

FCC Report (NFC)

Applicant: EarlySense Ltd.

Address of Applicant: Derech Ze'ev Jabotinsky 7, 5252007, Ramat Gan, Israel

Manufacturer: EarlySense Ltd.

Address of Manufacturer: Derech Ze'ev Jabotinsky 7, 5252007, Ramat Gan, Israel

Factory 1:

CPC Solutions Ltd.

Address of Factory 1: 18, Ha'nawah St. Karmiel, Israel

Factory 2: Baya Technologies Ltd.

Address of Factory 2: 9 Ben Tsion Galis street, Petah Tikva 4927909 Israel

Equipment Under Test (EUT)

Product Name: EarlySense InSight System

Model No.: AME-01350-EU/EU-B/US/US-F

Trade Mark: EarlySense InSight

FCC ID: 2AQ32-INSIGHT

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.225

Date of sample receipt: October 18, 2018

Date of Test: October 19-30, 2018

Date of report issued: October 31, 2018

Test Result : PASS *

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

Authorized Signature:



Robinson Lo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	October 31, 2018	Original

Prepared By:

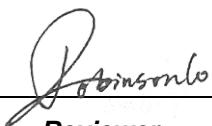


Date:

October 31, 2018

Project Engineer

Check By:



Date:

October 31, 2018

Reviewer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
4.1 MEASUREMENT UNCERTAINTY	4
5 GENERAL INFORMATION	5
5.1 GENERAL DESCRIPTION OF EUT	5
5.2 TEST MODE	6
5.3 DESCRIPTION OF SUPPORT UNITS	6
5.4 TEST FACILITY	6
5.5 TEST LOCATION	6
6 TEST INSTRUMENTS LIST	7
7 TEST RESULTS AND MEASUREMENT DATA	9
7.1 ANTENNA REQUIREMENT	9
7.2 CONDUCTED EMISSIONS	10
7.3 FIELD STRENGTH OF FUNDAMENTAL EMISSIONS AND MASK MEASUREMENT	13
7.4 RADIATED EMISSION	15
7.5 20dB EMISSION BANDWIDTH	19
7.6 FREQUENCY STABILITY MEASUREMENT	21
8 TEST SETUP PHOTO	23
9 EUT CONSTRUCTIONAL DETAILS	23

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field Strength of Fundamental Emissions and Mask Measurement	15.225(a)(b)(c)	Pass
Radiated Emission	15.225(d)&15.209	Pass
20dB Emission Bandwidth	15.225&15.215	Pass
Frequency Stability Measurement	15.225(e)	Pass

Remark:

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	EarlySense InSight System
Model No.:	AME-01350-EU/EU-B/US/US-F
Serial No.:	N/A
Test sample(s) ID:	GTS201810000053-1
Sample(s) Status	Engineered sample
Hardware version:	N/A
Software version:	N/A
Operation Frequency:	13.56MHz
Channel Number:	1
Modulation:	ASK
Antenna:	PIFA antenna with max gain 0dBi
Power supply:	DC 5V, 2A

5.2 Test mode

Transmitter mode	Keep the EUT in continuously transmitting.										
Pre-test mode.											
GTS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:											
<table border="1"><thead><tr><th>Axis</th><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>Field Strength(dBuV/m)</td><td>32.82</td><td>34.79</td><td>37.11</td></tr></tbody></table>				Axis	X	Y	Z	Field Strength(dBuV/m)	32.82	34.79	37.11
Axis	X	Y	Z								
Field Strength(dBuV/m)	32.82	34.79	37.11								
Final Test Mode:											
According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup": Y axis (see the test setup photo)											

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
LENOVO	PC	X260	N/A

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: • FCC —Registration No.: 381383 Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 381383, January 08, 2018. • Industry Canada (IC) —Registration No.: 9079A-2 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.
--

5.5 Test Location

All tests were performed at: Global United Technology Services Co., Ltd. Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960
--

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019
21	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 27 2018	June. 26 2019

