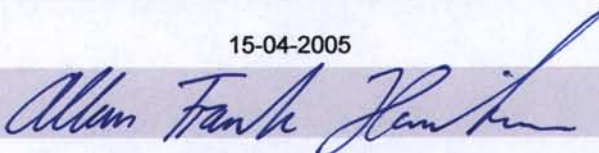


FCC Part 22/24 Compliance Test Report

Test Report no.:	Cph_FCC_0515_04.doc	Date of Report:	15-04-2005
Number of pages:	13	Customer's Contact person:	Anders Nielsen
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	Client:	Nokia Corporation Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934
FCC listing no.:	99059		
IC recognition no.:	4820 and 4820-1		
Tested devices/ accessories:	Phone; RH-28 (HW: 0780), Battery; BL-5C, Headset; HDS-3, AC-Charger; ACP-12, Multi Media Card; MU-14		
FCC ID:	QTKRH-28	IC:	661AD-RH28
Supplement reports:			
Testing has been carried out in accordance with:	CFR 47, FCC rules Parts 22 and 24, TIA-603-B-2002 and IC standards RSS-132 and RSS-133. 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:

15-04-2005



Allan F. Henriksen
Test Engineer

1. Summary for FCC Part 22/24 Compliance Test Report

Date of receipt	March 8 th 2005
Testing completed	March 10 th 2005
The customer's contact person	Anders Nielsen
Test Plan referred to	\\EMC\\TESTPLAN\\
Notes	None
Document name	\\satcc01nmp\\tcc_salo\\Projects\\RH-28\\results\\emc\\FCC\\Cph_FCC_0515_04.doc

1.1. EUT and Accessory Information

The EUT is a tri-band band (GSM850/1800/1900) mobile phone with EGPRS, bluetooth, FM-radio and a camera. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
Phone	RH-28	004400/25/1738512	0780	-	04.43	28908
Battery	BL-5C	0670400363563 L484220605461	-	-	-	28903
Charger	ACP-12	0675294409049L192 R104819142600	-	-	-	28905
Headset	HDS-3	EL 19863491	4.0	7.2	4.0	28873
Multi Media Card	MU-14	MC56UO32NCFA- QCY7A7900443	-	-	-	28904

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in 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, 6.4	Radiated RF output power	NP
§2.1049(h)	4.2	99 % occupied bandwidth	NP
§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, 6.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3, 6.3	Frequency stability, voltage variation	NP

GSM 1900:

Section in CFR 47	Section in RSS-133	Name of the test	Result
§2.1046(a)	6.2	Conducted RF output power	NP
§24.232(b)	6.2	Radiated RF output power	NP
§2.1049(h)	5.6	99 % occupied bandwidth	NP
§24.238(a)	6.3	Band edge compliance	PASSED
§24.238(a), §2.1051	6.3	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.3	Spurious radiated emissions	PASSED
§2.1055(a)	7	Frequency stability, temperature variation	NP
§2.1055(d)	7	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 Copenhagen Laboratory.

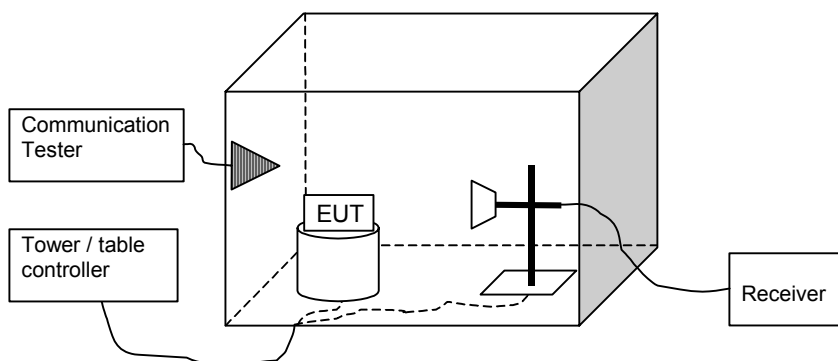
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2. Band edge compliance (FCC §22.917(a), 24.238(a), RSS-132 4.5, RSS-133 6.3)

