Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

TEST REPORT

FCC PART 15 SUBPART C 15.247

Report Reference No. ..... :	**CTL2207213031-WF01**	
Compiled by: (position+printed name+signature)	Happy Guo (File administrators)	Happy Guo
Tested by: (position+printed name+signature)	Gary Gao (Test Engineer)	Gary Gao
Approved by: (position+printed name+signature)	Ivan Xie (Manager)	Ivan Xie

Product Name ..... :	Mondo Alto Smart Internet Radio
Model/Type reference ..... :	GDI-WHAMALT05
List Model(s)..... :	GDI-WHAMALT01
Trade Mark..... :	gracedigital
FCC ID ..... :	**2AAUI-MONDOALTO**
Applicant's name ..... :	**Grace Digital Inc.**
Address of applicant ..... :	10531 4S Commons Drive #166 Suite #430 San Diego, CA 92127
Test Firm..... :	**Shenzhen CTL Testing Technology Co., Ltd.**
Address of Test Firm ..... :	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Test specification..... :	
Standard..... :	**47 CFR FCC Part 15 Subpart C 15.247**
TRF Originator..... :	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF..... :	Dated 2011-01
Date of receipt of test item..... :	Jul. 25, 2022
Date of sampling..... :	Jul. 25, 2022
Date of Test Date..... :	Jul. 25, 2022 - Aug. 25, 2022
Date of Issue ..... :	Aug. 26, 2022
Result ..... :	**Pass**

TEST REPORT

Test Report No.:	CTL2207213031-WF01	Aug. 26, 2022 Date of issue

Equipment under Test	:	Mondo Alto Smart Internet Radio
Sample No.	:	CTL220721303-1-S001(Normal sample) CTL220721303-1-S002(Engineer sample)
Model /Type	:	GDI-WHAMALT05
Listed Models	:	GDI-WHAMALT01
Applicant	:	**Grace Digital Inc.**
Address	:	10531 4S Commons Drive #166 Suite #430 San Diego, CA 92127
Manufacturer	:	**Ming Le Electronics Factory**
Address	:	NO. 33 Lane 7, XinZhuangShe, LianTang, XinHua Town, HuaDu District, GuangZhou, CHINA.

Test result	Pass *

* In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

** Modified History **

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2022-08-26	CTL2207213031-WF01	Tracy Qi

Table of Contents **Page**

1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10: 2013: American National Standard for Testing Unlicensed Wireless Devices

558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spreda Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules

1.2. Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10 and CISPR 32/EN 55032 requirements.

1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Power Spectral Density	±2.20 dB	(1)

Radiated Emission 9KHz ~30MHz	±3.40dB	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±3.20dB	(1)

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

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	Mondo Alto Smart Internet Radio
Model/Type reference:	GDI-WHAMALT05
Power supply:	DC 18V from adapter
Adapter information:	Model No: GM42-180220-1A Input: AC 100-240V 50/60Hz 1.5A Output: 18V⎓2.0A
Hardware version:	V1.0
Software version:	V1.0
WIFI:	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/802.11n(H40):OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40):2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40):7
Channel separation:	5MHz
Antenna type:	FPC Antenna
Antenna1 gain:	1.3dBi
Antenna2 gain:	1.3dBi
MIMO:	Not support

Note1: For more details, please refer to the user's manual of the EUT.

2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software (CMD Command) to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

There are 11 channels provided to the EUT and Channel 01/06/11 were selected for 802.11b/802.11g/802.11n(H20)/test. Channel 03/06/09 were selected for 802.11n(H40) test.

Operation Frequency WIFI：

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	**2412**	8	2447
2	2417	**9**	**2452**
3	**2422**	10	2457
4	2427	**11**	**2462**
5	2432		
6	**2437**		
7	2442		

Note: The line display in grey were the channel selected for testing

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	6.5Mbps	3/9

Power setting during the test:

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Antenna ID	Test Software Version	Test Command		
	Frequency	2412/2422MHz	2437MHz	2452/2462MHz
1	802.11b power level	13	13	13
	802.11g power level	12	12	12
	802.11n(Ht20) power level	12	12	12
	802.11n(Ht40) power level	12	12	12
2	802.11b power level	13	13	13
	802.11g power level	12	12	12
	802.11n(Ht20) power level	12	12	12
	802.11n(Ht40) power level	12	12	12

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ESH2-Z5	860014/010	2022/05/07	2023/05/06
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	2020/04/07	2023/04/06
Horn Antenna	Ocean Microwave	OBH100400	26999002	2019/11/28	2022/11/27
EMI Test Receiver	R&S	ESCI	1166.5950.03	2022/05/07	2023/05/06
Spectrum Analyzer	Agilent	E4407B	MY41440676	2022/05/07	2023/05/06
Spectrum Analyzer	Agilent	N9020A	US46220290	2022/05/07	2023/05/06

Spectrum Analyzer	Keysight	N9020A	MY53420874	2022/05/07	2023/05/06
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2021/12/23	2024/12/22
Active Loop Antenna	Da Ze	ZN30900A	/	2021/05/13	2024/05/12
Amplifier	Agilent	8449B	3008A02306	2022/05/07	2023/05/06
Amplifier	Agilent	8447D	2944A10176	2022/05/06	2023/05/05
Amplifier	Brief&Smart	LNA-4018	2104197	2022/05/07	2023/05/06
Temperature/Humidity Meter	Ji Yu	MC501	/	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY55130004	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY55130006	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY54510008	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY55060003	2022/05/07	2023/05/06
Spectrum Analyzer	RS	FSP	1164.4391.38	2022/05/07	2023/05/06
RF Cable	Megalon	RF-A303	N/A	2022/05/07	2023/05/06
RF Control Unit	Tonsecnd	JS0806-2	20J8060323	2022/05/07	2023/05/06

Test Software	
Name of Software	Version
JS1120-3	2.6.880341
EZ_EMC(Below 1GHz)	V1.1.4.2
EZ_EMC((Above 1GHz)	V1.1.4.2

The calibration interval was one year

2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

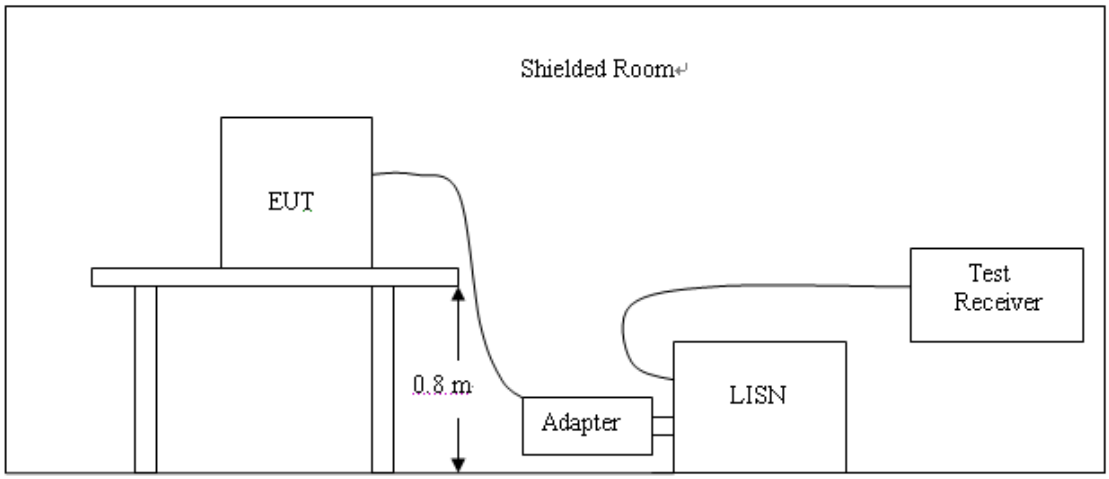
LIMIT

According to FCC CFR Title 47 Part 15 Subpart C Section 15.207 and RSS Gen 8.8, AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus as below:

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 CONFIGURATION



TEST PROCEDURE

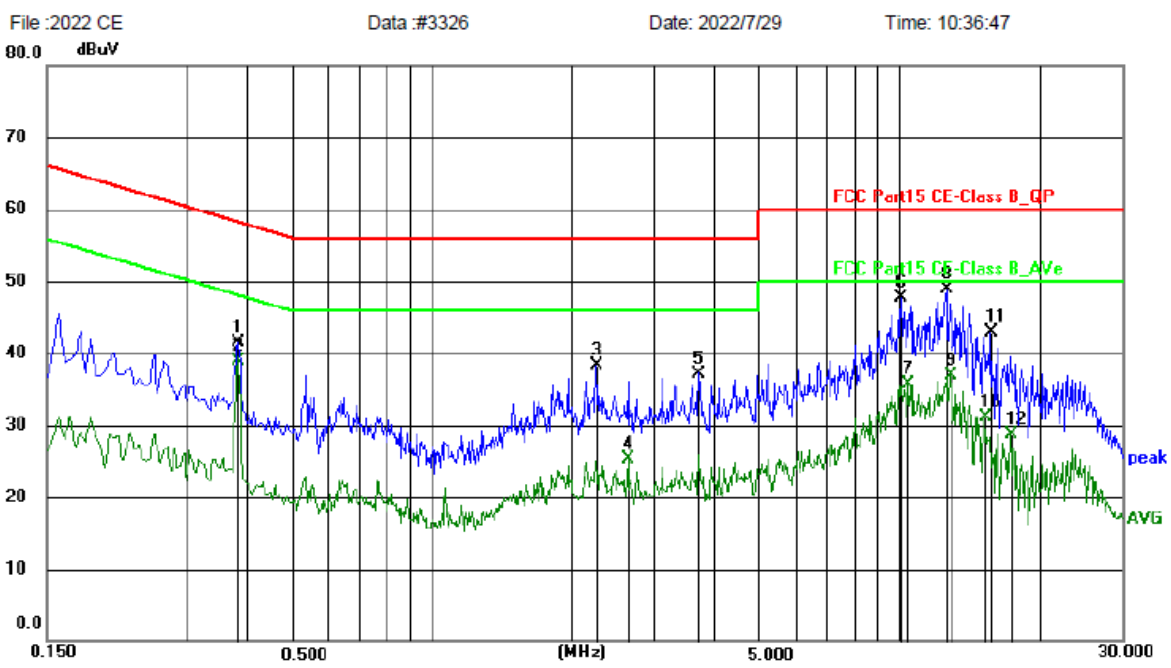
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Remark:

1. Both WIFI antenna1 and antenna2 have been tested, only the worst result of WIFI antenna2 was reported as below:
2. All modes of 802.11b/g/n were tested at Low, Middle, and High channel; only the worst result of 11N20 CH01 was reported as below:
3. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

Test Mode	WIFI2.4G	Line:	L



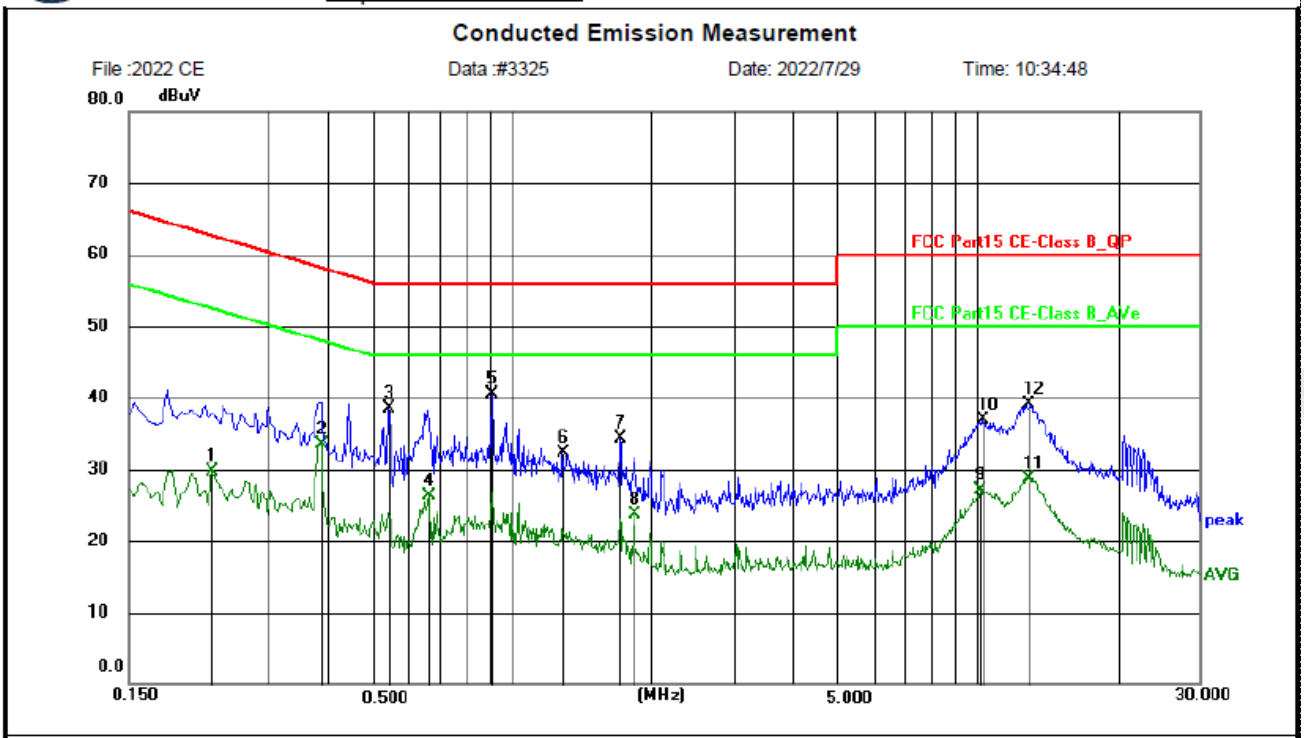
Site LAB
Limit: FCC Part15 CE-Class B_QP
EUT: Internet Radio
M/N: Mondo Alto
Mode: WORKING
Note:
Company name: Ming Le Electronics Factory

Phase: L1
Power: AC120/60Hz

Temperature: 26(C)
Humidity: 60 %RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.3840	31.38	10.07	41.45	58.19	16.74	peak	P	
2	0.3840	28.92	10.07	38.99	48.19	9.20	AVG	P	
3	2.2470	28.24	10.06	38.30	56.00	17.70	peak	P	
4	2.6295	15.14	10.07	25.21	46.00	20.79	AVG	P	
5	3.7275	27.11	10.09	37.20	56.00	18.80	peak	P	
6	10.0860	37.44	10.23	47.67	60.00	12.33	peak	P	
7	10.4550	25.56	10.24	35.80	50.00	14.20	AVG	P	
8	12.6330	38.53	10.28	48.81	60.00	11.19	peak	P	
9	12.8310	26.66	10.28	36.94	50.00	13.06	AVG	P	
10	15.1710	20.87	10.29	31.16	50.00	18.84	AVG	P	
11	15.6840	32.64	10.29	42.93	60.00	17.07	peak	P	
12	17.2185	18.30	10.31	28.61	50.00	21.39	AVG	P	

