



FCC- TEST REPORT

Report Number	: 7095022051331-00	Date of Issue: <u>August 23, 2022</u>
Model	: ASEP00	
Product Type	: Enter Feeding Pump	
Applicant	: Amsino International, Inc.	
Address	: 708 Corporate Center Drive Pomona California United States	
Production Facility	: Zhejiang MDKingdom Technology Co., Ltd.	
Address	: 4th Floor, 22 Cang Ling Road Huzhen Town, Jinyun County	
		321404 Lishui City, Zhejiang Province PEOPLE'S REPUBLIC OF CHINA
Test Result	: <input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Total pages including Appendices	: <u>22</u>	

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch
No.16 Lane, 1951 Du Hui Road,
Shanghai 201108,
P.R. China

Test Firm FCC 820234
Registration
Number:

Designation
number: CN1183

IC Company
Number: 25988

CAB identifier: CN0101

Telephone: +86 21 6141 0123
Fax: +86 21 6140 8600

3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	Enteral Feeding Pump
Model no.:	ASEP00
FCC ID:	2AYKB-ASEP00
IC:	N/A
Rating:	Internal Power Supply:DC 11.1V Adapter Input: 100-240V, 50/60Hz Output:15V DC,1.6A
RF Transmission Frequency:	13.56MHz
Antenna Type:	onboard PCB loop antenna
Antenna Gain:	3dBi
Description of the EUT:	The EUT was an Enteral Feeding Pump which transmitter operated at 13.56MHz.
Test sample no.:	SHA-666943-1

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to ANSI C63.10-2013.

5 Summary of Test Results

		Technical Requirements		
FCC Part 15 Subpart C				
Test Condition		Pages	Test Site	Test Result
§15.207	Conducted emission AC power port	10-12	Test Site 1	Pass
§15.205, §15.209, 15.225 (a, b, c, d)	Radiated Emission, 9KHz to 1000MHz	13-19	Test Site 1	Pass
§15.215 (c)	20dB Bandwidth Measurement	20	Test Site 1	Pass
§15.225(e)	Frequency Stability	21	Test Site 1	Pass
§15.203	Antenna requirement	--	See Note 2	Pass

Note 1: N/A=Not Applicable. Conducted emission is not apply for battery operated device.

Note 2: The EUT uses an onboard PCB Antenna (65mm*37mm), which gain is 3dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AYKB-ASEP00 complies with Section 15.205, 15.207, 15.209, 15.225 of the FCC Part 15, Subpart C Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

- Not Performed

The Equipment Under Test

- - Fulfills the general approval requirements.

- Does not fulfill the general approval requirements.

Sample Received Date: August 1, 2022

Testing Start Date: August 10, 2022

Testing End Date: August 17, 2022

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Reviewed by:

Prepared by:

Tested by:

Hui Tong

Hui TONG
EMC Section Manager

Jiaxi XU
EMC Project Engineer

Zeng Jianqing
EMC Test Engineer

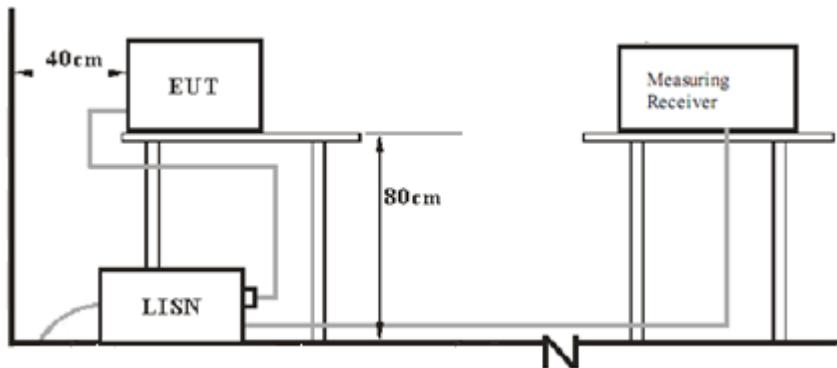
7 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
--	--	--	--

