

FCC PART 15B CLASS B

MEASUREMENT AND 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: Original Report	Equipment Name: Tablet Computer
Report Number: RSC181119002-0B	
Report Date: 2018-12-06	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **Chengdu Vantron Technology, Ltd.**, model number: **VT-TABLET-5081** (**FCC ID: 2AAGEVTTABLET-5081**) or the "EUT" as referred to in this report was the **Tablet Computer**. The highest operating frequency is 5850MHz.

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

The report was prepared on behalf of **Chengdu Vantron Technology, Ltd.** in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 15 Class B limits.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AAGEVTTABLET-5081

FCC Part 15C DSS submissions with FCC ID: 2AAGEVTTABLET-5081

FCC Part 15E NII submissions with FCC ID: 2AAGEVTTABLET-5081

FCC Part 15C DXX 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
	1GHz-6GHz		5.49 dB
	6GHz-18GHz		4.51 dB
	18GHz-40GHz		4.49 dB

Test Methodology

All measurements contained in this report are conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement is performed at BACL. The radiated testing is 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 is configured for testing in a typical fashion (as a normally used by a typical user).

EUT Exercise Software

Media Player and Withdraw

Special Accessories

No special accessories were supplied by BACL.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

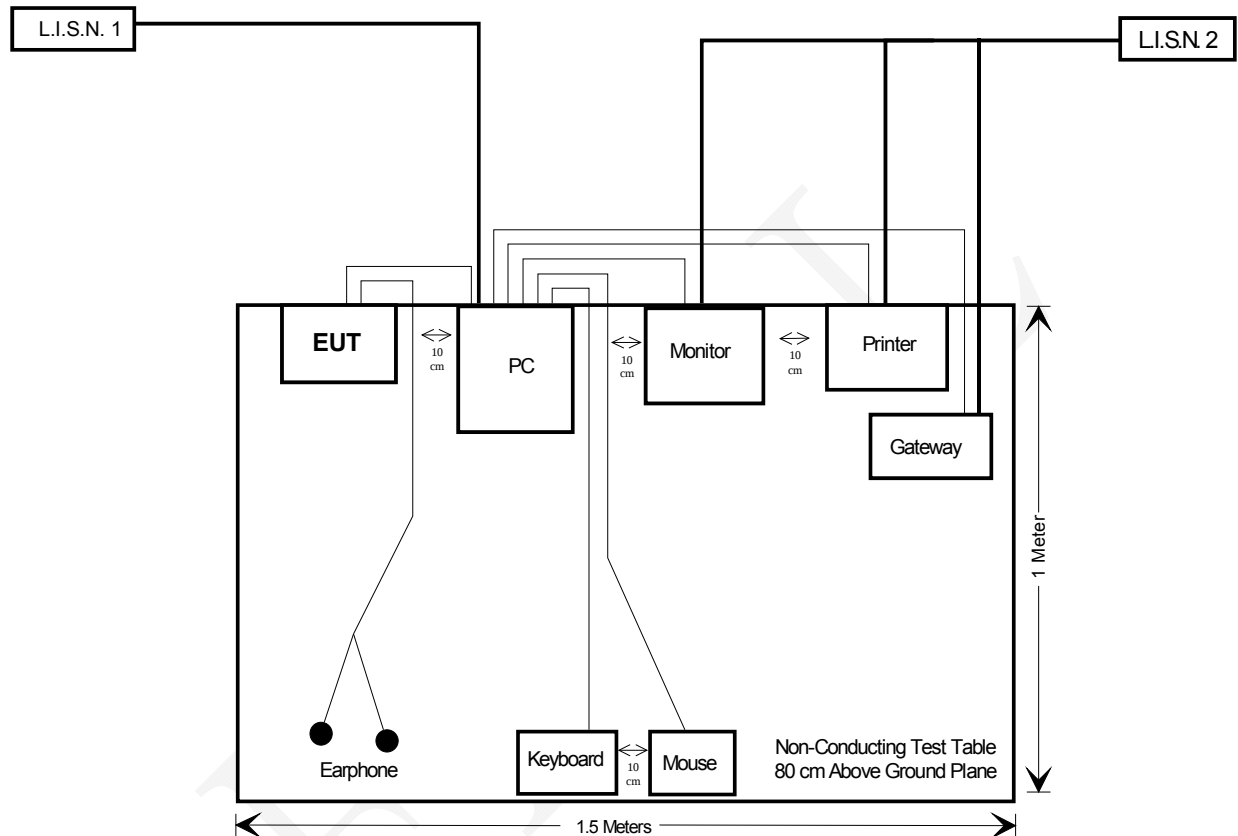
Manufacturer	Description	Model	Serial Number
IBM	PC	8176	99Y7315
DELL	Monitor	E157FPL	060229-11
ANTER	Gateway	EGW802	050835W5F-1B
Lenovo	Keyboard	KB-US19EB	IMHYX01107106460
Lenovo	Mouse	MU-513U	MJS011041409259
VIVO	Earphone	None	None
EPSON	Printer	Photo700	A2U0002196

