TEST REPORT

FCC ID: 2AHB5-HS-C09851

For

Zhejiang Hanshow Technology Co., Ltd.

Access Point

Model No.	:	HS_C09851
Trade name	:	N/A
Prepared for	:	Zhejiang Hanshow Technology Co., Ltd.
Address	:	Shanghai JiaoTong University Jiaxing Science Park, No.321, Jiachuang Rd., Xiuzhou District, Jiaxing City, Zhejiang, China
Prepared by	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China
Report No.	:	T1862504 01
Date of Receipt	:	December 12, 2016
Date of Test	:	December 12, 2016 - December 21, 2016
Date of Report	:	December 21, 2016
Version Number	:	REV0

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DECLARATION

Applicant	:	Zhejiang Hanshow Technology Co., Ltd.
Manufacturer	:	Zhejiang Hanshow Technology Co., Ltd.
Product	:	Access Point
	(A) Model No.	: HS_C09851
	(B) Trade Name	: N/A
	(C) Power supply	: DC 12V From DC Port or DC 48V From POE Port

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249: 2016, ANSI C63.10-2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Reak Yang Test Engineer	Reak Yang ……
Approved by (name + signature)…....:	Simple Guan Project Manager	……
Date of issue…… ……..:		December 21, 2016

1 General Information

1.1 Description of Device (EUT)

EUT	:	Access Point
Model No.	:	HS_C09851
Trade mark	:	N/A
Power supply	:	DC 12V From DC Port or DC 48V From POE Port
Radio Technology	:	2.4GHz
Operation frequency	:	2402-2480MHz
Channel No.		79 Channels
Channel Separation	:	1MHz
Modulation	:	GFSK
Antenna Type	:	4* Rod Antenna, max gain 0dBi.
Hardware Version	:	V4.0.2
Applicant	:	Zhejiang Hanshow Technology Co., Ltd.
Address	:	Shanghai JiaoTong University Jiaxing Science Park, No.321, Jiachuang Rd., Xiuzhou District, Jiaxing City, Zhejiang, China
Manufacturer	:	Zhejiang Hanshow Technology Co., Ltd.
Address	:	Shanghai JiaoTong University Jiaxing Science Park, No.321, Jiachuang Rd., Xiuzhou District, Jiaxing City, Zhejiang, China

1.2 Description of Test Facility

Shenzhen Alpha Product Testing Co., Ltd.

Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Due cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2017.01.16	1Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2017.01.16	1Year
Receiver	R&S	ESCI	101165	2017.01.16	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.01.16	1 Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.01.16	1 Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2018.01.18	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2017.01.20	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2017.01.20	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2017.01.16	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2017.01.18	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2017.01.18	1Year

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.

Equipment	Manufacture	Model No.	Serial No.	Test Location	Frequency Rang
Cable	Resenberger	SUCOFLEX 104	309972/4	Radiation	9KHz-2GHz
Cable	Resenberger	SUCOFLEX 104	329112/4	Radiation	1GHz-26.5GHz
Note: For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω , Cable Loss: 1.0 dB					

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard C63.10-2013 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 24.8℃ with a humidity of 56%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard C63.10-2013 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 24.8℃ with a humidity of 56%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.
Example:
Freq (MHz) METER READING + ACF + CABLE = FS
33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m
ANSI STANDARD C63.10-2013 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard C63.10-2013 10.1.7 with the EUT 40 cm from the vertical ground wall.

4 Summary of Measurement

4.1 Summary of test result

Test Item	Test Requirement	Standard Paragraph	Result
Spurious Emission	FCC PART 15: 2016	Section 15.249&15.209	Compliance
Conduction Emission	FCC PART 15: 2016	Section 15.207	Compliance
Occupied bandwidth	FCC PART 15: 2016	Section 15.215	Compliance
Band edge Requirement	FCC PART 15: 2016	Section 15.249	Compliance
Antenna Requirement	FCC PART 15: 2016	Section 15.203	Compliance

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.

4.2 Test connection

EUT was placed on a turn table, which is 0.8 meter high above ground for blew 1GHz, 1.5 meter high above ground for above 1GHz.

TX Mode:

EUT

4.3 Assistant equipment used for test

Description	:	N/A
Manufacturer	:	N/A
Model No.	:	N/A
Note: FCC DOC approved.		

4.4 Test mode

The EUT work in Continuous 4 TX together mode, and select test channel, wireless mode. Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2402	39	2440	77	2478
2	2403	40	2441	78	2479
3	2404	41	2442	79	2480
… …	… …	... ...	… …		

4.5 Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

4.6 Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.71dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.90 dB	Polarize: V
	3.92dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.26 dB	Polarize: H
	4.28 dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for DC and low frequency voltages	0.06%	

5 Spurious Emission

5.1 Radiation Emission

5.2 Radiation Emission Limits(15.209&249)

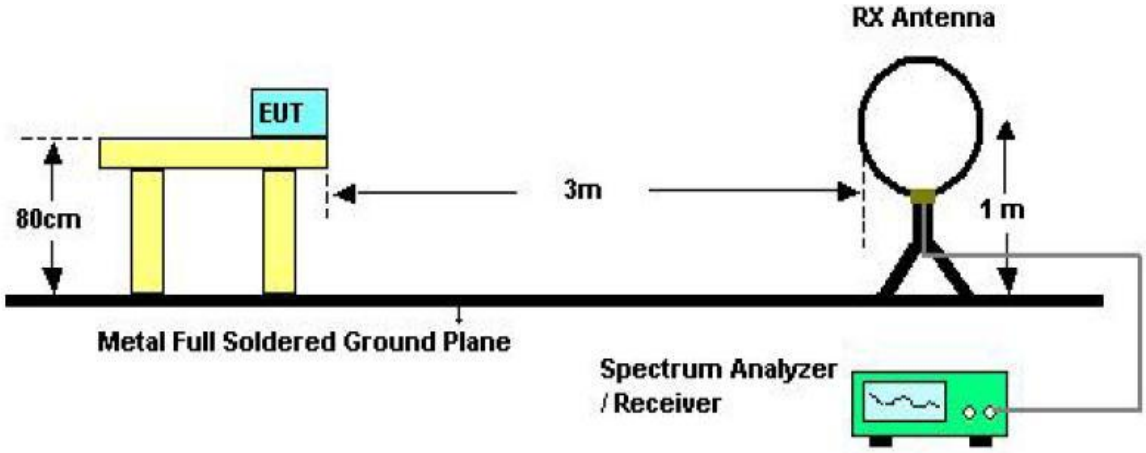
Frequency (MHz)	**Field Strength Limits at 3 metres (watts, e.i.r.p.)**		
	uV/m	dB uV/m	Measurement distance(m)
0.009-0.490	2400/F(kHz)	XX	300
0.490-1.705	24000/F(kHz)	XX	30
1.705-30	30	29.5	30
30~88	100(3nW)	40	3
88~216	150(6.8nW)	43.5	3
216~960	200(12nW)	46	3
Above960	500(75nW)	54	3
Carrier frequency		93.97(AV)	3
Carrier frequency		113.97(PK)	3

NOTE:

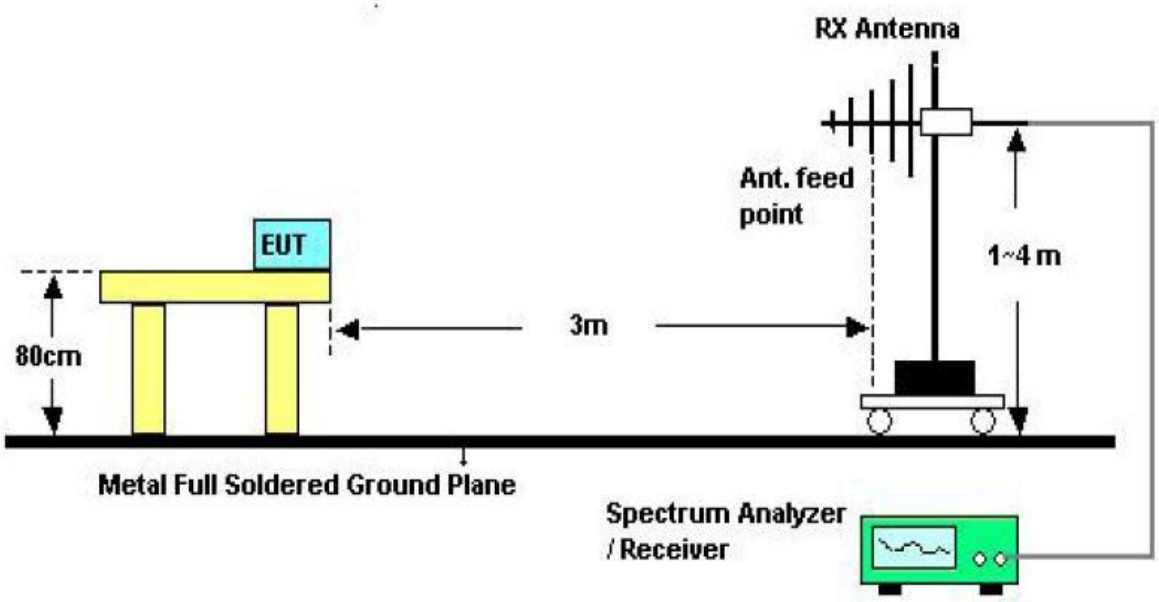
a) The tighter limit applies at the band edges.
b) Emission Level(dB uV/m)=20log Emission Level(uV /m)