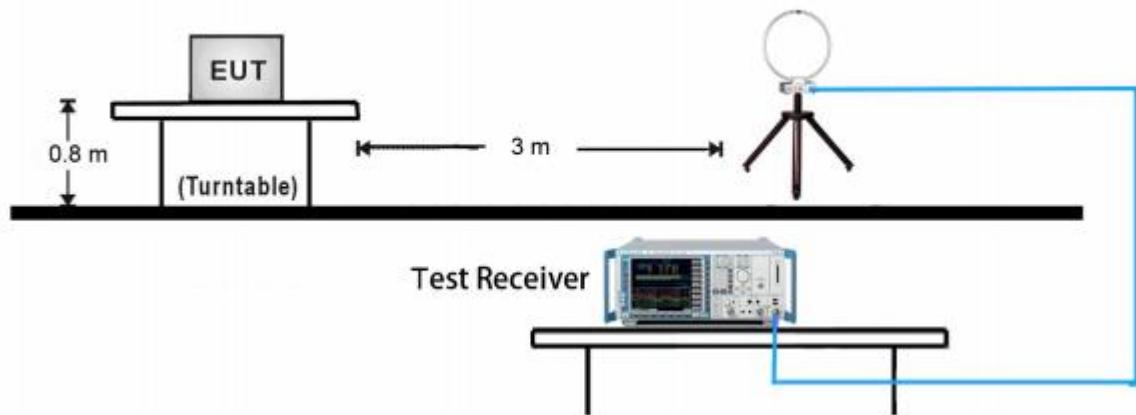
8 Test Setups

8.1 AC Power Line Conducted Emission test setups

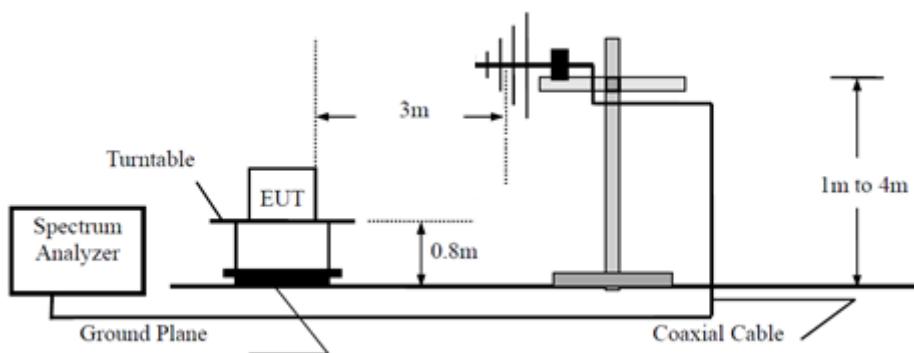


8.2 Radiated test setups

9kHz ~ 30MHz Test Setup:



30MHz ~ 1GHz Test- Setup



9 Test Methodology

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

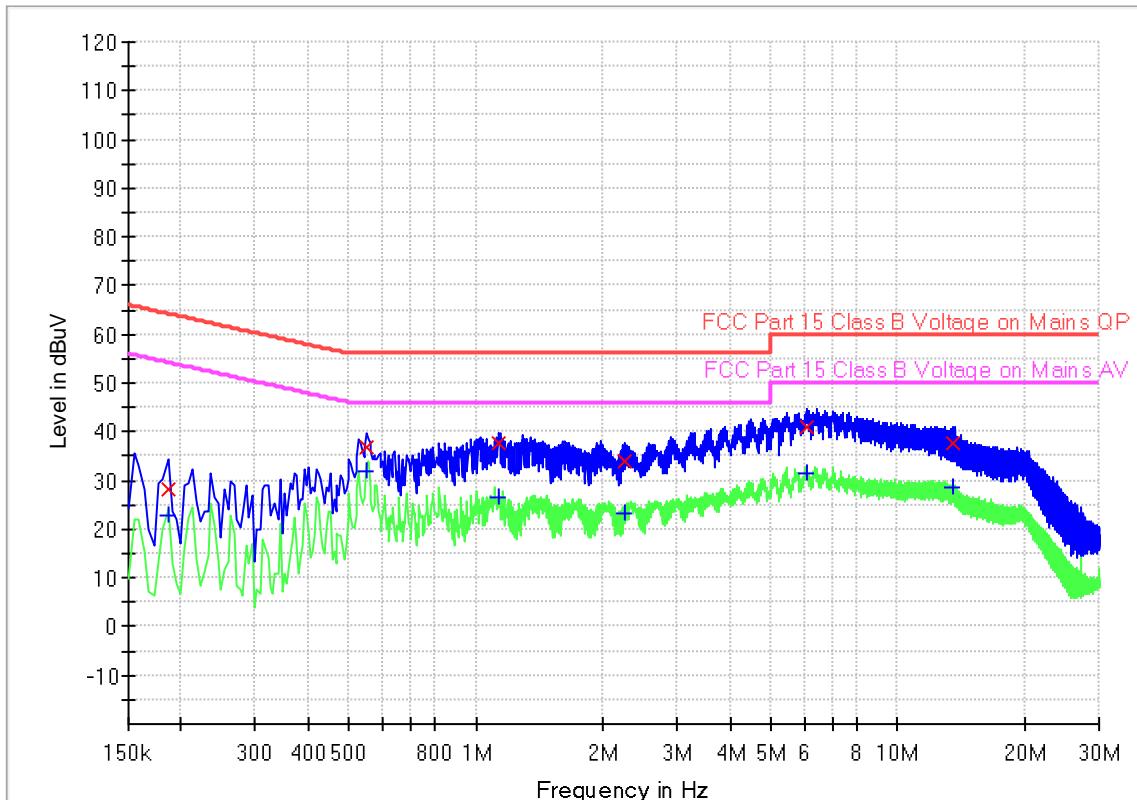
Limit

Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

Product Type : Enter Feeding Pump
 M/N : ASEP00
 Operating Condition : Mode 1: Transmit at 13.56MHz
 Test Specification : L-line
 Comment : AC 120V/60Hz by adapter

