



**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

## FCC PART 15 SUBPART C TEST REPORT

Report Reference No.....: **GTS20191104008-2-2**

FCC ID.....: **2AU2Q-PC-1**

Compiled by

( position+printed name+signature)..**File administrators Jimmy Wang**

Supervised by

( position+printed name+signature)..**Test Engineer Aaron Tan**



Approved by

( position+printed name+signature)..**Manager Jason Hu**

Date of issue.....: **Oct. 28, 2019**

**Representative Laboratory Name :** **Shenzhen Global Test Service Co., Ltd.**

Address.....: **No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong**

**Applicant's name**.....: **Shenzhen Annsma Wireless Charging Technology Co., LTD**

Address .....: **3/F, A1 Building, Sencheng Industrial Park, No.6 Hongmian Road, Yuanshan Street, Longgang District, Shenzhen, Guangdong, China**

**Test specification** .....

Standard .....: **FCC Rules and Regulations Part 15 Subpart C (Section 15.209), ANSI C63.10: 2013**

TRF Originator.....: **Shenzhen Global Test Service Co.,Ltd.**

Master TRF .....: **Dated 2014-12**

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**Test item description** .....: **Wireless charger power bank**

Trade Mark .....: **MILOFHIEP**

Manufacturer .....: **Shenzhen Mofhie Wireless Charging Technology Co., LTD**

Model/Type reference.....: **PC-1**

Listed Models .....: **N/A**

Modulation Type .....: **ASK**

Operation Frequency.....: **From 110KHz to 205KHz**

Rating .....: **5V/3A 9V/2A 12V/1.5A**

Result.....: **PASS**

## TEST REPORT

Test Report No. :	GTS20191104008-2-2	Oct. 28, 2019
		Date of issue

Equipment under Test : Wireless charger power bank

Model /Type : PC-1

Listed Models : N/A

Applicant : **Shenzhen Ansmo Wireless Charging Technology Co., LTD**

Address : 3/F, A1 Building, Sencheng Industrial Park, No.6 Hongmian Road, Yuanshan Street, Longgang District, Shenzhen, Guangdong, China

Manufacturer : **Shenzhen Mophie Wireless Charging Technology Co., LTD**

Address : 3/F, A1 Building, Sencheng Industrial Park, No.6 Hongmian Road, Yuanshan Street, Longgang District, Shenzhen, Guangdong, China

<b>Test Result:</b>	<b>PASS</b>
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## **1 TEST STANDARDS**

The tests were performed according to following standards:

[FCC Rules and Regulations Part 15 Subpart C \(Section 15.207\)](#): Conducted limits.

[FCC Rules and Regulations Part 15 Subpart C \(Section 15.209\)](#): Radiated emission limits; general requirements.

[ANSI C63.10: 2013](#): American National Standard for Testing Unlicensed Wireless Devices

## 2 SUMMARY

### 2.1 General Remarks

Date of receipt of test sample	:	Oct. 14, 2019
Testing commenced on	:	Oct. 15, 2019
Testing concluded on	:	Oct. 27, 2019

### 2.2 Product Description

Product Name:	Wireless charger power bank
Model/Type reference:	PC-1
Power supply:	DC 3.6V from battery
Operation frequency:	110KHz - 205KHz
Modulation type:	ASK
Antenna type:	Loop coil antenna

### 2.3 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

Charging and communication mode

Test Modes:		
Mode 1	AC/DC Adapter (9V/2A) + EUT + Mobile Phone + iwatch (Battery Status: <1%)	Record
Mode 2	AC/DC Adapter (9V/2A) + EUT + Mobile Phone + iwatch (Battery Status: <50%)	Pre-tested
Mode 3	AC/DC Adapter (9V/2A) + EUT + Mobile Phone + iwatch (Battery Status: 100%)	Pre-tested
Mode 4	AC/DC Adapter (9V/2A) + EUT + Mobile Phone (Battery Status: <1%)	Pre-tested
Mode 5	AC/DC Adapter (9V/2A) + EUT + Mobile Phone (Battery Status: <50%)	Pre-tested
Mode 6	AC/DC Adapter (9V/2A) + EUT + Mobile Phone (Battery Status: 100%)	Pre-tested
Mode 7	AC/DC Adapter (9V/2A) + EUT + iwatch (Battery Status: <1%)	Pre-tested
Mode 8	AC/DC Adapter (9V/2A) + EUT + iwatch (Battery Status: <50%)	Pre-tested
Mode 9	AC/DC Adapter (9V/2A) + EUT + iwatch (Battery Status: 100%)	Pre-tested
Mode 10	AC/DC Adapter (5V/3A) + EUT + Mobile Phone + iwatch (Battery Status: <1%)	Pre-tested
Mode 11	AC/DC Adapter (5V/3A) + EUT + Mobile Phone + iwatch (Battery Status: <50%)	Pre-tested
Mode 12	AC/DC Adapter (5V/3A) + EUT + Mobile Phone + iwatch (Battery Status: 100%)	Pre-tested
Mode 13	AC/DC Adapter (5V/3A) + EUT + Mobile Phone (Battery Status: <1%)	Pre-tested
Mode 14	AC/DC Adapter (5V/3A) + EUT + Mobile Phone (Battery Status: <50%)	Pre-tested
Mode 15	AC/DC Adapter (5V/3A) + EUT + Mobile Phone (Battery Status: 100%)	Pre-tested
Mode 16	AC/DC Adapter (5V/3A) + EUT + iwatch (Battery Status: <1%)	Pre-tested
Mode 17	AC/DC Adapter (5V/3A) + EUT + iwatch (Battery Status: <50%)	Pre-tested
Mode 18	AC/DC Adapter (5V/3A) + EUT + iwatch (Battery Status: 100%)	Pre-tested
Mode 19	AC/DC Adapter (12V/1.5A) + EUT + Mobile Phone + iwatch (Battery Status: <1%)	Pre-tested
Mode 20	AC/DC Adapter (12V/1.5A) + EUT + Mobile Phone + iwatch (Battery Status: <50%)	Pre-tested

Mode 21	AC/DC Adapter (12V/1.5A) + EUT + Mobile Phone + iwatch (Battery Status: 100%)	Pre-tested
Mode 22	AC/DC Adapter (12V/1.5A) + EUT + Mobile Phone (Battery Status: <1%)	Pre-tested
Mode 23	AC/DC Adapter (12V/1.5A) + EUT + Mobile Phone (Battery Status: <50%)	Pre-tested
Mode 24	AC/DC Adapter (12V/1.5A) + EUT + Mobile Phone (Battery Status: 100%)	Pre-tested
Mode 25	AC/DC Adapter (12V/1.5A) + EUT + iwatch (Battery Status: <1%)	Pre-tested
Mode 26	AC/DC Adapter (12V/1.5A) + EUT + iwatch (Battery Status: <50%)	Pre-tested
Mode 27	AC/DC Adapter (12V/1.5A) + EUT + iwatch (Battery Status: 100%)	Pre-tested
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

## 2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
Adapter	CHENYANG ELECTRONICS	CD101	Input: 100-240V~, 50/60Hz, 0.5A Output: 5V---3A / 9V---2A / 12V---1.5A	CE/FCC	laboratory
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

## 2.5 Modifications

No modifications were implemented to meet testing criteria.

