



FCC/IC - TEST REPORT

Report Number : 709502403251-00B Date of Issue: Sep. 24, 2024

Model : Cra EW

Product Type : Cradle

Applicant : SHINING 3D Tech Co., Ltd.

Address : No.1398 Xiangbin Road, Wenyan, Xiaoshan, Hangzhou,
Zhejiang, China

Manufacturer : SHINING 3D Tech Co., Ltd.

Address : No.1398 Xiangbin Road, Wenyan, Xiaoshan, Hangzhou,
Zhejiang, China

Test Result : ☒ Positive ☐ Negative

Total pages including
Appendices : 43



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2. Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	09/24/2024

3. 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

Telephone: +86 21 6141 0123

Fax: +86 21 6140 8600

FCC Registration No.: 820234

FCC Designation Number: CN1183

ISED CAB identifier CN0101

IC Registration No.: 31668



4. Description of the Equipment Under Test

4.1 EUT Description

Product: Cradle

Model no.: Cra EW

Hardware Version Cra EW
Identification No. (HVIN)

Product Marketing Name (PMN) Cra EW

FCC ID: 2AMG4-CRAEW

IC: 24652-CRAEW

Options and accessories: NA

Rating: DC 5V, 3A

RF Transmission Frequency: For WPT:
111-205KHz

For 5G Wi-Fi:
5180~5240 MHz (U-NII-1)
5745~5825 MHz (U-NII-3)

No. of Operated Channel: For 5G Wi-Fi:

Band (GHz)	Operating Channel Number	Channel center frequencies for 20MHz bandwidth (MHz)
5.15GHz~5.25GHz	36	5180
	40	5200
	44	5220
	48	5240
5.725GHz~5.825GHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825



Band (GHz)	Operating Channel Number	Channel center frequencies for 40MHz bandwidth (MHz)
5.15GHz~5.25GHz	38	5190
	46	5230
5.725GHz~5.825GHz	151	5755
	159	5795

Band (GHz)	Operating Channel Number	Channel center frequencies for 80MHz bandwidth (MHz)
5.15GHz~5.25GHz	42	5210
5.725GHz~5.825GHz	155	5775

Modulation: For WPT:
ASK

For 5G Wi-Fi:
Orthogonal Frequency Division Multiplexing (OFDM) for 802.11a/n/ac/ax

Hardware Version: 3

Software Version: /

Data speed: 5G Wi-Fi:
SISO: 11a 6 ~ 54Mbps,
11n HT20 6.5 ~ 72.2Mbps, 11n HT 40 13.5 ~ 150Mbps,
11ac VHT20 6.5 ~ 86.7Mbps, 11ac VHT40 13.5 ~ 200Mbps,
11ac VHT80 29.3 ~ 433.3Mbps
11ax HE20 7.313 ~ 143.382Mbps, 11ax HE40 14.625 ~ 286.765Mbps,
11ax HE80 30.625 ~ 600.490Mbps
MIMO: 11a 6 ~ 54Mbps,
11n HT20 13 ~ 144.4Mbps, 11n HT 40 27 ~ 300Mbps,
11ac VHT20 13 ~ 173.3Mbps, 11ac VHT40 27 ~ 400Mbps,
11ac VHT80 58.5 ~ 866.7Mbps
11ax HE20 14.625 ~ 286.765Mbps, 11ax HE40 29.250 ~ 573.529Mbps,
11ax HE80 61.250 ~ 1200.980Mbps

Antenna Type: For WPT:
Coil antenna

For 5G Wi-Fi:
Capacitor Antenna

Antenna Gain: For 5G Wi-Fi:
Antenna1: 4.26 dBi, Antenna2: 3.09 dBi

Directional gain: For 5GHz Wi-Fi output power & power spectral density: 6.71 dBi
Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi
G1 = 4.26 dBi, G2 = 3.09 dBi, NANT = 2



So Directional gain =

$$10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi} = 10 \log[(10^{3.09/20} + 10^{3.09/20})^2 / 2] \text{ dBi} = 6.71 \text{ dBi}$$

The Equipment supports MIMO and does not support beamforming and CDD modulation, and all antennas have the different gain,

According to KDB662911 D01 chapter F d) (i) :

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi}$$

[Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.],

Description of the EUT:

The Equipment Under Test (EUT) is a Cradle with Wi-Fi Module and Wireless Power Transmission function. The EUT support Wireless Power Transmission function operated at 111-205KHz and Wi-Fi operated at 5GHz.

Test sample no.: SHA-809685-1

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment, antenna gain, or any information supplied.

4.2 Peripheral devices during the testing:

- | | |
|------------------------------|--|
| ■ - <u>Intraoral Scanner</u> | Type : <u>Aoralscan Elite Wireless</u> |
| ■ - <u>Notebook</u> | Type : <u>Crossnair 15 R6E B12UEZ</u> |



5. Summary of Test Standards

Test Standards	
RSS-216 Issue 2 January 2016	Wireless Power Transfer Devices
RSS-Gen Issue 5 March 2019 Amendment 1	General Requirements for Compliance of Radio Apparatus
ICES-001 Issue 5 July 2020	Industrial, Scientific and Medical (ISM) Radio Frequency Generators
CFR 47 Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

6. Summary of Test Results

Technical Requirements		
RSS-216 ICES-001 CFR 47 Part 15 Subpart C		
Test Condition		Test Result
RSS-216 §6.2.2.1 ICES-001 §3.3.3 CFR 47 §15.207	Conducted emission AC power port	Pass
RSS-216 §6.2.2.2 ICES-001 §3.3.4 CFR 47 §15.209	Radiated Emissions	Pass
RSS-GEN §6.7, §8.10 CFR 47 §15.215	20dB Bandwidth & Restricted frequency bands and occupied bandwidth	Pass
CFR 47 §15.203	Antenna requirement	See note 2

Note 1: Because the highest frequency of the internal sources of the EUT is less than 108MHz, so the measurement only is made up to 1GHz.

Note 2: The EUT uses a coil antenna. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.



7. General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AMG4-CRAEW, IC: 24652-CRAEW, complies with Section 15.207, 15.209, 15.205 of the FCC Part 15, Subpart C rules.

This report is only for WPT, for the 5GHz Wi-Fi test report please refer to 709502403251-00C.

SUMMARY:

All tests according to the regulations cited on page 7 were

■ - Performed

□ - Not Performed

The Equipment under Test

■ - Fulfills the general approval requirements.

□ - Does not fulfill the general approval requirements.

Sample Received Date: April 29, 2024

Testing Start Date: May 9, 2024

Testing End Date: September 12, 2024

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

Reviewed by:

Prepared by:

Tested by:



