FCC Test Report

Report No.:	HQ191216JL07-FI
Applicant name:	Dongguan Shunlang Electronics Co., Ltd
Applicant address:	Floor 5, Building 2, Shenxiang Industrial Park, Dabandi Cuntou Community, Humen town, Dongguan City
FCC ID:	2AVMZ-AC190DGSL
Product name:	ALARM CLOCK RADIO
Brand Name:	ANJANK
Test model name:	AC190
Additional model:	N/A
Test Date:	Apr. 11, 2020~ June 01, 2020
Issued Date:	Jun. 15, 2020
Issued By:	Hwa-Hsing (Dongguan) Testing Co., Ltd.
Lab Address:	No.101, Bld N1,Yuyuan 2Rd, Yuyuan Industrial Park, HuangJiang Town, Dongguan, China
FCC Designation Number:	CN1255
Standards:	FCC Part 15, Subpart C ANSI C63.10-2013

The above equipment has been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Tank , **Date:** Jun. 15, 2020

Tank Tan//Engineer

Approved by : Harry Li , **Date:** Jun. 15, 2020

Harry Li/ Supervisor

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Release Control Record

Issue No.	Description	Date Issued
HQ191216JL07-FI	Original release.	**Jun. 1**5, 2020

1 Summary of Test Results

FCC Part 15, Subpart C ANSI C63.10-2013			
Clause	Test Item	Result/Remarks	Verdict
§15.203	Antenna Requirement	No antenna connector is used.	Pass
§15.207	AC Power Conducted Emission	Meet the requirement of limit.	Pass
§15.209	Radiated Emission	Meet the requirement of limit.	Pass
§15.215 (c)	20dB Bandwidth	Meet the requirement of limit.	Pass

Note: There is no deviation to the applied test methods and requirements covered by the scope of this report

1.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.66 dB
Radiated Emissions 9KHz ~ 30MHz	9KHz ~ 30MHz	2.49 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	3.47 dB
Radiated Emissions above 1 GHz	Above 1GHz	4.84 dB

1.2 Modification Record

There were no modifications required for compliance.

2 General Information

2.1 General Description of EUT

Product Name	ALARM CLOCK RADIO
Brand	ANJANK
FCC ID	2AVMZ-AC190DGSL
Test Model	AC190
Series Models	N/A
Power Supply Rating	DC 1.5V*2 (AAA) battery DC 9V2A from adapter, The adapter input: AC100-240V~50/60Hz 0.5A max.
Modulation type	ASK
Operating frequency	110KHz ~ 150KHz
Antenna type	Coil Antenna

1. For a more detailed features description, please refer to the manufacturer's specification or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: HQ191216JL07) for detailed product photo.
4. Adapter informantion as below:

Model name	Input	Output	Cable support
HX18H-0902000-AU	AC100V-240V~50/60Hz 0.5A Max.	DC9V2A	1.5m DC cable no core

2.2 Operating Modes of EUT and Determination of Worst Case Operating Mode

The EUT was tested under the following modes the final worst mode was marked in boldface and recorded in this report.

Test frequency	Test mode	Test voltage
110~130kHz	wireless charging + Transmiting	DC 9V from Adapter
130~150kHz	Standby + Transmiting	

2.3 General description of applied standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C

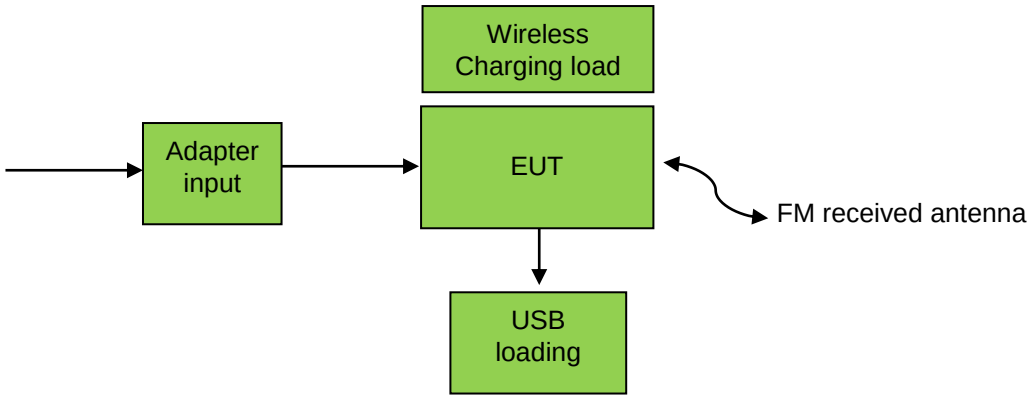
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

3 Configuration and Connections with EUT

3.1 Connection Diagram of EUT and Peripheral Devices

Configuration:



3.2 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB Dummy load	N/A	N/A	N/A	N/A	N/A
B.	Earphone	Lenovo	JHGHG-SWQ1	N/A	N/A	N/A

Note:

1. All power cords of the above support units are non-shielded (1.5m).
2. Items E~Gacted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Line	1	1.2	No	N/A	
2.	Earphone Line	1	1.2	No	N/A	

