



EMC TEST REPORT

Report No.: SET2022-06271

Product Name: METAVERTU 5G digital mobile phone

FCC ID: 2A6IQ-VTL202201

IC: 28629-VTL202201

Model No. : VTL-202201

Applicant: VERTU INTERNATIONAL CORPORATION LIMITED

Address: 25 St Thomas Street, Winchester, Hampshire, SO23 9HJ, United Kingdom

Received Date: 2022.05.07

Dates of Testing: 2022.05.07—2022.05.23

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China.

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Test Report

Product Name..... METAVERTU 5G digital mobile phone

Model No. VTL-202201

Trade name..... VERTU

Brand Name..... VERTU

Applicant..... VERTU INTERNATIONAL CORPORATION LIMITED

Applicant Address..... 25 St Thomas Street, Winchester, Hampshire, SO23 9HJ, United Kingdom

Manufacturer Chengdu Vertu Business and Service Management Co., Ltd.

Manufacturer Address 1601,16th Floor, No. 1577 Middle Section of Tianfu Avenue, Chengdu High-tech Zone, China (Sichuan) Pilot Free Trade Zone

Test Standards..... 47 CFR Part 15 Subpart B
ICES-003 Issue 7

Test Result..... PASS

Tested by Ruihong Xie
Ruihong Xie Test Engineer 2022.05.23

Reviewed by Chris You
Chris You Senior Engineer 2022.05.23

Approved by Shuangwen Zhang
Shuangwen Zhang, Manager 2022.05.23

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Change History		
Issue	Date	Reason for change
1.0	2022.05.23	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Name : METAVERTU 5G digital mobile phone
Trade Name.....: VERTU
Brand Name.....: VERTU
Hardware Version..... : N/A
Software Version..... : 12.0.0_6.01.01.01
Power supply..... : Battery
Model No.: Li3941T44P8h826453
Capacitance: 4500mAh
Rated Voltage: 3.87V
Charge Limit: 4.45V
Manufacturer : Zhuhai CosMX Battery Co.,Ltd.

Ancillary Equipment ... : AC Adapter
Model No.: FC139U
I/p: 100-240V~50/60Hz ,1500mA,Max
O/p: 5V--- 3000mA,15W
9V--- 3000mA,27 W
12V--- 3000mA,36 W
15V--- 3000mA,45 W
20V--- 3250mA,65 W
PPS: 3.3-11Vdc 5.0A Max
Manufacturer : ShenZhen KunXing Technology Co.,Ltd

*Note1:*The EUT is a METAVERTU 5G digital mobile phone;

*Note2 :*For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B 2018	Radio Frequency Devices
2	ICES-003 Issue 7	Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107	Conducted Emission	PASS
2	15.109	Radiated Emission	PASS
3	ICES 003 Issue 7 Section3.2.1	Conducted Emission	PASS
4	ICES 003 Issue 7 Section3.2.2	Radiated Emission	PASS

NOTE:

- (1) The EUT has been tested according to 47 CFR Part 15 Subpart B, Class B. The test procedure is according to ANSI C63.4:2014.
- (2) The EUT has been tested according to ICES 003 Issue 7. The test procedure is according to ANSI C63.4:2014.



1.3 Facilities and Accreditations

1.3.1 Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing 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. Designation Number: CN1283, valid time is until April 19th, 2023.

ISED Registration: 11185A-1

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until April 20th, 2023.

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.3.2 Test Environment Conditions

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

Temperature (°C):	15 °C - 35 °C
Relative Humidity (%):	25% -75%
Atmospheric Pressure (kPa):	86kPa-106kPa

1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	Uc = 3.2 dB (k=2)
Uncertainty of Radiated Emission: (30MHz~1GHz)	Uc = 5.8 dB (k=2)
Uncertainty of Radiated Emission: (1~6GHz)	Uc = 5.1 dB (k=2)
Uncertainty of Radiated Emission: (6~18GHz)	Uc = 5.5 dB (k=2)



2. TEST CONDITIONS SETTING

2.1 Test Peripherals

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Support Equipment:

Description	Brand name	Model	Serial No.	FCCID
Notebook	ThinkPad	E430C	A131101550	N/A
Mouse	Logitech	M100r	25011051	N/A

Support Cable:

Description	Shield Type	Ferrite Core	Length
PC Power adapter Cable	Un- shielding	No	1.2m
Mouse Cable	Un- shielding	No	1m

2.2 Test Mode

The EUT have the following typical setups during the test:

Setup1:EUT+ Charger

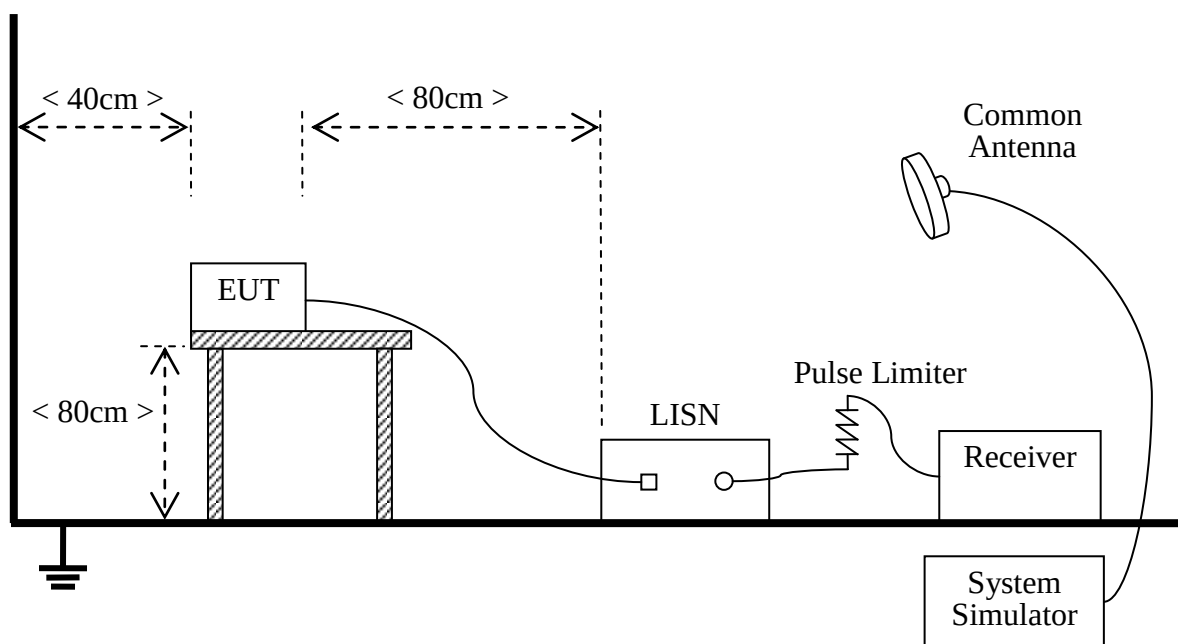
Setup2: EUT+PC+DATA Traffic

Note: only worst-case mode setup 1 mode data provide at the report

2.3 Test Setup and Equipments List

2.3.1 Conducted Emission

A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides $50\Omega/50\mu\text{H}$ of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

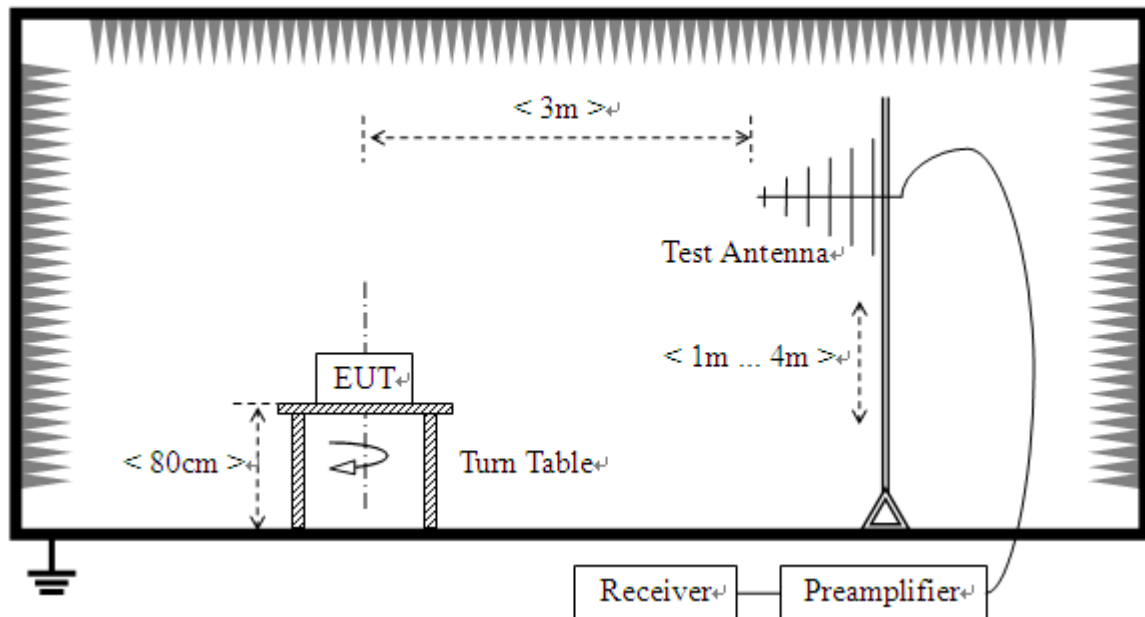
B. Equipments List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
Test Receiver	KEYSIGHT	N9038A	A141202036	2021.09.20	2022.08.04
LISN	ROHDE&SCHWARZ	ENV216	A140701847	2021.08.02	2022.08.02
Cable	MATCHING PAD	W7	/	2021.08.02	2022.08.02

