



FCC TEST REPORT

**Test report
On Behalf of
Shenzhen Topwell Technology Co., Ltd.
For
Home Assistant for Seniors and Disabled
Model No.: 18US1-1.7**

FCC ID: 2AR7Z-18US1

Prepared for : Shenzhen Topwell Technology Co., Ltd.
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Bao'an District, Shenzhen City, China

Date of Test: Dec. 10, 2018 ~ Dec. 24, 2018
Date of Report: Dec. 24, 2018
Report Number: HK1812131950-9E



TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Topwell Technology Co., Ltd.
Room B518-520, Yousong Keji Building, Donghuan 1st Road,
Address : Longhua New District, Shenzhen City, Guangdong Province, China

Manufacture's Name : Shenzhen Topwell Technology Co., Ltd.
Room B518-520, Yousong Keji Building, Donghuan 1st Road,
Address : Longhua New District, Shenzhen City, Guangdong Province, China

Product description

Trade Mark: Sofihub

Product name : Home Assistant for Seniors and Disabled

Model and/or type reference : 18US1-1.7

Standards : FCC Rules and Regulations Part 15 Subpart C Section 15.249
ANSI C63.10: 2013

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Date of Test

Date (s) of performance of tests : Dec. 10, 2018 ~ Dec. 24, 2018

Date of Issue : Dec. 24, 2018

Test Result : **Pass**

Testing Engineer :

(Gary Qian)

Technical Manager :

(Eden Hu)

Authorized Signatory :

(Jason Zhou)



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1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	Pass
RADIATED EMISSION TEST	COMPLIANT
BAND EDGE	compliance *
OCCUPIED BANDWIDTH MEASUREMENT	compliance *
ANTENNA REQUIREMENT	Pass

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. compliance *: Test data refers to FCC ID: XBAZW090, and report number is: WTS15S0122741E
4. The test result judgment is decided by the limit of test standard.
5. Test data refers to FCC ID: XBAZW090, and report number is: WTS15S0122741E

1.2 TEST FACILITY

Test Firm : Shenzhen HUAKE Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty	
Conducted Emission Expanded Uncertainty	= 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.06dB, k=2



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Home Assistant for Seniors and Disabled
Model Name	18US1-1.7
Serial No.	N/A
Trade Mark	Sofihub
Model Difference	N/A
FCC ID	2AR7Z-18US1
Antenna Type	PCB antenna
Antenna Gain	0 dBi
BT Operation frequency	908.40MHz, 908.42MHz
Number of Channels	2CH
Modulation Type	FSK
Power Source	DC 3.7V From Battery; DC6V/2.8A From Adapter
Power Rating	DC 3.7V From Battery; DC6V/2.8A From Adapter



2.2 Carrier Frequency of Channels

Channel List		
Channel	Frequency (MHz)	Channel
01	908.40	1
02	908.42	2

2.3 Operation of EUT during testing

Operating Mode

The mode is used: **Transmitting mode**

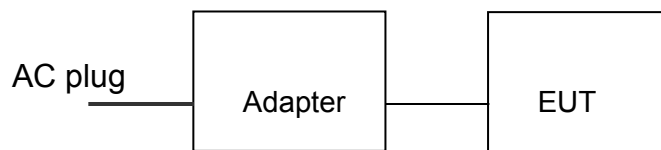
Low Channel: 908.40MHz

Middle Channel: N/A

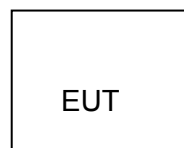
High Channel: 908.42MHz

2.4 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing and Radiation testing:



Operation of EUT during Above1GHz Radiation testing:



● Adapter information

Model: KT241060280H

Input: 100-240V~, 50/60Hz, 0.35A

Output: 6VDC, 2.8A



2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Dec. 28, 2017	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Dec. 28, 2017	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 28, 2017	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 28, 2017	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 28, 2017	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 28, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 28, 2017	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 28, 2017	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 28, 2017	1 Year
10.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Dec. 28, 2017	1 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Dec. 28, 2017	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Dec. 28, 2017	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JZOZtheBO T120-B Version	HKE-083	Dec. 28, 2017	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Dec. 28, 2017	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 28, 2017	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Dec. 28, 2017	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Dec. 28, 2017	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 28, 2017	3 Year



3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

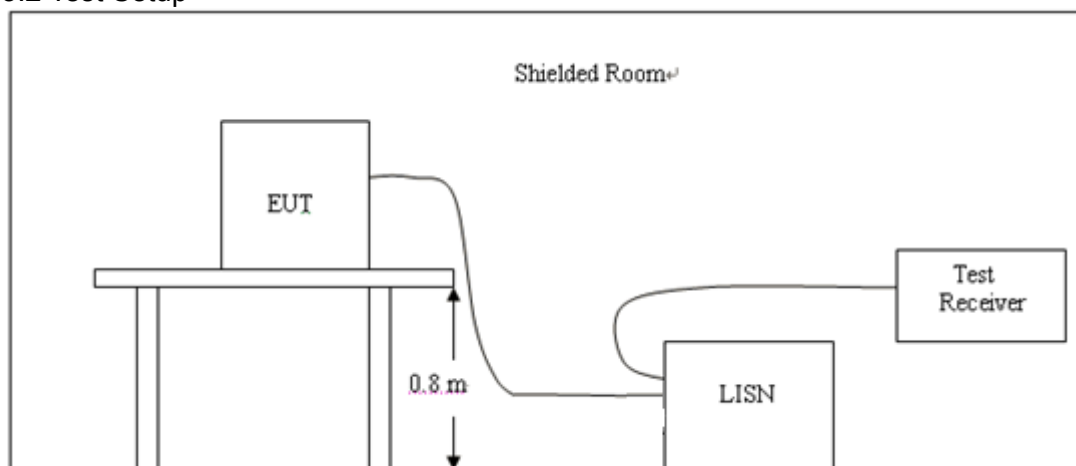
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



3.3 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 AC120V/60Hz 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.

