

EMC TEST REPORT

Report No.: FCC2012-8037

Product: ATA

Model No. : HT701

Brand Name: Grandstream

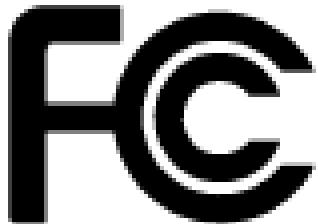
Applicant: Grandstream Networks, INC

FCC ID: YZZHT701V21

Issued by: ShenZhen Electronic Product Quality Testing Center

Lab Location: Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055, P. R. China

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Test Report

Product : ATA

Model No. : HT701

Applicant : Grandstream Networks, INC

Applicant Address : 5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park,
Shenzhen, China

Manufacturer : Grandstream Networks, INC

Manufacturer Address : 5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park
Shenzhen, China

Test Standards : FCC PART 15 Subpart B
«RADIO FREQUENCY DEVICES»

Test Result : PASS

Tested by :

Zhu Qi Oct. 11, 2012

Signature, Date

Reviewed by :

Shuangren Zhang Oct. 11, 2012

Signature, Date

Approved by :

Sonesta Li Oct. 11, 2012

Signature, Date

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1 General Information

1.1 Description of EUT

Product: ATA

Model No.: HT701

Brand Name: Grandstream

Serial No.: 207GG65C80424DB2

Rating: DC 12V 0.5A

I/O Ports: LAN,PHONE,POWER

Accessories: Adaptor:

1#

Model:SDF1200050E1BB,SDF1200050A1BB,SDF1200050I1BA

Input: AC 100-240V, 50/60Hz, 0.18A

Output: DC 12V 0.5A

2#

Model:UE06L8-120050SPAU, UE06L8-120050SPAV

Input: AC 100-240V, 50/60Hz, 0.2A

Output: DC 12V 0.5A

Note:

1. Adaptor 1# has three models, SDF1200050E1BB, SDF1200050A1BB and SDF1200050I1BA. The models are identical except for plug. Unless otherwise specified, all tests are performed on SDF1200050A1BB to represent other models. Adaptor 2# has two models, UE06L8-120050SPAU and UE06L8-120050SPAV. The models are identical except for plug. Unless otherwise specified, all tests are performed on UE06L8-120050SPAV to represent other models.

1.2 Auxiliary Equipment

Equipment Name	Manufacturer	Model name	FCC ID/DoC
Computer	IBM	T43	DoC
Phone	DEX	HCD129TSDL	/

2 Test Facilities and Configuration

2.1 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

2.2 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in Measurement” (GUM) published by ISO.

- Uncertainty of Conducted Emission, $U_c = \pm 1.8 \text{dB}$
- Uncertainty of Radiated Emission, $U_c = \pm 5.0 \text{dB}$

2.3 Test Facility

Shenzhen Electronic Product Quality Testing Center (SET) is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

The EMC chamber site No.1 (EMC12.8×6.8×6.4(m)), and the radiated and conducted Emission test equipments of SET are constructed and calibrated to meet the FCC requirements ANSI C63.4 and CISPR 22/EN 55022. The FCC Registration Number is 406086.

2.3 Measurement Equipments Used

Description	Manufacturer	Model No.	Calibration Date	Serial No.
Test Receiver	ROHDE&SCHWARZ	ESCS30	Jun.10, 2012	A0304260
LISN	ROHDE&SCHWARZ	ESH2-Z5	Jun.10, 2012	A0304221
Shield Room	Nanbo Tech	RF-2 10.5×5×3.2 (m)	Jan 17, 2012	A0301188
Ultra-Broadband Ant.	SCHWARZBECK	VULB 09160	Jun.10, 2012	A0805560
Horn Antenna	ROHDE&SCHWARZ	HF906	Jun.10, 2012	/
Test Receiver	ROHDE&SCHWARZ	ESU8	Jun.10, 2012	A0805559
Semi-Anechoic Chamber	Albatross	SAC-10MAC19. 6*11.8*8.55m	Jun.10, 2012	A0802520

NOTE: Equipments above have been calibrated and are in the period of validation.

3 Summary of Test Results

The EUT has been tested according to the following specifications:

EMISSION		
Standard	Test Type	Result
FCC PART 15, Class B	Conducted Disturbance at Mains Terminals	PASS
	Radiated disturbance	PASS

4 Emission Test

4.1 EUT Setup and Operation

No.	Power supply
Mode 1	DC 12V(Adaptor 1#)
Mode 2	DC 12V(Adaptor 2#)

The EUT and cables, and operation modes were configured to produce the maximum level of emissions for each test.

4.2 Conducted Disturbance at Mains Terminals

4.2.1 Limits

According to FCC §15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 H/50 ohms line impedance stabilization network (LISN).

