

# FCC TEST REPORT FCC ID: 2AP2N-DECK-D

On Behalf of

## Shenzhen Esorun Technology Co.,LTD

**Dual Wireless Charger** 

Model No.: Deck DZ, Deck DP

Prepared for : Shenzhen Esorun Technology Co.,LTD

Address Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan

Community, Dalang Street, Longhua District, Shenzhen

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.

Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,

518103, Shenzhen, Guangdong, China

Report Number : A2108234-C01-R07 Date of Receipt : September 3, 2021

Date of Test : September 3, 2021–November 9, 2021

Date of Report : November 9, 2021

Version Number : V0

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#### TEST REPORT DECLARATION

Applicant : Shenzhen Esorun Technology Co.,LTD

Address Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan

Community, Dalang Street, Longhua District, Shenzhen

Manufacturer : Shenzhen Esorun Technology Co.,LTD

Address Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan

Community, Dalang Street, Longhua District, Shenzhen

EUT Description : Dual Wireless Charger

(A) Model No. : Deck DZ, Deck DP

(B) Trademark : **ESORUN** 

#### Measurement Standard Used:

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C Section 15.209 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature)......

Yannis Wen
Project Engineer

Approved by (name + signature).....:

Simple Guan
Project Manager

# **Revision History**

Revision	Issue Date	Revisions	Revised By
V0	November 9, 2021	Initial released Issue	Yannis Wen

#### **Test Result Summary** 1.

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a)(f)	PASS
Occupied Bandwidth	§15.215 (c)	PASS

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#### Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.

## 2. General Information

## 2.1. Description of Device (EUT)

EUT Name : Dual Wireless Charger

Model No. : Deck DZ, Deck DP

DIFF.

There is no difference except for the appearance color and model name. So

all the test were performed on the model Deck DZ

Trademark : **ESORUN** 

Power supply : Input: 5V=2A, 9V=2A

Single wireless output: 5W, 7.5W, 10W, 15W

Input: 9V=3A

Double wireless output: 10W+10W

Operation frequency : 112~205KHz

Modulation : MSK

Antenna Type : Coil Antenna, Maximum Gain is 0dBi (This value is supplied by applicant).

Software version : V1.0

Hardware version : V1.0

Connector cable loss : 0.5dB (This value is supplied by applicant).

Intend use environment : Residential, commercial and light industrial environment

Note: 1. There are two coil antennas in the EUT. The coil specifications are the same. The two antennas can only detect and allow coupling between single coil pairs. So the report reflects the data from the two antennas.

2. The maximum output power of two coil antennas inside the product is 20W.

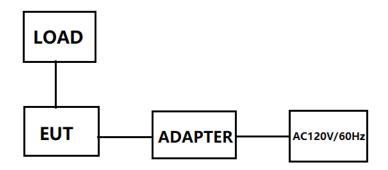
## **2.2.** Accessories of Device (EUT)

Accessories 1 : /
Manufacturer : /
Model : /
Ratings : /

## 2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification
1	Wireless load				
2	Adapter		HNFCQC3024UU	1	

## 2.4. Block Diagram of Connection between EUT and Simulators



## 2.5. Description of Test Modes

Channel	Frequency (KHz)
1	120

#### 2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35°C	24°C
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

## 2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

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June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

July 15, 2019 Certificated by IC Registration Number: CN0085

## 2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Conducted Emission Test	2.74dB	
Uncertainty for Radiation Emission test in 3m chamber	2.13 dB	Polarize: V
(below 30MHz)	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber	3.77dB	Polarize: V
(30MHz to 1GHz)	3.80dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber	4.13dB	Polarize: H
(1GHz to 25GHz)	4.16dB	Polarize: V
Uncertainty for radio frequency	5.4×10 <sup>-8</sup>	
Uncertainty for conducted RF Power	0.37dB	

