

FCC Part 15C Compliance Test Report

Test Report no.:	Cph_FCC_0612_06.doc	Date of Report:	23.03.2006
Number of pages:	13	Customer's Contact person:	Jorma Hanni
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FCC listing no.:	99059		
IC recognition no.:	4820 and 4820-1		
Tested devices/ accessories:	Phone RM-199, Battery BL-4C, AC charger AC-4, Headset HS-23		
FCC ID:	P4JRM-199	IC:	661Y-RM199
Supplement reports:			
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), IC standards RSS-GEN 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:			

Juho Tuohino, System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	23.03.2006
Testing completed	23.03.2006
The customer's contact person	Jorma Hanni
Test Plan referred to	\\satcc01nmp\tcc_salo\Projects\RM-199\TestPlan_RS\ Puma_RM199_EMC_TestPlan.xls
Notes	-
Document name	\\satcc01nmp\tcc_salo\Projects\RM- 199\EMC\Results\FCC\Cph_FCC_0612_06.doc

1.1. EUT and Accessory Information

The EUT is a quadri band (GSM850/900/1800/1900) mobile phone with GPRS, EGPRS and WLAN. WLAN is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-199	004400/63/164349/9	500432	-	3.09	28208
Battery	BL-4C	0670386417535M415B21076488	-	-	-	28205
Headset	HS-23	GM2750741D	0.6	1.2	0.2	28403
AC Charger	AC-3E	0675370409049MO2601 0000220	1.1	0.3	-	28636

1.2. Summary of Test Results

WLAN:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.247(b)(1)	A8.4 (4)	Peak output power	Passed
15.247(c)	A8.5	Band edge compliance of RF emissions	Passed
15.247(c)	A8.5	Spurious RF conducted emissions	-
15.247(c), 15.209	A8.5	Spurious radiated emissions	-
15.207	7.2.2	AC powerline conducted emissions	-
15.247(a)(2)	A8.2 (1)	6 dB bandwidth	-
15.247(e)	A8.2 (2)	Power spectral density	-

PASSED
FAILED
NP

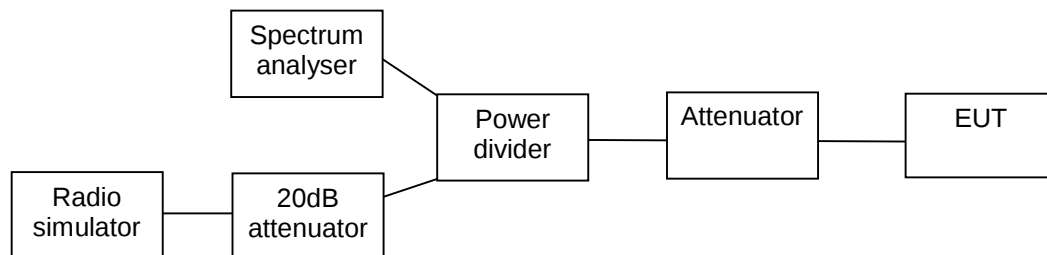
The EUT complies with the essential requirements in the standard.
The EUT does not comply with the essential requirements in the standard.
The test was not performed by the TCC Nokia Copenhagen Laboratory.

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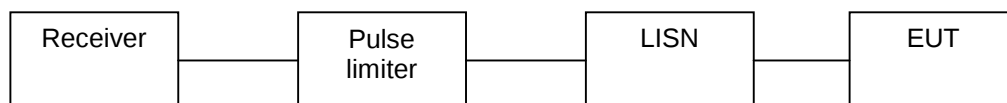
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2. Test setups

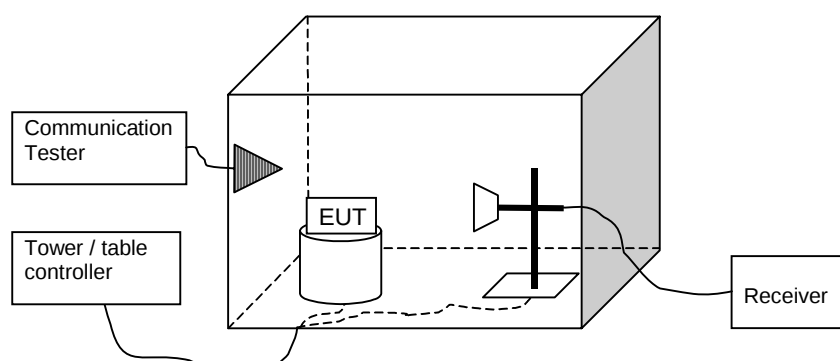
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



