

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CFMTX_RM-774_08.docx	Date of Report:	13-May-2011
Number of pages:	13	Customer's Contact person:	Melava Tia
Testing laboratory:	TCC Nokia Salo Laboratory P.O.Box(86) Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220	Customer:	Nokia Corporation P.O.Box(86) Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220
FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-774 / Battery BL-5K / AC Charger AC-15E		
FCC ID:	PYARM-774	IC:	661V-RM774
Supplement reports:	RM-774_HW_Change_Description_v2_0		
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. 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:			

Sami Lehtonen, System Specialist, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	06-Jun-2011
Testing completed	13-Jun-2011
The customer's contact person	Melava Tia
Test Plan referred to	T:\Projects\RM-774\TestPlan\RS_testplan_RM-774_CR_HW2010.xls
Notes	RM-774_HW_Change_Description_v2_0
Document name	T:\Projects\RM-774\EMC\FCC15CFMTX_RM-774_08.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, HSDPA, HSUPA and WLAN and Bluetooth and FM transmitter. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-774	004402/13/470768/0	2010	-	111.001.070 6	15699
Battery	BL-5K	4181571045A1010183600670580	-	-	-	15674
AC Charger	AC-15E	409049101412120785760675463	CE	-	-	15640

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(0.8)	Field strength of the fundamental signal	PASSED
15.239(c)	A2(0.8)	Spurious radiated emissions	PASSED
15.207	6.6	AC powerline conducted emissions	PASSED
15.239(a)	A2(0.8)	26dB(bandwidth)	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 Laboratory.

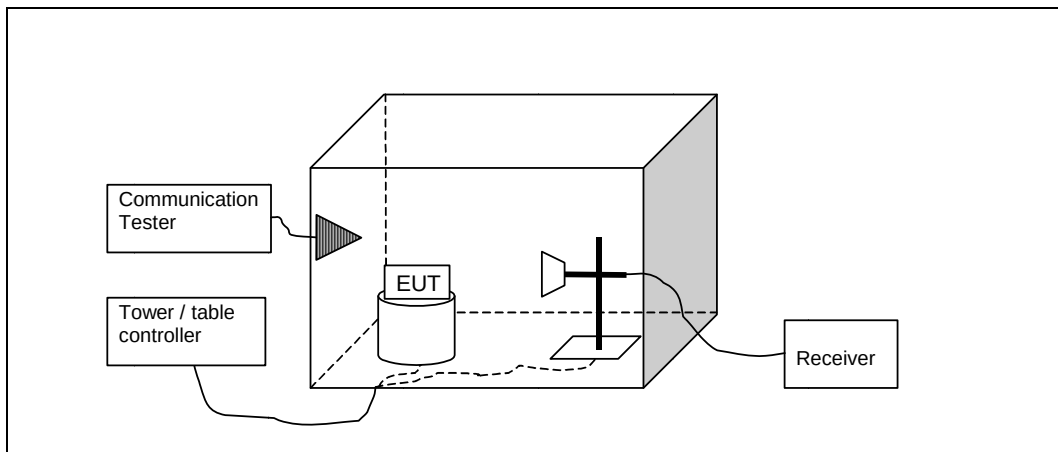
CONTENTS

1. Summary for FCC Part 15C Compliance Test Report	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Field strength of the fundamental signal (FCC §15.239(a), RSS-210 A2.8)	4
2.2. Test method and limit	4
2.3. FMTX Test results	5
3. Spurious radiated emissions (FCC §15.239(c), RSS-210 A2.8)	6
3.2. Test method and limit	6
3.3. FMTX Test results	8
4. 26dB bandwidth (FCC §15.239(a), RSS-210 A2.8)	9
4.2. Test method and limit	9
4.3. FMTX Test results	10
5. Test Equipment	12
5.1. Conducted measurements	12
5.2. Radiated measurements	12

2. Field strength of the fundamental signal (FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-774, DUT 15699
Accessories with DUT numbers	BL-5K, DUT 15674 ; AC-15E, DUT 15640
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 35 / 100.6
Date of measurements	13-Jun-2011
Measured by	Sami Lehtonen

2.1.1 Test Setup



2.2. 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

2.3. FMTX Test results

Middle channel / 98.0 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
97.98	42.1	127.365	69.19	-27.09	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
97.98	39.42	93.573	66.51	-27.09	VERTICAL	PASSED

Low channel / 88.1 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
88.129	34.77	54.771	62.73	-27.96	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
88.129	30.92	35.16	58.88	-27.96	HORIZONTAL	PASSED

High channel / 107.9 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
107.94	42.06	126.736	69.48	-27.42	HORIZONTAL	PASSED

