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File Number **23/36400126_M1**

TEST REPORT
Radio frequency

Petitioner's Reference: METALOGENIA RESEARCH & TECHNOLOGIES			
Customer Address :	C/ d'Àvila, 45, 08005 Barcelona		
Equipment:			
Brand:	MTG	Model:	DS-MFS-01
s/n:	535 (Tx mode)	Applus Id	7669-00006
Sample #2 (s/n):	B17 (Normal Mode)	Applus Id:	7669-00001
Sample #3 (s/n):	303 (Normal mode)	Applus Id:	7669-00002
Result: complies			
It has been tested and complies the standard specifications Applicable / s See specifications applied on page 9			
Applicable Standards			
RADIO standard/s:	**FCC 47 CFR Part 15 Subpart C (October 2021)[1]** *[1]The latest modifications of the standard, published at the date of the tests reported in this document, have been considered* **ISED RSS-210 Issue 10 (December 2019)**		

M1: This report replaces and annuls the report with certificate number 23/36400125 dated 19-01-2023.
Modifications performed: 15.203 Antenna requirement of FCC, Subpart C - Intentional Radiators is added in the test report on page 5, 9 and 10. Model name has been modified to properly one according to customer specifications on page 1, 3 and 9.
It is responsibility of the petitioner to replace the previous version with this one.

Date of issue: Bellaterra, February 3, 2023

LUIS GUARDIOLA ECHEVARRIA
2023.02.03 15:30:37 +01'00'

EMC & Wireless Technical Manager
Electrical and Electronics
LGAI Technological Center S.A.

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1. EQUIPMENT RECEIVED AND TESTED

EQUIPMENT:			
Brand:	MTG	**Model:**	DS-MFS-01
Sample #1 (s/n):	535 (Tx mode)	**Power Supply:**	Internal battery
Sample #3 (s/n):	B17 (Normal Mode)		
Sample #4 (s/n):	303 (Normal mode)		
HW version:	V1.2	**SW version:**	V1.2

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

Sensor that detects the detachment of an excavator's ground engaging tools.

RF FEATURES:
Radio chipset: SPIRIT1
Brand: STMicroelectronics
Antenna: Antenna slot, custom made

Test product reception:	2022-05-30
Test initial date:	2022-07-21
Test final date:	2022-12-21

1.1. Test configuration

Power Supply:	Internal battery
Set-up:	Tabletop.
Test exercise:	The 433 MHz RF module is set in continuous transmission mode non-hopping device for the tests in which it is required to evaluate the "Transmitter" mode
Equipment size:	33.7 mm x 58.7 mm x 32.75 mm

1.2. Auxiliary and control equipment

Tablet interface is used to monitor the system for Deactivation time test.

1.3. Input/output wires

The DUT does not have any input/output cable longer than 3 m.

1.4. Modification performed

No modifications were performed.

2. APPLICABLE STANDARDS

2.1. TEST APPLICABLE STANDARDS

Standard: FCC 47 CFR Part 15 Subpart C (October 2021) and ISED RSS-210 Issue 10 (December 2019)
Basic standard: ANSI C63.10:2013, RSS Gen Issue 5, Amendment 2 February 2021: February.
☒ Fundamental & spurious emission
Basic standard: ANSI C63.10:2013, RSS Gen Issue 5, Amendment 2 February 2021: February.
☒ Restrict band radiated emission
Basic standard: ANSI C63.10:2013, RSS Gen Issue 5, Amendment 2 February 2021: February.
☐ Conducted emission
Basic standard: ANSI C63.10:2013, RSS Gen Issue 5, Amendment 2 February 2021: February.
☒ Emission bandwidth
Basic standard: ANSI C63.10:2013, RSS Gen Issue 5, Amendment 2 February 2021: February.
☒ Deactivating time
Basic standard: ANSI C63.10:2013, RSS Gen Issue 5, Amendment 2 February 2021: February.
☒ Occupied bandwidth
Basic standard: FCC 47 CFR Part 15 Subpart C (October 2021) – 15.203
☒ Antenna requirements

2.1.1. Test facilities ID

FCC Test Firm Registration Number:	507478
ISED Assigned Code:	5766A
CABID	ES0002

2.1.2.Competences and Guarantees

LGAI Technological Center, S.A. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 9/LE894.
In order to assure the traceability to other national and international laboratories, Applus+ Laboratories has a calibration and maintenance program for its measurement equipment.
Applus+ Laboratories guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at Applus+ Laboratories at the time of performance of the test.
Applus+ Laboratories is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test. The results presented in this Test Report apply only to the particular item under test established in this document.

General conditions:

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of Applus+ Laboratories.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of Applus+ Laboratories and the Accreditation Bodies.

2.2. Measuring uncertainties

Fundamental & spurious emission	± 4.3 dB
Restrict band radiated emission	± 4.3 dB
Emission bandwidth	± 2.31 kHz
Deactivating time	--
Occupied bandwidth	± 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.

2.3. Environmental conditions

See results sheets

2.4. USED EQUIPMENT

Emission bandwidth, Deactivating time and Occupied bandwidth					
EQUIPMENT	**BRAND**	**MODEL**	**NUMBER**	**LAST CALIBRATION**	**NEXT CALIBRATION**
EMI RECEIVER	R&S	ESW 26	1041791	21/01/2022	21/01/2023
BILOG ANTENNA	SCHAWARZBECK	VULB 9162	1042229	11/01/2022	11/01/2023
CABLE	HUBER/SUHNER	SF103/11N/16N/4000MM	1041909	01/02/2022	01/02/2023
RF CABLE (WALL PANEL),	--	--	104572	23/08/2021	23/08/2022
SEMIANECHOIC CHAMBER SAC2	EUROSHIELD	TC2	104563	17/09/2021	17/09/2023
TEST SOFTWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624	--	--
AUTOMATIC ANTENNA MAST	MATURO	--	1042591	--	--
MAST-TABLE CONTROLLER	MATURO	--	1042590	--	--
CLIMATIC CHAMBER P-8	THERMOTRON	SE-300-2-2	CL110772	02/12/2021	02/12/2022
RF CABLE	HUBER+SUHNER	SUCOFLEX 104	1042431	11/02/2022	11/02/2023