4 Conducted Emissions at Mains Ports

4.1 Limits

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Notes: 1.The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
EMI Test Receiver Rohde&Schwarz	ESCI3	101418	2019-9-19	2020-9-18
Artificial Mains Network Rohde&Schwarz	ENV216	3560.6550.15	2019-10-18	2020-10-17
Test software FARAD	EZ_EMC V1.1.4.2	N/A	N/A	N/A
Hygrothermograph Yuhuaze	HTC-1	NA	2019-10-18	2020-10-17
Digital Multimeter FLUKE	15B+	43512617WS	2019-10-18	2020-10-17

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA.
2. The test was performed in Shielded Room

4.3 Test Arrangement

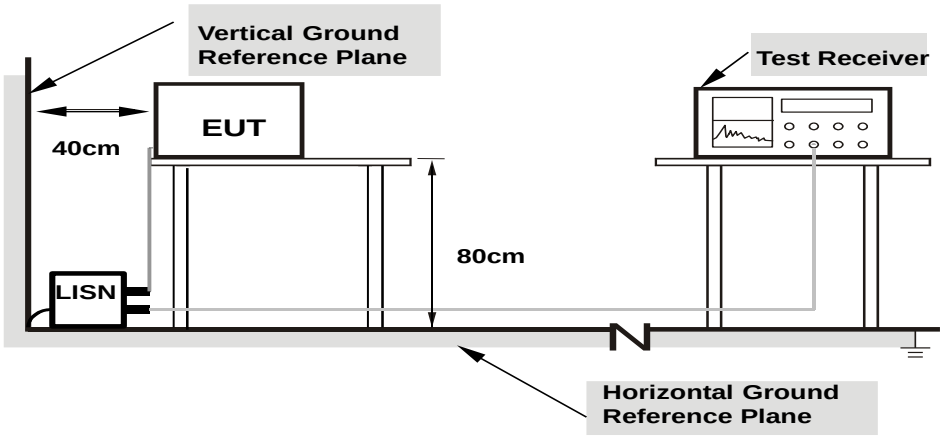
The basic test procedure was in accordance with ANSI C63.4:2014 (section 7).

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits atfrequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency0.15MHz-30MHz.



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

Note:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

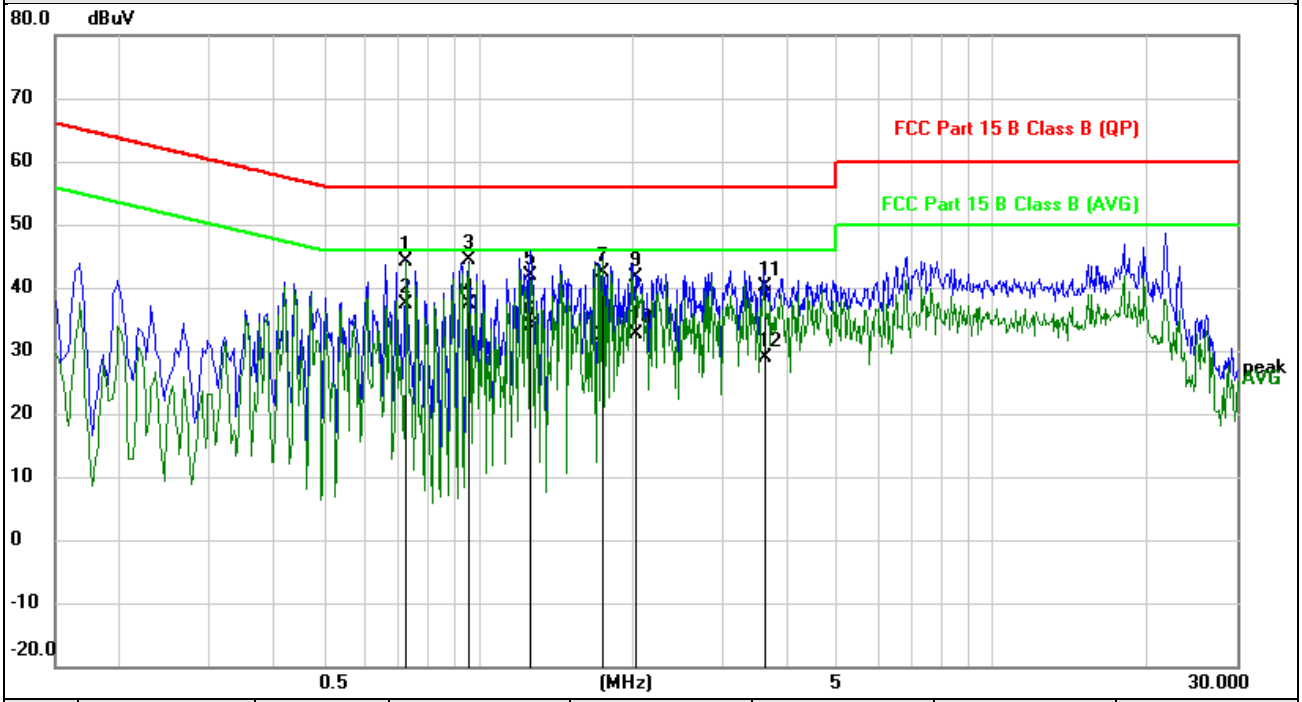
4.4 Deviation from test standard

No deviation.