Frequency range (MHz)	Limits (dB μ V), Class B ITE	
	Quasi-peak	Average
0.15 - 0.50	66~56	56~46
0.50 - 5	56	46
5-30	60	50

NOTE:

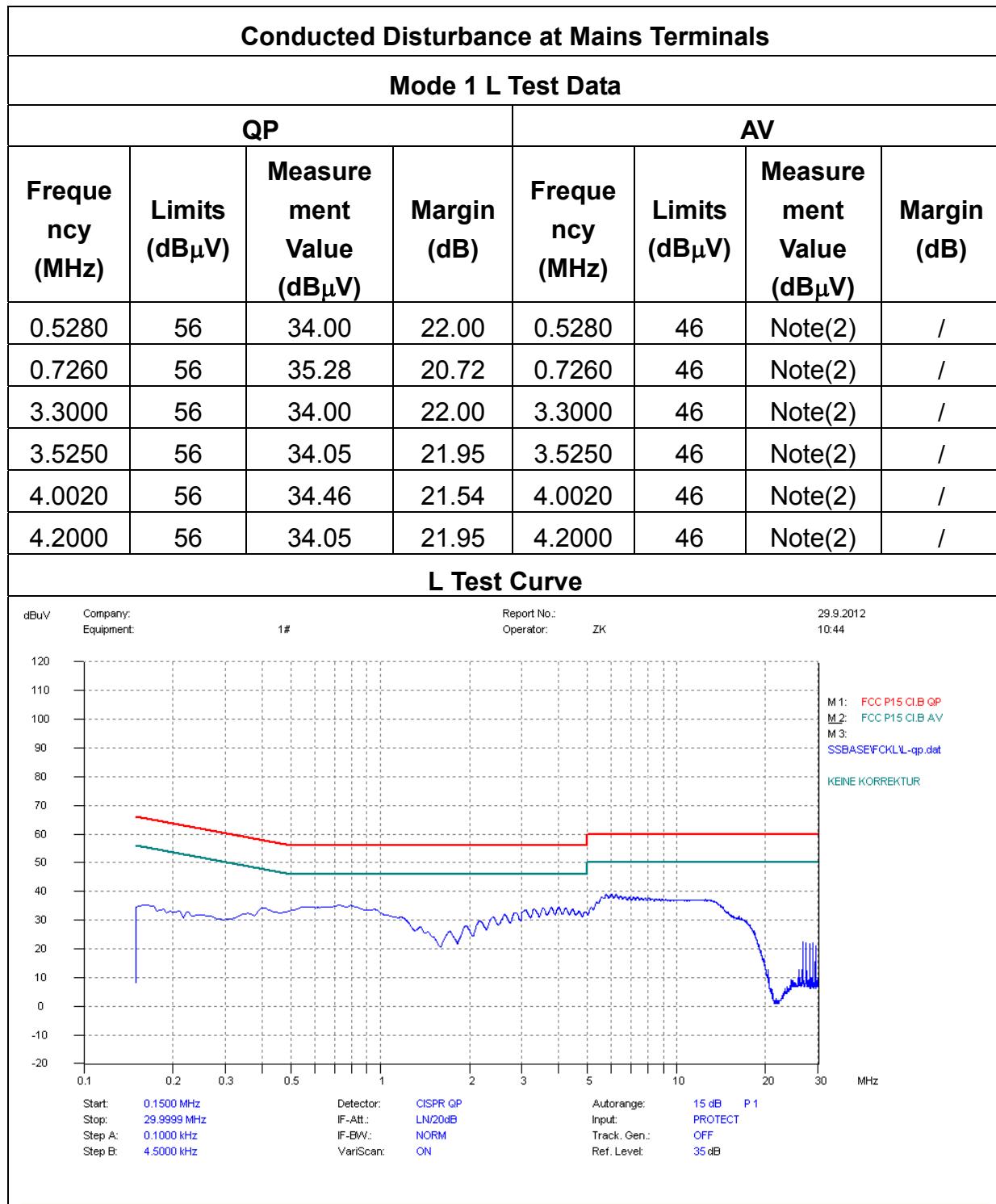
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.
3. If the quasi-peak value is lower than Average Limits, it is no necessary to conduct the average measurement.

4.2.2 Test Procedure

- a. The EUT was placed 0.4 meters from the conducting wall of shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). The LISN provide 50 Ω /50 μ H of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits are not reported.
- d. The receiver was set to CISPR Quasi-Peak detector and average detector
- e. The resolution bandwidth of the receiver was comparable to the emission bandwidth. VBW=RBW=9kHz

4.2.3 Test Result

1, Conducted Disturbance at Mains Terminals



NOTE:

1. The lower limit shall apply at the transition frequencies.
2. If the emission levels measured with QP detector are lower than AV limits, there is unnecessary to measure with AV detector.

