



**REPORT ON THE CERTIFICATION TESTING OF AN
SENNHEISER COMMUNICATIONS A/S
DW 20 HS
RADIATED EMISSIONS ONLY
WITH RESPECT TO
FCC RULES CFR 47, PART 15 July 2008
INTENTIONAL RADIATOR SPECIFICATION
&
INDUSTRY CANADA
RADIO STANDARDS SPECIFICATION
RSS-213 ISSUE 2 December 2005**

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INDUSTRY CANADA
RADIO STANDARDS SPECIFICATION
RSS-213 ISSUE 2 December 2005**

TEST DATE: 11th – 22nd June 2010

APPROVED BY:



J CHARTERS
RADIO PRODUCT
MANAGER

DATE: 5th August 2010

Distribution: Sennheiser Communications A/S
TRaC Telecoms & Radio

THIS DOCUMENT MAY BE REPRODUCED ONLY IN ITS ENTIRETY AND WITHOUT CHANGE

The results herein relate only to the sample tested. Full results are contained in the relevant works order file.

CONTENTS

	PAGE
CERTIFICATE OF CONFORMITY & COMPLIANCE	4
APPLICANT'S SUMMARY	5
TESTS REQUIRED	6
EQUIPMENT TEST CONDITIONS	7
SYSTEM DESCRIPTION	7
TEST RESULTS	8 – 13
	ANNEX
PHOTOGRAPHS	A
PHOTOGRAPH No. 1: Radiated Test Setup	
PHOTOGRAPH No. 2: Top Overview	
PHOTOGRAPH No. 3: Bottom Overview	
	ANNEX
SPURIOUS EMISSIONS – RADIATED	B
EQUIPMENT DETAILS & CALIBRATION	C
MEASUREMENT UNCERTAINTY	D
Notes:	
1. Component failure during test	YES [] NO [X]
2. If Yes, details of failure:	
3. The facilities used for the testing of the product contain in this report are FCC Listed.	
4. The contents of the attached applicants declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations' and is provided in good faith.	

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY: DMOCDHDFC

IC NUMBER: 2099D-TDH1

PURPOSE OF TEST: Certification

TEST SPECIFICATION(s): FCC RULES CFR 47, Part 15 July 2008
RSS-213

TEST RESULT: Compliant to Specification

EQUIPMENT UNDER TEST: DW 20 HS

EQUIPMENT TYPE: UPCS Transceiver

PRODUCT USE: Personal communications

CARRIER POWER: 19.55 dBm (Conducted) (See TRaC Telecoms & Radio Test Report 8F1839WUS1)

ANTENNA TYPE: Integral

ALTERNATIVE ANTENNA: Not Applicable

BAND OF OPERATION: 1920 MHz – 1930 MHz

CHANNEL SPACING: 1.728 MHz (starting at 1921.536 MHz – 1928.448MHz)

MAXIMUM NUMBER OF CHANNELS: 5 frequencies, 12 single time slots per frequency giving 60 channels

FREQUENCY GENERATION: SAW Resonator Crystal Synthesiser

MODULATION METHOD: Amplitude Digital Angle

POWER SOURCE(s): +3.7Vdc

TEST DATE(s): 11th – 22nd June 2010

APPLICANT: Sennheiser Communications A/S

ADDRESS: Langager 6
DK-2680
Solrød Stand
Denmark

TESTED BY: D WINSTANLEY

APPROVED BY:



J CHARTERS
RADIO PRODUCT
MANAGER

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	Part 15	RSS-213	Applicable
Coordination with Fixed Microwave Service	15.307 (b)	2.1	No Note 1
Cross reference to Subpart B	15.309 (b)	N/A	Yes
Labelling Requirements	15.311 15.19 (a)(3)	RSS-GEN 5.2	Yes
Measurement Procedures	15.313	4.1	Yes
Antenna Requirement	15.317 15.203	4.1(e)	Yes
Modulation Techniques	15.319 (b)	4.3.1	Yes
Conducted AC Powerline	15.315 15.207	4.2	No Note 2
Emission Bandwidth	15.323 (a)	4.3.2.1	No Note 5
Peak Transmit Power	15.319 (c)	4.3.1	No Note 5
Power Spectral Density	15.319 (d)	4.3.2.1	No Note 5
Antenna Gain	15.319 (e)	4.1 (e)	No Note 5
Automatic Discontinuation of Transmission	15.319 (f)	4.3.4(a)	No Note 5
Radio Frequency Radiation Exposure	15.319 (i)	RSS-102	No Note 5
Monitoring Thresholds	15.323 (c)(2) 15.323 (c)(9)	4.3.4(b)(2)	No Note 5
Monitoring of Intended Transmit Window and Maximum Reaction Time	15.323 (c)(1)	4.3.4(b)(1)	No Note 5
Monitoring Bandwidth	15.323 (c)(7)	4.3.4(b)(7)	No Note 5
Access Criteria Functional Test	15.323 (c)(6)	4.3.4(b)(6)	No Note 2
Duration of Transmission	15.323 (c)(3)	4.3.4(b)(3)	No Note 5
Connection Acknowledgement	15.323 (c)(4)	4.3.4(b)(4)	No Note 5
Lower threshold Selected Channel, Power Accuracy, Segment Occupancy	15.323 (c)(5)	4.3.4(b)(5)	No Note 5
Monitoring Antenna	15.323 (c)(8)	4.3.4(b)(8)	No Note 5
Duplex Connections	15.323 (c)(10)	4.3.4(b)(10)	No Note 5
Alternative Monitoring Interval for Co-located Devices	15.323 (c)(11)	4.3.4(b)(11)	No Note 3
Fair Access to Spectrum Related to (c)(10) & (c)(11)	15.323 (c)(12)	4.3.4(b)(12)	No Note 5
Emission Inside and Outside the Sub-band	15.323 (d)	4.3.3	Yes
Frame Period	15.323 (e)	4.3.4(c)	No Note 5
Frequency Stability	15.323 (f)	6.2	No Note 5
Note:	1. Requirement removed April 4 th 2005 see public notice DX 05-1005. 2. The portable part connects indirectly via the fixed part see 8F1839WUS2 for results 3. The EUT does not transmit control and signalling information. 4. Not utilized by this EUT as devices will not be co-located within 1m of each other. 5. See 8F1839WUS1 for results		

2. Product Use:	Personal Communications	
3. Duty Cycle:		8.33%
4. Transmitter bit or pulse rate and level:		2Mbps
5. Temperatures:	Ambient (Tnom)	22°C
6. Supply Voltages:	Vnom	+3.7Vdc

Note: Vnom voltages are as stated above unless otherwise shown on the test report page

7. Equipment Category:	Single channel	<input type="checkbox"/>
	Two channel	<input type="checkbox"/>
	Multi-channel	<input checked="" type="checkbox"/>
8. Channel spacing:	Narrowband	<input type="checkbox"/>
	Wideband	<input checked="" type="checkbox"/>
9. System Description:		

The system is made up of two parts, a fixed part and a portable part. The portable part is a cordless headset device. The portable part is capable of operating on a maximum of 60 channels (time spectrum windows). The fixed part is a desktop transmitters connected to an exchange/personal computer.

The system operates in the 1920MHz -1930MHz band. The system use 5 different frequency channels 1.728MHz apart using MC/TDMA/TDD (Multi Carrier / Time Division Multiple Access / Time Division Duplex) using QPSK modulation.

The system employs a 10ms frame, divided into 24 equal timeslots, numbered 0-23. The Base station always transmits in the first half of the frame, and the Portable always transmits on the duplex mate in the second half of the frame.

The Portable is the initiating device. A physical bearer is composed of a transmit single-slot and a receive single-slot for narrowband communications or a transmit long-slot and a receive long-slot for wideband communications. The two halves of a given bearer are always exactly half a frame (5ms, 12 single slots) apart. When configured to operate using long slots the transmission extends in the next consecutive transmit/receive time slot.

The Fixed part is always capable of realising >40 channels when transmitting control and signalling information. The portable part is capable of realising >40 Channels in single-slot configuration and <40channels in long-slot configuration.

During the testing frequency administration was utilised to allow operation on only certain channels during the tests. The frequency administration was performed using a software interface. A portable part was supplied with a temporary antenna connector to allow conducted measurements where applicable.

CROSS REFERENCE TO SUBPART B

The unit contains digital circuitry, which is not directly related to the radio transmitter. See unintentional radiated emissions for results.

LABELLING INFORMATION

This information is contained in a separate document. See attached exhibit.

ANTENNA REQUIREMENTS

The unit employs an integral antenna arrangement.

MODULATION TECHNIQUES

The Sennheiser Communications A/S DW 20 HS is an isochronous device operating in the 1920 MHz – 1930 MHz frequency band.

The Sennheiser Communications A/S DW 20 HS modulation technique is based on DECT technology as described in European standards EN 300 175-2 and EN 300 175-3.

The Sennheiser Communications A/S DW 20 HS modulation techniques are MC/TDMA/TDD (Multi Carrier / Time Division Multiple Access / Time Division Duplex) using QPSK modulation.

EMISSIONS OUTSIDE THE SUB-BAND – RADIATED

RF carrier set to the lowest carrier defined by the EUT – Single Slot Configuration.

These measurements are carried out in accordance with ANSI C63.17 sub-clause 6.1.6

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	PRE AMP (dB)	EXTRAP FACTOR	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
1.705MHz - 30MHz								Note 11	30
30MHz - 88MHz								Note 11	100
88MHz - 216MHz								Note 11	150
216MHz - 960MHz								Note 11	200
960MHz - 1GHz								Note 11	500
1GHz - 20GHz	3842.847	46.47	2.5	32.2	36.0	9.54	35.63	60.46	500
	5763.774	43.14	3.5	33.9	36.2	9.54	34.80	54.95	500
	13448.732	34.94	3.4	40.7	35.5	9.54	34.00	50.12	500
Limits	1.705MHz to 30MHz				30µV/m @ 30m				
	30MHz to 88MHz				100µV/m @ 3m				
	88MHz to 216MHz				150µV/m @ 3m				
	216MHz to 960MHz				200µV/m @ 3m				
	960MHz to 1GHz				500µV/m @ 3m				
	1GHz to 20GHz				500µV/m @ 3m				

Notes:

- 1 Emissions were searched to: 20,000MHz inclusive, as per Part 15.33a.
- 2 Emission due to digital circuitry not directly associated with the radio transmitter, see page 13.
- 3 Measurements >1GHz @ 3m as per Part 15.31f(1).
- 4 Measurements >3GHz @ 1m as per Part 15.31f(1).
- 5 1m to 3m extrapolation 9.5 dB as per Part 15.31f
- 6 Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth.
- 7 Receiver detector >1GHz = Average & Peak Detector, 1MHz RBW, 10MHz VBW.
- 8 New / Fully Charged batteries used for battery powered products.
- 9 Only Average emissions within 20 dB of the limit are recorded.
- 10 See Annex B for scan plots
- 11 Peak emissions are within 20 dB of the average limit.

Test Method:

- 1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
- 2 Measuring distances as Notes 1 to 4 above.
- 3 EUT 0.8 metre above ground plane.
- 4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded.

EMISSIONS OUTSIDE THE SUB-BAND – RADIATED

RF carrier set to the lowest carrier defined by the EUT – Long Slot Configuration.

