DEKRA Testing and Certification (Suzhou) Co., Ltd.
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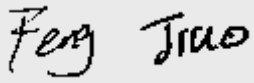
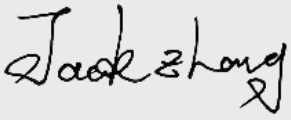
Test report No:
2350798R-RF-US-P07V02

FCC&IC TEST REPORT

Product Name	Gateway
Model and /or type reference	BASGE-EN902
Trade Name	CTRLINK
FCC ID	2AU57BASGE-EN902
IC	31004-BASGEEN902
Applicant´s name / address	Contemporary Control Systems, Inc. 2431 Curtiss Street Downers Grove, Illinois United States
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.231 ANSI C63.10: 2013 RSS-210 issue 10 RSS-Gen Issue5
Verdict Summary	IN COMPLIANCE
Testedby (name / position & signature)	Feng Jiao/Project Engineer 
Approved by (name / position & signature)	Jack Zhang/Manager 
Date of issue	2023-08-22
Report Version	V1.1
Report template No	Template_FCC 15.231-RF-V1.0

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page

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)	Jun. 01, 2023
Date (start test)	Jun. 02, 2023
Date (finish test)	Jul. 20, 2023

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 DEKRA.
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
2350798R-RF-US-P07V02	V1.0	Initial issue of report.	2023-08-11
2350798R-RF-US-P07V02	V1.1	Page 27~28 Modified frequency point (The test report No.: 2350798R-RF-US-P07V02 V1.1 is to replace the test report No.: 2350798R-RF-US-P07V02 V1.0, and test report 2350798R-RF-US-P07V02 V1.0 is obsoleted.)	2023-08-22

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 Paragraph 15.231, RSS-210 issue 10 and RSS-Gen Issue5 .
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 Information
- 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	2022.09.04	2023.09.03
Two-Line V-Network	R&S	ENV216	101044	2023.01.07	2024.01.06
50ohm Termination	SHX	N/A	N/A	2023.02.10	2024.02.09
50ohm Termination	SHX	N/A	N/A	2023.02.10	2024.02.09
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2023.05.14	2024.05.13
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2023.05.19	2024.05.18
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	2022.09.17	2023.09.16
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2023.02.20	2024.02.19
Coaxial Cable	Huber+Suhner	RG 214	AC2-C	2023.05.21	2024.05.20
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2023.05.19	2024.05.18
Dekra test software	Dekra	-	-	-	-

Radiated Emission(1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2022.12.08	2023.12.07
Amplifier	SKET	LNPA_0118G-45	SK2021090101	2023.05.14	2024.05.13
Preamplifier	EMCI	EMC184045SE	980263	2023.07.09	2024.07.08
DRG Horn Antenna	ETS-Lindgren	3117	00167055	2022.08.29	2023.08.28
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2023.05.31	2024.05.30
Coaxial Cable	TIMES	HF290A-NMNM-5.00M	651945-0001	2022.11.19	2023.11.18
Coaxial Cable	TIMES	HF290A-NMNM-6.00M	651946-0001	2022.11.19	2023.11.18
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2023.05.19	2024.05.18
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%The Uncertainties is complice with standard required as below.

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
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB
Occupied Bandwidth	±1kHz
Time	

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name..... :	Gateway
Model No. ..... :	BASGE-EN902
FCC ID ..... :	2AU57BASGE-EN902
IC..... :	31004-BASGEEN902
Manufacturter..... :	Contemporary Control Systems, Inc.
Manufacturer Address..... :	2431 Curtiss Street Downers Grove, Illinois United States
Factory ..... :	Contemporary Control Systems, Inc.
Address ..... :	2431 Curtiss Street Downers Grove, Illinois United States

Wireless specifiction..... :	N/A
Operating frequency range(s)..... :	902.8MHz
Type of Modulation..... :	FSK
Number of channel..... :	1

Rated power supply .....:	Voltage and Frequency	
	☐	AC: 220 – 240 V, 50/60 Hz
	☒	AC: 24V
	☒	DC: 24V
	☐	Battery: …3V…
Mounting position.....:	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Head-mounted equipment
	☒	Other:

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	☐	FPC
			☐	PCB
			☐	Metal Monopole Antenna
			☐	Ceramic chip
			☐	Others……..

1.3 Channel List

SRD Working Frequency							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	902.8 MHz	--	--	--	--	--	--

Note: The general description of the Item(s) and channel list in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

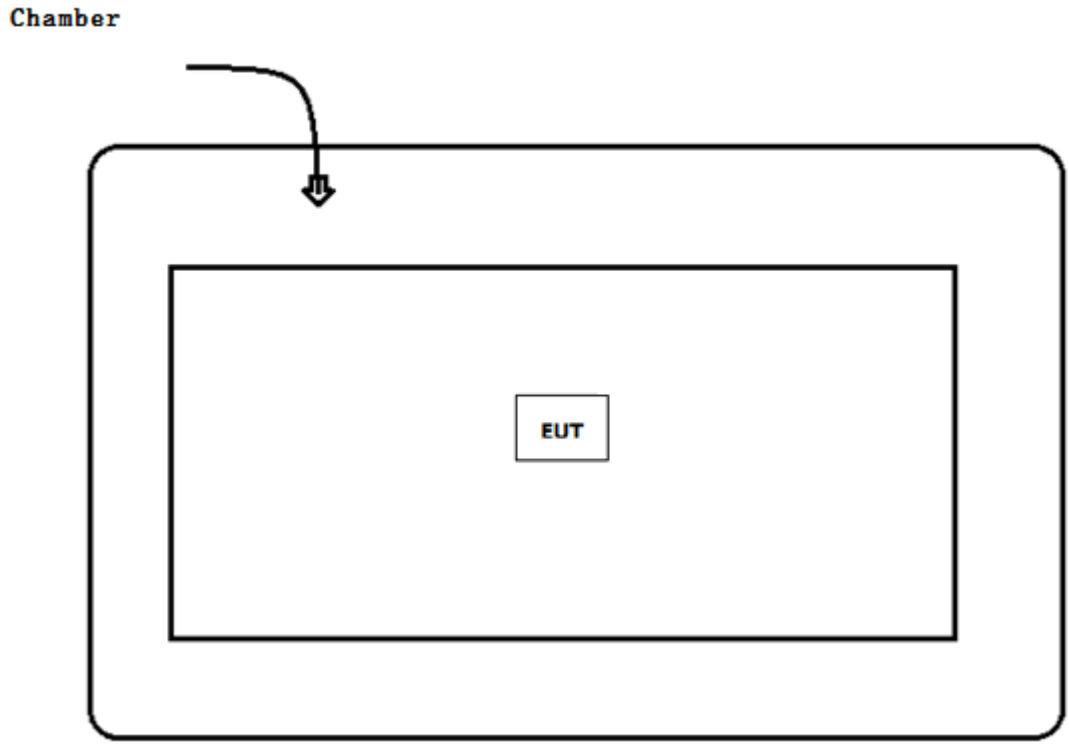
During the tests the following operating mode(s) has(have) been used.

Test Mode	Mode1: 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 Emission


2.4 Testing process

1	Setup the EUT as shown in Section 2.3.
2	Press the transmit button.
3	Configure the test mode, the test channel, and the data rate.
4	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 Section 15.231	2021	Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.
ANSI C63.10	2013	American National Standard ofProcedures for Compliance Testing ofUnlicensed Wireless Devices
RSS-Gen Issue 5 Amendment 2	2021	General Requirements forCompliance of Radio Apparatus
RSS-210 issue 10	2019	Licence-Exempt Radio Apparatus: Category I Equipment

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

For FCC

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	FCC 15.207	PASS	---
Field strength of fundamental	FCC 15.231(b)(1)	PASS	---
Field strength of spurious emissions	FCC 15.231(b)(1)(2),FCC 15.209	PASS	---
20dB Bandwidth	FCC 15.231(c)	PASS	---
Duration Time	FCC 15.231(a)(1)	PASS	---

For ISED

Requirement – Test case	Basic standard(s)	Verdict	Remark
Conducted Emission	RSS-Gen Issue 5Section 8.8	PASS	---
Field strength of fundamental	RSS-210 A1.4	PASS	---
Field strength of spurious emissions	RSS-210 A1.4	PASS	---
20dB Bandwidth	RSS-210 A1.3	PASS	---
Duration Time	RSS-210 A1.4	PASS	---

