

File Number **26/36400884M1**

TEST REPORT

Electromagnetic Compatibility

Petitioner's Reference: NAD, S.L

Company Address: C/.OctaveLecante,2-6 08100 Mollet del Vallés - Spain

Equipment: KEYLESS 2.0

Brand: SHAD Model: Keyless

Sample #1: WPTNA0120260427 Applus Id: 42398-00001

Result: **complies**

It has been tested and complies with the applicable standard. See test result summary section.

Applicable Standard:

EMC standard/s: **FCC 47 CFR Part 18 (October 2025)¹**

¹The latest modifications of the standard, published at the date of the tests reported in this document, have been considered.

Dates and Test Site: Applus Barcelona, Bellaterra

Equipment Reception Date April 27, 2026

Test Initial Date: May 20, 2026

Test Final Date: May 20, 2026

Modification Description: M1

This report replaces and supersedes the report 26/36400884 dated on June 23, 2026.

Modifications performed: Correction of calibration dates for the instrumentation used.

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

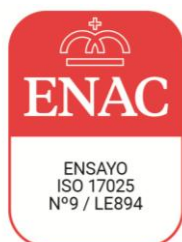
Test Manager: Javier Miguel Nadales Lisbona

Date of issue: Bellaterra, October 9, 2026

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Technical Manager
Electrical and Electronics



The results refer only and exclusively to the sample, product or material delivered for testing, and tested under conditions stipulated in this document. The equipment has been tested under conditions stipulated by standard(s) quoted in this document. This document will not be reproduced otherwise than in full. This is the first page of the document, which consists of 22 pages.

1 TEST RESULTS SUMMARY

Test Description	Sample #	DUT Test Modes	Req. Criteria	Results	Criteria Note
RADIO-FREQUENCY RADIATED EMISSIONS (FCC Part 18.305)	#1	Mode 1	CLASS B	PASS	CN4

The test results are shown in detail on the following pages.

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:

CN1: The measured results are above the upper limit, even considering the uncertainty interval.

CN2: 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.

CN3: 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.

CN4: The measured results are within the limits, including the uncertainty interval.

Service Quality Assurance

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Within our improvement program we would be grateful if you would send us any commentary that you consider opportune, to the person in charge who signs this document, or to the Quality Manager of Applus+, in the following e-mail address:

satisfaccion.cliente@applus.com

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3 GENERAL DESCRIPTION OF TEST ITEMS

3.1 EQUIPMENT DESCRIPTION

(This information has been provided by the customer and it is not covered by the accreditation. LGAI does not assume any responsibility from it.)

EQUIPMENT DESCRIPTION				
Description	Induction system with power transfer between Motorcycle and Motorcase, using FSK/ASK modulation to control motor and LED.			
EUT Version	SW Version		HW Version	
	TxRx_20260313		70100x	
Power supply	DC	+/-	12 V	-- Hz
Applicability	Fixed Equipment	Vehicular Equipment	Portable Equipment	
	☐	☒	☐	
Equipment Size	Length	Width	Height	
	6 cm	10 cm	4 cm	
Maximum internal frequency	64 MHz			

Table 1: Equipment description

I/O CABLES						
Description	Port #	Name	Type	Cable length	Cable Shielded	Comments
	1	POWER	+12 V	70 cm	No	Provided by customer
	2	Ground	GND	70 cm	No	Provided by customer
	3	A	Signal: Unlock Motor	70 cm	No	Provided by customer
	4	B	Signal: Lock Motor	70 cm	No	Provided by customer
	5	LIN	LIN bus line	70 cm	No	Provided by customer

Table 2: Input/output ports description

RF FEATURES					
Description	Communication Technology	Radio Chipset	Brand	Module Model	Antenna Peak Gain
	WPT (Wireless Power Transfer)	--	--	--	--

Table 3: RF Features

3.2 PHOTOGRAPHS

Photographs identifying the equipment under test and its auxiliaries, as well as assembly photographs for radiated and conducted tests, can be found in the document: *Annex_Photos_SHAD_Keyless.pdf*

3.2.1 DUT Modifications performed

No modifications were performed.

3.3 DUT TEST MODES

DUT Operation Modes		
Mode #	Description	Set-up
1	OPEN input: Applying 12V to this input will make motor be unlocked + turn ON the LED. CLOSE input: Applying 12V to this input will make motor be locked + turn OFF the LED. LIN: LIN commands can be sent to Lock or Unlock the motor: ID=0x9A (1 Byte-length) -> Unlock the motor ID=0x0A (1 Byte-Length) -> Lock the motor. ID=0x0B (1 Byte-Length) -> Receive status.	Table top

Table 4: DUT test modes

3.4 ACCEPTANCE CRITERIA

According to standard **FCC 47 CFR Part 18 Subpart C**

3.5 TEST FACILITIES ID

TEST FACILITIES ID	
FCC Test Firm Registration Number:	507478

Table 5: Test facilities ID

3.6 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.

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4 TEST RESULTS

4.1 RADIO-FREQUENCY RADIATED EMISSIONS

4.1.1 Test Setup Required

According to standard ANSI C63.4:2014 and FCC MP-5.

