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FCC TEST REPORT

Under:
FCC Part 15, Class B

Prepared For:

YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD.

309, 3th Floor, No.16, Yun Ding North Road, Huli District, Xiamen City, Fujian, China

FCC ID: T2C-W60B
EUT: DECT IP Base Station
Model: W60B

September 12, 2017 **Issue Date:**
Original Report **Report Type:**
Jacky Huang **Test Engineer:** Jacky Huang
Apollo Liu **Review By:** Apollo Liu / Manager

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1. General Information

1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

1. 2 Testing Laboratory

Ke Mei Ou Laboratory Co., Ltd.

ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.
FCC Test Site Registration Number: 962205
Internet: www.kmolab.com

1. 3 Details of Applicant

Name : YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD.
Address : 309, 3th Floor, No.16, Yun Ding North Road, Huli District, Xiamen City, Fujian, China

1. 4 Application Details

Date of Receipt of Application	: June 22, 2017
Date of Receipt of Test Item	: June 22, 2017
Date of Test	: June 22 ~ July 2, 2017

1. 5 Test Item

Manufacturer	: Same as applicant
Address	: Same as applicant
Trade Name	: YEALINK
Model No.(Base)	: W60B
Model No.(Extension)	: N/A
Description	: DECT IP Base Station

Additional Information

Frequency	: 1921.536~1928.448MHz
RF Power	: FP- Ant0: 90.78mW, Ant1:98.86mW(Conducted Peak)
Number of Channels	: 5
Type of Modulation	: GFSK
Power Supply	:
	1# AC/DC Adapter
	Input:100-240~50/60Hz 0.25A; Output: 5.0V/0.6 (OH-1006B0500600U-UL）
	2# AC/DC Adapter
	Input:100-240~50/60Hz 0.2A; Output: 5.0V/0.6 (YLPS050600C-US)
	POE 48V
Antenna	: FP-Internal Ant0&Ant1 (-1.0dBi)

1. 6 Test Standards

FCC Part 15, Class B

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

2. Technical Test

2. 1 Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107	Conducted Test	PASS	Complies
FCC Part 15, Paragraph 15.109	Radiated Test	PASS	Complies

2. 2 Measurement Uncertainty

Measurement	Frequency	Uncertainty
Conducted emissions	0.15MHz~30MHz	1.72
Radiated emissions	30MHz ~ 300MHz	3.88
Radiated emissions	300MHz ~1000MHz	3.86
Radiated emissions	1000MHz ~18000MHz	5.28

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

3. EUT Modifications

No modification by test lab.

4. Conducted Power Line Test

4. 1 Test Equipment

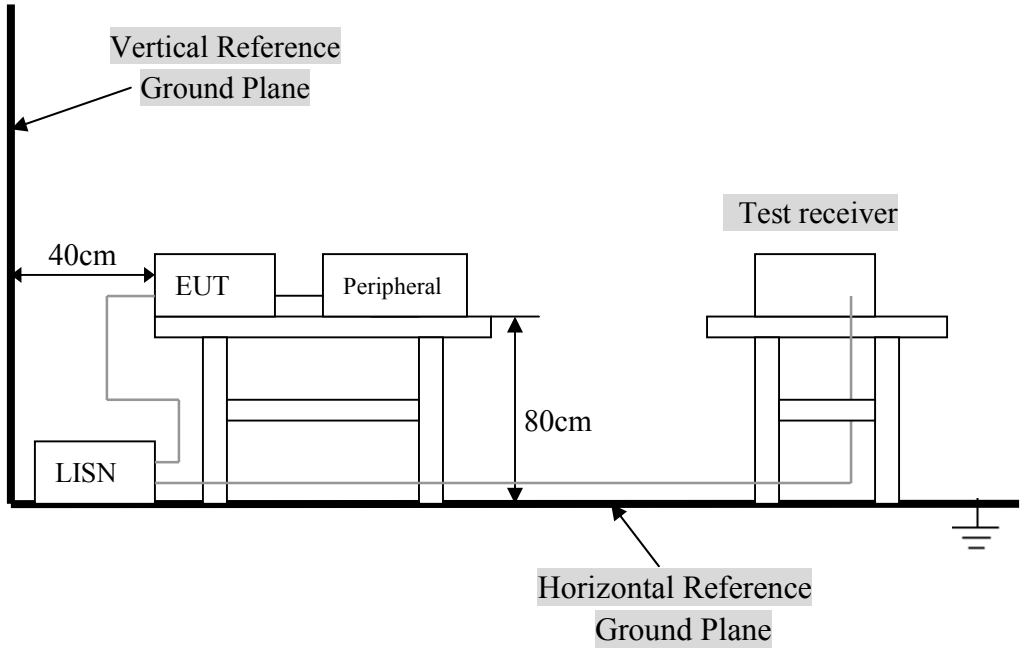
Please refer to Section 8 this report.

4. 2 Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission., the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4:2014 on conducted measurement. Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

4. 3 Test Setup



For the actual test configuration, Please refer to the related items – Photos of Testing.

4. 4 Configuration of The EUT

The EUT was configured according to ANSI C63.4:2014. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model #	FCC ID
DECT IP Base Station	Same as applicant	W60B	T2C-W60B

B. Internal Devices

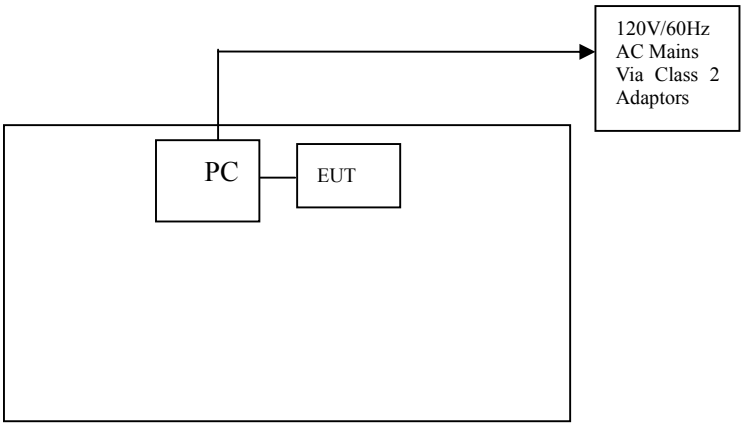
Device	Manufacturer	Model #	FCCID / DoC
N/A			

C. Peripherals

Device	Manufacturer	Model # Serial #	FCC ID/ DoC	Cable
Notebook	LENOVO	20195	DoC	1.5m unshielded power cord
Keyboard	DELL	KB212-B	DoC	1.5m unshielded cable
Mouse	DELL	MS-111	DoC	1.5m unshielded cable

4. 5 EUT Operating Condition

Operating condition is according to ANSI C63.4:2014.
A. Setup the EUT and simulators as shown on follow.
B. Enable RF signal and confirm EUT active.
A. Modulate output capacity of EUT up to specification.



4. 6 Conducted Power Line Emission Limits

Frequency Range (MHz)	Class A QP/AV (dBuV)	Class B QP/AV (dBuV)
0.15 – 0.5	79/66	66 –56/56 –46
0.5 – 5.0	73/60	56/46
5.0 – 30	73/60	60/50

Note: In the above table, the tighter limit applies at the band edges.

