

FCC PART 15C

TEST REPORT

For

Chengdu Vantron Technology, Ltd.

No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

FCC ID: 2AAGETAB5071-TM

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Chengdu Vantron Technology, Ltd., model number: VT-TABLET-5071-TM-FP (FCC ID: 2AAGETAB5071-TM) or the "EUT" as referred to in this report was the Tablet Computer.

Mechanical Description of EUT

The EUT was measured approximately: 226mm (L) x 127 mm (W) x 18 mm (H).

Rated input voltage: DC 3.7V rechargeable Li-ion battery or DC 5V charging from USB port.

*All measurement and test data in this report were gathered from final production sample, serial number: 170626001/01 (assigned by BACL). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-06-23, and EUT complied with test requirement.

Objective

This Type approval report is prepared on behalf of *Chengdu Vantron Technology, Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209 and 15.225.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: 2AAGETAB5071-TM. FCC Part 15C DSS submissions with FCC ID: 2AAGETAB5071-TM. FCC Part 15C DTS submissions with FCC ID: 2AAGETAB5071-TM. FCC Part 15E NII submissions with FCC ID: 2AAGETAB5071-TM.

Measurement Uncertainty

| ltem | Uncertainty | | |
|-----------------------------------|------------------|---|--------|
| AC power line conducte | 2.71dB | | |
| | 9kHz-30MHz | | 6.1dB |
| | 201411- 2001411- | Н | 4.57dB |
| | 30IVINZ-200IVINZ | V | 4.81dB |
| Radiated Emission(Field Strength) | | Н | 5.69dB |
| | 20010102-10002 | V | 6.07dB |
| | 1GHz-6GHz | | 5.49dB |
| | 6GHz-18GHz | | 5.57dB |

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by BACL to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules, The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014. The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332.

BACL's test facility has been fully described in reports on file and registered with the Innovation, Science and Economic Development Canada under Registration Numbers: 3062C-1.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode

EUT Exercise Software

N/A

Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|------------|---------------|
| N/A | Earphone | N/A | N/A |
| Xinheyuan | Adapter | XHY0501WLC | N/A |

External I/O Cable

| Cable Description | Length (m) | From | То |
|---------------------------|------------|---------|----------|
| Unshielded USB Cable | 1.0 | Adapter | EUT |
| Unshielded Earphone Cable | 1.2 | EUT | Earphone |

Block Diagram of Test Setup

For AC Line Conducted Emission



Test Equipments List

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------------------------|-------------------|------------------|---------------------|-------------------------|
| | Con | ducted Emission | s Test | | |
| Rohde & Schwarz | EMI Test Receiver | ESCS 30 | 836858/0016 | 2016-12-02 | 2017-12-01 |
| Rohde & Schwarz | L.I.S.N. | ENV216 | 100018 | 2017-05-20 | 2018-05-19 |
| Rohde & Schwarz | PULSE LIMITER | ESH3Z2 | DE14781 | 2016-11-10 | 2017-11-09 |
| N/A | Conducted Cable | NO.5 | N/A | N/A | N/A |
| Rohde & Schwarz | EMC32 | N/A | V 8.52.0 | N/A | N/A |
| | Ra | diated Emissions | Test | | |
| Agilent | Pre-Amplifier | 8447D | 2944A10442 | 2016-12-02 | 2017-12-01 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100028 | 2017-05-20 | 2018-05-19 |
| Sunol Sciences | Broadband Antenna | JB3 | A121808 | 2017-05-18 | 2020-05-17 |
| A.H.Systems,inc | Active 12" Loop Antenna | SAS-563B | 365 | 2016-12-02 | 2017-12-01 |
| INMET | Attenuator | N-6dB | 1 | 2016-11-10 | 2017-11-09 |
| EMCT | Semi-Anechoic Chamber | 966 | N/A | 2015-04-24 | 2018-04-23 |
| N/A | RF Cable (below 1GHz) | NO.1 | N/A | 2016-11-10 | 2017-11-09 |
| N/A | RF Cable (below 1GHz) | NO.4 | N/A | 2016-11-10 | 2017-11-09 |
| Rohde & Schwarz | EMC32 | N/A | V 8.52.0 | N/A | N/A |
| | Fre | equency Stability | Test | | |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100028 | 2017-05-20 | 2018-05-19 |
| A.H.Systems,inc | Active 12" Loop Antenna | SAS-563B | 365 | 2016-12-02 | 2017-12-01 |
| ZhaoXin | DC Power supply | RXN-305D | 20141218916 | 2016-11-05 | 2017-11-04 |
| Shenzhen BACL | High Temperature Test Chamber | BTH-150 | 30024 | 2016-12-02 | 2017-12-01 |

