TCC
Nokia

FINAS
Finnish Accreditation Service
T117 (EN ISO/IEC 17025)

Part 15C Compliance Test Report

Test Report no.:	FCC Part 15C_RM-675_22	**Date of Report:**	05-Aug-2010
Number of pages:	14	**Customer's Contact person:**	Alison Lenaghan
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Customer:**	Nokia Corporation Nokia House Summit Avenue, Southwood FARNBOROUGH HAMPSHIRE GU14 0NG UK Tel. +44 1252 866000 Fax. +44 1252 866001
FCC listing no.: **IC recognition no.:**	99059 661AL-1		
Tested devices/ accessories:	**Phone RM-675 / Battery BL-5K / AC Charger AC-15E**		
FCC ID:	QFXRM-675X	**IC:**	661Z-RM675
Supplement reports:			
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). 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:	Digitally signed by Niels Christian Andersen Date: 2010.10.09 00:37:49 +02'00'		

Christian Andersen, System Specialist, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	03-Jun-2010
Testing completed	04-Aug-2010
The customer's contact person	Alison Lenaghan
Test Plan referred to	T:\Projects\RM-675\TestPlan\RS_testplan_RM-675.xls
Notes	-
Document name	FCC Part 15C_RM-675_22.docx

1.1. EUT and Accessory Information

The EUT is a 9-band (GSM850/900/1800/1900 and WCDMA Band I/II(1900)/IV(1700)/V(850)/VIII) mobile phone with GPRS, EGPRS, Bluetooth, WLAN and FM transmitter. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-675	004402/13/142374/5	3001	-	010.022	24197
Battery	BL-5K	4620400051K10101382;0670580	-	-	-	24166
AC Charger	AC-15E	409049951223070136 9;0675463	-	-	-	24195

1.2. Summary of Test Results

FM TX:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.239(a)	A2.8	Field strength of the fundamental signal	Passed
15.239(c)	A2.8	Spurious radiated emissions	Passed
15.207	6.6	AC powerline conducted emissions	Passed
15.239(a)	A2.8	26 dB bandwidth	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 Copenhagen Laboratory.

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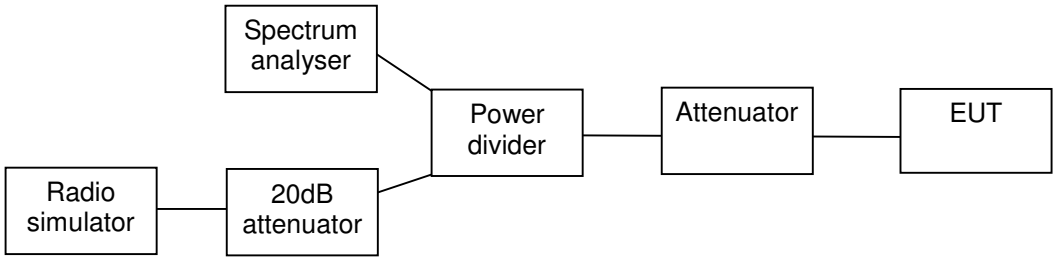
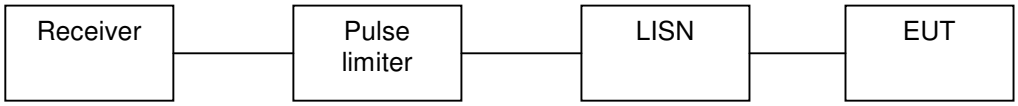
2. Test setups

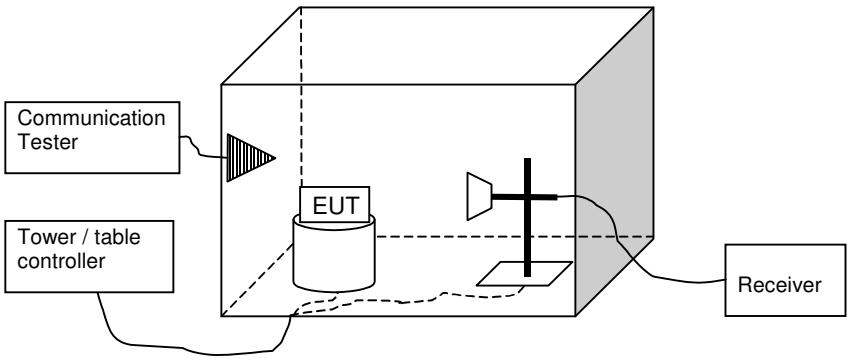
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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3. Field strength of the fundamental signal

(FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-675 DUT 24197
Accessories with DUT numbers	BL-5K DUT 24166 ; AC-15E DUT 24195
Operation Voltage [V] / [Hz]	115 / 60
Result	Passed
Remarks	FM TX with music modulation
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 41 / 100
Date of measurements	04-Aug-2010
Measured by	Christian Andersen

3.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210.

