

File Number **21/36400529M1**



TEST REPORT

FCC/ISED Test Report

Petitioner's Reference: ADVEEZ

Customer Address : 4, Avenue Jean Monnet
31100 – COLOMIERS
France

Equipment: FLEET ASSET MANAGEMENT FOR AIRPORTS

Brand:	ADVEEZ	PMN:	FAMA V4
s/n:	AD-FA05-0419-526	FCC ID:	R8T-FAMAV4
		ISED ID:	21312-FAMAV4

EUT Operating Frequencies Evaluated: Bluetooth 2.4 GHz
GSM/LTE 700/850/900/1800/1900/2100 MHz
LF 125 kHz
GPS 1575.42 MHz
Rx 915 MHz

Result: complies

It has been tested and complies the standard specifications Applicable / s
See specifications applied on page 10

Applicable Standards

Applicable Standard/s:	FCC Title 47 part 15 Subpart C RSS-210 Issue 10 RSS-Gen Issue 5 ANSI C63.10:2013
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Date of issue: Bellaterra, May 20, 2021

M1: This report replaces and annuls the report with certificate number 21/36400529 dated 23-02-2021.

Modifications performed: Added Occupied Bandwidth (99% and 20 dB) measurements for the 125 kHz signal for informative purposes. Added FCC and IC IDs for Bluetooth and cellular module. Added measurement results table for Unwanted emissions into Restricted Frequency Bands for the range 9kHz 30 MHz

"It is responsibility of the petitioner to replace the previous version with this one"

Fernando Rivas Fernández
Technical Responsible
Electrical and Electronics
LGAI Technological Center S.A.

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This is the first page of the document, which consists of 22 pages.

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1. EQUIPMENT RECEIVED AND TESTED

EQUIPMENT: FLEET ASSET MANAGEMENT FOR AIRPORTS

Brand:	ADVEEZ	PMN:	FAMA V4
s/n:	AD-FA05-0419-526	Power Supply:	12V DC
SW version:	ADM-F-330-4.02	HW Version:	ADM-P-105-05
FCC ID:	R8T-FAMAV4	ISED ID:	21312-FAMAV4
Maximum internal frequency:	2.4 GHz		

Product description:

(Information declared by the manufacturer, Applus + is not responsible)

FAMA (Fleet Asset Management for Airports) solution is a global connected solution adaptable to any powered GSE fleet in order to collect data, in real time, and contribute to digitalize operators and equipment activities. FAMA effectively provides a dashboard for fleet managers with current information on each asset and operator so they can re-deploy resources instantly to support fast-paced ground service situations.

125 kHz chipset details:

- **Brand:** NXP; **Model:** HTRC11001T/02EE,11
- **Frequency range:** 125 kHz
- **Power Setting:**
Output peak-current (permanent) = 200 mA max & Output peak-current (Pulse) = 400 mA max
- **Modulation:** AM/PM
- **Module powered by 5V DC from test board**

Bluetooth 2.4 GHz module details:

RF FEATURES

- **Brand:** Silicon Labs; **Model:** BT121
- **IC:** 5123A-BGTBT121; **FCC ID:** QOQ-BT121
- **Frequency range:** 2.402 GHz to 2.48 GHz
- **Power Setting:** (Adjustable) 12dBm Max
- **Modulation:** BDR/EDR/LE
Module powered by (3.3V ±0.1V) DC from test board

GSM/LTE 700/850/900/1800/1900/2100 MHz module details:

- **Brand:** SIMCOM; **Model:** SIM7000G;
- **IC:** 23761-SIM7000G; **FCC ID:** 2AJYU-SIM7000G
- **Frequency range:** 700MHz-2200MHz
- **Power Setting:** Up to 33dBm ± 2dBm
- **Modulation:** GMSK/8PSK/QPSK/16QAM
- **Module powered by (4.8V ±0.1V) DC from test board**

DESCRIPTION OF AVAILABLE ANTENNAS

- **EXTERNAL ANTENNAS**
 - GPS Patch antenna/ GSM Meander Dipole
 - 125 kHz LF Coil Antenna
- **INTEGRATED ANTENNAS:**
 - Rx 915 MHz ceramic antenna
 - 2.4 GHz BLE ceramic antenna

WORST-CASE CONFIGURATION AND MODE

A pre-exploratory was performed in order to determinate the worst case and setup configuration to carry out the measurements reported in this document. Moreover, the operation mode was set with all the following radio modules ON:

- Bluetooth 2.4 GHz module in Tx/Rx mode
- GSM 850 MHz in Tx/Rx mode
- RF 915 MHz only operate in Rx mode
- GPS 1.5GHz only operate in Rx mode
- 125 kHz communications in Tx mode continuously

Test product reception:	2019-07-08
Test initial date:	2019-07-08
Test final date:	2021-05-12

Test configuration

Power Supply:	12V DC
Set-up:	Tabletop
Test exercise:	All the following radio modules ON: <ul style="list-style-type: none">- Bluetooth module 2.4 GHz in Tx/Rx mode- GSM 850 MHz in Tx/Rx mode- RF 915 MHz only operate in Rx mode- GPS 1.5GHz only operate in Rx mode- 125 kHz communications in Tx mode continuously
Equipment size:	4.5 x 19 x 12 cm