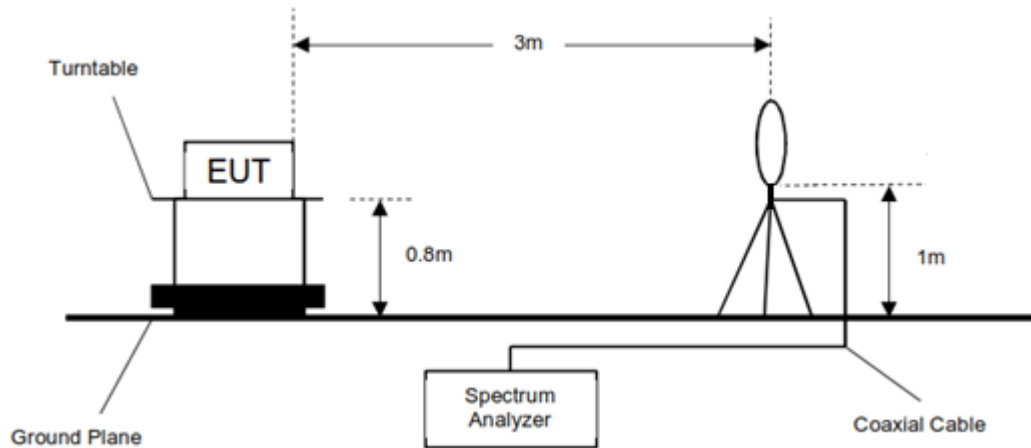
Hui TONG
Review Engineer

Wenqiang LU
Project Engineer

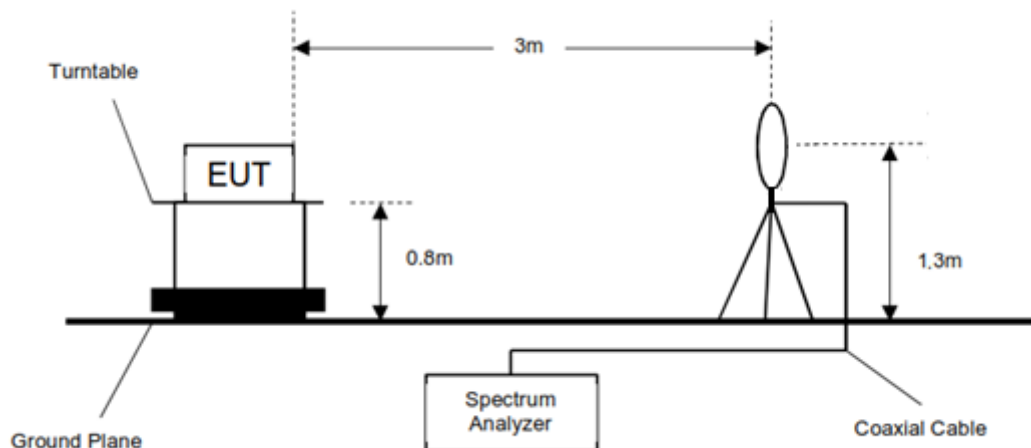
Chengjie GUO
Test Engineer

8. Test Setups

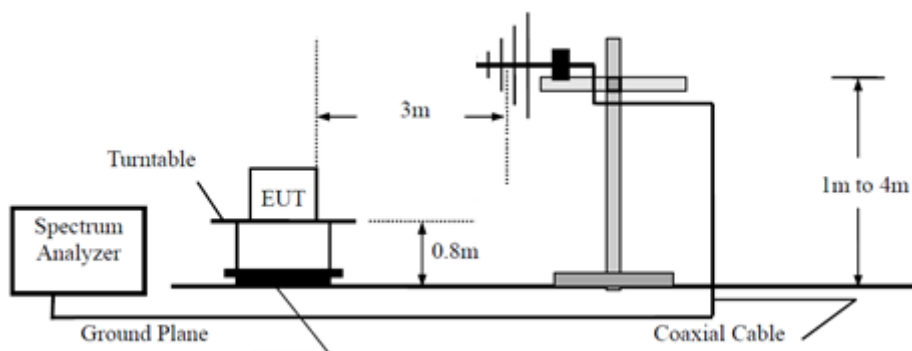
Below 30MHz for FCC



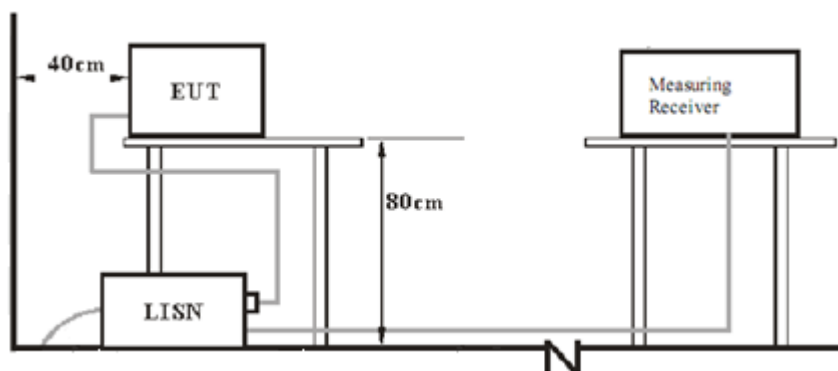
Below 30MHz for ICES-001



30MHz-1GHz



AC Power Line Conducted Emission test setups



9. Technical Requirement

9.1 Conducted Emission Test

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 an Artificial Mains Network (A.M.N.).
3. Maximum disturbance 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

According to CFR 47 §15.207, conducted emissions limit as below:

Frequency of emission (MHz)	Conducted limit (dBμV)	
	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.

According to RSS-216 §6.2.2.1 and ICES-001 §3.3.3 conducted emissions limit as below:

Frequency range (MHz)	Appliances rated 120 V, without an earth connection Quasi-peak (dBμV)	Appliances rated 120 V, without an earth connection Average (dBμV)	All other appliances Quasi-peak (dBμV)	All other appliances Average (dBμV)
0.009 – 0.05	122	—	110	—
0.05 – 0.15	102 to 92 *	—	90 to 80 *	—
0.15 – 0.5	72 to 62 *	62 to 52 *	66 to 56 *	56 to 46 *
0.5 – 5	56	46	56	46
5 – 30	60	50	60	50
Note: The more stringent limit applies at transition frequencies. * The limit level in dBμV decreases linearly with the logarithm of frequency.				

**Test Result:**

150k-30MHz Conducted Emission Test

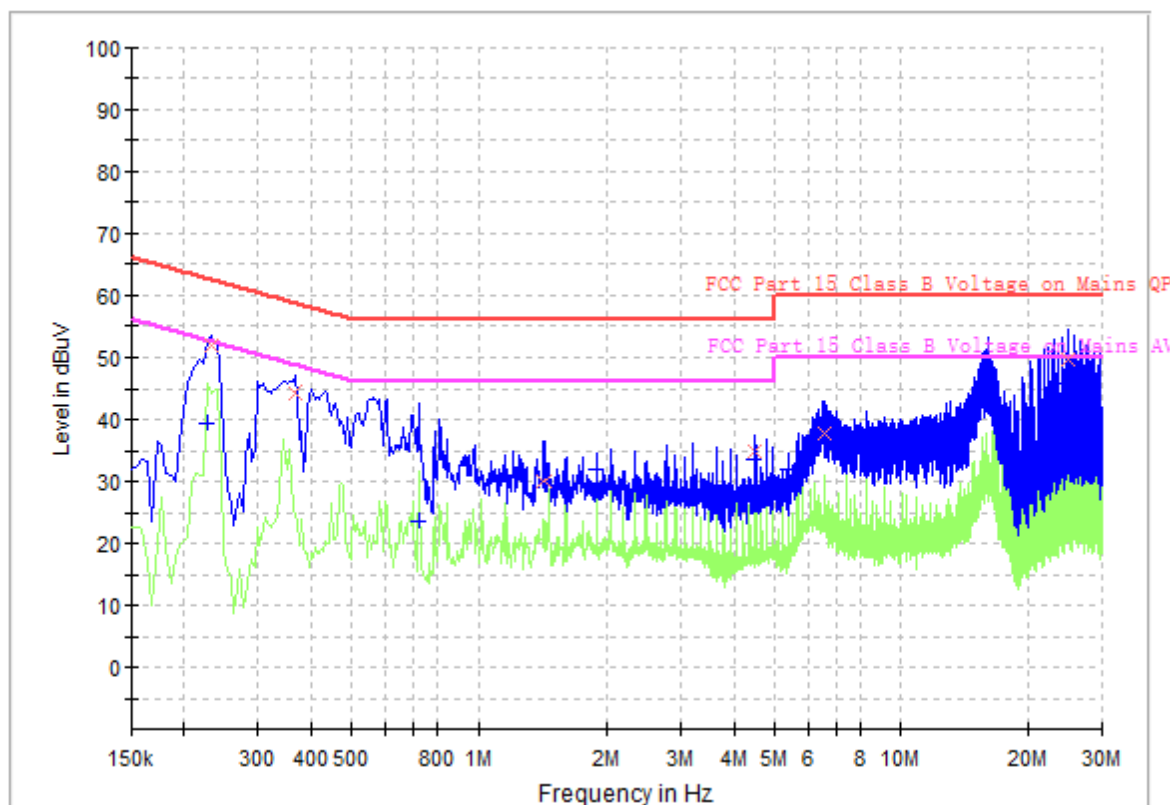
EUT Information

EUT Name:	Cradle
Model	Cra EW
Client:	SHINING 3D Tech Co., Ltd.
Op Cond	Power on, output: 5V/0.8A, AC 120V/60Hz, T21.1, H41.1%, P103.4kPa
Operator:	Chengjie GUO
Standard	FCC 15.207
Comment:	Phase L
Sample No.:	SHA-809685-1

Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Receiver:	[ESR 3]
Level Unit:	dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.02 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.226500	---	39.60	52.58	12.98	1000.0	9.000	L1	19.4
0.231000	51.93	---	62.41	10.48	1000.0	9.000	L1	19.4
0.366000	44.36	---	58.59	14.23	1000.0	9.000	L1	19.5
0.721500	---	23.78	46.00	22.22	1000.0	9.000	L1	19.5
1.419000	30.27	---	56.00	25.73	1000.0	9.000	L1	19.5
1.891500	---	31.94	46.00	14.06	1000.0	9.000	L1	19.5
4.506000	34.84	---	56.00	21.16	1000.0	9.000	L1	19.6
4.506000	---	33.59	46.00	12.41	1000.0	9.000	L1	19.6
5.379000	---	31.93	50.00	18.07	1000.0	9.000	L1	19.6
6.544500	38.01	---	60.00	21.99	1000.0	9.000	L1	19.7
24.859500	---	45.79	50.00	4.21	1000.0	9.000	L1	20.9
24.859500	49.66	---	60.00	10.34	1000.0	9.000	L1	20.9