4. 7 Conducted Power Line Test Result

Product	: DECT Repeater	Test Mode	: Normal
Test Item	: Conducted Emission Data	Temperature	: 25 ℃
Test Voltage	: DC 5V	Humidity	: 56%RH
Test Result	: **PASS**		

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All readings are quasi -peak values with a resolution bandwidth of 9 KHz.

· Temperature ： 26 ℃

· Humidity ： 53 % RH

FP:

1# AC/DC Adapter

FCC 15 Class B										
Frequency (MHz)	Read Level (dBuV)		Factor (dB)	Emission (dBuV)		Line/ Neutral	Limit (dBuV)		Margin (dBuV)	
	QP	AV		QP	AV		QP	AV	QP	AV
0.346	33.65	18.69	10.40	44.05	29.09	Line	59.06	49.06	-15.01	-19.97
0.150	42.97	35.43	10.30	53.27	45.73	Neutral	66.00	56.00	-12.73	-10.27
0.438	26.68	12.97	10.40	37.08	23.37	Line	57.10	47.10	-20.02	-23.73
0.326	40.06	33.51	10.30	50.36	43.81	Neutral	59.55	49.55	-9.19	-5.74
0.954	26.38	11.57	10.40	36.78	21.97	Line	56.00	46.00	-19.22	-24.03
1.026	25.85	20.57	10.40	36.25	30.97	Neutral	56.00	46.00	-19.75	-15.03
FCC 15 Class B										

Note: NF = No Significant Peak was Found.

2# AC/DC Adapter

FCC 15 Class B										
Frequency (MHz)	Read Level (dBuV)		Factor (dB)	Emission (dBuV)		Line/ Neutral	Limit (dBuV)		Margin (dBuV)	
	QP	AV		QP	AV		QP	AV	QP	AV
0.802	33.08	22.85	10.40	43.48	33.25	Line	56.00	46.00	-12.52	-12.75
0.154	40.93	22.35	10.30	51.23	32.65	Neutral	65.78	55.78	-14.55	-23.13
0.878	34.89	21.55	10.40	45.29	31.95	Line	56.00	46.00	-10.71	-14.05
0.278	33.09	25.30	10.30	43.39	35.6	Neutral	60.88	50.88	-17.49	-15.28
0.902	35.15	20.22	10.40	45.55	30.62	Line	56.00	46.00	-10.45	-15.38
0.326	39.59	31.17	10.30	49.89	41.47	Neutral	59.55	49.55	-9.66	-8.08
0.946	27.25	15.22	10.40	37.65	25.62	Line	56.00	46.00	-18.35	-20.38
0.842	26.53	17.85	10.40	36.93	28.25	Neutral	56.00	46.00	-19.07	-17.75
1.042	31.00	23.04	10.50	41.50	33.54	Line	56.00	46.00	-14.50	-12.46
0.954	29.76	24.32	10.40	40.16	34.72	Neutral	56.00	46.00	-15.84	-11.28
1.558	26.09	21.84	10.50	36.59	32.34	Line	56.00	46.00	-19.41	-13.66
0.978	28.61	22.81	10.40	39.01	33.21	Neutral	56.00	46.00	-16.99	-12.79
FCC 15 Class B										

Note: NF = No Significant Peak was Found.

Note:

1.Uncertainty in conducted emission measured is <+/ -2dB.

2.The emission levels of other frequencies were very low against the limit.

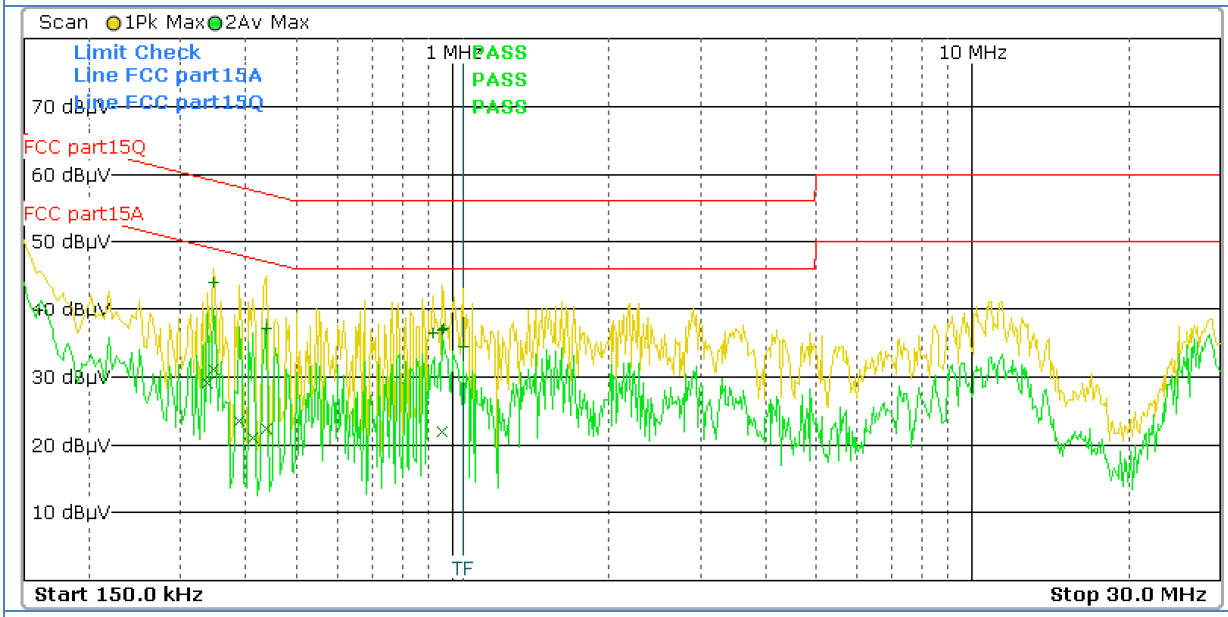
3.All Reading Levels are Quasi-Peak and Average value.

4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.