External I/O Cable

Cable Description	Length (m)	From	To
Shielded VGA Cable	1.5	PC	Monitor
Unshielded Serial Cable	1.6	PC	Gateway
Unshielded Mouse Cable	1.4	PC	Mouse
Unshielded Keyboard Cable	1.3	PC	Keyboard
Unshielded Parallel Cable	1.8	PC	Printer
Unshielded Earphone Cable	1.2	EUT	Earphone
Unshielded USB Cable	1.0	EUT	PC

Block Diagram of Test Setup

Conducted Emissions



SUMMARY OF TEST RESULTS

Standard	Description	Result
FCC §15.107	Conducted Emission	Compliance
FCC §15.109	Radiated Emission	Compliance

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
EMCO	L.I.S.N.	3810/2BR	9509-1102	2017-12-02	2018-12-01
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	ESIB 40	100215	2018-04-18	2019-04-17
Rohde & Schwarz	Spectrum Analyzer	FSU26	200835	2018-05-08	2019-05-09
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2018-04-18	2019-04-17
A.H. Systems, Inc	Amplifier	PAM-0118P	467	2018-10-19	2019-10-18
EM Electronics	RF Pre-Amplifier	EM18G40	060725	2018-03-28	2019-03-27
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2017-05-19	2020-05-18
ETS	Horn Antenna	3115	003-6076	2017-05-19	2020-05-18
A.H. Systems, Inc	Horn Antenna	SAS-574	510	2017-05-19	2020-05-18
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
Unknown	RF Cable (above 1GHz)	T-E069	000069	2018-11-10	2019-11-09
Micro-coax	RF Cable (above 1GHz)	T-E209	MFR 64639 2310	2018-03-14	2019-03-13
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	N/A	N/A

