



588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Telephone: +86 (0) 21 6191 5666

Fax: +86 (0) 21 6191 5678

ee.shanghai@sgs.com

Report No.: SHEM180800730603

Page: 1 of 8

1 Cover Page

RF Exposure Evaluation Report

Application No.:	SHEM1808007306CR
Applicant:	Lenbrook Industries Limited
FCC ID:	SVC-NADD3045
IC	152C-NADD3045
Equipment Under Test (EUT): NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Hybrid Digital Dac Amplifier
Model No.:	D3045
Standards:	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 (March 2015)
Date of Receipt:	2018-08-23
Date of Test:	2018-09-20 to 2018-09-20
Date of Issue:	2019-01-02
Test Result:	Pass*

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



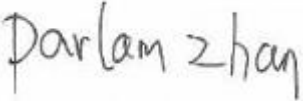
Parlam Zhan
E&E Section Manager

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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.



Revision Record			
Version	Description	Date	Remark
00	Original	2019-01-02	/

Authorized for issue by:			
			
		<hr/>	
		Vincent Zhu /Project Engineer	
			
		<hr/>	
		Parlam Zhan /Reviewer	



2 Contents

	Page
1 COVER PAGE	1
2 CONTENTS.....	3
3 GENERAL INFORMATION.....	4
3.1 CLIENT INFORMATION	4
3.2 GENERAL DESCRIPTION OF E.U.T.	4
3.3 TEST LOCATION	5
3.4 TEST FACILITY	5
4 TEST STANDARDS AND LIMITS.....	6
4.1 FCC RADIOFREQUENCY RADIATION EXPOSURE LIMITS:	6
4.2 IC RADIOFREQUENCY RADIATION EXPOSURE LIMITS:.....	6
5 MEASUREMENT AND CALCULATION.....	7
5.1 MAXIMUM TRANSMIT POWER.....	7
5.2 MPE CALCULATION.....	8



3 General Information

3.1 Client Information

Applicant:	Lenbrook Industries Limited
Address of Applicant:	633 Granite Court, Pickering Ontario, Canada L1W 3K1
Manufacturer:	Lenbrook Industries Limited
Address of Manufacturer:	633 Granite Court, Pickering Ontario, Canada L1W 3K1
Factory:	HANSONG(NANJING) TECHNOLOGY LTD.
Address of Factory:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China.

3.2 General Description of E.U.T.

BLE

Power supply:	AC 100-120V~60Hz/220V-240V~50Hz
Test voltage:	AC 120V/60Hz
Cable:	AC Cable 1.8m
Antenna Gain	3dBi
Antenna Type	PCB Antenna
Channel Spacing	2MHz
Modulation Type	GFSK
Number of Channels	40
Operation Frequency	2402MHz to 2480MHz

BT

Power supply:	AC 100-120V~60Hz/220V-240V~50Hz
Test voltage:	AC 120V/60Hz
Cable:	AC Cable 1.8m
Antenna Gain	3dBi
Antenna Type	PCB Antenna
Channel Spacing	1MHz
Modulation Type	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	79
Operation Frequency	2402MHz to 2480MHz
Spectrum Spread Technology	Frequency Hopping Spread Spectrum(FHSS)



3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China.

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

3.4 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.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **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-1.

- **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-13868, C-14336, T-12221, G-10830 respectively.



4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm ²)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

4.2 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W



5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM180800730601 & SHEM180800730602

BT

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
GFSK	2402	5.89	3.88
	2441	7.26	5.32
	2480	7.03	5.05
$\pi/4$ DQPSK	2402	6.07	4.05
	2441	7.35	5.43
	2480	7.18	5.22
8DPSK	2402	6.11	4.08
	2441	7.33	5.41
	2480	7.15	5.19

BLE

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
BLE	2402	1.72	1.49
	2440	3.8	2.40
	2480	3.17	2.07



5.2 MPE Calculation

For FCC:

The Max Conducted Peak Output Power is 5.43mW

According to the formula $S = \frac{PG}{4R^2\pi}$, we can calculate S which is MPE.

Note:

- 1) P (Watts) = Power Input to antenna = $10^{\frac{dBm}{10}} / 1000$
- 2) G (Antenna gain in numeric) = $10^{(\text{Antenna gain in dBi} / 10)}$
- 3) R = distance to the center of radiation of antenna (in meter) = 20cm
- 4) MPE limit = 1mW/cm²

$$S = \frac{PG}{4R^2\pi} = \frac{5.43 \times 1.995}{4 \times 400 \times 3.14} = 0.002 \text{ mW/cm}^2$$

For IC:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz

$$\text{E.I.R.P.} = P \times G = 0.00543 \times 1.995 = 0.01 \text{ W} < 2.68 \text{ W}$$

So the device is exclusion from SAR test.

--End of the Report--