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|----------------------------|----------------------------|------------|
| §15.203 | Antenna Requirement | Compliance |
| §15.207 | AC Line Conducted Emission | Compliance |
| §15.225 §15.209 §15.205 | Radiated Emission Test | Compliance |
| §15.225(e) | Frequency Stability | Compliance |
| §15.215(c) | 20 dB Emission Bandwidth | Compliance |

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

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 shall be considered sufficient to comply with the provisions of this section.

Antenna Connected Construction

The EUT has one integrated loop inductive antenna arrangement, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSION

Applicable Standard

FCC §15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz |

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

According FCC publication number 174176, for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

 $V_{\rm C} = V_{\rm R} + A_{\rm C} + VDF$

Herein, V_C : corrected voltage amplitude V_R : reading voltage amplitude

A_c: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

Environmental Conditions

| Temperature: | 29 °C |
|---------------------------|----------|
| Relative Humidity: | 50 % |
| ATM Pressure: | 94.9 kPa |

The testing was performed by Tom Tang on 2017-07-08.

Test Mode: Transmitting

AC120V/60Hz, Line:



| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|--------------------|---------------------|--------------------|--------------------|------|---------------|----------------|-----------------|
| 0.158200 | 53.0 | 200.0 | 9.000 | L1 | 19.7 | 12.5 | 65.5 |
| 0.197569 | 50.7 | 200.0 | 9.000 | L1 | 19.7 | 12.9 | 63.6 |
| 0.236458 | 48.9 | 200.0 | 9.000 | L1 | 19.7 | 13.1 | 62.0 |
| 7.382361 | 43.4 | 200.0 | 9.000 | L1 | 20.0 | 16.6 | 60.0 |
| 7.998940 | 45.7 | 200.0 | 9.000 | L1 | 20.0 | 14.3 | 60.0 |
| 9.447849 | 46.2 | 200.0 | 9.000 | L1 | 20.0 | 13.8 | 60.0 |

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|--------------------|-------------------|--------------------|--------------------|------|---------------|----------------|-----------------|
| 0.157990 | 39.6 | 200.0 | 9.000 | L1 | 19.7 | 15.9 | 55.5 |
| 0.197569 | 36.8 | 200.0 | 9.000 | L1 | 19.7 | 16.7 | 53.5 |
| 0.236448 | 36.4 | 200.0 | 9.000 | L1 | 19.7 | 15.6 | 52.0 |
| 0.394140 | 33.6 | 200.0 | 9.000 | L1 | 19.8 | 14.3 | 47.8 |
| 9.380328 | 34.2 | 200.0 | 9.000 | L1 | 20.0 | 15.8 | 50.0 |
| 10.364798 | 34.2 | 200.0 | 9.000 | L1 | 20.0 | 15.8 | 50.0 |

