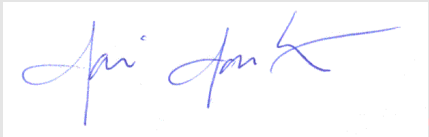
FCC Part 15B Compliance Test Report

Test Report no.:	Tre_FCC_0604_04.doc	**Date of Report:**	6.3.2006
Number of pages:	23	**Customer's Contact person:**	Robert Binder
Testing laboratory:	TCC Nokia Tampere Laboratory P.O. Box 68 Sinitaival 5 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880	**Client:**	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.: **IC recognition no.:**	94436 3608		
Tested devices/ accessories:	**GSM phone RM-55 / Battery BP-6M, AC charger AC-4, Headset HS-23, Memory card MU-17, Data cable CA-53, Video cable CA-64U, Laptop IBM Thinkpad T22, AC adapter 02K6543, Printer HP deskjet 1600CC3540A, Digital camera FUJI DS-7, Serial cable for camera, Parallel cable for printer, LCD display Dell 2001FP, Audio set Dell AS500, AC adapter Dell ADp-90FP**		
FCC ID:	QVVRM-55	**IC:**	661AE-RM55
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), ICES-003, CISPR 22 and IC standards RSS-132, RSS-133 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:	 Digitally signed by Jari Jantunen DN: CN = Jari Jantunen, C = FI, O = TCC Nokia Tampere, OU = TCC Nokia Date: 2006.03.06 15:01:22 +02'00'		

Jari Jantunen, System Manager

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	23.1.2006
Testing completed	6.3.2006
The customer's contact person	Robert Binder
Test Plan referred to	\EMC\TESTPLAN\
Notes	-
Document name	T:\Projects\RM-55\EMC\Results\FCC\Tre_FCC_0604_04.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. GSM band is tested in idle mode. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
GSM phone	RM-55	004400801722214	4002	-	2.0551.0	40510
GSM phone	RM-55	004400801727957	4100	-	02.0.026	40547
Headset	HS-23	-	-	-	-	40513
Battery	BP-6M	-	-	-	-	40511
AC-Charger	AC-4	-	-	-	-	40512
Memory Card	MU-17	-	-	-	-	40516
Data cable	CA-53	-	-	-	-	40514
Video cable	CA-64U	-	-	-	-	40515
Laptop	IBM Thinkpad T22	555V2PT	-	-	-	40201
AC Adapter	02K6543	-	-	-		40202
Printer	HP deskjet 1600CC3540A	USB8302546	-	-	-	40077
Digital camera	FUJI DS-7	7102516	-	-	-	40076
Serial cable for camera	-	-	-	-	-	40088
Parallel cable for printer	-	-	-	-	-	40087
LCD display	Dell 2001FP	-	-	-	-	40561
Audio Set	Dell AS500	-	-	-	-	40562
AC adapter	Dell ADP-90FB	-	-	-	-	40563

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1.2. Summary of Test Results

GSM 1900:

Section in CFR 47	Section in ICES-003 (RSS-133)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	PASSED
15.109, a	5.5 (9)	Radiated emissions	PASSED

Bluetooth:

Section in CFR 47	Section in ICES-003	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP
15.109, a	5.5	Radiated emissions	PASSED

WLAN:

Section in CFR 47	Section in ICES-003	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP
15.109, a	5.5	Radiated emissions	PASSED

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

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CONTENTS

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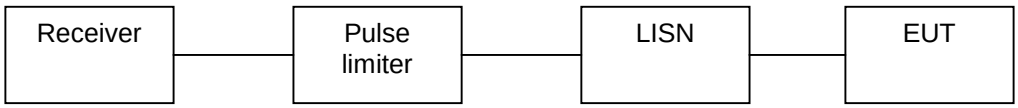
2. AC powerline conducted emissions, GSM 1900 idle mode + computer peripherals

(FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-55 DUT 40510
Accessories with DUT numbers	BP-6M DUT 40511, AC-4 DUT 40512, MU-17 DUT 40516, CA-53 DUT 40514, IBM Thinkpad T22 DUT 40201, 02K6543 DUT 40202, HP deskjet 1600CC3540A DUT 40077, FUJI DS-7 DUT 40076, Serial cable for camera DUT 40088, Parallel cable for printer DUT 40087
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 100.9
Date of measurements	27.2.2006
Measured by	Jari Jantunen

