

FCC Part 15B Compliance Test Report

Test Report no.:	Cph_FCC_0634_04.doc	Date of Report:	30-08-2006
Number of pages:	12	Customer's Contact person:	Thomas Reitmayer
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	Customer:	Nokia Corporation Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.:	99059		
IC recognition no.:	4820 and 4820-1		
Tested devices/ accessories:	Phone; RM-209 (HW: 0200), Battery; BL-4B, AC-Charger; AC-3E, Data Cable; CA-53, Multi Media Card; MU-26		
FCC ID:	PPIRM-209	IC:	661U-RM209
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	08-08-2006
Testing completed	28-08-2006
The customer's contact person	Thomas Reitmayer
Test Plan referred to	\\EMC\\TESTPLAN\\
Notes	None
Document name	T:\\Projects\\RM-209\\EMC\\Results\\FCC\\Cph_FCC_0634_04.doc

1.1. EUT and Accessory Information

The EUT is a triple band (GSM900/1800/1900) mobile phone with GPRS, EGPRS and Bluetooth. GSM band is tested in idle mode. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-209	004400/91/164067/8	0200	-	3.11.1	27882
Phone	RM-209	004400/91/164066/0	0200	-	3.11.1	27883
Battery	BL-4B	0670491363563N213110701794	-	-	-	27876
Battery	BL-4B	0670491363563N213110701790	-	-	-	27875
AC Charger	AC-3E	1103336133141301706;0675370	-	-	-	29076
AC-Charger	AC-3E	1103336133141301737;0675370	-	-	-	27869
Multi Media Card	MU-26	0545E10041NC128T	-	-	-	27861
Memory Card	MU-26	0545E10041N C128T	-	-	-	29078
Data Cable	CA-53	EM2008882A	-	4.0	-	28401
Data Cable	CA-53	108382607201	-	-	-	27873

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	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 Copenhagen Laboratory.

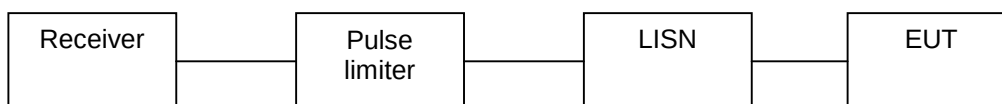
CONTENTS

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. GSM 1900 Test results	5
2.4. Bluetooth Test results	5
3. Radiated emissions (FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9) 7	
3.1. Test setup	7
3.2. Test method and limit.....	7
3.3. GSM 1900 Test results	8
3.4. Bluetooth Test results	9
4. Test Equipment.....	11
4.1. Conducted measurements	11
4.2. Radiated measurements	11

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

EUT with DUT number	RM-209 Dut # 27882
Accessories with DUT numbers	BL-4B Dut # 27876 + AC-3E Dut # 29076 + HS-31 Dut # 27874 + MU-26 Dut # 27861 + CA-53 Dut # 28401
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 [mBar]	22.4 / 57.5 1013
Date of measurements	23-08-2006
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:

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

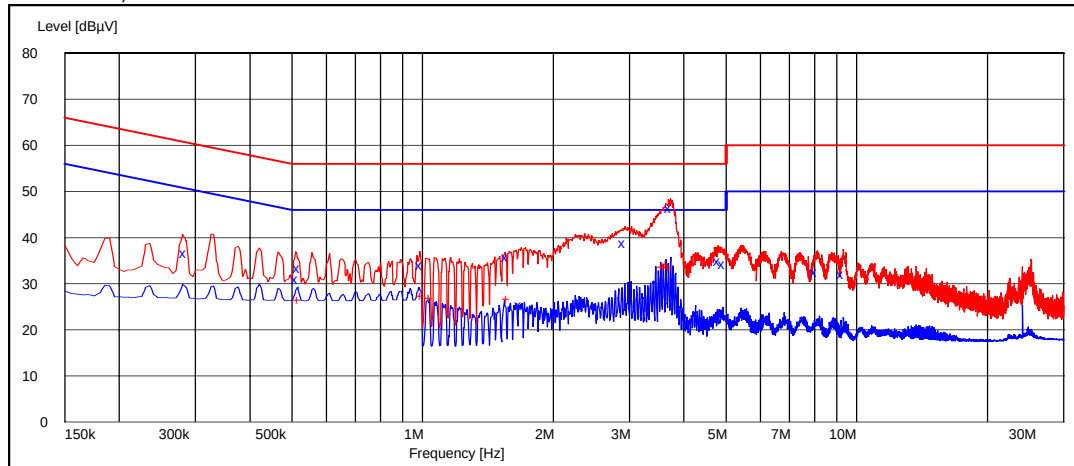
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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 1900 Test results