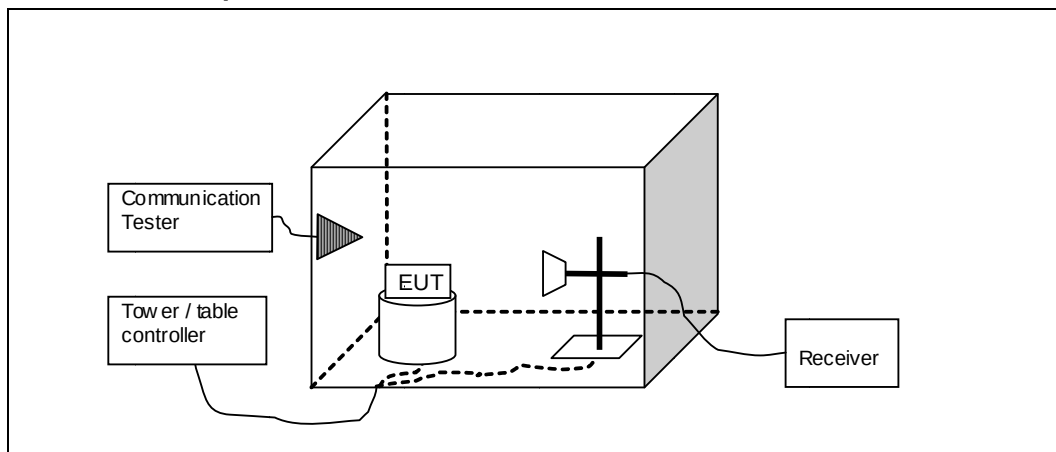
Average(RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
107.88	38.8	87.096	66.22	-27.42	HORIZONTAL	PASSED

3. Spurious radiated emissions (FCC §15.239(c), RSS-210 A2.8)

EUT with DUT number	RM-774, DUT 15699
Accessories with DUT numbers	BL-5K, DUT 15674 ; AC-15E, DUT 15640
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 35 / 100.6
Date of measurements	13-Jun-2011
Measured by	Sami Lehtonen

3.1.1 Test Setup



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

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

Frequency range [MHz]	Limit [$\mu V/m$]	Limit [dB $\mu V/m$]	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.

3.3. FMTX Test results

Middle channel / 98.0 MHz

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

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
60.82	23.48	14.926	47.92	-24.44	HORIZONTAL	PASSED
61.321	22.29	13.021	46.72	-24.43	HORIZONTAL	PASSED
61.545	22.22	12.908	46.65	-24.43	HORIZONTAL	PASSED
61.58	22.14	12.798	46.57	-24.43	HORIZONTAL	PASSED
61.592	22.48	13.298	46.91	-24.43	HORIZONTAL	PASSED
61.723	21.63	12.061	46.06	-24.43	HORIZONTAL	PASSED
61.744	21.65	12.092	46.08	-24.43	HORIZONTAL	PASSED
61.841	21.49	11.874	45.91	-24.42	HORIZONTAL	PASSED
62.052	20.98	11.188	45.4	-24.42	HORIZONTAL	PASSED
62.673	20.99	11.212	45.4	-24.41	HORIZONTAL	PASSED

Low channel / 88.1 MHz

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

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
176.2	40.13	101.496	63.19	-23.06	VERTICAL	PASSED
264.3	14.38	5.234	36.3	-21.92	HORIZONTAL	PASSED
352.4	15.62	6.038	35.42	-19.8	HORIZONTAL	PASSED

High channel / 107.9 MHz

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

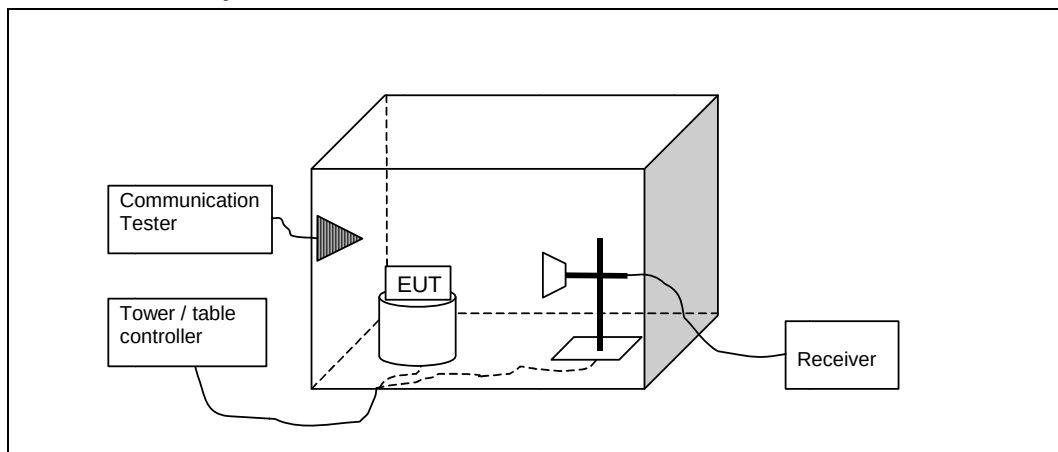
Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
215.8	28.49	26.577	51.89	-23.4	HORIZONTAL	PASSED
323.7	33	44.674	53.4	-20.4	HORIZONTAL	PASSED
431.6	17.46	7.468	35.48	-18.02	HORIZONTAL	PASSED

