

FCC Test Report for Part 15.249

Product name : IPT WPTT Base
Applicant : IP Trade S.A
FCC ID : 2ADNWIPT-WPTTB

Test report No. : 151201851-402 Ver 1.00

Laboratory information

Accreditation

Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001

Documentation

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Testing Location

Test Site	Telefication BV
Test Site location	Edisonstraat 12a 6902 PK Zevenaar The Netherlands Tel. +31316583180 Fax. +31316583189
Test Site FCC	NL0001

Revision History

Version	Date	Remarks	By
v0.50	23-03-2016	Draft version main module	RvB
v1.00	12-04-2015	First release version	RvB

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Summary of Test results

FCC	Description	Section in report	Verdict
15.249(a)	Field strength of fundamental	3.1	Pass
15.209(a)	Radiated emissions	3.2	Pass
15.209(a)	Band edge	3.3	Pass

1 General Description

1.1 Applicant

Client name:	IP Trade S.A
Address	Rue de l'Aéropostale 8, Grace-Hollogne, Belgium
Zip code:	4460
Telephone:	+32 43640460
Contact name:	C. Wargnies

1.2 Manufacturer

Manufacturer name:	IP Trade S.A
Address:	Rue de l'Aéropostale 8, Grace-Hollogne, Belgium
Zip code:	4460
Telephone:	+32 43640460
Contact name:	C. Wargnies

1.3 Tested Equipment Under Test (EUT)

Product name:	WPTT Base
Brand name:	IP Trade
Product type:	Wireless push to talk
FCC ID:	2ADNWIPT-WPTTB
Model(s):	WPTT Base
Software version:	1.3
Hardware version:	000
Date of receipt	16-03-2016
Tests started:	16-03-2016
Testing ended:	30-03-2016

1.4 Product specifications of Equipment under test

Tx Frequencies:	905 MHz ~ 925 MHz
Rx frequencies:	905 MHz ~ 925 MHz
Maximum output power to antenna:	-3.4 dBm
Antenna type and gain:	Chip and PCB antenna Peak Antenna Gain: -1dBi Average Antenna Gain:-4.0 dBi
Emission Designator	F1D
Type of modulation:	GFSK

1.5 Environmental conditions

Test date	17-03-2016	21-03-2016	30-03-2016
Ambient temperature	22.8°C	20.7°C	21.6°C
Humidity	29.3%	38.1%	40.1%

1.6 Applicable standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.249 and Part15 Subpart C §15.209.
- ANSI C63.4: 2014
- ANSI C63.10:2013

1.7 Conclusions

The sample of the product showed NO NON-COMPLIANCES to the specifications stated in paragraph 1.6 of this report.

The results of the test as stated in this report are exclusively applicable to the product items as identified in this report. Telefication accepts no responsibility for any properties of product items in this test report, which are not supported by the tests as specified in paragraph 1.6 "*Applicable standards*".

All tests are performed by:

Name : ing R van Barneveld

Review of test methods and report by:

Name : ing J.C. le Clercq

The above conclusions have been verified by the following signatory:

Date :12-04-2016

Name : ing M.T.P.M Wouters v/d Oudenweijer

Function : Director Certification

Signature :



2 Test configuration of the Equipment Under Test

2.1 Test mode

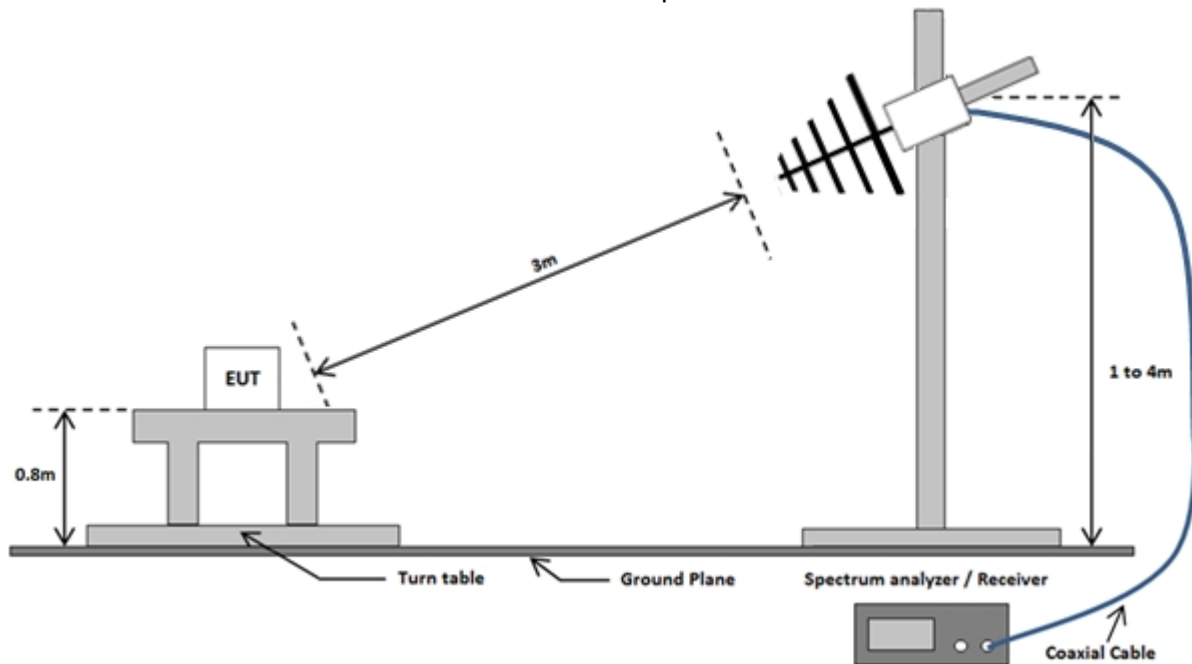
Radiated test cases were performed with the EUT configured to transmit at -3.4 dBm with test mode software. Frequency range from 30 MHz up to at least the 10th Harmonic of the Fundamental Frequencies. The low, mid and high channel were examined.

