FCC RADIO TEST REPORT

FCC ID:2AUXBDSI-0177

Product： programmable and mulit-protocol mini IoT gateway

Trade Name： DUSUN

Model Name： DSI-0177

Serial Model： N/A

Report No.： UNIA19092902-01FR-01

Prepared for

Hangzhou Roombanker Technology Co., Ltd.

A#801 Wantong Center, Hangzhou China

Prepared by

Shenzhen United Testing Technology Co., Ltd.

2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

TEST RESULTCERTIFICATION

Applicant's name..... :	Hangzhou Roombanker Technology Co., Ltd.
Address..... :	A#801 Wantong Center, Hangzhou China
Manufacture's Name..... :	Zhejiang Dusun Electron Co.,Ltd.
Address..... :	No.640 Fengqing Str, Deqing, Zhejiang, 313200, China
Product description	
Product name..... :	programmable and mulit-protocol mini IoT gateway
Trade Mark..... :	DUSUN
Model and/or type reference .:	DSI-0177
Standards..... :	FCC Rules and Regulations Part 15 Subpart C Section 15.249, ANSI C63.10: 2013

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test..... :	
Date (s) of performance of tests.....:	Sep. 29, 2019 ~ Nov. 12, 2019
Date of Issue..... :	Nov. 12, 2019
Test Result..... :	Pass

Prepared by: Kahn yang/Editor

Reviewer: Sherwin Qian/Supervisor

Approved & Authorized Signer: Liuze/Manager

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1. TEST SUMMARY

TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT	STANGARD
CONDUCTED EMISSIONS TEST	COMPLIANT	FCC Part 15.207
RADIATED EMISSION TEST	COMPLIANT	FCC Part 15.209/15.249
BAND EDGE	COMPLIANT	FCC Part 15.249/15.205
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT	FCC Part 15.215
ANTENNA REQUIREMENT	COMPLIANT	FCC Part 15.203

TEST FACILITY

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

Address :2F, Annex Bldg, JiahuangyuanTech Park, #365 Baotian 1 Rd,TiegangCommunity, XixiangStr, Bao'an District, Shenzhen,China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

CNAS-LAB Code: L6964

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of testing Laboratories.

Designation Number: CN1227

Test Firm Registration Number: 674885

The 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.

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	programmable and mulit-protocol mini IoT gateway
Trade Mark	DUSUN
Model Name	DSI-0177
Serial No.	N/A
Model Difference	N/A
FCC ID	2AUXBDSI-0177
Antenna Type	PCB Antenna
Antenna Gain	1dBi
Frequency Range	2405~2480MHz
Number of Channels	16CH
Modulation Type	DSSS
Battery	N/A
PowerSource	AC 100-240V~50/60Hz

2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405	9	2445
2	2410	10	2450
3	2415	11	2455
4	2420	12	2460
5	2425	13	2465
6	2430	14	2470
7	2435	15	2475
8	2440	16	2480

2.3 Operation of EUT during testing

Operating Mode
The mode is used: Transmitting mode
Low Channel: 2405MHz
Middle Channel: 2440MHz
High Channel: 2480MHz

2.4 DESCRIPTION OF TEST SETUP

Operation of EUT during Conducted testing:

Table forauxiliary equipment:

Equipment Description	Manufacturer	Model	Calibration Due Date
N/A			

2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
CONDUCTED EMISSIONS TEST					
1	AMN	Schwarzbeck	NNLK8121	8121370	2020.09.06
2	AMN	ETS	3810/2	00020199	2020.09.06
3	EMI TEST RECEIVER	Rohde&Schwarz	ESCI	101210	2020.09.06
4	AAN	TESEQ	T8-Cat6	38888	2020.09.06
RADIATED EMISSION TEST					
1	Horn Antenna	Sunol	DRH-118	A101415	2020.09.06
2	BicoNILog Antenna	Sunol	JB1 Antenna	A090215	2020.09.06
3	PREAMP	HP	8449B	3008A00160	2020.09.06
4	PREAMP	HP	8447D	2944A07999	2020.09.06
5	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2020.09.06
6	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2020.09.06
7	Signal Generator	Agilent	E4421B	MY4335105	2020.09.06
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2020.09.06
9	MXA Signal Analyzer	Agilent	N9020A	MY51110104	2020.09.06
10	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2020.09.06
11	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2020.09.06
12	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2020.09.06
13	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2020.3.14
14	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2020.3.14
15	RF power divider	Anritsu	K241B	992289	2020.09.06
16	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2020.09.06
17	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2020.09.06
18	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2020.09.06
19	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2020.09.06
20	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2020.1.12
21	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2020.09.06
22	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2020.03.14
23	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2020.09.06
24	Active Loop Antenna	Com-Power	AL-130R	10160009	2020.09.06
25	Power Meter	KEYSIGHT	N1911A	MY50520168	2020.09.06
26	Frequency Meter	VICTOR	VC2000	997406086	2020.09.06
27	DC Power Source	HYELEC	HY5020E	055161818	2020.09.06