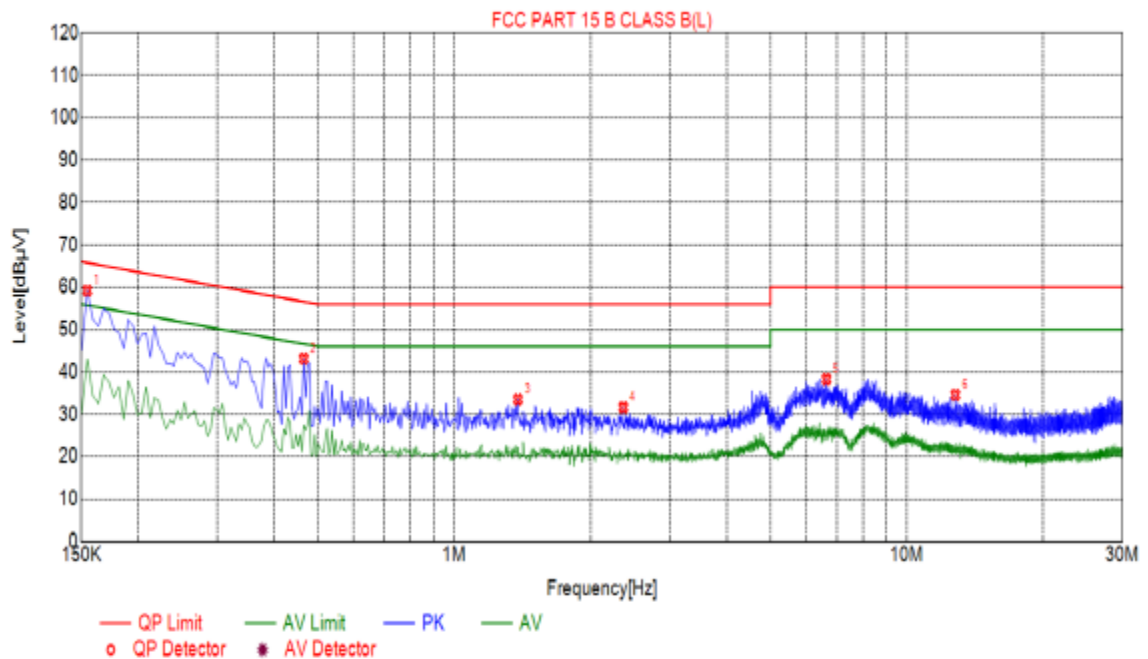
3.4 Test Result

PASS

All the test modes completed for test. only the worst result of High Channel was reported as below:



Test Specification: Line

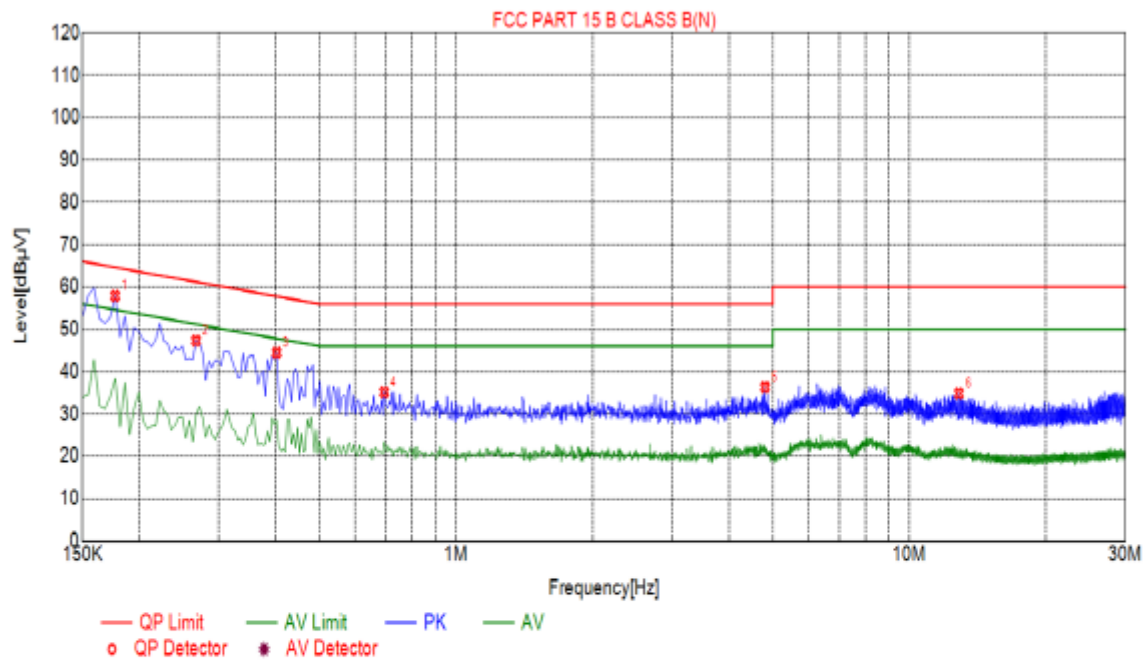


Suspected List						
NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Detector
1	0.1545	59.21	10.03	65.75	6.54	PK
2	0.4650	43.12	10.04	56.60	13.48	PK
3	1.3630	33.53	10.11	56.00	22.47	PK
4	2.3640	31.64	10.18	56.00	24.36	PK
5	6.6480	38.31	10.21	60.00	21.69	PK
6	12.8130	34.58	9.97	60.00	25.42	PK