5.3 Test Setup

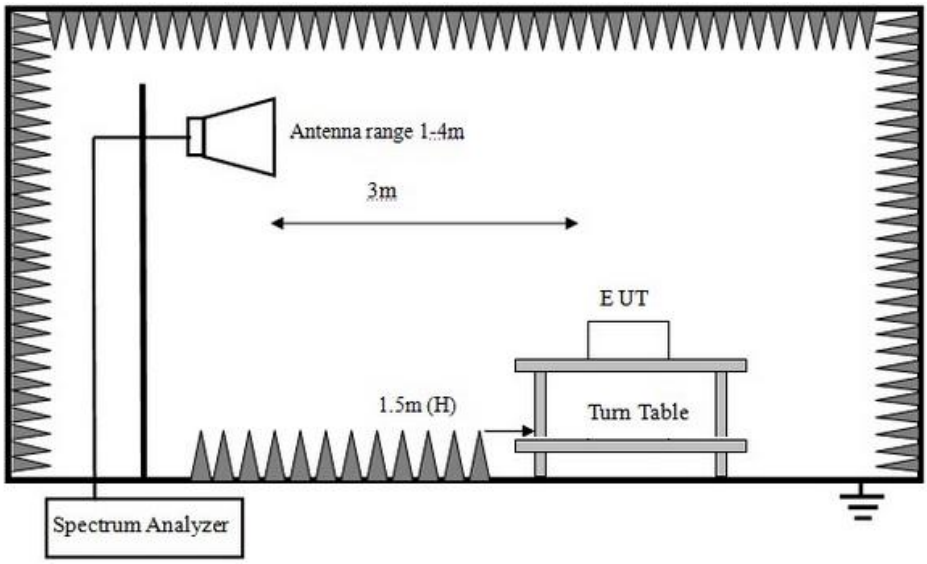
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

5.4 Test Procedure

a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation
b) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.
c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Qusia Peak Detector mode premeasured
d) If Peak value comply with QP limit Below 1GHz.The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
e) For the actual test configuration, please see the test setup photo.
f) Test for all x, y, z axes is performed and only the worst case of X xes was recorded in the test report.
g) 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.

5.5 Test Equipment Setting For emission test Result.

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHZ~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

5.6 Test Condition

Continual Transmitting in maximum power.

5.7 Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Remark: Only show the test data of the worst Channel in this report.

From 30MHz to 1000MHz: Conclusion: PASS

Below 1GHz

Shenzhen Alpha Product Testing Co., Ltd.
Building i, No.2, Lixin Road, Fuyong Street,
Bao'an District, 518103, Shenzhen, Guangdong, China

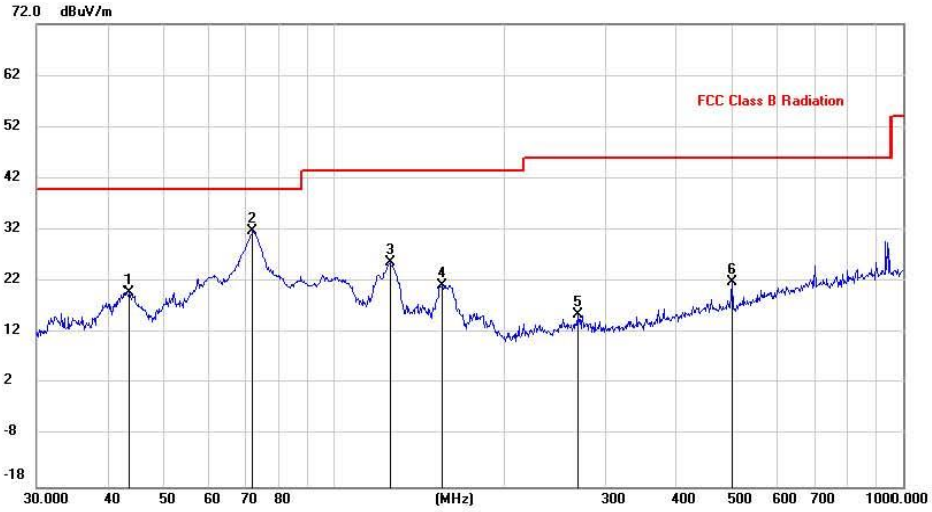
Site LAB
Limit:
EUT:
M/N:
Mode:
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

Radiated Emission Measurement

File :2016 Data :#18 Date: 2016/12/18 Time: 15:38:20



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		43.5056	6.03	13.90	19.93	40.00	-20.07	peak			
2	*	71.8319	21.04	10.70	31.74	40.00	-8.26	peak			
3		125.4457	12.82	12.94	25.76	43.50	-17.74	peak			
4		155.3642	6.78	14.57	21.35	43.50	-22.15	peak			
5		268.4852	2.93	12.71	15.64	46.00	-30.36	peak			
6		501.1788	4.61	17.22	21.83	46.00	-24.17	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

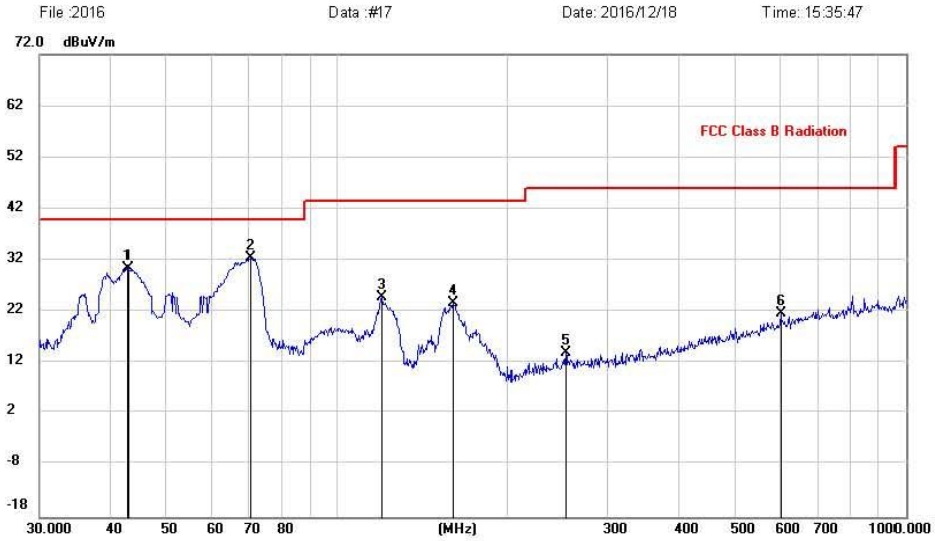
Shenzhen Alpha Product Testing Co., Ltd.
Building i, No.2, Lixin Road, Fuyong Street,
Bao'an District, 518103, Shenzhen, Guangdong, China

Site LAB
Limit:
EUT:
M/N:
Mode:
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		43.0504	16.56	13.93	30.49	40.00	-9.51	peak			
2	*	70.3365	21.66	10.94	32.60	40.00	-7.40	peak			
3		119.8555	12.21	12.58	24.79	43.50	-18.71	peak			
4		160.3455	9.28	14.56	23.84	43.50	-19.66	peak			
5		252.0627	2.06	12.11	14.17	46.00	-31.83	peak			
6		603.5392	2.12	19.49	21.61	46.00	-24.39	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Notes: Above is below 1GHz test data. This report only shall the worst case mode for TX 2402MHz.