3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

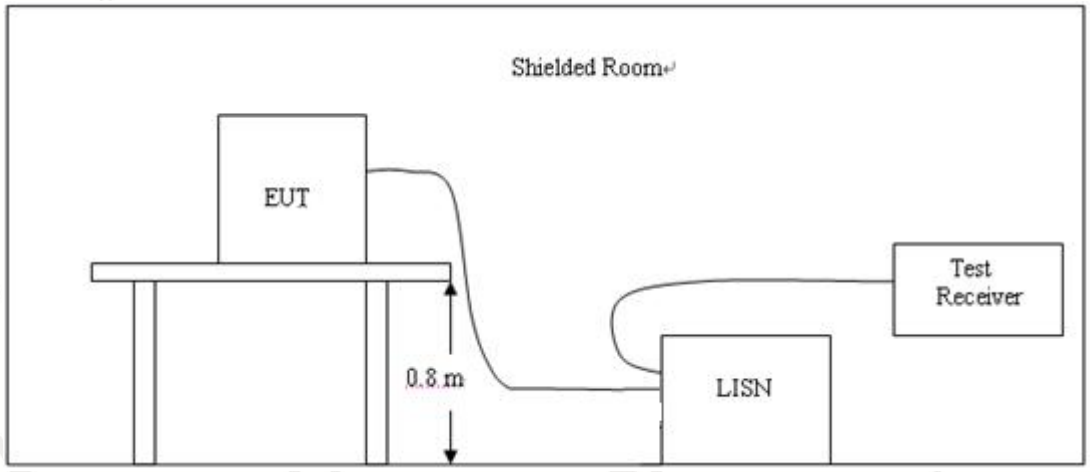
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

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'smanual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed onthe 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/60Hzpower through a Line Impedance Stabilization Network (LISN) which supplied power source and wasgrounded 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 EUTusing a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has twomonitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1connected 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

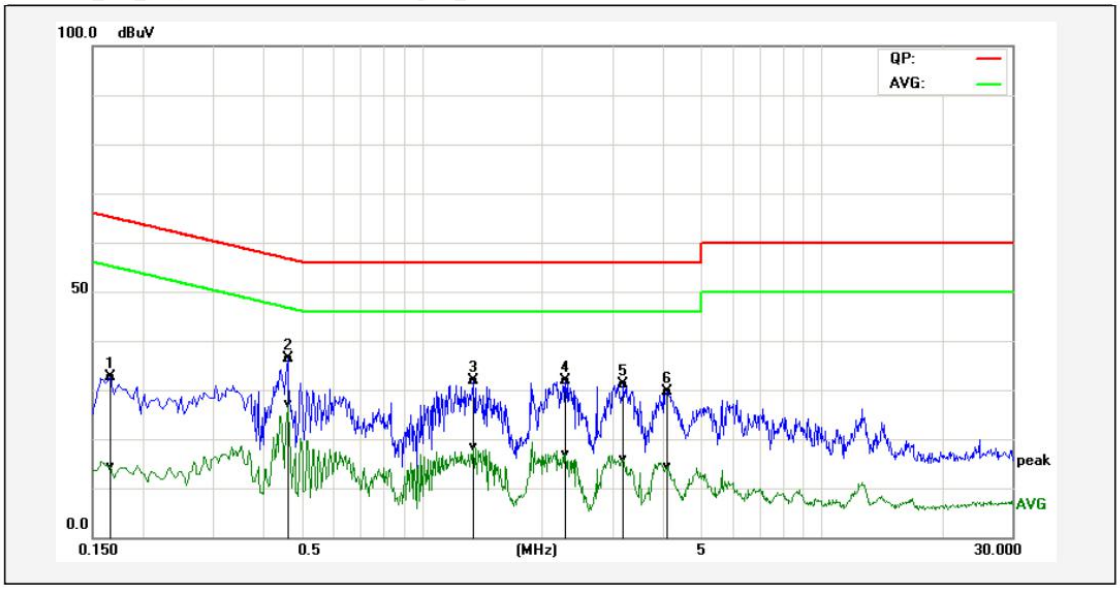
Pass

Remark:

1. All modes were tested at AC 120V and 240V , only the worst result of AC 120V was reported.

2. All modes of Low, Middle, and High channel were tested, only the worst result of High Channel was reported as below:

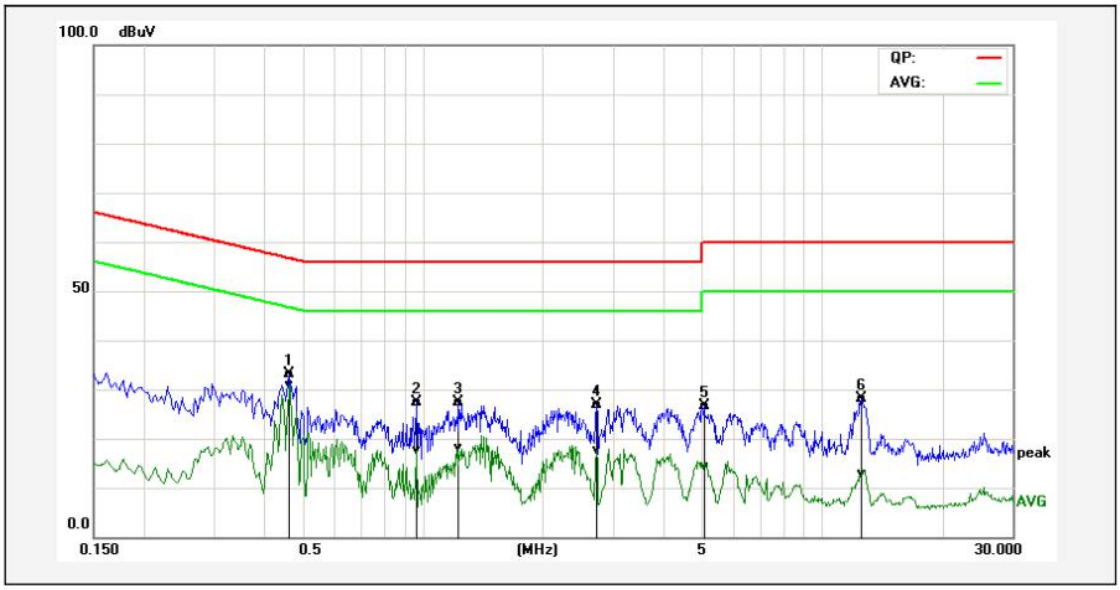
Temperature:	24℃	Relative Humidity:	45%
Test Date:	Nov. 08, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of DSSS 2480MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1660	23.02	4.72	9.56	32.58	14.28	65.15	55.16	-32.57	-40.88	Pass
2*	0.4620	26.79	17.50	9.69	36.48	27.19	56.66	46.66	-20.18	-19.47	Pass
3P	1.3500	22.03	8.62	9.79	31.82	18.41	56.00	46.00	-24.18	-27.59	Pass
4P	2.2940	21.98	7.01	9.81	31.79	16.82	56.00	46.00	-24.21	-29.18	Pass
5P	3.1940	21.37	6.02	9.83	31.20	15.85	56.00	46.00	-24.80	-30.15	Pass
6P	4.1180	19.71	4.61	9.84	29.55	14.45	56.00	46.00	-26.45	-31.55	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result=Reading + Factor, Margin=Result – Limit.

Temperature:	24℃	Relative Humidity:	45%
Test Date:	Nov. 08, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of DSSS 2480MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.4620	23.44	21.30	9.69	33.13	30.99	56.66	46.66	-23.53	-15.67	Pass
2P	0.9660	17.55	7.96	9.77	27.32	17.73	56.00	46.00	-28.68	-28.27	Pass
3P	1.2300	17.61	8.41	9.74	27.35	18.15	56.00	46.00	-28.65	-27.85	Pass
4P	2.7220	17.14	7.75	9.82	26.96	17.57	56.00	46.00	-29.04	-28.43	Pass
5P	5.0660	16.85	4.43	9.85	26.70	14.28	60.00	50.00	-33.30	-35.72	Pass
6P	12.5500	27.98	12.61	0.22	28.20	12.83	60.00	50.00	-31.80	-37.17	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result=Reading + Factor, Margin=Result – Limit.

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 ofradiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the followingvalues：

Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	20log(2400/F(KHz))+40log(300/3)	3
0.490-1.705	20log(24000/F(KHz))+40log(30/3)	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

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

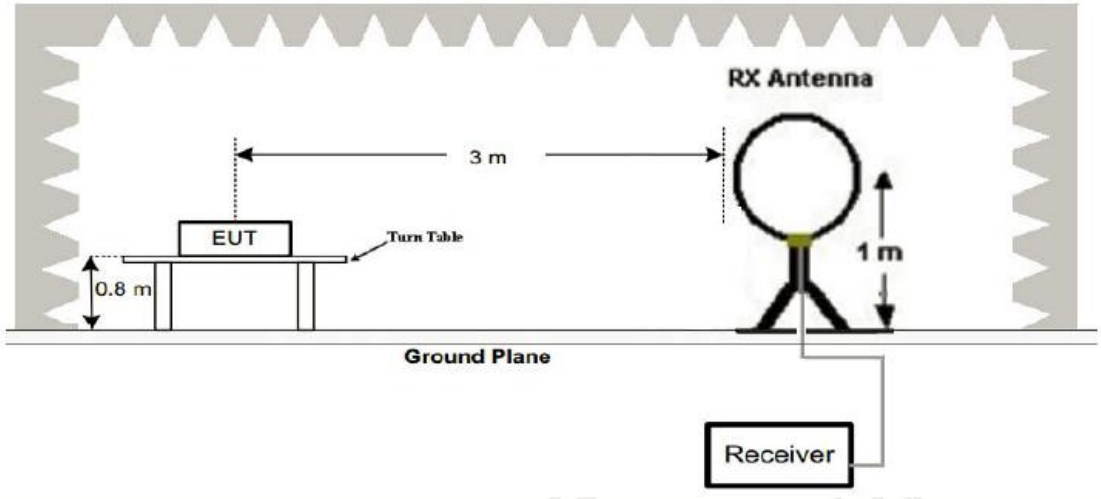
(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

