

TEST REPORT

Annex to Test Report No.: 1-1954-31-02/10

Testing Laboratory

CETECOM ICT Services GmbH

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Accredited Test Laboratory:

The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025
DAR registration number: DGA-PL-176/94-D1

Area of Testing: Radio Satellite Communications

Applicant

Sony Ericsson Mobile Communications AB

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Phone: +46 707 19 57 36

Manufacturer

Sony Ericsson Mobile Communications AB

Nya Vattentorget
22188 Lund/Sweden

Test Standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
ICES-003 Issue 4	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	Mobile Phone 850/ 900/1800/1900/UMTS /HSDPA /HSUPA/ BT2.0+EDR, A-GPS, FM Rx, WLAN
Model name:	AAD-3880091-BV
FCC ID:	PY7A3880091
IC:	4170B-A3880091
Frequency [MHz]:	824.2 – 848.8 MHz and 1850.2 – 1909.8 MHz
Power supply:	3.70V DC by Li-Polymer Battery (EP800) and Power Supply
Temperature range:	-30 °C to 60 °C



Test performed:

2010-07-01 Jakob Reschke

Test Report authorised:

2010-07-01 Stefan Bös

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2 General Information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

2.2 Application details

Date of receipt of order:	2010-06-16
Date of receipt of test item:	2010-06-23
Start of test:	2010-06-23
End of test:	2010-06-28
Person(s) present during the test:	-/-

3 Test standard/s

Test Standard	Version	Test Standard Description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
ICES-003 Issue 4	2004-04	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard

4 Test Environment

Temperature:	T _{nom}	24	°C during room temperature tests
	T _{max}	60	°C during high temperature test
	T _{min}	-30	°C during low temperature test
Relative humidity content:		53	%
Air pressure:		not relevant for this kind of testing	
Power supply:	V _{nom}	3.70 V	DC by Li-Polymer Battery (EP800) and Power Supply
	V _{max}	4.40 V	
	V _{min}	3.30 V	

5 Test item

Kind of test item	:	Mobile Phone 850/ 900/1800/1900/UMTS /HSDPA/HSUPA/ BT2.0+EDR, A-GPS, FM RX, WLAN
Type identification	:	AAD-3880091-BV
S/N serial number	:	Rad. CB511JVN9J Cond. CB511JVN9G
HW hardware status	:	AP1
SW software status	:	1.2.A.0.8
Frequency Band [MHz]	:	824.2 – 848.8 MHz and 1850.2 – 1909.8 MHz
Type of Modulation	:	GMSK; 8-PSK
Number of channels	:	125 (PCS850) and 300 (PCS1900)
Antenna	:	Integrated antenna
Power Supply	:	3.70 V DC by Li-Polymer Battery (EP800) and Power Supply
Temperature Range	:	-30°C to 60 °C

The GPS-Receiver was turned on during the measurements.

6 Test Laboratories sub-contracted

None

7 Summary of Measurement Results

- ☒ No deviations from the technical specifications were ascertained
- ☐ There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	CFR Part 15.107, 15.109 ICES-003, Issue 4	passed	2010-07-01	-/-

7.1 Receiver

Test Case	temperature conditions	power source voltages	Pass	Fail	NA	NP	Results (max.)
RX-Spurious Emissions Conducted < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	35 dB μ V/m
Spurious Emissions Radiated	Nominal	Nominal	☒	☐	☐	☐	22.8 db μ V/m at 10 m - QP

Note:

NA = Not applicable; NP = Not performed

8 Measurement Results

8.1 RX Spurious Emissions Conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to Idle mode. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
CFR Part 15.107(a)		ICES-003, Issue 4
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBμV/m)	Average (dBμV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

