FCC Part 15B Compliance Test Report

Test Report no.:	Salo_FCC_0924_26.doc	**Date of Report:**	16-Jun-2009
Number of pages:	12	**Customer's Contact person:**	Bruno Ramelli
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 Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.: **IC recognition no.:**	533467 661V-1		
Tested devices/ accessories:	**Phone RM-518 / Battery BL-5CT / Headset HS-105 / AC-Charger AC-8E / Laptop IBM T-60 / Digital Camera Canon Ixus 70**		
FCC ID:	PPIRM-518	**IC:**	661U-RM518
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 (Issue 2, September 2005), RSS-133 (Issue 4, February 2008), RSS-139 (Issue 1, February 2008) 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 Anni Manninen DN: cn=Anni Manninen, c=FI, o=Nokia, ou=CertMT, email=ext-anni.manninen@nokia.com Date: 2009.06.16 15:25:15 +03'00'		

Anni Manninen, System Specialist

Copyright © TCC Nokia

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	05-May-2009
Testing completed	12-Jun-2009
The customer's contact person	Bruno Ramelli
Test Plan referred to	T:\Projects\RM-518\TestPlan_RS\RS_testplan_RM-518.xls
Notes	-
Document name	T:\Projects\RM-518\EMC\Results\FCC\Salo_FCC_0924_26.doc

1.1. EUT and Accessory Information

The EUT is a 3-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-518	004401/10/589351/1	0250	-	6.38	13812
Battery	BL-5CT	3820668263260413204;0670555	-	-	-	13811
Headset	HS-105	06942878455K3102726	-	-	-	13814
AC-Charger	AC-8E	1103338234120300751;0675387	-	-	-	13654
Phone	RM-518	004401105894006	0250	-	6.38	13737
Battery	BL-5CT	3820668263260413510;0670555	-	-	-	13738
AC-Charger	AC-8E	3997917527070300543;0675387	-	-	-	13785
Laptop	T-60	-	-	-	-	13918
Digital Camera	IXUS 70	-	-	-	-	13919

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 (6.6)	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	NP
15.109, a	5.5	Radiated emissions	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 Salo Laboratory.

Copyright © TCC Nokia
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

CONTENTS

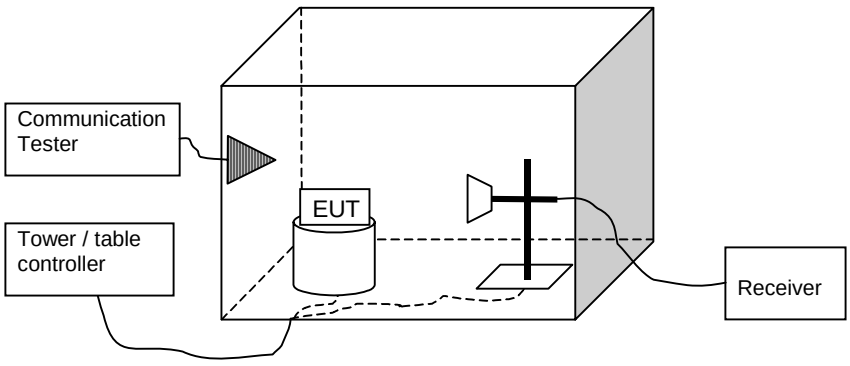
Copyright © TCC Nokia
TCC Nokia Salo Laboratory
P.O. Box 86
Joensuunkatu 7H / Kiila 1B
FIN-24101 SALO, FINLAND
Tel. +358 (0) 7180 08000
Fax. +358 (0) 7180 45220

2. Radiated emissions

(FCC §15.109, ICES-003 section 5.5, RSS-132 4.6, RSS-133 6.6, RSS-139 6.6)

EUT with DUT number	RM-518, DUT 13812
Accessories with DUT numbers	BL-5CT, DUT 13811; HS-105, DUT 13814; AC-8E, DUT 13654; T-60, DUT 13918; Ixus70, DUT 13919
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	In GSM1900 test FM-Radio was receiving 98 MHz signal and it was monitored that channel was not changing during the test. Continuous data transfer was active between the phone and the computer during the test in BT test. Laptop T60 and camera Ixus 70 was only used in Bluetooth measurements.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 42 / 99.3
Date of measurements	12-Jun-2009
Measured by	Kalle Hannila

2.1. Test setup



2.2. 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.

