EMF TEST REPORT

For

Intel Corporation

Intel® NUC

Model Name: NUC7i3BNH

Family Product Code: xNUC7xBNHx

(Where x may be a combination of alphanumeric characters or blank)

Brand: Intel®

Prepared for : Intel Corporation
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Santa Clara, CA 95054,
USA

Prepared By : AUDIX Technology Corporation
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Testing Laboratory 1724

TESTING
NVLAP LAB CODE 200077-0

File Number	:	C1M1611094
Report Number	:	EM-RF160268
Date of Test	:	2016. 11. 25
Date of Report	:	2016. 11. 28

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EMF TEST REPORT

Applicant	:	Intel Corporation
EUT Description	:	Intel® NUC
(A) Model Name	:	NUC7i3BNH
(B) Family Product Code	:	xNUC7xBNHx (Where x may be a combination of alphanumeric characters or blank)
(C) Serial Number	:	G6BN6470002B
(D) Brand Name	:	Intel®
(E) Power Supply	:	DC 19V, 3.42A
(F) Test Voltage	:	AC 230V, 50Hz (Via AC Adapter)

Measurement Standards Used:

EN 62311:2008
EN 62479:2010

Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)

The device described above is tested by AUDIX Technology Corporation, and found compliance with the requirement of the above standards. The client should not use it to claim product endorsement by any government agencies.

This report applies to above tested sample only and shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: 2016. 11. 25 Date of Report: 2016. 11. 28

Producer: Sabrina Wang
(Sabrina Wang/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. DESCRIPTION OF REVISION HISTORY

Edition No.	Date of Rev.	Revision Summary	Report No.
0	2016. 11. 28	Original Report	EM-RF160268

2. SUMMARY OF MEASUREMENTS AND RESULTS

2.1.Description of Standards and Results

Clause (EN 62311)	Description of Item	Results
3.6	Electric field strength (E)	**PASS**

3. GENERAL INFORMATION

3.1. Description of Device (EUT)

Product	Intel® NUC
Model Name	NUC7i3BNH
Family Product Code	xNUC7xBNHx (Where x may be a combination of alphanumeric characters or blank)
Serial Number	G6BN6470002B
Firmware Version	BN0025
Brand Name	Intel®
Applicant	Intel Corporation 2200 Mission College Blvd, Santa Clara, CA 95054, USA
The Equipment type	802.11a/b/g/n/ac +BT2.1(BDR/EDR) + BT4.2(BLE)
Fundamental Range	2.4GHz: 802.11b/g/n-HT20: 2412MHz ~ 2472MHz 802.11n-HT40: 2422MHz ~ 2462MHz 5GHz: **UNII Band I:** 802.11a/n-HT20/ac-VHT20: 5180MHz ~ 5240MHz 802.11n-HT40/ac-VHT40: 5190MHz ~ 5230MHz 802.11ac-VHT80: 5210MHz **UNII Band II:** 802.11a/n-HT20/ac-VHT20: 5260Hz ~ 5320MHz 802.11n-HT40/ac-VHT40: 5270MHz ~ 5310MHz 802.11ac-VHT80: 5290MHz **UNII Band III:** 802.11a/n-HT20/ac-VHT20: 5500MHz ~ 5700MHz 802.11n-HT40/ac-VHT40: 5510MHz ~ 5670MHz 802.11ac-VHT80: 5530MHz ~ 5610MHz **UNII Band IV:** 802.11a/n-HT20/ac-VHT20: 5745MHz ~ 5825MHz 802.11n-HT40/ac-VHT40: 5755MHz ~ 5795MHz 802.11ac-VHT80: 5775MHz Bluetooth and BLE: 2402MHz ~ 2480MHz

Frequency Channel	2.4GHz: 802.11b/g/n-HT20: 13 channels 802.11n-HT40: 9 channels 5GHz: **UNII Band I:** 802.11a/n-HT20/ac-VHT20: 4 channels 802.11n-HT40/ac-VHT40: 2 channels 802.11ac-VHT80: 1 channel **UNII Band II:** 802.11a/n-HT20/ac-VHT20: 4 channels 802.11n-HT40/ac-VHT40: 2 channels 802.11ac-VHT80: 1 channel **UNII Band III:** 802.11a/n-HT20/ac-VHT20: 11 channels 802.11n-HT40/ac-VHT40: 5 channels 802.11ac-VHT80: 2 channel **UNII Band IV:** 802.11a/n-HT20/ac-VHT20: 5 channels 802.11n-HT40/ac-VHT40: 2 channels 802.11ac-VHT80: 1 channel Bluetooth: 79 channels BLE: 40 channels
Radio Technology	802.11b: DSSS Modulation (DBPSK/DQPSK/CCK) 802.11g: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11a: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11n: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11ac: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) Bluetooth: FHSS (GFSK, π/4DQPSK, 8-DPSK) BLE: GFSK
Data Transfer Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11a: up to 54Mbps 802.11n: up to 150Mbps 802.11ac: up to 433Mbps BT: 1/2/3Mbps BLE: 1Mbps
Antenna Type	PIFA Antenna
Antenna Gain	Main: 2.4G WLAN: -2.67dBi 5G WLAN: UNII Band I: 0.69dBi UNII Band II : 0.69dBi UNII Band III: 1.70dBi UNII Band IV: 1.51dBi AUX: BT: -2.67dBi
Power Supply Rating	Refer to AC adapter rating.
Date of Receipt of Sample	2016. 11. 08
Sample Status	Mass-production
Interface Ports of EUT	Type C Port (Including Thunderbolt) x1 HDMI Port x1 USB 3.0 Ports x3 (Front x1, Back x2) USB Port x1 (Front x1) SPK/MIC/Audio Port x1 RJ45 Ethernet Port x1 (10/100/1000Mbps) SD Slot x1 DC In x1

