FCC Test Report

Report No.: AGC15705231227FR01

FCC ID	:	2AIKSQUADCI
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	QUAD Ci
BRAND NAME	:	MARES
MODEL NAME	:	QUAD Ci
APPLICANT	:	Mares Spa
DATE OF ISSUE	:	Jan. 09, 2024
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 09, 2024	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	Mares Spa
Address	Via Salita Bonsen, 4 Rapallo GE 16035, Italy
Manufacturer	Mares Spa
Address	Via Salita Bonsen, 4 Rapallo GE 16035, Italy
Factory	Mares Spa
Address	Via Salita Bonsen, 4 Rapallo GE 16035, Italy
Product Designation	QUAD Ci
Brand Name	MARES
Test Model	QUAD Ci
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Dec. 11, 2023
Date of test	Dec. 11, 2023 to Jan. 08, 2024
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-2.4G/RF

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Thea Huang Thea Huang (Project Engineer)	Jan. 09, 2024
Reviewed By	Calvin Liu Calvin Liu (Reviewer)	Jan. 09, 2024
Approved By	Max Zhang Max Zhang (Authorized Officer)	Jan. 09, 2024

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2402MHz-2480MHz
Bluetooth Version	V5.3
Maximum field strength	97.65dBuV/m(Peak)@3m
Modulation	BLE ☒GFSK 1Mbps ☐GFSK 2Mbps
Number of channels	40 Channels
Antenna Gain	1.48dBi
Antenna Designation	Chip Antenna
Hardware Version	100
Software Version	V1.0
Power Supply	DC 3.7V by battery or DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCY

Channel	Frequency (GHz)	Channel	Frequency (GHz)
00	2.402	20	2.442
01	2.404	21	2.444
02	2.406	22	2.446
03	2.408	23	2.448
04	2.410	24	2.450
05	2.412	25	2.452
06	2.414	26	2.454
07	2.416	27	2.456
08	2.418	28	2.458
09	2.420	29	2.460
10	2.422	30	2.462
11	2.424	31	2.464
12	2.426	32	2.466
13	2.428	33	2.468
14	2.430	34	2.470
15	2.432	35	2.472
16	2.434	36	2.474
17	2.436	37	2.476
18	2.438	38	2.478
19	2.440	39	2.480

2.3. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	U_c = ±2.9 dB
Uncertainty of Radiated Emission below 1GHz	U_c = ±3.9 dB
Uncertainty of Radiated Emission above 1GHz	U_c = ±4.9 dB
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

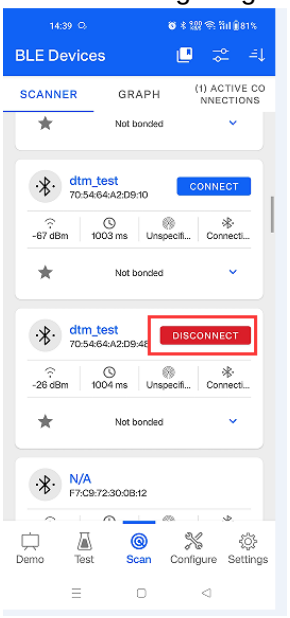
4. DESCRIPTION OF TEST MODES

Summary Table of Test Cases	
Test Item	Equipment type / Modulation
	Bluetooth – LE(1Mbps) / GFSK
Radiated Test Cases	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps(Battery powered or AC/DC adapter) Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps(Battery powered or AC/DC adapter) Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps(Battery powered or AC/DC adapter)
AC Conducted Emission	Mode 1: Bluetooth Link + Battery + USB Cable (Charging from AC Adapter)

Note:

1. Only the result of the worst case was recorded in the report, if no other cases.
2. The battery is full-charged during the test.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

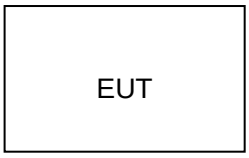
Software Setting Diagram



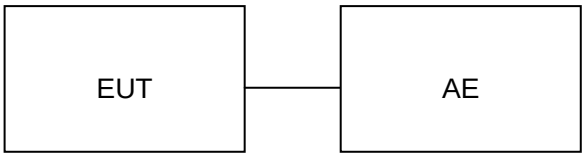
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	QUAD Ci	QUAD Ci	2AIKSQUADCI	EUT
2	Adapter	KT05W050100USU	N/A	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249&15.209	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

● Radiated Spurious Emission

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023-02-18	2024-02-17
☐	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-11-13	2024-11-12
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03
☒	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08

● AC Power Line Conducted Emission

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02
☒	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2024-06-08
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024/06/02

● Test Software

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S004	RE Test System	Tonscend	TS+ Ver2.1(JS32-RE)	4.0.0.0
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+ Ver2.1(JS36-RSE)	4.0.0.0

☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
☒	AGC-ER-S009	BT/WIFI Test System	Tonscend	JS1120-3	2.6.77.0518

7. RADIATED EMISSION

7.1. TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark： (1) Emission level dBμV = 20 log Emission level μV/m.

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use minimum resolution bandwidth of 1 MHz. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

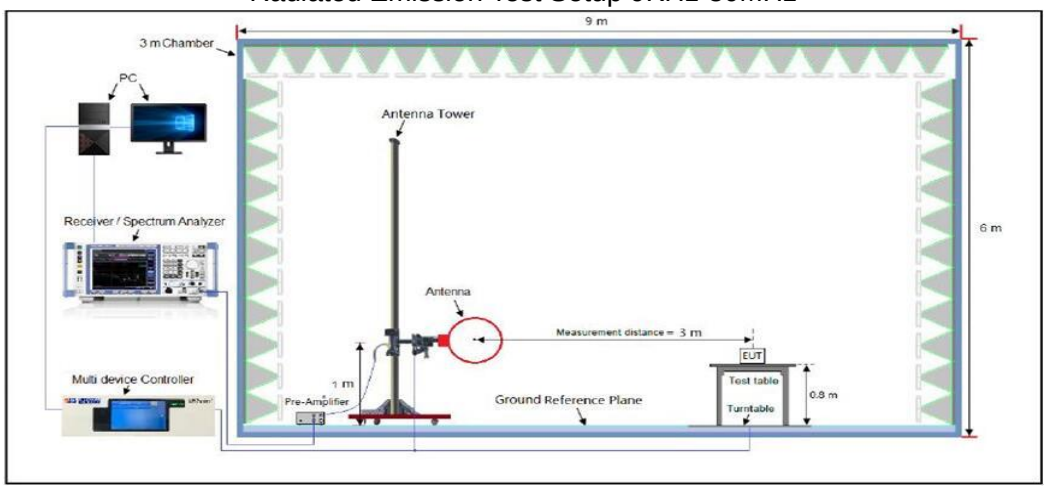
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz RBW 2.4MHz/ VBW 8MHz for Peak, RBW 2.4MHz/3MHz for Average