3. Peak output power (FCC §15.247(b)(1), RSS-210 A8.4 (4))

EUT with DUT number	RM-199 #28208
Accessories with DUT numbers	BL-4C #28205, HS-23 #28403, AC-3E #28636
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.8 / 41.0 / 1015.4
Date of measurements	23.03.2006
Measured by	Juho Tuohino

3.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for peak output power measurements

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

3.2. WLAN Test results, Flip Open

3.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	22.30	Passed
7 / 2442	23.20	Passed
11 / 2462	21.50	Passed

3.2.2 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	22.40	Passed
7 / 2442	24.70	Passed
11 / 2462	23.50	Passed

3.2.3 OFDM mode, 64QAM modulation, 48 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	22.6	Passed
7 / 2442	25.2	Passed
11 / 2462	23.8	Passed

3.3. WLAN Test results, Flip Closed

3.3.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	21.90	Passed
7 / 2442	24.60	Passed
11 / 2462	23.60	Passed

3.3.2 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	23.10	Passed
7 / 2442	25.60	Passed
11 / 2462	19.00	Passed

3.3.3 OFDM mode, 64QAM modulation, 48 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	23.90	Passed
7 / 2442	27.30	Passed
11 / 2462	21.8	Passed

4. Band edge compliance of RF emissions (FCC §15.247(c), RSS-210 A8.5)

EUT with DUT number	RM-199 #28208
Accessories with DUT numbers	BL-4C #28205, HS-23 #28403, AC-3E #28636
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.8 / 41.0 / 1015.4
Date of measurements	23.03.2006
Measured by	Juho Tuohino

4.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit Average [dBμV/m]	Limit Peak [dBμV/m]
Below 2390 and above 2483.5	≤ 54	≤ 74

4.2. WLAN Test results, Flip Open

4.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

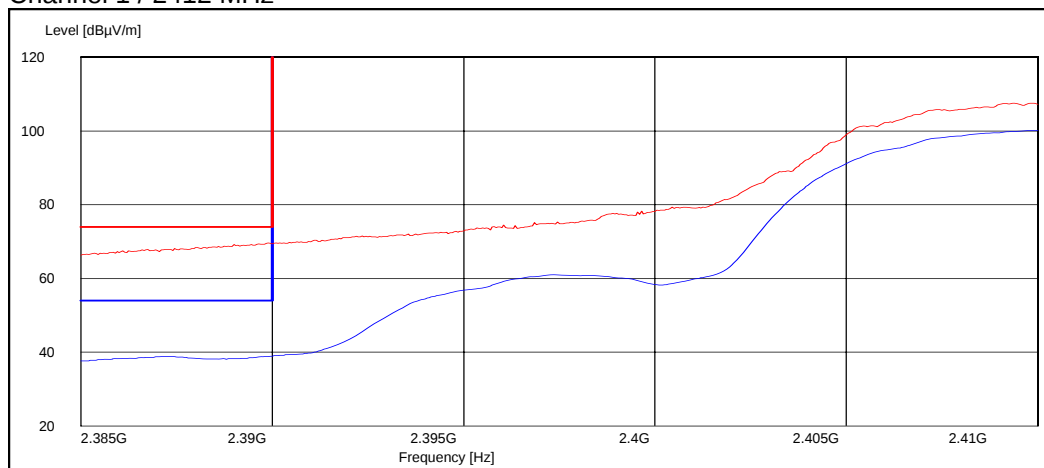
Average (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	38.97	Passed
11 / 2462	45.88	Passed

