

FCC - TEST REPORT

Report Number : **68.760.20.0180.01** Date of Issue: **April 20, 2020**

Model : **Theragun Elite**

Product Type : **Hand held Massager**

Applicant : **Theragun, Inc.**

Address : **2803 Colorado Avenue, Santa Monica, California, 90404, United States**

Manufacturer : **Theragun, Inc.**

Address : **2803 Colorado Avenue, Santa Monica, California, 90404, United States**

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

Total pages including
Appendices : **18**

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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
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Shenzhen 518052
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FCC Registration No.: 514049

3 Description of the Equipment Under Test

Product:	Hand held Massager
Model no.:	Theragun Elite
FCC ID:	2AU6TELITE-01
Options and accessories:	Adapter and USB Cable
Rated Input:	100-240VAC, 50-60Hz, 1.5A (for adapter) 20VDC, 2.25A (for Hand held Massager)
Adapter information:	Manufacturer: EDAC Power Electronics Co., Ltd. Model: EA1046SAR Input voltage: 100-240VAC, 50-60Hz, 1.5A Output voltage: 20VDC, 2.25A
RF Transmission Frequency:	110-165 kHz
Antenna Type:	Integrated coil antenna
Description of the EUT:	The Equipment Under Test (EUT) is a Hand held Massager which operated at 110-165KHz for Wireless charging function (with data transmitting function).

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2019 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	20dB bandwidth	12	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.205	Restricted bands of operation	12	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.209	Radiated emission	13	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.203	Antenna requirement	See note 1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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: April 8, 2020

Testing Start Date: April 17, 2020

Testing End Date: April 18, 2020

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

Reviewed by:

Prepared by:

Tested by:



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Project Engineer

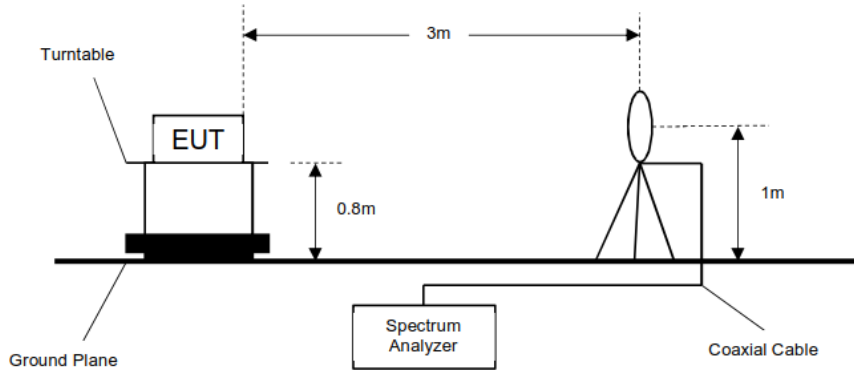


Tree Zhan
Test Engineer

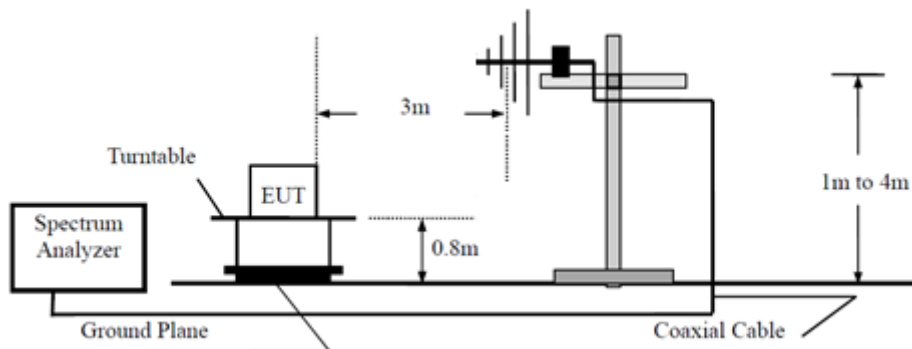
7 Test Setups

7.1 Radiated test setups

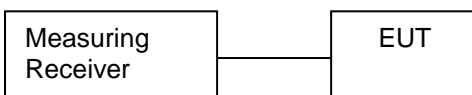
Below 30MHz



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. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

