

FCC Part 15B Compliance Test Report

Test Report no.:	Cph_FCC_0544_09.doc	Date of Report:	17-11-2005
Number of pages:	15	Customer's Contact person:	Stefan Emery
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FCC listing no.:	99059		
IC recognition no.:	4820 and 4820-1		
Tested devices/ accessories:	Phone; RM-92 (HW: 5020), Battery; BL-5B, AC-Charger; AC-4E, Data Cable; CA-53		
FCC ID:	QFXRM-92	IC:	661Z-RM92
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:			

Allan F. Henriksen, Engineer

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	03-11-2005
Testing completed	15-11-2005
The customer's contact person	Stefan Emery
Test Plan referred to	\\EMC\\TESTPLAN\\
Notes	None
Document name	T:\\Projects\\RM-92\\EMC\\Results\\FCC\\Cph_FCC_0544_09.doc

1.1. EUT and Accessory Information

The EUT is a five band (GSM850/900/1800/1900 and WCDMA2100) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. GSM bands are tested in idle mode. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-92	004400/68/165247/3	5020	-	1.0540.0.4	28319
Phone	RM-92	004400/68/165245/7	5020	-	1.0540.0.4	29009
Battery	BL-5B	0670455363807M183422202535	-	-	-	28315
Battery	BL-5B	0670455363807M183422202677	-	-	-	29010
AC-Charger	AC-4E	399791515712110078;0675384	1.1	-	-	28312
AC-Charger	AC-4E	3997915157121100129;0675384	-	-	-	28405
Data Cable	CA-53	EM2008882A	-	4.0	-	28313
Data Cable	CA-53	EM2008882A	-	4.0	-	29012

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	NP
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
FAILED
NP

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

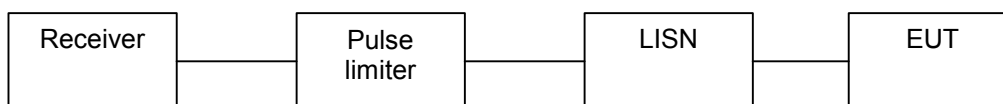
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2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-92 Dut # 28319
Accessories with DUT numbers	BL-5B Dut # 28315 + AC-4E Dut # 28312 + CA-53 Dut # 28313
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	Continuous data transfer was active between the Phone and the Computer during the Test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.8 / 41.5 1028.8
Date of measurements	08-11-2005
Measured by	Allan F. Henriksen

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:

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

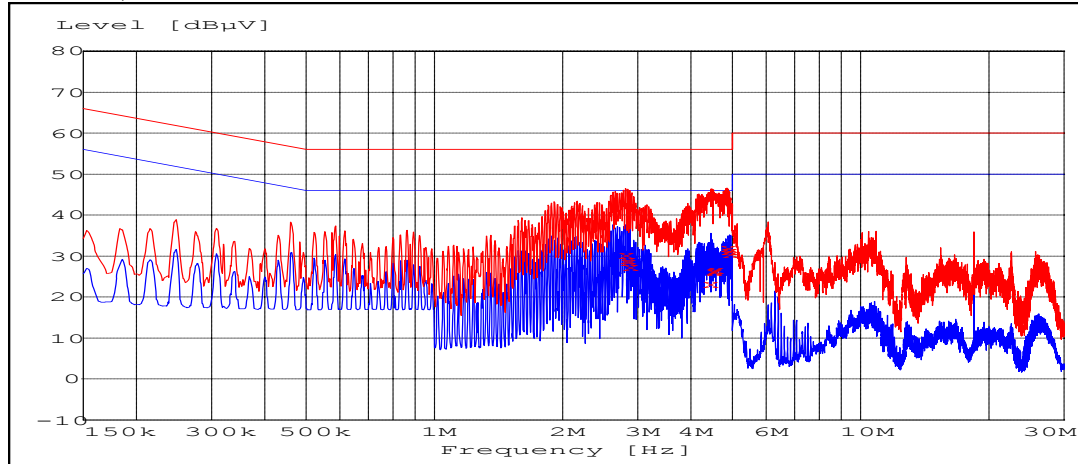
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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



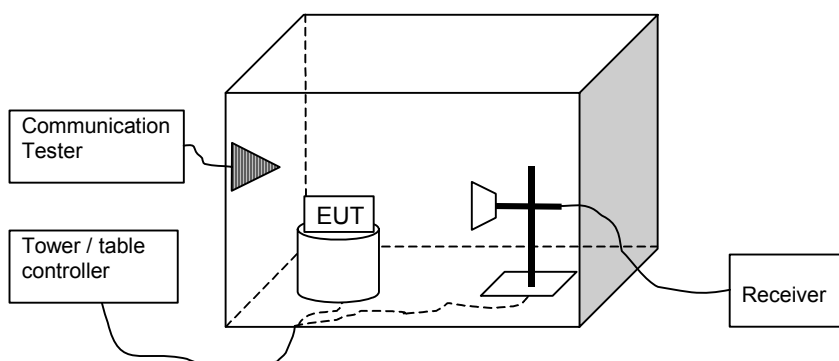
Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
2.787500	30.40	N	Passed
2.815000	29.10	L1	Passed
2.822500	28.60	L1	Passed
2.852500	27.60	N	Passed
4.405000	23.20	L1	Passed
4.490000	26.50	N	Passed
4.492500	26.30	N	Passed
4.525000	26.80	N	Passed
4.842500	32.20	N	Passed
4.867500	31.40	N	Passed
4.875000	31.30	N	Passed
4.900000	30.60	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-92 #29009
Accessories with DUT numbers	BL-5B #29010, AC-4E #28405, CA-53 #29012
Operation Voltage [V] / [Hz]	120 / 60
Result	Passed
Remarks	Continuous data transfer was active between the Phone and the Computer during the Test.
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	21.2 / 44.0 / 1023
Date of measurements	11.11.2005
Measured by	Juho Tuohino

