

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20240701528E-03	Rev.01	Initial report	2024-08-12

Note:

The report only embodies the test data of the 2# prototype

#1 refer to original test report NO.CQASZ20220400584E

The difference between product #1 and product #2 is that the battery model, battery capacity is different including having different battery supplier. The key differences are the appearance and the model number. These changes do not affect RF performance.

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
Conducted Emission (150KHz to 30MHz)	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.231 (b)	ANSI C63.10 (2013)	N/A
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.231 (b)/15.209	ANSI C63.10 (2013)	PASS
20dB Bandwidth	47 CFR Part 15, Subpart C Section 15.231 (c)	ANSI C63.10 (2013)	N/A
Dwell Time	47 CFR Part 15, Subpart C Section 15.231 (a)	ANSI C63.10 (2013)	N/A

For the fundamental testing items that are not applicable here since the application type is permissive change, please refer to the FCC test report in original grant for the result.

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN XINWU TECHNOLOGY LIMITED
Address of Applicant:	Floor 6, Building 2, Chungu Science park, Meisheng Huigu Science Park, 83 Dabao Road, Baoan District, Shenzhen
Manufacturer:	SHENZHEN XINWU TECHNOLOGY LIMITED
Address of Manufacturer:	Floor 6, Building 2, Chungu Science park, Meisheng Huigu Science Park, 83 Dabao Road, Baoan District, Shenzhen
Factory:	SHENZHEN XINWU TECHNOLOGY LIMITED
Address of Factory:	Floor 6, Building 2, Chungu Science park, Meisheng Huigu Science Park, 83 Dabao Road, Baoan District, Shenzhen

4.2 General Description of EUT

Product Name:	Smart Doorbell X9
Model No.:	XW133-X1, XW133-X2, XW133-X3, XW133-X4, XW133-X5, XW133-X6, XW133-X7, XW133-X8, XW133-X9, XW133-X10, XW133-D10
Test Model No.:	XW133-X9
Trade Mark:	N/A
Software Version:	XW133-X9_V1.5
Hardware Version:	XW133-X9-P0_V1.0&XW133-X9-P1_V1.0
Sample Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Operation Frequency:	433.92MHz
Channel Numbers:	1
Modulation Type:	FSK
Antenna Type:	internal antenna
Antenna Gain:	0 dBi
Power Supply:	Li-ion battery: DC 3.7V 750mAh, Charge by DC 5V for adapter Li-ion battery: DC 3.7V 600mAh, Charge by DC 5V for adapter

NOTE:

Model No.: XW133-X1, XW133-X2, XW133-X3, XW133-X4, XW133-X5, XW133-X6, XW133-X7, XW133-X8, XW133-X9, XW133-X10, XW133-D10

Their electrical circuit design, layout, components used and internal wiring are identical, Only the model is different.

4.3 Test Environment and Mode

Operating Environment:	
Radiated Emissions:	
Temperature:	25.5 °C
Humidity:	53 % RH
Atmospheric Pressure:	1009 mbar
Radio conducted item test (RF Conducted test room):	
Temperature:	25.5 °C
Humidity:	53 % RH
Atmospheric Pressure:	1009 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

4.4 Description of Support Units

The EUT has been tested independently.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Adapter	/	HW-0502000C01	/	CQA

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
/	/	/	/	/

4.5 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

4.6 Test Facility

- **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.7 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	5.12dB	(1)
Radiated Emission	Above 1GHz	4.60dB	(1)
Conducted Disturbance	0.15~30MHz	3.34dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Other Information Requested by the Customer

None.