These measurements are carried out in accordance with ANSI C63.17 sub-clause 6.1.6

	FREQ. (MHz)	MEAS. Rx. (dBμV)	CABLE LOSS (dB)	ANT FACTOR	PRE AMP (dB)	EXTRAP FACTOR	FIELD STRENGTH (dBμV/m)	FIELD STRENGTH (μV/m)	LIMIT (μV/m)
1.705MHz - 30MHz								Note 11	30
30MHz - 88MHz								Note 11	100
88MHz - 216MHz								Note 11	150
216MHz - 960MHz								Note 11	200
960MHz - 1GHz								Note 11	500
1GHz - 20GHz	3842.767	49.83	2.5	32.2	36.0	9.54	38.99	89.02	500
	5763.870	46.51	3.5	33.9	36.2	9.54	38.17	81.00	500
	13448.732	36.10	3.4	40.7	35.5	9.54	35.16	57.28	500
Limits	1.705MHz to 30MHz				30μV/m @ 30m				
	30MHz to 88MHz				100μV/m @ 3m				
	88MHz to 216MHz				150μV/m @ 3m				
	216MHz to 960MHz				200μV/m @ 3m				
	960MHz to 1GHz				500μV/m @ 3m				
	1GHz to 20GHz				500μV/m @ 3m				

- Notes:**
- 1 Emissions were searched to: 20,000MHz inclusive, as per Part 15.33a.
 - 2 Emission due to digital circuitry not directly associated with the radio transmitter, see page 13.
 - 3 Measurements >1GHz @ 3m as per Part 15.31f(1).
 - 4 Measurements >3GHz @ 1m as per Part 15.31f(1).
 - 5 1m to 3m extrapolation 9.5 dB as per Part 15.31f
 - 6 Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth.
 - 7 Receiver detector >1GHz = Average & Peak Detector, 1MHz RBW, 10MHz VBW.
 - 8 New / Fully Charged batteries used for battery powered products.
 - 9 Only Average emissions within 20 dB of the limit are recorded.
 - 10 See Annex B for scan plots
 - 11 Peak emissions are within 20 dB of the average limit.

- Test Method:**
- 1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
 - 2 Measuring distances as Notes 1 to 4 above.
 - 3 EUT 0.8 metre above ground plane.
 - 4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded.

EMISSIONS OUTSIDE THE SUB-BAND – RADIATED

RF carrier set to the highest carrier defined by the EUT – Single Slot Configuration.

These measurements are carried out in accordance with ANSI C63.17 sub-clause 6.1.6

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	PRE AMP (dB)	EXTRAP FACTOR	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)	
1.705MHz - 30MHz								Note 11	30	
30MHz - 88MHz								Note 11	100	
88MHz - 216MHz								Note 11	150	
216MHz - 960MHz								Note 11	200	
960MHz - 1GHz								Note 11	500	
1GHz - 20GHz	3856.703 5784.486	47.63 43.64	2.5 3.5	32.2 33.9	36.0 36.2	9.54 9.54	36.79 35.30	69.10 58.21	500 500	
Limits	1.705MHz to 30MHz				30µV/m @ 30m					
	30MHz to 88MHz				100µV/m @ 3m					
	88MHz to 216MHz				150µV/m @ 3m					
	216MHz to 960MHz				200µV/m @ 3m					
	960MHz to 1GHz				500µV/m @ 3m					
	1GHz to 20GHz				500µV/m @ 3m					

Notes:

- 1 Emissions were searched to: 20,000MHz inclusive, as per Part 15.33a.
- 2 Emission due to digital circuitry not directly associated with the radio transmitter, see page 13.
- 3 Measurements >1GHz @ 3m as per Part 15.31f(1).
- 4 Measurements >3GHz @ 1m as per Part 15.31f(1).
- 5 1m to 3m extrapolation 9.5 dB as per Part 15.31f
- 6 Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth.
- 7 Receiver detector >1GHz = Average & Peak Detector, 1MHz RBW, 10MHz VBW.
- 8 New / Fully Charged batteries used for battery powered products.
- 9 Only Average emissions within 20 dB of the limit are recorded.
- 10 See Annex B for scan plots
- 11 Peak emissions are within 20 dB of the average limit.

Test Method:

- 1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
- 2 Measuring distances as Notes 1 to 4 above.
- 3 EUT 0.8 metre above ground plane.
- 4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded.

EMISSIONS OUTSIDE THE SUB-BAND – RADIATED

RF carrier set to the highest carrier defined by the EUT – Long Slot Configuration.

These measurements are carried out in accordance with ANSI C63.17 sub-clause 6.1.6

	FREQ. (MHz)	MEAS. Rx. (dBμV)	CABLE LOSS (dB)	ANT FACTOR	PRE AMP (dB)	EXTRAP FACTOR	FIELD STRENGTH (dBμV/m)	FIELD STRENGTH (μV/m)	LIMIT (μV/m)
1.705MHz - 30MHz								Note 11	30
30MHz - 88MHz								Note 11	100
88MHz - 216MHz								Note 11	150
216MHz - 960MHz								Note 11	200
960MHz - 1GHz								Note 11	500
1GHz - 20GHz	3856.876	51.19	2.5	32.2	36.0	9.54	40.35	104.11	500
	5784.811	47.03	3.5	33.9	36.2	9.54	38.69	86.00	500
	13497.160	35.24	3.4	40.7	35.5	9.54	34.30	51.88	500
Limits	1.705MHz to 30MHz				30μV/m @ 30m				
	30MHz to 88MHz				100μV/m @ 3m				
	88MHz to 216MHz				150μV/m @ 3m				
	216MHz to 960MHz				200μV/m @ 3m				
	960MHz to 1GHz				500μV/m @ 3m				
	1GHz to 20GHz				500μV/m @ 3m				

Notes:

- 1 Emissions were searched to: 20,000MHz inclusive, as per Part 15.33a.
- 2 Emission due to digital circuitry not directly associated with the radio transmitter, see page 13.
- 3 Measurements >1GHz @ 3m as per Part 15.31f(1).
- 4 Measurements >3GHz @ 1m as per Part 15.31f(1).
- 5 1m to 3m extrapolation 9.5 dB as per Part 15.31f
- 6 Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth.
- 7 Receiver detector >1GHz = Average & Peak Detector, 1MHz RBW, 10MHz VBW.
- 8 New / Fully Charged batteries used for battery powered products.
- 9 Only Average emissions within 20 dB of the limit are recorded.
- 10 See Annex B for scan plots
- 11 Peak emissions are within 20 dB of the average limit.

Test Method:

- 1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
- 2 Measuring distances as Notes 1 to 4 above.
- 3 EUT 0.8 metre above ground plane.
- 4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded.

UNINTENTIONAL RADIATED EMISSIONS

These measurements are carried out in accordance with ANSI C63.17 sub-clause 6.1.6

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	PRE AMP (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
1.705MHz - 30MHz							Note 9	30
30MHz - 88MHz							Note 9	100
88MHz - 216MHz	190.90	15.8	1.5	-	8.1	25.4	18.62	150
	196.30	20.9	1.5	-	7.9	30.3	32.73	150
	198.95	18.9	1.5	-	7.8	28.2	25.70	150
	201.55	25.6	1.5	-	8.0	35.1	56.88	150
	204.30	18.0	1.5	-	8.1	27.6	23.98	150
216MHz - 960MHz							Note 9	200
960MHz - 1GHz							Note 9	500
1GHz - 20GHz							Note 9	500
Limits	1.705MHz to 30MHz			30µV/m @ 30m				
	30MHz to 88MHz			100µV/m @ 3m				
	88MHz to 216MHz			150µV/m @ 3m				
	216MHz to 960MHz			200µV/m @ 3m				
	960MHz to 1GHz			500µV/m @ 3m				
	1GHz to 20GHz			500µV/m @ 3m				

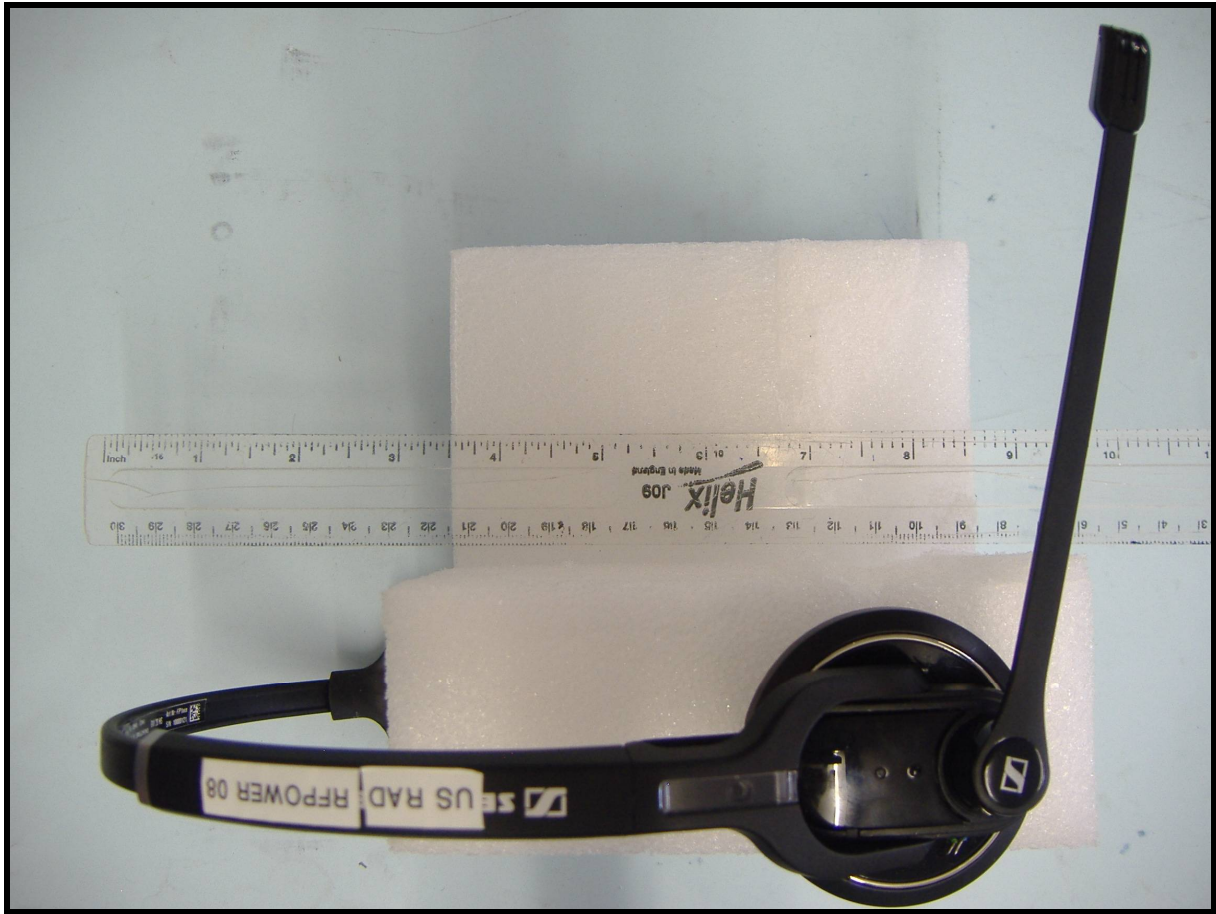
- Notes:**
- 1 Emissions were searched to: 20000MHz inclusive, as per Part 15.33a.
 - 2 Measurements <3GHz @ 3m as per Part 15.31f(1).
 - 3 Measurements >3GHz @ 1m as per Part 15.31f(1).
 - 4 1m to 3m extrapolation 9.5 dB as per Part 15.31f
 - 5 Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth.
 - 6 Receiver detector >1GHz = Average & Peak Detector, 1MHz RBW, 10MHz VBW.
 - 7 New / Fully Charged batteries used for battery powered products.
 - 8 Peak emissions are within 20 dB of the average limit.
 - 9 Only average emissions within 20 dB of the limit are recorded.

- Test Method:**
- 1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
 - 2 Measuring distances as Notes 1 to 4 above.
 - 3 EUT 0.8 metre above ground plane.
 - 4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded.

