

FCC Radio Test Report

FCC ID: 2AAGE5081SB4898W

This report concerns: Original Grant

Project No. 2201H017 Equipment Tablet : Vantron **Brand Name**

Test Model : VT-TABLET-5081S

Series Model : N/A

Applicant : Chengdu Vantron Technology Co., Ltd.

Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China

610045

Manufacturer : Chengdu Vantron Technology Co., Ltd.

Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China

610045

: Jan. 10, 2022 Date of Receipt

Date of Test : Jan. 24, 2022~Feb. 27, 2022

Issued Date : Apr. 01, 2022

Report Version : R01

: Engineering Sample No.: SH2022012417 for EUT Test Sample

: FCC CFR Title 47, Part 15, Subpart C Standard(s)

ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Maker Q

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.



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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-5-2201H017	R00	Original Issue.	Mar. 23, 2022	Invalid
BTL-FCCP-5-2201H017	R01	Updated the test model information.	Apr. 01, 2022	Valid



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section	Test Item	Test Result	Judgment	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	
15.225(a)-(d) 15.205(a) 15.209(a)	Radiated Emission	APPENDIX B APPENDIX C	PASS	
15.225(e)	Frequency Tolerance	APPENDIX D	PASS	
15.203	Antenna Requirement		PASS	Note(2)

Note:

- (1) "N/A" denotes test is not applicable in this test report
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.



1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China

BTL's Test Firm Registration Number for FCC: 476765

BTL's Designation Number for FCC: CN1241

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U, (dB)
SH-C01	CISPR	150 kHz ~ 30 MHz	2.64

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9 KHz~30 MHz	-	2.16
		30 MHz~200 MHz	V	4.04
SH-CB02	CISPR	30 MHz~200 MHz	Η	2.90
		200 MHz~1,000 MHz	V	3.76
		200 MHz~1,000 MHz	Н	3.82

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	15°C	38%	AC 120V/60Hz	Max Liu
Radiated Emissions-9kHz to 30MHz	24°C	58%	AC 120V/60Hz	Forest Li
Radiated Emissions-30MHz to 1000MHz	24°C	58%	AC 120V/60Hz	Forest Li
Frequency Tolerance	Normal & Extreme	38%	Normal & Extreme	Danny Dang



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Tablet
Brand Name	Vantron
Test Model	VT-TABLET-5081S
Series Model	N/A
Model Difference(s)	N/A
Software Version	V100R001.F0000-03
Hardware Version	V1.1
Power Source	DC power supply.
Power Rating	DC 5V/2A MAX.10W
Operation Frequency	13.56 MHz
Antenna Type	Internal PIFA Antenna
Field Strength	51.37dBuV/m
Max. E.I.R.P	-43.83 dBm

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Test Channel	Test Frequency (MHz)
01	13.56

3. For d=3m EIRP(dBm)=E(dB_µV / m)-95.2 EIRP=51.37-95.2=-43.83



2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX Mode_13.56MHz

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

AC power line conducted emissions test	
Final Test Mode	Description
Mode 1	TX Mode_13.56MHz

	Radiated emissions test - Below 1GHz
Final Test Mode	Description
Mode 1	TX Mode_13.56MHz

Conducted test			
Final Test Mode Description			
Mode 1	TX Mode_13.56MHz		



	EUT	

2.4 SUPPORT UNITS

Item	Cable Type	Shielded Type	Ferrite Core	Length
N/A	N/A	N/A	N/A	N/A



3. AC POWER LINE CONDUCTED EMISSIONS

3.1 LIMIT

Frequency of Emission (MHz)	Limit (d	ΒμV)
Frequency of Emission (Miriz)	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item EUT Test Photos.

The following table is the setting of the receiver

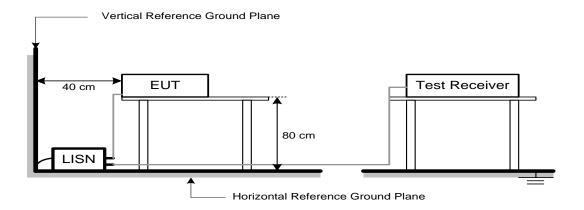
Receiver Parameter	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.3 DEVIATION FROM TEST STANDARD

No deviation.