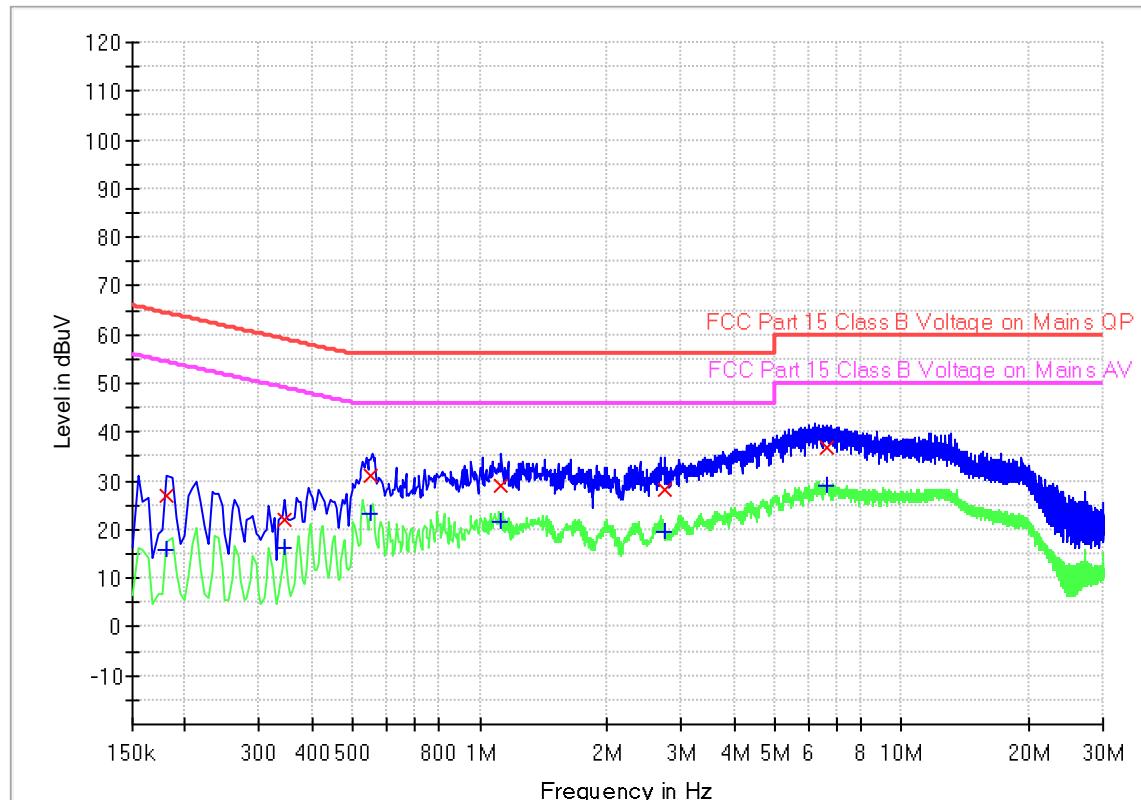


Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Margin - CAV (dBuV)
0.186000	28.2	22.9	1000.0	9.000	L1	OFF	19.5	36.0	64.2	31.3	54.2
0.550500	36.7	31.9	1000.0	9.000	L1	OFF	19.5	19.4	56.0	14.1	46.0
1.135500	37.5	26.7	1000.0	9.000	L1	OFF	19.5	18.5	56.0	19.3	46.0
2.256000	34.0	23.4	1000.0	9.000	L1	OFF	19.5	22.0	56.0	22.6	46.0
6.076500	41.0	31.4	1000.0	9.000	L1	OFF	19.6	19.0	60.0	18.6	50.0
13.479000	37.6	28.6	1000.0	9.000	L1	OFF	19.7	22.4	60.0	21.4	50.0

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)
 Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

Product Type : Enter Feeding Pump
 M/N : ASEP00
 Operating Condition : Mode 1: Transmit at 13.56MHz
 Test Specification : N-line
 Comment : AC 120V/60Hz by adapter



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)
0.181500	27.1	15.7	1000.0	9.000	N	OFF	19.5	37.3	64.4	38.7	54.4
0.343500	22.0	16.4	1000.0	9.000	N	OFF	19.5	37.1	59.1	32.7	49.1
0.550500	31.0	23.2	1000.0	9.000	N	OFF	19.5	25.0	56.0	22.8	46.0
1.122000	29.0	21.8	1000.0	9.000	N	OFF	19.5	27.0	56.0	24.2	46.0
2.737500	28.2	19.7	1000.0	9.000	N	OFF	19.5	27.8	56.0	26.3	46.0
6.630000	36.8	28.9	1000.0	9.000	N	OFF	19.6	23.2	60.0	21.1	50.0

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)
 Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

9.2 Radiated Emission

Test Method

1. The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
4. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
5. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
6. Use the following spectrum analyzer settings According to C63.10:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

VBW = 10 Hz, when duty cycle is no less than 98 percent.

VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
7. Repeat above procedures until all frequencies measured were complete.

