



Test report issued under the responsibility of:  
EMITECH MONTPELLIER laboratory  
MRA US-EU Designation Number: FR0006  
IC Assigned Code: 4379C

## RADIO TEST REPORT

FCC part 15.247  
RSS-247\_Issue 2, February 2017

**Company** ..... : **ADVEEZ SAS**  
**Address**..... : 12 rue Michel Labrousse  
Bâtiment 6  
31100 TOULOUSE  
FRANCE

**Test item description** ..... : **Tracking system**  
**Trade Mark** ..... : ADVEEZ SAS  
**Manufacturer** ..... : ADVEEZ SAS  
**Model/Type reference**..... : OTM  
**FCC ID**..... : R8T-OTM  
**IC**..... : 21312-OTM  
**Ratings**..... : 3.6 Vdc (internal battery pack of 8000mAh)

**Testing Laboratory** ..... : **EMITECH MONTPELLIER laboratory**  
**Address**..... : 145 rue de Massacan BP80025  
34741 VENDARGUES Cedex  
FRANCE

**Report Reference No**..... : **R410-17-105371-2A**  
**Test procedure** ..... : FCC IC Certification  
**Diffusion**..... : Mr ASRA  
**Applicant's name** ..... : ADVEEZ SAS  
**Date of issue**..... : 23/07/2018  
**Total number of pages**..... : 52  
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**Modified page(s)**..... : Creation  
**Compiled by**..... : Fabien MOINACHE  
**Approved by (+ signature)**..... : David MONTAULON (Technical Manager)

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the whole manufactured products of the tested sample.*



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## 1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **Tracking system OTM** (denominated hereafter E.U.T.: equipment under test) according to document(s) listed in §2 of this test report.

<b>TESTING PROCEDURE AND TESTING LOCATION:</b>			
<b>Testing Laboratory</b> .....	EMITECH MONTPELLIER laboratory & Open Area Test Site in SALINELLES (30)		
Address.....	145 rue de Massacan BP80025 34741 VENDARGUES Cedex FRANCE		
Test procedure. ....	FCC IC Certification		
Tested by .....	Fabien MOINACHE and Morgan PATEY		
Test supervisor .....	David MONTAULON		
Date of receipt of test item.....	N/A		
Date (s) of performance of tests.....	October 18th and 19th of 2017		
<b>APPLICANT'S GENERAL INFORMATIONS:</b>			
<b>Company name</b> .....	ADVEEZ SAS		
Company address. ....	12 rue Michel Labrousse Bâtiment 6 31100 TOULOUSE FRANCE		
Person(s) present during the tests. ....	Mr ASRA		
Responsible.....	Mr ASRA		
<b>GENERAL REMARKS:</b>			
<p><b>The test results presented in this report relate only to the object tested.</b>  <b>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.</b></p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. Throughout this report the decimal separator is point.</p>			
<b>POSSIBLE TEST CASE VERDICTS:</b>			
Test case does not apply to the test object..	N/A		
Information not communicated. ....	N/C		
Test case not performed.....	N/P		
Test object does meet the requirement.....	P (Pass)		
Test object does not meet the requirement..	F (Fail)		
Test object was not subjected to all tests.....	I (Inconclusive)		
<b>DEFINITIONS AND ABBREVIATIONS:</b>			
E.U.T.	Equipement under test	AE	Ancillary equipment
RBW	Resolution bandwidth	VBW	Video bandwidth
OATS	Open area test site	FAR	Full anechoic room
RF	Radio frequency	NTR	Nothing to report
SRD	Short Range Device	GPS	Global Positioning System

## 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

### 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.



### 3.2. EUT Marking Plate



### 3.3. EUT Internal view



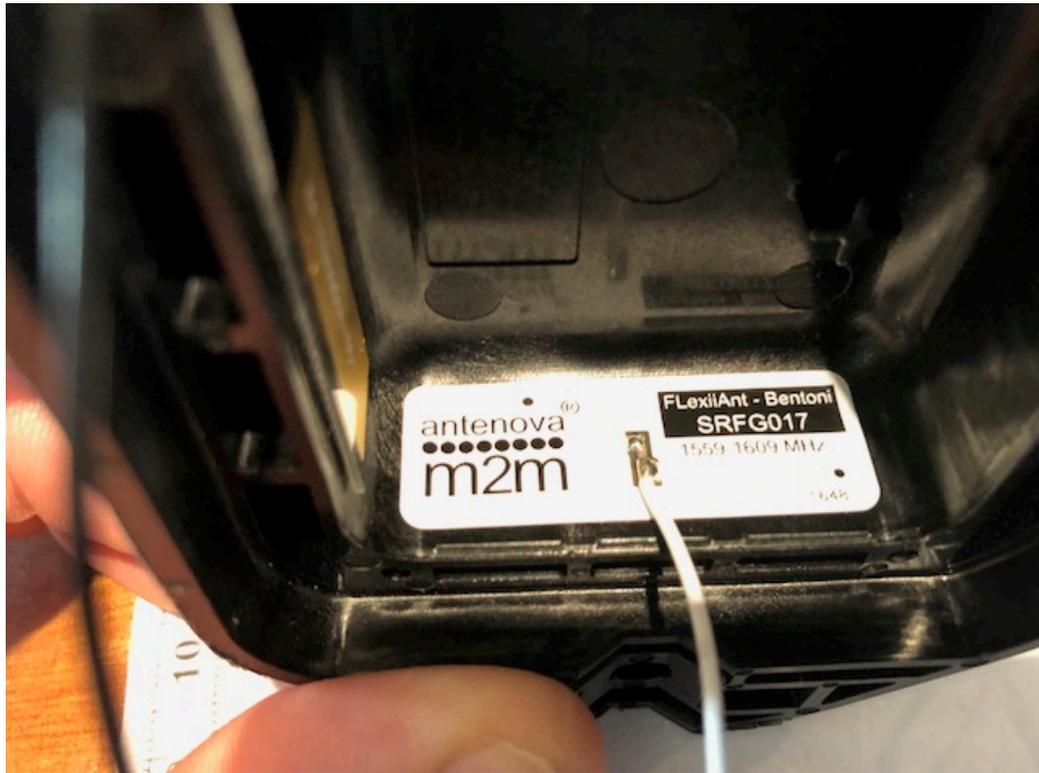
### 3.4. EUT Integral SRD antenna



### 3.5. EUT SRD Antenna + PCB



### 3.6. EUT GPS Antenna



### 3.7. EUT Electronic board



### 3.8. EUT Internal view



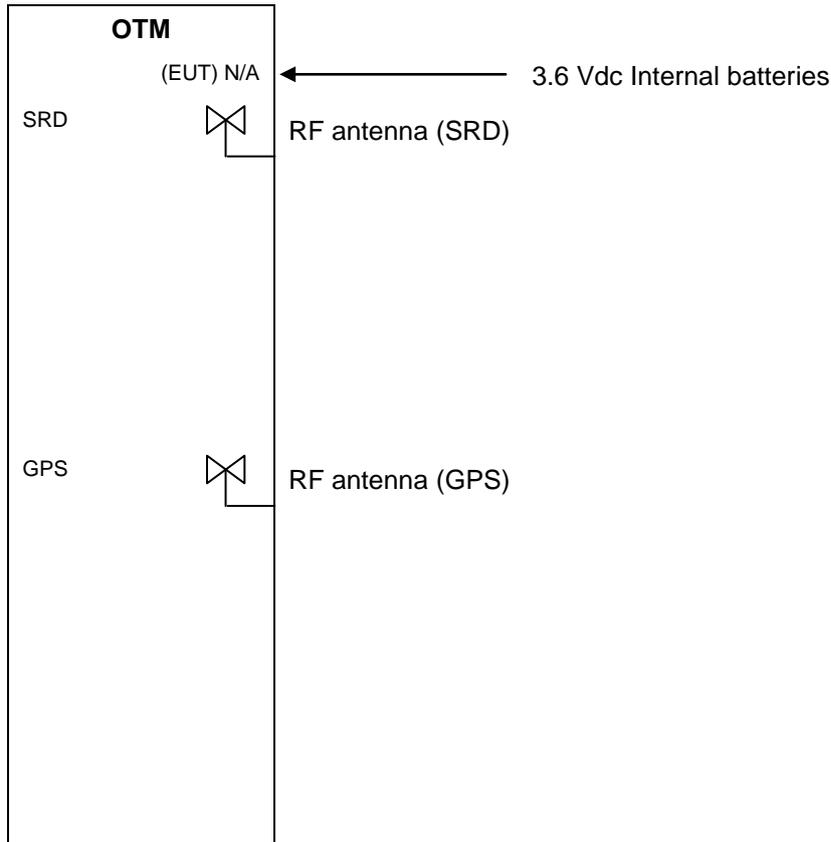
### 3.9. EUT Mechanical and Electrical Design

Power supply. ....	: 3.6 Vdc (internal battery pack of 8000mAh)
Power supply range.....	: 3.6 Vdc (internal battery pack of 8000mAh)
Power type.....	: Battery powered
Power (W).....	: N/A
Nominal current (A). ....	: N/A
Dimensions (L x W x H) (m). ....	: 0.16m x 0.08m x 0.04m
Weight (kg). ....	: N/C
Temperature range (°C). ....	: -20/+50°C
Ground bounding strap.....	: No

**Comments:**

Device also includes a GPS module wich is activated during all the tests.

### 3.10. EUT Input/Output ports



PORT	NAME	TYPE	LENGHT	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	Plastic	
1	3.6 Vdc Internal batteries	DC	N/A	N/A	
2	RF antenna (SRD)	RF	N/A	N/A	
3	RF antenna (GPS)	RF	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 .....: Discontinuous current port  
 RF.....: Radio frequency port

### 3.11. Supporting Equipment Used During Test

Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
N/A	N/A	N/A	N/A

### 3.12. EUT Radio Specifications

<b>a) GENERAL INFORMATIONS</b>	
According to manufacturer's declarations :	
EUT type.....	: Transmitter
Technology .....	: SRD
Environmental profile.....	: Data transmission
Temperature range.....	: -20/+50 °C
Antenna type .....	: Integral
Antenna Gain.....	: 6dBi (Max)
<b>Comments:</b>	
Device also includes a GPS module wich is activated during all the tests.	
<b>b) TRANSMITTER PARAMITERS (Tx)</b>	
Frequency bands .....	: 902MHz-928MHz
RF Power.....	: 1W max (standard value)
Number of channels / Separation.....	: 64 for FHSS/200kHz (See test report R410-17-105371-1A Ed.3) 8 for DSSS/1.6MHz
Modulation type .....	: LORA
Duty cycle .....	: N/C
Tested frequency.....	: 903MHz-914.2MHz (DSSS)
<b>c) RECEIVER PARAMETERS (Rx)</b>	
Frequency bands .....	: 903MHz-914.2MHz (DSSS)
Category/Class .....	: pointless
Bandwidth .....	: pointless

#### 4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
<b>SUBPART A - GENERAL</b>			
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
<b>SUBPART B – UNINTENTIONAL RADIATORS</b>			
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		N/A	15.107 / Battery powered equipment
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
<b>SUBPART C –INTENTIONAL RADIATORS</b>			

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
<b>Equipment authorization requirement</b>		PASS	15.201 / Transmitter part is subject to Certification procedure
<b>Certified operating frequency range</b>		N/A	15.202
<b>Antenna requirement</b>		PASS	15.203 / Dedicated integral antenna
<b>External radio frequency power amplifiers and antenna modifications</b>		N/A	15.204
<b>Restricted bands of operation</b>		PASS	15.204
<b>Conducted limits</b>	Class B	N/A	15.207 / Battery powered equipment
<b>Radiated emission limits; general requirements</b>	Class B	PASS	15.209
<b>Tunnel radio systems</b>		N/A	15.211
<b>Modular transmitters</b>		N/A	15.212
<b>Cable locating equipment</b>		N/A	15.213
<b>Cordless telephones</b>		N/A	15.214
<b>Additional provisions to the general radiated emission limits</b>		PASS	15.215
<b>Operation within the band 902-928MHz, 2400-2483.5MHz and 5725-5850MHz</b>			15.247
- Frequency hopping and digitally modulated		-	a)
- Frequency hopping system		N/P	a) (1) See test report R410-17-105371-1A Ed.3
- Digital modulation system		PASS	a) (2) BW > 500kHz
- <b>Maximum peak conducted output power</b>		-	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		N/P	b) (2) See test report R410-17-105371-1A Ed.3
- For system using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands		PASS	b) (3) BW > 500kHz
- <b>Operation with directional antenna gains &gt; 6 dBi</b>		N/A	c)
- <b>Out-of-band emissions</b>		PASS	d)
- <b>Power spectral density conducted</b>		PASS	e)
- <b>Hybrid system</b>		N/A	f)
- <b>Frequency hopping additional requirements</b>		N/P	g) See certification documents
- <b>Frequency hopping intelligence</b>		N/P	h) See certification documents
- <b>RF exposure compliance</b>		PASS	i)

Sample subject to the test complies 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 account of uncertainty associated with the results.