Test Mode	WIFI2.4G	Line:	N



Site LAB
Limit: FCC Part15 CE-Class B_QP
EUT: Internet Radio
M/N: Mondo Alto
Mode: WORKING
Note:
Company name: Ming Le Electronics Factory

Phase: N
Power: AC120/60Hz

Temperature: 26(C)
Humidity: 60 %RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2265	19.73	10.06	29.79	52.58	22.79	AVG	P	
2	0.3885	23.35	10.07	33.42	48.10	14.68	AVG	P	
3	0.5415	28.51	10.07	38.58	56.00	17.42	peak	P	
4	0.6630	16.32	10.08	26.40	46.00	19.60	AVG	P	
5	0.9060	30.44	10.07	40.51	56.00	15.49	peak	P	
6	1.2885	22.16	10.06	32.22	56.00	23.78	peak	P	
7	1.7115	24.35	10.05	34.40	56.00	21.60	peak	P	
8	1.8330	13.71	10.05	23.76	46.00	22.24	AVG	P	
9	10.1760	16.85	10.23	27.08	50.00	22.92	AVG	P	
10	10.2480	26.71	10.23	36.94	60.00	23.06	peak	P	
11	12.9120	18.52	10.28	28.80	50.00	21.20	AVG	P	
12	12.9435	28.73	10.28	39.01	60.00	20.99	peak	P	

Remark: Level(dBuV)=Reading(dBuV) + Factor(dB)
Margin=Limit(dBuV/m)- Level(dBuV/m)

3.2. Radiated Emissions and Band Edge

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

For intentional device, according to RSS-Gen section 8.9, the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

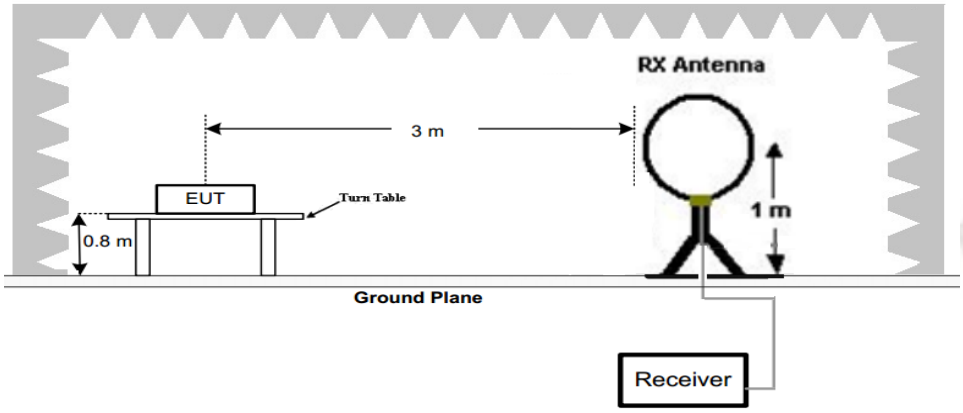
In addition, radiated emissions which fall in the restricted bands, as defined in RSS-Gen section 8.10, must also comply with the radiated emission limits specified in RSS-Gen section 8.9

Radiated emission limits

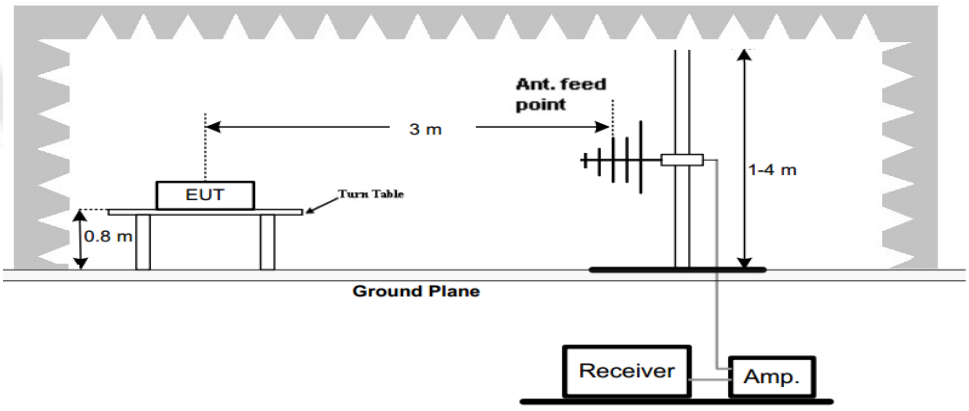
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

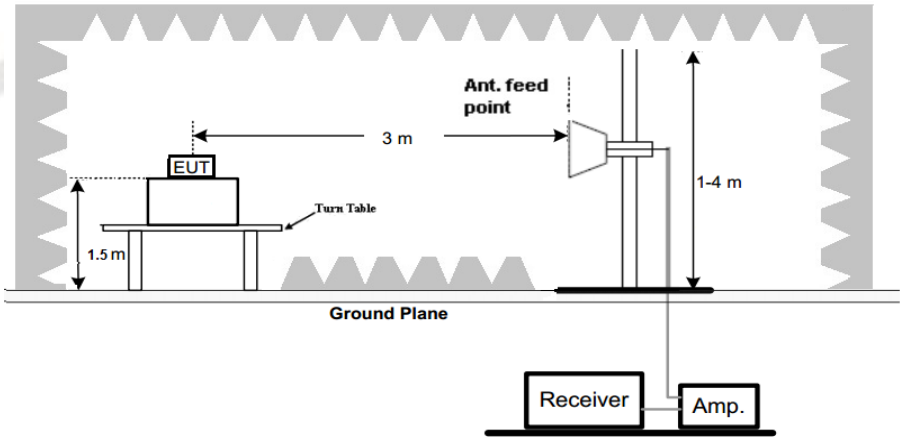
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

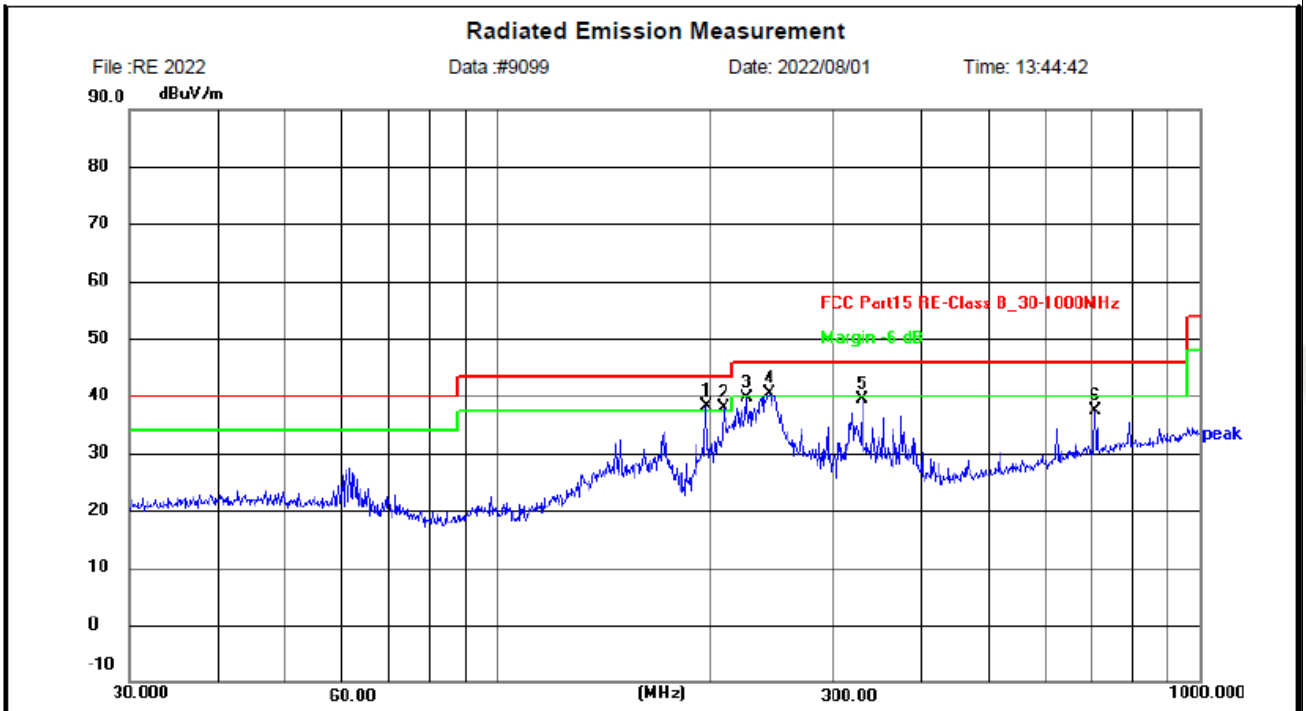
Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

Remark:
1. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and The emission levels from 9kHz to 30MHz are attenuated 20dB below the limit and not recorded in report.
2. For below 1GHz measurement, all three channels (lowest/middle/highest) of each mode were tested and recorded worst case at antenna2 11N20 channel 01.
3. For above 1GHz measurement, all three channels (lowest/middle/highest) of each mode were tested and recorded worst case at 11N20 mode.

For 30MHz-1GHz

Test mode:	WIFI	Polarization:	Horizontal



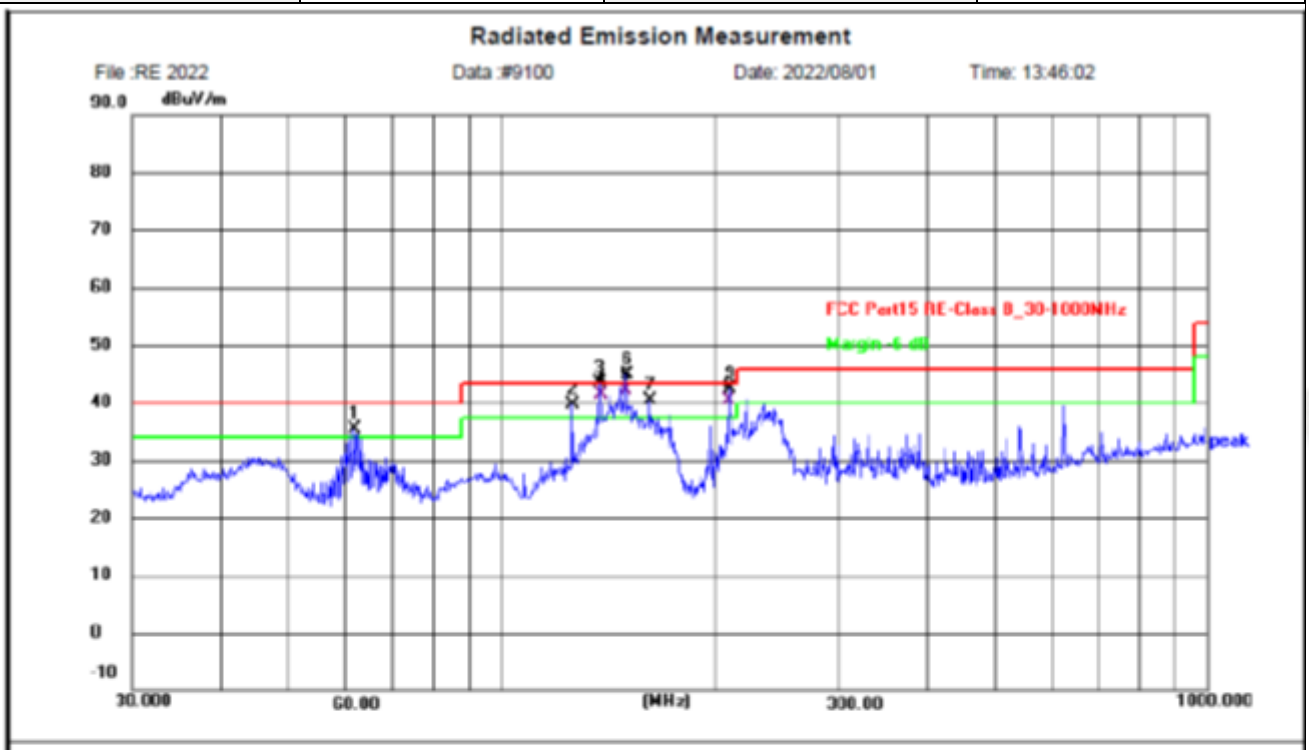
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT:
M/N: Mondo Alto
Mode: WORKING
Note:
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power: AC120/60Hz
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	197.8928	55.42	-17.24	38.18	43.50	5.32	peak	100	258	P	
2	210.0481	55.21	-17.31	37.90	43.50	5.60	peak	100	250	P	
3	226.0994	56.17	-16.53	39.64	46.00	6.36	peak	100	113	P	
4	244.2321	56.58	-16.19	40.39	46.00	5.61	peak	100	157	P	
5	330.1948	53.65	-14.30	39.35	46.00	6.65	peak	100	289	P	
6	709.1821	43.77	-6.42	37.35	46.00	8.65	peak	100	130	P	

Test mode:	WIFI	Polarization:	Vertical



Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_30-1000MHz
EUT:
M/N: Mondo Alto
Mode: WORKING
Note:
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power: AC120/60Hz
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	61.7781	51.68	-16.35	35.33	40.00	4.67	peak	100	304	P	
2	125.8864	54.83	-15.08	39.75	43.50	3.75	peak	100	255	P	
3	137.9028	57.48	-14.08	43.40	43.50	0.10	peak	100	353	P	
4	137.9978	55.35	-14.07	41.28	43.50	2.22	QP	100	353	P	
5	150.0058	55.15	-13.08	42.07	43.50	1.43	QP	100	295	P	
6	150.0108	57.86	-13.08	44.78	43.50	-1.28	peak	100	295	F	
7	162.0414	53.48	-13.10	40.38	43.50	3.12	peak	100	230	P	
8	210.0032	57.58	-17.30	40.28	43.50	3.22	QP	100	295	P	
9	210.0482	59.67	-17.31	42.36	43.50	1.14	peak	100	295	P	

Remark: Level(dBuV/m)=Reading(dBuV)+Factor(dB/m)
Margin= Limit(dBuV/m)- Level(dBuV/m)

For 1GHz to 25GHz

Antenna 1

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	47.81	PK	74	26.19	60.75	33.52	6.92	53.38	-12.94
4824.00	--	AV	54	--	--	--	--	--	--
7236.00	45.31	PK	74	28.69	52.20	37.10	9.19	53.18	-6.89
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	44.19	PK	74	29.81	57.13	33.52	6.92	53.38	-12.94
4824.00	--	AV	54	--	--	--	--	--	--
7236.00	47.33	PK	74	26.67	54.22	37.10	9.19	53.18	-6.89
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	47.93	PK	74	26.07	60.73	33.59	6.95	53.34	-12.80
4874.00	--	AV	54	--	--	--	--	--	--
7311.00	47.87	PK	74	26.13	54.40	37.44	9.22	53.19	-6.53
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	45.79	PK	74	28.21	58.59	33.59	6.95	53.34	-12.80
4874.00	--	AV	54	--	--	--	--	--	--
7311.00	47.36	PK	74	26.64	53.89	37.44	9.22	53.19	-6.53
7311.00	--	AV	54	--	--	--	--	--	--

