



LCIE

902MHz-928MHz Template: Release November 03rd, 2020

TEST REPORT

N°: 171174 -761649 A(FILE# 1797354)

Version : 02

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5

Issued to

KUKA Deutschland GmbH
Zugspitzstraße 140
86165 Augsburg
Germany

Apparatus under test

- ↪ Product
- ↪ Trade mark
- ↪ Manufacturer
- ↪ Model under test
- ↪ Serial number
- ↪ FCC ID
- ↪ IC

Central Radio Transmitter
KUKA
KUKA Deutschland GmbH
FNA
0000114
R7TAMB9826
5136A-AMB9826

Conclusion

See Test Program chapter

Test date

February 15, 2021 to February 16, 2021

Test location

Moirans

Test Site

6500A-1 & 6500A-3

Sample receipt date

February 12, 2021

Fcc test site

197516

Composition of document

29 pages

Document issued on

February 16, 2021

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Tests operator

Approved by :
Gaëtan DESCHAMPS
Technical manager

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	February 16, 2021	Mounir BOUAMARA	Creation of the document
02	September 27, 2021	Mounir BOUAMARA	Adding the following information Fcc test site :197516

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.



SUMMARY

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1. TEST PROGRAM

References

- 47 CFR Part 15.247
- RSS 247 Issue 2
- RSS Gen Issue 5
- KDB 558074 D01 DTS Meas Guidance v05r02
- ANSI C63.10-2013

Radio requirement:

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input checked="" type="checkbox"/> NP(1)
6dB Bandwidth	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input checked="" type="checkbox"/> NP(1)
Duty Cycle	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Maximum Output Power	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Power Spectral Density	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input checked="" type="checkbox"/> NP(1)
Conducted Spurious Emission at the Band Edge	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input checked="" type="checkbox"/> NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input checked="" type="checkbox"/> NP(1)
AC Power Line Conducted Emission	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA(2)	<input checked="" type="checkbox"/> NP(1)
Unwanted Emissions into Restricted Frequency Bands	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated emissions	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> NA	<input type="checkbox"/> NP(1)
This table is a summary of test report, see conclusion of each clause of this test report for detail.				

(1): Limited program

(2): EUT not directly or indirectly connected to the AC Power Public Network

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

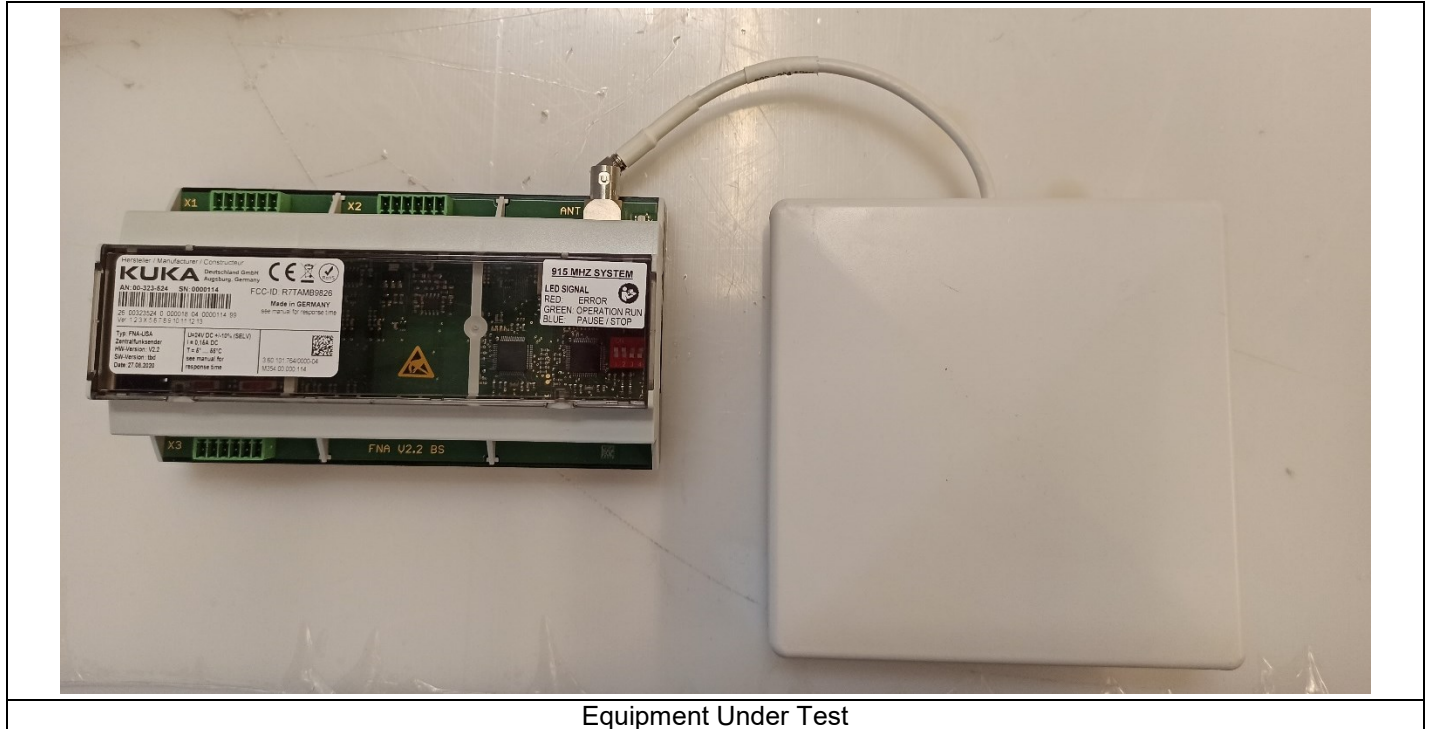
2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

KUKA FNA

Serial Number: 0000114



Equipment Under Test

Power supply:

During all the tests, EUT is supplied by V_{nom} : 24VDC

For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	<input type="checkbox"/> AC <input checked="" type="checkbox"/> DC <input type="checkbox"/> Battery	24		

Voltage table used (for Power Line Conducted Emissions):

Type	Measurement performed:	
<input type="checkbox"/> AC	<input type="checkbox"/> 120VAC/60Hz	<input type="checkbox"/> 240VAC/50Hz
<input checked="" type="checkbox"/> DC	<input type="checkbox"/> +12VDC	<input checked="" type="checkbox"/> 24VDC
<input type="checkbox"/> Battery	<input type="checkbox"/> +3.6VDC	<input type="checkbox"/> -....VDC
<input type="checkbox"/> USB (Laptop auxiliary)	<input type="checkbox"/> 120VAC/60Hz (Laptop auxiliary)	<input type="checkbox"/> 240VAC/50Hz(Laptop auxiliary)

Inputs/outputs - Cable:

FNA: Assignment of X2

Access	Type	Function	Length used (m)	Declared <3m	Shielded	Under test	Comment
1	NC	Not connected		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
2	NC	Not connected		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
3	SO_A	Testing Safe Input A		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Self-supply: Connected with SI_A
4	SI_A	Safe Input A		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Connected with SO_A
5	SO_B	Testing Safe Input B		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Self-supply: Connected with SI_A
6	SI_B	Safe Input B		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Connected with SO_B



L C I E

FNA: Assignment of X3

Access	Type	Function	Length used (m)	Declared <3m	Shielded	Under test	Comment
1	+24Vin	24V Supply		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Master: Output Repeater: Input
2	GND	Ground		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Master: Output Repeater: Input
3	RX_A	RS485 – Input A		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	RX_B	RS485 – Input B		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5	TX_Y	RS485 – Output Y		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6	TX_Z	RS485 – Output Z		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Equipment information:

Frequency band:	[902 – 928] MHz		
Number of Channel:	4		
Spacing channel:	2 MHz		
Channel bandwidth:	MHz		
Antenna Type:	<input type="checkbox"/> Integral	<input checked="" type="checkbox"/> External	<input type="checkbox"/> Dedicated
Antenna connector:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Temporary for test
Transmit chains:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	
Receiver chains:	<input type="checkbox"/> 1	<input type="checkbox"/> 2	
Type of equipment:	<input checked="" type="checkbox"/> Stand-alone	<input type="checkbox"/> Plug-in	<input type="checkbox"/> Combined
Ad-Hoc mode:	<input type="checkbox"/> Yes		<input type="checkbox"/> No
Duty cycle:	<input type="checkbox"/> Continuous duty	<input checked="" type="checkbox"/> Intermittent duty	<input type="checkbox"/> 100% duty
Equipment type:	<input checked="" type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model
Operating temperature range:	Tmin:	<input type="checkbox"/> -20°C	<input type="checkbox"/> 0°C <input checked="" type="checkbox"/> 5°C
	Tnom:	20°C	
	Tmax:	<input type="checkbox"/> 35°C	<input checked="" type="checkbox"/> 55°C <input type="checkbox"/> X°C
Type of power source:	<input type="checkbox"/> AC power supply	<input checked="" type="checkbox"/> DC power supply	<input type="checkbox"/> Battery
Operating voltage range:	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 24 Vdc
		<input type="checkbox"/> 240V/50Hz	<input type="checkbox"/> X Vdc

Antenna Characteristic

Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)	Reference of the antenna
1	6	902 - 928 MHz	50	PN6-915 Patch

CHANNEL PLAN

Channel	Frequency (MHz)
Cmin	902.5 MHz
Cmid	904.5 MHz
Cmax	908.5 MHz

Hardware information

Software (if applicable):	V. :	Not communicated
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2.2. RUNNING MODE

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
Test mode 2	Permanent reception

Test	Running mode	
Occupied Bandwidth	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
6dB Bandwidth	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Duty Cycle	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Maximum Output Power	<input type="checkbox"/> Test mode 1 (1)	<input checked="" type="checkbox"/> Alternative test mode()
Power Spectral Density	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Conducted Spurious Emission at the Band Edge	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Unwanted Emissions into Non-Restricted Frequency Bands	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
AC Power Line Conducted Emission	<input type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Unwanted Emissions into Restricted Frequency Bands	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Receiver Radiated emissions	<input type="checkbox"/> Test mode 2 (1)	<input type="checkbox"/> Alternative test mode()

- (1) Following commands with the specific test software "X" are used to set the product:
 a. – See document "X"(provided by customer) for the command used during test.