ANNEX A
PHOTOGRAPHS

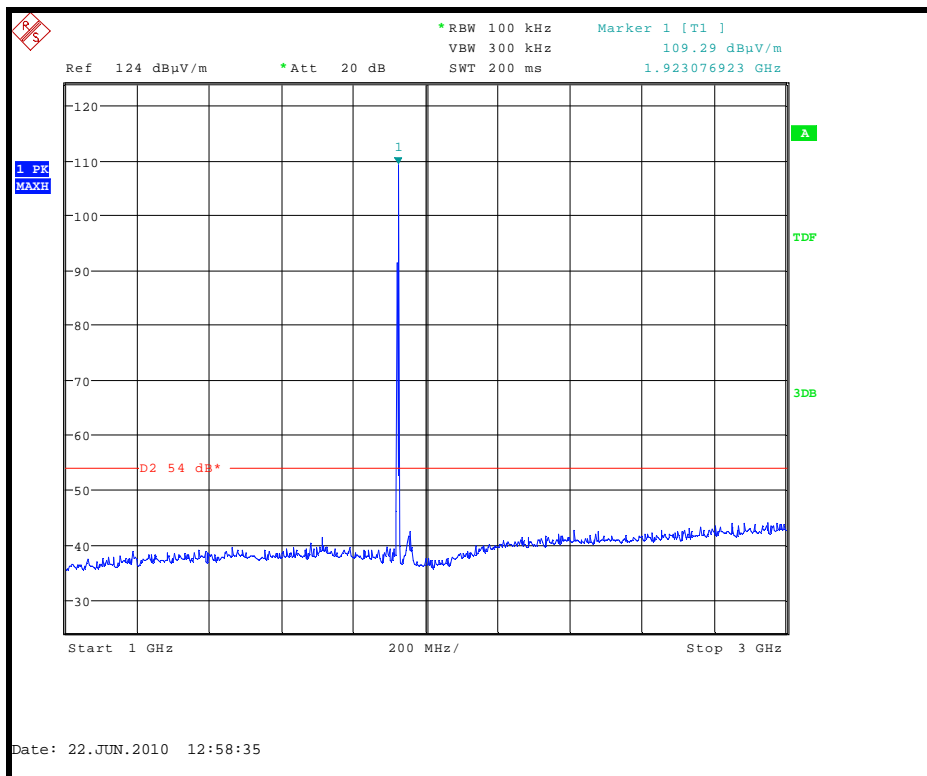
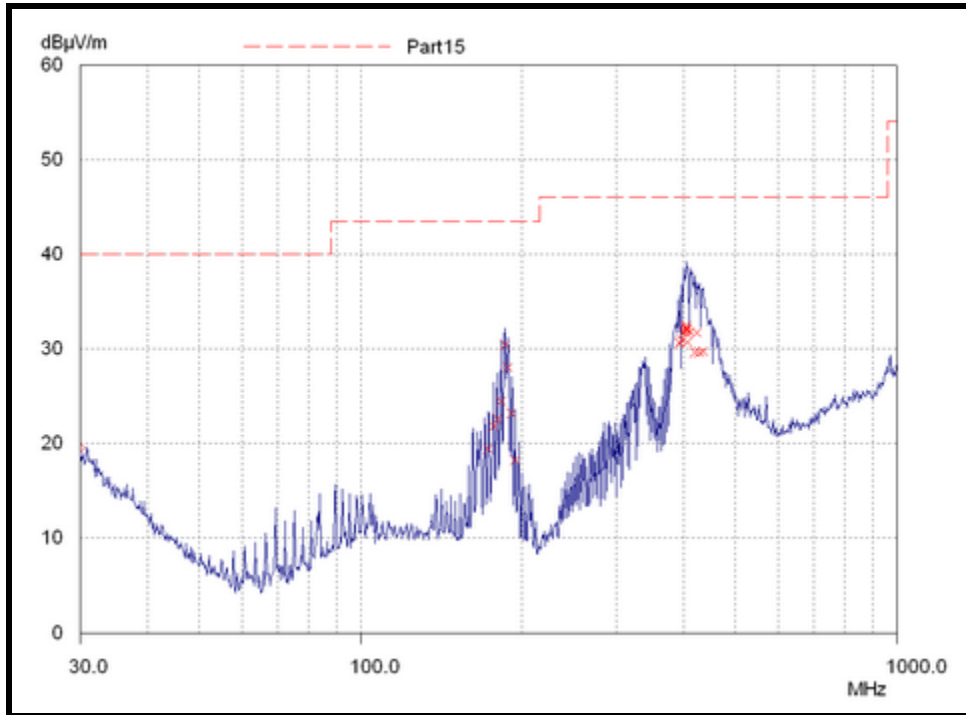




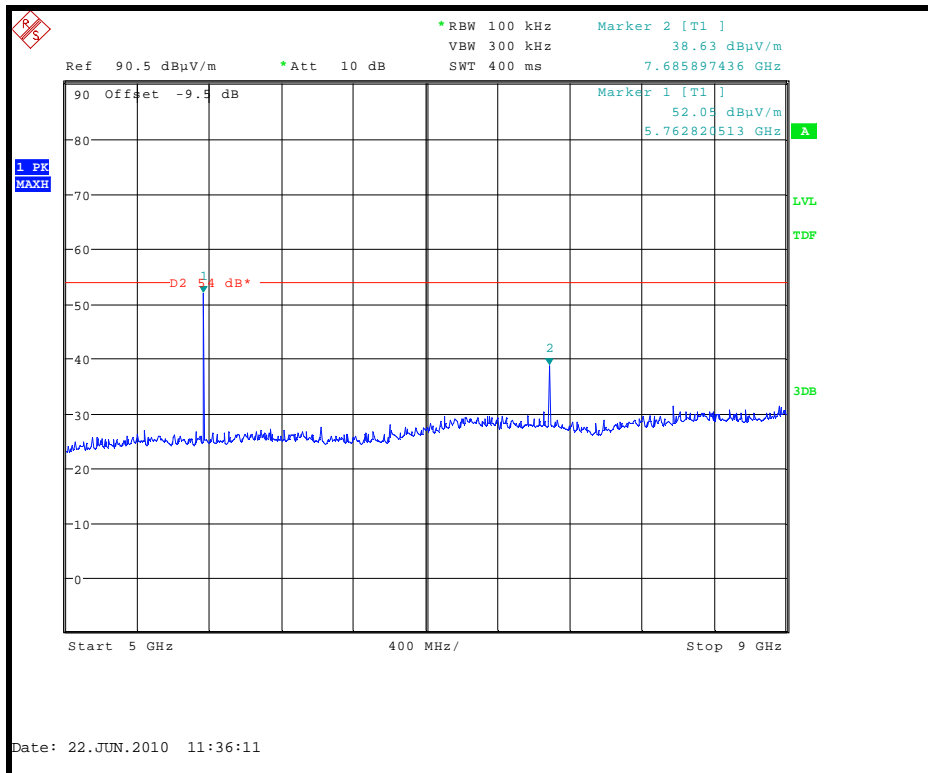
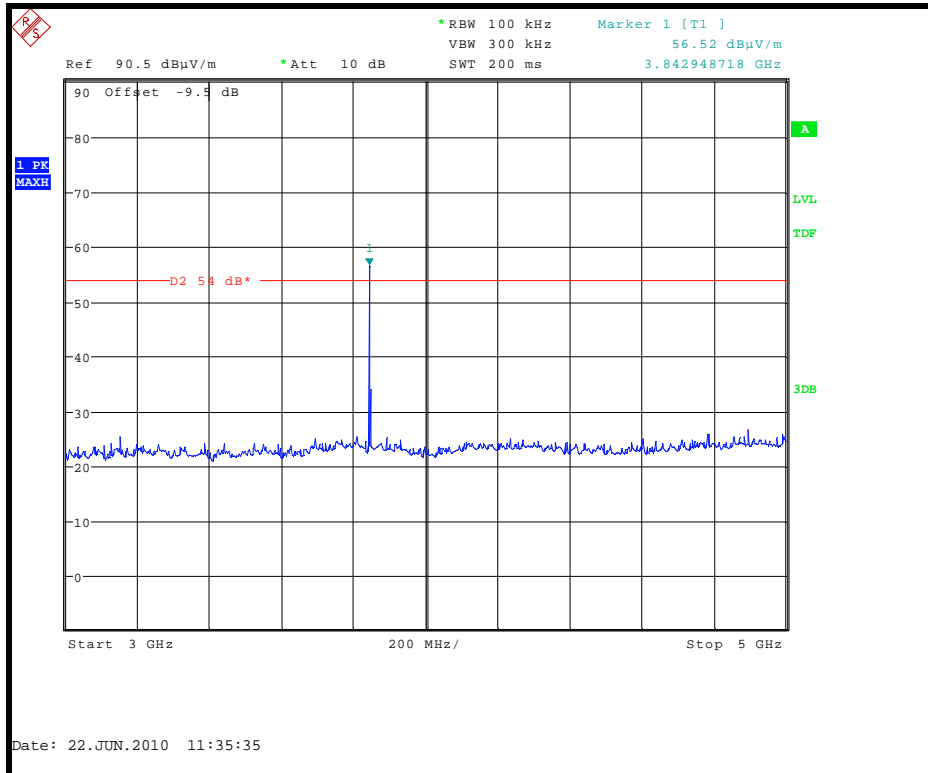


ANNEX B
SPURIOUS EMISSIONS – RADIATED

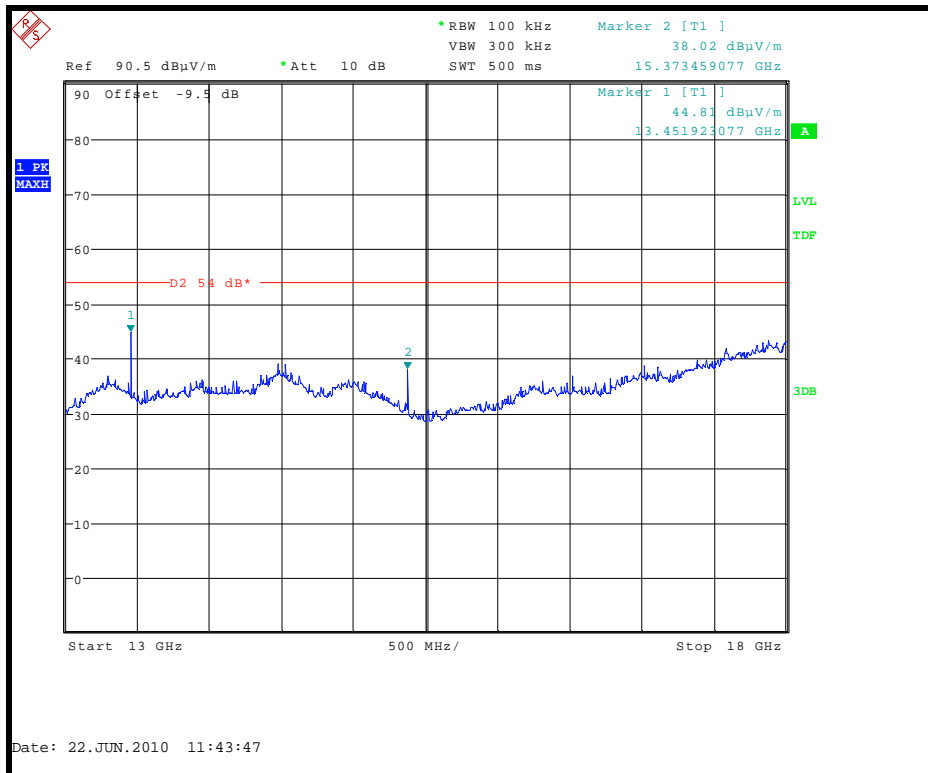
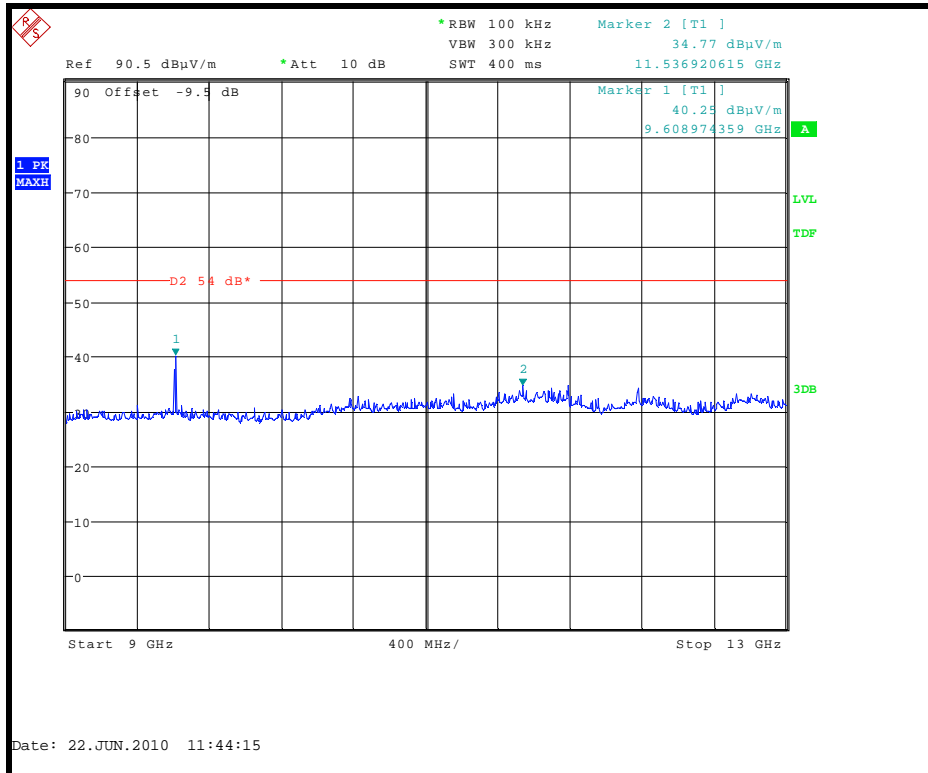
RF carrier set to the lowest carrier defined by the EUT – Single Slot Operation