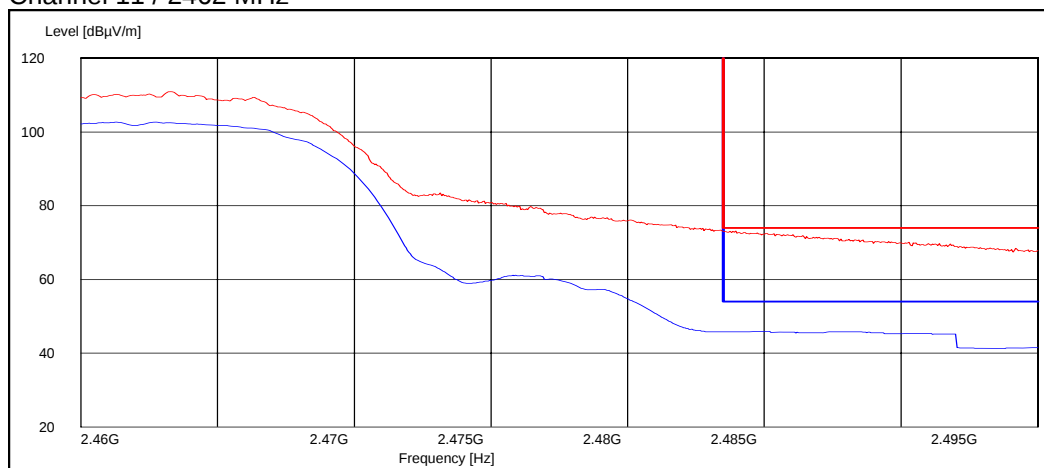
Peak (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	69.66	Passed
11 / 2462	73.10	Passed

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



4.2.2 OFDM mode, 64QAM modulation, 48 Mbps data rate

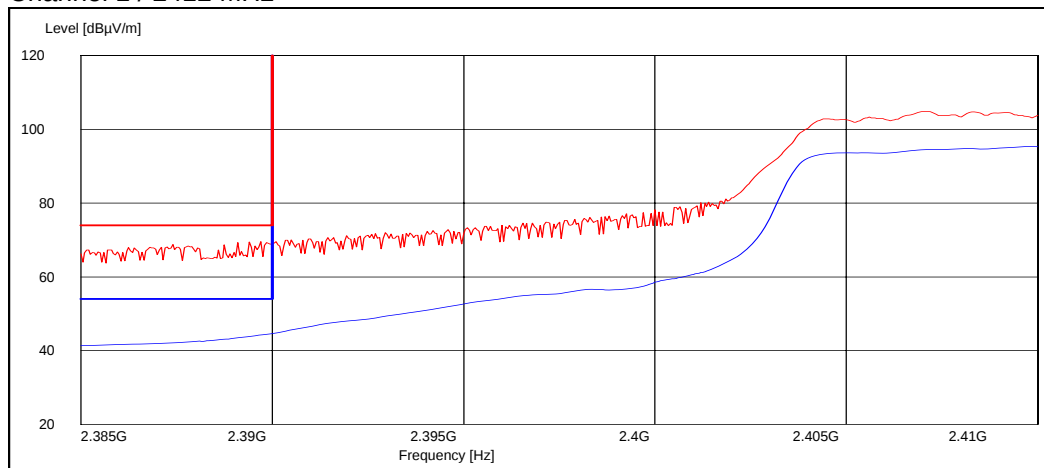
Average (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	44.62	Passed
11 / 2462	46.65	Passed

