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: 2AAGEVTTABLET-5081

Report Type:	**Product Name:**
Original Report	Tablet Computer

Report Number:	RSC181119002-0E
Report Date:	2018-12-06
Reviewed By:	Sula Huang EMC Director
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: 028-65525123 Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***Chengdu Vantron Technology, Ltd.***'s product, model number: **VT-TABLET-5081 (FCC ID: 2AAGEVTTABLET-5081)** or the "EUT" as referred to in this report was the **Tablet Computer**.

Mechanical Description of EUT

The EUT was measured approximately: 235 mm (L) x 153 mm (W) x 21 mm (H).
Rated input voltage: DC 3.7V rechargeable Li-ion battery or DC 5V from adapter

Adapter Information
Manufacturer: Anthin
Model: APS318-0530
Input: AC 100-220V; 50/60Hz
Output: DC 5V, 3A

Note: The products, test model: VT-TABLET-5081, multiple model: ETAB-8-VAN-01-FNQ. Their differences were presented in Product Difference Statement provided by the applicant. So we selected model VT-TABLET-5081 to fully test.

**All measurement and test data in this report was gathered from final production sample, serial number: 181119002/01 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2018-11-19, and EUT conformed to 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: 2AAGEVTTABLET-5081
FCC Part 15C DSS submissions with FCC ID: 2AAGEVTTABLET-5081
FCC Part 15C DTS submissions with FCC ID: 2AAGEVTTABLET-5081
FCC Part 15E NII submissions with FCC ID: 2AAGEVTTABLET-5081

Measurement Uncertainty

Item			Uncertainty
AC power line conducted emission			2.93 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.63 dB
		V	4.88 dB
	200MHz-1GHz	H	5.02 dB
		V	6.06 dB
Occupied Bandwidth			±5%
DC supply voltage			±2%
Humidity			±5%
Temperature			±1℃

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 Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Bay Area Compliance Laboratories Corp. (Chengdu) lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4324.01) and the FCC designation No. CN1186 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode

EUT Exercise Software

No

Support Equipment List and Details

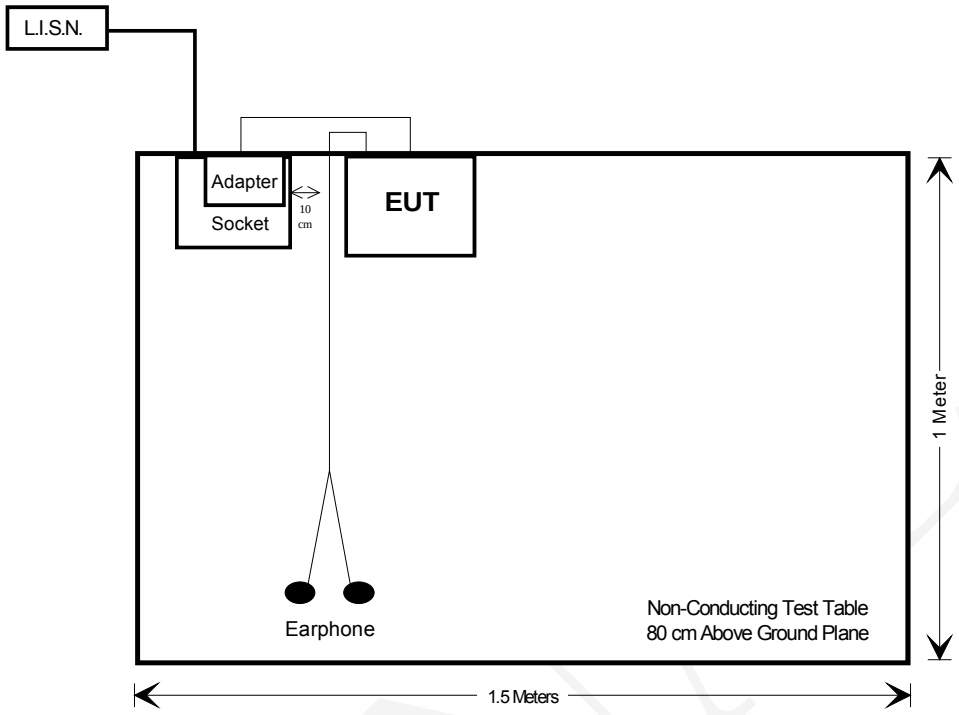
Manufacturer	Description	Model	Serial Number
HUAWEI	Earphone	P9	None

