Report No. 251949-1

Test Report

Product	Wrist Mounted Alarm Transceiver
Name and address of the applicant	Ascom Sweden AB Grimbodalen 2, P.O. Box 8783, Goteborg, SE-40276, Sweden
Name and address of the manufacturer	Ascom Sweden AB Grimbodalen 2, P.O. Box 8783, Goteborg, SE-40276, Sweden
Model	NITX
Rating	3.0 Vdc (Lithium battery)
Trademark	Ascom
Serial number	/
Additional information	900MHz Transceiver
Tested according to	**FCC Part 15.249** Low Power Transmitte. 902 – 928MHz band **Industry Canada RSS-210, Issue 8** Low Power Licence-Exempt Radiocommunications Devices 902 – 928MHz band
Order number	251949
Tested in period	2014.02.18 – 2014.02.19
Issue date	2014.03.12
Name and address of the testing laboratory	Instituttveien 6 Kjeller, Norway FCC No: 994405 IC OATS: 2040D-1 TEL: (+47) 22 96 03 30 FAX: (+47) 22 96 05 50

Prepared by [G.Suhanthakumar]	Approved by [Frode Sveinsen]

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ENTERPRISE NUMBER NO974404532
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CONTENTS

1 TEST INFORMATION

1.1 Test item

Name :	Ascom
Model/version :	NITX-AAB, NITX-BAB, NITX-BBB
FCC ID:	BXZNITX
IC ID:	3724B-NITX
Serial number :	-
Hardware identity and/or version:	-
Software identity and/or version :	-
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 :	0.340 mW
Type of Power Supply :	Battery (tested with 2 AA batteries)
Antenna Connector :	N/A
Antenna type:	Wire antenna
Declared antenna gain dBd:	0
Antenna Diversity Supported :	None

Description of test item

The NITX is a wrist mounted alarm device with a 900 MHz radio transceiver. It also has a 125 kHz magnetic field transceiver with very low output power for unit-to-unit communication and position beacon reception.

1.2 Test environment

1.2.1 Normal test condition

Temperature:	20.6 – 21.2 °C
Relative humidity:	40 - 42 %
Normal test voltage:	3.0Vdc

The values are the limit registered during the test period.

1.3 Test period

Item received date: 2014-02-18
Test period : from 2014-02-18 - 2014-02-19

2 TEST REPORT SUMMARY

2.1 General

Manufacturer: Ascom
Model No.: NITX Transceiver

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 8 and RSS-GEN, Issue 3.

Radiated tests were conducted in accordance with ANSI C63.4-2003 and ANSI C63.10-2009. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3 and 10 meters.

☒ 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”.

2.2 Test summary

Name of test	FCC Part 15 reference	RSS-210 Issue 8 & RSS-GEN Issue 3	Result
Supply Voltage Variations	15.31(e)	N/A	Complies [1]
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	N/A [2]
Power-line Conducted Emission	15.207(c)	7.2.2 (RSS-GEN)	N/A [1]
Occupied Bandwidth	N/A	4.6.1 (RSS-GEN)	-
Peak Power Output	15.249(a)(c)	A2.9	Complies
Band edge Emissions	15.249(d)	A.2.9	Complies
Spurious Emissions (Radiated)	15.249 (e) 15.209	A2.9 4.9 (RSS-GEN)	Complies

[1] EUT is battery powered (3.0 V Lithium Battery)

[2] Only integral antenna

RSS Gen issue 3 covers section 7 & 6

RSS 210 issue 8 covers section A2.9

2.3 Description of modification for modification filing

Not applicable.

2.4 Comments

The channels are selected with the use of dedicated test software from the manufacturer.
The radiated measurements are tested on three axis.
Two fully charged AA batteries are used.

2.5 Family list rationale

Not Applicable.

3 TEST RESULTS

3.1 Transmitter Frequency Stability

Para. No.: 15.31(m)/7.2.4

Test Performed By: G.Suhanthakumar	**Date of Test: 18.02.2014**

Measurement Data:

Temperature	Channel nr.	Given Frequency (MHz)	Measured value (MHz)	Deviation (Hz)
20 ° C	-	916.2125	916.212660	160
	-	918.2125	918.212740	240
	-	920.2125	920.212740	240

Comment: Reported for information only. There are no requirements to frequency tolerance for low power devices in the 902-928 MHz band certified to 15.249 or RSS 210

3.2 20 dB Bandwidth

Para. No.: RSS-Gen

Test Performed By: G.Suhanthakumar	**Date of Test: 2014.02.18**

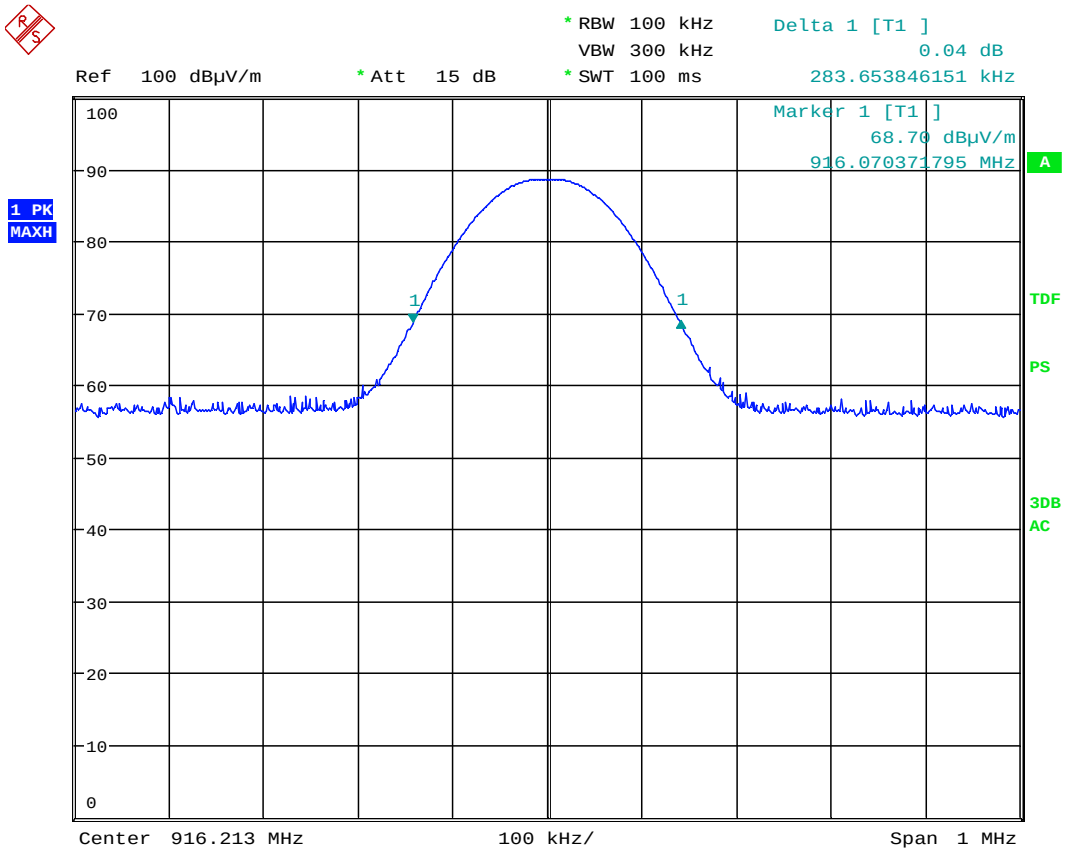
Test Results: Complies

Measurement Data:

Data Rate	**20 dB Bandwidth (kHz)**		
	916.2125MHz	**918.2125MHz**	**920.2125MHz**
19.2kbps	283.65	280.45	280.45

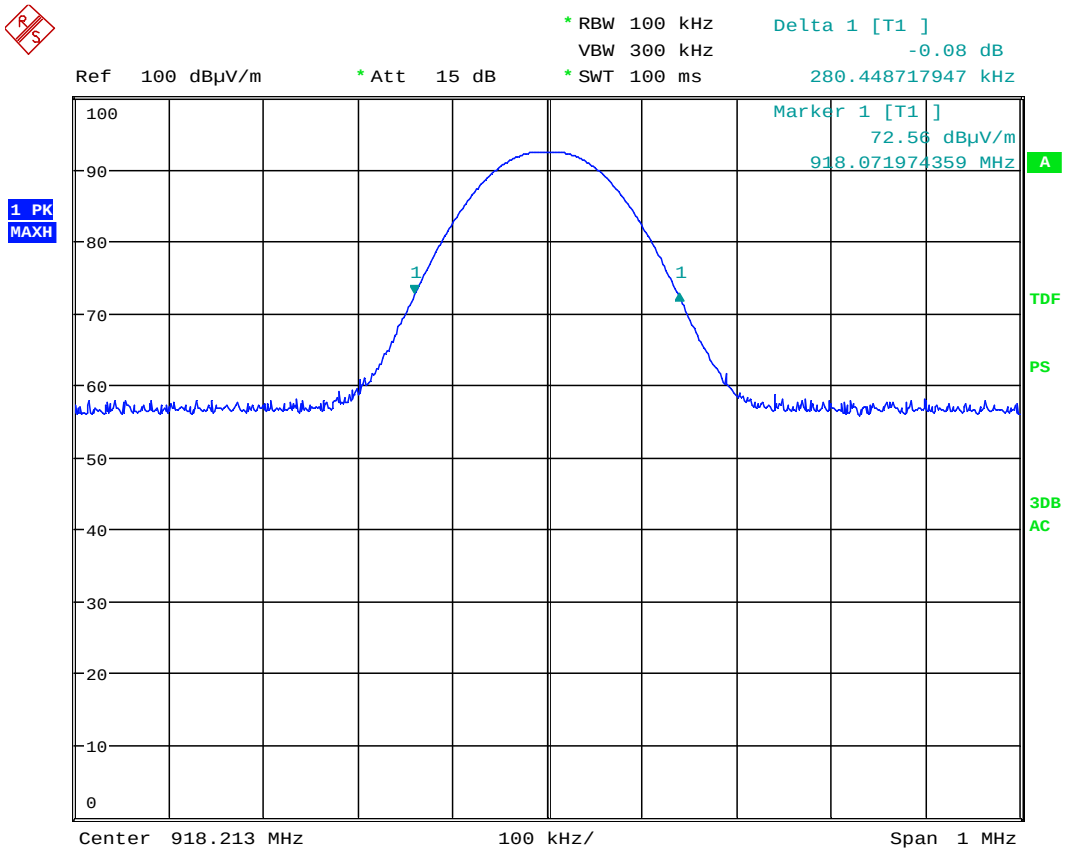
Requirements:

For information only



Date: 18.FEB.2014 15:26:41

916.2125MHz – 20 dB bandwidth



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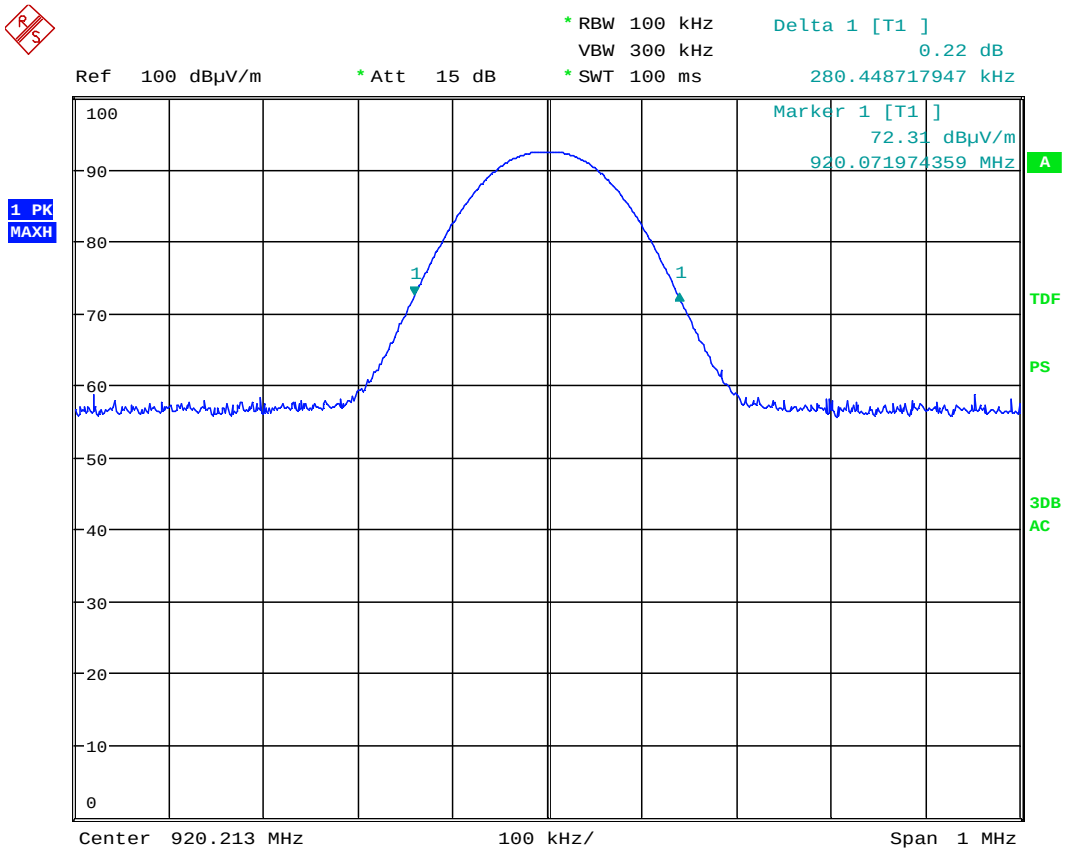
918.2125MHz – 20 dB bandwidth



Date: 18.FEB.2014 15:48:26

926.5MHz – 20 dB bandwidth

3.3 Peak power output

Para. No.: 15.249 (a) / A2.9

Test Performed By: G.Suhanthakumar	**Date of Test: 2014.02.18**

Test Results: Complies

Measurement data:

Maximum field strength

RF channel	**916.2125MHz**	**918.2125MHz**	**920.2125MHz**
VP: Measured value (dBµV/m)	87.60	88.27	89.25
HP: Measured value (dBµV/m)	89.00	92.70	92.70

Calculated erp

RF channel	**916.2125MHz**	**918.2125MHz**	**920.2125MHz**
Radiated power (mW)	0.146	0.340	0.340
Radiated e.r.p. (dBm)	-8.37	-4.68	-4.68
Declared antenna gain dBd	0	0	0
Calculated conducted power (mW)	0.146	0.340	0.340

Radiated measurements are performed at 3 m distance.

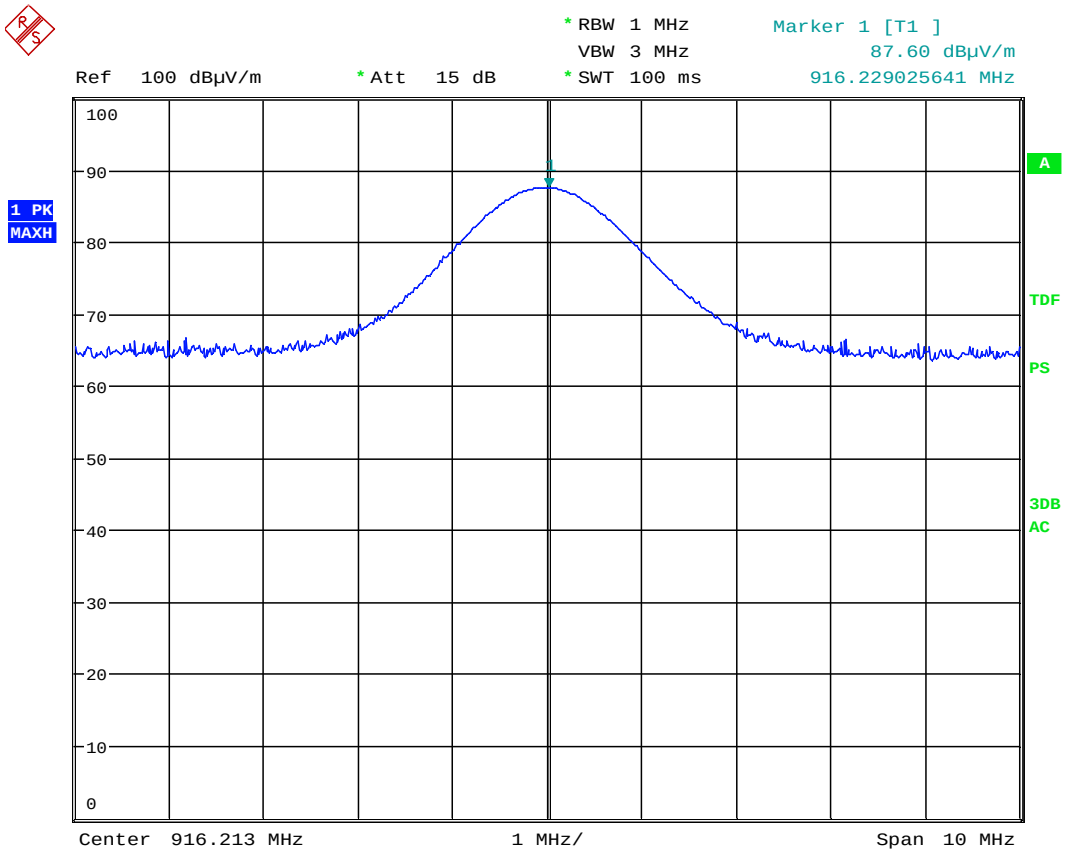
Radiated Power is calculated from measured field strength by the formulas in KDB 412172 D01 Determining ERP and EIRP v01.

Detachable antenna?	☐ Yes	☒ No
If detachable, is the antenna connector non-standard?	☐ Yes	☐ No

New batteries were used.

Requirements:

The maximum peak output power shall be ≤ 94dBµV/m



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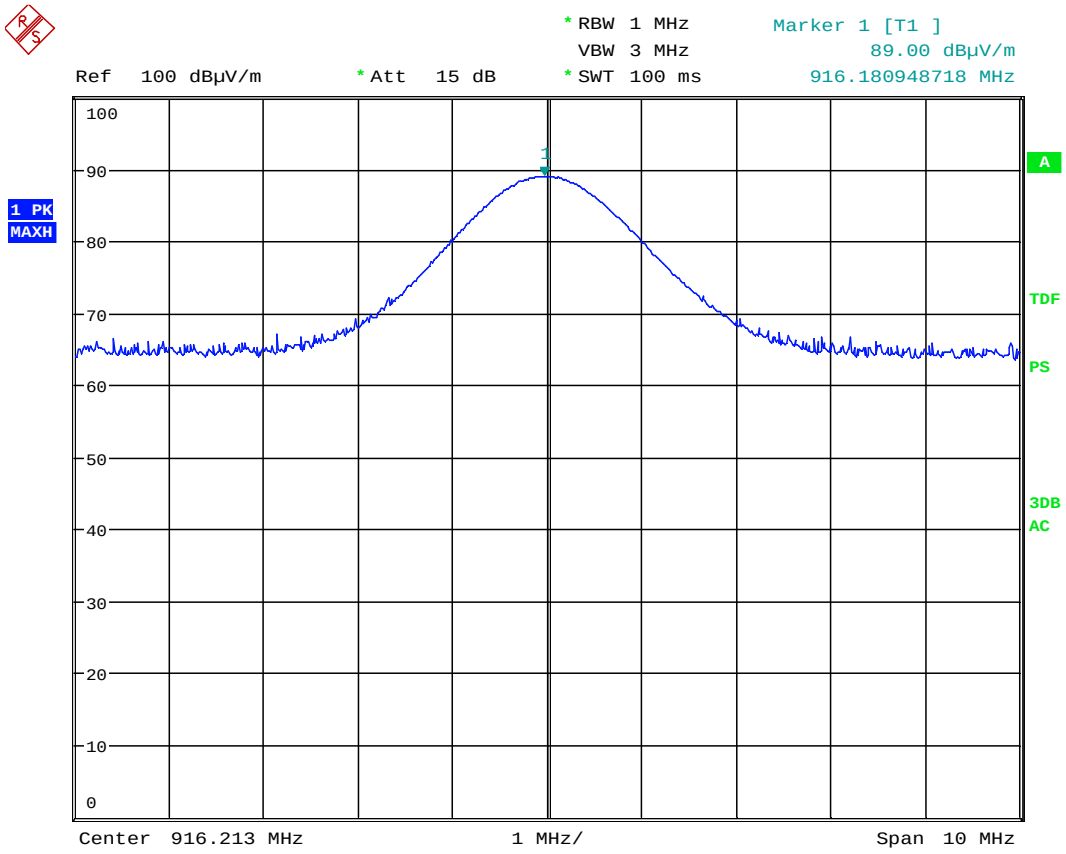
VP: 916.2125MHz – Field strength



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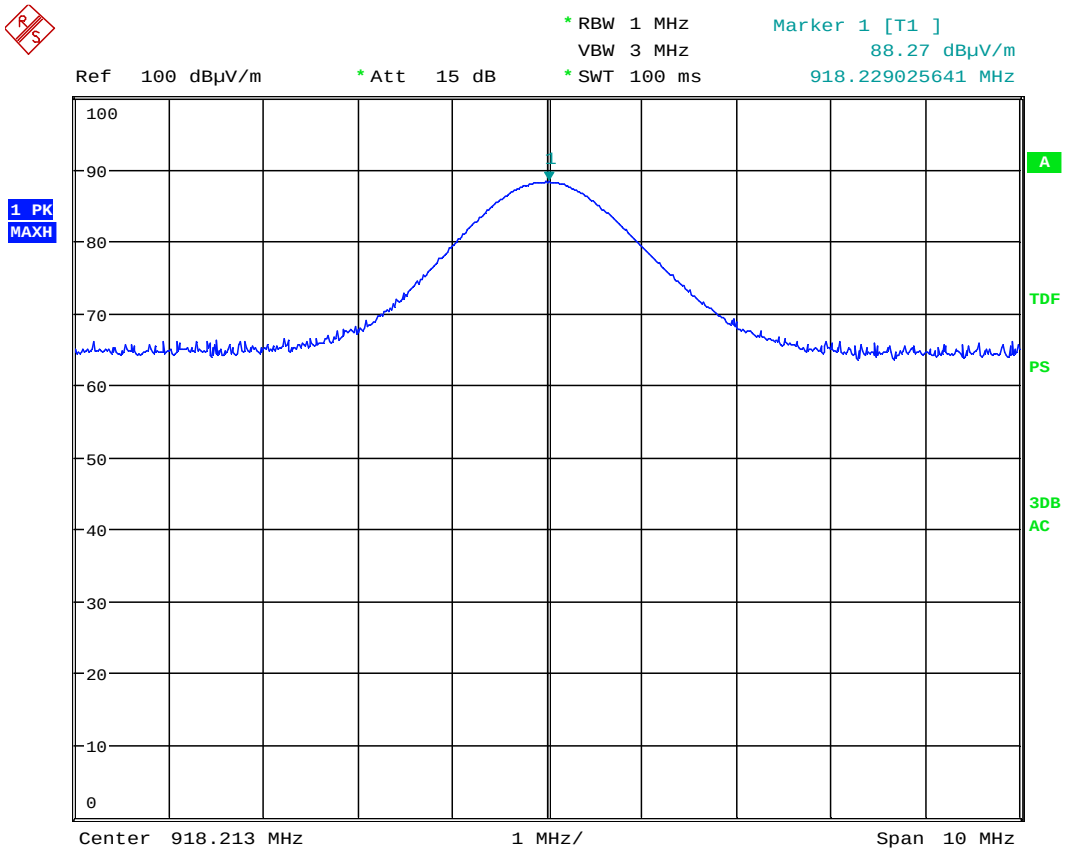
HP: 916.2125MHz – Field strength