Limit

According to §15.225 (a, b, c), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Frequency (MHz)	Field Strength Limitation		Field Strength Limitation at 3m Distance	
	(uV/m)	Distance	dBuv/m	Distance
13.553-13.567	15.848	30m	124	3m
13.110-13.410				
13.710-14.010	106	30m	90.5	3m
13.410-13.553				
13.567-13.710	334	30m	80.5	3m

Limits for 15.209 Radiated emission limits; general requirements

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Frequency	Limit at 3m (dBuV/m)
0.009 MHz – 0.490 MHz	128.5 to 93.8 ¹
0.490 MHz – 1.705 MHz	73.8 to 63 ¹
1.705 MHz – 30 MHz	69.5 ¹
30 MHz – 88 MHz	40.0 ¹
88 MHz – 216 MHz	43.5 ¹
216 MHz – 960 MHz	46.0 ¹
Above 960 MHz	54.0 ¹
Above 1000 MHz	54.0 ²
Above 1000 MHz	74.0 ³

¹Limit is with detector with bandwidths as defined in CISPR-16-1-1 except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz where an Average detector is used.

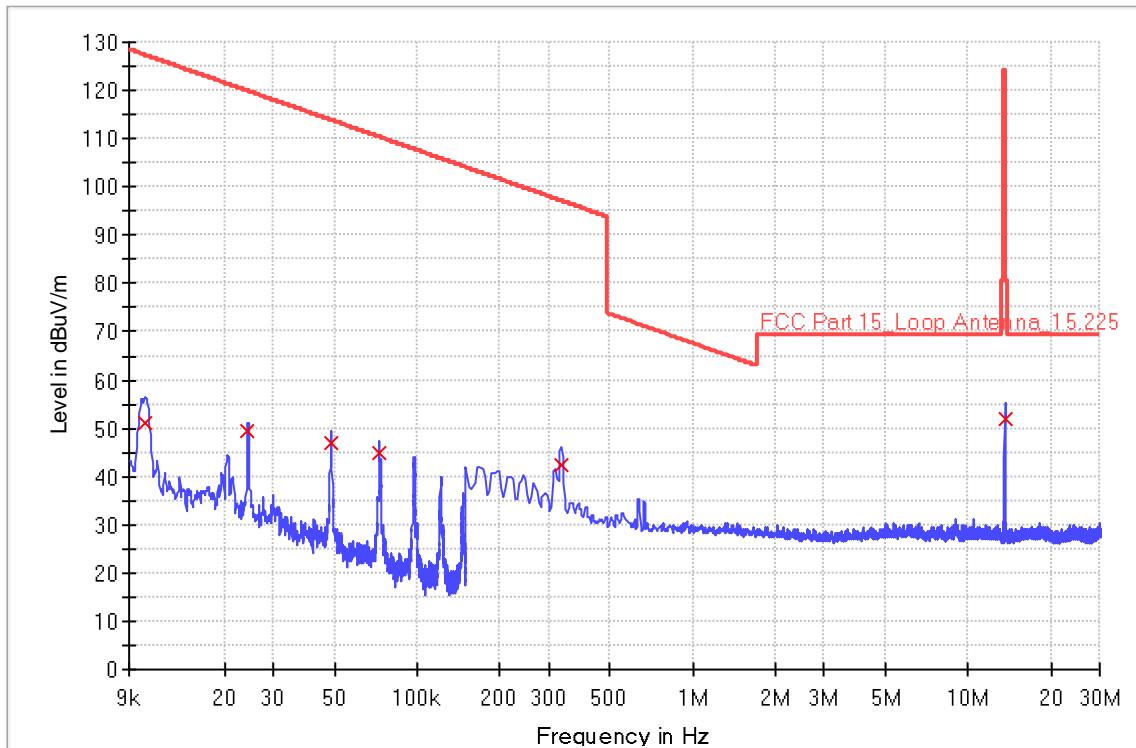
²Limit is with 1 MHz measurement bandwidth and using an Average detector

