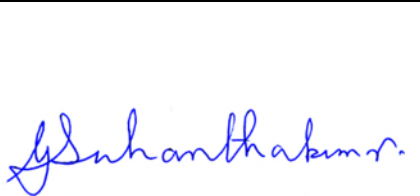


Test Report

Product	Wireless PIR sensor & Universal Transmitter for Emergency call systems		
Name and address of the applicant	Ascom Sweden AB Grimbodalen 2, Goteborg, SE-40276, Sweden		
Name and address of the manufacturer	Ascom Sweden AB Grimbodalen 2, Goteborg, SE-40276, Sweden		
Model	NUWIR NUUTX		
Rating	3Vdc		
Trademark	Ascom		
Serial number	G2978921		
Additional information	900MHz Transceiver		
Tested according to	FCC Part 15.249 Low Power Transmitter. 902 – 928MHz band Industry Canada RSS-210, Issue 9 Licence-Exempt Radio Apparatus, Category I Equipment 902 – 928MHz band		
Order number	327231		
Tested in period	2017.05.18 – 2017.06.12		
Issue date	2017.08.29		
Name and address of the testing laboratory	 FCC No: 994405 IC OATS: 2040D-1 TEL: (+47) 22 96 03 30 FAX: (+47) 22 96 05 50 Instituttveien 6 Kjeller, Norway 		
	 Prepared by [G.Suhanthakumar]  Approved by [Roy Uggerud]		
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1 TEST INFORMATION

1.1 Test item

Name :	Ascom
Model/version :	NUWIR NUUTX
FCC ID:	NUWIR: BXZNUWIR
IC ID:	NUWIR: 3724B-NUWIR
Serial number :	G2996397
Hardware identity and/or version:	C
Software identity and/or version :	1.0.0
Frequency Range :	916.2125 – 920.2125 MHz
Number of Channels :	11
Operating Modes :	TX and RX
Type of Modulation :	4-GFSK
Data rate:	19.2 kbit/s
User Frequency Adjustment :	None, Software controlled
Cal. Conducted Output Power :	0.58 mW
Type of Power Supply :	3Vdc
Antenna Connector :	N/A (Only for testing purposes)
Antenna type:	PCB antenna
Antenna Diversity Supported :	None

Description of test item

Wireless devices for emergency calls intended for use in nursing homes and in assisted living facilities. This device contains radio module which operates in 902 – 928MHz band. And it is only powered with DC Voltage

1.2 Normal test condition

Temperature: 20 - 24 °C
Relative humidity: 20 - 50 %
Normal test voltage: 5Vdc

The values are the limit registered during the test period.

1.3 Test Engineer(s)

G.Suhanthakumar

1.4 Description of modification for Modification Filing

Not applicable.

1.5 Family List Rational

The following model variations are considered covered by this report

VA no.	Variant	Comment	Investigated
1	NUWIR	With IR sensor	Yes
2	NUUTX	Only difference is the IR sensor	no

1.6 Antenna Requirement

Is the antenna detachable?

☐ Yes ☒ No

If detachable, is the antenna connector non-standard?

☐ Yes ☐ No

Type of antenna connector: N/A

Ref. FCC §15.203

1.7 Worst-Case Configuration and Mode

Radiated Emissions and Power Line Conducted Emissions were performed with the EUT set to transmit at the channel with the highest output power as worst-case scenario.

1.8 Comments

The measurements were done with the EUT powered by 5Vdc. It was checked that power variations between 85% and 115% did not have any influence on the measurements.

All ports were populated during spurious emission measurements.

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15.249 and Industry Canada RSS-210, Issue 9 and RSS-GEN, Issue 4.

Tests were performed in accordance with ANSI C63.4-2014 and ANSI C63.10-2013.

Radiated tests were made in a semi-anechoic chamber at measuring distances of 1m, 3m and 10m. A description of the test facility is on file with the FCC and Industry Canada.

☒ New Submission

☐ Production Unit

☐ Class II Permissive Change

☒ Pre-production Unit

DXT Equipment Code

☐ Family Listing



THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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2.2 Test summary

Name of test	FCC Part 15 reference	RSS-GEN Issue 4 & RSS-210 Issue 9	Result
Supply Voltage Variations	15.31(e)	F.2.2 (RSS210) 6.11,8.11 (RSS-Gen)	Complies
Antenna Requirement	15.203	6.7 (RSS-GEN)	Complies ¹
Power-line Conducted Emission	15.207(c)	8.8 (RSS-GEN)	N/A ²
Occupied Bandwidth	N/A	6.6 RSS-GEN)	-
Peak Power Output	15.249(a)(c)	B.10(RSS210)	Complies
Band edge Emissions	15.249(d)	B.10(RSS210)	Complies
Spurious Emissions (Radiated)	15.249 (d),(e) 15.209	8.9,8.10 (RSS-GEN) B.10(RSS210)	Complies

¹ only integral antenna

¹ only only operated with batteries

RSS Gen issue 4 covers section 6 & 8

RSS 210 issue 9 covers Annex B

3 TEST RESULTS

3.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)/8.8

Test Performed By: -	Date of Test: -
----------------------	-----------------

Measurement procedure: ANSI C63.4-2014 using 50 μ H/50 ohms LISN.

Test Results: N/A

Measurement Data: N/A

/

3.2 Occupied Bandwidth

Para. No.: 6.6 RSS-Gen

Test Performed By: G.Suhandhakumar

Date of Test: 2017.06.12

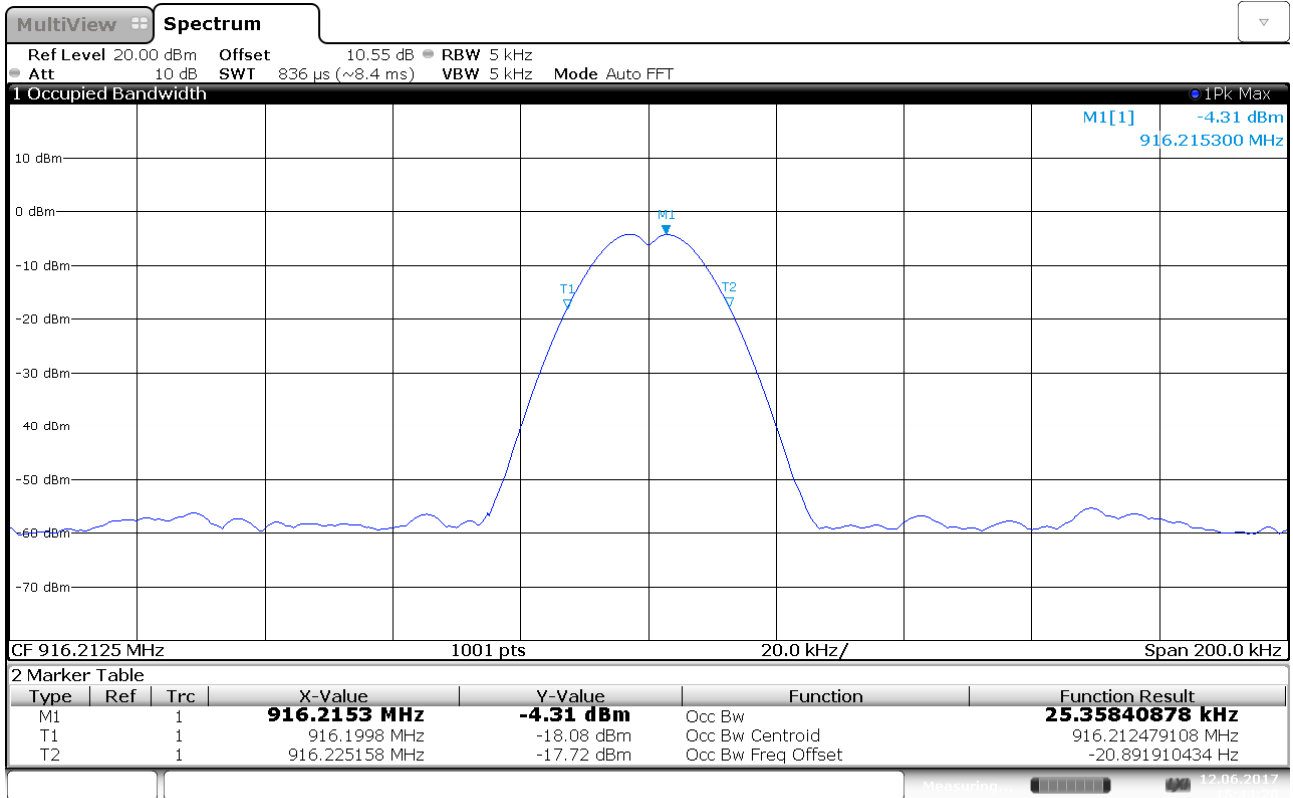
Test Results: -

Measurement Data:

Data Rate	OBW (kHz)		
	916.2125MHz	918.2125MHz	920.2125MHz
19.2kbps	25.36	25.48	25.40

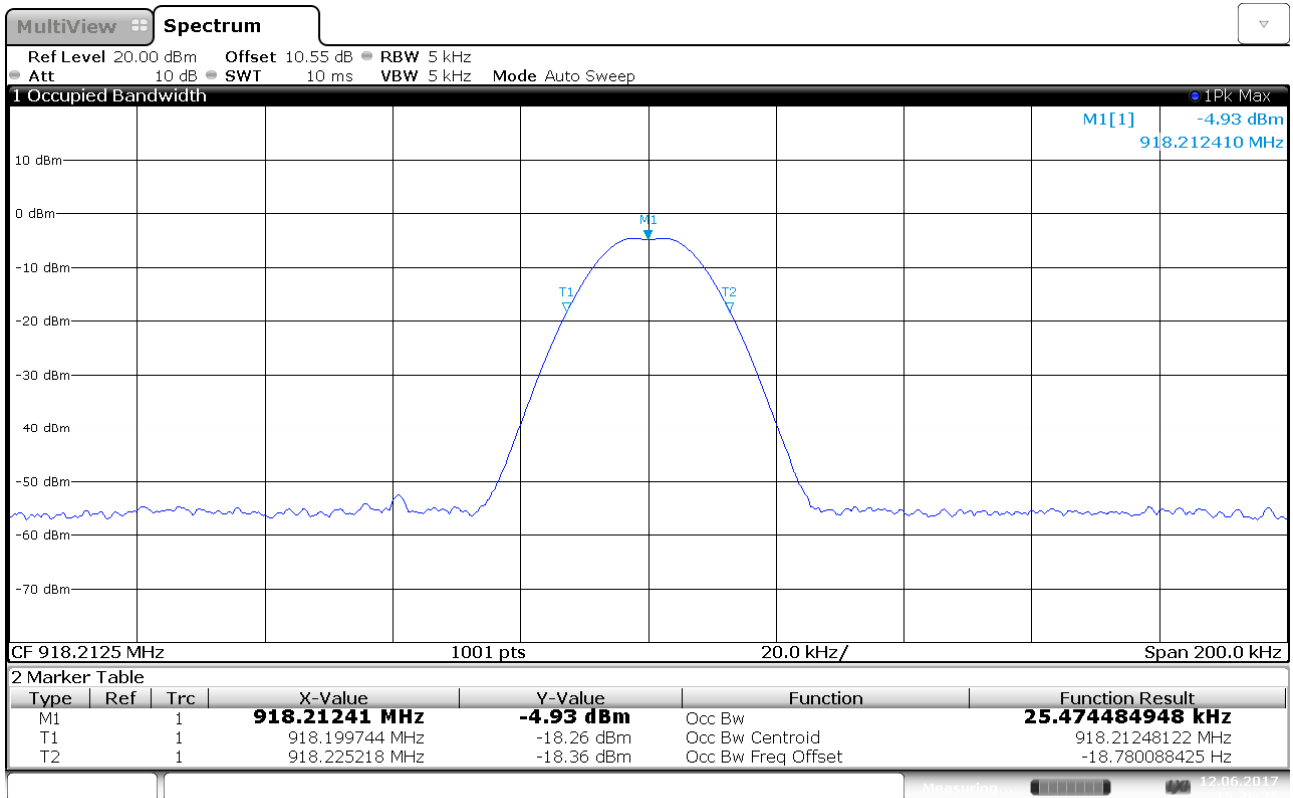
Requirements:

For information only



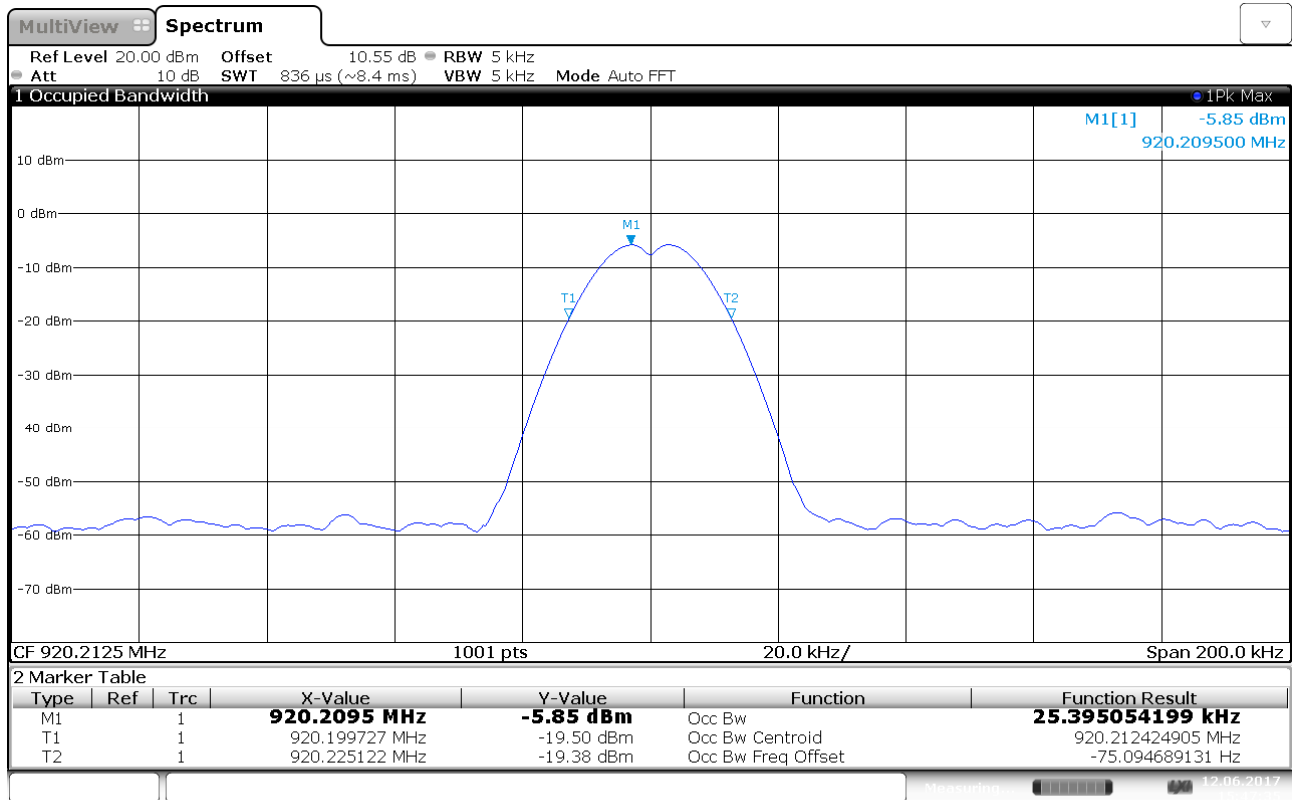
15:44:29 12.06.2017

916.2125MHz – OBW



15:36:25 12.06.2017

918.2125MHz – OBW



920.2125MHz – OBW

3.3 Peak power output

Para. No.: 15.249 (a) / B.10

Test Performed By: G.Suwanthakumar	Date of Test: 2017.05.23
------------------------------------	--------------------------

Test Results: Complies

Measurement data:

RF channel	916.2125MHz	918.2125MHz	920.2125MHz
Measured Maxium PK Field strength (dBμV/m) –HP	93.62	93.29	92.17
Calc. Radiated Power (dBm)	-1.61	-1.94	-3.06
Calc. Radiated Power (mW)	0.69	0.64	0.49
Measured Conducted Power (dBm)	-2.34	-2.58	-3.98
Measured Conducted Power (mW)	0.58	0.55	0.4
Calculated Antenna Gain (dBd)	-1.4	-1.5	-1.2

Radiated measurements are performed at 3 m distance.