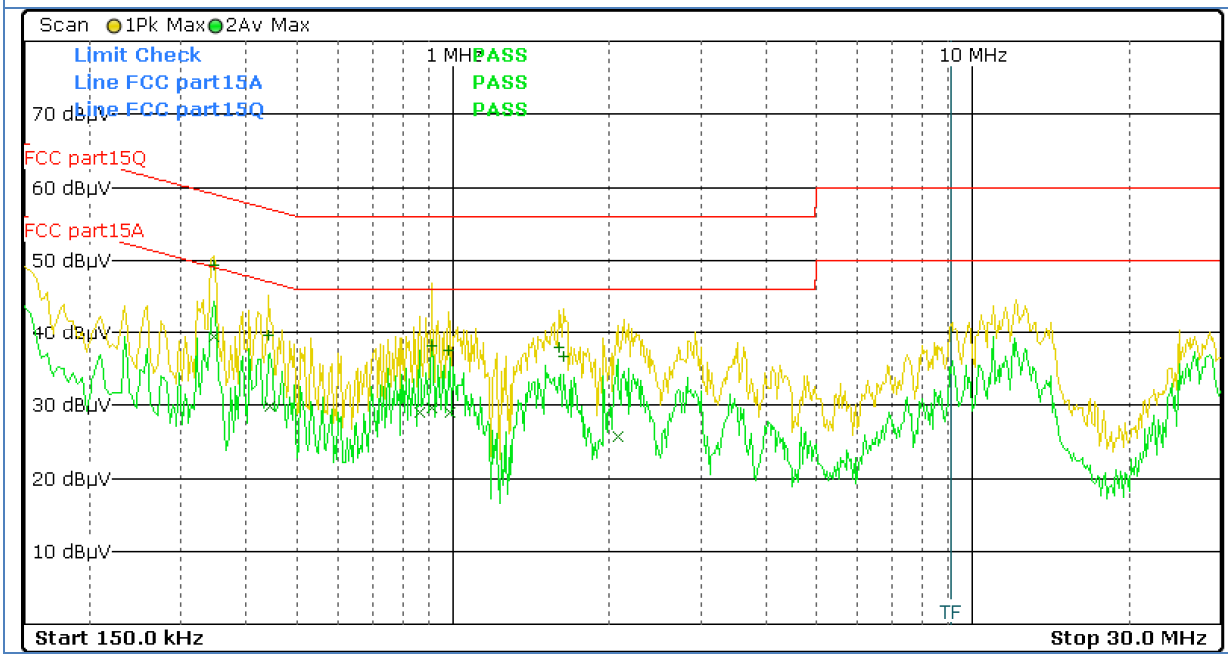
5.Margin Value = Emission Level - Limit Value.