4.11 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2023/9/8	2024/9/7
Spectrum analyzer	R&S	FSU26	CQA-038	2023/9/8	2024/9/7
Spectrum analyzer	R&S	FSU40	CQA-075	2023/9/8	2024/9/7
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2023/9/8	2024/9/7
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2023/9/8	2024/9/7
Preamplifier	EMCI	EMC184055SE	CQA-089	2023/9/8	2024/9/7
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/09/16	2024/09/15
Bilog Antenna	R&S	HL562	CQA-011	2021/09/16	2024/09/15
Horn Antenna	R&S	HF906	CQA-012	2021/09/16	2024/09/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/09/16	2024/09/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2023/9/8	2024/9/7
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2023/9/8	2024/9/7
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2023/9/8	2024/9/7
Antenna Connector	CQA	RFC-01	CQA-080	2023/9/8	2024/9/7
Power Sensor N1918A Power Analysis Manager Power Panel	KEYSIGHT	U2021XA	CQA-30	2023/9/8	2024/9/7
Power meter	Agilent	N1918A	CQA-074	2023/9/8	2024/9/7
Power meter	R&S	NRVD	CQA-029	2023/9/8	2024/9/7
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2023/9/8	2024/9/7
EMI Test Receiver	R&S	ESR7	CQA-005	2023/9/8	2024/9/7
LISN	R&S	ENV216	CQA-003	2023/9/8	2024/9/7
Coaxial cable	CQA	N/A	CQA-C009	2023/9/8	2024/9/7
DC power	KEYSIGHT	E3631A	CQA-028	2023/9/8	2024/9/7

Test software:

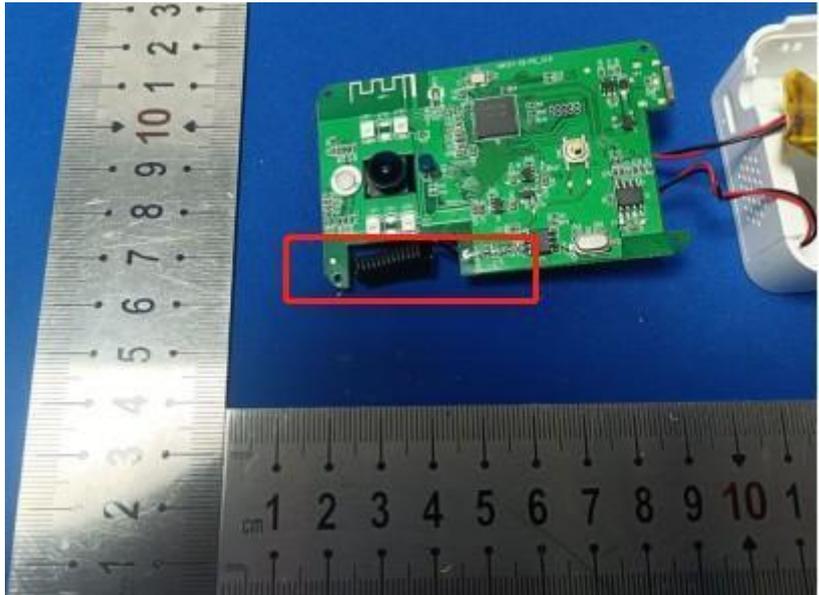
	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
RF Conducted test software	Audix	e3

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

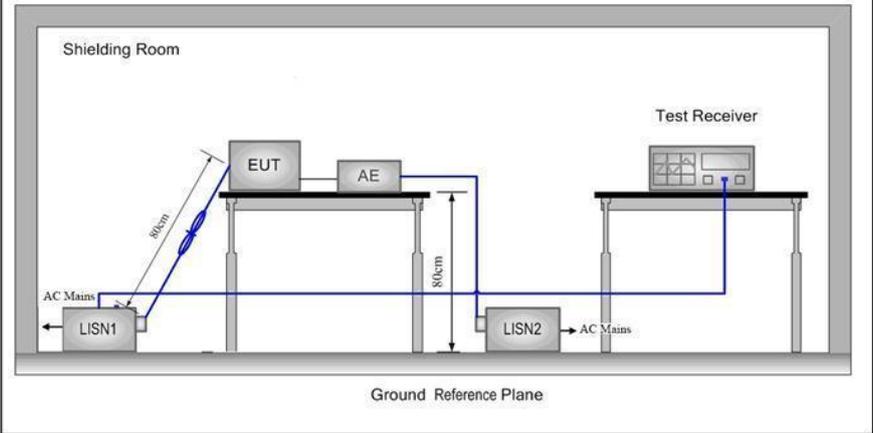
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
<p>15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible 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, 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 electrical connector is prohibited.</p>	
EUT Antenna:	
<p>The antenna is internal antenna. The best case gain of the antenna is 0dBi.</p>	