150k-30MHz Conducted Emission Test

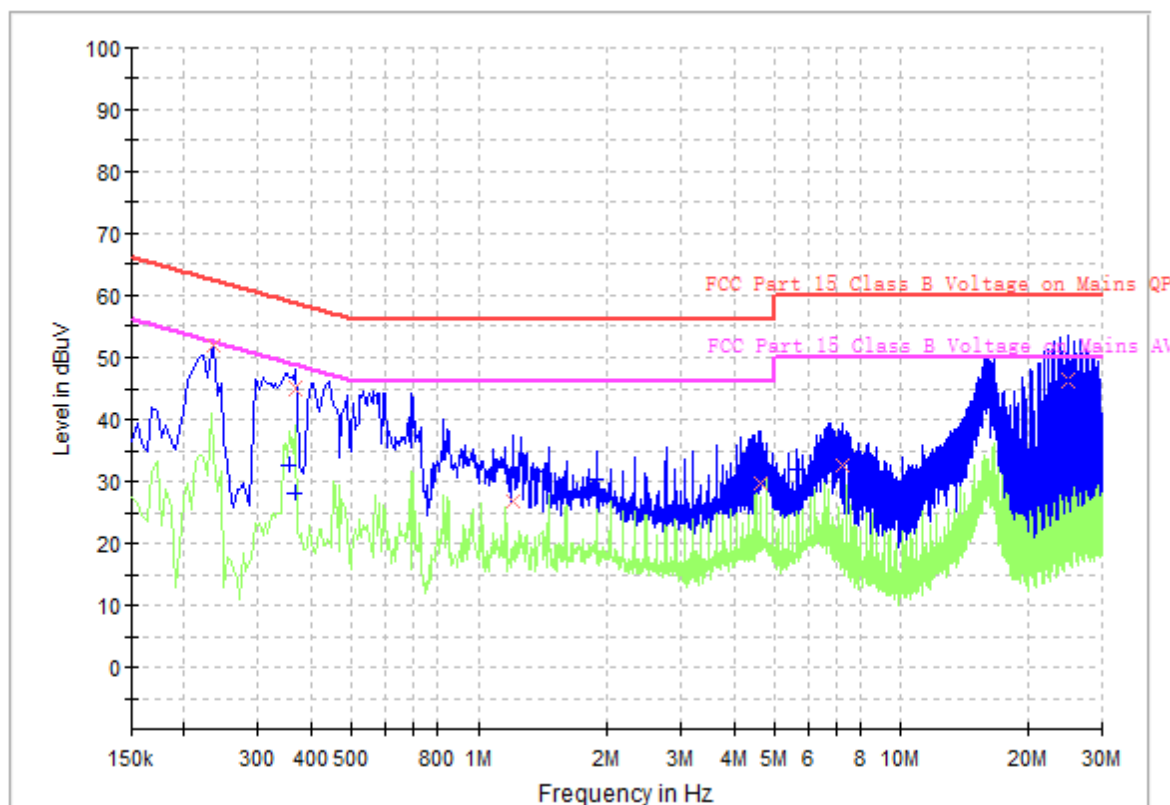
EUT Information

EUT Name:	Cradle
Model	Cra EW
Client:	SHINING 3D Tech Co., Ltd.
Op Cond	Power on, output: 5V/0.8A, AC 120V/60Hz, T21.1, H41.1%, P3.4kPa
Operator:	Chengjie GUO
Standard	FCC Part 15.207
Comment:	Phase N
Sample No.:	SHA-809685-1

Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Receiver:	[ESR 3]
Level Unit:	dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamplifier
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.02 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.235500	51.95	---	62.25	10.30	1000.0	9.000	N	19.4
0.357000	---	32.61	48.80	16.19	1000.0	9.000	N	19.5
0.366000	---	28.10	48.59	20.49	1000.0	9.000	N	19.5
0.366000	44.98	---	58.59	13.61	1000.0	9.000	N	19.5
1.207500	26.98	---	56.00	29.02	1000.0	9.000	N	19.5
1.887000	---	30.37	46.00	15.63	1000.0	9.000	N	19.5
4.506000	---	34.36	46.00	11.64	1000.0	9.000	N	19.6
4.636500	29.67	---	56.00	26.33	1000.0	9.000	N	19.6
5.667000	---	31.98	50.00	18.02	1000.0	9.000	N	19.6
7.215000	32.61	---	60.00	27.39	1000.0	9.000	N	19.6
24.850500	---	44.88	50.00	5.12	1000.0	9.000	N	20.6
24.850500	46.41	---	60.00	13.59	1000.0	9.000	N	20.6

150k-30MHz Conducted Emission Test

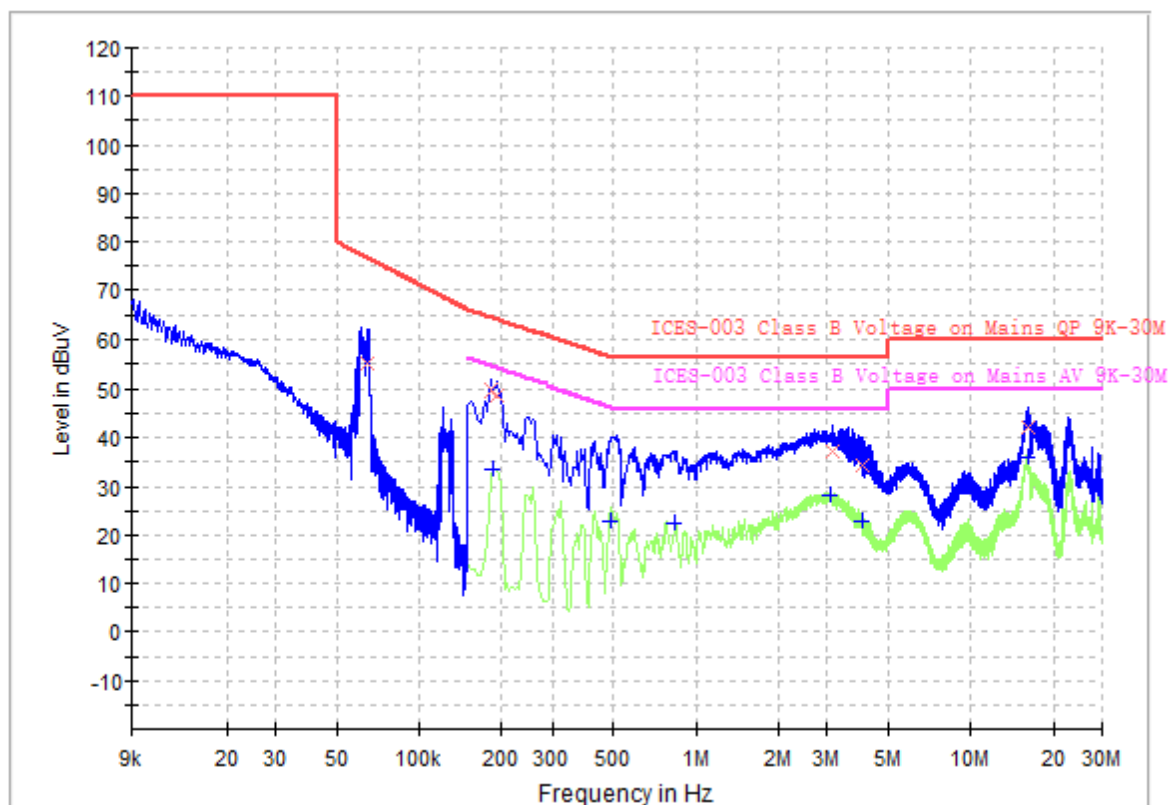
EUT Information

EUT Name:	Cradle
Model	Cra EW
Client:	SHINING 3D Tech Co., Ltd.
Op Cond	Power on, output: 5V/0.8A, AC 120V/60Hz, T21.1, H41.1%, P103.4kPa
Operator:	Chengjie GUO
Standard	ICES-003
Comment:	Phase L
Sample No.:	SHA-809685-1

Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Receiver:	[ESR 3]
Level Unit:	dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamplifier
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.02 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.065300	55.12	---	76.60	21.48	1000.0	0.200	L1	19.5
0.181500	49.59	---	64.42	14.83	1000.0	9.000	L1	19.4
0.186000	---	33.48	54.21	20.73	1000.0	9.000	L1	19.4
0.190500	48.59	---	64.01	15.42	1000.0	9.000	L1	19.4
0.487500	---	22.75	46.21	23.46	1000.0	9.000	L1	19.4
0.838500	---	22.41	46.00	23.59	1000.0	9.000	L1	19.5
3.093000	---	28.14	46.00	17.86	1000.0	9.000	L1	19.5
3.160500	37.24	---	56.00	18.76	1000.0	9.000	L1	19.5
4.006500	---	22.99	46.00	23.01	1000.0	9.000	L1	19.6
4.024500	34.31	---	56.00	21.69	1000.0	9.000	L1	19.6
16.057500	42.00	---	60.00	18.00	1000.0	9.000	L1	20.1
16.165500	---	35.82	50.00	14.18	1000.0	9.000	L1	20.1

