



Test report issued under the responsibility of:
EMITECH MONTPELLIER laboratory
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RADIO TEST REPORT

FCC part 15.247
RSS-247_Issue 2, February 2017

Company: **STID**
Address.....: 20 PARC D'ACTIVITES DES PRADEAUX
13850 GREASQUE
FRANCE

Test item description: **UHF RFID reader**
Trade Mark: STID
Manufacturer.....: STID
Model/Type reference.....: W55 / ARC
FCC ID.....: OVNAC9
IC: 10520A-ARCU
Ratings.....: 4.5Vdc to 5.5Vdc

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

Report Reference No.....: **RR-EVE21C753-2A**
Test procedure: FCC IC Certification
Diffusion.....: Mr SOGOYAN
Applicant's name: STID
Date of issue.....: February 23, 2023
Total number of pages.....: 48
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Compiled by.....: Olivier AELBRECHT
Approved by (+ signature): Olivier HEYER (Laboratory Manager)

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REVISION HISTORY:

Revision	Date	Modified pages	Modifications
0	February 23, 2023	/	Creation

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **UHF RFID reader ARC-W55-G/U04-5AA/1** (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	Olivier AELBRECHT				
Test supervisor	None				
Date of receipt of test item	N/A				
Date (s) of performance of tests	From May the 25th to June the 11th of 2021				
APPLICANT'S GENERAL INFORMATIONS:					
Company name	STID				
Company address	20 PARC D'ACTIVITES DES PRADEAUX 13850 GREASQUE FRANCE				
Person(s) present during the tests	No representative for company attended the tests.				
Responsible	Mr SOGOYAN				
GENERAL REMARKS:					
<p>The information in italics 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.</p> <p>"(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.</p>					
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
OATS	Open area test site	FAR	Full anechoic room	Av	Average detector
VP	Vertical Polarization	HP	Horizontal Polarization	RMS	Root Mean Square
RF	Radio frequency	NTR	Nothing to report	N/C	Not communicated

2. REFERENCE DOCUMENT(S)

NORMATIVE REFERENCES:

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

FCC part 15

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 2, February 2017

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

RSS/CNR-Gen, Issue 4, November 2014

Exigences générales et information relatives à la certification du matériel de radiocommunication

ANSI C 63.10:2013

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

ANSI C 63.4:2014

American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

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. EQUIPMENT TECHNICAL DESCRIPTION

3.1. Test Conditions

Test item description. : UHF RFID reader
Model/Type reference..... : W55 / ARC
Trade Mark. : STID
Serial number (S/N)..... : Not communicated
Part number (P/N). : Not communicated
Software version..... : 1.1.0.851
Firmware version..... : 2
Type of sample..... : Standard equipment
Function(s)..... : UHF RFID reader
Manufacturer name. : STID
Address. : 20 PARC D'ACTIVITES DES PRADEAUX
13850 GREASQUE
FRANCE

General product information:

N/A

3.2. EUT Marking plate



3.3. EUT General view



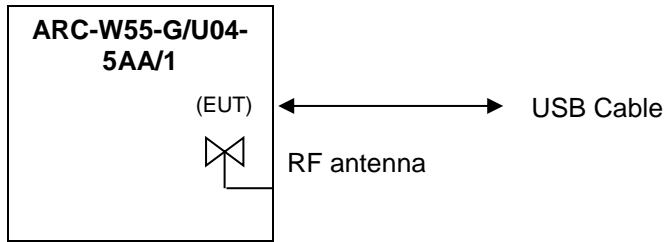
3.4. EUT Mechanical and Electrical Design

Power supply.	: 5Vdc
Power supply range.....	: 4.5Vdc to 5.5Vdc
Power type.....	: USB
Power (W).....	: 1.7
Nominal current (A).	: 0.35
Dimensions (L x W x H) (m).	: 8cmx10cmx2cm
Weight (kg).	: 0.178
Temperature range (°C).	: -20°C to +50°C
Ground bounding strap.....	: No

Comments:

N/A

3.5. EUT Input/Output ports



PORT	NAME	TYPE	LENGHT	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	Plastic	N/A
1	USB Cable	I/O + DC	1.5m	Not shielded	(5Vdc)
2	RF antenna	RF	N/A	N/A	N/A

AC/DC		AC		DC	
.....	AC/DC Converter port	Alternative current port	Discontinuous current port
:		:		:	
I/O		TP		RF	
.....	Input or Output port	Telecommunication port	Radio frequency port
:		:		:	
N/E					
.....	Non Electrical port				
:					

3.6. Supporting Equipment Used During Test

Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
Laptop	DELL	Latitude 5510	Used to powered the EUT and set it in test mode
AC/DC block	DELL	LA55NM170	Used for conducted emissions measurement

(AE) LAPTOP



(AE) AC/DC BLOCK



3.7. EUT Radio Specifications


a) GENERAL INFORMATIONS	
According to manufacturer's declarations:	
EUT type.....	<i>Transceiver</i>
Technology	<i>RFID</i>
Environmental profile.....	<i>Data transmissions</i>
Temperature range.....	<i>-20°C to +55°C</i>
Antenna type	<i>Patch</i>
Antenna Gain.....	<i>2 dBi</i>
Comments:	
b) TRANSMITTER PARAMETERS (Tx)	
Frequency bands.....	<i>902MHz to 928MHz</i>
RF Power.....	<i>Not communicated</i>
Number of channels / Separation.....	<i>50 channels / 500kHz</i>
Modulation type	<i>FHSS</i>
Tested frequency.....	<i>902.75MHz (Low Channel)</i> <i>915.25MHz (Mid Channel)</i> <i>927.25MHz (High Channel)</i>
c) RECEIVER PARAMETERS (Rx)	
Frequency bands.....	<i>902MHz to 928MHz</i>
Category/Class	<i>Not communicated</i>
Bandwidth	<i>Not communicated</i>

4. EUT REQUIREMENTS FOR FCC RULES

4.1. Subpart A - General

This part sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of part 15 devices.

The user notice **Référence du manuel utilisateur**, shall include the following informations:

a) LABELING REQUIREMENTS (§15.19):
<p>Equipment authorization: Supplier's Declaration of Conformity (SDoC) or Certification</p> <p>List of different type of devices and associated "<i>statement on product</i>":</p> <p>§15.19(a)(1) - Receivers associated with the operation of a licensed radio service: <i>"This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference."</i></p> <p>§15.19(a)(2) - A stand-alone cable input selector switch: <i>"This device complies with part 15 of the FCC Rules for use with cable television service."</i></p> <p>§15.19(a)(3) - All other devices: <i>"This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."</i></p> <p>§15.19(a)(4) - Where a device is constructed in two or more sections connected by wires and marketed together: The statement specified only to the main control unit: <i>"This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference."</i></p> <p>§15.19(a)(5) - When the device is so small: The statement of §15.19(a) shall be placed in the user manual and must also either be placed on the device packaging or on a removable label attached to the device.</p> <p>Compliance information (§2.1077): The identification, by name, address and telephone number or internet contact information, of the responsible party, as defined in § 2.909 of the standard. The responsible party for Supplier's Declaration of Conformity must be located within the United States.</p> <p>Identification (§2.1074):</p> <p>(a) Devices subject only to Supplier's Declaration of Conformity shall be uniquely identified by the party responsible for marketing or importing the equipment within the United States.</p> <p>(b) Devices subject to authorization under Supplier's Declaration of Conformity may be labeled with the following logo on a voluntary basis as a visual indication that the product complies with the applicable FCC requirements.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">(image size: 6.7 x 2.8" ;3.5 x 1.4" ;1.6 x .7")</p>

The label shall be located in a conspicuous location on the device.

The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible (font of at least 4-point or larger) to the purchaser at the time of purchase.

EUT LABEL

**b) DEVICES INCLUDING MODULAR TRANSMITTER(S) (§15.212):**

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:

“Contains Transmitter Module FCC ID: XYZMODEL1” or “Contains FCC ID: XYZMODEL1.”

Device under test doesn't include single modular transmitter(s):

FCC ID: N/A

IC: N/A

c) INFORMATION TO USER (§15.21):

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that:

“The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment”

4.2. Subpart B - Unintentional Radiators

In addition to Subpart A, the user notice, shall include the following information:

a) INFORMATION TO USER (§15.105):
<p>Equipment authorization: Supplier's Declaration of Conformity (SDoC) or Certification</p> <p>§15.105(a) - For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:</p> <p><i>“NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.”</i></p> <p>§15.105(b) - For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:</p> <p><i>“NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:</i></p> <ul style="list-style-type: none"> <i>—Reorient or relocate the receiving antenna.</i> <i>—Increase the separation between the equipment and receiver.</i> <i>—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.</i> <i>—Consult the dealer or an experienced radio/TV technician for help.”</i>

5. OPINION(S) AND INTERPRETATION(S)

TEST(S) PERFORMED	DEVIATION(S) TO TEST METHOD(S)
FCC part 15.247	N/A
ANSI C 63.10	N/A
ANSI C 63.4	N/A

Comments: N/A

6. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
SUBPART A - GENERAL			
Labeling requirements		PASS	15.19 / See certification documents
Information to user		PASS	15.21 / See certification documents
Home-built devices		N/A	15.23
Kits		N/A	15.25
Special Accessories		PASS	15.27 / See certification documents
Inspection by the Commission		N/A	15.29
Measurement standards		PASS	15.31
Test procedure for CPU boards and computer power supplies		N/A	15.32
Frequency range of radiated measurements		PASS	15.33
Measurement detector functions and bandwidths		PASS	15.35
Transition provisions for compliance with the rules		PASS	15.37 / See certification documents
SUBPART B – UNINTENTIONAL RADIATORS			
Equipment authorization			15.101
- Verification		N/A	
- Declaration of Conformity		N/A	
CPU boards and power supplies used in personal computers		N/A	15.102
Exempted device		N/A	15.103
Information to the user		PASS	15.105 / See certification documents
Conducted limits		PASS	15.107
Radiated emission limits	Class B	PASS	15.109
Antenna power conduction limits for receivers		N/A	15.111
Power line carrier systems		N/A	15.113
TV interface devices, including cable system terminal devices		N/A	15.115
TV broadcast receivers		N/A	15.117
Cable ready consumer electronics equipment		N/A	15.118
Program blocking technology requirements for TV receivers		N/A	15.120
Scanning receivers and frequency converters used with scanning receivers		N/A	15.121
Labeling of digital cable ready products		N/A	15.123
SUBPART C –INTENTIONAL RADIATORS			

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
Equipment authorization requirement		PASS	15.201 / Transmitter part is subject to Certification procedure
Certified operating frequency range		N/A	15.202
Antenna requirement		PASS	15.203 / Dedicated integral antenna
External radio frequency power amplifiers and antenna modifications		N/A	15.204
Restricted bands of operation		PASS	15.204
Conducted limits	Class B	PASS	15.207
Radiated emission limits; general requirements	Class B	PASS	15.209
Tunnel radio systems		N/A	15.211
Modular transmitters		N/A	15.212
Cable locating equipment		N/A	15.213
Cordless telephones		N/A	15.214
Additional provisions to the general radiated emission limits		PASS	15.215
Operation within the band 902-928MHz, 2400-2483.5MHz and 5725-5850MHz			15.247
- Frequency hopping and digitally modulated		-	a)
- Frequency hopping system		PASS	a) (1)
- Digital modulation system		N/P	a) (2)
- Maximum peak conducted output power		-	b)
- For hopping system in the 2400-2483.5 MHz and 5725-5850 MHz bands		N/A	b) (1)
- For hopping system in the 902-928MHz band		PASS	b) (2)
- For system using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands		N/A	b) (3) 0
- Operation with directional antenna gains > 6 dBi		N/A	c)
- Out-of-band emissions		PASS	d)
- Power spectral density conducted		N/A	e)
- Hybrid system		N/A	f)
- Frequency hopping additional requirements		PASS	g)
- Frequency hopping intelligence		PASS	h)
- RF exposure compliance		PASS	i)

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.

TEST(S) PERFORMED	MODIFICATION(S)
FCC part 15.247	N/A
ANSI C 63.10	N/A
ANSI C 63.4	N/A

7. RF EXPOSURE

Maximum EIRP = 3.52 mW (eirp) at 927.75 MHz

In accordance with KDB 447498 D01 General RF Exposure Guidance v06:

$$PSD = EIRP / (4 * \pi * R^2) = 3.52 / (4 * \pi * (20 \text{ cm})^2) = 0.0007 \text{ mW/cm}^2$$

Limit = 0.618 mW/cm² (f / 1500 if 300 < f < 1500 MHz)

In accordance with RSS-102, Issue 5, Section 2.5.1., as EIRP is lower than 16.13 mW at 927.75 MHz, SAR exemption for ISED can be considered for a distance ≤ 5cm.