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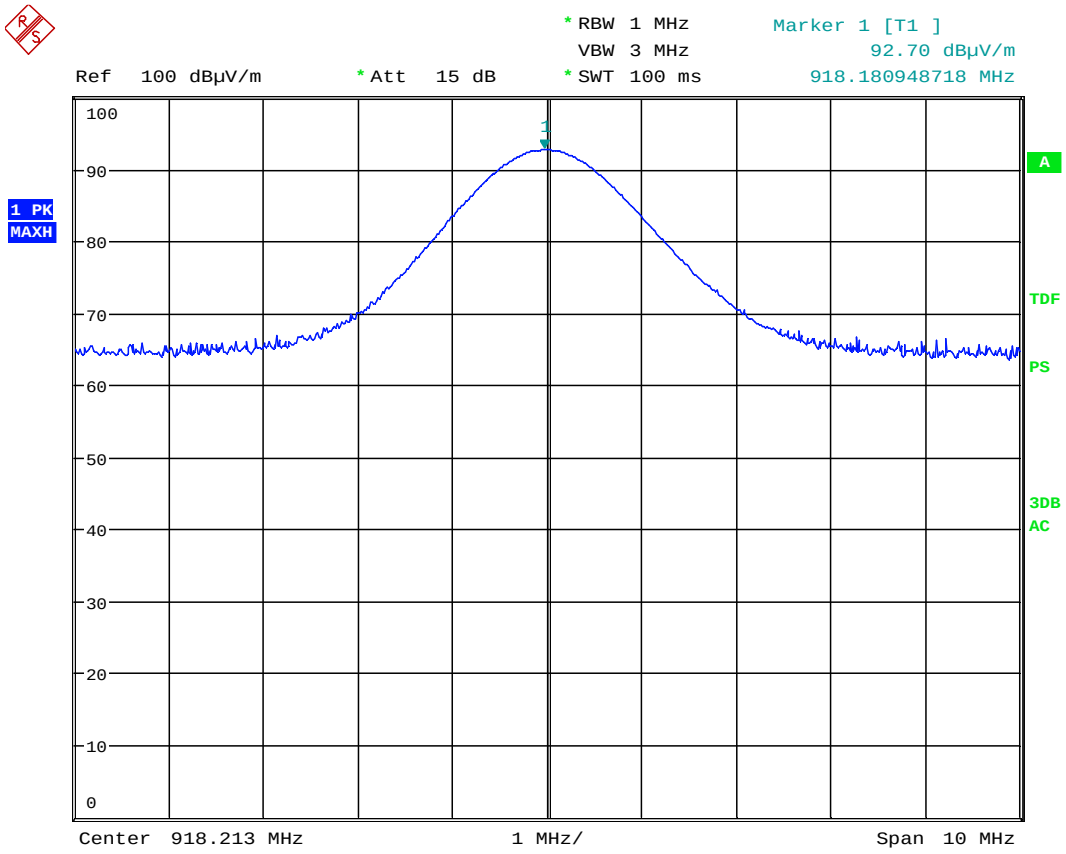
VP: 918.2125MHz – Field strength



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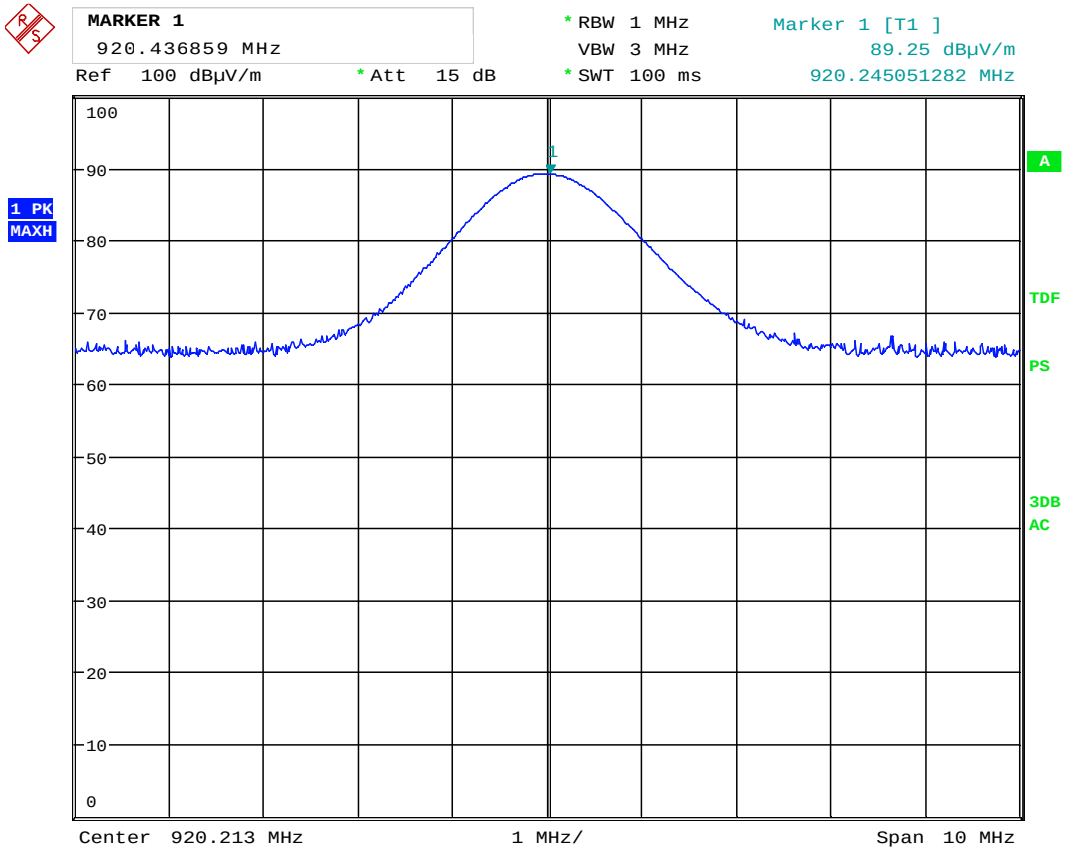
HP: 918.2125MHz – Field strength



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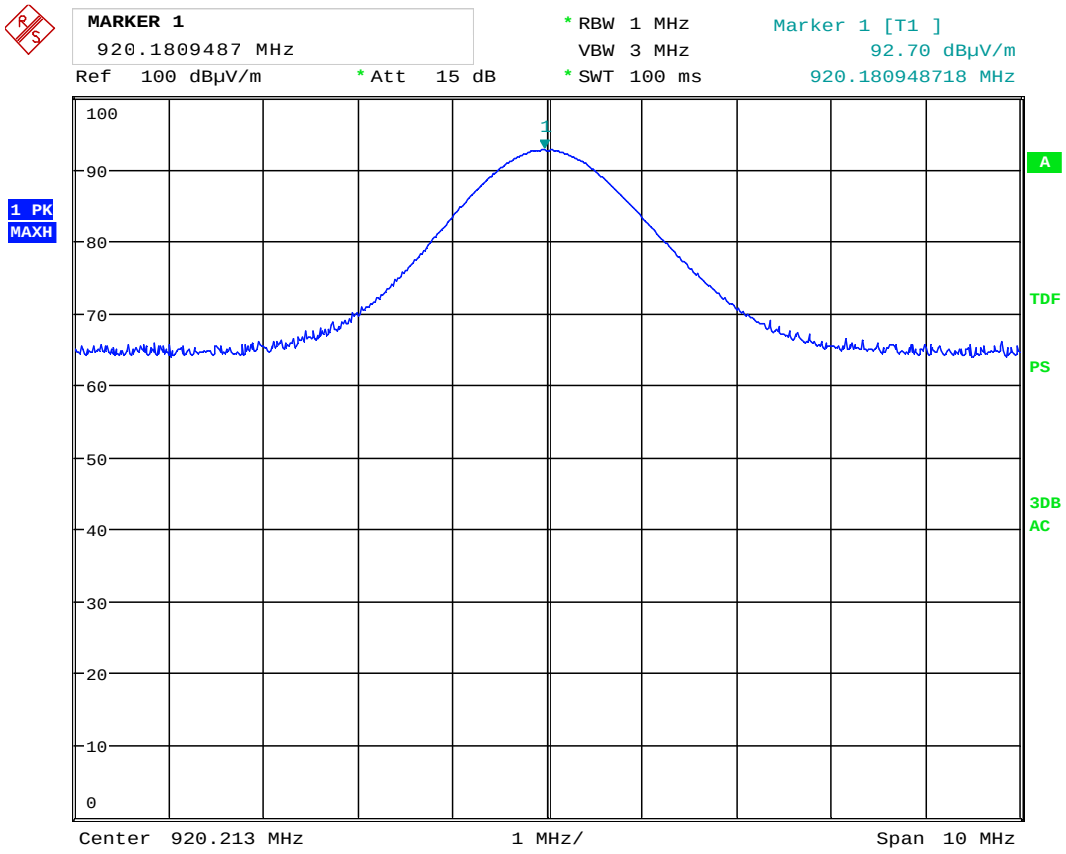
VP: 920.2125MHz – Field strength



Date: 18.FEB.2014 15:46:49

HP: 920.2125MHz – Field strength

3.4 Spurious emissions (radiated)

Para. No.: 15.209 / 15.249 (e) / A2.9 / 4.9

Test Performed By: G.Suhanthakumar	**Date of Test: 2014.02.18 – 2014.02.19**

Test Results: Complies

Measurement Data:

Radiated Emissions with antenna, 1-10 GHz

1-10 GHz measured at a distance of 3m.

Measured with Peak Detector:

Frequency	Channel	Field strength, Peak	Duty cycle corr. factor	Limit	Margin
GHz	MHz	dBµV/m	dB	dBµV/m	dB
1.832	916.2125	47.57	-	74	26.43
1.836	918.2125	49.99	-	74	24.01
1.840	920.2125	49.47	-	74	24.53
2.748	916.2125	55.07	-	74	18.93
2.754	918.2125	55.02	-	74	18.98
2.760	920.2125	55.50	-	74	18.50
3 - 10	All channels	None detected	-	-	-

Average Detector:

Frequency	Channel	Field strength, Peak	Duty cycle corr. factor	Limit	Margin
GHz	MHz	dBµV/m	dB	dBµV/m	dB
1.832	916.2125	43.06	-	54	10.94
1.836	918.2125	47.20	-	54	6.80
1.840	920.2125	46.64	-	54	7.36
2.748	916.2125	53.73	-	54	0.27
2.754	918.2125	53.28	-	54	0.72
2.760	920.2125	53.87	-	54	0.13
3 - 10	All channels	None detected	-	-	-

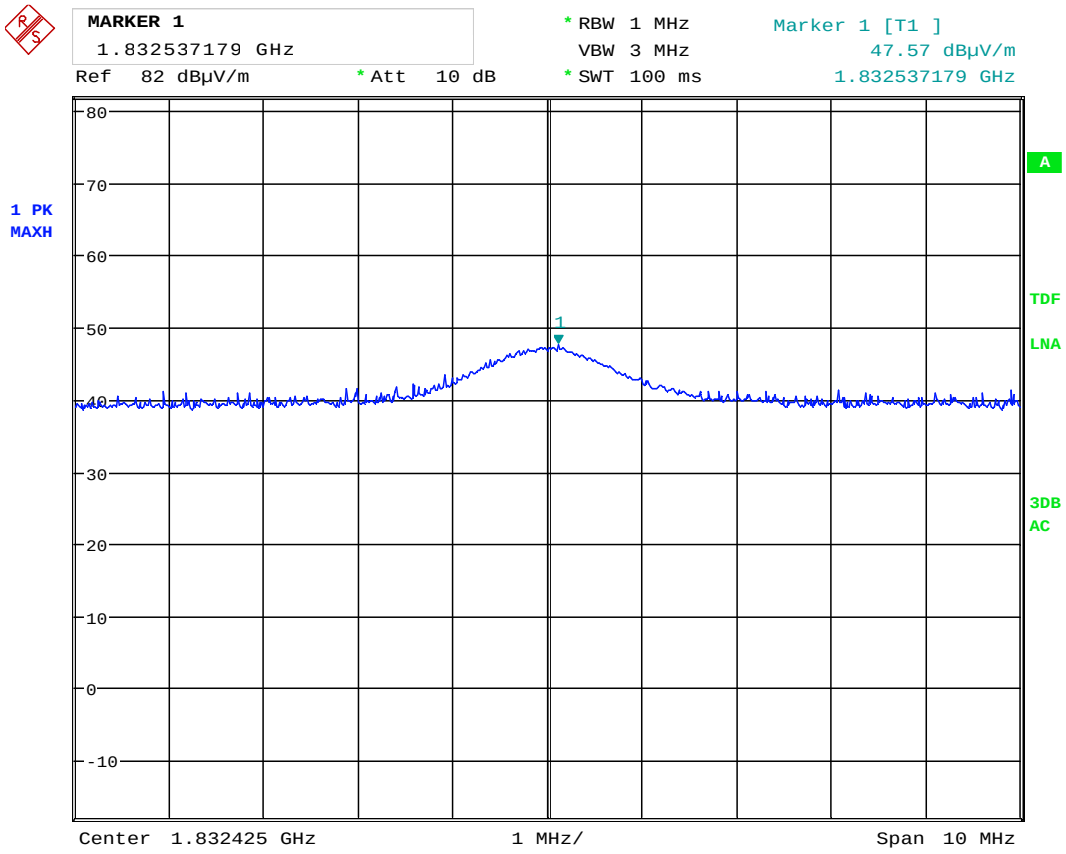
The maximum is observed in Vertical polarization for 2nd harmonic & Horizontal polarization for 3rd Harmonic.