Frequency (MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	47.50	PK	74	26.50	60.10	33.71	6.98	53.29	-12.60
4924.00	--	AV	54	--	--	--	--	--	--
7386.00	47.88	PK	74	26.12	54.21	37.61	9.25	53.19	-6.33
7386.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	46.46	PK	74	27.54	59.06	33.71	6.98	53.29	-12.60
4924.00	--	AV	54	--	--	--	--	--	--
7386.00	46.83	PK	74	27.17	53.16	37.61	9.25	53.19	-6.33
7386.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. Other emission levels are attenuated 20dB below the limit and not recorded in report.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Antenna 2

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	48.79	PK	74	25.21	61.73	33.52	6.92	53.38	-12.94
4824.00	--	AV	54	--	--	--	--	--	--
7236.00	45.72	PK	74	28.28	52.61	37.10	9.19	53.18	-6.89
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	56.17	PK	74	17.83	69.11	33.52	6.92	53.38	-12.94
4824.00	52.91	AV	54	1.09	65.85	33.52	6.92	53.38	-12.94
7236.00	44.70	PK	74	29.30	51.59	37.10	9.19	53.18	-6.89
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	50.72	PK	74	23.28	63.52	33.59	6.95	53.34	-12.80
4874.00	--	AV	54	--	--	--	--	--	--
7311.00	48.02	PK	74	25.98	54.55	37.44	9.22	53.19	-6.53
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	52.38	PK	74	21.62	65.18	33.59	6.95	53.34	-12.80
4874.00	--	AV	54	--	--	--	--	--	--
7311.00	46.11	PK	74	27.89	52.64	37.44	9.22	53.19	-6.53
7311.00	--	AV	54	--	--	--	--	--	--

Frequency (MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	50.93	PK	74	23.07	63.53	33.71	6.98	53.29	-12.60
4924.00	--	AV	54	--	--	--	--	--	--
7386.00	48.07	PK	74	25.93	54.40	37.61	9.25	53.19	-6.33
7386.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	51.05	PK	74	22.95	63.65	33.71	6.98	53.29	-12.60
4924.00	--	AV	54	--	--	--	--	--	--
7386.00	46.92	PK	74	27.08	53.25	37.61	9.25	53.19	-6.33
7386.00	--	AV	54	--	--	--	--	--	--

REMARKS:

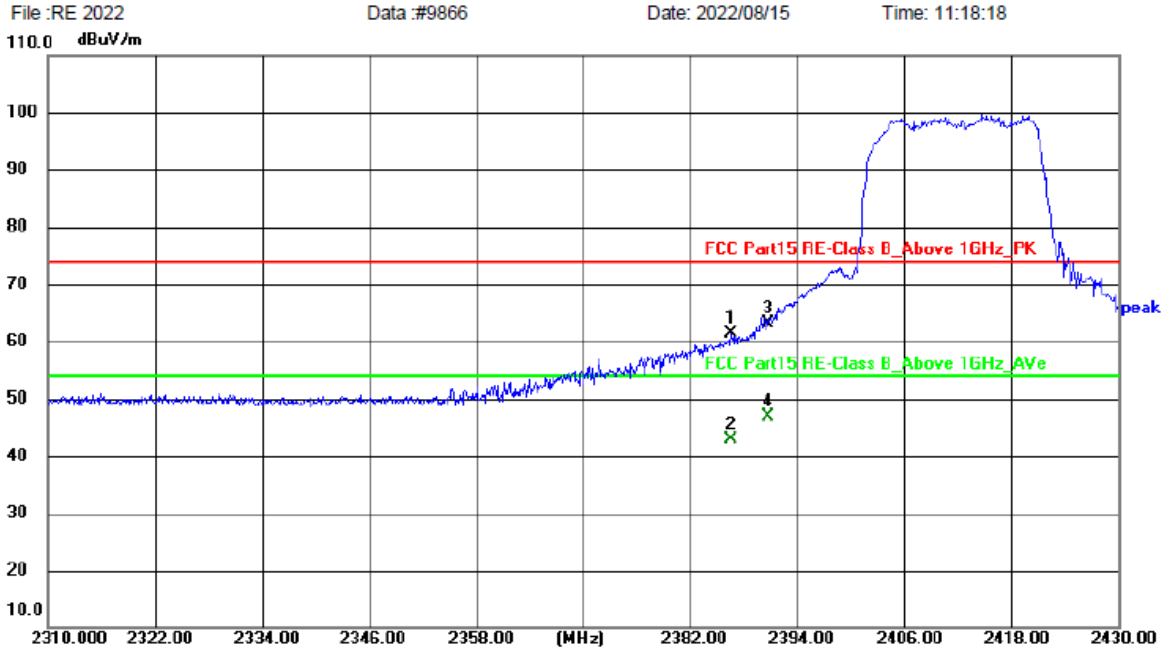
1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. Other emission levels are attenuated 20dB below the limit and not recorded in report.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Results of Band Edges Test (Radiated)

Note: 802.11b/802.11g/802.11n (H20) /802.11n (H40) all have been tested, only worse case 802.11n (H20) and 802.11n (H40) mode was reported.

Antenna 1

Test frequency:	2412 MHz	Polarization:	Horizontal



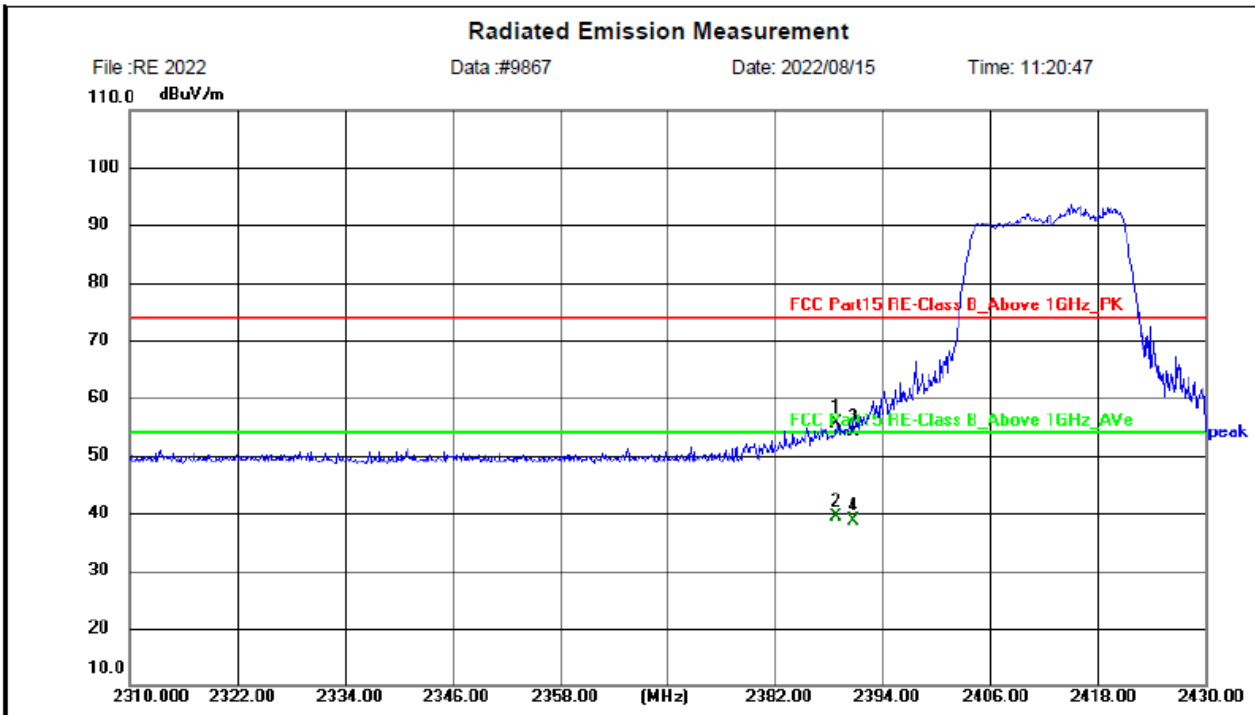
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N20 2412 ANT1
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2385.870	66.09	-4.69	61.40	74.00	12.60	peak	150	360	P	
2	2385.870	47.55	-4.69	42.86	54.00	11.14	AVG	150	360	P	
3	2390.000	67.76	-4.69	63.07	74.00	10.93	peak	150	360	P	
4	2390.000	51.56	-4.69	46.87	54.00	7.13	AVG	150	360	P	

Test frequency:	2412 MHz	Polarization:	Vertical



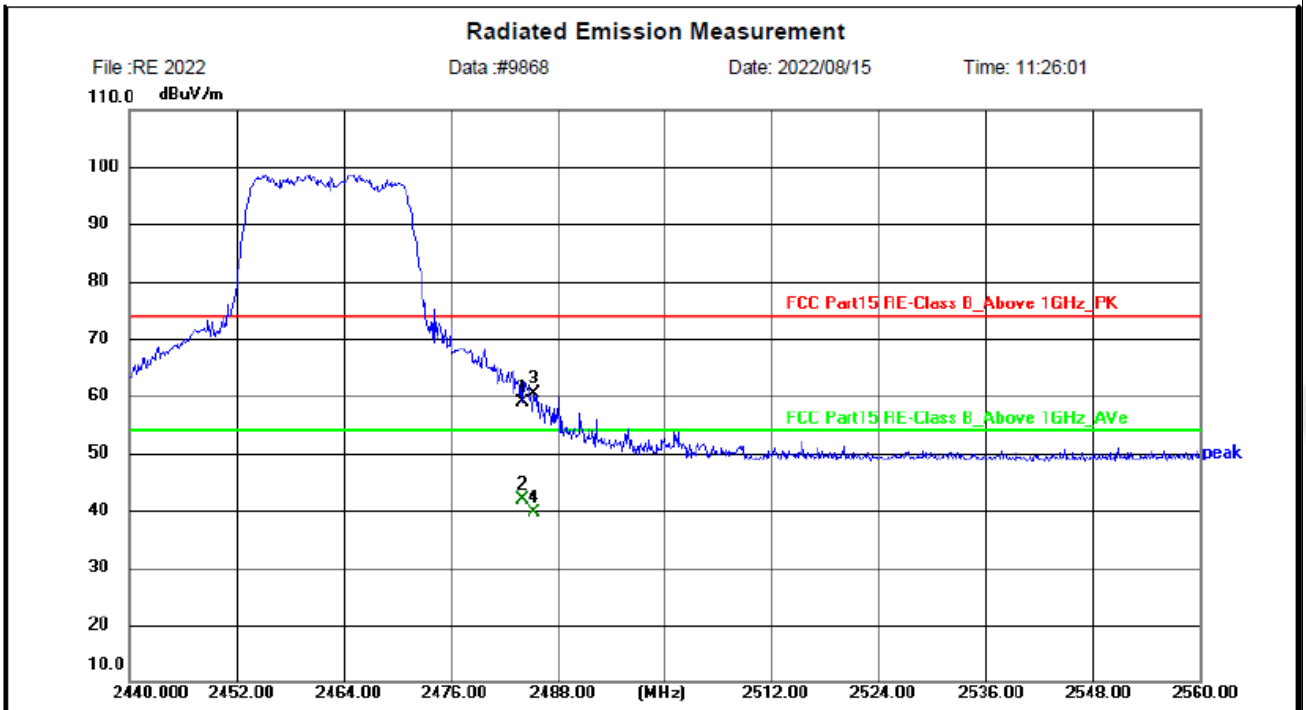
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N20 2412 ANT1
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2388.045	60.42	-4.70	55.72	74.00	18.28	peak	150	0	P	
2	2388.045	44.14	-4.70	39.44	54.00	14.56	AVG	150	0	P	
3	2390.000	58.93	-4.69	54.24	74.00	19.76	peak	150	0	P	
4	2390.000	43.32	-4.69	38.63	54.00	15.37	AVG	150	0	P	

Test frequency:	2462 MHz	Polarization:	Horizontal



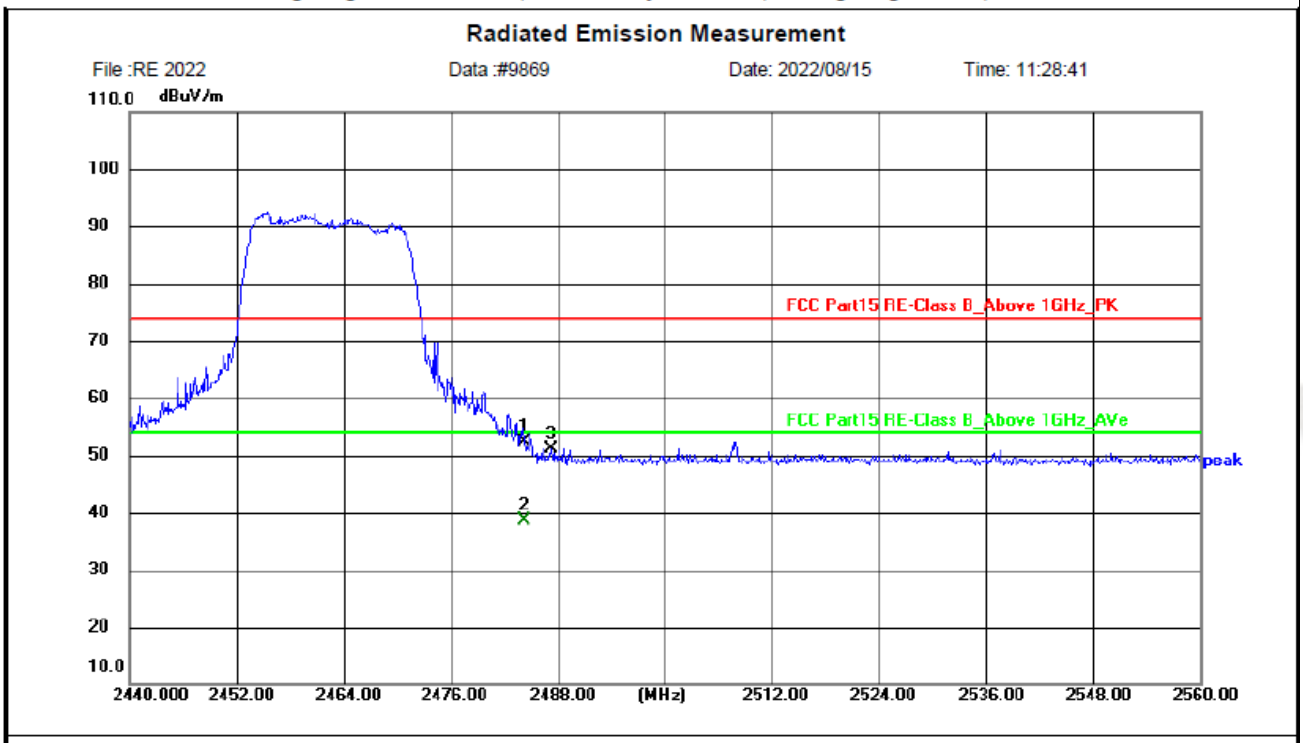
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N20 2462 ANT1
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	63.45	-4.45	59.00	74.00	15.00	peak	150	0	P	
2	2483.500	46.34	-4.45	41.89	54.00	12.11	AVG	150	0	P	
3	2484.730	64.92	-4.45	60.47	74.00	13.53	peak	150	0	P	
4	2484.730	43.99	-4.45	39.54	54.00	14.46	AVG	150	0	P	