2.1. Test setup



2.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 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

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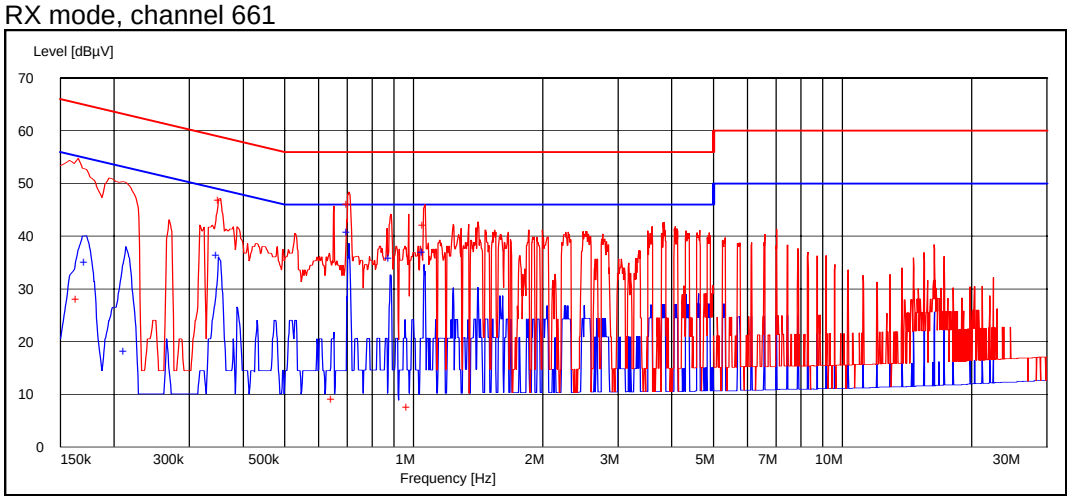
2.3. GSM 1900 Test results

RX mode, channel 661



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.164830	28.00	N	PASSED
0.353908	46.90	N	PASSED
0.650501	9.10	N	PASSED
0.706112	46.10	L1	PASSED
0.973046	7.60	N	PASSED
1.062024	42.10	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.172244	35.10	N	PASSED
0.213026	18.20	N	PASSED
0.350200	36.40	N	PASSED
0.706112	40.70	N	PASSED
0.884068	35.90	N	PASSED
1.058317	37.00	N	PASSED

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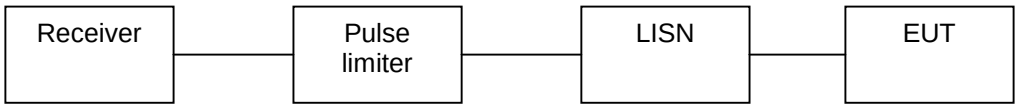
3. AC powerline conducted emissions, GSM 1900 idle mode + Video

(FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-55 DUT 40547
Accessories with DUT numbers	BP-6M DUT 40511, AC-4 DUT 40512, MU-17 DUT 40516, CA-64U DUT 40515, Dell 2001FP DUT 40561, Dell AS500 DUT 40562, Dell ADP-90FP DUT 40563
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous video transfer was active between the phone and the display during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 45 / 100.3
Date of measurements	6.3.2006
Measured by	Jari Jantunen

3.1. Test setup



3.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 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