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

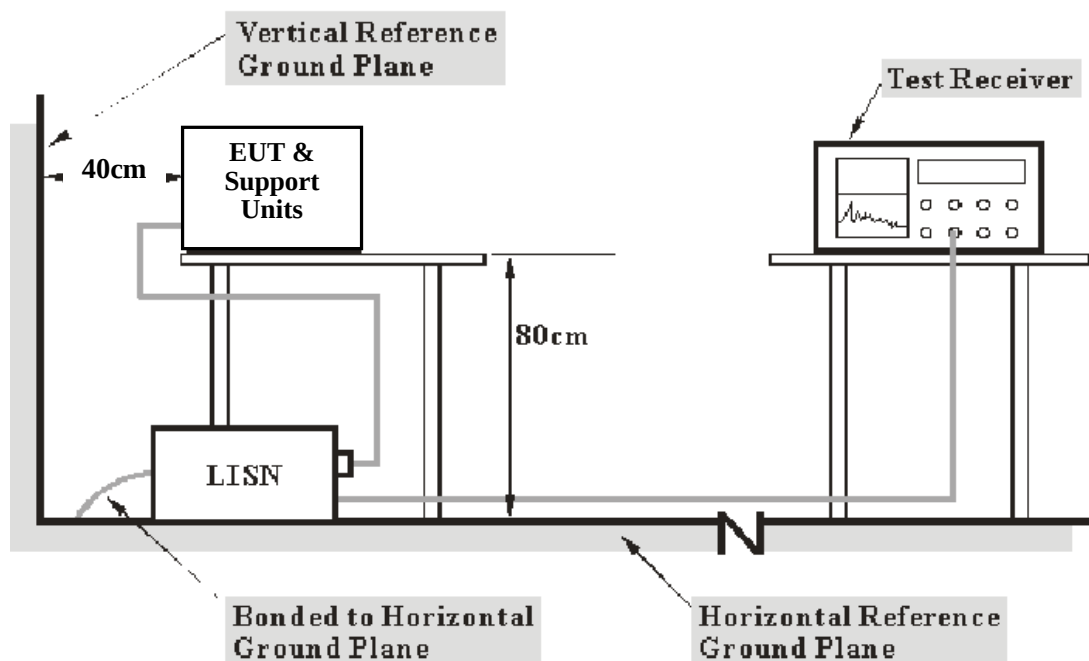
FCC §15.107 CONDUCTED EMISSION TEST

Applicable Standard

FCC §15.107

EUT Setup

The setup of EUT was in accordance with ANSI C63.4-2014 measurement procedure. The specification used was the FCC Part 15.107 CLASS B limits.



- 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 power cables and excess cables shall be folded at the cable center into a bundle no longer than 40 cm.

The spacing between the peripherals unit & EUT was 10 cm.

The adapter was connected to AC120V/60Hz 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

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combination.

All data are recorded in the Quasi-peak and Average detection mode. Quasi-peak readings are distinguished with a "**QP**". Average readings are distinguished with an "**AV**".

The EUT is in the normal operating mode during the final qualification test to represent the worst cases results.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$
$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF : voltage division factor of AMN

C_f : Correction Factor

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Summary of Test Results

According to the data in the following, the EUT complied with the FCC Part 15B Class B limit.

Test Data

Test Environment Conditions

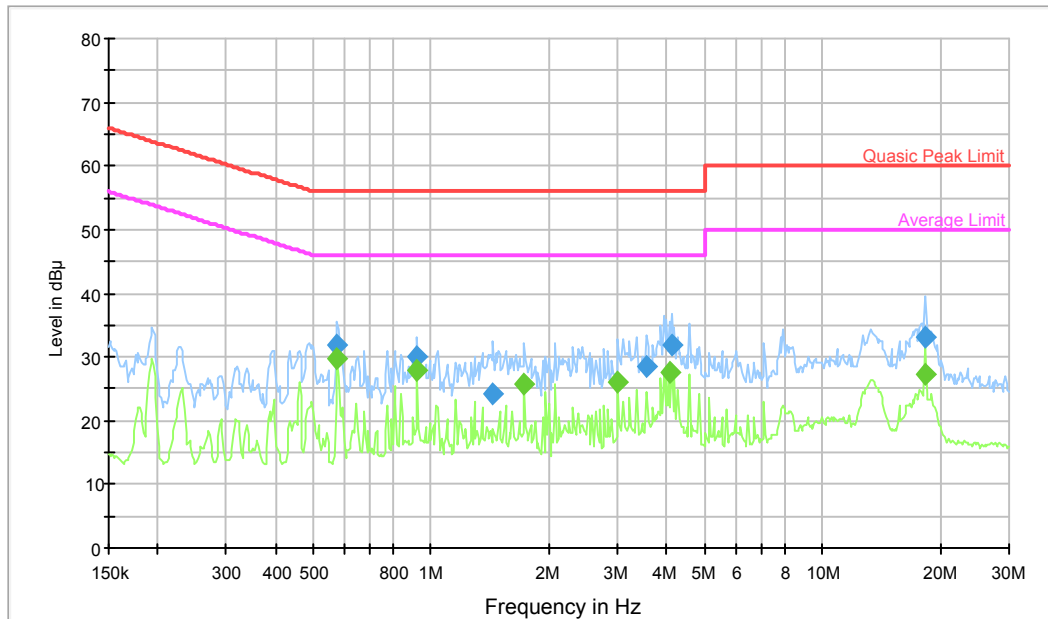
Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	94.9 kPa

The testing was performed by Tom Tang on 2018-11-20.