4.1.1.1 Tabletop equipment

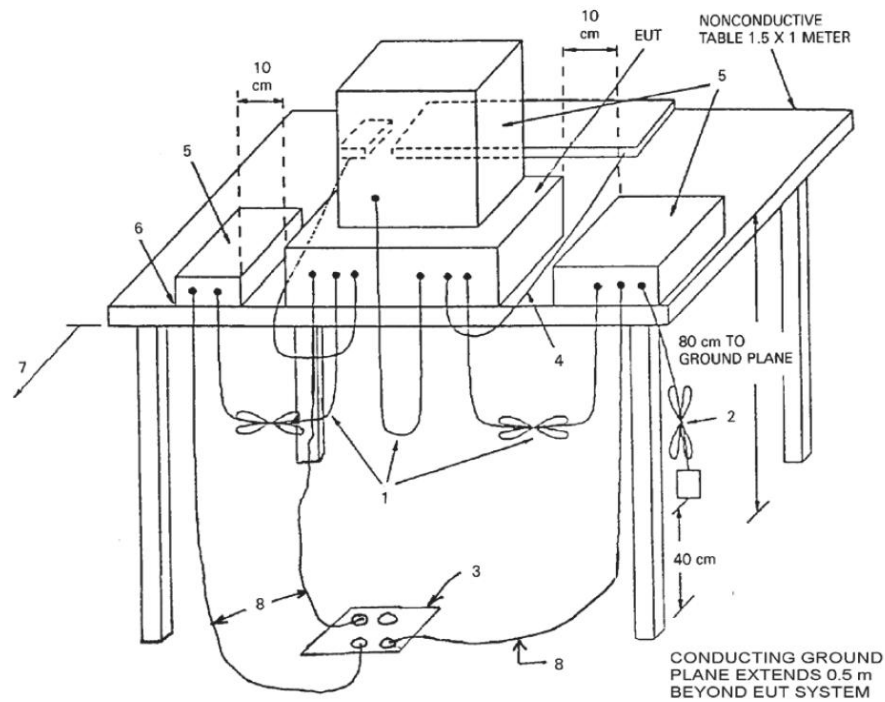


Fig. 1: Radio-frequency radiated emissions setup of table top equipment.

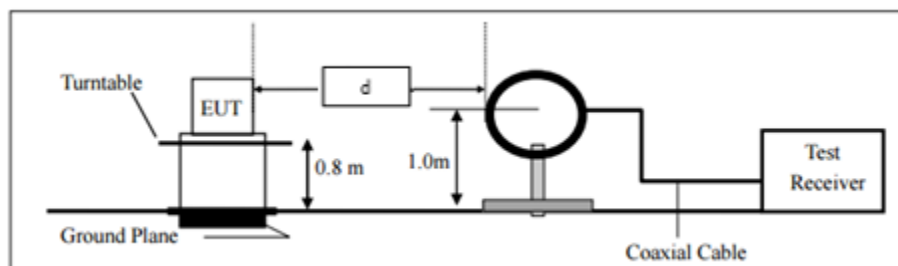


Fig. 2: Radio-frequency radiated emissions of table top equipment from 9 kHz to 30 MHz

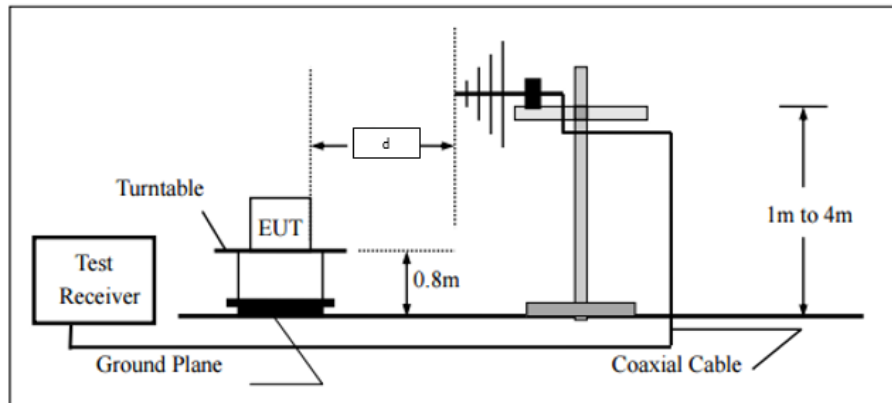


Fig. 3: Radio-frequency radiated emissions of table top equipment from 30 MHz to 1000 MHz

Distance "d" depends on test chamber.

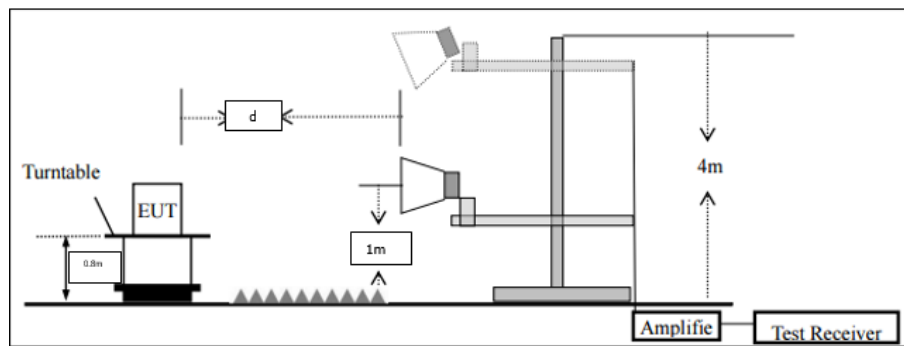


Fig. 4: Radio-frequency radiated emissions setup of table top equipment above 1 GHz

Distance "d" depends on test chamber.

