

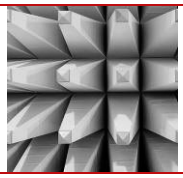

CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-2629-01-02/10-A

Deutscher Akkreditierungs Rat DAR

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

The area of testing is recognized by the FCC and IC.
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: 3462C-1 (IC)
Certification ID: DE 0001 (FCC)
Accreditation ID: DE 0002 (IC)

Applicant

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route de Montena 75
CH-1728 Rossens / Switzerland
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Fax: +41 (0) 26 411 93 30
Contact: Daniel Leuenberger
e-mail: daniel.leuenberger@montena.com

Manufacturer

Gamma Remote Sensing
Worbstrasse 225
CH-3073 Gümlingen / Switzerland
Phone: +41 (0) 31 951 70 05
Fax: +41 (0) 31 951 70 08
e-mail: gamma@gamma-rs.ch

Test standard/s

47 CFR Part 90 Subpart F - Radiolocation Service

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

Test item

Kind of test item:	**radar system 17.1-17.3 GHz**
Model name:	**Gamma GPRI-II Radar 17.1-17.3 GHz**
FCC ID:	**Y3Z-GPRI-II-1**
Power supply:	**110 - 240 V AC, 50 / 60 Hz**

Test performed:

M. Walla

2011-01-24 Meheza Walla

Test report authorised:

Geraldy Karsten

2011-01-24 Karsten Geraldy

CETECOM Cetecom ICT Services Accredited Test Laboratory Untertürkheimer Str. 6-10 D-66117 Saarbrücken

1 Table of contents

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:	2010-11-16
Date of receipt of test item:	2010-11-29
Start of test:	2010-11-29
End of test:	2010-11-29
Person(s) present during the test:	Mr. Andreas Kurz

3 Test standard/s

Test standard	Version	Test standard description
47 CFR Part 90	2009-10	Subpart F - Radiolocation Service

4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	+50 °C during high temperature test
	T_{min}	-30 °C during low temperature test
Relative humidity:		45 %
Air pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	110 - 240 V AC
	V_{max}	103 V AC
	V_{min}	127 V AC

5 Test laboratories sub-contracted

None

6 Test item

6.1 General Description

Kind of test item:	radar system 17.1-17.3 GHz
Type identification:	Gamma GPRI-II Radar 17.1-17.3 GHz
S/N serial number:	see table below
HW hardware status:	2010-11
SW software status:	2010-11
Frequency band [MHz]:	17.1 - 17.3 GHz
Type of modulation:	FM-CW
Number of channels:	-/-
Emission designator	200M0F0N
Antenna:	end fed slotted array antenna
Power supply:	110 - 240 V AC, 50 / 60 Hz
Temperature range:	-30 °C to +50 °C

6.2 List of components

No.	Component	Manufacturer	Type	S/N	Note
1	control unit	Gamma Remote Sensing	GPRI-II (control unit)	001	
2	RF-unit / transceiver	Gamma Remote Sensing	GPRI-II (RF-unit)	002	
3	antenna	Cobham Technical Services	ANT6235-011-110:	042/10	
4	antenna	Cobham Technical Services	ANT6235-011-110:	043/10	
5	antenna	Cobham Technical Services	ANT6235-011-110:	044/10	

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	47 CFR Part 2 47 CFR Part 90 - F	Passed	2011-01-24	-/-

Test Specification Clause	Test Case	Temperature / Voltage	Pass	Fail	NA	NP	Results (max.)
FCC 47 CFR § 2.1046 § 90.205 (r)	Measurements required: RF power output / Power limits (conducted/radiated)	nominal / nominal	☒	☐	☐	☐	19.5 dBm / 52.5 dBm
FCC 47 CFR § 2.1049	Measurements required: Occupied bandwidth	nominal / nominal	☒	☐	☐	☐	199.6 MHz
FCC 47 CFR § 2.1051 § 90.210	Measurements required: Spurious emissions at antenna terminals / Emission mask	nominal / nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 2.1051 § 90.210	Measurements required: Spurious emissions at antenna terminals / Spurious emissions (conducted)	nominal / nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 2.1053 § 90.210	Measurements required: Field strength of spurious radiation / Spurious emissions (radiated)	nominal / nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 2.1055 § 90.213	Measurements required: Frequency stability	extreme / nominal nominal / extreme	☒	☐	☐	☐	+10 Hz (5.8×10^{-10})

Note: NA = Not Applicable; NP = Not Performed

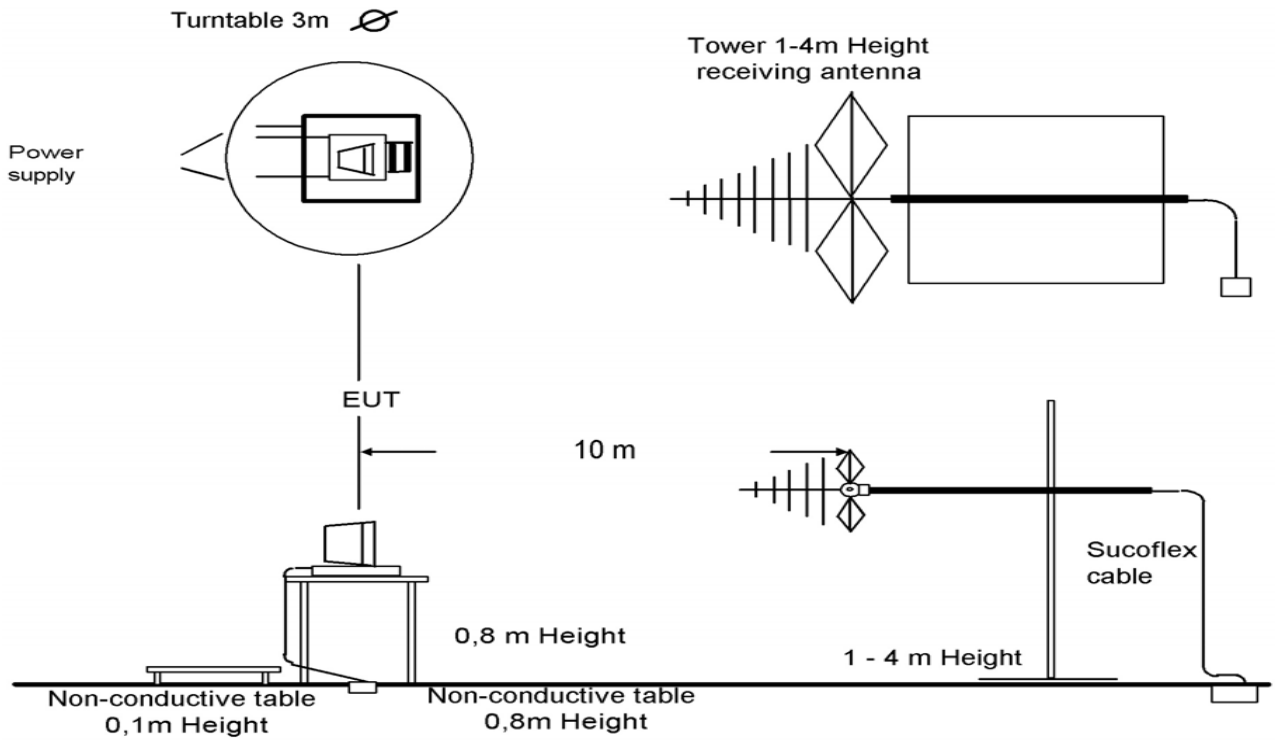
8 RF measurement testing

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2009 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2009 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



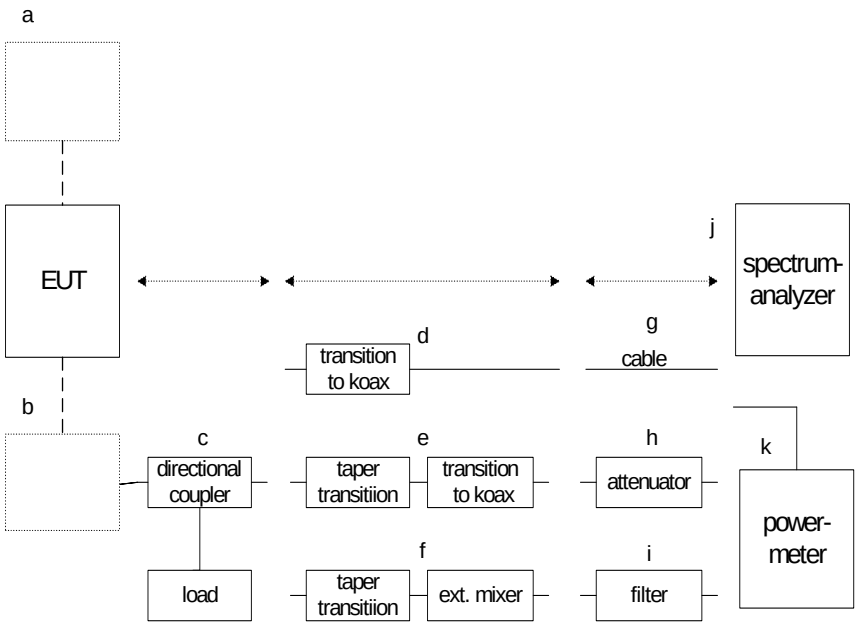
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage.

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is fet to the spectrum analyzer. The specific loss is first checked within a calibration. The measurement readings on the spectrum analyzer are corrected by the specific test set-up loss. The attenuator, cables and the spectrum analyzer are impedance matched on 50 Ohm.



Picture 2: Diagram conducted measurements

8.2 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

9 Measurement results

9.1 Conducted / radiated peak output power (EIRP)

Conducted measurements:

The EUT was set for low, mid, high channel and normal operation (chirp) and highest RF output power. The spectrum analyzer was connected to the EUT's antenna terminal.

Measurement parameters	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	20 MHz / 250 MHz
Trace-Mode:	Max. hold

Limits:

FCC
47 CFR § 2.1046 / § 90.205 (r)
Measurements required: RF output power / Power limits
All other frequency bands. Requested transmitter power will be considered and authorized on a case by case basis.

Result:

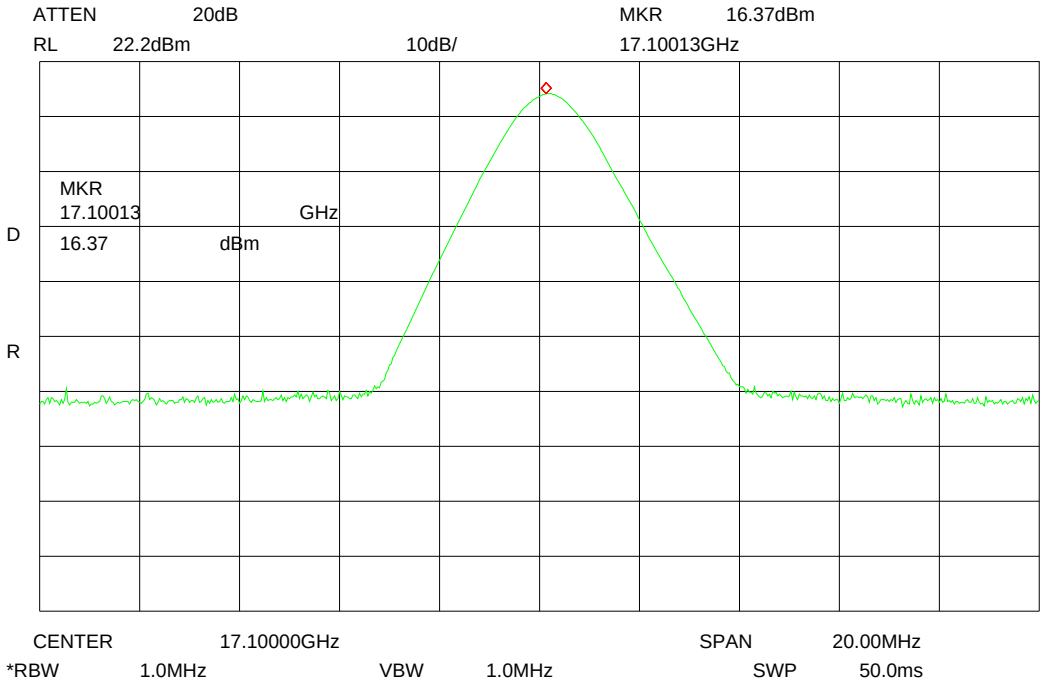
Frequency (channel)	Conducted peak output power	Radiated peak output power (EIRP)
17.1 GHz (low)	16.4 dBm	49.4 dBm
17.2 GHz (mid)	19.5 dBm	52.5 dBm
17.3 GHz (high)	18.9 dBm	51.9 dBm
17.1 - 17.3 GHz (chirp)	19.5 dBm	52.5 dBm

Note: Radiated peak output power (EIRP) values are calculated, based on the conducted peak output power values plus an antenna gain of 33 dBi.

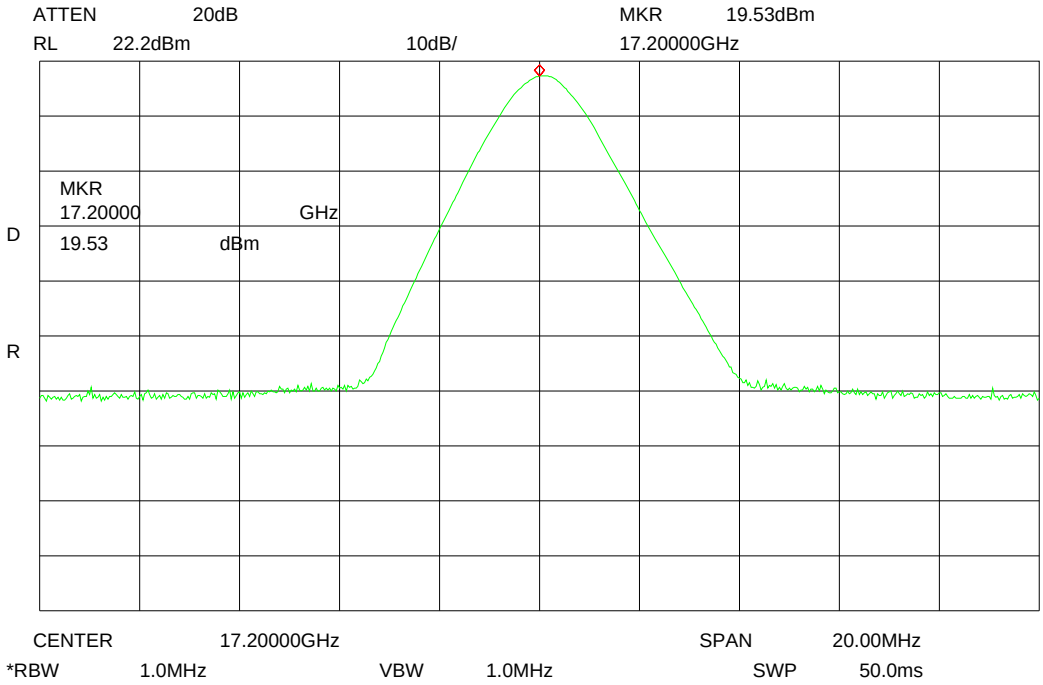
Result: The measurement is passed.

Plots of the measurement:

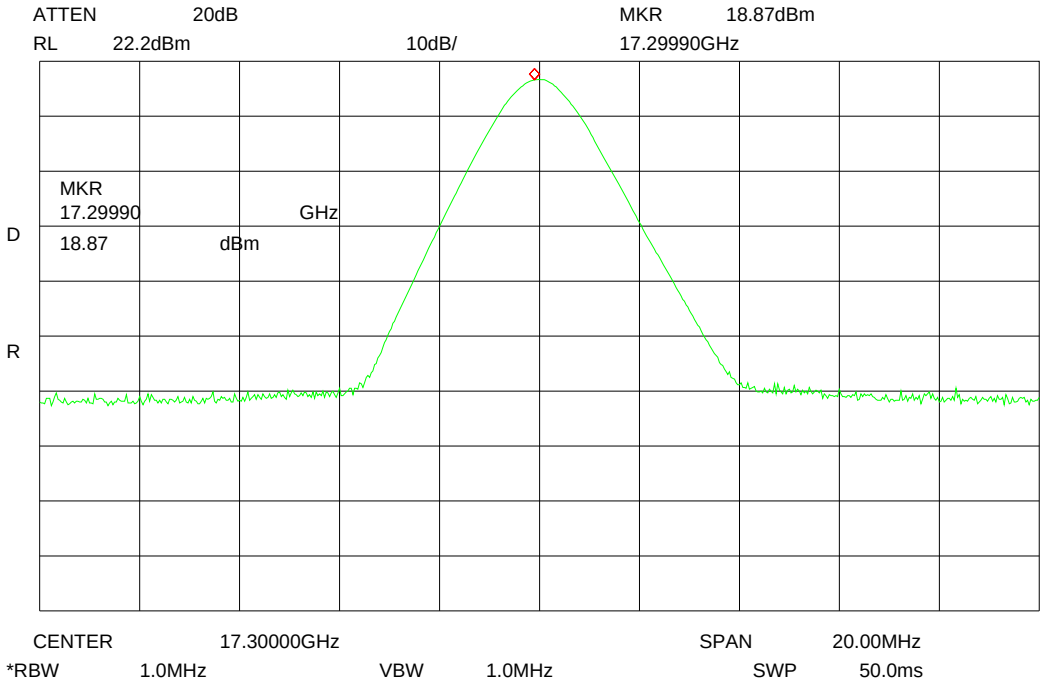
Plot 1: low channel



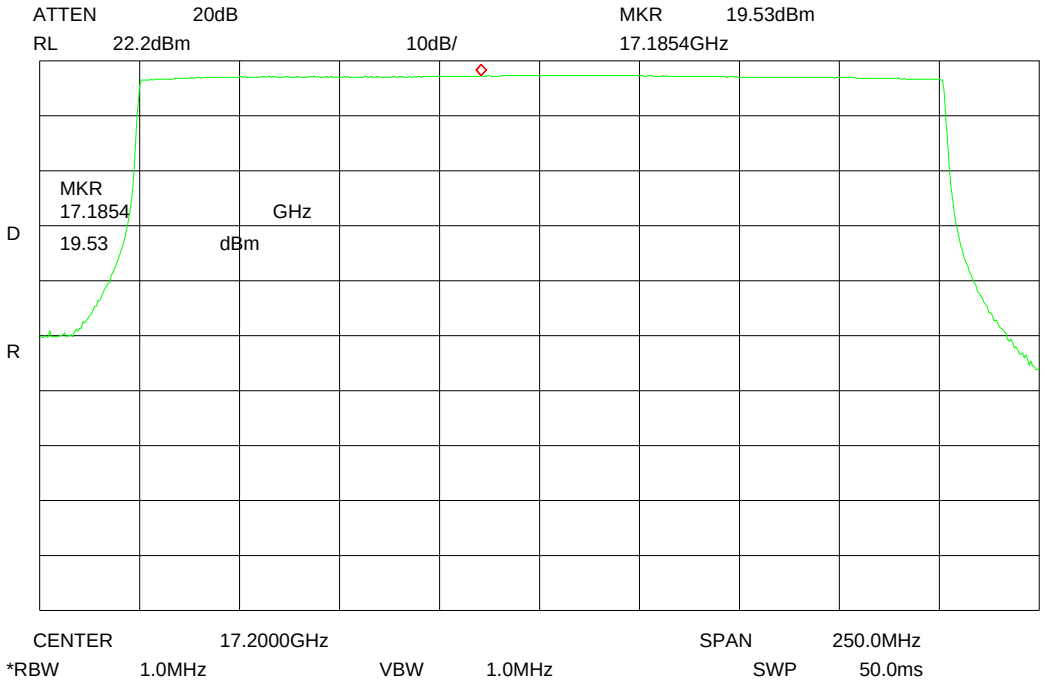
Plot 2: mid channel



Plot 3: high channel



Plot 4: chirp



9.2 MPE calculation

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units e.g. mW)
G = power gain of the antenna in the direction of interest relative to the isotropic radiator
R = distance to the centre of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = EIRP/4\pi R^2$$

where EIRP = equivalent isotropically radiated power

Calculation:

(Calculated for max. EIRP)

EIRP: 52.5 dBm (178.000 mW)

calculated safety distance:

safety distance = SQRT(178.000 mW / (4π * 1mW/cm^2)) = 120 cm

Limit:

1mW/ cm^2 is the reference level for general public exposure according to the OET Bulletin 65, Edition 97-01 Table 1.

9.3 Occupied bandwidth

Conducted measurements:

The EUT was set for low, mid, high channel and normal operation (chirp) and highest RF output power. The spectrum analyzer was connected to the EUT's antenna terminal.

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	20 MHz / 250 MHz
Trace-Mode:	Max. hold

Limits:

FCC
47 CFR § 2.1049 (1)
Measurements required: Occupied bandwidth
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

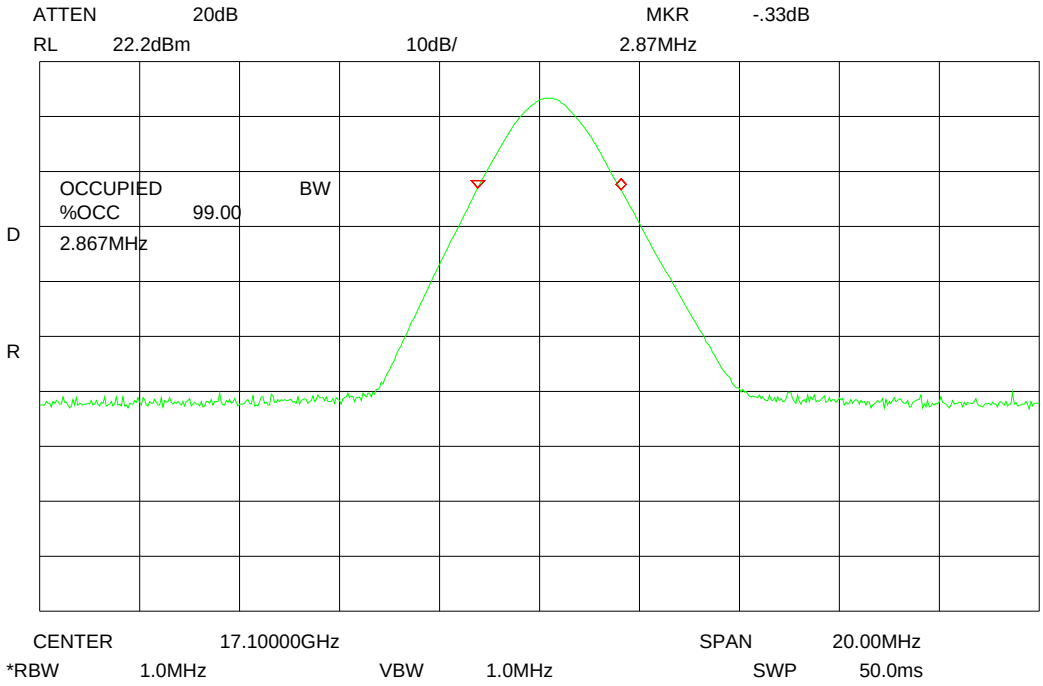
Result:

Frequency (channel)	Bandwidth
17.1 GHz (low)	2.87 MHz
17.2 GHz (mid)	2.87 MHz
17.3 GHz (high)	2.87 MHz
17.1 - 17.3 GHz (chirp)	199.6 MHz

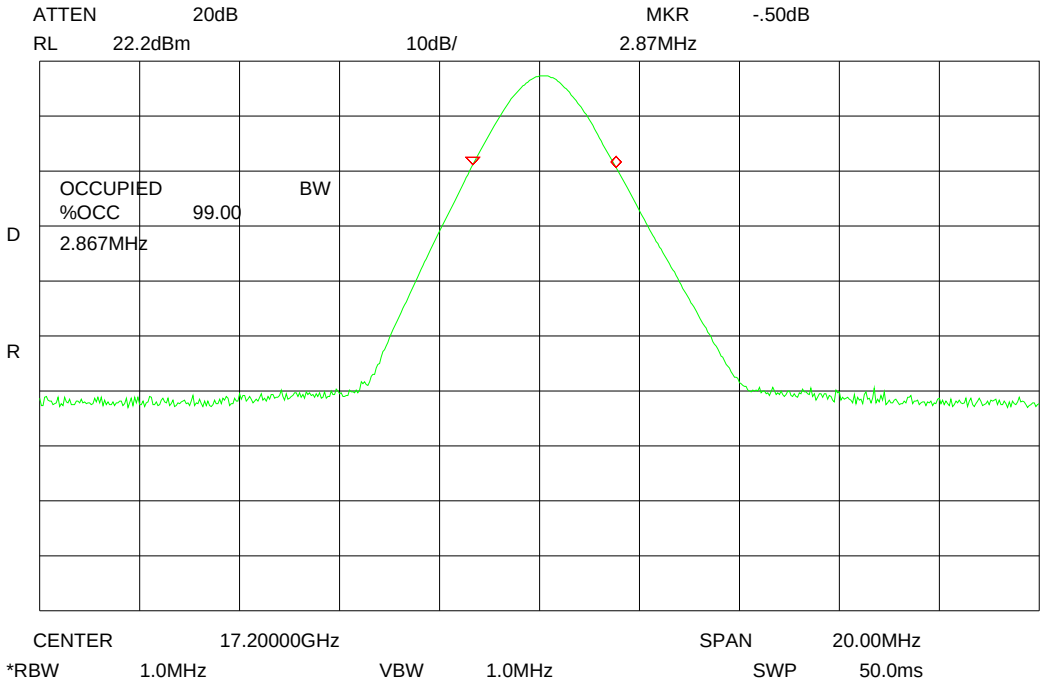
Result: The measurement is passed.

Plots of the measurements

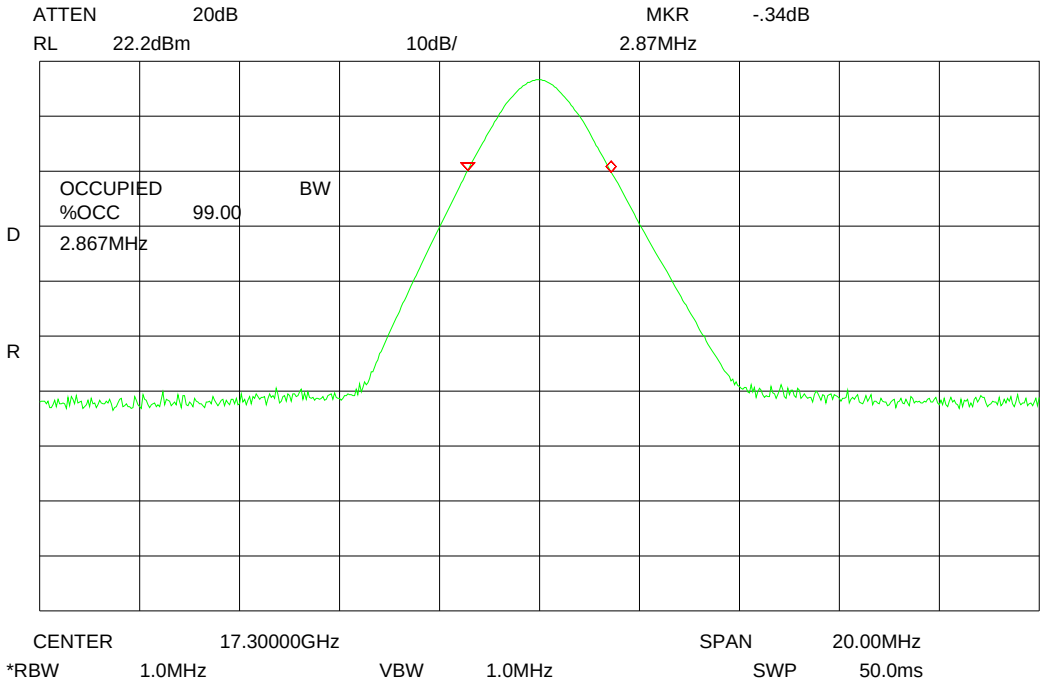
Plot 5: low channel



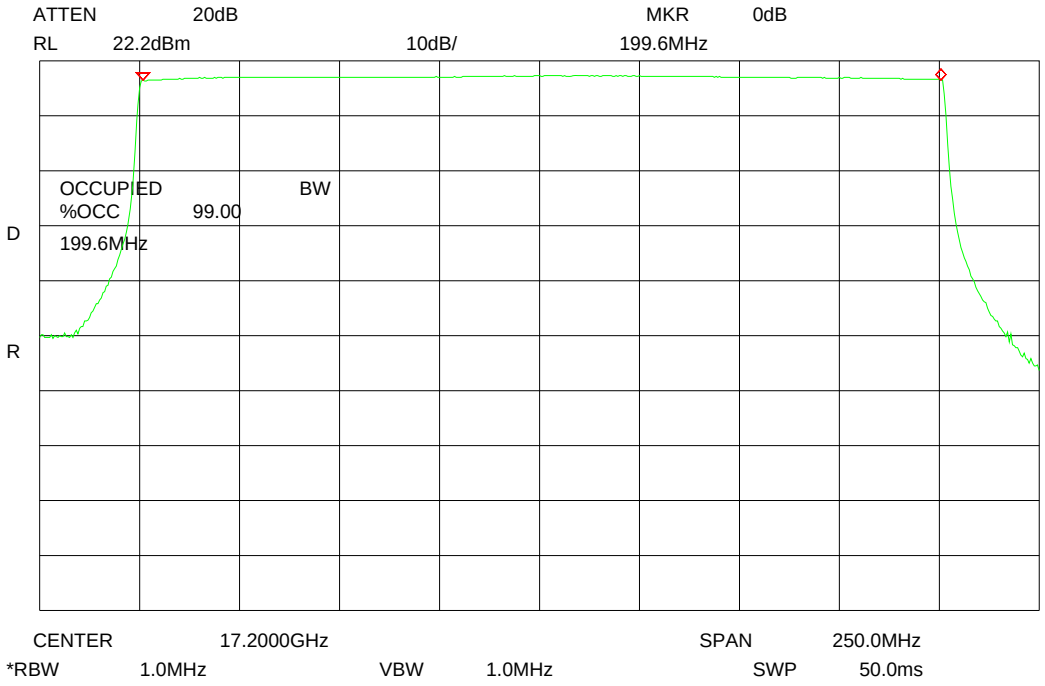
Plot 6: mid channel



Plot 7: high channel



Plot 8: chirp



9.4 Spurious emissions (emission mask)

Conducted measurements:

The EUT was set for low, mid, high channel and highest RF output power. The spectrum analyzer was connected to the EUT's antenna terminal.

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	1 MHz
Span:	14 MHz
Trace-Mode:	Max. hold

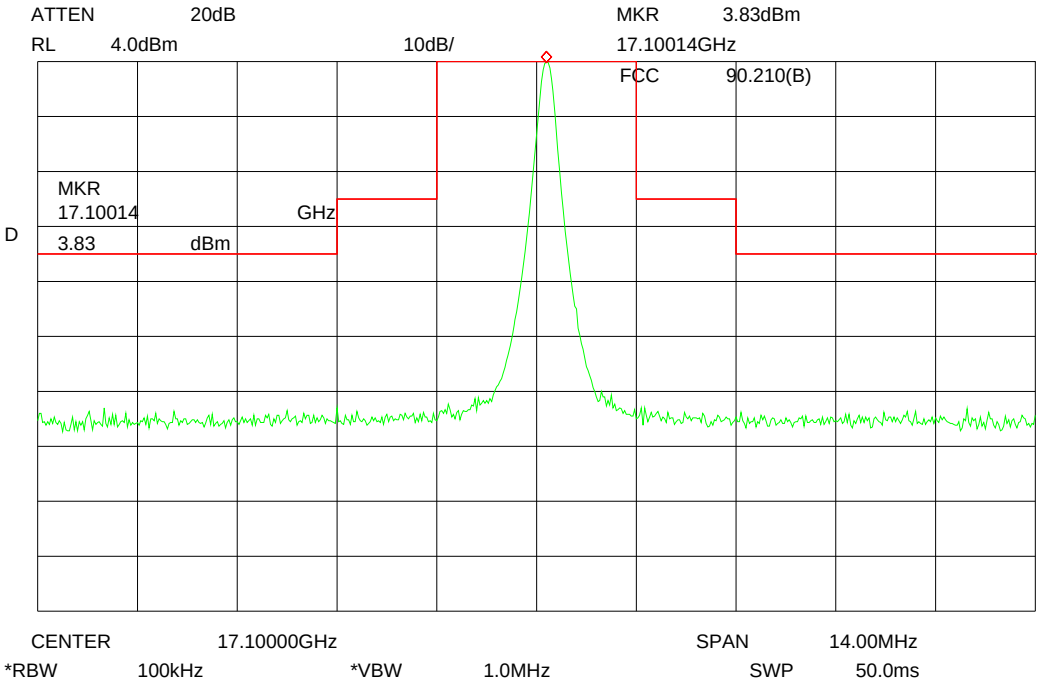
Limits:

FCC
47 CFR §2.1051 / § 90.210 (b) (n)
Measurements required: Spurious emissions at antenna terminals / Emission mask
(b) *Emission Mask B.* For transmitters that are equipped with an audio lowpass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows: (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB. (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB. (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB. (n) *Other frequency bands.* Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B.