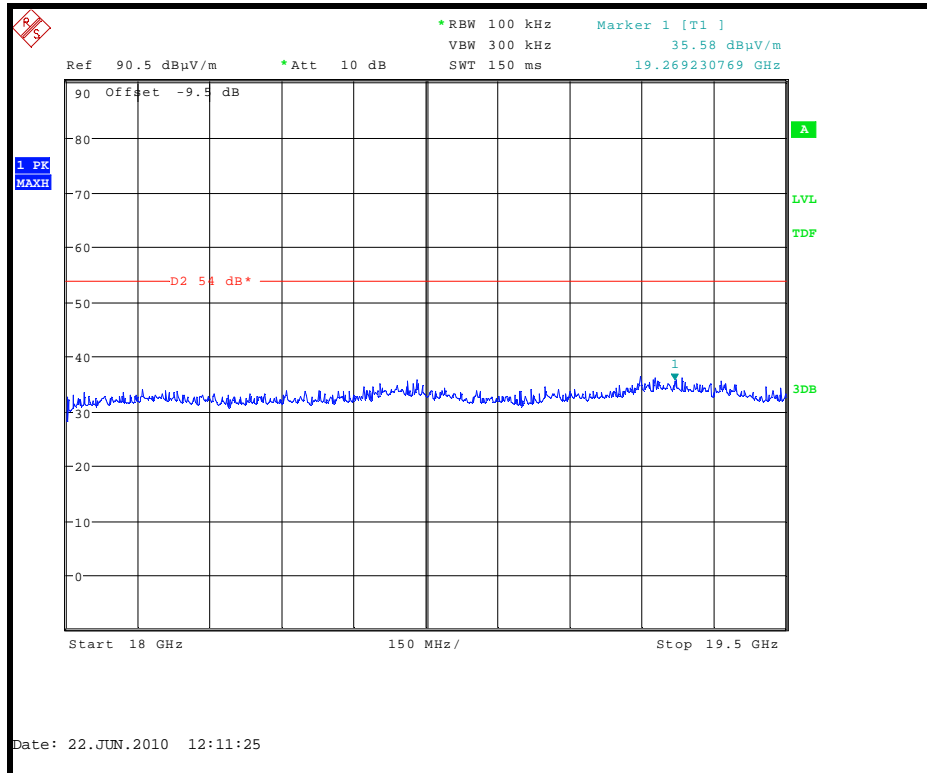
RF carrier set to the lowest carrier defined by the EUT – Single Slot Operation



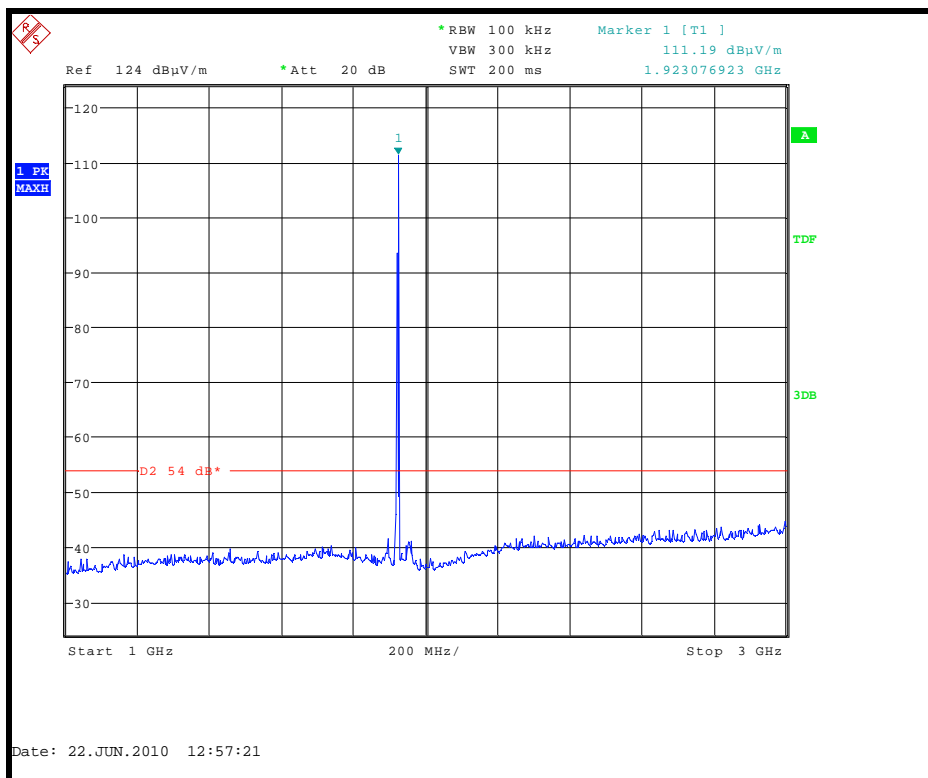
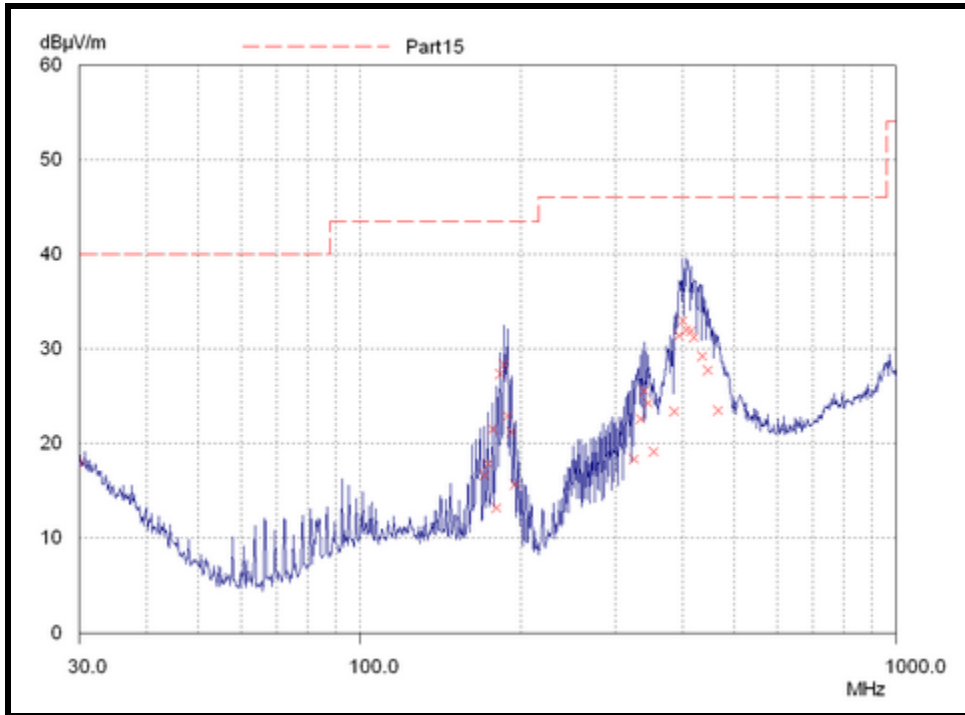
RF carrier set to the lowest carrier defined by the EUT – Single Slot Operation



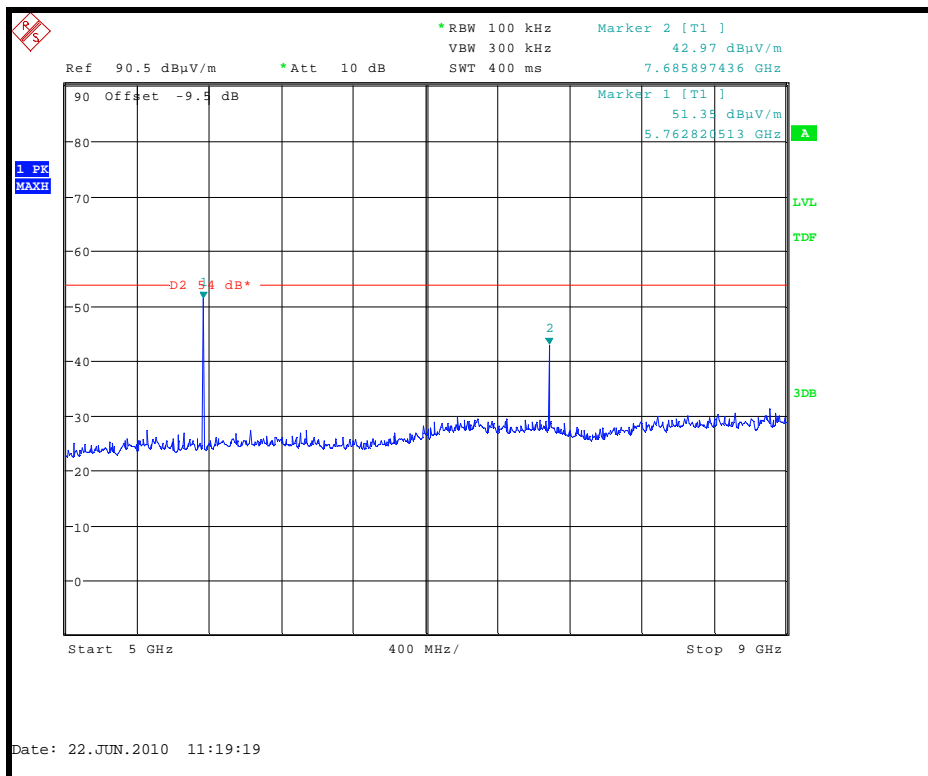
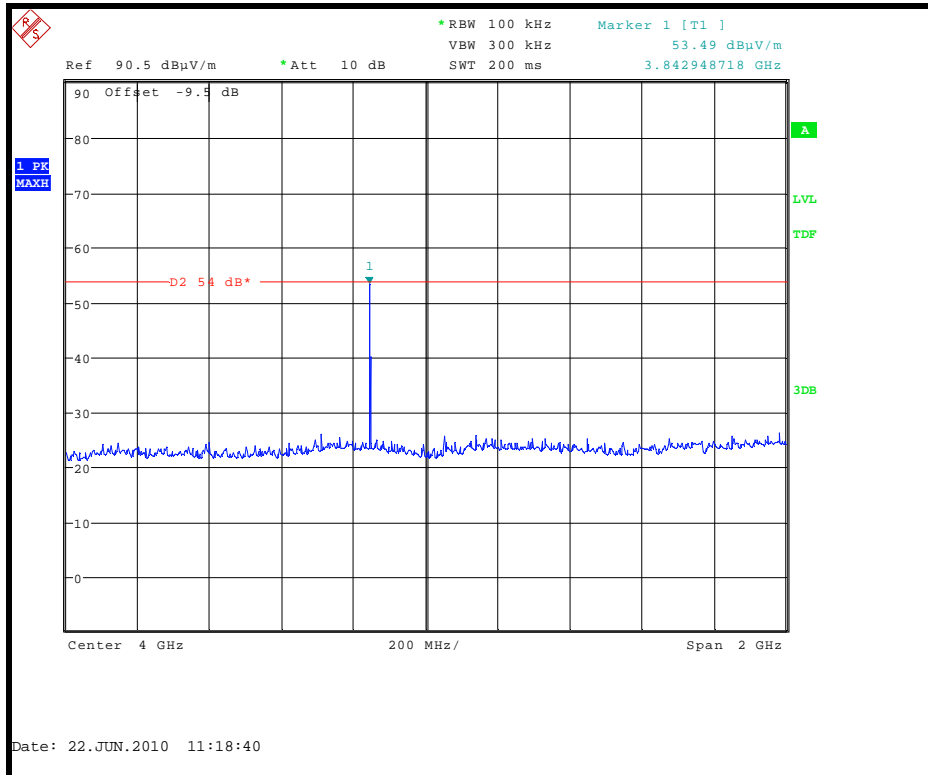
RF carrier set to the lowest carrier defined by the EUT – Single Slot Operation