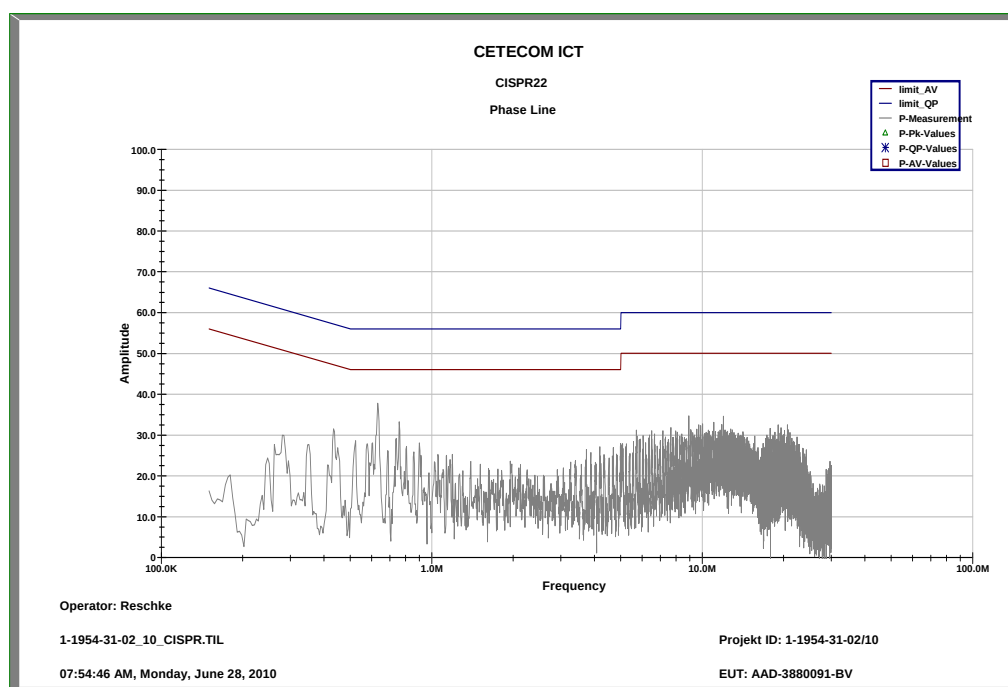
*Decreases with the logarithm of the frequency

Result: Also see plots

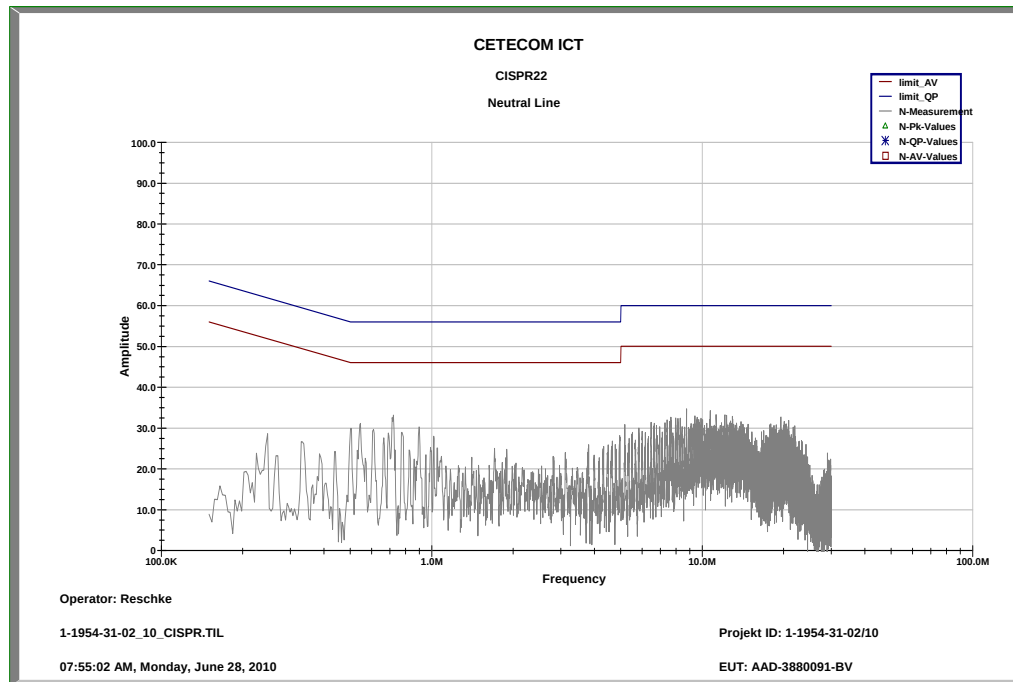
RX Spurious Emissions Conducted < 30 MHz [dBμV/m]		
F [MHz]	Detector	Level [dBμV/m]
No critical peaks found		
Measurement uncertainty	± 3 dB	

Result: The result of the measurement is passed.

Plot 1: 9 kHz to 30 MHz / Phase Line



Plot 2: 9 kHz to 30 MHz / Neutral Line



8.2 Spurious Emissions Radiated – Receiver Mode

Description:

The measurement was performed in worst case. The EUT was not connected to the CMU 200. So the EUT performs a network search. In this mode all oscillators are active.