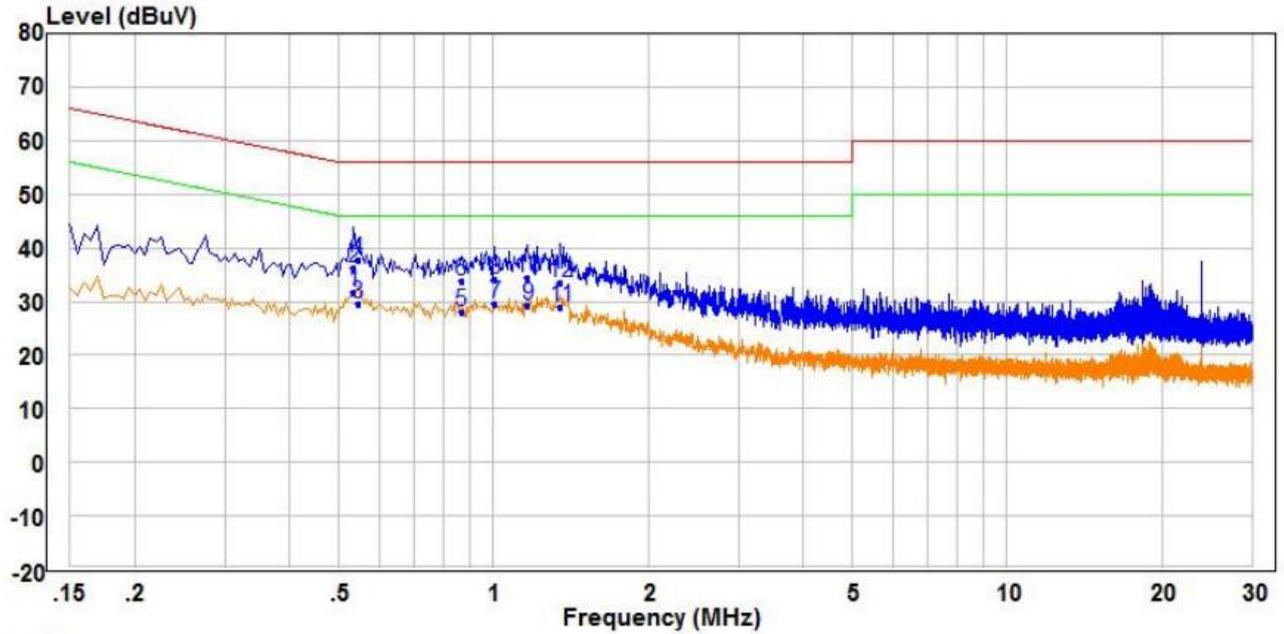
5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test Procedure:	<ol style="list-style-type: none"> 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 		

<p>Test Setup:</p>	
<p>Test Mode:</p>	<p>Charging mode</p>
<p>Test Voltage:</p>	<p>AC 120V/60Hz</p>
<p>Test Results:</p>	<p>Pass</p>

Measurement Data

Live line:

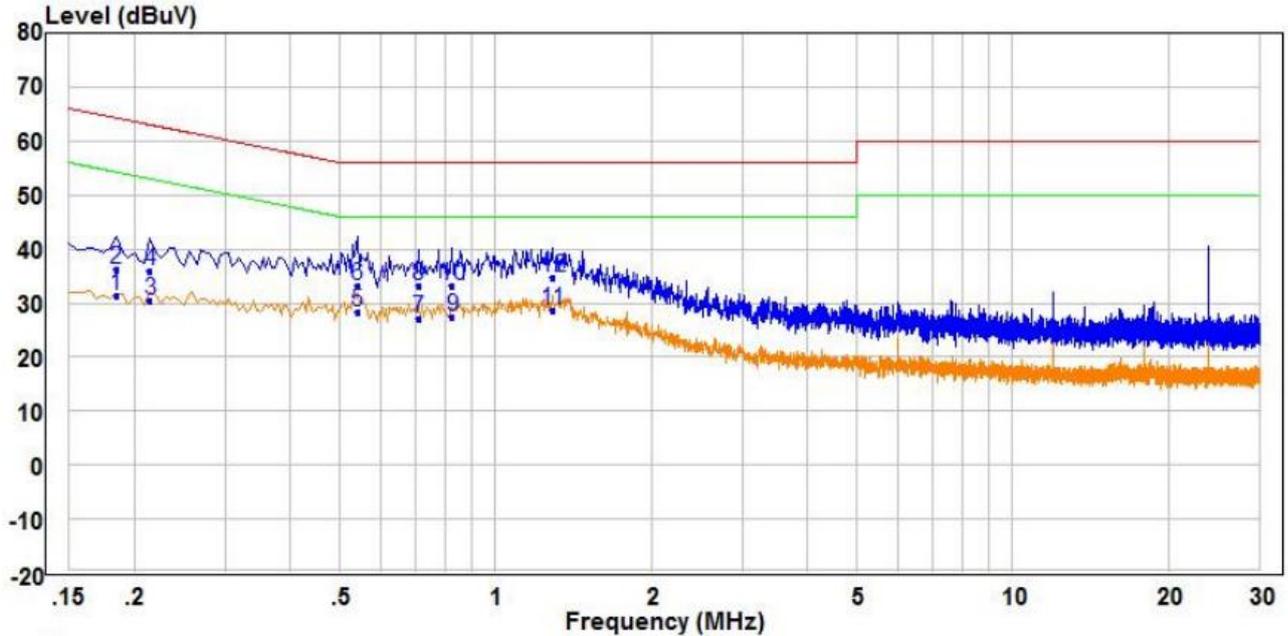


		Read		Limit	Over				
	Freq	Level	Factor	Level	Line	Limit	Remark		
	MHz	dBuV	dB	dBuV	dBuV	dB	Pol/Phase		
1	PP	0.535	21.96	9.59	31.55	46.00	-14.45	Average	Line
2		0.535	26.80	9.59	36.39	56.00	-19.61	QP	Line
3		0.545	20.08	9.61	29.69	46.00	-16.31	Average	Line
4	QP	0.545	28.26	9.61	37.87	56.00	-18.13	QP	Line
5		0.865	18.42	9.68	28.10	46.00	-17.90	Average	Line
6		0.865	24.18	9.68	33.86	56.00	-22.14	QP	Line
7		1.005	20.07	9.53	29.60	46.00	-16.40	Average	Line
8		1.005	24.55	9.53	34.08	56.00	-21.92	QP	Line
9		1.165	19.84	9.53	29.37	46.00	-16.63	Average	Line
10		1.165	24.88	9.53	34.41	56.00	-21.59	QP	Line
11		1.350	19.50	9.53	29.03	46.00	-16.97	Average	Line
12		1.350	24.03	9.53	33.56	56.00	-22.44	QP	Line

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.185	21.65	9.63	31.28	54.26	-22.98	Average	Neutral
2	0.185	26.60	9.63	36.23	64.26	-28.03	QP	Neutral
3	0.215	20.89	9.59	30.48	53.01	-22.53	Average	Neutral
4	0.215	26.20	9.59	35.79	63.01	-27.22	QP	Neutral
5	0.540	18.71	9.74	28.45	46.00	-17.55	Average	Neutral
6	0.540	23.40	9.74	33.14	56.00	-22.86	QP	Neutral
7	0.710	17.26	9.89	27.15	46.00	-18.85	Average	Neutral
8	0.710	23.22	9.89	33.11	56.00	-22.89	QP	Neutral
9	0.825	17.66	9.82	27.48	46.00	-18.52	Average	Neutral
10	0.825	23.50	9.82	33.32	56.00	-22.68	QP	Neutral
11 PP	1.290	18.86	9.71	28.57	46.00	-17.43	Average	Neutral
12 QP	1.290	25.13	9.71	34.84	56.00	-21.16	QP	Neutral

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

5.2.1 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.231(b) and 15.209				
Test Method:	ANSI C63.10: 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Limit: (Spurious Emissions)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
<p>Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.</p>					
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	314.2MHz	80.8		Average Value	
		100.8		Peak Value	
Test Procedure:	<p>a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360</p>				

degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the Z axis positioning which it is worse case, Only the test worst case mode is recorded in the report.