External I/O Cable

Cable Description	Length (m)	From	To
Unshielded Power Cable	1.2	Adapter	EUT
Unshielded Earphone Cable	1.0	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
Conducted Emission					
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2018-04-18	2019-04-19
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2018-04-18	2019-04-19
HP	RF Limiter	11947A	3107A01270	2018-08-13	2019-08-12
Unknown	Conducted Cable	L-E003	000003	2018-11-02	2019-11-01
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	N/A	N/A
Radiated Emission					
EMCT	Semi-Anechoic Chamber	966	001	2017-05-18	2020-05-17
Sonoma	Pre-Amplifier	310N	186684	2018-08-24	2019-08-23
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2018-04-18	2019-04-17
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2017-05-19	2020-05-18
ETS.LINDGREN	Passive Loop Antenna	6512	0004050	2018-11-09	2019-11-08
INMET	Attenuator	18N-6dB	64671	2018-10-27	2019-10-26
Unknown	RF Cable (below 1GHz)	L-E005	000005	2018-10-27	2019-10-26
Unknown	RF Cable (below 1GHz)	T-E128	000128	2018-11-10	2019-11-09
Unknown	RF Cable (below 1GHz)	T-E129	000129	2018-11-10	2019-11-09
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	N/A	N/A
Frequency Stability Test					
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2018-05-09	2019-05-08
E-Microwave	DC Block	EMDCB-00036	OE01304225	2018-10-27	2019-10-26
ZhaoXin	DC Power supply	RXN-305D	20141218916	2018-05-18	2019-05-17
ETS.LINDGREN	Passive Loop Antenna	6512	0004050	2018-11-09	2019-11-08
Shenzhen BACL	High Temperature Test Chamber	BTH-150	30024	2018-05-09	2019-05-08
FLUKE	Digital Multimeter	FLUKE 1587	27870099	2018-05-08	2019-05-07

*** 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 Wi-Fi/BT antenna and one NFC antenna, which are permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

RF Module	Manufacturer	Antenna Model	Antenna Gain	Antenna Type
2.4G WLAN	shenzhen bogesi communication technology co.,ltd	WCC-005A	3dBi	FPC Antenna
5G WLAN				
Bluetooth				
NFC	SHENZHEN SUNSHINE GOOD ELECTRONICS CO.,LTD	P134FQ1990A0	0dBi	FPC Antenna

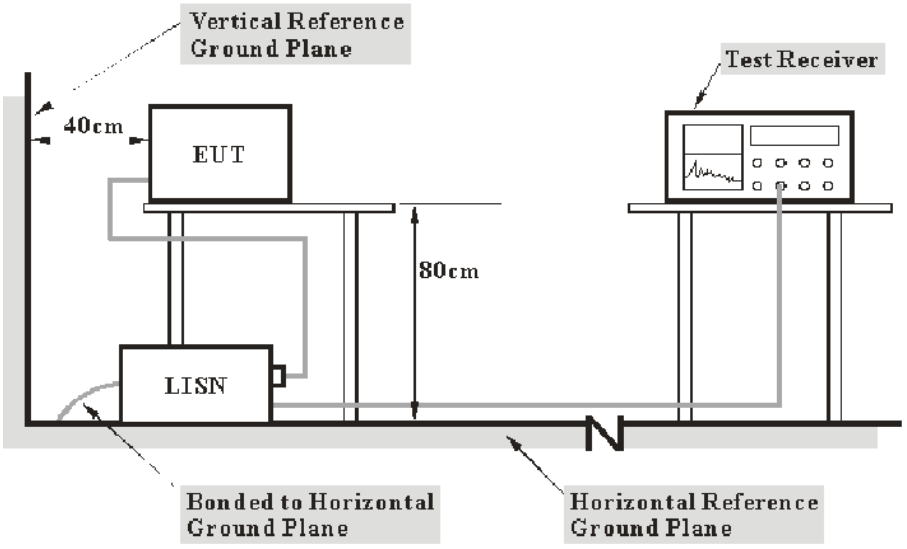
Result: Compliance.

