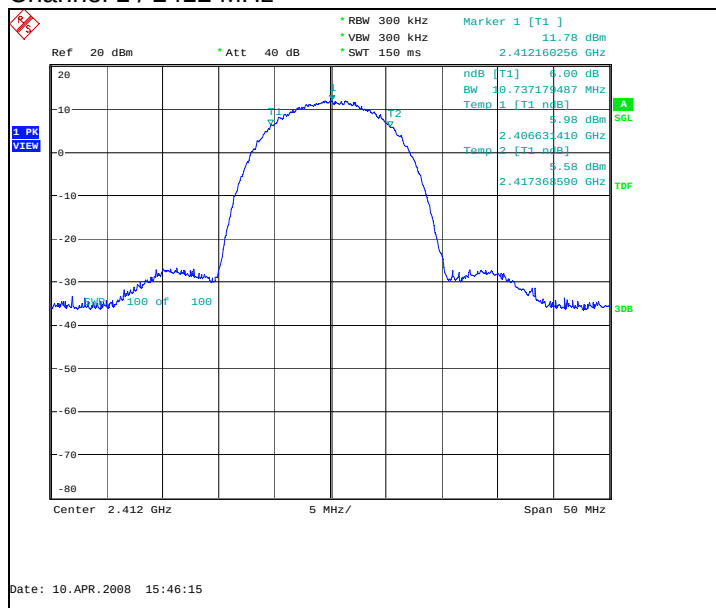
Limit [kHz]
≥ 500

12.2. WLAN test results

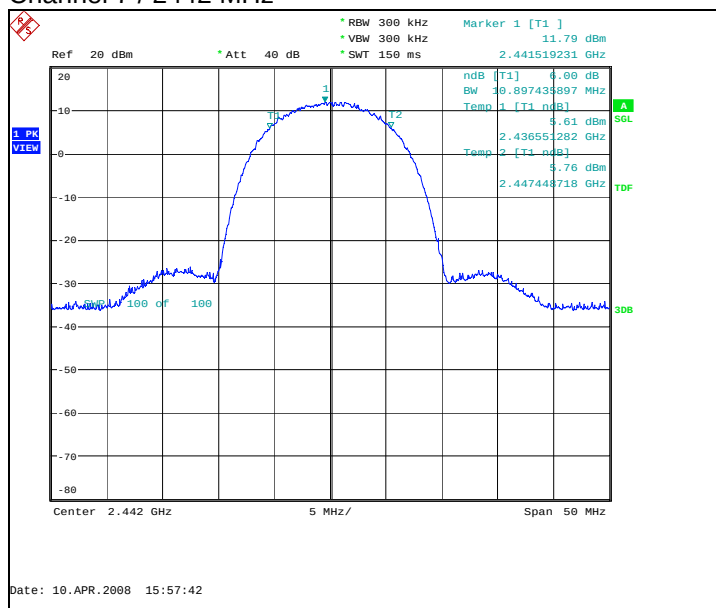
12.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1	10737.179	PASSED
7	10897.436	PASSED
11	10737.179	PASSED

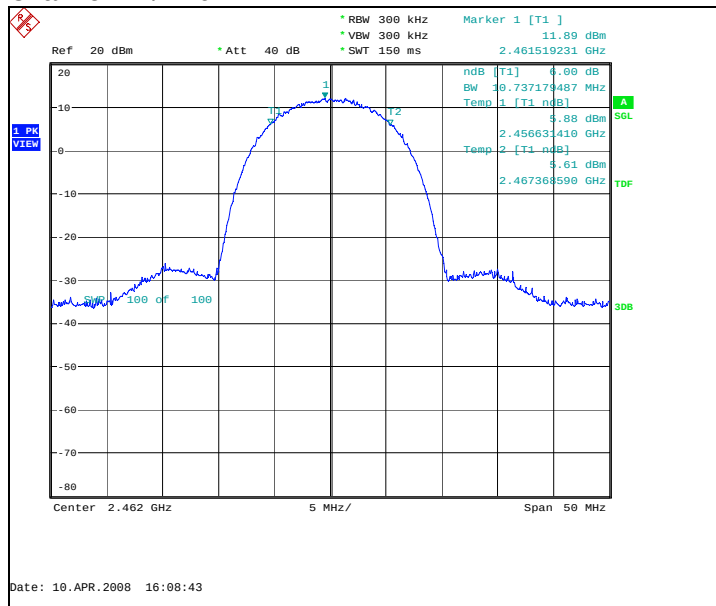
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