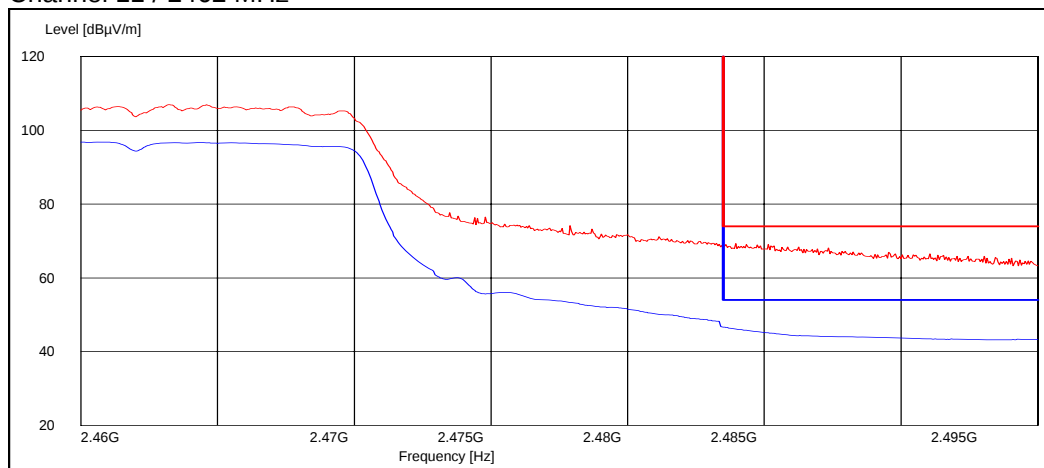
Peak (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	69.53	Passed
11 / 2462	69.26	Passed

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



4.3. WLAN Test results, Flip Closed

4.3.1 DSSS mode, QPSK modulation, 11 Mbps data rate

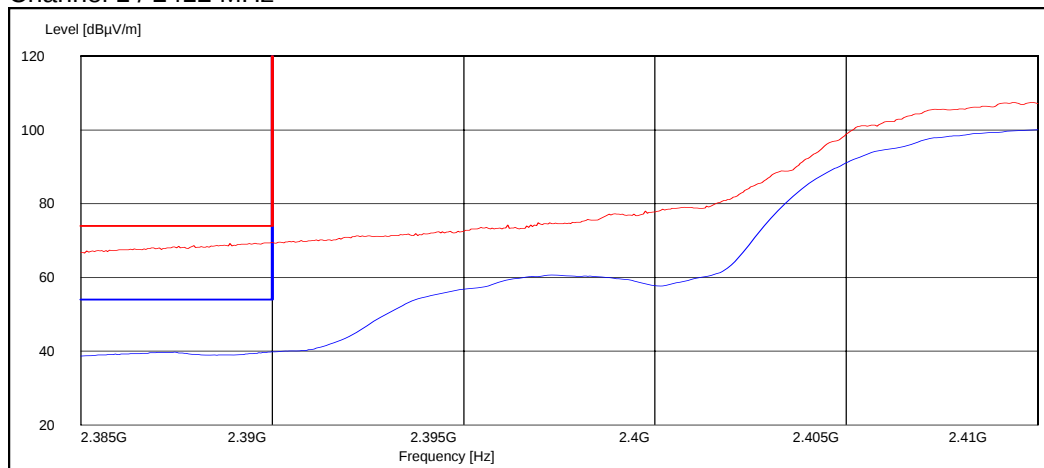
Average (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	39.89	Passed
11 / 2462	40.14	Passed

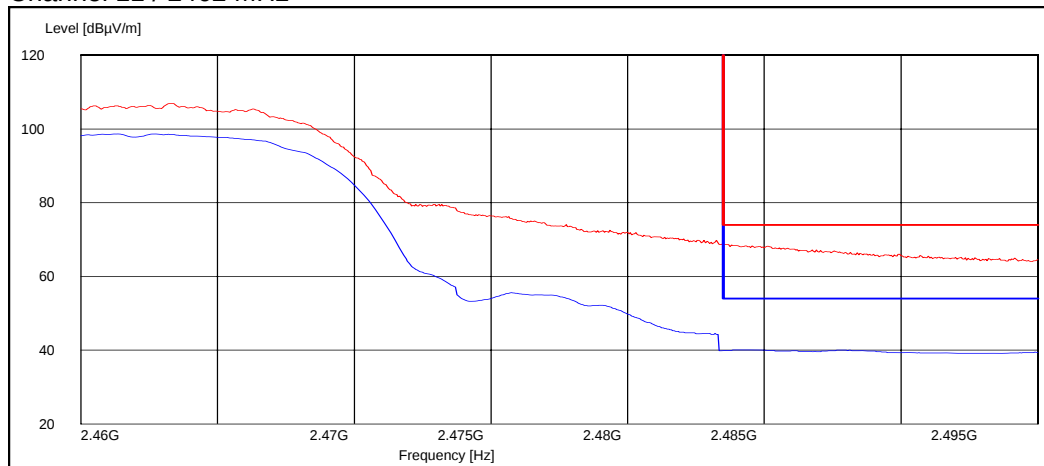
Peak (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	69.52	Passed
11 / 2462	68.63	Passed