3.4 TEST SETUP



3.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting data or hopping on mode.

3.6 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of <code>Note</code>. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "*" marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150 kHz to 30 MHz.



4. RADIATED EMISSION

4.1 LIMIT

§15.225 (a)

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

§15.225 (b)

Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

§15.225 (c)

Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

§15.225 (d)

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

§15.209 (a)

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

- (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).



4.2 TEST PROCEDURE

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

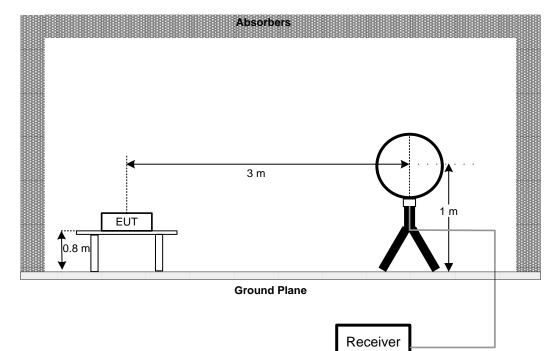
4.3 DEVIATION FROM TEST STANDARD

No deviation.

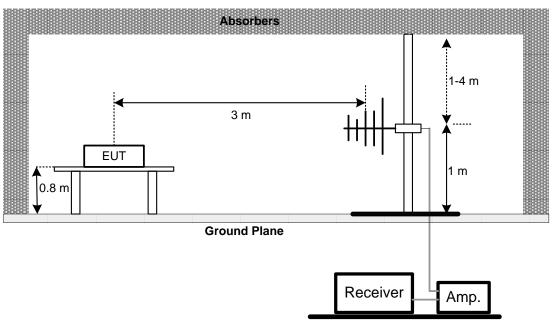


4.4 TEST SETUP

9 kHz to 30 MHz



30 MHz to 1000 MHz







4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULTS - 9 kHz TO 30 MHz

Please refer to the APPENDIX B.

Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.7 TEST RESULTS - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.



5. FREQUENCY TOLERANCE

5.1 LIMIT

Section	Test Item	Limit
FCC 15.225(e)	Frequency Tolerance	±1.356 kHz

5.2 TEST PROCEDURE

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of -20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

Please refer to the APPENDIX D.



6. MEASUREMENT INSTRUMENTS LIST

	AC Power Line Conducted Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Line Impedance Stabilisation Network	Schwarzbeck	NNLK 8121	8121-822	Mar. 20, 2022	
2	TWO-LINE V-NETWORK	R&S	ENV216	101340	Aug. 23, 2022	
3	Test Cable	emci	EMCRG400-BM-N M-10000	170628	Apr. 11, 2022	
4	EMI Test Receiver	R&S	ESCI	100082	Mar. 21, 2022	
5	50Ω Terminator	SHX	TF2-1G-A	17051602	Mar. 20, 2022	
6	50Ω coaxial switch	Anritsu	MP59B	6201750902	Mar. 21, 2022	
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

	Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Loop Antenna	EMCI	EMCI LPA600	275	May. 20, 2022	
2	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022	
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

	Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9160	9160-3233	Mar. 26, 2022	
2	Pre-Amplifier	emci	EMC9135	980401	Mar. 20, 2022	
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022	
4	Test Cable	emci	EMC104-SM-SM-7 000	181020	Apr. 11, 2022	
5	Test Cable	emci	EMC104-SM-SM-2 500	170618	Apr. 11, 2022	
6	Test Cable	emci	EMC104-SM-SM-8 00	170647	Apr. 11, 2022	
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

Frequency Tolerance										
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Spectrum Analyzer	R&S	FSP40	100626	May 29, 2022					
2	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Aug. 23, 2022					

Remark "N/A" denotes no model name, serial no. or calibration specified.