Test mode: Downloading

FINAL

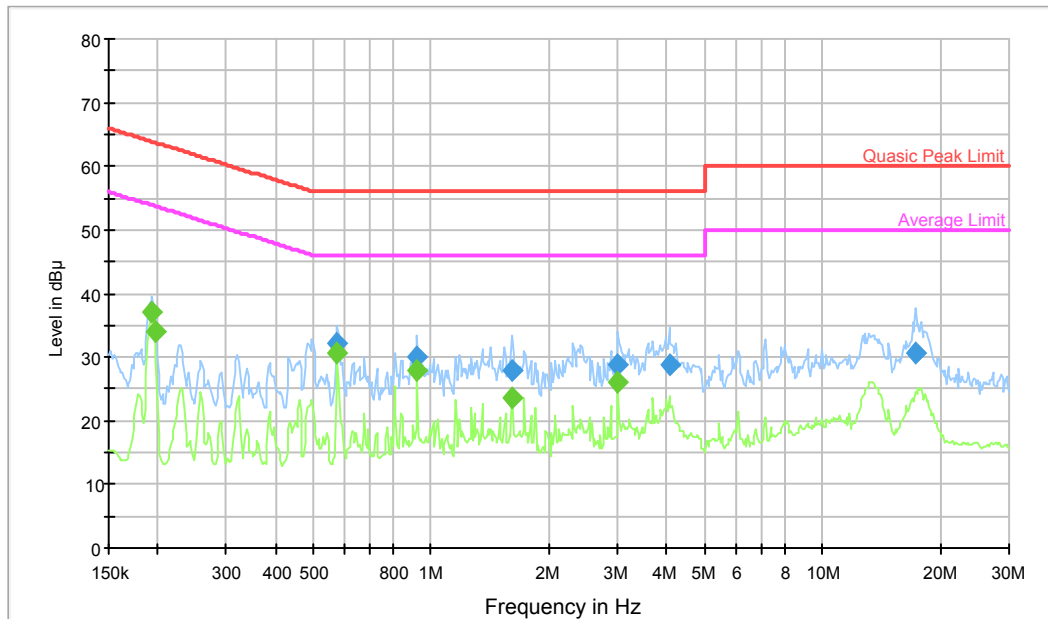
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.576662	32.0	9.000	L	19.6	24.0	56.0
0.922769	30.1	9.000	L	19.7	25.9	56.0
1.441726	24.1	9.000	L	19.8	31.9	56.0
3.547503	28.7	9.000	L	19.9	27.3	56.0
4.127365	31.8	9.000	L	20.0	24.2	56.0
18.314388	33.0	9.000	L	20.3	27.0	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.576662	29.7	9.000	L	19.6	16.3	46.0
0.922769	28.0	9.000	L	19.7	18.0	46.0
1.731709	25.8	9.000	L	19.8	20.2	46.0
3.000901	26.1	9.000	L	19.9	19.9	46.0
4.062112	27.7	9.000	L	20.0	18.3	46.0
18.314388	27.3	9.000	L	20.3	22.7	50.0

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.576662	32.2	9.000	N	19.6	23.8	56.0
0.922769	30.1	9.000	N	19.7	25.9	56.0
1.611870	27.8	9.000	N	19.8	28.2	56.0
3.000901	28.9	9.000	N	19.9	27.1	56.0
4.062112	28.8	9.000	N	20.0	27.2	56.0
17.320829	30.6	9.000	N	20.3	29.4	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.193566	37.1	9.000	N	19.4	16.8	53.9
0.196675	34.0	9.000	N	19.4	19.7	53.7
0.576662	30.7	9.000	N	19.6	15.3	46.0
0.922769	27.8	9.000	N	19.7	18.2	46.0
1.611870	23.7	9.000	N	19.8	22.3	46.0
3.000901	26.2	9.000	N	19.9	19.8	46.0

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 §15.109 RADIATED EMISSION TEST