³Limit is with 1 MHz measurement bandwidth and using a Peak detector

Spurious radiated emissions for transmitter

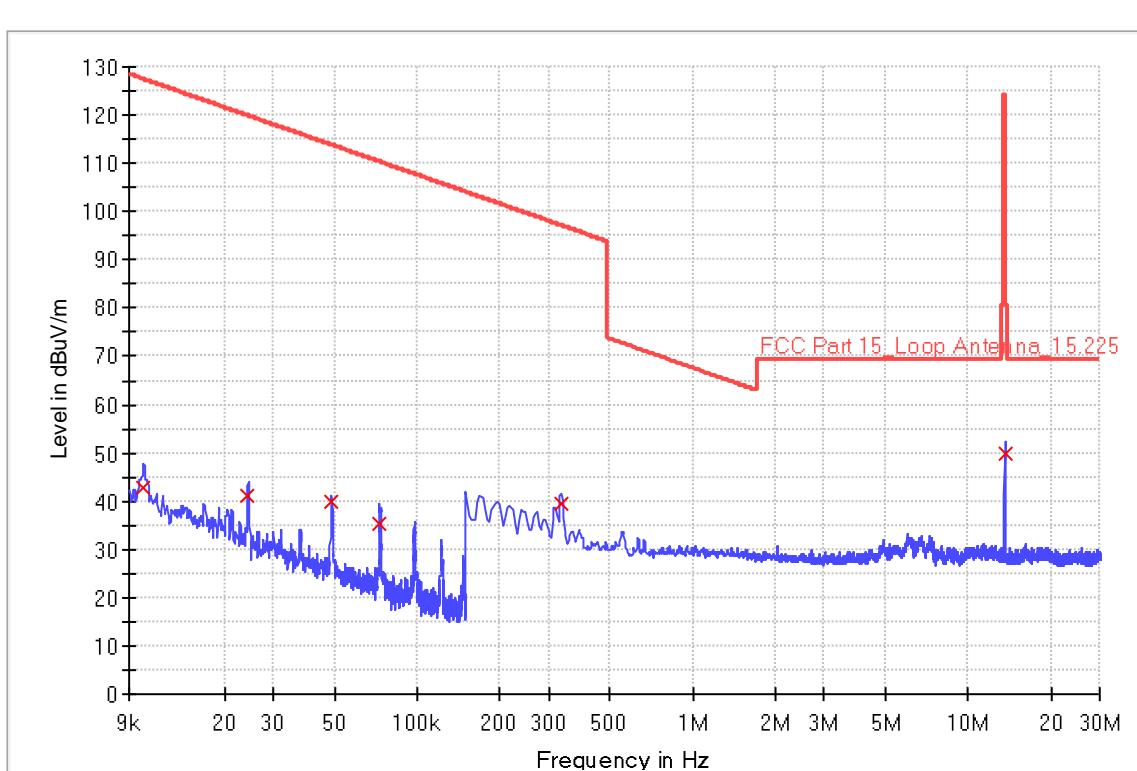
Site: 3 meter chamber	Time: 2022/08/10 - 12:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Zeng Jianqing
Probe: HFH2-Z2	Polarity: X
EUT: Enter Feeding Pump	Power: AC 120V,60Hz
Note: Transmit at 13.56MHz.	

RE_Loop E_pre



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
0.010360	51.1	1000.0	0.200	155.0	X	121.0	19.6	76.217	127.297
0.024280	49.4	1000.0	9.000	155.0	X	320.0	19.1	70.509	119.899
0.048760	47.1	1000.0	0.200	155.0	X	86.0	19.0	66.713	113.843
0.073240	44.7	1000.0	0.200	155.0	X	212.0	18.9	65.589	110.309
0.334000	42.6	1000.0	0.200	155.0	X	256.0	18.8	54.569	97.129
13.562000	51.8	1000.0	9.000	155.0	X	163.0	18.8	72.220	124.000

Site: 3 meter chamber	Time: 2022/08/10 - 12:35
Limit: FCC_Part15.209_RE(3m)	Engineer: Zeng Jianqing
Probe: HFH2-Z2	Polarity: Y
EUT: Enter Feeding Pump	Power: AC 120V,60Hz
Note: Transmit at 13.56MHz.	