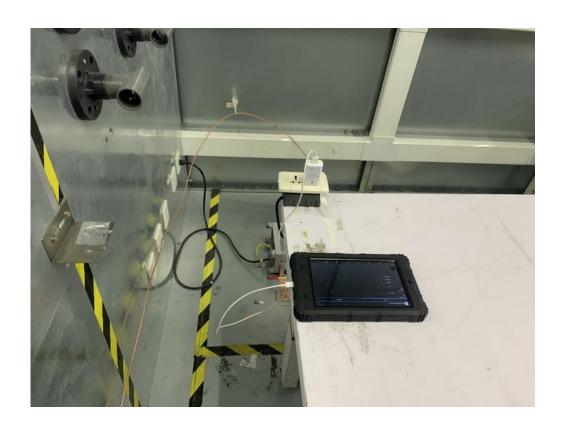
All calibration period of equipment list is one year.



7. EUT TEST PHOTO



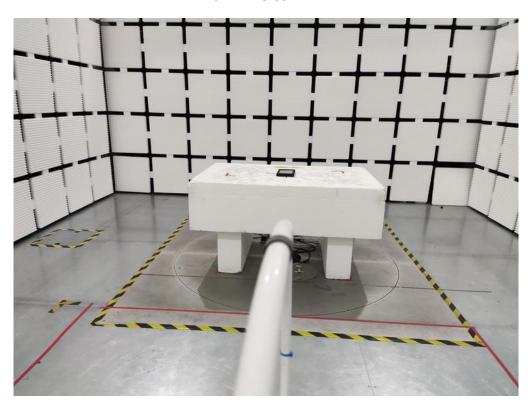


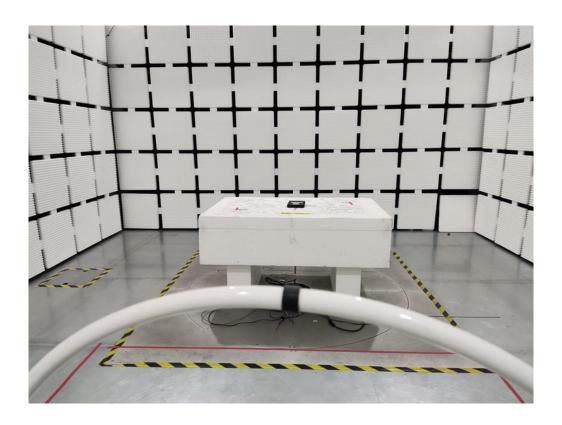




Radiated Emissions Test Photos

9 kHz TO 30 MHz