Opinion(s) and interpretation(s): N/A

## 5. RF EXPOSURE

Conducted measurement = 9.379dBm  
 Maximum antenna gain = 6dBi  
 Maximum EIRP with antenna gain of 6dBi = 34.67 mW (eirp) at 902.3MHz

In accordance with KDB 447498 D01 General RF Exposure Guidance v06:  
 $PSD = EIRP / (4 * \pi * R^2) = 162.2 / (4 * \pi * (20 \text{ cm})^2) = 0.00689 \text{ mW/cm}^2$   
 Limit = 0.61 mW/cm<sup>2</sup> ( f /1500 if 300 < f < 1500 MHz)

## 6. 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	$\pm 0.8\text{dB}$	$\pm 1 \text{ dB}$
Power spectral density	$\pm 2.3\text{dB}$	$\pm 3 \text{ dB}$
Occupied bandwidth		
RF power	$\pm 1.2 \%$	$\pm 5 \%$
Conducted emission (spurious)		
f $\leq$ 1 GHz	$\pm 0.8 \text{ dB}$	$\pm 3 \text{ dB}$
1 GHz - 12.75 GHz	$\pm 1.6 \text{ dB}$	
Radiated emission (PAR / PIRE / RNE)		
f $\leq$ 62.5 MHz	$\pm 5.1 \text{ dB}$	$\pm 6 \text{ dB}$
62.5 MHz - 1 GHz	$\pm 5.1 \text{ dB}$	$\pm 6 \text{ dB}$
1 GHz - 18 GHz	$\pm 5.2 \text{ dB}$	$\pm 6 \text{ dB}$
18 GHz – 26 GHz	$\pm 5.1 \text{ dB}$	$\pm 6 \text{ dB}$
26 GHz – 40 GHz	$\pm 5.4 \text{ dB}$	$\pm 6 \text{ dB}$
PIRE and power spectral density with diode	$\pm 5.4 \text{ dB}$	$\pm 6 \text{ dB}$
Radiated emission (magnetic field)		
9kHz – 30MHz	$\pm 2.7 \text{ dB}$	$\pm 6 \text{ dB}$
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	$\pm 4.4 \%$	$\pm 5 \%$
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	$\pm 2.7 \text{ dB}$	/
30MHz – 1GHz	$\pm 5.2 \text{ dB}$	/
1GHz – 18GHz	$\pm 5.3 \text{ dB}$	/
18GHz – 26GHz	$\pm 5.5 \text{ dB}$	/
26GHz – 40GHz	$\pm 5.5 \text{ dB}$	/

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

## 7. TEST CONDITIONS AND RESULTS

### 7.1. Occupied Bandwidth

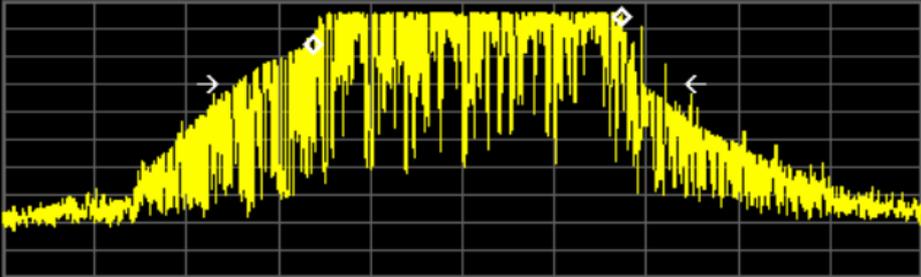
<b>Reference standard:</b>	FCC part 15 Radio part 15.247 and RSS-247
<b>Test method:</b>	FCC part 15.247 and RSS-247
<p><b>Test description:</b> The occupied bandwidth (OBW) is the Frequency Range in which 99 % of the total mean power of a given emission falls. The residual part of the total power being denoted as <math>\beta</math>, which, in cases of symmetrical spectra, splits up into <math>\beta/2</math> on each side of the spectrum. Unless otherwise specified, <math>\beta/2</math> 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> <p>EUT is connected to the measuring receiver via 50<math>\Omega</math> attenuator(s).</p>	

TESTED PARAMETER	OBW	SEVERITY	RESULT TAB.	VERDICT
Lora 500kHz	512.5713kHz	>500kHz	EMI6000	<b>PASS</b>

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	25.3°C
Relative Humidity	20 to 75 %	44.6 %
Atmospheric pressure	N/A	1021 hPa
<b>Test method deviation:</b> N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412710124	4390	25/11/2015	25/01/2018
Attenuator	Radiall	R412720124	4391	25/11/2015	25/01/2018
Cable	STORM MICROWAVE	N-1.5m	10263	05/10/2016	05/12/2018
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	RAY PROOF	C.V1	1123		
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

Blank cells = Permanent validity

OCCUPIED BANDWIDTH - GRAPH	
LORA 500kHz	
EMI6000	
<b>EUT mode:</b>	Tx digital modulated mode
<b>Test Date:</b>	19/10/2017
<b>Test Operator:</b>	FMO
<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid black;"> <span><b>Ch Freq</b> 903 MHz</span> <span><b>Trig</b> Free</span> </div> <div style="border-bottom: 1px solid black; padding: 2px 0;"> <span>Occupied Bandwidth</span> </div> <div style="padding: 5px;"> <p>Ref -6.584 dBm    Atten 10 dB</p> <p>#Avg Log 10 dB/</p>  <p style="text-align: center;">Center 903.000 00 MHz    Span 1.5 MHz</p> <p style="text-align: center;">#Res BW 10 kHz    VBW 30 kHz    Sweep 45.87 ms (8192 pts)</p> <div style="border: 2px solid green; padding: 5px; margin-top: 5px;"> <p><b>Occupied Bandwidth</b>    <b>Occ BW % Pwr</b> 99.00 %</p> <p style="text-align: center; font-size: 1.2em;">512.5713 kHz    <b>x dB</b> -26.00 dB</p> <p><b>Transmit Freq Error</b> 8.015 kHz</p> <p><b>x dB Bandwidth</b> 712.488 kHz*</p> </div> </div> </div>	
<b>Results:</b>	The system has an OBW of 512.5713 kHz
<i>EUT modification(s): N/A</i>	

## 7.2. 20dB bandwidth, Carrier Frequency separation and Number of Channels

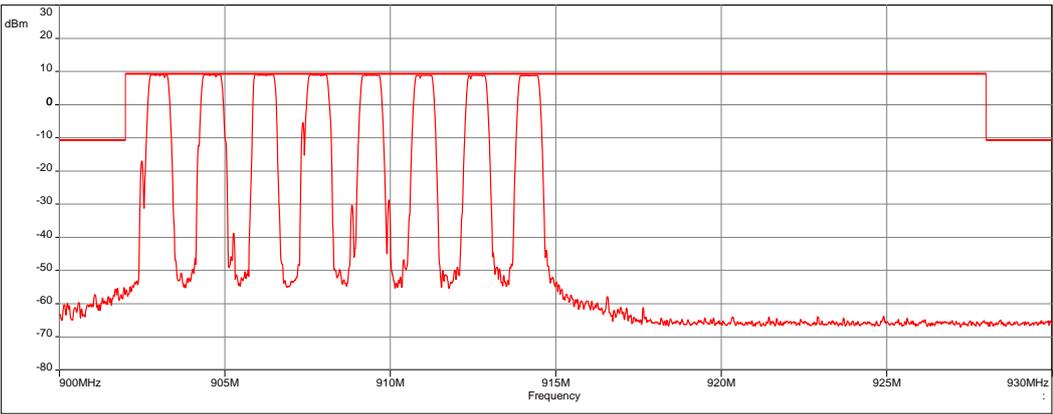
<b>Reference standard:</b>	FCC part 15 Radio part 15.247 and RSS-247
<b>Test method:</b>	FCC part 15.247 and RSS-247
<b>Test description: a) (2):</b> Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz. EUT is connected to the measuring receiver via 50Ω attenuator(s). Tests are done in max-hold mode in order to capture all channels.	

TESTED PARAMETER	RESULT	SEVERITY	RESULT TAB.	VERDICT
Number of channels	8	informative	EMI5980	<b>PASS</b>
Channels separation	1.6MHz	informative	EMI6002	<b>PASS</b>
6dB Bandwidth	520.72kHz	>500kHz	EMI6003	<b>PASS</b>
20dB Bandwidth	686.32kHz	>500kHz	EMI5567	<b>PASS</b>

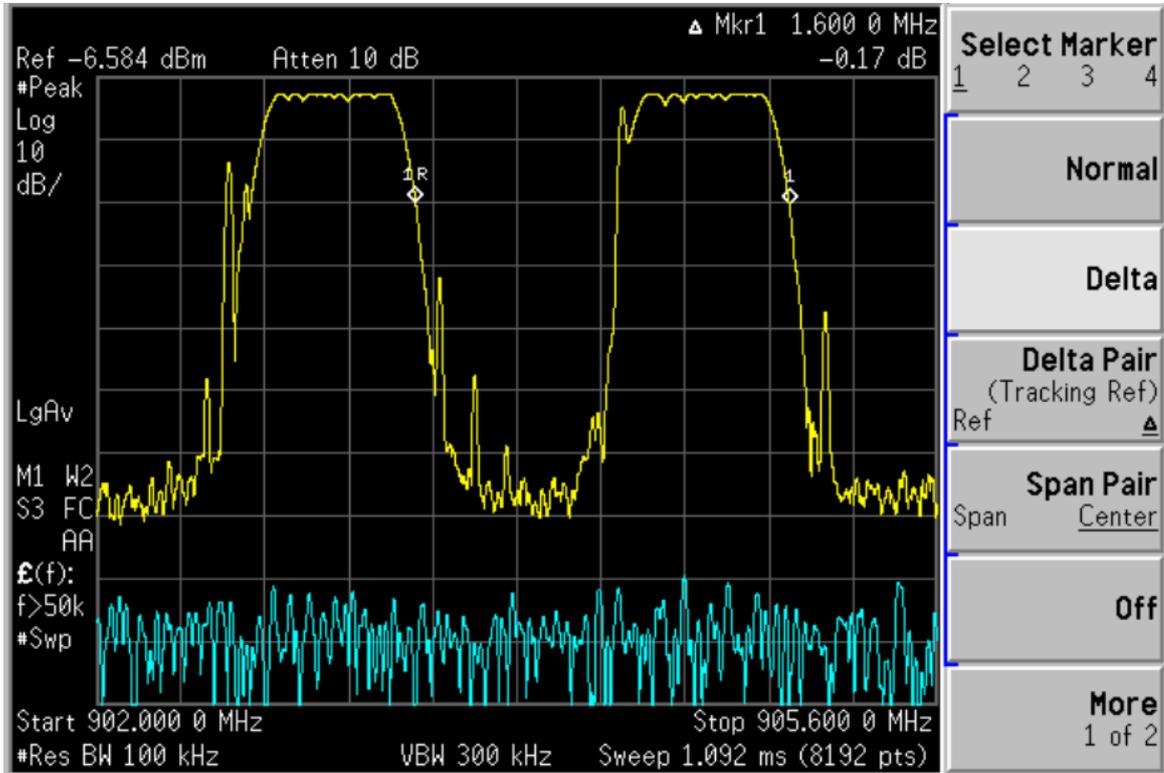
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	20 to 75 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
<b>Test method deviation:</b> N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412710124	4390	25/11/2015	25/01/2018
Attenuator	Radiall	R412720124	4391	25/11/2015	25/01/2018
Cable	STORM MICROWAVE	N-1.5m	10263	05/10/2016	05/12/2018
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	RAY PROOF	C.V1	1123		
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

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NUMBER OF CHANNELS FOR DIGITALLY MODULATED SYSTEMS - GRAPH					
LORA 500KHZ			EMI5980		
<b>EUT mode:</b>	Tx digital modulated mode			<b>T (°C):</b>	25.3
<b>Test Date:</b>	19/10/2017			<b>H (%):</b>	44.6
<b>Test Operator:</b>	FMO			<b>P (hPa):</b>	1021
<p>Sub-range 1            Frequencies: 900 MHz - 930 MHz (Analyser mode) 8192 Points            Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off</p> <p style="text-align: right;"> <span style="color: red;">—</span> FCC/BAND EDGE 902-928MHz 9.35 dBm - RMS/  <span style="color: red;">—</span> Meas.Peak         </p> 					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
RF port	900MHz-930MHz	100kHz	300kHz	Peak max hold	
<b>Configuration:</b>	N/A				
<b>Comments:</b>	Informative: The system uses 8 channels				
<i>EUT modification(s): N/A</i>					

CHANNEL SEPARATION FOR DIGITALLY MODULATED SYSTEMS - GRAPH			
LORA 500kHz		EMI6002	
<b>EUT mode:</b>	Tx digital modulated mode	<b>T (°C):</b>	25.3
<b>Test Date:</b>	19/10/2017	<b>H (%):</b>	44.6
<b>Test Operator:</b>	FMO	<b>P (hPa):</b>	1021



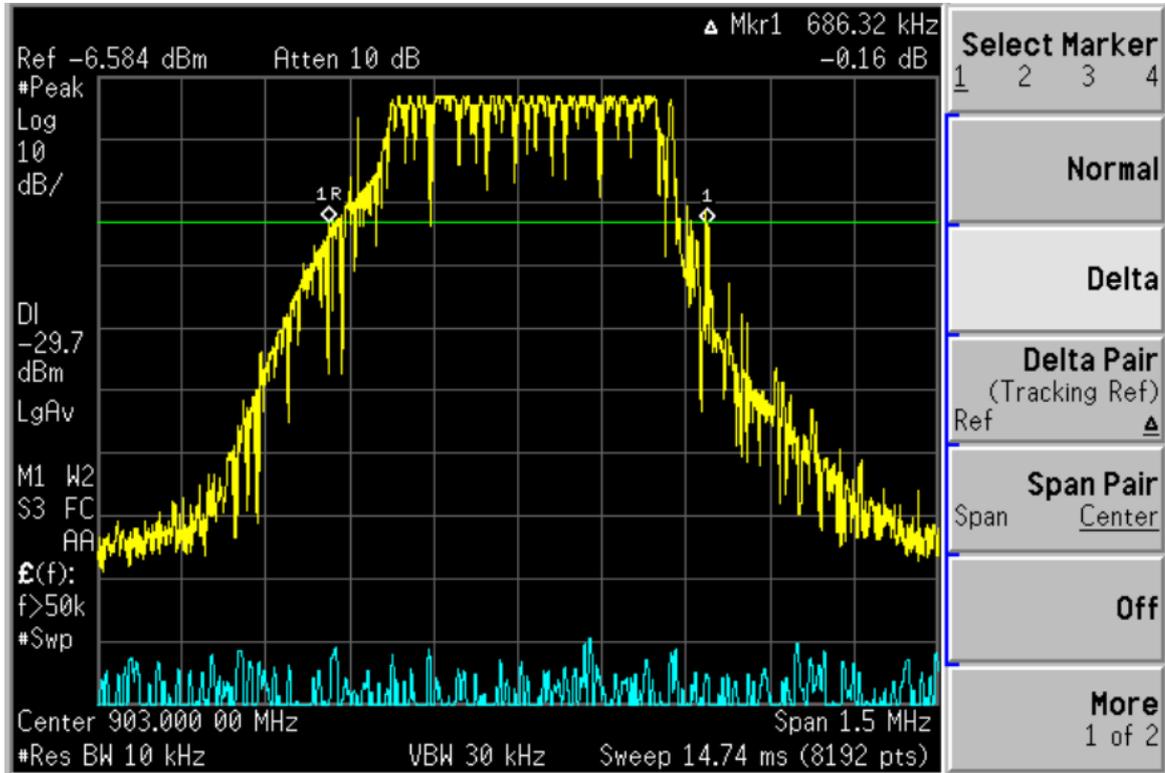
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
RF port	902MHz-905.6MHz	100kHz	300kHz	Peak max hold
<b>Configuration:</b>	N/A			
<b>Comments:</b>	Informative: The channels separation is almost 1.6MHz.			
<i>EUT modification(s): N/A</i>				

6dB BANDWIDTH FOR DIGITALLY MODULATED SYSTEMS - GRAPH			
LORA 500kHz		EMI6003	
<b>EUT mode:</b>	Tx digital modulated mode	<b>T (°C):</b>	25.3
<b>Test Date:</b>	19/10/2017	<b>H (%):</b>	44.6
<b>Test Operator:</b>	FMO	<b>P (hPa):</b>	1021



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
RF port	903MHz	10kHz	30kHz	Peak max hold
<b>Configuration:</b>	N/A			
<b>Comments:</b>	The 6dB bandwidth is 520.72kHz			
<i>EUT modification(s): N/A</i>				

20dB BANDWIDTH FOR DIGITALLY MODULATED SYSTEMS - GRAPH			
LORA 500kHz		EMI6004	
<b>EUT mode:</b>	Tx digital modulated mode	<b>T (°C):</b>	25.3
<b>Test Date:</b>	19/10/2017	<b>H (%):</b>	44.6
<b>Test Operator:</b>	FMO	<b>P (hPa):</b>	1021



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
RF port	903MHz	10kHz	30kHz	Peak max hold
<b>Configuration:</b>	N/A			
<b>Comments:</b>	The 20dB bandwidth is 686.32kHz			
<i>EUT modification(s): N/A</i>				

### 7.3. Maximum peak conducted power of the intentional radiator

<b>Reference standard:</b>	FCC part 15 Radio part 15.247 and RSS-247
<b>Test method:</b>	FCC part 15.247 and RSS-247
<b>Test description:</b> b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. EUT is connected to the measuring receiver via 50Ω attenuator(s). Only the highest levels are recorded.	

