

TEST REPORT

Ref. n.	KDBTR_183856-0	Issue Date:	05/12/2023	Pages:	34
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Test object	Type test according to Standards 996369 D04 – Module Integration Guide v02
Applicant	DATALOGIC S.r.l. Via S. Vitalino 13 - 40012 Lippo Di Calderara Di Reno - Bologna - Italy Phone. +39 051 3147196 Fax +39 051 3147561
Trade mark	
Manufacturer	DATALOGIC S.r.l.
Product	Base Charger Station
Testing model	BC9620
Type	BT
Date of test samples receipt	18/10/2023
No. of tested samples	1 – Sampled by the manufacturer
Testing date	From 10/11/2023 to 13/11/2023
Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy
Assessment results	COMPLIANT
Verifications carried out by	Edoardo AMATI Laboratory Engineer
Approved by	Daniele AOSANI Reviewer

The test results reported in this test report shall refer only to the samples tested.

The sample has been provided by the customer and the results apply to the sample as received.

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PRS refuses any responsibility about information provided by the customer contained in this test report.

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0. RELEASE CONTROL RECORD

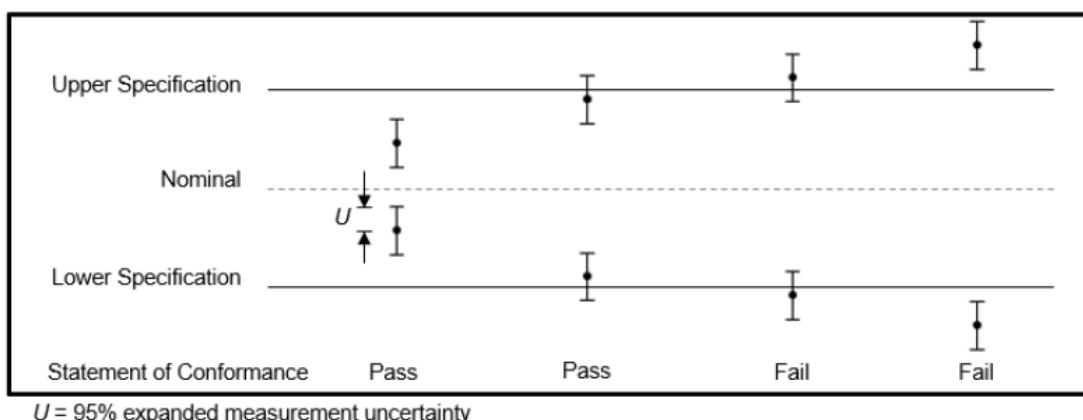
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
KDBTR_183856-0	Original release	05/12/2023

This document is valid in last revision that deletes and replaces the previous one

1. DECISION RULE

PRS LAB specifies that, if the decision rules of conformity of the test results are not indicated in detail in the standard/s object of tests, it takes as a decision rule for the declaration of conformity the simple binary system ($w = 0$) stated in the ILAC-G8-09:2019 document.

The decision rule is applicable for all parts of standard



Statements of conformity are reported as:

- Pass: the measured value is below the acceptance limit, $AL=TL$.
- Fail: the measured value is above the acceptance limit, $AL=TL$.

Definitions

- Guard Band (w): interval between a tolerance limit and a corresponding acceptance limit where length $w=|TL-AL|$.
- Tolerance Limit (TL) (Specification Limit): specified upper or lower bound of permissible values of a property.
- Acceptance Limit (AL): specified upper or lower bound of permissible measured quantity values.

2. INFORMATION PROVIDED BY CUSTOMER

- None

3. GENERAL REMARKS

- None

4. INTRODUCTION

This report KDBTR_183856-0 presents the results of the base charger station mod **BC9620 type BT** according to **FCC KDB 996369 D04 – Module Integration Guide v02**.

“Testing of the host product with all the transmitters installed is recommended, to verify that the host product meets all the applicable FCC rules. The radio spectrum is to be investigated with all the transmitters in the final host product functioning to determine that no emissions exceed the highest limit permitted for any one individual transmitter as required by Section 2.947(f).”

a) A host product with a clock frequency of 30 MHz and dual band Wi-Fi would require an investigation up to 10 times the 5.8 GHz operating frequency or around 60 GHz, or the lower value of 40 GHz as permitted by Section 15.33(a)(1). In this case the Wi-Fi fundamental frequency of the modular transmitter is the highest frequency used.

b) A host product with a 13.56 MHz transmitter and a clock at 28 MHz would require an investigation range per the table in Section 15.33(b)(1): 1.705-108 MHz to 1 GHz. The highest investigation frequency is determined by Section 15.33(a)(1) through (a)(3), or per the table in Section 15.33(b)(1). In this case, the digital clock rate of the host product is the highest frequency used.”

a) Measure the fundamental and unwanted/spurious emissions with the modular transmitter(s) operating in a normal mode.

b) Perform testing on unwanted (spurious) radiated emissions on the worst-case modulation and channel per frequency range as shown in original filing.

c) Where the transmitter power is based on ERP/EIRP or field strength, the host product manufacturer should ensure that installation of the modular transmitter has not affected the modular transmitter ERP/EIRP or its field strength rating. It should not be necessary to re-test the transmitter output power of any modular transmitter which has been certified based on conducted power.

d) When power is not listed on the FCC grant, it should be assumed that the limit is based on field strength and that information will be in the associated test report in the modular transmitter application. The host product manufacturer may want to create a matrix based on test results.”

The base charger station mod **BC9620 type BT** contains a BLE/BT classic module already approved: U4FBT-MRY-A1. So, the following test have been performed:

SUMMARY OF TEST RESULTS		
Test	Reference Standard	Results
Radiated Spurious Emissions	CFR 47 Part 15 Subpart C § 15.247 (d)	Within the limits

5. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

5.1 EUT Identification

DESCRIPTION	Base charger station
MODEL NAME	BC9620
TYPE	BT
SERIAL NO.	B23P03616
PRS LAB INTERNAL REFERENCE	BC286/2023 1/1
TRADEMARK	 DATALOGIC™
MANUFACTURER	DATALOGIC S.r.l.
COUNTRY OF MANUFACTURER	Slovakia
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	AC/DC adapter model PSAA18-120 with DC output 12V, manufactured by PHIHONG Technology Co., Ltd.
SUPPLY VOLTAGE	10÷30Vdc
MAX POWER OR MAX ABSORBED CURRENT	1.5A
OPERATING TEMPERATURE	0°C ÷ +50°C
HW VERSION (Information provided by Customer)	A
SW VERSION (Information provided by Customer)	A
DIMENSIONS	See photographic documentation
EUT STANDING	<input type="checkbox"/> WALL; <input type="checkbox"/> CEILING; <input checked="" type="checkbox"/> TABLE; <input type="checkbox"/> FLOOR; <input type="checkbox"/> RACK MOUNTED; <input type="checkbox"/> BODY WORN; <input type="checkbox"/> HANDLED; <input type="checkbox"/> PORTABLE; <input type="checkbox"/> MOBILE
HIGHEST INTERNAL FREQUENCY (Information provided by Customer)	<input type="checkbox"/> <108MHz; <input type="checkbox"/> 108MHz<F<500MHz; <input type="checkbox"/> 500MHz<F<1GHz; <input checked="" type="checkbox"/> F>1GHz; F = 2480MHz

5.2 Bluetooth Low Energy module technical data

MODULE MANUFACTURER	
MODEL NAME	BT-MRY-A1
FCC ID	U4FBT-MRY-A1
ETS CATEGORY	Bluetooth Low Energy
TYPE OF RADIO DEVICE	Transceiver
FREQUENCY BAND	2400 – 2483.5MHz
NUMBER OF CHANNELS	40
CHANNEL BANDWIDTH	2MHz
CHANNEL SPACING	2MHz
TYPE OF MODULATION	GFSK
SENSITIVITY	-96.5dBm
TRANSFER RATES (Mbit/s)	Up to 1
ANTENNA TYPE (Information provided by Customer)	PCB Antenna
ANTENNA GAIN (Information provided by Customer)	+0.5dBi

5.2.1 Channel List Bluetooth Low Energy

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

5.3 Bluetooth Classic module technical data

MODULE MANUFACTURER	DATALOGIC ™		
MODEL NAME	BT-MRY-A1		
FCC ID	U4FBT-MRY-A1		
ETS CATEGORY	Classic Bluetooth - Basic Rate & Enhanced Data Rate		
TYPE OF RADIO DEVICE	Transceiver		
FREQUENCY BAND	2400 – 2483.5MHz		
NUMBER OF CHANNELS	79		
CHANNEL BANDWIDTH	1MHz		
CHANNEL SPACING	1MHz		
MODE	Basic Rate mode (BR)	Enhanced Data Rate (EDR)	
TYPE OF MODULATION	GFSK	$\pi/4$ -DQPSK	8DQPSK
PACKET TYPE	DH5	2DH5	3DH5
SENSITIVITY	-89.5dBm		
TRANSFER RATES (Mbit/s)	Up to 3		
ANTENNA TYPE (Information provided by Customer)	PCB Antenna		
ANTENNA GAIN (Information provided by Customer)	+0.5dBi		

5.3.1 Classic Bluetooth Channels list

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

5.4 Ports identification

PORT	DESCRIPTION	CONNECTION	NOTES
<input checked="" type="checkbox"/> Enclosure	Plastic	Screw	---
<input checked="" type="checkbox"/> AC power input	230V~50Hz from AC/DC adapter	Plug	<3mt
<input type="checkbox"/> DC power input	Port not present	---	---
<input type="checkbox"/> Wired network	Port not present	---	---
<input checked="" type="checkbox"/> Signal / Control port	USB	Type A Type C	<3mt
<input type="checkbox"/> Antenna port	<input checked="" type="checkbox"/> Internal; <input type="checkbox"/> External		

Note:

During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

5.5 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

5.6 Auxiliary equipment

- Laboratory personal computer model **SATELLITE**, manufactured by **TOSHIBA**, with software Tera Term, used to set BLE and BT channels.

6. REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	DESCRIPTION
KDB 996369 D04_v02 (October 13, 2020)	Modular Transmitter Integration Guide – Guidance for host product Manufacturers
Title 47 Part 15 Subpart C	Radio frequency devices - Unintentional Radiators
Title 47 Part 15 Subpart C § 15.247	Radio frequency devices - Unintentional Radiators Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz
ANSI C63.10:2013	American National Standard for Testing Unlicensed Wireless Devices

7. OPERATING TEST MODES AND TEST CONDITIONS

In the following table there are the operating conditions adopted during tests identified by an indicator (#) at which has been referred the item "Operating condition of the equipment under test".

OPERATING CONDITION	DESCRIPTION
#1	BLE continuous transmission, modulated carrier. WPT active at max charging power.
#2	BT continuous transmission, modulated carrier. WPT active at max charging power.

8. UNITS OF MEASUREMENTS

Conducted EMI Data is in dB μ V; dB referenced to one microvolt

Radiated EMI Data is in dB μ V/m; dB/m referenced to one microvolt per meter

Sample Calculation:

RFS = Radiated Field Strength,

FSM = Field Strength Measured,

A.F. = Receive antenna factor,

Gain = amplification gains and/or cable losses.

$$\text{RFS (dB}\mu\text{V/m @ 3m)} = \text{FSM (dB}\mu\text{V)} + \text{A.F. (dB/m)} - \text{Gain (dB)}$$

9. SUMMARY OF TEST RESULTS

According to KDB 996369 D04 – Module Integration Guide v02 (October 13, 2020), The Lab has executed only the Radiated Spurious Emission test to verify compliance with the FCC standard.

9.1 Emission tests

SUMMARY OF TEST RESULTS				
Port	Test	Reference Standard	Operating Condition ¹	Results
Antenna	Radiated emissions 9kHz ÷ 10th harmonic	Title 47 Part 15 Subpart C § 15.247 (d)	#1, #2	Within the limits

¹ Ref. Tab. of Section 7

10. TEST RESULTS

RADIATED EMISSION 9kHz ÷ 10th Harmonic..... 12

TEST 1.

RADIATED EMISSION 9kHz ÷ 10th HARMONIC

REFERENCE DOCUMENT	<p>According to §15.247) d)</p> <p>In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 Db instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)).</p>
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• TEST LOCATION	Semi-Anechoic Chamber							
• DISTANCE OF MEASUREMENT	3m							
• TYPE OF MEASUREMENT	Radiated							
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to		
	Receiver	Rohde & Schwarz	ESU40	100111	03/2023	03/2024		
	Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2023	02/2024		
	Network simulator	SPITZENBERGE R+SPIES	PAS5000	A154201/00595	02/2022	02/2024		
	Loop antenna	Rohde & Schwarz	HM 020	843885/006	12/2021	12/2024		
	Bi-log antenna	Chase	CBL6111C	2717	04/2022	04/2025		
	Horn antenna	Electro Metrics	EM-6961	6278	10/2023	10/2026		
	Horn antenna + low noise preamplifier	Bonn Elektronik	BLMA 1840-1A	262WL80452	07/2023	07/2025		
	High pass filter	Wainwright	WHK 1,3/15G	9	10/2023	10/2025		
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.			
• TESTED PORT	Antenna							
• TEST METHOD	ANSI C63.10:2013 section 6.3; FCC KDB 558074 sections 11							
• FREQUENCY RANGE	9kHz – 26GHz							
• LIMITS	Acc. To ref. Std.							
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty 9kHz – 30MHz = 4,24 dB Expanded uncertainty 30MHz – 1GHz = 5,72 dB Expanded uncertainty 1GHz – 18GHz = 5,15 dB Expanded uncertainty 18GHz – 26GHz = 5,82 dB							

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	86 - 106kPa (860mbar - 1060mbar)	960 mbar
Voltage		115V~60Hz AC/DC adapter

OPERATING CONDITION: #1, #2

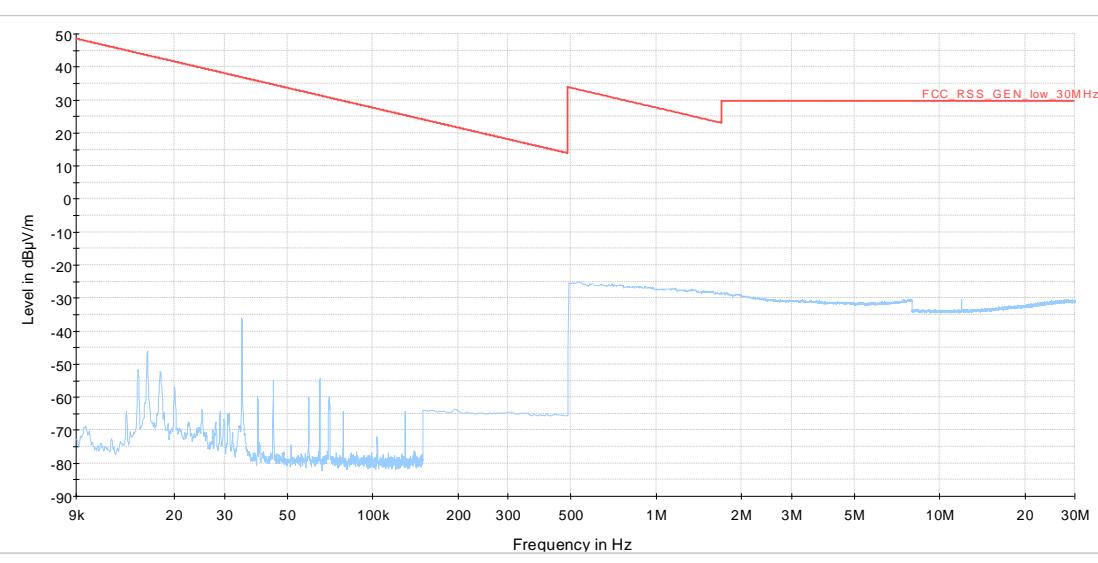
RESULT: WITHIN THE LIMITS

TEST RESULTS

Operative condition #1

Polarization	---
BLE Channel	39
Operating frequency	2480

Frequency Range: 9kHz – 30MHz

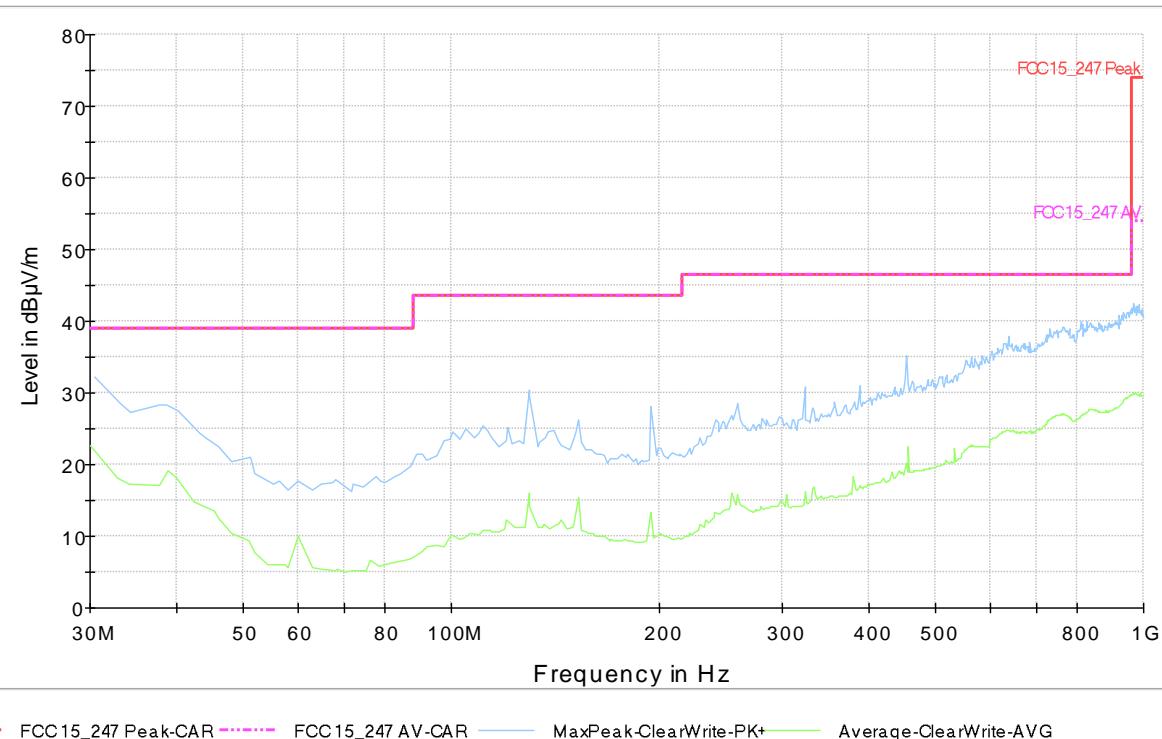


The measurement from 9 kHz to 490 kHz was performed at a distance of 3m and reported at 300m using the square of an inverse linear distance extrapolation factor (40 dB/decade), as described in FCC Cfr 47 part 15 - Subpart A - §15.31 (f) (2). Extrapolation factor from 300m to 3m = 80dB