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level



Test Specification: Neutral



Suspected List						
NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Detector
1	0.1770	57.90	10.05	64.63	6.73	PK
2	0.2670	47.32	10.03	61.21	13.89	PK
3	0.4020	44.50	10.04	57.81	13.31	PK
4	0.6945	35.17	10.05	56.00	20.83	PK
5	4.8075	36.33	10.26	56.00	19.67	PK
6	12.8715	34.86	9.97	60.00	25.14	PK

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

4 RADIATED EMISSION TEST

4.1 Radiation Limit

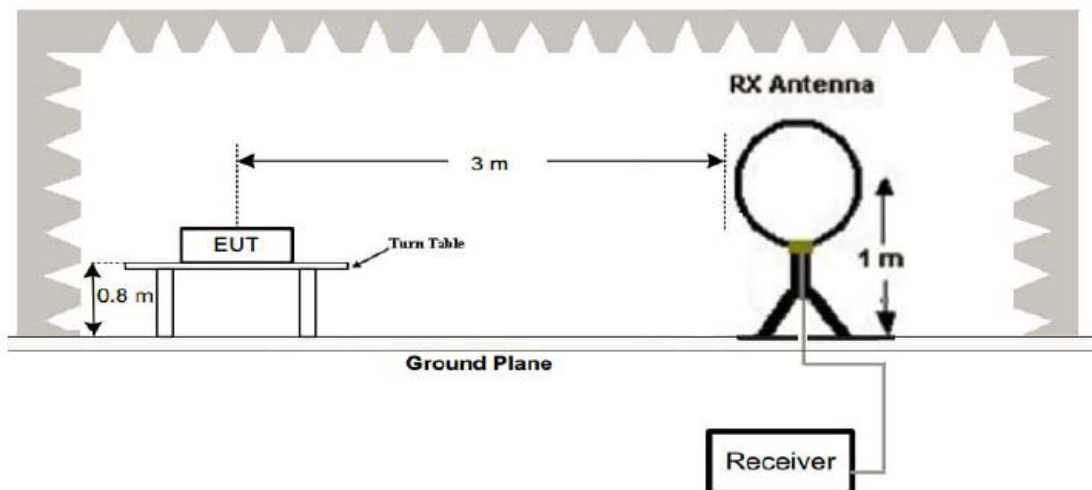
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

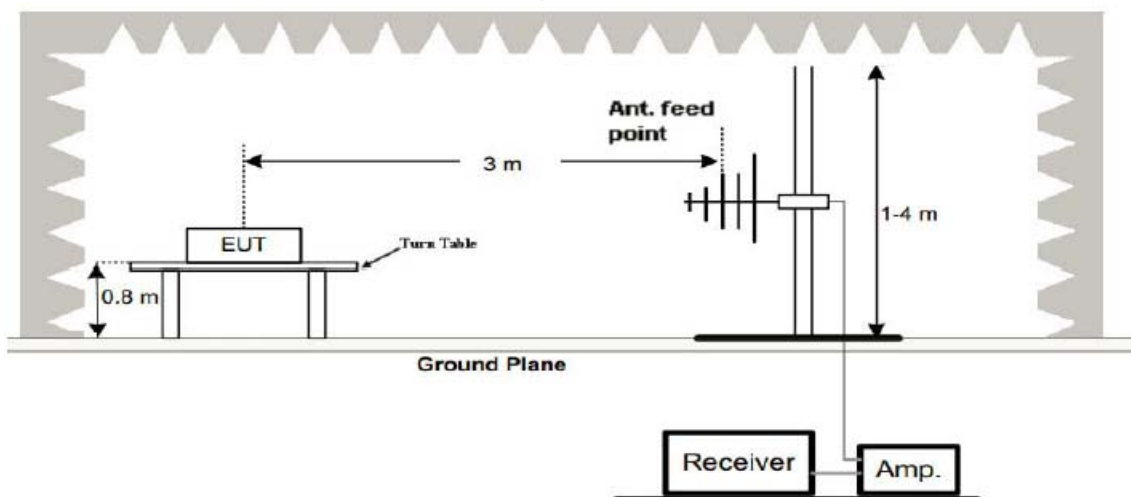
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