Fundamental & spurious emission and Restrict band radiated emission 30 MHz to 1 GHz (RADIATED)					
EQUIPMENT	**BRAND**	**MODEL**	**NUMBER**	**LAST CALIBRATION**	**NEXT CALIBRATION**
EMI RECEIVER	R&S	ESW 26	1041791	21/01/2022	21/01/2023
BILOG ANTENNA	SCHAWARZBECK	VULB 9162	1042229	11/01/2022	11/01/2023
ATENUADOR 3 DB	HUBER/SUHNER	6803.17.B	1042020	01/08/2022	01/08/2023
CABLE	HUBER/SUHNE	FERRITE	1042729	23/08/2022	23/08/2023
CABLE	HUBER/SUHNER	SF103/11N/16N/4000MM	1041909	01/02/2022	01/02/2023
RF CABLE (WALL PANEL),	--	--	104572	01/08/2022	01/08/2023
SEMIANECHOIC CHAMBER SAC2	EUROSHIELD	TC2	104563	17/09/2021	17/09/2022
TEST SOFTWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624	--	--
AUTOMATIC ANTENNA MAST	MATURO	--	1042591	--	--
MAST-TABLE CONTROLLER	MATURO	NCD/052/8931211	1042758	--	--

Fundamental & spurious emission and Restrict band radiated emission 1GHz to 6 GHz (RADIATED)					
EQUIPMENT	**BRAND**	**MODEL**	**NUMBER**	**LAST CALIBRATION**	**NEXT CALIBRATION**
EMI RECEIVER	R&S	ESW 26	1041791	21/01/2022	21/01/2023
HORN ANTENNA	EMCO	3115	05-ER-017	20/10/2021	20/10/2022
RF PREAMPLIFIER	BONN ELEKTRONIK	BLMA 0118-M	1041733	16/03/2022	16/03/2023
CABLE	HUBER/SUHNER	SF104 WITH FERRITE	1042729	23/08/2022	23/08/2023
CABLE	HUBER+SUHNER	SF104/11N/11N/500	1042586	13/06/2022	13/06/2023
HIGHPASS FILTER	WAINWRIGHT INSTRUMENTS GmbH	WHNX6-2765-3500-26500-40CC	1042511	11/02/2022	11/02/2023
DC BLOCK	Weinschel	WA6043	1042486	09/12/2021	09/12/2022
SEMIANECHOIC CHAMBER SAC2	EUROSHIELD	TC2	104563	17/09/2021	17/09/2023
TEST SOFTWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624	--	--
MAST-TABLE CONTROLLER	MATURO	NCD/052/8931211	1042758	--	--

3. RESULT

PRODUCT:			
Brand:	MTG	**Model:**	DS-MFS-01
Sample #1 (s/n):	305 (Tx mode)	**Internal Id:**	7669-00004
Sample #2 (s/n):	B17 (Normal Mode)	**Internal Id:**	7669-00001
Sample #3 (s/n):	303 (Normal mode)	**Internal Id:**	7669-00002

EMISSION TESTING	RESULTS	NOTES
Fundamental & spurious emission	Pass	Note: 4
Restrict band radiated emission	Pass	Note: 4
Emission bandwidth	Pass	Note: 4
Deactivating time	Pass	Note: --
Occupied bandwidth	Pass	Note: 4
Atenna requirements	Pass	--

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).
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:

1: The measured results are above the upper limit, even considering the uncertainty interval**.**
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
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
4: The measured results are within the limits, including the uncertainty interval.

4. ANNEXES

4.1 Test Results

4.1.1.Antenna Requirements – FCC 15.203

Test Procedures:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Antenna Requirements		
Technician: N/A		**Test Area:** N/A
Test date: Feb 03, 2023		
Basic standard: FCC 47 CFR Part 15 Subpart C (October 2021) – 15.203		
Temperature:	21.5	ºC
Humidity:	43.1	%
Atm. Pressure:	1012.3	hPa
RESULTS: Pass		
Comments:		
The antenna is not accessible by the user due to it is protected with the cover. Therefore, it is not possible to replace the antenna to modify it. See pictures of 4.3 section.		

4.1.2.Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

Test Procedures:

The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz.

The EUT was placed on the top of a rotating table 0.8 m for below 1GHz. 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 1 GHz; 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 1 GHz:
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:

EMI Receiver configuration:

During the radiated emission test, the EMI receiver was set with the following configurations:

Frequency band (MHz)	Function	Resolution Bandwidth	Video Bandwidth
0.009 to 0.150	QP	200 Hz	1 kHz
0.150 to 30	QP	9 kHz	30 kHz
30 to 1000	QP	120 kHz	300 kHz
Above 1000	PK	1 MHz	3 MHz

Correction Factor:
Emission Level = Read Level + Corrections (Ant.Factor + Cable Loss – Ampli.Gain (if applies) + Attenuator (if applies))

Limits:

The emission shall test through the 10th harmonic or to 40GHz, whichever is lower. It must comply with the limits below:

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 3 m.The setup is according to the requirements of ANSI C63.10-2013.

According to FCC Part 15.225: radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). According to FCC Part15.205, Restricted bands.