Limits for field strength of the fundamental signal measurements (3 m measurement distance)

Limit [µV/m]	Limit [dBµV/m]	Detector
250	48	Average
2500	68	Peak

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3.2. FM TX Test results

Peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
88.100000	39.90	98.86	64.20	-24.3	HORIZONTAL	Passed
98.000000	48.90	278.61	73.00	-24.1	HORIZONTAL	Passed
107.900000	41.10	113.50	64.90	-23.8	VERTICAL	Passed

Average (RBW: 120 kHz, VBW: 300 kHz)

Channel / f_C [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
Low / 88.1	38.30	82.22	62.60	-24.3	HORIZONTAL	Passed
Middle / 98.0	47.90	248.31	72.00	-24.1	HORIZONTAL	Passed
High / 107.9	39.60	95.50	63.40	-23.8	VERTICAL	Passed

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4. Spurious radiated emissions

(FCC §15.239(c), RSS-210 A2.8)

EUT with DUT number	RM-675 DUT 24197
Accessories with DUT numbers	BL-5K DUT 24166 ; AC-15E DUT 24195
Operation Voltage [V] / [Hz]	115 / 60
Result	Passed
Remarks	FM TX with music modulation
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 41 / 100
Date of measurements	04-Aug-2010
Measured by	Christian Andersen

4.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

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 ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

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Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [µV/m]	Limit [dBµV/m]	Detector
30 – 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
1000 – 1100	500	54	Average
1000 – 1100	5000	74	Peak

Spurious radiated emissions shall not exceed the field strength of the fundamental signal at any frequencies.

4.2. FM TX Test results

Low channel / 88.1 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
41.831182	26.00	19.95	45.00	-19.0	VERTICAL	Passed
876.002305	54.20	512.86	66.80	-12.6	VERTICAL	Passed

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

Middle channel / 98.0 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.100000	18.30	8.22	29.50	-11.2	VERTICAL	Passed
32.537856	25.70	19.28	38.60	-12.9	VERTICAL	Passed
876.002305	54.20	512.86	66.80	-12.6	VERTICAL	Passed

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

High channel / 107.9 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
32.587856	15.90	6.24	28.80	-12.9	VERTICAL	Passed
876.002305	54.10	506.99	66.70	-12.6	VERTICAL	Passed

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

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5. AC powerline conducted emissions

(FCC §15.207, RSS-210 6.6)

EUT with DUT number	RM-675 DUT 24197
Accessories with DUT numbers	BL-5K DUT 24166 ; AC-15E DUT 24195
Operation Voltage [V] / [Hz]	115 / 60
Result	Passed
Remarks	FM TX with music modulation
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 42 / 100.2
Date of measurements	30-Jul-2010
Measured by	Bo Moltved Christiansen

5.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-GEN 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

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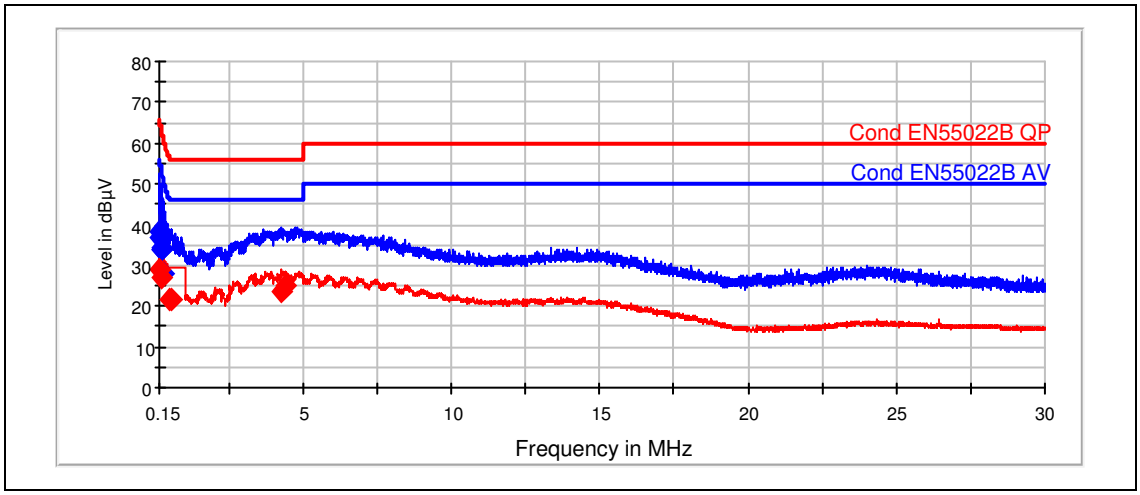
5.2. FM TX Test results