1# AC/DC Adapter

FCC 15.107 - Conducted Emission - Line

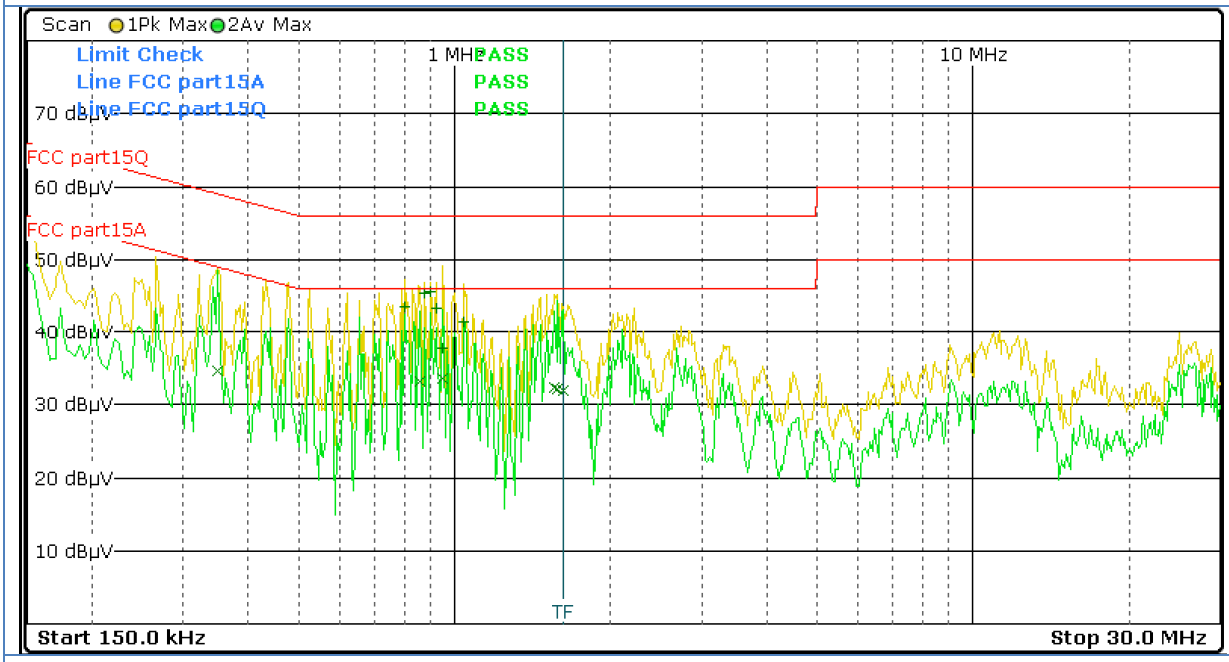


FCC 15.107 - Conducted Emission - Neutral

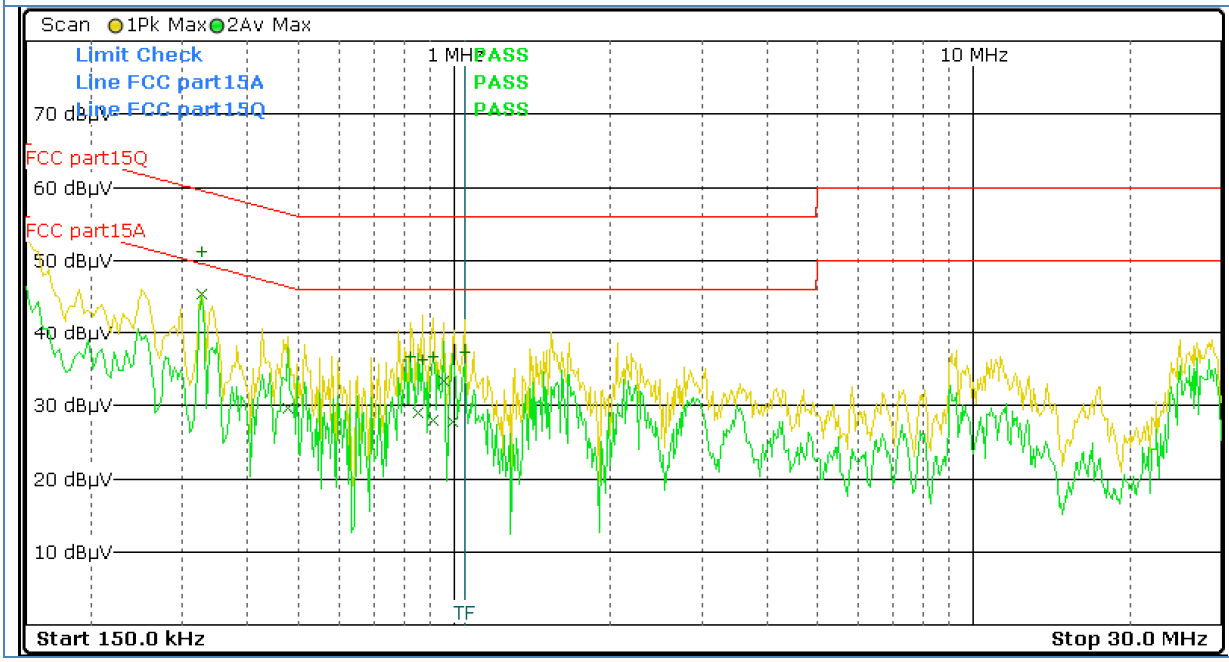


2# AC/DC Adapter

FCC 15.107 - Conducted Emission - Line



FCC 15.107 - Conducted Emission - Neutral



5. Radiated Emission Test

5. 1 Test Equipment

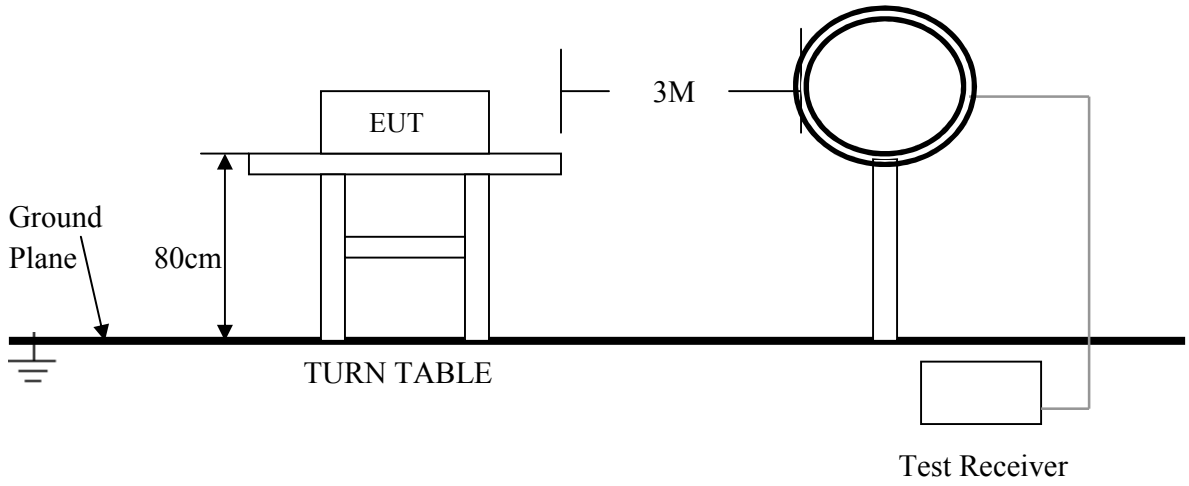
Please refer to Section 8 this report.

5. 2 Test Procedure

1. The EUT was tested according to ANSI C63.4:2014.
2. The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m, and which is 1.5 m high for above 1 GHz. All set up is according to ANSI C63.4:2014 .
3. The frequency spectrum from 9 kHz to 25 GHz was investigated. All readings from 9 kHz to 150 kHz are quasi-peak values with a resolution bandwidth of 200 Hz. All readings from 150 kHz to 30 MHz are quasi-peak values with a resolution bandwidth of 9 KHz. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz , peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
4. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. The Receiving antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency. Emissions below 30MHz were measured with a loop antenna while emission above 30MHz were measured using a broadband E-field antenna.
5. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4:2014

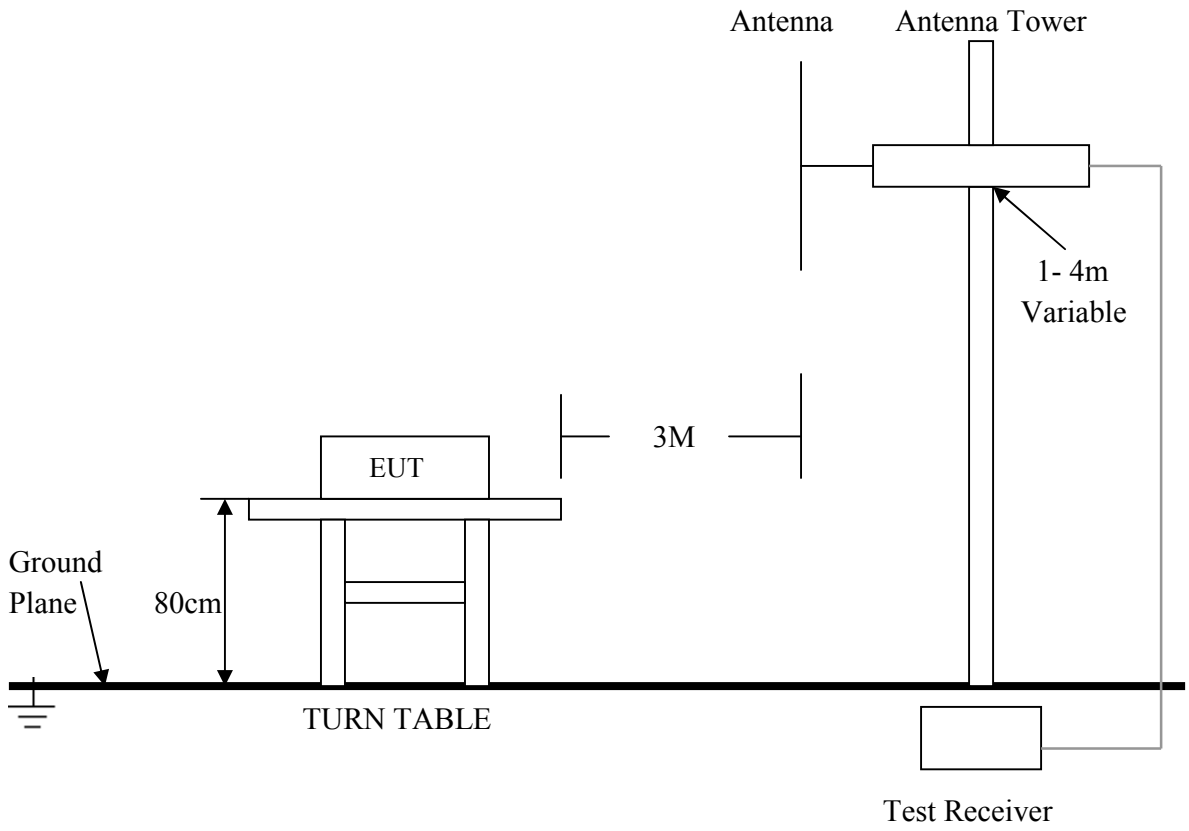
5. 3 Radiated Test Setup

For Frequencies below 30 MHz



For the actual test configuration , please refer to the related items – Photos of Testing

For Frequencies above 30 MHz



For the actual test configuration , please refer to the related items – Photos of Testing

5. 4 Configuration of The EUT

Same as section 4.4 of this report

5. 5 EUT Operating Condition

Same as section 4.5 of this report

5. 6 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.109.

Frequency (MHz)	Distance (m)	Field Strength (dBuV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

Note:

1. In the emission tables above, the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.
3. The lower limit shall apply at the transition frequencies.

5. 7 Radiated Emission Test Result

Product	: DECT Repeater	Test Mode	: Normal Link / Auto
Test Item	: Fundamental Radiated Emission Data	Temperature	: 25 ℃
Test Voltage	: DC 5V	Humidity	: 56%RH
Test Result	: **PASS**	Model	:

For Frequency below 30MHz

Freq. (MHz)	Emission (dBuV/m) QP Detector	HORIZ / VERT	Limits (dBuV/m)	Margin (dB)
N/A				
N/A				
N/A				
N/A				
N/A				
N/A				

Note: (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
(2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
(3) Emission Level = Reading Level + Probe Factor + Cable Loss.

