

FCC - TEST REPORT

Report Number : **68.760.22.0372.01** Date of Issue: **June 10, 2022**

Model : **4-LD6142**

Product Type : **ALARM CLOCK WITH QI CHARGING PAD**

Applicant : **Guangzhou Hai Na Bai Chuan Electronics Industrial Co., LTD**

Address : **601-605 6/F, Doctor YI Building 2, No.96 BanHe Road,**
Huangpu District, Guangzhou, China

Manufacturer : **Guangzhou Hai Na Bai Chuan Electronics Industrial Co., LTD**

Address : **601-605 6/F, Doctor YI Building 2, No.96 BanHe Road,**
Huangpu District, Guangzhou, China

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : **19**

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1 Table of Contents

1	Table of Contents	2
2	Details about the Test Laboratory	3
3	Description of the Equipment Under Test.....	4
4	Summary of Test Standards.....	5
5	Summary of Test Results	6
6	General Remarks	7
7	Test Setups	8
8	Technical Requirement	9
8.1	Conducted Emission Test.....	9
8.2	20 dB Bandwidth	12
8.3	Radiated Emission Test.....	13
9	Test Equipment List	18
10	System Measurement Uncertainty	19

2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park,
Guankou Erlu, Nantou, Nanshan District,
Shenzhen, 518052 China

Telephone: 86 755 8828 6998

Fax: 86 755 828 5299

FCC Registration No.: 514049

3 Description of the Equipment Under Test

Product:	ALARM CLOCK WITH QI CHARGING PAD
Model no.:	4-LD6142
FCC ID:	2A7B84-LD6142
Options and accessories:	Adapter
Rated Input:	9.0VDC, 2.0A
Adapter information:	Model: HH0024B-090200-AU Input: 100-240V~50/60Hz, 0.8A Max Output: 9.0VDC 2.0A 18.0W
RF Transmission Frequency:	110-148.5 kHz
Antenna Type:	Integrated coil antenna
Description of the EUT:	The Equipment Under Test (EUT) is an ALARM CLOCK WITH QI CHARGING PAD which operated at 110-148.5 kHz for Wireless charging function (with data transmitting function).

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2020 Edition	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		
				Pass	Fail	N/A
§15.207	Conducted emission AC power port	9	Site 1	☒	☐	☐
--	20dB bandwidth	12	Site 1	☒	☐	☐
§15.205	Restricted bands of operation	12	Site 1	☒	☐	☐
§15.209	Radiated emission	13	Site 1	☒	☐	☐
§15.203	Antenna requirement	See note 1		☒	☐	☐

Note 1: The EUT uses an Integrated coil antenna, which gain is 0dBi. 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) complies with Section 15.207, 15.209, 15.205 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: May 11, 2022

Testing Start Date: May 17, 2022

Testing End Date: May 20, 2022

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

Reviewed by:



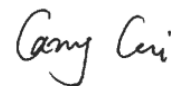
Jessie He
Project Manager

Prepared by:



Myron Yu
Project Engineer

Tested by:

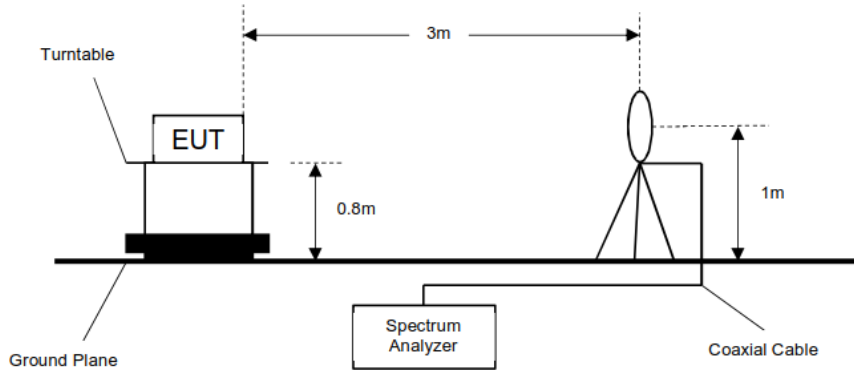


Carry Cai
Test Engineer

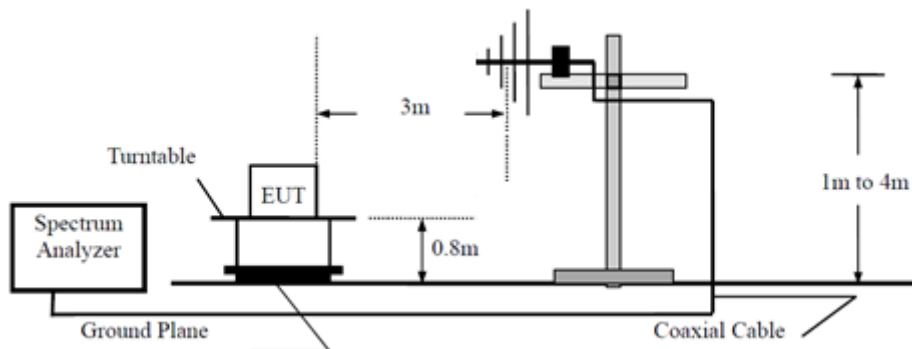
7 Test Setups

7.1 Radiated test setups

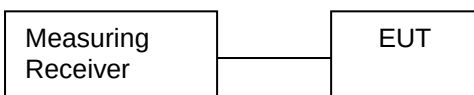
Below 30MHz



30MHz-1GHz



7.2 Conducted RF test setups



8 Technical Requirement

8.1 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 procedure was performed to ensure EUT compliance
4. An EMI test receiver is used to test the emissions from both sides of AC line

Limit

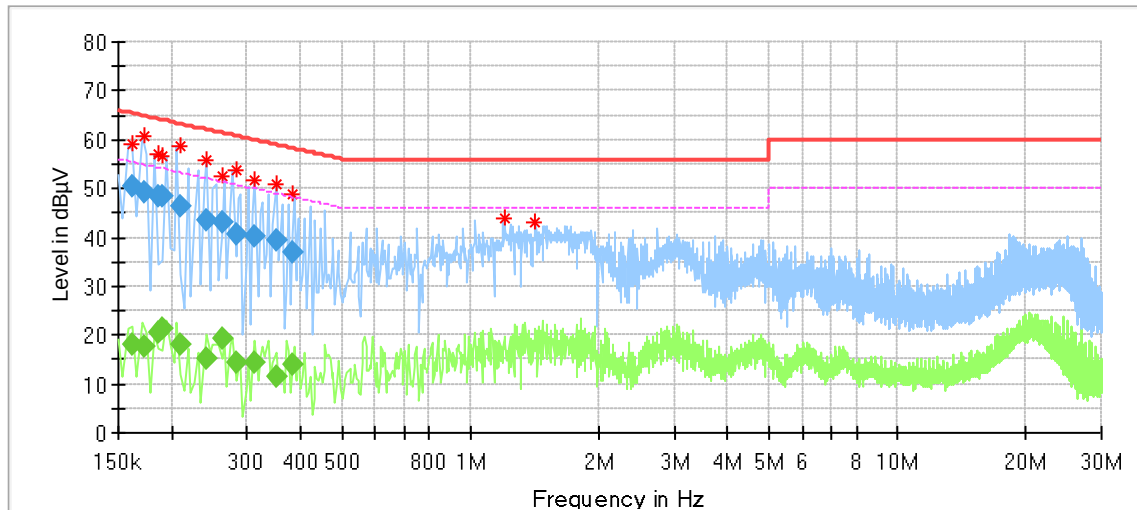
According to §15.207, conducted emissions limit as below:

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 : ALARM CLOCK WITH QI CHARGING PAD
 M/N : 4-LD6142
 Operating : Wireless Charging (with data transmitting function)
 Condition :
 Test Specification : Line
 Comment : AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
1.202000	43.76	---	56.00	12.24	L1	9.20
1.422000	42.98	---	56.00	13.02	L1	9.21

Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.162500	---	17.91	55.34	37.43	L1	9.26
0.162500	50.28	---	65.34	15.06	L1	9.26
0.173500	---	17.46	54.79	37.33	L1	9.25
0.173500	49.40	---	64.79	15.39	L1	9.25
0.185500	---	20.57	54.24	33.66	L1	9.24
0.185500	48.40	---	64.24	15.83	L1	9.24
0.189500	---	21.37	54.06	32.69	L1	9.24
0.189500	48.38	---	64.06	15.68	L1	9.24
0.209500	---	18.04	53.23	35.19	L1	9.23
0.209500	46.41	---	63.23	16.82	L1	9.23
0.241500	---	15.21	52.04	36.84	L1	9.23
0.241500	43.59	---	62.04	18.46	L1	9.23
0.261500	---	19.11	51.38	32.27	L1	9.22
0.261500	42.95	---	61.38	18.43	L1	9.22
0.282500	---	14.25	50.74	36.49	L1	9.22
0.282500	40.49	---	60.74	20.25	L1	9.22
0.313500	---	14.26	49.88	35.62	L1	9.22
0.313500	40.35	---	59.88	19.53	L1	9.22
0.353500	---	11.51	48.88	37.37	L1	9.21
0.353500	39.34	---	58.88	19.54	L1	9.21
0.381500	---	13.99	48.25	34.26	L1	9.21
0.381500	36.88	---	58.25	21.36	L1	9.21

Remark:

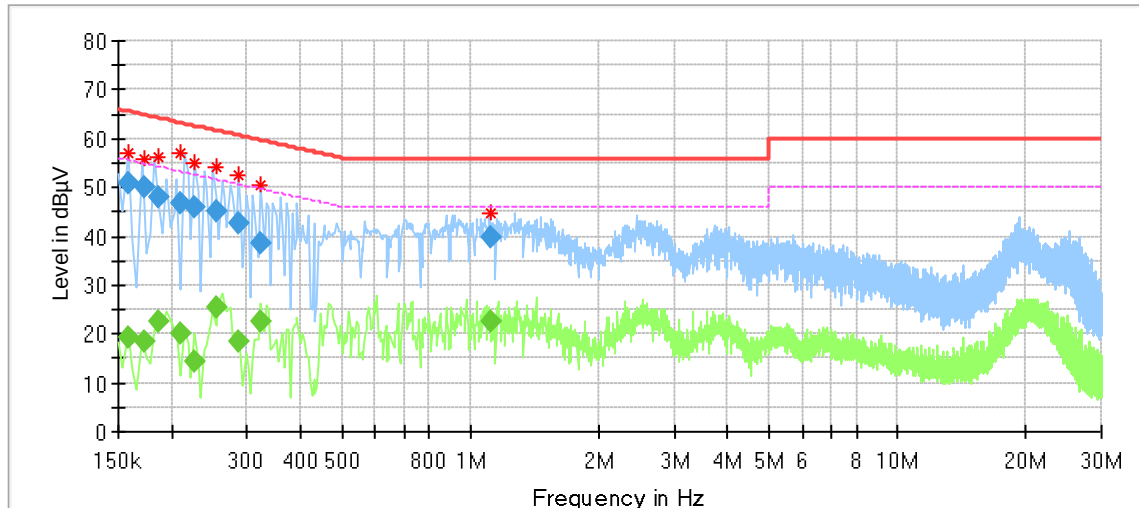
Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

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

Conducted Emission

Product Type : ALARM CLOCK WITH QI CHARGING PAD
 M/N : 4-LD6142
 Operating Condition : Wireless Charging (with data transmitting function)
 Test Specification : Neutral
 Comment : AC 120V/60Hz