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.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

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

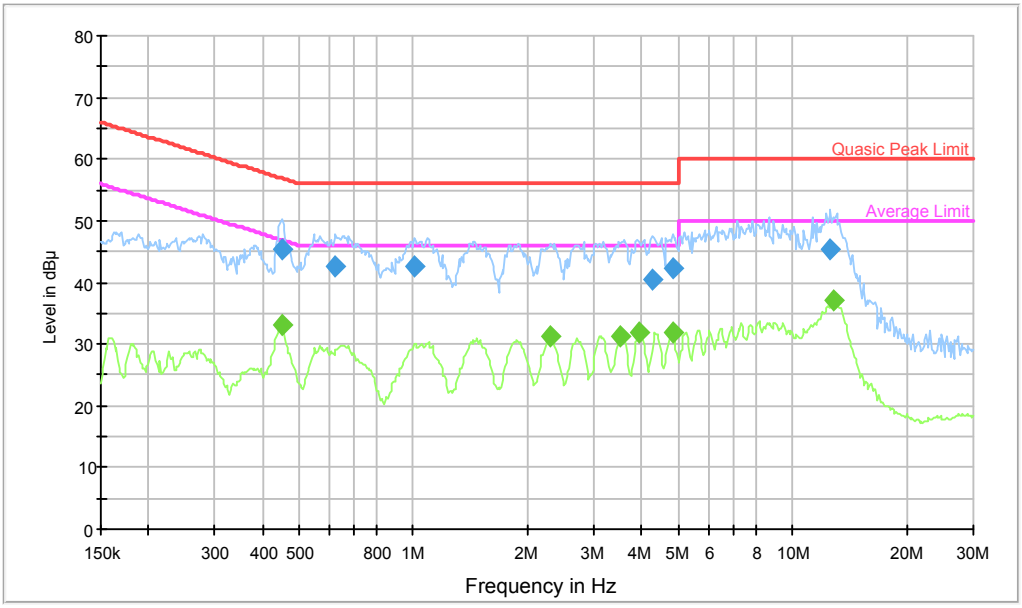
Environmental Conditions

Temperature:	23 °C
Relative Humidity:	64 %
ATM Pressure:	94.8 kPa

The testing was performed by Tom Tang on 2018-11-22.

