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Test report No:
2190851R-RF-US-P06V01

FCC TEST REPORT & ISED TEST REPORT

Product Name	Wireless Charger
Trademark	BCS
Model and /or type reference	WPC003-5
FCC ID	2AXPS-WPC003-5
Applicant´s name / address	BCS Automotive Interface Solutions(Suzhou)Co.,Ltd No.2052 Taidong Road Xiangcheng Economic Development District,215413 Suzhou China
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.10: 2013
Verdict Summary	IN COMPLIANCE
Documented by (name / position & signature)	Adma Lu/Project Engineer
Approved by (name / position & signature)	Jack Zhang/ Supervisor
Date of issue	2022-03-28
Report Version	V1.1
Report template No	Template_FCC Part 15C-RF-V1.0

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.
In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA 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 in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA 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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Dec. 27, 2021
Date (start test)	Jan. 19, 2022
Date (finish test)	Jan. 22, 2022

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.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT : Equipment Under Test
QP : Quasi-Peak
CAV : CISPR Average
AV : Average
CDN : Coupling Decoupling Network
SAC : Semi-Anechoic Chamber
OATS : Open Area Test Site
BW : Bandwidth
AM : Amplitude Modulation
PM : Pulse Modulation
HCP : Horizontal Coupling Plane
VCP : Vertical Coupling Plane
U_N : Nominal voltage
*T*x : Transmitter
*R*x : Receiver
N/A : Not Applicable
N/M : Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2190851R-RF-US-P06V01	V1.0	Initial issue of report.	2022-02-09
2190851R-RF-US-P06V01	V1.1	Modified frequency range	2022-03-28

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
    - Chapter 1.1 General Description of the Item(s);
    - Chapter 1.2 Antenna Informaion;
    - Chapter 1.3 Channel List.

USED EQUIPMENT

AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100906	2021.03.20	2022.03.19
Two-Line V-Network	R&S	ENV216	101190	2021.01.27	2022.01.26
Two-Line V-Network	R&S	ENV216	101044	2021.03.20	2022.03.19
Current Probe	R&S	EZ-17	100678	2021.01.27	2022.01.26
50ohm Termination	SHX	TF2	07081402	2021.09.22	2022.09.21
50ohm Termination	SHX	TF2	07081403	2021.09.22	2022.09.21
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2021.08.12	2022.08.11
Coaxial Cable	Suhner	RG 223	TR1-C1	2021.08.12	2022.08.11
Coaxial Cable	Suhner	RG 223	TR1-C2	2021.08.12	2022.08.11
Dekra test software	Dekra	-	-	-	-

Radiated Emission(30MHz-1GHz) / AC2

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2021.12.05	2022.12.04
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2021.08.18	2022.08.17
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2021.08.12	2022.08.11
Coaxial Cable	Huber+Suhner	RG 214	AC2-C	2021.03.31	2022.03.30
Dekra test software	Dekra	-	-	-	-

UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95% .

Test item	Uncertainty
AC Power Line Conducted Emission	9kHz~150kHz: 2.80dB 150kHz~30MHz: 2.40dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 3.50 dB 300MHz~1GHz: 3.60 dB Vertical: 30MHz~200MHz: 3.60 dB 300MHz~1GHz: 3.50 dB
Occupied Bandwidth	±150Hz

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name..... :	Wireless Charger
Model No. ..... :	WPC003-5
Trademark ..... :	BCS
FCC ID ..... :	2AXPS-WPC003-5
Manufacturer..... :	BCS Automotive Interface Solutions(Suzhou)Co.,Ltd
Manufacturer address ..... :	No.2052 Taidong Road Xiangcheng Economic Development District, 215413 Suzhou China

Operating Frequency Range ..... :	110~300 kHz
Type of Modulation..... :	ASK
Number of Channel..... :	1
Operating Temperature Range..... :	-40℃ ~ 85 ℃

Rated power supply .....:	Voltage and Frequency	
	☐	AC: 220 – 240 V, 50/60 Hz
	☐	AC: 110 – 130 V, 50/60 Hz
	☒	DC: 12 V
	☒	Battery: 12 Vdc
Mounting position.....:	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held equipment
	☒	Other: vehicle-mounted equipment

1.2 Antenna Information

Antenna model / type number.....:	N/A			
Antenna serial number .....:	N/A			
Antenna Delivery .....:	☒	1TX + 1RX		
	☐	2TX + 2RX		
	☐	Others:……		
Antenna technology.....:	☒	SISO		
	☐	MIMO	☐	CDD
			☐	Beam-forming
Antenna Type.....:	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☐	Ceramic Chip
			☐	PIFA
			☐	PCB
			☒	Others: Coil antenna
Antenna Gain.....:	N/A			

1.3 Channel List

Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	110.8 kHz	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Note: The General Description of the Item , antenna information and Channel List for the EUT in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