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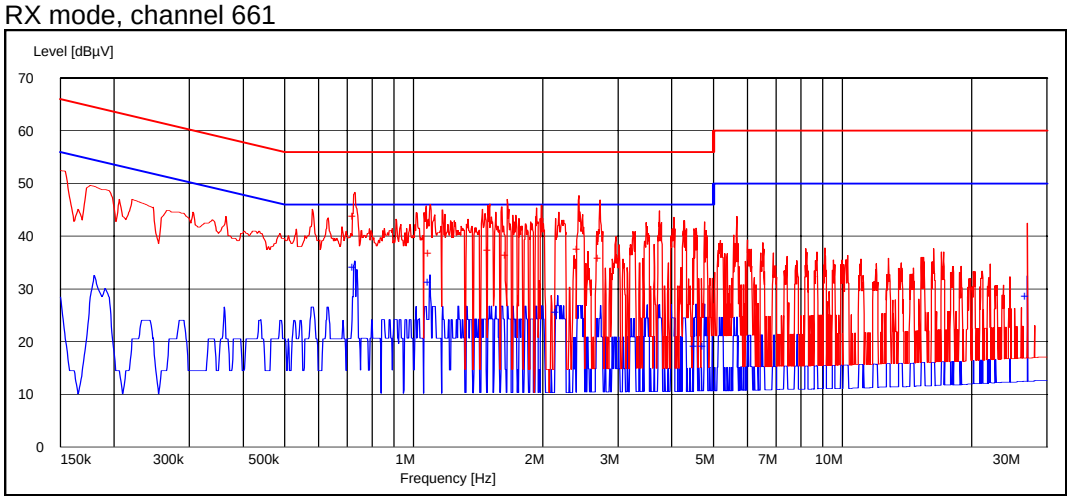
3.3. GSM 1900 Test results

RX mode, channel 661



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.728357	43.80	L1	PASSED
1.095391	36.80	L1	PASSED
1.503206	37.40	L1	PASSED
1.655210	36.40	N	PASSED
2.426854	37.60	L1	PASSED
2.721443	35.80	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.728357	34.10	L1	PASSED
1.091683	31.30	L1	PASSED
2.168337	25.70	L1	PASSED
4.555110	19.20	L1	PASSED
4.765531	19.10	L1	PASSED
26.993988	28.70	L1	PASSED

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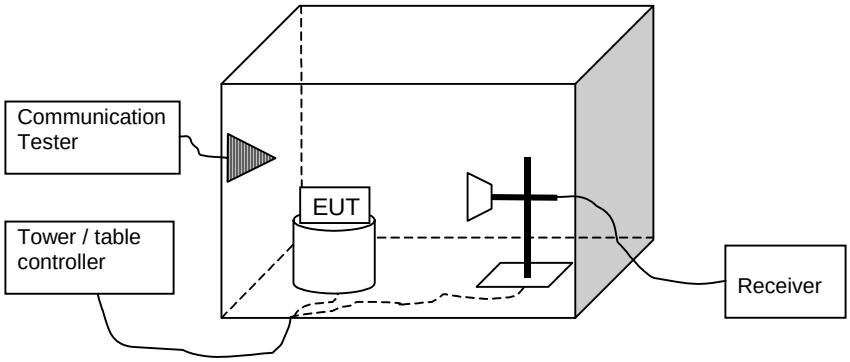
4. Radiated emissions, GSM 1900 idle mode + computer peripherals

(FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	RM-55 DUT 40510
Accessories with DUT numbers	BP-6M DUT 40511, AC-4 DUT 40512, MU-17 DUT 40516, CA-53 DUT 40514, IBM Thinkpad T22 DUT 40201, 02K6543 DUT 40202, HP deskjet 1600CC3540A DUT 40077, FUJI DS-7 DUT 40076, Serial cable for camera DUT 40088, Parallel cable for printer DUT 40087
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 46 / 102.1
Date of measurements	26.1.2005
Measured by	Jari Jantunen

4.1. Test setup



4.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.
The EUT is placed on a nonconductive plate at 80 cm height.

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.

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

The measurement results are obtained as described below:

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

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

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBµV/m]	Average limit [dBµV/m]	Peak limit [dBµV/m]
30 - 230	40	-	-
230 - 1000	47	-	-
Above 1000	-	54	74

4.3. GSM 1900 Test results

RX mode, channel 512

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3860.000000	41.00	112.20	43.30	-2.30	HORIZONTAL	PASSED
7720.000000	46.60	213.80	42.40	4.20	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3860.000000	27.60	23.99	29.90	-2.30	HORIZONTAL	PASSED
7720.000000	33.40	46.77	29.20	4.20	HORIZONTAL	PASSED