AC120V/60Hz, Neutral:



| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|--------------------|---------------------|--------------------|--------------------|------|---------------|----------------|-----------------|
| 1.034404 | 41.7 | 200.0 | 9.000 | L1 | 19.8 | 14.1 | 56.0 |
| 1.065745 | 41.3 | 200.0 | 9.000 | L1 | 19.8 | 14.7 | 56.0 |
| 1.174330 | 40.8 | 200.0 | 9.000 | L1 | 19.8 | 15.2 | 56.0 |
| 1.479280 | 40.2 | 200.0 | 9.000 | L1 | 19.8 | 15.8 | 56.0 |
| 7.892274 | 46.2 | 200.0 | 9.000 | L1 | 20.0 | 13.8 | 60.0 |
| 9.753473 | 47.0 | 200.0 | 9.000 | L1 | 20.0 | 13.0 | 60.0 |
| | | | | | | | |

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|--------------------|-------------------|--------------------|--------------------|------|---------------|----------------|-----------------|
| 0.404140 | 33.1 | 200.0 | 9.000 | L1 | 19.8 | 14.7 | 47.8 |
| 0.569868 | 31.0 | 200.0 | 9.000 | L1 | 19.8 | 15.0 | 46.0 |
| 0.640245 | 31.6 | 200.0 | 9.000 | L1 | 19.8 | 14.4 | 46.0 |
| 8.860516 | 36.2 | 200.0 | 9.000 | L1 | 20.0 | 13.8 | 50.0 |
| 9.043239 | 26.0 | 200.0 | 9.000 | L1 | 20.0 | 13.1 | 50.0 |
| 9.837623 | 37.5 | 200.0 | 9.000 | L1 | 20.0 | 12.5 | 50.0 |

Note:

Corrected Amplitude = Reading + Correction Factor
 Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter
 Margin = Limit – Corrected Amplitude

FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

As per FCC Part 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.
- (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.
- (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.
- (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.

EUT Setup



All measurements contained in this report were conducted with ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to 120VAC/60Hz power source.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

| Frequency Range | RBW | Video B/W | Detector | |
|-------------------|--------------|-----------|----------|--|
| 9 kHz – 150 kHz | 200 Hz 1 kHz | | QP | |
| 150 kHz – 30 MHz | 9 kHz | 30 kHz | QP | |
| 30 MHz – 1000 MHz | 120 kHz | 300 kHz | QP | |

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss+ Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit - Corr. Ampl.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209.

Test Data

Environmental Conditions

| Temperature: | 28°C |
|--------------------|----------|
| Relative Humidity: | 56 % |
| ATM Pressure: | 94.9 kPa |

* The testing was performed by Tom Tang on 2017-07-08.

Test mode: Transmitting

1) Fundamental (9 kHz~30 MHz):

| Frequency Receiver Rx Anten | | Rx Antenna | Cable | Corrected | Corrected | Limit | Margin | |
|-----------------------------|---------|------------|--------|-----------|-----------|-----------|-----------|--------|
| Trequency | Reading | Detector | MAF | loss | Amplitude | Amplitude | Linit | wargin |
| MHz | dBµV | PK/QP/AV | dB/m | dB | dBµA/m | dBµV/m | dBµV/m@3m | dB |
| 13.56 | 40.4 | QP | -56.04 | 0.33 | -15.31 | 36.19 | 124.00 | 87.81 |
| 13.553 | 24.2 | QP | -56.04 | 0.33 | -31.51 | 19.99 | 90.47 | 70.48 |
| 13.567 | 28.2 | QP | -56.04 | 0.33 | -27.51 | 23.99 | 90.47 | 66.48 |
| 13.35 | 12.2 | QP | -55.98 | 0.33 | -43.45 | 8.05 | 80.51 | 72.46 |
| 12.11 | 13.1 | QP | -55.89 | 0.31 | -42.48 | 9.02 | 69.54 | 60.52 |