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.



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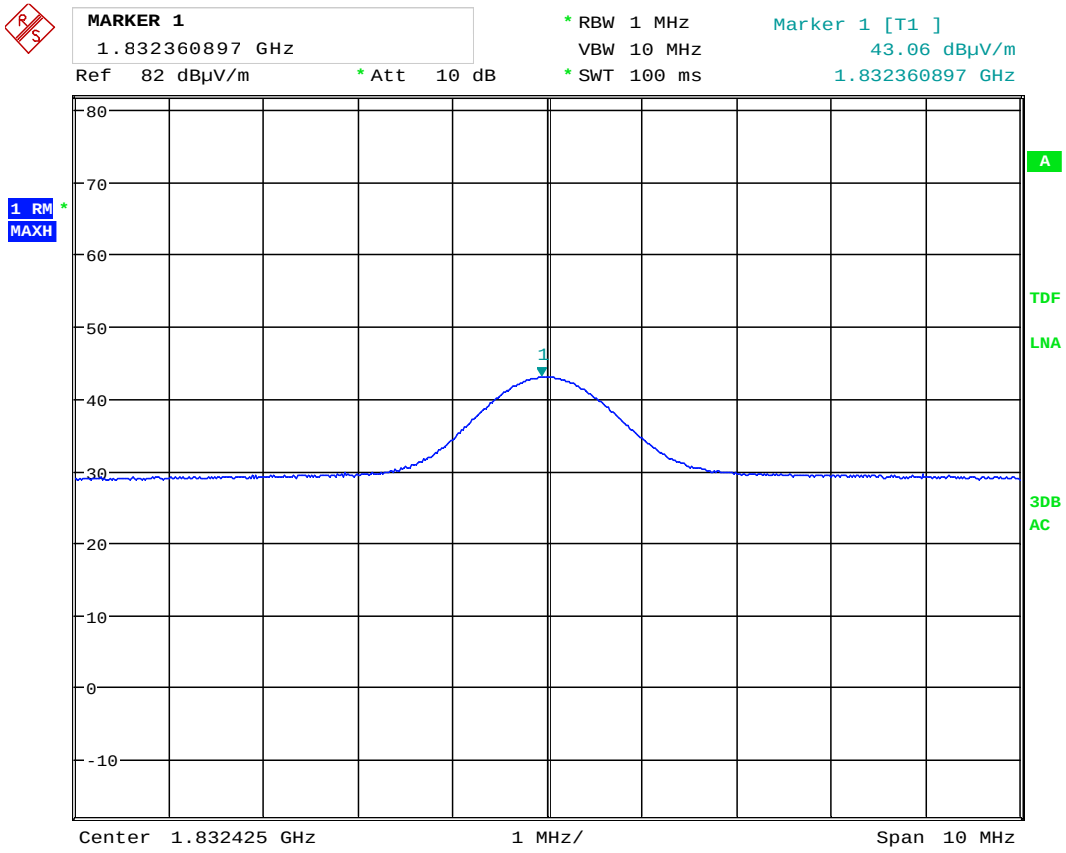
VP: 2nd Harmonic –Pk with HP-filter – ch916.2125MHz



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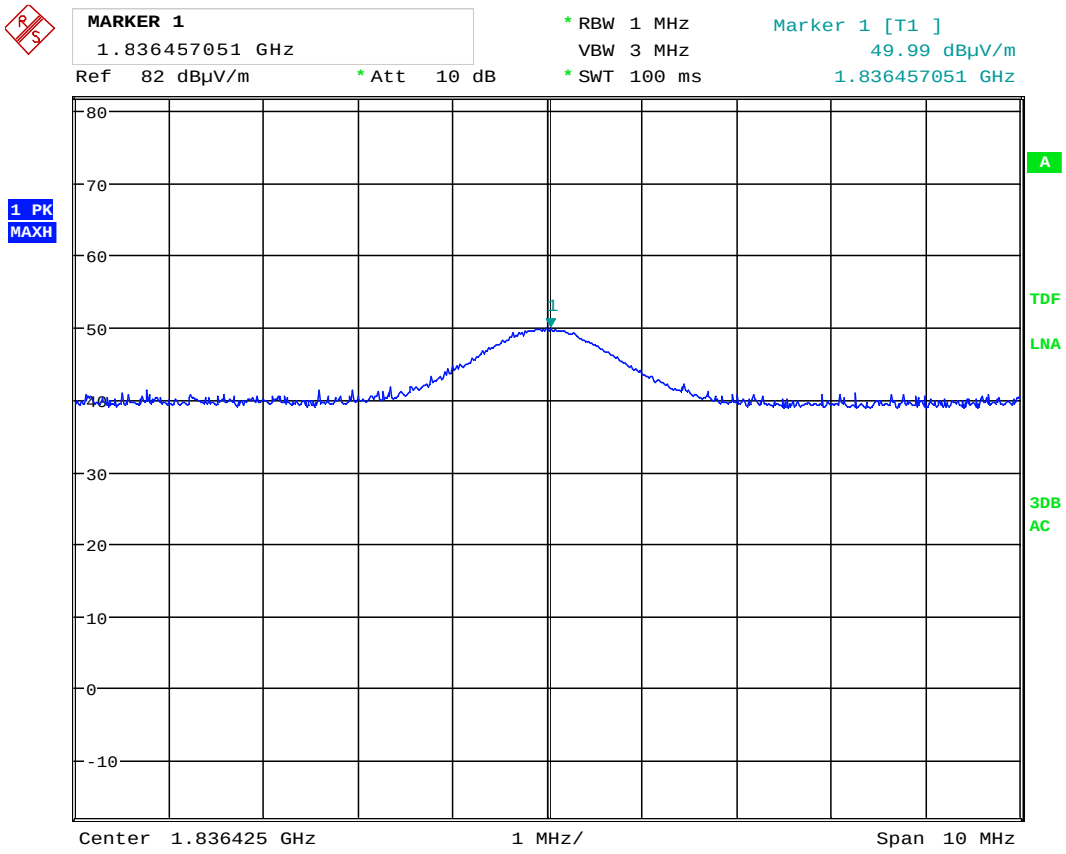
VP: 2nd Harmonic –Av with HP-filter – ch916.2125MHz



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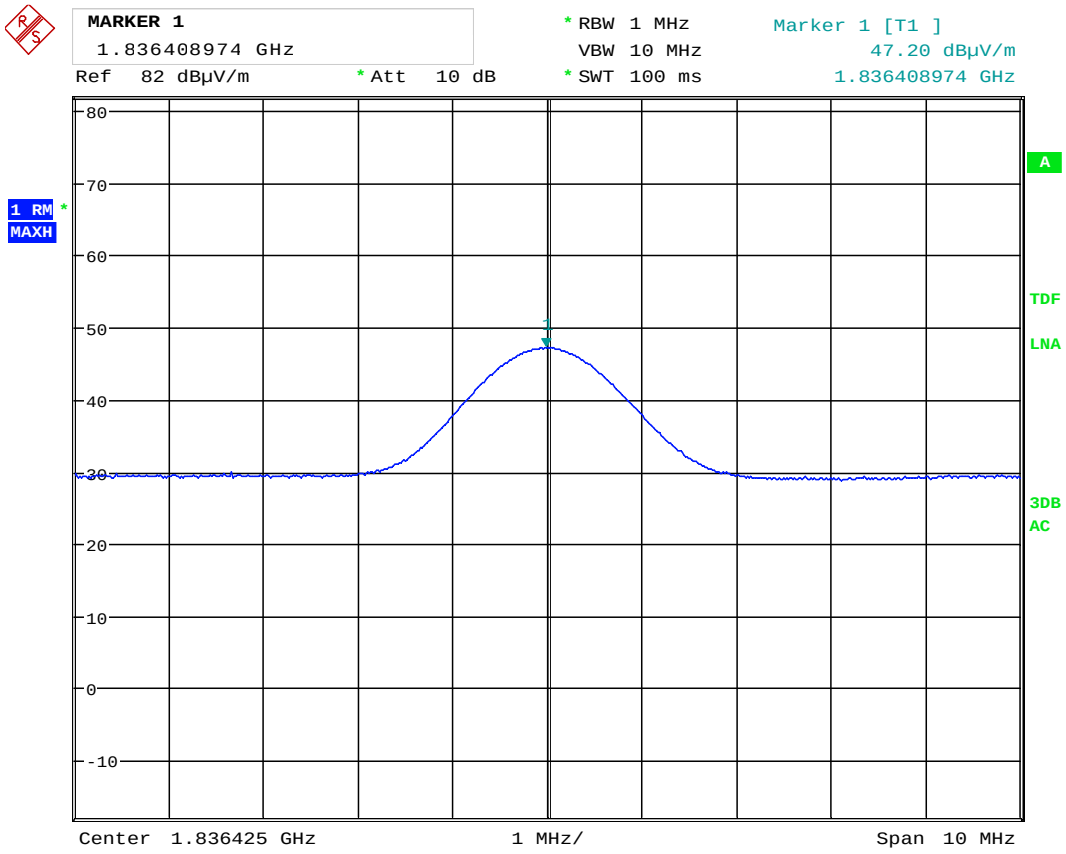
VP: 2nd Harmonic –Pk with HP-filter – ch918.2125MHz



