

FCC Part 15B Compliance Test Report

Test Report no.:	Tre_FCC_0730_03.doc	Date of Report:	6.8.2007
Number of pages:	14	Customer's Contact person:	Ralph Schwarz
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FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	GSM phone RM-304 / Battery BL-4CT, AC charger AC-3E, Headset HS-45, Audio adapter AD-57, 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:	PPIRM-304	IC:	661U-RM304
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	27.7.2007
Testing completed	2.8.2007
The customer's contact person	Ralph Schwarz
Test Plan referred to	T:\Projects\
Notes	-
Document name	T:\Projects\RM-304\EMC\Results\FCC\Tre_FCC_0730_03.doc

1.1. EUT and Accessory Information

The EUT is a 3-band (GSM850/1800/1900) mobile phone with GPRS, EGPRS and Bluetooth. GSM bands are tested in idle mode. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
GSM phone	RM-304	004401012735144	0360	-	Vp pl3.06	41198
Battery	BL-4CT	-	-	-	-	41200
AC charger	AC-3E	-	-	-	-	41202
Headset	HS-45	-	-	-	-	41204
Audio adapter	AD-57	0789	0.5	0.4	-	41205
Data cable	CA-101	-	-	-	-	41206
Data cable	CA-101	-	-	-	-	41206
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

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in ICES-003 (RSS-132)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	PASSED
15.109, a	5.5 (6.6)	Radiated emissions	PASSED

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	PASSED
15.109, a	5.5	Radiated emissions	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.

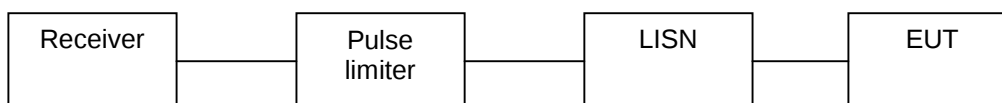
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2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-304 DUT 41198
Accessories with DUT numbers	BL-4CT DUT 41200, AC-3E DUT 41202, AD-57 DUT 41205, HS-45 DUT 41204, CA-101 DUT 41206, 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 / 51 / 101.0
Date of measurements	2.8..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:

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

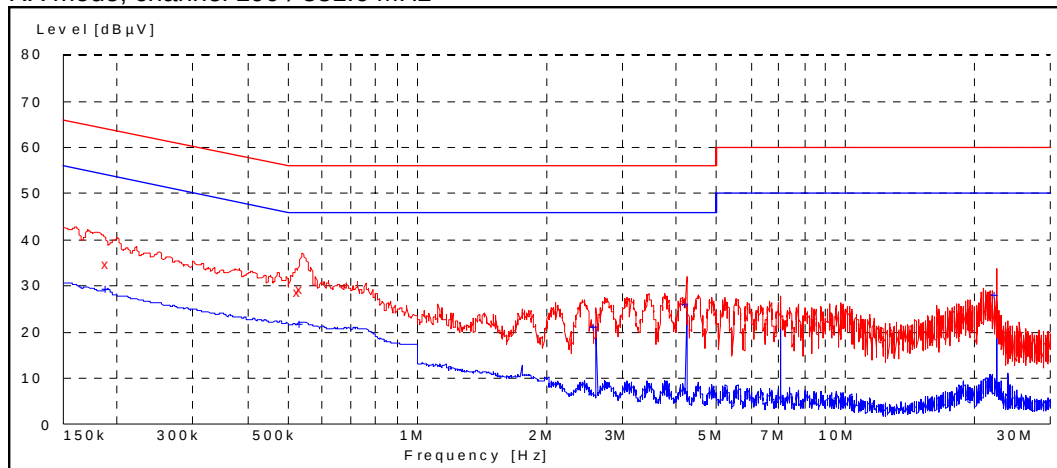
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

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

2.3. GSM 850 Test results

RX mode, channel 190 / 881.6 MHz



Quasi peak (RBW: 9 kHz)

