



Test report issued under the responsibility of:
EMITECH MONTPELLIER laboratory
MRA US-EU Designation Number: FR0006
Canadian CAB Identifier: FR0003

RADIO TEST REPORT

KDB 996369 D04 v02: October 2020

FCC 47 CFR PART 15: March 2024

FCC part 15.247

RSS-247, Issue 3: August 2023

(Partial tests)

Company: **VOGO**
Address.....: 895 RUE DE LA VIEILLE POSTE,
34000 MONTPELLIER
FRANCE

Test item description: **Radio module in host**
Trade Mark: VOKKERO
Manufacturer.....: **VOGO**
Model/Type reference.....: VO8364AA+ / Into VOK-ELITE PLUS-VARSITY II - VO8364VA
FCC ID.....: 2AU6N-VO8364AA
IC: 25704-VO8364AA
Ratings.....: 3.7Vdc to 4.2Vdc

Testing Laboratory: **EMITECH MONTPELLIER laboratory**
Address.....: 145 rue de Massacan
34740 VENDARGUES
FRANCE

Report Reference No.....: **RR-EVE-24B929-5A**
Test procedure: FCC IC Certification
Diffusion.....: M SAGUIN
Applicant's name: VOGO
Date of issue.....: November 26, 2024
Total number of pages.....: 23
Revision: 0
Compiled by.....: Fabien MOINACHE
Approved by (+ signature): Olivier AELBRECHT (Technical Manager)

*Duplication of this test report is only permitted for an integral photographic facsimile. It includes the number of pages referenced here above.
This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of
the whole manufactured products of the tested sample.*

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REVISION HISTORY:

Revision	Date	Modified pages	Modifications
0	November 26, 2024	/	Creation

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **VOK-ELITE PLUS-VARSITY II VO8364VA** (denominated hereafter E.U.T.: equipment under test) according to document(s) listed in §2 of this test report.

TESTING PROCEDURE AND TESTING LOCATION:					
Testing Location : EMITECH MONTPELLIER laboratory Address. : 145 rue de Massacan 34740 VENDARGUES FRANCE Test procedure. : FCC IC Certification Tested by : Fabien MOINACHE Test supervisor : None Date of receipt of test item : N/A Date (s) of performance of tests : From August the 5 th to the 6 th of 2024					
APPLICANT'S GENERAL INFORMATIONS:					
Company name : VOGO Company address. : 895 RUE DE LA VIEILLE POSTE, 34000 MONTPELLIER FRANCE Person(s) present during the tests. : M DE BARROS Responsible. : M SAGUIN					
GENERAL REMARKS:					
The information in <i>italics</i> is declared by the manufacturer and is under his responsibility The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report the decimal separator is point.					
POSSIBLE TEST CASE VERDICTS:					
Test case does not apply to the test object.: N/A Test case not performed : N/P Test object does meet the requirement..... : P (Pass) Test object does not meet the requirement. : F (Fail)					
DEFINITIONS AND ABBREVIATIONS:					
E.U.T.	Equipment Under Test	AE	Ancillary Equipment	Pk	Peak detector
RBW	Resolution BandWidth	VBW	Video BandWidth	QP	Quasi-peak detector
FSOATS	Free Space Open Area Test Site	FAR	Full Anechoic Room	Av	Average detector
VP	Vertical Polarization	HP	Horizontal Polarization	RMS	Root Mean Square
RF	Radio Frequency	N.T.R	Nothing To Report	N/C	Not Communicated
SAC	Semi Anechoic Chamber				

2. REFERENCE DOCUMENT(S)

NORMATIVE REFERENCES:

The following referenced documents are necessary for the application of the present test report.

KDB 996369 D04 v02: October 2020

Modular transmitter integration guide — Guidance for host product manufacturers

FCC 47 CFR PART 15: March 2024

Code of federal regulations. Title 47- Telecommunication Chapter 1- Federal Communication Commission. Part 15- Radio frequency devices Subpart B- Unintentional Radiators. Limits and methods of measurement of radio disturbance. Characteristic of information technology equipment

FCC part 15.247

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850MHz. (frequency hopping and digitally modulated)

RSS-247, Issue 3: August 2023

Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence Exempt Local Area Network (LE-LAN) Devices

RSS-Gen, Issue 5: April 2018 / AMD1: March 2019 / AMD2: February 2021

General Requirements for Compliance of Radio Apparatus

ANSI C 63.10: 2013

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Although the product standard uses obsolete technical standards, the latest versions of standards achievable by the laboratory will be used for testing.

INFORMATIVE REFERENCES:

The following referenced documents are not necessary for the application of the present test report but they assist the user with regard to a particular subject area.