3.2. Modification Record

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

3.3. Descriptions of Key Components and Operating Modes

3.3.1. For the All Component Lists

Item	Supplier	Model / Type	Character
Mother Board	Intel	NUC7i3BNB	AA#: J22859-300 S/N: GEBN64000BDS
CPU (BGA1356)	Intel	I3-7100U	2.4GHz
Memory	Transcend	TS2GSH64V1B	16GB, DDR4-2133MHz
	Samsung	M471A2K43BB0-CPB	16GB, DDR4-2133MHz
	ADATA	AD4S2400316G17-B	16GB, DDR4-2400MHz
	Samsung	M471A2K43BB1-CRC	16GB, DDR4-2400MHz
	Transcend	TS2GSH64V4B	16GB, DDR4-2400MHz
M.2 SSD	Micron	CT250MX200SSD4	250GB, M.2(2280)-SATA
	ADATA	ASP900NS38-256GM-C	256GB, M.2(2280)-SATA
	Intel	SSDSCKKR180H6XN	180GB, M.2(2280)-SATA
	Intel	SSDSCKKF010X6	1TB, M.2(2280)-SATA
	Liteon	L8T-256L9G	256GB, M.2(2280)-SATA
	Liteon	LGT-256B1P	256GB, M.2(2280)-SATA
	Kingston	SHPM2280P2	240GB, M.2(2280)-SATA
	SAMSUNG	MZVPV512HDGL-00000	512GB, M.2(2280)-SATA
	Toshiba	THNSN5256GPU7	256GB, M.2(2280)-SATA
	Transcend	TS256GMTS800	256GB, M.2(2280)-SATA
SSD / HDD	Samsung	MZ-7KE1T0	1TB, SATA III, SSD
	Intel	SSDSC2BW240A401	240GB, SATA III, SSD
	Transcend	TS512GSSD370	512GB, SATA III, SSD
	SanDisk	SDSSDHII-480G-G25	480GB, SATA III, SSD
	Crucial (Micron)	CT120M500SSD1	120GB, SATA III, SSD
	Kingston	SV300S37A/480G	480GB, SATA III, SSD
	Seagate (Samsung)	ST2000LM003	2TB, 5400rpm, HDD
	Seagate (Samsung)	ST1000LM014	1TB, 5400rpm, HDD
	WD	WD10JPVX-22JC3T0	1TB, 5400rpm, HDD
	Toshiba	MQ01ABD100	1TB, 5400rpm, HDD
	Hitachi	HTS721010A9E630	1TB, 7200rpm, HDD
	Intel	SSDSC2KW010X6X1	1TB, SATA3, SSD
	Intel	SSDSC2BB120G6XA	120GB, SATA3, SSD
	Intel	SSDSC2KR180H6XN	180GB, SATA3, SSD
	Intel	SSDSC2KF010X6X1	1TB, SATA3, SSD
	Seagate	ST1000LM035	1TB, SATA3, Mobile HDD
	Seagate	ST2000LM007	2TB, SATA3, Mobile HDD
WLAN Combo Card	Intel	8265D2W	802.11 a/b/g/n/ac + BT 4.2 + BLE FCC ID: PD98265D2
Antenna	Linking	T-543-9291126-1	Main, PIFA Antenna
		T-543-9291126-2	AUX, PIFA Antenna

Item	Supplier	Model / Type	Character
AC Adapter (Wall-mount, 2C)	FSP	FSP065-10AABA	I/P: 100-240Vac, 50-60Hz, 1.5A. O/P: 19Vdc, 3.43A, 65W max

Remark: For more detailed features description, please refer to the manufacturer's specifications or the user manual.