### **3 TEST ENVIRONMENT**

#### **3.1 Address of the test laboratory**

##### **Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

#### **3.2 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

##### **FCC-Registration No.: 165725**

Shenzhen Global Test Service Co.,Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

##### **A2LA-Lab Cert. No.: 4758.01**

Shenzhen Global Test Service Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

##### **CNAS-Lab Code: L8169**

Shenzhen Global Test Service Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories. Date of Registration: Dec. 11, 2015. Valid time is until Dec. 10, 2024.

#### **3.3 Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

### 3.4 Summary of measurement results

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	COMPLIANT
RADIATED EMISSION TEST	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

### 3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

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

### 3.6 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2019/09/20	2020/09/19
LISN	R&S	ESH2-Z5	893606/008	2019/09/20	2020/09/19
Bilog Antenna	Schwarzbeck	VULB9163	976	2019/09/20	2020/09/19
EMI Test Receiver	R&S	ESCI7	101102	2019/09/20	2020/09/19
Spectrum Analyzer	Agilent	N9020A	MY48010425	2019/09/20	2020/09/19
Spectrum Analyzer	R&S	FSP40	100019	2019/09/20	2020/09/19
Controller	EM Electronics	Controller EM 1000	N/A	N/A	N/A
Horn Antenna	Schwarzbeck	BBHA 9120D	01622	2019/09/20	2020/09/19
Active Loop Antenna	SCHWARZBEC K	FMZB1519	1519-037	2019/09/20	2020/09/19
Broadband Horn Antenna	SCHWARZBEC K	BBHA 9170	971	2019/09/20	2020/09/19
Amplifier	Schwarzbeck	BBV 9743	#202	2019/09/20	2020/09/19
Amplifier	EMCI	EMC051845B	980355	2019/09/20	2020/09/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2019/09/20	2020/09/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	KL142031	2019/09/20	2020/09/19
High-Pass Filter	K&L	41H10-1375/U12750-	KL142032	2019/09/20	2020/09/19

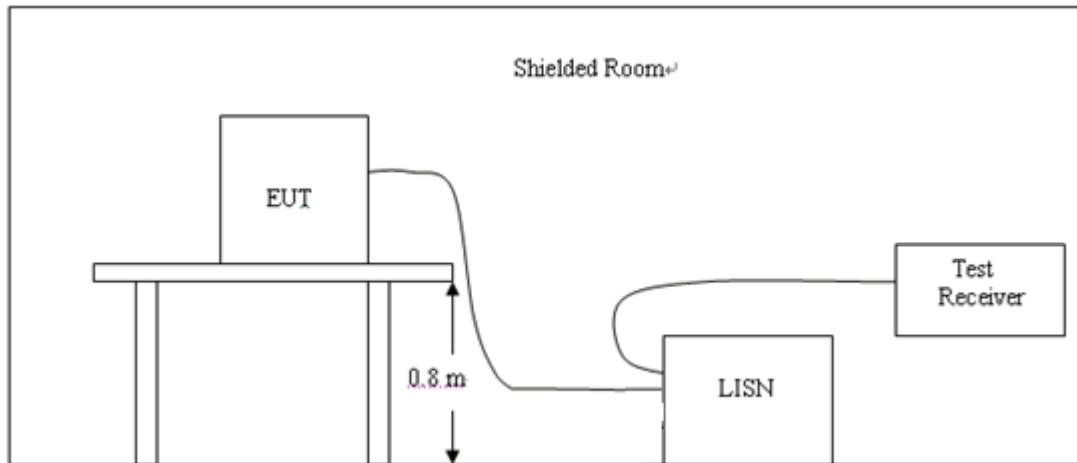
		O/O			
RF Cable(below 1GHz)	HUBER+SUHNE R	RG214	RE01	2019/09/20	2020/09/19
RF Cable(above 1GHz)	HUBER+SUHNE R	RG214	RE02	2019/09/20	2020/09/19
Data acquisition card	Agilent	U2531A	TW53323507	2019/09/20	2020/09/19
Power Sensor	Agilent	U2021XA	MY5365004	2019/09/20	2020/09/19
EMI Test Software	R&S	ES-K1	V1.7.1	2019/09/20	2020/09/19
EMI Test Software	JS Tonscend	JS32-RE	2.0.1.5	2019/09/20	2020/09/19
EMI Test Software	Audix	E3	2..1.1	2019/09/20	2020/09/19

Note: The Cal.Interval was one year.

## 4 TEST CONDITIONS AND RESULTS

### 4.1 AC Power Conducted Emission

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

#### AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

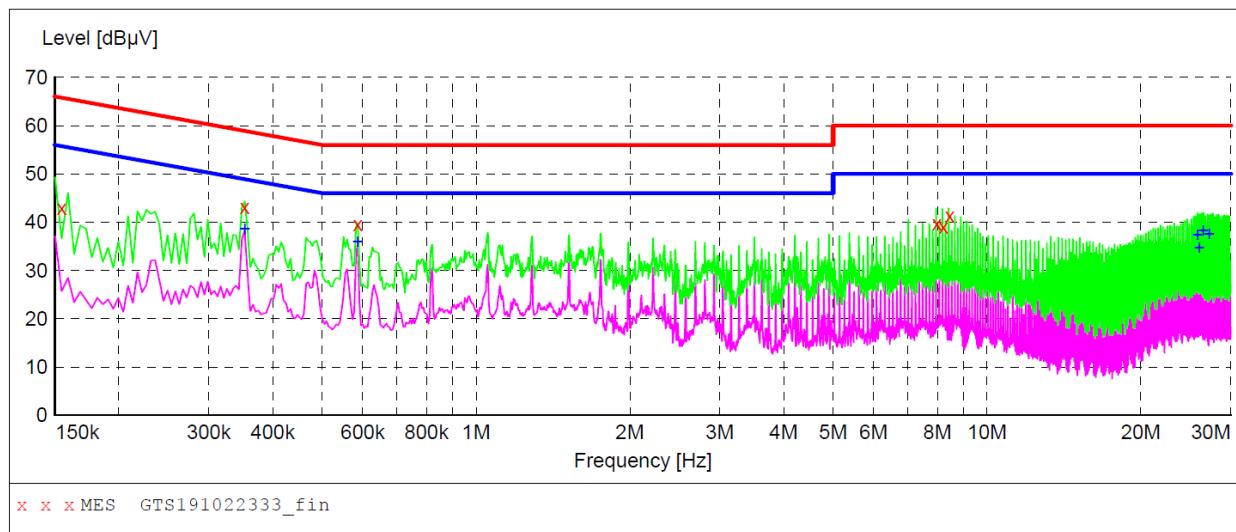
\* Decreases with the logarithm of the frequency.

**TEST RESULTS**

- Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:
- All test modes described in section 2.3 has been tested, only the worst result of Mode 1 is recorded.

Power supply:	DC 9V from Adapter AC 120V/60Hz	Polarization	L
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**SCAN TABLE: "Voltage (9K-30M) FIN"**  
Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "GTS191022333\_fin"**

2019-10-22 05:02??