TESTED CONFIGURATION	RESULTS	SEVERITY	RESULT TAB.	VERDICT
Low channel – LoRa 500kHz	9.026 dBm	1W (30dBm)	EMI6030	<b>PASS</b>
High channel – LoRa 500kHz	8.81 dBm	1W (30dBm)	EMI6030	<b>PASS</b>

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	25.3 °C
Relative Humidity	20 to 75 %	44.6 %
Atmospheric pressure	N/A	1021 hPa
<b>Test method deviation:</b> N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412710124	4390	25/11/2015	25/01/2018
Attenuator	Radiall	R412720124	4391	25/11/2015	25/01/2018
Cable	STORM MICROWAVE	N-1.5m	10263	05/10/2016	05/12/2018
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	RAY PROOF	C.V1	1123		
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

Blank cells = Permanent validity

## TEST SETUP PHOTO(S)



## PUISSANCE MOYENNE CONDUITE - TABULATED RESULTS

LoRA 500KHZ				EMI6030
Frequency (MHz)	P <sub>conducted</sub> (dBm)	Gain <sub>dBi</sub>	P <sub>eirp</sub> (dBm)	Limit <sub>eirp</sub> (dBm)
903	9.026	6dBi (Max)	15.026	36
914.2	8.81	6dBi (Max)	15.81	36

$$P_{erp} = P_{conducted} + \text{antenna Gain}_{dBd} ; \text{Gain}_{dBd} = \text{Gain}_{dBi} - 2.15dB$$

$$P_{erp} = P_{conducted} + \text{Gain}_{dBi} - 2.15dB$$

$$P_{eirp} = P_{erp} + 2.15dB$$

$$P_{eirp} = P_{conducted} + \text{Gain}_{dBi}$$

In case of a dedicated antenna the antenna gain (in dB, i.e. relative to a dipole) is declared by the manufacturer.

Using the formula  $E_{(V/m)} = \sqrt{(30P_{dBm}G_{dBi})}/d_{(m)}$  where P is the conducted power and G the maximum antenna gain. Equivalent maximum E-field should be approximatively of 110.25dB $\mu$ V/m.

### 7.4. Power spectral density

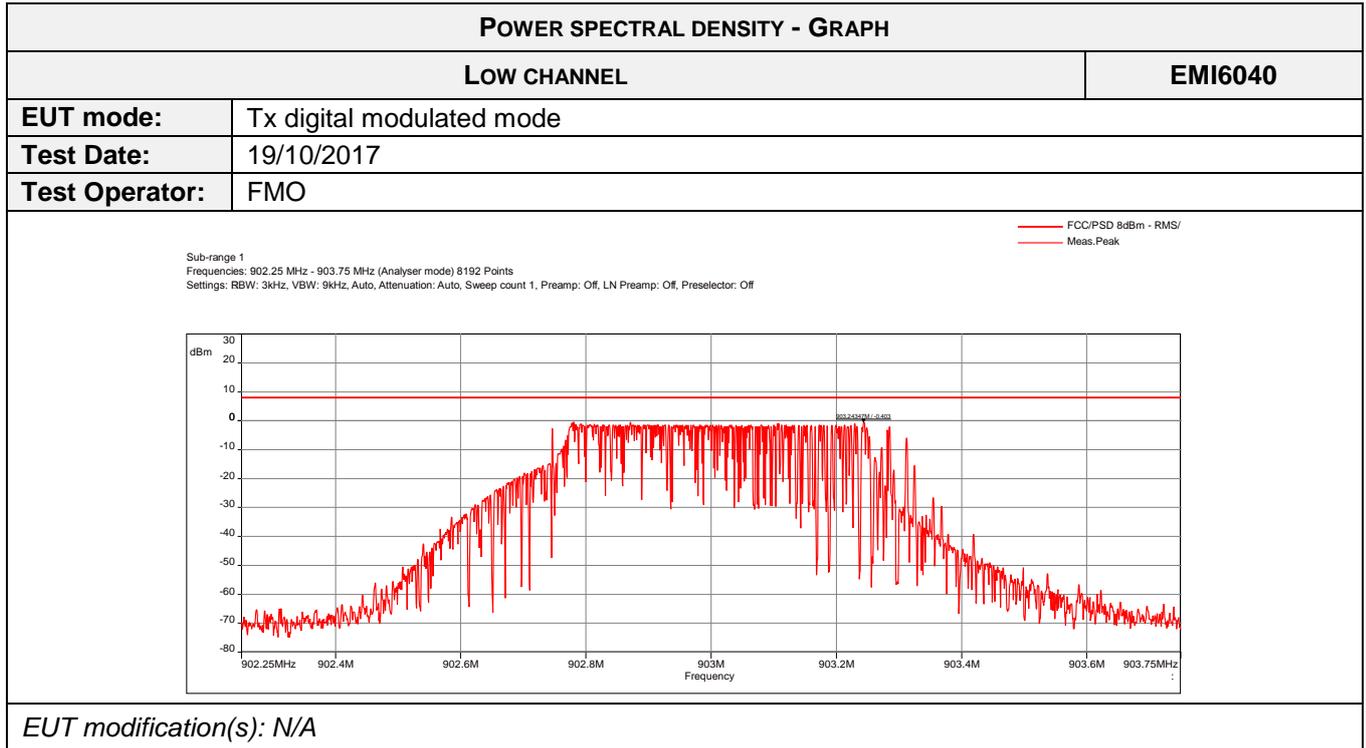
<b>Reference standard:</b>	FCC part 15 Radio part 15.247 and RSS-247
<b>Test method:</b>	FCC part 15.247 and RSS-247
<b>Test description: e)</b>	
<p>For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.</p> <p>EUT is connected to the measuring receiver via 50Ω attenuator(s). Only the highest levels are recorded.</p>	

TESTED CHANNEL	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Low channel (maximum power)	Lora 500kHz	8dBm/3kHz	EMI6040	<b>PASS</b>

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	25.3 °C
Relative Humidity	20 to 75 %	44.6 %
Atmospheric pressure	N/A	1021 hPa
<b>Test method deviation: N/A</b>		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412710124	4390	25/11/2015	25/01/2018
Attenuator	Radiall	R412720124	4391	25/11/2015	25/01/2018
Cable	STORM MICROWAVE	N-1.5m	10263	05/10/2016	05/12/2018
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	RAY PROOF	C.V1	1123		
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

Blank cells = Permanent validity



MAXIMUM EFFECTIVE RADIATED POWER SPECTRAL DENSITY - TABULATED RESULTS			
LOW CHANNEL			EM6040
Frequency	Frequency Fc	Level (dBm/3kHz)	Limit (dBm/3kHz)
903MHz	N/A	-0.403	8

### 7.5. Band-edge compliance of conducted emissions (Transmitter)

<b>Reference standard:</b>	FCC part 15 Radio part 15.247 and RSS-247
<b>Test method:</b>	FCC part 15.247 subclause d) and RSS-247
<b>Test description: d)</b>	
<p>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.</p> <p>EUT is connected to the measuring receiver via 50Ω attenuator(s). Only the highest levels are recorded.</p>	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Lora / 500kHz	900MHz-930MHz	20dBc	EMI6041	<b>PASS</b>

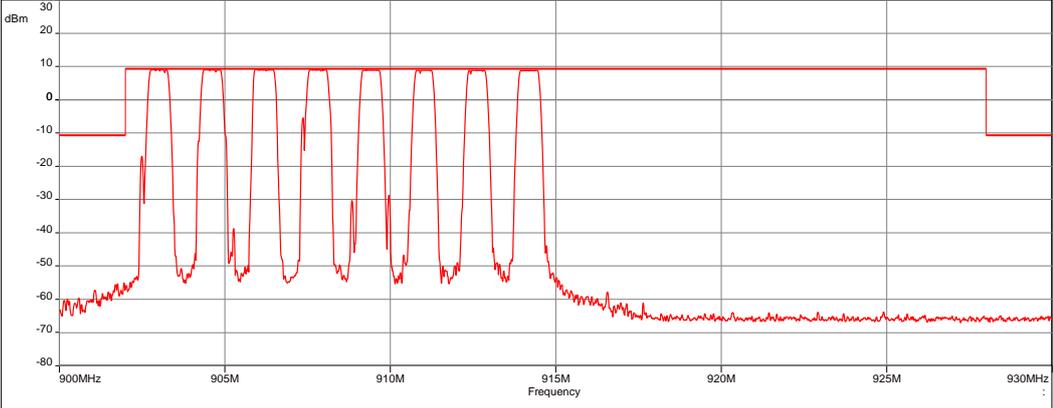
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	23.2°C
Relative Humidity	20 to 75 %	56.7 %
Atmospheric pressure	N/A	1010 hPa
<b>Test method deviation: N/A</b>		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412710124	4390	25/11/2015	25/01/2018
Attenuator	Radiall	R412720124	4391	25/11/2015	25/01/2018
Cable	STORM MICROWAVE	N-1.5m	10263	05/10/2016	05/12/2018
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	RAY PROOF	C.V1	1123		
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

Blank cells = Permanent validity

TEST SETUP PHOTO(S)



BAND EDGE COMPLIANCE - GRAPH					
LORA / 500kHz			EMI6041		
<b>EUT mode:</b>	Tx digital modulated mode			<b>T (°C):</b>	23.2
<b>Test Date:</b>	19/10/2017			<b>H (%):</b>	56.7
<b>Test Operator:</b>	FMO			<b>P (hPa):</b>	1010
<div style="text-align: right;"> <p>— FCC/BAND EDGE 902-928MHz 9.35 dBm - RMS/            — Meas.Peak</p> </div> <p>Sub-range 1            Frequencies: 900 MHz - 930 MHz (Analyser mode) 8192 Points            Settings: RBW: 100kHz, VBW: 300kHz, Auto, Attenuation: Auto, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off</p> 					
POSITION	FREQUENCIES	RBW	VBW	DETECTOR	
RF port	900MHz-930MHz	100kHz	300kHz	Peak	
<b>Configuration:</b>	N/A				
<b>Comments:</b>	No Out of Band Emissions				
<i>EUT modification(s): N/A</i>					

## 7.6. Radiated spurious emissions

<b>Reference standard:</b>	FCC part 15 Radio part 15.247 and RSS-247
<b>Test method:</b>	FCC part 15.109, 15.209, 15.205, 15.215 RSS-247, CNR Gen
<p><b>General test setup:</b> For <math>f &lt; 30\text{MHz}</math>, 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 <math>f &gt; 30\text{MHz}</math>, EUT is set on an insulating support at 80cm above the ground reference plane (150cm for <math>f &gt; 1\text{GHz}</math>).</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
Lora Tx mode 500kHz, Rx mode	9kHz-150kHz	15.209	See below	<b>PASS</b>
Lora Tx mode 500kHz, Rx mode	150kHz-30MHz	15.209	See below	<b>PASS</b>
Lora Tx mode 500kHz, Rx mode	30MHz-1GHz	15.209	See below	<b>PASS</b>
Lora Tx mode 500kHz, Rx mode	1GHz-10GHz	15.209	See below	<b>PASS</b>

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:

From 9 kHz to 30MHz: limit indicated on the curves is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.

From 30MHz to 1GHz Quasi peak limit provided is the limit given in §15.209.

Above 1GHz average limit in restricted bands §15.205 is 54dB $\mu$ V/m. Otherwise, the limit is 20dB under carrier emission level at 3m without averaging.