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 below 3 GHz and 1.6 m above that.

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 [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

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3476.800000	40.24	102.80	33.74	6.50	HORIZONTAL	Passed
6953.600000	52.94	443.61	41.44	11.50	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3476.800000	26.14	20.28	19.64	6.50	HORIZONTAL	Passed
6953.600000	39.84	98.17	28.34	11.50	HORIZONTAL	Passed

RX mode, channel 190

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.314429	25.90	19.72	41.30	-15.40	VERTICAL	Passed
132.104409	24.60	16.98	47.50	-22.90	VERTICAL	Passed
257.915230	13.00	4.47	34.20	-21.20	VERTICAL	Passed
389.980361	37.20	72.44	54.20	-17.00	VERTICAL	Passed
875.951503	50.80	346.74	58.40	-7.60	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2295.091182	38.90	88.10	31.30	7.60	VERTICAL	Passed
2906.809619	39.10	90.16	27.00	12.10	VERTICAL	Passed
6700.900802	29.04	28.31	17.54	11.50	HORIZONTAL	Passed
6947.399800	31.14	36.06	19.64	11.50	VERTICAL	Passed
7472.945892	26.84	21.98	13.74	13.10	VERTICAL	Passed
7825.147295	27.44	23.55	14.04	13.40	HORIZONTAL	Passed

RX mode, channel 251

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3575.200000	39.54	94.84	32.94	6.60	VERTICAL	Passed
7150.400000	44.04	159.22	32.04	12.00	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3575.200000	26.24	20.51	19.64	6.60	VERTICAL	Passed
7150.400000	31.64	38.19	19.64	12.00	VERTICAL	Passed

3.4. 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	40.54	106.41	32.84	7.70	VERTICAL	Passed
7720.000000	44.74	172.58	32.04	12.70	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	27.54	23.82	19.84	7.70	VERTICAL	Passed
7720.000000	31.44	37.33	18.74	12.70	VERTICAL	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
37.033467	26.30	20.65	41.50	-15.20	VERTICAL	Passed
134.849699	28.10	25.41	51.30	-23.20	VERTICAL	Passed
797.495190	22.30	13.03	31.00	-8.70	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
7840.179359	42.24	129.42	29.04	13.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1959.921844	45.90	197.24	41.40	4.50	VERTICAL	Passed
2295.091182	38.30	82.22	30.70	7.60	VERTICAL	Passed

2905.309619	39.10	90.16	26.90	12.20	VERTICAL	Passed
6703.400802	29.04	28.31	17.64	11.40	HORIZONTAL	Passed
6948.399800	31.14	36.06	19.64	11.50	VERTICAL	Passed
7423.845691	26.84	21.98	13.94	12.90	VERTICAL	Passed
7840.179359	28.44	26.42	15.24	13.20	VERTICAL	Passed

RX mode, channel 810

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
3980.000000	39.74	97.05	31.94	7.80	HORIZONTAL	Passed
7960.000000	45.24	182.81	32.04	13.20	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
3980.000000	27.24	23.01	19.44	7.80	VERTICAL	Passed
7960.000000	32.14	40.46	18.94	13.20	VERTICAL	Passed

3.5. Bluetooth Test results

RX mode, channel 0

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
37.014429	24.50	16.79	39.70	-15.20	VERTICAL	Passed
362.324248	18.60	8.51	36.60	-18.00	VERTICAL	Passed
725.148898	18.30	8.22	28.10	-9.80	VERTICAL	Passed
831.261323	19.00	8.91	26.90	-7.90	VERTICAL	Passed
831.965331	19.70	9.66	27.60	-7.90	VERTICAL	Passed
865.131463	18.70	8.61	26.50	-7.80	HORIZONTAL	Passed

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
3917.839679	35.84	61.94	28.04	7.80	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
2295.091182	38.10	80.35	30.50	7.60	VERTICAL	Passed
2901.809619	38.90	88.10	26.90	12.00	VERTICAL	Passed
3916.339679	22.14	12.79	14.34	7.80	HORIZONTAL	Passed
6947.895792	31.14	36.06	19.64	11.50	VERTICAL	Passed
7472.443888	26.84	21.98	13.74	13.10	HORIZONTAL	Passed
7823.147295	27.44	23.55	14.04	13.40	HORIZONTAL	Passed