# 2.9. Test Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2020.09.02	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	102137	2021.08.25	1Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2021.08.25	1Year
Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-10208 2-Wa	2021.08.25	1Year
Receiver	R&S	ESCI	101165	2021.08.25	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2020.04.12	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2020.04.12	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00059	2021.08.30	2Year
RF Cable	Resenberger	Cable 1	RE1	2021.08.25	1Year
RF Cable	Resenberger	Cable 2	RE2	2021.08.25	1Year
RF Cable	Resenberger	Cable 3	CE1	2021.08.25	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2021.08.25	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2021.08.25	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126-466	2021.08.25	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2021.08.25	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	00946	2021.08.30	2 Year
Preamplifier	SKET	LNPA_1840 -50	SK2018101801	2021.08.25	1 Year
Power Meter	Agilent	E9300A	MY41496628	2021.08.25	1 Year
Power Sensor	DARE	RPR3006W	15100041SNO91	2021.08.25	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000 -40-880	100631	2021.04.21	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	20140927-6	2021.08.25	1 Year
Adjustable attenuator	MWRFtest	N/A	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	N/A	N/A	N/A

	Software Information					
Test Item	Software Name	Manufacturer	Version			
RE	EZ-EMC	EZ	Alpha-3A1			
CE	EZ-EMC	EZ	Alpha-3A1			
RF-CE	MTS 8310	MW	V2.0.0.0			

## 3.1. Conducted Emission

## 3.1.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207			
Test Method:	ANSI C63.10:2013			
Frequency Range:	150 kHz to 30 MHz			
Receiver setup:	RBW=9 kHz, VBW=30 kHz	, Sweep time=auto		
Limits:	Frequency range (MHz) Quasi-peak Ave 0.15-0.5 66 to 56* 56 to 56* 55-30 60 55*			
Test Setup:	Reference Plane  40cm 80cm Filter AC power  E.U.T Adapter  Test table/Insulation plane  Remark  E.U.T. Equipment Under Test LISN Line Impedence Stabilization Network			
Test Mode:	Charging + Transmitting Mode			
Test Procedure:	<ol> <li>The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>Both sides of A.C. line are checked for maximum conducted interference. 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.</li> </ol>			
Test Result:	PASS			

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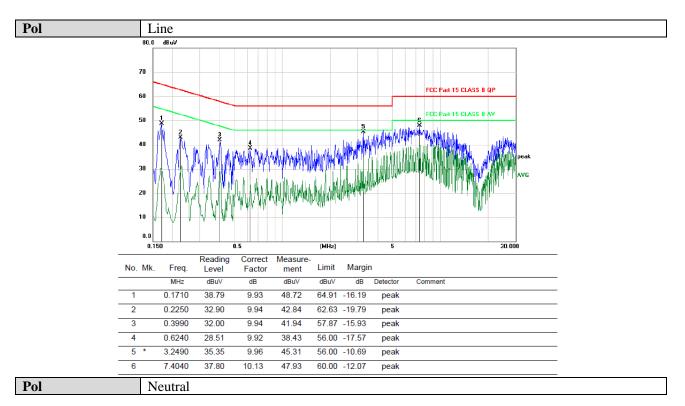
#### **3.1.2.** Test Data

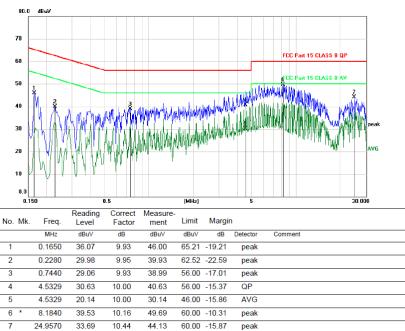
Test Mode : Full Load, Empty Load

Test Result : PASS

Note: The test results are listed in next pages.

All test modes has been tested, this report only reflected the worst mode. (Full Load) If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.