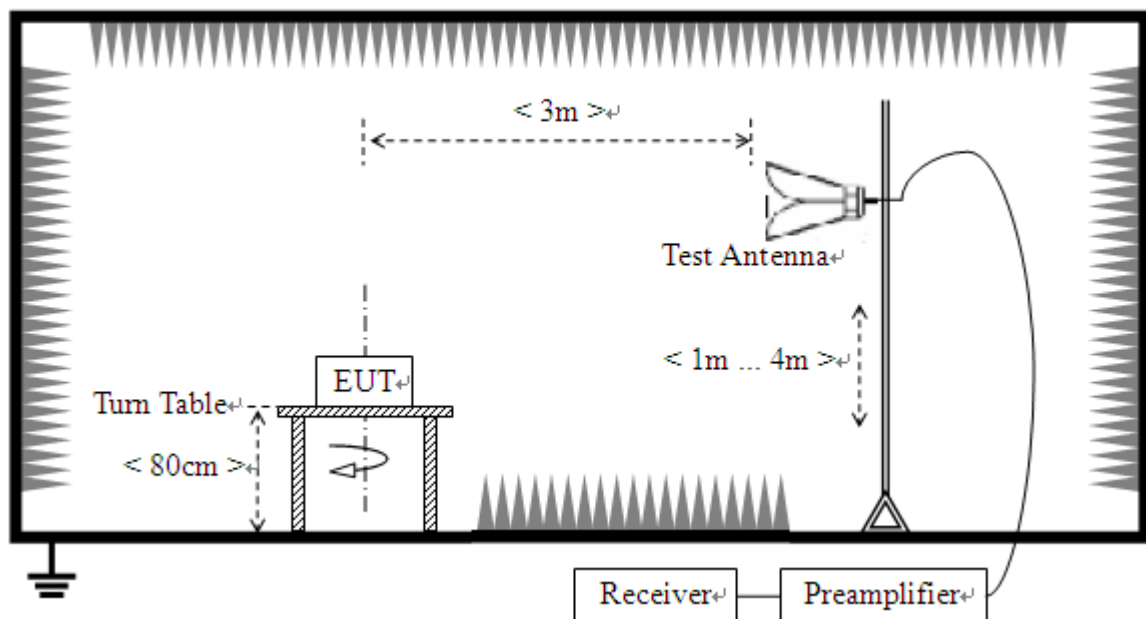
2.3.2 Radiated Emission

A. Test Setup:

- 1) For radiated emissions from 30MHz to 1GHz



2) For radiated emissions above 1GHz



B. Test Procedure

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a



variable-height antenna master tower.

For the test Antenna:

- 1) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

C. Equipments List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
Test Receiver	KEYSIGHT	N9038A	A141202036	2021.09.20	2022.08.04
LISN	ROHDE&SCHWARZ	ENV216	A140701847	2021.09.21	2022.08.02
Shield Room	Xinju Electronics	L7300*W4500 *H3100	A181003226	2021.09.05	2024.07.29
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	A0902601	2022.05.23	2023.04.17
Broadband Ant.	2786	ETC	A150402239	2021.09.16	2024.03.03
3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2019.03.26	2023.03.25
EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2021.08.12	2022.08.06
System Simulator	ROHDE&SCHWARZ	CMW500	A150802214	2021.08.02	2022.07.22
5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2021.08.02	2022.07.22
EMI Horn Ant.	ROHDE&SCHWARZ	HF906	A0304225	2019.03.25	2023.03.24

3. 47 CFR PART 15B REQUIREMENTS

3.1 Conducted Emission

3.1.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2 Test Description

See section 2.3.1 of this report.