8. MEASUREMENT UNCERTAINTY

PARAMETER	MAXIMAL EMITECH UNCERTAINTY	MINIMAL STANDARD UNCERTAINTY
Radio frequency	± 1 x 10 ⁻⁷	± 1 x 10 ⁻⁷
RF power, conducted		
RF power	± 0.8dB	± 1 dB
Power spectral density	± 2.3dB	± 3 dB
Occupied bandwidth		
RF power	± 3.8 %	± 5 %
Conducted emission (spurious)		
f ≤ 1 GHz	± 0.8 dB	
1 GHz - 12.75 GHz	± 1.6 dB	± 3 dB
Radiated emission (PAR / PIRE / RNE)		
f ≤ 62.5 MHz	± 5.1 dB	± 6 dB
62.5 MHz - 1 GHz	± 5.1 dB	± 6 dB
1 GHz - 18 GHz	± 5.2 dB	± 6 dB
18 GHz – 26 GHz	± 5.1 dB	± 6 dB
26 GHz – 40 GHz	± 5.4 dB	± 6 dB
PIRE and power spectral density with diode	± 5.2 dB	± 6 dB
Supply voltages	± 3 %	± 3 %
Temperature	± 1 °C	± 1°C
Humidity	± 5 %	± 5 %
Time / Duty cycle	± 4.4 %	± 5 %
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	± 2.7 dB	/
30MHz – 1GHz	± 5.0 dB	/
1GHz – 18GHz	± 5.6 dB	/
18GHz – 26GHz	± 5.7 dB	/
26GHz – 40GHz	± 5.7 dB	/

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

9. TEST CONDITIONS AND RESULTS

9.1. Conducted emission (measurement)

Reference standard:	CFR 47 FCC part 15 (2017) 15.107, 15.207
Test method:	ANSI C63.4: 2004
<p>General test setup: EUT is set on an insulating support at 40cm from the ground reference plane. All power was connected to the system through Artificial Mains Network (AMN). The AMN is placed at 80cm from the boundary of the EUT and bonded to a ground reference plane.</p> <p>All tested telecommunications lines (if applicable) were connected to an Asymmetric Artificial Network (AAN) and conducted voltage measurements on telecommunications lines were made at the output of the AAN.</p> <p>Where an AAN was not appropriate or available, measurements were made using a Capacitive Voltage Probe and/or a Current probe.</p> <p>Additional ground terminals (if any) are connected to earth terminal of the AMN.</p>	

TESTED CABLE	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
AC Power Supply / 120Vac-60Hz	150kHz-30MHz	Class B	EMI4614	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	30 to 60 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
AC power source	KIKUSUI	PCR4000L	3074	25/07/2019	25/09/2021
Cable	EMITECH	Current absorber sheath	9491	23/06/2020	23/08/2022
Cable	C&C	N-5m	14339	18/03/2021	18/05/2023
Ground plane	EMITECH	Test area	11569		
LISN	PMM	L2-16	1209	08/06/2020	08/08/2022
Multimeter	FLUKE	8808A	12446	29/09/2020	29/11/2021
Receiver	Agilent Technologies	E4440A	5824	22/10/2020	22/12/2022
Receiver	Rohde & Schwarz	ESI	9704	03/03/2020	03/11/2021
Software	Nexio		0000		
Surges Suppressor	Hewlett Packard	11947A	0238	20/12/2019	20/02/2023
Thermohygrometer	Testo	608-H2	12269	07/05/2020	07/07/2022

BAT-EMC software version: V3.18.0.26

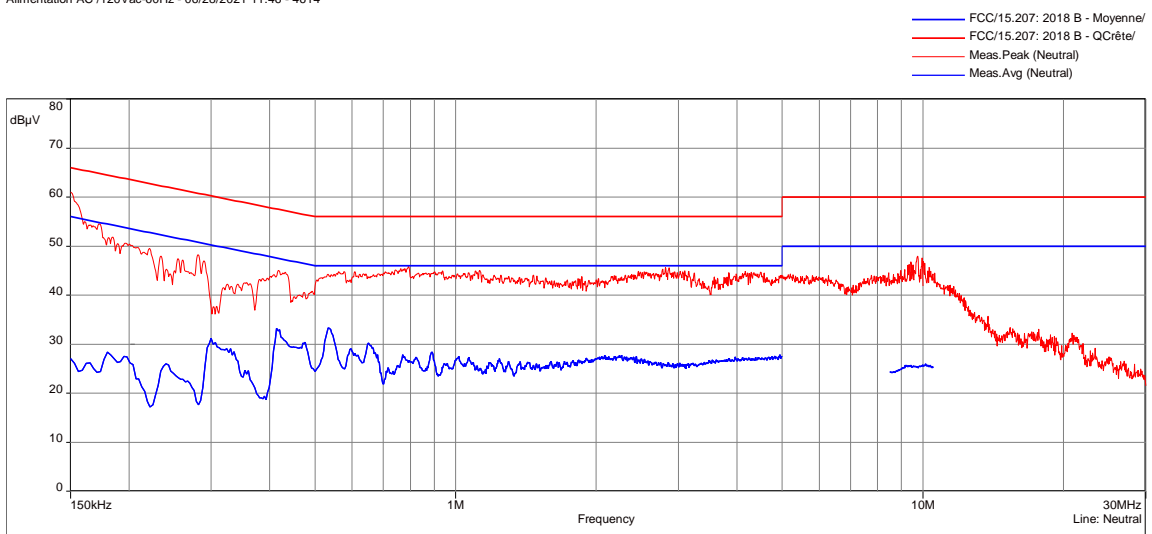
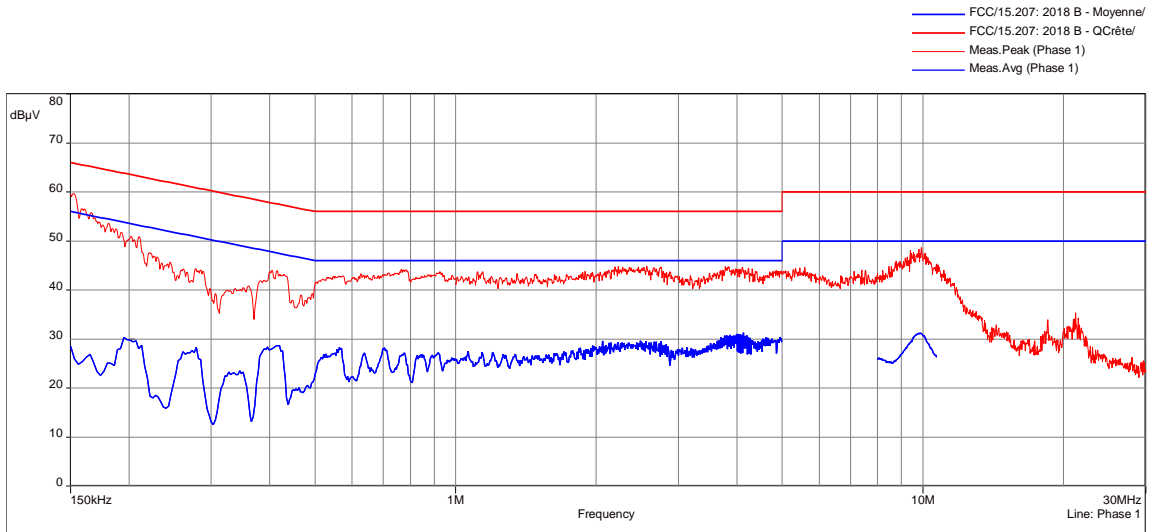
Blank cells = Permanent validity

TEST SETUP PHOTO(S)



CONDUCTED EMISSION (MEASUREMENT) - TABULATED RESULTS						
AC POWER SUPPLY / 120VAC-60Hz						EMI4614
Terminal	Test Frequency (MHz)	Level Peak (dBµV)	Level Avg (dBµV)	Gain/Loss Factor (dB)	Limit Avg (dBµV)	Margin (dB)
Neutral	0.150	60.98	26.1	10.09	56	-29.9
Neutral	0.281	48.23	17.59	10.1	50.78	-33.19
Neutral	0.357	42.52	23.91	10.11	48.79	-24.88
Neutral	0.418	45.01	32.68	10.11	47.48	-14.8
Neutral	0.793	45.82	26.24	10.15	46	-19.76
Neutral	2.815	45.66	25.54	10.28	46	-20.46
Neutral	9.760	47.94	24.89	10.54	50	-25.11
Neutral	9.960	47.59	25.15	10.54	50	-24.85
Neutral	10.034	46.86	25.23	10.54	50	-24.77
Neutral	10.090	46.5	25.402	10.54	50	-24.598
Phase	0.152	59.62	25.88	10.09	55.87	-29.99
Phase	0.405	44	28.01	10.11	47.76	-19.75
Phase	0.766	44.22	26.69	10.15	46	-19.31
Phase	2.566	44.81	28.16	10.26	46	-17.84
Phase	9.923	48.63	31.09	10.54	50	-18.91
Phase	10.082	47.38	29.84	10.54	50	-20.16
Supplementary information: N/A						

CONDUCTED EMISSION (MEASUREMENT) - GRAPH			
ALIMENTATION AC /120VAC-60Hz			EMI4614
EUT mode:	Continuous Modulated Tx		T (°C): 24.9
Test Date:	27/05/2021		H (%): 37.5
Test Operator:	OAT		P (hPa): 1012



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Neutral	150kHz-1MHz	10kHz	30kHz	Peak
Neutral	1MHz-10MHz	10kHz	30kHz	Peak
Neutral	10MHz-30MHz	10kHz	30kHz	Peak
Phase 1	150kHz-1MHz	10kHz	30kHz	Peak
Phase 1	1MHz-10MHz	10kHz	30kHz	Peak
Phase 1	10MHz-30MHz	10kHz	30kHz	Peak
Phase 1	150kHz-5MHz	10kHz	N/A	Average
Phase 1	8MHz-10.7MHz	10kHz	N/A	Average
Neutral	150kHz-5MHz	10kHz	N/A	Average
Neutral	8.5MHz-10.5MHz	10kHz	N/A	Average

Measure with:	A.M.N.
Comments:	

EUT modification(s): N/A

9.2. Occupied Bandwidth

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
<p>Test description: The occupied bandwidth (OBW) is the Frequency Range in which 99 % of the total mean power of a given emission falls. The residual part of the total power being denoted as β, which, in cases of symmetrical spectra, splits up into $\beta/2$ on each side of the spectrum. Unless otherwise specified, $\beta/2$ is taken as 0,5 %.</p> <p>The maximum occupied bandwidth includes all associated side bands above the appropriate emissions level and the frequency error or drift under extreme test conditions.</p>	

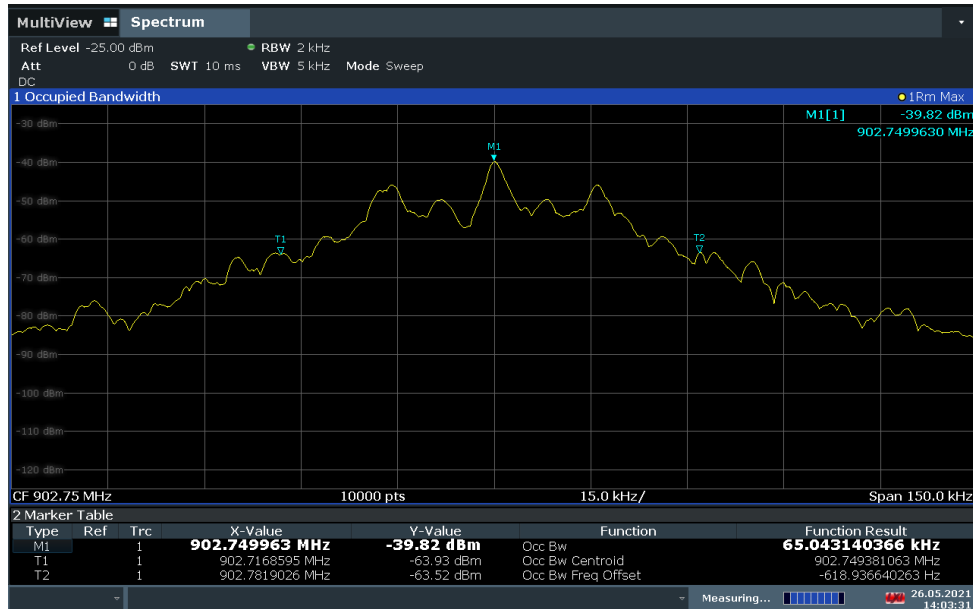
TESTED PARAMETER	OBW	SEVERITY	RESULT TAB.	VERDICT
OBW 99% Low channel	65.043 kHz	Within the 902MHz 928MHz band	EMI4579	PASS
OBW 99% Mid channel	66.698 kHz		EMI4580	PASS
OBW 99% High channel	63.378 kHz		EMI4581	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	21.8 °C
Relative Humidity	20 to 75 %	35.2 %
Atmospheric pressure	N/A	1010 hPa
Test method deviation: N/A		
Supplementary information:		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HL223	3126	13/06/2018	13/08/2021
Cable	MegaPhase	F135N1N28	16666	25/10/2019	25/12/2021
Cable	SUCOFLEX	N-3m	14378	25/06/2019	25/08/2021
Cable	SUCOFLEX	N-5,5m	14381	25/06/2019	25/08/2021
Cable	Huber + Suhner	SF102K	16042	24/03/2021	24/05/2023
Receiver	Rohde & Schwarz	FSW43	14830	29/07/2020	29/09/2021
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/12/2022
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermometer contactless	GHM Greisinger	GMH 3710	12968	06/10/2020	06/12/2021