RX mode, channel 661

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
59.879158	19.20	9.12	58.90	-39.70	HORIZONTAL	PASSED
598.396393	27.30	23.17	53.70	-26.40	VERTICAL	PASSED
637.776553	23.20	14.45	49.20	-26.00	VERTICAL	PASSED
859.719439	19.70	9.66	42.80	-23.10	VERTICAL	PASSED
895.089579	28.90	27.86	51.40	-22.50	VERTICAL	PASSED
923.445691	20.70	10.84	42.60	-21.90	HORIZONTAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3920.000000	40.90	110.92	42.90	-2.00	HORIZONTAL	PASSED
7840.000000	46.40	208.93	41.80	4.60	HORIZONTAL	PASSED

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Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3920.000000	27.70	24.27	29.70	-2.00	HORIZONTAL	PASSED
7840.000000	33.70	48.42	29.10	4.60	VERTICAL	PASSED

RX mode, channel 810

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3980.000000	44.10	160.32	45.80	-1.70	HORIZONTAL	PASSED
7960.000000	46.90	221.31	42.10	4.80	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3980.000000	28.40	26.30	30.10	-1.70	HORIZONTAL	PASSED
7960.000000	33.90	49.55	29.10	4.80	HORIZONTAL	PASSED

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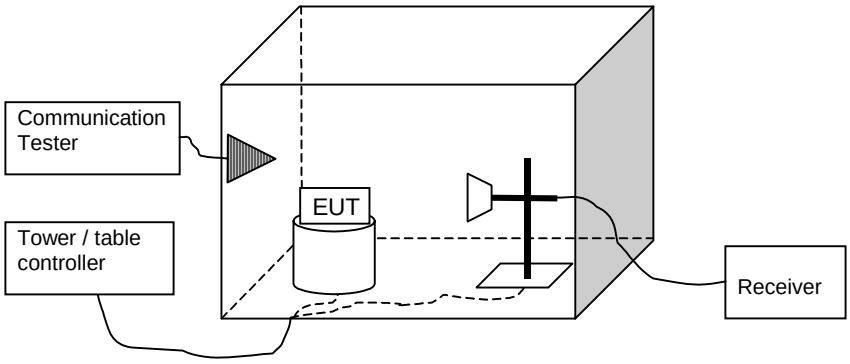
5. Radiated emissions, GSM 1900 idle mode + Video

(FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	RM-55 DUT 40547
Accessories with DUT numbers	BP-6M DUT 40511, AC-4 DUT 40512, MU-17 DUT 40516, CA-64U DUT 40515, Dell 2001FP DUT 40561, Dell AS500 DUT 40562, Dell ADP-90FP DUT 40563
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous video transfer was active between the phone and the display during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 44 / 100.9
Date of measurements	3.3.2005
Measured by	Jari Jantunen

5.1. Test setup



5.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.
The EUT is placed on a nonconductive plate at 80 cm height.

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.

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The measurement results are obtained as described below:

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

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

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBµV/m]	Average limit [dBµV/m]	Peak limit [dBµV/m]
30 - 230	40	-	-
230 - 1000	47	-	-
Above 1000	-	54	74

5.3. GSM 1900 Test results

RX mode, channel 512

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3860.000000	40.20	102.33	42.90	-2.70	HORIZONTAL	PASSED
7720.000000	43.10	142.89	39.90	3.20	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3860.000000	27.50	23.71	30.20	-2.70	HORIZONTAL	PASSED
7720.000000	30.50	33.50	27.30	3.20	VERTICAL	PASSED

RX mode, channel 661

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3920.000000	41.50	118.85	43.80	-2.30	VERTICAL	PASSED
7840.000000	43.00	141.25	39.70	3.30	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3920.000000	27.80	24.55	30.10	-2.30	VERTICAL	PASSED
7840.000000	30.60	33.88	27.30	3.30	VERTICAL	PASSED

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RX mode, channel 810

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3980.000000	42.60	134.90	44.60	-2.00	VERTICAL	PASSED
7960.000000	44.30	164.06	40.60	3.70	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3980.000000	28.60	26.92	30.60	-2.00	VERTICAL	PASSED
7960.000000	30.80	34.67	27.10	3.70	VERTICAL	PASSED