2.2 Tested channels and Data rates

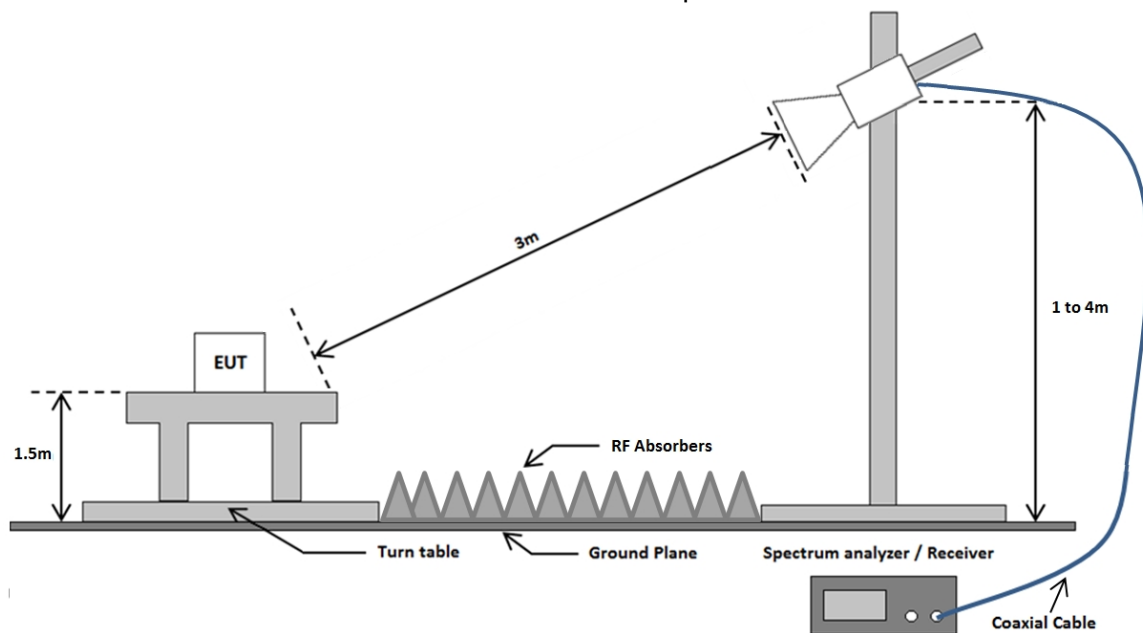
Technology	Channels	Data rate (kBaud)	Frequency (MHz)
Propriety RF	Low	249.756	905
	Mid	249.756	915
	High	249.756	925

2.3 Radiated Test setup

Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



2.4 Equipment used in the test configuration

Description	Manufacturer	Model	ID	Used at Par.
Spectrum Analyser	Rohde & Schwarz	FSP40	TE11125	3.2
EMI Receiver	Rohde & Schwarz	ESCI	TE11124	3.1/3.2/3.3
Biconilog Antenna	Chase	CBL6112A	TE00967	3.1/3.2/3.3
Horn Antenna	EMCO The Electro – Mechanics Co	3115	TE00531	3.2
Pre-amplifier	Miteq	JF4-18004000-30-8P-A1	TE11131	3.2
Semi Anechoic Room	Comtest Engineering BV	--	TE00861	3.1/3.2/3.3

2.5 Sample calculations

dBμV/m to dBm.(EIRP)	dBμV/m to dBm(ERP).	μV/m to dBμV/m
$E(\text{dB}\mu\text{V/m}) = \text{EIRP}(\text{dBm}) + 95.2$	$E(\text{dB}\mu\text{V/m}) = \text{ERP}(\text{dBm}) + 97.4$	$E(\text{dB}\mu\text{V/m}) = 20 \log (\mu\text{V/m})$

3 Test results

3.1 Field Strength of Fundamental Measurement

3.1.1 Limit

According to 15.249(a)

Frequency (MHz)	Field strength (mV/m)	Field strength (dB μ V/m)	Measurement distance(m)
902 – 928	50	94	3

3.1.2 Measurement instruments

The measurement instruments are listed in chapter 2.4 of this report.