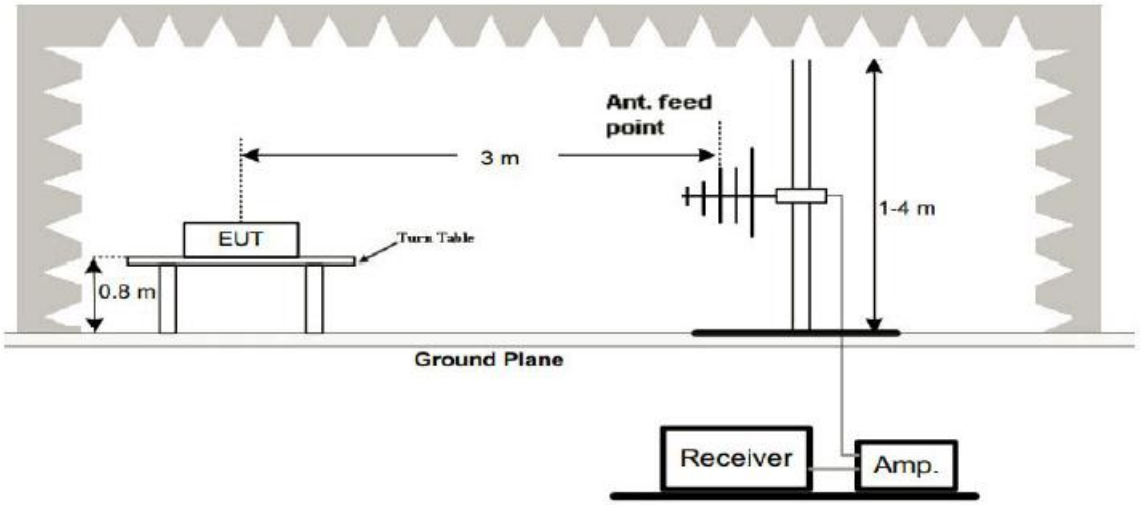
For intentionally used equipment, the general requirements for the magnetic field strength limits of the fundamental and harmonic radiation from the intentional radiator at a distance of 3 meters shall not exceed the above table, as specified in § 15.249(a).

4.2 Test Setup

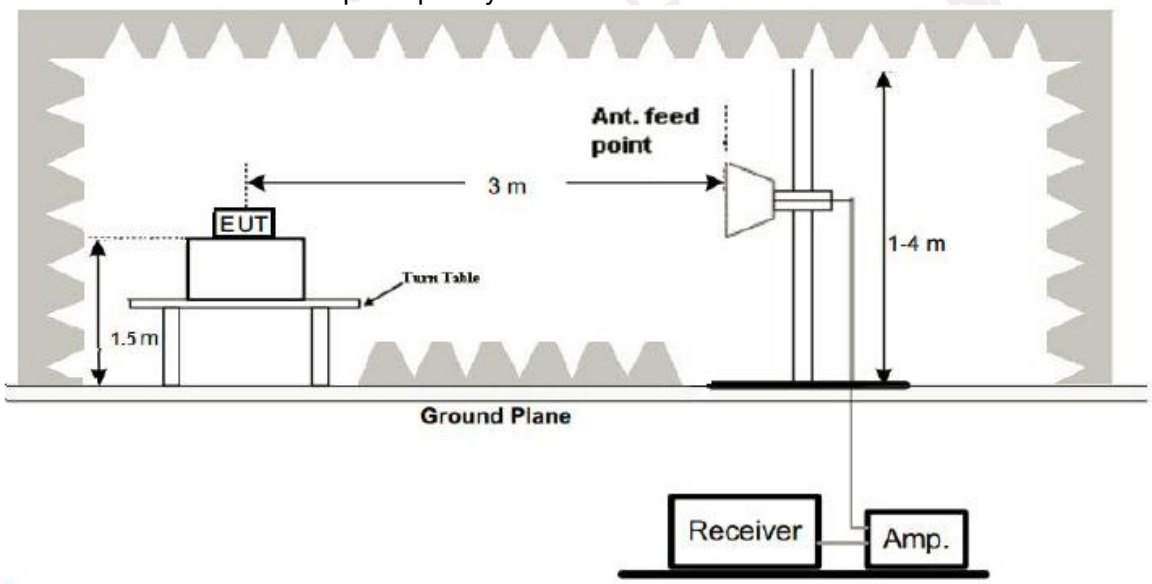
1. Radiated Emission Test-Up Frequency Below 30MHz



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 highestemissions.
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 bothhorizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to25GHz 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