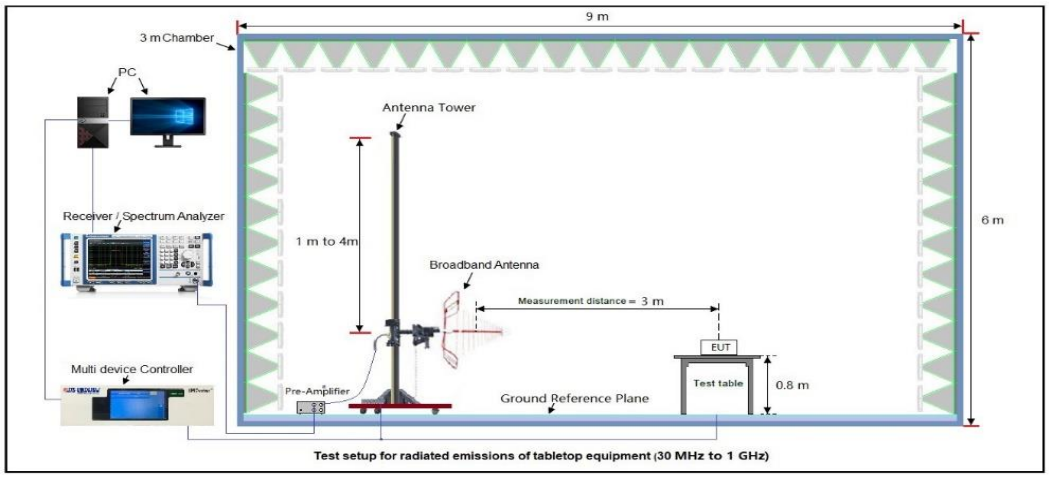
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

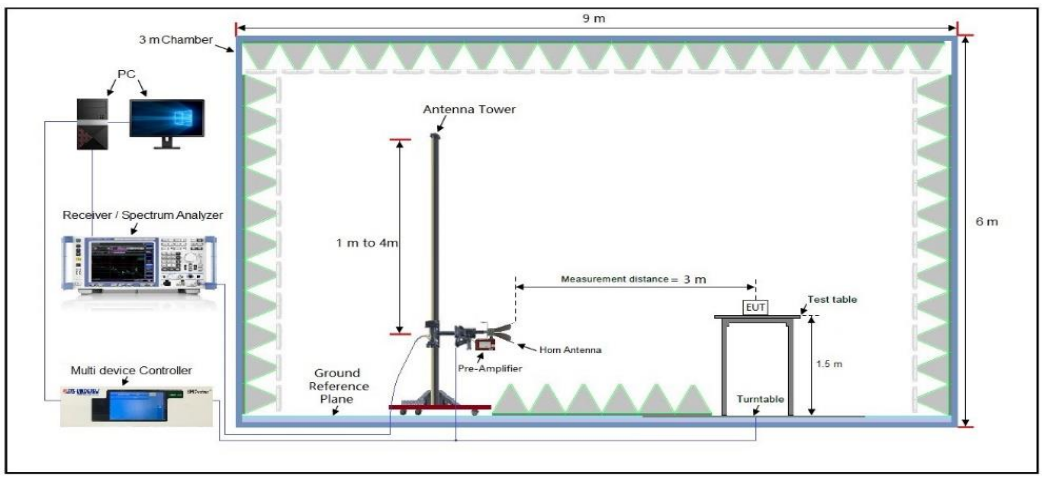
Radiated Emission Test Setup 9KHz-30MHz



Radiated Emission Test Setup 30MHz-1000MHz



Radiated Emission Test Setup Above 1000MHz



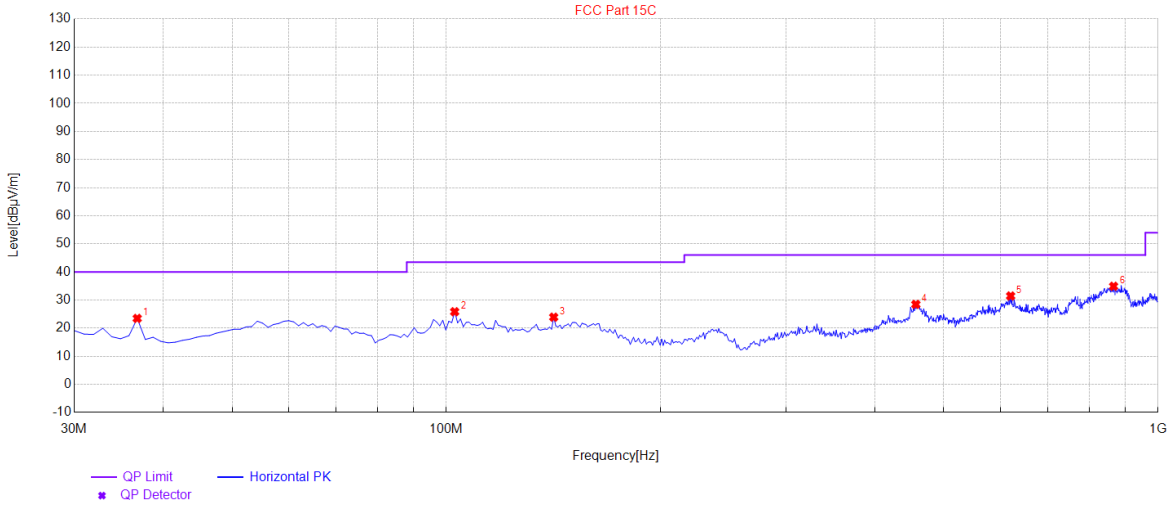
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

RADIATED EMISSION 30MHz- 1GHZ

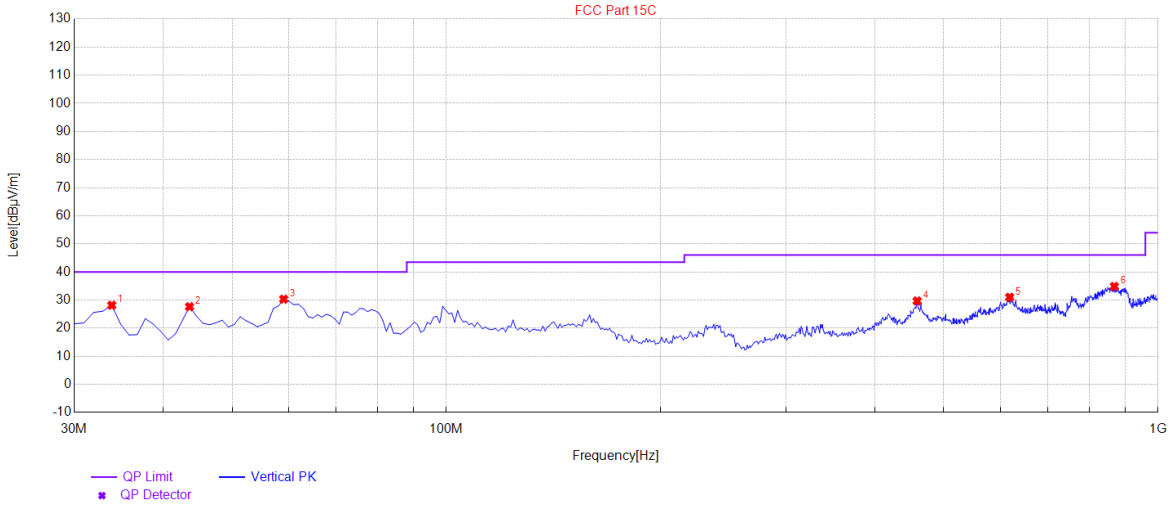
EUT	QUAD Ci	**Model Name**	QUAD Ci
Temperature	22.8°C	**Relative Humidity**	59.7%
Pressure	985kPa	**Test Voltage**	DC 3.7V by battery
Test Mode	Mode 1	**Polarization**	Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.79	23.47	11.23	40.00	16.53	100	170	Horizontal
2	102.75	25.85	16.93	43.50	17.65	100	330	Horizontal
3	141.55	23.91	16.13	43.50	19.59	100	350	Horizontal
4	456.8	28.46	23.86	46.00	17.54	100	330	Horizontal
5	620.73	31.46	25.82	46.00	14.54	100	230	Horizontal
6	866.14	34.91	29.80	46.00	11.09	100	10	Horizontal