EUT with DUT number	RH-28 dut#28908
Accessories with DUT numbers	BL-5C dut#28903
Operation Voltage V / Hz	Internal battery
Result	Passed
Remarks	None
Temp °C / Humidity RH % / Air Pressure mbar	19.3°C / 40.0 %RH / 1018 mbar
Date of measurements	March 10 th 2005
Measured by	Jesper Nielsen

2.1. Test setup



2.2. Test method and limit

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

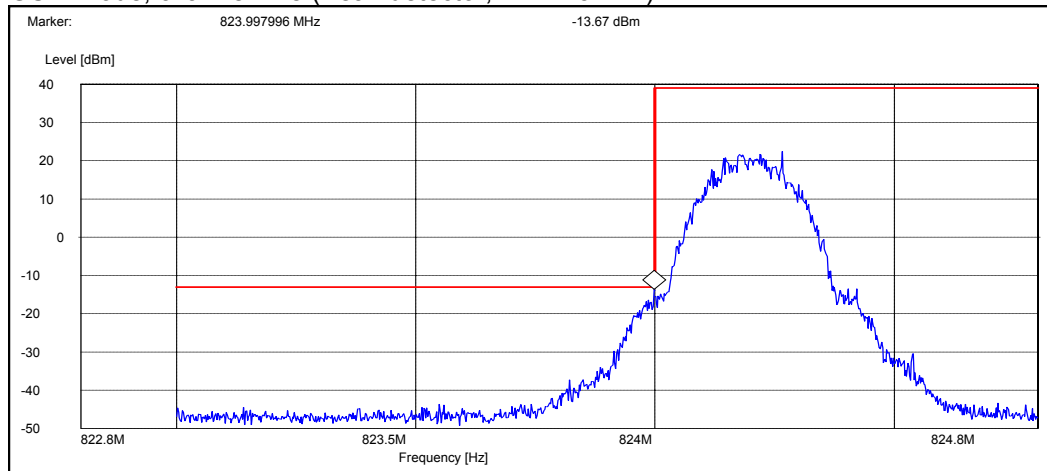
Limits for band edge compliance measurements

Operation band	Frequency range / MHz	Limit / dBm
GSM 850	Below 824 and above 849	-13
GSM 1900	Below 1850 and above 1910	-13

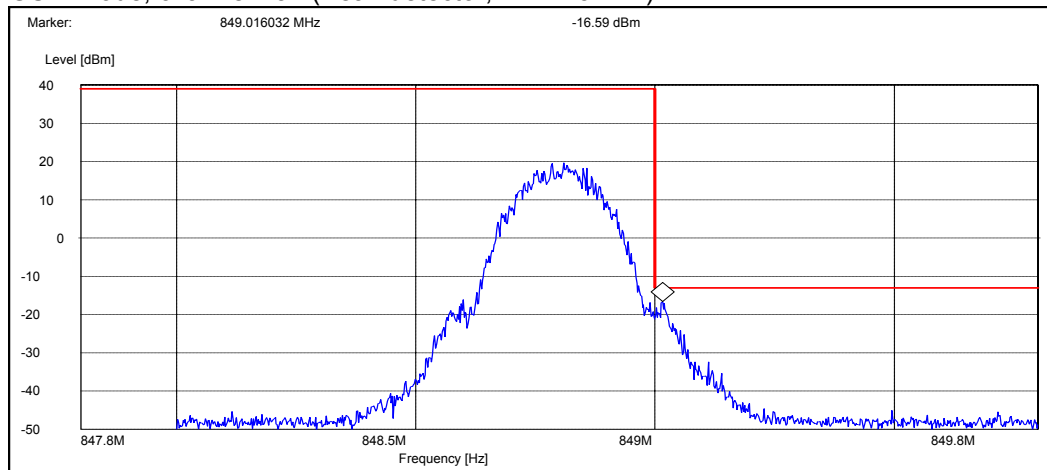
2.3. GSM 850 Test results

Operation mode (TX on)	Channel	Level / dBm
GSM	128	-13.67
GSM	251	-16.59
EGPRS	128	-19.25
EGPRS	251	-21.08