Radiated Power is calculated from measured field strength by the formulas in KDB 412172 D01 Determining ERP and EIRP v01.

Detachable antenna?

☐ Yes ☒ No

If detachable, is the antenna connector non-standard?

☐ Yes ☐ No

Requirements:

The maximum average output power shall be $\leq 94\text{dB}\mu\text{V/m}$ & Peak $\leq 114\text{dB}\mu\text{V/m}$



MARKER 1

916.2189103 MHz

* RBW 100 kHz

VBW 300 kHz

SWT 2.5 ms

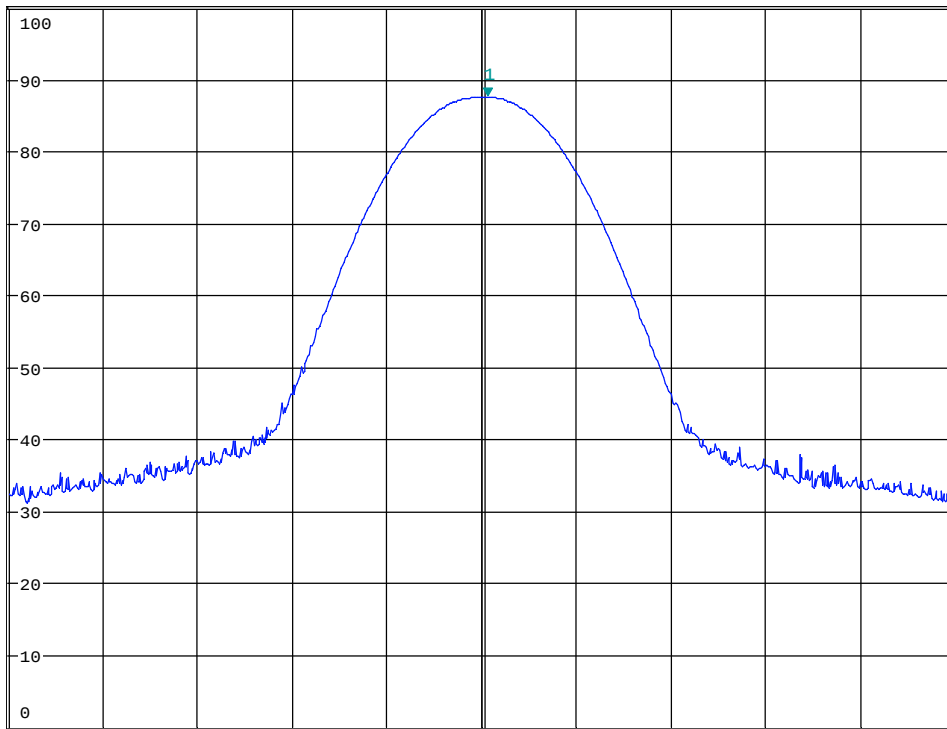
Marker 1 [T1]

87.48 dBμV/m

916.218910256 MHz

Ref 100 dBμV/m * Att 15 dB

1 PK
MAXH



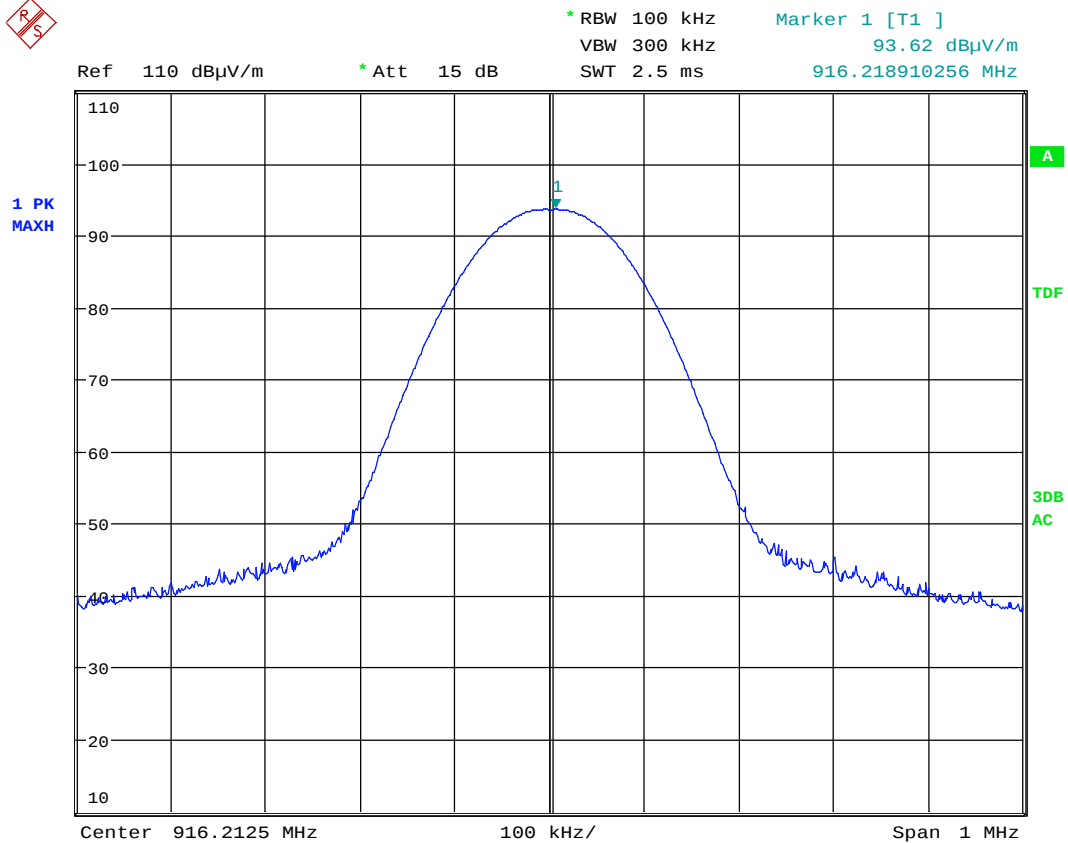
Center 916.2125 MHz

100 kHz/

Span 1 MHz

Date: 18.MAY.2017 13:58:43

VP: 916.2125MHz – Field strength



Date: 18.MAY.2017 13:53:00

HP: 916.2125MHz – Field strength



MARKER 1

918.2108974 MHz

Ref 100 dBμV/m

* Att 15 dB

* RBW 100 kHz

VBW 300 kHz

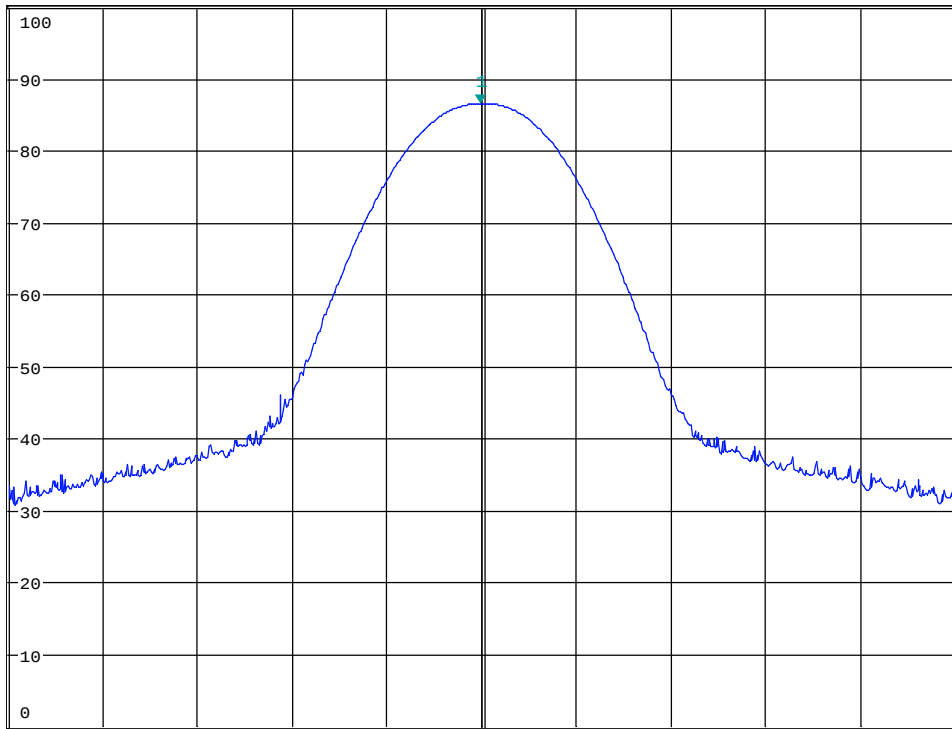
SWT 2.5 ms

Marker 1 [T1]

86.43 dBμV/m

918.210897436 MHz

1 PK
MAXH



Center 918.2125 MHz

100 kHz/

Span 1 MHz

Date: 18.MAY.2017 14:05:26

VP: 918.2125MHz – Field strength



MARKER 1

918.2125 MHz

Ref 110 dBμV/m

* Att 15 dB

* RBW 100 kHz

VBW 300 kHz

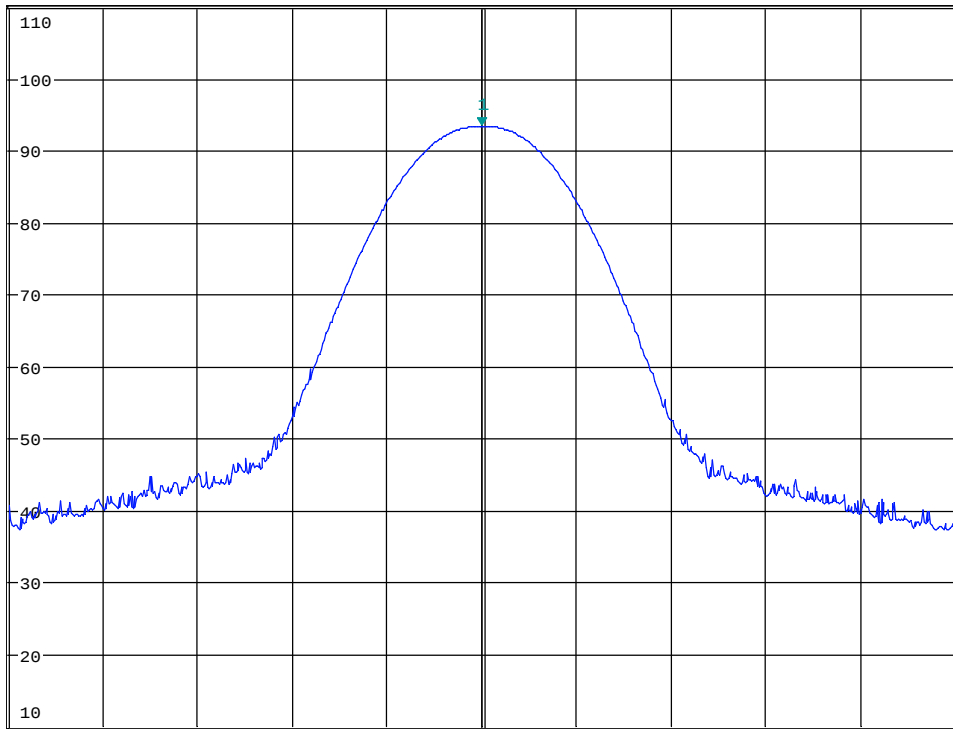
SWT 2.5 ms

Marker 1 [T1]

93.29 dBμV/m

918.212500000 MHz

1 PK
MAXH



Center 918.2125 MHz

100 kHz/

Span 1 MHz

Date: 18.MAY.2017 14:06:46

HP: 918.2125MHz – Field strength



MARKER 1

920.2141026 MHz

Ref 110 dBμV/m

* Att 15 dB

* RBW 100 kHz

VBW 300 kHz

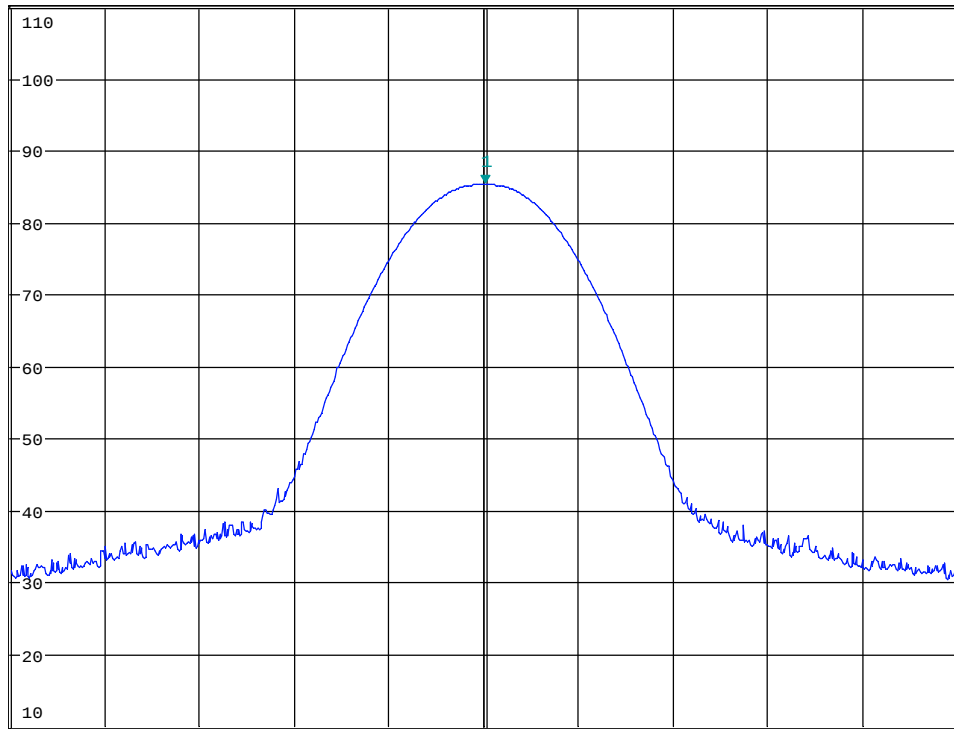
SWT 2.5 ms

Marker 1 [T1]