Copyright © TCC Nokia
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

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.

Copyright © TCC Nokia
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

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

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

2.3. 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	43.00	141.25	45.80	-2.8	VERTICAL	PASSED
7720.000000	48.00	251.19	43.60	4.4	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3860.000000	29.40	29.51	32.20	-2.8	VERTICAL	PASSED
7720.000000	34.60	53.70	30.20	4.4	HORIZONTAL	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
32.585772	24.30	16.41	34.00	-9.7	VERTICAL	PASSED
66.872144	12.50	4.22	35.20	-22.7	VERTICAL	PASSED
74.629459	16.50	6.68	38.30	-21.8	VERTICAL	PASSED
97.956112	46.90	221.31	67.70	-20.8	VERTICAL	*PASSED

*97.95 MHz frequency is FM-Radio signal and thus ignored.

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2940.379760	52.80	436.52	48.60	4.2	VERTICAL	PASSED
3919.839679	44.90	175.79	47.40	-2.5	VERTICAL	PASSED
3920.849699	42.80	138.04	45.30	-2.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2938.879760	39.90	98.86	35.80	4.1	VERTICAL	PASSED
3919.839679	30.90	35.08	33.40	-2.5	VERTICAL	PASSED
3924.849699	29.30	29.17	31.80	-2.5	VERTICAL	PASSED

Copyright © TCC Nokia
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

7501.500000	35.20	57.54	30.30	4.9	HORIZONTAL	PASSED
7966.941884	35.50	59.57	29.80	5.7	HORIZONTAL	PASSED

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	44.00	158.49	46.60	-2.6	VERTICAL	PASSED
7960.000000	48.50	266.07	42.80	5.7	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
3980.000000	29.70	30.55	32.30	-2.6	VERTICAL	PASSED
7960.000000	35.10	56.89	29.40	5.7	HORIZONTAL	PASSED

2.4. 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	44.50	167.88	43.50	1.0	HORIZONTAL	PASSED
7206.000000	46.30	206.54	43.40	2.9	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	31.50	37.58	30.50	1.0	VERTICAL	PASSED
7206.000000	33.60	47.86	30.70	2.9	HORIZONTAL	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
271.242285	21.60	12.02	50.40	-28.8	VERTICAL	PASSED
272.446493	12.70	4.32	41.40	-28.7	VERTICAL	PASSED
276.153707	14.80	5.50	43.50	-28.7	VERTICAL	PASSED
284.268136	14.90	5.56	43.70	-28.8	VERTICAL	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4842.689379	45.00	177.83	43.50	1.5	VERTICAL	PASSED
12391.287575	52.90	441.57	41.60	11.3	HORIZONTAL	PASSED
13370.247495	53.50	473.15	40.00	13.5	HORIZONTAL	PASSED
15374.745491	56.30	653.13	37.90	18.4	HORIZONTAL	PASSED
15840.675351	56.10	638.26	38.00	18.1	HORIZONTAL	PASSED

Copyright © TCC Nokia
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

16054.602204	56.80	691.83	36.50	20.3	VERTICAL	PASSED
17966.937876	57.50	749.89	37.20	20.3	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4845.689379	32.20	40.74	30.70	1.5	VERTICAL	PASSED
12394.287575	39.60	95.50	28.30	11.3	HORIZONTAL	PASSED
13377.747495	40.40	104.71	26.80	13.6	HORIZONTAL	PASSED
15375.245491	43.50	149.62	25.10	18.4	HORIZONTAL	PASSED
15839.175351	42.60	134.90	24.40	18.2	HORIZONTAL	PASSED
16048.102204	44.60	169.82	23.90	20.7	VERTICAL	PASSED
17967.437876	44.70	171.79	24.40	20.3	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	43.10	142.89	42.90	0.2	HORIZONTAL	PASSED
7440.000000	48.60	269.15	44.20	4.4	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	30.80	34.67	30.60	0.2	VERTICAL	PASSED
7440.000000	34.80	54.95	30.40	4.4	HORIZONTAL	PASSED