2.3. EQUIPMENT LABELLING

Hersteller / Manufacturer / Constructeur KUKA Deutschland GmbH Augsburg, Germany		 
AN: 00-323-524	SN: 0000114	FCC-ID: R7TAMB9826
 26 00323524 0 000018 04 0000114 99 Ver 12 3 X 5 6 7 8 9 10 11 12 13		Made in GERMANY see manual for response time
Typ: FNA-USA Zentralfunksender HW-Version: V2.2 SW-Version: tbd Date: 27.08.2020	U=24V DC +/-10% (SELV) I = 0,15A DC T = 5° 55°C see manual for response time	 3 60 101.764/0000-04 M354.00.000.114

2.4. EQUIPMENT MODIFICATION

- None Modification:



3. MAXIMUM OUTPUT POWER

3.1. TEST CONDITIONS

Test performed by : Mounir BOUAMARA
Date of test : February 15, 2021 to February 16, 2021
Ambient temperature : 23 °C
Relative humidity : 26 %

3.2. TEST SETUP

- The Equipment Under Test is installed:

- OATS
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

- Test Procedure:

- ANSI C63.10 § 11.9.1.1
- ANSI C63.10 § 11.9.1.2
- ANSI C63.10 § 11.9.2.2.2 (Method AVGSA-1)
- ANSI C63.10 § 11.9.2.2.4 (Method AVGSA-2)

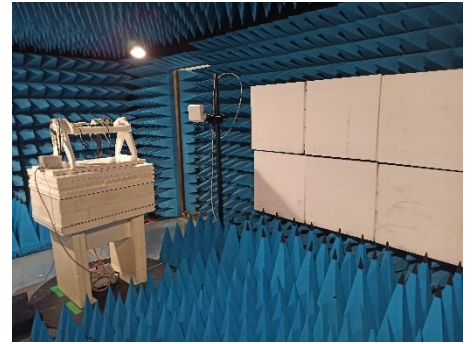
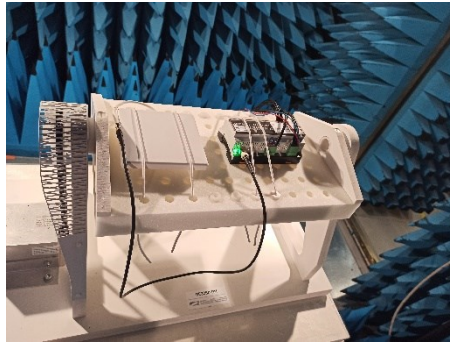
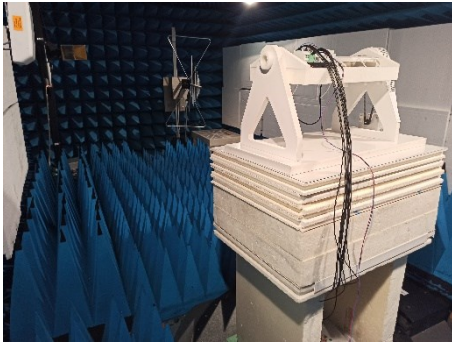


Photo Setup : anechoic chamber (XY axis)

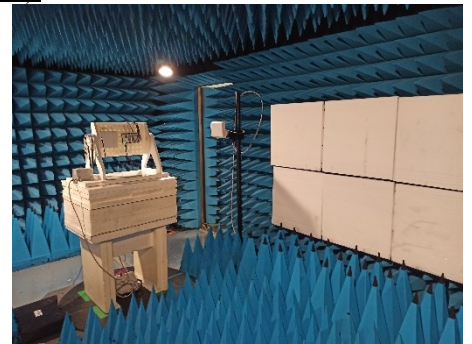
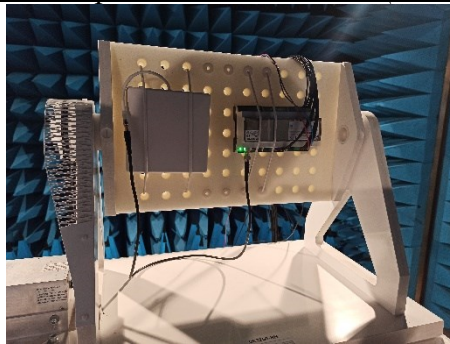


Photo Setup : anechoic chamber (Z axis)

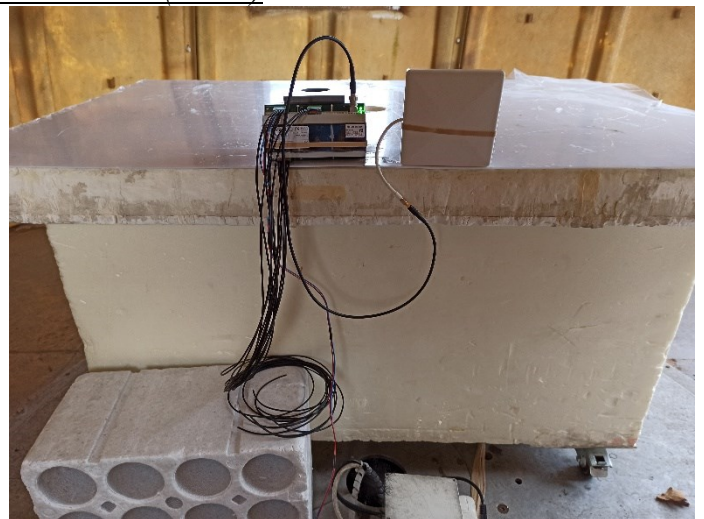
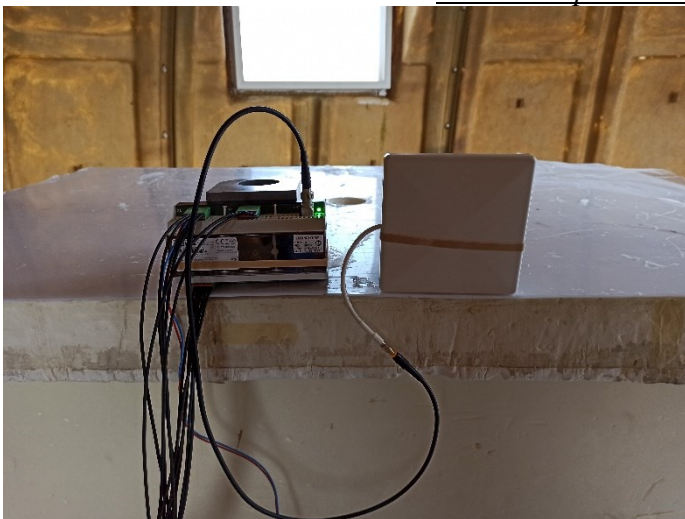


Photo Setup – OATS

Photograph for Maximum Conducted Output Power



3.3. LIMIT

Frequency range	Maximum Conducted Output Power
2400MHz to 2483.5MHz	≤30dBm*

*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

3.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Antenna Bi-log	CHASE	CBL6111A	C2040051	06/19	06/21
Antenna Dipole precision	SCHWARZBECK	UHAP	C2040075	08/20	08/22
Antenna Dipole precision	SCHWARZBECK	VHAP	C2040076	08/20	08/22
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392		
Cable (OATS)	—	1GHz	A5329623	05/20	05/21
Cable substitution (OATS)	—	1GHz	A5329059	05/20	05/22
Cable substitution (OATS)	—	1GHz	A5329057	05/20	05/22
Emission Cable	SUCOFLEX	6GHz	A5329061	06/20	06/21
Frequency generator 0.1-2060MHz	HEWLETT PACKARD	8657B	A5442025	05/20	05/21
Multimeter - CEM	FLUKE	87	A1240251	11/18	11/20
OATS	—	—	F2000409	04/20	04/21
RADIO ERP_EIRP	LCIE SUD EST	v4	L2000034		
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
Rehausse Table C1/OATS	LCIE	—	F2000512		
Table C1/OATS	LCIE	—	F2000445		
Turntable (OATS)	ETS Lingren	Model 2187	F2000403		
Turntable / Mast controller (OATS)	ETS Lingren	Model 2066	F2000372		
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052	06/19	06/22
Radiated emission comb generator	BARDET	—	A3169050		

Note: In our quality system, the test equipment calibration due is more & less 2 months



3.5. RESULTS

Channel	Cmin	Cmid	Cmax
Voltage	Vnom		
Temperature	Tnom	Tnom	Tnom
EIRP (dBm)	10.76	10.06	10.38

3.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **KUKA FNA** , SN: **0000114**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

4. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

4.1. TEST CONDITIONS

Test performed by : Mounir BOUAMARA
 Date of test : February 15, 2021 to February 16, 2021
 Ambient temperature : 23 °C
 Relative humidity : 26 %

4.2. TEST SETUP

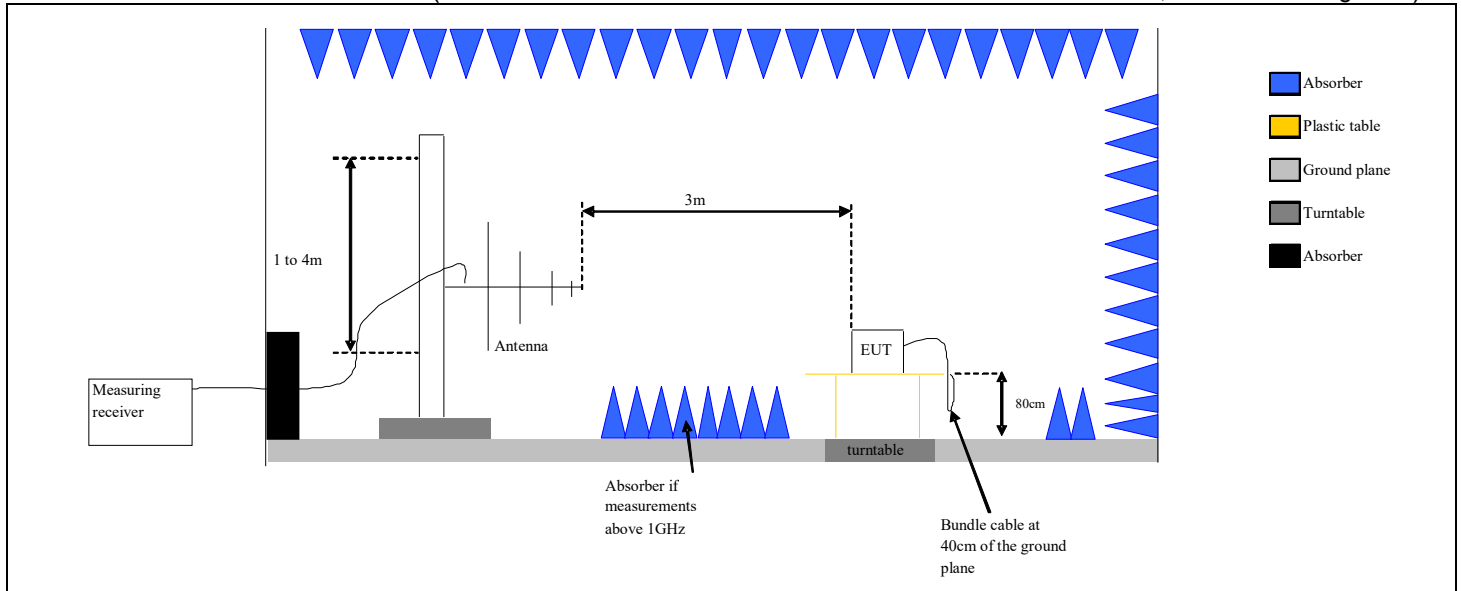
The product has been tested according to ANSI C63.10 (2013) and FCC part 15 subpart C.