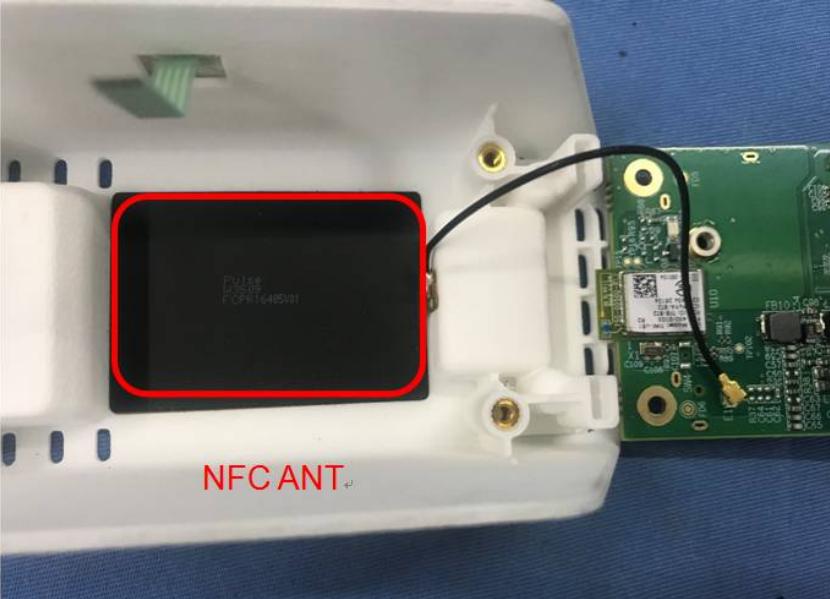
Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

7 Test results and Measurement Data

7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
<i>The NFC antenna is PIFA antenna, the best case gain of the antenna is 0dBi</i>	



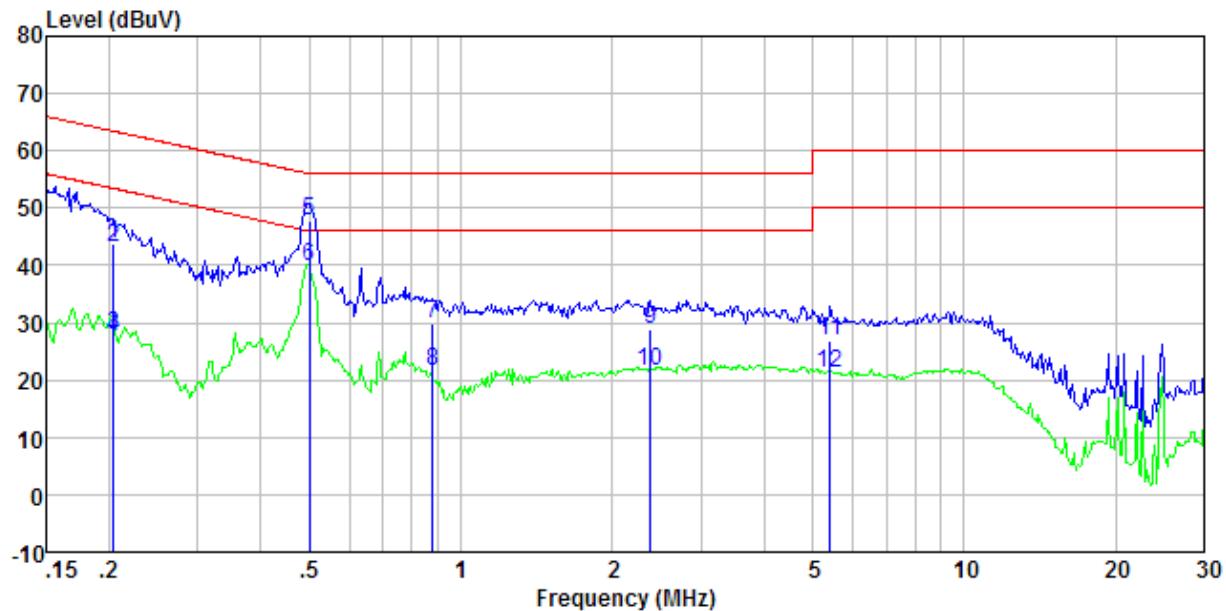
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207																
Test Method:	ANSI C63.10:2013																
Test Frequency Range:	150KHz to 30MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto																
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>			Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															
	* Decreases with the logarithm of the frequency.																
Test setup:	<p>Reference Plane</p> <p>LISN</p> <p>AUX Equipment</p> <p>E.U.T</p> <p>Test table/Insulation plane</p> <p>EMI Receiver</p> <p>Filter</p> <p>AC power</p> <p>40cm</p> <p>80cm</p> <p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>																
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 																
Test Instruments:	Refer to section 6.0 for details																
Test mode:	Refer to section 5.2 for details																
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar											
Test voltage:	AC120V 60Hz																
Test results:	Pass																

