

FCC REPORT

(BLE)

Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

Address of Applicant: Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen

Equipment Under Test (EUT)

Product Name: Tracker

Model No.: cp311A

FCC ID: R38YLC311A

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

Date of sample receipt: 20 Jan., 2022

Date of Test: 21 Jan., to 27 Jan., 2022

Date of report issued: 28 Jan., 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	28 Jan., 2022	Original

Tested by:

Mike.ou

Test Engineer

Date:

28 Jan., 2022

Reviewed by:

Winner Zhang

Project Engineer

Date:

28 Jan., 2022

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4 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203 & 15.247 (b)	Pass
AC Power Line Conducted Emission	15.207	Pass ¹
Conducted Peak Output Power	15.247 (b)(3)	Pass ²
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass ¹
Power Spectral Density	15.247 (e)	Pass ¹
Band Edge	15.247 (d)	Pass ¹
Emissions in Restricted Frequency Bands	15.205 & 15.209	Pass ²
Conducted Spurious Emission	15.247 (d)	Pass ¹
Spurious Emission	15.205 & 15.209	Pass ²
Remark: 1. Pass ¹ : Items data are refer from the original report issued by SGS-CSTC Standards Technical Services, Co., Ltd. Shenzhen Branch. (Date of Test: 2019/1/10-2019/1/24). The detailed data refer to Appendix- Bluetooth BLE 2. Pass ² : These items are tested by JianYan Testing Group Shenzhen Co., Ltd. 3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).		
Test Method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02	

5 General Information

5.1 Client Information

Applicant:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Manufacturer:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen

5.2 General Description of E.U.T.

Product Name:	Tracker
Model No.:	cp311A
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Integrated Antenna
Antenna gain:	-0.13dBi
Power supply:	☒ AC/DC Adapter
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

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. Channel No. 0, 20 & 39 were selected as Lowest, Middle and Highest channel.

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
Radiated Emission: 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.	

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission (9kHz ~ 30MHz electric field) for 3m SAC	3.13 dB
Radiated Emission (9kHz ~ 30MHz magnetic field) for 3m SAC	3.13 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
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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:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
3m SAC	ETS	RFD-100	Q1984	04-14-2021	04-13-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	9163-1246	03-07-2021	03-06-2022
Biconical Antenna	SCHWARZBECK	VUBA 9117	9117#359	06-17-2021	06-17-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	912D-916	03-07-2021	03-06-2022
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1067	04-02-2021	04-01-2022
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1068	04-02-2021	04-01-2022
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
Spectrum analyzer	Keysight	N9010B	MY60240202	10-27-2021	10-26-2022
Band Reject Filter Group	Tonscend	JS0806	21B8060367	04-06-2021	04-05-2022
Low Pre-amplifier	SCHWARZBECK	BBV9743B	00305	03-07-2021	03-06-2022
High Pre-amplifier	SKET	LNPA 0118G-50	MF280208233	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-1G-NN-8M	JYT3M-1	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-18G-NN-8M	JYT3M-2	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-1G-BB-5M	JYT3M-3	03-07-2021	03-06-2022
Cable	Bost	JYT3M-40G-SS-8M	JYT3M-4	04-02-2021	04-01-2022
EMI Test Software	Tonscend	TS+	Version:3.0.0.1		

Conducted method:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Spectrum Analyzer	Keysight	N9010B	MY60240202	10-27-2021	10-26-2022
Power Detector Box	MWRF-test	MW100-PSB	MW201020JYT	11-19-2021	11-18-2022
RF Control Box	MWRF-test	MW100-RFCB	MW200927JYT	N/A	N/A
DC Power Supply	Keysight	E3642A	MY60296194	11-27-2020	11-26-2023
Test Software	MWRF-tes	MTS 8310	Version: 2.0.0.0		

6 Test results and Measurement Data

6.1 Antenna requirement

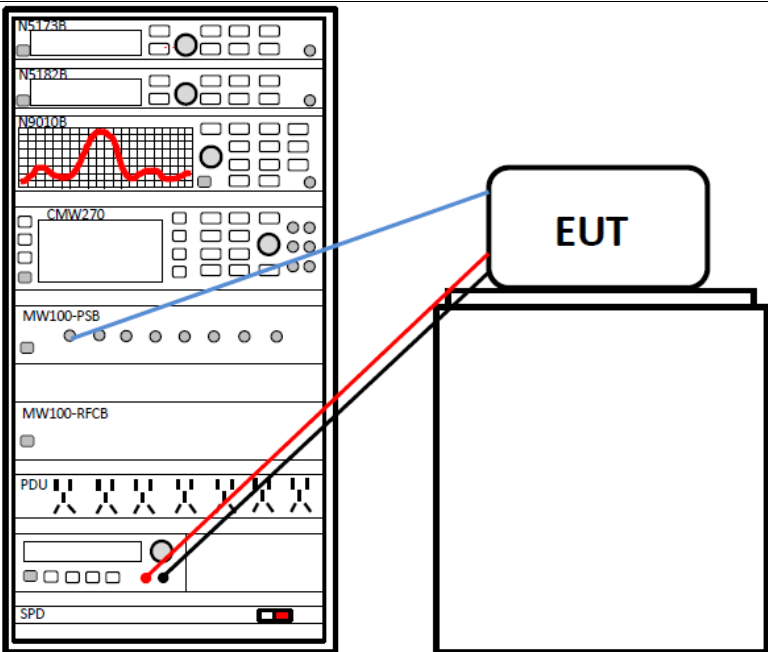
Standard requirement:	FCC Part 15 C Section 15.203 /247(b)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique 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(b) (4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
E.U.T Antenna:	
The BLE antenna is an Integrated Antenna which cannot replace by end-user, the best case gain of the antenna is -0.13 dBi.	