4. 26dB bandwidth

(FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-774, DUT 15699
Accessories with DUT numbers	BL-5K, DUT 15674 ; AC-15E, DUT 15640
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 35 / 100.6
Date of measurements	13-Jun-2011
Measured by	Sami Lehtonen

4.1.1 Test Setup



4.2. Test method and limit

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

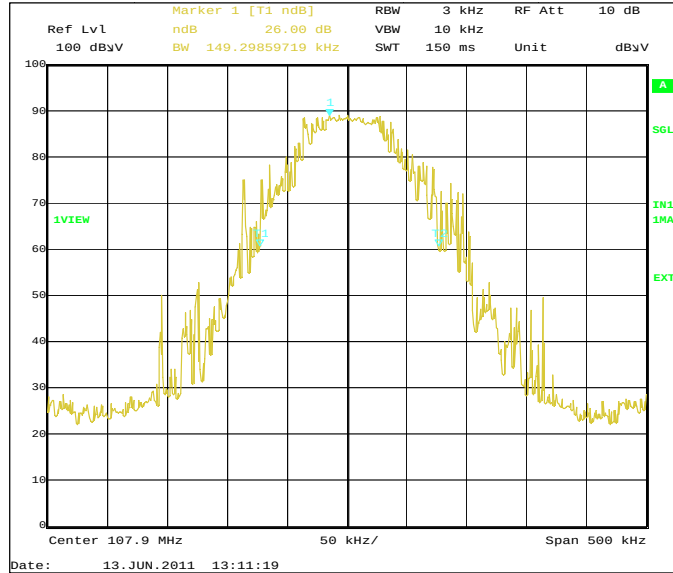
Limits for 26 dB bandwidth measurements

Limits for ES and sandwich measurements				
Limit [kHz]				
<200				

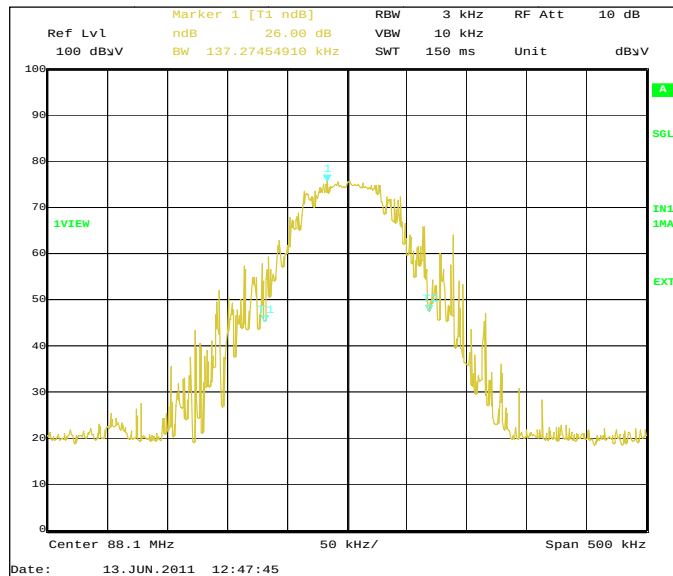
4.3. FMTX Test results

Channel / f_c [MHz]	26 dB bandwidth [kHz]	Result
Middle / 98.0	152.304	PASSED
Low / 88.1	137.274	PASSED
High / 107.9	149.298	PASSED