85.24 dBμV/m

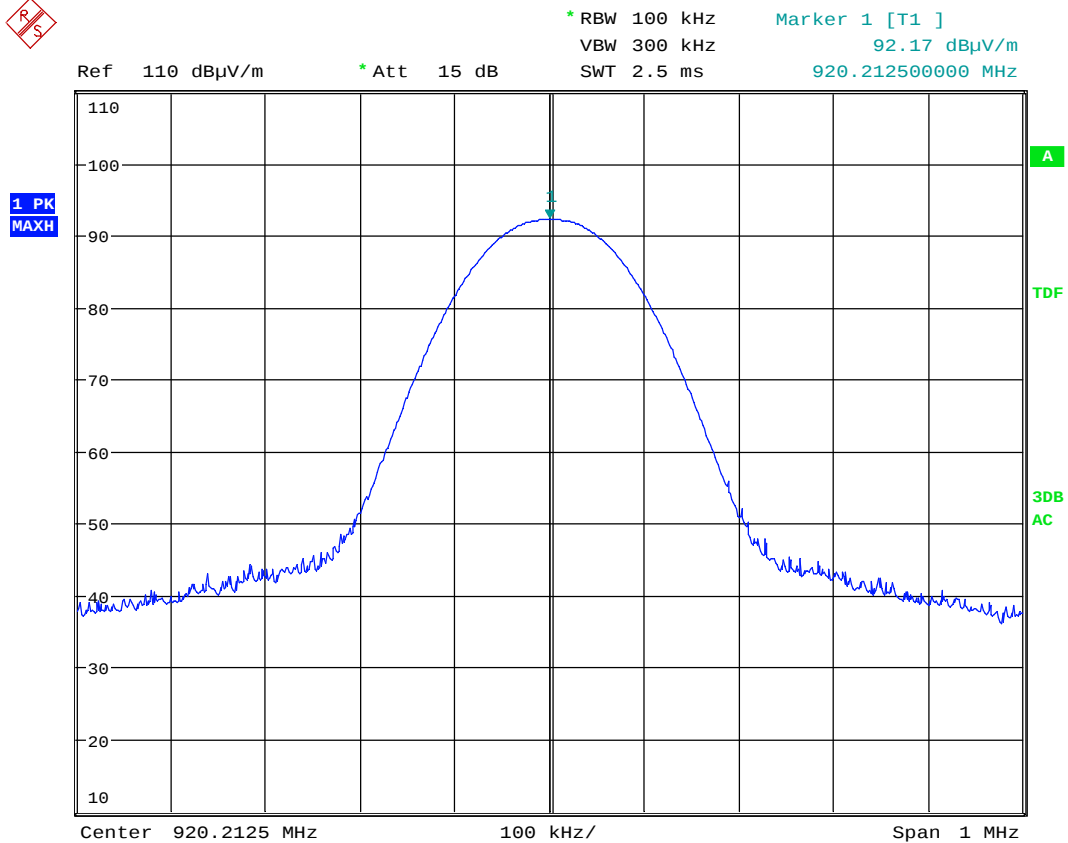
920.214102564 MHz

1 PK
MAXH



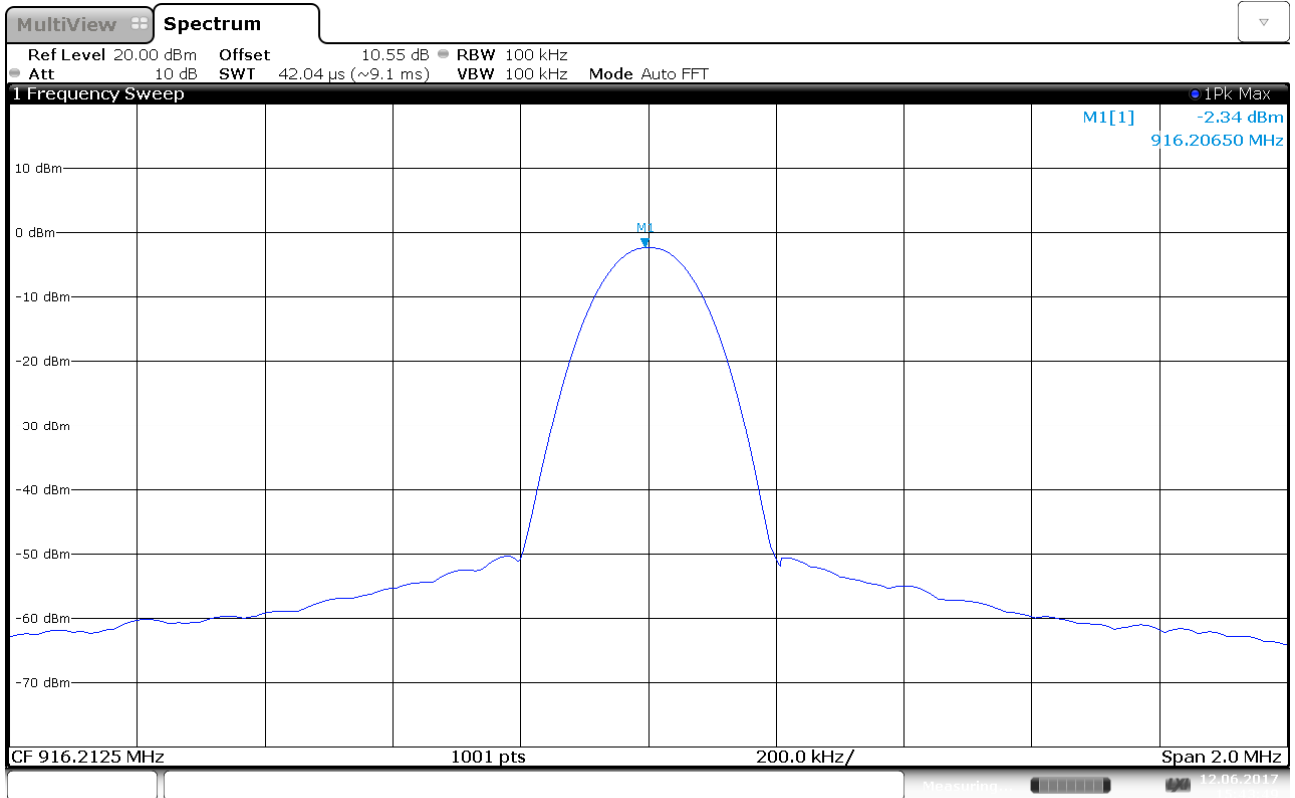
Date: 18.MAY.2017 14:17:25

VP: 920.2125MHz – Field strength



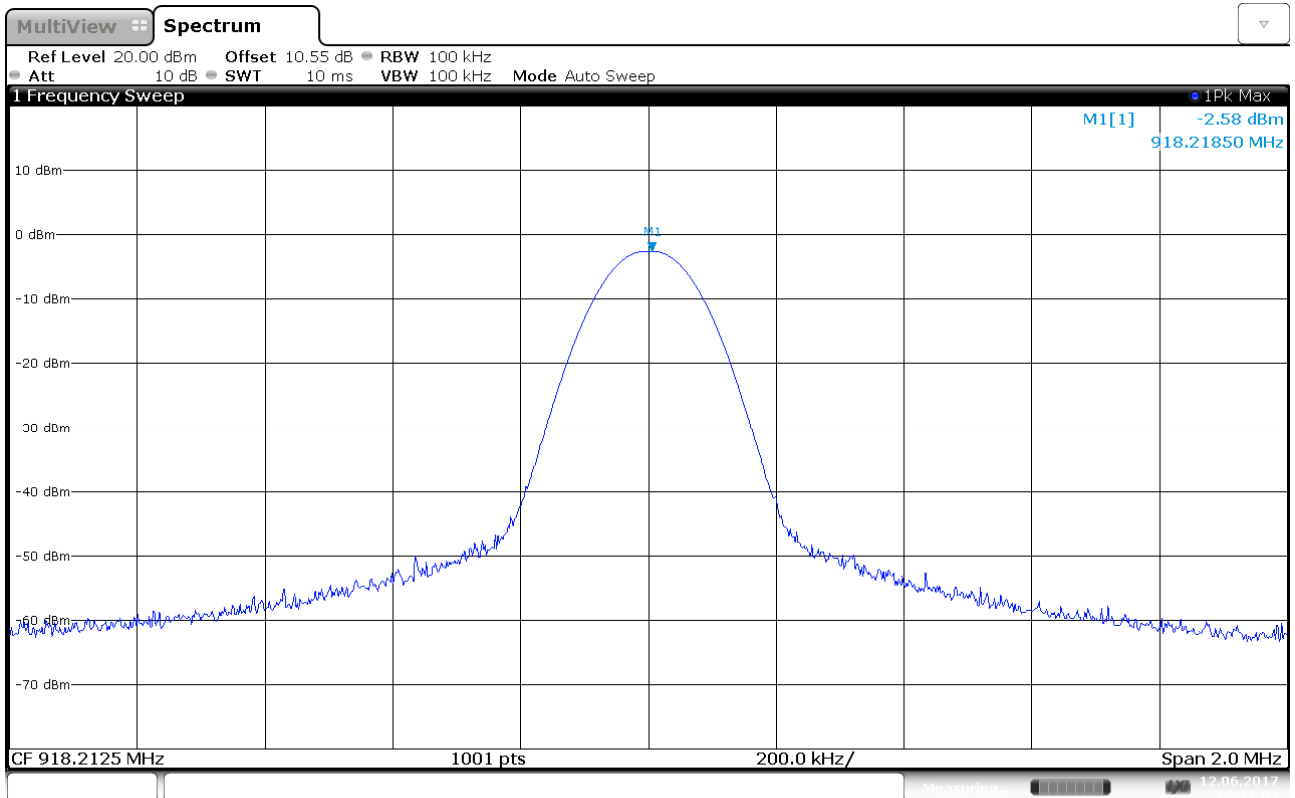
Date: 18.MAY.2017 14:14:42

HP: 920.2125MHz – Field strength



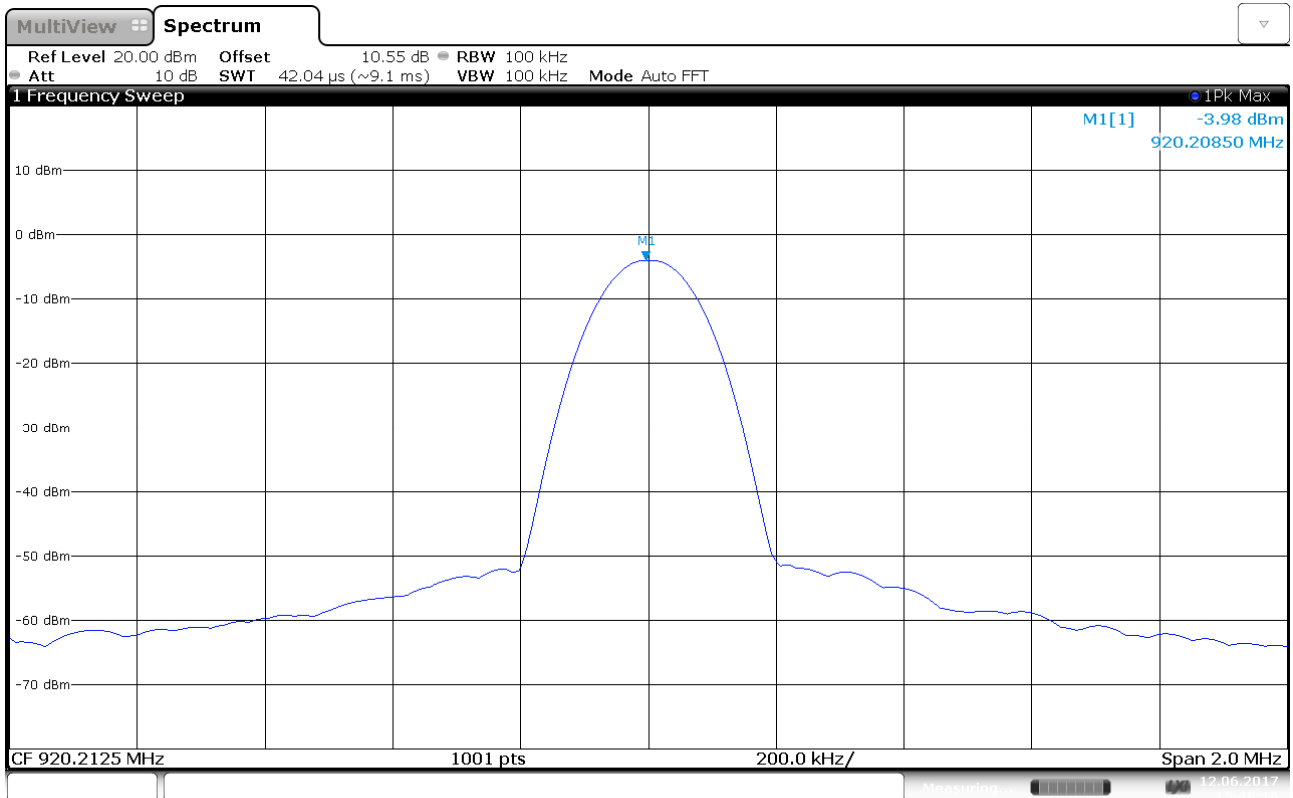
15:43:49 12.06.2017

Conducted power, ch916.2125MHz

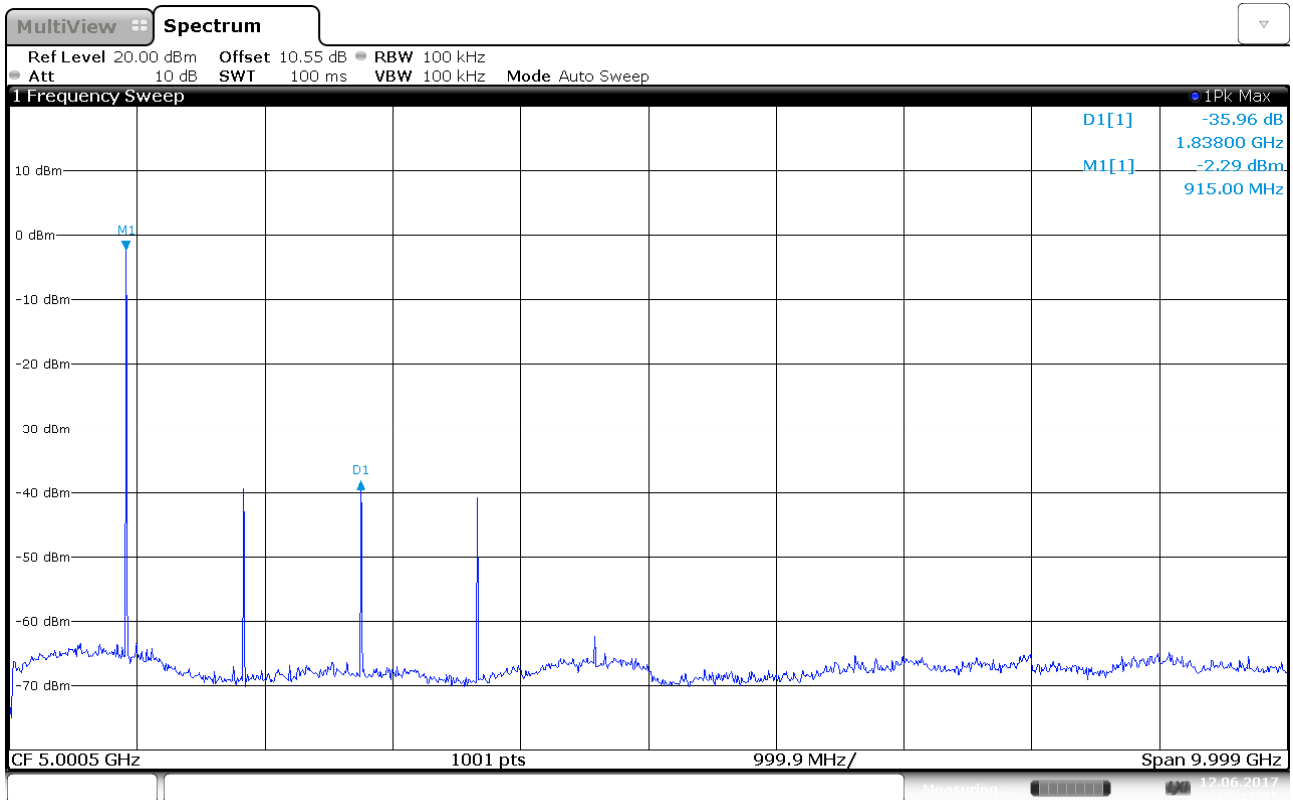


15:37:08 12.06.2017

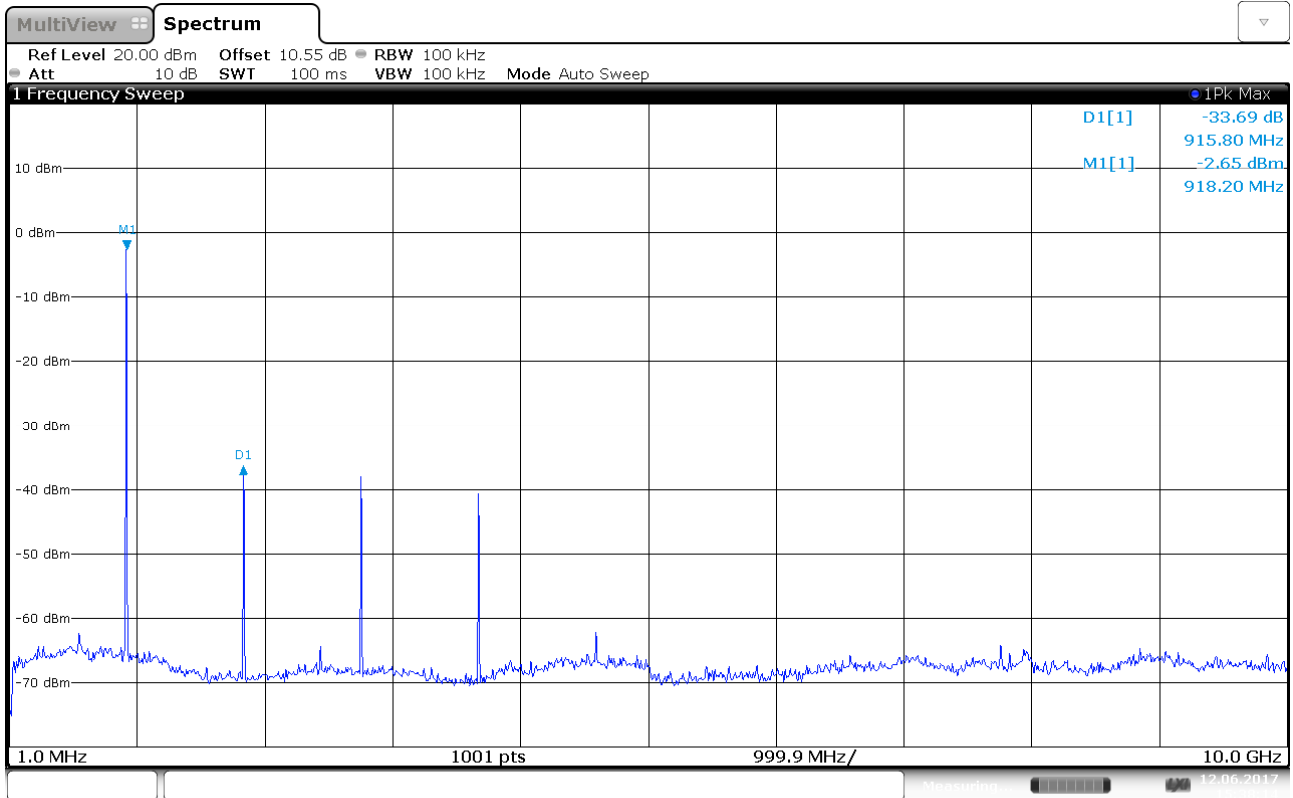
Conducted power, ch918.2125MHz



Conducted power, ch920.2125MHz

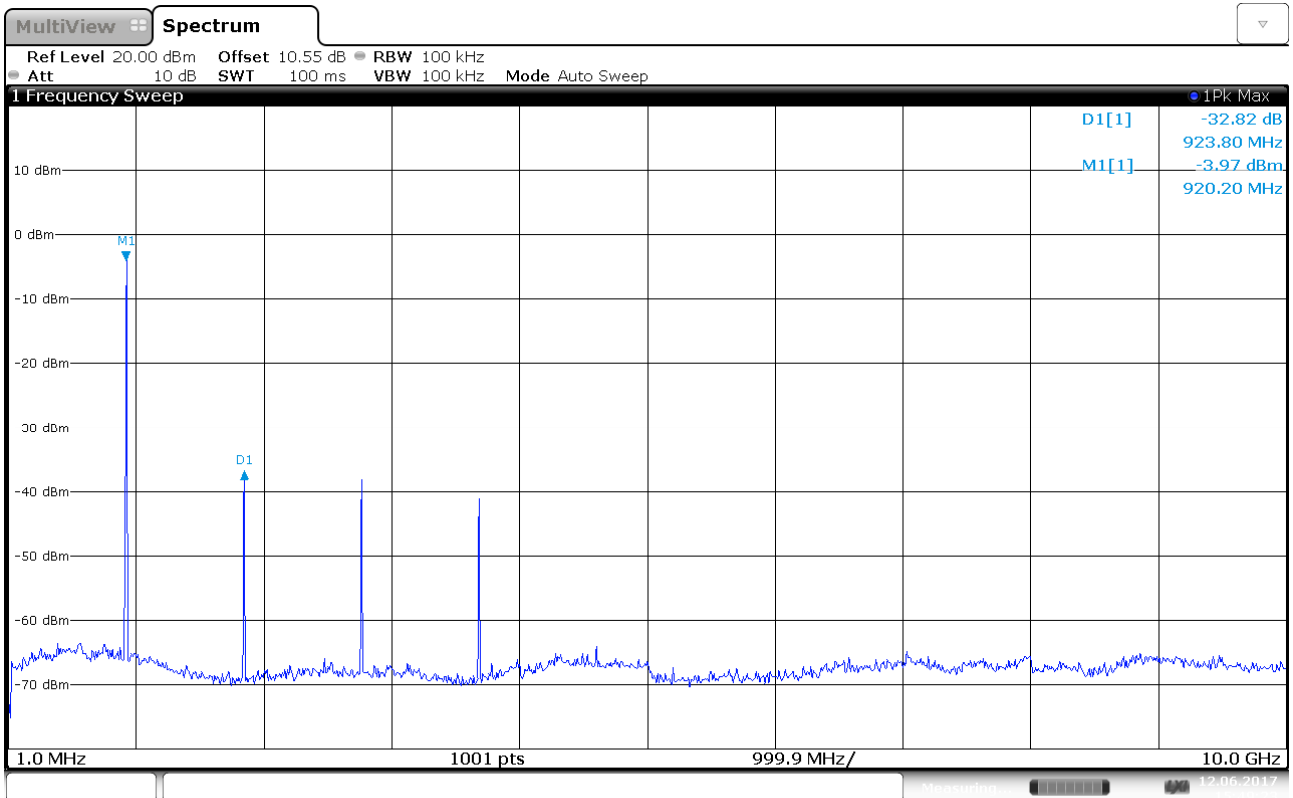


Conducted spurious emissions 1MHz – 10GHz , ch916.2125MHz



15:38:15 12.06.2017

Conducted spurious emissions 1MHz – 10GHz , ch918.2125MHz



15:49:24 12.06.2017

Conducted spurious emissions 1MHz – 10GHz , ch920.2125MHz

3.4 Spurious emissions (radiated)

Para. No.: 15.209 / 15.249 (d) (e) / 8.9, 8.10, B.10