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/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

In addition to the provisions of § 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

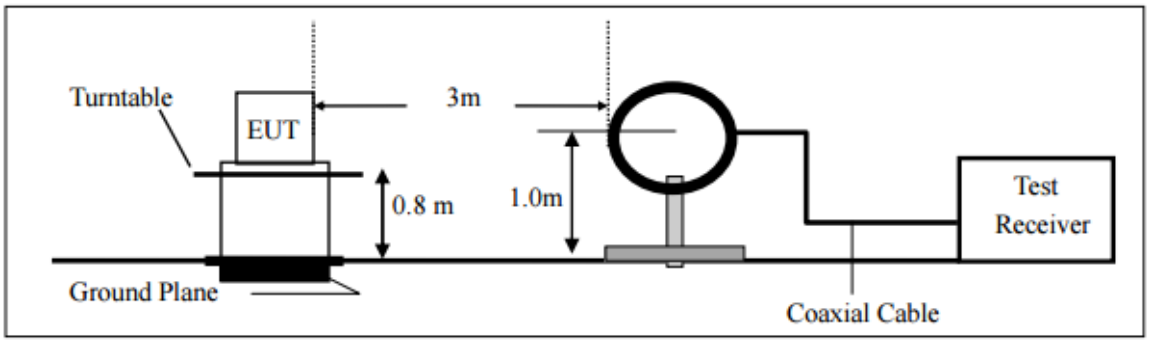
Fundamental frequency (MHz)	**Field strength of fundamental (microvolts/meter) [1]**	**Field strength of spurious emissions (microvolts/meter)[1]**
260 – 470	3750 to 12500	375 to 1250

Note 1. Linear interpolations.

The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.
The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

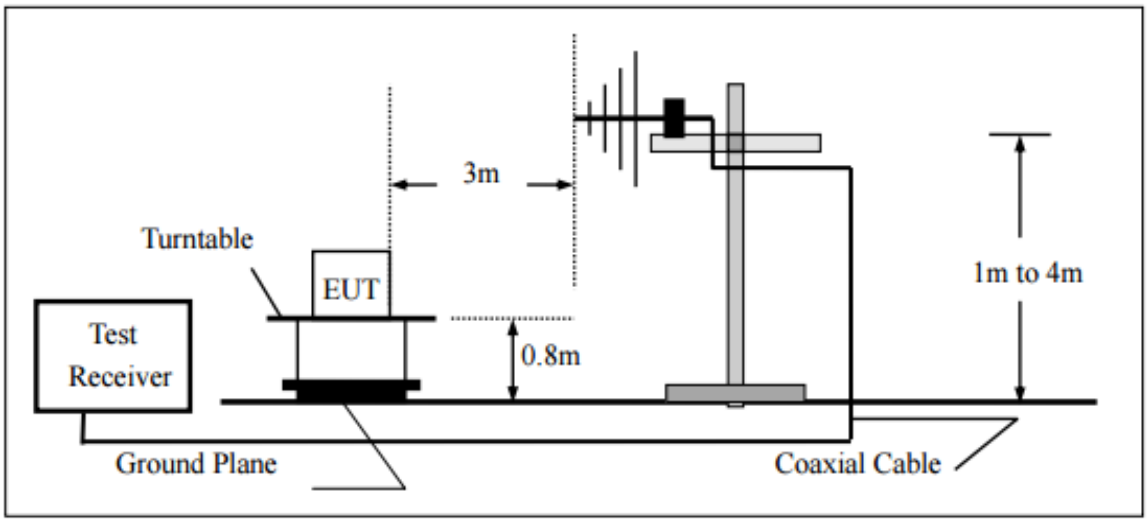
Test Configuration (depending on the EUT arrangement):

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



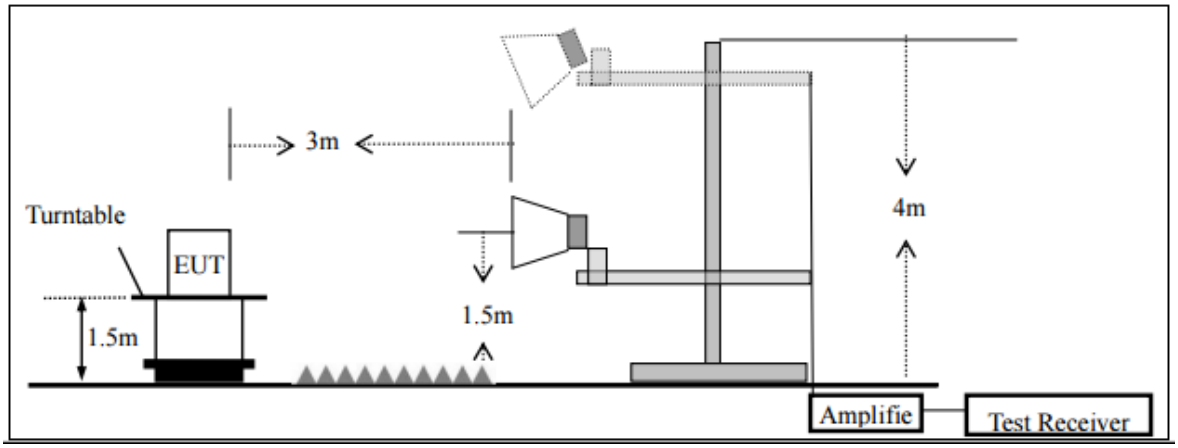
Radio-frequency radiated emissions of table-top equipment.

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



Radio-frequency radiated emissions of table-top equipment.

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



Radio-frequency radiated emissions of table-top equipment.

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

Technician: R. Montoya **Frequency range:** 9 kHz – 6 GHz

Test date: 2022-07-21

Basic standard: ANSI C63.10:2013

Temperature:	22.1	ºC
Humidity:	61.3	%
Atm. Pressure:	999.8	hPa

EUT:	Class	Test Area	Distance	PreScan	Evaluation
Table-top	N/A	SAC2	3 m	8 faces	Individual

