

FCC Part 22 Compliance Test Report

Test Report no.:	FCC22_RM-624_01.doc	Date of Report:	04-Feb-2010
Number of pages:	13	Customer's Contact person:	Lasse Vaattovaara
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FCC listing no.:	99059		
IC recognition no.:	661AL-1		
Tested devices/ accessories:	Phone RM-624 / Battery BL-4J / AC Charger AC-8E / Headset WH-102		
FCC ID:	PYARM-624	IC:	661V-RM624
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 22, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007) and RSS-132 (Issue 2, September 2005). 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:			

Christian Andersen, System Specialist, EMC

1. Summary for FCC Part 22 Compliance Test Report

Date of receipt	06-Jan-2010
Testing completed	29-Jan-2010
The customer's contact person	Lasse Vaattovaara
Test Plan referred to	T:\Projects\RM-624\TestPlan_RS\RS_testplan_RM-624.xls
Notes	-
Document name	T:\Projects\RM-624\EMC\FCC22_RM-624_01.doc

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900) and WCDMA Band (I/II(1900)/V(850)) mobile phone with GPRS, EGPRS, HSDPA and WLAN and Bluetooth. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-624	004401109082418	0521	-	52.50.2009.50	24575
Battery	BL-4J	4944559463080100000;0670616	-	-	-	24571
AC Charger	AC-8E	1103338311100315245;0675387	-	-	-	24566
Headset	WH-102	06943239443f4104582	-	-	-	24560

1.2. Summary of Test Results

WCDMA 850 (Band V):

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	Passed
§2.1049(h)	4.6.1	99 % occupied bandwidth	Passed
§22.917(a)	4.5	Band edge compliance	Passed
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	Passed
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

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 Laboratory.

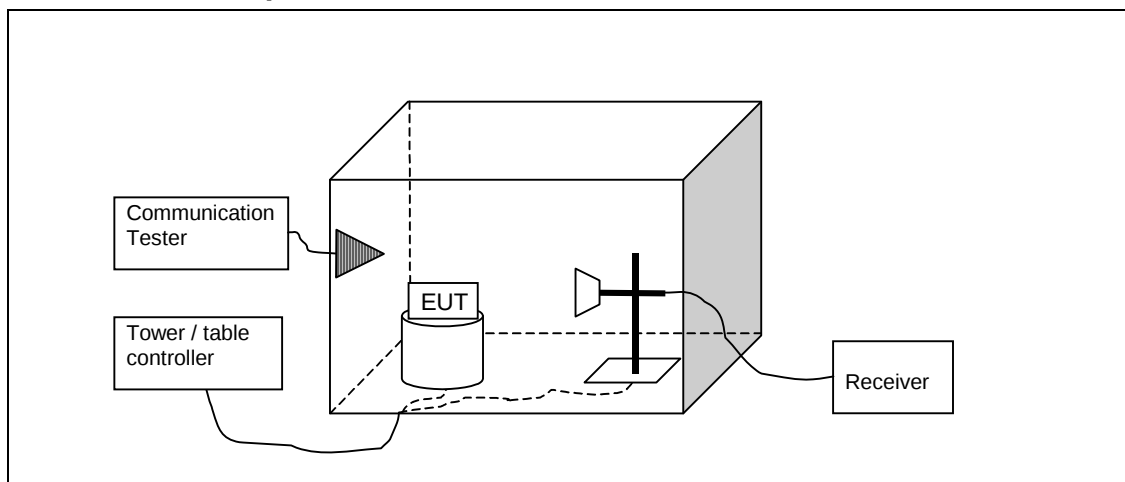
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2. Radiated RF output power (FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4)

EUT with DUT number	RM-624, 24575
Accessories with DUT numbers	BL-4J, 24571
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 102.3
Date of measurements	28-Jan-10
Measured by	Christian Andersen

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software.

The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\ TX} - P_{SUBST\ RX} - L_{SUBST\ CABLES} + G_{SUBST\ TX\ ANT}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain. $P_{SUBST\ TX}$ is signal generator level, $P_{SUBST\ RX}$ is receiver level, $L_{SUBST\ CABLES}$ is cable losses including both TX and RX cables and $G_{SUBST\ TX\ ANT}$ is substitution antenna gain.