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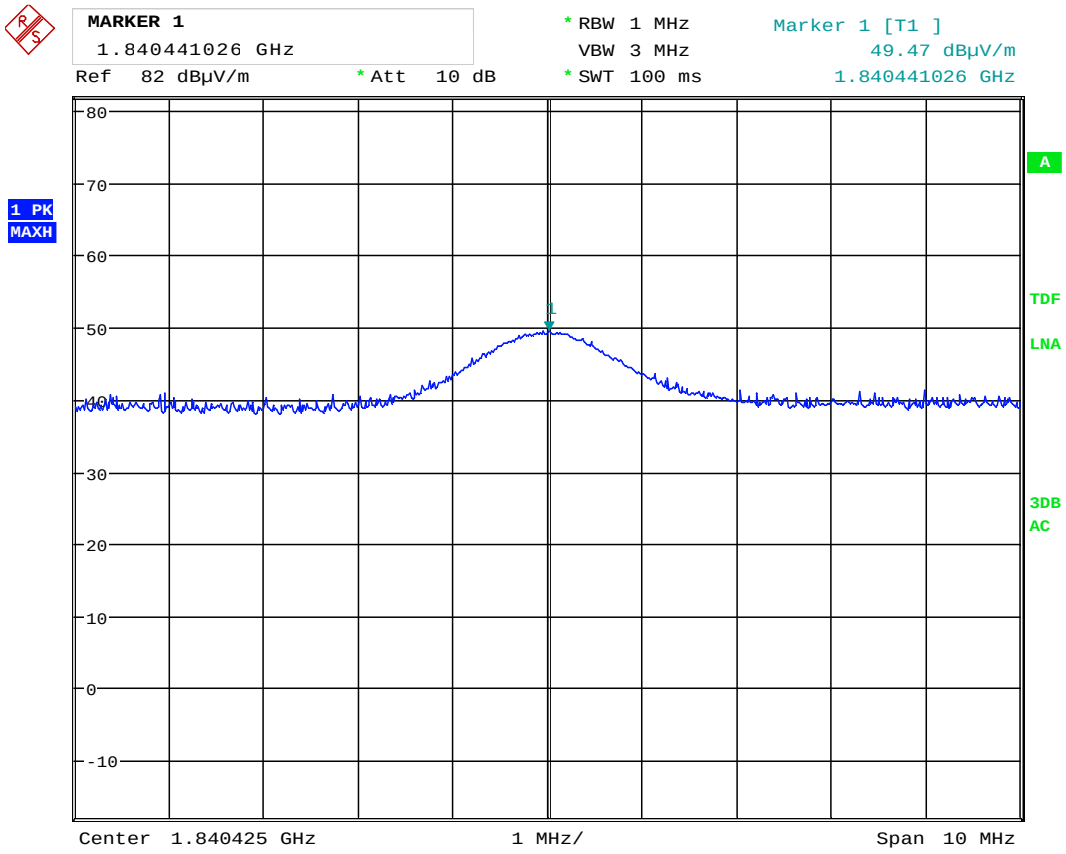
VP: 2nd Harmonic –Av with HP-filter – ch918.2125MHz



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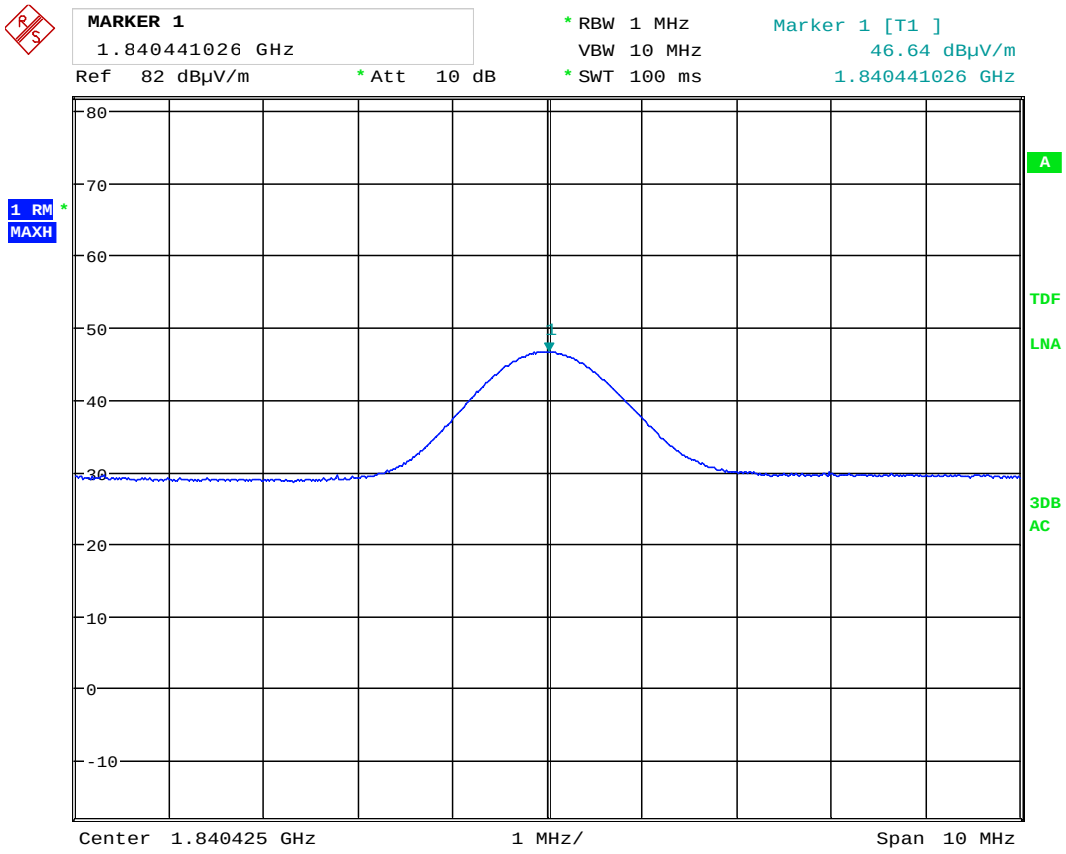
VP: 2nd Harmonic –Pk with HP-filter – ch920.2125MHz



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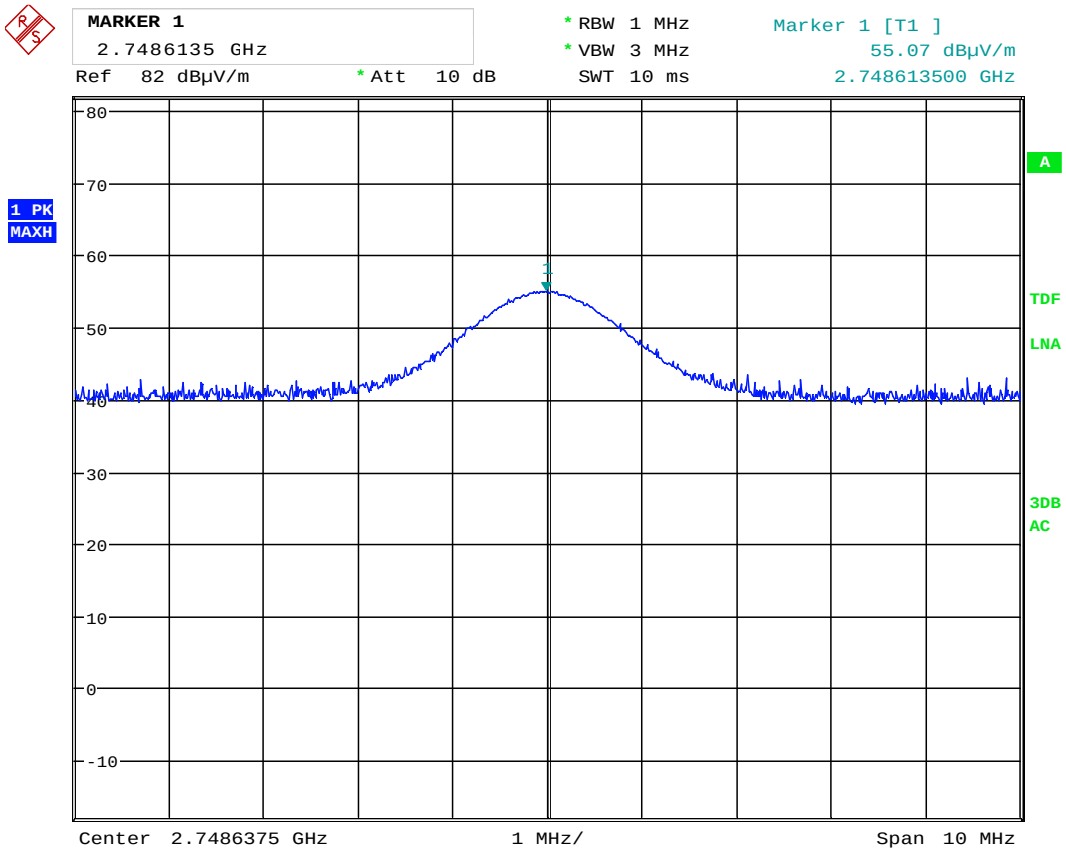
VP: 2nd Harmonic –Av with HP-filter – ch920.2125MHz



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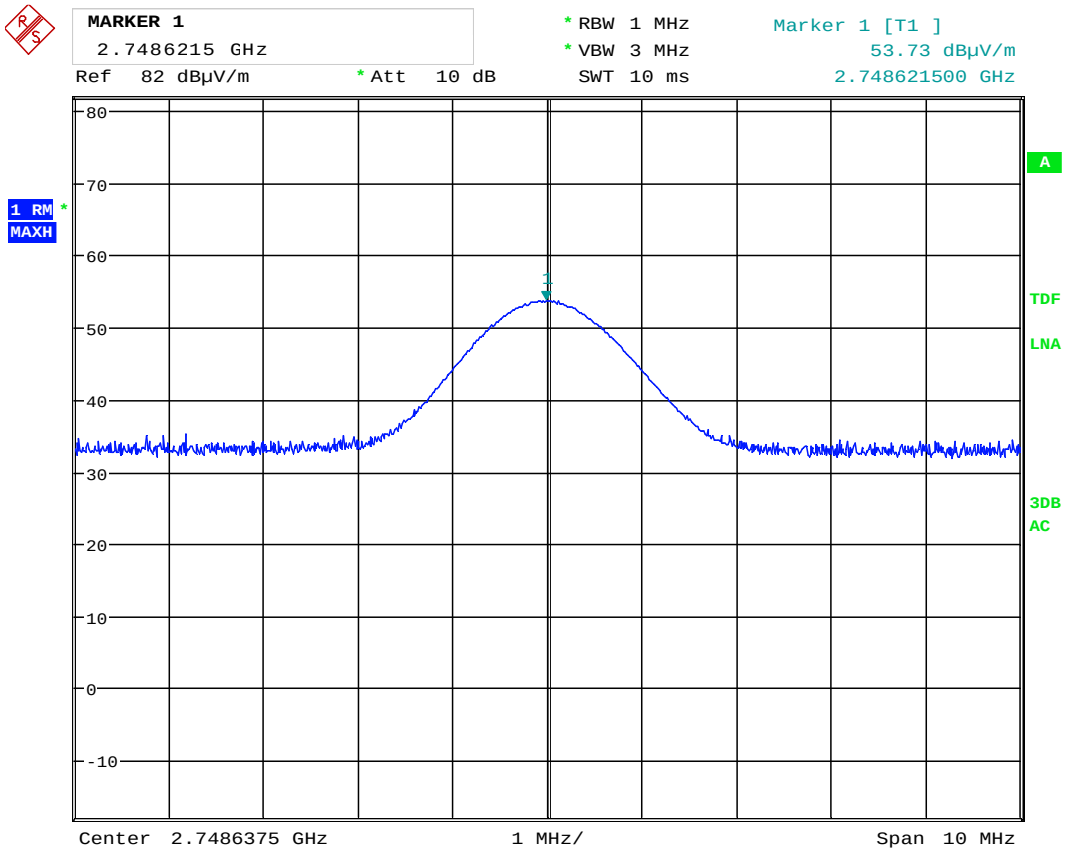
HP: 3rd Harmonic –Pk with HP-filter – ch916.2125MHz