Test Mode: Transmitting

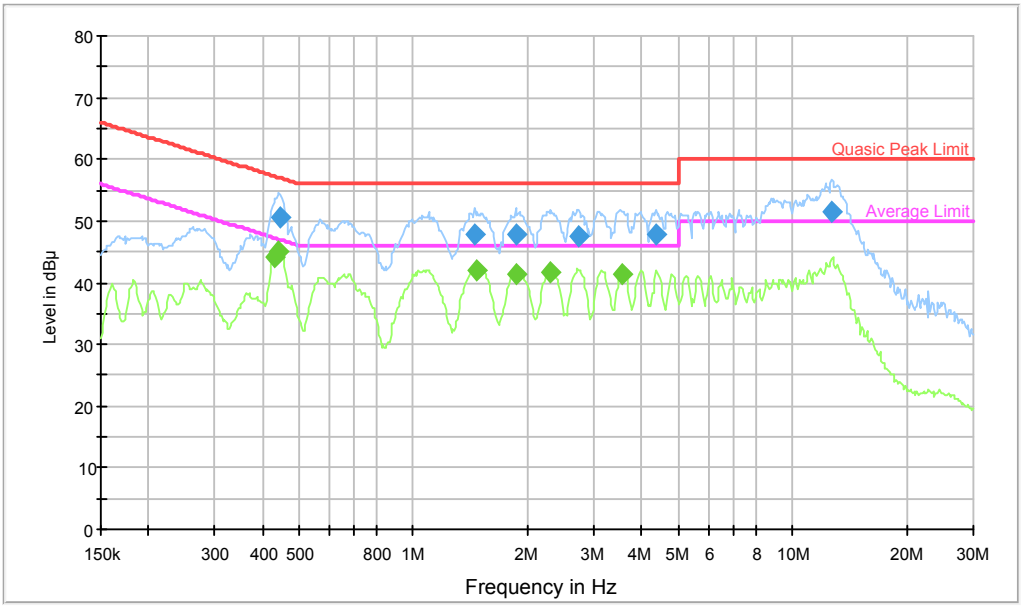
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dB µ V)
0.450448	45.5	9.000	L1	19.6	11.4	56.9
0.624492	42.5	9.000	L1	19.6	13.5	56.0
1.007300	42.7	9.000	L1	19.6	13.3	56.0
4.261034	40.6	9.000	L1	19.8	15.4	56.0
4.840426	42.4	9.000	L1	19.8	13.6	56.0
12.593528	45.3	9.000	L1	20.1	14.7	60.0

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dB µ V)
0.450448	33.1	9.000	L1	19.6	13.8	46.9
2.288725	31.3	9.000	L1	19.7	14.7	46.0
3.519348	31.4	9.000	L1	19.8	14.6	46.0
3.934683	31.8	9.000	L1	19.8	14.2	46.0
4.840426	31.9	9.000	L1	19.8	14.1	46.0
12.795830	37.0	9.000	L1	20.1	13.0	50.0

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dB µ V)
0.446873	50.7	9.000	N	19.6	6.2	56.9
1.453260	47.8	9.000	N	19.8	8.2	56.0
1.860457	47.7	9.000	N	19.8	8.3	56.0
2.727252	47.6	9.000	N	19.9	8.4	56.0
4.364119	47.7	9.000	N	20.0	8.3	56.0
12.694276	51.4	9.000	N	20.2	8.6	60.0

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dB µ V)
0.429420	44.2	9.000	N	19.6	3.1*	47.3
0.443327	44.9	9.000	N	19.6	2.1*	47.0
1.476605	41.9	9.000	N	19.8	4.1	46.0
1.875341	41.5	9.000	N	19.8	4.5	46.0
2.307034	41.8	9.000	N	19.9	4.2	46.0
3.547503	41.5	9.000	N	19.9	4.5	46.0

**Within measurement uncertainty!*

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

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

Applicable Standard

As per FCC Part 15.225

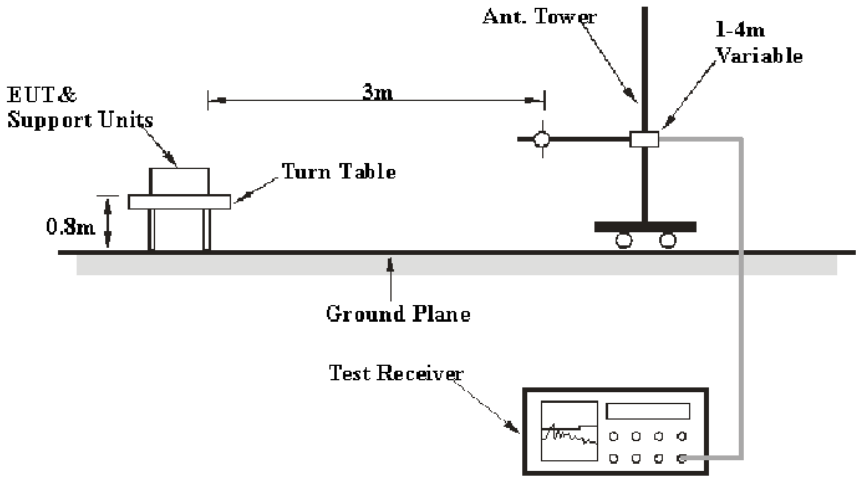
(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(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:

Corrected Amplitude = Meter Reading + Antenna factor+ 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 - Corrected Amplitude

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209;15.225.

