

Technical Compliance Statement FCC Test Report

For the following information Ref. File No.: A1Z1908081

Product	:	Intelligent Processing Card
Model No.	:	MLU270-F5K; MLU270-F5; MLU270-F4; MLU270-F4K
Applicant	:	Cambricon Technologies Corporation Limited
Address	:	Room 1805, Building 1, Lane 2290, Zuchongzhi Road,
		Zhangjiang Hi-Tech Park, Shanghai, China
Rules and Standards	:	47 CFR FCC Part 15 Subpart B and
		ANSI C63.4:2014
		(Class B Limit)

We hereby certify that the above product has been tested by us and complied with above FCC standard limits. The test was performed according to the procedures ANSI C63.4-2014. The equipment might be marketed in US or Canada in accordance with the rules of 47 CFR FCC Part 2 regulations.

The test data and results are issued on the test report ACS-F19169.

Test Laboratory: Audix Technology (Shenzhen) Co., Ltd. NVLAP Lab. Code: 200372-0 FCC OET Designation: CN5022 Web Site: www.audix.com.cn

AUDIX®	信章科技 (深圳) 有限公司 Audix Technology (Shenzhen) Co., Ltd. EMC 部 門 報 告 専 用 章
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	Date: 2019.10.10

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.



FCC TEST REPORT

Intelligent Processing Card

Model No. : MLU270-F5K; MLU270-F5; MLU270-F4; MLU270-F4K

Prepared for: Cambricon Technologies Corporation Limited Room 1805, Building 1, Lane 2290, Zuchongzhi Road, Zhangjiang Hi - Tech Park, Shanghai, China

Prepared By: Audix Technology (Shenzhen) Co., Ltd. No. 6, Kefeng Road, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26639496 Fax: (0755) 26632877



TESTING NVLAP LAB CODE 200372-0

Report Number Date of Test Date of Report ACS-F19169 Sep.03~18, 2019 Oct.10, 2019

The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, TAF, or any agency of the U.S. Government.



TABLE OF CONTENTS

De	escription	Page
TI	EST REPORT	
1.	SUMMARY OF STANDARDS AND RESULTS	4
	1.1. Description of Standards and Results	
2	GENERAL INFORMATION	5
	2.1 Descriptions of Device (FUT)	5
	2.2. Tested Supporting System Details	
	2.3. Block Diagram of Connection Between EUT and Simulator	
	2.4. Test Facility	7
	2.5. Measurement Uncertainty (95% confidence levels, k=2)	7
3.	CONDUCTED EMISSION AT MAINS TERMINALS TEST	8
	3.1. Test Equipments	
	3.2. Block Diagram of Test Setup	
	3.3. Power Line Conducted Emission at Mains Terminals Limit	
	3.4. EUT Configuration on Test	
	3.5. Operating Condition of EUT	
	3.6. Test Procedure	
	3.7. Conducted Emission at Mains Terminals Test Results	
4.	RADIATED EMISSION MEASUREMENT	
	4.1. Test Equipments	
	4.2. Block Diagram of Test Setup	
	4.3. Radiated Emission Limit All emanations from a Class B computing	devices or system, including
	specified below:	14
	4.4 EUT Configuration on Test	
	4.5. Operating Condition of EUT	
	4.6. Test Procedure	
	4.7. Radiated Emission Test Results	
5.	DEVIATION TO TEST SPECIFICATIONS	20
6.	PHOTOGRAPHS	
	6.1. Photos of Power Line Conducted Emission Test	
	6.2. Photos of Radiated Emission Test (In 3m Anechoic Chamber)	
7.	PHOTOS OF THE EUT	



AUDIX Technology (Shenzhen) Co., Ltd.

TEST REPORT

Applicant: Cambricon Technologies Corporation LimitedProduct: Intelligent Processing Card(A) Model No.: MLU270-F5K; MLU270-F5; MLU270-F4; MLU270-F4K

(B) Power Supply : Power by PC System

(C) Test Voltage : AC 120V/60Hz

Rules of Compliance and Applicable Standards:

47 CFR FCC Part 15 Subpart B, Class B Limit ANSI C63.4:2014

The device described above was tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device. All of the tests were requested by the applicant and the results thereof based upon the information that the applicant provided to us. We, Audix Technology (Shenzhen) Co., Ltd. assume full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT is compliance with the requirements of 47 CFR FCC Part 2 standards.