RESULTS: Pass

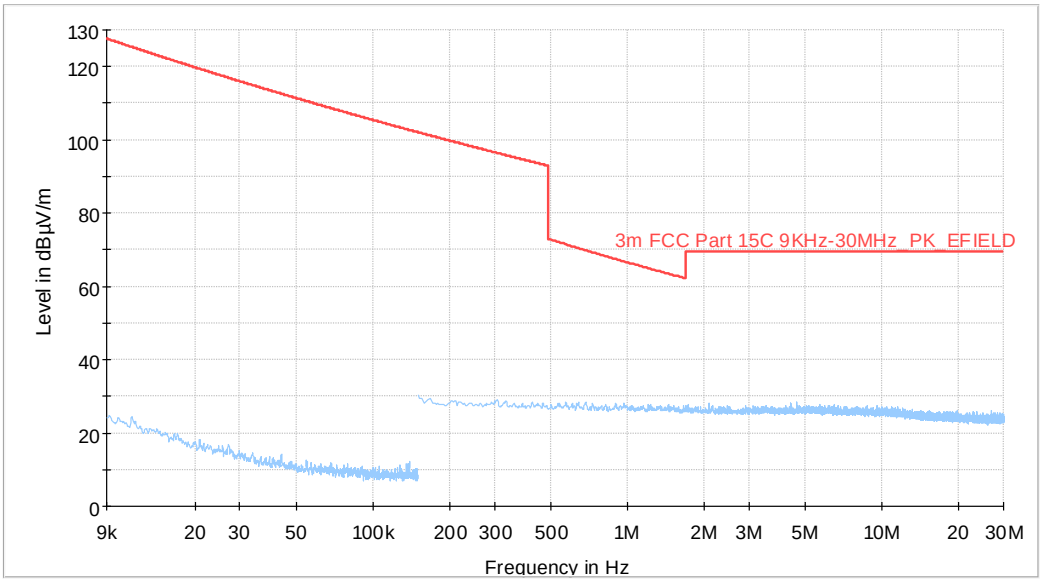
Identification	Emissions	Main emission source and type
DUT: Device under test AUX: Auxiliary Devices SYS: DUT + AUX BB: Broad-band NB: Narrow-band QP: Quasi-peak I=Uncertainty	QP < Limit - I	EBP, NB

Comments

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 9 kHz – 30 MHz

X AXIS



Preview Result 1-PK+ 3m FCC Part 15C 9KHz-30MHz_PK_EFIELD

FINAL MEASUREMENTS

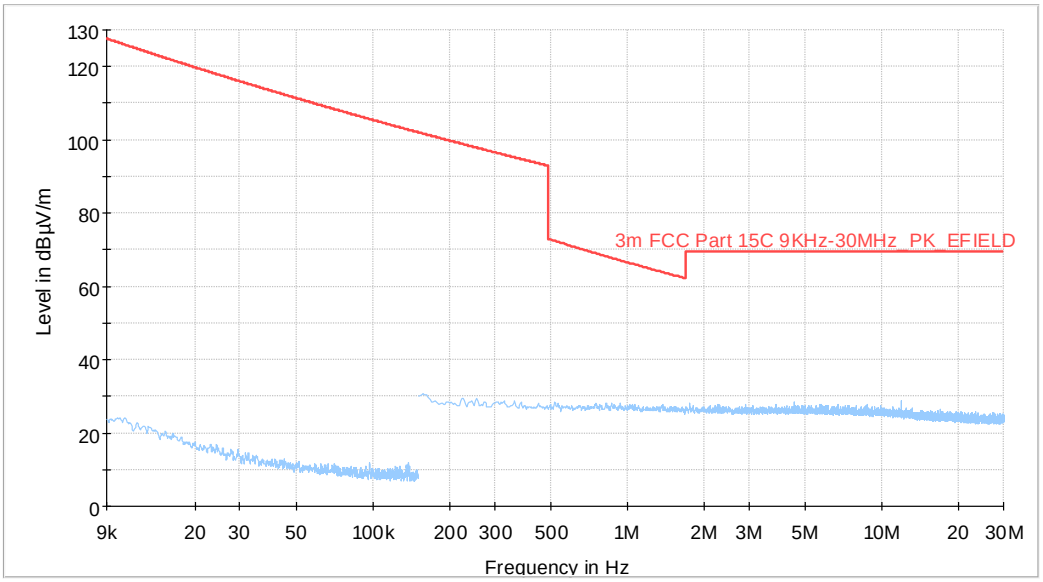
No spurious detected. All emissions are more than 6 dB below of the limit.

Comments:

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 9 kHz – 30 MHz

Y AXIS



FINAL MEASUREMENTS

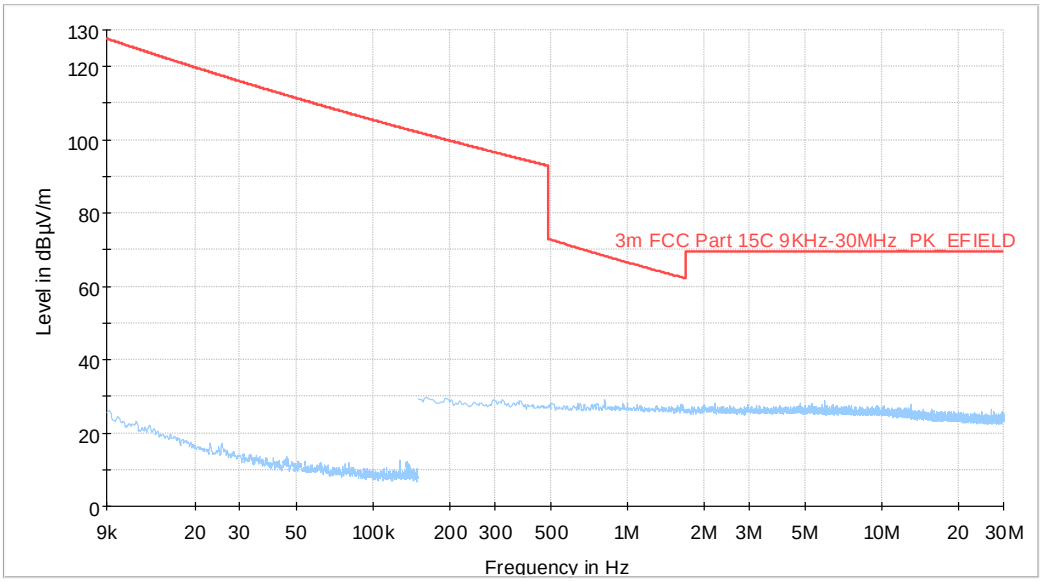
No spurious detected. All emissions are more than 6 dB below of the limit.