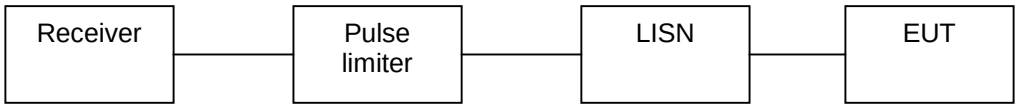
Copyright © TCC Nokia
TCC Nokia Salo Laboratory
P.O. Box 86
Joensuunkatu 7H / Kiila 1B
FIN-24101 SALO, FINLAND
Tel. +358 (0) 7180 08000
Fax. +358 (0) 7180 45220

3. AC powerline conducted emissions

(FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-518, DUT 13737
Accessories with DUT numbers	BL-5CT, DUT 13738; AC-8E, DUT 13785; T-60, DUT 13918; Ixus70, DUT 13919
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 48 / 100
Date of measurements	15-Jun-2009
Measured by	Anni Manninen

3.1. Test setup



3.2. 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.

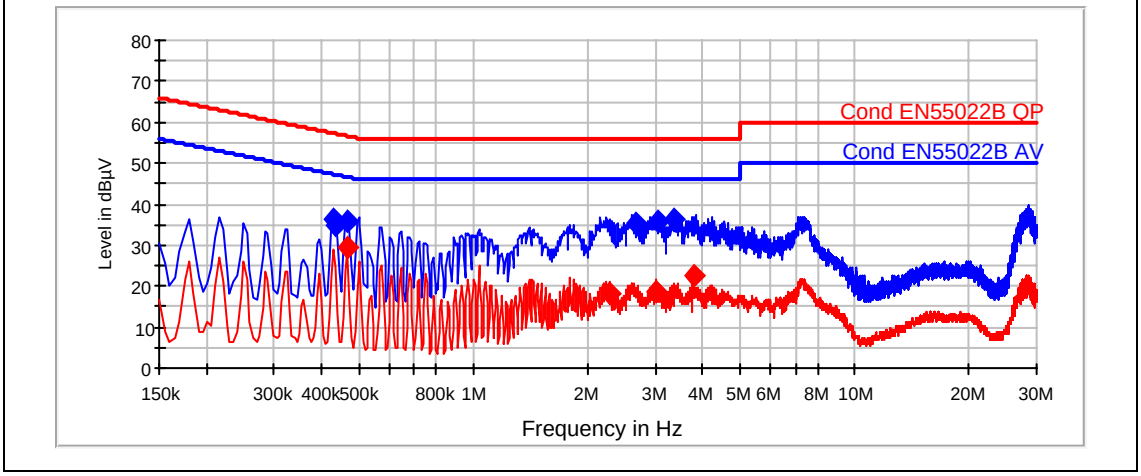
CISPR 22 Class B limits

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

Copyright © TCC Nokia
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

3.3. GSM 1900 Test results

RX mode, channel 661 / 1960.0 MHz



Quasi Peak (RBW: 9 kHz)

Frequency [MHz]	Quasi peak [dBµV]	Line	Margin [dB]	Result
0.430	36.22	L1	21.05	PASSED
0.435	34.83	L1	22.36	PASSED
0.465	35.89	L1	20.70	PASSED
2.655	35.38	L1	20.60	PASSED
3.055	35.62	L1	20.40	PASSED
3.340	36.18	L1	19.80	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	Average [dBµV]	Line	Margin [dB]	Result
0.465	29.44	L1	17.20	PASSED
2.285	17.99	L1	28.00	PASSED
3.030	18.43	N	27.60	PASSED
3.775	22.70	L1	23.30	PASSED