4.5 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution andwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 60%RH
Tested by	Tank Tan	Test Date	2020/04/22

Phase Of Power: Line (L)



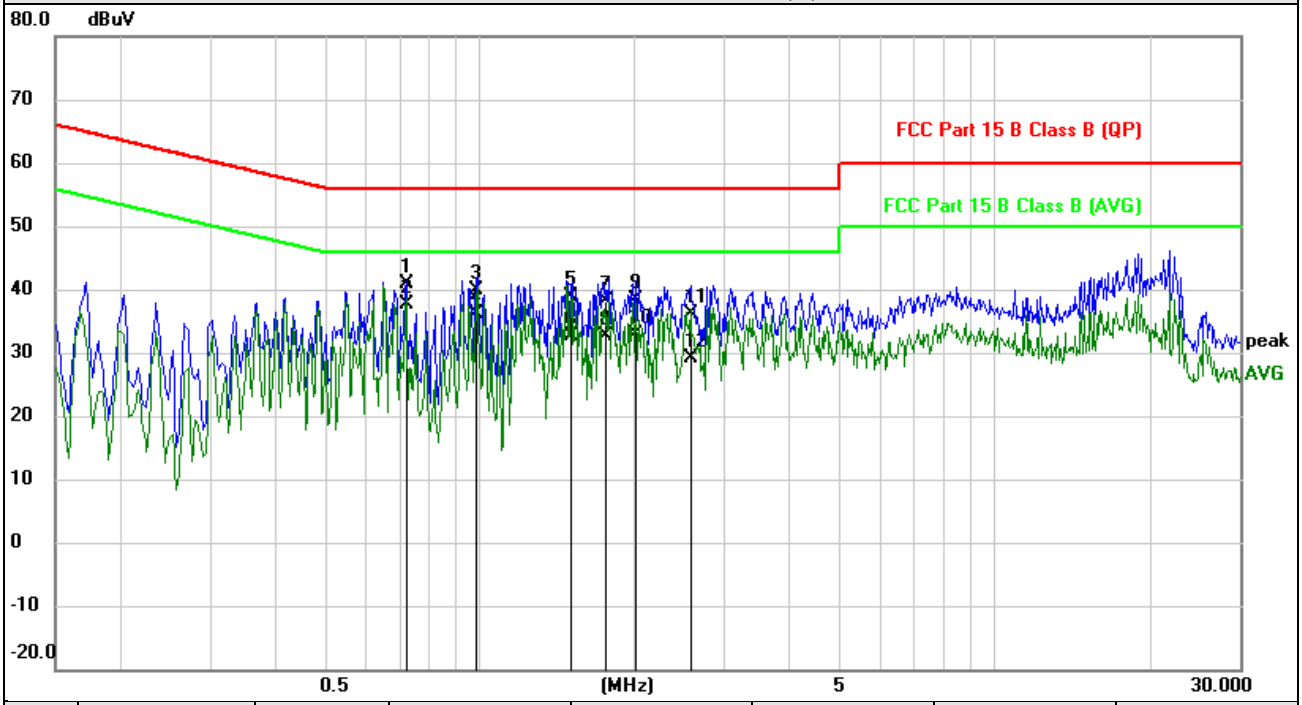
No	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark Detecter
1	0.7230	34.36	9.66	44.02	56.00	-11.98	QP
2	0.7230	27.72	9.66	37.38	46.00	-8.62	AVG
3	0.9594	34.72	9.57	44.29	56.00	-11.71	QP
4	0.9594	27.76	9.57	37.33	46.00	-8.67	AVG
5	1.2622	32.27	9.55	41.82	56.00	-14.18	QP
6	1.2622	24.32	9.55	33.87	46.00	-12.13	AVG
7	1.7518	32.80	9.53	42.33	56.00	-13.67	QP
8	1.7518	22.83	9.53	32.36	46.00	-13.64	AVG
9	2.0213	32.02	9.52	41.54	56.00	-14.46	QP
10	2.0213	23.08	9.52	32.60	46.00	-13.40	AVG
11	3.6350	30.74	9.44	40.18	56.00	-15.82	QP
12	3.6350	19.55	9.44	28.99	46.00	-17.01	AVG

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution andwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 60%RH
Tested by	Tank Tan	Test Date	2020/04/22

Phase Of Power: Neutral (N)



No	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark Detecter
1	0.7201	31.15	9.66	40.81	56.00	-15.19	QP
2	**0.7201**	**27.98**	**9.66**	**37.64**	**46.00**	**-8.36**	**AVG**
3	0.9863	30.30	9.56	39.86	56.00	-16.14	QP
4	0.9863	26.58	9.56	36.14	46.00	-9.86	AVG
5	1.5025	29.35	9.54	38.89	56.00	-17.11	QP
6	1.5025	23.18	9.54	32.72	46.00	-13.28	AVG
7	1.7701	28.70	9.53	38.23	56.00	-17.77	QP
8	1.7701	23.05	9.53	32.58	46.00	-13.42	AVG
9	2.0196	28.87	9.52	38.39	56.00	-17.61	QP
10	2.0196	23.35	9.52	32.87	46.00	-13.13	AVG
11	2.5595	26.66	9.47	36.13	56.00	-19.87	QP
12	2.5595	19.69	9.47	29.16	46.00	-16.84	AVG