6.2 Conducted Output Power

6.2.1 Re-test statement

Re-test statement: The EUT is operating at the same power level with the original testing of SGS-CSTC Standards Technical Services, Co Ltd. Shenzhen Branch.

6.2.2 Test Result

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

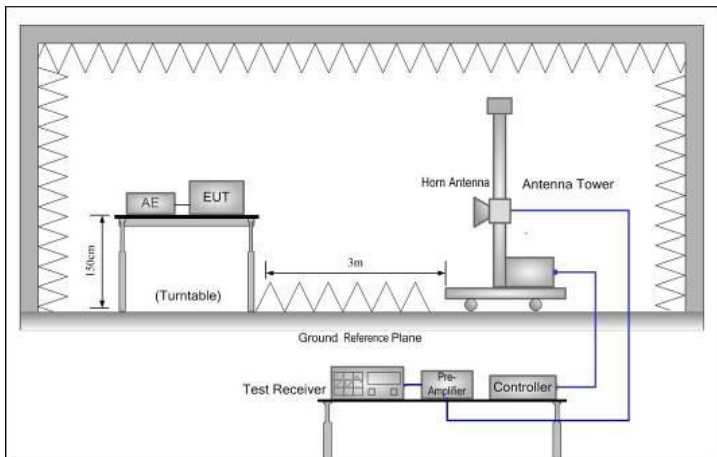
Measurement Data:

Mode	Test Channel	The Original Reports Level [dBm]	Re-Test Reports Level [dBm]	Power level
GFSK	Lowest	4.85	4.374	7
	Middle	5.12	4.823	7
	Highest	5.44	4.887	7

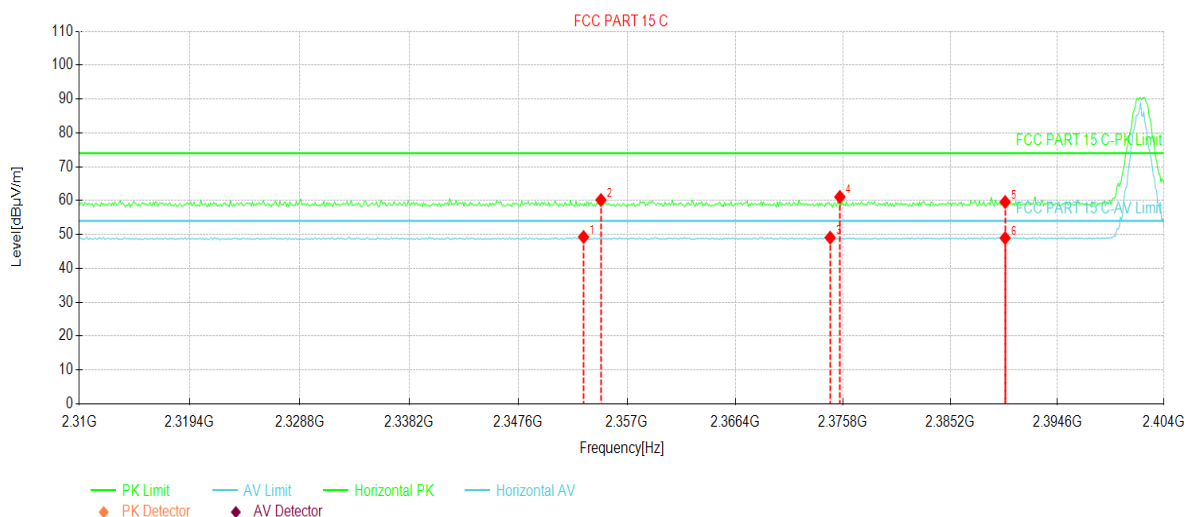
Remark:

	The Original Reports	Re-Test Reports
File name:	test report BLE	test report BLE rev1
Test location:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch	JianYan Testing Group Shenzhen Co., Ltd.
The output power is re-test at JianYan Testing Group Shenzhen Co., Ltd.		

6.3 Emissions in Restricted Frequency Bands

Test Requirement:	FCC Part 15 C Section 15.205 and 15.209				
Test Frequency Range:	2310 MHz to 2390 MHz and 2483.5MHz to 2500 MHz				
Test Distance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak RMS	1MHz 1MHz	3MHz 3MHz	Peak Value Average Value
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	Above 1GHz	54.00 74.00		Average Value Peak Value	
Test Procedure:	1. The EUT was placed on the top of a rotating table 1.5 meters 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:					
Test Instruments:	Refer to section 5.9 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Pass				

Product name:	Tracker	Product model:	cp311A
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%