Conducted Disturbance at Mains Terminals							
Mode 1 N Test Data							
QP				AV			
Frequency (MHz)	Limits (dB μ V)	Measurement Value (dB μ V)	Margin (dB)	Frequency (MHz)	Limits (dB μ V)	Measurement Value (dB μ V)	Margin (dB)
0.5325	56	33.25	22.75	0.5325	46	Note(2)	/
0.5865	56	35.11	20.89	0.5865	46	Note(2)	/
0.6495	56	32.99	23.01	0.6495	46	Note(2)	/
5.4690	60	35.01	24.99	5.4690	50	Note(2)	/
7.9395	60	34.97	25.03	7.9395	50	Note(2)	/
12.5115	60	37.12	22.88	12.5115	50	Note(2)	/

N Test Curve

dB μ V Company: Report No.: 29.9.2012
Equipment: 1# Operator: ZK 10:37

M 1: FCC P15 Cl.B QP
M 2: FCC P15 Cl.B AV
M 3: SSBASEFCKLN-qp.dat
KEINE KORREKTUR

Start: 0.1500 MHz Detector: CISPR QP Autorange: 15 dB P 0
Stop: 29.9999 MHz IF-Att.: LN/20dB Input: PROTECT
Step A: 0.1000 kHz IF-BW: NORM Track. Gen.: OFF
Step B: 4.5000 kHz VariScan: ON Ref. Level: 35 dB

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. If the emission levels measured with QP detector are lower than AV limits, there is unnecessary to measure with AV detector.

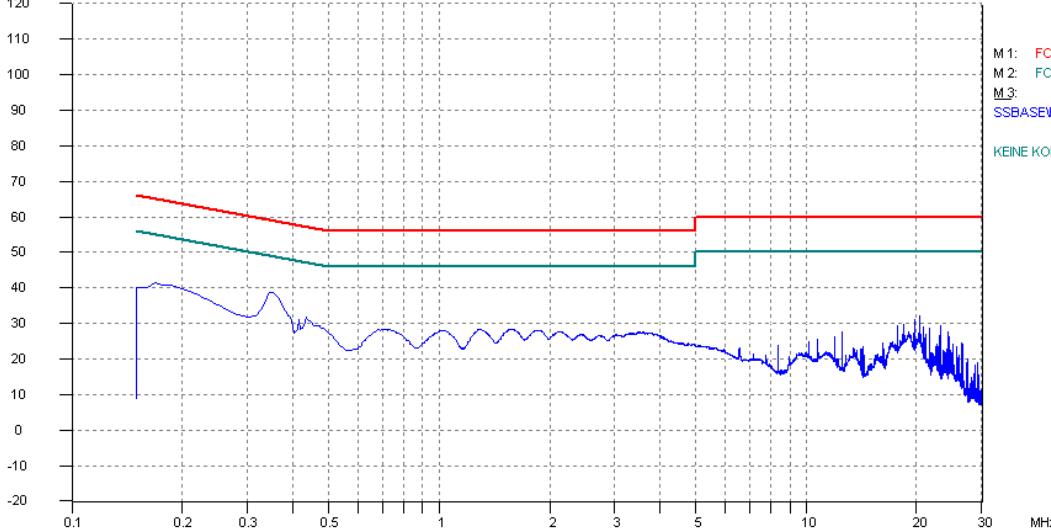
Conducted Disturbance at Mains Terminals							
Mode 2 L Test Data							
QP				AV			
Frequency (MHz)	Limits (dB μ V)	Measurement Value (dB μ V)	Margin (dB)	Frequency (MHz)	Limits (dB μ V)	Measurement Value (dB μ V)	Margin (dB)
0.5100	56	24.83	31.17	0.5100	46	Note(2)	/
1.2795	56	25.23	30.77	1.2795	46	Note(2)	/
1.5360	56	25.10	30.90	1.5360	46	Note(2)	/
1.8105	56	25.10	30.90	1.8105	46	Note(2)	/
2.6655	56	25.03	30.97	2.6655	46	Note(2)	/
3.2235	56	26.16	29.84	3.2235	46	Note(2)	/

L Test Curve							
dB μ V	Company: Equipment:	2#	Report No.: Operator:	ZK	29.9.2012 11:01		

NOTE:

- 1 The lower limit shall apply at the transition frequencies.
- 2 If the emission levels measured with QP detector are lower than AV limits, there is unnecessary to measure with AV detector.