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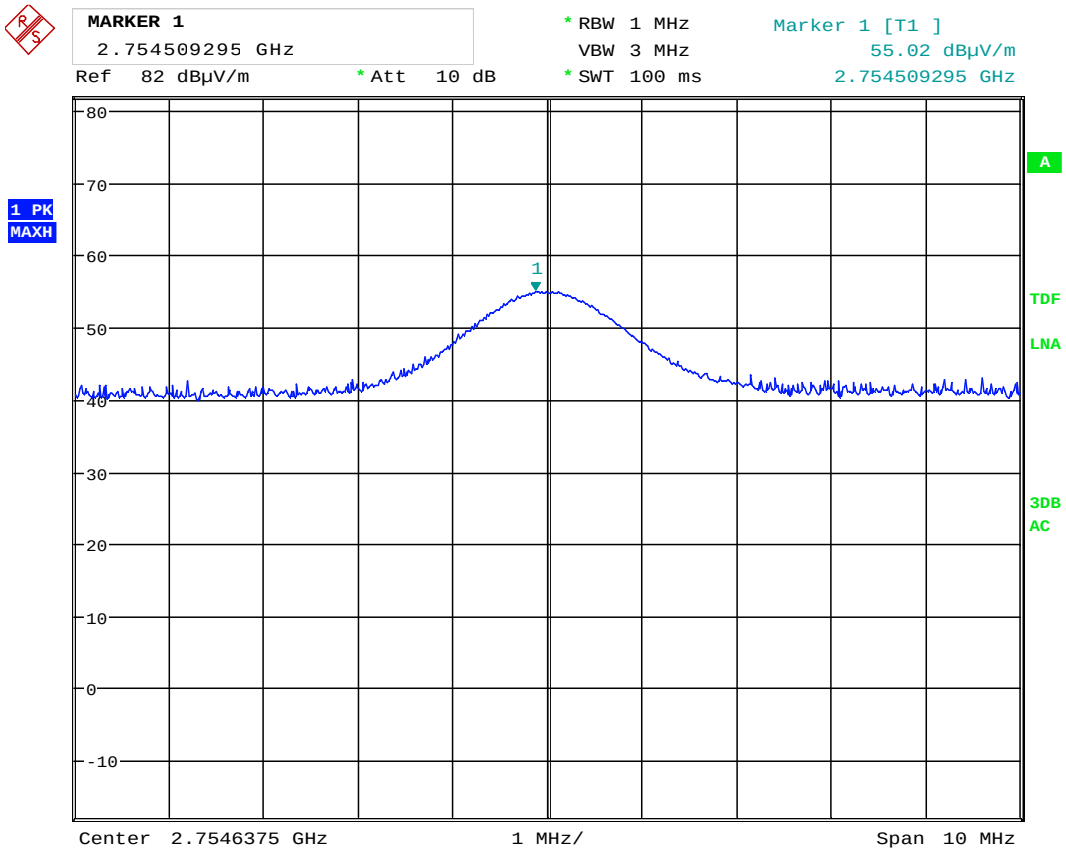
HP: 3rd Harmonic –Av with HP-filter – ch916.2125MHz



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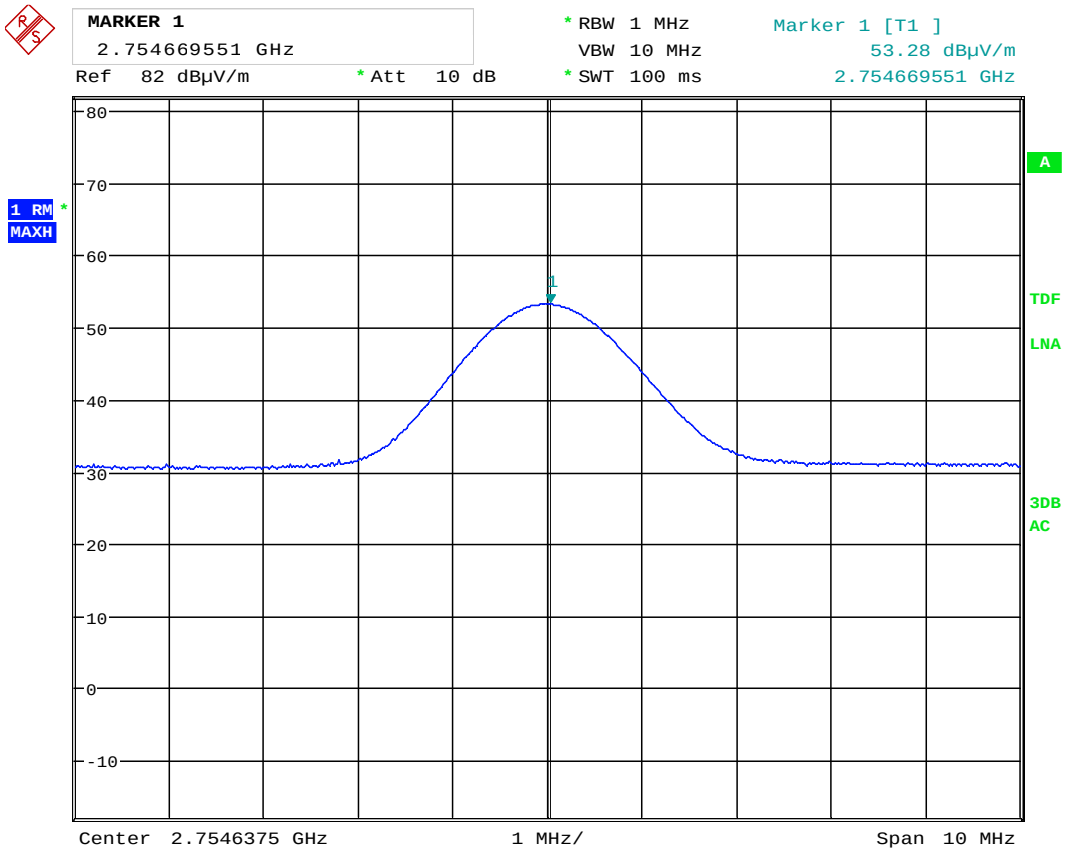
HP: 3rd Harmonic –Pk with HP-filter – ch918.2125MHz



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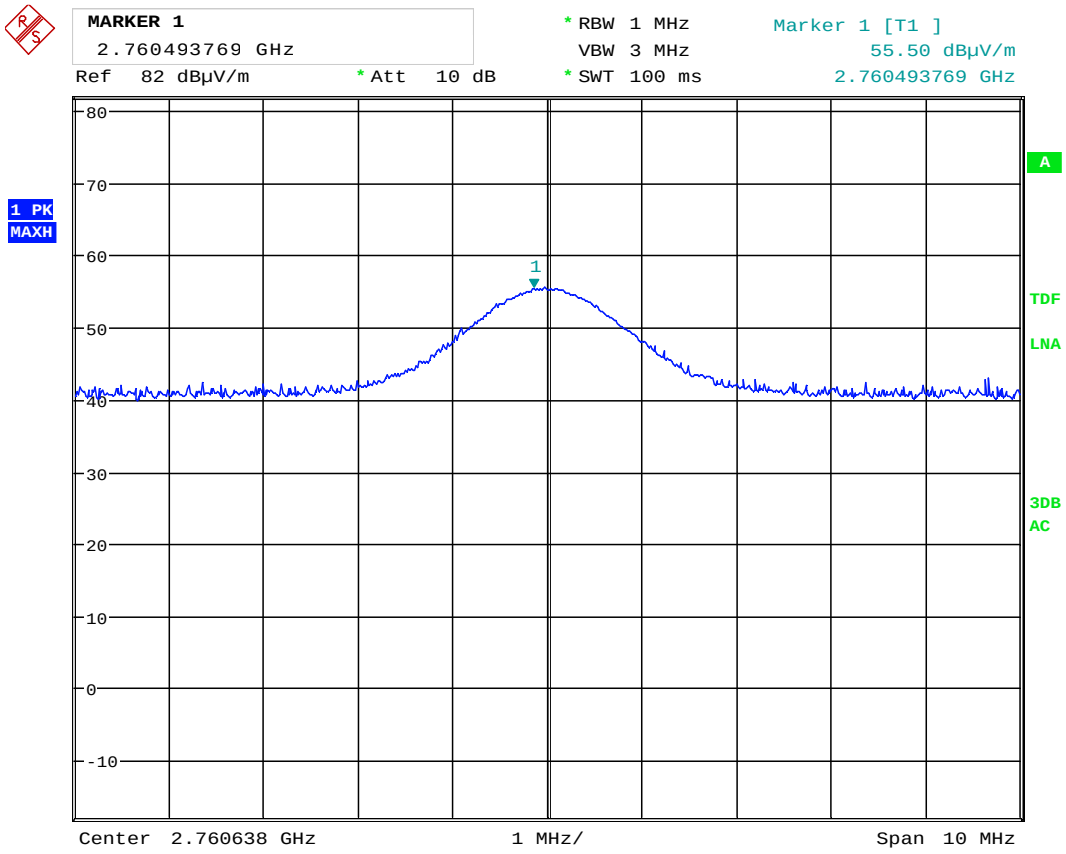
HP: 3rd Harmonic –Av with HP-filter – ch918.2125MHz



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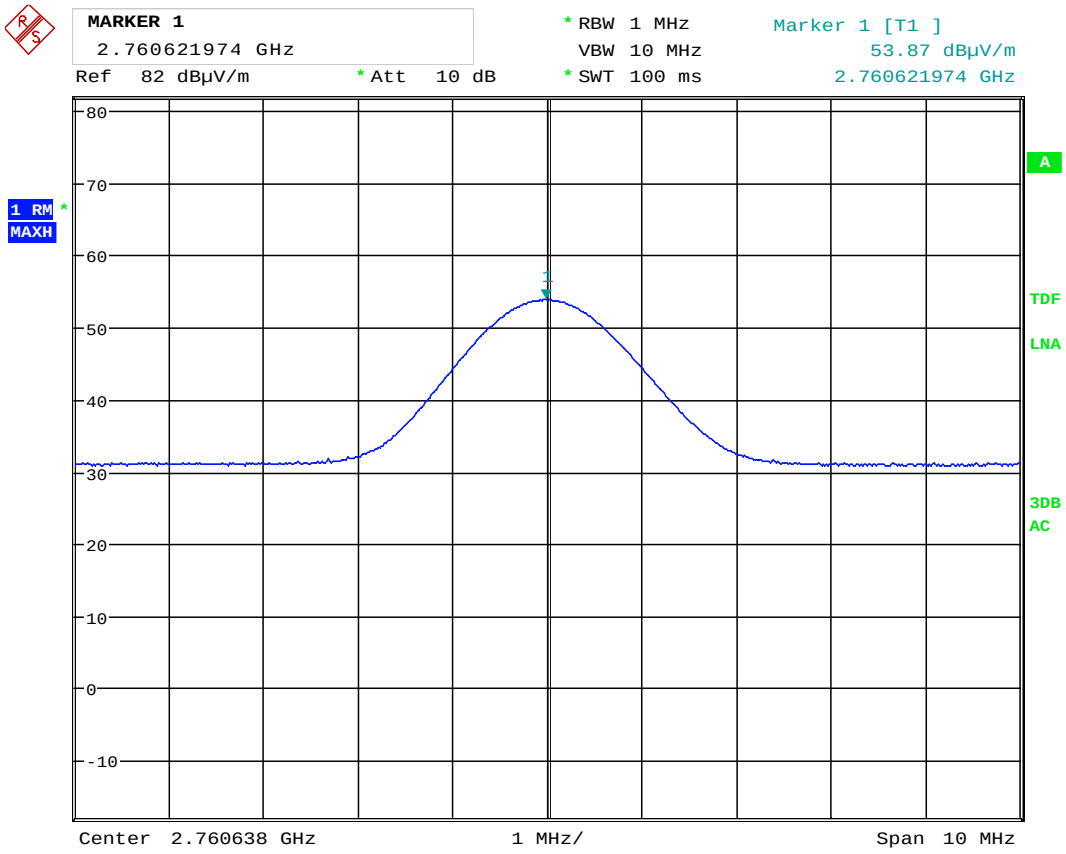
HP: 3rd Harmonic –Pk with HP-filter – ch920.2125MHz