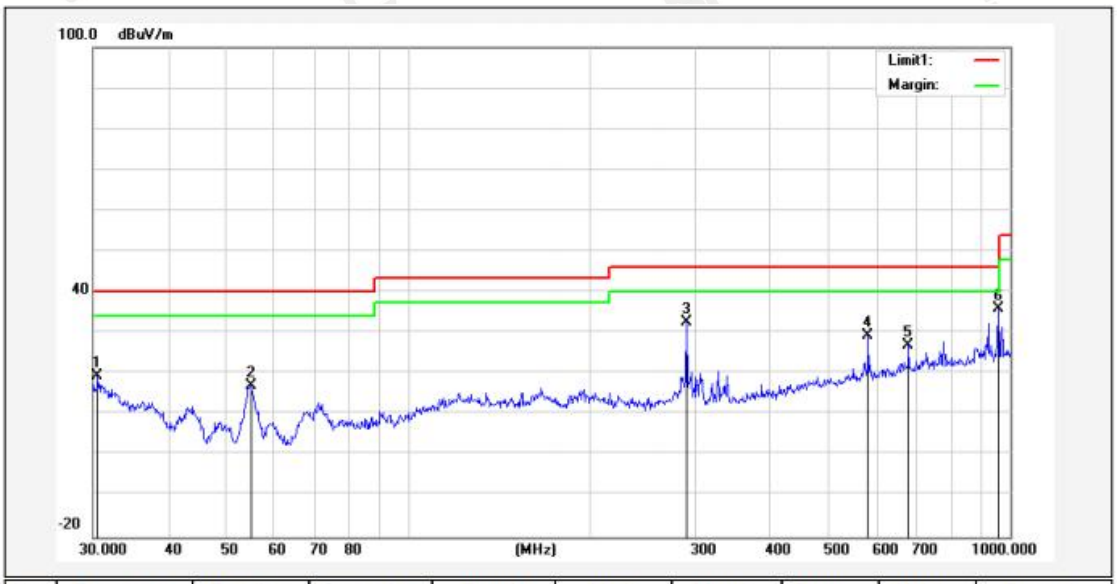
PASS

Remark:

1. All the test modes completed for test. The worst case of Radiated Emissionis High channel, the test data of this mode was reported.
2. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
3. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9KHz to 30MHz and not recorded in this report.

Below 1GHz Test Results:

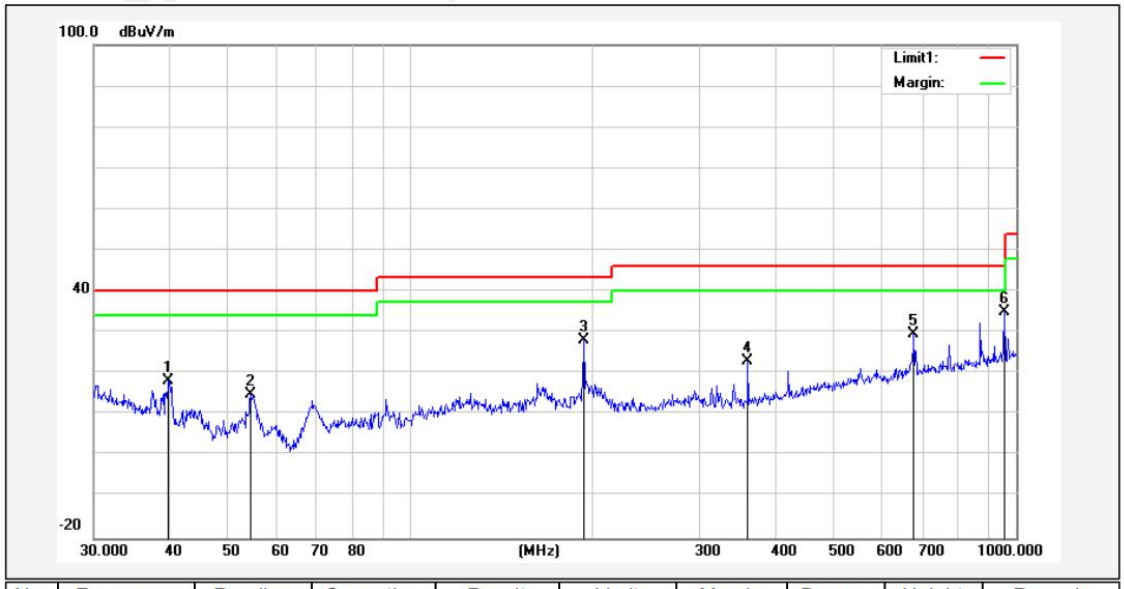
Temperature:	24℃	Relative Humidity:	45%
Test Date:	Nov. 08, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Polarization:	Horizontal
Test Mode:	Transmitting mode of DSSS 2480MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.5306	30.13	-10.64	19.49	40.00	-20.51	300	100	peak
2	54.8348	40.92	-23.93	16.99	40.00	-23.01	180	100	peak
3	290.0172	45.15	-12.51	32.64	46.00	-13.36	30	100	peak
4	580.7026	36.66	-7.27	29.39	46.00	-16.61	120	100	peak
5	677.5798	32.41	-5.32	27.09	46.00	-18.91	150	100	peak
6*	955.4381	37.57	-1.48	36.09	46.00	-9.91	120	100	peak

Remark: Absolute Level= Reading Level+ Factor, Margin= Absolute Level – Limit
Factor=Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	24℃	Relative Humidity:	45%
Test Date:	Nov. 08, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Polarization:	Vertical
Test Mode:	Transmitting mode of DSSS 2480MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	39.8692	35.94	-17.81	18.13	40.00	-21.87	120	100	peak
2	54.6546	38.83	-23.95	14.88	40.00	-25.12	150	100	peak
3	193.5452	41.41	-13.26	28.15	43.50	-15.35	270	100	peak
4	360.4377	34.50	-11.53	22.97	46.00	-23.03	60	100	peak
5	677.5898	34.92	-5.32	29.60	46.00	-16.40	330	100	peak
6*	955.4281	36.50	-1.48	35.02	46.00	-10.98	30	100	peak

