FCC PART 15 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: 2AAGETAB5071-TM

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

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Reviewed By:	Sula Huang EMC Director
Prepared By:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: +86-28-65525123 Fax: +86-28-65525125 www.baclcorp.com

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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**. The highest frequency used in the device is 5850 MHz.

Mechanical Description of EUT

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

Rated input voltage: DC3.7V rechargeable Li-ion battery or DC5V 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

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 15.407 NII submissions with FCC ID: 2AAGETAB5071-TM.
FCC Part 15.247 DTS submissions with FCC ID: 2AAGETAB5071-TM.
FCC Part 15.247 DSS submissions with FCC ID: 2AAGETAB5071-TM.
FCC Part 15.225 DXX submissions with FCC ID: 2AAGETAB5071-TM.

Measurement Uncertainty

Item			Uncertainty
AC power line conducted emission			2.71 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.57dB
		V	4.81dB
	200MHz-1GHz	H	5.69dB
		V	6.07dB
	1GHz-6GHz		5.49dB
	6GHz-18GHz		5.57dB

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 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 on April 24, 2015. 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. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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.

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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

The software “winthrax.exe” was used during test.

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	Display	E157FPL	060229-11
ANTER	Gateway	EGW802	050835W5F-1B
Lenovo	Keyboard	KB-US19EB	IMHYX01107106460
Lenovo	Mouse	MU-513U	IMJS011041409259
N/A	Earphone	N/A	N/A
EPSON	Printer	R23U	U026070WW

External I/O Cable

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

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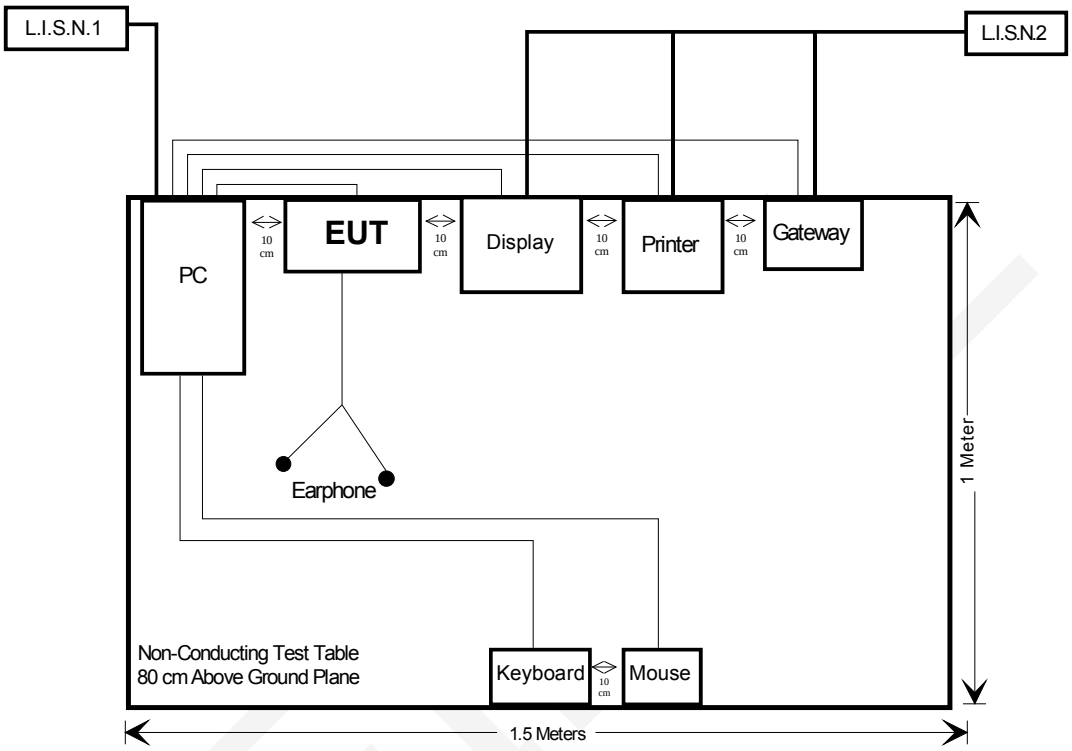
Block Diagram of Test Setup

AC power line conducted emissions test:



Test Equipments List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions 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
EMCO	L.I.S.N.	3810-2/NM	9803-1907	2016-10-31	2017-10-30
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
Radiated 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
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2017-05-18	2018-05-17
ETS	Horn Antenna	3115	003-6076	2017-05-19	2020-05-18
A.H.Systems,inc	Horn Antenna	SAS-574	505	2016-12-02	2017-12-01
Mini-circuits	Pre-Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
Quinstar	Pre-Amplifier	QLW-18405536-JO	15964004001	2017-05-20	2018-05-19
HP	Pre-Amplifier	8449B	3008A00277	2016-12-02	2017-12-01
INMET	Attenuator	N-6dB	/	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
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09
Rohde & Schwarz	EMC32	N/A	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).