Test Data

Environmental Conditions

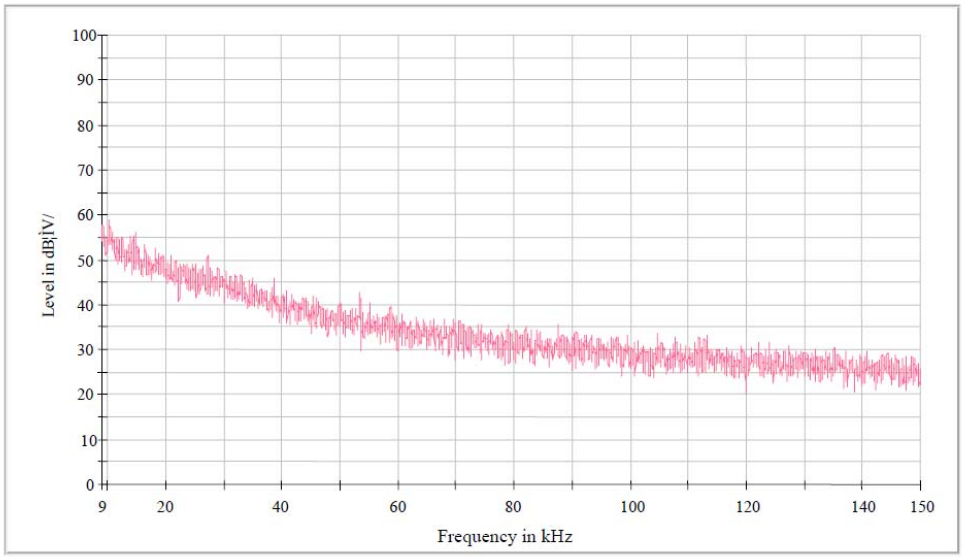
Temperature:	23°C
Relative Humidity:	57 %
ATM Pressure:	95.0 kPa