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.154500	42.90	10.2	66	22.9	QP	L1	GND
0.352500	43.10	10.2	59	15.8	QP	L1	GND
0.586500	39.50	10.2	56	16.5	QP	L1	GND
7.975500	39.80	10.5	60	20.2	QP	L1	GND
8.209500	39.00	10.5	60	21.0	QP	L1	GND
8.448000	41.30	10.6	60	18.7	QP	L1	GND

**MEASUREMENT RESULT: "GTS191022333\_fin2"**

2019-10-22 05:02??

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.352500	38.60	10.2	49	10.3	AV	L1	GND
0.586500	36.00	10.2	46	10.0	AV	L1	GND
25.809000	37.40	11.1	50	12.6	AV	L1	GND
26.043000	34.80	11.1	50	15.2	AV	L1	GND
26.515500	38.20	11.2	50	11.8	AV	L1	GND
27.217500	37.60	11.2	50	12.4	AV	L1	GND

Power supply:	DC 9V from Adapter AC 120V/60Hz	Polarization	N
<b>SCAN TABLE: "Voltage (9K-30M) FIN"</b> Short Description: 150K-30M Voltage			

Level [dB $\mu$ V]

Frequency [Hz]

MES GTS191022334\_fin

#### **MEASUREMENT RESULT: "GTS191022334\_fin"**

2019-10-22 05:05??

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.159000	39.20	10.2	66	26.3	QP	N	GND
8.916000	39.80	10.6	60	20.2	QP	N	GND
9.384000	39.30	10.6	60	20.7	QP	N	GND
9.856500	39.60	10.6	60	20.4	QP	N	GND
10.090500	39.60	10.6	60	20.4	QP	N	GND
10.324500	39.00	10.6	60	21.0	QP	N	GND

#### **MEASUREMENT RESULT: "GTS191022334\_fin2"**

2019-10-22 05:05??

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
25.579500	37.20	11.1	50	12.8	AV	N	GND
25.813500	37.20	11.1	50	12.8	AV	N	GND
26.047500	37.60	11.1	50	12.4	AV	N	GND
26.281500	37.60	11.2	50	12.4	AV	N	GND
27.694500	30.30	11.2	50	19.7	AV	N	GND
28.162500	36.90	11.2	50	13.1	AV	N	GND

## 4.2 Radiated Emission

### Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

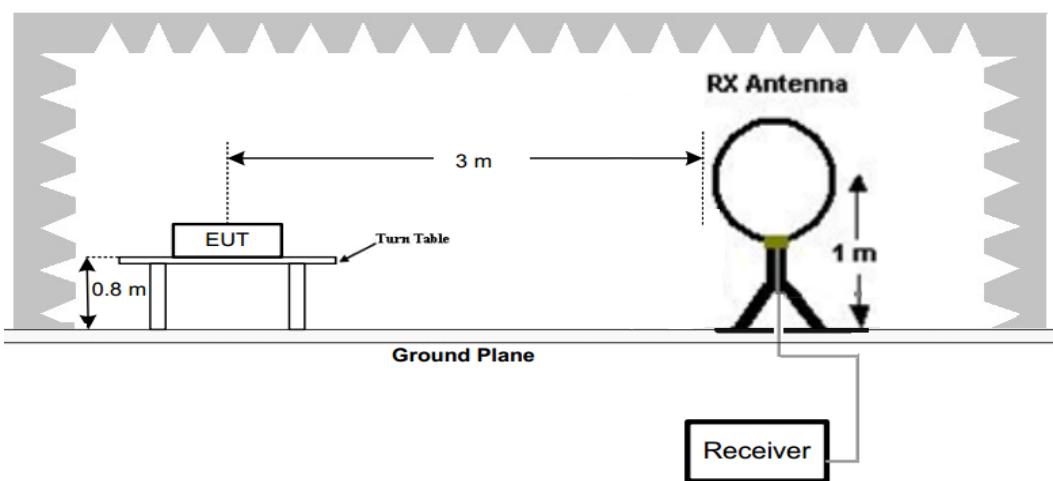
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

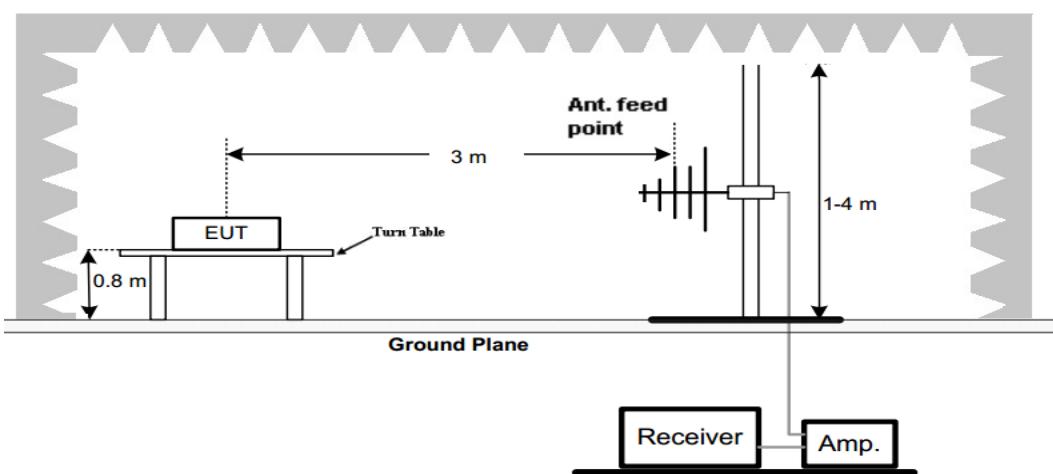
Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

### TEST CONFIGURATION

#### 1. Radiated Emission Test Set-Up, Frequency Below 30MHz



#### 2. Radiated Emission Test Set-Up, Frequency below 1000MHz



**Test Procedure**

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 1000MHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP

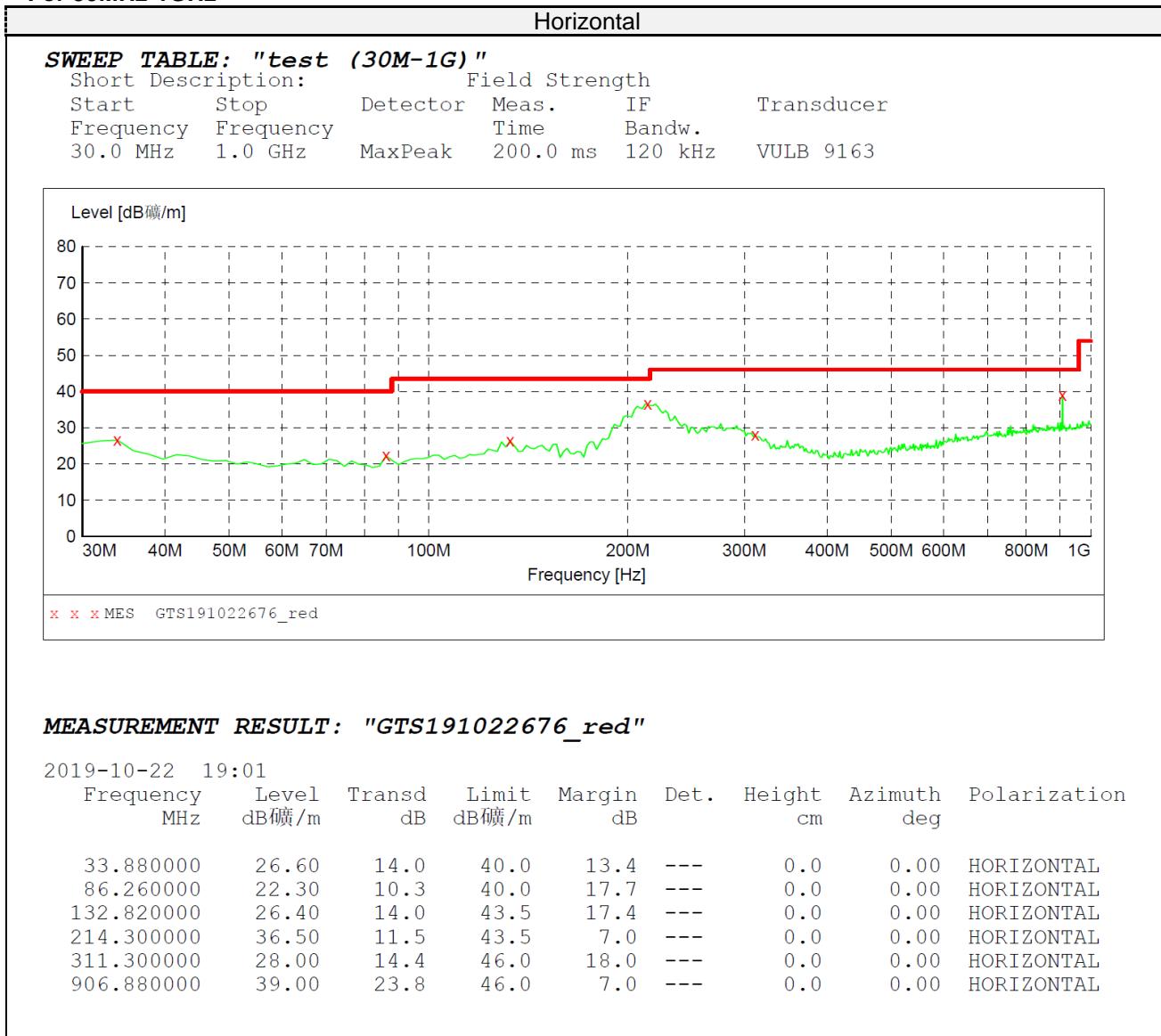
**TEST RESULTS****For 9 KHz-30MHz****WORST-CASE RADIATED EMISSION BELOW 30 MHz**

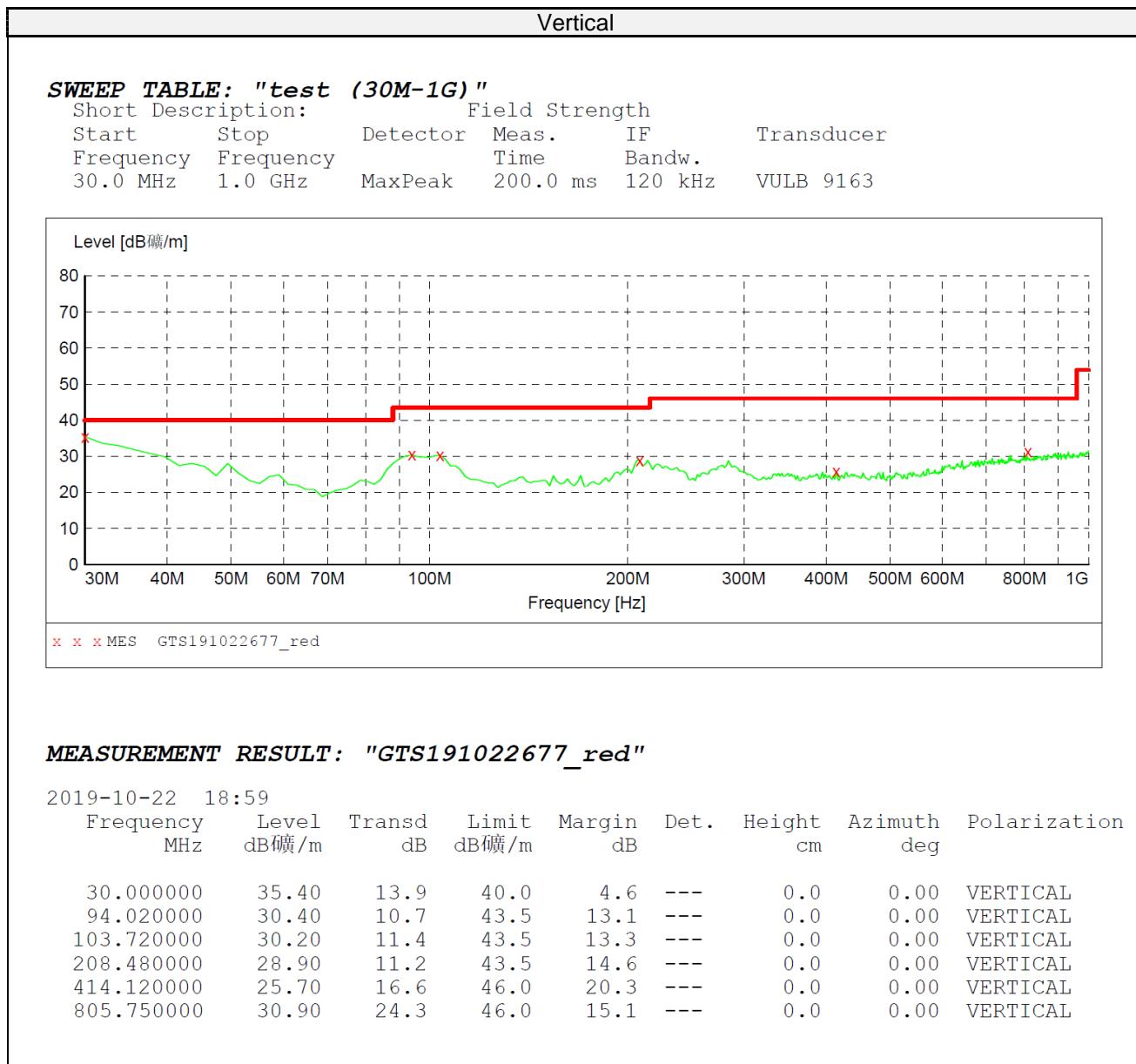
Frequency (MHz)	Reading (dB $\mu$ V/m)	Polar Loop	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Levels (dB $\mu$ V/m)	Limits at 3m (dB $\mu$ V/m)	Margin (dB)	Detector Mode
0.113(F)	58.50	Loop	23.64	0.01	82.15	103.91	21.76	PK
0.113(F)	47.80	Loop	23.64	0.01	71.45	83.91	12.46	AV
0.110	41.89	Loop	23.55	0.01	65.45	106.78	41.33	PK
0.110	33.19	Loop	23.55	0.01	56.75	86.78	30.03	AV
0.685	25.76	Loop	25.07	-0.17	50.66	70.89	20.23	QP
1.735	20.38	Loop	27.12	-0.25	47.25	62.82	15.57	QP
6.525	25.68	Loop	23.91	-0.24	49.35	69.54	20.19	QP
--	--	--	--	--	--	--	--	--

Remark:

1. Data of measurement within this frequency range shown “-- in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits and not recorded.
2. The test limit distance is 3m limit.
3. PK means Peak Value, QP means Quasi Peak Value, AV means Average Value.
4. F means Fundamental Frequency.
5. Emission level (dB $\mu$ V/m) =Reading + Antenna Factor + Cable Loss.
6. Margin value = Limit value- Emission level.