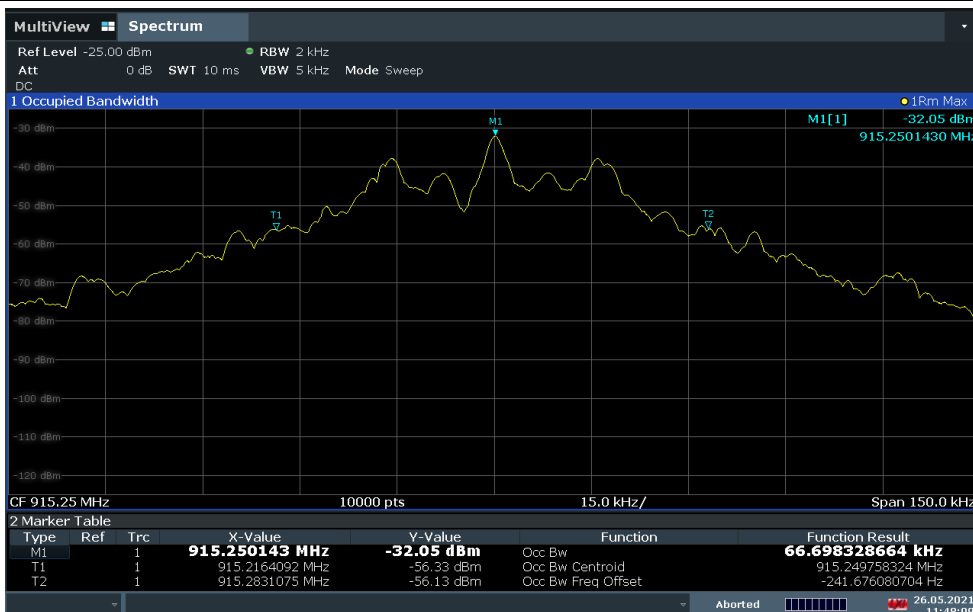
Blank cells = Permanent validity

OCCUPIED BANDWIDTH- GRAPH	
OBW 99% LOW CHANNEL	EMI4579
EUT mode:	Continuous modulated Tx
Test Date:	26/05/2021
Test Operator:	OAT




Results:	OBW = 65.043 kHz
EUT modification(s): N/A	

OCCUPIED BANDWIDTH- GRAPH	
OBW 99% MID CHANNEL	EMI4580
EUT mode:	Continuous modulated Tx
Test Date:	26/05/2021
Test Operator:	OAT



Results:	OBW = 66.698 kHz
EUT modification(s): N/A	

OCCUPIED BANDWIDTH- GRAPH																													
OBW 99% HIGH CHANNEL																													
EMI4581																													
EUT mode:	Continuous modulated Tx																												
Test Date:	26/05/2021																												
Test Operator:	OAT																												
 <p>MultiView Spectrum Ref Level -25.00 dBm RBW 2 kHz Att 0 dB SWT 10 ms VBW 5 kHz Mode Sweep DC 1 Occupied Bandwidth M1 [1] -29.46 dBm 927.2500530 MHz CF 927.25 MHz 10000 pts 15.0 kHz/ Span 150.0 kHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-Value</th> <th>Y-Value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>927.250053 MHz</td> <td>-29.46 dBm</td> <td>Occ Bw</td> <td>63.378454538 kHz</td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>927.2195603 MHz</td> <td>-54.43 dBm</td> <td>Occ Bw Centroid</td> <td>927.251249529 MHz</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>927.2829388 MHz</td> <td>-54.59 dBm</td> <td>Occ Bw Freq Offset</td> <td>1.249528835 kHz</td> </tr> </tbody> </table>		Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		927.250053 MHz	-29.46 dBm	Occ Bw	63.378454538 kHz	T1	1		927.2195603 MHz	-54.43 dBm	Occ Bw Centroid	927.251249529 MHz	T2	1		927.2829388 MHz	-54.59 dBm	Occ Bw Freq Offset	1.249528835 kHz
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																							
M1	1		927.250053 MHz	-29.46 dBm	Occ Bw	63.378454538 kHz																							
T1	1		927.2195603 MHz	-54.43 dBm	Occ Bw Centroid	927.251249529 MHz																							
T2	1		927.2829388 MHz	-54.59 dBm	Occ Bw Freq Offset	1.249528835 kHz																							
Results:	OBW = 63.378 kHz																												
EUT modification(s): N/A																													

9.3. 20dB bandwidth, Carrier Frequency separation and Number of Hopping Channels

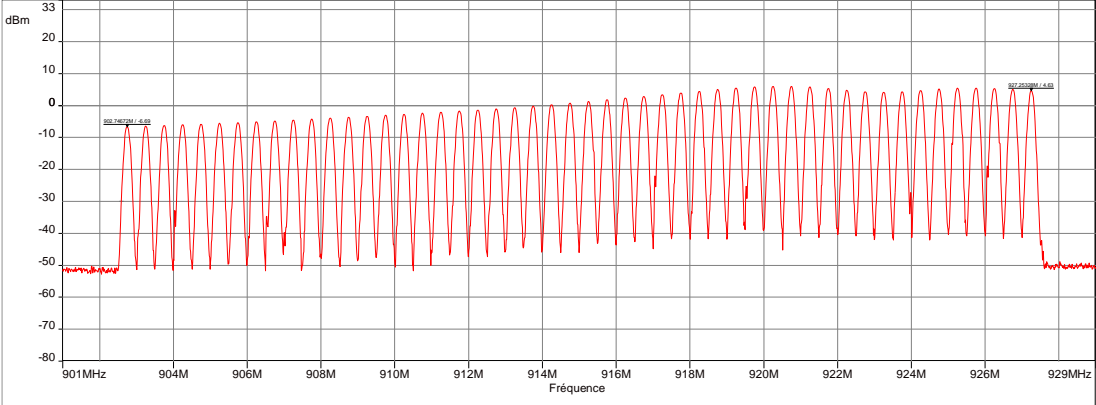
Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
Test description: a) (1) (i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.	

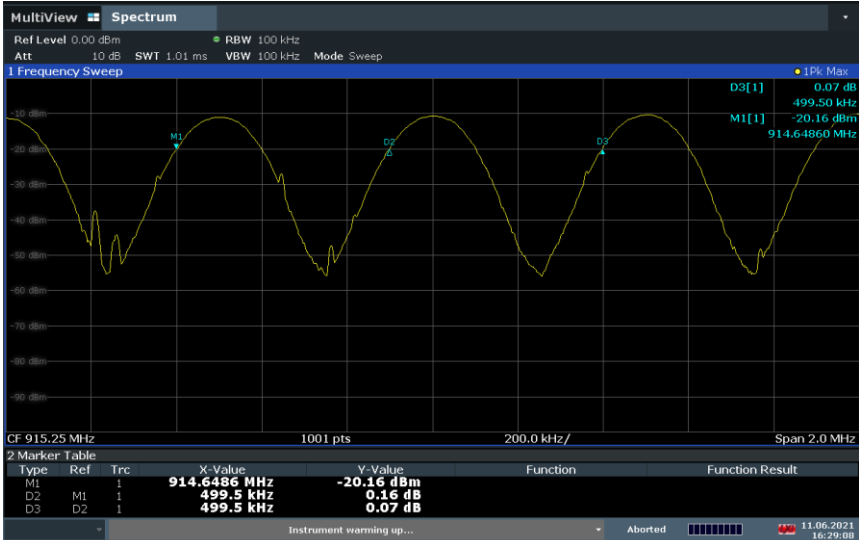
TEST CASE AND CONDITIONS	MODULATION BANDWIDTH		RESULT TAB.	VERDICT
Number of channels	50	≥50	EMI4577	PASS
Channels separation	499.5 kHz.	>54.075 kHz	EMI5566	PASS
20dB Bandwidth / Low channel	53.925 kHz	<499.5 kHz.	EMI4517	PASS
20dB Bandwidth / Mid channel	54.075 kHz	<499.5 kHz.	EMI4582	PASS
20dB Bandwidth / High channel	53.190 kHz	<499.5 kHz.	EMI4583	PASS
Occupation time	400ms	≤400ms	EMI5574	PASS

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

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HL223	3126	13/06/2018	13/08/2021
Cable	MegaPhase	F135N1N28	16666	25/10/2019	25/12/2021
Cable	SUCOFLEX	N-3m	14378	25/06/2019	25/08/2021
Cable	SUCOFLEX	N-5,5m	14381	25/06/2019	25/08/2021
Cable	Huber + Suhner	SF102K	16042	24/03/2021	24/05/2023
Receiver	Rohde & Schwarz	FSW43	14830	29/07/2020	29/09/2021
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/12/2022
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermometer contactless	GHM Greisinger	GMH 3710	12968	06/10/2020	06/12/2021

Blank cells = Permanent validity

NUMBER OF CHANNELS FOR FREQUENCY HOPPING SYSTEMS - GRAPH					
NUMBER OF CHANNELS				EMI4577	
EUT mode:	Tx hopping mode			T (°C):	21.8
Test Date:	26/05/2021			H (%):	35.2
Test Operator:	OAT			P (hPa):	1010
<p>Description Sous-bande 1 Fréquences:901 MHz - 929 MHz (Mode analyseur) 8000 Points Réglages: RBW: 100kHz, VBW: 300kHz, Auto, Atténuation : 10 dB, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: Off Polarisation:Horizontale Distance: 3 m</p> <p style="text-align: right;">— Mes.Peak (Horizontale)</p>  <p>Number of channels - 28/06/2021 12:02 - 4577</p>					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
Horizontal	901MHz-929MHz	100kHz	300kHz	Peak max hold	
Configuration:	N/A				
Comments:	The system uses 50 channels				
<i>EUT modification(s): N/A</i>					

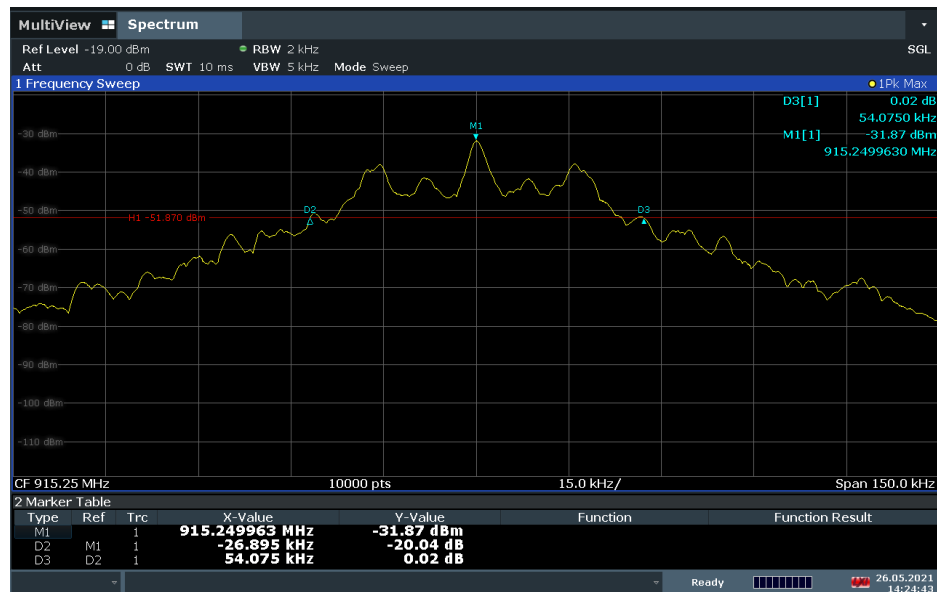
CHANNEL SEPARATION FOR FREQUENCY HOPPING SYSTEMS - GRAPH					
CHANNELS SEPARATION				EMI5566	
EUT mode:	Tx hopping mode			T (°C):	23.2
Test Date:	11/06/2021			H (%):	52.1
Test Operator:	OAT			P (hPa):	1009
					
Results :	The channels separation is 499.5 kHz.				
<i>EUT modification(s): N/A</i>					

20dB BANDWIDTH FOR FREQUENCY HOPPING SYSTEMS - GRAPH			
20dB BANDWIDTH / LOW CHANNEL			EMI4517
EUT mode:	Tx hopping mode		T (°C): 21.8
Test Date:	26/05/2021		H (%): 35.2
Test Operator:	OAT		P (hPa): 1010