Test frequency:	2462 MHz	Polarization:	Vertical



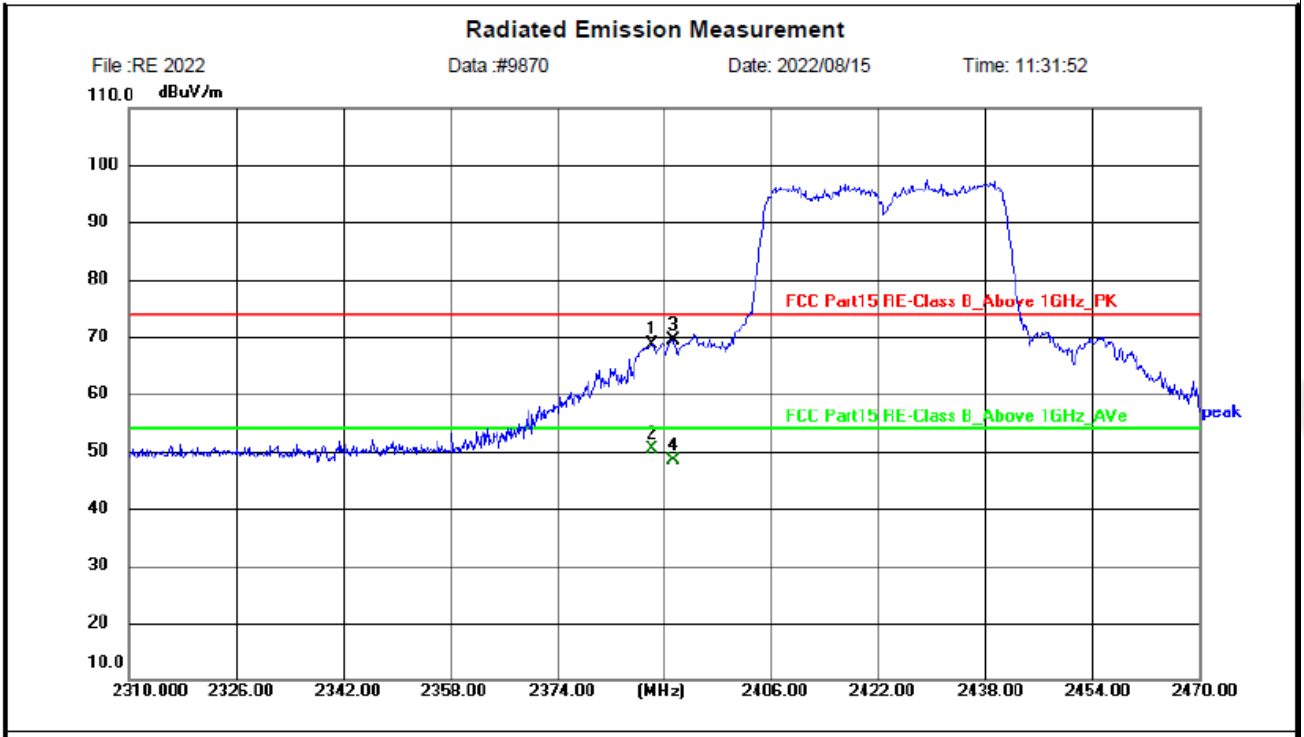
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N20 2462 ANT1
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	56.87	-4.45	52.42	74.00	21.58	peak	150	360	P	
2	2483.500	43.18	-4.45	38.73	54.00	15.27	AVG	150	360	P	
3	2486.605	55.64	-4.45	51.19	74.00	22.81	peak	150	360	P	

Test frequency:	2422 MHz	Polarization:	Horizontal



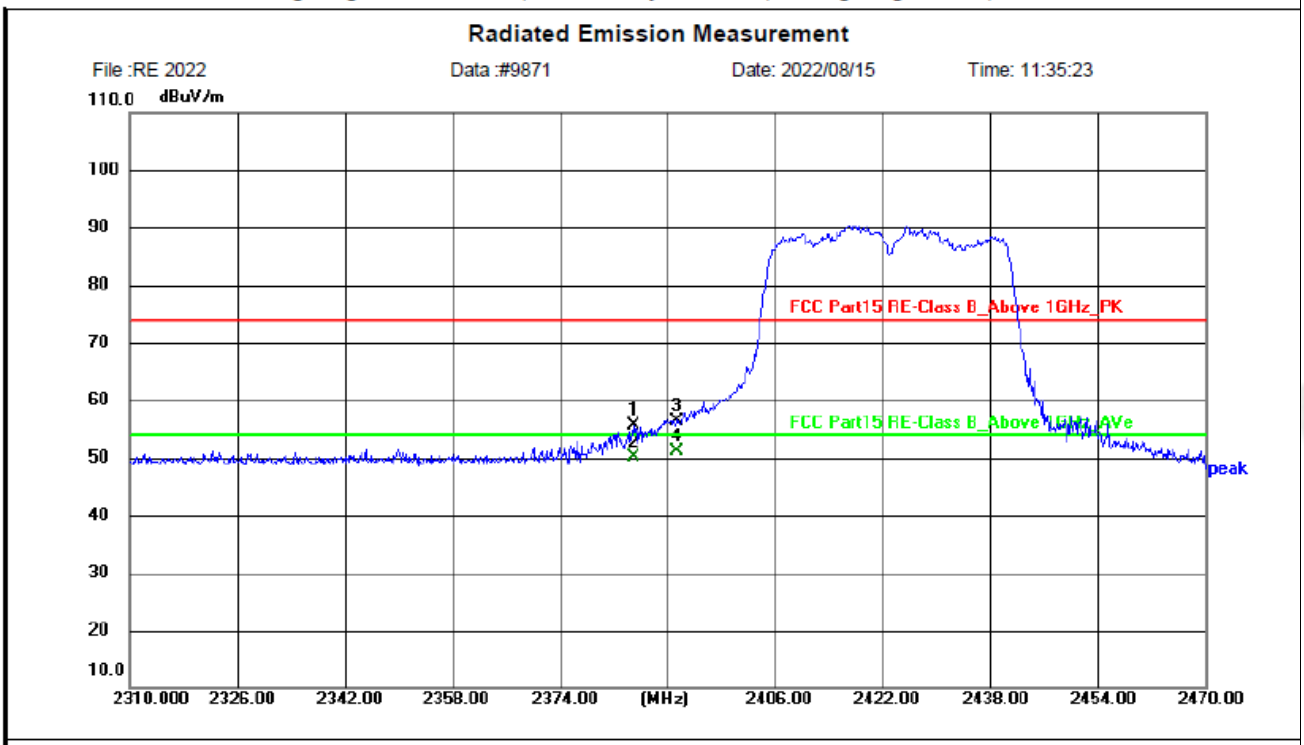
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2422 ANT1
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2387.000	73.32	-4.70	68.62	74.00	5.38	peak	150	0	P	
2	2387.000	55.13	-4.70	50.43	54.00	3.57	AVG	150	0	P	
3	2390.000	74.00	-4.69	69.31	74.00	4.69	peak	150	0	P	
4	2390.000	53.03	-4.69	48.34	54.00	5.66	AVG	150	0	P	

Test frequency:	2422 MHz	Polarization:	Vertical



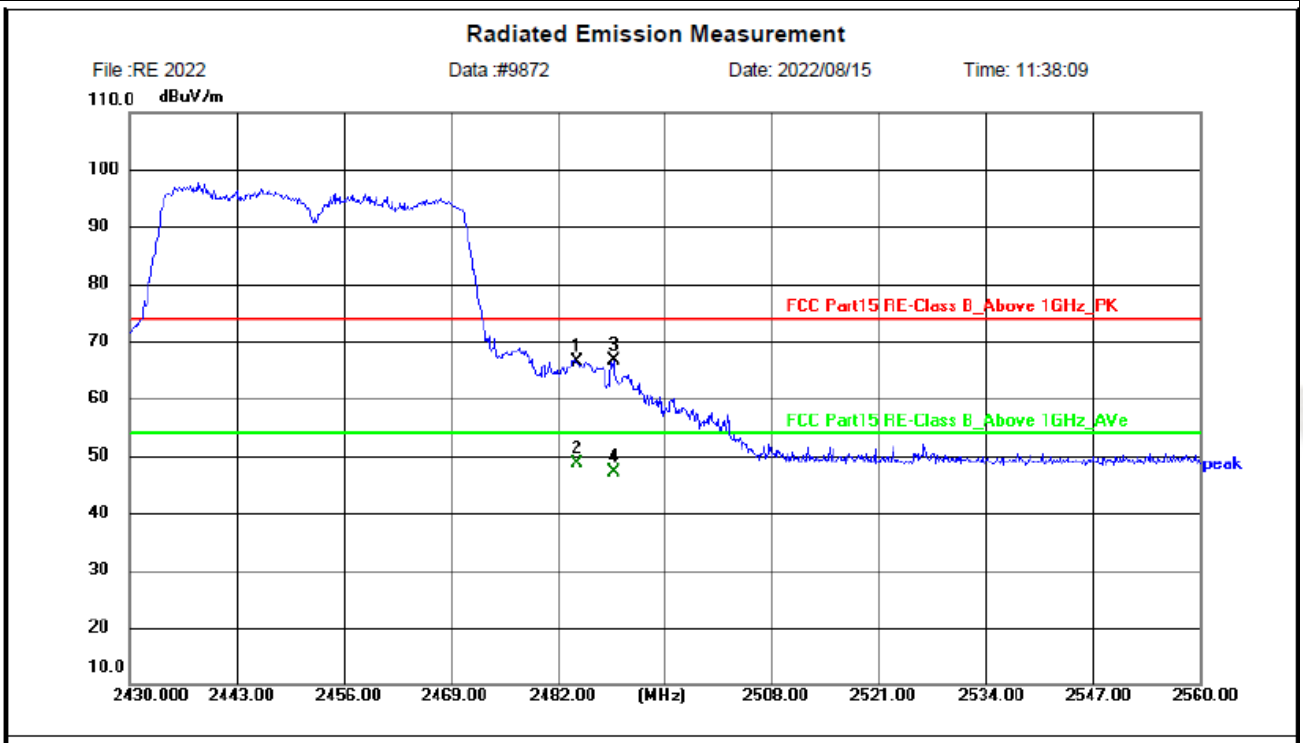
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2422 ANT1
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2383.660	60.30	-4.70	55.60	74.00	18.40	peak	150	360	P	
2	2383.660	54.82	-4.70	50.12	54.00	3.88	AVG	150	360	P	
3	2390.000	61.14	-4.69	56.45	74.00	17.55	peak	150	360	P	
4	2390.000	55.80	-4.69	51.11	54.00	2.89	AVG	150	360	P	

Test frequency:	2452 MHz	Polarization:	Horizontal



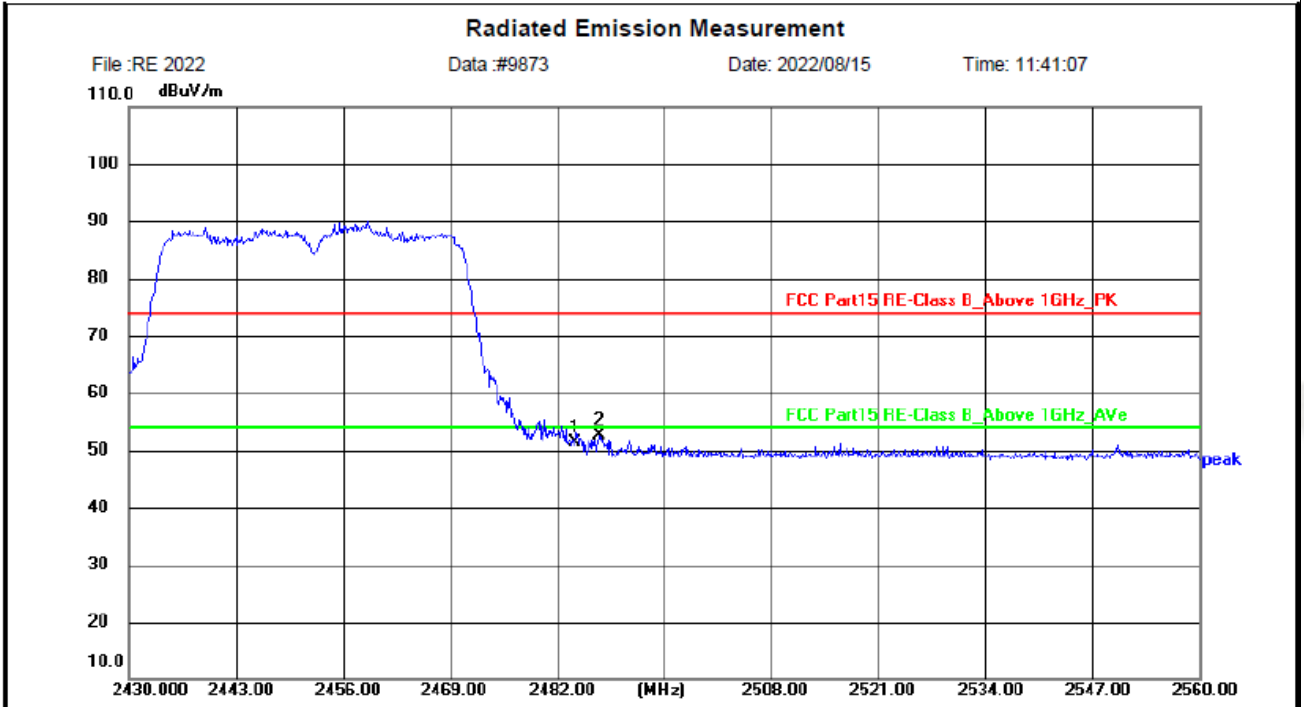
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N40 2452 ANT1
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	70.91	-4.45	66.46	74.00	7.54	peak	150	0	P	
2	2483.500	53.13	-4.45	48.68	54.00	5.32	AVG	150	0	P	
3	2487.931	71.19	-4.44	66.75	74.00	7.25	peak	150	0	P	
4	2487.931	51.67	-4.44	47.23	54.00	6.77	AVG	150	0	P	

Test frequency:	2452 MHz	Polarization:	Vertical



Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N40 2452 ANT1
Company name: Grace Digital Inc.