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	8387	10/02/2017	10/04/2018
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Antenna	Electro Metrics	BIA-30HF	1107	25/04/2015	25/06/2018
Antenna	Rohde & Schwarz	HL 223	1137	25/04/2015	25/06/2018
Cable	MegaPhase	TM18-N1N1-197	12840	05/04/2016	05/06/2018
Cable	MegaPhase	TM18-N1N1-118	12841	05/04/2016	05/06/2018
Cable	MegaPhase	TM18-N1N1-118	12842	05/04/2016	05/06/2018
Cable	SUCOFLEX	N-6,5m	14380	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-6,5m	14379	18/01/2017	18/03/2019
Cable	Huber + Suhner	N-10m	8472	16/02/2017	16/04/2019
Cable	Huber + Suhner	N-20m	8385	11/10/2017	11/10/2019
Filter	Wainwright Instruments	WTRCTV5-700-1000-20-60	12838	04/04/2016	04/06/2018
Filter	Micro-Tronics	HPM18865	12843	04/04/2016	04/06/2018
Preamplifier	Techniwave	APS16-0087	14040	25/08/2016	25/10/2017
Open area test site	EMITECH	Salinelles	3482	10/10/2017	10/12/2020
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	COMTEST	SAC 3m	14494	15/02/2017	15/04/2018
Shielded enclosure	RAY PROOF	C.V2	1423	06/07/2016	06/09/2019
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

Blank cells = Permanent validity

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / LOW CHANNEL				
Frequency (MHz)	Position / Polarization	Peak Level (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Margin (dB)
1804.3	AXE 1 / H	66	74	-8
2705.3	AXE 1 / H	64.1	74	-9.9
3608.5	AXE 1 / H	62.2	74	-11.8
5411.5	AXE 1 / H	49.6	74	-24.4
6314.7	AXE 1 / H	52.8	74	-21.2
7216.8	AXE 1 / H	57.4	74	-16.6
1804.3	AXE 1 / V	60.9	74	-13.1
2706.4	AXE 1 / V	58.3	74	-15.7
3607.4	AXE 1 / V	55.2	74	-18.8
5412.6	AXE 1 / V	52.5	74	-21.5
6312.5	AXE 1 / V	59.2	74	-14.8
7216.8	AXE 1 / V	58.8	74	-15.2
8118.9	AXE 1 / V	52.8	74	-21.2
1804.3	AXE 2 / H	61.1	74	-12.9
2705.3	AXE 2 / H	59.9	74	-14.1
3608.5	AXE 2 / H	54.4	74	-19.6
5411.5	AXE 2 / H	52.7	74	-21.3
6314.7	AXE 2 / H	60.9	74	-13.1
7216.8	AXE 2 / H	57.8	74	-16.2
8116.7	AXE 2 / H	52.6	74	-21.4

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / LOW CHANNEL				
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
9018.8	AXE 2 / H	56.4	74	-17.6
9920.9	AXE 2 / H	54.4	74	-19.6
1804.3	AXE 2 / V	62.8	74	-11.2
2706.4	AXE 2 / V	63.5	74	-10.5
3607.4	AXE 2 / V	56.9	74	-17.1
5412.6	AXE 2 / V	49.9	74	-24.1
6312.5	AXE 2 / V	49.5	74	-24.5
7216.8	AXE 2 / V	54.1	74	-19.9
8118.9	AXE 2 / V	55.7	74	-18.3
9019.9	AXE 2 / V	52.5	74	-21.5
1804.3	AXE 3 / H	63.4	74	-10.6
2705.3	AXE 3 / H	61.3	74	-12.7
3608.5	AXE 3 / H	57.7	74	-16.3
4510.6	AXE 3 / H	50.7	74	-23.3
6314.7	AXE 3 / H	53.4	74	-20.6
7216.8	AXE 3 / H	57.7	74	-16.3
1804.3	AXE 3 / V	65.1	74	-8.9
2706.4	AXE 3 / V	65.2	74	-8.8
3607.4	AXE 3 / V	60.4	74	-13.6
5412.6	AXE 3 / V	52	74	-22
6312.5	AXE 3 / V	60.5	74	-13.5
7216.8	AXE 3 / V	60.1	74	-13.9
8118.9	AXE 3 / V	54.8	74	-19.2
9019.9	AXE 3 / V	56.2	74	-17.8

V= Vertical H=Horizontal

Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / HIGH CHANNEL				
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
1855.9	AXE 1 / H	68.2	74	-5.8
2783.3	AXE 1 / H	62.8	74	-11.2
3711.8	AXE 1 / H	60.5	74	-13.5
5566.5	AXE 1 / H	53.7	74	-20.3
6496	AXE 1 / H	55.8	74	-18.2
7422.3	AXE 1 / H	62.6	74	-11.4
1885.9	AXE 1 / V	63.9	74	-10.1
2784.4	AXE 1 / V	55.6	74	-18.4
3711.8	AXE 1 / V	55.7	74	-18.3
5567.6	AXE 1 / V	57.8	74	-16.2
6494.9	AXE 1 / V	58.8	74	-15.2
7424.5	AXE 1 / V	61.5	74	-12.5
1855.9	AXE 2 / H	62.6	74	-11.4
2783.3	AXE 2 / H	56.6	74	-17.4
3711.8	AXE 2 / H	54.5	74	-19.5

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS				
TX MODE / HIGH CHANNEL				
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
5566.5	AXE 2 / H	54.8	74	-19.2
6496	AXE 2 / H	58.2	74	-15.8
7422.3	AXE 2 / H	60	74	-14
8234.3	AXE 2 / H	53.4	74	-20.6
1885.9	AXE 2 / V	68.9	74	-5.1
2784.4	AXE 2 / V	63.3	74	-10.7
3711.8	AXE 2 / V	60.3	74	-13.7
5567.6	AXE 2 / V	50.3	74	-23.7
6494.9	AXE 2 / V	53.3	74	-20.7
7424.5	AXE 2 / V	59.9	74	-14.1
1855.9	AXE 3 / H	62.6	74	-11.4
2783.3	AXE 3 / H	56.6	74	-17.4
3711.8	AXE 3 / H	54.5	74	-19.5
5566.5	AXE 3 / H	54.8	74	-19.2
6496	AXE 3 / H	58.2	74	-15.8
7422.3	AXE 3 / H	60	74	-14
8234.3	AXE 3 / H	53.4	74	-20.6
1885.9	AXE 3 / V	68.9	74	-5.1
2784.4	AXE 3 / V	63.3	74	-10.7
3711.8	AXE 3 / V	60.3	74	-13.7
5567.6	AXE 3 / V	50.3	74	-23.7
6494.9	AXE 3 / V	53.3	74	-20.7
7424.5	AXE 3 / V	59.9	74	-14.1

V= Vertical H=Horizontal

Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
TX MODE / LOW CHANNEL					
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)	Margin (dB)
1804.3	AXE 1 / H	66	31.99	54	-22.01
2705.3	AXE 1 / H	64.1	-	78.9	-14.8
3608.5	AXE 1 / H	62.2	-	78.9	-16.7
5411.5	AXE 1 / H	49.6	-	78.9	-29.3
6314.7	AXE 1 / H	52.8	36.9	54	-17.1
7216.8	AXE 1 / H	57.4	37.6	54	-16.4
1804.3	AXE 1 / V	60.9	39.3	54	-14.7
2706.4	AXE 1 / V	58.3	-	78.9	-20.6
3607.4	AXE 1 / V	55.2	-	78.9	-23.7
5412.6	AXE 1 / V	52.5	-	78.9	-26.4
6312.5	AXE 1 / V	59.2	37.1	54	-16.9
7216.8	AXE 1 / V	58.8	38.5	54	-15.5
8118.9	AXE 1 / V	52.8	-	78.9	-26.1
1804.3	AXE 2 / H	61.1	31.7	54	-22.3
2705.3	AXE 2 / H	59.9	-	78.9	-19
3608.5	AXE 2 / H	54.4	-	78.9	-24.5
5411.5	AXE 2 / H	52.7	-	78.9	-26.2

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
TX MODE / LOW CHANNEL					
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)	Margin (dB)
6314.7	AXE 2 / H	60.9	37.3	54	-16.7
7216.8	AXE 2 / H	57.8	38.7	54	-15.3
8116.7	AXE 2 / H	52.6	-	78.9	-26.3
9018.8	AXE 2 / H	56.4	-	78.9	-22.5
9920.9	AXE 2 / H	54.4	-	78.9	-24.5
1804.3	AXE 2 / V	62.8	32	54	-22
2706.4	AXE 2 / V	63.5	-	78.9	-15.4
3607.4	AXE 2 / V	56.9	-	78.9	-22
5412.6	AXE 2 / V	49.9	-	78.9	-29
6312.5	AXE 2 / V	49.5	37.03	54	-16.97
7216.8	AXE 2 / V	54.1	38.9	54	-15.1
8118.9	AXE 2 / V	55.7	-	78.9	-23.2
9019.9	AXE 2 / V	52.5	-	78.9	-26.4
1804.3	AXE 3 / H	63.4	32	54	-22
2705.3	AXE 3 / H	61.3	-	78.9	-17.6
3608.5	AXE 3 / H	57.7	-	78.9	-21.2
4510.6	AXE 3 / H	50.7	-	78.9	-28.2
6314.7	AXE 3 / H	53.4	37.05	54	-16.95
7216.8	AXE 3 / H	57.7	38.6	54	-15.4
1804.3	AXE 3 / V	65.1	32.3	78.9	-46.6
2706.4	AXE 3 / V	65.2	-	78.9	-13.7
3607.4	AXE 3 / V	60.4	-	78.9	-18.5
5412.6	AXE 3 / V	52	-	78.9	-26.9
6312.5	AXE 3 / V	60.5	37.02	54	-16.98
7216.8	AXE 3 / V	60.1	38.5	54	-15.5
8118.9	AXE 3 / V	54.8	-	78.9	-24.1
9019.9	AXE 3 / V	56.2	-	78.9	-22.7

V= Vertical H=Horizontal

Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

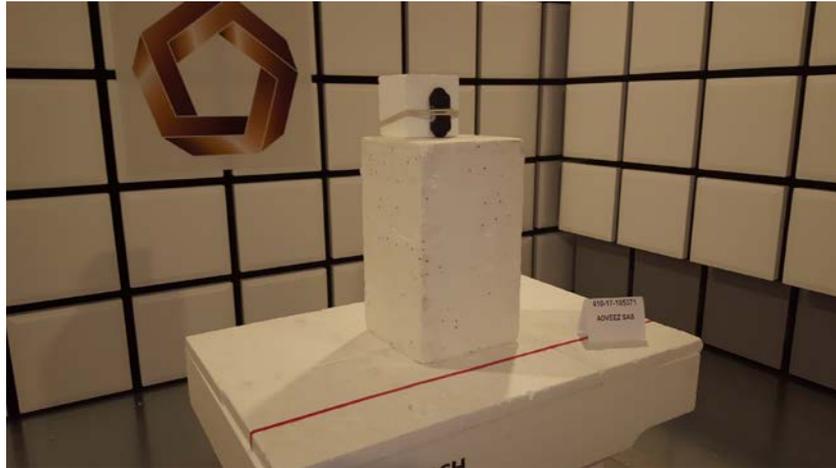
RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
TX MODE / HIGH CHANNEL					
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)	Margin (dB)
1855.9	AXE 1 / H	68.2	31.04	54	-22.96
2783.3	AXE 1 / H	62.8		78.3	-15.5
3711.8	AXE 1 / H	60.5		78.3	-17.8
5566.5	AXE 1 / H	53.7	50.92	54	-3.08
6496	AXE 1 / H	55.8	36.01	54	-17.99
7422.3	AXE 1 / H	62.6		78.3	-15.7
1885.9	AXE 1 / V	63.9	33.01	54	-20.99
2784.4	AXE 1 / V	55.6		78.3	-22.7
3711.8	AXE 1 / V	55.7		78.3	-22.6
5567.6	AXE 1 / V	57.8	36.04	54	-17.96
6494.9	AXE 1 / V	58.8	37.09	54	-16.91
7424.5	AXE 1 / V	61.5		78.3	-16.8
1855.9	AXE 2 / H	62.6	31.08	54	-22.92

RADIATED SPURIOUS EMISSIONS - TABULATED RESULTS					
TX MODE / HIGH CHANNEL					
Frequency (MHz)	Position / Polarization	Peak Level (dBµV/m)	Avg Level (dBµV/m)	Avg Limit (dBµV/m)	Margin (dB)
2783.3	AXE 2 / H	56.6		78.3	-21.7
3711.8	AXE 2 / H	54.5		78.3	-23.8
5566.5	AXE 2 / H	54.8	36.05	54	-17.95
6496	AXE 2 / H	58.2	37.03	54	-16.97
7422.3	AXE 2 / H	60		78.3	-18.3
8234.3	AXE 2 / H	53.4		78.3	-24.9
1885.9	AXE 2 / V	68.9	31.07	54	-22.93
2784.4	AXE 2 / V	63.3		78.3	-15
3711.8	AXE 2 / V	60.3		78.3	-18
5567.6	AXE 2 / V	50.3	36.06	54	-17.94
6494.9	AXE 2 / V	53.3	37.07	54	-16.93
7424.5	AXE 2 / V	59.9		54	5.9
1855.9	AXE 3 / H	62.6	31.04	54	-22.96
2783.3	AXE 3 / H	56.6		78.3	-21.7
3711.8	AXE 3 / H	54.5		78.3	-23.8
5566.5	AXE 3 / H	54.8		78.3	-23.5
6496	AXE 3 / H	58.2		78.3	-20.1
7422.3	AXE 3 / H	60		78.3	-18.3
8234.3	AXE 3 / H	53.4		78.3	-24.9
1885.9	AXE 3 / V	68.9	31.06	54	-22.94
2784.4	AXE 3 / V	63.3		78.3	-15
3711.8	AXE 3 / V	60.3		78.3	-18
5567.6	AXE 3 / V	50.3	36.05	54	-17.95
6494.9	AXE 3 / V	53.3	37.03	54	-16.97
7424.5	AXE 3 / V	59.9		78.3	-18.4