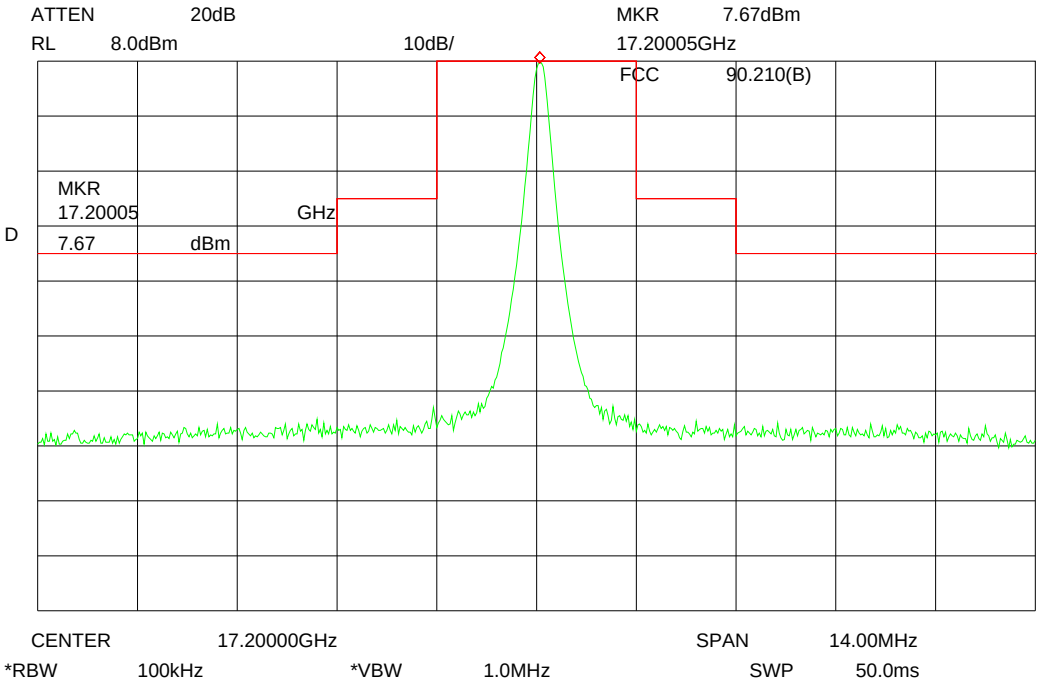
Result: The measurement is passed.

Plots of the measurements

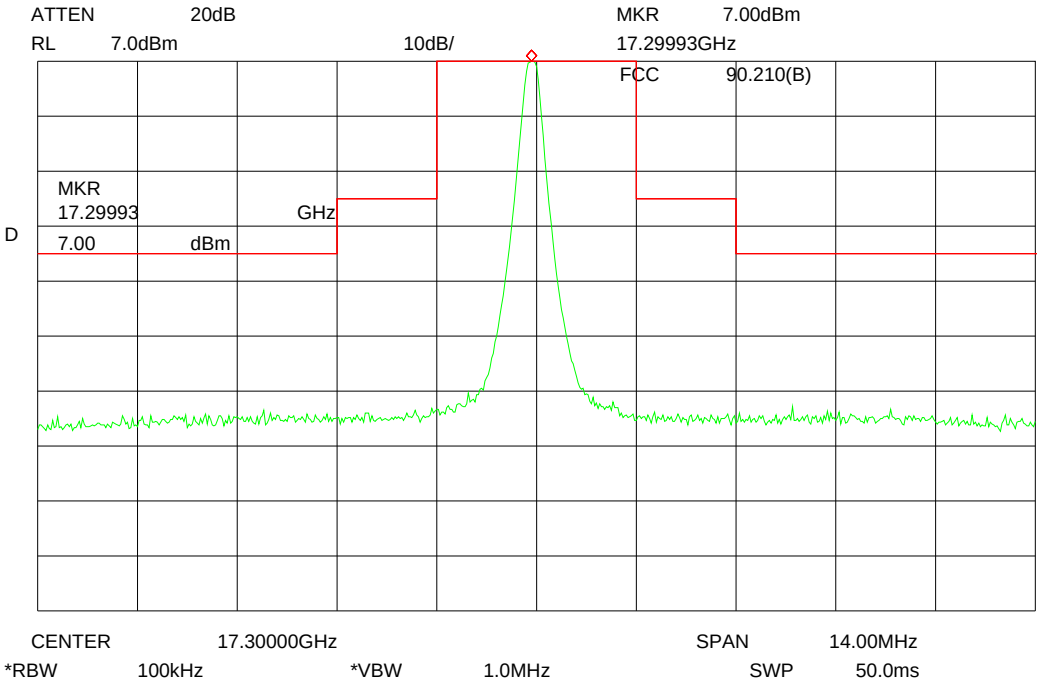
Plot 9: low channel



Plot 10: mid channel



Plot 11: high channel



9.5 Spurious emissions (conducted)

Conducted measurements:

The EUT was set for low, mid, high channel and highest RF output power. The spectrum analyzer was connected to the EUT's antenna terminal.

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	-/-
Trace-Mode:	Max. hold

Limits:

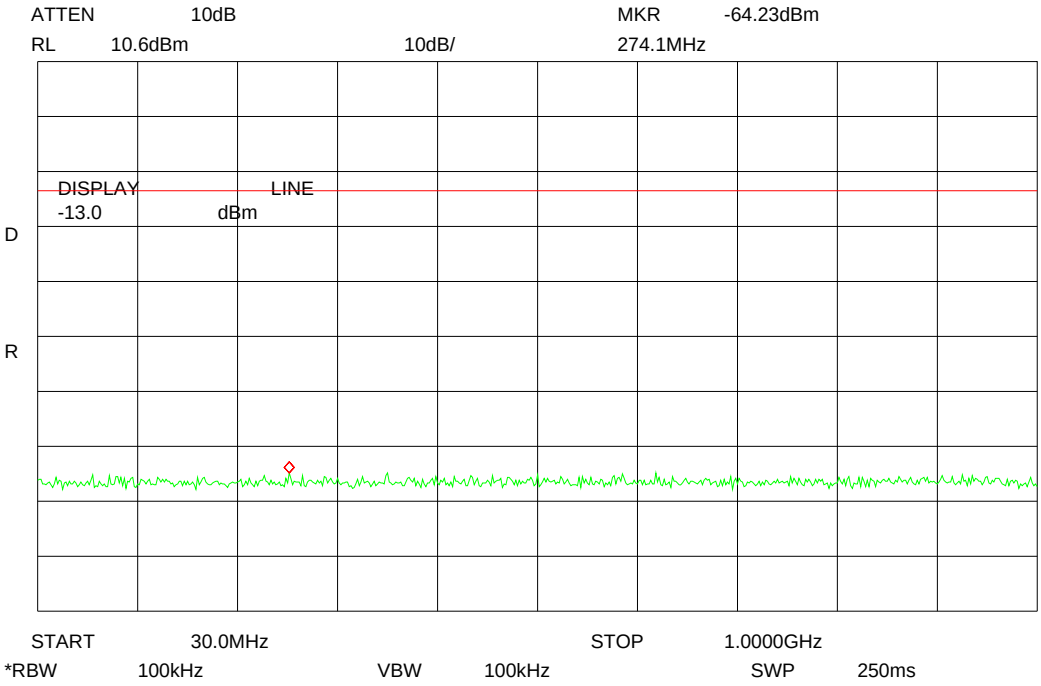
FCC
47 CFR §2.1051 / § 90.210 (b) (n)
Measurements required: Spurious emissions at antenna terminals / Emission mask
(b) *Emission Mask B.* … (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB. (n) *Other frequency bands.* Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B.

SPURIOUS EMISSIONS LEVEL (dBm)								
low channel			mid channel			high channel		
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
17.2007	pos-peak	-33.7	16.9880	pos-peak	-40.7	16.8950	pos-peak	-43.9
17.4000	pos-peak	-31.7	17.3007	pos-peak	-31.1	17.2007	pos-peak	-25.2
						17.4000	pos-peak	-29.1
All detected spurious are more than 16 dB below the limit.			All detected spurious are more than 16 dB below the limit.			All detected spurious are more than 16 dB below the limit.		
Measurement uncertainty ± 3 dB								

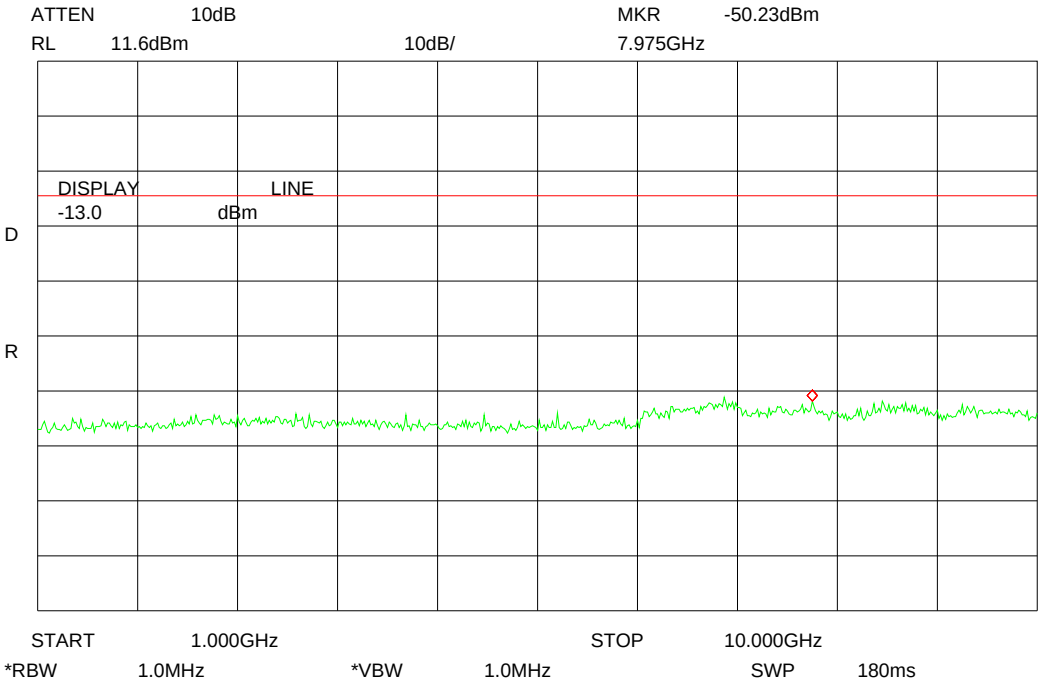
Result: The result of the measurement is passed.