Conducted Disturbance at Mains Terminals							
Mode 2 N Test Data							
QP				AV			
Frequency (MHz)	Limits (dB μ V)	Measurement Value (dB μ V)	Margin (dB)	Frequency (MHz)	Limits (dB μ V)	Measurement Value (dB μ V)	Margin (dB)
0.3480	59	38.80	20.20	0.3480	49	Note(2)	/
0.5010	56	27.31	28.69	0.5010	46	Note(2)	/
0.6270	56	25.10	30.90	0.6270	46	Note(2)	/
0.6990	56	28.42	27.58	0.6990	46	Note(2)	/
1.0185	56	28.10	27.90	1.0185	46	Note(2)	/
1.2975	56	28.33	27.67	1.2975	46	Note(2)	/

N Test Curve							
dB μ V	Company: Equipment:	2#	Report No.: Operator:	ZK	29.9.2012 10:53		
							
<p>M 1: FCC P15 Cl.B QP M 2: FCC P15 Cl.B AV M 3: SSBASEFCKLN-qp.dat KEINE KORREKTUR</p> <p>Start: 0.1500 MHz Stop: 29.9999 MHz Step A: 0.1000 kHz Step B: 4.5000 kHz</p> <p>Detector: CISPR QP IF-Att.: LN/20dB IF-BW: NORM VarScan: ON</p> <p>Autorange: 15 dB P 0 Input: PROTECT Track. Gen.: OFF Ref. Level: 35 dB</p>							

NOTE:

- 1 The lower limit shall apply at the transition frequencies.
2. If the emission levels measured with QP detector are lower than AV limits, there is unnecessary to measure with AV detector.

4.3 Radiated Disturbance Measurement

4.3.1 Limits of Radiated Disturbance

According to FCC §15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)
30 - 88	100	40
88 -216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE:

1. Field Strength (dB μ V/m)=20log Field Strength (μ V/m).
2. In the emission tables above, the tighter limit applies at the band edges.

4.3.2 Test Procedure

- a. The EUT was placed on the top of an insulating table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from 1 to 4 meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the heights from 1 to 4 meters and the ratable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For Radiated Emission test below 1GHz, the test-receiver was set to Peak Detector Function and $VBW=RBW=120\text{kHz}$ with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be

stopped and the peak values of the EUT would be reported. Otherwise the emission that did not have 10dB margin would be retested one by one using the quasi-peak method and the RBW and VBW was also set to 120kHz.

- f. For Radiated Emission test above 1GHz, the test-receiver was set to Peak Detector Function and Average Detector Function, VBW=RBW=1MHz.