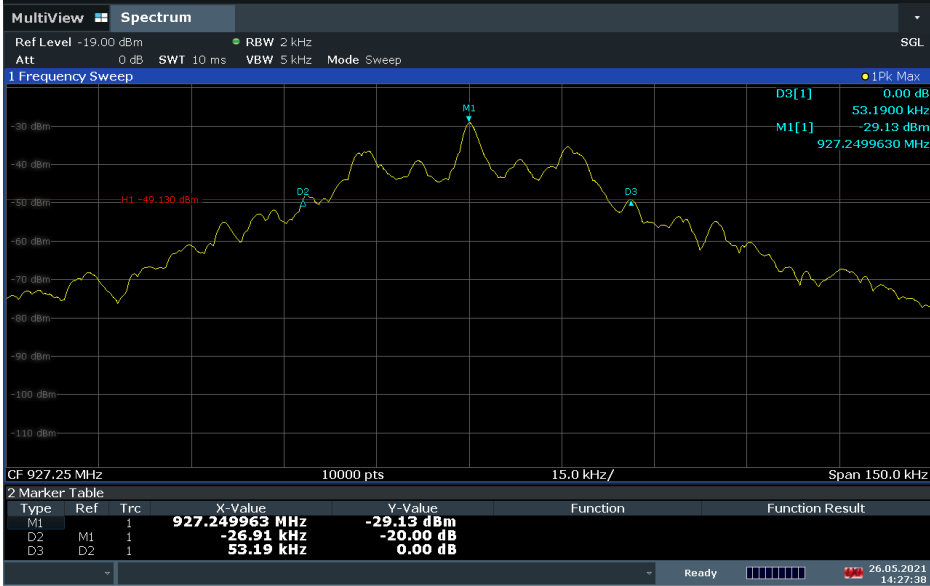


Results:	The 20dB bandwidth is 53.925 kHz
EUT modification(s):	N/A

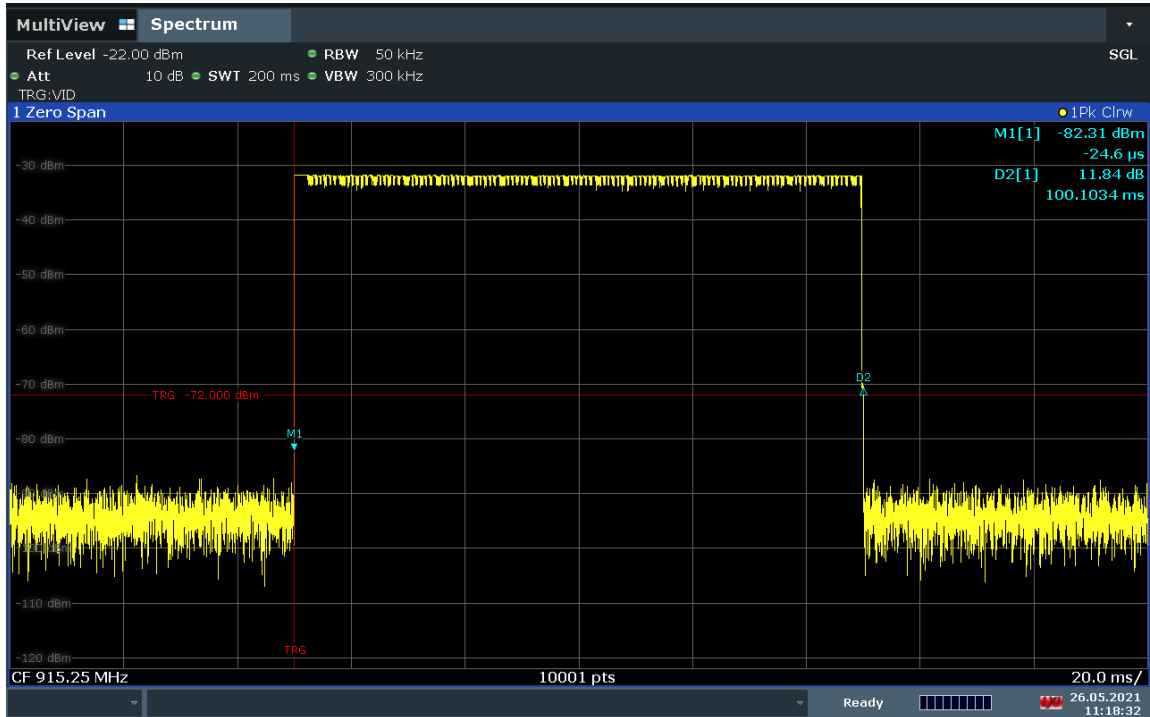
MODULATION BANDWIDTH - GRAPH			
20dB BANDWIDTH / MID CHANNEL			EMI4582
EUT mode:	Tx hopping mode		T (°C): 21.8
Test Date:	26/05/2021		H (%): 35.2
Test Operator:	OAT		P (hPa): 1010



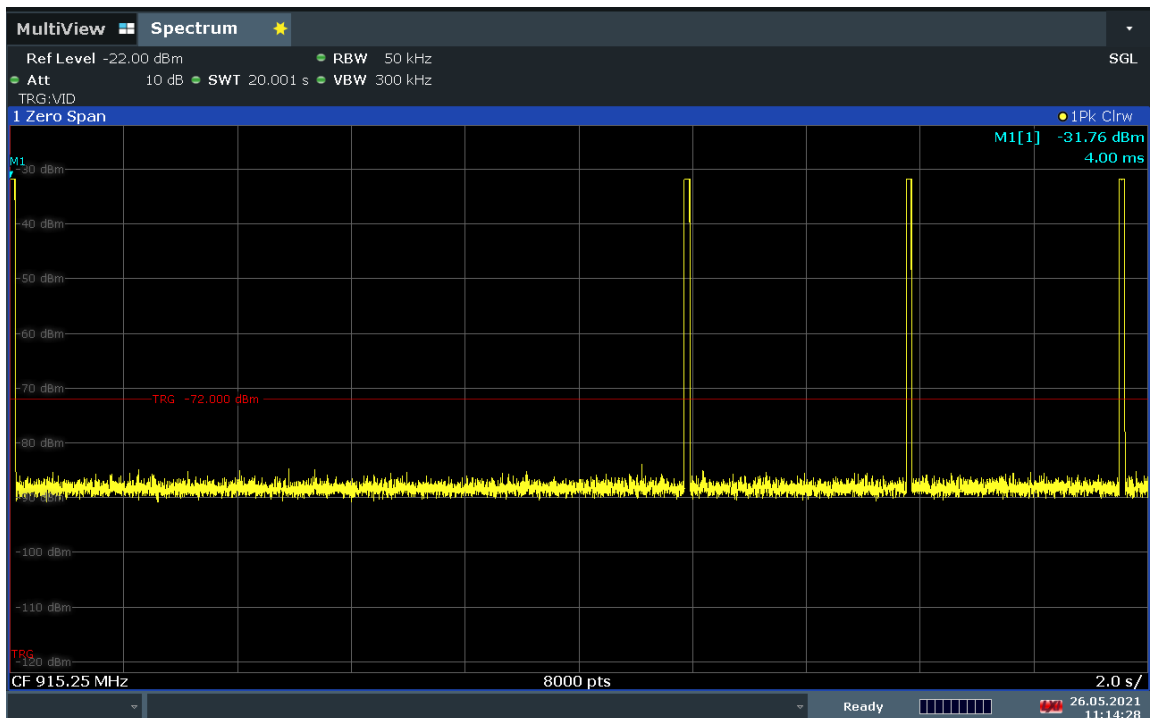
Results:	The 20dB bandwidth is 54.075 kHz
EUT modification(s):	N/A

MODULATION BANDWIDTH - GRAPH			
20dB BANDWIDTH / HIGH CHANNEL			EMI4583
EUT mode:	Tx hopping mode		T (°C): 21.8
Test Date:	26/05/2021		H (%): 35.2
Test Operator:	OAT		P (hPa): 1010
			
Results:	The 20dB bandwidth is 53.190 kHz		
EUT modification(s): N/A			

OCCUPATION TIME FOR FREQUENCY HOPPING SYSTEMS - GRAPH			
OCCUPATION TIME		EMI5574	
EUT mode:	Tx hopping mode	T (°C):	21.8
Test Date:	26/05/2021	H (%):	35.2
Test Operator:	OAT	P (hPa):	1010



11:18:33 26.05.2021



11:14:28 26.05.2021

Results:	the worst case average time is 400ms in a period of 20s.
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9.4. Radiated spurious emissions

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.109, 15.209, 15.205, 15.215 RSS-247, CNR Gen
<p>General test setup: For $f < 30\text{MHz}$, EUT is set on an insulating support at 80cm above the ground reference plane.</p> <p>Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter in a semi-anechoic chamber. The EUT was rotated 360° in order to maximize radiated levels. Test antenna was oriented in 3 axes (0°, 45° and 90°).</p> <p>Final measurements (quasi-peak) were then performed in a 10-meter Open Area Test Site that complies to CISPR 16 in the same measurement conditions.</p> <p>For $f > 30\text{MHz}$, EUT is set on an insulating support at 80cm above the ground reference plane (150cm for $f > 1\text{GHz}$).</p> <p>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.</p> <p>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.</p> <p>All frequencies were investigated, where applicable.</p> <p>For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.</p>	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Tx mode / All Channels / 0°	9kHz-30MHz	15.209	EMI4564	PASS
Tx mode / All Channels / 45°	9kHz-30MHz	15.209	EMI4567	PASS
Tx mode / All Channels / 90°	9kHz-30MHz	15.209	EMI4568	PASS
Tx mode / All Channels / for Freq > 30MHz	30MHz-10GHz	15.209	EMI4570	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	20 to 75 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
Test method deviation: N/A		
<p>Supplementary information:</p> <p>From 9 kHz to 30MHz: limit indicated on the curves is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.</p> <p>From 30MHz to 1GHz Quasi peak limit provided is the limit given in §15.209.</p> <p>Above 1GHz average limit in restricted bands §15.205 is 54dBμV/m. Otherwise, the limit is 20dB under carrier emission level at 3m without averaging.</p>		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	24/04/2020	24/06/2022
Antenna	ETS-Lindgren	3117	5456	24/07/2019	24/09/2022
Antenna	Electro Metrics	BIA-30HF	0824	13/06/2018	13/08/2021
Antenna	Rohde & Schwarz	HL223	3126	13/06/2018	13/08/2021

CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Cable	MegaPhase	F135N1N28	16664	25/10/2019	25/12/2021
Cable	MegaPhase	F135N1N28	16666	25/10/2019	25/12/2021
Cable	/	N-1m	3627	27/01/2021	27/03/2023
Cable	SUCOFLEX	N-3m	14378	25/06/2019	25/08/2021
Cable	SUCOFLEX	N-3m	14379	25/06/2019	25/08/2021
Cable	SUCOFLEX	N-6,5m	14380	25/07/2019	25/09/2021
Cable	MegaPhase	N-8m	15813	14/01/2021	14/03/2023
Cable	Huber + Suhner	SF102K	16042	24/03/2021	24/05/2023
Cable	MegaPhase	TM18-N1N1-118	12841	14/08/2020	14/10/2022
Cable	MegaPhase	TM18-N1N1-118	12842	02/12/2020	02/02/2023
Filter	Micro-Tronics	HPM18865	12843	09/06/2018	09/08/2021
Filter	Wainwright Instruments	WTRCTV5-700-1000-20-60	12838	27/06/2018	27/08/2021
Preamplifier	Techniwave	APS16-0087	14040	02/12/2020	02/02/2022
Receiver	Rohde & Schwarz	FSW43	14830	29/07/2020	29/09/2021
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/12/2022
Shielded enclosure	COMTEST	SAC 3m	14494	02/10/2019	02/12/2022
Software	Nexio		0000		
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermohygrometer	Testo	608-H2	12268	07/05/2020	07/07/2022
Thermohygrometer	Testo	608-H2	12269	07/05/2020	07/07/2022

BAT-EMC software version: V3.18.0.26

Blank cells = Permanent validity

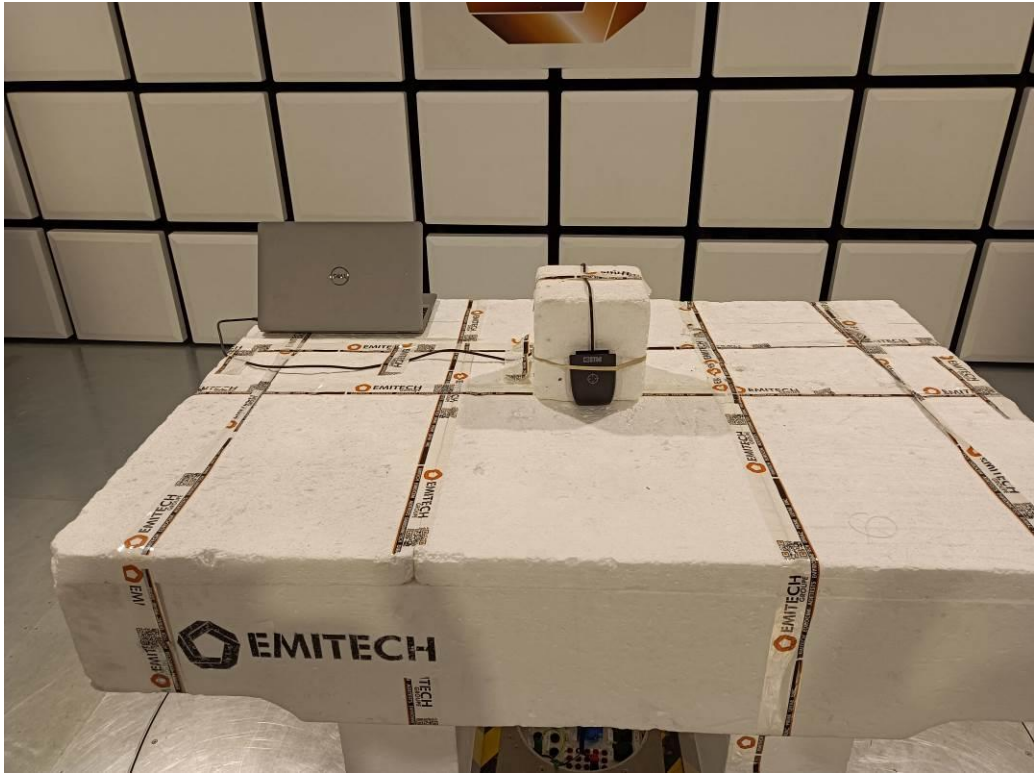
RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / ALL CHANNELS / 0°				
Frequency (MHz)	Peak Level (dBμA/m)	QPeak Level (dBμA/m)	QPeak Limit @ 3m (dBμA/m)	Margin (dB)
1.551	-7.41	N/P	12.92	-20.33