The measurement results are obtained as described below:

$$P[dBm] = P_{MEAS} + A_{TOT}$$

Where P_{MEAS} is receiver reading in dBm and A_{TOT} is total correction factor including cable loss and substitution correction ($A_{TOT} = L_{CABLES} + A_{SUBST}$).

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit([dBm])
824 - 849	7	38.5
1850 - 1910	2	33

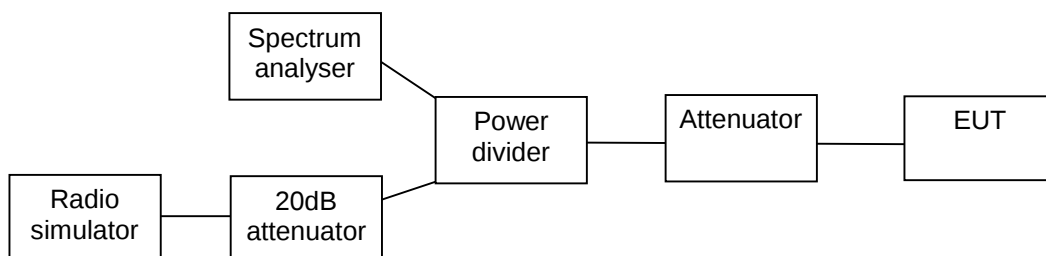
2.3. WCDMA5 TX Test results

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
4132 / 826.4	24.74	0.298	9.84	34.58	HORIZONTAL	Passed
4183 / 836.6	24.62	0.29	9.39	34.01	HORIZONTAL	Passed
4233 / 846.6	25.09	0.323	8.96	34.05	HORIZONTAL	Passed

3. 99 % occupied bandwidth (FCC §2.1049(h), RSS-GEN 4.6.1)

EUT with DUT number	DUT 24577
Accessories with DUT numbers	BL-4J DUT 24568 ; AC-8E, 24566 ; WH-102, 24560
Operation Voltage [V] / [Hz]	115 / 60
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 102.3
Date of measurements	29-Jan-10
Measured by	Ruben Hansen

3.1. Test setup



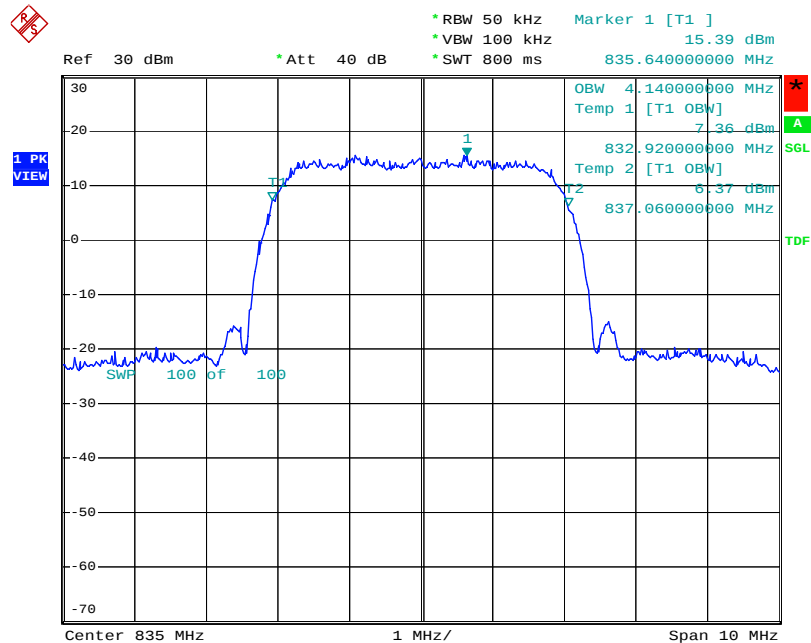
3.2. Test method and limit

The measurement is made according to FCC rules part 22 and IC standard RSS-GEN.