SUMMARY OF TEST RESULTS

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

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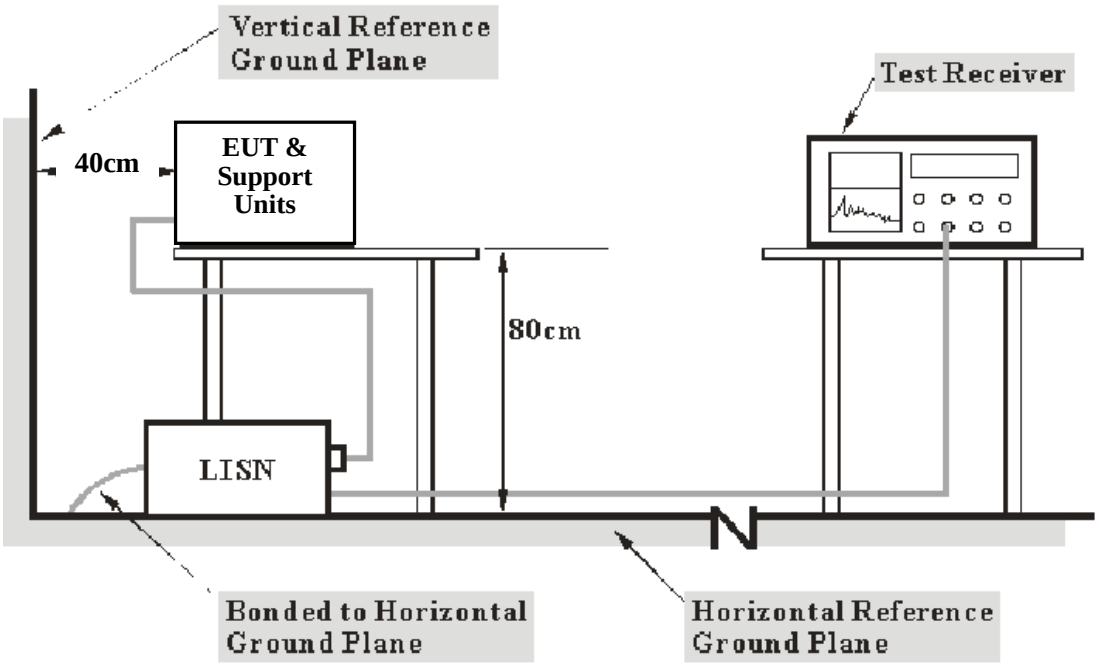
FCC §15.107 CONDUCTED EMISSION TEST

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 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 PC was connected to AC 120V/60Hz.

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:

$V_C = V_R + A_C + VDF$

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

Summary of Test Results

According to the data in the following, the EUT complied with the FCC PART 15 CLASS B limit.

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Test Data

Test Environment Conditions

Temperature:	29 °C
Relative Humidity:	54 %
ATM Pressure:	95.1 kPa

The testing was performed by Tom Tang on 2017-07-04.