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / ALL CHANNELS / 45°				
Frequency (MHz)	Peak Level (dBμA/m)	QPeak Level (dBμA/m)	QPeak Limit @ 3m (dBμA/m)	Margin (dB)
0.654	-10.19	N/P	19.79	-29.98
1.551	-12.60	N/P	12.92	-25.52

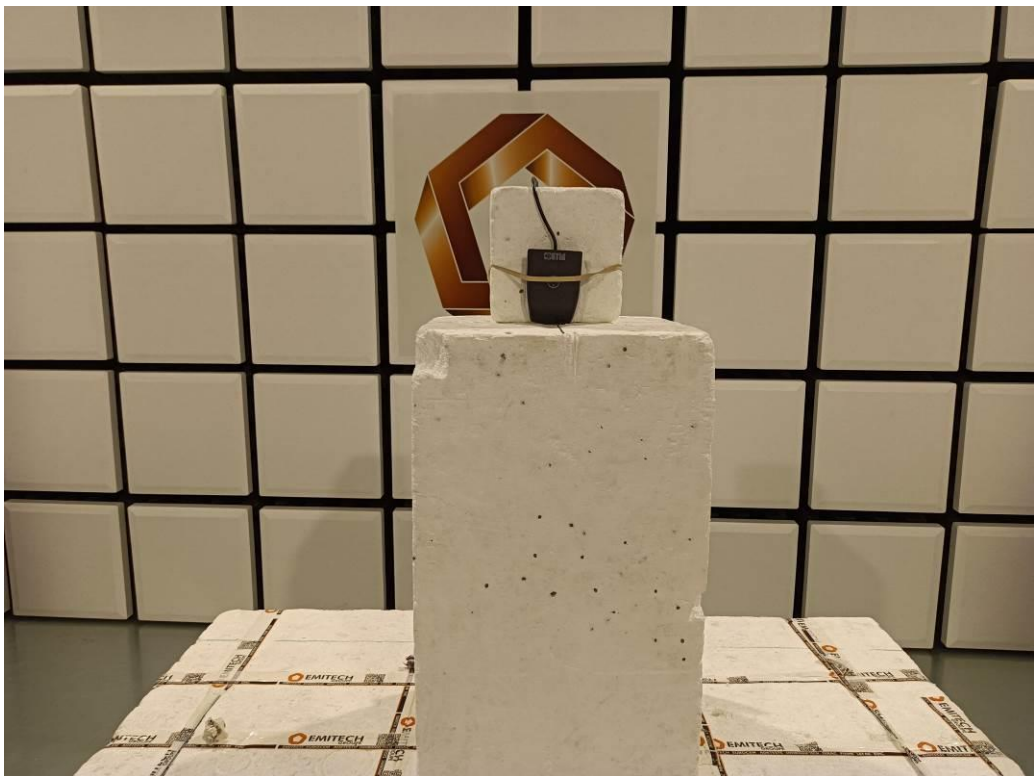
RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / ALL CHANNELS / 90°				
Frequency (MHz)	Peak Level (dBμA/m)	QPeak Level (dBμA/m)	QPeak Limit @ 3m (dBμA/m)	Margin (dB)
1.559	-11.25	N/P	12.25	-23.52
2.253	-10.04	N/P	18.04	-28.08

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS							
TX MODE / ALL CHANNELS / FOR FREQ > 30MHz							
Frequency (MHz)	Polarization	Peak Level (dBµV/m)		QPeak Level (dBµV/m)	QPeak Limit (dBµV/m)	Margin Avg (dB)	
55.524	Vertical	27.73		N/P	40.0	-12.27	
132.140	Vertical	26.65		N/P	43.5	-16.85	
55.482	Horizontal	32.41		N/P	40.0	-7.59	
132.140	Horizontal	32.38		N/P	43.5	-11.12	
156.198	Horizontal	28.19		N/P	43.5	-15.31	
180.214	Horizontal	30.45		N/P	43.5	-13.05	
204.201	Vertical	26.72		N/P	43.5	-16.78	
221.503	Vertical	26.82		N/P	46.0	-19.18	
228.204	Vertical	26.93		N/P	46.0	-19.07	
332.117	Vertical	29.90		N/P	46.0	-16.10	
204.201	Horizontal	32.16		N/P	43.5	-11.34	
221.503	Horizontal	31.10		N/P	46.0	-14.90	
228.204	Horizontal	31.80		N/P	46.0	-14.20	
252.207	Horizontal	28.06		N/P	46.0	-17.94	
Frequency (MHz)	Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Peak Limit (dBµV/m)	Avg Limit (dBµV/m)	Margin vs Peak Limit (dB)	Margin vs Avg Limit (dB)
3610.326	Vertical	49.61	N/P	74.0	54.0	-24.39	-4.39
3986.123	Vertical	47.93	N/P	74.0	54.0	-26.07	-6.07
3999.625	Vertical	47.97	N/P	74.0	54.0	-26.03	-6.03
7417.802	Vertical	49.55	N/P	74.0	54.0	-24.45	-4.45
2781.098	Horizontal	47.83	N/P	74.0	54.0	-26.17	-6.17
3610.326	Horizontal	46.96	N/P	74.0	54.0	-27.04	-7.04
3660.958	Horizontal	46.60	N/P	74.0	54.0	-27.40	-7.40
3708.214	Horizontal	46.69	N/P	74.0	54.0	-27.31	-7.31

TEST SETUP PHOTO(S) - EUT POSITION FOR FREQ < 1GHZ



TEST SETUP PHOTO(S) - EUT POSITION FOR FREQ > 1GHZ



TEST SETUP PHOTO(S) - FOR FREQ < 30MHZ



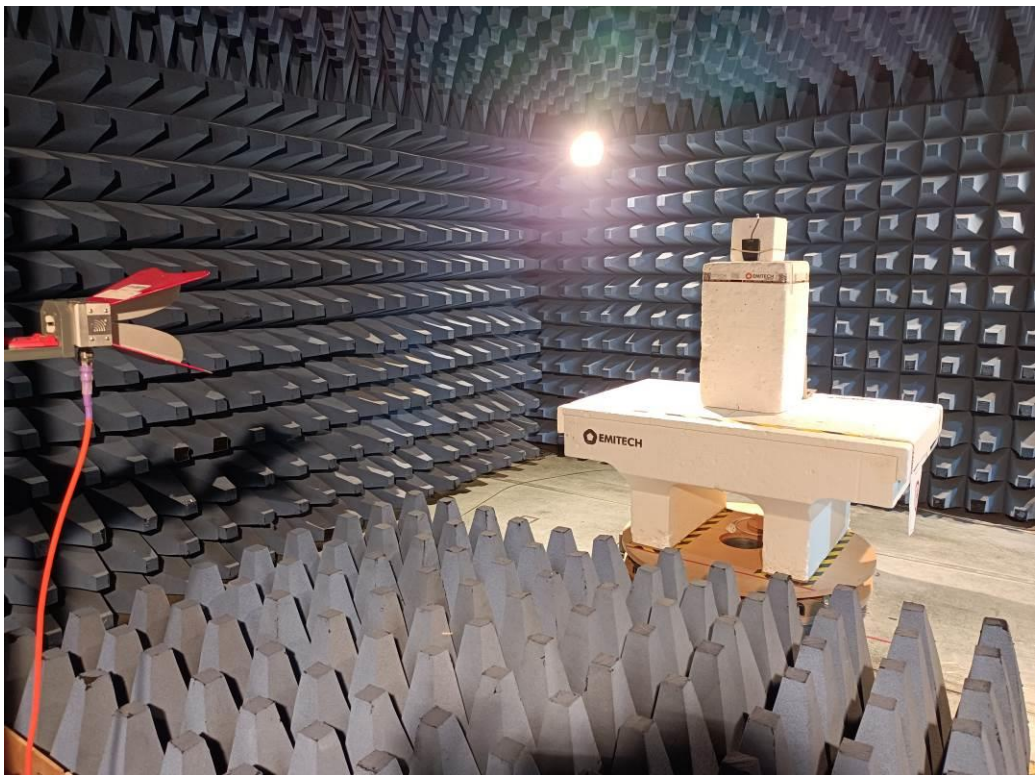
TEST SETUP PHOTO(S) - FOR 30MHZ < FREQ < 200MHZ

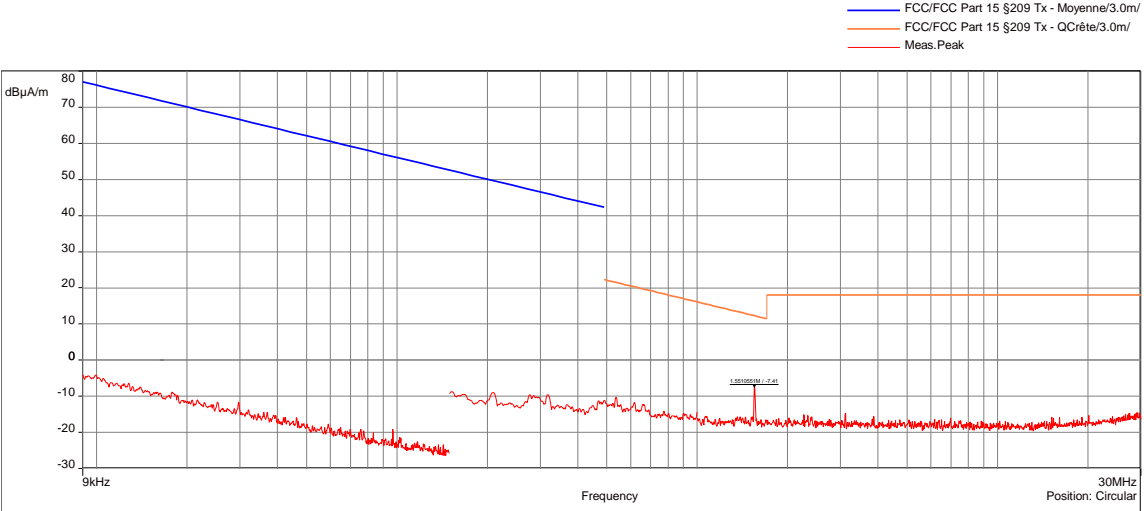


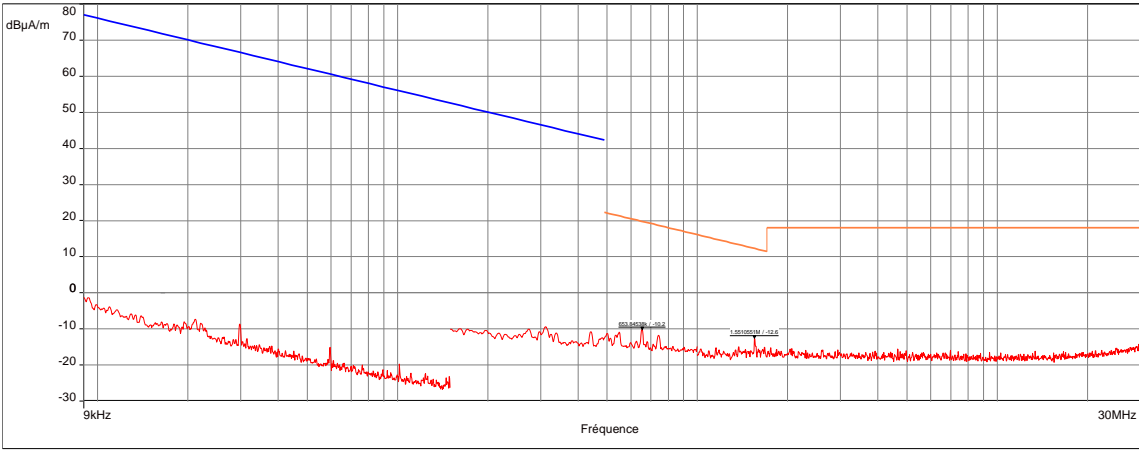
TEST SETUP PHOTO(S) - FOR 200MHZ < FREQ < 1GHZ