3.3.E.U.T. General view



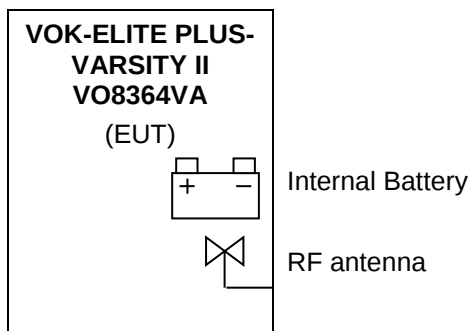
3.4.E.U.T. Mechanical and Electrical Design

Power supply.....	: 3.7Vdc
Power supply range.....	: 3.7Vdc to 4.2 Vdc
Power type.....	: Lithium battery
Power (W).....	: 3
Nominal current (mA).	: 800
Dimensions (L x W x H) (mm).	: 57 x 96 x 23
Weight (g).	: 130 (including battery)
Temperature range (°C).	: -20 to +55
Ground bounding strap.....	: No

Comments:

N/A

3.5.E.U.T. Input/Output ports



PORT	NAME	TYPE	LENGTH	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	Plastic	N/A
1	Internal Battery	DC	N/A	Shielded	3.7Vdc
2	RF antenna	RF	N/A	N/A	N/A

AC/DC : AC/DC Converter port

I/O: Input or Output port

N/E: Non Electrical port

AC.....: Alternative current port

TP: Telecommunication port

DC.....: Direct current port

RF.....: Radio frequency port

3.6. EUT Radio Specifications

a) GENERAL INFORMATIONS	
According to manufacturer's declarations :	
EUT type.....	Transceiver
Technology	DTS FHSS
Environmental profile.....	Data transmission
Temperature range.....	-20°C to +55°C
Antenna type	Integral
Antenna Gain.....	Not communicated
Comments:	
N/A	
b) TRANSMITTER PARAMETERS (Tx)	
Frequency bands.....	DTS band 902.4 MHz to 927.6 MHz FHSS band 915.42 MHz to 927.42 MHz
RF Power.....	Not communicated
Number of channels / Separation.....	DTS: 127 FHSS: 25/26
Modulation type	GFSK
Duty cycle	Not communicated
Tested frequency.....	902.4MHz (Low Freq.) 915MHz (Mid. Freq.) 927.6MHz (High Freq.)
c) RECEIVER PARAMETERS (Rx)	
Frequency bands.....	DTS band 902.4 MHz to 927.6 MHz FHSS band 915.42 MHz to 927.42 MHz

4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
Conducted RF Power - RF output power / Low Freq. / VO8364VA - RF output power / Mid. Freq. / VO8364VA - RF output power / High Freq. / VO8364VA Effective isotropic radiated power - EIRP / Low Freq. / VO8364VA - EIRP / Mid. Freq. / VO8364VA - EIRP / High Freq. / VO8364VA Transmitter radiated spurious emissions at frequencies >30MHz - Radiated measurement / Low Freq. / VO8364VA - Radiated measurement / Mid. Freq. / VO8364VA - Radiated measurement / High Freq. / VO8364VA	30dBm 30dBm 30dBm 36dBm 36dBm 36dBm 15.209 15.209 15.209	PASS PASS PASS PASS PASS PASS PASS PASS PASS	FCC part 15.247 RSS-247 ANSI C63.10: 2013 FCC part 15.247 RSS-247 ANSI C63.10: 2013 FCC part 15.247; 15.209; 15.205 RSS-247; RSS-Gen ANSI C63.10: 2013

Sample subject to the test complies for tests done with the requirements of the reference document(s) listed in §2 of this test report and, where applicable, with deviation(s) specified in this document.

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the results with the exception of emission tests based on CISPR standards.

5. MEASUREMENT UNCERTAINTY

PARAMETER	MAXIMAL EMITECH UNCERTAINTY	MINIMAL STANDARD UNCERTAINTY
Radio frequency	$\pm 1 \times 10^{-7}$	$\pm 1 \times 10^{-7}$
RF power, conducted		
RF power	$\pm 0.8\text{dB}$	$\pm 1 \text{ dB}$
Conducted emission (spurious)		
$f \leq 1 \text{ GHz}$	$\pm 0.8 \text{ dB}$	$\pm 3 \text{ dB}$
1 GHz - 12.75 GHz	$\pm 1.6 \text{ dB}$	
Radiated emission (ERP / EIRP)		
$f \leq 62.5 \text{ MHz}$	$\pm 5.7 \text{ dB}$	$\pm 6 \text{ dB}$
62.5 MHz - 1 GHz	$\pm 5.8 \text{ dB}$	$\pm 6 \text{ dB}$
1 GHz - 18 GHz	$\pm 5.6 \text{ dB}$	$\pm 6 \text{ dB}$
18 GHz – 40 GHz	$\pm 5.6 \text{ dB}$	$\pm 6 \text{ dB}$
40 GHz – 110 GHz	$\pm 5.9 \text{ dB}$	Between ± 6 to 10 dB
Supply voltages	$\pm 3 \%$	$\pm 3 \%$
Temperature	$\pm 1 \text{ }^{\circ}\text{C}$	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5 \%$	$\pm 5 \%$
Time / Duty cycle	$\pm 4.4 \%$	$\pm 5 \%$
Conducted emission (FCC)		
(Artificial Mains Network) 150kHz – 30MHz	$\pm 3.4 \text{ dB}$	$\pm 3.4 \text{ dB}$
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	$\pm 2.7 \text{ dB}$	/
30MHz – 1GHz	$\pm 5.0 \text{ dB}$	/
1GHz – 18GHz	$\pm 5.3 \text{ dB}$	/
18GHz – 40GHz	$\pm 6.1 \text{ dB}$	/
40GHz – 140GHz	$\pm 5.7 \text{ dB}$	/

For the calculation of expanded uncertainty, the confidence interval is 95 % (k=2).