No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

Date of Test : _	Sep.03~18, 2019	Report of date:	Oct.10, 2019
Prepared by :	yena Xu	Reviewed by :	Bangon the
	Yena Xu / Assistant	AUDIX [®] 信集件批 Audix Te EMC 等	Bensun Chen / Deputy Manager echnology (Shenzhen) Co., Ltd. 門報告專用章
Approved & A	uthorized Signer ·	Stamp only for	EMC Dept. Report
Name of the I	Representative of the Re		David Jin / Manager

Name of the Representative of the Responsible Party:

Signature:



1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

	EMISSION					
Description of Test Item	Standard	Results	Remarks			
Power Line Conducted Emission Test	47 CFR FCC Part 15 Subpart B ANSI C63.4:2014	PASS	Minimum passing margin is 15.04dB at 16.486MHz			
Radiated Emission Test (30-1000MHz)	47 CFR FCC Part 15 Subpart B ANSI C63.4:2014 ICES-003 Issue 6: 2017(Updated)	PASS	Minimum passing margin is 4.62dB at 313.228 MHz			
Radiated Emission Test (Above 1GHz)	47 CFR FCC Part 15 Subpart B ANSI C63.4:2014 ICES-003 Issue 6: 2017(Updated)	PASS	Minimum passing margin is 8.93dB at 3000.214MHz			



2. GENERAL INFORMATION

2.1. Descriptions of Device (EUT)

Product

: Intelligent Processing Card

Model No.

: MLU270-F5K; MLU270-F5; MLU270-F4; MLU270-F4K models, and the differences are as follows:

	MLU270-F4	MLU270-F4K	MLU270-F5	MLU270-F5K
	C20L	C20L	C20L	C20L
IPU	Support max	Support max	Support max	Support max
	1.0GHz	1.2GHz	1.0GHz	1.2GHz
Hashrate	INT8 128TOPS	INT8 160TOPS	INT8 128TOPS	INT8 160T0PS
Memory	16GB	16GB	32GB	32GB

Test Model	:	MLU270-F5K
FCC ID	:	2ARVF-MLU270-F
Max. Work Frequency	:	1.2GHz
Applicant	:	Cambricon Technologies Corporation Limited Room 1805, Building 1, Lane 2290, Zuchongzhi Road, Zhangjiang Hi - Tech Park, Shanghai, China
Date of Test	:	Sep.03~18, 2019
Date of Receipt	:	Aug.21, 2019
Sample Type	:	Series production



No.	Description	ACS No.	Manufacturer	Model	Serial Number	
1	Covor		DELL	D02T		
1.	Sever	Power Cord: Unshield	ed, Detachable, 1	.8m		
	2. Monitor		DELL	E2216HVf		
Ζ.		Power Cord: Unshield	Power Cord: Unshielded, Detachable, 1.8m			
3	USP Kayboard	ACS-EMC-K11R	DELL	KB4021	CN-0N291F-71581- 395-03Z3-A01	
5.	USB Reyboard	USB Cable: Shielded,	Undetachable, 2.	0m		
1	USB Mouse	ACS-EMC-M09R	DELL	MS111-T	CN-0X9DCG-7616- 49B-11HA-A03	
4.	USB Mouse	USB Cable: Shielded,	Undetachable, 1.	8m		

2.2. Tested Supporting System Details

2.3. Block Diagram of Connection Between EUT and Simulator.



(EUT: Intelligent Processing Card)



2.4.	Test Facility Site Description		
	Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd. No. 6, Kefeng Road, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China
	EMC Lab.	:	Certificated by DAkkS, Germany Registration Number: D-PL-12151-01-00 Valid Date: Dec.07, 2021
		:	Certificated by FCC, USA. Designation No.: CN5022 Valid Date: Mar.31, 2020
			Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2020
			Certificated by TAF, Taiwan Registration No: 1418 Valid Date: Nov.08, 2020

2.5. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	2.6dB (150kHz to 30MHz)
	3.6dB (30~200MHz, Polarization: H)
Uncertainty for Radiation Emission test	4.0dB (30~200MHz, Polarization: V)
in 3m chamber (Distance: 3m)	3.6dB (200M~1GHz, Polarization: H)
	3.8dB (200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 3m	4.6dB (1~6GHz, Distance: 3m)
chamber (1GHz-18GHz)	4.6dB (6~18GHz, Distance: 3m)
Uncertainty for test site temperature and	0.6°C
humidity	3%

Note: EMI uncertainty is evaluated by CISPR16-4-2.

The value of measurement uncertainty of EMI is less than U_{CISPR} . The value is not calculated in the test results.