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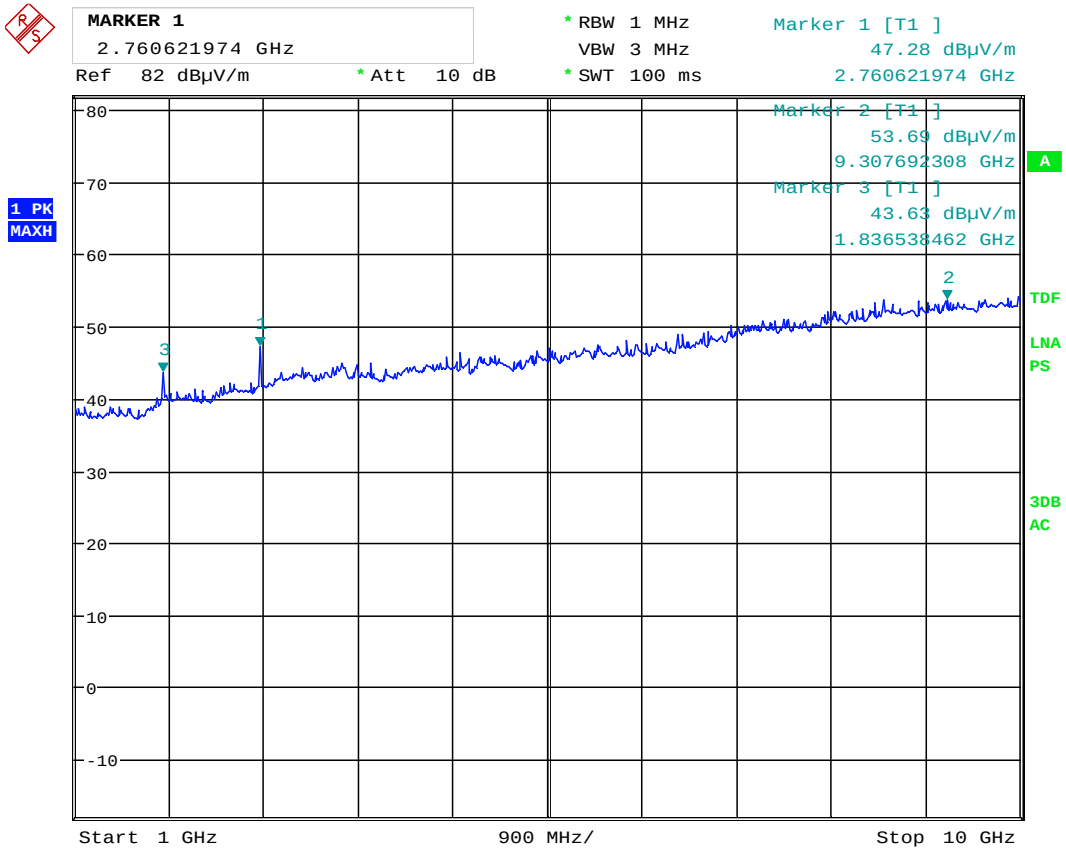
HP: 3rd Harmonic –Av with HP-filter – ch920.2125MHz



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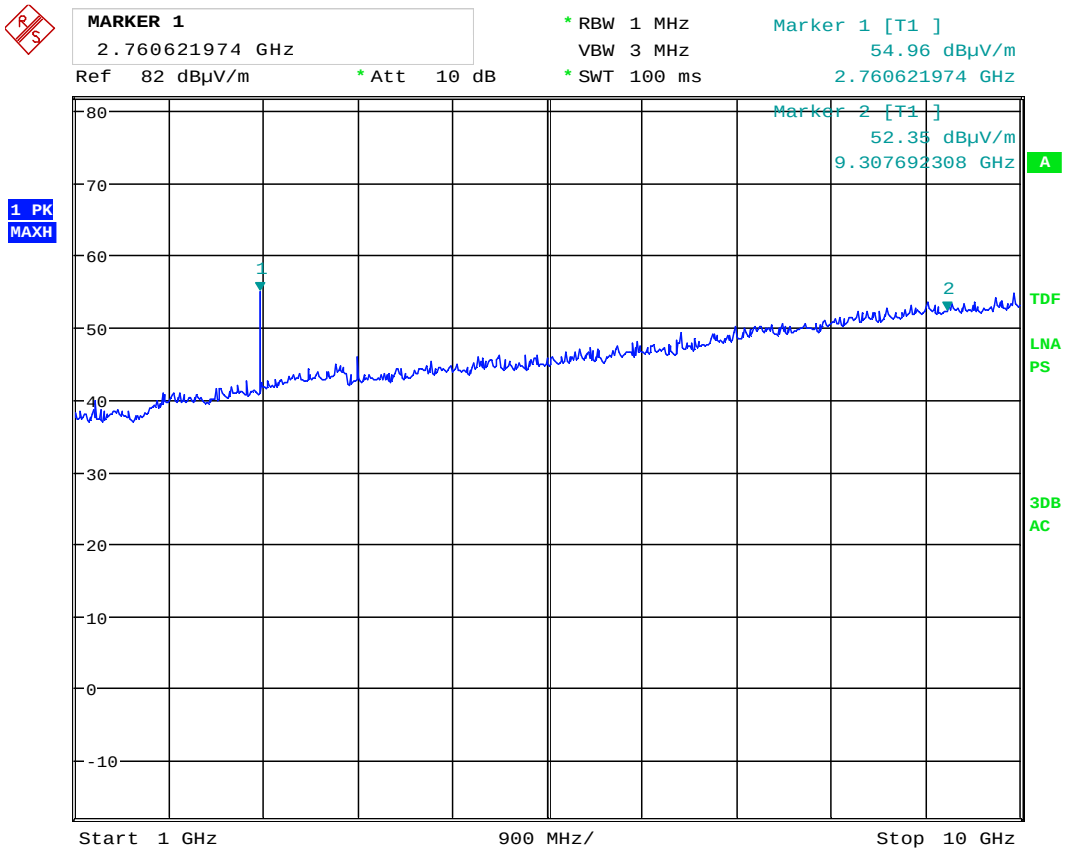
VP: pre-view scan 1 - 10 GHz –Pk with HP-filter – ch920.2125MHz



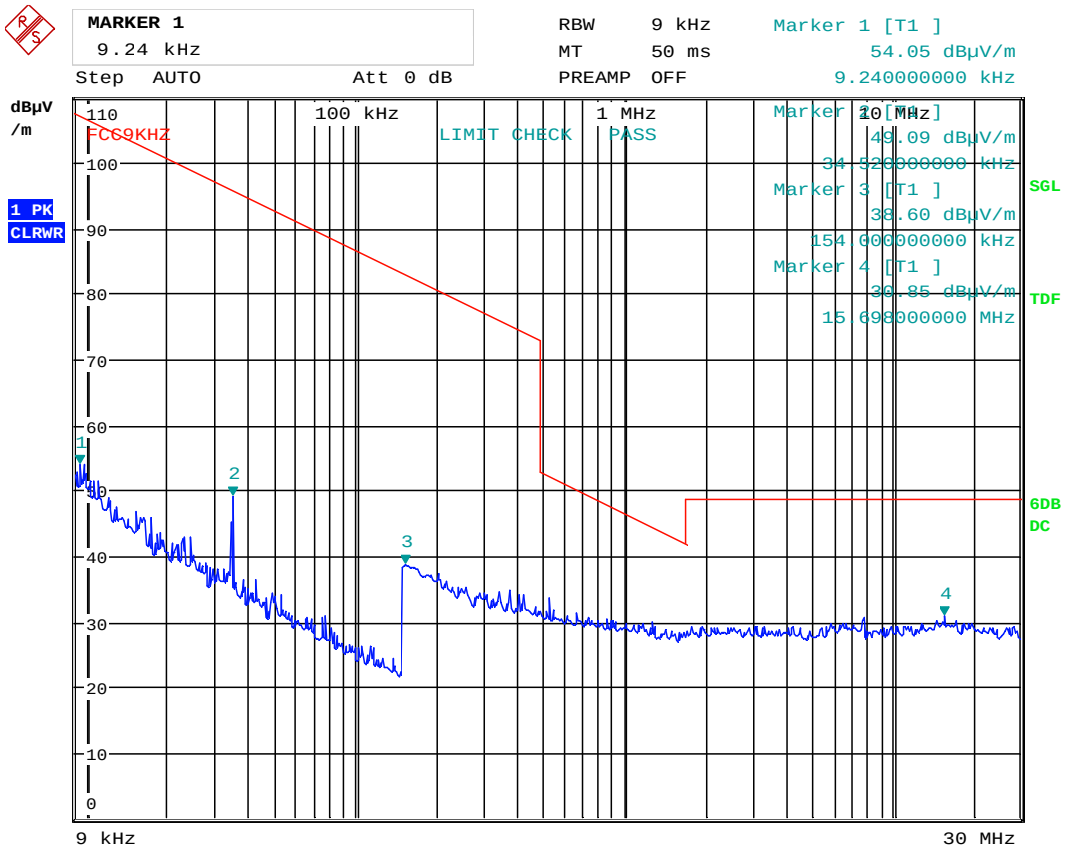
Date: 18.FEB.2014 16:17:33

HP: pre-view scan 1 - 10 GHz –Pk with HP-filter – ch920.2125MHz

Radiated emissions 9kHz – 30 MHz.

Detector: Peak

Measuring distance 10 m.



Date: 18.FEB.2014 10:04:21

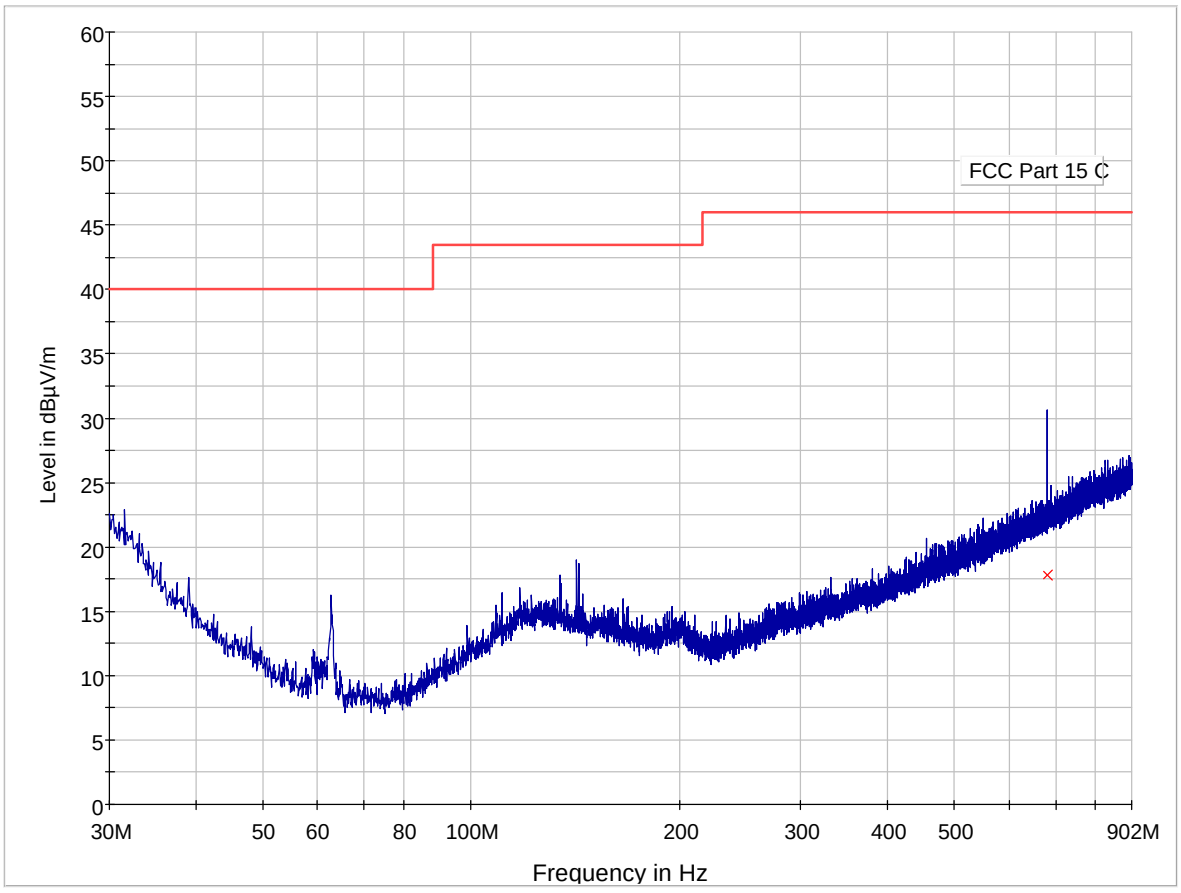
Radiated emissions 30 – 1000 MHz.

