

FCC REPORT

(RFID)

Applicant: Ham-Let Singapore Valves & Fittings Pte Ltd

Address of Applicant: 1 Bukit Batok Street 22 #01-04/01-05 Singapore 659592

Equipment Under Test (EUT)

Product Name: IoT-COMMBOX-IoT MANIFOLD

Model No.: IoTHFEE

FCC ID: 2A3I5-HFEE

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 11 Feb., 2022

Date of Test: 12 Feb., to 03 Mar., 2022

Date of report issued: 08 Mar., 2022

Test Result: PASS *

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

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	08 Mar., 2022	Original

Tested by:

Mike Ou

Test Engineer

Date:

08 Mar., 2022

Reviewed by:

Winner Zhang

Project Engineer

Date:

08 Mar., 2022

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4 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass*
6dB Emission Bandwidth	15.247 (a)(2)	Pass*
Power Spectral Density	15.247 (e)	Pass*
Band Edge	15.247(d)	Pass*
Conducted and radiated Spurious Emission	15.205/15.209	Pass*
Remark: 1. Pass: Meet the requirement. 2. Pass*: Please refer to report No. SHEM160900621801. 3. N/A: Not Applicable for Non-adaptive equipment. 4. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer). 5. Remark: The conducted data please refer to FCC ID: VPYCMABZ, report No. SHEM160900621801. The differences between them as below: antenna. So the radiation part needs to retest.		
Test Method:	ANSI C63.4-2014 ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02	

5 General Information

5.1 Client Information

Applicant:	Ham-Let Singapore Valves & Fittings Pte Ltd
Address:	1 Bukit Batok Street 22 #01-04/01-05 Singapore 659592
Manufacturer:	Ham-Let Singapore Valves & Fittings Pte Ltd
Address:	1 Bukit Batok Street 22 #01-04/01-05 Singapore 659592

5.2 General Description of E.U.T.

Product Name:	IoT-COMMBOX-IoT MANIFOLD
Model No.:	IoTHFEE
Operation Frequency:	125KHz Channel: 902.3 MHz - 914.9MHz 500kHz Channel: 903 MHz - 914.2MHz
Channel numbers:	125KHz Channel: 64 channels 500KHz Channel: 8 channels
Channel Space::	125KHz Channel: 200KHz 500kHz Channel: 1.6MHz
Spread Factor (SF):	125KHz Channel: 7-10 500KHz Channel: 7-12
Modulation technology:	CSS
Antenna Type:	Omni-directional antenna
Antenna gain:	2 dBi
AC adapter:	Model: DYS850-240210W-K Input: AC100-240V, 50/60Hz, 1.3A Output: DC24.0V, 2.1A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Test channel						
	125KHz Channel			500KHz Channel		
	Channel	Frequency	SF	Channel	Frequency	SF
Lowest channel	CH01	902.3MHz	10	CH65	903.0MHz	12
Middle channel	CH32	908.5MHz	10	CH68	907.8MHz	12
Highest channel	CH64	914.9MHz	10	CH72	914.2MHz	12
Note: In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test.						

5.3 Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation
The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.	
Remark: JianYan Testing Group Shenzhen Co., Ltd. is only responsible for the test project data of the above samples, and will keep the above samples for a month.	

5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
LENOVO	Laptop	SL510	2847A65	DoC
EBYTE	Test suite	E25 D1	N/A	N/A

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 150KHz) for V-AMN	3.11 dB
Conducted Emission (150kHz ~ 30MHz) for V-AMN	2.62 dB
Conducted Emission (150kHz ~ 30MHz) for AAN	3.54 dB
Radiated Emission (30MHz ~ 1GHz) for 3m SAC	4.45 dB
Radiated Emission (1GHz ~ 18GHz) for 3m SAC	5.34 dB
Radiated Emission (18GHz ~ 40GHz) for 3m SAC	5.34 dB

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

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

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

5.9 Test Instruments list

Radiated Emission(3m SAC):					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	WXJ001-1	01-19-2021	01-18-2024
BiConiLog Antenna	Schwarzbeck	VULB9163	WXJ002	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Biconical Antenna	Schwarzbeck	VUBA9117	WXJ002-1	06-20-2021	06-19-2022
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-2	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-3	06-18-2021	06-17-2022
Pre-amplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9743B	WXG001-7	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Pre-amplifier (1GHz ~ 18GHz)	SKET	LNPA_0118G-50	WXG001-3	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Pre-amplifier (18GHz ~ 40GHz)	RF System	TRLA-180400G45B	WXG001-9	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
EMI Test Receiver	Rohde & Schwarz	ESRP7	WXJ003-1	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Spectrum Analyzer	KEYSIGHT	N9010B	WXJ004-2	11-27-2021	11-26-2022
Coaxial Cable (30MHz ~ 1GHz)	JYTSZ	JYT3M-1G-NN-8M	WXG001-4	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Coaxial Cable (1GHz ~ 18GHz)	JYTSZ	JYT3M-18G-NN-8M	WXG001-5	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Coaxial Cable (18GHz ~ 40GHz)	JYTSZ	JYT3M-40G-SS-8M	WXG001-7	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Band Reject Filter Group	Tonscend	JS0806-F	WXJ089	N/A	
Test Software	Tonscend	TS+	Version: 3.0.0.1		

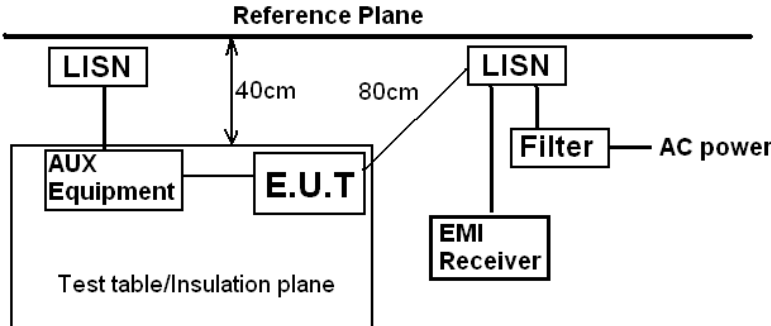
Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI 3	WXJ003	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
RF Switch	TOP PRECISION	RSU0301	WXG003	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
LISN	Schwarzbeck	NSLK 8127	QCJ001-13	03-18-2021	03-17-2022
				02-17-2022	02-16-2023
LISN	Rohde & Schwarz	ESH3-Z5	WXJ005-1	06-18-2021	06-17-2022
LISN Coaxial Cable (9kHz ~ 30MHz)	JYTSZ	JYTCE-1G-NN-2M	WXG003-1	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Test Software	AUDIX	E3	Version: 6.110919b		

6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement:	FCC Part 15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
E.U.T Antenna:	
The LoRa antenna is an Omni-directional antenna which cannot replace by end-user, the best-case gain of the antenna is 2 dBi.	

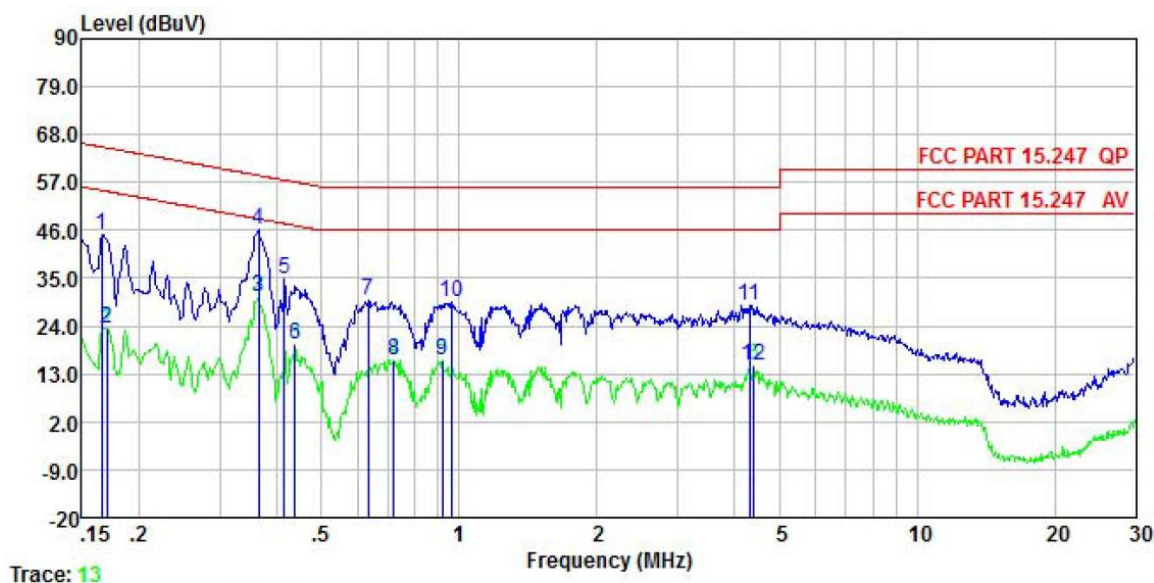
6.2 Conducted Emission

Test Requirement:	FCC Part 15 C Section 15.207		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test procedure	- The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/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. (Please refer to the block diagram of the test setup and photographs). - 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(latest version) on conducted measurement.		
Test setup:	 <i>Remark:</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data:

125 KHz:

Product name:	IoT-COMMBOX-IoT MANIFOLD	Product model:	IoTTHFEE
Test by:	Mike	Test mode:	Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Humi: 55%

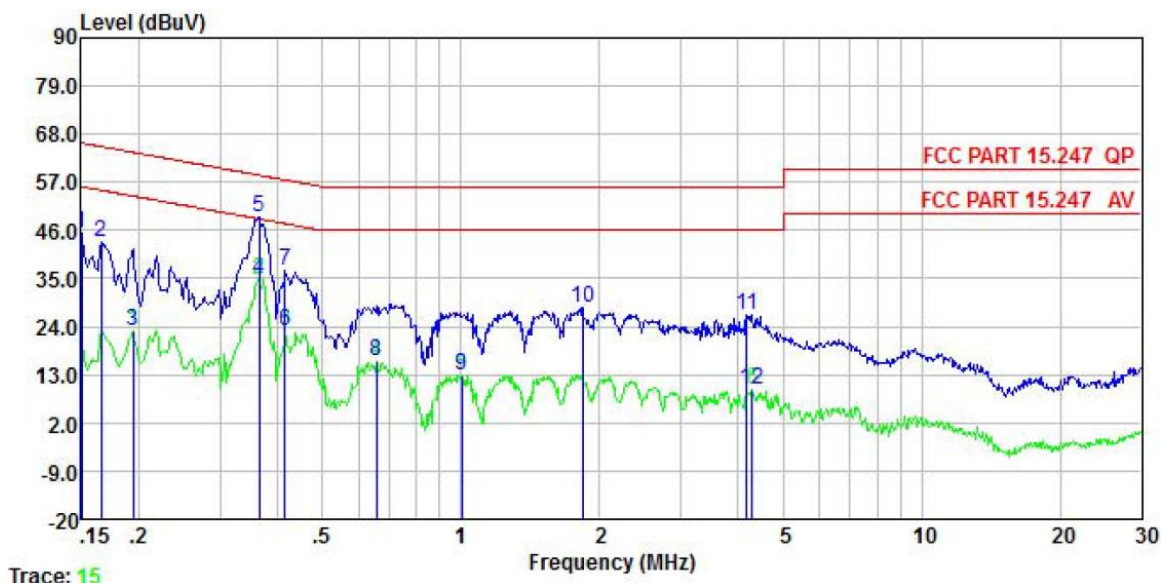


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	45.05	0.04	0.01	45.10	65.16	-20.06	QP
2	0.170	23.56	0.04	0.01	23.61	54.94	-31.33	Average
3	0.365	30.48	0.04	0.03	30.55	48.61	-18.06	Average
4	0.365	45.91	0.04	0.03	45.98	58.61	-12.63	QP
5	0.415	34.64	0.04	0.04	34.72	57.55	-22.83	QP
6	0.437	19.82	0.04	0.03	19.89	47.11	-27.22	Average
7	0.634	29.75	0.04	0.02	29.81	56.00	-26.19	QP
8	0.720	16.21	0.04	0.03	16.28	46.00	-29.72	Average
9	0.918	16.03	0.05	0.04	16.12	46.00	-29.88	Average
10	0.963	29.32	0.05	0.05	29.42	56.00	-26.58	QP
11	4.315	28.49	0.11	0.08	28.68	56.00	-27.32	QP
12	4.407	14.79	0.11	0.08	14.98	46.00	-31.02	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Product name:	IoT-COMMBOX-IoT MANIFOLD	Product model:	IoTHFEE
Test by:	Mike	Test mode:	Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Humi: 55%



Trace: 15

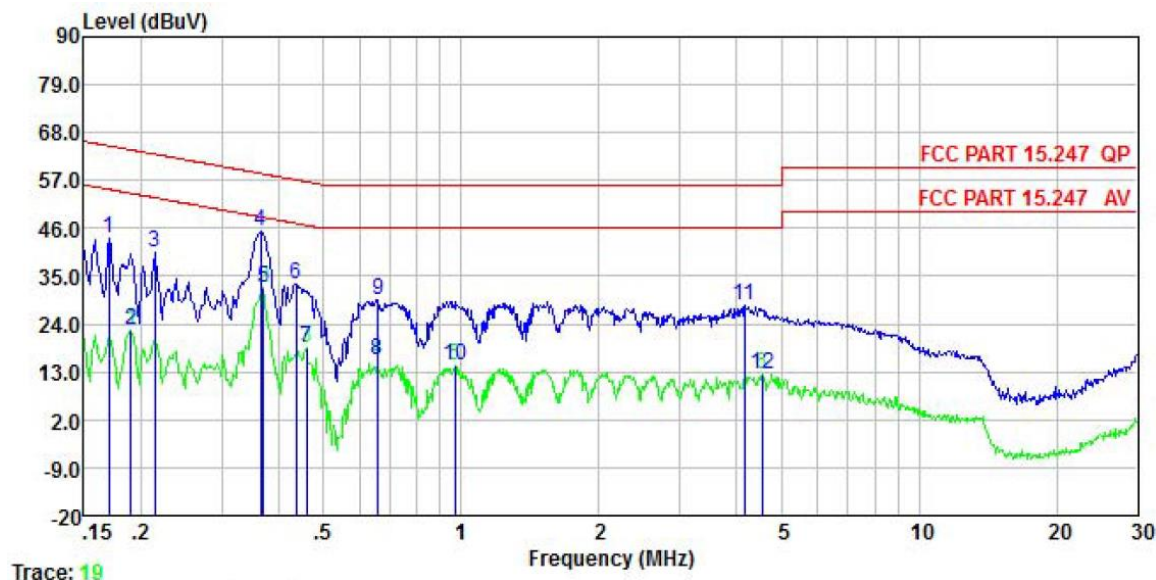
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	45.27	0.05	0.01	45.33	66.00	-20.67	QP
2	0.166	43.32	0.05	0.01	43.38	65.16	-21.78	QP
3	0.194	23.00	0.04	0.03	23.07	53.84	-30.77	Average
4	0.365	34.83	0.04	0.03	34.90	48.61	-13.71	Average
5	0.365	49.05	0.04	0.03	49.12	58.61	-9.49	QP
6	0.415	23.13	0.04	0.04	23.21	47.55	-24.34	Average
7	0.415	36.87	0.04	0.04	36.95	57.55	-20.60	QP
8	0.654	15.99	0.04	0.03	16.06	46.00	-29.94	Average
9	1.005	12.84	0.05	0.05	12.94	46.00	-33.06	Average
10	1.839	28.07	0.06	0.19	28.32	56.00	-27.68	QP
11	4.180	26.36	0.09	0.08	26.53	56.00	-29.47	QP
12	4.292	9.53	0.09	0.08	9.70	46.00	-36.30	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

500 KHz:

Product name:	IoT-COMMBOX-IoT MANIFOLD	Product model:	IoTHFEE
Test by:	Mike	Test mode:	Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Humi: 55%