Radiated Emissions Result of Inside band and out of band

1GHz—25GHz Radiated emission Test result									
EUT: Access Point M/N: HS_C09851									
Power: DC 12V From DC Port									
Test date: 2016-12-20 Test site: 3m Chamber Tested by: Reak Yang									
Test mode: 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2402	99.72	27.61	3.94	34.97	96.30	114	17.70	PK
2	2402	85.38	27.61	3.94	34.97	81.96	94	12.04	AV
3	4804	58.64	31.29	5.70	34.19	61.44	74	12.56	PK
4	4804	43.75	31.29	5.70	34.19	46.55	54	7.45	AV
5	2400	58.19	27.62	3.94	34.97	54.78	74	19.22	PK
6	2400	43.25	27.62	3.94	34.97	39.84	54	14.16	AV
	/								
Antenna Polarity: Horizontal									
1	2402	103.28	27.61	3.94	34.97	99.86	114	14.14	PK
2	2402	89.75	27.61	3.94	34.97	86.33	94	7.67	AV
3	4804	59.12	31.29	5.70	34.19	61.92	74	12.08	PK
4	4804	46.38	31.29	5.70	34.19	49.18	54	4.82	AV
5	2400	56.73	27.62	3.94	34.97	53.32	74	20.68	PK
6	2400	43.29	27.62	3.94	34.97	39.88	54	14.12	AV
	/	/							
Note: 1,Measuring frequency from 1GHz to 25GHz 2,Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2,Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

EUT: Access Point M/N: HS_C09851

Power: DC 12V From DC Port

Test date: 2016-12-20 Test site: 3m Chamber Tested by: Reak Yang

Test mode: 2441MHz

Antenna polarity: Vertical

No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2441	97.65	27.60	3.97	34.97	94.25	114	19.75	PK
2	2441	83.47	27.60	3.97	34.97	80.07	94	13.93	AV
3	4882	57.88	31.38	5.75	34.14	60.87	74	13.13	PK
4	4882	44.96	31.38	5.75	34.14	47.95	54	6.05	AV
	/	/							
Antenna Polarity: Horizontal									
1	2441	101.12	27.60	3.97	34.97	97.72	114	16.28	PK
2	2441	87.24	27.60	3.97	34.97	83.84	94	10.16	AV
3	4882	56.38	31.38	5.75	34.14	59.37	74	14.63	PK
4	4882	43.29	31.38	5.75	34.14	46.28	54	7.72	AV
	/	/							

Note:
1, Measuring frequency from 1GHz to 25GHz
2,Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2,Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

EUT: Access Point M/N: HS_C09851

Power: DC 12V From DC Port

Test date: 2016-12-20 Test site: 3m Chamber Tested by: Reak Yang

Test mode: 2480MHz

Antenna polarity: Vertical

No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480	95.96	27.59	4.00	34.97	92.58	114	21.42	PK
2	2480	81.36	27.59	4.00	34.97	77.98	94	16.02	AV
3	4960	56.73	31.43	5.79	34.12	59.83	74	14.17	PK
4	4960	43.42	31.43	5.79	34.12	46.52	54	7.48	AV
5	2483.5	58.13	27.59	4.00	34.97	54.75	74	19.25	PK
6	2483.5	42.63	27.59	4.00	34.97	39.25	54	14.75	AV
	/	/							

Antenna Polarity: Horizontal

1	2480	99.87	27.59	4.00	34.97	96.49	114	17.51	PK
2	2480	85.19	27.59	4.00	34.97	81.81	94	12.19	AV
3	4960	56.93	31.43	5.79	34.12	60.03	74	13.97	PK
4	4960	45.01	31.43	5.79	34.12	48.11	54	5.89	AV
5	2483.5	57.34	27.59	4.00	34.97	53.96	74	20.04	PK
6	2483.5	43.77	27.59	4.00	34.97	40.39	54	13.61	AV
	/	/							

Note:

1, Measuring frequency from 1GHz to 25GHz

2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK

2,Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS

3, Result = Read level + Antenna factor + cable loss-Amp factor

4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

6 POWER LINE CONDUCTED EMISSION

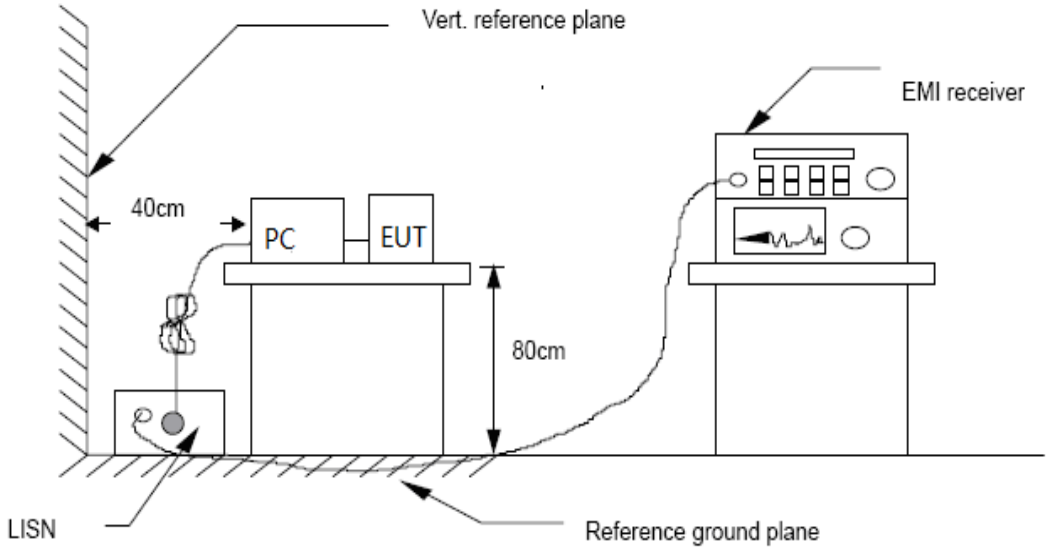
6.1 Conducted Emission Limits(15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

6.2 Test Setup



6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10-2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

6.4 Test Results

TX MODE

All modes have been tested, and only worse case of TX CH:2402MHz mode is reported only.

PASS

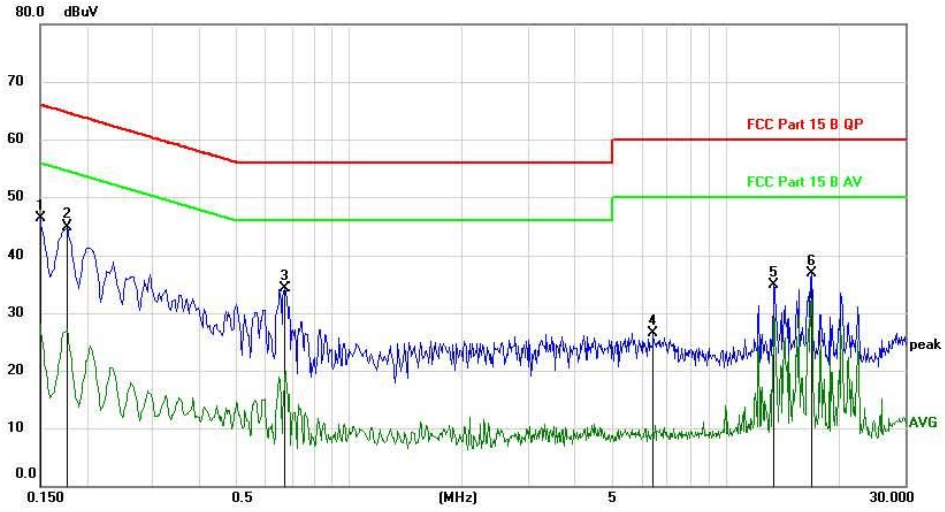
Detailed information please see the following page.

Shenzhen Alpha Product Testing Co., Ltd.
Building i, No.2, Lixin Road, Fuyong Street,
Bao'an District, 518103, Shenzhen, Guangdong, China

Site LAB	Phase:	N	Temperature: 24
Limit: FCC Part 15 B QP	Power:	AC 120V/60Hz	Humidity: 45 %
EUT:			
M/N:			
Mode:			
Note:			

Conducted Emission Measurement

File :HCSD-16850200 Data :#3 Date: 2016-12-21 Time: 18:23:10



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	36.73	9.66	46.39	66.00	-19.61	peak	
2		0.1770	35.33	9.67	45.00	64.63	-19.63	peak	
3		0.6720	24.60	9.74	34.34	56.00	-21.66	peak	
4		6.4405	16.30	10.23	26.53	60.00	-33.47	peak	
5		13.3605	24.56	10.35	34.91	60.00	-25.09	peak	
6		16.8405	26.40	10.44	36.84	60.00	-23.16	peak	

*:Maximum data x:Over limit I:over margin (Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

