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FCC Test Report

Report No.: CQASZ20180500005E-02

SUNVALLEYTEK INTERNATIONAL, INC. Applicant:

Address of Applicant: 46724 Lakeview Blvd. Fremont. California. United States. 94538-6529 Shenzhen NearbyExpress Technology Development Company Limited Manufacturer:

Address of 333 Bulong Road, Jialianda Industrial Park, Building 1, Bantian, Longgang

Manufacturer: District, Shenzhen, China

GANZHOU DEHUIDA TECHNOLOGY CO., LTD. **Factory:**

Address of Factory: No. 5,6,7,8,9 Build, Dehuida Science and Technology Park, Huoyanshan Road,

Anyuan District, Ganzhou City, Jianxi Province, China

Equipment Under Test (EUT):

Sound Bar **Product:** TT-SK020 Model No.: **TaoTronics Brand Name:**

FCC ID: 2AFDGTT-SK020

Standards: 47 CFR Part 15, Subpart C Date of Test: 2018-05-15 to 2018-06-13

Date of Issue: 2018-06-13 Test Result: PASS*

Tested By:

Reviewed By:

Owen Zhou)

Approved By:

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

^{*} In the configuration tested, the EUT complied with the standards specified above.



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2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20180500005E-02	Rev.01	Initial report	2018-06-13



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3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement 47 CFR Part 15, Subpart C 15.203		ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2013)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS





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5 General Information

5.1 Client Information

Applicant:	SUNVALLEYTEK INTERNATIONAL, INC.
Address of Applicant:	46724 Lakeview Blvd, Fremont, California, United States, 94538-6529
Manufacturer:	Shenzhen NearbyExpress Technology Development Company Limited
Address of Manufacturer:	333 Bulong Road, Jialianda Industrial Park, Building 1, Bantian, Longgang District, Shenzhen, China
Factory:	GANZHOU DEHUIDA TECHNOLOGY CO., LTD.
Address of Factory:	No. 5,6,7,8,9 Build, Dehuida Science and Technology Park, Huoyanshan Road, Anyuan District, Ganzhou City, Jianxi Province, China

5.2 General Description of EUT

Name:	Sound Bar
Model No.:	TT-SK020
Trade Mark :	TaoTronics
Hardware Version:	V1.0
Software Version:	V1.2
Frequency Range:	912MHz
Modulation Type:	FSK
Number of Channels:	1 (declared by the client)
Sample Type:	Mobile production
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	Adaptor : VSL1800220HU
	Input:100-240V~50/60Hz 1.2A Output: DC18V 2.2A



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Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	912MHz	/	/	/	/	/	1

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
1	912MHz
/	/
/	/



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5.3 Test Environment and Mode

Operating Environment:	Operating Environment:			
Temperature:	24.0 °C			
Humidity:	52 % RH			
Atmospheric Pressure:	1008 mbar			
Test Mode:	Use test software (RF test) to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.			

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
PC	Lenovo	ThinkPad E450c	Provide by lab	FCC ID

5.5 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 Huaxia Testing Technology 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 CQA laboratory is reported:

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	±5.12dB	(1)
Radiated Emission	Above 1GHz	±4.60dB	(1)
Conducted Disturbance	0.15~30MHz	±3.34dB	(1)

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



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5.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

5.7 Test Facility

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

• CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• ISED Registration No.: 22984-1

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen 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. Registration No.:522263

5.8 Deviation from Standards

None.

5.9 Abnormalities from Standard Conditions

None.

5.10 Other Information Requested by the Customer

None.