3.1.3 Test Result

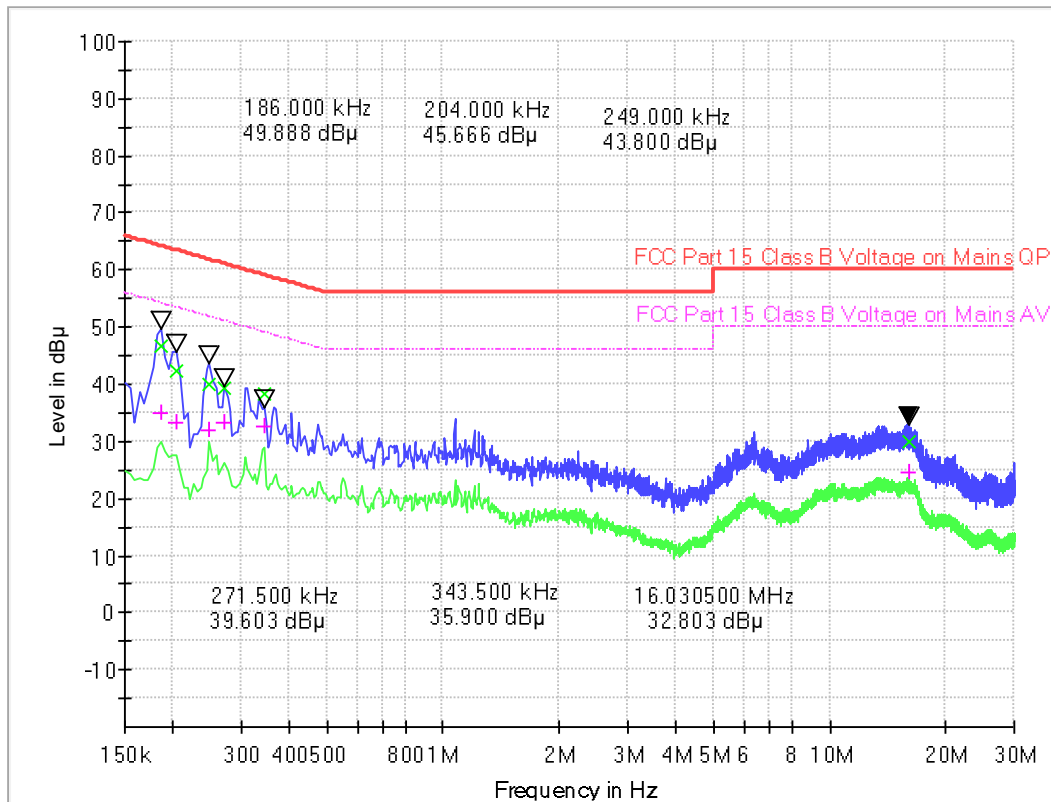
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

Note:

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a Nominal 120V AC,50/60Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

Test voltage and frequency (120V AC,60Hz)