6. TEST CONDITIONS AND RESULTS

6.1. Conducted RF Power

Reference standard:	FCC 47 CFR PART 15.247 RSS-247
Test method:	ANSI C63.10
General test setup: EUT is connected to the measuring receiver via 50Ω attenuator(s). Only the highest levels are recorded.	

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
RF output power / Low Freq. / VO8346VA	Unmodulated Tx	30dBm	EMI4525	PASS
RF output power / Mid. Freq. / VO8346VA	Unmodulated Tx	30dBm	EMI4628	PASS
RF output power / High Freq. / VO8346VA	Unmodulated Tx	30dBm	EMI4629	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	24.2 °C
Relative Humidity	20 to 75 %	46.4 %
Atmospheric pressure	N/A	1012 hPa
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
AC power source	GW Instek	APS-1102	17754	24/06/2023	24/08/2024
Attenuator	Radiall	R412720124	4391	01/10/2022	01/10/2025
Attenuator	Radiall	R412710124	17328	17/08/2023	17/10/2026
Cable	Radiall	SMA-1m	16561	16/08/2023	16/10/2025
Cable	Radiall	SMA-1m	16563	16/08/2023	16/10/2025
Multimeter	FLUKKE	8808A	10382	11/07/2024	11/09/2025
Spectrum analyzer	Rohde & Schwarz	FPL1007	17908	04/12/2023	04/02/2025
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025

BAT-EMC software version: V3.18.0.26

Blank cells = Permanent validity

RF CONDUCTED POWER - TABULATED RESULTS				
TEST CASE	FREQUENCY	LEVEL (dBm)	LIMIT (dBm)	RESULT TAB.
RF output power / Low Freq. / VO8346VA	902.4MHz	19.25	30	EMI4525
RF output power / Mid. Freq. / VO8346VA	915MHz	19.56	30	EMI4628
RF output power / High Freq. / VO8346VA	927.6MHz	16.91	30	EMI4629

EUT MODIFICATIONS	OPERATOR	TEST DATE
N/A	FMO	05/08/2024

6.2. Effective isotropic radiated power

Reference standard:	FCC 47 CFR PART 15.247 RSS-247
Test method:	ANSI C63.10
General test setup: EUT is set on an insulating support at 150cm above the ground reference plane. Measurement are done on a normalized test site by the substitution method. The test antenna is oriented in the two polarizations (vertical and horizontal), and the product is rotated at 360° in the horizontal plane (See photo(s) for initial position of the EUT(0°)). If applicable the test antenna was raised and lowered through the specified range of height until a maximum signal level is detected. For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
EIRP / Low Freq. / VO8346VA	901.4MHz-903.4MHz	36dBm	EMI4614	PASS
EIRP / Mid. Freq. / VO8346VA	914MHz-916MHz	36dBm	EMI4613	PASS
EIRP / High Freq. / VO8346VA	926.6MHz-928.6MHz	36dBm	EMI4615	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(s)
Relative Humidity	20 to 75 %	See Graph(s)
Atmospheric pressure	N/A	See Graph(s)
Test method deviation: N/A		
Supplementary information: N/A		

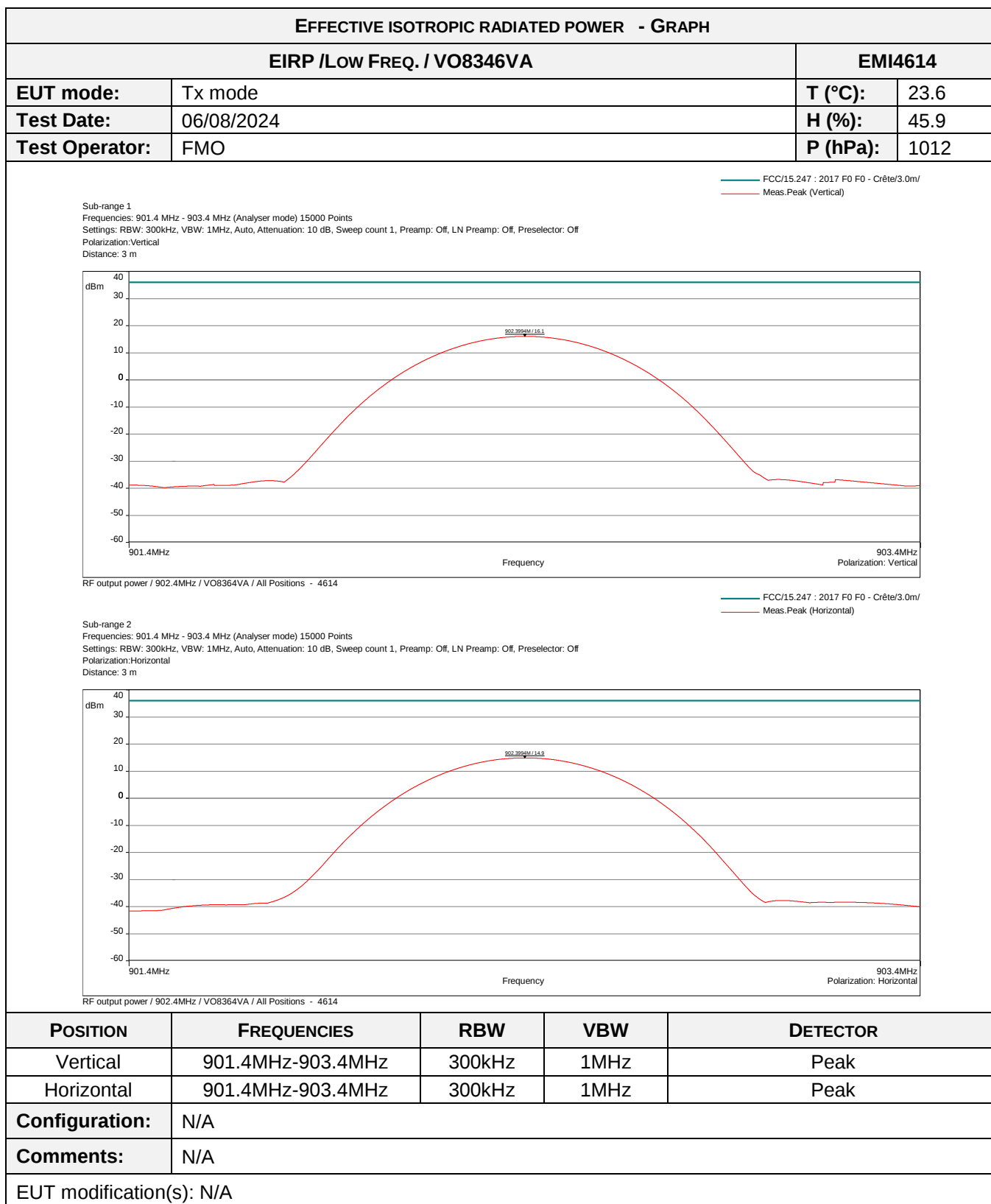
TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS lindgren	3143B	17930	12/08/2021	12/10/2024
Attenuator	EMITECH	SUB.V4-H	18112	28/05/2024	28/07/2025
Attenuator	EMITECH	SUB.V4-V	18111	28/05/2024	28/07/2025
Cable	/	N-1m	3625	02/05/2023	02/07/2025
Cable	Techniwave	N-3.5m	18353	17/08/2023	17/10/2025
Cable	Techniwave	N-4m	18355	17/08/2023	17/10/2025
Receiver	Rohde & Schwarz	ESW26	17791	16/07/2024	16/09/2025
Shielded enclosure	COMTEST	FAR-3m	18014	17/08/2021	17/10/2024
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12269	07/06/2022	07/08/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025