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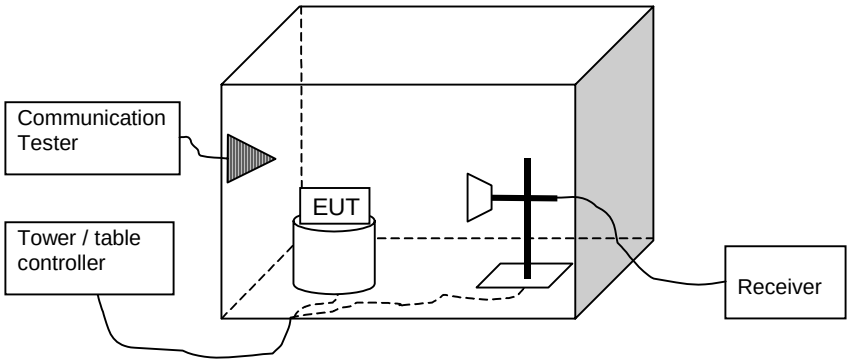
6. Radiated emissions, Bluetooth TX mode + FM radio on

(FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	RM-55 DUT 40510
Accessories with DUT numbers	BP-6M DUT 40511, AC-4 DUT 40512, HS-23 DUT 40513, MU-17 DUT 40516
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	FM radio on
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 44 / 101.5
Date of measurements	27.1.2006
Measured by	Jari Jantunen

6.1. Test setup



6.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.
The EUT is placed on a nonconductive plate at 80 cm height.

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:

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

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

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBµV/m]	Average limit [dBµV/m]	Peak limit [dBµV/m]
30 - 230	40	-	-
230 - 1000	47	-	-
Above 1000	-	54	74

6.3. Bluetooth Test results

TX mode, channel 0

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	40.70	108.39	41.00	-0.30	VERTICAL	PASSED
7206.000000	43.10	142.89	40.10	3.00	HORIZONTAL	PASSED
9608.000000	46.30	206.54	37.00	9.30	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	27.70	24.27	28.00	-0.30	VERTICAL	PASSED
7206.000000	30.10	31.99	27.10	3.00	VERTICAL	PASSED
9608.000000	33.40	46.77	24.10	9.30	HORIZONTAL	PASSED

TX mode, channel 40

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4943.891784	41.20	114.82	41.50	-0.30	VERTICAL	PASSED
4948.893788	41.30	116.14	41.50	-0.20	VERTICAL	PASSED
7330.163327	43.90	156.68	40.30	3.60	HORIZONTAL	PASSED
7350.195391	44.50	167.88	40.10	4.40	HORIZONTAL	PASSED
7381.265531	43.90	156.68	39.60	4.30	HORIZONTAL	PASSED
7418.841683	44.60	169.82	40.10	4.50	HORIZONTAL	PASSED
17938.383768	55.80	616.60	34.10	21.70	HORIZONTAL	PASSED

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Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4948.891784	28.30	26.00	28.50	-0.20	VERTICAL	PASSED
4949.893788	28.40	26.30	28.60	-0.20	VERTICAL	PASSED
7334.163327	31.10	35.89	27.30	3.80	HORIZONTAL	PASSED
7345.695391	31.50	37.58	27.20	4.30	HORIZONTAL	PASSED
7378.765531	31.60	38.02	27.30	4.30	HORIZONTAL	PASSED
7417.841683	31.80	38.90	27.30	4.50	HORIZONTAL	PASSED
17944.883768	42.70	136.46	21.00	21.70	HORIZONTAL	PASSED

TX mode, channel 78

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	49.30	291.74	49.40	-0.10	VERTICAL	PASSED
7440.000000	44.60	169.82	40.20	4.40	VERTICAL	PASSED
9920.000000	46.30	206.54	37.10	9.20	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	37.50	74.99	37.60	-0.10	VERTICAL	PASSED
7440.000000	32.30	41.21	27.90	4.40	VERTICAL	PASSED
9920.000000	33.70	48.42	24.50	9.20	HORIZONTAL	PASSED