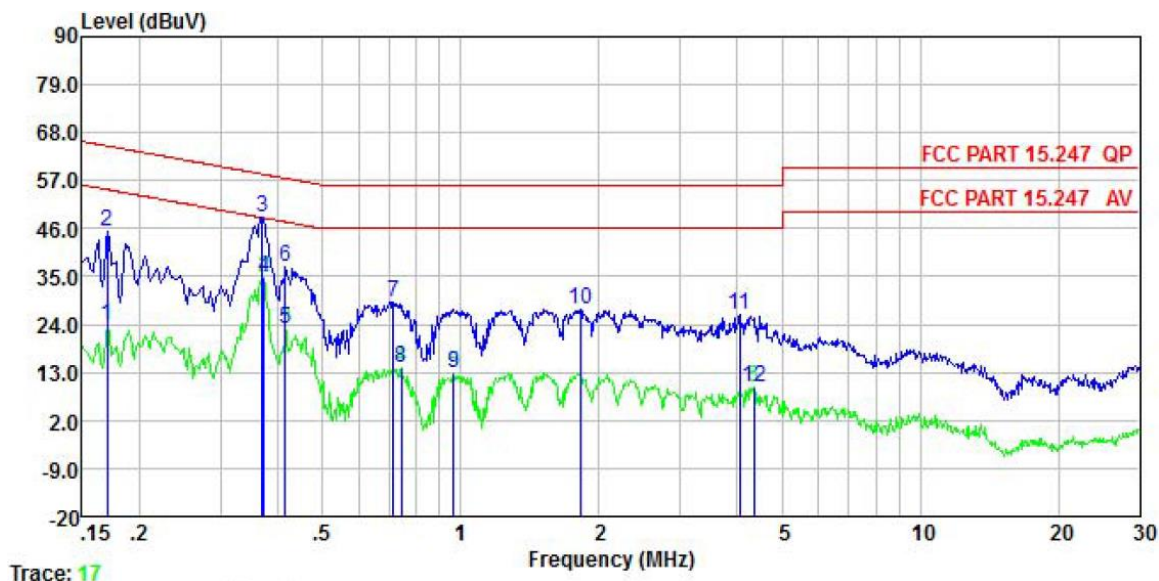


	Freq	Read	LISN	Cable	Level	Limit	Over	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	43.88	0.04	0.01	43.93	64.94	-21.01	QP
2	0.190	22.71	0.04	0.03	22.78	54.02	-31.24	Average
3	0.214	40.45	0.04	0.03	40.52	63.05	-22.53	QP
4	0.365	45.26	0.04	0.03	45.33	58.61	-13.28	QP
5	0.369	32.15	0.04	0.03	32.22	48.52	-16.30	Average
6	0.435	33.16	0.04	0.03	33.23	57.15	-23.92	QP
7	0.459	18.69	0.04	0.03	18.76	46.71	-27.95	Average
8	0.654	15.71	0.04	0.03	15.78	46.00	-30.22	Average
9	0.658	29.50	0.04	0.03	29.57	56.00	-26.43	QP
10	0.968	14.42	0.05	0.05	14.52	46.00	-31.48	Average
11	4.158	28.14	0.11	0.08	28.33	56.00	-27.67	QP
12	4.549	12.22	0.11	0.09	12.42	46.00	-33.58	Average

Notes:

- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level = Receiver Read level + LISN Factor + Cable Loss.

Product name:	IoT-COMMBOX-IoT MANIFOLD	Product model:	IoTHFEE
Test by:	Mike	Test mode:	Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Humi: 55%

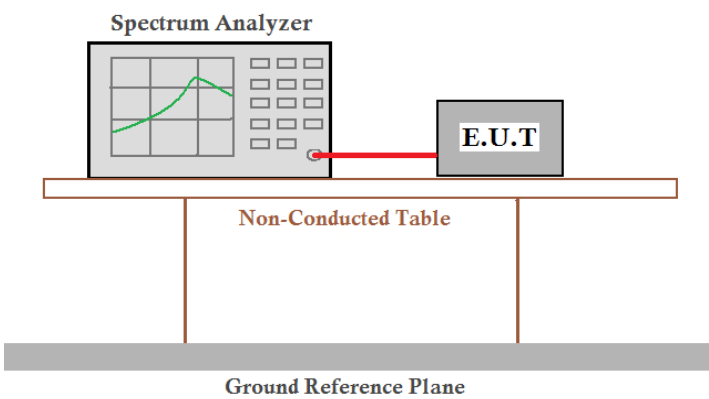


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	23.67	0.05	0.01	23.73	54.94	-31.21	Average
2	0.170	45.29	0.05	0.01	45.35	64.94	-19.59	QP
3	0.369	48.56	0.04	0.03	48.63	58.52	-9.89	QP
4	0.373	34.62	0.04	0.03	34.69	48.43	-13.74	Average
5	0.415	22.93	0.04	0.04	23.01	47.55	-24.54	Average
6	0.415	36.96	0.04	0.04	37.04	57.55	-20.51	QP
7	0.712	29.16	0.04	0.03	29.23	56.00	-26.77	QP
8	0.743	13.93	0.04	0.03	14.00	46.00	-32.00	Average
9	0.963	12.92	0.05	0.05	13.02	46.00	-32.98	Average
10	1.819	27.38	0.06	0.19	27.63	56.00	-28.37	QP
11	4.049	25.97	0.09	0.08	26.14	56.00	-29.86	QP
12	4.338	9.30	0.09	0.08	9.47	46.00	-36.53	Average

Notes:

- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level = Receiver Read level + LISN Factor + Cable Loss.

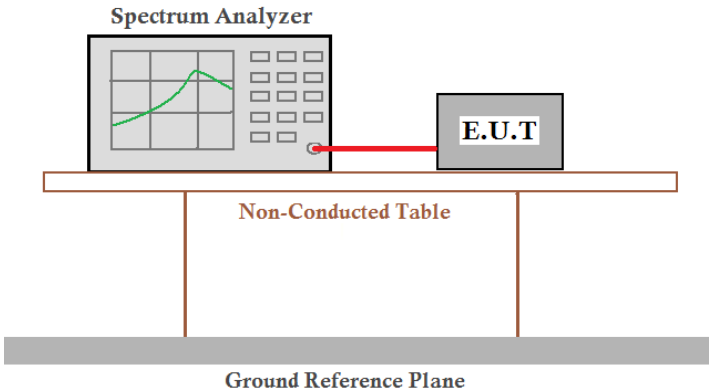
6.3 Conducted Output Power

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Limit:	30dBm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a grid and a green curve, is connected to an E.U.T (Equipment Under Test) box by a red cable. Both the Spectrum Analyzer and the E.U.T are positioned on a white rectangular table labeled 'Non-Conducted Table'. This table is supported by two vertical legs and rests on a thick grey horizontal bar labeled 'Ground Reference Plane'.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Refer to FCC ID: VPYCMABZ, report No. SHEM160900621801.

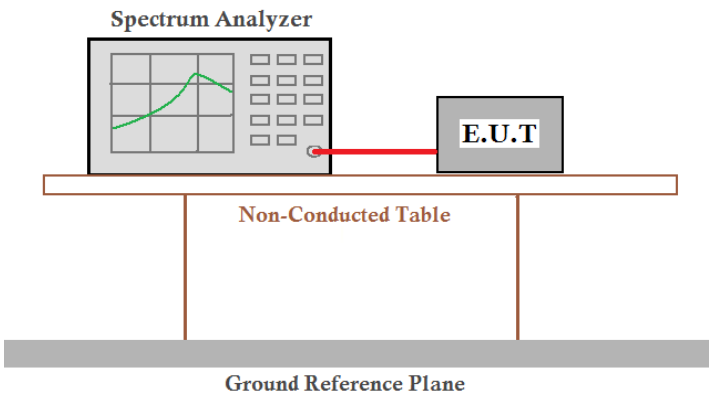
6.4 Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)
Limit:	>500kHz
Test setup:	 The diagram illustrates the test setup for measuring Occupy Bandwidth. A Spectrum Analyzer is connected to an Equipment Under Test (E.U.T.) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Refer to FCC ID: VPYCMABZ, report No. SHEM160900621801.

6.5 Power Spectral Density

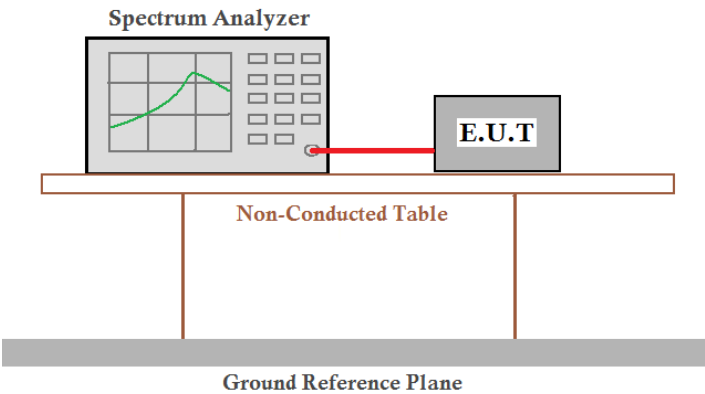
Test Requirement:	FCC Part 15 C Section 15.247 (e)
Limit:	8 dBm/3kHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a grid and a green curve, is connected to an E.U.T. (Equipment Under Test) box by a red cable. Both the analyzer and the E.U.T. are positioned on a 'Non-Conducted Table', which is a rectangular platform supported by two vertical legs. Below this table is a 'Ground Reference Plane', represented by a thick grey horizontal bar.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Refer to FCC ID: VPYCMABZ, report No. SHEM160900621801.