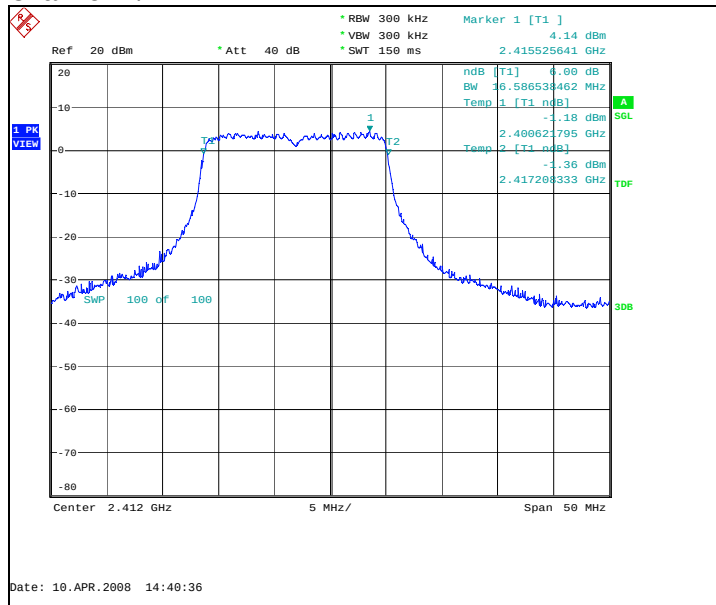
Channel 11 / 2462 MHz



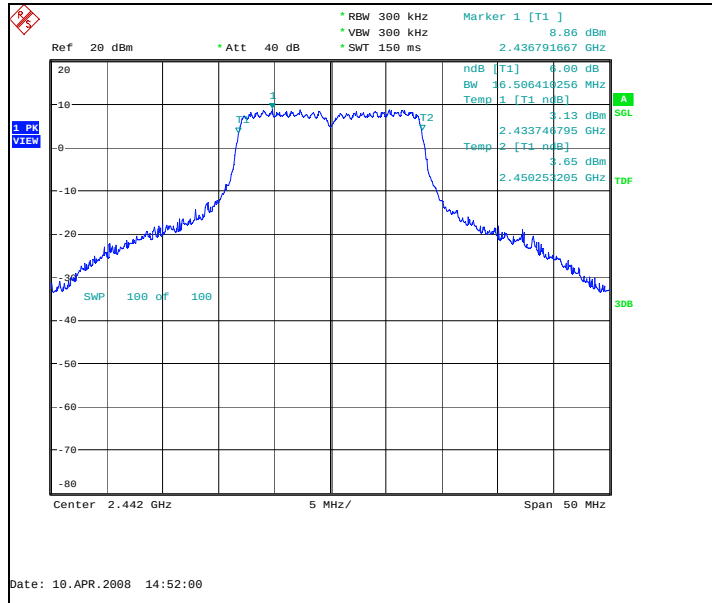
12.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1	16586.538	PASSED
7	16506.410	PASSED
11	16506.410	PASSED