** The testing was performed by Tom Tang on 2018-11-28.*

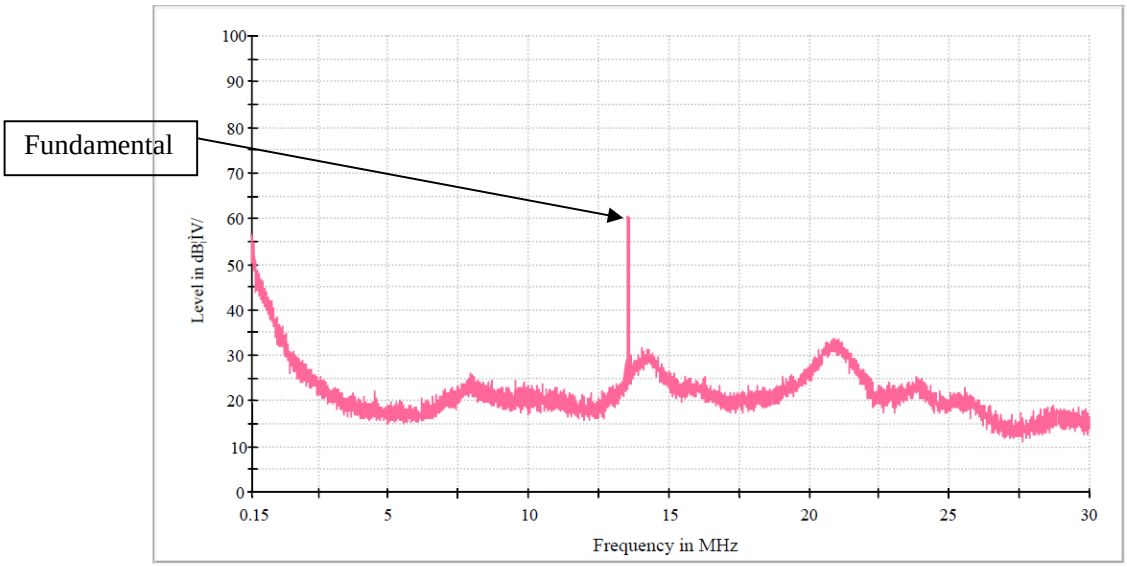
Test mode: Transmitting

1）Radiated Emissions (9 kHz ~ 30MHz):

9kHz-150kHz

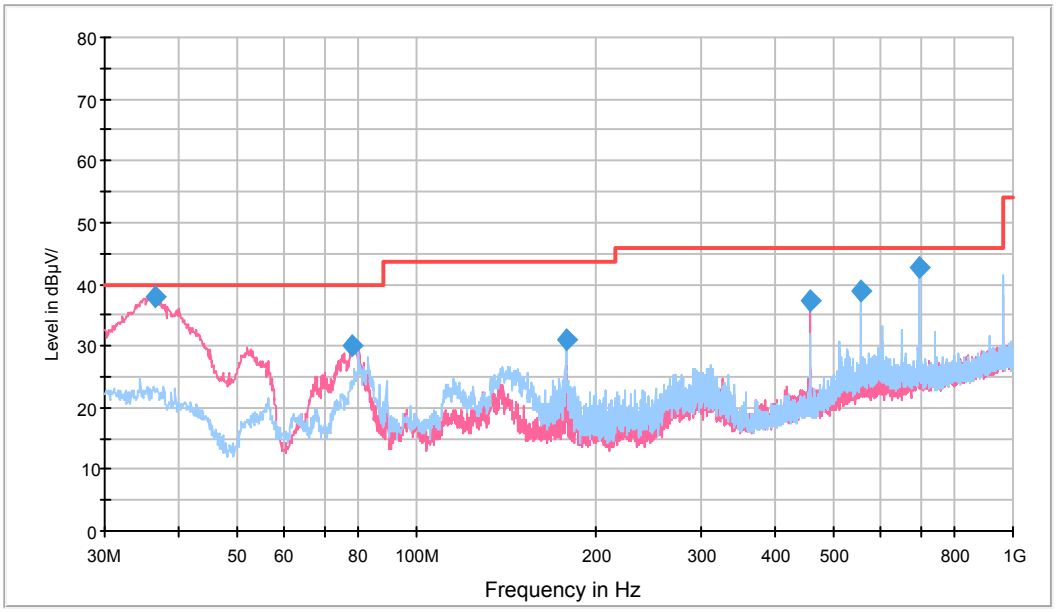


150kHz-30MHz



Frequency	Receiver		Rx Antenna	Pre-Amplifier	Cable loss	Corrected Amplitude @3m	Limit	Margin
	Reading	Detector	AF	Gain				
MHz	dBµV	PK/QP/AV	dB(1/m)	dB	dB	dBµV/m	dBµV/m@3m	dB
13.56	56.61	QP	34.80	31.43	0.32	60.30	124.00	63.70
13.553	34.61	QP	34.80	31.43	0.32	38.30	90.47	52.17
13.567	42.54	QP	34.80	31.43	0.32	46.23	90.47	44.24
20.92	32.68	QP	32.38	31.46	0.34	33.94	69.54	35.60
13.61	18.52	QP	37.75	31.44	0.32	25.15	69.54	44.39
12.66	21.67	QP	34.92	31.42	0.31	25.48	69.54	44.06
0.15	23.18	QP	62.84	31.28	0.08	54.82	104.08	49.26