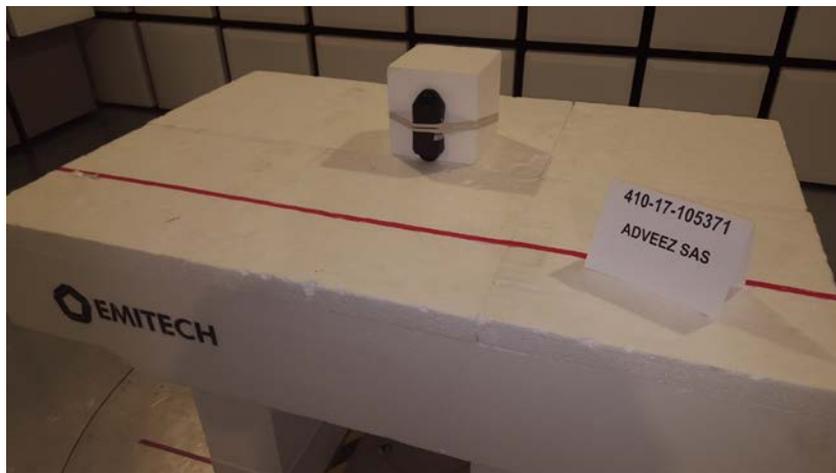
V= Vertical H=Horizontal

Spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported

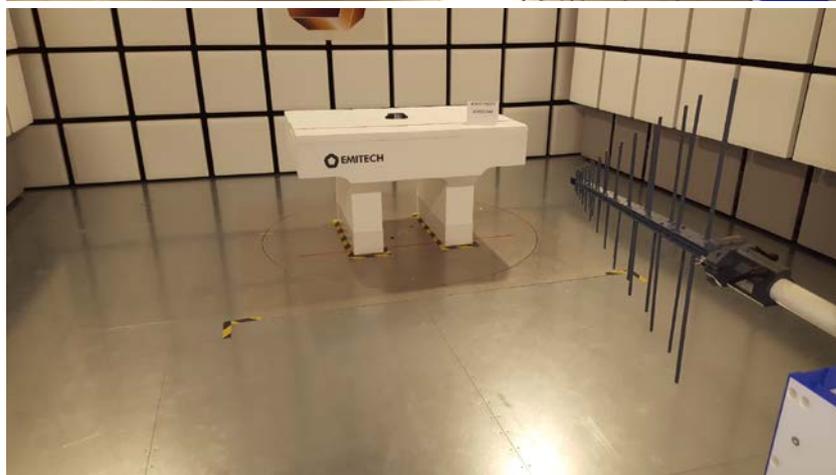
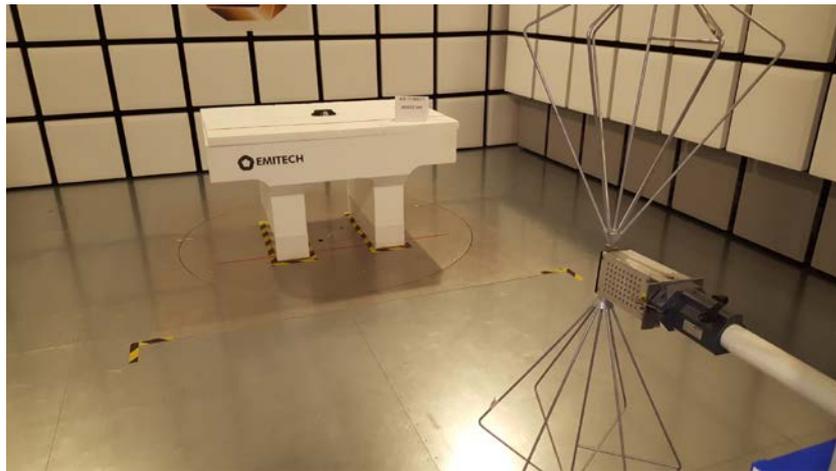
TEST SETUP PHOTO(S) RADIATED EMISSIONS (F>1GHZ)



TEST SETUP PHOTO(S) RADIATED EMISSIONS POSITIONS

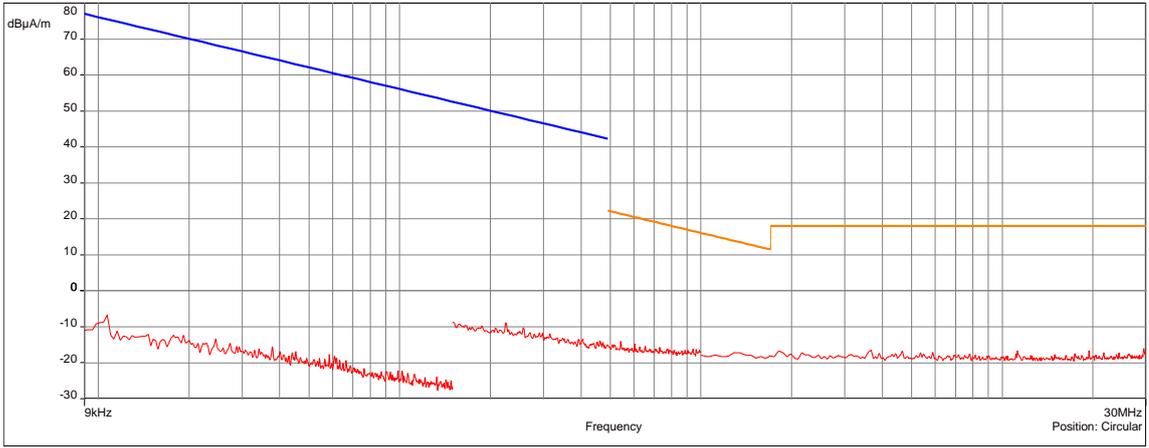


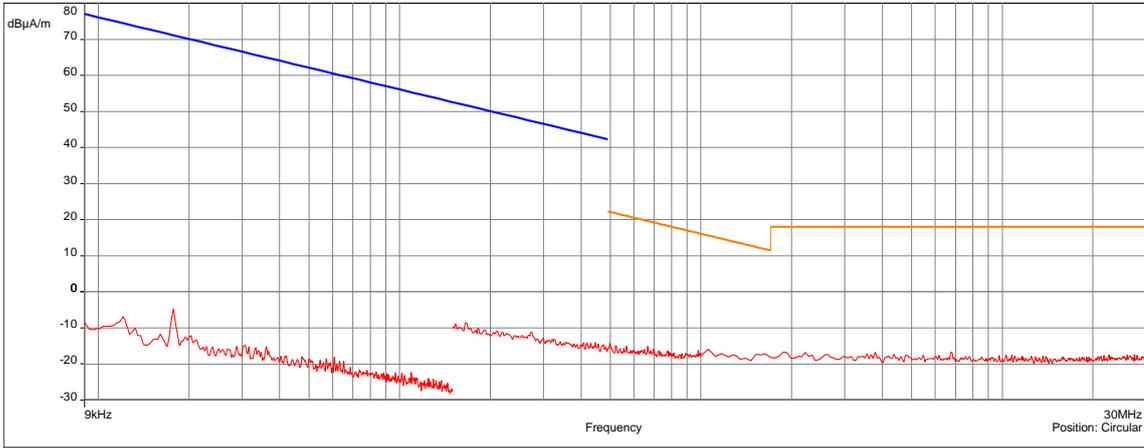
**TEST SETUP PHOTO(S) RADIATED EMISSIONS (30MHZ-1GHZ)**

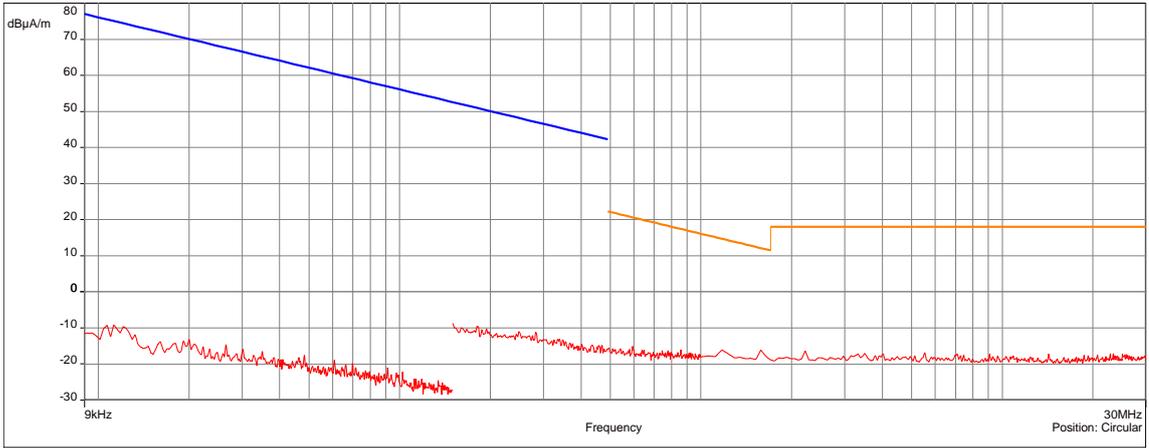


**TEST SETUP PHOTO(S) RADIATED EMISSION(F<30MHZ)**

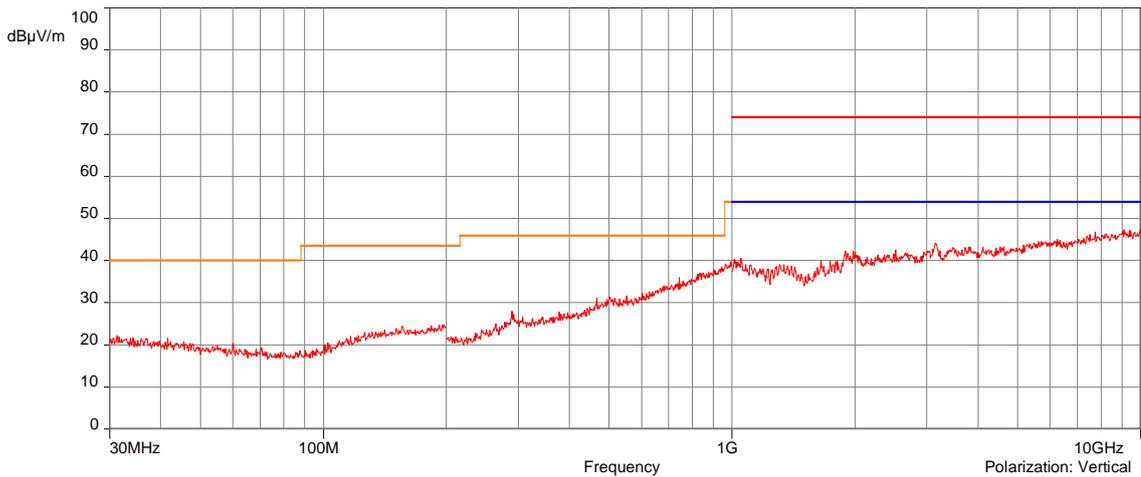
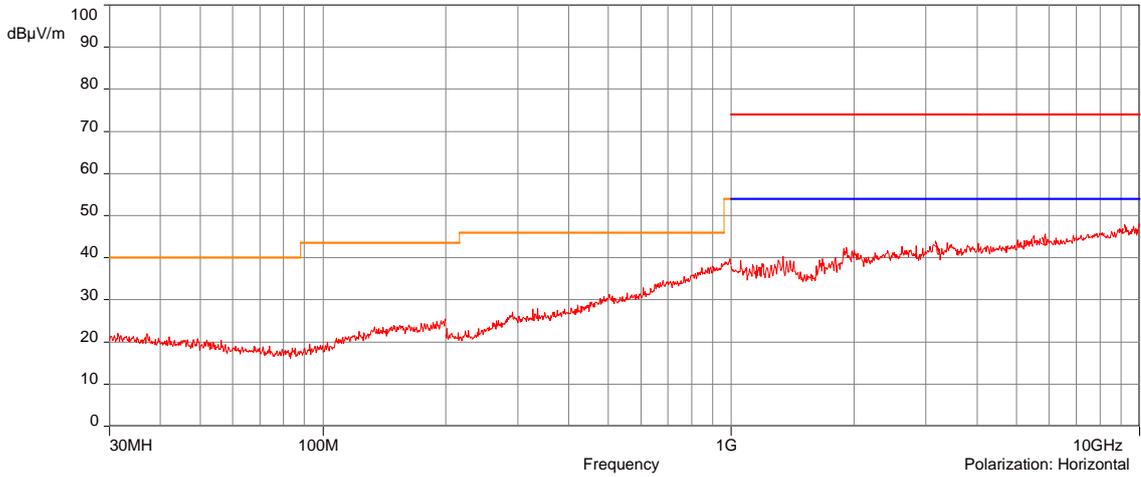


RADIATED SPURIOUS EMISSIONS - GRAPH				
0°			EMI5775	
<b>EUT mode:</b>	All modes		<b>T (°C):</b>	23.4
<b>Test Date:</b>	18/10/2017		<b>H (%):</b>	54.2
<b>Test Operator:</b>	MPA		<b>P (hPa):</b>	1010
— FCC/FCC Part 15 §209 Tx - Moyenne/3.0m/ — FCC/FCC Part 15 §209 Tx - QCrête/3.0m/ — Meas.Peak				
				
<b>POSITION</b>	<b>FREQUENCIES</b>	<b>RBW</b>	<b>VBW</b>	<b>DETECTOR</b>
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-10MHz	10kHz	30kHz	Peak
Circular	10MHz-30MHz	10kHz	30kHz	Peak
<b>Configuration:</b>	N/A			
<b>Comments:</b>	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.			
<i>EUT modification(s): N/A</i>				

RADIATED SPURIOUS EMISSIONS - GRAPH				
45°			EMI6022	
<b>EUT mode:</b>	All modes		<b>T (°C):</b>	23.4
<b>Test Date:</b>	18/10/2017		<b>H (%):</b>	54.2
<b>Test Operator:</b>	MPA		<b>P (hPa):</b>	1010
<div style="font-size: small;"> <span style="color: blue;">—</span> FCC/FCC Part 15 §209 Tx - Moyenne/3.0m/  <span style="color: orange;">—</span> FCC/FCC Part 15 §209 Tx - QCrête/3.0m/  <span style="color: red;">—</span> Meas.Peak                 </div>				
				
<b>POSITION</b>	<b>FREQUENCIES</b>	<b>RBW</b>	<b>VBW</b>	<b>DETECTOR</b>
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-10MHz	10kHz	30kHz	Peak
Circular	10MHz-30MHz	10kHz	30kHz	Peak
<b>Configuration:</b>	N/A			
<b>Comments:</b>	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.			
<i>EUT modification(s): N/A</i>				

RADIATED SPURIOUS EMISSIONS - GRAPH				
90°			EMI6023	
<b>EUT mode:</b>	All modes		<b>T (°C):</b>	23.4
<b>Test Date:</b>	18/10/2017		<b>H (%):</b>	54.2
<b>Test Operator:</b>	MPA		<b>P (hPa):</b>	1010
— FCC/FCC Part 15 §209 Tx - Moyenne/3.0m/ — FCC/FCC Part 15 §209 Tx - QCrête/3.0m/ — Meas.Peak				
				
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Circular	9kHz-150kHz	300Hz	1kHz	Peak
Circular	150kHz-1MHz	10kHz	30kHz	Peak
Circular	1MHz-10MHz	10kHz	30kHz	Peak
Circular	10MHz-30MHz	10kHz	30kHz	Peak
<b>Configuration:</b>	N/A			
<b>Comments:</b>	Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.			
<i>EUT modification(s): N/A</i>				