3.3.2. The EUT has the following critical components, which are used to establish a basic configuration of system during test:

Worst Configuration			
Component Item	Supplier	Model/Type	Specification
Mother Board	Intel	NUC7i3BNB	AA#: J22859-300 S/N: GEBN64000BDS
CPU (BGA1356)	Intel	I3-7100U	2.4GHz
Memory	Transcend	TS2GSH64V4B	16GB, DDR4-2400MHz
M.2 SSD	Intel	SSDSCKKF010X6	1TB, M.2(2280)-SATA
SSD	Samsung	MZ-7KE1T0	1TB, SATA III, SSD
WLAN Combo Card	Intel	8265D2W	802.11 a/b/g/n/ac + BT 4.2 + BLE FCC ID: PD98265D2
Antenna	Linking	T-543-9291126-1	Main, PIFA Antenna
		T-543-9291126-2	AUX, PIFA Antenna
AC Adapter	FSP	FSP065-10AABA	I/P: 100-240Vac, 50-60Hz, 1.5A. O/P: 19Vdc, 3.43A, 65W max

3.4. Tested Supporting System List

3.4.1. Support Peripheral Unit

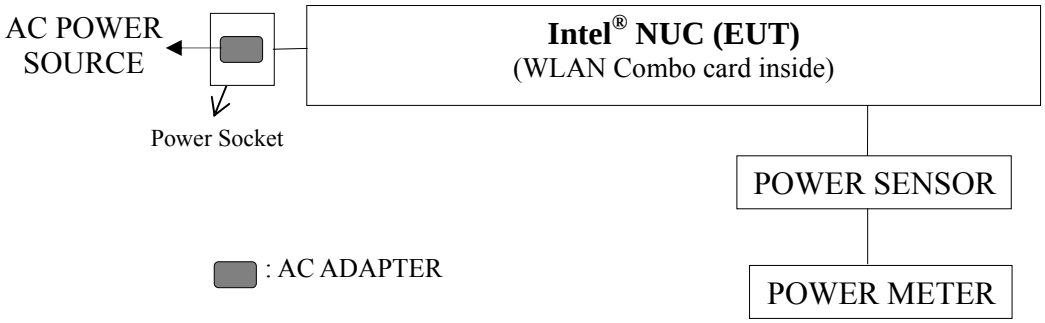
No.	Product	Brand	Model No.	Serial No.	Approval	Remarks
A	Power Socket	N/A	N/A	N/A	N/A	Provided by LAB

3.4.2. Cable Lists

No.	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Power Cord	1	1.8	No	1	Supplied by Client
2	AC Power Cord	2	1.8	No	0	Provided by LAB

3.5. Block Diagram of Test Setup

3.5.1. RF Output Power Measurement



3.6. View of Test Setup

3.7. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099301 Website : www.audixtech.com Contact e-mail: sales@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation TW1004 & TW1090 (4) VCCI (Japan) Member No. 0237
Test Facilities	(1) Fully Anechoic Chamber (2) RF Test Room