Auxiliary and control equipment

The EUT has no auxiliary nor control equipment

Input/output wires

12V DC power supply cable

2. APPLICABLE STANDARDS

TEST APPLICABLE STANDARDS

Test Summary:	
Basic standard: ANSI C63.10:2013	
<input checked="" type="checkbox"/> Unwanted emissions into Restricted Frequency Bands (Radiated) (9kHz -26000MHz): 15.31(h), 15.209 (a) / 15.205 (a) RSS-GEN 7.1, 8.9, 8.10 / RSS-210 / RSS-247 5.5 Note: Conducted Emission Not Applicable, since the EUT is not AC-operated device.	
Basic standard: ANSI C63.10:2013	
<input checked="" type="checkbox"/> Occupied Bandwidth (20dB): FCC 15.215 and RSS-GEN 6.7 <input checked="" type="checkbox"/> Occupied Bandwidth (99%): RSS-GEN 6.7	
Basic standard: FCC Title 47 part 15 Subpart C & RSS-Gen Issue 5, April 2018 and ANSI C63.10	
<input checked="" type="checkbox"/> Antenna Requirements: FCC 15.203 and RSS-GEN 6.8	

Acceptance criteria for the test

According to standard	FCC Title 47 part 15 Subpart C RSS-210 Issue 10 RSS-Gen Issue 5 ANSI C63.10:2013
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Test facilities ID

FCC Test Firm Registration Number:	507478
ISED Assigned Code:	5766A

Test procedures

Unwanted Radiated Emission / Band Edge and Unwanted emissions into Restricted Frequency Bands	C5401665
Occupied Channel Bandwidth	C5401665
Antenna Requirements	C5401665

Measuring uncertainties

Radiated emission tests (9 kHz to 1 GHz)	±4.3 dB
Radiated emission tests above 1 GHz to 40 GHz	±4.3 dB
RF bandwidth measurements	±2.31 kHz

Expanded uncertainty measurement is obtained multiplying the typical uncertainty measurement with a coverage factor k=2, which corresponds to a confidence level of 95% for a normal distribution.

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Field Strength Calculation

The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading.

The basic equation is as follow:

$$FS = RA + AF + CF - AG$$

Where FS = Field Strength (Level)

- RA = Receiver Amplitude (Meter Reading)
- AF = Antenna Factor
- CF = Cable Factor
- AG = Amplifier Gain

Margin value = Emission level – Limit value

Example:

RA: 14.0dB μ V / AF: 16.5 dBm-1 / CF: 3.5dB / AG: 15dB

- Total factor: 5dBm-1
- Field level: 19.0dB μ V/m (-21.0dB for margin if limit is 40dB μ V/m)

Modifications



Ferrite bead Wurth Elektronik 742 711 12 was added to the 125 kHz antenna cable.

USED EQUIPMENT

RF RADIATED EMISSION					
INSTRUMENT	BRAND	MODEL	NUMBER	LAST CALIBRATION	NEXT CALIBRATION
SEMI ANECHOIC CHAMBER SAC2	EUROSHIELD	TC2	104563	30/07/2020	30/07/2021
EMC32	R&S	v.10.50.00	1041158	N/A	N/A
EMI RECEIVER	R&S	ESU 40	1041155	17/11/2020	17/11/2021
EMI RECEIVER	R&S	ESW 26	1041791	09/07/2020	09/07/2021
RF CABLE	HUBER+SUHNER	SF104	1042327	21/08/2020	21/08/2021
RF CABLE	HUBER+SUHNER	ST26	1041825	14/10/2020	14/10/2021
RF PREAMPLIFIER	BONN ELEKTRONIK	BLMA 0118-M	1041733	28/04/2020	28/04/2021
RF PREAMPLIFIER	BONN ELEKTRONIK	BLMA 1826-4A	1041808	25/08/2020	25/08/2021
BILOG ANTENNA	SCHWARZBECK MESS-ELEKTRONIK	VULB 9162	1042229	14/12/2020	14/12/2021
LOOP ANTENNA	EMCO	6502	05-ER-019	26/02/2020	26/02/2021
HORN ANTENNA	EMCO	3115	05-ER-017	05/11/2020	05/11/2021
LOGOPERIODIC ANTENNA	ROHDE & SCHWARZ	HL050	1041226	12/03/2019	12/03/2022
WB RADIO COMMUNICATION TESTER	R&S	CMW 500	1041541	10/10/2018	10/10/2021
PROGRAMMABLE POWER SUPPLY	R&S	HMP2020	1041752	05/11/2020	05/11/2021
BAND REJECT FILTER	Wainwright Instruments GmbH	WRCGV8-825-875-960-1010-40SS-100	1041665	28/05/2020	28/05/2021
HIGH PASS FILTER	Wainwright Instruments GmbH	WHNX6-2765-3500-26500-40CC	1042511	21/01/2021	21/01/2022

OCCUPIED BANDWIDTH (20 dB and 99%)					
INSTRUMENT	BRAND	MODEL	NUMBER	LAST CALIBRATION	NEXT CALIBRATION
SEMI ANECHOIC CHAMBER SAC2	EUROSHIELD	TC2	104563	30/07/2020	30/07/2021
EMI RECEIVER	R&S	ESW 26	1041791	09/07/2020	09/07/2021
RF CABLE	HUBER+SUHNER	SF104	1042327	21/08/2020	21/08/2021
PASSIVE LOOP ANTENNA	EMCO	6509	05-ER-020	26/04/2021	26/04/2022

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Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min = 15°C Max = 35°C
Relative Humidity	Min = 20% Max = 80%
Shielding Effectiveness	>100dB
Reference Resistance to Earth	< 1 Ohm

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min = 15°C Max = 35°C
Relative Humidity	Min = 45% Max = 60%
Air Pressure	Min = 860 mbar Max = 1060 mbar
Shielding Effectiveness	>100dB
Reference Resistance to Earth	< 1 Ohm
Normal Site Attenuation (NSA)	< ±4 dB at 3 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Site VSWR	< ±6 dB at 3m distance between item under test and receiver antenna, (1 GHz to 18 GHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 18 GHz).