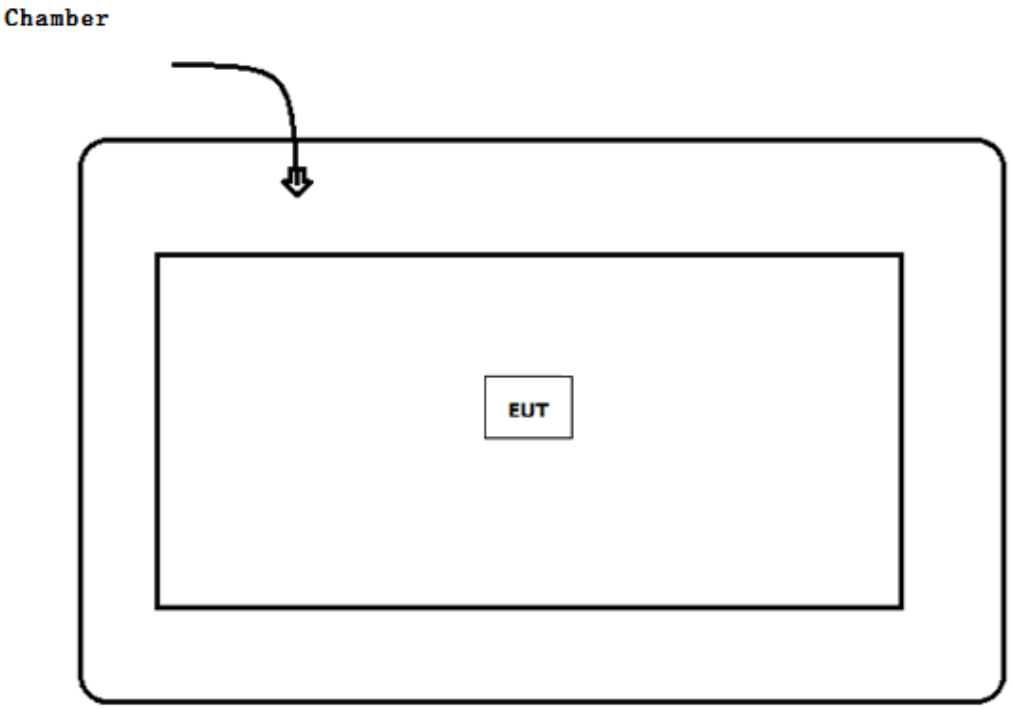
Test Mode For WPT	Mode 1: Transmit

2.2 Auxiliary equipment / Test software for the EUT

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
N/A	N/A	N/A	N/A
software	Type / Version	Manufacturer	Supplied by
N/A	N/A	N/A	N/A

2.3 Test Configuration / Block diagram used for tests

Test setup Diagram- Radiated Test



2.4 Testing process

1	Setup the EUT as shown in Section 2.3.
2	Turn on the power of equipment.
3	Verify that the EUT works properly.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C	2021	Intentional Radiators
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

(Please define the deviations from the standard(s) if applicable)

3.3 Overview of results

Requirement – Test case	Basic standard(s)	Verdict	Remark
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C Section 15.207	N/A	---
Field Strength of Spurious	FCC CFR Title 47 Part 15 Subpart C Section 15.209	PASS	---
Channel Bandwidth	FCC CFR Title 47 Part 15 Subpart C Section 15.215(c)	PASS	---
Antenna Requirement	FCC CFR Title 47 Part 15 Subpart C: Section 15.203	PASS	---

3.4 Test Facility

USA	**:**	**FCC Designation Number: CN1199**

4 TEST RESULTS

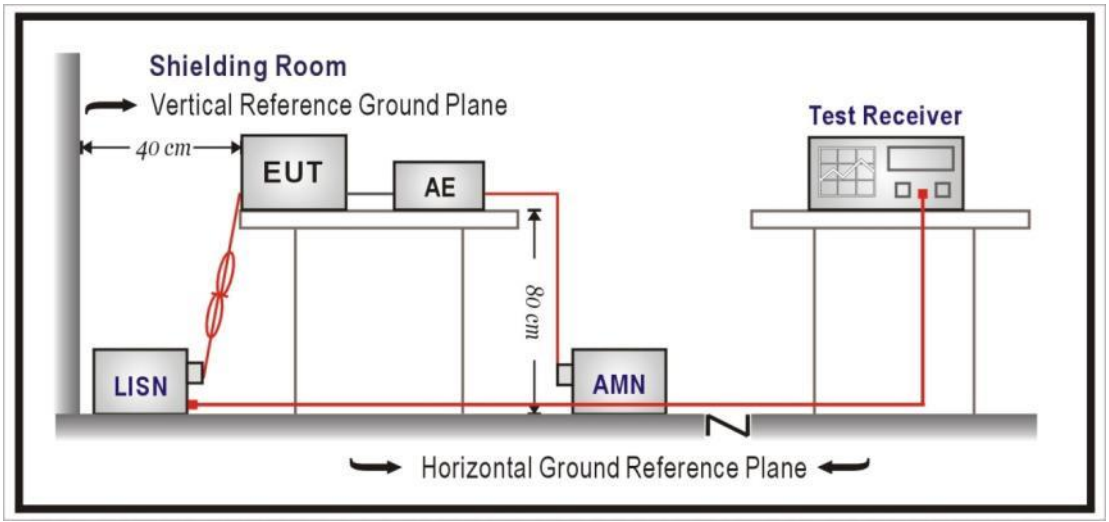
4.1 AC Power Line Conducted Emission	VERDICT: N/A