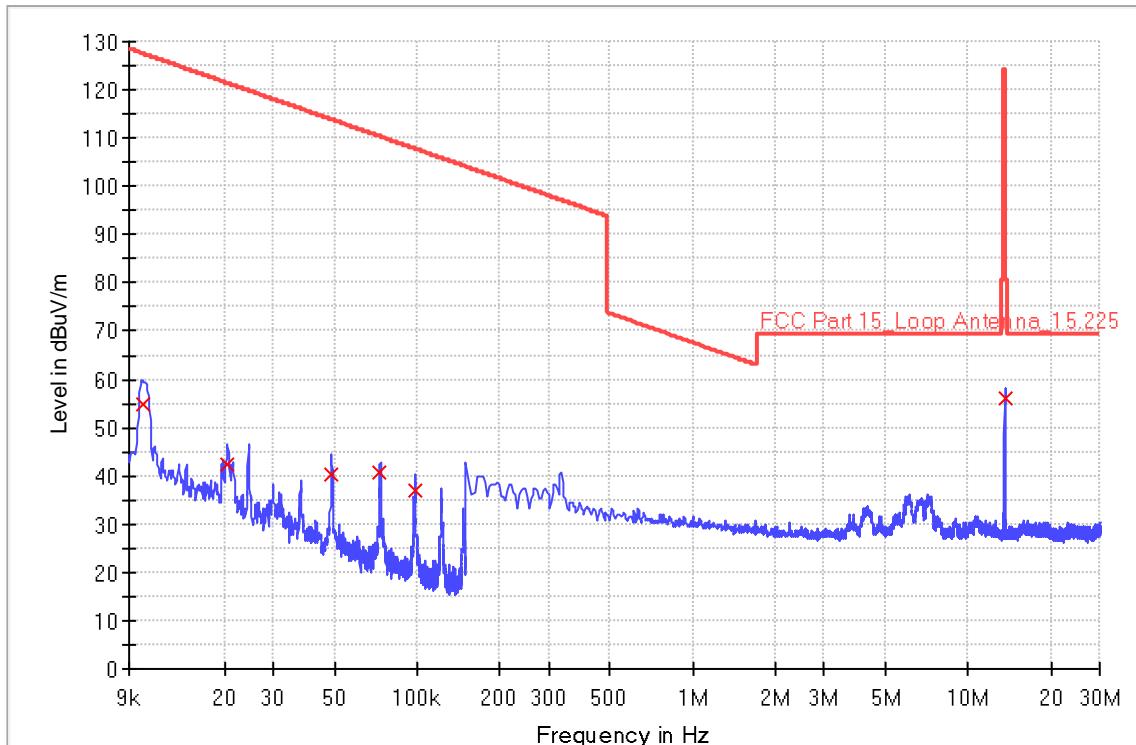


Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
0.010200	42.6	1000.0	0.200	155.0	Y	101.0	19.7	84.852	127.432
0.024280	41.1	1000.0	0.200	155.0	Y	195.0	19.1	78.809	119.899
0.048840	39.8	1000.0	0.200	155.0	Y	241.0	19.0	74.008	113.828
0.073240	35.3	1000.0	0.200	155.0	Y	86.0	18.9	75.059	110.309
0.334000	39.6	1000.0	9.000	155.0	Y	327.0	18.8	57.509	97.129
13.562000	49.8	1000.0	9.000	155.0	Y	296.0	18.8	74.190	124.000

Site: 3 meter chamber	Time: 2022/08/10 - 13:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Zeng Jianqing
Probe: HFH2-Z2	Polarity: Z
EUT: Enter Feeding Pump	Power: AC 120V,60Hz
Note: Transmit at 13.56MHz.	

RE_Loop E_pre

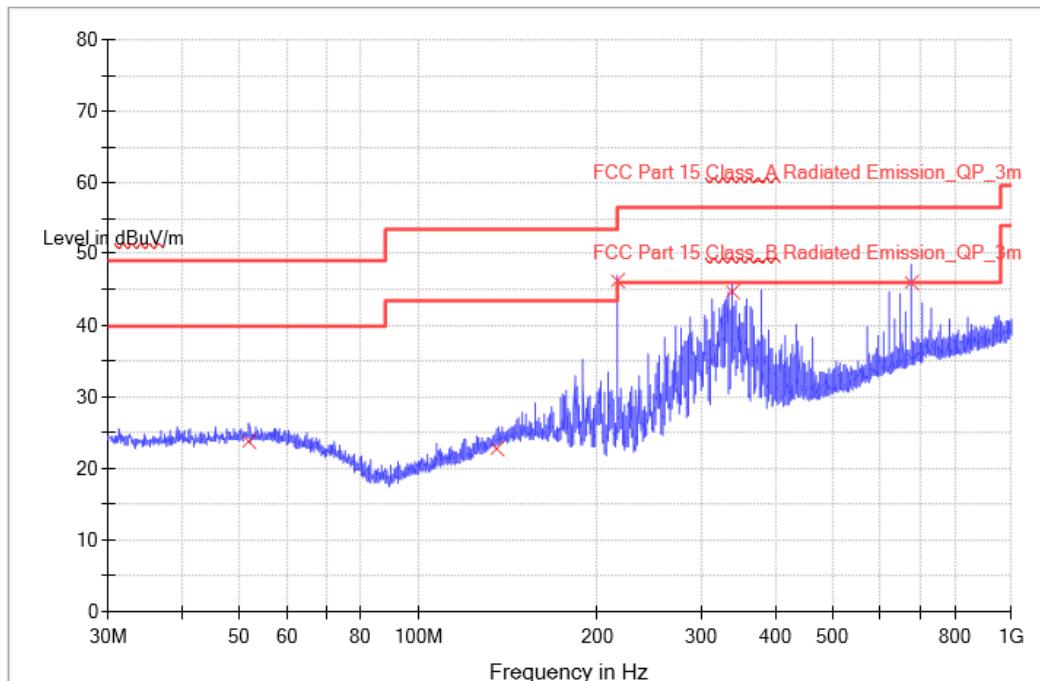


Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
0.010120	54.7	1000.0	0.200	155.0	Z	210.0	19.7	72.800	127.500
0.020520	42.2	1000.0	0.200	155.0	Z	277.0	19.1	79.150	121.360
0.049000	40.5	1000.0	0.200	155.0	Z	156.0	19.0	73.320	113.800
0.073400	40.9	1000.0	0.200	155.0	Z	241.0	18.9	69.390	110.290
0.097960	36.9	1000.0	0.200	155.0	Z	348.0	18.9	70.893	107.783
13.562000	55.9	1000.0	9.000	155.0	Z	191.0	18.8	68.080	124.000

Site: 3 meter chamber	Time: 2022/08/10 - 13:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Zeng Jianqing
Probe: VULB 9168	Polarity: Horizontal
EUT: Enter Feeding Pump	Power: AC 120V,60Hz
Note: Transmit at 13.56MHz.	