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min = 15°C Max = 35°C
Relative Humidity	Min = 45% Max = 60%
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding Effectiveness	>100dB
Reference Resistance to Earth	< 1 Ohm

See results sheets

3. RESULT

PRODUCT: FLEET ASSET MANAGEMENT FOR AIRPORTS			
Brand:	ADVEEZ	PMN:	FAMA V4
s/n:	AD-FA05-0419-526	Power Supply:	12V DC
TESTING		RESULTS	
Unwanted emissions into Restricted Frequency Bands *.		Pass	Note: 3
<i>*Co-Location Testing included</i>			
Occupied Bandwidth (20dB and 99%)		--	
Antenna Requirements		Pass	
<p>The criteria to give conformity in those cases where it is not implicit in the standard or specification will be, for EMC emissions tests, a non-simple binary decision rule will be followed with a safety zone equal to the value of the uncertainty ($w = U$).</p> <p>In this case, the upper limit of the value of the probability of false acceptance, according to ILAC G8, is 2.5% and the criteria notes are:</p> <p>1: The measured results are above the upper limit, even considering the uncertainty interval.</p> <p>2: The measured results are above the specified limits, but within the uncertainty interval. It is therefore not possible to state compliance based on the 95% level of confidence. However, the results indicate that non-compliance is more probable than compliance</p> <p>3: The measured results are below the specified limits, but within the uncertainty interval. It is therefore not possible to state compliance based on the 95% level of confidence. However, the results indicate that compliance is more probable than non-compliance</p> <p>4: The measured results are within the limits, including the uncertainty interval.</p>			

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satisfaccion.cliente@applus.com

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4. ANNEXES

Test Results

Unwanted emissions into Restricted Frequency Bands

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013.

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

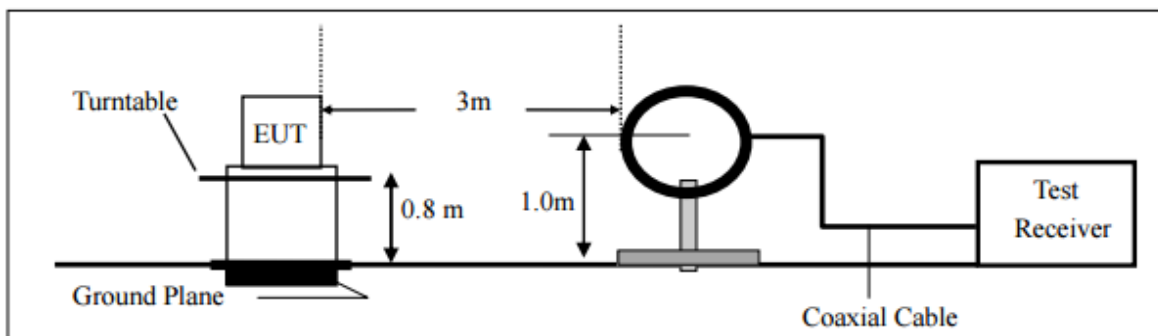
Restricted Frequency(MHz)	Field Strength ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log ($\mu\text{V/m}$)	300
0.490~1.705	2400/F(KHz)	20 log ($\mu\text{V/m}$)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement (Above 1000 MHz)

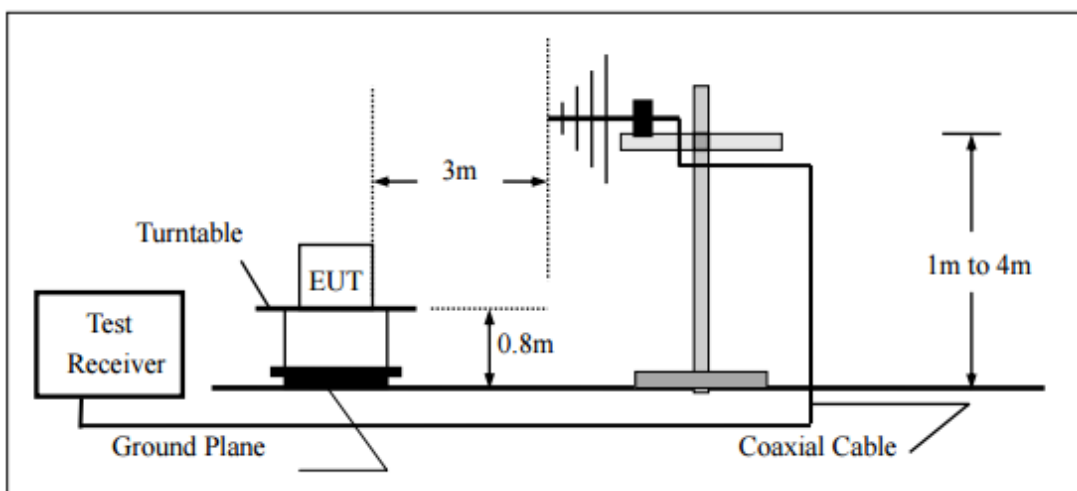
Frequency(MHz)	Class B ($\text{dB}\mu\text{V/m}$) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Test Configuration