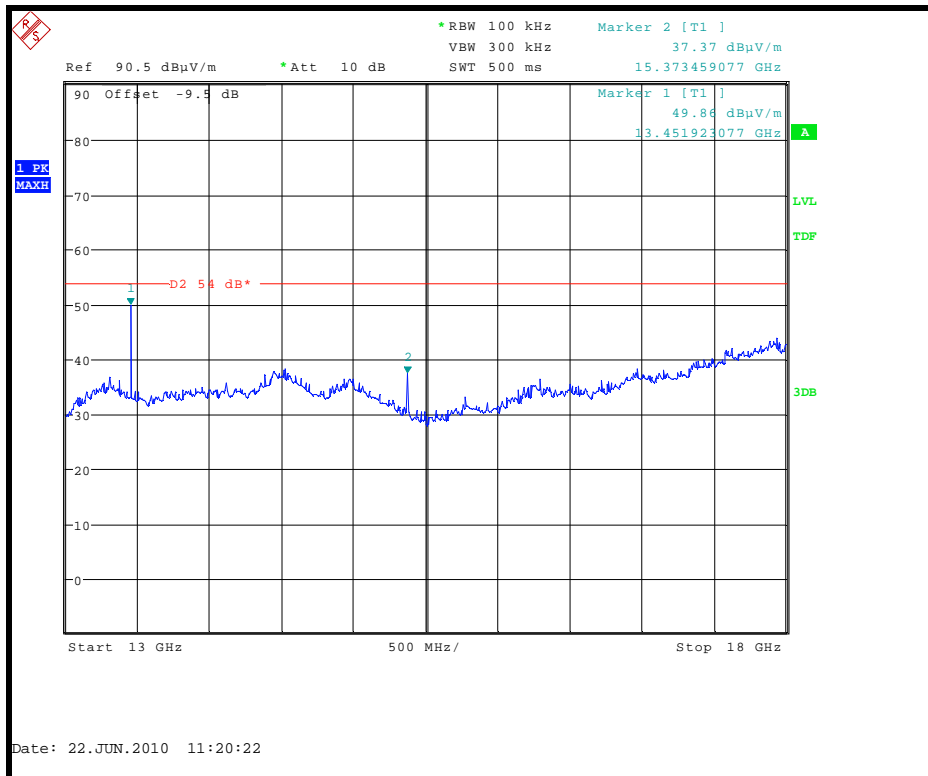
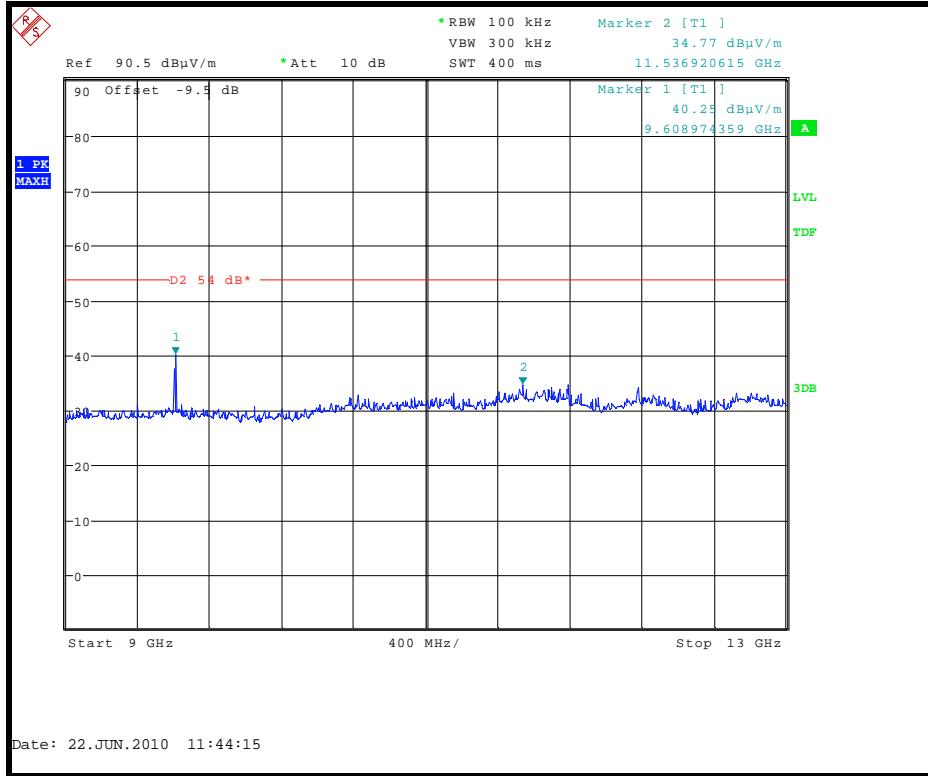
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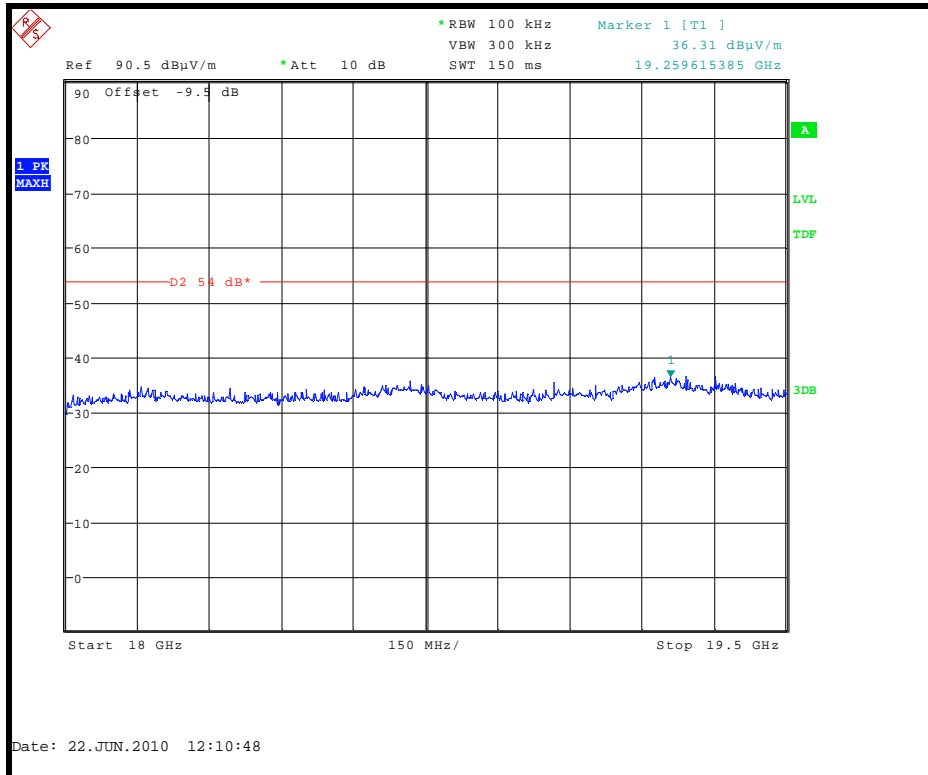
RF carrier set to the lowest carrier defined by the EUT – Long Slot Operation



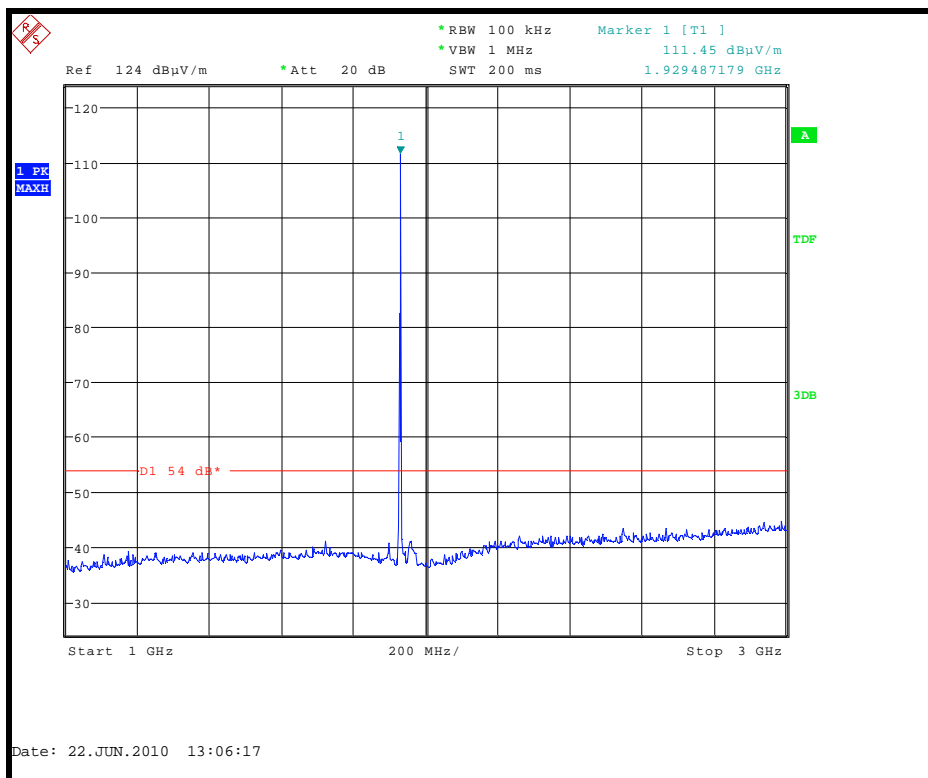
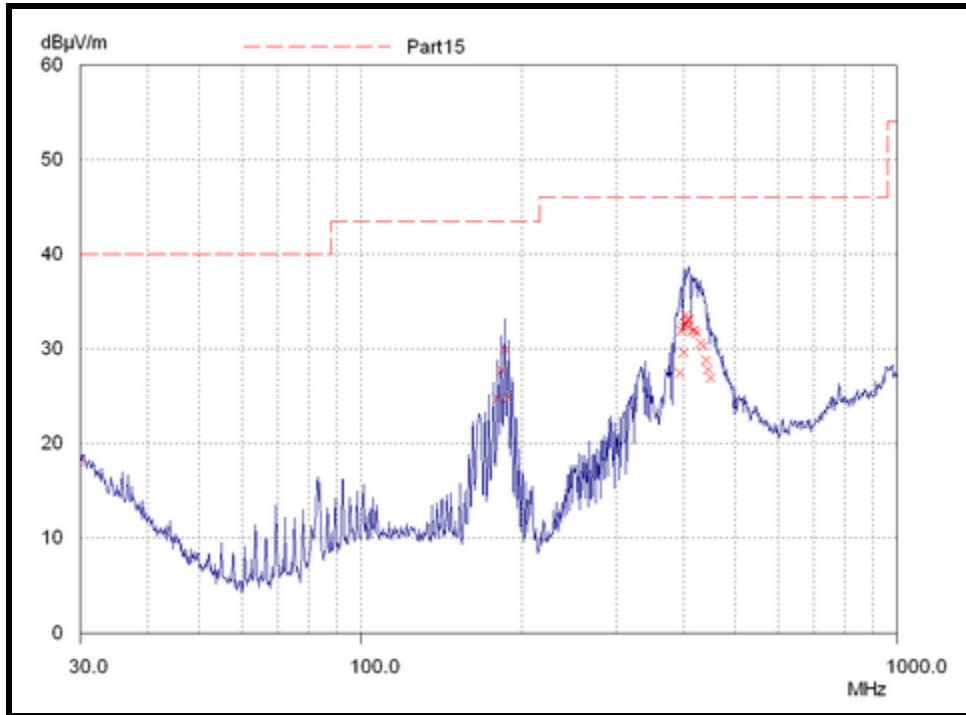
RF carrier set to the lowest carrier defined by the EUT – Long Slot Operation