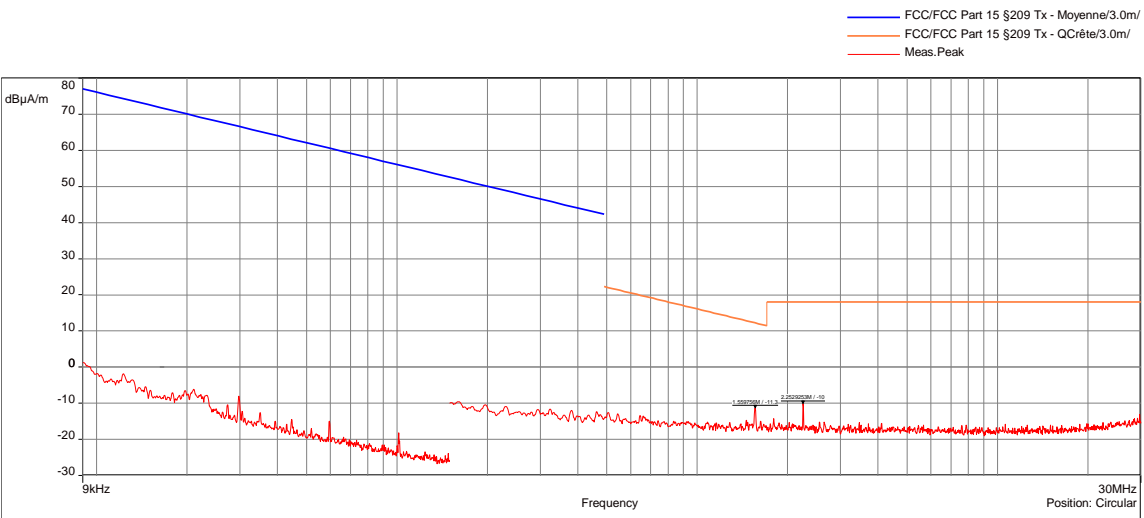


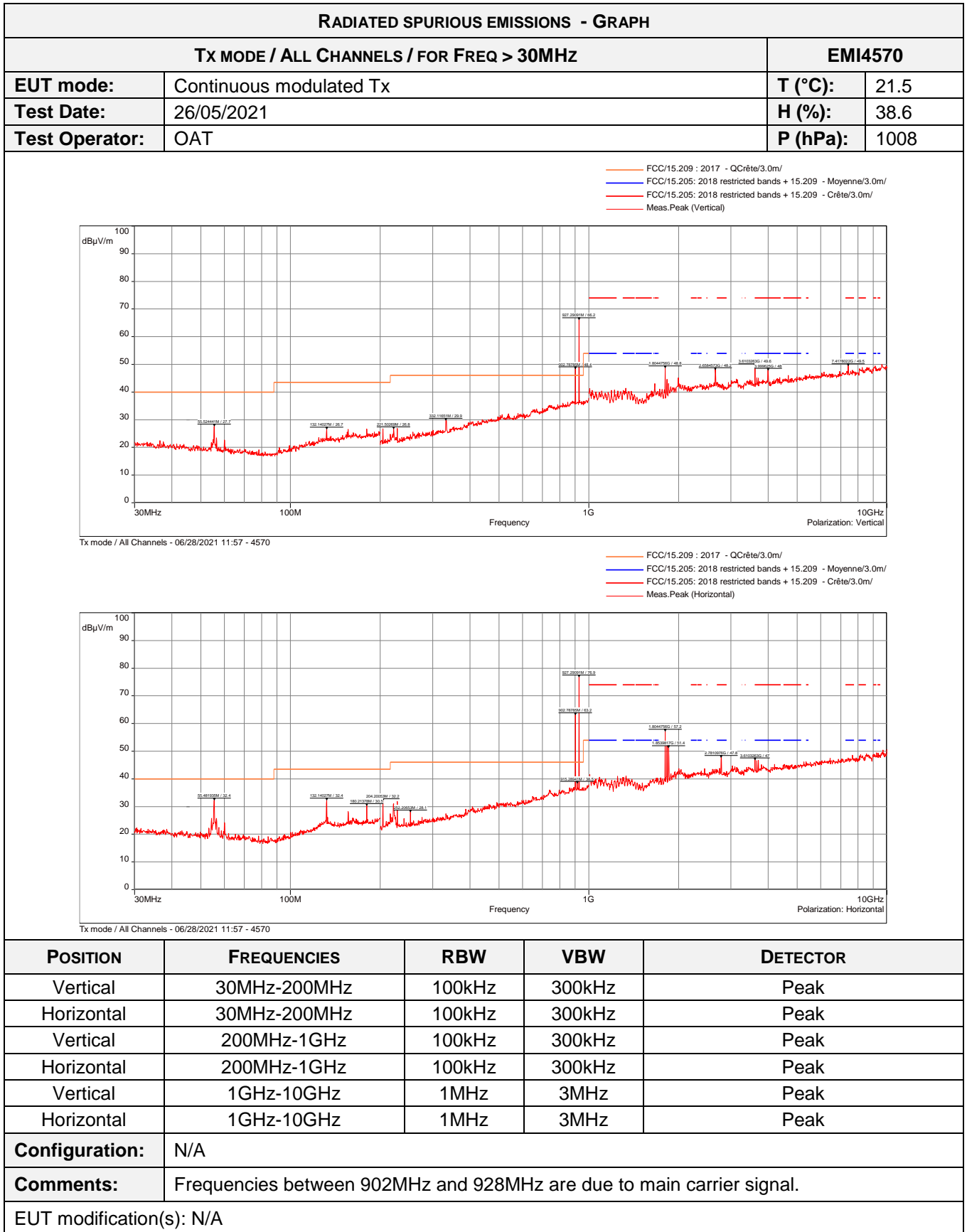
TEST SETUP PHOTO(S) - FOR 1GHZ < FREQ



RADIATED SPURIOUS EMISSIONS - GRAPH					
Tx MODE / ALL CHANNELS / 0°				EMI4564	
EUT mode:	Continuous modulated Tx			T (°C):	22.3
Test Date:	25/05/2021			H (%):	36.9
Test Operator:	OAT			P (hPa):	1008
 <p>Legend: — FCC/FCC Part 15 §209 Tx - Moyenne/3.0m/ — FCC/FCC Part 15 §209 Tx - QCrête/3.0m/ — Meas. Peak</p>					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
Circular	9kHz-150kHz	300Hz	1kHz	Peak	
Circular	150kHz-1MHz	10kHz	30kHz	Peak	
Circular	1MHz-30MHz	10kHz	30kHz	Peak	
Configuration:	N/A				
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.				
EUT modification(s): N/A					

RADIATED SPURIOUS EMISSIONS - GRAPH					
TX MODE / ALL CHANNELS / 45°				EMI4567	
EUT mode:	Continuous modulated Tx			T (°C):	22.3
Test Date:	25/05/2021			H (%):	36.9
Test Operator:	OAT			P (hPa):	1008
— FCC/FCC Part 15 §209 - Classe:Tx - Moyenne/3.0m/ — FCC/FCC Part 15 §209 - Classe:Tx - QCrête/3.0m/ — Mes.Peak					
					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
Circular	9kHz-150kHz	300Hz	1kHz	Peak	
Circular	150kHz-1MHz	10kHz	30kHz	Peak	
Circular	1MHz-30MHz	10kHz	30kHz	Peak	
Configuration:	N/A				
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.				
EUT modification(s): N/A					

RADIATED SPURIOUS EMISSIONS - GRAPH					
TX MODE / ALL CHANNELS / 90°				EMI4568	
EUT mode:	Continuous modulated Tx			T (°C):	22.3
Test Date:	25/05/2021			H (%):	36.9
Test Operator:	OAT			P (hPa):	1008
 <p>The graph displays radiated spurious emissions in dBµA/m against frequency in kHz. The y-axis ranges from -30 to 80 dBµA/m, and the x-axis ranges from 9 kHz to 30 MHz. A blue line represents the FCC/FCC Part 15 §209 Tx - Moyenne/3.0m/ limit, which decreases linearly from 80 dBµA/m at 9 kHz to approximately 42 dBµA/m at 150 kHz. An orange line represents the FCC/FCC Part 15 §209 Tx - QCrête/3.0m/ limit, which is constant at 20 dBµA/m from 150 kHz to 1 MHz, then drops to 10 dBµA/m from 1 MHz to 30 MHz. A red line represents the Meas. Peak, which shows a noisy signal starting at approximately -10 dBµA/m at 9 kHz and decreasing to about -25 dBµA/m at 150 kHz, remaining below the limits throughout the measured range.</p>					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
Circular	9kHz-150kHz	300Hz	1kHz	Peak	
Circular	150kHz-1MHz	10kHz	30kHz	Peak	
Circular	1MHz-30MHz	10kHz	30kHz	Peak	
Configuration:	N/A				
Comments:	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.				
EUT modification(s): N/A					



9.5. Band-edge compliance of emissions

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 subclause d) and RSS-247
Test description: d) In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. EUT is connected to the measuring receiver via 50Ω attenuator(s). Only the highest levels are recorded.	

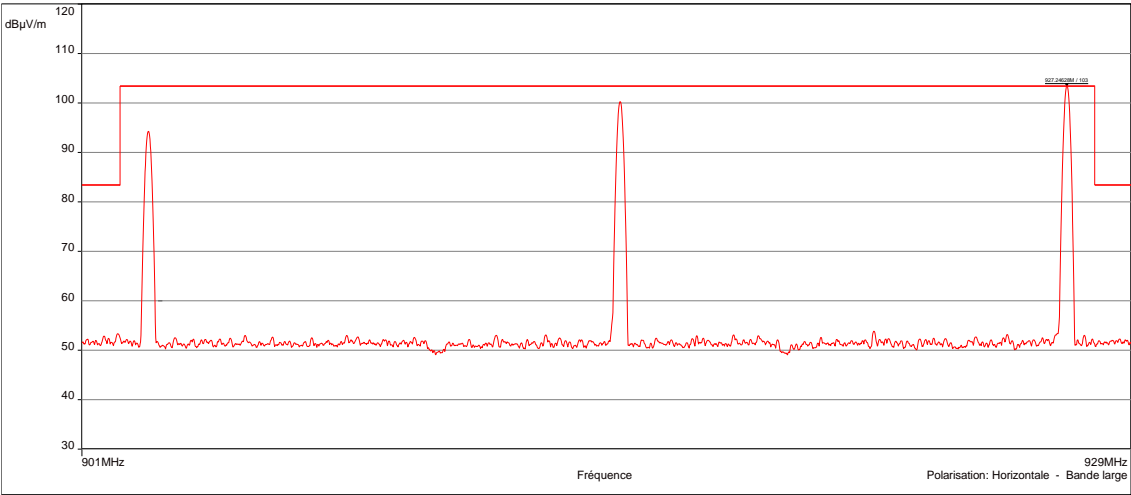
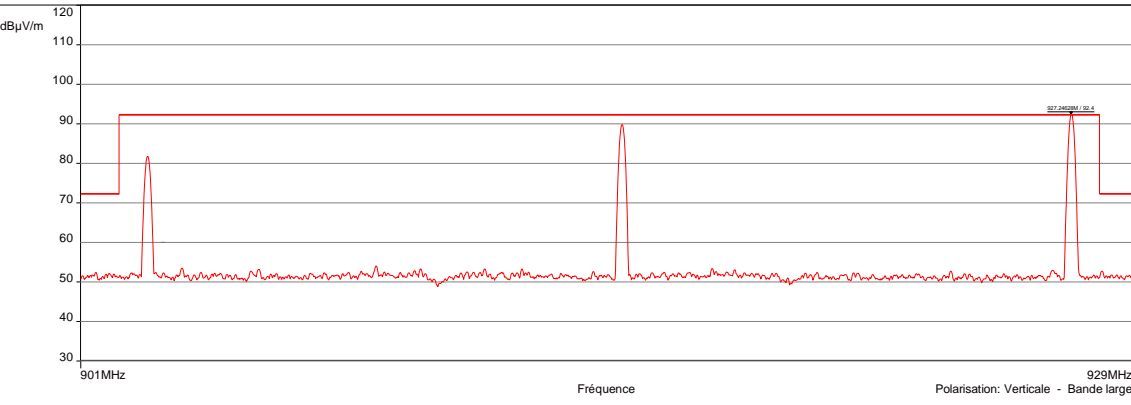
TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Band edge / All Channels	901MHz-929MHz	20dBc	EMI4571	PASS

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

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HL223	3126	13/06/2018	13/08/2021
Cable	MegaPhase	F135N1N28	16666	25/10/2019	25/12/2021
Cable	SUCOFLEX	N-6,5m	14380	25/07/2019	25/09/2021
Cable	MegaPhase	N-8m	15813	14/01/2021	14/03/2023
Cable	MegaPhase	TM18-N1N1-118	12841	14/08/2020	14/10/2022
Receiver	Rohde & Schwarz	FSW43	14830	29/07/2020	29/09/2021
Shielded enclosure	COMTEST	SAC 3m	14494	02/10/2019	02/12/2022
Software	Nexio		0000		
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermohygrometer	Testo	608-H2	12268	07/05/2020	07/07/2022
Thermohygrometer	Testo	608-H2	12269	07/05/2020	07/07/2022