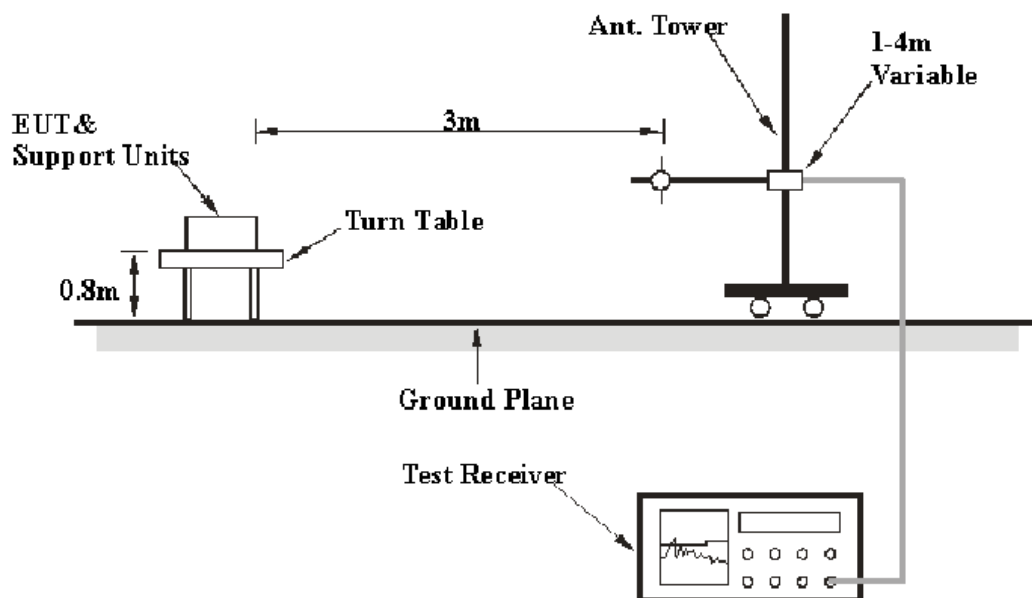
Applicable Standard

FCC §15.109

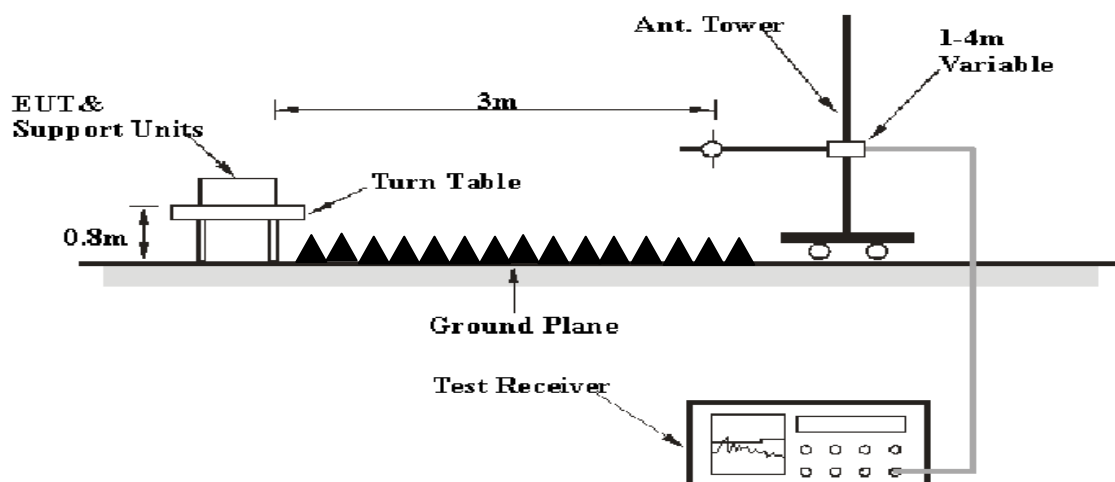
EUT Setup

The radiated emission tests were performed in the 3 meter Semi Anechoic Chamber, using the setup in accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15B Class B limits.

Below 1GHz:



Above 1GHz:



The excess cables shall be folded at the cable center into a bundle no longer than 40 cm.

The spacing between the peripherals unit & EUT was 10 cm.

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

EMI Test Receiver Setup

Per FCC 15.33 requirement, the frequency range is investigated from 30MHz to 30GHz.

During the radiated emission test, the EMI test receiver is set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	1 MHz	PK
	1 MHz	3 MHz	1 MHz	AV

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data were recorded in the quasi-peak detection mode from 30 MHz to 1 GHz. Peak and average detection mode above 1 GHz.

The EUT was in the normal operating mode during the final qualification test to represent the worst case results.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - 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 limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Summary of Test Results

According to the data in the following, the EUT complied with the FCC Part 15.109 Class B limit.

