

FCC Part 15B Compliance Test Report

Test Report no.:	Tre_FCC_0736_03.doc	Date of Report:	21.9.2007
Number of pages:	13	Customer's Contact person:	Niko Balabanis

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	Customer:	Nokia Corporation P.O. Box 300 Yrtytipellontie 6 FIN-90230 OULU, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 58300
----------------------------	---	------------------	---

FCC listing no.:	94436
IC recognition no.:	3608

Tested devices/ accessories:	Transceiver RX-44 / Battery BP-4L, AC-Charger AC-4E, Headset HS-48, Data cable CA-101, Laptop IBM Thinkpad T22, AC adapter 02K6543, Printer HP deskjet 1600CC3540A, Digital camera FUJI DS-7, Serial cable for camera, Parallel cable for printer
-------------------------------------	--

FCC ID:	LJPRX-44	IC:	661E-RX44
----------------	----------	------------	-----------

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:	
---	--

Jari Jantunen, System Manager

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	30.8.2007
Testing completed	20.9.2007
The customer's contact person	Niko Balabanis
Test Plan referred to	T:\Projects\
Notes	-
Document name	T:\Projects\accessor\RX-44\EMC\Results\FCC\Tre_FCC_0736_03.doc

1.1. EUT and Accessory Information

The EUT is a Bluetooth and WLAN device. WCDMA band is tested in idle mode. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Transceiver	RX-44	Z6A009043	0703	-	0.2007.34-9	41250
Battery	BP-4L	-	-	-	-	41248
Charger	AC-4E	-	-	-	-	41245
Headset	HS-48	-	-	-	-	41242
Data cable	CA-101	-	1.2	1.1	-	41244
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

1.2. Summary of Test Results

Bluetooth:

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

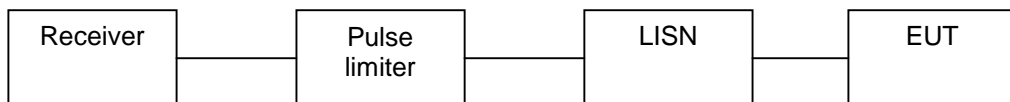
CONTENTS

1. Summary for FCC Part 15B Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results.....	2
2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3).....	4
2.1. Test setup	4
2.2. Test method and limit.....	4
2.3. Bluetooth Test results,	5
2.4. WLAN Test results	6
2.5. GPS Test results	7
3. Radiated emissions (FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)	8
3.1. Test setup	8
3.2. Test method and limit.....	8
3.3. Bluetooth Test results	9
3.4. WLAN Test results	10
3.5. Bluetooth+GPS Test Results	11
4. Test Equipment.....	13
4.1. Conducted measurements	13
4.2. Radiated measurements	13

2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RX-44 DUT 41250
Accessories with DUT numbers	BP-4L DUT 41248, AC-4E DUT 41245, HS-48 DUT 41242, CA-101 DUT 41244, 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]	21 / 48 / 99.5
Date of measurements	17.9.2007
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:

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

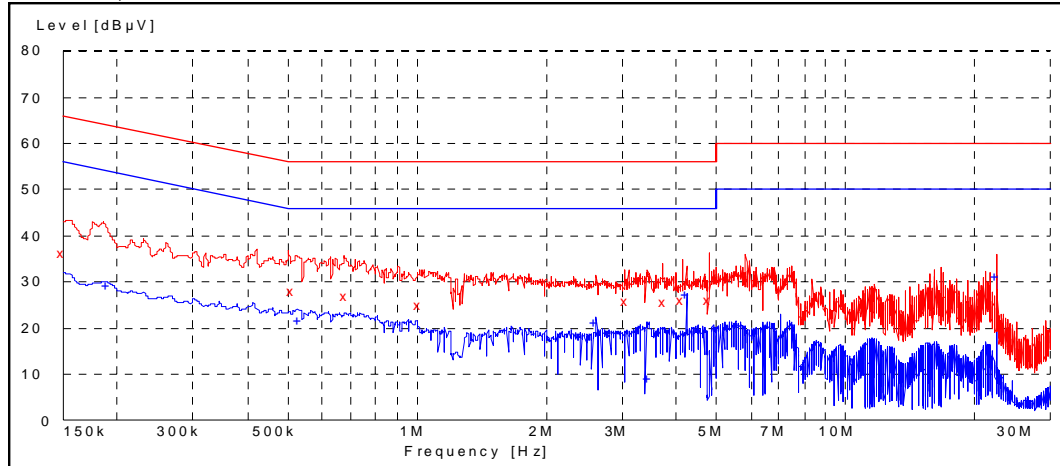
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