4.1.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.207	
Frequency range [MHz]	Limit: QP [dB(μV)[1)]]	Limit: AV [dB(μV) [1)]]
0,15 - 0,50	66 – 56 [2)]	56 - 46 [2)]
0,50 - 5,0	56	46
5,0 - 30	60	50

[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.
NOTE 1: The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.
NOTE 2: Where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

4.1.2 Test Setup



4.1.3 Test Procedure

	References Rule	Chapter	Item
☒	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices

4.1.4 Test Data

Note: The product is vehicle-mounted equipment and powered by DC, so that this item is not applicable.

4.2 Radiated emission — VERDICT: PASS

4.2.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30(Note 1)
1.705 - 30	30	29.5	30(Note 1)
30 - 88	100	40	3(Note 2)
88 - 216	150	43.5	3(Note 2)
216 - 960	200	46	3(Note 2)
Above 960	500	54	3(Note 2)

Note 1: The tighter limits apply at the band edges.

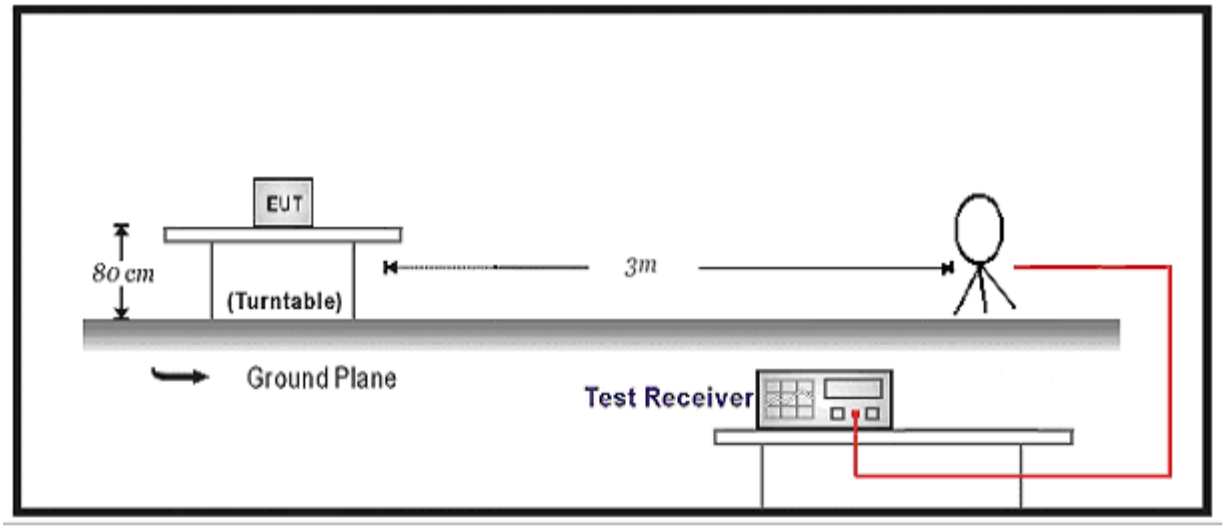
Note 2: Measurements were performed at 10m and the data was extrapolated to the specified measurement distance of 300m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = 40 log10(300/10) = 59dB for example.

Measurements were performed at 10m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = 40 log10(30/10) = 19dB for example.

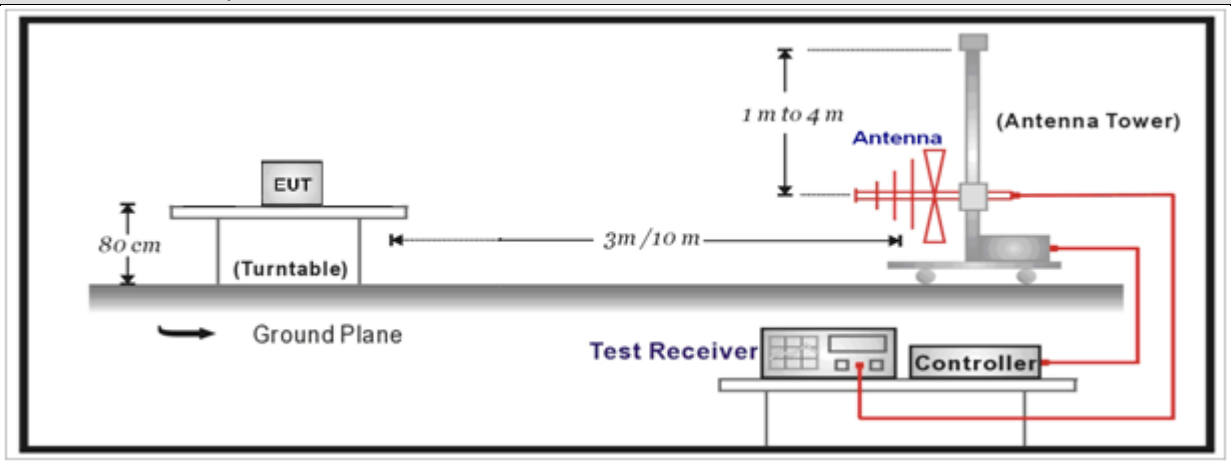
Note 3: All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.