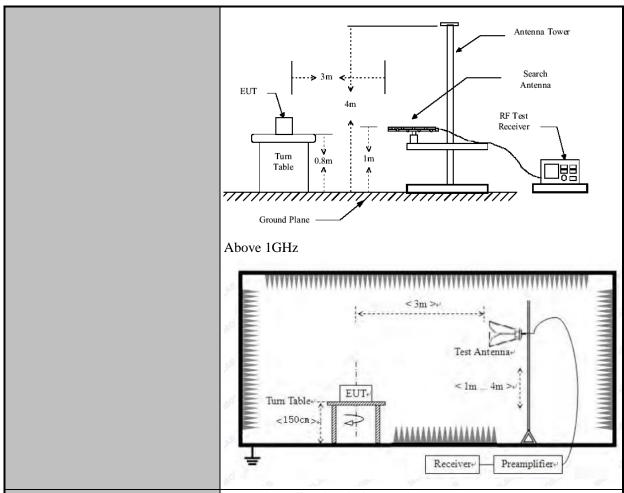
<sup>\*:</sup>Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

# **3.2.** Radiated Spurious Emission Measurement

## 3.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209						
Test Method:	ANSI C63.10: 2013						
Frequency Range:	9 kHz to 25 GH	Z					
Measurement Distance:	3 m						
Antenna Polarization:	Horizontal & Ve	ertical					
Operation mode:	Refer to item 4.1						
	Frequency 9kHz- 150kHz 150kHz-	Detec Quasi- Quasi-	peak	RBW 200Hz 9kHz	VBW 1kHz 30kHz		Remark si-peak Value si-peak Value
Receiver Setup:	30MHz	Quasi-	реак	ЭКПХ	SUKHZ	Qua	si-peak value
	30MHz-1GHz	Quasi-		100KHz	300KHz		si-peak Value
	Above 1GHz	Pea		1MHz	3MHz		Peak Value
		Pea	K	1MHz	10Hz	A	erage Value
	Engagon			Field Stre	ngth	M	easurement
	Frequency		(microvolts		meter)	Dist	ance (meters)
	0.009-0.490			2400/F(KHz)		300	
	0.490-1.705			24000/F(KHz)		30	
	1.705-30			30		30	
	30-88			100 150		3 3	
Limit:	88-216 216-960			200		3	
Limit.	Above 960			500		3	
	Above 900   500   3					3	
			T		Measure	ment	
	Frequency		Field Strength		Distance		Detector
			(microvolts/meter)		(meter	rs)	
	Above 1GHz			500	3		Average
	5000			5000	3		Peak
	For radiated emi	issions t	elov	w 30MHz			
	I	Distance = 3	Computer			Computer	
	Pre -Amplifier						
Test setup:	EUT 1m Turn table					eiver	
			Grou	und Plane		Rec	Civer
	30MHz to 1GHz	Z					



1. For the radiated emission test below 1GHz:

The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.

For the radiated emission test above 1GHz:

Place the measurement antenna on a turntable with 1.5 meter above ground, which is 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.

- 2. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable

#### **Test Procedure:**

	limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.  4. Use the following spectrum analyzer settings:  (1) Span shall wide enough to fully capture the emission being measured;
	<ul> <li>(2) Set RBW=100 kHz for f &lt; 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold;</li> <li>(3) Set RBW = 1 MHz, VBW= 3MHz for f □ 1 GHz for peak measurement.</li> <li>For average measurement: VBW = 10 Hz, when duty cycle is no</li> </ul>
	less than 98 percent. VBW ≥ 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.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

#### **3.2.2.** Test Data

#### Please refer to following diagram for individual

Frequency Range : 9KHz~30MHz

Test Mode : TX: 120KHz

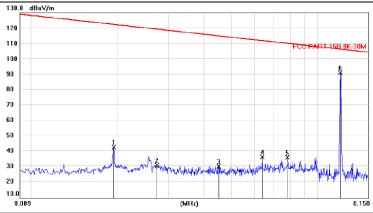
Test Results : PASS

Note: 1. The test results are listed in next pages.