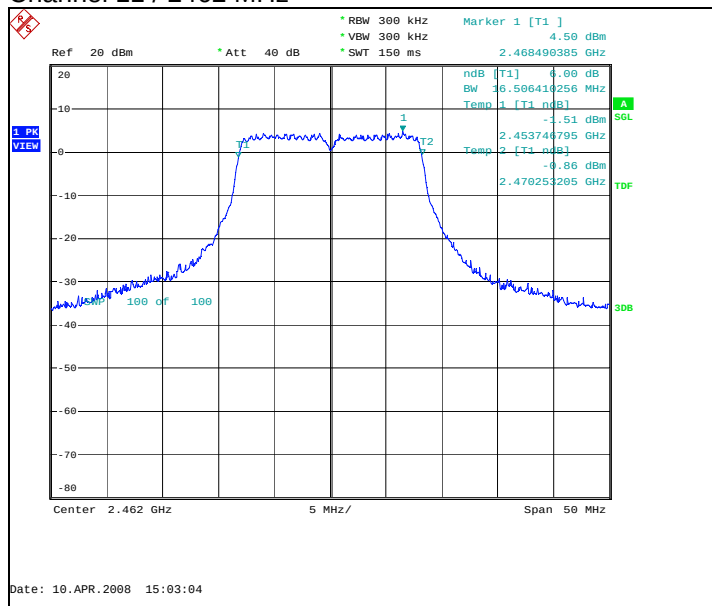
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-356 DUT 41450
Accessories with DUT numbers	BL-5J DUT 41454 / AC-8E DUT 41458 / AD-54 DUT 41045 / HS-45 DUT 41046
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 100.1
Date of measurements	10-Apr-2008
Measured by	Petteri Suni

13.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for power spectral density measurements

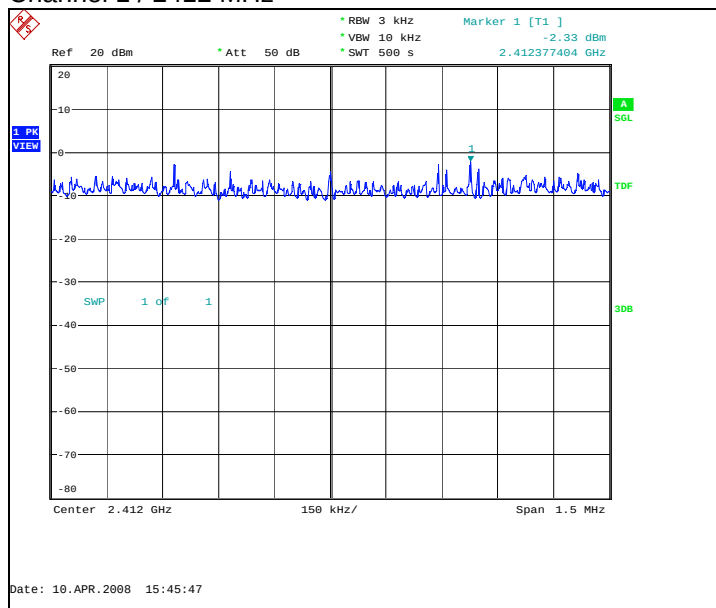
Limit [dBm] @ 3 kHz
≤ 8

13.2. WLAN test results

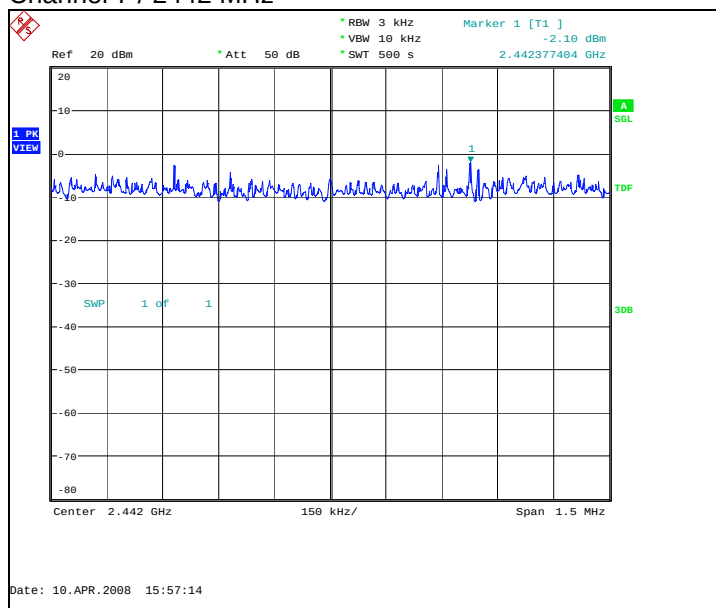
13.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-2.33	PASSED
7 / 2442	-2.10	PASSED
11 / 2462	-2.56	PASSED