150k-30MHz Conducted Emission Test

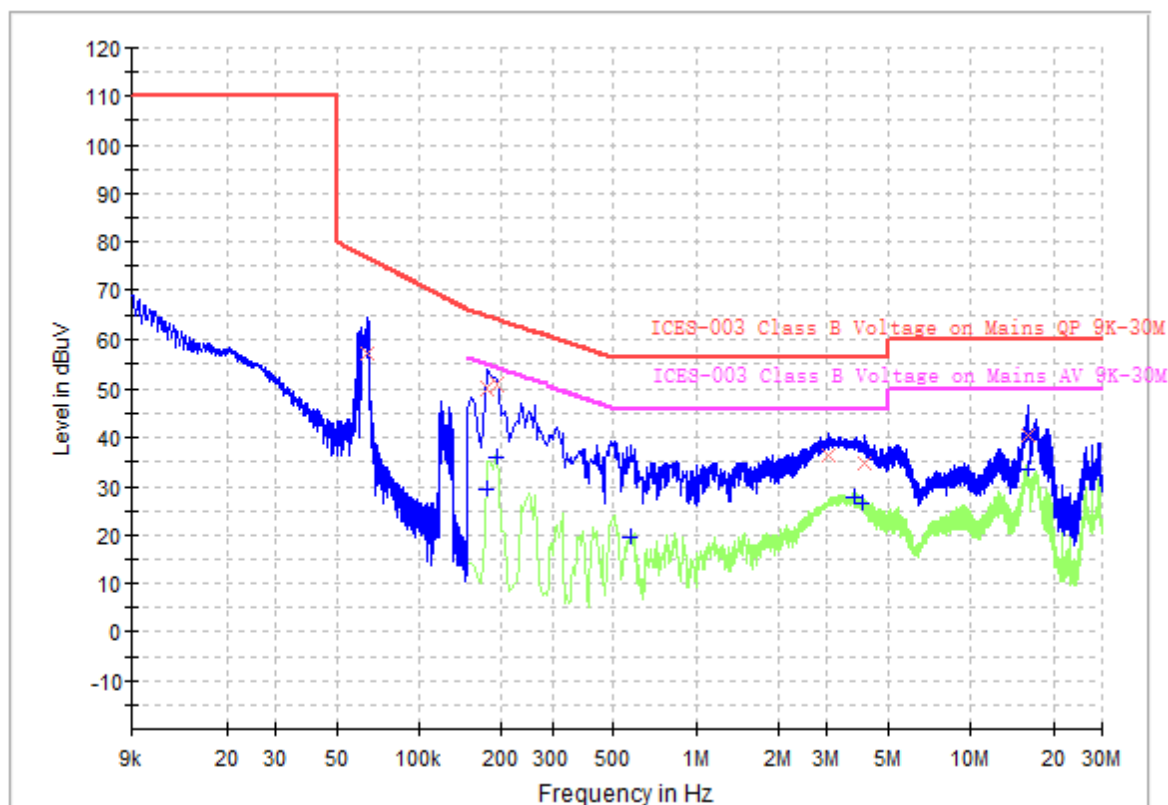
EUT Information

EUT Name:	Cradle
Model	Cra EW
Client:	SHINING 3D Tech Co., Ltd.
Op Cond	Power on, output: 5V/0.8A, AC 120V/60Hz, T21.1, H41.1%, P3.4kPa
Operator:	Chengjie GUO
Standard	ICES-003
Comment:	Phase N
Sample No.:	SHA-809685-1

Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Receiver:	[ESR 3]
Level Unit:	dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamplifier
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.02 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+, AVG	9 kHz	0.01 s	0 dB





Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.065200	56.96	---	76.62	19.66	1000.0	0.200	N	19.5
0.177000	---	29.32	54.63	25.31	1000.0	9.000	N	19.4
0.177000	49.87	---	64.63	14.76	1000.0	9.000	N	19.4
0.190500	---	35.80	54.01	18.21	1000.0	9.000	N	19.4
0.190500	50.71	---	64.01	13.30	1000.0	9.000	N	19.4
0.577500	---	19.54	46.00	26.46	1000.0	9.000	N	19.5
3.030000	36.39	---	56.00	19.61	1000.0	9.000	N	19.5
3.750000	---	27.64	46.00	18.36	1000.0	9.000	N	19.6
4.002000	---	26.55	46.00	19.45	1000.0	9.000	N	19.6
4.105500	34.95	---	56.00	21.05	1000.0	9.000	N	19.6
16.080000	---	33.49	50.00	16.51	1000.0	9.000	N	20.0
16.147500	40.38	---	60.00	19.62	1000.0	9.000	N	20.0

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

(The Reading Level is recorded by software which is not shown in the sheet)



9.2 Radiated Emission Test for 9KHz-30MHz

Test Method

1: Field strength measurements are made in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna as specified in ANSI C63.4 clause 4.5.2, positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The lowest height of the loop shall be 1 m above the ground. This method is applicable for radiated radio-noise measurements from all units, cables, power cords, and interconnect cabling or wiring.

2: For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Limits

According to CFR 47 §15.209, radiated emissions limit as below:

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

Frequency	Limit at 3m (dBuV/m)
0.009 MHz – 0.490 MHz	128.5 to 93.8
0.490 MHz – 1.705 MHz	73.8 to 63
1.705 MHz – 30 MHz	69.5

According to RSS-216 §6.2.2.2 and ICES-001 §3.3.4.1, radiated emissions limit as below

Frequency range (MHz)	Quasi-peak, at 3 m distance (dBμA/m)
0.009 – 0.07	69
0.07 – 0.15	69 to 39 *
0.15 – 30	39 to 7 *
* The limit level in dBμA/m decreases linearly with the logarithm of frequency.	

Test Result

0.009-30MHz Radiated Emission

EUT Information

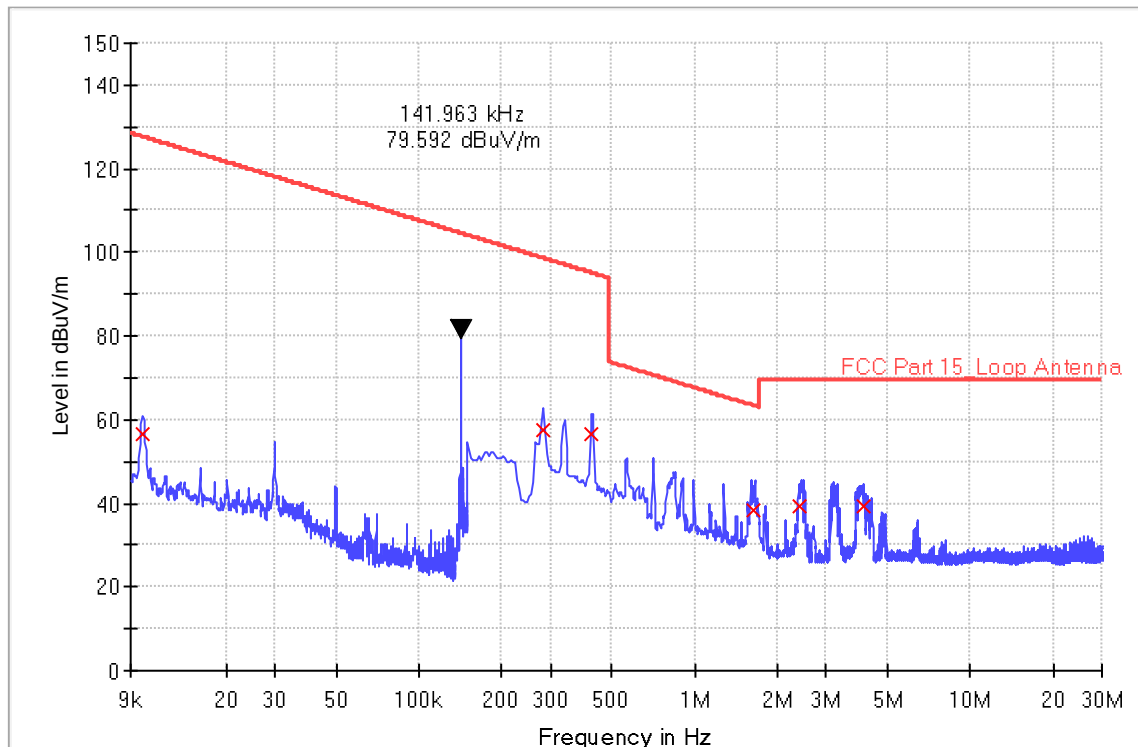
EUT Name: Cradle
Model: Cra EW
Client: SHINING 3D Tech Co., Ltd.
Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa
Operator: Chengjie GUO
Test Spec: FCC Part 15.209
Comment: X
Sample No: SHA-809685-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

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)
0.009880	56.5	1000.0	0.200	100.0	X	6.0	19.6	71.179	127.709
0.282000	57.5	1000.0	9.000	100.0	X	84.0	18.8	41.059	98.599
0.422000	56.8	1000.0	9.000	100.0	X	25.0	18.7	38.338	95.098
1.634000	38.4	1000.0	9.000	100.0	X	132.0	18.9	24.919	63.339
2.398000	39.5	1000.0	9.000	100.0	X	112.0	19.1	30.072	69.542
4.070000	39.3	1000.0	9.000	100.0	X	231.0	19.1	30.262	69.542