Comments:

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 9 kHz – 30 MHz

Z AXIS



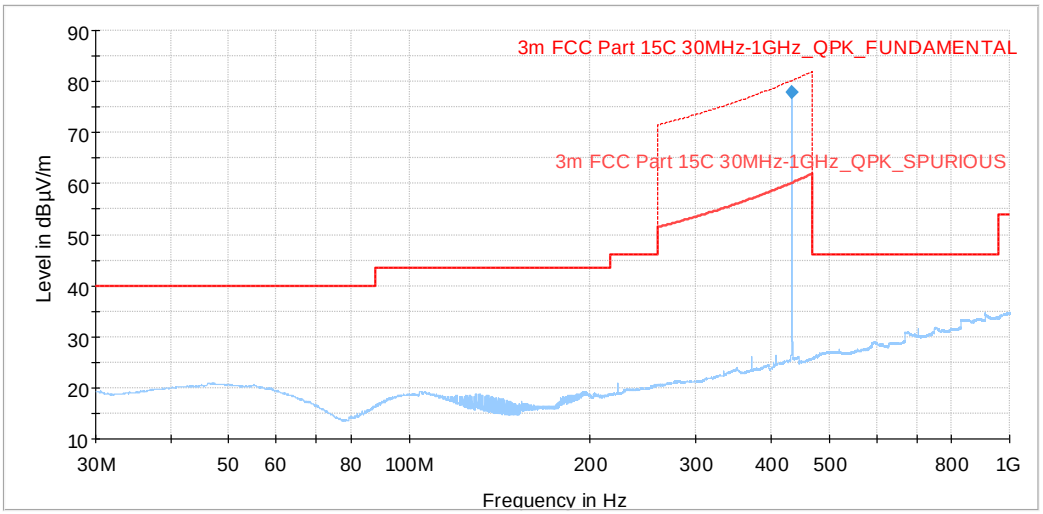
FINAL MEASUREMENTS

No spurious detected. All emissions are more than 6 dB below of the limit.

Comments:

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 30 MHz – 1 GHz H



Preview Result 1-QPK
3m FCC Part 15C 30MHz-1GHz_QPK_SPURIOUS
3m FCC Part 15C 30MHz-1GHz_QPK_FUNDAMENTAL
Final_Result QPK

FINAL MEASUREMENTS

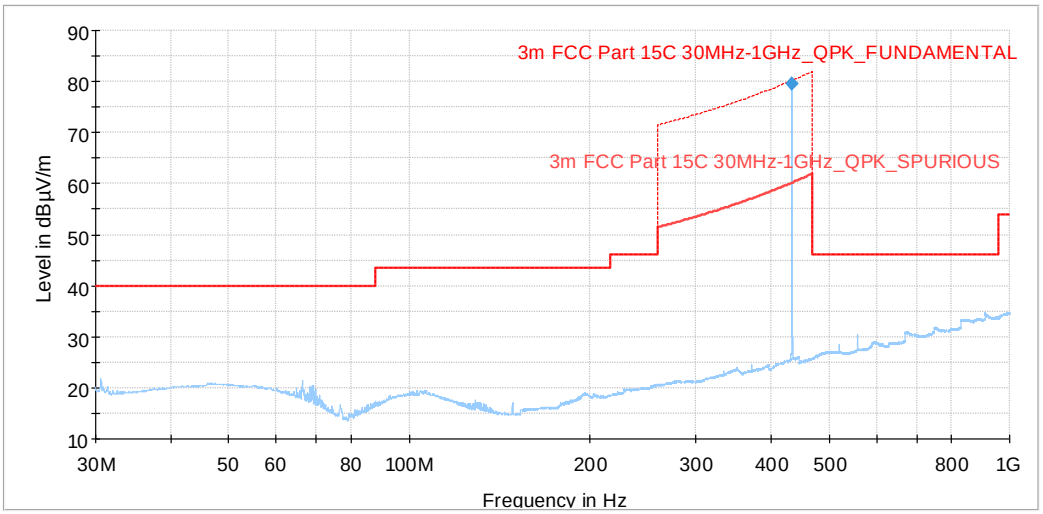
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
433.830000	77.86	80.14	2.27	100.0	H	90.0	22.0

Comments:

Fundamental emission test performed at worst case, without taking into account the Duty Cycle correction.

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 30 MHz – 1 GHz V



Preview Result 1-QPK
3m FCC Part 15C 30MHz-1GHz_QPK_SPURIOUS
3m FCC Part 15C 30MHz-1GHz_QPK_FUNDAMENTAL
Final_Result QPK

FINAL MEASUREMENTS

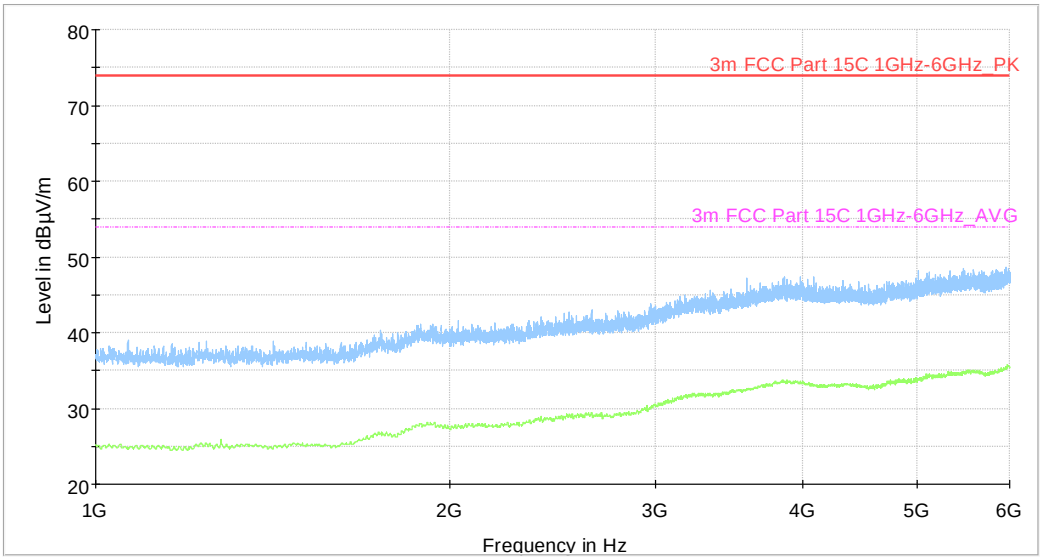
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
433.830000	79.49	80.14	0.65	100.0	V	0.0	22.0