The measurement from 490 kHz to 30 MHz was performed at a distance of 3m and reported at 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade), as described in FCC Cfr 47 part 15 - Subpart A - §15.31 (f) (2). Extrapolation factor from 30m to 3m = 40dB

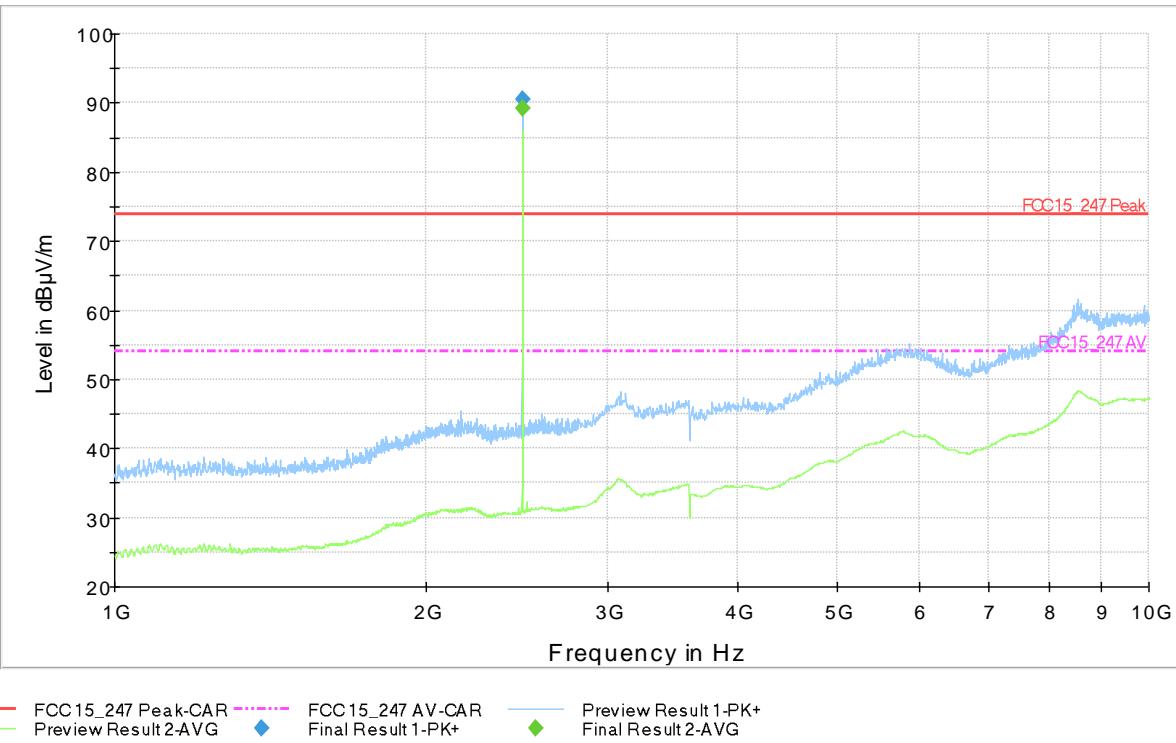
Polarization	Vertical
BLE Channel	39
Operating frequency	2480

Frequency Range: 30MHz – 1GHz



Polarization	Vertical
BLE Channel	39
Operating frequency	2480

Frequency Range: 1GHz – 10GHz



Final Result:

Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	90.5	99.8	7.0	-16.50	74.00

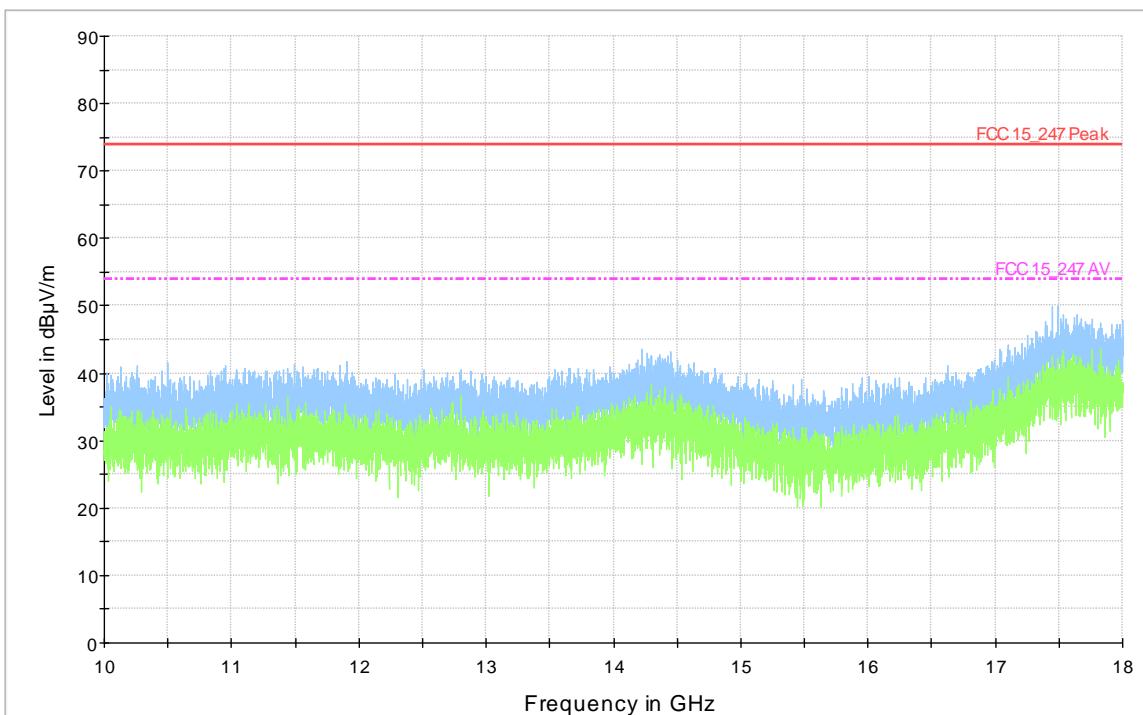
Final Result Average:

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	89.2	124.8	7.0	-35.20	54.00

NOTE: Peaks out of limits are due to BLE carrier.

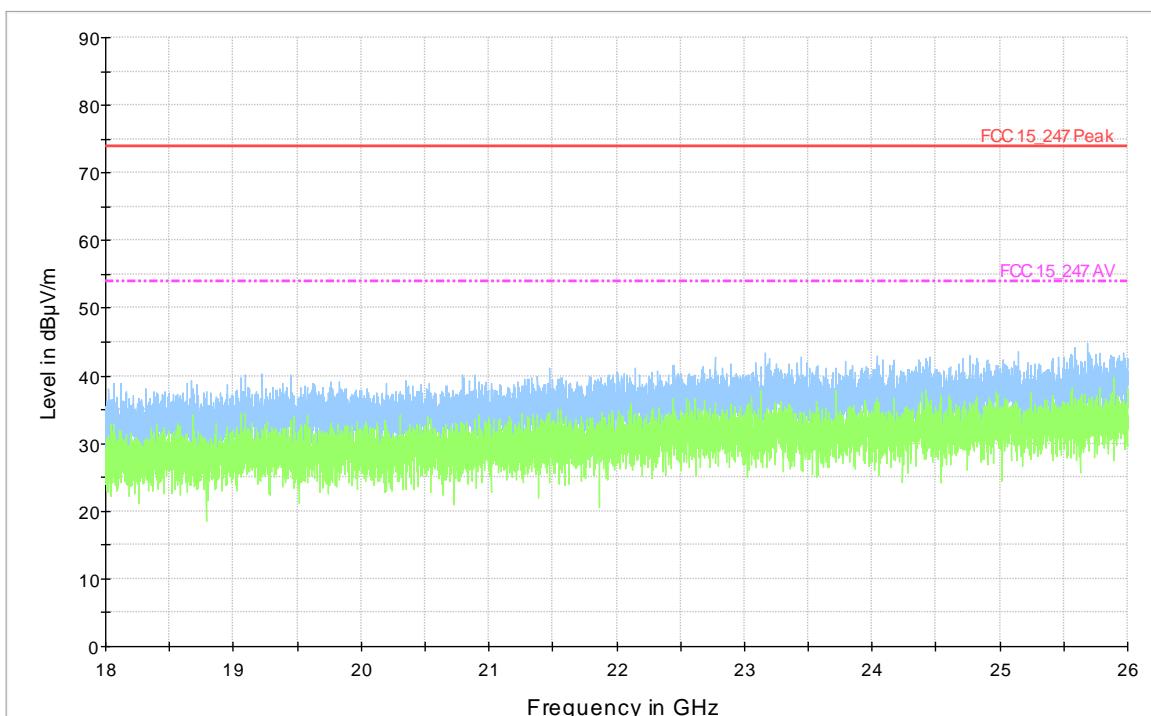
Polarization	Vertical
BLE Channel	39
Operating frequency	2480