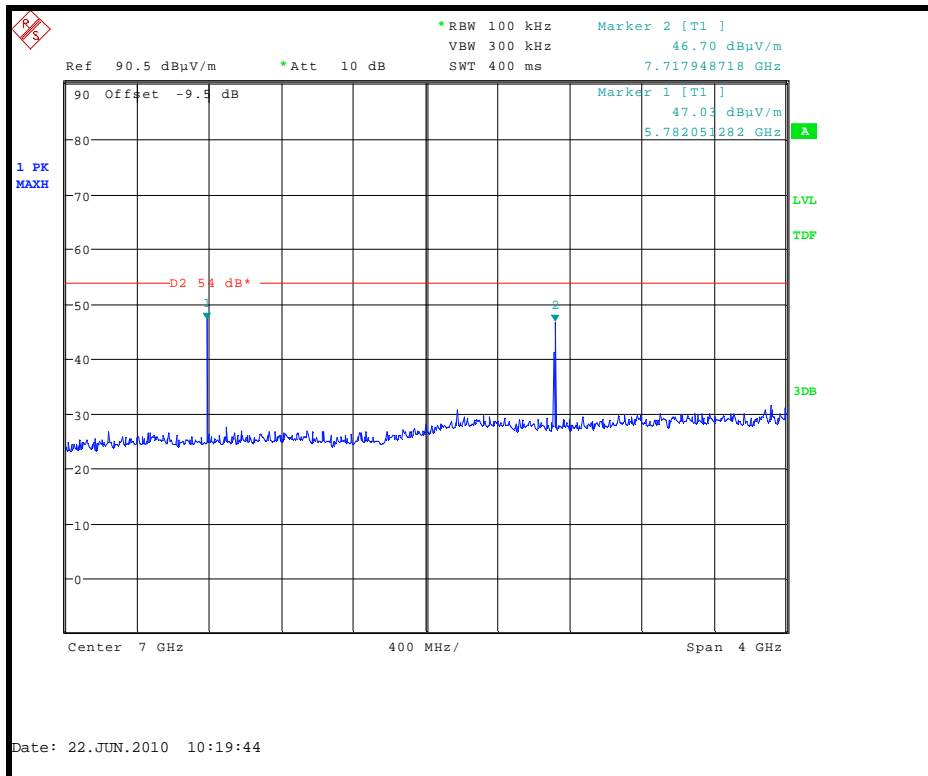
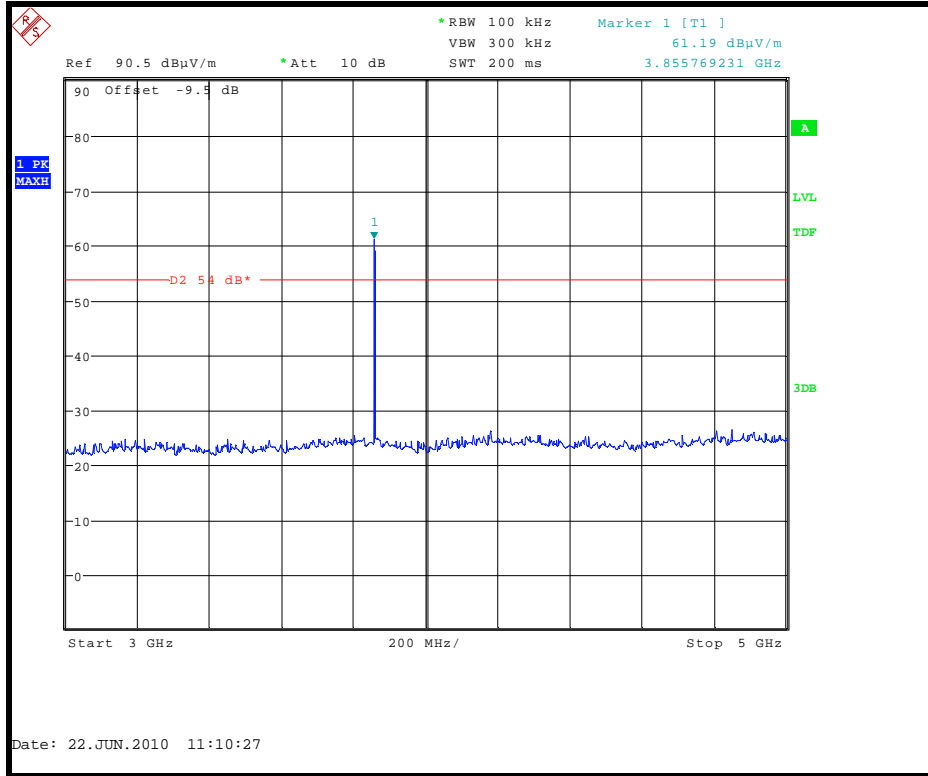
RF carrier set to the lowest carrier defined by the EUT – Long Slot Operation



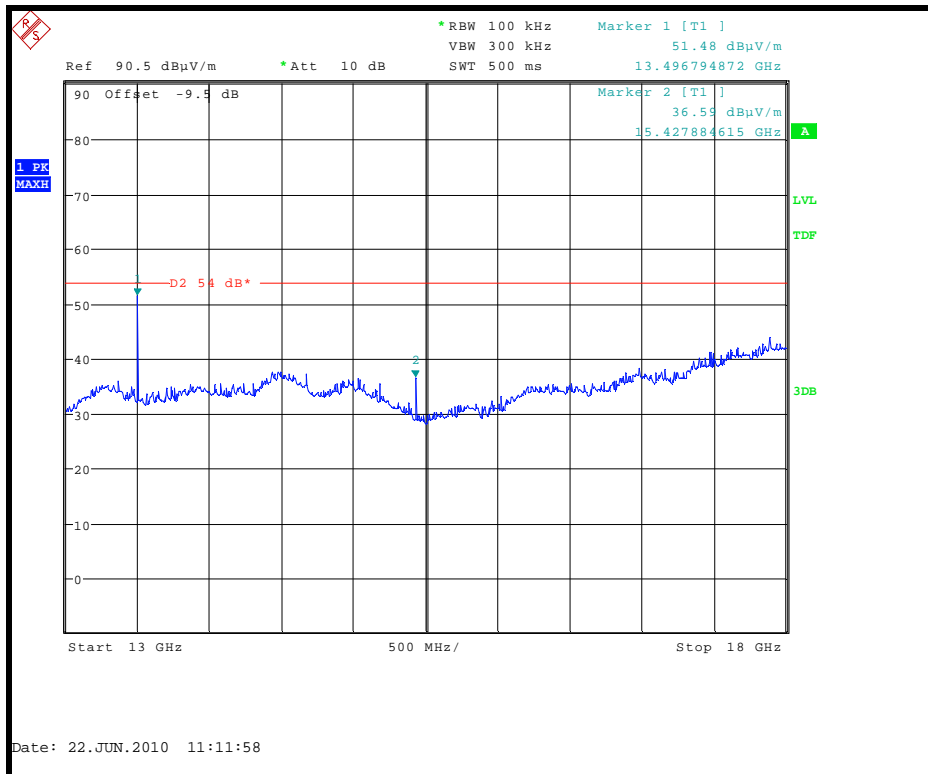
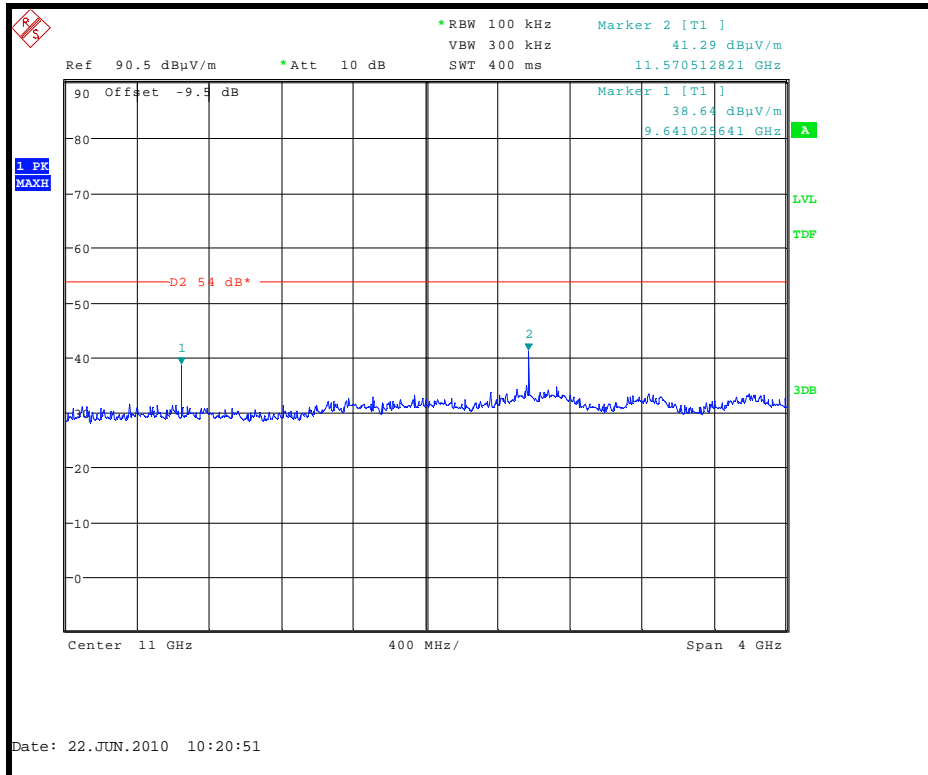
RF carrier set to the highest carrier defined by the EUT – Single Slot Operation