RESULT: PASS

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Polarization	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	33.88	28.15	12.12	40.00	11.85	100	120	Vertical
2	43.58	27.64	12.03	40.00	12.36	100	110	Vertical
3	59.1	30.31	17.64	40.00	9.69	100	290	Vertical
4	458.74	29.68	24.42	46.00	16.32	100	180	Vertical
5	618.79	30.99	25.79	46.00	15.01	100	200	Vertical
6	868.08	34.86	29.74	46.00	11.14	100	340	Vertical

RESULT: PASS

Note: Factor=Antenna Factor + Cable loss, Margin=Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

FIELD STRENGTH OF FUNDAMENTAL

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Modulation	GFSK	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402	48.60	49.05	97.65	114.00	-16.35	peak
2402	39.50	49.05	88.55	94.00	-5.45	AVG
2440	47.22	49.12	96.34	114.00	-17.66	peak
2440	37.85	49.12	86.97	94.00	-7.03	AVG
2480	45.36	49.25	94.61	114.00	-19.39	peak
2480	36.22	49.25	85.47	94.00	-8.53	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Modulation	GFSK	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402	44.37	49.05	89.81	114.00	-24.19	peak
2402	29.51	49.05	79.62	94.00	-14.38	AVG
2440	45.31	49.12	86.23	114.00	-27.77	peak
2440	30.11	49.12	77.19	94.00	-16.81	AVG
2480	40.78	49.25	85.28	114.00	-28.72	peak
2480	30.48	49.25	76.01	94.00	-17.99	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ

EUT	QUAD Ci	**Model Name**	QUAD Ci
Temperature	22.8°C	**Relative Humidity**	59.7%
Pressure	985kPa	**Test Voltage**	DC 3.7V by battery
Test Mode	Mode 1	**Polarization**	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4804	46.20	3.76	49.96	74.00	-24.04	peak
4804	37.12	3.76	40.88	54.00	-13.12	AVG
7206	42.54	8.17	50.71	74.00	-23.29	peak
7206	32.64	8.17	40.81	54.00	-13.19	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	QUAD Ci	**Model Name**	QUAD Ci
Temperature	22.8°C	**Relative Humidity**	59.7%
Pressure	985kPa	**Test Voltage**	DC 3.7V by battery
Test Mode	Mode 1	**Polarization**	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4804	45.26	3.76	49.02	74.00	-24.98	peak
4804	37.54	3.76	41.30	54.00	-12.70	AVG
7206	40.05	8.17	48.22	74.00	-25.78	peak
7206	32.58	8.17	40.75	54.00	-13.25	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 2	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4880	46.28	3.78	50.06	74.00	-23.94	peak
4880	37.54	3.78	41.32	54.00	-12.68	AVG
7320	41.05	8.23	49.28	74.00	-24.72	peak
7320	32.67	8.23	40.90	54.00	-13.10	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 2	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4880	45.29	3.78	49.07	74.00	-24.93	peak
4880	35.98	3.78	39.76	54.00	-14.24	AVG
7320	41.05	8.23	49.28	74.00	-24.72	peak
7320	32.54	8.23	40.77	54.00	-13.23	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 3	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960	46.28	3.81	50.09	74.00	-23.91	peak
4960	37.54	3.81	41.35	54.00	-12.65	AVG
7440	42.64	8.27	50.91	74.00	-23.09	peak
7440	31.29	8.27	39.56	54.00	-14.44	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 3	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960	45.97	3.81	49.78	74.00	-24.22	peak
4960	36.55	3.81	40.36	54.00	-13.64	AVG
7440	41.54	8.27	49.81	74.00	-24.19	peak
7440	32.97	8.27	41.24	54.00	-12.76	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RESULT: PASS

Note: The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Emission Level-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

8. BAND EDGE EMISSION

8.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

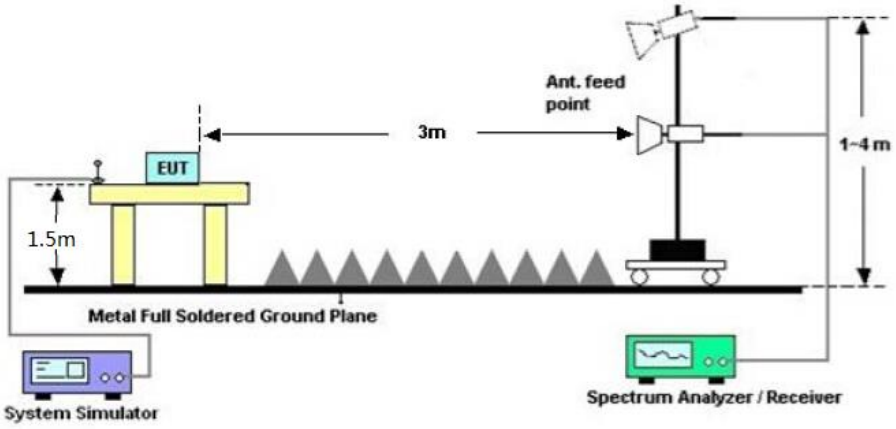
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz; VBW=3MHz / Sweep=AUTO