4.2.2 Test Setup

Below 30MHz Test Setup:



30MHz-1GHz Test Setup:

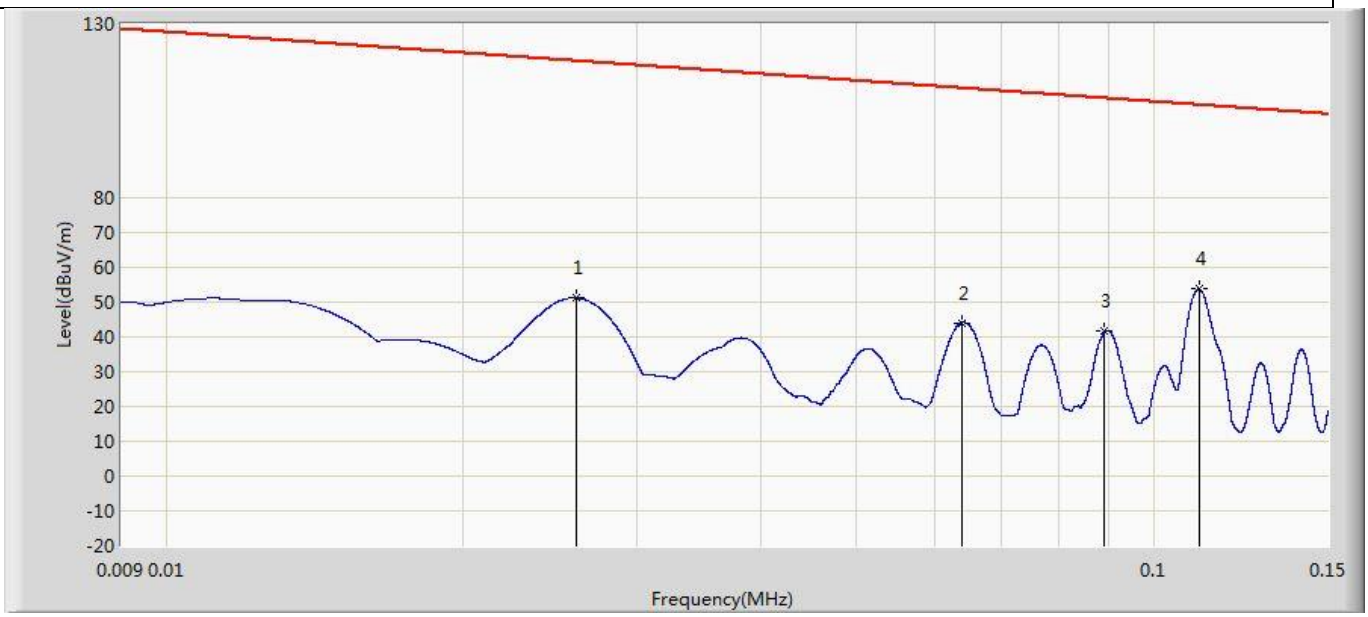


4.2.3 Test Procedure

	References Rule		Chapter	Description
☒	ANSI C63.10		11.12	Emissions in restricted frequency bands
	☒ ANSI C63.10		11.12.1	Radiated emission measurements
	☒ ANSI C63.10		11.12.2.7	Radiated spurious emission test
		☒ ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
		☒ ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
		☐ ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