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

5 Radiated Emissions up to 1 GHz

5.1 Limits of radiated emissions

FCC Part 15, Subpart C, Section 15.209
Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Frequencies (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
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

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5.2 Test Instruments

Equipment	Manufacturer	Model No.	**Serial No.**	**Last Cal.**	**Next Cal.**
EMI Test Receiver (10kHz~7GHz)	Rohde&Schwarz	ESCI 7	100962	2020/05/20	2021/05/20
Loop Antenna 9kHz~30MHz	TESEQ	HLA 6121	56735	2020/04/15	2021/04/15
Broadband antenna (25MHz~2500MHz)	Schwarzbeck	VULB 9168	00937	2019/10/20	2021/10/19
Signal Amplifier (30MHz~1000MHz)	Com-power	PAM-103	18020051	2019/10/18	2020/10/17
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	NSEMC003	2020/04/15	2021/04/15
Attenuator	R&S	TS2GA-6dB	18101101	2019/10/18	2020/10/17
Test software	EZ	EZ_EMC V1.1.4.2	N/A	N/A	N/A

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations aretraceable to CEPREI/CHINA.
2. The test was performed in Chamber 1.

5.3 Test Arrangement

Below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

30MHz~1GHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height 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.

d. 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.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

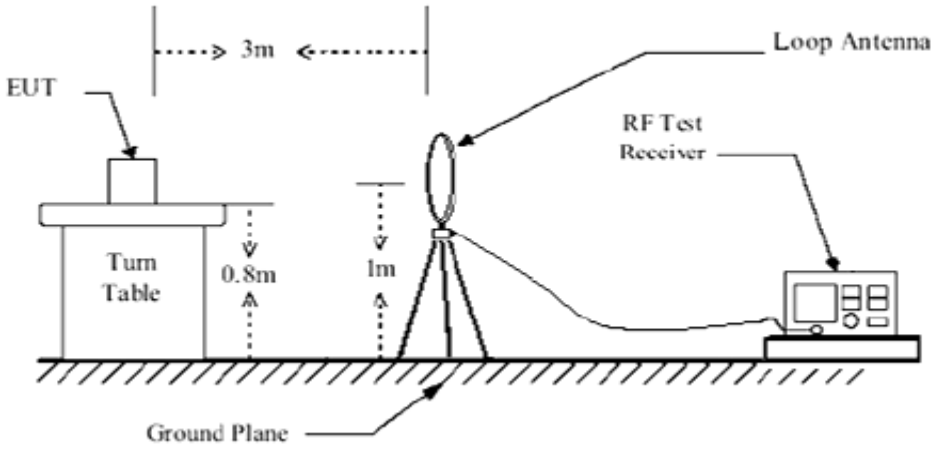
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
4. Margin value = Emission level – Limit value.

5.4 Deviation from test standard

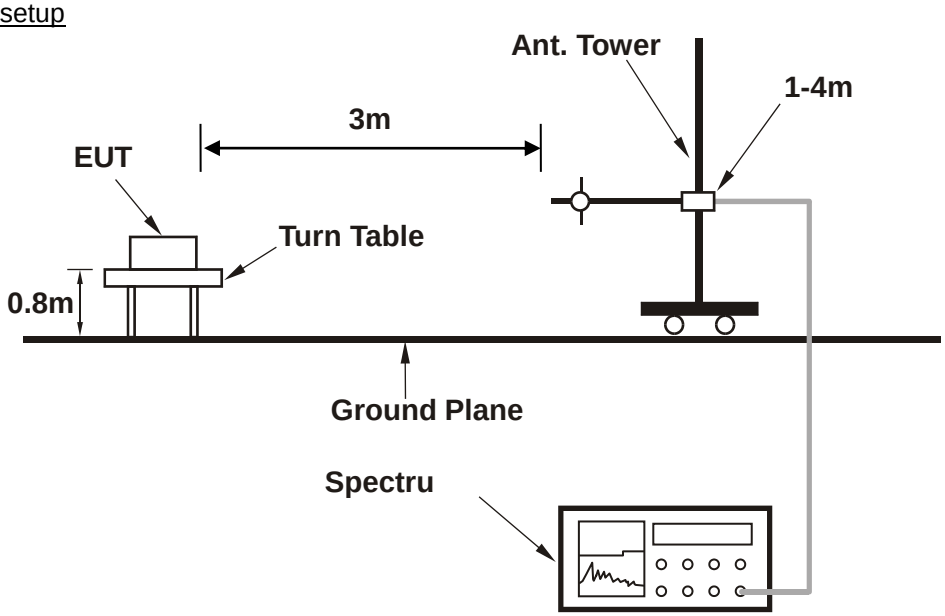
No deviation.