Plots of the measurements

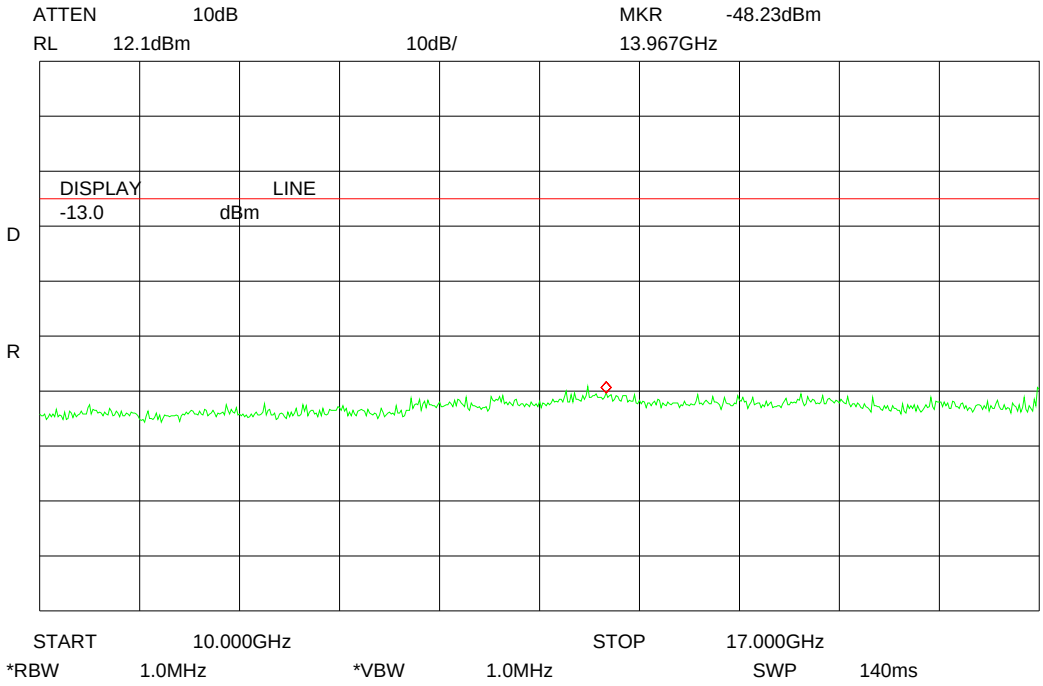
Plot 12: low channel



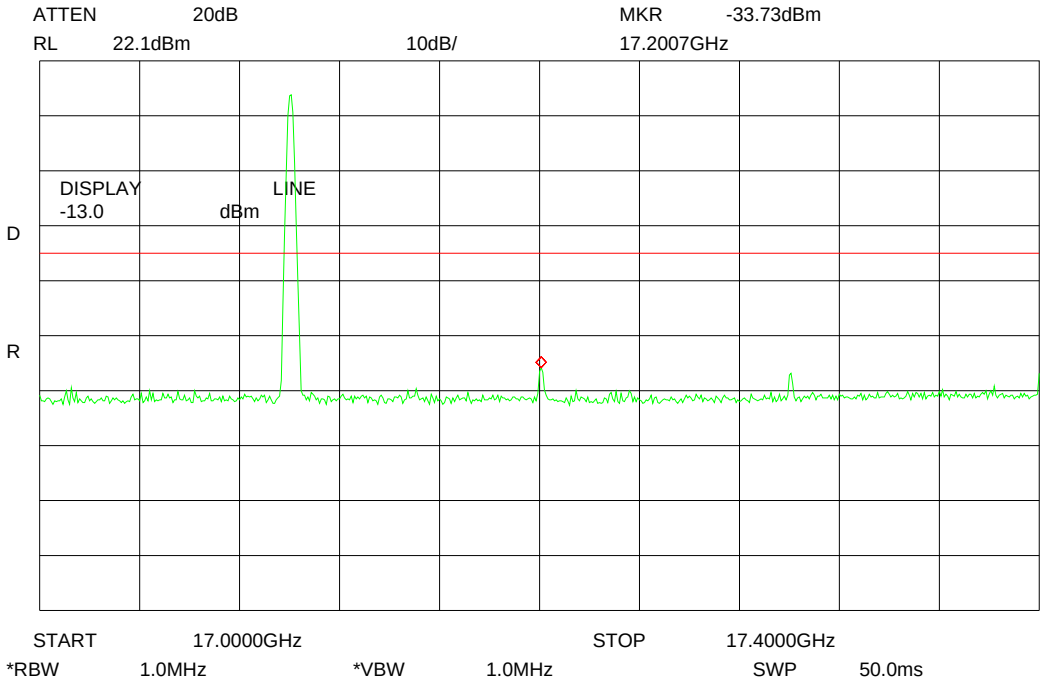
Plot 13: low channel



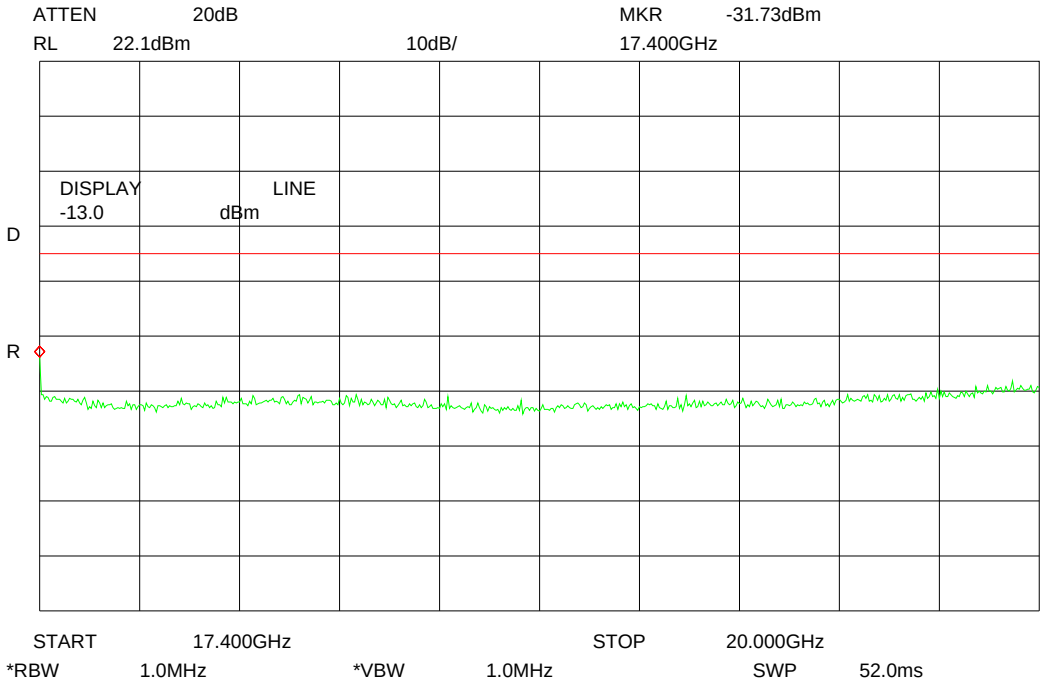
Plot 14: low channel



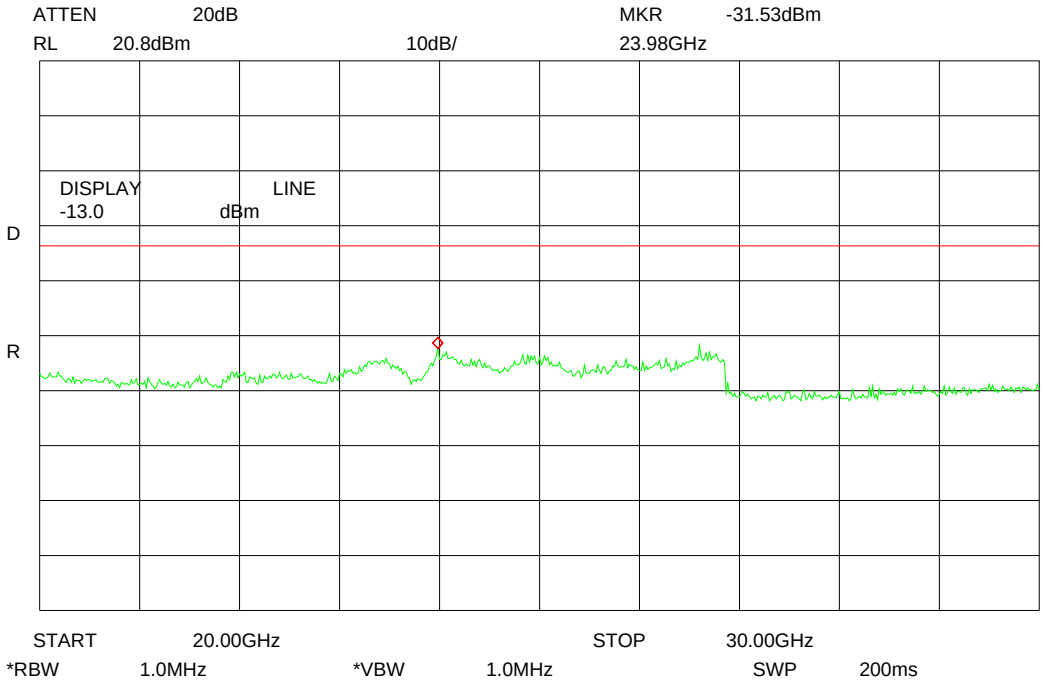
Plot 15: low channel



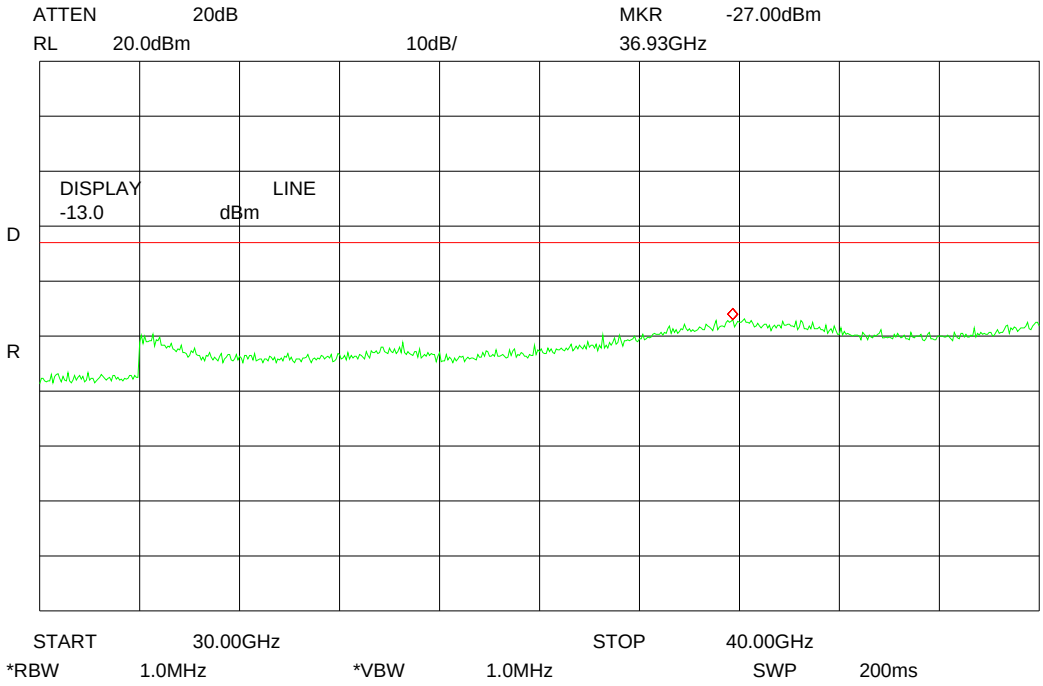
Plot 16: low channel



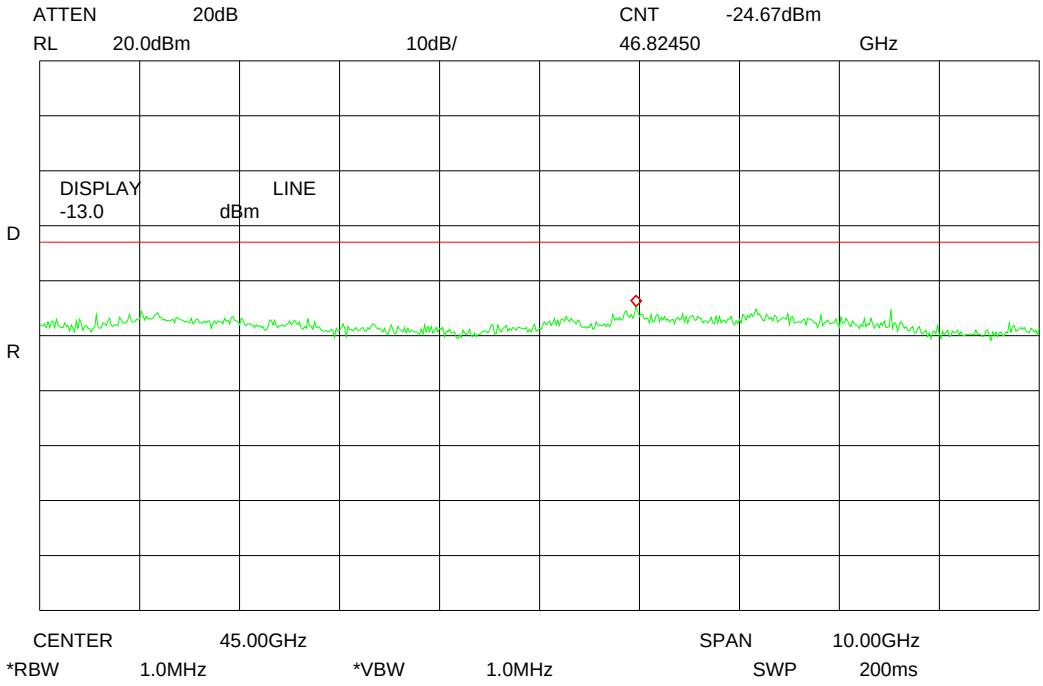
Plot 17: low channel



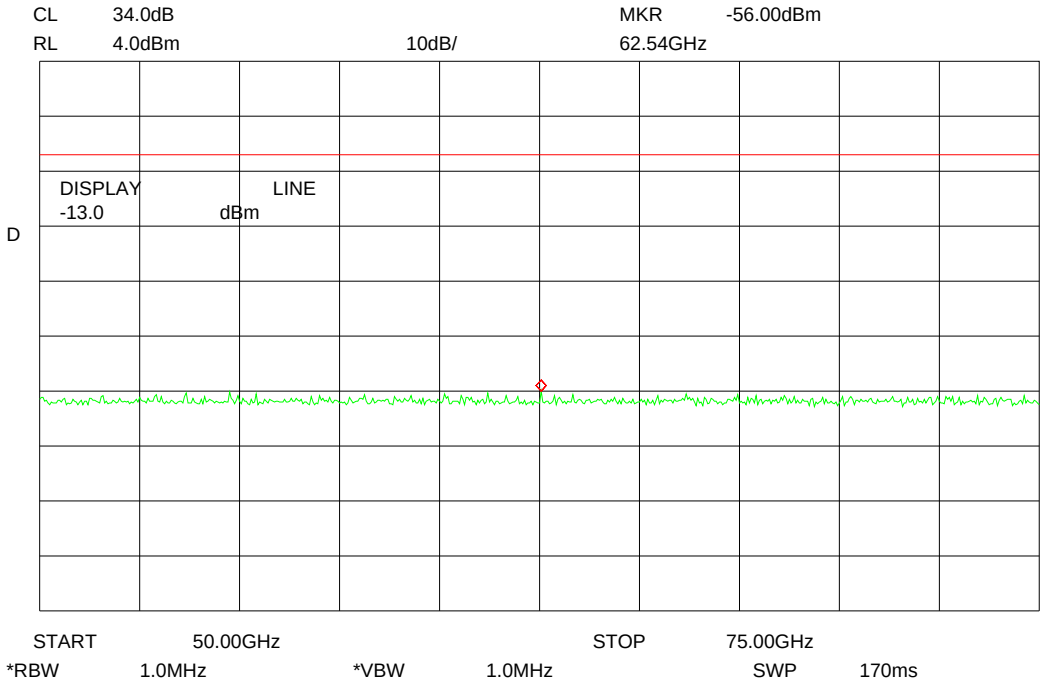
Plot 18: low channel



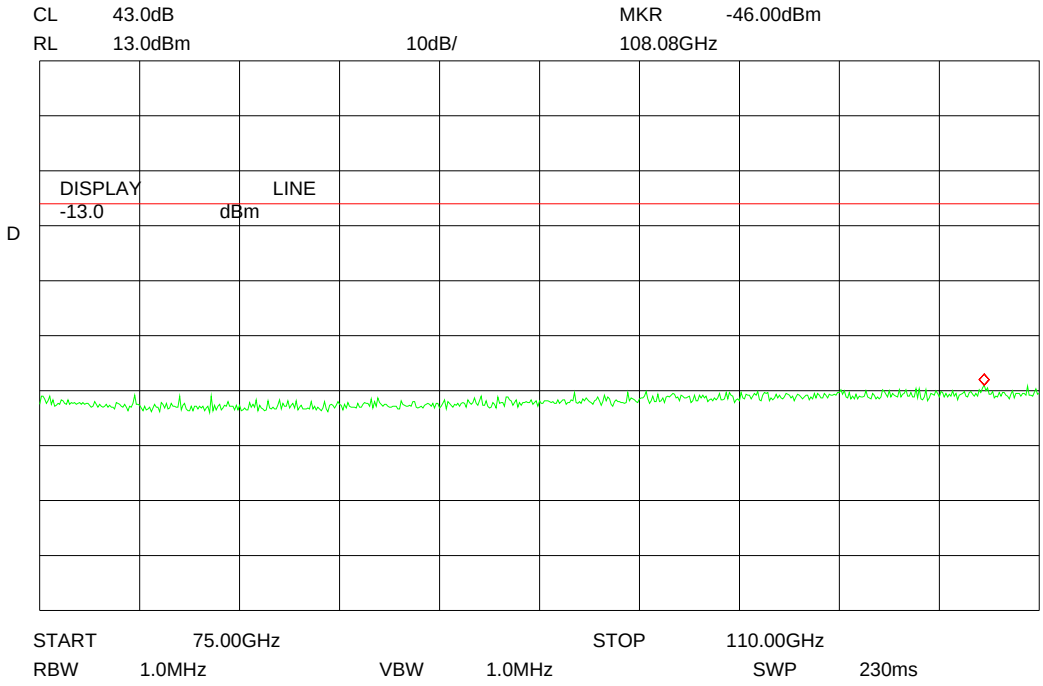
Plot 19: low channel



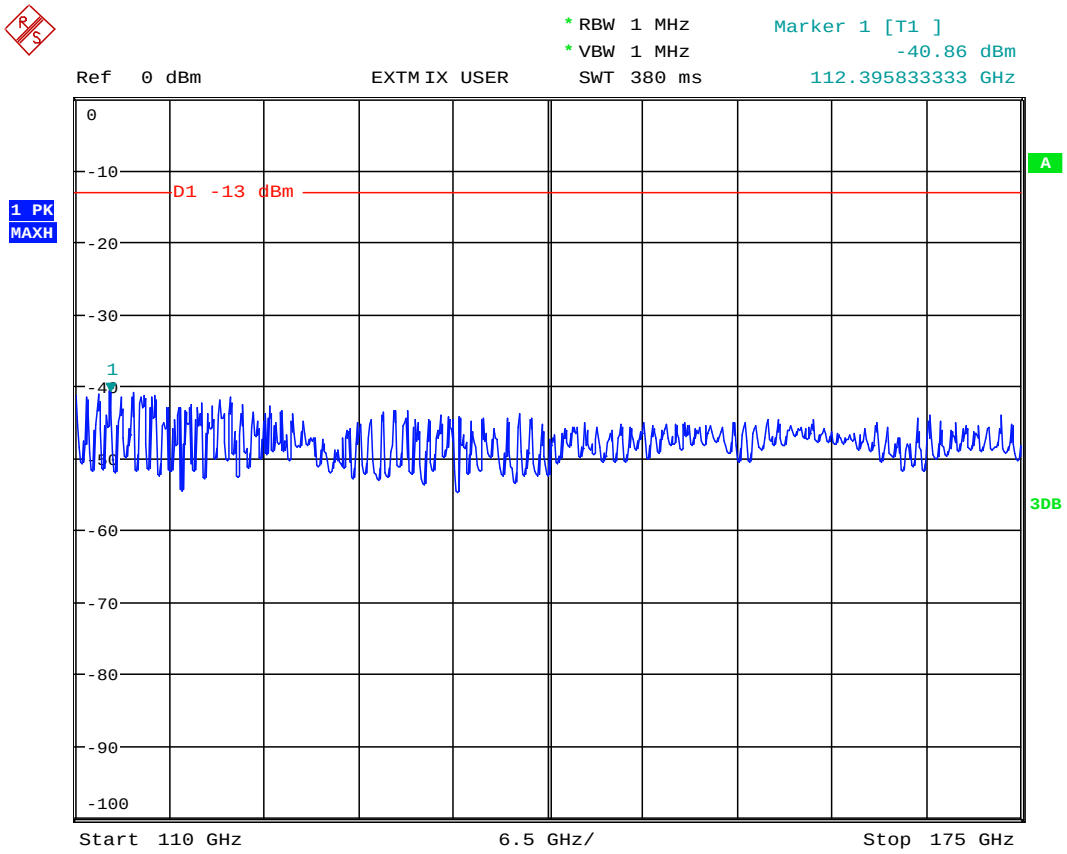
Plot 20: low channel



Plot 21: low channel

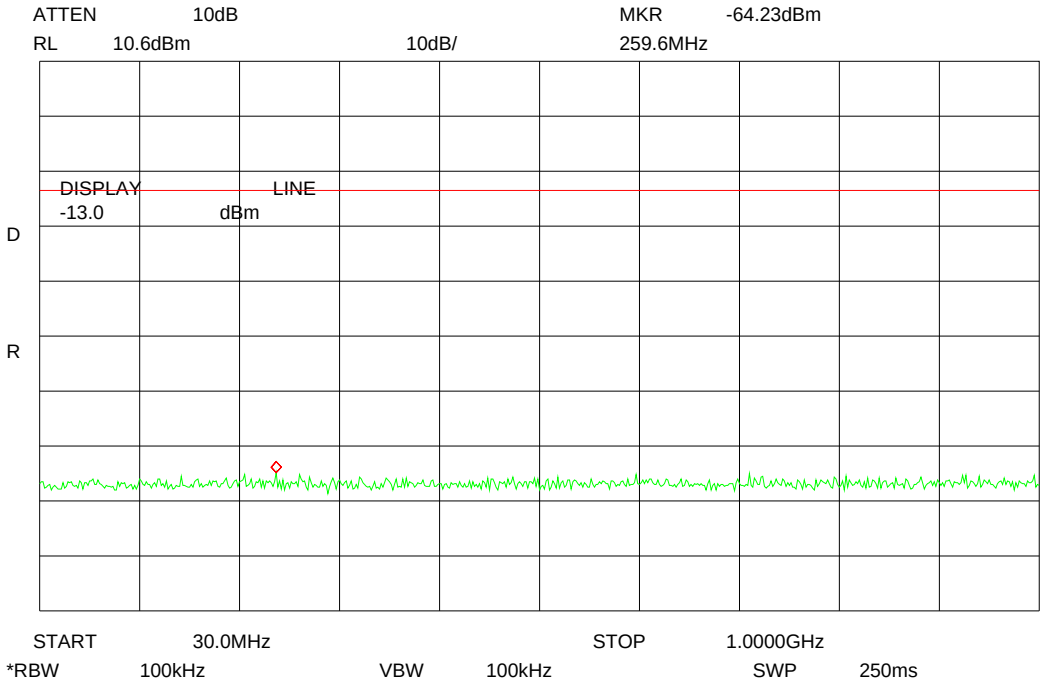


Plot 22: low channel

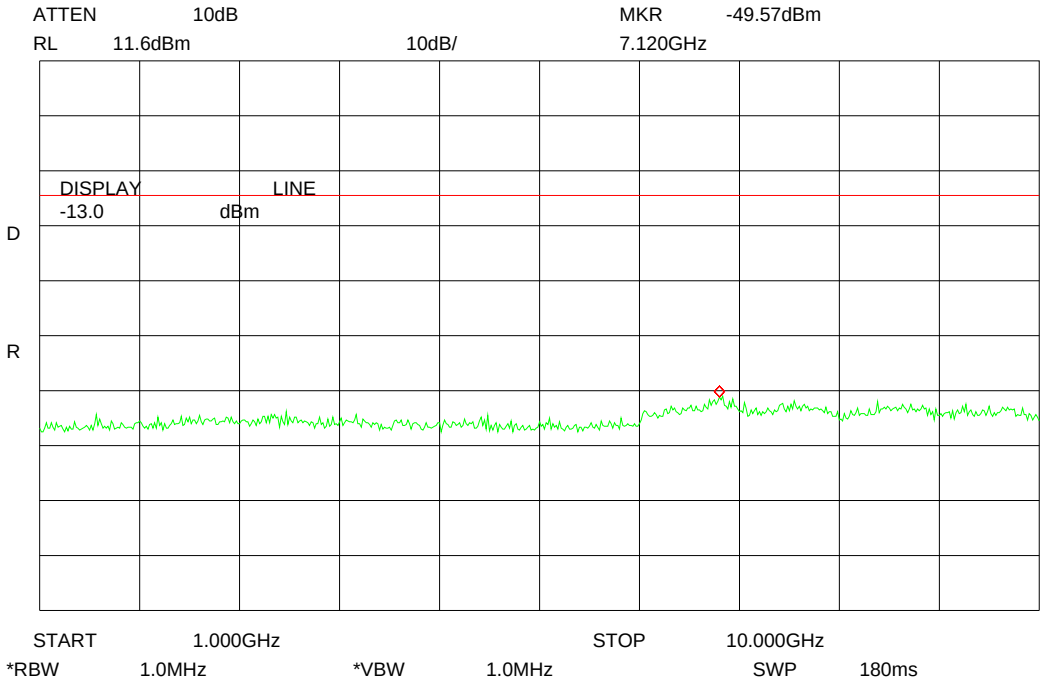


Date: 29.NOV.2010 14:43:53

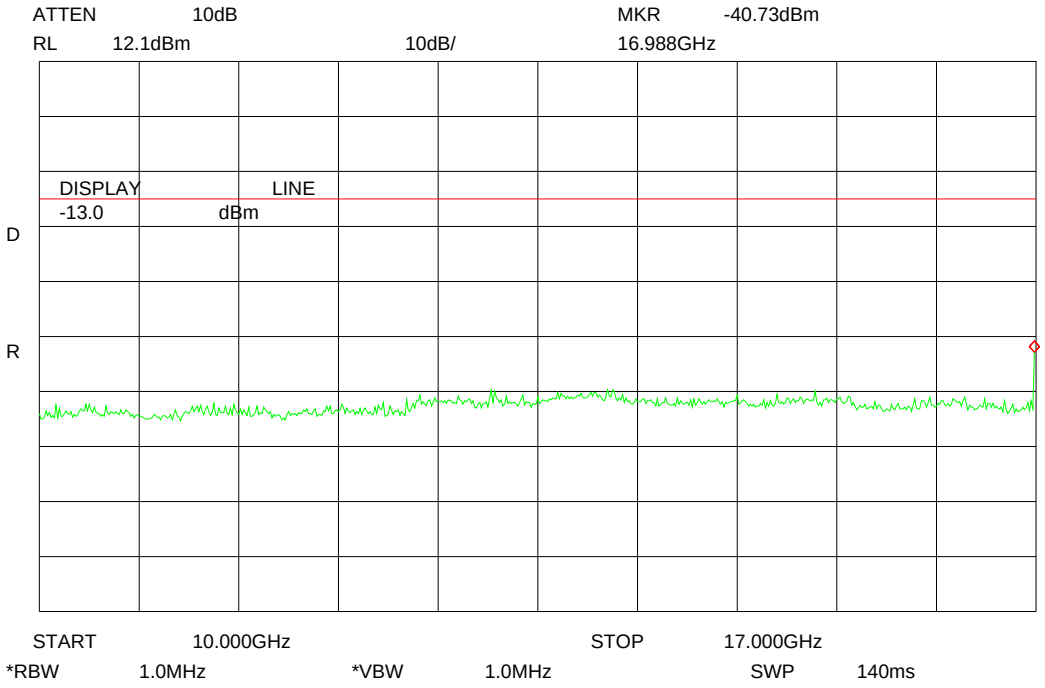
Plot 23: mid channel



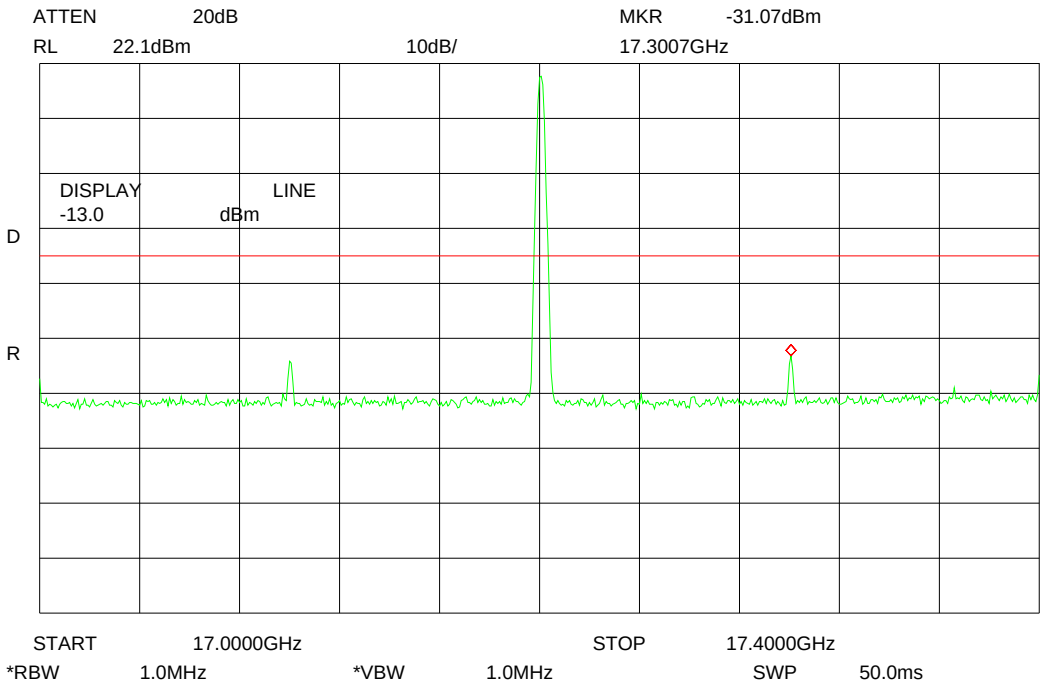
Plot 24: mid channel



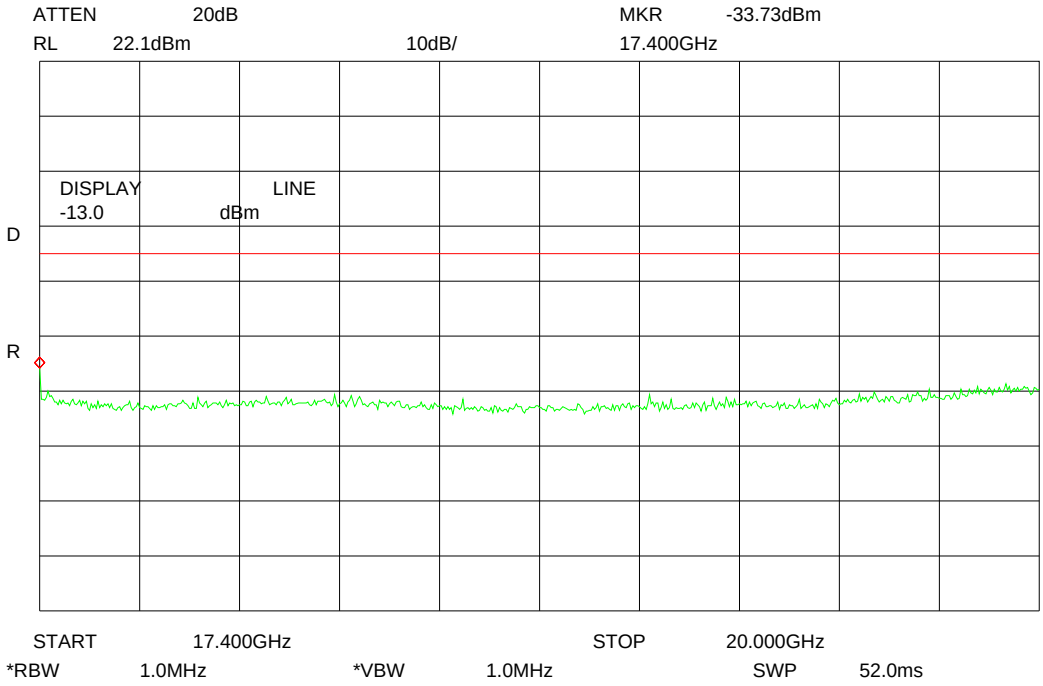
Plot 25: mid channel



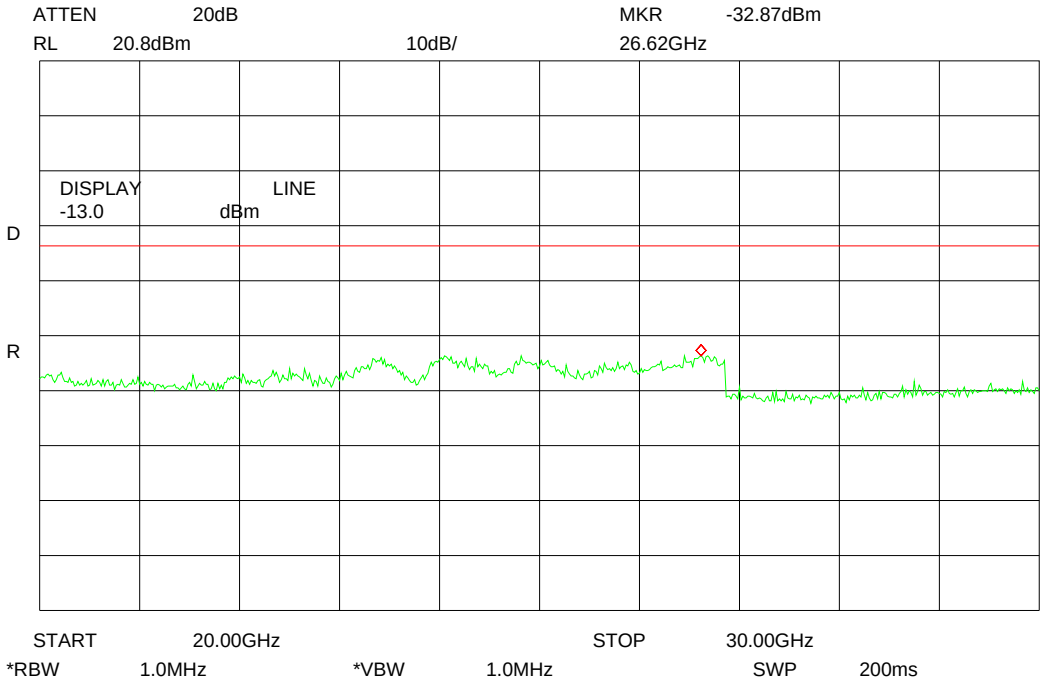
Plot 26: mid channel



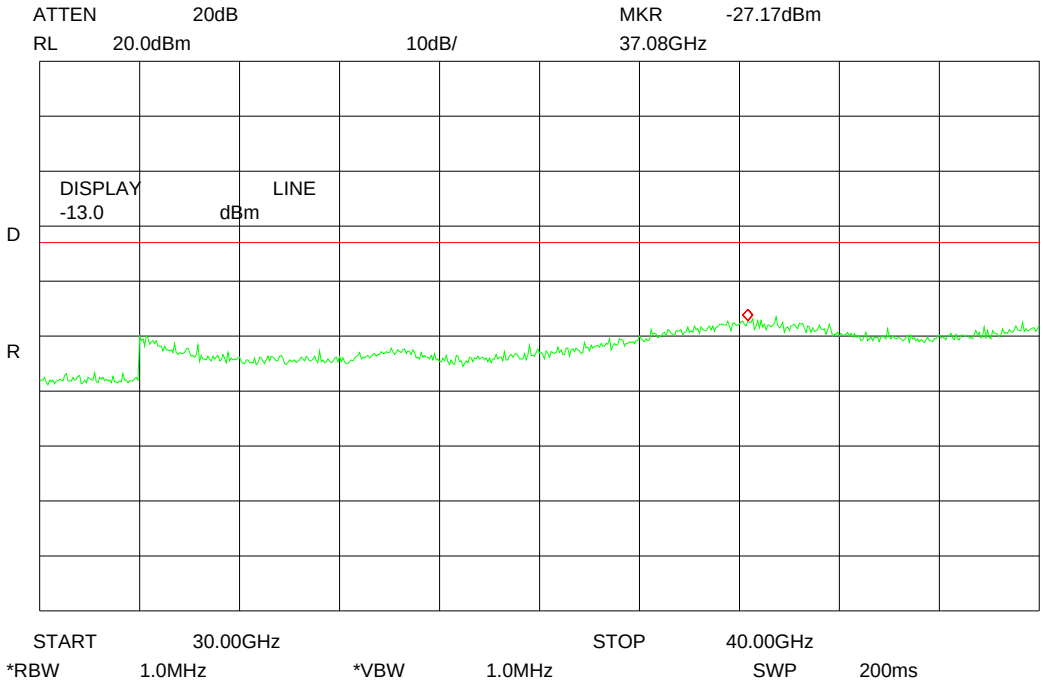
Plot 27: mid channel



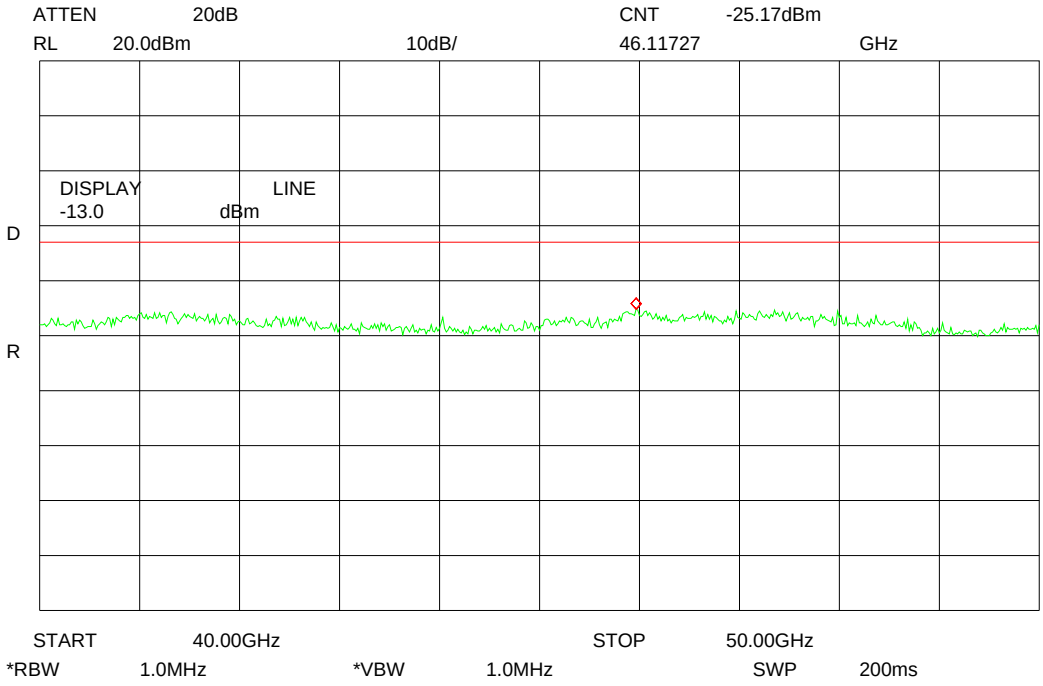
Plot 28: mid channel



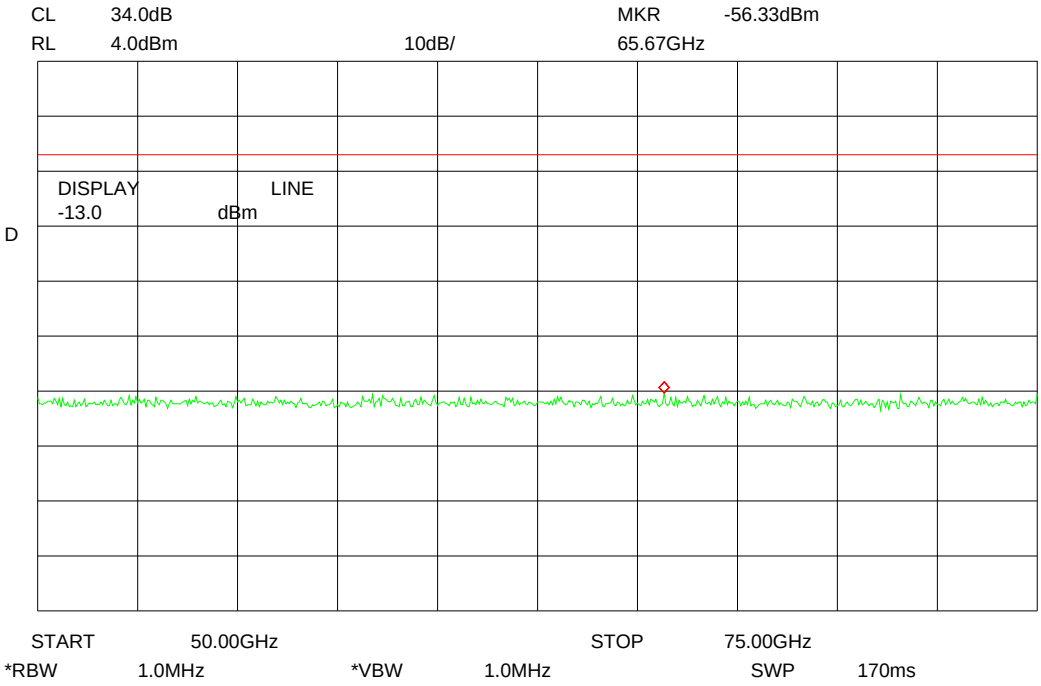
Plot 29: mid channel



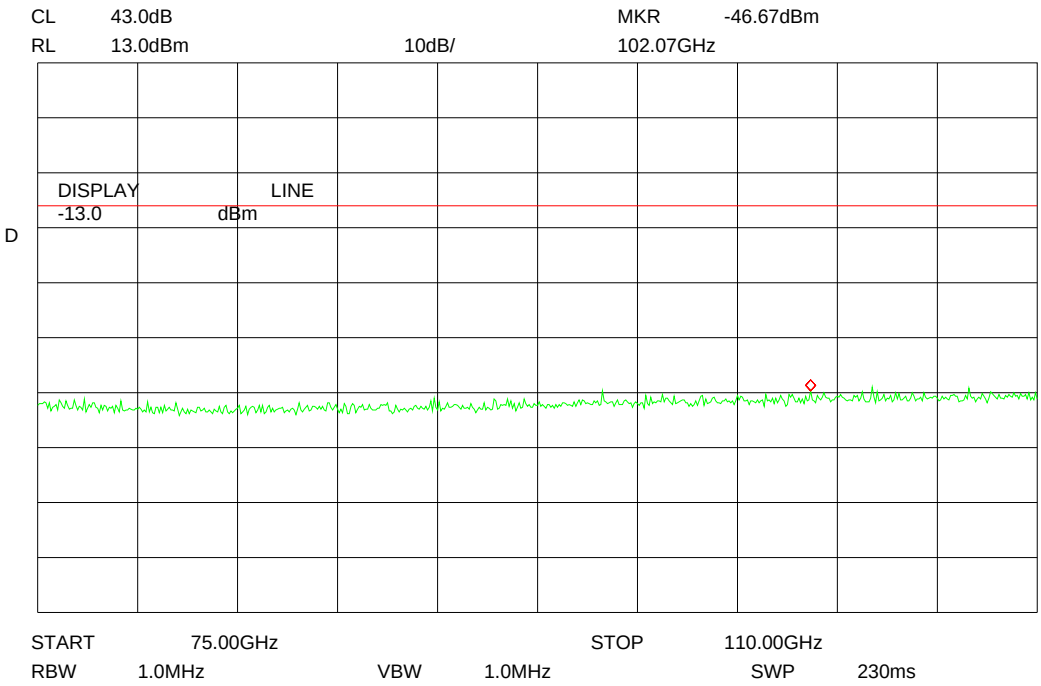
Plot 30: mid channel



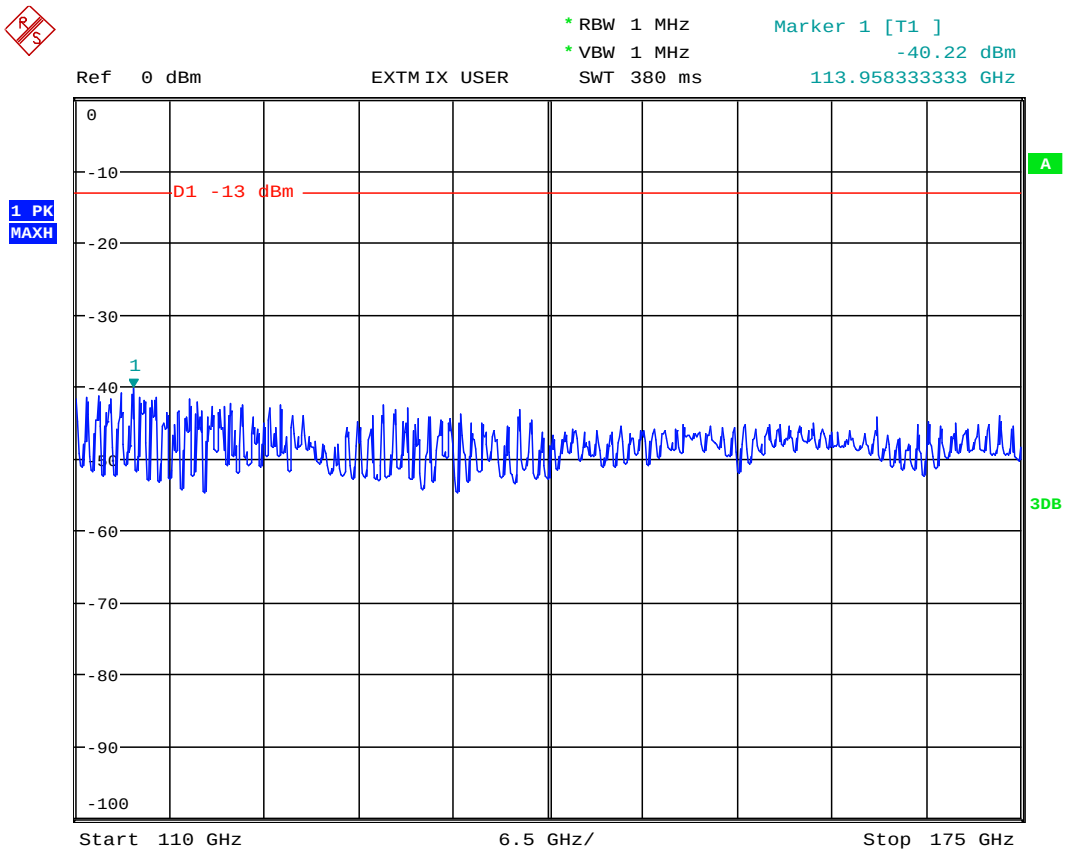
Plot 31: mid channel



Plot 32: mid channel



Plot 33: mid channel



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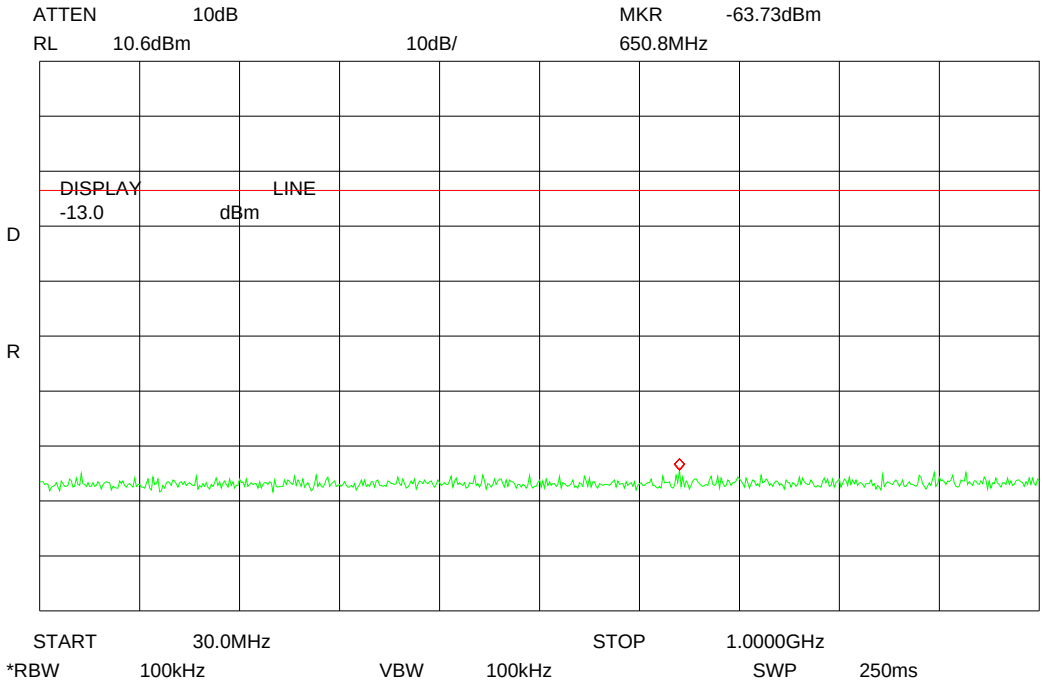
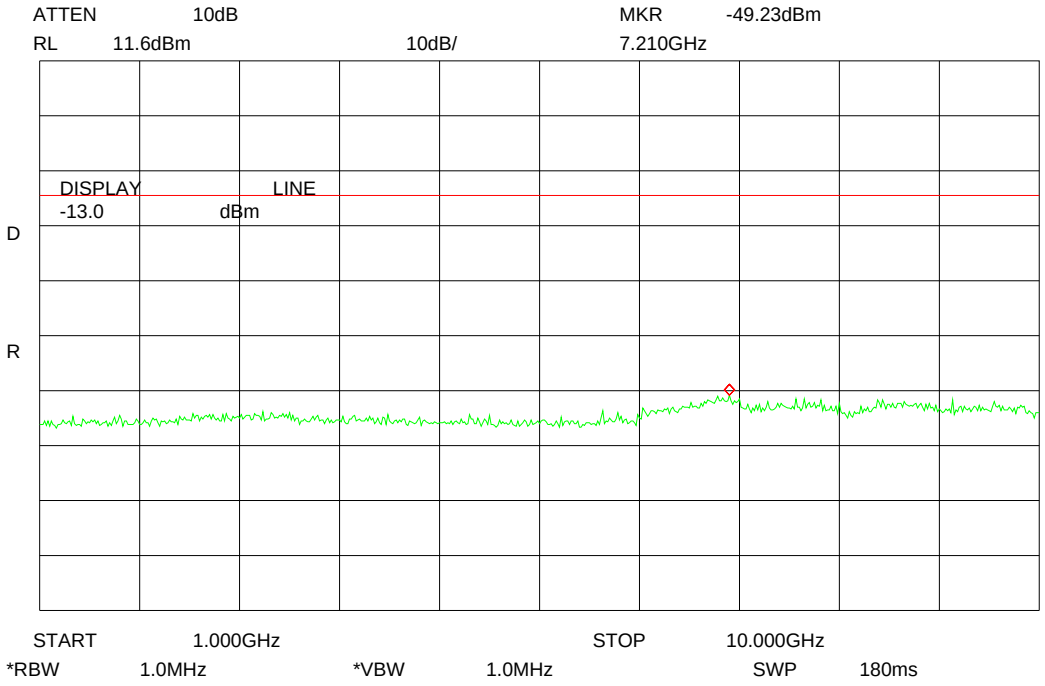
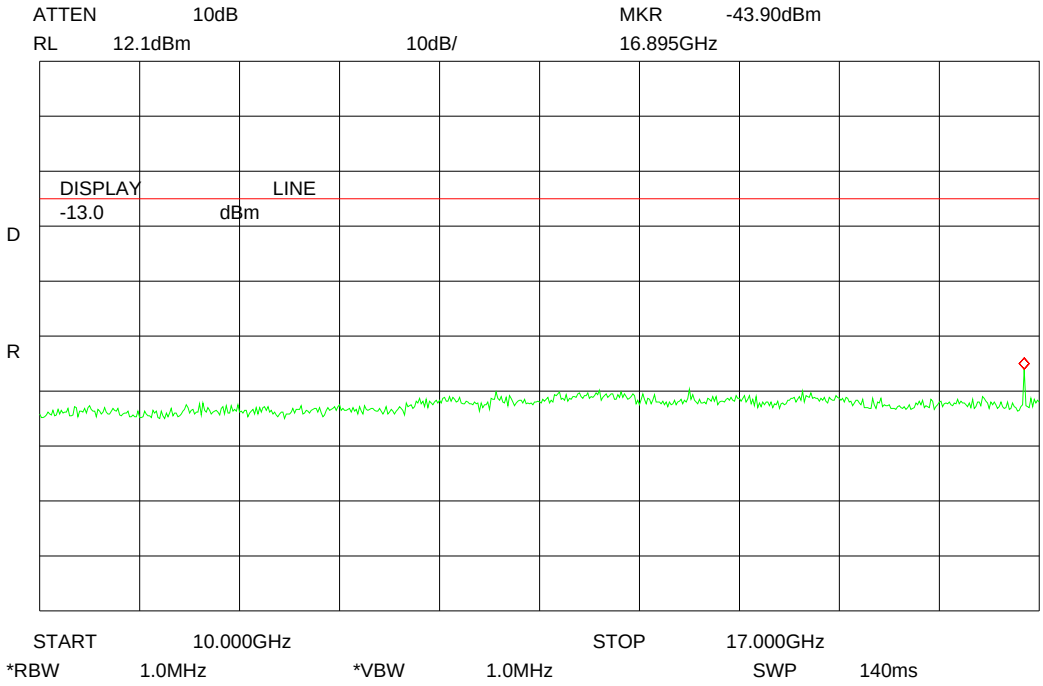
Plot 34: high channel