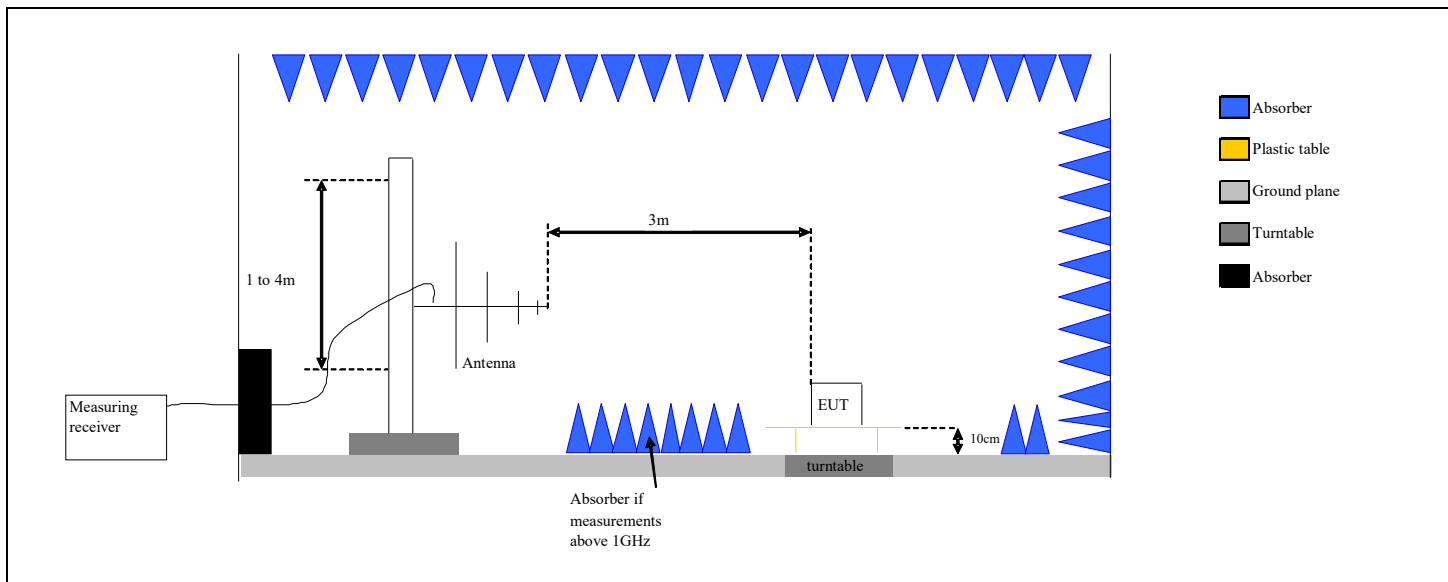
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. Antenna height was 1m. The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **10m**.

Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. The EUT is placed at 1.5m high above 1GHz and at 0.8m high under 1GHz. The EUT is placed **in a full anechoic chamber** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **10m**. The height antenna is varied from 1m to 4m from 30MHz to 1GHz and above 1GHz is :

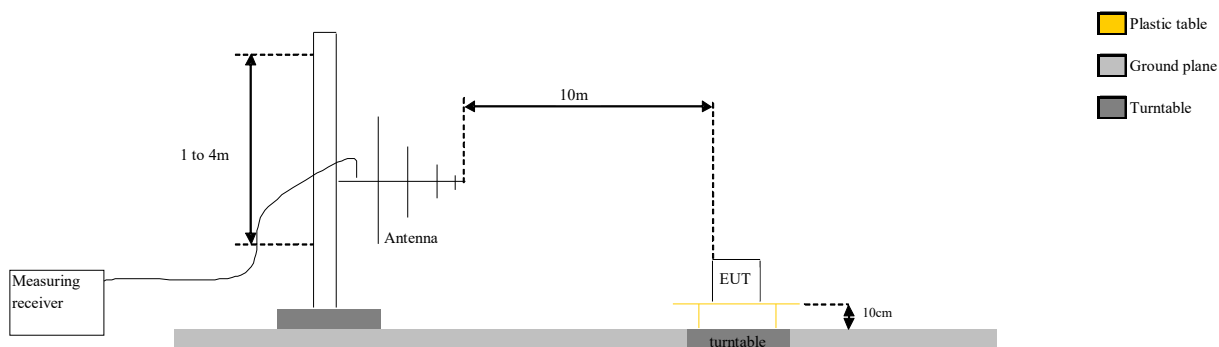
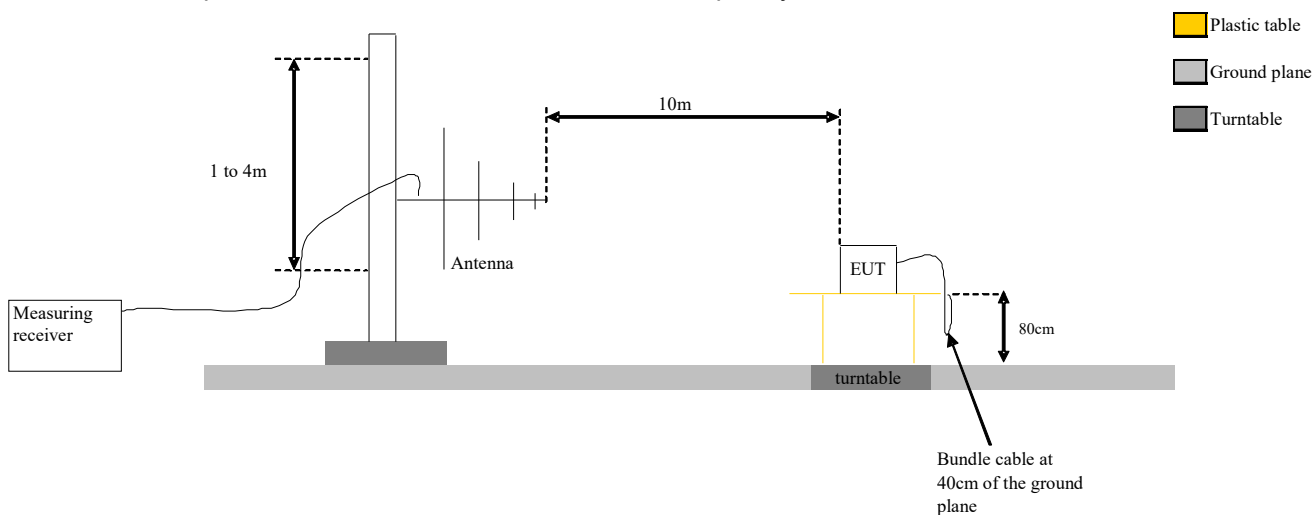
On mast, varied from 1m to 4m

Fixed and centered on the EUT (EUT smaller than the bandwidth of the measurement antenna, ANSI C63.10 §6.6.5)





Test set up of Unwanted Emissions in Restricted Frequency Bands in semi anechoic chamber



Test Set up for radiated measurement in open area test site

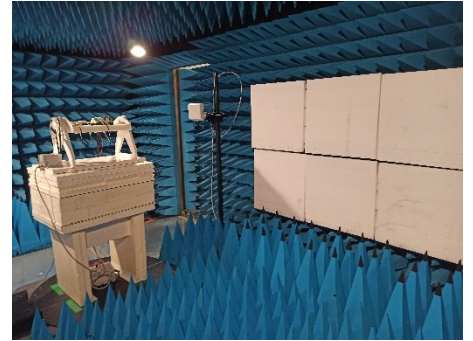
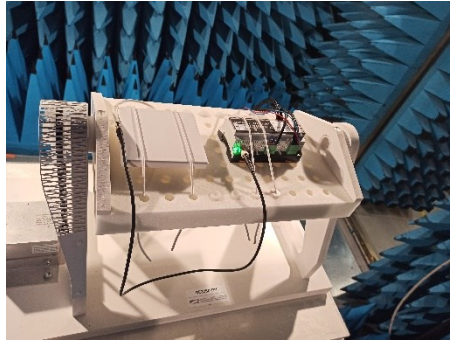


Photo Setup : anechoic chamber (XY axis)

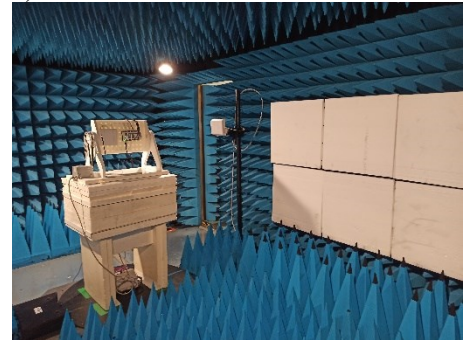
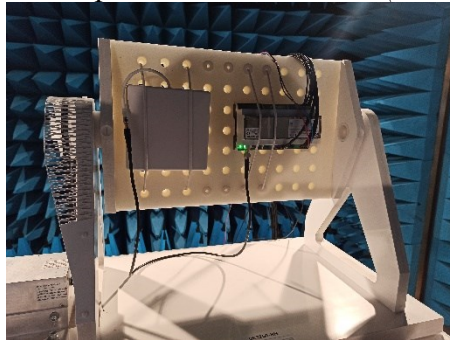


Photo Setup : anechoic chamber (Z axis)

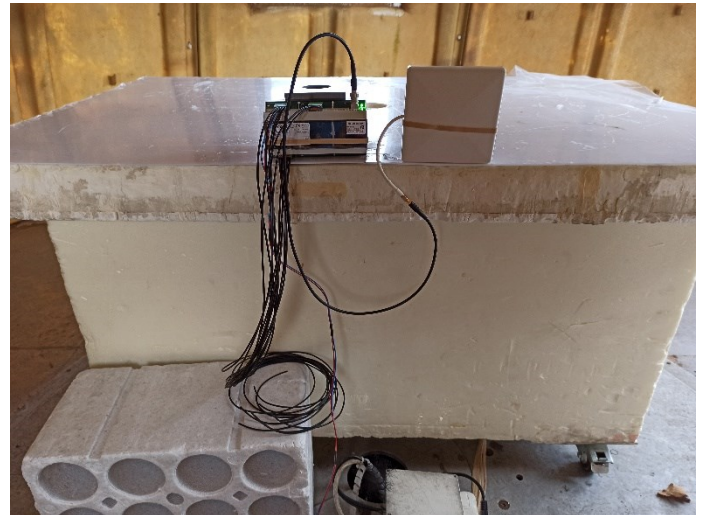
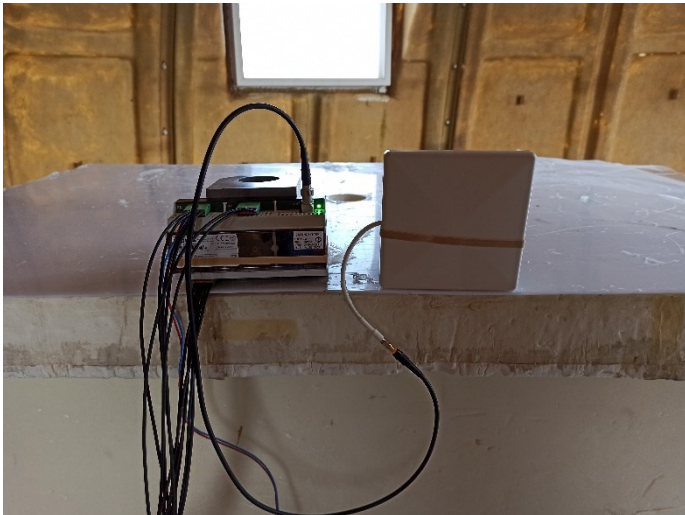