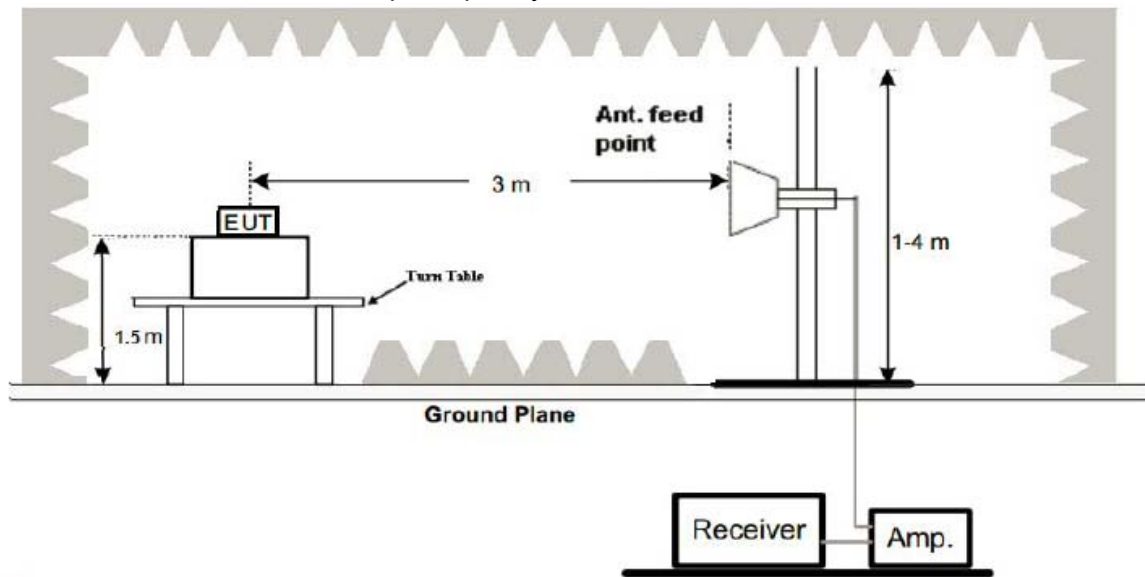
(1) Radiated Emission Test-Up Frequency Below 30MHz



(2) Radiated Emission Test-Up Frequency 30MHz~1GHz



(3) Radiated Emission Test-Up Frequency Above 1GHz



4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

PASS

All the test modes completed for test. The worst case of Radiated Emission is High Channel; the test data of this mode was reported.



Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.249/209/20	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
92.54	19.47	QP	188	1.7	V	13.39	32.86	43.50	-10.64
520.46	13.54	QP	231	2.0	V	23.23	36.77	46.00	-9.23
908.42	61.57	PK	226	1.8	H	27.26	88.83	114.00	-25.17
908.42	72.16	PK	325	1.3	V	27.26	99.42	114.00	-14.58
1816.84	50.64	PK	104	1.8	H	-13.21	37.43	74.00	-36.57
1816.84	59.33	PK	88	1.3	V	-13.21	46.12	74.00	-27.88
2725.26	54.73	PK	127	1.3	H	-13.08	41.65	74.00	-32.35
2725.26	54.64	PK	355	1.7	V	-13.08	41.56	74.00	-32.44
3633.68	56.07	PK	32	1.2	H	-9.08	46.99	74.00	-27.01
3633.68	52.40	PK	145	1.5	V	-9.08	43.32	74.00	-30.68