Test Performed By: G.Suwanthakumar	Date of Test: 2017.05.23 – 2017.06.12
------------------------------------	---------------------------------------

Test Results: Complies

Measurement Data:

Radiated Emissions with antenna, 9kHz -10 GHz

30MHz -10 GHz measured at a distance of 3m.

Measured with Peak Detector:

Frequency	Operational condition	Field strength, Peak	Duty cycle corr. factor	Limit	Margin
MHz	-	dB μ V/m	dB	dB μ V/m	dB
45.80	Tx ON	20.57	/	40	>10
239.36	Tx ON	25.05	/	46	>10
895.25	Tx ON	28.45	/	46	>10
/	All channels	/	-	-	-

Average Detector:

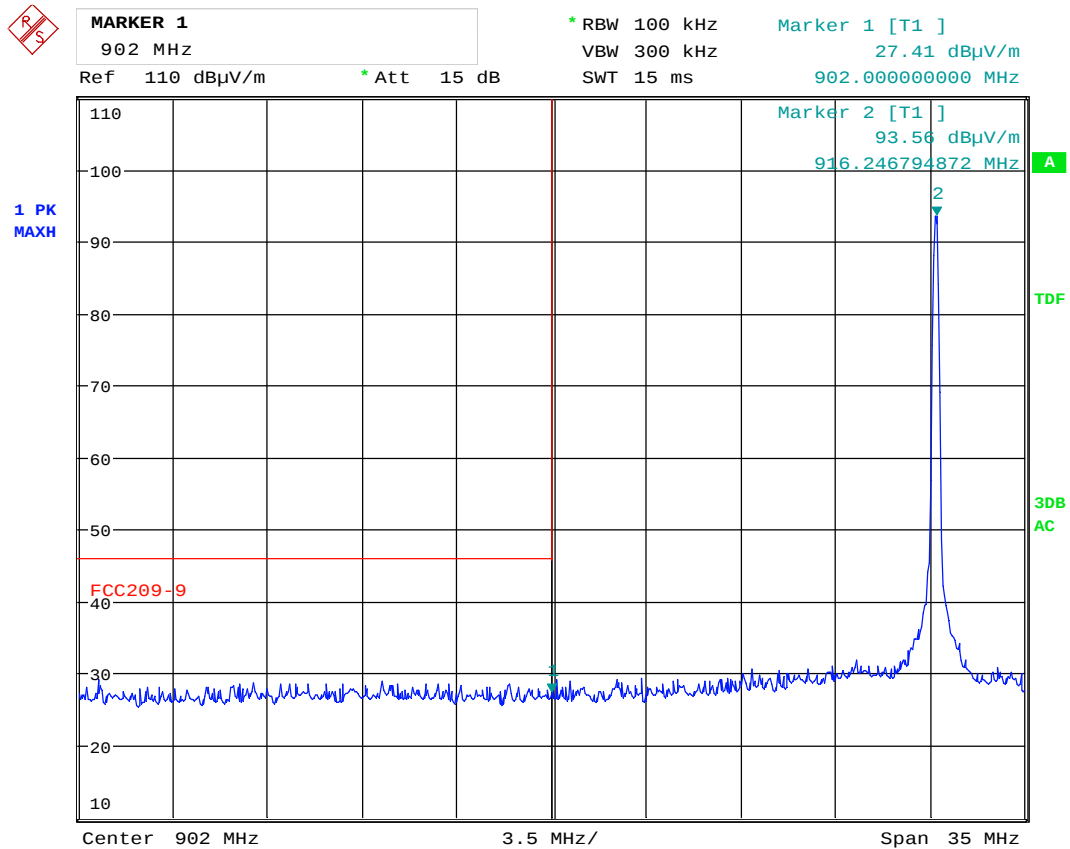
Frequency	Operational condition	Field strength, Peak	Duty cycle corr. factor	Limit	Margin
9kHz – 10GHz		dB μ V/m	dB	dB μ V/m	dB
/	Tx ON	/	-	-	-

The test sample was transmitting with 100% duty cycle for all tests.

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor".

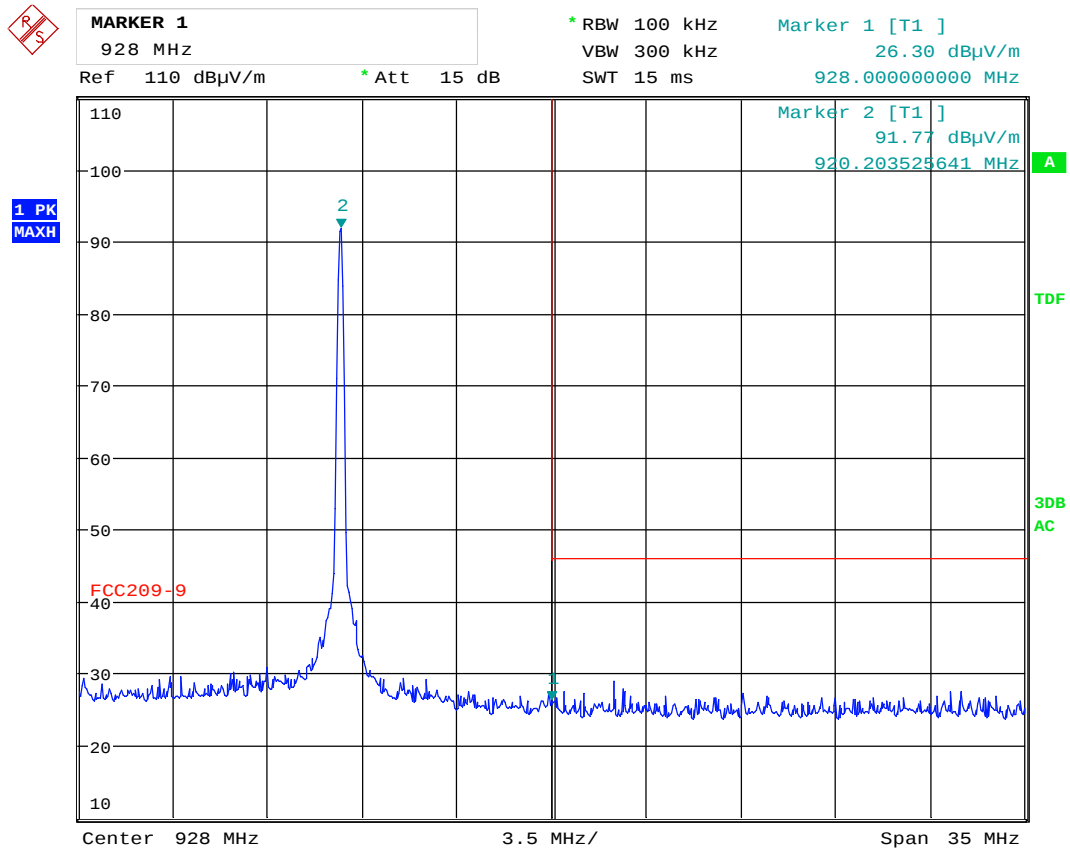
Requirement:

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.



