

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

Telephone: +86-755-26648640 Fax: +86-755-26648637

Website: www.cga-cert.com

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TEST REPORT

Report No.: CQASZ20220701271E-04

Applicant: Shenzhen Leaderment Technology Co., Ltd.

1st Floor, Building 24, Longcheng Industrial Zone Gaofeng Community,

Address of Applicant: Dalang Street, Longhua District, shenzhen, China 518109

Equipment Under Test (EUT):

EUT Name: Car Charger Model No.: UBCH449
Test mode No.: UBCH449

Brand Name: UNBREAKcable FCC ID: 2ASUP-UBCH449

Standards: 47 CFR Part 15, Subpart C

Date of Receipt: 2022-07-25

Date of Test: 2022-07-25 to 2022-08-10

Date of Issue: 2022-08-11
Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above

Tested By:

(Lewis Zhou)

Reviewed By:

(K Liao)

Approved By:

(Jack Ai)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.



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1 Version

Revision History of Report

Report No.	Version	Description	Issue Date
CQASZ20220701271E-04	Rev.01	Initial report	2022-08-11



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2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10-2013	N/A
20dB Bandwidth	47 CFR Part 15, Subpart C Section 15.239(a)	RSS-Gen section 6.7	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.239(b)	RSS-Gen section 6.12 & ANSI C63.10-2013	PASS
Radiated Transmitter Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	RSS-Gen section 6.13 & ANSI C63.10-2013	PASS

Note:

The EUT is powered by a DC power supply and does not need to test this item



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4 General Information

4.1 Client Information

Applicant:	Shenzhen Leaderment Technology Co., Ltd.	
Address of Applicant:	1st Floor, Building 24, Longcheng Industrial Zone Gaofeng Community Dalang Street, Longhua District, shenzhen, China 518109	
Manufacturer:	Shenzhen Leaderment Technology Co., Ltd.	
Address of Manufacturer:	1st Floor, Building 24, Longcheng Industrial Zone Gaofeng Community, Dalang Street, Longhua District, shenzhen, China 518109	
Factory:	Sage Human Electronics International Co., Ltd.	
Address of Factory:	4th Floor, A- building, No.2 Guiyuan Road, Guihua Community, Guanlan Town, Longhua New District, Shenzhen China	

4.2 General Description of EUT

•	
Product Name:	Car Charger
All Model No.:	UBCH449
Test Model No. :	UBCH449
Trade Mark:	UNBREAKcable
Software Version:	V1.1
Hardware Version:	V1.1
Operation Frequency:	88.1MHz-107.9 MHz
Number of Channels:	100CH
Channel Separation:	200KHz
Modulation Type:	FM
Product Type:	
Antenna Type:	Spring antenna
Antenna Gain:	1.5dBi
Power Supply:	Power by DC 12-24V



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Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	88.1MHz	26	93.1MHz	51	98.1MHz	76	103.1MHz
2	88.3MHz	27	93.3MHz	52	98.3MHz	77	103.3MHz
3	88.5MHz	28	93.5MHz	53	98.5MHz	78	103.5MHz
4	88.7MHz	29	93.7MHz	54	98.7MHz	79	103.7MHz
5	88.9MHz	30	93.9MHz	55	98.9MHz	80	103.9MHz
6	89.1MHz	31	94.1MHz	56	99.1MHz	81	104.1MHz
7	89.3MHz	32	94.3MHz	57	99.3MHz	82	104.3MHz
8	89.5MHz	33	94.5MHz	58	99.5MHz	83	104.5MHz
9	89.7MHz	34	94.7MHz	59	99.7MHz	84	104.7MHz
10	89.9MHz	35	94.9MHz	60	99.9MHz	85	104.9MHz
11	90.1MHz	36	95.1MHz	64	100.1MHz	86	105.1MHz
12	90.3MHz	37	95.3MHz	62	100.3MHz	87	105.3MHz
13	90.5MHz	38	95.5MHz	63	100.5MHz	88	105.5MHz
14	90.7MHz	39	95.7MHz	64	100.7MHz	89	105.7MHz
15	90.9MHz	40	95.9MHz	65	100.9MHz	90	105.9MHz
25	92.9MHz	50	97.9MHz	75	102.9MHz	100	107.9MHz

Note:

In RSS-Gen, regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	88.1MHz
The Middle channel	98.1MHz
The Highest channel	107.9MHz

4.3 Test Environment and Mode

Test Environment:			
Temperature:	24.0 °C		
Humidity:	52 % RH		
Atmospheric Pressure:	1008 mbar		
Test mode:			
Transmitter mode	Keep the EUT in transmitting mode with modulation.		