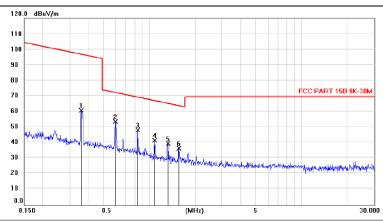
2. This mode is worst case mode, so this report only reflected the worst mode. (Full Load)

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

#### Signal coil



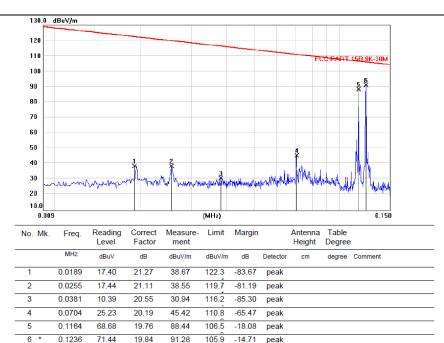
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	0.0190	21.65	21.27	42.92	122.3	-79.38	peak			
2	0.0273	10.10	21.06	31.16	119.1	-87.98	peak			
3	0.0449	10.41	20.18	30.59	114.8	-84.22	peak			
4	0.0638	16.48	20.11	36.59	111.7	-75.16	peak			
5	0.0782	16.21	20.08	36.29	109.9	-73.69	peak			
6 *	0.1200	71.37	19.80	91.17	106.2	-15.08	peak			



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	0.3571	40.71	19.90	60.61	96.75	-36.14	peak			
2 *	0.5998	33.66	19.76	53.42	72.22	-18.80	peak			
3	0.8372	28.30	19.90	48.20	69.27	-21.07	peak			
4	1.0852	21.58	20.02	41.60	66.99	-25.39	peak			
5	1.3249	19.24	20.08	39.32	65.23	-25.91	peak			
6	1.5659	16.33	20.14	36.47	63.75	-27.28	peak			

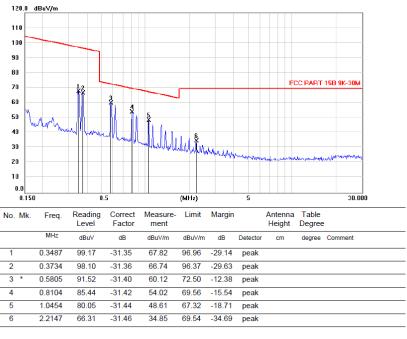
\*:Maximum data x:Over limit !:over margin
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

#### Two coils



peak

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\*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Frequency Range : 30MHz~1000MHz

Test Mode : Full Load, Half Load, Empty Load

Test Results : PASS

Note: 1. The test results are listed in next pages.

- 2. All test modes has been tested, this report only reflected the worst mode. (Full Load)
- 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Frequency Range	:	Above 1GHz			
EUT	:	/	Test Date	:	/
M/N	:	/	Temperature	:	/
Test Engineer	:	/	Humidity	•	/
Test Mode	:	/			
Test Results	:	N/A		•	

Note:

1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.

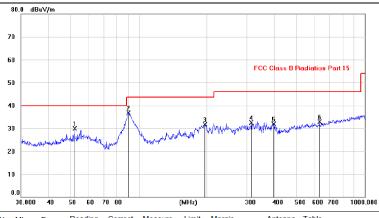
# 30MHz-1GHz

# Signal coil Pol Vertical



No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBu∀	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	30.5485	20.11	13.56	33.67	40.00	-6.33	QP			
2 *	51.8006	21.15	13.88	35.03	40.00	-4.97	QP			
3	93.1785	24.77	10.35	35.12	43.50	-8.38	QP			
4	188.1704	24.53	11.69	36.22	43.50	-7.28	QP			
5	314.8913	19.77	14.48	34.25	46.00	-11.75	peak			
6	543.2742	11.83	19.08	30.91	46.00	-15.09	peak			