4.1.1.2 Floor standing equipment

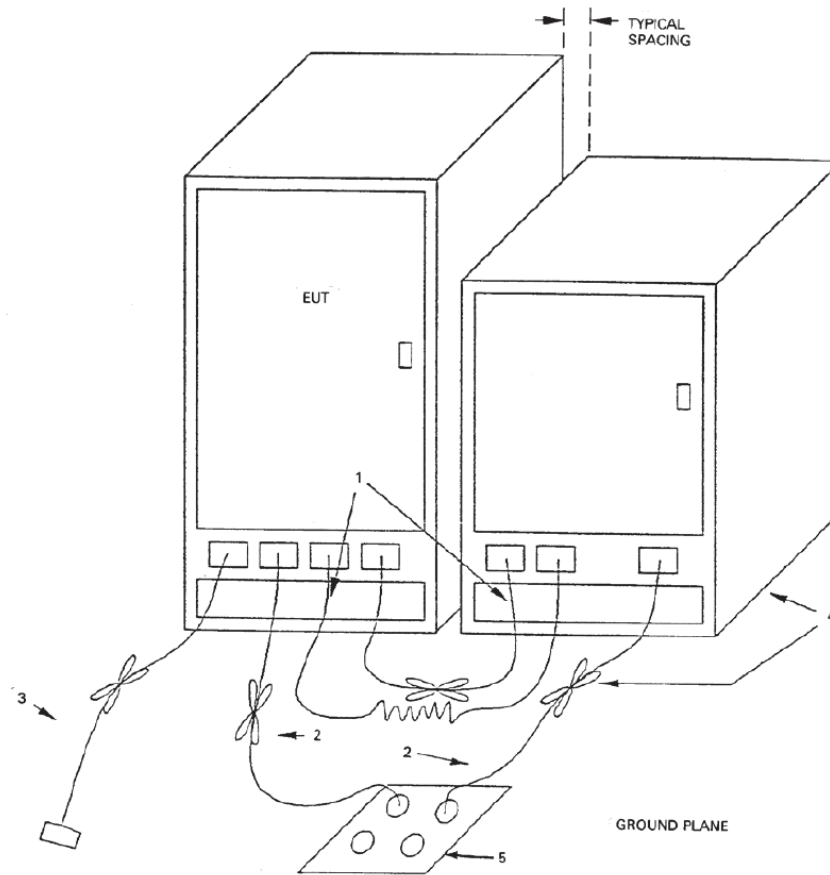


Fig. 5: Radio-frequency radiated emissions of floor-standing setup equipment.

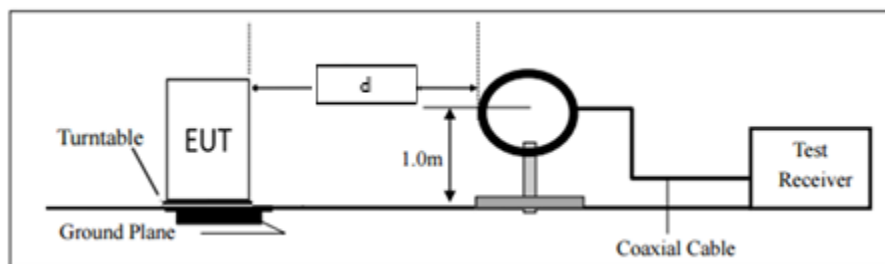


Fig. 6: Radio-frequency radiated emissions of floor-standing setup equipment from 9 kHz to 30 MHz

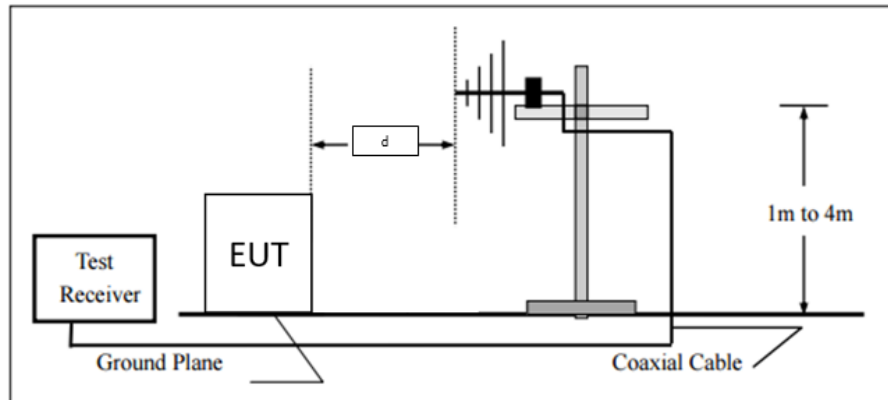


Fig. 7: Radio-frequency radiated emissions of floor-standing setup equipment from 30 MHz to 1000 MHz

Distance "d" depends on test chamber.

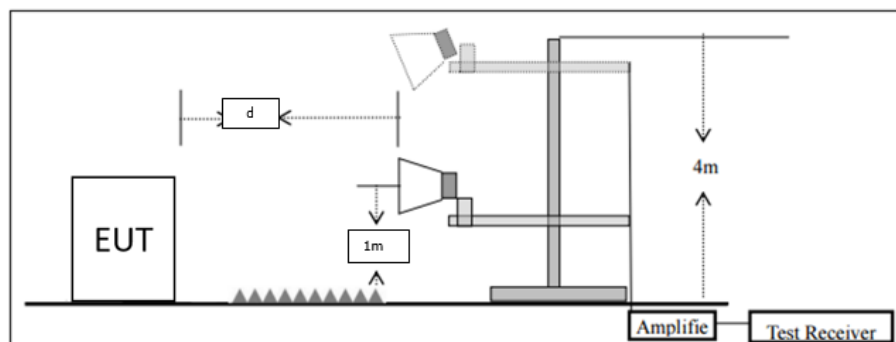


Fig. 8: Radio-frequency radiated emissions of floor-standing setup equipment above 1 GHz

Distance "d" depends on test chamber.