Test Mode: Downloading

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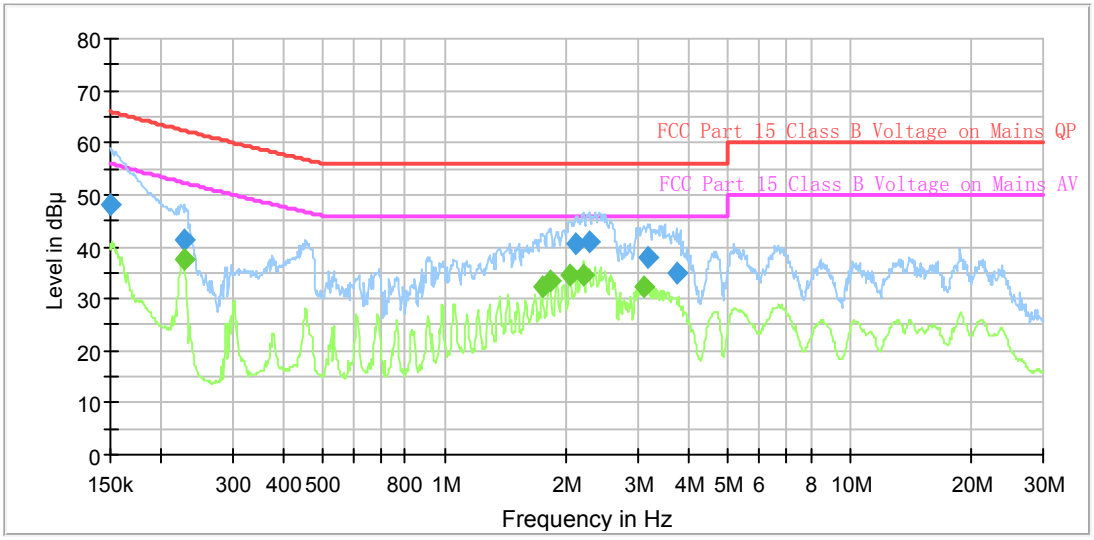
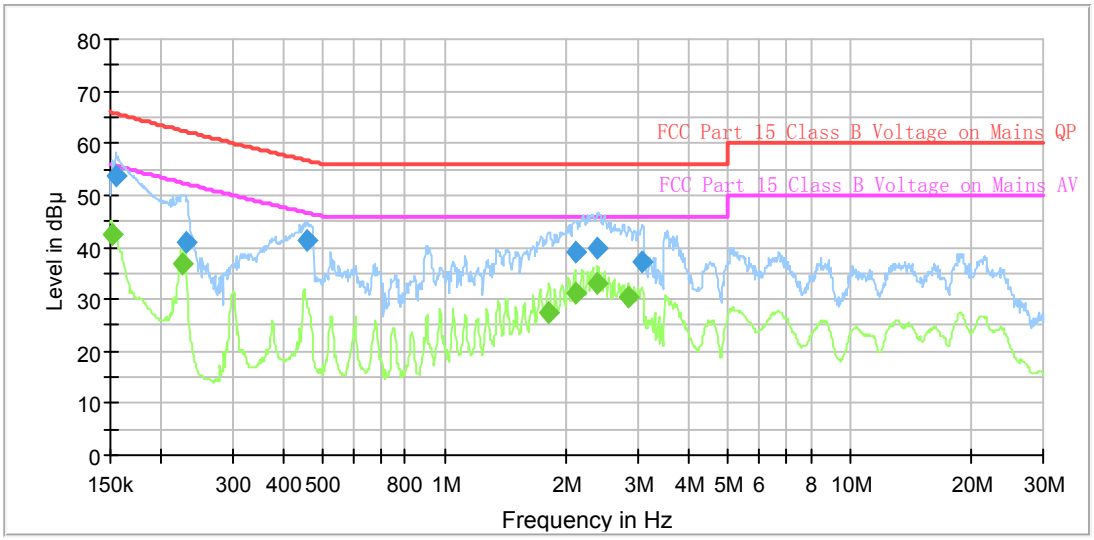
AC120V/60Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150600	47.9	200.0	9.000	L1	19.7	18.0	66.0
0.228103	41.3	200.0	9.000	L1	19.7	21.1	62.3
2.116134	40.7	200.0	9.000	L1	19.8	15.3	56.0
2.282883	40.9	200.0	9.000	L1	19.9	15.1	56.0
3.167001	37.9	200.0	9.000	L1	19.9	18.1	56.0
3.730185	34.9	200.0	9.000	L1	19.9	21.1	56.0

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.227194	37.7	200.0	9.000	L1	19.7	14.6	52.3
1.740168	32.5	200.0	9.000	L1	19.8	13.5	46.0
1.825559	33.6	200.0	9.000	L1	19.8	12.4	46.0
2.041455	34.7	200.0	9.000	L1	19.8	11.3	46.0
2.202319	34.5	200.0	9.000	L1	19.9	11.5	46.0
3.104414	32.2	200.0	9.000	L1	19.9	13.8	46.0

AC120V/60Hz, Neutral



Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154868	53.5	200.0	9.000	N	19.6	12.2	65.7
0.229932	40.8	200.0	9.000	N	19.5	21.5	62.3
0.460537	41.4	200.0	9.000	N	19.6	15.3	56.6
2.116134	39.2	200.0	9.000	N	19.6	16.8	56.0
2.394905	39.8	200.0	9.000	N	19.6	16.2	56.0
3.079726	37.0	200.0	9.000	N	19.6	19.0	56.0