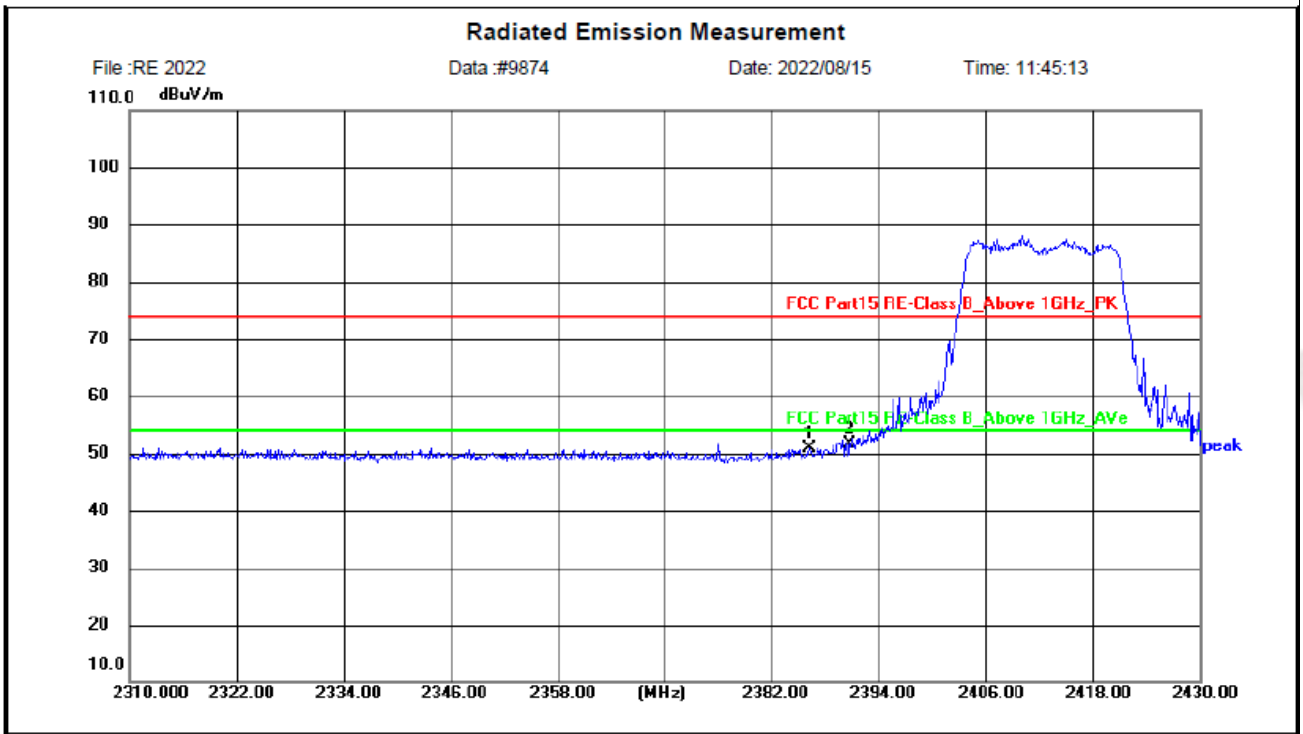
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	55.73	-4.45	51.28	74.00	22.72	peak	150	360	P	
2	2486.241	57.07	-4.45	52.62	74.00	21.38	peak	150	360	P	

Antenna 2

Test frequency:	2412 MHz	Polarization:	Horizontal



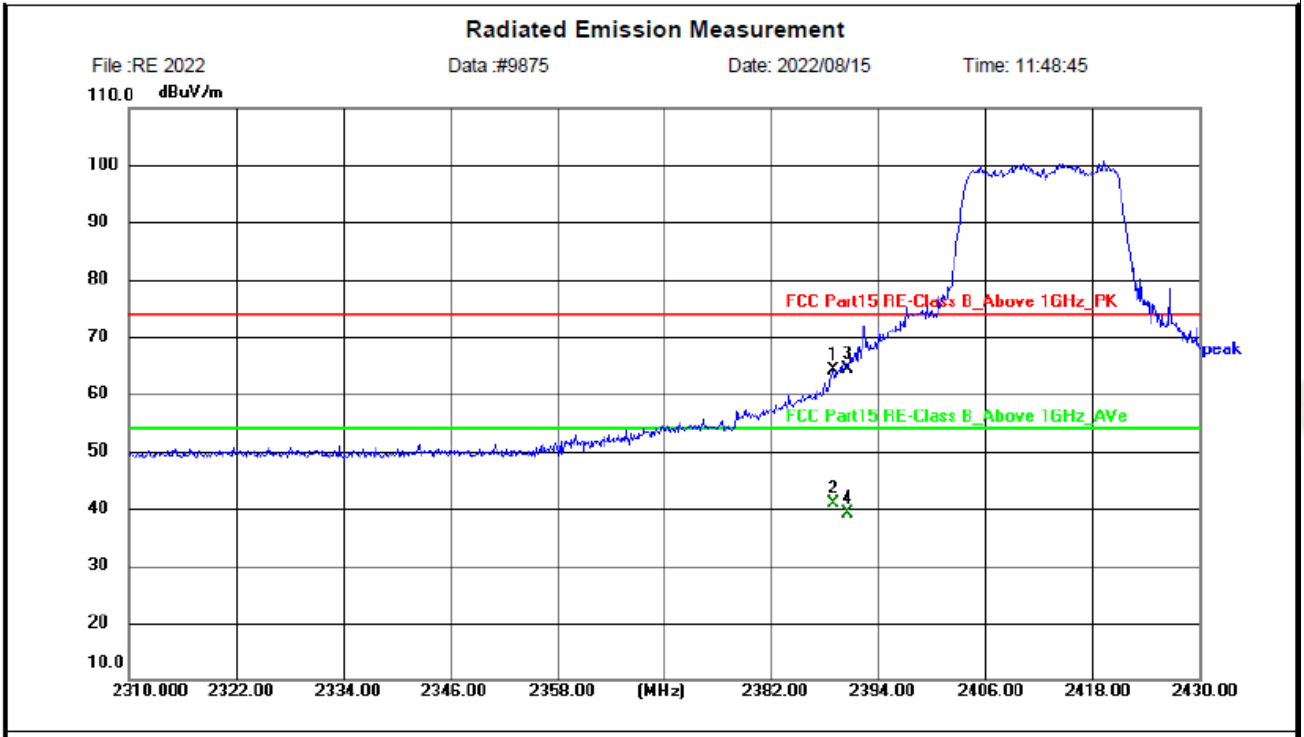
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2412 ANT2
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2385.570	55.67	-4.70	50.97	74.00	23.03	peak	150	0	P	
2	2390.000	56.39	-4.69	51.70	74.00	22.30	peak	150	0	P	

Test frequency:	2412 MHz	Polarization:	Vertical



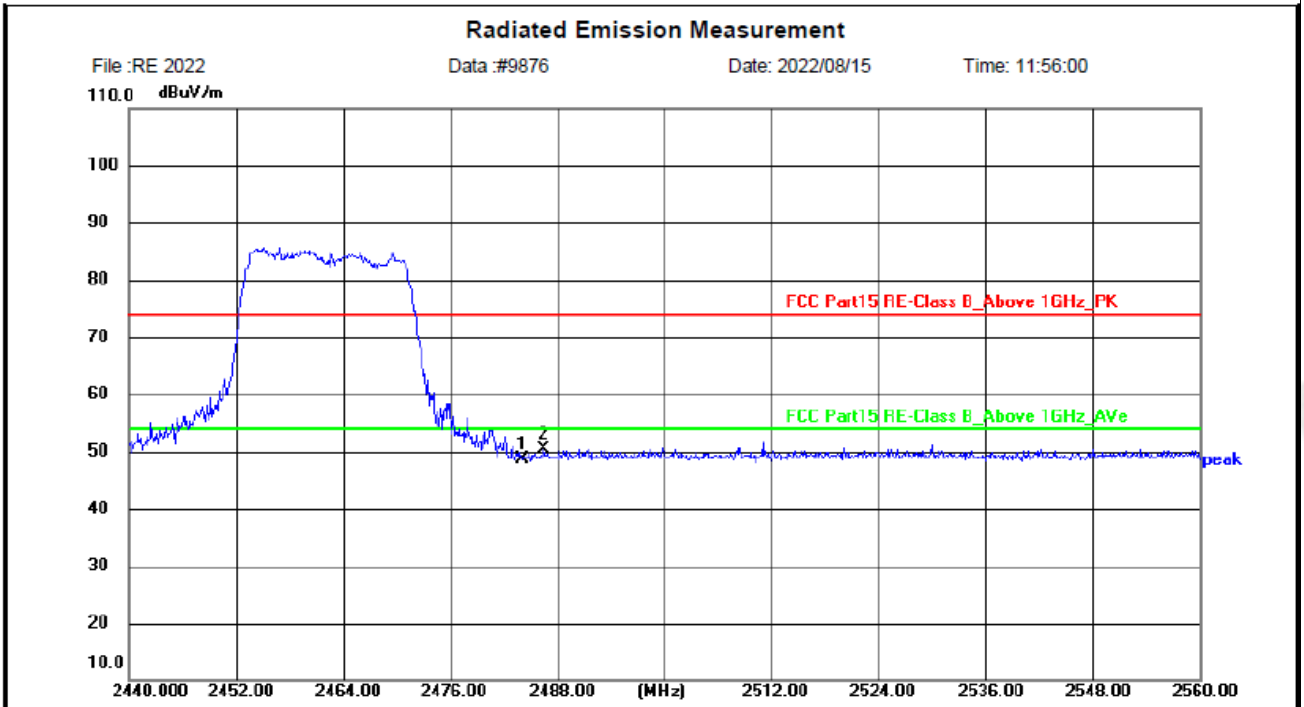
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2412 ANT2
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2388.315	68.91	-4.70	64.21	74.00	9.79	peak	150	360	P	
2	2388.315	45.52	-4.70	40.82	54.00	13.18	AVG	150	360	P	
3	2390.000	68.98	-4.69	64.29	74.00	9.71	peak	150	360	P	
4	2390.000	43.90	-4.69	39.21	54.00	14.79	AVG	150	360	P	

Test frequency:	2462 MHz	Polarization:	Horizontal



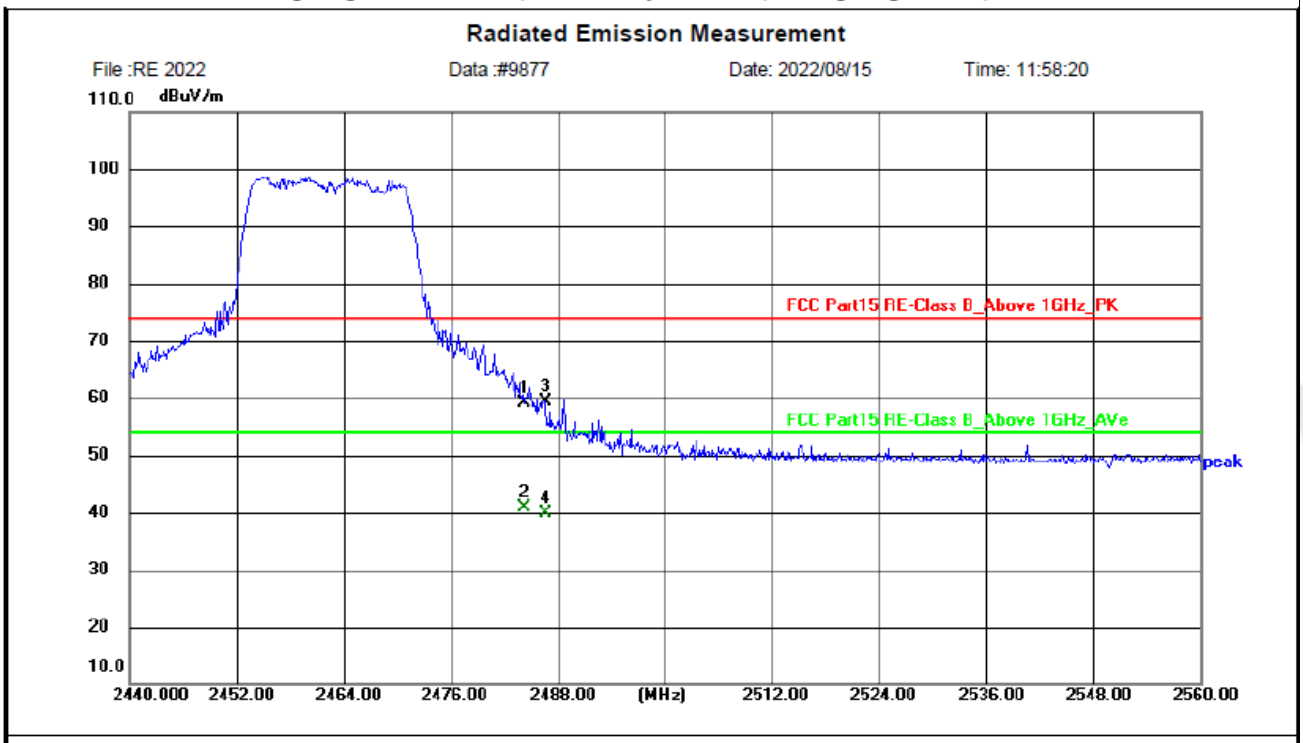
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2462 ANT2
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	53.14	-4.45	48.69	74.00	25.31	peak	150	360	P	
2	2485.840	54.75	-4.45	50.30	74.00	23.70	peak	150	360	P	