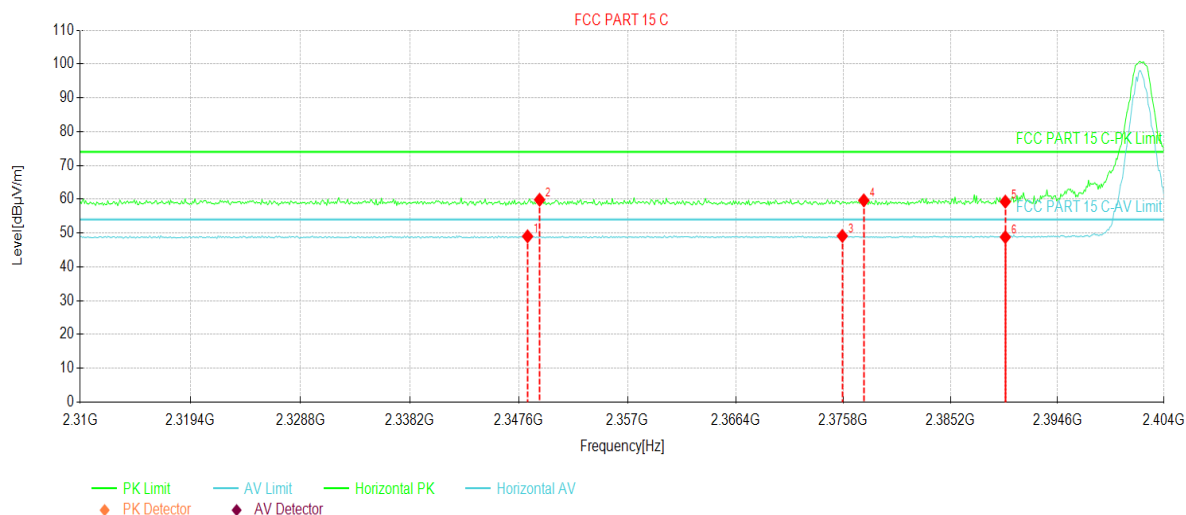


Suspected Data List										
NO	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	2353.2	13.69	49.27	35.58	54.00	4.73	315	148	AV	Vertical
2	2354.7	24.59	60.18	35.59	74.00	13.82	337	140	PK	Vertical
3	2374.6	13.34	49.07	35.73	54.00	4.93	15	139	AV	Vertical
4	2375.5	25.34	61.08	35.74	74.00	12.92	37	150	PK	Vertical
5	2390.0	23.75	59.59	35.84	74.00	14.41	202	161	PK	Vertical
6	2390.0	13.12	48.96	35.84	54.00	5.04	189	167	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:	Tracker	Product model:	cp311A
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	DC 3.85V	Environment:	Temp: 24°C Huni: 57%

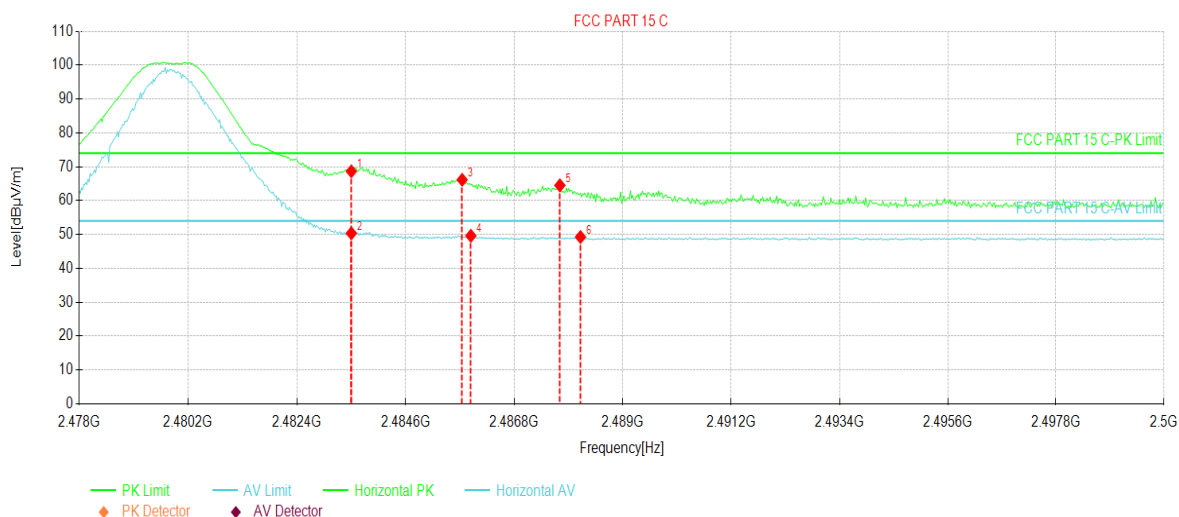


Suspected Data List										
NO	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	2348.3	13.49	49.03	35.54	54.00	4.97	89	129	AV	Horizontal
2	2349.3	24.30	59.85	35.55	74.00	14.15	112	133	PK	Horizontal
3	2375.7	13.40	49.14	35.74	54.00	4.86	212	143	AV	Horizontal
4	2377.5	23.91	59.66	35.75	74.00	14.34	236	158	PK	Horizontal
5	2390.0	23.45	59.29	35.84	74.00	14.71	306	164	PK	Horizontal
6	2390.0	12.98	48.82	35.84	54.00	5.18	331	152	AV	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.

Product name:	Tracker	Product model:	cp311A
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Huni: 57%