RX mode, channel 661 / 1960.0 MHz



Quasi peak (RBW: 9 kHz)

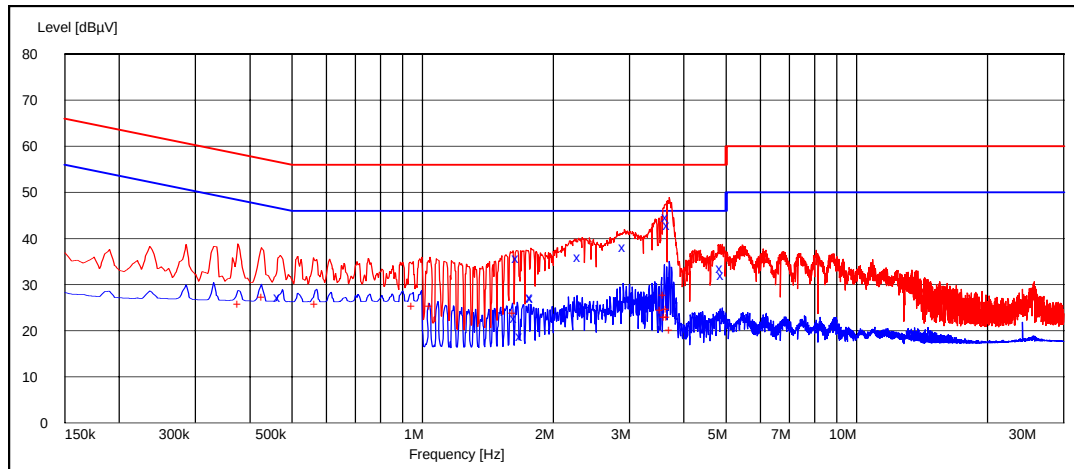
Frequency [MHz]	U [dBμV]	Line	Result
0.285000	36.60	L1	Passed
0.515000	30.90	L1	Passed
0.520000	33.30	L1	Passed
0.995000	34.00	N	Passed
1.570000	35.70	N	Passed
1.685000	25.40	N	Passed
2.920000	38.80	N	Passed
3.730000	46.50	N	Passed
4.840000	34.80	L1	Passed
4.960000	34.20	N	Passed
8.080000	32.60	L1	Passed
9.320000	32.00	L1	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.520000	26.50	N	Passed
1.000000	27.20	N	Passed
1.045000	26.90	N	Passed
1.575000	26.60	N	Passed
3.590000	33.60	N	Passed
3.635000	33.50	N	Passed
3.685000	34.20	N	Passed
3.735000	33.40	N	Passed

2.4. Bluetooth Test results

TX mode, channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.470000	27.30	L1	Passed
1.645000	22.70	L1	Passed
1.665000	35.70	N	Passed
1.695000	18.90	L1	Passed
1.790000	27.20	L1	Passed
1.795000	27.00	N	Passed
2.305000	36.00	N	Passed
2.930000	38.20	N	Passed
3.685000	44.60	N	Passed
3.705000	42.90	N	Passed
4.900000	33.60	L1	Passed
4.935000	32.10	N	Passed

Average (RBW: 9 kHz)

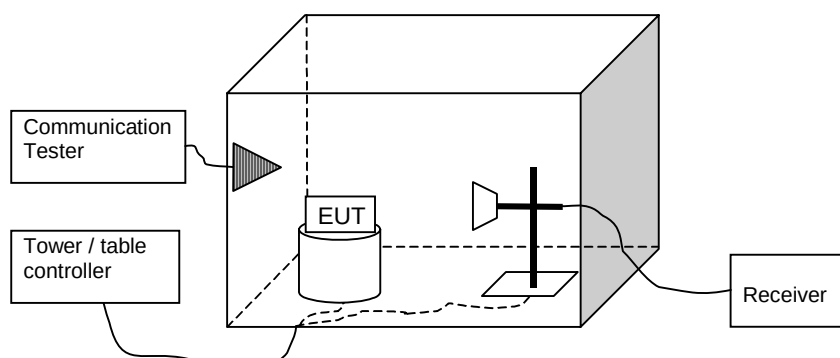
Frequency [MHz]	U [dBμV]	Line	Result
0.380000	25.70	N	Passed
0.430000	27.20	L1	Passed
0.570000	25.70	N	Passed
0.955000	25.40	N	Passed
1.050000	25.30	N	Passed
1.630000	23.90	N	Passed
3.570000	24.50	N	Passed
3.620000	27.80	N	Passed
3.640000	22.90	L1	Passed
3.680000	24.70	L1	Passed
3.690000	22.90	N	Passed
3.740000	20.20	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-209 Dut#27883
Accessories with DUT numbers	BL-4B Dut#27875, AC-3E Dut#27869, CA-53 Dut#27873, MU-26 Dut#29078
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 [mBar]	23 / 46 / 1013
Date of measurements	28-08-2006
Measured by	Christian Andersen