Remark: If the audio input signal is audio and the transmitter is frequency modulated, compliance with the RSS210 B 9(c) requirements shall be demonstrated by modulating the transmitter with a 2.5 kHz tone at a level 16 dB higher than that required to produce a frequency deviation of 75 kHz, or 50 % of the manufacturer's rated deviation, whichever is less.



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4.4 Description of Support Units

The EUT has been tested independently and or The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
1	1	/	1	/

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
1	/	,	,	,

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 District, Shenzhen,

No tests were sub-contracted:

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.



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4.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9 x 10 ⁻⁸
2 RF power, conducted		0.31dB (30MHz-1GHz)
	RF power, conducted	0.57dB (1GHz-18GHz)
2	Padiated Spurious emission test	4.5dB (30MHz-1GHz)
3 Radiated Spurious emission test	4.8dB (1GHz-12.75GHz)	
4	Conduction emission	3.6dB (9kHz to 150kHz)
4	Conduction emission	3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%



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5 Equipment List

			Instrument	Calibration	Calibration
Test Equipment	Manufacturer	Model No.	No.	Date	Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2021/9/10	2022/9/9
Spectrum analyzer	R&S	FSU26	CQA-038	2021/9/10	2022/9/9
		AFS4-00010300-18-10P-			
Preamplifier	MITEQ	4	CQA-035	2021/9/10	2022/9/9
		AMF-6D-02001800-29-			
Preamplifier	MITEQ	20P	CQA-036	2021/9/10	2022/9/9
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2021/9/16	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2021/9/16	2024/9/15
Horn Antenna	R&S	HF906	CQA-012	2021/9/16	2024/9/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/9/16	2024/9/15
Coaxial Cable					
(Above 1GHz)	CQA	N/A	C019	2021/9/10	2022/9/9
Coaxial Cable					
(Below 1GHz)	CQA	N/A	C020	2021/9/10	2022/9/9
Antenna Connector	CQA	RFC-01	CQA-080	2021/9/10	2022/9/9
RF					
cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2021/9/10	2022/9/9
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2021/9/10	2022/9/9
EMI Test Receiver	R&S	ESPI3	CQA-013	2021/9/10	2022/9/9
LISN	R&S	ENV216	CQA-003	2021/9/10	2022/9/9
Coaxial cable	CQA	N/A	CQA-C009	2021/9/10	2022/9/9

Note:

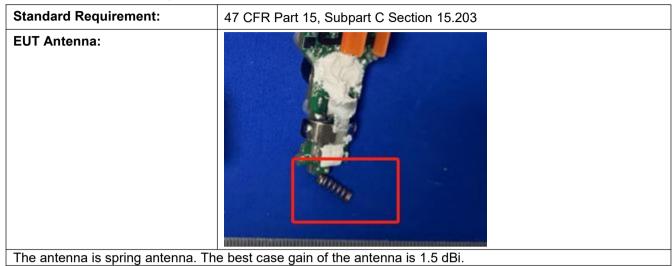
The temporary antenna connector is soldered on the Integral board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



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6 Test results and Measurement Data

6.1 Antenna Requirement





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6.2 20dB Bandwidth

Test Requirement: 47 CFR Part 15, Subpart C Section 15.239(a) **Test Method:** ANSI C63.10:2013 instead of RSS-GEN 6.7

Spectrum Analyzer

E.U.T

Non-Conducted Table

Test Setup:

Ground Reference Plane

Instruments Used: Refer to section 6 for details

Limit: The occupied bandwidth shall not exceed 200 kHz.

Test Mode: Transmitting mode

Test Results: Pass

Measurement Data

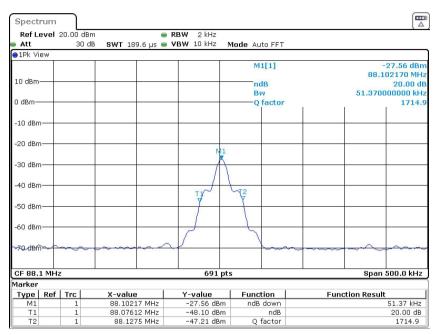
Test channel	20dB Bandwidth(KHz)	Limit(KHz)
Lowest	51.4	≤200
Middle	50.7	≤200
Highest	50.7	≤200