3. Other procedures refer to clause 7.2.

8.2. TEST SETUP

RADIATED EMISSION TEST SETUP



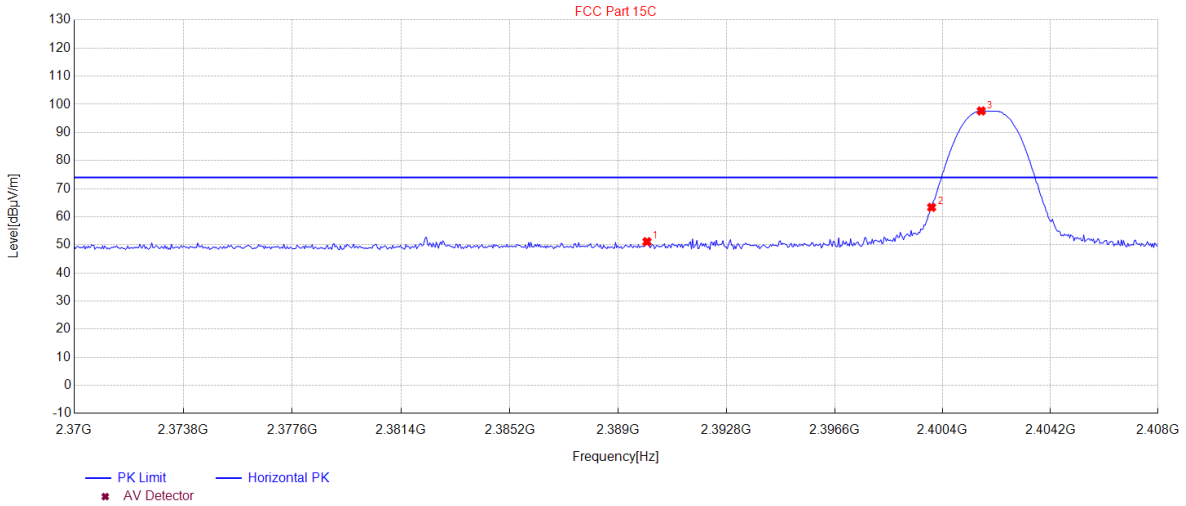
8.3 RADIATED TEST RESULT

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.

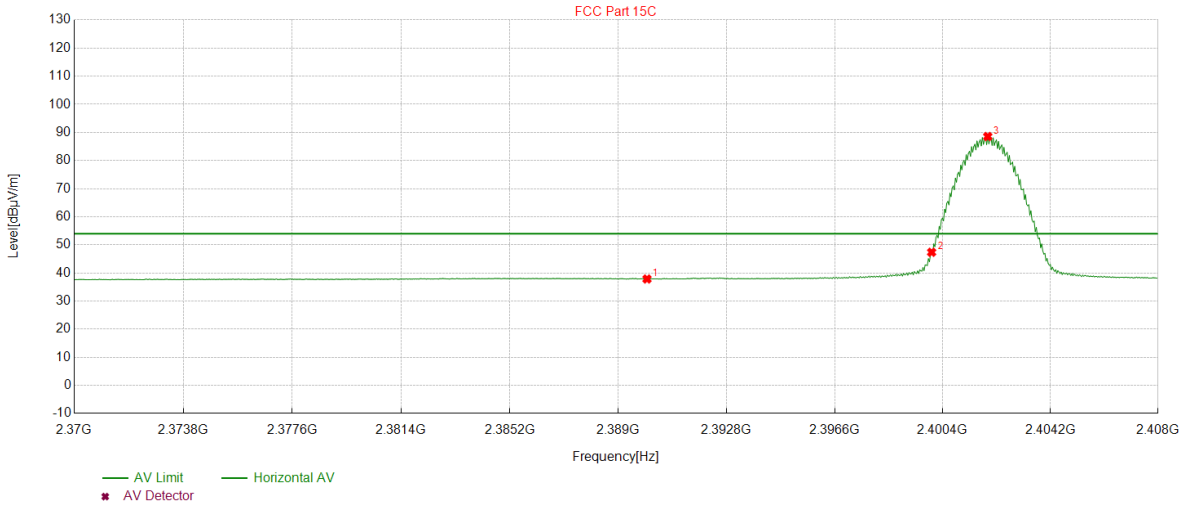
EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Polarization	Horizontal

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.008	51.13	34.40	74.00	22.87	150	286	Horizontal
2	2400.012	63.35	34.43	74.00	10.65	150	76	Horizontal
3	2401.7618	97.65	34.43	114.00	16.35	150	67	Horizontal

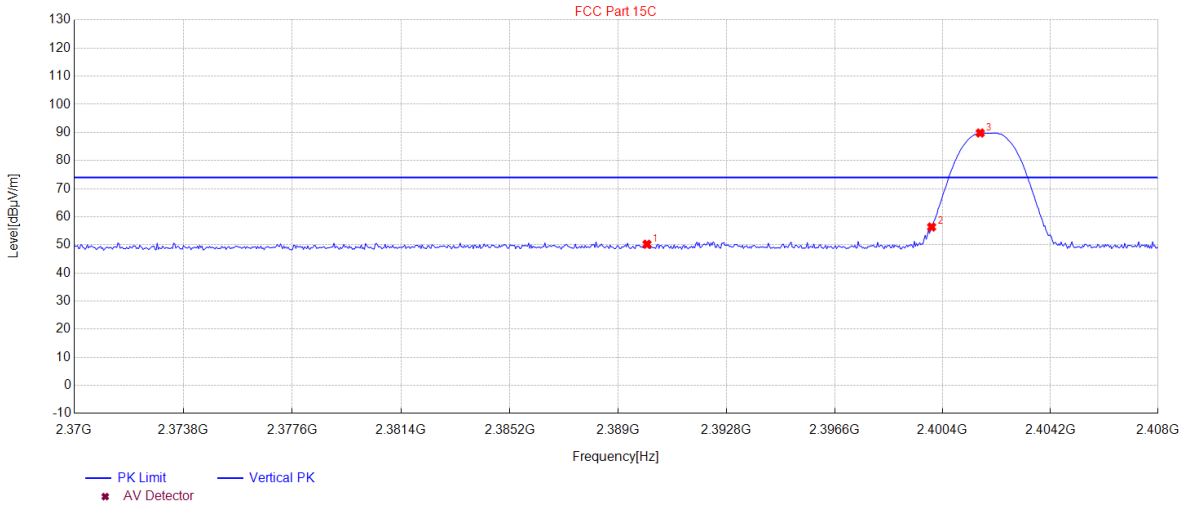
Average Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.008	37.86	34.40	54.00	16.14	150	93	Horizontal
2	2400.012	47.37	34.43	54.00	6.63	150	89	Horizontal
3	2401.99	88.55	34.44	94.00	5.45	150	72	Horizontal