Frequency Range: 10GHz – 18GHz



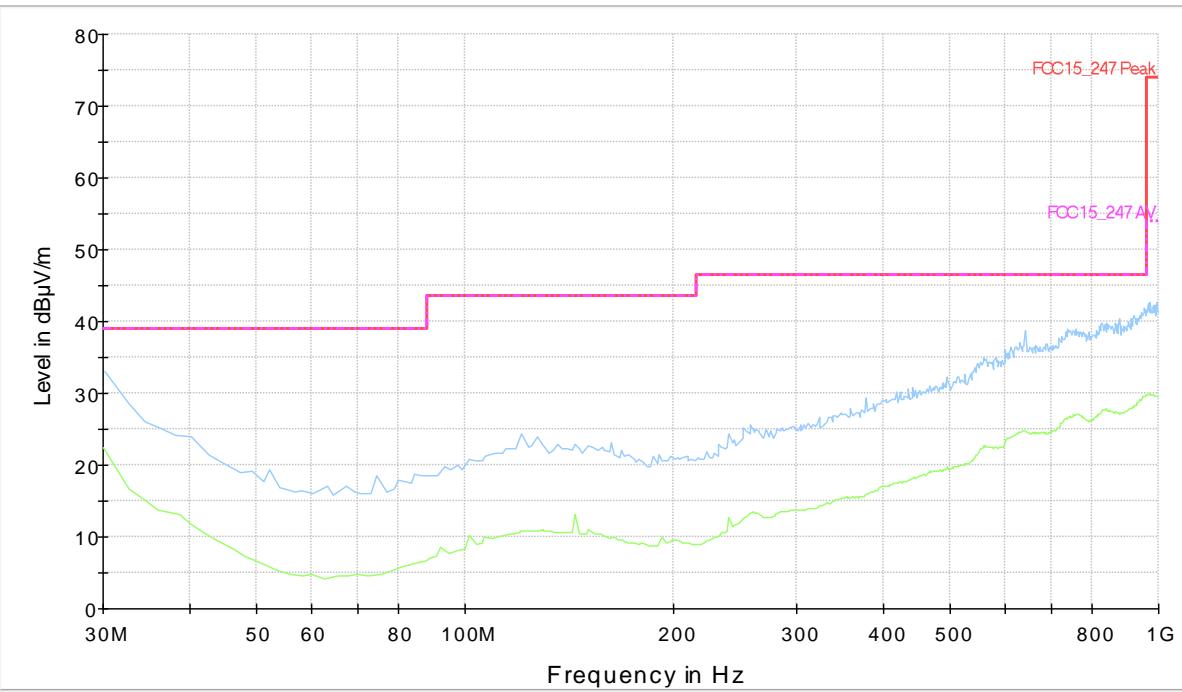
Polarization	Vertical
BLE Channel	39
Operating frequency	2480

Frequency Range: 18GHz – 26GHz



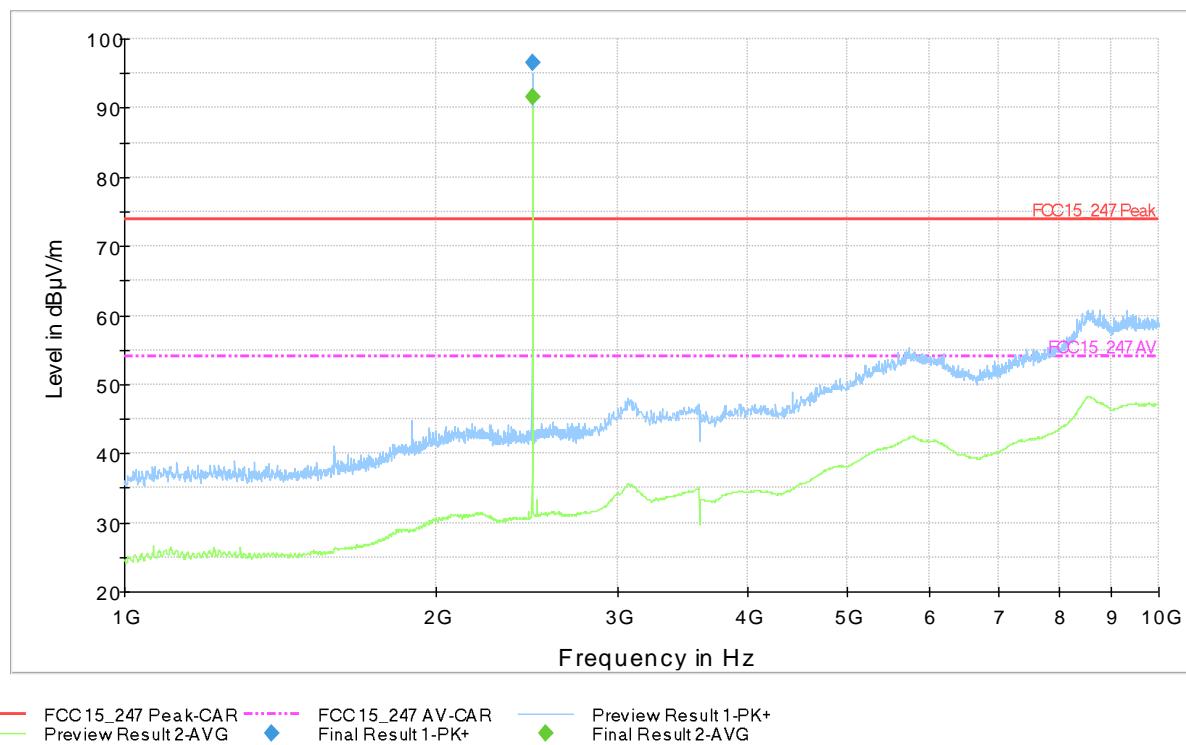
Polarization	Horizontal
BLE Channel	39
Operating frequency	2480

Frequency Range: 30MHz – 1GHz



Polarization	Horizontal
BLE Channel	39
Operating frequency	2480

Frequency Range: 1GHz – 10GHz



Final Result:

Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	96.5	104.7	172.0	-22.50	74.00

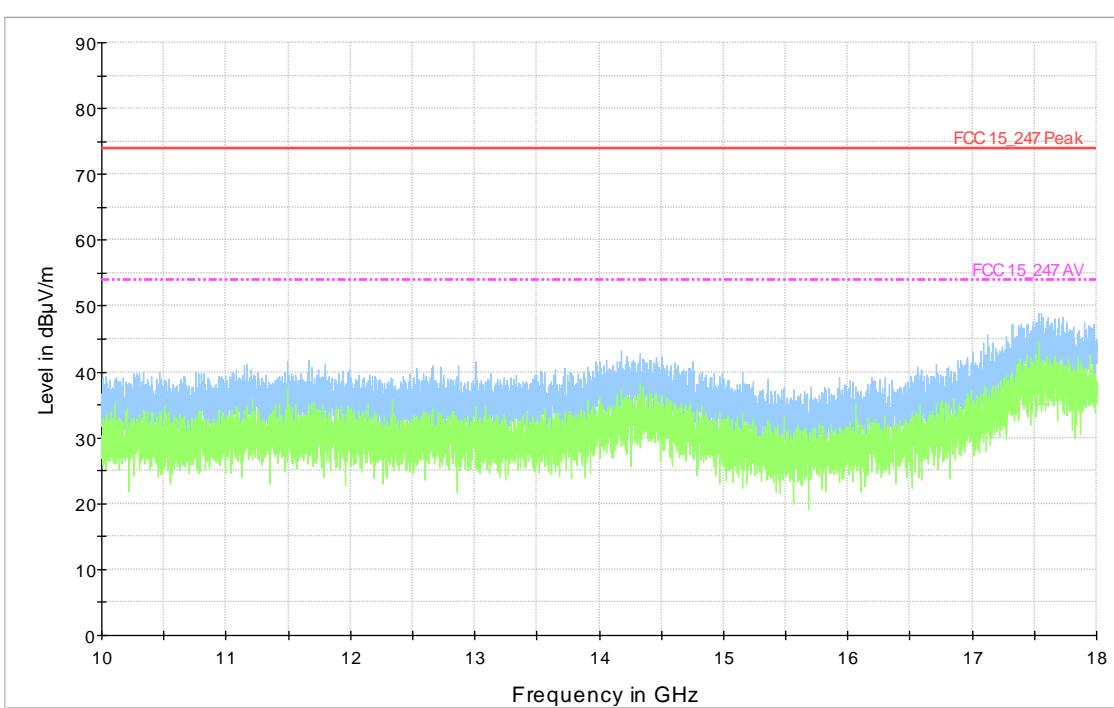
Final Result Average:

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	91.7	104.7	172.0	-37.70	54.00

NOTE: Peaks out of limits are due to BLE carrier.