Photo Setup – OATS

Photograph for Unwanted Emission in restricted frequency bands



L C I E

4.3. LIMIT

Measure at 300m		
Frequency range	Level	Detector
9kHz-490kHz	67.6dB μ V/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	Level	Detector
490kHz-1.705MHz	87.6dB μ V/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dB μ V/m	QPeak
Measure at 10m		
Frequency range	Level	Detector
30MHz to 88MHz	29.5dB μ V/m	QPeak
88MHz to 216MHz	33dB μ V/m	QPeak
216MHz to 960MHz	35.5B μ V/m	QPeak
960MHz to 1000MHz	43.5dB μ V/m	QPeak
Above 1000MHz	63.5dB μ V/m	Peak
	43.5dB μ V/m	Average
Measure at 3m		
Frequency range	Level	Detector
30MHz to 88MHz	40dB μ V/m	QPeak
88MHz to 216MHz	43.5dB μ V/m	QPeak
216MHz to 960MHz	46B μ V/m	QPeak
960MHz to 1000MHz	54dB μ V/m	QPeak
Above 1000MHz	74dB μ V/m	Peak
	54dB μ V/m	Average



4.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Antenna Bi-log	CHASE	CBL6111A	C2040051	06/19	06/21
Antenna Biconic	EMCO	3104C	C2040175	03/20	03/22
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392		
BAT EMC	NEXIO	v3.19.1.23	L1000115		
Cable (OATS)	–	1GHz	A5329623	05/20	05/21
Emission Cable	SUCOFLEX	6GHz	A5329061	06/20	06/21
OATS	–	–	F2000409	04/20	04/21
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
Table C1/OATS	LCIE	–	F2000445		
Turntable (OATS)	ETS Lingren	Model 2187	F2000403		
Turntable / Mast controller (OATS)	ETS Lingren	Model 2066	F2000372		
Amplifier 9kHz - 40GHz	LCIE SUD EST	–	A7102082	06/20	06/21
Antenna Bi-Log	CHASE	UPA6192	C2040221	01/18	01/23
Antenna horn 18GHz	EMCO	3115	C2042029	09/17	02/21
BAT EMC	NEXIO	v3.19.1.23	L1000115		
Cable 1m	HUBER & SUHNER	18GHz	A5329705	02/19	01/21
Comb EMR HF	YORK	CGE01	A3169114		
Emission Cable	–	6GHz	A5329069	02/20	02/21
Emission Cable (SMA 1m)	TELEDYNE	26GHz	A5329874	10/20	10/21
Emission Cable (SMA 3.3m)	TELEDYNE	26GHz	A5329875	10/20	10/21
Emission Cable <1GHz (Ampl <-> Cage)	-	18GHz	A5329907	08/20	08/21
Filter Matrice	LCIE SUD EST	Combined filters	A7484078	09/20	09/21
Multimeter - CEM	FLUKE	87	A1240251	11/18	02/21
Power supply DC	METRIX	AX503	A7042308		
Radiated emission comb generator	BARDET	–	A3169050		
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
Rehausse Table C3	LCIE	–	F2000507		
Semi-Anechoic chamber #3 (BF)	SIEPEL	–	D3044017 BF	12/19	12/22
Semi-Anechoic chamber #3 (VSWR)	SIEPEL	–	D3044017 VSWR	12/19	12/22
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	09/19	09/21
Table C3	LCIE	–	F2000461		
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	10/18	02/21
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371		
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444		

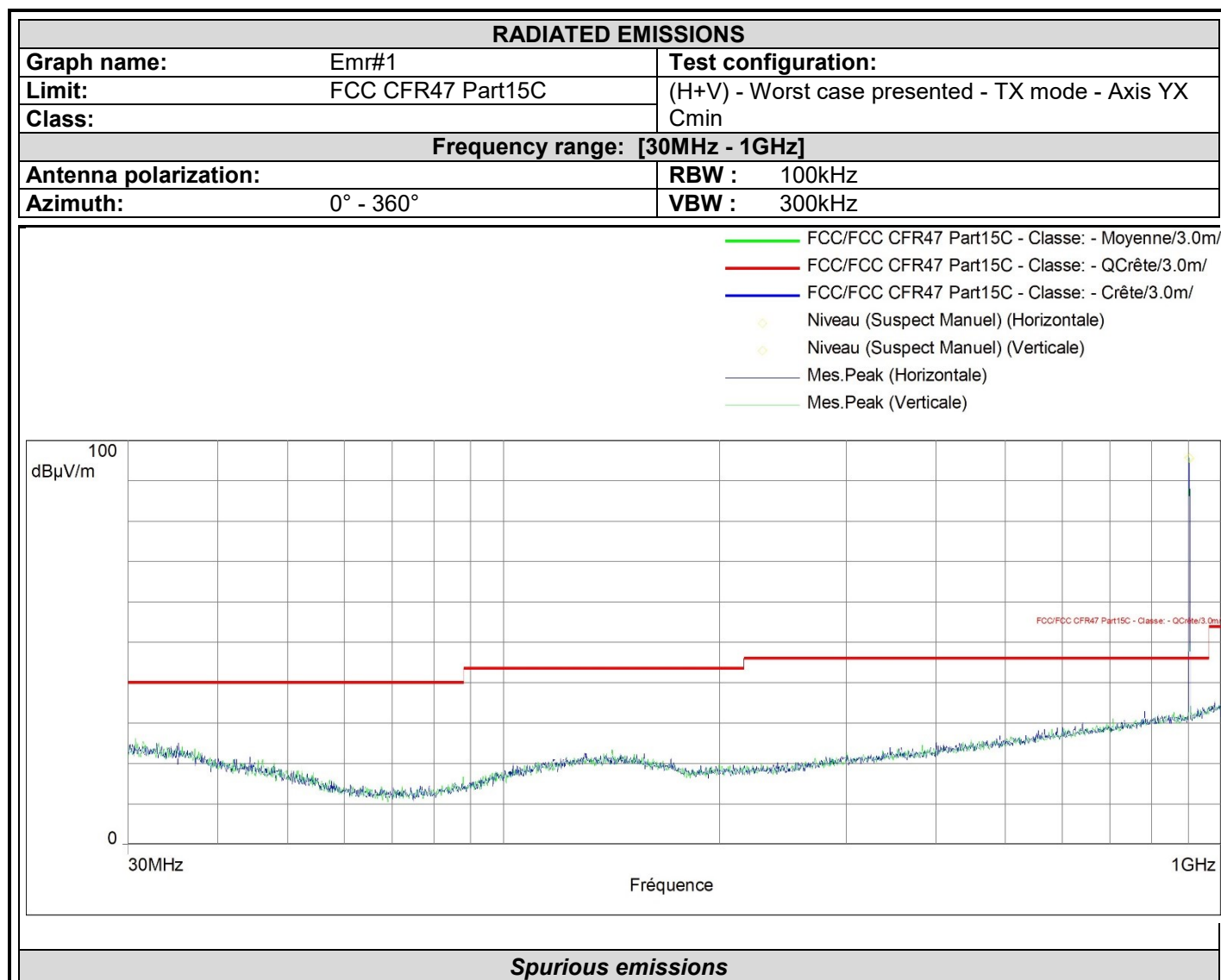
Note: In our quality system, the test equipment calibration due is more & less 2 months

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:

4.6. RESULTS

Results in the frequency band [30-1000] MHz:

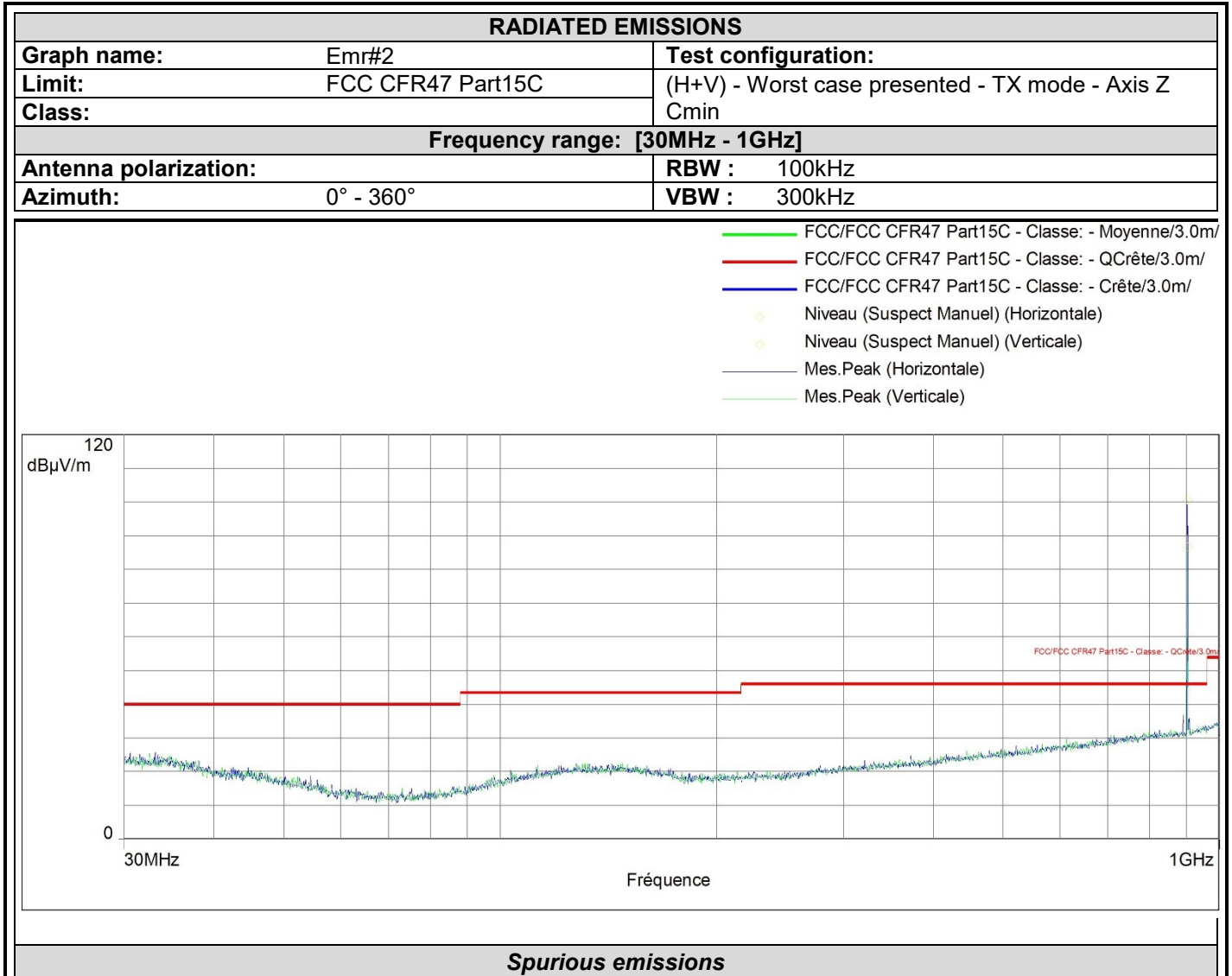


Frequency (MHz)	Peak Level (dBµV/m)	Polarization	Correction (dB)
902.758*	95.5	Horizontal	-8.4
902.272*	95.8	Vertical	-8.4