3.4 Test Facility

USA	:	**FCC Designation Number: CN1199**
CA	:	**ISED CAB identifier: CN0040**

4 TEST RESULTS

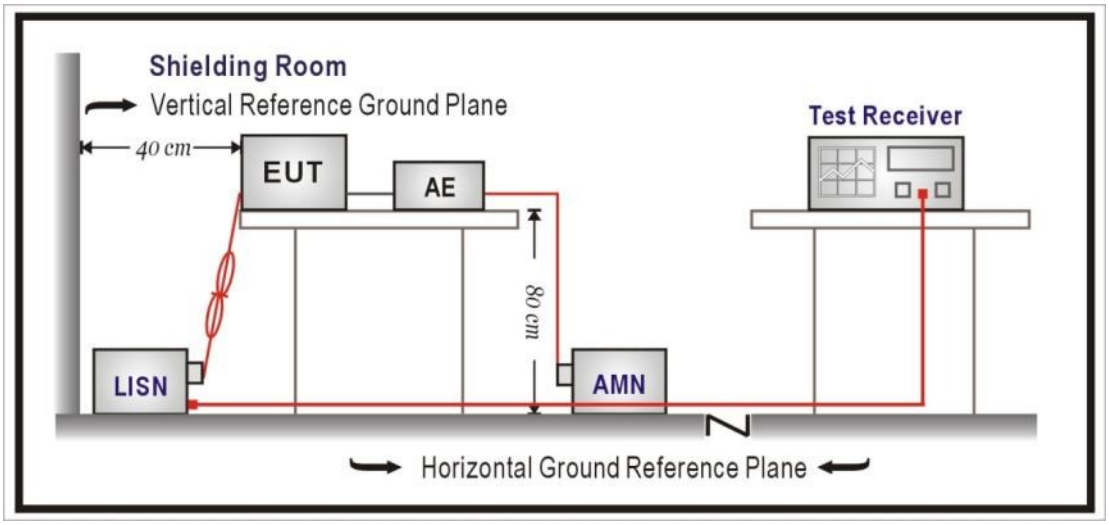
4.1 AC Power Line Conducted Emission	VERDICT: PASS

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

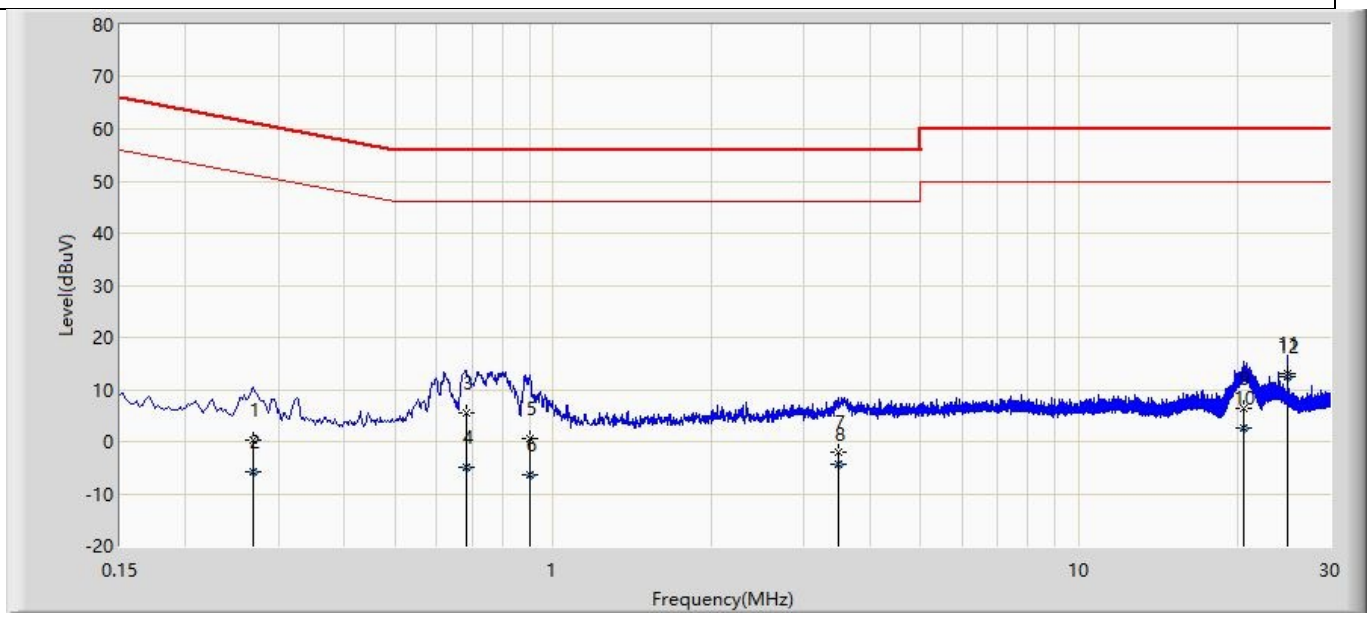


4.1.3 Test Procedure

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

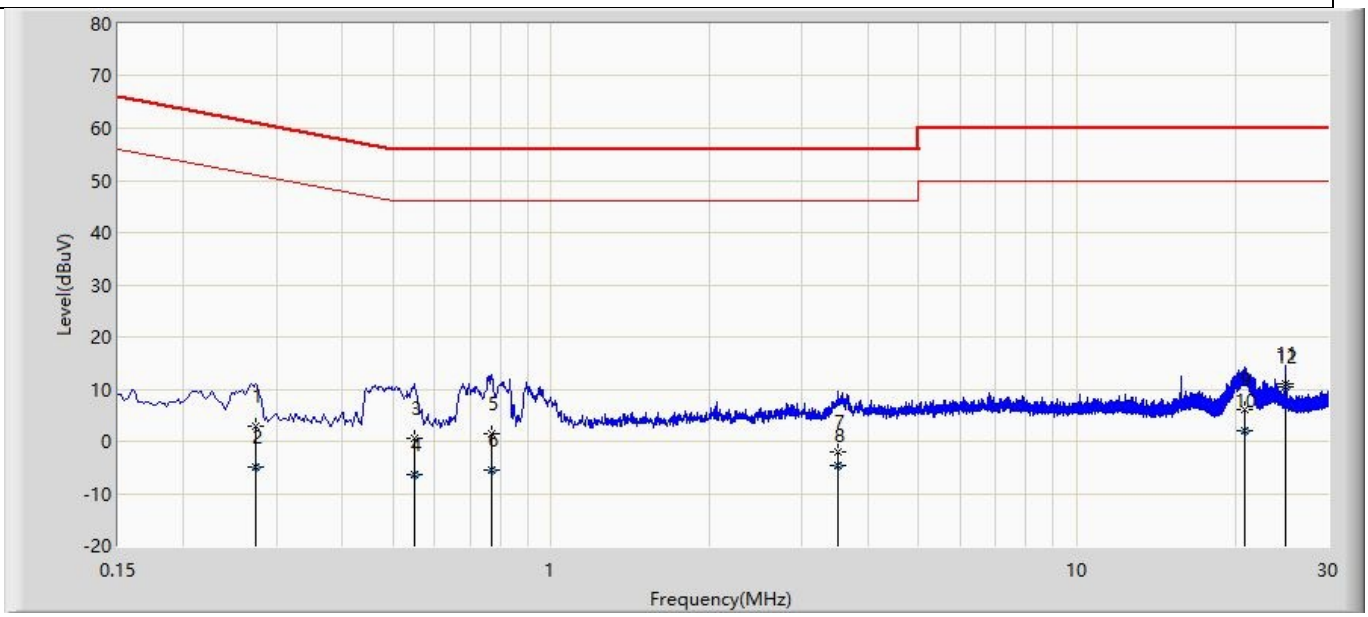
4.1.4 Test Data

Profile: 2350798R	Page No.: 1
Engineer: Yu Liu	
Site: TR1	Time: 2023/06/08 - 08:46
Limit: FCC_Part 15.207_CE_AC Power_Class A	Margin: 0
Probe: ENV216_101190(0.009-30MHz)	Polarity: Neutral
EUT: Gateway	Power: AC 24V
Note: Mode: N-Neutral	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.269	0.430	-9.160	-60.711	61.141	9.590	QP
2		0.269	-5.747	-15.337	-56.888	51.141	9.590	AV
3		0.683	5.372	-4.261	-50.628	56.000	9.633	QP
4		0.683	-5.000	-14.633	-51.000	46.000	9.633	AV
5		0.901	0.577	-9.055	-55.423	56.000	9.632	QP
6		0.901	-6.488	-16.120	-52.488	46.000	9.632	AV
7		3.480	-1.978	-11.726	-57.978	56.000	9.747	QP
8		3.480	-4.461	-14.208	-50.461	46.000	9.747	AV
9		20.546	6.437	-3.845	-53.563	60.000	10.283	QP
10		20.546	2.590	-7.693	-47.410	50.000	10.283	AV
11		24.999	12.918	2.535	-47.082	60.000	10.384	QP
12	*	24.999	12.529	2.145	-37.471	50.000	10.384	AV

