

Variant FCC RF Test Report

APPLICANT : Lenovo (Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT : Portable Tablet Computer
BRAND NAME : lenovo
MODEL NAME : Lenovo A3300-GV
MARKETING NAME : Lenovo A3300-GV
FCC ID : O57A3300GV
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

This is a variant report which is only valid together with the original test report. The product was received on Mar. 21, 2014 and testing was completed on Apr. 01, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3N2302-02B	Rev. 01	This is a variant report for Lenovo A3300-GV. The product equality declaration could be referred to Appendix B. Based on the similarity between two models, only the worst case of Radiated Spurious Emission from original test report (Sporton Report Number FR3N2302B) was verified.	May 05, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.14 dB at 41.640 MHz

1 General Description

1.1 Applicant

Lenovo (Shanghai) Electronics Technology Co., Ltd.

No. 68 Building, 199 Fenju Road, Wai Gao Qiao FTZ, Shanghai, China

1.2 Manufacturer

Lenovo PC HK Limited

23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Portable Tablet Computer
Brand Name	lenovo
Model Name	Lenovo A3300-GV
Marketing Name	Lenovo A3300-GV
FCC ID	O57A3300GV
EUT supports Radios application	GSM/GPRS/EGPRS/WLAN 2.4GHz 802.11bgn (HT20/HT40) Bluetooth v3.0 + EDR/Bluetooth v4.0
HW Version	A977_MB_PCB_V3.0
SW Version	A3300T_A422_01_02_131014_CN
EUT Stage	Pre-Production

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Antenna Type	PIFA Antenna
Type of Modulation	Bluetooth v4.0 LE : GFSK

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH01-SZ	831040

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
- ♦ ANSI C63.4-2003

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

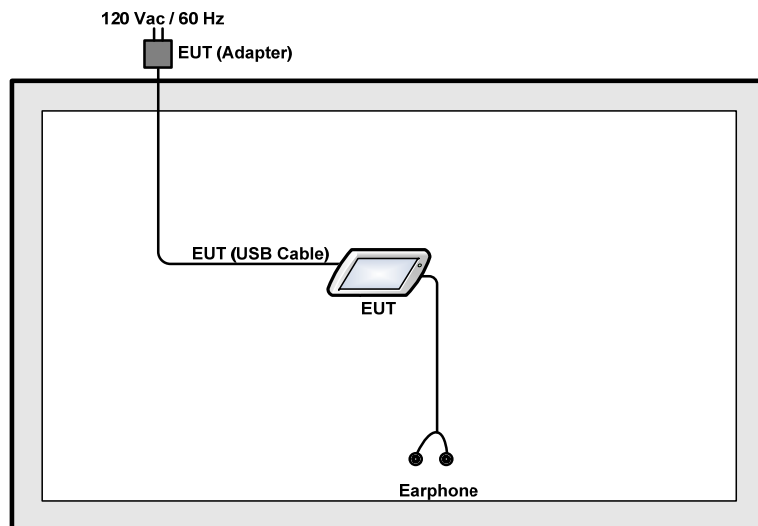
2.1 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth v4.0 LE / GFSK
Radiated TCs	Mode 1: Bluetooth Tx CH39_2480 MHz_1Mbps
Remark: All the radiated test cases were performed with adapter, earphone and USB cable 1.	

2.2 Connection Diagram of Test System

<Bluetooth v4.0 LE Tx Mode>



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Earphone	Lenovo	SH100	FCC DoC	Unshielded, 1.2 m	N/A

2.4 EUT Operation Test Setup

For Bluetooth v4.0 LE function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