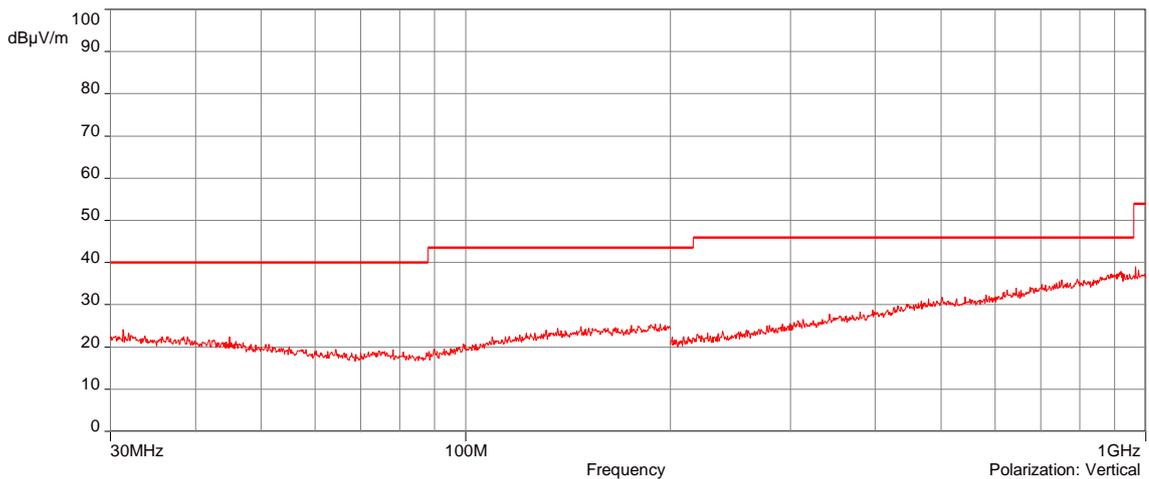
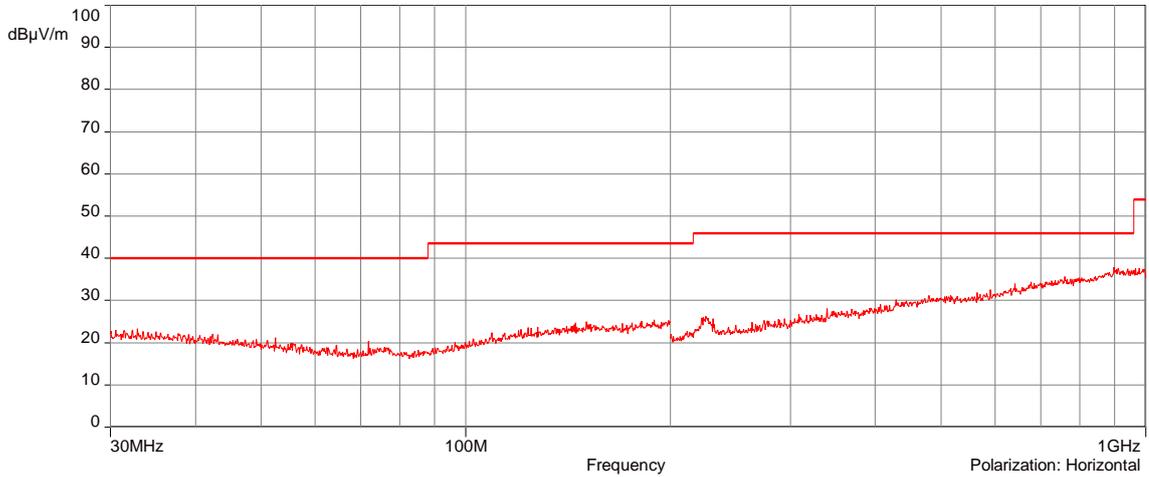
RADIATED SPURIOUS EMISSIONS - GRAPH			
RX MODE		EMI4539	
<b>EUT mode:</b>	Rx mode	<b>T (°C):</b>	20.1
<b>Test Date:</b>	18/10/2017	<b>H (%):</b>	61.1
<b>Test Operator:</b>	FMO	<b>P (hPa):</b>	1015



POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	1GHz-10GHz	1MHz	3MHz	Peak
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak
<b>Configuration:</b>	N/A			
<b>Comments:</b>	N/A			

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS - GRAPH			
Tx MODE (F<1GHz) / POSITION 1		EMI4540	
EUT mode:	Tx mode	T (°C):	20.1
Test Date:	18/10/2017	H (%):	61.1
Test Operator:	FMO	P (hPa):	1015

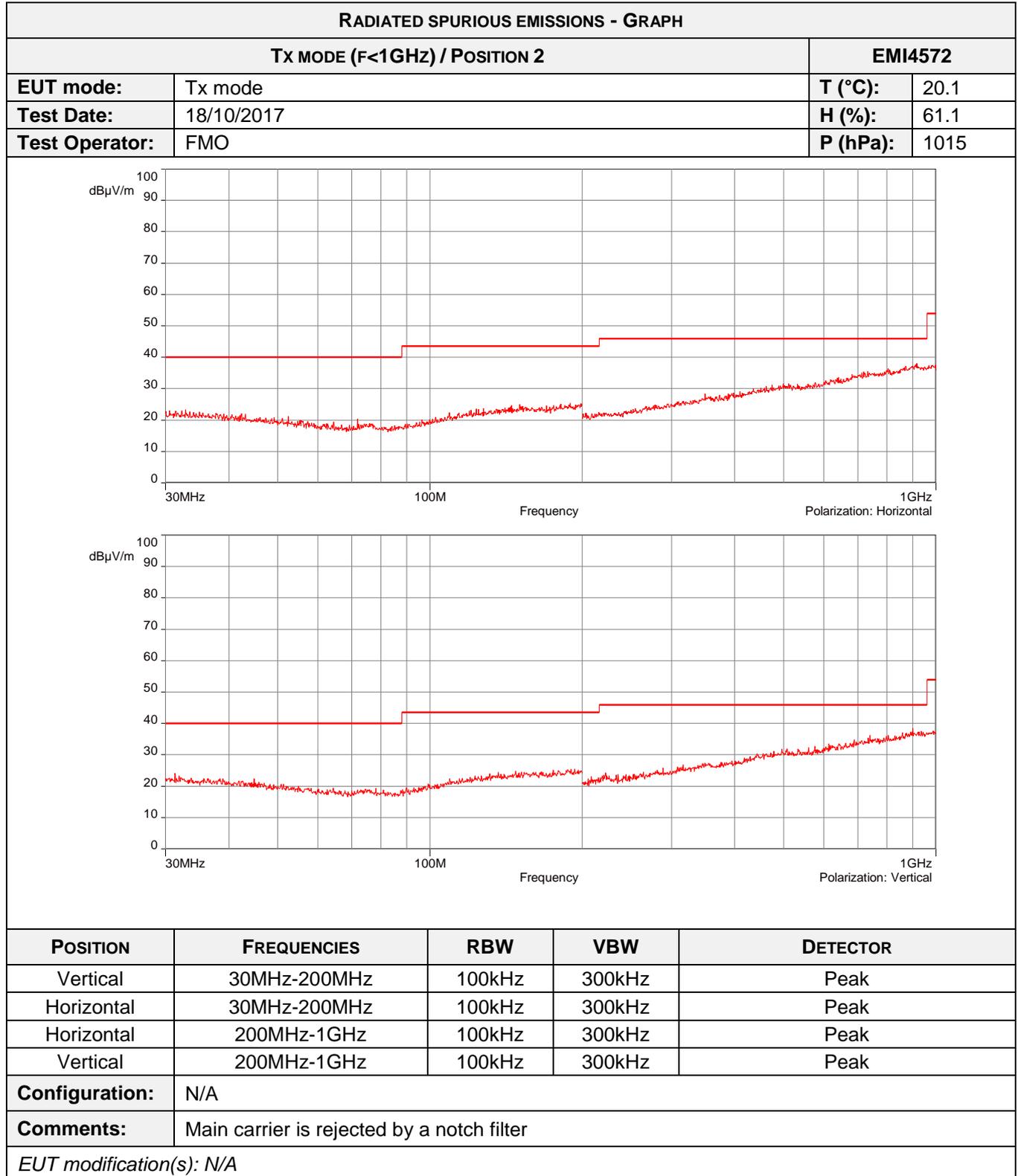


POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak

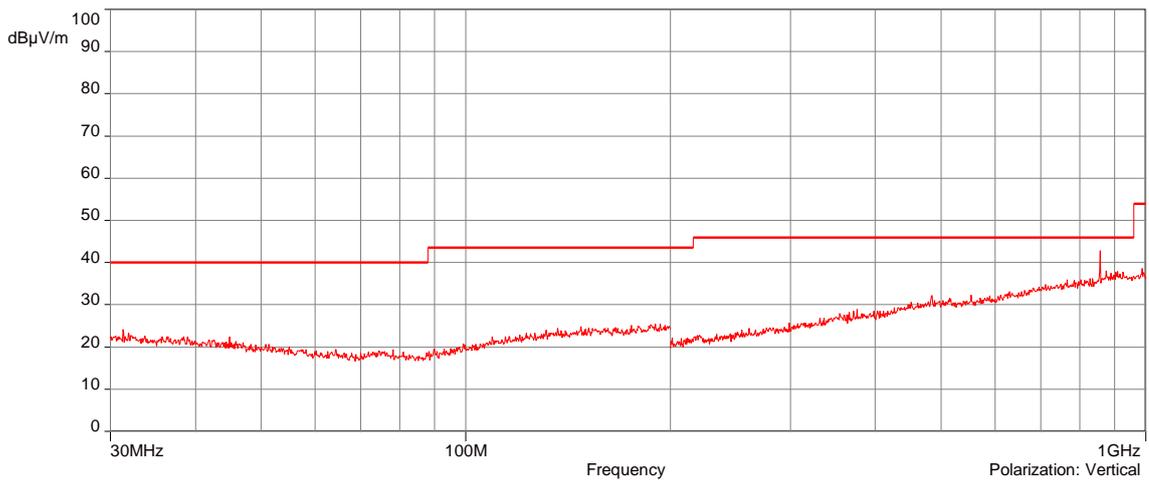
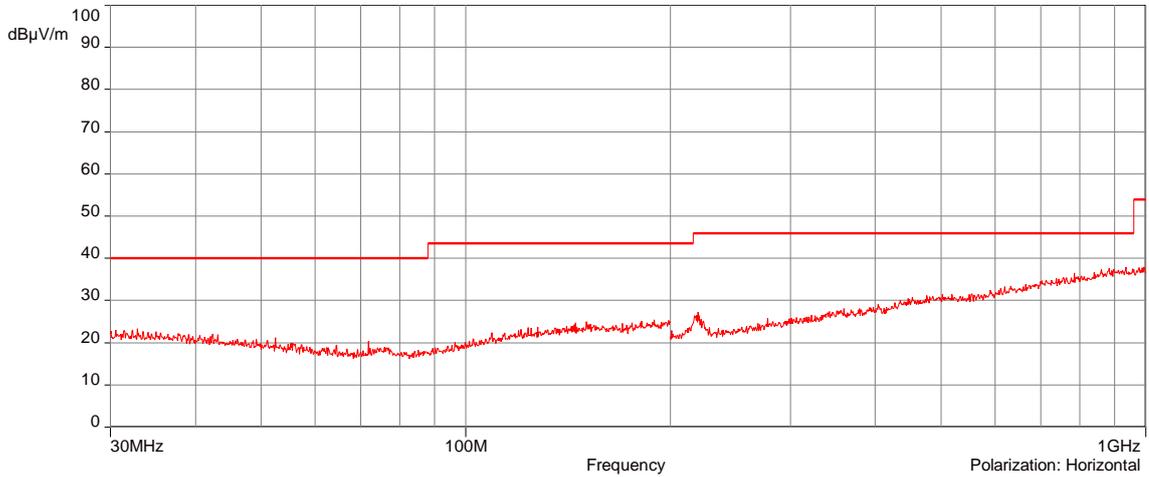
**Configuration:** N/A

**Comments:** Main carrier is rejected by a notch filter

EUT modification(s): N/A



RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F<1GHz) / POSITION 3		EMI4573	
EUT mode:	Tx mode	T (°C):	20.1
Test Date:	18/10/2017	H (%):	61.1
Test Operator:	FMO	P (hPa):	1015



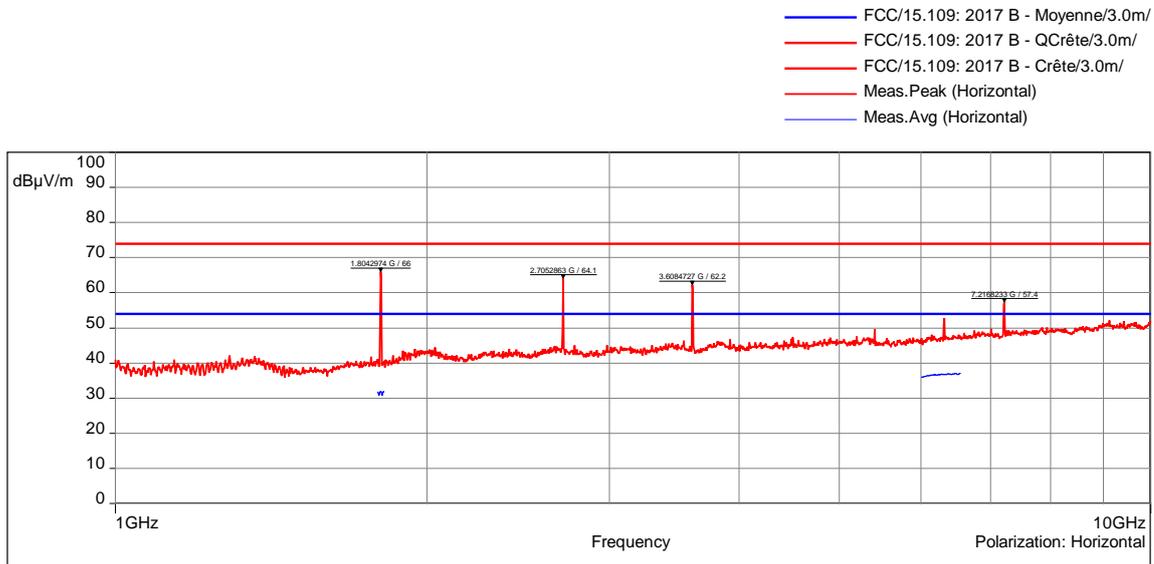
POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	30MHz-200MHz	100kHz	300kHz	Peak
Horizontal	200MHz-1GHz	100kHz	300kHz	Peak
Vertical	200MHz-1GHz	100kHz	300kHz	Peak