5.11 Equipment List

Item	Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Due Date
1	EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/24
2	Spectrum analyzer	R&S	FSU26	CQA-038	2018/9/24
3	Preamplifier	MITEQ	AFS4-00010300- 18-10P-4	CQA-035	2018/9/24
4	Preamplifier	MITEQ	AMF-6D-02001800- 29-20P	CQA-036	2018/9/24
5	Loop antenna	ZHINAN	ZN30900A	CQA-087	2019/3/21
6	Bilog Antenna	R&S	HL562	CQA-011	2018/9/24
7	Horn Antenna	R&S	HF906	CQA-012	2018/9/24
8	Horn Antenna	R&S	BBHA 9170	CQA-088	2018/9/24
9	Coax cable (9KHz~40GHz)	CQA	RE-low-01	CQA-077	2018/9/24
10	Coax cable (9KHz~40GHz)	CQA	RE-high-02	CQA-078	2018/9/24
11	Antenna Connector	CQA	RFC-01	CQA-080	2018/9/24
12	RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2018/9/24
13	EMI Test Receiver	R&S	ESPI3	CQA-005	2018/9/24
14	LISN	R&S	ENV216	CQA-003	2018/9/24
15	Coaxial cable (9KHz~300MHz)	CQA	N/A	CQA-C009	2018/10/17
16	Power divider	CQA	PWD-2533-02- SMA-79	CQA-067	2018/9/29

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



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6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203

15.203 requirement:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:



The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

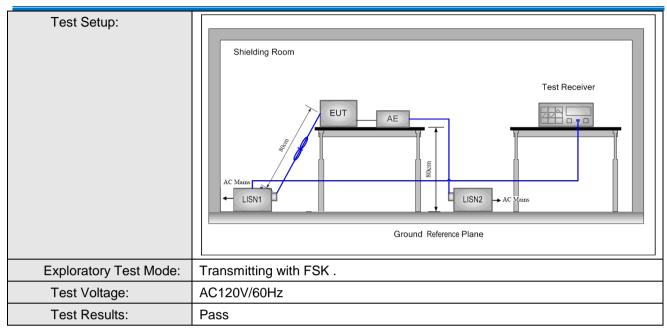


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6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.2	207			
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	150kHz to 30MHz				
Limit:	5 (441)	Limit (d	Limit (dBuV)		
	Frequency range (MHz)	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	n of the frequency.		1	
Test Procedure:					

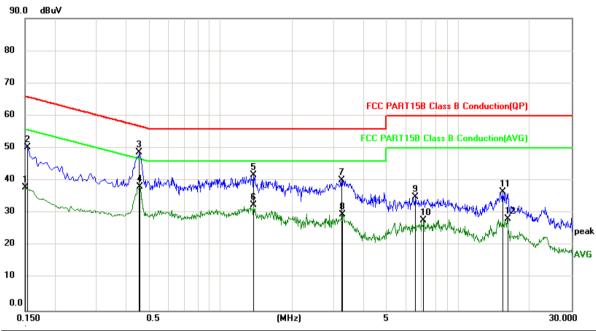






Measurement Data





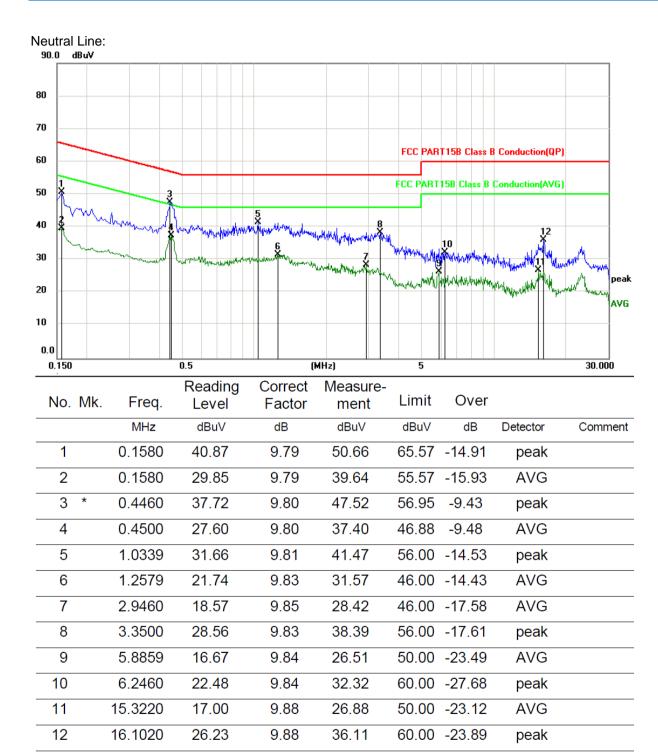
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	28.26	9.73	37.99	56.00	-18.01	AVG	
2	0.1539	40.66	9.73	50.39	65.79	-15.40	peak	
3 *	0.4540	38.94	9.74	48.68	56.80	-8.12	peak	
4	0.4580	28.46	9.74	38.20	46.73	-8.53	AVG	
5	1.3779	32.09	9.75	41.84	56.00	-14.16	peak	
6	1.3779	22.68	9.75	32.43	46.00	-13.57	AVG	
7	3.2260	30.36	9.77	40.13	56.00	-15.87	peak	
8	3.2620	19.83	9.77	29.60	46.00	-16.40	AVG	
9	6.6140	25.12	9.80	34.92	60.00	-25.08	peak	
10	7.1500	17.95	9.80	27.75	50.00	-22.25	AVG	
11	15.4620	26.81	9.84	36.65	60.00	-23.35	peak	
12	16.1340	18.39	9.84	28.23	50.00	-21.77	AVG	

Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.







Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



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6.3 Radiated Emission

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209 and 15.205							
Test Method:	ANSI C63.10: 2013							
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)							
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark			
	0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak	1		
	0.009MHz-0.090MHz	Average	10kHz	30KHz	Average	1		
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak			
	0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak			
	0.110MHz-0.490MHz	Average	10kHz	30KHz	Average			
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak			
	Above 1GHz	Peak	1MHz	3MHz	Peak			
	710070 10112	Peak	1MHz	10Hz	Average			
	Note: For fundamental f value, RMS detect			=5MHz, Peak	detector is fo	r PK		
Limit: (Spurious Emissions and band edge)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m) Remark	Measurement distance (m)			
, , , , , , , , , , , , , , , , , , ,	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300	300		
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30			
	1.705MHz-30MHz	30	-	-	30			
	30MHz-88MHz	100	40.0	0 Quasi-pea	k 3			
	88MHz-216MHz	150	43.	5 Quasi-pea	k 3			
	216MHz-960MHz	200	46.0	0 Quasi-pea	k 3			
	960MHz-1GHz	500	54.0	0 Quasi-pea	k 3			
	Above 1GHz	500	54.0	0 Average	3			
	Note: 1) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.							
	2) Emissions radiated outside of the specified frequency bar				ds, except for			
	harmonics, shall be attenuated by at least 50 dB below the level of the							
	fundamental or to the general radiated emission limits in Section 15.209,							
	whichever is the lesser attenuation.							
Limit:	Frequency	Limit (dBuV	m @3m) Remai					
(Field strength of the	902MHz-928MHz		94.0		Average Value			
fundamental signal)	COZIVII IZ OZOIVII IZ	114.	114.0		Peak Value			



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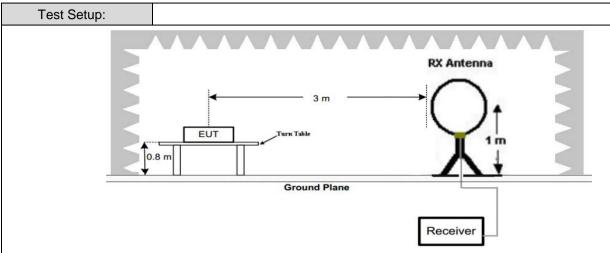
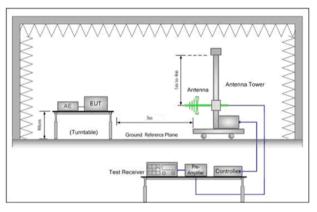


Figure 1. Below 30MHz



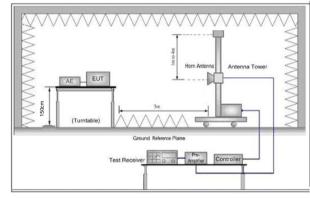


Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
 - 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:

Place the measurement antenna 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.