*Carrier frequency



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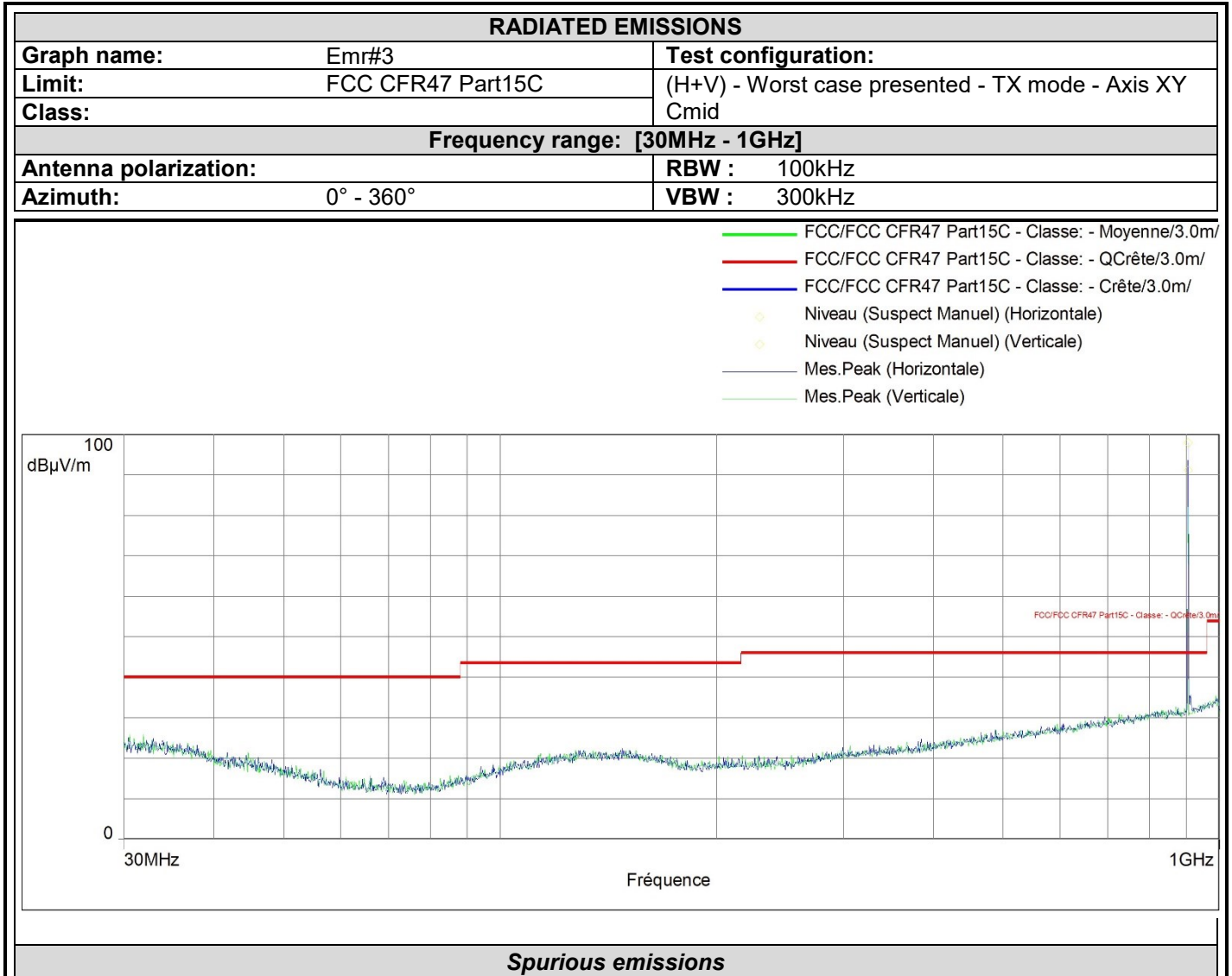


Frequency (MHz)	Peak Level (dBµV/m)	Polarization	Correction (dB)
902.321*	100.4	Horizontal	-8.4
902.758*	86.7	Vertical	-8.4

*Carrier frequency



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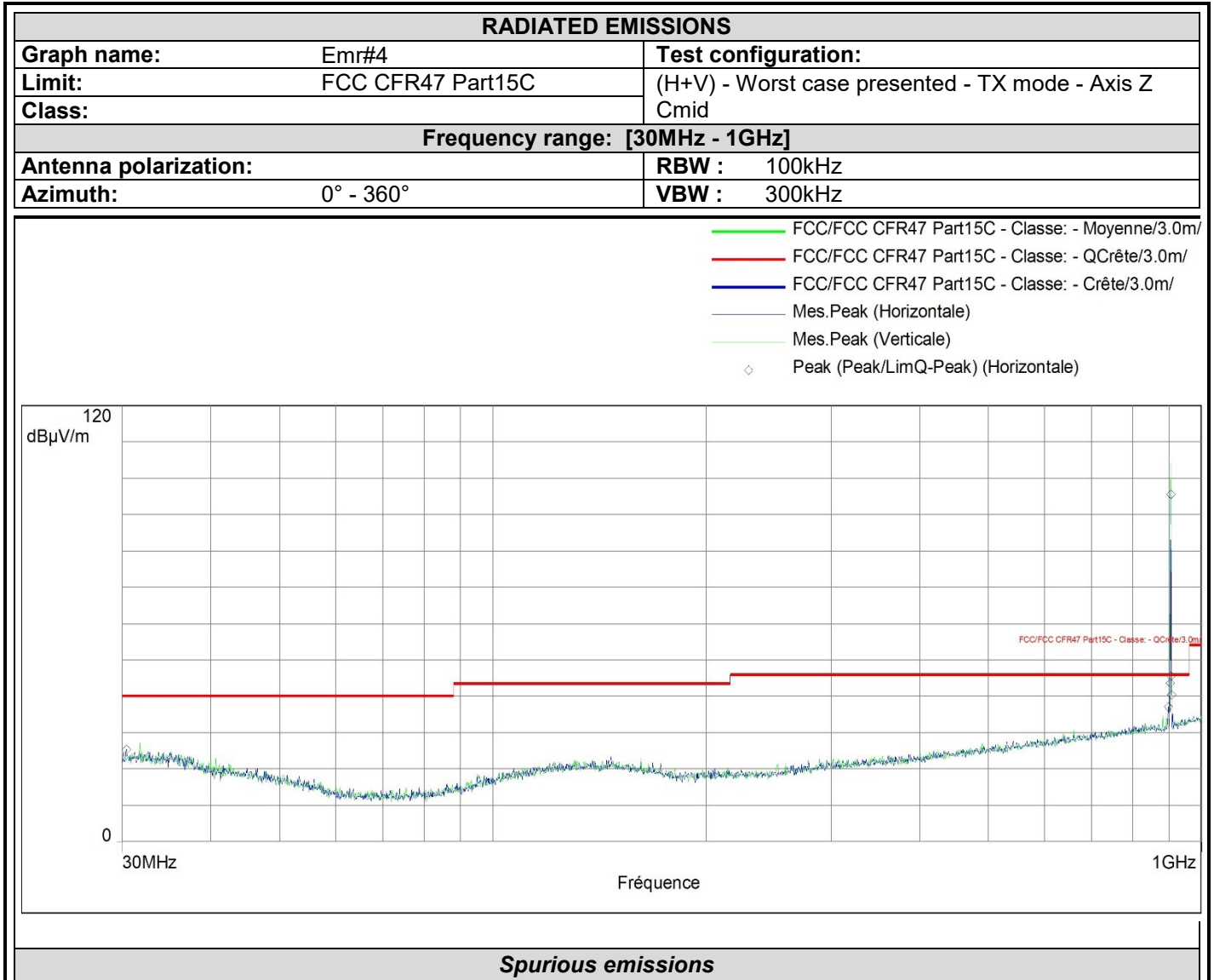


Frequency (MHz)	Peak Level (dBµV/m)	Polarization	Correction (dB)
904.310*	98.0	Horizontal	-8.4
904.698*	91.1	Vertical	-8.4

*Carrier frequency



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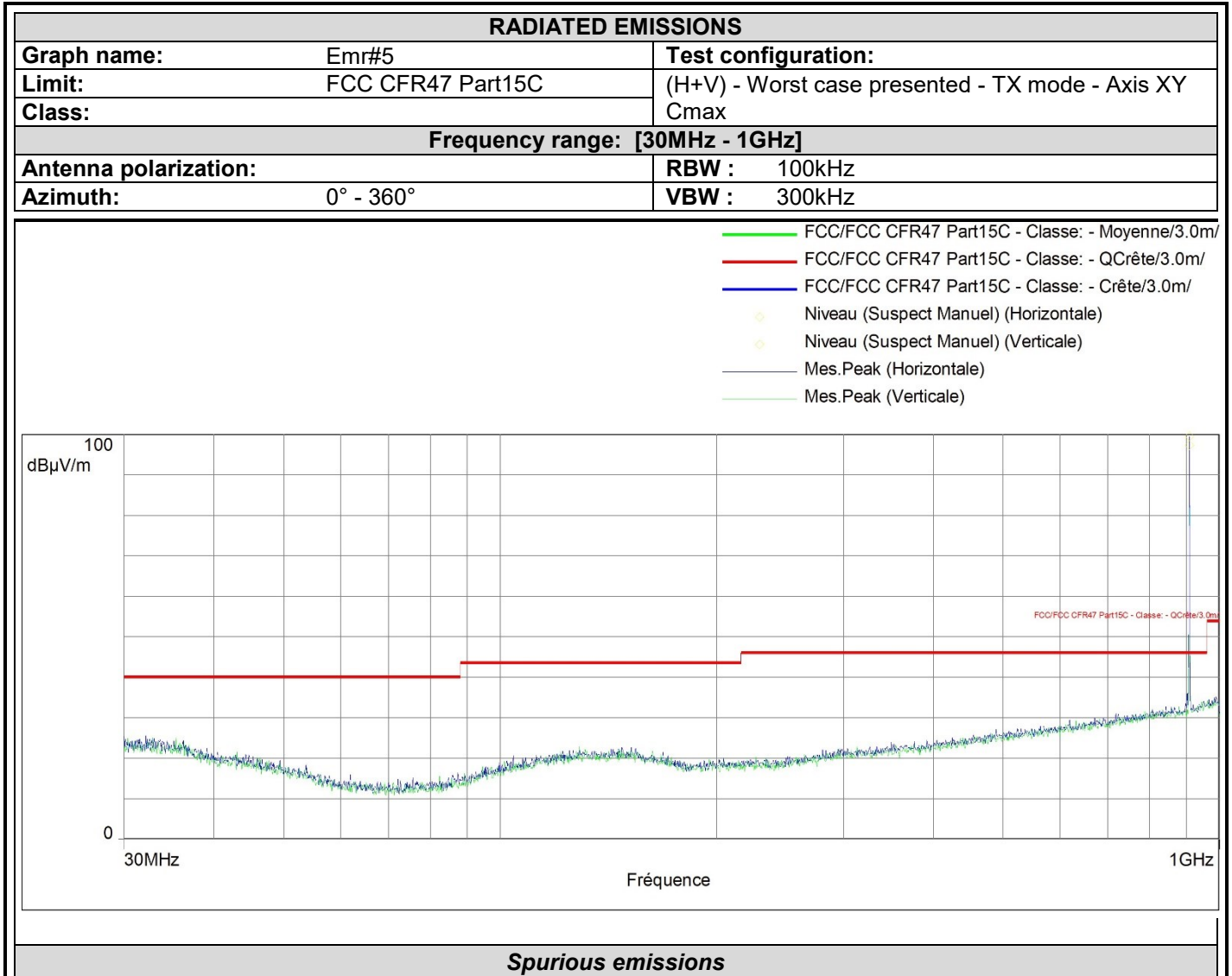


Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
904.600*	95.5	46.0	49.5	Horizontal	-8.4

*Carrier frequency



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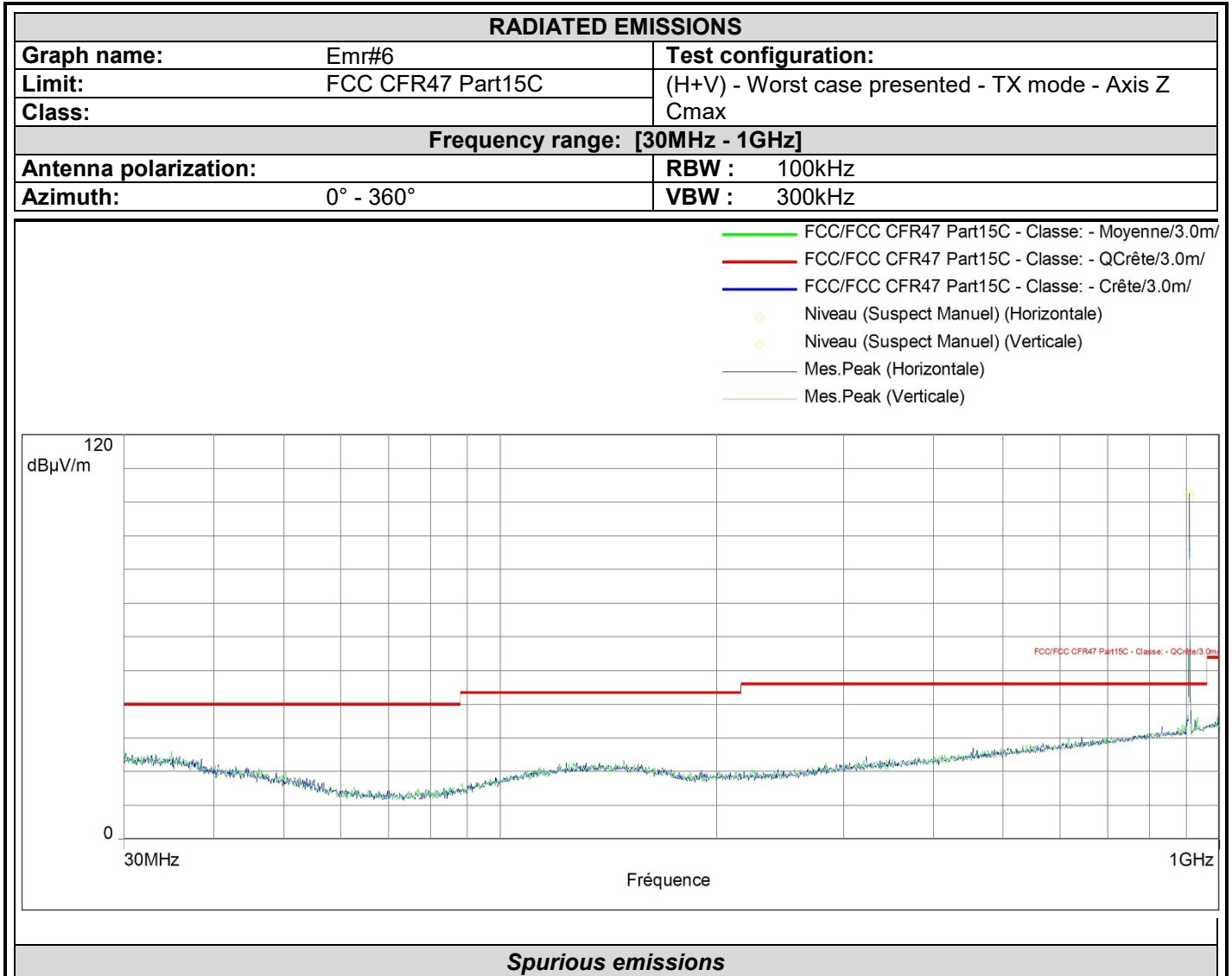


Frequency (MHz)	Peak Level (dBµV/m)	Polarization	Correction (dB)
908.723*	99.5	Horizontal	-8.2
908.286*	97.3	Vertical	-8.2

*Carrier frequency



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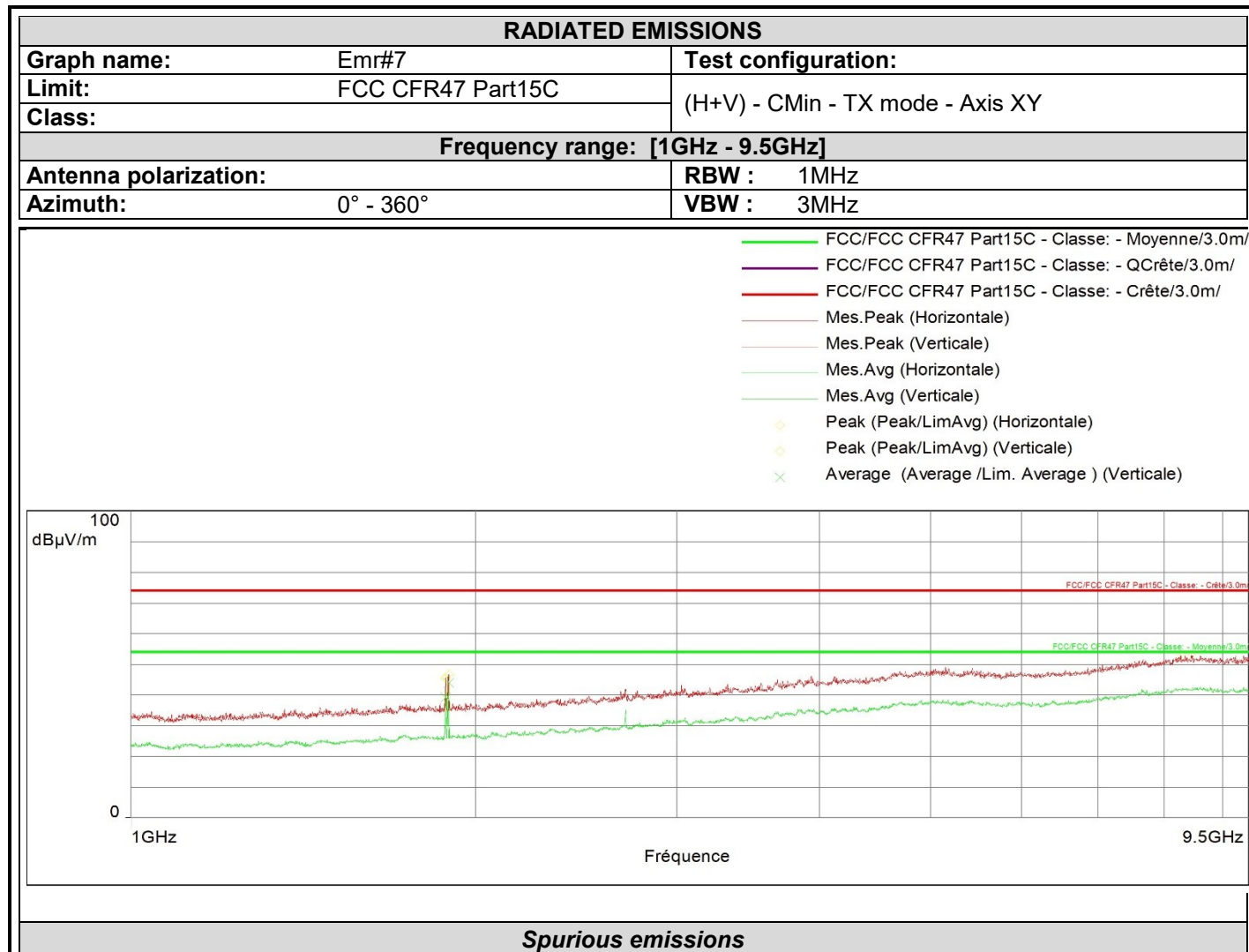


Frequency (MHz)	Peak Level (dBµV/m)	Polarization	Correction (dB)
908.286*	102.7	Horizontal	-8.2
908.772*	101.8	Vertical	-8.2