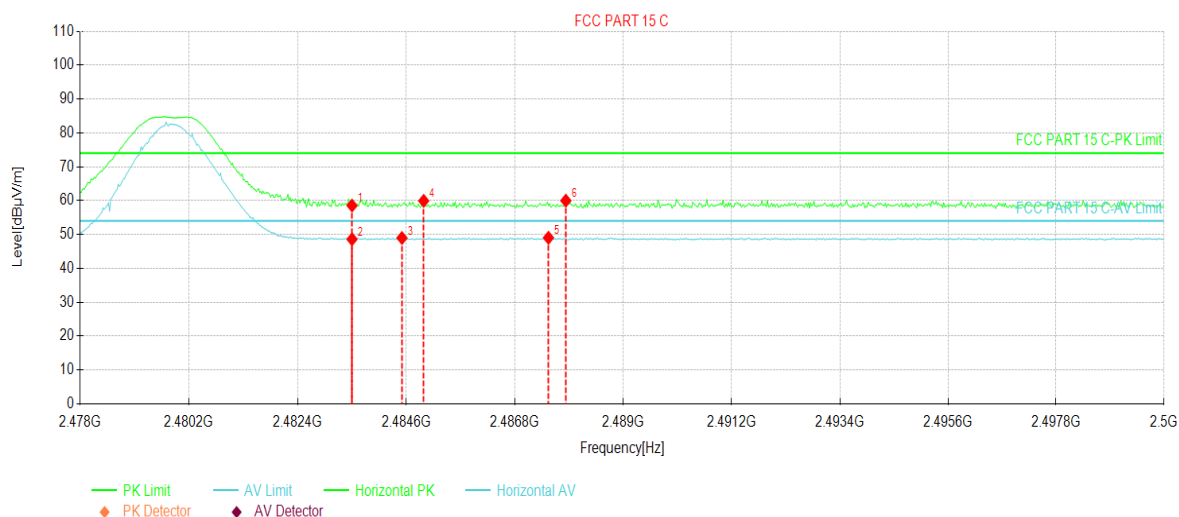
Suspected Data List

NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	2483.5	32.93	68.65	35.72	74.00	5.35	168	133	PK	Vertical
2	2483.5	14.64	50.36	35.72	54.00	3.64	187	139	AV	Vertical
3	2485.7	30.45	66.16	35.71	74.00	7.84	213	145	PK	Vertical
4	2485.9	13.92	49.63	35.71	54.00	4.37	240	151	AV	Vertical
5	2487.7	28.80	64.51	35.71	74.00	9.49	302	156	PK	Vertical
6	2488.1	13.55	49.26	35.71	54.00	4.74	294	160	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:	Tracker	Product model:	cp311A
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	DC 3.85V	Environment:	Temp: 24°C Humi: 57%



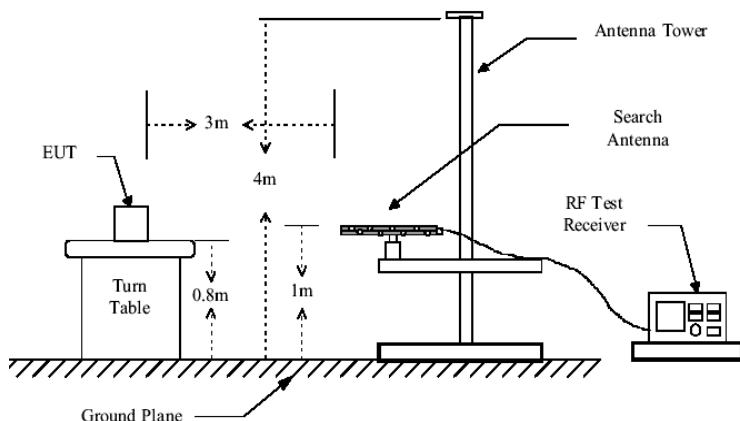
Suspected Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	2483.5	22.83	58.55	35.72	74.00	15.45	64	147	PK	Horizontal
2	2483.5	12.89	48.61	35.72	54.00	5.39	90	140	AV	Horizontal
3	2484.5	13.24	48.96	35.72	54.00	5.04	176	156	AV	Horizontal
4	2484.9	24.23	59.94	35.71	74.00	14.06	199	161	PK	Horizontal
5	2487.4	13.32	49.03	35.71	54.00	4.97	240	172	AV	Horizontal
6	2487.8	24.28	59.99	35.71	74.00	14.01	265	163	PK	Horizontal

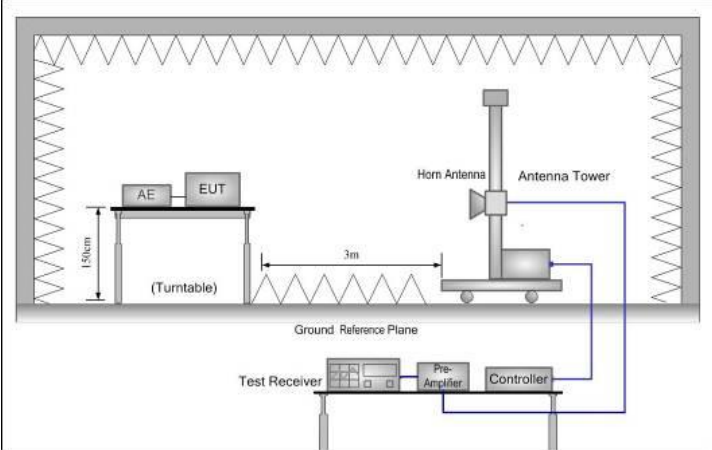
Remark:

- 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.