Comments:

Fundamental emission test performed at worst case, without taking into account the Duty Cycle correction.

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 1 GHz – 6 GHz H



Preview Result 2-AVG
3m FCC Part 15C 1GHz-6GHz_PK
Preview Result 1-PK+
3m FCC Part 15C 1GHz-6GHz_AVG

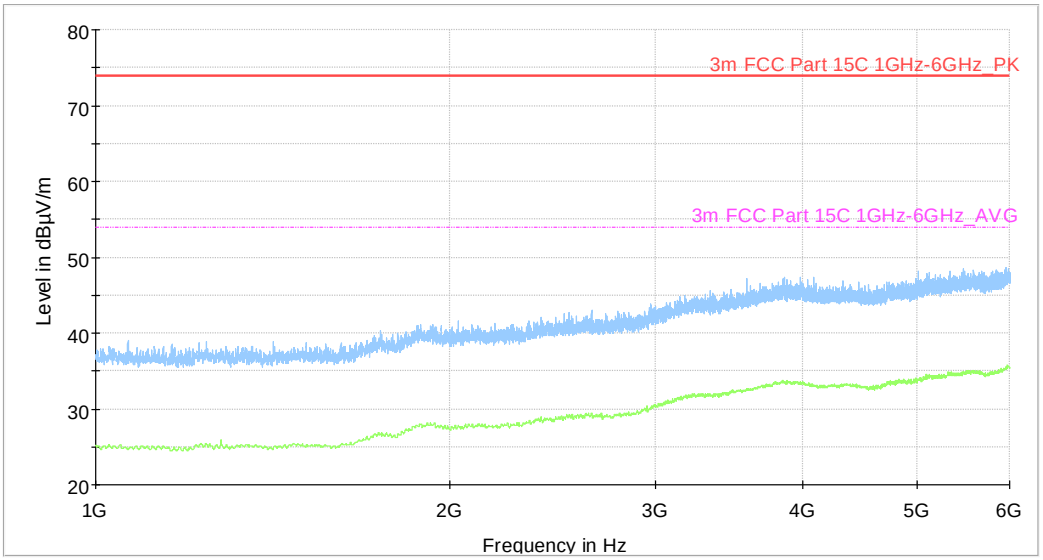
FINAL MEASUREMENTS

No spurious detected. All emissions are more than 6 dB below of the limit.

Comments:

Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205

PRESCAN 1 GHz – 6 GHz V



Preview Result 2-AVG
3m FCC Part 15C 1GHz-6GHz_PK
Preview Result 1-PK+
3m FCC Part 15C 1GHz-6GHz_AVG

FINAL MEASUREMENTS

No spurious detected. All emissions are more than 6 dB below of the limit.

Comments:

4.1.3.Emission Bandwidth and Occupied Bandwidth – FCC 15.215(c)

Test Procedures:

The EUT was placed on the top of a rotating table 0.8 m and at a measurement distance of 3 m. dThe table was rotated 360 degrees to determine the position of the highest radiation.

The height of the test antenna shall be at 1 m.

Bandwidth measurement with power higher than 20 dB below the carrier.

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier.

The limit for the EUT = 0.25 % * 433.83 MHz = 1085 kHz

EMI Receiver configuration:

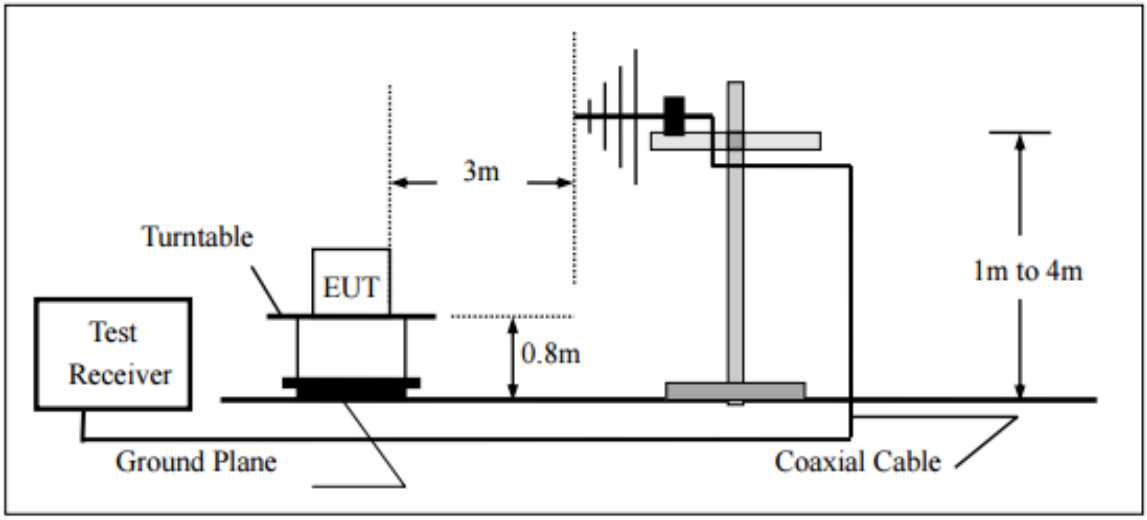
During the radiated emission test, the EMI receiver was set with the following configurations:

Frequency band (MHz)	Function	Resolution Bandwidth	Video Bandwidth
300 MHz to 500 MHz	PK	3 kHz	10 kHz

Limits:
N/A. For reporting purposes only.