*Carrier frequency



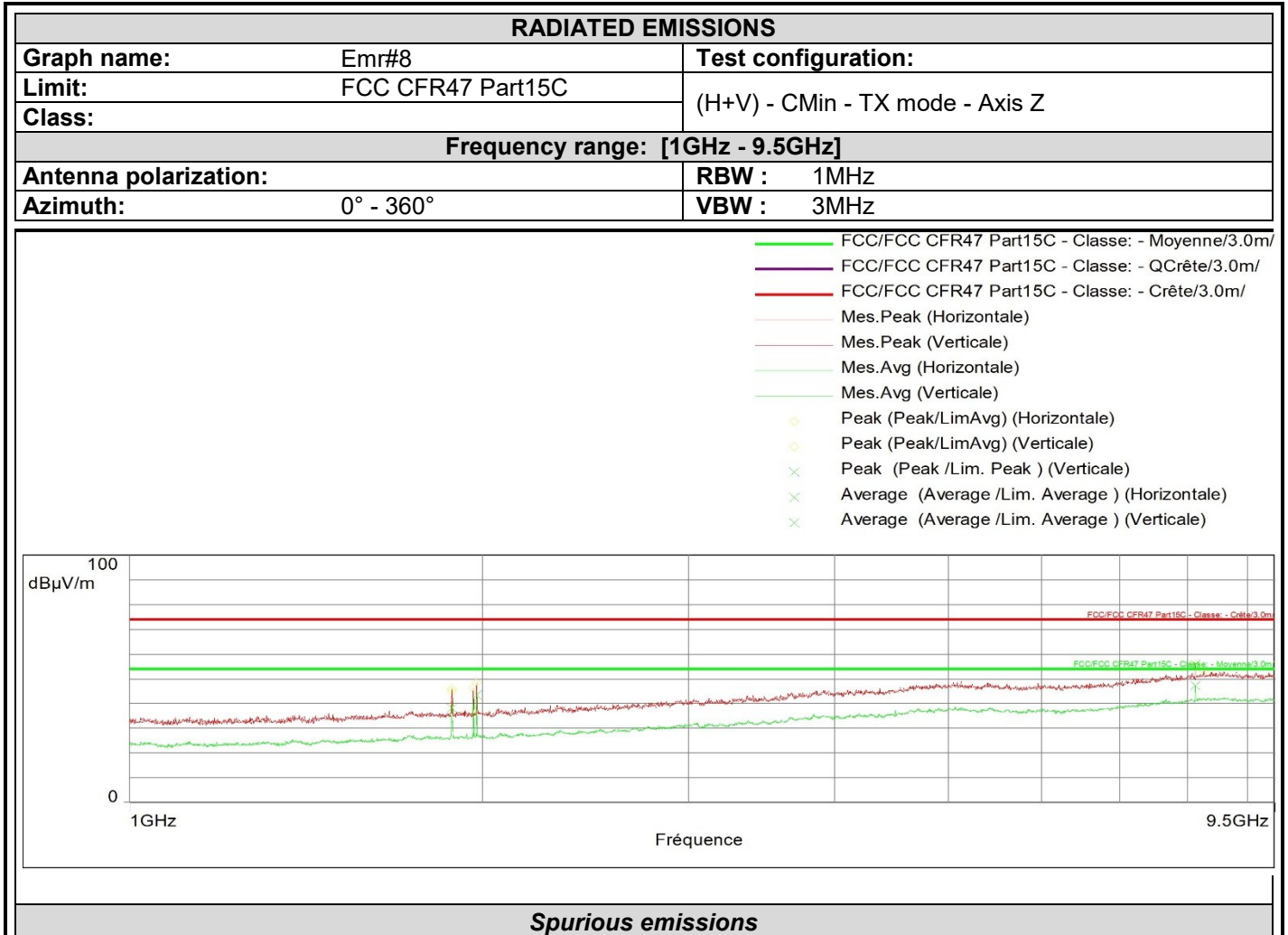
Results in the frequency band [1-9.5] GHz:



Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Commentaire	Polarization	Correction (dB)
1882.867	39.2	54.0	-14.8	Vertical	Vertical	-31.2
1895.333	44.0	54.0	-10.0	Vertical	Vertical	-31.1



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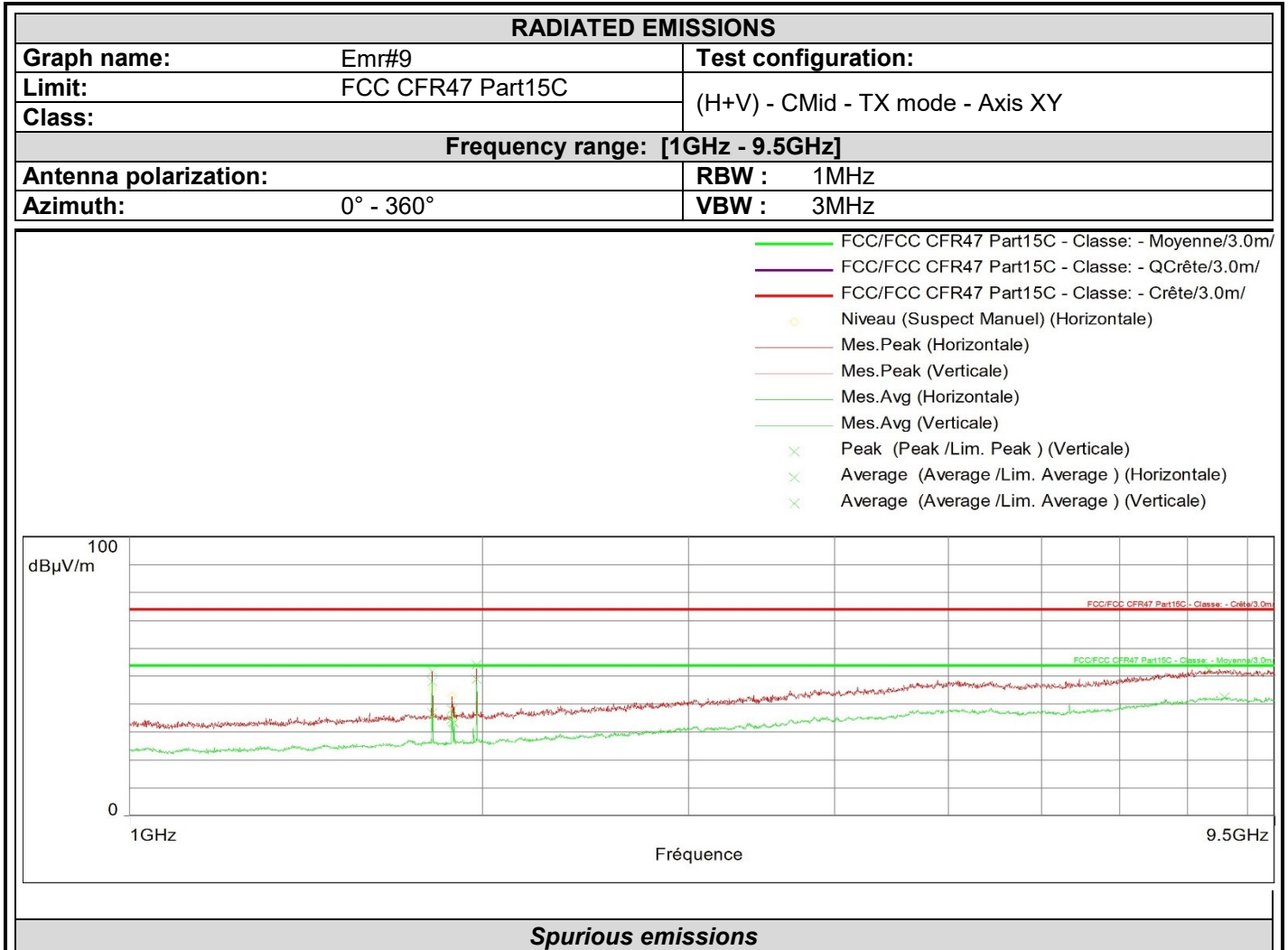


Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Commentaire	Polarization	Correction (dB)
1882.867	38.3	54.0	-15.7	Horizontal	Horizontal	-31.2
1978.633	43.6	54.0	-10.4	Vertical	Vertical	-30.8
8120.733	47.2	54.0	-6.8	Vertical	Vertical	-13.8

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Peak-Lim.Peak (dB)	Commentaire	Polarization	Correction (dB)
8120.733	55.8	74.0	-18.2	Vertical	Vertical	-13.8



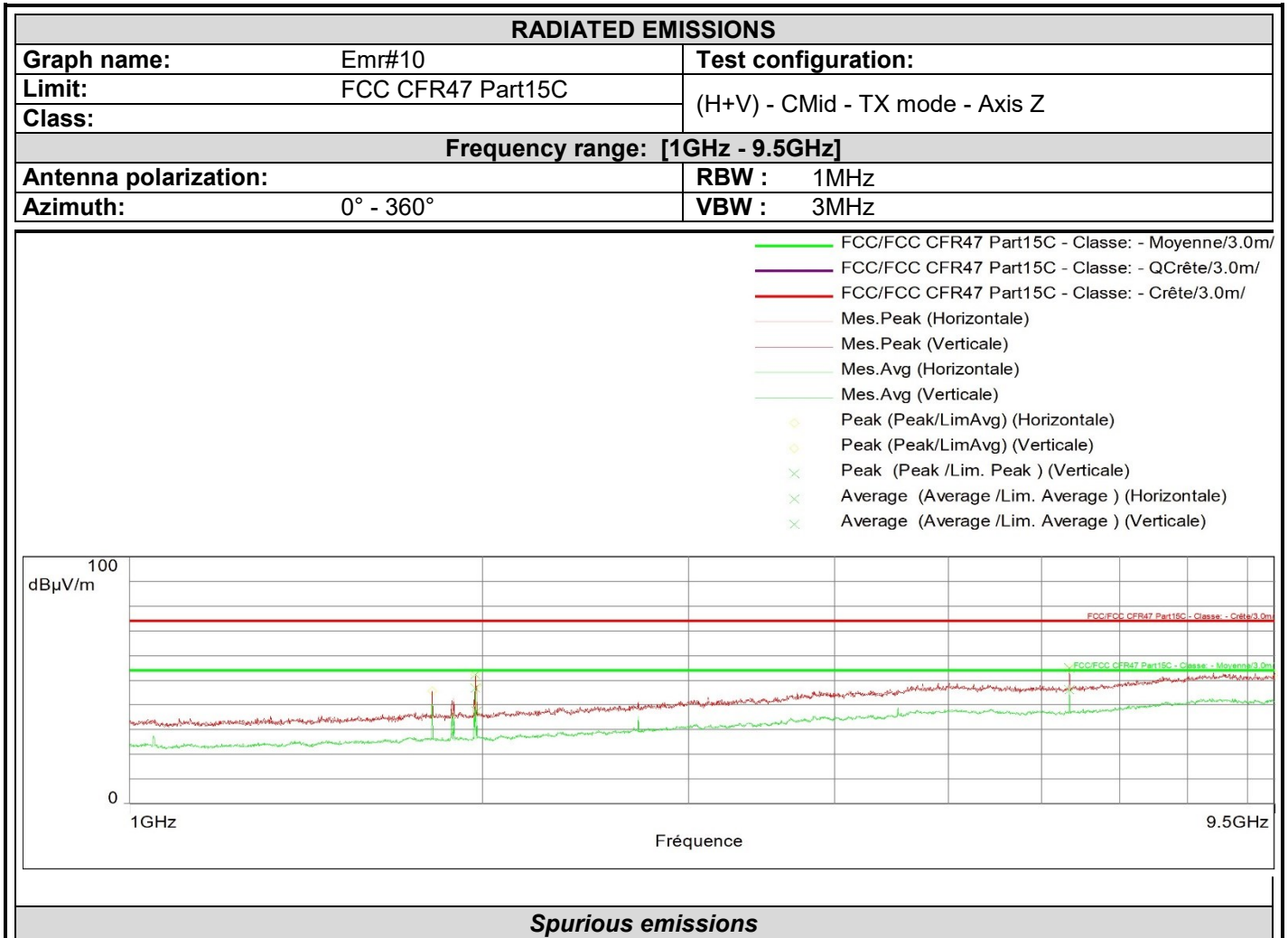
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Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Commentaire	Polarization	Correction (dB)
1813.167	36.7	54.0	-17.3	Horizontal	Horizontal	-31.2
1884.567	38.1	54.0	-15.9	Horizontal	Horizontal	-31.2
1812.600	48.1	54.0	-5.9	Vertical	Vertical	-31.2
1885.133	34.7	54.0	-19.3	Vertical	Vertical	-31.2
1886.833	33.6	54.0	-20.4	Vertical	Vertical	-31.2
1890.800	33.4	54.0	-20.6	Vertical	Vertical	-31.2
1978.067	48.9	54.0	-5.1	Vertical	Vertical	-30.8
8612.033	42.5	54.0	-11.5	Vertical	Vertical	-13.3
1812.033	51.6	74.0	-22.4	Vertical	Vertical	-31.2
1978.067	54.1	74.0	-19.9	Vertical	Vertical	-30.8
8342.867	52.5	74.0	-21.5	Vertical	Vertical	-13.5