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.151203	42.5	200.0	9.000	N	19.6	13.4	55.9
0.226289	36.9	200.0	9.000	N	19.5	15.5	52.4
1.811041	27.3	200.0	9.000	N	19.6	18.7	46.0
2.099306	31.0	200.0	9.000	N	19.6	15.0	46.0
2.394905	33.1	200.0	9.000	N	19.6	12.9	46.0
2.843400	30.4	200.0	9.000	N	19.6	15.6	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

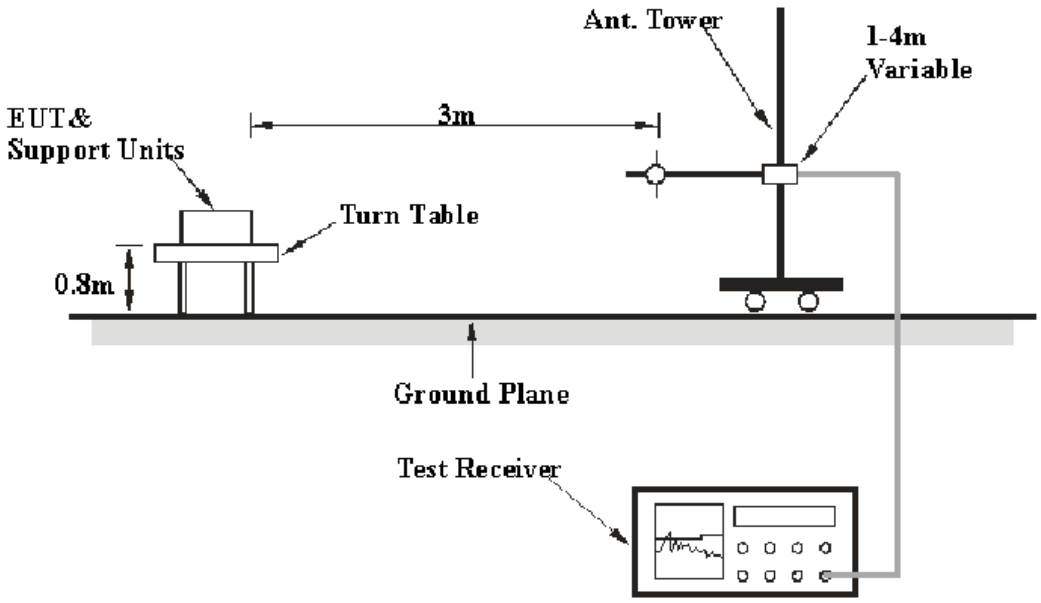
Applicable Standard

FCC §15.109

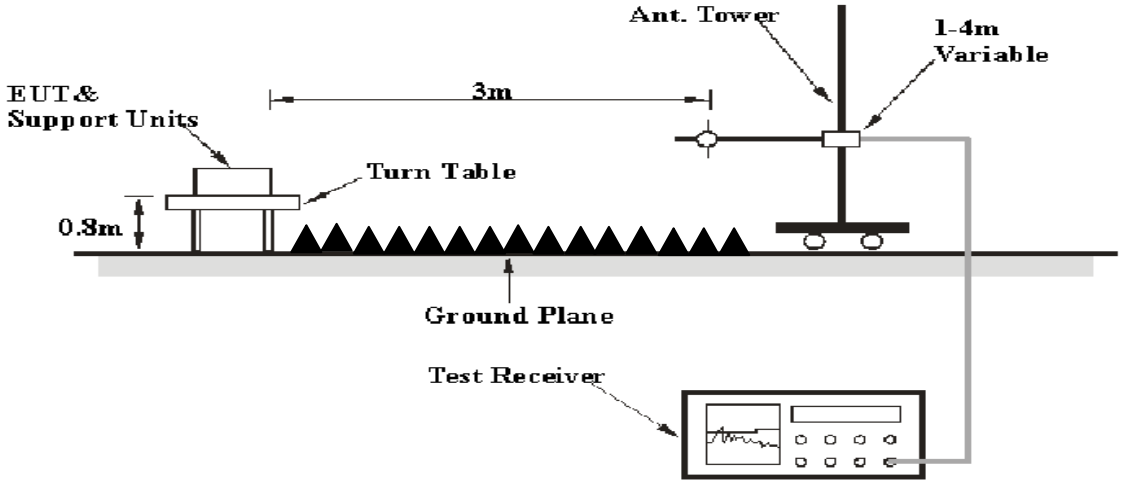
EUT Setup

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 15 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 PC was connected to AC 120V/60Hz.