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

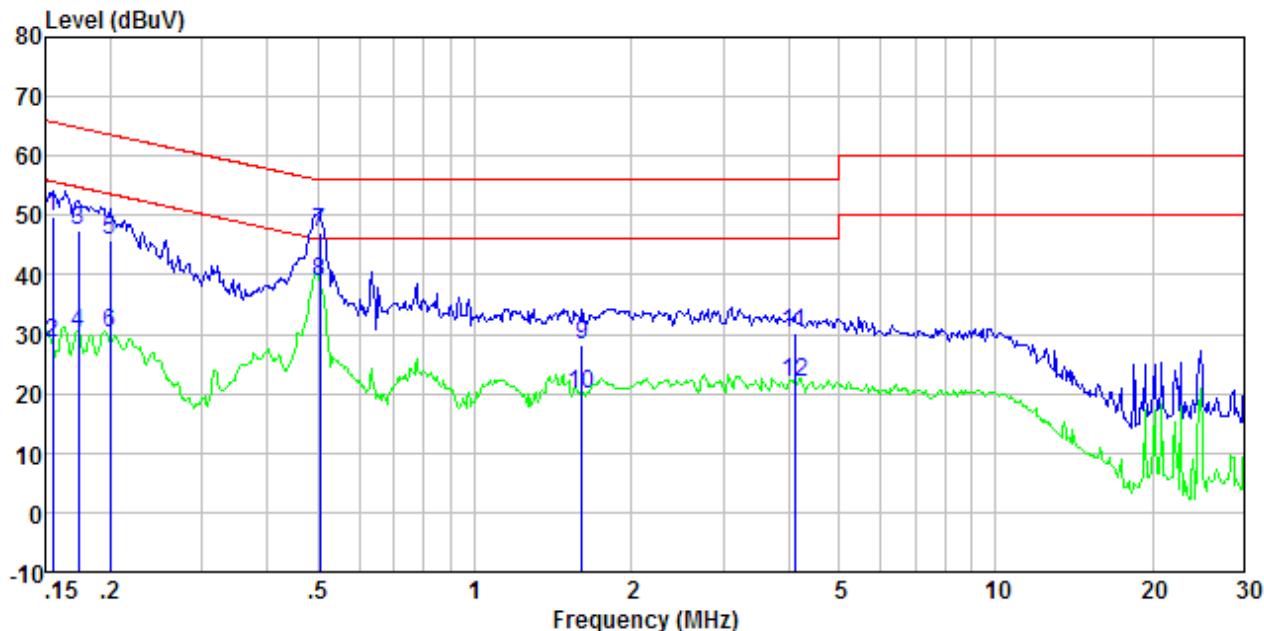
Measurement data:

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.20	43.26	0.40	0.11	43.77	63.45	-19.68	QP
0.20	42.64	0.40	0.11	43.15	63.45	-20.30	QP
0.20	27.42	0.40	0.11	27.93	53.45	-25.52	Average
0.20	27.15	0.40	0.11	27.66	53.45	-25.79	Average
0.50	47.27	0.32	0.11	47.70	56.01	-8.31	QP
0.50	39.23	0.32	0.11	39.66	46.01	-6.35	Average
0.88	29.63	0.22	0.14	29.99	56.00	-26.01	QP
0.88	21.18	0.22	0.14	21.54	46.00	-24.46	Average
2.38	28.41	0.20	0.18	28.79	56.00	-27.21	QP
2.38	21.15	0.20	0.18	21.53	46.00	-24.47	Average
5.42	26.38	0.20	0.17	26.75	60.00	-33.25	QP
5.42	20.88	0.20	0.17	21.25	50.00	-28.75	Average

Neutral:

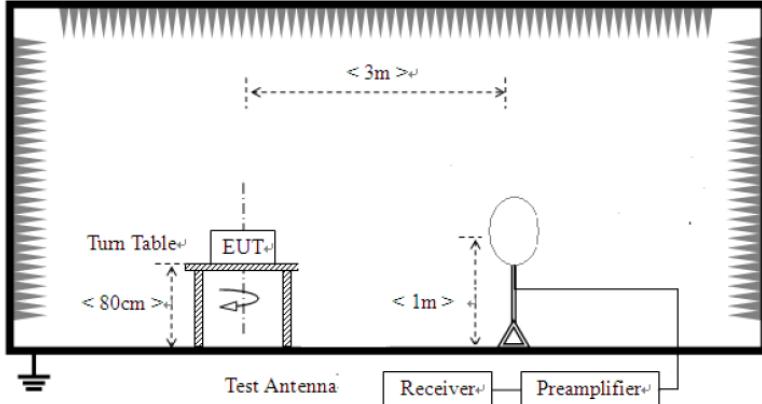


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	49.25	0.40	0.07	49.72	65.74	-16.02	QP
0.15	28.11	0.40	0.07	28.58	55.74	-27.16	Average
0.17	46.93	0.40	0.09	47.42	64.77	-17.35	QP
0.17	29.67	0.40	0.09	30.16	54.77	-24.61	Average
0.20	45.38	0.40	0.11	45.89	63.62	-17.73	QP
0.20	29.52	0.40	0.11	30.03	53.62	-23.59	Average
0.50	46.79	0.31	0.11	47.21	56.00	-8.79	QP
0.50	38.44	0.31	0.11	38.86	46.00	-7.14	Average
1.61	27.80	0.20	0.17	28.17	56.00	-27.83	QP
1.61	19.48	0.20	0.17	19.85	46.00	-26.15	Average
4.11	29.75	0.20	0.18	30.13	56.00	-25.87	QP
4.11	21.61	0.20	0.18	21.99	46.00	-24.01	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss

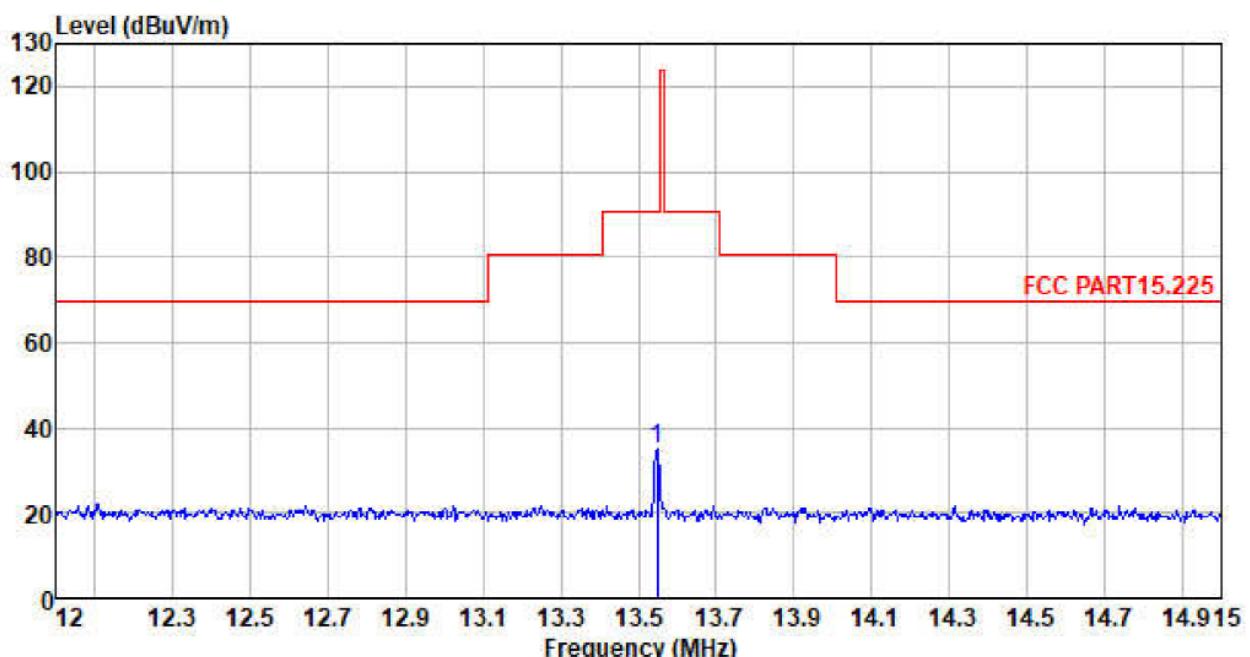
7.3 Field Strength of Fundamental Emissions and Mask Measurement

Test Requirement:	FCC Part15 C Section 15.225(a)(b)(c)		
Test Method:	ANSI C63.10:2013		
Test site:	Measurement Distance: 3m		
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=Auto		
limit:	Frequency (MHz)	Field Strength (microvolts/meter) at 30m	Field Strength (dBuV/m) at 3m
	13.410~13.553	334	90.5
	13.553~13.567	15848	124.0
	13.567~13.710	334	90.5
	13.710~14.010	106	80.5
Test setup:			
Test Procedure:	<ol style="list-style-type: none"> Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable. Power on the EUT, the turntable was rotated by 360 degrees to determine the position of the highest radiation. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength. For Fundamental emissions, use the receiver to measure QP reading. When the radiated emissions limits are expressed in terms of the average value of the emissions and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. 		