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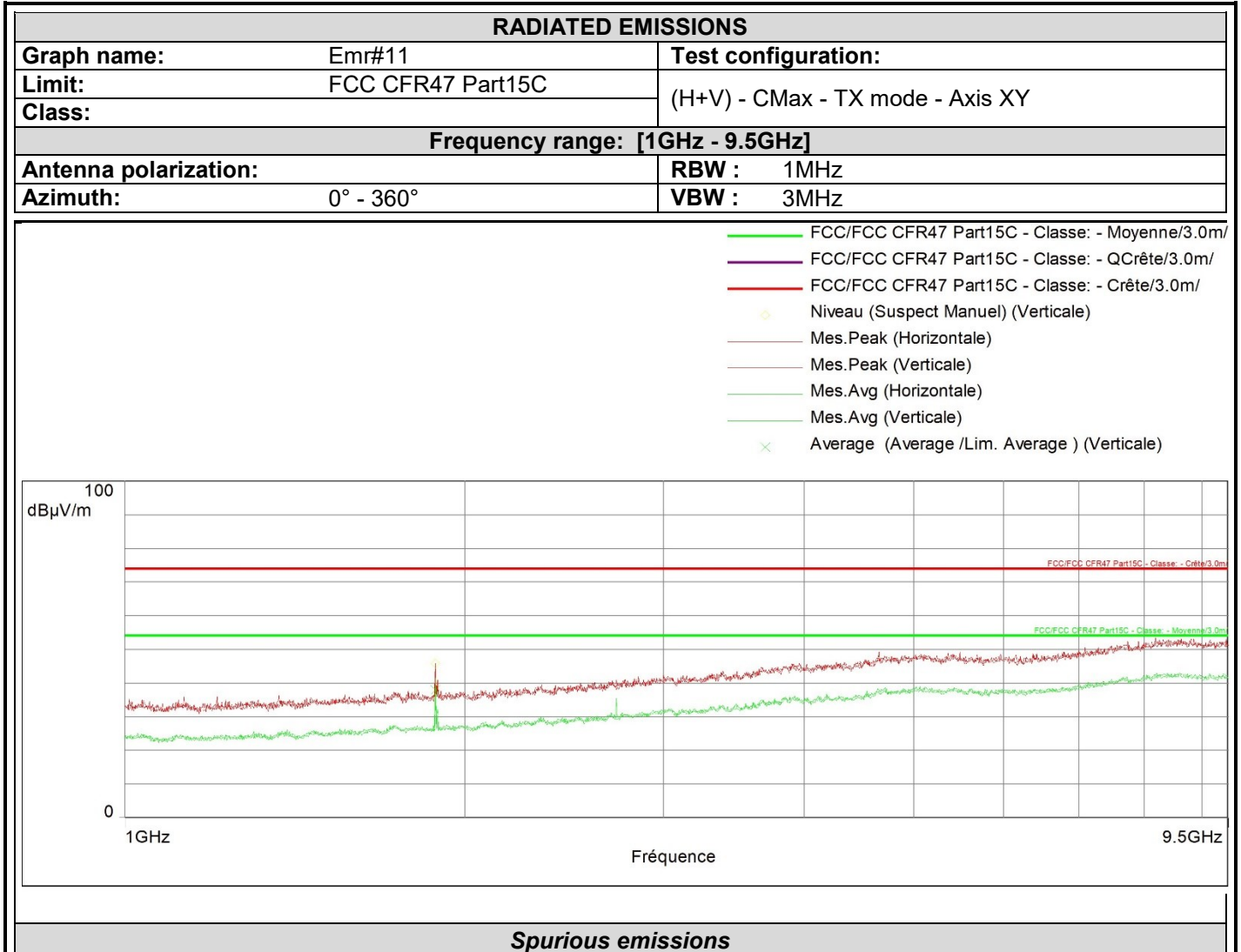


Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Commentaire	Polarization	Correction (dB)
1976.933	37.4	54.0	-16.6	Horizontal	Horizontal	-30.8
1972.400	46.9	54.0	-7.1	Vertical	Vertical	-30.8
6344.233	46.0	54.0	-8.0	Vertical	Vertical	-18.7

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Peak-Lim.Peak (dB)	Commentaire	Polarization	Correction (dB)
1972.400	52.2	74.0	-21.8	Vertical	Vertical	-30.8
6344.233	54.8	74.0	-19.2	Vertical	Vertical	-18.7



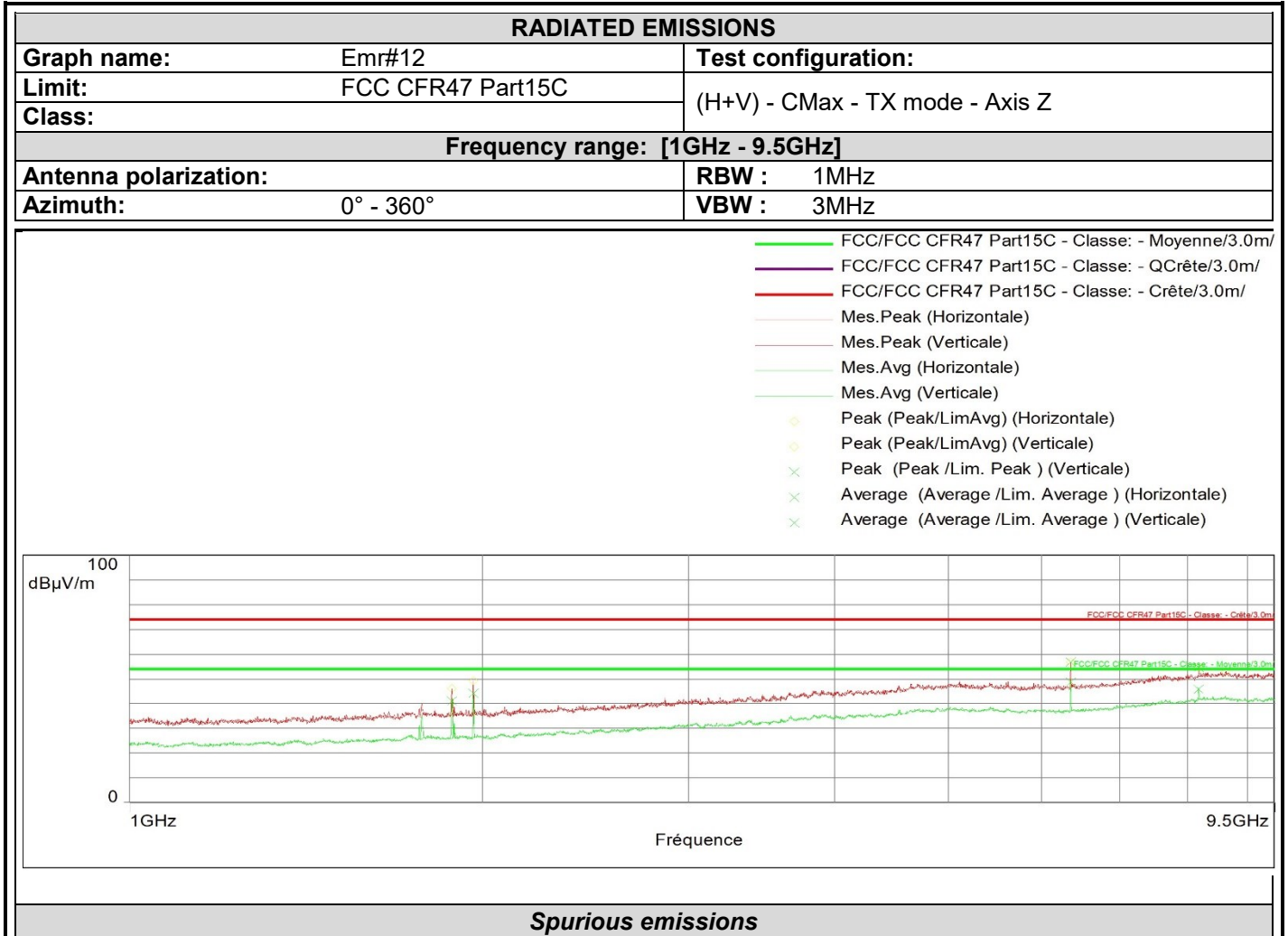
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Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Commentaire	Polarization	Correction (dB)
1882.867	37.9	54.0	-16.1	Vertical	Vertical	-31.2



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Frequency (MHz)	Average (dBµV/m)	Lim.Average (dBµV/m)	Average-Lim.Average (dB)	Commentaire	Polarization	Correction (dB)
1882.867	41.1	54.0	-12.9	Horizontal	Horizontal	-31.2
1965.600	44.2	54.0	-9.8	Vertical	Vertical	-30.8
6357.833	48.8	54.0	-5.2	Vertical	Vertical	-18.7
8174.567	45.8	54.0	-8.2	Vertical	Vertical	-13.4

Frequency (MHz)	Peak (dBµV/m)	Lim.Peak (dBµV/m)	Peak-Lim.Peak (dB)	Commentaire	Polarization	Correction (dB)
6357.833	56.9	74.0	-17.1	Vertical	Vertical	-18.7
8174.567	54.6	74.0	-19.4	Vertical	Vertical	-13.4

4.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **KUKA FNA** , SN: **0000114**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

5. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty laboratory (k=2) $\pm x(\text{dB}) / (\text{Hz}) /$ ms	Uncertainty limit
Measurement of conducted disturbances in voltage on the AC power port (9 kHz – 150 kHz)	2,67	3.8
Measurement of conducted disturbances in voltage on the AC power port (150 kHz – 30 MHz)	2,67	3.4
Measurement of conducted disturbances in voltage on the telecommunication port. (AAN)	3,67	5.0
Measurement of conducted disturbances in current (current clamp)	2,73	2.9
Measurement of disturbance power	2,67	4.5
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC V01	4,48	/
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC C01	4,48	/
Measurement of radiated electric field from 30 to 1000MHz in horizontal position on the OATS (Ecuelles)	4,88	6.3
Measurement of radiated electric field from 1 to 18GHz on the Ecuelles site	5.16	/
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the OATS (Ecuelles)	4,99	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC C01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC C01	5,16	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC V01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC V01	5,15	6.3
Measurement of radiated electric field from 1 to 6 GHz C01	5,1	5.2
Measurement of radiated electric field from 1 to 6 GHz V01	4,85	5.2
Measurement of radiated magnetic field from 10kHz to 30MHz on the OATS (Ecuelles)	4,48	/

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report