4.1.2 Test Procedure

The test site, 3 or 10 m semi-anechoic chamber, has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4-2014

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The receiving antennas conform to specifications ANSI C63. These antennas can be moved over the height range between 1 m and 4 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

Pre-measurement

- The turntable rotates from 0° to 315° using 45° steps
- The antenna is polarized vertical and horizontal
- The antenna height changes from 1 m to 4 m
- At each turntable position, antenna polarization and height the receiver finds the maximum of all emissions

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by changing turntable position 360° and antenna height between 1 m and 4 m
- The final measurement is done with quasi-peak detector (as described in ANSI C63.4) for 30MHz to 1GHz emissions test
- The final measurement is done in the position (azimuth, height and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C63.4) for 1 GHz to 18 GHz test
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factors, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is shown

Correction Factor:

Emission Level = Read Level + Corrections (Antenna Factor + Cable Loss – Amplifier Gain (if applies) + Attenuator (if applies))

4.1.3 Test Parameters

4.1.3.1 Requirements

According to FCC Part 18.305:

Any type unless otherwise specified (miscellaneous) Any non-ISM frequency operating frequency Below 500 (watts) of RF Power generated by equipment				
Frequency Range [MHz]	Quasi-peak detector (QP) [$\mu\text{V}/\text{m}$]	Quasi-peak detector (QP) [$\text{dB}\mu\text{V}/\text{m}$]	Quasi-peak detector (QP) [$\text{dB}\mu\text{V}/\text{m}$]	
	300 m measuring distance	300 m measuring distance ¹	10 m measuring distance	3 m measuring distance
0.009 - 30	15	23.5	82.6 ²	103.5 ⁴
30 - 1000	15	23.5	53.1 ³	63.5 ⁵

Table 6: Radio-frequency radiated emissions requirements - Any type unless otherwise specified

Note 1: The limits has been modified according to the applicable standard applying the formula: $L_2 = 20\log(L_1)$, where:

L₂: New limit in dBuV/m at 300 meters.

L₁: Limit in $\mu\text{V}/\text{m}$ at 300 meters.

Note 2: The limits has been modified according to the applicable standard applying the formula: $L_2 = L_1 - 40\log(d_2/d_1)$, where:

L₂: New Limit.

L₁: Limit at 300 meters.

d₁: 300 meters (standard distance).

d₂: 10 meters (new measurement distance).

Note 3: The limits has been modified according to the applicable standard applying the formula: $L_2 = L_1 - 20\log(d_2/d_1)$, where:

L₂: New Limit.

L₁: Limit at 300 meters.

d₁: 300 meters (standard distance).

d₂: 10 meters (new measurement distance).

Note 4: The limits has been modified according to the applicable standard applying the formula: $L_2 = L_1 - 40\log(d_2/d_1)$, where:

L₂: New Limit.

L₁: Limit at 300 meters.

d₁: 300 meters (standard distance).

d₂: 3 meters (new measurement distance).

Note 5: The limits has been modified according to the applicable standard applying the formula: $L_2 = L_1 - 20\log(d_2/d_1)$, where:

L₂: New Limit.

L₁: Limit at 300 meters.

d₁: 300 meters (standard distance).

d₂: 3 meters (new measurement distance).

4.1.3.2 Receiver Parameters

According to standard ANSI C63.4:2014:

Frequency Range [MHz]	Detector	Resolution Bandwidth [MHz]	Video Bandwidth [MHz]
0.009 – 0.15	Quasi-peak (QP)	$200 \cdot 10^{-6}$	$1 \cdot 10^{-3}$
0.15 – 30	Quasi-peak (QP)	$9 \cdot 10^{-3}$	$30 \cdot 10^{-3}$
30 – 1000	Quasi-peak (QP)	0.12	0.30
Above 1000	Peak (PK)	1	3
	Average (AVG)	1	10

Table 7: Receiver parameters – Radio-frequency radiated emissions

4.1.3.3 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Receiver readings, based on the following equation:

$$Final\ Result\ [dB\mu V/m] = Raw\ Rec\ [dB\mu V] + Corr.\ [dB/m]$$

$$Final\ Result\ [dB\mu V/m] = Raw\ Rec\ [dB\mu V] + Trd\ Corr\ [dB/m] + Preamp\ [dB] + Sig\ Path\ [dB]$$

Equation 1: Equation for Calculation for Field Strength

Where:

- *Raw Rec* – Measured reading in $dB\mu V$.
- *Sig Path* – Cable Loss + External Amplifier in dB.
- *Preamp* – Internal Amplifier in dB.
- *Trd Corr* – Antenna Factor in dB/m.
- $Corr\ [dB/m] = Sig\ Path\ [dB] + Preamp\ [dB] + Trd\ Corr\ [dB/m]$

Example calculation from primary register taken from EMC-32 Test Software:

Frequency [MHz]	MaxPeak [dBμV/m]	CAverage [dBμV/m]	Limit [dBμV/m]	Corr. [dB/m]	Raw Rec [dBμV]	Sig Path [dB]	Preamp [dB]	Trd Corr. [dB/m]
1060.000	61.2	---	74.0	26.4	34.8	2.0	0.0	24.4
1060.000	---	22.8	54.0	26.4	-3.6	2.0	0.0	24.4

Table 8: Sample Calculation for Field Strength

$$MaxPeak\ [dB\mu V/m] = 34.8 + 24.4 + 0 + 2 = 61.2\ [dB\mu V/m]$$

$$CAverage\ [dB\mu V/m] = -3.6 + 24.4 + 0 + 2 = 22.8\ [dB\mu V/m]$$

Equation 2: Sample Calculation for Field Strength

4.1.4 Test Environmental Conditions

Test Date	Technician	Supervisor	Temperature [°C]	Humidity [%]	Atm. Pressure [mbar]
20/05/2026	R. Gonzalo	J. M. Nadales	23.5	65.2	1001.2

Table 9: Test environmental conditions – Radio-frequency radiated emissions

4.1.5 Summary Test Results

Frequency Range [MHz]	Equipment Class	Test Area	Distance [m]	Emissions	Results
0.009 – 30	B	SAC 1	3	Limit - I <= QP < Limit	PASS