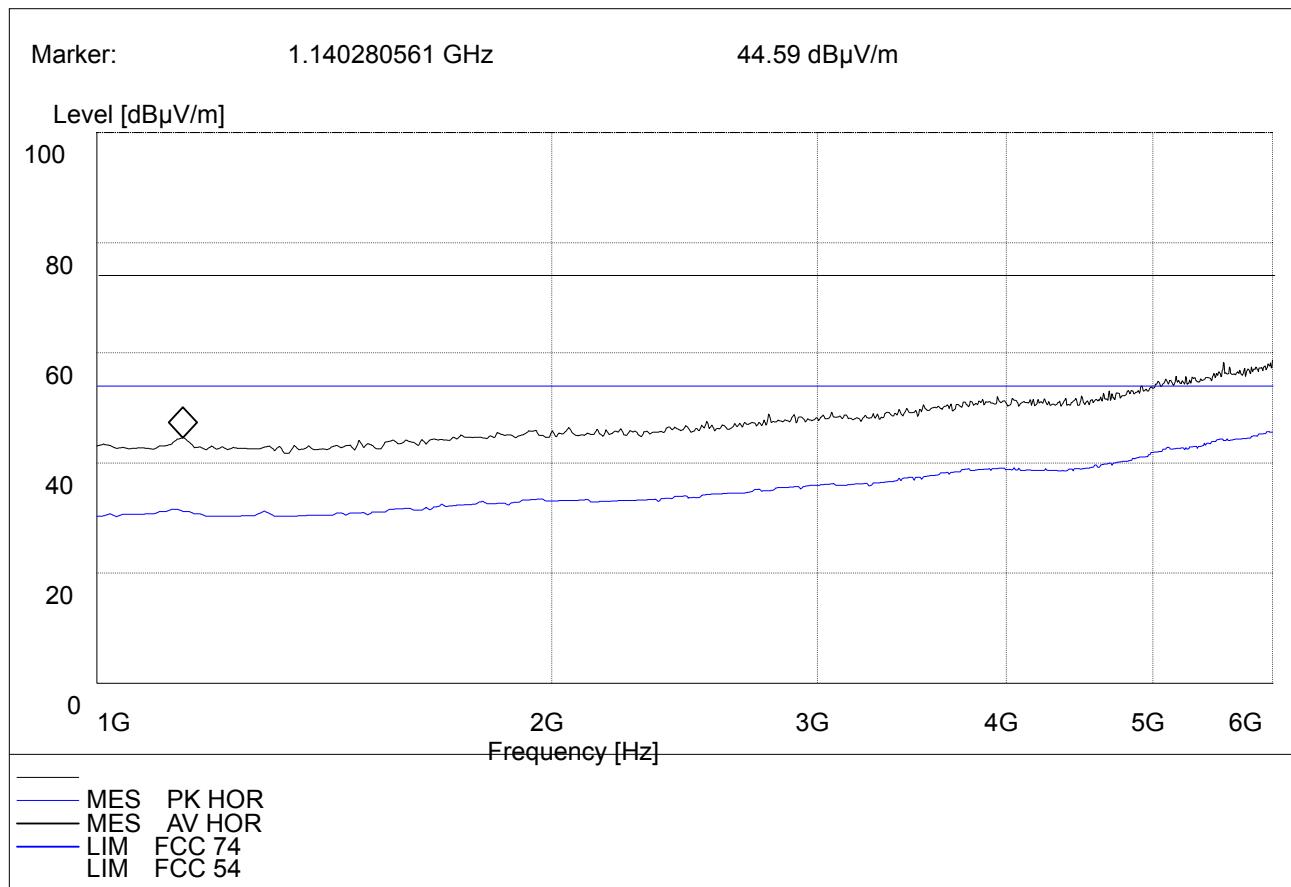
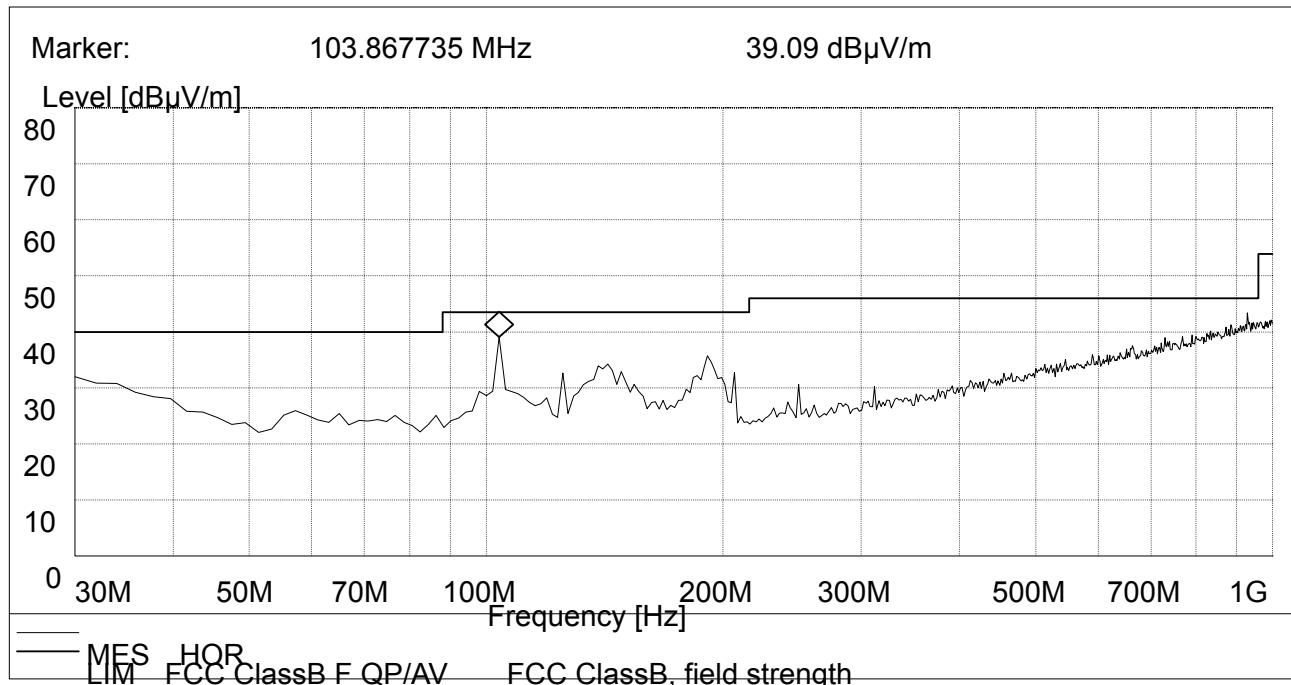
4.3.3 Test Result