Test Setup:

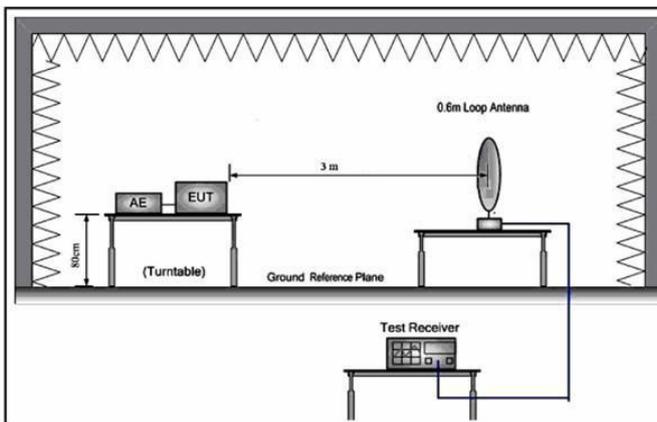


Figure 1. Below 30MHz

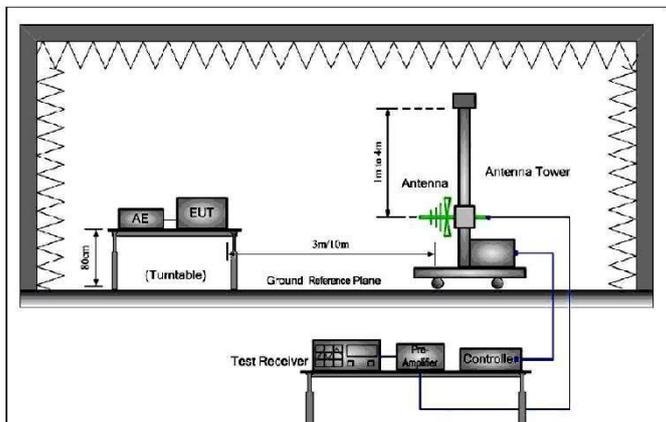


Figure 2. 30MHz to 1GHz

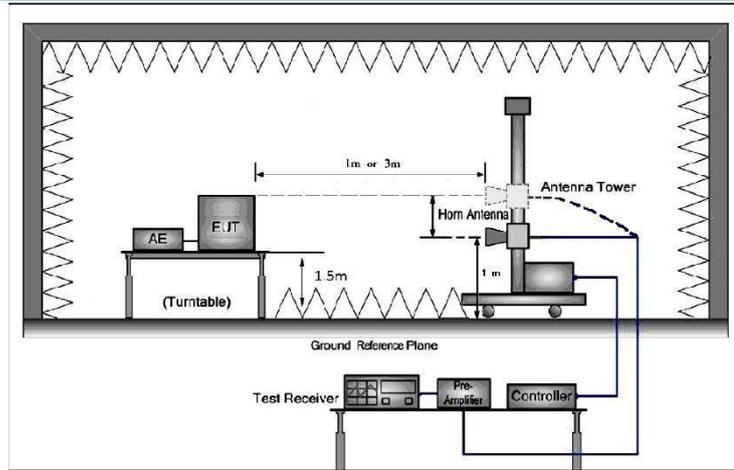


Figure 3. Above 1 GHz

Test Mode:	Transmitting mode
Test Results:	Pass

5.2.1.1 Spurious Emissions

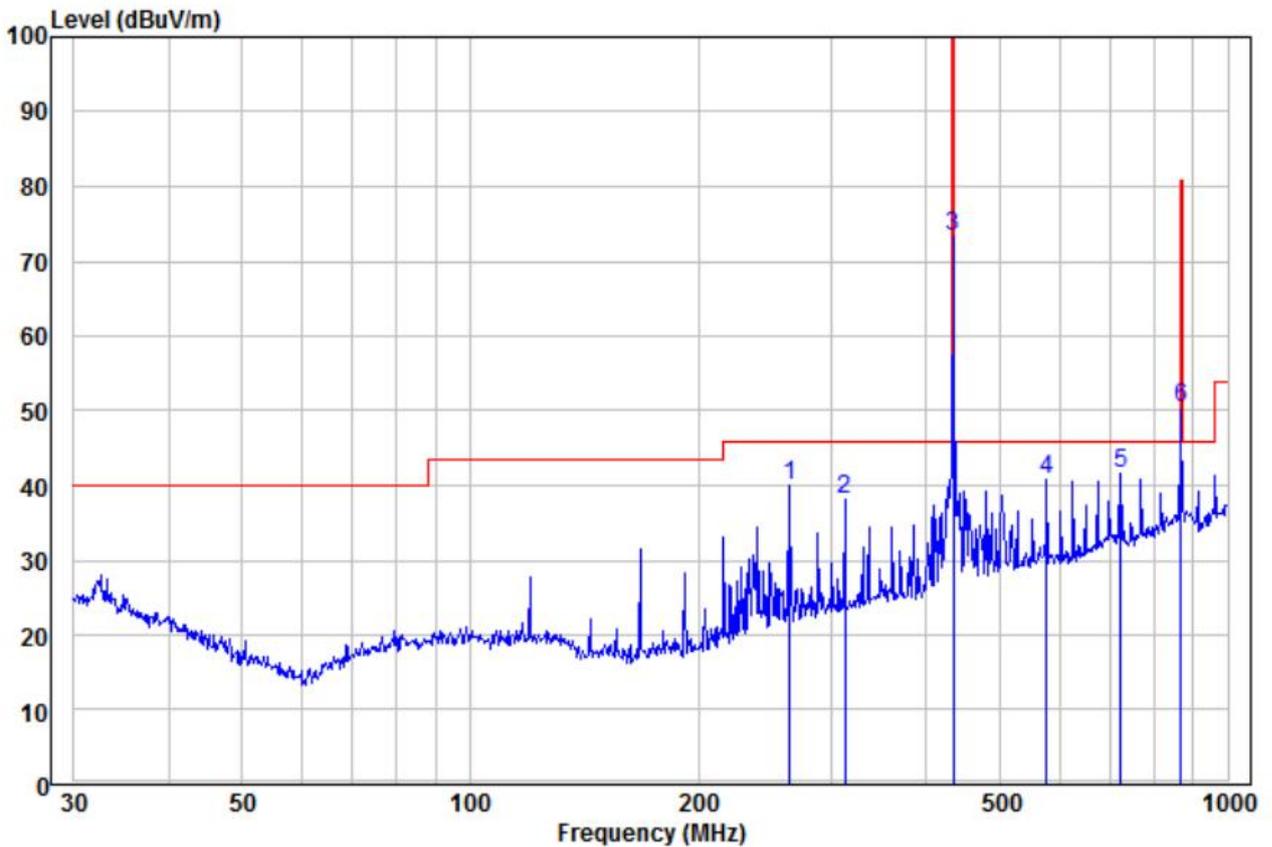
9KHz-30MHz

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

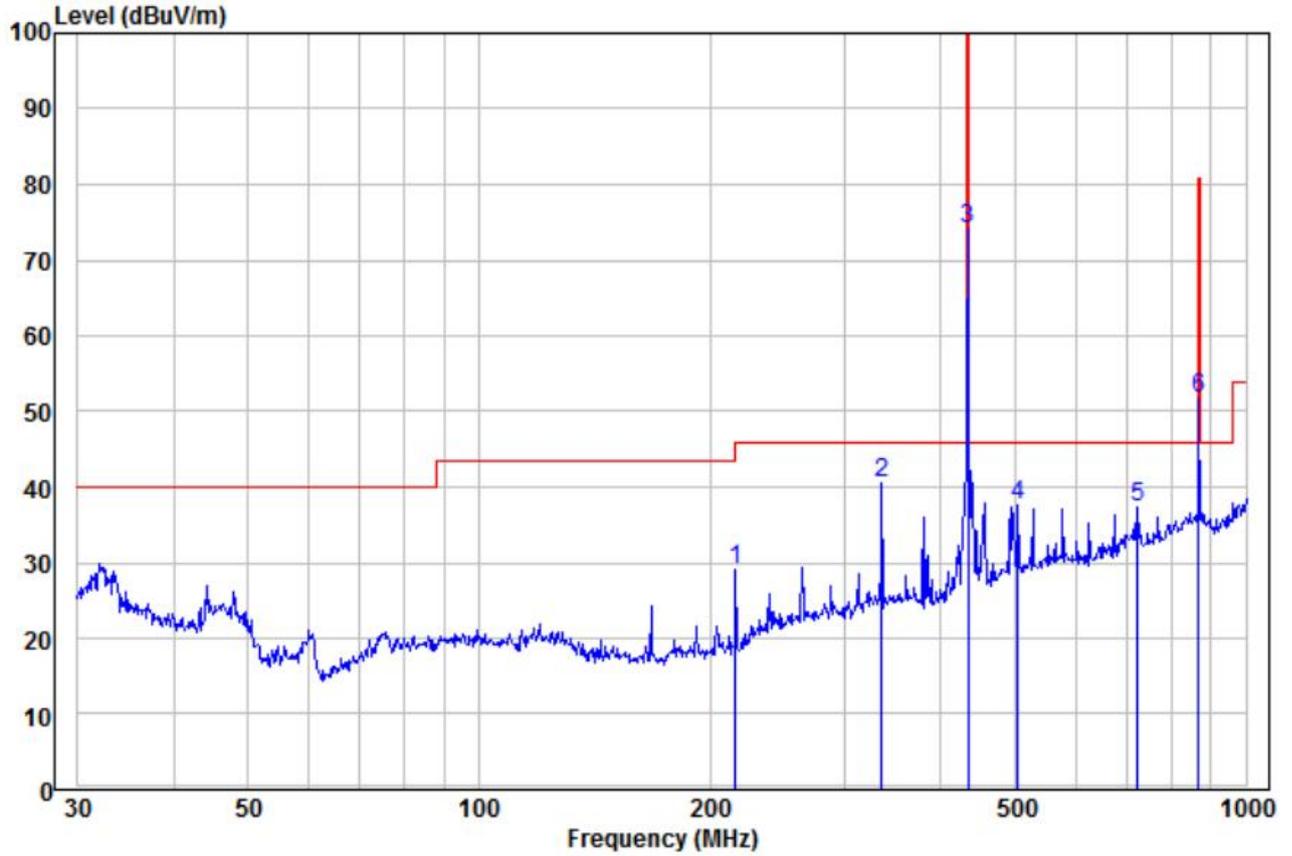
Below 1GHz (30MHz-1GHz)

Horizontal