Date: 18.MAY.2017 13:55:05

Lower band edge, ch916.2125MHz



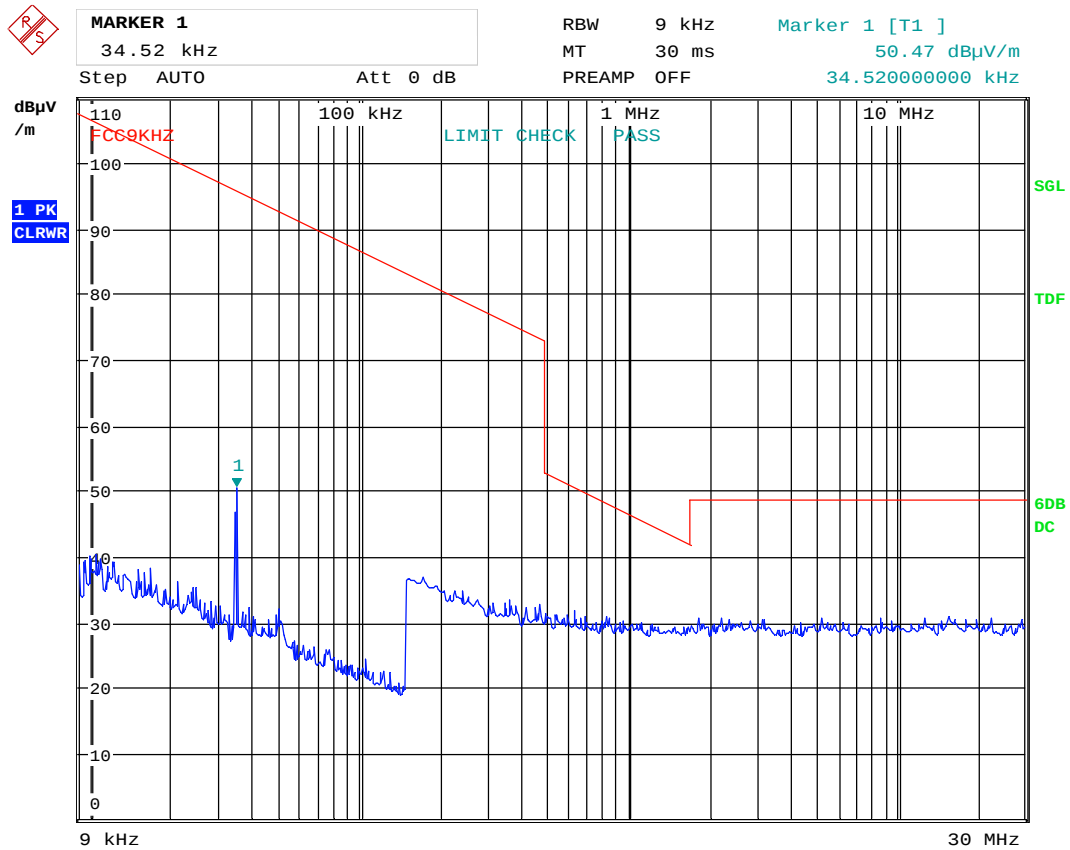
Date: 18.MAY.2017 14:15:20

Upper band edge , ch920.2125MHz

Radiated emissions 9kHz – 30 MHz.

Detector: Peak

Measuring distance 10 m.



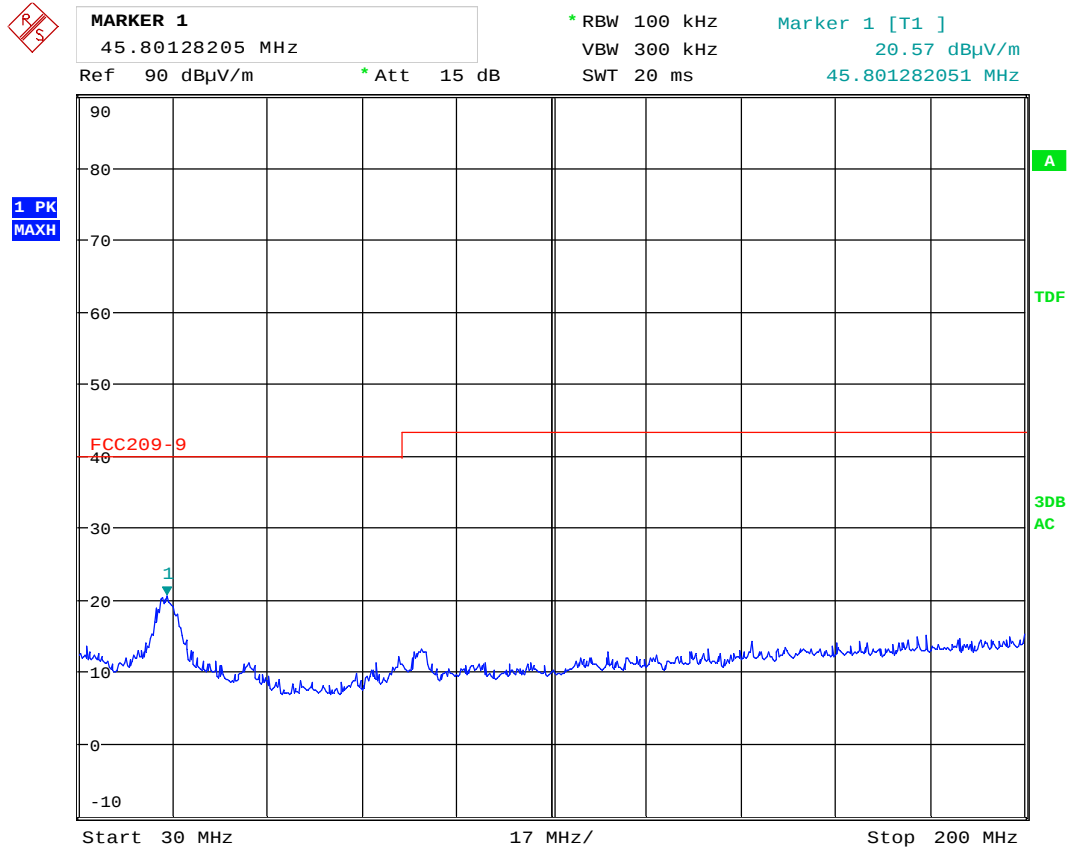
Date: 18.MAY.2017 18:59:28

Radiated emissions 30 – 1000 MHz.

Detector: Peak

Measuring distance 3 m.

The graph shows peak scan and highest values. Since there is no spurious found no QP values are measured.



Date: 18.MAY.2017 14:37:15

VP: 30 - 200MHz



MARKER 1

45.25641026 MHz

Ref 90 dB μ V/m

* Att 15 dB

* RBW 100 kHz

VBW 300 kHz

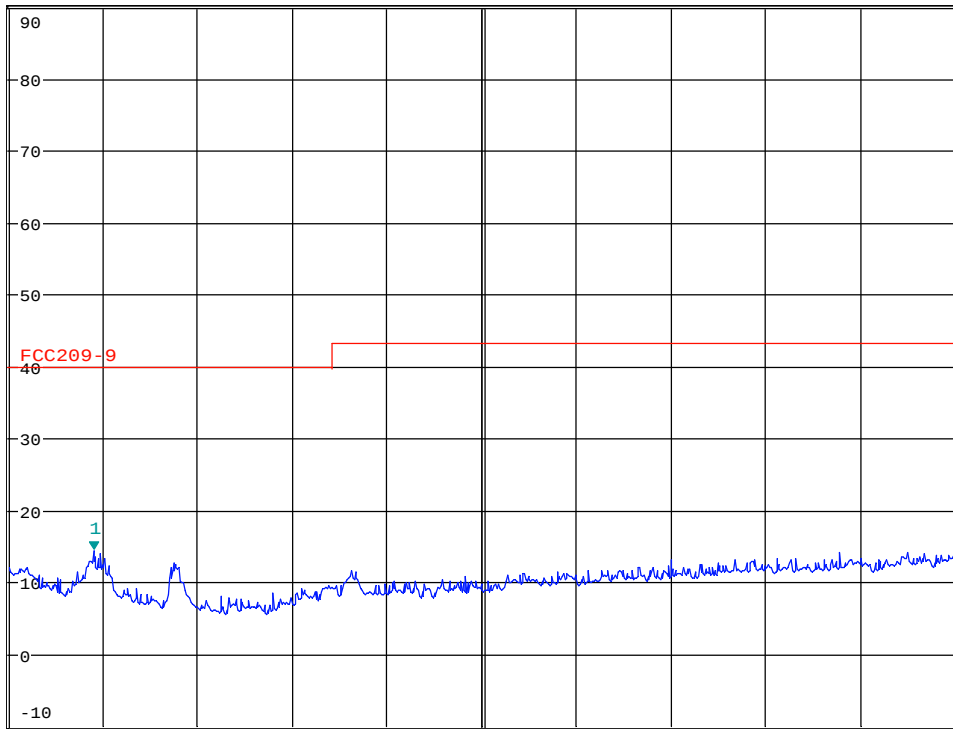
SWT 20 ms

Marker 1 [T1]