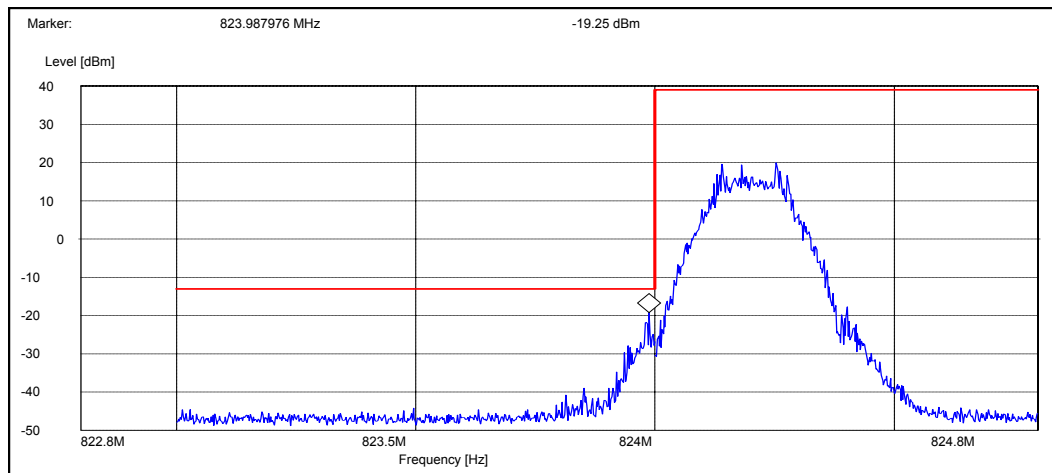
GSM mode, channel 128 (Peak detector, RBW: 3 kHz)



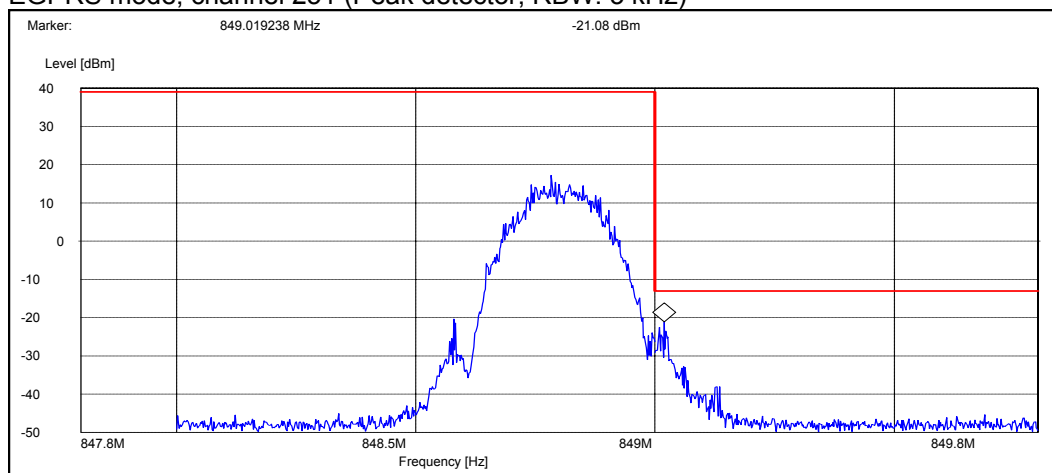
GSM mode, channel 251 (Peak detector, RBW: 3 kHz)



EGPRS mode, channel 128 (Peak detector, RBW: 3 kHz)



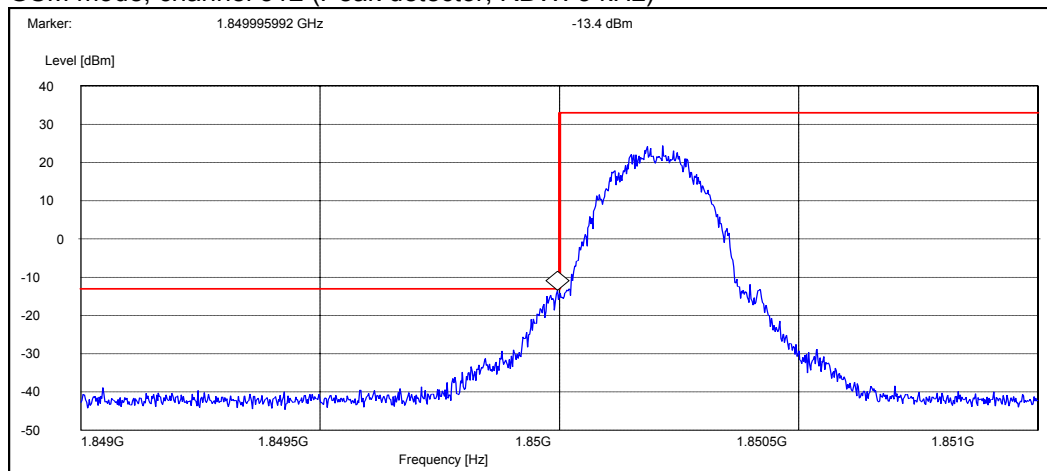
EGPRS mode, channel 251 (Peak detector, RBW: 3 kHz)