	Read Freq	Read Level	Factor	Limit Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	263.82	25.78	14.09	39.87	46.00	-6.13	Peak	HORIZONTAL
2	312.18	22.40	15.63	38.03	46.00	-7.97	Peak	HORIZONTAL
3	434.07	55.36	18.04	73.40	100.80	-27.40	Peak	HORIZONTAL
4	576.64	19.80	21.11	40.91	46.00	-5.09	Peak	HORIZONTAL
5 pp	721.73	18.05	23.52	41.57	46.00	-4.43	Peak	HORIZONTAL
6	869.13	23.63	26.78	50.41	80.80	-30.39	Peak	HORIZONTAL

Vertical



	Read Freq	Read Level	Factor	Limit Level	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	216.02	18.57	10.52	29.09	46.00	-16.91 Peak	VERTICAL
2 pp	334.86	24.24	16.22	40.46	46.00	-5.54 Peak	VERTICAL
3	434.07	56.02	18.04	74.06	100.80	-26.74 Peak	VERTICAL
4	504.71	17.34	20.36	37.70	46.00	-8.30 Peak	VERTICAL
5	721.73	13.83	23.52	37.35	46.00	-8.65 Peak	VERTICAL
6	869.13	24.92	26.78	51.70	80.80	-29.10 Peak	VERTICAL

6 Photographs - EUT Test Setup

6.1 Radiated Emission

9kHz~30MHz:



30MHz~1GHz:



6.2 Conducted Emissions Test Setup



7 Photographs - EUT Constructional Details

Refer to APPENDIX 2 PHOTOGRAPHS OF EUT for CQASZ20240701528E-01.

*** End of Report ***