Test Configuration (depending on the EUT arrangement):

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



Radio-frequency radiated emissions of table-top equipment.

Emission Bandwidth and Occupied Bandwidth – FCC 15.215(c)

Technician: Roger Montoya **Test Area:** Semi-anechoic chamber, SAC-2

Test date: 2022-07-25

Basic standard: ANSI C63.10:2013

Temperature:	23.2	ºC
Humidity:	46.7	%
Atm. Pressure:	1008.1	hPa

RESULTS: Pass

Temperature (ºC)	Frequency (MHz)	Antena Polaritation (H/V)	Emission Bandwidth (kHz)	Limit (kHz)	Result
23	433.831	H	90.13	1085	**PASS**
23	433.831	V	90.40	1085	**PASS**

Temperature (ºC)	Frequency (MHz)	Antena Polaritation (H/V)	99% bandwidth (kHz)	Limit (kHz)	Result
23	433.831	H	92.865	--	**PASS**
23	433.831	V	92.411	--	**PASS**

Comments:

4.1.4.Deactivating time – FCC 15.231 (a)

Test Procedures:

The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz.

The EUT was placed on the top of a rotating table 0.8 m for below 1GHz. 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 1 GHz; the height of the test antenna shall be at 1 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

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.

The central frequency of test receiver was set as the operating frequency of EUT and the Span was set as 0.
The EUT was switched once. The test receiver recorded the whole time from the triggered moment to the time of stopping radiating. For manual switching, to avoid uncertainty, the operating above would be repeated five times and the worst data is recorded.

EMI Receiver configuration:

During the radiated emission test, the EMI receiver was set with the following configurations:

Frequency band (MHz)	Function	Resolution Bandwidth	Video Bandwidth
0.009 to 0.150	QP	200 Hz	1 kHz
0.150 to 30	QP	9 kHz	30 kHz

Correction Factor:

Emission Level = Read Level + Corrections (Ant.Factor + Cable Loss – Ampli.Gain (if applies) + Attenuator (if applies))

Limits:

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 3 m.The setup is according to the requirements of ANSI C63.10-2013.

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

☐ (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

☐ (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

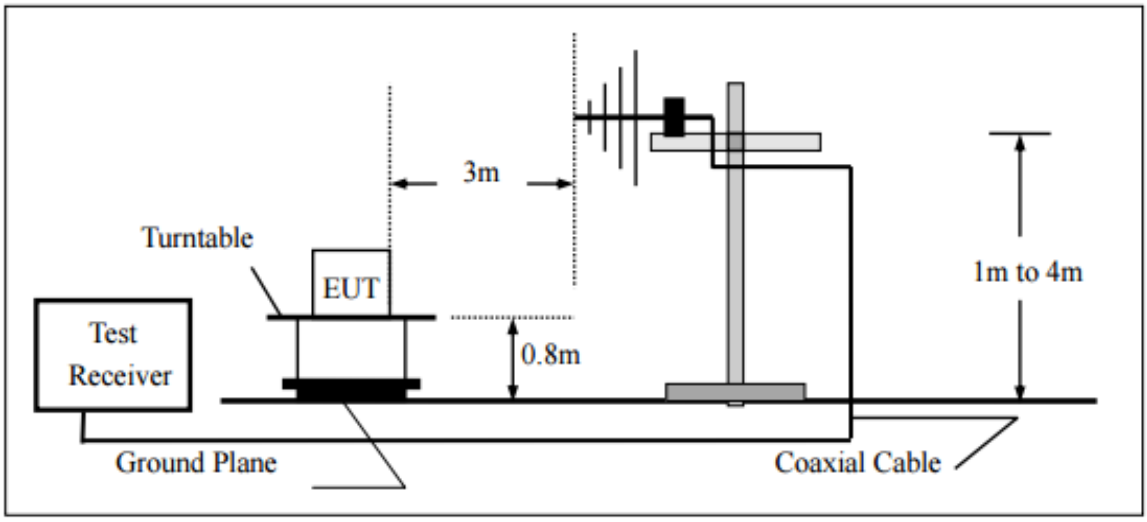
☒ (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

☐ (4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition

☐ (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Test Configuration (depending on the EUT arrangement):

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



Radio-frequency radiated emissions of table-top equipment.

Deactivating time – FCC 15.231 (a)

Technician: J. Nadales **Test Area:** Semi-anechoic chamber, SAC-2

Test date: 2022-12-21

Basic standard: ANSI C63.10:2013

Temperature:	22.5	ºC
Humidity:	45.1	%
Atm. Pressure:	1012.7	hPa

System #1 (Sample #2 and Sample #3)

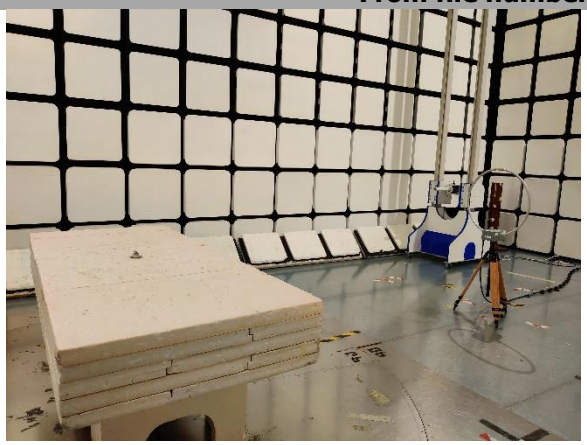
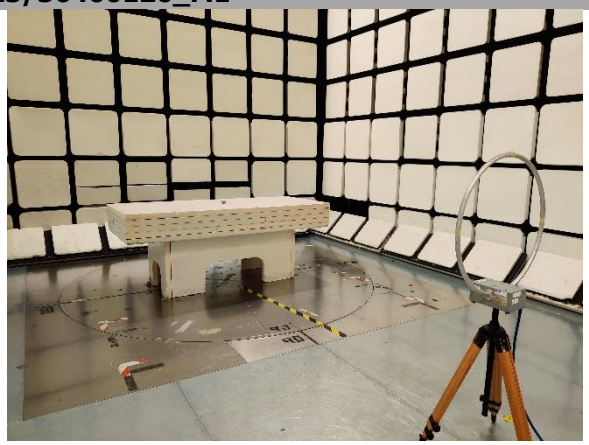
RESULTS: Pass