Remark: Absolute Level= Reading Level+ Factor, Margin= Absolute Level – Limit
Factor=Ant. Factor + Cable Loss – Pre-amplifier

Remark：
(1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHzwas verified, and no any emission was found except system noise floor.
(2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

Above 1 GHz Test Results:
CH Low (2405MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2405	106.89	-5.84	101.05	114	-12.95	PK
2405	79.35	-5.84	73.51	94	-20.49	AV
4810	61.35	-3.64	57.71	74	-16.29	PK
4810	48.98	-3.64	45.34	54	-8.66	AV
7215	59.21	-0.95	58.26	74	-15.74	PK
7215	48.21	-0.95	47.26	54	-6.74	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2405	107.35	-5.84	101.51	114	-12.49	PK
2405	80.31	-5.84	74.47	94	-19.53	AV
4810	62.15	-3.64	58.51	74	-15.49	PK
4810	50.39	-3.64	46.75	54	-7.25	AV
7215	57.44	-0.95	56.49	74	-17.51	PK
7215	47.29	-0.95	46.34	54	-7.66	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

CH Middle (2440MHz)

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	108.74	-5.71	103.03	114	-10.97	PK
2440	80.24	-5.71	74.53	94	-19.47	AV
4880	63.21	-3.51	59.70	74	-14.30	PK
4880	50.22	-3.51	46.71	54	-7.29	AV
7320	56.77	-0.82	55.95	74	-18.05	PK
7320	46.39	-0.82	45.57	54	-8.43	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	109.31	-5.71	103.6	114	-10.4	PK
2440	81.36	-5.71	75.65	94	-18.35	AV
4880	62.34	-3.51	58.83	74	-15.17	PK
4880	50.41	-3.51	46.90	54	-7.10	AV
7320	57.28	-0.82	56.46	74	-17.54	PK
7320	46.37	-0.82	45.55	54	-8.45	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

CH High (2480MHz)
Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	110.06	-5.65	104.41	114	-9.59	PK
2480	81.82	-5.65	76.17	94	-17.83	AV
4960	62.31	-3.43	58.88	74	-15.12	PK
4960	50.37	-3.43	46.94	54	-7.06	AV
7440	56.91	-0.75	56.16	74	-17.84	PK
7440	47.25	-0.75	46.50	54	-7.50	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2480	108.36	-5.65	102.71	114	-11.29	PK
2480	81.34	-5.65	75.69	94	-18.31	AV
4960	61.35	-3.43	57.92	74	-16.08	PK
4960	48.26	-3.43	44.83	54	-9.17	AV
7440	56.37	-0.75	55.62	74	-18.38	PK
7440	47.22	-0.75	46.47	54	-7.53	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

Remark：
(1) Measuring frequencies from 1 GHz to the 25 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) 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 or the field strength is too small to be measured.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.The resolution bandwidth of test receiver/spectrum analyzer is 1MHzand video bandwidth is 3MHz for peak measurement with peak detectorat frequency above 1GHz.The resolution bandwidth of test receiver/spectrum analyzer is 1MHzand video bandwidth is 10Hz for Average measurement with peak
detection at frequency above 1GHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.
(7)All modes of operation were investigated and the worst-case emissionsare reported.
(8)Fundamental frequency test setting, the primary frequency setting should be RBW >20dB BW , VBW>=3XRBW , PK detector for PK value , RMS detector for AV value .

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 emissionlimits 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 ANSIC63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT issituated in three orthogonal planes (if appropriate), adjusting the measurement antenna height andpolarization etc. RBW 1MHz VBW 3MHz PK detector for PK value, RBW 1MHz VBW 10Hz PK detector for AV value .The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capturethe 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

PASS

Radiated Band Edge Test:

Operation Mode: TX CH Low (2405MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	55.26	-5.81	49.45	74	-24.55	PK
2310	/	-5.81	/	54	/	AV
2390	56.47	-5.84	50.63	74	-23.37	PK
2390	/	-5.84	/	54	/	AV
2400	57.69	-5.84	51.85	74	-22.15	PK
2400	/	-5.84	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	55.34	-5.81	49.53	74	-24.47	PK
2310	/	-5.81	/	54	/	AV
2390	56.21	-5.84	50.37	74	-23.63	PK
2390	/	-5.84	/	54	/	AV
2400	56.75	-5.84	50.91	74	-23.09	PK
2400	/	-5.84	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	57.64	-5.65	51.99	74	-22.42	PK
2483.5	/	-5.65	/	54	/	AV
2500	57.26	-5.72	51.54	74	-20.42	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	57.41	-5.65	51.76	74	-22.24	PK
2483.5	/	-5.65	/	54	/	AV
2500	56.82	-5.72	51.10	74	-22.90	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Setup

Same asRadiated 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=100KHz, Span=3MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector.