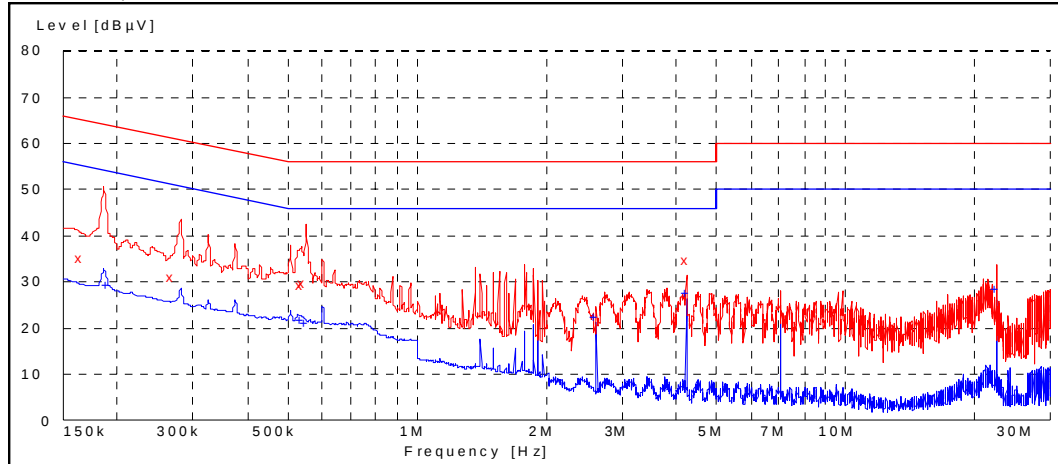
Frequency [MHz]	U [dBμV]	Line	Result
0.190000	34.60	L1	PASSED
0.530000	28.60	N	PASSED
0.535000	29.20	N	PASSED
4.240000	27.10	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.190000	29.30	N	PASSED
0.540000	21.50	L1	PASSED
2.625000	21.20	L1	PASSED
4.240000	26.20	L1	PASSED
22.500000	28.10	L1	PASSED

2.4. GSM 1900 Test results

RX mode, channel 661 / 1960.0 MHz



Quasi peak (RBW: 9 kHz)

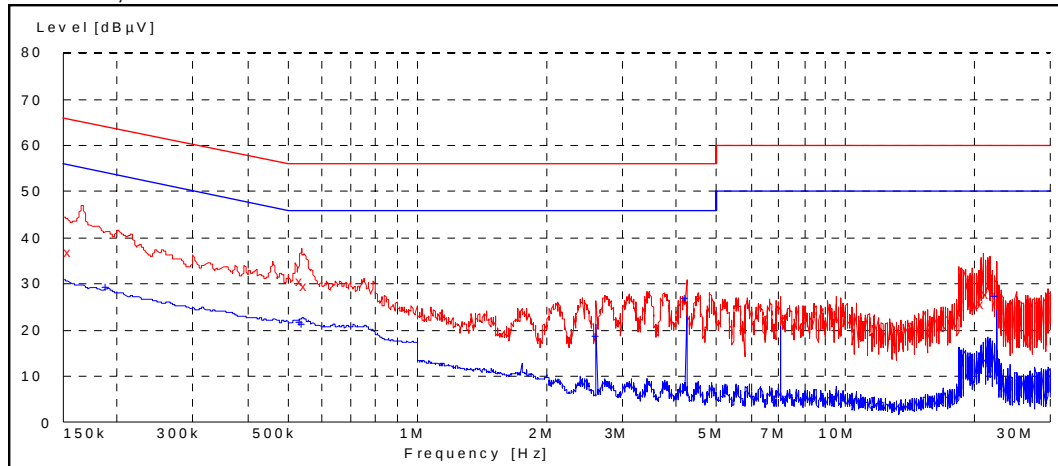
Frequency [MHz]	U [dBμV]	Line	Result
0.165000	35.30	L1	PASSED
0.270000	31.00	L1	PASSED
0.535000	29.20	N	PASSED
0.545000	29.90	L1	PASSED
4.260000	34.60	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.190000	29.20	N	PASSED
0.535000	21.50	L1	PASSED
0.550000	21.00	L1	PASSED
2.605000	22.50	L1	PASSED
4.240000	27.40	N	PASSED
22.500000	28.30	L1	PASSED