Measurement:

Measurement parameters	
Detector:	Below 1 GHz QuasiPeak Above 1 GHz Average
Sweep time:	2 sec
Video bandwidth:	Below 1 GHz 100 kHz Above 1 GHz 1 MHz
Resolution bandwidth:	1 MHz
Span:	100 MHz Steps
Trace-Mode:	Max Hold

Limits:

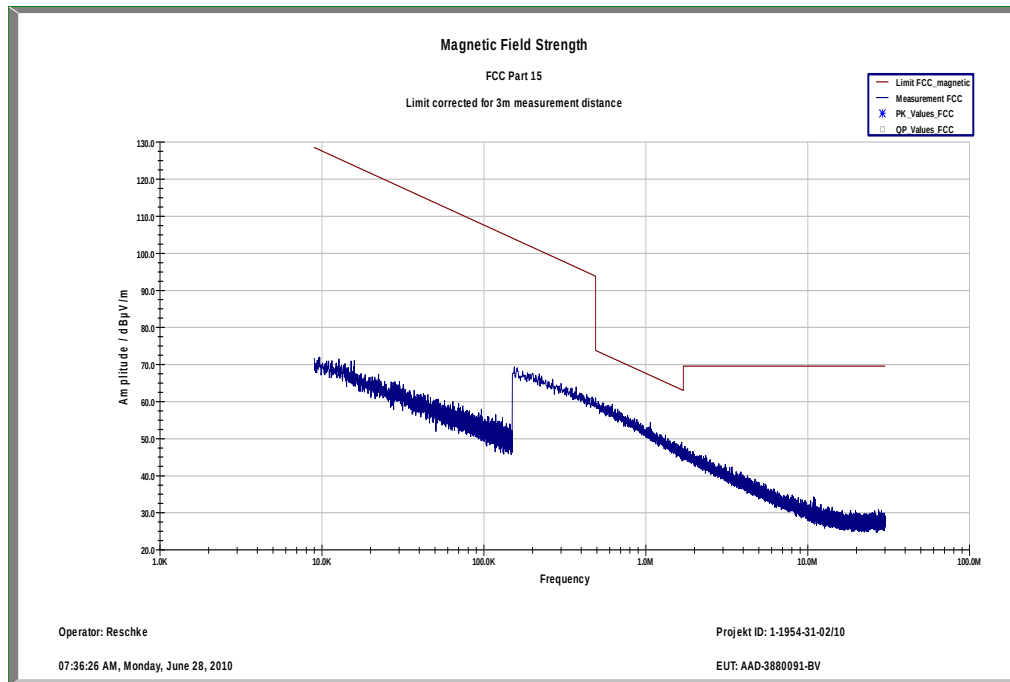
FCC		IC
CFR Part 15.109 CFR Part 2.1053		RSS Gen, Issue 2, Section 4.10 ICES-003 Issue 4
Spurious Emissions Radiated – Receiver Mode		
Frequency (MHz)	Field Strength (dB μ V/m)	Measurement distance (m)
30 – 88	30.0	10
88 - 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results:

Spurious Emission Level (dB μ V/m)		
Frequency (MHz)	Detector	Level (dB μ V/m)
No critical peaks found		
Measurement uncertainty		± 3 dB

Result: The result of the measurement is passed.

Plot 1: Receiver mode up to 30 MHz



Plot 2: Receiver mode (30 MHz - 1 GHz)