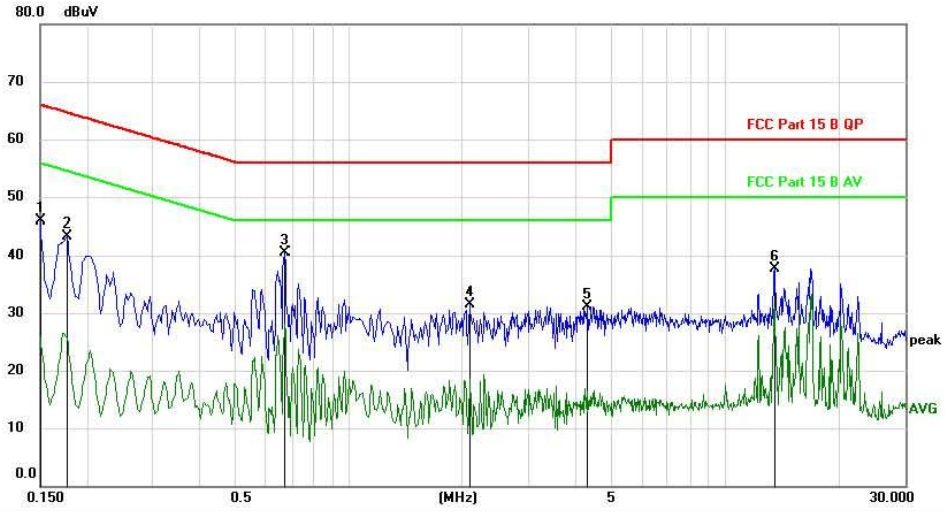
E:\EZ-EMC\Test Report\H\Hengchangshendi Page: 1 Engineer Signature:

Shenzhen Alpha Product Testing Co., Ltd.
Building i, No.2, Lixin Road, Fuyong Street,
Bao'an District, 518103, Shenzhen, Guangdong, China

Site LAB	Phase:	*L1*	Temperature: 24
Limit: FCC Part 15 B QP	Power:	AC 120V/60Hz	Humidity: 45 %
EUT:			
M/N:			
Mode:			
Note:			

Conducted Emission Measurement

File :HCSD-16850200 Data :#4 Date: 2016-12-21 Time: 18:25:00



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	36.32	9.66	45.98	66.00	-20.02	peak	
2		0.1770	33.70	9.66	43.36	64.63	-21.27	peak	
3	*	0.6720	30.67	9.74	40.41	56.00	-15.59	peak	
4		2.0805	21.53	9.89	31.42	56.00	-24.58	peak	
5		4.3005	21.08	10.11	31.19	56.00	-24.81	peak	
6		13.4205	27.40	10.35	37.75	60.00	-22.25	peak	

*:Maximum data x:Over limit l:over margin (Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

E:\EZ-EMC\Test Report\H\Hengchangshendi *Page: 1* Engineer Signature:

7 Bandwidth

7.1 Test limit

Please refer section15.215

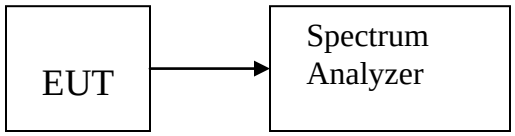
7.2 Method of measurement

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b)The test receiver RBW set 100kHz,VBW set 300KHz,Sweep time set auto.

c) Peak detector is used

7.3 Test Setup



7.4 Test Results

PASS.

All 4 antennas are tested, and only list the worst data.

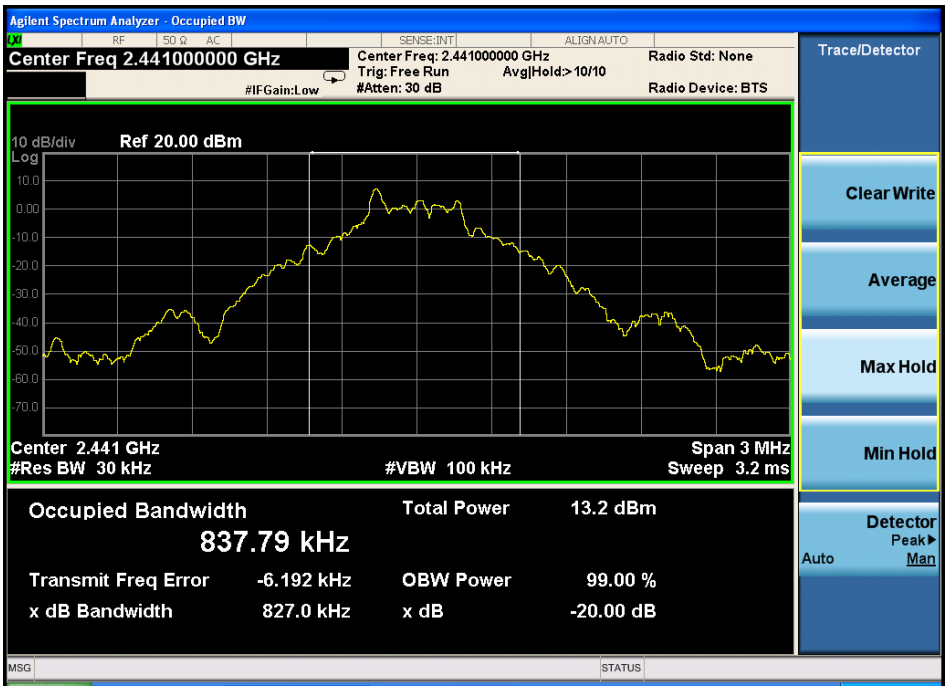
Detailed information please see the following page.

Channel	Frequency (MHz)	20dB Bandwidth (KHz)	99%Bandwidth (KHz)	Limit (KHz)	Result
CH1	2402	834.3	/	/	PASS
CH40	2441	827.0	/	/	PASS
CH79	2480	835.3	/	/	PASS

CH Low :

Agilent Spectrum Analyzer - Occupied BW
x dB -20.00 dB
Center Freq: 2.402000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
Center 2.402 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
836.91 kHz
Total Power
12.6 dBm
Transmit Freq Error
-4.694 kHz
OBW Power
99.00 %
x dB Bandwidth
834.3 kHz
x dB
-20.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

CH Mid :


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.441000000 GHz
Center Freq: 2.441000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
Center 2.441 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
837.79 kHz
Total Power
13.2 dBm
Transmit Freq Error
-6.192 kHz
OBW Power
99.00 %
x dB Bandwidth
827.0 kHz
x dB
-20.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

CH High :

Agilent Spectrum Analyzer - Occupied BW
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
Center Freq 2.480000000 GHz
#IFGain:Low
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
5.000000 MHz
Auto
Man
Occupied Bandwidth
837.47 kHz
Total Power
13.2 dBm
Freq Offset
0 Hz
Transmit Freq Error
-5.507 kHz
OBW Power
99.00 %
x dB Bandwidth
835.3 kHz
x dB
-20.00 dB
MSG
STATUS

8 Antenna Requirement

8.1 Standard 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 shall be considered sufficient to comply with the provisions of this Section. 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.

8.2 Antenna Connected Construction

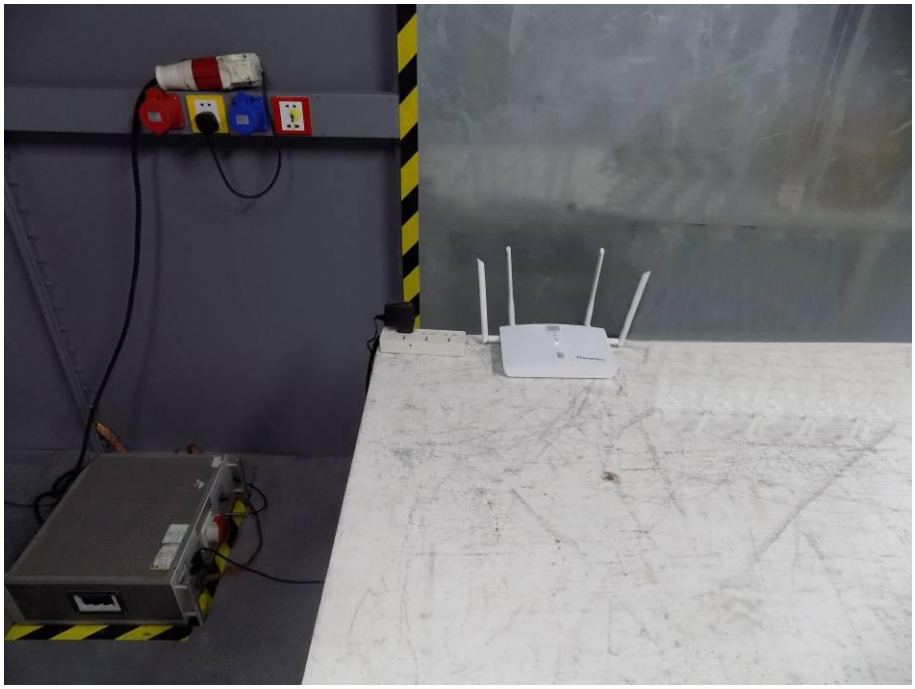
The directional gains of antenna used for transmitting is 0dBi, and is a PCB Antenna and no consideration of replacement. Please see EUT photo for details.