| Frequency | Receiver | | Rx Antenna | | Cable | Amplifier | Corrected | Lingit | Margin |
|-----------|----------|----------|------------|---------|-------|-----------|-----------|--------|--------|
| Frequency | Reading | Detector | Polar | Factor | loss | Gain | Amplitude | Limit | wargin |
| MHz | dBµV | PK/QP/AV | H/V | dB(1/m) | dB | dB | dBµV/m | dBµV/m | dB |
| 30.61 | 29.4 | QP | V | 22.32 | 0.32 | 28.57 | 23.47 | 40.00 | 16.53 |
| 40.67 | 32.2 | QP | V | 14.70 | 0.34 | 28.52 | 18.72 | 40.00 | 21.28 |
| 81.29 | 30.8 | QP | V | 8.23 | 0.47 | 28.38 | 11.12 | 40.00 | 28.88 |
| 115.12 | 29.5 | QP | V | 14.38 | 0.62 | 28.20 | 16.30 | 43.50 | 27.20 |
| 720.16 | 34.7 | QP | V | 21.08 | 2.05 | 28.66 | 29.17 | 46.00 | 16.83 |
| 945.68 | 32.1 | QP | V | 23.35 | 2.56 | 28.04 | 29.97 | 46.00 | 16.03 |
| 32.06 | 26.4 | QP | Н | 21.41 | 0.34 | 28.56 | 19.59 | 40.00 | 20.41 |
| 36.18 | 22.5 | QP | Н | 18.40 | 0.38 | 28.54 | 12.74 | 40.00 | 27.26 |
| 116.45 | 25.4 | QP | Н | 14.71 | 0.65 | 28.19 | 12.57 | 43.50 | 30.93 |
| 661.59 | 29.1 | QP | Н | 20.42 | 1.94 | 28.82 | 22.64 | 46.00 | 23.36 |
| 720.52 | 31.6 | QP | Н | 21.09 | 2.05 | 28.65 | 26.09 | 46.00 | 19.91 |
| 854.99 | 32.1 | QP | Н | 22.26 | 2.31 | 28.32 | 28.35 | 46.00 | 17.65 |

2) Spurious Emissions (30 MHz ~1 GHz):

Note:

Corrected Amplitude = Corrected Factor + Reading Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor Margin = Limit- Corr. Amplitude

FCC§15.225(e) - FREQUENCY STABILITY

Applicable Standard

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ 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.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to DC power supply source which connected to an external AC power supply and loop antenna was connected to a Spectrum Analyzer.

The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.

Test Data

Environmental Conditions

| Temperature: | 29 °C | | |
|--------------------|----------|--|--|
| Relative Humidity: | 50 % | | |
| ATM Pressure: | 94.9 kPa | | |

* The testing was performed by Tom Tang on 2017-07-08.

Test Mode: Transmitting

| f _o = 13.56 MHz | | | | | | |
|----------------------------|---------|----------------------|-----------------|--------|--|--|
| Temperature | Voltage | Measure Frequency | Frequency Error | Limit | | |
| | Vdc | MHz | | | | |
| 0 | | 13.56045 | 0.0033% | | | |
| 10 | | 13.56087 | 0.0064% | | | |
| 20 | 3.7 | 13.56031 | 0.0023% | | | |
| 30 | | 13.56064 | 0.0047% | ±0.01% | | |
| 40 | | 13.56059 | 0.0044% | | | |
| 20 | 4.2 | 13.56064 | 0.0047% | | | |
| 20 | 3.5 | 13.56045 | 0.0033% | | | |

Test Result: Compliant. Please refer to the below table.

FCC §15.215(c) – 20 dB EMISSION BANDWIDTH

Applicable Standard

Per FCC §15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through § 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of band operation.

Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- 3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test Data

Environmental Conditions

| Temperature: | 29 °C |
|--------------------|----------|
| Relative Humidity: | 50 % |
| ATM Pressure: | 94.9 kPa |

* The testing was performed by Tom Tang on 2017-07-08.

Test Mode: Transmitting



20 dB Emission Bandwidth

Date: 8.JUL.2017 14:37:09

*****END OF REPORT*****

Report No.: RSC170626001E

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