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Test plot as follows:

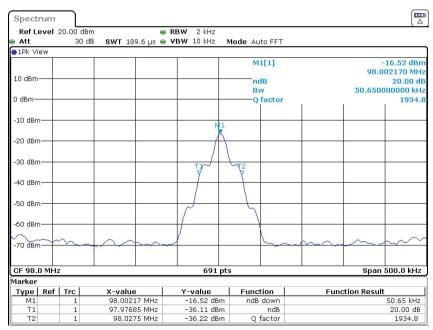
Test channel: Lowest



Date: 24.MAR.2022 10:43:11

20dB

Test channel:	Middle



Date: 24.MAR.2022 10:44:01

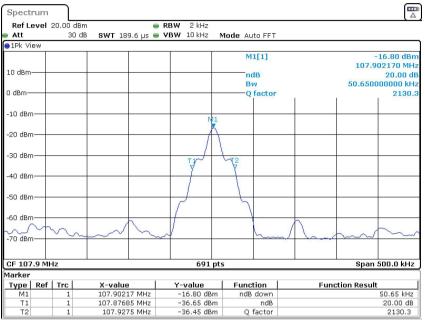
20dB

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Test channel: Highest



Date: 24.MAR.2022 10:39:26

20dB



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6.4 Radiated Transmitter Spurious Emission

Test Requirement: 47 CFR Part 15, Subpart C Section 15.205/15.209

Test Method: ANSI C63.10

Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.015MHz	Quasi-peak	200Hz	1KHz	Quasi-peak
0.015MHz-30MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300KHz	Quasi-peak
Above 4011-	Peak	1MHz	3MHz	Peak
Above 1GHz	Peak	1MHz	10Hz	Average

Test Setup:

Receiver Setup:

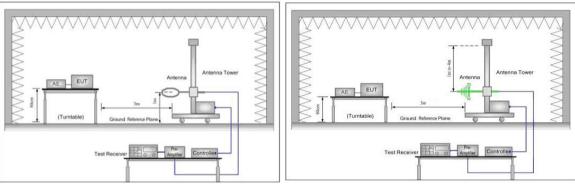


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

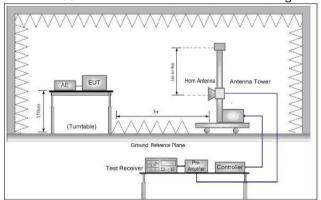


Figure 3. Above 1GHz



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Test Procedure:

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.

Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel ,middle channel, the Highest channel
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.

i. Repeat above procedures until all frequencies measured was complete.

Frequency	Field strength (microvolt/meter)	Limit (dBµV/m)	Remark	distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	Quasi-peak	300
0.490MHz-1.705MHz	24000/F(kHz)	-	Quasi-peak	30
1.705MHz-30MHz	30	-	Quasi-peak	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
	300	74.0	Peak	3

Limit:

Limit:

(Field strength of the fundamental signal)

Frequency	Limit (dBµV/m @3m)	Remark
OOMLI- 400MLI-	48.0	Average Value
88MHz-108MHz	68.0	Peak Value

Test Mode: Transmitting mode

Instruments Used: Refer to section 6 for details

Test Results: Pass



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Field Strength of the Fundamental Signal

Peak value:

Test	Level	Limit (dBµV/m)	Over Limit	Result	Antenna Polaxis
88.1	54.63	68.0	-13.37	Pass	Н
88.1	61.37	68.0	-6.63	Pass	V
98.1	57.04	68.0	-10.96	Pass	Н
98.1	54.38	68.0	-13.62	Pass	V
107.9	57.39	68.0	-10.61	Pass	Н
107.9	55.09	68.0	-12.91	Pass	V

Average value:

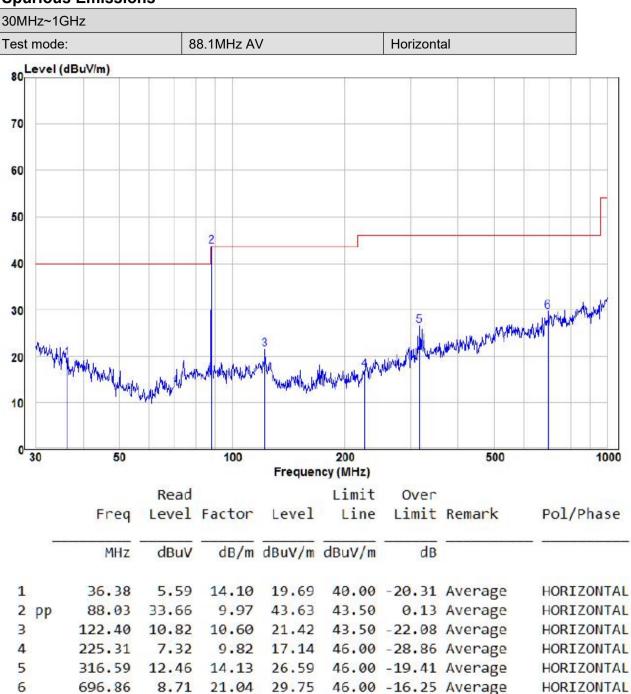
Test	Level	Limit	Over Limit		Antenna
frequency	(dBµV/m)	(dBµV/m)	(dB)	Result	Polaxis
88.1	43.63	48.0	-4.37	Pass	Н
88.1	45.37	48.0	-2.63	Pass	V
98.1	45.04	48.0	-2.96	Pass	Н
98.1	44.38	48.0	-3.62	Pass	V
107.9	44.39	48.0	-3.61	Pass	Н
107.9	44.09	48.0	-3.91	Pass	V



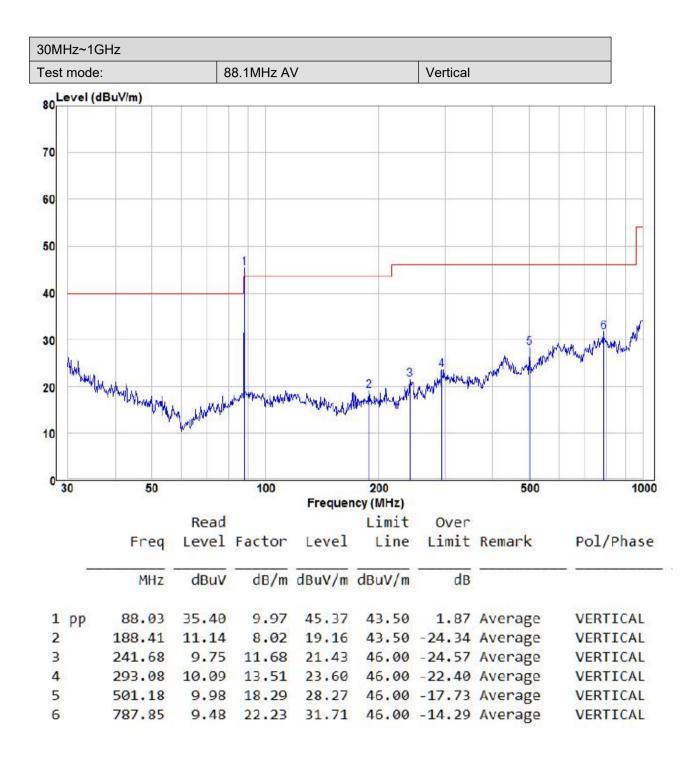
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HORIZONTAL