3.3. WCDMA 5 Test results

Operation mode (TX on)	99% occupied bandwidth [kHz]
FDD	4140

Channel 4175 / 835.0 MHz

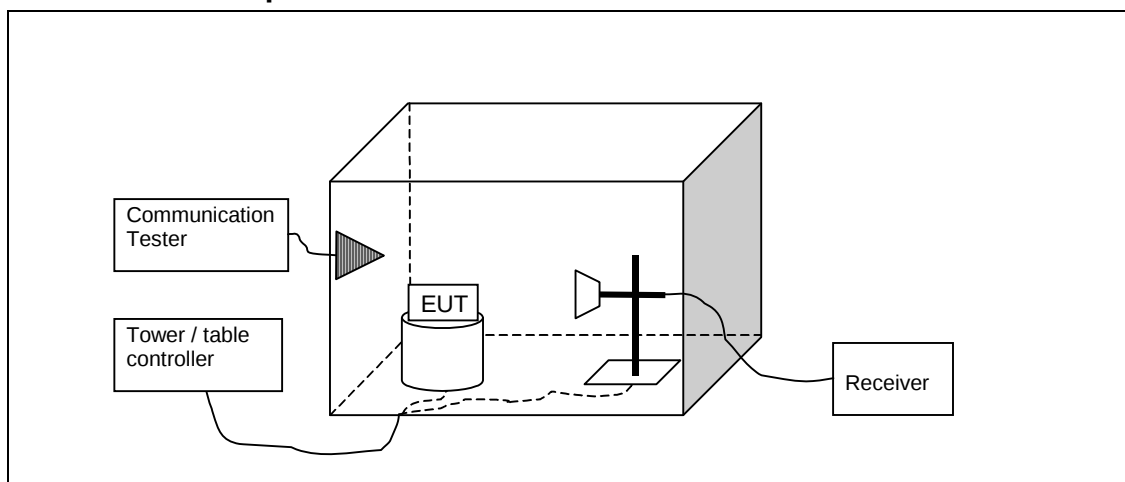


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4. Band edge compliance (FCC §22.917(a), 24.238(a), RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-624, 24575
Accessories with DUT numbers	BL-4J, 24571
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 102.3
Date of measurements	28-Jan-10
Measured by	Christian Andersen

4.1. Test Setup



4.2. Test method and limit

The measurement is made according to FCC rules parts 22 and 24 and IC standards RSS-132 and RSS-133.

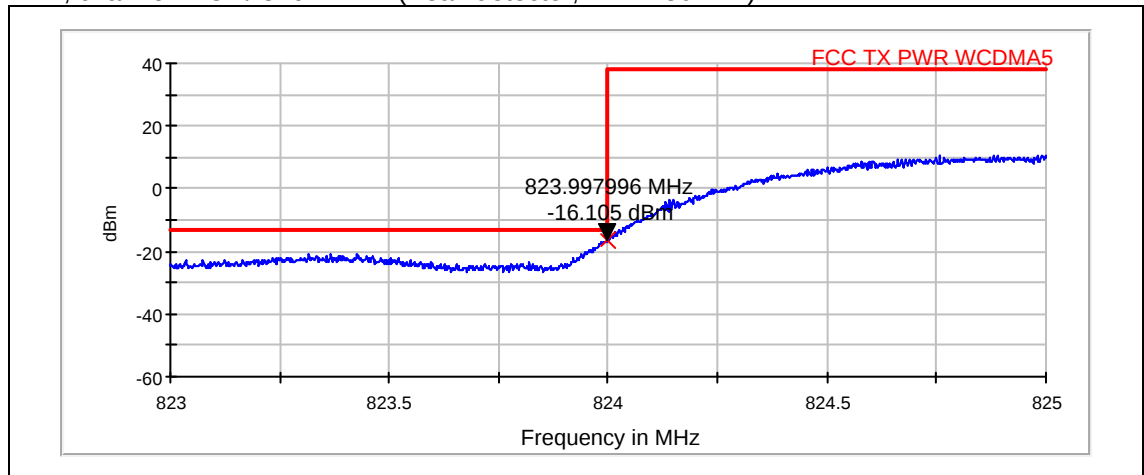
Limits for band edge compliance measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM850	Below 824 and above 849	-13
GSM 1900 / WCDMA 1900	Below 1850 and above 1910	-13