0.009-30MHz Radiated Emission

EUT Information

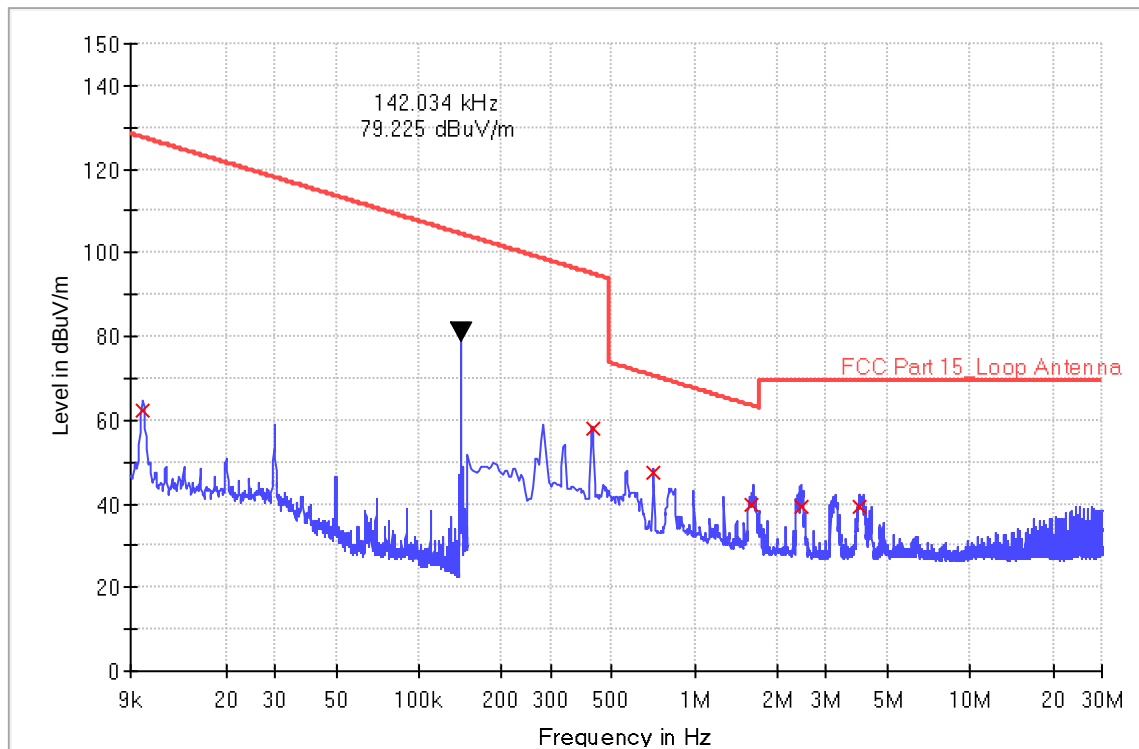
EUT Name: Cradle
Model: Cra EW
Client: SHINING 3D Tech Co., Ltd.
Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa
Operator: Chengjie GUO
Test Spec: FCC Part 15.209
Comment: Y
Sample No: SHA-809685-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

RE_Loop E_pre





Limit and Margin

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)
0.009960	62.4	1000.0	0.200	100.0	Y	61.0	19.6	65.289	127.639
0.426000	57.9	1000.0	9.000	100.0	Y	124.0	18.7	37.126	95.016
0.706000	47.3	1000.0	9.000	100.0	Y	115.0	18.8	23.378	70.628
1.618000	40.0	1000.0	9.000	100.0	Y	153.0	18.9	23.455	63.425
2.422000	39.4	1000.0	9.000	100.0	Y	123.0	19.1	30.192	69.542
3.958000	39.1	1000.0	9.000	100.0	Y	124.0	19.1	30.472	69.542



0.009-30MHz Radiated Emission

EUT Information

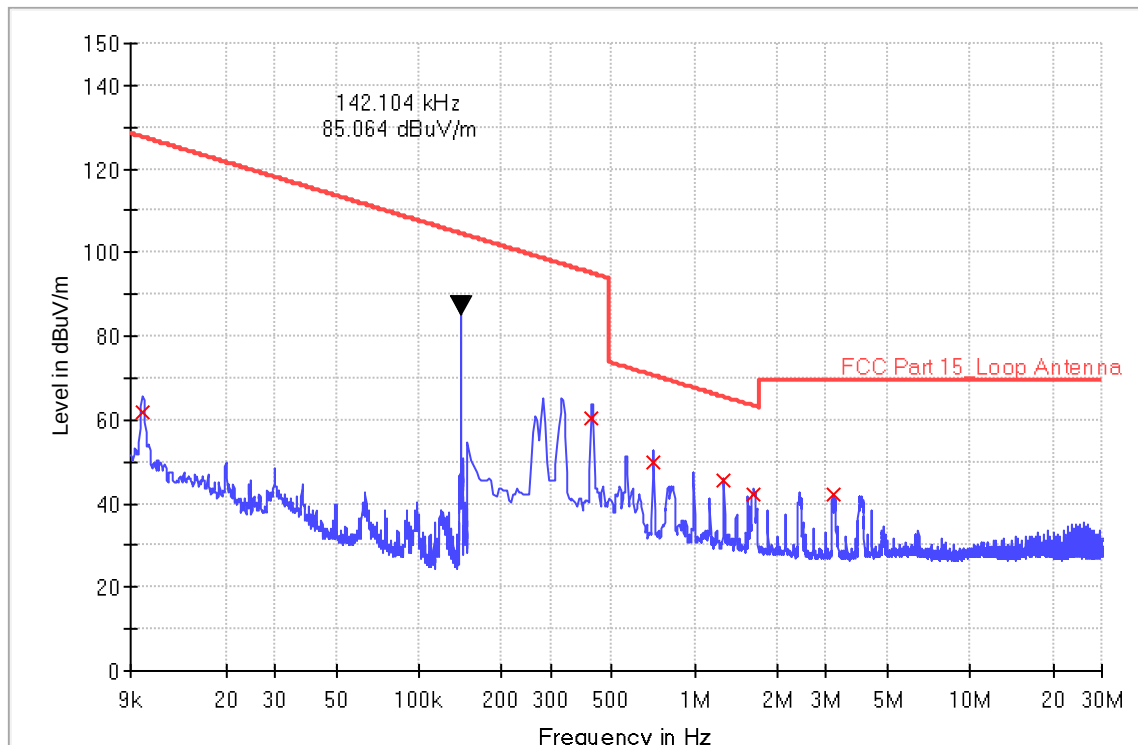
EUT Name: Cradle
Model: Cra EW
Client: SHINING 3D Tech Co., Ltd.
Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa
Operator: Chengjie GUO
Test Spec: FCC Part 15.209
Comment: Z
Sample No: SHA-809685-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

RE_Loop E_pre





Limit and Margin

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)
0.009880	61.9	1000.0	0.200	100.0	Z	123.0	19.6	65.849	127.709
0.422000	60.5	1000.0	9.000	100.0	Z	221.0	18.7	34.568	95.098
0.706000	49.7	1000.0	9.000	100.0	Z	175.0	18.8	20.888	70.628
1.278000	45.3	1000.0	9.000	100.0	Z	154.0	18.9	20.134	65.474
1.646000	42.1	1000.0	9.000	100.0	Z	115.0	18.9	21.156	63.276
3.206000	42.0	1000.0	9.000	100.0	Z	153.0	19.1	27.592	69.542

Remark:

$$E[\text{dB}(\mu\text{V/m})] = V[\text{dB}(\mu\text{V})] + L[\text{dB}] + AF^E[\text{dB}(\text{m}^{-1})]$$

Where

E is the electrical field strength level

AF^E is the "electric" antenna factor

V is the voltage reading level measured by the receiver, the reading Level is recorded by software which is not shown in the sheet

L is the cable loss

The worst-case data were reported, and no other spurious and harmonics emissions were reported greater than listed emission above table.



0.009-30MHz Radiated Emission

EUT Information

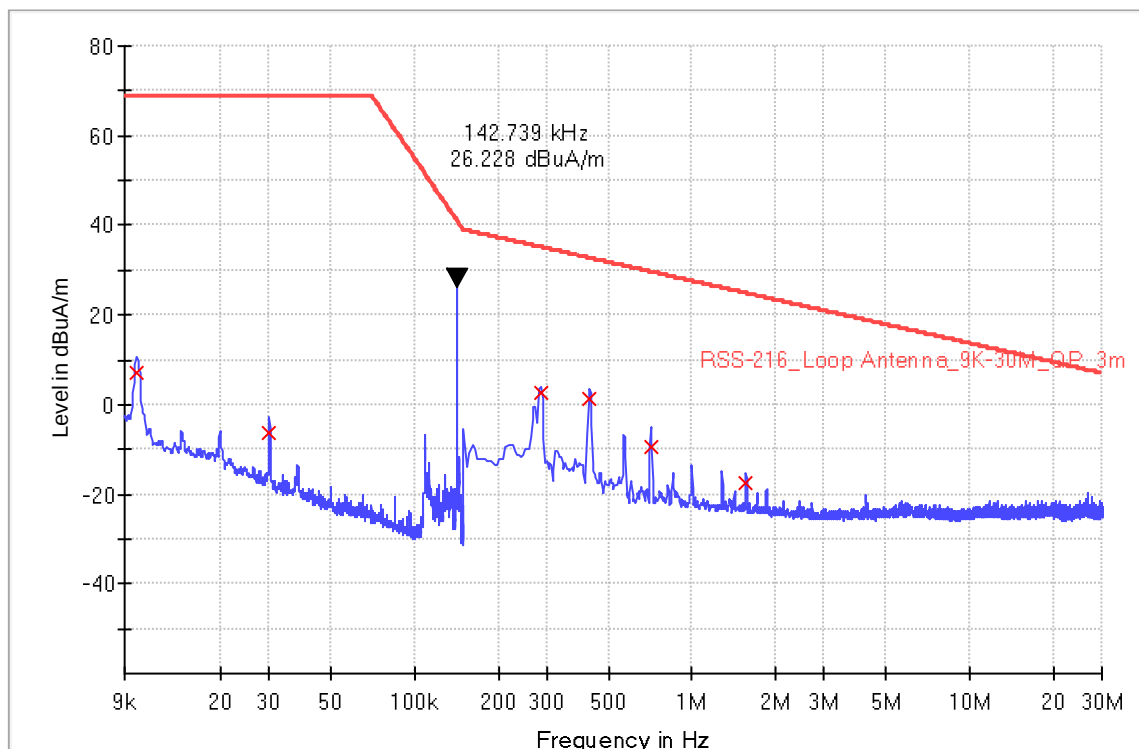
EUT Name: Cradle
Model: Cra EW
Client: SHINING 3D Tech Co., Ltd.
Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa
Operator: Chengjie GUO
Test Spec: RSS-216
Comment: coaxial
Sample No: SHA-809685-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