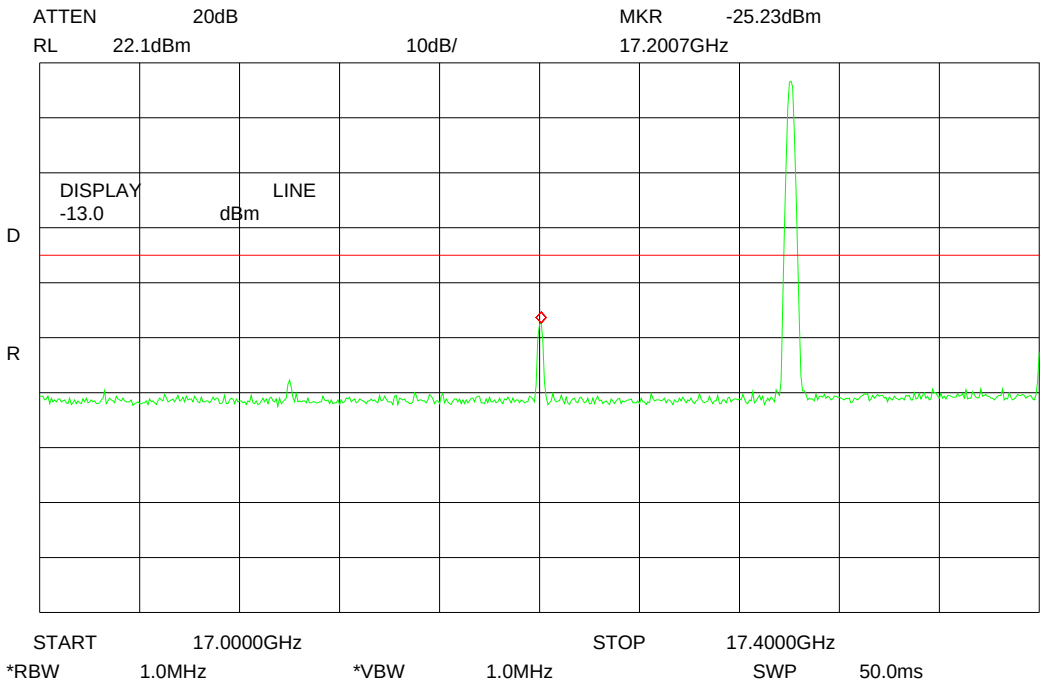
Plot 35: high channel



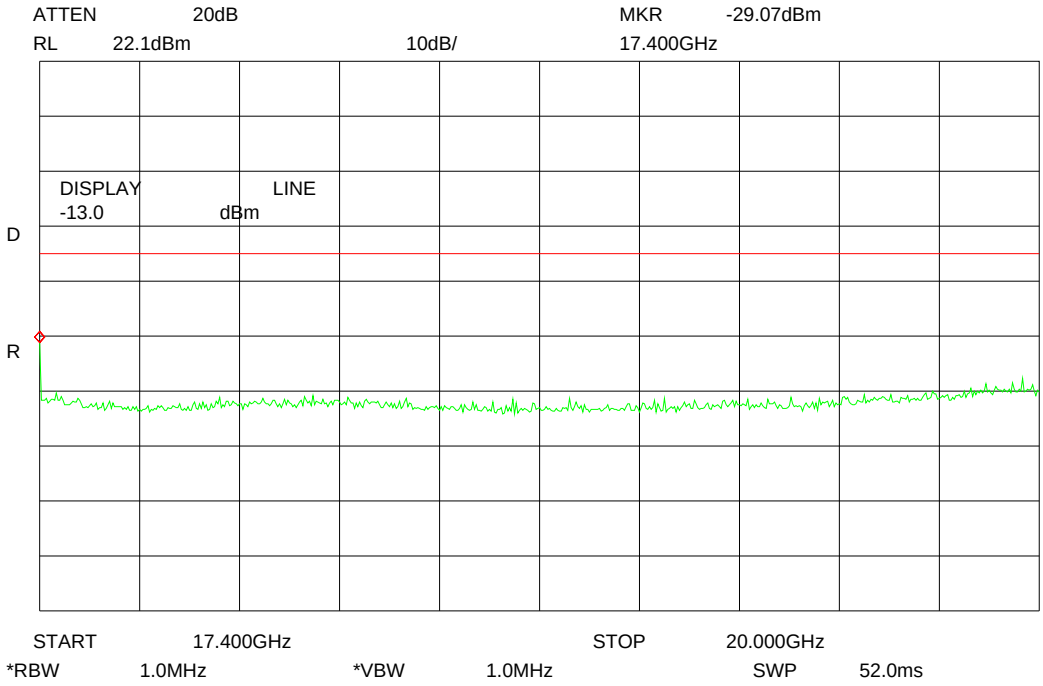
Plot 36: high channel



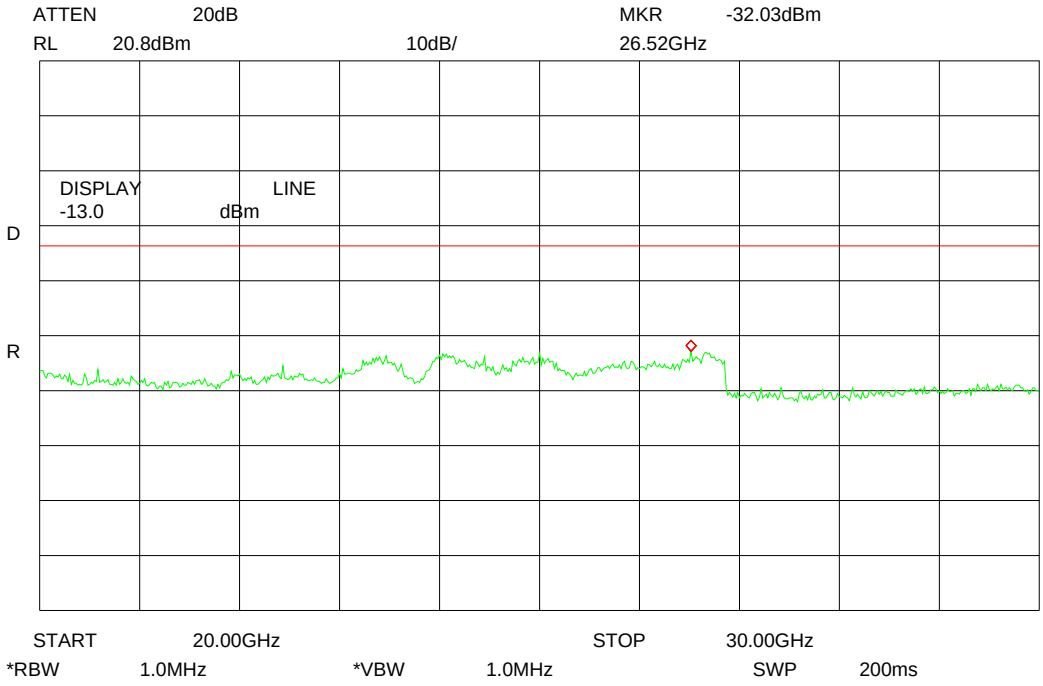
Plot 37: high channel



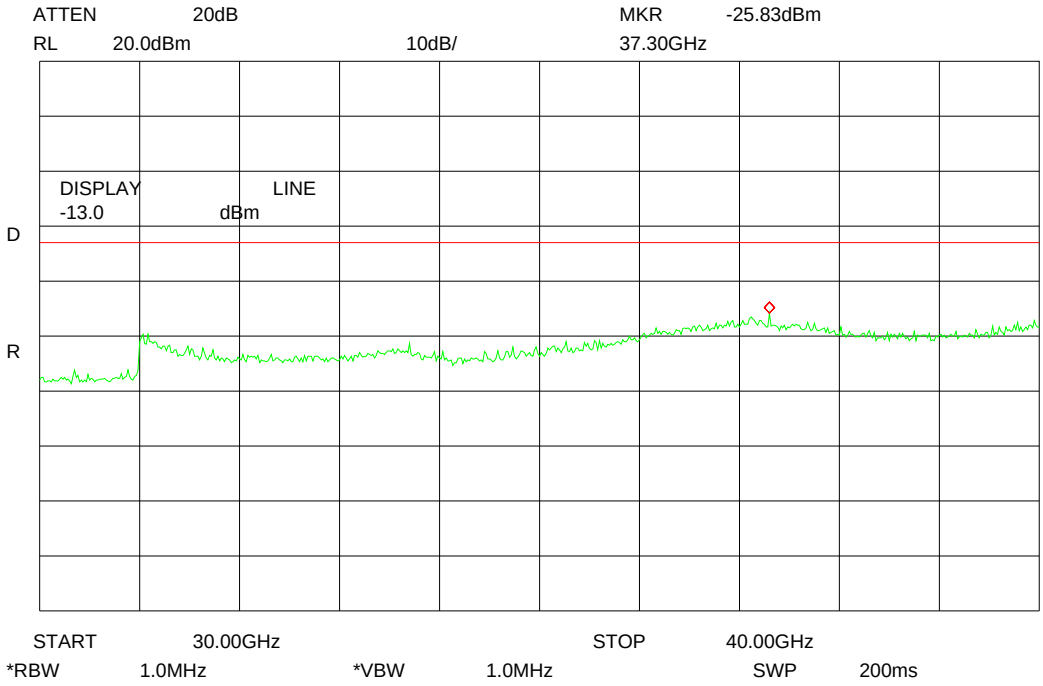
Plot 38: high channel



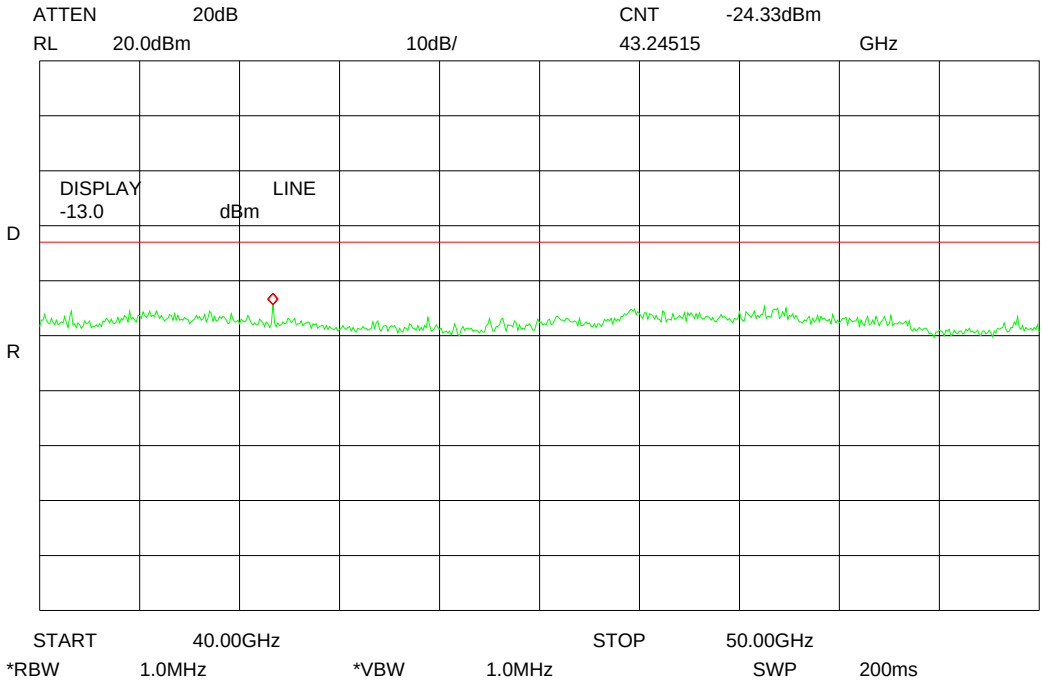
Plot 39: high channel



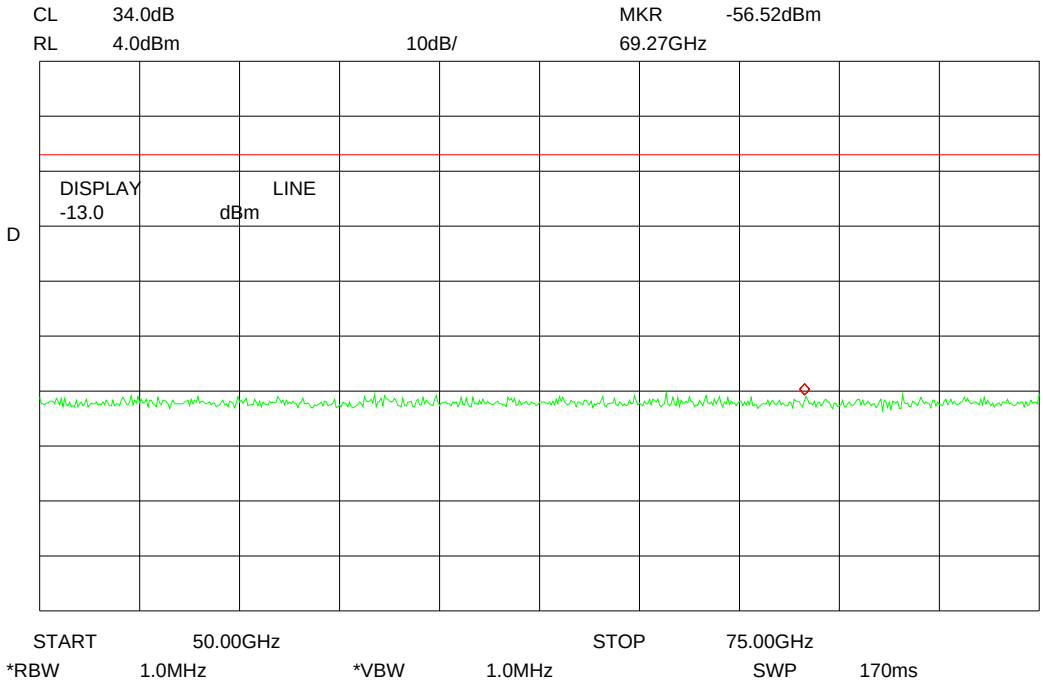
Plot 40: high channel



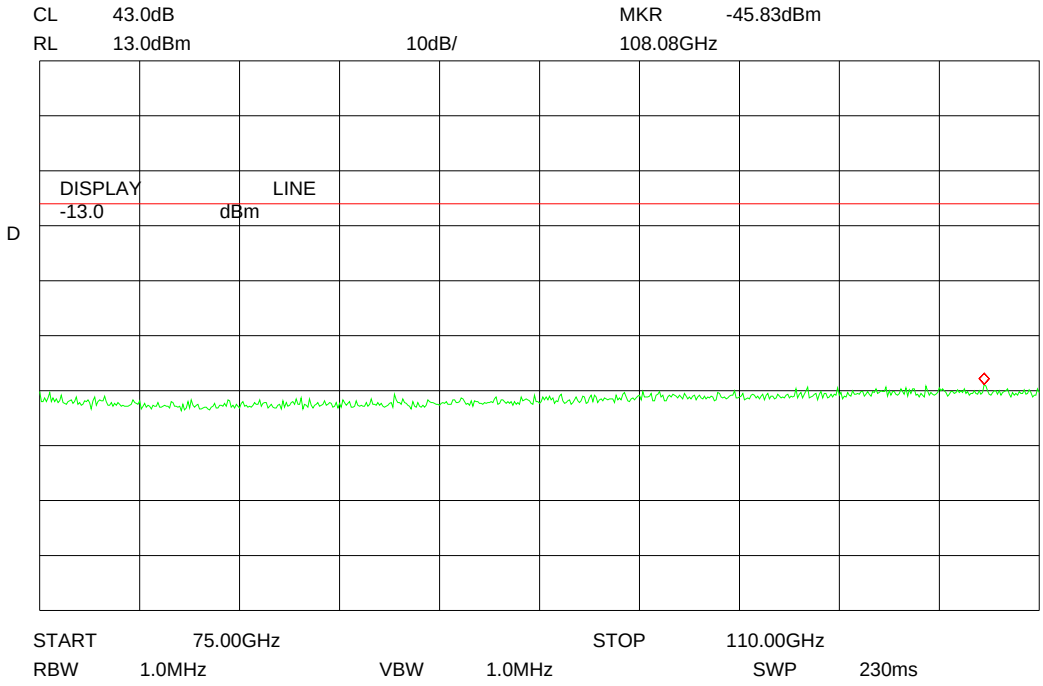
Plot 41: high channel



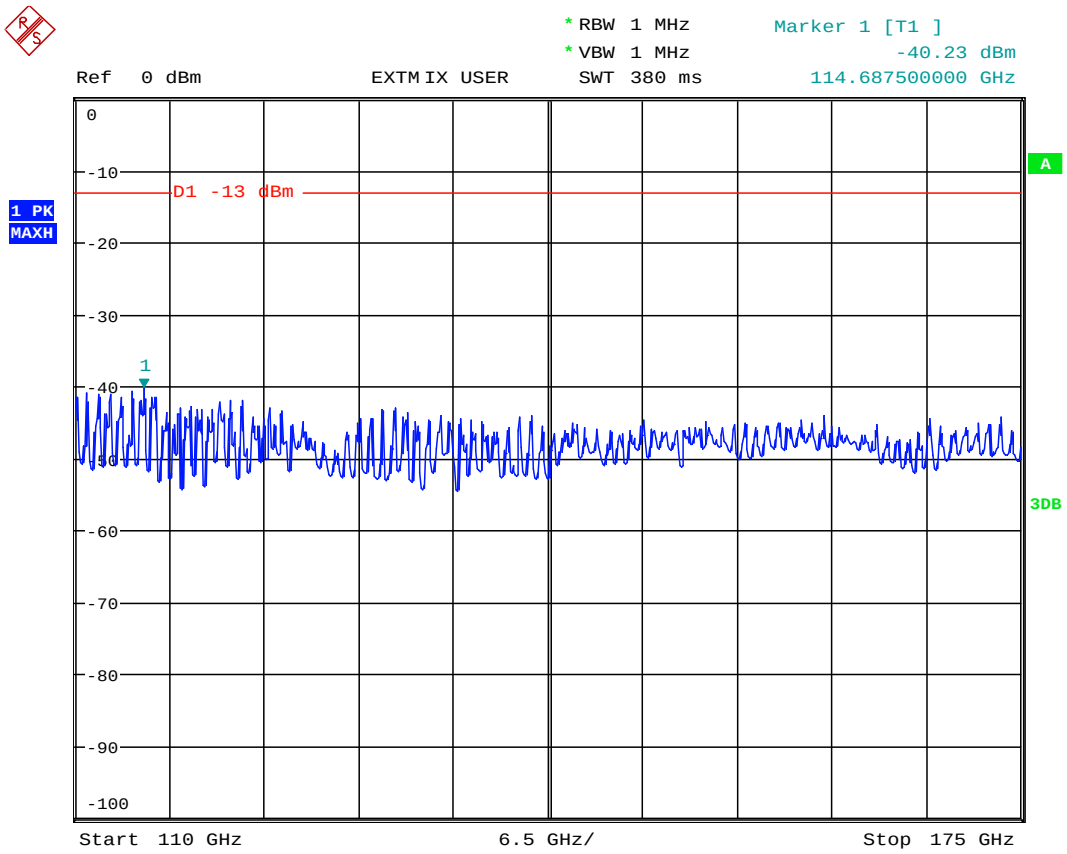
Plot 42: high channel



Plot 43: high channel



Plot 44: high channel



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9.6 Spurious emissions (radiated)

Radiated measurements:

The EUT was set for low, mid, high channel and highest RF output power.

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	-/-
Trace-Mode:	Max. hold

Limits:

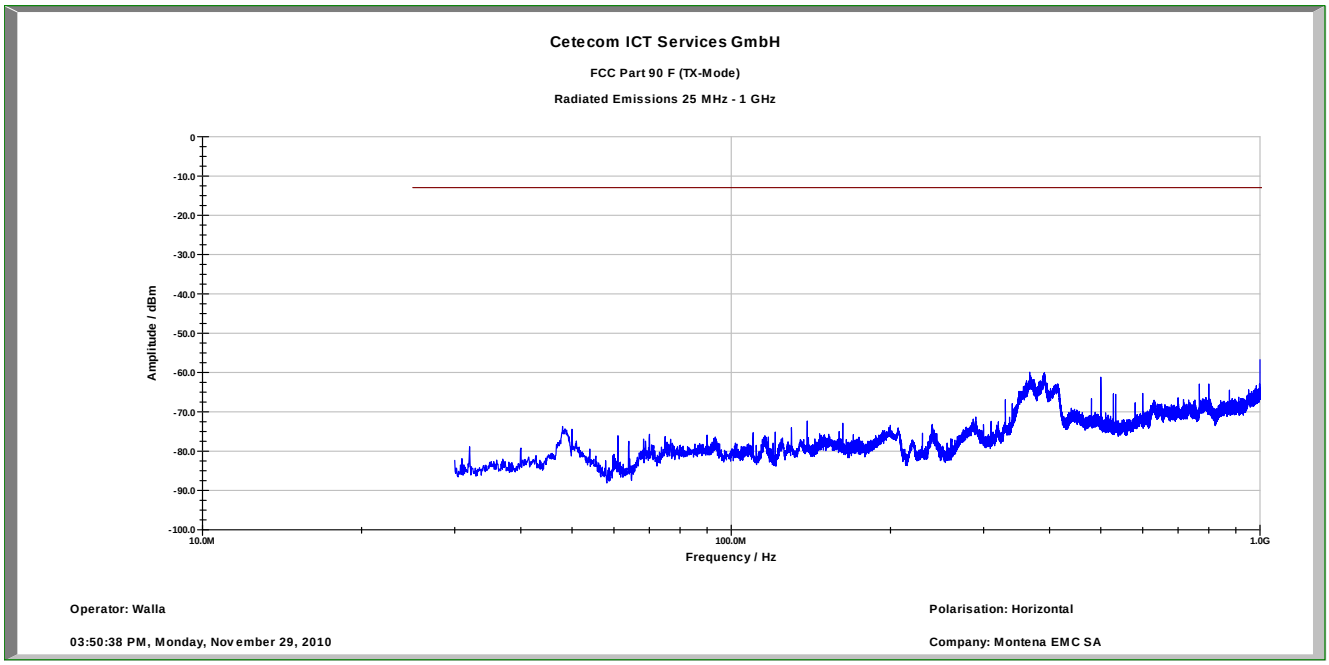
FCC
47 CFR §2.1051 / § 90.210 (b) (n)
Measurements required: Spurious emissions at antenna terminals / Emission mask
(b) *Emission Mask B.* … (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB. (n) *Other frequency bands.* Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B.

SPURIOUS EMISSIONS LEVEL (dBm)								
low channel			mid channel			high channel		
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
8.1000	pos-peak	-38.4	8.1000	pos-peak	-38.6	8.1000	pos-peak	-33.2
17.080	pos-peak	-26.0	17.180	pos-peak	-25.9	17.280	pos-peak	-23.4
18.000	pos-peak	-53.3	18.200	pos-peak	-50.6	18.400	pos-peak	-46.3
All detected spurious are more than 10 dB below the limit.			All detected spurious are more than 10 dB below the limit.			All detected spurious are more than 10 dB below the limit.		
Measurement uncertainty ± 3 dB								

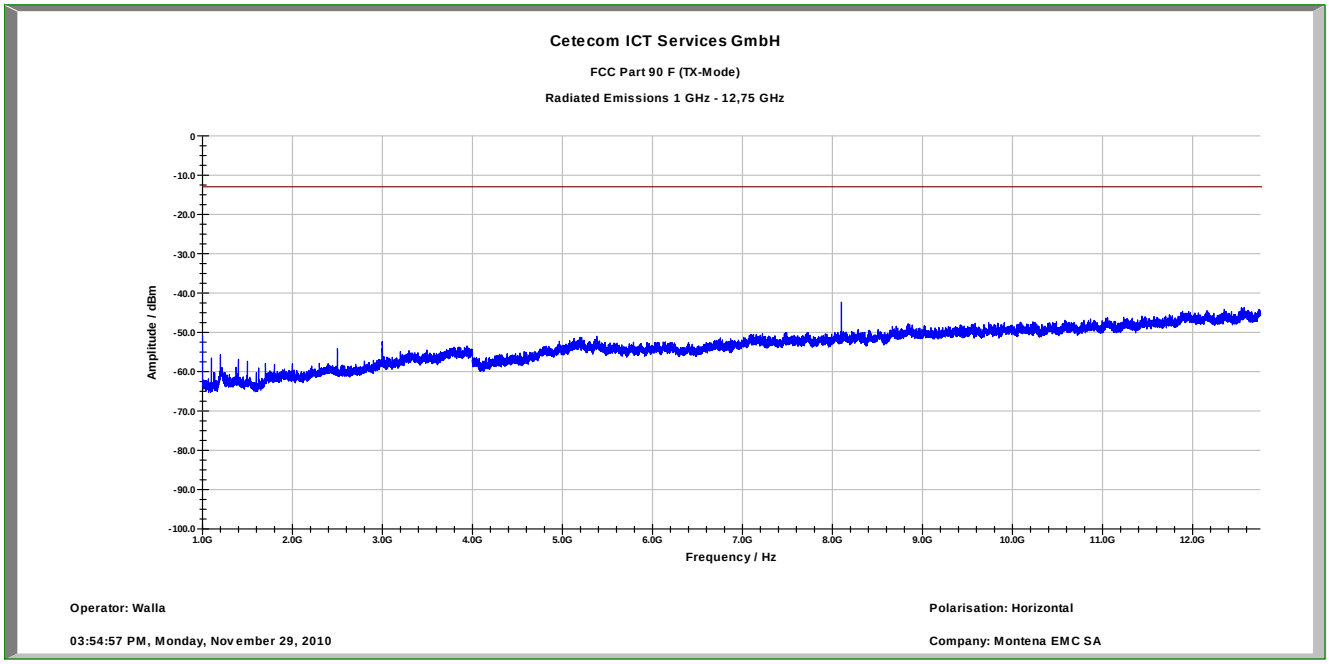
Result: **The result of the measurement is passed.**

Plots of the measurements

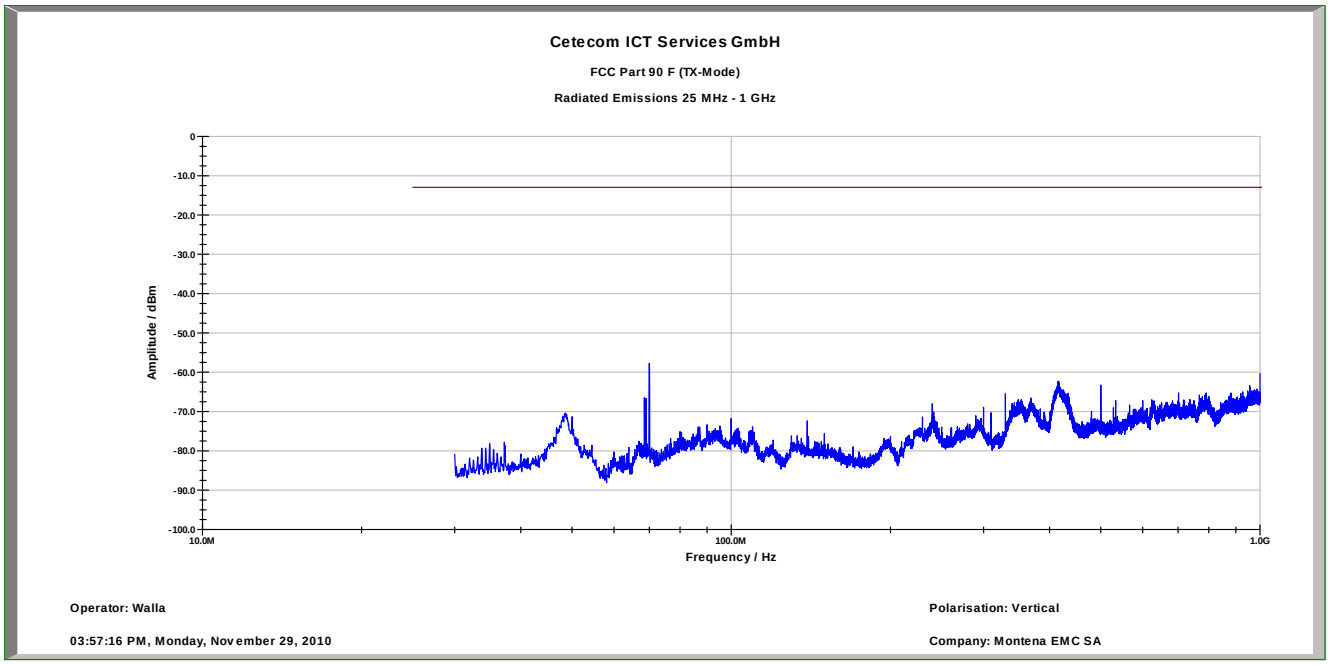
Plot 45: low channel, horizontal polarization