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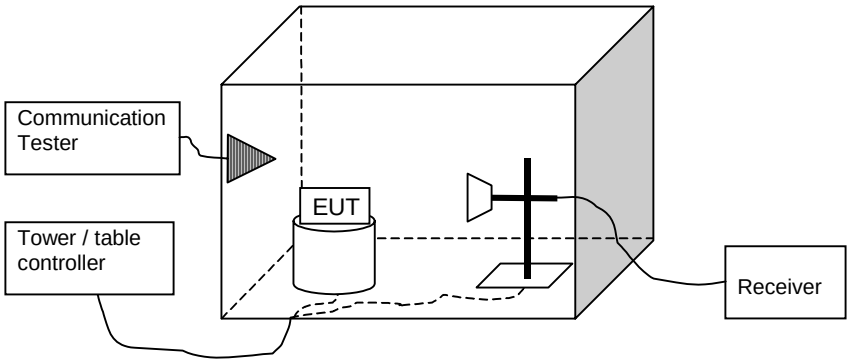
7. Radiated emissions, WLAN TX mode + FM radio on

(FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	RM-55 DUT 40547
Accessories with DUT numbers	BP-6M DUT 40511, AC-4 DUT 40512, HS-23 DUT 40513, MU-17 DUT 40516
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	FM radio on
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 43 / 100.8
Date of measurements	28.2.2006
Measured by	Jari Jantunen

7.1. Test setup



7.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.
The EUT is placed on a nonconductive plate at 80 cm height.

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:

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

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

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBµV/m]	Average limit [dBµV/m]	Peak limit [dBµV/m]
30 - 230	40	-	-
230 - 1000	47	-	-
Above 1000	-	54	74

7.3. WLAN Test results

7.3.1 DSSS mode, QPSK modulation, 5.5 Mbps data rate

TX mode, channel 1

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	41.70	121.62	43.10	-1.40	VERTICAL	PASSED
7236.000000	42.70	136.46	40.40	2.30	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	29.30	29.17	30.70	-1.40	VERTICAL	PASSED
7236.000000	29.80	30.90	27.50	2.30	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
109.299198	35.80	61.66	59.60	-23.80	VERTICAL	PASSED
127.235271	37.10	71.61	61.70	-24.60	VERTICAL	PASSED
172.343287	33.80	48.98	60.10	-26.30	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4878.257515	46.30	206.54	47.80	-1.50	VERTICAL	PASSED
4889.779559	46.50	211.35	48.10	-1.60	VERTICAL	PASSED
7264.035070	43.00	141.25	40.50	2.50	VERTICAL	PASSED
7419.337675	43.70	153.11	40.40	3.30	HORIZONTAL	PASSED
17478.449900	52.70	431.52	34.80	17.90	HORIZONTAL	PASSED
17986.979960	55.70	609.54	34.20	21.50	VERTICAL	PASSED

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Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4878.757515	38.20	81.28	39.70	-1.50	VERTICAL	PASSED
4889.279559	37.80	77.62	39.40	-1.60	VERTICAL	PASSED
7268.535070	30.40	33.11	27.80	2.60	VERTICAL	PASSED
7420.337675	30.80	34.67	27.50	3.30	HORIZONTAL	PASSED
17473.949900	38.80	87.10	20.90	17.90	HORIZONTAL	PASSED
17985.979960	42.80	138.04	21.30	21.50	VERTICAL	PASSED

TX mode, channel 11

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	42.80	138.04	44.30	-1.50	VERTICAL	PASSED
7386.000000	44.30	164.06	41.20	3.10	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	30.10	31.99	31.60	-1.50	VERTICAL	PASSED
7386.000000	30.80	34.67	27.70	3.10	VERTICAL	PASSED

7.3.2 OFDM mode, BPSK modulation, 9 Mbps data rate

TX mode, channel 1

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	44.60	169.82	46.00	-1.40	VERTICAL	PASSED
7236.000000	43.10	142.89	40.80	2.30	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	32.30	41.21	33.70	-1.40	VERTICAL	PASSED
7236.000000	29.70	30.55	27.40	2.30	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
137.794990	35.00	56.23	60.60	-25.60	VERTICAL	PASSED
172.744489	36.50	66.83	62.80	-26.30	VERTICAL	PASSED
329.858517	28.40	26.30	49.00	-20.60	VERTICAL	PASSED