BAT-EMC software version: V3.18.0.26

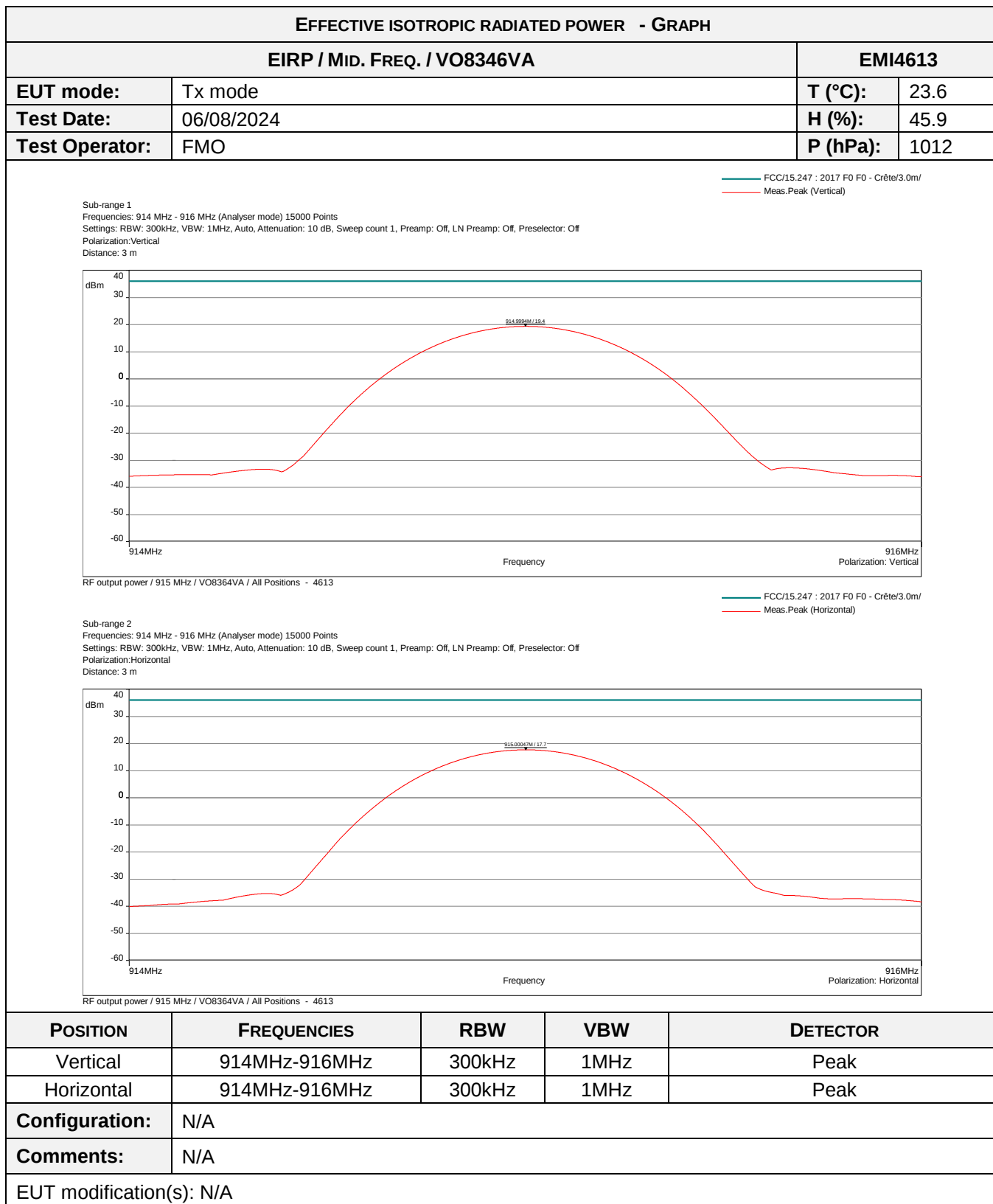
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TEST SETUP PHOTO(S)