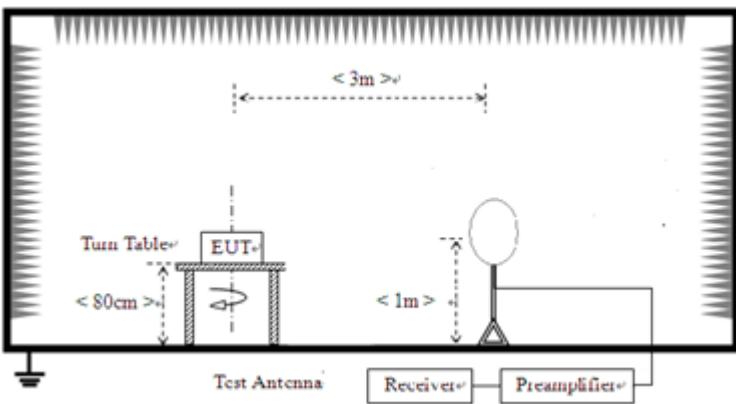
	6. Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1KHz for the band 13.553~13.567MHz.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test results:	Pass					

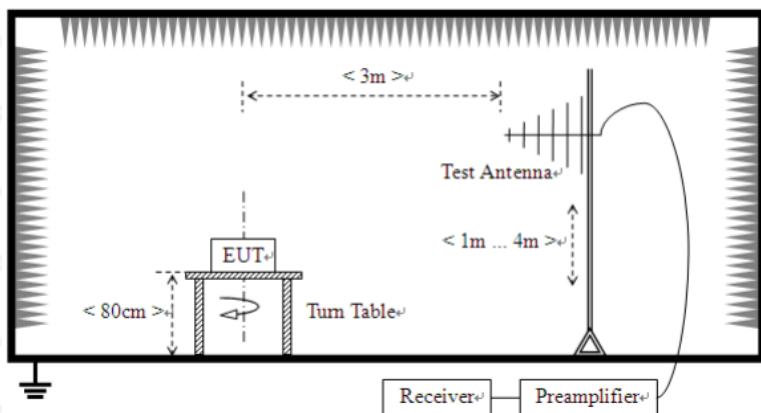
Measurement data:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
13.56	11.42	22.85	0.51	34.79	124.00	-89.21	QP