A. Mains terminal disturbance voltage, L phase

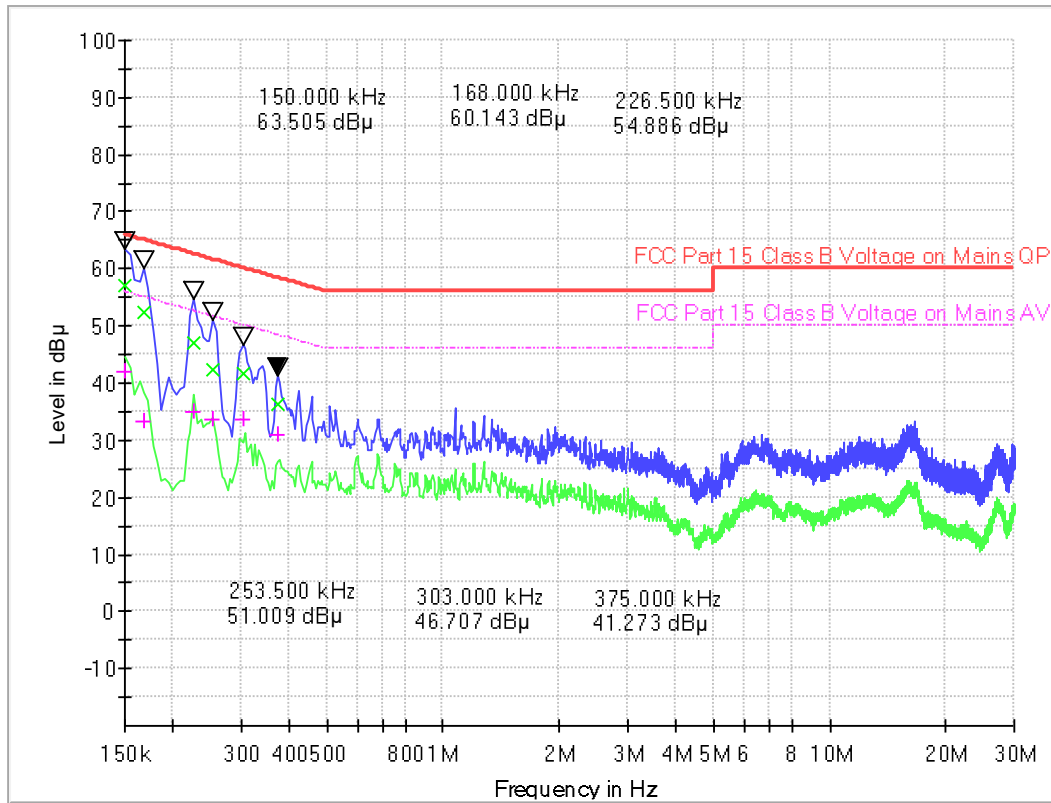


(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB μ V)
0.186000	46.57	34.97	0.1	19.5	17.64	64.2	19.24	54.2
0.204000	42.45	33.15	0.2	19.5	21.00	63.4	20.30	53.4
0.249000	40.05	31.91	0.2	19.5	21.74	61.8	19.88	51.8
0.271500	39.41	33.40	0.2	19.5	21.66	61.1	17.67	51.1
0.343500	38.32	32.76	0.1	19.5	20.80	59.1	16.36	49.1
16.030500	29.86	24.58	0.3	20.1	30.14	60.0	25.42	50.0

Note: Correction factor=Cabel loss+ attenuation factor
attenuation factor=10dB

B. Mains terminal disturbance voltage, N phase



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB μ V)
0.150000	57.22	42.03	0.1	19.5	8.78	66.0	13.97	56.0
0.168000	52.25	33.43	0.2	19.5	12.81	65.1	21.63	55.1
0.226500	46.99	35.07	0.1	19.5	15.59	62.6	17.51	52.6
0.253500	42.35	33.62	0.2	19.5	19.29	61.6	18.02	51.6
0.303000	41.65	33.67	0.2	19.5	18.51	60.2	16.49	50.2
0.375000	36.37	30.84	0.2	19.5	22.02	58.4	17.55	48.4

3.2 Radiated Emission

3.2.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength		Field Strength Limitation at 3m Measurement Dist	
	$\mu\text{V/m}$	Dist	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
30.0 - 88.0	100	3m	100	$20\log 100$
88.0 - 216.0	150	3m	150	$20\log 150$
216.0 - 960.0	200	3m	200	$20\log 200$
Above 960.0	500	3m	500	$20\log 500$

According to ICES-003 the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	Class A(3m) QP ($\text{dB}\mu\text{V/m}$)	Class B(3m) QP ($\text{dB}\mu\text{V/m}$)
30 - 88	50.0	40.0
88 - 216	54.0	43.5
216 - 230	56.9	46.0
230 - 960	57.0	47.0
960-1000	60.0	54.0
Frequency range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	Class A(3m) ($\text{dB}\mu\text{V/m}$)	Class B(3m) ($\text{dB}\mu\text{V/m}$)
Above 1G	60(AV) /80(PK)	54(AV) /74(PK)

- For frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.
- Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

c) For below 1G :QP detector RBW 120kHz ,VBW 300kHz.

For Above 1G: PK detector RBW 1MHz,VBW 3MHz for PK value ;AV detector RBW 1MHz, VBW 10Hz for AV value.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dBuV/m is calculated by $20\log$ Emission Level(uV/m).
- 3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^2$.

Example:

F.S Limit at 30m distance is 30uV/m, then F.S Limitation at 3m distance is adjusted as

$$Ld1 = L1 = 30\text{uV/m} * (10)^2 = 100 * 30\text{uV/m}.$$

3.2.2 Test Description

See section 2.3.2 of this report.