For Frequency from 30MHz to 1GHz

1# AC/DC Adapter

FCC 15 Class B						
Frequency (MHz)	**Read Level (dBuV)**	**Factor (dB)**	**Emission (dBuV/m)**	**Horiz./ Vert.**	**Limit (dBuV/m)**	**Margin (dB)**
52.600	12.99	10.66	23.65	Horiz./	40.0	-16.35
36.220	7.74	11.78	19.52	Vert.	40.0	-20.48
69.250	16.87	8.81	25.68	Horiz./	40.0	-14.32
101.230	7.85	8.67	16.52	Vert.	43.5	-26.98
156.020	7.86	15.18	23.04	Horiz./	43.5	-20.46
155.360	6.88	15.18	22.06	Vert.	43.5	-21.44
FCC 15 Class B						

2# AC/DC Adapter

FCC 15 Class B						
Frequency (MHz)	**Read Level (dBuV)**	**Factor (dB)**	**Emission (dBuV/m)**	**Horiz./ Vert.**	**Limit (dBuV/m)**	**Margin (dB)**
52.650	11.19	10.66	21.85	Horiz./	40.0	-18.15
36.050	8.09	11.78	19.87	Vert.	40.0	-20.13
69.680	15.45	8.81	24.26	Horiz./	40.0	-15.74
101.650	8.98	8.67	17.65	Vert.	43.5	-25.85
156.100	11.05	10.96	22.01	Horiz./	43.5	-21.49
157.230	10.93	10.96	21.89	Vert.	43.5	-21.61
FCC 15 Class B						

POE

FCC 15 Class B						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
52.630	10.23	10.66	20.89	Horiz./	40.0	-19.11
36.230	8.14	11.78	19.92	Vert.	40.0	-20.08
69.560	14.84	8.81	23.65	Horiz./	40.0	-16.35
101.480	9.79	8.67	18.46	Vert.	43.5	-25.04
156.420	10.69	10.96	21.65	Horiz./	43.5	-21.85
157.680	10.00	10.96	20.96	Vert.	43.5	-22.54
FCC 15 Class B						

Note: (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
(2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
(3) Emission Level = Reading Level + Probe Factor + Cable Loss.

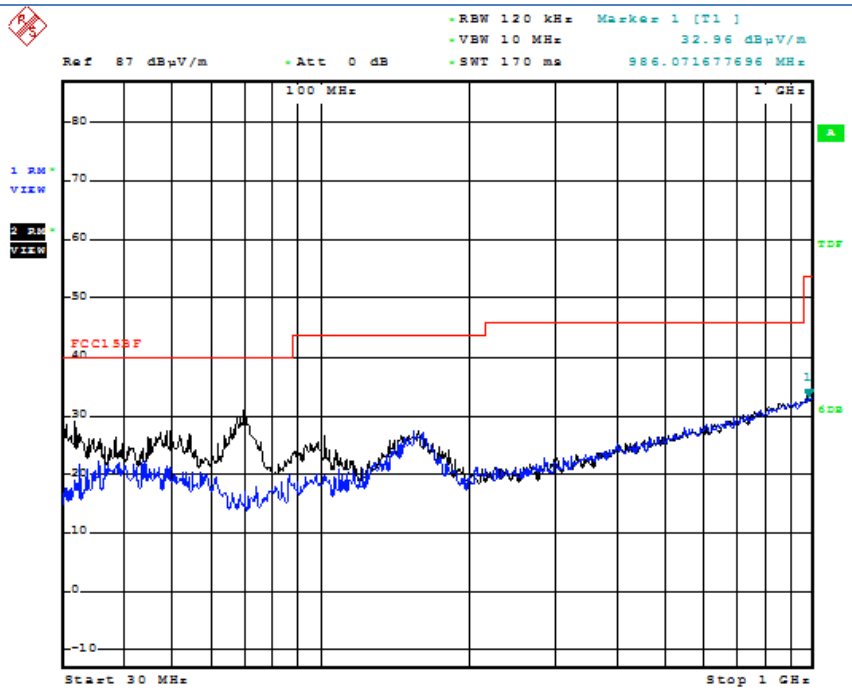
Frequency above 1 GHz

FCC 15 Class B										
Frequency (MHz)	Read Level(dBuV)		Factor (dB)	Emission(dBuV/m)		Horiz./ Vert.	Limit (dBuV/m)		Margin(dB)	
	PK	AV		PK	AV		PK	AV	PK	AV
2432.600	39.49	31.13	0.37	39.86	31.5	Horiz./	74.0	54.0	-34.14	-22.50
2435.200	38.19	33.94	0.37	38.56	34.31	Vert.	74.0	54.0	-35.44	-19.69
3001.500	39.44	34.31	3.21	42.65	37.52	Horiz./	74.0	54.0	-31.35	-16.48
3001.600	38.64	32.47	3.21	41.85	35.68	Vert.	74.0	54.0	-32.15	-18.32
4445.320	36.48	24.58	10.10	46.58	34.68	Horiz./	74.0	54.0	-27.42	-19.32
4443.500	37.02	24.77	10.10	47.12	34.87	Vert.	74.0	54.0	-26.88	-19.13
FCC 15 Class B										

Note: (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
(2) Emission Level = Reading Level + Probe Factor + Cable Loss.