Detector: Peak

Measuring distance 3 m.

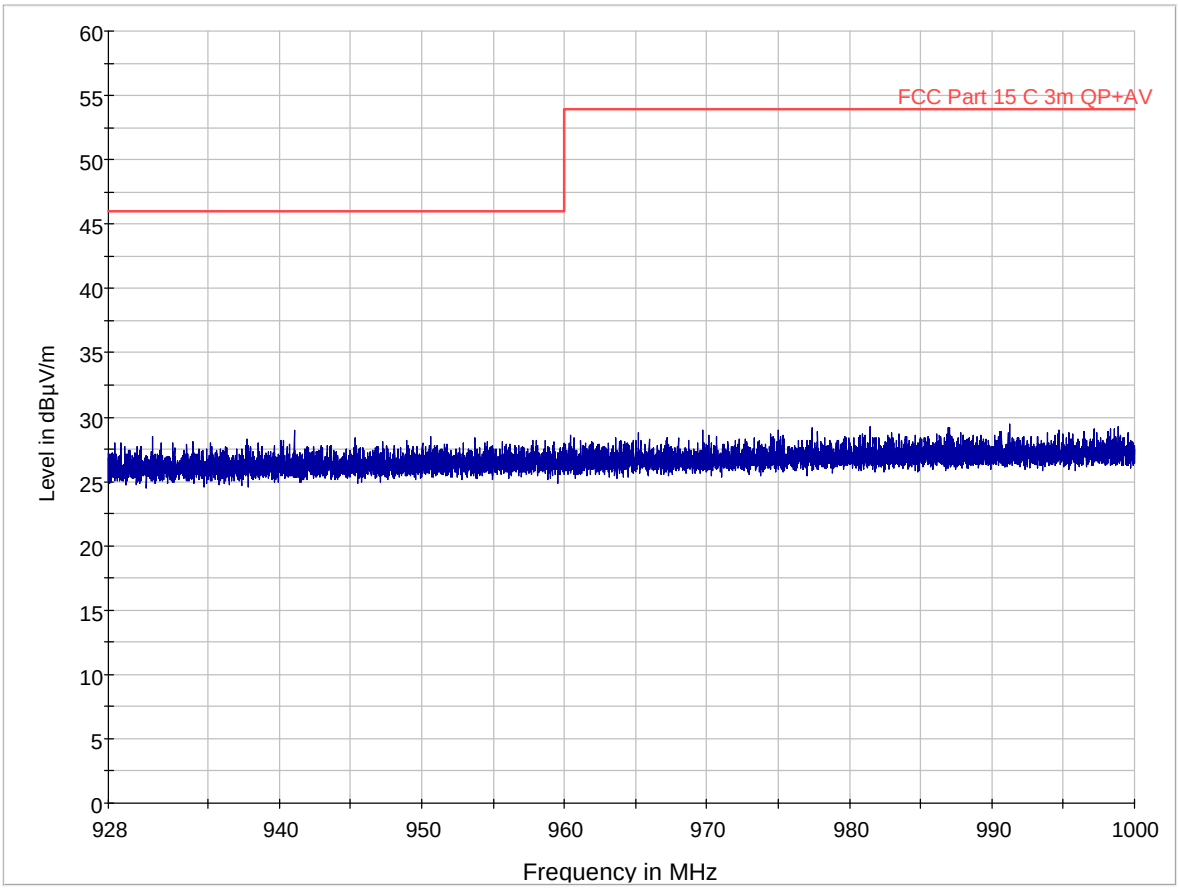
The graph shows peak scan and highest values. Since there is no spurious found no QP values are measured.

FCC Pt15 C 30-1000 MHz 3m



30 - 902MHz - channel 916.2125 MHz

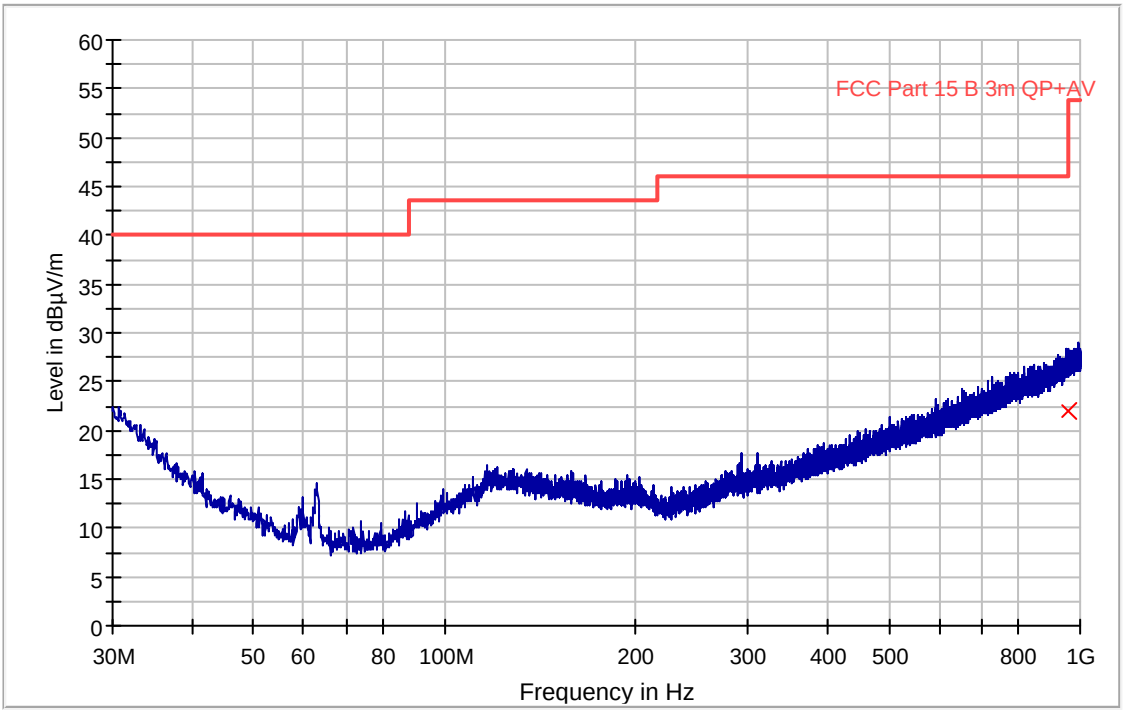
Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Margin (dB)	Limit (dBµV/m)	Comment
681.230642	17.8	120.000	28.2	46.0	



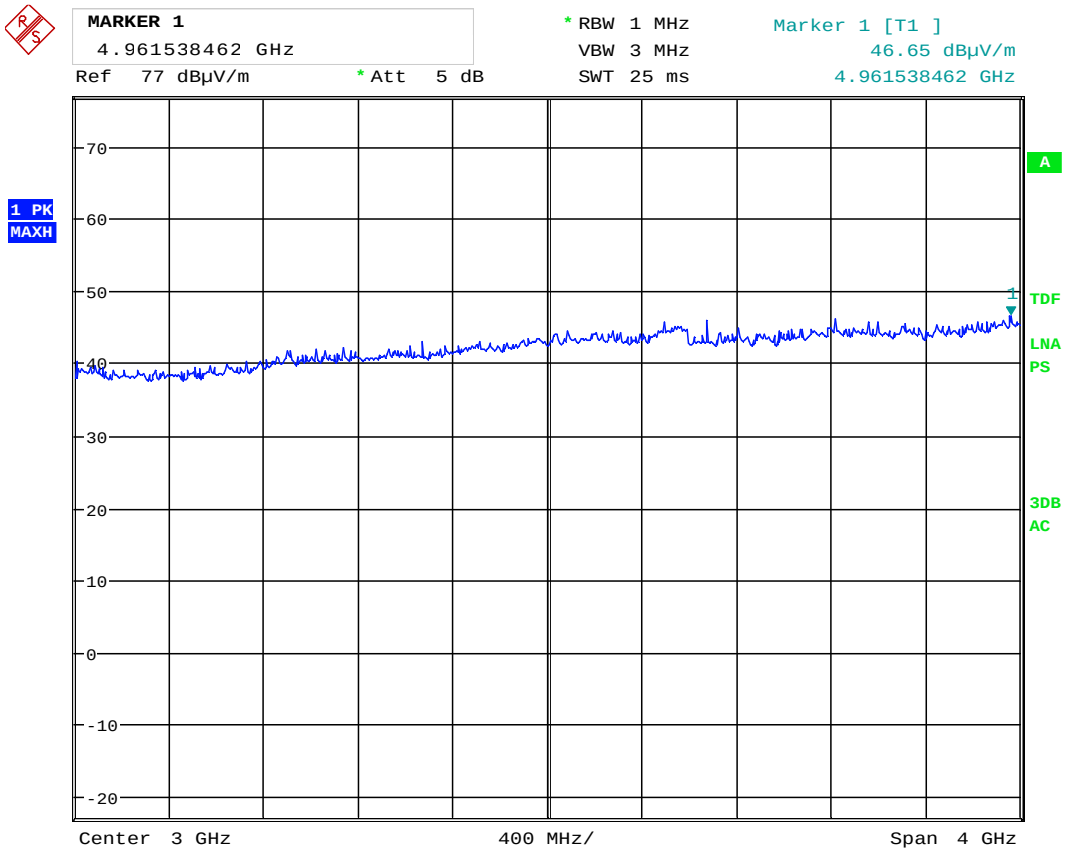
928 - 1000MHz – Channel 920.2125MHz

Part 15B in RX mode

FCC Pt15 Class B 30-1000M 3m



30 - 1000MHz @3m



Date: 19.FEB.2014 10:57:35

VP/HP in Rx mode : 1 - 5GHz

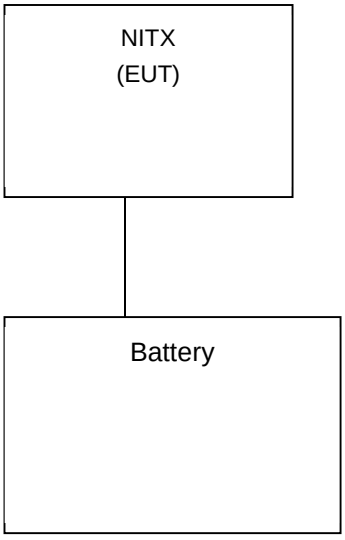
4 LIST OF TEST EQUIPMENT

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	2013.06	2014.06
2	3115	Antenna horn	EMCO	LR 1330	2014.01.05	2015.01.05
3	JB3	Antenna bilog	Sunol Sceiences Inc.	N-4525	2013.12	2014.12
4	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2013.09.27	2014.09.27
5	LNA6900	Pre-amplifier	Teseq	LR 1593	2013.11	2014.11
6	6812B	Power Supply	Agilent	LR 1515	2013.10.28	2014.10.28
7	ESH3-Z2	Pulse Limiter	Rohde & Schwarz	N-3821	2013.11	2015.11
8	ESCS 30	Measuring Receiver	Rohde & Schwarz	N-3529	2013.08	2014.08
9	ESH3-Z5	Two Line V-Network	Rohde & Schwarz	N-3558	2013.02	2015.02
10	Model 87 V	Multimeter	Fluke	LR 1598	2012.12.14	2014.12.14
11	6810.17A	10 attenuator	Suhner	LR 1143	2012.09.15	2014.09.15
12	FA210A1010003030	Microwave cable	Rosenberger	LR1566	Cal b4 use	
13	6HC 1000-18000	HP Filter	Trithlic	-	Cal b4 use	
14	6HC 2500-18000	HP Filter	Trithlic	LR1615	Cal b4 use	
15	B32-10R	Power Supply	Oltronix	LR1021	Cal b4 use	

5 BLOCK DIAGRAM

5.1 System set up for radiated measurements



Test equipment: 1- 12

5.2 Test site radiated emission