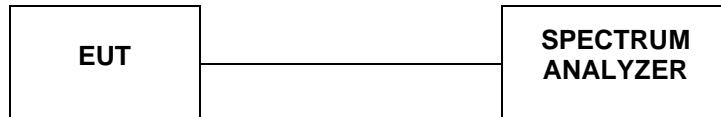
## For 30MHz-1GHz





## 4.3 Occupied Bandwidth

### TEST CONFIGURATION



### TEST PROCEDURE

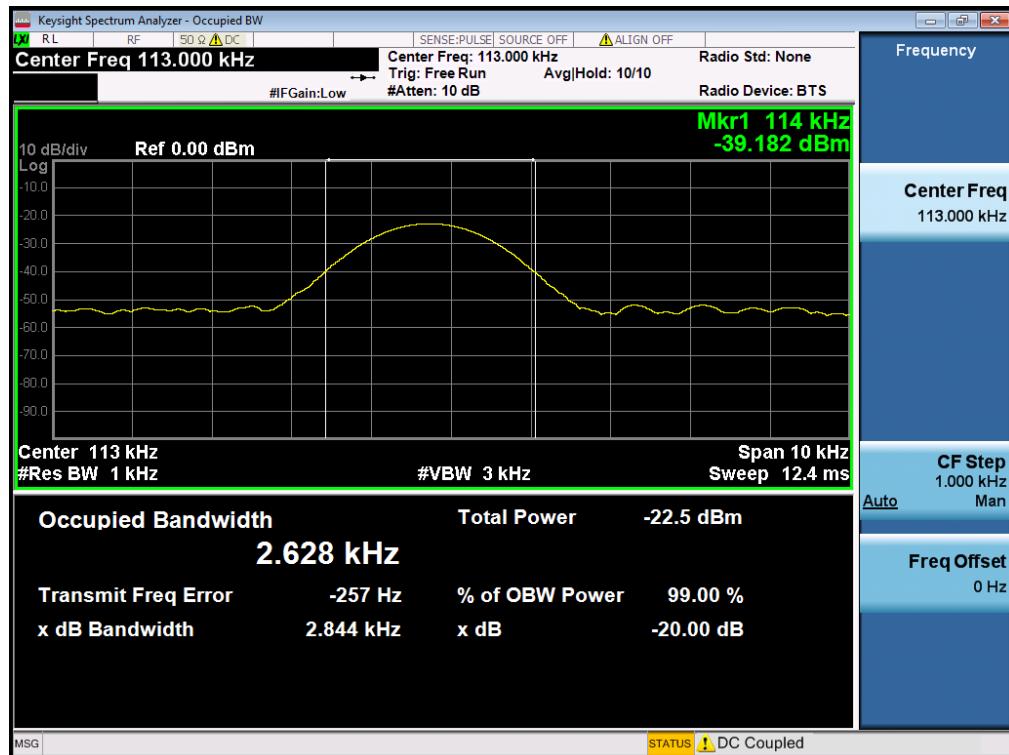
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment complies with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be demonstrated by measuring the radiated emissions.

### LIMIT

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

### TEST RESULTS

Mode	Freq (KHz)	20dB Bandwidth (KHz)	99% OBW (KHz)	Conclusion
Tx Mode	113	2.628	2.844	PASS



#### 4.4 Antenna Requirement

##### Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

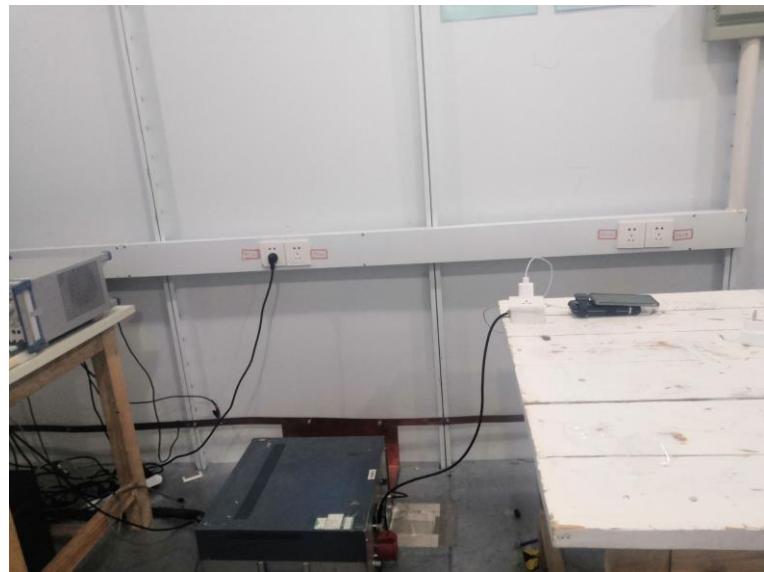
##### **Refer to statement below for compliance**