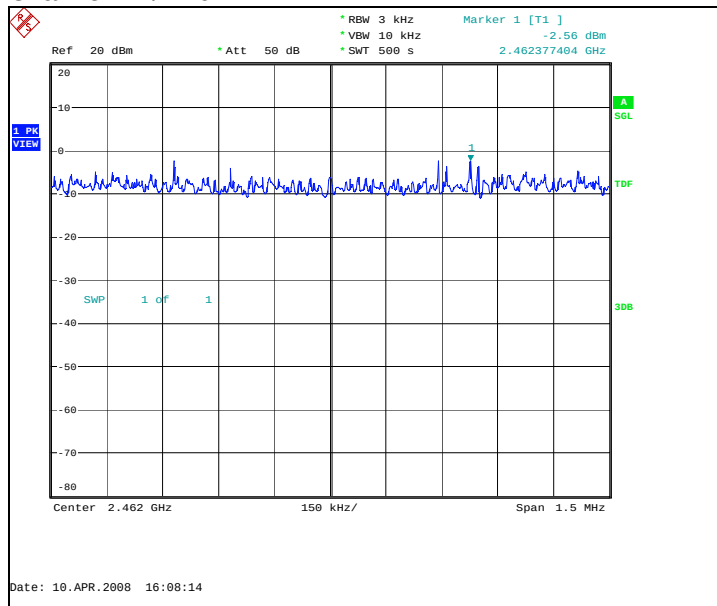
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