6.4 Spurious Emission

6.4.1 Radiated Emission Method

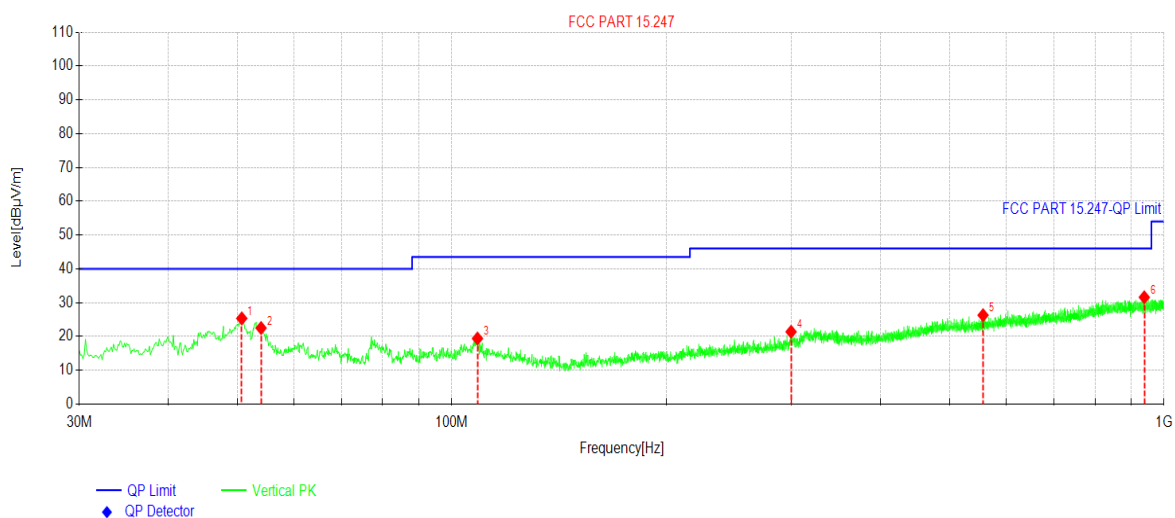
Test Requirement:	FCC Part 15 C Section 15.205 and 15.209				
Test Frequency Range:	9kHz to 25GHz				
Test Distance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
RMS		1MHz	3MHz	Average Value	
Limit:	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:	Pass
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 lower than the limit 20dB, so only shows the data of above 30MHz in this report.

Measurement Data (worst case):

Below 1GHz:

Product name:	Tracker	Product model:	cp311A
Test By:	Mike	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%



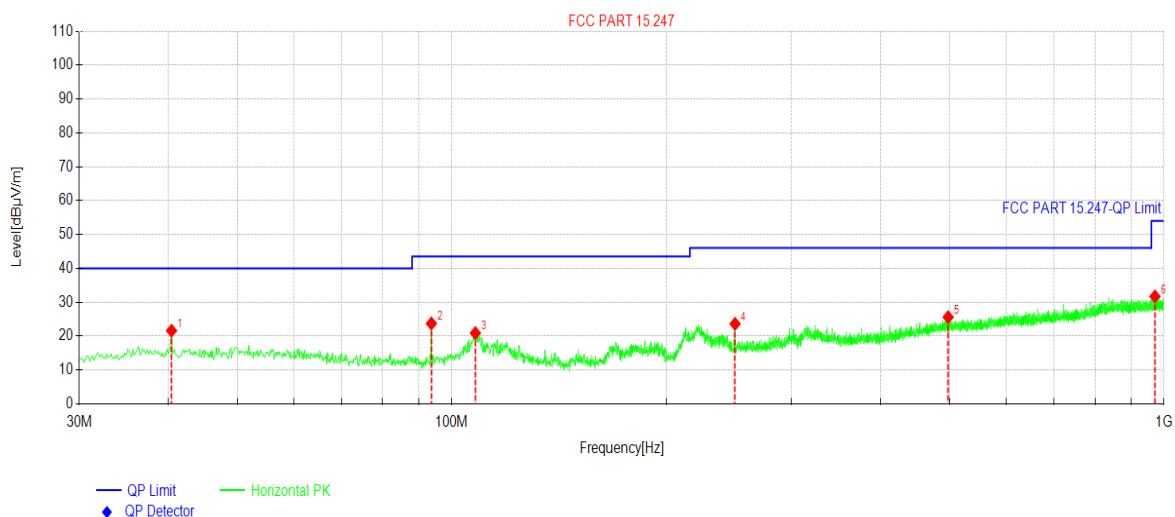
Suspected Data List

NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Polarity
1	50.7338	40.05	25.35	-14.70	40.00	14.65	110	105	Vertical
2	54.0075	37.14	22.51	-14.63	40.00	17.49	245	123	Vertical
3	108.691	35.30	19.40	-15.90	43.50	24.10	178	134	Vertical
4	299.538	34.11	21.39	-12.72	46.00	24.61	180	114	Vertical
5	557.195	32.94	26.30	-6.64	46.00	19.70	164	109	Vertical
6	938.283	32.82	31.60	-1.22	46.00	14.40	189	122	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:	Tracker	Product model:	cp311A
Test By:	Mike	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%



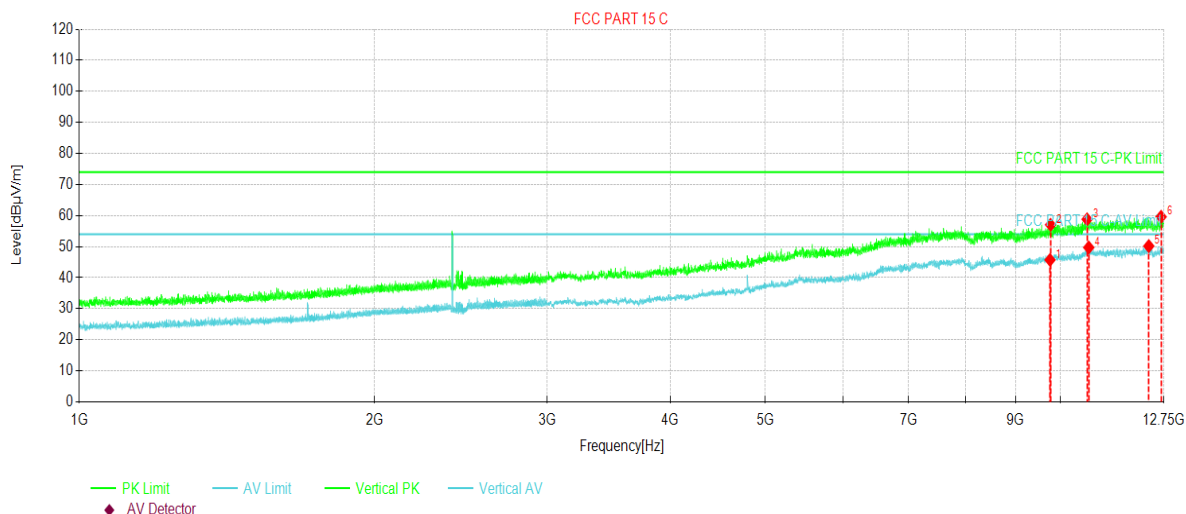
Suspected Data List									
NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Polarity
1	40.4275	36.12	21.61	-14.51	40.00	18.39	144	101	Horizontal
2	93.6563	40.94	23.73	-17.21	43.50	19.77	216	128	Horizontal
3	107.963	36.84	20.90	-15.94	43.50	22.60	126	116	Horizontal
4	249.947	37.42	23.63	-13.79	46.00	22.37	236	132	Horizontal
5	497.782	32.64	25.60	-7.04	46.00	20.40	163	119	Horizontal
6	971.263	32.60	31.72	-0.88	54.00	22.28	196	120	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.