6.6 Band Edge

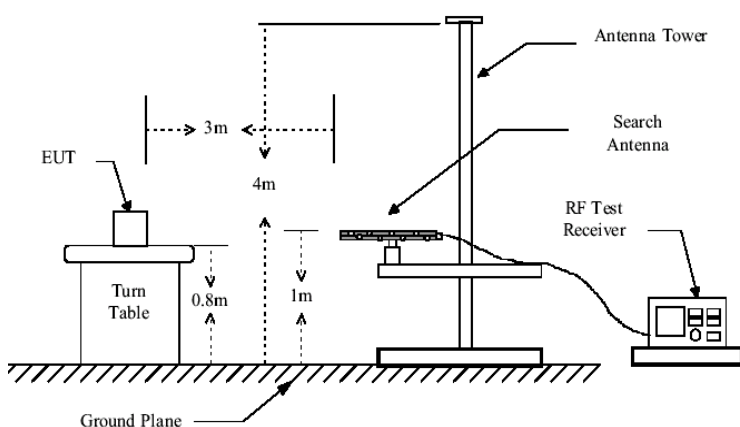
6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plots as follow:

Refer to FCC ID: VPYCMABZ, report No. SHEM160900621801.

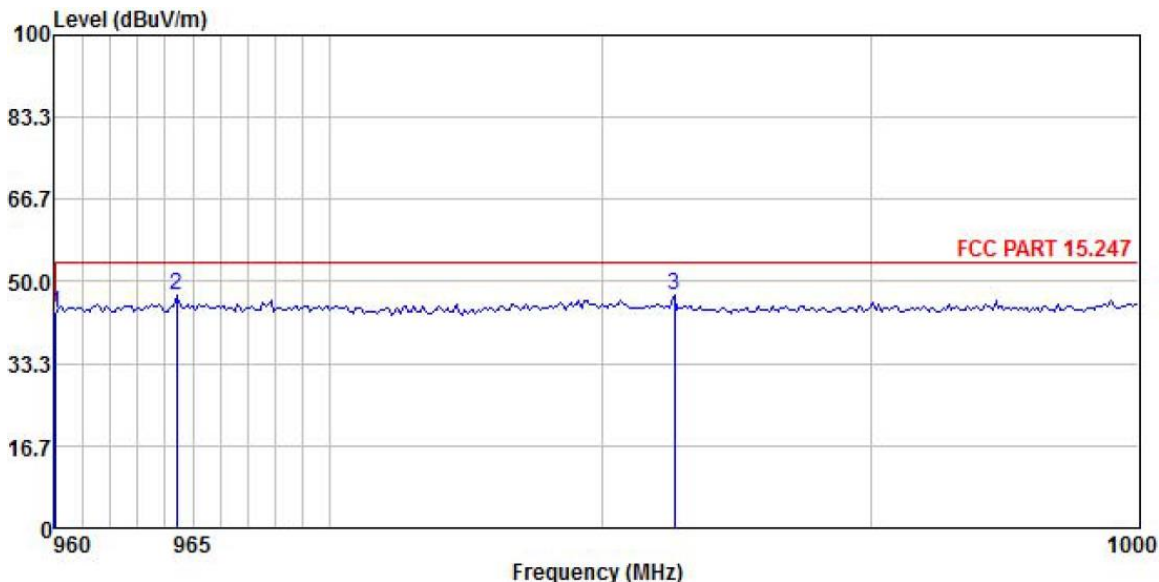
6.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Frequency Range:	960MHz to 1.240GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	960MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	960MHz-1GHz		54.00		Quasi-peak Value
	Above 1GHz		54.00		Average Value
			74.00		Peak Value
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the groundat a 3 meter chamber.The table was rotated 360 degrees todetermine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.				
Test setup:	Below 1GHz  Above 1GHz				

Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

125KHZ Below 1GHz:

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.6℃ Humi: 58%

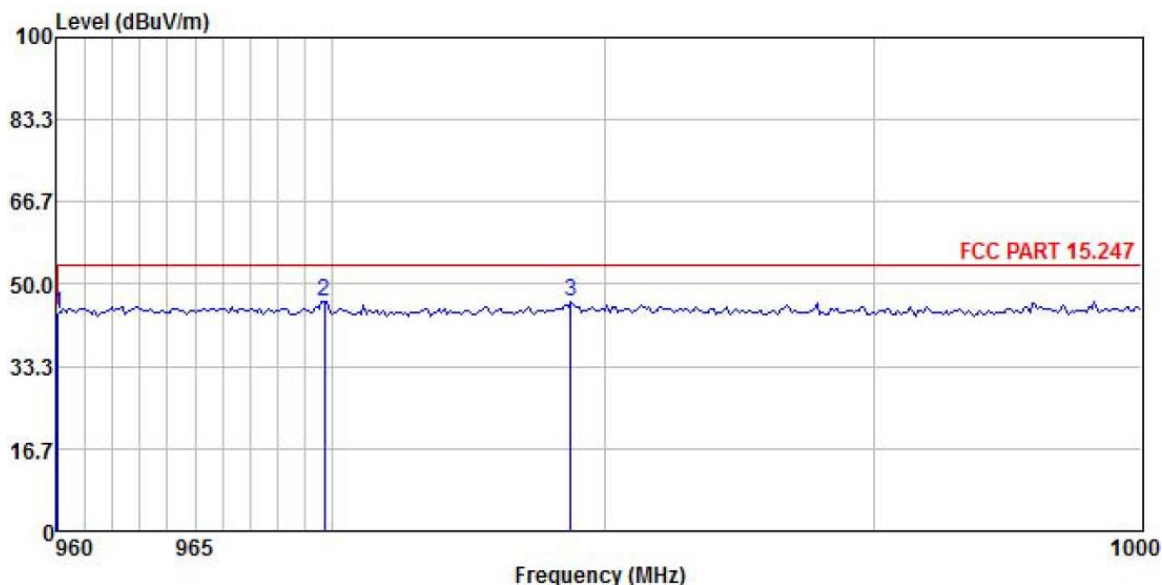


	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	960.046	17.31	22.86	3.51	0.00	43.68	54.00	-10.32	
2	964.405	20.71	22.90	3.54	0.00	47.15	54.00	-6.85	
3	982.662	20.68	23.00	3.61	0.00	47.29	54.00	-6.71	

Remark:

1. Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.6℃ Humi: 58%



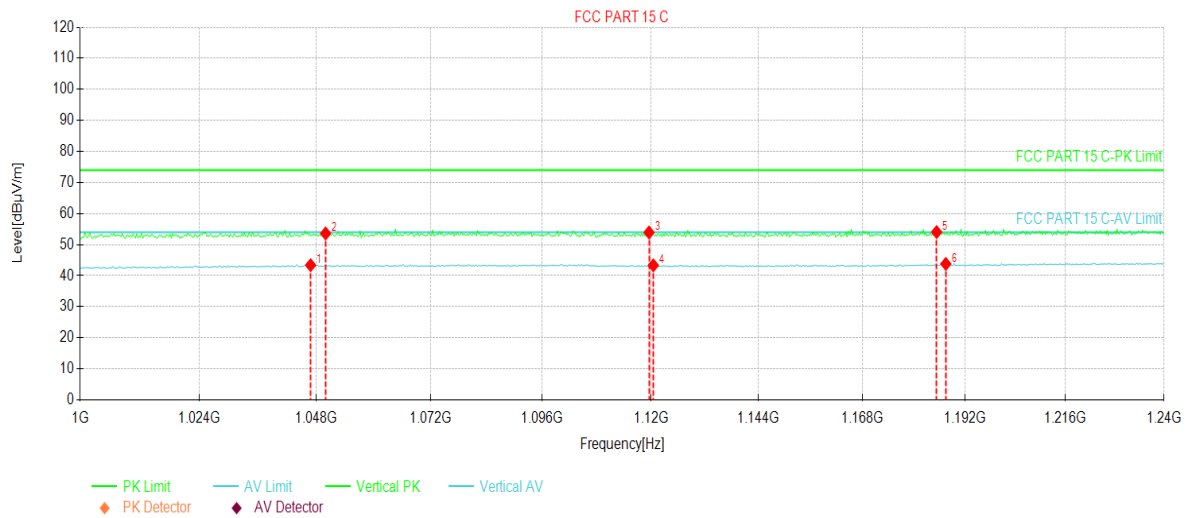
	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	960.046	17.63	22.86	3.51	0.00	44.00	54.00	-10.00	
2	969.703	20.19	22.92	3.55	0.00	46.66	54.00	-7.34	
3	978.736	19.80	22.98	3.60	0.00	46.38	54.00	-7.62	