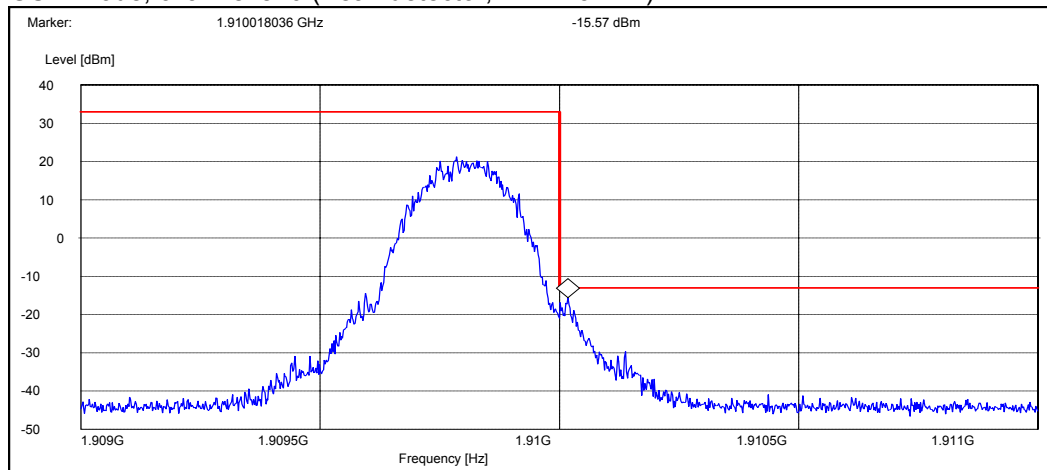
2.4. GSM 1900 Test results

Operation mode (TX on)	Channel	Level / dBm
GSM	512	-13.40
GSM	810	-15.57
EGPRS	512	-23.63
EGPRS	810	-24.26

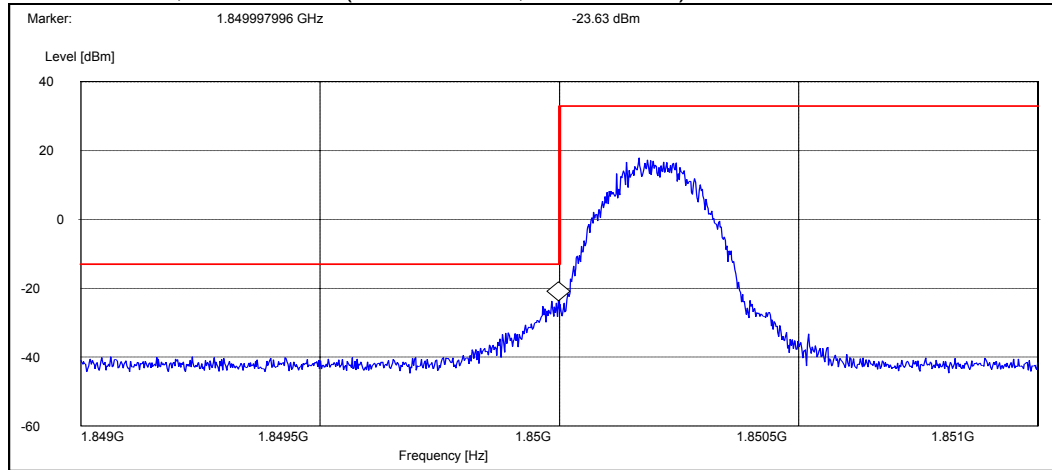
GSM mode, channel 512 (Peak detector, RBW: 3 kHz)