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.157500	---	19.25	55.60	36.34	N	9.40
0.157500	51.01	---	65.60	14.59	N	9.40
0.173500	---	18.58	54.79	36.21	N	9.40
0.173500	49.86	---	64.79	14.93	N	9.40
0.185500	---	22.42	54.24	31.81	N	9.40
0.185500	47.84	---	64.24	16.39	N	9.40
0.209500	---	20.07	53.23	33.16	N	9.39
0.209500	46.86	---	63.23	16.36	N	9.39
0.225500	---	14.47	52.61	38.14	N	9.39
0.225500	46.01	---	62.61	16.60	N	9.39
0.254500	---	25.47	51.61	26.14	N	9.39
0.254500	44.93	---	61.61	16.68	N	9.39
0.285500	---	18.38	50.65	32.28	N	9.39
0.285500	42.63	---	60.65	18.02	N	9.39
0.321500	---	22.74	49.67	26.92	N	9.39
0.321500	38.58	---	59.67	21.09	N	9.39
1.113500	---	22.44	46.00	23.56	N	9.40
1.113500	39.68	---	56.00	16.32	N	9.40

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)

8.2 20 dB Bandwidth

Test Method

1. Use the following spectrum analyzer settings:
RBW=200Hz, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 20 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be $\geq$ 20 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]

No Limit

Test result

Operated mode	20dB bandwidth kHz	Result		Result
		F _L (kHz)	F _H (kHz)	
Wireless Charging (with data transmitting function)	0.82	119.03	--	Pass
		--	142.19	

The fundamental frequency is outside the restricted bands of 15.205 section.

8.3 Radiated Emission Test

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 C63.10:

Limit

the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

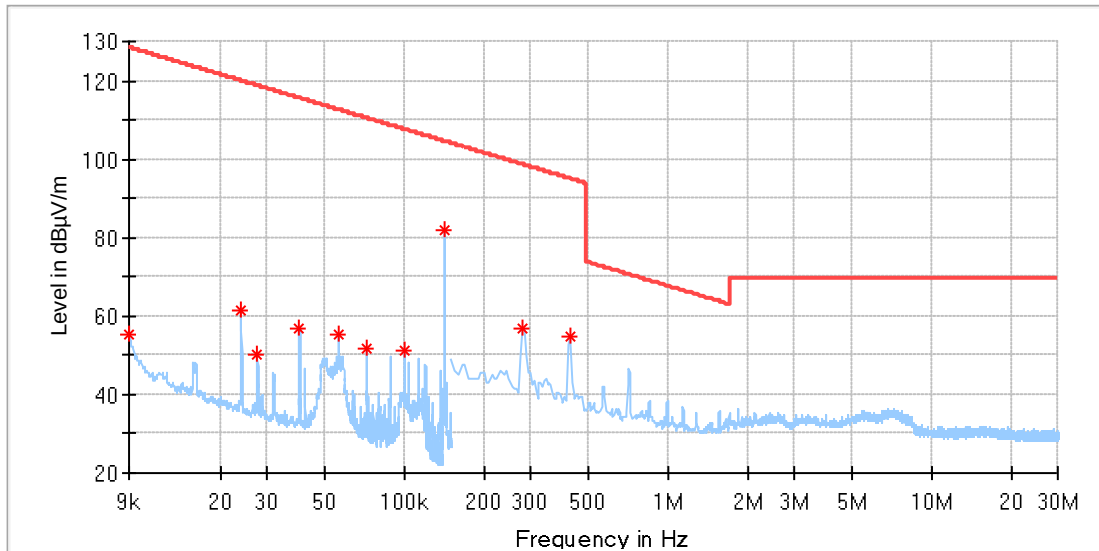
Frequency MHz	Field Strength $\mu\text{V/m}$	Field Strength $\text{dB}\mu\text{V/m}$	Detector	Measurement distance meters
0.009-0.490	2400/F(kHz)	48.5-13.8	QP	300
0.490-1.705	24000/F(kHz)	33.8-23.0	QP	30
1.705-30	30	29.5	QP	30
30-88	100	40	QP	3
88-216	150	43.5	QP	3
216-960	200	46	QP	3
960-1000	500	54	QP	3
Above 1000	500	54	AV	3
Above 1000	5000	74	PK	3