14.41 dB μ V/m

45.256410256 MHz

1 PK
MAXH



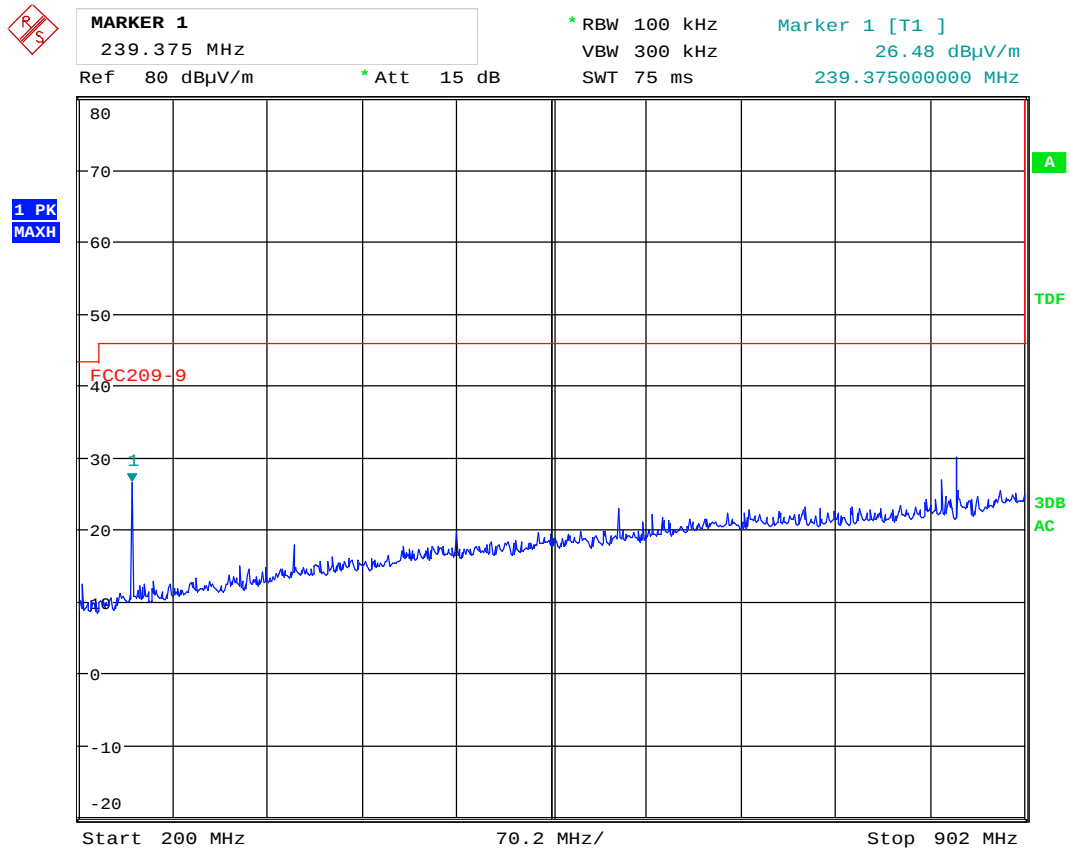
Start 30 MHz

17 MHz/

Stop 200 MHz

Date: 18.MAY.2017 14:39:55

HP: 30 - 200MHz



Date: 18.MAY.2017 14:00:04

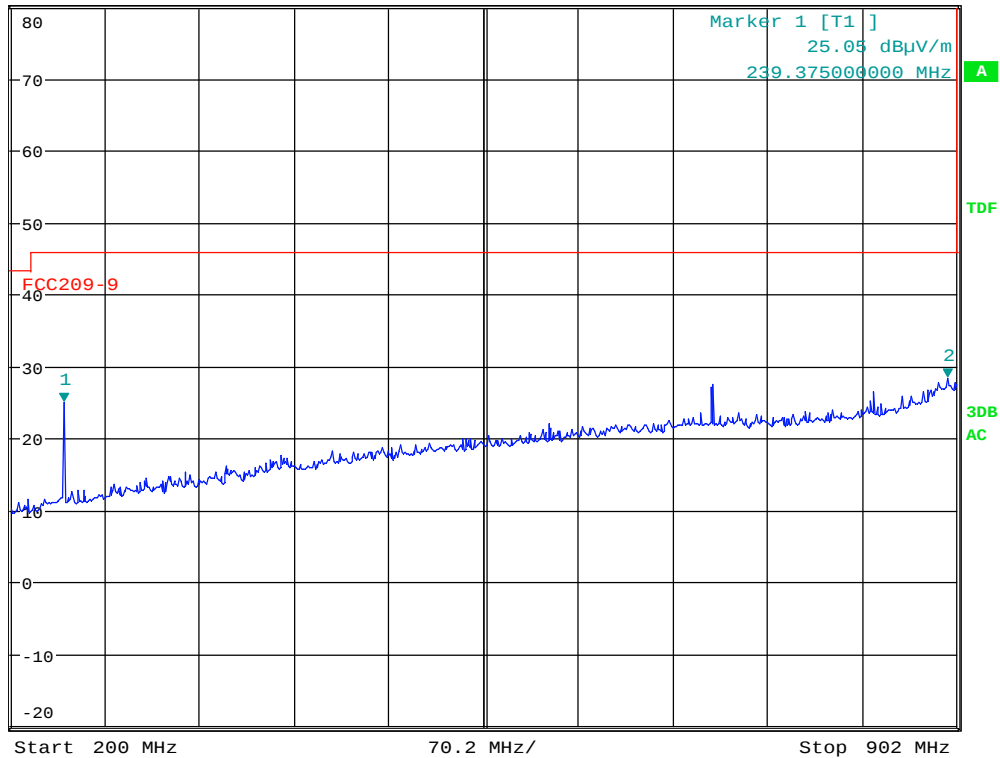
VP: 200 - 902 – Channel 916.2125MHz



MARKER 2
895.25 MHz
Ref 80 dBμV/m * Att 15 dB

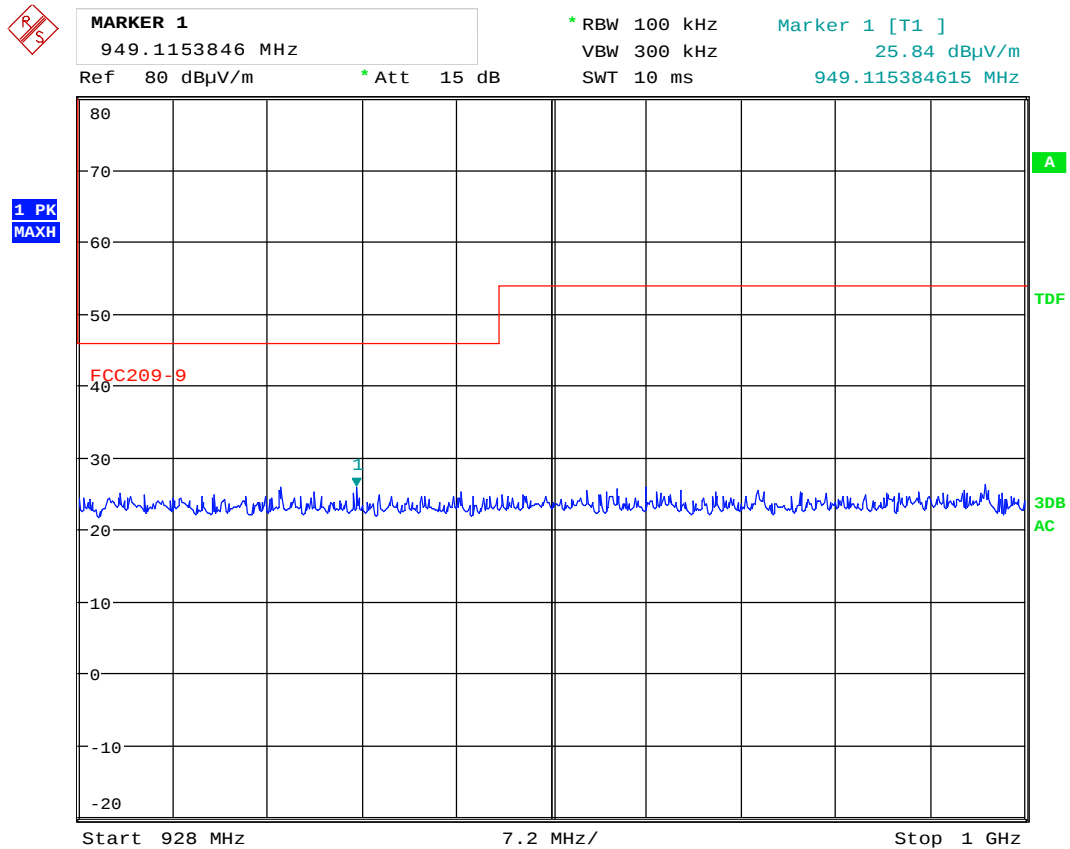
* RBW 100 kHz
VBW 300 kHz
SWT 75 ms
Marker 2 [T1]
28.45 dBμV/m
895.250000000 MHz

1 PK
MAXH



Date: 18.MAY.2017 13:56:49

HP: 200 - 902 – Channel 916.2125MHz



Date: 18.MAY.2017 14:13:50

VP: 928 - 1000MHz – Channel 920.2125MHz



MARKER 1

977.1538462 MHz

Ref 80 dB μ V/m

* Att 15 dB

* RBW 100 kHz

VBW 300 kHz

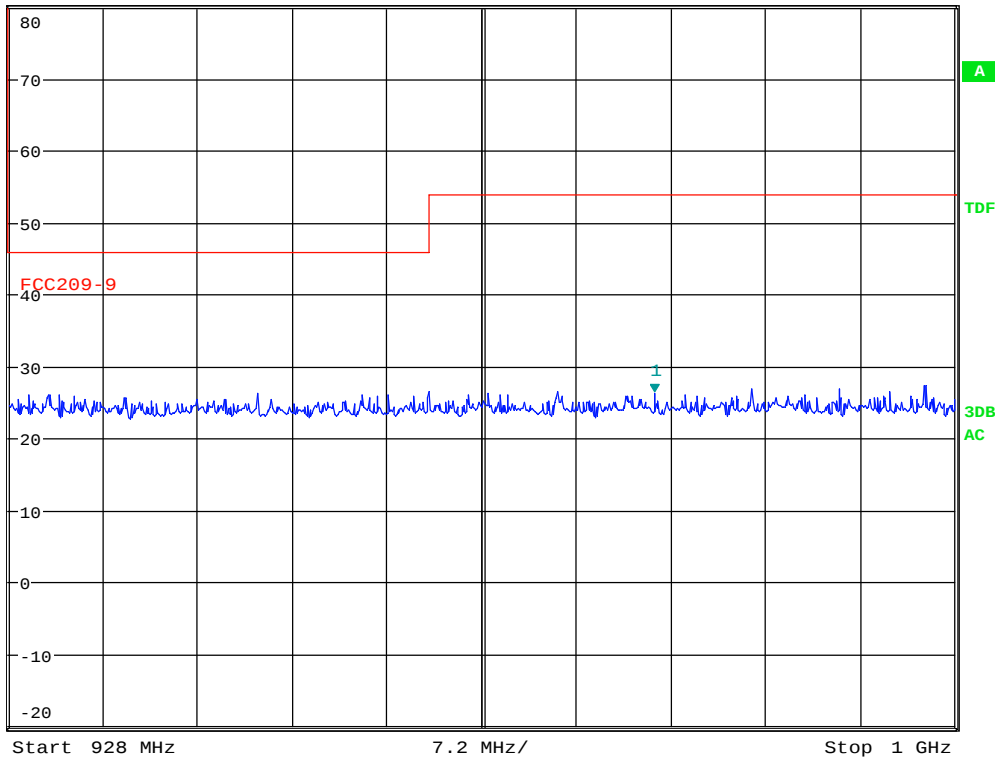
SWT 10 ms

Marker 1 [T1]

26.41 dB μ V/m

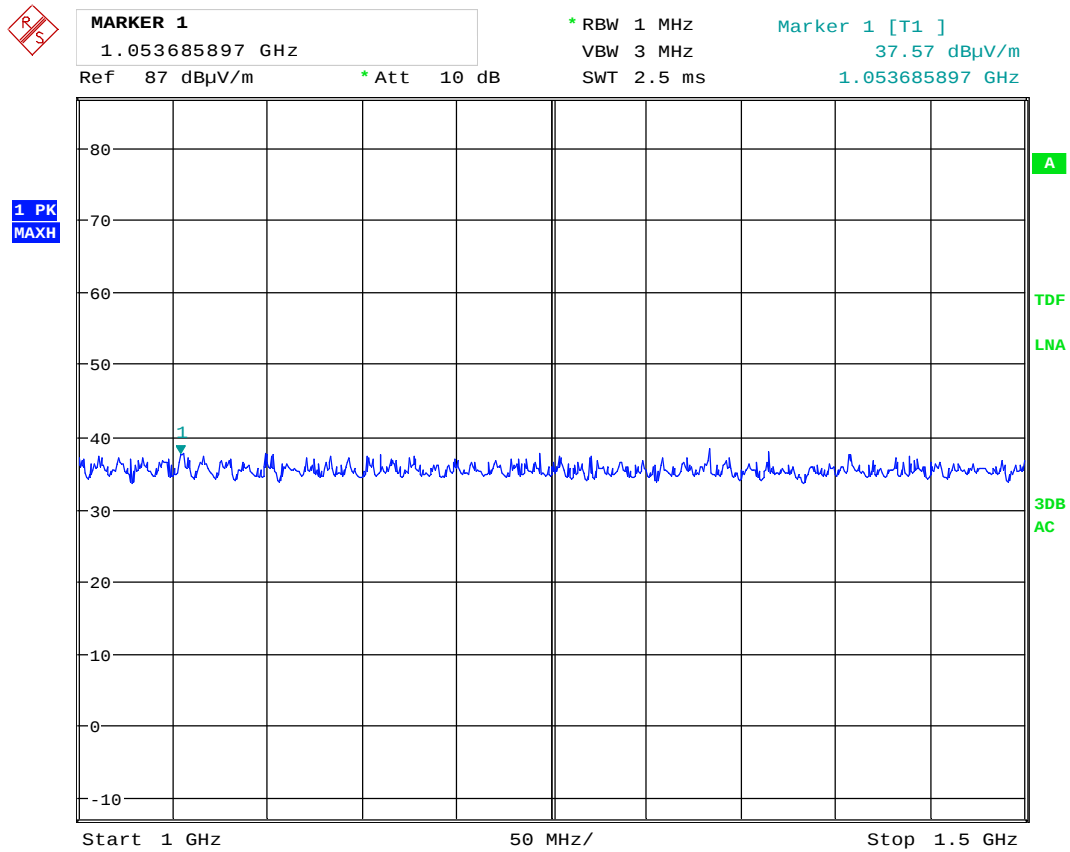
977.153846154 MHz

1 PK
MAXH



Date: 18.MAY.2017 14:13:26

HP: 928 - 1000MHz – Channel 920.2125MHz



Date: 18.MAY.2017 16:46:27

VP: 1 – 1.5GHz , ch916.2125MHz



MARKER 1

1.164262821 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

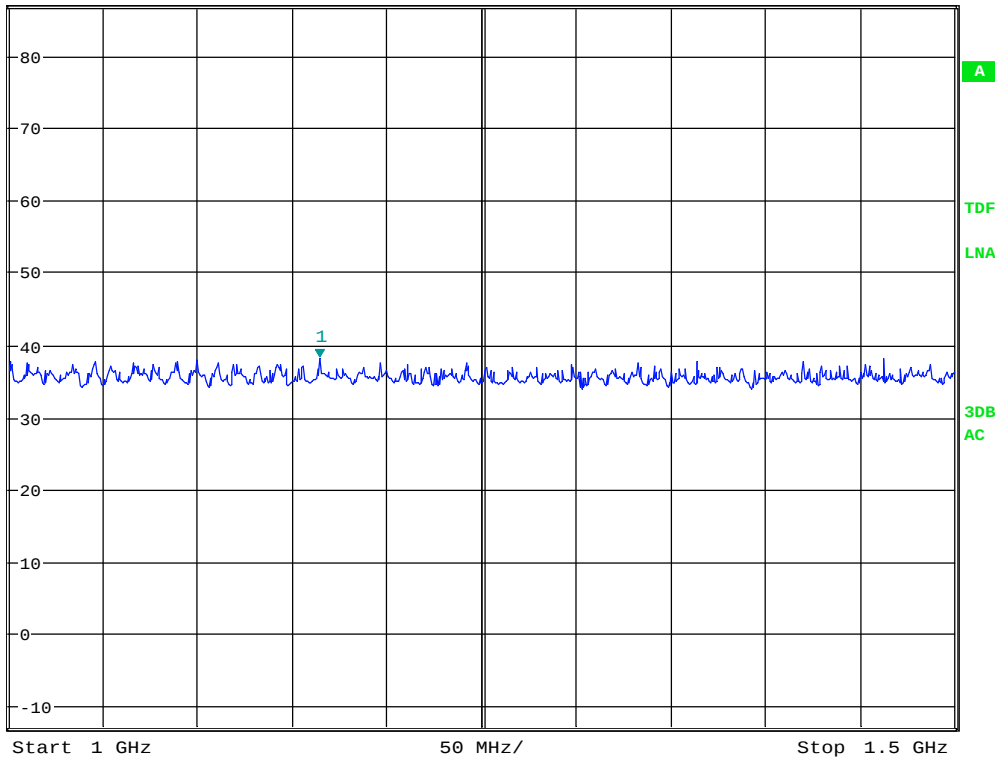
SWT 2.5 ms

Marker 1 [T1]

38.20 dB μ V/m

1.164262821 GHz

1 PK
MAXH



Date: 18.MAY.2017 16:47:30

HP: 1 – 1.5GHz , ch916.2125MHz



MARKER 1

1.209134615 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

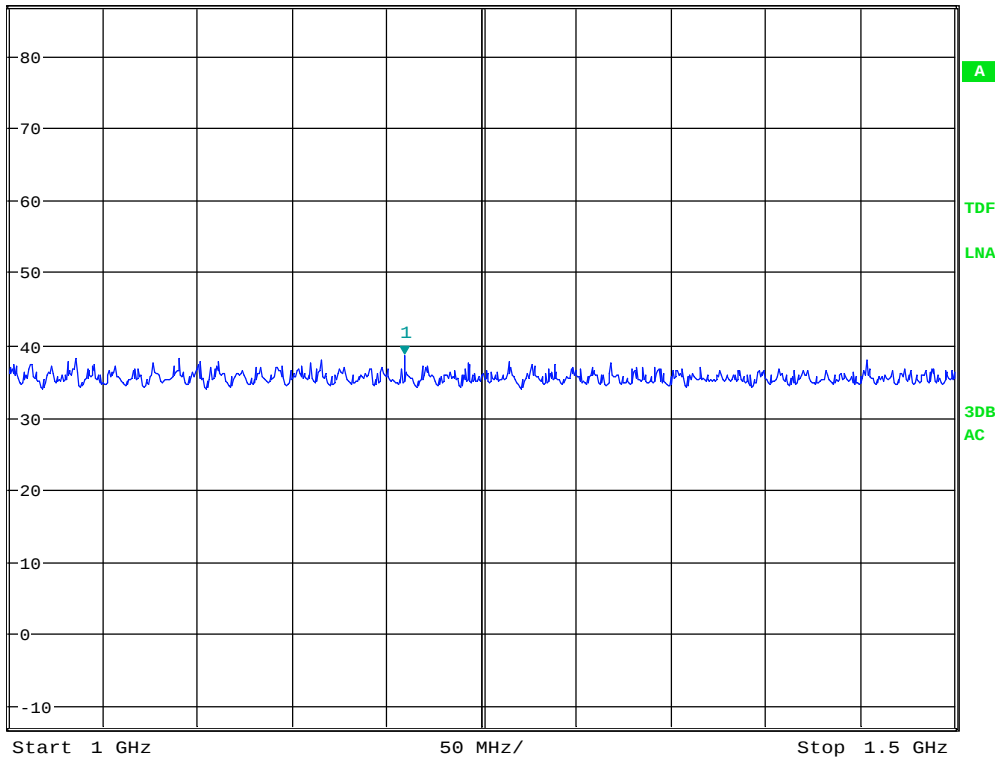
SWT 2.5 ms

Marker 1 [T1]