7.4 Radiated Emission

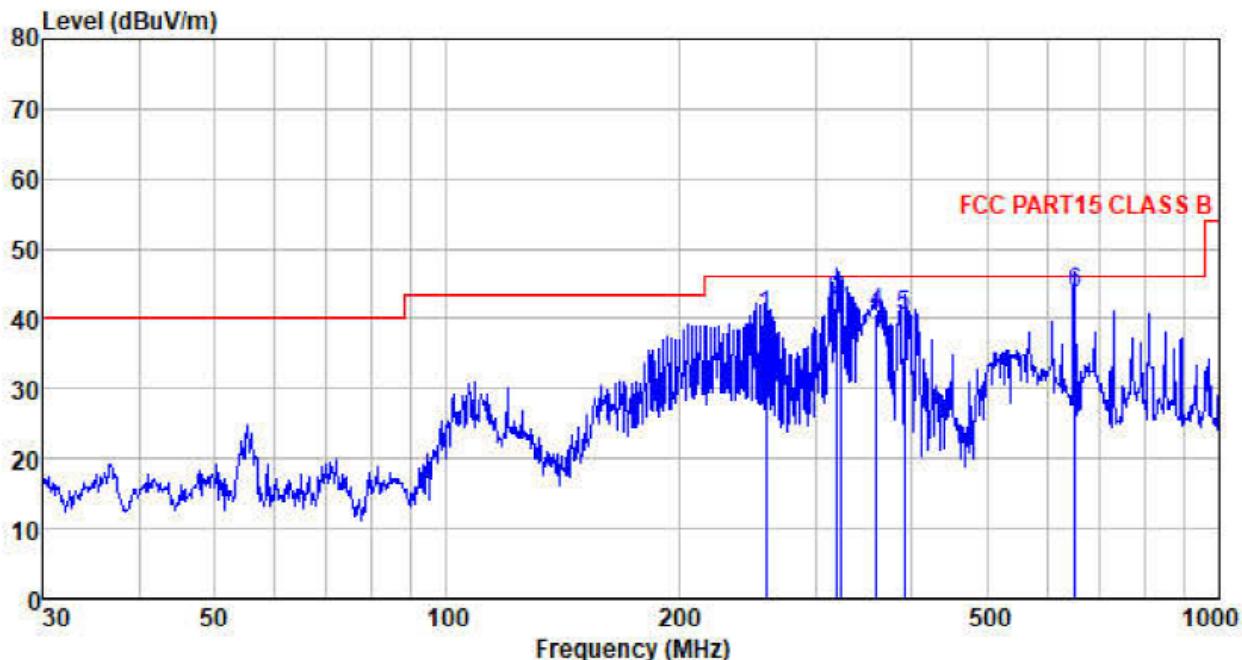
Test Requirement:	FCC Part15 C Section 15.225(d) and 15.209																												
Test Method:	ANSI C63.10: 2013																												
Test Frequency Range:	9KHz to 1000MHz																												
Test site:	Measurement Distance: 3m																												
Receiver setup:	Frequency	Detector	RBW	VBW	Remark																								
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value																								
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value																								
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value																								
Limit:	<p>All out of band emissions appearing in a restricted band as specified in Section 15.225 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.</p> <table border="1"> <thead> <tr> <th>Frequency (MHz)</th><th>Field strength (microvolt/meter)</th><th>Measurement distance (meters)</th></tr> </thead> <tbody> <tr> <td>0.009~0.490</td><td>2400/F(KHz)</td><td>300</td></tr> <tr> <td>0.490~1.705</td><td>24000/F(KHz)</td><td>30</td></tr> <tr> <td>1.705~30</td><td>30</td><td>30</td></tr> <tr> <td>30~88</td><td>100</td><td>3</td></tr> <tr> <td>88~216</td><td>150</td><td>3</td></tr> <tr> <td>216~960</td><td>200</td><td>3</td></tr> <tr> <td>960~1000</td><td>500</td><td>3</td></tr> </tbody> </table>					Frequency (MHz)	Field strength (microvolt/meter)	Measurement distance (meters)	0.009~0.490	2400/F(KHz)	300	0.490~1.705	24000/F(KHz)	30	1.705~30	30	30	30~88	100	3	88~216	150	3	216~960	200	3	960~1000	500	3
Frequency (MHz)	Field strength (microvolt/meter)	Measurement distance (meters)																											
0.009~0.490	2400/F(KHz)	300																											
0.490~1.705	24000/F(KHz)	30																											
1.705~30	30	30																											
30~88	100	3																											
88~216	150	3																											
216~960	200	3																											
960~1000	500	3																											
Test setup:	<p>Below 30MHz</p>  <p>Above 30MHz</p>																												



Test Procedure:	<ol style="list-style-type: none"> Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable. Power on the EUT, the turntable was rotated by 360 degrees to determine the position of the highest radiation. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization. For each suspected emissions, the antenna tower was scan (from 1M to 4M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading. Set the test-receiver system to Peak or CISPR quasi-peak detect function with specified bandwidth under maximum hold mode. When the radiated emissions limits are expressed in terms of the average value of the emissions and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1012mbar
Test voltage:	AC120V 60Hz
Test results:	Pass