Note 1: Limit $3\text{m}(\text{dB}\mu\text{V/m}) = \text{Limit } 300\text{m}(\text{dB}\mu\text{V/m}) + 40\text{Log}(300\text{m}/3\text{m})$ (Below 30MHz)

Note 2: Limit $3\text{m}(\text{dB}\mu\text{V/m}) = \text{Limit } 30\text{m}(\text{dB}\mu\text{V/m}) + 40\text{Log}(30\text{m}/3\text{m})$ (Below 30MHz)

Radiated emissions test (9kHz-30MHz)

Model: 4-LD6142
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz
 Remark: Horizontal



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Azimuth (deg)	Corr. (dB/m)
0.009000	55.10	128.50	73.40	H	343.0	20.60
0.023993	61.42	120.00	58.58	H	0.0	20.11
0.027612	50.34	118.78	68.44	H	164.0	20.12
0.039973	56.91	115.57	58.66	H	0.0	20.13
0.056000	55.20	112.64	57.44	H	0.0	20.17
0.071980	51.64	110.46	58.82	H	0.0	20.14
0.100180	51.13	107.59	56.46	H	237.0	20.15
0.142151	81.90	104.55	22.65	H	319.0	20.12
0.279350	56.75	98.68	41.93	H	293.0	20.08
0.423625	54.81	95.06	40.25	H	333.0	20.02

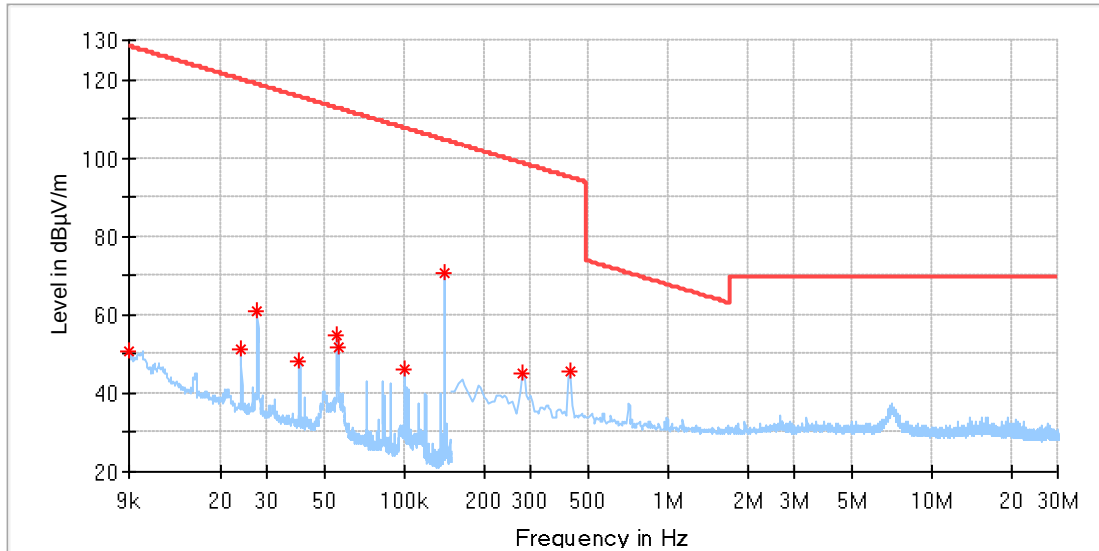
Remark:

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)

Model: 4-LD6142
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz
 Remark: Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)	Corr. (dB/m)
0.009000	50.55	128.50	77.95	V	145.0	20.60
0.023993	51.14	120.00	68.86	V	0.0	20.11
0.027659	60.85	118.78	57.93	V	90.0	20.12
0.039973	48.38	115.57	67.19	V	0.0	20.13
0.055342	55.00	112.64	57.64	V	182.0	20.17
0.055906	51.94	110.46	58.52	V	0.0	20.17
0.100180	46.20	107.59	61.39	V	173.0	20.15
0.142057	70.51	104.55	34.04	V	237.0	20.12
0.279350	44.87	98.68	53.81	V	202.0	20.08
0.423625	45.63	95.06	49.43	V	245.0	20.02

Remark:

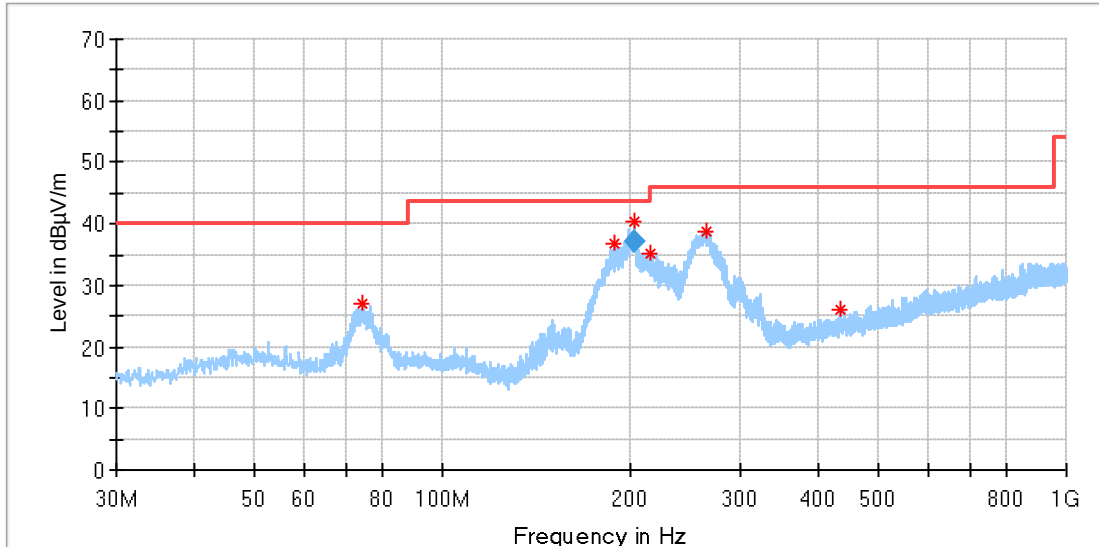
Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss

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

Radiated emissions test (30MHz-1000MHz)

Model: 4-LD6142
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz
 Remark: Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
74.620000	26.91	40.00	13.09	200.0	H	215.0	15.59
188.958750	36.84	43.50	6.66	200.0	H	282.0	18.11
202.356875	40.26	43.50	3.24	200.0	H	282.0	19.06
215.270000	35.19	43.50	8.31	100.0	H	256.0	18.98
264.315625	38.78	46.00	7.22	100.0	H	227.0	20.85
435.702500	25.96	46.00	20.04	200.0	H	150.0	25.10

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
202.356875	37.00	43.50	6.50	200.0	H	282.0	19.06