38.62 dB μ V/m

1.209134615 GHz

1 PK
MAXH



Date: 18.MAY.2017 16:50:54

VP: 1 – 1.5GHz , ch918.2125MHz



MARKER 1

1.155448718 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

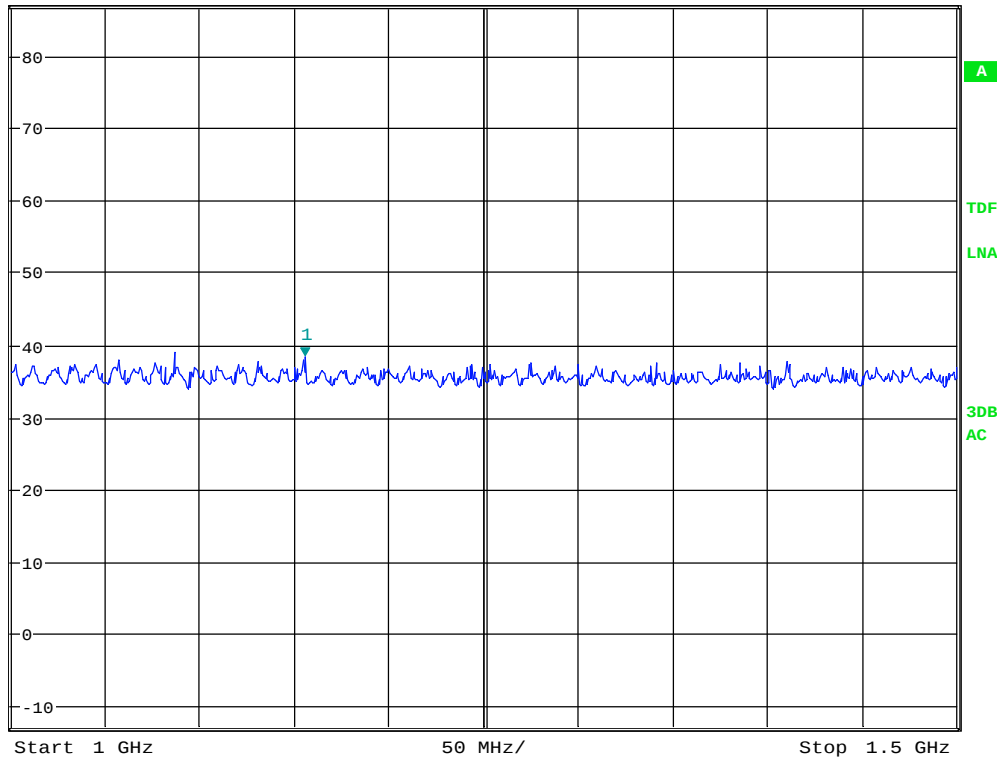
SWT 2.5 ms

Marker 1 [T1]

38.27 dB μ V/m

1.155448718 GHz

1 PK
MAXH



Date: 18.MAY.2017 16:50:33

HP: 1 – 1.5GHz , ch918.2125MHz



MARKER 1

1.08974359 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

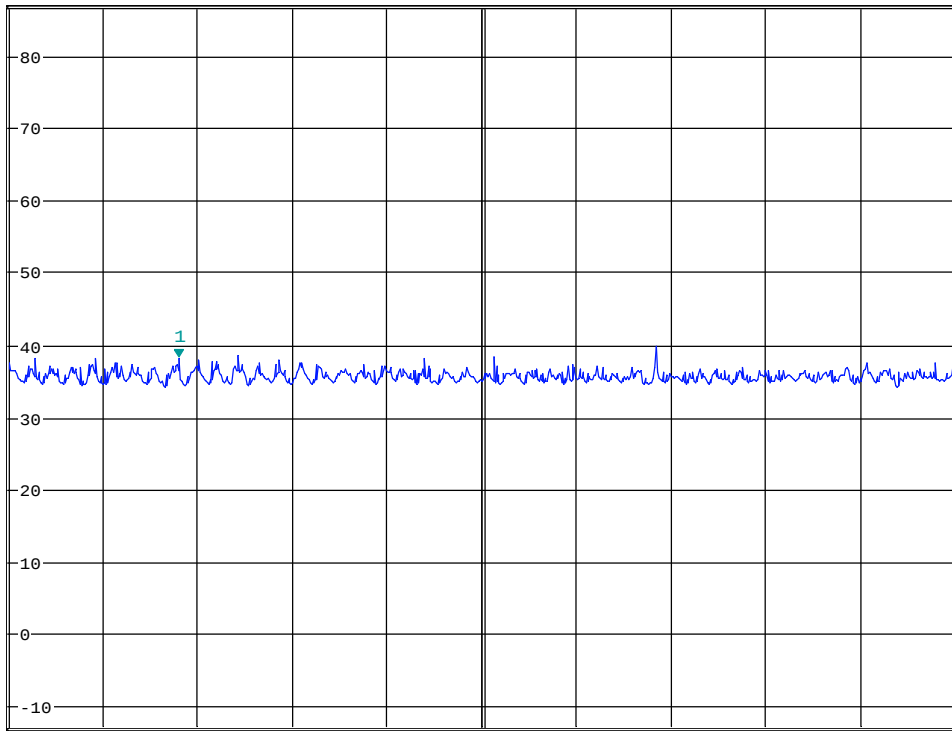
SWT 2.5 ms

Marker 1 [T1]

38.21 dB μ V/m

1.089743590 GHz

1 PK
MAXH



Start 1 GHz

50 MHz/

Stop 1.5 GHz

Date: 18.MAY.2017 17:37:41

VP: 1 – 1.5GHz , ch920.2125MHz



MARKER 1

1.413461538 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

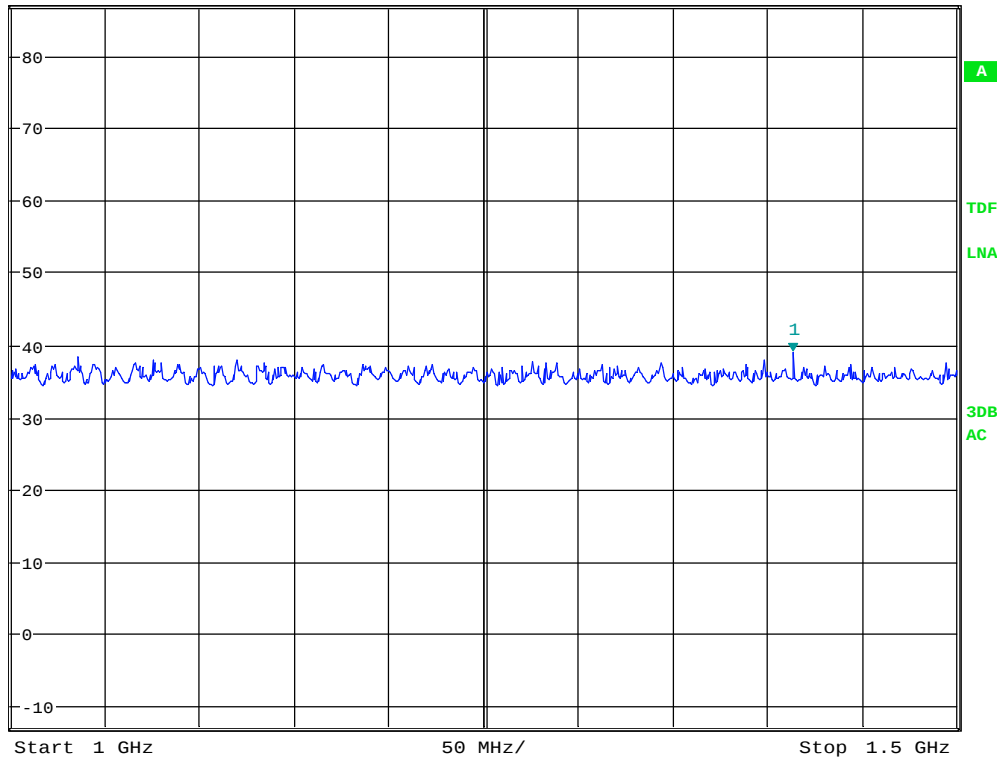
SWT 2.5 ms

Marker 1 [T1]

39.09 dB μ V/m

1.413461538 GHz

1 PK
MAXH



Date: 18.MAY.2017 17:38:14

HP: 1 – 1.5GHz , ch920.2125MHz



MARKER 1

8.978365385 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

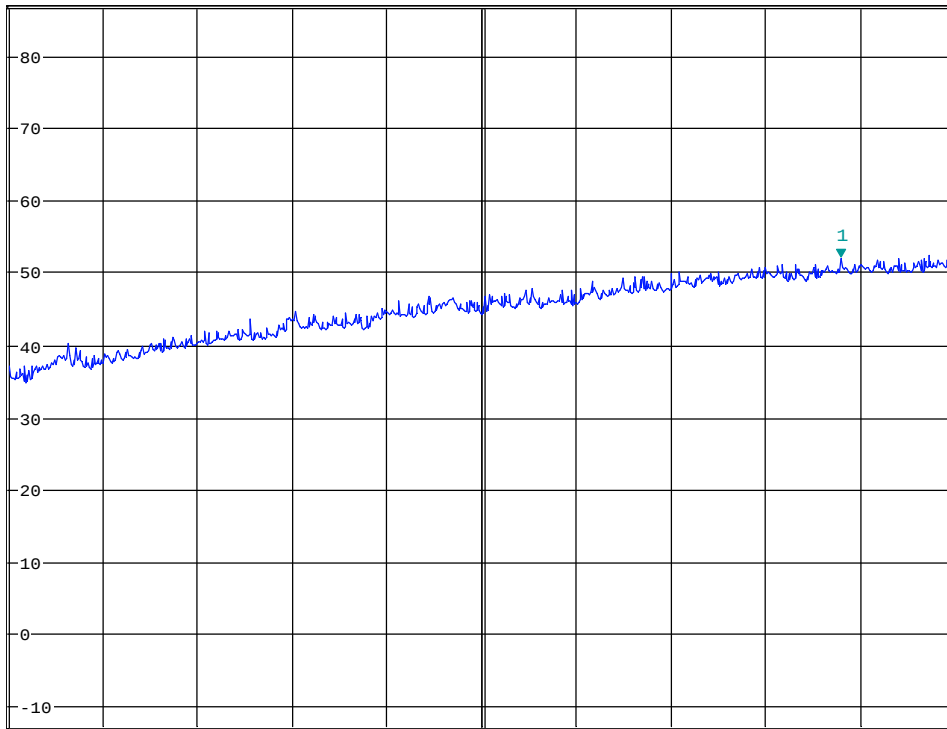
SWT 50 ms

Marker 1 [T1]

51.93 dB μ V/m

8.978365385 GHz

1 PK
MAXH



Start 1.5 GHz

850 MHz/

Stop 10 GHz

A

TDF

LNA

3DB

AC

Date: 18.MAY.2017 17:02:52

VP: 1.5 - 10GHz , ch916.2125MHz



MARKER 1

2.739583333 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

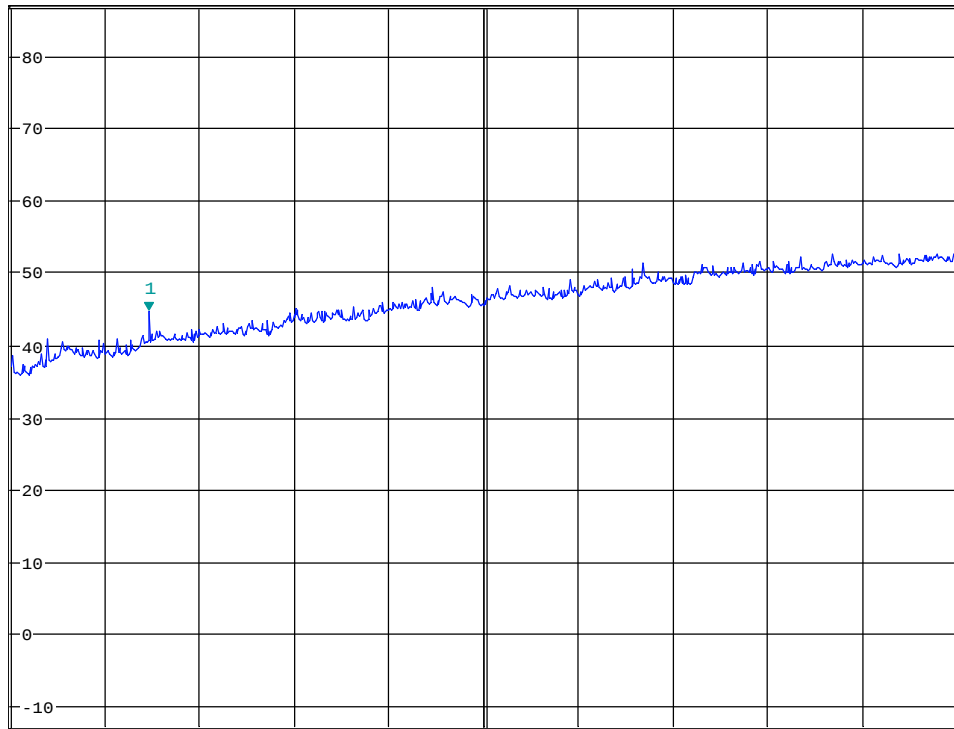
SWT 50 ms

Marker 1 [T1]

44.62 dB μ V/m

2.739583333 GHz

1 PK
MAXH



Start 1.5 GHz

850 MHz/

Stop 10 GHz

Date: 18.MAY.2017 17:11:40

HP: 1.5 - 10GHz , ch916.2125MHz



MARKER 1

9.318910256 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

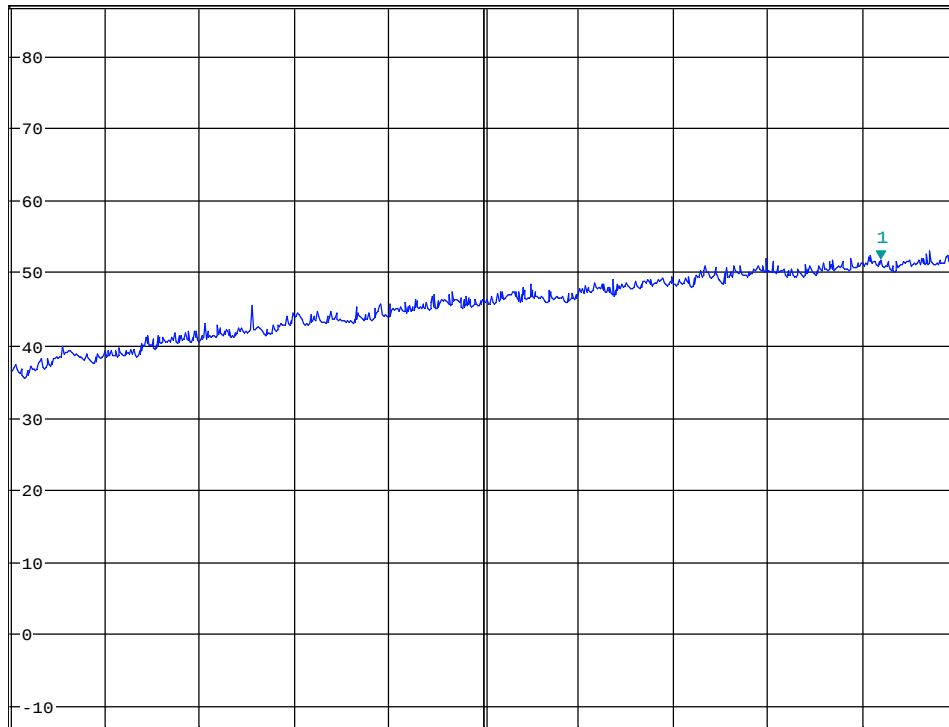
SWT 50 ms

Marker 1 [T1]