Test frequency:	2462 MHz	Polarization:	Vertical



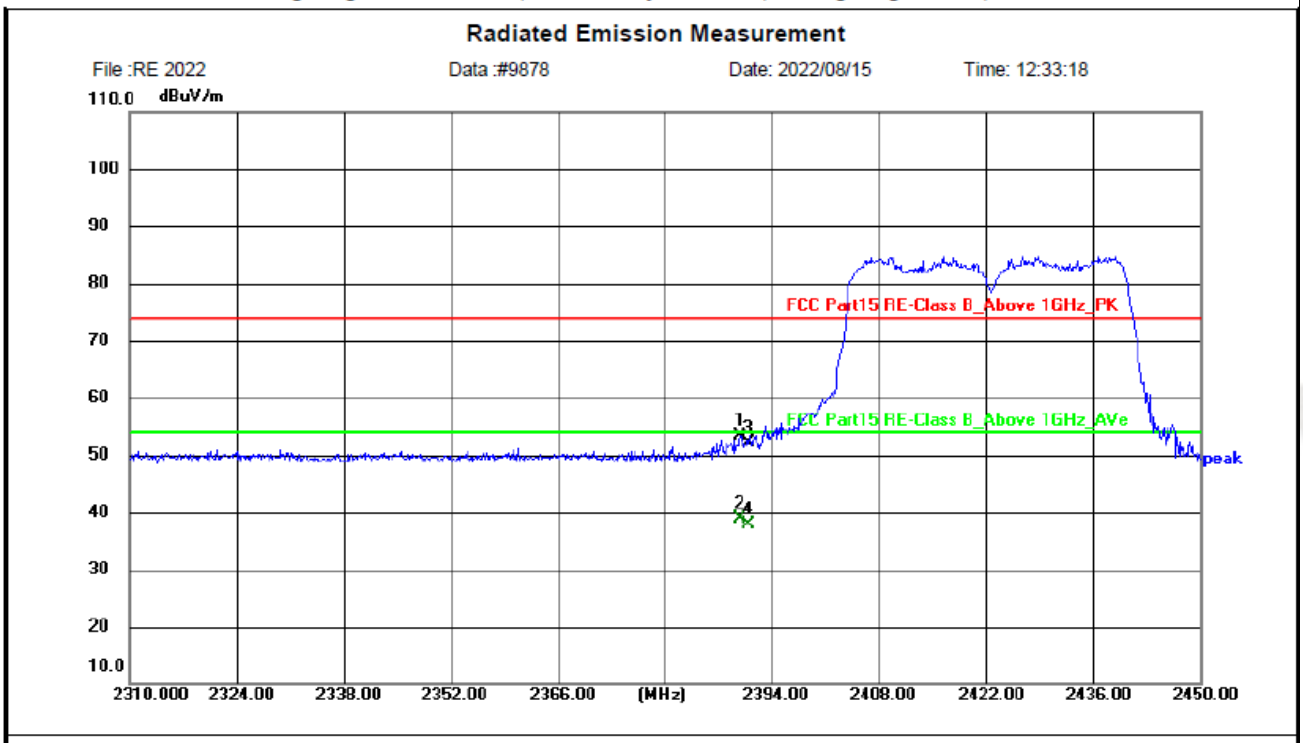
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2462 ANT2
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	63.53	-4.45	59.08	74.00	14.92	peak	150	0	P	
2	2483.500	45.33	-4.45	40.88	54.00	13.12	AVG	150	0	P	
3	2485.885	63.85	-4.45	59.40	74.00	14.60	peak	150	0	P	
4	2485.885	44.37	-4.45	39.92	54.00	14.08	AVG	150	0	P	

Test frequency:	2422 MHz	Polarization:	Horizontal



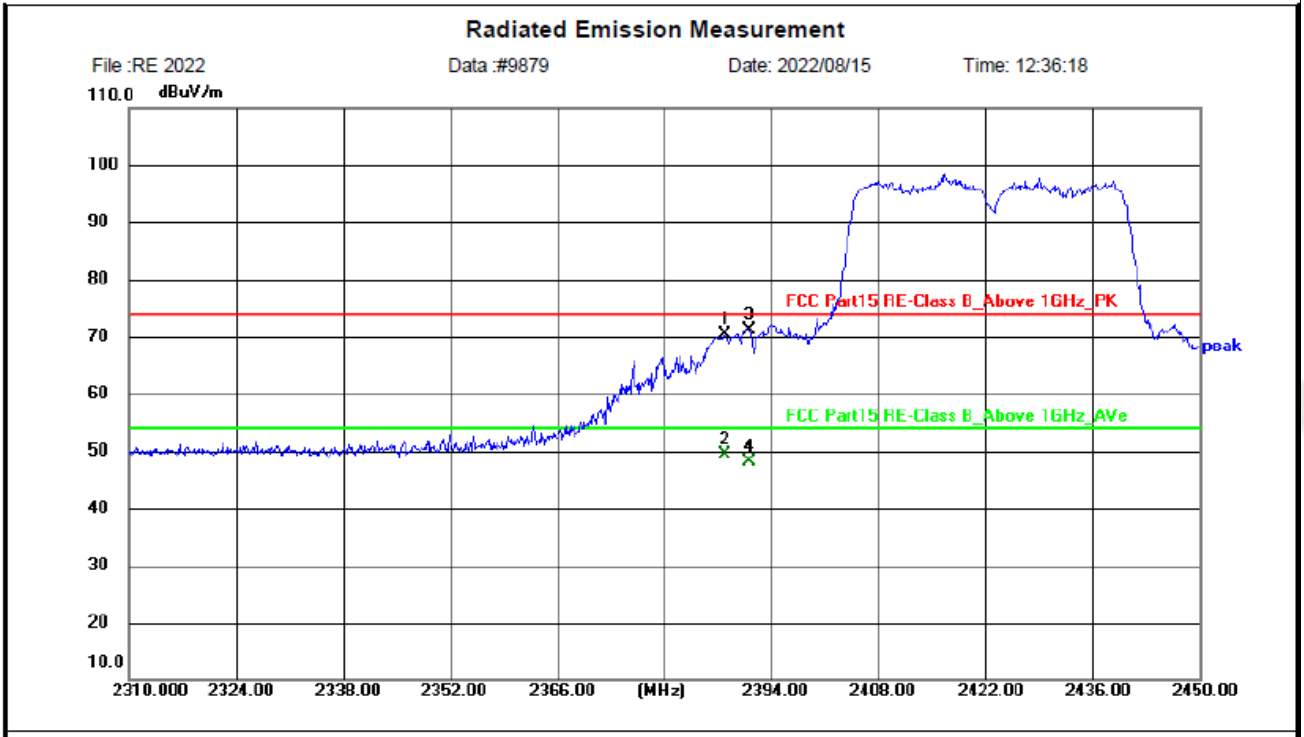
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N40 2422 ANT2
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2388.907	58.00	-4.70	53.30	74.00	20.70	peak	150	360	P	
2	2388.907	43.61	-4.70	38.91	54.00	15.09	AVG	150	360	P	
3	2390.000	56.77	-4.69	52.08	74.00	21.92	peak	150	360	P	
4	2390.000	42.58	-4.69	37.89	54.00	16.11	AVG	150	360	P	

Test frequency:	2422 MHz	Polarization:	Vertical



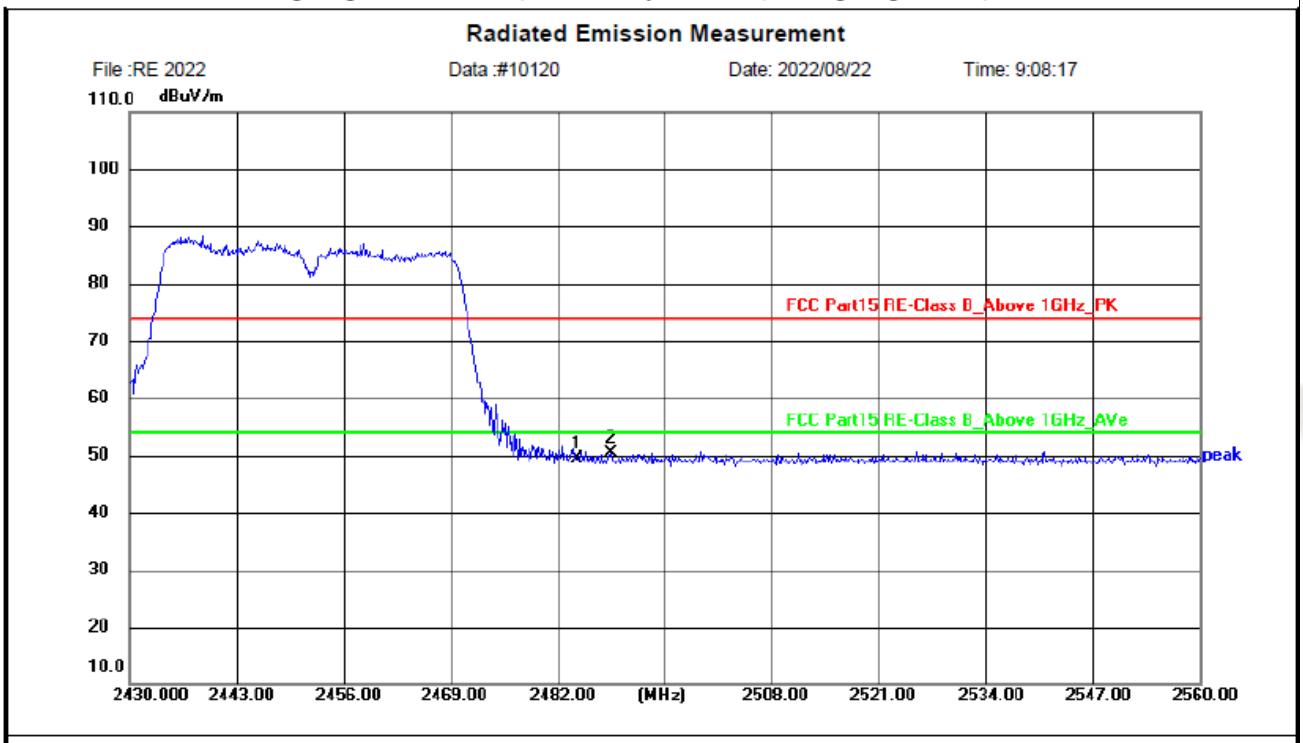
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: N40 2422 ANT2
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2387.000	75.07	-4.70	70.37	74.00	3.63	peak	150	0	P	
2	2387.000	53.98	-4.70	49.28	54.00	4.72	AVG	150	0	P	
3	2390.000	75.94	-4.69	71.25	74.00	2.75	peak	150	0	P	
4	2390.000	52.81	-4.69	48.12	54.00	5.88	AVG	150	0	P	

Test frequency:	2452 MHz	Polarization:	Horizontal



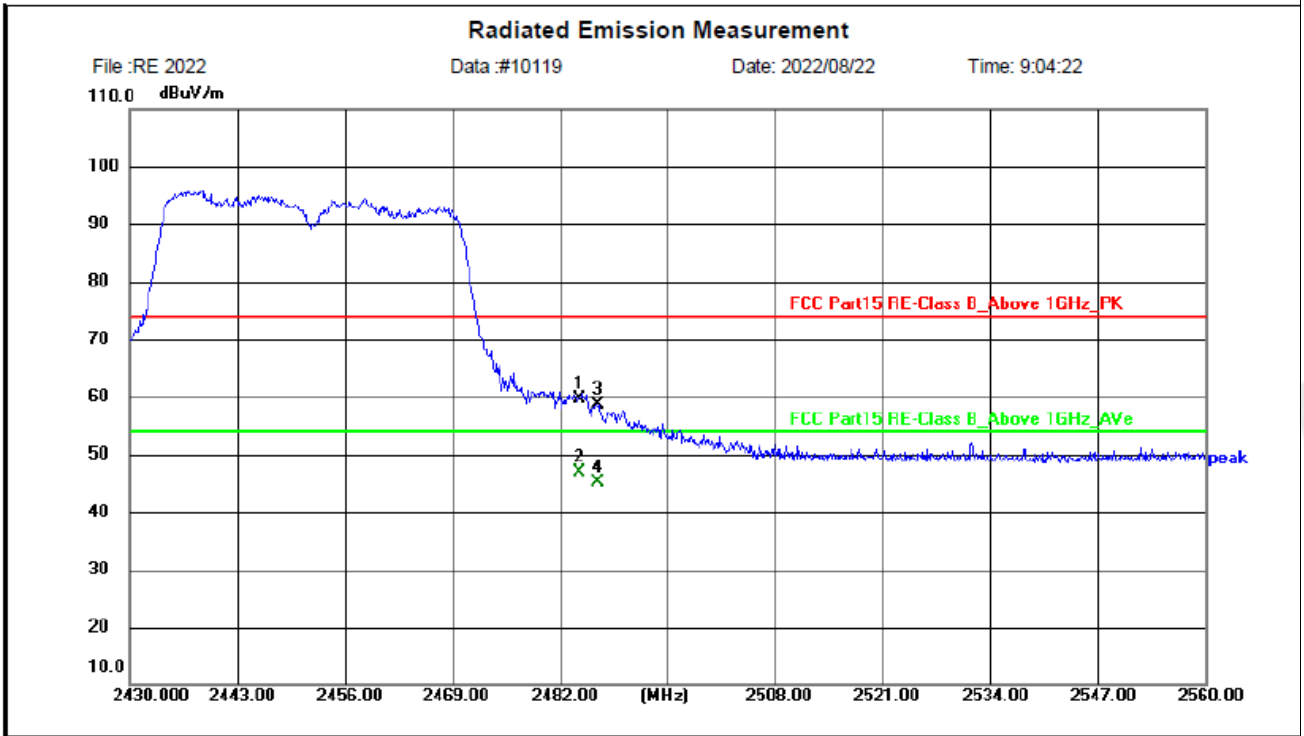
Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2452 ANT2 功率12
Company name: Grace Digital Inc.

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	53.93	-4.45	49.48	74.00	24.52	peak	149	0	P	
2	2487.662	54.80	-4.45	50.35	74.00	23.65	peak	149	0	P	

Test frequency:	2452 MHz	Polarization:	Vertical



Site CTL 966 Chamber 1
Limit: FCC Part15 RE-Class B_Above 1GHz_PK
EUT:
M/N: Mondo Alto
Mode: WORKING
Note: 2452 ANT2 功率12
Company name: Grace Digital Inc.

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 25(C)
Humidity: 50 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	64.13	-4.45	59.68	74.00	14.32	peak	149	360	P	
2	2483.500	51.32	-4.45	46.87	54.00	7.13	AVG	150	360	P	
3	2485.589	63.05	-4.45	58.60	74.00	15.40	peak	149	360	P	
4	2485.589	49.57	-4.45	45.12	54.00	8.88	AVG	150	360	P	

REMARKS:

1. Level (dBuV/m) =Reading (dBuV)+ Factor (dB/m)
2. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value-Level value.
4. Other emission levels are attenuated 20dB below the limit and not recorded in report.
5. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

3.3. Maximum Conducted Output Power

Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Test Configuration

Test Results

Raw data reference to Appendix for 2.4G WIFI.

3.4. Power Spectral Density

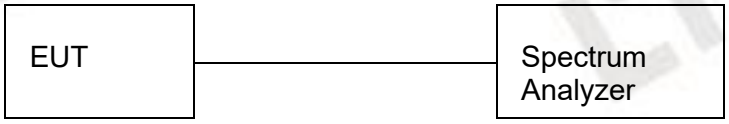
Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW ≥ 3× RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration



Test Results

Raw data reference to Appendix for 2.4G WIFI.

3.5. 6dB Bandwidth

Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration

Test Results

Raw data reference to Appendix for 2.4G WIFI.