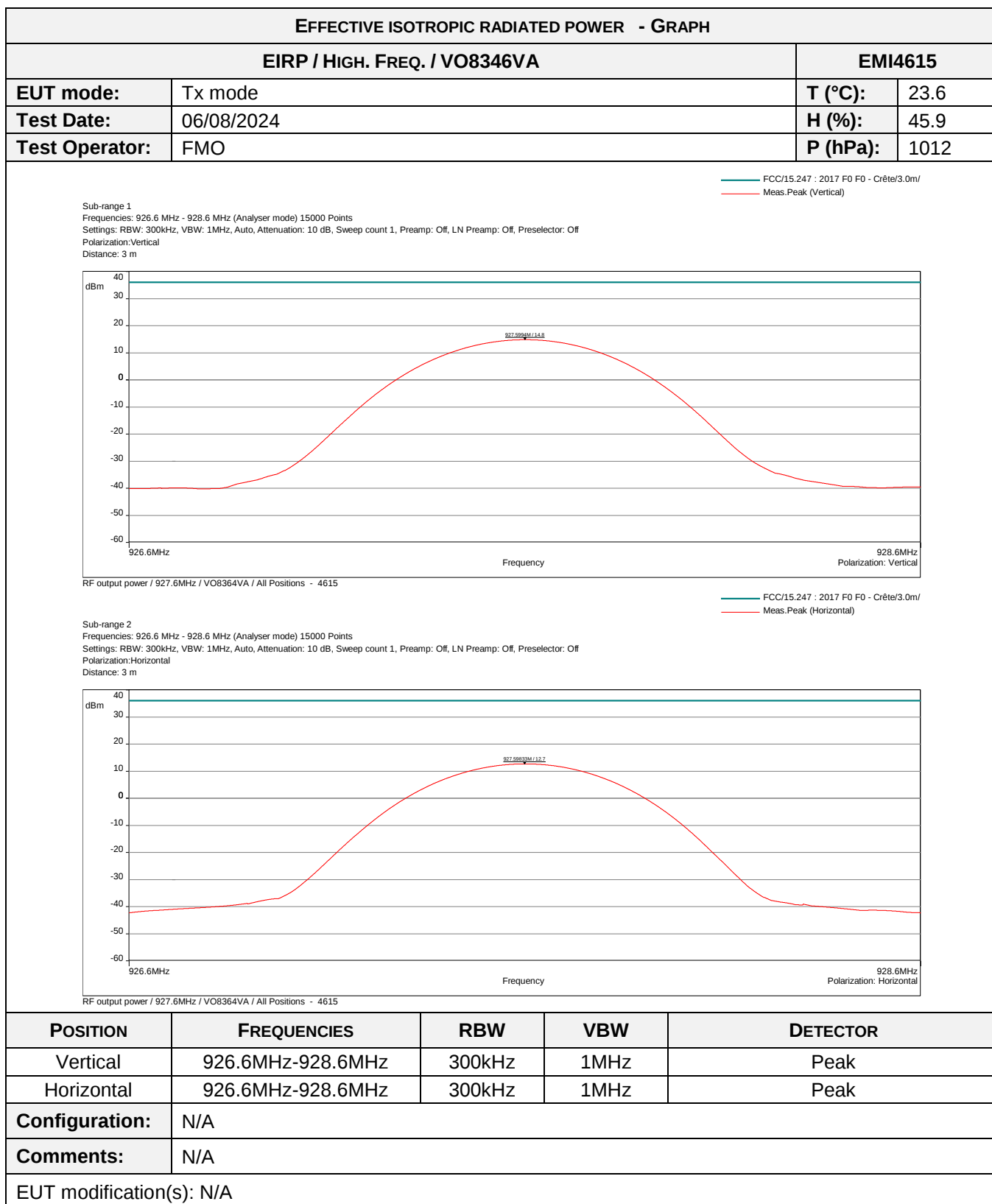




EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
EIRP /Low FREQ. / VO8346VA			EMI4614
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)
902.4	Vertical	16.1	36dBm
902.4	Horizontal	14.9	36dBm



EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
EIRP / MID. FREQ. / VO8346VA			EMI4613
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)
915	Vertical	19.4	36dBm
915	Horizontal	17.7	36dBm



EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
EIRP / HIGH. FREQ. / VO8346VA			EMI4615
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)
927.6	Vertical	14.8	36dBm
927.6	Horizontal	12.7	36dBm