Middle channel / 98.0 MHz



Quasi peak

Frequency [MHz]	Level [dBµV]	IF-BW[kHz]	Line	Margin	Result
0.16	38.18	10	L1	27.26	PASSED
0.17	36.87	10	L1	28.06	PASSED
0.2	34.51	10	L1	29.11	PASSED
0.24	33.94	10	L1	28.2	PASSED
0.25	34.1	10	L1	27.66	PASSED
0.29	27.99	10	N	32.52	PASSED

Average

Frequency [MHz]	Level [dBµV]	IF-BW[kHz]	Line	Margin	Result
0.165	29	10	L1	26.21	PASSED
0.205	27.22	10	L1	26.21	PASSED
0.49	21.71	10	N	24.47	PASSED
0.53	21.62	10	L1	24.4	PASSED
4.25	23.59	10	N	22.4	PASSED
4.42	25.23	10	N	20.8	PASSED

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6. 26 dB bandwidth

(FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-675 DUT 24197
Accessories with DUT numbers	BL-5K DUT 24166 ; AC-15E DUT 24195
Operation Voltage [V] / [Hz]	115 / 60
Result	Passed
Remarks	FM TX with music modulation
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 41 / 100
Date of measurements	04-Aug-2010
Measured by	Christian Andersen

6.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210.

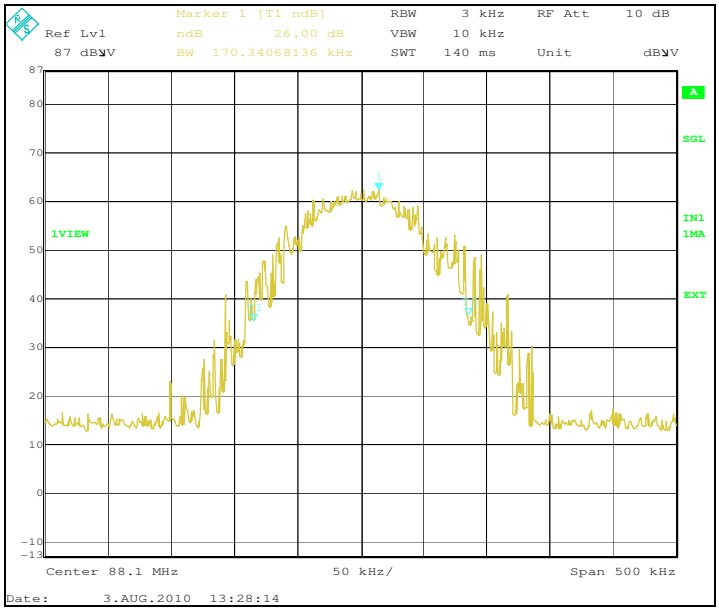
Limits for 26 dB bandwidth measurements

Limit [kHz]
≤ 200

6.2. FM TX Test results

Channel / f_C [MHz]	26 dB bandwidth [kHz]	Result
Low / 88.1	170.341	Passed
Middle / 98.0	157.315	Passed
High / 107.9	163.327	Passed