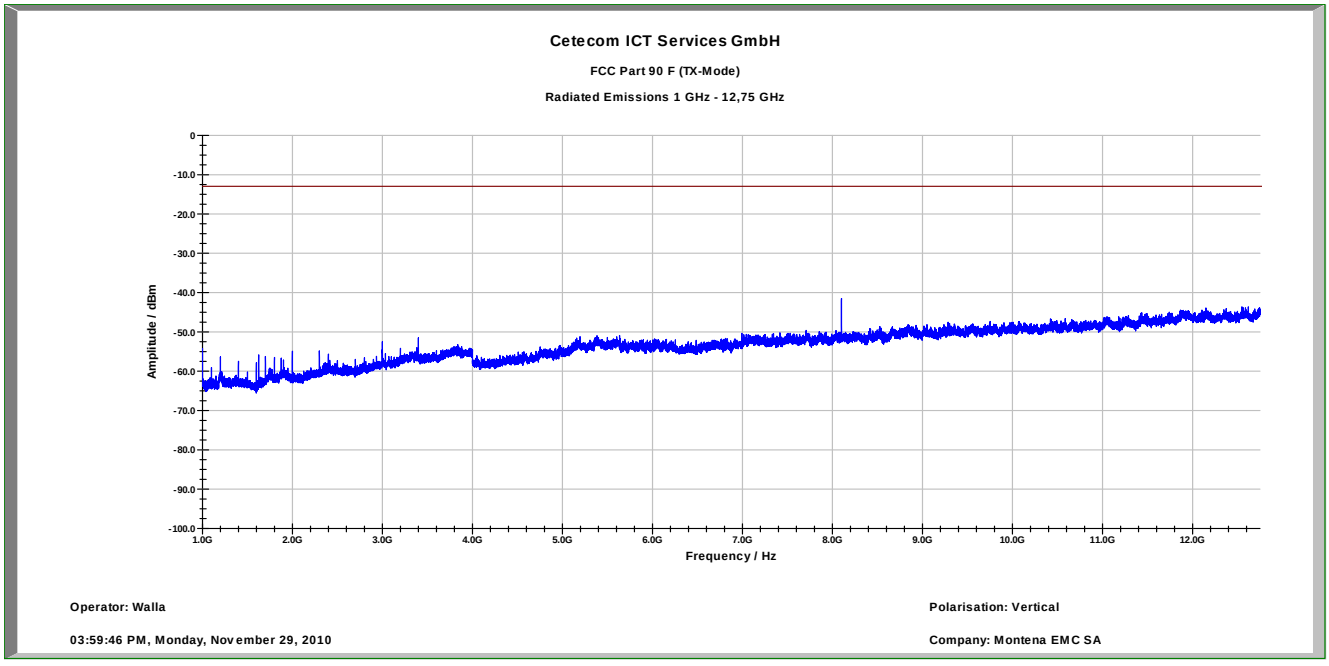
Plot 46: low channel, horizontal polarization



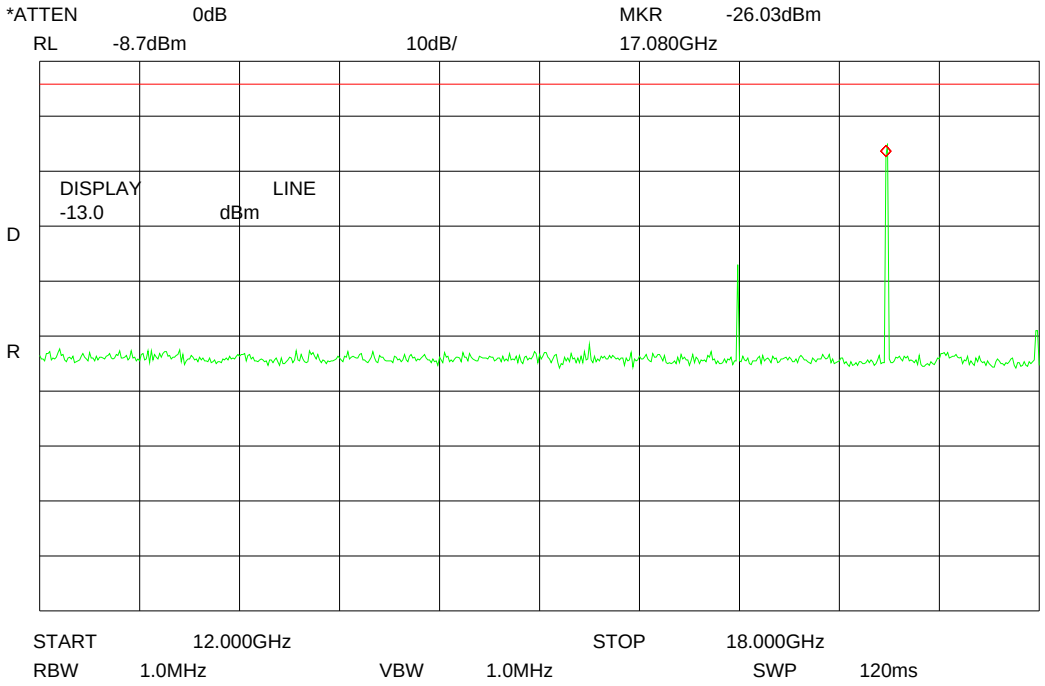
Plot 47: low channel, vertical polarization



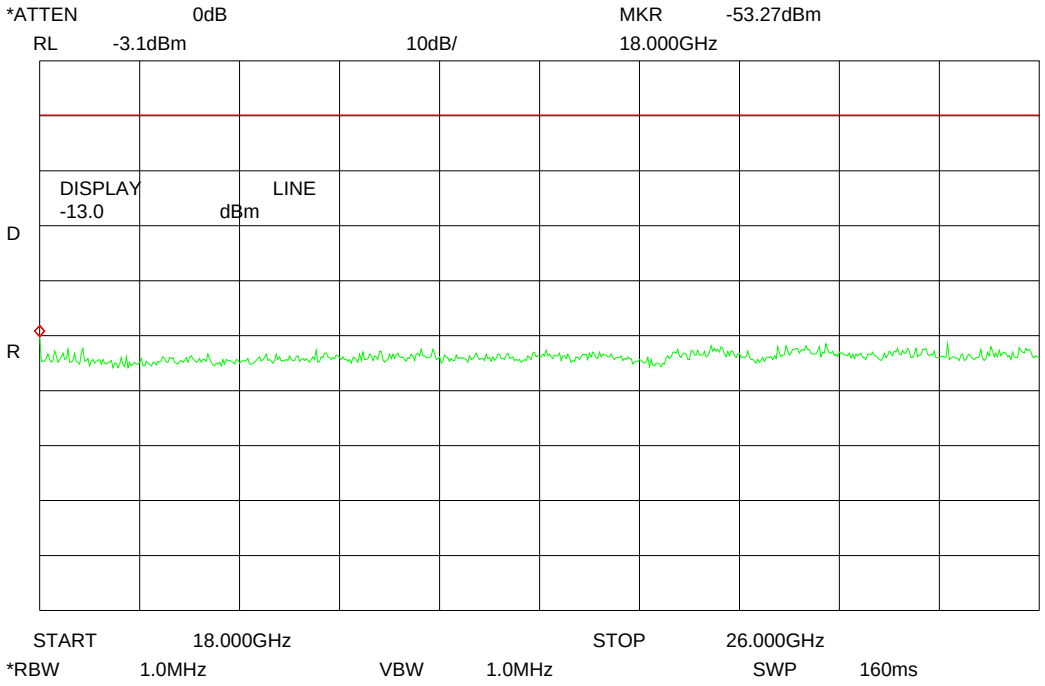
Plot 48: low channel, vertical polarization



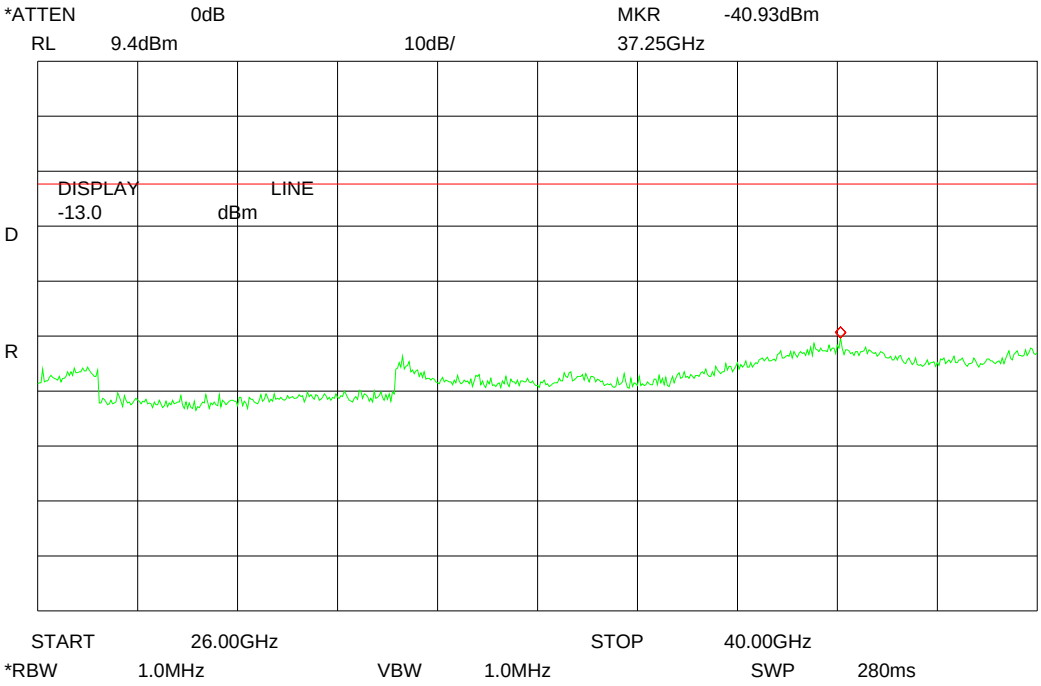
Plot 49: low channel



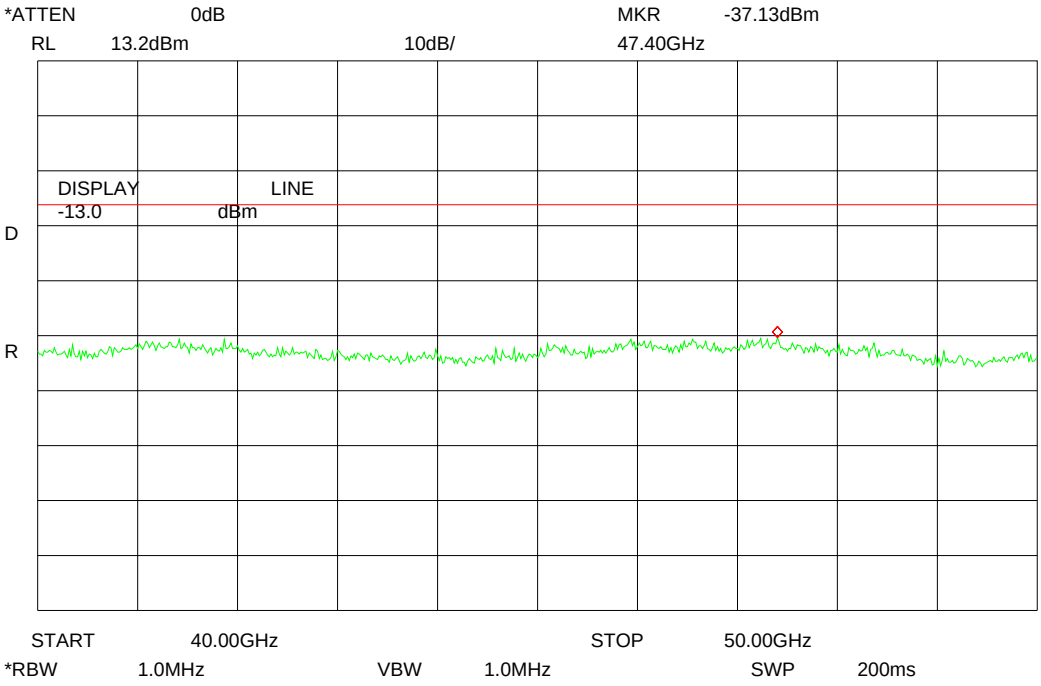
Plot 50: low channel



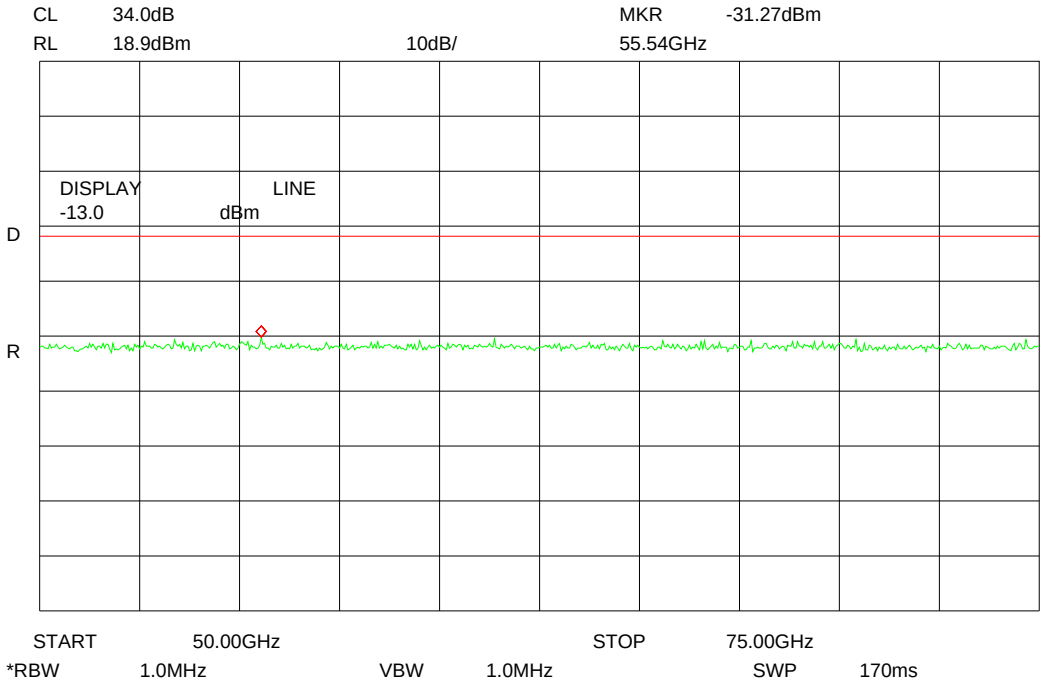
Plot 51: low channel



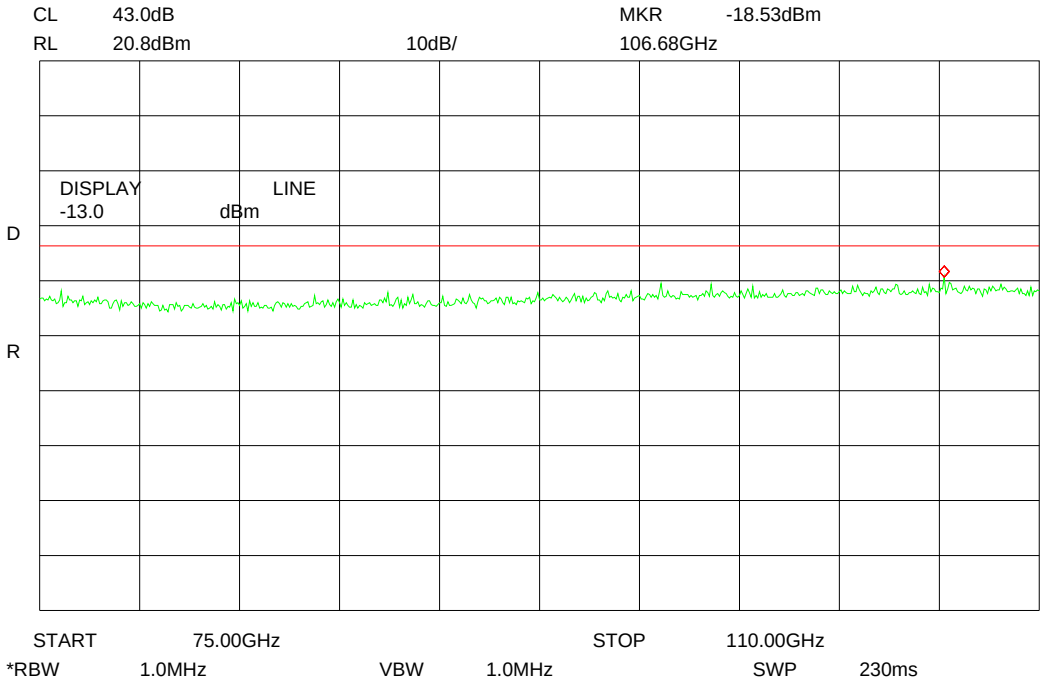
Plot 52: low channel



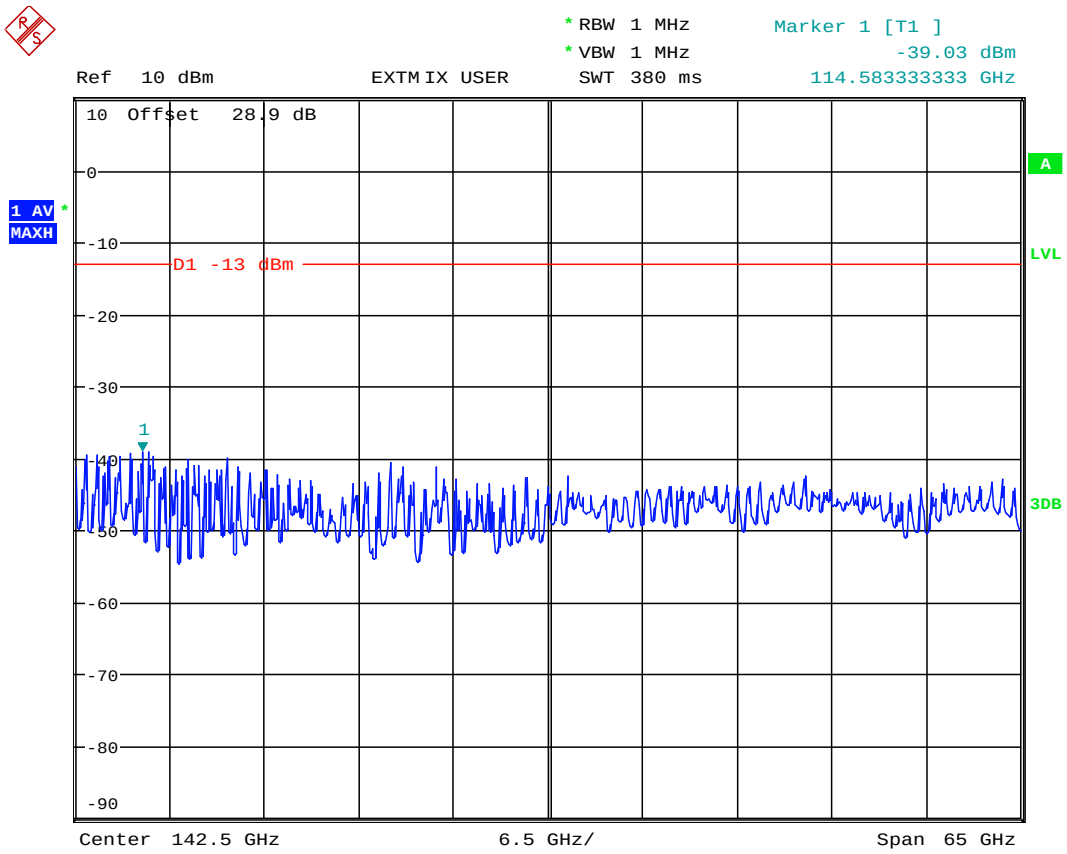
Plot 53: low channel



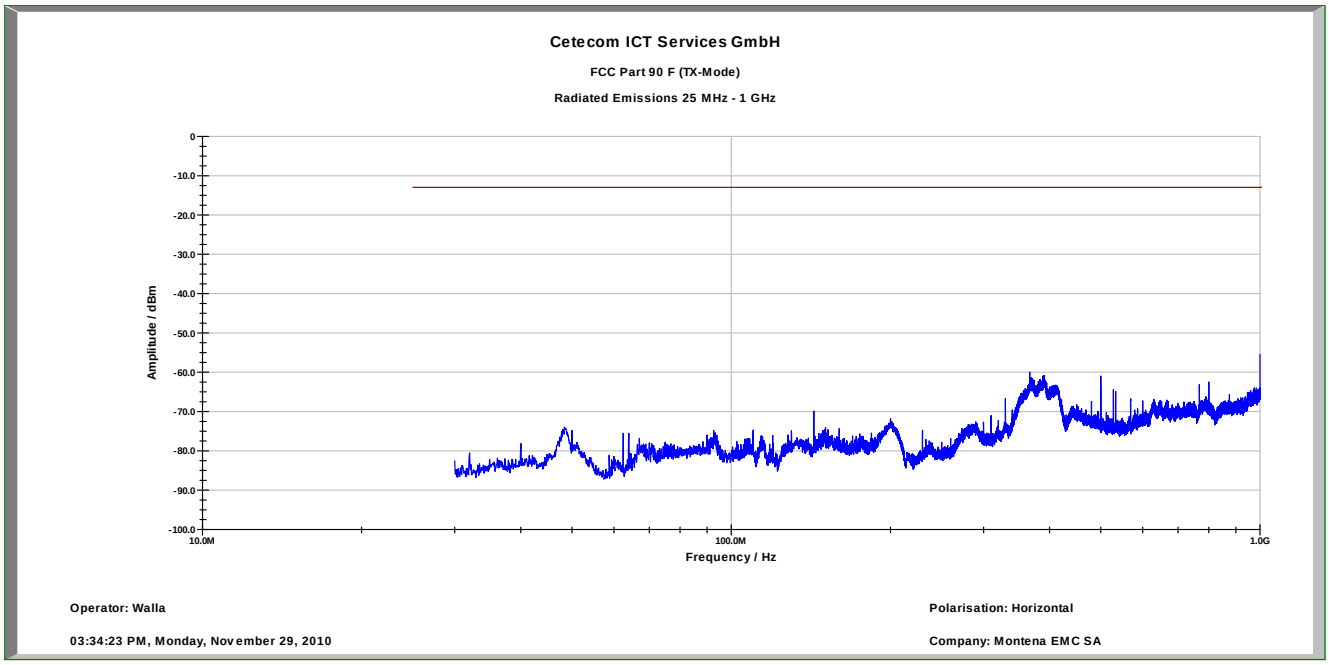
Plot 54: low channel



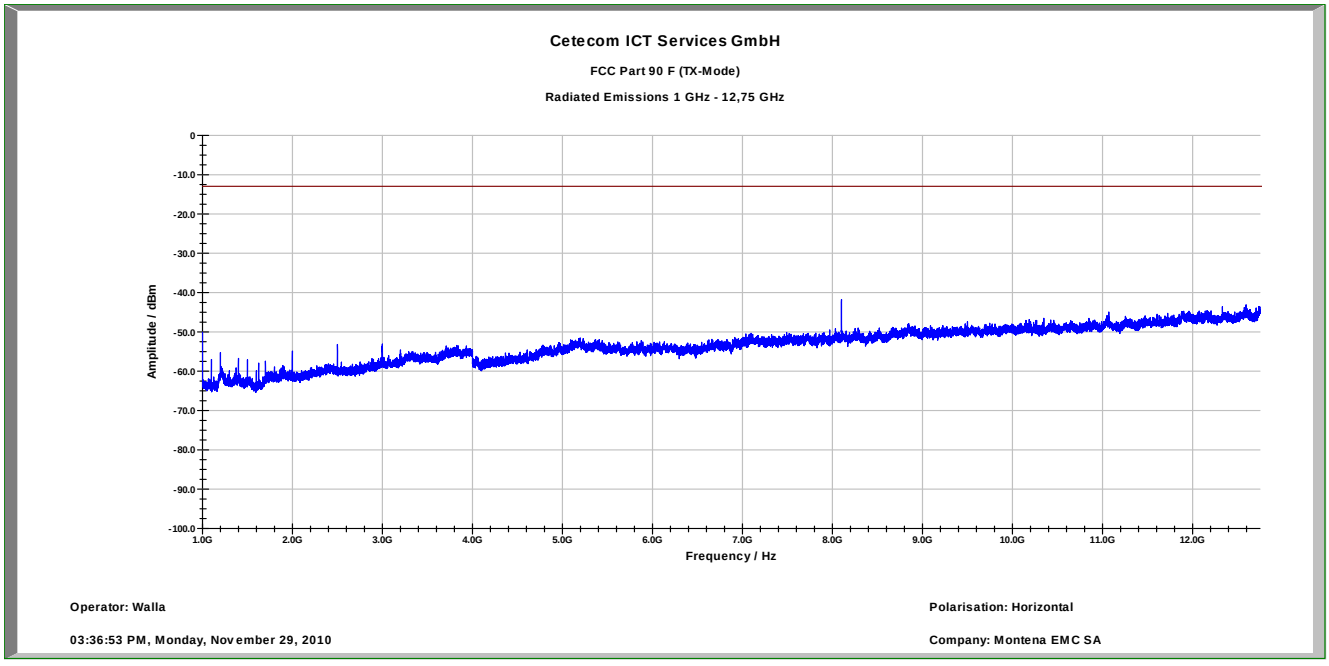
Plot 55: low channel



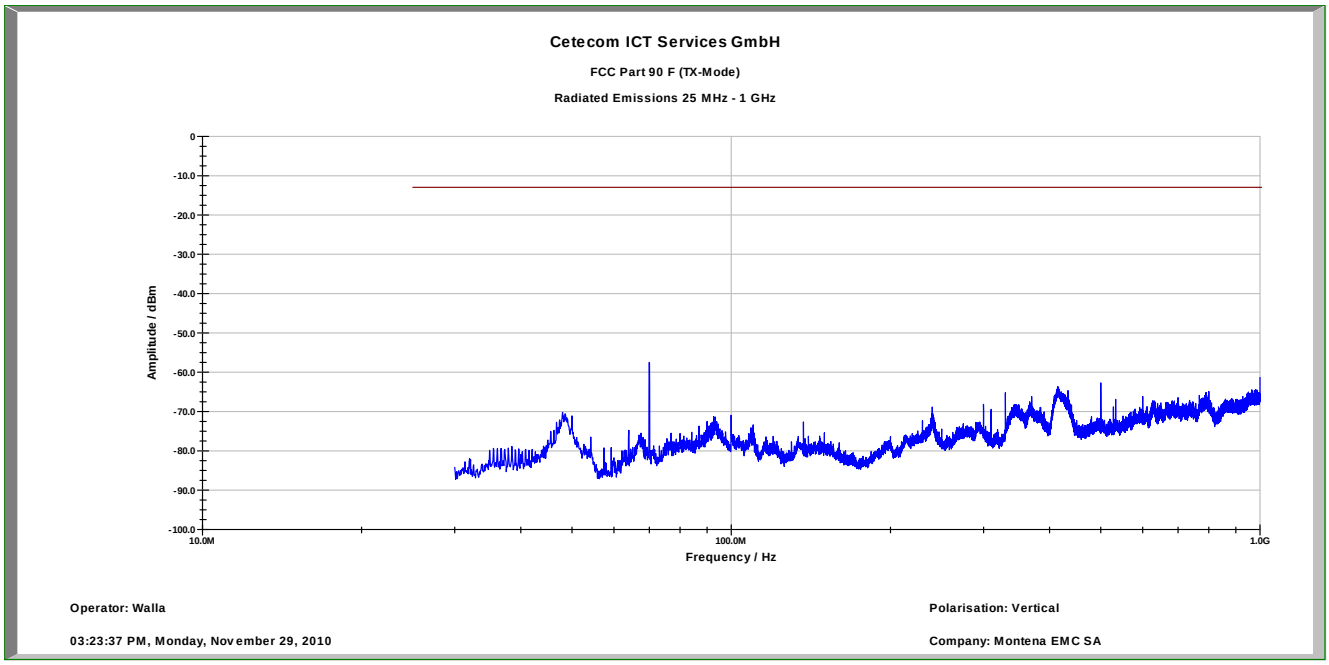
Plot 56: mid channel, horizontal polarization



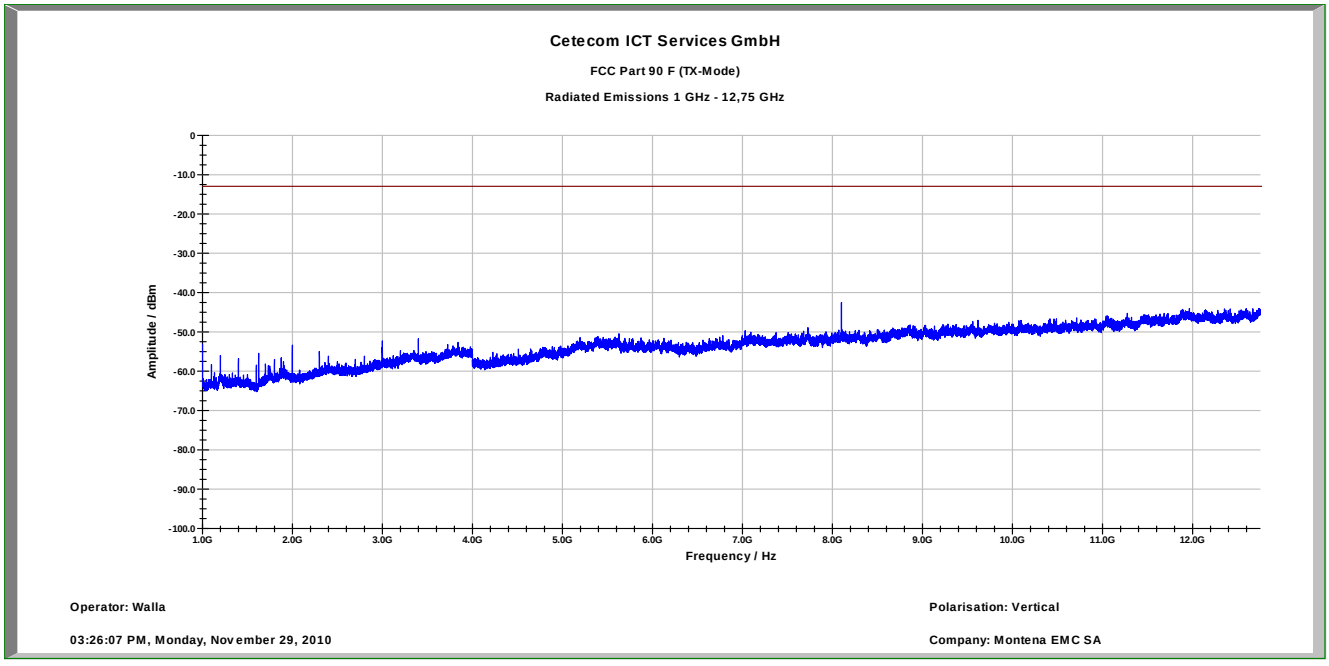
Plot 57: mid channel, horizontal polarization



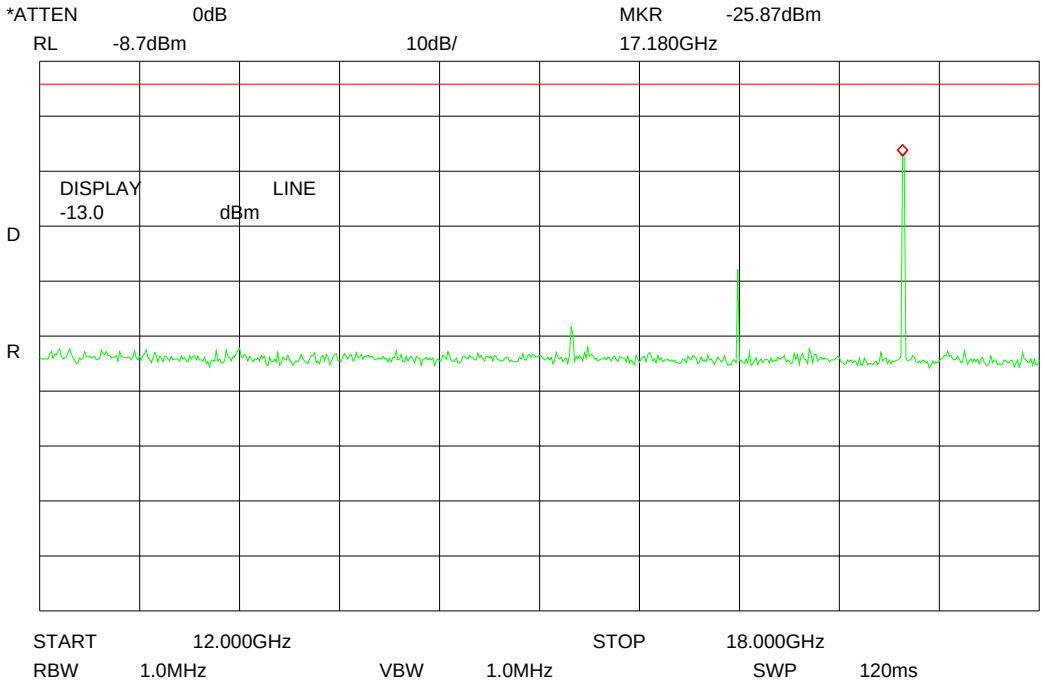
Plot 58: mid channel, vertical polarization