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

##### Antenna Construction information

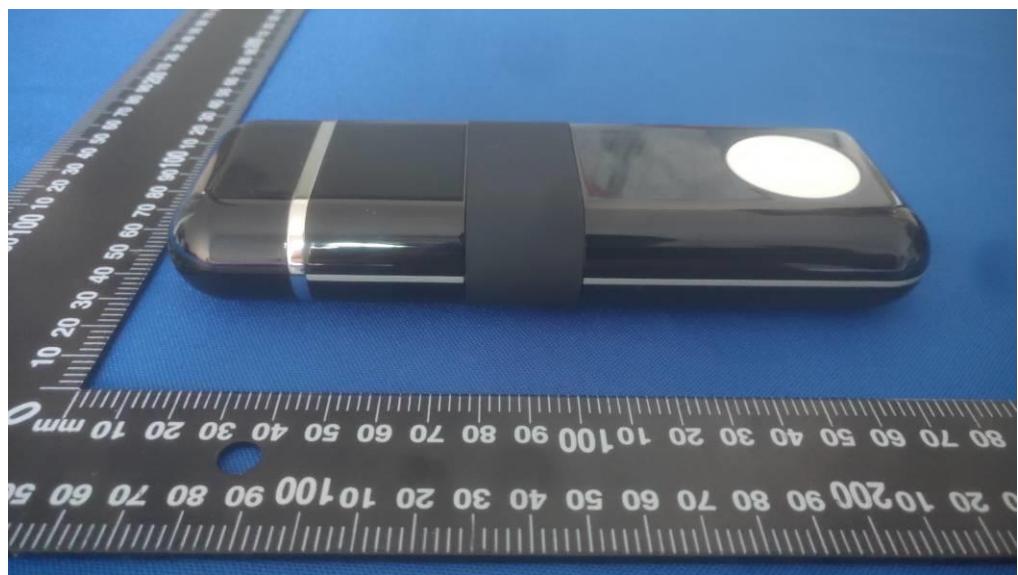
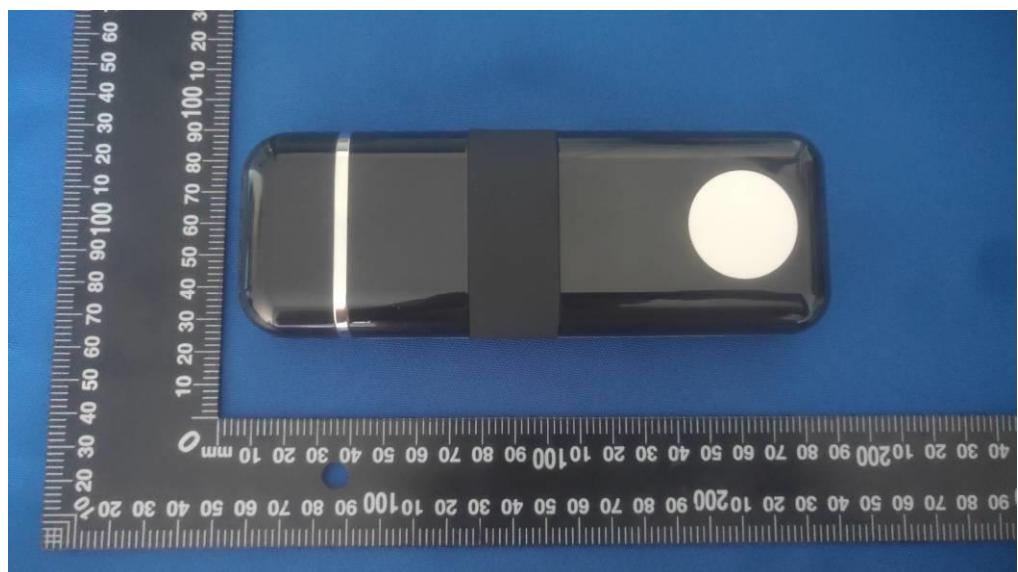
The antenna used in this product is a Coil Antenna, The antenna is integrated on the main PCB must be professionally installed.