3 Test Result

3.1 Radiated Band Edges and Spurious Emission Measurement

3.1.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

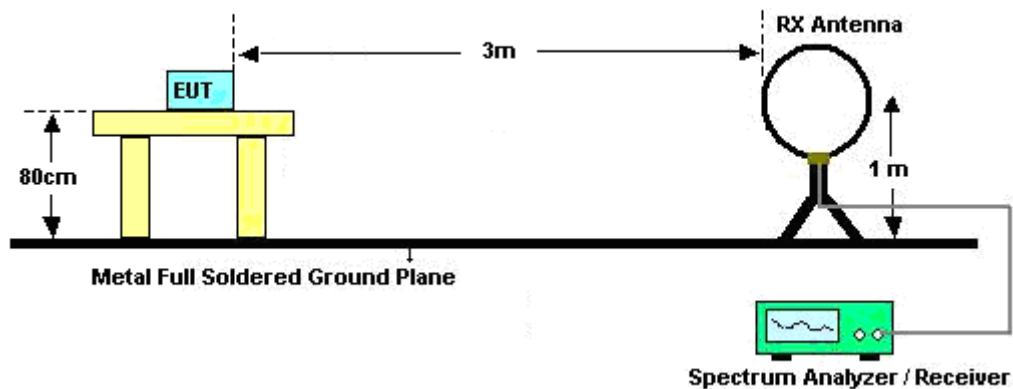
For average measurement:

 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

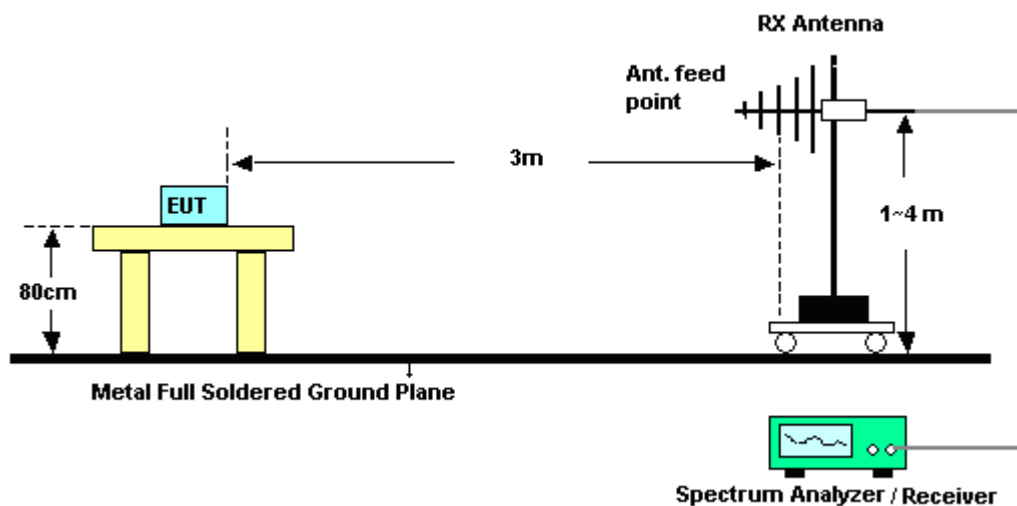
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth v4.0 LE	60.25	0.382	2.618	3kHz

3.1.4 Test Setup

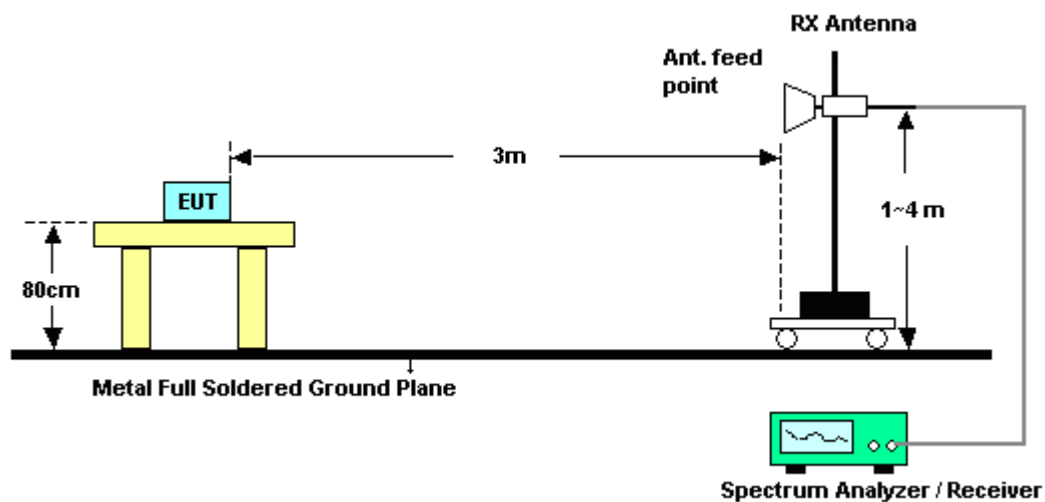
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