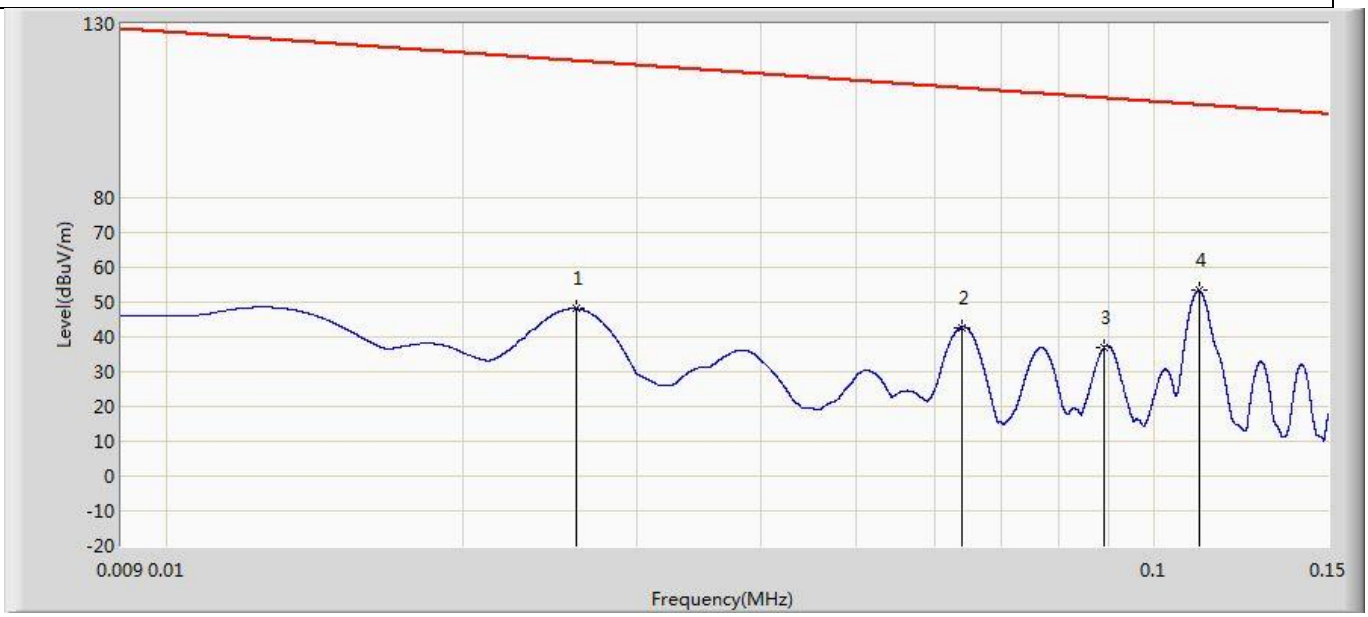
4.2.4 Test Data

Profile: 2190851R	Page No.: 5
Engineer: Julius zhou	
Site: AC2	Time: 2022/01/21 - 18:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: RF(0.009-30MHz)	Polarity: Horizontal
EUT: WPC003-5	Power: DC 12V
Note: Mode 1	



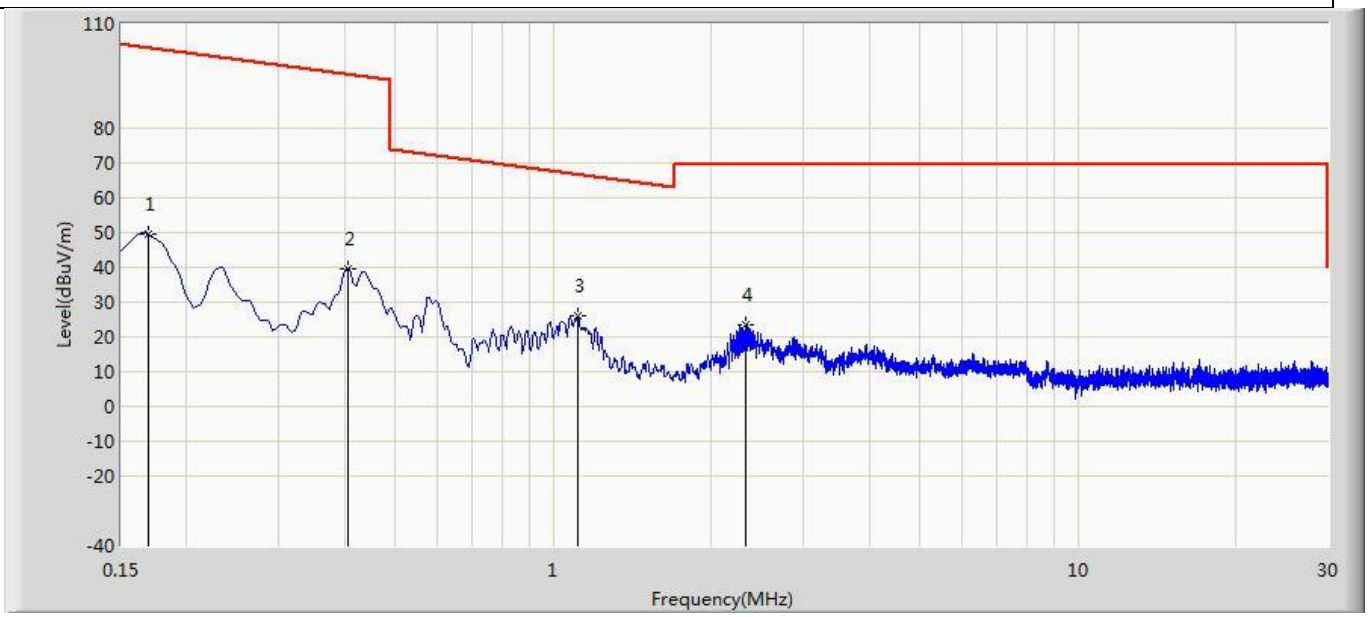
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.026	51.130	29.587	-68.160	119.290	21.544	PK
2		0.064	44.064	22.138	-67.407	111.471	21.926	PK
3		0.089	41.725	19.830	-66.883	108.608	21.895	PK
4	*	0.111	53.849	31.979	-52.841	106.690	21.870	PK