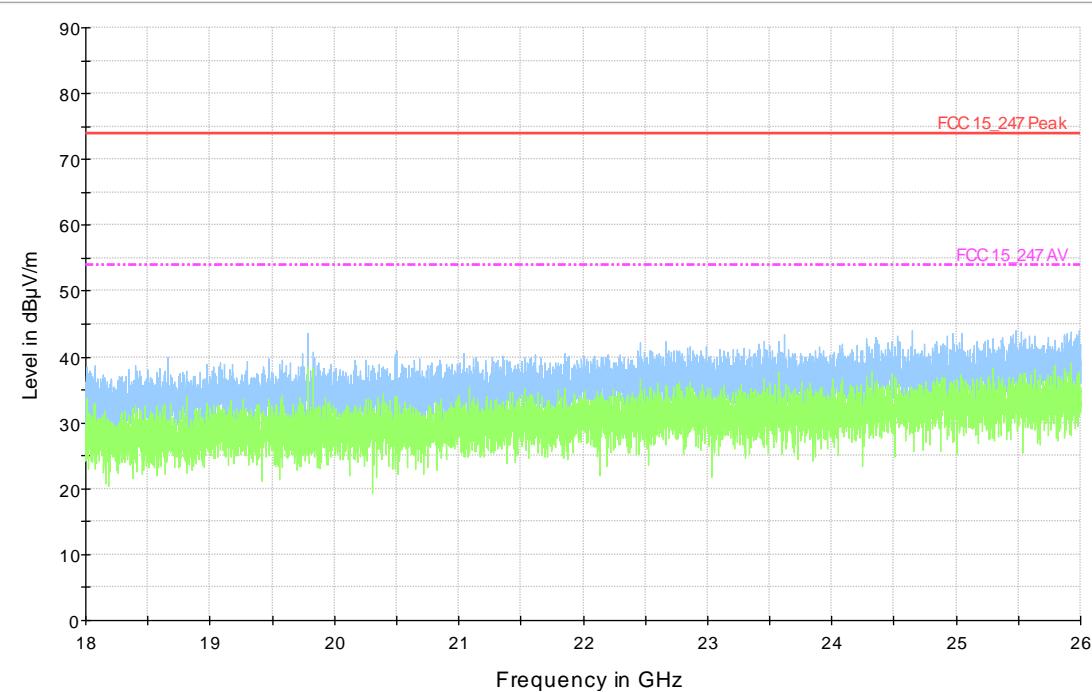
Polarization	Horizontal
BLE Channel	39
Operating frequency	2480

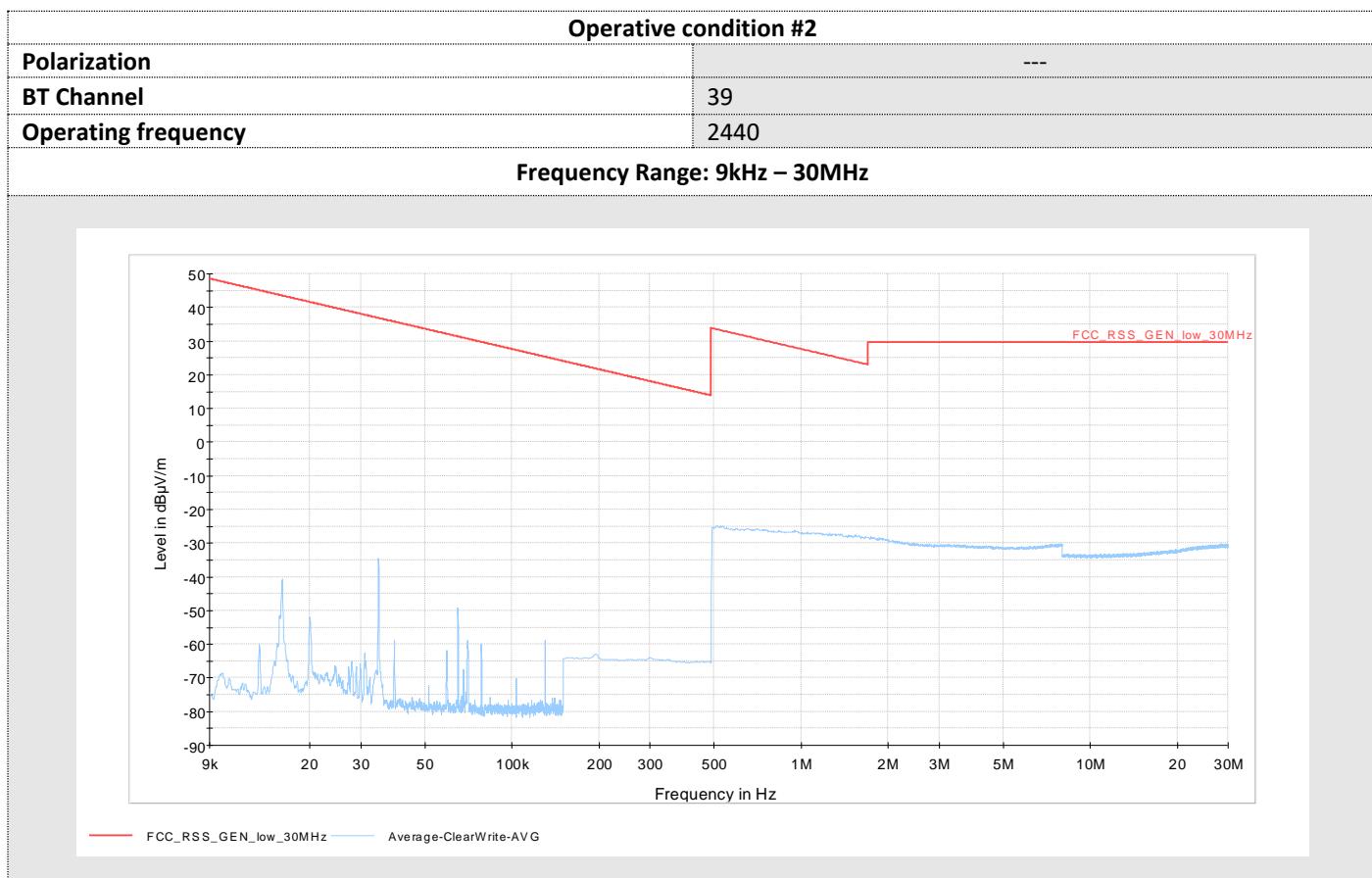
Frequency Range: 10GHz – 18GHz



Polarization	Horizontal
BLE Channel	39
Operating frequency	2480

Frequency Range: 18GHz – 26GHz



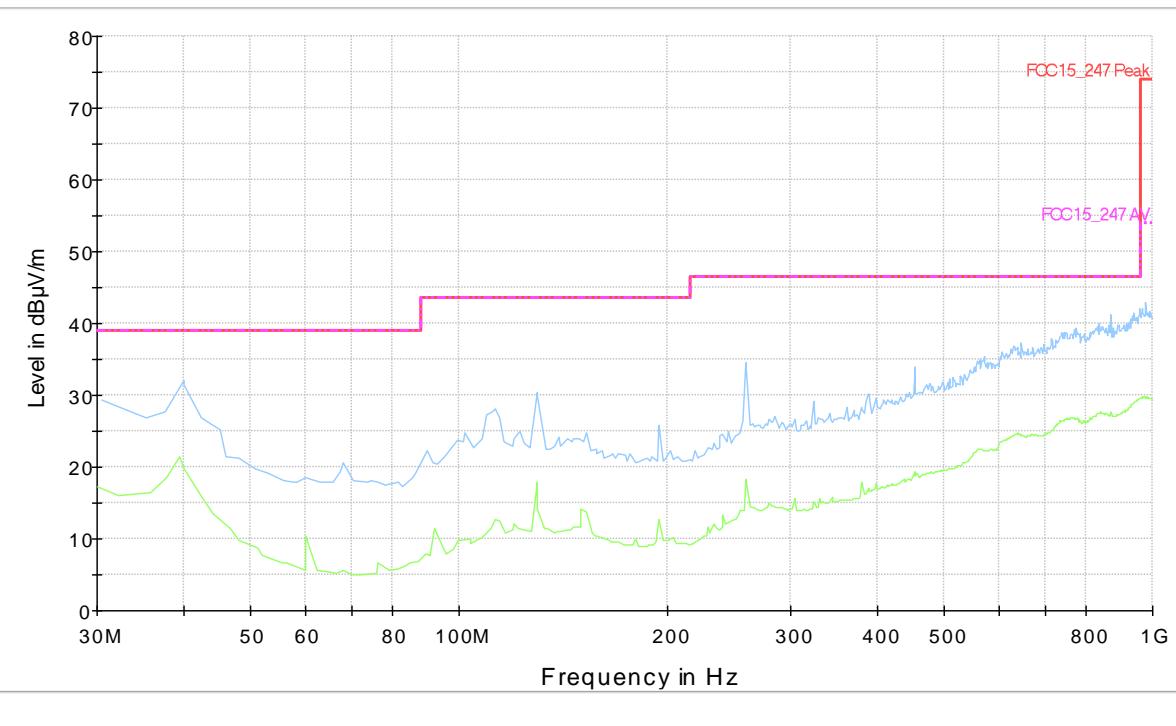


The measurement from 9 kHz to 490 kHz was performed at a distance of 3m and reported at 300m using the square of an inverse linear distance extrapolation factor (40 dB/decade), as described in FCC Cfr 47 part 15 - Subpart A - §15.31 (f) (2). Extrapolation factor from 300m to 3m = 80dB