Copyright © TCC Nokia
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

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1742	EMI Test Receiver	ESMI	R&S	15C, 15B
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1872	Thermo- Hygrograph	00.02520.150700	Lambrecht	15C, 15B
1916	Radio Communication tester	CMTA84	R&S	15C, 15B
2039	Power Supply	PL330QMD	THURLBY	15C, 15B
2060	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
2068	CDN-Antenna line	S1	NMP	15C, 15B
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2111	Multimeter	TX3	Tektronix	15C, 15B
2156	Digital Radio Communication Tester	CMU200	R&S	15C, 15B
2206	Signal generator	SMX	R&S	15C, 15B
2335	GPIB Switch 2 to 1	-	National Instruments	15C, 15B
2347	Digital Radio Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP	R&S	22/24/27, 15C
2359	Temperature Test system	VT4002	Vötsch Industrietechnik	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	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1748	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1749	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1875	Thermo- Hygrograph	00.02520.150700	Lambrecht	22/24/27, 15C, 15B
1917	Radio Communication tester	CMTA84	R&S	22/24/27, 15C, 15B
1933	Precision half-wave dipole antennas	HZ-13	R&S	22/24/27, 15C
1938	Precision half-wave dipole antennas	HZ-12	R&S	22/24/27, 15C
2006	Radiation Reference Source	VSQ	MEB	22/24/27, 15C, 15B
2009	Signal generator	SMP 22	R&S	22/24/27, 15C, 15B
2019	Multimeter	34401A	HP	22/24/27, 15C, 15B
2027	Coupling and Decoupling Network	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	Coupling and Decoupling Network	M3 (modified) DC2	MEB	22/24/27, 15C, 15B
2029	Power Supply	PL330	THURLBY	22/24/27, 15C, 15B
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22, 15C, 15B
2047	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24, 15C, 15B
2048	Band Reject Filter	WRCC1700/1800-0.2-10SS	Wainwright	27, 15C, 15B
2051	High Pass Filter	4HC1700-1-KK	R&S	22/24/27, 15C
2057	Log. per. Antenna	HL025	R&S	22/24/27, 15C
2109	Power Supply	PL330QMD	THURLBY	22/24/27, 15C, 15B
2110	Multimeter	34401A	HP	22/24/27, 15C, 15B
2112	Multimeter	TX3	Tektronix	22/24/27, 15C, 15B
2116	Controller	EMCO MODEL 2090	ETS	22/24/27, 15C, 15B
2133	Power Meter	NRVS	R&S	22/24/27, 15C
2134	Power Sensor	NRV-Z32	R&S	22/24/27, 15C
2135	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B

Copyright © TCC Nokia
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

Eq. No	Equipment	Type	Manufacturer	Used in
2138	Ultra Broadband Antenna	HL562	R&S	22/24/27, 15C, 15B
2140	Biconical Antenna	EMCO93110B	EMCO	22/24/27, 15C
2142	Log.-per.-dipol Antenna	3146	EMCO	22/24/27, 15C
2144	Attenuator	6803.17B	Huber-Suhner	22/24/27, 15C, 15B
2150	High Pass Filter	F-15041	RLC ELECTRONICS	22/24/27, 15C
2176	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B
2180	Digital Radio Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	MITEQ	22/24/27, 15C, 15B
2330	EMI Test receiver	ESIB26	R&S	22/24/27, 15C, 15B
2334	GPIB Switch 2 to 1	-	National Instruments	22/24/27, 15C, 15B
2348	Yaesu controller	G-1000DXC	YAESU	22/24/27, 15C, 15B
2349	Computer controller (Yaesu)	GS-232B	YAESU	22/24/27, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	MITEQ	22/24/27, 15C
2361	Anechoic chamber	3 meter semi/full anechoic chamber	Euroshield	22/24/27, 15C, 15B
2398	Horn antenna	HF906	R&S	22/24/27, 15C
2363	Band Reject Filter	WRCG 832/838-825/845/5SS	Wainwright	22/24/27
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	22/24/27
2365	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2366	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22/24/27
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B

Copyright © TCC Nokia
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