8.3 Result

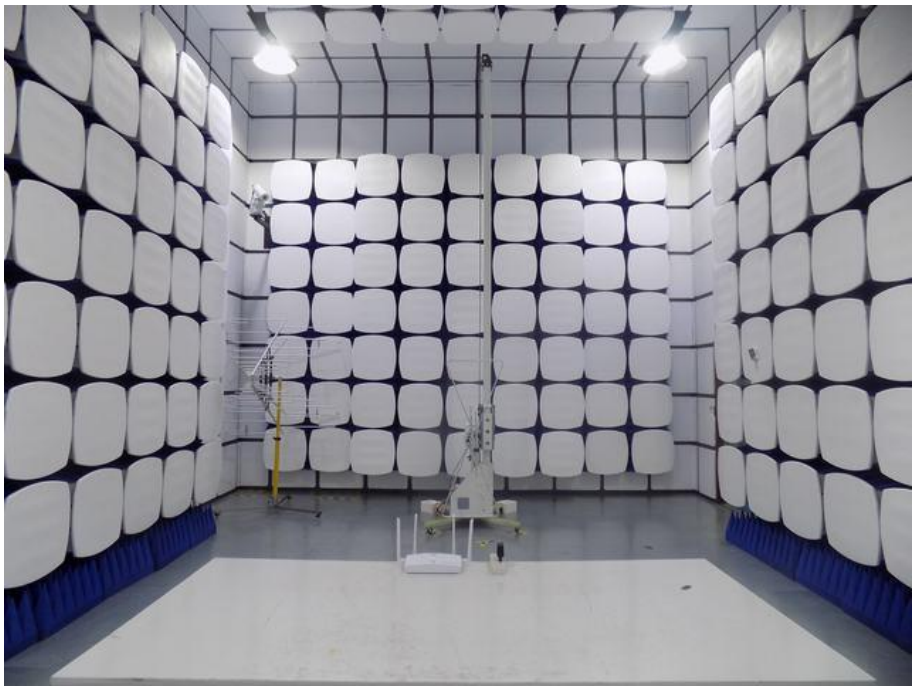
The EUT antenna is PCB Antenna. It comply with the standard requirement.