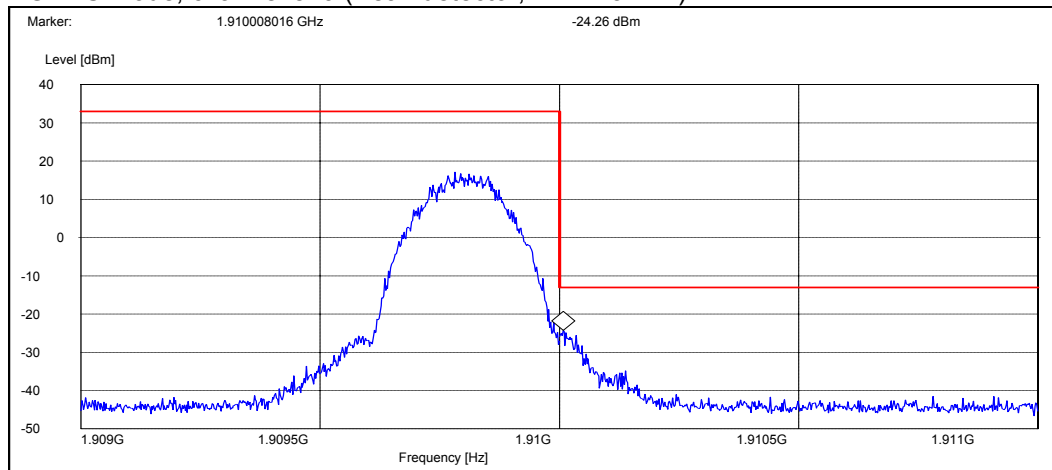
GSM mode, channel 810 (Peak detector, RBW: 3 kHz)



EGPRS mode, channel 512 (Peak detector, RBW: 3 kHz)



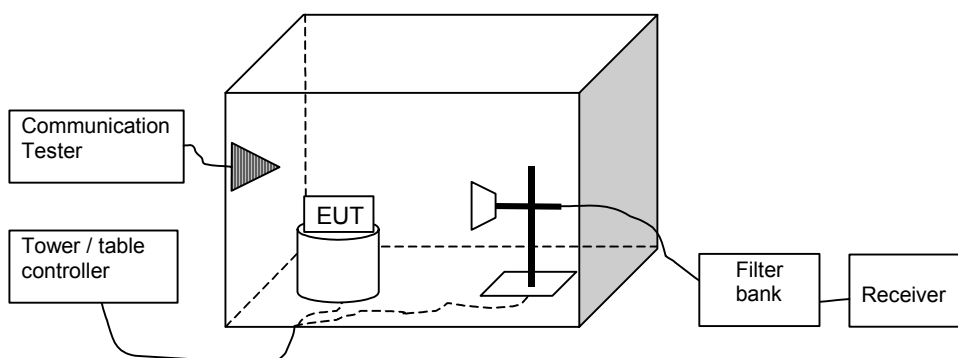
EGPRS mode, channel 819 (Peak detector, RBW: 3 kHz)



3. Spurious radiated emissions (FCC §22.917(a), §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.3)

EUT with DUT number	RH-28 dut#28908
Accessories with DUT numbers	BL-5C dut#28903, ACP-12 dut#28905, HDS-3 dut#28873
Operation Voltage V / Hz	115 VAC / 60Hz
Result	Passed
Remarks	None
Temp °C / Humidity RH % / Air Pressure mbar	19.3°C / 40.0 %RH / 1018 mbar
Date of measurements	March 10 th 2005
Measured by	Jesper Nielsen

3.1. Test setup



3.2. Test method and limit

The measurement is made according to TIA-603-B-2002 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 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:

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

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

Limits for spurious radiated emissions measurements

Operation band	Frequency range / MHz	Limit / dBm
GSM 850	30 - 8500	-13
GSM 1900	30 - 18000	-13

3.3. GSM 850 Test results

GSM mode, channel 190

Frequency / MHz	Level / dBm	Level / μ W	$A_{CORRECTION}$ / dB	Polarisation	Result
1673.143287	-36.50	0.22387	11.60	HORIZONTAL	Passed
2509.820641	-35.80	0.26303	18.60	VERTICAL	Passed
3346.689379	-44.90	0.03236	14.50	HORIZONTAL	Passed