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

2.3. Bluetooth Test results,

TX mode, channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

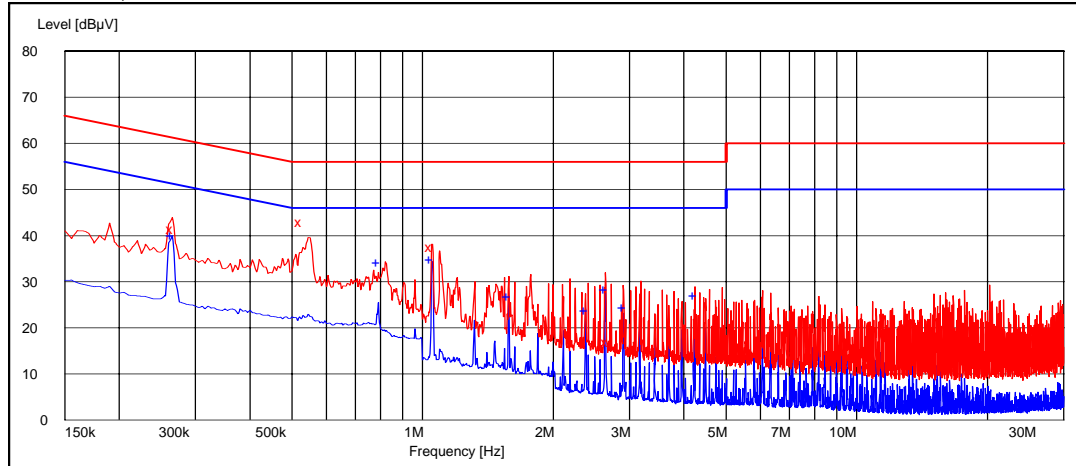
Frequency [MHz]	U [dBµV]	Line	Result
0.150000	36.40	L1	PASSED
0.515000	28.20	L1	PASSED
0.685000	27.10	L1	PASSED
1.020000	25.00	L1	PASSED
3.105000	25.90	L1	PASSED
3.790000	25.70	L1	PASSED
4.170000	26.10	L1	PASSED
4.800000	26.20	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.190000	29.20	L1	PASSED
0.530000	21.70	L1	PASSED
2.625000	21.30	N	PASSED
3.475000	9.30	N	PASSED
4.240000	27.30	L1	PASSED
22.500000	31.30	L1	PASSED

2.4. WLAN Test results

RX mode, channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

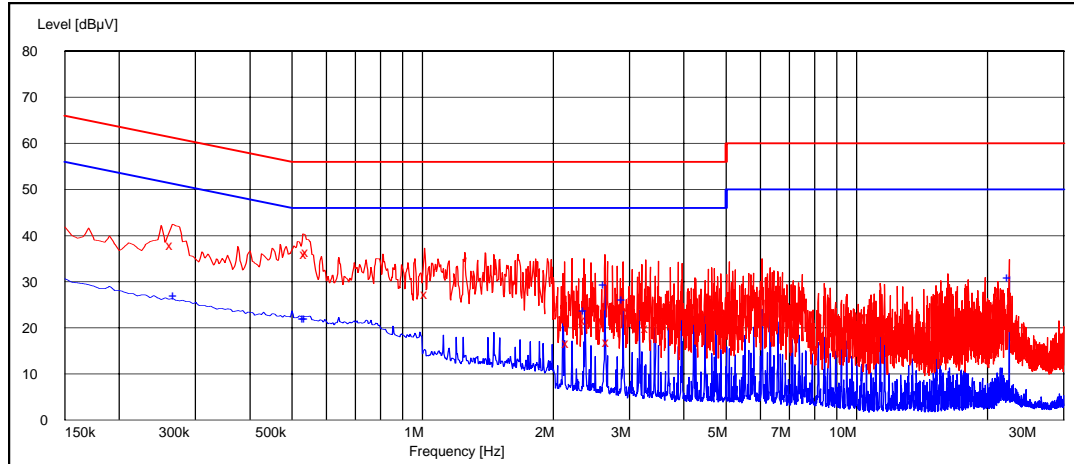
Frequency [MHz]	U [dBµV]	Line	Result
0.265000	41.50	L1	PASSED
0.525000	42.90	L1	PASSED
1.050000	37.40	L1	PASSED
2.665000	16.90	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.265000	40.20	L1	PASSED
0.790000	34.30	L1	PASSED
1.050000	34.80	L1	PASSED
1.580000	26.80	L1	PASSED
2.380000	23.90	L1	PASSED
2.645000	28.40	L1	PASSED
2.910000	24.60	L1	PASSED
4.240000	27.10	N	PASSED