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Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4886.271543	46.70	216.27	48.30	-1.60	VERTICAL	PASSED
4889.781563	45.00	177.83	46.60	-1.60	VERTICAL	PASSED
7310.619238	43.80	154.88	41.10	2.70	HORIZONTAL	PASSED
7413.827655	43.10	142.89	39.80	3.30	HORIZONTAL	PASSED
17456.417836	51.60	380.19	33.80	17.80	HORIZONTAL	PASSED
17983.967936	55.50	595.66	34.00	21.50	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4886.271543	31.90	39.36	33.50	-1.60	VERTICAL	PASSED
4888.781563	31.70	38.46	33.30	-1.60	VERTICAL	PASSED
7312.619238	30.30	32.73	27.60	2.70	HORIZONTAL	PASSED
7414.827655	30.80	34.67	27.50	3.30	HORIZONTAL	PASSED
17462.917836	38.70	86.10	20.90	17.80	HORIZONTAL	PASSED
17980.967936	42.80	138.04	21.30	21.50	VERTICAL	PASSED

TX mode, channel 11

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	45.50	188.36	47.00	-1.50	VERTICAL	PASSED
7386.000000	43.10	142.89	40.00	3.10	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	32.60	42.66	34.10	-1.50	VERTICAL	PASSED
7386.000000	30.70	34.28	27.60	3.10	VERTICAL	PASSED

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8. Test Equipment

8.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM37610	Spectrum analyzer	FSU	R&S	15C,22/24
TM37678	Radio communication tester	CMU-200	R&S	15C,22/24
	Attenuator 10 dB	6251.17.A	Huber+Suhner AG	15C,22/24
TM22901	Step attenuator 110dB	8496A	Agilent	15C,22/24
TM37499	Power splitter	11667A	Agilent	15C,22/24
	Temperature chamber	VT4002	Vötsch	15C,22/24
TM38112	DC power supply	6632A	Agilent	15C,22/24
TM38111	Multimeter	34401A	Agilent	15C,22/24
TM38845	EMI receiver	ESI 40	R&S	15B,15C
TM37773	Radio communication tester	CMU-200	R&S	15B,15C
TM38631	Signal generator	83640L	Agilent	15B,15C
TM38114	DC power supply	6632A	Agilent	15B,15C
TM22835	Multimeter	87	Fluke	15B,15C
TM30600	Pulse Limiter	ESH3-Z2	R&S	15B,15C
TM26490	LISN 50 µH	ESH3-Z5/	R&S	15B,15C
TM30636	LISN 50 µH	L2-16/	PMM	15B,15C

8.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	15B,15C, 22/24
TM38845	EMI receiver	ESI 40	R&S	15B,15C, 22/24
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	15B,15C, 22/24
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	15B,15C, 22/24
TM37516	Biconilog antenna	HL562	R&S	15B,15C, 22/24
TM26496	Double ridged waveguide antenna	3115	EMCO	15B,15C, 22/24
TM39158	Horn antenna	3116	EMCO	15B,15C, 22/24
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	15B,15C, 22/24
TM37501	Dipole antenna	3125-870	EMCO	22/24
TM37502	Dipole antenna	3125-1880	EMCO	22/24
TM37773	Radio communication tester	CMU-200	R&S	15B,15C, 22/24
TM38631	Signal generator	83640L	Agilent	15B,15C, 22/24
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	15B,15C, 22/24
	High pass filter	WHK2010-10SS	Trilithic	15B,15C, 22/24
	Low pass filter	WLK1750-10SS	Trilithic	15B,15C, 22/24
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Turntable controller	HD-100	Deisel	15B,15C, 22/24
TM26500	Turntable	DS412	Deisel	15B,15C, 22/24
TM38842	Antenna mast controller	2090	EMCO	15B,15C, 22/24
TM38843	Antenna mast	2075	EMCO	15B,15C, 22/24
TM38114	DC power supply	6632A	Agilent	15B,15C, 22/24
TM22835	Multimeter	87	Fluke	15B,15C, 22/24

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