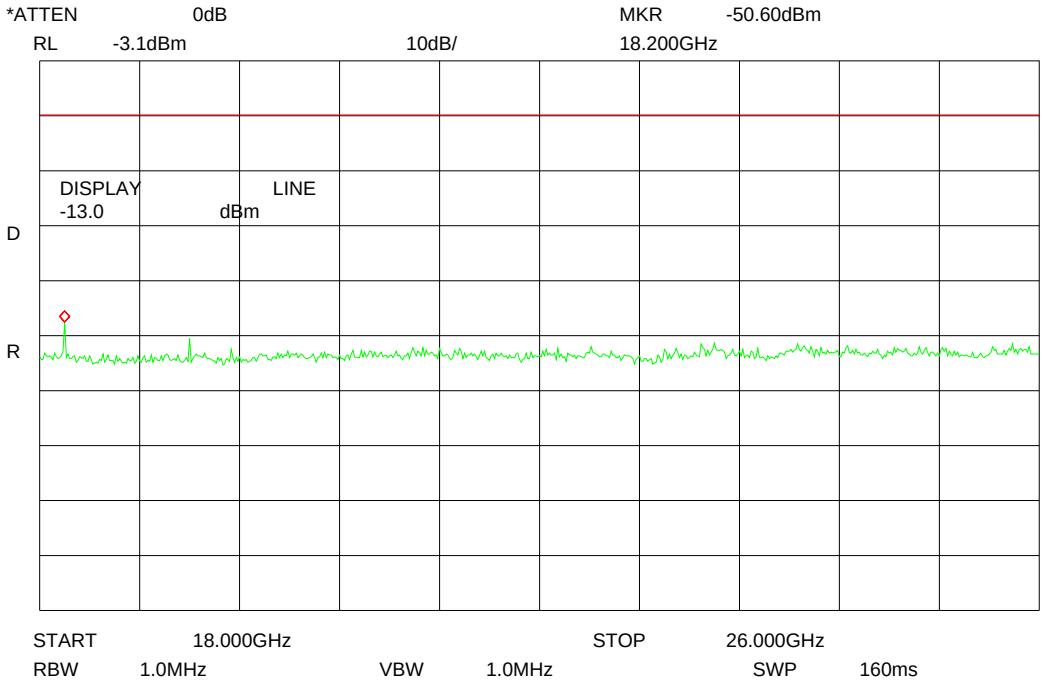
Plot 59: mid channel, vertical polarization



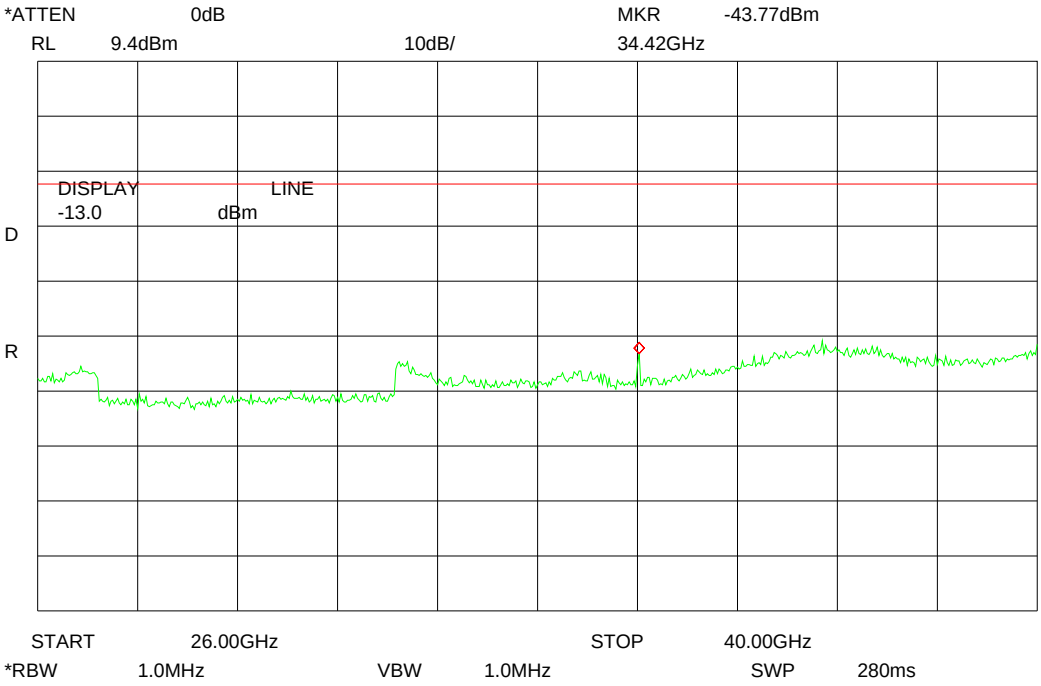
Plot 60: mid channel



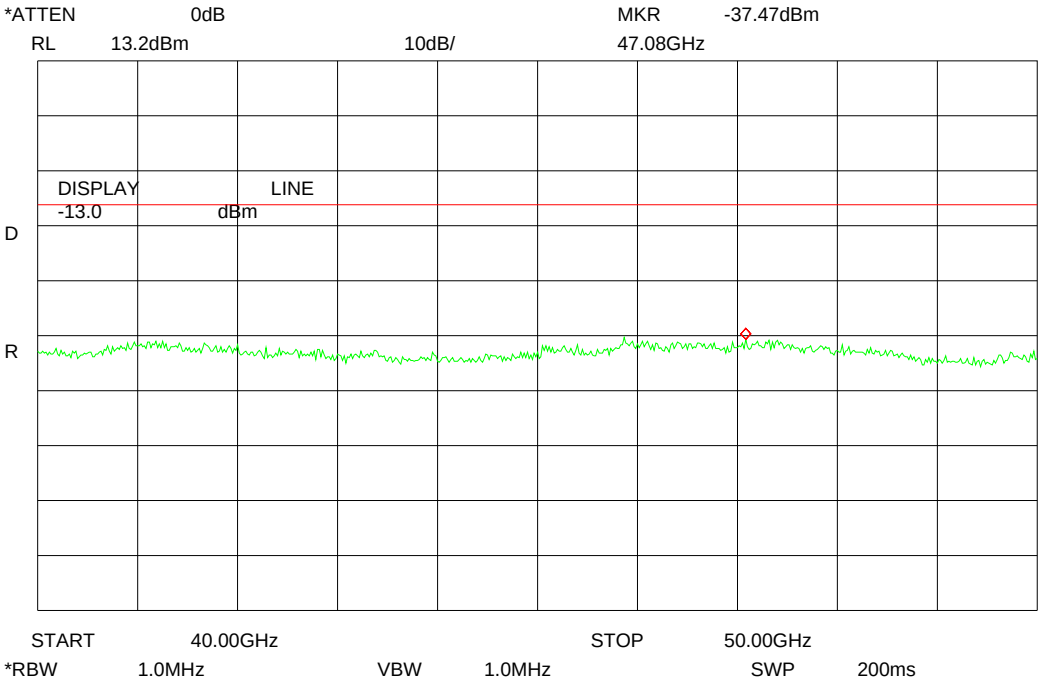
Plot 61: mid channel



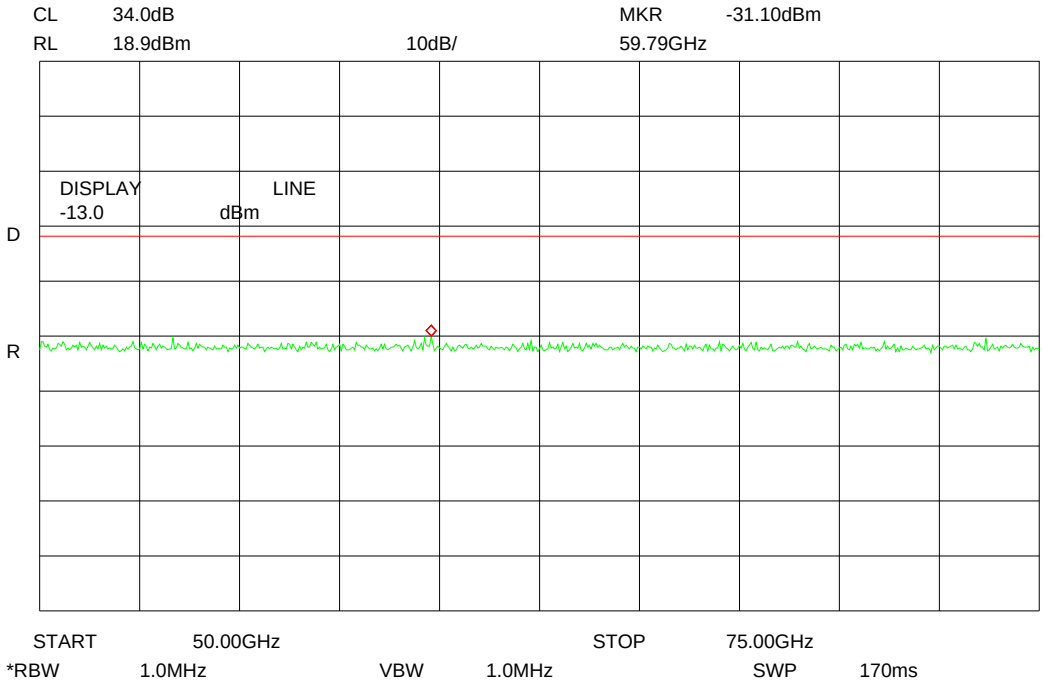
Plot 62: mid channel



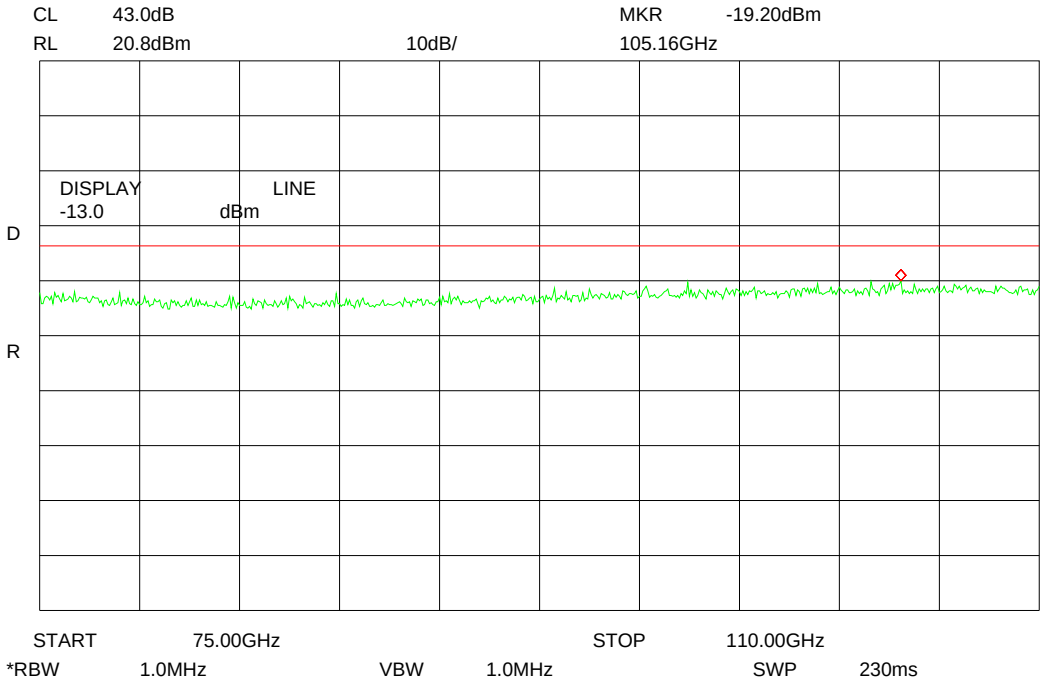
Plot 63: mid channel



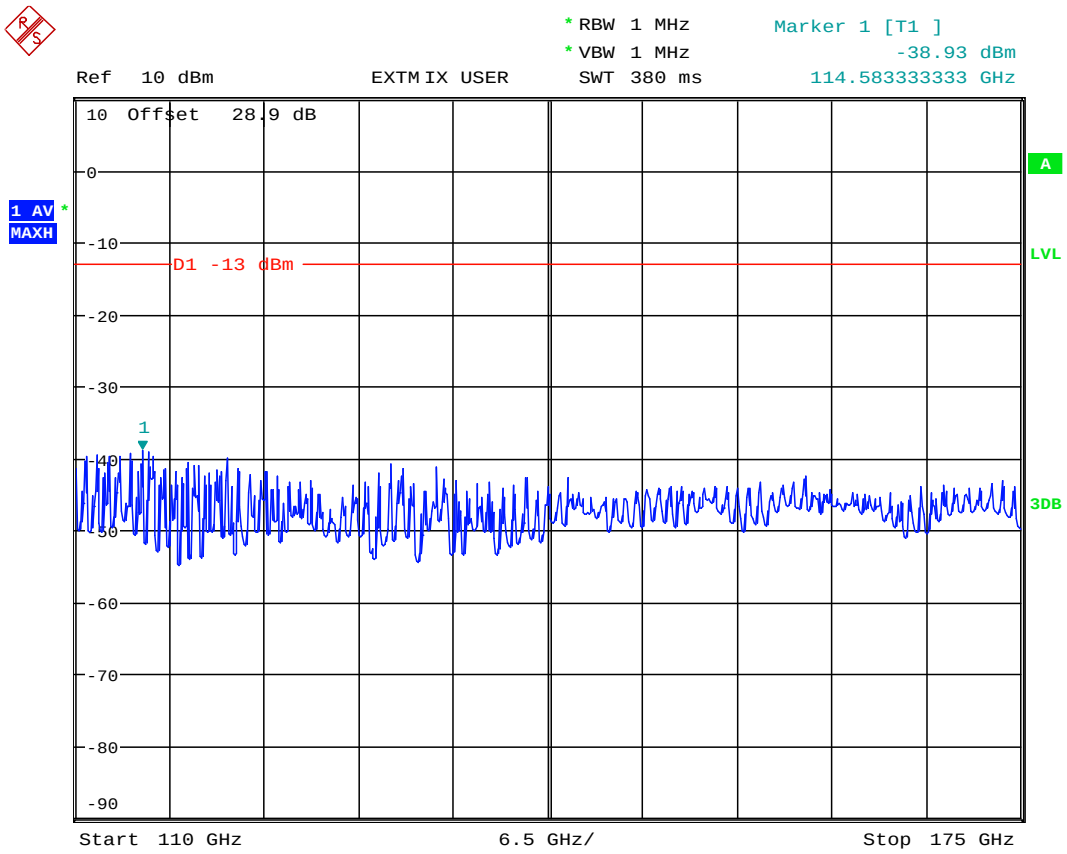
Plot 64: mid channel



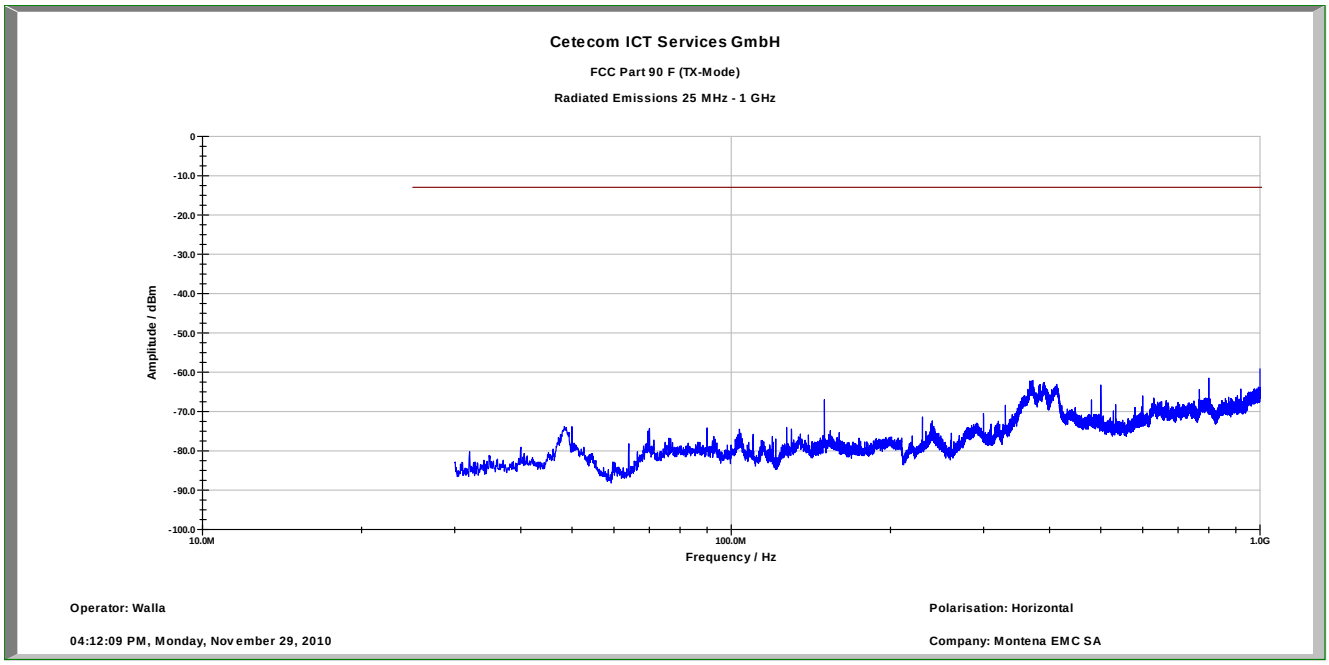
Plot 65: mid channel



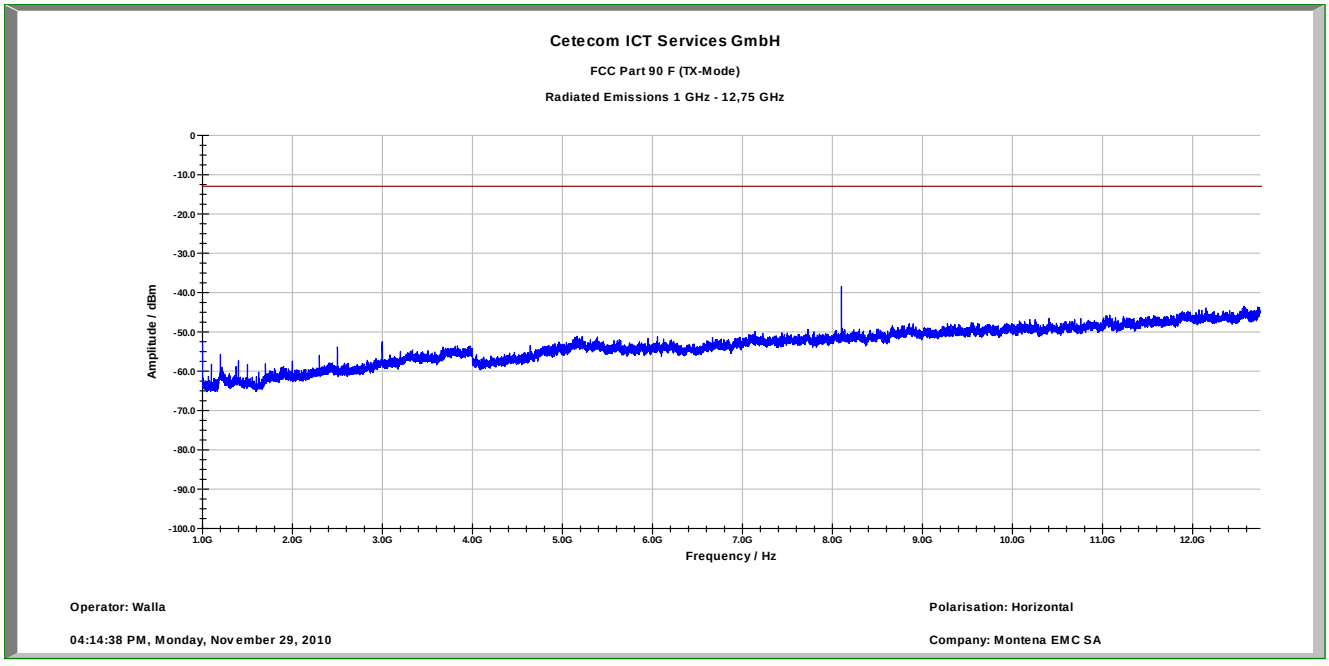
Plot 66: mid channel



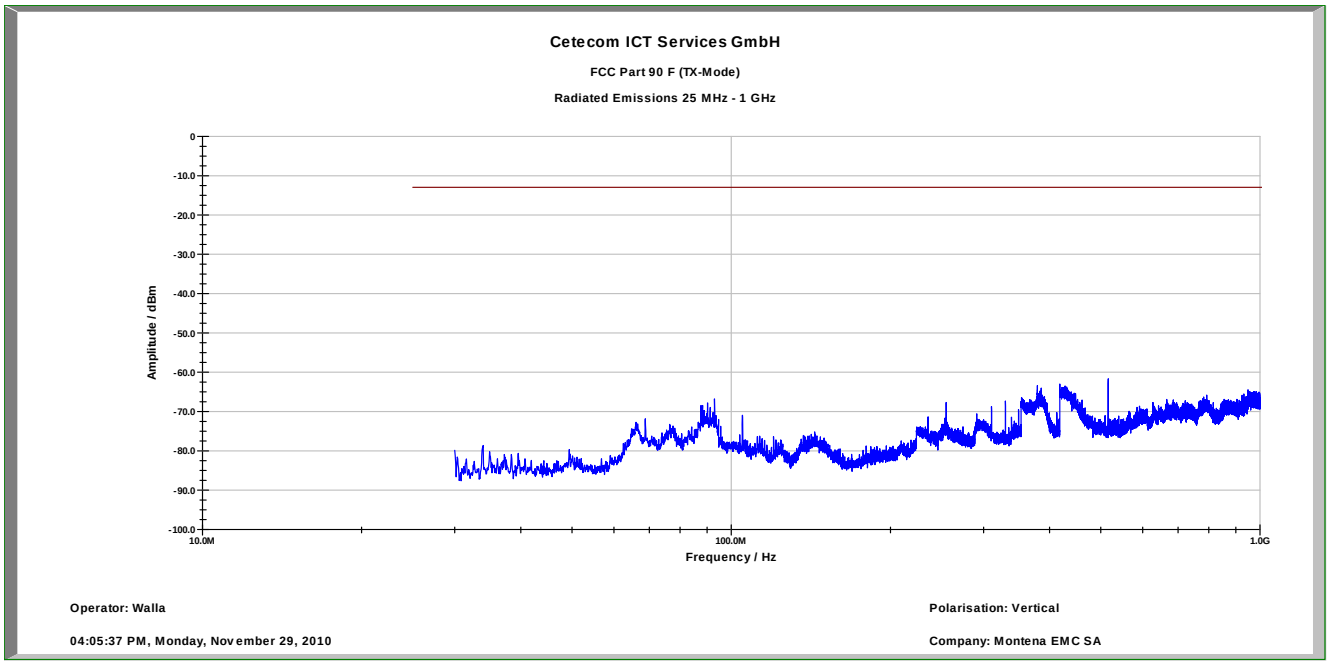
Plot 67: high channel, horizontal polarization



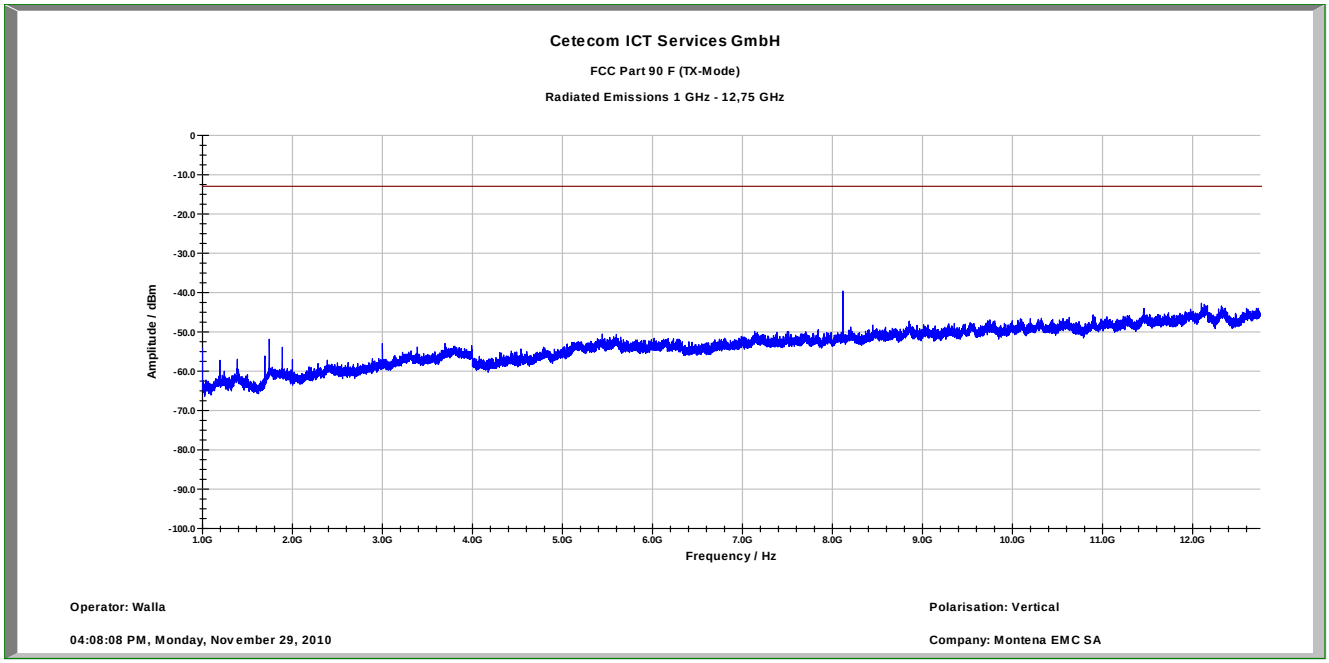
Plot 68: high channel, horizontal polarization



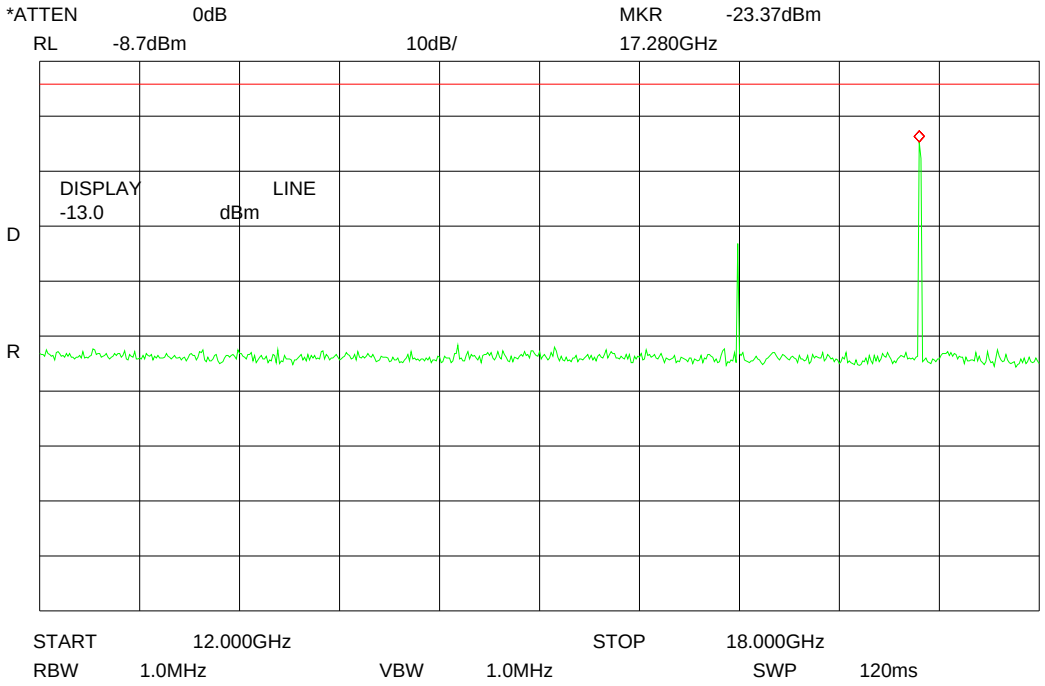
Plot 69: high channel, vertical polarization



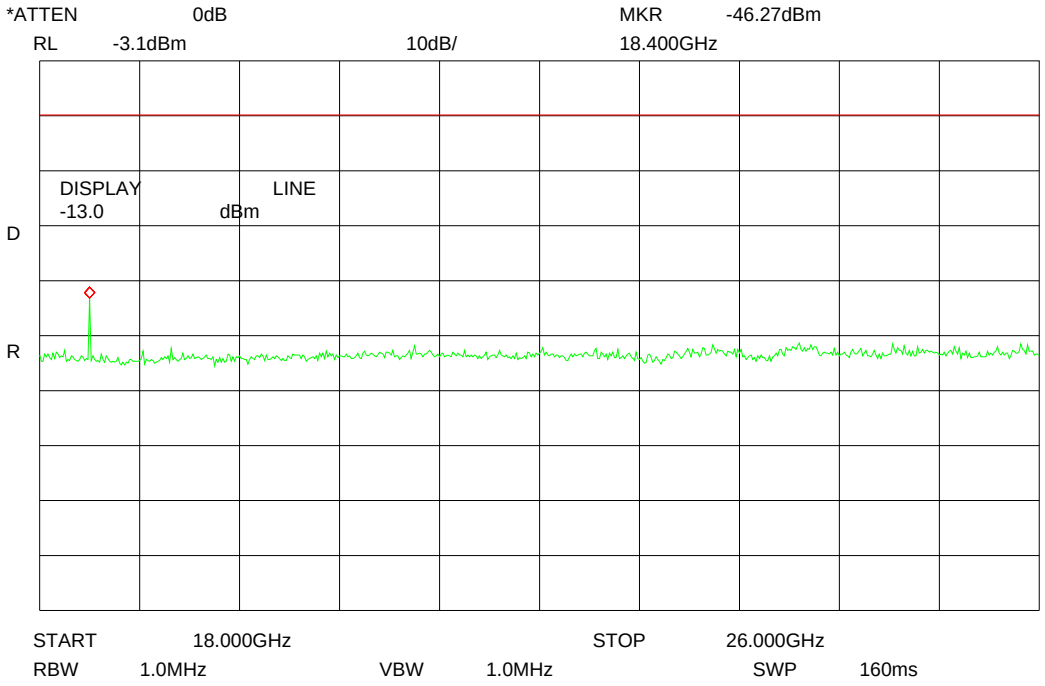
Plot 70: high channel, vertical polarization