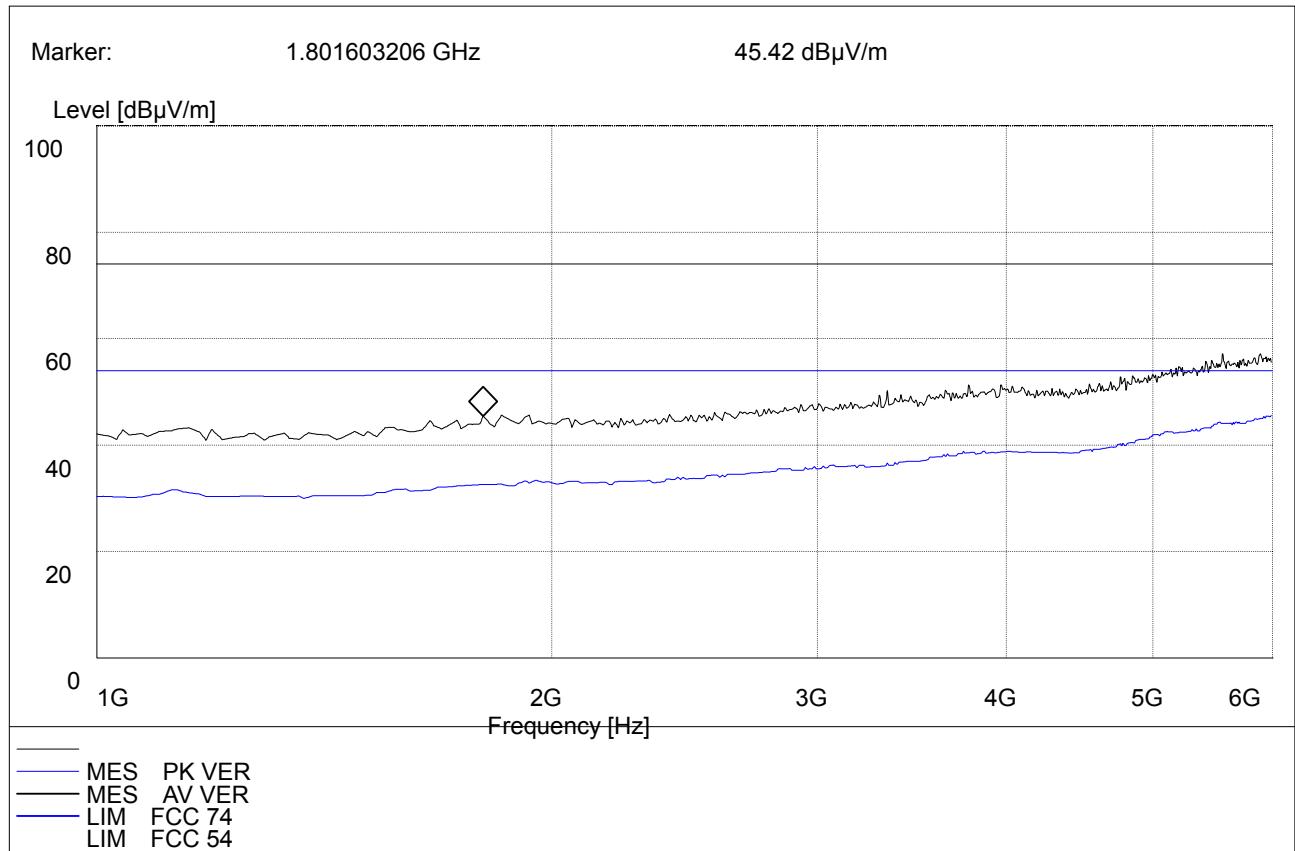
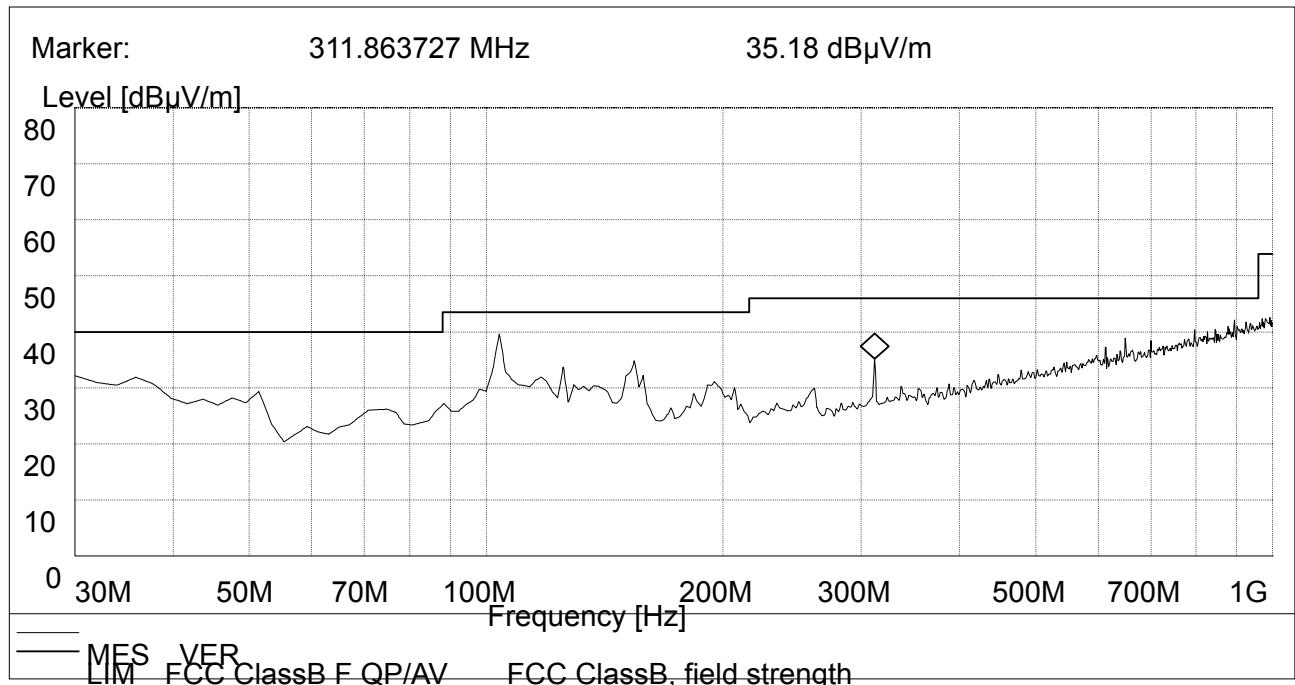
1. Radiated Emission Test data