EMI Test Receiver Setup

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

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	/	PK
	1 MHz	10 Hz	/	Ave.

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:

Corr. Ampl. = 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:

Margin = Limit – Corr. Ampl.

Summary of Test Results

According to the data in the following, the EUT complied with the FCC PART 15 CLASS B limit.

Please refer to the Test Data and Plots.

Test Data

Test Environment Conditions

Temperature:	28 °C
Relative Humidity:	47 %
ATM Pressure:	94.5 kPa

The testing was performed by Tom Tang on 2017-07-04.

Test Mode: Downloading

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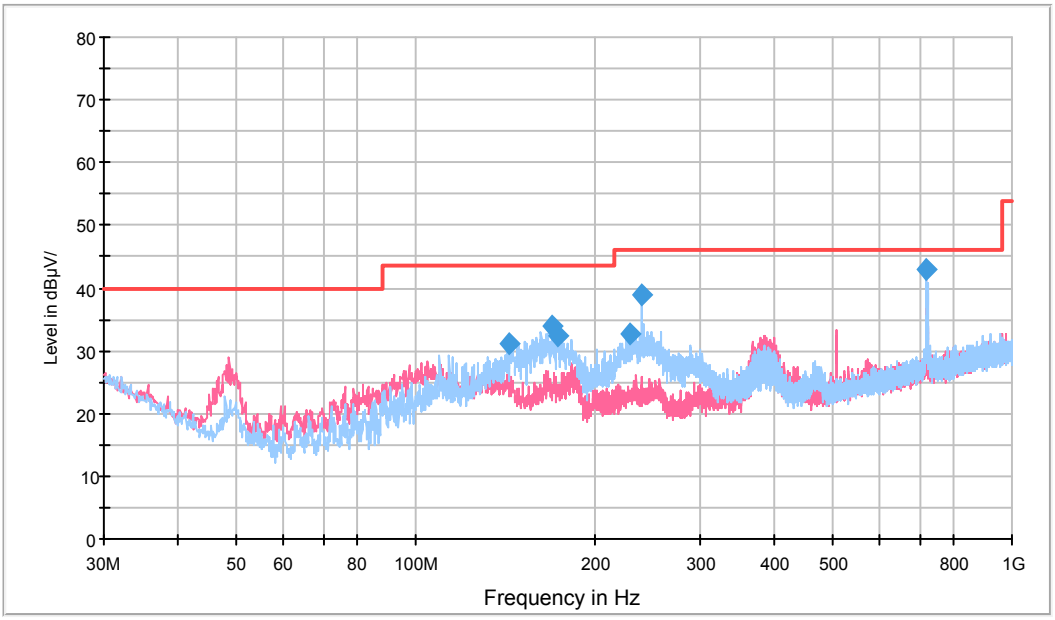
30MHz-1GHz:



Frequency (MHz)	Quasic Peak (dB µ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)
143.975000	31.1	115.0	H	212.0	-6.6	12.4	43.5
169.922500	34.0	100.0	H	194.0	-7.7	9.5	43.5
173.681250	32.4	150.0	H	194.0	-8.1	7.6	40.0
228.486250	32.7	100.0	H	131.0	-8.8	7.3	40.0
240.005000	38.8	200.0	H	114.0	-8.2	7.2	46.0
720.276250	42.9	100.0	V	257.0	0.9	3.1	46.0

Above 1GHz:

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Detector	Polar	Factor					
MHz	dBµV	PK/QP/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
1200	56.13	PK	V	24.28	2.26	26.62	56.05	74.00	17.95
1200	34.16	AV	V	24.28	2.26	26.62	34.08	54.00	19.92
1681	48.63	PK	V	25.91	2.81	26.51	50.84	74.00	23.16
1681	29.73	AV	V	25.91	2.81	26.51	31.94	54.00	22.06
1831	43.51	PK	V	26.66	2.92	26.65	46.44	74.00	27.56
1831	30.06	AV	V	26.66	2.92	26.65	32.99	54.00	21.01
1200	57.65	PK	H	24.28	2.26	26.62	57.57	74.00	16.43
1200	36.85	AV	H	24.28	2.26	26.62	36.77	54.00	17.23
1681	46.15	PK	H	25.91	2.81	26.51	48.36	74.00	25.64
1681	27.46	AV	H	25.91	2.81	26.51	29.67	54.00	24.33
2162	43.02	PK	H	27.99	3.03	26.84	47.20	74.00	26.80
2162	26.04	AV	H	27.99	3.03	26.84	30.22	54.00	23.78

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

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