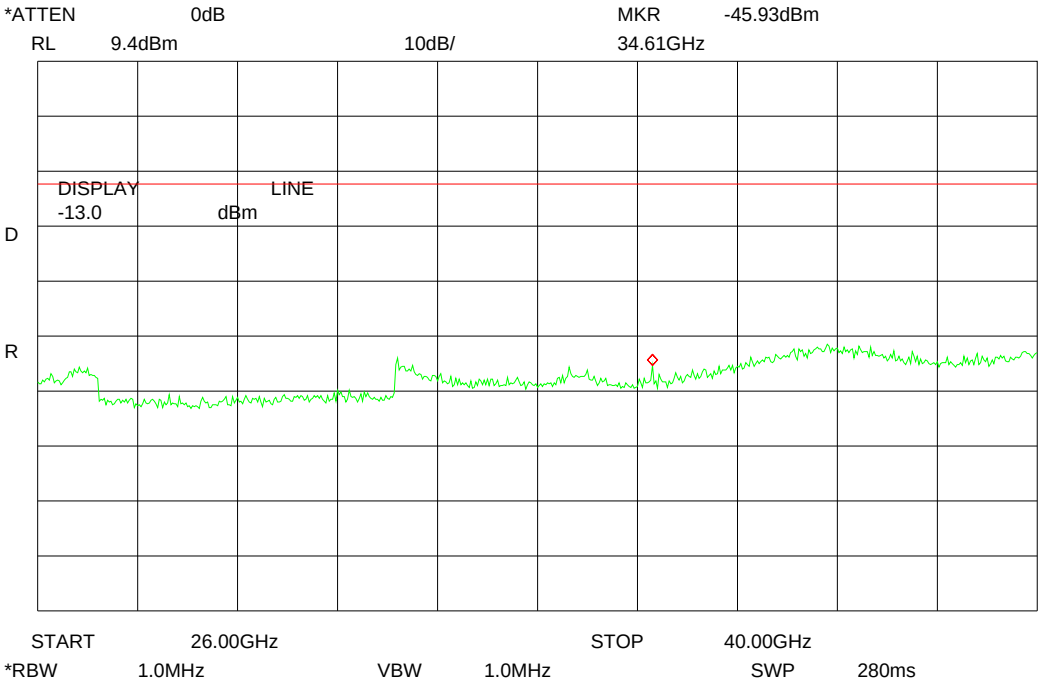
Plot 71: high channel



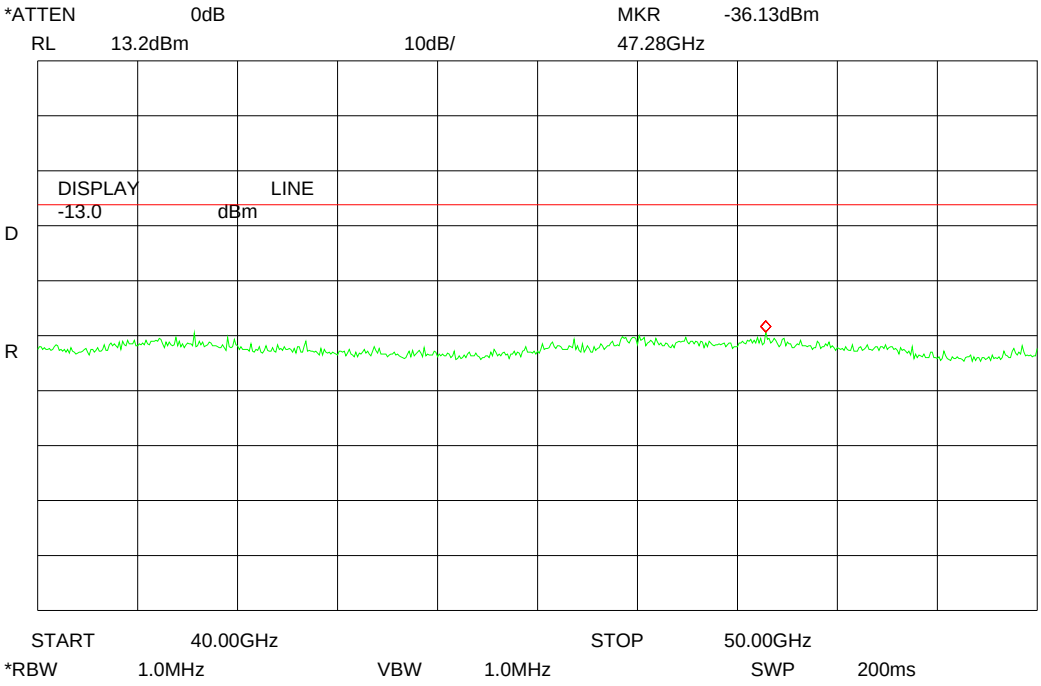
Plot 72: high channel



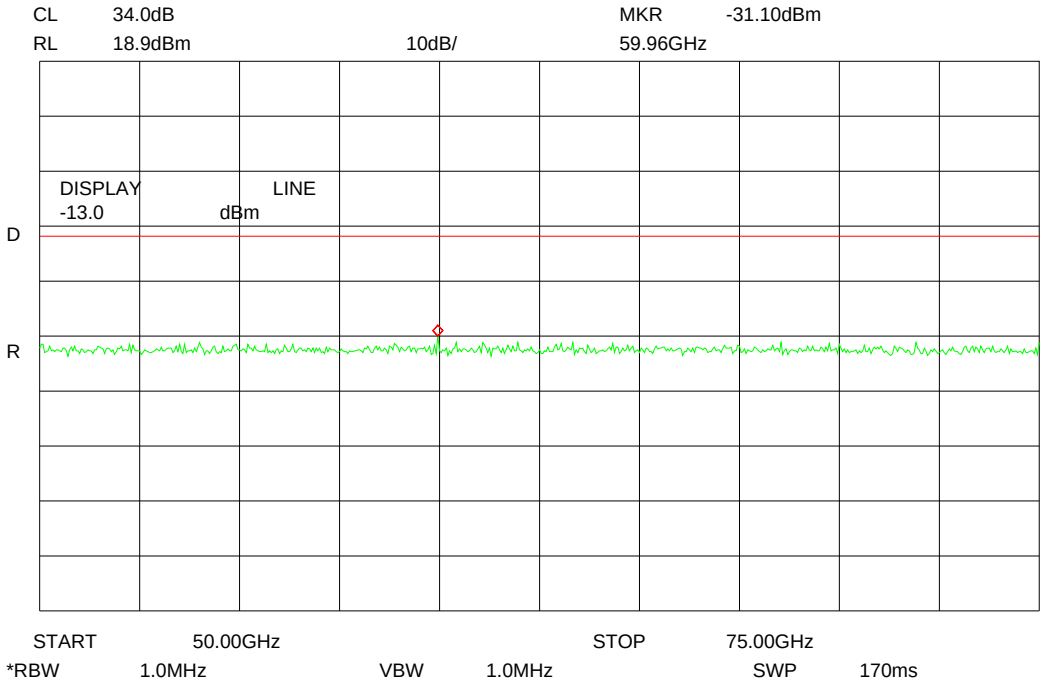
Plot 73: high channel



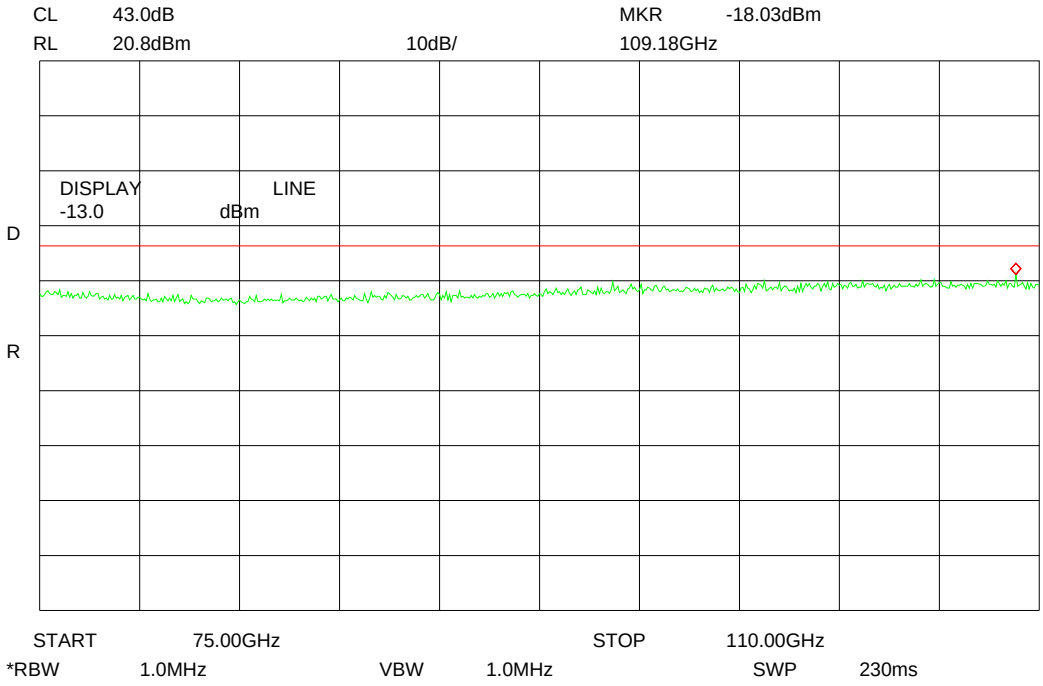
Plot 74: high channel



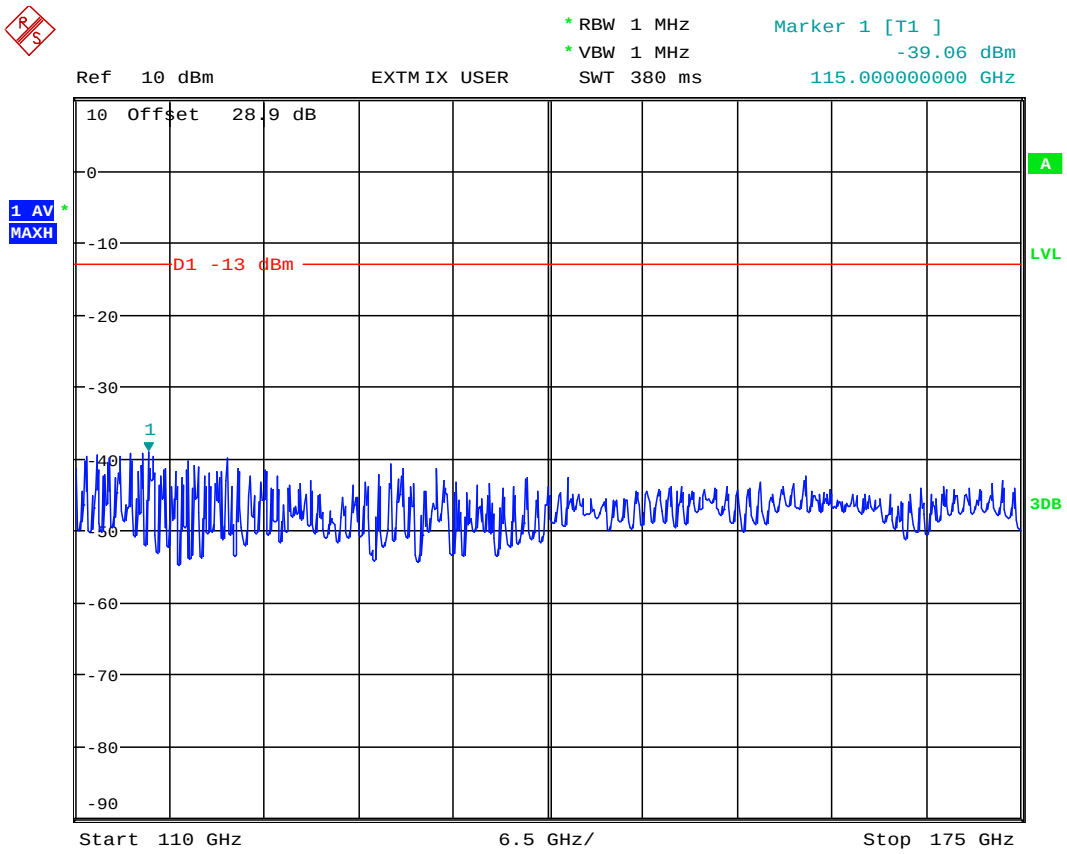
Plot 75: high channel



Plot 76: high channel



Plot 77: high channel



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9.7 Frequency stability

Measurement:

Frequency stability was measured with a frequency counter. To improve the quality of measurement the frequency counter was connected to an external GPS based 10 MHz reference signal.

Limits:

FCC
47 CFR § 2.1055 / § 90.213
There are no limits specified Note 10: … frequency stability is to be specified in the station authorization.

Results: nominal frequency at 17.2 GHz

Temperature	Frequency (GHz)	Deviation (Hz)
-30 °C	17.200 000 000	0
-20 °C	17.199 999 999	-1
-10 °C	17.200 000 001	1
0 °C	17.200 000 000	0
10 °C	17.200 000 000	0
20 °C (V nom)	17.200 000 008	8
30 °C	17.200 000 008	8
40 °C	17.200 000 010	10
50 °C	17.200 000 002	2
Voltage		
85 %	17.200 000 008	8
115 %	17.200 000 008	8

Result: The measurement is passed.

10 Test equipment and ancillaries used for tests

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).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

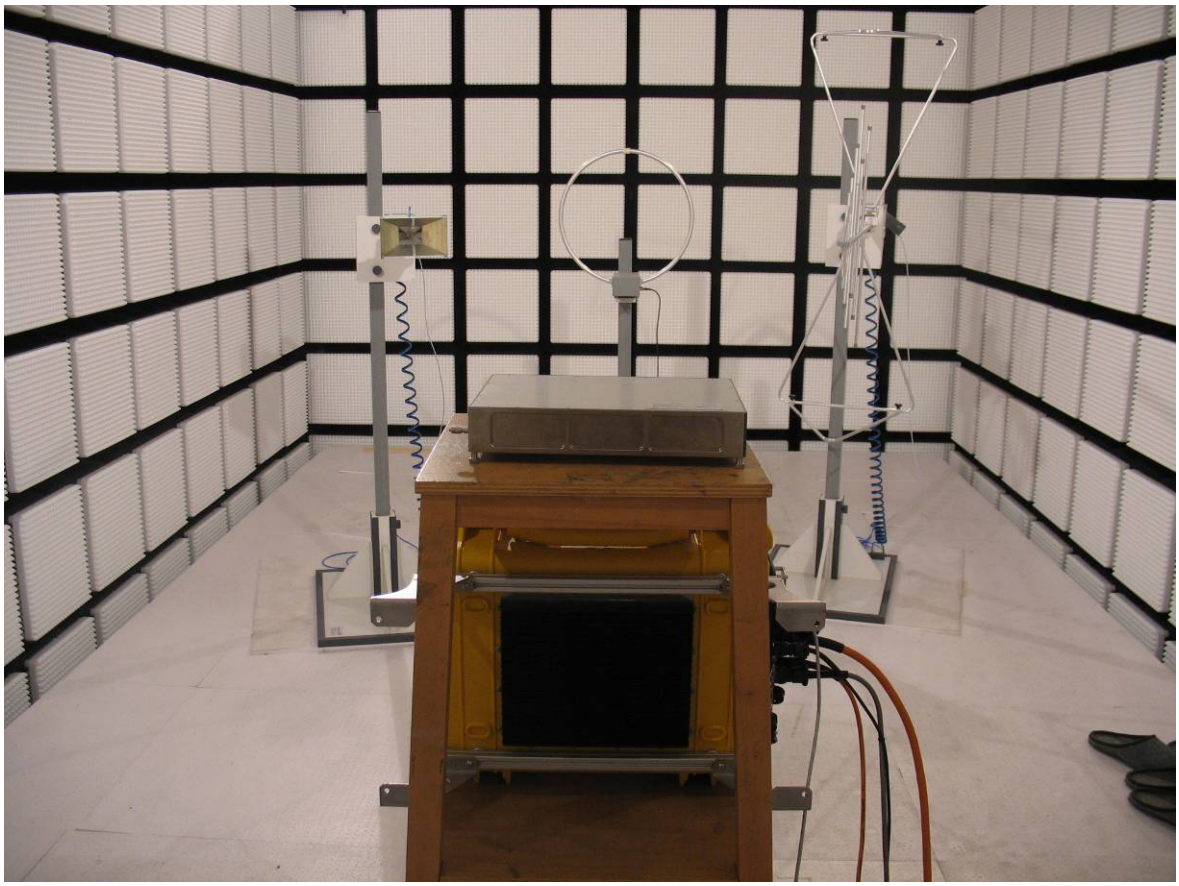
No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
2	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKl!	05.03.2009	05.03.2011
3	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
4	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
5	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
6	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
7	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
8	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
9	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
10	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
11	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
12	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
13	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
14	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
15	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
16	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
17	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
18	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
19	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	13.09.2010	13.09.2012
20	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKl!	08.09.2010	08.09.2012
21	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	17.12.2010	17.12.2012
22	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve	01.07.2010	01.07.2012
23	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04590	300001041	Ve	08.01.2009	08.01.2012
24	n. a.	Temperature Test Chamber	VT 4002	Heraeus Voetsch	521/83761	300002326	Ve	28.05.2009	28.05.2011
25	A026	Std. Gain Horn	639	Narda		300000787	ne		

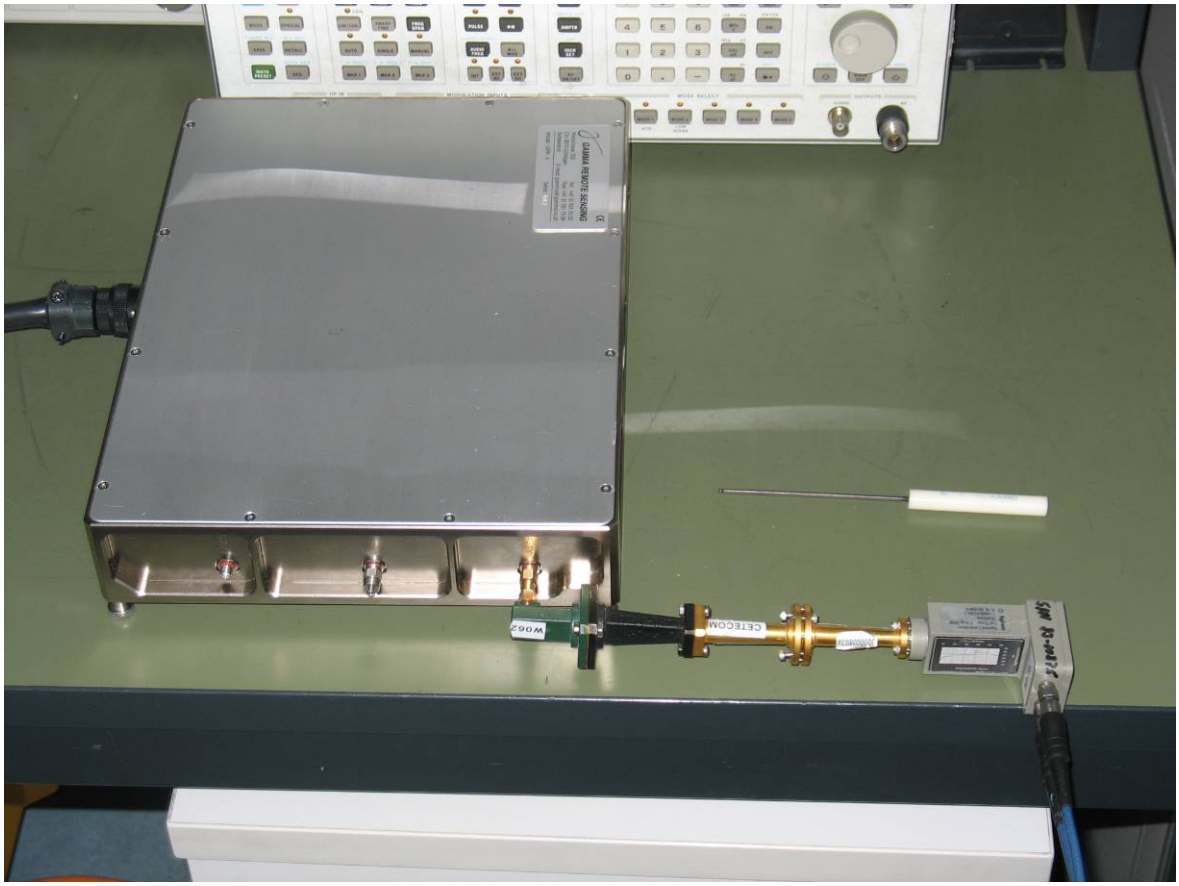
		Antenna 12.4 to 18.0 GHz							
26	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
27	CR79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
28	A023	Std. Gain Horn Antenna 39.3-59.7 GHz	2424-20	Flann	75	300001979	ne		
29	A025	Std. Gain Horn Antenna 49.9-75.8 GHz	2524-20	Flann		300001983	ne		
30	A028	Std. Gain Horn Antenna 73.8-112 GHz	2724-20	Flann		300001991	ne		
31	A032	Std. Gain Horn Antenna 114-173 GHz	2924-20	Flann	*	300001999	ne		
32	A033	Std. Gain Horn Antenna 145-220 GHz	3024-20	Flann	*	300002000	ne		
33	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	3123A00105	300002268	ev		
34	n.a.	Amplifier	FLNA-28B	Farran	FTL 1067B	300002843	ne		
35	Ü013	Waveguide Harmonic Mixer to 140 GHz	11970 (U, W, V, Q, A, K)	HP Meßtechnik		300000781	k	19.03.2010	19.03.2013
36	n.a.	Harmonic Mixer Set 60-325 GHz	WM780	Tektronix	div.	300001685b	ne		
37	n.a.	Spectrum Analyzer 9kHz-50GHz portable spectrum analyzer	8565E	HP Meßtechnik	3738A00773	300001665	Ve	08.01.2010	08.01.2012
38	n.a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve	01.07.2010	01.07.2012
39	R008	CW Microwave Frequency Counter 10Hz - 26.5 GHz	5351B	HP Meßtechnik	2719U00174	300000893	Ve	10.12.2009	10.12.2011
40		Power Sensor, 50 MHz to 26.5 GHz, -30 to +20 dBm	8485A	HP Meßtechnik	2238A00798	300000511	Ve	12.01.2009	12.01.2011
41		Power meter - EPM series, dual channel	E4419B	HP Meßtechnik	GP39510924	300002627	vlkl!	14.09.2010	14.09.2012

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

Annex A Photographs of the test setup





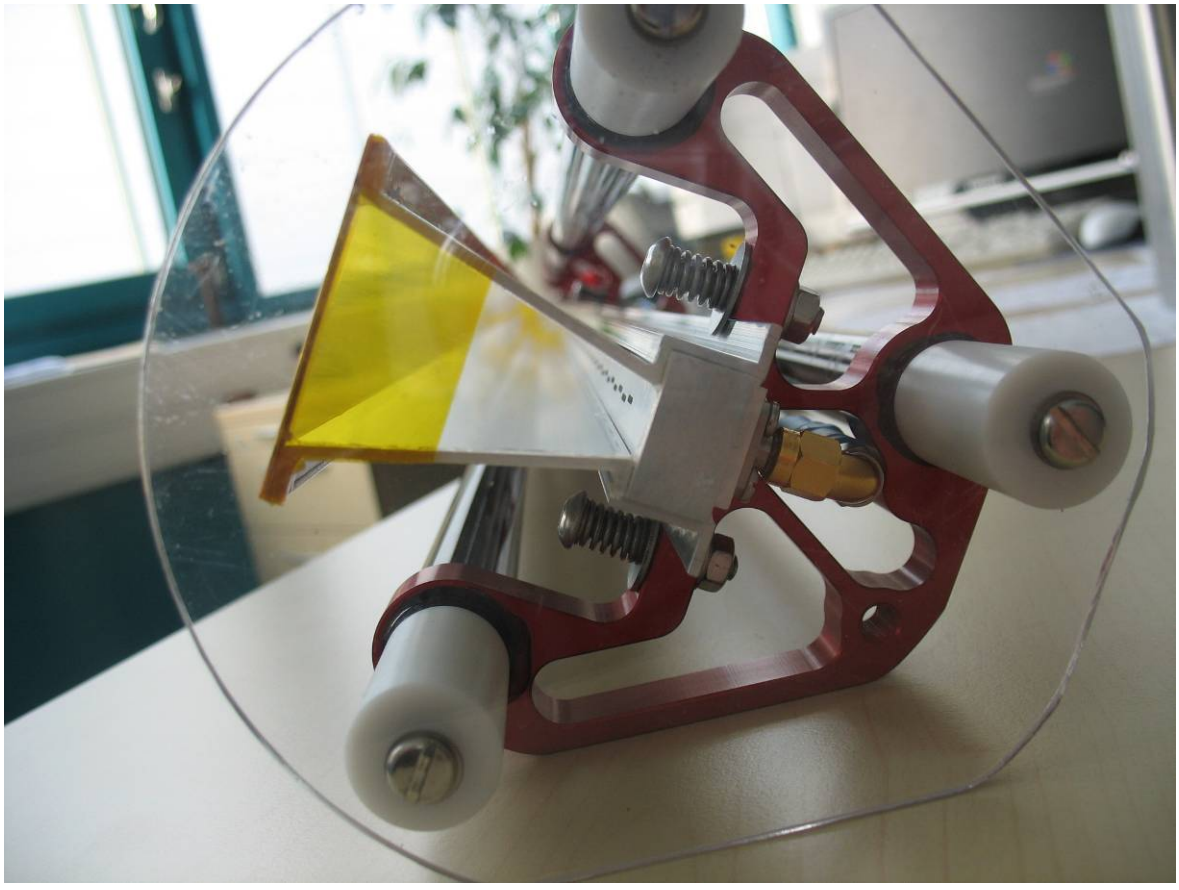
Annex B External photographs of the EUT

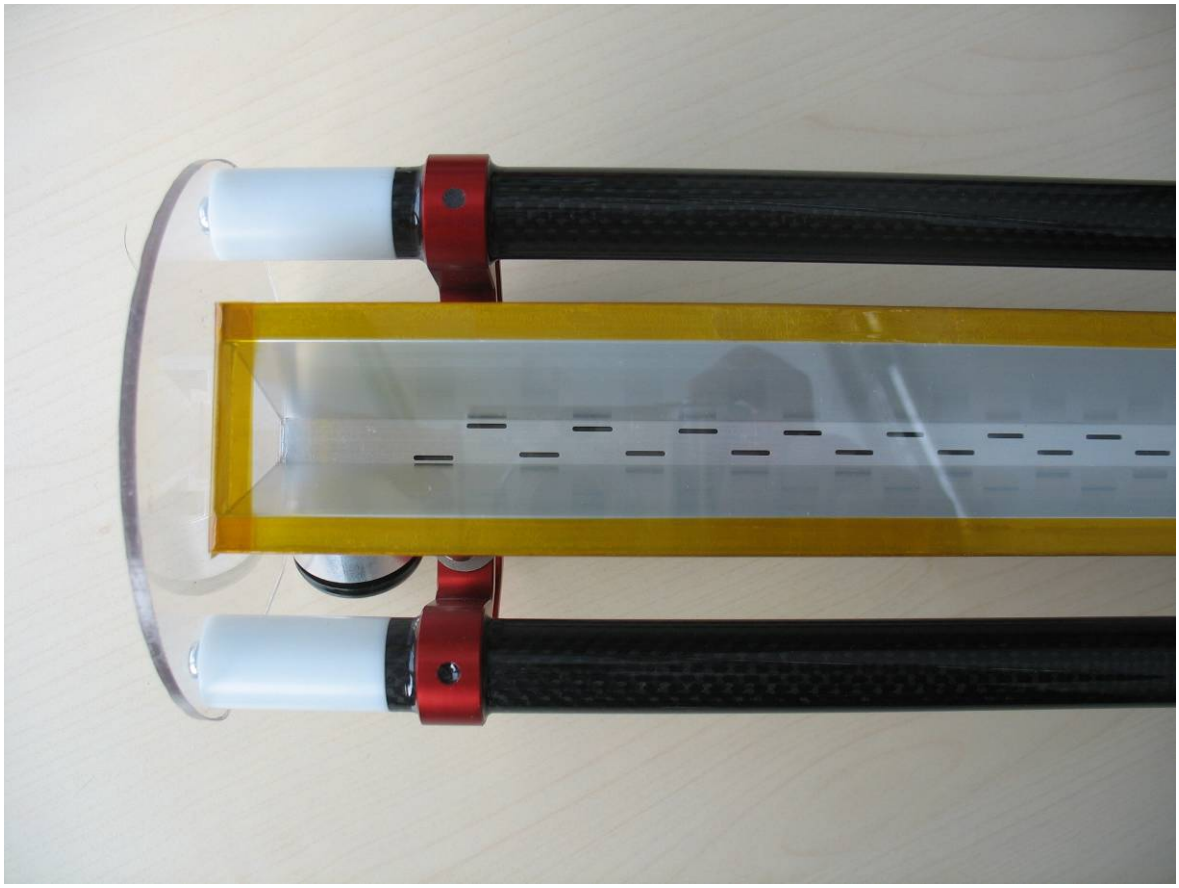

WLAN
LAN
RFA
Power
Power
USB
Encoder
Motor
GAMMA REMOTE SENSING
Worbstrasse 225
CH-3073 Gümligen
Switzerland
Tel: +41 31 951 70 05
Fax: +41 31 951 70 08
E-Mail: gamma@gamma-rs.ch
Model : GPRI - II
Serial : 001


CE
GAMMA REMOTE SENSING
Worbstrasse 225
CH-3073 Gümligen
Switzerland
Tel: +41 31 951 70 05
Fax: +41 31 951 70 08
E-Mail: gamma@gamma-rs.ch
Model : GPRI - II
Serial : 001


CE
GAMMA REMOTE SENSING
Worbstrasse 225
CH-3073 Gümligen
Switzerland
Tel: +41 31 951 70 05
Fax: +41 31 951 70 08
E-Mail: gamma@gamma-rs.ch
Model : GPR - II
Serial : 002


CE
GAMMA REMOTE SENSING
Worbstrasse 225
CH-3073 Gümligen
Switzerland
Tel: +41 31 951 70 05
Fax: +41 31 951 70 08
E-Mail: gamma@gamma-rs.ch
Model : GPRI - II
Serial : 002