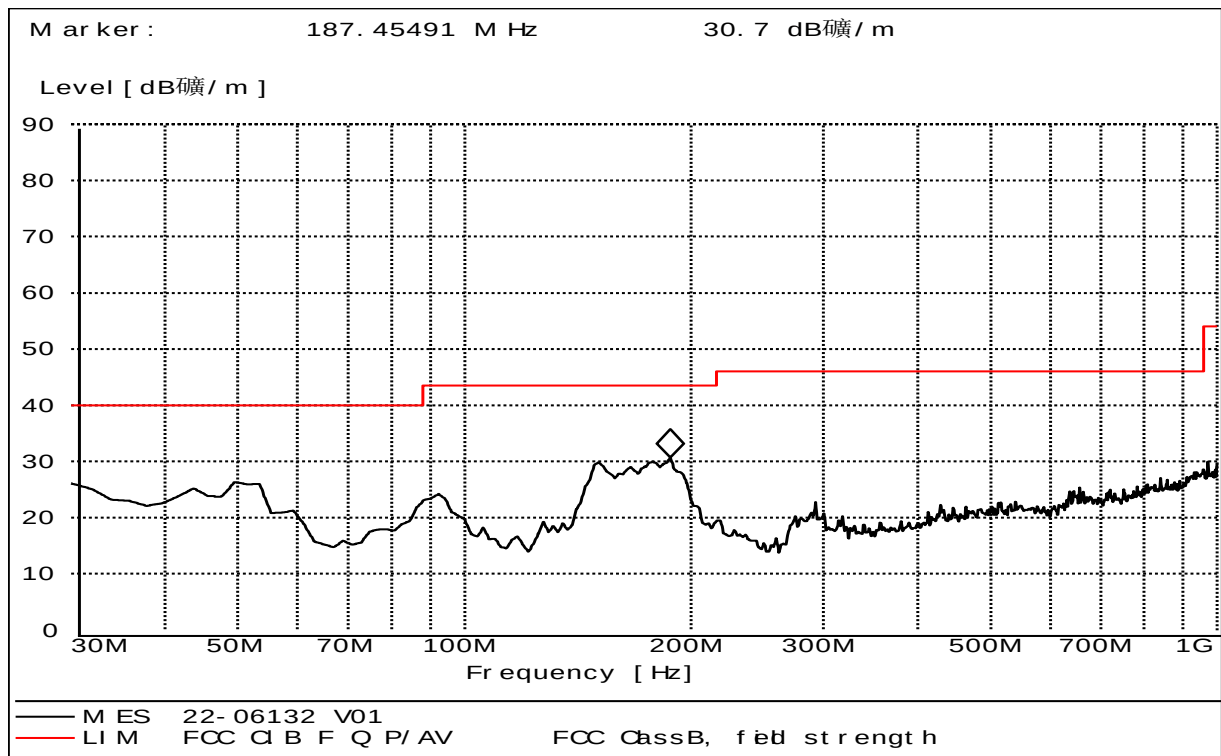
3.2.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

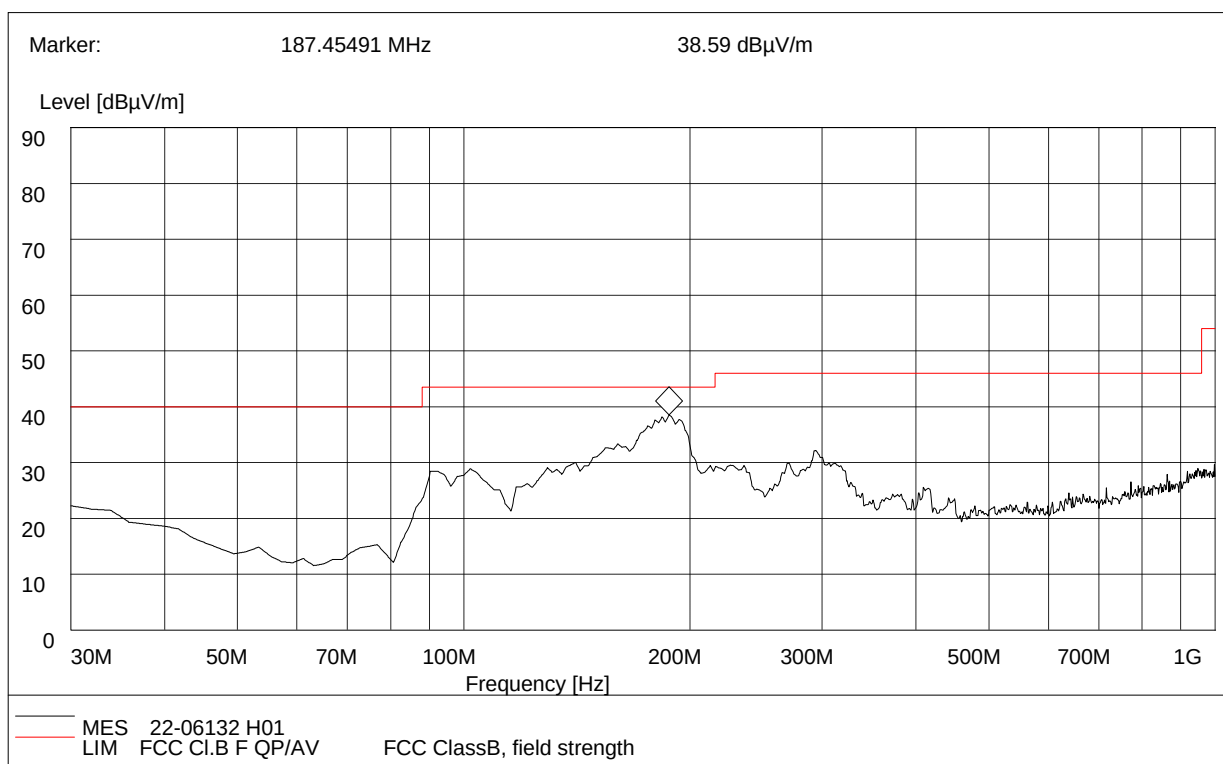
A.Radiation disturbances, antenna polarization:Vertical