RE_Loop H_pre





Limit and Margin

Frequency (MHz)	QuasiPeak (dBuA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuA/m)
0.009960	7.2	1000.0	0.200	100.0	H	161.0	-32.0	61.8	69.0
0.029960	-6.1	1000.0	0.200	100.0	H	123.0	-32.6	75.1	69.0
0.286000	2.4	1000.0	9.000	100.0	H	84.0	-32.8	32.7	35.1
0.426000	1.3	1000.0	9.000	100.0	H	46.0	-32.8	31.4	32.7
0.710000	-9.5	1000.0	9.000	100.0	H	1.0	-32.7	39.1	29.6
1.566000	-17.4	1000.0	9.000	100.0	H	152.0	-32.6	42.2	24.8

0.009-30MHz Radiated Emission

EUT Information

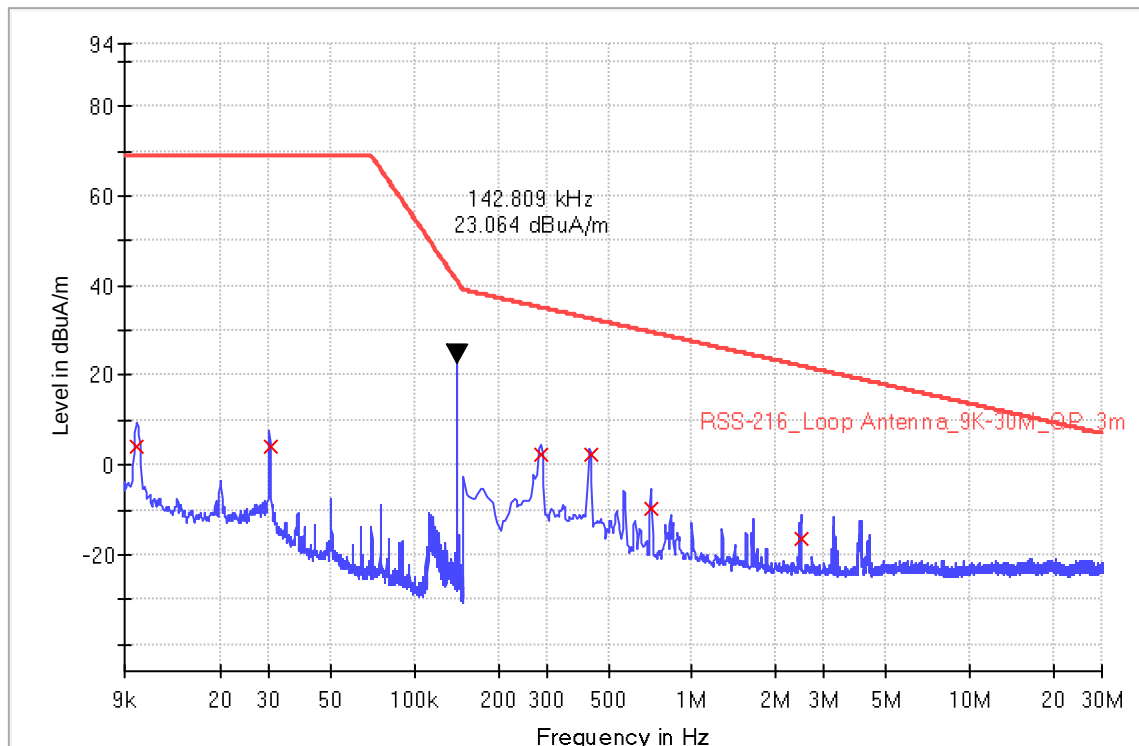
EUT Name: Cradle
 Model: Cra EW
 Client: SHINING 3D Tech Co., Ltd.
 Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa
 Operator: Chengjie GUO
 Test Spec: ICES-001
 Comment: coplanar
 Sample No: SHA-809685-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
 Receiver: [ESR 3]
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

RE_Loop H_pre





Limit and Margin

Frequency (MHz)	QuasiPeak (dBuA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuA/m)
0.009880	4.0	1000.0	0.200	100.0	H	213.0	-31.9	65.0	69.0
0.030040	4.2	1000.0	0.200	100.0	H	153.0	-32.6	64.8	69.0
0.286000	2.4	1000.0	9.000	100.0	H	234.0	-32.8	32.7	35.1
0.430000	2.2	1000.0	9.000	100.0	H	214.0	-32.8	30.5	32.6
0.710000	-9.8	1000.0	9.000	100.0	H	113.0	-32.7	39.4	29.6
2.466000	-16.6	1000.0	9.000	100.0	H	123.0	-32.4	38.7	22.1

Remark:

$$E[\text{dB}(\mu\text{A/m})] = V[\text{dB}(\mu\text{A})] + L[\text{dB}] + AF^E[\text{dB}(\text{m}^{-1})]$$

Where

E is the electrical field strength level

AF^E is the "electric" antenna factor

V is the voltage reading level measured by the receiver, the reading Level is recorded by software which is not shown in the sheet

L is the cable loss

The worst-case data were reported, and no other spurious and harmonics emissions were reported greater than listed emission above table.



9.3 Radiated Emission Test for 30MHz-1GHz

Test Method

- 1: The EUT was placed on a turn table which is 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: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
- 3: 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.
- 4: 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.
- 5: Use the following spectrum analyzer settings According to C63.4:
 Span = wide enough to capture the peak level of the in-band emission and all spurious
 RBW = 100 KHz, VBW ≥ RBW for peak measurement, Sweep = auto, Detector function = peak,
 Trace = max hold.

Note:

- 1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.

Limits

According to CFR 47 §15.209, radiated emissions limit as below:

Test Limits		
Frequency (MHz)	Distance (m)	QP (dBμV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

According to RSS-216 §6.2.2.2 and ICES-001, radiated emissions limit as below

Test Limits		
Frequency (MHz)	Distance (m)	QP (dBμV/m)
30 – 230	3	40
230 – 1000	3	47



Test Result

30-1000MHz Radiated Emission

EUT Information

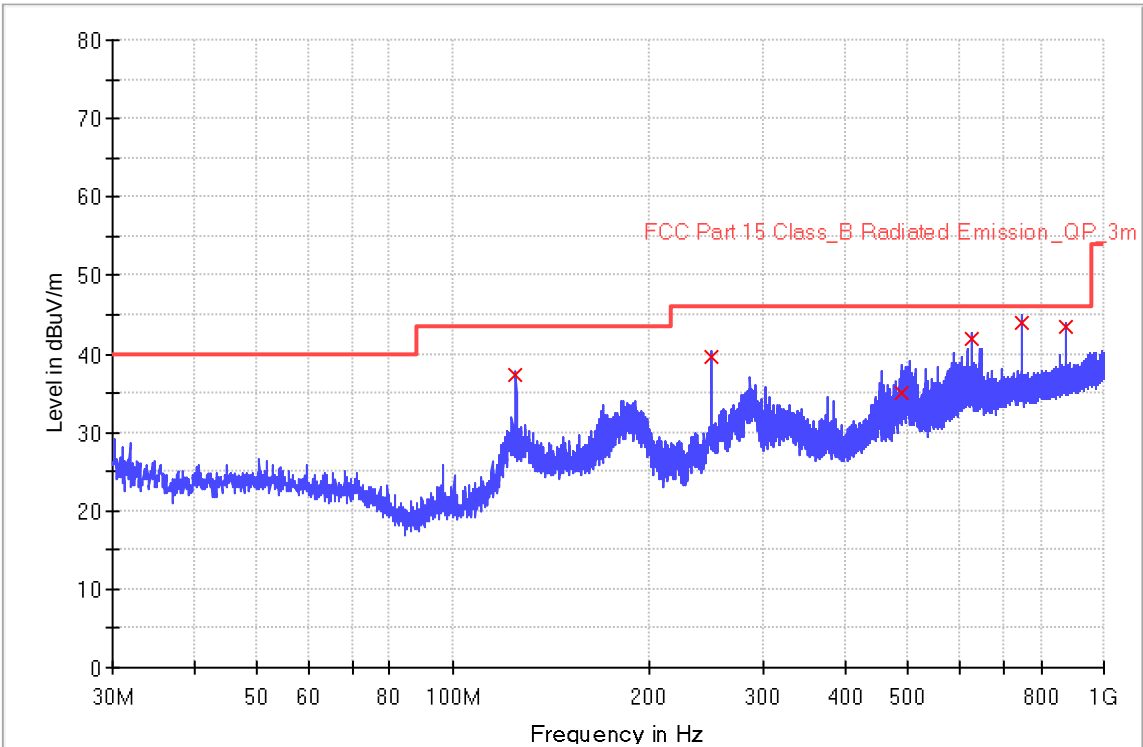
EUT Name: Cradle
Model: Cra EW
Client: SHINING 3D Tech Co., Ltd.
Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa
Operator: Chengjie GUO
Test Spec: FCC Part 15.209
Comment: Horizontal
Sample No: SHA-809685-1