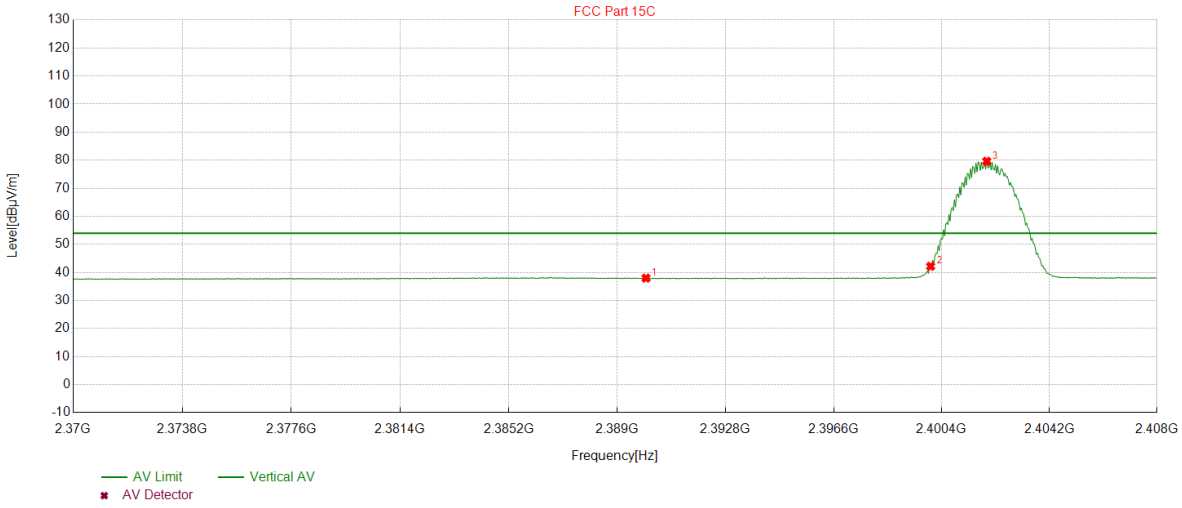
EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Polarization	Vertical

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.008	50.23	34.40	74.00	23.77	150	208	Vertical
2	2400.012	56.36	34.43	74.00	17.64	150	290	Vertical
3	2401.7237	89.81	34.43	114.00	24.19	150	299	Vertical

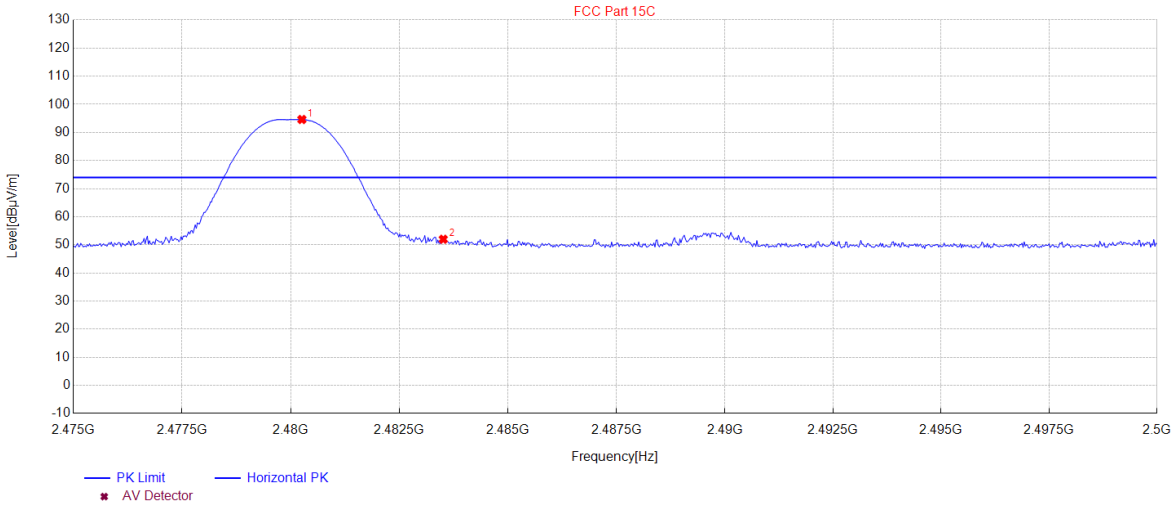
Average Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.008	37.97	34.40	54.00	16.03	150	355	Vertical
2	2400.012	42.18	34.43	54.00	11.82	150	280	Vertical
3	2401.99	79.62	34.44	94.00	14.38	150	305	Vertical

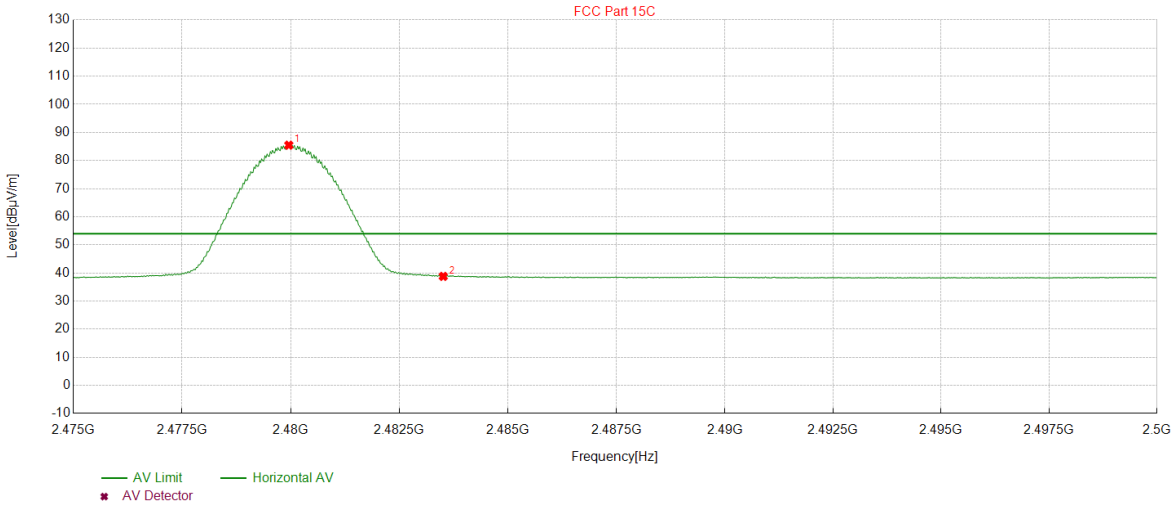
EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 3	Polarization	Horizontal

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2480.2553	94.61	34.65	114.00	19.39	150	150	Horizontal
2	2483.5085	52.00	34.66	74.00	22.00	150	150	Horizontal

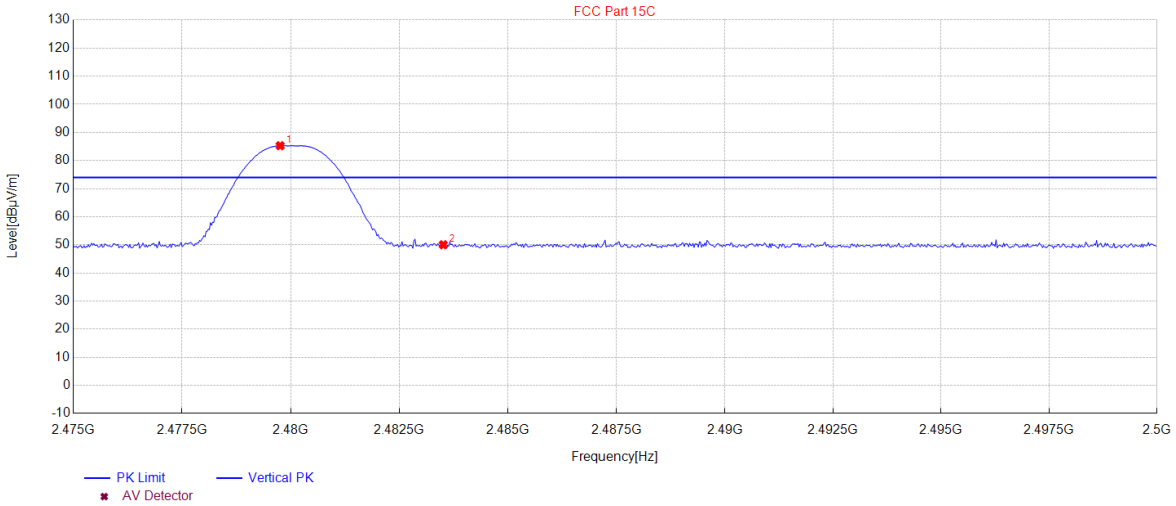
Average Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2479.955	85.47	34.65	94.00	8.53	150	155	Horizontal
2	2483.5085	38.79	34.66	54.00	15.21	150	167	Horizontal