6.3. Transmitter radiated spurious emissions at frequencies >1GHz

Reference standard:	FCC 47 CFR PART 15.247; 15.209; 15.205 RSS-247; RSS-Gen
Test method:	ANSI C63.10
General test setup: EUT is set on an insulating support at 150cm above the ground reference plane. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak or average) were then performed in a semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. The EUT was rotated 360° about its azimuth and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated, where applicable. For portable equipments: For frequencies > 1GHz styrofoam wedges, precut to the 30°, 60°, and 90° angles, are used to support the EUT in the 6 different orientations. Only the highest levels are recorded	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Radiated measurement / Low Freq. / VO8364VA / All Positions	1GHz-10GHz	15.205 & 15.209	EMI4616	PASS
Radiated measurement / Mid. Freq. / VO8364VA / All Positions	1GHz-10GHz	15.205 & 15.209	EMI4617	PASS
Radiated measurement / High Freq / VO8364VA / All Positions	1GHz-10GHz	15.205 & 15.209	EMI4618	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(s)
Relative Humidity	20 to 75 %	See Graph(s)
Atmospheric pressure	N/A	See Graph(s)
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	AARONIA	Powerlog 70180	15306	04/01/2023	04/03/2026
Cable	Techniwave	N-1.5m	18340	17/08/2023	17/10/2025
Cable	Techniwave	N-1.5m	18341	17/08/2023	17/10/2025
Cable	/	N-1m	3625	02/05/2023	02/07/2025
Filter	Micro-Tronics	HPM18865	12843	24/08/2021	24/10/2024
Preamplifier	IMPULSE	CA118-546ACN	9169	15/06/2023	15/08/2024
Receiver	Rohde & Schwarz	ESW26	17791	16/07/2024	16/09/2025
Shielded enclosure	COMTEST	FAR-3m	18014	17/08/2021	17/10/2024
Software	Nexio	BAT EMC	0000		
Thermohygrometer	Testo	608-H2	12268	24/10/2022	24/12/2024
Thermohygrometer	Bioblock Scientific	Météostar	0963	25/09/2023	25/11/2025

BAT-EMC software version: V3.18.0.26

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TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >1GHz - TABULATED RESULTS			
RADIATED MEASUREMENT / Low FREQ. / VO8346VA			EMI4616
Frequency (MHz)	Polarization	Level (dBμV/m)	Limit (dbμV/m)
N/A	N/A	N/A	N/A
Supplementary information: No spurious emissions were detected.			

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >1GHz - TABULATED RESULTS			
RADIATED MEASUREMENT / Mid. FREQ. / VO8346VA			EMI4617
Frequency (MHz)	Polarization	Level (dBμV/m)	Limit (dbμV/m)
N/A	N/A	N/A	N/A
Supplementary information: No spurious emissions were detected.			

TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >1GHz - TABULATED RESULTS			
RADIATED MEASUREMENT / High FREQ. / VO8346VA			EMI4618
Frequency (MHz)	Polarization	Level (dBμV/m)	Limit (dbμV/m)
N/A	N/A	N/A	N/A
Supplementary information: No spurious emissions were detected.			

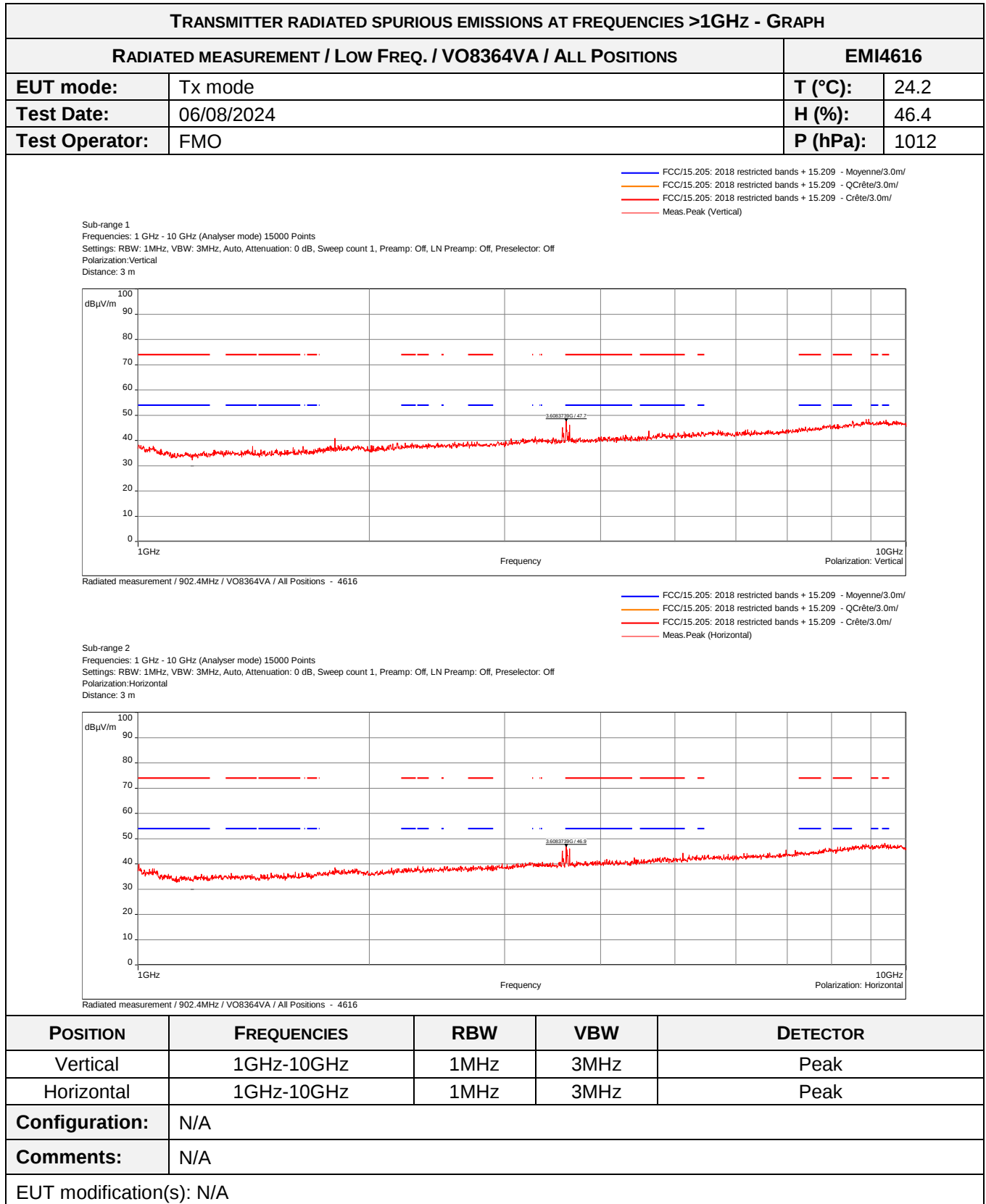
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >1GHz - TABULATED RESULTS				
RADIATED MEASUREMENT / LOW FREQ. / VO8364VA / ALL POSITIONS				EMI4616
Frequency (MHz)	Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)
3608.3	Vertical	47.7	N/P	54.0
3608.3	Horizontal	46.9	N/P	54.0
Supplementary information: When margin between peak measurements and average limit is > 6dB, so no average measurements were performed.				