3.6. Out-of-band Emissions

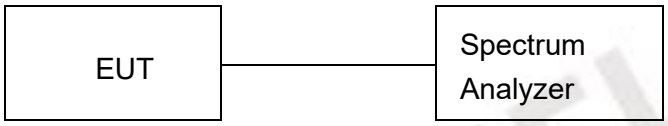
Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector , and max hold. Measurements utilizing these setting are made of the in-band reference level, bandedge and out-of-band emissions.

Test Configuration



Test Results

Raw data reference to Appendix for 2.4G WIFI.

3.7. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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

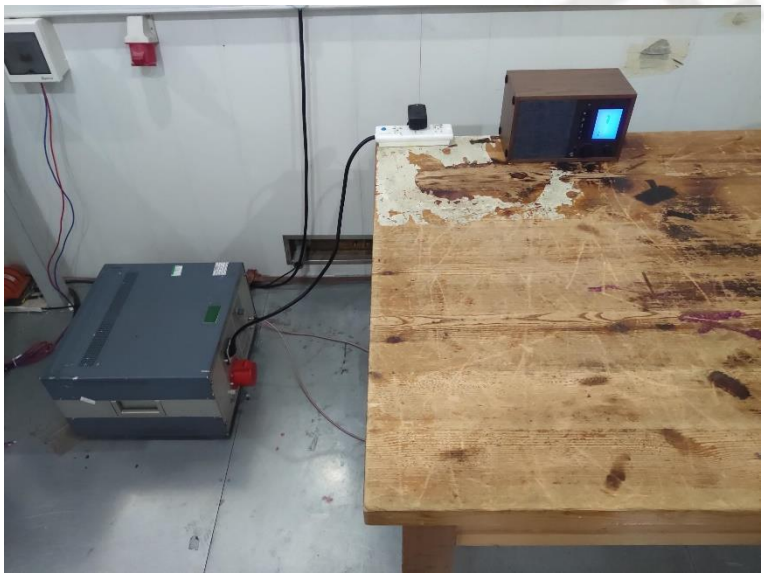
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c)(1)(i):

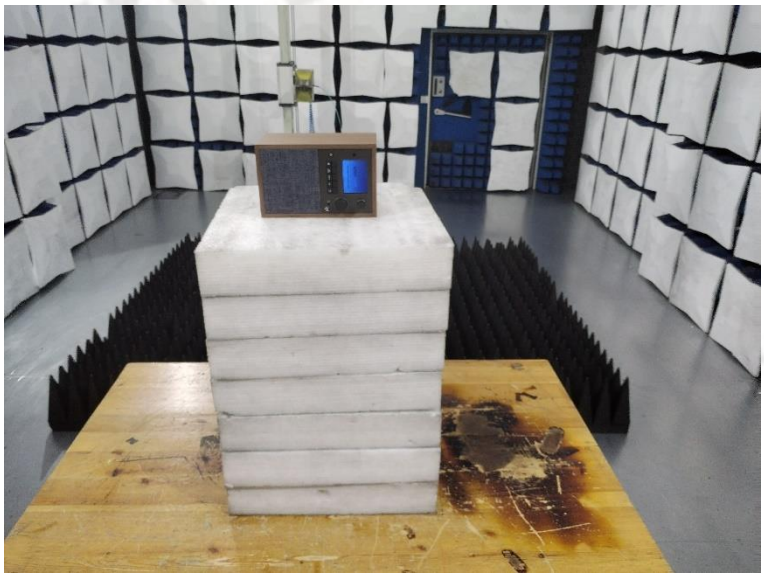
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result:

The device used a FPC antenna and the maximum gain is 1.3dBi.