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup: RE_VULB9168
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB

RE_VULB9168_pre_Cont_30-1000





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)
125.000000	37.4	1000.0	120.000	125.0	H	123.0	18.5	6.1	43.5
250.000000	39.7	1000.0	120.000	214.0	H	124.0	19.9	6.3	46.0
489.360000	35.1	1000.0	120.000	124.0	H	212.0	26.4	11.0	46.0
625.000000	41.9	1000.0	120.000	231.0	H	153.0	29.2	4.1	46.0
750.040000	43.9	1000.0	120.000	221.0	H	124.0	31.7	2.1	46.0
875.000000	43.4	1000.0	120.000	125.0	H	126.0	32.8	2.6	46.0



30-1000MHz Radiated Emission

EUT Information

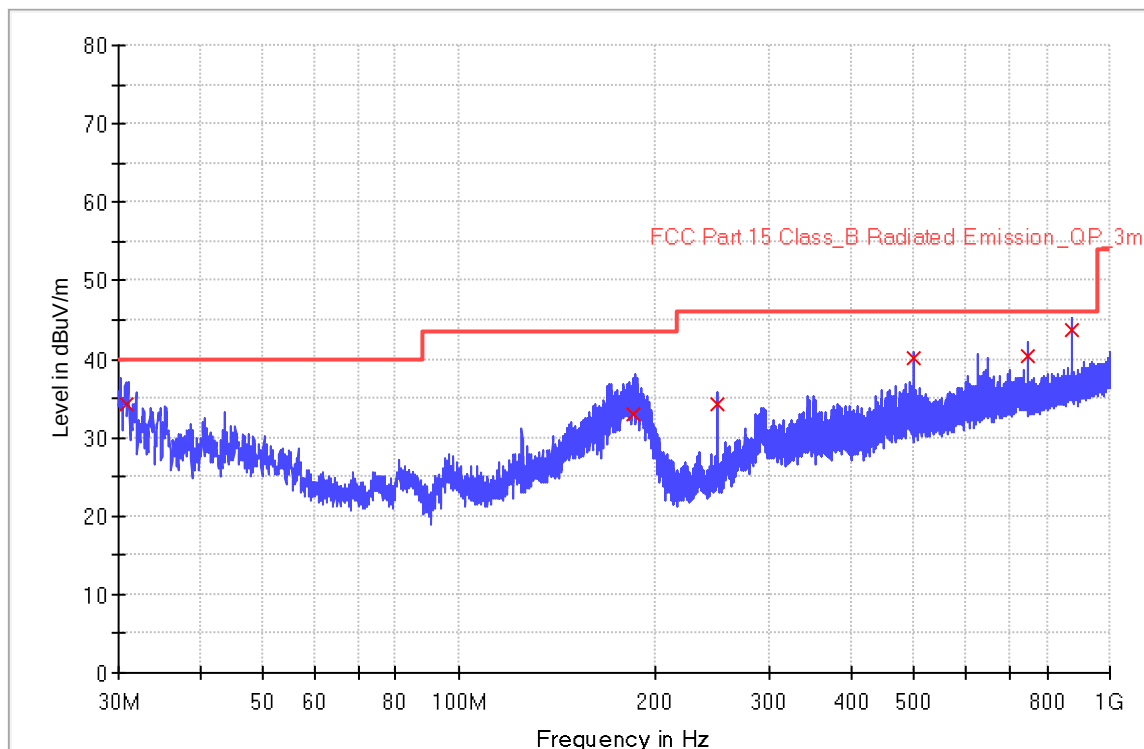
EUT Name: Cradle
 Model: Cra EW
 Client: SHINING 3D Tech Co., Ltd.
 Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%,
 Operator: Chengjie GUO
 Test Spec: FCC Part 15.209
 Comment: Vertical
 Sample No: SHA-809685-1

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup: RE_VULB9168
 Receiver: [ESR 3]
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB

RE_VULB9168_pre_Cont_30-1000





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)
30.840000	34.1	1000.0	120.000	164.0	V	242.0	19.3	5.9	40.0
184.760000	32.9	1000.0	120.000	116.0	V	112.0	18.9	10.6	43.5
250.000000	34.3	1000.0	120.000	175.0	V	164.0	19.9	11.7	46.0
500.000000	40.0	1000.0	120.000	132.0	V	143.0	26.6	6.0	46.0
750.000000	40.5	1000.0	120.000	164.0	V	114.0	31.7	5.5	46.0
875.080000	43.6	1000.0	120.000	177.0	V	321.0	32.8	2.4	46.0

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss

(The Reading Level is recorded by software which is not shown in the sheet)



30-1000MHz Radiated Emission

EUT Information

EUT Name: Cradle

Model: Cra EW

Client: SHINING 3D Tech Co., Ltd.

Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%, P103.4kPa

Operator: Chengjie GUO

Test Spec: ICES-001

Comment: Horizontal

Sample No: SHA-809685-1

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

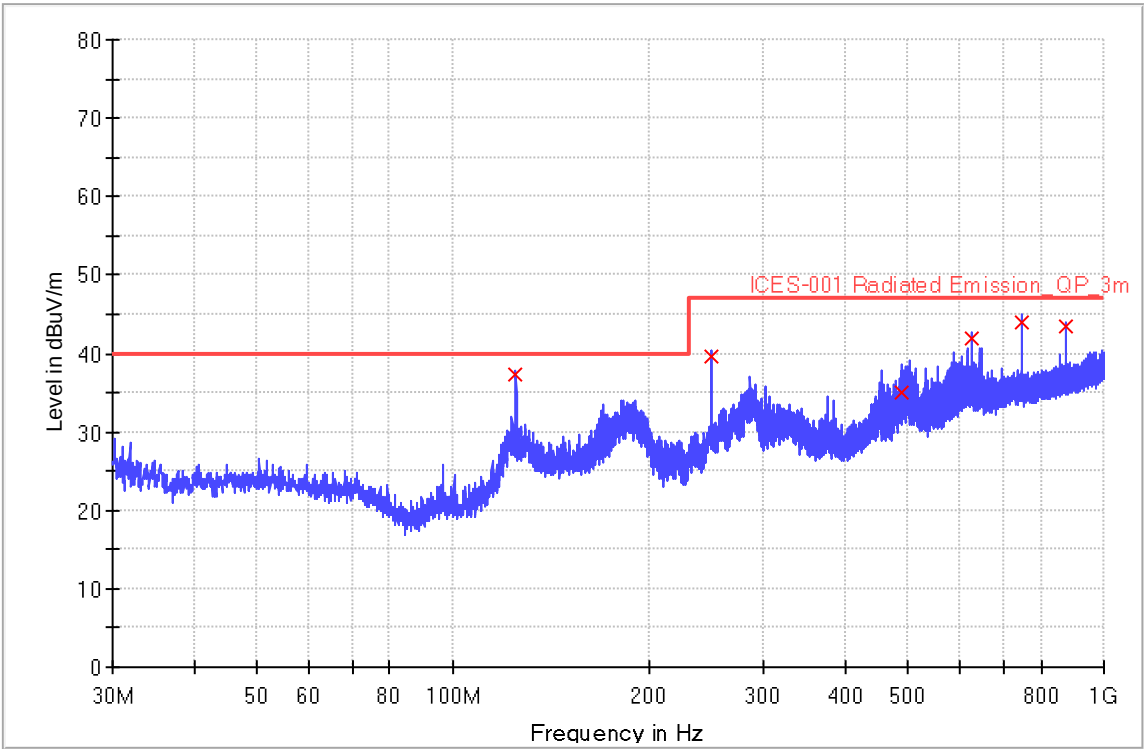
Hardware Setup: RE_VULB9168

Receiver: [ESR 3]

Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB

RE_VULB9168_pre_Cont_30-1000





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)
125.000000	37.4	1000.0	120.000	125.0	H	123.0	18.5	2.6	40.0
250.000000	39.7	1000.0	120.000	214.0	H	124.0	19.9	7.3	47.0
489.360000	35.1	1000.0	120.000	124.0	H	212.0	26.4	12.0	47.0
625.000000	41.9	1000.0	120.000	231.0	H	153.0	29.2	5.1	47.0
750.040000	43.9	1000.0	120.000	221.0	H	124.0	31.7	3.1	47.0
875.000000	43.4	1000.0	120.000	125.0	H	126.0	32.8	3.6	47.0