Mode 1

No.	Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	QP Limits (dB μ V/m)	Emission Level (dB μ V/m)
1	103.68	H	150	0	43.5	36.50
2	191.54	H	150	0	43.5	32.12
3	143.02	H	150	0	43.5	31.24
4	103.68	V	100	0	43.5	37.53
5	154.78	V	100	0	43.5	32.64
6	311.05	V	100	0	46	34.08

No.	Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	Limit Value (dB μ V)		Emission Level (dB μ V)	
					PK	AV	PK	AV
1	1000-6000	H	100-400	0-360	74	54	<60	<45
2	1000-6000	V	100-400	0-360	74	54	<60	<45

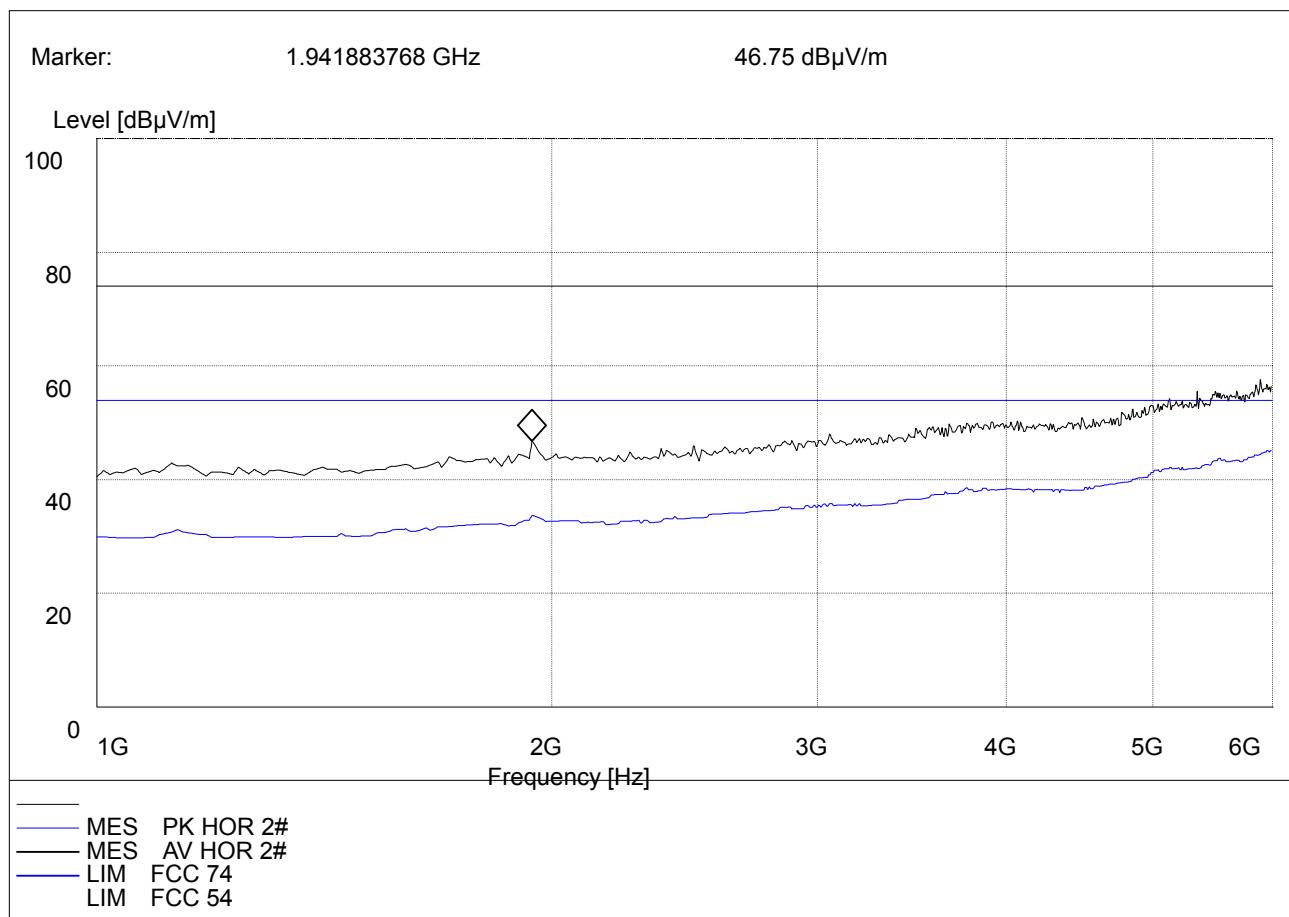
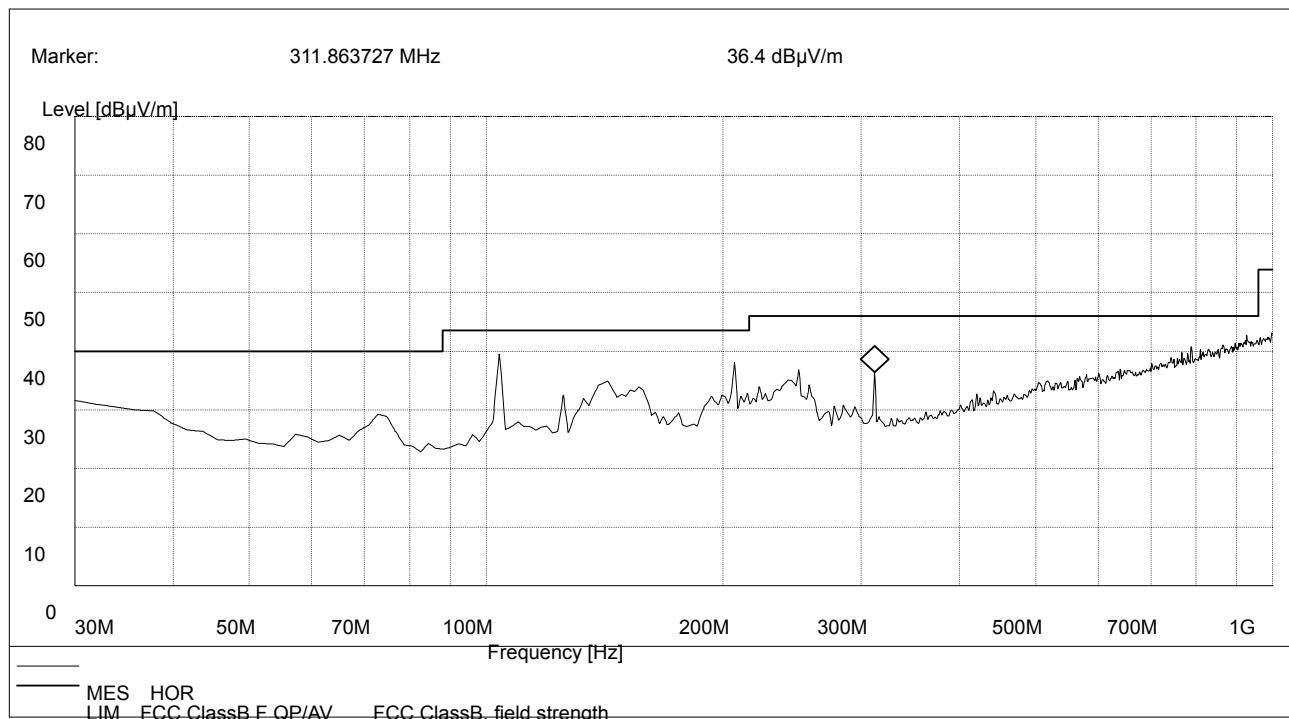
-Horizontal

-Vertical

Mode 2

No.	Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	QP Limits (dB μ V/m)	Emission Level (dB μ V/m)
1	103.68	H	150	0	43.5	38.12
2	207.36	H	150	0	43.5	38.45
3	311.97	H	150	0	46	35.42
4	48.68	V	100	0	40	31.46
5	103.68	V	100	0	43.5	38.56
6	247.46	V	100	0	43.5	35.06

No.	Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	Limit Value (dB μ V)		Emission Level (dB μ V)	
					PK	AV	PK	AV
1	1000-6000	H	100-400	0-360	74	54	<60	<45
2	1000-6000	V	100-400	0-360	74	54	<60	<45

-Horizontal

-Vertical