Spurious Emissions

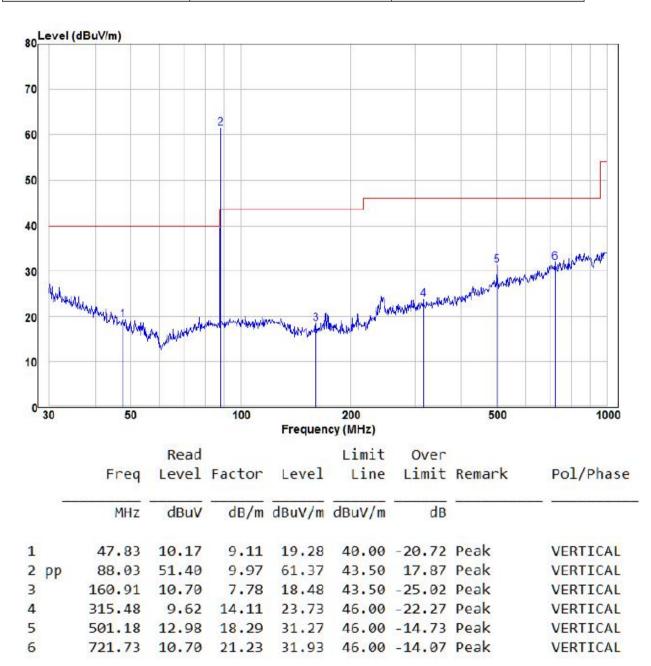




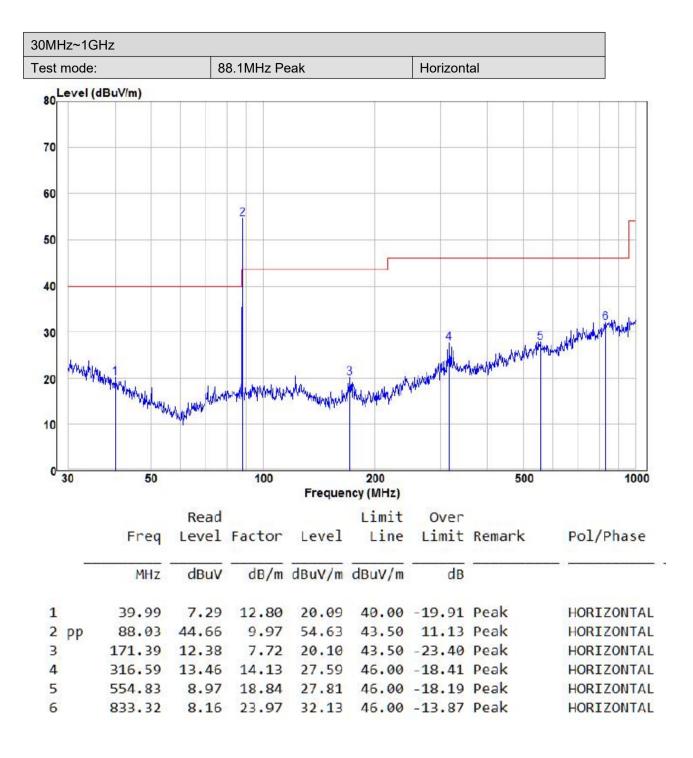




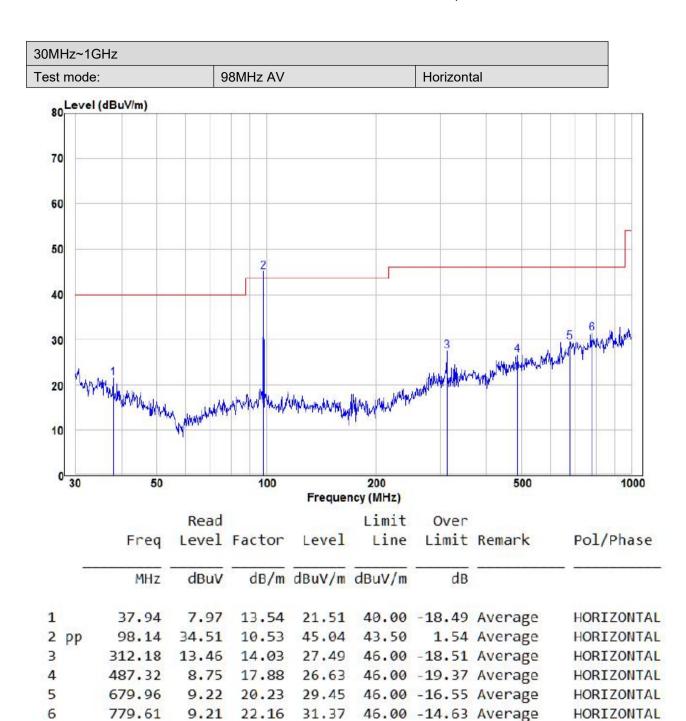
30MHz~1GHz		
Test mode:	88.1MHz Peak	Vertical