(Plot C: Test Antenna Vertical 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
30.00	24.37	120.000	119	40.00	15.63	Vertical	0.4	26.2	Pass
43.60	23.29	120.000	120	40.00	16.71	Vertical	0.4	26.1	Pass
49.43	24.35	120.000	137	40.00	15.65	Vertical	0.3	26.3	Pass
92.20	22.11	120.000	124	43.50	21.39	Vertical	0.5	27.2	Pass
150.52	27.33	120.000	118	43.50	16.17	Vertical	0.5	27.4	Pass
187.45	28.67	120.000	142	43.50	14.83	Vertical	0.6	27.6	Pass

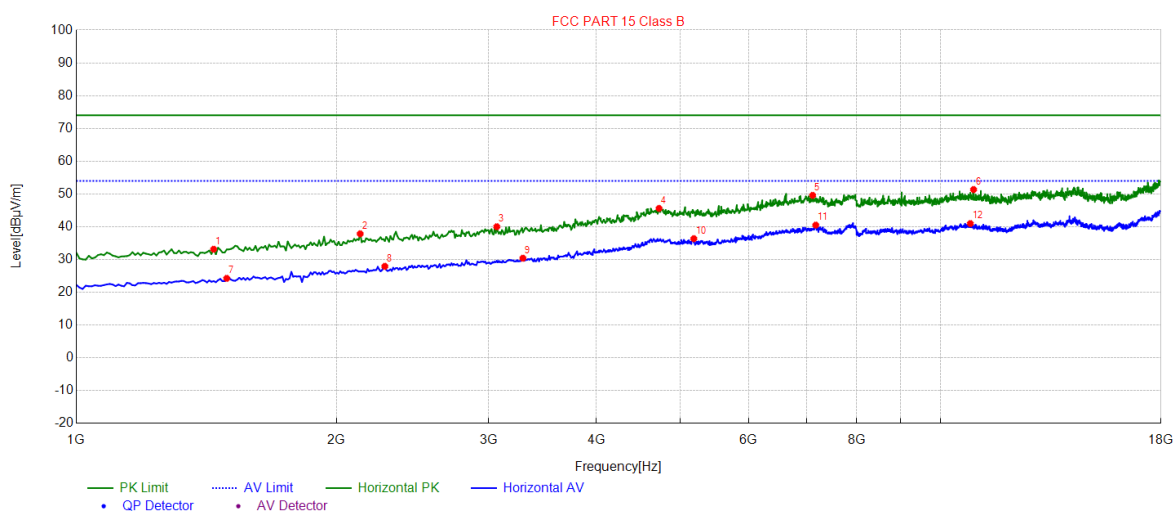
B.Radiation disturbances, antenna polarization: Horizontal



(Plot D: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
90.23	25.36	120.000	119	43.5	18.14	Horizontal	0.4	26.8	Pass
101.92	24.61	120.000	134	43.5	18.89	Horizontal	0.4	27.1	Pass
140.80	28.35	120.000	124	43.5	15.15	Horizontal	0.5	27.2	Pass
160.24	31.81	120.000	108	43.5	11.69	Horizontal	0.6	26.9	Pass
187.45	38.56	120.000	143	43.5	4.94	Horizontal	0.5	26.8	Pass
293.09	30.19	120.000	148	46.0	15.81	Horizontal	0.6	27.4	Pass