The measurement from 490 kHz to 30 MHz was performed at a distance of 3m and reported at 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade), as described in FCC Cfr 47 part 15 - Subpart A - §15.31 (f) (2). Extrapolation factor from 30m to 3m = 40dB

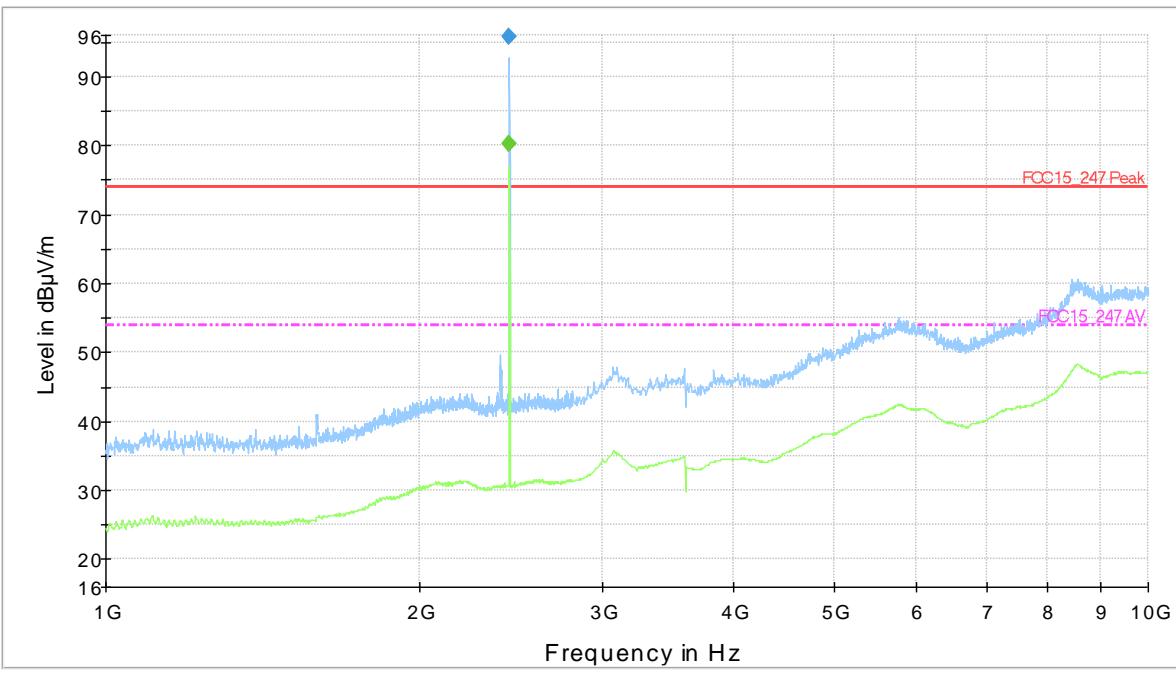
Polarization	Vertical
BT Channel	39
Operating frequency	2440

Frequency Range: 30MHz – 1GHz



Polarization	Vertical
BT Channel	39
Operating frequency	2440

Frequency Range: 1GHz – 10GHz



Final Result:

Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2440.000000	95.7	99.8	-8.0	-21.70	74.00

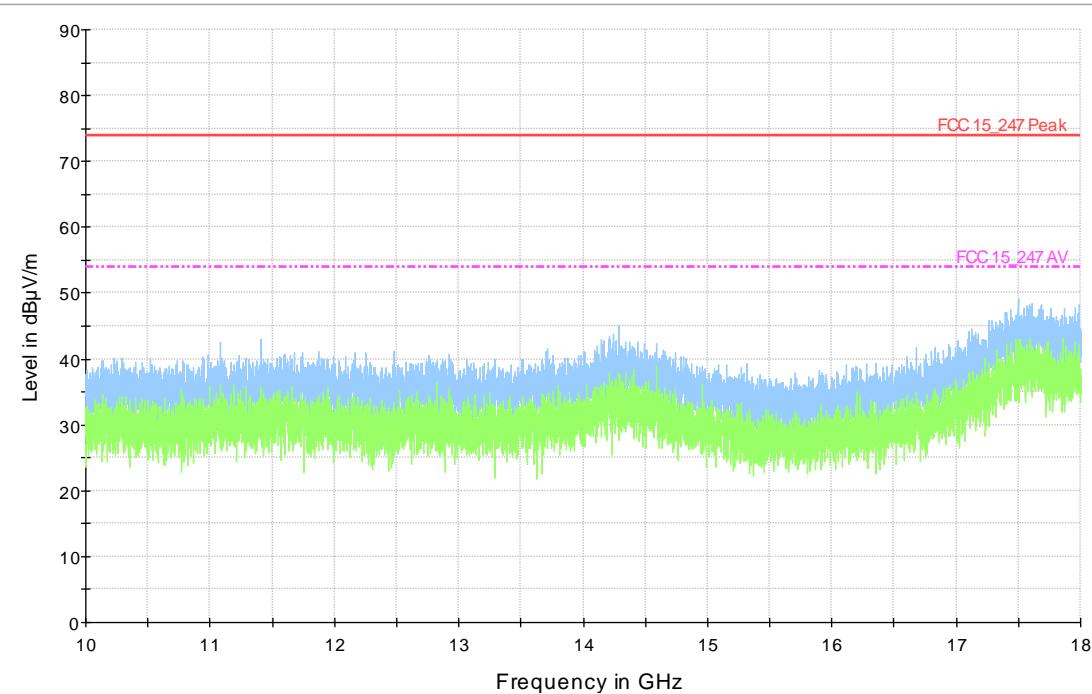
Final Result Average:

Frequency (MHz)	Average (dB μ V/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2440.000000	80.3	99.7	-8.0	-26.30	54.00

NOTE: Peaks out of limits are due to BT carrier.

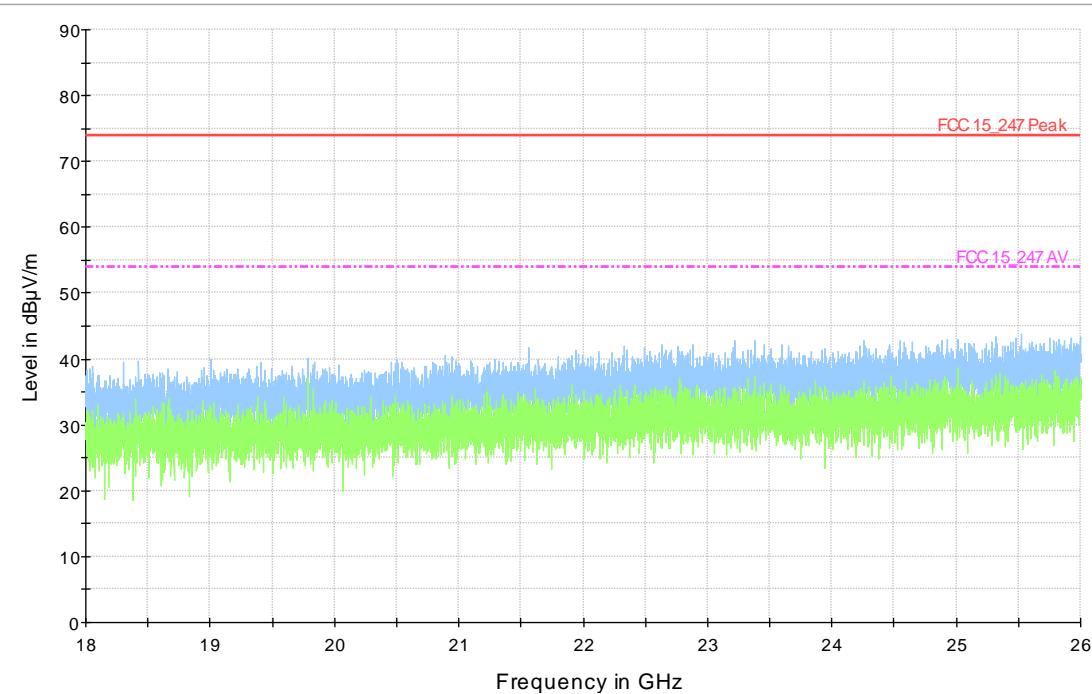
Polarization	Vertical
BT Channel	39
Operating frequency	2440