3.1.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.1.4 Test procedure

According to ANSI C63.10: 2013 chapter 6.5

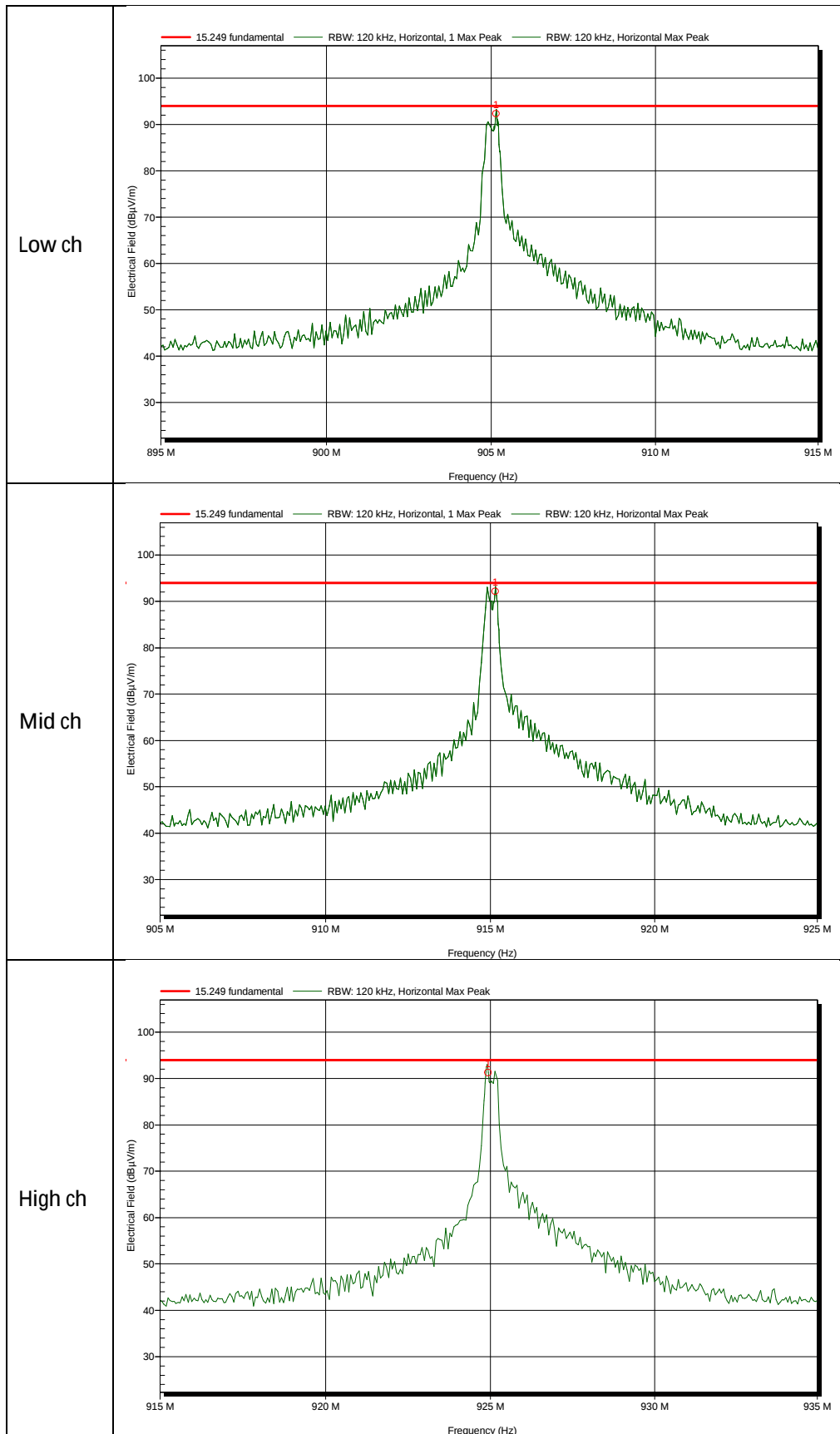
3.1.5 Test results of Field Strength of Fundamental Measurement

Field strength of fundamental					
Channels	Frequency (MHz)	Data rate (kBaud)	Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low	905	249.756	92,3	94	1,7
Mid	915	249.756	92,1	94	1,9
High	925	249.756	91,2	94	2,7
Uncertainty	± 3.6 dB				

3.1.6 Notes

- The worst case Field Strength was found, with vertical antenna polarization.

3.1.7 Plots of the Field Strength of Fundamental Measurement



3.2 Radiated Spurious Emissions Measurement

3.2.1 Limit

According to FCC part 15.209(a)

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Field strength ($\text{dB}\mu\text{V}/\text{m}$)	Measurement distance(m)
30 -88	100	40	3
88 - 216	150	43,5	3
216-960	200	46	3
Above 960	500	54	3

3.2.2 Measurement instruments

The measurement instruments are listed in chapter 2.4 of this report.

3.2.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.2.4 Test procedure

According to ANSI C63.10: 2013 chapter 6.5 and 6.6

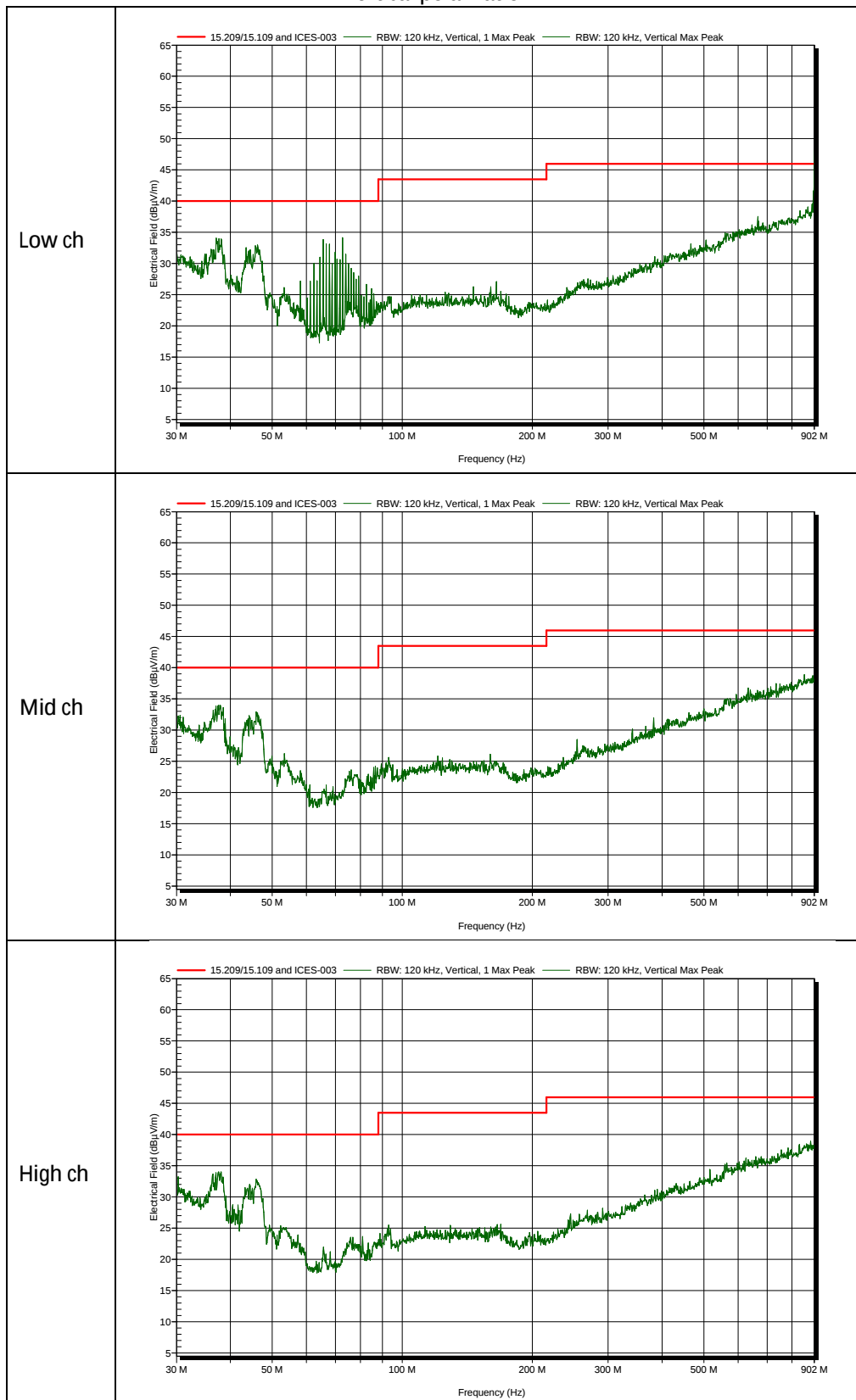
3.2.5 Notes:

- The trace is measured with an peak detector the peak sfound are re-measured using a Quasi-peak detector

3.2.6 Plots and Results of the Radiated Spurious Emissions Measurement

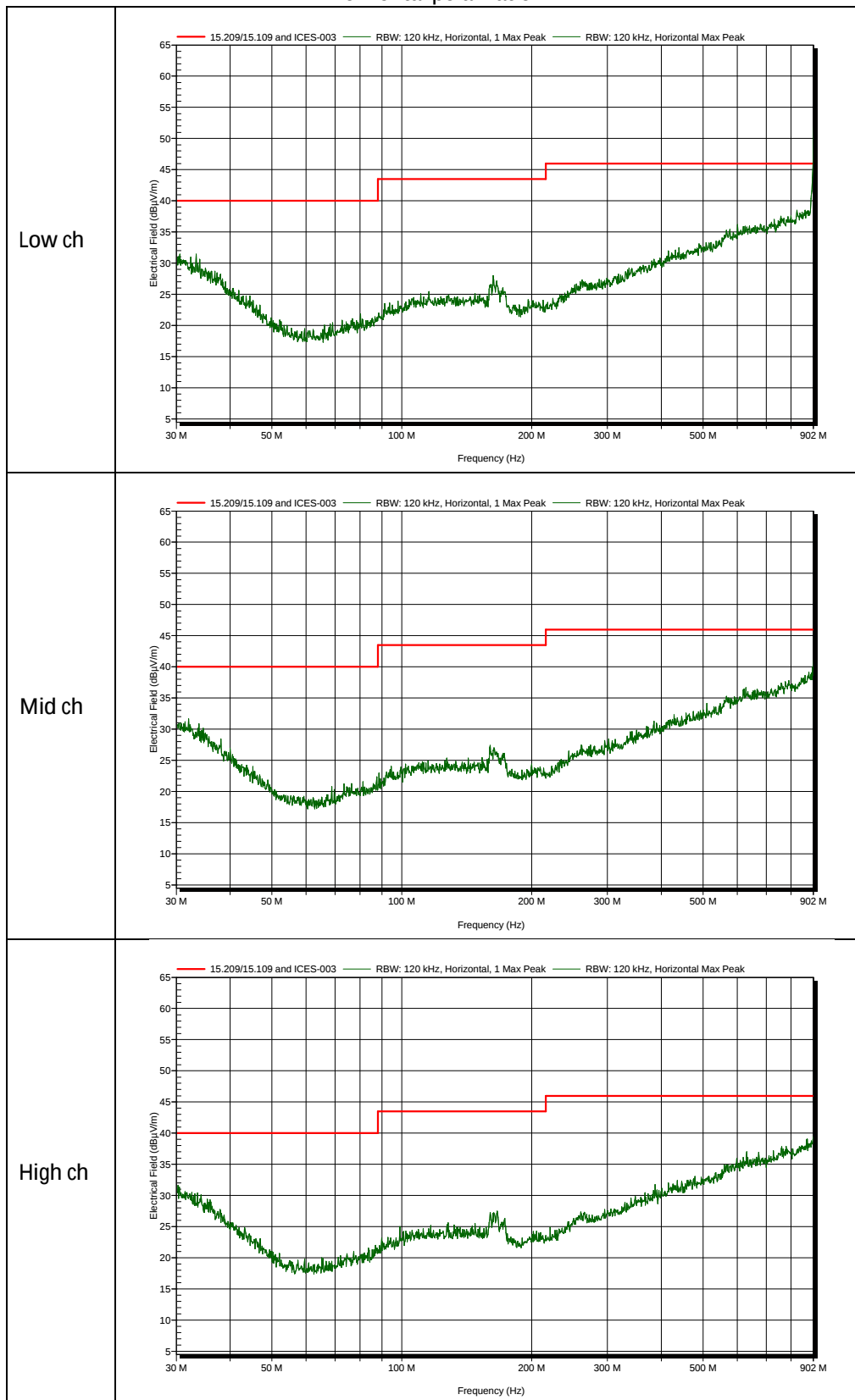
30 MHz to 902 MHz

Vertical polarization



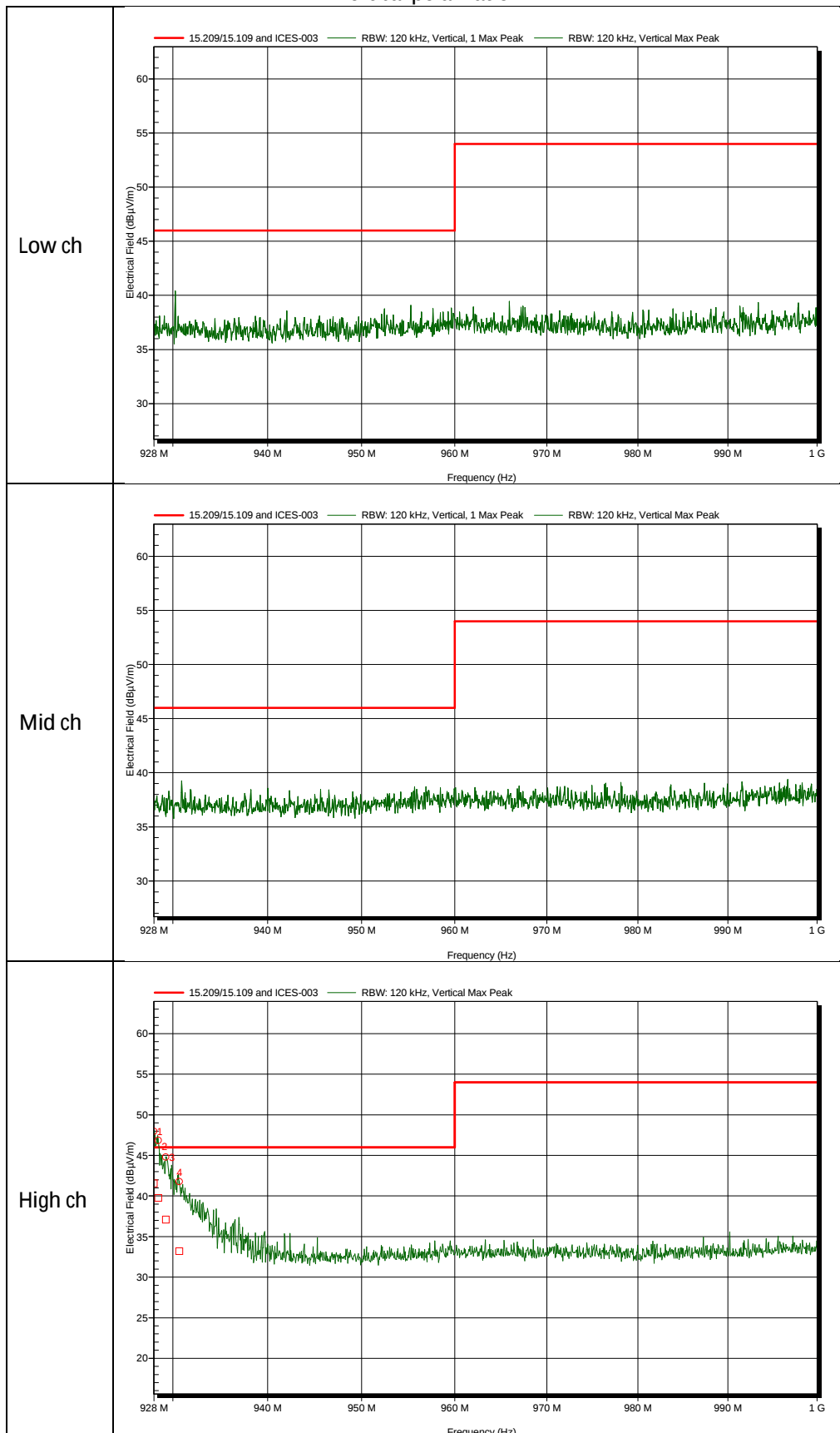
30 MHz to 902 MHz

Horizontal polarization



928 MHz to 1 GHz

Vertical polarization

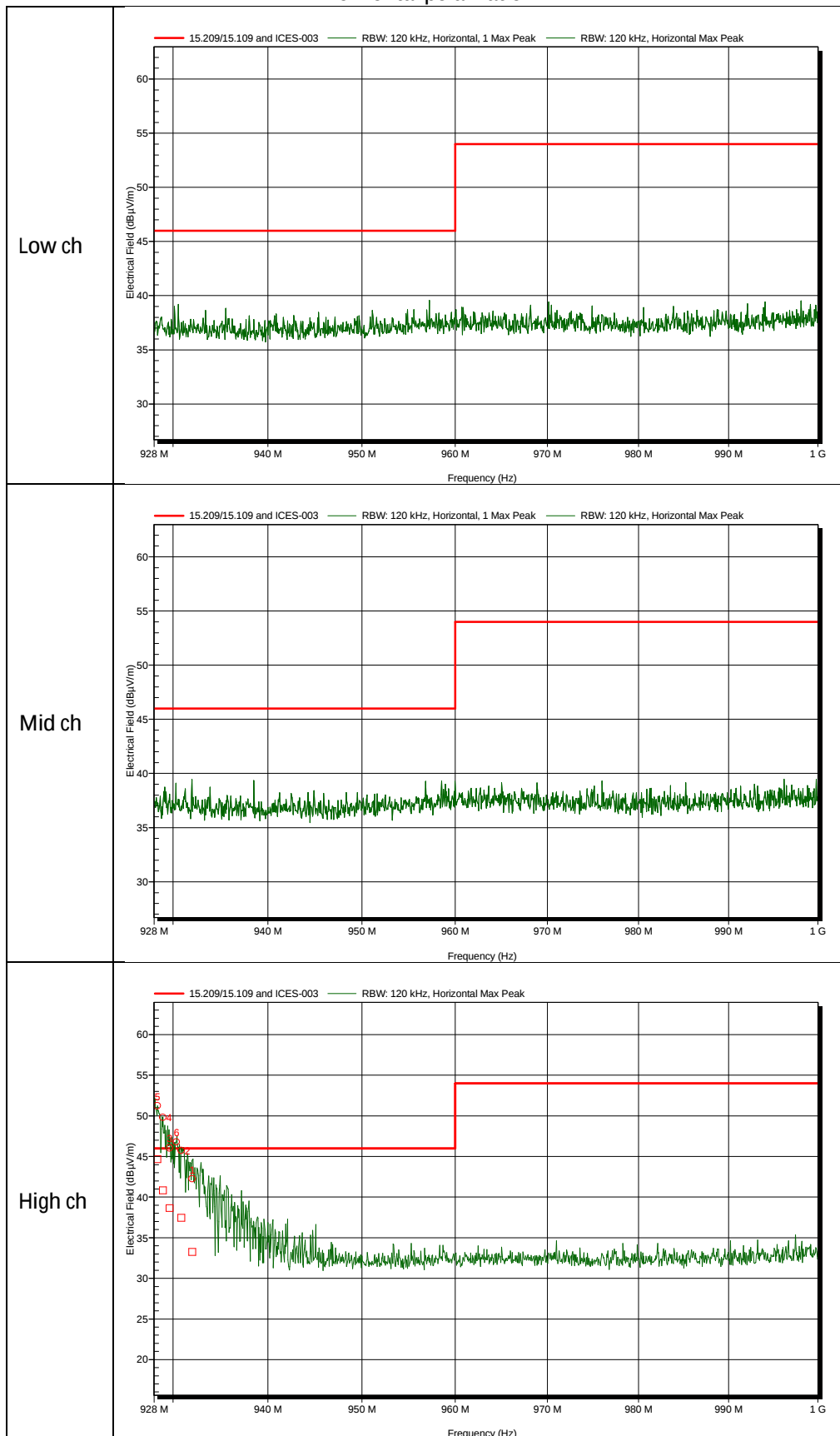


Measured peaks Vertical 928 – 1000 MHz High channel