BAT-EMC software version: V3.18.0.26

Blank cells = Permanent validity

BAND-EDGE COMPLIANCE OF EMISSIONS - GRAPH					
BAND EDGE / ALL CHANNELS			EMI4571		
EUT mode:	Continuous modulated Tx			T (°C):	21.5
Test Date:	25/05/2021			H (%):	38.6
Test Operator:	OAT			P (hPa):	1008
<p style="text-align: right;"> — OAT/15.247: 2018 d) band Edged - 20dBc vs EIRP - Classe:Vertica&l - QCrête/3.0m/ — marqueurs be (verticale) (Horizontale) — Mes.Peak (Horizontale) </p> <p>Description Sous-bande 2 Fréquences:901 MHz - 929 MHz (Mode analyseur) 8000 Points Réglages: RBW: 100kHz, VBW: 300kHz, Auto, Atténuation : 10 dB, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: Off Polarisation:Horizontale Distance: 3 m</p>  <p style="text-align: right;">Polarisation: Horizontale - Bande large</p> <p>Bandedge / All Channels - 28/06/2021 11:56 - 4571</p> <p style="text-align: right;"> — OAT/15.247: 2018 d) band Edged - 20dBc vs EIRP - Classe:horizontal - QCrête/3.0m/ — Marqueurs BE (Verticale) — Mes.Peak (Verticale) </p> <p>Description Sous-bande 1 Fréquences:901 MHz - 929 MHz (Mode analyseur) 8000 Points Réglages: RBW: 100kHz, VBW: 300kHz, Auto, Atténuation : 10 dB, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: Off Polarisation:Verticale Distance: 3 m</p>  <p style="text-align: right;">Polarisation: Verticale - Bande large</p> <p>Bandedge / All Channels - 28/06/2021 11:56 - 4571</p>					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
Vertical	901MHz-929MHz	100kHz	300kHz	Peak	
Horizontal	901MHz-929MHz	100kHz	300kHz	Peak	
Configuration:	N/A				
Comments:	No spurious emissions were detected.				
EUT modification(s): N/A					

9.6. Effective isotropic radiated power

a) NORMAL TESTS CONDITIONS

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
<p>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.</p> <p>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.</p> <p>For portable equipments a research of maximum level is done on the 3 axes. Only the highest levels are recorded.</p>	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
EIRP / Low Channel	902.25MHz-903.25MHz	1 w (30dBm)	EMI4574	PASS
EIRP / Mid Channel	914.75MHz-915.75MHz	1 w (30dBm)	EMI4575	PASS
EIRP / High Channel	926.75MHz-927.75MHz	1 w (30dBm)	EMI4576	PASS

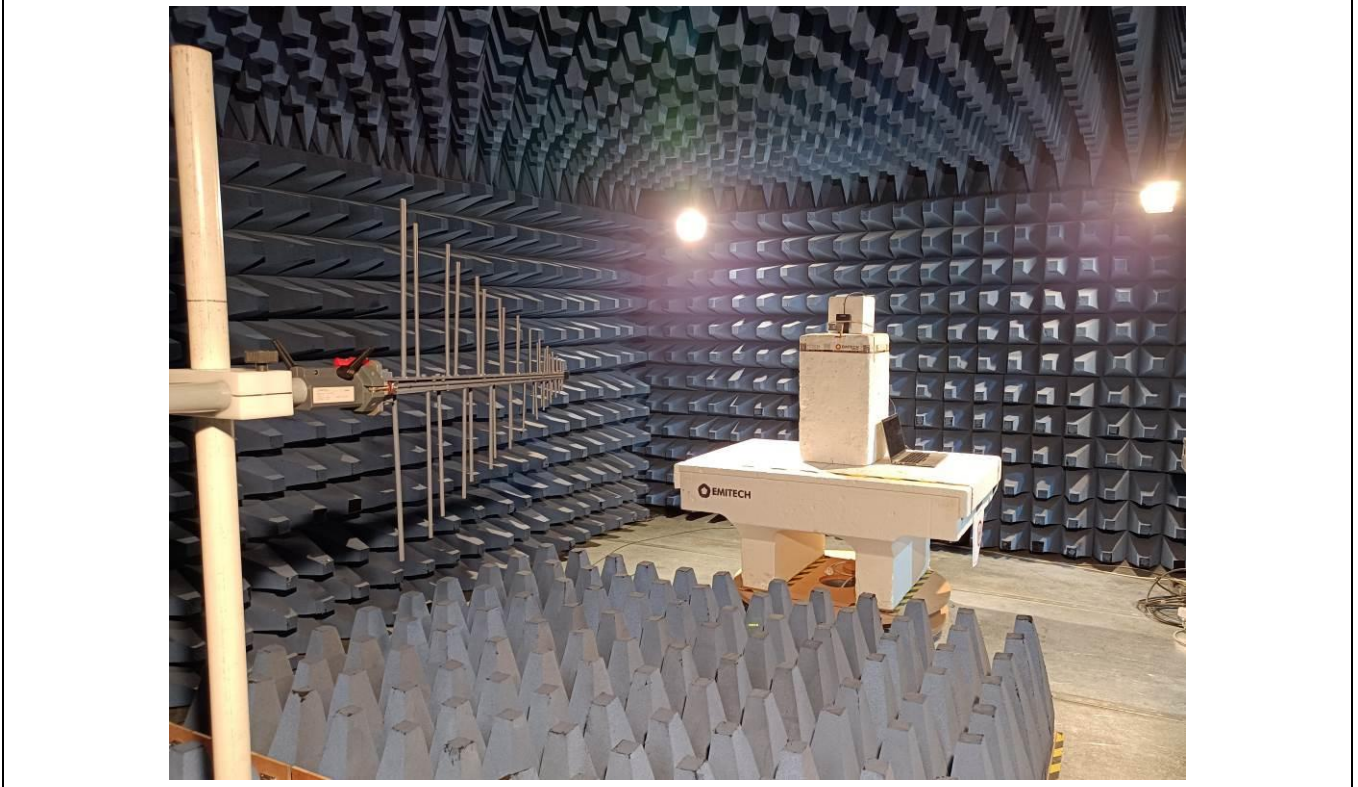
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	20 to 75 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HL223	3126	13/06/2018	13/08/2021
Attenuator	EMITECH	SUB.V2-H	14495	13/01/2021	13/03/2022
Attenuator	EMITECH	SUB.V2-V	14496	13/01/2021	13/03/2022
Cable	MegaPhase	F135N1N28	16666	25/10/2019	25/12/2021
Cable	SUCOFLEX	N-3m	14378	25/06/2019	25/08/2021
Cable	SUCOFLEX	N-5,5m	14381	25/06/2019	25/08/2021
Cable	Huber + Suhner	SF102K	16042	24/03/2021	24/05/2023
Receiver	Rohde & Schwarz	FSW43	14830	29/07/2020	29/09/2021
Shielded enclosure	RAY PROOF	C.V2	1423	04/10/2019	04/12/2022
Software	Nexio		0000		
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermohygrometer	Testo	608-H2	12268	07/05/2020	07/07/2022
Thermohygrometer	Testo	608-H2	12269	07/05/2020	07/07/2022

BAT-EMC software version: V3.18.0.26

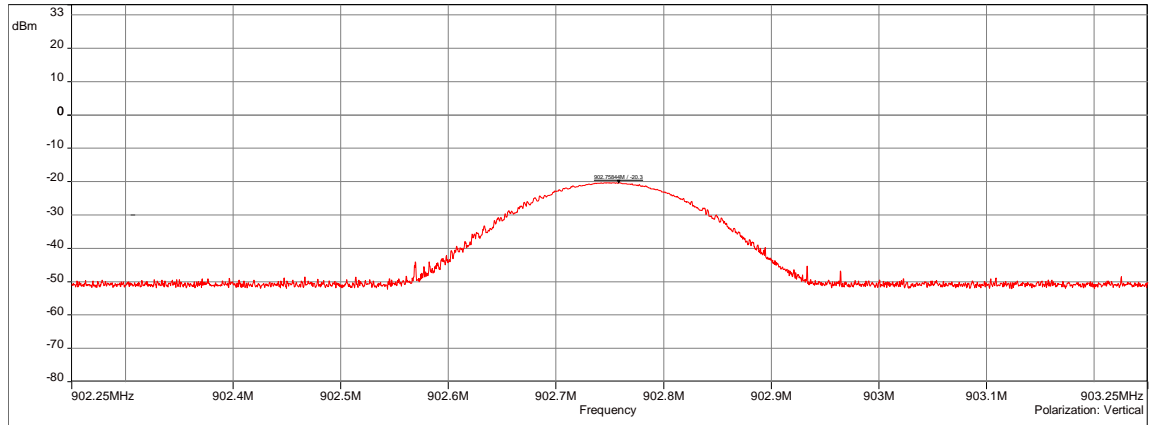
Blank cells = Permanent validity

TEST SETUP PHOTO(S)



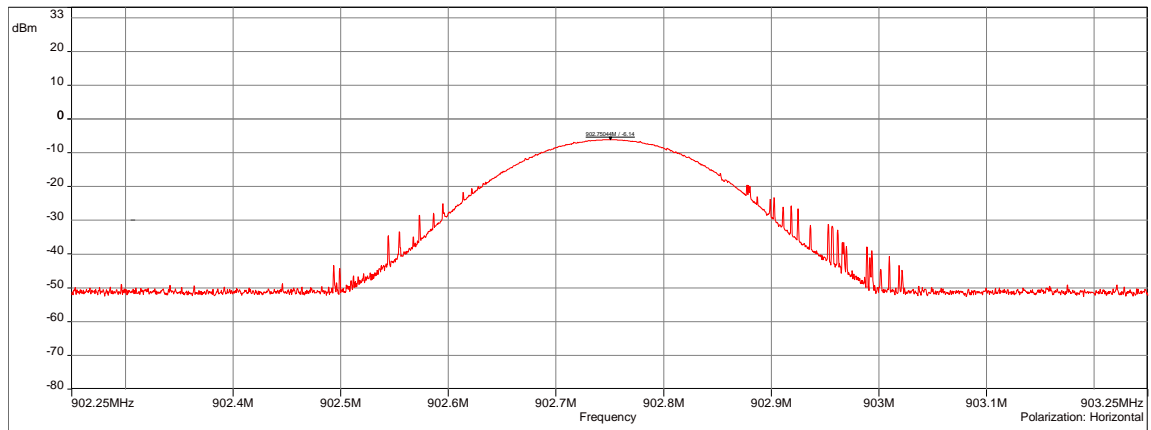
EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
EIRP / Low CHANNEL			EMI4574
EUT mode:	Continuous modulated Tx		T (°C): 20.4
Test Date:	26/05/2021		H (%): 32.5
Test Operator:	OAT		P (hPa): 1011

Sub-range 1
 Frequencies: 902.25 MHz - 903.25 MHz (Analyser mode) 8000 Points
 Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
 Polarization: Vertical
 Distance: 3 m



EIRP / Low Channel - 05/26/2021 10:40 - 4574

Sub-range 2
 Frequencies: 902.25 MHz - 903.25 MHz (Analyser mode) 8000 Points
 Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
 Polarization: Horizontal
 Distance: 3 m



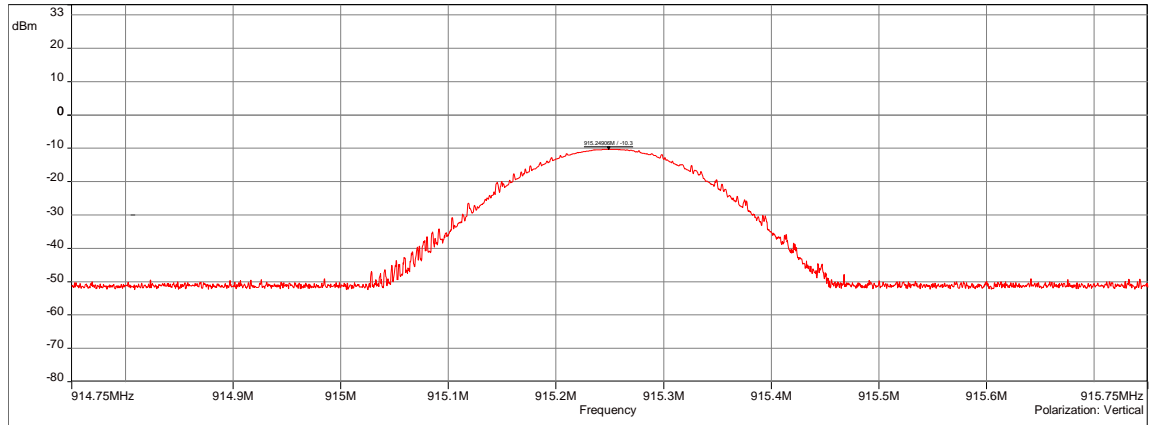
EIRP / Low Channel - 05/26/2021 10:40 - 4574

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	902.25MHz-903.25MHz	100kHz	300kHz	Peak
Horizontal	902.25MHz-903.25MHz	100kHz	300kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
EIRP / Low CHANNEL			EMI4574
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)
902.75	Vertical	-20.3	30
902.75	Horizontal	-6.14	30