5.5 Test Setup

Below 30MHz test setup



Below 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

5.6 Test Results

Worst case test data: 9kHz ~30MHz

Test mode	Wireless charging mode		
FrequencyRange	9kHz ~30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input voltage	Adapted input AC 120V/60Hz	Environmental Conditions	23℃, 60%RH
Tested by	Tank Tan	Test Date	2020/05/14

Antenna Polarity &Test Distance : Parallel at 3M								
No	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)
1	0.03520	52.78	-11.08	41.70	116.67	-74.97	100	35
2	0.06050	42.85	-11.41	31.44	111.97	-80.53	100	72
3	0.06480	47.76	-11.40	36.36	111.37	-75.01	100	122
4	0.08420	40.13	-11.37	28.76	109.10	-80.34	100	72
5	0.10010	53.21	-11.33	41.88	107.59	-65.71	100	127
6	0.14610	90.17	-11.20	78.97	104.31	-25.34	100	36

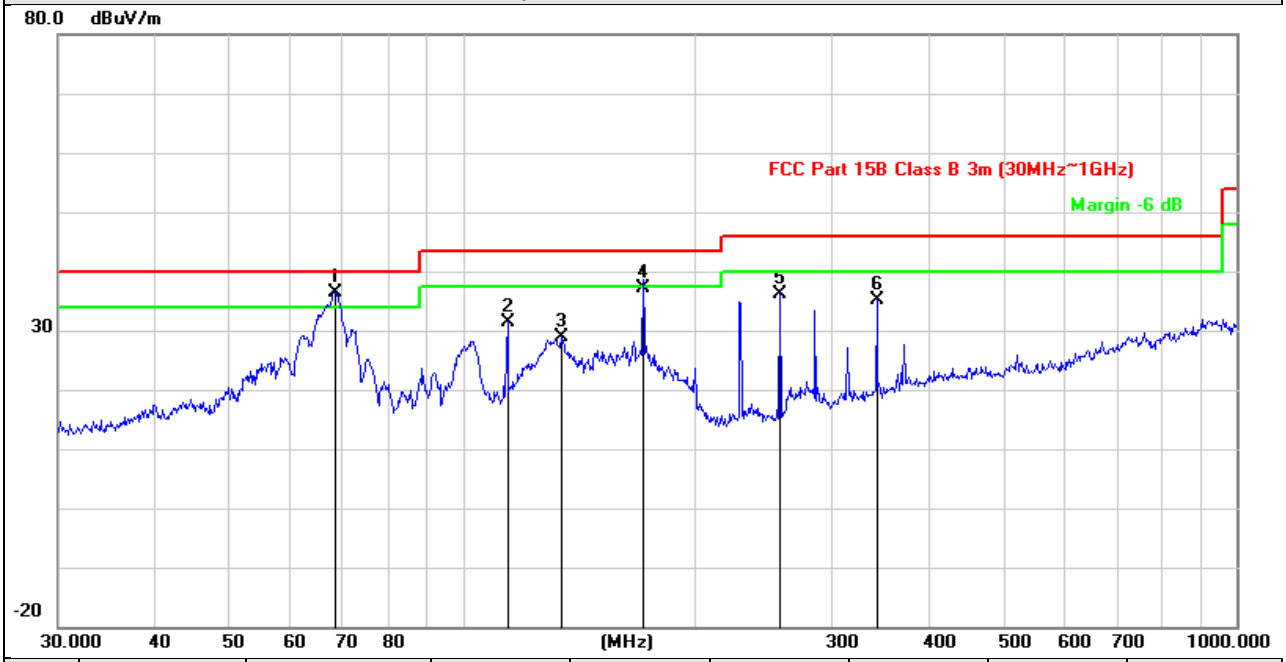
Antenna Polarity &Test Distance : Perpendicylarl at 3M								
No	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)
1	0.03520	52.94	-11.08	41.86	116.67	-74.81	100	325
2	0.05590	46.35	-11.42	34.93	112.65	-77.72	100	42
3	0.06430	45.37	-11.40	33.97	111.44	-77.47	100	38
4	0.08290	42.79	-11.38	31.41	109.23	-77.82	100	63
5	0.10030	58.43	-11.33	47.10	107.58	-60.48	100	95
6	0.14610	95.77	-11.20	84.57	104.31	-19.74	100	125

REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 0.009-0.15MHz.
4. Only emissions significantly above equipment noise floor are reported.