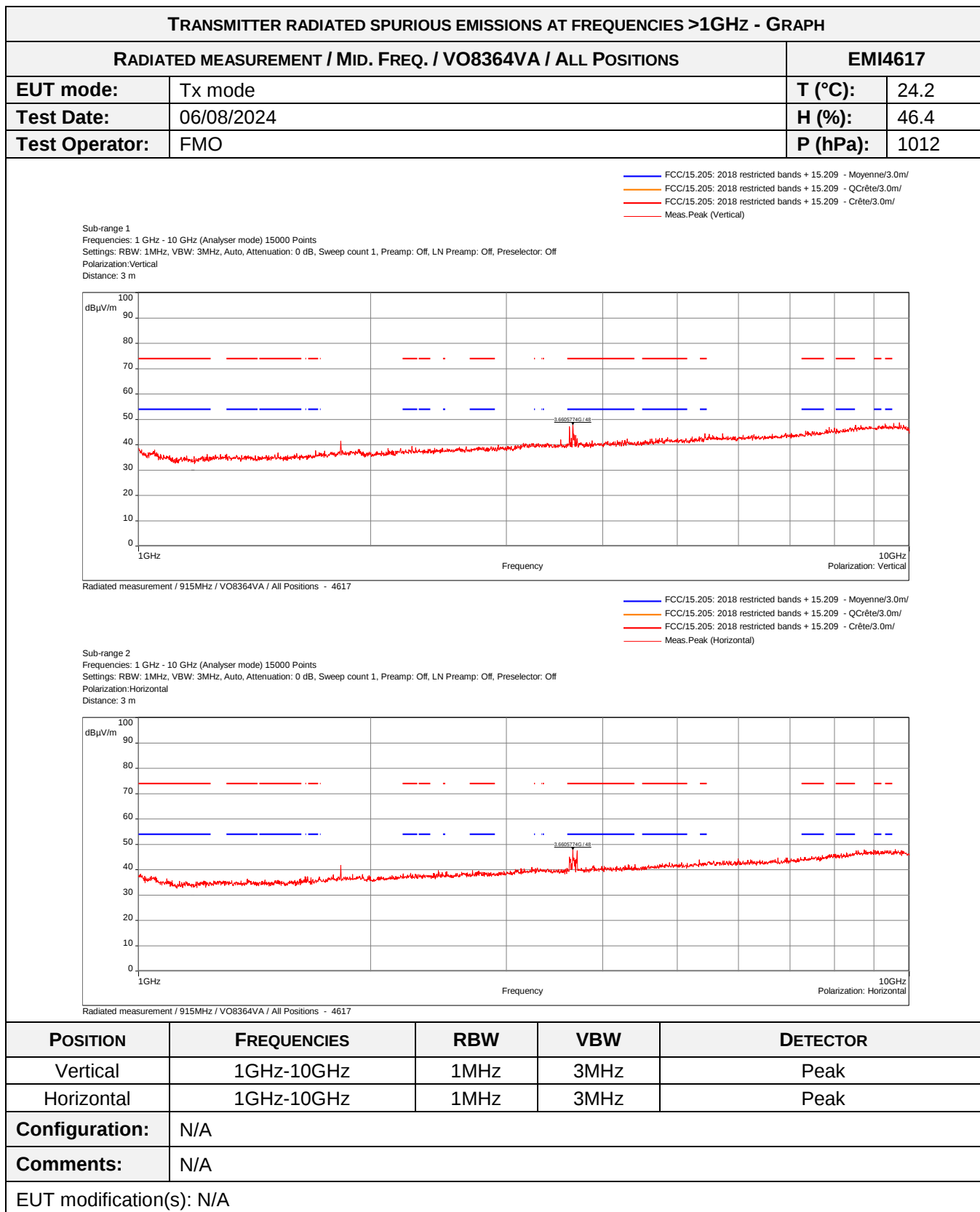
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >1GHz - TABULATED RESULTS				
RADIATED MEASUREMENT / MID. FREQ. / VO8364VA / ALL POSITIONS				EMI4617
Frequency (MHz)	Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)
3660.5	Vertical	48.0	N/P	54.0
3660.5	Horizontal	48.0	N/P	54.0
Supplementary information: When margin between peak measurements and average limit is > 6dB, so no average measurements were performed.				