Test Data

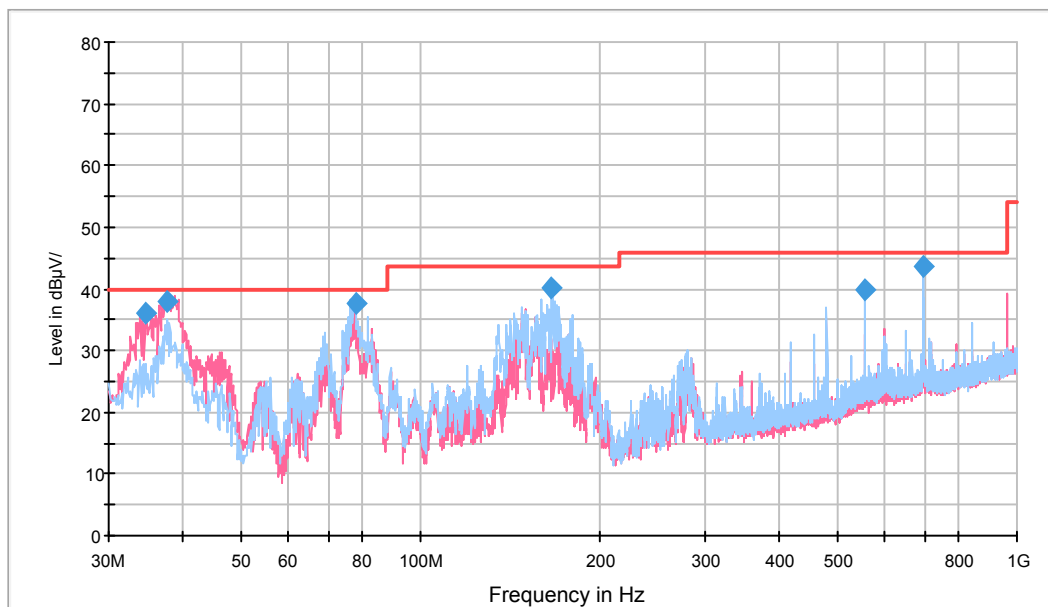
Test Environment Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	96.7 kPa

The testing was performed by Tom Tang on 2018-11-20.

Test mode: Downloading

1) 30MHz-1GHz:

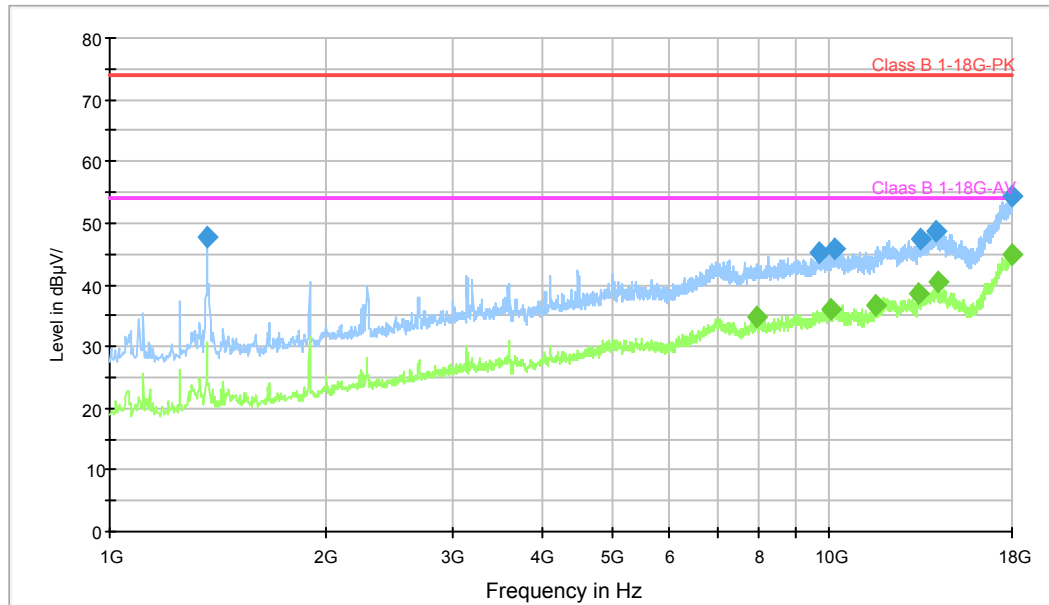


Frequency (MHz)	QuasicPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
34.728750	35.9	100.0	V	0.0	-8.0	*4.1	40.0
37.638750	38.1	105.0	V	292.0	-9.8	*1.9	40.0
78.015000	37.5	100.0	H	314.0	-16.6	*2.5	40.0
165.436250	40.1	125.0	H	314.0	-12.1	*3.4	43.5
556.952500	39.9	150.0	H	254.0	-5.1	6.1	46.0
696.268750	43.6	145.0	H	337.0	-3.0	*2.4	46.0

* Within Measurement Uncertainty.