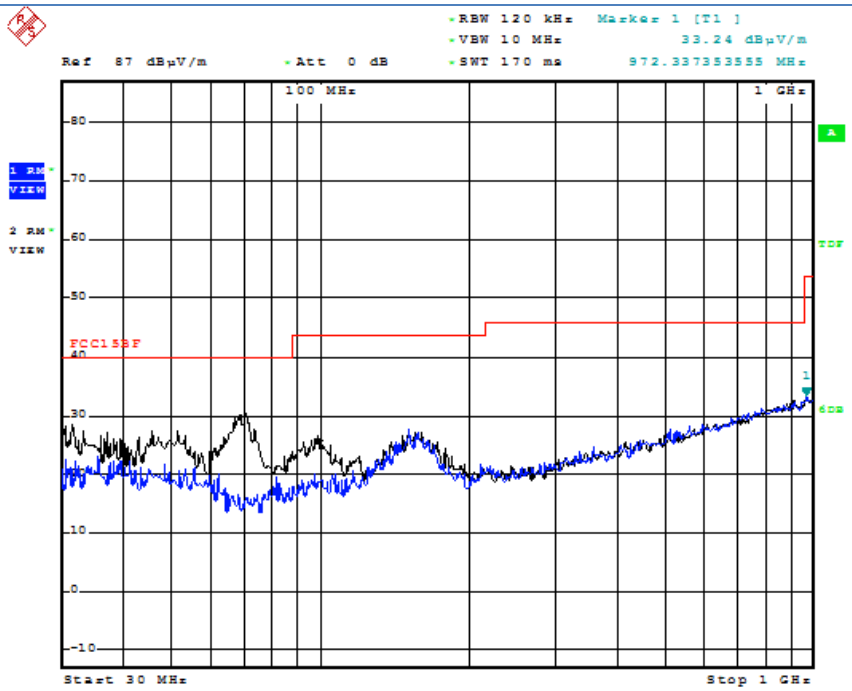
1# AC/DC Adapter

FCC 15.209 – Radiated Emission

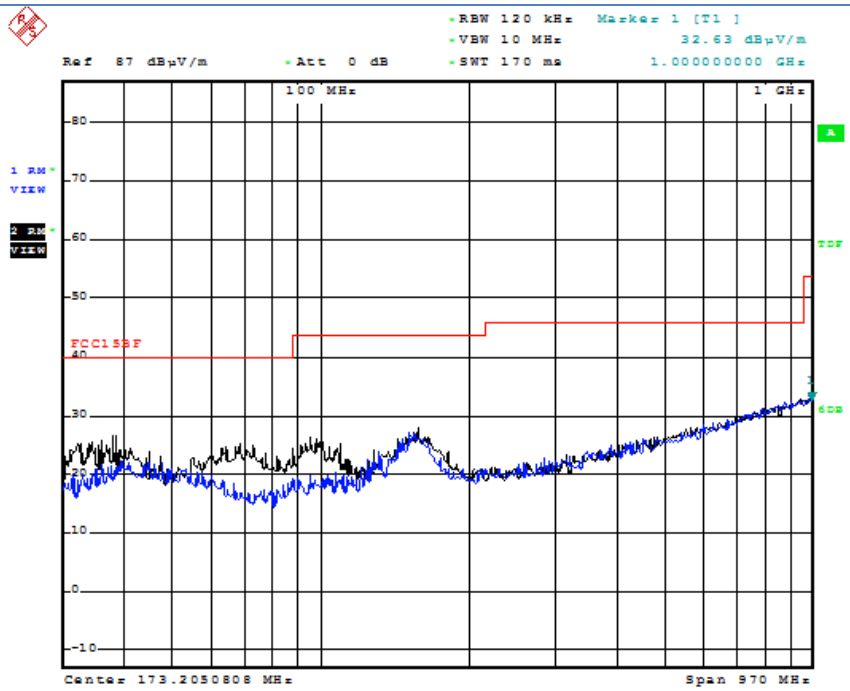


2# AC/DC Adapter

FCC 15.209 – Radiated Emission



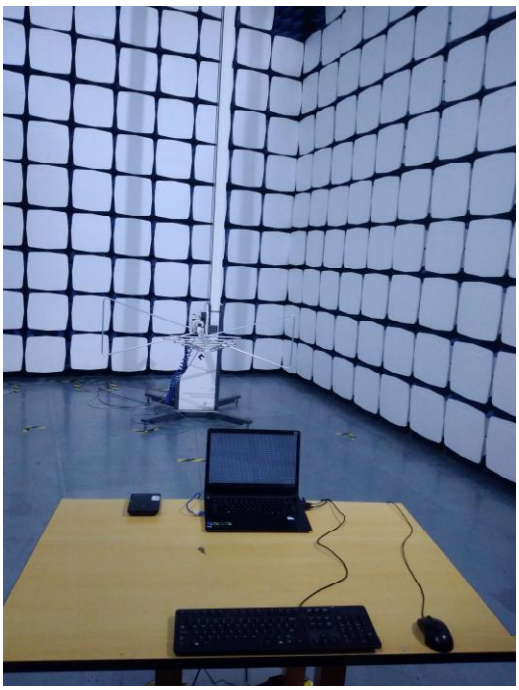
POE
FCC 15.209 – Radiated Emission

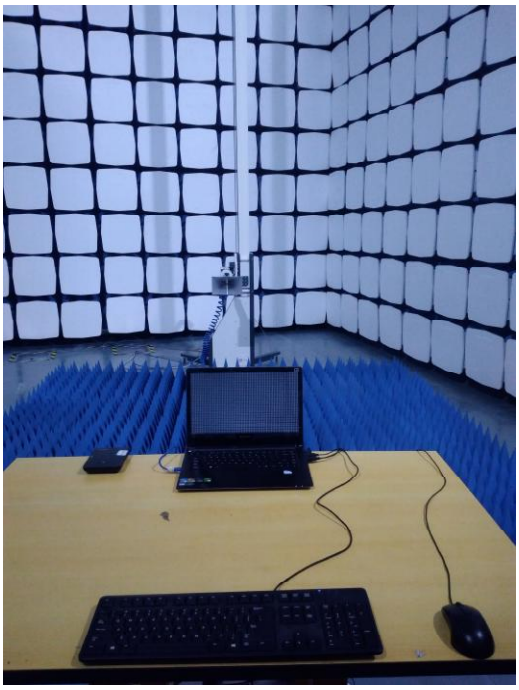


6. Photo of Testing

6.1 Emission test view

FP Conducted Emission test view

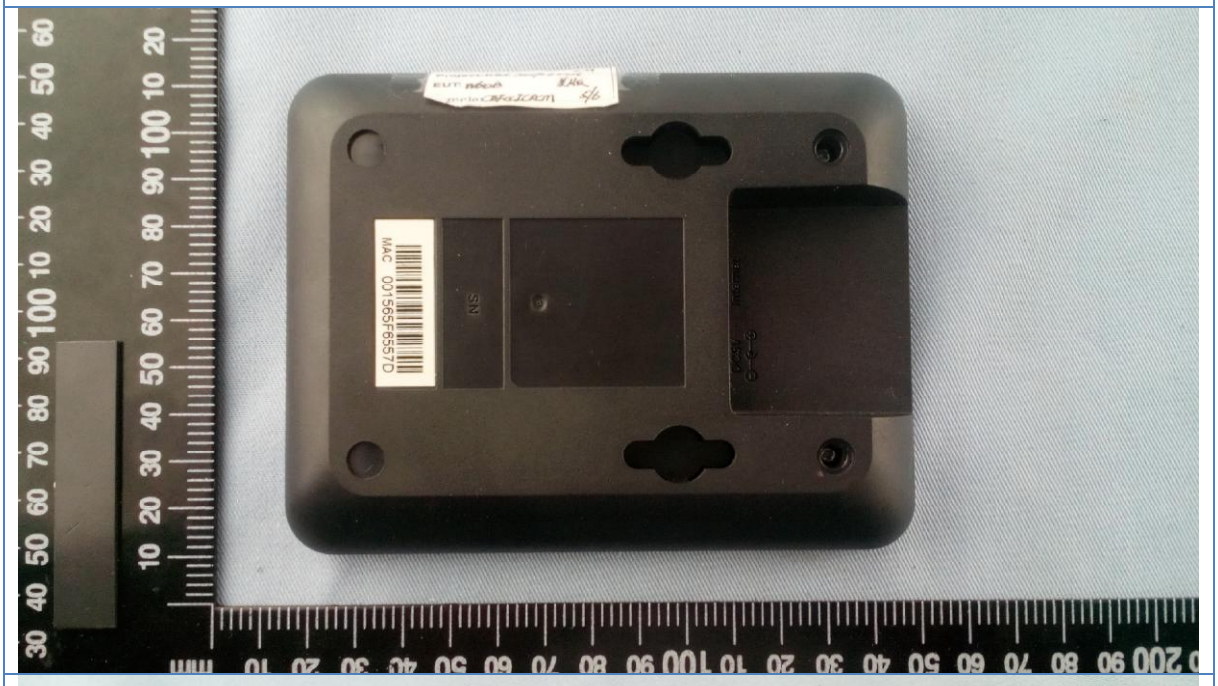

FP - Radiated Emission test view (Frequency from 30MHz to 1GHz)