Frequency (GHz)	Polarization	Height (m)	Quasi peak(dB μ V/m)	Quasi peak limit(dB μ V/m)	Margin (dB)
928,006	Vertical	1,5	41,6	46	4,4
928,48	Vertical	1,5	39,8	46	6,2
929,272	Vertical	1,5	37,1	46	8,9
930,67	Vertical	1,5	33,2	46	12,8

928 MHz to 1 GHz

Horizontal polarization

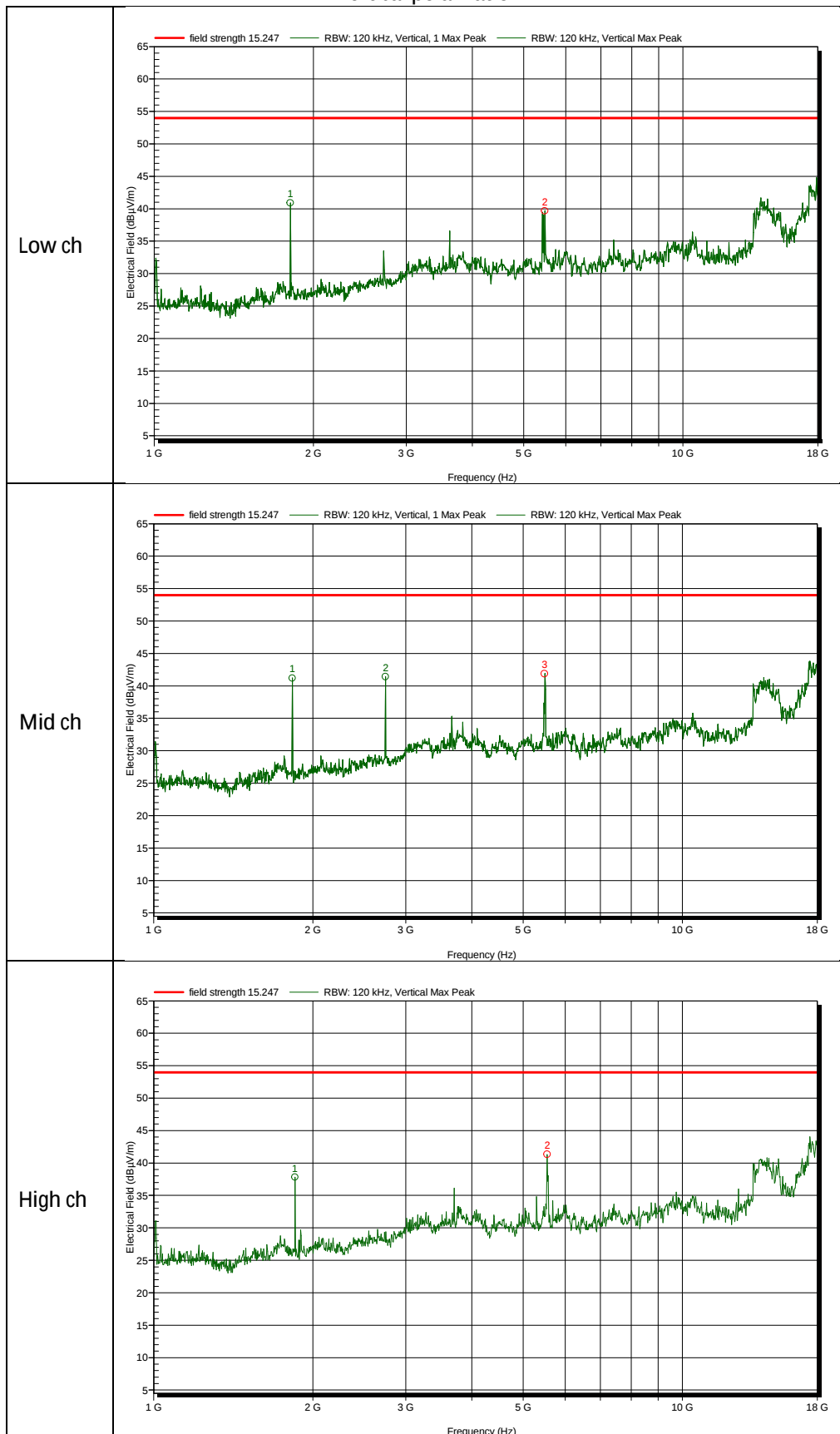


Measured peaks Horizontal 928 – 1000 MHz High channel

Frequency (GHz)	Polarization	Height (m)	Quasi peak (dB μ V/m)	Quasi peak limit(dB μ V/m)	Margin (dB)
932,026	Horizontal	1,5	33,2	46	12,8
930,88	Horizontal	1,5	37,5	46	7,3
930,286	Horizontal	1,5	38,9	46	1,3
929,656	Horizontal	1,5	38,7	46	8,5
928,96	Horizontal	1,5	40,8	46	5,2
928,006	Horizontal	1,5	44,7	46	1,3

1 GHz to 18 GHz

Vertical polarization



Measured peaks Vertical 1 – 18 GHz Low channel

Frequency (GHz)	Polarization	Height (m)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1,81	Vertical	3	40,9	54	13,1
5,477	Vertical	2,5	39,7	54	14,3