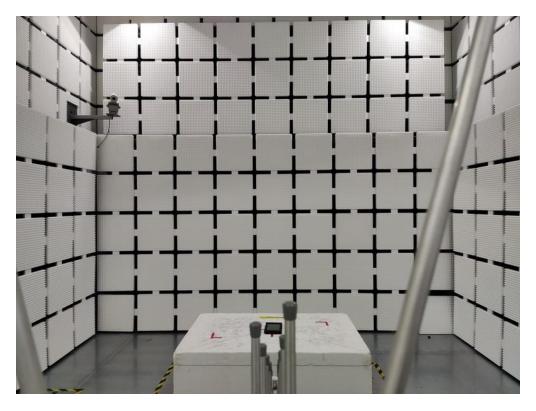


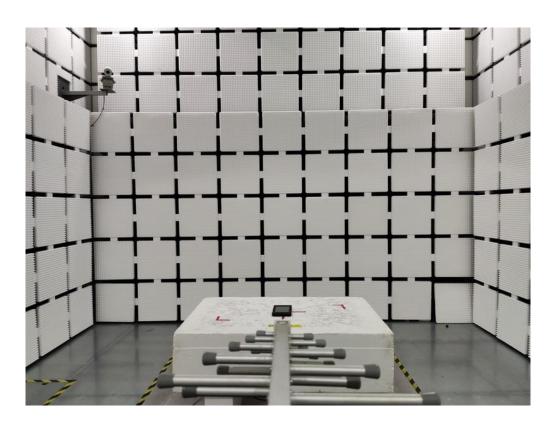




Radiated Emissions Test Photos

30 MHz TO 1000 MHz

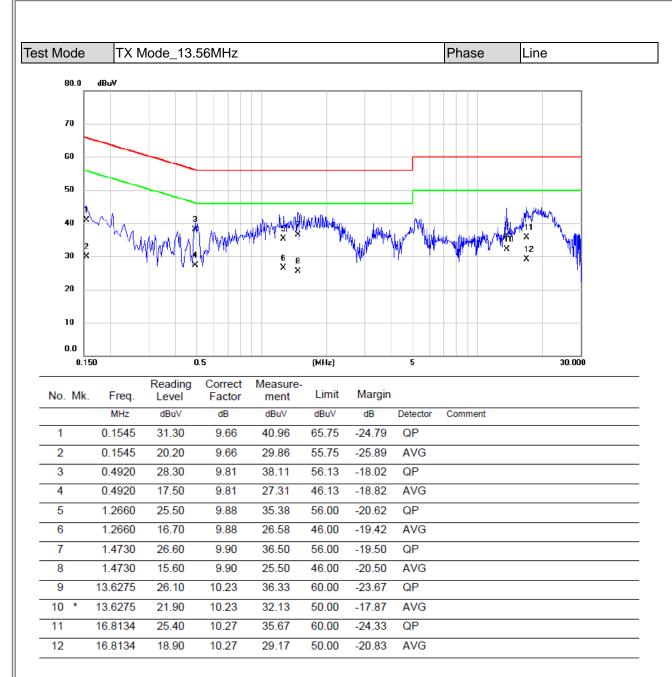






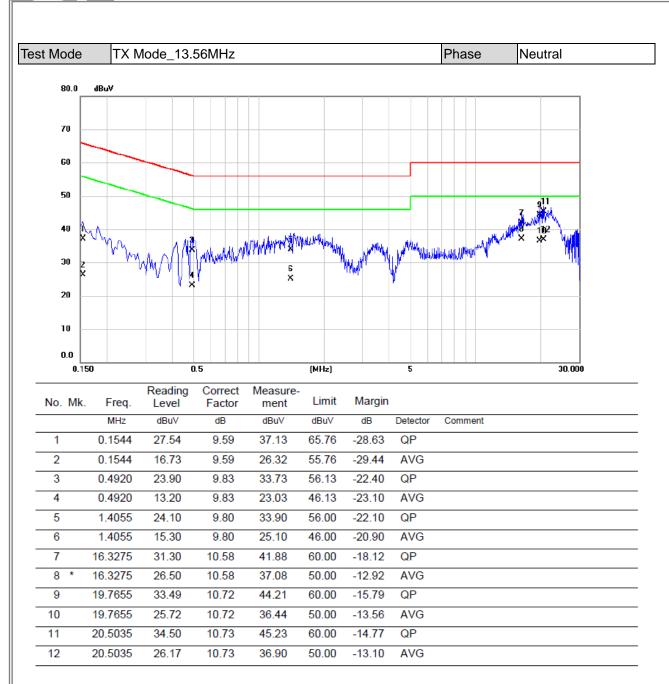
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