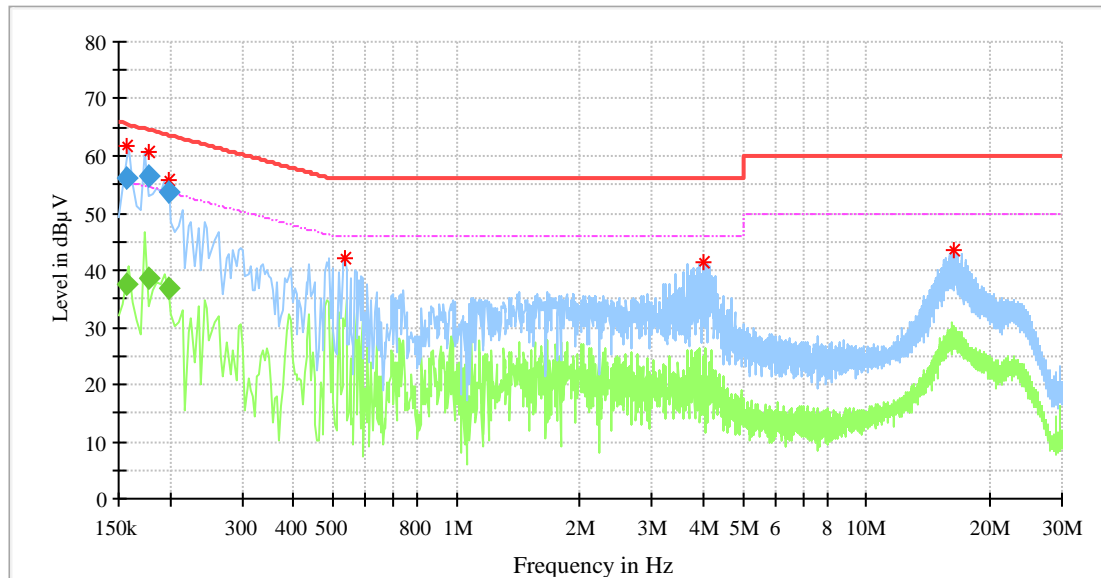
According to §15.207, conducted emissions limit as below:

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 : Hand held Massager
 M/N : Theragun Elite
 Operating Condition : Wireless Charging (with data transmitting function)
 Test Specification : Line
 Comment : AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.157500	61.82	---	65.57	3.74	L1	10.3
0.177500	60.62	---	64.77	4.14	L1	10.3
0.198500	55.92	---	63.86	7.94	L1	10.3
0.534000	42.14	---	56.00	13.86	L1	10.3
4.014000	41.36	---	56.00	14.64	L1	10.4
16.282000	43.43	---	60.00	16.57	L1	10.9

Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.157500	---	37.64	55.59	17.95	L1	10.3
0.157500	56.00	---	65.59	9.59	L1	10.3
0.177500	---	38.74	54.60	15.86	L1	10.3
0.177500	56.33	---	64.60	8.27	L1	10.3
0.198500	---	36.75	53.67	16.92	L1	10.3
0.198500	53.65	---	63.67	10.02	L1	10.3

Remark:

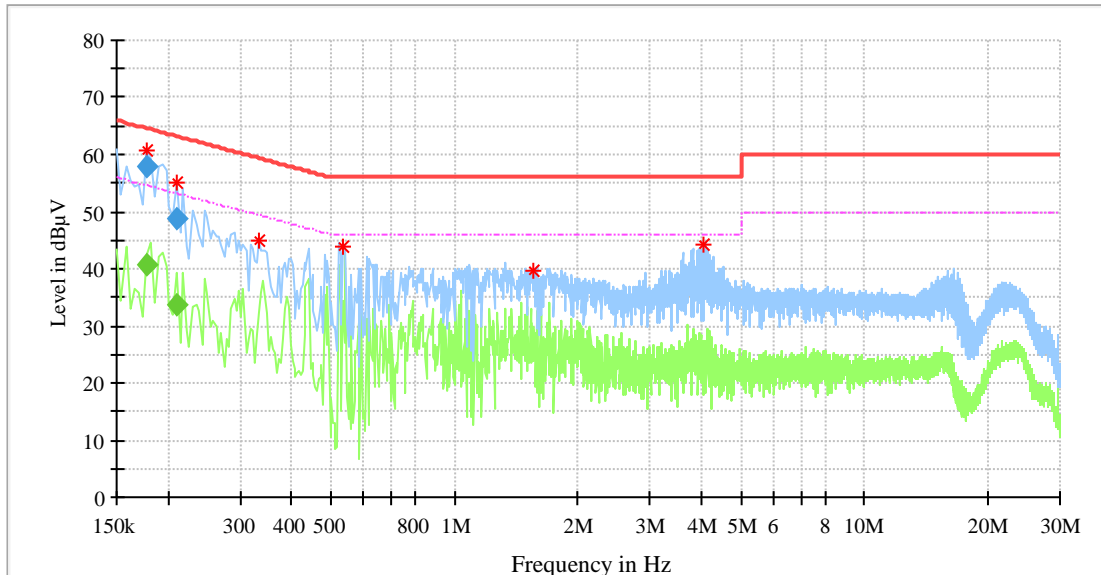
Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