3.8. Measurement Uncertainty

Test Item	Uncertainty
RF Output Power	±0.34dB

Remark：Uncertainty = $ku_c(y)$

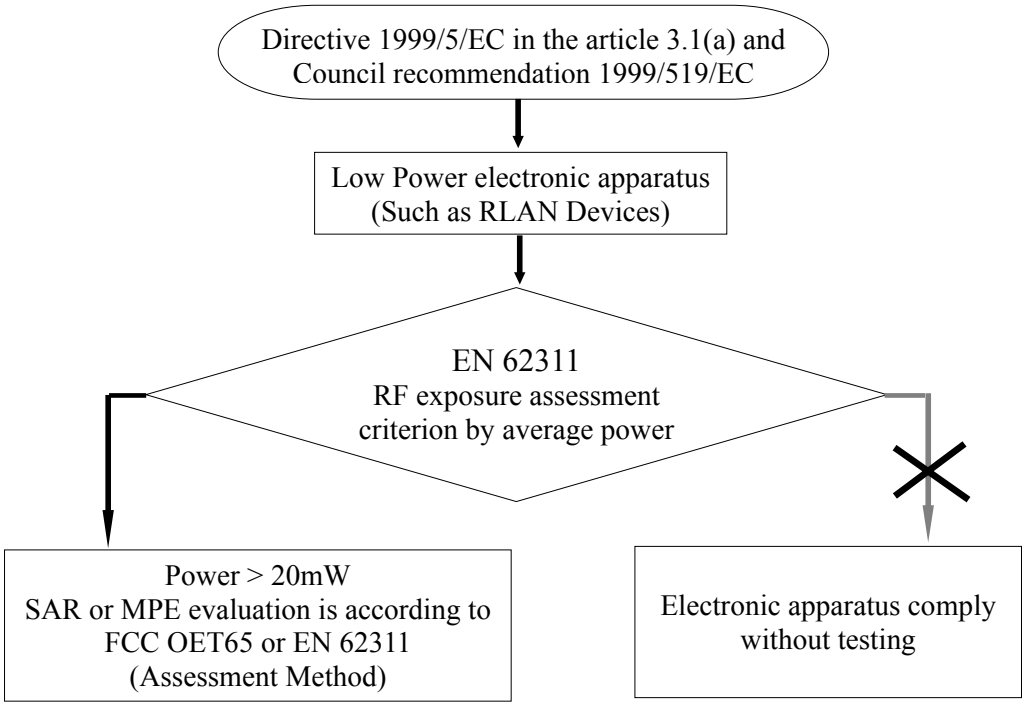
4. EN 62311 REQUIREMENT

4.1. Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Power Meter	Anritsu	ML2487A	6K00005406	2016. 02. 18	2017. 02. 17
2.	Power Sensor	Anritsu	MA2491A	030873	2016. 02. 18	2017. 02. 17

4.2. Evaluation Routine

4.2.1. Low Power Electronic Apparatus for RF exposure evaluation routine



4.2.2. Reference Levels

Council Recommendation 1999/519/EC Annex III
Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)

Frequency range	E-field Strength (V/m)	H-field Strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m2)
0-1 Hz	–	3.2×10^4	4×10^4	–
1-8 Hz	10000	$3.2\times10^4/f^2$	$4\times10^4/f^2$	–
8-25 Hz	10000	4000/f	5000/f	–
0.025-0.8 kHz	250/f	4/f	5/f	–
0.8-3 kHz	250/f	5	6.25	–
3-150 kHz	87	5	6.25	–
0.15-1 MHz	87	0.73/f	0.92/f	–
1-10 MHz	$87/f^{1/2}$	0.73/f	0.92/f	–
10-400 MHz	28	0.073	0.092	2
400-2000 MHz	$1.375\ f^{1/2}$	$0.0037\ f^{1/2}$	$0.0046\ f^{1/2}$	f/200
2-300 GHz	61	0.16	0.20	10

Notes:
1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, S_{eq}, E^2, H^2, and B^2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, S_{eq}, E^2, H^2, and B^2 are to be averaged over any $68/f^{1.05}$- minute period (f in GHz).
4. No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

4.2.3. Human Exposure Assessment

Classification of the Assessment Methods

The antenna of the product, under normal use condition is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the user's manual. So, this product under normal use is located on electromagnetic far field between the human body.

Far Field Calculation Formula:

$$E = \eta_0 H = \frac{\sqrt{30PG(\theta\Phi)}}{r}$$

G = antenna gain relative to an isotropic antenna
θ, Φ = elevation and azimuth angles to point of investigation
r = distance from observation point to the antenna
η_0 = Characteristic impedance of free space

4.3. Test Information

EUT	Intel® NUC
Test Model Number	NUC7i3BNH
Test Date:	2016. 11. 25
Ambient Temperature	26°C
Relative Humidity	49%
Test Program	DRTU

4.4. Test Results

PASSED.

The test results presented was worse modes in each band.

4.4.1. For 2.4G Band

Test Mode: 802.11n-HT20

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 7	2442	15.01	31.6957	4.8756	61	0.0160

Test Mode: Bluetooth, GFSK Modulation

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 39	2441	7.55	5.6885	2.0655	61	0.0068

Test Mode: BLE Function

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 17	2440	1.99	1.5812	1.0890	61	0.0036

4.4.2. For 5G Band

Band I, Test Mode: 802.11n-HT40

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 38	5190	18.52	71.1214	7.3035	61	0.0239

Band II, Test Mode: 802.11ac-VHT80

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 58	5290	18.83	76.3836	7.5689	61	0.0248

Band III, Test Mode: 802.11n-HT40

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 102	5510	19.74	94.1890	8.4049	61	0.0276

Band IV, Test Mode: 802.11a

Channel	Channel Frequency (MHz)	Output Power-EIRP (dBm)	Output Power EIRP (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Safety Distance for complying with 1999/519/EC (m)
CH 149	5745	11.29	13.4586	3.1771	61	0.0104

APPENDIX I

(Lab. Certificate)

(Total Pages: 2 Pages)

Certificate No.：L1724-151202

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Audix Technology Corporation
EMC Department
No.53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan (R.O.C.)

is accredited in respect of laboratory

Accreditation Criteria	：	ISO/IEC 17025: 2005
Accreditation Number	：	1724
Originally Accredited	：	November 27, 2006
Effective Period	：	November 27, 2015 to November 26, 2018
Accredited Scope	：	Testing Field, see described in the Appendix
Specific Accreditation Program	：	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date：December 02, 2015

P1, total 22 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200077-0

Audix Technology Corporation EMC Department

New Taipei City
Taiwan

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2015-12-15 through 2016-12-31
Effective Dates

For the National Voluntary Laboratory Accreditation Program