- 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 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table



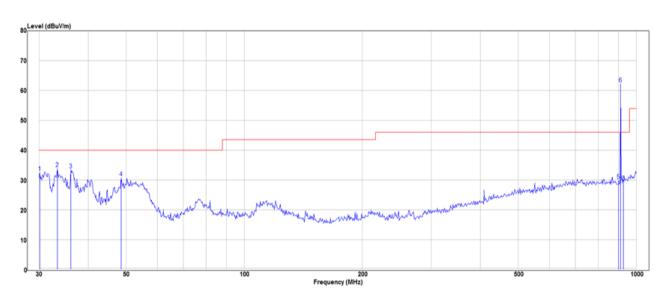
	was turned from 0 degrees to 360 degrees to find the maximum reading.
	e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. Output Description:
	 f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel
	 h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.11 for details
Exploratory Test Mode:	Transmitting with FSK modulation
Test Voltage:	120V/50Hz
Test Results:	Pass



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Measurement Data

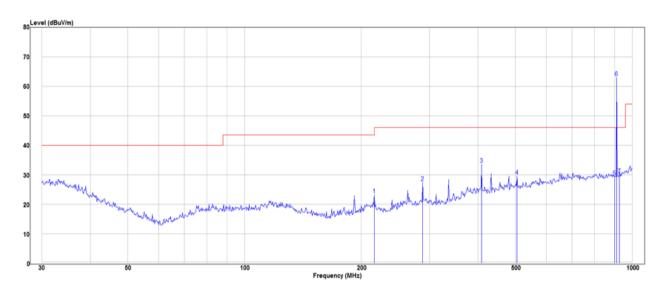
30MHz~1GHz				
Test mode:	Transmitting	Vertical		



Freq (MHz)	Read_Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
30.105	13.6	18.9	32.5	40	-7.5	Peak
33.328	15.19	18.64	33.83	40	-6.17	Peak
36.127	15.7	17.71	33.41	40	-6.59	Peak
48.502	20.6	10.14	30.74	40	-9.26	Peak
902	9.34	20.57	29.91	46	-16.09	Peak
912	41.46	20.76	62.22	114	-51.78	Peak
928	8.23	21.02	29.25	46	-16.75	Peak



Test mode:	Transmitting	Horizontal
------------	--------------	------------



Freq (MHz)	Read_Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
216.024	13.32	9.98	23.3	46	-22.7	Peak
287.99	17.11	10.21	27.32	46	-18.68	Peak
408.946	19.21	14.34	33.55	46	-12.45	Peak
504.706	12.4	17.21	29.61	46	-16.39	Peak
902	8.67	20.57	29.24	46	-16.76	Peak
912	42.14	20.76	62.9	114	-51.1	Peak
928	9.04	21.02	30.06	46	-15.94	Peak



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Above 1GHz							
Test mode:		Transmitti	ng				
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
1824	61.25	-10.1	51.15	74	-22.85	Peak	Н
2736	56.49	-7.26	49.23	74	-24.77	Peak	Н
3648	57.16	-5.24	51.92	74	-22.08	Peak	Н
1824	60.59	-10.1	50.49	74	-23.51	Peak	V
2736	56.54	-7.26	49.28	74	-24.72	Peak	V
3648	56.13	-5.24	50.89	74	-23.11	Peak	V

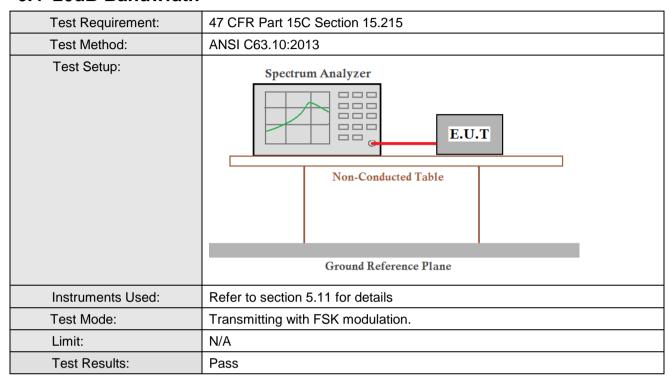
Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level = Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 2) Scan from 9kHz to 10GHz, the disturbance above 5GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.