6.3 Measurement Equipment Used

Same asRadiated Emission Measurement

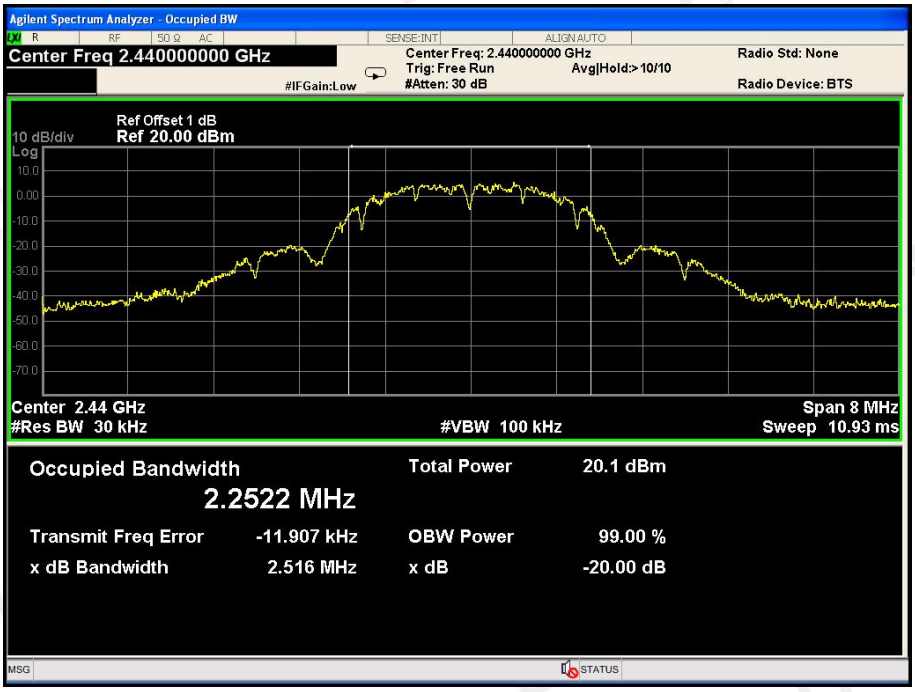
6.4 Test Result

PASS

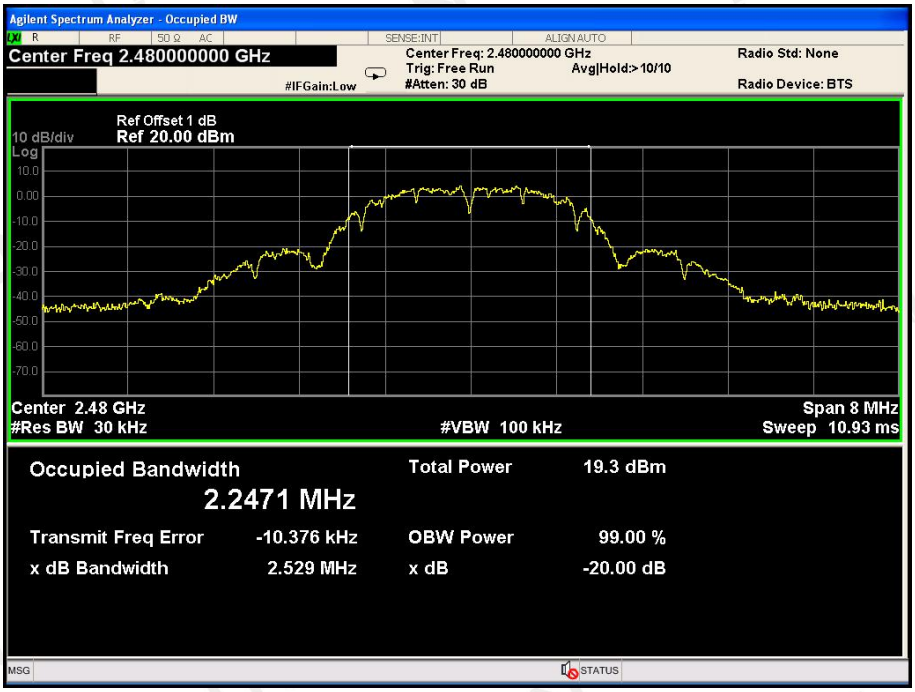
Frequency (MHz)	20dB Bandwidth (MHz)	Result
2405	2.506	PASS
2440	2.516	PASS
2480	2.529	PASS