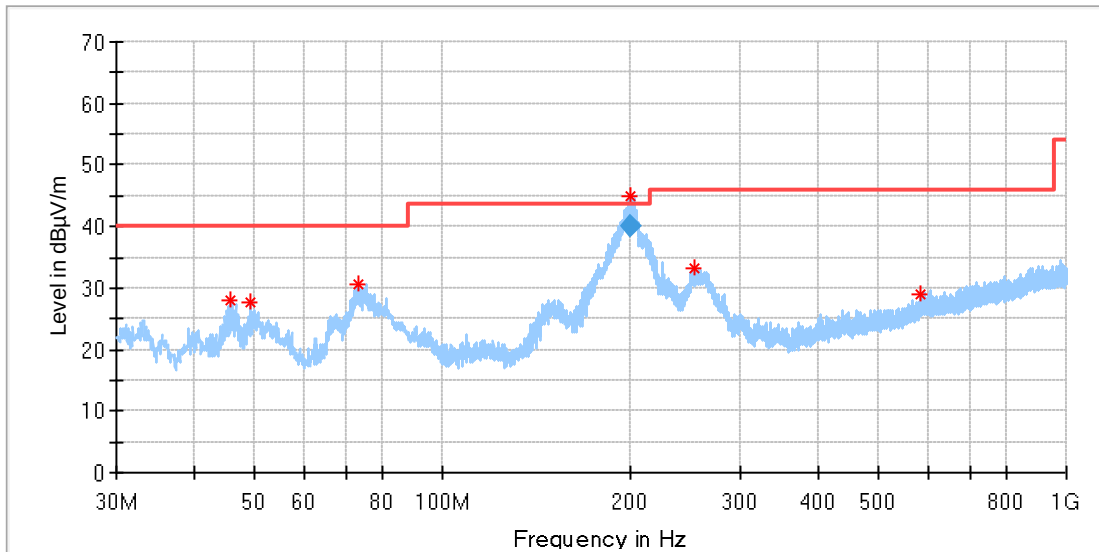
Remark:

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)

Model: 4-LD6142
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz
 Remark: Vertical



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.701875	27.95	40.00	12.05	100.0	V	95.0	20.83
49.278750	27.54	40.00	12.46	100.0	V	312.0	20.96
73.225625	30.68	40.00	9.32	100.0	V	105.0	16.07
200.477500	45.02	43.50	-1.52	100.0	V	0.0	19.28
252.978750	33.15	46.00	12.85	200.0	V	302.0	20.63
583.324375	28.95	46.00	17.05	200.0	V	274.0	27.99

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
200.477500	39.98	43.50	3.52	100.0	V	0.0	19.28

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 Test Equipment List

List of Test Instruments

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 7	68-4-74-19-001	102176	1	2022-6-4
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	68-4-80-14-002	707	1	2022-7-23
Horn Antenna	Rohde & Schwarz	HF907	68-4-80-14-005	102294	1	2022-6-23
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	1	2022-8-25
Pre-amplifier	Rohde & Schwarz	SCU 18	68-4-29-14-001	102230	1	2022-6-6
Attenuator	Mini-circuits	UNAT-6+	68-4-81-21-001	15542	1	2022-8-23
3m Semi-anechoic chamber	TDK	SAC-3 #1	68-4-90-14-001	----	2	2023-5-28
Test software	Rohde & Schwarz	EMC32	68-4-90-14-001-A10	Version 10.35.02	N/A	N/A

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-19-002	102590	1	2022-6-4
LISN	Rohde & Schwarz	ENV216	68-4-87-19-001	102472	1	2022-6-5
Attenuator	Shanghai Huaxiang	TS2-26-3	68-4-81-16-003	080928189	1	2022-6-3
Test software	Rohde & Schwarz	EMC32	68-4-90-19-005-A01	Version 10.35.02	N/A	N/A
Shielding Room	TDK	CSR #2	68-4-90-19-005	----	1	2022-11-07
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-19-002	102590	1	2022-6-4

10 System Measurement Uncertainty

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

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission 150kHz-30MHz	3.31dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 9kHz-30MHz	4.66dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 30MHz-1000MHz	Horizontal: 4.68dB; Vertical: 4.65dB

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2021, clause 4.4.3 and 4.5.1.