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



4.3.2 OFDM mode, 64QAM modulation, 48 Mbps data rate

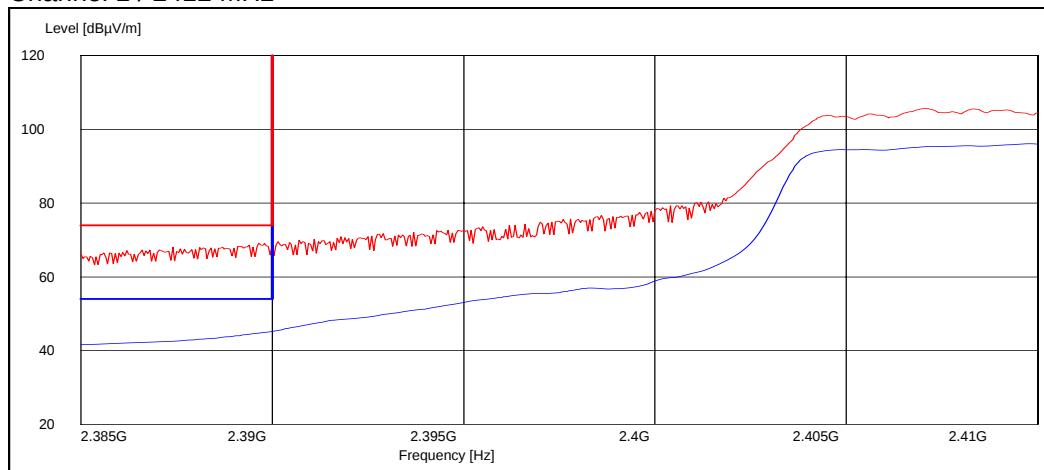
Average (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	45.23	Passed
11 / 2462	45.16	Passed

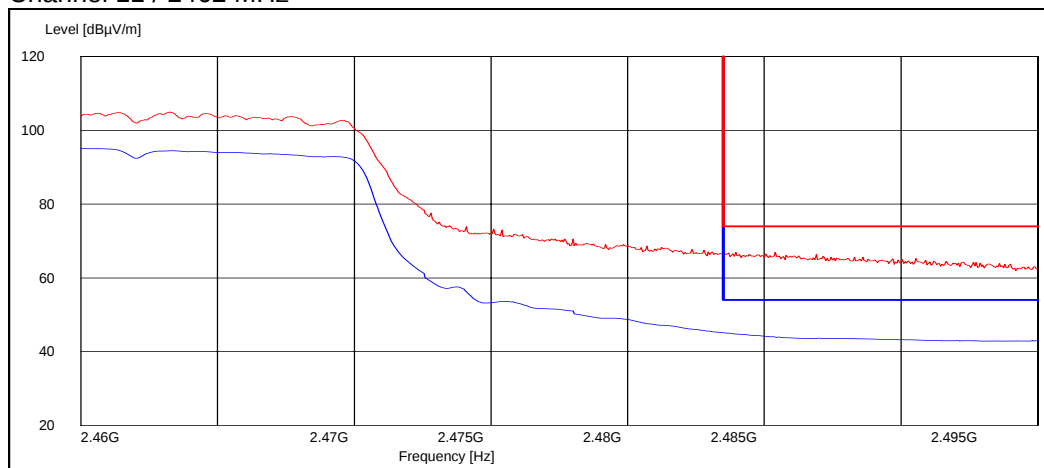
Peak (RBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	Result
1 / 2412	69.15	Passed
11 / 2462	66.97	Passed

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



5. Test Equipment

5.1. 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

5.2. 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