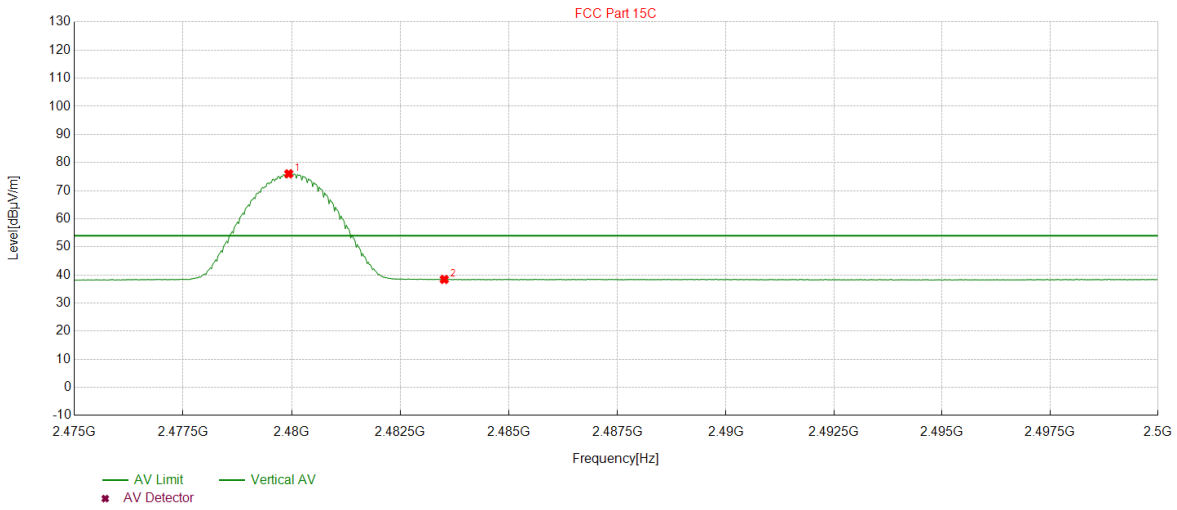
EUT	QUAD Ci	Model Name	QUAD Ci
Temperature	22.8°C	Relative Humidity	59.7%
Pressure	985kPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 3	Polarization	Vertical

Peak Value



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2479.7548	85.28	34.65	114.00	28.72	150	270	Vertical
2	2483.5085	50.04	34.66	74.00	23.96	150	359	Vertical

Average Value



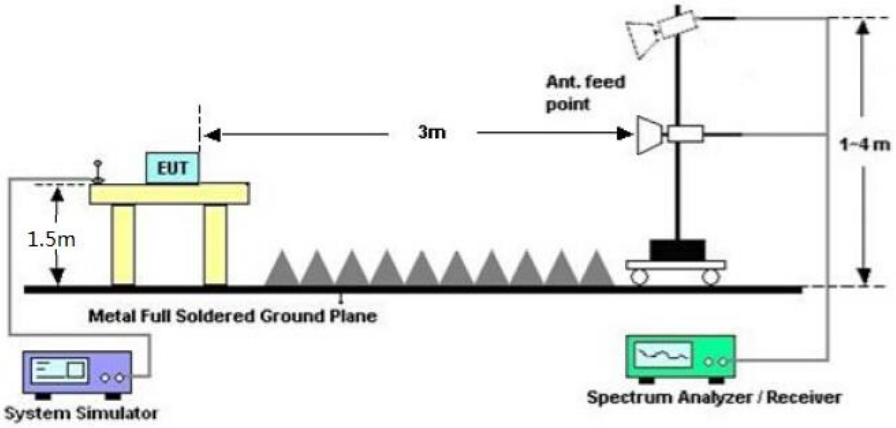
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2479.9299	76.01	34.65	94.00	17.99	150	276	Vertical
2	2483.5085	38.41	34.66	54.00	15.59	150	238	Vertical

9. 20DB BANDWIDTH

9.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
2. Set SPA Centre Frequency = Operation Frequency, RBW= 30 KHz, VBW≥3×RBW.
3. Set SPA Trace 1 Max hold, then View.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