Frequency (MHz)	Total transmission time	Limit	Result
433.811	1.26 seconds per hour	Total transmission time does not exceed two seconds per hour.	**PASS**

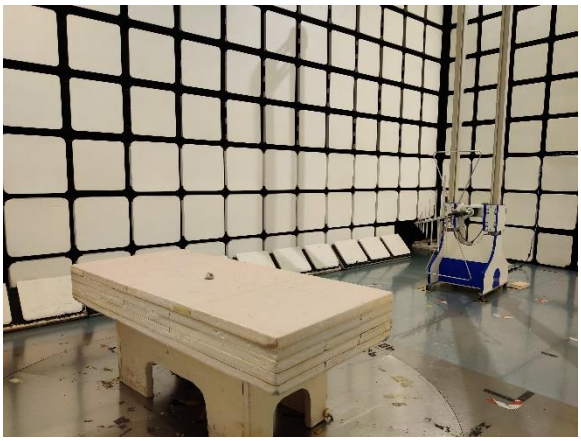
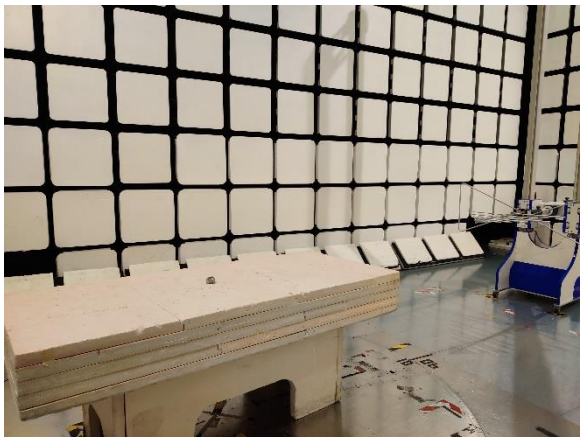
Comments:

4.2. Test Setup Configuration

From file number: 23/36400126_M1

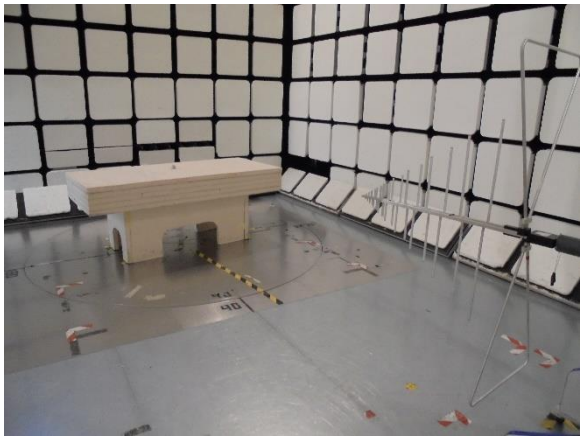



Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205: 9 kHz – 30 MHz

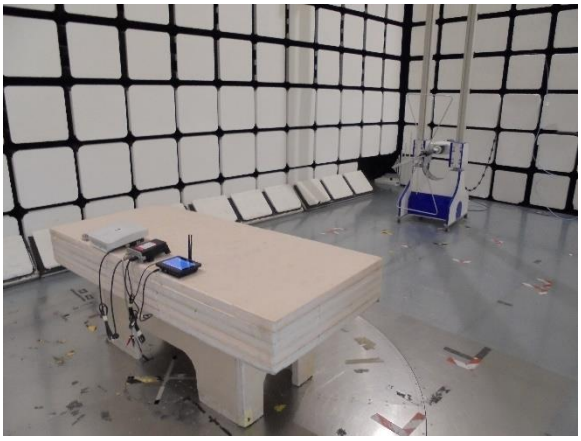



Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205: 30 MHz – 1 GHz


Fundamental & Spurious Emission & Restrict band radiated emission – FCC 15.231(b) and 15.205: 1 GHz – 6 GHz

Emission Bandwidth and Occupied Bandwidth – FCC 15.215(c)




Deactivating time – FCC 15.231 (a)

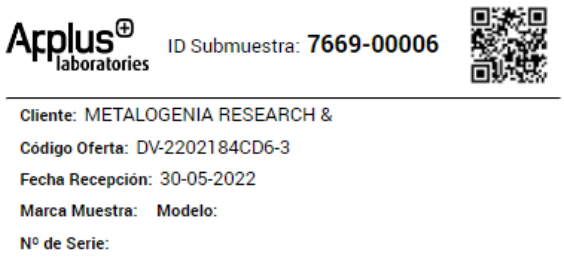
4.3. Identification pictures

From file number: 23/36400126_M1

General view (Sample #1)

Front View

Back view



Id Applus Label

G.E.T. Sensor
General view

G.E.T. Sensor
Front view

ANTENNA
Top view

ANTENNA
Bottom view

ECU GEN V1.0
Top view

ECU GEN V1.0
Bottom view

Applus laboratories ID Submuestra: **7669-00006**

Cliente: METALOGENIA RESEARCH &
Código Oferta: DV-2202184CD6-3
Fecha Recepción: 30-05-2022
Marca Muestra: **Modelo:**
Nº de Serie:

Id Applus Label

TABLE INTERFACE
Auxiliary Device

End of document