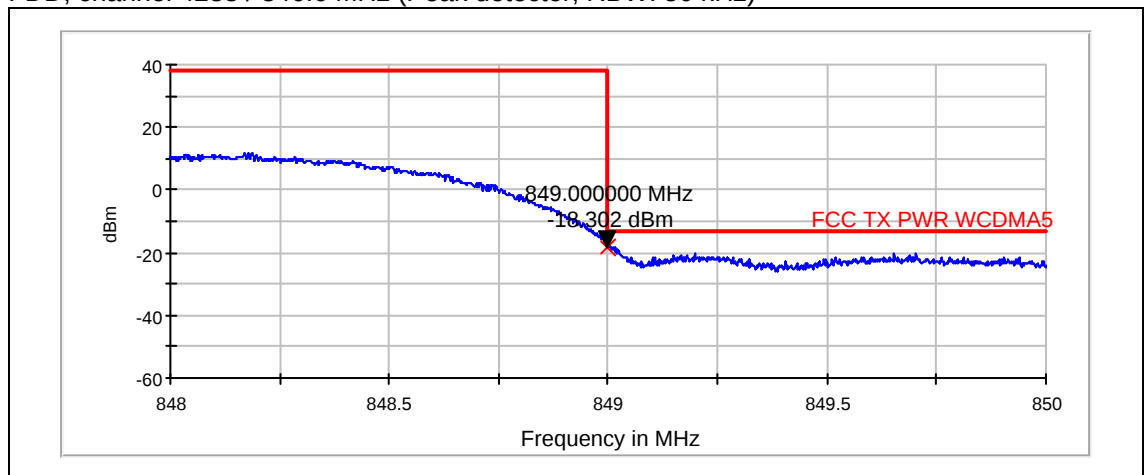
4.3. WCDMA5 Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
FDD	4132 / 826.4	-16.11
FDD	4233 / 846.6	-18.3

FDD, channel 4132 / 826.4 MHz (Peak detector, RBW: 50 kHz)



FDD, channel 4233 / 846.6 MHz (Peak detector, RBW: 50 kHz)

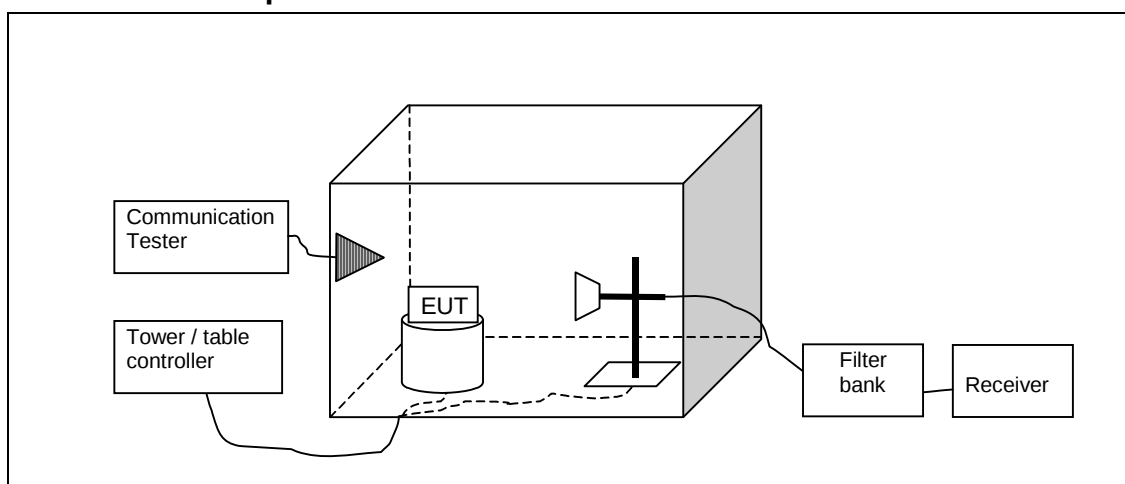


5. Spurious radiated emissions

(FCC §22.917(a), §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-624, 24575
Accessories with DUT numbers	BL-4J, 24571 ; AC-8E, 24566 ; WH-102, 24560
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 102.3
Date of measurements	28-Jan-10
Measured by	Christian Andersen

5.1. Test Setup



5.2. Test method and limit

The measurement is made according to TIA-603-C-2004 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 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 substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software.