Profile: 2350798R	Page No.: 2
Engineer: Yu Liu	
Site: TR1	Time: 2023/06/08 - 08:51
Limit: FCC_Part 15.207_CE_AC Power_Class A	Margin: 0
Probe: ENV216_101190(0.009-30MHz)	Polarity: Line
EUT: Gateway	Power: AC 24V
Note: Mode: L-Line	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.274	2.795	-6.803	-58.208	61.003	9.599	QP
2		0.274	-4.889	-14.487	-55.892	51.003	9.599	AV
3		0.548	0.618	-9.010	-55.382	56.000	9.628	QP
4		0.548	-6.318	-15.945	-52.318	46.000	9.628	AV
5		0.769	1.483	-8.152	-54.517	56.000	9.635	QP
6		0.769	-5.475	-15.110	-51.475	46.000	9.635	AV
7		3.500	-1.966	-11.719	-57.966	56.000	9.752	QP
8		3.500	-4.546	-14.298	-50.546	46.000	9.752	AV
9		20.868	6.062	-4.191	-53.938	60.000	10.253	QP
10		20.868	2.058	-8.195	-47.942	50.000	10.253	AV
11		24.999	10.897	0.563	-49.103	60.000	10.334	QP
12	*	24.999	10.484	0.150	-39.516	50.000	10.334	AV

4.2 Field strength of fundamental — VERDICT: PASS

4.2.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.231

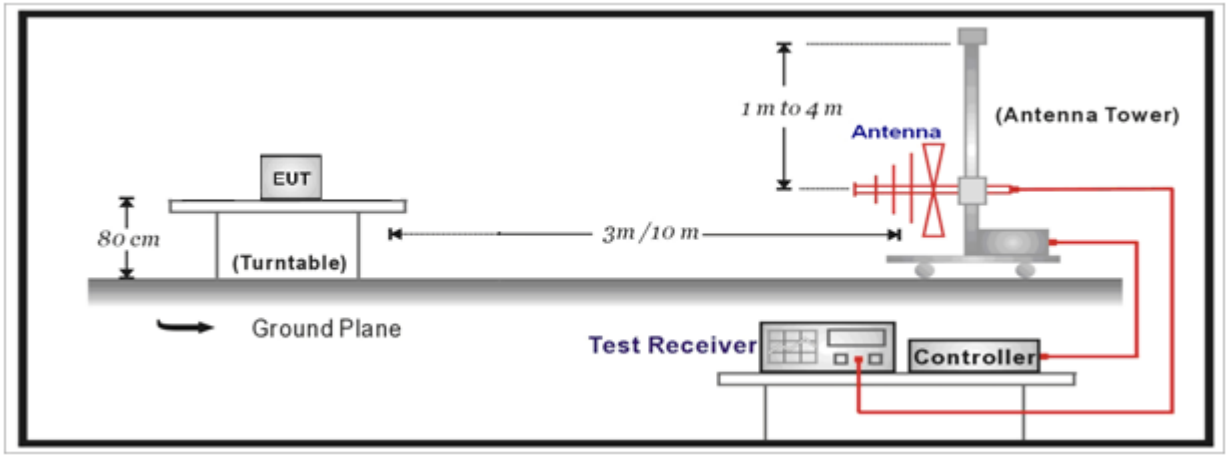
Restricted Bands of operation for FCC

Fundamental frequency (MHz)	Field strength of fundamental (μV/m)	Field strength of fundamental (dB μV/m)
40.66-40.70	2250	67.04
70-130	1250	61.93
130-174	1250-3750	61.93-71.48 [1)]
174-260	3750	71.48
260-470	3750-12500	71.48-81.93 [1)]
Above 470	12500	81.93

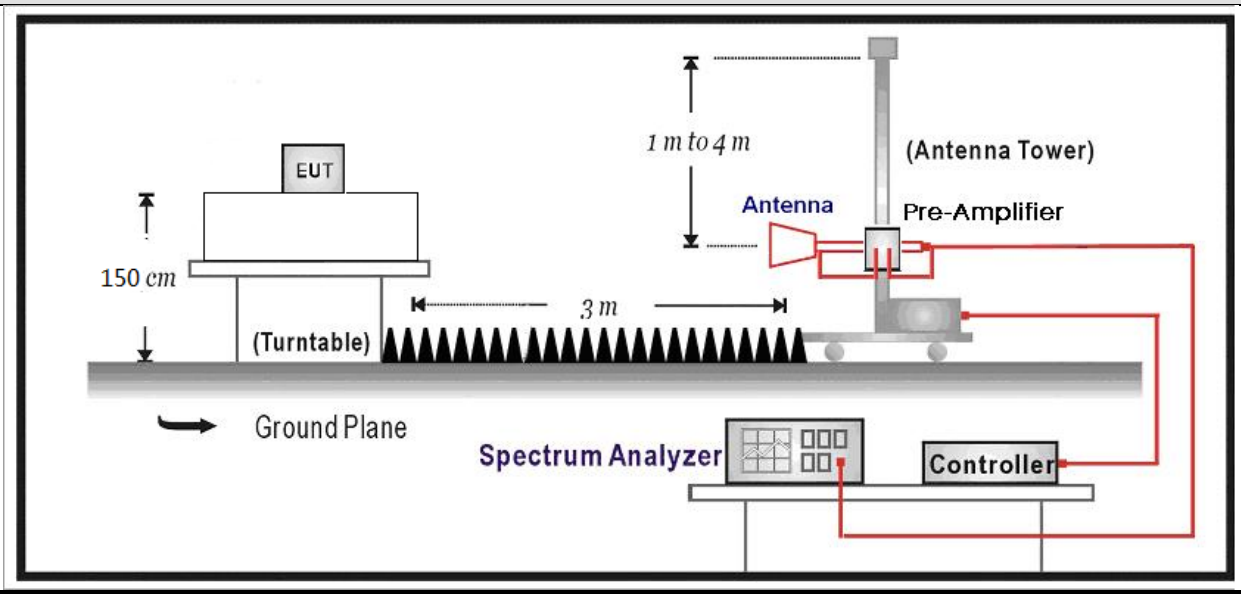
Note [1)]： Linear interpolations

4.2.2 Test Setup

30MHz-1GHz Test Setup:



Above 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

L-1RC3B:

Frequency (MHz)	Measure Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Type
902.8(X Axis)	94.189	101.93	-7.741	Horizontal	PK
902.8(X Axis)	90.300	101.93	-11.63	Vertical	PK

Frequency (MHz)	Measure Level (dBuV/m)	Duty cycle Factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.8(X Axis)	94.189	-32.4	61.789	81.93	-20.141	Horizontal
902.8(X Axis)	90.300	-32.4	57.90	81.93	-24.03	Vertical

Note 1:
Average value=Peak value + Duty Cycle Factor
Duty cycle factor = 20log(Duty cycle)
Duty cycle = on time/100 milliseconds or period, whichever is less
T on time =0.8*3=2.4(ms)
T on time+T off time=100ms
Duty cycle =2.4%
Duty cycle factor = 20log(Duty cycle) = -32.4
Note 2:
We have evluaed three orthogonal positions (X , Y , Z) and the position with the highest emission level(X Axis) was recorded and shown in the report.

M-1RB1D:

Frequency (MHz)	Measure Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Type
902.8(X Axis)	86.836	101.93	-15.094	Horizontal	PK
902.8(X Axis)	89.739	101.93	-12.191	Vertical	PK

Frequency (MHz)	Measure Level (dBuV/m)	Duty cycle Factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.8(X Axis)	86.836	-32.4	54.436	81.93	-27.494	Horizontal
902.8(X Axis)	89.739	-32.4	57.339	81.93	-24.591	Vertical

Note 1:
Average value=Peak value + Duty Cycle Factor
Duty cycle factor = 20log(Duty cycle)
Duty cycle = on time/100 milliseconds or period, whichever is less
T on time =0.8*3=2.4(ms)
T on time+T off time=100ms
Duty cycle =2.4%
Duty cycle factor = 20log(Duty cycle) = -32.4
Note 2:
We have evluaed three orthogonal positions (X , Y , Z) and the position with the highest emission level(X Axis) was recorded and shown in the report.

4.3 Field strength of spurious emissions — VERDICT: PASS

4.3.1 Limit

Standard	FCC 15.231(b)(1)(2),FCC 15.209	
FCC 15.231		
Fundamental frequency (MHz)	Field strength of spurious emission (μV/m)	Field strength of spurious emission (dB μV/m)
40.66-40.70	225	47.04
70-130	125	41.93
130-174	125-375	41.93-51.48(Note 1)
174-260	375	51.48
260-470	375-1250	51.48-61.93(Note 1)
Above 470	1250	61.93

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.

Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

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.

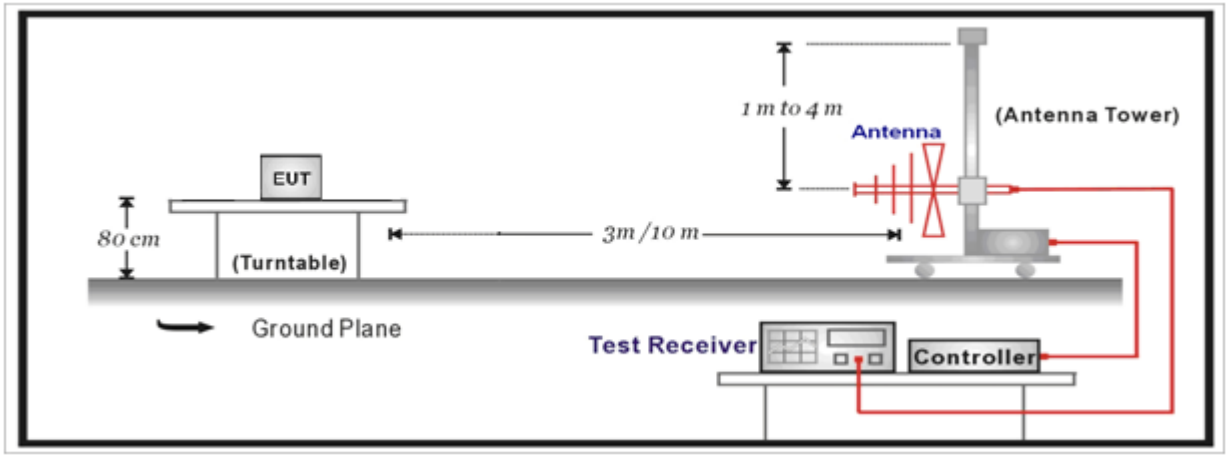
FCC 15.209			
Frequency (MHz)	Field strength (μ V/m)	Field strength (dB μ V/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30(Note 1)
1.705 - 30	30	29.5	30(Note 1)
30 -88	100	40	3(Note 2)
88-216	150	43.5	3(Note 2)
216 - 960	200	46	3(Note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

Note 2: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

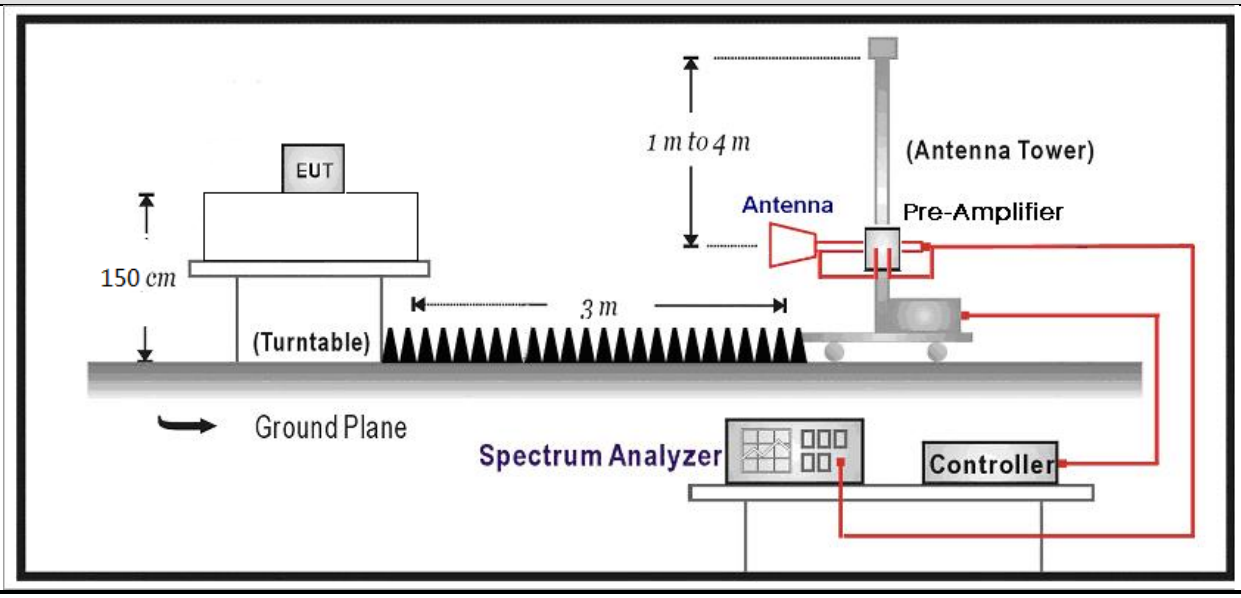
Note 3: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.3.2 Test Setup

30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



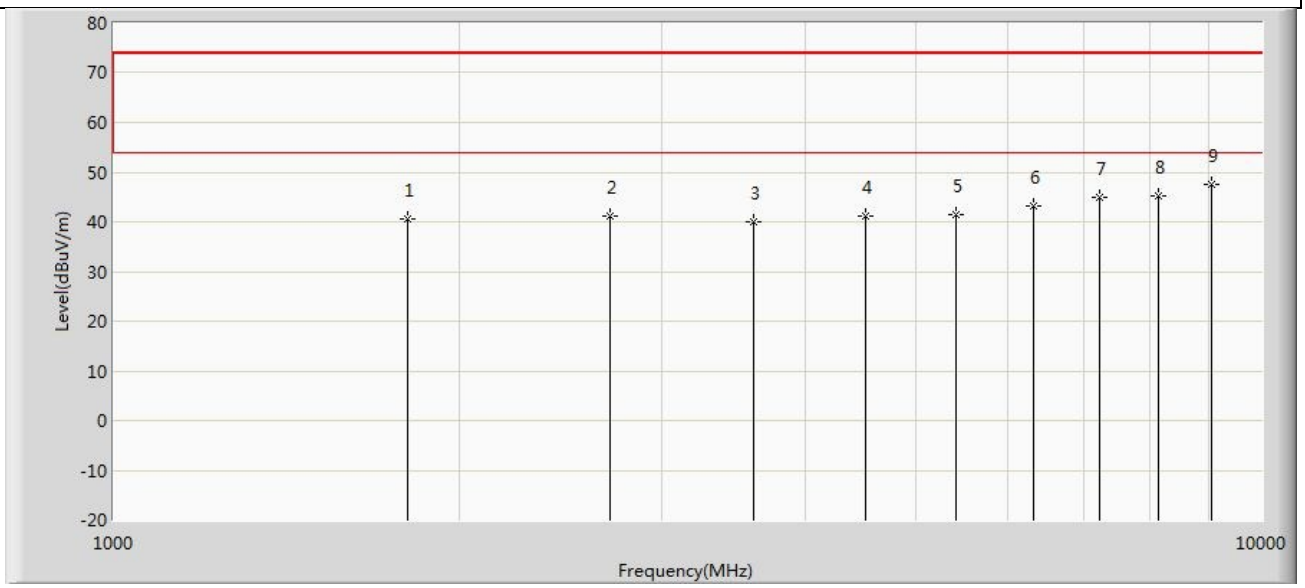
4.3.3 Test Procedure

	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

4.3.4 Test Data

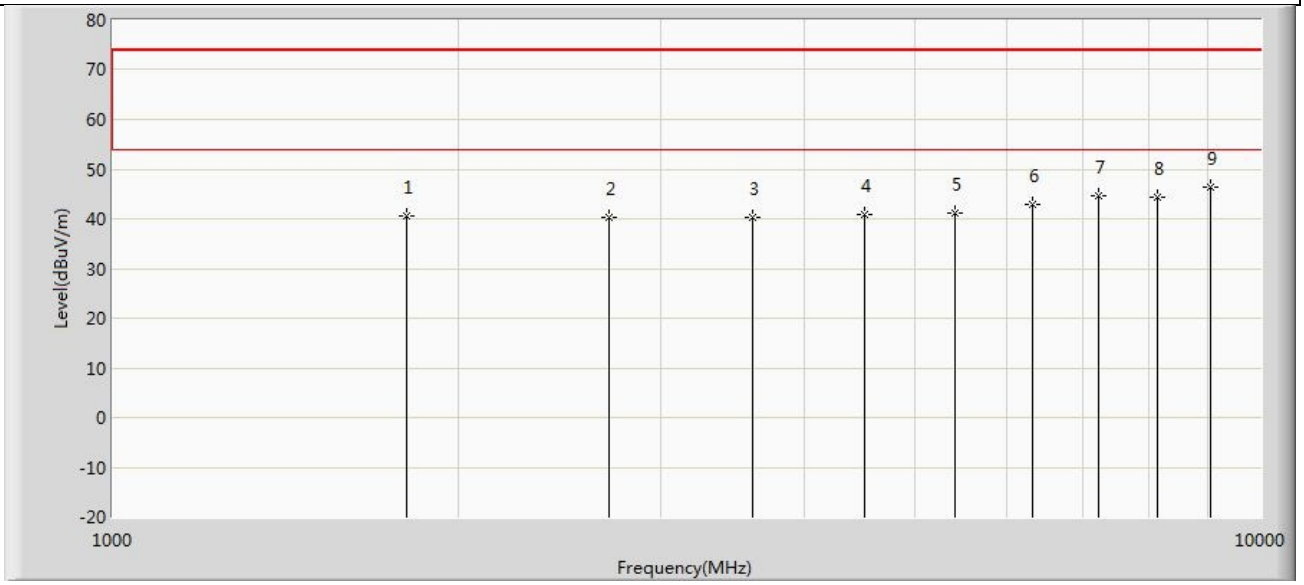
L-1RC3B:

Profile: 2350798R	Page No.: 3
Engineer: PengchengYang	
Site: AC5	Time: 2023/06/07 - 17:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Gateway	Power: AC 24V
Note: Mode 1：Transmit at 902.8MHz	



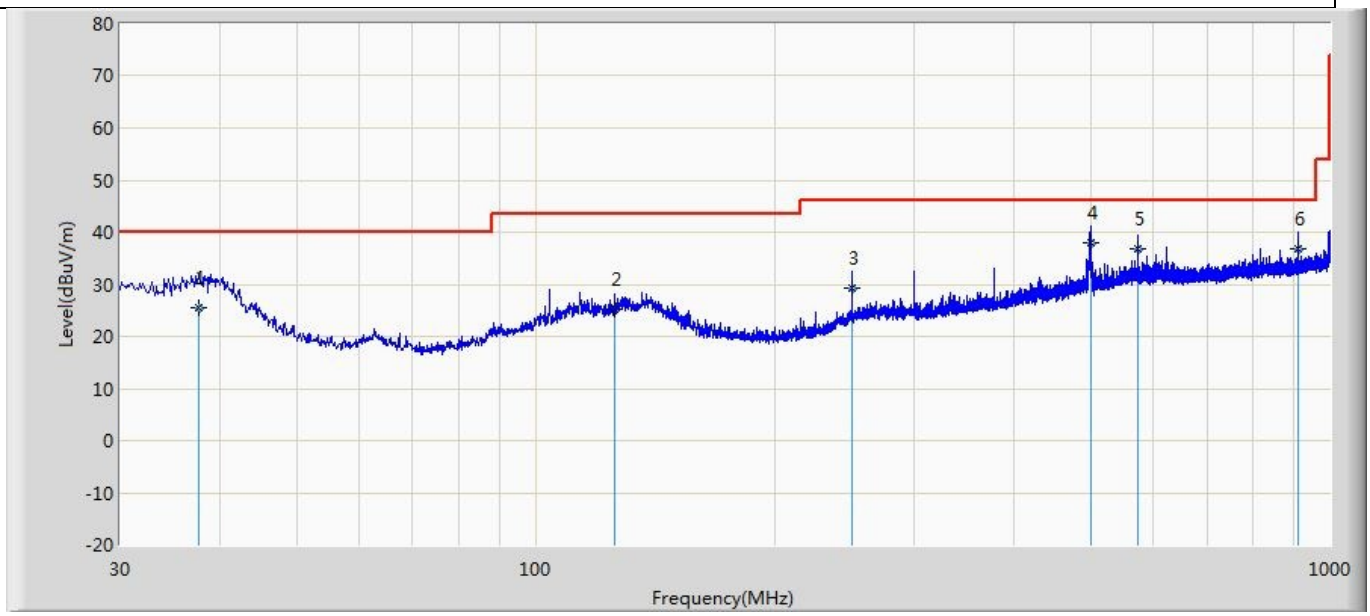
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1806.000	40.719	58.855	-33.281	74.000	-18.135	PK
2		2709.000	41.052	58.393	-32.948	74.000	-17.342	PK
3		3612.000	39.873	56.725	-34.127	74.000	-16.851	PK
4		4515.000	41.097	56.358	-32.902.8	74.000	-15.260	PK
5		5418.000	41.442	54.605	-32.558	74.000	-13.163	PK
6		6321.000	43.266	53.984	-30.734	74.000	-10.718	PK
7		7224.000	45.004	54.981	-28.996	74.000	-9.977	PK
8		8127.000	45.175	54.647	-28.825	74.000	-9.472	PK
9	*	9028.000	47.443	55.217	-26.557	74.000	-7.774	PK

Profile: 2350798R	Page No.: 4
Engineer: PengchengYang	
Site: AC5	Time: 2023/06/07 - 17:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Gateway	Power: AC 24V
Note: Mode 1：Transmit at 902.8MHz	



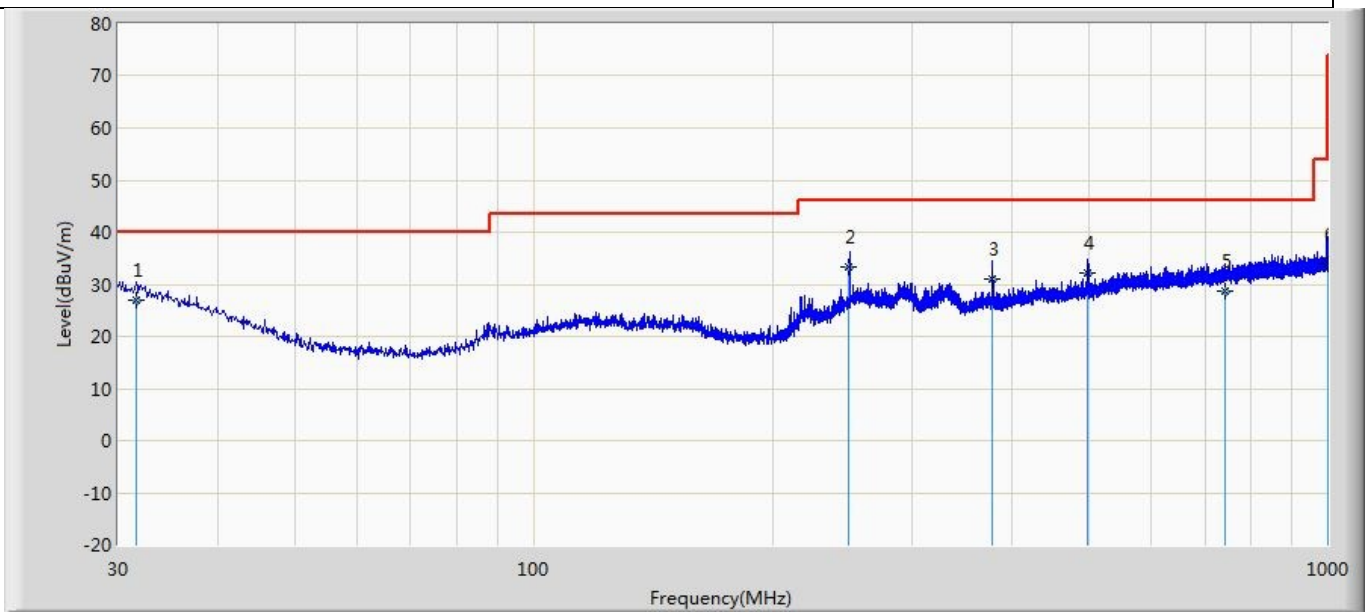
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1806.000	40.615	58.751	-33.385	74.000	-18.135	PK
2		2709.000	40.176	57.517	-33.824	74.000	-17.342	PK
3		3612.000	40.327	57.179	-33.673	74.000	-16.851	PK
4		4515.000	40.940	56.201	-33.060	74.000	-15.260	PK
5		5418.000	41.090	54.253	-32.910	74.000	-13.163	PK
6		6321.000	42.863	53.581	-31.137	74.000	-10.718	PK
7		7224.000	44.635	54.612	-29.365	74.000	-9.977	PK
8		8127.000	44.304	53.776	-29.696	74.000	-9.472	PK
9	*	9028.000	46.326	54.100	-27.674	74.000	-7.774	PK