CH:2405MHz

CH:2440MHz



CH:2480MHz

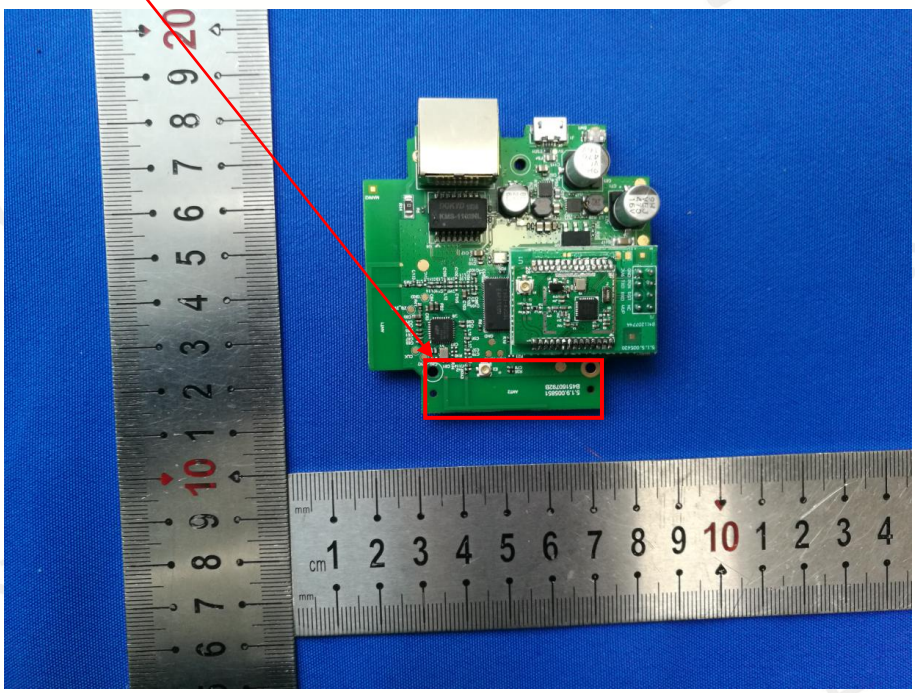


7 ANTENNA REQUIREMENT

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

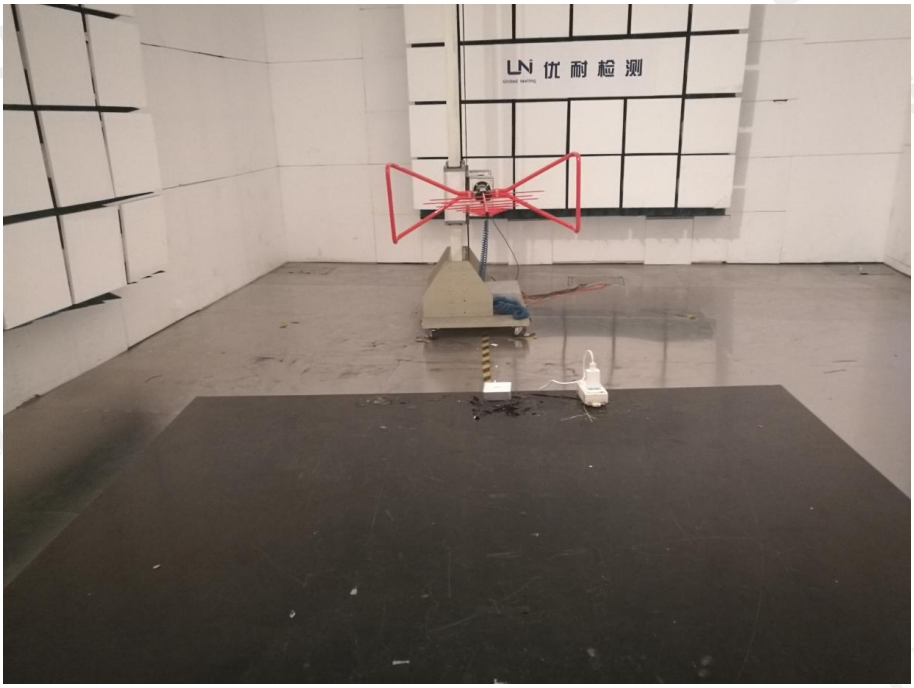
Antenna Connected Construction
The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 1dBi.

ANTENNA:

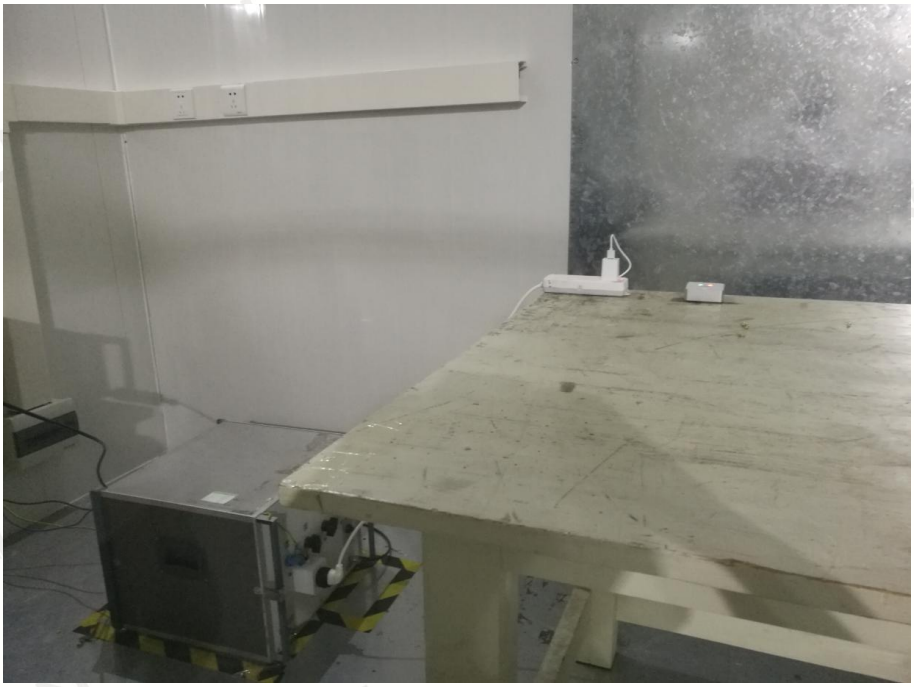


8 PHOTOGRAPH OF TEST

8.1Radiated Emission



8.2Conducted Emission



End of Report