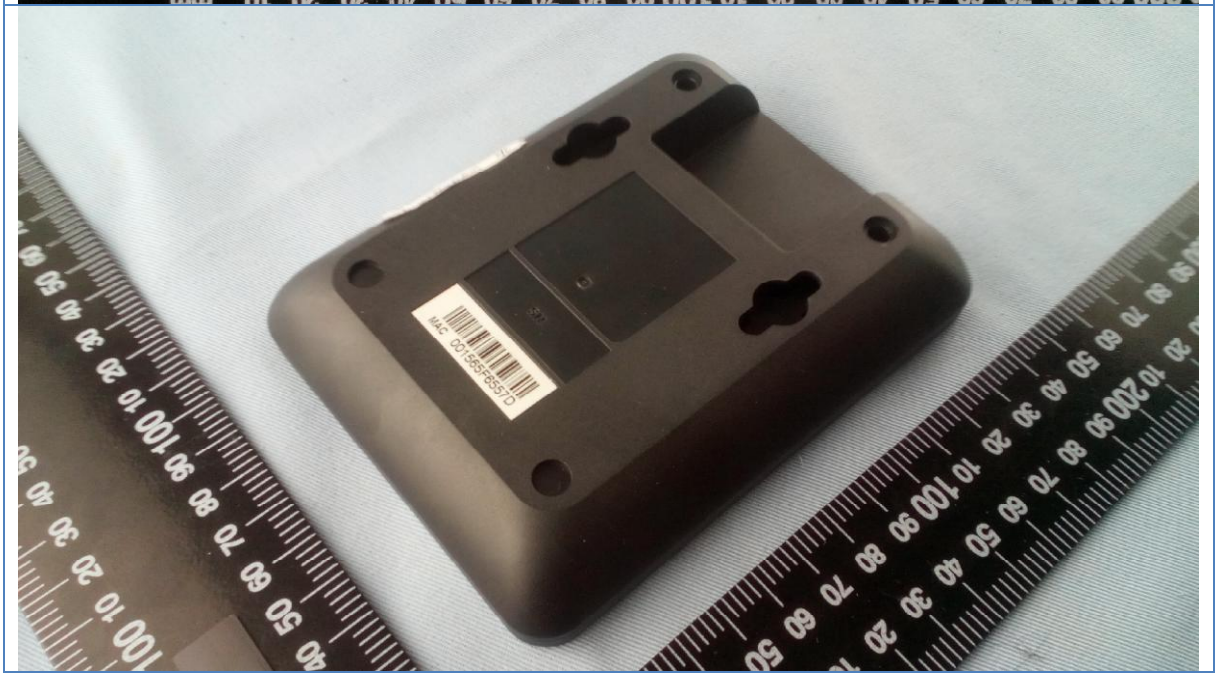
FP - Radiated Emission test view (Frequency above 1GHz)