3. CONDUCTED EMISSION AT MAINS TERMINALS TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	May.17,18	3 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100842	Apr.14,19	1 Year
3.	L.I.S.N.#1	Rohde & Schwarz	ENV216	102160	Dec.01,18	1 Year
4.	A.M.N	Kyoritsu	K NW-403D	8-1750-2	Apr.18,19	1 Year
5.	Terminator	Hubersuhner	50Ω	No.1	Apr.14,19	1 Year
6.	Terminator	Hubersuhner	50Ω	No.2	Apr.14,19	1 Year
7.	RF Cable	Fujikura	RG55/U	No.1	Apr.13,19	1 Year
8.	Test Software	AUDIX	e3	6.100913a	N/A	N/A
Note:	N/A means Not applica	ble				

3.2. Block Diagram of Test Setup



🛛 :50Ω Terminator

3.3. Power Line Conducted Emission at Mains Terminals Limit (FCC §15.107)

	Maximum RF Line Voltage			
Frequency	Quasi-Peak Level	Average Level		
	$dB(\mu V)$	$dB(\mu V)$		
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*		
500kHz ~ 5MHz	56	46		
5MHz ~ 30MHz	60	50		

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.4. EUT Configuration on Test

The following equipment is installed on conducted emission test to meet EN 55032 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

- 3.4.1. Intelligent Processing Card (EUT)
- 3.4.2. Model No. : MLU270-F5K
- 3.4.3. Support Equipment : as tested supporting system detail, in section 2.2.



3.5. Operating Condition of EUT

- 3.5.1. Setup the EUT and simulator as shown as Section 3.2.
- 3.5.2. Turn on the power of all equipments.
- 3.5.3. Let the EUT worked in test mode (Running) and tested it.

3.6. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (A.M.N). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on conducted Emission test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked. These test results of the conducted disturbance are recorded in section 3.7.

3.7. Conducted Emission at Mains Terminals Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

EUT: Intelligent Processing Card Model No. : MLU270-F5K

The EUT with the following test modes was tested to read Q.P and Average values, all the test results are listed in next pages.

Test Date: Sep.03, 2019

Temperature: 24.1℃

Humidity: 56%

The details of test modes are as follows :

No.	Test Mode	Reference Test Data No.		
		Line	Neutral	
1.	Running	#3	#4	





Dis./Lisn	:2018 ENV216-L	LISN phase	:
Limit	:FCC PART 15 B QP		
Env./Ins.	:24.1*C/56%	Engineer	:Kennen
EUT	:Intelligent Processing Card		
Power Rating	:AC 120V/60Hz		
Test Mode	:Running		
	M/N:MLU270-F5K		

	emark
1 0.150 9.40 0.03 24.00 33.43 56.00 22.57 Av	 verage
2 0.150 9.40 0.03 33.54 42.97 66.00 23.03 QP)
3 0.214 9.40 0.03 17.50 26.93 53.05 26.12 Av	zerage
4 0.214 9.40 0.03 26.94 36.37 63.05 26.68 QP	>
5 0.853 9.40 0.03 10.90 20.33 46.00 25.67 Av	verage
6 0.853 9.40 0.03 20.04 29.47 56.00 26.53 QP	>
7 2.321 9.50 0.04 11.00 20.54 46.00 25.46 Av	verage
8 2.321 9.50 0.04 20.81 30.35 56.00 25.65 QP	>
9 16.486 9.60 0.13 23.90 33.63 50.00 16.37 Av	/erage
10 16.486 9.60 0.13 34.32 44.05 60.00 15.95 QP	>
11 17.661 9.60 0.14 19.60 29.34 50.00 20.66 Av	verage
12 17.661 9.60 0.14 28.13 37.87 60.00 22.13 QP)

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.

2. If the average limit is met when using a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.





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Dis./Lisn	:2018 ENV216-N	LISN phase	:
Limit	:FCC PART 15 B QP		
Env./Ins.	:24.1*C/56%	Engineer	:Kennen
EUT	:Intelligent Processing Card		
Power Rating	:AC 120V/60Hz		
Test Mode	:Running		
	M/N:MLU270-F5K		

No	Freq (MHz)	LISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.150	9.40	0.03	25.30	34.73	56.00	21.27	Average
2	0.150	9.40	0.03	34.71	44.14	66.00	21.86	QP
3	0.322	9.40	0.03	13.70	23.13	49.66	26.53	Average
4	0.322	9.40	0.03	24.28	33.71	59.66	25.95	QP
5	0.743	9.40	0.02	15.20	24.62	46.00	21.38	Average
6	0.743	9.40	0.02	23.33	32.75	56.00	23.25	QP
7	2.321	9.42	0.04	12.00	21.46	46.00	24.54	Average
8	2.321	9.42	0.04	21.12	30.58	56.00	25.42	QP
9	16.486	9.63	0.13	25.20	34.96	50.00	15.04	Average
10	16.486	9.63	0.13	34.17	43.93	60.00	16.07	QP
11	17.661	9.65	0.14	18.80	28.59	50.00	21.41	Average
12	17.661	9.65	0.14	28.46	38.25	60.00	21.75	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.