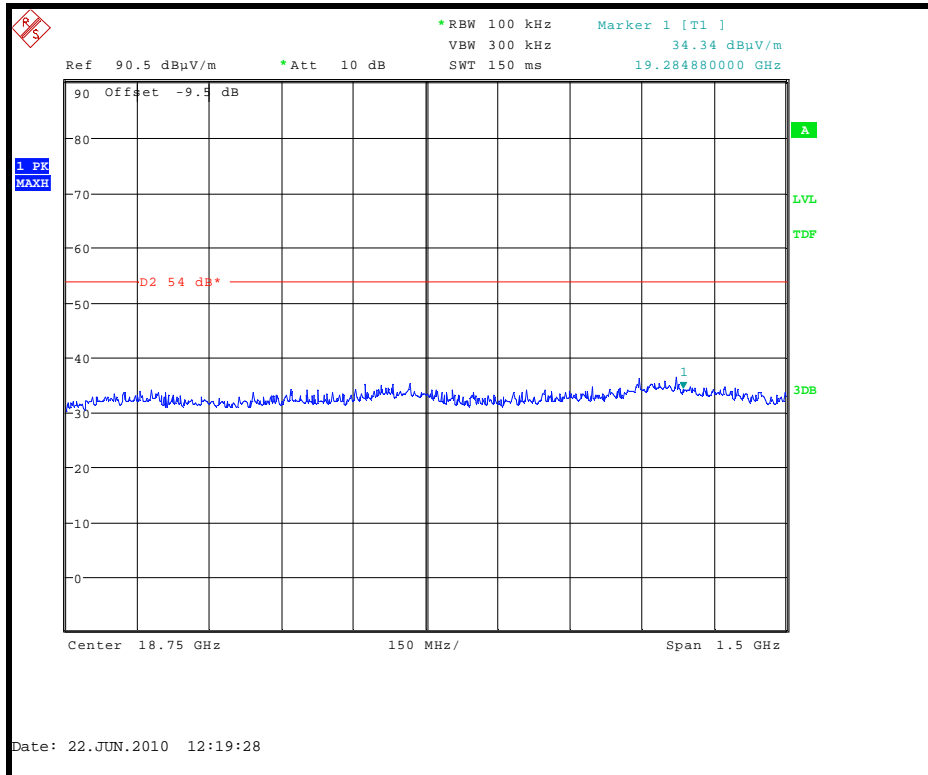
RF carrier set to the highest carrier defined by the EUT – Single Slot Operation



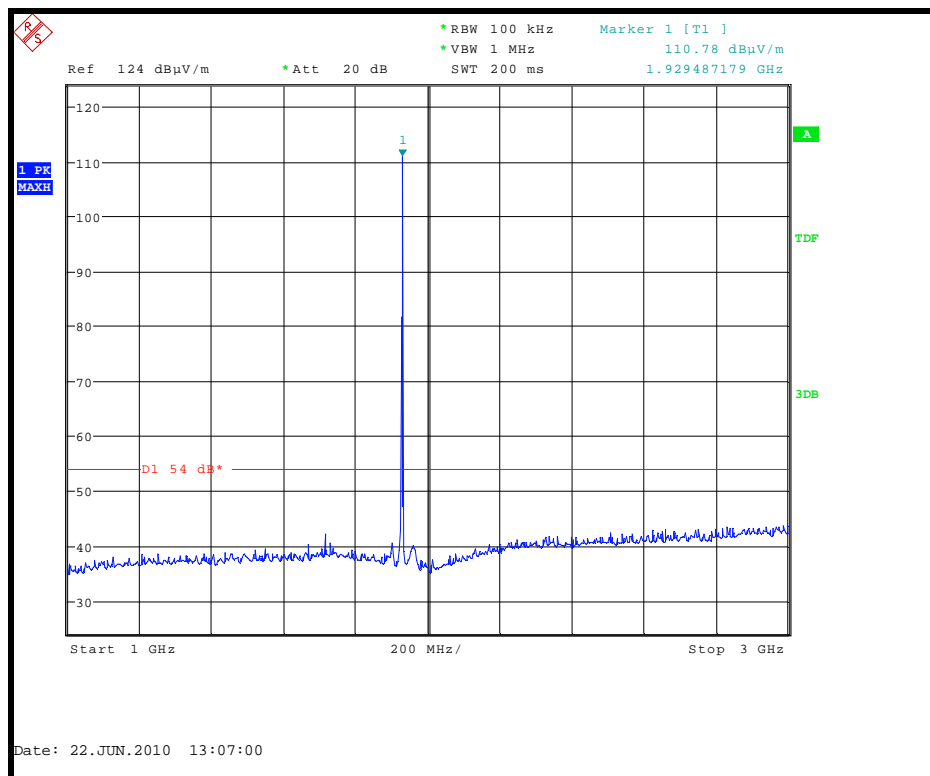
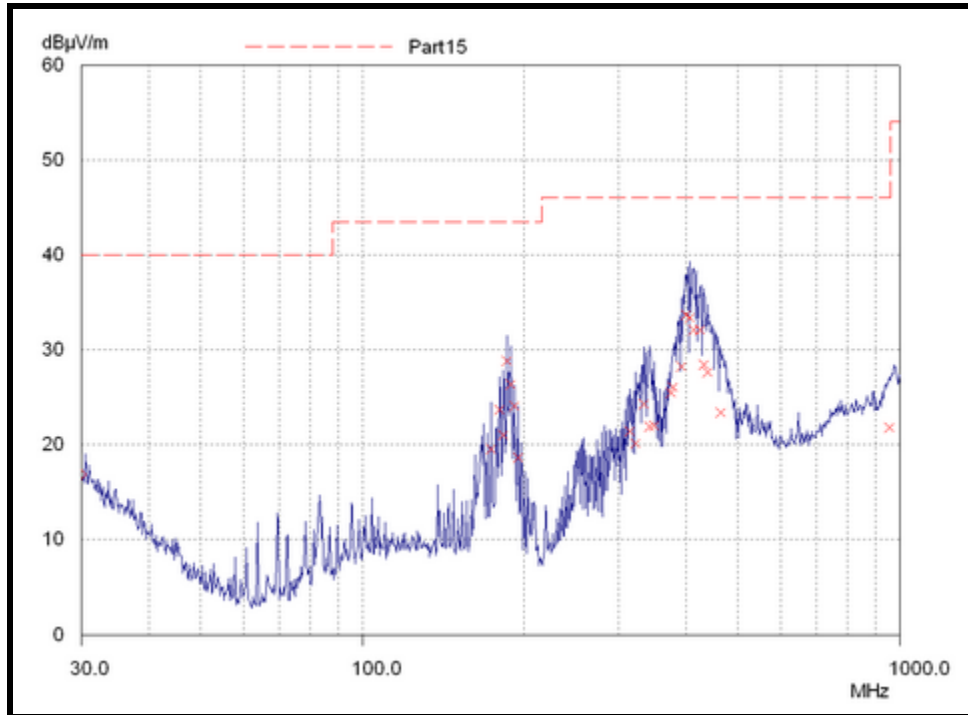
RF carrier set to the highest carrier defined by the EUT – Single Slot Operation



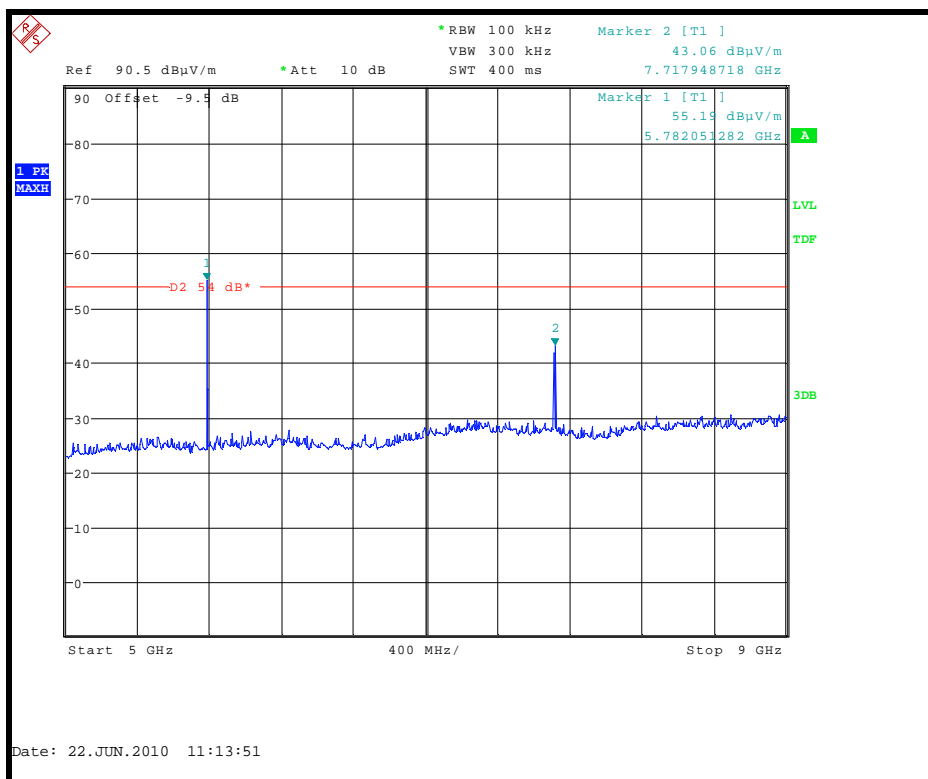
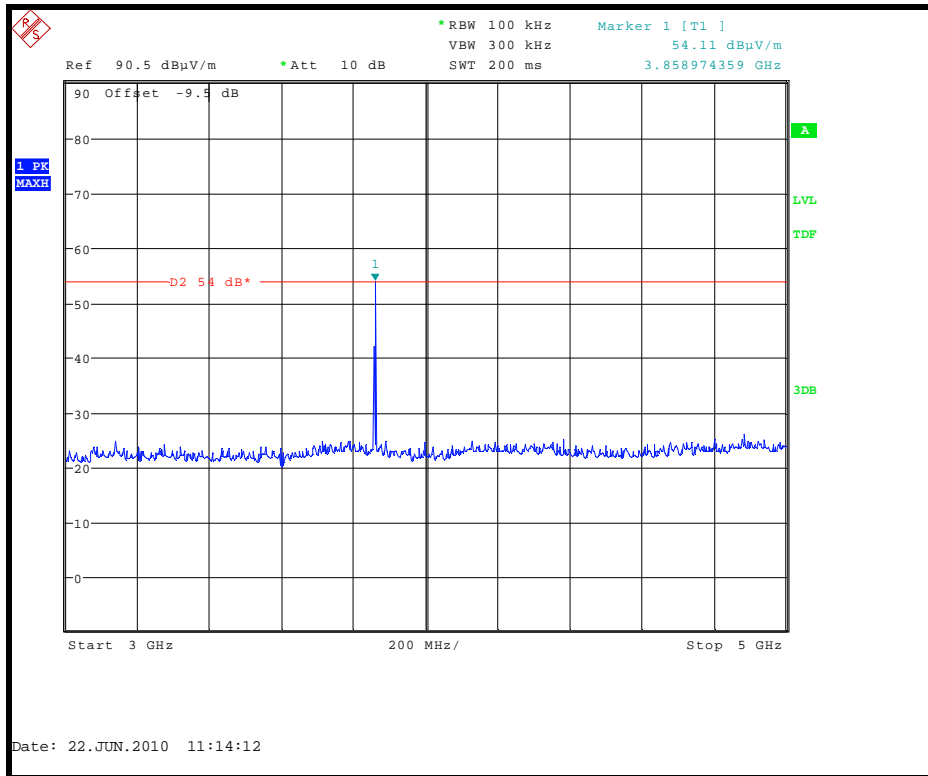
RF carrier set to the highest carrier defined by the EUT – Single Slot Operation