6.2 Photograph - EUT

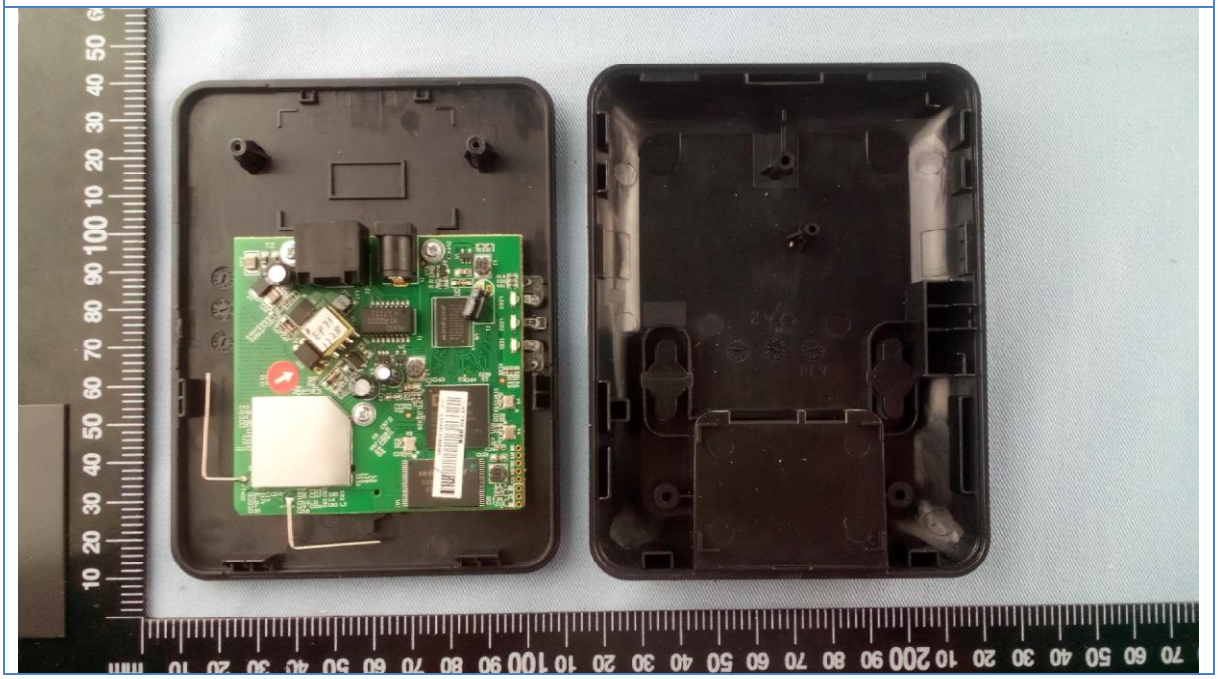
FP EUT top view

EUT bottom view

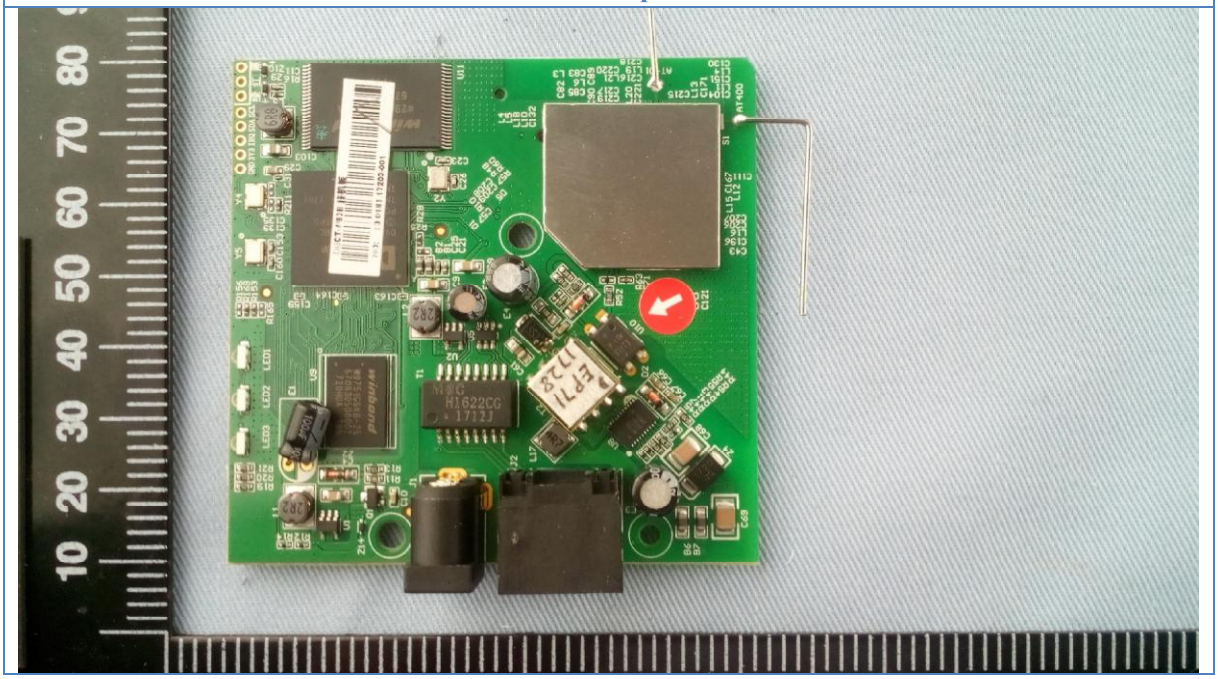


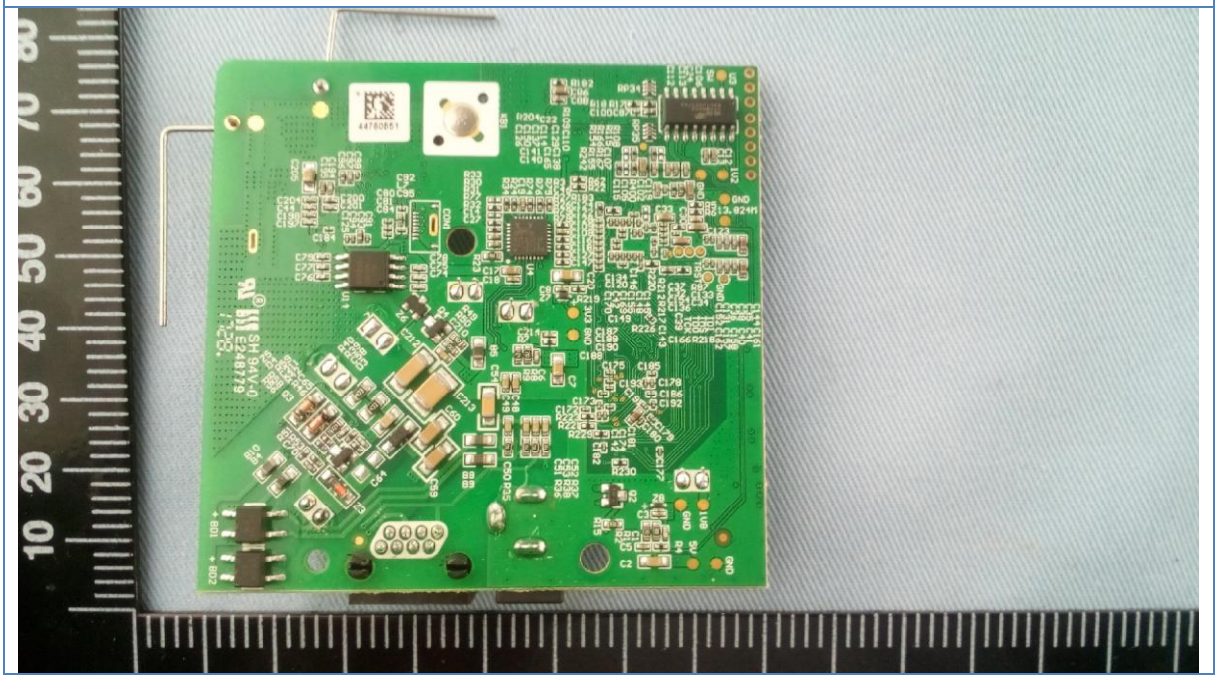


EUT inside whole view



Main board component side



Main board solder side


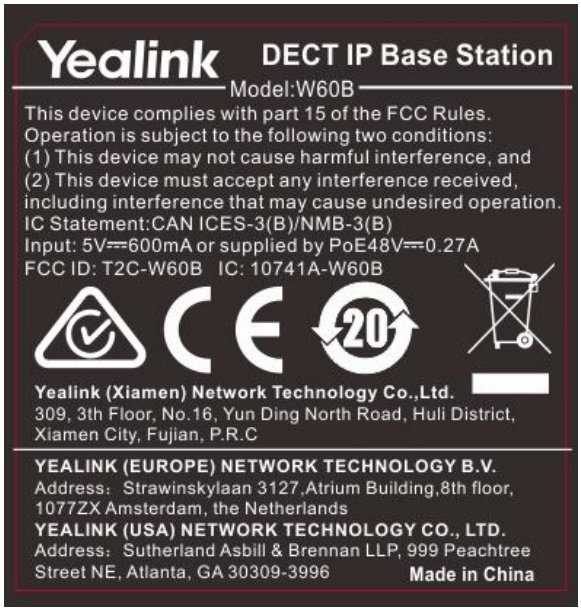
FCC Adapter top view


Adapter side view


FCC Adapter top view

Adapter side view

7. FCC ID Label



The following note shall be conspicuously placed in the users manual: "**Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.**"

The Label must not be a stick-on paper label. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT


8. Test Equipment

The following test equipments were used during the radiated & conducted emission test:

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Due Date
Turntable	Innco systems GmbH	CT-0801	KMO-SZ114	NCR
Antenna Tower	Innco systems GmbH	MM4000-PP	KMO-SZ115	NCR
Controller	Innco systems GmbH	CO2000	KMO-SZ116	NCR
Pre-Amplifier	Agilent	87405C	KMO-SZ155	Dec.6, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI7	KMO-SZ002	June 27, 2018
Spectrum Analyzer	Rohde & Schwarz	FSP40	KMO-SZ003	June 27, 2018
Loop Antenna	Rohde & Schwarz	HFH2-Z2	KMO-SZ004	August 19, 2018
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ005	August 27, 2018
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ007	August 19, 2018
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9170	KMO-SZ366	Jan.9, 2018
AMN	Rohde & Schwarz	ESH3-Z5	KMO-SZ009	June 27, 2018
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	KMO-SZ077	Nov.29, 2017
Digital Radio Communication Tester	Rohde & Schwarz	CMD60	KMO-SZ169	April 10, 2018