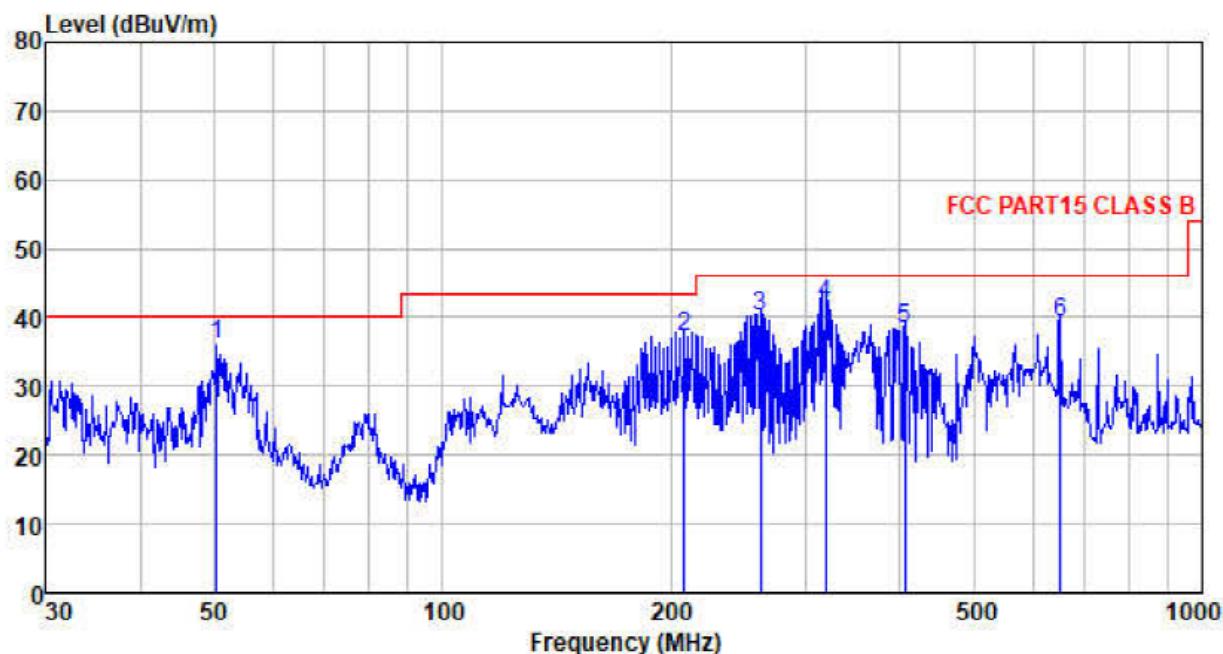
Measurement data:

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

Horizontal:

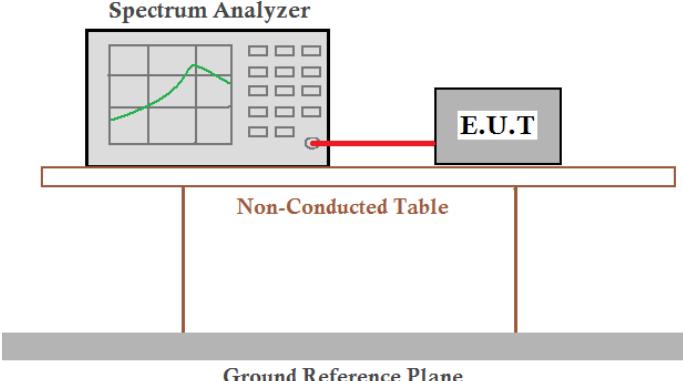
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
259.234	63.30	12.38	2.17	37.39	40.46	46.00	-5.54	QP
318.817	63.63	13.90	2.46	37.44	42.55	46.00	-3.45	QP
323.320	63.40	13.99	2.49	37.45	42.43	46.00	-3.57	QP
360.448	60.86	14.71	2.67	37.48	40.76	46.00	-5.24	QP
390.723	59.96	15.25	2.81	37.51	40.51	46.00	-5.49	QP
649.660	57.91	19.55	3.91	37.59	43.78	46.00	-2.22	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
50.409	59.08	12.44	0.77	36.19	36.10	40.00	-3.90	QP
207.850	61.93	10.69	1.89	37.34	37.17	43.50	-6.33	QP
261.975	62.84	12.46	2.18	37.39	40.09	46.00	-5.91	QP
318.817	63.08	13.90	2.46	37.44	42.00	46.00	-4.00	QP
406.088	57.46	15.52	2.88	37.52	38.34	46.00	-7.66	QP
649.660	53.43	19.55	3.91	37.59	39.30	46.00	-6.70	QP

