



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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Report No.: SHEM130400066703
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FCC MPE REPORT

Application No.:	SHEM1304000667RF
Applicant:	Lenbrook Industries Limited
Equipment Under Test (EUT):	
NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Direct Digital Network Amplifier
Brand Name:	NAD
Model:	D7050 DIRECT DIGITAL NETWORK AMPLIFIER
Added Model:	N/A
FCC ID:	SVC-NADD7050
IC:	SVC-NADD7050
Standards:	152C-NADD7050
Date of Receipt:	April 23, 2013
Date of Test:	May 02, 2013 to May 29, 2013
Date of Issue:	May 31, 2013
Test Result :	PASS*

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Tony Wu
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

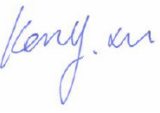
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	May 31, 2013	/	Original

Authorized for issue by:			
Engineer	Zenger Zhang		
	Print Name		
Clerk	Susie Liu		
	Print Name		
Reviewer	Keny Xu		
	Print Name		

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4 General Information

4.1 Client Information

Applicant:	Lenbrook Industries Limited
Address of Applicant:	633 Granite Court, Pickering Ontario, Toronto L1W 3K1, Canada
Manufacturer:	Lenbrook Industries Limited
Address of Manufacturer:	633 Granite Court, Pickering Ontario, Toronto L1W 3K1, Canada
Factory:	Hansong (Nanjing) Technology Ltd.

4.2 General Description of EUT (Equipment Under Test)

Product Name	Direct Digital Network Amplifier
Brand Name:	NAD
Model No:	D7050 DIRECT DIGITAL NETWORK AMPLIFIER
Added Model:	N/A
Product Description:	Mobile production

4.3 Technical Specifications:

Operation Frequency:	Wi-Fi 802.11b/g:2412MHz~2462MHz BT:2402MHz~2480MHz	
Modulation Technique:	Wi-Fi: 802.11b: DSSS, 802.11g: OFDM BT: GFSK, $\pi/4$ DQPSK, 8DPSK	
Power Supply:	Rated Input:	AC 100V-240V, 50-60Hz
	AC Cable:	About 100cm Length (3 Wires)
Antenna Type	Integral	
Antenna Gain	2.0dBi	

4.4 Test Location

All tests were performed at SGS E&E EMC lab

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4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5 Test Standards and Limits

The Equipment under Test (EUT) has been tested at SGS's (own or subcontracted) laboratories.

The following table summarizes the specific reference documents such as harmonized standards or test specifications which were used for testing as SGS's (own or subcontracted) laboratories.

Identity	Document Title	Version
FCC OET Bulletin 65 supplement C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields	2001

In the configuration tested, the EUT complied with the standards specified above.

FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	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

6 Summary of Results

Frequency Band	Limit (mW/cm ²)	Result (mW/cm ²)	Verdict
2412-2462MHz	1.0	0.087	Pass

7 Measurement and Calculation

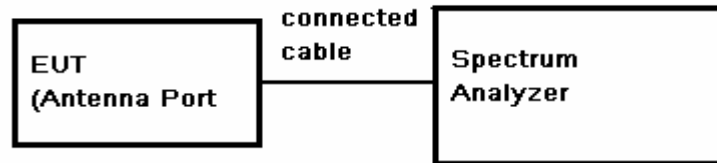
7.1 Conducted Output Power

Test Date: May 18, 2013

The is from RF test Reprot SHEM130400066701 for Wi-Fi and SHEM130400066702 for BT

EUT Operation: Test in fixing frequency operating mode at lowest, middle and highest frequency.

Test Configuration:



Test Results record:

For Antenna of BT:

Test mode	Channel	Reading (dBm)	Cable Loss (dB)	Output Peak Power (mW)
8DPSK	Low	-1.21	0.5	0.85
	Mid	-3.23	0.5	0.53
	High	-5.67	0.5	0.30
GFSK	Low	-2.86	0.5	0.58
	Mid	-4.66	0.5	0.38
	High	-7.16	0.5	0.22
π/4DQPSK	Low	-1.91	0.5	0.72
	Mid	-3.78	0.5	0.47
	High	-6.28	0.5	0.26

For Antenna A of WiFi:

Test mode	Channel	Reading (dBm)	Cable Loss (dB)	Output Peak Power (mW)
802.11b	Low	18.83	1.5	107.89
	Mid	19.08	1.5	114.29
	High	19.42	1.5	123.59
802.11g	Low	22.85	1.5	272.27
	Mid	22.75	1.5	266.07
	High	22.89	1.5	274.79

For Antenna B of WiFi:

Test mode	Channel	Reading (dBm)	Cable Loss (dB)	Output Peak Power (mW)
802.11b	Low	18.67	1.5	103.99
	Mid	19.16	1.5	116.41
	High	19.24	1.5	118.58
802.11g	Low	22.26	1.5	237.68
	Mid	22.58	1.5	255.86
	High	22.94	1.5	277.97

7.2 MPE Evaluation

Test Results: MPE Limit Calculation: the EUT's operating frequencies 2412MHz to 2464MHz; the highest power is High channel(2462MHz). The Measured maximum conducted power is 24.44 dBm(277.97mW).with maximum peak gain is 2.0dBi. Duty factor is 100%

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

$$S = PG * \text{Duty factor} / 4\pi R^2$$

P =Power Input to antenna (277.97mWatts)

G =Antenna Gain (1.585numeric)

R = distance to the center of radiation of antenna (in meter) = 20cm

$$S = (277.97 * 1.585 * 1) / (4\pi * 20^2) = 0.087 \text{mW/cm}^2$$

$$\text{MPE limit} = 1.0 \text{mW/cm}^2$$

Note:

$$1) P (\text{Watts}) = 10^{\frac{\text{dBm}}{10}} / 1000$$

$$2) G (\text{Antenna gain in numeric}) = 10^{\text{(Antenna gain in dBi / 10)}}$$

8 EUT Constructional Details

Refer to the < D7050 DIRECT DIGITAL NETWORK AMPLIFIER_External Photos > & < D7050 DIRECT DIGITAL NETWORK AMPLIFIER_Internal Photos >.

The End Of Report