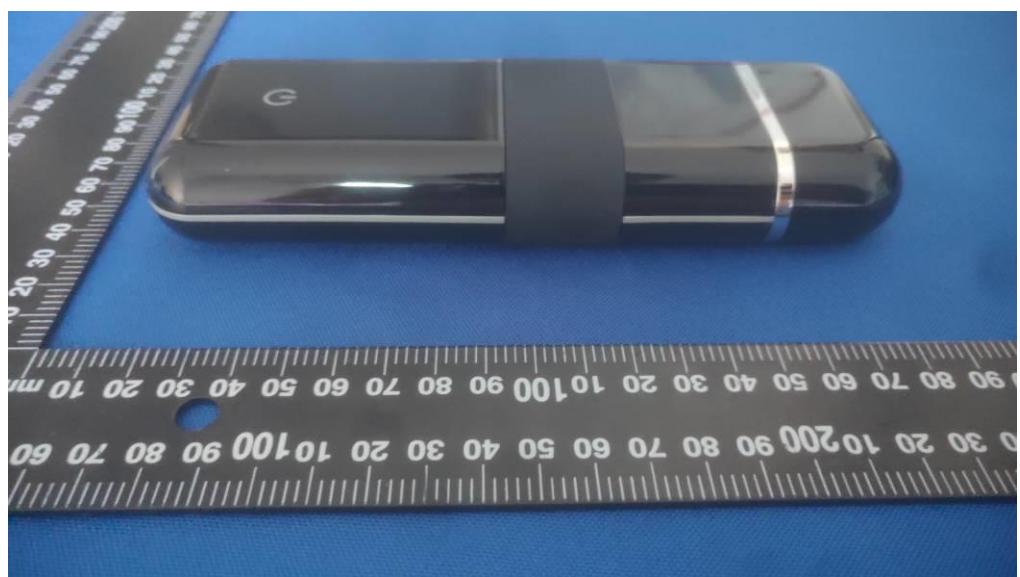
## 5 Test Setup Photos of the EUT

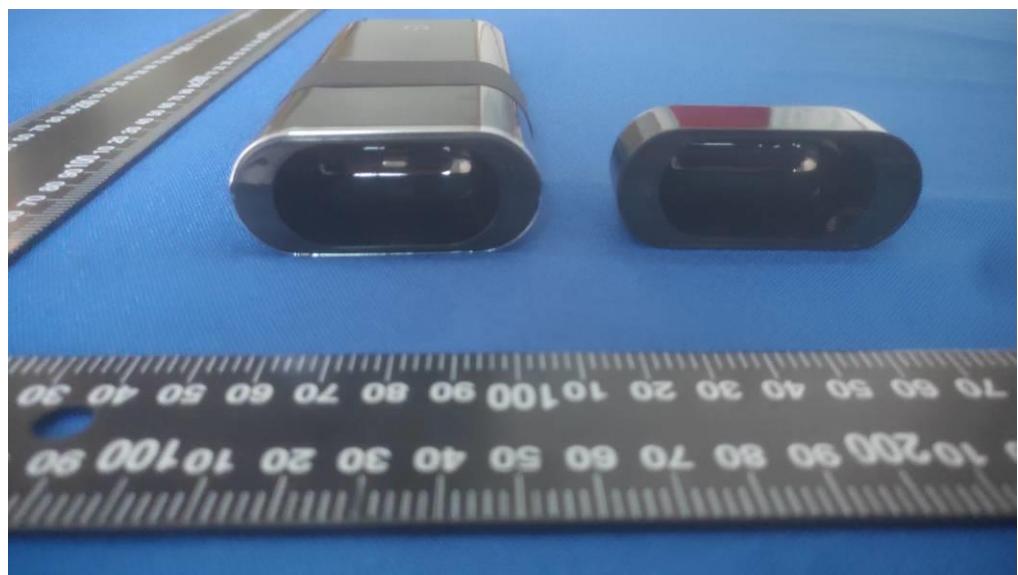


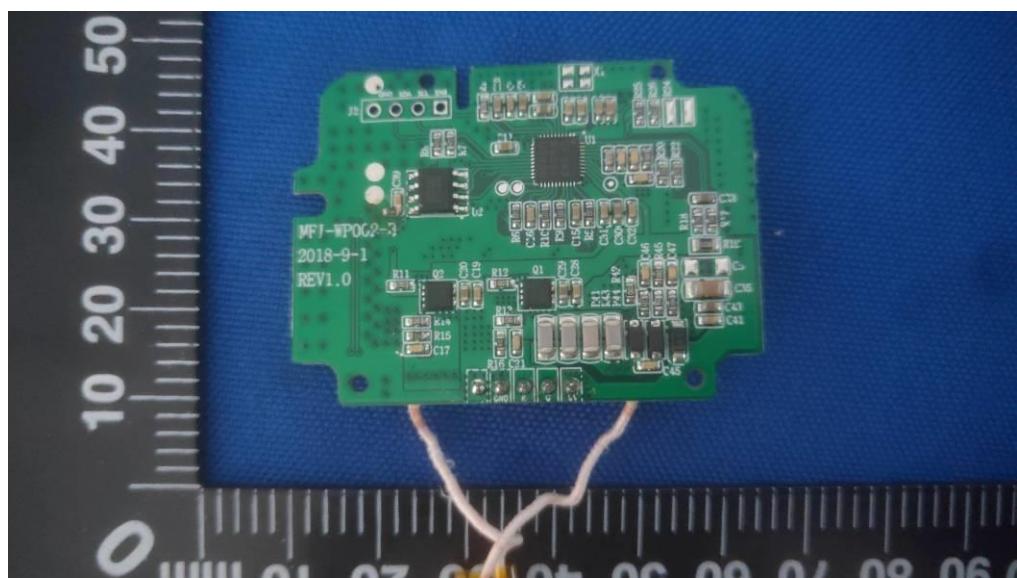
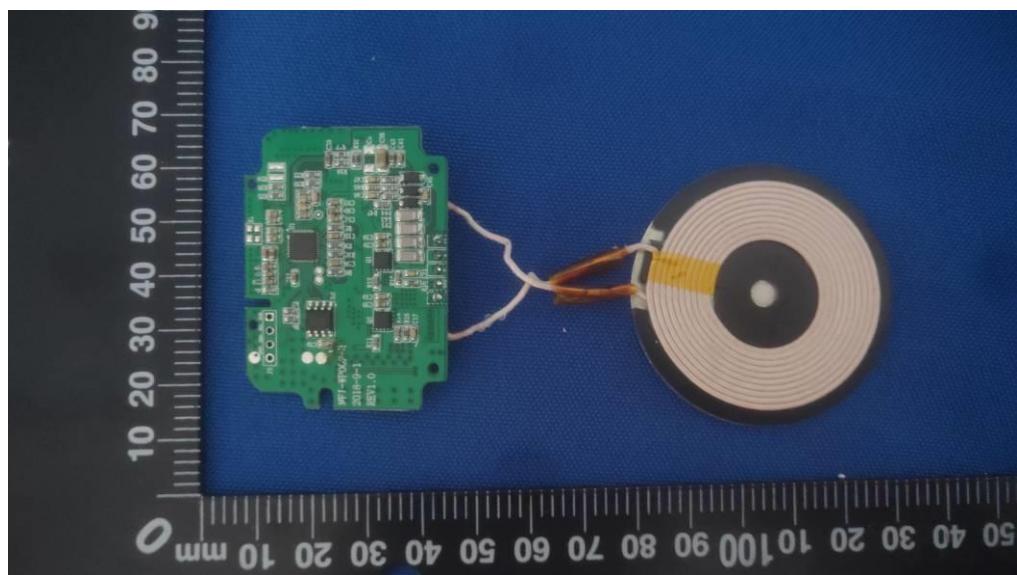
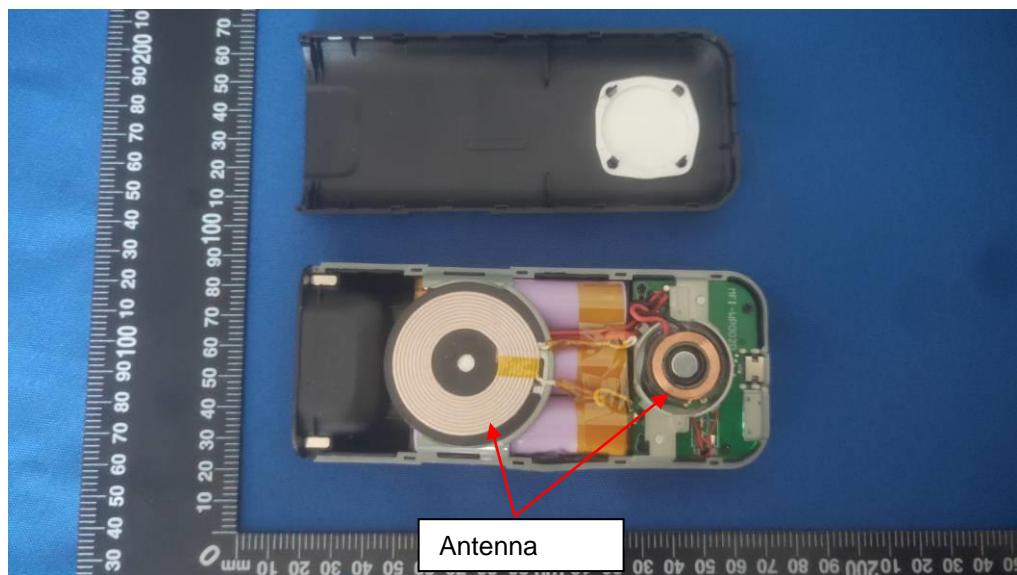
## 6 PHOTOS OF THE EUT