Profile: 2190851R	Page No.: 6
Engineer: Julius zhou	
Site: AC2	Time: 2022/01/21 - 18:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: RF(0.009-30MHz)	Polarity: Vertical
EUT: WPC003-5	Power: DC 12V
Note: Mode 1	



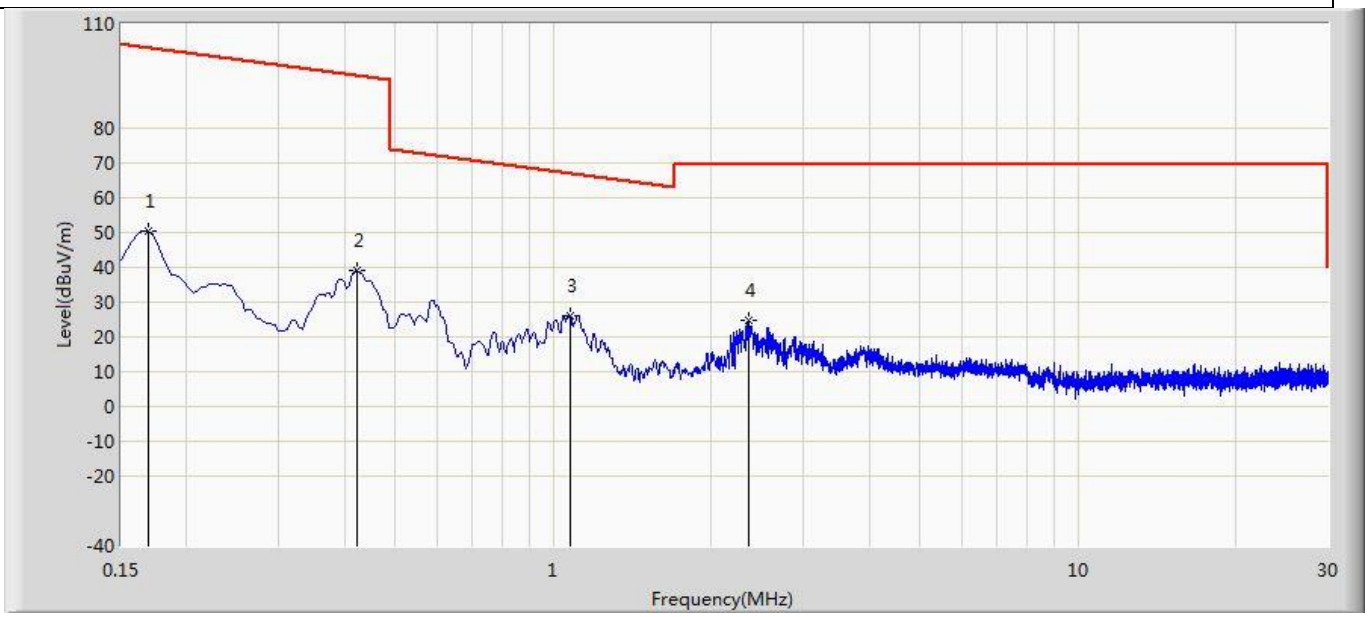
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.026	48.120	27.077	-71.170	119.290	21.044	PK
2		0.064	42.813	21.387	-68.658	111.471	21.426	PK
3		0.089	37.085	15.690	-71.523	108.608	21.395	PK
4	*	0.111	53.369	31.999	-53.321	106.690	21.370	PK

Profile: 2190851R	Page No.: 3
Engineer: Julius zhou	
Site: AC2	Time: 2022/01/21 - 19:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: RF(0.009-30MHz)	Polarity: Horizontal
EUT: WPC003-5	Power: DC 12V
Note: Mode 1	