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



Frequency (MHz)	QuasicPeak (dB µ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dB µ V/m)
36.426250	37.6	100.0	V	209.0	-9.1	2.4	40.0
78.010000	29.9	100.0	V	194.0	-16.6	10.1	40.0
178.280000	31.1	100.0	H	196.0	-13.0	12.4	43.5
456.072500	37.2	120.0	V	39.0	-7.9	8.8	46.0
556.952500	39.0	150.0	H	109.0	-5.1	7.0	46.0
696.268750	42.8	150.0	H	177.0	-3.0	3.2	46.0

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

FCC§15.225(e) - FREQUENCY STABILITY

Applicable Standard

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.

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:	23 °C
Relative Humidity:	57 %
ATM Pressure:	95.0 kPa

** The testing was performed by Tom Tang on 2018-11-28.*

Test Mode: Transmitting

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

f_o = 13.56 MHz				
Temperature	Voltage	Measure Frequency	Frequency Error	Limit
℃	Vdc	MHz		
-20	3.7	13.56054	0.0040%	±0.01%
-10		13.56047	0.0035%	
0		13.56062	0.0046%	
10		13.56053	0.0039%	
20		13.56040	0.0029%	
30		13.56029	0.0021%	
40		13.56048	0.0035%	
50		13.56033	0.0024%	
20	4.2	13.56051	0.0038%	
	3.5	13.56043	0.0032%	

Note: The extreme temperature and voltage condition was declared by manufacturer.

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

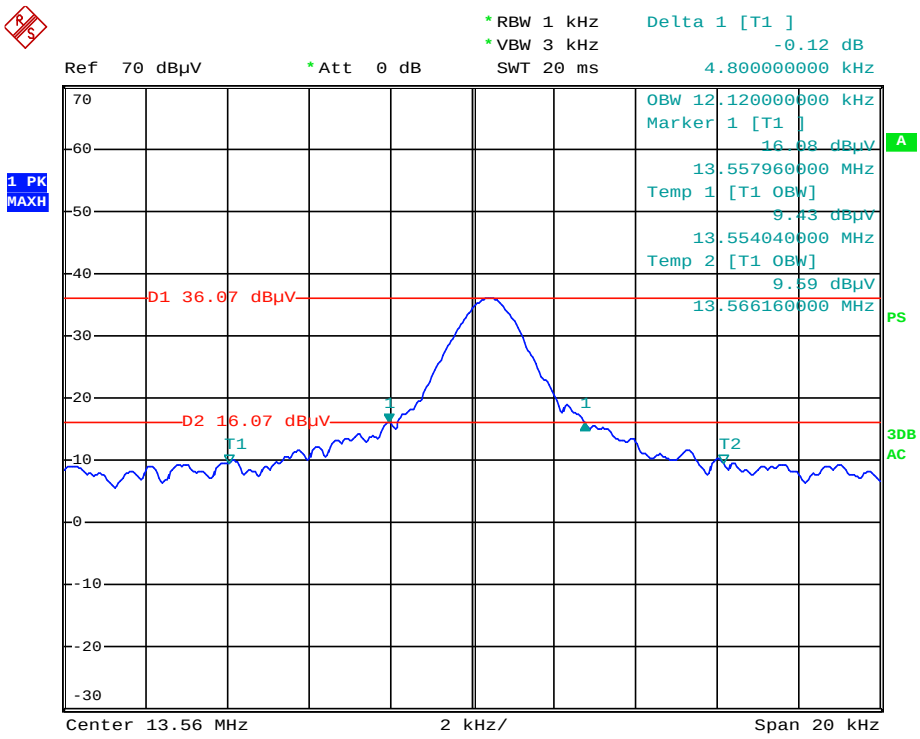
Environmental Conditions

Temperature:	23 °C
Relative Humidity:	57 %
ATM Pressure:	95.0 kPa

** The testing was performed by Tom Tang on 2018-11-27.*

Test Mode: Transmitting

20 dB Emission Bandwidth



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