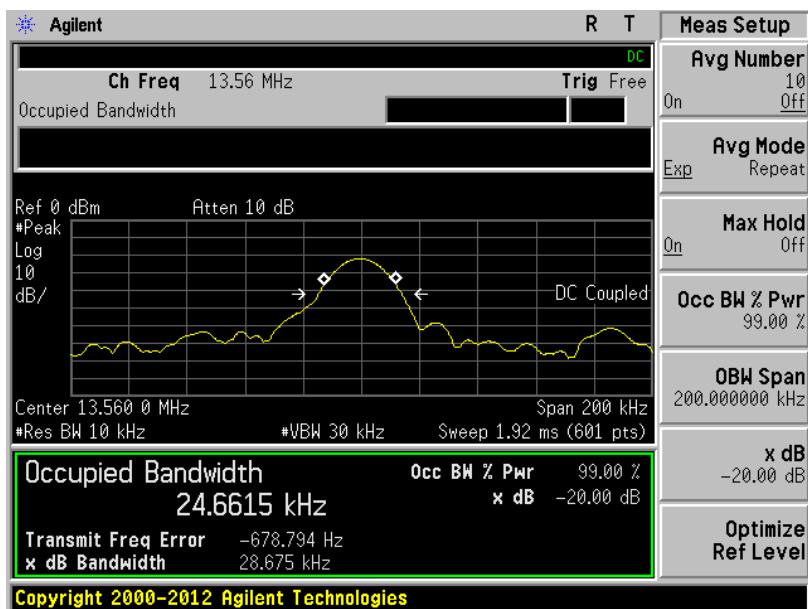
7.5 20dB Emission Bandwidth

Test Requirement:	FCC Part15 C Section 15.225 and 15.215
Test Method:	ANSI C63.10:2013
Limit:	N/A
Test Procedure:	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	<p style="text-align: center;">Spectrum Analyzer</p>  <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">Ground Reference Plane</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

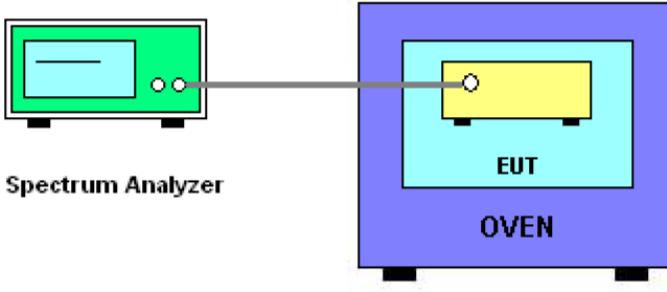
Measurement Data

Test frequency (MHz)	20dB bandwidth (KHz)	Result
13.56	28.675	Pass

Test plot as follows:



7.6 Frequency Stability Measurement

Test Requirement:	FCC Part15 C Section 15.225 (e)
Test Method:	ANSI C63.10: 2013
Receiver setup:	RBW=1KHz, VBW=1KHz, Sweep time=Auto
Limit:	<p>The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency</p> <p>over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage,</p> <p>for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.</p> <p>For battery operated equipment, the equipment tests shall be performed using a new battery.</p>
Test setup:	 <p>The diagram illustrates the test setup. A green 'Spectrum Analyzer' is connected to the 'antenna port' of a yellow 'EUT' (Equipment Under Test) box. The 'EUT' box is placed inside a purple 'OVEN' (oven) which is used to maintain a constant temperature during the test.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output (antenna port) was connected to the spectrum analyzer. 2. EUT have transmitted absence of modulation signal and fixed channelize 3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. 4. Set RBW=1KHz, VBW=1KHz with peak detector and maxhold settings. 5. fc is declaring of channel frequency. Then the frequency error formula is $(fc-f)/fc \times 10^6$ ppm and the limit is less than ± 100 ppm. 6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value 7. Extreme temperature rule is $-20^{\circ}\text{C} \sim 50^{\circ}\text{C}$
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Reference Frequency: 13.56MHz					
Power supplied (Vac)	Temperature (°C)	Frequency error		Limit	Result
		Hz	%		
120	-20	79	0.00058	+/- 0.01%	Pass
	-10	74	0.00055		
	0	83	0.00061		
	10	89	0.00066		
	20	75	0.00055		
	30	68	0.00050		
	40	85	0.00063		
	50	62	0.00046		

Reference Frequency: 13.56MHz					
Temperature (°C)	Power supplied (Vac)	Frequency error		Limit	Result
		Hz	Ppm(%)		
20	100	73	0.00054	+/- 0.01%	Pass
	120	77	0.00057		
	138	79	0.00058		

8 Test Setup Photo

Reference to the Annex

9 EUT Constructional Details

Reference to the Annex

----- End -----