30-1000MHz Radiated Emission

EUT Information

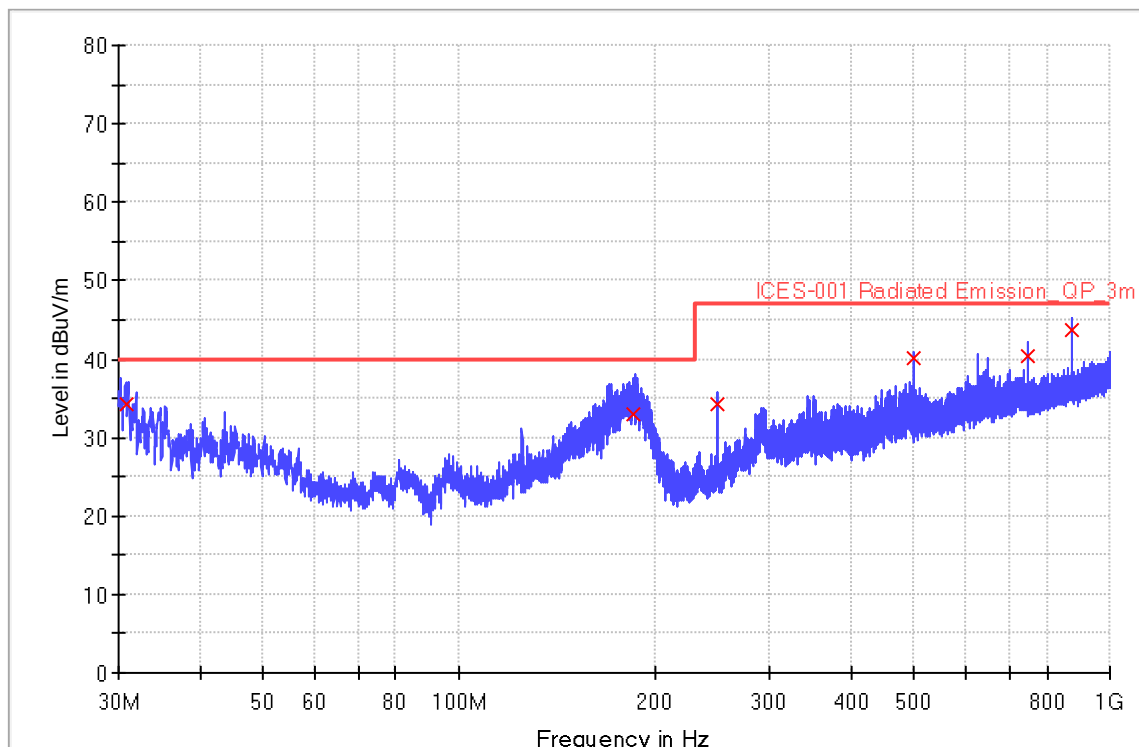
EUT Name: Cradle
Model: Cra EW
Client: SHINING 3D Tech Co., Ltd.
Op Cond: Power on, output: 5V/0.8A, AC 120V/60Hz, T20.2, 42.4%,
Operator: Chengjie GUO
Test Spec: ICES-001
Comment: Vertical
Sample No: SHA-809685-1

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup: RE_VULB9168
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB

RE_VULB9168_pre_Cont_30-1000





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)
30.840000	34.1	1000.0	120.000	164.0	V	242.0	19.3	5.9	40.0
184.760000	32.9	1000.0	120.000	116.0	V	112.0	18.9	7.1	40.0
250.000000	34.3	1000.0	120.000	175.0	V	164.0	19.9	12.7	47.0
500.000000	40.0	1000.0	120.000	132.0	V	143.0	26.6	7.0	47.0
750.000000	40.5	1000.0	120.000	164.0	V	114.0	31.7	6.5	47.0
875.080000	43.6	1000.0	120.000	177.0	V	321.0	32.8	3.4	47.0

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss

(The Reading Level is recorded by software which is not shown in the sheet)



9.4 20dB Bandwidth & Restricted frequency bands and occupied bandwidth

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.
RBW = 1% to 5% of the 20dB bandwidth of the emission being measured, VBW ≥ 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.

Limit

According to CFR 47 §15.215, radiated emissions limit as below:

Limit [KHz]

No Limit

According to RSS-GEN §8.10, the transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table below

Table 7 – Restricted frequency bands*

MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138	--	

* Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

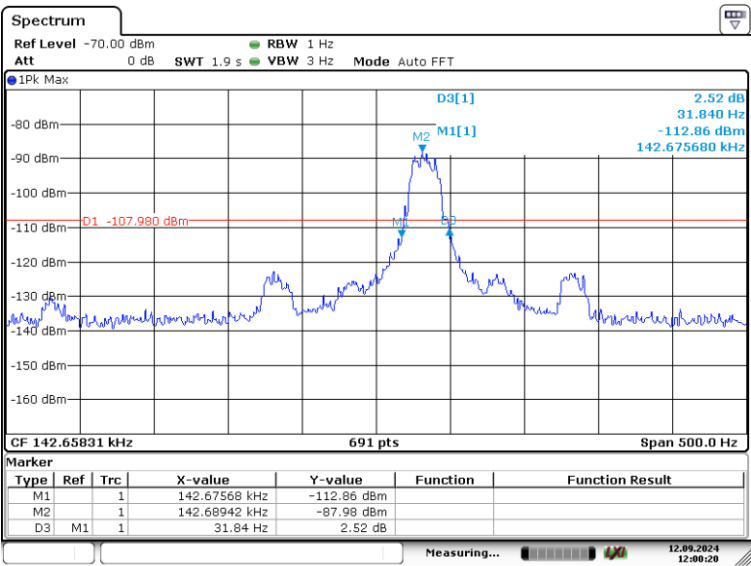


Test result

Frequency KHz	20dB bandwidth Hz	99% bandwidth Hz	Result		Result
			F _L (KHz)	F _H (KHz)	
142	31.840	29.67	141.730	141.760	Pass

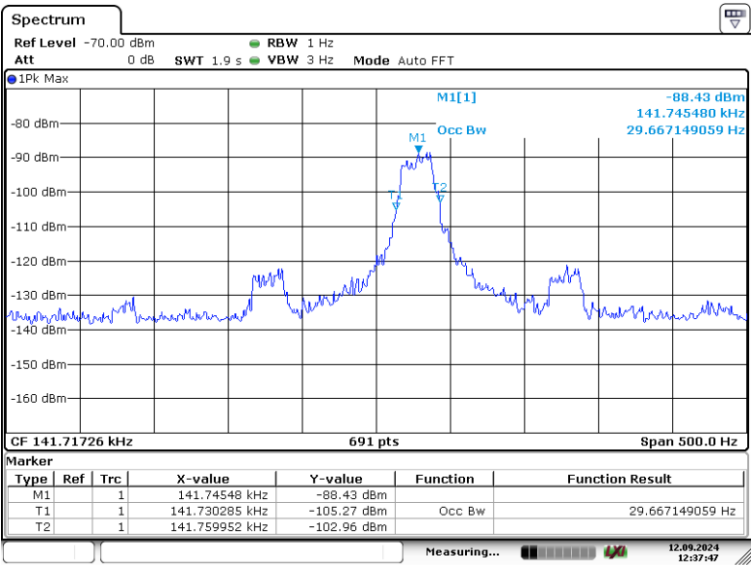
The fundamental frequency is outside the restricted bands of RSS-GEN §8.10.

20dB bandwidth



Date: 12.SEP.2024 12:00:20

99% bandwidth



Date: 12.SEP.2024 12:37:47



10. Test Equipment List

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
RE	EMI Test Receiver	Rohde & Schwarz	ESR3	101906	2023-8-1	2024-7-31
	Signal Analyzer	Rohde & Schwarz	FSV40	101091	2023-8-1	2024-7-31
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	961	2021-9-23	2024-9-22
	Loop antenna	Rohde & Schwarz	HFH2-Z2	100443	2023-6-15	2024-6-14
	3m Semi-anechoic chamber	TDK	9X6X6	----	2024-5-8	2027-5-7
CE	EMI Test Receiver	Rohde & Schwarz	ESR3	101907	2023-8-1	2024-7-31
	LISN	Rohde & Schwarz	ENV216	101924	2023-8-1	2024-7-31
Measurement Software Information						
Test Item	Software	Manufacturer	Version			
RE	EMC 32	Rohde & Schwarz	10.50.40			
CE	EMC 32	Rohde & Schwarz	V9.15.03			



11. Measurement System 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
Conducted Disturbance at Mains Terminals	150kHz to 30MHz, LISN, 3.16dB
Radiated Disturbance	30MHz to 1GHz, 5.03dB (Horizontal) 5.12dB (Vertical) 1GHz to 18GHz, 5.49dB 18GHz to 40GHz, 5.63dB

Measurement Uncertainty Decision Rule:

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2023, clause 4.3.3.

-----End of Test Report-----
-