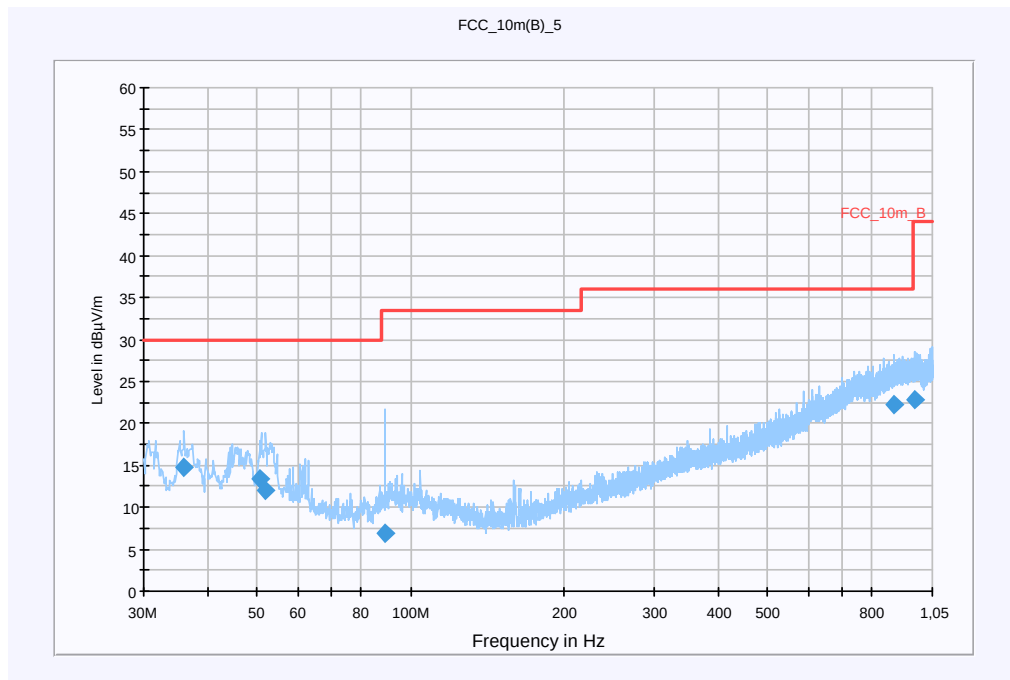
Common Information

EUT: AAD-3880091-BV + EP 800
 Serial Number: IMEI:00440214-075762-0 + 1109w50400488
 Test Description: FCC part 15 @ 10 m
 Operating Conditions: GSM idle; GPS on
 Operator Name: Lang
 Comment: Power: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.000000	14.7	15000.000	120.000	207.0	V	303.0	13.1	15.3	30.0	
50.640000	13.3	15000.000	120.000	110.0	V	10.0	13.3	16.7	30.0	
52.080000	12.0	15000.000	120.000	220.0	V	268.0	13.2	18.0	30.0	
89.280000	6.8	15000.000	120.000	129.0	V	253.0	10.4	26.7	33.5	
886.440000	22.2	15000.000	120.000	198.0	H	10.0	25.0	13.8	36.0	
969.480000	22.8	15000.000	120.000	220.0	H	268.0	25.5	21.2	44.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.32

Signal Path: without Notch
FW 1.0

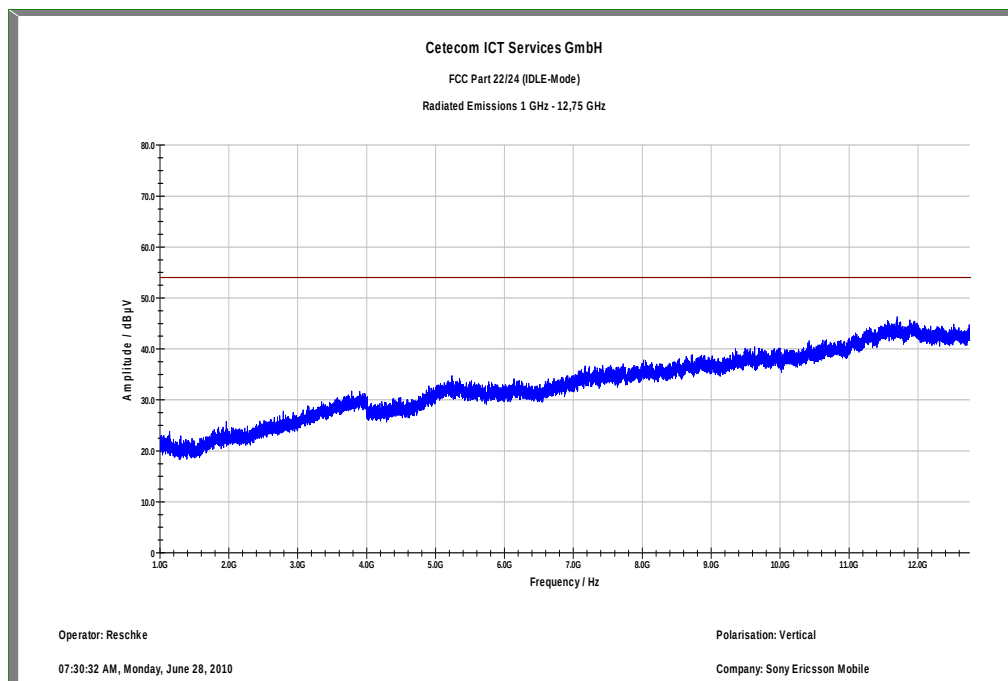
Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table: Cable_EN_1GHz (1005)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

RBW/VBW: 100 kHz

Plot 3: Receiver mode (1 GHz – 12.75 GHz)



RBW/VBW: 1MHz

9 Test equipment and ancillaries used for tests

In order to simplify the identification of the equipment used at each specific test, each item of test equipment and ancillaries are provided with an identifier or number in the equipment list below.

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

No.	Labor / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kal. Art	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	k	06.01.2009	06.01.2011
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	08.01.2010	08.01.2012
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k		
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k		
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	08.01.2010	08.01.2012
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
13	n. a.	PowerAttenuator	8325	Byrd	1530	300001595			
14	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKI!	05.03.2009	05.03.2011
15	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
16	n. a.	Anechoic chamber		MWB	87400/02	300000996			
17	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
18	9	Artificial Mains 9 kHz to 30 MHz, 4 x 25 Ampere	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
19	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
20	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
21	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
22	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
23	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
24	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		

25	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
26	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
27	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
28	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
29	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
30	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	05.08.2008	05.08.2010
31	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	06.08.2008	06.08.2010
32	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKI!	19.08.2008	19.08.2010
33	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKI!	17.12.2008	17.12.2010

Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2010-06-30

Annex E Further information

Glossary

DUT	-	Device under Test
EMC	-	Electromagnetic Compatibility
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software