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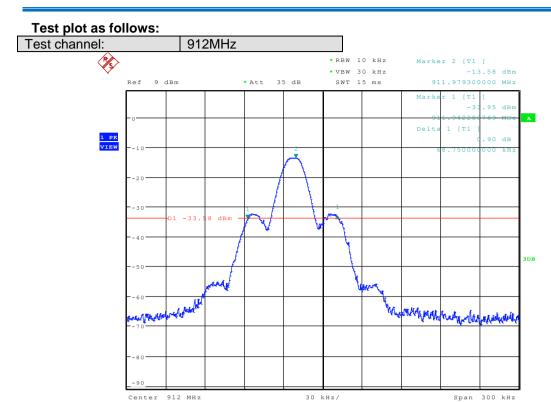
6.4 20dB Bandwidth



Measurement Data

Test channel	20dB bandwidth (MHz)	Results
912MHz	0.6875	Pass



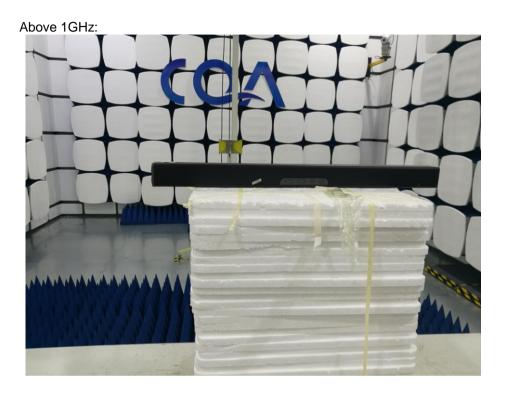


7 Photographs

7.1 Radiated Emission Test Setup





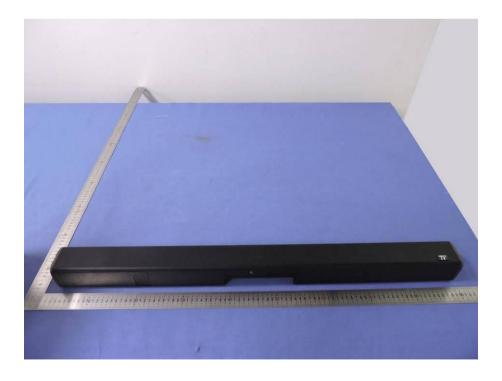


7.2 Conducted Emission

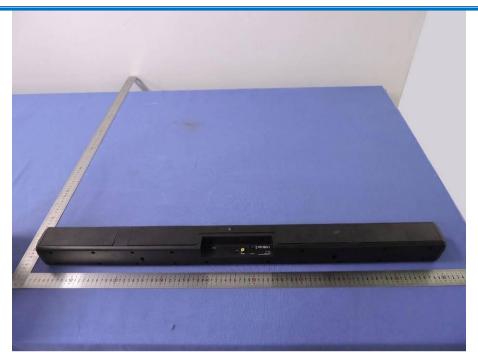


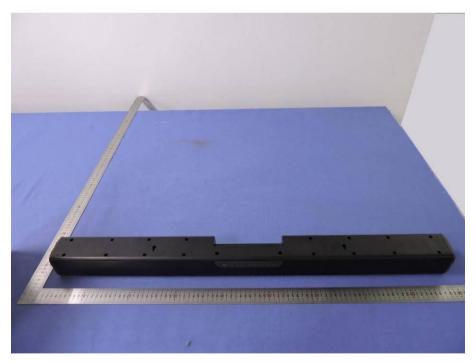