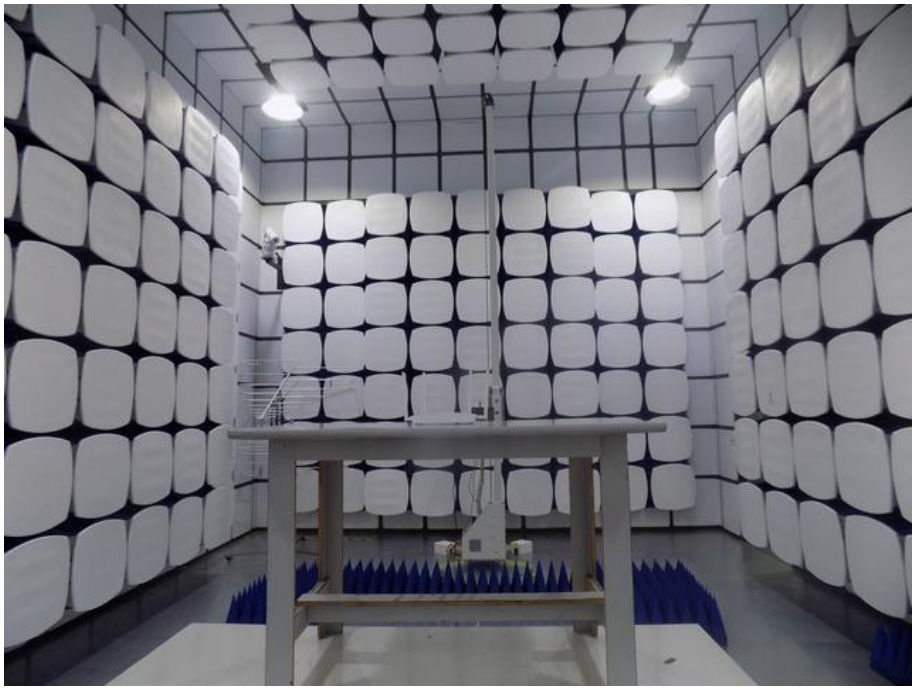
9 Photographs of Test Setup

9.1 Photo of Conducted Emission

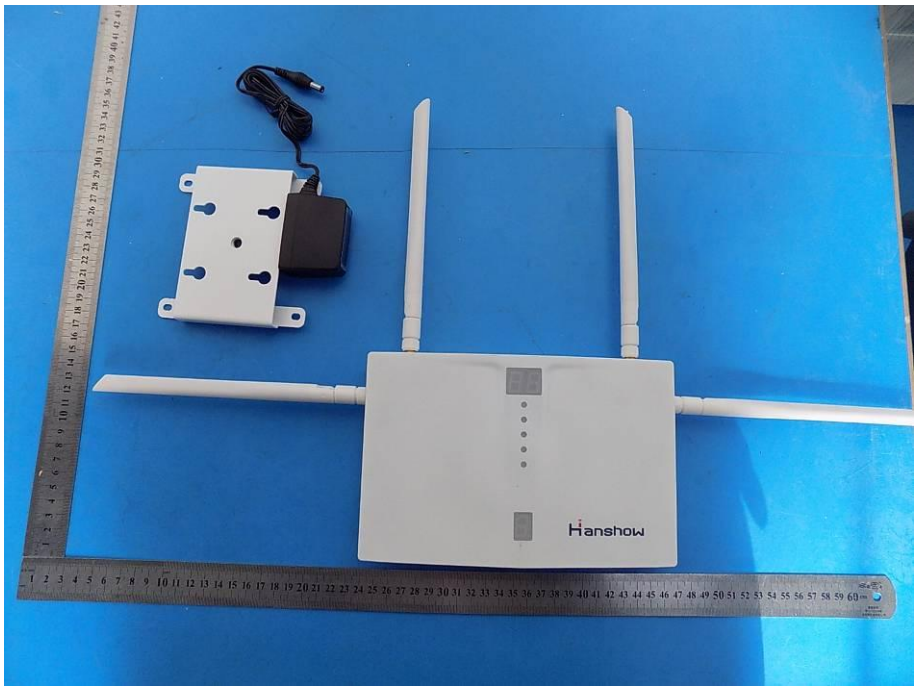


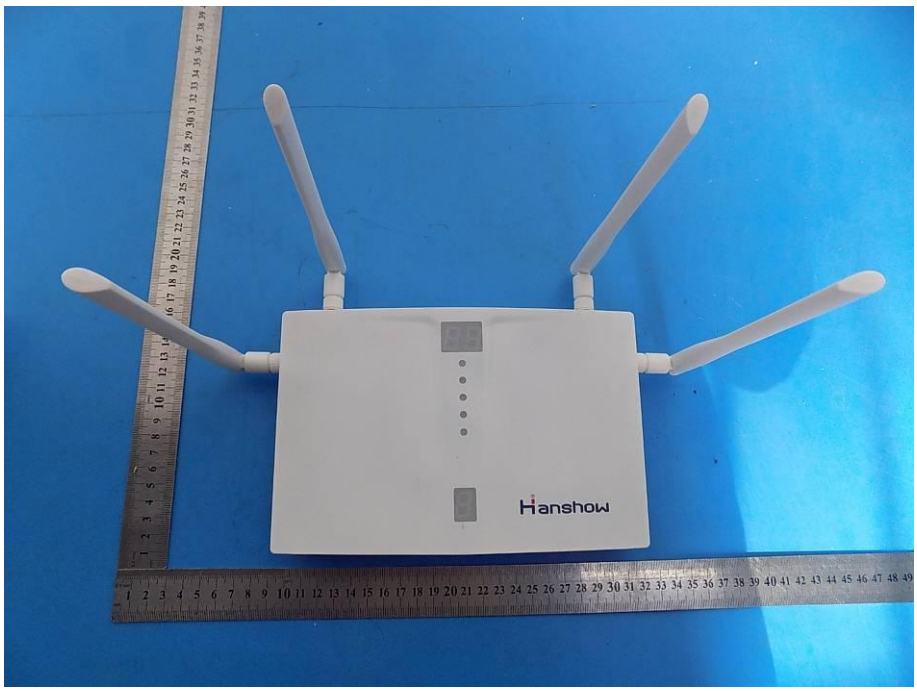
9.2 Photos of Radiated emission

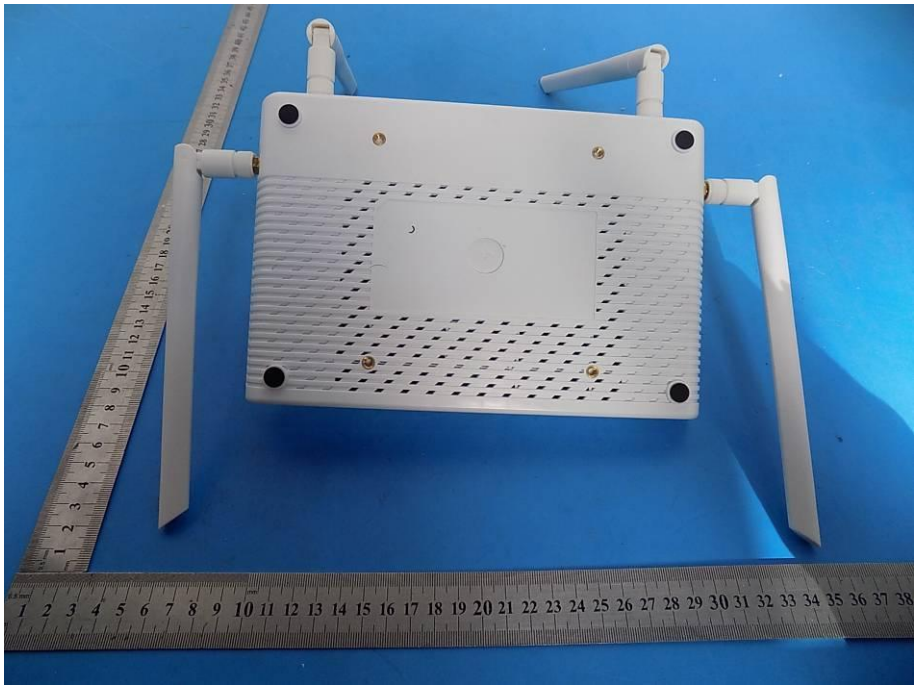


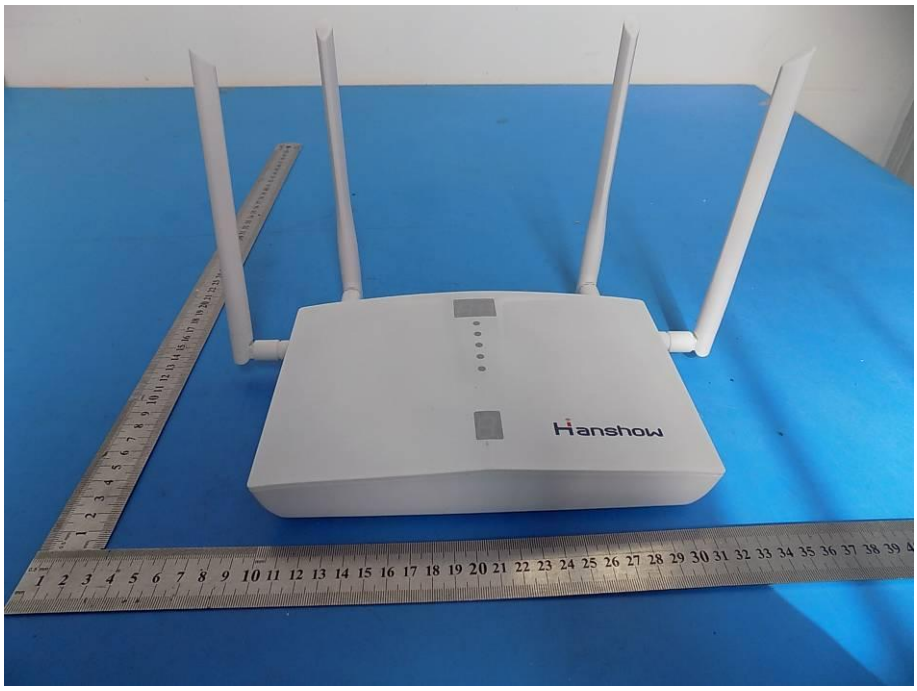


10 Photographs of EUT

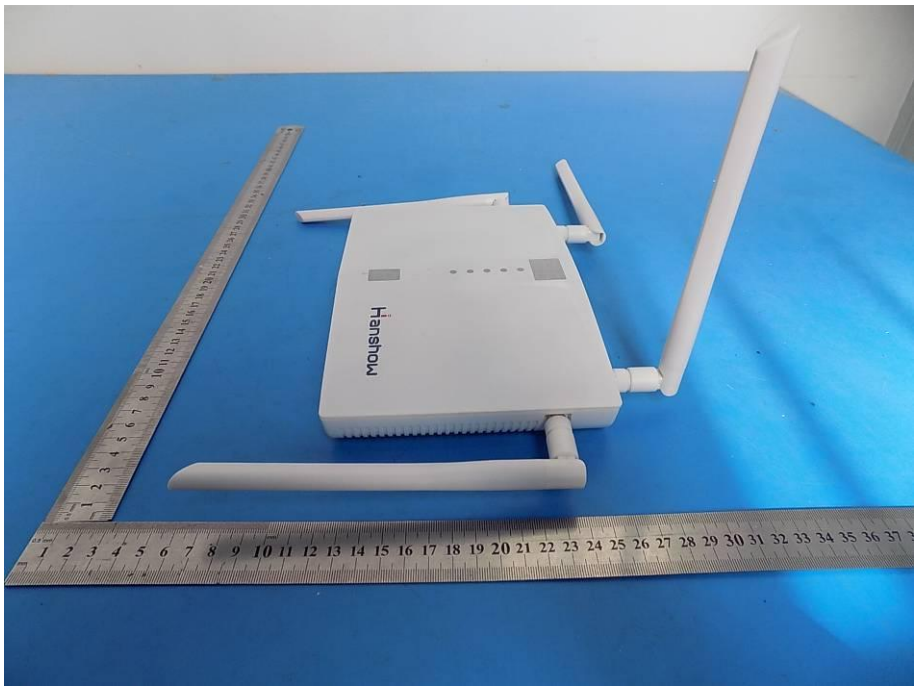


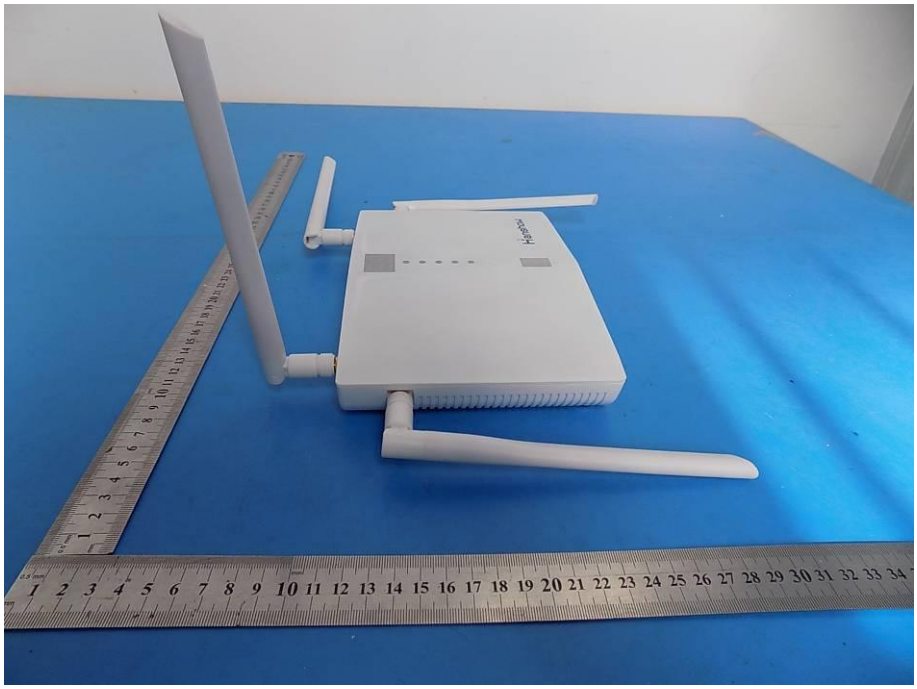