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

Conducted Emission

Product Type : Hand held Massager
 M/N : Theragun Elite
 Operating Condition : Wireless Charging (with data transmitting function)
 Test Specification : Neutral
 Comment : AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.177500	60.80	---	64.58	3.78	N	10.3
0.209500	55.08	---	63.21	8.13	N	10.3
0.334000	44.86	---	59.35	14.49	N	10.3
0.534000	43.72	---	56.00	12.28	N	10.3
1.550000	39.57	---	56.00	16.43	N	10.3
4.030000	44.36	---	56.00	11.64	N	10.5

Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.177500	---	40.54	54.60	14.06	N	10.3
0.177500	57.86	---	64.60	6.74	N	10.3
0.209500	---	33.67	53.23	19.56	N	10.3
0.209500	48.83	---	63.23	14.40	N	10.3

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)	8.68	113.86	--	Pass
		--	121.82	

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: Theragun Elite
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz

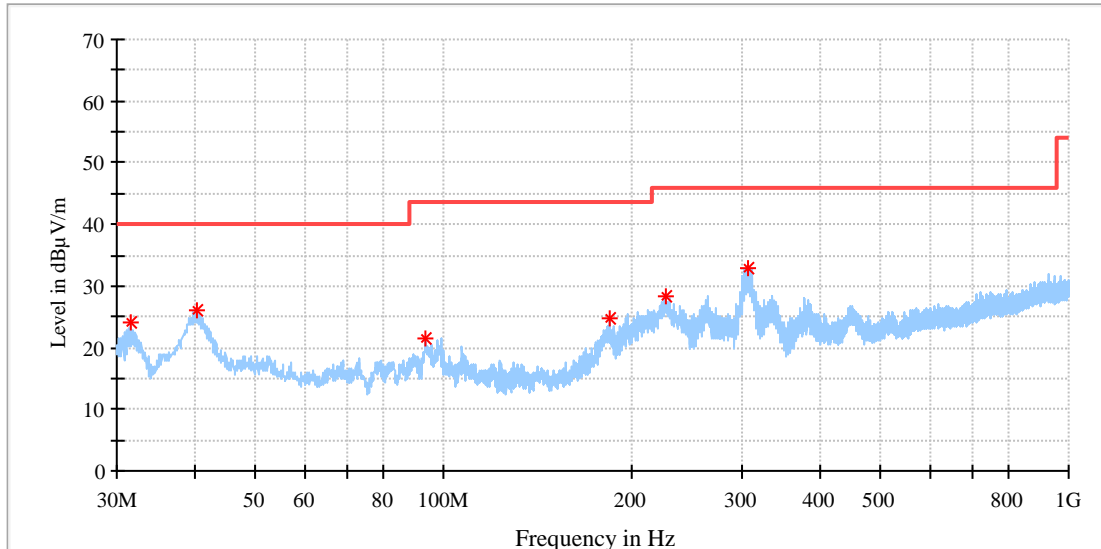
Frequency Band	Frequency MHz	Emission Level dBμV/m	Polarization	Limit dBμV/m	Detector	Margin dBμV/m	Correct factor (dB)	Result
9KHz-30MHz	0.117006	67.99	H	106.24	QP	38.25	20	Pass
	0.118980	90.20	H	106.09	QP	15.89	20	Pass
	0.353975	74.22	H	96.62	QP	22.40	20	Pass
	0.117100	65.23	V	106.23	QP	41.00	20.0	Pass
	0.119074	89.30	V	106.09	QP	16.79	20.0	Pass
	0.353975	72.32	V	96.62	QP	24.30	20.0	Pass

Remark:

- (1) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (2) Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
 Below 1GHz: Corrector factor = Antenna Factor + Cable Loss

Radiated emissions test (30MHz-1000MHz)