Above 1GHz

Product Name:	Tracker	Product Model:	cp311A
Test By:	Mike	Test mode:	BLE Tx Low CH
Test Frequency:	1 GHz ~ 25 GHz	Polarization:	Vertical
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%

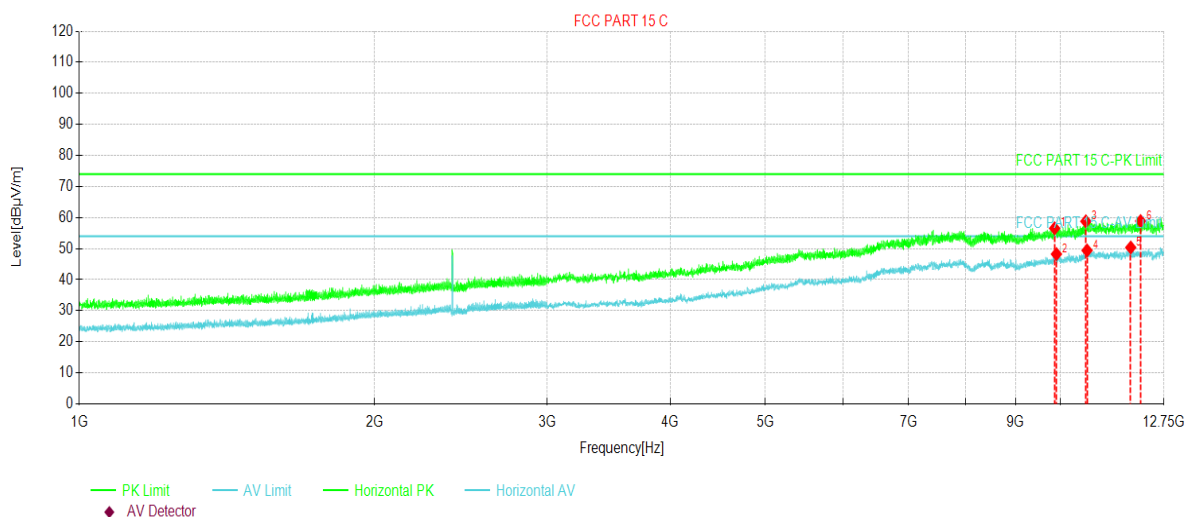


Suspected Data List											
NO	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity	
1	9757.9	41.73	45.72	3.99	54.00	8.28	269	142	AV	Vertical	
2	9771.3	52.98	57.02	4.04	74.00	16.98	283	134	PK	Vertical	
3	10645.	51.71	58.79	7.08	74.00	15.21	330	138	PK	Vertical	
4	10686.	42.50	49.72	7.22	54.00	4.28	305	148	AV	Vertical	
5	12303.	42.34	50.17	7.83	54.00	3.83	17	151	AV	Vertical	
6	12663.	51.35	59.61	8.26	74.00	14.39	46	161	PK	Vertical	

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of above 12.75GHz are lower than the limit 20dB and not show in test report.

Product Name:	Tracker	Product Model:	cp311A
Test By:	Mike	Test mode:	BLE Tx Low CH
Test Frequency:	1 GHz ~ 25 GHz	Polarization:	Horizontal
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%