2.5. GPS Test results

RX mode



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.265000	37.90	L1	PASSED
0.540000	36.00	L1	PASSED
0.545000	36.50	L1	PASSED
1.025000	27.30	L1	PASSED
2.165000	16.60	N	PASSED
2.370000	21.60	L1	PASSED
2.680000	16.80	N	PASSED
3.300000	19.90	L1	PASSED

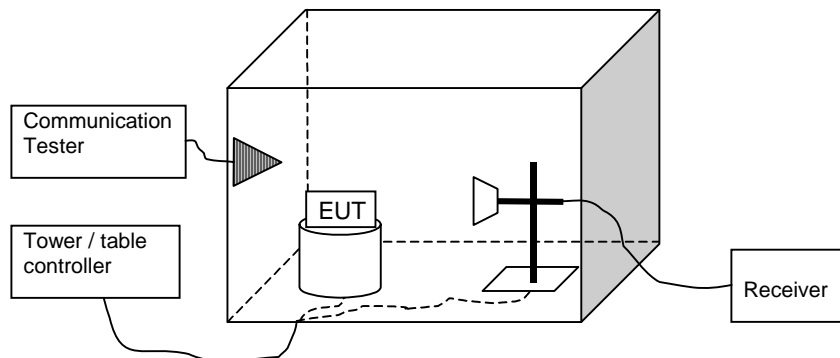
Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.270000	27.00	L1	PASSED
0.535000	22.20	L1	PASSED
0.540000	22.20	L1	PASSED
2.375000	23.80	L1	PASSED
2.640000	29.50	L1	PASSED
2.905000	26.20	L1	PASSED
22.500000	31.00	L1	PASSED

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

EUT with DUT number	RX-44 DUT 41250
Accessories with DUT numbers	BP-4L DUT 41248, AC-4E DUT 41245, HS-48 DUT 41242, CA-101 DUT 41244, 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]	20-22 / 50-53 / 99.5-101.3
Date of measurements	7-20.9.2007
Measured by	Jari Jantunen

3.1. Test setup



3.2. 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:

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

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

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

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

3.3. Bluetooth Test results

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
4804.000000	39.30	92.26	41.10	-1.8	VERTICAL	PASSED
7206.000000	41.70	121.62	39.30	2.4	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
4804.000000	26.60	21.38	28.40	-1.8	VERTICAL	PASSED
7206.000000	29.00	28.18	26.60	2.4	HORIZONTAL	PASSED

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
245.791784	30.90	35.08	53.40	-22.5	HORIZONTAL	PASSED
269.939880	30.30	32.73	52.00	-21.7	VERTICAL	PASSED

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

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
4966.933868	40.60	107.15	41.60	-1.0	HORIZONTAL	PASSED
7285.563126	43.50	149.62	40.50	3.0	HORIZONTAL	PASSED
7298.089178	42.50	133.35	39.40	3.1	VERTICAL	PASSED
7402.805611	43.20	144.54	39.50	3.7	VERTICAL	PASSED
7419.341683	43.00	141.25	39.30	3.7	HORIZONTAL	PASSED
17968.943888	55.10	568.85	33.60	21.5	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4966.433868	28.00	25.12	29.00	-1.0	HORIZONTAL	PASSED
7284.563126	30.20	32.36	27.20	3.0	HORIZONTAL	PASSED
7296.089178	30.00	31.62	26.90	3.1	VERTICAL	PASSED
7403.305611	30.40	33.11	26.70	3.7	VERTICAL	PASSED
7418.841683	30.50	33.50	26.80	3.7	HORIZONTAL	PASSED
17975.443888	42.50	133.35	21.00	21.5	HORIZONTAL	PASSED