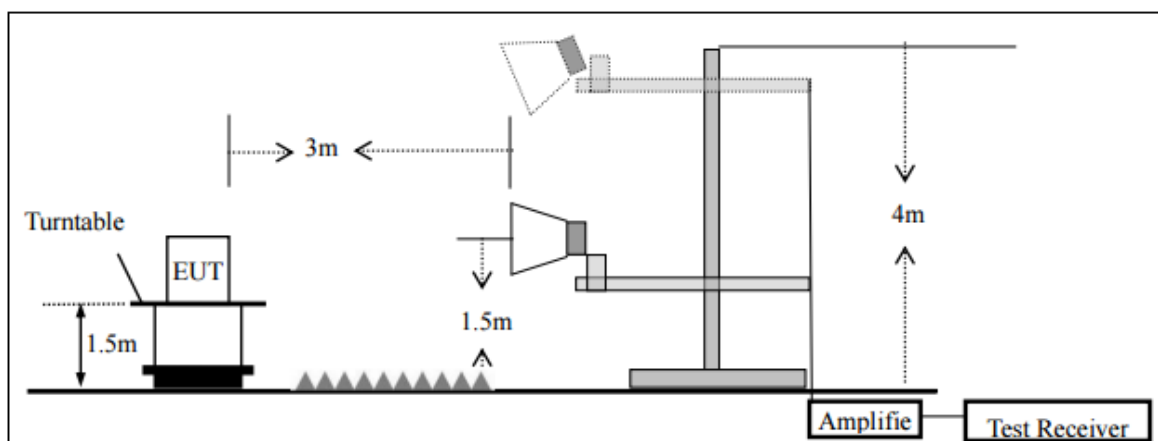
- **For radiated emissions below 30 MHz:**



- **For radiated emissions from 30 MHz to 1000 MHz:**



- **For radiated emissions above 1000 MHz:**



Test Procedures

The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

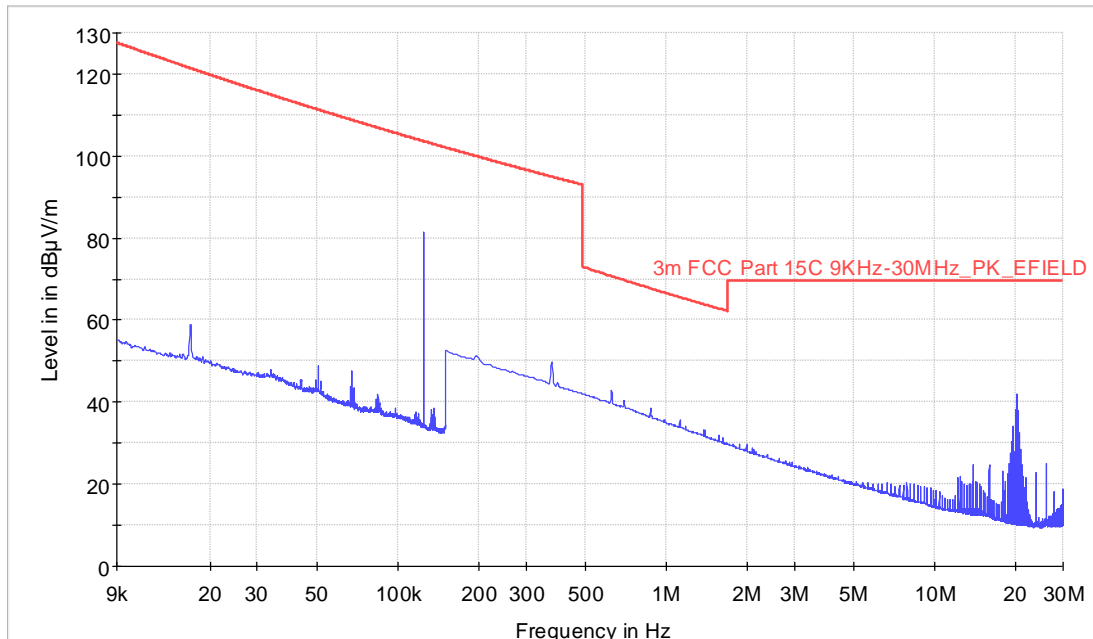
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 * \lg(100 [kHz] / \text{narrower RBW [kHz]})$. the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS (RADIATED)														
Technician: Pau Aguilà			Test Area: Semi-anechoic chamber, SAC-2											
Test date: 2019-07-10/2021-01-22														
Basic standard: ANSI C63.10:2013														
<table border="1"> <tr> <td>Temperature:</td> <td>24.1</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>48.8</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>1014.2</td> <td>hPa</td> </tr> </table>						Temperature:	24.1	°C	Humidity:	48.8	%	Atm. Pressure:	1014.2	hPa
Temperature:	24.1	°C												
Humidity:	48.8	%												
Atm. Pressure:	1014.2	hPa												
EUT:	Class	Test Area	Distance	PreScan	Evaluation									
Tabletop	B	SAC2	3 m	Worst-case mode	Individual									
RESULTS: Pass														
Identification		Emissions		Main emission source and type										
DUT: Device under test AUX: Auxiliary Devices SYS: DUT + AUX BB : Broad-band NB : Narrow-band QP: Quasi-peak		Limit + I <= QP I=Uncertainty		DUT, NB										
Comments:														

UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS

PRESCAN 9 kHz – 30 MHz



— QPK_CLRWR — 3m FCC Part 15C 9KHz-30MHz_PK_EFIELD

FINAL MEASUREMENTS

Frequency (kHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16.95	59.02	123.02	64	100	H	180	-31
21.15	49.36	122.59	73.23	100	H	270	-33
50.65	48.86	113.51	64.65	100	H	0	-37
125.00	81.51	104.08	22.57	100	H	90	-39
152.25	52.56	103.95	51.39	100	H	270	-39
375.00	49.92	96.12	46.2	100	H	90	-39

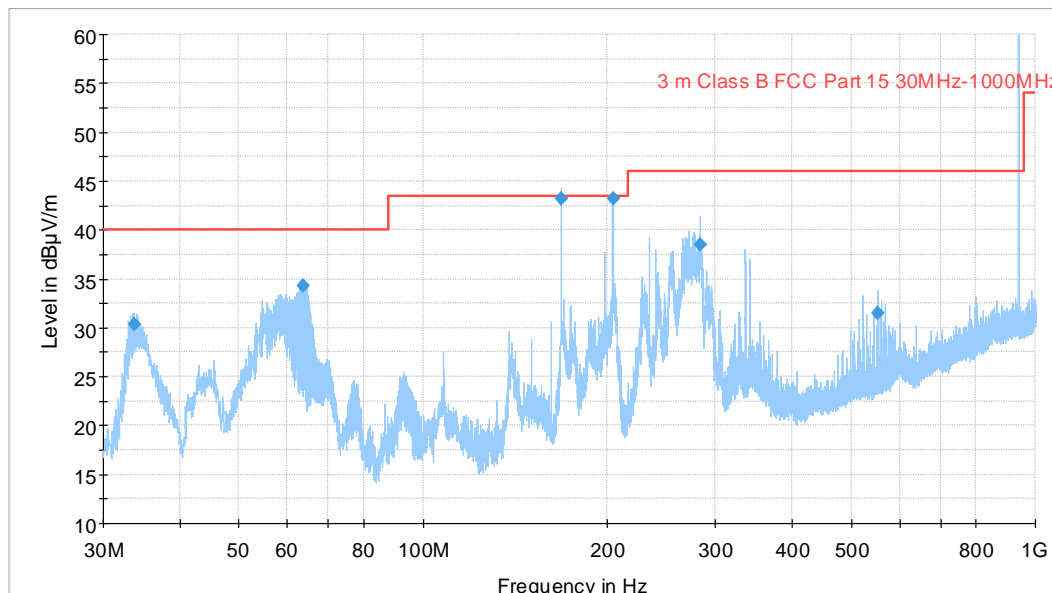
Comments:

Co-Location Testing: In order to satisfy test requirements for multiple transmitters, co-location testing was performed during this test where the 125kHz transmitter and the following technologies of the EUT were active:

- **All Radio modules ON.**
 - Bluetooth 2.4 GHz module in Tx/Rx mode
 - GSM 850 MHz in Tx/Rx mode
 - RF 915 MHz only operate in Rx mode
 - GPS 1.5 GHz only operate in Rx mode
 - 125 kHz communications in Tx mode continuously

UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS I

PRESCAN 30 - 1000 MHz



— Preview Result 1-PK+ — 3 m Class B FCC Part 15 30MHz-1000MHz ◆ Final_Result QP

FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.75	30.39	40.00	9.61	104.0	V	88.0	14
63.75	34.26	40.00	5.74	100.0	V	51.0	16
168.00	43.18	43.50	0.32	137.0	H	77.0	14
204.06	43.15	43.50	0.35	137.0	H	99.0	16
283.80	38.49	46.00	7.51	106.0	H	102.0	18
552.96	31.56	43.50	11.94	124.0	V	68.0	24

Comments:

Co-Location Testing: In order to satisfy test requirements for multiple transmitters, co-location testing was performed during this test where the 125kHz transmitter and the following technologies of the EUT where active:

- **All Radio modules ON.**
 - Bluetooth 2.4 GHz module in Tx/Rx mode
 - GSM 850 MHz in Tx/Rx mode
 - RF 915 MHz only operate in Rx mode
 - GPS 1.5 GHz only operate in Rx mode
- 125 kHz communications in Tx mode continuously

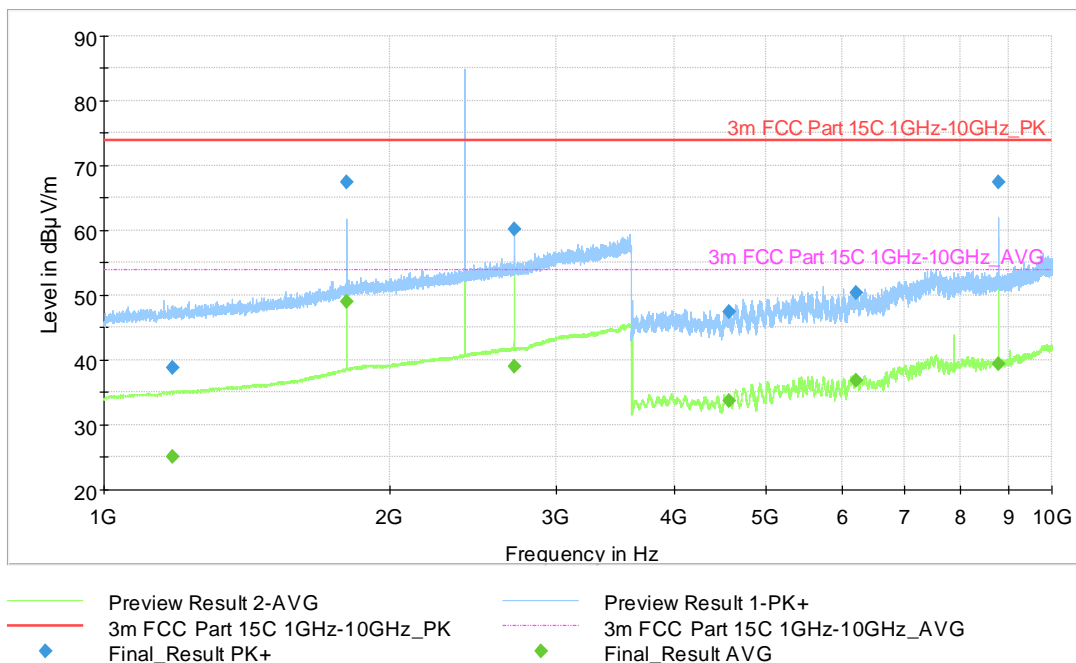
Note 1: Ferrite bead Wurth Elektronik 742 711 12 was added to the 125 kHz antenna cable. Please refer to "Modifications" section for more information.