7.3 EUT Constructional Details



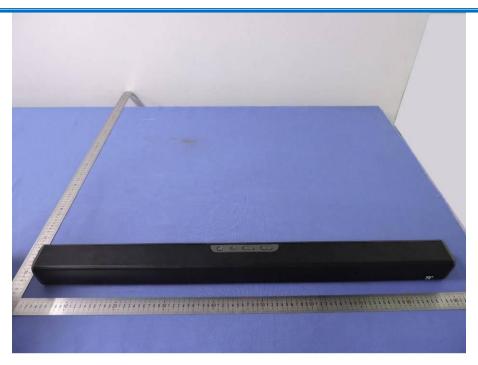






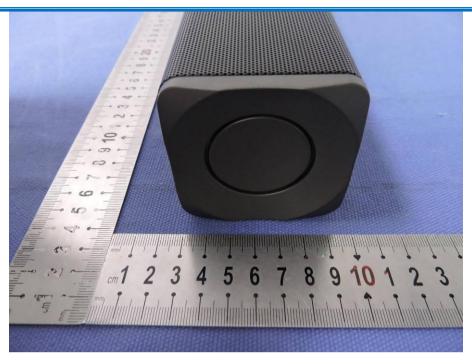






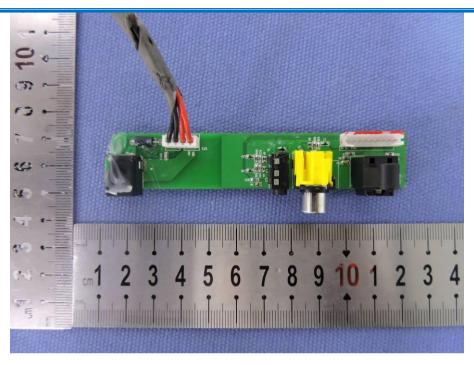


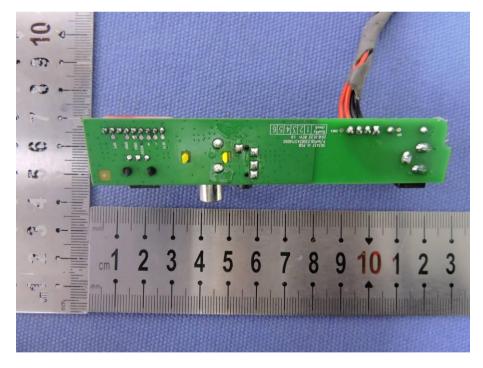




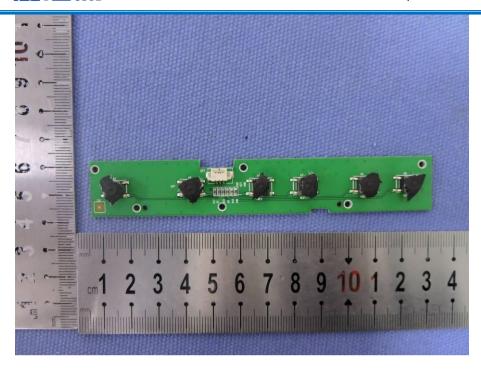


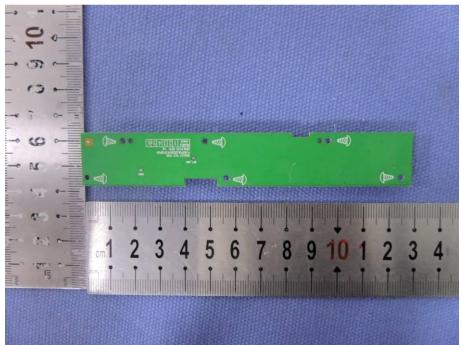




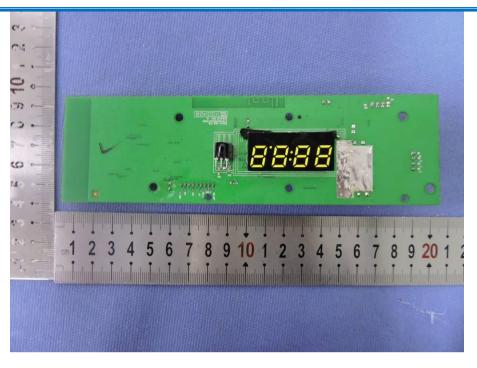


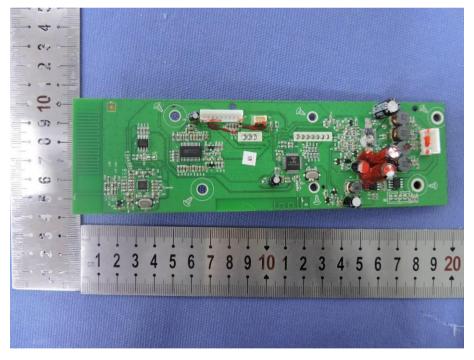








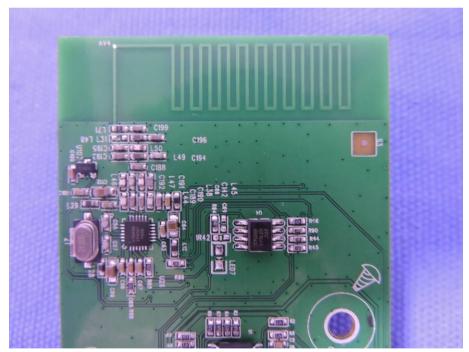












END OF THE REPORT