Measured peaks Vertical 1 – 18 GHz Middle channel

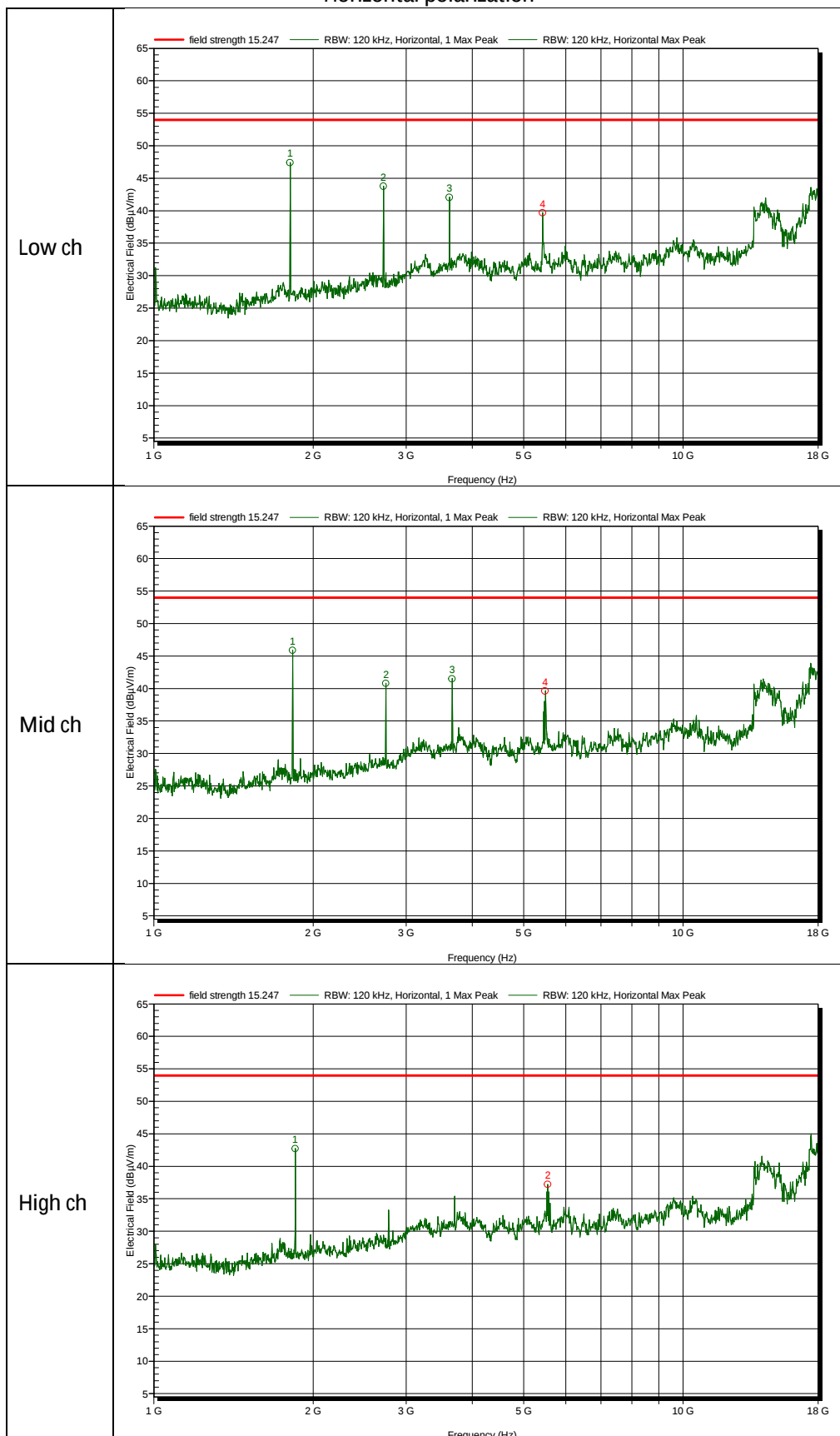
Frequency (GHz)	Polarization	Height (m)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1,829	Vertical	1,5	41,2	54	12,8
2,744	Vertical	3	41,4	54	12,6
5,487	Vertical	2,5	41,9	54	12,1

Measured peaks Vertical 1 – 18 GHz High channel

Frequency (GHz)	Polarization	Height (m)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1,85	Vertical	2,5	37,8	54	16,2
5,549	Vertical	1,5	41,3	54	12,7

1 GHz to 18 GHz

Horizontal polarization



Measured peaks Horizontal 1 – 18 GHz Low channel

Frequency (GHz)	Polarization	Height (m)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1,81	Horizontal	1,5	47,4	54	6,6
2,715	Horizontal	4	43,7	54	10,3
3,618	Horizontal	1	42	54	12
5,428	Horizontal	1	39,7	54	14,3

Measured peaks Horizontal 1 – 18 GHz Middle channel

Frequency (GHz)	Polarization	Height (m)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1,829	Horizontal	1,5	45,9	54	8,1
2,744	Horizontal	3	40,8	54	13,2
3,658	Horizontal	1,5	41,5	54	12,5
5,487	Horizontal	1	39,6	54	14,4

Measured peaks Horizontal 1 – 18 GHz High channel

Frequency (GHz)	Polarization	Height (m)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1,85	Horizontal	3	42,7	54	11,3
5,549	Horizontal	2,5	37,2	54	16,8

3.2.7 Measurement Uncertainty

Measurement uncertainty Radiated Emissions below 1 GHz

Horizontal polarization	
30 – 200 MHz	4.5 dB
200 – 1000 MHz	3.6 dB
Vertical polarization	
30 – 200 MHz	5.4 dB
200 – 1000 MHz	4.6 dB

Measurement uncertainty Radiated emissions above 1 GHz

< 2 GHz	+ 1.7/- 1.9 dB
≥ 2 GHz	+2.4/-2.7 dB

3.4 Radiated Band edge Measurement

3.4.1 Limit

According to FCC part 15.209(a)

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance(m)
216-960	200	46	3

3.4.2 Measurement instruments

The measurement instruments are listed in chapter 2.4 of this report.