Frequency Range: 10GHz – 18GHz



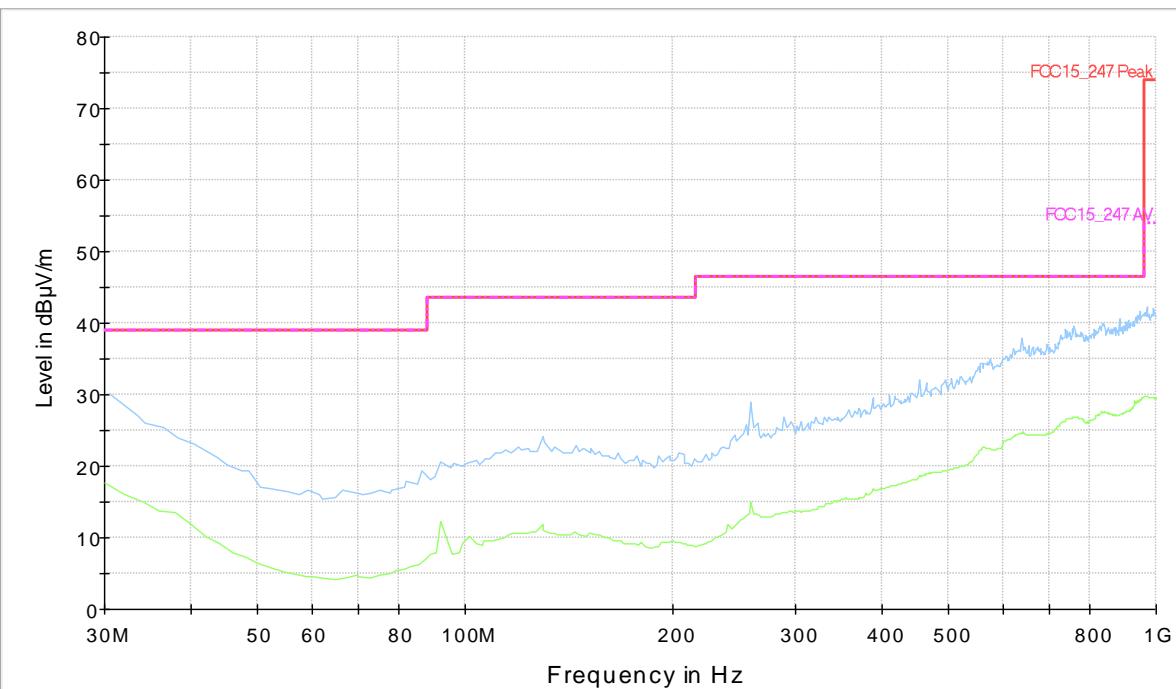
Polarization	Vertical
BT Channel	39
Operating frequency	2440

Frequency Range: 18GHz – 26GHz



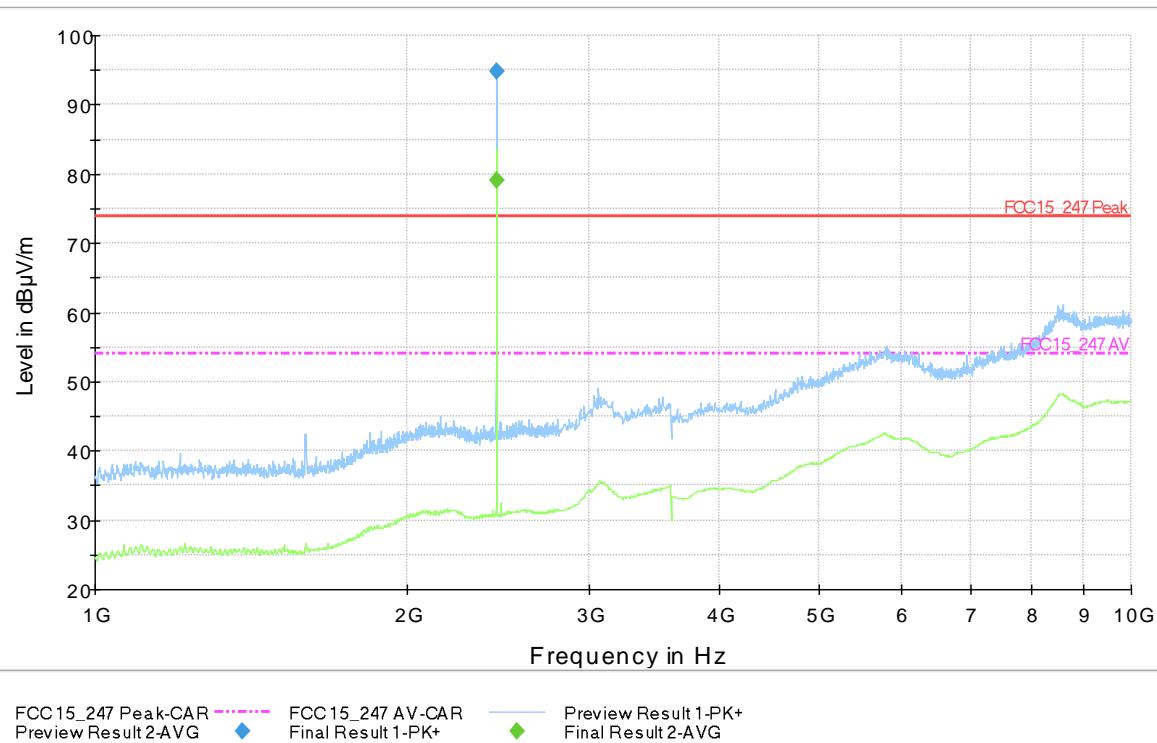
Polarization	Horizontal
BT Channel	39
Operating frequency	2440

Frequency Range: 30MHz – 1GHz



Polarization	Horizontal
BT Channel	39
Operating frequency	2440

Frequency Range: 1GHz – 10GHz



Final Result:

Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2440.000000	94.8	99.8	172.0	-20.80	74.00

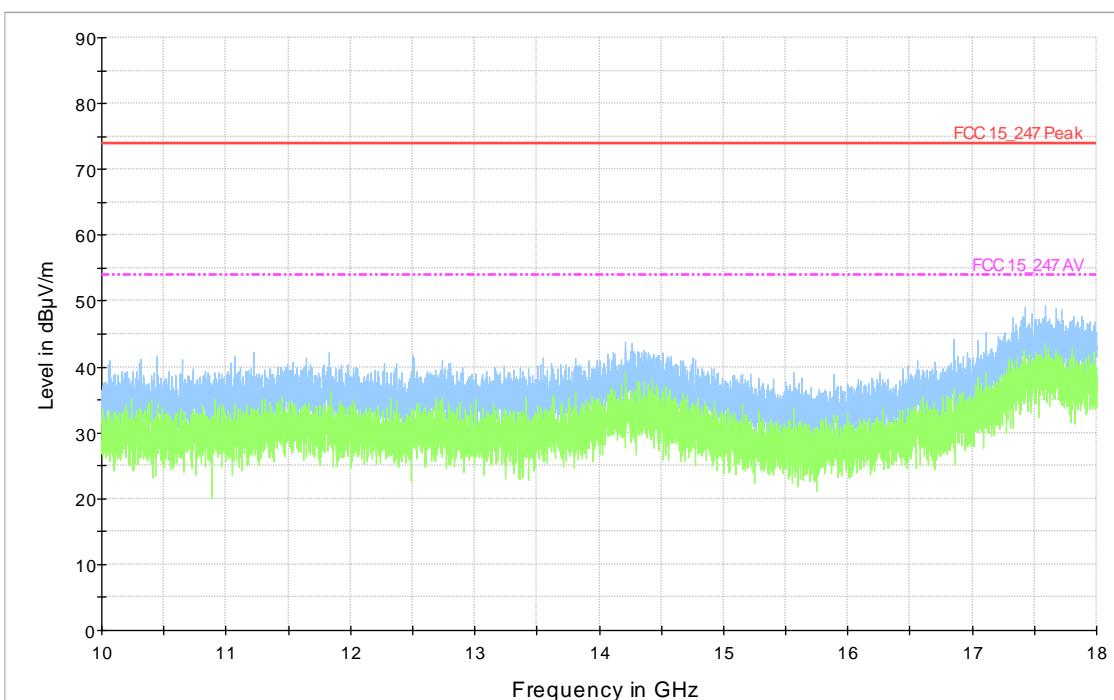
Final Result Average:

Frequency (MHz)	Average (dB μ V/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2440.000000	79.0	99.7	172.0	-25.00	54.00

NOTE: Peaks out of limits are due to BT carrier.