RE_VULB9168_pre_Cont_30-1000



Limit and Margin for intentional radiator (30-135.6MHz)

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
51.920000	23.8	1000.0	120.000	100.0	H	103.0	20.6	16.2	40.0
135.600000	22.7	1000.0	120.000	100.0	H	263.0	19.9	20.8	43.5

Remark:

Reference FCC Rule Part 15.33 (a)(1), If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Limit and Margin (30-1000MHz)

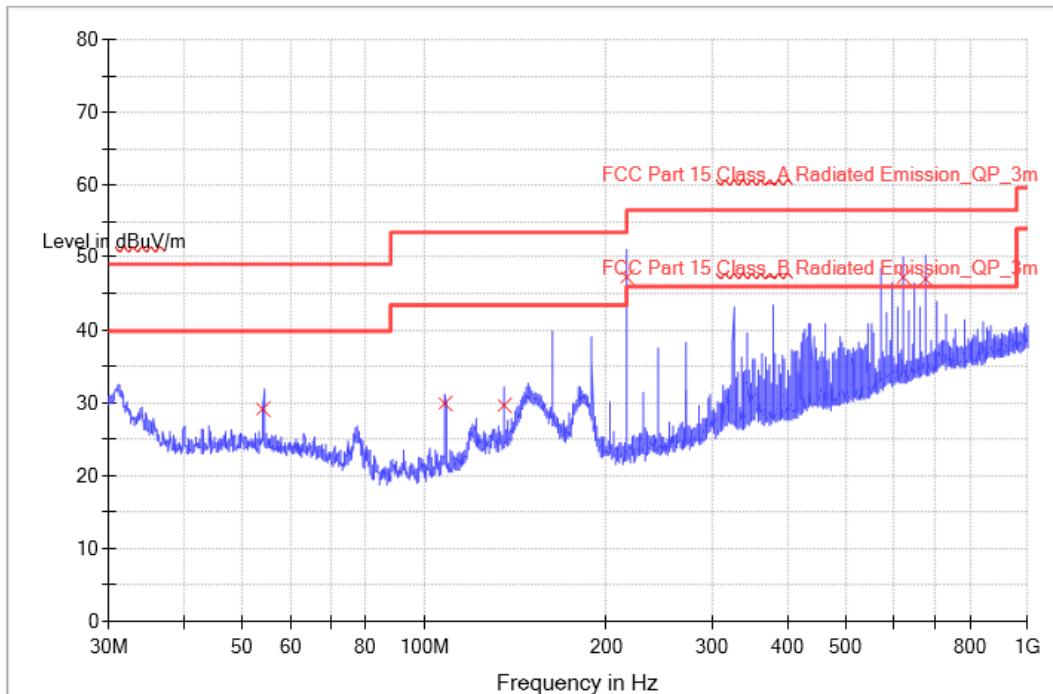
Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
51.920000	23.8	1000.0	120.000	100.0	H	103.0	20.6	26.2	50.0
135.600000	22.7	1000.0	120.000	100.0	H	263.0	19.9	30.8	53.5
216.960000	46.3	1000.0	120.000	100.0	H	49.0	17.5	10.1	56.4
338.160000	44.8	1000.0	120.000	180.0	H	165.0	22.6	11.6	56.4
678.000000	46.1	1000.0	120.000	100.0	H	21.0	30.0	10.3	56.4

Remark:

- 1.The test frequency range and limit refer to FCC Rule Part 15.209 (f) and Part 15.33(5)
- 2.This device will be used in a commercial environment (hospital) and it defined as Class A digital device, whose highest frequency is less than 108MHz. So, the radiated emission range is 30MHz to 1000MHz.

Site: 3 meter chamber	Time: 2022/08/10 - 13:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Zeng Jianqing
Probe: VULB 9168	Polarity: Vertical
EUT: Enter Feeding Pump	Power: AC 120V,60Hz
Note: Transmit at 13.56MHz.	

RE_VULB9168_pre_Cont_30-1000



Limit and Margin for intentional radiator (30-135.6MHz)

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
54.200000	29.0	1000.0	120.000	100.0	V	263.0	20.4	11.0	40.0
108.480000	30.0	1000.0	120.000	100.0	V	20.0	17.2	13.5	43.5
135.600000	29.7	1000.0	120.000	100.0	V	151.0	19.9	13.8	43.5

Remark:

Reference FCC Rule Part 15.33 (a)(1), If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Limit and Margin (30-1000MHz)

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
54.200000	29.0	1000.0	120.000	100.0	V	263.0	20.4	21.0	50.0
108.480000	30.0	1000.0	120.000	100.0	V	20.0	17.2	23.5	53.5
135.600000	29.7	1000.0	120.000	100.0	V	151.0	19.9	23.8	53.5
216.920000	47.3	1000.0	120.000	100.0	V	341.0	17.5	9.1	56.4
623.800000	47.2	1000.0	120.000	100.0	V	297.0	29.2	9.2	56.4
678.000000	46.9	1000.0	120.000	100.0	V	96.0	30.0	9.5	56.4

Remark:

- 1.The test frequency range and limit refer to FCC Rule Part 15.209 (f) and Part 15.33(5)
- 2.This device will be used in a commercial environment (hospital) and it defined as Class A digital device, whose highest frequency is less than 108MHz. So, the radiated emission range is 30MHz to 1000MHz.