2.5. Bluetooth Test results

TX mode, channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.155000	36.80	N	PASSED
0.540000	30.60	L1	PASSED
0.550000	29.50	L1	PASSED
21.025000	25.60	L1	PASSED
21.570000	27.80	L1	PASSED

Average (RBW: 9 kHz)

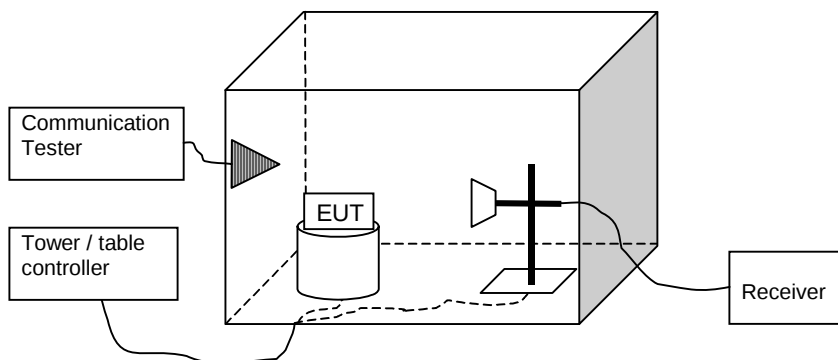
Frequency [MHz]	U [dBμV]	Line	Result
0.190000	29.20	N	PASSED
0.535000	21.50	L1	PASSED
0.545000	21.30	L1	PASSED
2.655000	18.80	N	PASSED
4.240000	26.90	N	PASSED
22.500000	27.30	N	PASSED

3. Radiated emissions

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

EUT with DUT number	RM-304 DUT 41198
Accessories with DUT numbers	BL-4CT DUT 41200, AC-3E DUT 41202, AD-57 DUT 41205, HS-45 DUT 41204, CA-101 DUT 41206, 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 / 50 / 98.5
Date of measurements	31.7.2007
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:

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

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

3.3. GSM 850 Test results

RX mode, channel 128 / 869.2 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3476.800000	38.90	88.10	44.00	-5.1	VERTICAL	PASSED
6953.600000	43.10	142.89	42.20	0.9	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3476.800000	25.80	19.50	30.90	-5.1	HORIZONTAL	PASSED
6953.600000	30.20	32.36	29.30	0.9	VERTICAL	PASSED

RX mode, channel 190 / 881.6 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
348.497796	35.50	59.57	66.60	-31.1	HORIZONTAL	PASSED
617.234469	32.50	42.17	58.40	-25.9	VERTICAL	PASSED
637.374549	34.70	54.33	60.20	-25.5	VERTICAL	PASSED
648.196593	36.10	63.83	61.00	-24.9	VERTICAL	PASSED
697.494790	38.00	79.43	62.10	-24.1	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1065.132265	25.10	17.99	45.40	-20.3	VERTICAL	PASSED
1166.332665	34.00	50.12	53.30	-19.3	VERTICAL	PASSED
1196.898798	24.50	16.79	43.80	-19.3	VERTICAL	PASSED
1205.408818	34.40	52.48	53.80	-19.4	VERTICAL	PASSED
1260.519038	37.20	72.44	55.90	-18.7	VERTICAL	PASSED
1994.483968	33.60	47.86	45.50	-11.9	VERTICAL	PASSED

RX mode, channel 251 / 893.8 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3575.200000	39.30	92.26	43.90	-4.6	VERTICAL	PASSED
7150.400000	40.80	109.65	39.30	1.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3575.200000	25.90	19.72	30.50	-4.6	VERTICAL	PASSED
7150.400000	28.20	25.70	26.70	1.5	VERTICAL	PASSED