**Configuration:** N/A

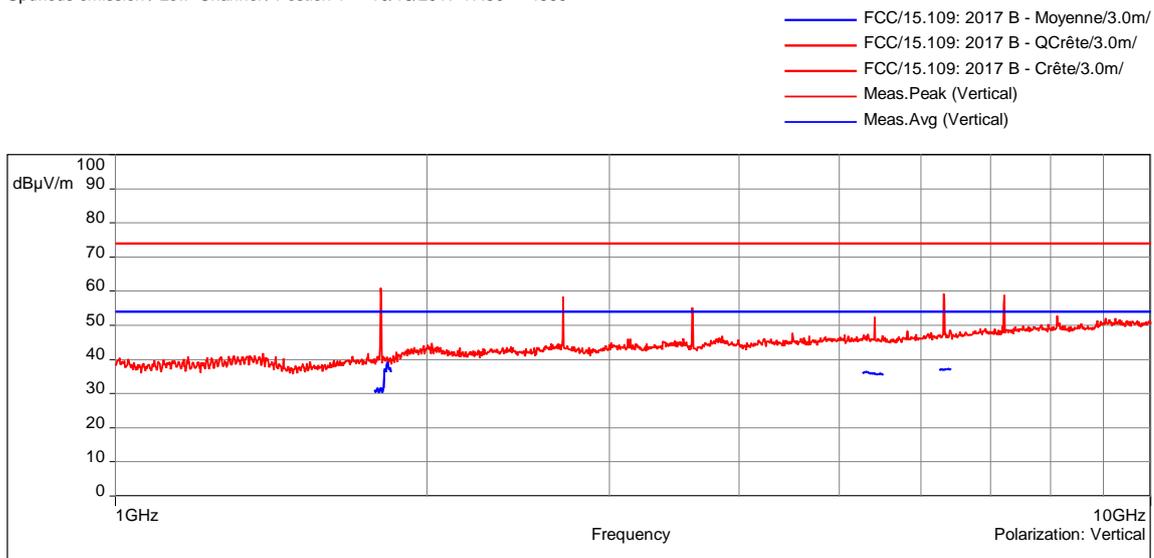
**Comments:** Main carrier is rejected by a notch filter

EUT modification(s): N/A

RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F>1GHz) / LOW CHANNEL / POSITION 1		EMI4569	
EUT mode:	Tx mode	T (°C):	20.1
Test Date:	18/10/2017	H (%):	61.1
Test Operator:	FMO	P (hPa):	1015



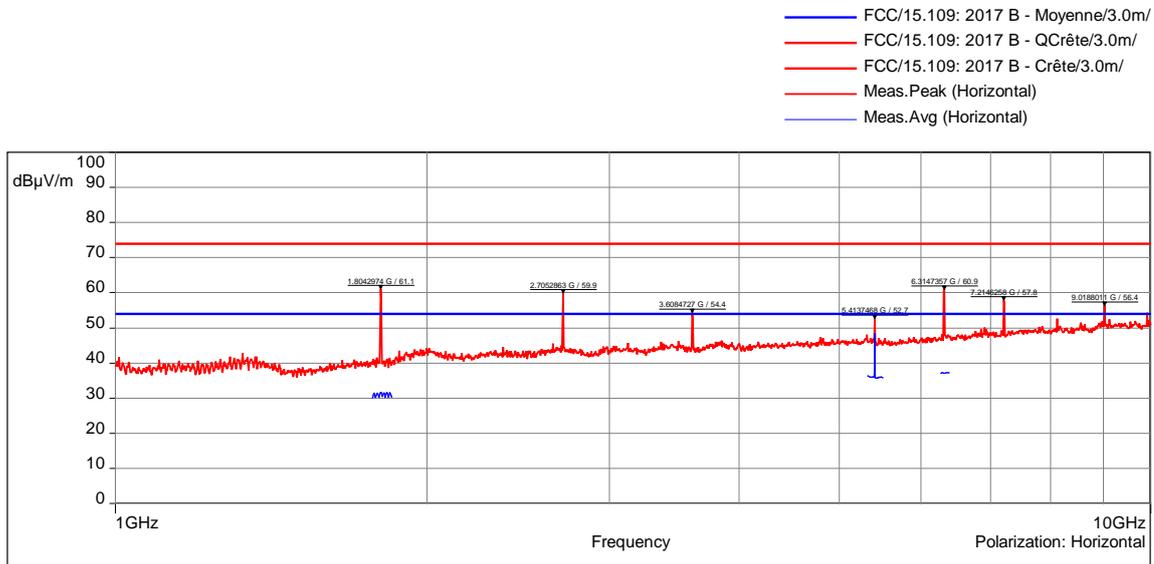
Spurious emission / Low Channel / Postion 1 - 10/18/2017 17:50 - 4569



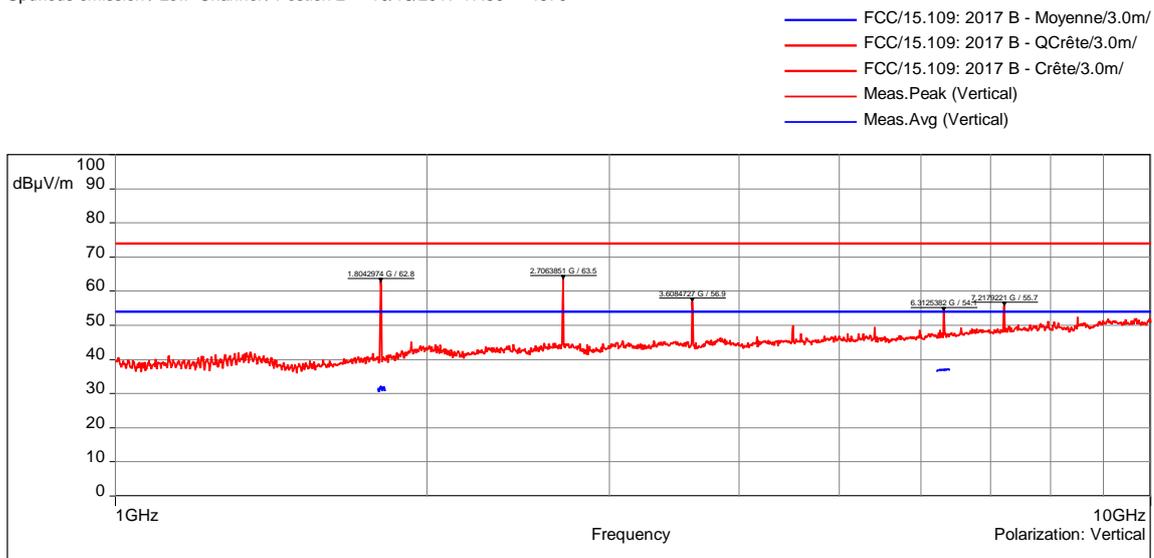
Spurious emission / Low Channel / Postion 1 - 10/18/2017 17:50 - 4569

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Configuration:	N/A			
Comments:	See tables for finals measurements			
EUT modification(s): N/A				

RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F>1GHz) / Low CHANNEL / POSITION 2			EMI4570
EUT mode:	Tx mode		T (°C): 20.1
Test Date:	18/10/2017		H (%): 61.1
Test Operator:	FMO		P (hPa): 1015



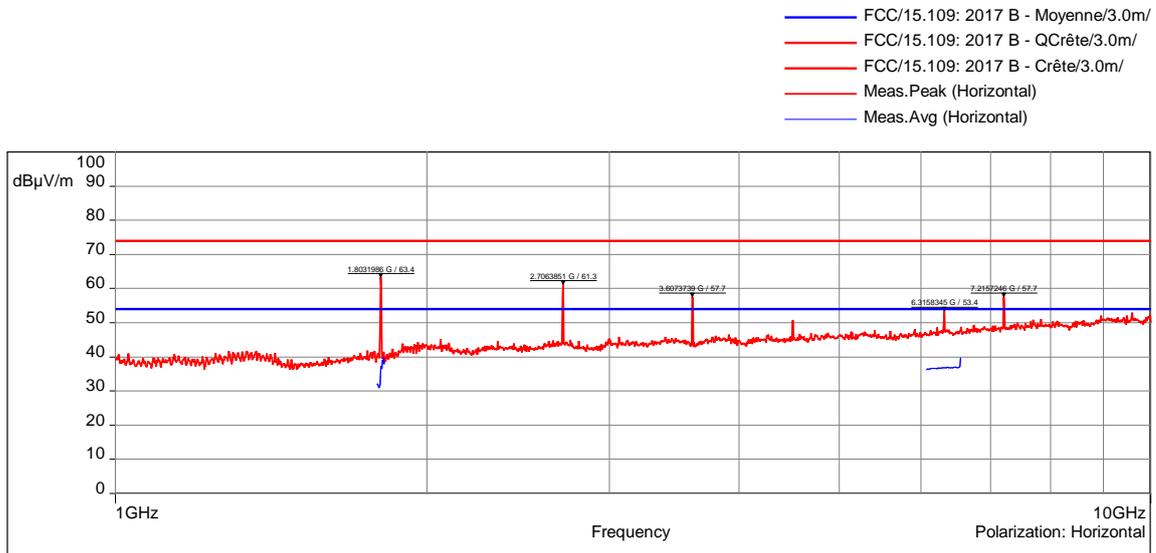
Spurious emission / Low Channel / Postion 2 - 10/18/2017 17:59 - 4570



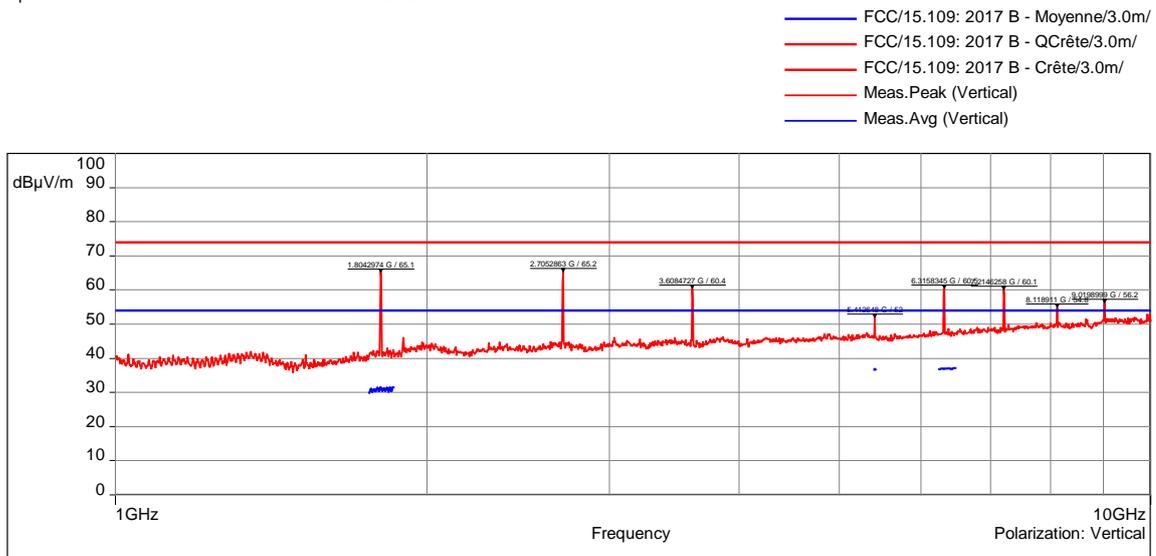
Spurious emission / Low Channel / Postion 2 - 10/18/2017 17:59 - 4570

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Configuration:	N/A			
Comments:	See tables for finals measurements			
EUT modification(s): N/A				

RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F>1GHz) / Low CHANNEL / POSITION 3			EMI4571
EUT mode:	Tx mode	T (°C):	20.1
Test Date:	18/10/2017	H (%):	61.1
Test Operator:	FMO	P (hPa):	1015



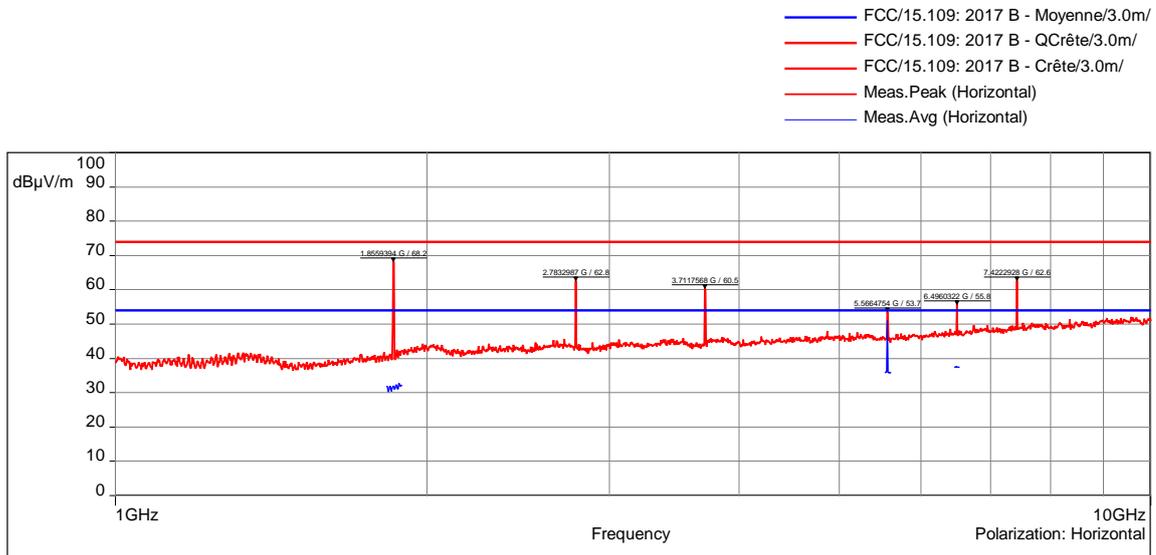
Spurious emission / Low Channel / Postion 3 - 10/18/2017 18:13 - 4571



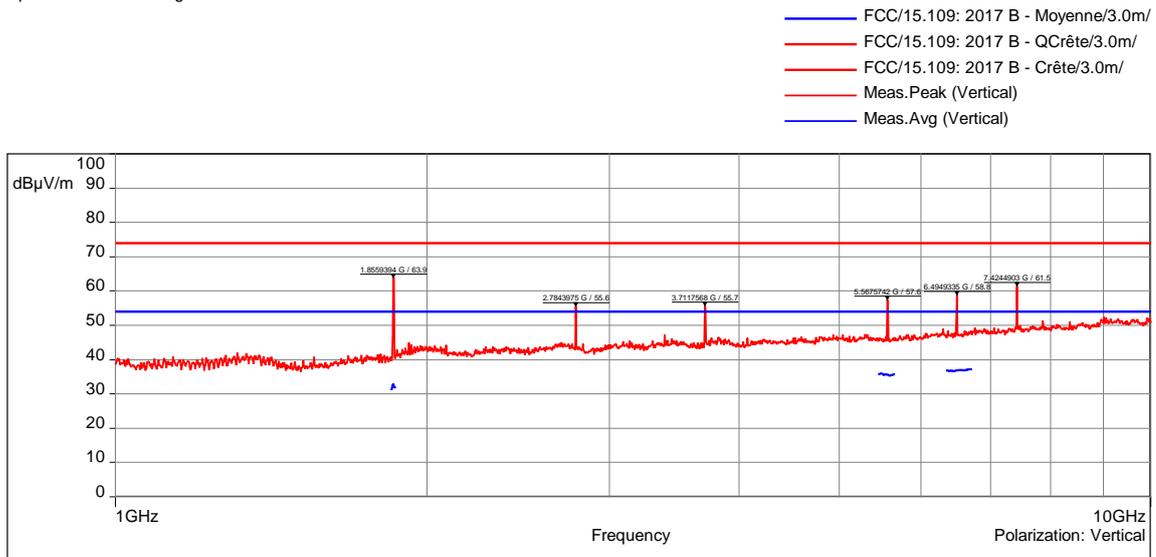
Spurious emission / Low Channel / Postion 3 - 10/18/2017 18:13 - 4571