Worst case test data: 30MHz~1000MHz

FrequencyRange	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input voltage	Adapted input AC 120V/60Hz	Environmental Conditions	23℃, 60%RH
Tested by	Tank Tan	Test Date	2020/05/14

Antenna Polarity &Test Distance : Horizontal at 3 m



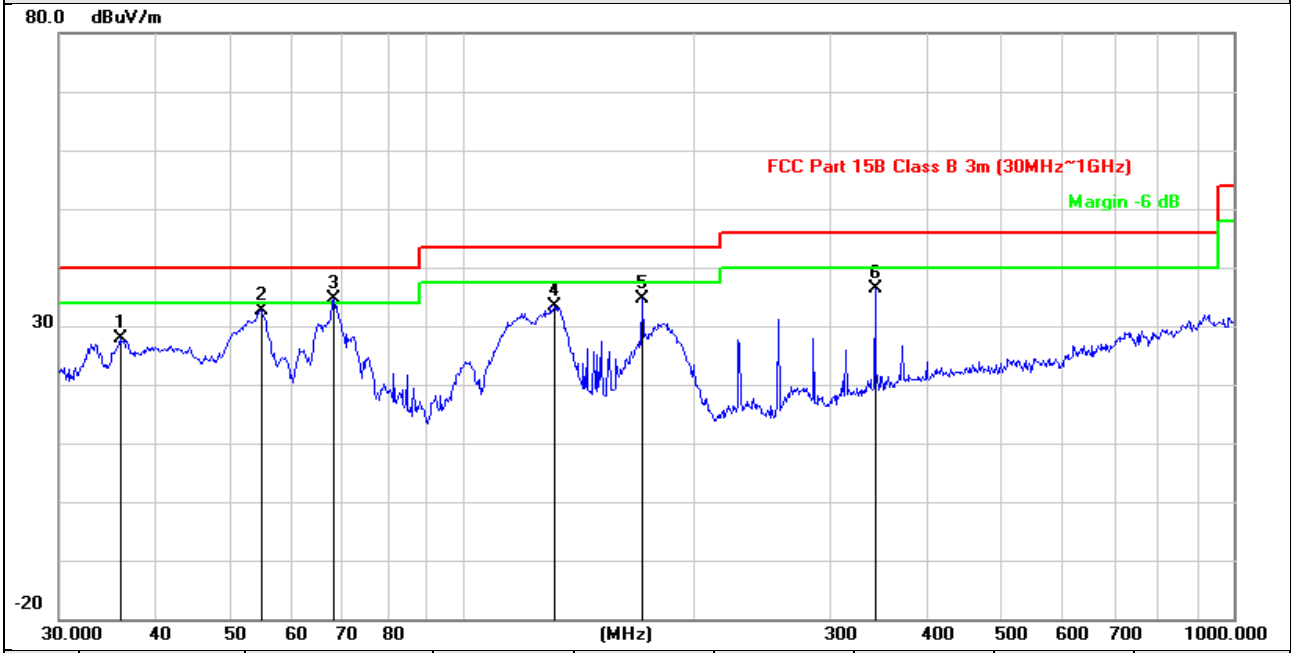
No	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)
1	**68.3908**	**52.11**	**-15.61**	**36.50**	**40.00**	**-3.50**	**100**	**147**
2	114.1138	46.93	-15.51	31.42	43.50	-12.08	100	241
3	134.0882	43.22	-14.46	28.76	43.50	-14.74	100	157
4	170.7926	50.49	-13.26	37.23	43.50	-6.27	254	175
5	256.5211	51.16	-14.97	36.19	46.00	-9.81	100	268
6	341.9786	46.47	-11.46	35.01	46.00	-10.99	100	310

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

FrequencyRange	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input voltage	Adapted input AC 120V/60Hz	Environmental Conditions	23℃, 60%RH
Tested by	Tank Tan	Test Date	2020/05/14

Antenna Polarity & Test distance: Vertical at3m



No	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)
1	36.0007	44.52	-16.60	27.92	40.00	-12.08	100	102
2	54.8348	47.12	-14.40	32.72	40.00	-7.28	100	286
3	68.1514	50.31	-15.58	34.73	40.00	-5.27	100	147
4	131.7577	48.04	-14.59	33.45	43.50	-10.05	100	154
5	170.7926	47.93	-13.26	34.67	43.50	-8.83	100	232
6	341.9786	47.73	-11.46	36.27	46.00	-9.73	100	164

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

6 20dB bandwidth measurement

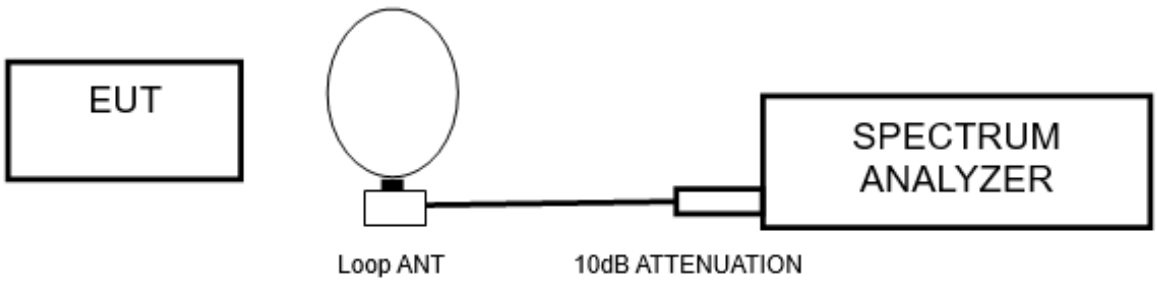
6.1 Limits of 20dB bandwidth measurement

The field strength of any emissions appearing between the band edges and out of band shall be attenuated at least 20 dB below the level of the unmodulated carrier or to the general limits in Section 15.209