Table 10: Summary test results – Radio-frequency radiated emissions

4.1.6 Test Results

4.1.6.1 Ambient Levels. Frequency range: Antenna Pos X 9 kHz - 30 MHz

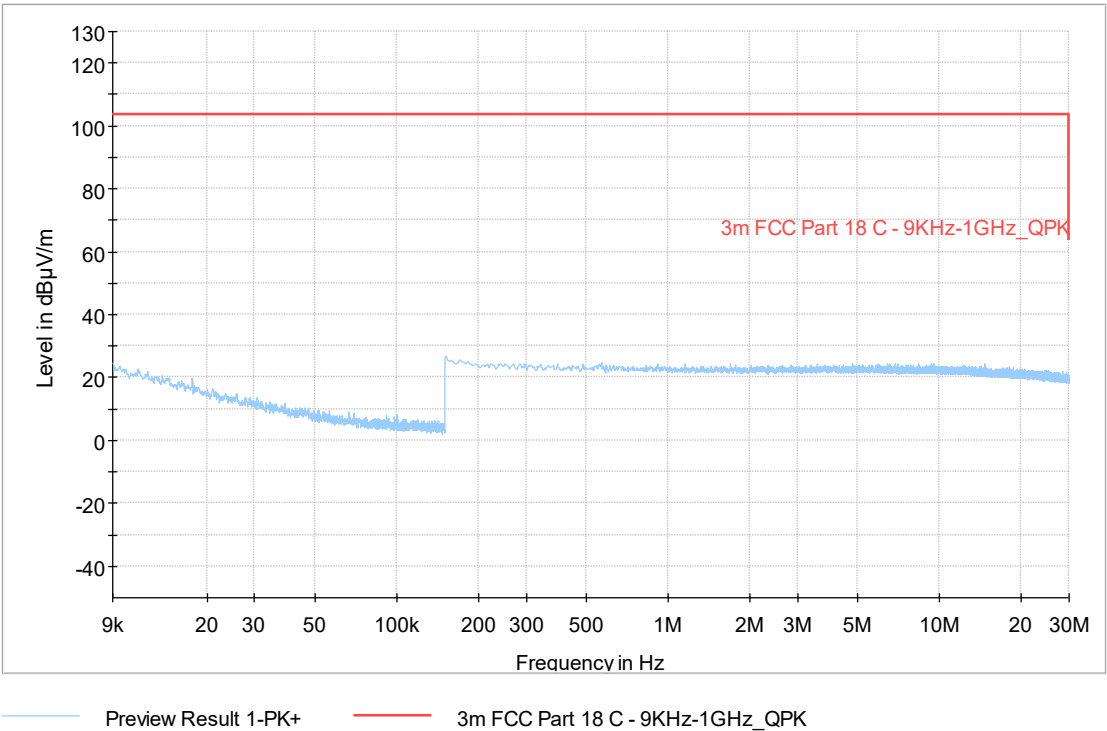


Fig. 9: Ambient level. Antenna Pos X Frequency range: 9 kHz - 30 MHz

4.1.6.2 Ambient Levels. Frequency range: Antenna Pos Y 9 kHz - 30 MHz

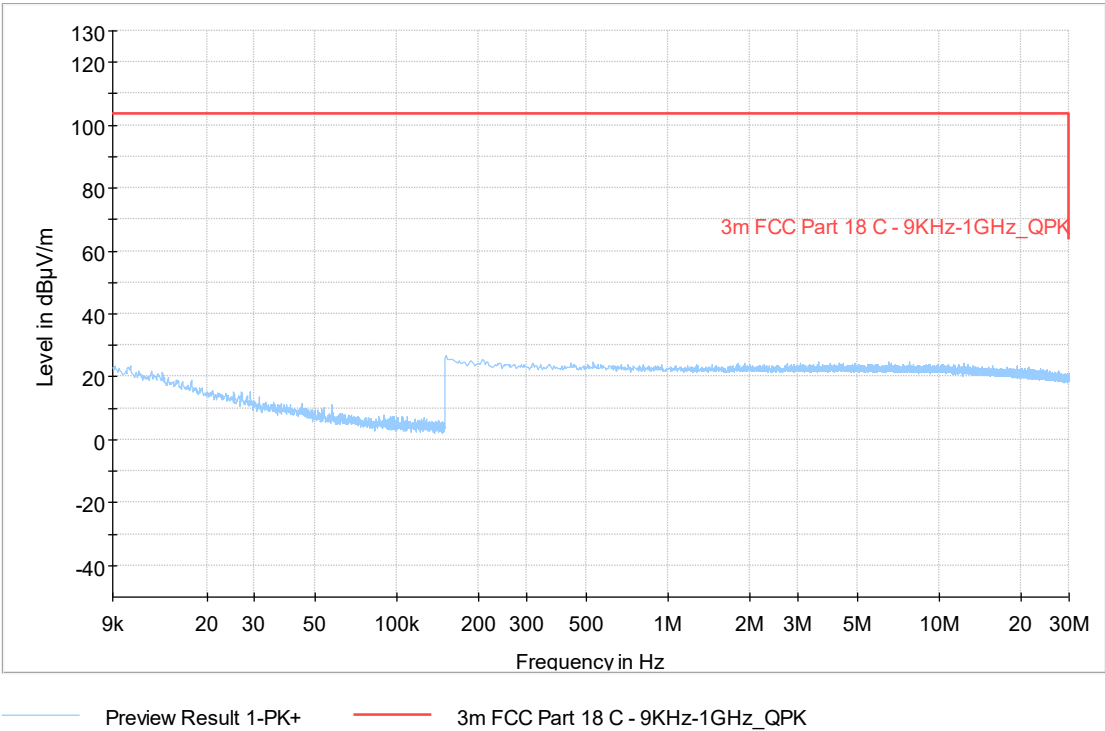
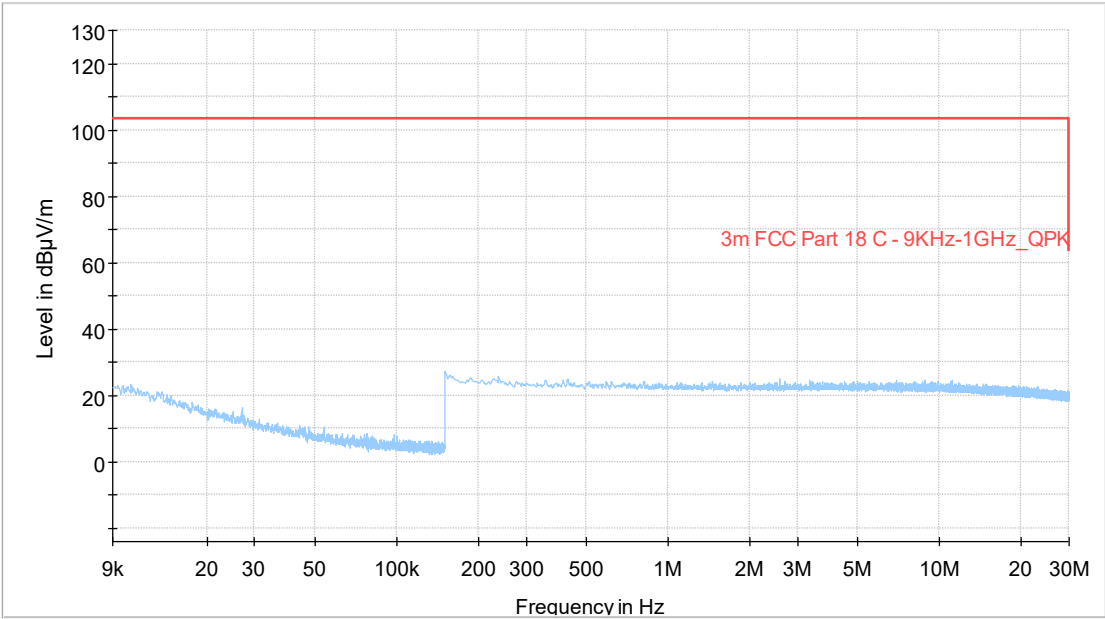