Frequency	PK	Turn table Angle	RX Antenna		Duty cycle Factor	AV	FCC Part 15.249/209/2	
			Height	Polar			Limit	Margin
(MHz)	(dB μ V/m)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
908.42	88.83	226	1.8	H	-10.59	78.24	94.00	-15.76
908.42	99.42	325	1.3	V	-10.59	88.83	94.00	-5.17
1816.84	37.43	104	1.8	H	-10.59	26.84	54.00	-27.16
1816.84	46.12	88	1.3	V	-10.59	35.53	54.00	-18.47
2725.26	41.65	127	1.3	H	-10.59	31.06	54.00	-22.94
2725.26	41.56	355	1.7	V	-10.59	30.97	54.00	-23.03
3633.68	46.99	32	1.2	H	-10.59	36.40	54.00	-17.60
3633.68	43.32	145	1.5	V	-10.59	32.73	54.00	-21.27

Remark: only the worst case was recorded.

AV = Peak +20Log10(duty cycle) =PK+(-10.59) [refer to section 8 for more detail]

Test Frequency: 30MHz ~ 10GHz

Test Mode: Transmitting



5 BAND EDGE

5.1 Limits

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, 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 §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 100KHz and VBM to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBW to 300 KHz, to measure the conducted peak band edge.

5.3 Test Result

N/A*

Note: Test data refers to FCC ID: XBAZW090, and report number is: WTS15S0122741E



6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Setup

Same as Radiated Emission Measurement

6.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on ANSI C63.10 section 6.9.2: RBW= 30KHz. VBW= 100 KHz, Span=4MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

6.4 Test Result

N/A*

Note: Test data refers to FCC ID: XBAZW090, and report number is: WTS15S0122741E

7 ANTENNA REQUIREMENT

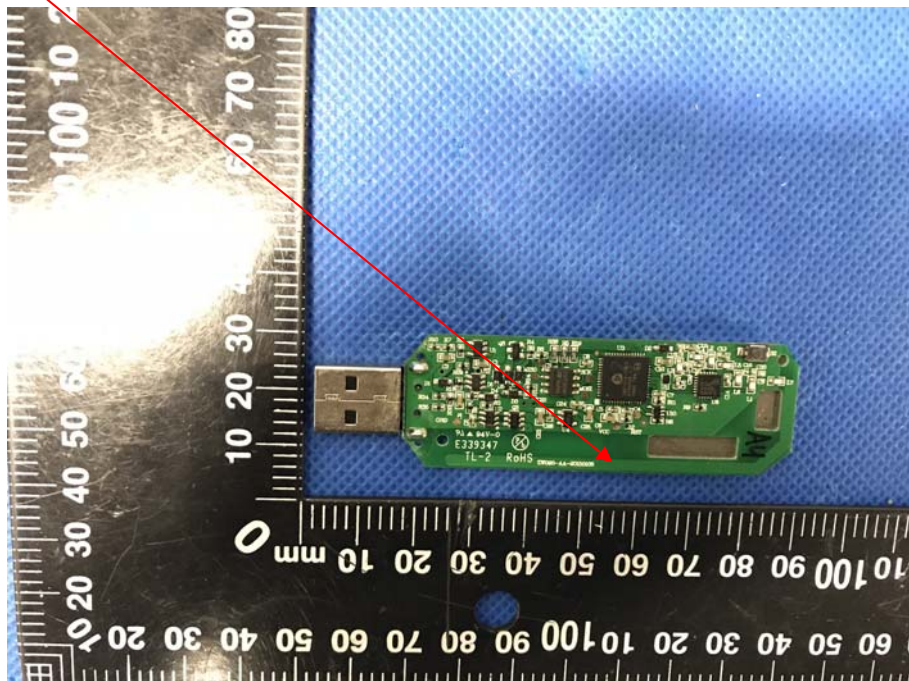
Standard Applicable

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.

Antenna Connected Construction

The antenna used in this product is a PCB antenna, The directional gains of antenna used for transmitting is 0dBi.

BT ANTENNA





8 PHOTOGRAPH OF TEST