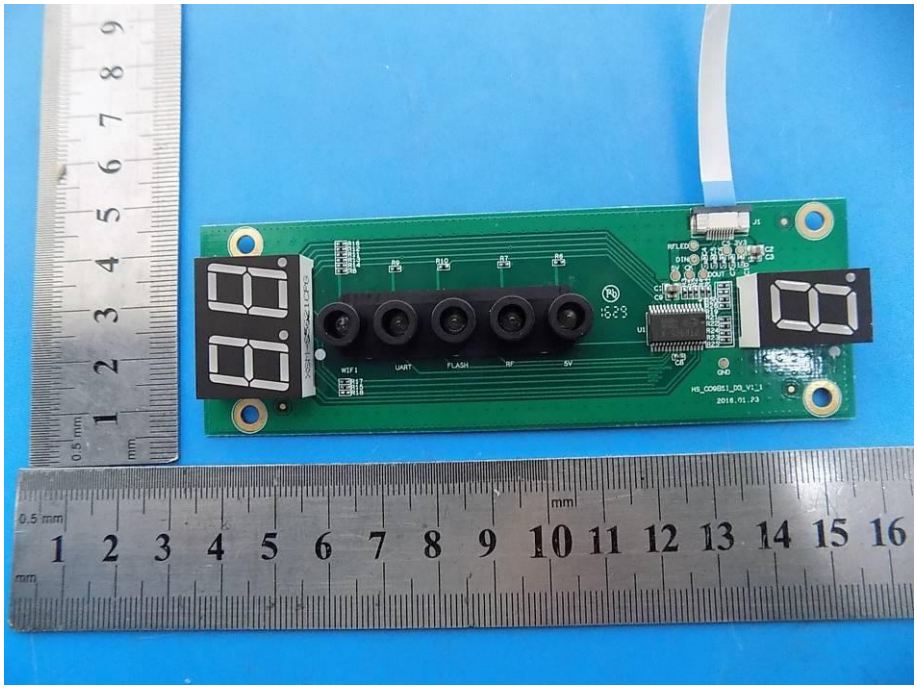


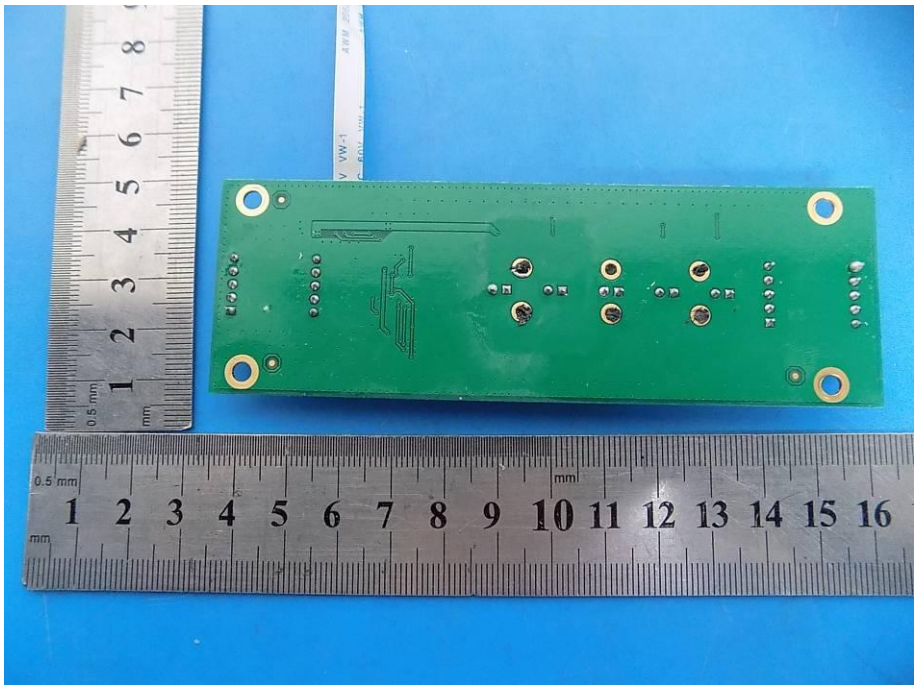

Hanshow

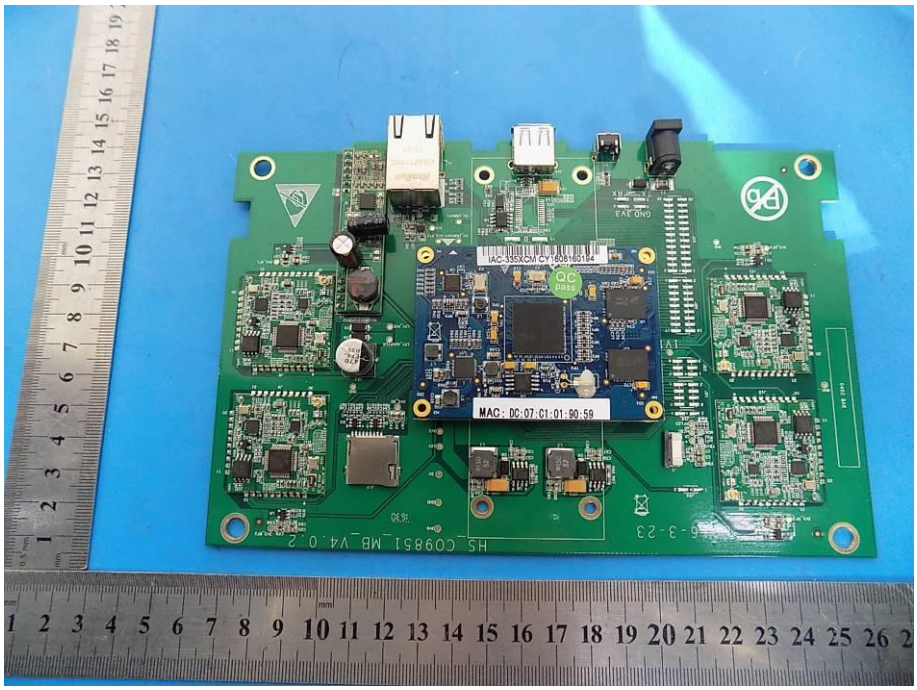
Hanshow
POWER
RESET
USB
LAN

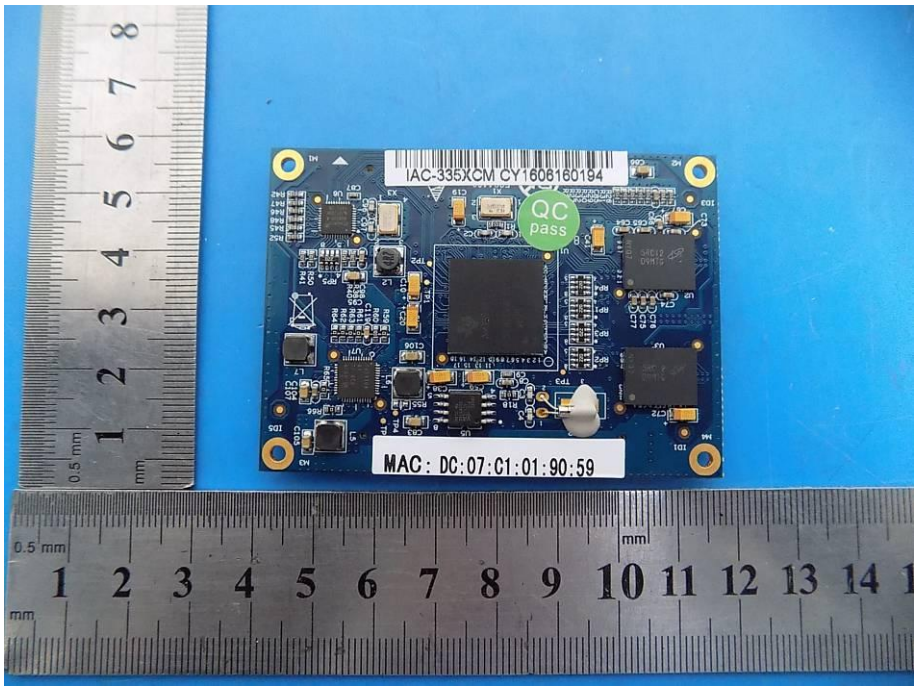

Hanshow

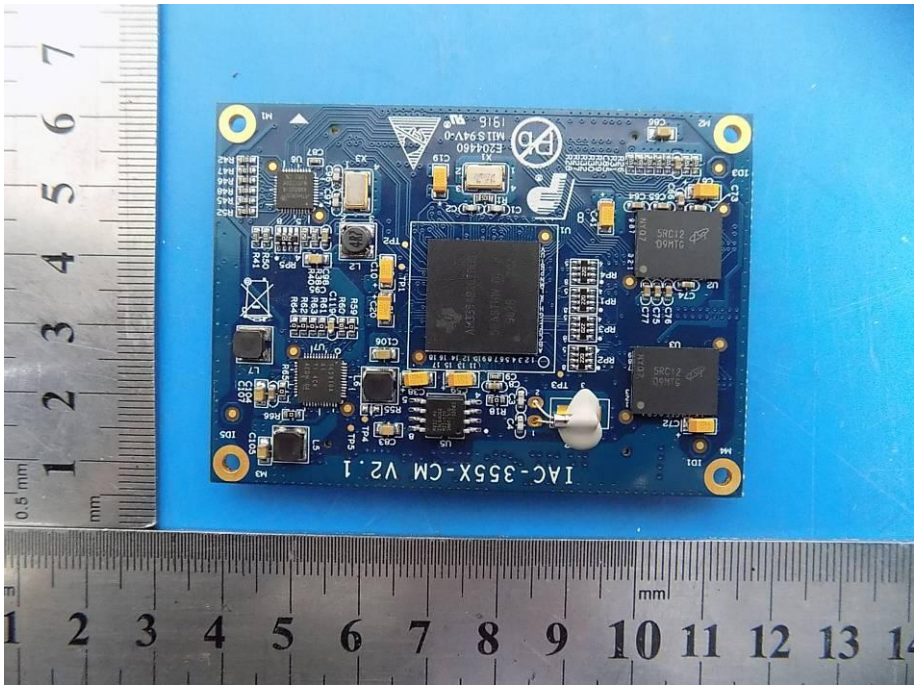


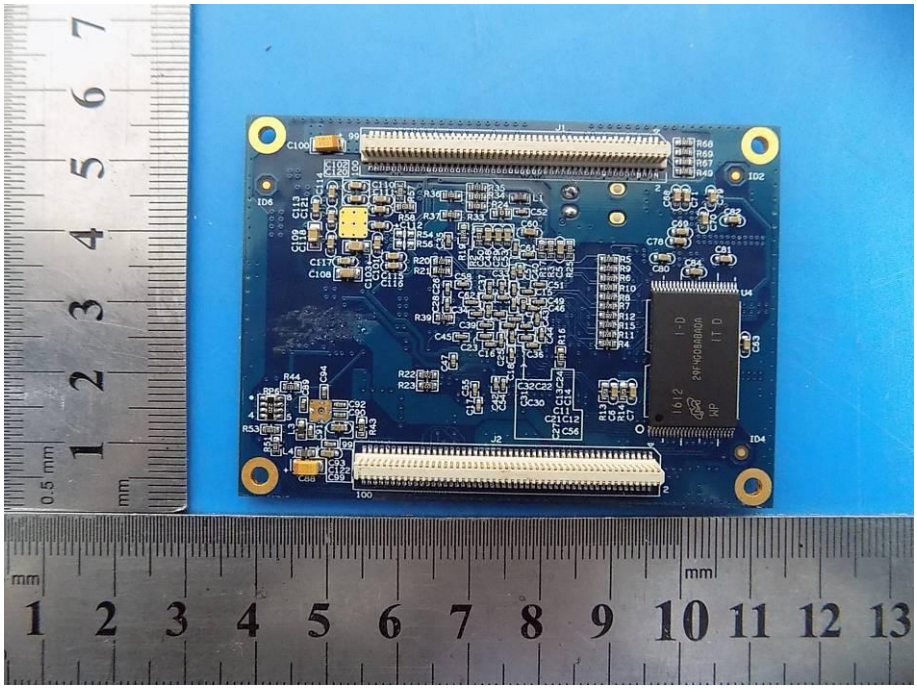

WIFI
UART
FLASH
RF
5V
GND
0.5 mm
mm
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