Fig. 10: Ambient level. Antenna Pos Y Frequency range: 9 kHz - 30 MHz

4.1.6.3 Ambient Levels. Frequency range: Antenna Pos Z 9 kHz - 30 MHz



Preview Result 1-PK+ 3m FCC Part 18 C - 9KHz-1GHz_QPK Final_Result QPK

Fig. 11: Ambient level. Antenna Pos Z Frequency range: 9 kHz - 30 MHz

4.1.6.4 Sample #1. Mode 1. Antenna Pos X Frequency range: 9 kHz - 30 MHz

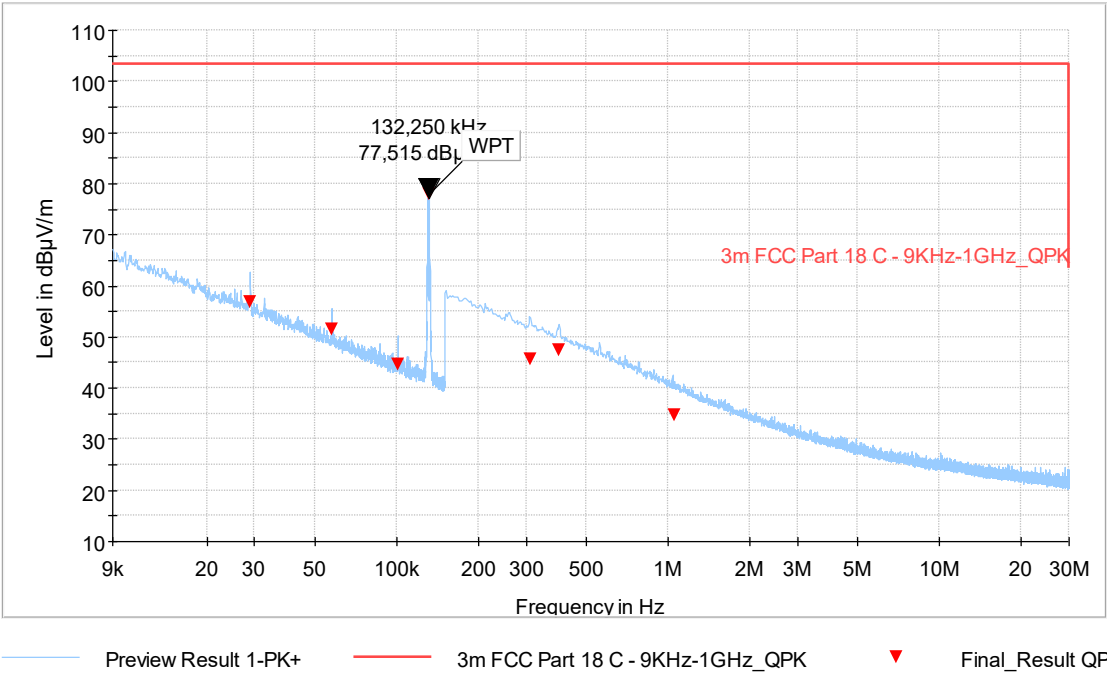


Fig. 12: Ambient level. Frequency range: 30 MHz – 1 GHz

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.028	56.8	103.5	46.69	140.0	V	0.0	19.0
0.057	51.5	103.5	51.96	140.0	V	328.0	15.1
0.101	44.5	103.5	58.96	140.0	V	54.0	13.5
0.132	78.0	103.5	25.51	140.0	V	159.0	13.2
0.312	45.7	103.5	57.76	140.0	V	22.0	12.2
0.397	47.5	103.5	56.04	140.0	V	147.0	12.1

Table 11: Test results – Radio-frequency radiated emissions

4.1.6.5 Sample #1. Mode 1. Antenna Pos Y Frequency range: 9 kHz - 30 MHz

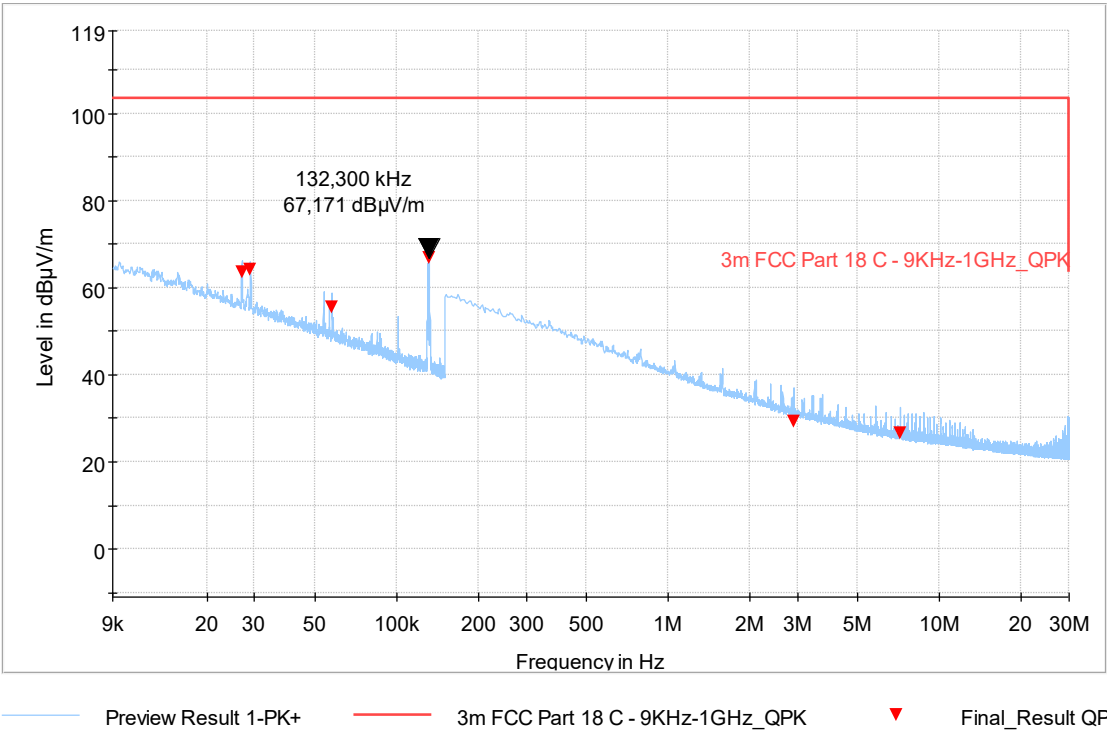


Fig. 10: Sample #1. Antenna Pos Y Mode 1. Frequency range: 9 kHz - 30 MHz

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.026950	63.45	103.50	40.05	140.0	V	15.0	19.6
0.029000	63.99	103.50	39.51	140.0	V	109.0	19.0
0.057950	55.46	103.50	48.04	140.0	V	43.0	15.1
0.132350	66.86	103.50	36.64	140.0	V	75.0	13.2
2.915250	29.38	103.50	74.12	140.0	V	275.0	11.6
7.147500	26.69	103.50	76.81	140.0	V	128.0	11.3