3.4.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.4.4 Test procedure

According to ANSI C63.10: 2013 chapter 6.10

3.4.5 Test results of Band edge Measurement

Measured peaks lower band edge

Frequency (MHz)	Polarization	Height (m)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)	Quasi-Peak Limit ($\text{dB}\mu\text{V/m}$)	Margin (dB)
902	Horizontal	1	43	46	3
901,86	Horizontal	1	42,5	46	3,5
901,44	Horizontal	1	41,2	46	4,8
901,26	Horizontal	1	40,8	46	5,2
901,164	Horizontal	1	40,5	46	5,5
900,45	Horizontal	1	39	46	7
900,174	Horizontal	1	38,5	46	7,5
900,888	Horizontal	1	37,8	46	8,2

Measured peaks upper band edge

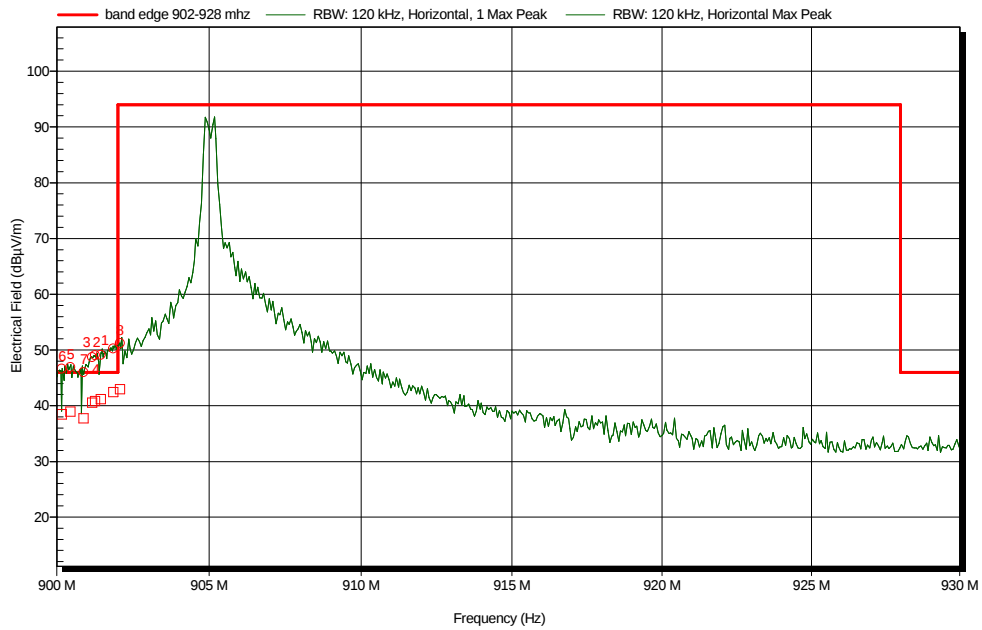
Frequency (MHz)	Polarization	Height (m)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)	Quasi-Peak Limit ($\text{dB}\mu\text{V/m}$)	Margin (dB)
928	Horizontal	1	45	46	1
928,194	Horizontal	1	44	46	2
928,26	Horizontal	1,5	44,4	46	1,6
928,374	Horizontal	1,5	45,2	46	0,8
928,41	Horizontal	1,5	45,1	46	0,9
929,43	Horizontal	1	40,5	46	5,5
929,634	Horizontal	1,5	41,4	46	4,6
928,692	Horizontal	1,5	44,4	46	1,6
929,16	Horizontal	1,5	42,9	46	3,1
930	Horizontal	1	38,9	46	7,1

3.4.6 Notes

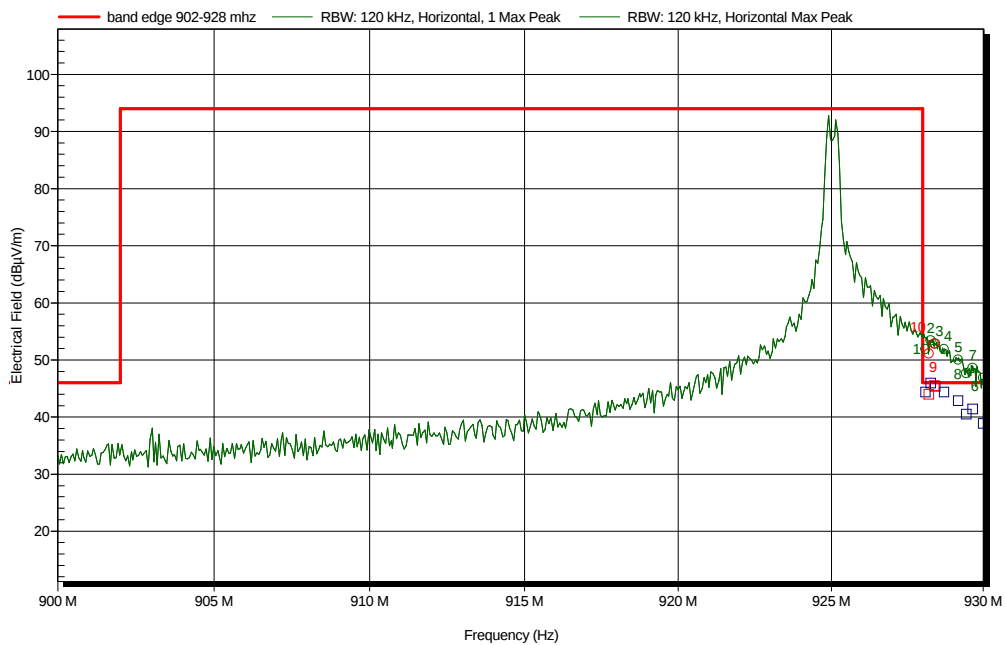
- The worst case Field Strength was found, with Horizontal antenna polarization.

3.4.7 Plots of the Radiated Band Edge Measurement

Radiated Lower band edge



Radiated Upper band edge



3.4.8 Measurement Uncertainty

Uncertainty: $\pm 3,6$ dB