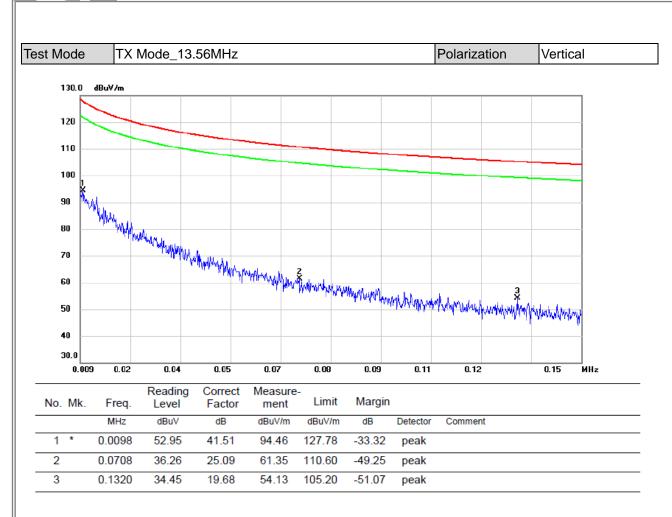


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

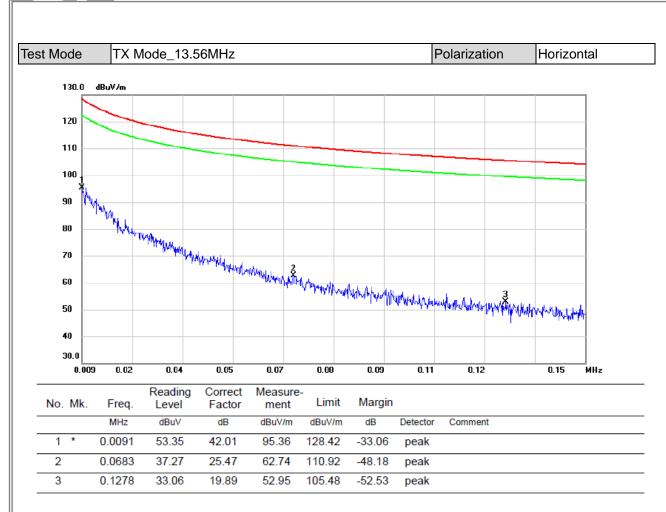


APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

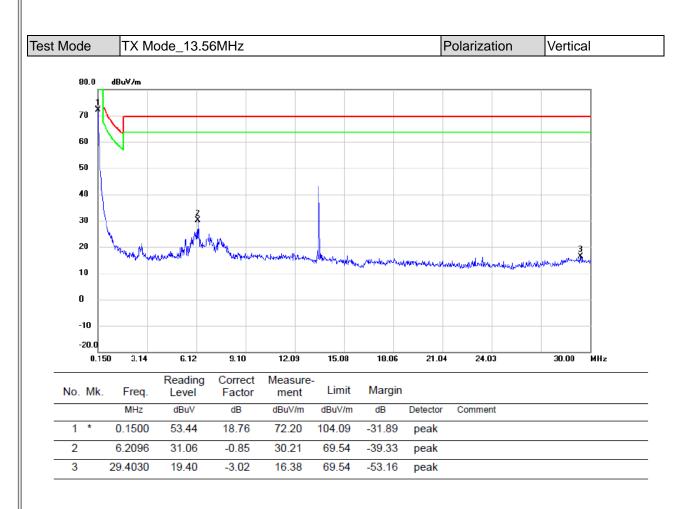






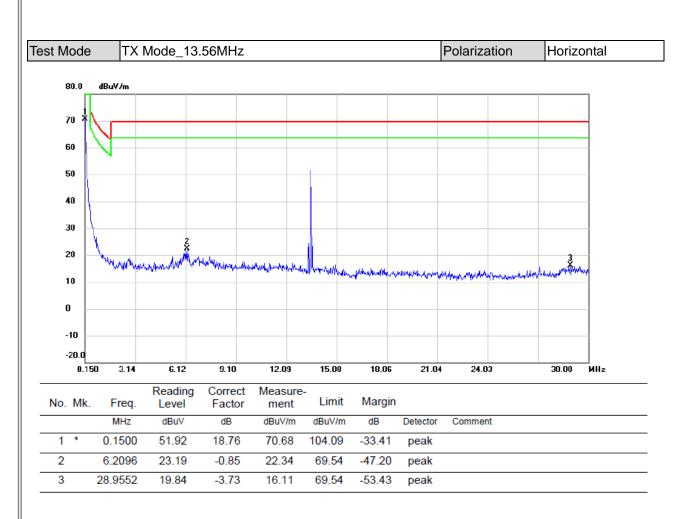






- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.
- (3)The measurement points between 9-90 kHz, 110-490 KHz satisfy the peak limit and can also satisfy the AVG limit.