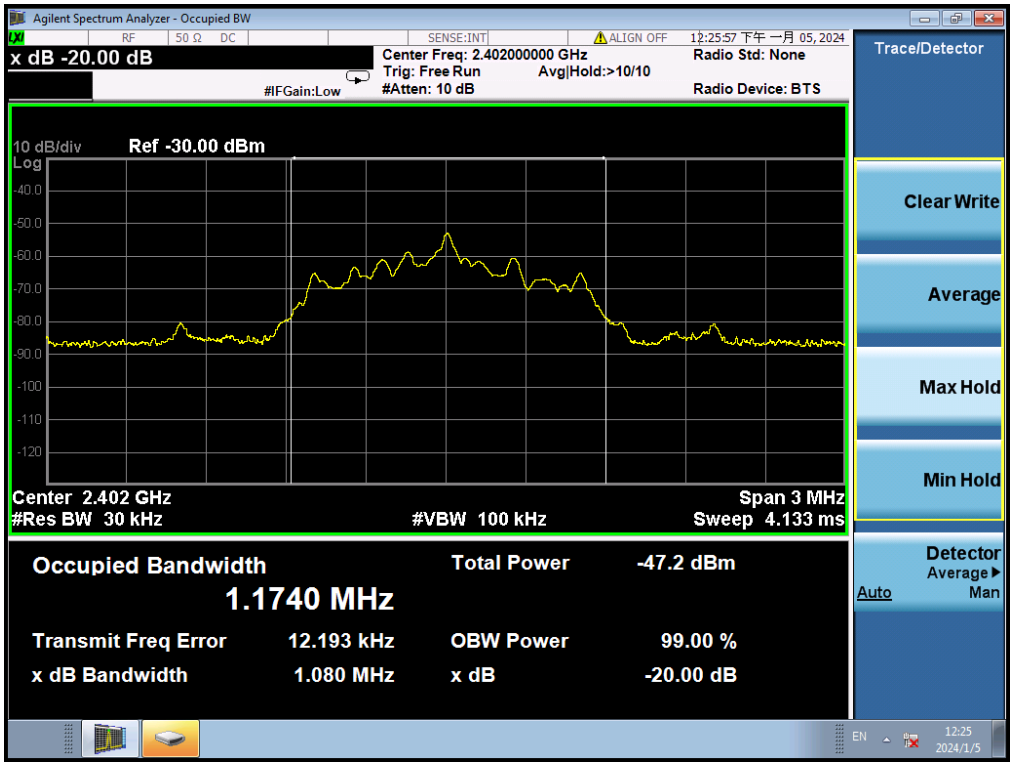


9.3. MEASUREMENT RESULTS

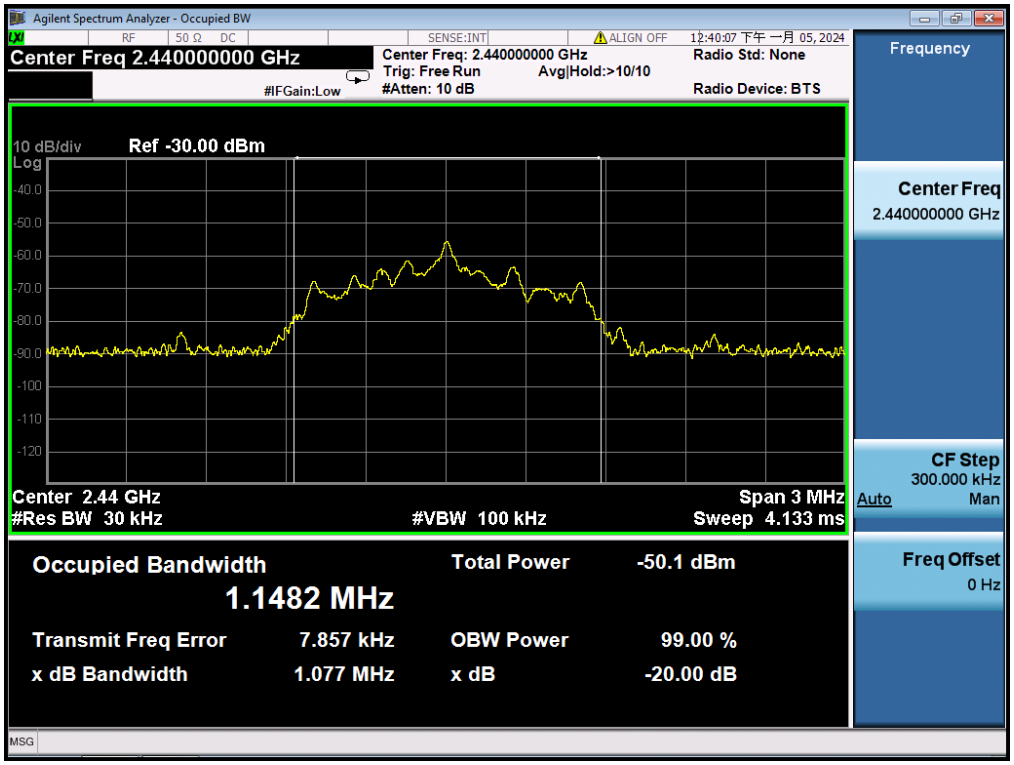
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

Test Channel (MHz)	20DB BANDWIDTH (MHz)	99% BANDWIDTH (MHz)	Criteria
2402	1.080	1.1740	PASS
2440	1.077	1.1482	PASS
2480	1.075	1.2816	PASS

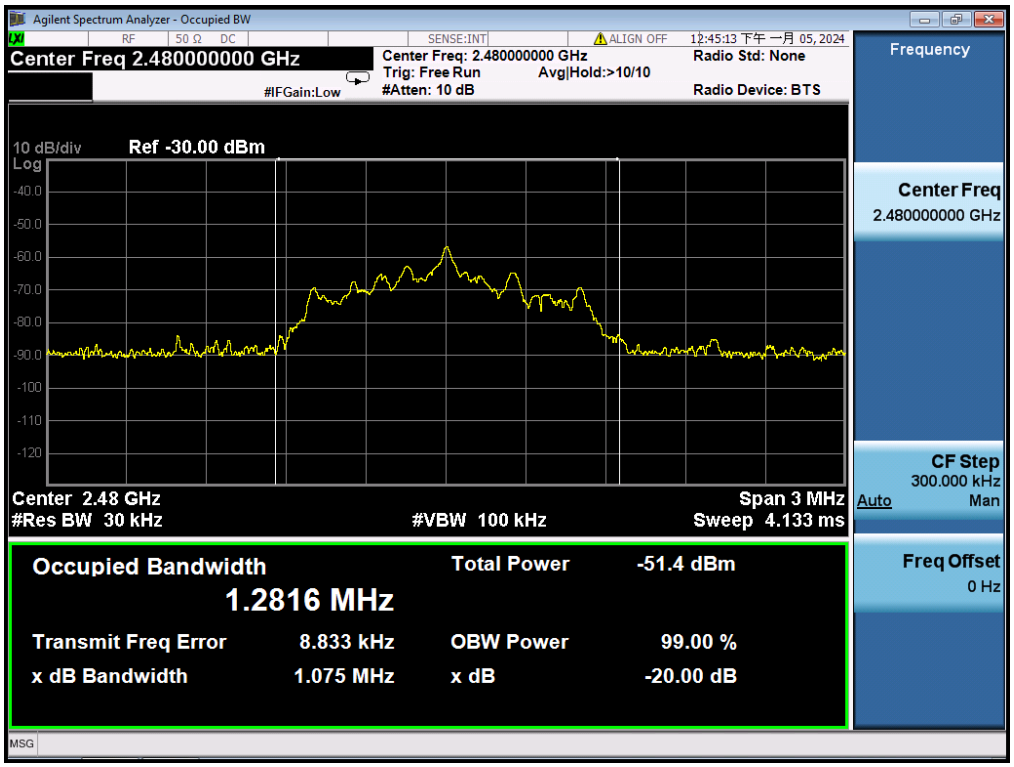
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