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 [dBμV/m]	Average limit [dBμV/m]	Peak limit [dBμV/m]
30 – 230	40	-	-
230 – 1000	47	-	-
Above 1000	-	54	74

3.3. 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	41.60	120.23	44.30	-2.70	VERTICAL	Passed
7720.000000	45.80	194.98	40.60	5.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	28.00	25.12	30.70	-2.70	VERTICAL	Passed
7720.000000	28.60	26.92	23.40	5.20	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
34.228657	32.10	40.27	47.80	-15.70	VERTICAL	Passed
41.221643	34.70	54.33	54.90	-20.20	VERTICAL	Passed
53.548096	26.40	20.89	55.20	-28.80	VERTICAL	Passed
114.249299	29.00	28.18	54.50	-25.50	VERTICAL	Passed
182.966132	31.80	38.90	59.10	-27.30	HORIZONTAL	Passed
311.923246	17.80	7.76	40.70	-22.90	HORIZONTAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1959.919840	66.60	2,137.96	69.50	-2.90	VERTICAL	Passed
3524.052104	37.00	70.79	41.40	-4.40	VERTICAL	Passed
3919.839679	42.50	133.35	45.50	-3.00	VERTICAL	Passed
7840.179359	49.50	298.54	43.50	6.00	VERTICAL	Passed
7840.181363	49.10	285.10	43.10	6.00	VERTICAL	Passed

*1960 MHz frequency is coming from communication tester and thus ignored.

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1592.678357	28.80	27.54	33.50	-4.70	VERTICAL	Passed
1959.919840	65.60	1,905.46	68.50	-2.90	VERTICAL	Passed
2403.815631	30.80	34.67	30.90	-0.10	VERTICAL	Passed
2460.419840	31.50	37.58	31.20	0.30	VERTICAL	Passed
2906.809619	34.80	54.95	30.30	4.50	VERTICAL	Passed
3528.552104	24.40	16.60	28.80	-4.40	VERTICAL	Passed
3919.839679	28.10	25.41	31.10	-3.00	VERTICAL	Passed
7840.179359	34.00	50.12	28.00	6.00	VERTICAL	Passed
7840.181363	34.20	51.29	28.20	6.00	VERTICAL	Passed

*1960 MHz frequency is coming from communication tester and thus ignored.

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	41.70	121.62	44.50	-2.80	VERTICAL	Passed
7960.000000	44.70	171.79	39.40	5.30	VERTICAL	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	30.10	-2.80	VERTICAL	Passed
7960.000000	29.00	28.18	23.70	5.30	VERTICAL	Passed

3.4. 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	37.00	70.79	39.00	-2.00	HORIZONTAL	Passed
7206.000000	39.90	98.86	35.70	4.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	24.00	15.85	26.00	-2.00	VERTICAL	Passed
7206.000000	27.00	22.39	22.80	4.20	VERTICAL	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
38.076353	25.50	18.84	43.60	-18.10	VERTICAL	Passed
119.458918	23.30	14.62	48.30	-25.00	VERTICAL	Passed
137.975952	20.80	10.96	47.40	-26.60	HORIZONTAL	Passed
150.000000	24.80	17.38	51.90	-27.10	VERTICAL	Passed
278.957916	27.60	23.99	51.40	-23.80	HORIZONTAL	Passed

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4912.327655	37.50	74.99	39.20	-1.70	VERTICAL	Passed
4914.831663	37.70	76.74	39.30	-1.60	VERTICAL	Passed
7416.339679	42.00	125.89	37.00	5.00	VERTICAL	Passed
7417.841683	41.80	123.03	36.80	5.00	VERTICAL	Passed
17829.663327	57.60	758.58	32.90	24.70	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4912.831663	24.80	17.38	26.50	-1.70	VERTICAL	Passed
4914.827655	24.80	17.38	26.40	-1.60	VERTICAL	Passed
7417.839679	29.30	29.17	24.30	5.00	VERTICAL	Passed
7419.341683	29.40	29.51	24.50	4.90	VERTICAL	Passed
17829.163327	44.30	164.06	19.60	24.70	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	39.70	96.61	41.30	-1.60	VERTICAL	Passed
7440.000000	41.00	112.20	36.10	4.90	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	26.60	21.38	28.20	-1.60	VERTICAL	Passed
7440.000000	28.30	26.00	23.40	4.90	VERTICAL	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