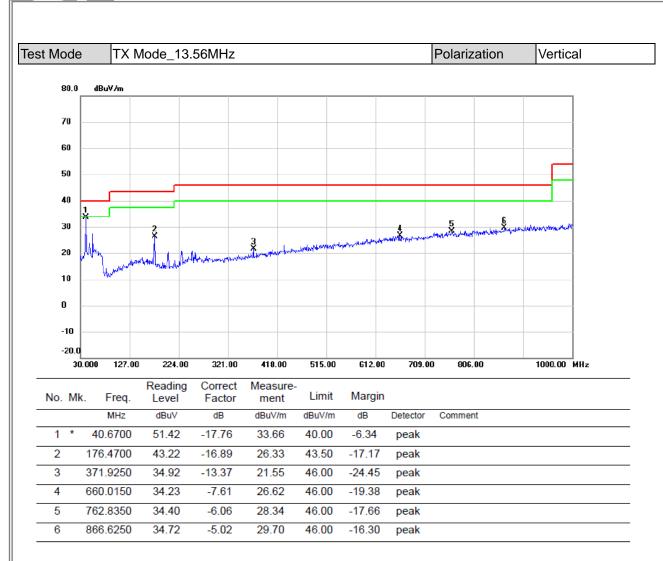


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.
- (3)The measurement points between 9-90 kHz, 110-490 KHz satisfy the peak limit and can also satisfy the AVG limit



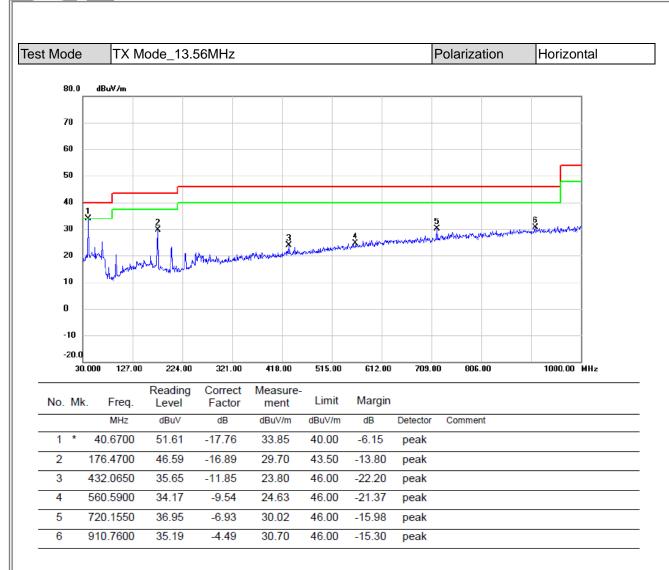
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX D - FREQUENCY TOLERANCE



Test Mode	TX Mode 13.56MHz

		Fr	equency Tole	rance Versus Envi	ronmental Tempo	erature			
	Temper (°C		Voltage (V)	Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result		
	20)	120	13.560156	0.156	-	-		
0 min	50		120	13.560362	0.362	+/- 1.356	PASS		
-2)	120	13.560214	0.214	+/- 1.356	PASS		
2 min)	120	13.560435	0.435	+/- 1.356	PASS		
	-20)	120	13.560375	0.375	+/- 1.356	PASS		
5 min	50)	120	13.560213	0.213	+/- 1.356	PASS		
	-20)	120	13.560264	0.264	+/- 1.356	PASS		
10 min	50)	120	13.560226	0.226	+/- 1.356	PASS		
	-20 120		120	13.560252	0.252	+/- 1.356	PASS		
Frequency Tolerance Versus Input Voltage									
Temperature (°C)		Voltage (V)		Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result		
20		V nom	120	13.560218	0.218	-	-		
20		V min	102	13.560285	0.285	+/- 1.356	PASS		
20		V _{max}	138	13.560291	0.291	+/- 1.356	PASS		

End of Test Report