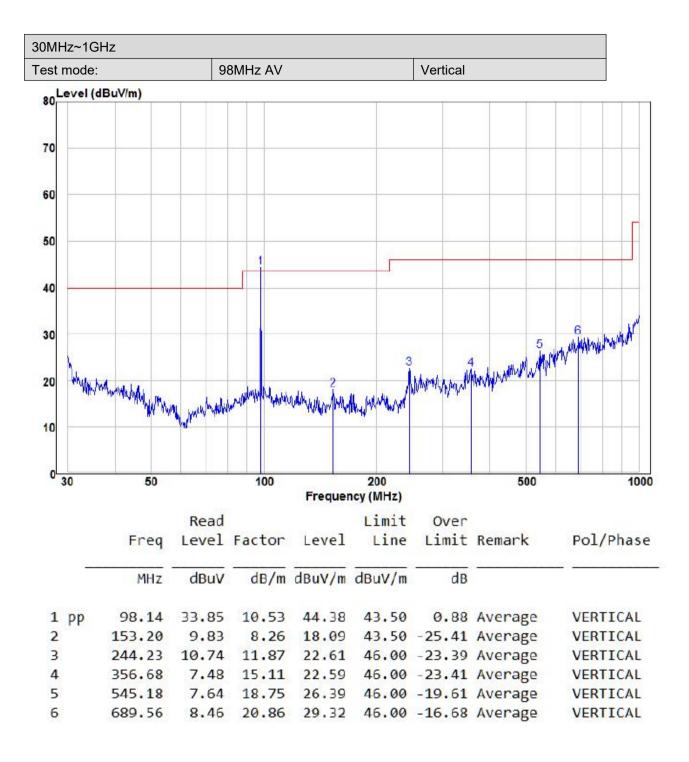




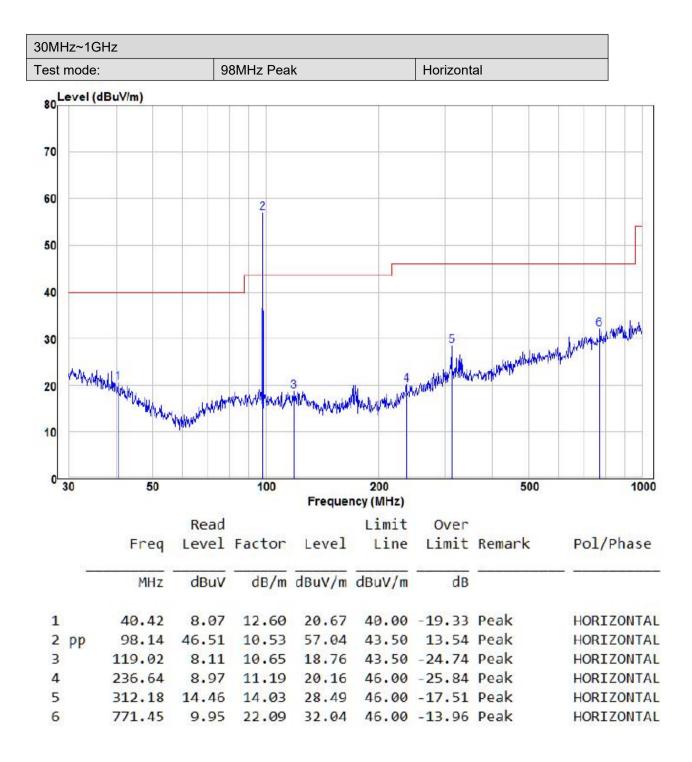




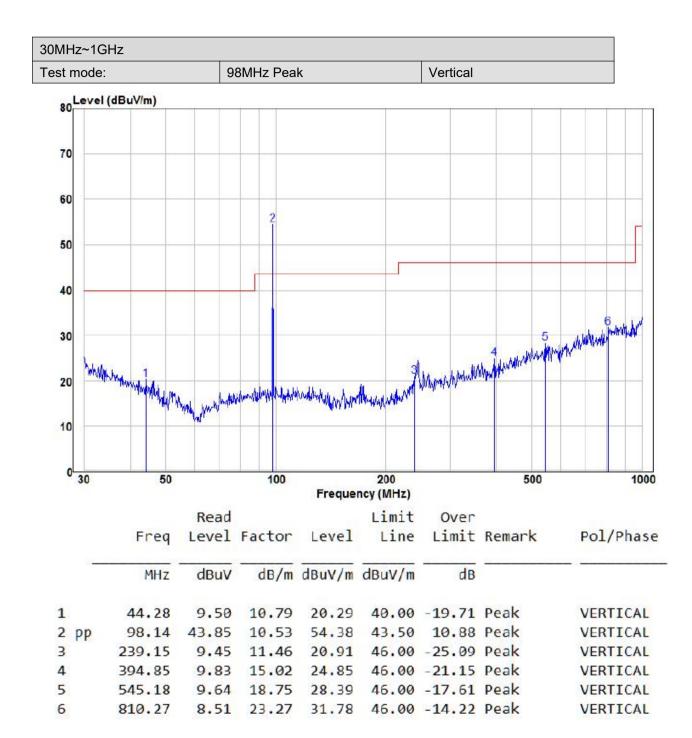




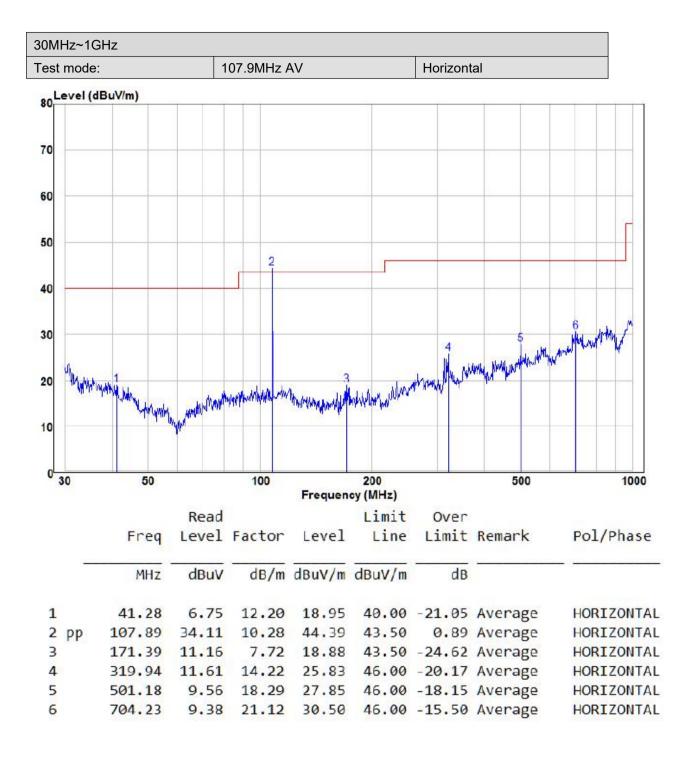




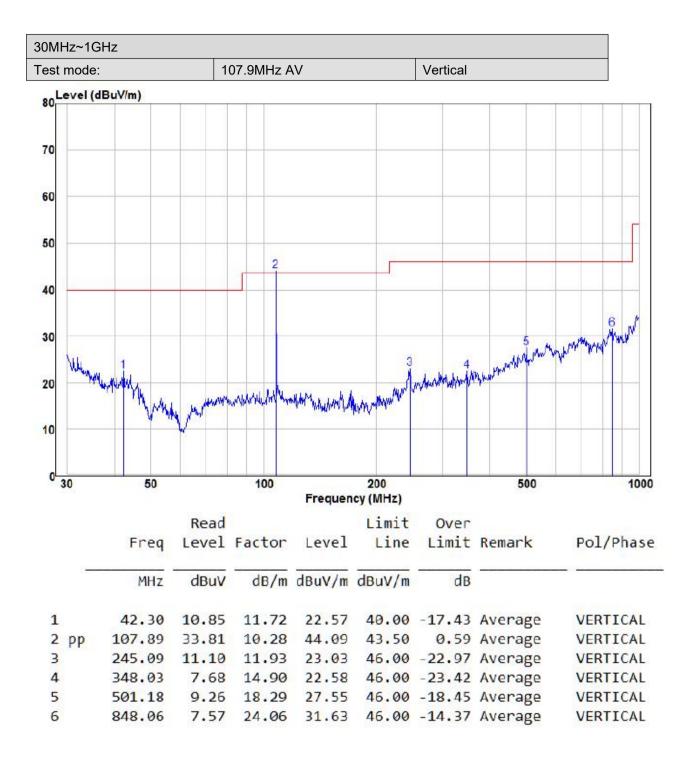




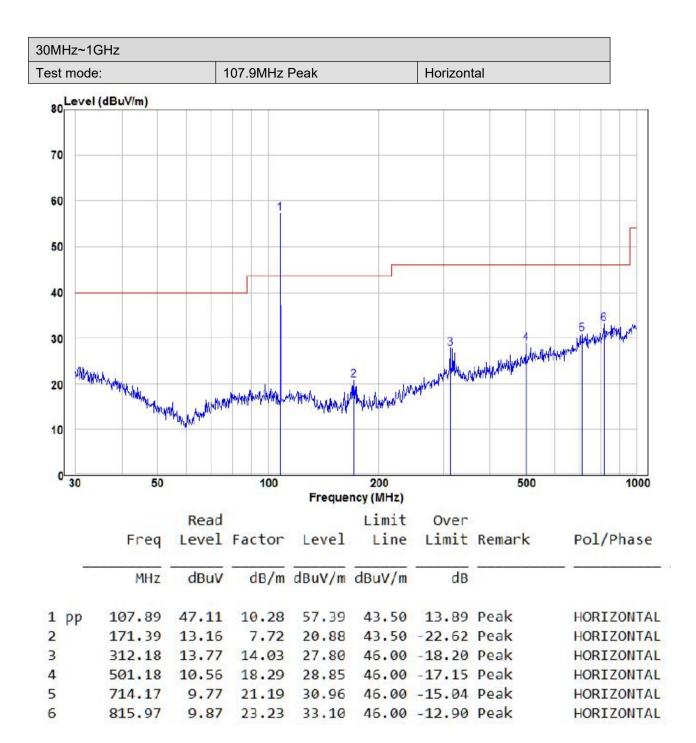






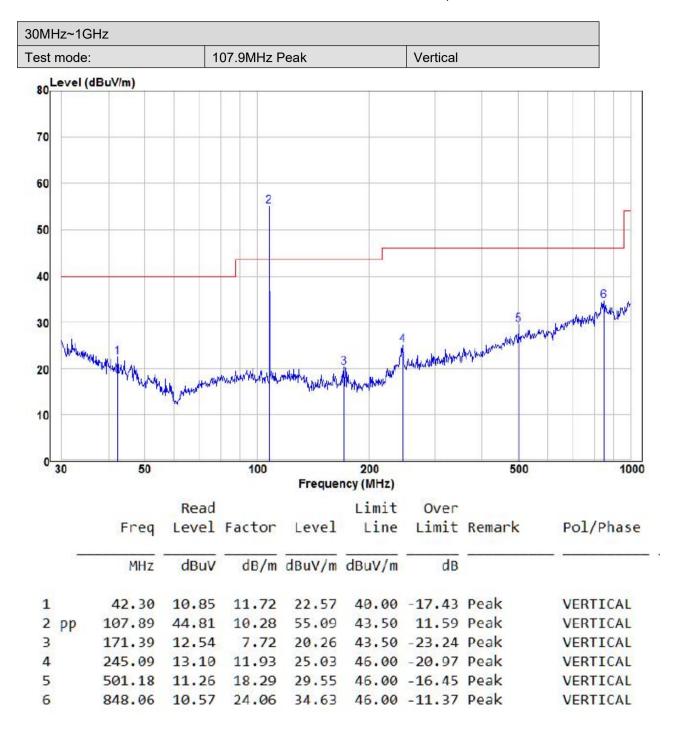