Table 12: Test results – Radio-frequency radiated emissions

4.1.6.6 Sample #1. Mode 1. Antenna Pos Z Frequency range: 9 kHz - 30 MHz

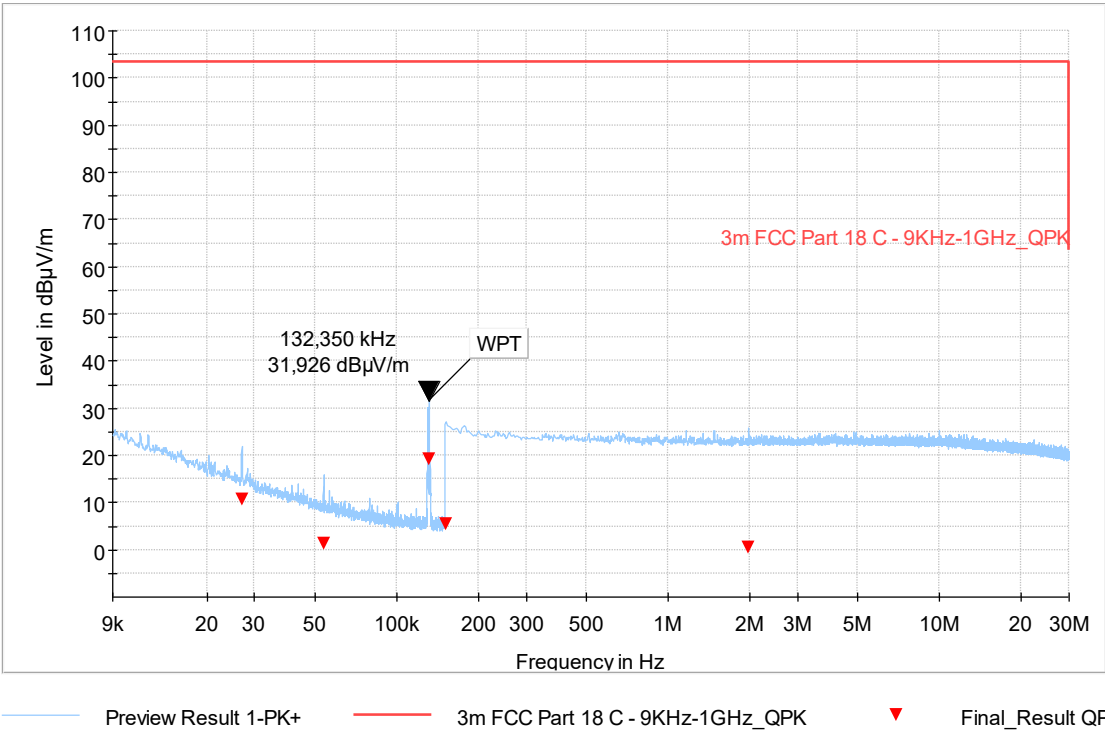


Fig. 10: Sample #1. Antenna Pos z Mode 1. Frequency range: 9 kHz - 30 MHz

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.026950	10.53	103.50	92.97	110.0	H	333.0	19.6
0.053900	1.33	103.50	102.17	110.0	H	91.0	15.4
0.132350	19.21	103.50	84.29	110.0	H	33.0	13.2
0.152250	5.29	103.50	98.21	110.0	H	12.0	13.0
1.983750	0.50	103.50	103.00	110.0	H	345.0	11.7
0.026950	10.53	103.50	92.97	110.0	H	333.0	19.6

Table 13: Test results – Radio-frequency radiated emissions

4.1.7 Test Equipment Used

Equipment	Brand	Model	Applus Ref.	Last Calibration	Next Calibration
ESW RECEIVER	ROHDE & SCHWARZ	ESW44	1042953	30/05/2025	30/05/2026
BILOG ANTENNA	SCHWARZBECK	VULB 9164	1042740	17/12/2025	17/12/2026
LOOP ANTENNA	EMCO	EMCO	05-ER-19	26/09/2025	26/09/2026
ATENUADOR 3 DB	HUBER/SUHNER	6803.17.B	1042021	17/04/2026	17/04/2027
ROTATORY JOINT	SPINNER	BN835088	1041794	10/03/2026	10/03/2027
RF CABLE Receiver SAC-1	HUBER/SUHNER	SF103/11N/16N/4000MM	1041964	15/05/2026	15/11/2026
CABLE RF Ferritas	HUBER & SUHNER	SF 106	1043040	26/09/2025	26/09/2026
RF Cable bajo cámara EMI 1	HUBER & SUHNER	SF 103	1042866	15/04/2026	15/04/2027
SEMIANECHOIC CHAMBER SAC1	EUROSHIELD	TC1	104446	12/03/2026	12/03/2029
TEST SOFTWARE	R&S	EMC32 v.10.50.00	104624	----	----
MAST-TABLE CONTROLLER	MATURO	NCD/052/8931211	1042757	----	----

Table 14: Test Instruments – Radio-frequency radiated emissions

4.1.8 Uncertainty

Test Type	Test Description	Uncertainty
Emissions	RADIO-FREQUENCY RADIATED EMISSIONS 9 kHz – 30 MHz	± 3.9 dB

Table 15: Radio-frequency radiated emissions measuring Uncertainties

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by a coverage factor $k=2$, which for normal distribution corresponds to a coverage probability of approximately 95%.