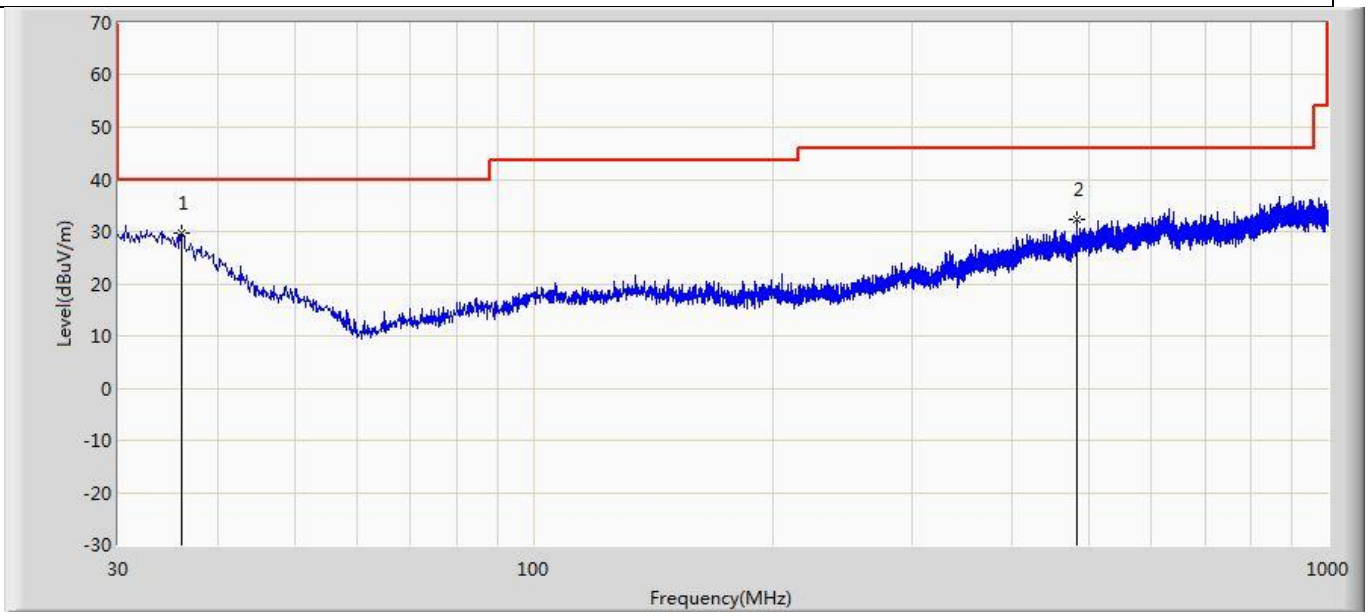
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.169	49.688	27.877	-53.354	103.041	21.811	PK
2		0.407	39.644	18.092	-55.767	95.411	21.552	PK
3	*	1.113	26.015	5.994	-40.679	66.694	20.021	PK
4		2.333	23.584	2.727	-45.916	69.500	20.857	PK

Profile: 2190851R	Page No.: 4
Engineer: Julius zhou	
Site: AC2	Time: 2022/01/21 - 18:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: RF(0.009-30MHz)	Polarity: Vertical
EUT: WPC003-5	Power: DC 12V
Note: Mode 1	



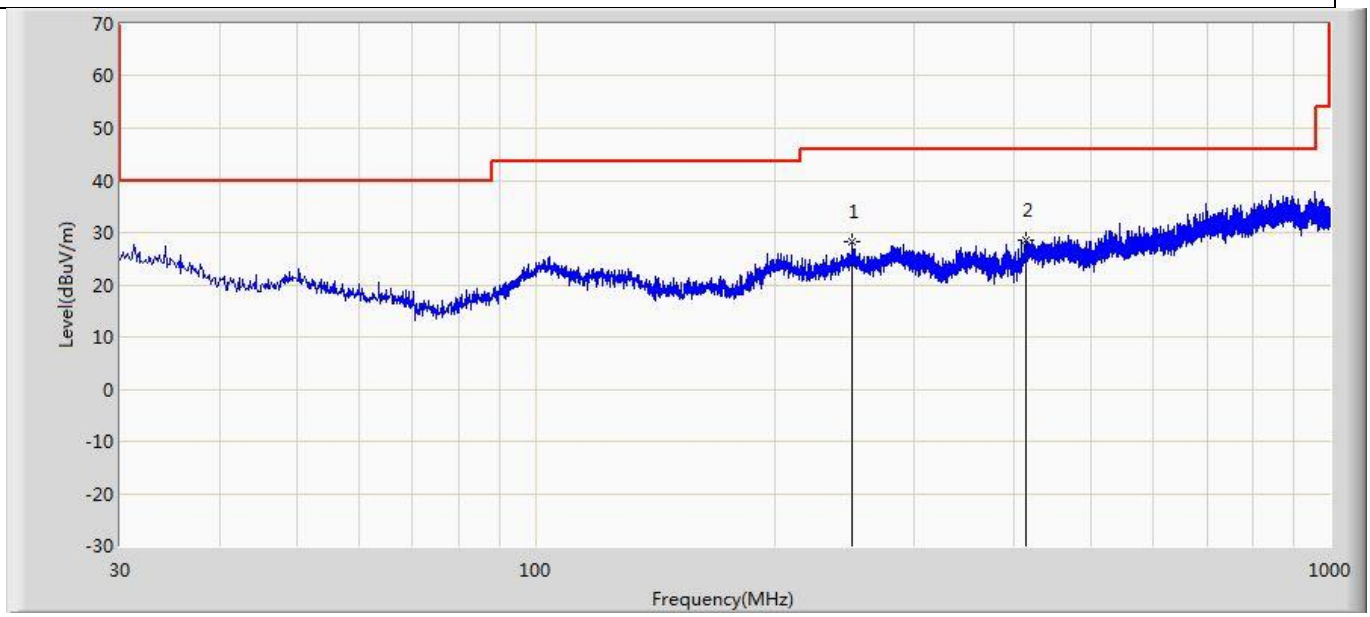
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.169	50.290	28.979	-52.752	103.041	21.311	PK
2		0.422	39.200	18.163	-55.897	95.097	21.037	PK
3	*	1.075	26.079	6.596	-40.916	66.995	19.483	PK
4		2.363	24.789	4.431	-44.711	69.500	20.358	PK