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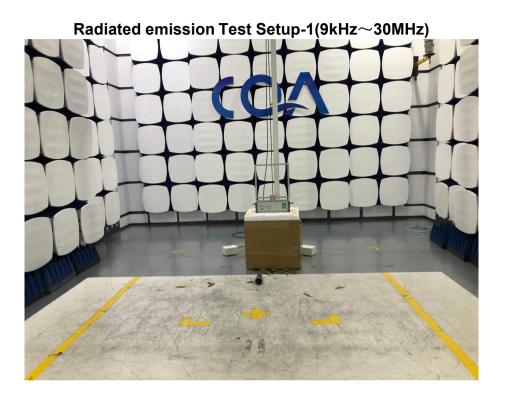
Remark:

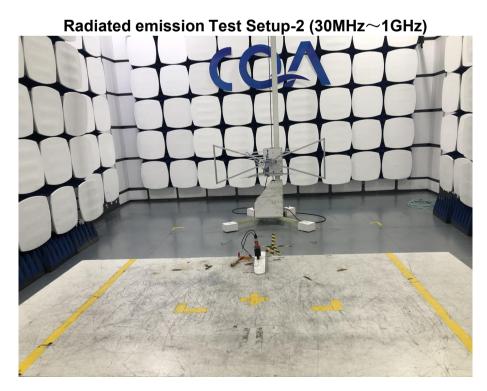
- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level =Receiver Reading Correct Factor
 - Correct Factor = Preamplifier Factor Antenna Factor Cable Factor
- 2) Scan from 9kHz to 1GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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APENDIX 1 PHOTOGRAPHS OF TEST SETUP







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PHOTOGRAPHS OF EUT Constructional Details

Refer to Photographs - EUT Constructional Details OF EUT for CQASZ20220701271E-01.

*** END OF REPORT ***