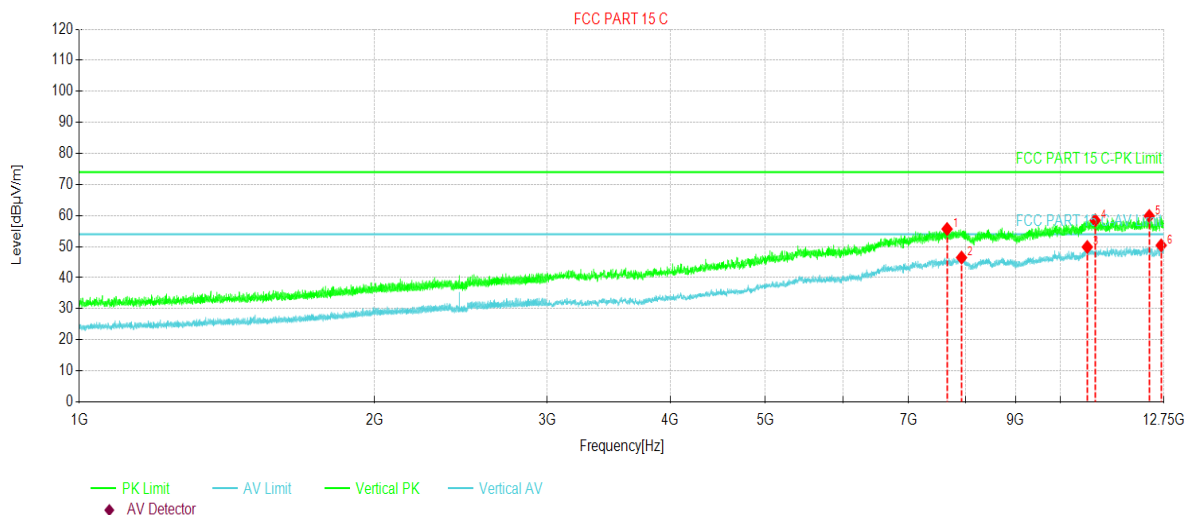


Suspected Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	9864.0	51.74	56.53	4.79	74.00	17.47	149	133	PK	Horizontal
2	9905.4	43.10	48.23	5.13	54.00	5.77	173	143	AV	Horizontal
3	10614.	51.80	58.79	6.99	74.00	15.21	25	149	PK	Horizontal
4	10644.	42.32	49.40	7.08	54.00	4.60	46	155	AV	Horizontal
5	11792.	42.47	50.36	7.89	54.00	3.64	246	161	AV	Horizontal
6	12068.	51.50	58.88	7.38	74.00	15.12	271	167	PK	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of above 12.75GHz are lower than the limit 20dB and not show in test report.

Product Name:	Tracker	Product Model:	cp311A
Test By:	Mike	Test mode:	BLE Tx Mid CH
Test Frequency:	1 GHz ~ 25 GHz	Polarization:	Vertical
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%

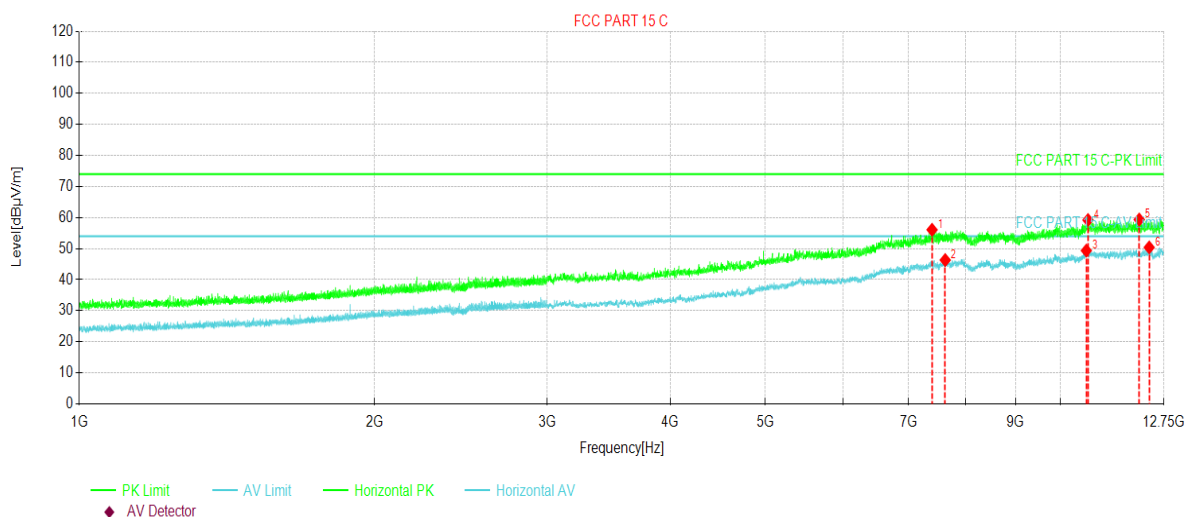


Suspected Data List										
NO	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	7664.1	54.95	55.67	0.72	74.00	18.33	244	170	PK	Vertical
2	7928.6	45.49	46.47	0.98	54.00	7.53	256	165	AV	Vertical
3	10648.	42.78	49.88	7.10	54.00	4.12	12	151	AV	Vertical
4	10848.	51.25	58.47	7.22	74.00	15.53	354	159	PK	Vertical
5	12317.	52.02	59.85	7.83	74.00	14.15	194	143	PK	Vertical
6	12667.	42.12	50.39	8.27	54.00	3.61	172	133	AV	Vertical

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of above 12.75GHz are lower than the limit 20dB and not show in test report.

Product Name:	Tracker	Product Model:	cp311A
Test By:	Mike	Test mode:	BLE Tx Mid CH
Test Frequency:	1 GHz ~ 25 GHz	Polarization:	Horizontal
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%