Remark:

1. Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Above 1GHz:

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.8℃ Humi: 57%

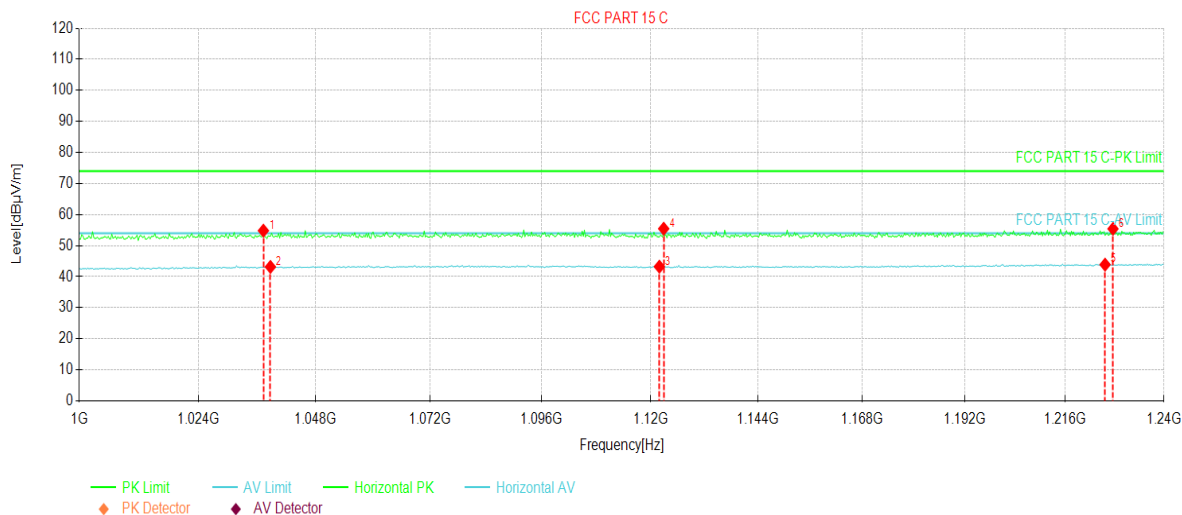


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	1046.80	13.49	43.38	29.89	54.00	10.62	AV	Vertical
2	1049.92	23.70	53.60	29.90	74.00	20.40	PK	Vertical
3	1119.52	23.72	53.91	30.19	74.00	20.09	PK	Vertical
4	1120.48	13.14	43.33	30.19	54.00	10.67	AV	Vertical
5	1185.28	23.78	54.04	30.26	74.00	19.96	PK	Vertical
6	1187.44	13.52	43.79	30.27	54.00	10.21	AV	Vertical

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.8℃ Humi: 57%



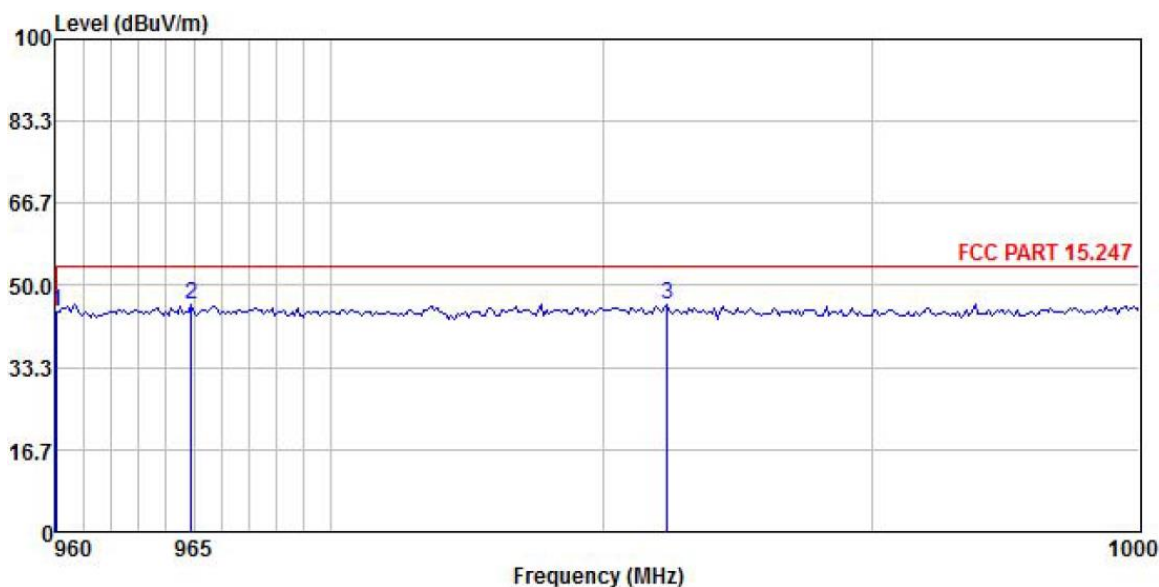
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	1037.20	24.98	54.82	29.84	74.00	19.18	PK	Horizontal
2	1038.64	13.30	43.14	29.84	54.00	10.86	AV	Horizontal
3	1121.92	13.03	43.22	30.19	54.00	10.78	AV	Horizontal
4	1122.88	25.25	55.45	30.20	74.00	18.55	PK	Horizontal
5	1225.60	13.53	43.88	30.35	54.00	10.12	AV	Horizontal
6	1227.52	25.04	55.40	30.36	74.00	18.60	PK	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

500KHZ Below 1GHz:

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.6℃ Humi: 58%

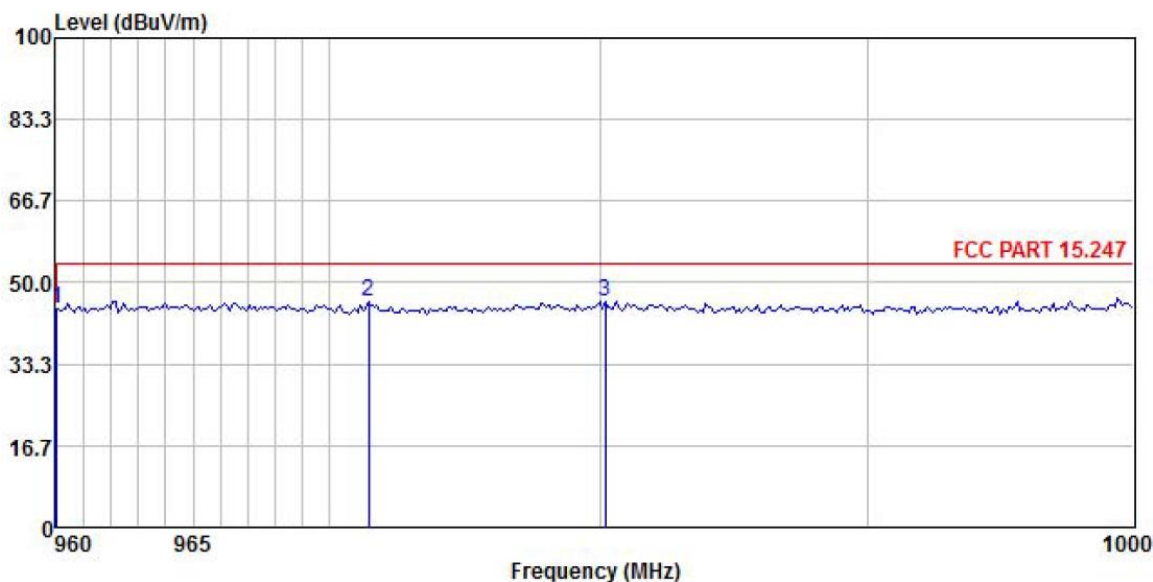


	Freq	ReadAntenna	Cable Preamp		Limit	Over	
	Level	Factor	Loss	Factor	Level	Line	Limit
	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
	MHz						
1	960.046	18.30	22.86	3.51	0.00	44.67	54.00
2	964.913	19.78	22.90	3.54	0.00	46.22	54.00
3	982.352	19.55	23.00	3.61	0.00	46.16	54.00