3.4. GSM 1900 Test results

RX mode, channel 512 / 1930.2 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	40.30	103.51	42.70	-2.4	VERTICAL	PASSED
7720.000000	42.60	134.90	39.90	2.7	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	27.50	23.71	29.90	-2.4	VERTICAL	PASSED
7720.000000	29.50	29.85	26.80	2.7	VERTICAL	PASSED

RX mode, channel 661 / 1960.0 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
49.719439	34.70	54.33	69.70	-35.0	VERTICAL	PASSED
449.098196	26.00	19.95	55.00	-29.0	HORIZONTAL	PASSED
617.936473	33.30	46.24	59.20	-25.9	VERTICAL	PASSED
637.174549	34.20	51.29	59.70	-25.5	VERTICAL	PASSED
647.596593	32.30	41.21	57.20	-24.9	VERTICAL	PASSED
796.993186	36.00	63.10	59.00	-23.0	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
1959.919840	59.70	966.05	72.10	-12.4	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1166.332665	34.50	53.09	53.80	-19.3	VERTICAL	PASSED
1205.408818	33.30	46.24	52.70	-19.4	VERTICAL	PASSED
1234.466934	25.30	18.41	44.40	-19.1	VERTICAL	PASSED
1260.019038	39.10	90.16	57.80	-18.7	VERTICAL	PASSED

RX mode, channel 810 / 1989.8 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3980.000000	40.00	100.00	42.70	-2.7	HORIZONTAL	PASSED
7960.000000	43.00	141.25	39.90	3.1	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3980.000000	27.30	23.17	30.00	-2.7	VERTICAL	PASSED
7960.000000	29.70	30.55	26.60	3.1	VERTICAL	PASSED

3.5. Bluetooth Test results

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	39.20	91.20	40.90	-1.7	HORIZONTAL	PASSED
7206.000000	40.80	109.65	39.10	1.7	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	26.10	20.18	27.80	-1.7	VERTICAL	PASSED
7206.000000	28.40	26.30	26.70	1.7	HORIZONTAL	PASSED

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
38.176353	7.00	2.24	18.40	-11.4	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3984.473948	43.40	147.91	46.10	-2.7	HORIZONTAL	PASSED
4925.353707	40.90	110.92	42.20	-1.3	VERTICAL	PASSED
4948.401804	40.50	105.93	41.70	-1.2	VERTICAL	PASSED
7269.035070	42.40	131.83	40.10	2.3	HORIZONTAL	PASSED
7281.557114	42.60	134.90	40.20	2.4	VERTICAL	PASSED
7419.331663	42.50	133.35	39.70	2.8	VERTICAL	PASSED
7432.863727	42.50	133.35	39.80	2.7	HORIZONTAL	PASSED
17956.917836	55.50	595.66	34.30	21.2	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3984.973948	28.50	26.61	31.20	-2.7	HORIZONTAL	PASSED
4923.353707	27.30	23.17	28.70	-1.4	VERTICAL	PASSED
4948.901804	27.40	23.44	28.60	-1.2	VERTICAL	PASSED
7270.535070	29.60	30.20	27.30	2.3	HORIZONTAL	PASSED
7277.557114	29.70	30.55	27.30	2.4	VERTICAL	PASSED
7413.831663	29.80	30.90	27.00	2.8	VERTICAL	PASSED
7434.863727	29.50	29.85	26.80	2.7	HORIZONTAL	PASSED
17955.417836	42.30	130.32	21.10	21.2	VERTICAL	PASSED

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	40.80	109.65	42.00	-1.2	VERTICAL	PASSED
7440.000000	42.80	138.04	40.10	2.7	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	27.10	22.65	28.30	-1.2	HORIZONTAL	PASSED
7440.000000	29.50	29.85	26.80	2.7	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