The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\ TX} - P_{SUBST\ RX} - L_{SUBST\ CABLES} + G_{SUBST\ TX\ ANT}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain. $P_{SUBST\ TX}$ is signal generator level, $P_{SUBST\ RX}$ is receiver level, $L_{SUBST\ CABLES}$ is cable losses including both TX and RX cables and $G_{SUBST\ TX\ ANT}$ is substitution antenna gain.

The measurement results are obtained as described below:

$$P[dBm] = P_{MEAS} + A_{TOT}$$

Where P_{MEAS} is receiver reading in dBm and A_{TOT} is total correction factor including cable loss and substitution correction ($A_{TOT} = L_{CABLES} - G_{PREAMP} + A_{SUBST}$).

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
WCDMA 850	30 - 8500	-13
GSM 1900 / WCDMA 1700 / WCDMA 1900	30 - 18500	-13

5.3. WCDMA5 TX Test results

Channel 4175 / 835.0 MHz

Frequency [MHz]	P[dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
823.899	-37.96	0.15996	-36.77	-1.19	HORIZONTAL	Passed
848.6	-55.69	0.0027	-52.4	-3.29	VERTICAL	Passed
848.732	-41.86	0.06516	-39.76	-2.1	HORIZONTAL	Passed
1241.97	-62.5	0.00056	-63.45	0.95	VERTICAL	Passed
2501.703	-50.72	0.00847	-61.82	11.1	VERTICAL	Passed
2507.154	-48.92	0.01282	-59.92	11	HORIZONTAL	Passed

6. Test Equipment

6.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
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	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	Cable EUT to FSP Analyzer,	-	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

6.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
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	-----	Pickering	22/24/27, 15C, 15B
20078	Relay 2x6 Chnl μ Wave Mux	10-785B-522	Pickering	22/24/27, 15C, 15B
14021	Relay Dual 6 Chnl μ Wave Mux	10-785-522	-	22/24/27, 15C, 15B
-	Relay Dual 6 Chnl μ Wave Mux	10-785-522	-	22/24/27, 15C, 15B
17644	Dual 6 Channel MUX Microwave	10-785-522	Pickering	22/24/27, 15C, 15B
16948	Dual 6 Channel MUX Microwave	10-785-522	Pickering	22/24/27, 15C, 15B
16949	Dual 6 Channel MUX Microwave	10-785-522	Pickering	22/24/27, 15C, 15B
18861	Receiver	EMI Test Receiver	Rohde&Schwarz	22/24/27, 15C, 15B
18860	Antenna	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
18773	Anechoic chambre	RFD-100	ETS-Lindgren	22/24/27, 15C, 15B
18774	Anechoic chambre	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-	Wainwright	22/24/27, 15C, 15B
13936	Band reject filter	WRCD1747.5-0.2/40-	Wainwright	22/24/27, 15C, 15B
14114	Highpass Filter	WHK1000-12SS	Wainwright	22/24/27, 15C, 15B
14188	Band reject filter	WRCA902.4-0.2/40-	Wainwright	22/24/27, 15C, 15B
14187	Band reject filter	WRCD1747.5-0.2/40-	Wainwright	22/24/27, 15C, 15B
16633	Band reject filter	WRCD1880.0-0.2/40-	Wainwright	22/24/27, 15C, 15B
19587	Band reject filter	WRCG2400/2483-	Wainwright	22/24/27, 15C, 15B
20115	Band reject filter	-	Wainwright	22/24/27, 15C, 15B
20114	Band reject filter	WRCG1737/1743-	Wainwright	22/24/27, 15C, 15B
20116	Band reject filter	WRCG832/83/-	Wainwright	22/24/27, 15C, 15B
-	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