Note 2: 893 MHz frequency belongs to GSM/LTE 700/850/900/1800/1900/2100 MHz module. Frequency excluded from this test.

Note 3: Measurement Level = Reading Level + Correct Factor

UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS II

PRESCAN 1 - 10 GHz



FINAL MEASUREMENTS

Frequency (MHz)	MaxPeak (dBµV/m)	Limit PK (dBµV/m)	Margin PK (dB)	Average (dBµV/m)	Limit AVG (dBµV/m)	Margin AVG (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1182.75	25.12	38.91	54	74	28.88	35.09	253	V	343	27
1804.5	49.00	67.49	54	74	5.00	6.51	148	V	149	30
2706.75	39.10	60.21	54	74	14.90	13.79	309	V	23	32
4566.25	33.73	47.47	54	74	20.27	26.53	395	H	333	37
6221.5	36.92	50.36	54	74	17.08	23.64	120	V	310	39
8777.75	39.44	67.46	54	74	14.56	6.54	224	H	8	43

Comments:

Co-Location Testing: In order to satisfy test requirements for multiple transmitters, co-location testing was performed during this test where the 125kHz transmitter and the following technologies of the EUT were active:

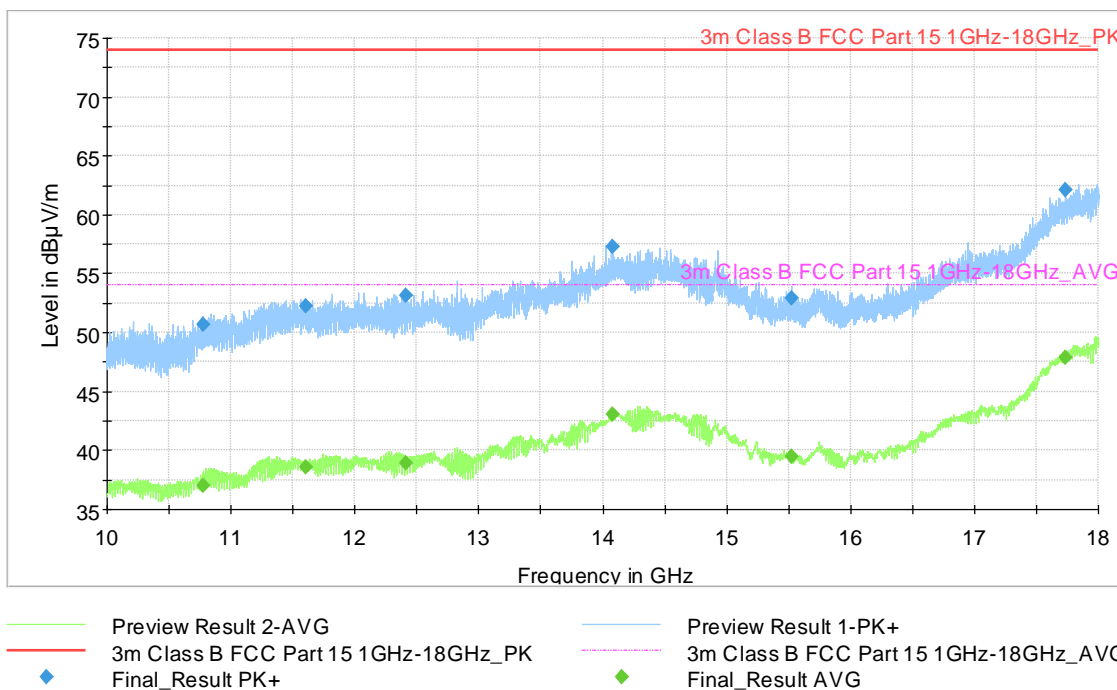
- **All Radio modules ON.**
 - Bluetooth 2.4 GHz module in Tx/Rx mode
 - GSM 850 MHz in Tx/Rx mode
 - RF 915 MHz only operate in Rx mode
 - GPS 1.5 GHz only operate in Rx mode
 - 125 kHz communications in Tx mode continuously

Note 1: 2401.75 MHz frequency belongs to Bluetooth 2.4 GHz module. Frequency excluded from this test.