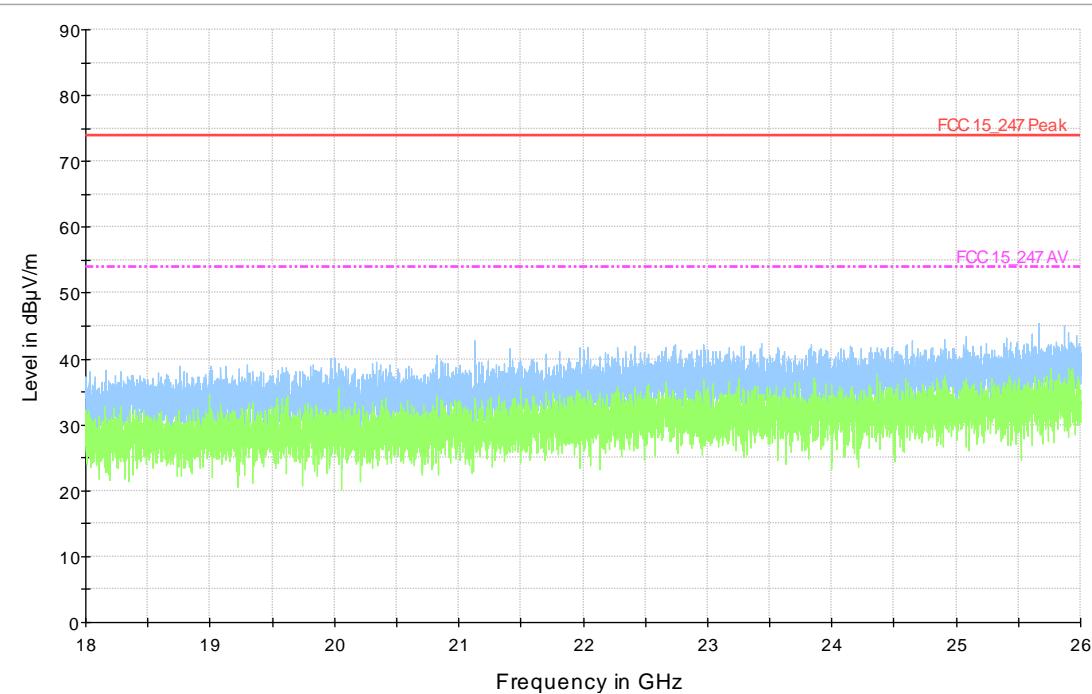
Polarization	Horizontal
BT Channel	0
Operating frequency	2402

Frequency Range: 10GHz – 18GHz



Polarization	Horizontal
BT Channel	0
Operating frequency	2402

Frequency Range: 18GHz – 26GHz



11. PHOTOGRAPHIC DOCUMENTATION

PHOTO N° 1 – EUT IDENTIFICATION



PHOTO N° 2 – AUXILIARY CABLE IDENTIFICATION

USB TYPE A (CAB 552 REV. P2)

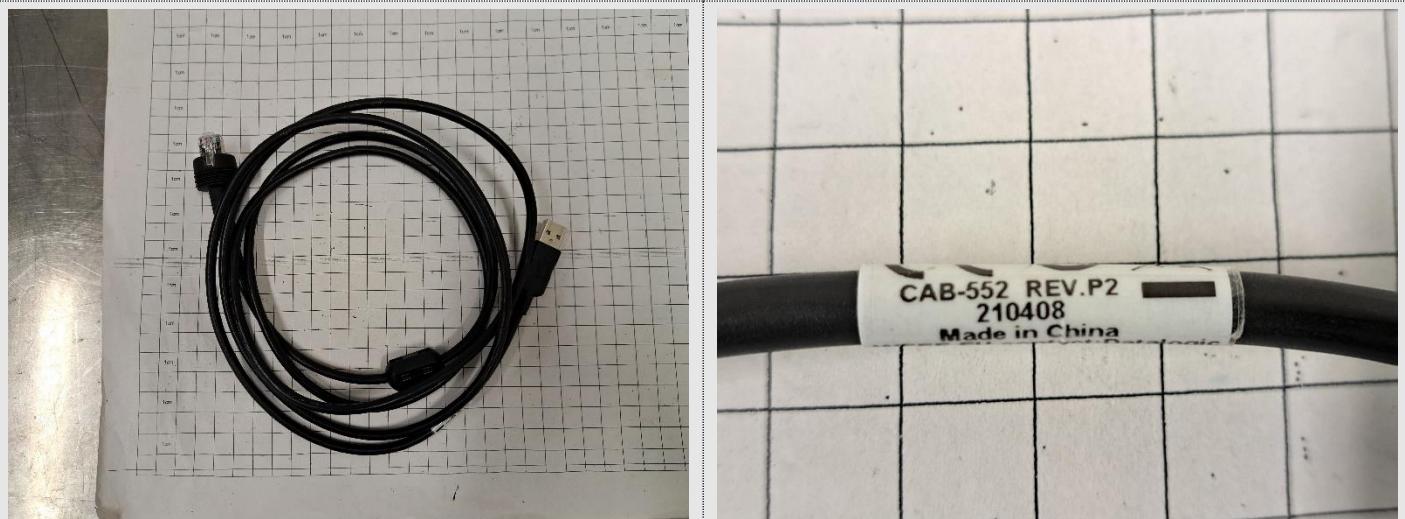
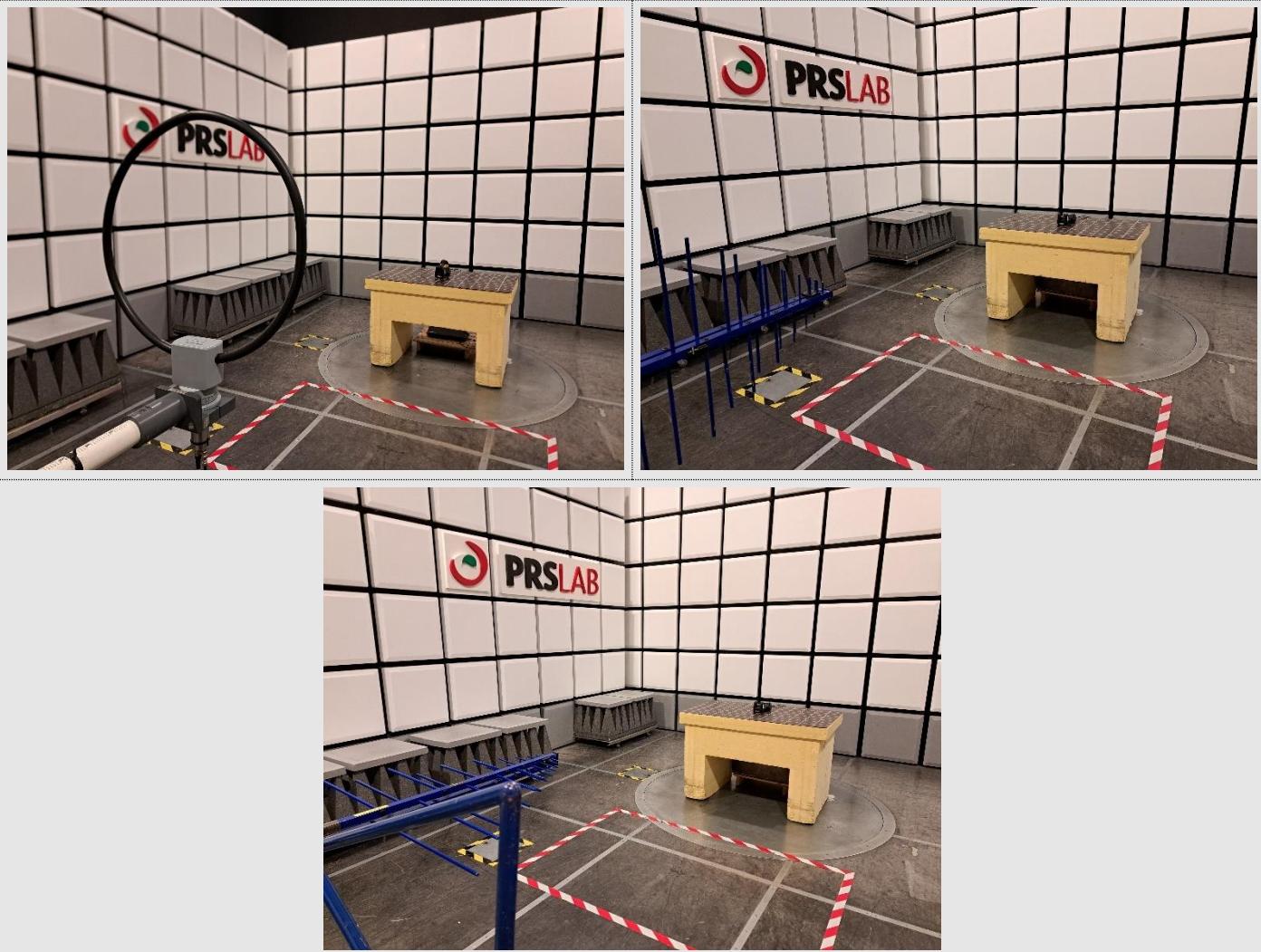


PHOTO N° 3 - RADIATED EMISSION TEST SETUP



END OF TEST REPORT