Low channel / 88.1 MHz



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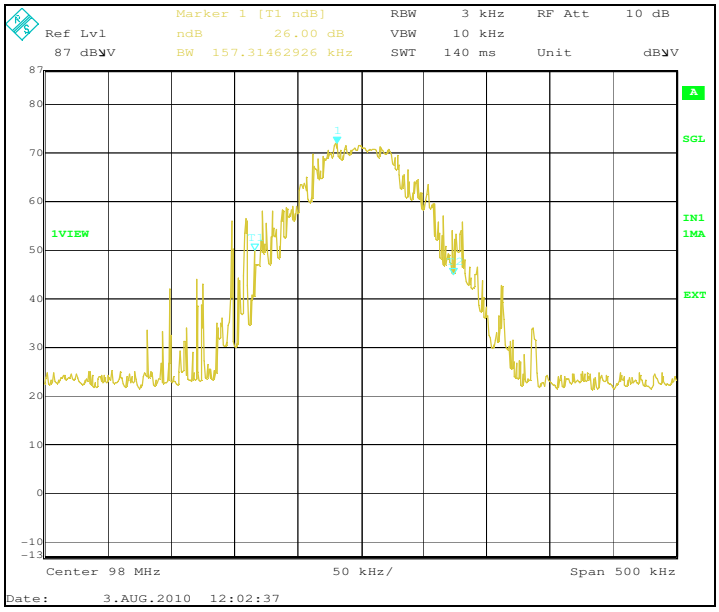
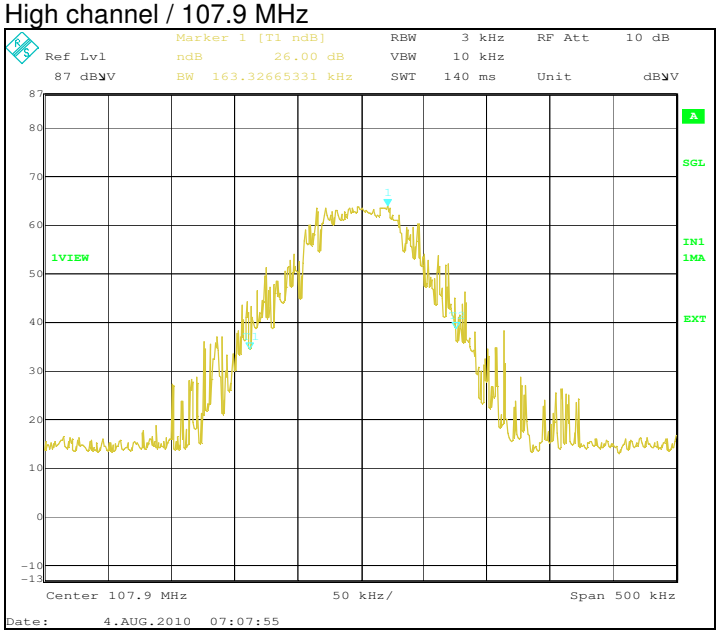
Middle channel / 98.0 MHz



High channel / 107.9 MHz



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7. Test Equipment

7.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15C, 15B
13513	Pulse Limiter	ESH3Z2	Rohde&Schwarz	15C, 15B
13666	Receiver	ESPC	Rohde&Schwarz	15C, 15B
13935	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
16995	Directional Coupler 20dB 0,5-2,0 GHz SMA Conn.	1538RA-20	Weinschel	15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
19171	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B
11386	DC Power Supply	HP6632A	Hewlett Packard	22/24/27, 15C, 15B
19678	Spectrum Analyzer	FSP	Rohde&Schwarz	22/24/27, 15C, 15B
16601	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
19625	Climatic Chamber	VT4002EMC	Vötsch	22/24/27, 15C, 15B
13357	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
19116	Power splitter	-	various	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B

7.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
18792	Mast/turntable controller	2090	ETS-EMCO	22/24/27, 15C, 15B
18416	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
13077	Power Supply	EA-3016	-	22/24/27, 15C, 15B
15742	Programmable Relay Switching System	----------	Pickering	22/24/27, 15C, 15B
20078	Relay 2x6 Chnl µWave Mux	10-785B-522	Pickering	22/24/27, 15C, 15B
14021	Relay Dual 6 Chnl µWave Mux	10-785-522	-	22/24/27, 15C, 15B
-	Relay Dual 6 Chnl µWave Mux	10-785-522	-	22/24/27, 15C, 15B
17644	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
16948	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
16949	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
18861	Receiver	EMI Test Receiver 20Hz-26,5GHz ESI	Rohde&Schwarz	22/24/27, 15C, 15B
18860	Antenna	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
18773	Anechoic chamber	RFD-100	ETS-Lindgren	22/24/27, 15C, 15B
18774	Anechoic chamber	RFSD-F/A-100	ETS-Lindgren	22/24/27, 15C, 15B
19151	High Pass Filter	WHJS3000-10SS	Wainwright	22/24/27, 15C, 15B
13937	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright Instruments	22/24/27, 15C, 15B
13936	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	22/24/27, 15C, 15B
14114	Highpass Filter	WHK1000-12SS	Wainwright Instruments	22/24/27, 15C, 15B
14188	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright	22/24/27, 15C, 15B
14187	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
16633	Band reject filter	WRCD1880.0-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B
19587	Band reject filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	22/24/27, 15C, 15B
20115	Band reject filter	-	Wainwright	22/24/27, 15C, 15B
20114	Band reject filter	WRCG1737/1743-1733/1747-40/6SS	Wainwright	22/24/27, 15C, 15B
20116	Band reject filter	WRCG832/83/-825/845-40/5SS	Wainwright	22/24/27, 15C, 15B
20698	Antenna	BBHA 9120 D	SCHWARZBECK	22/24/27, 15C, 15B
19966	Antenna	HFH2-Z2	Rohde&Schwarz	15C, 15B
13799	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
15191	Turntable Contoller Unit	G-800SDX	YAESU	22/24/27, 15C, 15B
14900	Antenna Controller	HD100	HD GmbH	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B

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