Note 2: Measurement Level = Reading Level + Correct Factor

UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS III

PRESCAN 10 - 18 GHz



FINAL MEASUREMENTS

Frequency (MHz)	MaxPeak (dBµV/m)	Limit PK (dBµV/m)	Margin PK (dB)	Average (dBµV/m)	Limit AVG (dBµV/m)	Margin AVG (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
10773.50	37.01	50.64	54	74	16.99	23.36	369.0	V	339.0	-8
11602.25	38.53	52.25	54	74	15.47	21.75	327.0	H	83.0	-6
12410.25	38.93	53.17	54	74	15.07	20.83	355.0	V	218.0	-6
14083.50	43.04	57.26	54	74	10.96	16.74	274.0	H	114.0	-2
15525.50	39.45	52.95	54	74	14.55	21.05	366.0	H	275.0	-6
17737.75	47.90	62.08	54	74	6.10	11.92	128.0	H	17.0	5

Comments:

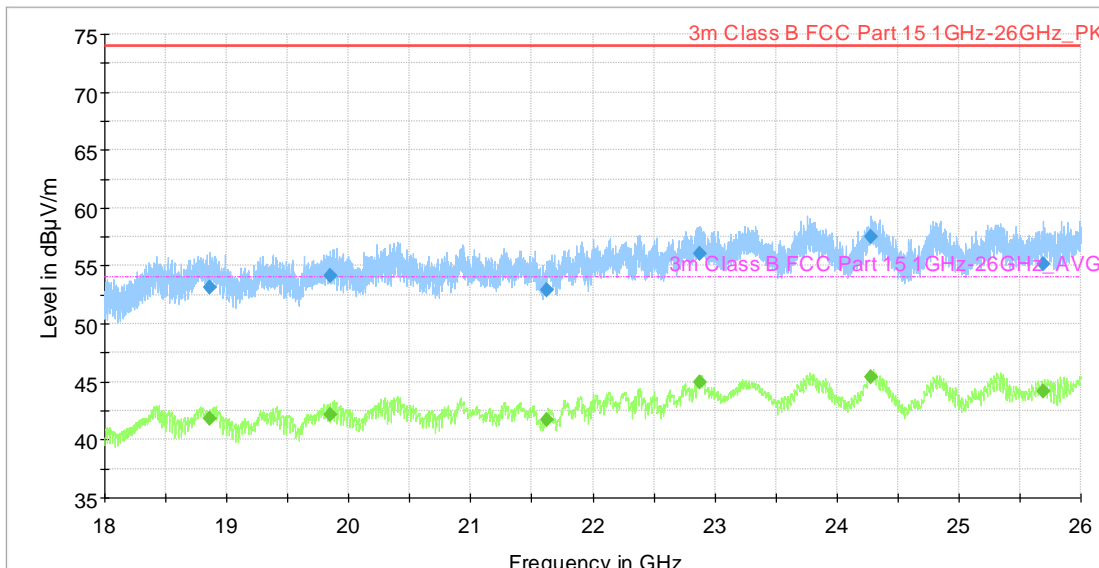
Co-Location Testing: In order to satisfy test requirements for multiple transmitters, co-location testing was performed during this test where the 125kHz transmitter and the following technologies of the EUT were active:

- **All Radio modules ON.**
 - Bluetooth 2.4 GHz module in Tx/Rx mode
 - GSM 850 MHz in Tx/Rx mode
 - RF 915 MHz only operate in Rx mode
 - GPS 1.5 GHz only operate in Rx mode
 - 125 kHz communications in Tx mode continuously

Note 1: Measurement Level = Reading Level + Correct Factor

UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS IV

PRESCAN 18 - 26 GHz



— Preview Result 2-AVG — Preview Result 1-PK+
— 3m Class B FCC Part 15 1GHz-26GHz_PK — 3m Class B FCC Part 15 1GHz-26GHz_AVG
◆ Final_Result PK+ ◆ Final_Result AVG

FINAL MEASUREMENTS

Frequency (MHz)	MaxPeak (dBµV/m)	Limit PK (dBµV/m)	Margin PK (dB)	Average (dBµV/m)	Limit AVG (dBµV/m)	Margin AVG (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18856.25	41.82	53.12	54	74	12.18	20.88	150	V	321.0	8
19849.00	42.12	54.21	54	74	11.88	19.79	150	V	139.0	9
21620.75	41.72	52.94	54	74	12.28	21.06	150	V	80.0	10
22879.75	44.92	56.10	54	74	9.08	17.90	150	V	149.0	13
24279.00	45.41	57.48	54	74	8.59	16.52	150	V	35.0	14
25691.75	44.19	55.21	54	74	9.81	18.79	150	V	222.0	13