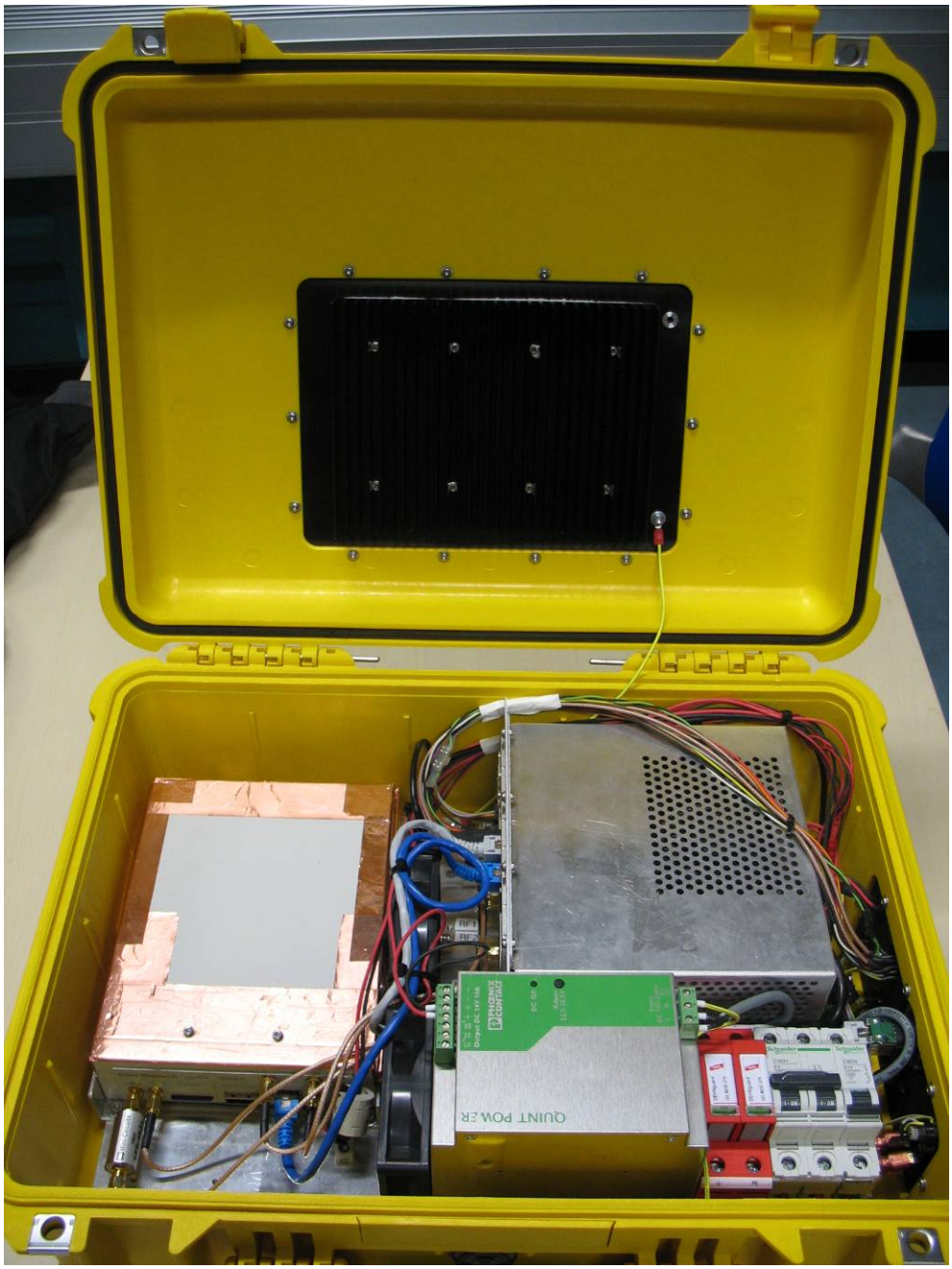


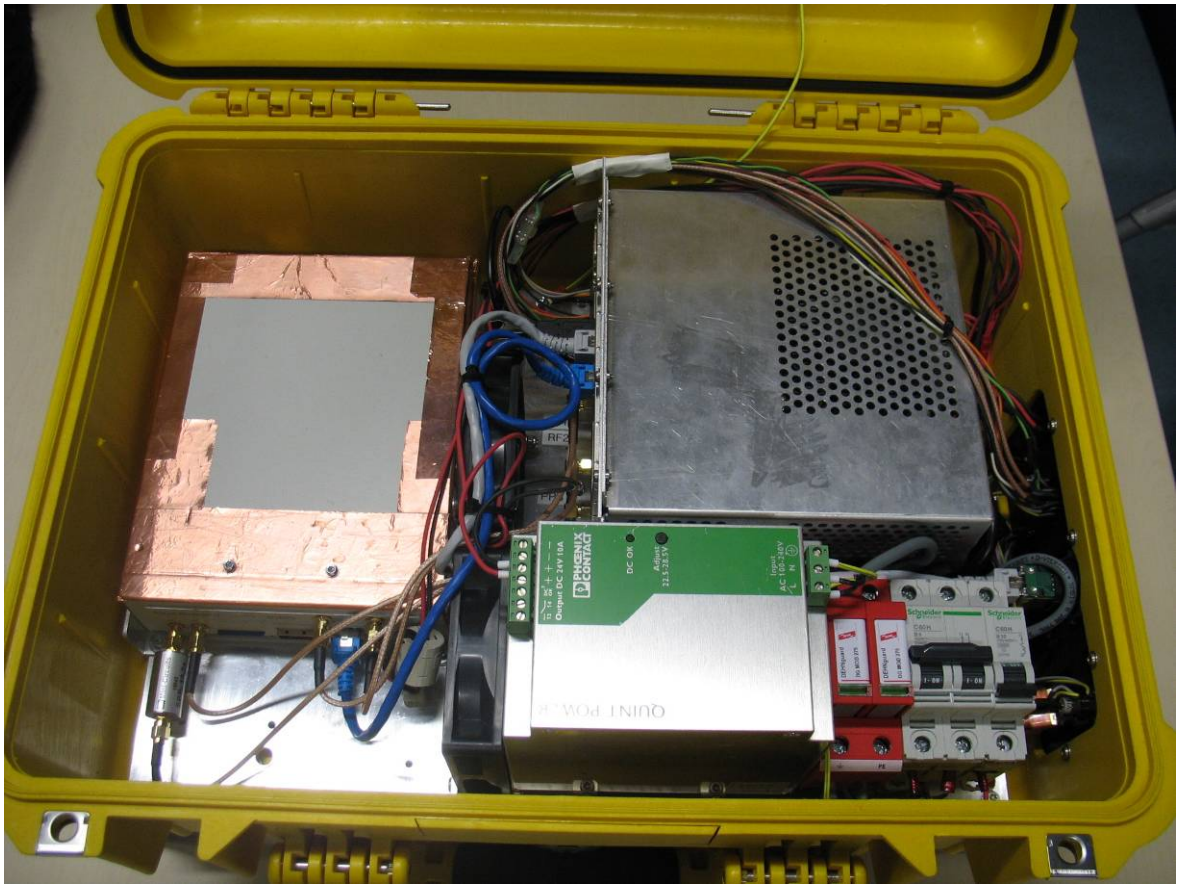



Cobham Technical Services
COBHAM
51-145380001
S/No:043/10
ANT0235-0100-ICD Issue B
ERA Technology Ltd trading as Cobham Technical Services

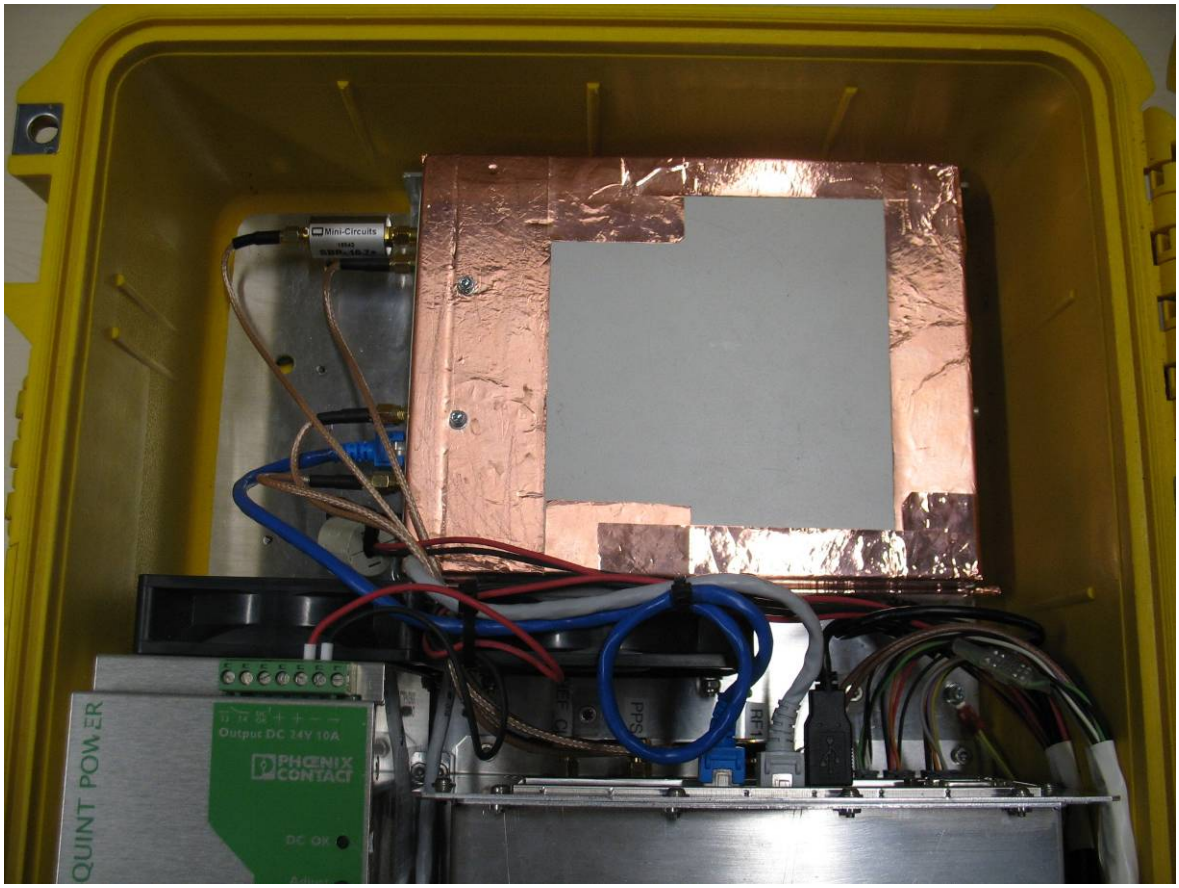

Trimble

Annex C Internal photographs of the EUT




PHOENIX CONTACT
DC OK
Adjust
Input
AC 100-240V
Schneider


QUINT POWER
PHOENIX CONTACT
DC OK
Adjust
Input
AC 100-240V
DEHNguard
Schneider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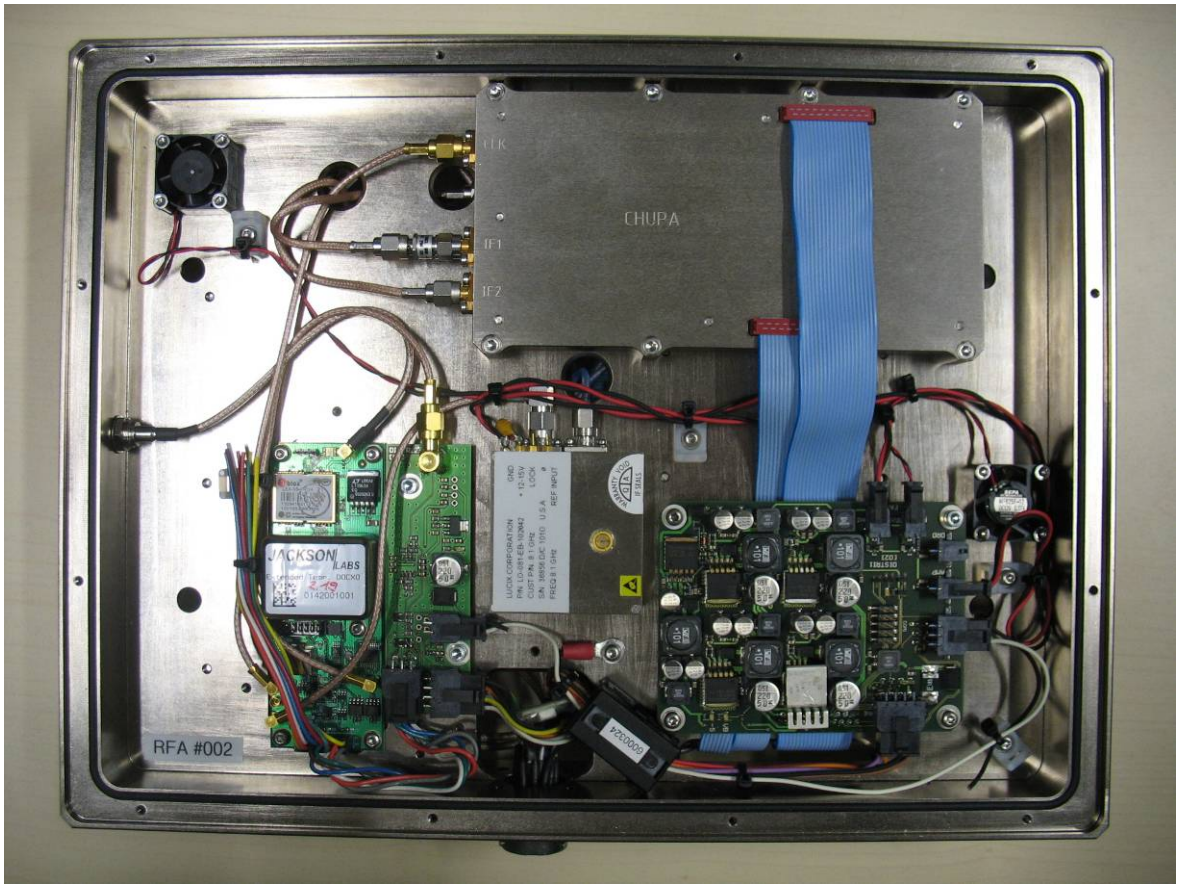
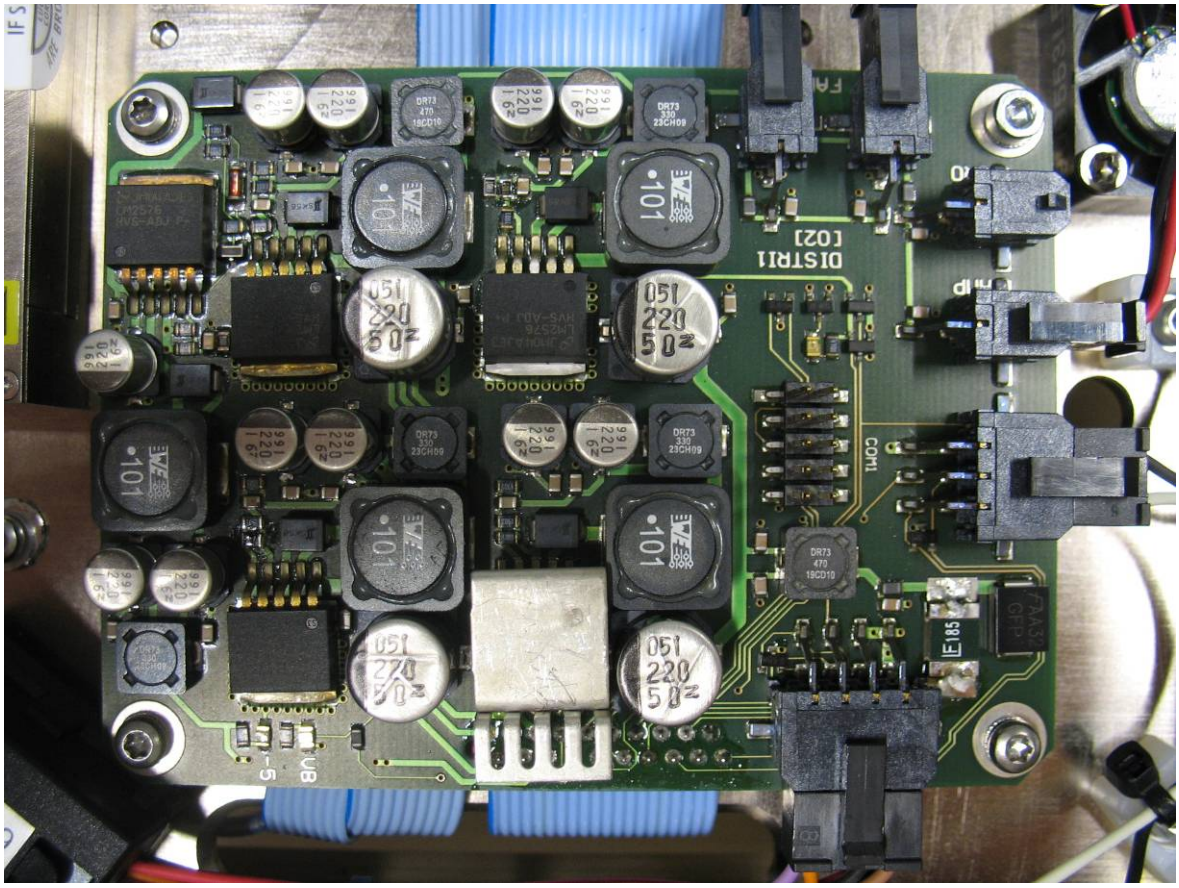
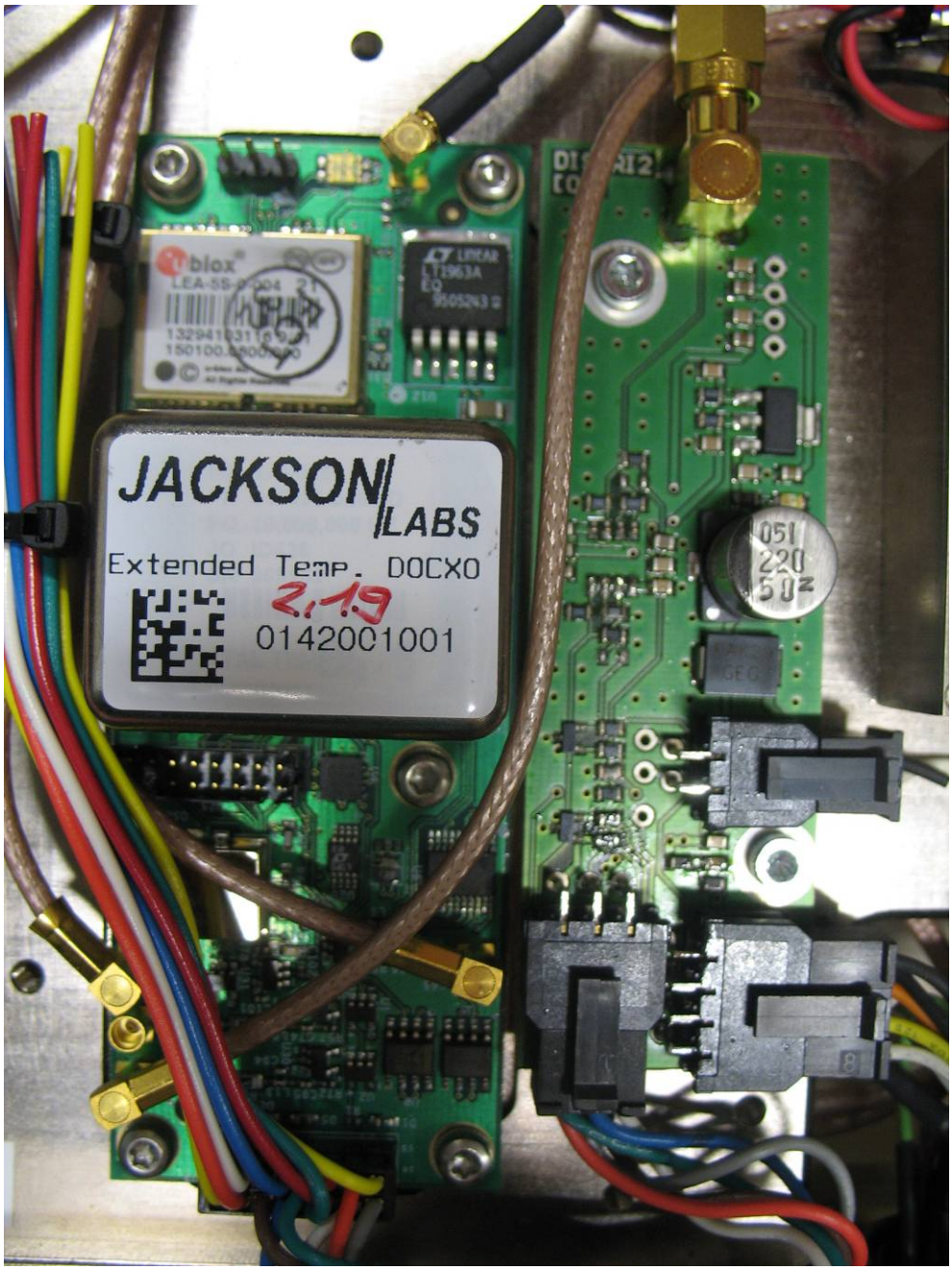
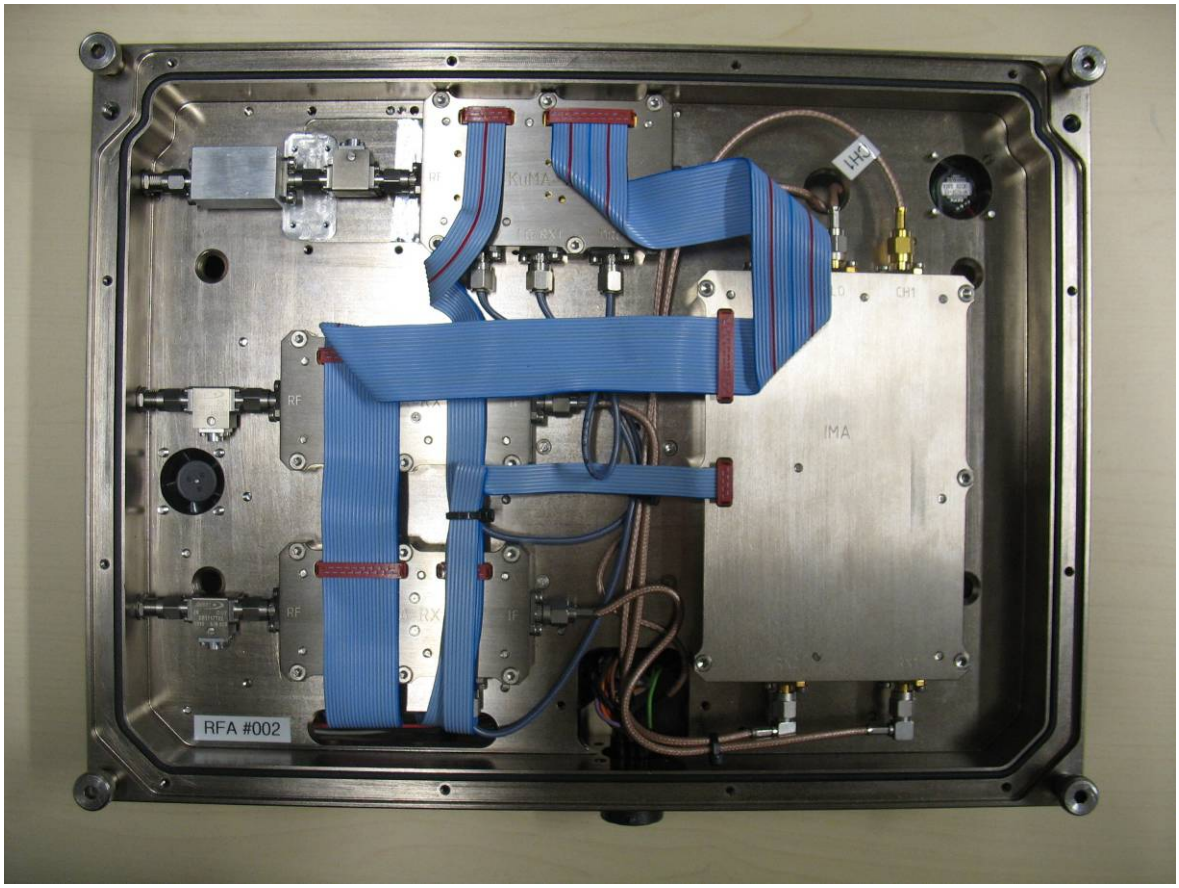
QUINT POWER
Output DC 24V 10A
PHOENIX CONTACT
DC OK


CHUPA
IF1
IF2
JACKSON LABS
RFA #002


DISTRI1
[02]
COM1


JACKSON LABS
Extended Temp. DOCXO
2.19
0142001001


LUCIX CORPORATION
P/N: LO-081-EB-102042
CUST P/N: 8.1 GHz
S/N: 36856 D/C 1010 U.S.A
FREQ:8.1 GHz
GND
+ 12-15V
LOCK
ø
REF INPUT
WARRANTY VOID
Q A
IF SEALS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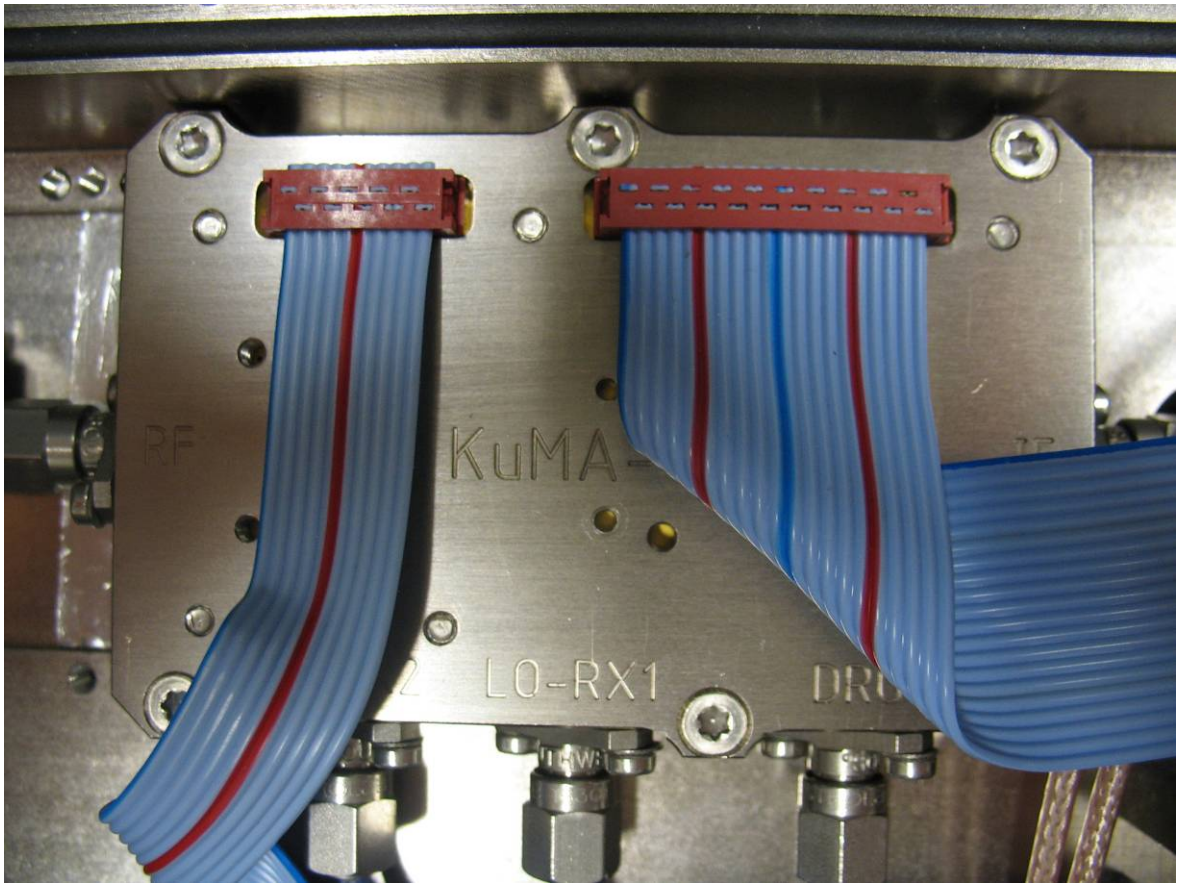
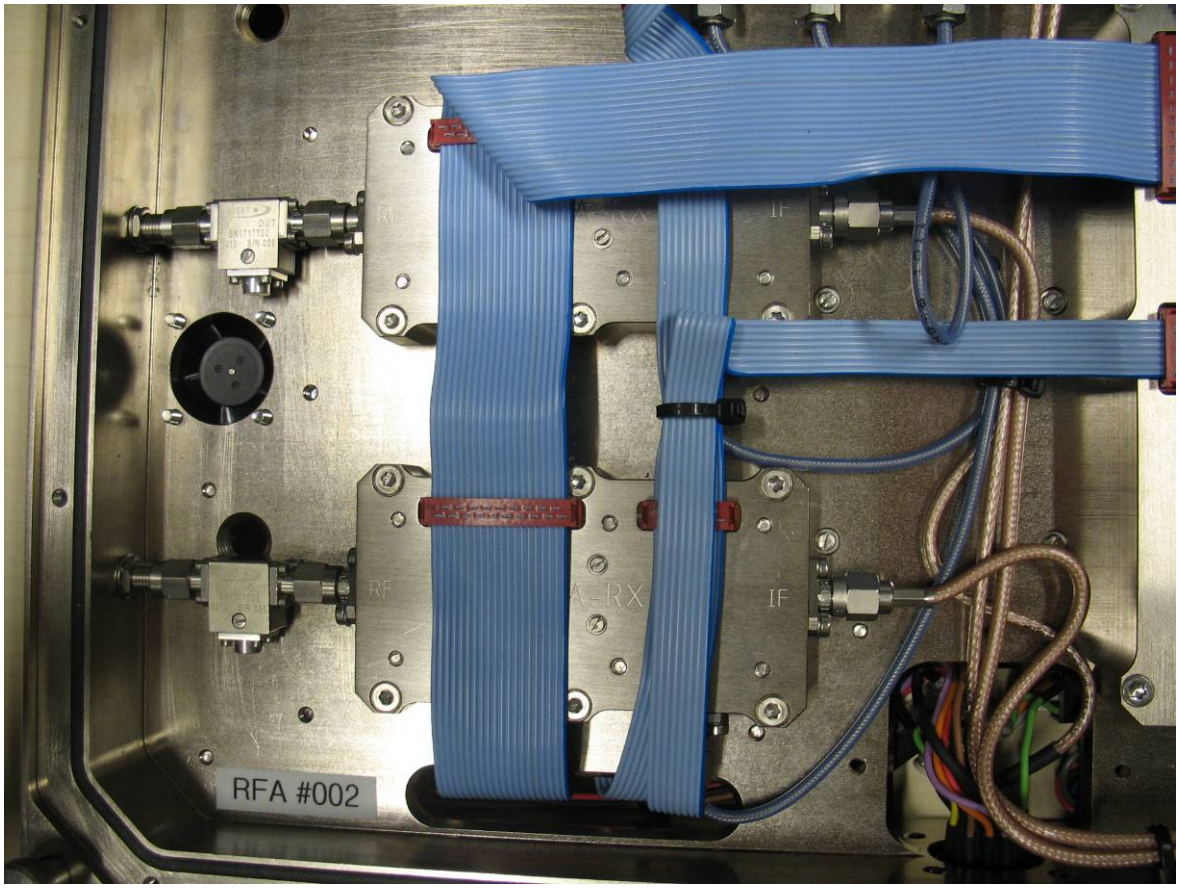
IMA


KuMA
LO-RX1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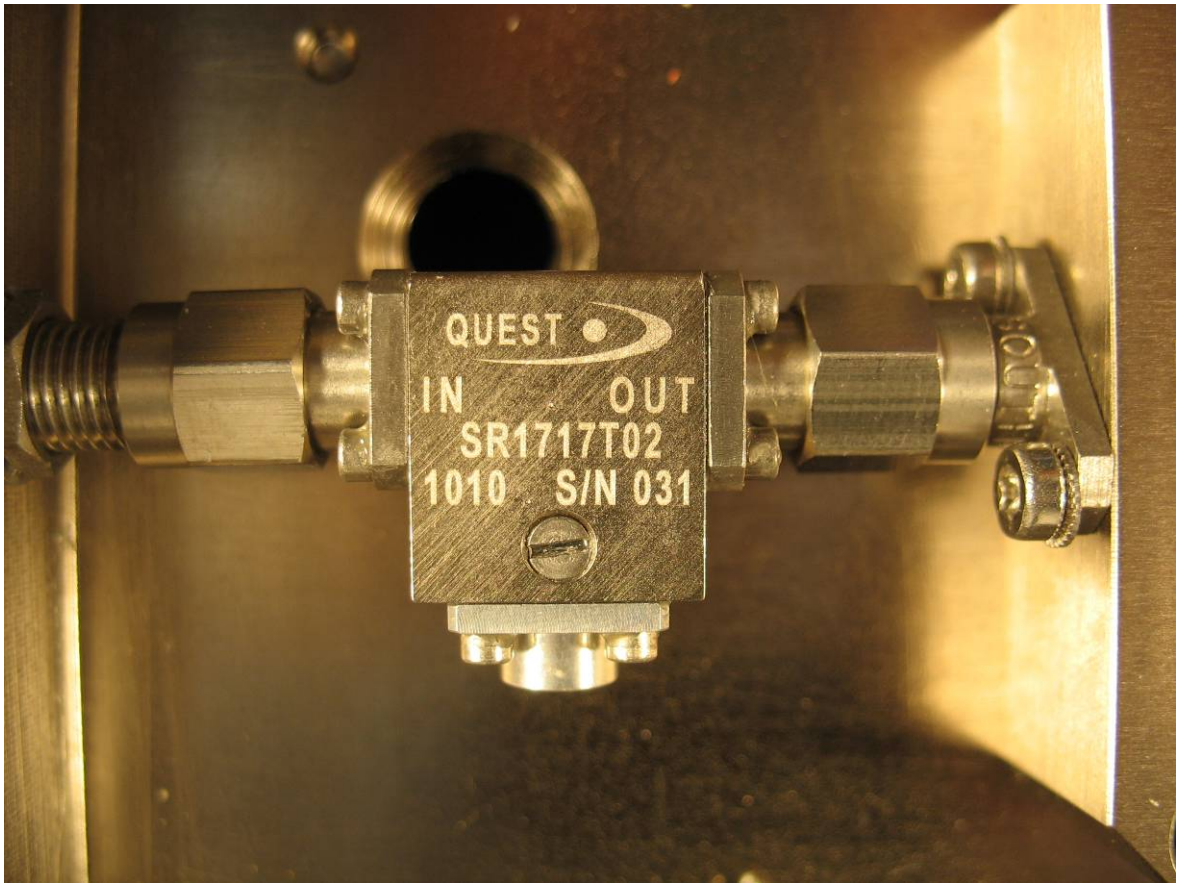
QUEST
IN OUT
SR1717T02
1010 S/N 031

Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2011-01-10
1.1	Emission designator, RF Exposure added	2011-01-24

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