EGPRS mode, channel 190

Frequency / MHz	Level / dBm	Level / μ W	$A_{CORRECTION}$ / dB	Polarisation	Result
1673.143287	-40.40	0.09120	11.60	HORIZONTAL	Passed
2510.320641	-48.10	0.01549	18.70	VERTICAL	Passed
3346.689379	-51.60	0.00692	14.50	HORIZONTAL	Passed

3.4. GSM 1900 Test results

GSM mode, channel 661

Frequency / MHz	Level / dBm	Level / μ W	$A_{CORRECTION}$ / dB	Polarisation	Result
3761.523046	-33.32	0.46559	16.80	HORIZONTAL	Passed
5641.282565	-36.21	0.23933	19.90	HORIZONTAL	Passed
7520.042084	-31.60	0.69183	24.10	HORIZONTAL	Passed

EGPRS mode, channel 661

Frequency / MHz	Level / dBm	Level / μ W	A _{CORRECTION} / dB	Polarisation	Result
3761.523046	-33.32	0.46559	16.80	HORIZONTAL	Passed
5641.282565	-36.21	0.23933	19.90	HORIZONTAL	Passed
7520.042084	-32.25	0.59566	24.10	HORIZONTAL	Passed
15993.487976	-29.30	1.17490	36.70	HORIZONTAL	Passed
16031.560120	-28.70	1.34896	36.60	HORIZONTAL	Passed
16290.073146	-31.00	0.79433	38.40	HORIZONTAL	Passed

4. Test Equipment

4.1. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
14020	Programmable Relay Switching System	-	Pickering	15B,15C,22,24
18792	Multi Device Controller	2090	ETS-EMCO	15B,15C,22,24
13829	Turntable Controller	4630-100	Comtest	15B,15C,22,24
14963	RF Preamplifier 100MHz-4GHz (Metal Chassis)	AFS3-00100400	Miteq/NMP Cph	15B,15C,22,24
13668	BiLog Antenna 30-2000MHz	BiLog-CBL6112A	Chase	15B,15C,22,24
18861	EMI Test Receiver 20Hz-26,5GHz	ESI	Rohde&Schwarz	15B,15C,22,24
12679	Dual Log Periodic Antenna 1-18 GHz	HL025	Rohde&Schwarz	15B,15C,22,24
18860	Ultra Broadband Antenna Ultralog 30-3000MHz	HL562	Rohde&Schwarz	15B,15C,22,24
18773	Shielded Chamber	RFD-100	ETS-Lindgren	15B,15C,22,24
18774	Shielded Chamber	RFSD-F/A-100	ETS-Lindgren	15B,15C,22,24
18324	High Pass Filter 3GHz SMA f Conn	WHJS3000-10SS	Wainwright	15B,15C,22,24
14114	Highpass Filter 1000MHz-4500MHz	WHK1000-12SS	Wainwright	15B,15C,22,24
13918	Highpass Filter 2000-4000MHz 50OHM SMA Conn	WHKS2000-10SS	Wainwright Instruments	15B,15C,22,24
13937	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright Instruments	15B,15C,22,24
13936	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	15B,15C,22,24
13917	Highpass Filter 1000-3000MHz 50OHM SMA Conn	WHKS1000-10SS	Wainwright Instruments	15B,15C,22,24
14188	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright	15B,15C,22,24
14187	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright	15B,15C,22,24
16633	Ultra Stable Notch Filter 1880,0MHz	WRCD1880.0-0.2/40-10SS	Wainwright	15B,15C,22,24
18323	Band reject filter 1947-1953MHz 40dB	WRCG1947/1953-1940/1960-40/6SS	Wainwright	15B,15C,22,24
15190	Infra Red Remote Control Unit	4630	Emco	22,24,15B,15C
14993	EMI Test Receiver 9KHz-2750MHz	ESCS30	Rohde&Schwarz	22,24,15B,15C
15191	Turntable Contoller Unit	G-800SDX	YAESU	22,24,15B,15C
14900	Antenna Controller	HD100	HD GmbH	22,24,15B,15C