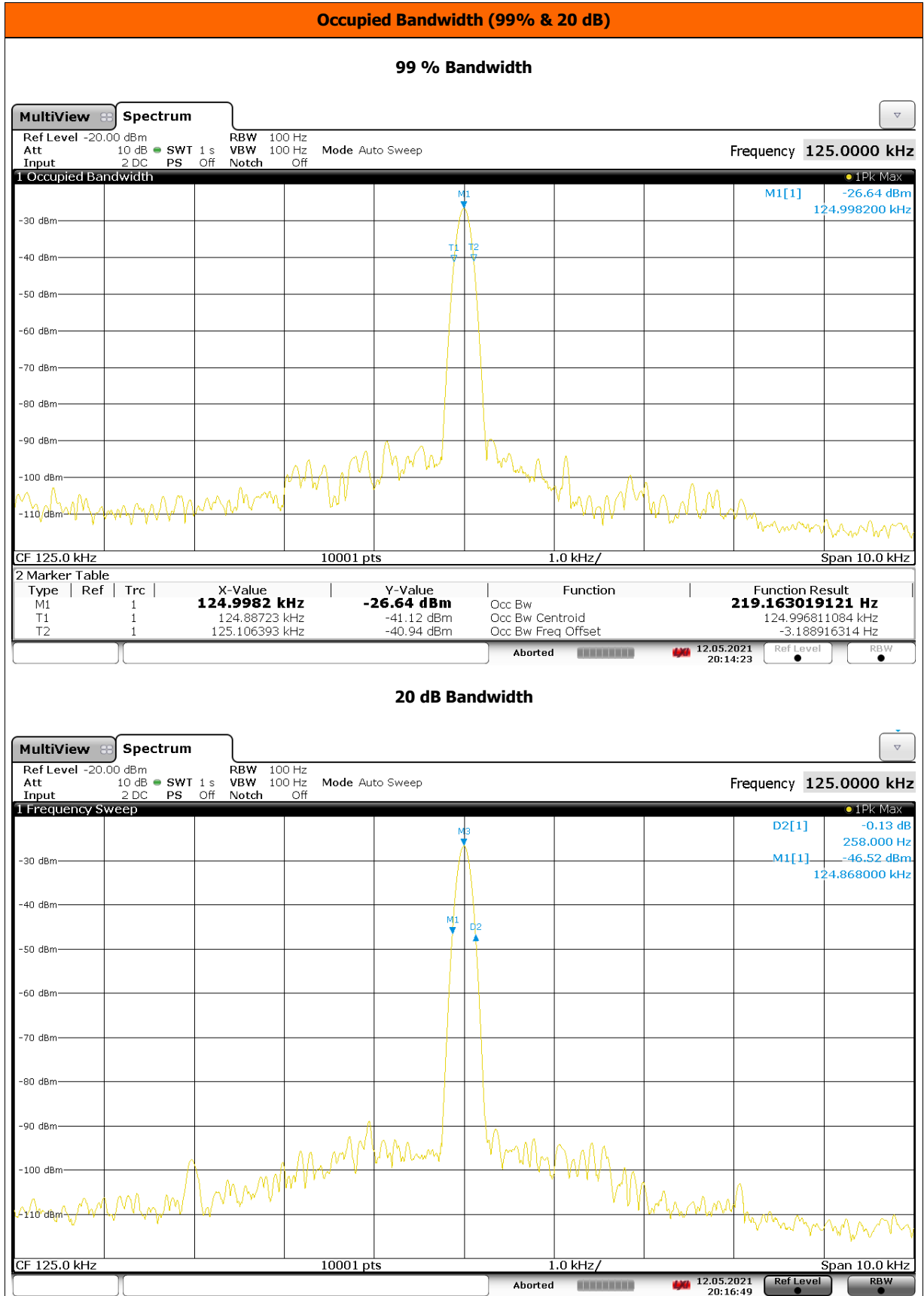
Comments:

Co-Location Testing: In order to satisfy test requirements for multiple transmitters, co-location testing was performed during this test where the 125kHz transmitter and the following technologies of the EUT where active:

- **All Radio modules ON.**
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Note 1: Measurement Level = Reading Level + Correct Factor

Occupied Bandwidth (99% & 20 dB)											
Technician: Pau Aguilà		Test Area: Semi-anechoic chamber, SAC-2									
Test date: 2021-05-12											
Basic standard: ANSI C63.10:2013											
Temperature:	24.2	°C									
Humidity:	59.5	%									
Atm. Pressure:	1010.3	hPa									
RESULTS: --											
Comments:											
<table border="1"><thead><tr><th>Frequency (kHz)</th><th>20dB bandwidth (Hz)</th><th>Limit (kHz)</th><th>Result</th></tr></thead><tbody><tr><td>125</td><td>258</td><td>--</td><td>--</td></tr></tbody></table>				Frequency (kHz)	20dB bandwidth (Hz)	Limit (kHz)	Result	125	258	--	--
Frequency (kHz)	20dB bandwidth (Hz)	Limit (kHz)	Result								
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<table border="1"><thead><tr><th>Frequency (kHz)</th><th>99% bandwidth (Hz)</th><th>Limit (kHz)</th><th>Result</th></tr></thead><tbody><tr><td>125</td><td>219.16</td><td>--</td><td>--</td></tr></tbody></table>				Frequency (kHz)	99% bandwidth (Hz)	Limit (kHz)	Result	125	219.16	--	--
Frequency (kHz)	99% bandwidth (Hz)	Limit (kHz)	Result								
125	219.16	--	--								



Antenna Requirements										
Technician: Pau Aguilà	Test Area: Semi-anechoic chamber, SAC-2									
Test date: 2019-07-10										
Basic standard:										
<table border="1"><tr><td>Temperature:</td><td>23.1</td><td>°C</td></tr><tr><td>Humidity:</td><td>44.8</td><td>%</td></tr><tr><td>Atm. Pressure:</td><td>1004.2</td><td>hPa</td></tr></table>	Temperature:	23.1	°C	Humidity:	44.8	%	Atm. Pressure:	1004.2	hPa	
Temperature:	23.1	°C								
Humidity:	44.8	%								
Atm. Pressure:	1004.2	hPa								
RESULTS: Pass										
Comments:										
<p>Excerpt from 15.203 of the FCC Rules/Regulations:</p> <p>"An intentional radiator antenna shall be designed to ensure that no antenna other than furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."</p> <p>The external antennas of the FLEET ASSET MANAGEMENT FOR AIRPORTS are only accessible for specialized technicians, therefore they are not within reach of general public.</p>										

END OF TEST REPORT