



RF Exposure evaluation

Report Reference No..... : GTSR16050040-MPE

FCC ID. : 2AIOU-MINIPC

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Date of issue: Jun. 6, 2016

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Address: 1F, Building No. 13A, Zhonghaixin Science and Technology City, No.12,6 Road, Ganli Industrial Park, Buji Street, Longgang District, Shenzhen, Guangdong

Applicant's name.....: Shenzhen Cenovo Technology Co.,Ltd.

Address: No.103, the first alley, 108# Buyong South Road, Shajing Street, Bao'an District, Shenzhen City, Guangdong

Test specification

Standard.....: 47CFR §1.1310

47CFR §2.1091

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd.

Master TRF: Dated 2014-12

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Test item description : Cenovo

Trade Mark.....: /

Manufacturer: Shenzhen Cenovo Technology Co.,Ltd.

Model/Type reference: MiniPC1

Listed Models: MiniPC2,king, MiniPCS,storg

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Hardware Version: AP6212V1.1

Software Version.....: CX-S-V1.1

Rating.....: Input:AC100-240V,50/60Hz,0.6A

Output:DC5V,4A

Result.....: **PASS**

TEST REPORT

Test Report No. :	GTSR16050040-MPE	Jun. 6, 2016
		Date of issue

Equipment under Test : **Cenovo**

Model /Type : MiniPC1

Listed Models : MiniPC2,king, MiniPCS,storg

Applicant : **Shenzhen Cenovo Technology Co.,Ltd.**

Address : No.103, the first alley, 108# Buyong South Road, Shajing Street, Bao'an District, Shenzhen City, Guangdong

Manufacturer : **Shenzhen Cenovo Technology Co.,Ltd.**

Address : NO.202A,2F,Building A, Jiepeng Commerce Square, Fuyong Town, Bao'an District, Shenzhen City, Guangdong

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/

1.2. Note

	Test Standards	Reference Report
Bluetooth-BLE	FCC Part 15 Subpart C	GTSR16050040-BLE
WLAN	FCC Part 15 Subpart C	GTSR16050040-WLAN
EMF	FCC Per 47 CFR 2.1093(d)	GTSR16050040-MPE

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.

1F, Building No. 13A, Zhonghaixin Science and Technology City, No.12,6 Road, Ganli Industrial Park, Buji Street, Longgang District, Shenzhen, Guangdong

2.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 964637

Shenzhen Global Test Service Co.,Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 964637, Jul 24, 2015.

CNAS-Lab Code: L8169

Shenzhen Global Test Service Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories. Date of Registration: Dec. 11, 2015. Valid time is until Dec. 10, 2018.

2.3. Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f ²)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

3.3. Conducted Power Results

WLAN					
Type	Channel	Frequency (MHz)	Worst case Data rate	Output power PK (dBm)	Output power AV (dBm)
802.11b	01	2412	1Mbps	12.74	9.74
	06	2437	1Mbps	12.90	8.90
	11	2462	1Mbps	12.71	9.24
802.11g	01	2412	6Mbps	11.07	7.07
	06	2437	6Mbps	11.04	7.04
	11	2462	6Mbps	11.97	7.52
802.11n(HT20)	01	2412	6.5 Mbps	11.96	7.02
	06	2437	6.5 Mbps	11.27	7.27
	11	2462	6.5 Mbps	11.92	6.99

BT

Type	Channel	Frequency (MHz)	Worst case Data rate	Output power PK (dBm)	Output power AV (dBm)
GFSK	0	2402	1Mbps	2.42	1.08
	19	2440	1Mbps	1.85	0.92
	39	2480	1Mbps	2.37	1.25

Manufacturing tolerance**WLAN**

IEEE 802.11b (Average)			
Frequency	2412	2437	2462
Target (dBm)	9	9	9
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g (Average)			
Frequency	2412	2437	2462
Target (dBm)	7	7	7
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Frequency	2412	2437	2462
Target (dBm)	7	7	7
Tolerance ±(dB)	1.0	1.0	1.0

BT

GFSK(Average)			
Frequency	2402	2440	2480
Target (dBm)	1	1	1
Tolerance ±(dB)	1.0	1.0	1.0

3.4. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum source-based Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, $r = 20\text{cm}$, as well as the gain of the used antenna, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained..

4. Evaluation Result

4.1. Standalone MPE

	Minimum Separation Distance (cm)	Output Power (Turn-up Procedure)		Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Results
		dBm	mW				
WLAN	20.00	10	10.0	1.222	0.0024	1.0000	PASS
BT4.0	20.00	2	1.585	1.236	0.0004	1.0000	PASS

5. Conclusion

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

.....End of Report.....