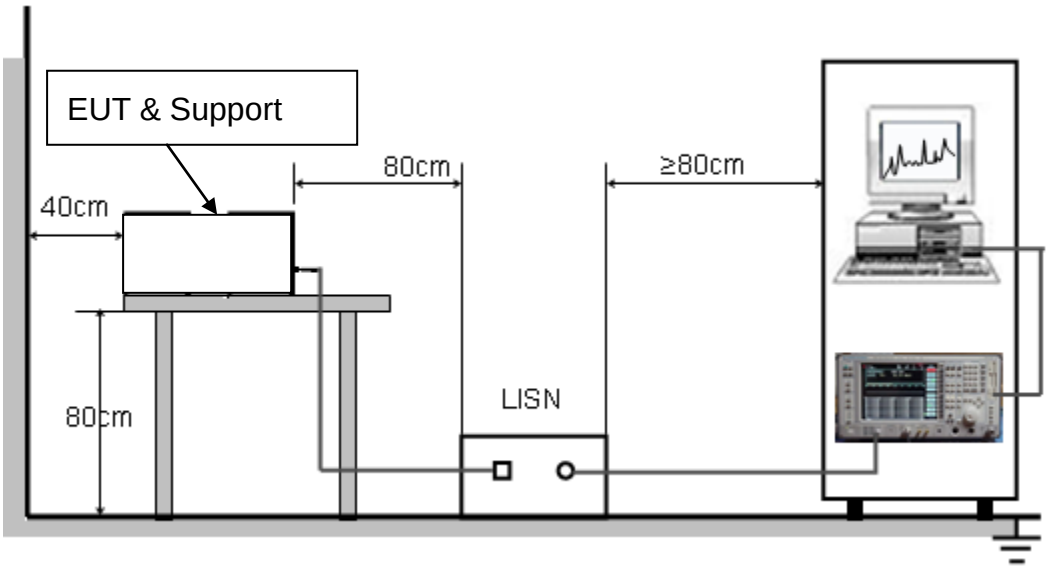
10. FCC LINE CONDUCTED EMISSION TEST

10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When 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 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
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. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
6. The 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.
9. The test mode(s) were scanned during the preliminary test.

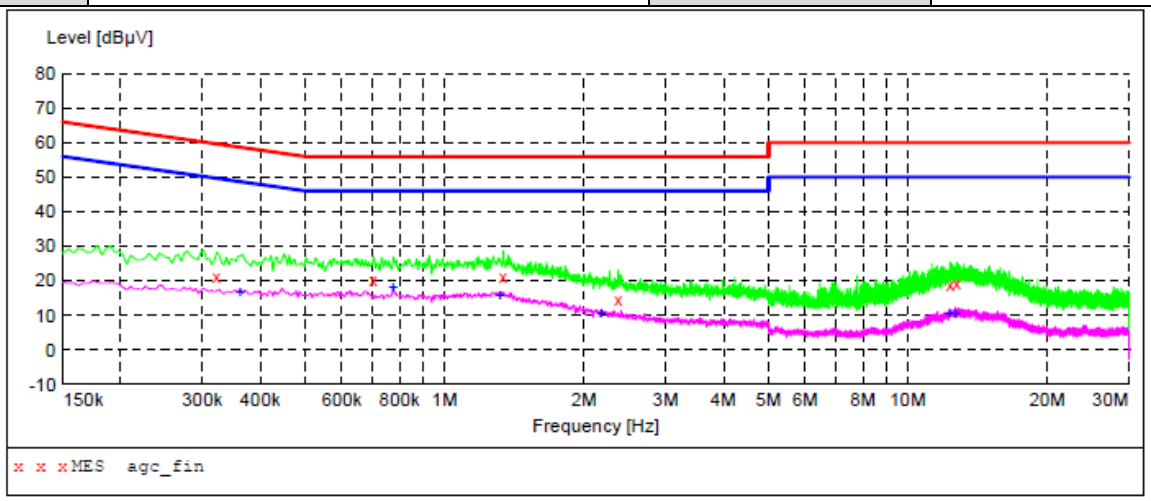
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

10.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

AC Power Line Conducted Emission Test			
Test Mode	mode 1	LISN Line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2023/12/13 16:07

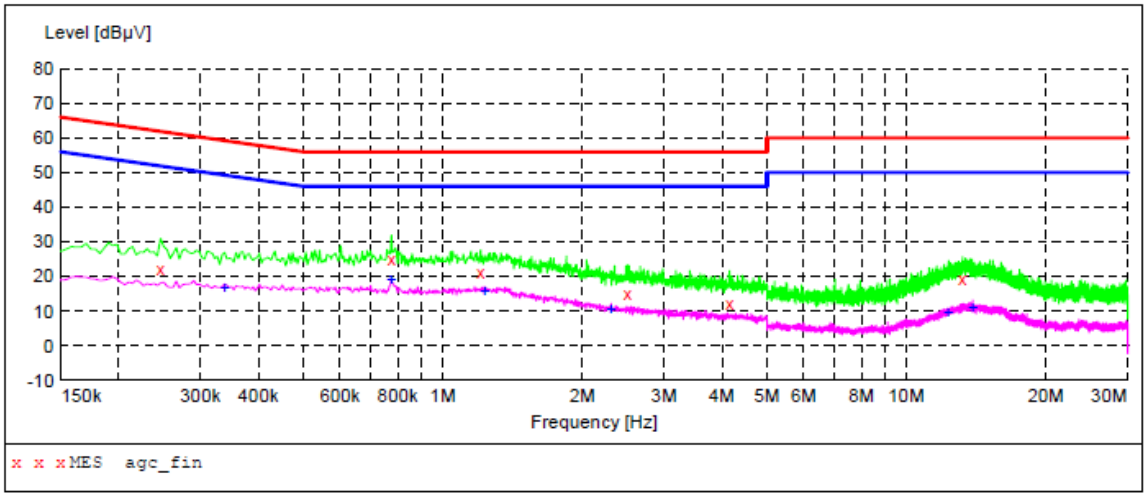
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.322000	21.10	6.1	60	38.6	QP	L1
0.702000	20.40	6.2	56	35.6	QP	L1
1.338000	21.40	6.2	56	34.6	QP	L1
2.370000	14.30	6.3	56	41.7	QP	L1
12.346000	18.60	6.8	60	41.4	QP	L1
12.734000	19.10	6.8	60	40.9	QP	L1

MEASUREMENT RESULT: "agc_fin2"

2023/12/13 16:07

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.362000	16.70	6.1	49	32.0	AV	L1
0.774000	18.30	6.2	46	27.7	AV	L1
1.318000	16.10	6.2	46	29.9	AV	L1
2.178000	10.80	6.3	46	35.2	AV	L1
12.310000	10.50	6.8	50	39.5	AV	L1
12.658000	10.80	6.8	50	39.2	AV	L1

AC Power Line Conducted Emission Test			
Test Mode	mode 1	LISN Line	Neutral Side



MEASUREMENT RESULT: "agc_fin"

2023/12/13 16:10

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.246000	21.90	6.1	62	40.0	QP	N
0.774000	25.20	6.2	56	30.8	QP	N
1.206000	21.30	6.2	56	34.7	QP	N
2.502000	15.10	6.3	56	40.9	QP	N
4.154000	12.30	6.3	56	43.7	QP	N
13.206000	19.30	6.8	60	40.7	QP	N

MEASUREMENT RESULT: "agc_fin2"

2023/12/13 16:10

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.338000	17.00	6.1	49	32.3	AV	N
0.774000	19.40	6.2	46	26.6	AV	N
1.230000	16.00	6.2	46	30.0	AV	N
2.306000	10.70	6.3	46	35.3	AV	N
12.274000	9.90	6.8	50	40.1	AV	N
13.898000	11.00	6.8	50	39.0	AV	N

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC15705231227AP02

APPENDIX B: PHOTOGRAPHS OF THE EUT

Refer to the Report No.: AGC15705231227AP03

----END OF REPORT----

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.