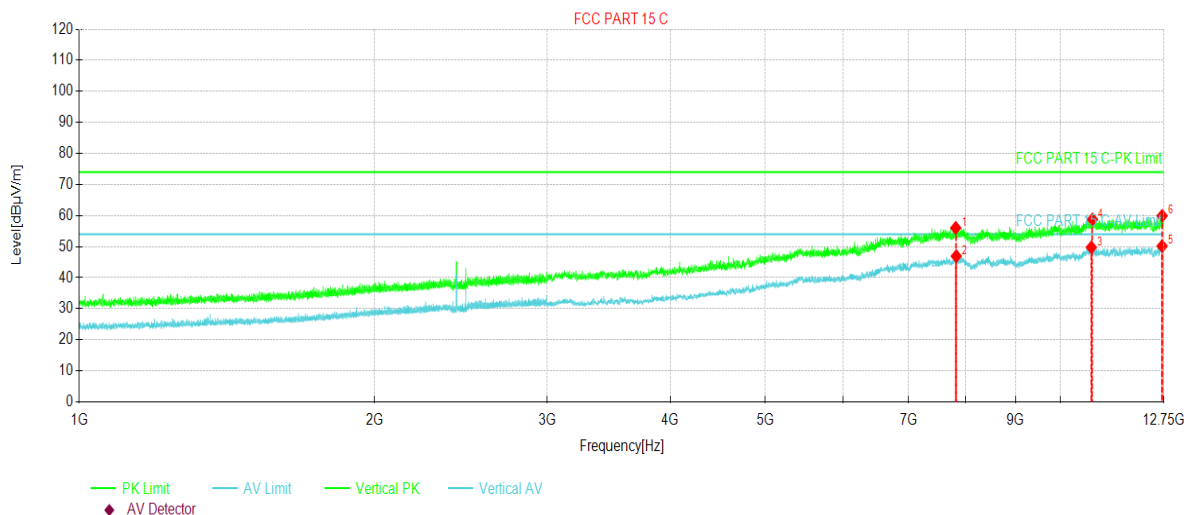


Suspected Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	7398.4	55.80	56.06	0.26	74.00	17.94	314	132	PK	Horizontal
2	7631.2	45.43	46.31	0.88	54.00	7.69	352	138	AV	Horizontal
3	10625.	42.34	49.36	7.02	54.00	4.64	64	142	AV	Horizontal
4	10667.	52.05	59.20	7.15	74.00	14.80	81	151	PK	Horizontal
5	12030.	51.76	59.35	7.59	74.00	14.65	228	158	PK	Horizontal
6	12314.	42.56	50.39	7.83	54.00	3.61	245	166	AV	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of above 12.75GHz are lower than the limit 20dB and not show in test report.

Product Name:	Tracker	Product Model:	cp311A
Test By:	Mike	Test mode:	BLE Tx High CH
Test Frequency:	1 GHz ~ 25 GHz	Polarization:	Vertical
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%

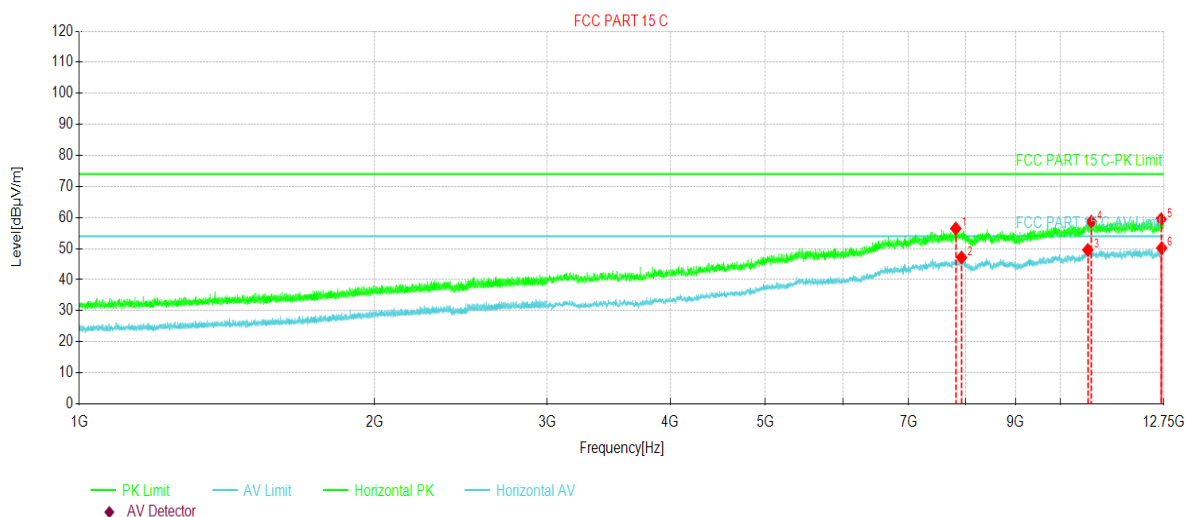


Suspected Data List										
NO	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	7820.1	55.00	56.02	1.02	74.00	17.98	245	145	PK	Vertical
2	7831.1	45.91	46.93	1.02	54.00	7.07	210	153	AV	Vertical
3	10751.	42.56	49.76	7.20	54.00	4.24	194	137	AV	Vertical
4	10779.	51.58	58.74	7.16	74.00	15.26	180	130	PK	Vertical
5	12693.	41.82	50.18	8.36	54.00	3.82	312	164	AV	Vertical
6	12695.	51.56	59.92	8.36	74.00	14.08	329	167	PK	Vertical

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of above 12.75GHz are lower than the limit 20dB and not show in test report.

Product Name:	Tracker	Product Model:	cp311A
Test By:	Mike	Test mode:	BLE Tx High CH
Test Frequency:	1 GHz ~ 25 GHz	Polarization:	Horizontal
Test Voltage:	DC 3.85V	Environment:	Temp: 24℃ Humi: 57%



Suspected Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Height [cm]	Trace	Polarity
1	7821.3	55.44	56.46	1.02	74.00	17.54	261	134	PK	Horizontal
2	7928.6	46.16	47.14	0.98	54.00	6.86	247	129	AV	Horizontal
3	10662.	42.44	49.58	7.14	54.00	4.42	112	141	AV	Horizontal
4	10752.	51.48	58.68	7.20	74.00	15.32	101	146	PK	Horizontal
5	12664.	51.20	59.46	8.26	74.00	14.54	23	151	PK	Horizontal
6	12682.	41.86	50.18	8.32	54.00	3.82	40	162	AV	Horizontal

Remark:

- Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).
- The emission levels of above 12.75GHz are lower than the limit 20dB and not show in test report.

7 Appendix

The below Appendix was detail result tested by SGS-CSTC Standards Technical Services, Co., Ltd. Shenzhen Branch.

(Date of Test: 2019/1/10-2019/1/24).

Appendix	Item
Appendix- Bluetooth BLE	BLE