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Configuration:	N/A			
Comments:	See tables for finals measurements			
EUT modification(s): N/A				

RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F>1GHz) / HIGH CHANNEL / POSITION 1			EMI4563
EUT mode:	Tx mode	T (°C):	20.1
Test Date:	18/10/2017	H (%):	61.1
Test Operator:	FMO	P (hPa):	1015



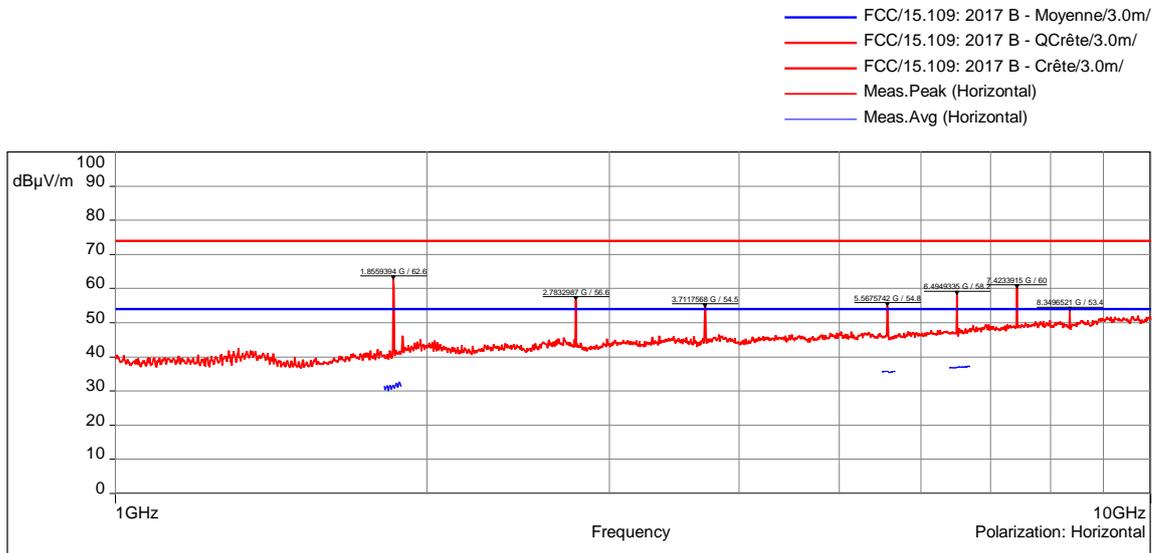
Spurious emission / High Channel / Postion 1 - 10/18/2017 14:01 - 4563



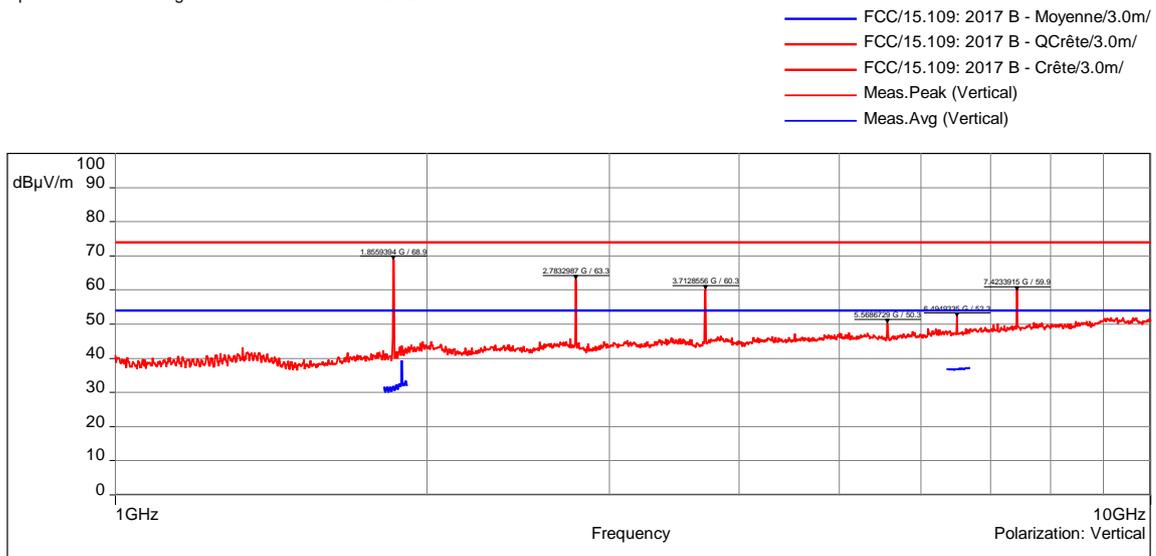
Spurious emission / High Channel / Postion 1 - 10/18/2017 14:01 - 4563

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Configuration:	N/A			
Comments:	See tables for finals measurements			
EUT modification(s): N/A				

RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F>1GHz) / HIGH CHANNEL / POSITION 2			EMI4564
EUT mode:	Tx mode		T (°C): 20.1
Test Date:	18/10/2017		H (%): 61.1
Test Operator:	FMO		P (hPa): 1015



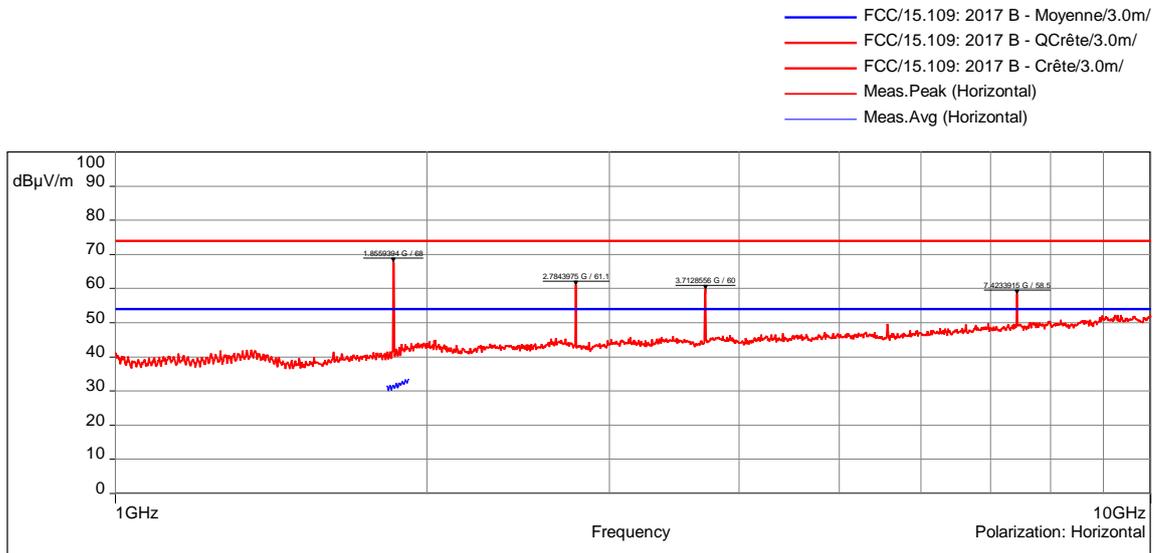
Spurious emission / High Channel / Postion 2 - 10/18/2017 15:23 - 4564



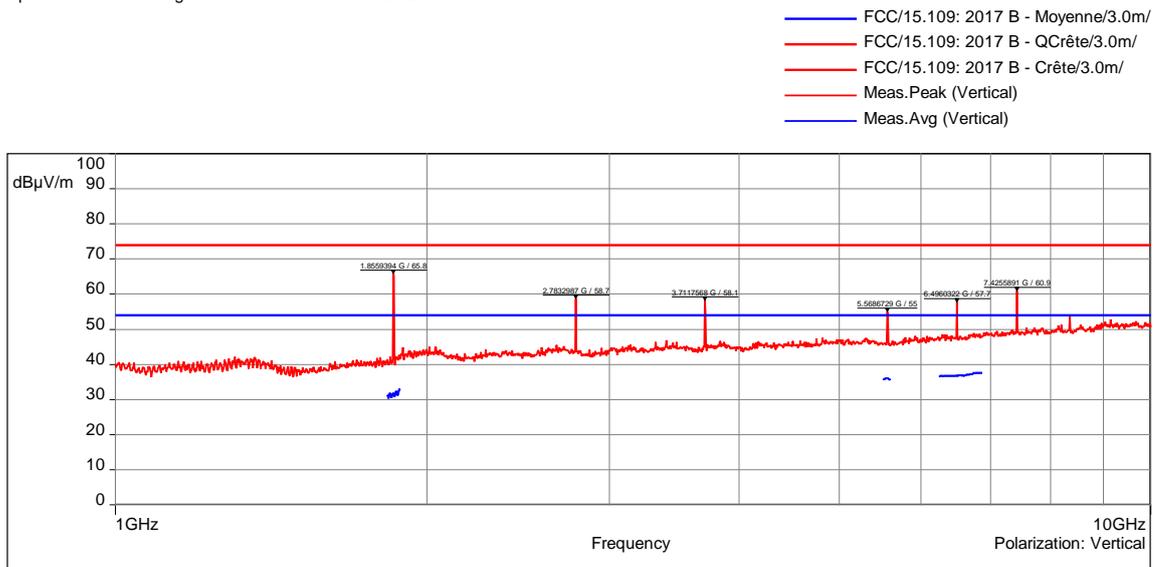
Spurious emission / High Channel / Postion 2 - 10/18/2017 15:23 - 4564

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Configuration:	N/A			
Comments:	See tables for finals measurements			
EUT modification(s): N/A				

RADIATED SPURIOUS EMISSIONS - GRAPH			
TX MODE (F>1GHz) / HIGH CHANNEL / POSITION 3			EMI4565
EUT mode:	Tx mode	T (°C):	20.1
Test Date:	18/10/2017	H (%):	61.1
Test Operator:	FMO	P (hPa):	1015



Spurious emission / High Channel / Postion 3 - 10/18/2017 15:49 - 4565



Spurious emission / High Channel / Postion 3 - 10/18/2017 15:49 - 4565

POSITION	FREQUENCIES	RBW	VBW	DETECTOR
Vertical	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Horizontal	1GHz-10GHz	1MHz	3MHz	Peak and Avg
Configuration:	N/A			
Comments:	See tables for finals measurements			
EUT modification(s): N/A				

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

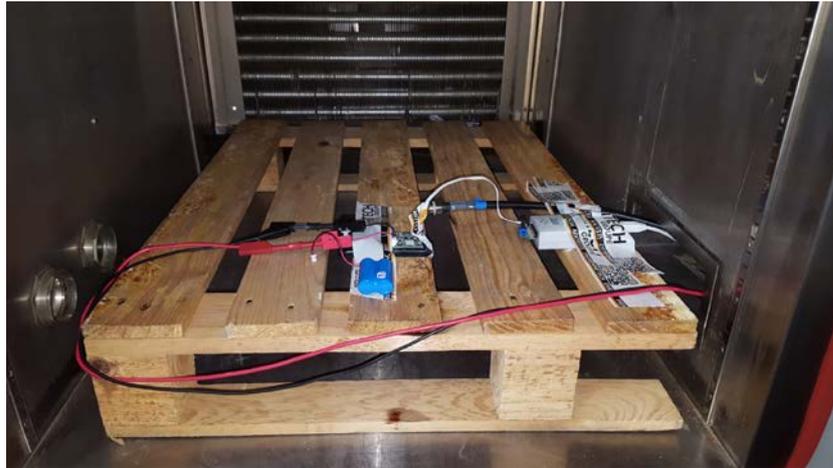
<b>Reference standard:</b>	FCC part 15 Radio part 15.215 c)
<b>Test method:</b>	FCC part 15 Radio part 15.215 c) and RSS Gen
<p><b>General test setup:</b> The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, 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.</p> <p>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
Tx mode	Permanent emission mode	902-928 MHz	-	<b>PASS</b>

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	N/A
Relative Humidity	20 to 75 %	N/A
Atmospheric pressure	N/A	N/A
<b>Test method deviation:</b> 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
Attenuator	Radiall	R412710124	4390	25/11/2015	25/01/2018
Attenuator	Radiall	R412720124	4391	25/11/2015	25/01/2018
Cable	STORM MICROWAVE	N-1.5m	10263	05/10/2016	05/12/2018
Climatic enclosure	CLIMATS	10489	14261		
Digital thermometer	GHM Greisinger	GMH 3710	12968	31/01/2017	31/03/2018
Receiver	Agilent Technologies	E4440A	5824	11/01/2016	11/03/2018
Shielded enclosure	RAY PROOF	C.V1	1123		
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H1	7561	27/12/2016	27/02/2019

Blank cells = Permanent validity

**TEST SETUP PHOTO(S)**

**EFFECTIVE RADIATED POWER - TABULATED RESULTS**

Test Case	Temperature (°C)	Power supply (Vdc)	Frequency (MHz)	Frequency error (kHz)
Normal conditions / Low channel	25	3.6	903.012559	-
Extremes tests conditions / Low channel	-20	3.6	903.011147	-1.411
Extremes tests conditions / Low channel	55	3.6	903.011258	-1.301
Normal conditions / High channel	25	3.6	914.205469	-
Extremes tests conditions / High channel	-20	3.6	914.203658	-1.811
Extremes tests conditions / High channel	55	3.6	914.203947	-1.522

EUT MODIFICATIONS	OPERATOR	TEST DATE	RESULT TAB.
N/A	FMO	19/10/2017	-

●●● End of test report ●●●