### Pol Horizontal



No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1		51.8855	15.98	13.88	29.86	40.00	-10.14	peak			
2	*	89.7577	26.71	10.04	36.75	43.50	-6.75	peak			
3		196.2114	20.52	11.12	31.64	43.50	-11.86	peak			
4		314.8545	17.94	14.48	32.42	46.00	-13.58	peak			
5		395.5012	15.65	16.17	31.82	46.00	-14.18	peak			
6		629.9924	11.99	20.85	32.84	46.00	-13.16	peak			

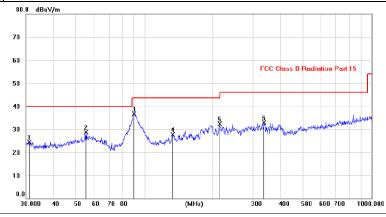
## Two coils

#### Pol Vertical



No. I	Mk. Fred	q. Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	30.577	0 16.92	13.56	30.48	40.00	-9.52	QP			
2	55.677	5 21.07	13.57	34.64	40.00	-5.36	QP			
3	90.505	6 26.48	10.11	36.59	43.50	-6.91	QP			
4	* 182.069	1 27.16	12.43	39.59	43.50	-3.91	QP			
5	329.693	5 19.82	14.81	34.63	46.00	-11.37	peak			
6	500.067	2 12.49	18.21	30.70	46.00	-15.30	peak			

## Pol Horizontal



ı	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
	1		31.1252	10.89	13.59	24.48	40.00	-15.52	peak			
	2		55.3629	15.09	13.57	28.66	40.00	-11.34	peak			
	3	*	89.7577	26.71	10.04	36.75	43.50	-6.75	peak			
	4		133.5720	13.84	13.85	27.69	43.50	-15.81	peak			
	5		214.7903	20.85	11.39	32.24	43.50	-11.26	peak			
	6		336.1137	17.95	14.98	32.93	46.00	-13.07	peak			

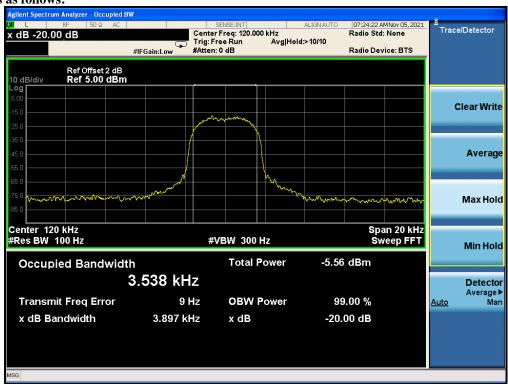
# **3.3.** Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.215(c)					
Test Method:	ANSI C63.10: 2013					
Limit:	N/A					
Test Procedure:	<ol> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Use the following spectrum analyzer settings for 20dB Bandwidth measurement.         Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.     </li> <li>Measure and record the results in the test report.</li> </ol>					
Test setup:	Spectrum Analyzer EUT					
Test Mode:	Refer to section 4.1 for details					
Test results:	PASS					

#### **3.3.1.** Test Data

Coil 1								
Frequency(KHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion					
120	3.897		PASS					

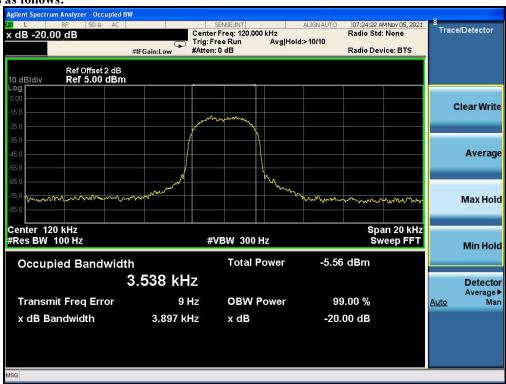
Test plots as follows:



#### 3.3.1. Test Data

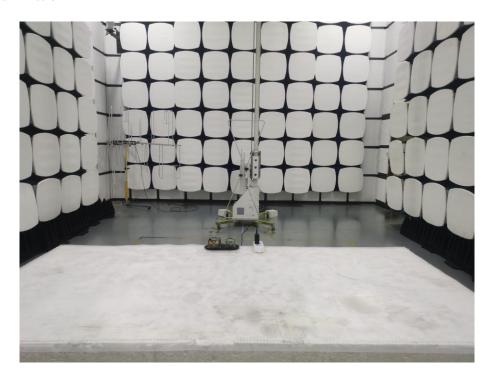
Coil 1								
Frequency(KHz) 20dB Occupy Bandwidth Limit (kHz) Conclusion								
120	3.897		PASS					

Test plots as follows:



# 4. Photos of Test Setup

Radiated Emission



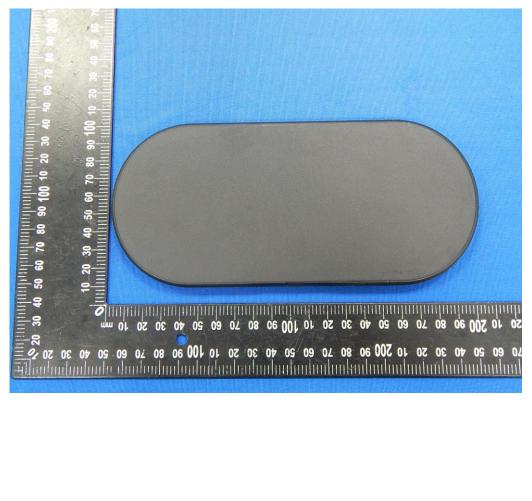


## Conducted Emission

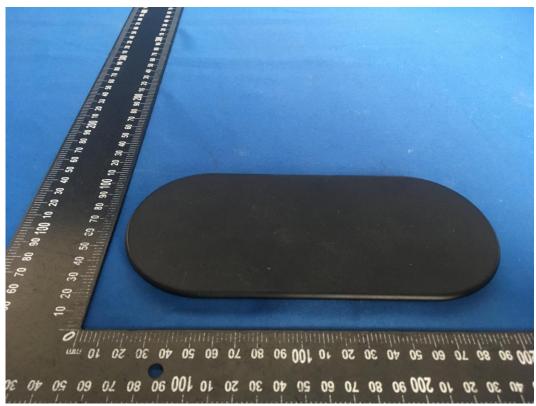