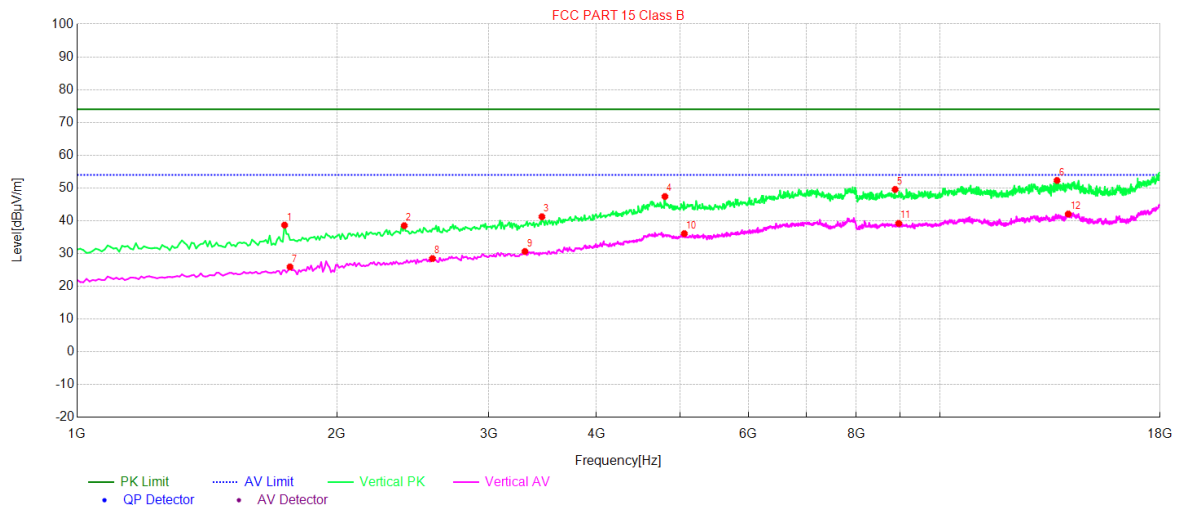
A.Radiation disturbances, antenna polarization: Horizontal



(Plot M: Test Antenna Horizontal 1G – 18G)

NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1442.22	33.15	74.00	40.85	PK	104	252	Horizontal
2	2131.06	37.85	74.00	36.15	PK	195	341	Horizontal
3	3066.53	40.01	74.00	33.99	PK	189	263	Horizontal
4	4724.86	45.60	74.00	28.40	PK	164	304	Horizontal
5	7114.55	49.58	74.00	24.42	PK	155	310	Horizontal
6	10924.4	51.35	74.00	22.65	PK	160	46	Horizontal
7	1493.24	24.27	54.00	29.73	AV	142	355	Horizontal
8	2275.63	27.93	54.00	26.07	AV	209	136	Horizontal
9	3287.64	30.41	54.00	23.59	AV	147	334	Horizontal
10	5184.09	36.38	54.00	17.62	AV	217	197	Horizontal
11	7174.08	40.51	54.00	13.49	AV	145	221	Horizontal
12	10830.9	40.98	54.00	13.02	AV	157	80	Horizontal

B.Radiation disturbances, antenna polarization: Vertical



(Plot N: Test Antenna Vertical 1G – 18G)

NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1739.86	38.66	74.00	35.34	PK	120	71	Vertical
2	2394.69	38.50	74.00	35.50	PK	147	230	Vertical
3	3457.72	41.23	74.00	32.77	PK	136	352	Vertical
4	4801.40	47.40	74.00	26.60	PK	151	163	Vertical
5	8874.93	49.56	74.00	24.44	PK	124	335	Vertical
6	13671.3	52.30	74.00	21.70	PK	108	147	Vertical
7	1765.38	25.93	54.00	28.07	AV	119	165	Vertical
8	2581.79	28.49	54.00	25.51	AV	127	260	Vertical
9	3304.65	30.64	54.00	23.36	AV	118	87	Vertical
10	5056.52	36.08	54.00	17.92	AV	134	55	Vertical
11	8959.98	39.21	54.00	14.79	AV	166	233	Vertical
12	14088.0	42.07	54.00	11.93	AV	102	306	Vertical

-----End of Report-----