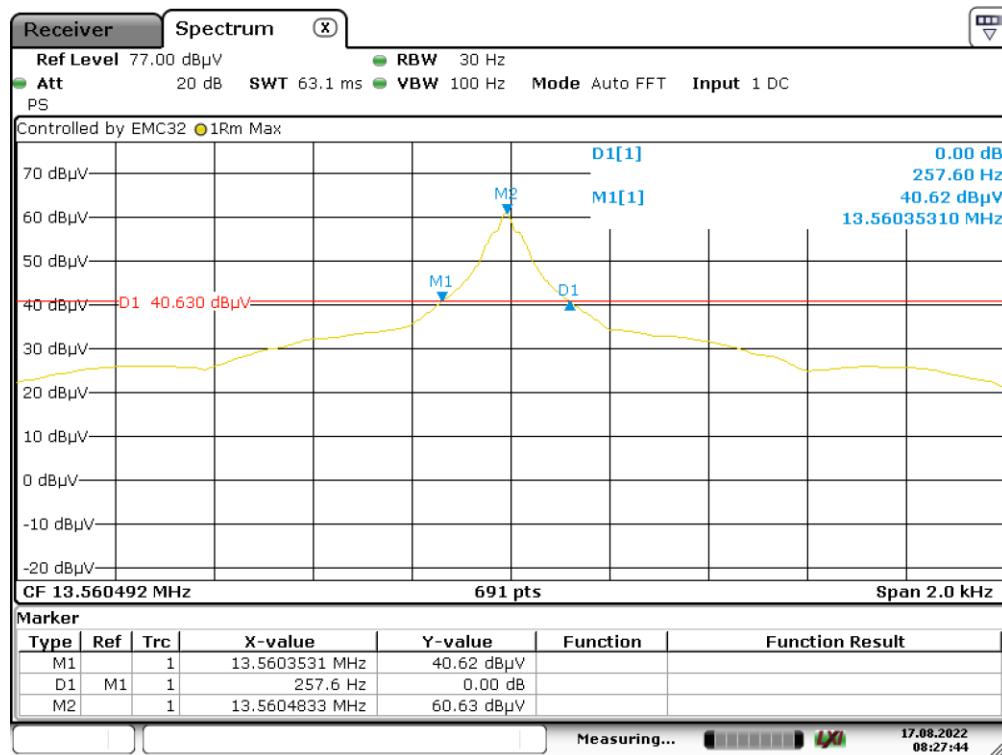
9.3 20dB Bandwidth Measurement

Test Method

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. Use the following test receiver settings:
Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel
RBW = 1% to 5% of the 20dB bandwidth of the emission being measured, $VBW \geq RBW$,
Sweep = auto, Detector function = peak, Trace = max hold
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth. Record the results.
4. Repeat above procedures until all frequencies measured were complete.

Test Result

Channel	20dB Bandwidth (Hz)	Limit (KHz)
13.56MHz	257.6Hz	NA



Date: 17.AUG.2022 08:27:44

9.4 FREQUENCY STABILITY

Test Method

1. The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber.
2. After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.
3. At room temperature ($25\pm5^{\circ}\text{C}$), an external variable AC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

Limit

The frequency tolerance of the carrier signal shall be maintained within $+\text{-}0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Result

Frequency Stability: Temperature variation					
Temperature (°C)	Voltage (AC)	Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result
20	120V	13.56033	0.00003	within $+\text{-} 1.356$	Pass
50	120V	13.56055	0.00022	within $+\text{-} 1.356$	Pass
-20	120V	13.56055	0.00022	within $+\text{-} 1.356$	Pass

Frequency Stability: Voltage variation					
Temperature (°C)	Voltage (AC)	Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result
20	102V	13.56033	0.00003	within $+\text{-} 1.356$	Pass
20	120V	13.56033	0	within $+\text{-} 1.356$	Pass
20	138V	13.56033	0	within $+\text{-} 1.356$	Pass

10 Test Equipment List

List of Test Instruments

USED	Equipment Name	Model	Manufacturer	Equipment ID.	Calibration Date	Calibration Due
<input checked="" type="checkbox"/>	EMI test receiver	ESR3	R&S	S1503109-YQ-EMC	2022.8.1	2023.7.31
<input checked="" type="checkbox"/>	Trilog super broadband test antenna	SCHWARZBECK	VULB9168	S1808296-YQ-EMC	2021.9.23	2024.9.22
<input checked="" type="checkbox"/>	Temperature Chamber	HTT-100AP	Shanghai HUCAN	S2201430b-YQ-EMC	2022-3-08	2023-3-07
<input checked="" type="checkbox"/>	Loop antenna	HFH2-Z2	R&S	S1503013-YQ-EMC	2022-6-13	2022-6-12
<input checked="" type="checkbox"/>	EMI test receiver	R & S	ESR3	S1503001-YQ-EMC	2022.8.1	2023.7.31
<input checked="" type="checkbox"/>	2-Line V-network	R & S	ENV216	S1503103-YQ-EMC	2022.8.1	2023.7.31

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Items	Extended Uncertainty
Radiated Disturbance	30MHz to 1GHz, $\pm 5.03\text{dB}$ (Horizontal) $\pm 5.11\text{dB}$ (Vertical) 1GHz to 18GHz, $\pm 5.15\text{dB}$ (Horizontal) $\pm 5.12\text{dB}$ (Vertical)