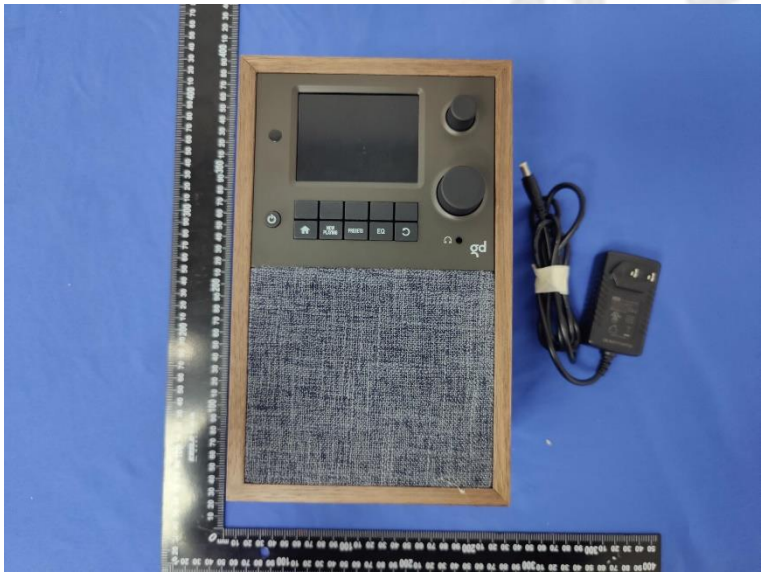
4. Test Setup Photos of the EUT

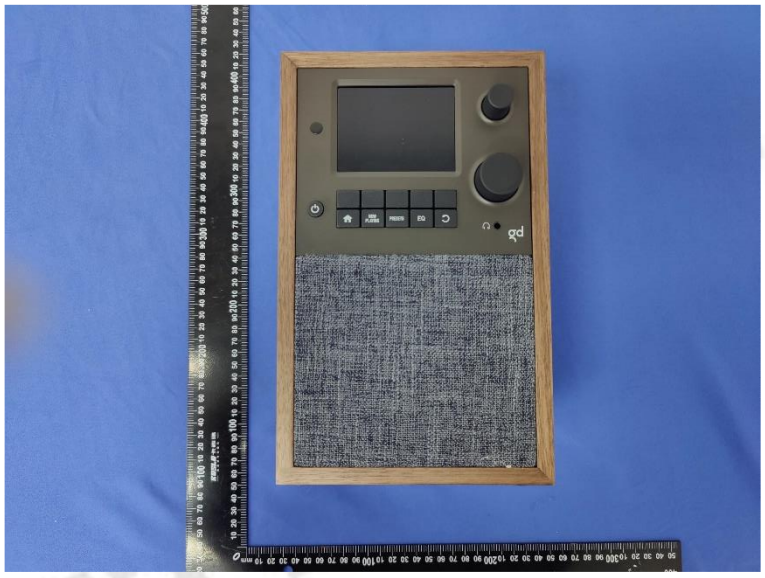


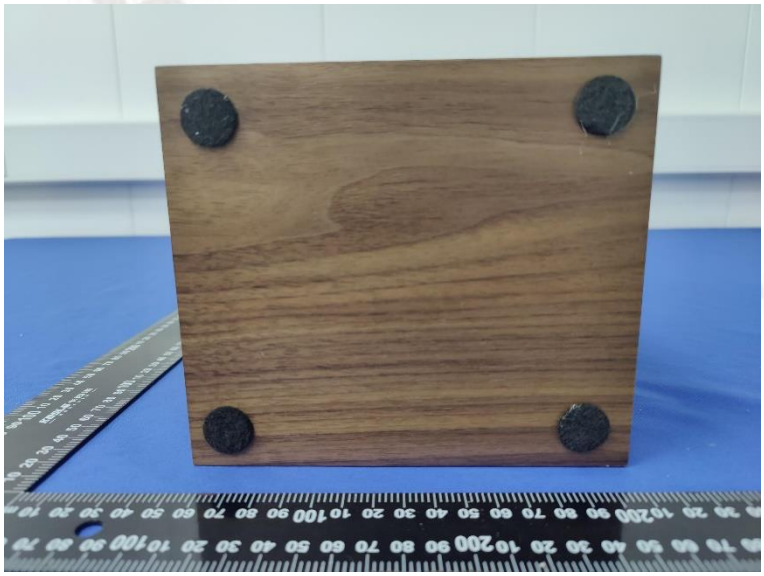


5. Photos of the EUT

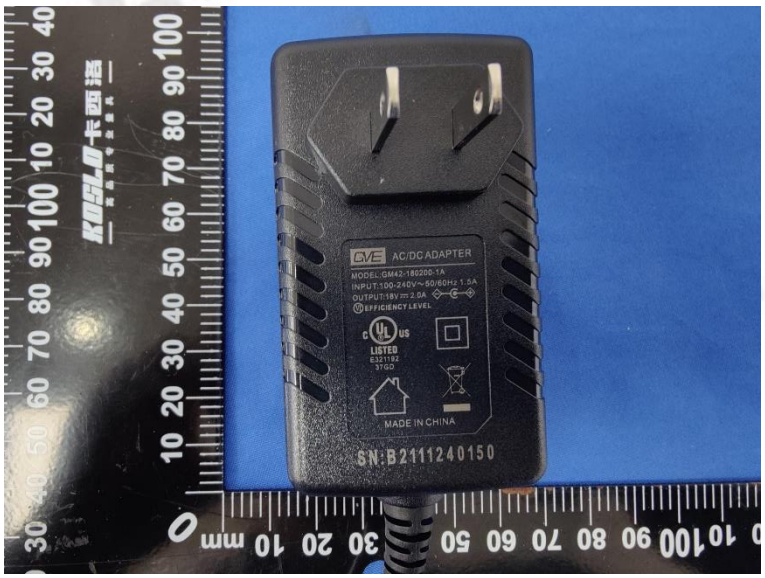
External Photos of EUT



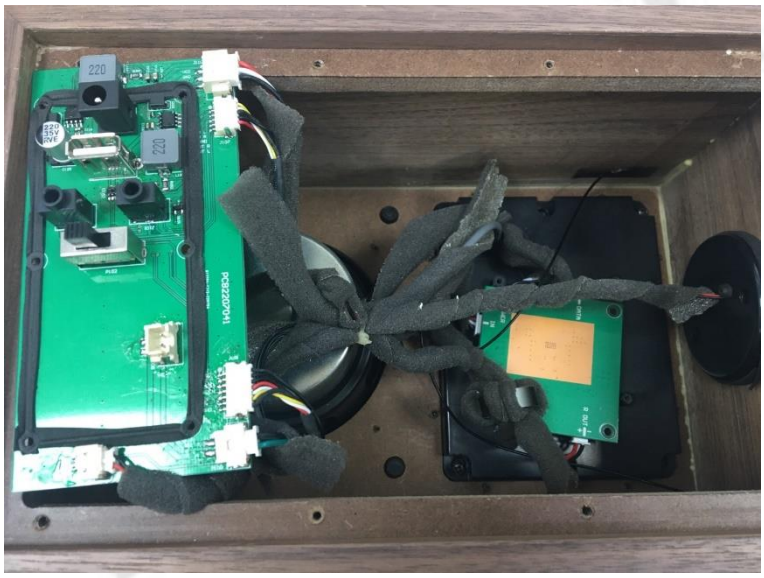


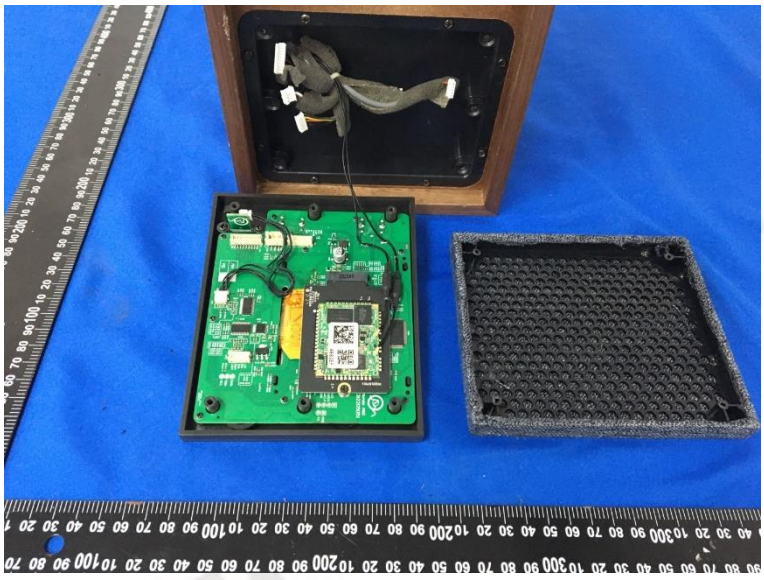


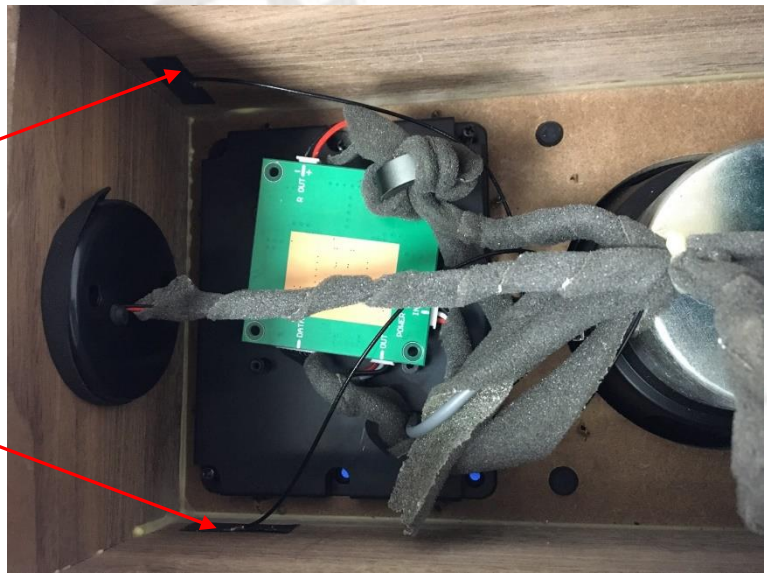

SNOOZE
sleep timer

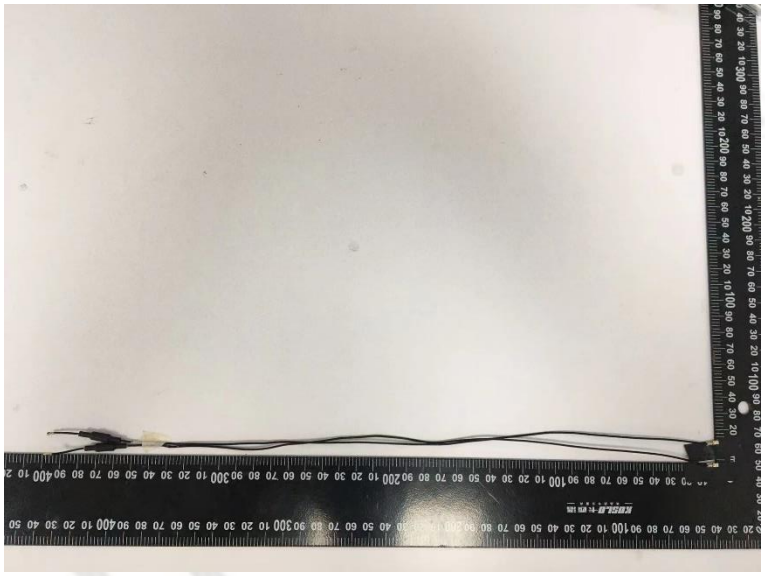

AC/DC ADAPTER
MADE IN CHINA
SN:B2111240150

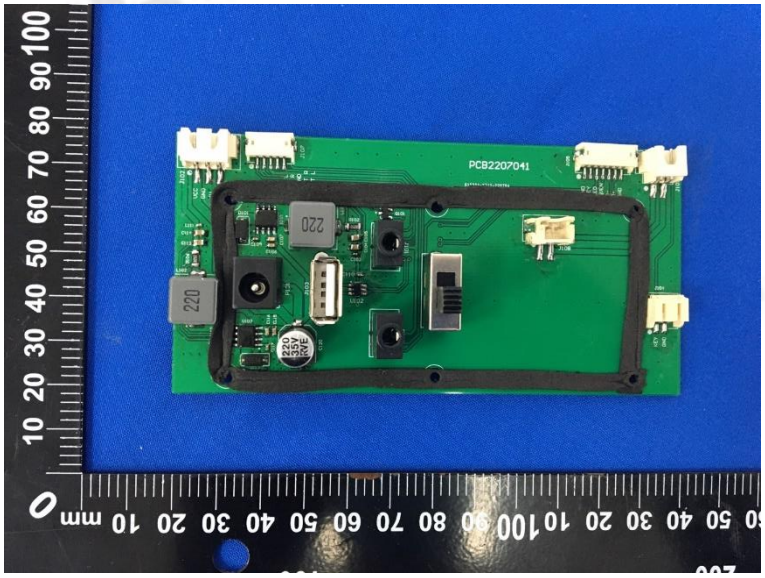
Internal Photos of EUT

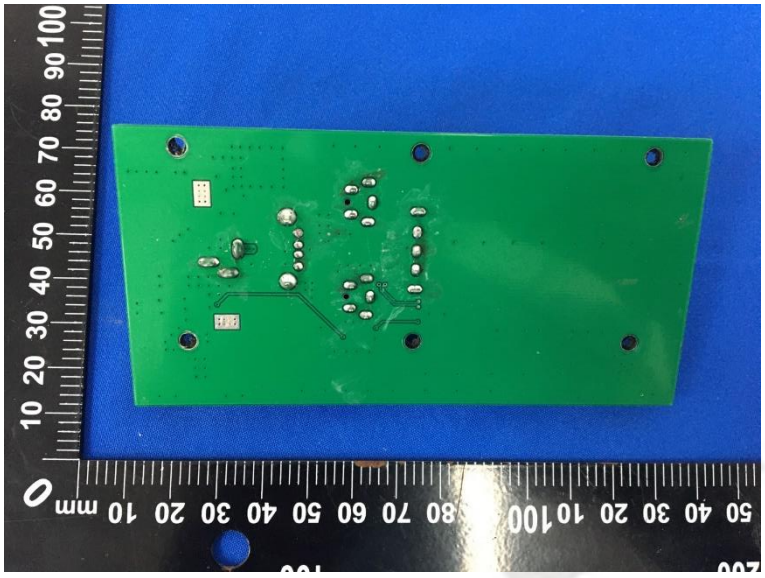


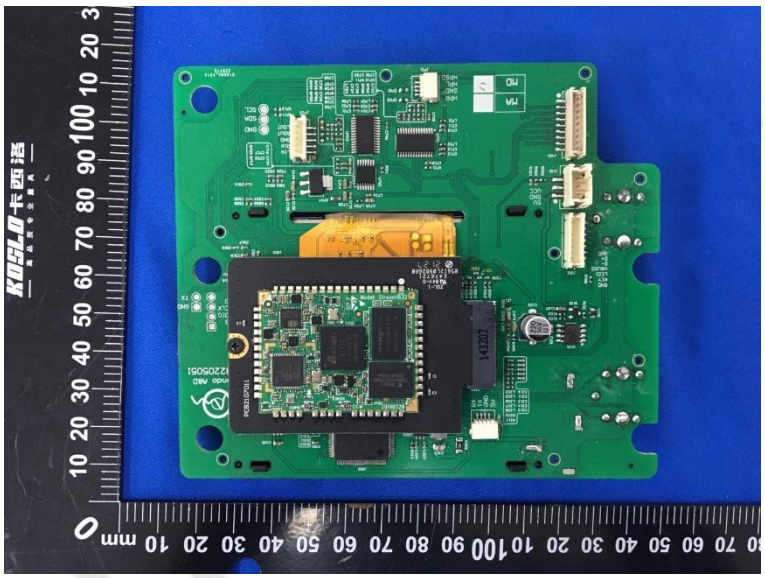


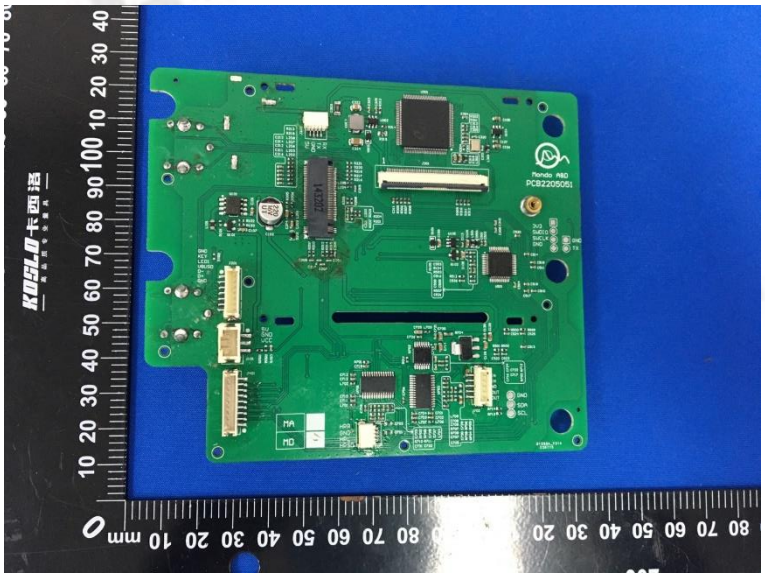


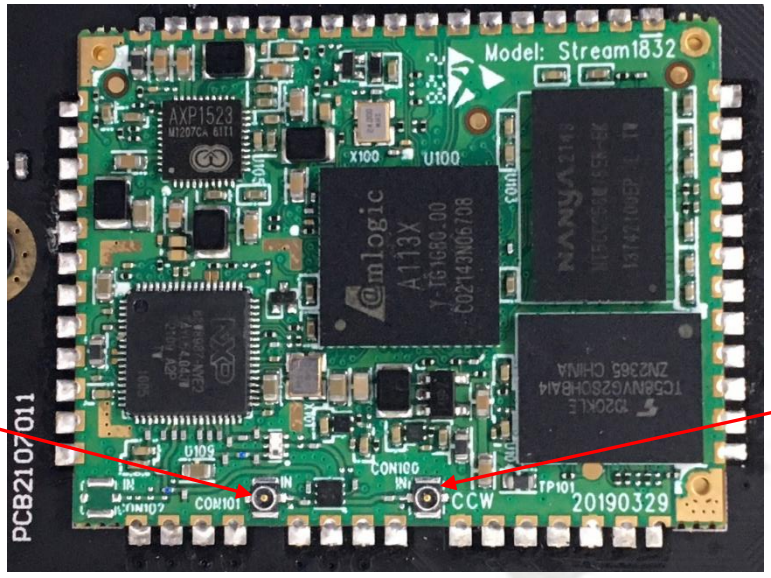



PCB2207041



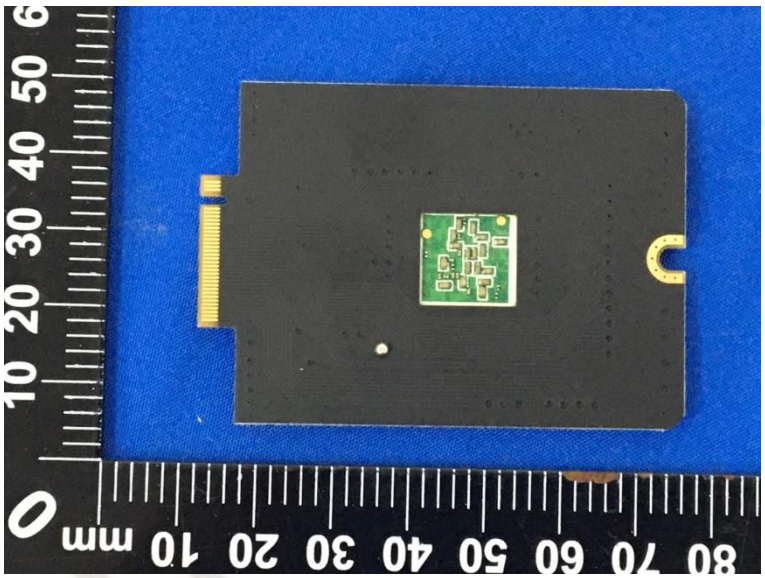


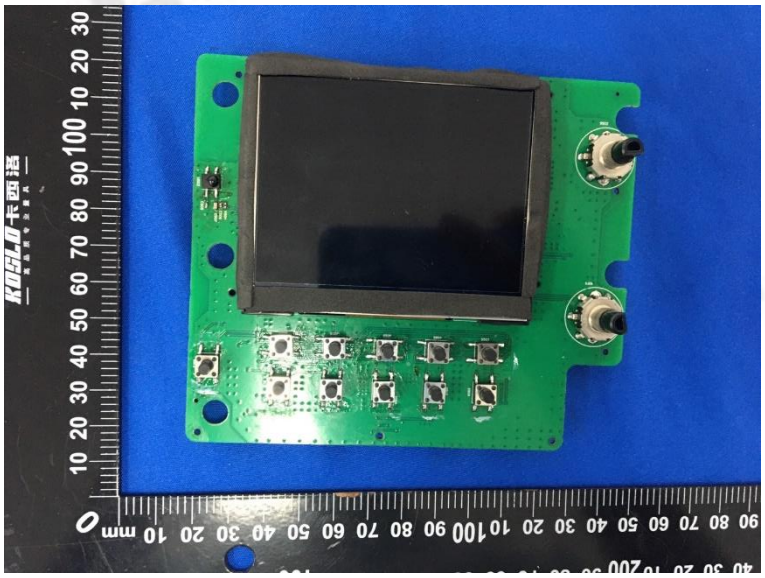


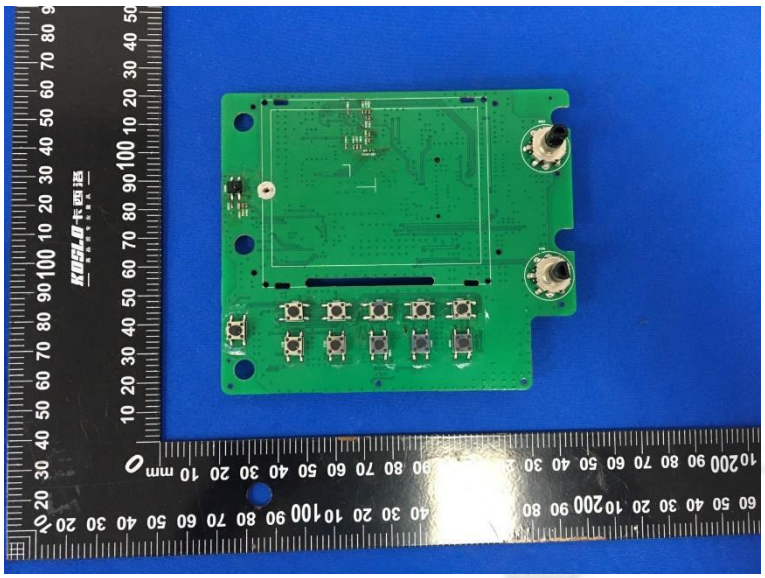


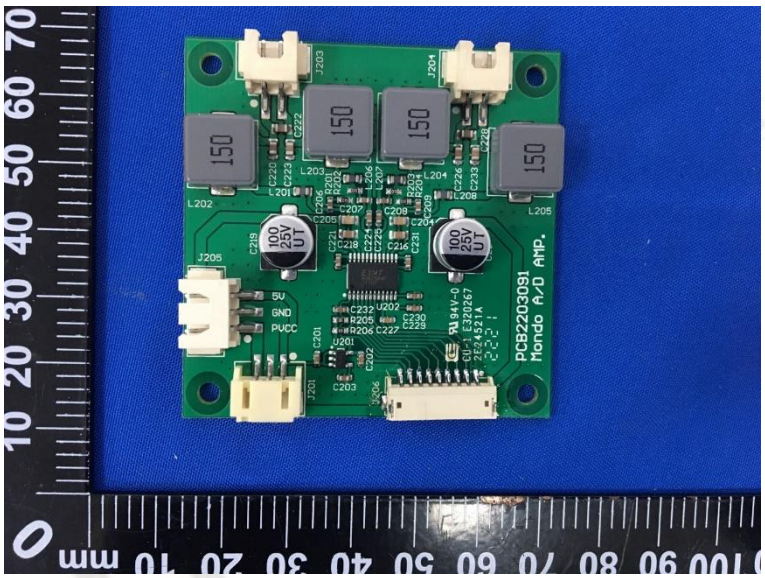
BT Antenna 2 / WIFI Antenna 1

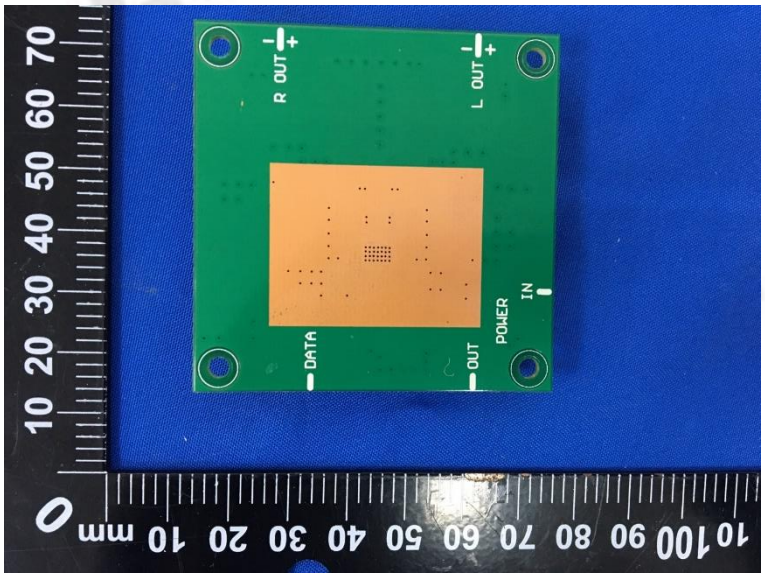
BT Antenna 1 / WIFI Antenna 2











********** End of Report **********