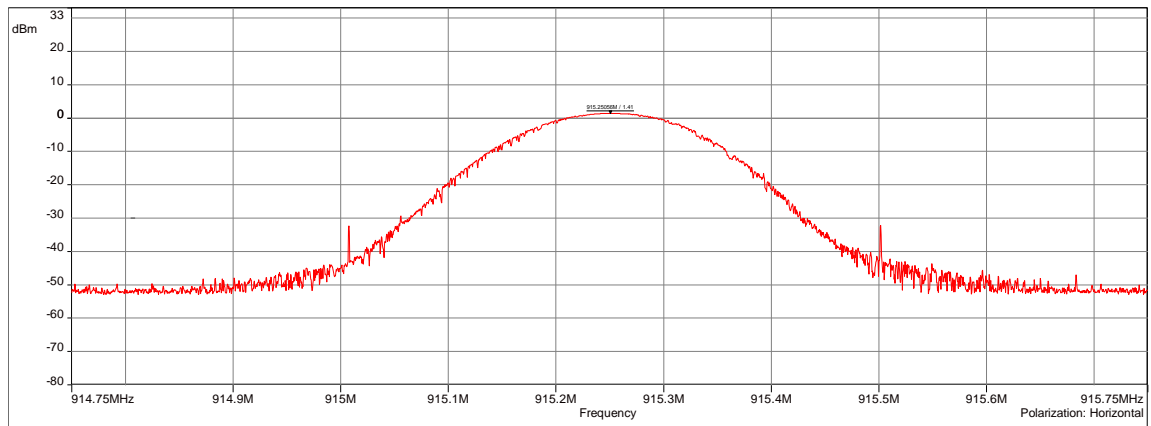
EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH				
EIRP / MID CHANNEL			EMI4575	
EUT mode:	Continuous modulated Tx		T (°C):	20.4
Test Date:	26/05/2021		H (%):	32.5
Test Operator:	OAT		P (hPa):	1011

Sub-range 1
 Frequencies: 914.75 MHz - 915.75 MHz (Analyser mode) 8000 Points
 Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
 Polarization: Vertical
 Distance: 3 m



EIRP / Mid Channel - 05/26/2021 10:49 - 4575

Sub-range 2
 Frequencies: 914.75 MHz - 915.75 MHz (Analyser mode) 8000 Points
 Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
 Polarization: Horizontal
 Distance: 3 m



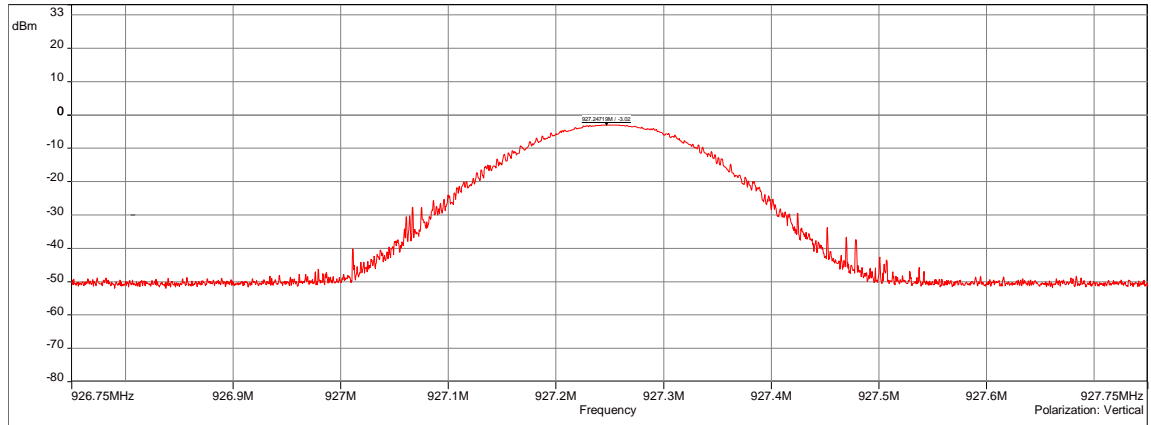
EIRP / Mid Channel - 05/26/2021 10:49 - 4575

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	914.75MHz-915.75MHz	100kHz	300kHz	Peak
Horizontal	914.75MHz-915.75MHz	100kHz	300kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
EIRP / MID CHANNEL			EMI4575
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)
915.25	Vertical	-10.3	30
915.25	Horizontal	1.41	30

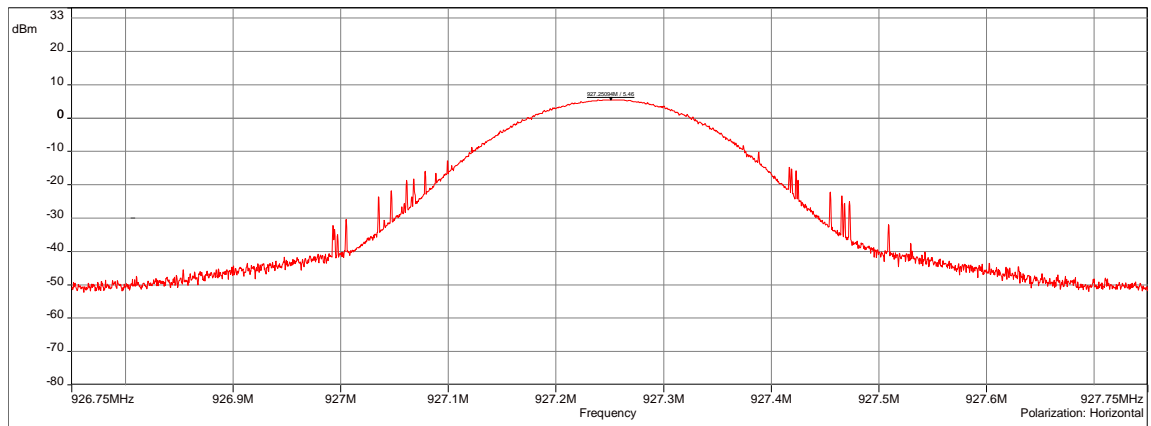
EFFECTIVE ISOTROPIC RADIATED POWER - GRAPH			
EIRP / HIGH CHANNEL			EMI4576
EUT mode:	Continuous modulated Tx		T (°C): 20.4
Test Date:	26/05/2021		H (%): 32.5
Test Operator:	OAT		P (hPa): 1011

Sub-range 1
 Frequencies: 926.75 MHz - 927.75 MHz (Analyser mode) 8000 Points
 Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
 Polarization: Vertical
 Distance: 3 m



EIRP / High Channel - 05/26/2021 10:53 - 4576

Sub-range 2
 Frequencies: 926.75 MHz - 927.75 MHz (Analyser mode) 8000 Points
 Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
 Polarization: Horizontal
 Distance: 3 m



EIRP / High Channel - 05/26/2021 10:53 - 4576

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	926.75MHz-927.75MHz	100kHz	300kHz	Peak
Horizontal	926.75MHz-927.75MHz	100kHz	300kHz	Peak
Configuration:	N/A			
Comments:	N/A			
EUT modification(s): N/A				

EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS			
EIRP / HIGH CHANNEL			EMI4576
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)
927.25	Vertical	-3.02	30
927.25	Horizontal	5.46	30

b) EXTREMES TESTS CONDITIONS

Reference standard:	FCC part 15 Radio part 15.247 and RSS-247
Test method:	FCC part 15.247 and RSS-247
General test setup: EUT is set inside the climatic enclosure. EIRP measurements are repeated in extreme test conditions with the power levels correlated with the maximum effective radiated power measured in normal conditions.	

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Low Channel / 25°C	Continuous Unmodulated Tx	30 dBm	EMI4650	PASS
Mid Channel / 25°C	Continuous Unmodulated Tx	30 dBm	EMI4652	PASS
High Channel / 25°C	Continuous Unmodulated Tx	30 dBm	EMI4653	PASS
Low Channel / 55°C	Continuous Unmodulated Tx	30 dBm	EMI4659	PASS
Mid Channel / 55°C	Continuous Unmodulated Tx	30 dBm	EMI4660	PASS
High Channel / 55°C	Continuous Unmodulated Tx	30 dBm	EMI4661	PASS
Low Channel / -20°C	Continuous Unmodulated Tx	30 dBm	EMI4665	PASS
Mid Channel / -20°C	Continuous Unmodulated Tx	30 dBm	EMI4666	PASS
High Channel / -20°C	Continuous Unmodulated Tx	30 dBm	EMI4667	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	23.2 °C
Relative Humidity	20 to 75 %	52.1 %
Atmospheric pressure	N/A	1009 hPa
Test method deviation: N/A		
Supplementary information: EUT power supply is replaced by a stabilized power supply.		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	EMITECH	3.5 cm	4653		
Attenuator	Radiall	R412710124	17328	22/06/2020	22/08/2023
Cable	C&C	N-3m	14335	18/03/2021	18/05/2023
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	19/09/2019	19/07/2021
Spectrum analyzer	Rohde & Schwarz	FPL1003	16027	14/08/2020	14/10/2021
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermohygrometer	Testo	608-H2	12268	07/05/2020	07/07/2022
Thermometer contactless	GHM Greisinger	GMH 3710	12968	06/10/2020	06/12/2021

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TEST SETUP PHOTO(S)



EFFECTIVE ISOTROPIC RADIATED POWER - TABULATED RESULTS

TEST CASE	FREQUENCY	LEVEL	LIMIT	RESULT TAB.
Low Channel / 25°C	902.75 MHz	-6.14 dBm	30 dBm	EMI4650
Mid Channel / 25°C	915.25 MHz	1.41 dBm	30 dBm	EMI4652
High Channel / 25°C	927.75 MHz	5.46 dBm	30 dBm	EMI4653
Low Channel / 55°C	902.75 MHz	-7.51 dBm	30 dBm	EMI4659
Mid Channel / 55°C	915.25 MHz	1.15 dBm	30 dBm	EMI4660
High Channel / 55°C	927.75 MHz	3.95 dBm	30 dBm	EMI4661
Low Channel / -20°C	902.75 MHz	-4.61 dBm	30 dBm	EMI4665
Mid Channel / -20°C	915.25 MHz	2.91 dBm	30 dBm	EMI4666
High Channel / -20°C	927.75 MHz	14.96 dBm	30 dBm	EMI4667

EUT MODIFICATIONS	OPERATOR	TEST DATE	RESULT TAB.
N/A	OAT	11/06/2021	-

9.7. Measurement of Frequency Stability §15.215 (C) And RSS-GEN

Reference standard:	FCC part 15 Radio part 15.215 c)
Test method:	FCC part 15 Radio part 15.215 c) and RSS Gen
<p>Test description: requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation. EUT is set inside the climatic enclosure. EUT is connected to the measuring receiver via 50Ω attenuator(s).</p>	

TEST CASE	EUT MODE	SEVERITY	RESULT TAB.	VERDICT
Low Channel / 25°C	Continuous unmodulated Tx	902-928 MHz	EMI4651	PASS
Mid Channel / 25°C	Continuous unmodulated Tx	902-928 MHz	EMI4654	PASS
High Channel / 25°C	Continuous unmodulated Tx	902-928 MHz	EMI4655	PASS
Low Channel / 55°C	Continuous unmodulated Tx	902-928 MHz	EMI4656	PASS
Mid Channel / 55°C	Continuous unmodulated Tx	902-928 MHz	EMI4657	PASS
High Channel / 55°C	Continuous unmodulated Tx	902-928 MHz	EMI4658	PASS
Low Channel / -20°C	Continuous unmodulated Tx	902-928 MHz	EMI4662	PASS
Mid Channel / -20°C	Continuous unmodulated Tx	902-928 MHz	EMI4663	PASS
High Channel / -20°C	Continuous unmodulated Tx	902-928 MHz	EMI4664	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	23.2 °C
Relative Humidity	20 to 75 %	52.1 %
Atmospheric pressure	N/A	1009 hPa
Test method deviation: N/A		
Supplementary information: EUT power supply is replaced by a stabilized power supply.		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	EMITECH	3.5 cm	4653		
Attenuator	Radiall	R412710124	17328	22/06/2020	22/08/2023
Cable	C&C	N-3m	14335	18/03/2021	18/05/2023
Climatic enclosure	CLIMATS	EXCAL 7714-HA	14261	19/09/2019	19/07/2021
Spectrum analyzer	Rohde & Schwarz	FPL1003	16027	14/08/2020	14/10/2021
Thermo-Hygro-Baromètre	LUFFT	OPUS 20	14563	08/03/2021	08/05/2022
Thermohygrometer	Testo	608-H2	12268	07/05/2020	07/07/2022

CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Thermometer contactless	GHM Greisinger	GMH 3710	12968	06/10/2020	06/12/2021

Blank cells = Permanent validity

TEST SETUP PHOTO(S)

FREQUENCY ERROR - TABULATED RESULTS

TEST CASE	FREQUENCY	FREQUENCY ERROR	LIMIT	RESULT TAB.
Low Channel / 25°C	902.750205 MHz	N/A	Within the 902MHz 928MHz band	EMI4651
Mid Channel / 25°C	915.250265 MHz	N/A		EMI4654
High Channel / 25°C	927.250285 MHz	N/A		EMI4655
Low Channel / 55°C	902.750005 MHz	-0.200 kHz		EMI4656
Mid Channel / 55°C	915.249975 MHz	-0.290 kHz		EMI4657
High Channel / 55°C	927.249945 MHz	-0.340 kHz		EMI4658
Low Channel / -20°C	902.749745 MHz	-0.460 kHz		EMI4662
Mid Channel / -20°C	915.249800 MHz	-0.465 kHz		EMI4663
High Channel / -20°C	927.249793 MHz	-0.492 kHz		EMI4664

EUT MODIFICATIONS	OPERATOR	TEST DATE	RESULT TAB.
N/A	OAT	11/06/2021	-

○○○ End of test report ○○○