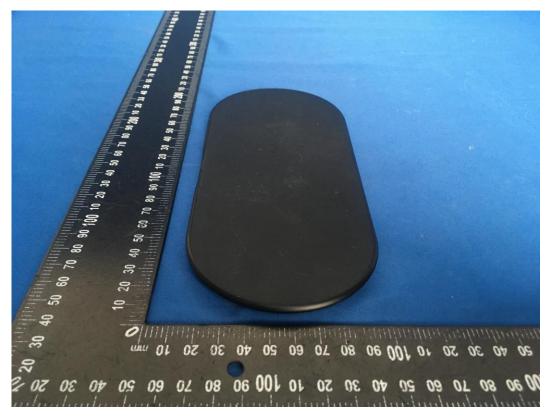
# 5. Photographs of EUT



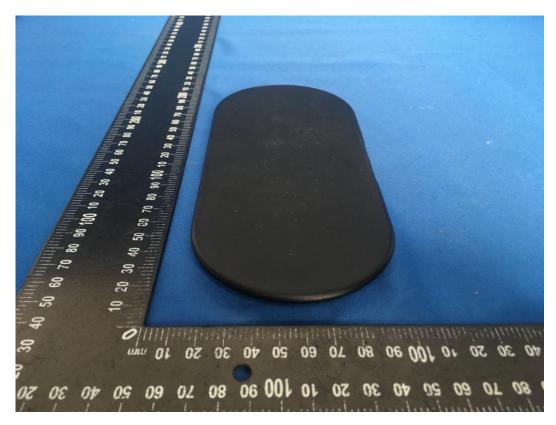




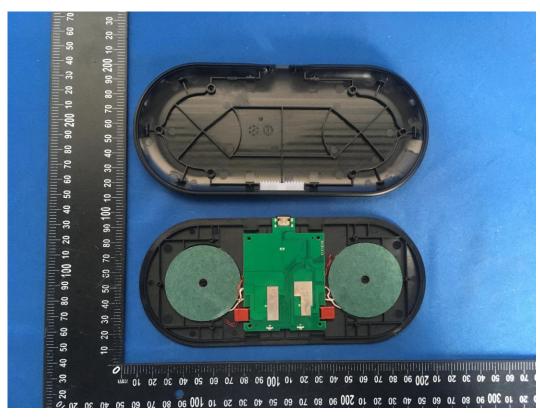


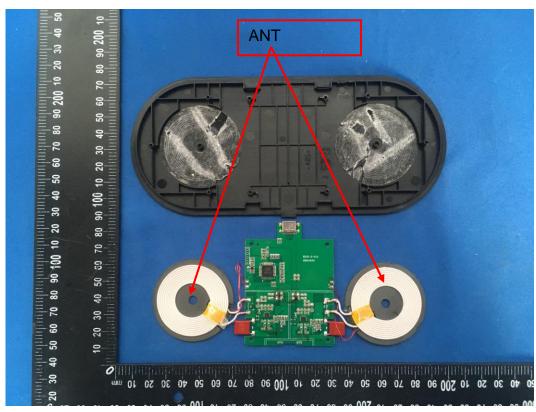


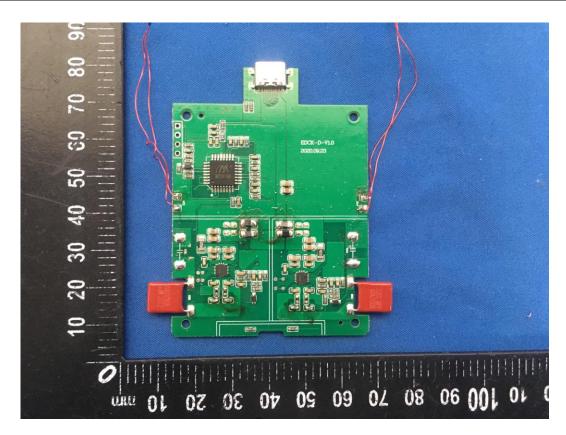


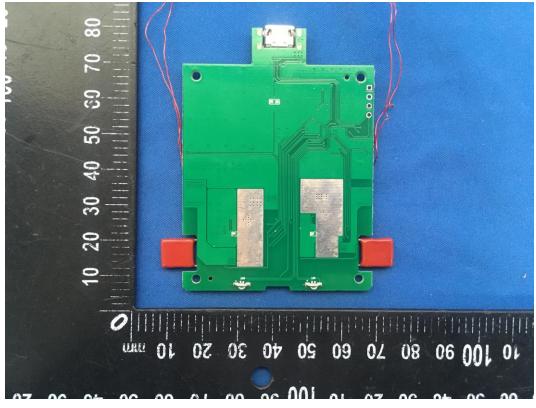


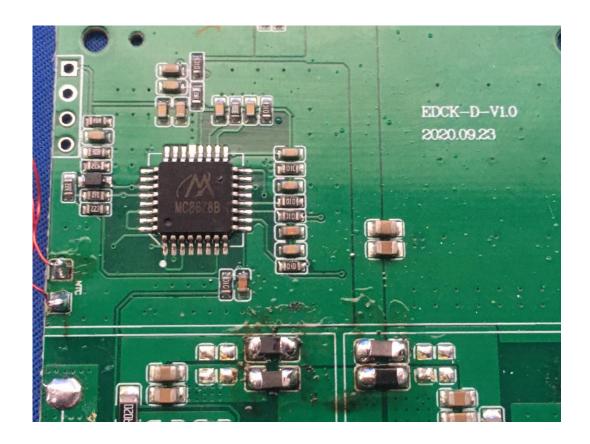












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