2. If the average limit is met when using a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipments

4.1.1. For frequency range 30MHz~1000MHz (In 3m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval		
1.	3#Chamber(NSA)	AUDIX	N/A	N/A	May.10,19	1 Year		
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	3 Year		
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.14,19	1 Year		
4.	EMI Test Receiver	Rohde & Schwarz	ESR7	101547	Apr.14,19	1 Year		
5.	Amplifier	HP	8447D	2648A04738	Apr.14,19	1 Year		
6.	Bi log Antenna	TESEQ	CBL6112D	35375	Nov.21,18	1 Year		
7.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3	Dec.01,18	1 Year		
8.	Coaxial Switch	Anritsu	MP59B	6201397222	Apr.14,19	1 Year		
9.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A		
Note:	Note: N/A means Not applicable							

Note: N/A means Not applicable.

4.1.2. For frequency range 1GHz~12GHz (In 3m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval		
1.	3#Chamber(Svswr)	AUDIX	N/A	N/A	Apr.18,19	1 Year		
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	3 Year		
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.14,19	1 Year		
4.	Horn Antenna	ETS	3115	9607-4877	Dec.13,18	1 Year		
5.	Amplifier	Agilent	83017A	MY53270084	Oct.14,18	1 Year		
6.	RF Cable	Hubersuhner	SUCOFLEX106	505238/6	Apr.13,19	1 Year		
7.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A		
Note:	Note: N/A means Not applicable.							





4.2.1. In 3m Anechoic Chamber Test Setup Diagram for 30-1000MHz



4.2.2. In 3m Anechoic Chamber Test Setup Diagram for 1-12GHz





4.3. Radiated Emission Limit

All emanations from a Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dBµV/m)
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216~960	3	46.0
960~1000	3	54.0
Above 1000	3	74.0(Peak), 54.0(Average)

Notes: (1) Emission level = Antenna Factor + Cable Loss + Reading Emission level = Antenna Factor - Amp Factor + Cable Loss + Reading

(above 1000 MHz)

- (2) The lower limit shall apply at the transition frequencies.
- 4.4. EUT Configuration on Test

The configurations of EUT are listed in section 3.5.

4.5. Operating Condition of EUT

- 4.5.1. Setup the EUT and simulator as shown as Section 4.2.
- 4.5.2. Turn on the power of all equipments.
- 4.5.3. Let the EUT worked in test mode (Running) and tested it.

4.6. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane measurement distance was 10m at a semi-anechoic chamber. An antenna was located 10m from the periphery of test system on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all the interface cables were changed according to ANSI C63.4:2014 on Radiated Emission test.

The bandwidth setting on the test receiver (R&S ESR7) is 120 kHz.

The resolution bandwidth of the Agilent Spectrum Analyzer FSV30 was set at 1MHz. (For above 1GHz)

The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values.

The frequency range from 1GHz to 12GHz was checked and all final readings of measurement were with Peak and Average detector, measurement distance was 3m at semi-anechoic chamber. The EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. The portion of the test volume that was obstructed by absorber placed on the floor (30cm maximum).

Finally, selected operating situations at Anechoic Chamber measurement, all the test results are listed in section 4.7.



4.7. Radiated Emission Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)EUT: Intelligent Processing CardModel No. : GeForce RTX 2060

For frequency range 30MHz~1GHz

Test Date: Sep.18, 2019 Test

Temperature: 22.8°C

Humidity: 61%

]	The de	tails of test modes are as follows:			
	No	. Test Mode	Reference Test Data N		
	110.		Horizontal	Vertical	
	1.	Running	#10	#9	

For frequency range 1GHz~12GHz

Test Date: Sep.03, 2019

Temperature: 22.8°C

Humidity: 61%

The details of test modes are as follows :

No	Test Mode	Reference Test Data No.		
INO.		Horizontal	Vertical	
1.	Running	#3	#4	



















5. DEVIATION TO TEST SPECIFICATIONS

[NONE]



6. PHOTOGRAPHS

6.1. Photos of Power Line Conducted Emission Test















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Figure 2 General appearance of the EUT



Audix Technology (Shenzhen) Co., ltd.. Report No. ACS-F19169 Page 24 of 30

















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Figure 8 General appearance of the EUT







Figure 9 General appearance of the EUT



Figure 10 General appearance of the EUT







Figure 12 General appearance of the EUT