Engineer: PengchengYang	
Site: AC2	Time: 2023/06/07
Limit: FCC_Part 15.209_RE (3m)	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Vertical
EUT: Gateway	Power: DC 24V
Note: Mode 1：Transmit at 902.8MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		37.654	25.413	3.500	-14.587	40.000	15.516	6.396	0.000	200	84	QP
2		125.840	25.132	6.400	-18.368	43.500	11.846	6.886	0.000	139	84	QP
3		249.842	29.235	9.400	-16.765	46.000	12.440	7.395	0.000	187	254	QP
4	*	499.841	37.998	12.500	-8.002	46.000	17.339	8.159	0.000	196	360	QP
5		572.360	36.871	9.800	-9.129	46.000	18.709	8.362	0.000	130	284	QP
6		912.300	36.791	7.200	-9.209	46.000	20.370	9.221	0.000	105	315	QP

Engineer: PengchengYang	
Site: AC2	Time: 2023/06/07
Limit: FCC_Part 15.309_RE (3m)	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Horizontal
EUT: Gateway	Power: DC 24V
Note: Mode 1：Transmit at 902.8MHz	

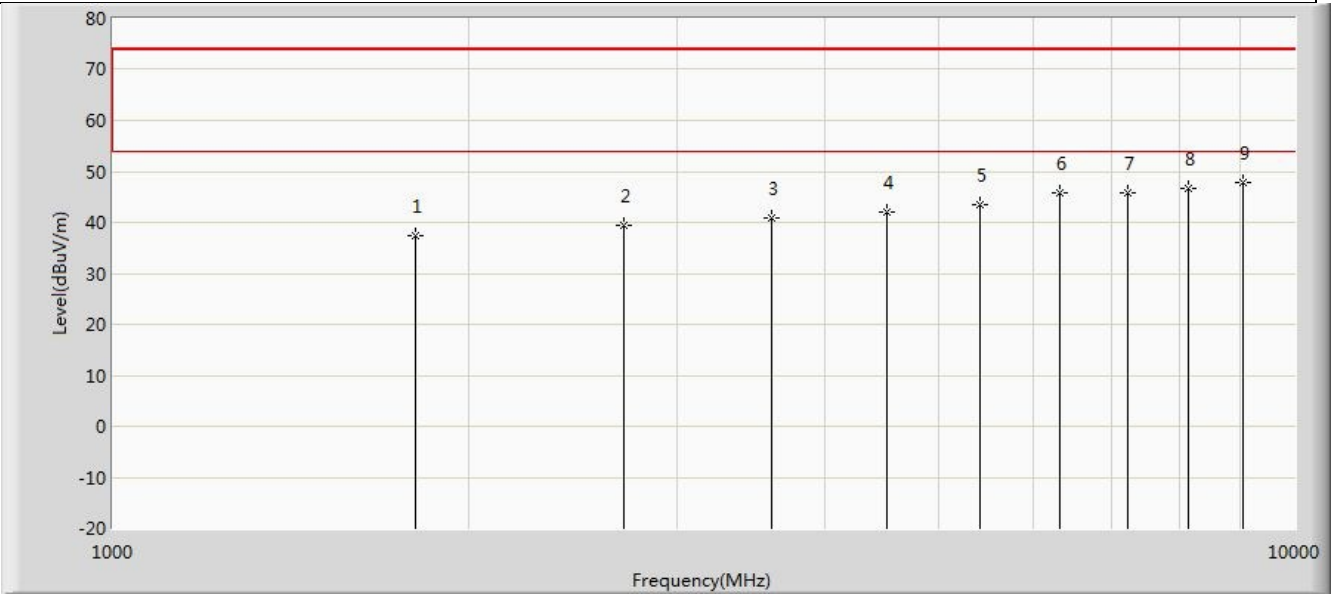


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		31.650	26.995	2.100	-13.005	40.000	18.535	6.360	0.000	174	205	QP
2	*	249.600	33.210	13.400	-12.790	46.000	12.417	7.394	0.000	175	35	QP
3		377.840	30.950	8.200	-15.050	46.000	14.946	7.804	0.000	100	258	QP
4		498.100	32.272	6.800	-13.728	46.000	17.317	8.155	0.000	219	257	QP
5		743.841	28.605	0.200	-17.395	46.000	19.590	8.815	0.000	164	284	QP
6		999.842	34.018	3.500	-19.982	54.000	21.078	9.440	0.000	175	218	QP

Note:
1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, both of the worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. As the radiated emission was performed, so conducted emission was not tested.
5. We have evluaed three orthogonal positions (X , Y , Z) and the position with the highest emission level(X Axis) was recorded and shown in the report.

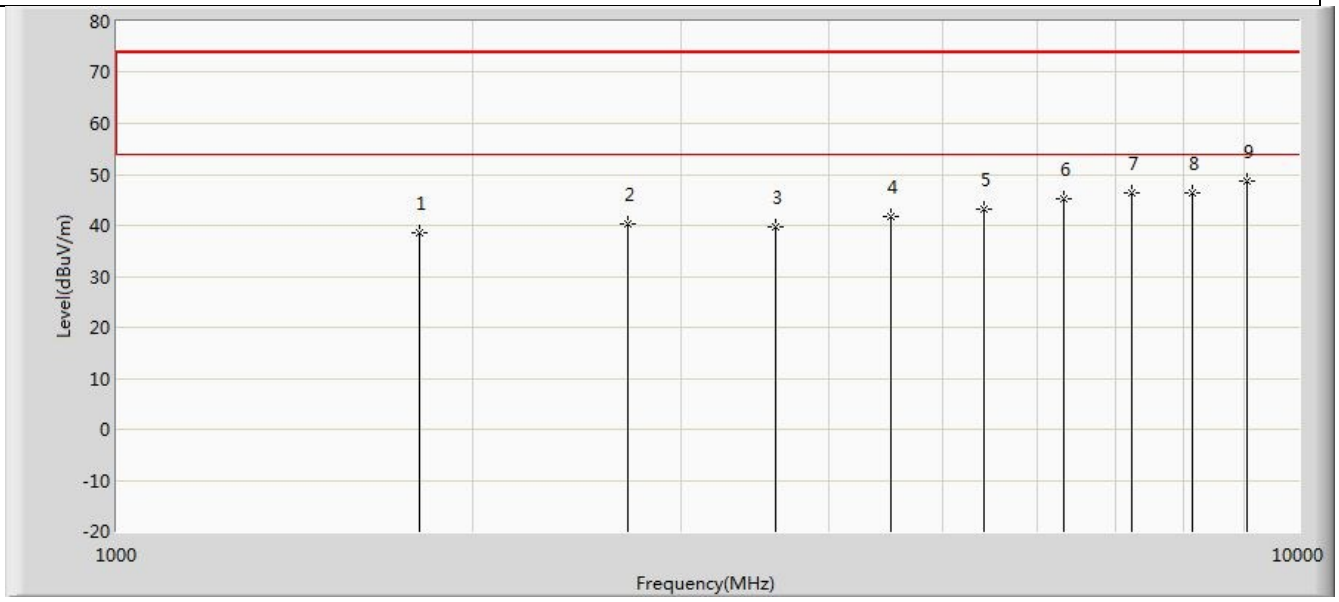
M-1RB1D:

Profile: 2350798R	Page No.: 7
Engineer: PengchengYang	
Site: AC5	Time: 2023/07/20 - 21:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Gateway	Power: DC 24V
Note: Mode 1：Transmit at 902.8MHz	