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.6℃ Humi: 58%



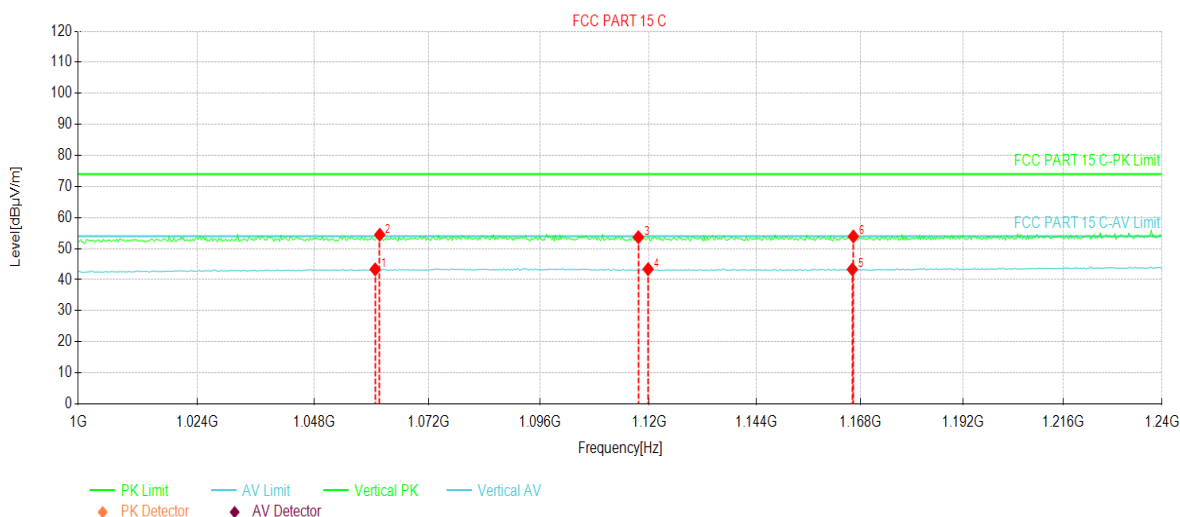
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	960.046	18.12	22.86	3.51	0.00	44.49	54.00	-9.51	
2	971.442	19.69	22.94	3.57	0.00	46.20	54.00	-7.80	
3	980.181	19.59	22.98	3.60	0.00	46.17	54.00	-7.83	

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Above 1GHz:

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.8℃ Humi: 57%

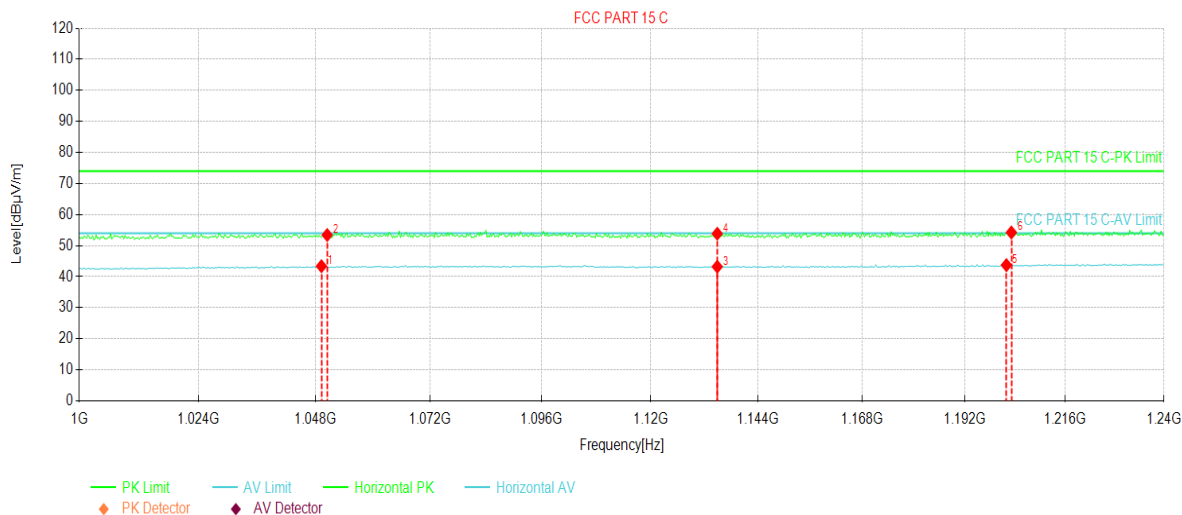


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	1060.72	13.36	43.32	29.96	54.00	10.68	AV	Vertical
2	1061.68	24.50	54.47	29.97	74.00	19.53	PK	Vertical
3	1117.60	23.49	53.68	30.19	74.00	20.32	PK	Vertical
4	1119.76	13.19	43.38	30.19	54.00	10.62	AV	Vertical
5	1166.08	13.07	43.31	30.24	54.00	10.69	AV	Vertical
6	1166.32	23.67	53.91	30.24	74.00	20.09	PK	Vertical

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 21.8℃ Humi: 57%



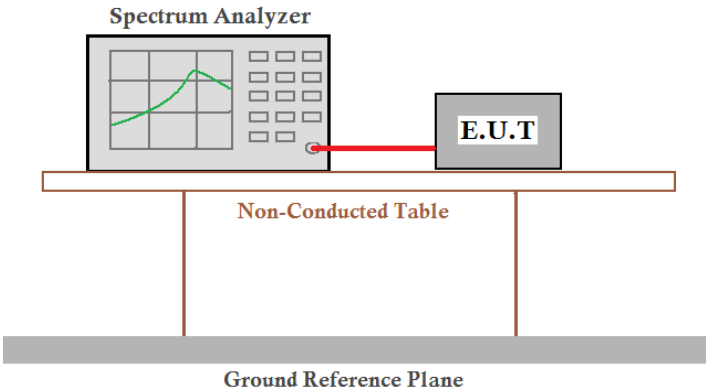
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	1049.20	13.48	43.38	29.90	54.00	10.62	AV	Horizontal
2	1050.40	23.51	53.42	29.91	74.00	20.58	PK	Horizontal
3	1134.88	13.00	43.21	30.21	54.00	10.79	AV	Horizontal
4	1134.88	23.62	53.83	30.21	74.00	20.17	PK	Horizontal
5	1201.84	13.43	43.72	30.29	54.00	10.28	AV	Horizontal
6	1203.04	23.94	54.23	30.29	74.00	19.77	PK	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

6.7 Spurious Emission

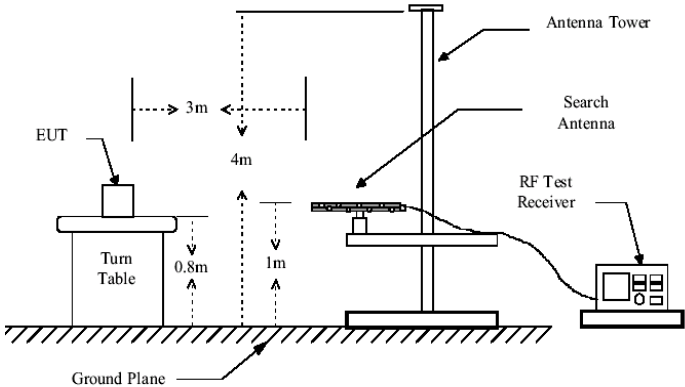
6.7.1 Conducted Emission Method

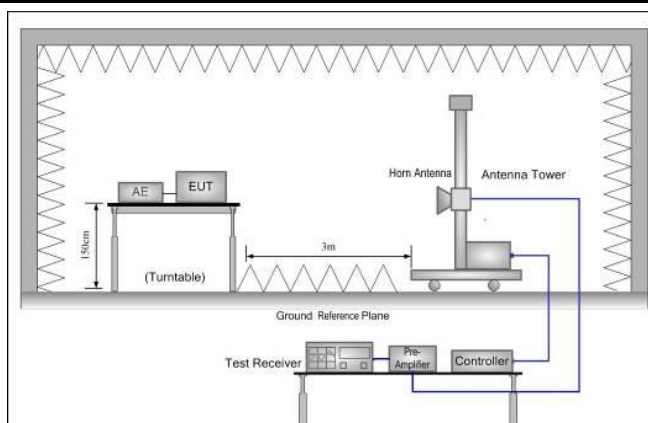
Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 The diagram illustrates the test setup. A 'Spectrum Analyzer' is connected to an 'E.U.T.' (Equipment Under Test) by a red cable. Both the Spectrum Analyzer and the E.U.T. are positioned on a 'Non-Conducted Table'. This table is supported by two vertical legs and rests on a 'Ground Reference Plane', which is represented by a thick grey bar at the bottom of the setup.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

Refer to FCC ID: VPYCMABZ, report No. SHEM160900621801.