51.87 dB μ V/m

9.318910256 GHz

1 PK
MAXH



Start 1.5 GHz

850 MHz/

Stop 10 GHz

Date: 18.MAY.2017 17:01:57

VP: 1.5 - 10GHz , ch918.2125MHz



MARKER 1

9.904647436 GHz

Ref 87 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

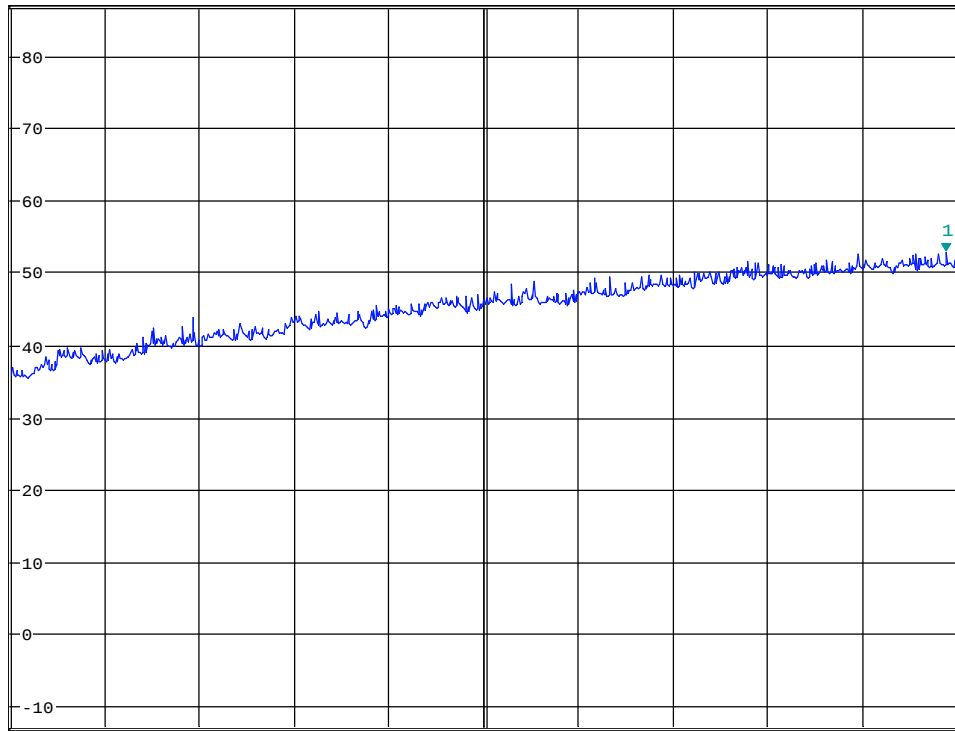
SWT 50 ms

Marker 1 [T1]

52.91 dB μ V/m

9.904647436 GHz

1 PK
MAXH



Start 1.5 GHz

850 MHz/

Stop 10 GHz

Date: 18.MAY.2017 17:01:18

HP: 1.5 - 10GHz , ch918.2125MHz



MARKER 1

2.753205128 GHz

Ref 82 dB μ V/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

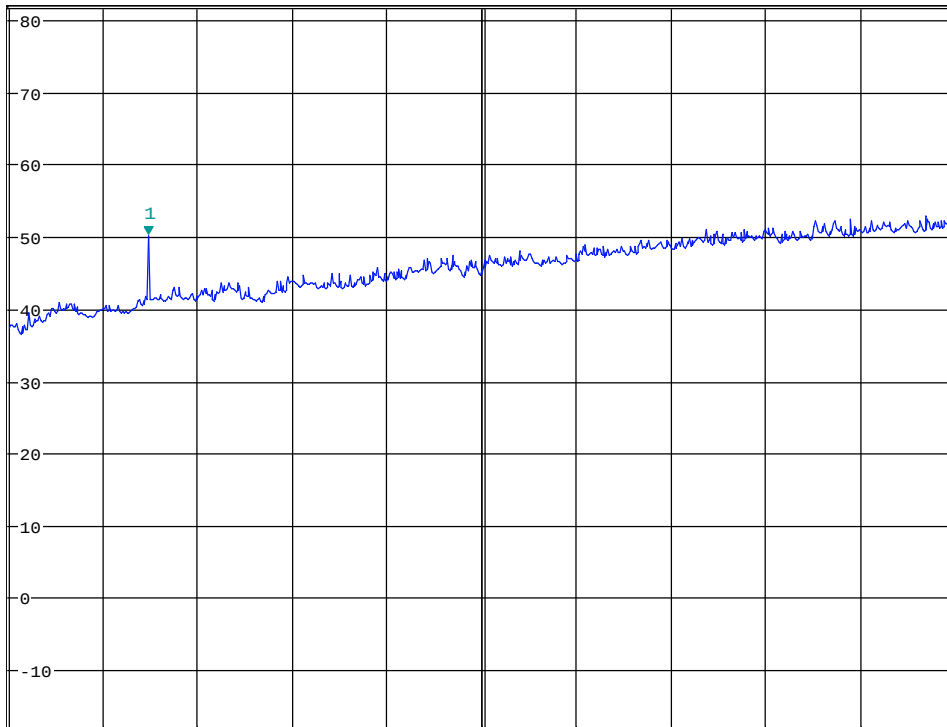
SWT 50 ms

Marker 1 [T1]

50.24 dB μ V/m

2.753205128 GHz

1 PK
MAXH



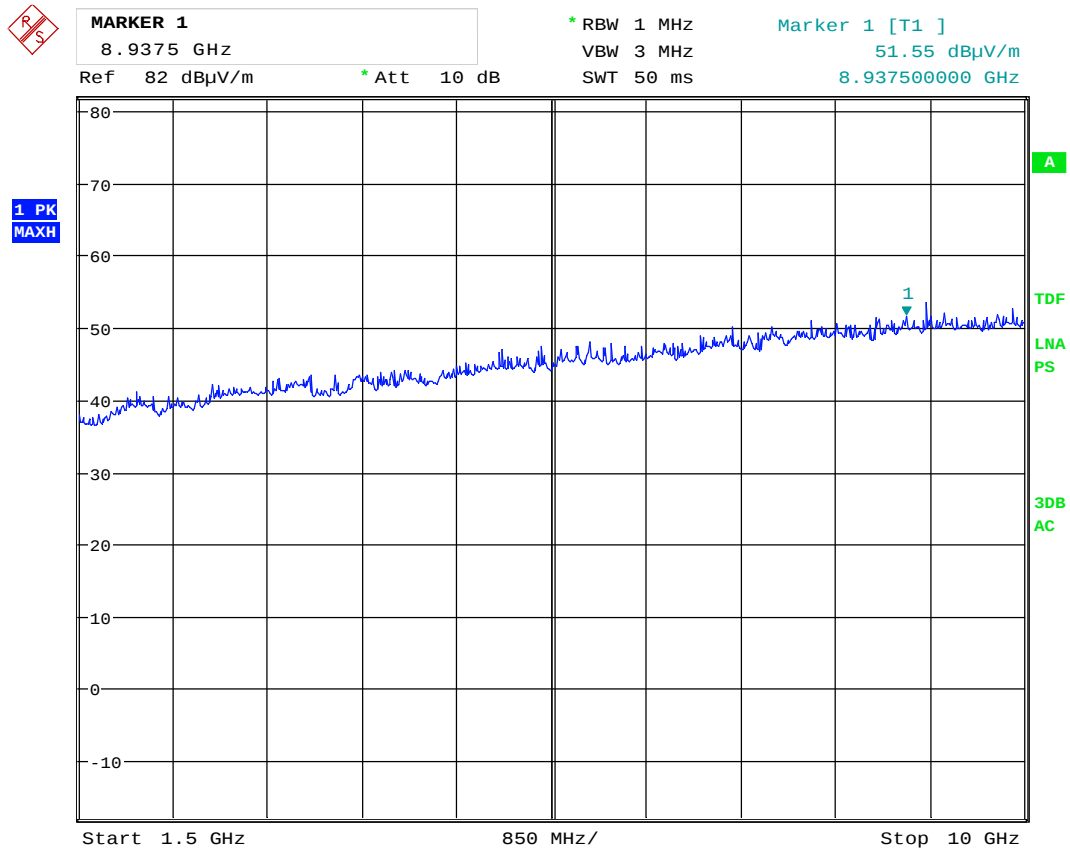
Start 1.5 GHz

850 MHz/

Stop 10 GHz

Date: 18.MAY.2017 17:41:01

VP: 1.5 - 10GHz , ch920.2125MHz



Date: 18.MAY.2017 17:40:01

HP: 1.5 - 10GHz , ch920.2125MHz

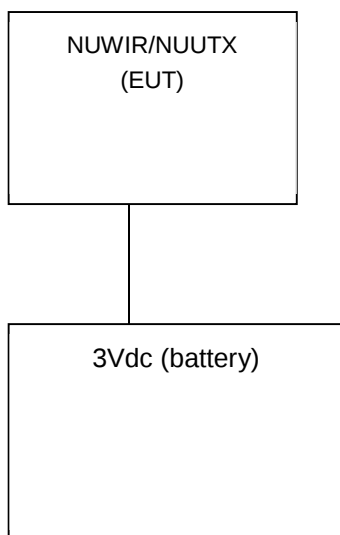
4 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Instrument/ ancillary	Type of instrument/ ancillary	Manufacturer	Ref. no.	Cal. Date	Cal. Due
1.	ESU40	EMI Receiver	Rohde & Schwarz	LR1639	2016.11	2017.11
2.	FSW40	Spectrum Analyzer	Rohde & Schwarz	LR 1640	2015.11	2017.11
3.	ESR	EMI Receiver	Rohde & Schwarz	LR 1675	2015.12	2017.12
4.	HFH2-Z2	Active Loop antenna	Rohde & Schwarz	LR1660	2014.10	2017.10
5.	3115	Antenna horn	EMCO	LR 1330	2010.08	2017.08
6.	HK116	Biconical Antenna	Rohde & Schwarz	LR 1260	2016.12	2018.12
7.	HL223	Log Periodic antenna	Rohde & Schwarz	LR 1261	2016.12	2018.12
8.	643	Antenna Horn	Narda	LR 093	2009.10	2019.10
9.	PM7320X	Antenna Horn	Sivers Lab	LR 102	2009.10	2019.10
10.	DBF-520-20	Antenna Horn	Systron Donner	LR 100	2009.10	2019.10
11.	638	Antenna Horn	Narda	LR 1480	2009.10	2019.10
12.	4768-10	Attenuator	Narda	LR 1356	Cal b4 use	
13.	6HC1500/18000	Highpass Filter	Trilithic	-	Cal b4 use	
14.	5385A	Frequency counter	HP	LR 1013	2015.11	2017.11
15.	TTY 80	Climatic Chamber	ACS	LR 1083	2017.03	2018.03
16.	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2016.10	2017.10
17.	317	Pre-amplifier	Sonoma	LR 1687	2016.9	2017.9
18.	Model 87 V	Multimeter	Fluke	LR 1598	2016.10	2018.10
19.	6812B	Power source	Agilent	LR 1515	2015.12	2017.12
20.	CPX400S	DC power supply	AIM TTI	LR 1710	Cal b4 use	

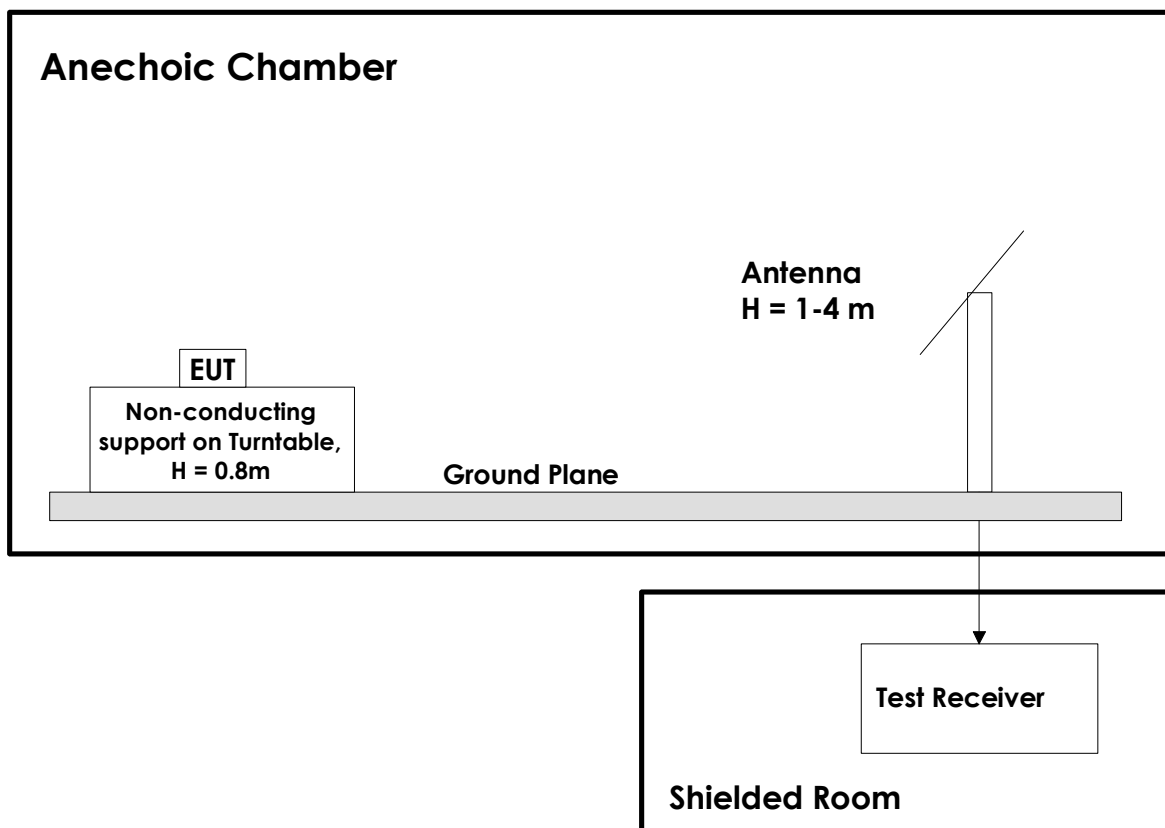
5 BLOCK DIAGRAM

5.1 System set up for radiated measurements



Test equipment: 1- 20

5.2 Test site radiated emission



Measurements at 1GHz and above were performed with turntable height 1.5m and with the ground plane covered by absorbers.

Revisions

Revision #	Date	Order #	Description
00	2017.07.03	327231	First issued
01	2017.08.29	327231	First revision (Only editorial)