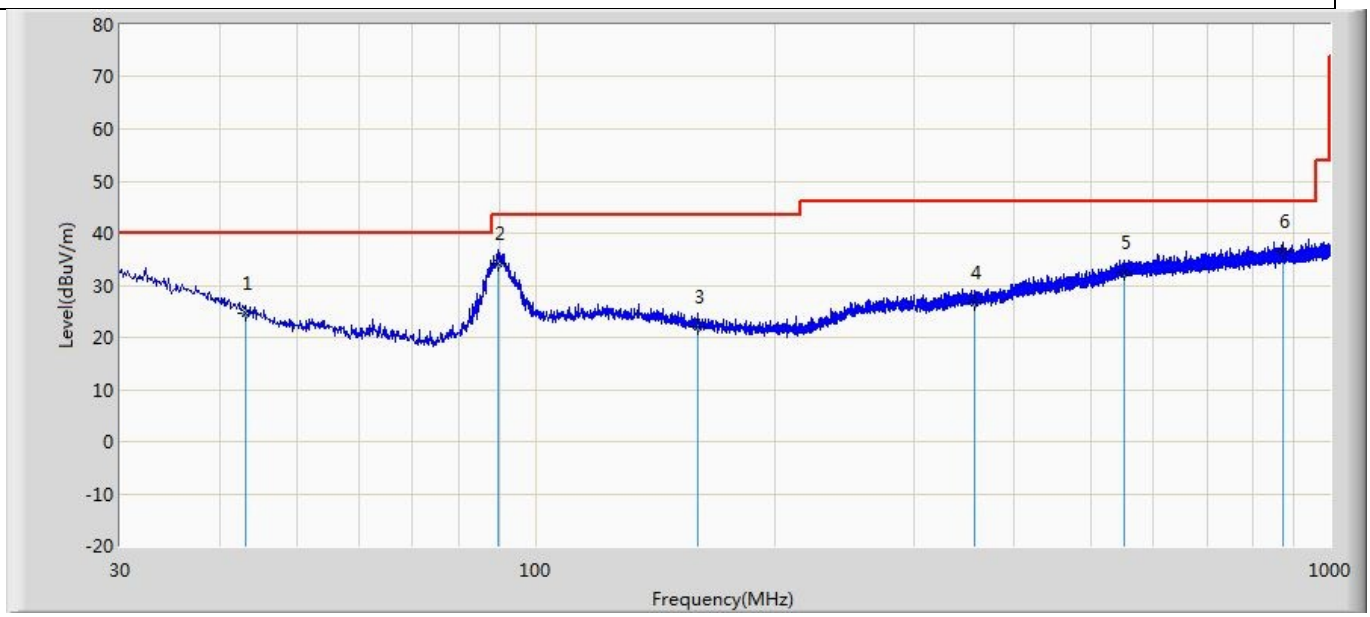
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1806.000	37.413	57.142	-36.587	74.000	-19.728	PK
2		2709.000	39.438	57.930	-34.562	74.000	-18.493	PK
3		3612.000	40.832	58.038	-33.168	74.000	-17.206	PK
4		4515.000	41.898	57.021	-32.102	74.000	-15.122	PK
5		5418.000	43.501	55.545	-30.499	74.000	-12.044	PK
6		6321.000	45.935	55.294	-28.065	74.000	-9.359	PK
7		7224.000	45.921	54.473	-28.079	74.000	-8.552	PK
8		8127.000	46.593	54.301	-27.407	74.000	-7.708	PK
9	*	9030.000	47.949	53.866	-26.051	74.000	-5.917	PK

Profile: 2350798R	Page No.: 8
Engineer: PengchengYang	
Site: AC5	Time: 2023/07/20 - 21:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Gateway	Power: DC 24V
Note: Mode 1：Transmit at 902.8MHz	



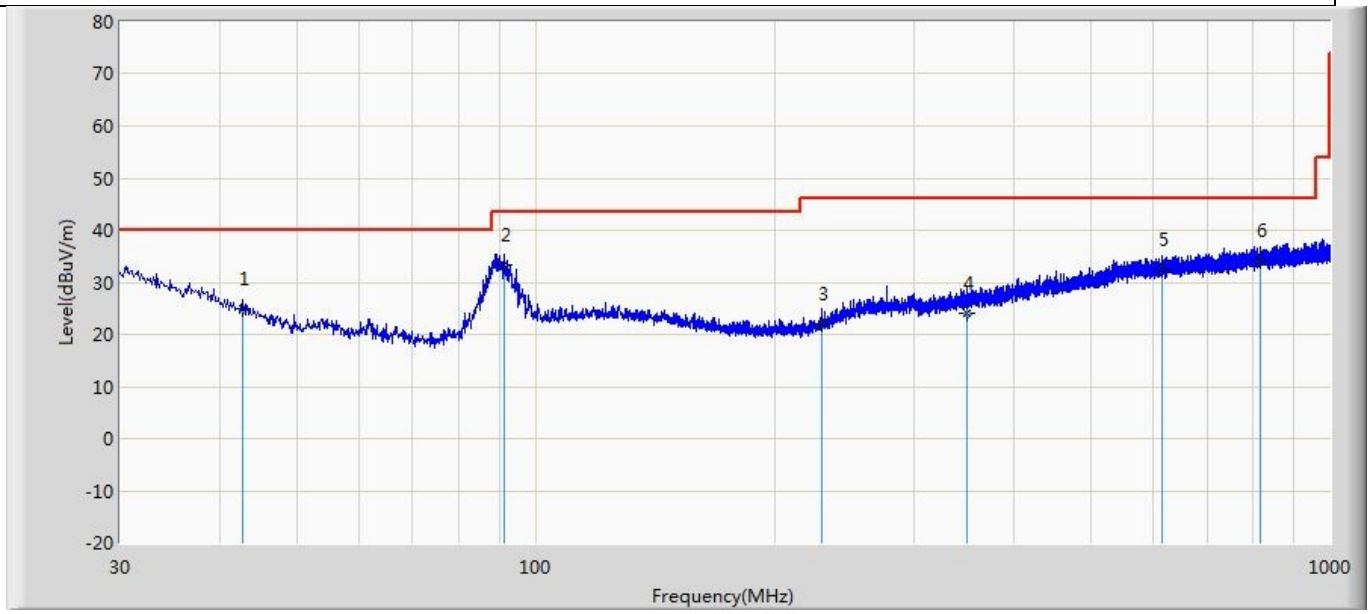
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1806.000	38.507	58.236	-35.493	74.000	-19.728	PK
2		2709.000	40.229	58.721	-33.771	74.000	-18.493	PK
3		3612.000	39.712	56.918	-34.288	74.000	-17.206	PK
4		4515.000	41.691	56.814	-32.309	74.000	-15.122	PK
5		5418.000	43.051	55.095	-30.949	74.000	-12.044	PK
6		6321.000	45.125	54.484	-28.875	74.000	-9.359	PK
7		7224.000	46.448	55.000	-27.552	74.000	-8.552	PK
8		8127.000	46.391	54.099	-27.609	74.000	-7.708	PK
9	*	9030.000	48.785	54.702	-25.215	74.000	-5.917	PK

Profile: 2350798R	Page No.: 5
Engineer: PengchengYang	
Site: AC2	Time: 2023/07/20 - 21:10
Limit: FCC_Part 15.209_RE (3m)	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Horizontal
EUT: Gateway	Power: DC 24V
Note: Mode 1：Transmit at 902.8MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		43.095	24.719	5.776	-15.281	40.000	18.943	QP
2	*	89.776	34.169	18.263	-9.331	43.500	15.906	QP
3		159.980	22.159	5.078	-21.341	43.500	17.081	QP
4		356.769	26.599	4.274	-19.401	46.000	22.326	QP
5		551.981	32.418	5.221	-13.582	46.000	27.197	QP
6		873.294	36.662	7.368	-9.338	46.000	29.294	QP

Profile: 2350798R	Page No.: 6
Engineer: PengchengYang	
Site: AC2	Time: 2023/07/20 - 21:11
Limit: FCC_Part 15.209_RE (3m)	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Vertical
EUT: Gateway	Power: DC 24V
Note: Mode 1 ：Transmit at 902.8MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		42.731	24.957	5.794	-15.043	40.000	19.163	QP
2	*	91.353	33.245	17.054	-10.255	43.500	16.191	QP
3		228.850	22.148	4.786	-23.852	46.000	17.362	QP
4		348.524	24.178	2.010	-21.822	46.000	22.168	QP
5		613.819	32.369	5.091	-13.631	46.000	27.278	QP
6		819.095	34.077	4.926	-11.923	46.000	29.151	QP

Note:
1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, both of the worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. As the radiated emission was performed, so conducted emission was not tested.
5. We have evluaed three orthogonal positions (X , Y , Z) and the position with the highest emission level(X Axis) was recorded and shown in the report.

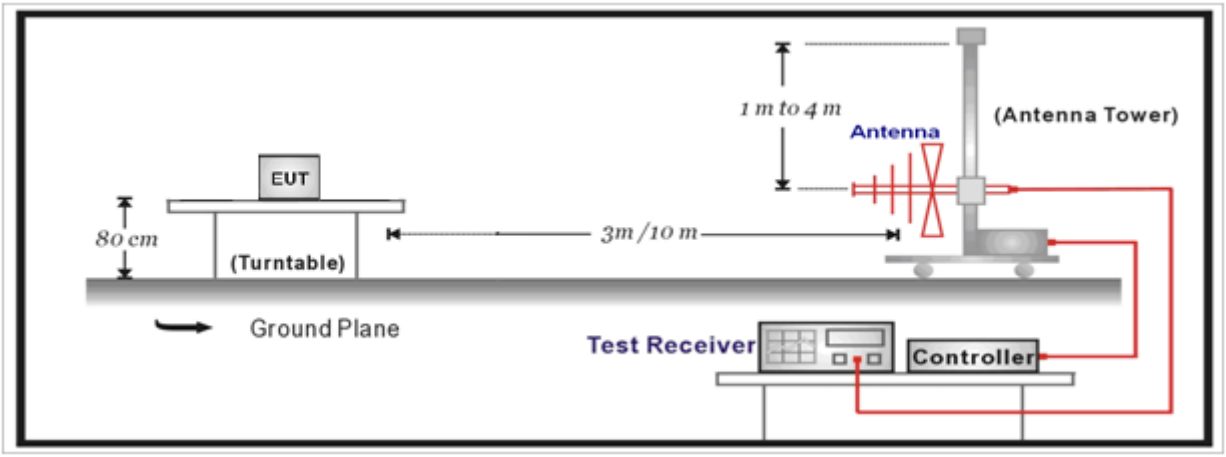
4.4 DTS Bandwidth	VERDICT: PASS

4.4.1 Limit

Standard	FCC 15.231(c)