1)1GHz-18GHz:

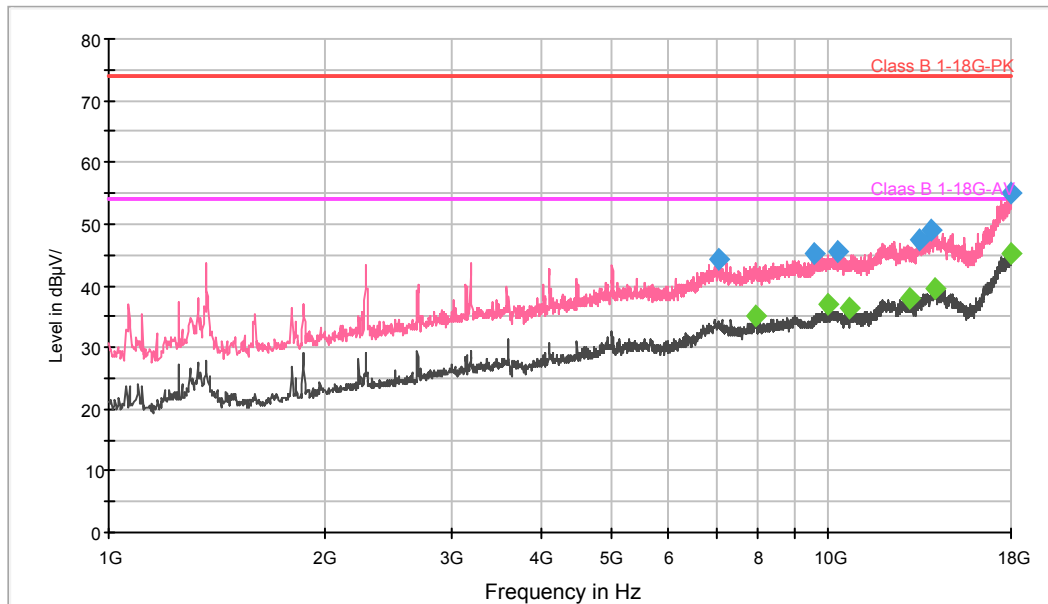
Horizontal



Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
1367.200000	47.9	100.0	H	203.0	-16.2	26.1	74.0
9721.000000	45.3	150.0	H	329.0	1.3	28.7	74.0
10220.800000	45.8	100.0	H	265.0	2.3	28.2	74.0
13437.200000	47.5	100.0	H	346.0	6.8	26.5	74.0
14127.400000	48.7	100.0	H	283.0	8.6	25.3	74.0
17945.600000	54.4	150.0	H	311.0	15.4	19.6	74.0

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
7959.800000	34.9	150.0	H	121.0	-0.1	19.1	54.0
10054.200000	36.0	100.0	H	265.0	2.3	18.0	54.0
11642.000000	36.8	150.0	H	0.0	3.6	17.2	54.0
13352.200000	38.5	150.0	H	202.0	6.7	15.5	54.0
14154.600000	40.3	150.0	H	50.0	8.6	13.7	54.0
17972.800000	44.9	150.0	H	175.0	15.4	9.1	54.0

Vertical



Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
7058.800000	44.3	150.0	V	82.0	-0.2	29.7	74.0
9591.800000	45.1	100.0	V	248.0	0.8	28.9	74.0
10295.600000	45.6	100.0	V	194.0	2.2	28.4	74.0
13464.400000	47.5	100.0	V	194.0	6.9	26.5	74.0
13899.600000	49.0	150.0	V	270.0	8.3	25.0	74.0
17966.000000	55.2	100.0	V	0.0	15.4	18.8	74.0

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
7942.800000	35.1	150.0	V	171.0	-0.1	18.9	54.0
10027.000000	36.8	150.0	V	126.0	2.3	17.2	54.0
10741.000000	36.2	100.0	V	41.0	2.3	17.8	54.0
12981.600000	38.0	150.0	V	3.0	6.0	16.0	54.0
14144.400000	39.5	150.0	V	279.0	8.6	14.5	54.0
17989.800000	45.2	150.0	V	99.0	15.4	8.8	54.0

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

No emissions were detected above 18GHz.

****END OF REPORT****