**3.1.6 Test Result of Radiated Spurious at Band Edges**

Test Mode :	Mode 1	Temperature :	23~25°C
Test Channel :	39	Relative Humidity :	48~52%
		Test Engineer :	Gavin Zhang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V /m)	Over Limit (dB)	Limit Line (dB μ V /m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2495.8	52.35	-21.65	74	41.76	32.5	5.74	27.65	119	68	Peak
2492.08	41.93	-12.07	54	31.34	32.5	5.74	27.65	119	68	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V /m)	Over Limit (dB)	Limit Line (dB μ V /m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2491.69	52.01	-21.99	74	41.47	32.5	5.71	27.67	100	86	Peak
2490.52	41.89	-12.11	54	31.35	32.5	5.71	27.67	100	86	Average

3.1.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	23~25°C
Test Channel :	39	Relative Humidity :	48~52%
Test Engineer :	Gavin Zhang	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
62.01	21.44	-18.56	40	45.66	4.7	1.01	29.93	-	-	Peak
159.98	27.04	-16.46	43.5	46.53	8.9	1.55	29.94	156	263	Peak
296.75	25.81	-20.19	46	41.4	12.33	2.01	29.93	-	-	Peak
395.69	24.18	-21.82	46	36.09	15.74	2.28	29.93	-	-	Peak
815.7	24.85	-21.15	46	31.18	20.4	3.2	29.93	-	-	Peak
922.4	25.07	-20.93	46	30.46	21.16	3.39	29.94	-	-	Peak
2480	96.78	-	-	86.33	32.41	5.71	27.67	119	68	Peak
2480	95.88	-	-	85.43	32.41	5.71	27.67	119	68	Average
4960	38.44	-35.56	74	52.85	34.12	8.49	57.02	146	121	Peak
7440	37.26	-36.74	74	50.24	33.97	10.04	56.99	175	260	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 1	Temperature :	23~25°C
Test Channel :	39	Relative Humidity :	48~52%
Test Engineer :	Gavin Zhang	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
41.64	32.86	-7.14	40	50.02	11.9	0.87	29.93	100	231	Peak
101.78	22.92	-20.58	43.5	40.23	11.36	1.27	29.94	-	-	Peak
208.48	20.9	-22.6	43.5	39.76	9.35	1.72	29.93	-	-	Peak
478.14	21.34	-24.66	46	31.45	17.34	2.47	29.92	-	-	Peak
737.13	25.03	-20.97	46	31.92	20	3.04	29.93	-	-	Peak
839.95	24.87	-21.13	46	30.98	20.6	3.22	29.93	-	-	Peak
2480	94.43	-	-	83.98	32.41	5.71	27.67	100	86	Peak
2480	93.53	-	-	83.08	32.41	5.71	27.67	100	86	Average
4960	38.62	-35.38	74	53.03	34.12	8.49	57.02	146	121	Peak
7440	37.6	-36.4	74	50.58	33.97	10.04	56.99	175	260	Peak

Note: Other harmonics are lower than background noise.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Signal Analyzer	R&S	FSV40	101078	10Hz~40GHz	Jun. 17, 2013	Apr. 01, 2014	Jun. 16, 2014	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 29, 2013	Apr. 01, 2014	May 28, 2014	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	23188	30MHz~2GHz	Oct. 26, 2013	Apr. 01, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 26, 2013	Apr. 01, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Apr. 01, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Agilent	83017A	MY395013 02	3Hz~26.5GHz	Mar. 03, 2014	Apr. 01, 2014	Mar. 02, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Apr. 01, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Apr. 01, 2014	NCR	Radiation (03CH01-SZ)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.90
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Appendix B. Product Equality Declaration

Lenovo (Shanghai) Electronics Technology Co., Ltd.

No. 68 Building, 199 Fenju Road, Wai Gao Qiao FTZ , Shanghai , China

Tel: 86-21-50504500-8237

Date: May 5, 2014

Product Equality Declaration

We, Lenovo (Shanghai) Electronics Technology Co., Ltd., declare on our sole responsibility for product of Lenovo A3300-GV that the difference between the present product and the original product is only different supplier for LCD Panel.

Should you have any questions or comments regarding this matter, please have my best attention.

Declared by : 

on behalf of Lenovo (Shanghai) Electronics Technology Co., Ltd.