Profile: 2190851R	Page No.: 1
Engineer: Julius zhou	
Site: AC2	Time: 2022/01/21 - 09:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: WPC003-5	Power: DC 12V
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	36.062	29.572	3.577	-10.428	40.000	25.996	PK
2		482.384	32.326	5.005	-13.674	46.000	27.320	PK

Profile: 2190851R	Page No.: 2
Engineer: Julius zhou	
Site: AC2	Time: 2022/01/21 - 18:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: WPC003-5	Power: DC 12V
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		250.190	28.344	3.881	-17.656	46.000	24.463	PK
2	*	413.999	28.695	2.922	-17.305	46.000	25.772	PK

Note 1: The final result only applies for using QP detector, if the pre-test result on peak is lower than limit, then QP measurement needn't be performed.
Note 2: " * ", means this data is the worst emission level.
Note 3: Measurement Level = Reading Level + Factor(Probe+Cable-Amp).
Note 4: The orthogonal orientations (x/y/z) of the shielded loop antenna are evaluated, shown in the report is the worst data.

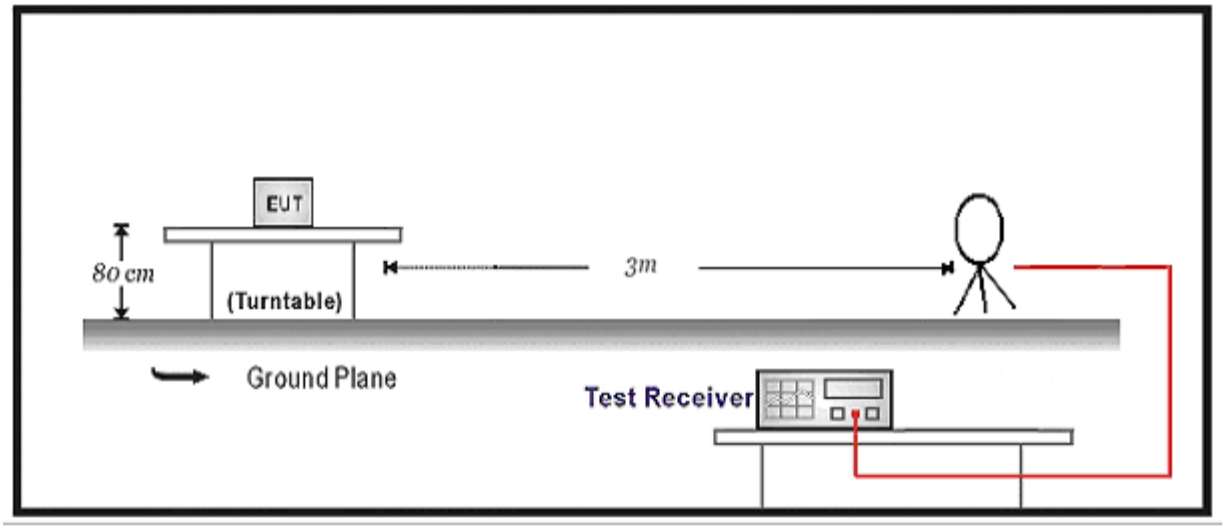
4.3 20dB Bandwidth	VERDICT: PASS

4.3.1 Limit

Standard	FCC Part 15 Subpart C

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3.2 Test Setup



4.3.3 Test Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with the RBW 1%~5% of 20dBc bandwidth and the VBW three times of the RBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3.4 Test Data

Mode	Test Freq. (kHz)	20dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)	Result
1	110.6	929	691	Pass

4.4 Antenna Requirement	VERDICT: PASS

4.4.1 Limit:	
Standard	FCC Part 15 Subpart C Paragraph 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsibby LE 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 eby LEctrical 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, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally instalby LEd, 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 instalby LEr shall be responsibby LE for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

4.4.2 Antenna Connector Construction:	
☒	The use of a permanently attached antenna
☐	The antenna use of a unique coupling to the intentional radiator
☐	The use of a nonstandard antenna jack or eby LEctrical connector

Pby LEase refer to the attached document “Internal Photograph” to show the antenna connector.

5 TEST SETUP PHOTO AND EUT PHOTO

Remark: The test setup photo and EUT Photo pby LEase see appendix.

The End