6.2 Test instruments

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum （10kHz~26.5GHz）	Keysight	N9020A	MY51240612	2019/10/18	2020/10/17
Power Meter 10Hz~18GHz	Tonscend	JS0806-2	188060126	2019-10-18	2020-10-17
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2019/10/18	2020/10/17
Signal generator	Keysight	N5182A	GB40051020	2019/10/18	2020/10/17
Signal generator	Keysight	N5182A	MY47420944	2019/10/18	2020/10/17
Test Software	Tonscend	JS0806-2	NA	NA	NA
Power Meter 10Hz~18GHz	Tonscend	JS0806-2	188060126	2019-10-18	2020-10-17
Universal Switch Control Unit	Rohde&Schwarz	CMW500	12010002K50	2019-10-18	2020-10-17
Test Software	Tonscend	JS0806-2	NA	NA	NA
Loop Antenna 9kHz~30MHz	TESEQ	HLA 6121	56735	2020/04/15	2021/04/15

6.3 Test setup



6.4 EUT operating condition

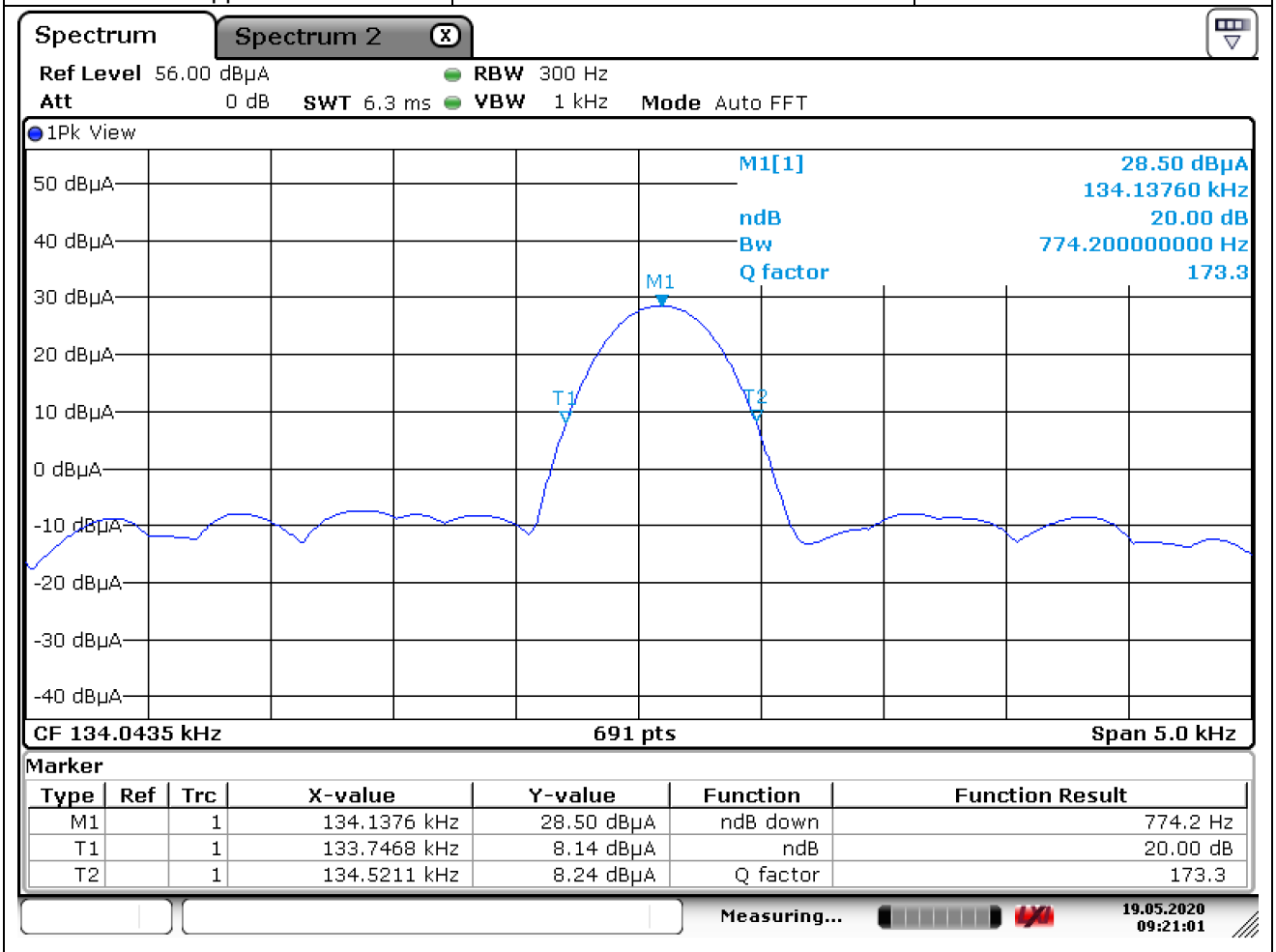
a. Turn on the EUT.