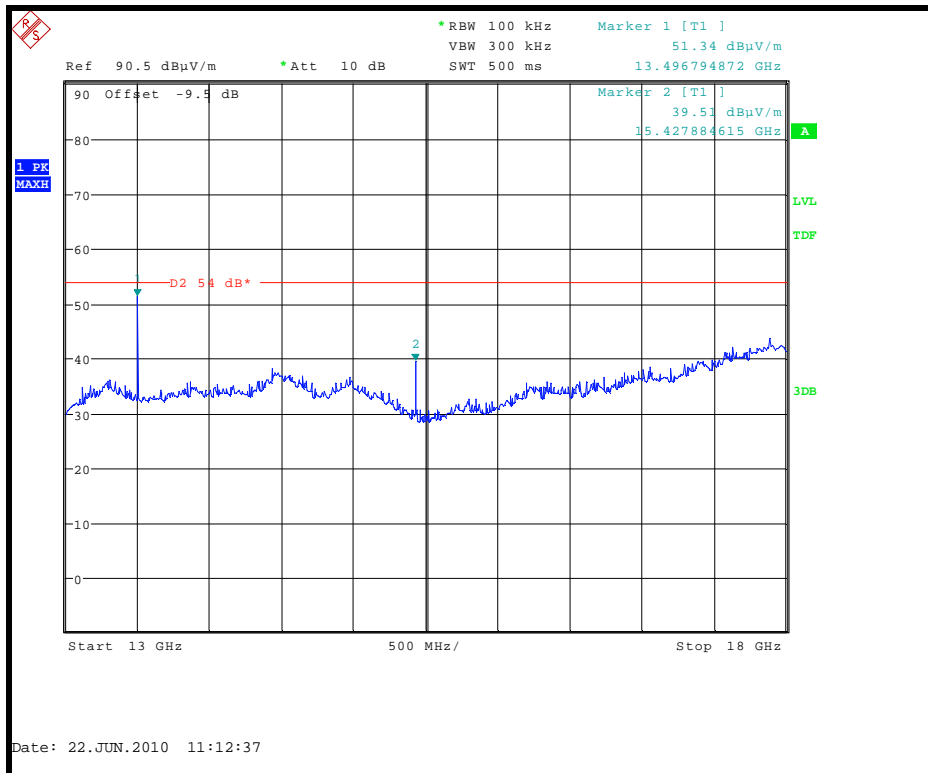
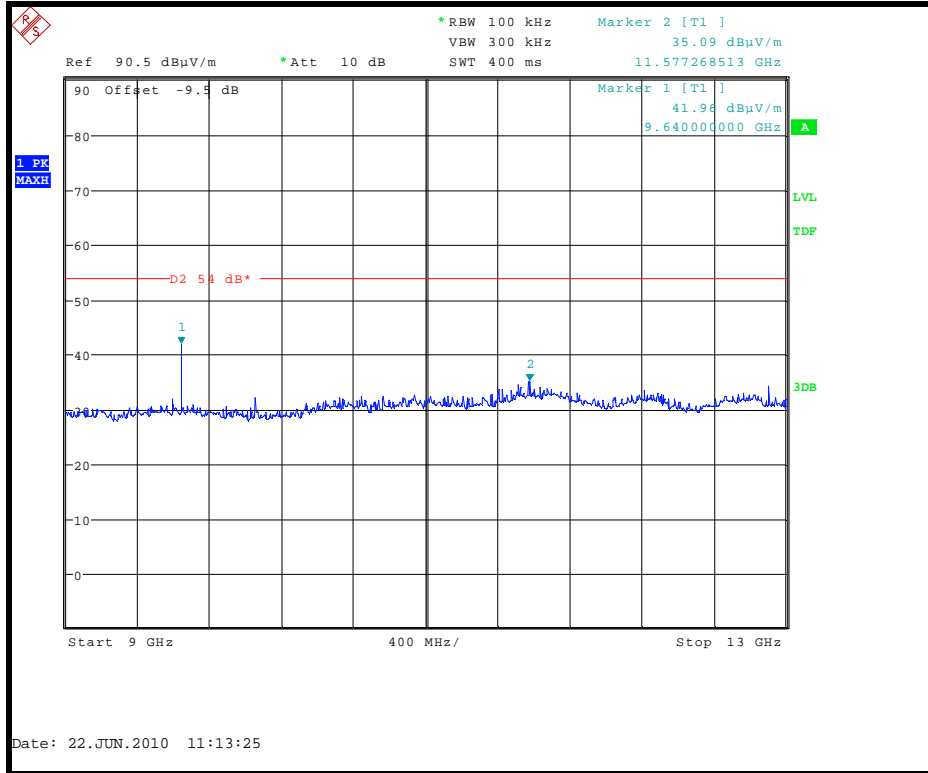
RF carrier set to the highest carrier defined by the EUT – Long Slot Operation



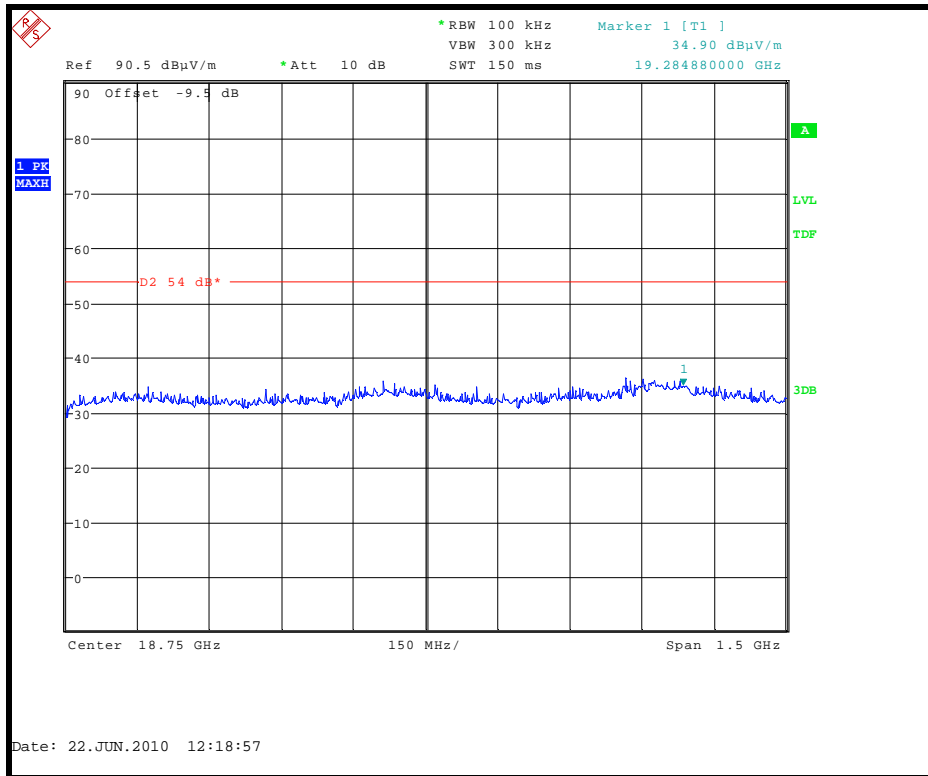
RF carrier set to the highest carrier defined by the EUT – Long Slot Operation



RF carrier set to the highest carrier defined by the EUT – Long Slot Operation



RF carrier set to the highest carrier defined by the EUT – Long Slot Operation



ANNEX C
EQUIPMENT DETAILS & CALIBRATION

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No
HORN	EMCO	3115	9010-3581	139
PRE AMPLIFIER	AGILENT	8449B	2118	572
OATS	TRaC	3 Meter	N/A	UH06
RECEIVER	R&S	ESVS10	825892/006	UH04
BILOG ANTENNA	YORK	CBL611/A	1618	UH191
K-Type Cable	Succoflex	N/A	35226/4	UH291
K-Type Cable	Megaphase	TM26 3131 36	400559	UH293
PRE AMPLIFIER	WATKINS JONHSON	6201-69	2740	UH372
HIGH PASS FILTER	BSC	SH4141	147301	N/A

REF Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH004	Receiver	R&S	10/12/2009	12	10/12/2010
UH06/07	IC OATS Submission	TRaC	02/07/2009	24	02/07/2011
UH06/07	NSA Calibration	TRaC	19/06/2009	12	19/06/2010
UH191	Bilog	York	01/10/2008	24	01/10/2010
UH281	Spectrum Analyser	R&S	29/01/2010	12	29/01/2011
UH291	K-Type Cable	Succoflex	15/07/2009	12	15/07/2010
UH293	K-Type Cable	Megaphase	15/07/2009	12	15/07/2010
UH372	Pre Amplifier	Watkins Johnson	19/03/2009	24	19/03/2010
L139	1-18GHz Horn	EMCO	17/08/2009	24	17/08/2011
L572	Pre Amp	Agilent	15/07/2009	12	15/07/2010
N/A	High Pass Filter	BSC	04/12/2009	12	04/12/2010

ANNEX D

MEASUREMENT UNCERTAINTY

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

[1] Adjacent Channel Power

Uncertainty in test result = **1.86dB**

[2] Carrier Power

Uncertainty in test result (Equipment - TRLUH120) = **2.18dB**

Uncertainty in test result (Equipment – TRL05) = **1.08dB**

Uncertainty in test result (Equipment – TRL479) = **2.48dB**

[3] Effective Radiated Power

Uncertainty in test result = **4.71dB**

[4] Spurious Emissions

Uncertainty in test result = **4.75dB**

[5] Maximum frequency error

Uncertainty in test result (Equipment - TRLUH120) = **119ppm**

Uncertainty in test result (Equipment – TRL05) = **0.113ppm**

Uncertainty in test result (Equipment – TRL479) = **0.265ppm**

[6] Radiated Emissions, field strength OATS 14kHz-18GHz Electric Field

Uncertainty in test result (14kHz – 30MHz) = **4.8dB**, Uncertainty in test result (30MHz – 1GHz) = **4.6dB**,

Uncertainty in test result (1GHz-18GHz) = **4.7dB**

[7] Frequency deviation

Uncertainty in test result = **3.2%**

[8] Magnetic Field Emissions

Uncertainty in test result = **2.3dB**

[9] Conducted Spurious

Uncertainty in test result (Equipment TRL479) Up to 8.1GHz = **3.31dB**

Uncertainty in test result (Equipment TRL479) 8.1GHz – 15.3GHz = **4.43dB**

Uncertainty in test result (Equipment TRL479) 15.3GHz – 21GHz = **5.34dB**

Uncertainty in test result (Equipment TRLUH120) Up to 26GHz = **3.14dB**

[10] Channel Bandwidth

Uncertainty in test result = **15.5%**

[11] Amplitude and Time Measurement – Oscilloscope

Uncertainty in overall test level = **2.1dB**, Uncertainty in time measurement = **0.59%**, Uncertainty in Amplitude measurement = **0.82%**

[11] Power Line Conduction

Uncertainty in test result = **3.4dB**

[12] Spectrum Mask Measurements

Uncertainty in test result = **2.59% (frequency)**
Uncertainty in test result = **1.32dB (amplitude)**

[13] Adjacent Sub Band Selectivity

Uncertainty in test result = **1.24dB**

[14] Receiver Blocking – Listen Mode, Radiated

Uncertainty in test result = **3.42dB**

[15] Receiver Blocking – Talk Mode, Radiated

Uncertainty in test result = **3.36dB**

[16] Receiver Blocking – Talk Mode, Conducted

Uncertainty in test result = **1.24dB**

[17] Receiver Threshold

Uncertainty in test result = **3.23dB**

[18] Transmission Time Measurement

Uncertainty in test result = **7.98%**