6.7.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209 and 15.205				
Test Frequency Range:	9kHz to 25GHz				
Test Distance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
	Above 1GHz		54.0		Average Value
		74.0		Peak Value	
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.				
Test setup:	Below 1GHz  Above 1GHz				

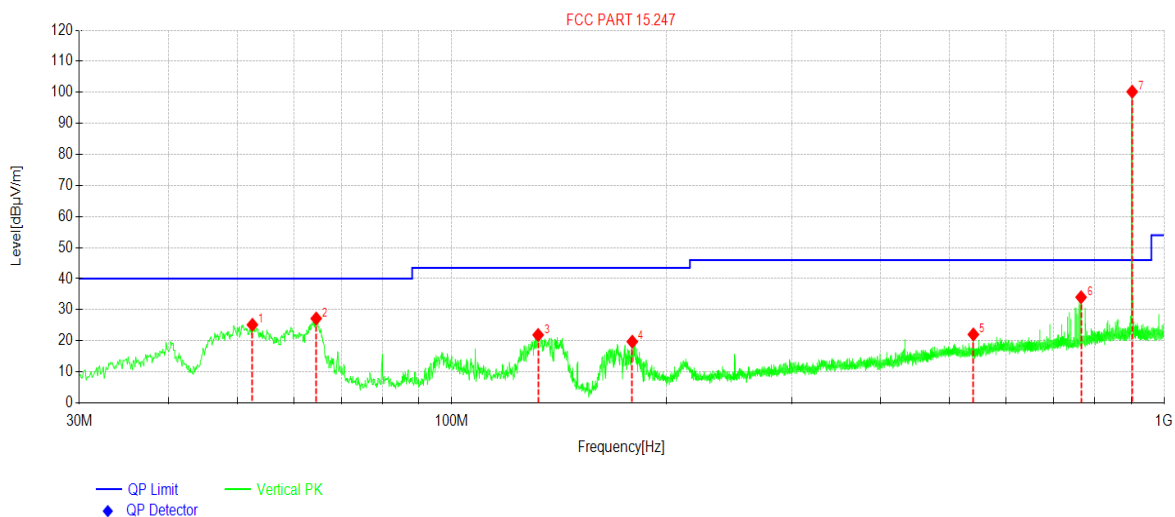


Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

Measurement Data (worst case):

125KHz Below 1GHz:

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp:22.2℃ Humi: 56%

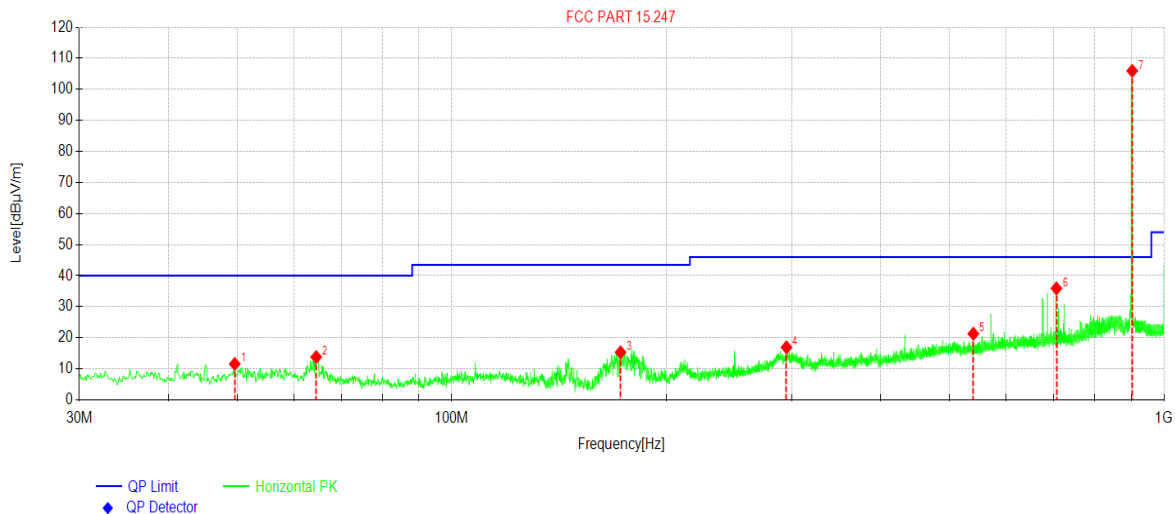


NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	52.5063	39.81	25.15	-14.66	40.00	14.85	PK	Vertical
2	64.5355	42.75	27.18	-15.57	40.00	12.82	PK	Vertical
3	132.248	39.46	21.88	-17.58	43.50	21.62	PK	Vertical
4	179.297	36.50	19.71	-16.79	43.50	23.79	PK	Vertical
5	540.077	28.83	22.03	-6.80	46.00	23.97	PK	Vertical
6	764.945	37.56	34.03	-3.53	46.00	11.97	PK	Vertical
7	902.311	101.58	100.21	-1.37	46.00	-54.21	PK	Vertical

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp:22.2℃ Humi: 56%



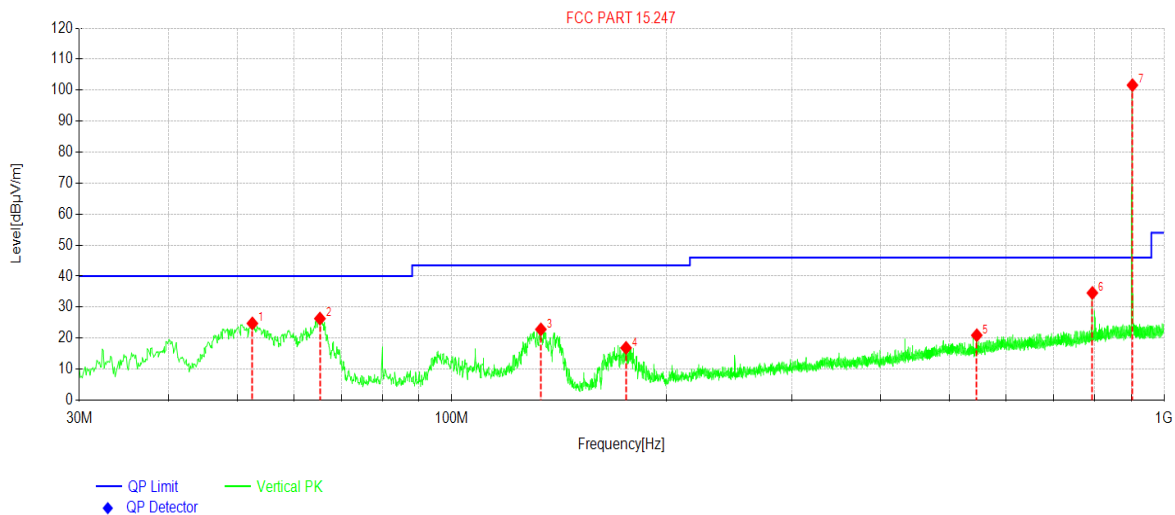
NO.	Freq. [MHz]	Reading[d BμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	49.5960	26.32	11.58	-14.74	40.00	28.42	PK	Horizontal
2	64.5355	29.36	13.79	-15.57	40.00	26.21	PK	Horizontal
3	172.604	32.31	15.32	-16.99	43.50	28.18	PK	Horizontal
4	295.127	29.73	16.93	-12.80	46.00	29.07	PK	Horizontal
5	540.077	28.12	21.32	-6.80	46.00	24.68	PK	Horizontal
6	706.351	40.14	35.91	-4.23	46.00	10.09	PK	Horizontal
7	902.408	107.34	105.97	-1.37	46.00	-59.97	PK	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

500KHz Below 1GHz:

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp:22.2℃ Huni: 56%

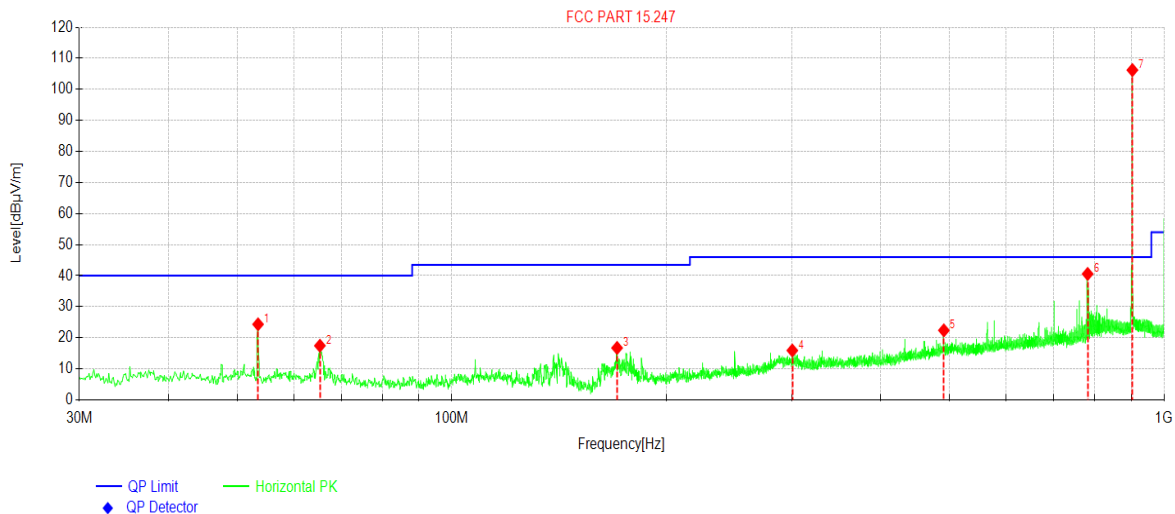


NO.	Freq. [MHz]	Reading[dBuV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	52.5063	39.40	24.74	-14.66	40.00	15.26	PK	Vertical
2	65.3115	42.01	26.30	-15.71	40.00	13.70	PK	Vertical
3	133.412	40.49	22.82	-17.67	43.50	20.68	PK	Vertical
4	175.708	33.79	16.84	-16.95	43.50	26.66	PK	Vertical
5	545.994	27.76	20.91	-6.85	46.00	25.09	PK	Vertical
6	793.369	37.35	34.59	-2.76	46.00	11.41	PK	Vertical
7	903.087	102.99	101.62	-1.37	46.00	-55.62	PK	Vertical

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	IoT-COMMBOX-IoT MANIFOLD	Product Model:	IoTHFEE
Test By:	Mike	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp:22.2℃ Humi: 56%



NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	53.4763	38.97	24.33	-14.64	40.00	15.67	PK	Horizontal
2	65.3115	33.15	17.44	-15.71	40.00	22.56	PK	Horizontal
3	170.664	33.73	16.73	-17.00	43.50	26.77	PK	Horizontal
4	300.754	28.61	15.92	-12.69	46.00	30.08	PK	Horizontal
5	490.893	29.68	22.39	-7.29	46.00	23.61	PK	Horizontal
6	781.243	43.68	40.56	-3.12	46.00	5.44	PK	Horizontal
7	902.893	107.57	106.20	-1.37	46.00	-60.20	PK	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

125KHz Above 1GHz:

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1804.6	73.22	-21.37	51.85	74.00	22.15	Vertical
2706.9	55.60	-17.60	38.00	74.00	36.00	Vertical
3609.2	56.10	-14.87	41.23	74.00	32.77	Vertical
1804.6	56.70	-21.37	35.33	74.00	38.67	Horizontal
2706.9	56.99	-17.60	39.39	74.00	34.61	Horizontal
3609.2	56.40	-14.87	41.53	74.00	32.47	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1804.6	67.80	-21.37	46.43	54.00	7.57	Vertical
2706.9	47.52	-17.60	29.92	54.00	24.08	Vertical
3609.2	47.58	-14.87	32.71	54.00	21.29	Vertical
1804.6	48.19	-21.37	26.82	54.00	27.18	Horizontal
2706.9	47.93	-17.60	30.33	54.00	23.67	Horizontal
3609.2	48.39	-14.87	33.52	54.00	20.48	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1817	72.82	-21.37	51.45	74.00	22.55	Vertical
2725.5	55.06	-17.60	37.46	74.00	36.54	Vertical
3634	56.03	-14.87	41.16	74.00	32.84	Vertical
1817	56.38	-21.37	35.01	74.00	38.99	Horizontal
2725.5	57.53	-17.60	39.93	74.00	34.07	Horizontal
3634	56.80	-14.87	41.93	74.00	32.07	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1817	68.02	-21.37	46.65	54.00	7.35	Vertical
2725.5	47.74	-17.60	30.14	54.00	23.86	Vertical
3634	48.10	-14.87	33.23	54.00	20.77	Vertical
1817	48.24	-21.37	26.87	54.00	27.13	Horizontal
2725.5	48.14	-17.60	30.54	54.00	23.46	Horizontal
3634	48.12	-14.87	33.25	54.00	20.75	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1829.8	72.83	-21.37	51.46	74.00	22.54	Vertical
2744.7	55.79	-17.60	38.19	74.00	35.81	Vertical

3659.6	55.52	-14.87	40.65	74.00	33.35	Vertical
1829.8	56.74	-21.37	35.37	74.00	38.63	Horizontal
2744.7	57.50	-17.60	39.90	74.00	34.10	Horizontal
3659.6	56.79	-14.87	41.92	74.00	32.08	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1829.8	67.56	-21.37	46.19	54.00	7.81	Vertical
2744.7	47.31	-17.60	29.71	54.00	24.29	Vertical
3659.6	47.34	-14.87	32.47	54.00	21.53	Vertical
1829.8	48.09	-21.37	26.72	54.00	27.28	Horizontal
2744.7	47.84	-17.60	30.24	54.00	23.76	Horizontal
3659.6	47.92	-14.87	33.05	54.00	20.95	Horizontal
Remark:						
1. Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).						
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.						

500KHz Above 1GHz:

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1806	56.47	-21.37	35.10	74.00	38.90	Vertical
2709	74.26	-17.59	56.67	74.00	17.33	Vertical
3612	56.66	-14.86	41.80	74.00	32.20	Vertical
1806	57.72	-21.37	36.35	74.00	37.65	Horizontal
2709	55.51	-17.59	37.92	74.00	36.08	Horizontal
3612	56.44	-14.86	41.58	74.00	32.42	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1806	48.82	-21.37	27.45	54.00	26.55	Vertical
2709	67.03	-17.59	49.44	54.00	4.56	Vertical
3612	47.13	-14.86	32.27	54.00	21.73	Vertical
1806	48.56	-21.37	27.19	54.00	26.81	Horizontal
2709	47.84	-17.59	30.25	54.00	23.75	Horizontal
3612	48.41	-14.86	33.55	54.00	20.45	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1815.6	56.90	-21.37	35.53	74.00	38.47	Vertical
2723.4	74.80	-17.59	57.21	74.00	16.79	Vertical
3631.2	56.14	-14.86	41.28	74.00	32.72	Vertical
1815.6	57.36	-21.37	35.99	74.00	38.01	Horizontal
2723.4	54.91	-17.59	37.32	74.00	36.68	Horizontal
3631.2	56.56	-14.86	41.70	74.00	32.30	Horizontal

Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1815.6	48.58	-21.37	27.21	54.00	26.79	Vertical
2723.4	66.79	-17.59	49.20	54.00	4.80	Vertical
3631.2	46.59	-14.86	31.73	54.00	22.27	Vertical
1815.6	48.12	-21.37	26.75	54.00	27.25	Horizontal
2723.4	47.32	-17.59	29.73	54.00	24.27	Horizontal
3631.2	48.76	-14.86	33.90	54.00	20.10	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1828.4	56.62	-21.37	35.25	74.00	38.75	Vertical
2742.6	74.39	-17.59	56.80	74.00	17.20	Vertical
3656.8	56.21	-14.86	41.35	74.00	32.65	Vertical
1828.4	57.27	-21.37	35.90	74.00	38.10	Horizontal
2742.6	55.47	-17.59	37.88	74.00	36.12	Horizontal
3656.8	56.17	-14.86	41.31	74.00	32.69	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1828.4	48.76	-21.37	27.39	54.00	26.61	Vertical
2742.6	67.53	-17.59	49.94	54.00	4.06	Vertical
3656.8	46.93	-14.86	32.07	54.00	21.93	Vertical
1828.4	49.05	-21.37	27.68	54.00	26.32	Horizontal
2742.6	48.00	-17.59	30.41	54.00	23.59	Horizontal
3656.8	48.00	-14.86	33.14	54.00	20.86	Horizontal
Remark: 3. Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor). 4. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.						