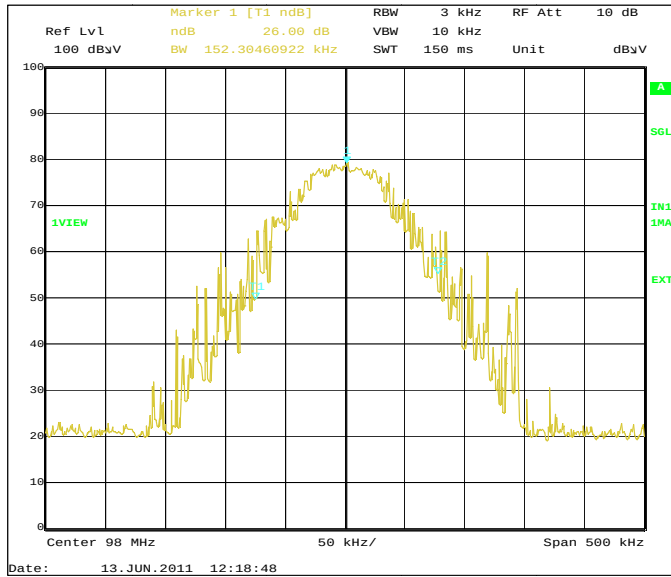
High channel / 107.9 MHz



Low channel / 88.1 MHz



Middle channel / 98.0 MHz



5. Test Equipment

5.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1916	Communication Tester	CMTA84	R&S	15B
1986	GPS Antenna	AMHP10-15R/390	European Antenna	15C, 15B
1992	Signal Generator	83630B	Agilent	15C, 15B
2039	Power Supply	PL330QMD	Thurlby	15C, 15B
2060	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
2068	CDN	S1	NMP	15C, 15B
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2156	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2180	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2206	Signal Generator	SMX	R&S	15C, 15B
2347	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP-30	R&S	22/24/27, 15C
2359	Temperature Test Chamber	VT4002	Vötsch	22/24/27
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24/27
2362	Power Supply	NGPX 70/5	R&S	22/24/27
2388	Bluetooth Tester	CBT	R&S	15B
2389	Signal Generator	SMJ 100A	R&S	15B
2390	Directional Coupler	DC2600	AR	-
6009	GPS Antenna	SA-700	Chronos	15C
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	15C
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	15C
6012	CDN	CDN USB/c	Teseq	-
6015	Receiver	ESI	R&S	22/24, 15C, 15B
6016	ESD gun	PESD 1610	HAEFELY	-
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B
6036	Data Logger	175-H2	Testo	22/24/27, 15C, 15B
6038	Data Logger	Testo 580	Testo	22/24/27, 15C, 15B
6039	USB Interface	5541765	Testo	22/24/27, 15C, 15B
2059	V-network	ESH3-Z6	R&S	-
6044	V-network	ESH3-Z6	R&S	-
6045	Power splitter	11667B	Agilent	22/24/27, 15C
6046	Attenuator 10dB	8493C	Agilent	22/24/27, 15C
6047	Attenuator 20dB	8493C	Agilent	22/24/27, 15C

5.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1917	Communication Tester	CMTA84	R&S	15B
1984	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B
1986	GPS Antenna	AMHP10-15R/390	European Antenna	15C, 15B
1988	Antenna	HL562	R&S	22/24/27, 15C, 15B
1989	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2009	Signal Generator	SMP 22	R&S	22/24/27, 15C, 15B
2027	CDN	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	CDN	M3 (modified) DC2	MEB	22/24/27, 15C, 15B
2029	Power Supply	PL330	Thurlby	22/24/27, 15C
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22
2047	Band Reject Filter	WRCC1800/2000-0,2-10SS	Wainwright	24

Eq. No	Equipment	Type	Manufacturer	Used in
2051	High Pass Filter	4HC1700-1-KK	R&S	22
2109	Power Supply	PL330QMD	Thurlby	22/24/27, 15C, 15B
2116	Controller	EMCO 2090	ETS	22/24/27, 15C, 15B
2135	CDN	CDN 801-M3	Lüthi	22/24/27, 15C, 15B
2140	Antenna	EMCO93110B	EMCO	22/24/27, 15C
2142	Antenna	3146	EMCO	22/24/27, 15C
2150	High Pass Filter	F-15041	RLC	22/24/27, 15C
2156	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2176	CDN	CDN 801-M3	Lüthi	22/24/27, 15C, 15B
2180	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	Miteq	22/24/27, 15C, 15B
2347	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2348	Controller	G-1000DXC	Yaesu	22/24/27, 15C, 15B
2349	Computer Controller	GS-232B	Yaesu	22/24/27, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	Miteq	22/24/27, 15C, 15B
2353	Receiver	ESIB26	R&S	22/24/27, 15C, 15B
2357	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	15C
2361	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	Euroshield	22/24/27, 15C, 15B
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
2366	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22
2388	Bluetooth Tester	CBT	R&S	15B
2389	Signal Generator	SMJ 100A	R&S	15B
2391	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
6009	GPS Antenna	SA-700	Chronos	15C
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	15C
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	15C
6014	Substitute Calibration Cable	Sucoflex 104PB	Suhner	-
6017	Antenna	SBA 9113	Schwarzbeck	22 / 24 / 27
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B
-	RF immunity / Emission Software	EMC32	R&S	22/24/27, 15C, 15B
6037	Data Logger	175-H2	Testo	22/24/27, 15C, 15B
6038	Data Logger	Testo 580	Testo	22/24/27, 15C, 15B
6039	USB Interface	5541765	Testo	22/24/27, 15C, 15B