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

4.4.2 Test Setup

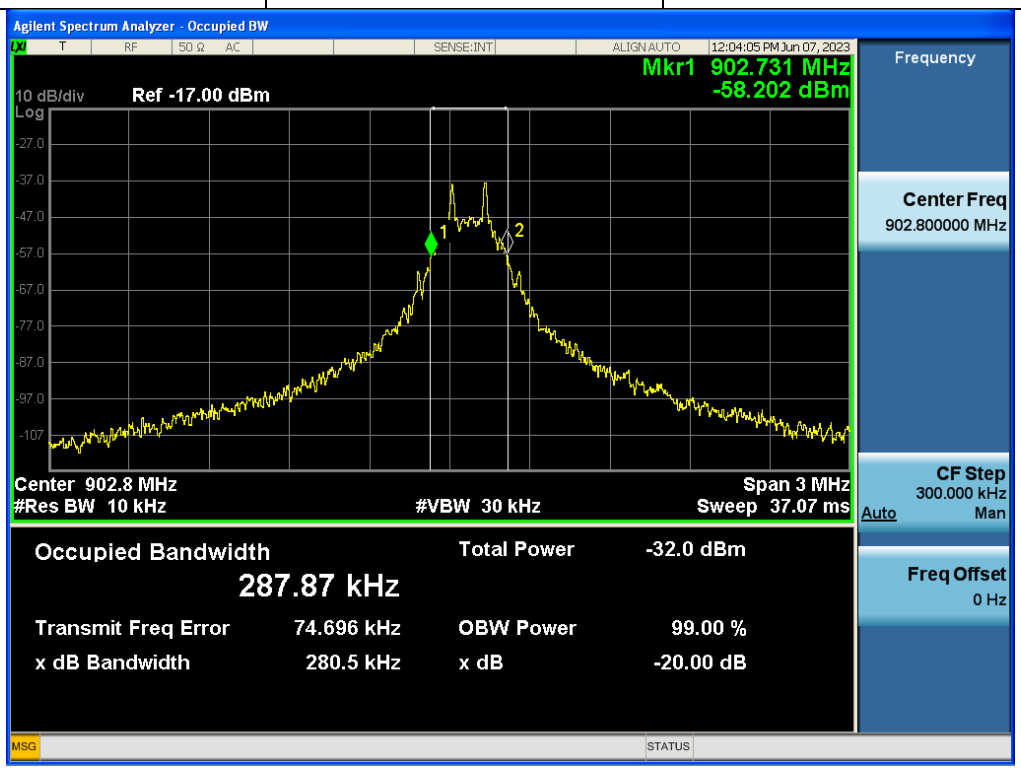


4.4.3 Test Procedure

	Reference Rule		Chapter	Description
☒	ANSI C63.10		6.9	Occupied bandwidth tests
	☒	ANSI C63.10	6.9.2	Occupied bandwidth—relative measurement procedure
	☐	ANSI C63.10	6.9.3	Occupied bandwidth—power bandwidth (99%) measurement procedure

4.4.4 Test Data

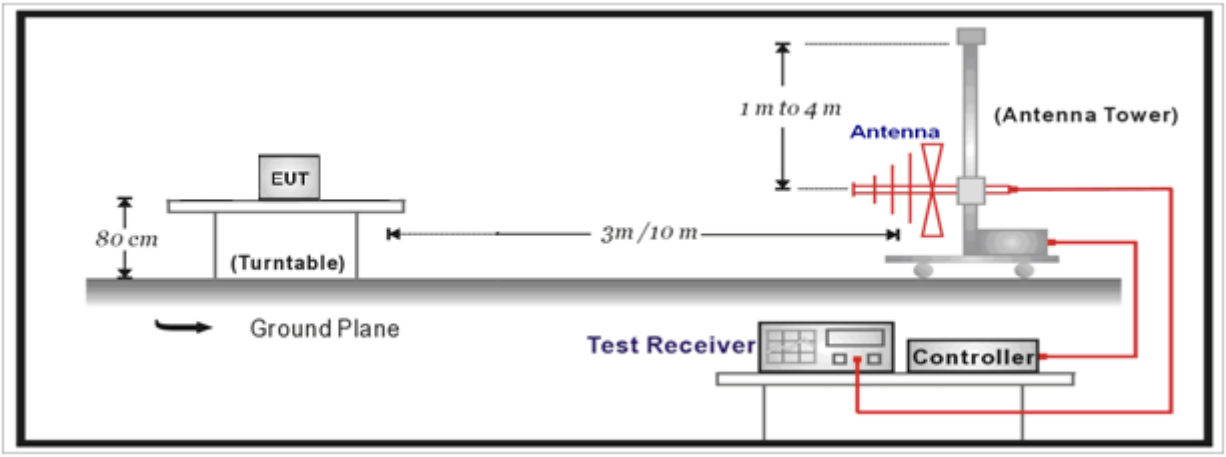
Mode	CH.	Test Freq. (MHz)	20dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
1	00	902.8	280.5	Within band	Pass



4.5 Duration Time	VERDICT: PASS

4.5.1 Limit	
Standard	FCC Part 15 Subpart C Paragraph 15.247 (b)(3)
(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.	

4.5.2 Test Setup



4.5.3 Test Procedure

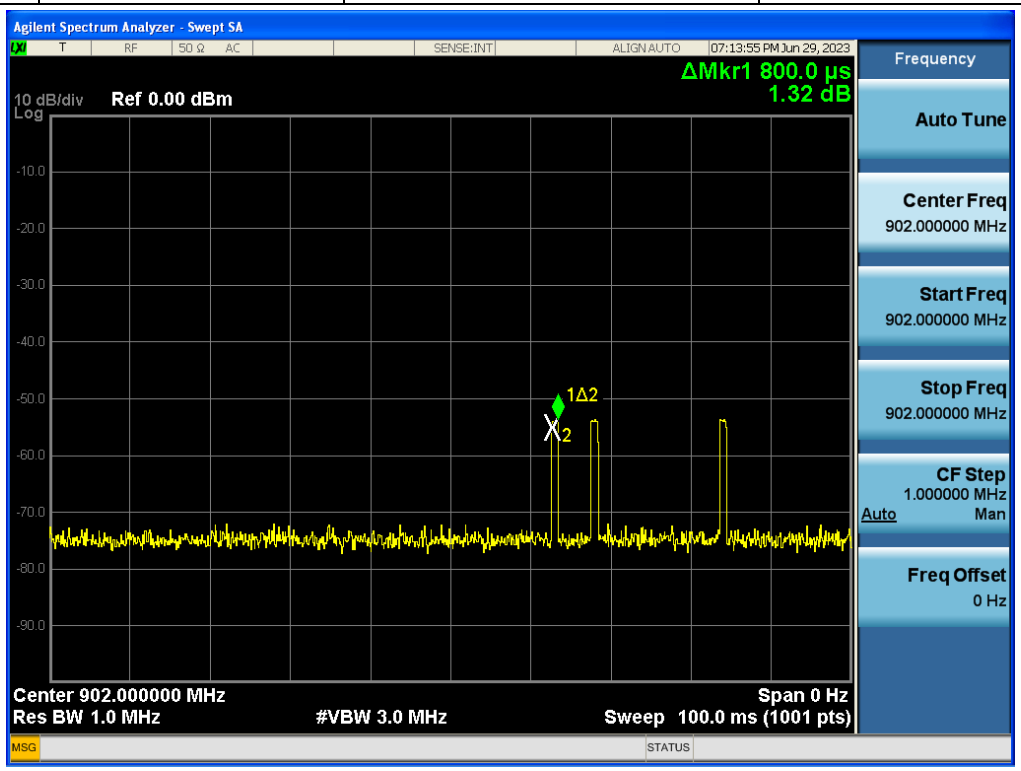
1.According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.

2. Set the EUT to proper test channel.

3. Single scan the transmission, and read the transmission time.

4.5.4 Test Data

Frequency (MHz)	Duration Time (S)	Limit (S)	Result
902.8	0.0008	＜5.0	Pass



5 TEST SETUP PHOTO AND EUT PHOTO

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

The End