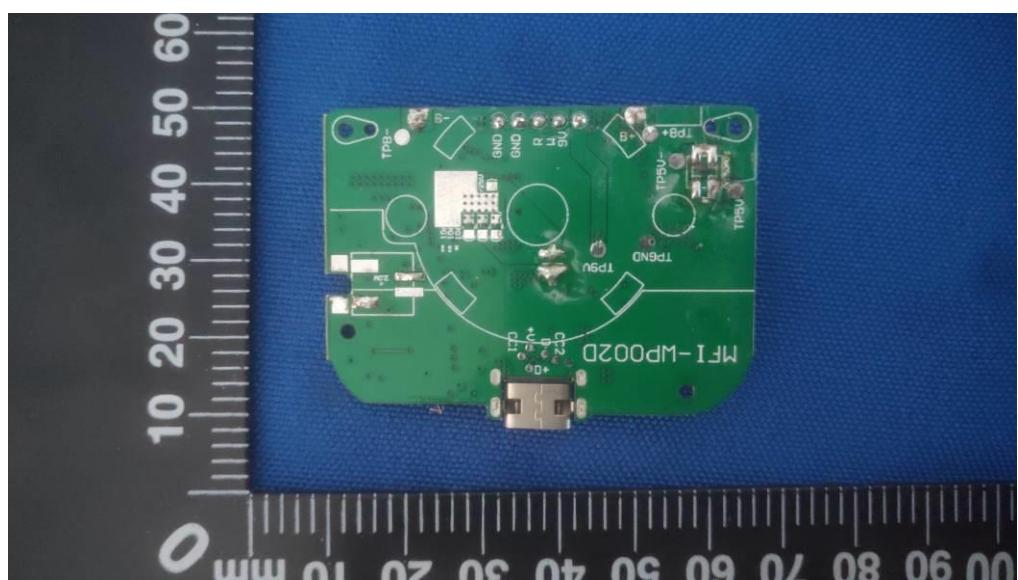
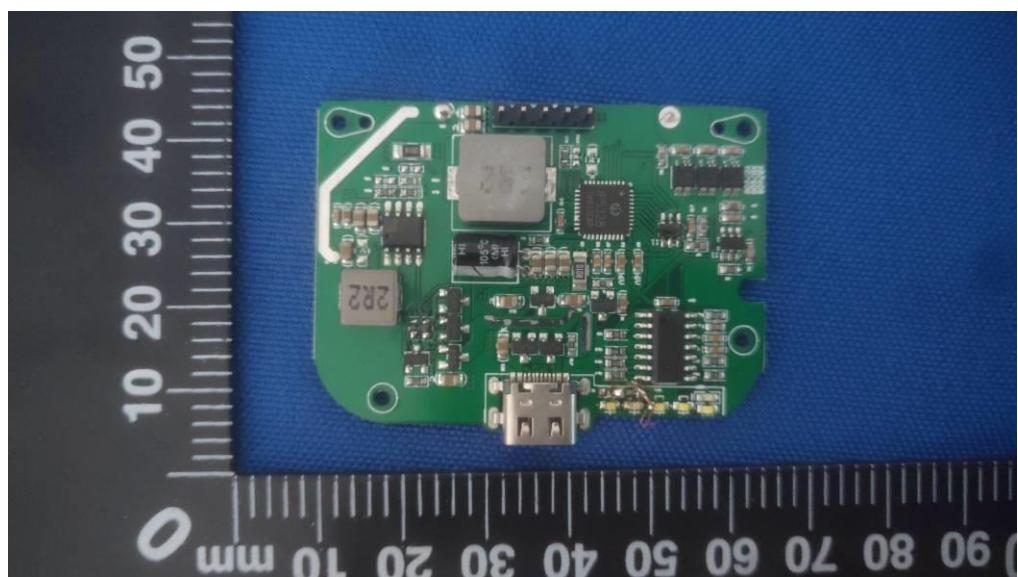
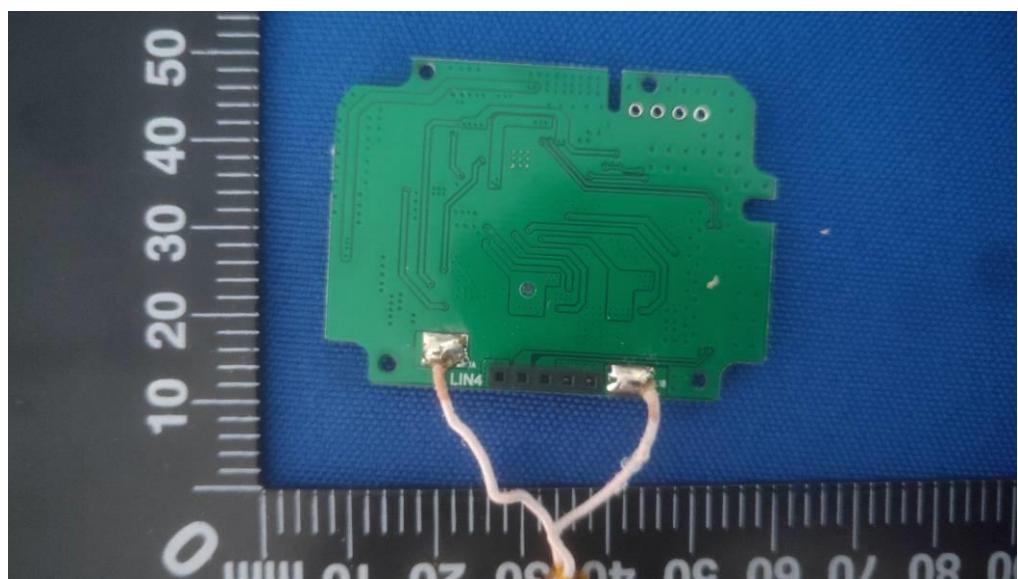
### External photos

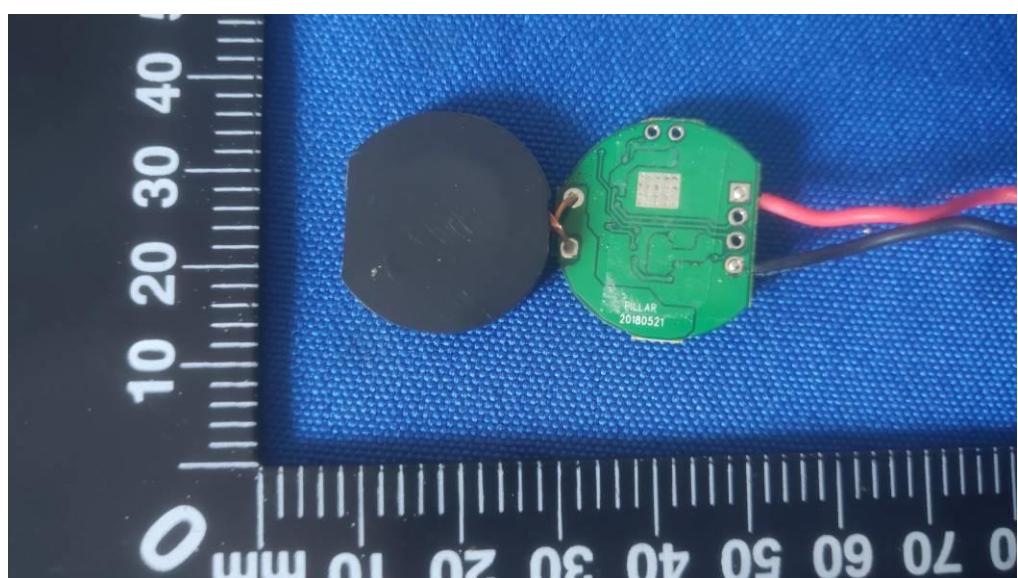
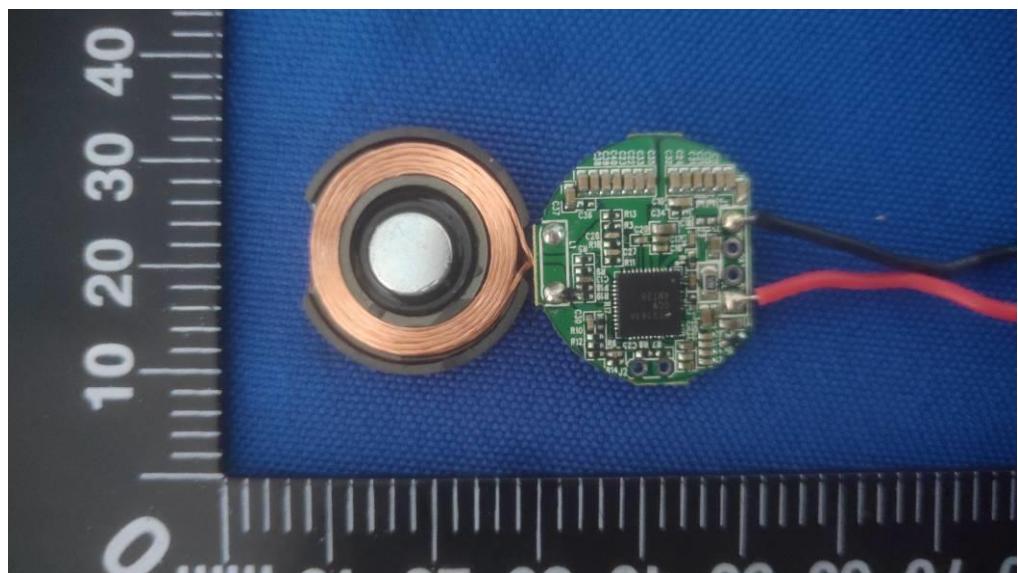






Internal Photos





\*\*\*\*\* End of Report \*\*\*\*\*