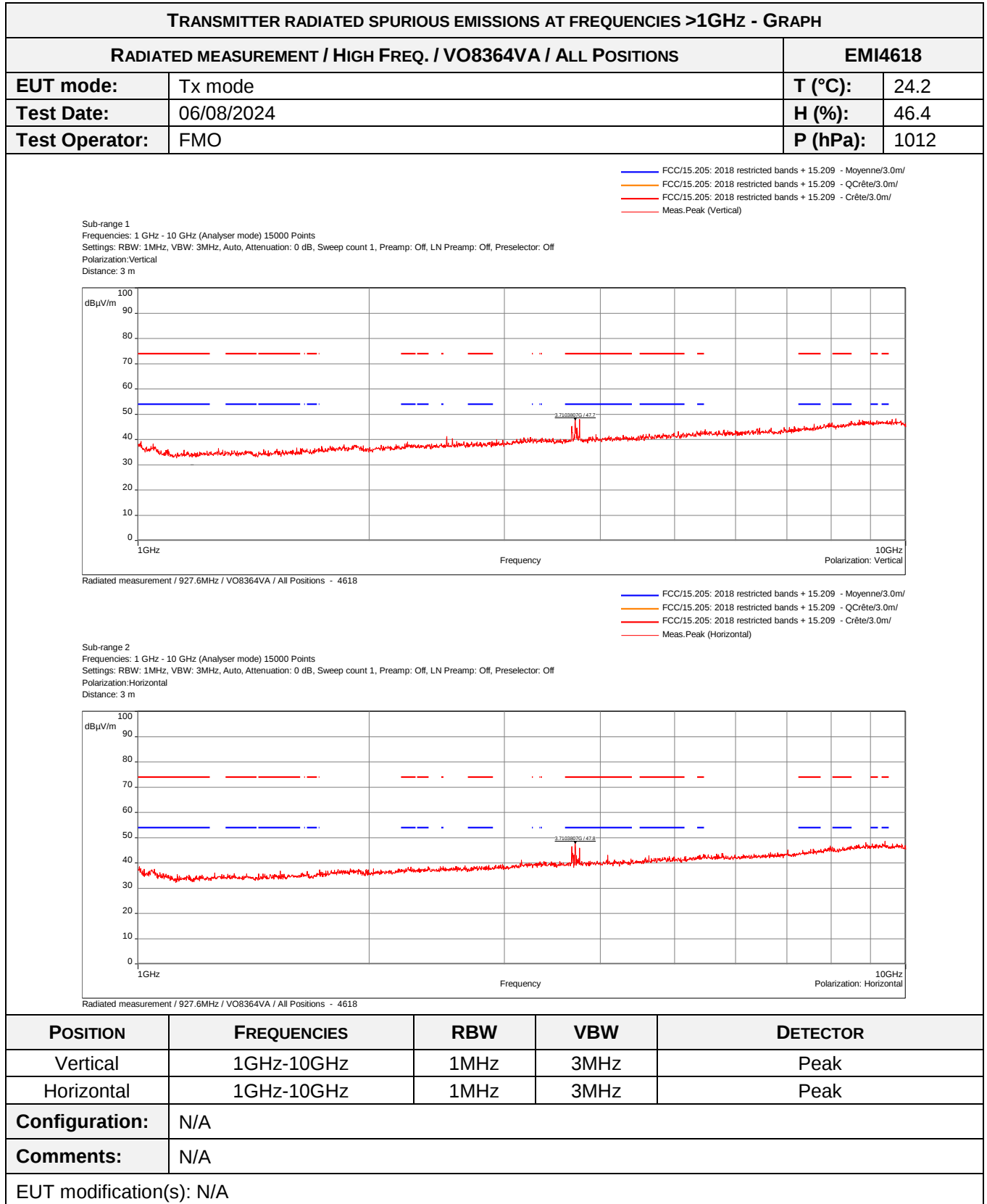
TRANSMITTER RADIATED SPURIOUS EMISSIONS AT FREQUENCIES >1GHz - TABULATED RESULTS				
RADIATED MEASUREMENT / HIGH FREQ. / VO8364VA / ALL POSITIONS				EMI4618
Frequency (MHz)	Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)
3710.4	Vertical	47.7	N/P	54.0
3710.4	Horizontal	47.8	N/P	54.0
Supplementary information: When margin between peak measurements and average limit is > 6dB, so no average measurements were performed.				

TEST SETUP PHOTO(S)









End of test report