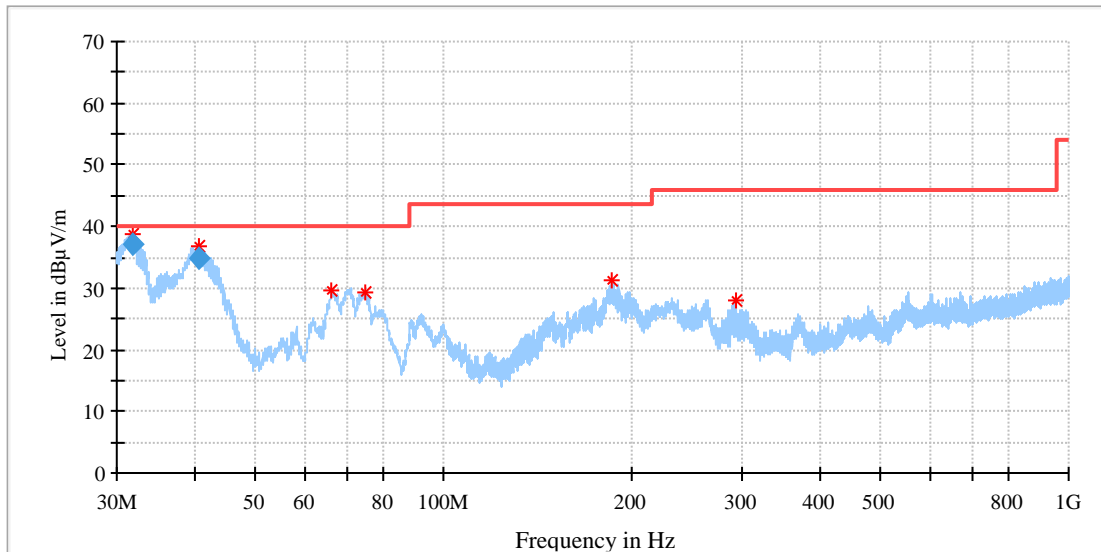
Model: Theragun Elite
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz
 Remark: Horizontal



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.636875	24.00	40.00	16.00	200.0	H	302.0	13
40.366875	25.89	40.00	14.11	200.0	H	263.0	17
93.353125	21.43	43.50	22.07	200.0	H	9.0	15
183.805625	24.71	43.50	18.79	200.0	H	263.0	15
227.273750	28.20	46.00	17.80	200.0	H	255.0	17
306.389375	32.94	46.00	13.06	100.0	H	100.0	19

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: Theragun Elite
 Test Mode: Wireless Charging (with data transmitting function)
 Test Voltage: AC 120V/60Hz
 Remark: Vertical



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.864260	38.82	40.00	1.18	128.0	V	342.0	13
40.488125	36.76	40.00	3.24	100.0	V	171.0	17
66.071875	29.79	40.00	10.21	100.0	V	0.0	15
75.044375	29.45	40.00	10.55	200.0	V	213.0	12
185.745625	31.13	43.50	12.37	100.0	V	334.0	15
292.627500	28.11	46.00	17.89	200.0	V	8.0	19

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.864260	36.99	40.00	3.01	128.0	V	342.0	13
40.488125	34.73	40.00	5.27	100.0	V	171.0	17

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. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	68-4-74-14-002	101269	2020-6-28
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	68-4-80-14-002	707	2020-8-20
Horn Antenna	Rohde & Schwarz	HF907	68-4-80-14-005	102294	2020-6-22
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	2020-7-7
Pre-amplifier	Rohde & Schwarz	SCU 18	68-4-29-14-001	102230	2020-6-28
Signal Generator	Rohde & Schwarz	SMY01	68-4-48-16-001	839369/005	2020-6-28
Attenuator	Agilent	8491A	68-4-81-16-001	MY39264334	2020-6-28
3m Semi-anechoic chamber	TDK	9X6X6	68-4-90-14-001	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	68-4-90-14-001-A10	Version9.15.00	N/A

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-14-001	101782	2020-6-28
LISN	Rohde & Schwarz	ENV432	68-4-87-16-001	101318	2020-7-19
Attenuator	Shanghai Huaxiang	TS2-26-3	68-4-81-16-003	080928189	2020-6-28
Test software	Rohde & Schwarz	EMC32	68-4-90-14-003-A10	Version9.15.00	N/A

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	3.21dB
Uncertainty for Radiated Emission in 3m chamber 9KHz-30MHz	4.76dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 5.12dB Vertical: 5.10dB