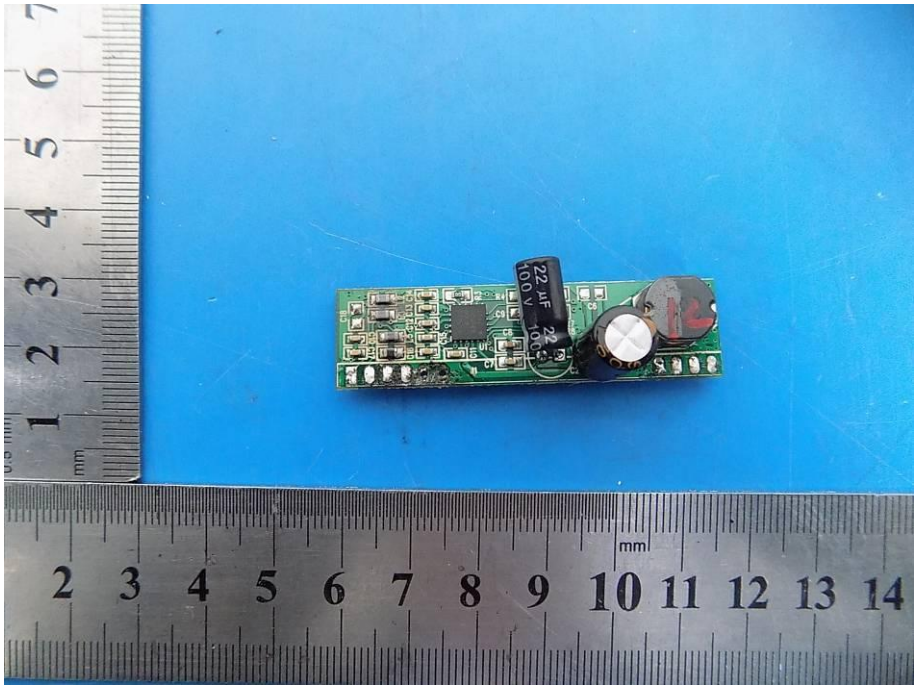

0.5 mm
mm
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

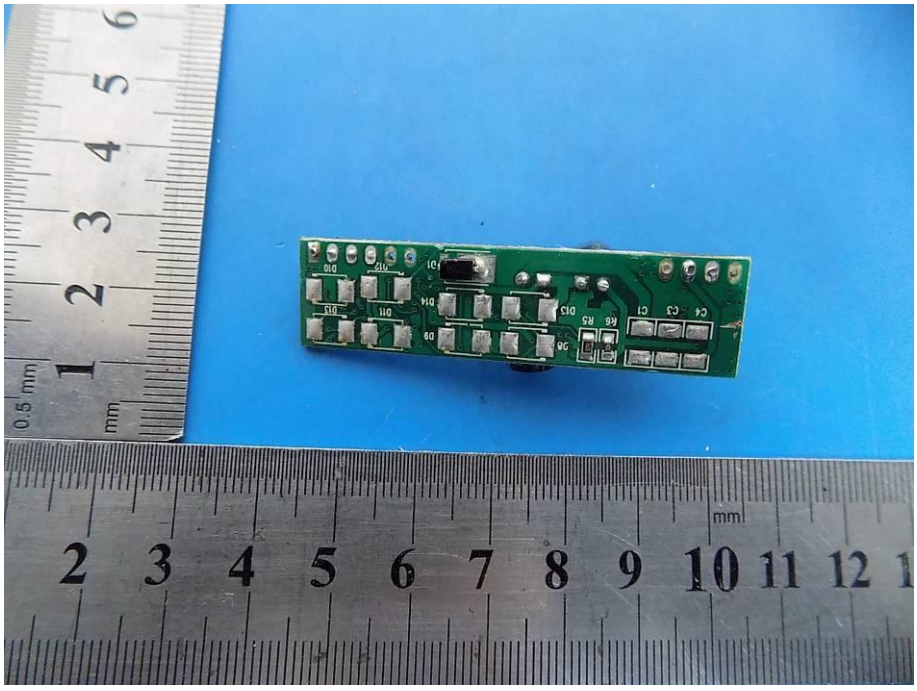

IAC-335XCM CY1606160194
QC pass
MAC: DC:07:C1:01:90:59

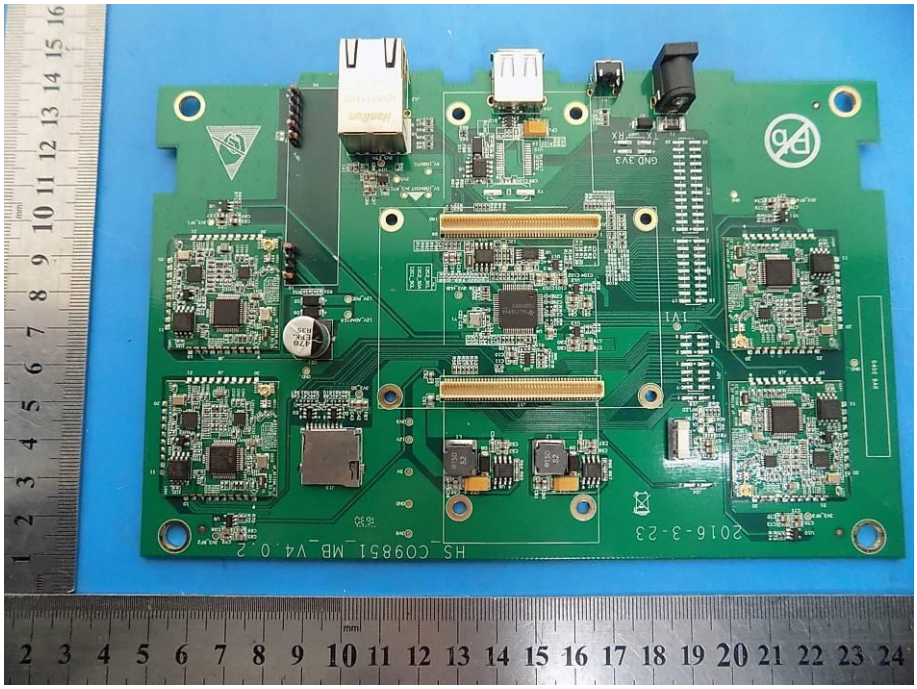

IAC-335XCM CY1606160194
QC pass
MAC: DC:07:C1:01:90:59


IAC-355X-CM V2.1




22 uF
100 V
mm


0.5 mm
mm



------ END OF REPORT-------