b. The EUT tested in charging mode and standby mode respectivel

6.5 Test results

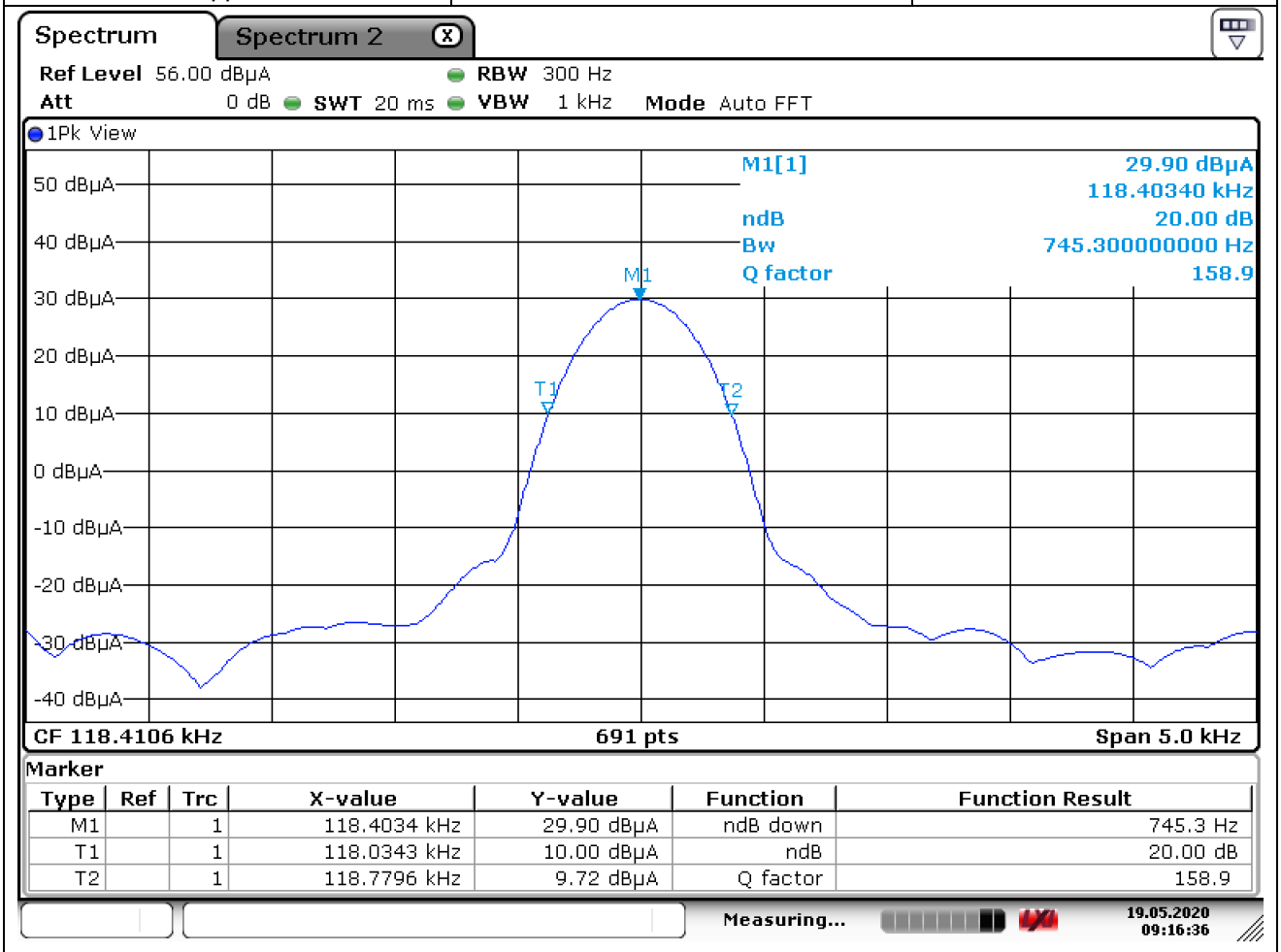
Test mode	Channel frequency (kHz)	20dB bandwidth (kHz)
Standby mode	110~130	0.7743

Lower & Upper Test Frequency Point (MHz)	Test Frequency (KHz)	P/F
Lower	133.7468	Pass
Upper	134.5211	Pass



Test mode	Channel frequency (kHz)	20dB bandwidth (kHz)
Charging + Transmiting	130~150	0.7453

Lower & Upper Test Frequency Point (MHz)	Test Frequency (KHz)	P/F
Lower	118.0343	PASS
Upper	118.7796	PASS



Date: 19.MAY.2020 09:16:36

7 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Hwa-Hsing (Dongguan) Co., Ltd., A global provider of TESTING and CERTIFICATION services for consumer products, electronic products and wireless information technology products. Adhering to the core values “HONEST and TRUSTWORTHY, OBJECTIVE and IMPARTIALITY, RIGOROUS and AFFICIENT”, commitment to provide professional, perfect and efficient comprehensive ONE-STOP solution of TESTING and CERTIFICATION services for Manufacturers, Buyers, Traders, Brands, Retailers. Assist client to better manage risk, protect their brands, reduce costs and cut time to over 150 markets in global. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site:www.hwa-hsing.com

The address and road map of all our labs can be found in our web site also.

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