RX mode, channel 40

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
36.692986	27.20	22.91	42.30	-15.10	VERTICAL	Passed
364.931463	15.00	5.62	33.00	-18.00	HORIZONTAL	Passed
728.758918	17.10	7.16	26.90	-9.80	VERTICAL	Passed
739.878958	17.00	7.08	26.60	-9.60	VERTICAL	Passed
799.899198	22.60	13.49	31.20	-8.60	VERTICAL	Passed
860.421443	19.10	9.02	27.00	-7.90	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2295.091182	38.50	84.14	30.90	7.60	VERTICAL	Passed
2905.809619	39.10	90.16	27.00	12.10	VERTICAL	Passed
6700.900802	29.04	28.31	17.54	11.50	VERTICAL	Passed
6952.399800	30.84	34.83	19.34	11.50	VERTICAL	Passed
7421.343687	26.84	21.98	14.04	12.80	HORIZONTAL	Passed
7827.647295	27.34	23.28	13.94	13.40	HORIZONTAL	Passed

RX mode, channel 78

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.073948	26.50	21.13	41.80	-15.30	VERTICAL	Passed
255.111022	13.80	4.90	35.10	-21.30	VERTICAL	Passed
731.262926	17.60	7.59	27.40	-9.80	VERTICAL	Passed
862.523447	15.30	5.82	23.20	-7.90	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2295.091182	38.10	80.35	30.50	7.60	VERTICAL	Passed
2906.809619	39.00	89.13	26.90	12.10	VERTICAL	Passed
6699.402806	29.04	28.31	17.54	11.50	HORIZONTAL	Passed
6947.399800	31.14	36.06	19.64	11.50	VERTICAL	Passed
7418.343687	26.84	21.98	14.04	12.80	HORIZONTAL	Passed
7825.647295	27.44	23.55	14.04	13.40	HORIZONTAL	Passed

3.6. WLAN Test results

RX mode, channel 1

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
30.900000	15.40	5.89	27.30	-11.90	VERTICAL	Passed
37.235872	24.50	16.79	39.80	-15.30	VERTICAL	Passed
38.516834	18.90	8.81	35.00	-16.10	VERTICAL	Passed
44.269339	19.40	9.33	39.20	-19.80	VERTICAL	Passed
73.127054	15.00	5.62	39.10	-24.10	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1800.609218	29.80	30.90	26.30	3.50	VERTICAL	Passed
2293.591182	35.30	58.21	27.80	7.50	VERTICAL	Passed
2905.809619	39.10	90.16	27.00	12.10	VERTICAL	Passed
6701.400802	29.04	28.31	17.54	11.50	VERTICAL	Passed
6950.897796	30.94	35.24	19.44	11.50	VERTICAL	Passed
7420.845691	26.84	21.98	14.04	12.80	HORIZONTAL	Passed
7821.147295	27.44	23.55	14.04	13.40	VERTICAL	Passed

RX mode, channel 7

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.073948	30.30	32.73	45.60	-15.30	VERTICAL	Passed
51.281363	13.00	4.47	37.50	-24.50	VERTICAL	Passed
73.967535	24.20	16.22	48.10	-23.90	HORIZONTAL	Passed
132.304409	29.40	29.51	52.30	-22.90	VERTICAL	Passed
354.810621	23.70	15.31	41.80	-18.10	HORIZONTAL	Passed
865.531463	18.30	8.22	26.10	-7.80	HORIZONTAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2294.091182	35.90	62.37	28.40	7.50	VERTICAL	Passed
2908.809619	38.90	88.10	27.00	11.90	VERTICAL	Passed
6704.400802	29.14	28.64	17.74	11.40	VERTICAL	Passed
6952.899800	30.84	34.83	19.34	11.50	VERTICAL	Passed
7426.849699	26.84	21.98	13.94	12.90	HORIZONTAL	Passed
7822.151303	27.54	23.82	14.14	13.40	VERTICAL	Passed

RX mode, channel 11

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
37.173948	22.30	13.03	37.60	-15.30	VERTICAL	Passed
38.097796	19.50	9.44	35.40	-15.90	VERTICAL	Passed
43.426453	20.50	10.59	39.70	-19.20	VERTICAL	Passed
44.588377	23.10	14.29	43.10	-20.00	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
2295.091182	37.30	73.28	29.70	7.60	VERTICAL	Passed
2907.811623	38.90	88.10	26.90	12.00	VERTICAL	Passed
6700.900802	29.04	28.31	17.54	11.50	VERTICAL	Passed
6948.899800	31.04	35.65	19.54	11.50	HORIZONTAL	Passed
7425.843687	26.84	21.98	13.94	12.90	VERTICAL	Passed
7823.147295	27.44	23.55	14.04	13.40	HORIZONTAL	Passed

4. Test Equipment

4.1. Conducted measurements

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

4.2. Radiated measurements

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

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