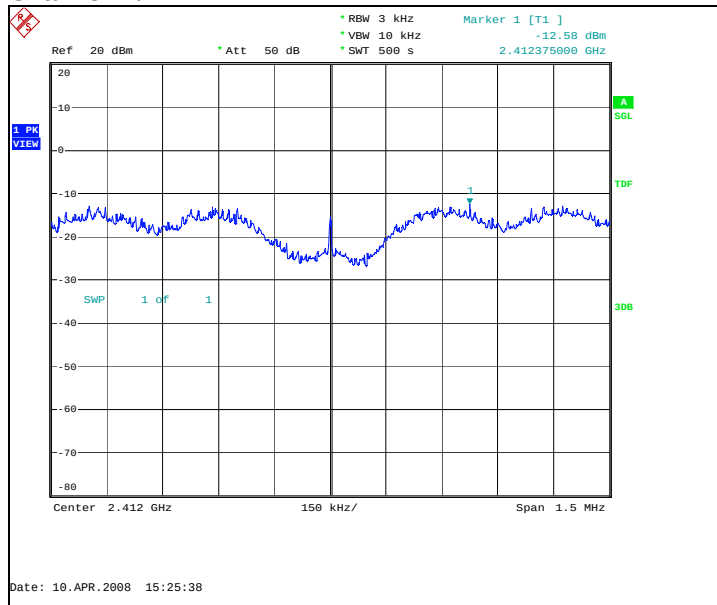
Channel 11 / 2462 MHz



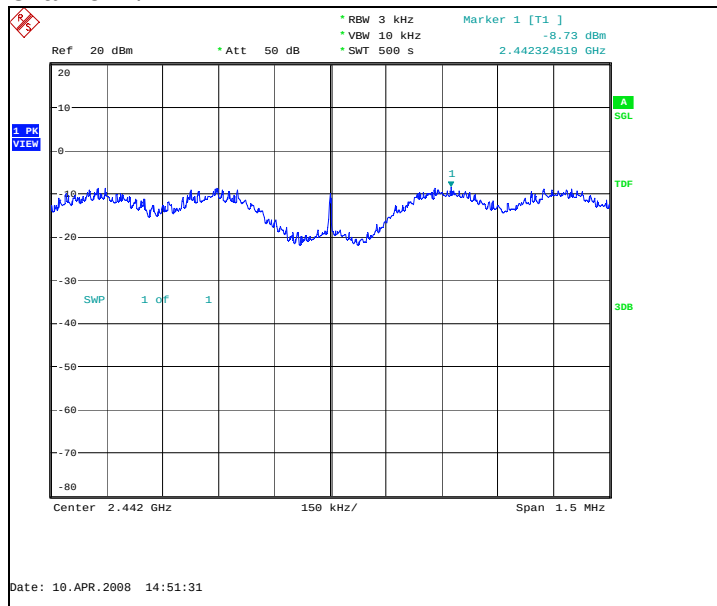
13.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-12.58	PASSED
7 / 2442	-8.73	PASSED
11 / 2462	-13.02	PASSED

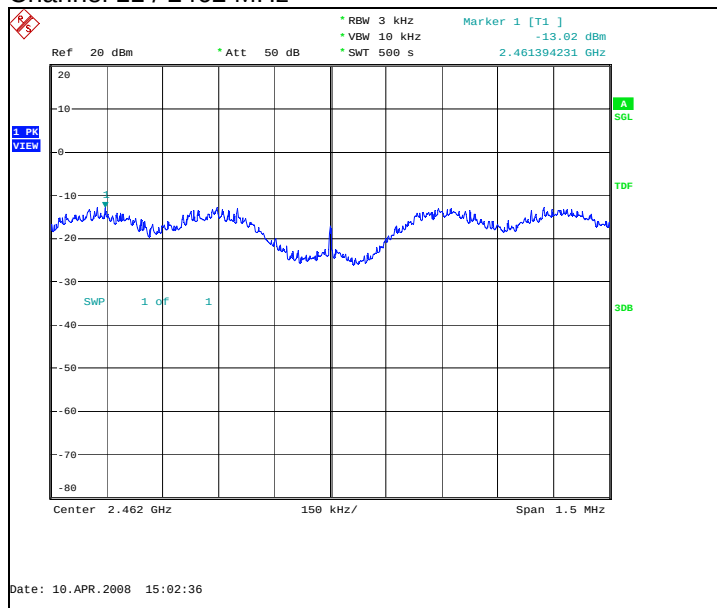
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



14. Test Equipment

14.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30597	Power splitter	11667A	Agilent	22/24/27, 15C
TM37499	Power splitter	11667A	Agilent	22/24/27, 15C
TM38111	Multimeter	34401A	Agilent	22/24/27, 15C
TM38112	DC power supply	6632A	Agilent	22/24/27, 15C
TM22901	Attenuator	8496A	Agilent	22/24/27, 15C
TM30636	Artificial mains net	L2-16	PMM	15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum analyzer	FSU	R&S	22/24/27, 15C
TM22835	Multimeter	87	Fluke	15C, 15B
TM37500	Microwave switch system	7116-MSW	Keithley	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transmatic	22/24/27, 15C, 15B
	Temperature chamber	VT4002	Vötsch	22/24/27, 15C
2058	EMI Test receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

14.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24/27, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24/27, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24/27, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24/27, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24/27, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24/27, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24/27
TM37502	Dipole antenna	3125-1880	EMCO	22/24/27
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24/27
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24/27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Mast/Turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24/27, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24/27, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transmatic	22/24/27, 15C, 15B
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B