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	40.60	107.15	41.70	-1.1	VERTICAL	PASSED
7440.000000	43.60	151.36	40.10	3.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	27.70	24.27	28.80	-1.1	VERTICAL	PASSED
7440.000000	30.20	32.36	26.70	3.5	VERTICAL	PASSED

3.4. WLAN Test results

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4824.000000	40.50	105.93	42.20	-1.7	VERTICAL	PASSED
7236.000000	43.70	153.11	41.10	2.6	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4824.000000	27.40	23.44	29.10	-1.7	VERTICAL	PASSED
7236.000000	29.70	30.55	27.10	2.6	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4955.403808	40.90	110.92	42.00	-1.1	HORIZONTAL	PASSED
7282.069138	43.20	144.54	40.20	3.0	VERTICAL	PASSED
7290.085170	43.10	142.89	40.10	3.0	VERTICAL	PASSED
7367.733467	43.10	142.89	39.80	3.3	HORIZONTAL	PASSED
7421.843687	43.90	156.68	40.20	3.7	VERTICAL	PASSED
17993.489980	55.30	582.10	33.80	21.5	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4955.903808	27.80	24.55	28.90	-1.1	HORIZONTAL	PASSED
7280.569138	30.40	33.11	27.40	3.0	VERTICAL	PASSED
7295.585170	30.20	32.36	27.10	3.1	VERTICAL	PASSED
7363.233467	30.10	31.99	26.80	3.3	HORIZONTAL	PASSED
7425.343687	30.50	33.50	26.90	3.6	VERTICAL	PASSED
17995.989980	42.60	134.90	21.10	21.5	HORIZONTAL	PASSED

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4924.000000	41.00	112.20	42.60	-1.6	HORIZONTAL	PASSED
7386.000000	43.60	151.36	40.10	3.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4924.000000	28.90	27.86	30.50	-1.6	VERTICAL	PASSED
7386.000000	30.60	33.88	27.10	3.5	VERTICAL	PASSED

3.5. Bluetooth+GPS Test Results

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4804.000000	39.20	91.20	41.00	-1.8	VERTICAL	PASSED
7206.000000	41.70	121.62	39.30	2.4	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4804.000000	26.70	21.63	28.50	-1.8	VERTICAL	PASSED
7206.000000	29.10	28.51	26.70	2.4	HORIZONTAL	PASSED

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
240.781563	25.10	17.99	47.40	-22.3	HORIZONTAL	PASSED
270.040481	29.70	30.55	51.40	-21.7	VERTICAL	PASSED

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

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4891.277555	40.60	107.15	42.20	-1.6	VERTICAL	PASSED
4963.931864	41.30	116.14	42.40	-1.1	VERTICAL	PASSED
7254.515030	42.70	136.46	40.00	2.7	VERTICAL	PASSED
7279.065130	43.30	146.22	40.30	3.0	HORIZONTAL	PASSED
7370.741483	44.30	164.06	41.00	3.3	VERTICAL	PASSED
7405.311623	43.80	154.88	40.10	3.7	HORIZONTAL	PASSED
17470.435872	51.40	371.54	33.40	18.0	VERTICAL	PASSED
17963.935872	55.40	588.84	33.90	21.5	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4891.277555	27.60	23.99	29.20	-1.6	VERTICAL	PASSED
4963.931864	28.00	25.12	29.10	-1.1	VERTICAL	PASSED
7261.015030	29.80	30.90	27.00	2.8	VERTICAL	PASSED
7284.065130	30.30	32.73	27.30	3.0	HORIZONTAL	PASSED
7367.241483	30.20	32.36	26.90	3.3	VERTICAL	PASSED
7408.811623	30.60	33.88	26.90	3.7	HORIZONTAL	PASSED
17466.935872	38.70	86.10	20.70	18.0	VERTICAL	PASSED
17970.435872	42.40	131.83	20.90	21.5	HORIZONTAL	PASSED

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	40.80	109.65	41.90	-1.1	HORIZONTAL	PASSED
7440.000000	43.20	144.54	39.70	3.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	27.70	24.27	28.80	-1.1	HORIZONTAL	PASSED
7440.000000	30.30	32.73	26.80	3.5	HORIZONTAL	PASSED

4. Test Equipment

4.1. Conducted measurements

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

4.2. Radiated measurements

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